

SITRANS P measuring instruments for pressure

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You can download all instructions, catalogs and certificates for SITRANS P free of charge at the following Internet address:
www.siemens.com/sitransp

SITRANS P measuring instruments for pressure

Product overview

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Overview

Application	Description	Page	Software for Parameterization
SITRANS P – measuring instruments for pressure, absolute pressure, differential pressure, flow and level			
	<p>Two- or three-wire transmitters for measuring gage and absolute pressure</p> <p>SITRANS P, Z series Compact single-range transmitters Analog electronics Available ex stock</p>	2/4	–
	<p>Two- or three-wire transmitters for measuring differential pressure</p> <p>SITRANS P250 Compact single-range transmitters Analog electronics Available ex stock</p>	2/12	–
	<p>Two- or three-wire transmitters for measuring gage and absolute pressure</p> <p>SITRANS P, ZD series Range adjustment: 5 : 1 Digital display Available ex stock</p>	2/17	–
	<p>Transmitters for gage and absolute pressure for food, pharmaceuticals and biotechnology</p> <p>SITRANS P Compact Single-range transmitters in 2-wire system Hygiene-based design with various aseptic connections according to EHEDG, FDA and GMP recommendations.</p>	2/21	–
	<p>Two-wire transmitters for measuring gage and absolute pressure</p> <p>SITRANS P300</p> <ul style="list-style-type: none"> • Hygiene-based design according to EHEDG, FDA and GMP • Parameterization over 3 buttons or communication over HART, PROFIBUS PA or FOUNDATION Fieldbus • Standard process connection G1½, ½-NPT and flush-mounted process connections available • Measuring range adjustment 100 : 1 	2/28	SIMATIC PDM
	<p>Two-wire transmitters for measuring gage pressure</p> <p>SITRANS P300 and DS III series with PMC connection for the paper industry</p> <ul style="list-style-type: none"> • Measuring range adjustment 100 : 1 • Process connections for the paper industry • Parameter assignment over 3 buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus 	2/47	SIMATIC PDM
	<p>Two-wire transmitters for measuring:</p> <ul style="list-style-type: none"> • Gage pressure, • Absolute pressure • Differential pressure and • Flow or • Level <p>SITRANS P, DS III series SITRANS P, DS III PA series SITRANS P, DS III FF series Range adjustment: 100 : 1 Parameterization using:</p> <ul style="list-style-type: none"> • 3 keys and HART for DS III series • 3 keys and PROFIBUS-PA for DS III PA series • 3 buttons and FOUNDATION Fieldbus for DS III FF series • Available ex stock 	2/63	SIMATIC PDM SIMATIC PDM
	<p>Supplementary electronics for adaptatioSiemens FI 01 · 2009n of two-wire transmitters for four-wire connections</p> <p>Output: 0 or 4 to 20 mA Power supply: 24 V AC/DC, 230 V AC</p>	2/134	–

SITRANS P measuring instruments for pressure

Product overview

Application	Description	Page	Software for Parameterization
	<p>2-wire transmitter for measuring hydrostatic levels</p> <p>SITRANS P, MPS series (submersible sensor)</p> <p>For measuring liquid levels in wells, tanks, channels, dams etc.</p>	2/146	–
	<p>Remote seals for measuring viscous, corrosive or fibrous media (as well as media at extreme temperatures)</p> <p>Remote seals in sandwich and flange designs</p> <p>Quick-release remote seals for the food industry</p> <p>Wide range of diaphragm materials and filling liquids available</p>	2/150	–
	<p>Shutting off the lines for the medium and differential pressure</p> <p>Mounting of transmitter on valve manifold or shut-off fitting</p> <p>Shut-off fittings and valve manifolds available in steel, brass or stainless steel</p> <p>Valve manifolds available for the various process connections of the SITRANS P transmitters</p>	2/190	–

SITRANS P measuring instruments for pressure

Z series for gage pressure

Siemens FI 01 · 2009 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.

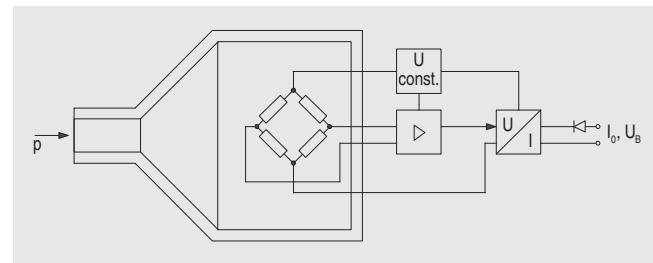
The electrical connection is made using a plug to DIN 43650 with a M16x1.5 cable inlet.

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.

SITRANS P measuring instruments for pressure

Z series for gage pressure

Technical specifications

SITRANS P pressure transmitter, Z series for gage pressure

Mode of operation

Measuring principle Thin-film strain gage

Input

Measured variable Reative 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

Error in measurement (at 25 °C (77 °F), including conformity error, hysteresis and repeatability) 0.5% of full-scale value-typical

Response time T₉₉ < 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 Al₂O₃ - 96%
• Process connection Brass, mat. No. 2.0402
• Gasket Viton
Process connection Male thread G₁/₂B female thread G₁/₈B

Power supply

Terminal voltage on pressure transmitter

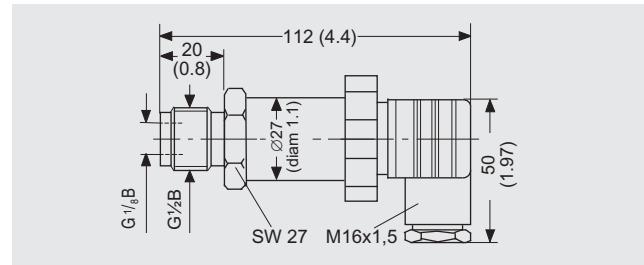
• For current output 10 to 36 V DC

Certificate and approvals

Classification according to pressure equipment directive (DRG 97/23/EC)

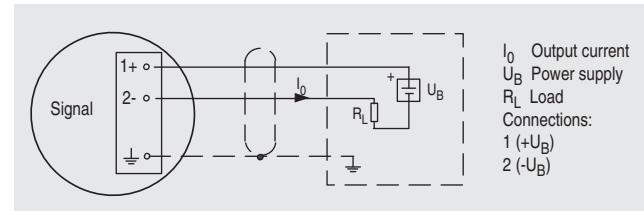
For gases of fluid group 1 and liquids of fluid 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

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

SITRANS P pressure transmitters, Z series for pressure

2-wire system, characteristic rising

Measured range

0 ... 16 bar g (0 ... 232 psi g) 32 bar g (464 psi g)
0 ... 25 bar g (0 ... 363 psi g) 64 bar g (928 psi g)

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)

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

Order No.

D) 7MF1562 - 00

Order code

3CB

3CD

9AA

H1Y

SITRANS P measuring instruments for pressure

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:

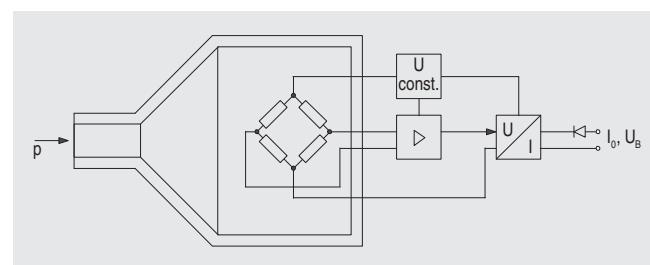
- Stainless steel housing with ceramic measuring cell and electronics module. The temperature-compensated ceramic measuring cell has a thin-film strain gage which is mounted on a ceramic diaphragm. The ceramic diaphragm can also be used for aggressive media.
- Process connection made of stainless steel 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.

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

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

Error in measurement (at 25 °C (77 °F), including conformity error, hysteresis and repeatability)	To EN 60770-1 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

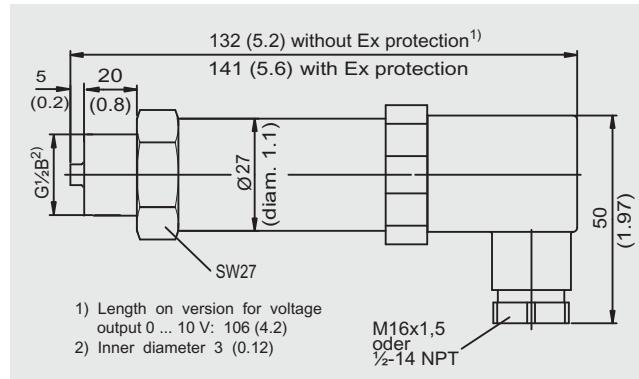
Classification according to pressure equipment directive (DRGL 97/23/EC) For gases of fluid group 1 and liquids of fluid 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

Explosion protection

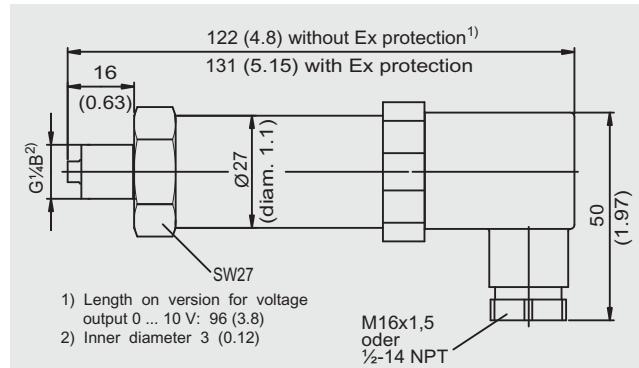
- Intrinsic safety "i" (only with current output)
 - Identification Ex II 1/2G EEx ia IIC T4
- Intrinsic safety "T.I.I.S." (only with current output) applied

Lloyds Register of Shipping Certificate No. 03/30003

Dimensional drawings



Pressure transmitter 7MF1564... with process connection G 1/2" male, dimensions in mm (inch)



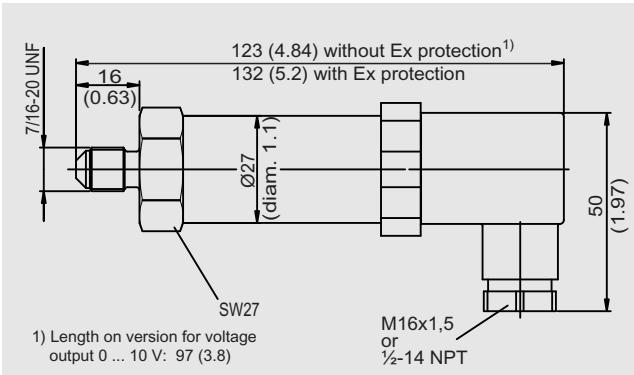
Pressure transmitter 7MF1564... with process connection G 1/4" male, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

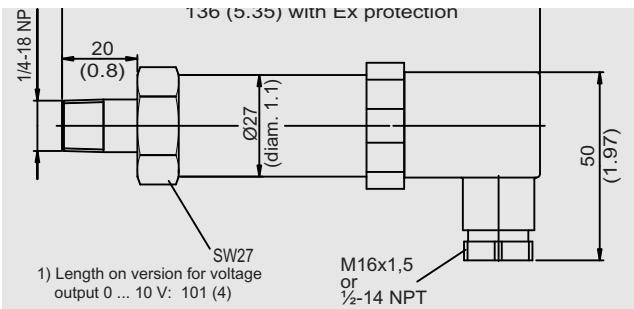
Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

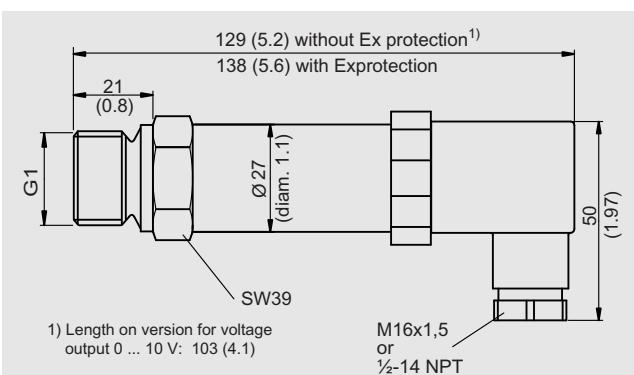
2



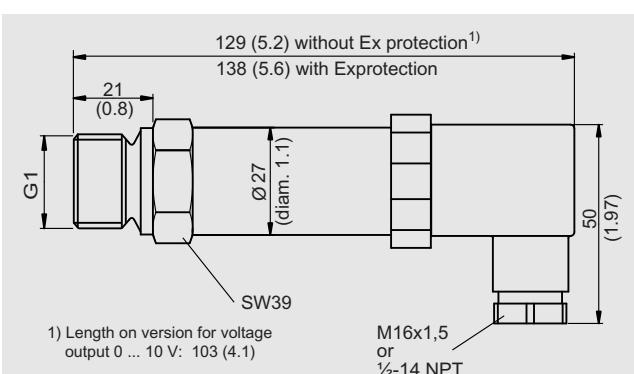
Pressure transmitter 7MF1564-... with process connection 7/16-20 UNF male, dimensions in mm (inch)



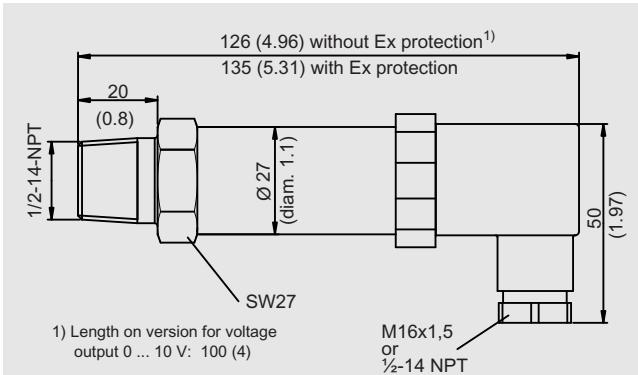
Pressure transmitter 7MF1564... with process connection 1/4"-18 NPT male, dimensions in mm (inch)



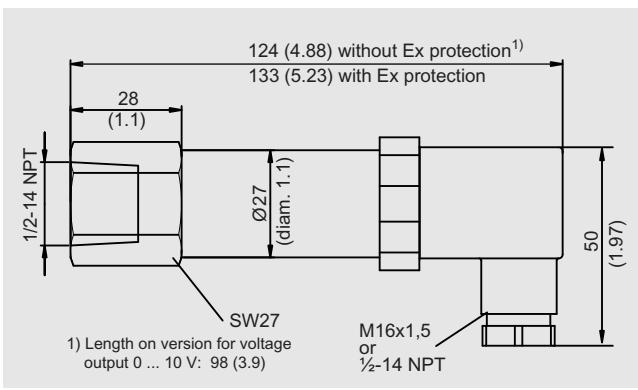
Pressure transmitter 7MF1564... with process connection 1/4"-18 NPT female, dimensions in mm (inch)



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

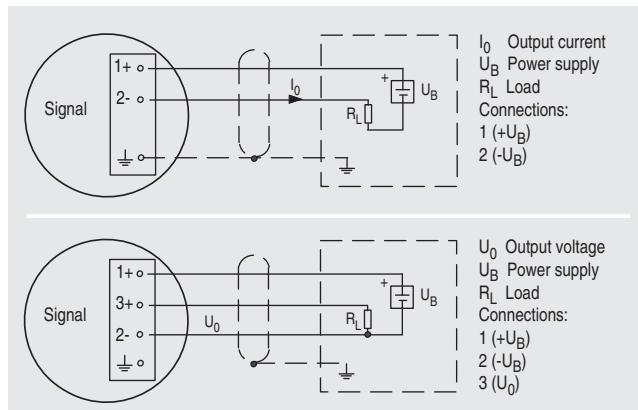


Pressure transmitter 7MF1564... with process connection 1/2"-14 NPT male, dimensions in mm (inch)



Pressure transmitter 7MF1564... with process connection 1/2"-14 NPT female, 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

Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

Selection and Ordering data

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

Order No.

Order code

D) 7 MF 1 5 6 4 - ■■■■■ - ■■■■■ 1

Measuring range

perm. working pressure

Min.

Max.

Burst pressure

For gage 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) ►	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

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) ►	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 g (≥ 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

► 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 measuring cell.
- The required span of the device must lie between the smallest and the largest possible span of the entire device range

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

Selection and Ordering data

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

Order No.

Order code

D) 7 MF 1 5 6 4 -  1

Measuring range	Perm. working pressure min.	Perm. working pressure max.	Burst pressure			
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
Measuring ranges for absolute pressure (only for US market)						
(0 ... 10 psi a)	(0 psi a)	(20 psi a)	(60 psi a) J)	6 AG		
(0 ... 15 psi a)	(0 psi a)	(30 psi a)	(72 psi a) J)	6 BA		
(0 ... 20 psi a)	(0 psi a)	(40 psi a)	(72 psi a) J)	6 BB		
(0 ... 30 psi a)	(0 psi a)	(60 psi a)	(72 psi a) J)	6 BD		
(0 ... 60 psi a)	(0 psi a)	(120 psi a)	(175 psi a) J)	6 BE		
(0 ... 100 psi a)	(0 psi a)	(200 psi a)	(360 psi a) J)	6 BG		
(0 ... 150 psi a)	(0 psi a)	(300 psi a)	(725 psi a) J)	6 CA		
(0 ... 200 psi a)	(0 psi a)	(400 psi a)	(725 psi a) J)	6 CB		
(0 ... 300 psi a)	(0 psi a)	(600 psi a)	(1725 psi a) J)	6 CC		
Other version, add Order code and plain text: Measuring range: ... up to ... psi a				9 BB		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				1 0		
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 PE cable, IP68				6		
Special version (specify Order code and plain text)				9		N 1 Y

► Available ex stock

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

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

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

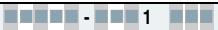
Z series for gage and absolute pressure

Selection and Ordering data

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

Order No.

Order code

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 EN837-1 (¼" 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

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 P1Y

Sealing material between sensor and housing

Viton (standard)

► A

Neoprene

B

Perbunan

C

Special version (specify Order code and plain text)

Z Q1Y

Further designs

Order code / Order No.

Quality inspection certificate (Factory calibration) to IEC 60770-2,
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

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.

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

Overview



SITRANS P250 transmitter for differential pressure

The SITRANS P250 transmitter measures the differential pressure of liquids and gases.

Benefits

- High measuring accuracy
- Sturdy stainless steel enclosure
- For aggressive and non-aggressive media
- For the measurement of the differential pressure of liquids and gases
- Temperature-compensated measuring cell
- Compact design

Application

The SITRANS P250 transmitter for differential pressure is primarily used in the following industries:

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

Design

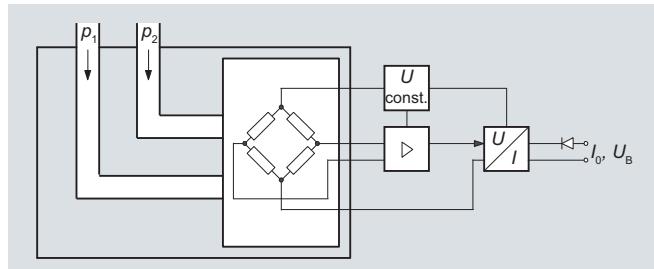
Main components:

- Stainless steel enclosure with piezo-resistive ceramic measuring cell and (temperature-compensated) electronics module.
- Process connection made of stainless steel in diverse designs (see Selection and ordering data)
- Electrical connection through connectors acc. to EN 175301-803-A and round connectors M12, as well as with permanently fixed cable

Function

The pressure transmitter measures the differential pressure of liquids and gases.

Mode of operation



SITRANS P250 pressure transmitter, function diagram

The piezo-resistive ceramic measuring cell (membrane) has a Wheatstone bridge circuit, on which the operating pressure P1 and P2 of the media acts at both ends.

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 5 or 10 V DC.

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

Technische Daten

SITRANS P250 differential pressure transmitter

Application

Differential pressure transmitter	Liquids and neutral gases
-----------------------------------	---------------------------

Mode of operation

Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)
---------------------	--

Input

Measured variable	Differential pressure
-------------------	-----------------------

Measuring range	0 ... 0.1 to 0 ... 25 bar (0 ... 1.45 to 0 ... 363 psi)
-----------------	--

Operating pressure	≤ 25 bar (363 psi) at a differential pressure range < 6 bar (87 psi)
--------------------	--

	≤ 50 bar (725 psi) at a differential pressure range > 10 bar (145 psi)
--	--

Burst pressure	1.5 x operating pressure
----------------	--------------------------

Output

Output signal	
---------------	--

• Current output signal	4 ... 20 mA
-------------------------	-------------

• Voltage output signal	0 ... 5 V and 0 ... 10 V DC
-------------------------	-----------------------------

Load	
------	--

3-wire	> 10 kΩ
--------	---------

2-wire	≤ (U _H - 11 V) / 0.02 A
--------	------------------------------------

Measuring accuracy

Dynamic behavior (at 25°C (77°F), including conformity error, hysteresis and repeatability)	≤ 1 % of typical full-scale value, see "Measuring range" table
---	--

Long-term drift acc. to IEC 60770	≤ 0.5 % of full-scale value/year
-----------------------------------	----------------------------------

Influence of ambient temperature	
----------------------------------	--

• Start of scale	≤ 0.6 %/10K of full-scale value (≤ 1.2 % / 10K for measuring cell 0 ... 0.1 bar (1.45 psi))
------------------	--

• Full-scale value	≤ 0.22 %/10K of full-scale value (≤ 0.37 % / 10K for measuring cell 0 ... 0.1 bar (1.45 psi))
--------------------	--

Dynamic behavior	Suitable for static and dynamic measurements
------------------	--

Response time T ₉₉	< 5 ms
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Load variation	< 50 Hz
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SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

2

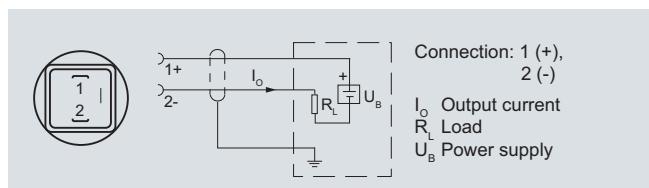
Z series for gage and absolute pressure

Conditions of use		Measuring range	Max. permissible operating pressure (on either side)	Burst pressure	Max. permissible operating pressure (on one side)	Accuracy	
Ambient conditions							
• Temperature of medium	- 15 ... + 85 °C (5 ... 185 °F)						
• Ambient temperature	- 15 ... + 85 °C (5 ... 185 °F)						
• Storage temperature	- 40 ... + 85 °C (-40 ... +185 °F)						
Degree of protection acc. to EN 60529	IP65						
Mounting position	Any						
Mounting	Mounting bracket, included in delivery						
Design							
Weight	Approx. 430 g (approx. 0.95 lb)	0 ... 0,1	0 ... 1.45	25 bar (363 psi)	37,5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 1,0 %
Enclosure material	Stainless steel 1.4305/AISI 303	0 ... 0,2	0 ... 2.9	25 bar (363 psi)	37,5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 1,0 %
Electrical connection	<ul style="list-style-type: none"> • Plug EN 175301-803-A • Circular plug EN 60130-9 • Cable 1.5 m 	0 ... 0,4	0 ... 5.8	25 bar (363 psi)	37,5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,8 %
Process connection	<ul style="list-style-type: none"> • Hose sleeve Ø 4 mm/6 mm • Pipe union Ø 6 mm/8 mm • Male thread 7/16-20 UNF, G1/8 • Female thread 1/8-27 NPT • (Standard), G1/8 	0 ... 0,5	0 ... 7.25	25 bar (363 psi)	37,5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,5 %
Wetted parts materials	Stainless steel 1.4305/AISI 303, CuZn nickel-plated	0 ... 0,6	0 ... 8.7	25 bar (363 psi)	37,5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,5 %
• Process connection	Approx. 430 g (approx. 0.95 lb)	0 ... 1,0	0 ... 14.5	25 bar (363 psi)	37,5 bar (544 psi)	2 bar (29 psi)	≤ 0,5 %
• Diaphragm	Ceramic Al ₂ O ₃ (96 %)	0 ... 1,6	0 ... 23.2	25 bar (363 psi)	37,5 bar (544 psi)	3.2 bar (46.4 psi)	≤ 0,5 %
• Sealing material	FPM (standard), EPDM, NBR, MVQ, CR	0 ... 2,5	0 ... 36.3	25 bar (363 psi)	37,5 bar (544 psi)	5 bar (72.5 psi)	≤ 0,5 %
Power supply U_H		0 ... 4	0 ... 58	25 bar (363 psi)	37,5 bar (544 psi)	8 bar (116 psi)	≤ 0,5 %
Terminal voltage on pressure transmitter		0 ... 6	0 ... 87	25 bar (363 psi)	37,5 bar (544 psi)	12 bar (174 psi)	≤ 0,5 %
• 2-wire, 4 ... 20 mA	11 ... 33 V DC	0 ... 10	0 ... 145	50 bar (725 psi)	75 bar (1088 psi)	20 bar (290 psi)	≤ 0,5 %
• 3-wire, 0 ... 5 V DC	11 ... 33 V DC/ 24 V AC ± 15 %	0 ... 16	0 ... 232	50 bar (725 psi)	75 bar (1088 psi)	32 bar (464 psi)	≤ 0,5 %
• 3-wire, 0 ... 10 V DC	18 ... 33 V DC/ 24 V AC ± 15 %	0 ... 25	0 ... 363	50 bar (725 psi)	75 bar (1088 psi)	50 bar (725 psi)	≤ 0,5 %
Current consumption at nominal pressure							
• 2-wire	< 20 mA						
• 3-wire	< 5 mA						
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.						

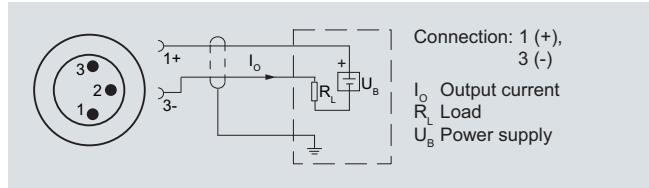
Certificates and approvals

Approval	CE conformity
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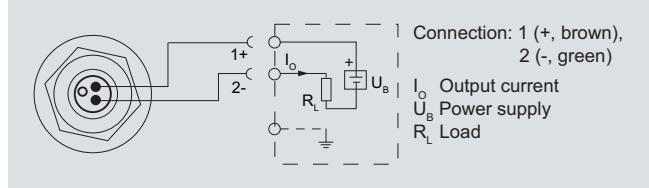
Schematics



Connection with current output 4 ... 20 mA and plug to EN 175301-803-A



Connection with current output 4 ... 20 mA and round connector

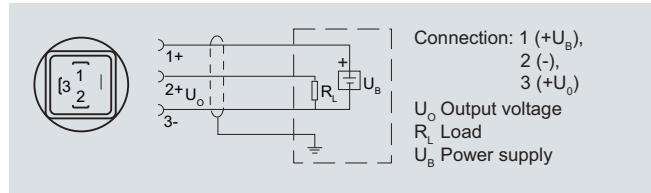


Connection with current output 4 ... 20 mA and permanently fixed cable

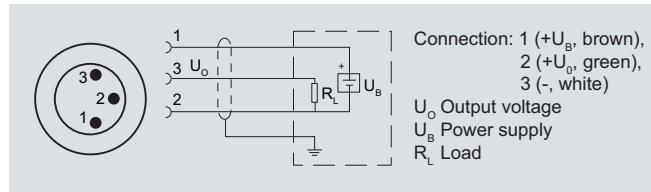
SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

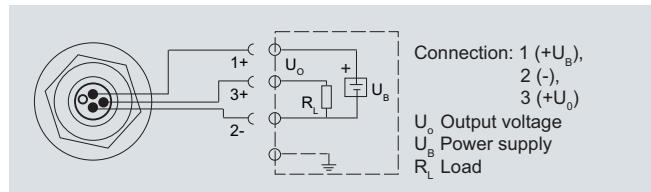
Z series for gage and absolute pressure



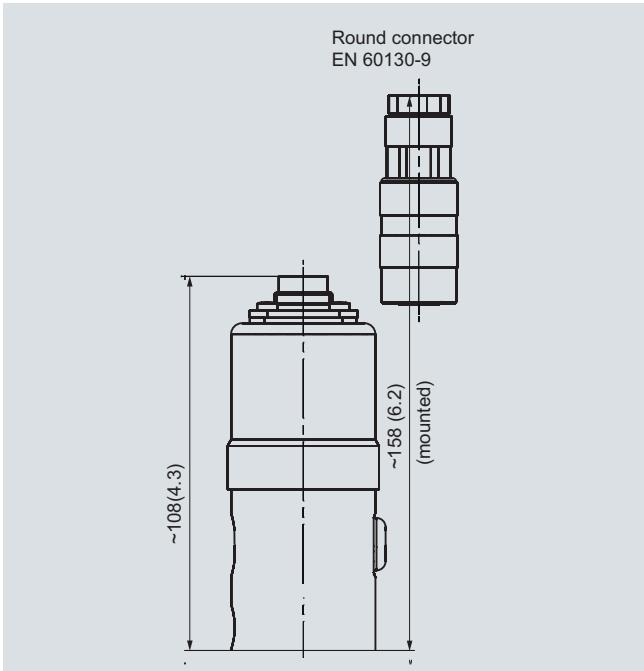
Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and plug to EN 175301-803-A



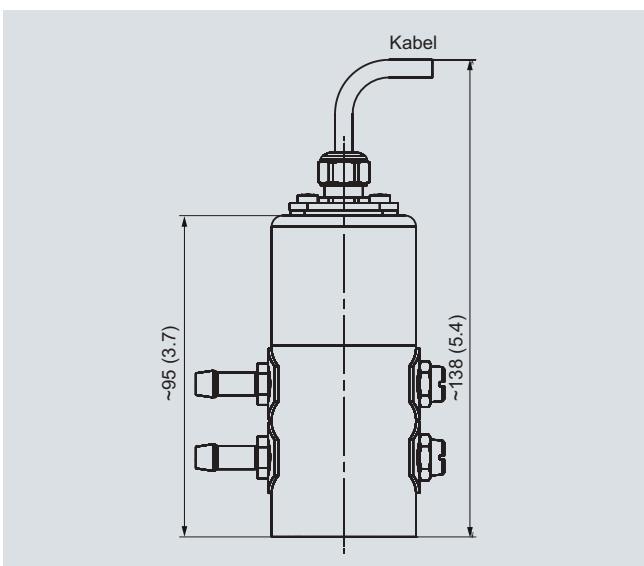
Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and round connector



Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and permanently fixed cable

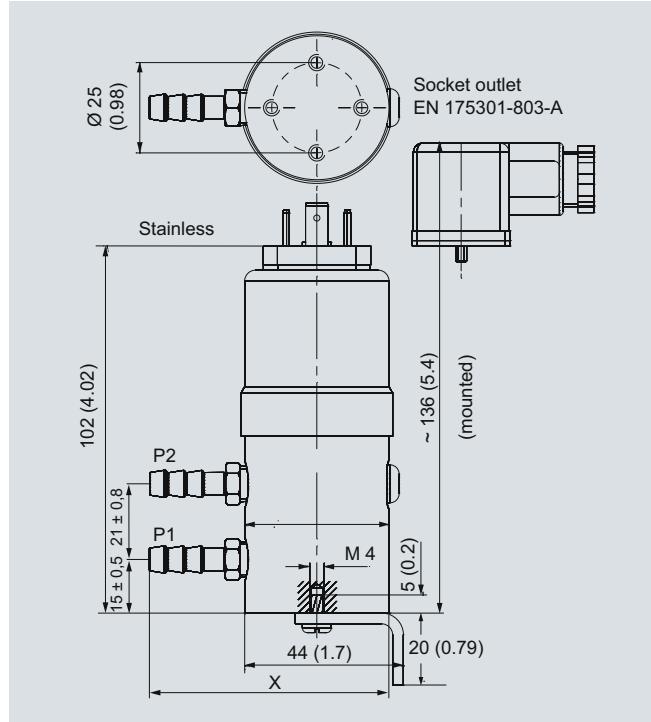


SITRANS P250 differential pressure transmitter with round connector to EN 60130-9, dimensions in mm (inch)



SITRANS P250 differential pressure transmitter with cable, dimensions in mm (inch)

Maßzeichnungen

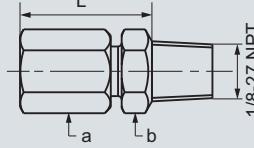
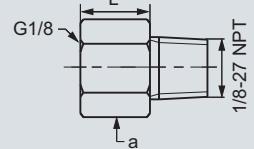
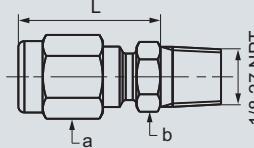
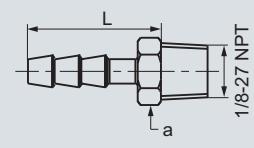
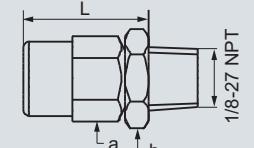
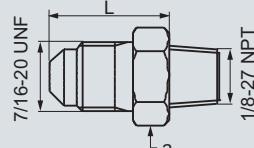


SITRANS P250 differential pressure transmitter with socket outlet to EN 175301-803-A, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

Process connections	\emptyset [mm] [inch]	Width across flats	L [mm] [inch]	X [mm] [inch]
 Pipe union with screw-in nipple for outer pipe (stainless steel 1.4305/AISI 303)	6	a = 10 b = 12	24	65
	8	a = 12 b = 14	26	67
 Female thread G1/8 (stainless steel 1.4305/AISI 303)	-	a = 14	12	53
 Pipe union with screw-in nipple for outer pipe (CuZn nickel-plated)	6	a = 10 b = 12	24	65
	8	a = 12 b = 14	25	66
 Hose connection for hose (CuZn nickel-plated, stainless steel 1.4571/AISI 316TI)	4	a = 10	20	61
	6	a = 10	25	66
 Male thread G1/8 (CuZn nickel-plated)	-	a = 10 b = 12	20	61
 Male thread G1/8 7/16-20 UNF (CuZn nickel-plated)	-	a = 14	18	59

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

2

Selection and ordering data	Order No.	Order code
SITRANS P 250 pressure transmitter for differential pressure Accuracy $\leq 1\%$, wetted parts ceramic/stainless steel 1.4301, scope of delivery: transmitter, mounting bracket and instruction manual, without explosion protection	7MF1641 - 0 - 0	
Measuring range		
0 ... 0.1 bar (0 ... 1.45 psi)	►	3AA
0 ... 0.2 bar (0 ... 2.90 psi)	►	3AC
0 ... 0.25 bar (0 ... 3.63 psi)	►	3AD
0 ... 0.3 bar (0 ... 5.35 psi)	►	3AE
0 ... 0.4 bar (0 ... 5.80 psi)	►	3AF
0 ... 0.5 bar (0 ... 7.25 psi)	►	3AG
0 ... 0.6 bar (0 ... 8.70 psi)	►	3AH
0 ... 1.0 bar (0 ... 14.5 psi)	►	3BA
0 ... 1.6 bar (0 ... 23.2 psi)	►	3BB
0 ... 2.5 bar (0 ... 36.3 psi)	►	3BD
0 ... 4.0 bar (0 ... 58.0 psi)	►	3BE
0 ... 6.0 bar (0 ... 87.0 psi)	►	3BG
0 ... 10.0 bar (0 ... 145 psi)	►	3CA
0 ... 16.0 bar (0 ... 232 psi)	►	3CB
0 ... 25.0 bar (0 ... 363 psi)	►	3CD
Output signal		
4 ... 20 mA	►	0
0 ... 5 V DC		1
0 ... 10 V DC		2
Electrical connection		
• Plug acc. to EN 175 301-803-A (suitable coupling included in scope of delivery)	►	1
• Round connector acc. to EN 60139-9		2
• Cable 1.5 m with cable gland		3
Process connection		
• Without connections, female thread 1/8-27 NPT	►	A
• Hose connection		
- CuZn nickel-plated, for hose Ø 4 mm		B
- CuZn nickel-plated, for hose Ø 6 mm		C
- PVDF, for hose Ø 6 mm		D
• Pipe union		
- CuZn nickel-plated, for pipe Ø 6 mm		E
- Stainless steel 1.4304, for pipe Ø 6 mm		F
- CuZn nickel-plated, for pipe Ø 8 mm		G
- Stainless steel 1.4304, for pipe Ø 8 mm		H
• Male thread, 7/16-20 UNF (CuZn nickel-plated)		L
• Adapter		
- Inner, G1/8 (stainless steel), for pipe Ø 6 mm		M
- Outer, with union nut, for pipe Ø 6 mm		N
sealing material		
• Fluoro rubber (Viton/FPM)	►	A
• Ethylene propylene diene monomer rubber (EPDM)		B
• Nitrile butadiene rubber (NBR)		C
• Silicone rubber (MVQ)		D
• Neoprene (CR)		E
Weitere Ausführungen	Kurzangabe	
Please add "Z" to Order No. and specify Order code(s).		
Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied	C11	

► Available ex stock

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

ZD series for gage and absolute pressure

Overview



SITRANS P pressure transmitters, ZD series, are for measuring the gage pressure, absolute pressure and level of liquids and gases.

They are used to indicate and monitor the pressure measured at the point of installation. ZD pressure transmitters are available in an axial and a radial version.

Benefits

- Robust stainless steel housing with 2 connection versions
- Integrated display with status messages
- Thin-film measuring cell with ceramic diaphragm
- 2-wire system, 4 ... 20 mA
- Parameterizable using keys underneath the housing cover
- Range adjustment 1:5 (max. 1:10)
- Measuring accuracy < 0.25% (typical)

Application

The ZD is a configurable pressure transmitter for measuring the gage and absolute pressure of gases, liquids and vapor.

It is equipped with a display for indicating the pressure value at the point of installation.

SITRANS P pressure transmitters, ZD series, are used in the following industrial areas for example:

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

Design

The pressure transmitter is comprised of a thin-film measuring cell with a ceramic diaphragm, an electronics board and a digital indicator.

All parts are accommodated in a stainless steel field housing (\varnothing 80 mm) with a glass cover and stainless steel process connection.

At the rear of the housing is the electrical connection for the voltage supply using a current loop 4 ... 20 mA. The connection is made with a plug connector.

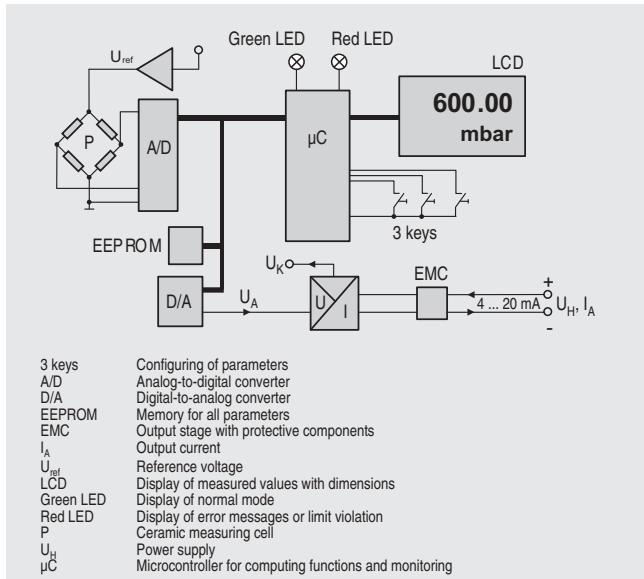
At the front of the housing is the 5-digit display behind a glass cover. Underneath the display are the 3 keys for parameterizing the pressure transmitter. Above the display are a green and a red LED for indicating the operating status.

The ZD pressure transmitter is available in two versions (see "Dimension drawing"):

In the radial version (type A) the display is fitted in parallel with the process connection. The display can be rotated by up to $\pm 120^\circ$ relative to the process connection.

In the axial version (type B) the display is at right angles to the process connection. The display can be rotated by 360° relative to the process connection.

Function



SITRANS P pressure transmitters, ZD series, mode of operation

Mode of operation

The ZD pressure transmitter has a thin-film strain gage which is mounted on a ceramic diaphragm.

The measuring cell is temperature-compensated.

Functions

The ZD pressure transmitter has a 5-digit display behind a glass cover. The following data are shown on the display:

- Measured pressure
- Technical pressure dimension (default setting: bar)
- Limit violation in upward or downward direction, indicated by LED and arrow symbols in the display

The pressure transmitter is set using the 3 input keys behind the glass cover underneath the display.

The key "M" is used to select the operating mode. Following modes of operation are available:

- Measured value
- Password
- Dimension
- Start and end of scale
- Upper and lower limit value
- Zero adjustment

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

2

ZD series for gage and absolute pressure

- Upper and lower current saturation limit
- Electrical damping

The other two keys are used to set the values in the individual operating modes.

Two LED indicators are fitted above the display to monitor the set range and the status.

The green LED signals that the measured pressure lies within the set limits. The red LED lights up when the measured pressure lies outside the set limits and when there is an error.

Technical specifications

SITRANS P pressure transmitters, ZD series

Mode of operation

Measuring principle Thin-film strain gage

Input

Measured variable	Gage and absolute pressure
Measured range	Resolution
0 ... 2 bar (0 ... 29 psi)	0.6 mbar (0.008 psi)
0 ... 10 bar (0 ... 145 psi)	3 mbar (0.044 psi)
0 ... 50 bar (0 ... 725 psi)	15 mbar (0.218 psi)
0 ... 200 bar (0 ... 2900 psi)	60 mbar (0.9 psi)
0 ... 400 bar (0 ... 5800 psi)	120 mbar (1.8 psi)
Measured range	Overload limit
0 ... 2 bar (0 ... 29 psi)	5 bar (72.5 psi)
0 ... 10 bar (0 ... 145 psi)	25 bar (363 psi)
0 ... 50 bar (0 ... 725 psi)	120 bar (1740 psi)
0 ... 200 bar (0 ... 2900 psi)	500 bar (7250 psi)
0 ... 400 bar (0 ... 5800 psi)	600 bar (8700 psi)
Range adjustment (turndown)	5:1

Output

Output signal	4 ... 20 mA
Lower current limit	min. 3.6 mA
Upper current limit	max. 23 mA
Output protected against	Reversed polarity, overvoltage and short-circuiting
Max. load	$R_B = (U_H - 12 \text{ V}) / 0.023 \text{ A}$
Voltage measurement	Linear rising

Measuring accuracy

Error in measurement (including non-linearity, hysteresis and repeatability, at 25 °C (77 °F))	< 0.25% of full-scale value (typical), max. 0.5%
Adjustment time	< 100 ms
Long-term drift	0.25% of full scale value/year
Influence of ambient temperature	< ±0.25%/10 K (< ±0.25%/10 K) of full-scale value
Vibration influence	0.05%/g to 500 Hz in all directions (to IEC 68-2-64)
Power supply effect	< ±0.01%/V of full-scale value

Rated conditions

Ambient conditions	
• Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Medium conditions	
• Process temperature	-30 ... +100 °C (-22 ... +212 °F)
Degree of protection	IP65 to EN 60529
Electromagnetic compatibility	
• Emitted interference and interference immunity	To EN 61326/A1 appendix A (1998)

Displays and controls

Display	LCD, max. 5 digits, digit height 9 mm
Decimal point	Freely parameterizable
Limit values	Freely parameterizable
Limit violation display	Red LED and message on LCD (↑ symbol /↓ symbol in case of limit violation in upward / downward direction)
Parameterization	With 3 keys
Units	mA or % or physical variable (default setting: bar) Other dimensions: mbar, kPa, MPa, mmH ₂ O, mH ₂ O, psi, inH ₂ O, mmHg, kg/cm ² , torr, atm
Damping	Between 0.1 and 100 s (increment: 0.1 s) freely parameterizable

Design

Weight	≈0.6 kg (≈1.32 lb)
Electrical connection	Using 2-pole plug connector with M16x1.5-Cable inlet to EN 175301-803A, plastic
Process connection	<ul style="list-style-type: none"> • Male thread G₁/2B and female thread G₁/8B • G₁/2B to EN 837-1 • Female thread: 1/2-14 NPT • Radial (type A), can be swiveled by max. ±120° (α) • Axial (type B), can be swiveled by max. ±360°
Version of housing/process connection	

Material

Non-wetted parts materials	
• Field housing	Ø 80 mm (3.15 inch), stainless steel mat. No. 1.4016
• Cover	Stainless steel, mat. No. 1.4016 with glass
Wetted parts materials	
• Measuring cell	Al ₂ O ₃
• Gasket	Viton
• Process connection	Stainless steel, mat. No. 1.4571/316Ti

Power supply

Terminal voltage on pressure transmitter (U_H) 12 ... 30 V DC

Certificate and approvals

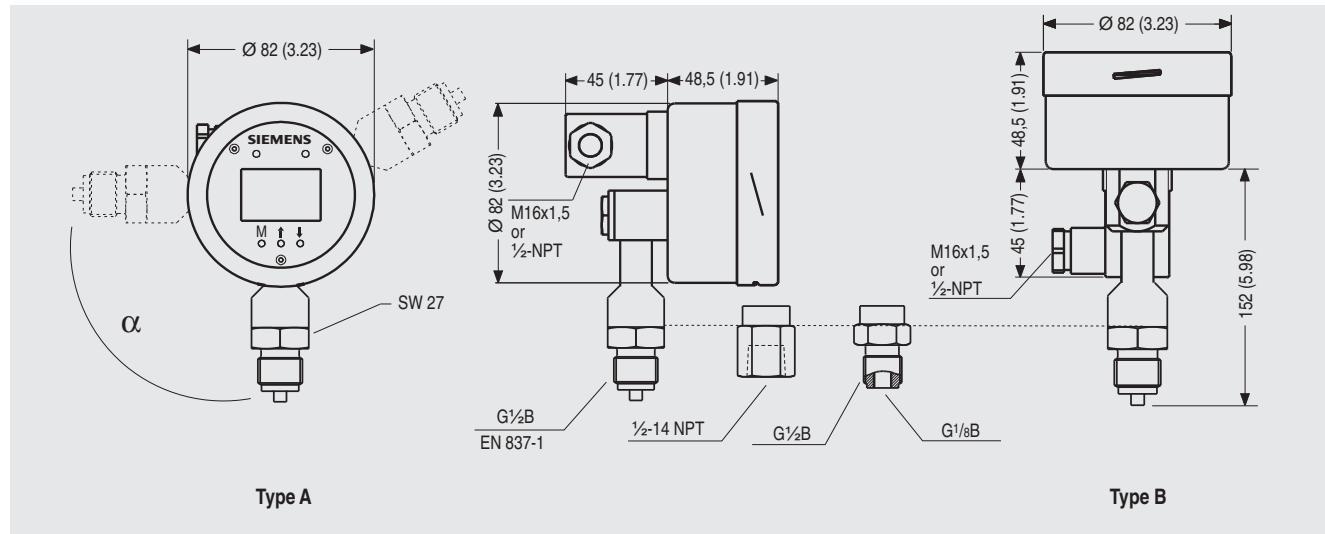
Classification according to pressure equipment directive 97/23/EC
For gases of fluid group 1 and liquids of fluid 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

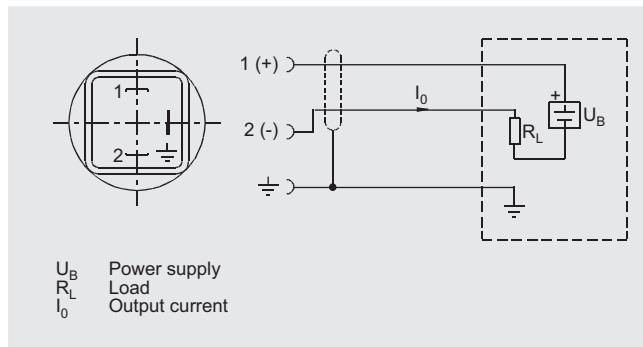
ZD series for gage and absolute pressure

Dimensional drawings



SITRANS P pressure transmitters, ZD series, dimensional drawing, dimensions in mm (inch)

Schematics



SITRANS P pressure transmitters, ZD series, connection diagram

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

ZD series for gage and absolute pressure

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Selection and Ordering data		Order No. Ord. Code
SITRANS P pressure transmitters, ZD series for gage and absolute pressure		7MF 1 5 8 0 -
Conformity error 0.25%, range adjustment 1 : 5 (max. 1 : 10), housing and process connection made of stainless steel, membrane made of ceramic, 2-wire system, output 4 ... 20 mA		0
Input variable		
Gage pressure	► 1	
Absolute pressure	► 2	
	F)	
Measured range	Span	
0 ... 2 bar (0 ... 29 psi)	0 ... 0.4 / 2 bar (0 ... 5.8 / 29 psi)	► D
0 ... 10 bar (0 ... 145 psi)	0 ... 2 / 10 bar (0 ... 5.8 / 145 psi)	► E
0 ... 50 bar (0 ... 725 psi)	0 ... 10 / 50 bar (0 ... 145 / 725 psi)	► F
0 ... 200 bar (0 ... 2900 psi)	0 ... 40 / 200 bar (0 ... 580 / 2900 psi)	► G
0 ... 400 bar (0 ... 5800 psi)	0 ... 80 / 400 bar (0 ... 1160 / 5800 psi)	► H
Other version (on request) add Order Code and plain text: Process connection:	Z	J 1 Y
Process connection		
G $\frac{1}{2}$ B male thread and G $\frac{1}{8}$ B female thread	► A	
G $\frac{1}{2}$ B to EN 837-1	F)	
Female thread 1/2-14 NPT	F)	
G 1" male thread	F)	
Design		
Process connection vertically downwards, thread in connector M16x1.5	► 1	
Process connection horizontally to rear, thread in connector M16x1.5	2	
Process connection vertically downwards, thread in connector 1/2"-14 NPT	3	
Process connection horizontally to rear, thread in connector 1/2"-14 NPT	4	

Selection and Ordering data	Order Code
Further designs	
Please add "Z" to Order No. and specify Order code(s) and plain text.	
Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied	C1 1
Factory certificate to EN 10204-2.2 supplied	C1 4
Oxygen application, oil and grease-free cleaned	E1 0
(only in conjunction with the sealing material Viton between sensor and enclosure and only in conjunction with measuring ranges \geq 1 bar g and 1 bar abs)	
Sealing material FEP between sensor and housing , instead of Viton max. operating pressure 15 bar (218 psi), max. measuring temperature -10 ... +50 °C	E2 0
Additional data	
Please add "Z" to Order No. and specify Order code(s) and plain text.	
Measuring range to be set, specify in plain text:	Y0 1
Y01: ... up to ... mbar, bar, kPa, MPa, psi	
TAG number made of stainless steel	Y1 5
Accessories	Order No.
Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied later, specify factory of transmitter.	7MF1564-8CC11
► Available ex stock	

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact for gage and absolute pressure

Overview



The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

Particular value has been placed on a high surface quality. It is therefore possible, for example, to guarantee roughness values down to $R_a = 0.4 \mu\text{m}$ ($1.57 \cdot 10^{-5}$ inch) in the wetted area (welded seam area $R_a < 0.8 \mu\text{m}$ ($3.15 \cdot 10^{-5}$ inch)). The system can be electropolished in addition.

A further important feature is the hygiene-based design of the process connection by means of various aseptic connections.

The completely welded stainless steel housing can be designed up to degree of protection IP67.

Using appropriate thermal decouplers, the SITRANS P Compact pressure transmitter can be used for process temperatures up to 200°C (392°F).

Benefits

- Measuring ranges from 0 to 160 mbar (0 to 2.32 psi) to 0 to 40 bar (0 to 580 psi)
- Linearity error including hysteresis $< +0.2\%$ of full-scale value
- Piezo-resistive measurement system, vacuum-proof and over-load-proof
- Hygiene-based design according to EHEDG, FDA and GMP recommendations
- Material and surface quality according to hygiene requirements
- Wetted parts made of stainless steel; completely welded
- Signal output 4 to 20 mA (0 to 20 mA as option)
- Stainless steel housing with degree of protection IP65 (IP67 as option)
- Process temperature up to 200°C (392°F)
- Explosion protection II 2G EEx [ib] IIC T6 to ATEX
- Easy and safe to clean

Application

The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

The SITRANS P Compact pressure transmitter is available in many versions. Exact adaptation of the pressure transmitter to conditions at the place of use is thus possible

Design

The electronics is potted to protect it against moisture, corrosive atmospheres and vibration.

Notes on operating the pressure transmitter

Compensation of internal atmospheric pressure

Compensation of the internal atmospheric pressure of the SITRANS P Compact pressure transmitters is performed as follows:

- in the plug versions by means of the screwed gland (IP65)
- in the field housings by means of an integral sintered filter (IP65) or a vented cable (IP67)
- in versions with cable outlet by means of a vented cable (IP67)

In the absolute pressure range there is no need for compensation with respect to atmospheric pressure.

Note: These degrees of protection are only achieved under the following conditions:

- if the pressure transmitter is installed correctly
- if the screwed glands are securely tightened
- if the cable diameters agree with the nominal diameters of the gaskets in the housing

Note: The integral EMC measures are only effective if the earth connection is made correctly.

CE marking

The CE marking of the pressure transmitter certifies compliance with the guidelines of the European Council (9/336/EC), the EMC law (13.11.1992), as well as the applicable generic standards.

Interference-free operation in systems and plants is achieved only if the specifications for shielding, earthing, cable routing and electrical isolation are observed during installation and assembly.

Hazardous areas

Note: Electrical equipment in hazardous areas must only be installed and operated by trained personnel.

Modifications to units and connections result in cancellation of the explosion protection and guarantee.

With intrinsically-safe circuits, make sure that equipotential bonding exists throughout the complete cabling inside and outside of the hazardous area. The limits specified in the ATEX approval must be observed.

SITRANS P measuring instruments for pressure

Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact for gage and absolute pressure

Function

The process pressure acts on a piezo-resistive semiconductor measuring bridge through a remote seal and a transmission liquid. The pressure transmitter converts the pressure values into a load-independent current.

A compensation network makes the output signal largely independent of the ambient temperature. As a result of a specially adapted remote seal connection with minimized volume, the influence of the process temperature on the output signal is greatly reduced compared to a conventional screw connection.

The pressure transmitters can be powered with a non-regulated DC voltage of 10 to 30 V. Output signals common to measuring technology are available.

Technical specifications

Pressure transmitters for food, pharmaceuticals and biotechnology

Mode of operation

Measuring principle Piezo-resistive

Input

Measured variable Gage or absolute pressure
Measured range 0 ... 160 mbar (0 ... 2.32 psi)
...
0 ... 40 bar (0 ... 580 psi)

Output

Output signal
• Two-wire system 4 ... 20 mA
• Three-wire system 0 ... 20 mA

Measuring accuracy

Linearity error including hysteresis (reference point adjustment) $\leq 0.2\%$ of full-scale value
Adjustment accuracy $\leq \pm 0.2\%$ of full-scale value
Adjustment time < 20 ms

Influence of ambient temperature

On the enclosure
• Zero $< 0.2\%/10$ K of full-scale value
• Measured span $< 0.2\%/10$ K of full-scale value
On the process connection (remote seal)
• Flange remote seal
- DN 25 / 1" 4.8 mbar/10 K (0.070 psi/10 K)
- DN 32 / 1 1/4" 2.3 mbar/10 K (0.033 psi/10 K)
- DN 40 / 1 1/2" 1.6 mbar/10 K (0.023 psi/10 K)
- DN 50 / 2" 0.6 mbar/10 K (0.009 psi/10 K)
• Clamp-on seal
- DN 25 / 1" 9.5 mbar/10 K (0.138 psi/10 K)
- DN 32 / 1 1/4" 4.1 mbar/10 K (0.060 psi/10 K)
- DN 40 / 1 1/2" 3.9 mbar/10 K (0.057 psi/10 K)
- DN 50 / 2" 3.9 mbar/10 K (0.057 psi/10 K)

The zero error specified for the process connection should be considered as a guideline for a standard design. We will produce a detailed system calculation on request. Systems with reduced remote seal errors are available on request.

Rated conditions

Installation conditions

• Mounting position Any, vertical as standard

Ambient conditions

• Ambient temperature $-10 \dots +70$ °C (14 ... 158 °F)

• Storage temperature $-10 \dots +90$ °C (14 ... 194 °F)

• Process temperature Max. 200 °C (392 °F), depends on design

• Degree of protection (to EN 60529) IP65, optional IP67

• Electromagnetic compatibility

- Emitted interference To EN 50081 Part 1, issue 1993 (residential and industrial areas). The unit has no own emissions.

- Interference immunity to EN 50082 Part 2, issue March 1995 (industrial areas)

Design

Weight (without remote seal)

≈ 460 g (≈ 1.01 lb)

• Field housing ≈ 200 g (≈ 0.44 lb)

Housing

• Designs • Field housing IP65 or IP67, with screwed gland
• Angled plug DIN 43650, IP65
• Cable connection, IP67
• Round plug connector M12, IP65

• Material

Stainless steel, mat. No. 1.4404/1.4305

Material of union nut

Polyamide (with electrical connection using plug or cable)

Electronics unit potted with silicone

Internal ventilation for measuring ranges < 16 bar (< 232 psi), through housing thread or connection cable depending on design

Process connection

• Versions See Ordering data

• Material of coupling

Stainless steel, mat. No. 1.4404/316L

Power supply

Terminal voltage on transmitter 10 ... 30 V DC

Rated voltage 24 V DC

Certificate and approvals

Classification according to pressure equipment directive (DRG 97/23/EC)

For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord

Explosion protection

• Intrinsic safety "i"
- Identification TÜV 03 ATEX 2099 X
Ex II 2G EEx ib IIC T6

SITRANS P measuring instruments for pressure

Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact
for gage and absolute pressure

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Selection and Ordering data	Order No.	Ord. code	Selection and Ordering data	Order No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front	7MF8010 -		SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front	7MF8010 -	
2-wire system	1		2-wire system	1	
Process temperature up to 140 °C (284 °F)			Process temperature up to 140 °C (284 °F)		
Accuracy: 0.2% of full-scale value			Accuracy: 0.2% of full-scale value		
Output 4 ... 20 mA			Output 4 ... 20 mA		
Diaphragm seal with quick-release clamp			Diaphragm seal with aseptic connection		
Milk pipe union to DIN 11851 with slotted union nut			Aseptic screwed gland to DIN 11864-1, form A, with slotted union nut		
• DN 25	AD		• 1 inch	PM	
• DN 32	AE		• 1½ inch	PN	
• DN 40	AF		• 2 inch	PP	
• DN 50	AG		• 2½ inch	PQ	
• DN 65	AH		Aseptic screwed gland to DIN 11864-1, form A with threaded socket		
Milk pipe union to DIN 11851 with threaded socket			• 1 inch	QM	
• DN 25	BD		• 1½ inch	QN	
• DN 32	BE		• 2 inch	QP	
• DN 40	BF		• 2½ inch	QQ	
• DN 50	BG		Aseptic screwed NEUMO with slotted union nut ¹⁾		
• DN 65	BH		• DN 25	RD	
Clamp connection to DIN 32676			• DN 32	RE	
• DN 25	CD		• DN 40	RF	
• DN 40	CF		• DN 50	RG	
• DN 50	CG		Aseptic screwed NEUMO with threaded socket ¹⁾		
Clamp connection to ISO 2852			• DN 25	SD	
• 1 inch	DM		• DN 32	SE	
• 1½ inch	DN		• DN 40	SF	
• 2 inch	DP		• DN 50	SG	
• 2½ inch	DQ		Aseptic screwed NEUMO with clamp connection, form R ¹⁾		
IDF standard with slotted union nut			• DN 25	TD	
• 1 inch	EM		• DN 32	TE	
• 1½ inch	EN		• DN 40	TF	
• 2 inch	EP		• DN 50	TG	
IDF standard with threaded socket			Aseptic screwed NEUMO with clamp connection, form V ¹⁾		
• 1 inch	FM		• DN 25	UD	
• 1½ inch	FN		• DN 32	UE	
• 2 inch	FP		• DN 40	UF	
SMS standard with slotted union nut			• DN 50	UG	
• 1 inch	GM		Special version (add Order code and plain text)	ZA	j 1 y
• 1½ inch	GN				
• 2 inch	GP		Filling liquid		
SMS standard with threaded socket			Vegetable oil	1	
• 1 inch	HM		medicinal white oil	2	
• 1½ inch	HN		Food oil, FDA-listed	3	
• 2 inch	HP		Special version (add Order code and plain text)	9	l 1 y
DRD flange, without welding-type flange			Output signal		
• DN 50, PN 40	JH		4 ... 20 mA	1	
Varivent connection (Tuchenhagen)			Special version (add Order code and plain text)	9	m 1 y
• D = 50, for Varivent housing DN 25 and 1 inch	KF				
• D = 68, for Varivent housing DN 40 ... DN 125 and 1½ ... 6 inch	KL				
Special version (add Order code and plain text)	ZA	J 1 Y			
Filling liquid					
Vegetable oil	1				
medicinal white oil	2				
Food oil, FDA-listed	3				
Special version (add Order code and plain text)	9	L 1 y			
Output signal					
4 ... 20 mA	1				
Special version (add Order code and plain text)	9	m 1 y			

¹⁾ Please specify as well:
Connections for pipes: R01, R02 or R03,
see table "Further designs" on next page

SITRANS P measuring instruments for pressure

Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact for gage and absolute pressure

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Selection and Ordering data		Order No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front		7 MF 8 0 1 0 -	
2-wire system		1	
Process temperature up to 140 °C (284 °F)			
Accuracy: 0.2% of full-scale value			
Output 4 ... 20 mA			
Housing design (stainless steel mat. No. 1.4404/316L) / electr. connection			
Housing with angled plug to DIN 43650, IP65	1		
Housing with round plug M12, IP65, union nut made of polyamide	2		
Housing with round plug M12, IP65, union nut made of stainless steel	3		
Stainless steel field housing (small) with cable gland, IP65	4		
Stainless steel field housing (small) with cable gland, IP67	5		
Internal ventilation for measuring ranges < 10 bar (< 145 psi)			
Measured range	Overload pressure		
0 ... 160 mbar g (0 ... 2.32 psi g)	2 bar g (29 psi g)	BB	
0 ... 250 mbar g (0 ... 3.63 psi g)	2 bar g (29 psi g)	BC	
0 ... 400 mbar g (0 ... 5.8 psi g)	6 bar g (87 psi g)	BD	
0 ... 600 mbar g (0 ... 8.7 psi g)	6 bar g (87 psi g)	BE	
0 ... 1 bar g (0 ... 14.5 psi g)	10 bar g (145 psi g)	CA	
0 ... 1.6 bar g (0 ... 23.2 psi g)	10 bar g (145 psi g)	CB	
0 ... 2.5 bar g (0 ... 36.3 psi g)	16 bar g (232 psi g)	CC	
0 ... 4 bar g (0 ... 58 psi g)	16 bar g (232 psi g)	CD	
0 ... 6 bar g (0 ... 87 psi g)	30 bar g (435 psi g)	CE	
0 ... 10 bar g (0 ... 145 psi g)	30 bar g (435 psi g)	DA	
0 ... 16 bar g (0 ... 232 psi g)	50 bar g (725 psi g)	DB	
0 ... 25 bar g (0 ... 363 psi g)	50 bar g (725 psi g)	DC	
0 ... 40 bar g (0 ... 580 psi g)	70 bar g (1015 psi g)	DD	
-160 ... 0 mbar g (-2.32 ... 0 psi g)	2 bar g (29 psi g)	EB	
-250 ... 0 bar g (-3.73 ... 0 psi g)	2 bar g (29 psi g)	EC	
-400 ... 0 bar g (-5.8 ... 0 psi g)	6 bar g (87 psi g)	ED	
-600 ... 0 bar g (-8.7 ... 0 psi g)	6 bar g (87 psi g)	EE	
-1 ... 0 bar g (-14.5 ... 0 psi g)	10 bar g (145 psi g)	FA	
-1 ... 0.6 bar g (-14.5 ... 0.7 psi g)	10 bar g (145 psi g)	FB	
-1 ... 1.5 bar g (-14.5 ... 21.8 psi g)	16 bar g (232 psi g)	FC	
-1 ... 3 bar g (-14.5 ... 43.5 psi g)	16 bar g (232 psi g)	FD	
-1 ... 5 bar g (-14.5 ... 72.5 psi g)	30 bar g (435 psi g)	FE	

Selection and Ordering data		Order No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front		7 MF 8 0 1 0 -	
2-wire system		1	
Process temperature up to 140 °C (284 °F)			
Accuracy: 0.2% of full-scale value			
Output 4 ... 20 mA			
Measured range	Overload pressure		
(continued)			
-1 ... 9 bar g (-14.5 ... 130.5 psi g)	30 bar g (435 psi g)	GA	
-1 ... 15 bar g (-14.5 ... 217.6 psi g)	50 bar g (725 psi g)	GB	
0 ... 1 bar a (0 ... 14.5 psi a)	10 bar a (145 psi a)	F)	HA
0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar a (145 psi a)	F)	HB
0 ... 2.5 bar a (0 ... 36.3 psi a)	16 bar a (232 psi a)	F)	HC
0 ... 4 bar a (0 ... 58 psi a)	16 bar a (232 psi a)	F)	HD
0 ... 6 bar a (0 ... 87 psi a)	30 bar a (435 psi a)	F)	HE
0 ... 10 bar a (0 ... 145 psi a)	30 bar a (435 psi a)	F)	j A
Special version (add Order code and plain text)		F)	z A
			P 1 y
Explosion protection			
without		1	
with, to ATEX 100a, II 2 G, EEx ib IIC T6		2	
Further designs		Order code	
Please add "-Z" to Order No. and specify Order code			
Hygiene version		p01	
Roughness of process connection: Foil $R_a < 0.8 \mu\text{m}$ (3.15 · 10^{-8} inch); Welded seams $R_a < 1.5 \mu\text{m}$ (5.9 · 10^{-8} inch)			
Integral cooling element		k01	
Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)			
Connections for pipe		r01	
Pipes to DIN 11850		r01	
ISO pipes to DIN 2463		r02	
Pipes to O. D. Tubing "BS 4825 Part 1"		r03	
Certificates			
Quality inspection certificate (Factory calibration) to IEC 60770-2		C11	
Acceptance test certificate to EN 10204-3.1		C12	
Use of FDA-listed remote seal filling liquids certified by factory certificate to EN 10204-2.2		C17	
Roughness depth measurement R_a certified by factory certificate to EN 10204-3.1		C18	
Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864		C19	

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact
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Selection and Ordering data	Order No.	Ord. code	Selection and Ordering data	Order No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal	7MF8010 -		SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal	7MF8010 -	
2-wire system	2		2-wire system	2	
Process temperature up to 140 °C (284 °F)			Process temperature up to 140 °C (284 °F)		
Accuracy: 0.2% of full-scale value			Accuracy: 0.2% of full-scale value		
Output 4 ... 20 mA			Output 4 ... 20 mA		
Clamp-on remote seal (screwed gland at both ends) with quick-release clamps			Clamp-on seal with aseptic connection		
Milk pipe union to DIN 11851 with threaded socket			Aseptic screwed gland to DIN 11864-1, form A with threaded socket		
• DN 25	AD		• 1 inch	QM	
• DN 32	AE		• 1½ inch	QN	
• DN 40	AF		• 2 inch	QP	
• DN 50	AG		Aseptic screwed NEUMO with threaded socket ¹⁾		
• DN 65	AH		• DN 25	SD	
Clamp connection to DIN 32676			• DN 32	SE	
• DN 25	CD		• DN 40	SF	
• DN 32	CE		• DN 50	SG	
• DN 40	CF		• DN 65	Sh	
• DN 50	CG		Aseptic screwed NEUMO with clamp connection, form R ¹⁾		
• DN 65	CH		• DN 25	TD	
Clamp connection to ISO 2852 ¹⁾			• DN 32	TE	
• 1 inch	DM		• DN 40	TF	
• 1½ inch	DN		• DN 50	TG	
• 2 inch	DP		Aseptic screwed gland SÜDMO with threaded socket W 501		
• 2½ inch	DQ		• 1 inch	VM	
Special version (add Order code and plain text)	Za	j 1 y	• 1½ inch	VN	
			• 2 inch	VP	
Filling liquid			Aseptic screwed gland SÜDMO with clamp connection W 601		
Vegetable oil	1		• 1 inch	WM	
Medicinal white oil	2		• 1½ inch	WN	
Food oil, FDA-listed	3		• 2 inch	WP	
Special version (add Order code and plain text)	9	I 1 y	Special version (add Order code and plain text)	ZA	j 1 y
Output signal			Filling liquid		
4 ... 20 mA	1		Vegetable oil	1	
Special version (add Order code and plain text)	9	M 1 y	medicinal white oil	2	
			Food oil, FDA-listed	3	
			Special version (add Order code and plain text)	9	I 1 y
¹⁾ Please note the internal diameter of the pipe. Please specify pipe classes (see "Further designs")			Output signal		
			4 ... 20 mA	1	
			Special version (add Order code and plain text)	9	m 1 y

¹⁾ Please specify as well:
Connections for pipes: R01, R02 or R03,
see table "Further designs" on next page

SITRANS P measuring instruments for pressure

Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact for gage and absolute pressure

2

Selection and Ordering data		Order No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal		7MF8010 -	
2-wire system		2	
Process temperature up to 140 °C (284 °F)			
Accuracy: 0.2% of full-scale value			
Output 4 ... 20 mA			
Housing design (stainless steel mat. No. 1.4404/316L) / electr. connection			
Housing with angled plug to DIN 43650, IP65, union nut made of polyamide	1		
Housing with round plug M12, IP65, union nut made of polyamide	2		
Housing with round plug M12, IP65, union nut made of stainless steel	3		
Stainless steel field housing (small) with cable gland, IP65	4		
Stainless steel field housing (small) with cable gland, IP67	5		
Internal ventilation for measuring ranges < 10 bar (< 145 psi)			
Measured range	Overload pressure		
0 ... 160 mbar g (0 ... 2.32 psi g)	2 bar g (29 psi g)	BB	
0 ... 250 mbar g (0 ... 3.63 psi g)	2 bar g (29 psi g)	BC	
0 ... 400 mbar g (0 ... 5.8 psi g)	6 bar g (87 psi g)	BD	
0 ... 600 mbar g (0 ... 8.7 psi g)	6 bar g (87 psi g)	BE	
0 ... 1 bar g (0 ... 14.5 psi g)	10 bar g (145 psi g)	CA	
0 ... 1.6 bar g (0 ... 23.2 psi g)	10 bar g (145 psi g)	CB	
0 ... 2.5 bar g (0 ... 36.3 psi g)	16 bar g (232 psi g)	CC	
0 ... 4 bar g (0 ... 58 psi g)	16 bar g (232 psi g)	CD	
0 ... 6 bar g (0 ... 87 psi g)	30 bar g (435 psi g)	CE	
0 ... 10 bar g (0 ... 145 psi g)	30 bar g (435 psi g)	DA	
0 ... 16 bar g (0 ... 232 psi g)	50 bar g (725 psi g)	DB	
0 ... 25 bar g (0 ... 363 psi g)	50 bar g (725 psi g)	DC	
0 ... 40 bar g (0 ... 580 psi g)	70 bar g (1015 psi g)	DD	
-160 ... 0 mbar g (-2.32 ... 0 psi g)	2 bar g (29 psi g)	EB	
-250 ... 0 bar g (-3.73 ... 0 psi g)	2 bar g (29 psi g)	EC	
-400 ... 0 bar g (-5.8 ... 0 psi g)	6 bar g (87 psi g)	ED	
-600 ... 0 bar g (-8.7 ... 0 psi g)	6 bar g (87 psi g)	EE	
-1 ... 0 bar g (-14.5 ... 0 psi g)	10 bar g (145 psi g)	FA	
-1 ... 0.6 bar g (-14.5 ... 8.7 psi g)	10 bar g (145 psi g)	FB	
-1 ... 1.5 bar g (-14.5 ... 21.8 psi g)	16 bar g (232 psi g)	FC	
-1 ... 3 bar g (-14.5 ... 43.5 psi g)	16 bar g (232 psi g)	FD	
-1 ... 5 bar g (-14.5 ... 72.5 psi g)	30 bar g (435 psi g)	FE	

Selection and Ordering data		Order No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal		7MF8010 -	
2-wire system		2	
Process temperature up to 140 °C (284 °F)			
Accuracy: 0.2% of full-scale value			
Output 4 ... 20 mA			
Measured range	Overload pressure		
(continued)			
-1 ... 9 bar g (-14.5 ... 130.5 psi g)	30 bar g (435 psi g)	GA	
-1 ... 15 bar g (-14.5 ... 217.6 psi g)	50 bar g (725 psi g)	GB	
0 ... 1 bar a (0 ... 14.5 psi a)	10 bar a (145 psi a)	F)	HA
0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar a (145 psi a)	F)	HB
0 ... 2.5 bar a (0 ... 36.3 psi a)	16 bar a (232 psi a)	F)	HC
0 ... 4 bar a (0 ... 58 psi a)	16 bar a (232 psi a)	F)	HD
0 ... 6 bar a (0 ... 87 psi a)	30 bar a (435 psi a)	F)	HE
0 ... 10 bar a (0 ... 145 psi a)	30 bar a (435 psi a)	F)	j A
Special version (add Order code and plain text)		F)	z A P 1 y
Explosion protection			
without			1
with, to ATEX 100a, II 2 G, EEx ib IIC T6			2
Further designs		Order code	
Please add "-Z" to Order No. and specify Order code			
Hygiene version		p01	
Roughness of process connection: Foil $R_a < 0.8 \mu\text{m}$ ($3.15 \cdot 10^{-8}$ inch); Welded seams $R_a < 1.5 \mu\text{m}$ ($5.9 \cdot 10^{-8}$ inch)			
Integral cooling element		k01	
Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)			
Connections for pipe			
Pipes to DIN 11850		r01	
ISO pipes to ISO 2463		r02	
Pipes to O. D. Tubing "BS 4825 Part 1"		r03	
Certificates			
Quality inspection certificate (Factory calibration) to IEC 60770-2		C11	
Acceptance test certificate to EN 10204-3.1		C12	
Use of FDA-listed remote seal filling liquids certified by factory certificate to EN 10204-2.2		C17	
Roughness depth measurement R_a certified by factory certificate to EN 10204-3.1		C18	
Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864		C19	

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

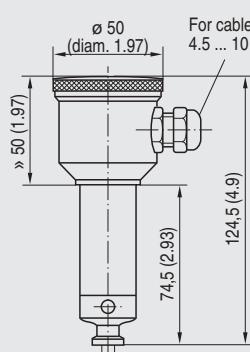
Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact
for gage and absolute pressure

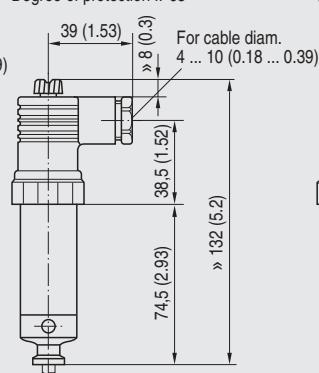
Dimensional drawings

Housing

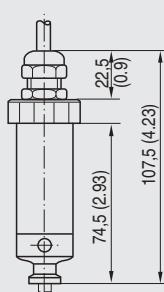
Fieldhousing
stainless steel
Degree of protection IP65
IP67 as alternative



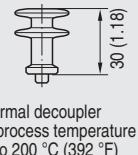
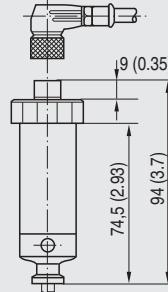
Angled plug to
DIN 43 650
Degree of protection IP65



Cable connection
Degree of protection IP67
(cable ventilation)

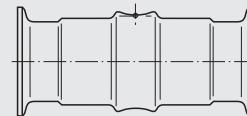
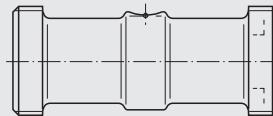


Round plug with
screw connection M12
Degree of protection IP65



Process connections

Standard



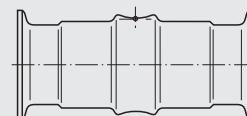
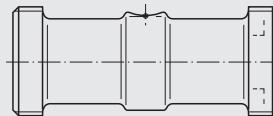
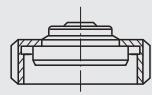
Food screwed gland
Union nut
to DIN 11 851
DN 25 ... 65

Clamp connection
to DIN 32 676
ISO 2852
DN 25 ... 65
1" ... 2 1/2"

Pipe-screwed gland
(food)
Round thread
to DIN 11 851
DN 25 ... 65

Pipe clamp connection
to DIN 32 676
DN 25 ... 100
to ISO 2853
1" ... 2 1/2"

Aseptic



Aseptic screwed gland
Round thread
Neumo, Südmo, Guth
DIN 11 864-1
DN 25 ... 65
1" ... 2"

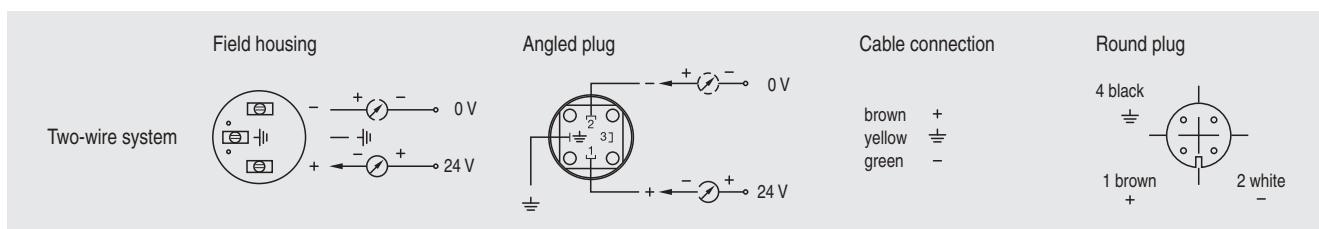
Clamp connection
Neumo, Südmo, Guth
DN 25 ... 50
1" ... 2"

Pipe screwed gland (aseptic)
Round thread
DIN 11 864-1
Neumo, Südmo, Guth
DN 25 ... 65
1" ... 2"

Pipe clamp connection
Neumo, Südmo, Guth
DN 25 ... 65
1" ... 2"

SITRANS P, dimensions in mm (inch)

Schematics



SITRANS P Compact, connection diagram

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

Overview

2



The SITRANS P300 is a digital pressure transmitter for gage and absolute pressure. All conventional thread versions are available as process connections. In addition, various hygiene-based connections and flange connections with front-flush diaphragms meet the requirements of a dead space free process connection.

The output signal is a load-independent direct current from 4 to 20 mA or a PROFIBUS PA signal, which is linearly proportional to the input pressure. Communication is over HART protocol or over PROFIBUS PA interface. Convenient buttons for easy local operation of the basic settings of the pressure transmitter.

The SITRANS P300 has a single-chamber stainless steel casing. The pressure transmitter is approved with "intrinsically safe" type of protection. It can be used in zone 1 or zone 0.

Benefits

- High quality and long life
- High reliability even under extreme chemical and mechanical loads
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (such as stainless steel, Hastelloy)
- Measuring range 8 mbar to 400 bar
- High measuring accuracy
- Parameterization over control keys and HART communication or PROFIBUS PA communication

Application

The pressure transmitter is available in versions for gage pressure and for absolute pressure. The output signal is always a load-independent direct current from 4 to 20 mA or a PROFIBUS PA signal, which is linearly proportional to the input pressure. The pressure transmitter measures aggressive, non-aggressive and hazardous gases, as well as vapors and liquids.

It can be used for the following measurement types:

- Gage pressure
- Absolute pressure

With appropriate parameter settings, it can also be used for the following additional measurement types:

- Level
- Volume
- Mass

The "intrinsically-safe" EEx version of the transmitter can be installed in hazardous areas (zone 1). The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards of ATEX.

Gage pressure

This variant measures aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 10 mbar g, the largest 400 bar g.

Level

With appropriate parameter settings, the gage pressure variant measures the level of aggressive, non-aggressive and hazardous liquids.

For measuring the level in an open container you require one device; for measuring the level in a closed container, you require two devices and a process control system.

Absolute pressure

This variant measures the absolute pressure of aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 8 mbar a, the largest 30 bar a.

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

Design

The device comprises:

- Electronics
- Housing
- Measuring cell

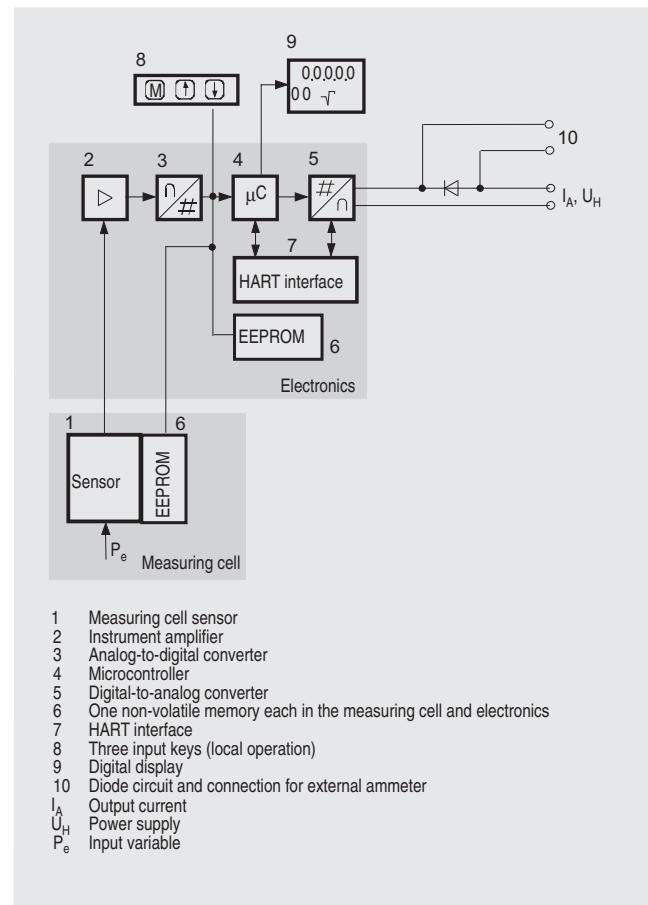


Perspective view of the SITRANS P300

The housing has a screw-on cover (3), with or without an inspection window depending on the version. The electrical terminal housing, the buttons for operation of the device and, depending on the version, the digital display are located under this cover. The connections for the auxiliary power UH and the shield are in the terminal housing. The cable gland is mounted on the side of the housing. The measuring cell with the process connection (5) is located on the underside of the housing. Depending on the version of the device, the measuring cell with the process connection may differ from the one shown in the diagram.

Function

Operation of the electronics with HART communication



Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog to digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected with regard to linearity and thermal characteristics. In a digital to analog converter (5) it is then converted into the output current of 4 to 20 mA. A diode circuit provides reverse voltage protection. You can make an uninterrupted current measurement with a low-ohm ammeter at the connection (10). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked with the measuring cell, the second with the electronics.

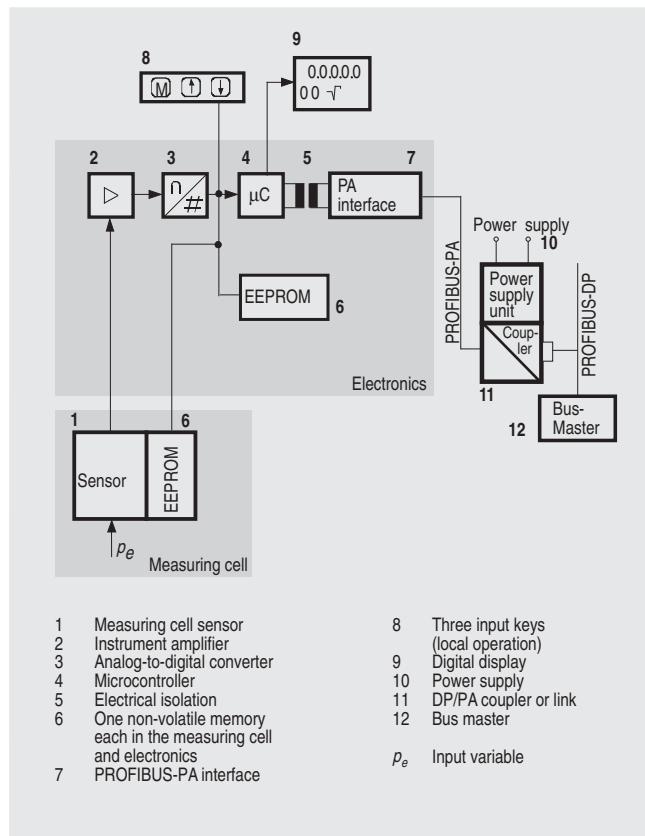
The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a digital display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer via the HART modem (7).

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

Operation of the electronics with PROFIBUS PA communication

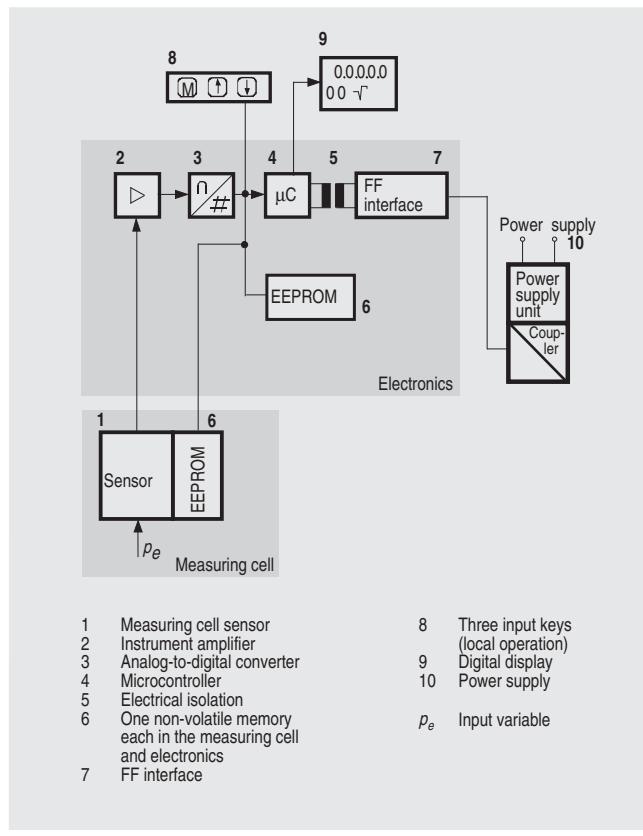


Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog to digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected with regard to linearity and thermal characteristics. It is then made available at the PROFIBUS PA over an electrically isolated PROFIBUS PA interface (7). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked with the measuring cell, the second with the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a digital display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer over the bus master (12).

Mode of operation of the FOUNDATION Fieldbus electronics



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the instrument amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus Interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input keys (8) you can parameterize the pressure transmitter directly at the point of measurement. The input keys can also be used to control the view of the results, the error messages and the operating modes on the digital display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

Mode of operation of the measuring cells

The process connections available include the following:

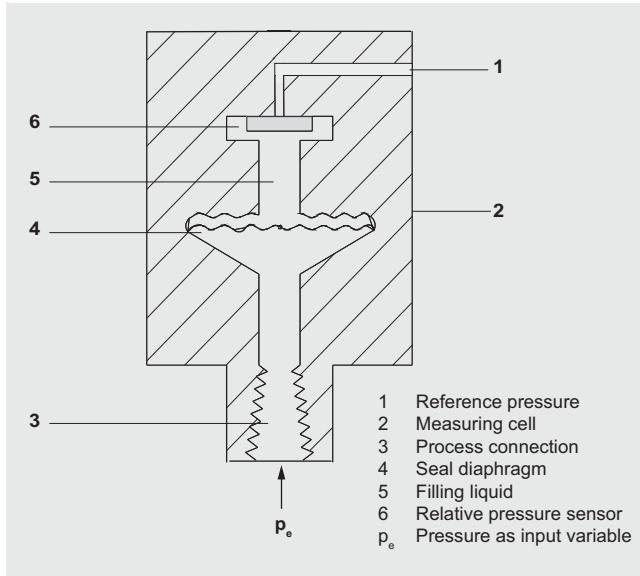
- G1½
- ½-14 NPT
- Front-flush diaphragm:
 - Flanges to EN
 - Flanges to ASME
 - NuG and pharmaceutical connections

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

Measuring cell for gage pressure

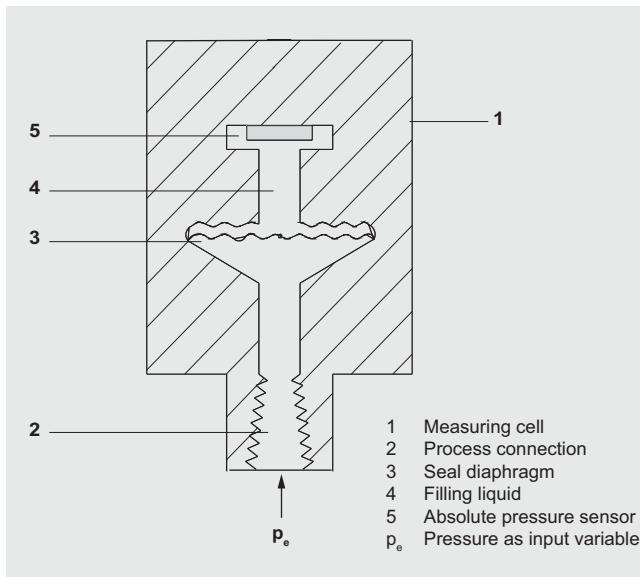


Measuring cell for gage pressure, function chart

The input pressure (p_e) is transferred to the gage pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

The transmitters with spans ≤ 63 bar measure the input pressure against atmosphere, those with spans ≥ 160 bar against vacuum.

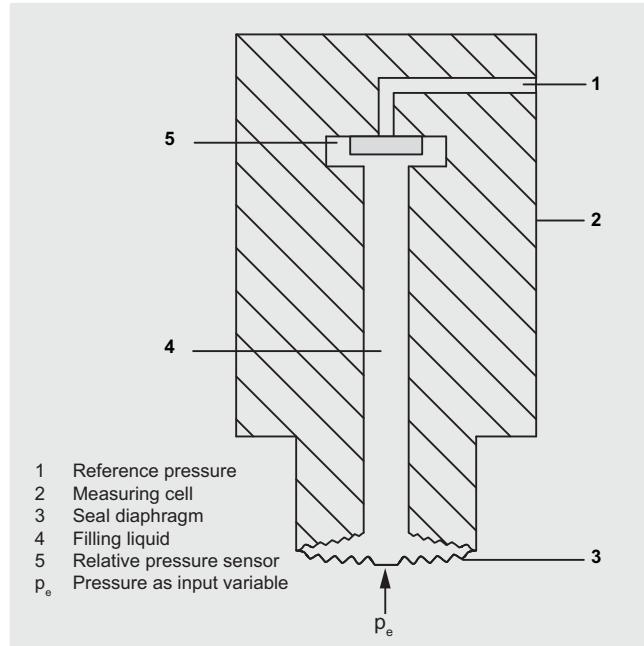
Measuring cell for absolute pressure



Measuring cell for absolute pressure, function chart

The input pressure (p_e) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Measuring cell for gage pressure, front-flush diaphragm

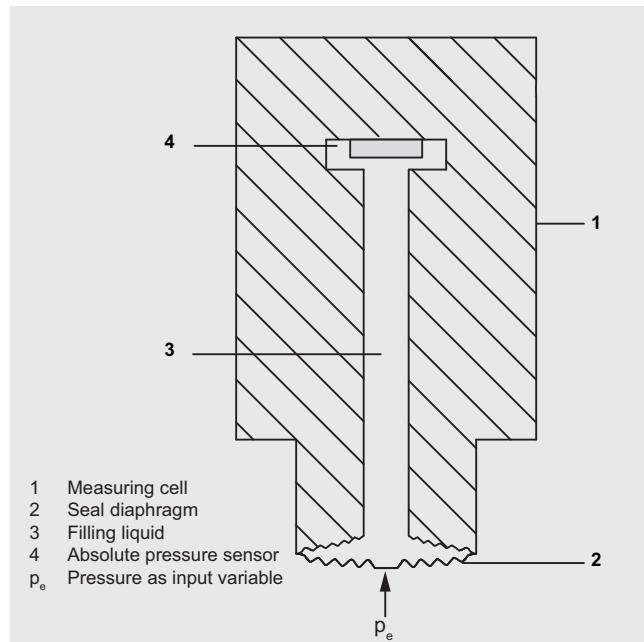


Measuring cell for gage pressure, front-flush diaphragm, function chart

The input pressure (p_e) is transferred to the gage pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

The transmitters with spans ≤ 63 bar measure the input pressure against atmosphere, those with spans ≥ 160 bar against vacuum.

Measuring cell for absolute pressure, front-flush diaphragm



Measuring cell for absolute pressure, front-flush diaphragm, function chart

The input pressure (p_e) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Parameterization of SITRANS P300

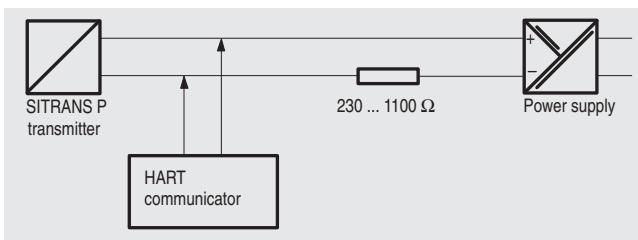
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input keys (local operation)

With the input keys you can easily set the most important parameters without any additional equipment.

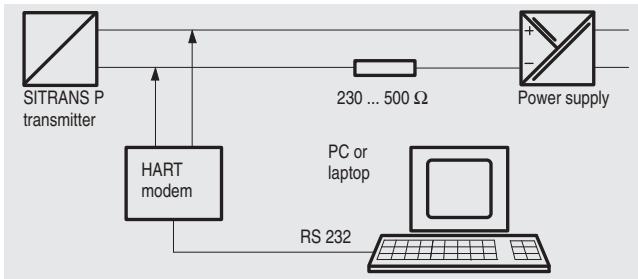
Parameterization using HART communication

Parameterization using HART communication is performed with a HART communicator or a PC.



Communication between a HART communicator and a pressure transmitter

When parameterizing with the HART communicator, the connection is made directly to the 2-wire system.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

Adjustable parameters on SITRANS P300 with HART communication

Parameters	Input keys	HART communication
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
Current transmitter	x	x
Fault current	x	x
Disabling of keys, write protection	x	x ¹⁾
Type of dimension and actual dimension	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostics functions		x

¹⁾ Cancel apart from write protection

Diagnostic functions for SITRANS P300 with HART communication

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

Available physical units of display for SITRANS P300 with HART communication

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , inH ₂ O, inH ₂ O (4 °C), mmH ₂ O, ftH ₂ O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS puts the DS III PA in connection with a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

Parameterization through FOUNDATION Fieldbus Interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the P300 FF is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for P300 PA and FF

Parameters	Input keys (DS III HART)	PROFIBUS PA and (DS III HART) FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Key and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic		x
Freely-programmable LCD	x	
Diagnostics functions		x

Diagnostic functions for P300 PA and FF

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , mmH ₂ O, mmH ₂ O (4 °C), inH ₂ O, inH ₂ O (4 °C), ftH ₂ O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Volume flow	m ³ /s, m ³ /min, m ³ /h, m ³ /d, l/s, l/min, l/h, l/d, Ml/d, ft ³ /s, ft ³ /min, ft ³ /h, ft ³ /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

Hygiene version

In the case of the SITRANS P300 with 7MF812.-... front-flush diaphragm, selected connections comply with the requirements of the EHEDG or 3A. You will find further details in the order form. Please note in particular that the seal materials used must comply with the requirements of 3A. Similarly, the filling liquids used must be FDA-compliant.

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

Technical specifications

SITRANS P300 for gage pressure and absolute pressure

2

	HART	PROFIBUS PA and FOUNDATION Fieldbus		
Gage pressure input				
Measured variable	Gage pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
0.01 ... 1 bar g (0.15 ... 14.5 psi g)	6 bar g (87 psi g)	1 bar g (14.5 psi g)	6 bar g (87 psi g)	6 bar g (87 psi g)
0.04 ... 4 bar g (0.58 ... 58 psi g)	10 bar g (145 psi g)	4 bar g (58 psi g)	10 bar g (145 psi g)	10 bar g (145 psi g)
0.16 ... 16 bar g (2.3 ... 232 psi g)	32 bar g (464 psi g)	16 bar g (232 psi g)	32 bar g (464 psi g)	32 bar g (464 psi g)
0.6 ... 63 bar g (9.1 ... 914 psi g)	100 bar g (1450 psi g)	63 bar g (914 psi g)	100 bar g (1450 psi g)	100 bar g (1450 psi g)
1.6 ... 160 bar g (23.2 ... 2321 psi g)	250 bar g (3626 psi g)	160 bar g (2321 psi g)	250 bar g (3626 psi g)	250 bar g (3626 psi g)
4.0 ... 400 bar g (58 ... 5802 psi g)	600 bar g (8700 psi g)	400 bar g (5802 psi g)	600 bar g (8700 psi g)	600 bar g (8700 psi g)
Lower measuring limit	Depending on the process connection, the span may differ from these values		Depending on the process connection, the nominal measuring range may differ from these values	
• Measuring cell with silicone oil	30 mbar a (0.44 psi a)			
Upper measuring limit				
• Measuring cell with silicone oil	100% of max. span		100% of the max. nominal measuring range	
Absolute pressure input				
Measured variable	Absolute pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
8 ... 250 mbar a (0.12 ... 3.6 psi a)	6 bar a (87 psi a)	250 mbar a (3.6 psi a)	6 bar a (87 psi a)	6 bar a (87 psi a)
0.043 ... 1.30 bar a (0.62 ... 19 psi a)	10 bar a (145 psi a)	1.30 bar a (19 psi a)	10 bar a (145 psi a)	10 bar a (145 psi a)
0.16 ... 5 bar a (2.3 ... 73 psi a)	30 bar a (435 psi a)	5 bar a (73 psi a)	30 bar a (435 psi a)	30 bar a (435 psi a)
1 ... 30 bar a (14.5 ... 435 psi a)	100 bar a (1450 psi a)	30 bar a (435 psi a)	100 bar a (1450 psi a)	100 bar a (1450 psi a)
Lower measuring limit	0 mbar a (0 psi a)			
• Measuring cell with silicone oil	0 mbar a (0 psi a)			
Upper measuring limit				
• Measuring cell with silicone oil	100% of max. span		100% of the max. nominal measuring range	
Input of gage pressure, with front-flush diaphragm				
Measured variable	Gage pressure, front-flush			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
0.01 ... 1 bar g (0.145 ... 14.5 psi g)	6 bar g (87 psi g)	1 bar g (14.5 psi g)	6 bar g (87 psi g)	6 bar g (87 psi g)
0.04 ... 4 bar g (0.58 ... 58 psi g)	10 bar g (145 psi g)	4 bar g (58 psi g)	10 bar g (145 psi g)	10 bar g (145 psi g)
0.16 ... 16 bar g (2.32 ... 232 psi g)	32 bar g (464 psi g)	16 bar g (232 psi g)	32 bar g (464 psi g)	32 bar g (464 psi g)
0.6 ... 63 bar g (9.14 ... 914 psi g)	100 bar g (1450 psi g)	63 bar g (914 psi g)	100 bar g (1450 psi g)	100 bar g (1450 psi g)
Lower measuring limit	-100 mbar g (-1.45 psi g)			
Upper measuring limit				
• Measuring cell with silicone oil	100% of max. span		100% of the max. nominal measuring range	

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

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SITRANS P300 for gage pressure and absolute pressure

	HART	PROFIBUS PA and FOUNDATION Fieldbus		
Input of absolute pressure, with front-flush diaphragm				
Measured variable	Absolute pressure (front-flush)			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span 43 ... 1300 mbar a (0.62 ... 18.9 psi a) 0,16 ... 5 bar a (2.32 ... 72,5 psi a) 1 ... 30 bar a (14.5 ... 435 psi a)	Max. perm. test pressure 10 bar a (145 psi a) 30 bar a (435 psi a) 100 bar a (1450 psi a)	Nominal measuring range 1300 mbar a (18.9 psi a) 5 bar a (72,5 psi a) 30 bar a (435 psi a)	Max. perm. test pressure 10 bar a (145 psi a) 30 bar a (435 psi a) 100 bar a (1450 psi a)
	Depending on the process connection, the span may differ from these values			
Lower measuring limit	0 bar a (0 psi a)			
Upper measuring limit				
• Measuring cell with silicone oil	100% der max. Messspanne		100% des max. Nennmessbereichs	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA signal	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	No		Yes	
Electrical damping T_{63} (step width 0.1 s)	Set to 0.1 s (0 ... 100 s)			
Accuracy				
Reference conditions (All error data refer always refer to the set span)	To EN 60770-1 Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, measuring cell with silicone oil, room temperature 25 °C (77 °F), span ratio (r = max. span / set span)			
Measurement deviation with cut-off point setting, including hysteresis and repeatability.	Gage pressure Approx. 0.2 s			
Linear characteristic curve	Gage pressure $\leq (0.0029 \cdot r + 0.071)\%$ $\leq (0.0045 \cdot r + 0.071)\%$ $\leq (0.005 \cdot r + 0.05)\%$	Absolute pressure $\leq 0,1\%$ $\leq 0,2\%$ -	(Absolute pressure, front-flushed) $\leq 0,2\%$ $\leq 0,4\%$ -	Gage pressure $\leq 0,075\%$ $\leq 0,1\%$ $\leq 0,2\%$
Settling time T_{63} without electrical damping	Approx. 0.2 s			
Long-term drift at ± 30 °C (± 54 °F)	$\leq (0.25 \cdot r)/5$ years	$\leq (0.1 \cdot r)/\text{year}$	$\leq 0.25\%/5$ years	$\leq 0.1\%/\text{year}$
Influence of ambient temperature	$\leq (0.1 \cdot r + 0.2)\%$ $\leq (0.1 \cdot r + 0.15)\% / 10$ K			
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.2 \cdot r + 0.3)\%$ $\leq (0.2 \cdot r + 0.3)\%/10$ K			
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... 14 °F and 140 ... 185 °F)	$\leq 0.3\%$ $\leq 0.25\%/10$ K			
Influence of the medium temperature (only with front-flush diaphragm)	3 mbar/10 K (0.04 psi/10 K)			
• Temperature difference between medium temperature and ambient temperature				

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

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SITRANS P300 for gage pressure and absolute pressure

	HART	PROFIBUS PA and FOUNDATION Fieldbus
Rated operating conditions		
<u>Installation conditions</u>		
Ambient temperature	Observe the temperature class in areas subject to explosion hazard.	
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)	
• Measuring cell with Neobee oil (with front-flush diaphragm)	-10 ... +85 °C (14 ... +185 °F)	
• Measuring cell with inert liquid (not with front-flush diaphragm)	-20 ... +85 °C (-4 ... +185 °F)	
• Digital display	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with Neobee: -20 ... +85 °C (-4 ... +185 °F))	
Climatic class	Permissible	
Condensation	Permissible	
Degree of protection to EN 60529	IP65, IP68, NEMA X, enclosure cleaning, resistant to lyes, steam to 150° C (302 °F)	
Electromagnetic compatibility	To EN 61326 and NAMUR NE 21	
<u>Medium conditions</u>		
Process temperature		
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with silicone oil (with front-flush diaphragm)	-40 ... +150 °C (-40 ... +302 °F)	
• Measuring cell with Neobee oil (with front-flush diaphragm)	-40 ... +150 °C (-40 ... +302 °F)	
• Measuring cell with silicone oil, with temperature isolator (only with front-flush diaphragm)	-40 ... +200 °C (-40 ... +392 °F)	
• Measuring cell with inert liquid	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with high temperature oil	-10 ... +250 °C (14 ... +482 °F)	
Design (standard version)		
Weight (without options)	Approx. 800 g (1.8 lb)	
Housing material	Stainless steel, mat. No. 1.4301/304	
Material of parts in contact with the medium		
• Connection shank	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819	
• Oval flange	Stainless steel, mat. No. 1.4404/316L	
• Seal diaphragm	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819	
• Measuring cell filling	• Silicone oil • Inert filling liquid	
Process connection	• G½B to DIN EN 837-1 • Female thread ½-14 NPT • Oval flange PN 160 (MWP 2320 psi) with fastening thread: - 7/16-20 UNF to IEC 61518 - M10 as per DIN 19213	
Design (version with front-flush diaphragm)		
Weight (without options)	Approx. 1 ... 13 kg (2.2 ... 29 lb)	
Housing material	Stainless steel, mat. No. 1.4301/304	
Material of parts in contact with the medium		
• Process connection	Stainless steel, mat. No. 1.4404/316L	
• Seal diaphragm	Stainless steel, mat. No. 1.4404/316L	
• Measuring cell filling	• Silicone oil • Inert filling liquid • FDA compliant fill fluid (Neobee oil)	
Process connection	• Flanges as per EN and ASME • F&B and pharmaceutical flanges	

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

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SITRANS P300 for gage pressure and absolute pressure

	HART	PROFIBUS PA and FOUNDATION Fieldbus
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	Supplied through bus
Separate power supply	-	Not necessary
Bus voltage		
• Without EEx	-	9 ... 32 V
• For intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Startup current \leq basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE)	-	Available
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Water, waste water	Available soon	
Explosion protection		
Intrinsic safety "i"	PTB 05 ATEX 2048	
Identification	Ex II 1/2 G EEx ia/b IIB/IIC T4, T5, T6	
Permissible ambient temperature		
• Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
• Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
• Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	To certified intrinsically-safe circuits with maximum values: FISCO supply unit: $U_i = 17.5 \text{ V}$, $I_i = 380 \text{ mA}$, $P_i = 5.32 \text{ W}$ Linear barrier: $U_i = 24 \text{ V}$, $I_i = 250 \text{ mA}$, $P_i = 1.2 \text{ W}$ $C_i = 1.1 \text{ nF}$ $L_i \leq 7 \mu\text{H}$
Effective inner capacitance:	$C_i = 6 \text{ nF}$	
Effective inner inductance:	$L_i = 0.4 \text{ mH}$	
Explosion protection to FM for USA and Canada (cFMUS)		
• Identification (DIP) or (IS); (NI)	Certificate of Compliance 3025099 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6;	
• Identification (DIP) or (IS)	CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

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HART communication

HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM

PROFIBUS PA communication

Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measuring value) or 10 (two measuring values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	
- Failure mode	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a container characteristic with	Max. 30 nodes
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

Communication FOUNDATION Fieldbus

Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FF function block
• Physical block	1 Resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

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Selection and Ordering data

Order No.

SITRANS P300 pressure transmitters for gage and absolute pressure, single-chamber measuring housing, rating plate inscription in English

4 ... 20 mA/HART 7MF8023 -

PROFIBUS PA 7MF8024 -

FOUNDATION Fieldbus (FF) 7MF8025 -

Measuring cell filling Measuring cell cleaning

Silicone oil Standard 1
Inert liquid Cleanliness level 2 to 3
DIN 25410

max. span

0,01 ... 1 bar g (0,145 ... 14,5 psi g) B
0,04 ... 4 bar g (0,58 ... 58 psi g) C
0,16 ... 16 bar g (2,32 ... 232 psi g) D
0,63 ... 63 bar g (9,14 ... 914 psi g) E
1,6 ... 160 bar g (23,2 ... 2320 psi g) F
4 ... 400 bar g (58 ... 5800 psi g) G
2,5 ... 25 mbar a (0,036 ... 3,63 psi a) H
13 ... 1300 mbar a (0,19 ... 18,9 psi a) I
0,05 ... 5 bar a (0,7 ... 72,5 psi a) J
0,3 ... 30 bar a (4,35 ... 435 psi a) K

Wetted parts materials

Seal diaphragm Measuring cell
Stainless steel Stainless steel A
Hastelloy Stainless steel B
Hastelloy Hastelloy C
Version for diaphragm seal 1) 2) Y

Process connection

- G $\frac{1}{2}$ B to EN 837-1 0
- $\frac{1}{2}$ -14 NPT 1
- Oval flange made of stainless steel 2
- Mounting thread 7/16-20 UNF to EN 61518 3
- Mounting thread M10 to DIN 19213 4
- Mounting thread M12 to DIN 19213 5
- Male thread M20 x 1,5 6
- Male thread 1/2 -14 NPT 6

Non-wetted parts materials

- St. steel, deep-drawn and electrolytically polished

Version

- Standard version 1

Explosion protection

- Without
- With ATEX, Type of protection:
 - "Intrinsic safety (EEx ia)"
- Zone 20/21/22³⁾
- Ex nA/nL (zone 2)⁴⁾
- With FM „Intrinsic safe“ (cFM_{US})

Electrical connection / cable entry

- Screwed gland M20x1.5 (Polyamide) ⁵⁾
- Screwed gland M20x1.5 (metal)
- Screwed gland M20x1.5 (stainless steel)
- M12 connector (metal, without cable socket)
- M12 connector (stainless steel, without cable socket)
- $\frac{1}{2}$ -14 NPT thread, metal ⁶⁾
- $\frac{1}{2}$ -14 NPT thread, stainless steel ⁶⁾

Selection and Ordering data

Order No.

SITRANS P300 pressure transmitters for gage and absolute pressure, single-chamber measuring housing, rating plate inscription in English

4 ... 20 mA/HART 7MF8023 -

PROFIBUS PA 7MF8024 -

FOUNDATION Fieldbus (FF) 7MF8025 -

Display

- Without display, with keys, closed lid ⁵⁾ 1
- With display and keys, closed lid 2
- With display and keys, lid with macrolon washer (setting on HART devices: mA, on PROFIBUS PA and FOUNDATION Fieldbus devices: pressure units) 4
- With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with macrolon washer 5
- With display and keys, lid with glass pane (setting on HART devices: mA, on PROFIBUS and FOUNDATION Fieldbus devices: pressure units) 6
- With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane 7

Power supply units see "SITRANS I power supply units and isol. amplifiers".

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

2) Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.

3) Can only be ordered in conjunction with electrical connection Option A.

4) Can only be ordered in conjunction with electrical connection Option B, C, F or G.

5) Only together with HART electronics.

6) Without cable gland.

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

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Selection and Ordering data		Order No.	Selection and Ordering data	Order No.
SITRANS P300 pressure transmitters for gage and absolute pressure with front-flush membrane, single-chamber measuring housing, rating plate inscription in English			SITRANS P300 pressure transmitters for gage and absolute pressure with front-flush membrane, single-chamber measuring housing, rating plate inscription in English	
4 ... 20 mA/HART		F) 7MF8123 -	4 ... 20 mA/HART	F) 7MF8123 -
PROFIBUS PA		F) 7MF8124 -	PROFIBUS PA	F) 7MF8124 -
FOUNDATION Fieldbus (FF)		F) 7MF8125 -	FOUNDATION Fieldbus (FF)	F) 7MF8125 -
Measuring cell filling	Measuring cell cleaning		Display	
Silicone oil	Standard	1	• Without display, with keys, closed lid ⁴⁾	1
Inert liquid	Cleanliness level 2 to DIN 25410	3	• With display and keys, closed lid	2
FDA compliant fill fluid			• With display and keys, lid with macrolon washer (setting on HART devices: mA, on PROFIBUS PA and FOUNDATION Fieldbus devices: pressure units)	4
• Neobee oil	Standard	4	• With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with macrolon washer	5
max. span			• With display and keys, lid with glass pane (setting on HART devices: mA, on PROFIBUS PA and FOUNDATION Fieldbus devices: pressure units)	6
0,01 ... 1 bar g	(0,15 ... 14,5 psi g)	B	• With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane	7
0,04 ... 4 bar g	(0,58 ... 58 psi g)	C		
0,16 ... 16 bar g	(2,32 ... 232 psi g)	D		
0,63 ... 63 bar g	(9,14 ... 914 psi g)	E		
13 ... 1300 mbar a ¹⁾	(0,19 ... 18,9 psi a)	S		
0,05 ... 5 bar a ¹⁾	(0,7 ... 72,5 psi a)	T		
0,03 ... 30 bar a ¹⁾	(4,35 ... 435 psi a)	U		
Wetted parts materials				
Seal diaphragm	Measuring cell		Power supply units see "SITRANS I power supply units and isol. amplifiers".	
Stainless steel	Stainless steel	A	Included in delivery of the device:	
Process connection			• Brief instructions (Leporello)	
• Flange version with Order code M.., N.., R.. or Q.. (see "Further designs")		7	• CD-ROM with detailed documentation	
Non-wetted parts materials				
• Stainless steel, deep-drawn and electrolytically polished		4		
Version				
• Standard version		1		
Explosion protection				
• Without		A		
• With ATEX, Type of protection:		B		
- "Intrinsic safety (EEx ia)"		C		
• Zone 20/21/22 ²⁾		E		
• Ex nA/nL (zone 2) ³⁾		M		
• With FM „Intrinsic safe“ (cFM _{US})		A		
Electrical connection / cable entry		B		
• Screwed gland M20x1,5 (Polyamide) ⁴⁾		C		
• Screwed gland M20x1,5 (metal)		F		
• Screwed gland M20x1,5 (stainless steel)		G		
• M12 connector (without cable socket)		H		
• M12 connector (stainless steel, without cable socket)		J		
• 1/2-14 NPT thread, metal ⁵⁾				
• 1/2-14 NPT thread, stainless steel ⁵⁾				

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

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Selection and Ordering data		Order code			Selection and Ordering data		Order code		
		HART	PA	FF			HART	PA	FF
Further designs Add "-Z" to Order No. and specify Order code.					Further designs Add "-Z" to Order No. and specify Order code.				
Mounting bracket made completely of stainless steel, for wall or pipe mounting	A02	✓	✓	✓	Varivent connection certified to 3A and EHEDG ³⁾				
Cable socket for M12 plug	A50		✓	✓	• Type N = 68 for Varivent housing DN 40 ... 125 and 1 1/2" ... 6", PN 40	N28	✓	✓	✓
• Metal • Stainless steel	A51		✓	✓	Temperature decoupler up to 200 °C⁷⁾ for version with front-flush diaphragm	P00	✓	✓	✓
Rating plate inscription (instead of English)	B10	✓	✓	✓	Temperature decoupler up to 250 °C Measuring cell filling: High-temperature oil, only in conjunction with measuring cell filling silicone oil	P10	✓	✓	✓
• German • French • Spanish • Italian	B12	✓	✓	✓	Bio-Control (Neumo) sanitary connection certified to 3A and EHEDG ³⁾				
English rating plate Pressure units in inH ₂ O or psi	B13	✓	✓	✓	• DN 50, PN 16	Q53	✓	✓	✓
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾ to IEC 60770-2	B14	✓	✓	✓	• DN 65, PN 16	Q54	✓	✓	✓
Acceptance test certificate²⁾ to EN 10204-3.1	B21	✓	✓	✓	Sanitary process connection to DRD				
Factory certificate to EN 10204-2.2	C11	✓	✓	✓	• 65 mm, PN 40	M32	✓	✓	✓
Type of protection IP68	C12	✓	✓	✓	SMS socket with union nut				
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)	C14	✓	✓	✓	• 2"	M67	✓	✓	✓
Flange to EN 1092-1, form B1	D12	✓	✓	✓	• 2 1/2"	M68	✓	✓	✓
• DN 25, PN 40 ³⁾ • DN 25, PN 100 ³⁾ • DN 40, PN 40 • DN 40, PN 100 • DN 50, PN 16 • DN 50, PN 40 • DN 80, PN 25 • DN 80, PN 40	M11	✓	✓	✓	• 3"	M69	✓	✓	✓
Flanges to ASME B16.5	M21	✓	✓	✓	SMS threaded socket				
• 1", class 150 ³⁾ • 1 1/2", class 150 • 2", class 150 • 3", class 150 • 4", class 150 • 1", class 300 ³⁾ • 1 1/2", class 300 • 2", class 300 • 3", class 300	M13	✓	✓	✓	• 2"	M73	✓	✓	✓
Threaded connection acc. to DIN 3852-2, Form A	M23	✓	✓	✓	• 2 1/2"	M74	✓	✓	✓
• G 3/4"-A, flush-mounted ⁴⁾ • G 1"-A, flush-mounted ⁴⁾ • G 2"-A, flush-mounted ⁴⁾	M04	✓	✓	✓	• 3"	M75	✓	✓	✓
Tank connection⁵⁾ Sealing is included in delivery	M14	✓	✓	✓	IDF socket with union nut ISO 2853				
• TG 52/50, PN 40 • TG 52/150, PN 40	M06	✓	✓	✓	• 2"	M82	✓	✓	✓
Sanitary process connection according DIN 11851 (Dairy connection) certified to 3A ⁶⁾	M16	✓	✓	✓	• 2 1/2"	M83	✓	✓	✓
certified to 3A ⁶⁾					• 3"	M84	✓	✓	✓
Tri-Clamp connection according DIN 32676/ISO 2852 certified to 3A ⁶⁾	M40	✓	✓	✓	IDF threaded socket ISO 2853				
• DN 50, PN 25 • DN 80, PN 25	M41	✓	✓	✓	• 2"	M92	✓	✓	✓
N04	✓	✓	✓		• 2 1/2"	M93	✓	✓	✓
N06	✓	✓	✓		• 3"	M94	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)	M42	✓	✓	✓	Sanitary process connection to NEUMO Bio-Connect screw connection certified to 3A and EHEDG ³⁾				
M43	✓	✓	✓		• DN 50, PN 16	Q05	✓	✓	✓
M44	✓	✓	✓		• DN 65, PN 16	Q06	✓	✓	✓
M45	✓	✓	✓		• DN 80, PN 16	Q07	✓	✓	✓
M46	✓	✓	✓		• DN 100, PN 16	Q08	✓	✓	✓
M47	✓	✓	✓		• DN 2", PN 16	Q13	✓	✓	✓
M48	✓	✓	✓		• DN 2 1/2", PN 16	Q14	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 3", PN 16	Q15	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 4", PN 16	Q16	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)	R01	✓	✓	✓	Sanitary process connection to NEUMO Bio-Connect flange connection certified to 3A and EHEDG ³⁾				
R02	✓	✓	✓		• DN 50, PN 16	Q23	✓	✓	✓
R04	✓	✓	✓		• DN 65, PN 16	Q24	✓	✓	✓
R10	✓	✓	✓		• DN 80, PN 16	Q25	✓	✓	✓
R11	✓	✓	✓		• DN 100, PN 16	Q26	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 2", PN 16	Q31	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 2 1/2", PN 16	Q32	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 3", PN 16	Q33	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 4", PN 16	Q34	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)	N04	✓	✓	✓	Sanitary process connection to NEUMO Bio-Connect clamp connection certified to 3A and EHEDG ³⁾				
N06	✓	✓	✓		• DN 50, PN 16	Q39	✓	✓	✓
N14	✓	✓	✓		• DN 65, PN 10	Q40	✓	✓	✓
N15	✓	✓	✓		• DN 80, PN 10	Q41	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 100, PN 10	Q42	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 2 1/2", PN 16	Q48	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 3", PN 10	Q49	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)					• DN 4", PN 10	Q50	✓	✓	✓

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

2

Selection and Ordering data		Order code			Selection and Ordering data		Order code				
Further designs			HART	PA	FF	Additional data			HART	PA	FF
Add "-Z" to Order No. and specify Order code.						Add "-Z" to Order No. and specify Order code.					
Sanitary process connection to NEUMO Connect S flange connection certified to 3A and EHEDG						Measuring range to be set Specify in plain text V (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓			
• DN 50, PN 16	Q63	✓	✓	✓		Y15	✓	✓	✓	✓	
• DN 65, PN 10	Q64	✓	✓	✓		Y16	✓	✓	✓	✓	
• DN 80, PN 10	Q65	✓	✓	✓		Y17	✓				
• DN 100, PN 10	Q66	✓	✓	✓		Y21	✓	✓	✓	✓	
• DN 2", PN 16	Q72	✓	✓	✓		Y22 + Y01	✓				
• DN 2½", PN 10	Q73	✓	✓	✓		Y25	✓	✓	✓	✓	
• DN 3", PN 10	Q74	✓	✓	✓							
• DN 4", PN 10	Q75	✓	✓	✓							
Aseptic threaded socket to DIN 11864-1 Form A											
• DN 50, PN 25	N33	✓	✓	✓							
• DN 65, PN 25	N34	✓	✓	✓							
• DN 80, PN 25	N35	✓	✓	✓							
• DN 100, PN 25	N36	✓	✓	✓							
Aseptic flange with notch to DIN 11864-2 Form A											
• DN 50, PN 16	N43	✓	✓	✓							
• DN 65, PN 16	N44	✓	✓	✓							
• DN 80, PN 16	N45	✓	✓	✓							
• DN 100, PN 16	N46	✓	✓	✓							
Aseptic flange with groove to DIN 11864-2 Form A											
• DN 50, PN 16	N43 + P11	✓	✓	✓							
• DN 65, PN 16	N44 + P11	✓	✓	✓							
• DN 80, PN 16	N45 + P11	✓	✓	✓							
• DN 100, PN 16	N46 + P11	✓	✓	✓							
Aseptic clamp with groove to DIN 11864-3 Form A											
• DN 50, PN 25	N53	✓	✓	✓							
• DN 65, PN 25	N54	✓	✓	✓							
• DN 80, PN 16	N55	✓	✓	✓							
• DN 100, PN 16	N56	✓	✓	✓							

- 1) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
- 3) Special Viton seal included in delivery.
- 4) Lower measuring limit -100 mbar g (1.45 psi g).
- 5) The weldable socket can be ordered under accessories
- 6) Certified to 3A.
The maximum temperatures of the medium depend on the respective cell fillings.
- 7) 3A certification only if used in conjunction with 3A-compliant sealing rings.

Only "Y01" and "Y21" can be factory preset

✓ = available

Ordering example

Item line: 7MF8023-1DB24-1AB7-Z
 B line: A02 + Y01 + Y21
 C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)
 C line: Y21: bar (psi)

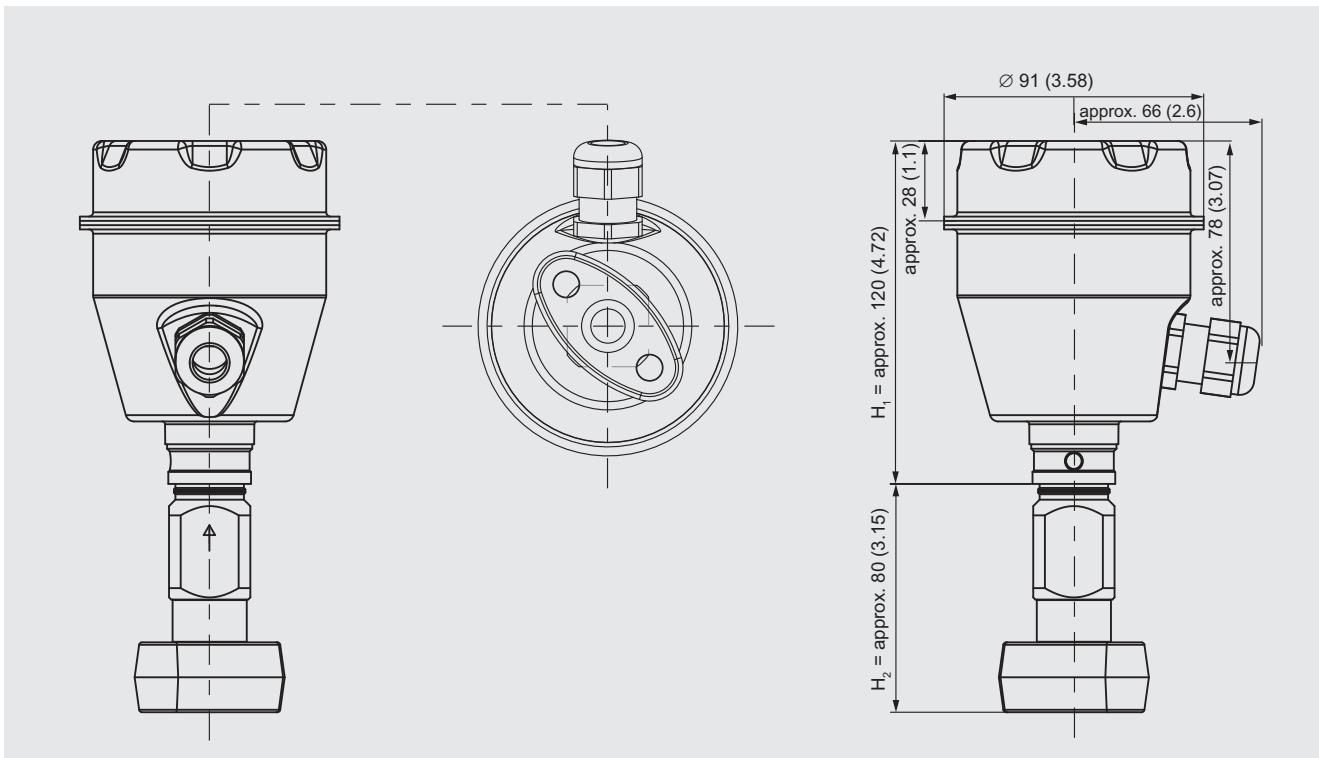
SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

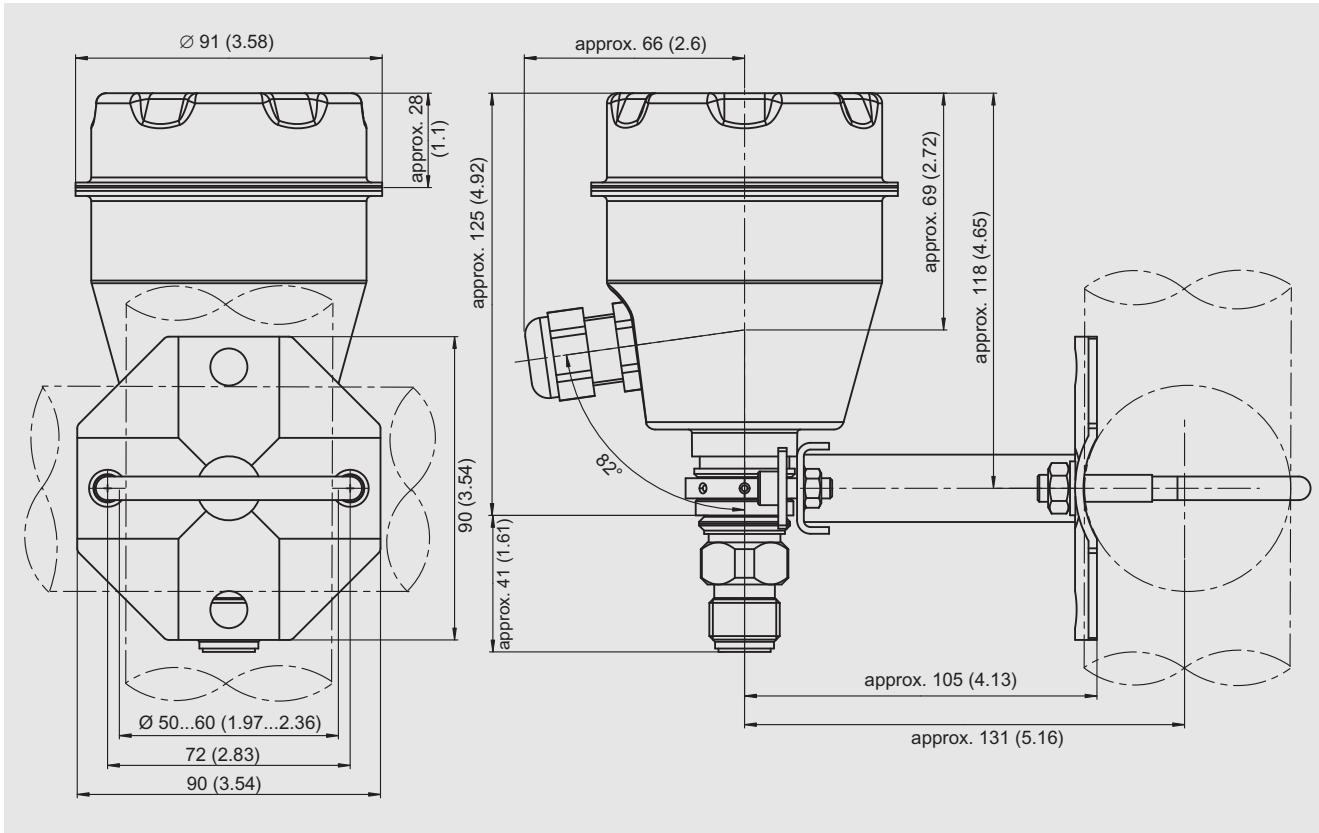
SITRANS P300

Dimensional drawings

2



SITRANS P300, with oval flange, dimensions in mm (inch)



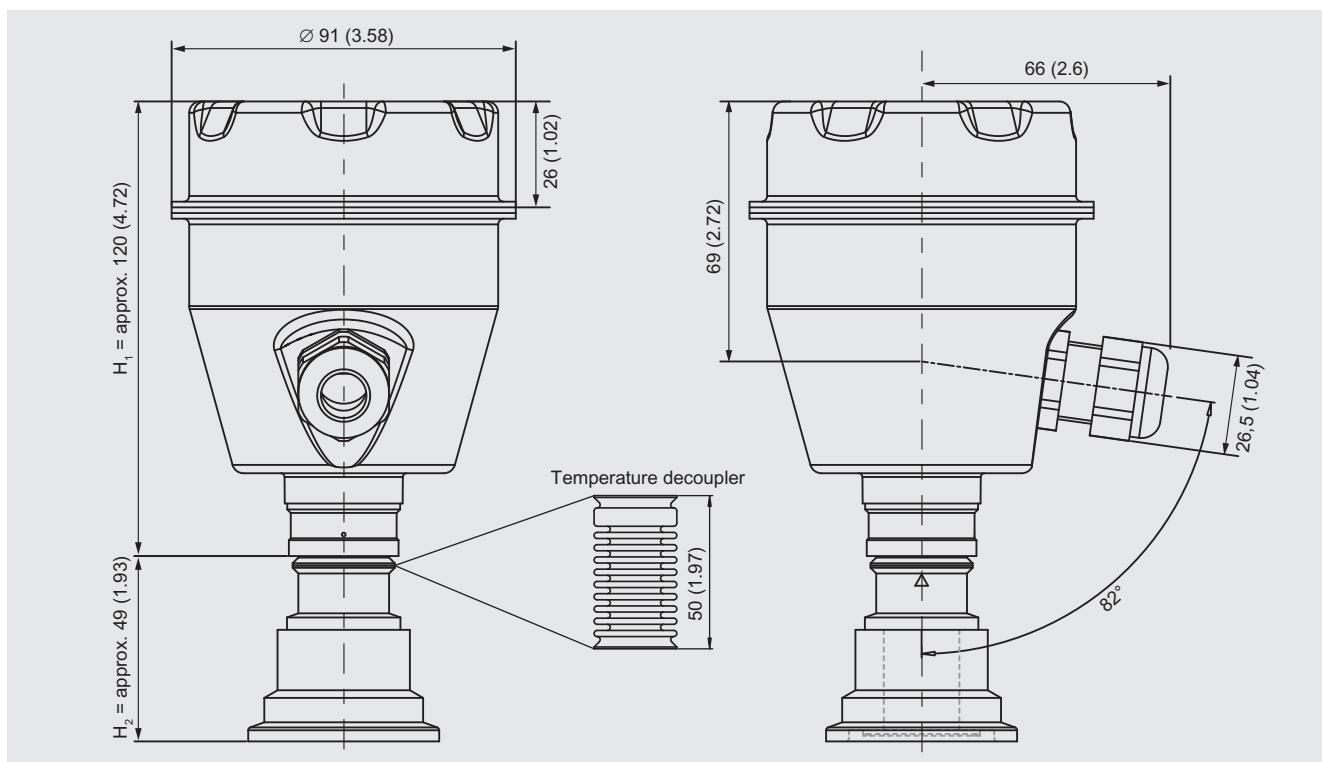
SITRANS P300, process connection M20 x 1.5, with mounted mounting bracket, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

2



SITRANS P300, front-flush, dimensions in mm (inch)

The diagram shows a SITRANS P300 with an example of a flange. In this drawing the height is subdivided into H₁ and H₂.

H₁ = Height of the SITRANS P300 up to a defined cross-section

H₂ = Height of the flange up to this defined cross-section

Only the height H₂ is indicated in the dimensions of the flanges.

SITRANS P measuring instruments for pressure

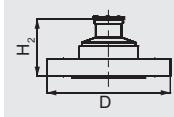
Transmitters for gage and absolute pressure

SITRANS P300

Flanges to EN and ASME

Flanges to EN

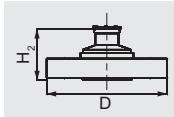
EN 1092-1



DN	PN	$\varnothing D$	H_2
25	40	115 mm (4.5")	Approx.
25	100	140 mm (5.5")	52 mm (2")
40	40	150 mm (5.9")	
40	100	170 mm (6.7")	
50	16	165 mm (6.5")	
50	40	165 mm (6.5")	
80	16	200 mm (7.9")	
80	40	200 mm (7.9")	

Flanges to ASME

ASME B16.5

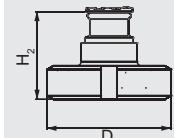


DN	class	$\varnothing D$	H_2
1"	150	110 mm (4.3")	Approx.
1"	300	125 mm (4.9")	52 mm (2")
1½"	150	130 mm (5.1")	
1½"	300	155 mm (6.1")	
2"	150	150 mm (5.9")	
2"	300	165 mm (6.5")	
3"	150	190 mm (7.5")	
3"	300	210 mm (8.1")	
4"	150	230 mm (9.1")	
4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

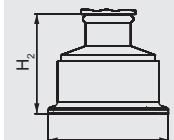
Connections to DIN

DIN 11851 (Dairy connection)



DN	PN	$\varnothing D$	H_2
50	25	92 mm (3.6")	Approx.
80	25	127 mm (5.0")	52 mm (2")

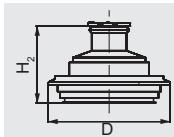
Tri-Clamp according DIN 32676



DN	PN	$\varnothing D$	H_2
50	16	64 mm (2.5")	Approx.
65	16	91 mm (3.6")	52 mm (2")

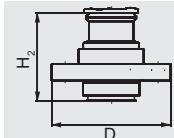
Other connections

Varivent connection



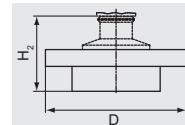
DN	PN	$\varnothing D$	H_2
40 ... 125	40	84 mm (3.3")	Approx.

Bio-Control connection



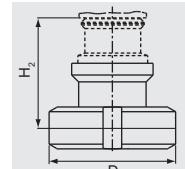
DN	PN	$\varnothing D$	H_2
50	16	90 mm (3.5")	Approx.
65	16	120 mm (4.7")	52 mm (2")

Sanitary process connection to DRD



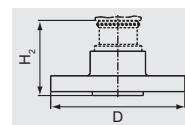
DN	PN	$\varnothing D$	H_2
50	40	105 mm (4.1")	Approx.

Sanitary process screw connection to NEUMO Bio-Connect



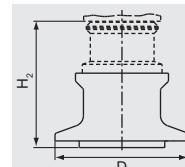
DN	PN	$\varnothing D$	H_2
50	16	82 mm (3.2")	Approx.
65	16	105 mm (4.1")	52 mm (2")
80	16	115 mm (4.5")	
100	16	145 mm (5.7")	
2"	16	82 mm (3.2")	
2½"	16	105 mm (4.1")	
3"	16	105 mm (4.1")	
4"	16	145 mm (5.7")	

Sanitary connection to NEUMO Bio-Connect flange connection



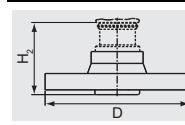
DN	PN	$\varnothing D$	H_2
50	16	110 mm (4.3")	Approx.
65	16	140 mm (5.5")	52 mm (2")
80	16	150 mm (5.9")	
100	16	175 mm (6.9")	
2"	16	100 mm (3.9")	
2½"	16	110 mm (4.3")	
3"	16	140 mm (5.5")	
4"	16	175 mm (6.9")	

Sanitary connection to NEUMO Bio-Connect clamp connection



DN	PN	$\varnothing D$	H_2
50	16	77,4 mm (3.0")	Approx.
65	10	90,9 mm (3.6")	52 mm (2")
80	10	106 mm (4.2")	
100	10	119 mm (4.7")	
2"	16	64 mm (2.5")	
2½"	16	77,4 mm (3.0")	
3"	10	90,9 mm (3.6")	
4"	10	119 mm (4.7")	

Sanitary connection to NEUMO Bio-Connect S flange connection



DN	PN	$\varnothing D$	H_2
50	16	125 mm (4.9")	Approx.
65	10	145 mm (5.7")	52 mm (2")
80	10	155 mm (6.1")	
100	10	180 mm (7.1")	
2"	16	125 mm (4.9")	
2½"	10	135 mm (5.3")	
3"	10	145 mm (5.7")	
4"	10	180 mm (7.1")	

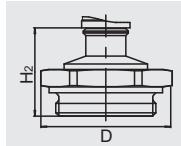
SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

SITRANS P300

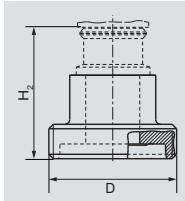
2

Thread connection G $\frac{3}{4}$ “, G1“ and G2“ to DIN 3852



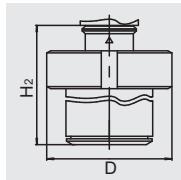
DN	PN	$\varnothing D$	H_2
$\frac{3}{4}$ “	63	37 mm (1.5“)	Approx. 45 mm (1.8“)
1“	63	48 mm (1.9“)	Approx. 47 mm (1.9“)
2“	63	78 mm (3.1“)	Approx. 52 mm (2“)

Aseptic threaded socket to DIN 11864-1 Form A



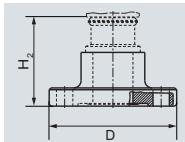
DN	PN	$\varnothing D$	H_2
50	25	78 x 1/6“	Approx. 52 mm (2.1“)
65	25	95 x 1/6“	
80	25	110 x 1/4“	
100	25	130 x 1/4“	

Tank connection TG52/50 und TG52/150



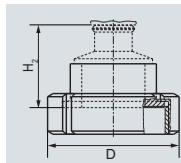
DN	PN	$\varnothing D$	H_2
25	40	63 mm (2.5“)	Approx. 63 mm (2.5“)
25	40	63 mm (2.5“)	Approx. 170 mm (6.7“)

Aseptic flange with notch to DIN 11864-2 Form A



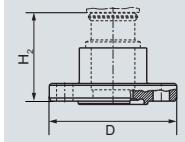
DN	PN	$\varnothing D$	H_2
50	16	94	Approx. 52 mm (2.1“)
65	16	113	
80	16	133	
100	16	159	

SMS socket with union nut



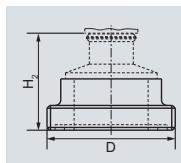
DN	PN	$\varnothing D$	H_2
2“	25	84 mm (3.3“)	Approx. 52 mm (2.1“)
2½“	25	100 mm (3.9“)	
3“	25	114 mm (4.5“)	

Aseptic flange with groove to DIN 11864-2 Form A



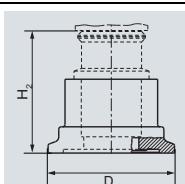
DN	PN	$\varnothing D$	H_2
50	16	94	Approx. 52 mm (2.1“)
65	16	113	
80	16	133	
100	16	159	

SMS threaded socket



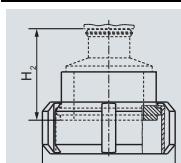
DN	PN	$\varnothing D$	H_2
2“	25	70 x 1/6 mm	Approx. 52 mm (2.1“)
2½“	25	85 x 1/6 mm	
3“	25	98 x 1/6 mm	

Aseptic clamp with groove to DIN 11864-3 Form A



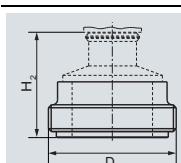
DN	PN	$\varnothing D$	H_2
50	25	77,5	Approx. 52 mm (2.1“)
65	25	91	
80	16	106	
100	16	130	

IDF socket with union nut



DN	PN	$\varnothing D$	H_2
2“	25	77 mm (3“)	Approx. 52 mm (2.1“)
2½“	25	91 mm (3.6“)	
3“	25	106 mm (4.2“)	

IDF threaded socket



DN	PN	$\varnothing D$	H_2
2“	25	64 mm (2.5“)	Approx. 52 mm (2.1“)
2½“	25	77,5 mm (3.1“)	
3“	25	91 mm (3.6“)	

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 and DS III series with PMC connection – Technical description

Overview



The SITRANS P300 and DS III pressure transmitters have been fitted with special process connections for the paper industry. With the two process connection threads 1½" and 1" flush at the front, the SITRANS P300 and DS III transmitters can be used for all processes in the paper industry.

SITRANS P300 and DS III series pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys, over HART communication, PROFIBUS PA or FOUNDATION Fieldbus interface (DS III only).

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Various versions of the pressure transmitters are available for measuring:

- Gage pressure
- Filling level
- Volume level
- Mass level

Benefits

- High quality and long life
- High reliability even under extreme chemical and mechanical loads, e.g. abrasion.
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Minimum conformity error

- Small long-term drift
- Wetted parts made of Hastelloy
- Infinitely adjustable spans from 30 mbar g to 16 bar g for DS III with HART interface
- Nominal measuring range from 1 mbar g to 16 bar g for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- Infinitely adjustable spans from 30 mbar g to 16 bar g for SITRANS P300 with HART interface
- Nominal measuring range from 1 bar g to 16 bar g for SITRANS P300 with PROFIBUS PA interface
- High measuring accuracy
- Parameterization over control keys and HART communication, or over PROFIBUS PA or FOUNDATION Fieldbus interface (DS III only).

Application

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz ... 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 control keys or programmed externally over HART communication or over PROFIBUS PA or FOUNDATION Fieldbus interface (only DS III).

SITRANS P, DS III series

Measured variable: Gage pressure of aggressive and non-aggressive gases, vapors and liquids.

Span (infinitely adjustable)

For DS III HART: 0.03 ... 16 bar g (0.433 ... 232 psi g)

Nominal measuring range

For DS III PA and FF: 1 ... 16 bar g (14.5 ... 232 psi g)

SITRANS P300

Span (infinitely adjustable)

For DS III HART: 0.03 ... 16 bar g (0.433 ... 232 psi g)

Nominal measuring range

For DS III PA: 1 ... 16 bar g (14.5 ... 232 psi g)

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 and DS III series with PMC connection – Technical description

2

Design

SITRANS P, DS III series



Device front view, SITRANS P DS III

The transmitter comprises a range of different components, depending on the order specifications. The various options are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (3, Figure "Front view") with the Order No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover is screwed on at the front and rear of the housing. The front cover (6) can be fitted with a viewing pane so that the measured values can be read directly on the digital display. The inlet (4) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

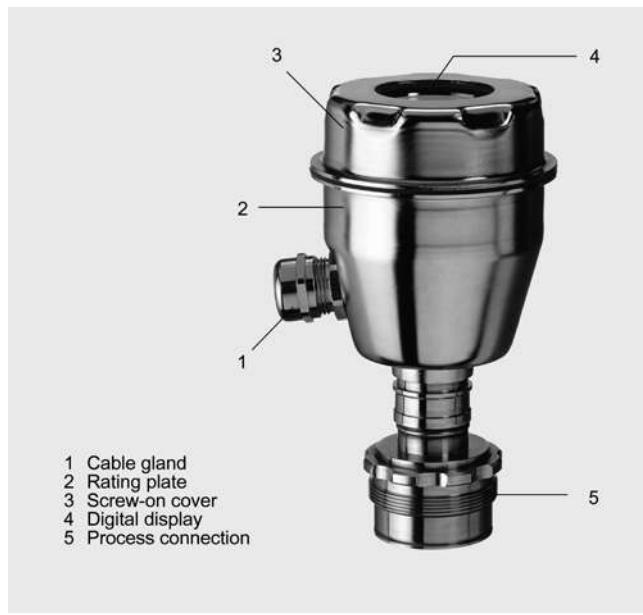
The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (1). The measuring cell is prevented from rotating by a locking screw (8). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the housing is a plastic cover (5), which hides the input keys.

SITRANS P300

The device comprises:

- Electronics
- Housing
- Measuring cell



Perspective view of the SITRANS P300

The housing has a screwable cover (3), with or without an inspection window depending on the version. The electrical terminal housing, the buttons for operation of the device and, depending on the version, the digital display are located under this cover. The connections for the auxiliary power U_H and the shield are in the terminal housing. The cable gland is on the side of the housing. The measuring cell with the process connection (5) is located on the underside of the housing. Depending on the version of the device, the measuring cell with the process connection may differ from the one shown in the diagram.

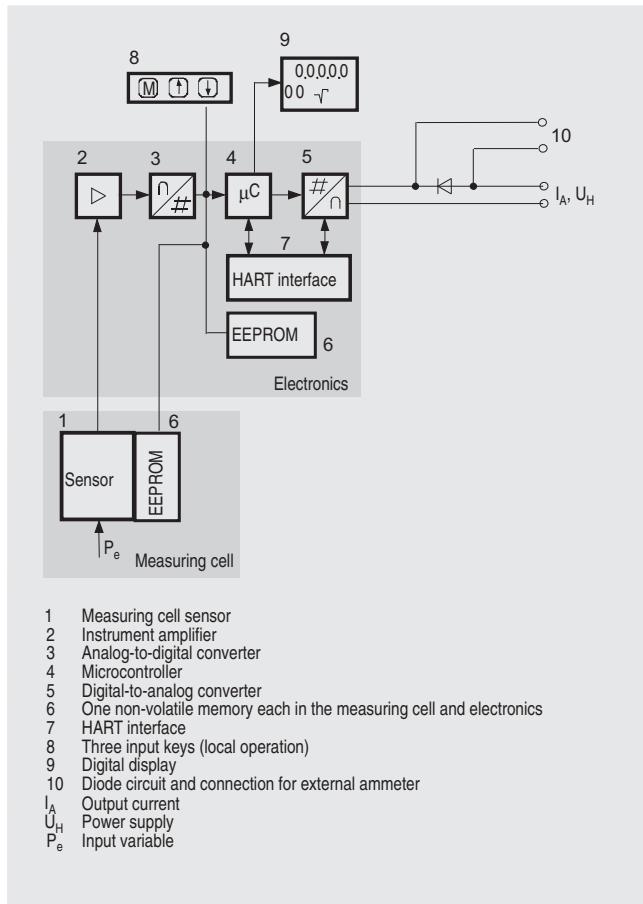
SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

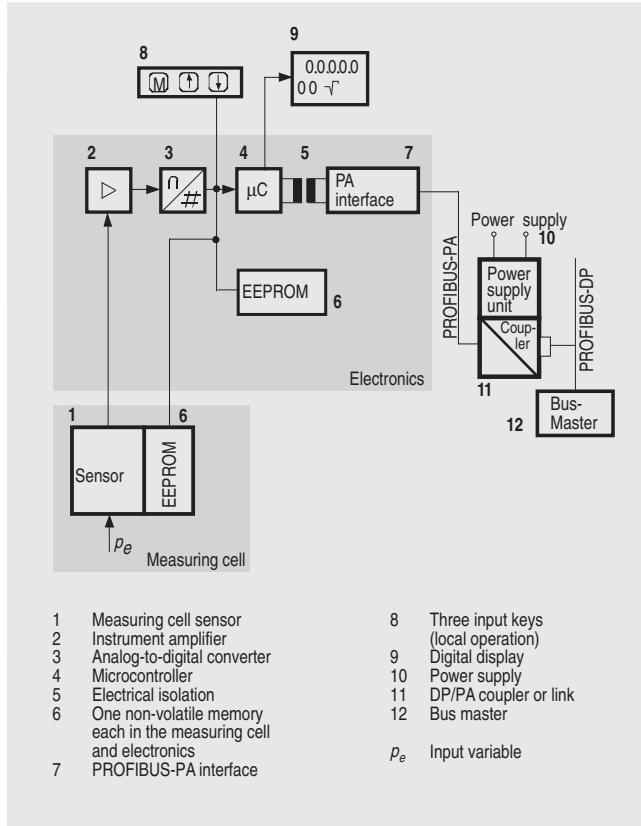
SITRANS P300 and DS III series
with PMC connection – Technical description

Function

Operation of the electronics with PROFIBUS PA communication



Operation of the electronics with PROFIBUS PA communication



The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the instrument amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the point of measurement. The input keys can also be used to control the view of the results, the error messages and the operating modes on the digital display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

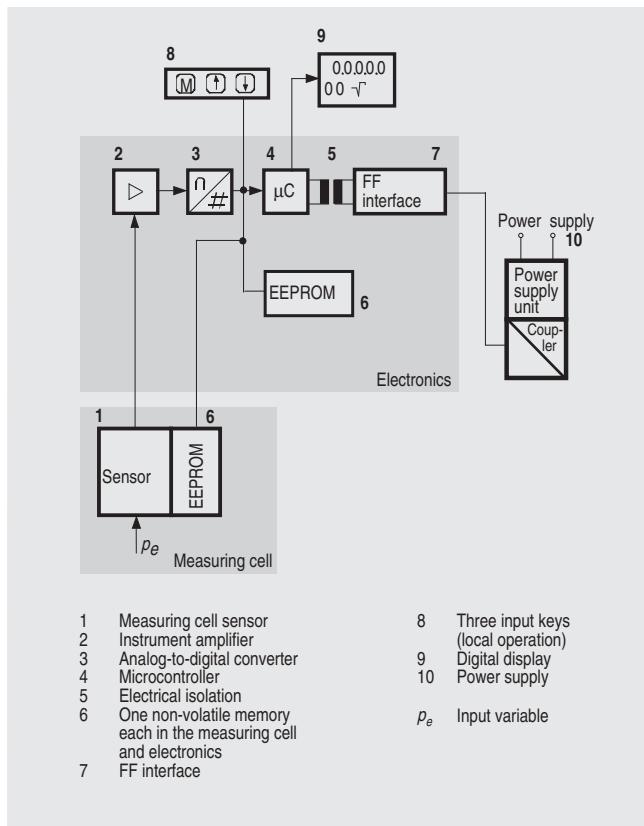
The pressure transmitters with spans ≤ 63 bar g measure the input pressure compared to atmosphere, transmitters with spans ≥ 160 bar g compared to vacuum.

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 and DS III series with PMC connection – Technical description

Mode of operation of the FOUNDATION Fieldbus electronics



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the instrument amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus Interface (7).

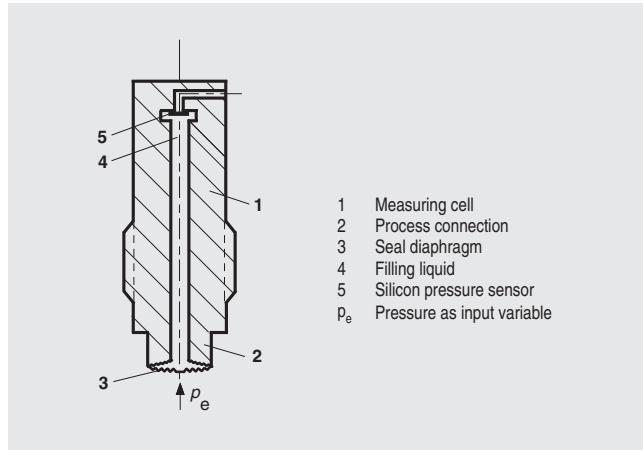
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input keys (8) you can parameterize the pressure transmitter directly at the point of measurement. The input keys can also be used to control the view of the results, the error messages and the operating modes on the digital display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

Mode of operation of the measuring cell

Measuring cell for gage pressure with front-flush diaphragm



Measuring cell for gage pressure, with front-flush diaphragm, function diagram

The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gage pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the input pressure.

Parameterization

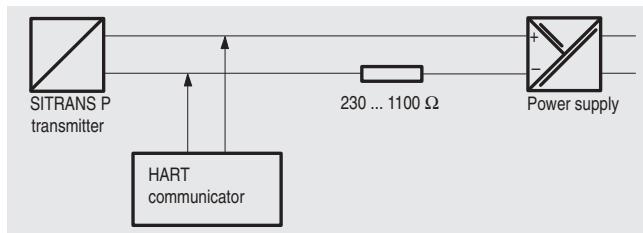
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input keys (local operation)

With the input keys you can easily set the most important parameters without any additional equipment.

Parameterization using HART communication

Parameterization using HART communication is performed with a HART communicator or a PC.



Communication between a HART communicator and a pressure transmitter

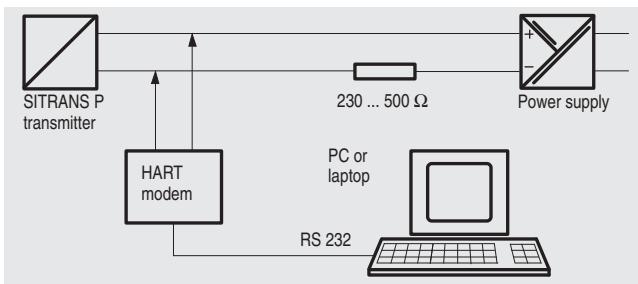
When parameterizing with the HART communicator, the connection is made directly to the 2-wire system.

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 and DS III series with PMC connection – Technical description

2



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

Adjustable parameter DS III HART and P300 HART

Parameters	Input keys	HART communication
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
Current transmitter	x	x
Fault current	x	x
Disabling of keys, write protection	x	x ¹⁾
Type of dimension and actual dimension	x	x
Characteristic (linear)	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostics functions		x

¹⁾ Cancel apart from write protection

Diagnostic functions for DS III HART and P300 HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

Available physical units of display for DS III HART and P300 HART

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , inH ₂ O, inHg (4 °C), mmH ₂ O, ftH ₂ O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp, gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Temperature	K, °C, °F, °R
Miscellaneous	%

Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS puts the DS III PA is in connection with a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

Parameterization through FOUNDATION Fieldbus Interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III FF is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for DS III PA and FF and P300 PA and FF

Adjustable parameters	Input keys	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Key and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic	x	
Freely-programmable LCD		x
Diagnostic functions		x

Diagnostic functions for DS III PA and FF and P300 PA and FF

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , mmH ₂ O, mmH ₂ O (4 °C), inH ₂ O, inHg (4 °C), ftH ₂ O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp, gallon, bushel, barrel, barrel liquid
Temperature	K, °C, °F, °R
Miscellaneous	%

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

DS III series with PMC connection

Technical specifications

SITRANS P, DS III series for gage pressure with PMC connection for the paper industry

	HART	PROFIBUS PA or FOUNDATION Fieldbus		
Input				
Measured variable	Gage pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.01 ... 1 bar g (0.145 ... 14.5 psi g)	6 bar g (87 psi g)	1 bar g (14.5 psi g)	6 bar g (87 psi g)
	0.04 ... 4 bar g (0.58 ... 58 psi g)	10 bar g (145 psi g)	4 bar g (58 psi g)	10 bar g (145 psi g)
	0.16 ... 16 bar g (2.23 ... 232 psi g)	32 bar g (464 psi g)	16 bar g (232 psi g)	32 bar g (464 psi g)
Lower measuring limit				
• Measuring cell with silicone oil filling	100 mbar a (1.45 psi a)			
Upper measuring limit	100% of max. span			
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA or FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V		-	
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	-		Yes	
Accuracy				
Reference conditions (All error data refer always refer to the set span)	To EN 60770-1			
Error in measurement and fixed-point setting (including hysteresis and repeatability)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span/set span)			
• Linear characteristic				
- $r \leq 10$	$\leq (0.0029 \cdot r + 0.071)\%$		$\leq 0,075\%$	
- $10 < r \leq 30$	$\leq (0.0045 \cdot r + 0.071)\%$			
- $30 < r \leq 100$	$\leq (0.005 \cdot r + 0.05)\%$			
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.25 \cdot r)\%$ every 5 years		$\leq 0.25\%$ every 5 years	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.08 \cdot r + 0.1)\%$		$\leq 0,3\%$	
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)	$\leq (0.1 \cdot r + 0.15)\%/10 \text{ K}$		$\leq 0.25\%/10 \text{ K}$	
Influence of medium temperature				
• Temperature difference between medium temperature and ambient temperature	3 mbar/10 K (0.04 psi/10 K)			
Influence of mounting position	$\leq 0.1 \text{ mbar g}$ (0.00145 psi g) per 10° inclination			
Measured Value Resolution	-		$3 \cdot 10^{-5}$ of nominal measuring range	

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

DS III series with PMC connection

SITRANS P, DS III series for gage pressure with PMC connection for the paper industry

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Rated operating conditions		
Degree of protection (to EN 60529)	IP65, IP68, NEMA X, enclosure cleaning, resistant to lyes, steam to 150° C (302 °F)	
Process temperature	-20 ... +100 °C (-4 ... +212 °F)	
Ambient conditions		
• Ambient temperature	-20 ... +85 °C (-4 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Permissible	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Housing material	Poor in copper die-cast aluminium, GD-AlSi12	
Wetted parts materials	Stainless steel	
• Gasket (standard)	PTFE flat gasket	
• O-ring (minibolt)	FPM (Viton) or optionally: FFPM or NBR	
Measuring cell filling	Silicone oil or inert filling liquid	
Process connection (standard)	Front-flush, 1½", PMC Standard design	
Process connection (minibolt)	Front-flush, 1", minibolt design	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	Supplied through bus -
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Startup current \leq basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

DS III series with PMC connection

SITRANS P, DS III series for gage pressure with PMC connection for the paper industry

HART communication

HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM

PROFIBUS PA communication

Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measuring value) or 10 (two measuring values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	Can be parameterized (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a container characteristic with	Max. 30 nodes
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

Communication FOUNDATION Fieldbus

Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FF function block
• Physical block	1 Resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

DS III series with PMC connection

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure, with PMC connection series DS III HART		7MF4133 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
Span		
0.01 ... 1 bar g ¹⁾	(0.15 ... 14.5 psi g) ¹⁾	B
0.04 ... 4 bar g	(0.58 ... 58 psi g)	C
0.16 ... 16 bar g	(2.32 ... 232 psi g)	D
Wetted parts materials		
Seal diaphragm	Connection shank	B
Hastelloy	Stainless steel	
Process connection		
• PMC Style Standard: Thread 1½"		2
• PMC Style Mini bolt: 1" front-flush (min. span: 500 mbar (7.25 psi), can not be ordered with mit 1-bar (14.5 psi) measuring cell (Option B))		3
Non-wetted parts materials		
• Housing made of die-cast aluminum		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• None		A
Electrical connection / cable entry		
• Female thread M20x1.5		B
• Female thread ½-14 NPT		C
• M12 connectors (metal)		F
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator ► hidden, setting: mA)		1
• With visible digital indication, setting: mA		6
• With customer-specific digital indication (setting as specified, Order code "Y21" or "Y22" required)		7
Power supply units see "SITRANS I power supply units and isolation amplifiers".		
Included in delivery of the device:		
• Brief instructions (Leporello)		
• CD-ROM with detailed documentation		
• Sealing ring		

¹⁾ Only with "PMC Style Standard" process connection

F) Subject to export regulations AL: 91999, ECCN: N.

Selection and Ordering data		Order No.
SITRANS P pressure transmitter for gage pressure, with PMC connection		
DS III PA (PROFIBUS PA) series		7MF4134 -
DS III FF series (FOUNDATION Fieldbus)		7MF4135 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
Nominal measuring range		
1 bar g ¹⁾	(14.5 psi g) ¹⁾	B
4 bar g	(58 psi g)	C
16 bar g	(232 psi g)	D
Wetted parts materials		
Seal diaphragm	Connection shank	B
Hastelloy	Stainless steel	
Process connection		
• PMC Style Standard: front-flush 1½"		2
• PMC Style Mini bolt: front-flush 1" (min. span: 500 mbar (7.25 psi), can not be ordered with mit 1-bar (14.5 psi) measuring cell (Option B))		3
Non-wetted parts materials		
• Housing made of die-cast aluminum		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• None		A
Electrical connection / cable inlet		
• Screwed gland M20x1.5		B
• Screwed gland ½-14 NPT		C
• M12 connectors (metal)		F
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator ► hidden, setting: mA)		1
• With visible digital display		6
• With customer-specific digital display (setting as specified, Order code "Y21" or required)		7
Included in delivery of the device:		
• Brief instructions (Leporello)		
• CD-ROM with detailed documentation		
• Sealing ring		

¹⁾ Only with "PMC Style Standard" process connection

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

DS III series with PMC connection

Selection and Ordering data		Order code			Selection and Ordering data		Order code		
Further designs		HART	PA	FF	Additional data		HART	PA	FF
Add "Z" to Order No. and specify Order code.					Add "Z" to Order No. and specify Order code.				
M12 cable sockets (metal)	A50	✓	✓	✓	Measuring range to be set	Y01	✓		
Rating plate inscription (instead of German)	B11	✓	✓	✓	Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
• English	B12	✓	✓	✓	Measuring point number (TAG No.)	Y15	✓	✓	✓
• French	B13	✓	✓	✓	Max. 16 characters, specify in plain text: Y15:				
• Spanish	B14	✓	✓	✓	Measuring point text	Y16	✓	✓	✓
• Italian	B21	✓	✓	✓	Max. 27 characters, specify in plain text: Y16:				
English rating plate					Entry of HART address (TAG)	Y17	✓		
Pressure units in inH ₂ O or psi					Max. 8 characters, specify in plain text: Y17:				
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11	✓	✓	✓	Setting of pressure indication in pressure units	Y21	✓	✓	✓
Acceptance test certificate	C12	✓	✓	✓	Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ...				
To EN 10204-3.1					Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ⁺ , inH ₂ O ⁺ , ftH ₂ O ⁺ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % *) ref. temperature 20 °C				
Factory certificate	C14	✓	✓	✓	Setting of pressure indication in non-pressure units	Y22 + Y01	✓		
To EN 10204-2.2					Specify in plain text: Y22: up to l, m ³ , m, USg, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)				
Output signal can be set to upper limit of 22.0 mA	D05	✓	✓	✓	Preset bus address	Y25	✓	✓	
Mounting					Max. 8 characters, specify in plain text: Y25:				
• Weldable sockets for standard 1½" threaded connection	P01	✓	✓	✓					
• Weldable socket for mini bolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	P02	✓	✓	✓					

Only "Y01" and "Y21" can be factory preset

✓ = available

Ordering example

Item line: 7MF4133-1DB20-1AB7-Z
 B line: A22 + Y01 + Y21
 C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)
 C line: Y21: bar (psi)

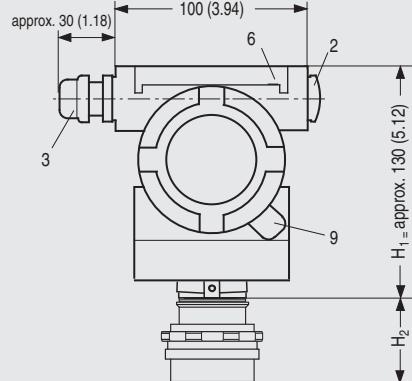
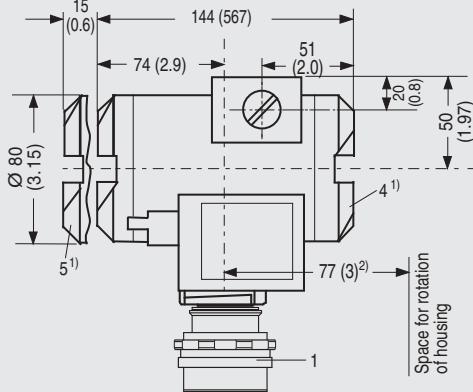
SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

DS III series with PMC connection

Dimensional drawings

2



- 1 Process connection: PMC standard
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland M20x1,5
 - screwed gland 1/2-14 NPT
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover safety bracket (only for explosion-proof enclosure, not shown in the drawing)

- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

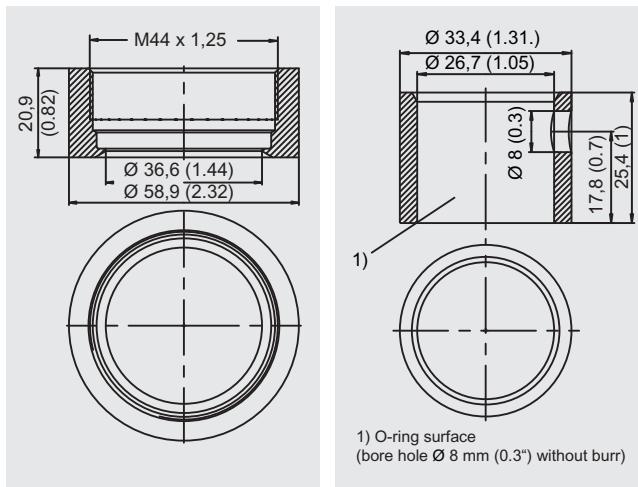
SITRANS P DS III pressure transmitters for gage pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into H_1 and H_2 .

H_1 = Height of the SITRANS P DS III up to a defined cross-section

H_2 = Height of the flange up to this defined cross-section

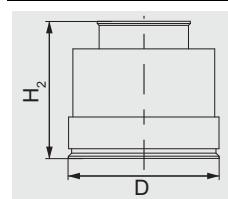
Only the height H_2 is indicated in the dimensions of the flanges.



PMC Style standard (left) and PMC Style minibolt (right) weldable sockets, dimensions in mm (inch)

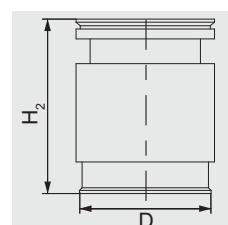
Material: Stainless steel, mat. No. 1.4404 / 316L

PMC Style standard



DN	PN	ØD	H_2
40.9 mm (1.6")		40.9 mm (1.6")	Approx. 36.8 mm (1.4")

PMC Style minibolt



DN	PN	ØD	H_2
26.3 mm (1.0")		26.3 mm (1.0")	Approx. 33.1 mm (1.3")

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 with PMC connection

Technical specifications

SITRANS P300 for gage pressure with PMC connection for the paper industry

	HART	PROFIBUS PA		
Input				
Measured variable	Gage pressure (flush-mounted)			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span 0.01 ... 1 bar g (0.15 ... 14.5 psi g) 0.04 ... 4 bar g (0.58 ... 58 psi g) 0.16 ... 16 bar g (2.3 ... 232 psi g)	Max. perm. test pressure 6 bar g (87 psi g) 10 bar g (145 psi g) 32 bar g (464 psi g)	Nominal measuring range 1 bar g (14.5 psi g) 4 bar g (58 psi g) 16 bar g (232 psi g)	Max. perm. test pressure 6 bar g (87 psi g) 10 bar g (145 psi g) 32 bar g (464 psi g)
	Depending on the process connection, the span may differ from these values			Depending on the process connection, the nominal measuring range may differ from these values
Lower measuring limit				
• Measuring cell with silicone oil	100 mbar a (1.45 psi a)			
Upper measuring limit				
• Measuring cell with silicone oil	100% of max. span		100% of the max. nominal measuring range	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA signal	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	No		Yes	
Electrical damping T_{63} (step width 0.1 s)	Set to 0.1 s (0 ... 100 s)			
Accuracy				
Reference conditions (All error data refer always to the set span)	To EN 60770-1			
Measurement deviation with cut-off point setting, including hysteresis and repeatability.	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, measuring cell with silicone oil, room temperature 25 °C (77 °F), span ratio (r = max. span/set span)			
Linear characteristic curve			$\leq 0,075\%$	
• $r \leq 10$	$\leq (0.0029 \cdot r + 0.071)\%$			
• $10 < r \leq 30$	$\leq (0.0045 \cdot r + 0.071)\%$			
• $30 < r \leq 100$	$\leq (0.005 \cdot r + 0.05)\%$			
Settling time T_{63} without electrical damping	Approx. 0.2 s			
Long-term drift at ± 30 °C (± 54 °F)	$\leq (0.25 \cdot r)\% / 5$ years		$\leq 0.25\% / 5$ years	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.1 \cdot r + 0.2)\%$		$\leq 0,3\%$	
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... 14 °F and 140 ... 185 °F)	$\leq (0.1 \cdot r + 0.15)\% / 10$ K		$\leq 0.25\% / 10$ K	
Influence of the medium temperature (only with front-flush diaphragm)				
• Temperature difference between medium temperature and ambient temperature	3 mbar/10 K (0.04 psi/10 K)			
Rated operating conditions				
<u>Installation conditions</u>				
Ambient temperature	Observe the temperature class in areas subject to explosion hazard.			
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)			
• Digital display	-30 ... +85 °C (-22 ... +185 °F)			
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)			
Climatic class	Permissible			
Condensation				
Degree of protection to EN 60529	IP65, IP68, NEMA X, enclosure cleaning, resistant to lyes, steam to 150° C (302 °F)			
Electromagnetic compatibility				
• Emitted interference and interfer. immunity	To EN 61326 and NAMUR NE 21			
<u>Medium conditions</u>				
Process temperature				

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 with PMC connection

SITRANS P300 for gage pressure with PMC connection for the paper industry

	HART	PROFIBUS PA
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)	
Design		
Weight (without options)	Approx. 1 kg (2.2 lb)	
Housing material	Stainless steel, mat. No. 1.4301/304	
Material of parts in contact with the medium		
• Seal diaphragm	Hastelloy C276, mat. No. 2.4819	
• Measuring cell filling	Silicone oil	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	Supplied through bus
Separate power supply	-	Not necessary
Bus voltage		
• Without EEx	-	9 ... 32 V
• For intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Startup current \leq basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE)	-	Available
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
Intrinsic safety "i"	PTB 05 ATEX 2048	
Identification	Ex II 1/2 G EEx ia(ib) IIB/IIC T4, T5, T6	
Permissible ambient temperature		
• Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
• Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
• Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	To certified intrinsically-safe circuits with maximum values: <u>FISCO supply unit</u> : $U_i = 17.5 \text{ V}$, $I_i = 380 \text{ mA}$, $P_i = 5.32 \text{ W}$ <u>Linear barrier</u> : $U_i = 24 \text{ V}$, $I_i = 250 \text{ mA}$, $P_i = 1.2 \text{ W}$
Effective inner capacitance:	$C_i = 6 \text{ nF}$	$C_i = 1.1 \text{ nF}$
Effective inner inductance:	$L_i = 0.4 \text{ mH}$	$L_i \leq 7 \mu\text{H}$
Explosion protection to FM for USA and Canada (cFM _{US})		
• Identification (DIP) or (IS); (NI)	Certificate of Compliance 3025099 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
• Identification (DIP) or (IS)	Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 with PMC connection

2

SITRANS P300 for gage pressure with PMC connection for the paper industry

HART communication

HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM

PROFIBUS PA communication

Simultaneous communication with master class 2 (max.)	4
The address can be set using	configuration tool Local operation (standard setting Address 126)
Cyclic data usage	
• Output byte	One measuring value: 5 bytes Two measuring values: 10 bytes
• Input byte	Register operating mode: 1 bytes Reset function due to metering. 1 bytes
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Linearly rising or falling characteristic
- Electrical damping T_{63}	0 ... 100 s adjustable
- Simulation function	Input /Output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset and preset Optional direction of counting Simulation function of the register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Monitoring of sensor limits	Yes
- Specification of a container characteristic with	Max. 31 nodes
- Characteristic	Linear
- Simulation function	Available
• Transducer block "Electronic temperature"	
- Simulation function	Available

SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 with PMC connection

F) Subject to export regulations AL: 91999, ECCN: N.

Selection and Ordering data		Order No.
SITRANS P300 pressure transmitters with PMC connection , single-chamber measuring housing, rating plate inscription in English		
4 ... 20 mA/HART		F) 7MF8123 -
PROFIBUS PA		F) 7MF8124 -
FOUNDATION Fieldbus (FF)		F) 7MF8125 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Cleanliness level 2 to DIN 25410	3
Span		
1 bar g	(14.5 psi g)	B
4 bar g	(58 psi g)	C
16 bar g	(232 psi g)	D
Wetted parts materials		
Seal diaphragm	Measuring cell	B
Hastelloy	Stainless steel	B
Process connection		
• PMC Style Standard: Thread 1½"		2
• PMC Style Mini bolt: 1" front-flush (min. span: 500 mbar (7.25 psi), can not be ordered with mit 1-bar (14.5 psi) measuring cell (Option B))		3
Non-wetted parts materials		
• Stainless steel, deep-drawn and electrolytically polished		4
Version		
• Standard version		1
Explosion protection		
• None		A
• With ATEX, Type of protection:		B
- "Intrinsic safety (EEx ia)"		C
• Zone 20/21/22 ¹⁾		E
• Ex nA/nL (zone 2) ²⁾		M
• With FM + CSA, Type of protection:		A
- "Intrinsic Safe (is)" (planned)		B
Electrical connection / cable entry		
• Screwed gland M20x1.5 (Polyamide) ³⁾		C
• Screwed gland M20x1.5 (metal)		C
• Screwed gland M20x1.5 (stainless steel)		C
• M12 connector (without cable socket)		F
• M12 connector (stainless steel, without cable socket)		G
• ½-14 NPT thread, metal ⁴⁾		H
• ½-14 NPT thread, stainless steel ⁴⁾		J
Display		
• Without display, with keys, closed lid ¹⁾		1
• With display and keys, closed lid		2
• With display and keys, lid with glass pane (setting on HART devices: mA, on PROFIBUS PA and FOUNDATION Fieldbus devices: pressure unit)		6
• With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane		7
Power supply units see "SITRANS I power supply units and isolation amplifiers".		
Included in delivery of the device:		
• Brief instructions (Leporello)		
• CD-ROM with detailed documentation		
• Sealing ring		

¹⁾ Can only be ordered in conjunction with electrical connection Option A.

²⁾ Can only be ordered in conjunction with electrical connection Option B, C, F or G.

³⁾ Only together with HART electronics.

⁴⁾ Without cable gland.

Selection and Ordering data	Order code
Further designs	HART PA FF
Add "Z" to Order No. and specify Order code.	
Cable socket for M12 plug	
• Metal	A50
• Stainless steel	A51
Rating plate inscription (instead of English)	
• German	B10
• French	B12
• Spanish	B13
• Italian	B14
English rating plate Pressure units in inH ₂ O or psi	B21
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11
Acceptance test certificate To EN 10204-3.1	C12
Factory certificate To EN 10204-2.2	C14
Set output signal to upper limit of 22.0 mA	D05
Type of protection IP68	D12
Mounting	
• Weldable sockets for standard 1½" threaded connection	P01
• Weldable socket for mini bolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	P02
Additional data	
Add "Z" to Order No. and specify Order code.	
Measuring range to be set	Y01
Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	
Measuring point number (TAG No.)	Y15
Max. 16 characters, specify in plain text: Y15:	
Measuring point text	Y16
Max. 27 characters, specify in plain text: Y16:	
Entry of HART address (TAG)	Y17
Max. 8 characters, specify in plain text: Y17:	
Setting of pressure indication in pressure units	Y21
Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % *) ref. temperature 20 °C	
Setting of pressure indication in non-pressure units	Y22 + Y01
Specify in plain text: Y22: up to l, m ³ , m, USg, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	
Preset bus address	Y25
Specify in plain text: Y25:	

Only "Y01" and "Y21" can be factory preset

✓ = available

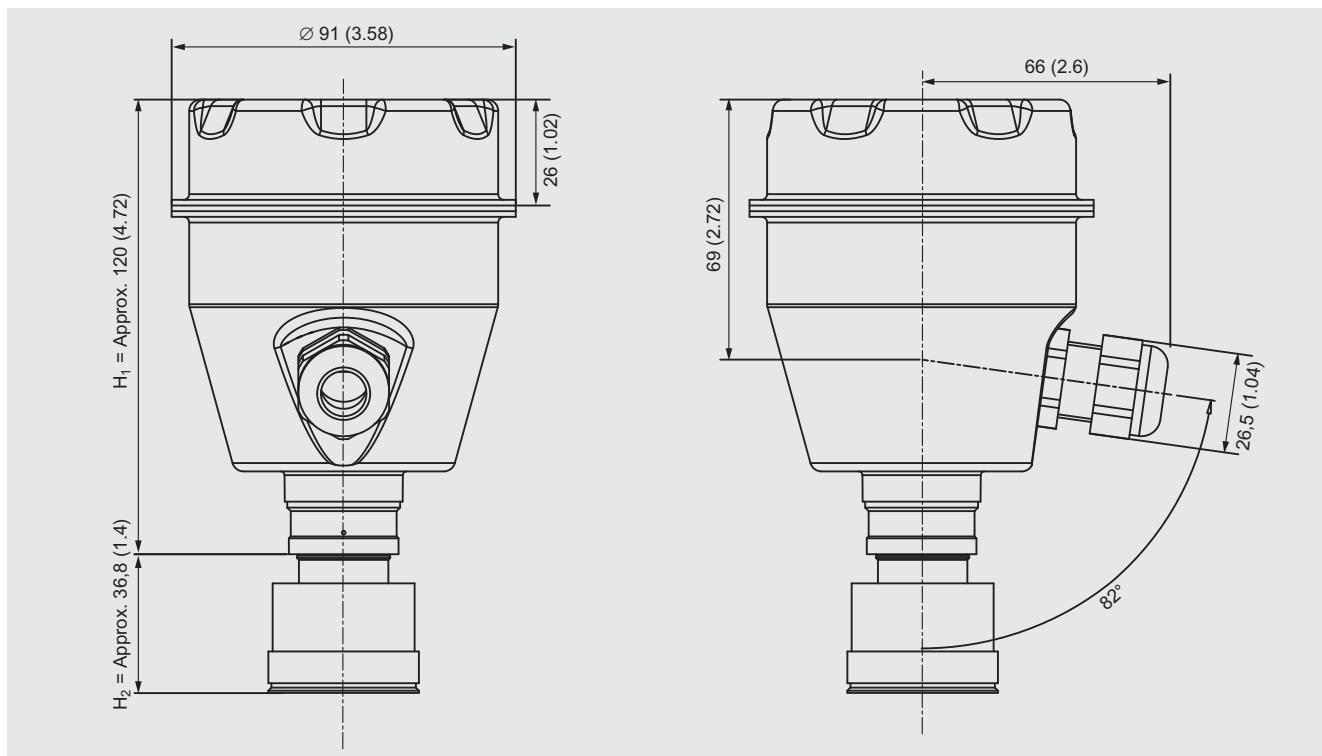
SITRANS P measuring instruments for pressure

Transmitters for gage pressure for the paper industry

SITRANS P300 with PMC connection

2

Dimensional drawings



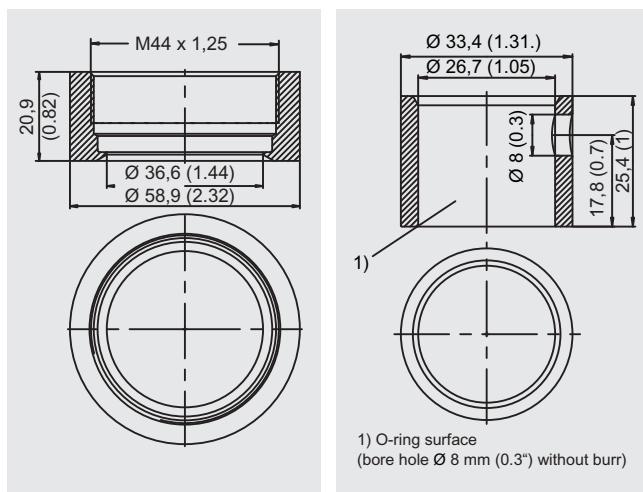
SITRANS P300 pressure transmitters for gage pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P300 with an example of a flange. In this drawing the height is subdivided into H_1 and H_2 .

H_1 = Height of the SITRANS P300 up to a defined cross-section

H_2 = Height of the flange up to this defined cross-section

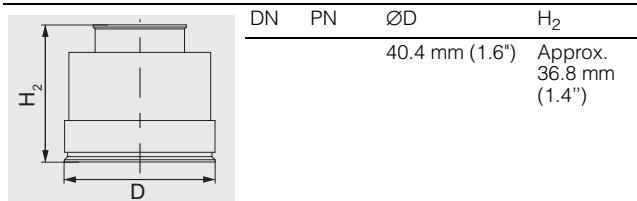
Only the height H_2 is indicated in the dimensions of the flanges.



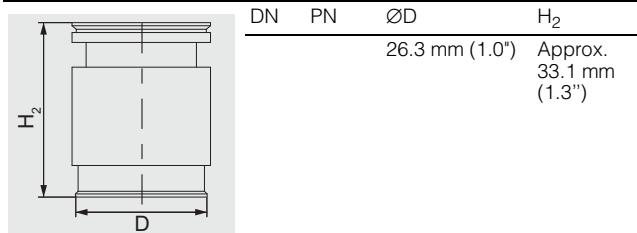
PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

Material: Stainless steel, mat. No. 1.4404 / 316L

PMC Style Standard



PMC Style Minibolt



Overview



SITRANS P pressure transmitters, DS III series, are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys, over HART communication, PROFIBUS-PA or FOUNDATION Fieldbus interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

Various versions of the DS III pressure transmitters are available for measuring:

- Gage pressure
- Absolute pressure
- For differential pressure transmitters
- Filling level
- Mass level
- Volume level
- Volume flow
- Mass flow

Benefits

- High quality and long life
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Minimum conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (e.g. stainless steel, Hastelloy, gold, Monel, tantalum)

- Infinitely adjustable span from 0.01 mbar to 400 mbar for DS III with HART communication
- Nominal measuring range from 1 to 400 bar for DS III PA (PROFIBUS PA) and FF (FOUNDATION Fieldbus)
- High measuring accuracy
- Parameterization over control keys and HART communication, PROFIBUS PA communication or FOUNDATION Fieldbus interface.

Application

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 control keys or programmed externally over HART communication or over PROFIBUS PA or FOUNDATION Fieldbus interface.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series

Technical description

Pressure transmitter for gage pressure

- Measured variable: Gage pressure of aggressive and non-aggressive gases, vapors and liquids.
- Span (infinitely adjustable)
for DS III HART: 0.01 ... 400 bar g (0.145 ... 5802 psi g)
- Nominal measuring range
for DS III PA and FF: 1 ... 400 bar g (14.5 ... 5802 psi g)

Pressure transmitters for absolute pressure

- Measured variable: Absolute pressure of aggressive and non-aggressive gases, vapors and liquids.
- Span (infinitely adjustable)
for DS III HART: 8.3 mbar a ... 100 bar a (0.12 ... 1450 psi a)
- Nominal measuring range
for DS III PA and FF: 250 mbar a ... 100 bar a (3.63 ... 1450 psi a)
- There are two series:
 - Gage pressure series
 - Differential pressure series

Pressure transmitters for differential pressure and flow

- Measured variables:
 - Differential pressure
 - Small positive or negative pressure
 - Flow $q \sim \sqrt{\Delta p}$ (together with a primary differential pressure device (see Chapter "Flow Meters"))
- Span (infinitely adjustable)
for DS III HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)
- Nominal measuring range
for DS III PA and FF: 20 mbar ... 30 bar (0.29 ... 435 psi)

Pressure transmitters for level

- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Span (infinitely adjustable)
for DS III HART: 25 mbar ... 5 bar (0.363 ... 72.5 psi)
- Nominal measuring range
for DS III PA and FF: 250 mbar ... 5 bar (3.63 ... 72.5 psi)
- Nominal diameter of the mounting flange
 - DN 80 or DN 100
 - 3 inch or 4 inch

In the case of level measurements in open containers, the low-pressure connection of the measuring cell remains open (measurement "compared to atmospheric").

In the case of measurements in closed containers, the lower-pressure connection has to be connected to the container in order to compensate the static pressure.

The wetted parts are made from a variety of materials, depending on the degree of corrosion resistance required.

Design



Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (3, Figure "Front view") with the Order No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover is screwed on at the front and rear of the housing. The front cover (6) can be fitted with a viewing pane so that the measured values can be read directly on the digital display. The inlet (4) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (1). The measuring cell is prevented from rotating by a locking screw (8). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the housing is a plastic cover (5), which hides the input keys.

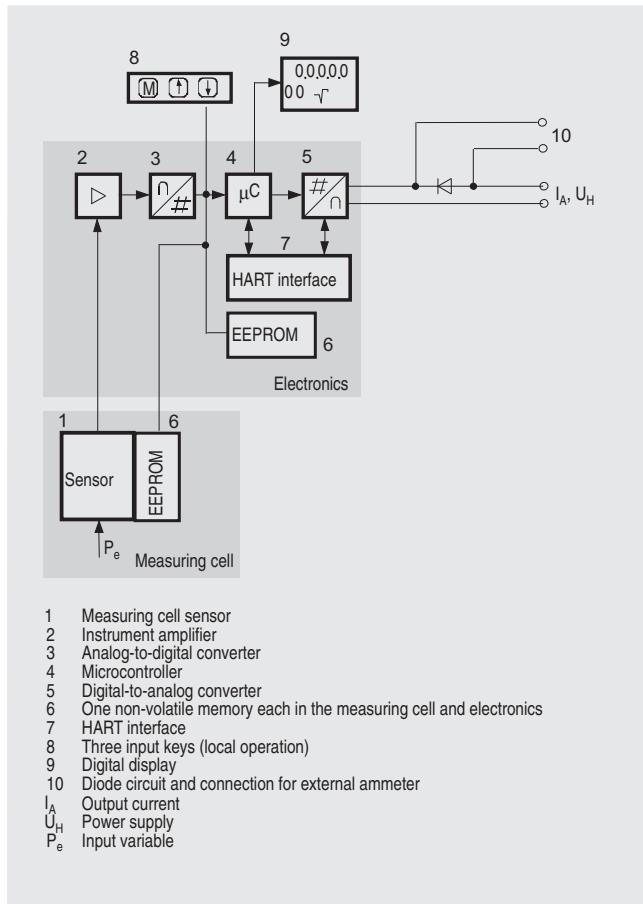
SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

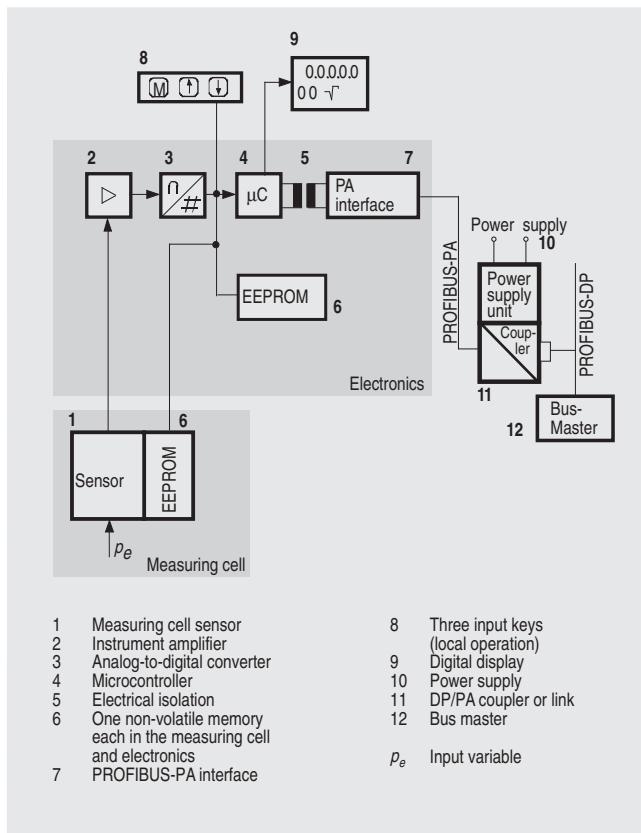
DS III series
Technical description

Function

Operation of the electronics with PROFIBUS PA communication



Operation of the electronics with PROFIBUS PA communication



The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the instrument amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the point of measurement. The input keys can also be used to control the view of the results, the error messages and the operating modes on the digital display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with spans \leq 63 bar measure the input pressure compared to atmosphere, transmitters with spans \geq 160 bar compared to vacuum.

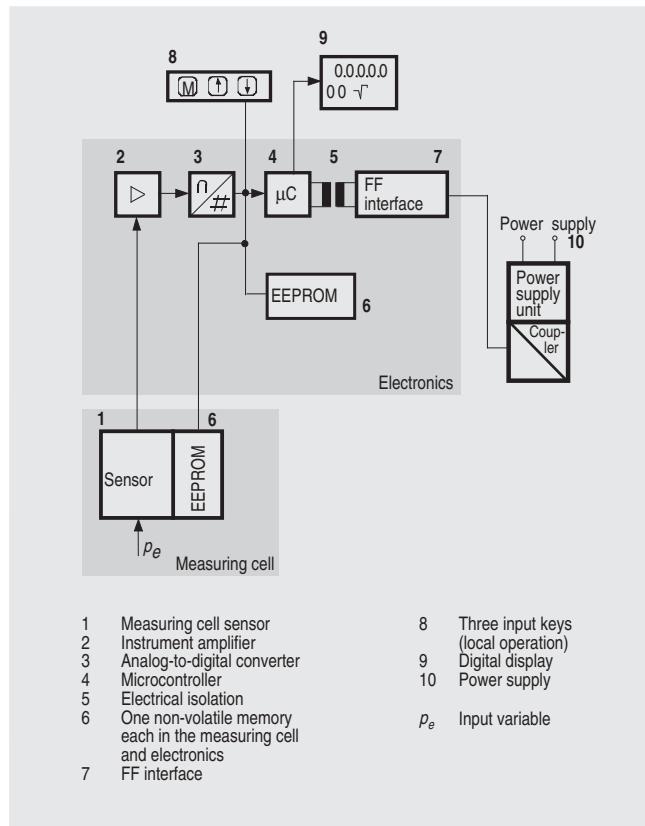
SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series

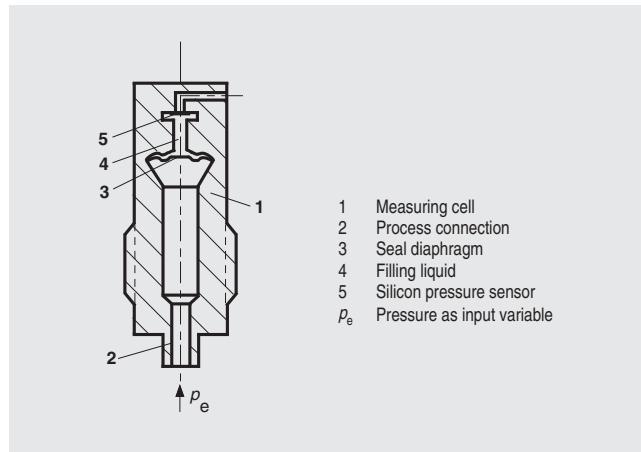
Technical description

Mode of operation of the FOUNDATION Fieldbus electronics



Mode of operation of the measuring cells

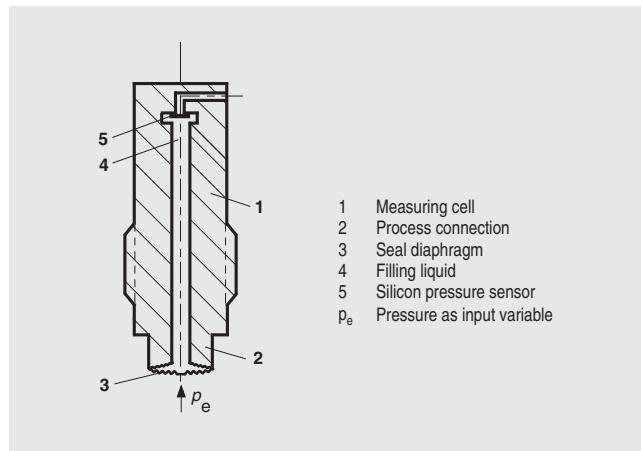
Measuring cell for gage pressure



Measuring cell for gage pressure, function diagram

The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gage pressure, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the input pressure.

Measuring cell for gage pressure, with front-flush diaphragm for paper industry



Measuring cell for gage pressure, with front-flush diaphragm for paper industry, function diagram

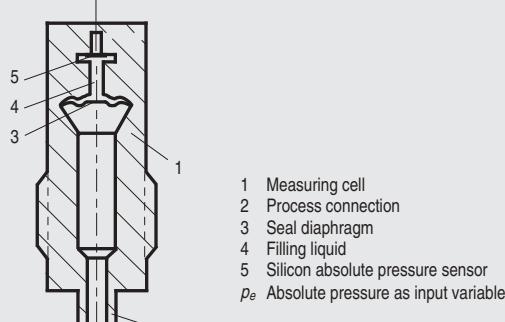
The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gage pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the input pressure.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
Technical description

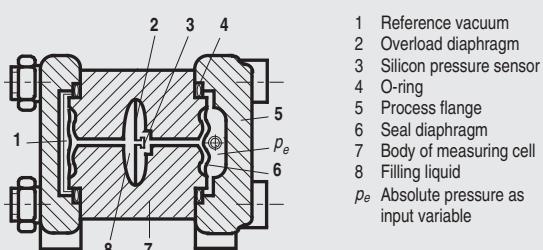
Measuring cell for absolute pressure from gage pressure series



Measuring cell for absolute pressure from the pressure series, function diagram

The absolute pressure p_e is transmitted through the seal diaphragm (3, Figure "Measuring cell for absolute pressure from the gage pressure series, function diagram") and the filling liquid (4) to the silicon absolute pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the input pressure.

Measuring cell for absolute pressure from differential pressure series



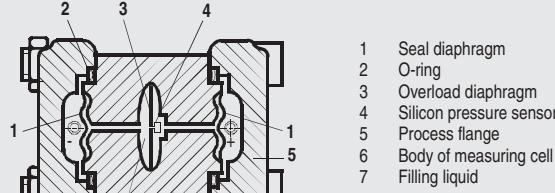
Measuring cell for absolute pressure from differential pressure series, function diagram

The input pressure p_e is transmitted through the seal diaphragm (6, Figure "Measuring cell for absolute pressure from differential pressure series, function diagram") and the filling liquid (8) to the silicon pressure sensor (3).

The difference in pressure between the input pressure p_e and the reference vacuum (1) on the low-pressure side of the measuring cell flexes the measuring diaphragm. The resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit thus changes. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

Measuring cell for differential pressure and flow



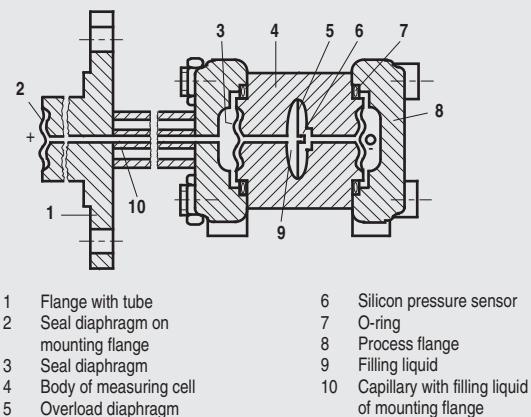
Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

Measuring cell for level



Measuring cell for level, function diagram

The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell through the seal diaphragm on the mounting flange (2, Figure "Measuring cell for level, function diagram"). This differential pressure is subsequently transmitted further through the measuring cell (3) and the filling liquid (9) to the silicon pressure sensor (6) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit.

This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series

Technical description

Parameterization DS III

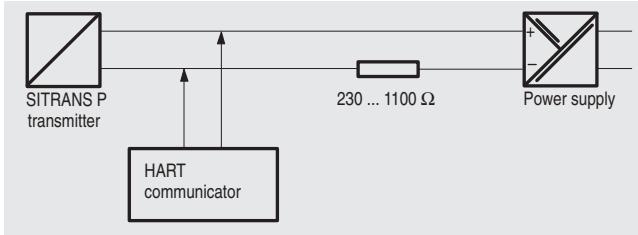
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input keys (local operation)

With the input keys you can easily set the most important parameters without any additional equipment.

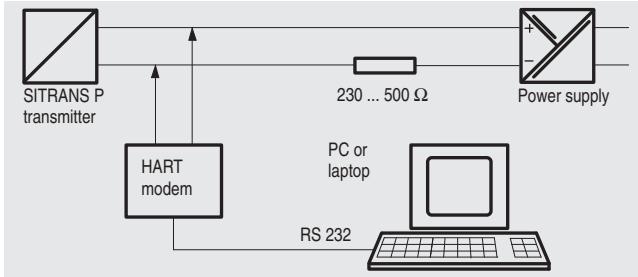
Parameterization using HART communication

Parameterization using HART communication is performed with a HART communicator or a PC.



Communication between a HART communicator and a pressure transm.

When parameterizing with the HART communicator, the connection is made directly to the 2-wire system.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

Adjustable parameters, DS III HART

Parameters	Input keys (DS III HART)	HART com- munication
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
Current transmitter	x	x
Fault current	x	x
Disabling of keys, write protection	x	x ¹⁾
Type of dimension and actual dimension	x	x
Characteristic (linear / square-rooted)	x ²⁾	x ²⁾
Input of characteristic	x	
Freely-programmable LCD	x	
Diagnostics functions	x	

¹⁾ Cancel apart from write protection

²⁾ Only differential pressure

Diagnostic functions for DS III HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

Available physical units of display for DS III HART

Table style: Technical specifications 2

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , inH ₂ O, inH ₂ O (4 °C), mmH ₂ O, ftH ₂ O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Volume flow	m ³ /d, m ³ /h, m ³ /s, l/min, l/s, ft ³ /d, ft ³ /min, ft ³ /s, US gallon/min, US gallon/s
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS puts the DS III PA in connection with a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

Parameterization through FOUNDATION Fieldbus Interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III FF is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for DS III PA and FF

Parameters	Input keys (DS III HART)	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Key and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostics functions		x

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
Technical description

Diagnostic functions for DS III PA and FF

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , mmH ₂ O, mmH ₂ O (4 °C), inH ₂ O, inH ₂ O (4 °C), ftH ₂ O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Volume flow	m ³ /s, m ³ /min, m ³ /h, m ³ /d, l/s, l/min, l/h, l/d, Ml/d, ft ³ /s, ft ³ /min, ft ³ /h, ft ³ /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

Technical specifications

SITRANS P, DS III series for gage pressure

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	HART	PROFIBUS PA or FOUNDATION Fieldbus		
Input				
Measured variable	Gage pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.01 ... 1 bar g (0.145 ... 14.5 psi g)	6 bar g (87 psi g)	1 bar g (14.5 psi g)	6 bar g (87 psi g)
	0.04 ... 4 bar g (0.58 ... 58 psi g)	10 bar g (145 psi g)	4 bar g (58 psi g)	10 bar g (145 psi g)
	0.16 ... 16 bar g (2.23 ... 232 psi g)	32 bar g (464 psi g)	16 bar g (232 psi g)	32 bar g (464 psi g)
	0.6 ... 63 bar g (9.14 ... 914 psi g)	100 bar g (1450 psi g)	63 bar g (914 psi g)	100 bar g (1450 psi g)
	1.6 ... 160 bar g (23.2 ... 2320 psi g)	250 bar g (3626 psi g)	160 bar g (2320 psi g)	250 bar g (3626 psi g)
	4.0 ... 400 bar g (58 ... 5802 psi g)	600 bar g (8700 psi g)	400 bar g (5802 psi g)	600 bar g (8700 psi g)
	7.0 ... 700 bar g (102 ... 10153 psi g)	800 bar g (11603 psi g)	700 bar g (10153 psi g)	800 bar g (11603 psi g)
Lower measuring limit				
• Measuring cell with silicone oil filling	30 mbar a (0.435 psi a)			
• Measuring cell with inert filling liquid	30 mbar a (0.435 psi a)			
Upper measuring limit		100% of max. span (max. 160 bar g (2320 psi g) with oxygen measurement and inert liquid)		
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA or FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V		-	
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	-		Yes	
Accuracy				
Reference conditions (All error data refer always refer to the set span)		To EN 60770-1		
Error in measurement and fixed-point setting (including hysteresis and repeatability)		Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span/set span)		
• Linear characteristic			$\leq 0.075\%$	
- $r \leq 10$		$\leq (0.0029 \cdot r + 0.071)\%$		
- $10 < r \leq 30$		$\leq (0.0045 \cdot r + 0.071)\%$		
- $30 < r \leq 100$		$\leq (0.005 \cdot r + 0.05)\%$		
Long-term drift (temperature change ± 30 °C (± 54 °F))		$\leq (0.25 \cdot r)\%$ every 5 years		$\leq 0.25\%$ every 5 years
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)		$\leq (0.08 \cdot r + 0.1)\%$ (at 700 bar: $\leq (0.1 \cdot r + 0.2)\%$)		$\leq 0.3\%$
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)		$\leq (0.1 \cdot r + 0.15)\%/10 \text{ K}$		$\leq 0.25\%/10 \text{ K}$
Measured Value Resolution		-		$3 \cdot 10^{-5}$ of nominal measuring range

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

SITRANS P, DS III series for gage pressure

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Digital indicators	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Permissible	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Housing material	Poor in copper die-cast aluminium, GD-AlSi12 or stainless steel precision casting, mat. No. 1.4408	
Wetted parts materials		
• Connection shank	Stainless steel, mat. No. 1.4404/316L or Hastelloy C4, mat. No. 2.4610	
• Oval flange	Stainless steel, mat. No. 1.4404/316L	
• Seal diaphragm	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819	
Measuring cell filling	Silicone oil or inert filling liquid (max. 160 bar (2320 psi g) with oxygen measurement)	
Process connection	Connection shank G 1/2 A to DIN EN 837-1, female thread 1/2 -14 NPT or oval flange (PN 160 (MWP 2320 psi g)) to DIN 19213 with mounting thread M10 or 7/16-20 UNF to EN 61518	
Material of the mounting bracket		
• Steel	Sheet steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Stainless steel, Mat. No. 1.4301 (SS304)	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	Supplied through bus
Separate 24 V power supply necessary	-	-
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Startup current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

**DS III series
for gage pressure**

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SITRANS P, DS III series for gage pressure

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/b IIB/IIC T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
• Explosion-proof "d"	PTB 99 ATEX 1160	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C	
- Permissible ambient temperature	Ex II 1/2 D IP65 T 120 °C	
- Max.surface temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Connection	120 °C (248 °F)	
- Effective internal inductance/capacitance	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Identification	Ex II 2 D IP65 T 120 °C	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
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HART communication		Communication FOUNDATION Fieldbus	
HART communication	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	- Adaptation to customer-specific process variables Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM		- Electrical damping T_{63} , adjustable 0 ... 100 s
PROFIBUS PA communication		- Simulation function Output/input (can be locked within the device with a bridge)	
Simultaneous communication with master class 2 (max.)	4	• Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Square-rooted characteristic for flow measurement	Yes
• Output byte	5 (one measuring value) or 10 (two measuring values)	• PID	Standard FF function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• Physical block	1 Resource block
Internal preprocessing		Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B	• Pressure transducer block	
Function blocks	2	- Can be calibrated by applying two pressures	Yes
• Analog input		- Monitoring of sensor limits	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Electrical damping T_{63} , adjustable	0 ... 100 s		
- Simulation function	Input /Output		
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	Can be parameterized (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

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Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure, series DS III HART		7MF4033 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid ¹⁾	Grease-free	3
Span		
0.01 ... 1 bar g	(0.15 ... 14.5 psi g)	B
0.04 ... 4 bar g	(0.58 ... 58 psi g)	C
0.16 ... 16 bar g	(2.32 ... 232 psi g)	D
0.63 ... 63 bar g	(9.14 ... 914 psi g)	E
1.6 ... 160 bar g	(23.2 ... 2320 psi g)	F
4.0 ... 400 bar g	(58.0 ... 5802 psi g)	G
7.0 ... 700 bar g	(102.0 ... 10153 psi g)	J
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version as diaphragm seal ^{2) 3)}		Y
Process connection		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 NPT		1
• Oval flange made of stainless steel		2
- Mounting thread 7/16-20 UNF to EN 61518		3
- Mounting thread M10 to DIN 19213		4
- Mounting thread M12 to DIN 19213		5
• Male thread M20 x 1,5		6
• Male thread 1/2-14 NPT		0
Non-wetted parts materials		3
• Housing made of die-cast aluminium		1
• Housing stainless steel precision casting ⁴⁾		2
Version		
• Standard version		A
• International version, English label inscriptions, documentation in 5 languages on CD		B
Explosion protection		D
• Without		P
• With ATEX, Type of protection:		E
- "Intrinsic safety (EEx ia)"		R
- "Explosion-proof (EEx d)" ⁵⁾		NC
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁶⁾		A
- "Ex nA/nL (zone 2)"		B
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁶⁾		C
• With FM + CSA, Type of protection:		D
- "Intrinsic safety and explosion-proof (is + xp)" ⁵⁾		F
Electrical connection / cable entry		
• Screwed gland Pg 13.5 (adapter) ⁷⁾		
• Screwed gland M20x1.5		
• Screwed gland 1/2-14 NPT		
• Han 7D plug (plastic housing) incl. mating connector ⁷⁾		
• M12 connector (metall) ⁸⁾		

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure, series DS III HART		7MF4033 -
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator ► hidden, setting: mA)		1
• With visible digital indicator, setting: mA		6
• with customer-specific digital indicator (setting as specified, Order code "Y21" or "Y22" required)		7
► Available ex stock		
Power supply units see "SITRANS I power supply units and isolation amplifiers".		
Factory-mounting of shut-off valves and valve manifolds see page 2/142.		
Included in delivery of the device:		
• Brief instructions (Leporello)		
• CD-ROM with detailed documentation		
1) For oxygen application, add Order code E10.		
2) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.		
3) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.		
4) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.		
5) Without cable gland, with blanking plug		
6) With enclosed cable gland EEx ia and blanking plug		
7) Not together with type of protection "Explosion-proof" and type of protection "Ex nA".		
8) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"		
F) Subject to export regulations AL: 91999, ECCN: N.		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

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Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure		
DS III PA (PROFIBUS PA) series		7 MF 4 0 3 4 -
DS III FF series (FOUNDATION Fieldbus)		7 MF 4 0 3 5 -
Measuring cell filling		
Silicone oil	Standard	1
Inert liquid ¹⁾	Grease-free	3
Nominal measuring range		
1 bar g	(14.5 psi g)	B
4 bar g	(58 psi g)	C
16 bar g	(232 psi g)	D
63 bar g	(914 psi g)	E
160 bar g	(2320 psi g)	F
400 bar g	(5802 psi g)	G
700 bar g	(10153 psi g)	J
Wetted parts materials		
Seal diaphragm	Process connection	A
Stainless steel	Stainless steel	B
Hastelloy	Stainless steel	C
Hastelloy	Hastelloy	Y
Version as diaphragm seal ^{2) 3)}		
Process connection		
• Connection shank G $\frac{1}{2}$ A to EN 837-1		0
• Female thread $\frac{1}{2}$ -14 NPT		1
• Oval flange made of stainless steel		2
- Mounting thread $\frac{7}{16}$ -20 UNF to EN 61518		3
- Mounting thread M10 to DIN 19213		4
- Mounting thread M12 nach DIN 19213		5
• Male thread M20 x 1,5		6
• Male thread $\frac{1}{2}$ -14 NPT		
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		B
- "Intrinsic safety (EEx ia)"		D
- "Explosion-proof (EEx d)" ⁴⁾		P
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁵⁾		E
- "Ex nA/hL (zone 2)"		R
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁶⁾ (not for DS III FF)		NC
• With FM + CSA, Type of protection:		B
- "Intrinsic safety and explosion-proof (is + xp)" ⁵⁾		C
Electrical connection / cable entry		
• Screwed gland M20x1.5		F
• Screwed gland $\frac{1}{2}$ -14 NPT		
• Plug M12 (metal) ⁶⁾		
Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure		
DS III PA (PROFIBUS PA) series		7 MF 4 0 3 4 -
DS III FF series (FOUNDATION Fieldbus)		7 MF 4 0 3 5 -
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator ► hidden, setting: mA)		1
• With visible digital indicator		6
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)		7
Factory-mounting of shut-off valves and valve manifolds see page 2/142.		
The device is delivered together with brief instructions (Leporello) and a CD-ROM containing detailed documentation.		
1) For oxygen application, add Order code E10.		
2) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.		
3) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.		
4) Without cable gland, with blanking plug.		
5) With enclosed cable gland EEx ia and blanking plug.		
6) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"		
F) Subject to export regulations AL: 91999, ECCN: N.		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

2

Selection and Ordering data		Order code		
Further designs		HART	PA	FF
Add "-Z" to Order No. and specify Order code.				
Pressure transmitter with mounting bracket made of:				
• Steel	A01	✓	✓	✓
• Stainless steel	A02	✓	✓	✓
Plug				
• Han 7D (metal, gray)	A30	✓		
• Han 8U (instead of Han 7D)	A31	✓		
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓
Rating plate inscription (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
English rating plate	B21	✓	✓	✓
Pressure units in inH ₂ O or psi				
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾	C11	✓	✓	✓
Acceptance test certificate²⁾ To EN 10204-3.1	C12	✓	✓	✓
Factory certificate To EN 10204-2.2	C14	✓	✓	✓
"Functional Safety (SIL)" certificate	C20	✓		
"PROFIsafe" certificate and protocol	C21		✓	
Setting of upper limit of output signal to 22.0 mA	D05	✓		
Manufacturer's declaration acc. to NACE	D07	✓	✓	✓
Type of protection IP68 (not together with 7D/ Han 8U plug, cable gland Pg 13.5)	D12	✓	✓	✓
Digital indicator alongside the input keys (only together with the devices 7MF4033--A.6 or -.A.7-Z, Y21 or Y22 + Y01)	D27	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓	✓
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓	✓
Oxygen application (max. 120 bar g (1740 psi g) at 60°C (140 °F) for oxygen measurement and inert liquid)	E10	✓	✓	✓
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4....-....-B..)	E25	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4....-....-B..)	E55	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4....-....-D..)	E56	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4....-....-E..)	E57	✓	✓	✓

Selection and Ordering data		Order code		
Additional data		HART	PA	FF
Add "-Z" to Order No. and specify Order code.				
Measuring range to be set	Y01	✓		
Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
Measuring point number (TAG No.)	Y15	✓	✓	✓
Max. 16 characters, specify in plain text: Y15:				
Measuring point text	Y16	✓	✓	✓
Max. 27 characters, specify in plain text: Y16:				
Entry of HART address (TAG)	Y17	✓		
Max. 8 characters, specify in plain text: Y17:				
Setting of pressure indication in pressure units	Y21	✓	✓	✓
Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O*, inH ₂ O*, ftH ₂ O*, mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder % *) ref. temperature 20 °C				
Setting of pressure indication in non-pressure units	Y22 + Y01		✓	
Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)				
Preset bus address (possible between 1 and 126)	Y25			✓
Specify in plain text: Y25:				

Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset

✓ = available

Ordering example

Item line: 7MF4033-1EA00-1AA7-Z
B line: A01 + Y01 + Y21
C line: Y01: 10 ... 20 bar (145 ... 290 psi)
C line: Y21: bar (psi)

¹⁾ When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

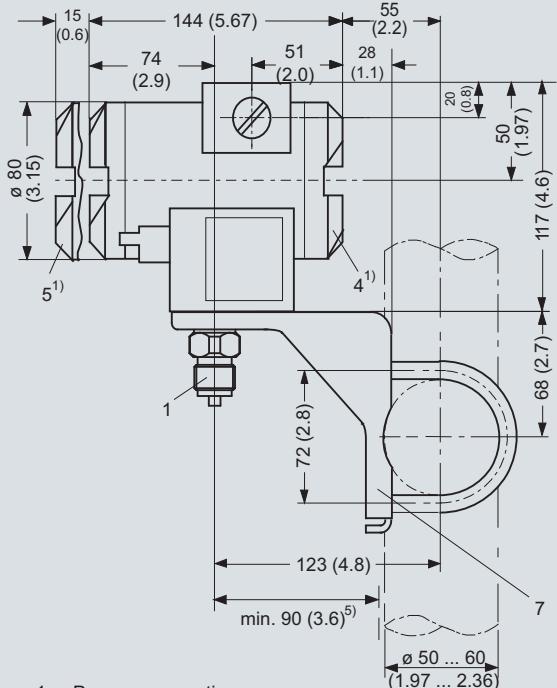
²⁾ Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.

SITRANS P measuring instruments for pressure

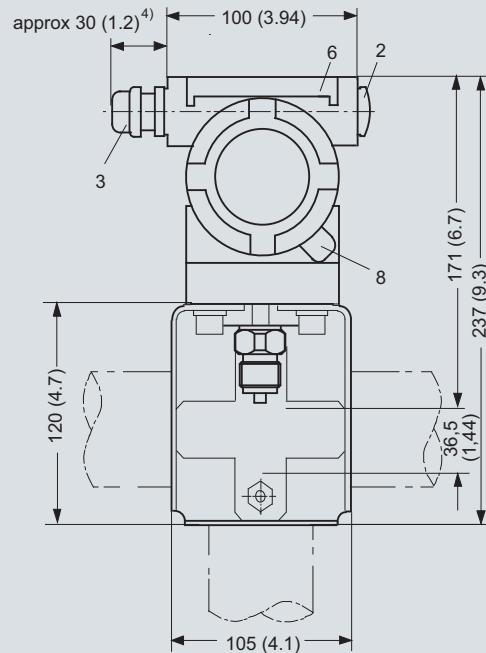
Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

Dimensional drawings



- 1 Process connection:
- $\frac{1}{2}$ -14 NPT,
- connection shank G $\frac{1}{2}$ B or
- oval flange
- 2 Blanking plug
- 3 Electrical connection:
- screwed gland M20x1,5 ⁴⁾,
- screwed gland $\frac{1}{2}$ -14 NPT or
- PROFIBUS-Stecker M12 ³⁾⁴⁾
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)



- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) Minimum distance for rotating
- 3) Not with type of protection "Explosion-proof enclosure"
- 4) Not with type of protection "FM + CSA"

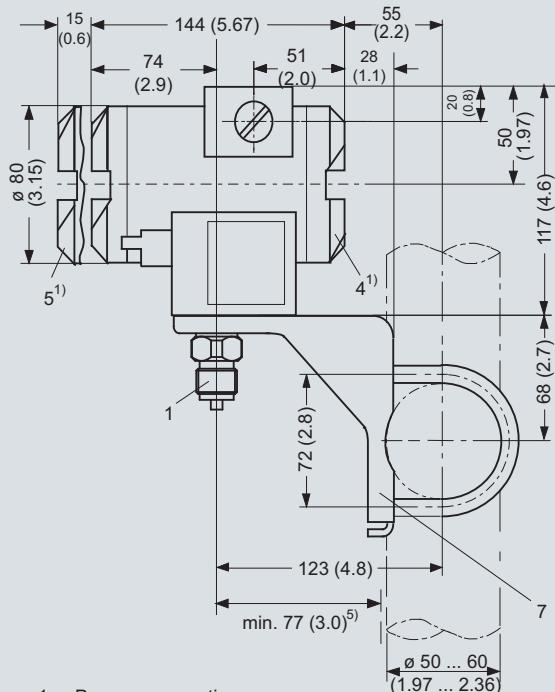
SITRANS P pressure transmitters, DS III HART series for gage pressure, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

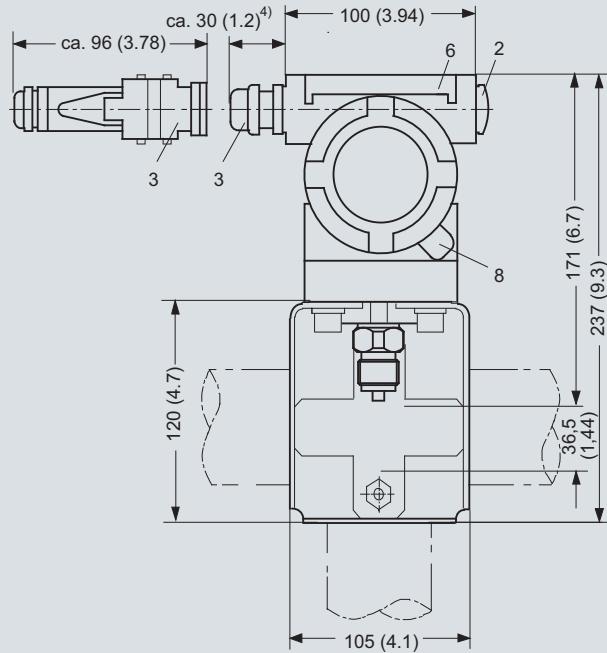
Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

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- 1 Process connection:
- 1/2-14 NPT,
- connection shank G1/2B or
- oval flange
- 2 Blanking plug
- 3 Electrical connection:
- screwed gland Pg 13,5 (adapter)²⁾³⁾,
- screwed gland M20x1,5³⁾,
- screwed gland 1/2-14 NPT or
- Han 7D/ Han 8U²⁾³⁾ plug
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)



- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [is + xp]"
- 4) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)
- 5) Minimum distance for rotating

SITRANS P pressure transmitters, DS III PA and FF series for gage pressure, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for gage and absolute pressure,
with front-flush diaphragm

Technical specifications

SITRANS P, DS III series for gage and absolute pressure, with front-flush diaphragm

	HART	PROFIBUS PA or FOUNDATION Fieldbus		
Input gage pressure, with front-flush diaphragm				
Measured variable	Gage pressure, flush-mounted			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.01 ... 1 bar g (0.145 ... 14.5 psi g)	6 bar g (87 psi g)	1 bar g (14.5 psi g)	6 bar g (87 psi g)
	0.04 ... 4 bar g (0.58 ... 58 psi g)	10 bar g (145 psi g)	4 bar g (58 psi g)	10 bar g (145 psi g)
	0.16 ... 16 bar g (2.23 ... 232 psi g)	32 bar g (464 psi g)	16 bar g (232 psi g)	32 bar g (464 psi g)
	0.6 ... 63 bar g (9.14 ... 914 psi g)	100 bar g (1450 psi g)	63 bar g (914 psi g)	100 bar g (1450 psi g)
Lower measuring limit	-100 mbar a (-1.45 psi a)			
Upper measuring limit	100% of max. span		100% of nominal measuring range	
Input absolute pressure, with front-flush diaphragm				
Measured variable	Absolute pressure, flush-mounted			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	43 ... 1300 mbar a (0.62 ... 18.9 psi a)	10 bar a (145 psi a)	1300 mbar a (18.9 psi a)	10 bar a (145 psi a)
	0.16 ... 5 bar a (2.32 ... 72.5 psi a)	30 bar a (435 psi a)	5 bar a (72.5 psi a)	30 bar a (435 psi a)
	1 ... 30 bar a (14.5 ... 435 psi a)	100 bar a (1450 psi a)	30 bar a (435 psi a)	100 bar a (1450 psi a)
	Depending on the process connection, the span may differ from these values		Je nach Prozessanschluss kann die Messspanne von diesen Werten abweichen	
Lower measuring limit	100 mbar a (1.45 psi a)			
Upper measuring limit	100% of max. span		100% of nominal measuring range	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA or FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V		-	
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	-		Yes	
Accuracy	To EN 60770-1			
Reference conditions (All error data refer always to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span/set span)			
Error in measurement and fixed-point setting (including hysteresis and repeatability)	Gage pressure, front-flushed	Absolute pressure, front-flushed	Gage pressure, front-flushed	Absolute pressure, front-flushed
• Linear characteristic			$\leq 0,075\%$	$\leq 0,2\%$
- $r \leq 10$	$\leq (0.0029 \cdot r + 0.071)\%$	$\leq 0,2\%$		
- $10 < r \leq 30$	$\leq (0.0045 \cdot r + 0.071)\%$	$\leq 0,4\%$		
- $30 < r \leq 100$	$\leq (0.005 \cdot r + 0.05)\%$	-		
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.25 \cdot r)\%$ every 5 years		$\leq 0.25\%$ every 5 years	
Influence of ambient temperature				

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for gage and absolute pressure,
with front-flush diaphragm

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SITRANS P, DS III series for gage and absolute pressure, with front-flush diaphragm

	HART	PROFIBUS PA or FOUNDATION Fieldbus
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.1 \cdot r + 0.2)\%$	$\leq 0.3\%$
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)	$\leq (0.1 \cdot r + 0.15)\% / 10 \text{ K}$	$\leq 0.25\% / 10 \text{ K}$
Influence of mounting position	0.1 mbar g (0.00145 psi g) per 10° inclination	$\leq 0.5\% / 10 \text{ K}$
Measured Value Resolution	-	$3 \cdot 10^{-5}$ of nominal measuring range
Influence of the medium temperature (only with front-flush diaphragm)		
• Temperature difference between medium temperature and ambient temperature	3 mbar/10 K (0.04 psi/10 K)	
Rated operating conditions		
<u>Installation conditions</u>		
Ambient temperature	Observe the temperature class in areas subject to explosion hazard.	
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)	
• Measuring cell with Neobee oil (with front-flush diaphragm)	-10 ... +85 °C (14 ... +185 °F)	
• Measuring cell with inert liquid (not with front-flush diaphragm)	-20 ... +85 °C (-4 ... +185 °F)	
• Digital display	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with Neobee: -20 ... +85 °C (-4 ... +185 °F))	
Climatic class		
Condensation	Permissible	
Degree of protection to EN 60529	IP65, IP68, NEMA X, enclosure cleaning, resistant to lyes, steam to 150° C (302 °F)	
Electromagnetic compatibility		
• Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
<u>Medium conditions</u>		
Process temperature		
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with silicone oil (with front-flush diaphragm)	-40 ... +150 °C (-40 ... +302 °F)	
• Measuring cell with Neobee oil (with front-flush diaphragm)	-40 ... +150 °C (-40 ... +302 °F)	
• Measuring cell with silicone oil, with temperature isolator (only with front-flush diaphragm)	-40 ... +200 °C (-40 ... +392 °F)	
• Measuring cell with inert liquid	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with high temperature oil	-10 ... +250 °C (14 ... +482 °F)	
<u>Design</u>		
Weight (without options)	$\approx 1.5 \text{ kg} (\approx 3.3 \text{ lb})$	
Housing material	Poor in copper die-cast aluminium, GD-AlSi12 or stainless steel precision casting, mat. No. 1.4408	
Wetted parts materials	Stainless steel, mat. No. 1.4404/316L	
Measuring cell filling	Silicone oil or inert filling liquid	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for gage and absolute pressure,
with front-flush diaphragm

SITRANS P, DS III series for gage and absolute pressure, with front-flush diaphragm

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	Supplied through bus -
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ...32 V
• With intrinsically-safe operation	-	9 ...24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Startup current \leq basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
Certificate and approvals		
Classification according to pressure equipment directive (DRG 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	

Hygiene version

In the case of SITRANS P DSIII with 7MF413x front-flush diaphragm, selected connections comply with the requirements of EHEDG.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for gage and absolute pressure, with front-flush diaphragm

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HART communication

HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM

PROFIBUS PA communication

Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measuring value) or 10 (two measuring values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	
- Failure mode	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a container characteristic with	Max. 30 nodes
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

Communication FOUNDATION Fieldbus

Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FF function block
• Physical block	1 Resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for gage and absolute pressure,
with front-flush diaphragm

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage and absolute pressure, front-flush membrane, series DS III HART		F) 7MF4133 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
FDA compliant fill fluid		
• Neobee oil	Standard	4
Span		
0.01 ... 1 bar g ¹⁾	(0.15 ... 14.5 psi g ¹⁾	B
0.04 ... 4 bar g	(0.58 ... 58 psi g)	C
0.16 ... 16 bar g	(2.32 ... 232 psi g)	D
0.63 ... 63 bar g	(9.14 ... 914 psi g)	E
13 ... 1300 mbar a ²⁾	(0.19 ... 18.9 psi a ²⁾	S
0.05 ... 5 bar a ²⁾	(0.7 ... 72.5 psi a ²⁾	T
3 ... 30 bar a ²⁾	(43.5 ... 435 psi a ²⁾	U
Wetted parts materials		
Seal diaphragm	Connection shank	A
Stainless steel	Stainless steel	
Process connection		
• Flange version with Order code M.., N.., R.. or Q..		7
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		B
- "Intrinsic safety (EEx ia)"		D
- "Explosion-proof (EEx d)" ³⁾		R
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁴⁾		NC
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ³⁾ (available soon)		
Electrical connection / cable entry		
• Inner thread M20x1.5		B
• Female thread 1/2-14 NPT		C
• M12 connectors (metal) ⁵⁾		F
Display		
• without (digital indicator hidden, setting: mA)		1
• with visible digital indication, setting: mA		6
• with customer-specific digital indication (setting as specified, Order code "Y21" or "Y22" required)		7

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) Only with "Standard" process connection

2) Not with temperature decoupler P00 and P10, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.

3) Without cable gland, with blanking plug.

4) With enclosed cable gland EEx ia and blanking plug.

5) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure, front-flush membrane		
DS III PA series (PROFIBUS PA)		F) 7MF4134 -
DS III FF series (FOUNDATION Fieldbus)		F) 7MF4135 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
FDA compliant fill fluid		
• Neobee oil	Standard	4
Nominal measuring range		
1 bar g ¹⁾	(14.5 psi g ¹⁾	B
4 bar g	(58 psi g)	C
16 bar g	(232 psi g)	D
63 bar g	(914 psi g)	E
1300 mbar a ²⁾	(18.9 psi a ²⁾	S
5 bar a ²⁾	(72.5 psi a ²⁾	T
30 bar a ²⁾	(435 psi a ²⁾	U
Wetted parts materials		
Seal diaphragm	Connection shank	A
Stainless steel	Stainless steel	
Process connection		
• Flange version with Order code M.., N.., R.. or Q..		7
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		B
- "Intrinsic safety (EEx ia)"		D
- "Explosion-proof (EEx d)" ³⁾		R
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁴⁾		NC
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ³⁾ (available soon)		
Electrical connection / cable entry		
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• M12 connectors (metal) ⁵⁾		F
Display		
• Without (digital display hidden)		1
• With visible digital display		6
• With customer-specific digital display (setting as specified, Order code "Y21" or required)		7

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) Only with "Standard" process connection

2) Not with temperature decoupler P00 and P10, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.

3) Without cable gland, with blanking plug.

4) With enclosed cable gland EEx ia and blanking plug.

5) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for gage and absolute pressure,
with front-flush diaphragm

2

Selection and Ordering data		Order code			Selection and Ordering data		Order code		
Further designs		HART	PA	FF	Further designs		HART	PA	FF
Add "-Z" to Order No. and specify Order code.					Add "-Z" to Order No. and specify Order code.				
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓	Temperature decoupler up to 200 °C⁴⁾ for version with front-flush diaphragm	P00	✓	✓	✓
Rating plate inscription (instead of German)					Temperature decoupler up to 250 °C Measuring cell filling: High-temperature oil, only in conjunction with measuring cell filling silicone oil	P10	✓	✓	✓
• English	B11	✓	✓	✓	Bio-Control (Neumo) sanitary connection certified to EHEDG				
• French	B12	✓	✓	✓	• DN 50, PN 16	Q53	✓	✓	✓
• Spanish	B13	✓	✓	✓	• DN 65, PN 16	Q54	✓	✓	✓
• Italian	B14	✓	✓	✓	Sanitary process connection to DRD	M32	✓	✓	✓
English rating plate	B21	✓	✓	✓	• 65 mm, PN 40				
Pressure units in inH ₂ O or psi					SMS socket with union nut				
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11	✓	✓	✓	• 2"	M67	✓	✓	✓
Acceptance test certificate	C12	✓	✓	✓	• 2½"	M68	✓	✓	✓
To EN 10204-3.1					• 3"	M69	✓	✓	✓
Factory certificate	C14	✓	✓	✓	SMS threaded socket				
To EN 10204-2.2					• 2"	M73	✓	✓	✓
"PROFIsafe" certificate and protocol	C21		✓		• 2½"	M74	✓	✓	✓
Flanges to EN 1092-1					• 3"	M75	✓	✓	✓
• DN 25, PN 40 ¹⁾	M11	✓	✓	✓	IDF socket with union nut ISO 2853				
• DN 25, PN 100 ¹⁾	M21	✓	✓	✓	• 2"	M82	✓	✓	✓
• DN 40, PN 40	M13	✓	✓	✓	• 2½"	M83	✓	✓	✓
• DN 40, PN 100	M23	✓	✓	✓	• 3"	M84	✓	✓	✓
• DN 50, PN 16	M04	✓	✓	✓	IDF threaded socket ISO 2853				
• DN 50, PN 40	M14	✓	✓	✓	• 2"	M92	✓	✓	✓
• DN 80, PN 16	M06	✓	✓	✓	• 2½"	M93	✓	✓	✓
• DN 80, PN 40	M16	✓	✓	✓	• 3"	M94	✓	✓	✓
Flanges to ASME B16.5					Sanitary process connection to NEUMO Bio-Connect screw connection certified to EHEDG				
• Stainless steel flange 1" class 150 ¹⁾	M40	✓	✓	✓	• DN 50, PN 16	Q05	✓	✓	✓
• Stainless steel flange 1½" class 150	M41	✓	✓	✓	• DN 65, PN 16	Q06	✓	✓	✓
• Stainless steel flange 2" class 150	M42	✓	✓	✓	• DN 80, PN 16	Q07	✓	✓	✓
• Stainless steel flange 3" class 150	M43	✓	✓	✓	• DN 100, PN 16	Q08	✓	✓	✓
• Stainless steel flange 4" class 150	M44	✓	✓	✓	• DN 2", PN 16	Q13	✓	✓	✓
• Stainless steel flange 1" class 300 ¹⁾	M45	✓	✓	✓	• DN 2½", PN 16	Q14	✓	✓	✓
• Stainless steel flange 1½" class 300	M46	✓	✓	✓	• DN 3", PN 16	Q15	✓	✓	✓
• Stainless steel flange 2" class 300	M47	✓	✓	✓	• DN 4", PN 16	Q16	✓	✓	✓
• Stainless steel flange 3" class 300	M48	✓	✓	✓	Sanitary process connection to NEUMO Bio-Connect flange connection certified to EHEDG				
• Stainless steel flange 4" class 300	M49	✓	✓	✓	• DN 50, PN 16	Q23	✓	✓	✓
Threaded connection acc. to DIN 3852-2, Form A					• DN 65, PN 16	Q24	✓	✓	✓
• G ¾", flush-mounted ²⁾	R01	✓	✓	✓	• DN 80, PN 16	Q25	✓	✓	✓
• G 1", flush-mounted ²⁾	R02	✓	✓	✓	• DN 100, PN 16	Q26	✓	✓	✓
• G 2", flush-mounted ²⁾	R04	✓	✓	✓	• DN 2", PN 16	Q31	✓	✓	✓
Tank connection³⁾					• DN 2½", PN 16	Q32	✓	✓	✓
Sealing is included in delivery					• DN 3", PN 16	Q33	✓	✓	✓
• TG 52/50, PN 40	R10	✓	✓	✓	• DN 4", PN 16	Q34	✓	✓	✓
• TG 52/150, PN 40	R11	✓	✓	✓	Sanitary process connection to NEUMO Bio-Connect clamp connection certified to EHEDG				
Sanitary process connection according DIN 11851 (Dairy connection)					• DN 50, PN 16	Q39	✓	✓	✓
• DN 50, PN 25	N04	✓	✓	✓	• DN 65, PN 10	Q40	✓	✓	✓
• DN 80, PN 25	N06	✓	✓	✓	• DN 80, PN 10	Q41	✓	✓	✓
Tri-Clamp connection according DIN 32676/ISO 2852					• DN 100, PN 10	Q42	✓	✓	✓
• DN 50/2", PN 16	N14	✓	✓	✓	• DN 2½", PN 16	Q48	✓	✓	✓
• DN 65/3", PN 10	N15	✓	✓	✓	• DN 3", PN 10	Q49	✓	✓	✓
Varivent connection certified to EHEDG					• DN 4", PN 10	Q50	✓	✓	✓
• Type N = 68 for Varivent housing DN 40 ... 125 and 1½" ... 6", PN 40	N28	✓	✓	✓					

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for gage and absolute pressure,
with front-flush diaphragm

2

Selection and Ordering data		Order code			Selection and Ordering data		Order code		
Further designs		HART	PA	FF	Additional data		HART	PA	FF
Add "-Z" to Order No. and specify Order code.					Add "-Z" to Order No. and specify Order code.				
Sanitary process connection to NEUMO					Measuring range to be set	Y01	✓		
Connect S flange connection					Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
certified to EHEDG					Measuring point number (TAG No.)	Y15	✓	✓	✓
• DN 50, PN 16	Q63	✓	✓	✓	Max. 16 characters, specify in plain text: Y15:				
• DN 65, PN 10	Q64	✓	✓	✓	Measuring point text	Y16	✓	✓	✓
• DN 80, PN 10	Q65	✓	✓	✓	Max. 27 characters, specify in plain text: Y16:				
• DN 100, PN 10	Q66	✓	✓	✓	Setting of pressure indicator in pressure units	Y21	✓	✓	✓
• DN 2", PN 16	Q72	✓	✓	✓	Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ...				
• DN 2½", PN 10	Q73	✓	✓	✓	Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder %				
• DN 3", PN 10	Q74	✓	✓	✓	*) ref. temperature 20 °C				
• DN 4", PN 10	Q75	✓	✓	✓	Preset bus address	Y25		✓	
Aseptic threaded socket to DIN 11864-1					(possible between 1 and 126)				
Form A					Specify in plain text: Y25:				
• DN 50, PN 25	N33	✓	✓	✓	Only "Y01" and "Y21" can be factory preset				
• DN 65, PN 25	N34	✓	✓	✓	✓ = available				
• DN 80, PN 25	N35	✓	✓	✓	Ordering example				
• DN 100, PN 25	N36	✓	✓	✓	Item line: 7MF4133-1DB20-1AB7-Z				
Aseptic flange with notch to DIN 11864-2					B line: A22 + Y01 + Y21				
Form A					C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)				
• DN 50, PN 16	N43	✓	✓	✓	C line: Y21: bar (psi)				
• DN 65, PN 16	N44	✓	✓	✓					
• DN 80, PN 16	N45	✓	✓	✓					
• DN 100, PN 16	N46	✓	✓	✓					
Aseptic flange with groove to DIN 11864-2									
Form A									
• DN 50, PN 16	N43 + P11	✓	✓	✓					
• DN 65, PN 16	N44 + P11	✓	✓	✓					
• DN 80, PN 16	N45 + P11	✓	✓	✓					
• DN 100, PN 16	N46 + P11	✓	✓	✓					
Aseptic clamp with groove to DIN 11864-3									
Form A									
• DN 50, PN 25	N53	✓	✓	✓					
• DN 65, PN 25	N54	✓	✓	✓					
• DN 80, PN 16	N55	✓	✓	✓					
• DN 100, PN 16	N56	✓	✓	✓					

1) Special Viton seal included in delivery.

2) Lower measuring limit -100 mbar g (1.45 psi g).

3) The weldable socket can be ordered under accessories

4) The maximum temperatures of the medium depend on the respective cell fillings.

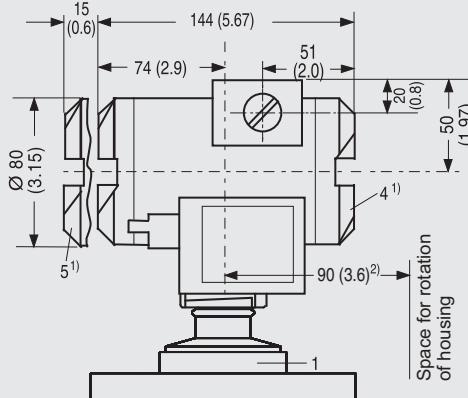
SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

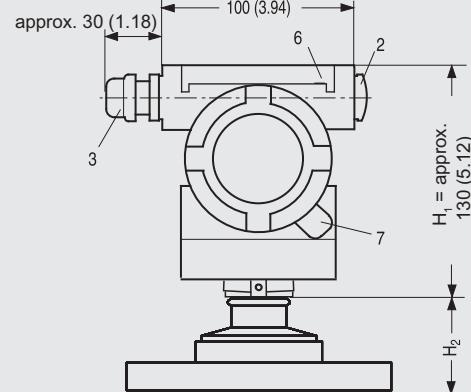
DS III series for gage and absolute pressure,
with front-flush diaphragm

2

Dimensional drawings



- 1 Process connection: see flange tables
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland M20x1.5
 - screwed gland 1/2-14 NPT
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for ~~to cover~~ to cover)
- 6 Protective cover over keys
- 7 Screw cover safety bracket (only for explosion-proof enclosure, not shown in the drawing)



- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

SITRANS P pressure transmitters, DS III series for gage pressure, with front-flush diaphragm, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into H_1 and H_2 .

H_1 = Height of the SITRANS DS III up to a defined cross-section

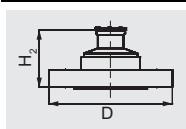
H_2 = Height of the flange up to this defined cross-section

Only the height H_2 is indicated in the dimensions of the flanges.

Flanges to EN and ASME

Flanges to EN

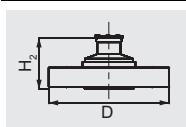
EN 1092-1



DN	PN	$\varnothing D$	H_2
25	40	115 mm (4.5")	Approx.
25	100	140 mm (5.5")	52 mm (2")
40	40	150 mm (5.9")	
40	100	170 mm (6.7")	
50	16	165 mm (6.5")	
50	40	165 mm (6.5")	
80	16	200 mm (7.9")	
80	40	200 mm (7.9")	

Flanges to ASME

ASME B16.5

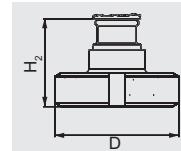


DN	class	$\varnothing D$	H_2
1"	150	110 mm (4.3")	Approx.
1"	300	125 mm (4.9")	52 mm (2")
1 1/2"	150	130 mm (5.1")	
1 1/2"	300	155 mm (6.1")	
2"	150	150 mm (5.9")	
2"	300	165 mm (6.5")	
3"	150	190 mm (7.5")	
3"	300	210 mm (8.1")	
4"	150	230 mm (9.1")	
4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

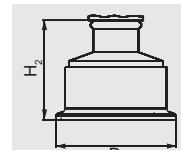
Connections to DIN

DIN 11851 (Dairy connection)



DN	PN	$\varnothing D$	H_2
50	25	92 mm (3.6")	Approx.
80	25	127 mm (5.0")	52 mm (2")

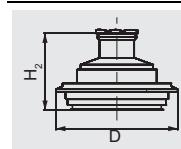
Tri-Clamp according DIN 32676



DN	PN	$\varnothing D$	H_2
50	16	64 mm (2.5")	Approx.
65	16	91 mm (3.6")	52 mm (2")

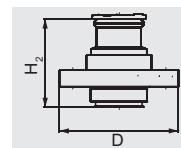
Other connections

Varivent connection



DN	PN	$\varnothing D$	H_2
40 ... 125	40	84 mm (3.3")	Approx.
			52 mm (2")

Bio-Control connection



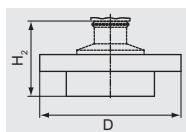
DN	PN	$\varnothing D$	H_2
50	16	90 mm (3.5")	Approx.
65	16	120 mm (4.7")	52 mm (2")

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

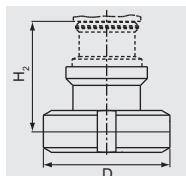
DS III series for gage and absolute pressure,
with front-flush diaphragm

Sanitary process connection to DRD



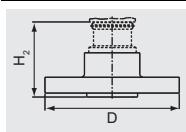
DN	PN	ØD	H ₂
50	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process screw connection to NEUMO Bio-Connect



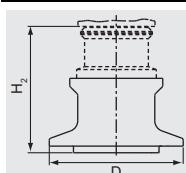
DN	PN	ØD	H ₂
50	16	82 mm (3.2")	Approx. 52 mm (2")
65	16	105 mm (4.1")	
80	16	115 mm (4.5")	
100	16	145 mm (5.7")	
2"	16	82 mm (3.2")	
2½"	16	105 mm (4.1")	
3"	16	105 mm (4.1")	
4"	16	145 mm (5.7")	

Sanitary connection to NEUMO Bio-Connect flange connection



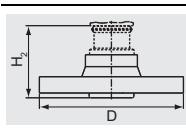
DN	PN	ØD	H ₂
50	16	110 mm (4.3")	Approx. 52 mm (2")
65	16	140 mm (5.5")	
80	16	150 mm (5.9")	
100	16	175 mm (6.9")	
2"	16	100 mm (3.9")	
2½"	16	110 mm (4.3")	
3"	16	140 mm (5.5")	
4"	16	175 mm (6.9")	

Sanitary connection to NEUMO Bio-Connect clamp connection



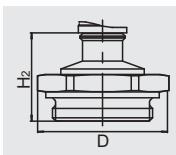
DN	PN	ØD	H ₂
50	16	77,4 mm (3.0")	Approx. 52 mm (2")
65	10	90,9 mm (3.6")	
80	10	106 mm (4.2")	
100	10	119 mm (4.7")	
2"	16	64 mm (2.5")	
2½"	16	77,4 mm (3.0")	
3"	10	90,9 mm (3.6")	
4"	10	119 mm (4.7")	

Sanitary connection to NEUMO Bio-Connect S flange connection



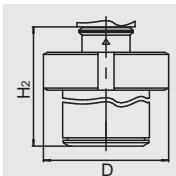
DN	PN	ØD	H ₂
50	16	125 mm (4.9")	Approx. 52 mm (2")
65	10	145 mm (5.7")	
80	10	155 mm (6.1")	
100	10	180 mm (7.1")	
2"	16	125 mm (4.9")	
2½"	10	135 mm (5.3")	
3"	10	145 mm (5.7")	
4"	10	180 mm (7.1")	

Thread connection G2" to DIN 3852



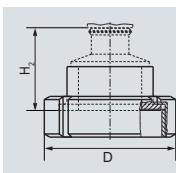
DN	PN	ØD	H ₂
2"	63	78 mm (3.1")	Approx. 52 mm (2")

Tank connection TG52/50



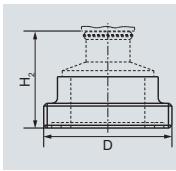
DN	PN	ØD	H ₂
25	40	63 mm (2.5")	Approx. 63 mm (2.5")

SMS socket with union nut



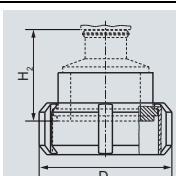
DN	PN	ØD	H ₂
2"	25	84 mm (3.3")	Approx. 52 mm (2.1")
2½"	25	100 mm (3.9")	

SMS threaded socket



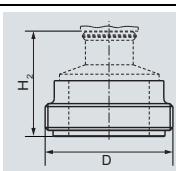
DN	PN	ØD	H ₂
2"	25	70 x 1/6 mm	Approx. 52 mm (2.1")
2½"	25	85 x 1/6 mm	

IDF socket with union nut



DN	PN	ØD	H ₂
2"	25	77 mm (3")	Approx. 52 mm (2.1")
2½"	25	91 mm (3.6")	

IDF threaded socket



DN	PN	ØD	H ₂
2"	25	64 mm (2.5")	Approx. 52 mm (2.1")
2½"	25	77,5 mm (3.1")	

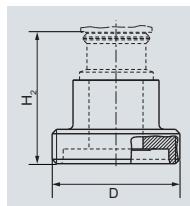
SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

**DS III series for gage and absolute pressure,
with front-flush diaphragm**

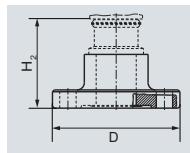
2

Aseptic threaded socket to DIN 11864-1 Form A



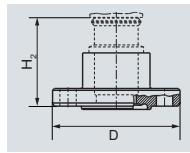
DN	PN	ØD	H ₂
50	25	78 x 1/6"	Approx. 52 mm (2.1")
65	25	95 x 1/6"	
80	25	110 x 1/4"	
100	25	130 x 1/4"	

Aseptic flange with notch to DIN 11864-2 Form A



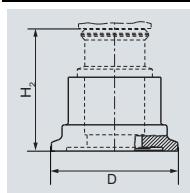
DN	PN	ØD	H ₂
50	16	94	Approx. 52 mm (2.1")
65	16	113	
80	16	133	
100	16	159	

Aseptic flange with groove to DIN 11864-2 Form A



DN	PN	ØD	H ₂
50	16	94	Approx. 52 mm (2.1")
65	16	113	
80	16	133	
100	16	159	

Aseptic clamp with groove to DIN 11864-3 Form A



DN	PN	ØD	H ₂
50	25	77,5	Approx. 52 mm (2.1")
65	25	91	
80	16	106	
100	16	130	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from gage pressure series)

Technical specifications

SITRANS P, DS III series for absolute pressure (from the gage pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus		
Input				
Measured variable	Absolute pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	8.3 ... 250 mbar a (0.12 ... 3.6 psi a)	6 bar a (87 psi a)	250 mbar a (3.6 psi a)	6 bar a (87 psi a)
	43 ... 1300 mbar a (0.62 ... 18.9 psi a)	10 bar a (145 psi a)	1300 mbar a (18.9 psi a)	10 bar a (145 psi a)
	160 ... 5000 mbar a (2.32 ... 72.5 psi a)	30 bar a (435 psi a)	5 bar a (72.5 psi a)	30 bar a (435 psi a)
	1 ... 30 bar a (14.5 ... 435 psi a)	100 bar a (1450 psi a)	30 bar a (435 psi a)	100 bar a (1450 psi a)
Lower measuring limit	0 mbar a (0 psi a)			
• Measuring cell with silicone oil filling				
Upper measuring limit	100% of max. span			
Output				
Output signal	4 ... 20 mA	Digital PROFIBUS PA or FOUNDATION Fieldbus signal		
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-		
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-		
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V	-		
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-		
Physical bus	-	IEC 61158-2		
With polarity reversal protection	-	Yes		
Accuracy				
Reference conditions (All error data refer always refer to the set span)	To EN 60770-1 Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span)			
Error in measurement and fixed-point setting (including hysteresis and repeatability)				
• Linear characteristic				
- $r \leq 10$	$\leq 0.1\%$	$\leq 0.1\%$		
- $10 < r \leq 30$	$\leq 0.2\%$			
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.1 \cdot r)/\text{year}$		$\leq 0.1\%/\text{year}$	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.1 \cdot r + 0.2)\%$	$\leq 0.3\%$		
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)	$\leq (0.1 \cdot r + 0.15)/10 \text{ K}$	$\leq 0.25\%/10 \text{ K}$		
Measured Value Resolution	-		$3 \cdot 10^{-5}$ of nominal measuring range	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure (from gage pressure series)

SITRANS P, DS III series for absolute pressure (from the gage pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Digital indicators	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Permissible	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Housing material	Poor in copper die-cast aluminium, GD-AlSi12 or stainless steel precision casting, mat. No. 1.4408	
Wetted parts materials		
• Connection shank	Stainless steel, mat. No. 1.4404/316L or Hastelloy C4, mat. No. 2.4610	
• Oval flange	Stainless steel, mat. No. 1.4404/316L	
• Seal diaphragm	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819	
Measuring cell filling	Silicone oil or inert filling liquid (max. 160 bar a (2320 psi a) with oxygen measurement)	
Process connection	Connection shank G½A to DIN EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MWP 2320 psi a)) to DIN 19213 with mounting thread M10 or 7/16-20 UNF to EN 61518	
Material of the mounting bracket		
• Steel	Sheet steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Stainless steel, Mat. No. 1.4301 (SS304)	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	Supplied through bus
Separate 24 V power supply necessary	-	-
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Startup current \leq basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from gage pressure series)

SITRANS P, DS III series for absolute pressure (from the gage pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		2
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/b IIB/IIC T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
• Explosion-proof "d"	PTB 99 ATEX 1160	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C	
- Permissible ambient temperature	Ex II 1/2 D IP65 T 120 °C	
- Max.surface temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Connection	120 °C (248 °F)	
- Effective internal inductance/capacitance	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Identification	Ex II 2 D IP65 T 120 °C	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure (from gage pressure series)

HART communication		Communication FOUNDATION Fieldbus	
HART communication	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	
Software for computer	SIMATIC PDM	<ul style="list-style-type: none"> - Adaptation to customer-specific process variables - Electrical damping T_{63}, adjustable - Simulation function - Failure mode - Limit monitoring - Square-rooted characteristic for flow measurement 	<ul style="list-style-type: none"> Yes, linearly rising or falling characteristic 0 ... 100 s Output/input (can be locked within the device with a bridge) Can be parameterized (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes
PROFIBUS PA communication		• PID	
Simultaneous communication with master class 2 (max.)	4	• Physical block	Standard FF function block
The address can be set using	Configuration tool or local operation (standard setting address 126)	Transducer blocks	1 Resource block
Cyclic data usage		• Pressure transducer block	1 transducer block Pressure with calibration, 1 transducer block LCD
• Output byte	5 (one measuring value) or 10 (two measuring values)	<ul style="list-style-type: none"> - Can be calibrated by applying two pressures - Monitoring of sensor limits - Simulation function: Measured pressure value, sensor temperature and electronics temperature 	Yes
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)		Yes
Internal preprocessing			
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B		
Function blocks	2		
• Analog input			
<ul style="list-style-type: none"> - Adaptation to customer-specific process variables - Electrical damping T_{63}, adjustable - Simulation function - Failure mode - Limit monitoring - Register (totalizer) - Failure mode - Limit monitoring 	<ul style="list-style-type: none"> Yes, linearly rising or falling characteristic 0 ... 100 s Input /Output Can be parameterized (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Can be reset, preset, optional direction of counting, simulation function of register output Can be parameterized (summation with last good value, continuous summation, summation with incorrect value) One upper and lower warning limit and one alarm limit respectively 		
• Register (totalizer)			
- Failure mode			
- Limit monitoring			
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
<ul style="list-style-type: none"> - Can be calibrated by applying two pressures - Monitoring of sensor limits - Specification of a container characteristic with - Square-rooted characteristic for flow measurement - Gradual volume suppression and implementation point of square-root extraction - Simulation function for measured pressure value and sensor temperature 	<ul style="list-style-type: none"> Yes Yes Max. 30 nodes Yes Parameterizable Constant value or over parameterizable ramp function 		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from gage pressure series)

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute pressure, from the pressure series DS III HART		7MF4233 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid ¹⁾	Grease-free	3
Span		
8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	D
43 ... 1300 mbar a	(0.62 ... 18.9 psi a)	F
0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	G
1 ... 30 bar a	(14.5 ... 435 psi a)	H
Wetted parts materials		
Seal diaphragm	Process connection	A
Stainless steel	Stainless steel	B
Hastelloy	Stainless steel	C
Hastelloy	Hastelloy	Y
Version for diaphragm seal ²⁾³⁾⁴⁾		
Process connection		0
• Connection shank G½B to EN 837-1		1
• Female thread ½-14 NPT		2
• Oval flange made of stainless steel		3
- Mounting thread 7/16-20 UNF to EN 61518		5
- Mounting thread M10 to DIN 19213		6
• Male thread M20 x 1.5		0
• Male thread ½-14 NPT		3
Non-wetted parts materials		
• Housing made of die-cast aluminium		1
• Housing stainless steel precision casting ⁵⁾		2
Version		
• Standard version		A
• International version, English label inscriptions, documentation in 5 languages on CD		B
Explosion protection		D
• Without		P
• With ATEX, Type of protection:		E
- "Intrinsic safety (EEx ia)"		R
- "Explosion-proof (EEx d)" ⁶⁾		NC
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁷⁾		A
- "Ex nA/nL (zone 2)"		B
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁷⁾		C
• With FM + CSA, Type of protection:		D
- "Intrinsic safety and explosion-proof (is + xp)" ⁶⁾		F
Electrical connection / cable entry		
• Screwed gland Pg 13.5 ⁸⁾		1
• Screwed gland M20x1.5		6
• Screwed gland ½-14 NPT		7
• Han 7D plug (plastic housing) incl. mating connector ⁸⁾		
• Plug M12 (metal) ⁹⁾		
Display		
• Without (digital indicator hidden, setting: mA)		
• With visible digital indicator		
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)		

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- 1) For oxygen application, add Order code E10.
- 2) Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psi a)
- 3) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 4) Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
- 5) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland EEx ia and blanking plug.
- 8) Not together with type of protection "Explosion-proof" and type of protection "Ex nA".
- 9) Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure (from gage pressure series)

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute pressure (from the gage pressure series)		
DS III PA series (PROFIBUS PA)	F)	7MF4234 -
DS III FF series (FOUNDATION Fieldbus)	F)	7MF4235 -
Measuring cell filling		Measuring cell cleaning
Silicone oil	1	Standard
Inert liquid ¹⁾	3	Grease-free
Nominal measuring range		
250 mbar a	D	(3.63 psi a)
1300 mbar a	F	(18.9 psi a)
5 bar a	G	(72.5 psi a)
30 bar a	H	(435 psi a)
Wetted parts materials		
Seal diaphragm	A	Process connection
Stainless steel	B	Stainless steel
Hastelloy	C	Stainless steel
Hastelloy	Y	Hastelloy
Version as diaphragm seal ²⁾³⁾⁴⁾		
Process connection		
• Connection shank G $\frac{1}{2}$ B to EN 837-1	0	
• Female thread 1/2-14 NPT	1	
• Oval flange made of stainless steel	2	
- Mounting thread 7/16-20 UNF to EN 61518	3	
- Mounting thread M10 to DIN 19213	5	
• Male thread M20 x 1,5	6	
• Male thread 1/2-14 NPT		
Non-wetted parts materials		
• Housing made of die-cast aluminium	0	
• Housing stainless steel precision casting	3	
Version		
• Standard version	1	
• International version, English label inscriptions, documentation in 5 languages on CD	2	
Explosion protection		
• Without	A	
• With ATEX, Type of protection:	B	
- "Intrinsic safety (EEx ia)" ⁵⁾	D	
- "Explosion-proof (EEx d)" ⁵⁾	P	
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁶⁾	E	
- "Ex nA/nL (zone 2)"	R	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁶⁾ (not for DS III FF)	NC	
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ⁵⁾	B	
Electrical connection / cable entry		
• Screwed gland M20x1.5	C	
• Screwed gland 1/2-14 NPT	F	
• Plug M12 incl. mating connector ⁷⁾		
Display		
• Without (digital display hidden)	1	
• With visible digital indicator	6	
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)	7	

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- 1) For oxygen application, add Order code E10.
- 2) Version 7MF4233-1D... only up to max. span 200 mbar a (2.9 psi a).
- 3) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 4) Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
- 5) Without cable gland, with blanking plug.
- 6) With enclosed cable gland EEx ia and blanking plug.
- 7) Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from gage pressure series)

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Selection and Ordering data		Order code			Selection and Ordering data		Order code			
Further designs		HART	PA	FF	Additional data		HART	PA	FF	
Add "-Z" to Order No. and specify Order code.					Add "-Z" to Order No. and specify Order code.					
Pressure transmitter with mounting bracket made of:					Measuring range to be set	Y01	✓			
• Steel	A01	✓	✓	✓	Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi					
• Stainless steel	A02	✓	✓	✓						
Plug					Measuring point number (TAG No.)	Y15	✓	✓	✓	
• Han 7D (metal, gray)	A30	✓			Max. 16 characters, specify in plain text: Y15:					
• Han 8U (instead of Han 7D)	A31	✓								
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓	Measuring point text	Y16	✓	✓	✓	
Rating plate inscription (instead of German)					Max. 27 characters, specify in plain text: Y16:					
• English	B11	✓	✓	✓						
• French	B12	✓	✓	✓	Entry of HART address (TAG)	Y17	✓			
• Spanish	B13	✓	✓	✓	Max. 8 characters, specify in plain text: Y17:					
• Italian	B14	✓	✓	✓						
English rating plate	B21	✓	✓	✓	Setting of pressure indication in pressure units	Y21	✓	✓	✓	
Pressure units in inH ₂ O or psi					Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder % *) ref. temperature 20 °C					
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾	C11	✓	✓	✓						
Acceptance test certificate²⁾	C12	✓	✓	✓	Setting of pressure indication in non-pressure units	Y22 + Y01	✓	✓	✓	
To EN 10204-3.1					Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)					
Factory certificate	C14	✓	✓	✓						
To EN 10204-2.2					Preset bus address	Y25		✓		
"Functional Safety (SIL)" certificate	C20	✓			(possible between 1 and 126)					
"PROFIsafe" certificate and protocol	C21		✓		Specify in plain text: Y25:					
Setting of upper limit of output signal to 22.0 mA	D05	✓								
Manufacturer's declaration acc. to NACE	D07	✓	✓	✓	Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset					
Type of protection IP68 (not together with Han 7D / Han 8U plug, Pg 13.5 screwed gland)	D12	✓	✓	✓	✓ = available					
Digital indicator alongside the input keys (only together with the devices 7MF4233-....-0-A.6 or -.A.7-Z, Y21 or Y22 + Y01).	D27	✓	✓	✓						
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓	✓	1) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.					
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓	✓	2) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.					
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓	✓						
Oxygen application (max. 120 bar a (1740 psi a) at 60°C (140 °F) with oxygen measurement and inert liquid)	E10	✓	✓	✓						
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4....-....-B..)	E25	✓	✓	✓						
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4....-....-B..)	E55	✓	✓	✓						
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4....-....-D..)	E56	✓	✓	✓						
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4....-....-E..)	E57	✓	✓	✓						

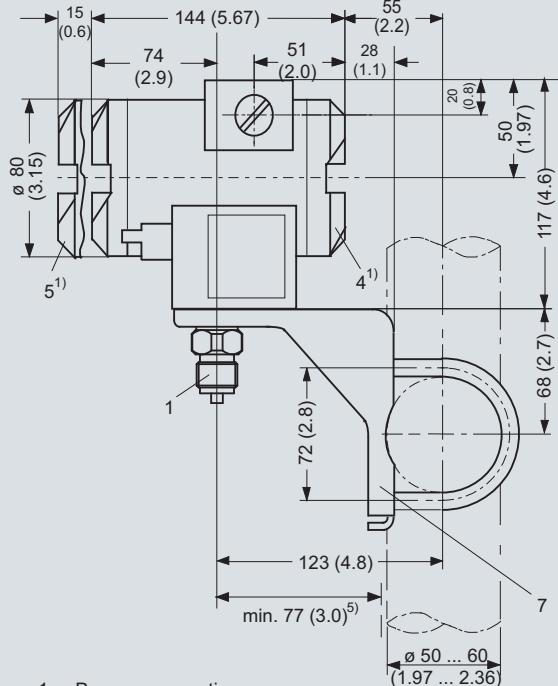
SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

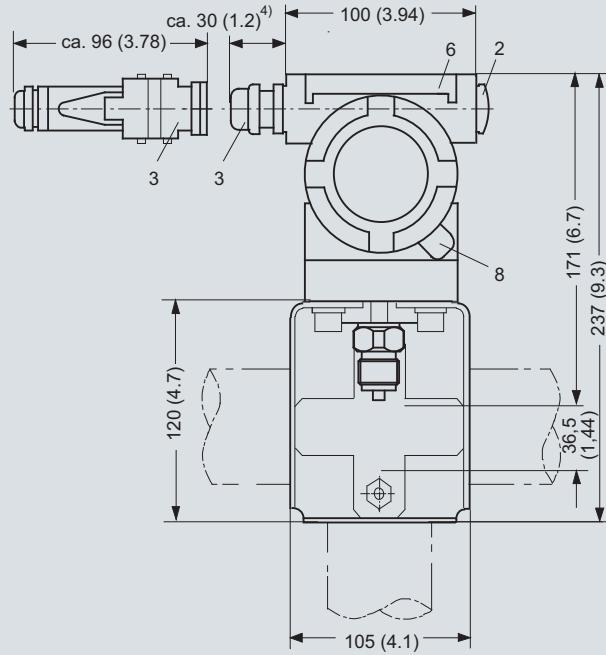
DS III series for absolute pressure
(from gage pressure series)

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Dimensional drawings



- 1 Process connection:
 - 1/2-14 NPT,
 - connection shank G 1/2 B or
 - oval flange
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13,5 (adapter)²⁾³⁾,
 - screwed gland M20x1,5³⁾,
 - screwed gland 1/2-14 NPT or
 - Han 7D/ Han 8U²⁾³⁾ plug
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)



- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [is + xp]"
- 4) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)
- 5) Minimum distance for rotating

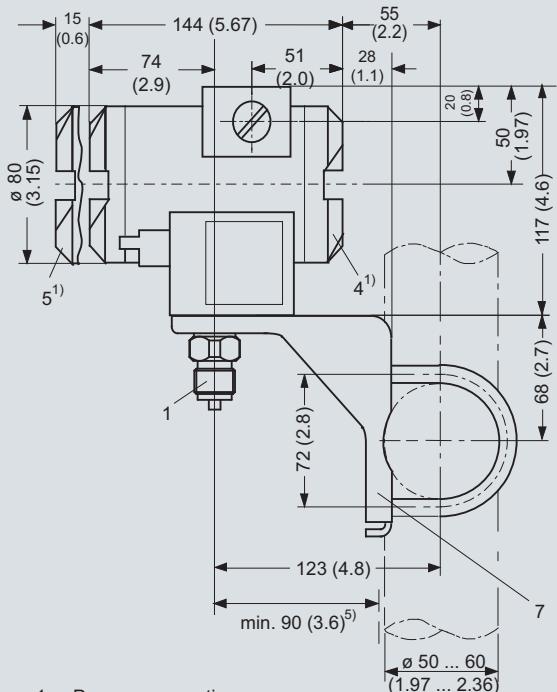
SITRANS P pressure transmitters, DS III HART series for absolute pressure, from the pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

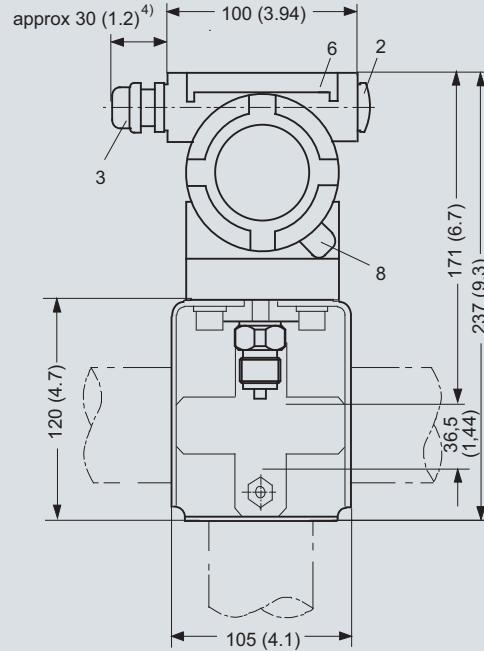
Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from gage pressure series)

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- 1 Process connection:
- 1/2-14 NPT,
- connection shank G1/2B or
- oval flange
- 2 Blanking plug
- 3 Electrical connection:
- screwed gland M20x1,5 ⁴⁾,
- screwed gland 1/2-14 NPT or
- PROFIBUS-Stecker M12 ³⁾⁴⁾
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)



- 1 Allow approx. 20 mm (0.79 inch) thread length in addition
- 2 Minimum distance for rotating
- 3 Not with type of protection "Explosion-proof enclosure"
- 4 Not with type of protection "FM + CSA"

SITRANS P pressure transmitters, DS III PA and FF series for absolute pressure, from the pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure (from differential pressure series)

Technical specifications

SITRANS P, DS III series for absolute pressure (from differential pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus		
Input				
Measured variable	Absolute pressure pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible working pressure	Span	Maximum working pressure	Nominal measuring range	Maximum working pressure
	8.3 ... 250 mbar a (0.12 ... 3.6 psi a)	32 bar a (464 psi a)	250 mbar a (3.6 psi a)	32 bar a (464 psi a)
	43 ... 1300 mbar a (0.62 ... 18.9 psi a)	32 bar a (464 psi a)	1300 bar a (18.9 psi a)	32 bar a (464 psi a)
	160 ... 5000 mbar a (2.32 ... 72.5 psi a)	32 bar a (464 psi a)	5 bar a (72.5 psi a)	32 bar a (464 psi a)
	1 ... 30 bar a (14.5 ... 435 psi a)	160 bar a (2320 psi a)	30 bar a (435 psi a)	160 bar a (2320 psi a)
	5.3 ... 100 bar a (77 ... 1450 psi a)	160 bar a (2320 psi a) (for connection thread M10 and $\frac{7}{16}$ -20 UNF in the process flanges)	100 bar a (1450 psi a)	160 bar a (2320 psi a) (for connection thread M10 and $\frac{7}{16}$ -20 UNF in the process flanges)
Lower measuring limit	0 mbar a (0 psi a)			
• Measuring cell with silicone oil filling				
Upper measuring limit	100% of max. span			
Output				
Output signal	4 ... 20 mA	Digital PROFIBUS PA or FOUNDATION Fieldbus signal		
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-		
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-		
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V	-		
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-		
Physical bus	-	IEC 61158-2		
With polarity reversal protection	-	Yes		
Accuracy	To EN 60770-1			
Reference conditions (All error data refer always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span)			
Error in measurement and fixed-point setting (including hysteresis and repeatability)				
• Linear characteristic				
- $r \leq 10$	$\leq 0.1\%$	$\leq 0.1\%$		
- $10 < r \leq 30$	$\leq 0.2\%$			
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.1 \cdot r)/\text{year}$	$\leq 0.1\%/\text{year}$		
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.1 \cdot r + 0.2)\%$	$\leq 0.3\%$		
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)	$\leq (0.1 \cdot r + 0.15)/10 \text{ K}$	$\leq 0.25\%/10 \text{ K}$		
Measured Value Resolution	-	$3 \cdot 10^{-5}$ of nominal measuring range		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from differential pressure series)

SITRANS P, DS III series for absolute pressure (from differential pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Digital indicators	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Permissible	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 4.5 kg (≈ 9.9 lb)	
Housing material	Poor in copper die-cast aluminium, GD-AlSi12 or stainless steel precision casting, mat. No. 1.4408	
Wetted parts materials		
• Seal diaphragm	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819, Monel, mat. No. 2.4360, tantalum or gold	
• Process flanges and sealing screw	Stainless steel, mat. No. 1.4408, Hastelloy C4, mat. No. 2.4610 or Monel, mat. No. 2.4360	
• O-Ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR	
Measuring cell filling	Silicone oil or inert filling liquid (max. 160 bar (2320 psi a) with oxygen measurement)	
Process connection	1/4-18 NPT and flange connection to DIN 19213 with mounting thread M10 to DIN 19213 or 7/16-20 UNF to EN 61518	
Material of the mounting bracket		
• Steel	Sheet steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Stainless steel, Mat. No. 1.4301 (SS304)	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	Supplied through bus -
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Startup current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure (from differential pressure series)

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SITRANS P, DS III series for absolute pressure (from differential pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122 Ex II 1/2 G EEx ia/b IIB/IIC T6 -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Identification		
- Permissible ambient temperature		
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Effective internal inductance/capacitance		
• Explosion-proof "d"	PTB 99 ATEX 1160 Ex II 1/2 G EEx d IIC T4/T6 -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Identification		
- Permissible ambient temperature		
- Connection		
• Dust explosion protection for zone 20	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
- Identification	PTB 01 ATEX 2055 Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C -40 ... +85 °C (-40 ... +185 °F) 120 °C (248 °F)	
- Permissible ambient temperature		
- Max.surface temperature		
- Connection		
- Effective internal inductance/capacitance	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055 Ex II 2 D IP65 T 120 °C	
- Identification		
- Connection		
• Type of protection "n" (zone 2)	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$
- Identification	TÜV 01 ATEX 1696 X Ex II 3 G EEx nA L IIC T4/T5/T6	Planned
• Explosion protection to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from differential pressure series)

HART communication		Communication FOUNDATION Fieldbus	
HART communication	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	<ul style="list-style-type: none"> - Adaptation to customer-specific process variables - Electrical damping T_{63}, adjustable - Simulation function - Failure mode - Limit monitoring - Square-rooted characteristic for flow measurement
Software for computer	SIMATIC PDM	• PID	Standard FF function block
PROFIBUS PA communication		Physical block	
Simultaneous communication with master class 2 (max.)	4	Transducer blocks	1 Resource block
The address can be set using	Configuration tool or local operation (standard setting address 126)	• Pressure transducer block	1 transducer block Pressure with calibration, 1 transducer block LCD
Cyclic data usage		- Can be calibrated by applying two pressures	Yes
• Output byte	5 (one measuring value) or 10 (two measuring values)	- Monitoring of sensor limits	Yes
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
Internal preprocessing			
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B		
Function blocks	2		
• Analog input			
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic		
- Electrical damping T_{63} , adjustable	0 ... 100 s		
- Simulation function	Input /Output		
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	Can be parameterized (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure (from differential pressure series)

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute F) pressure, from the differential pressure, series DS III HART		7MF4333 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liqui ¹⁾	Grease-free	3
Span		
8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	E) D
43 ... 1300 mbar a	(0.62 ... 18.9 psi a)	E) F
0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	E) G
1 ... 30 bar a	(14.5 ... 435 psi a)	E) H
5.3 ... 100 bar a	(76.9 ... 1450 psi a)	E) KE
Wetted parts materials		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum	Tantalum	E
Monel	Monel	H
Gold	Gold	L
Version for diaphragm seal ²⁾³⁾⁴⁾		Y
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to EN 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement needs)		0
• Vent on side of process flange ⁵⁾		
- Mounting thread 7/16-20 UNF to EN 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement needs)		4
Non-wetted parts materials		
Process flange screws	Electronics housing	
Stainless steel	Die-cast aluminium	2
Stainless steel	Stainless steel precision casting ⁶⁾	3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d)" ⁷⁾		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁸⁾		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁸⁾		R
• With FM + CSA, Type of protection:		NC
- "Intrinsic safety and explosion-proof (is + xp)" ⁷⁾		
Electrical connection / cable entry		
• Screwed gland Pg 13.5 ⁹⁾		A
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector ⁹⁾		D
• Plug M12 (metal) ¹⁰⁾		F

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute F) pressure, from the differential pressure, series DS III HART		7MF4333 -

Display		
• Without (digital indicator hidden, setting: mA)		1
• With visible digital indicator		6
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)		7

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

1) For oxygen applications, add Order code E10.

2) Version 7MF4333-1DY... only up to max. span 200 mbar a (2.9 psi a).

3) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

4) Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.

5) Not for span "5.3 ... 100 bar a (76.9 ... 1450 psi a)". Position of the top vent valve in the process flange (see dimensional drawing).

6) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.

7) Without cable gland, with blanking plug

8) With enclosed cable gland EEx ia and blanking plug

9) Not together with type of protection "Explosion-proof" and and type of protection "Ex nA".

10) Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"

E) Combinations of the versions marked with E) are subject to the export regulations AL: 2B230, ECCN: N.

F) Subject to export regulations AL: 9I999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from differential pressure series)

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Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute pressure (from the differential pressure series)		
DS III PA series (PROFIBUS PA)		F) 7 MF 4 3 3 4 -
DS III FF series (FOUNDATION Fieldbus)		F) 7 MF 4 3 3 5 -
Measuring cell filling		
Silicone oil	Standard	1
Inert liquid ¹⁾	Grease-free	3
Nominal measuring range		
250 mbar a	(3.63 psi a)	E) D
1300 mbar a	(18.9 psi a)	E) F
5 bar a	(72.5 psi a)	E) G
30 bar a	(435 psi a)	E) H
100 bar a	(1450 psi a)	E) K E
Wetted parts materials		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum	Tantalum	E
Monel	Monel	H
Gold	Gold	L
Version as diaphragm seal ²⁾³⁾⁴⁾		Y
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to EN 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement needs)		0
• Vent on side of process flange ⁵⁾		
- Mounting thread 7/16-20 UNF to EN 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement needs)		4
Non-wetted parts materials		
Process flange screws	Electronics housing	
Stainless steel	Die-cast aluminium	2
Stainless steel	Stainless steel precision casting	3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d)" ⁶⁾		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁷⁾		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁷⁾ (not for DS III FF)		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ⁶⁾		NC
Electrical connection / cable entry		
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• M12 Connector (metall) ⁸⁾		F

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure (from differential pressure series)

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Selection and Ordering data		Order code			Selection and Ordering data		Order code			
Further designs		HART	PA	FF	Further designs		HART	PA	FF	
Add "-Z" to Order No. and specify Order code.					Add "-Z" to Order No. and specify Order code.					
Pressure transmitter with mounting bracket made of:					Explosion-proof "Intrinsic safety" to NEPSI (China)	E55	✓	✓	✓	
• Steel	A01	✓	✓	✓	(only for transmitter 7MF4...-...-B..)					
• Stainless steel	A02	✓	✓	✓	Explosion protection "Explosion-proof" to NEPSI (China)	E56	✓	✓	✓	
					(only for transmitter 7MF4...-...-D..)					
O-rings for process flanges (instead of FPM (Viton))					Explosion-proof "Zone 2" to NEPSI (China)	E57	✓	✓	✓	
• PTFE (Teflon)	A20	✓	✓	✓	(only for transmitter 7MF4...-...-E..)					
• FEP (with silicone core, approved for food)	A21	✓	✓	✓	Interchanging of process connection side	H01	✓	✓	✓	
• FFPM (Kalrez, compound 4079)	A22	✓	✓	✓	Vent on side for gas measurements	H02	✓	✓	✓	
• NBR (Buna N)	A23	✓	✓	✓	Process flange					
Plug					• Hastelloy	K01	✓	✓	✓	
• Han 7D (metal, gray)	A30	✓			• Monel	K02	✓	✓	✓	
• Han 8U (instead of Han 7D)	A31	✓			• Stainless steel with PVDF insert max. PN 10 (MWP 145 psi), max. temperature of medium 90 °C (194 °F)	K04	✓	✓	✓	
Sealing screws					For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible					
1/4-18 NPT, with valve in material of process flanges	A40	✓	✓	✓	Additional data					
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓	Add "-Z" to Order No. and specify Order code.					
Rating plate inscription (instead of German)					Measuring range to be set	Y01	✓			
• English	B11	✓	✓	✓	Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi					
• French	B12	✓	✓	✓	Measuring point number (TAG No.)	Y15	✓	✓	✓	
• Spanish	B13	✓	✓	✓	Max. 16 characters, specify in plain text: Y15:					
• Italian	B14	✓	✓	✓	Measuring point text	Y16	✓	✓	✓	
English rating plate	B21	✓	✓	✓	Max. 27 characters, specify in plain text: Y16:					
Pressure units in inH ₂ O or psi					Entry of HART address (TAG)	Y17	✓			
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾	C11	✓	✓	✓	Max. 8 characters, specify in plain text: Y17:					
Acceptance test certificate²⁾	C12	✓	✓	✓	Setting of pressure indication in pressure units	Y21	✓	✓	✓	
To EN 10204-3.1					Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder % *) ref. temperature 20 °C					
Factory certificate	C14	✓	✓	✓	Setting of pressure indication in non-pressure units	Y22 + Y01	✓			
To EN 10204-2.2					Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)					
"Functional Safety (SIL)" certificate	C20	✓			Preset bus address	Y25		✓		
"PROFIsafe" certificate and protocol	C21		✓		(possible between 1 and 126) Specify in plain text: Y25:					
Setting of upper limit of output signal to 22.0 mA	D05	✓			Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset ✓ = available					
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓	✓	¹⁾ When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.					
Type of protection IP68 (not together with Han 7D/Han 8U plug, cable gland PG 13.5)	D12	✓	✓	✓	²⁾ Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.					
Digital indicator alongside the input keys (only together with the devices 7MF4333-...-2-A.6 or -A.7-Z, Y21 or Y22 + Y01)	D27	✓	✓	✓						
Supplied with oval flange (1 item), PTFE packing and stainless steel screws in thread of process flange	D37	✓	✓	✓						
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓	✓						
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓	✓						
Oxygen application (max. 120 bar a (1740 psi a) at 60°C (140 °F) with oxygen measurement and inert liquid)	E10	✓	✓	✓						
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4...-...-B..)	E25	✓	✓	✓						

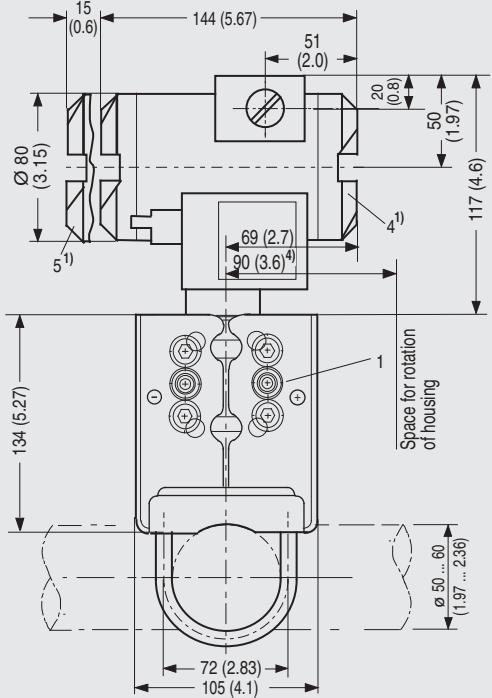
SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

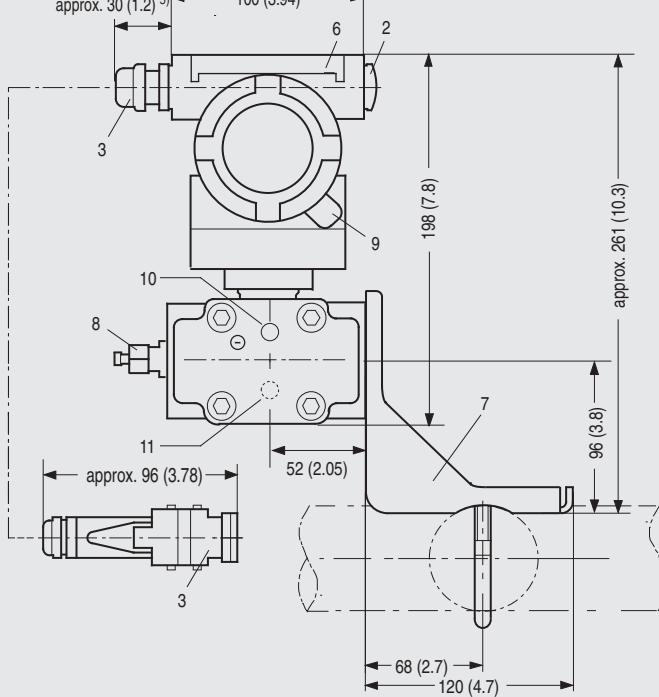
DS III series for absolute pressure
(from differential pressure series)

Dimensional drawings

2



- 1 Process connection: 1/4-18 NPT (EN 61518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13.5 (adapter) ^{2) 3)},
 - screwed gland M20x1.5 ³⁾,
 - screwed gland 1/2-14 NPT or
 - Han 7D/ Han 8U plug ^{2) 3)}
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- 10 Lateral venting for liquid measurement (Standard)
- 11 Lateral venting for gas measurement (suffix H02)



- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA [is + xp]"
- 4) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator
- 5) 45 mm (1.8 inch) for Pg 13.5 with adapter

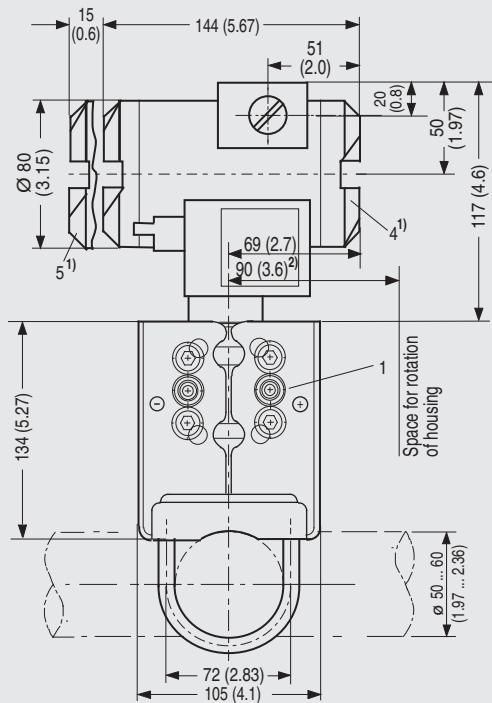
SITRANS P pressure transmitters, DS III HART series for absolute pressure, from the differential pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for absolute pressure
(from differential pressure series)

2



1 Process connection: 1/4-18 NPT (EN 61518)
2 Blanking plug

3 Electrical connection:
- screwed gland M20x1.5 ⁴⁾,
- screwed gland 1/2-14 NPT or
- PROFIBUS plug M12 ^{3) 4)}

4 Terminal side

5 Electronic side, digital display (longer overall length for cover with window)

6 Protective cover over keys

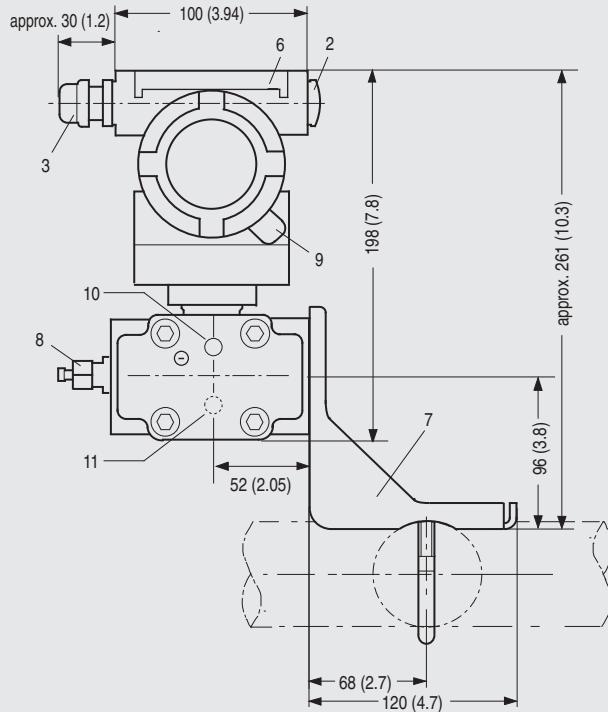
7 Mounting bracket (option)

8 Sealing screw with valve (option)

9 Screw cover – safety bracket (only for explosion-proof enclosure,
not shown in the drawing)

10 Lateral venting for liquid measurement (Standard)

11 Lateral venting for gas measurement (suffix H02)



1) Allow approx. 20 mm (0.79 inch) thread length in addition

2) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator

3) Not with type of protection "explosion-proof enclosure"

4) Not with type of protection "FM + CSA"

SITRANS P pressure transmitters, DS III PA and FF series for absolute pressure, from the differential pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

Technical specifications

SITRANS P, DS III series, for differential pressure and flow

	HART		PROFIBUS PA or FOUNDATION Fieldbus				
Input							
Measured variable	Differential pressure and flow						
Spans (infinitely adjustable) or nominal measuring range and max. permissible working pressure	Span 1 ... 20 mbar (0.4015 ... 8.031 inH ₂ O)	Maximum working pressure 32 bar (464 psi)	Nominal measuring range 20 mbar g (8.031 inH ₂ O)	Maximum working pressure 32 bar (464 psi)			
	1 ... 60 mbar (0.4015 ... 24.09 inH ₂ O)	160 bar (2320 psi)	60 mbar (24.09 inH ₂ O)	160 bar (2320 psi)			
	2.5 ... 250 mbar (1.004 ... 100.4 inH ₂ O)		250 mbar (100.4 inH ₂ O)				
	6 ... 600 mbar (2.409 ... 240.9 inH ₂ O)		600 mbar (240.9 inH ₂ O)				
	16 ... 1600 mbar (6.424 ... 642.4 inH ₂ O)		1600 mbar (642.4 inH ₂ O)				
	50 ... 5000 mbar (20.08 ... 2008 inH ₂ O)		5 bar (2008 inH ₂ O)				
	0.3 ... 30 bar (4.35 ... 435 psi)		30 bar (435 psi)				
	2.5 ... 250 mbar (1.004 ... 100.4 inH ₂ O)	420 bar (6091 psi)	250 mbar (100.4 inH ₂ O)	420 bar (6091 psi)			
	6 ... 600 mbar (2.409 ... 240.9 inH ₂ O)		600 mbar (240.9 inH ₂ O)				
	16 ... 1600 mbar (6.424 ... 642.4 inH ₂ O)		1600 mbar (642.4 inH ₂ O)				
	50 ... 5000 mbar (20.08 ... 2008 inH ₂ O)		5 bar (2008 inH ₂ O)				
	0.3 ... 30 bar (4.35 ... 435 psi)		30 bar (435 psi)				
Lower measuring limit	-100% of max. span (-33% with 30 bar (435 psi) measuring cell or 30 mbar a (0.44 psi))						
• Measuring cell with silicone oil filling							
Upper measuring limit	100% of max. span (for oxygen version and inert filling liquid; max. 160 bar g (2320 psi g))						
Output							
Output signal	4 ... 20 mA	Digital PROFIBUS PA or FOUNDATION Fieldbus signal					
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-					
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-					
Load	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V	-					
• Without HART communication		-					
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-					
Physical bus	IEC 61158-2						
With polarity reversal protection	Yes						
Accuracy							
Reference conditions (All error data refer always to the set span)	To EN 60770-1 Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span)						
Error in measurement and fixed-point setting (including hysteresis and repeatability)							
• Linear characteristic	$\leq (0.0029 \cdot r + 0.071)\%$						
- $r \leq 10$	$\leq (0.0045 \cdot r + 0.071)\%$						
- $10 < r \leq 30$	$\leq (0.005 \cdot r + 0.05)\%$						
- $30 < r \leq 100$							
• Square-root characteristic (flow > 50%)	$\leq 0.1\%$						
- $r \leq 10$	$\leq 0.2\%$						

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

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SITRANS P, DS III series, for differential pressure and flow

	HART	PROFIBUS PA or FOUNDATION Fieldbus
• Square-root characteristic (flow 25 ... 50%) - $r \leq 10$ - $10 < r \leq 30$ Long-term drift (temperature change ± 30 °C (± 54 °F)) • 20 mbar (0.29 psi)-measuring cell Influence of ambient temperature • at -10 ... +60 °C (14 ... 140 °F) • at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F) Influence of static pressure • on the zero point - 20 mbar (0.29 psi)-measuring cell • on the span - 20 mbar (0.29 psi)-measuring cell Measured Value Resolution	$\leq 0,2\%$ $\leq 0,4\%$ $\leq (0,25 \cdot r)\%$ every 5 years static pressure max. 70 bar g (1015 psi g) $\leq (0,2 \cdot r)$ per year $\leq (0,08 \cdot r + 0,1)\%$ $\leq (0,1 \cdot r + 0,15)/10$ K (Twice the value with 20-mbar (0.29 psi) measuring cell) $\leq (0,15 \cdot r)\%$ per 100 bar (1450 psi) $\leq (0,15 \cdot r)\%$ per 32 bar (464 psi) $\leq 0,2\%$ je 100 bar (1450 psi) $\leq 0,2\%$ je 32 bar (464 psi) -	$\leq 0,2$ - - $\leq (0,25\%$ every 5 years static pressure max. 70 bar g (1015 psi g) $\leq 0,2$ per year $\leq 0,3\%$ $\leq 0,25\%$ /10 K $\leq 0,15\%$ je 100 bar (1450 psi) $\leq 0,15\%$ je 32 bar (464 psi) - -
Rated operating conditions		
Degree of protection (to EN 60529) Process temperature • Measuring cell with silicone oil filling • Measuring cell with inert filling liquid • In conjunction with dust explosion protection	IP65 -40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions • Ambient temperature - Digital indicators • Storage temperature • Climatic class - Condensation • Electromagnetic compatibility - Emitted interference and interference immunity	-30 ... +85 °C (-22 ... +185 °F) -50 ... +85 °C (-58 ... +185 °F) Permissible To EN 61326 and NAMUR NE 21	
Material of the mounting bracket • Steel • Stainless steel	Sheet steel, Mat. No. 1.0330, chrome-plated Stainless steel, Mat. No. 1.4301 (SS304)	
Design		
Weight (without options)	$\approx 4,5$ kg ($\approx 9,9$ lb)	
Housing material	Poor in copper die-cast aluminium, GD-AlSi12 or stainless steel precision casting, mat. No. 1.4408	
Wetted parts materials • Seal diaphragm	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819, Monel, mat. No. 2.4360, tantalum or gold	
Measuring cell filling	Silicone oil or inert filling liquid (max. 160 bar (2320 psi g) with oxygen measurement)	
Process connection	Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to EN 61518	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

SITRANS P, DS III series, for differential pressure and flow

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	Supplied through bus -
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ...32 V
• With intrinsically-safe operation	-	9 ...24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Startup current \leq basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) avail.	-	Yes

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for differential pressure and flow

2

SITRANS P, DS III series, for differential pressure and flow

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)		
PN 32/160 (MWP 464/2320 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
PN 420 (MWP 6092 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with basic safety requirements of Article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord.	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia(ib) IIB/IIC T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C	
- Permissible ambient temperature	Ex II 1/2 D IP65 T 120 °C	
- Max.surface temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Connection	120 °C (248 °F)	
- Effective internal inductance/capacitance	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{max} = 1.2 \text{ W}$
- Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	
• Explosion protection to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2

HART communication		Communication FOUNDATION Fieldbus	
HART communication	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	- Adaptation to customer-specific process variables Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM		- Electrical damping T_{63} , adjustable 0 ... 100 s
PROFIBUS PA communication		<ul style="list-style-type: none"> - Simulation function - Failure mode - Limit monitoring - Square-rooted characteristic for flow measurement 	
Simultaneous communication with master class 2 (max.)	4	• PID	Standard FF function block
The address can be set using	Configuration tool or local operation (standard setting address 126)	• Physical block	1 Resource block
Cyclic data usage		Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Output byte	5 (one measuring value) or 10 (two measuring values)	• Pressure transducer block	
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	- Can be calibrated by applying two pressures	Yes
Internal preprocessing		- Monitoring of sensor limits	Yes
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
Function blocks	2		
• Analog input			
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic		
- Electrical damping T_{63} , adjustable	0 ... 100 s		
- Simulation function	Input /Output		
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	Can be parameterized (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for differential pressure and flow

2

Selection and Ordering data

SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART
PN 32/160 (MWP 464/2320 psi)

Order No.

7 MF 4 4 3 3 -

Measuring cell filling

Silicone oil Standard
Inert liqui¹⁾ Grease-free

1
3

Span

PN 32 (MWP 464 psi)	1 ... 20 mbar ²⁾	(0.4015 ... 8.03 inH ₂ O)	►	B
PN 160 (MWP 2320 psi)	1 ... 60 mbar	(0.4015 ... 24.09 inH ₂ O)	►	C
	2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)	►	D
	6 ... 600 mbar	(2.409 ... 240.9 inH ₂ O)	►	E
	16 ... 1600 mbar	(6.424 ... 642.4 inH ₂ O)	►	F
	50 ... 5000 mbar	(20.08 ... 2008 inH ₂ O)	►	G
	0.3 ... 30 bar	(4.35 ... 435 psi)	►	H

Wetted parts materials

(stainless steel process flanges)

Seal diaphragm	Parts of measuring cell
Stainless steel	Stainless steel
Hastelloy	Stainless steel
Hastelloy	Hastelloy
Tantalum ³⁾	Tantalum
Monel ³⁾	Monel
Gold ³⁾	Gold
Version for diaphragm seal ⁴⁾ 5)	

Process connection

Female thread 1/4-18 NPT with flange connection	
• Sealing screw opposite process connection	
- Mounting thread 7/16-20 UNF to EN 61518	►
- Mounting thread M10 to DIN 19213	
(only for replacement needs)	
• Vent on side of process flange ²⁾	
- Mounting thread 7/16-20 UNF to EN 61518	►
- Mounting thread M10 to DIN 19213	
(only for replacement needs)	

Non-wetted parts materials

Process flange screws	Electronics housing
Stainless steel	Die-cast aluminium
Stainless steel	Stainless steel precision casting ⁶⁾

Version

• Standard version	
• International version, English label inscriptions, documentation in 5 languages on CD	►

Explosion protection

• Without	
• With ATEX, Type of protection:	
- "Intrinsic safety (EEx ia)" ⁷⁾	
- "Explosion-proof (EEx d)" ⁷⁾	
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁸⁾	
- "Ex nA/nL (zone 2)" ⁹⁾	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁸⁾	►
• With FM + CSA, Type of protection:	
- "Intrinsic safety and explosion-proof (is + xp)" ¹⁰⁾	

Electrical connection / cable entry

• Screwed gland Pg 13.5 ⁹⁾	
• Screwed gland M20x1.5	
• Screwed gland 1/2-14 NPT	
• Han 7D plug (plastic housing) incl. mating connector ¹⁰⁾	
• M12 connectors (metal) ¹⁰⁾	

Selection and Ordering data

SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART
PN 32/160 (MWP 464/2320 psi)

Order No.

7 MF 4 4 3 3 -

Display

- without (digital indicator hidden, setting: mA)
- With visible digital indication
- With customer-specific digital indication (setting as specified, Order code "Y21" or required)

► Available ex stock

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

1) For oxygen application, add Order code E10.

2) Not suitable for connection of remote seal. Position of the top vent valve in the process flanges (see dimensional drawing).

3) Only together with max. spans 250, 1600, 5000 and 30000 mbar (100.4, 240.9, 2008 inH₂O and 435 psi)

4) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

5) Whe the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.

6) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.

7) Without cable gland, with blanking plug

8) With enclosed cable gland EEx ia and blanking plug

9) Not together with type of protection "Explosion-proof" and and type of protection "Ex nA".

10) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

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Selection and Ordering data		Order No.	Selection and Ordering data		Order No.
SITRANS P pressure transmitters for differential pressure and flow			SITRANS P pressure transmitters for differential pressure and flow		
PN 32/160 (MWP 464/2320 psi)			PN 32/160 (MWP 464/2320 psi)		
DS III PA series (PROFIBUS PA)	7 MF 4 4 3 4 -		DS III PA series (PROFIBUS PA)	7 MF 4 4 3 4 -	
DS III FF series (FOUNDATION Fieldbus)	7 MF 4 4 3 5 -		DS III FF series (FOUNDATION Fieldbus)	7 MF 4 4 3 5 -	
Measuring cell filling	Measuring cell cleaning		Electrical connection / cable entry		
Silicone oil	Standard	1	• Screwed gland M20x1.5		B
Inert liquid ¹⁾	Grease-free	3	• Screwed gland 1/2-14 NPT		C
			• M12 connectors (metal) ⁸⁾		F
Nominal measuring range			Display		
PN 32 (MWP 464 psi)			• Without (digital display hidden)	1	
20 mbar ²⁾	(8.03 inH ₂ O)	B	• With visible digital indication	6	
PN 160 (MWP 2320 psi)			• With customer-specific digital indication (setting as specified, Order code "Y21" or required)	7	
60 mbar	(24.09 inH ₂ O)	C			
250 mbar	(100.4 inH ₂ O)	D	Included in delivery of the device:		
600 mbar	(240.9 inH ₂ O)	E	• Brief instructions (Leporello)		
1600 mbar	(642.4 inH ₂ O)	F	• CD-ROM with detailed documentation		
5 bar	(2008 inH ₂ O)	G	• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
30 bar	(435 psi)	H			
Wetted parts materials					
(stainless steel process flanges)					
Seal diaphragm	Parts of measuring cell				
Stainless steel	Stainless steel	A			
Hastelloy	Stainless steel	B			
Hastelloy	Hastelloy	C			
Tantalum ³⁾	Tantalum	E			
Monel ³⁾	Monel	H			
Gold ³⁾	Gold	L			
Version as diaphragm seal ⁴⁾ ⁵⁾		Y			
Process connection					
Female thread 1/4-18 NPT with flange connection					
• Sealing screw opposite process connection					
- Mounting thread 7/16-20 UNF to EN 61518		2			
- Mounting thread M10 to DIN 19213 (only for replacement needs)		0			
• Venting on side of process flanges ²⁾					
- Mounting thread 7/16-20 UNF to EN 61518		6			
- Mounting thread M10 to DIN 19213 (only for replacement needs)		4			
Non-wetted parts materials					
Process flange screws	Electronics housing				
Stainless steel	Die-cast aluminium	2			
Stainless steel	Stainless steel precision casting	3			
Version					
• Standard version					
• International version, English label inscriptions, documentation in 5 languages on CD		1			
		2			
Explosion protection					
• Without					
• With ATEX, Type of protection:					
- "Intrinsic safety (EEx ia)"		A			
- "Explosion-proof (EEx d)" ⁶⁾		B			
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁷⁾		D			
- "n (Zone 2)" (planned)		P			
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁷⁾ (not for DS III FF)		E			
• With FM + CSA, Type of protection:					
- "Intrinsic safety and explosion-proof (is + xp)" ⁶⁾		R			
		NC			

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "-Z" to Order No. and specify Order code.				
Pressure transmitter with mounting bracket made of:				
• Steel	A01	✓	✓	✓
• Stainless steel	A02	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	A20	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓
• FFFM (Kalrez, compound 4079)	A22	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓
Plug				
• Han 7D (metal, gray)	A30	✓		
• Han 8U (instead of Han 7D)	A31	✓		
Sealing screws 1/4-18 NPT, with valve in mat. of process flanges	A40	✓	✓	✓
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓
Rating plate inscription (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
English rating plate (calibration certificate)	B21	✓	✓	✓
Pressure units in inH ₂ O or psi				
Quality inspection certificate (Factory calibration) to IEC 60770-2 1)	C11	✓	✓	✓
Acceptance test certificate²⁾ To EN 10 204-3.1	C12	✓	✓	✓
Factory certificate To EN 10 204-2.2	C14	✓	✓	✓
"Functional Safety (SIL)" certificate	C20	✓		
"PROFIsafe" certificate and protocol	C21		✓	
Setting of upper limit of output signal to 22.0 mA	D05	✓		
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓	✓
Type of protection IP68 (not together with 7D/ Han 8U plug, cable gland Pg 13.5)	D12	✓	✓	✓
Digital indicator alongside the input keys (only together with the devices 7MF4433-....2-.A.6 or -.A.7-Z, Y21 or Y22 + Y01)	D27	✓	✓	✓
Process flange screws made of Monel (max. nominal pressure PN20)	D34	✓	✓	✓
Supplied with oval flange set (2 items), PTFE packings and stainless steel screws in thread of process flanges	D37	✓	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓	✓
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓	✓
TÜV approval to AD/TRD (only together with type of protection "Intrinsic safety (EEx ia)")	E06	✓		
Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MWP 464 psi), basic device with type of protection "Intrinsic safety (EEx ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")	E08	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "-Z" to Order No. and specify Order code.				
Oxygen application (max. 120 bar (1740 psi) at 60°C (140 °F) with oxygen measurement and inert liquid)	E10	✓	✓	✓
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4....-....-B..)	E25	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4....-....-B..)	E55	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4....-....-D..)	E56	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4....-....-E..)	E57	✓	✓	✓
Interchanging of process connection side	H01	✓	✓	✓
Vent on side for gas measurements	H02	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04) ³⁾	H03	✓	✓	✓
Process flange				
• Hastelloy	K01 ^{F)}	✓	✓	✓
• Monel	K02 ^{F)}	✓	✓	✓
• Stainless steel with PVDF insert max. PN 10 (MWP 145 psi), max. temperature of medium 90 °C (194 °F)	K04	✓	✓	✓
For 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible				

✓ = available

¹⁾ When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

²⁾ When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.

³⁾ Not suitable for connection of remote seal

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2

Selection and Ordering data	Order code	HART	PA	FF
Additional data Add "-Z" to Order No. and specify Order code.				
Measuring range to be set Specify in plain text: • With linear characteristic (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓		
• With square-rooted characteristic (max. 5 digits): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y02	✓		
Measuring point number (TAG No.) Max. 16 char., specify in plain text: Y15:	Y15	✓	✓	✓
Measuring point text Max. 27 char., specify in plain text: Y16:	Y16	✓	✓	✓
Entry of HART address (TAG) Max. 8 char., specify in plain text: Y17:	Y17	✓		
Setting of pressure indicator in pressure units Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder % *) ref. temperature 20 °C	Y21	✓	✓	✓
Setting of pressure indicator in non-pressure units Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)	Y22¹⁾ + Y01 or Y02	✓		
Preset bus address (possible between 1 and 126) Specify in plain text: Y25:	Y25		✓	

Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset

✓ = available

¹⁾ Not together with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series for differential pressure and flow

2

Selection and Ordering data

SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART
PN 420 (MWP 6092 psi)

Order No.

7MF4533 -

Measuring cell filling Measuring cell cleaning

Silicone oil Standard

1

Span

2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)
6 ... 600 mbar	(2.409 ... 240.9 inH ₂ O)
16 ... 1600 mbar	(6.424 ... 642.4 inH ₂ O)
50 ... 5000 mbar	(20.08 ... 2008 inH ₂ O)
0.3 ... 30 bar	(4.35 ... 435 psi)

D
E
F
G
H

Wetted parts materials

(stainless steel process flanges)

Seal diaphragm	Parts of measuring cell
Stainless steel	Stainless steel
Hastelloy	Stainless steel
Gold ¹⁾	Gold

A
B
L

Process connection

Female thread 1/4-18 NPT with flange connection

- Sealing screw opposite process connection
 - Mounting thread 7/16-20 UNF to EN 61518
 - Mounting thread M12 to DIN 19213 (only for replacement needs)
- Venting on side of process flanges. Position of the top vent valve in the process flanges (see dimensional drawing).
 - Mounting thread 7/16-20 UNF to EN 61518
 - Mounting thread M12 to DIN 19213 (only for replacement needs)

3
1
7
5

Non-wetted parts materials

Process flange screws Electronics housing

Stainless steel	Die-cast aluminium
Stainless steel	Stainless steel precision casting ²⁾

2
3

Version

- Standard version
- International version, English label inscriptions, documentation in 5 languages on CD

1
2

Explosion protection

- Without
- With ATEX, Type of protection:
 - "Intrinsic safety (EEx ia)"
 - "Explosion-proof (EEx d)"³⁾
 - "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)"⁴⁾
 - "Ex nA/nL (zone 2)"
 - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)"⁴⁾
- With FM + CSA, Type of protection:
 - "Intrinsic safety and explosion-proof (is + xp)"³⁾, max PN 360

A
B
D
P
E
R
NC

Electrical connection / cable entry

- Screwed gland Pg 13.5⁵⁾
- Screwed gland M20x1.5
- Screwed gland 1/2-14 NPT
- Han 7D plug (plastic housing) incl. mating connector⁵⁾
- M12 connectors (metal)⁶⁾

A
B
C
D
F

Selection and Ordering data

SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART
PN 420 (MWP 6092 psi)

Order No.

7MF4533 -

Display

- without (digital indicator hidden, setting: mA)
- With visible digital indication
- With customer-specific digital indication (setting as specified, Order code "Y21" or required)

1
6
7

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item)

- Not together with max. span 600 mbar (240.9 inH₂O)
- Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.
- Without cable gland, with blanking plug
- With enclosed cable gland EEx ia and blanking plug
- Not together with type of protection "Explosion-proof" and and type of protection "Ex nA".
- Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof".

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2

Selection and Ordering data	Order No.	Selection and Ordering data	Order No.
SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 420 (MWP 6092 psi)		SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 420 (MWP 6092 psi)	
DS III PA (PROFIBUS PA) series	7 MF 4 5 3 4 -	DS III PA (PROFIBUS PA) series	7 MF 4 5 3 4 -
DS III FF series (FOUNDATION Fieldbus)	7 MF 4 5 3 5 -	DS III FF series (FOUNDATION Fieldbus)	7 MF 4 5 3 5 -
1	1	1	1
Nominal measuring range		Display	
250 mbar (100.4 inH ₂ O)	D	• Without (digital display hidden)	1
600 mbar (240.9 inH ₂ O)	E	• With visible digital indicator	6
1600 mbar (642.4 inH ₂ O)	F	• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)	7
5 bar (2008 inH ₂ O)	G		
30 bar (435 psi)	H		
Wetted parts materials		Factory-mounting of shut-off valves and valve manifolds see page 2/142.	
(stainless steel process flanges)		Included in delivery of the device:	
Seal diaphragm	Parts of measuring cell	• Brief instructions (Leporello)	
Stainless steel	Stainless steel	• CD-ROM with detailed documentation	
Hastelloy	Stainless steel	• Sealing plug(s) or sealing screw(s) for the process flanges(s)	
Gold ¹⁾	Gold		
Process connection			
Female thread 1/4-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread 7/16-20 UNF to EN 61518	3		
- Mounting thread M12 to DIN 19213 (only for replacement needs)	1		
• Venting on side of process flanges. Position of the top vent valve in the process flanges (see dimensional drawing).			
- Mounting thread 7/16-20 UNF to EN 61518	7		
- Mounting thread M12 to DIN 19213 (only for replacement needs)	5		
Non-wetted parts materials			
Process flange screws	Electronics housing		
Stainless steel	Die-cast aluminium	2	
Stainless steel	Stainless steel precision casting	3	
Version			
• Standard version		1	
• International version, English label inscriptions, documentation in 5 languages on CD		2	
Explosion protection			
• Without		A	
• With ATEX, Type of protection:		B	
- "Intrinsic safety (EEx ia)"		D	
- "Explosion-proof (EEx d)" ²⁾		P	
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ³⁾		E	
- "Ex nA/nL (zone 2)"		R	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ³⁾ (not for DS III FF)		N	
• With FM + CSA, Type of protection:		C	
- "Intrinsic safety and explosion-proof (is + xp)" ²⁾ , max PN 360		F	
Electrical connection / cable entry			
• Screwed gland M20x1.5	B		
• Screwed gland 1/2-14 NPT	C		
• Plug M12 incl. mating connector ⁴⁾	F		

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2

Selection and Ordering data		Order code		
Further designs		HART	PA	FF
Add "-Z" to Order No. and specify Order code.				
Pressure transmitter with mounting bracket made of:				
• Steel	A01	✓	✓	✓
• Stainless steel	A02	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	A20	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓
• FFPM (Kalrez, compound 4079)	A22	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓
Plug				
• Han 7D (metal, gray)	A30	✓		
• Han 8U (instead of Han 7D)	A31	✓		
Sealing screws				
1/4-18 NPT, with valve in material of process flanges	A40	✓	✓	✓
Cable sockets for M12 connectors (metal)				
Rating plate inscription (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
English rating plate				
Pressure units in inH ₂ O or psi	B21	✓	✓	✓
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11	✓	✓	✓
Acceptance test certificate	C12	✓	✓	✓
To EN 10204-3.1				
Factory certificate	C14	✓	✓	✓
To EN 10204-2.2				
"Functional Safety (SIL)" certificate	C20	✓		
"PROFIsafe" certificate and protocol	C21		✓	
Setting of upper limit of output signal to 22.0 mA	D05	✓		
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓	✓
Type of protection IP68 (not together with Han 7D / Han 8U plug, Pg 13.5 screwed gland)	D12	✓	✓	✓
Digital indicator alongside the input keys (only together with the devices 7MF4533-....2-A.6 or -A.7-Z, Y21 or Y22 + Y01)	D27	✓	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓	✓
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓	✓
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4-....-B..)	E25	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4-....-B..)	E55	✓	✓	✓

Selection and Ordering data		Order code		
Further designs		HART	PA	FF
Add "-Z" to Order No. and specify Order code.				
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4-....-D..)	E56	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4-....-E..)	E57	✓	✓	✓
Interchanging of process connection side	H01	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines	H03	✓	✓	✓
Additional data				
Add "-Z" to Order No. and specify Order code.				
Measuring range to be set				
Specify in plain text:				
• With linear characteristic (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓		
• With square-rooted characteristic (max. 5 digits): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y02	✓		
Measuring point number (TAG No.)	Y15	✓	✓	✓
Max. 16 characters, specify in plain text: Y15:				
Measuring point text	Y16	✓	✓	✓
Max. 27 characters, specify in plain text: Y16:				
Entry of HART address (TAG)	Y17	✓		
Max. 8 characters, specify in plain text: Y17:				
Setting of pressure indication in pressure units	Y21	✓	✓	✓
Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ...				
Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹ , inH ₂ O ¹ , ftH ₂ O ¹ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % *) ref. temperature 20 °C				
Setting of pressure indication in non-pressure units	Y22 + Y01 or Y02	✓		
Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)				
Preset bus address	Y25		✓	
(possible between 1 and 126)				
Specify in plain text: Y25:				

Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset

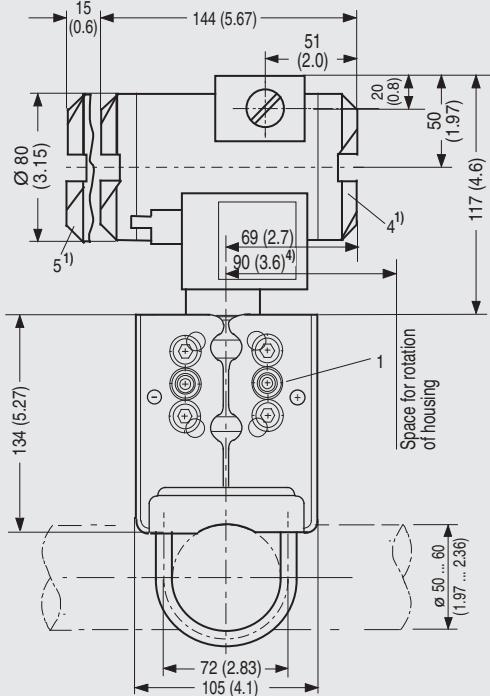
✓ = available

SITRANS P measuring instruments for pressure

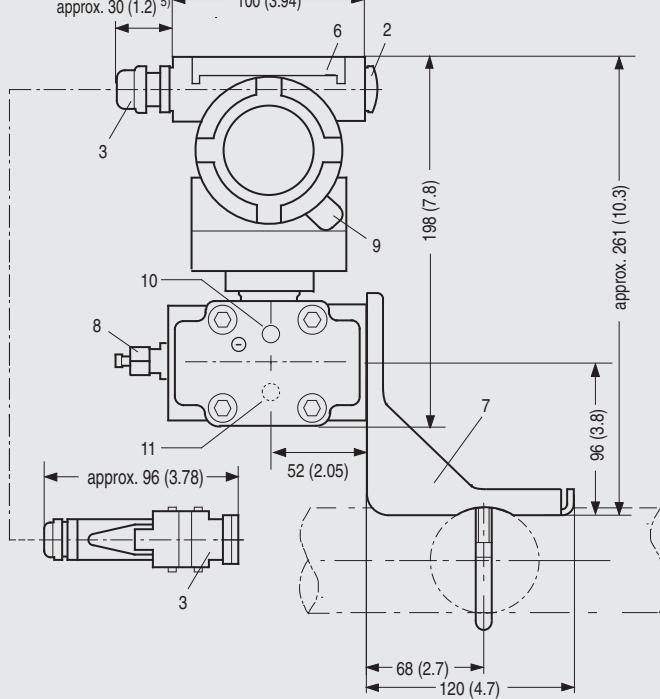
Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

Dimensional drawings



- 1 Process connection: 1/4-18 NPT (EN 61518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13.5 (adapter) ^{2) 3)},
 - screwed gland M20x1.5 ³⁾,
 - screwed gland 1/2-14 NPT or
 - Han 7D/ Han 8U plug ^{2) 3)}
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- 10 Lateral venting for liquid measurement (Standard)
- 11 Lateral venting for gas measurement (suffix H02)



- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA [is + xp]"
- 4) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator
- 5) 45 mm (1.8 inch) for Pg 13.5 with adapter

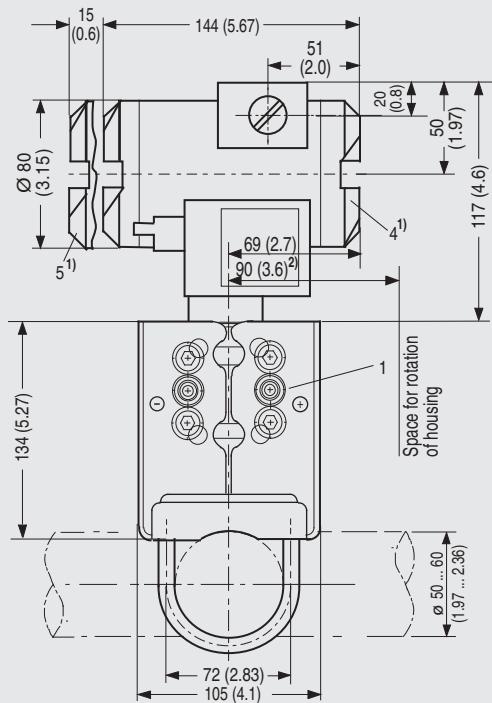
SITRANS P pressure transmitters, DS III HART series for differential pressure and flow, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2



1 Process connection: 1/4-18 NPT (EN 61518)
2 Blanking plug

3 Electrical connection:
- screwed gland M20x1.5 ⁴⁾,
- screwed gland 1/2-14 NPT or
- PROFIBUS plug M12 ^{3) 4)}

4 Terminal side

5 Electronic side, digital display (longer overall length for cover with window)

6 Protective cover over keys

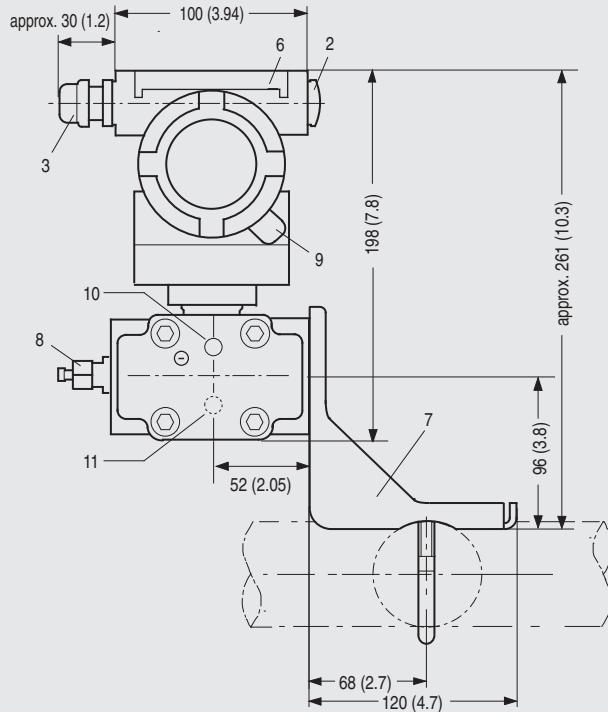
7 Mounting bracket (option)

8 Sealing screw with valve (option)

9 Screw cover – safety bracket (only for explosion-proof enclosure,
not shown in the drawing)

10 Lateral venting for liquid measurement (Standard)

11 Lateral venting for gas measurement (suffix H02)



1) Allow approx. 20 mm (0.79 inch) thread length in addition

2) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator

3) Not with type of protection "explosion-proof enclosure"

4) Not with type of protection "FM + CSA"

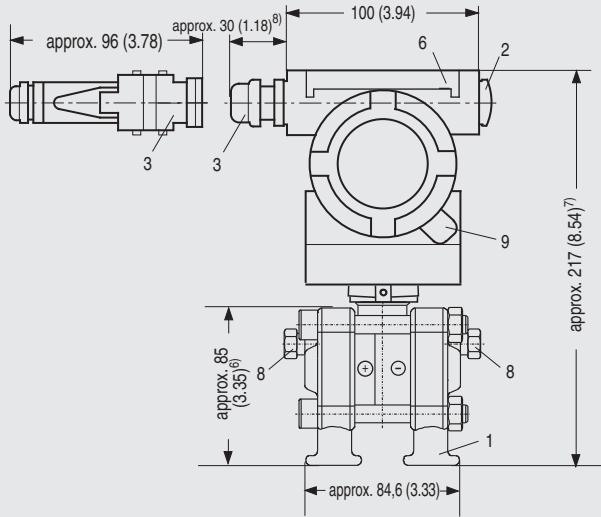
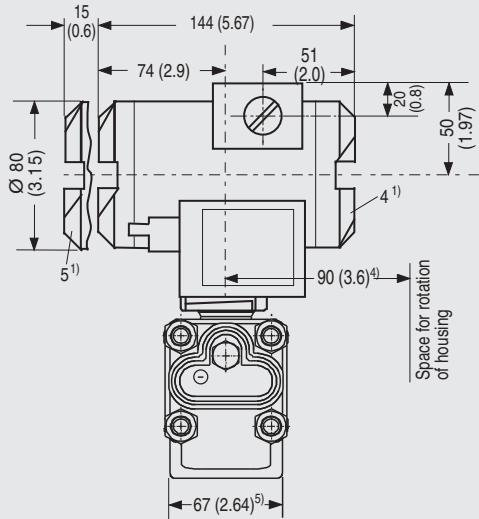
SITRANS P pressure transmitters, DS III PA and FF series for differential pressure and flow, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2



1 Process connection: 1/4-18 NPT (EN 61518)

2 Blanking plug

3 Electrical connection:

- screwed gland Pg 13,5 (adapter) ^{2) 3)},
- screwed gland M20x1,5 ³⁾,
- screwed gland 1/2-14 NPT or
- Han 7D/ Han 8U plug ^{2) 3)}

4 Terminal side

5 Electronics side, digital display (longer overall length for cover with window)

6 Protective cover over keys

7 Mounting bracket (option)

8 Sealing screw with valve (option)

9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)

1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

2) Not with type of protection "explosion-proof enclosure"

3) Not with type of protection "FM + CSA [is + xp]"

4) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

5) 74 mm (2.9 inch) for PN ≥ 420 (MWP ≥ 6092 psi)

6) 91 mm (3.6 inch) for PN ≥ 420 (MWP ≥ 6092 psi)

7) 219 mm (8.62 inch) for PN ≥ 420 (MWP ≥ 6092 psi)

8) 45 mm (1.8 inch) for Pg 13,5 with adapter

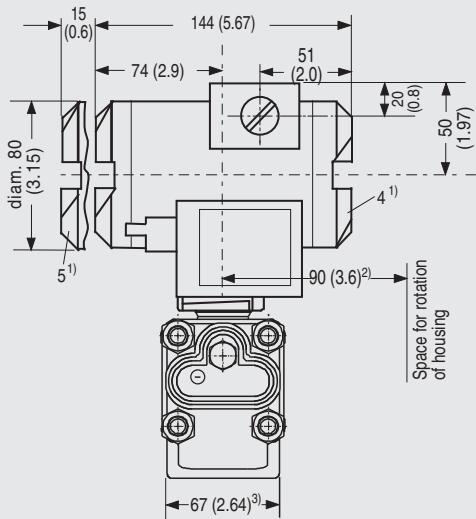
SITRANS P pressure transmitters, DS III HART series for differential pressure and flow, with process covers for vertical differential pressure lines, option „H03“, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

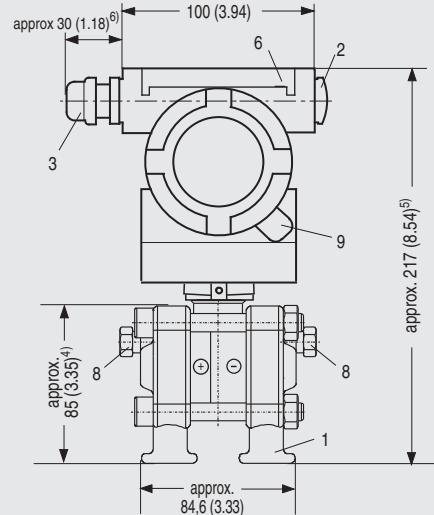
Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2

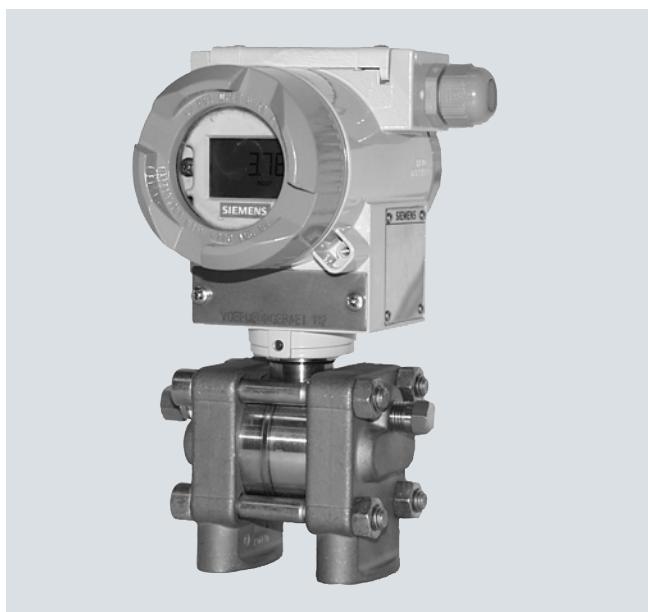


- 1 Process connection 1/4-18 NPT (EN 61 518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland M20x1.5,
 - screwed gland 1/2-14 NPT or
 - PROFIBUS plug M12
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover safety bracket (only for explosion-proof enclosure, not shown in the drawing)



- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) 92 mm (3.6 inch) for minimum distance to permit rotation without indicator
- 3) 74 mm (2.9 inch) for PN \geq 420 (MWP \geq 6092 psi)
- 4) 91 mm (3.6 inch) for PN \geq 420 (MWP \geq 6092 psi)
- 5) 219 mm (8.62 inch) for PN \geq 420 (MWP \geq 6092 psi)
- 6) Approx. 45 mm (1.77 inch) for Pg 13.5 with adapter

SITRANS P pressure transmitters, DS III PA and FF series for differential pressure and flow, with process covers for vertical differential pressure lines, dimensions in mm (inch)



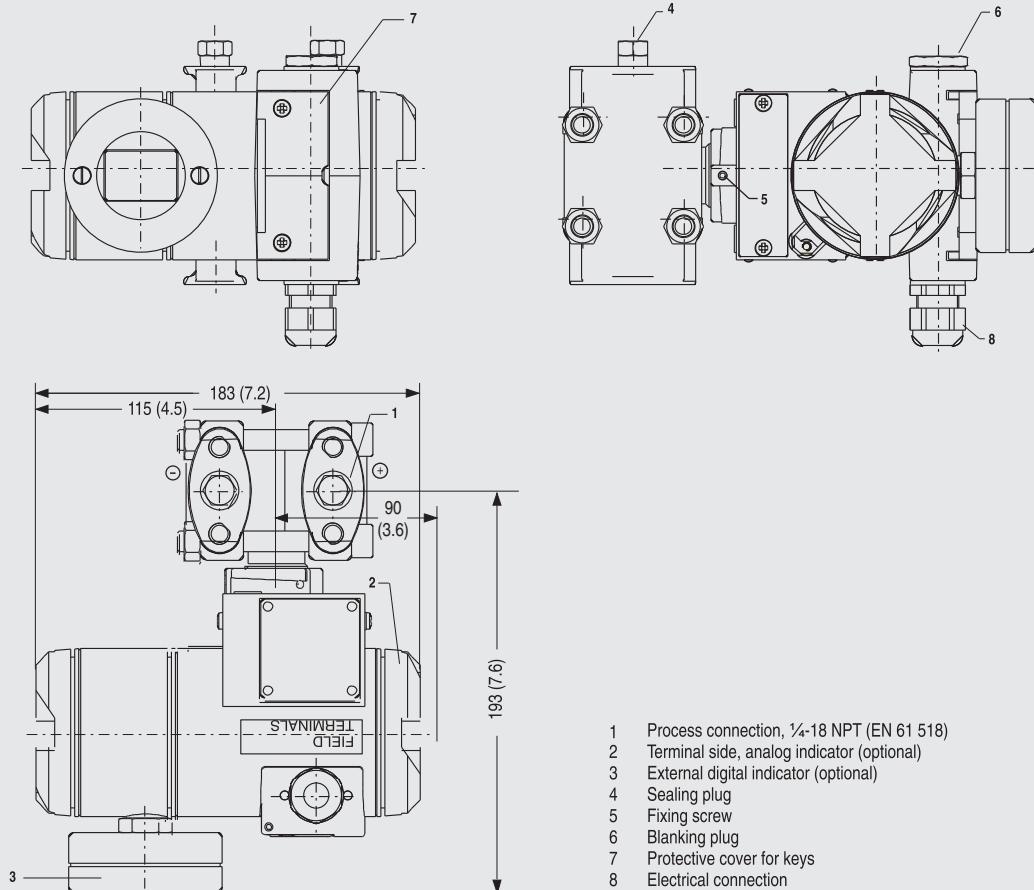
SITRANS P pressure transmitters, DS III series for differential pressure and flow, with process covers for vertical differential pressure lines

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for differential pressure and flow

2



SITRANS P pressure transmitters, DS III FF series for differential pressure and flow, with digital indicator beside control keys, for vertical differential pressure lines, dimensions in mm (inch)



SITRANS P pressure transmitters, DS III series for differential pressure and flow, with digital indicator beside control keys

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for level

Technical specifications

SITRANS P, DS III series for level

	HART	PROFIBUS PA or FOUNDATION Fieldbus		
Input				
Measured variable	Level			
Spans (infinitely adjustable) or nominal measuring range and max. permissible working pressure	Span 25 ... 250 mbar g (0.36 ... 3.63 psi g) 25 ... 600 mbar g (0.36 ... 8.7 psi g) 53 ... 1600 mbar g (0.77 ... 23.2 psi g) 160 ... 5000 mbar g (2.32 ... 72.5 psi g)	Maximum working pressure See "Mounting flange"	Nominal measuring range 250 mbar g (3.63 psi g) 600 mbar g (8.7 psi g) 1600 mbar g (23.2 psi g) 5000 mbar g (72.5 psi g)	Maximum working pressure See "Mounting flange"
Lower measuring limit	-100% of max. span or 30 mbar (0.435 psi a), depending on mounting flange			
• Measuring cell with silicone oil filling				
Upper measuring limit	100% of max. span		100% of the max. nominal measuring range	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA or FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V		-	
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	-		Yes	
Accuracy	To EN 60770-1			
Reference conditions (All error data refer always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span)			
Error in measurement and fixed-point setting (including hysteresis and repeatability)				
• Linear characteristic			$\leq 0.075\%$	
- $r \leq 10$	$\leq 0.15\%$			
- $10 < r \leq 30$	$\leq 0.3\%$			
- $30 < r \leq 100$	$\leq (0.0075 \cdot r + 0.075)\%$			
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.25 \cdot r)\%$ every 5 years static pressure max. 70 bar g (1015 psi g)		$\leq (0.25\%$ every 5 years static pressure max. 70 bar g (1015 psi g)	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)				
- 250-mbar (3.63 psi) measuring cell	$\leq (0.5 \cdot r + 0.2)\%$ (0.4 instead of 0.2 with $10 < r \leq 30$)		$\leq 0.7\%$	
- 600-mbar (8.7 psi) measuring cell	$\leq (0.3 \cdot r + 0.2)\%$ (0.4 instead of 0.2 with $10 < r \leq 30$)		$\leq 0.5\%$	
- 1600 and 5000 mbar (23.2 and 72.5 psi) measuring cells	$\leq (0.25 \cdot r + 0.2)\%$ (0.4 instead of 0.2 with $10 < r \leq 30$)		$\leq 0.45\%$	
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)				
- 250 mbar (3.63 psi) measuring cell	$\leq (0.25 \cdot r + 0.15)\%/10 \text{ K}$ double values with $10 < r \leq 30$		$\leq 0.4\%/10 \text{ K}$	
- 600 mbar (8.7 psi) measuring cell	$\leq (0.15 \cdot r + 0.15)\%/10 \text{ K}$ double values with $10 < r \leq 30$		$\leq 0.3\%/10 \text{ K}$	
- 1600 and 5000 mbar (23.2 and 72.5 psi) measuring cells	$\leq (0.12 \cdot r + 0.15)\%/10 \text{ K}$ double values with $10 < r \leq 30$		$\leq 0.27\%/10 \text{ K}$	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for level

2

SITRANS P, DS III series for level

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Influence of static pressure		
• on the zero point		
- 250 mbar (3.63 psi) measuring cell	$\leq (0.3 \cdot r)\%$ per nominal pressure	$\leq 0.3\%$ per nominal pressure
- 600 mbar (8.7 psi) measuring cell	$\leq (0.15 \cdot r)\%$ per nominal pressure	$\leq 0.15\%$ per nominal pressure
- 1600 and 5000 mbar (23.2 and 72.5 psi) measuring cells	$\leq (0.1 \cdot r)\%$ per nominal pressure	$\leq 0.1\%$ per nominal pressure
• on the span	$\leq (0.1 \cdot r)\%$ per nominal pressure	$\leq 0.1\%$ per nominal pressure
Measured Value Resolution	-	$3 \cdot 10^{-5}$ of nominal measuring range
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		Note: Always take into account assignment of max. permissible working temperature to max. permissible working pressure of the respective flange connection!
• Measuring cell with silicone oil filling		-40 ... +100 °C (-40 ... +212 °F)
- High-pressure side	$p_{abs} \geq 1\text{bar}$: -40 ... +175 °C (-40 ... +347 °F)	
- Low-pressure side	$p_{abs} \geq 1\text{bar}$: -40 ... +80 °C (-40 ... +176 °F)	-40 ... +100 °C (-40 ... +212 °F)
Ambient conditions		-20 ... +60 °C (-4 ... +140 °F) in conjunction with dust explosion protection
• Ambient temperature		
- Digital indicators	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		Permissible
- Condensation		
• Electromagnetic compatibility		To EN 61326 and NAMUR NE 21
- Emitted interference and interference immunity		
Design		
Weight (without options)		
• To EN (pressure transmitter with mounting flange, without tube)	$\approx 11 \dots 13 \text{ kg}$ ($\approx 24.2 \dots 28.7 \text{ lb}$)	
• To ASME (pressure transmitter with mounting flange, without tube)	$\approx 11 \dots 18 \text{ kg}$ ($\approx 24.2 \dots 39.7 \text{ lb}$)	
Wetted parts materials		Poor in copper die-cast aluminium, GD-AlSi12 or stainless steel precision casting, mat. No. 1.4408
Housing material		
High-pressure side		
• Seal diaphragm of mounting flange		Stainless steel, mat. No. 1.4404/316L, Monel, mat. No. 2.4360, Hastelloy B2, mat. No. 2.4617, Hastelloy C276, mat. No. 2.4819, Hastelloy C4, mat. No. 2.4610, tantalum, PTFE, ECTFE
Measuring cell filling		Silicone oil
Process connection		
• High-pressure side		Flange to EN and ASME
• Low-pressure side		Female thread $1\frac{1}{4}$ -18 NPT and flange connection with mounting thread M10 to DIN 19213 or $7/16$ -20 UNF to EN 61518
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	Supplied through bus -
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Startup current \leq basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

**DS III series
for level**

2

SITRANS P, DS III series for level

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia(ib) IIB/IIC T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C	
- Permissible ambient temperature	Ex II 1/2 D IP65 T 120 °C	
- Max.surface temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Connection	120 °C (248 °F)	
- Effective internal inductance/capacitance	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Connection	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for level

2

HART communication	
HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measuring value) or 10 (two measuring values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	
- Failure mode	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	Can be parameterized (summation with last good value, continuous summation, summation with incorrect value)
• Physical block	One upper and lower warning limit and one alarm limit respectively
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a container characteristic with	Max. 30 nodes
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

Communication FOUNDATION Fieldbus	
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FF function block
• Physical block	1 Resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function

Mounting flange	
Nom. diam.	Nom. press.
• To EN 1092-1	
- DN 80	PN 40
- DN 100	PN16, PN40
• To ASME B16.5	
- 3 inch	Class 150, class 300
- 4 inch	Class 150, class 300

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

**DS III series
for level**

2

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for level		7MF4633 -
series DS III HART		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Span		
25 ... 250 mbar	(0.363 ... 3.63 psi)	D
25 ... 600 mbar	(0.363 ... 8.70 psi)	E
53 ... 1600 mbar	(0.77 ... 23.2 psi)	F
0.16 ... 5 bar	(2.32 ... 72.5 psi)	G
Process connection of low-pressure side		
Female thread 1/4-18 NPT with flange connection		2
• Mounting thread 7/16-20 UNF to EN 61518		0
• Mounting thread M10 to DIN 19213 (only for replacement needs)		
Non-wetted parts materials		
Process flange screws	Electronics housing	
Stainless steel	Die-cast aluminium	2
Stainless steel	Stainless steel precision casting ¹⁾	3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d)" ²⁾		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ³⁾		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ³⁾		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ²⁾		N
Electrical connection / cable entry		
• Screwed gland Pg 13.5 ⁴⁾		A
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector ⁴⁾		D
• M12 connectors (metal) ⁵⁾		F
Display		
• without (digital indicator hidden, setting: mA)		1
• With visible digital indication		6
• With customer-specific digital indication (setting as specified, Order code "Y21" or required)		7

Ordering information:

1st order item: Pressure transmitter 7MF4633-...

2nd order item: Mounting flange 7MF4912-3...

Ordering example:

Item line 1: 7MF4633-1EY20-1AA1-Z

B line: Y01

C line: Y01: 80 to 143 mbar (1.16 to 2.1 psi)

Item line 2: 7MF4912-3GE01

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.
- 2) Without cable gland, with blanking plug.
- 3) With enclosed cable gland EEx ia and blanking plug.
- 4) Not together with type of protection "Explosion-proof" and type of protection "Ex nA".
- 5) Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for level

2

Selection and Ordering data		Order No.
SITRANS P pressure transmitter for level		7MF4634 -
DS III PA series (PROFIBUS PA)		7MF4635 -
DS III FF series (FOUNDATION Fieldbus)		1 Y -
Nominal measuring range		
250 mbar	(3.63 psi)	D
600 mbar	(8.70 psi)	E
1600 mbar	(23.2 psi)	F
5 bar	(72.5 psi)	G
Process connection of low-pressure side		
Female thread 1/4-18 NPT with flange connection		0
• Mounting thread M10 to DIN 19213 (only for replacement needs)		2
• Mounting thread 7/16-20 UNF to EN 61518		
Non-wetted parts materials		
Process flange screws	Electronics housing	2
Stainless steel	Die-cast aluminium	3
Stainless steel	Stainless steel precision casting	
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		B
- "Intrinsic safety (EEx ia)"		D
- "Explosion-proof (EEx d)" ¹⁾		P
- "Intrinsic safety and explosion-proof e nclosure (EEx ia + EEx d)" ²⁾		E
- "Ex nA/nL (zone2)"		R
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ²⁾ (not for DS III FF)		N
• With FM + CSA, Type of protection:		C
- "Intrinsic safety and explosion-proof (is + xp)" ²⁾		F
Electrical connection / cable entry		
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• Plug M12 incl. mating connector ³⁾		
Display		
• Without (digital display hidden)		1
• With visible digital indication		6
• With customer-specific digital indication (setting as specified, Order code "Y21" or required)		7

Ordering information:

1st order item: Pressure transmitter 7MF4634-...
2nd order item: Mounting flange 7MF4912-...

Ordering example:

Item line 1: 7MF4634-1EY20-1AA1
Item line 2: 7MF4912-3GE01

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

¹⁾ Without cable gland, with blanking plug.

²⁾ With enclosed cable gland EEx ia and blanking plug.

³⁾ Not together with types of protection "Explosion-proof" and "Intrinsic safety
and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

Selection and Ordering data		Order code		
Further designs		HART	PA	FF
Add "-Z" to Order No. and specify Order code.				
O-rings for process flanges on low-pressure side				
(instead of FPM (Viton))				
• PTFE (Teflon)	A20	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓
• FFFP (Kalrez, compound 4079)	A22	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓
Plug				
• Han 7D (metal, gray)	A30	✓		
• Han 8U (instead of Han 7D)	A31	✓		
Sealing screws				
1/4-18 NPT, with valve in material of process flanges	A40	✓	✓	✓
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓
Rating plate inscription				
(instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
English rating plate	B21	✓	✓	✓
Pressure units in inH ₂ O or psi				
Quality inspection certificate (Factory cali- bration) to IEC 60770-2	C11	✓	✓	✓
Acceptance test certificate	C12	✓	✓	✓
To EN 10204-3.1				
Factory certificate	C14	✓	✓	✓
To EN 10204-2.2				
"Functional Safety (SIL)" certificate	C20	✓		
"PROFIsafe" certificate and protocol	C21		✓	
Setting of upper limit of output signal to 22.0 mA	D05	✓		
Type of protection IP68	D12	✓	✓	✓
(not together with PROFIBUS plug M12)				
Supplied with oval flange	D37 ^{F)}	✓	✓	✓
(1 item), PTFE packing and stainless steel screws in thread of process flange				
Use on zone 1D / 2D	E01	✓	✓	✓
(only together with type of protection "Intrinsic safety (EEx ia)")				
Use on zone 0	E02	✓	✓	✓
(only together with type of protection "Intrinsic safety (EEx ia)")				
Overfilling safety device for flammable and non-flammable liquids	E08	✓	✓	
(max. PN 32 (MVWP 464 psi), basic device with type of protection "Intrinsic safety (EEx ia)")				
Explosion-proof "Intrinsic safety" to INME- TRO (Brazil)	E25	✓	✓	✓
(only for transmitter 7MF4...-....-B..)				
Explosion-proof "Intrinsic safety" to NEPSI (China)	E55	✓	✓	✓
(only for transmitter 7MF4...-....-B..)				
Explosion protection "Explosion-proof" to NEPSI (China)	E56	✓	✓	✓
(only for transmitter 7MF4...-....-D..)				
Explosion-proof "Zone 2" to NEPSI (China)	E57	✓	✓	✓
(only for transmitter 7MF4...-....-E..)				
Interchanging of process connection side	H01	✓	✓	✓

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for level

2

Selection and Ordering data		Order code		
Additional data		HART	PA	FF
Add "Z" to Order No. and specify Order code.				
Measuring range to be set Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓		
Measuring point number (TAG No.) Max. 16 characters, specify in plain text: Y15:	Y15	✓	✓	✓
Measuring point text Max. 27 characters, specify in plain text: Y16:	Y16	✓	✓	✓
Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17:	Y17	✓		
Setting of pressure indicator in pressure units Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % *) ref. temperature 20 °C	Y21	✓	✓	✓
Setting of pressure indicator in non-pressure units Specify in plain text: Y22 ¹⁾ + Y01 Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 ¹⁾ + Y01	✓		
Preset bus address (possible between 1 and 126) Specify in plain text: Y25:	Y25		✓	

Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset

✓ = available

¹⁾ Not together with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

Selection and Ordering data		Order No.Ord. code
Mounting flange		7MF4912 -
Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series	3	
Connection acc. to EN 1092-1		
Nom. diam.	Nom. press.	
DN 80	PN 40	D
DN 100	PN 16	G
	PN 40	H
Connection acc. to ASME B16.5		
Nom. diam.	Nom. press.	
3 inch	Class 150	Q
	Class 300	R
4 inch	Class 150	T
	Class 300	U
Other version, add Order code and plain text: Nominal diameter: ...; Nominal pressure: ...	Z	J1Y
Wetted parts materials		
• Stainless steel 316L	A	
- Coated with PFA	D	
- Coated with PTFE	E	0
- Coated with ECTFE ¹⁾	F	
• Monel 400, mat. No. 2.4360	G	
• Hastelloy B2, mat. No. 2.4617	H	
• Hastelloy C276, mat. No. 2.4819	J	
• Hastelloy C4, mat. No. 2.4610	U	
• Tantalum	K	
Other version, add Order code and plain text: material of parts in contact with the medium: ... Sealing face, see "Technical specifications"	Z	K1Y
Tube length		
• Without	0	
• 50 mm	1	
• 100 mm	2	
• 150 mm	3	
• 200 mm	4	
Other version, add Order code and plain text: Tube length: ...	9	L1Y
Filling liquid		
• Silicone oil M5	1	
• Silicone oil M50	2	
• High-temperature oil	3	
• Halocarbon oil (for O ₂ measurements)	4	
• Glycerin / water ²⁾	6	
• Food oil (FDA-listed)	7	
Other version, add Order code and plain text: filling liquid: ...	9	M1Y

¹⁾ For vacuum on request

²⁾ Not suitable for use in low-pressure range

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for level

2

Selection and Ordering data		Order code	
		HART	PA and FF
Further designs Add "-Z" to Order No. and specify Order code.			
Flame flashover lock-out For mounting on zone 0 (including documentation)	A01	✓	✓
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11	✓	✓
Acceptance test certificate To EN 10204-3.1	C12	✓	✓
Vacuum-proof design (for use in low-pressure range)	V04	✓	✓
Calculation of span of associated pressure transmitter (enclose filled-in questionnaire with order) Note: suffix "Y01" required with pressure transmitter!	Y05	✓	✓

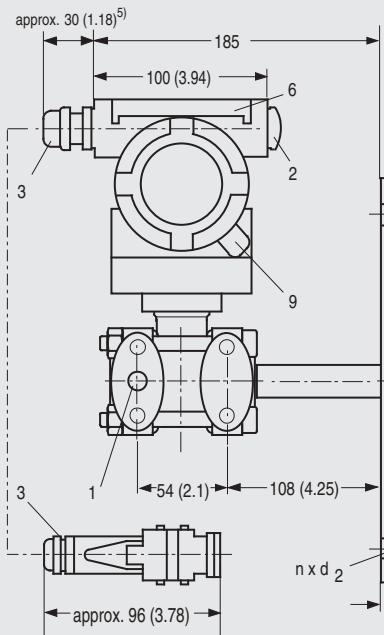
✓ = available

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

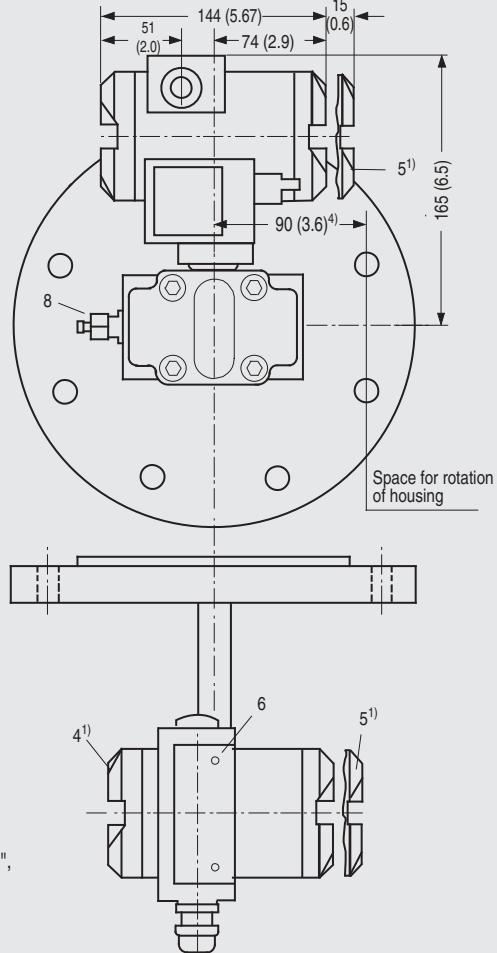
DS III series
for level

Dimensional drawings



- 1 Process connection of low pressure side 1/4-18 NPT (EN 61 518)
- 2 Blanking plug
- 3 Electrical connection:
screwed gland Pg 13.5 (adapter) ²⁾ ³⁾,
screwed gland M20x1.5, screwed gland 1/2-14 NPT or
Han 7D/ Han 8U plug ²⁾ ³⁾
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 8 Sealing screw with valve (option)
- 9 Screw cover safety bracket (only for type of protection "Explosion-proof enclosure",
not shown in the drawing)

- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA [is + xp]"
- 4) 92 mm (3.62 inch) for minimum distance to permit rotation without indicator



SITRANS P pressure transmitters, DS III HART series for level, including mounting flange, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d	d ₂	d ₄	d ₅	d _M	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 80	PN 40	24	200	90	18	138	76	72 ¹⁾	2	160	8	0, 50, 100, 150 or 200
DN 100	PN 40	20	220	115	18	158	94	89	2	180	8	
	PN 40	24	235	115	22	162	94	89	2	190	8	

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n	L
	lb/sq.in.	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
3 inch	150	0.94 (23.8)	7.5 (190.5)	0.75 (19.0)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6 (152.4)	4 (1.6)	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	1.12 (28.6)	8.25 (209.5)	0.87 (22.2)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6.69 (168.3)	8 (1.6)	
4 inch	150	0.94 (23.8)	9 (228.5)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.5 (190.5)	8 (1.6)	
	300	1.25 (31.7)	10 (254)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.88 (200)	8 (1.6)	

d: Internal diameter of gasket to DIN 2690
d_M: Effective diaphragm diameter

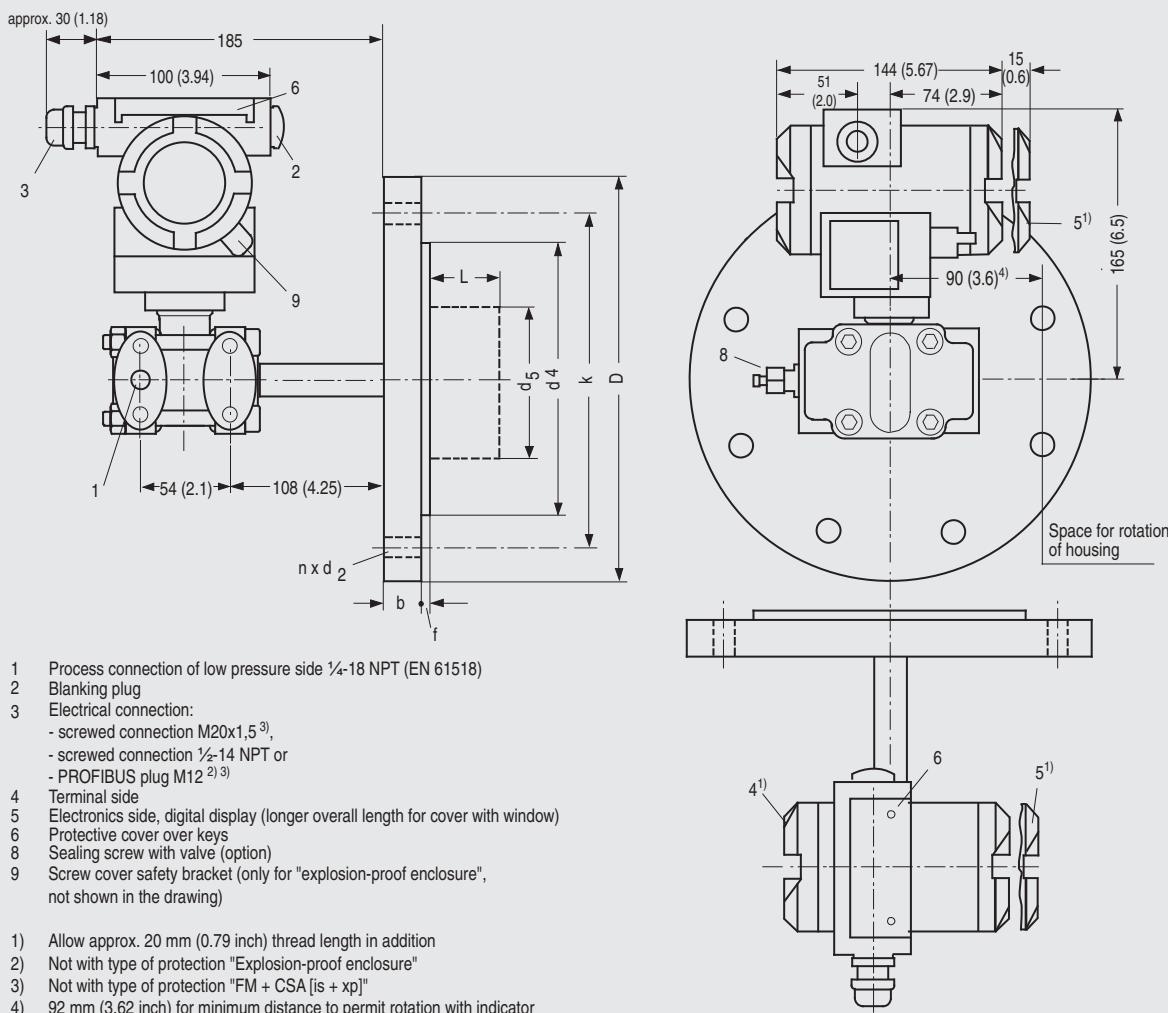
¹⁾ 89 mm = 3 1/2 inch with tube length L = 0.

SITRANS P measuring instruments for pressure

Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for level

2



SITRANS P pressure transmitters, DS III PA and FF series for level, including mounting flange, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d	d ₂	d ₄	d ₅	d _M	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 80	PN 40	24	200	90	18	138	76	72 ¹⁾	2	160	8	0, 50, 100, 150 or 200
DN 100	PN 40	20	220	115	18	158	94	89	2	180	8	
	PN 40	24	235	115	22	162	94	89	2	190	8	

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n	L
	lb/sq.in.	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
3 inch	150	0.94 (23.8)	7.5 (190.5)	0.75 (19.0)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6 (152.4)	4 (152.4)	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	1.12 (28.6)	8.25 (209.5)	0.87 (22.2)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6.69 (168.3)	8 (168.3)	
4 inch	150	0.94 (23.8)	9 (228.5)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.5 (190.5)	8 (190.5)	
	300	1.25 (31.7)	10 (254)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.88 (200)	8 (200)	

d: Internal diameter of gasket to DIN 2690
 d_M: Effective diaphragm diameter

¹⁾ 89 mm = 3 1/2 inch with tube length L = 0.

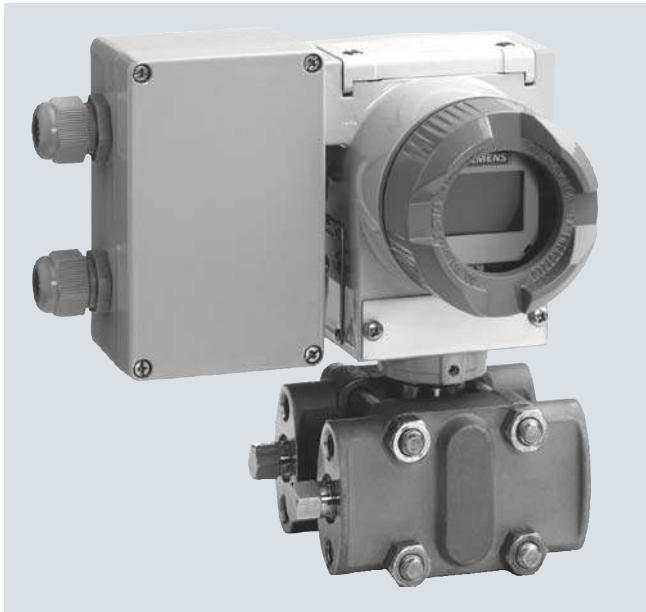
SITRANS P measuring instruments for pressure

SITRANS P Accessories

Supplementary electronics for 4-wire connection

2

Overview



SITRANS P pressure transmitter with supplementary electronics for 4-wire connection

Direct connection of the supplementary electronics to a SITRANS P pressure transmitter from the DS III HART series produces a transmitter for four-wire connection.

The supplementary electronics cannot be attached to explosion-protected pressure transmitters. The supplementary electronics is fitted in a light metal housing which is mounted on the left side of the pressure transmitter.

Note on ordering:

The supplementary electronics has to be ordered through the **supplementary options** of the pressure transmitter in question.

Technical specifications

SITRANS P, supplementary electronics for 4-wire connection

Output

Output signal	0 ... 20 mA or 4 ... 20 mA
Load	Max. 750 Ω
Voltage measurement	Linear (square-rooting in transmitter if necessary)
Electrical isolation	Between power supply and input/output

Measuring accuracy

Conformity error (in addition to transmitter)	$\leq 0.15\%$ of set span
Influence of ambient temperature	$\leq 0.1\%$ per 10 K
Power supply effect	$\leq 0.1\%$ per 10% change in voltage or frequency
Load effect	$\leq 0.1\%$ per 100% change

Rated conditions

Ambient temperature	-20 ... +80 °C (-4 ... +176 °F)
Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
Degree of protection	IP54 to EN 60529
Electromagnetic compatibility (EMC)	EN 50081, EN 50082

Structural design

Dimensions (W x H x D) in mm (inch) 80 x 120 x 60 (3.15 x 4.72 x 2.36)

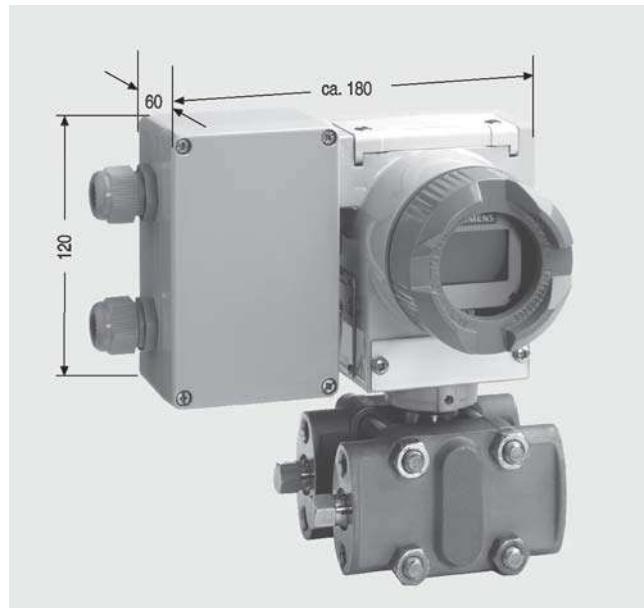
Electrical connection Screw terminals (Pg 13.5 cable inlet) or Han 7D / Han 8U plug

Power supply

Supply voltage 230 V AC (-10 ... +6%, 47 ... 63 Hz, approx. 6 VA) or 24 V AC/DC (24 V AC $\pm 10\%$, 47 ... 63 Hz, approx. 3 VA)

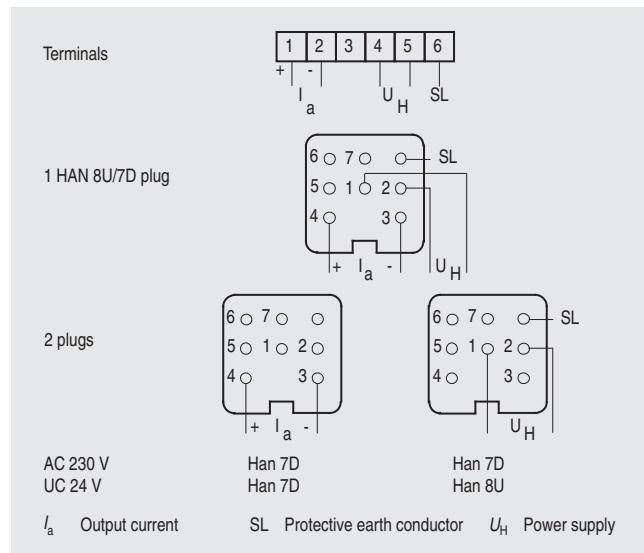
Permissible ripple (within the specified limits) Approx. 2.5 V_{pp}

Dimensional drawings



SITRANS P pressure transmitters with supplementary electronics for four-wire connection, dimension drawing, dimensions in mm (inch)

Schematics



Supplementary electronics for 4-wire connection, connection diagram

Supplementary electronics for 4-wire connection

Selection and Ordering data		Order code
Supplementary electronics for 4-wire connection		V
Order No. of the transmitter 7MF4.33-.....-1AB. add "-Z" and Order code.		
Power supply	Electrical connection	
24 V AC/DC	Terminals; 2 Pg screwed glands, to left 2 Han 7D/Han 8U plugs incl. mating connector, to left 1 Han 7D plug incl. mating connector, angled Terminals; 1 Pg screwed gland, downwards 1 Han 8U plug incl. mating connector, downwards (observe arrangement of plug and differential pressure line)	1 3 5 6 9
230 V AC	Terminals; 2 Pg screwed glands, to left 2 Han 7D plugs incl. mating connector, to left	7 8
Output current		
0 ... 20 mA		0
4 ... 20 mA		1

Selection and Ordering data	Order No.
<i>Accessories</i>	
Instruction Manual	A5E00322799

SITRANS P measuring instruments for pressure

SITRANS P Accessories

Accessories / spare parts for SITRANS P P300 and DS III series

2

Selection and Ordering data		Order No.
Replacement measuring cell for pressure for SITRANS P, DS III, DS III PA and DS III FF series		7MF4990 - 0 - 0 DC 0
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
Measured span		
0.01 ... 1 bar g	(0.15 ... 14.5 psi g)	b
0.04 ... 4 bar g	(0.58 ... 58 psi g)	c
0.16 ... 16 bar g	(2.32 ... 232 psi g)	d
0.63 ... 63 bar g	(9.14 ... 914 psi g)	e
1.6 ... 160 bar g	(23.2 ... 2320 psi g)	f
4.0 ... 400 bar g	(58.0 ... 5802 psi g)	g
Wetted parts materials		
Seal diaphragm	Process connection	a
Stainless steel	Stainless steel	b
Hastelloy	Stainless steel	c
Hastelloy	Hastelloy	
Process connection		
• Connection shank G $\frac{1}{2}$ B to EN 837-1	0	
• Female thread 1/2-14 NPT	1	
• Oval flange made of stainless steel, max. span 160 bar (2320 psi)		
- Mounting thread 7/16-20 UNF to EN 61518	2	
- Mounting thread M10 to DIN 19213	3	
Further designs	Order code	
Please add "-Z" to Order No. and specify Order code.		
Acceptance test certificate	c12	
to EN 10204-3.1		

Selection and Ordering data		Order No.
Replacement measuring cell for absolute pressure (from the pressure series) for SITRANS P, DS III, DS III PA and DS III FF series		F) 7MF4992 - 0 - 0 DC 0
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
Measured span		
8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	D
43 ... 1300 mbar a	(0.62 ... 18.9 psi a)	F
0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	G
1 ... 30 bar a	(14.5 ... 435 psi a)	H
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	a
Hastelloy	Stainless steel	b
Hastelloy	Hastelloy	c
Process connection		
• Connection shank G $\frac{1}{2}$ B to EN 837-1	0	
• Female thread 1/2-14 NPT	1	
• Oval flange made of stainless steel, max. span 160 bar (2320 psi)		
- Mounting thread 7/16-20 UNF to EN 61518	2	
- Mounting thread M10 to DIN 19213	3	
Further designs	Order code	
Please add "-Z" to Order No. and specify Order code.		
Acceptance test certificate	c12	
to EN 10204-3.1		

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

SITRANS P Accessories

Accessories / spare parts for SITRANS P P300 and DS III series

2

Selection and Ordering data		Order No.
<i>Spare parts / Accessories</i>		
Replacement measuring cell for absolute pressure (from the differential pressure series) for SITRANS P, DS III, DS III PA and DS III FF series		
Measuring cell filling	Measuring cell cleaning	F 7 MF 4 9 9 3 - 0 D C 0
Silicone oil	Standard	1
Inert liquid	Grease-free	3
Measured span		
8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	E) D
43 ... 1300 mbar a	(0.62 ... 18.9 psi a)	E) F
0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	E) G
1 ... 30 bar a	(14.5 ... 435 psi a)	E) H
5.3 ... 100 bar a	(76.9 ... 1450 psi a)	E) K E
Wetted parts materials		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	a
Hastelloy	Stainless steel	b
Hastelloy	Hastelloy	c
Tantalum	Tantalum	e
Monel	Monel	h
Gold	Gold	i
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread M10 to DIN 19213	0	
- Mounting thread 7/16-20 UNF to EN 61518	2	
• Vent on side of process flange ¹⁾		
- Mounting thread M10 to DIN 19213	4	
- Mounting thread 7/16-20 UNF to EN 61518	6	
Non-wetted parts materials		
• Stainless steel process flange screws	2	
Further designs		
Please add "-Z" to Order No. and specify Order code.		
O-rings for process flanges		
(instead of FPM (Viton))		
• PTFE (Teflon)	a20	
• FEP (with silicone core, approved for food)	a21	
• FFFPM (Kalrez, compound 4079)	a22	
• NBR (Buna N)	a23	
Acceptance test certificate		
to EN 10204-3.1	c12	
Process connection G1/2A		
D16		
Remote seal flanges		
(not together with K01, K02 and K04)	d20	
Vent on side for gas measurements		
h02		
Process flanges		
• without	K00	
• with process flange made of		
- Hastelloy	K01	
- Monel	K02	
- Stainless steel with PVDF insert max. PN 10 (MWP 145 psi) max. temperature of medium 90 °C (194 °F)	K04	

1) Not for span "5.3 ... 100 bar (76.9 ... 1450 psi)"

E) Combinations of the versions marked with E) are subject to the export regulations AL: 2B230, ECCN: N.

F) Subject to export regulations AL: 9I999, ECCN: N.

Selection and Ordering data		Order No.
<i>Spare parts / Accessories</i>		
Replacement measuring cell for differential pressure and PN 32/160 (MWP 464/2320 psi) for SITRANS P, DS III, DS III PA and DS III FF series		
Measuring cell filling	Measuring cell cleaning	7 MF 4 9 9 4 - 0 D C 0
Silicone oil	Standard	1
Inert liquid	Grease-free	3
Measured span		
PN 32 (MWP 464 psi)		
1 ... 20 mbar ¹⁾	(0.4015 ... 8.03 inH ₂ O)	b
PN 160 (MWP 2320 psi)		
1 ... 60 mbar	(0.4015 ... 24.09 inH ₂ O)	c
2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)	D
6 ... 600 mbar	(2.409 ... 240.9 inH ₂ O)	e
16 ... 1600 mbar	(6.424 ... 642.4 inH ₂ O)	F
50 ... 5000 mbar	(20.08 ... 2008 inH ₂ O)	G
0.3 ... 30 bar	(4.35 ... 435 psi)	H
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum ²⁾	Tantalum	e
Monel ²⁾	Monel	h
Gold ²⁾	Gold	i
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread M10 to DIN 19213	0	
- Mounting thread 7/16-20 UNF to EN 61518	2	
• Vent on side of process flange		
- Mounting thread M10 to DIN 19213	4	
- Mounting thread 7/16-20 UNF to EN 61518	6	
Non-wetted parts materials		
Stainless steel process flange screws	2	
Further designs		
Please add "-Z" to Order No. and specify Order code.		
O-rings for process flanges		
(instead of FPM (Viton))		
• PTFE (Teflon)	a20	
• FEP (with silicone core, approved for food)	a21	
• FFFPM (Kalrez, compound 4079)	a22	
• NBR (Buna N)	a23	
Acceptance test certificate		
to EN 10204-3.1	c12	
Remote seal flanges		
(not together with K01, K02 and K04)	d20	
Vent on side for gas measurements		
h02		
Stainless steel process flanges for vertical differential pressure lines		
(not together with K01, K02 and K04)	H03	
Process flanges		
• without	K00	
• with process flange made of		
- Hastelloy	K01	
- Monel	K02	
- Stainless steel with PVDF insert max. PN 10 (MWP 145 psi) max. temperature of medium 90 °C (194 °F)	K04	

1) Not suitable for connection of remote seal

2) Only together with max. spans 250, 1600, 5000 and 30000 mbar (3.63, 23.2, 72.5 and 435 psi).

F) Subject to export regulations AL: 9I999, ECCN: N.

SITRANS P measuring instruments for pressure

SITRANS P Accessories

Accessories / spare parts for SITRANS P P300 and DS III series

2

Selection and Ordering data		Order No.
<i>Spare parts / Accessories</i>		
Replacement measuring cell for differential pressure and PN 420 (MWP 6092 psi) for SITRANS P, DS III, DS III PA and DS III FF series	7 MF 4 9 9 5 -	0 D C 0
Measuring cell filling		
Silicone oil	Standard	1
Measured span		
2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)	D
6 ... 600 mbar	(2.409 ... 240.9 inH ₂ O)	e
16 ... 1600 mbar	(6.424 ... 642.4 inH ₂ O)	F
50 ... 5000 mbar	(20.08 ... 2008 inH ₂ O)	G
0.3 ... 30 bar	(4.35 ... 435 psi)	H
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	A
Stainless steel	Stainless steel	B
Hastelloy	Stainless steel	
Gold ¹⁾	Gold	I
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread M12 to DIN 19213	1	
- Mounting thread 7/16-20 UNF to EN 61518	3	
• Vent on side of process flange		
- Mounting thread M12 to DIN 19213	5	
- Mounting thread 7/16-20 UNF to EN 61518	7	
Non-wetted parts materials		
• Stainless steel process flange screws	2	
Further designs		
Please add "-Z" to Order No. and specify Order code.		
O-rings for process flanges		
(instead of FPM (Viton))		
• PTFE (Teflon)	a20	
• FEP (with silicone core, approved for food)	a21	
• FFFPM (Kalrez, compound 4079)	a22	
• NBR (Buna N)	a23	
Acceptance test certificate		
to EN 10204-3.1	c12	
Stainless steel process flanges for vertical differential pressure lines		
without process flanges	H03	
K00		

¹⁾ Not together with max. span 600 mbar (240.9 inH₂O)

F) Subject to export regulations AL: 91999, ECCN: N.

Selection and Ordering data		Order No.
<i>Spare parts / Accessories</i>		
Replacement measuring cell for level	7 MF 4 9 9 6 -	0 D C 0
for SITRANS P, DS III, DS III PA and DS III FF series		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Rated measuring range		
250 mbar	(3.63 psi)	D
600 mbar	(8.70 psi)	e
1600 mbar	(23.2 psi)	F
5 bar	(72.5 psi)	G
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	A
Stainless steel	Stainless steel	
Process connection of low-pressure side		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread M10 to DIN 19213	0	
- Mounting thread 7/16-20 UNF to EN 61518	2	
Non-wetted parts materials		
• Stainless steel process flange screws	2	
Further designs		
Please add "-Z" to Order No. and specify Order code.		
O-rings for process flanges		
(instead of FPM (Viton))		
• PTFE (Teflon)	a20	
• FEP (with silicone core, approved for food)	a21	
• FFFPM (Kalrez, compound 4079)	a22	
• NBR (Buna N)	a23	
Acceptance test certificate		
to EN 10204-3.1	c12	
without process flanges		
	k00	

SITRANS P measuring instruments for pressure

SITRANS P Accessories

Accessories / spare parts for SITRANS P P300 and DS III series

2

Selection and Ordering data	Order No.	Selection and Ordering data	Order No.
Spare parts / Accessories			
Mounting bracket and mounting parts for pressure transmitters			
DS III, DS III PA and DS III FF series (7MF403.-.C.)			
for absolute pressure transmitters			
DS III, DS III PA and DS III FF series (7MF423.-.C.)			
• made of steel			
• made of stainless steel			
Mounting bracket and mounting parts for pressure transmitters			
DS III, DS III PA and DS III FF series (7MF403.-.A., -.B. and -.D.)			
for absolute pressure transmitters			
DS III, DS III PA and DS III FF series (7MF423.-.A., -.B. and -.D.)			
• Made of steel			
• Made of stainless steel			
Mounting bracket and mounting parts for differential pressure transmitters with flange thread M10			
DS III, DS III PA and DS III FF series (7MF433. and 7MF443.)			
• made of steel			
• made of stainless steel			
Mounting bracket and mounting parts for differential pressure transmitters with flange thread M12			
DS III, DS III PA and DS III FF series (7MF453.)			
• made of steel			
• made of stainless steel			
Mounting bracket and mounting parts for differential and absolute pressure transmitters with flange thread 7/16-20 UNF			
DS III, DS III PA and DS III FF series (7MF433., 7MF443. and 7MF453.)			
• made of steel			
• made of stainless steel			
Cover			
Made of die-cast aluminium, including gasket, for DS III, DS III PA and DS III FF series			
• without window			
• with window			
Cover			
Made of stainless steel, including gasket, for DS III, DS III PA and DS III FF series			
• without window			
• with window			
Digital indicator			
Including mounting material for DS III, DS III PA and DS III FF series			
Measuring-point label			
• without inscription (5 off)			
• with inscription (1 off)			
Data according to Y01 or Y02, Y15 and Y16 (see "SITRANS P pressure transmitters")			
Mounting screws			
for measuring-point label, earthing and connection terminals or for digital indicator (50 off)			
Sealing screws			
(1 set = 2 off) for process flange			
• made of stainless steel			
• made of Hastelloy			
F) 7MF4997-1CG			
F) 7MF4997-1CH			
Screw plug with valve (1 set = 2 off)			
• made of stainless steel			
• made of Hastelloy			
F) 7MF4997-1CP			
F) 7MF4997-1CQ			
Electronics			
• for DS III series			
• for DS III PA series			
• for DS III FF series			
7MF4997-1DK			
7MF4997-1DL			
7MF4997-1DM			
Connection board			
• for DS III series			
• for DS III PA and DS III FF series			
7MF4997-1DN			
7MF4997-1DP			
O-rings for process flanges made of			
• FPM (Viton)			
• PTFE (Teflon)			
• FEP (with silicone core, approved for food)			
• FFFP (Kalrez, compound 4079)			
• NBR (Buna N)			
F) 7MF4997-2DA			
F) 7MF4997-2DB			
F) 7MF4997-2DC			
F) 7MF4997-2DD			
F) 7MF4997-2DE			
Weldable sockets for PMC connection			
for DS III and P300 series			
• PMC Style Standard: Thread 1 1/2"			
• PMC Style Mini bolt: front-flush 1"			
7MF4997-2HA			
F) 7MF4997-2HB			
Sealing rings for PMC connection			
(packing unit: 5 pcs)			
• Sealing ring made of PTFE for PMC Style Standard: Thread 1 1/2"			
• Sealing ring made of Viton for PMC Style Minibolt: front-flush 1"			
F) 7MF4997-2HC			
F) 7MF4997-2HD			
Weldable socket for TG 52/50- and TG 52/150 connection			
for DS III and P300 series			
• TG 52/50 connection			
• TG 52/150 connection			
7MF4997-2HE			
7MF4997-2HF			
Seals for TG 52/50 and TG 52/150 made of silicone			
Seals for flange connection with flush-mounted diaphragm			
Material FPM (Viton), 10 units			
• DN 25, PN 40 (M11)			
• DN 25, PN 100 (M21)			
• 1", class 150 (M40)			
• 1", class 300 (M45)			
F) 7MF4997-2HH			
F) 7MF4997-2HJ			
F) 7MF4997-2HK			
F) 7MF4997-2HL			
Mounting bracket and mounting parts for P300			
• Made of stainless steel			
7MF8997-1AA			
Lid without window for P300			
• Gasket not included			
7MF8997-1BA			
Lid with glass window for P300			
• Gasket not included			
7MF8997-1BD			
NBR housing gasket for P300			
Measuring point label for P300			
• Unlabeled			
7MF8997-1CA			
Cable gland for P300			
• Metal			
• Plastic (blue)			
7MF8997-1EA			
7MF8997-1EB			
► Available ex stock			

F) Subject to export regulations AL: 9I999, ECCN: N.

SITRANS P measuring instruments for pressure

SITRANS P Accessories

Accessories / spare parts for SITRANS P P300 and DS III series

2

Selection and Ordering data	Order No.
Instruction Manual¹⁾	
• for P300 series with HART communication	
- German	A5E00359580
- English	A5E00359579
- French	A5E00359578
- Spanish	A5E00359576
- Italian	A5E00359577
- Leporello German/English	A5E00359581
• for P300 series with PROFIBUS PA communication	
- German	A5E00414587
- English	A5E00414588
- French	A5E00414589
- Spanish	A5E00414590
- Italian	A5E00414591
- Leporello German/English	A5E00414592
• for DS III series	
- German	A5E00047090
- English	A5E00047092
- French	A5E00053218
- Spanish	A5E00053219
- Italian	A5E00053220
• for DS III PA series	
- German	A5E00053275
- English	A5E00053276
- French	A5E00053277
- Spanish	A5E00053278
- Italian	A5E00053279
• for DS III FF series	
- German	A5E00279627
- English	A5E00279629
- French (planned)	A5E00279630
- Spanish (planned)	A5E00279632
- Italian (planned)	A5E00279631
Brief instructions (Leporello)	
• for DS III series, German, English	A5E00047093
• for DS III PA series, German, English	A5E00053274
• for DS III FF series, German, English	A5E00282355
CD with documentation	G) A5E00090345
for P300, DS III, DS III PA and DS III FF series	
German, English, French, Italian, Spanish	
Instruction Manual	
for replacement of electronics, measuring cell and connection board	
• German/English	A5E00078060
HART modem	
• with RS232 interface	► 7MF4997-1DA
• with USB interface	D) ► 7MF4997-1DB
Supplementary electronics for 4-wire connection	see page 2/134

► Available ex stock

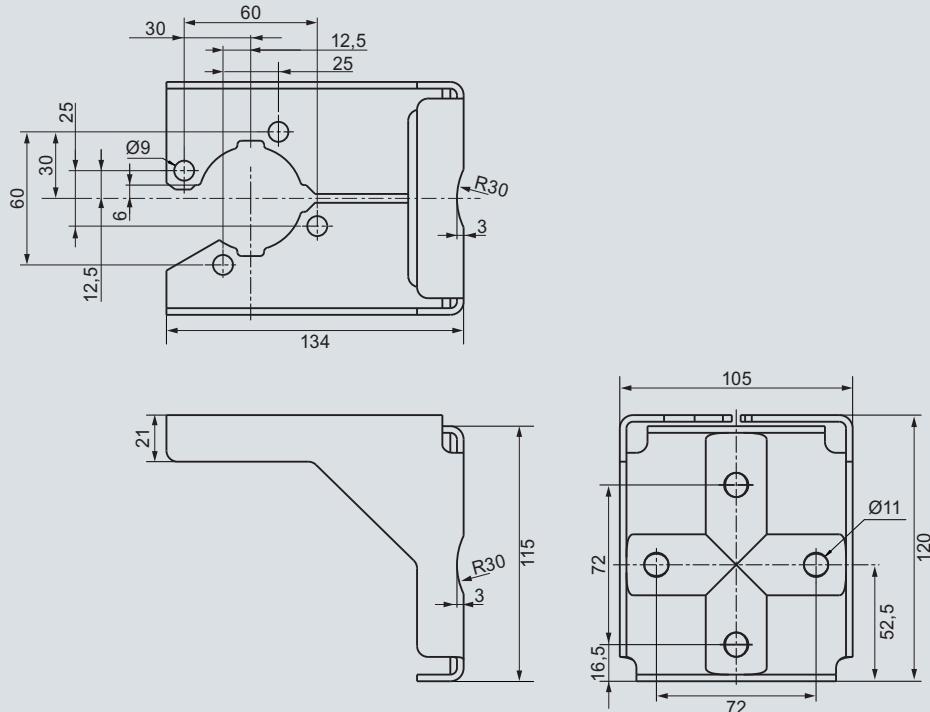
Power supply units see "SITRANS I power supply units and input isolators".

¹⁾ You can download the Instruction Manuals free-of-charge from the Internet site www.siemens.com/sittransp.

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

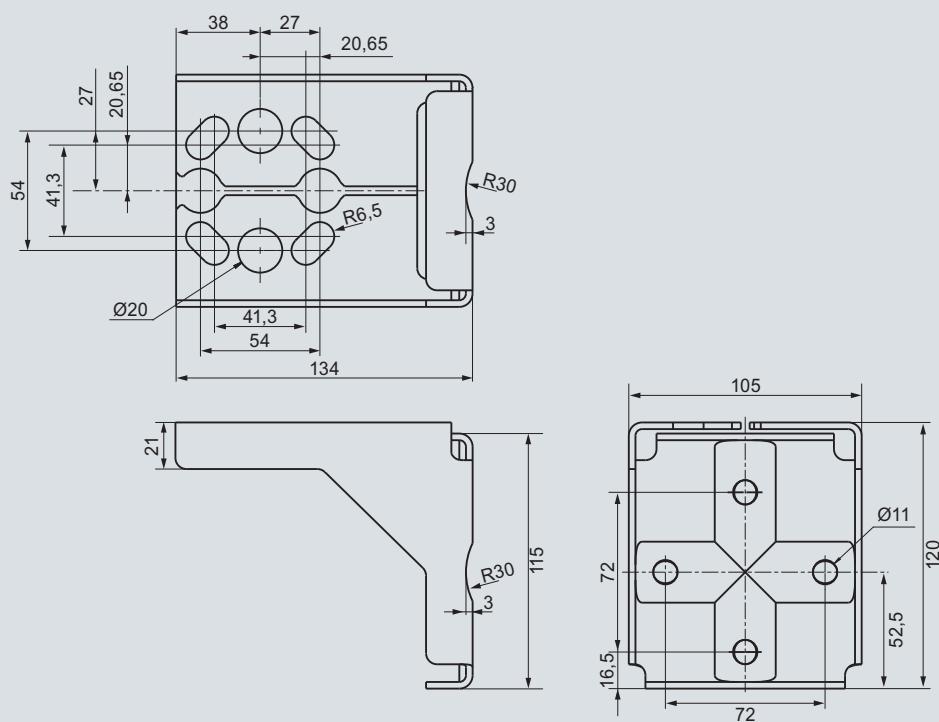
G) Subject to export regulations AL: N, ECCN: 5D992B1.

Dimensional drawings



Mounting bracket for SITRANS P gage and absolute pressure transmitter, DS III series

Material of mounting bracket: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



Mounting bracket for SITRANS P differential pressure transmitter, DS III series,

Material of mounting bracket: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)

SITRANS P measuring instruments for pressure

SITRANS P Accessories

Factory-mounting of valve manifolds on SITRANS P transmitters

Overview

SITRANS P transmitters

- P300 for relative and absolute pressure,
- DS III for relative and absolute pressure (both designs) and
- DS III for differential pressure

can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4EA and 7MF9011-4FA valve manifolds for relative pressure and absolute pressure transmitters
- 7MF9411-5BA and 7MF9411-5CA valve manifolds for absolute pressure and differential pressure transmitters

Design

The 7MF9011-4EA valve manifolds are sealed with gaskets made of PTFE between transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

The 7MF9411-5BA and 7MF9411-5CA valve manifolds are sealed with PTFE sealing rings between the transmitter and the valve manifold.

Once installed, the complete unit is checked under pressure for leaks and is certified leak-proof with a factory certificate to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an acceptance test certificate 3.1 to EN10204 when choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitters and the valve manifolds respectively.

Selection and Ordering data

7MF9011-4FA valve block on relative and absolute pressure transmitters



Add -Z to the Order No. of the transmitter and add order codes.	Order code
SITRANS P DSIII 7MF403.1., 7MF423.1. and SITRANS P300 7MF802.1.	T03
With process connection female thread 1/2-14 NPT in-sealed with PTFE sealing strip	
Delivery incl. high-pressure test certified by factory certificate to EN10204-2.2	

7MF9011-4EA valve block on relative and absolute pressure transmitters



Add -Z to the Order No. of the transmitter and add order codes.	Order code
SITRANS P DSIII 7MF403.0., 7MF423.0. and SITRANS P300 7MF802.0.	T02
with process connection collar G1/2 A to EN837-1 with gasket made of PTFE between valve manifold and transmitter	

Alternative sealing material:

- soft iron **A70**
- stainless steel, Mat. No. 14571 **A71**
- copper **A72**

Delivery incl. high-pressure test certified by factory certificate to EN10204-2.2

Further designs:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

A02

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold

C12

Oil and grease-free cleaning for oxygen operation

E10

7MF9411-5BA valve manifold on absolute and differential pressure transmitters



Add -Z to the Order No. of the transmitter and add order codes.	Order code
SITRANS P DSIII 7MF433., 7MF443. and 7MF453. ¹⁾	
mounted with gaskets made of PTFE and screws made of	
• chromized steel	U01
• stainless steel	U02
Delivery incl. high-pressure test certified by factory certificate to EN10204-2.2	

7MF9411-5CA valve manifold on differential pressure transmitters



Add -Z to the Order No. of the transmitter and add order codes.	Order code
SITRANS P DSIII 7MF443. und 7MF453. ¹⁾	
mounted with gaskets made of PTFE and screws made of	
• chromized steel	U03
• stainless steel	U04
Delivery incl. high-pressure test certified by factory certificate to EN10204-2.2	
Further designs:	
Delivery includes mounting bracket and mounting clips made of	
• steel	A01
• stainless steel	A02
(instead of the mounting bracket supplied with the transmitter)	
Supplied acceptance test certificate to EN10204-3.1 for transmitters and mounted valve manifold	C12
Oil and grease-free cleaning for oxygen operation	E10

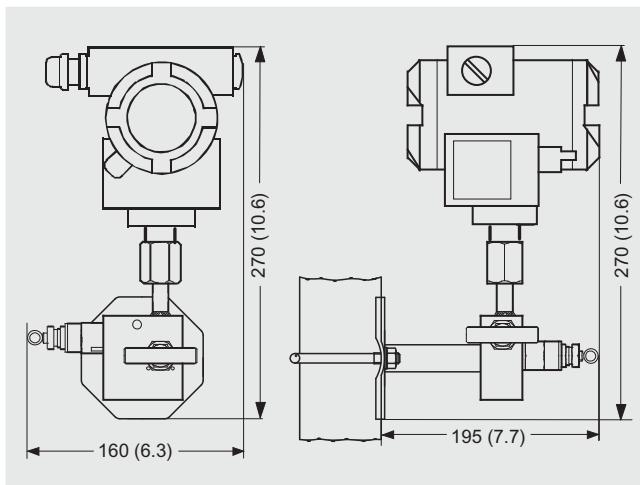
¹⁾ For 7MF453. transmitters, you require a 7/10-20 UNF connection thread in the process flange.

Dimensional drawings

Valve manifolds mounted on SITRANS P DS III



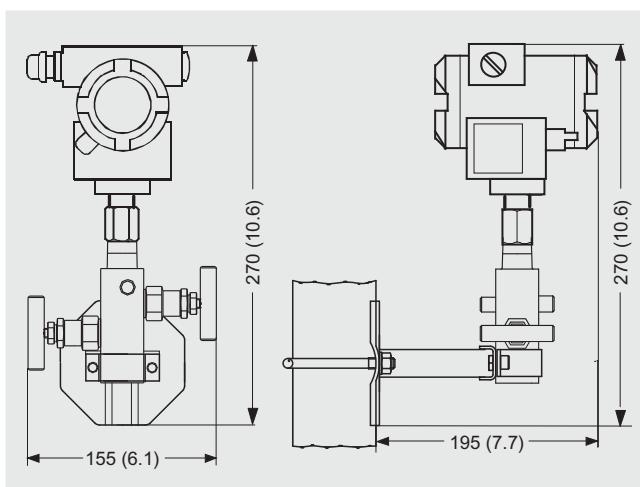
Valve manifold 7MF9011-4EA with mounted relative pressure and absolute pressure transmitters



Valve manifold 7MF9011-4EA with mounted relative pressure and absolute pressure transmitters, dimensions in mm (inch)



Valve manifold 7MF9011-4FA with mounted relative pressure and absolute pressure transmitters



Valve manifold 7MF9011-4FA with mounted relative pressure and absolute pressure transmitters, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

SITRANS P Accessories

Factory-mounting of valve manifolds on SITRANS P transmitters

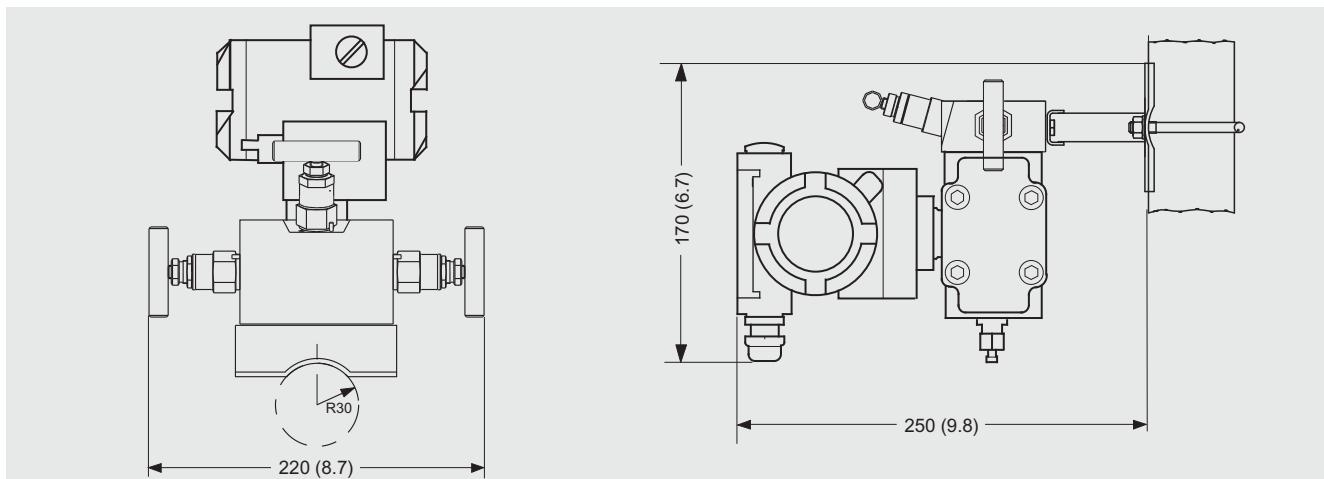
2



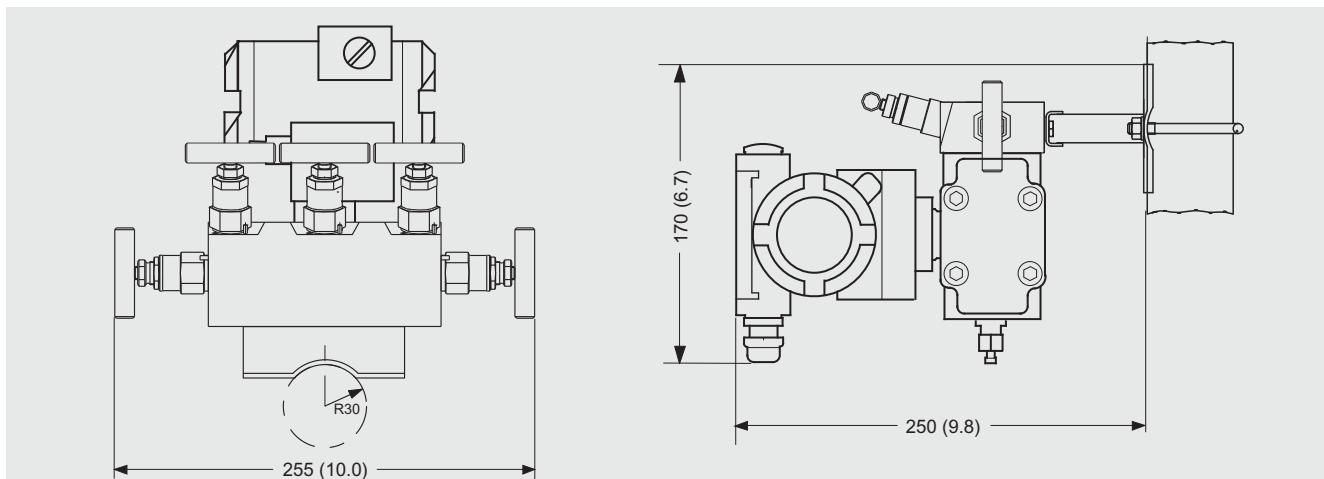
Valve manifold 7MF9411-5BA with mounted differential pressure transmitter



Valve manifold 7MF9411-5CA with mounted differential pressure transmitter



Valve manifold 7MF9411-5BA with mounted differential pressure transmitter, dimensions in mm (inch)



Valve manifold 7MF9411-5CA with mounted differential pressure transmitter, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

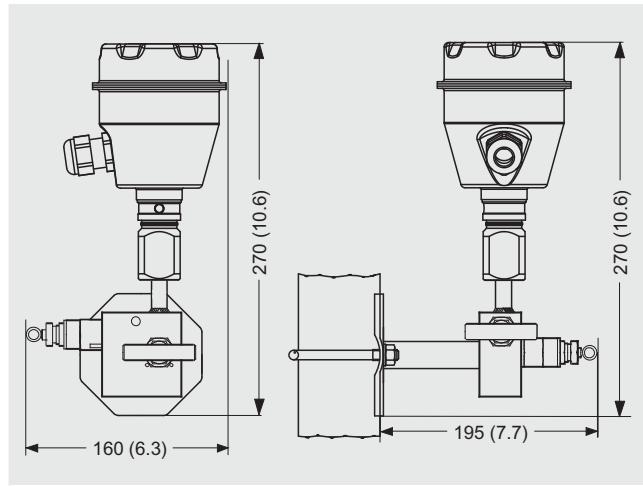
SITRANS P Accessories

Factory-mounting of valve manifolds on SITRANS P transmitters

Valve manifolds mounted on SITRANS P300



Valve manifold 7MF9011-4EA with mounted relative pressure and absolute pressure transmitters



2

Valve manifold 7MF9011-4EA with mounted relative pressure and absolute pressure transmitters, dimensions in mm (inch)



Valve manifold 7MF9011-4FA with mounted relative pressure and absolute pressure transmitters



Valve manifold 7MF9011-4FA with mounted relative pressure and absolute pressure transmitters, dimensions in mm

SITRANS P measuring instruments for pressure

Transmitters for hydrostatic level

MPS series (submersible sensor)

Overview



SITRANS P pressure transmitters, MPS series (submersible sensor)

SITRANS P pressure transmitters, MPS series, are submersible sensors for hydrostatic level measurements.

The pressure transmitters of the MPS series are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

Benefits

- Compact design
- Simple installation
- Small error in measurement (0.3%)
- Degree of protection IP68

Application

SITRANS P pressure transmitters, MPS series, are used in the following branches for example:

- Oil and gas industries
- Shipbuilding
- Water supply

Design

SITRANS P pressure transmitters, MPS series, have a flush-mounted piezo-resistive sensor with stainless steel diaphragm.

These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel housing. The cable also contains a strength cord and vent pipe.

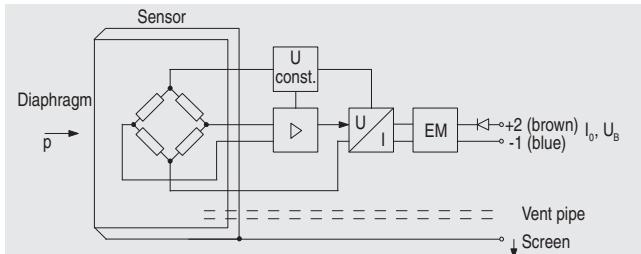
The diaphragm is protected against external influences by a protective cap.

The sensor, electronic circuit and cable are sealed in a common housing of small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

Function

SITRANS P pressure transmitters, MPS series, are for measuring the liquid levels in wells, tanks, channels and dams.



SITRANS P pressure transmitters, MPS series, mode of operation and wiring diagram

On one side of the sensor, the diaphragm is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe in the connection cable.

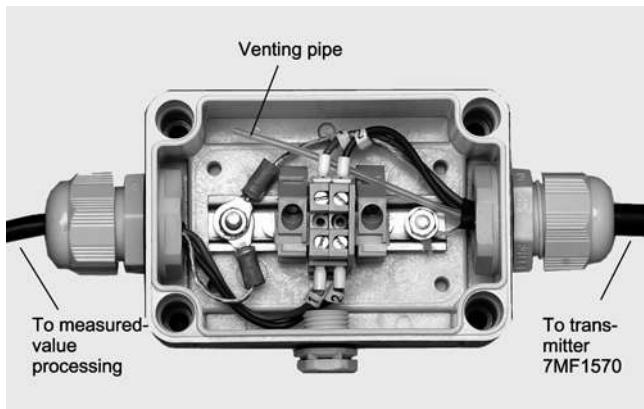
The hydrostatic pressure of the liquid column acts on the sensor diaphragm, and transmits the pressure to the piezo-resistive bridge in the sensor.

The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The cable of the 7MF1570 transmitter must always be connected in the supplied junction box. The junction box has to be installed near the measuring point.

If the medium is anything other than water, it is also necessary to check compatibility with the specified materials of the transmitter.

Integration



Junction box 7MF1570-8AA, opened

SITRANS P measuring instruments for pressure

Transmitters for hydrostatic level

MPS series (submersible sensor)



Measuring point setup, in principle

2

Technical specifications

SITRANS P pressure transmitters, MPS series (submersible sensor)

Mode of operation

Measuring principle	Piezo-resistive
---------------------	-----------------

Input

Measured variable	Hydrostatic level
Measuring range	Maximum working pressure
• 0 ... 2 mH ₂ O (0 ... 6 ftH ₂ O)	• 1.4 bar (20.3 psi) (corresponds to 14 mH ₂ O (42 ftH ₂ O))
• 0 ... 4 mH ₂ O (0 ... 12 ftH ₂ O)	• 1.4 bar (20.3 psi) (corresponds to 14 mH ₂ O (42 ftH ₂ O))
• 0 ... 5 mH ₂ O (0 ... 15 ftH ₂ O)	• 1.4 bar (20.3 psi) (corresponds to 14 mH ₂ O (42 ftH ₂ O))
• 0 ... 6 mH ₂ O (0 ... 18 ftH ₂ O)	• 3.0 bar (43.5 psi) (corresponds to 30 mH ₂ O (90 ftH ₂ O))
• 0 ... 10 mH ₂ O (0 ... 30 ftH ₂ O)	• 3.0 bar (43.5 psi) (corresponds to 30 mH ₂ O (90 ftH ₂ O))
• 0 ... 20 mH ₂ O (0 ... 60 ftH ₂ O)	• 6.0 bar (87.0 psi) (corresponds to 60 mH ₂ O (180 ftH ₂ O))

Output

Output signal	4 ... 20 mA
---------------	-------------

Accuracy

Error in measurement (including non-linearity, hysteresis and repeatability, at 25 °C (77 °F))	To EN 60770-1
	0.3% of full-scale value (typical)

Influence of ambient temperature

Zero and span	
• 1 ... 6 mH ₂ O (3 ... 18 ftH ₂ O)	0.45%/10 K of full-scale value
• ≥ 6 mH ₂ O (≥ 18 ftH ₂ O)	0.3%/10 K of full-scale value

Long-term stability

Zero and span

• 1 ... 6 mH ₂ O (3 ... 18 ftH ₂ O)	0.25% of full-scale value/year
• ≥ 6 mH ₂ O (≥ 18 ftH ₂ O)	0.2% of full-scale value/year

Rated operating conditions

Ambient conditions

• Process temperature	-10 ... +80 °C (+14 ... +176 °F)
• Storage temperature	-40 ... +100 °C (-40 ... +212 °F)

Degree of protection to DIN EN 60529

IP68

Design

Weight

• Pressure transmitters	≈ 0.4 kg (≈ 0.88 lb)
• Cable	0.08 kg/m (≈ 0.054 lb/ft)

Electrical connection

Cable with 2 conductors with screen and vent pipe, strength cord (max. 300 N (67.44 lbf)

Material

• Seal diaphragm	Stainless steel, mat. No. 1.4571/316 Ti
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• Casing	Stainless steel, mat. No. 1.4571/316 Ti
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• Gasket	Viton
----------	-------

• Connecting cable	Optionally PE/HFFR sheath (non-halogen) or FEP sheath
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Power supply

Terminal voltage on pressure transmitter (U_B) 10 ... 36 V DC

Certificate and approvals

The transmitter is not subject to the pressure equipment directive (DGRL 97/23/EC)

Explosion protection

• Intrinsic safety "i"	TÜV 03 ATEX 2004X
- Identification	Ex II 1 G EEx ia IIC T4

Junction box

Application	For connecting the transmitter cable
-------------	--------------------------------------

Design

Weight 0.2 kg (0.44 lb)

Electrical connection 2 x 3-way (28 ... 18 AWG)

Cable entry 2 x M20x1.5

Enclosure material Polycarbonate

Vent pipe for atmospheric pressure

Screw for cable strength cord

Rated operating conditions

Degree of protection to DIN EN 60529	IP54
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Cable hanger

Application	For mounting the transmitter
-------------	------------------------------

Design

Weight 0.16 kg (0.35 lb)

Material Galvanized steel, polyamide

SITRANS P measuring instruments for pressure

Transmitters for hydrostatic level

MPS series (submersible sensor)

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for pressure, MPS series (submersible sensor)		C) 7MF1570 - A0
2-wire system		1
Note: Junction box and cable hanger included in delivery		5
Cable material		
PE	►	
FEP	►	1
Measuring range	Cable length L	
0 ... 2 mH ₂ O	10 m	► C
0 ... 4 mH ₂ O	10 m	► D
0 ... 5 mH ₂ O	25 m	► B
0 ... 6 mH ₂ O	25 m	► E
0 ... 10 mH ₂ O	25 m	► F
0 ... 20 mH ₂ O	25 m	► G
0 ... 6 ftH ₂ O	32 ft	► K
0 ... 12 ftH ₂ O	32 ft	► L
0 ... 18 ftH ₂ O	82 ft	► M
0 ... 30 ftH ₂ O	82 ft	► N
0 ... 60 ftH ₂ O	82 ft	► P
Special measuring range/Special cable length ¹⁾		Z
Specify measuring range and cable length in plain text		J 1 Y
Explosion protection		
• without	►	1
• with, type of protection "Intrinsic safety" (Ex II 1 G EEx ia IIC T4)	►	2
• With approval for drinking water to WRAS and ACS	C)	6
Further designs	Order code	
Quality inspection certificate (Factory calibration) to IEC 60770-2, add "-Z" to Order No. and Order code.	C11	
Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied later, specify factory no. of transmitter for this purpose.	Order No.	
7MF1564-8CC11		
Accessories (as spare parts)		
Junction box for connecting the transmitter cable	7MF1570-8AA	
Cable hanger for mounting the pressure transmitter	7MF1570-8AB	

► Available ex stock

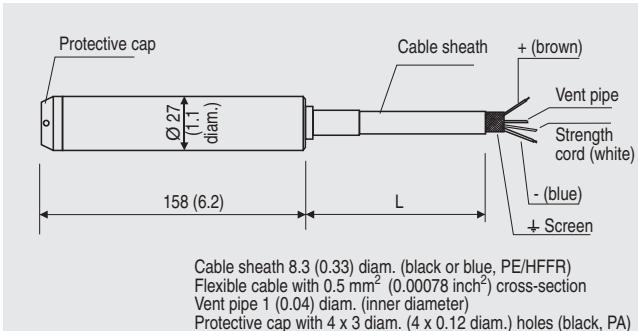
Power supply units see "SITRANS I power supply units and input isolators".

1) Special measuring ranges between 0 ... 1 mH₂O (0 ... 3 ftH₂O) and 0 ... 200 mH₂O (0 ... 656 ftH₂O) and special cable lengths up to 1000 m (3281ft) are possible. With Ex versions the max. special cable length is 50 m (150 ft). The length of free-hanging cable should not exceed 375 m.

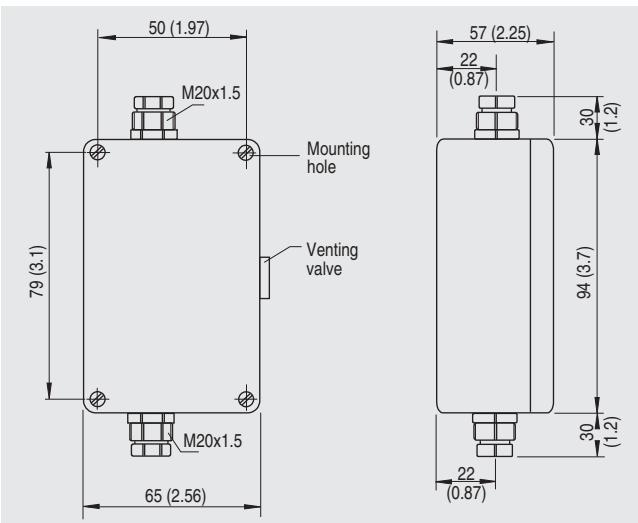
C) Subject to export regulations AL: N, ECCN: EAR99.

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

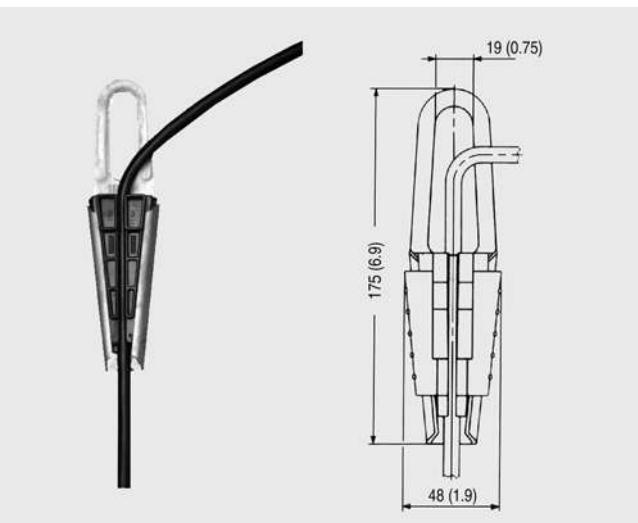
Dimensional drawings



SITRANS P pressure transmitters, MPS series, dimensions in mm (inch)



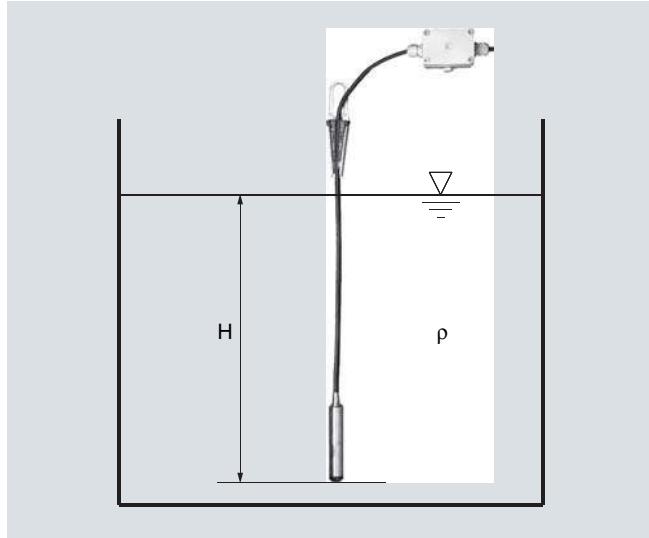
Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

More information

Determination of the measuring range in case of media with a density $\neq 1000 \text{ kg/m}^3$ (medium \neq water)



2

Calculation of the measuring range:

$$p = \rho \times g \times H$$

with:

ρ = density of medium

g = local acceleration due to gravity

H = maximum level

Example:

Medium: Diesel fuel = 850 kg/m^3

Acceleration due to gravity: 9.81 m/s^2

Start-of-scale : 0 m

Maximum level: 6,2 m

Calculation:

$$p = 850 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 6.2 \text{ m}$$

$$p = 51698.7 \text{ N/m}^2$$

$$p = 517 \text{ mbar}$$

Transmitter to be ordered:

7MF1570-5ZA02-Z

J1Y: 0 ... 517 mbar; able length e.g. 8 m

SITRANS P measuring instruments for pressure

Remote seals for transmitters and pressure gages

Technical description

Overview

In many cases the pressure transmitter and the measured medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the following SITRANS P pressure transmitter series:

- Pressure (P300, DS III, DS III PA, DS III FF)
- Absolute pressure (P300, DS III, DS III PA, DS III FF)
- Differential pressure and flow (DS III, DS III PA, DS III FF)

Note

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical data". Only then will the remote seal work to optimum effect.

Benefits

- No direct contact between the pressure transmitter and the medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

Application

Remote seal systems should be used if a separation between the measured medium and the measuring instrument is essential or appropriate.

Examples of such cases:

- The temperature of the medium is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials which are not available for the pressure transmitter.
- The medium is highly viscous or contains solids which would Siemens FI 01 · 2009 block the measuring chambers of the pressure transmitter.
- The medium may freeze in the measuring chambers or pulse line.
- The medium is heterogeneous or fibrous.
- The medium tends towards polymerization or crystallization.
- The process requires quick-release remote seals, as necessary e.g. in the food industry for fast cleaning.
- The process requires cleaning of the measuring point, e.g. in a batch process.

Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between pressure transmitter and remote seal (direct mounting or by means of capillary)

The volume in contact with the measured medium is terminated by a flat elastic diaphragm lying in a bed. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary has to be connected between the remote seal and the pressure transmitter in order e.g. to minimize temperature effects on the latter when hot media are involved.

However, the capillary influences the response time and the temperature response of the complete remote seal system. Two ca-

pillaries of equal length must always be used to connect a remote seal to a pressure transmitter for differential pressure.

The remote seal can be optionally equipped with a projecting diaphragm (tube).

Remote seals of sandwich design are fitted with a dummy flange.

Designs

Diaphragm seal

With diaphragm seals, the pressure is measured by means of a flat diaphragm which rests in a bed.

The following types of diaphragm seals exist:



Diaphragm seal of sandwich design without (left) and with a projecting diaphragm (tube)

- Sandwich design
- Sandwich design with projecting diaphragm (tube) to DIN or ASME which are secured using a dummy flange.



Diaphragm seal of flange design without (left) and with a projecting diaphragm (tube)

- Flange design
- Flange design with projecting diaphragm (tube) to DIN or ASME, secured using holes in the flange.



Quick-release diaphragm seal

- Quick-release remote seals, e.g. to DIN 11851, SMS standard, IDF standard, APV RJT standard, clamp connection, etc.
 - Miniature diaphragm seal with male thread for screwing into tapped holes
 - Remote seals with customer-specific process connections



Miniature diaphragm seal with diaphragm flush with front

- **Miniature diaphragm seals**

The quick-release remote seals are used above all in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismantling is possible for cleaning.

Clamp-on seal



Clamp-on seal with quick-release design (left) and for flange mounting

With clamp-on seals, the pressure is first measured using a cylindrical diaphragm positioned in a pipe, and then transmitted to the pressure transmitter by means of the filling liquid.

The clamp-on seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. Furthermore, the clamp-on seal can be cleaned by a pig.

The following types of clamp-on seals exist:

- Quick-release clamp-on seals, e.g. to DIN 11851, SMS standard, IDF standard, APV/RJT standard, clamp connection etc. The quick-release facility attached to the remote seal enables the seal to be removed quickly for cleaning purposes.
- Clamp-on seals for flanging to EN or ASME.
- Clamp-on seals with customer-specific process connections.

Note:

The pressure data on the transmitter and the remote seal must be observed with regard to pressure/temperature behavior.

Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the transmitter, are filled gas-free by the filling liquid.

Transmission response

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

Temperature error

Temperature errors are caused by the change of volume of the filling liquid due to temperature variations. To select the right remote seal you must calculate the temperature error.

Below you will find an overview of the factors which influence the size of the temperature error, as well as information on how to calculate the temperature error.

The temperature error is dependent on the following variables:

- Rigidity of the diaphragm used
- Filling liquid used
- Influence of the filling liquid underneath the process flanges or in the connection shank of the pressure transmitter
- Internal diameter of the capillary: The bigger the internal diameter, the bigger the temperature error
- Length of the capillary: The longer the capillary, the bigger the temperature error

Diaphragm rigidity

The rigidity of the diaphragm is of decisive importance. The bigger the diameter of the diaphragm, the softer the diaphragm and the more sensitively it reacts to temperature-induced changes in volume of the filling liquid.

The result is that small measuring ranges are only possible with large diaphragm diameters.

Other factors apart from diaphragm rigidity which also play a role:

- Diaphragm thickness
- Diaphragm material
- Coatings if present

Filling liquid

Every filling liquid reacts to temperature variations with a change of volume. Temperature errors can be minimized by selecting a suitable filling liquid, but the filling liquid must also be appropriate for the temperature limits and operating pressure. Furthermore, the filling liquid must also be physiologically harmless.

Since the filling liquid is present under the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank), the temperature error must be calculated separately for each combination.

Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof remote seal (see Selection and Ordering data).

An example of a temperature error calculation can be found in the section "Technical Specifications".

SITRANS P measuring instruments for pressure

Remote seals for transmitters and pressure gages

Technical description

Response time

The response time is dependent on the following factors:

- Internal diameter of the capillary: The bigger the internal diameter, the shorter the response time
- Viscosity of the filling liquid The greater the viscosity, the longer the response time
- Length of the capillary: The longer the capillary, the longer the response time
- Pressure in the pressure measuring system: The higher the pressure, the shorter the response time

Recommendations

The following should be observed to obtain an optimum combination of transmitter and remote seal:

- Choose the biggest possible diameter for the remote seal. The effective diameter of the seal diaphragm is then bigger and the temperature error smaller.
- Choose the shortest possible capillary. The response time is then shorter and the temperature error smaller
- Choose the filling liquid with the least viscosity and the smallest coefficient of expansion. Make sure, however, that the filling liquid meets the process requirements with regard to pressure, vacuum and temperature. And ensure that the filling liquid and the medium are compatible with one another.
- Note the following points for use in the vacuum range:
 - The pressure transmitter must always be positioned below the lowest spigot.
 - The operating range of some filling liquids is very limited with regard to the permissible temperature of the medium.
 - A vacuum-proof seal is necessary for continuous operation in the low-pressure range.
- Recommendations for the minimum span can be found in the section "Technical data".

Note

The remote seals listed here are a selection of the most common designs. On account of the large variety of process connections, certain remote seals which are not listed here may be available nevertheless.

Other versions can be:

- Other process connections, standards
- Aseptic or sterile connections
- Other dimensions
- Other nominal pressures
- Special diaphragm materials, including coatings
- Other sealing faces
- Other filling liquids
- Other capillary lengths
- Sheathing of capillaries with protective hose
- Calibration at higher/lower temperatures etc.

Please contact your Siemens Regional Office for more information.

SITRANS P measuring instruments for pressure

Remote seals for transmitters and pressure gages

Technical description

Technical specifications

Temperature error Diaphragm seals

Temperature errors of diaphragm seals when connected to pressure transmitters for pressure, absolute pressure, differential pressure (single-sided) and level

	Nominal diameter/ design	Diaphragm diameter	Temperature error of remote seal	Temperature error of capillary		Temperature error of process flange/connec- tion spigot	Recommended min. spans (guidance values, observe temp. error)				
				mm	(inch)	mbar/ 10 K	(psi/ 10 K)	mbar/ (10 K · m _{Kap})	(psi/ (10 K · m _{Kap})	mbar	(psi)
Sandwich design or with flange to EN 1092-1	DN 50 without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	DN 50 with tube	48	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	DN 80 without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	DN 80 with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	DN 100 without tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 100 with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 125 without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
	DN 125 with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
Sandwich design or with flange to ASME B16.5	2 inch without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	2 inch with tube	48	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	3 inch without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	3 inch with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	4 inch without tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	4 inch with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	5 inch without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
	5 inch with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
Remote seal with union nut to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Remote seal with threaded socket to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Clamp connec- tion	1½ inch	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	2 inch	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	2½ inch	59	(2.32)	3	(0.044)	5	(0.073)	5	(0.073)	500	(7.25)
	3 inch	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Miniature dia- phragm seal	G1B	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	G1½B	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	G2B	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Half the values apply to glycerin/water mixture as the filling liquid.
- Values apply to stainless steel as the diaphragm material.

SITRANS P measuring instruments for pressure

Remote seals for transmitters and pressure gages

Technical description

Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

Nominal diameter/ design		Diaphragm diameter	Temperature error of remote seal	Temperature error of capillary	Temperature error of process flange/connec- tion spigot	Recommended min. spans (guidance values, observe temperature error)
		mm (inch)	mbar/ 10 K (psi/ 10 K)	mbar/ (10 K · m _{Kap}) (psi/ (10 K · m _{Kap}))	mbar/ 10 K (psi/ 10 K)	mbar (psi)
Sandwich design or with flange to EN 1092-1	DN 50 without tube	59 (2.32)	0.3 (0.0043)	0.3 (0.0045)	0.3 (0.0045)	250 (3.626)
	DN 50 with tube	48 (1.89)	1.26 (0.018)	1.7 (0.025)	1.7 (0.025)	250 (3.626)
	DN 80 without tube	89 (3.50)	0.05 (0.001)	0.05 (0.001)	0.05 (0.0007)	50 (0.725)
	DN 80 with tube	72 (2.83)	0.24 (0.004)	0.17 (0.003)	0.17 (0.003)	100 (1.45)
	DN 100 without tube	89 (3.50)	0.1 (0.002)	0.07 (0.001)	0.07 (0.001)	50 (0.725)
	DN 100 with tube	89 (3.50)	0.1 (0.002)	0.07 (0.001)	0.07 (0.001)	50 (0.725)
	DN 125 without tube	124 (4.88)	0.05 (0.001)	0.03 (0.0004)	0.03 (0.0004)	20 (0.29)
	DN 125 with tube	124 (4.88)	0.05 (0.001)	0.03 (0.0004)	0.03 (0.0004)	20 (0.29)
Sandwich design with flange to ASME B16.5	2 inch without tube	59 (2.32)	0.3 (0.0043)	0.3 (0.0043)	0.3 (0.0045)	250 (3.626)
	2 inch with tube	48 (1.89)	1.26 (0.018)	1.7 (0.025)	1.7 (0.025)	250 (3.626)
	3 inch without tube	89 (3.50)	0.05 (0.001)	0.05 (0.0007)	0.05 (0.0007)	50 (0.725)
	3 inch with tube	72 (2.83)	0.24 (0.004)	0.17 (0.003)	0.17 (0.003)	100 (1.45)
	4 inch without tube	89 (3.50)	0.1 (0.002)	0.07 (0.001)	0.07 (0.001)	50 (0.725)
	4 inch with tube	89 (3.50)	0.1 (0.002)	0.07 (0.001)	0.07 (0.001)	50 (0.725)
	5 inch without tube	124 (4.88)	0.05 (0.001)	0.03 (0.0004)	0.03 (0.0004)	20 (0.29)
	5 inch with tube	124 (4.88)	0.05 (0.001)	0.03 (0.0004)	0.03 (0.0004)	20 (0.29)
Remote seal with union nut to DIN 11851	DN 50	52 (2.05)	1 (0.015)	0.83 (0.012)	0.83 (0.012)	250 (3.626)
	DN 65	59 (2.32)	0.7 (0.010)	0.67 (0.010)	0.67 (0.010)	250 (3.626)
	DN 80	72 (2.83)	0.24 (0.004)	0.17 (0.003)	0.17 (0.003)	100 (1.450)
Remote seal with threaded socket to DIN 11851	DN 50	52 (2.05)	1 (0.015)	0.83 (0.012)	0.83 (0.012)	250 (3.626)
	DN 65	59 (2.32)	0.7 (0.010)	0.67 (0.010)	0.67 (0.010)	250 (3.626)
	DN 80	72 (2.83)	0.24 (0.004)	0.17 (0.003)	0.17 (0.003)	100 (1.450)
Clamp connec- tion	2 inch	40 (1.57)	1 (0.015)	2.5 (0.036)	2.5 (0.036)	2000 (29.01)
	2½ inch	59 (2.32)	0.7 (0.010)	0.67 (0.010)	0.67 (0.010)	250 (3.626)
	3 inch	72 (2.83)	0.24 (0.004)	0.17 (0.003)	0.17 (0.003)	100 (1.450)

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed)
- Half the values apply to glycerin/water mixture as the filling liquid
- Values apply to stainless steel as the diaphragm material.

SITRANS P measuring instruments for pressure

Remote seals for transmitters and pressure gages

Technical description

Temperature error Clamp-on seals

Temperature errors of clamp-on seals when connected to pressure transmitters for pressure and absolute pressure, and with single-sided connection to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal	Temperature error of capillary	Temperature error of pro- cess flange/connection spigot	Recommended min. spans (guidance values, observe temperature error)
	mbar/10 K (psi/10 K)	mbar/10 K (psi/10 K)	mbar/10 K (psi/10 K)	mbar (psi)
DN 25 (1 inch)	6.0 (0.0870)	8.5 (0.123)	8.5 (0.123)	1000 (14.5)
DN 40 (1½ inch)	4.5 (0.065)	4.5 (0.065)	4.5 (0.065)	250 (3.63)
DN 50 (2 inch)	4.0 (0.058)	3.0 (0.044)	3.0 (0.044)	100 (1.45)
DN 80 (3 inch)	9.5 (0.138)	5.0 (0.073)	5.0 (0.073)	100 (1.45)
DN 100 (4 inch)	8.0 (0.012)	3.0 (0.044)	3.0 (0.044)	100 (1.45)

Temperature errors of clamp-on seals with double-sided connection to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal	Temperature error of capillary	Temperature error of pro- cess flange/connection spigot	Recommended min. spans (guidance values, observe temperature error)
	mbar/10 K (psi/10 K)	mbar/10 K (psi/10 K)	mbar/10 K (psi/10 K)	mbar (psi)
DN 25 (1 inch)	2.3 (0.033)	1.8 (0.026)	1.8 (0.026)	1000 (14.5)
DN 40 (1½ inch)	0.8 (0.012)	0.3 (0.004)	0.3 (0.004)	250 (3.63)
DN 50 (2 inch)	0.3 (0.004)	0.1 (0.002)	0.1 (0.002)	100 (1.45)
DN 80 (3 inch)	3.0 (0.044)	0.5 (0.007)	0.5 (0.007)	100 (1.45)
DN 100 (4 inch)	1.0 (0.015)	0.1 (0.002)	0.1 (0.002)	100 (1.45)

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Half the values apply to glycerin/water mixture as the filling liquid.
- Values apply to stainless steel as the diaphragm material.
- Diaphragm thickness 0.05 mm (0.002 inch) for DN 25/DN 40/DN 50 and 0.1 mm (0.004 inch) for DN 80/DN 100

SITRANS P measuring instruments for pressure

Remote seals for transmitters and pressure gages

Technical description

Calculation of the temperature error

The following equation is used to calculate the temperature error:

$$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{TR} - \vartheta_{Cal}) \cdot f_{PF}$$

dp	Additional temperature error (mbar)
ϑ_{RS}	Temperature on remote seal diaphragm (generally corresponds to temperature of medium)
ϑ_{Cal}	Calibration (reference) temperature (20 °C (68 °F))
f_{RS}	Temperature error of remote seal
ϑ_{Cap}	Ambient temperature on the capillaries
l_{Cap}	Capillary length
f_{Cap}	Temperature error of capillaries
ϑ_{TR}	Ambient temperature on pressure transmitter
f_{PF}	Temperature error of the oil filling in the process flanges of the pressure transmitter

Example of temperature error calculation

Existing conditions

SITRANS P pressure transmitter for differential pressure, 250 mbar, set to 0 ... 100 mbar, with DN 80 remote seal diaphragms without tube, diaphragm made of stainless steel, mat. No. 1.4404/316L

Capillary length	$l_{Cap} = 6 \text{ m (19.7 ft)}$
Capillaries fitted on both sides	$f_{Cap} = 0.07 \text{ mbar}/(10 \text{ K} \cdot m_{Cap})$ (0.001 psi/(10 K · m _{Cap}))
Filling liquid silicone M5	$f_{PF} = 0.07 \text{ mbar}/10 \text{ K}$ (0.001 psi/10 K)
Process temperature	$\vartheta_{RS} = 100 \text{ °C (212 °F)}$
Temperature on the capillaries	$\vartheta_{Cap} = 50 \text{ °C (122 °F)}$
Temperature on pressure transmitter	$\vartheta_{TR} = 50 \text{ °C (122 °F)}$
Calibration temperature	$\vartheta_{Cal} = 20 \text{ °C (68 °F)}$

Required

Additional temperature error of remote seals dp

Calculation

in mbar

$$dp = (100 \text{ °C} - 20 \text{ °C}) \cdot 0.1 \text{ mbar}/10 \text{ K} + (50 \text{ °C} - 20 \text{ °C}) \cdot 6 \text{ m} \cdot 0.07 \text{ mbar}/(10 \text{ K} \cdot \text{m}) + (50 \text{ °C} - 20 \text{ °C}) \cdot 0.07 \text{ mbar}/10 \text{ K}$$

$$dp = 0.8 \text{ mbar} + 1.26 \text{ mbar} + 0.21 \text{ mbar}$$

in psi

$$dp = (212 \text{ °F} - 68 \text{ °F}) \cdot 0.0014 \text{ psi}/10 \text{ K} + (112 \text{ °F} - 68 \text{ °F}) \cdot 19.7 \text{ ft} \cdot 0.001 \text{ psi}/(10 \text{ K} \cdot 3.28 \text{ ft}) + (112 \text{ °F} - 68 \text{ °F}) \cdot (0.001 \text{ psi}/10 \text{ K})$$

$$dp = 0.012 \text{ psi} + 0.018 \text{ psi} + 0.003 \text{ psi}$$

Result

dp = 2.27 mbar (0.033 psi) (corresponds to 2.27% of set span)

Note

The determined temperature error only applies to the error resulting from connection of the remote seal.

The transmission response of the respective transmitter is not included in this consideration.

It must be calculated separately, and the resulting error added to the error determined above from connection of the remote seal.

Dependence of temperature error on diaphragm material

The temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

Diaphragm material	Change in temperature error of remote seal
Stainless steel	Increase in values by
Hastelloy C4, mat. No. 2.4610	See previous tables
Hastelloy C276, mat. No. 2.4819	50%
Monel 400, mat. No. 2.4360	60%
Tantalum	50%
Titanium	50%
PTFE coating on stainless steel diaphragm	80%
ECTFE coating or PFA coating on stainless steel diaphragm	100%
Gold coating on stainless steel diaphragm	40%

Maximum temperature of medium

The following maximum temperatures of the medium apply depending on the material of the wetted parts:

Material	$p_{abs} < 1 \text{ bar (14.5 psi)}$		$p_{abs} > 1 \text{ bar (14.5 psi)}$	
	°C	(°F)	°C	(°F)
Stainless steel, 316L	200	(392)	400	(662)
PTFE coating	200	(392)	260	(500)
ECTFE coating	100	(212)	150	(302)
PFA coating	200	(392)	260	(500)
Hastelloy C4, mat. No. 2.4610	200	(392)	260	(500)
Hastelloy C276, mat. No. 2.4819	200	(392)	400	(662)
Monel 400, mat. No. 2.4360	200	(392)	400	(662)
Tantalum	200	(392)	300	(572)

Maximum capillary length for diaphragm seals (guidance values)

Nom. diam.	Max. length of capillary			
	Diaphragm seal		Clamp-on seal	
	m	(ft)	m	(ft)
DN 25 (1 inch)	2.5	(8.2)	2.5	(8.2)
DN 32 (1 1/4 inch)	2.5	(8.2)	2.5	(8.2)
DN 40 (1 1/2 inch)	4	(13.1)	6	(19.7)
DN 50 (2 inch)	6	(19.7)	10	(32.8)
DN 65 (2 1/2 inch)	8	(26.2)	10	(32.8)
DN 80 (3 inch)	10	(32.8)	10	(32.8)
DN 100 (4 inch)	10	(32.8)	10	(32.8)
DN 125 (5 inch)	10	(32.8)	-	-

SITRANS P measuring instruments for pressure

Remote seals for transmitters and pressure gages

Technical description

Response times

The values listed in the following table are the response times (in seconds per meter of capillary) for a change in pressure which corresponds to the set span.

The listed values must be multiplied by the respective length of the capillary, or with transmitters for differential pressure and flow by the total length of both capillaries.

Filling liquid	Density	Temperature on capillary	Response time in s/m (s/ft) with max. span of pressure transmitter					
Silicone oil M5	0.914 (0.033)	kg/dm ³ (lb/in ³)	°C (°F)	250 mbar (3.63 psi)	600 mbar (8.7 psi)	1600 mbar (23.2 psi)		
		+60 (140)	0.06	(0.018)	0.02	(0.006)	0.01	(0.003)
		+20 (68)	0.11	(0.034)	0.02	(0.006)	0.02	(0.006)
Silicone oil M50	0.966 (0.035)	-20 (-4)	0.3	(0.091)	0.12	(0.037)	0.05	(0.015)
		+60 (140)	0.6	(0.183)	0.25	(0.076)	0.09	(0.027)
		+20 (68)	0.61	(0.186)	0.26	(0.079)	0.1	(0.030)
High-temperature oil	1.070 (0.039)	-20 (-4)	1.69	(0.515)	0.71	(0.216)	0.27	(0.082)
		+60 (140)	0.14	(0.043)	0.06	(0.018)	0.02	(0.006)
		+20 (68)	0.65	(0.198)	0.27	(0.082)	0.1	(0.030)
Halocarbon oil	1.968 (0.071)	-10 (14)	3.96	(1.207)	1.65	(0.503)	0.62	(0.189)
		+60 (140)	0.07	(0.021)	0.03	(0.009)	0.01	(0.003)
		+20 (68)	0.29	(0.088)	0.12	(0.037)	0.05	(0.015)
Food oil (FDA listed)	0.920 (0.033)	-20 (-4)	2.88	(0.878)	1.2	(0.366)	0.45	(0.137)
		+60 (140)	0.75	(0.229)	0.33	(0.101)	0.17	(0.052)
		+20 (68)	4	(1.220)	1.75	(0.534)	0.67	(0.204)
Glycerin/water	1.220 (0.044)	-20 (-4)	20	(6.100)	8.5	(2.593)	3.25	(0.991)
		+60 (140)	0.13	(0.040)	0.05	(0.015)	0.02	(0.006)
		+20 (68)	0.76	(0.232)	0.32	(0.098)	0.12	(0.037)
		0 (32)	9.72	(2.963)	4.05	(1.234)	1.51	(0.460)

Technical data of filling liquids

When selecting the filling liquid, check that it is suitable with respect to the permissible temperature of the medium and the process pressure.

The response times are independent of the set span within the range of the respective transmitter. The response times are of insignificant importance for spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

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Filling liquid	Digit in Order No.	Permissible temperature of medium		Density at 20 °C (68 °F)	Viscosity at 20 °C (68 °F)	Coefficient of expansion		
		$p_{abs} < 1 \text{ bar}$	($p_{abs} < 14.5 \text{ psi}$)	$p_{abs} > 1 \text{ bar}$	($p_{abs} > 14.5 \text{ psi}$)			
		°C	(°F)	°C	(°F)	kg/dm ³ (lb/in ³)	$\text{m}^2/\text{s} \cdot 10^6$ (ft ² /s $\cdot 10^6$)	
Silicone oil M5	1	-60 ... +80	(-76 ... +176)	-90 ... +180	(-130 ... +356)	0.914 (0.03)	4 (43)	0.00108 (0.00060)
Silicone oil M50	2	-40 ... +150	(-40 ... +302)	-40 ... +250	(-40 ... +482)	0.96 (0.03)	50 (538)	0.00104 (0.00058)
High-temperature oil	3	-10 ... +200	(+14 ... +392)	-10 ... +350	(+14 ... +662)	1.07 (0.04)	39 (420)	0.00080 (0.00044)
Halocarbon oil	4	-40 ... +80	(-40 ... +176)	-40 ... +175	(-40 ... +347)	1.968 (0.07)	14 (151)	0.00086 (0.00048)
Glycerin/water	6	Not possible	Not possible	-10 ... +120	(+14 ... +248)	1.22 (0.04)	88 (947)	0.00050 (0.00028)
Food oil (FDA listed)	7	-20 ... +160	(-4 ... +320)	-20 ... +200	(-4 ... +392)	0.92 (0.03)	10 (107)	0.00080 (0.00044)

SITRANS P measuring instruments for pressure

Diaphragm seals of sandwich design

For gage, absolute, differential pressure and flow
with flexible capillary

Overview



Diaphragm seals of sandwich design

Technical specifications

Diaphragm seals of sandwich design

Nominal diameter	Nominal pressure
• DN 50	PN 16 ... PN 100
• DN 80	PN 16 ... PN 100
• DN 100	PN 16 ... PN 100
• DN 125	PN 16 ... PN 100
• 2 inch	Class 150 ... class 2500
• 3 inch	Class 150 ... class 2500
• 4 inch	Class 150 ... class 2500
• 5 inch	Class 150 ... class 2500
Sealing face	
• For stainless steel, mat. No. 1.4404/216L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel 316L
• Wetted parts	Stainless steel 316L
	• Without foil
	• PTFE (for vacuum on request)
	• ECTFE (for vacuum on request)
	• PFA (for vacuum on request)
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4610
	Tantalum
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral hose made of stainless steel, mat. No. 1.4301/316
Sealing material in the process flanges	
• For pressure transmitters, absolute pressure transmitters and low-pressure applications	Copper
• For other applications	Viton

Maximum pressure	See above and the technical data of the pressure transmitters
Tube length	Without tube as standard (tube available on request)
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	max. 2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	
	Silicone oil M5
	Silicone oil M50
	High-temperature oil
	Halocarbon oil (for measuring O ₂)
	Food oil (FDA listed)
	Glycerine/water (not suitable for use in low-pressure range)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal
	More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)

Certificate and approvals

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

Sealing material in the process flanges

• For pressure transmitters, absolute pressure transmitters and low-pressure applications

• For other applications

SITRANS P measuring instruments for pressure

Diaphragm seals of sandwich design

For gage, absolute, differential pressure and flow
with flexible capillary

2

Selection and Ordering data	Order No.	Ord.code	Selection and Ordering data	Order No.	Ord.code
Diaphragm seal			Diaphragm seal		
Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately):			Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately):		
for pressure 7MF403■ and 7MF423■ together with Order code "V01" (vacuum-proof design) and 7MF802■ ¹⁾ ; Scope of delivery (1 off)	D)	7 M F 4 9 0 0 -	for pressure 7MF403■ and 7MF423■ together with Order code "V01" (vacuum-proof design) and 7MF802■ ¹⁾ ; Scope of delivery (1 off)	D)	7 M F 4 9 0 0 -
for absolute pressure 7MF433■; Scope of delivery (1 off)	D)	7 M F 4 9 0 1 -	for absolute pressure 7MF433■; Scope of delivery (1 off)	D)	7 M F 4 9 0 1 -
for differential pressure and flow 7MF443■; scope of delivery 2 off	D)	7 M F 4 9 0 3 -	for differential pressure and flow 7MF443■; scope of delivery 2 off	D)	7 M F 4 9 0 3 -
Nominal diameter and nominal pressure			Length of capillary²⁾		
• DN 50 PN 16 ... 100 (recommended only for pressure transmitters for pressure)	A		• 1.0 m (3.28 ft)	2	
• DN 80 PN 16 ... 100	B		• 1.6 m (5.25 ft)	3	
• DN 100 PN 16 ... 100	C		• 2.5 m (8.20 ft)	4	
• DN 125 PN 16 ... 100	D		• 4.0 m (13.1 ft)	5	
• 2 inch Class 150 ... 2500 (recommended only for pressure transmitters for pressure)	E		• 6.0 m (19.7 ft)	6	
• 3 inch Class 150 ... 2500	H		• 8.0 m (26.25 ft)	7	
• 4 inch Class 150 ... 2500	L		• 10.0 m (32.8 ft)	8	
• 5 inch Class 150 ... 2500	N		Other version	9	N 1 y
Smooth sealing face to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA			Add Order code and plain text: Length of capillary: ...		
Other version	Z				
Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ... Sealing face: see "Technical data"					
Wetted parts materials					
• Stainless steel 316L - without foil - with PTFE coating - with ECTFE coating ²⁾ - with PFA coating	A				
• Monel 400, mat. No. 2.4360	E 0				
• Hastelloy C276, mat. No. 2.4819	F				
• Hastelloy C4, mat. No. 2.4610	D				
• Tantalum	G				
Other version	J				
Add Order code and plain text: Wetted parts materials: ...	U				
Tube length					
• without tube	K				
Other version:	Z				
Add Order code and plain text: Tube length: ...					
Filling liquid					
• Silicone oil M5	1				
• Silicone oil M50	2				
• High-temperature oil	3				
• Halocarbon oil (for measuring O ₂)	4				
• Glycerin/water ³⁾	6				
• Food oil (FDA listed)!	7				
Other version	9				
Add Order code and plain text: Filling liquid: ...	M 1 Y				

¹⁾With 7MF802■ and the measuring cells Q, S, T and U also order the vacuum-tight version.

²⁾For vacuum on request

³⁾Not suitable for use in low-pressure range.

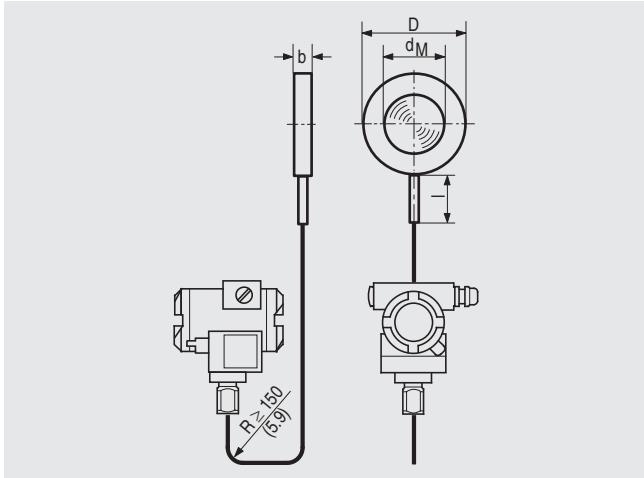
SITRANS P measuring instruments for pressure

Diaphragm seals of sandwich design

For gage, absolute, differential pressure and flow
with flexible capillary

2

Dimensional drawings



Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d _M	I
		mm	mm	mm	mm
DN 50	PN 16 ... PN 100	20	102	59	100
DN 80		20	138	89	100
DN 100		20	158	89	100
DN 125		22	188	124	100

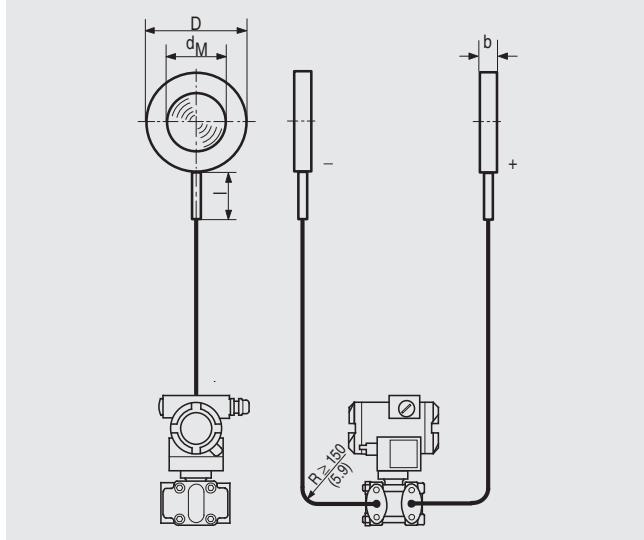
Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d _M	I
	lb/sq.in.	mm	mm	mm	mm
		(inch)	(inch)	(inch)	(inch)
2 inch	150 2500	20	100	59	100
		(0.79)	(3.94)	(2.32)	(3.94)
3 inch		20	134	89	100
		(0.79)	(5.28)	(2.32)	(3.94)
4 inch		20	158	89	100
		(0.79)	(6.22)	(2.32)	(3.94)
5 inch		22	186	124	100
		(0.87)	(7.32)	(4.88)	(3.94)

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d_M: Effective diaphragm diameter

Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)



Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d _M	I
		mm	mm	mm	mm
DN 50	PN 16 ... PN 100	20	102	59	100
DN 80		20	138	89	100
DN 100		20	158	89	100
DN 125		22	188	124	100

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d _M	I
	lb/sq.in.	mm	mm	mm	mm
		(inch)	(inch)	(inch)	(inch)
2 inch	150 ... 2500	20	100	59	100
		(0.79)	(3.94)	(2.32)	(3.94)
3 inch		20	134	89	100
		(0.79)	(5.28)	(2.32)	(3.94)
4 inch		20	158	89	100
		(0.79)	(6.22)	(2.32)	(3.94)
5 inch		22	186	124	100
		(0.87)	(7.32)	(4.88)	(3.94)

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d_M: Effective diaphragm diameter

Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Diaphragm seals of flange design

For gage, absolute, differential pressure and flow
with flexible capillary

Overview



Diaphragm seals of flange design

2

Technical specifications

Diaphragm seals of flange design with flexible capillary

Nominal diameter	Nominal pressure	Sealing material in the process flanges
• DN 50 (recommendable only for pressure transmitters for pressure)	PN 10 ... PN 40, PN 100	• For pressure transmitters, absolute pressure transmitters and low-pressure applications
• DN 80	PN 10 ... PN 40, PN 100	• For other applications
• DN 100	PN 16, PN 40	Maximum pressure
• DN 125	PN 16, PN 40	Tube length
• 2 inch (recommendable only for pressure transmitters for pressure)	Class 150, class 300, class 600, class 1500	Without tube as standard (tube available on request)
• 3 inch	Class 150, class 300, class 600	Capillary
• 4 inch	Class 150, class 300, class 400	• Length
• 5 inch	Class 150, class 300, class 400	• Internal diameter
Sealing face		• Minimum bending radius
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA	Filling liquid
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF	(for remote seals of sandwich and flange design)
Materials		Silicone oil M5
• Main body	Stainless steel 316L	Silicone oil M50
• Wetted parts	Stainless steel 316L	High-temperature oil
	• Without foil	Halocarbon oil (for measuring O ₂)
	• PTFE (for vacuum on request)	Food oil (FDA listed)
	• ECTFE (for vacuum on request)	Glycerine/water (not for use in low-pressure range)
	• PFA (for vacuum on request)	
	Monel 400, mat. No. 2.4360	Permissible ambient temperature
	Hastelloy C276, mat. No. 2.4819	Dependent on the pressure transmitter and the filling liquid of the remote seal
	Hastelloy C4, mat. No. 2.4610	More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
• Capillary	Tantalum	
• Sheath	Stainless steel, mat. No. 1.4571/316Ti	Weight
	Spiral hose made of stainless steel, mat. No. 1.4404/316L	Approx. 4 kg (8.82 lb)

Certificate and approvals

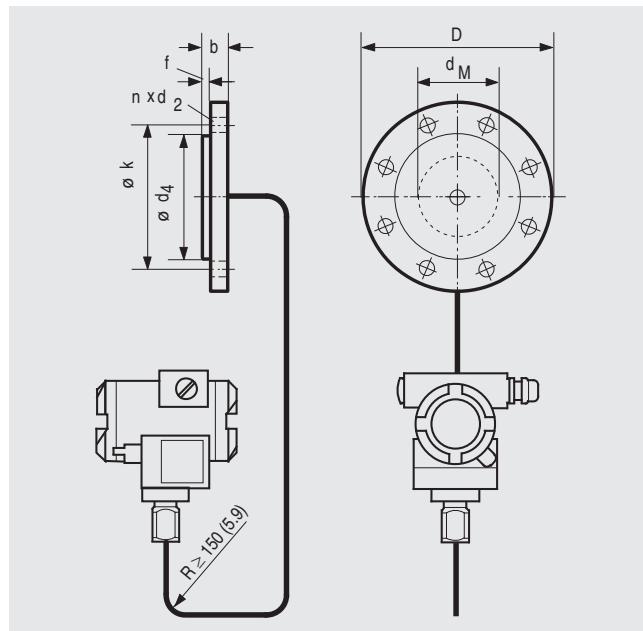
Classification according to pressure equipment directive (DRGL 97/23/EC) For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

SITRANS P measuring instruments for pressure

Diaphragm seals of flange design

For gage, absolute, differential pressure and flow
with flexible capillary

Dimensional drawings



Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d_2	d_4	d_M	f	k	n
DN 50	PN 40	20	165	18	102	59	2	125	4
	PN 100	28	195	26	102	59	2	145	4
DN 80	PN 40	24	200	18	138	89	2	160	8
	PN 100	32	230	26	138	89	2	180	8
DN 100	PN 16	20	220	18	158	89	2	180	8
	PN 40	24	235	22	162	89	2	190	8
	PN 40	26	270	26	188	124	2	210	8
DN 125	PN 16	22	250	18	188	124	2	220	8
	PN 40	26	270	26	188	124	2	220	8

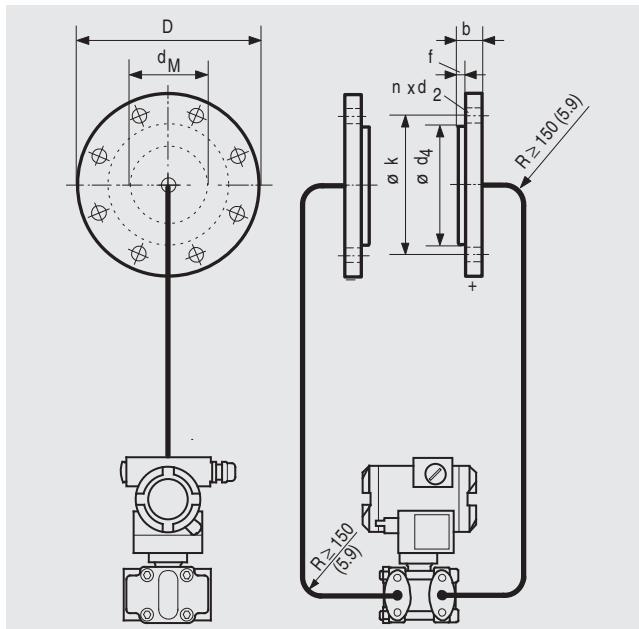
Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d_2	d_4	d_M	f	k	n
lb/sq.in. mm mm mm mm mm mm mm mm									
2 inch	150	20	150	20	92	59	1.6	120.5	4
		(0.79)	(5.80)	(0.79)	(3.62)	(2.32)	(0.06)	(4.74)	
	300	22.5	165	20	92	59	1.6	127	8
		(0.89)	(6.50)	(0.79)	(3.62)	(2.32)	(0.06)	(5)	
	600	32	165	20	92	59	1.6	127	8
		(1.26)	(6.50)	(0.79)	(3.62)	(2.32)	(0.06)	(5)	
3 inch	150	24	190	20	127	89	1.6	152.5	4
		(0.96)	(7.48)	(0.79)	(5)	(3.50)	(0.06)	(6)	
	300	29	210	22	127	89	1.6	168.5	8
		(1.14)	(8.27)	(0.87)	(5)	(3.50)	(0.06)	(6.63)	
	400	38.5	210	22	127	89	6.4	168.5	8
		(1.52)	(8.27)	(0.87)	(5)	(3.50)	(0.25)	(6.63)	
4 inch	150	24	230	20	158	89	1.6	190.5	4
		(0.95)	(9.06)	(0.79)	(6.22)	(3.50)	(0.06)	(7.5)	
	300	32	255	22	158	89	1.6	200	8
		(1.26)	(10.04)	(0.87)	(6.22)	(3.50)	(0.06)	(7.87)	
	400	41.5	255	26	158	89	6.4	200	8
		(1.62)	(10.04)	(1.02)	(6.22)	(3.50)	(0.25)	(7.87)	
5 inch	150	24	255	22	186	124	2	216	4
		(0.94)	(10.04)	(0.87)	(7.32)	(4.88)	(0.08)	(8.50)	
	300	35	280	22	186	124	2	235	8
		(1.38)	(11.02)	(0.87)	(7.32)	(4.88)	(0.08)	(9.25)	
	400	45.5	280	26	186	124	7	235	8
		(1.79)	(11.02)	(1.02)	(7.32)	(4.88)	(0.28)	(9.25)	

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d_M : Effective diaphragm diameter

Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)



Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d_2	d_4	d_M	f	k	n
DN 80	PN 40	24	200	18	138	89	2	160	8
	PN 100	32	230	26	138	89	2	180	8
DN 100	PN 16	20	220	18	158	89	2	180	8
	PN 40	24	235	22	162	89	2	190	8
DN 125	PN 16	22	250	18	188	124	2	210	8
	PN 40	26	270	26	188	124	2	220	8

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d_2	d_4	d_M	f	k	n
		lb/sq.in.	mm (inch)						
3 inch	150	24	190	20	127	89	1.6	152.5	4
		(0.96)	(7.48)	(0.79)	(5)	(3.50)	(0.06)	(6)	
	300	29	210	22	127	89	1.6	168.5	8
4 inch	600	38.5	210	22	127	89	6.4	168.5	8
		(1.52)	(8.27)	(0.87)	(5)	(3.50)	(0.25)	(6.63)	
	400	41.5	255	26	158	89	6.4	200	8
5 inch	150	24	255	22	186	124	2	216	4
		(0.94)	(10.04)	(0.87)	(7.32)	(4.88)	(0.08)	(8.50)	
	300	35	280	22	186	124	2	235	8
400		(1.38)	(11.02)	(0.87)	(7.32)	(4.88)	(0.08)	(9.25)	
		45.5	280	26	186	124	7	235	8
		(1.79)	(11.02)	(1.02)	(7.32)	(4.88)	(0.28)	(9.25)	

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d_M : Effective diaphragm diameter

Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Diaphragm seals of flange design

For gage and absolute pressure,
directly fitted on transmitter

2

Overview



Diaphragm seals of flange design, directly fitted on a pressure transmitter for pressure

Technical specifications

Diaphragm seals (flange design) for pressure and absolute pressure, directly fitted on a transmitter

Nominal diameter	Nominal pressure
• DN 50	PN 40, PN 100
• DN 80	PN 40, PN 100
• DN 100	PN 16, PN 40
• 2 inch	Class 150, class 300, class 600, class 1500
• 3 inch	Class 150, class 300, class 600
• 4 inch	Class 150, class 300, class 400
Sealing face	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel 316L
• Wetted parts	Stainless steel 316L <ul style="list-style-type: none">Without foilPTFE (for vacuum on request)ECTFE (for vacuum on request)PFA (for vacuum on request) Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4610
	Tantalum
• Capillary	Stainless steel, 1.4571/316Ti
• Sealing material on the process connection	Copper
Maximum pressure	See above and the technical data of the transmitter
Tube length	<ul style="list-style-type: none">Without tube50 mm (1.97 inch)100 mm (3.94 inch)150 mm (5.91 inch)200 mm (7.87 inch)

Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	<ul style="list-style-type: none">Silicone oil M5Silicone oil M50High-temperature oilHalocarbon oil (for measuring O₂)Food oil (FDA listed)Glycerine/water (not suitable for use in low-pressure range)
Max. recommended process temperature	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals.
Weight	Approx. 4 kg (8.82 lb)

Certificate and approvals

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

Diaphragm seals of flange design

For gage and absolute pressure,
directly fitted on transmitter

Selection and Ordering data		Order No. Ord.code
Diaphragm seal		D) 7MF4910 -
Directly fitted to a pressure transmitter SITRANS P for pressure 7MF403 and 7MF423 together with Order code "V01" (vacuum-proof design) and 7MF802 ¹⁾ ; must be ordered separately		
Process connection		
• Vertical (pressure transmitter upright)	0	
• Horizontal	2	
Nominal diameter and nominal pressure		
• DN 50	PN 40	A
	PN 100	B
• DN 80	PN 40	D
	PN 100	E
• DN 100	PN 16	G
	PN 40	H
• 2 inch	Class 150	L
	Class 300	M
	Class 600	N
	Class 1500	P
• 3 inch	Class 150	Q
	Class 300	R
	Class 600	S
• 4 inch	Class 150	T
	Class 300	U
	Class 400	V
Smooth sealing face to DIN 1092-01, form B1 or B2, or to ASME B16.5 125 ... 250 AA or RFSF		
Other version	Z	
Add Order code and plain text: Nominal diameter: ..., Nominal pressure: ...		J1Y
Wetted parts materials		
• Stainless steel 316L		A
- without foil		E0
- with PTFE coating		F
- with ECTFE coating ²⁾		D
- with PFA coating		G
• Monel 400, mat. No. 2.4360		J
• Hastelloy C276, mat. No. 2.4819		U
• Hastelloy C4, mat. No. 2.4610		K
• Tantalum		Z
Other version		
Add Order code and plain text: Wetted parts materials: ...		K1Y
Tube length		
• Without tube	0	
• 50 mm	1	
• 100 mm	2	
• 150 mm	3	
• 200 mm	4	
Other version:	9	
Add Order code and plain text: Tube length: ...		L1Y

Selection and Ordering data		Order No. Ord.code
Diaphragm seal		D) 7MF4910 -
Directly fitted to a pressure transmitter SITRANS P for pressure 7MF403 and 7MF423 together with Order code "V01" (vacuum-proof design) and 7MF802 ¹⁾ ; must be ordered separately		
Filling liquid		
• Silicone oil M5	1	
• Silicone oil M50	2	
• High-temperature oil	3	
• Halocarbon oil (for measuring O ₂)	4	
• Glycerin/water ³⁾	6	
• Food oil (FDA listed)	7	
Other version	9	
Add Order code and plain text: Filling liquid: ...		M1Y

¹⁾With 7MF802 and the measuring cells Q, S, T and U also order the vacuum-tight version.
²⁾For vacuum on request.
³⁾Not suitable for use in low-pressure range.
D) Subject to export regulations AL: N, ECCN: EAR99H.

Selection and Ordering data	Order code
<i>Further designs</i>	
Please add "-Z" to Order No. and specify Order code.	
Spark arrestor	A01
With spark arrestor for mounting on zone 0 (including documentation) for transmitters for pressure and absolute pressure	
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11
to IEC 60770-2	
Acceptance test certificate	C12
to EN 10204, section 3.1	
Vacuum-proof design	V01
for use in low-pressure range for transmitters for pressure	
Calculation of span of associated pressure transmitter	Y05
Enclose filled-in questionnaire with order	

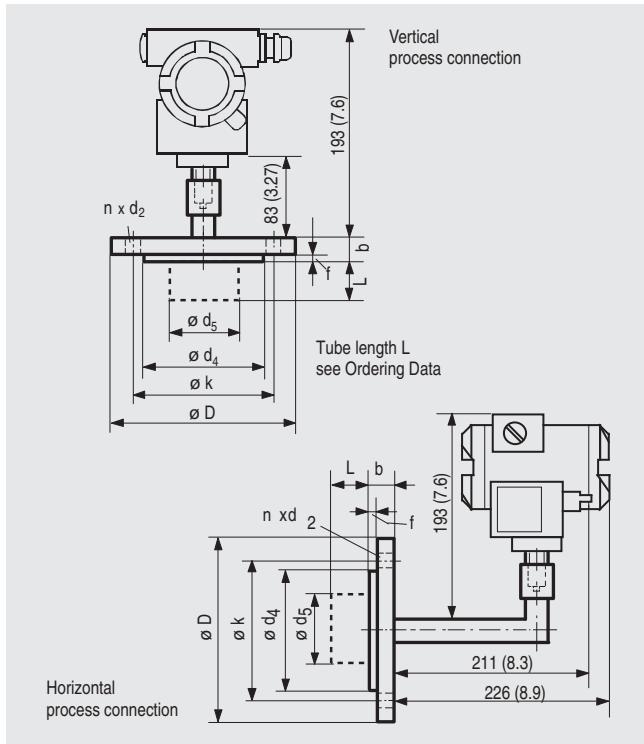
SITRANS P measuring instruments for pressure

Diaphragm seals of flange design

For gage and absolute pressure,
directly fitted on transmitter

2

Dimensional drawings



Diaphragm seals of flange design, direct connection to a SITRANS P pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n
		mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 50	PN 40	20	165	18	102	48.3	59	2	125	4
	PN 100	28	195	26	102	48.3	59	2	145	4
DN 80	PN 40	24	200	18	138	76	89	2	160	8
	PN 100	32	230	26	138	76	89	2	180	8
DN 100	PN 16	20	220	18	158	94	89	2	180	8
	PN 40	24	235	22	162	94	89	2	190	8

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n
		lb/ sq.in. (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
2 inch	150	20	150 (0.79)	20 (0.79)	92 (3.62)	48.3 (1.9)	59 (2.32)	1.6 (0.06)	120.5 (4.74)	4
	300	22.5	165 (0.89)	20 (0.79)	92 (3.62)	48.3 (1.9)	59 (2.32)	1.6 (0.06)	127 (5)	8
	600	32	165 (1.26)	20 (0.79)	92 (3.62)	48.3 (1.9)	59 (2.32)	6.4 (0.25)	127 (5)	8
	1500	45	215 (1.77)	26 (0.79)	92 (3.62)	48.3 (1.9)	59 (2.32)	6.4 (0.25)	165 (6.5)	8
	3 inch	150	24	190 (0.95)	20 (0.79)	127 (5)	76 (3)	89 (3.50)	1.6 (0.06)	152.5 (6)
3 inch	300	29	210 (1.14)	22 (0.87)	127 (5)	76 (3)	89 (3.50)	1.6 (0.06)	168.5 (6.63)	8
	600	38.5	210 (1.52)	22 (0.87)	127 (5)	76 (3)	89 (3.50)	6.4 (0.25)	168.5 (6.63)	8
	4 inch	150	24	230 (0.95)	20 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	1.6 (0.06)	190.5 (7.5)
	300	32	255 (1.26)	22 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	1.6 (0.06)	200 (7.87)	8
4 inch	400	41.5	255 (1.62)	26 (1.04)	158 (1.02)	94 (6.22)	89 (3.69)	6.4 (3.50)	200 (0.25)	200 (7.87)

d: Inside diameter of gasket according to EN 1092-1/
ASME B16.5

d_M: Effective diaphragm diameter

SITRANS P measuring instruments for pressure

Diaphragm seals of flange design

For differential pressure,
fixed connection and with capillary

Overview



Diaphragm seals of flange design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

2

Technical specifications

Diaphragm seals of flange design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

Nominal diameter	Nominal pressure
• DN 80	PN 40
• DN 100	PN 16, PN 40
• 3 inch	Class 150, class 300
• 4 inch	Class 150, class 300
Sealing face	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF

Materials	
• Main body	Stainless steel 316L
• Wetted parts	Stainless steel 316L
	• Without foil
	• PTFE (for vacuum on request)
	• ECTFE (for vacuum on request)
	• PFA (for vacuum on request)
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4610
	Tantalum
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral hose made of stainless steel, mat. No. 1.4301/316

Sealing material in the process flanges	
• For pressure transmitters, absolute pressure transmitters and low-pressure applications	Copper
• For other applications	Viton

Maximum pressure See above and the technical data of the pressure transmitter

Tube length	Without tube 50 mm (1.97 inch) 100 mm (3.94 inch) 150 mm (5.91 inch) 200 mm (7.87 inch)
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O ₂) Food oil (FDA listed) Glycerine/water (not suitable for use in low-pressure range)
Max. recommended process temperature	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)

Certificate and approvals

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

SITRANS P measuring instruments for pressure

Diaphragm seals of flange design

For differential pressure, fixed connection and with capillary

2

Selection and Ordering data		Order No. Ord. code
Diaphragm seal		D) 7MF4913 -
Mounting flange (with tube as option) for direct mounting to high-pressure side and flanged remote seal without tube , fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, DS III series (7MF443)	1	B
Flange, connection to EN 1092-1		
Nom. diam.	Nom. press.	
• DN 80	PN 40	D
• DN 100	PN 16	G
	PN 40	H
Flange, connection to ASME B16.5		
Nom. diam.	Nom. press.	
• 3 inch	Class 150	Q
	Class 300	R
• 4 inch	Class 150	T
	Class 300	U
Other version		Z
Add Order code and plain text:		
Flange: ... Nominal diameter: ...; Nominal pressure: ...		J Y
Wetted parts materials		
Smooth sealing face to EN 1092-1, form B1 or B2, or to ASME B16.5 RF 125 ... 250 AA or RFSF		
• Stainless steel 316L		A
- without foil		E 0
- with PTFE coating		F
- with ECTFE coating ¹⁾		D
- with PFA coating		G
• Monel 400, mat. No. 2.4360		J
• Hastelloy C276, mat. No. 2.4819		U
• Hastelloy C4, mat. No. 2.4610		K
• Tantalum		Z
Other version		
Add Order code and plain text:		
Wetted parts materials: ...		K 1 Y
Tube length		
(for mounting flange on high-pressure side)		
• Without tube		0
• 50 mm	(1.97 inch)	1
• 100 mm	(3.94 inch)	2
• 150 mm	(5.90 inch)	3
• 200 mm	(7.87 inch)	4
Other version:		9
Add Order code and plain text:		
Tube length: ...		L 1 Y
Filling liquid		
• Silicone oil M5		1
• Silicone oil M50		2
• High-temperature oil		3
• Halocarbon oil (for measuring O ₂)		4
• Glycerin/water ²⁾		6
• Food oil (FDA listed)		7
Other version		9
Add Order code and plain text:		
Filling liquid: ...		M 1 Y

Selection and Ordering data		Order No. Ord. code
Diaphragm seal		D) 7MF4913 -
Mounting flange (with tube as option) for direct mounting to high-pressure side and flanged remote seal without tube , fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, DS III series (7MF443)	1	B
Length of capillary ³⁾		
• 1.0 m	(3.28 ft)	2
• 1.6 m	(5.25 ft)	3
• 2.5 m	(8.20 ft)	4
• 4.0 m	(13.1 ft)	5
• 6.0 m	(19.7 ft)	6
• 8.0 m	(26.25 ft)	7
• 10.0 m	(32.8 ft)	8
Other version		9
Add Order code and plain text:		N 1 y
Length of capillary: ...		

¹⁾For vacuum on request.

²⁾Not suitable for use in low-pressure range.

³⁾Max. capillary length, see section "Technical description".

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

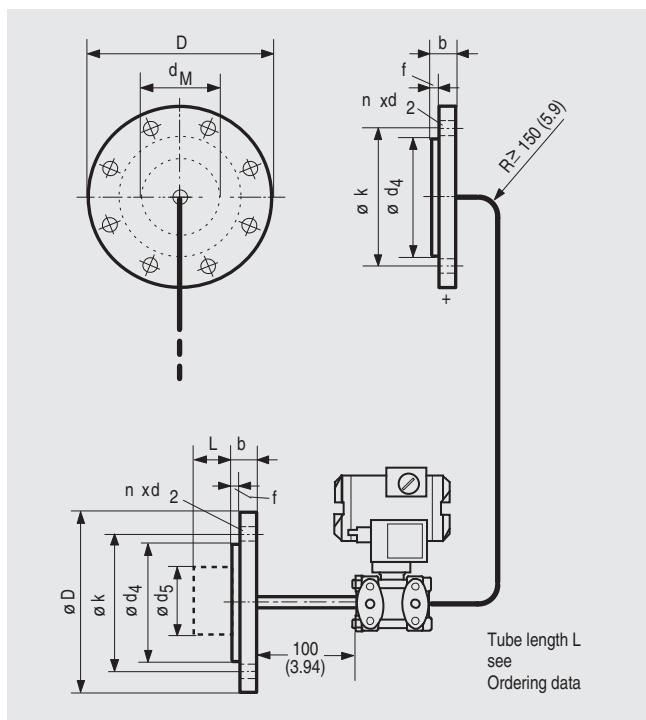
Selection and Ordering data	Order code
<i>Further designs</i>	
Please add "-Z" to Order No. and specify Order code.	
Spark arrestor	A02
With spark arrestor for mounting on zone 0 (including documentation)	
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11
Acceptance test certificate to EN 10204, section 3.1	C12
Vacuum-proof design for use in low-pressure range	V03
Calculation of span of associated pressure transmitter Enclose filled-in questionnaire with order	Y05

SITRANS P measuring instruments for pressure

Diaphragm seals of flange design

For differential pressure,
fixed connection and with capillary

Dimensional drawings



Diaphragm seals of flange design with flexible capillary, fixed connection, for connection to a SITRANS P pressure transmitter for differential pressure, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam. Nom. press. b D d₂ d₄ d₅ d_M f k n

			mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 80	PN 40	24	200	18	138	76	89	2	160	8	
DN 100	PN 16	20	200	18	158	94	89	2	180	8	

Connection to ASME B16.5

Nom. diam. Nom. press. b D d₂ d₄ d₅ d_M f k n

			lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
3 inch	150	24	(0.95)	190 (9.06)	20 (0.79)	127 (6.22)	76 (3.69)	89 (3.50)	1,6 (0.06)	152,5 (6)	4
	300	29	(1.14)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	89 (3.50)	1,6 (0.06)	168,5 (6.63)	8
4 inch	150	24	(0.95)	230 (9.06)	20 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	1,6 (0.06)	190,5 (7)	4
	300	32	(1.26)	255 (10.04)	22 (0.87)	158 (6.22)	94 (3.69)	89 (3.50)	1,6 (0.06)	200 (7.87)	8

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d_M: Effective diaphragm diameter

SITRANS P measuring instruments for pressure

Quick-release diaphragm seals

For gage, absolute and differential pressure

Selection and Ordering data		Order No. Ord. code		
Quick-release diaphragm seal		D) 7 M F 4 9 4 0 -		
for SITRANS P pressure transmitters for pressure 7MF403 and 7MF423 together with Order code "V01" (vacuum-proof design) and 7MF802 ¹⁾ ; must be ordered separately		A 0	B	
Filling liquid: Food oil (FDA listed)				
Material: Stainless steel, mat. No. 1.4435				
Nom. diam.	Nom. press.			
• Connection to DIN 11851 with slotted union nut				
- DN 25	PN 40	1 B		
- DN 32	PN 40	1 C		
- DN 40	PN 40	1 D		
- DN 50	PN 25	1 E		
- DN 65	PN 25	1 F		
- DN 80	PN 25	1 G		
• Connection to DIN 11851 with screw necks				
- DN 25	PN 40	2 B		
- DN 32	PN 40	2 C		
- DN 40	PN 40	2 D		
- DN 50	PN 25	2 E		
- DN 65	PN 25	2 F		
- DN 80	PN 25	2 G		
• Clamp connection				
- 1½ inch	PN 40	4 L		
- 2 inch	PN 40	4 M		
- 2½ inch	PN 40	4 N		
- 3 inch	PN 40	4 P		
Other version				
Add Order codes and plain text:				
Nominal diameter: ...		9	H 1 Y	
Nominal pressure: ...		Z	J 1 Y	
Filling liquid				
• Glycerin/water ²⁾		6		
• Food oil (FDA listed)		7		
Other version		9	M 1 Y	
Add Order code and plain text:				
Filling liquid: ...				
Connection to pressure transmitter				
• direct		0		
through capillary, length: ³⁾				
• 1.0 m (3.28 ft)		2		
• 1.6 m (5.25 ft)		3		
• 2.5 m (8.20 ft)		4		
• 4.0 m (13.1 ft)		5		
• 6.0 m (19.7 ft)		6		
• 8.0 m (26.25 ft)		7		
• 10.0 m (32.8 ft)		8		
Other version		9	N 1 y	
Add Order code and plain text:				
Length of capillary: ...				
Further designs		Order code		
Please add "-Z" to Order No. and specify Order code.				
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11			
Acceptance test certificate	C12			
to EN 10204, section 3.1				
Vacuum-proof design	V01			
for use in low-pressure range				

¹⁾With 7MF802 and the measuring cells Q, S, T and U also order the vacuum-tight version.

²⁾Not suitable for use in low-pressure range.

³⁾Max. capillary length, see section "Technical description"

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

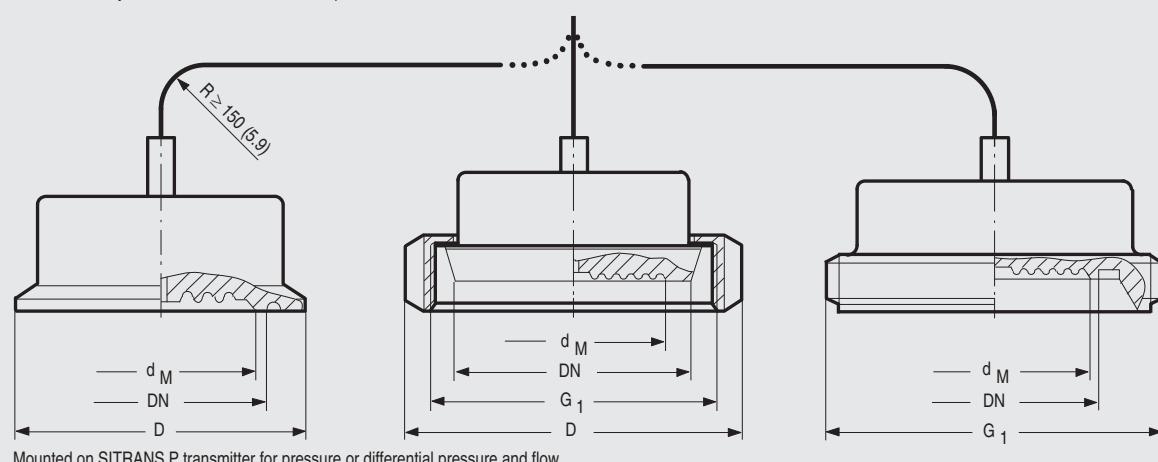
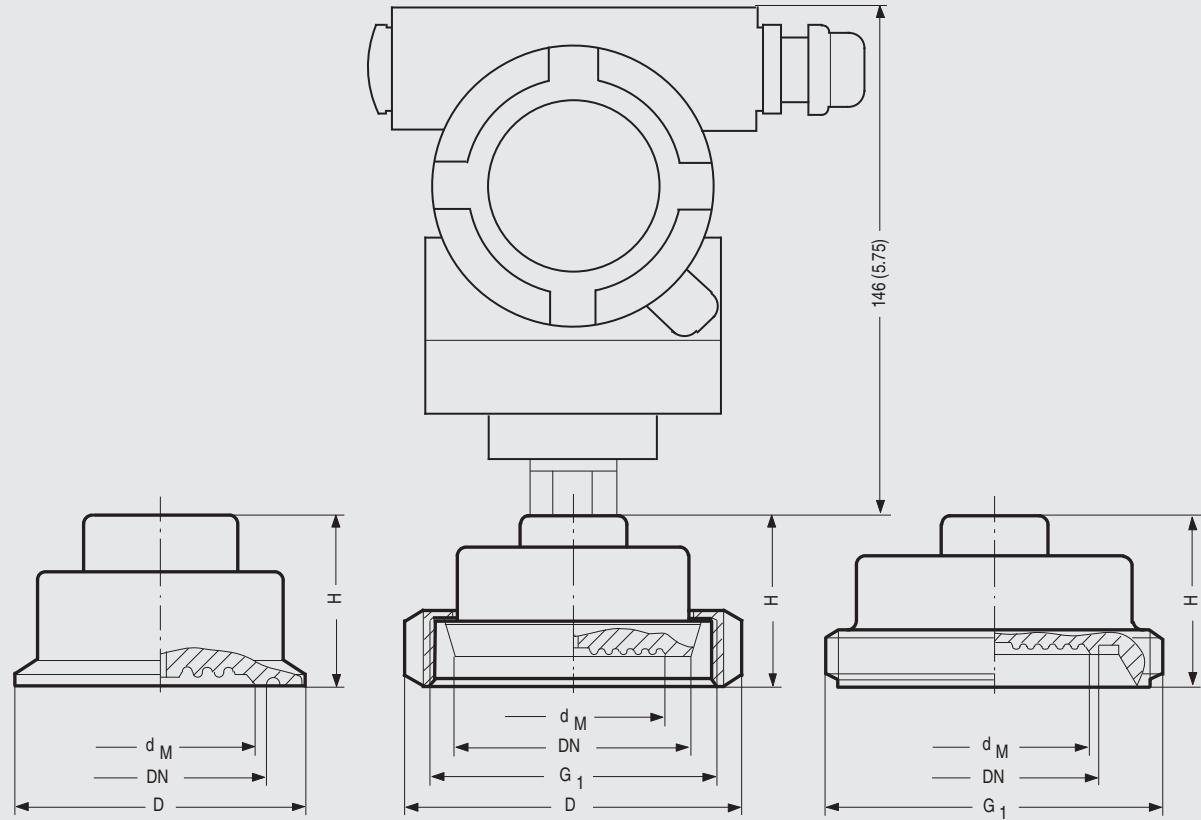
SITRANS P measuring instruments for pressure

Quick-release diaphragm seals

For gage, absolute and differential pressure

Dimensional drawings

2



Clamp connection (left)

DN	Ø d _M	Ø D	H
(1½ inch)	32 (1.26)	50,5 (2)	35 (1.38)
(2 inch)	40 (1.57)	64 (2.52)	35 (1.38)
(2½ inch)	52 (2.05)	77,5 (3.05)	35 (1.38)
(3 inch)	72 (2.83)	91 (3.58)	35 (1.38)

Connection to DIN 11851 with slotted union nut (center)

DN	Ø d _M	Ø D	H	G ₁
25	25	63	36	Rd 52x1/6
32	32	70	36	Rd 52x1/6
40	40	78	36	Rd 65x1/6
50	52	112	36	Rd 78x1/6
65	65	112	36	Rd 95x1/6
80	72	127	36	Rd 110x1/6
25	25	63	36	Rd 52x1/6

Connection to DIN 11851 with threaded socket (right)

DN	Ø d _M	H	G ₁
25	25	36	Rd 52x1/6
32	32	36	Rd 52x1/6
40	40	36	Rd 65x1/6
50	52	36	Rd 78x1/6
65	65	36	Rd 95x1/6
80	72	36	Rd 110x1/6

d_M Effective diaphragm diameter

Quick-release diaphragm seal, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Miniature diaphragm seal

For gage and absolute pressure

Overview



Miniature diaphragm seals

The miniature diaphragm seals are available for the following SITRANS P pressure transmitter series for pressure:

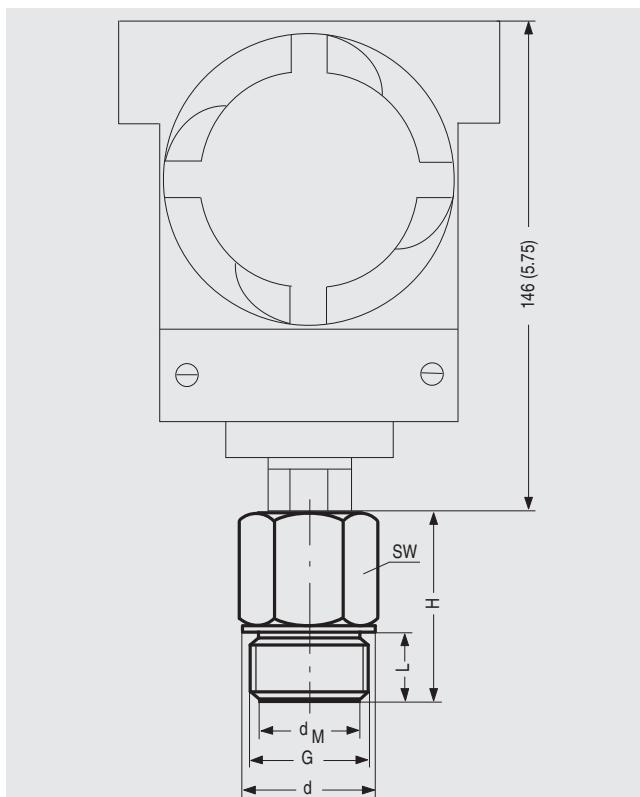
- P300, DS III, DS III PA, DS III FF

Suitable for high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

Design

- Flush-mounted diaphragm
- No dead spaces
- Fixed threaded stems

Dimensional drawings



G	Ø d _M	SW	Ø d	L	H
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
G1B	25 (0.98)	41 (1.61)	39 (1.53)	28 (1.1)	56 (2.21)
G1½B	40 (1.57)	55 (2.17)	60 (2.36)	30 (1.18)	50 (1.97)
G2B	50 (1.97)	60 (2.36)	70 (2.76)	30 (1.18)	63 (2.48)

d_M: Effective diaphragm diameter

Miniature diaphragm seal, dimensions in mm (inch)

Technical specifications

Miniature diaphragm seals

Span with

- G1B > 6 bar (> 87 psi)
- G1½B > 2 bar (> 29 psi)
- G2B > 600 mbar (> 8.7 psi)

Filling liquid

Silicone oil M5 or food oil (FDA listed)

Material

- Main body Stainl. steel mat No. 1.4404 / 316L
- Diaphragm Stainl. steel mat No. 1.4404 / 316L

Maximum pressure

100% of nominal pressure of pressure transmitter, up to maximum of PN 400 (5802 psi) (depending on the seal used)

Temperature of use

Same as pressure transmitter

Temperature range of medium

Same as pressure transmitter

Max. recommended process temperature

150 °C (302 °F)

Weight

- G1B Approx. 0.3 kg (approx. 0.66 lb)
- G1½B Approx. 0.5 kg (approx. 1.10 lb)
- G2B Approx. 0.8 kg (approx. 1.76 lb)

Certificate and approvals

Classification according to pressure equipment directive (DRGL 97/23/EC)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

Selection and Ordering data

Miniature diaphragm seals

Order No. Ord. code

D) 7MF4960 -

1 0

C
D
E
K
L
M
Z
J 1 Y

A
Z
K 1 Y

1
7
9
M 1 y

Process connection

- G1B
- G1½B
- G2B
- 1" - NPT
- 1½" - NPT
- 2" - NPT

Other version, add Order code and plain text:
Process connection: ...

Wetted parts materials

- Stainless steel 316L

Other version, add Order code and plain text:
Wetted parts materials: ...

Filling liquid

- Silicone oil M5
- Food oil (FDA listed)

Other version, add Order code and plain text:
Filling liquid: ...

1) With 7MF802 and the measuring cells Q, S, T and U also order the vacuum-tight version.

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

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Order No. and specify Order code.

Quality inspection certificate (Factory calibration) to IEC 60770-2

C11

Acceptance test certificate to EN 10204, section 3.1

C12

Vacuum-proof design

V01

SITRANS P measuring instruments for pressure

Flushing rings

For diaphragm seals

2

Overview



Flushing ring

Flushing rings are required for flange-mounted and sandwich-type remote seals (Order No. 7MF4900 ... 7MF4923) if the danger exists that the process conditions and the geometry of the connection could cause the medium to form deposits or blockages.

The flushing ring is clamped between the process flange and the remote seal.

Deposits can be flushed away from the diaphragm through the holes in the side, or the pressure volume can be vented. Different nominal diameters and forms permit adaptation to the respective process flange.

Process connection

For flanges to EN and ASME:

DN 50, 80, 100, 125; PN 16 ... 100 or

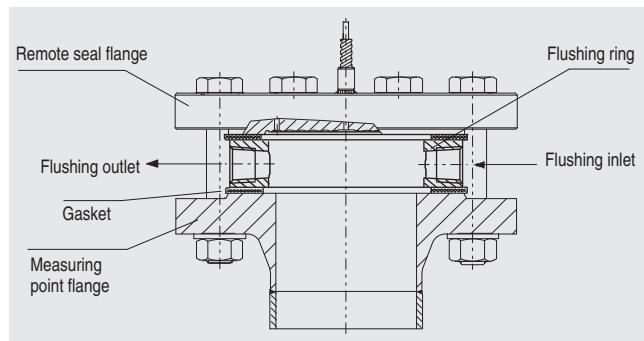
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

Standard design

Material: CrNi-Stahl, mat. No. 1.4404/316L

Sealing faces and flushing holes: See Selection and Ordering data

Design



Installation example

Technical specifications

Flushing ring for remote seals of sandwich and flange design

Nominal diameter	Nominal pressure
• DN 50	PN 16 ... PN 100
• DN 80	PN 16 ... PN 100
• DN 100	PN 16 ... PN 100
• DN 125	PN 16 ... PN 100
• 2 inch	Class 150 ... class 600
• 3 inch	Class 150 ... class 600
• 4 inch	Class 150 ... class 600
• 5 inch	Class 150 ... class 600

Sealing face

• To EN 1092-1	Form B1 Form B2 Form D/Form D Form C/Form C Form C/Form C Form E Form F
• To ASME B16.5	RF 125 ... 250 AA RFSF

RJT ring groove

Flushing holes (2 off), female thread:	• G $\frac{1}{4}$ • G $\frac{1}{2}$ • 1/4-18 NPT • 1/2-14 NPT
--	--

Material	Stainless steel 1.4404/316L
----------	-----------------------------

SITRANS P measuring instruments for pressure

Flushing rings

For diaphragm seals

2

Selection and Ordering data

Flushing ring

for remote seals 7MF4900 to 7MF4923

Nom. diam.

- DN 50 PN 16 ... PN 100
- DN 80 PN 16 ... PN 100
- DN 100 PN 16 ... PN 100
- DN 125 PN 16 ... PN 100
- 2 inch Class 150 ... 600
- 3 inch Class 150 ... 600
- 4 inch Class 150 ... 600
- 5 inch Class 150 ... 600

Other version

Add Order code and plain text:
Nominal diameter: ..., Nominal pressure: ...

Sealing face

- EN 1092-1
 - Form B1
 - Form B2
 - Form C/Form C
 - Form D/Form C
 - Form D/Form D
 - Form E
 - Form F
- ASME B16.5
 - RF 125 ... 250 AA
 - RFSF
 - RJT ring groove

Other version

Add Order code and plain text:
Sealing face: ...

Flushing holes (2 off)

- Female thread G $\frac{1}{4}$
- Female thread G $\frac{1}{2}$
- Female thread 1/4-18 NPT
- Female thread 1/2-14 NPT

Material

- Stainless steel 316L

Other version

Add Order code and plain text:
Material: ...

Order No. Ord. code

D) 7MF4925 -

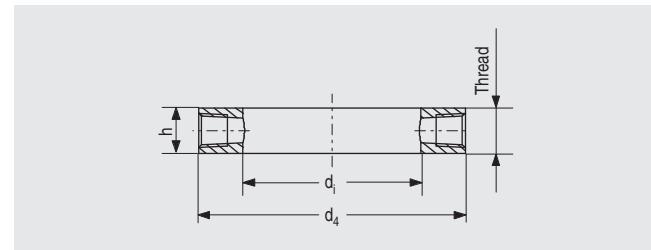
1 A B C D G H J K Z J 1 Y

A B C D G H J K Z J 1 Y

A C D E F G H M Q R Z J 1 Y

1 2 3 4 0 9 M 1 y

Dimensional drawings



Connection to EN 1092-1

DN	PN	d ₄	d _i	h	Weight
(mm)	(bar)	(mm)	(mm)	(mm)	(kg)
50	16 ... 100	102	62	30	1.10
80	16 ... 100	138	92	30	1.90
100	16 ... 100	162	92	30	3.15
125	16 ... 100	188	126	30	3.50

Connection to ASME B 16.5

DN	Class	d ₄	d _i	h	Weight		
inch		mm	(inch)	mm	(inch)	kg	(lb)
2	150 ... 600	92	(3.62)	62	(2.44)	30	(1.18)
3	150 ... 600	127	(5)	92	(3.62)	30	(1.18)
4	150 ... 600	157	(6.18)	92	(3.62)	30	(1.18)
5	150 ... 600	185.5	(7.3)	126	(4.96)	30	(1.18)

Flushing ring, dimension drawing

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Order No. and specify Order code.

Acceptance test certificate

C12

to EN 10204, section 3.1

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

SITRANS P measuring instruments for pressure

Clamp-on seals of flange design

For gage pressure, differential pressure and flow

2

Overview



Clamp-on seals for flange-mounting

The clamp-on seal is completely integrated in the process line. It is particularly suitable for flowing and highly viscous media.

The clamp-on remote seal consists of a cylindrical jacket into which a thin-walled pipe is welded. It is clamped directly between two flanges in the pipeline.

Design

- Clamp-on seals for flange-mounting (flange design) to EN/ASME for SITRANS P pressure transmitters
 - For pressure: P300, DS III, DS III PA and DS III FF series
 - For differential pressure and flow: DS III, DS III PA and DS III FF
- Sealing face to EN 1092-1 or ASME B16.5
- Connection to the transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical data for details of materials used for the wetted parts
- Material used for the capillary, the guard sleeve, the seal's main body and the measuring cell: Stainless steel, mat.-No. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA listed) or glycerin/water (not suitable for uses in low-pressure range)

Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes either directly or through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof remote seal (see Selection and Ordering data).

Technical specifications

Clamp-on seals for flange-mounting

Nominal diameter	Nominal pressure
• DN 25	PN 6 ... PN 100
• DN 40	PN 6 ... PN 100
• DN 50	PN 6 ... PN 100
• DN 80	PN 6 ... PN 100
• DN 100	PN 6 ... PN 100
• 1 inch	Class 150 ... class 2500
• 1½ inch	Class 150 ... class 2500
• 2 inch	Class 150 ... class 2500
• 3 inch	Class 150 ... class 2500
• 4 inch	Class 150 ... class 2500
Process connection	Flange to EN 1092-1 or ASME B 16.5
Sealing face	To EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 A or RFSF
Materials	
• Main body	Stainless steel 1.4404/316L
• Diaphragm	Stainless steel 1.4404/316L
• Wetted parts	Stainless steel 1.4404/316L
• Without foil	
• ECTFE coating	
• PFA coating (for vacuum on request)	
Monel 400, mat. No. 2.4360	
Hastelloy C276, mat. No. 2.4819	
Hastelloy C4, mat. No. 2.4610	
Tantalum	
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral hose made of stainless steel, mat. No. 1.4301/316
Capillary	
• Length	Max. 10 m (32.8 ft)
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	
	Silicone oil M5
	Silicone oil M50
	High-temperature oil
	Halocarbon oil
	Food oil (FDA listed)
	Glycerin/water (not suitable for uses in low-pressure range)
Permissible ambient temperature	See pressure transmitters, see filling liquid
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord

SITRANS P measuring instruments for pressure

Clamp-on seals of flange design

For gage pressure, differential pressure and flow

Selection and Ordering data	Order No. Ord. code
Clamp-on seal for flange-mounting for SITRANS P pressure transmitters	
for pressure	D) 7MF4980 -
7MF403■ and 7MF423■ together with Order code "V01" (vacuum-proof design) and 7MF802■ ¹⁾ ; must be ordered separately, scope of delivery: 1 off	
for differential pressure and flow	D) 7MF4983 -
7MF4433 or 7MF4434; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing face to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA	
Nominal diameter and nominal pressure	
• DN 25	PN 6 ... 100
• DN 40	PN 6 ... 100
• DN 50	PN 6 ... 100
• DN 80	PN 6 ... 100
• DN 100	PN 6 ... 100
• 1 inch	Class 150 ... 2500
• 1½ inch	Class 150 ... 2500
• 2 inch	Class 150 ... 2500
• 3 inch	Class 150 ... 2500
• 4 inch	Class 150 ... 2500
Other version	
Add Order code and plain text:	
Nominal diameter: ...; Nominal pressure: ...	
Wetted parts materials	
• Stainless steel 316L	
- Without foil	
- With PFA coating	
- With ECTFE coating ²⁾	
• Monel 400, mat. No. 2.4360	
• Hastelloy C276, mat. No. 2.4819	
• Hastelloy C4, mat. No. 2.4610	
• Tantalum	
Other version	
Add Order code and plain text:	
Wetted parts materials: ...	
Filling liquid	
• Silicone oil M5	
• Silicone oil M50	
• High-temperature oil	
• Halocarbon oil (for measuring O ₂)	
• Glycerin/water ³⁾	
• Food oil (FDA listed)	
Other version	
Add Order code and plain text:	
Filling liquid: ...	
Connection to transmitter	
• direct (only for 7MF4980)	
through capillary, length: ⁴⁾	
• 1.0 m	(3.28 ft)
• 1.6 m	(5.25 ft)
• 2.5 m	(8.20 ft)
• 4.0 m	(13.1 ft)
• 6.0 m	(19.7 ft)
• 8.0 m	(26.25 ft)
• 10.0 m	(32.8 ft)
Other version	
Add Order code and plain text:	
Length of capillary: ...	

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Order No. and specify Order code.	
Spark arrestor	
With spark arrestor for mounting on zone 0 (including documentation)	
• Pressure and absolute pressure	A01
• for differential pressure transmitters	A02
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11
Acceptance test certificate	C12
To EN 10204, section 3.1	
Vacuum-proof design	V01
For use in low-pressure range	
Calculation of span of associated pressure transmitter	Y05
Enclose filled-in questionnaire with order	
Note:	
Suffix "Y01" required with pressure transmitter!	
D) Subject to export regulations AL: N, ECCN: EAR99H.	

¹⁾ With 7MF802■ and the measuring cells Q, S, T and U also order the vacuum-tight version.

²⁾ For vacuum on request.

³⁾ Not suitable for use in low-pressure range.

⁴⁾ Max. capillary length, see section "Technical description"

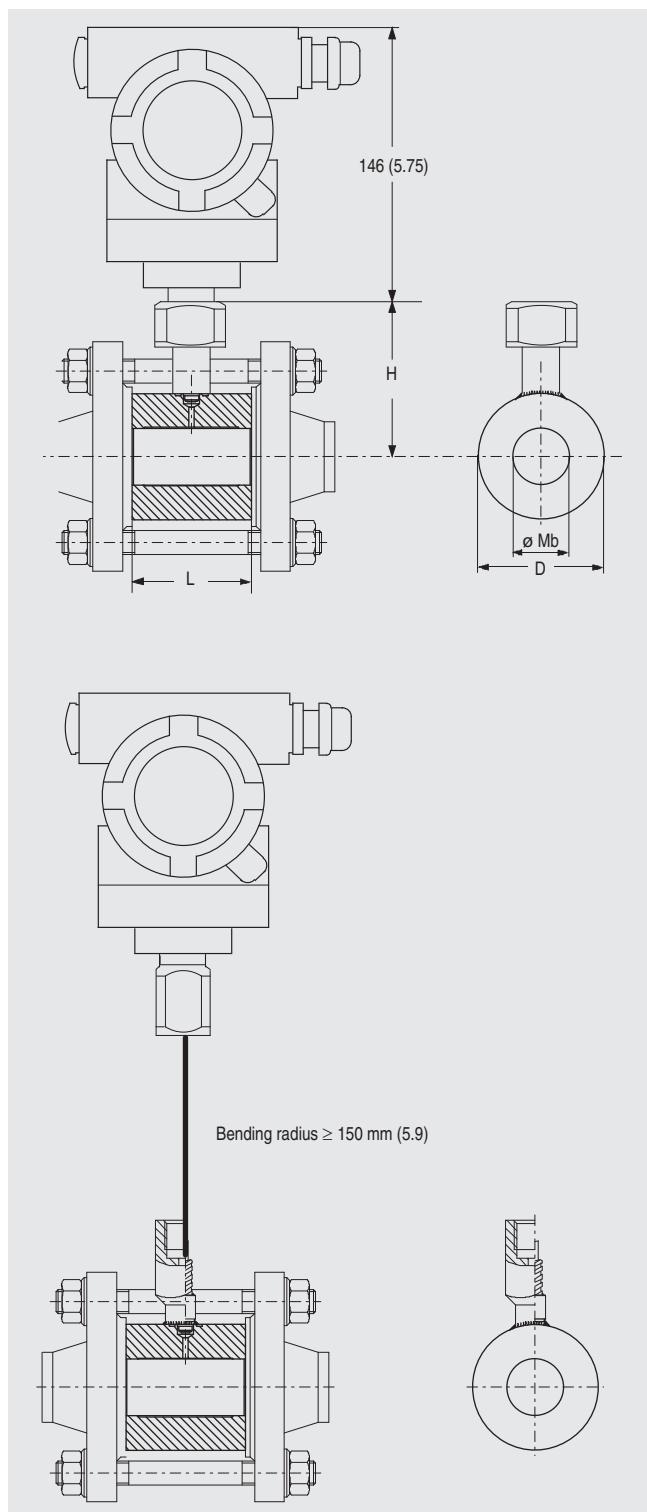
SITRANS P measuring instruments for pressure

Clamp-on seals of flange design

For gage pressure, differential pressure and flow

2

Dimensional drawings



Connection to EN 1092-1

DN	PN	D	Mb	L	H
mm	bar	mm	mm	mm	mm
25	6 ... 100	63	28,5	60	78,5
40	6 ... 100	85	43	60	89,5
50	6 ... 100	95	54,5	60	92,5
80	6 ... 100	130	82,5	60	112
100	6 ... 100	150	107	60	122

Connection to ASME B16.5

DN	Class	D	Mb	L	H
(inch)		mm	mm	mm	mm
		(inch)	(inch)	(inch)	(inch)
1	150 ... 2500	63	28,5	60	78,5
		(2.48)	(1.12)	(2.36)	(3.1)
1½	150 ... 2500	85	43	60	86
		(3.35)	(1.69)	(2.36)	(3.4)
2	150 ... 2500	95	54,5	60	94,5
		(3.74)	(2.15)	(2.36)	(3.72)
3	150 ... 2500	130	82,5	60	112
		(5.12)	(3.25)	(2.36)	(4.4)
4	150 ... 2500	150	107	60	122
		(5.9)	(4.21)	(2.36)	(4.8)

Clamp-on seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Quick-release clamp-on seals

For pressure and absolute pressure

Overview



Quick-release clamp-on seals, to DIN 11851 with threaded socket



Quick-release clamp-on seals, with clamp connection

Quick-release clamp-on seals for pressure are available for the following SITRANS P pressure transmitter series:

- P300
- DS III
- DS III PA
- DS III FF

Application

The quick-release clamp-on seal is a special design for flowing media and high-viscosity media. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. The measured medium flows unhindered through the clamp-on seal and results in self-cleaning of the measuring chamber. Furthermore, the clamp-on seal can be cleaned by a pig.

Design

The quick-release clamp is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The clamp-on seal is connected to the pressure transmitter either directly or by way of a capillary.

Function

The measured pressure is transferred from the diaphragm, mounted on the inner circumference of the clamp-on seal, to the filling liquid and then passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the clamp-on seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof pressure transmitter (see Selection and Ordering data).

Technical specifications

Clamp-on seals of quick-release design for pressure

Connection	Nominal diameter	Nominal pressure
• To DIN 11851 with threaded socket	DN 25	PN 40
	DN 40	PN 40
	DN 50	PN 25
	DN 65	PN 25
	DN 80	PN 25
	DN 100	PN 25
• Clamp connection	1½ inch	PN 40
	2 inch	PN 40
	2½ inch	PN 40
	3 inch	PN 40

Material

• Main body	Stainless steel 1.4404/316L
• Diaphragm	Stainless steel 1.4404/316L

Capillary

• Length	Max. 10 m (32.8 ft)
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)

Filling liquid

• Food oil (FDA listed)
• Glycerin/water (not suitable for use in low-pressure range)

Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal
More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals

Weight

Approx. 4 kg (approx. 8.82 lb)

Certificate and approvals

Classification according to pressure equipment directive (DRG 97/23/EC)

For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord
--

SITRANS P measuring instruments for pressure

Quick-release clamp-on seals

For pressure and absolute pressure

2

Selection and Ordering data	Order No. Ord. code	
Quick-release clamp-on seal	D) 7MF4950 -	
for SITRANS P pressure transmitters for pressure	A 0	
7MF403■ and 7MF423■ together with Order code "V01" (vacuum-proof design) and 7MF802■ ¹⁾ ; must be ordered separately	B	
Filling liquid: Food oil (FDA listed)		
Material: Stainless steel 316L		
Nom. diam.	Nom. press.	
• Connection to DIN 11851 with screw necks		
- DN 25	PN 40	2 B
- DN 40	PN 40	2 D
- DN 50	PN 25	2 E
- DN 65	PN 25	2 F
- DN 80	PN 25	2 G
- DN 100	PN 25	2 h
• Clamp connection		
- 1½ inch	PN 40	4 L
- 2 inch	PN 40	4 M
- 2½ inch	PN 40	4 N
- 3 inch	PN 40	4 P
Other version		
Add Order codes and plain text:		
Nominal diameter: ...	9	
Nominal pressure: ...	Z	
Filling liquid		
• Glycerin/water ²⁾	6	
• Food oil (FDA listed)	7	
Other version	9	
Add Order code and plain text:		
Filling liquid: ...	M 1 Y	
Connection to transmitter		
• Direct	0	
Through capillary, length: ³⁾		
• 1.0 m (3.28 ft)	2	
• 1.6 m (5.25 ft)	3	
• 2.5 m (8.20 ft)	4	
• 4.0 m (13.1 ft)	5	
• 6.0 m (19.7 ft)	6	
• 8.0 m (26.25 ft)	7	
• 10.0 m (32.8 ft)	8	
Other version	9	
Add Order code and plain text:		
Length of capillary: ...	N 1 y	

¹⁾With 7MF802■ and the measuring cells Q, S, T and U also order the vacuum-tight version.

²⁾Not suitable for use in low-pressure range.

³⁾Max. capillary length, see section "Technical description"

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

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Order No. and specify Order code.	
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11
Acceptance test certificate	C12
to EN 10204, section 3.1	
Vacuum-proof design	V01
for use in low-pressure range	

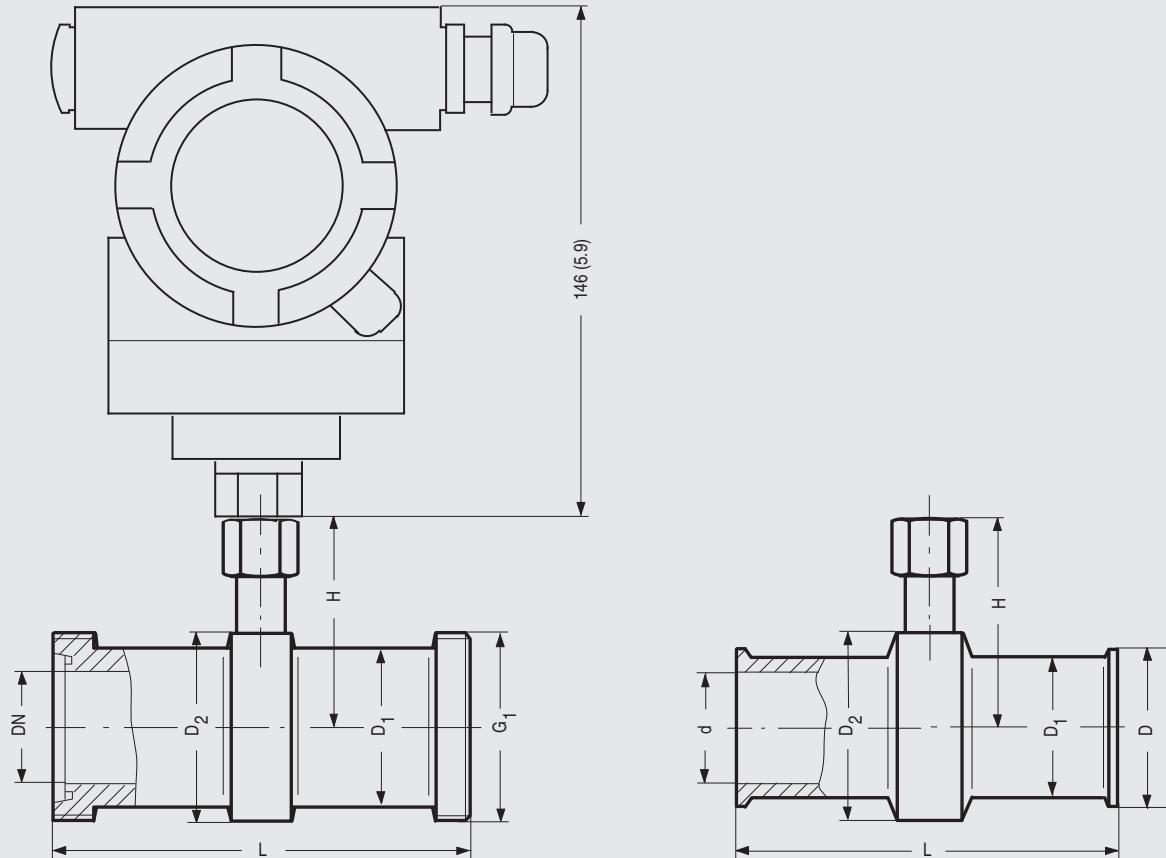
SITRANS P measuring instruments for pressure

Quick-release clamp-on seals

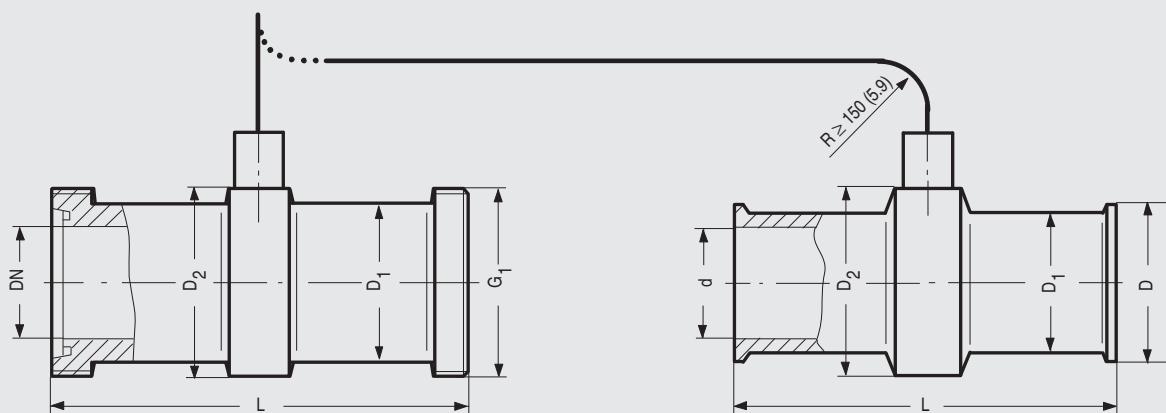
For pressure and absolute pressure

Dimensional drawings

2



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

Connection to DIN 11851 with screw necks

DN	$\varnothing D_1$	$\varnothing D_2$	H	L	G_1
25	38	52	68	128	Rd 52x1/6
40	55	65	74.5	160	Rd 65x1/6
50	68	78	81	170	Rd 78x1/6
65	85	95	89.5	182	Rd 95x1/6
80	110	110	97	182	Rd 110x1/4
100	130	130	107	182	Rd 110x1/4

Clamp connection for pipes to BS 4825/3 and o.D. tubes

d	$\varnothing D_1$	$\varnothing D_2$	H	L	D
mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
22.2 (1)	38 (1.5)	50 (1.97)	67 (2.64)	114 (4.49)	50.5 (1.98)
34.9 (1 1/2)	43 (1.69)	65 (2.56)	74.5 (2.93)	146 (5.75)	50.5 (1.98)
47.6 (2)	56 (2.2)	75 (2.95)	79.5 (3.13)	156 (6.14)	64 (2.52)
60.3 (2 1/2)	68 (2.68)	77 (3.03)	80.5 (3.17)	156 (6.14)	77.5 (3.05)
73.0 (3)	82 (3.23)	91 (3.58)	87.5 (3.44)	156 (6.14)	91 (3.58)

Quick-release clamp-on seal, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

Remote seals

Measuring setups

Overview

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating start of scale and full scale are provided for each example.

Questionnaires are included to help you select the right combination of remote seal and pressure transmitter.

Installation

Remote seals of sandwich design are fitted between the connection flange of the measuring point and a dummy flange. Remote seals of flange design are fitted directly on the connection flange of the measuring point. The respective pressure rating of the dummy flange or the flanged remote seal must be observed.

The pressure transmitter should be installed below the connection flange (and below the lower connection flange in the case of differential pressure transmitters). This arrangement must be used in the low-pressure range.

When measuring at pressures above atmospheric, the pressure transmitter can also be installed above the connection flange.

The capillaries between the remote seal and the pressure transmitter should be as short as possible to obtain a good transmission response.

Offset of measuring range

If there is a difference in height between the two connection flanges when measuring with two remote seals, an additional differential pressure will result from the oil filling of the remote seal capillaries. This results in a measuring range offset which has to be taken into account when you set the pressure transmitter.

An offset in the measuring range also occurs when combining a remote seal with a transmitter if the remote seal is not installed at the same height as the transmitter.

Pressure transmitter output

If the level, separation layer or density increase in closed vessels, the differential pressure and hence the output signal of the pressure transmitter also increase.

For an inverted relationship between the differential pressure and the output signal, the start-of-scale and full-scale values of the SITRANS P must be interchanged.

With open vessels, a rising pressure is usually assigned to an increasing level, separation layer or density.

Influence of ambient temperature

Temperature differences between the individual capillaries and between the individual remote seals should be avoided.

Temperature variations in the area of the measuring setup cause a change in volume of the filling liquid and hence measuring errors.

Notes

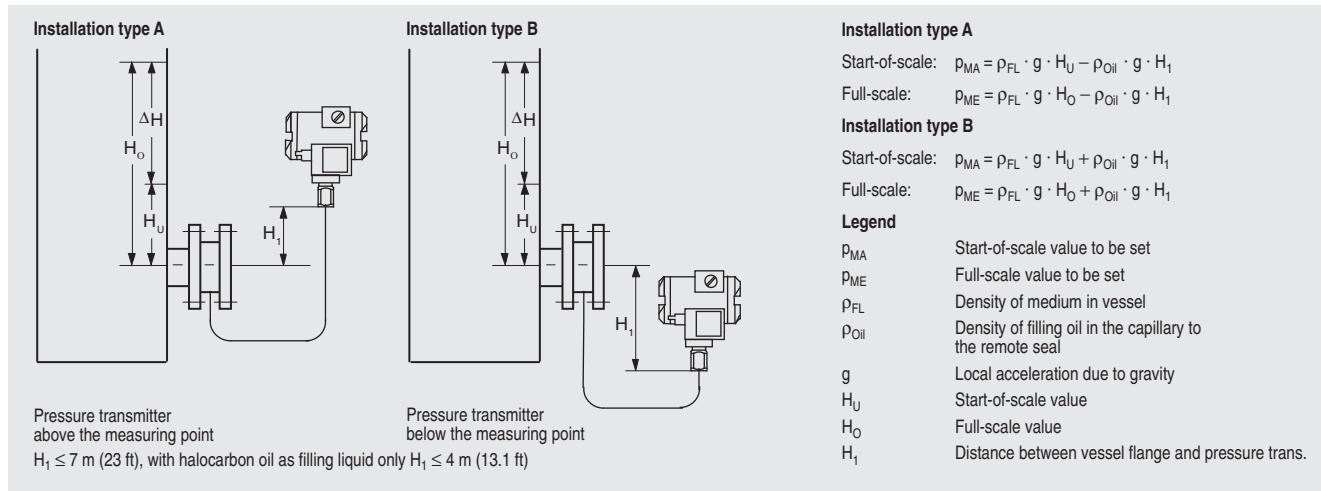
- For the separation layer measurement, the separation layer has to be positioned between the two spigots. Also you must make sure that the level in the container is always above the top spigot.
- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot.

Possible combinations of pressure transmitters and remote seals

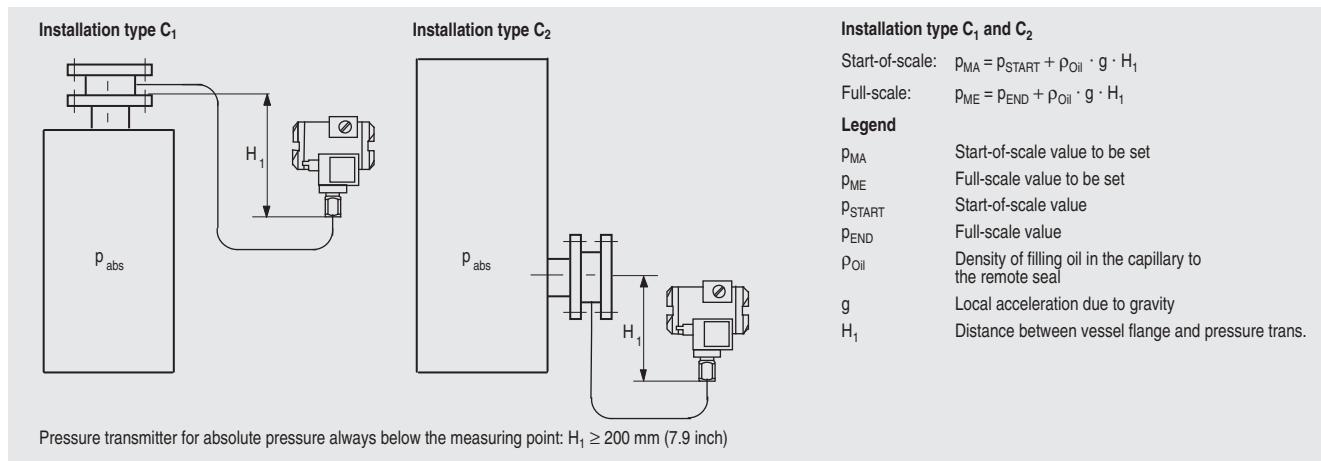
Type of installation	Pressure transmitters	Remote seals
A/B	7MF4033 7MF4034 7MF4035 7MF8023 7MF8024 7MF8025	7MF4900 7MF4910 7MF4920
C ₁ and C ₂	7MF4233 7MF4234 7MF4235	7MF4900 7MF4910 7MF4920 (vacuum-proof design in each case)
	7MF4333 7MF4334 7MF4335	7MF4901 7MF4921
D	7MF4433 7MF4434 7MF4435	7MF4903 7MF4923
E	7MF4433 7MF4434 7MF4435	7MF4913
G, H and J	7MF4433 7MF4434 7MF4435	7MF4903 7MF4923

Dimensional drawings

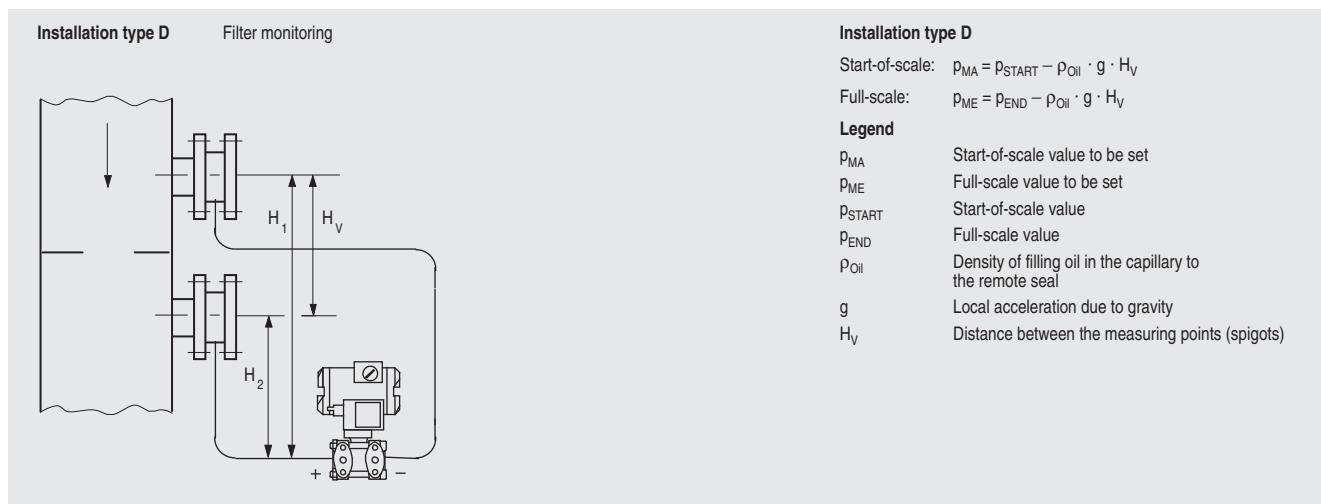
Types of installation for pressure and level measurements (open vessels)



Types of installation for absolute level measurements (closed vessels)



Type of installation for differential pressure and flow measurements



SITRANS P measuring instruments for pressure

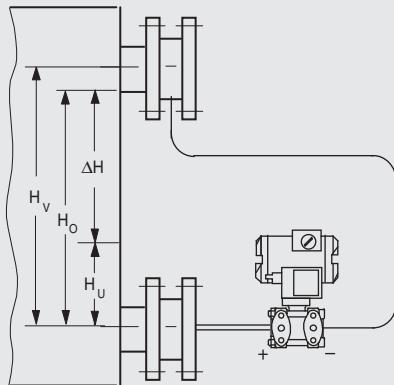
Remote seals

Measuring setups with remote seals

Types of installation for level measurements (closed vessels)

2

Installation type E



Installation type E

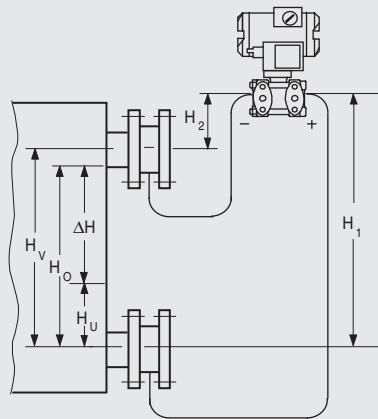
Start-of-scale: $P_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $P_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

P_{MA}	Start-of-scale value to be set
P_{ME}	Full-scale value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value
H_V	Distance between the measuring points (spigots)

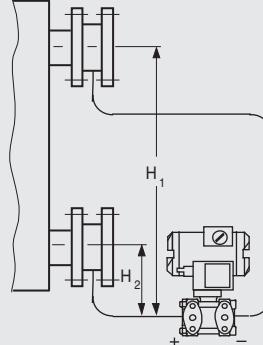
Installation type G



Pressure transmitter for differential pressure above the upper measuring point, no vacuum

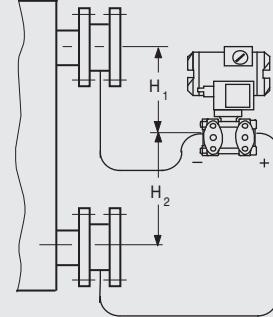
$H_1 \leq 7 \text{ m (23 ft)}$, with halocarbon oil as filling liquid only $H_1 \leq 4 \text{ m (13.1 ft)}$

Installation type H



below the lower measuring point

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$, with halocarbon oil as filling liquid only $H_2 \leq 4 \text{ m (13.1 ft)}$

Installation type G, H and J

Start-of-scale: $P_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $P_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

P_{MA}	Start-of-scale value to be set
P_{ME}	Full-scale value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal

g Local acceleration due to gravity

H_U Start-of-scale value

H_O Full-scale value

H_V Distance between the measuring points (spigots)

Measuring setups without remote seals

Overview

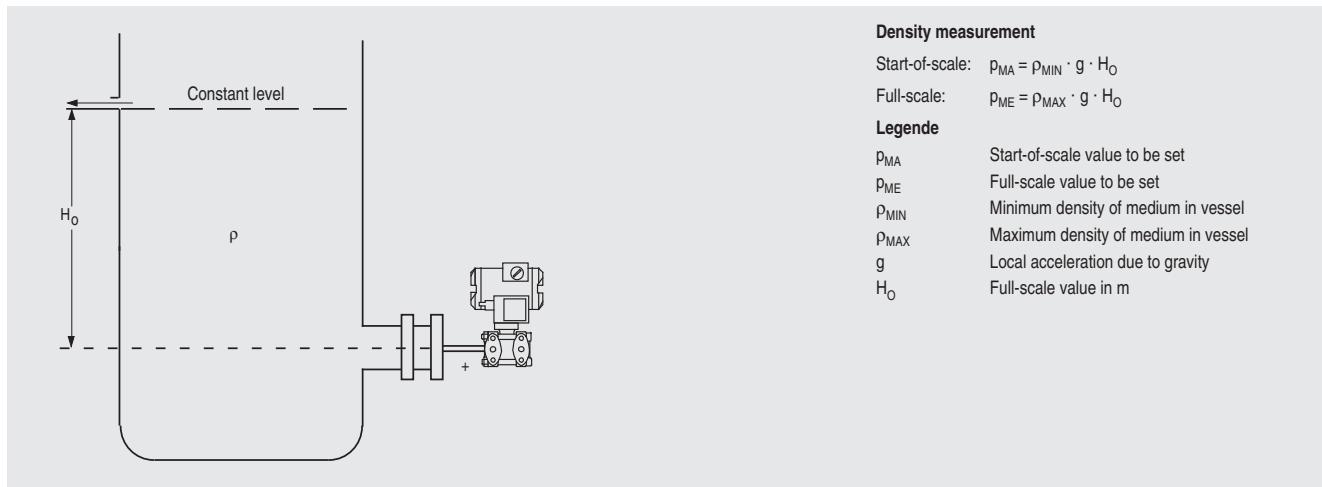
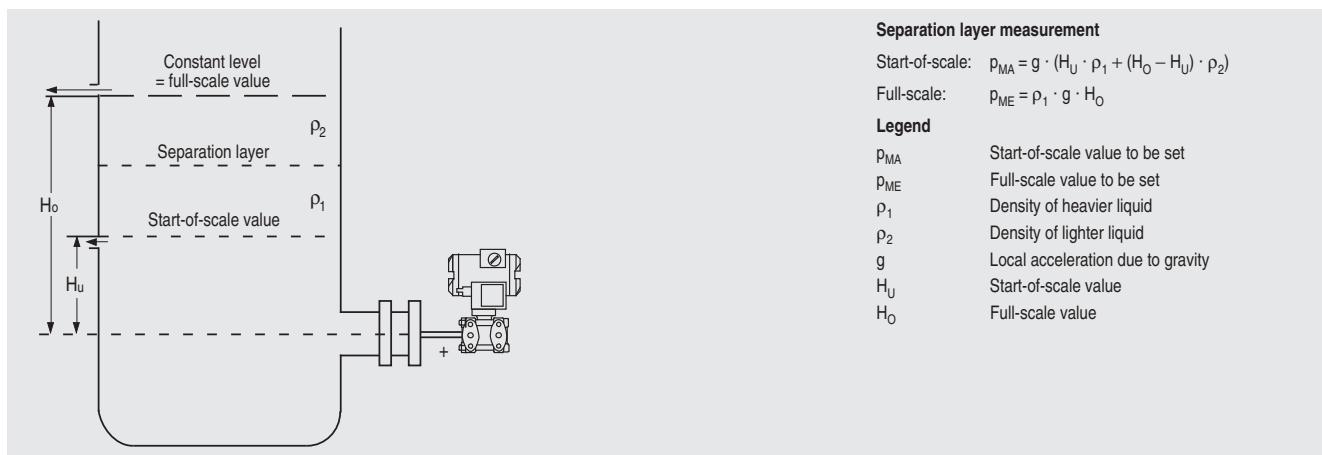
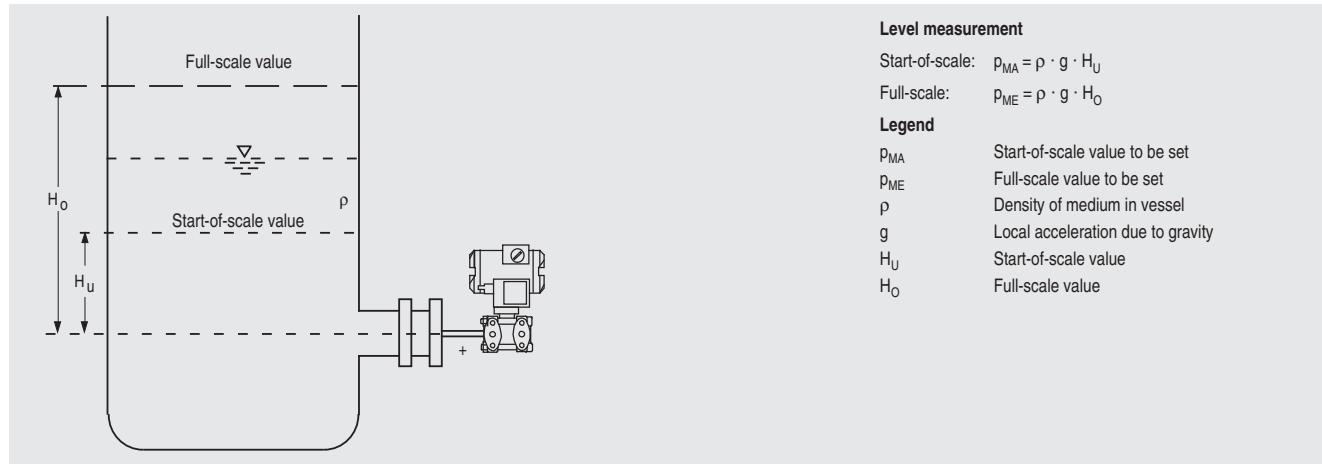
Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

Dimensional drawings

Pressure transmitters for differential pressure, for flanging

Measuring setups for open containers



Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

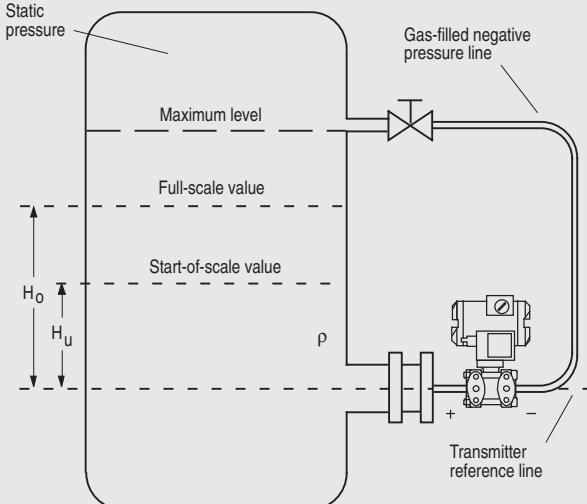
SITRANS P measuring instruments for pressure

Remote seals

Measuring setups without remote seals

Measuring setups for closed containers

2



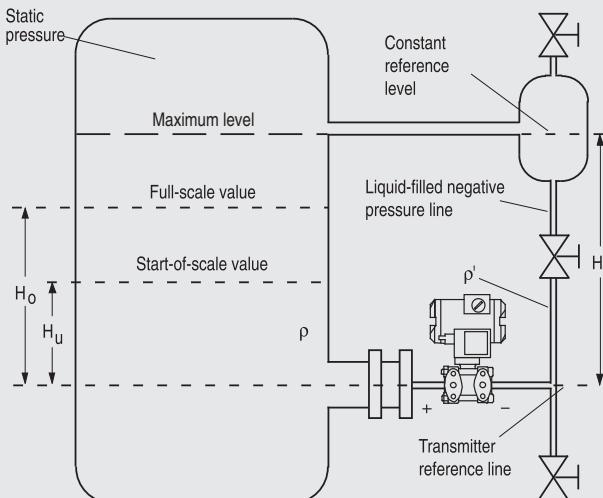
Level measurement, Version 1

Start-of-scale: $\Delta p_{MA} = \rho \cdot g \cdot H_u$

Full-scale: $\Delta p_{ME} = \rho \cdot g \cdot H_o$

Legend

Δp_{MA}	Start-of-scale value to be set
Δp_{ME}	Full-scale value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_u	Start-of-scale value
H_o	Full-scale value



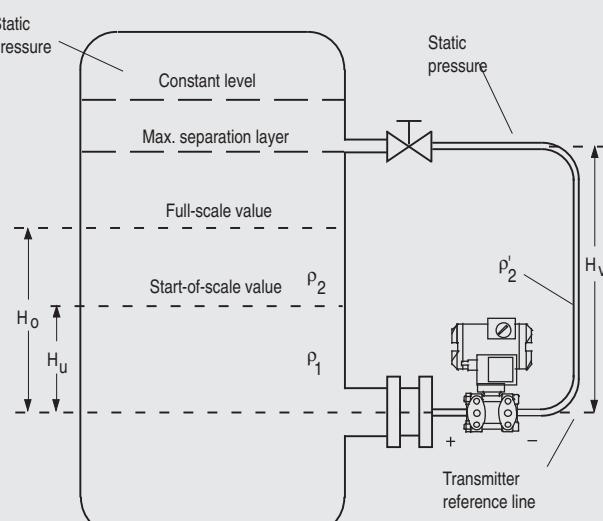
Level measurement, Version 2

Start-of-scale: $\Delta p_{MA} = g \cdot (H_u \cdot \rho - H_v \cdot \rho')$

Full-scale: $\Delta p_{ME} = g \cdot (H_o \cdot \rho - H_v \cdot \rho')$

Legend

Δp_{MA}	Start-of-scale value to be set
Δp_{ME}	Full-scale value to be set
ρ	Density of medium in vessel
ρ'	Density of liquid in the negative pressure line (corresponding to the temperature existing there)
g	Local acceleration due to gravity
H_u	Start-of-scale value
H_o	Full-scale value
H_v	Distance between the measuring points (spigots)



Separation layer measurement

Start-of-scale: $\Delta p_{MA} = g \cdot (H_u \cdot \rho_1 + (H_o - H_u) \cdot \rho_2 - H_v \cdot \rho'_2)$

Full-scale: $\Delta p_{ME} = g \cdot (H_o \cdot \rho_1 - H_v \cdot \rho'_2)$

Legend

Δp_{MA}	Start-of-scale value to be set
Δp_{ME}	Full-scale value to be set
ρ_1	Density of heavier liquid with separation layer in vessel
ρ_2	Density of lighter liquid with separation layer
ρ'_2	Density of liquid in the negative pressure line (corresponding to the temperature existing there)
g	Local acceleration due to gravity
H_u	Start-of-scale value
H_o	Full-scale value
H_v	Distance between the measuring points (spigots)

Checking of transmitter/remote seal combinations

* Customer: _____ Tag. No.: _____
 * Plant: _____ Item No.: _____
 * Ordering code: _____ Person responsible: _____
 * Ordering department: _____ Phone: _____
*** Transmitter Order No.: 7MF 4** **-1** **-1**

Order No. of transmitter known?

Yes

No

* Order No. of remote seal:

7MF 4 9 **-** **-** **-Z**

Suffixes _____

Suffixes _____

* Or without Order No.: Process connection

* Standard: _____
 * Nominal diameter: _____
 * Nominal pressure: _____
 * Constructional design: _____
 Sandwich-type rem. seal
 Flanged remote seal
 Quick-release remote seal
 Clamp-on seal
 Other.: _____
 Direct connection
 Capillary on one side; connection to:
 + side - side
 Capillaries on both sides;
 Capillary length: ___ m
 Yes No

* Connection:

* Vacuum-proof design
 * Wetted parts materials:
 * Tube:
 * Filling liquid
 * Miscellaneous

No Yes, ___ mm long

Calculation of measuring range necessary?

No

Yes

* Range to be set:
(without calculation)

Start-of-scale: _____ mbar (4 mA)

Full-scale: _____ mbar (20 mA)

* Required measuring accuracy:

Error: < . % of set span per
10 V change in
temperature

Medium _____

Density of medium: _____

kg/m³

Normal _____ °C

Minimum _____ °C

Maximum _____ °C

Normal _____ °C

Minimum _____ °C

Maximum _____ °C

Normal _____ °C

Minimum _____ °C

Maximum _____ °C

* Temperature of medium:

* Ambient temperature on capillaries:

* Ambient temperature on transmitter:

* Operating pressure referred to absolute zero: _____ bar a

 No Yes

_____ °C

If yes, associated temperature of medium: _____ °C
 * Installation type, see pages 2/183 and 2/184

 A B C₁ C₂ D E G H J

* Measuring: With install. types A, B, C₁, C₂ and D: from _____ to _____ mbar
 range With install. types A, B, G, H and J: H_U = _____ mm; H_O = _____ mm

* Dimensions: With install. types A, B, C₁ and C₂: H₁ = _____ mm
 With install. types D, G, H and J: H_V = _____ mm

* Start-of-scale value following calculation: _____ mbar (4 mA)

Full-scale value following calculation: _____ mbar (20 mA)

Associated span: _____ mbar

Error to be expected: < . % of set span per 10 K
change in temperature

Please fill in this questionnaire
and enclose with every order!

Checked: Name:
Department:
Date:

*) Values must be entered here!

Order date: _____

Processing date: _____

Ordering code (customer): _____

Ordering code (supplier): _____

Customer reference: _____

Measuring point: _____

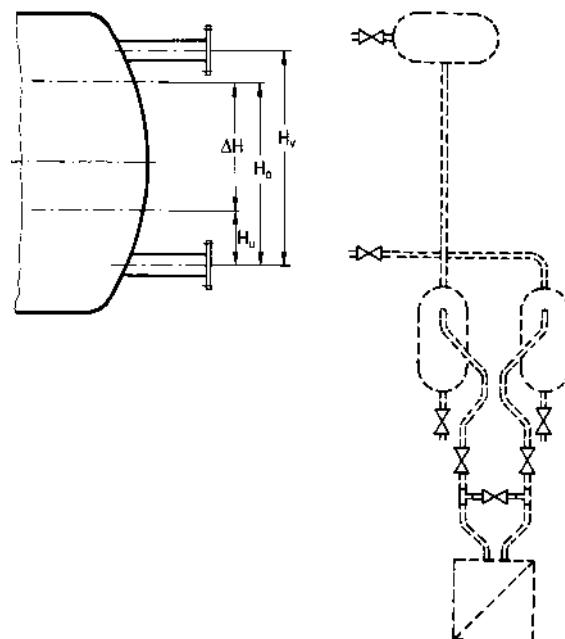
Position: _____

Dimensions: _____

Pressure: barTemperature: K °CMeasuring range: cm m
(please mark with cross)Order No. of transmitter ¹⁾: _____

7 M F 4 - - - - - Z

Y01



The different pressures and temperatures (densities) in the vessel and in the reference column result in an offset in the start-of-scale and full-scale values.

The calibration data are determined in addition.

It is also checked whether – as a result of the range offset – the ordered transmitter is suitable for this measurement.

Please supply the following characteristic data so that we can calculate the measuring range, start-of-scale value, full-scale value and calibration data:

Please mark type of boiler with a cross: Closed ¹⁾ <input type="checkbox"/>	
Open or not under pressure ²⁾ <input type="checkbox"/>	
Medium _____	
Licensed boiler pressure (absolute) _____ bar	
Operating pressure (absolute)	Lowest _____ bar
	Normal ³⁾ _____ bar
	Highest _____ bar
Temperature of reference column (cold) _____ K	
Distance between measuring points (dimension according to sketch) H_V = _____ m	
Measuring range ⁴⁾ = start-of-scale value to full-scale value	
Start-of-scale value	H_U = _____ m
Full-scale value	H_O = _____ m
Position of equalizing vessel above bottom measuring point if different from H_V _____ m	
Please mark pressure correction of level with a cross: No <input type="checkbox"/>	
Yes ⁴⁾ <input type="checkbox"/>	

¹⁾ Reference line filled with condensation! Falling differential pressure with increasing level.

²⁾ Reference line without gas or filled with gas (air). Rising differential pressure with increasing level.

³⁾ If not specified otherwise, this value is assumed as the calculation pressure of the level meter.
The input signal (differential pressure) depends on the density (pressure and temperature).
The influence is practically negligible for a lowest liquid level of 20 to 30% of the distance between the measuring points.

⁴⁾ If a pressure correction of the level is required, the **measuring range must be the same as the distance between the measuring points**, and the transmitter is designed for the calculation pressure of 1 bar (absolute).

Pressure correction means: the static pressure and the temperature are measured separately and calculated by a correction computer or measured-value computer.

Siemens FI 01 · 2009

* Customer: _____	Tag. No.: _____
* Plant: _____	Item No.: _____
* Ordering code: _____	Person responsible: _____
* Ordering department: _____	Phone: _____
* Transmitter Order No.: 7MF 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> -1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> -1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Order No. of transmitter known?

Yes

No

* Order No. of remote seal:

7MF 4 9 - - -Z

Suffixes _____

Suffixes _____

* Or without Order No.: Process connection

- * Standard: _____
- * Nominal diameter: _____
- * Nominal pressure: _____
- * Constructional design: Sandwich-type rem. seal
 Flanged remote seal
 Quick-release remote seal
 Clamp-on seal
 Other.: _____

* Connection:

- * Vacuum-proof design
- * Wetted parts materials: _____
- * Tube: _____
- * Filling liquid: _____
- * Miscellaneous: _____

No Yes, ___ inch long

Calculation of measuring range necessary?

No

Yes

* Range to be set:
(without calculation)

Start-of-scale: _____ psi (4 mA)

Full-scale: _____ psi (20 mA)

* Required measuring accuracy:

Error: < . % of set span per
18 °F change in
temperature

Medium _____

Density of medium: _____

kg/m³

Normal _____ °F

Minimum _____ °F

Maximum _____ °F

Normal _____ °F

Minimum _____ °F

Maximum _____ °F

Normal _____ °F

Minimum _____ °F

Maximum _____ °F

* Ambient temperature on capillaries:

* Ambient temperature on transmitter:

* Operating pressure referred to absolute zero: _____ psia_{abs} No Yes

_____ °F

 A B C₁ C₂ D E G H J* Measuring: With install. types A, B, C₁, C₂ and D: from _____ to _____ psi
range With install. types A, B, G, H and J: H_U = _____ inch; H_O = _____ inch* Dimensions: With install. types A, B, C₁ and C₂: H₁ = _____ inch
With install. types D, G, H and J: H_V = _____ inch

* Start-of-scale value following calculation: _____ psi (4 mA)

Full-scale value following calculation: _____ psi (20 mA)

Associated span: _____ psi

Error to be expected: < . % of set span per 18 °F
change in temperaturePlease fill in this questionnaire
and enclose with every order!Checked: Name:
Department:
Date:

*) Values must be entered here!

SITRANS P measuring instruments for pressure Fittings

Technical description

Overview

All shut-off fittings can be secured onto walls, racks (72 mm grid) and vertical and horizontal pipes.

This offers the advantage when assembling a plant that the shut-off fittings can be secured first and the lines for the medium and differential pressure connected to them. It is then possible to check all connections for leaks and to blow out or flush the pipes in order to remove dirt (welding residues, shavings etc.).

The measuring instruments can be screwed onto the shut-off fittings right at the end when all piping has been completed.

If an instrument has to be removed for maintenance, the fittings and pipes remain as they are. It is only necessary to close the valves – the instrument can then be removed, and refitted following maintenance.

Classification according to pressure equipment directive (DGRL 97/23/EC):

For gases of fluid group 1 and liquids of fluid group 1; compliance with requirements of article 3, paragraph 3 (sound engineering practice). Siemens FI 01 · 2009

New standard DIN EN 61518

The flange connection between transmitter and valve manifold was modified in the new standard DIN EN 61518. The only connection thread approved for use in the process flanges of the pressure transmitter is $7/16\text{-}20$ UNF.

The valve manifolds for M12 screws, including the accessory sets, have therefore been deleted.

Material acceptance test certificate to EN 10204-3.1

If a material acceptance test certificate to EN 10204-3.1 is required when ordering valve manifolds or shut-off fittings, please note that a single certificate is sufficient for each ordered item type. This means that you will only be charged for one certificate in the cost calculations.

Pressure transmitters with shut-off fittings - mounting examples



SITRANS P transmitter for gage pressure with double shut-off valve, SITRANS P pressure transmitter with multiway cock or 3-spindle valve manifold



SITRANS P pressure transmitter for differential pressure, mounted in protective box (available on request)



SITRANS P transmitter for differential pressure with 3-way valve manifold, 3-spindle valve manifold or valve manifold combination DN 5/DN 8



SITRANS P pressure transmitter mounted on valve combination "Monoflange" for direct connection to flanges (available on request)

Selection of available shut-off valves

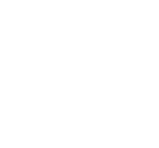
Transmitters	Shut-off valves for general applications	Page	Shut-off valves for special applications	Page		
Relative and absolute pressure transmitters with process connection G$\frac{1}{2}$" male thread e.g. <ul style="list-style-type: none">• SITRANS P, Z series 7MF1564-....-A..• SITRANS P300 7MF802-....0-....• SITRANS P DS III series 7MF403-....0-.... and 7MF423-....0-....	Shut-off valves/double shut-off valves to DIN 16270, DIN 16271 and DIN 16272	2/193		Double shut-off valve DN 5 for crossover 1/2-NPT-F to G $\frac{1}{2}$ nipple connection 7MF9011-4EA	2/196	
Relative and absolute pressure transmitter with G$\frac{1}{2}$"-14 NPT female thread e.g. <ul style="list-style-type: none">• SITRANS P Z series 7MF1564-....-H..• SITRANS P300 7MF802-....1-....• SITRANS P DS III series 7MF403-....1-.... and 7MF423-....1-....	Double shut-off valve DN 5 7MF9011-4FA and 7MF9011-4GA	2/196		Double shut-off valve DN 5 for process connection 1/2-NPT 7MF9011-4DA	2/196	
Absolute pressure transmitter with process connection to IEC 61518 e.g. <ul style="list-style-type: none">• SITRANS P DS III series 7MF433-....	2-spindle valve manifold DN 5 7MF9411-5A.	2/201		2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1C.	2/216	
				2-way valve manifolds, DN 5, forged version 7MF9401-2E. and 7MF9401-2F.	2/198	

SITRANS P measuring instruments for pressure

Fittings

Selection aid

2

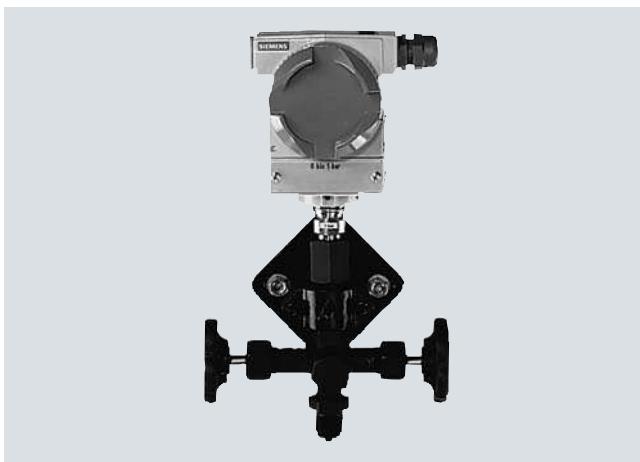
Transmitters	Shut-off valves for general applications	Page	Shut-off valves for special applications	Page		
Differential pressure transmitter with process connection to IEC 61518 e.g. • SITRANS P DS III series 7MF443-... and 7MF453-...	For 3/5-spindle valve manifold DN 5 7MF9411-5B. and 7MF9411-5C.	2/201		3-way valve manifolds, DN 5, forged version 7MF9410-1..	2/206	
	PN 100 multiway cocks 7MF9004-...	2/204		5-way valve manifolds, DN 5, forged version 7MF9410-3..	2/206	
				3-way valve manifolds, DN 8, forged version 7MF9416-1.. and 7MF9416-2..	2/209	
				Valve manifold combination DN 5/DN 8 for vapor measurement 7MF9416-6..	2/212	
				Valve manifold combination DN 8 for vapor measurement 7MF9416-4..	2/214	
				3- and 5-spindle valve manifolds for DN 5 for installation in protective boxes 7MF9412-1D. and 7MF9412-1E.	2/216	
				3- and 5-spindle valve manifolds for vertical differential pressure lines 7MF9413-1..	2/220	
				Low-pressure multiway cock 7MF9004-4..	2/223	

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for gage and absolute pressure transmitters

Shut-off valves
to DIN 16270, DIN 16271 and DIN 16272

Overview



Transmitter for pressure with double shut-off valve 7MF9401-...

The shut-off valves for pressure gages are used to shut off the line of the measured medium when dealing with aggressive and non-aggressive gases, vapors and liquids.

Design

A water trap must be connected upstream of the shut-off valve in the case of temperatures of the medium above 120 °C. The shut-off valves form B have a shaft with which they can be secured on an instrument bracket. An adapter is therefore not required to secure these valves. The vent/test connection can be shut off separately with the double shut-off valves DN 5. This permits checking of the zero on the pressure gage. In addition, the characteristic of the pressure gage can be checked using an external pressure source.

Selection and Ordering data

Order No.

Shut-off valves, form B, DIN 16270

without test collar, connection shank,
without certificate

Material	Maximum permissible working pressure
Valve housing	

CW614N (CuZn39Pb3) 250 bar
(mat. No. 2.0402) F) 7MF9401-7AA

P250GH 400 bar
(mat. No. 1.0460) F) 7MF9401-7AB

X 6 CrNiMoTi 17 12 2 400 bar
(mat. No. 1.4571/316Ti) F) 7MF9401-7AC

Shut-off valves, form B, DIN 16271

with test collar, connection shank,
without certificate

Material	Maximum permissible working pressure
Valve housing	

CW614N (CuZn39Pb3) 250 bar
(mat. No. 2.0402) F) 7MF9401-7BA

P250GH 400 bar
(mat. No. 1.0460) F) 7MF9401-7BB

X 6 CrNiMoTi 17 12 2 400 bar
(mat. No. 1.4571/316Ti) F) 7MF9401-7BC

Selection and Ordering data

Order No.

Shut-off valves, form B, DIN 16270

without test collar, pipe union with ferrule
12 S DIN EN ISO 8484-1, without certificate

Material	Maximum permissible working pressure
Valve housing	

P250GH 400 bar
(mat. No. 1.0460)

X 6 CrNiMoTi 17 12 2 400 bar
(mat. No. 1.4571/316Ti)

7MF9401-8AB

7MF9401-8AC

Shut-off valves, form B, DIN 16271

with test collar, pipe union with ferrule
12 S DIN EN ISO 8484-1, without certificate

Material	Maximum permissible working pressure
Valve housing	

P250GH 400 bar
(mat. No. 1.0460)

X 6 CrNiMoTi 17 12 2 400 bar
(mat. No. 1.4571/316Ti)

7MF9401-8BB

7MF9401-8BC

Double shut-off valves, form B, DIN 16272

with test collar, connection shank,
without certificate

Material	Maximum permissible working pressure
Valve housing	

CW614N (CuZn39Pb3) 250 bar
(mat. No. 2.0402)

P250GH 400 bar
(mat. No. 1.0460)

X 6 CrNiMoTi 17 12 2 400 bar
(mat. No. 1.4571/316Ti)

7MF9401-7DA

7MF9401-7DB

7MF9401-7DC

Double shut-off valves, form B, DIN 16272

with test collar, pipe union with ferrule
12 S DIN EN ISO 8484-1, without certificate

Material	Maximum permissible working pressure
Valve housing	

P250GH 400 bar
(mat. No. 1.0460)

X 6 CrNiMoTi 17 12 2 400 bar
(mat. No. 1.4571/316Ti)

7MF9401-8DB

7MF9401-8DC

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate
EN 10204-3.1

7MF9000-8AD

Instrument bracket, see page 2/197.

SITRANS P measuring instruments for pressure

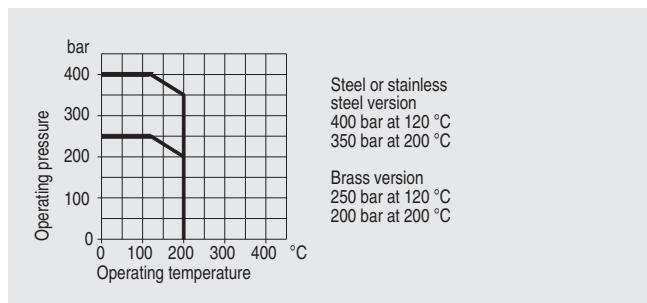
Fittings - Shut-off valves for gage and absolute pressure transmitters

Shut-off valves

to DIN 16270, DIN 16271 and DIN 16272

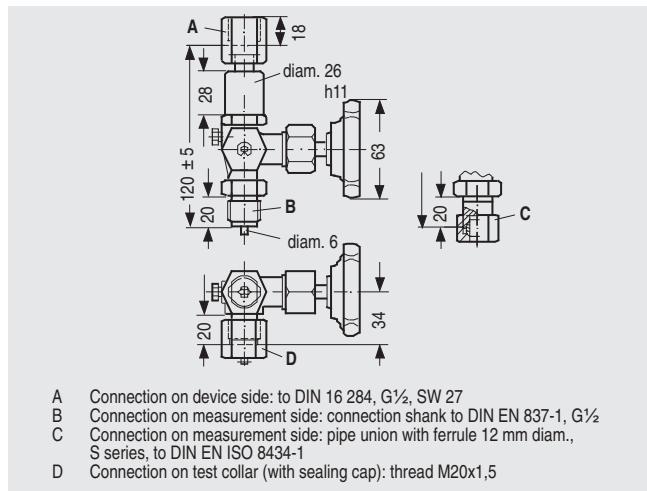
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Characteristic curves

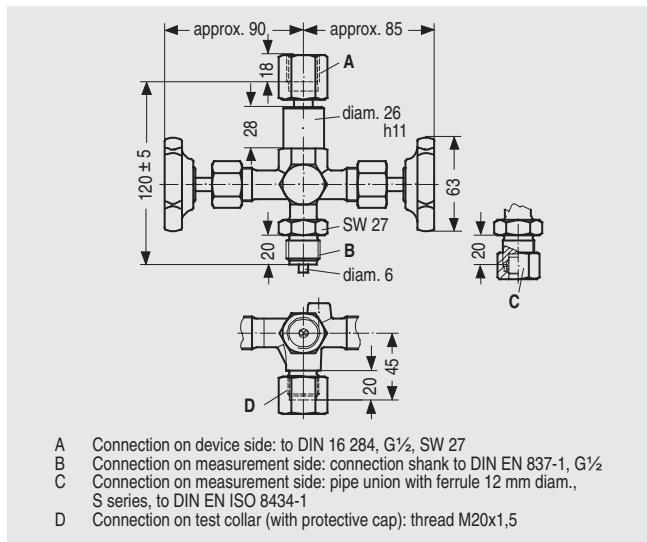


Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



Shut-off valve, form B, dimension drawing, dimensions in mm



Double shut-off valve, form B, dimension drawing, dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for gage and absolute pressure transmitters

Angle adapter

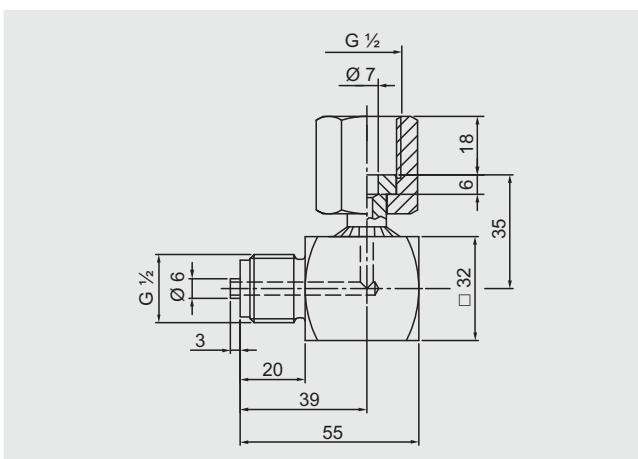
Overview



P300 pressure transmitter with shut-off valve and angle adapter

The angle adapter enables pressure transmitters with top displays to be read from the front.

Dimensional drawings



Angle adapter, dimensions in mm

2

Selection and Ordering data

Order No.

Angle adapters

7MF9401-7WA

Material: X 12 CrNiMoTi 17 12 2 (mat. No. 1.45714/316Ti), max. permissible operating pressure 400 bar

Accessories

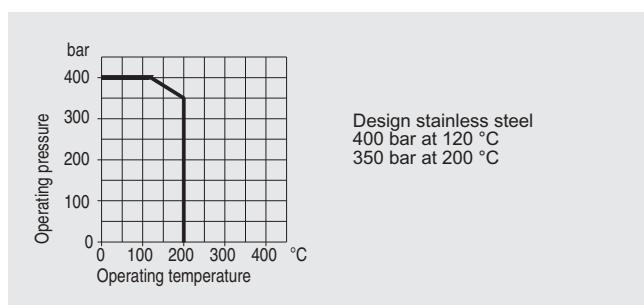
Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Characteristic curves



Permissible operating overpressure as a function of the permissible operating temperature

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for gage and absolute pressure transmitters

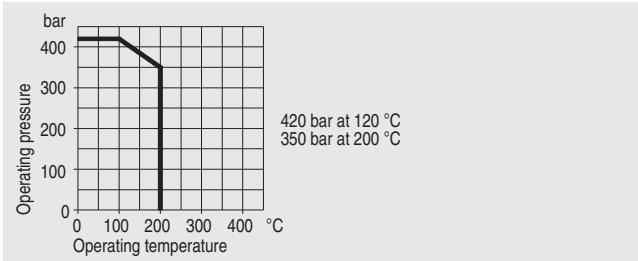
Double shut-off valves

Overview

The double shut-off valves DN 5 are suitable for pressure gages and pressure transmitters and available in 4 versions:

- Sleeve-collar
- Sleeve-sleeve
- Sleeve-nipple
- Collar-collar

Characteristic curves



Permissible operating pressure as a function of the permissible operating temperature

Selection and Ordering data

Order No.

Double shut-off valves DN 5

Material: X 6 CrNiMoTi 17 13 2 (mat. No. 1.4404/316L), max. permissible working pressure 420 bar;

- Sleeve-sleeve **7MF9011-4DA**
- Sleeve-nipple connection **7MF9011-4EA**
- Sleeve-collar **7MF9011-4FA**
- Collar-collar **7MF9011-4GA**

Accessories

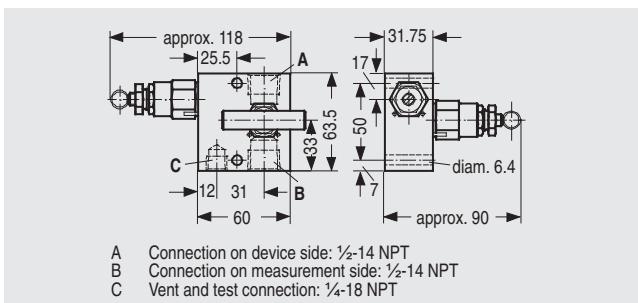
Factory test certificate EN 10204-2.2

7MF9000-8AB

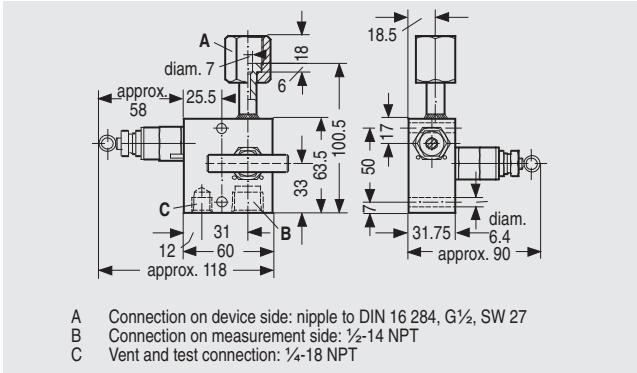
Material acceptance test certificate
EN 10204-3.1

7MF9000-8AD

Dimensional drawings

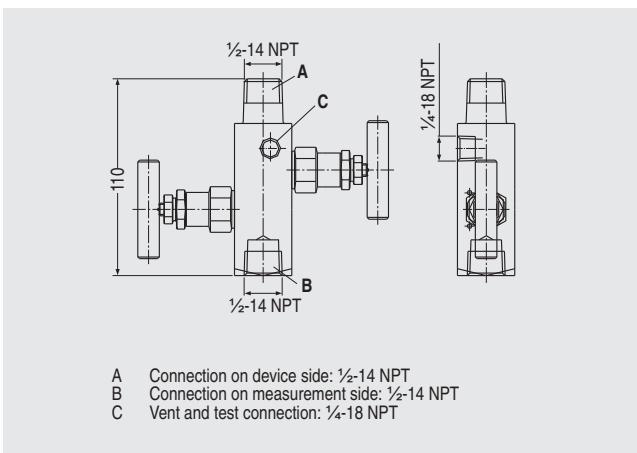


Double shut-off valve DN 5 (sleeve-sleeve) 7MF9011-4DA, dimensions in mm



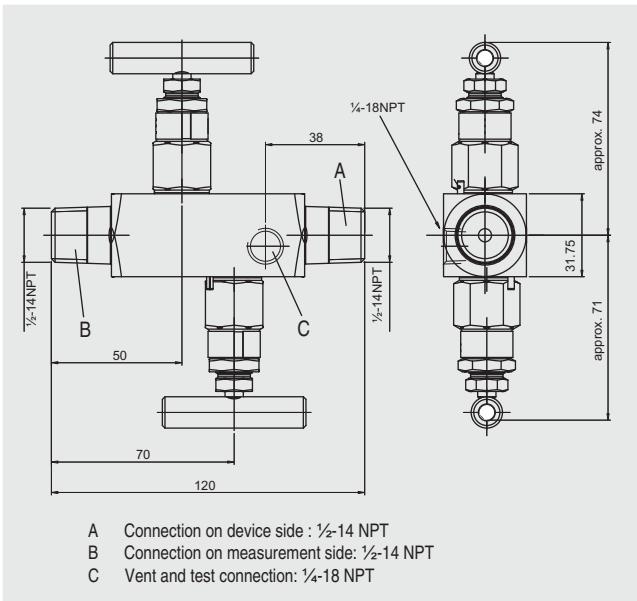
A Connection on device side: nipple to DIN 16 284, G $\frac{1}{2}$, SW 27
B Connection on measurement side: 1/2-14 NPT
C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (sleeve-nipple) 7MF9011-4EA, dimensions in mm



A Connection on device side: 1/2-14 NPT
B Connection on measurement side: 1/2-14 NPT
C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (sleeve-collar) 7MF9011-4FA, dimensions in mm



A Connection on device side: 1/2-14 NPT
B Connection on measurement side: 1/2-14 NPT
C Vent and test connection: 1/4-18 NPT

Double shut-off valve DN 5 (collar-collar) 7MF9011-4GA, dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for gage and absolute pressure transmitters

Accessories for shut-off valves / double shut-off valves

Overview

The mounting set is suitable for the double shut-off valves 7MF9011-4.A and for wall, rack and pipe mounting.

Selection and Ordering data

Mounting set for shut-off valves

- 7MF9011-4DA und -4EA

made of stainless steel, scope of delivery:
1x mounting bracket,
2x hexagon screws M6x40,
1x mounting clip,
2x washers 8.4 to DIN 125;
2x hexagon nuts 8.4 to DIN EN 24032

- 7MF9011-4FA und -4GA

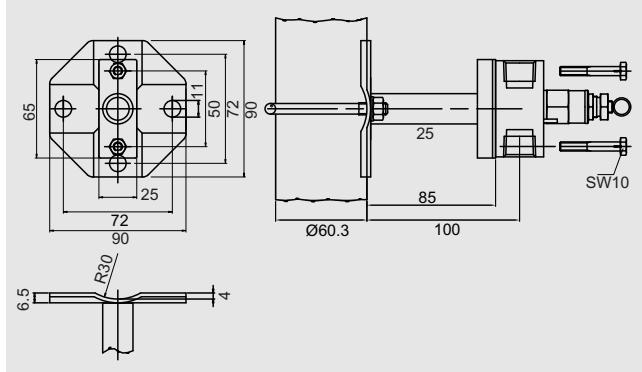
made of stainless steel, scope of delivery:
1x mounting bracket,
2x hexagon screws M6x10,
1x mounting clip,
2x washers 8.4 to DIN 125;
2x hexagon nuts 8.4 to DIN EN 24032

Order No.

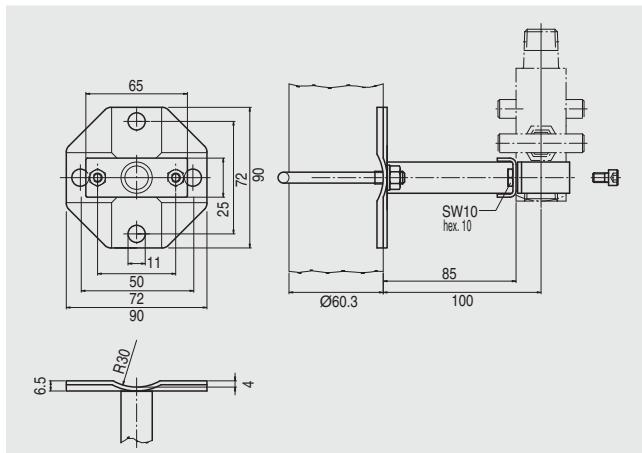
7MF9011-8AB

7MF9011-8AC

Dimensional drawings



Mounting bracket (7MF9011-8AB) for shut-off valves 7MF9011-4DA and 7MF9011-4EA for wall, rack or pipe mounting, dimensions in mm



Mounting bracket (7MF9011-8AC) for shut-off valves 7MF9011-4FA and 7MF9011-4GA for wall, rack or pipe mounting, dimensions in mm

Overview

The instrument brackets are needed to mount the following units:

- Pressure gages with threaded connection at the bottom
- Shut-off valves to DIN 16270, DIN 16271 and DIN 16272 (7MF9401-7.. and 7MF9401-8..)

Selection and Ordering data

Instrument bracket, form H, DIN 16281

made of aluminium alloy, painted black, **for wall mounting**, screw-type bracket cover

- Projection length 60 mm
- Projection length 100 mm

Order No.

M56340-A0046
M56340-A0047

Instrument bracket, form A, DIN 16281

made of annealed cast iron, galvanized and primed **for mounting on a wall** or rack or on a sectional rail (horizontal/vertical); Screw-type bracket cover

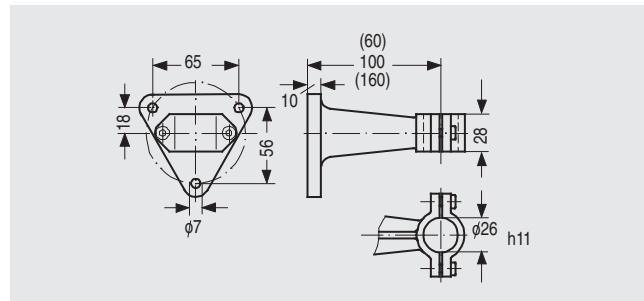
Instrument bracket, form A, DIN 16281

made of annealed cast iron, galvanized and primed with pipe clamp **for mounting on a pipe** (horizontal/vertical)
Screw-type bracket cover

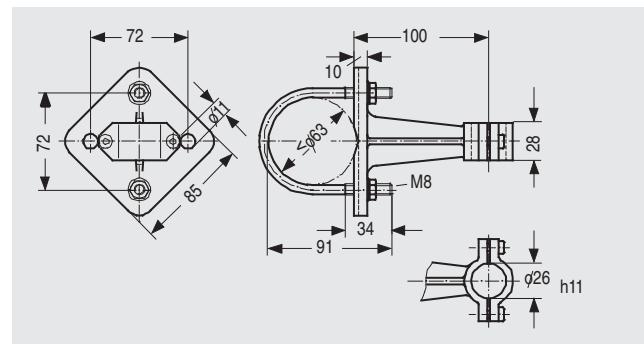
M56340-A0053

M56340-A0079

Dimensional drawings



Instrument bracket form H, for wall mounting, M56340-A0046/-A0047, dimensions in mm



Instrument bracket form A, wall or pipe mounting, M56340-A0053/-A0079, dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for gage and absolute pressure transmitters

2-way valve manifolds DN 5

Overview



The two-way valve manifold DN 5 (7MF9401-2..) is used to shut off and vent the line with the measured medium, and to test the connected pressure gage or transmitter.

Benefits

- Available for aggressive and non-aggressive liquids and gases
- Two connection versions available
 - For flanging to pressure transmitters
 - With nipple for connection of pressure gages and pressure transmitters for pressure
- Max. working pressure 420 bar, with version for oxygen max. 100 bar

Application

The 2-way valve manifold is available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

Design

The 2-way valve manifold DN 5 has 3 connections:

- A process connection (pipe union with ferrule Ø 12 mm)
- A connection for a pressure gage (flange or nipple)
- A test connection (thread G³/8)

The 2-fold valve manifold DN 5 also has an operating valve and a test valve, each with an internal spindle thread.

Materials used

2-way valve manifold DN 5 for flanging to pressure transmitters

	For non-aggressive liquids and gases	For aggressive liquids and gases	
Component	Material	Mat. No.	Material
Housing	P250GH	1.0460	X 6 CrNiMoTi 316Ti
Head parts	C 35	1.0501	17 12 2
Spindles	X 12 CrMoS 17	1.4104	
Cones	X 35 CrMo 17 hardened and tempered	1.4122	
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	
Packings	PTFE	-	PTFE

Function

The characteristic of the pressure measuring instrument or pressure transmitter can be tested through the test connection.

A pressure gage for local display can be connected to the test connection.

The two-way valve manifold DN 5 can be used in addition to shut off and vent the line with the measured medium.

Accessories

Accessory set for 2-way valve manifold DN 5 for flanging

- A31: 2 screws 7/16-20 UNF x 2¹/8 inch to ASME B18.3, 1 flat gasket
- A34: 2 screws 7/16-20 UNF x 2¹/8 inch to ASME B18.3, 1 O-ring (FPM 90)
- A11: 2 screws M10x55 to DIN EN 4762, 2 washers, 1 flat gasket
- A15 (suitable for oxygen): 2 screws M10x55 to DIN EN 4762, 2 washers, 1 flat gasket
- A16: 2 screws M10x55 to DIN EN 4762, 2 washers, 1 flat gasket (FPM 90)

Note: M10 screws only permissible up to PN 160!

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar, 80 °C

O-ring to DIN 3771, 20 x 2.65 - S – FPM90, max. 420 bar, 120 °C

Mounting plate

Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)
Scope of delivery:
 - 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting
Scope of delivery:
 - 1 mounting plate M11
 - 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

Valve manifold 100 bar, suitable for oxygen

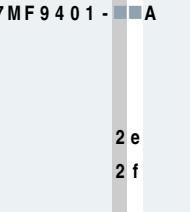
- S12: (only in combination with versions for aggressive liquids and gases): Suitable for oxygen

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for gage and absolute pressure transmitters

2-way valve manifolds DN 5

2

Selection and Ordering data	Order No.	Selection and Ordering data	Order code	Order No.
2-way valve manifold DN 5 for flanging to pressure transmitters, max. working pressure 420 bar, weight 1.85 kg (order accessory set and mounting plate with Order code), without certificate <ul style="list-style-type: none">• for non-aggressive liquids and gases• for aggressive liquids and gases for fitting to pressure gages or pressure transmitters for pressure, with nipple connection to DIN 16284, max. working pressure 420 bar, weight 1.8 kg (order mounting plate with Order code) ¹⁾ <ul style="list-style-type: none">• for non-aggressive liquids and gases• for aggressive liquids and gases	7MF9401 - 	Further designs¹⁾ Please add "-Z" to Order No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg) 2x screws 7/16-20 UNF x 2 1/8 inch to ASME B18.3; chromized steel 1x gasket made of PTFE, max. permissible 420 bar, 80 °C		Accessory set to EN (required for flanging, weight 0.2 kg) 2x screws 7/16-20 UNF x 2 1/8 inch to ASME B18.3; chromized steel 1x gasket made of PTFE, max. permissible 420 bar, 80 °C	A31	7MF9001-5CC
Accessory set to DIN²⁾ (required for flanging ³⁾ , weight 0.2 kg) 2x screws M10x55 to DIN EN ISO 4762; chromized steel 2x washers Ø 10.5 to DIN 125; 1x gaskets made of PTFE, max. permissible 420 bar, 80 °C <ul style="list-style-type: none">• Standard design• Version for oxygen		Accessory set to DIN²⁾ (required for flanging ³⁾ , weight 0.2 kg) 2x screws M10x55 to DIN EN ISO 4762; chromized steel 2x washers Ø 10.5 mm to DIN 125; 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C	A34	7MF9401-5AA
Mounting plate for valve manifold, made of electrogalvanized sheet-steel for wall mounting or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold		Mounting plate for valve manifold, made of electrogalvanized sheet-steel for wall mounting or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	A11 A15 A16	7MF9001-6AD 7MF9001-6AE 7MF9001-6AF
for pipe mounting , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)		for pipe mounting , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	M11 M12	7MF9006-6EA 7MF9006-6GA
Valve manifold 100 bar Suitable for oxygen, only for 7MF9401-2F. and 7MF9401-2K.		Valve manifold 100 bar Suitable for oxygen, only for 7MF9401-2F. and 7MF9401-2K.	S12	

¹⁾When ordering accessory set or mounting together with the 2-way valve manifold, please use Order code; otherwise use Order No.

²⁾Flange connections to DIN 19213 only permissible up to PN 160!

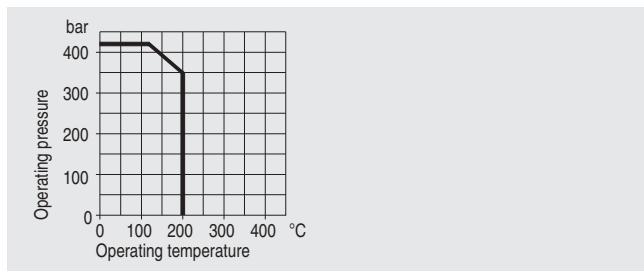
³⁾Only required for versions 7MF9401-2E. und -2F.

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for gage and absolute pressure transmitters

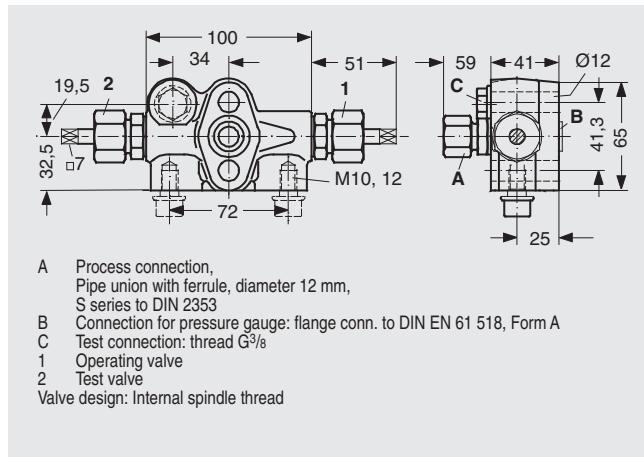
2-way valve manifolds DN 5

Characteristic curves

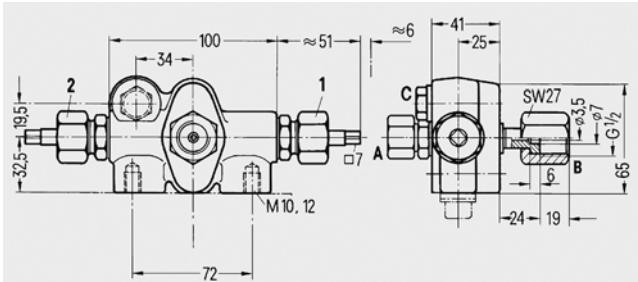


2-way valve manifold DN 5, permissible working pressure as a function of the permissible working temperature

Dimensional drawings



2-way valve manifold DN 5 (7MF9401-2E/-2F) for flanging, dimensions in mm



A Process connection,
Pipe union with ferrule, diameter 12 mm,
S series to DIN 2353

B Connection for pressure gauge: nipple conn. to DIN 16 284

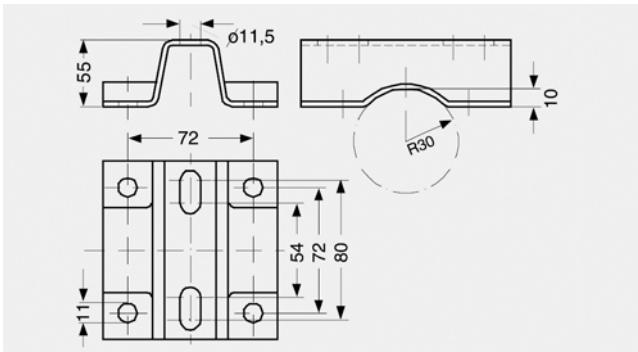
C Test connection: thread G³/₈

1 Operating valve

2 Test valve

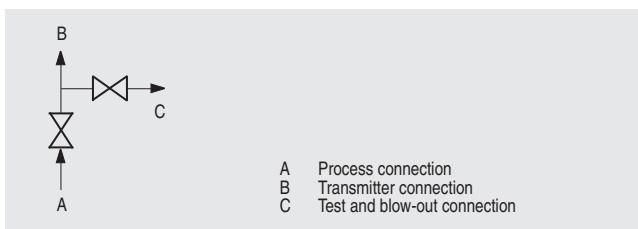
Valve design: internal spindle thread

2-way valve manifold DN 5 (7MF9401-2J/-2K) for connection to pressure gages and pressure transmitters, dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



Connection diagram of the 2-way valve manifolds

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

2-, 3- and 5-spindle valve manifolds DN 5

Overview



The 2-spindle, 3-spindle and 5-spindle valve manifolds 7MF9411-5.. are for pressure transmitters for absolute pressure or differential pressure.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 2-spindle and the 5-spindle valve manifold enable in addition venting on the transmitter side and checking of the pressure transmitter characteristic.

Benefits

- Max. working pressure 420 bar
- Each available in version for oxygen

Application

The spindle valve manifolds DN 5 are designed for liquids and gases

Each is available in a version for oxygen on request

Design

All versions of the valve manifolds have a process connection 1/2-14 NPT. The connection for the pressure transmitter is always designed as a flange connection to EN 61518, form B. The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

The valves have an external spindle thread.

Materials used

Component	Material	Mat. No.
Housing	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

Selection and Ordering data

Order No.

Valve manifolds DN 5

for liquids and gases, for flanging to pressure transmitters for absolute and differential pressure, max. working pressure 420 bar (order accessory set with Order code), without certificate

- 2-spindle valve manifold
- 3-spindle valve manifold
- 5-spindle valve manifold

7MF9411-5A

5A

7MF9411-5B

5B

7MF9411-5C

5C

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code Order No.

Further designs¹⁾

Please add "-Z" to Order No. and specify Order code.

Accessory set to EN

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9411-5A

2x screws 7/16-20 UNF x 1 1/4 inch to ASME B18.2.1; chromized steel

1x gasket made of PTFE, max. permissible 420 bar, 80 °C

K35 7MF9411-7DB

for valve manifold 7MF9411-5B and -5C

2x screws 7/16-20 UNF x 1 1/4 inch to ASME B18.2.1; **stainless steel**

1x gasket made of PTFE, max. permissible 420 bar, 80 °C

K45 7MF9411-7DC

for valve manifold 7MF9411-5B and -5C

4x screws 7/16-20 UNF x 1 1/4 inch to ASME B18.2.1; chromized steel

2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C

K36 7MF9411-5DB

for valve manifold 7MF9411-5B and -5C

4x screws 7/16-20 UNF x 1 1/4 inch to ASME B18.2.1; **stainless steel**

2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C

K46 7MF9411-5DC

Accessory set to DIN²⁾

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9411-5A

2x screws M10x45 to DIN EN 24014; chromized steel

2x washers Ø 10.5 mm to DIN 125; 1x gasket made of PTFE, max. permissible 420 bar, 80 °C

K15 7MF9411-7BB

for valve manifold 7MF9411-5B and -5C

2x screws M10x45 to DIN EN 24014; **stainless steel**

2x washers Ø 10.5 mm to DIN 125, **stainless steel**

1x gasket made of PTFE, max. permissible 420 bar, 80 °C

K25 7MF9411-7BC

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

2-, 3- and 5-spindle valve manifolds DN 5

Selection and Ordering data	Order code	Order No.
Further designs¹⁾		
Please add "-Z" to Order No. and specify Order code.		
for valve manifolds 7MF9411-5B.. and -5C..	K16	7MF9411-6BB
4x screws M10x45 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C Flange connection with M10 screws only permissible up to PN 160.	K26	7MF9411-6BC
Mounting plate		
• for valve manifold, made of electrogalvanized sheet-steel - for wall mounting or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	M11	7MF9006-6EA
- for pipe mounting , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	M12	7MF9006-6GA
• for valve manifold, made of stainless steel - for wall mounting or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	M21	7MF9006-6EC
- for pipe mounting , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	M22	7MF9006-6GC
Valve manifold 100 bar		
Suitable for oxygen		
• for 7MF9411-5A. • for 7MF9411-5B. • for 7MF9411-5C.	S12 S13 S14	

¹⁾When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Order No.

²⁾Flange connections to DIN 19213 only permissible up to 160!

Accessories

Accessory set for 2-, 3- and 5-spindle valve manifolds

2-spindle valve manifold DN 5

- K35: 2 screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1, 1 flat gasket
- K15: 2 screws M10x45 to DIN EN 24014, 2 washers, 1 flat gasket

3-spindle and 5-way valve manifold DN 5

- K36: 4 screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1, 2 flat gaskets
- K16: 4 screws M10x45 to DIN EN 24014, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar, 80 °C

Note: Flange connection with M10 screws only permissible up to PN 160!

Mounting plate

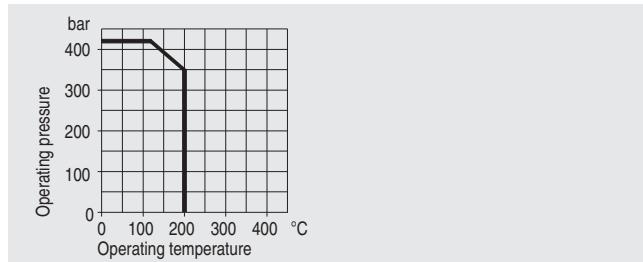
Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)
Scope of delivery:
- 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting
Scope of delivery:
- 1 mounting plate M11
- 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

Valve manifold 100 bar, suitable for oxygen

- S12: For 2-way valve manifold
- S13: For 3-way valve manifold
- S13: For 5-way valve manifold

Characteristic curves



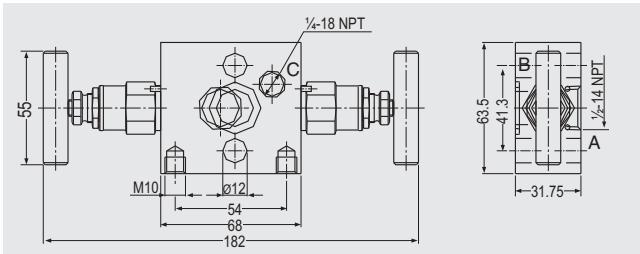
Valve manifolds PN 5 (7MF9411-5..), permissible working pressure as a function of the permissible working temperature

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

2-, 3- and 5-spindle valve manifolds DN 5

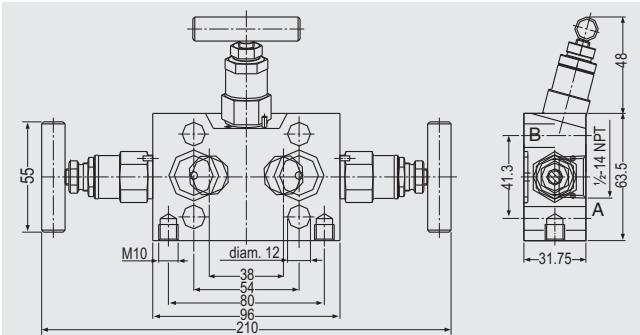
Dimensional drawings



- A Process connection: ½-14 NPT
- B Transmitter connection: Flange connection to EN 61 518, form B
- C Vent / test connection: ¼-18 NPT

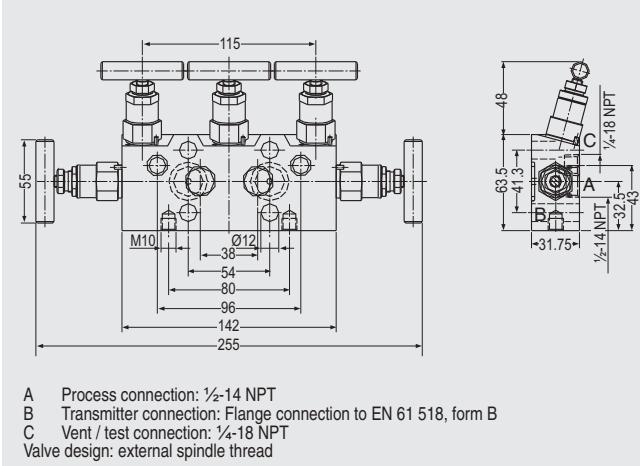
Valve design: external spindle thread

2-spindle valve manifold DN 5 (7MF9411-5A.), dimensions in mm

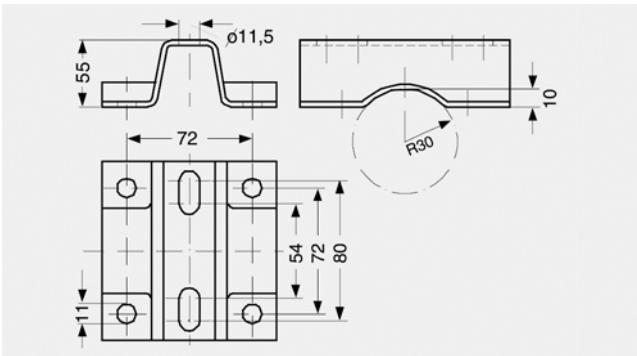


- A Process connection: 1/2-14 NPT
- B Transmitter connection: flange connection to EN 61 518, form B
- Valve design: external spindle thread

3-spindle valve manifold DN 5 (7MF9411-5B.), dimensions in mm

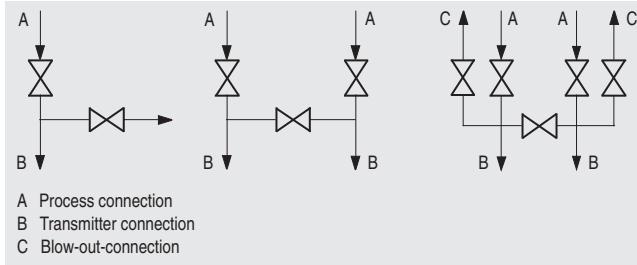


5-spindle valve manifold DN 5 (7MF9411-5C.), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



2-spindle, 3-spindle and 5-spindle valve manifold DN 5, connections

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Multiway cocks PN 100

Overview



Multiway cock PN 100 (7MF9004-1P.) for differential pressure transmitters

The multiway cock PN 100 can be flanged to pressure transmitters for differential pressure.

Benefits

- Version available for aggressive liquids, gases and vapors
- Robust design
- Oil-free and grease-free version possible
- One-hand operation

Application

The PN 100 multiway cock is available in versions for aggressive and non-aggressive liquids, gases and vapors.

Design

The multiway cock can be flanged with four screws to pressure transmitters for differential pressure.

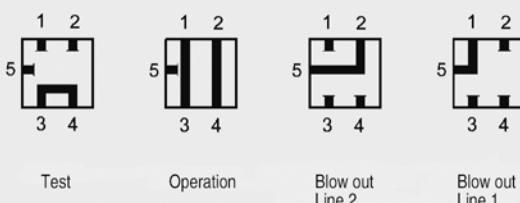
The PN 100 has 2 process connections and one blow-out connection. A steel version of the multiway cock is available for non-aggressive media, and a stainless steel version for aggressive media. The housing is forged in one piece. The switching lever is removable.

Sealing can be improved during operation.

Note: An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Testing the pressure transmitter zero



Cock positions; the symbols are printed on the cock

Technical specifications

Multiway cocks PN 100

Measured medium	Water, non-aggressive liquids and gases	Aggressive liquids, gases and vapors
Material	P250GH, mat. No.: 1.0460	X 6 CrNiMoTi 17 12 2, mat. No. 1.4571/316Ti
Connections	Steel, for pipe Ø 12 mm, L series	Stainless steel, for pipe Ø 12 mm, L series
• Process connection	2 bulkhead glands	
• Connection for blowing out	Pipe union with ferrule	
Max. permissible working temperature	200 °C	
Max. permissible working pressure	100 bar (up to max. 60 °C)	
Weight	2.5 kg	

Selection and Ordering data

Multiway cock PN 100

for flanging to pressure transmitters, weight 2.5 kg (without accessory set), without certificate

Order No.

7MF9004 - **A**

for water and non-aggressive gases and vapors

1 p

for aggressive liquids, gases and vapors

1 Q

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code Order No.

Further designs¹⁾

Please add "-Z" to Order No. and specify Order code.

Accessory set to EN

(required for flanging, weight 0.2 kg)

L31 **F) 7MF9004-5CC**

4x screws 7/16-20 UNF x 1 inch to ASME B18.2.1; chromized steel

2x gaskets made of PTFE, max. permissible temperature 80 °C

Accessory set to DIN

(required for flanging, weight 0.2 kg)

4x screws M10x25 to DIN EN 24017; chromized steel

4x washers Ø 10.5 mm to DIN 125;

2x gaskets made of PTFE, max. permissible temperature 80 °C

L11 **7MF9004-6AD**

L15 **7MF9004-6AE**

Multiway cock in oil-free and grease-free design

Max. PN 63 (instead of PN 100), BAM-tested lubricant, gasket suitable for oxygen measurement (only with Order No. 7MF9004-1Q.Z.)

S11

Mounting bracket

Required for wall mounting or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg

M13

7MF9004-6AA

¹⁾When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Order No.

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Multiway cocks PN 100

Accessories

Accessory set for multiway cock PN 100

- L31: 4 screws $7/16$ -20 UNF x 1 inch, 2 flat gaskets
- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C

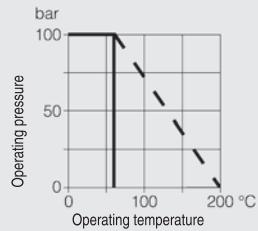
Multiway cock in oil-free and grease-free design

- S11 (only for aggressive liquids, gases and vapors (7MF9004-1Q.)): Max. PN 63 (instead of PN 100), BAM-tested lubricant, gasket suitable for oxygen

Mounting brackets

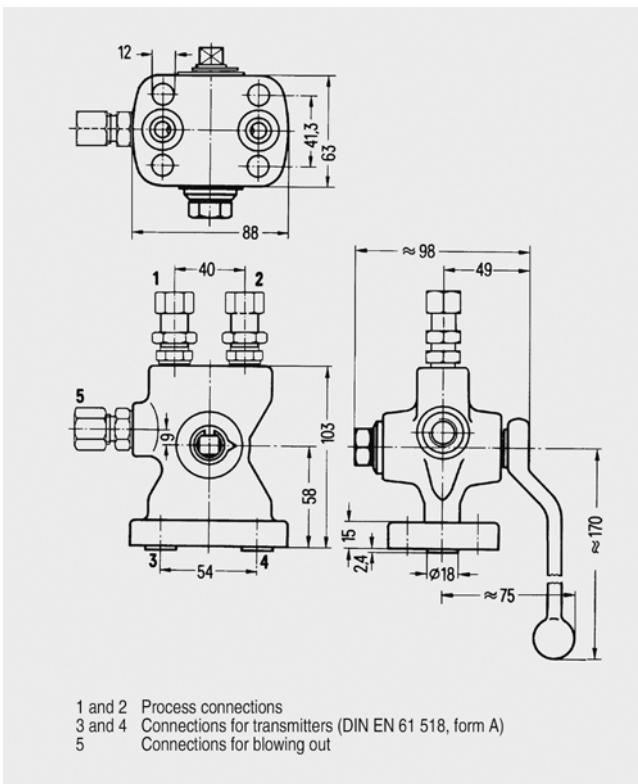
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

Characteristic curves



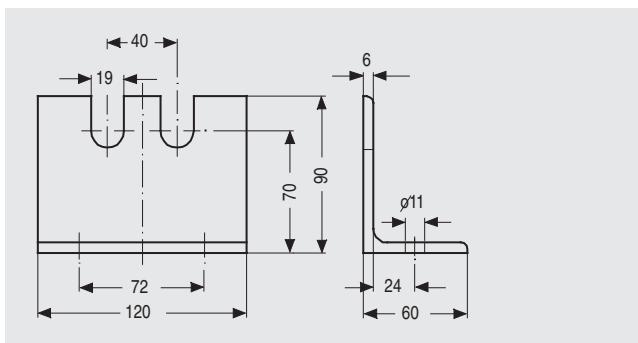
Multiway cock PN 100, permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



1 and 2 Process connections
3 and 4 Connections for transmitters (DIN EN 61 518, form A)
5 Connections for blowing out

Multiway cock 7MF9004-1P. for flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

3-way and 5-way valve manifolds DN 5

Overview



The three-spindle and five-spindle valve manifolds DN 5 (7MF9410-1..-/3..) are used to shut off the differential pressure lines and to check the transmitter zero.

In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

Benefits

- Available for aggressive and non-aggressive liquids and gases
- Max. working pressure 420 bar, with version for oxygen max. 100 bar

Application

The 3-way and 5-way valve manifolds are available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

Design

The process connection of the 3-way and 5-way valve manifolds is a pipe union with ferrule.

Both valve manifolds have 2 flange connections for connecting a pressure transmitter.

In addition, the five-way valve manifold has 2 blow-out connections.

Depending on the version the valve manifold has either 3 or 5 valves, each with an internal spindle thread.

Materials used

	For non-aggressive liquids and gases	For aggressive liquids and gases		
Component	Material	Mat. No.	Material	Mat. No.
Housing	P250GH	1.0460	X 6	1.4571/
Head parts	C 35	1.0501	CrNiMoTi	316Ti
Spindles	X 12 CrMoS 17	1.4104	17 12 2	
Cones	X 35 CrMo 17 hardened and tempered	1.4122		
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/		
		316Ti		
Packings	PTFE	-	PTFE	-

Function

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero
- In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

Selection and Ordering data

Order No.

7MF9410 - A

3-way valve manifold DN 5

for flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar, weight 2.9 kg (order accessory set and mounting plate with Order code), without certificate

- for non-aggressive liquids and gases
- for aggressive liquids and gases

1 e
1 f

5-way valve manifold DN 5

for flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar, weight 4.4 kg (order accessory set and mounting plate with Order code), without certificate

- for non-aggressive liquids and gases
- for aggressive liquids and gases

3 e
3 f

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate
EN 10204-3.1

7MF9000-8AD

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

3-way and 5-way valve manifolds DN 5

Selection and Ordering data	Order code	Order No.
<i>Further designs¹⁾</i>		
Please add "-Z" to Order No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg)		
4x screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C	B31	F) 7MF9010-5CC
4x screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C	B34	7MF9410-5CA
Accessory set to DIN²⁾ (required for flanging, weight 0.2 kg)		
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C	B11	7MF9010-6AD
• Standard design • Version for oxygen	B15	7MF9010-6AE
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C	B16	7MF9010-6CC
Mounting plate for valve manifold, made of electrogalvanized sheet-steel for wall mounting or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	M11	7MF9006-6EA
for pipe mounting , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	M12	7MF9006-6GA
Valve manifold 100 bar suitable for oxygen for 7MF9410-1F. for 7MF9410-3F.	S13	s14

Accessories

Accessory set for 3-way and 5-way valve manifold DN 5 for flanging

- B31: 4 screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B15 (suitable for oxygen): 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar, 80 °C

O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. 420 bar, 120 °C

Note: M10 screws only permissible up to PN 160!

Mounting plate

Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)
Scope of delivery:
- 1 mounting plate 7MF9006-6EA with bolts for mounting on valve manifold
- M12: For pipe mounting
Scope of delivery:
- 1 mounting plate M11
- 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

Valve manifold 100 bar, suitable for oxygen

S12: Only in combination with versions for aggressive liquids and gases

¹⁾When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Order No.

²⁾Flange connections to DIN 19213 only permissible up to PN 160!

F)Subject to export regulations AL: 91999, ECCN: N.

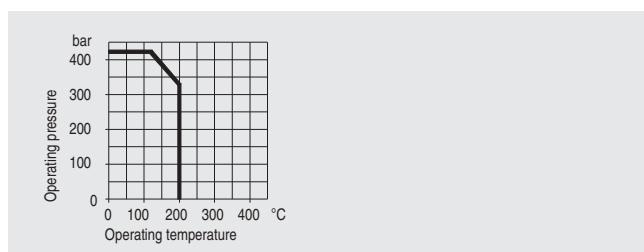
SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

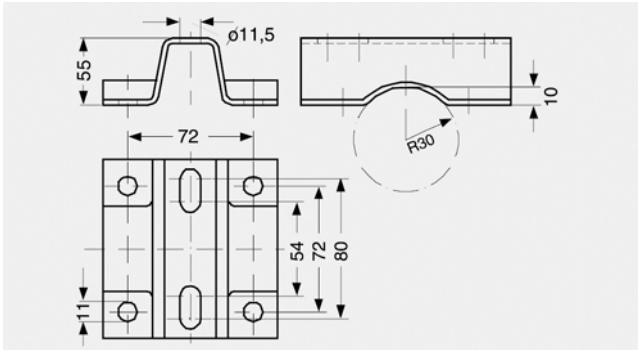
3-way and 5-way valve manifolds DN 5

2

Characteristic curves

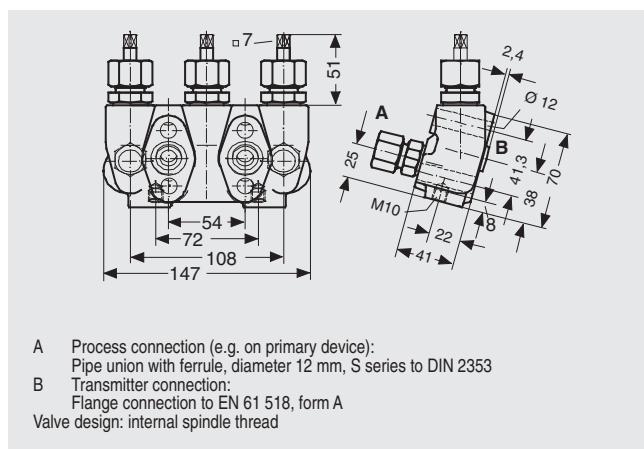


Permissible operating pressure as a function of the permissible operating temperature



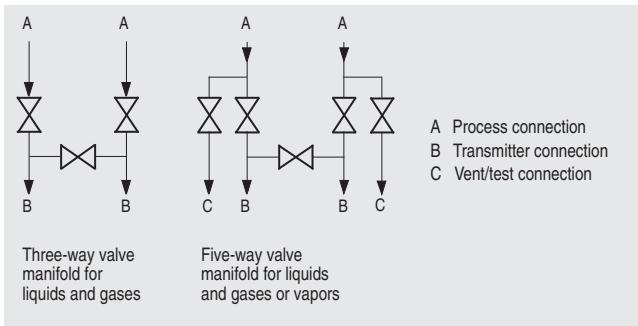
Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Dimensional drawings

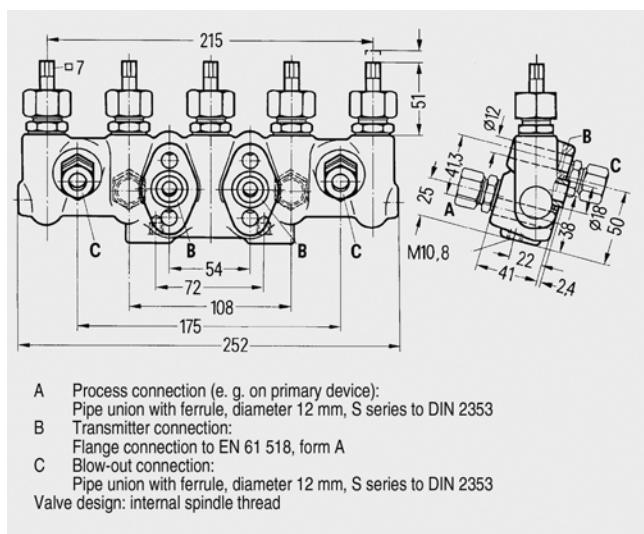


3-way valve manifold DN 5 (7MF9410-1..), dimensions in mm

Schematics



3-way and 5-way valve manifolds, connections



5-way valve manifold DN 5 (7MF9410-3..), dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

3-way valve manifold DN 8

Overview



The 3-way valve manifold DN 8 (7MF9416-1./-2..) is for pressure transmitters for differential pressure. It is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

Benefits

- For aggressive and non-aggressive liquids and gases
- The maximum working pressure is 420 bar.

Application

The 3-way valve manifold is available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

Design

For the process connection on the version for non-aggressive media it is possible to choose between a pipe union with ferrule and welding pins.

The version for aggressive media always has a pipe union with ferrule.

Both versions are available optionally with a test connection M20x1.5.

The valves have an internal spindle thread.

Materials used

Component	For non-aggressive liquids and gases		For aggressive liquids and gases	
	Material	Mat. No.	Material	Mat. No.
Housing	P250GH	1.0460	X 6 CrNiMoTi	1.4571/316Ti
Head parts	C 35	1.0501	17 12 2	
Spindles	X 12 CrMoS 17	1.4104		
Cones	X 35 CrMo 17 hardened and tempered	1.4122		
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/316Ti		
Packings	PTFE	-	PTFE	-

Function

The 3-way valve manifold DN 8 performs two functions as standard:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

All versions are also available with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

Selection and Ordering data

Order No.

3-way valve manifold DN 8	7MF9416 -	A
for flanging to pressure transmitters for differential pressure, max. working pressure 420 bar, (order accessory set and mounting plate with Order code), without certificate		
for non-aggressive liquids and gases process connection: Pipe union with ferrule		
• without test connection	1 b	
• with test connection	1 c	
for non-aggressive liquids and gases process connection: Welding pin Ø 14 x 2.5		
• without test connection	2 c	
• with test connection	2 d	
for aggressive liquids and gases process connection: Pipe union with ferrule		
• without test connection	1 d	
• with test connection	1 e	

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate
EN 10204-3.1

7MF9000-8AD

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

3-way valve manifold DN 8

2

Selection and Ordering data	Order code	Order No.
<i>Further designs¹⁾</i>		
Please add "-Z" to Order No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg)		
4x screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C	B31	F) 7MF9010-5CC
4x screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C	B34	7MF9410-5CA
Accessory set to DIN²⁾ (required for flanging, weight 0.2 kg)		
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C	B11	7MF9010-6AD
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C	B16	7MF9010-6CC
Mounting plate for valve manifold, made of electrogalvanized sheet-steel		
for wall mounting or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	M11	7MF9006-6EA
for pipe mounting , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	M12	7MF9006-6GA

¹⁾When ordering accessory set or mounting together with the valve manifold, please use Order code; otherwise use Order No.

²⁾Flange connections to DIN 19213 only permissible up to PN 160!

F)Subject to export regulations AL: 91999, ECCN: N.

Accessories

Accessory set for 3-way valve manifold DN 8 for flanging

- B31: 4 screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar, 80 °C

O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. 420 bar, 120 °C

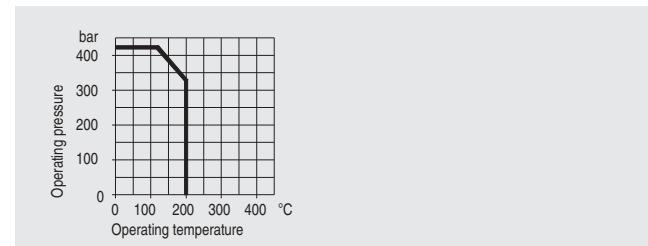
Note: M10 screws only permissible up to PN 160!

Mounting plate

Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)
Scope of delivery:
- 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting
Scope of delivery:
- 1 mounting plate M11
- 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

Characteristic curves



3-way valve manifold DN 8, permissible working pressure as a function of the permissible working temperature

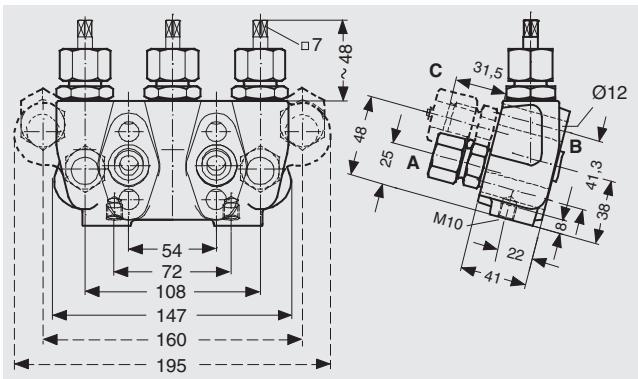
SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

3-way valve manifold DN 8

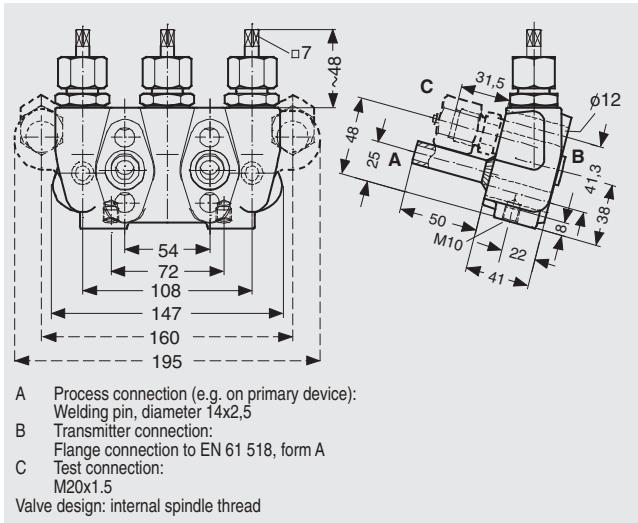
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Dimensional drawings

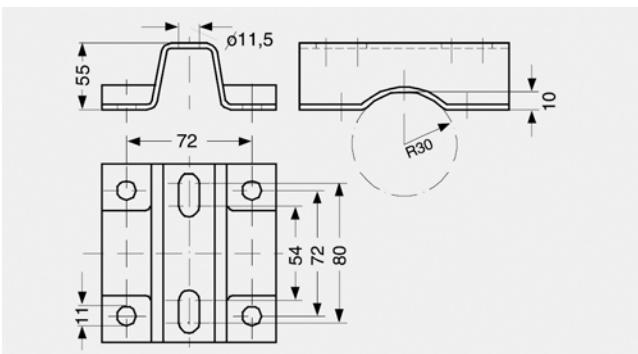


- A Process connection (e.g. on primary device):
Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
- B Transmitter connection:
Flange connection to EN 61 518, form A
- C Test connection:
M20x1.5
- Valve design: internal spindle thread

3-way valve manifold DN 8 (7MF9416-1..) with pipe union, dimensions in mm

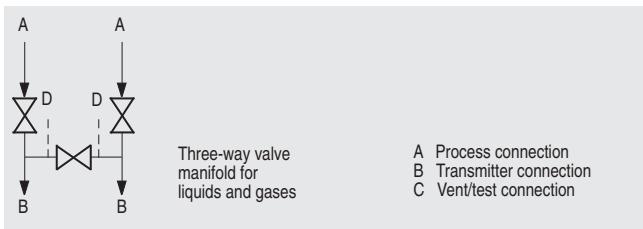


3-way valve manifold DN 8 (7MF9416-2..) with welding pin, dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



3-way valve manifold DN 8, connections

- A Process connection
- B Transmitter connection
- C Vent/test connection

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Valve manifold combination DN 5/DN 8

2

Overview



The valve manifold combination DN 5/DN 8 (7MF9416-6..) is for pressure transmitters for differential pressure.

The combination is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

Benefits

- Max. working pressure 420 bar

Application

The valve manifold combination DN 5/DN 8 is designed for vapors.

Design

The valve manifold combination DN 5/DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as a flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connections are M20x1.5.

Materials used

	Valve manifold DN 5		Blow-out valves DN 8	
Component	Material	Mat. No.	Material	Mat. No.
Housing	P250GH	1.0460	16 Mo 3	1.5415
Head parts	C 35	1.0501	21 CrMo V 57	1.7709
Spindles	X 12 CrMoS 17	1.4104	X 20 Cr 13	1.4021
Cones	X 35 CrMo 17	1.4122	X 35 CrMo 17 hardened and tempered	1.4122
Valve seats	X 6 CrNiMoTi	1.4571/316Ti	X 20 Cr 13	1.4021
Packings	PTFE	-	Pure graphite	-
Welding pins	-	-	16 Mo 3	1.5415

Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the transmitter characteristic can be connected.

Selection and Ordering data

Valve manifold combination DN 5/DN 8 for vapors

Order No.

7MF9416-6 A

for flanging to pressure transmitters for differential pressure, max. working pressure 420 bar, also available in stainless steel on request (order accessory set with Order code), without certificate

- without test connection
- with test connection M20 x 1.5

c

d

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code Order No.

Further designs¹⁾

Please add "-Z" to Order No. and specify Order code.

B34

7MF9410-5CA

Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws 7/16-20 UNF x 2 1/8 inch to ASME B18.2; chromized steel
2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C

Accessory set to DIN²⁾

(required for flanging, weight 0.2 kg)

4x screws M10x55 to DIN EN 24014; chromized steel
4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C
Flange connection to DIN 19213 only permissible up to PN 160!

B16

7MF9010-6CC

¹⁾When ordering accessory set together with the valve manifold combination, please use Order code; otherwise use Order No.

²⁾Flange connections to DIN 19213 only permissible up to 160!

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Valve manifold combination DN 5/DN 8

Accessories

Accessory set for valve manifold combination DN 5/DN 8 for flanging

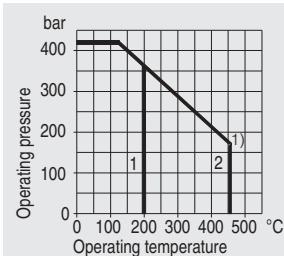
- B34: 4 screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. 420 bar, 120 °C

Note: M10 screws only permissible up to PN 160!

Characteristic curves

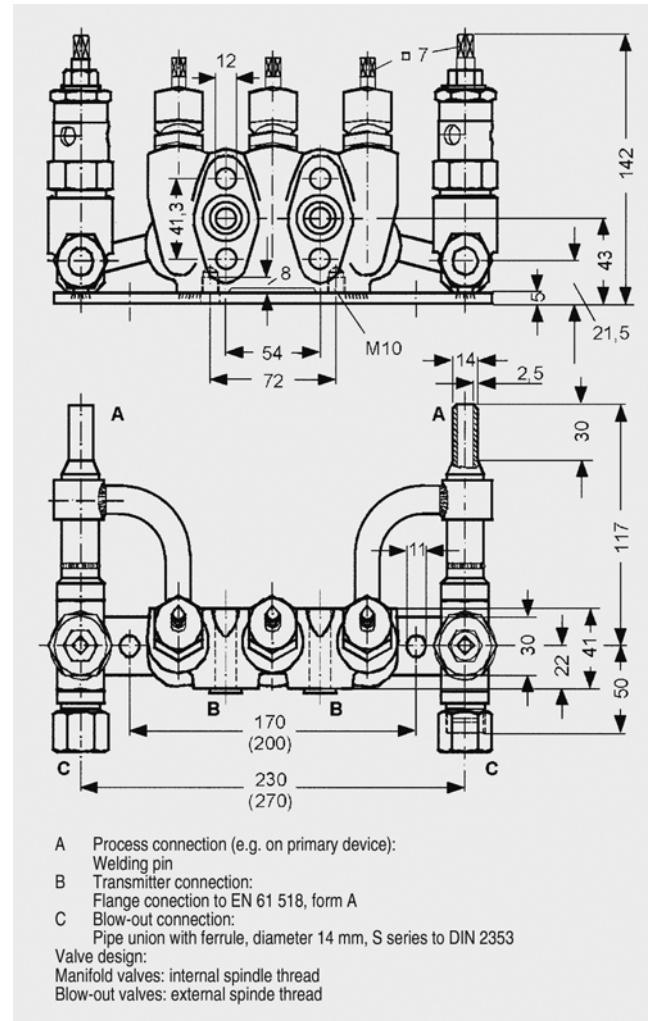


1 Valve manifold
2 Blow-out connection

1) According to DIN 19210 the design can be such that the temperatures for the differential pressure line can be set approx. 100 °C lower than the media temperature.

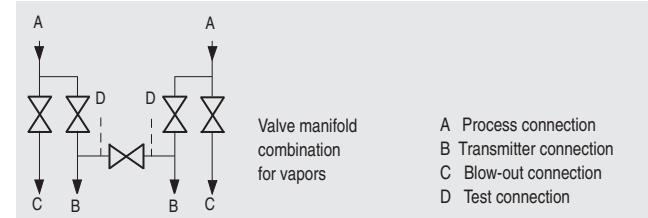
Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



Valve manifold combination DN 5/DN 8 (7MF9416-6C.), dimensions in mm (deviating dimensions for 7MF9416-6D. shown in brackets)

Schematics



Valve manifold combination DN 5/DN 8, connections

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Valve manifold combination DN 8

2

Overview



Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

The valve manifold combination DN 8 (7MF9416-4..) is for pressure transmitters for differential pressure.

It is used to shut off and blow out the differential pressure lines and to check the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to check the pressure transmitter characteristic.

Benefits

- Max. working pressure 420 bar

Application

The valve manifold combination DN 8 is designed for vapors.

Design

The valve manifold combination DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as a flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connection is M20x1.5.

The valve manifold combination DN 8 is supplied with a mounting plate.

Materials used

Valve manifold		Blow-out valves	
Component	Material	Mat. No.	Material
Housing	P250GH	1.0460	16 Mo 3
Head parts	C 35	1.0501	21 CrMo V 57
Spindles	X 12 CrMoS 17	1.4104	X 20 Cr 13
Cones	X 35 CrMo 17	1.4122	X 35 CrMo 17 hardened and tempered
Valve seats	X 6 CrNiMoTi	1.4571/316Ti	X 20 Cr 13
Packings	PTFE	-	Pure graphite
Welding pins	-	-	16 Mo 3
			1.5415

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Valve manifold combination DN 8

2

Selection and Ordering data

Valve manifold combination DN 8 for vapors

for flanging to pressure transmitters for differential pressure, with mounting plate, max. working pressure 420 bar, also available in stainless steel on request (order accessory set with Order code), without certificate

- without test connection
- with test connection M20 x 1.5

Accessories

Factory test certificate EN 10204-2.2

Order No.

7MF9416 - A

4 c
4 d

Material acceptance test certificate EN 10204-3.1

7MF9000-8AB

7MF9000-8AD

Selection and Ordering data

Further designs¹⁾

Please add "-Z" to Order No. and specify Order code.

Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws 7/16-20 UNF x 2 1/8 inch to ASME B18.2; chromized steel
2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C

Accessory set to DIN²⁾

(required for flanging, weight 0.2 kg)

4x screws M10x55 to DIN EN 24014; chromized steel
4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C
Flange connection to DIN 19 213 only permissible up to PN 160!

Order code

Order No.

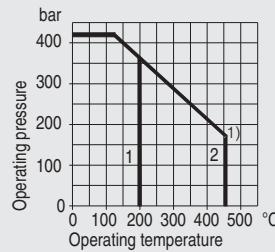
B34

7MF9410-5CA

B16

7MF9010-6CC

Characteristic curves

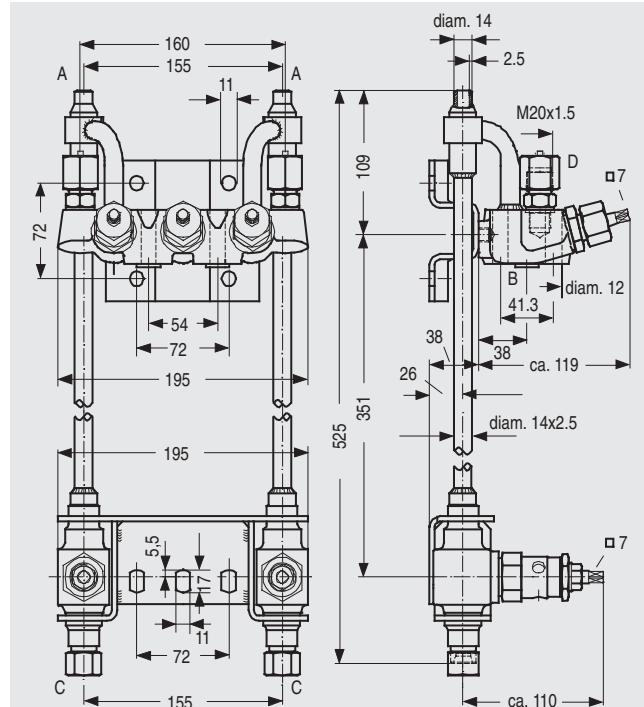


1) Valve manifold
2) Blow-out connection

1) According to DIN 19210 the design can be such that the temperatures for the differential pressure line can be set approx. 100 °C lower than the media temperature.

Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



A Process connection (e.g. on primary device):
Welding pin

B Transmitter connection:
Flange connection to EN 61 518, form A

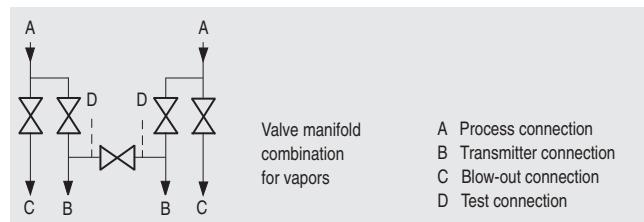
C Blow-out connection:
Pipe union with ferrule, diameter 14 mm, S series to DIN 2353

C Test connection (only with Order No. 7MF9416-4D.):
M20x1.5

Valve design:
Manifold valves: internal spindle thread
Blow-out valves: external spindle thread

Valve manifold combination DN 8 (7MF9416-4..), dimensions in mm

Schematics



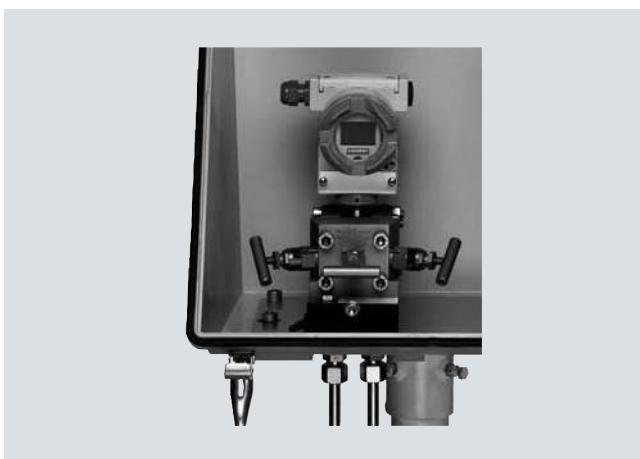
Valve manifold combination DN 8, connections

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

2-, 3- and 5-spindle valve manifolds for installing in protective boxes

Overview



The two-spindle, three-spindle and five-spindle valve manifolds (7MF9412-1..) are used to shut off the differential pressure lines and to check the transmitter zero.

The five-spindle valve manifold permits venting on the transmitter side and checking of the transmitter characteristic.

These valve manifolds are preferentially used when mounting in protective boxes. In addition, they can also be used for wall, frame or pipe mounting together with the mounting bracket.

Transmitters of the DS series can be operated and read from the front when using these valve manifolds.

Application

The valve manifolds DN 5 are designed for liquids and vapors and for installing in protective boxes.

Each is available in a version for oxygen on request

Design

All versions of the spindle manifolds have a process connection 1/2-14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to EN 61518, Form A.

The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

The valves have an external spindle thread.

Materials used

Components	Material	Mat. No.
Housing	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

Functions

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

Selection and Ordering data

Valve manifolds DN 5 for mounting in protective boxes

for liquids and gases
for flanging to pressure transmitters for absolute and differential pressure
Material: stainless steel, mat. No: 1.4404/316L
max. working pressure 420 bar
(order accessory set with Order code),
without certificate

- 2-spindle valve manifold with rotating sleeve G1/2
- 2-spindle valve manifold with flange connection
- 3-spindle valve manifold
- 5-spindle valve manifold

Order No.

7MF9412 - A

1 b

1 c

1 d

1 e

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate
EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code Order No.

Further designs¹⁾

Please add "-Z" to Order No. and specify Order code.

Accessory set to EN

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9412-1C.

f32 7MF9412-6CA

2x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel
1x O-ring to DIN 3771,
20 x 2.65 - S - FPM90,
max. permissible 420 bar, 120 °C

f35 7MF9412-6DA

2x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel
1x gasket made of PTFE,
max. permissible 420 bar, 80 °C²⁾

for valve manifold 7MF9412-1D and -1E.

f34 7MF9412-6GA

4x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel
2x O-rings to DIN 3771,
20 x 2.65 - S - FPM90,
max. permissible 420 bar, 120 °C²⁾

4x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel
2x flat gaskets made of PTFE,
max. permissible 420 bar, 80 °C²⁾

f36 7MF9412-6HA

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

2-, 3- and 5-spindle valve manifolds
for installing in protective boxes

2

Selection and Ordering data	Order code	Order No.
Further designs¹⁾ Please add "-Z" to Order No. and specify Order code.		
Accessory set to DIN (connection between valve manifold and pressure transmitter) for valve manifold 7MF9412-1C. 2x screws M10x50 to DIN EN 24014; chromized steel 2x washers Ø 10.5 mm to DIN 125; 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C ²⁾ 2x screws M10x50 to DIN EN 24014; chromized steel 2x washers Ø 10.5 mm to DIN 125; 1x gasket made of PTFE, max. permissible 420 bar, 80 °C ²⁾ for valve manifold 7MF9412-1D and -1E. 4x screws M10x50 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C ²⁾ 4x screws M10x50 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar, 80 °C ²⁾	f12	7MF9412-6AA
	f15	7MF9412-6BA
	f14	7MF9412-6EA
	f16	7MF9412-6FA
Mounting bracket required for wall mounting or for securing to mounting rack, with bolts for mounting on valve manifold • for valve manifolds 7MF9412-1B. and -1C. • for valve manifold 7MF9412-1D. • for valve manifold 7MF9412-1E.	M14	7MF9006-6LA
	M17	7MF9006-6NA
	M18	7MF9006-6PA
Mounting clip 2 off, to secure mounting bracket to pipe	M16	7MF9006-6KA
Valve manifold 100 bar suitable for oxygen • for valve manifolds 7MF9412-1B. and -1C. • for valve manifold 7MF9412-1D. • for valve manifold 7MF9412-1E.	S12	
	S13	
	S14	

¹⁾When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Order No.

²⁾Flange connections with M10 screws only permissible up to PN 160!

Accessories

Accessory set for 2-, 3- and 5-spindle valve manifolds (Connection between manifold and transmitter)

2-spindle valve manifold DN 5 with flange connection

- F32: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 O Ring (FPM90)
- F35: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 flat-gasket
- F12: 2 screws M10x50 to DIN EN 24014, 2 washers, 1 O-ring (FPM90)
- F15: 2 screws M10x50 toDIN EN 24014, 2 washers, 1 flat gasket

3-spindle and 5-way valve manifold DN 5

- F34: 4 screws 7/16 20 UNF x 2 inch toASME B 18.2.1, 2 O-rings (FPM90)
- F36: 4 screws 7/16 20 UNF x 2 inch toASME B 18.2.1, 2 flat-gaskets
- F14: 4 screws M10x50 toDIN EN 24014, 4 washers, 2 O-rings (FPM90)
- F16: 4 screws M10x50 toDIN EN 24014, 4 washers, 2 flat-gaskets

Washers Ø 10,5 to DIN 125

Flat-gaskets made of PTFE, max. 420 bar, 80 °C

O-ring to DIN 3771, 20 x 2,65 - S - FPM90; max.420 bar, 120 °C

Note:

Flange connections with M10 screws only permissible up to PN 160!

Mounting bracket for wall mounting or for securing to mounting rack

With bolts for mounting on valve manifold

- M14: For 2-spindle valve manifold DN 5
- M17: For 3-spindle valve manifold DN 5
- M18: For 5-spindle valve manifold DN 5

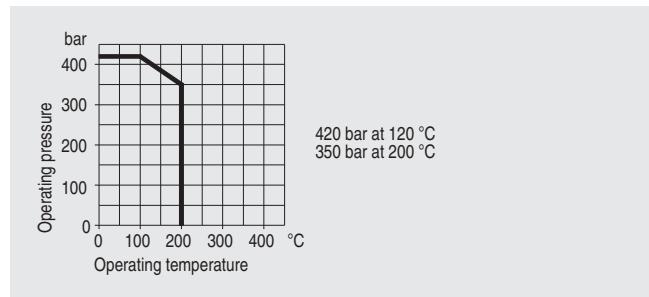
Mounting clips (2 off)

- M16: For securing the mounting brackets M14, M17 and M18 to pipe

Valve manifold 100 bar, suitable for oxygen

- S12: For 2-spindle valve manifold DN 5
- S13: For 3-spindle valve manifold DN 5
- S14: For 5-spindle valve manifold DN 5

Characteristic curves



Permissible operating pressure as a function of the permissible operating temperature

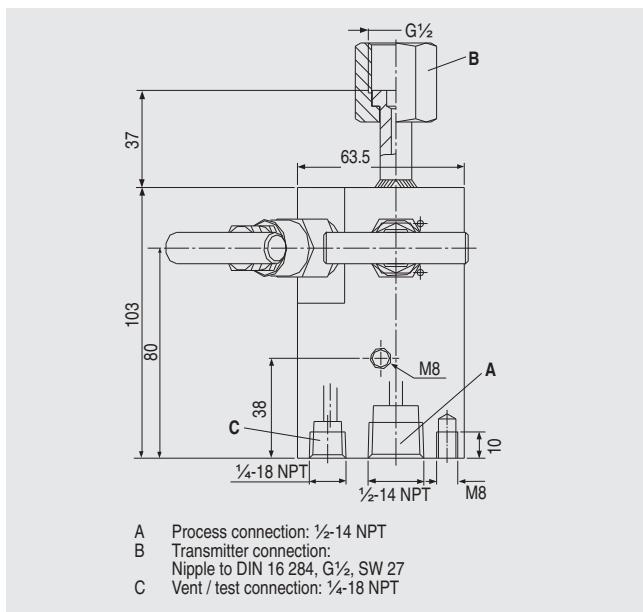
SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

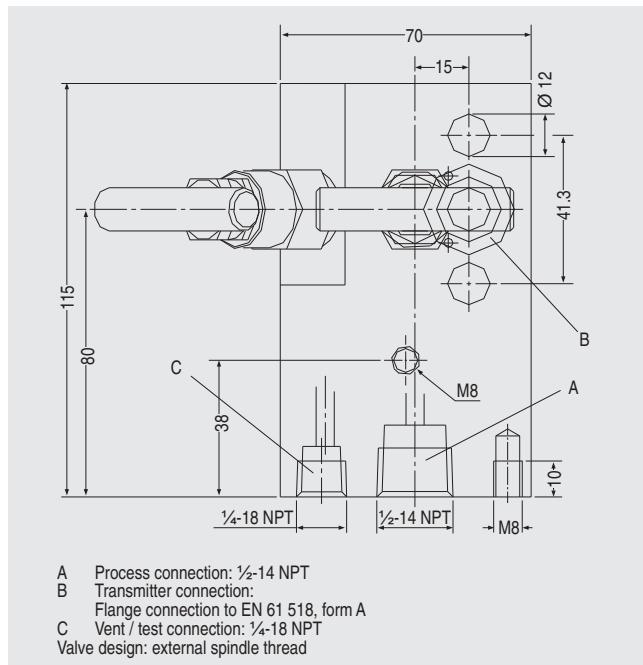
2-, 3- and 5-spindle valve manifolds for installing in protective boxes

Dimensional drawings

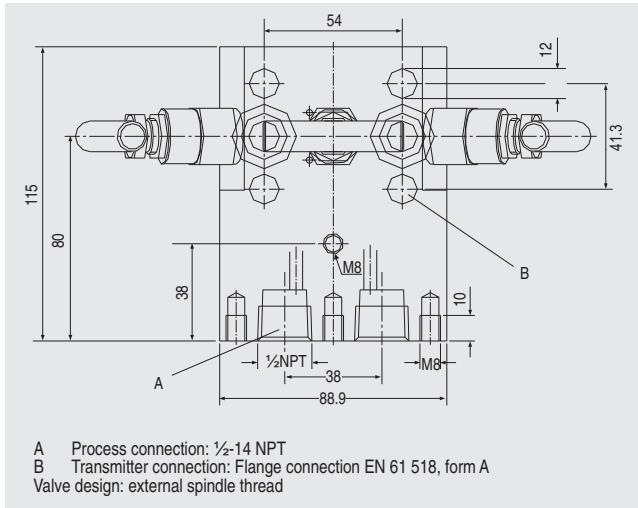
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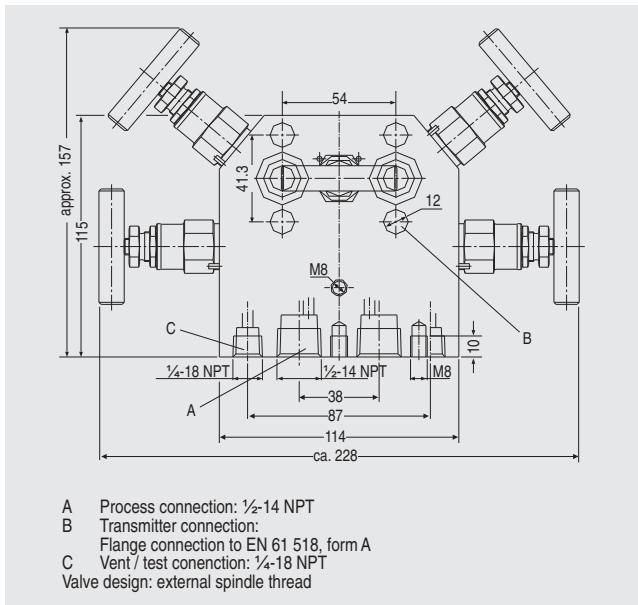
2-spindle valve manifold DN 5 (7MF9412-1B..) with rotating sleeve,
dimensions in mm



2-spindle valve manifold DN 5 (7MF9412-1C..), dimensions in mm



3-spindle valve manifold DN 5 (7MF9412-1D..), dimensions in mm

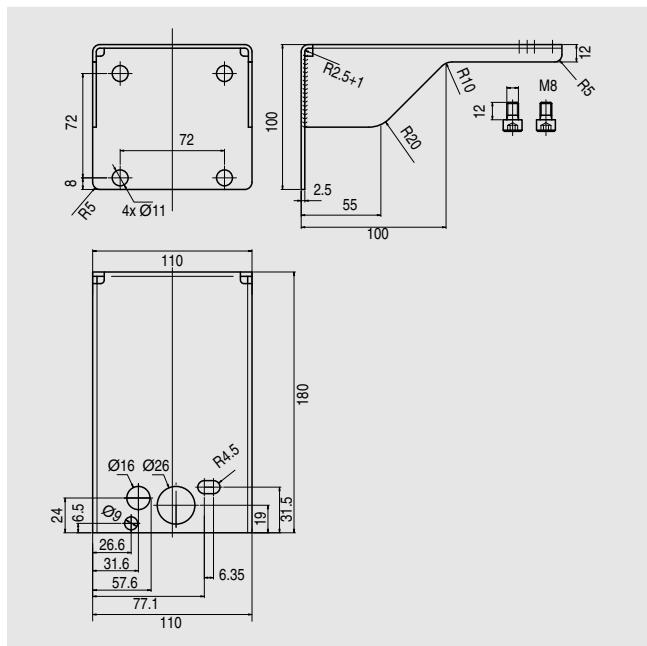


5-spindle valve manifold DN 5 (7MF9412-1E..), dimensions in mm

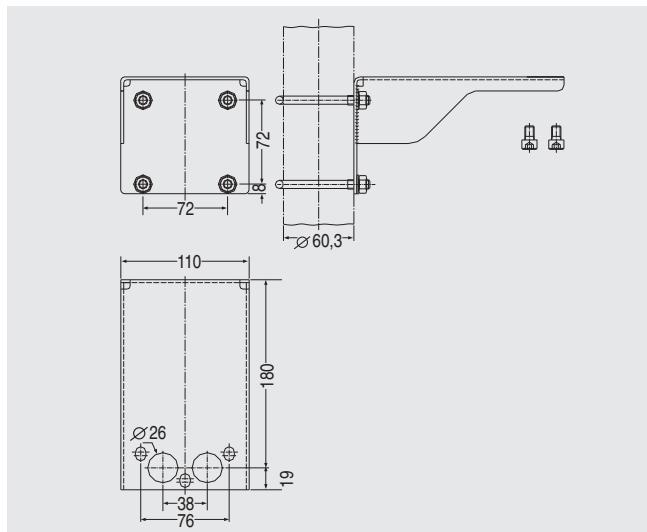
SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

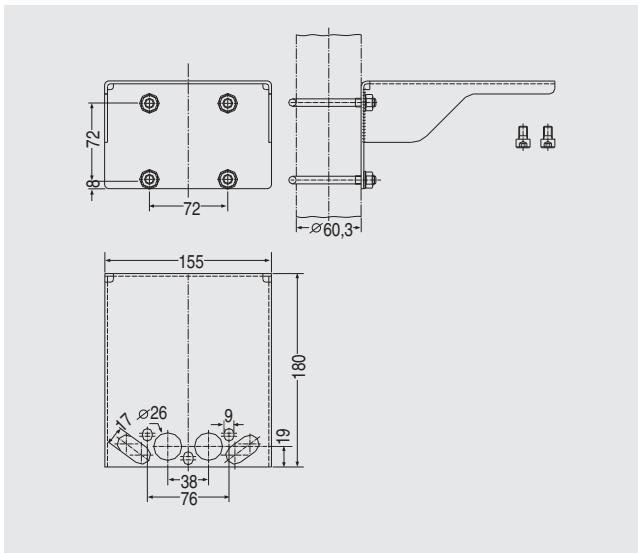
2-, 3- and 5-spindle valve manifolds
for installing in protective boxes



Mounting bracket (7MF9006-6LA)/(M14) for 2-spindle valve manifolds,
dimensions in mm

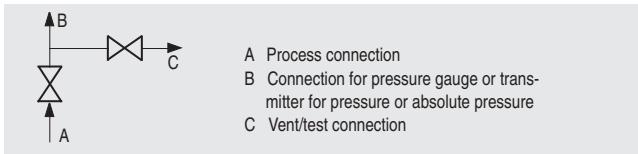


Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifolds,
dimensions in mm

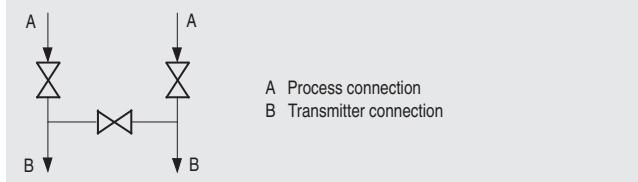


Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifolds,
dimensions in mm

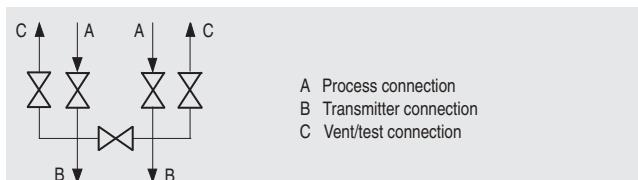
Schematics



2-spindle valve manifold DN 5 (with rotating sleeve G½ or flange connection), connections



3-spindle valve manifold DN 5, connections



5-spindle valve manifold DN 5, connections

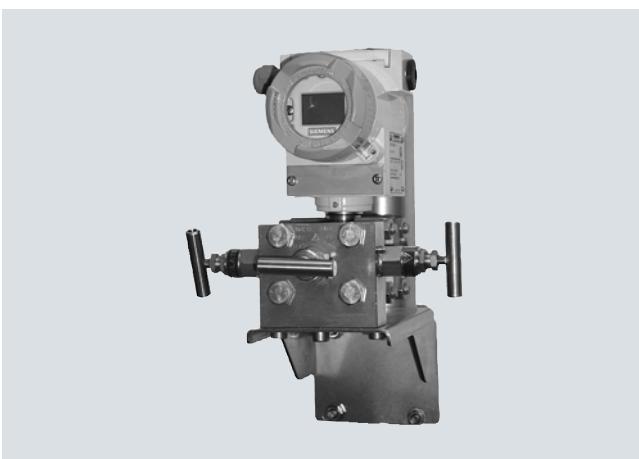
SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

3- and 5-spindle valve manifolds for vertical angular differential pressure lines

2

Overview



These 3-spindle and 5-spindle valve manifolds 7MF9413-1.. were developed specially for vertical differential pressure lines.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 5-spindle valve manifold permits venting on the transmitter side and checking of the pressure transmitter characteristic.

Benefits

- For vertical differential pressure lines
- Max. operating pressure 420 bar
- Transmitters of the DS series can be operated and read from the front.

Application

The 3-spindle and 5-spindle valve manifolds for vertical differential pressure lines are for liquids and gases. The valve manifolds are flanged on the pressure transmitter.

Design

All versions of the spindle valve manifolds have a process connection $\frac{1}{2}$ -14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to EN 61518, form B.

The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection $\frac{1}{4}$ -18 NPT.

Materials used:

Component	Material	Mat. No.
Housing	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

Selection and Ordering data

Order No.

Valve manifolds for vertical differential pressure lines

7MF9413 - A

for liquids and gases
for flanging to pressure transmitters for absolute and differential pressure
Material: stainless steel, mat. No: 1.4404/316L
max. working pressure 420 bar
(order accessory set with Order code),
without certificate

- 3-spindle valve manifold
- 5-spindle valve manifold

1 d
1 e

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate
EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code Order No.

Further designs¹⁾

Please add "-Z" to Order No. and specify Order code.

Accessory set to EN

(connection between valve manifold and pressure transmitter)

K36 7MF9411-5DB

4x screws $\frac{7}{16}$ -20 UNF x $1\frac{1}{4}$ inch to ASME B18.2.1; chromized steel

2x flat gaskets made of PTFE,
max. permissible 420 bar, 80 °C

Accessory set to DIN²⁾

(connection between valve manifold and pressure transmitter)

K16 7MF9411-6BB

4x screws M10x45 to DIN EN 24014;
chromized steel

4x washers Ø 10.5 mm to DIN 125;
2x flat gaskets made of PTFE,
max. permissible 420 bar, 80 °C
Flange connection with M10 screws
only permissible up to PN 160.

Mounting bracket

required for wall mounting or for
securing to mounting rack, with bolts
for mounting on valve manifold

M17 7MF9006-6NA

• for valve manifold 7MF9413-1D.

M18 7MF9006-6PA

required for mounting on 2" stand-
pipe, with bolts for mounting on
valve manifold

M19 7MF9006-6QA

Mounting clip

2 off, to secure mounting bracket
to pipe

M16 7MF9006-6KA

Valve manifold 100 bar

suitable for oxygen

- for valve manifold 7MF9413-1D.
- for valve manifold 7MF9413-1E.

S13

S14

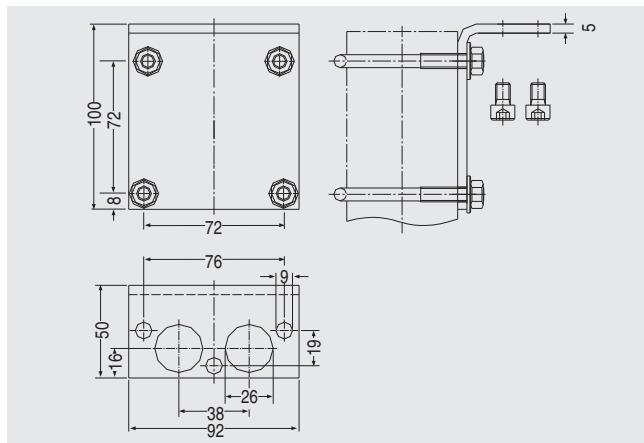
¹⁾When ordering accessory set or mounting together with the multiway cock,
please use Order code; otherwise use Order No.

²⁾Flange connections to DIN 19213 only permissible up to 160!

SITRANS P measuring instruments for pressure

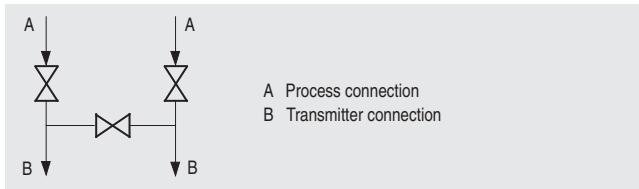
Fittings - Shut-off valves for differential pressure transmitters

3- and 5-spindle valve manifolds for vertical angular differential pressure lines

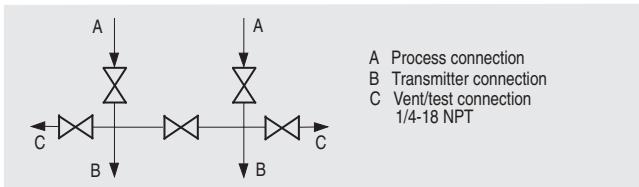


Mounting bracket (7MF9006-6QA)/(M19) for 3-spindle and 5-spindle valve manifolds, dimensions in mm

Schematics



3-spindle valve manifold for vertical differential pressure lines, connections



5-spindle valve manifold for vertical differential pressure lines, connections

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Low-pressure multiway cock

Overview



The low-pressure multiway cock 7MF9004-4CA/-4DA can be flanged to pressure transmitters for differential pressure.

Benefits

- Robust design
- For liquids and gases
- One-hand operation

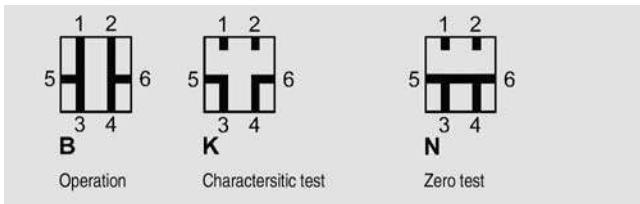
Design

The multiway cock has 2 process connections and 2 test connections, which are available in 2 versions (with sealing screws $G\frac{3}{8}$ or quick-release couplings). The housing is made of hot-pressed brass CuZn39Pb3, CW 614N. Test connections with sealing screws or with self-sealing quick-release couplings.

Note: An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

Function

- Shutting off the differential pressure lines
- Testing the pressure transmitter zero
- Testing the pressure transmitter characteristic



Cock positions; the symbols are printed on the cock

Selection and Ordering data

Order No.

Low-pressure multiway cock

for liquids and gases, for flanging to pressure transmitters, max. working pressure 25 bar, max. working temperature 60 °C (up to 80 °C for a short time), weight 1.75 kg (without accessory set)

Test connections

2x sealing screws $G\frac{3}{8}$

7MF9004-4CA

2x quick-release couplings

7MF9004-4DA

Selection and Ordering data

Order code Order No.

Further designs¹⁾

Please add "-Z" to Order No. and specify Order code.

Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws $7/16\text{-}20$ UNF x 1 inch to ASME B18.2.1; chromized steel
2x gaskets made of PTFE, max. permissible temperature 80 °C

L31

7MF9004-5CC

Accessory set to DIN

(required for flanging, weight 0.2 kg)

4x screws M10x25 to DIN EN 24017; chromized steel
4x washers Ø 10.5 mm to DIN 125; 2x gaskets made of PTFE, max. permissible temperature 80 °C

L11

7MF9004-6AD

L15

7MF9004-6AE

Multiway cock in oil-free and grease-free design

BAM-tested lubricant, gasket suitable for oxygen

S11

Mounting bracket

required for wall mounting or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg

M13

7MF9004-6AA

¹⁾When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Order No.

Accessories

Accessory set for low-pressure multiway cock

- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L31: 4 screws $7/16\text{-}20$ UNF x 1 inch, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C

Multiway cock in oil-free and grease-free design

- S11: BAM-tested lubricant, gasket suitable for oxygen

Mounting brackets

- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

SITRANS P measuring instruments for pressure

Fittings - Shut-off valves for differential pressure transmitters

Low-pressure multiway cock

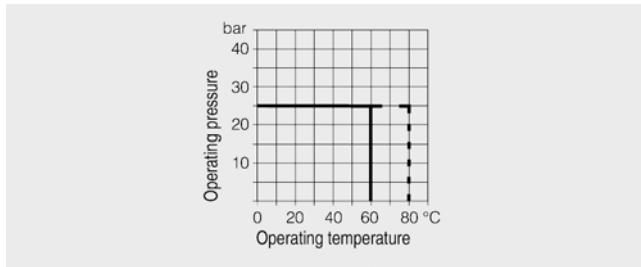
Options

Test connections

- 2 sealing screws G³/₈
- 2 quick-release couplings

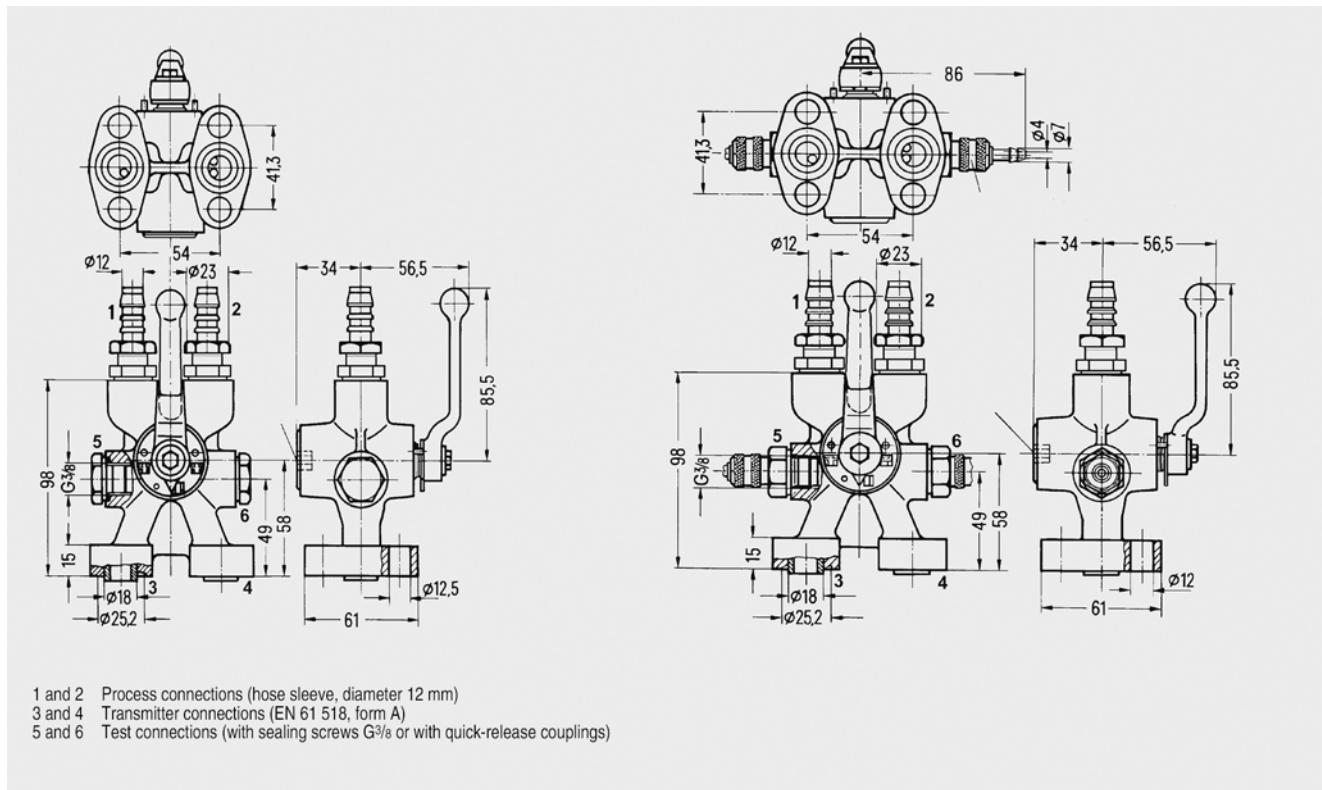
2

Characteristic curves

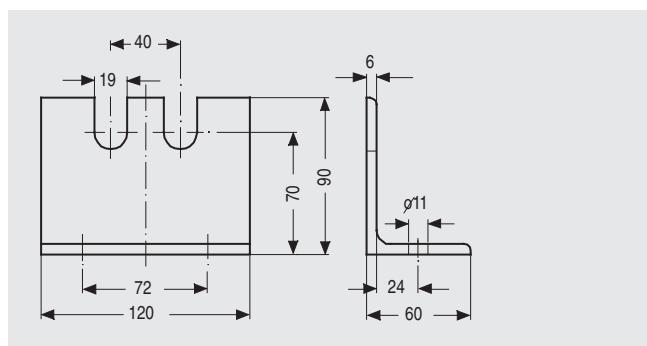


Low-pressure multiway cock, permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



Low-pressure multiway cock 7MF9004-4CA/-4DA for direct flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

Overview



The oval flange 7MF9408-2C. for pressure transmitters for absolute pressure and differential pressure has a 1/2-14 NPT female thread and is designed for max. operating pressure 400 bar.

Accessories

- E34: 2 screws $7/16$ -20 UNF x 1½ inch to ASME B18.3, 1 O-ring (FPM 90)
- E13: 2 screws M10x40 to DIN EN 4762, 2 washers, 1 O-ring (FPM 90)
- E36: 2 screws $7/16$ -20 UNF x 1½ inch to ASME B18.2.1, 1 flat gasket
- E16: 2 screws M10x40 to DIN EN ISO 4762, 2 washers, 1 flat gasket

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar, 80 °C

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar, 120 °C

Note: M10 screws only permissible up to PN 160!

Selection and Ordering data

Order No.

Oval flange

with female thread 1/2-14 NPT, max. working pressure 420 bar, flange connection to DIN EN 61518, form A

Material

P250GH, mat. No.: 1.0460

X 2 CrNiMo 17 13 2, mat. No. 1.4404/316L

7MF9408-2CE

7MF9408-2CL

Selection and Ordering data

Order code Order No.

Further designs

Please add "-Z" to Order No. and specify Order code.

Accessory set to EN¹⁾

2x screws $7/16$ -20 UNF x 1½ inch to ASME B 18.2.3; chromized steel

1x flat gasket made of PTFE, max. permissible 420 bar, 80 °C

E36

7MF9408-5DA

2x screws $7/16$ -20 UNF x 1½ inch to ASME B 18.2.3; chromized steel

1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C

E34

7MF9408-5CA

Accessory set to DIN¹⁾

2x screws M10x40 to DIN EN ISO 4762; chromized steel

2x washers Ø 10.5 mm to DIN 125; 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar, 120 °C²⁾

E13

7MF9408-6AA

2x screws M10x40 to DIN EN ISO 4762; chromized steel

2x washers Ø 10.5 mm to DIN 125;

1x flat gasket made of PTFE, max. permissible 420 bar, 80 °C²⁾

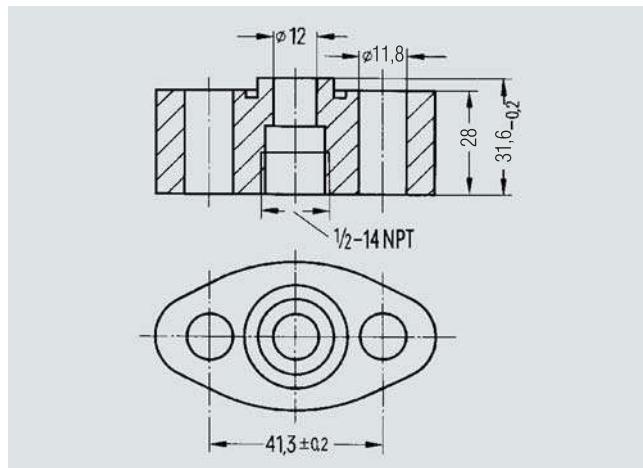
E16

7MF9408-6BA

¹⁾When ordering accessory set together with the oval flange, please use Order code; otherwise use Order No.

²⁾Flange connections with M10 screws only permissible up to PN 160!

Dimensional drawings



Oval flange 7MF9408-2C., dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Accessories

Adapters, connection glands

Overview

Adapters enable e.g. a transition from medium connections with NPT thread to shut-off valves to DIN 16270 ... 16272 or pipes in conjunction with a connection gland (e.g. 7MF9008).

Design

The connection pieces are made of X 6 CrNiMoTi 17 12 2, mat. No. 1.4571 and available in 3 versions

- Thread 1/4-18 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and thread 1/2-14 NPT

Selection and Ordering data

Order No.

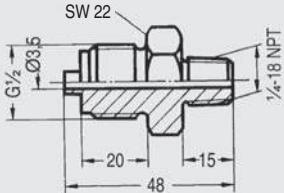
Adapter

(weight 0.2 kg)

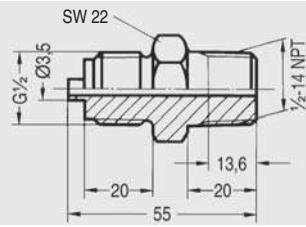
with thread 1/4-18 NPT – G1/2	F) 7MF9001-1AA
with thread 1/2-14 NPT – G1/2	F) 7MF9001-1CA
with thread 1/2-14 NPT – 1/2-14 NPT	F) 7MF9001-1DA
with thread 1/2-14 NPT – M20 x 1.5	F) 7MF9001-1EA

F)Subject to export regulations AL: 9I999, ECCN: N.

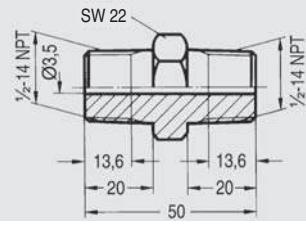
Dimensional drawings



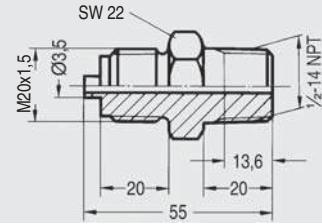
Connection piece with thread 1/4-18 NPT and connection shank G1/2 7MF9001-1AA, dimensions in mm



Connection piece with thread 1/2-14 NPT and connection shank G1/2 7MF9001-1CA, dimensions in mm



Connection piece with thread 1/2-14 NPT and thread 1/2-14 NPT 7MF9001-1DA, dimensions in mm



Connection piece with thread 1/2-14 NPT and thread M20 x 1.5 7MF9001-1EA, dimensions in mm

Overview

Connection glands to connect medium or differential pressure lines to collars G1/2 to DIN EN 837-1

- For rated pressures up to PN 630
- For oxygen only up to PN 250

Selection and Ordering data

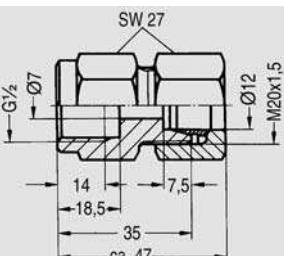
Order No.

Connection screwed gland for pipelines

(weight 0.2 kg)

Material	Design	
11SMn30	Standard	7MF9008-1GA
(mat. No. 1.0715)		
X 6 CrNiMoTi 17 12 2	Standard	7MF9008-1GB
(mat. No. 1.4571/316Ti)		
X 6 CrNiMoTi 17 12 2	Grease-free	7MF9008-1GC
(mat. No. 1.4571/316Ti)		

Dimensional drawings



Connection gland 7MF9008-1G., dimensions in mm

Overview

Connection parts G $\frac{1}{2}$ for pressure gages and shut-off fittings are available in 3 versions:

- Nipple connection
- Clamping sleeve
- Collar connection piece

Selection and Ordering data

Order No.

Adapters G $\frac{1}{2}$

for pressure gages and shut-off fittings

Nipple connection

G $\frac{1}{2}$ to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar; weight 0.1 kg; connection: G $\frac{1}{2}$ to DIN EN 837-1; Female thread G $\frac{1}{2}$

Material Mat. No.

CuZn39Pb3 CW 614N

M56340-A0001

Union nut 9 SMn 28 k

Nipple: RSt 37-2

Union nut X 8 CrNiS 18 9

Nipple: X 6 CrNiMoTi 17 12 2

1.0715

1.0037

1.4305

1.4571/316Ti

M56340-A0002

M56340-A0003

Nipple connection

M20 x 1.5 to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar; weight 0.1 kg; connection: G $\frac{1}{2}$ to DIN EN 837-1; Female thread G $\frac{1}{2}$

Material Mat. No.

Union nut X 8 CrNiS 18 9

Nipple: X 6 CrNiMoTi 17 12 2

1.4305

1.4571/316Ti

M56340-A0008

Clamping sleeve

G $\frac{1}{2}$ to DIN 16283; max. working pressure 400 bar; weight 0.1 kg; Connections: G $\frac{1}{2}$ to DIN EN 837-1; Female thread: G $\frac{1}{2}$ right-hand G $\frac{1}{2}$ left-hand

Material Mat. No.

CuZn39Pb3 CW614N

M56340-A0004

9 SMn 28 k

1.0715

M56340-A0005

Collar-adapter

max. working pressure; weight 0.1 kg; Connections: G $\frac{1}{2}$ to DIN EN 837-1; Male thread: G $\frac{1}{2}$, G $\frac{1}{2}$

Material Mat. No.

CuZn39Pb3 CW614N

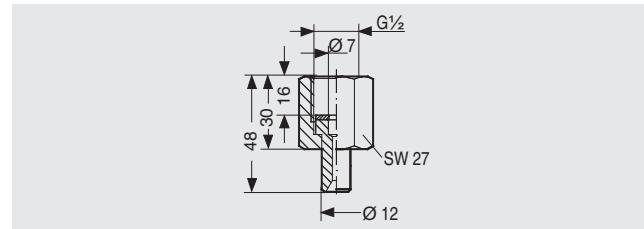
M56340-A0006

9 SMn 28 k

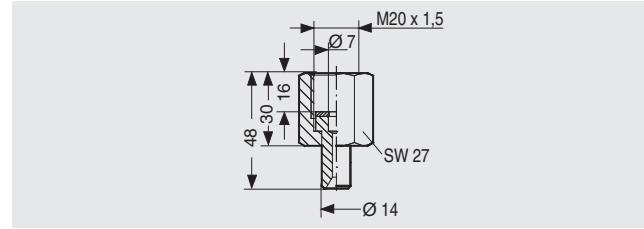
1.0715

M56340-A0007

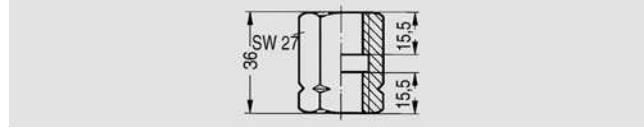
Dimensional drawings



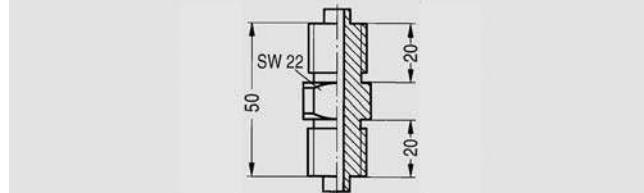
Nipple connection (G) M56340-A0001 to -A0003, dimensions in mm



Nipple connection (M20 x 1.5) M56340-A0008, dimensions in mm



Clamping sleeve M56340-A0004/-A0005, dimensions in mm



Collar connection piece M56340-A0006/-A0007, dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Accessories

Water traps, Sealing rings to EN 837-1

Overview

Water traps protect pressure gages and shut-off fittings from heating up (e.g. by steam) by the water column produced by the water trap.

The max. working temperature is 120 °C at 160 bar or 400 °C at 104 bar. If the temperature of the measured medium is higher, a sufficiently long line has to be connected upstream of the trap to enable heat dissipation.

Design

The water traps are available in U shape (type B) or circular shape (type D) to DIN 16282. They have a weld-on end Ø 20 mm x 2.6 mm on the measurement side. The connection on the device side is a clamping sleeve G $\frac{1}{2}$ to DIN 16283.

The water traps are made of steel (P250GH) or stainless steel (X 6 CrNiMoTi 17 12 2)

Water traps are designed as standard for max. operating temperature 120 °C at max. operating pressure 160 bar (400 °C at 104 bar). Water traps for higher operating pressures and temperatures are available on request.

Selection and Ordering data

Order No.

Water traps

for pressure gages and pressure transmitters,
max. working temperature 120 °C,
max. working pressure 160 bar (or 400 °C
and 104 bar), weight 0.7 kg

Water trap B to DIN 16282

Material	Mat. No.	
P235GH	1.0345	M56340-A0043
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	M56340-A0061

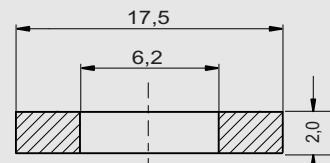
Water trap D to DIN 16282

Material	Mat. No.	
P235GH	1.0345	M56340-A0045
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	M56340-A0063

Overview

The sealing rings to EN 837-1 are required to seal measuring instruments for pressure with the process connection G $\frac{1}{2}$ B.

Dimensional drawings



Sealing ring 7MF9007-7A. to EN 837-1, dimensions in mm

Selection and Ordering data

Order No.

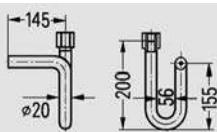
Sealing ring to EN 837-1 for thread G $\frac{1}{2}$ made of

(packing unit 100 pcs)

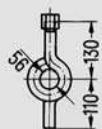
- copper F) **7MF9007-7AA**
- soft iron F) **7MF9007-7AB**
- stainless steel, mat.-No. 1.4571 F) **7MF9007-7AC**
- PTFE F) **7MF9007-7AD**

F) Subject to export regulations AL: 91999, ECCN: N.

Dimensional drawings



Water traps, type B, M56340-A0043/-A0061, dimensions in mm



Water traps, type D, M56340-A0045/-A0063, dimensions in mm

Overview

The pressure surge reducer protects the pressure gage against damage, premature wear and tear and inaccurate/fluctuating indications.

Application

The pressure reducer is used when pulsations occur in the measured medium (e.g. in slow-running vapor engines, piston pumps and compressors), or if drastic fluctuations are likely to occur in the measured medium (e.g. in hydraulic presses and tensile testing machines).

Design

- Enclosure made of brass or stainless steel
- Adjustable nozzle
- Sleeve for connection to the measuring instrument
- Pin for connection to supply lead

Selection and Ordering data

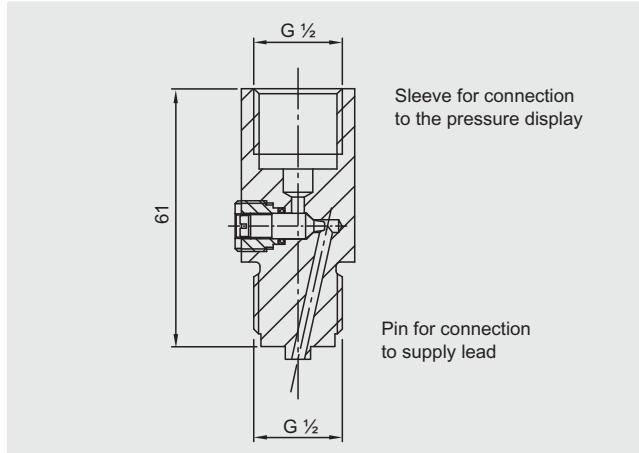
Order No.

Pressure surge reducer

Weight approx. 0,21 kg

Material	Full-scale value	Weight approx. in kg	Order No.
Brass	250 bar	0.21	M56340-A54
Stainless steel	600 bar	0.21	M56340-A59

Dimensional drawings



Pressure surge reducer, dimensions in mm

SITRANS P measuring instruments for pressure

Fittings - Accessories

Primary shut-off valves

Overview

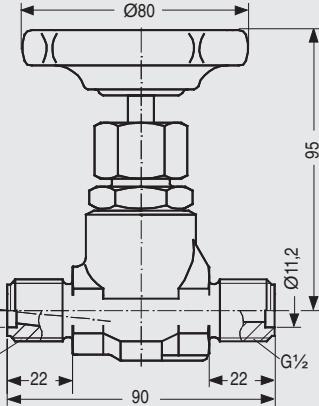
Primary shut-off valves are available in the following versions:

- For non-corrosive liquids, gases and vapors
- For corrosive liquids and gases
- Grease-free for oxygen

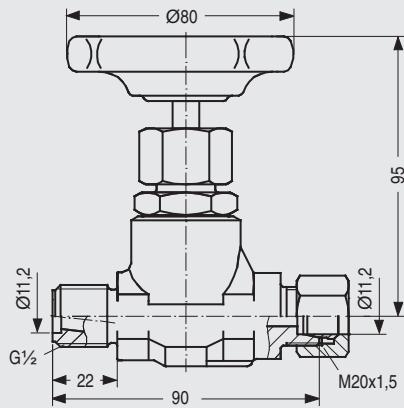
The shut-off valves are available in various materials and with various connections (see Selection and Ordering data)

2

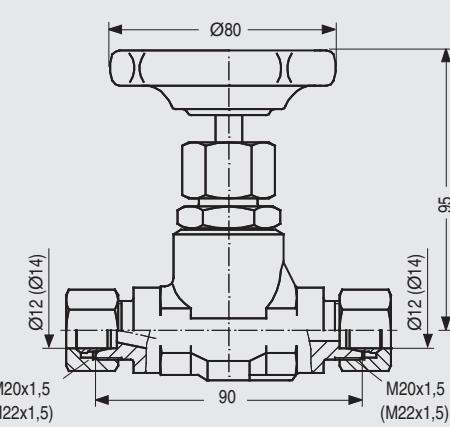
Dimensional drawings



Shut-off valve 7MF9017-1A., dimensions in mm

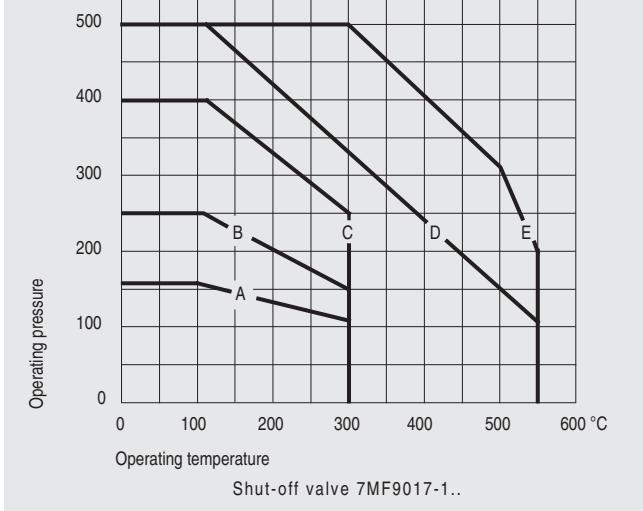


Shut-off valve 7MF9017-1B. and -2B., dimensions in mm



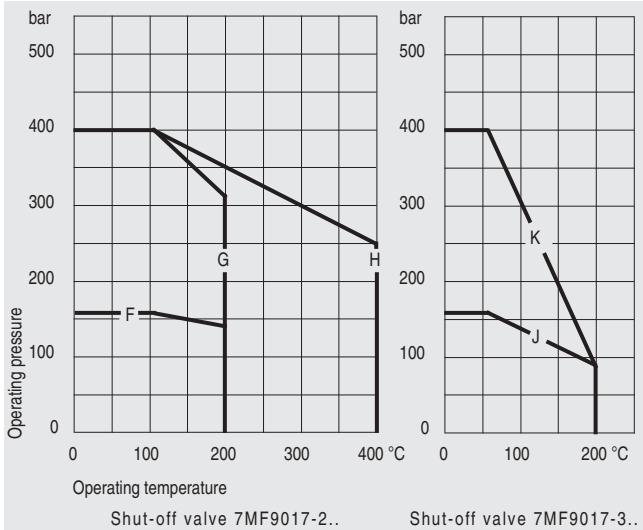
Shut-off valves 7MF9017-1C., -1D. and -2C., dimensions in mm

Characteristic curves



Shut-off valve 7MF9017-1..

Shut-off valve 7MF9017-1.., permissible working pressure as a function of the permissible working temperature



Shut-off valve 7MF9017-2..

Shut-off valve 7MF9017-3..

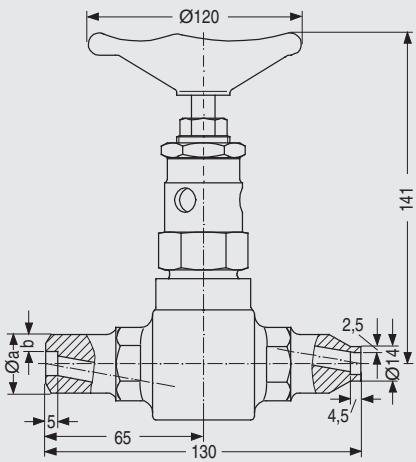
Shut-off valve 7MF9017-2.. and -3.., permissible working pressure as a function of the permissible working temperature

SITRANS P measuring instruments for pressure

Fittings - Accessories

Primary shut-off valves

2



Shut-off valves 7MF9017-, dimensions in mm

Selection and Ordering data

Primary shut-off valves, without certificate

Max. working pressure	Characteristic ¹⁾	Material	Mat. No.	Spindle thread	Connections	Approx. weight kg	Order No.
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Shut-off valve for non-aggressive liquids, gases and vapors

160 bar	A	P250GH	1.0460	Internal	Threaded socket G $\frac{1}{2}$ form R, DIN 19207	0.8	7MF9017-1 A
160 bar	A	P250GH	1.0460	Internal	Threaded socket G $\frac{1}{2}$ form R, DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series	0.8	a
400 bar	C	P250GH	1.0460	Internal	Pipe union with ferrule for pipe Ø 12 mm, S series	1	c
400 bar	C	P250GH	1.0460	Internal	Pipe union with ferrule for pipe Ø 14 mm, S series	1	d
500 bar	D	16 Mo 3	1.5415	External	Welding sleeves Ø 14 mm x 2.5 mm	1.6	f
500 bar	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 14 mm x 2.5 mm	1.6	g
500 bar	D	16 Mo 3	1.5415	External	Welding sleeves Ø 21.3 mm x 6.3 mm and Ø 14 mm x 2.5 mm	1.6	h
500 bar	D	16 Mo 3	1.5415	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	j
500 bar	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	k

Shut-off valve for aggressive liquids and gases

160 bar	F	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	Internal	Threaded socket G $\frac{1}{2}$ form R, DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series	0.8	7MF9017-2 A
400 bar	G	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	Internal	Pipe union with ferrule for pipe Ø 12 mm, S series	1	b
400 bar	H	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	External	Welding sleeves Ø 21.3 mm x 6.3 mm and Ø 14 mm x 2.5 mm	1.6	c
400 bar	H	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	h

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

¹⁾See Figure "Permissible working pressure as a function of the permissible working temperature"

SITRANS P measuring instruments for pressure

Fittings - Accessories

Compensation vessels

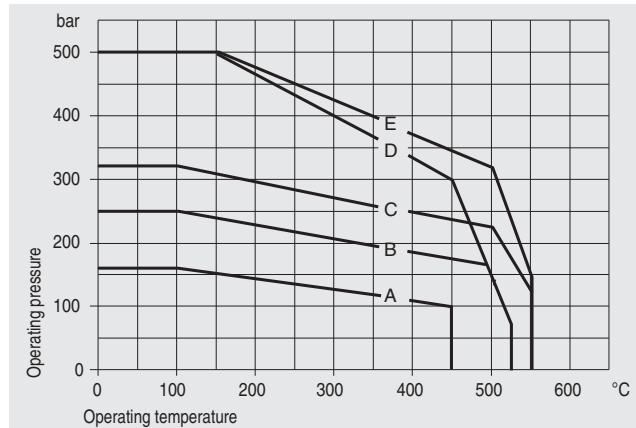
Overview

The compensation vessels prevent the level difference which occurs with pressure changes in the pressure lines and which falsifies the measurement.

According to DIN 19211, the temperature in the compensation vessel must be assumed to be 50 K less than the steam temperature in the pipe when calculating the wall thicknesses. This is because the temperature in the compensation vessel during operation can only rise up to the saturated steam temperature.

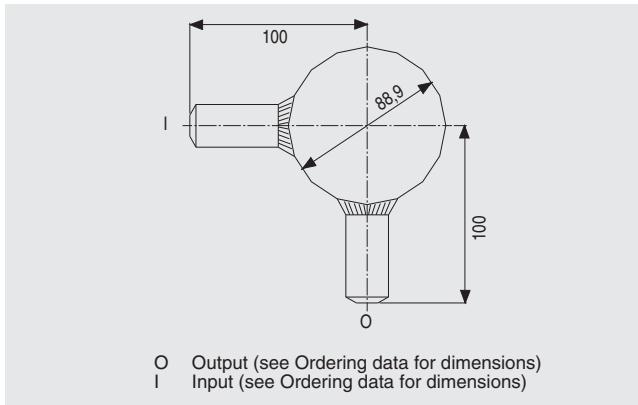
A material acceptance test certificate A to EN 10204-3.1 is available for the materials from which the compensation vessels are made.

Characteristic curves

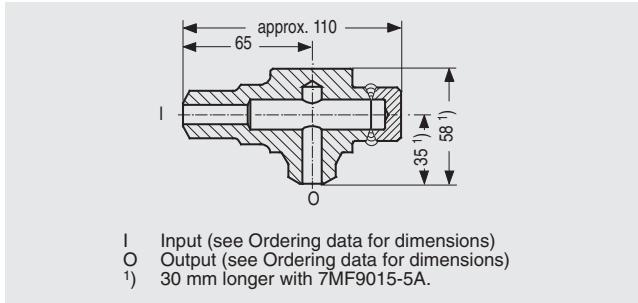


Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



Compensation vessel 7MF9015-1.., dimensions in mm



Compensation vessel 7MF9015-5.., dimensions in mm

Selection and Ordering data

Compensation vessel, without certificate

Max. working pressure	Characteristic ¹⁾	Material	Mat. No.	Connections	Output	Approx. contents cm ³	Approx. weight kg	Order No.
160 bar	A	16 Mo 3	1.5415	Threaded socket G $\frac{1}{2}$, form R, DIN 19207	Threaded socket G $\frac{1}{2}$, form V, DIN 19207	250	0.8	7MF9015-1a
250 bar	B	16 Mo 3	1.5415	Welding sleeve Ø 21 mm x 6.3 mm	Welding sleeve Ø 21.3 mm x 6.3 mm	250	0.8	1b
250 bar	B	16 Mo 3	1.5415	Welding sleeve Ø 24 mm x 7.1 mm	Welding sleeve Ø 24 mm x 7.1 mm	250	1	1c
250 bar	C	11 CrMo 9 10	1.7383	Welding sleeve Ø 24 mm x 7.1 mm	Welding sleeve Ø 24 mm x 7.1 mm	250	1	1d
250 bar	B	16 Mo 3	1.5415	Welding sleeve Ø 33.7 mm x 4.5 mm	Welding sleeve Ø 24 mm x 7.1 mm	250	0.7	1e
160 bar	A	16 Mo 3	1.5415	Threaded socket G $\frac{1}{2}$, form R, DIN 19207	Threaded socket G $\frac{1}{2}$, form V, DIN 19207	20	1.6	5a
500 bar	D	16 Mo 3	1.5415	Welding sleeve Ø 21 mm x 6.3 mm	Welding sleeve Ø 21.3 mm x 6.3 mm	20	1.6	5b
500 bar	D	16 Mo 3	1.5415	Welding sleeve Ø 24 mm x 7.1 mm	Welding sleeve Ø 24 mm x 7.1 mm	20	1.6	5c
500 bar	E	11 CrMo 9 10	1.7383	Welding sleeve Ø 24 mm x 7.1 mm	Welding sleeve Ø 24 mm x 7.1 mm	20	1.6	5d

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

¹⁾See Figure "Permissible working pressure as a function of the permissible working temperature"

Overview

Connection parts are available in the following versions:

- Threaded flange pair G $\frac{1}{2}$ with stainless steel gasket
- Nipple G $\frac{1}{2}$ form V to DIN 19207
- Union nut G $\frac{1}{2}$ made of C 35 to DIN 16284
- Gasket B $\frac{1}{2}$ (grooved) to DIN 19207

All connection parts are also available grease-free for oxygen.

Selection and Ordering data

Order No.

Threaded flange pair G $\frac{1}{2}$

- with stainless steel gasket
- grease-free for oxygen, with stainless steel gasket

Scope of delivery:

2x threaded flanges G $\frac{1}{2}$ to DIN 19207; material: P250GH (mat. No. 1.0460)

4x hexagon screws M10x45 to DIN EN 24014; Material: C35E (mat. No. 1.1181)

4x hexagon screws M10x50 to DIN EN 24032

1x gasket G $\frac{1}{2}$ (7MF9007-6BA) grooved, to DIN 19207; Material: X 6 CrNiMoTi 17 12 2 (mat. No. 14571/316Ti)

Only for 7MF9007-4CA!

1x gasket G $\frac{1}{2}$ (7MF9007-6CA), grease-free for oxygen, grooved, to DIN 19207; Material: X 6 CrNiMoTi 17 12 2 (mat. No. 14571/316Ti)

Only for 7MF9007-4DA!

Nipple G $\frac{1}{2}$

to DIN 19207

- Material: 16 Mo 3 (mat. No. 1.5415)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

Union nut G $\frac{1}{2}$

to DIN 16284

- Material: C35E (mat. No. 1.1181)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

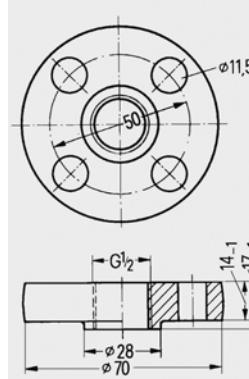
Gasket G $\frac{1}{2}$

to DIN 19207, grooved

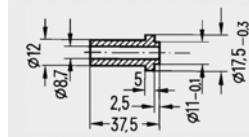
- Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

F) Subject to export regulations AL: 91999, ECCN: N.

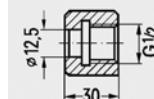
Dimensional drawings



Threaded flange 7MF9007-4CA/-4DA, dimensions in mm



Nipple G $\frac{1}{2}$ 7MF9007-4KA/-4LA, dimensions in mm



Union nut G $\frac{1}{2}$ 7MF9007-4MA/-4NA, dimensions in mm



Gasket 7MF9007-6BA/-6CA, dimensions in mm

