

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for level

1

Technical specifications

SITRANS P DS III for level

Input

Measured variable

Level

Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

HART

PROFIBUS PA/ FOUNDATION Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

25 ... 250 mbar
2.5 ... 25 kPa
10 ... 100 inH₂O

250 mbar
25 kPa
100 inH₂O

See "Mounting flange"

25 ... 600 mbar
2.5 ... 60 kPa
10 ... 240 inH₂O

600 mbar
60 kPa
240 inH₂O

53 ... 1600 mbar
5.3 ... 160 kPa
21 ... 642 inH₂O

1600 mbar
160 kPa
642 inH₂O

160 ... 5000 mbar
16 ... 500 kPa
2.32 ... 72.5 psi

5000 mbar
500 kPa
72.5 psi

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

-100 % of max. span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange

-100 % of max. span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange

Upper measuring limit

100 % of max. span

Start of scale value

Between the measuring limits (fully adjustable)

Output

HART

PROFIBUS PA/FOUNDATION Fieldbus

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

Load

- Without HART
- With HART

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$
 U_H : Power supply in V

$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or
 $R_B = 230 \dots 1100 \Omega$ (HART Communicator)

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal.
Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

SITRANS P DS III for level**Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

 $r \leq 5 : \leq 0.125 \%$
 $5 < r \leq 10 : \leq (0.007 \cdot r + 0.09) \%$

- 600 mbar/60 kPa/8.7 psi

 $r \leq 5 : \leq 0.125 \%$
 $5 < r \leq 25 : \leq (0.007 \cdot r + 0.09) \%$
- 1600 mbar/160 kPa/23.21 psi
5 bar/500 kPa/72.5 psi
 $r \leq 5 : \leq 0.125 \%$
 $5 < r \leq 30 : \leq (0.007 \cdot r + 0.09) \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.4 \cdot r + 0.16) \%$

- 600 mbar/60 kPa/8.7 psi

 $\leq (0.24 \cdot r + 0.16) \%$

- 1600 mbar/160 kPa/23.21 psi
5 bar/500 kPa/72.5 psi

 $\leq (0.2 \cdot r + 0.16) \%$

Influence of static pressure

- on the zero point

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.3 \cdot r) \% \text{ per nominal pressure}$

- 600 mbar/60 kPa/8.7 psi

 $\leq (0.15 \cdot r) \% \text{ per nominal pressure}$ - 1600 mbar/160 kPa/23.21 psi
5 bar/500 kPa/72.5 psi $\leq (0.1 \cdot r) \% \text{ per nominal pressure}$

- on the span

 $\leq (0.1 \cdot r) \% \text{ per nominal pressure}$

Long-term stability

(temperature change ± 30 °C (± 54 °F)) $\leq (0.25 \cdot r) \% \text{ in 5 years}$
static pressure max. 70 bar/7 MPa/1015 psi

Effect of mounting position

Depending on filling liquid of mounting flange

Effect of auxiliary power supply (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

 $3 \cdot 10^{-5}$ of nominal measuring range**Rated conditions**

Degree of protection

- according to EN 60529

IP66 (optional IP66/IP68)

- according to NEMA 250

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

- High-pressure side

Note: Always take into account assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection!-40 ... +100¹⁾ °C (-40 ... +212¹⁾ °F) $p_{\text{abs}} \geq 1 \text{ bar: } -40 \dots +175 \text{ °C } (-40 \dots +347 \text{ °F})$ $p_{\text{abs}} < 1 \text{ bar: } -40 \dots +80 \text{ °C } (-40 \dots +176 \text{ °F})$

- Low-pressure side

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F) in conjunction with dust explosion protection

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %, condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

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Design

Weight (without options)

- To EN (pressure transmitter with mounting flange, without tube) ≈ 11 ... 13 kg (≈ 24.2 ... 28.7 (lb))
- To ASME (pressure transmitter with mounting flange, without tube) ≈ 11 ... 18 kg (≈ 24.2 ... 39.7 (lb))

Enclosure material

Low-copper die-cast aluminum, GD-ALSi12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

High-pressure side

- Seal diaphragm of mounting flange

- Stainless steel, W.-Nr. 1.4404/316L
 - coated with PFA
 - coated with PTFE
 - coated with ECTFE
 - gold plated
- Monel 400, mat. no. 2.4360
- Hastelloy C276, mat. no. 2.4619
- Hastelloy C4, mat. no. 2.4602
- Hastelloy C22, mat. no. 2.4602
- Tantalum
- Titanium, mat. no. 3.7035
- Nickel 201
- Duplex 2205, mat. no. 1.4462

Measuring cell filling

Silicone oil

Process connection

- High-pressure side
- Low-pressure side

Flange to EN and ASME

Female thread 1/4"-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16"-20 UNF to IEC 61518/DIN EN 61518

Power supply U_H

Terminal voltage on transmitter

HART

10.5 ... 45 V DC
10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

SITRANS P DS III for level

Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

• Dust explosion protection for zone 20

- Marking

- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

• Dust explosion protection for zone 21/22

- Marking
- Connection

• Type of protection "n" (zone 2)

- Marking

- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

• Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

• Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values:
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$

 $U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

1) This value may be increased if the process connection is sufficiently insulated.

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HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
PROFIBUS PA communication		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input/Output		
- Failure mode	parameterizable (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	Mounting flange	
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)	Nominal diameter	Nominal pressure
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively	• Acc. to EN 1092-1	
• Physical block	1	- DN 80	PN 40
Transducer blocks	2	- DN100	PN16, PN40
• Pressure transducer block		• To ASME B16.5	
- Can be calibrated by applying two pressures	Yes	- 3 inch	class 150, class 300
- Monitoring of sensor limits	Yes	- 4 inch	class 150, class 300
- 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		

Selection and Ordering data		Article No.
Pressure transmitter for level, SITRANS P DS III with HART		7MF4633-
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		Y -
Measuring cell filling	Measuring cell cleaning	1
Silicone oil	normal	
Measuring span (min. ... max.)		
25 ... 250 mbar	(10 ... 100 inH ₂ O)	D
25 ... 600 mbar	(10 ... 240 inH ₂ O)	E
53 ... 1600 mbar	(21 ... 642 inH ₂ O)	F
0.16 ... 5 bar	(64.3 ... 2000 inH ₂ O)	G
Process connection of low-pressure side		
Female thread 1/4-18 NPT with flange connection		
<ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) 		2 0
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting ¹⁾	3
Version		
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal 		1 2 3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)²⁾" "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)³⁾ "Ex nA/ic (Zone 2)"⁴⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)³⁾⁵⁾ FM + CSA intrinsic safe (is)⁶⁾ FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D³⁾⁵⁾⁶⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic Safe and Explosion Proof (is + xp)¹⁾⁶⁾" 		A B D P E R F S NC
Electrical connection/cable entry		
<ul style="list-style-type: none"> Screwed gland M20x1.5 Screwed gland 1/2-14 NPT Device plug Han 7D (plastic housing) incl. mating connector⁷⁾ Device plugs M12 (stainless steel)^{8) 9)} 		B C D F
Display		
<ul style="list-style-type: none"> Without display Without visible display (display concealed, setting: mA) With visible display (setting mA) With customer-specific display (setting as specified, Order code "Y21" or "Y22" required) 		0 1 6 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 Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
 - Sealing plug(s) or sealing screw(s) for the process flanges(s)
- 1) Not in conjunction with Electrical connection "device plug Han 7D".
 - 2) Without cable gland, with blanking plug.
 - 3) With enclosed cable gland Ex ia and blanking plug.
 - 4) Configurations with device plugs Han and M12 are only available in Ex ic.
 - 5) Only in connection with IP66.
 - 6) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
 - 7) Only in connection with Ex approval A, B or E.
 - 8) M12 delivered without cable socket
 - 9) Only in connection with Ex approval A, B, E or F.

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for level

Selection and Ordering data	Article No.
Pressure transmitters for level	
SITRANS P DS III with PROFIBUS PA (PA)	7MF4634-
SITRANS P DS III with FOUNDATION Fieldbus (FF)	7MF4635-
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	1 Y - - - -
Nominal measuring range	
250 mbar (100 inH ₂ O)	D
600 mbar (240 inH ₂ O)	E
1600 mbar (642 inH ₂ O)	F
5 bar (2000 inH ₂ O)	G
Process connection of low-pressure side	
Female thread 1/4-18 NPT with flange connection	
• Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518	2
• Mounting thread M10 to DIN 19213 (only for replacement requirement)	0
Non-wetted parts materials	
process flange screws Electronics housing	
Stainless steel Die-cast aluminum	2
Stainless steel Stainless steel precision casting	3
Version	
• Standard version, German plate inscription, setting for pressure unit: bar	1
• International version, English plate inscription, setting for pressure unit: bar	2
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3
All versions include DVD with compact operating instructions in various EU languages.	
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)" ¹⁾	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" ²⁾	P
- "Ex nA/ic (Zone 2)" ³⁾	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ²⁾⁴⁾	R
• FM + CSA intrinsic safe (is) ⁵⁾	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ²⁾⁴⁾⁵⁾	S
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)" ¹⁾⁵⁾	NC
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland 1/2-14 NPT	C
• Device plugs M12 (stainless steel) ^{6) 7)}	F
Display	
• Without display	0
• Without visible display (display concealed, setting: bar)	1
• With visible display (setting: bar)	6
• With customer-specific display (setting as specified, Order code "Y21" 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:

- Quick-start guide
 - Sealing plug(s) or sealing screw(s) for the process flanges(s)
- 1) Without cable gland, with blanking plug.
 - 2) With enclosed cable gland Ex ia and blanking plug.
 - 3) Configurations with device plugs Han and M12 are only available in Ex ic.
 - 4) Only in connection with IP66.
 - 5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
 - 6) M12 delivered without cable socket
 - 7) Only in connection with Ex approval A, B, E or F.

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF	<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.				Add "-Z" to Article No. and specify Order code.			
O-rings for process flanges on low-pressure side (instead of FPM (Viton))				Use on zone 1D / 2D³⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	E01	✓	✓
• PTFE (Teflon)	A20	✓	✓	Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")	E08	✓	
• FEP (with silicone core, approved for food)	A21	✓	✓	Export approval Korea	E11	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	Dual seal	E24	✓	✓
• NBR (Buna N)	A23	✓	✓	Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)	E25 ⁴⁾	✓	✓
Device plugs¹⁾				"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..)	E26 ⁴⁾	✓	✓
• Han 7D (metal)	A30	✓		Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..)	E28 ⁴⁾	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..)	E45 ⁴⁾	✓	✓
• Angled	A32	✓		Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-D..)	E46 ⁴⁾	✓	✓
• Han 8D (metal)	A33	✓		Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55 ⁴⁾	✓	✓
Sealing screw				Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56 ⁴⁾	✓	✓
¼-18 NPT, with valve in mat. of process flanges	A40	✓	✓	Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57 ⁴⁾	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	A50	✓	✓	Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)	E58 ⁴⁾	✓	✓
Rating plate inscription (instead of German)				"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 ⁴⁾	✓	✓
• English	B11	✓	✓	Ex-protection Ex ia according to EAC Ex (Russia)	E80	✓	✓
• French	B12	✓	✓	Ex-protection Ex d according to EAC Ex (Russia)	E81	✓	✓
• Spanish	B13	✓	✓	Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	E82	✓	✓
• Italian	B14	✓	✓	Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	E83	✓	✓
• Cyrillic (russian)	B16	✓	✓	Two coats of lacquer on casing and cover (PU on epoxy)	G10	✓	✓
English rating plate Pressure units in inH ₂ O and/or psi	B21	✓	✓	Replacement of process connection side	H01	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	✓	✓				
Inspection certificate Acc. to EN 10204-3.1	C12	✓	✓				
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓				
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓				
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓					
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	C21 ²⁾		✓				
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓					
PED for Russia with initial calibration mark	C99	✓	✓				
Setting of the upper saturation limit of the output signal to 22.0 mA	D05	✓					
Degree of protection IP66/IP68 (only for M20x1.5 and ½-14 NPT)	D12	✓	✓				
Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange	D37	✓	✓				
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	D59	✓	✓				

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

Selection and Ordering data	Order code			
<i>Further designs</i>	HART	PA	FF	
Add "-Z" to Article No. and specify Order code.				
Transient protector 6 kV (lightning protection)	J01	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)⁵⁾	J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)⁵⁾	J09	✓	✓	✓

1) Device plug Han IP65

2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

3) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

5) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code			
<i>Additional data</i>	HART	PA	FF	
Please add "-Z" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ ¹⁾	
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	Y15	✓	✓	✓
Measuring point text (entry in device variable) 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: bar): 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	Y21	✓	✓	✓
Setting of pressure indicator in non-pressure units²⁾ 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)	Y22³⁾ + Y01	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	Y25		✓	✓
Damping adjustment in seconds (0 ... 100 s) Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset	Y30	✓	✓	✓

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Preset values can only be changed over SIMATIC PDM.

3) Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

Selection and Ordering data		Article No.	Order code
Mounting flange		7 MF 4 9 1 2	
Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series		3	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Connection to EN 1092-1			
Nominal diameter	Nominal pressure		
DN 25	PN 10/16/25/40	Z	J 0 A
	PN 63/100/160	Z	J 0 B
DN 40	PN 10/16/25/40	Z	J 0 C
	PN 63/100	Z	J 0 D
	PN 160	Z	J 0 E
DN 50	PN 10/16/25/40	A	
	PN 100	B	
DN 80	PN 10/16/25/40	D	
DN 100	PN 10/16	G	
	PN 25/40	H	
Connection to ASME B16.5			
Nominal diameter	Nominal pressure		
1 inch	class 150	Z	J 6 A
	class 300	Z	J 6 B
	class 400/600	Z	J 6 C
	class 900/1500	Z	J 6 D
1½ inch	class 150	Z	J 6 E
	class 300	Z	J 6 F
	class 400/600	Z	J 6 G
	class 900/1500	Z	J 6 H
2 inch	class 150	L	
	class 300	M	
	class 400/600	N	
	class 900/1500	P	
3 inch	class 150	Q	
	class 300	R	
4 inch	class 150	T	
	class 300	U	
Flange acc. to JIS			
Nominal diameter	Nominal pressure		
JIS DN 50	10 K 316L	Z	J 7 A
	20 K 316L	Z	J 7 B
JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D
Other version, add Order code and plain text: Nominal diameter: ...; Nominal press.: ...		Z	J 1 Y
Wetted parts materials			
<ul style="list-style-type: none"> Stainless steel 316L <ul style="list-style-type: none"> - Coated with PFA - Coated with PTFE - Coated with ECTFE¹⁾ Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4602 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 (max. 150 °C (302 °F)) Nickel 201 (max. 260 °C (500 °F)) Duplex 2205, mat. no. 1.4462 Duplex 2205, mat. no. 1.4462, incl. main body Stainless steel 316L, gold plated, thickness approx. 25 µm 		A D E F G J U V K L M Q R S	
Tube length			
<ul style="list-style-type: none"> without tube 		0	
Other version: add Order code and plain text: material of parts in contact with medium:, tubus length:		Z 8	K 1 Y

Selection and Ordering data		Article No.	Order code
Mounting flange		7 MF 4 9 1 2	
Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series		3	
Customer-specific tubus length			
Specify customer-specific length with Y44, see Order Code			
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel without foil 			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	A 1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	A 2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	A 3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	A 4	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	A 5	
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel coated with ECTFE 			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	F 1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	F 2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	F 3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	F 4	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	F 5	
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel coated with PFA 			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	D 1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	D 2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	D 3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	D 4	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	D 5	
<ul style="list-style-type: none"> Wetted parts materials: Monel 400 			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	G 1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	G 2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	G 3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	G 4	
<ul style="list-style-type: none"> Wetted parts materials: Hastelloy C276 			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	J 1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	J 2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	J 3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	J 4	
<ul style="list-style-type: none"> Wetted parts materials: Tantalum 			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	K 1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	K 2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	K 3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	K 4	
Filling liquid			
<ul style="list-style-type: none"> Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for O₂-measurement)²⁾ Food oil (FDA-listed) 			
Other version, add Order code and plain text: filling liquid: ...			
		1	
		2	
		3	
		4	
		7	
		9	M 1 Y
¹⁾ For vacuum on request ²⁾ Oil and grease-free cleaning according to DIN 25410, level 2, and packaging included in scope of delivery. Refer to "Further designs" C10 and E10.			

Pressure Measurement

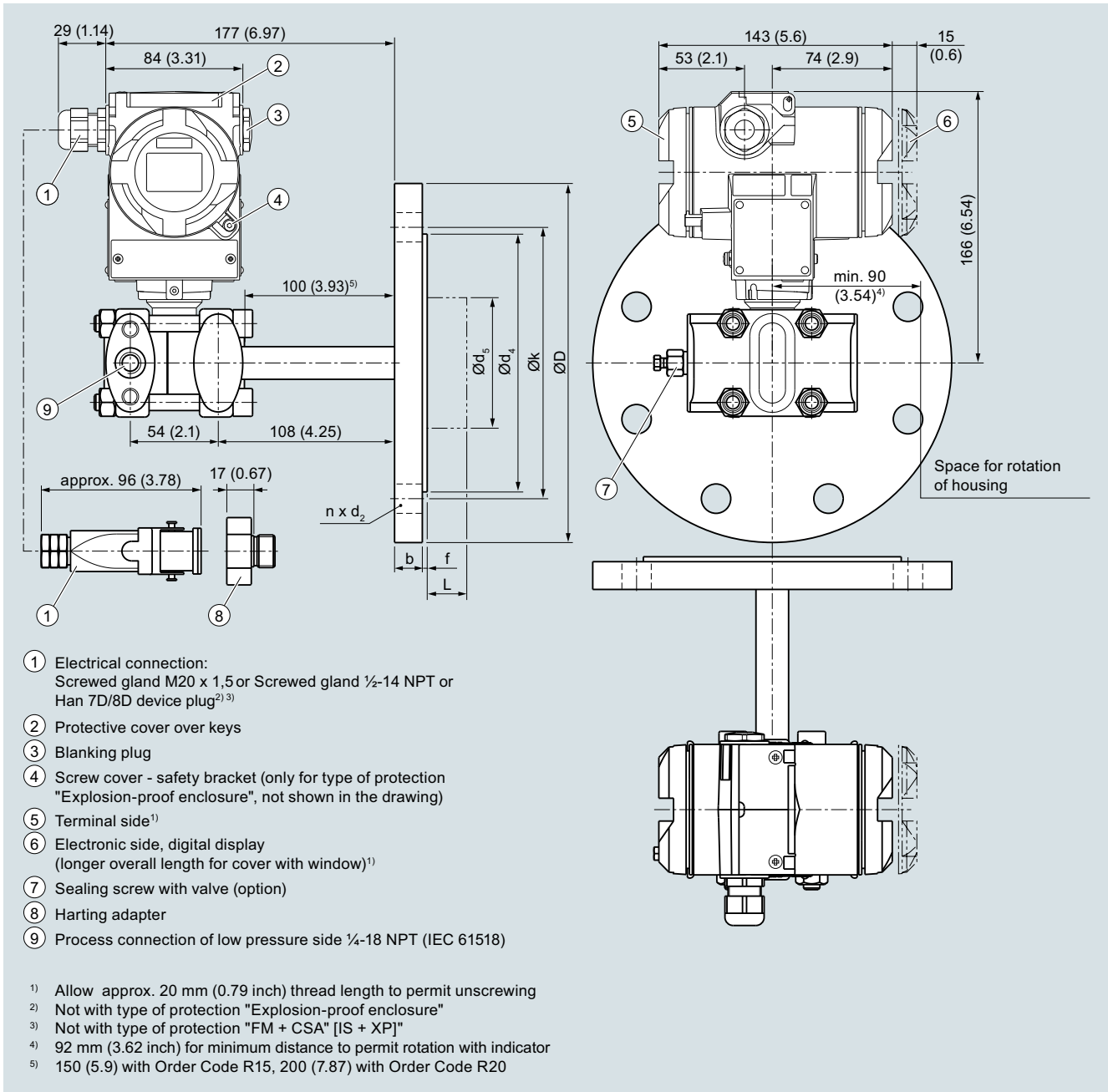
Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for level

1

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF	<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.				Add "-Z" to Article No. and specify Order code.			
Customer-specific tubus length Select range, enter desired length in plain text (No entry = standard length)	Y44	✓	✓	One sided-mounting, sealing surface below	H20		
Spark arrester For mounting on zone 0 (incl. documentation)	A01	✓	✓	Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm) previously DIN 2501, form E	J11	✓	✓
Remote seal nameplate attached out of stainless steel, contains Article No. and order number of the remote seal supplier	B20	✓	✓	Sealing surface groove, EN 1092-1, form D instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	J14	✓	✓
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	C10	✓	✓	Sealing surface with spring according to EN 1092-1, form F, (previously DIN 2512, form F) in stainless steel 316L.	J30	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	✓	✓	DN 25	J31	✓	✓
Inspection certificate Acc. to EN 10204-3.1	C12	✓	✓	DN 40	J32	✓	✓
2.2 Certificate of FDA approval of fill oil Only in conjunction with filling liquid "Food oil" (FDA listed)"	C17	✓	✓	DN 50	J33	✓	✓
"Functional safety (SIL2)" certificate to IEC 61508 (only for conjunction with the Order code "C20" in the case of SITRANS P DS III transmitter)	C20	✓	✓	DN 80	J34	✓	✓
"Functional safety (SIL2/3)" certificate to IEC 61508 (only for conjunction with the Order code "C23" in the case of SITRANS P DS III transmitter)	C23	✓	✓	DN 100	J35	✓	✓
Certification acc. to NACE MR-0175 Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D07	✓	✓	DN 125			
Certification acc. to NACE MR-0103 Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D08	✓	✓	Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L.	J40	✓	✓
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2	E10	✓	✓	DN 25	J41	✓	✓
Epoxy painting Not possible with negative pressure service Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42..., only possible with process connection G½B according to EN 837-1.	E15	✓	✓	DN 40	J42	✓	✓
				DN 50	J43	✓	✓
				DN 80	J44	✓	✓
				DN 100	J45	✓	✓
				DN 125			
				Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L.	J50	✓	✓
				DN 25	J51	✓	✓
				DN 40	J52	✓	✓
				DN 50	J53	✓	✓
				DN 80	J54	✓	✓
				DN 100	J55	✓	✓
				DN 125	J12	✓	✓
				Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80)			
				Sealing surface RJF (groove, previously RTJ) ASME B16.5 instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)	J24	✓	✓
				Elongated pipe, 150 mm instead of 100 mm, max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.	R15	✓	✓
				Elongated pipe, 200 mm instead of 100 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R20	✓	✓
				Negative pressure service for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter	V04	✓	✓
				Extended negative pressure service for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter ✓ = available	V54	✓	✓

Dimensional drawings

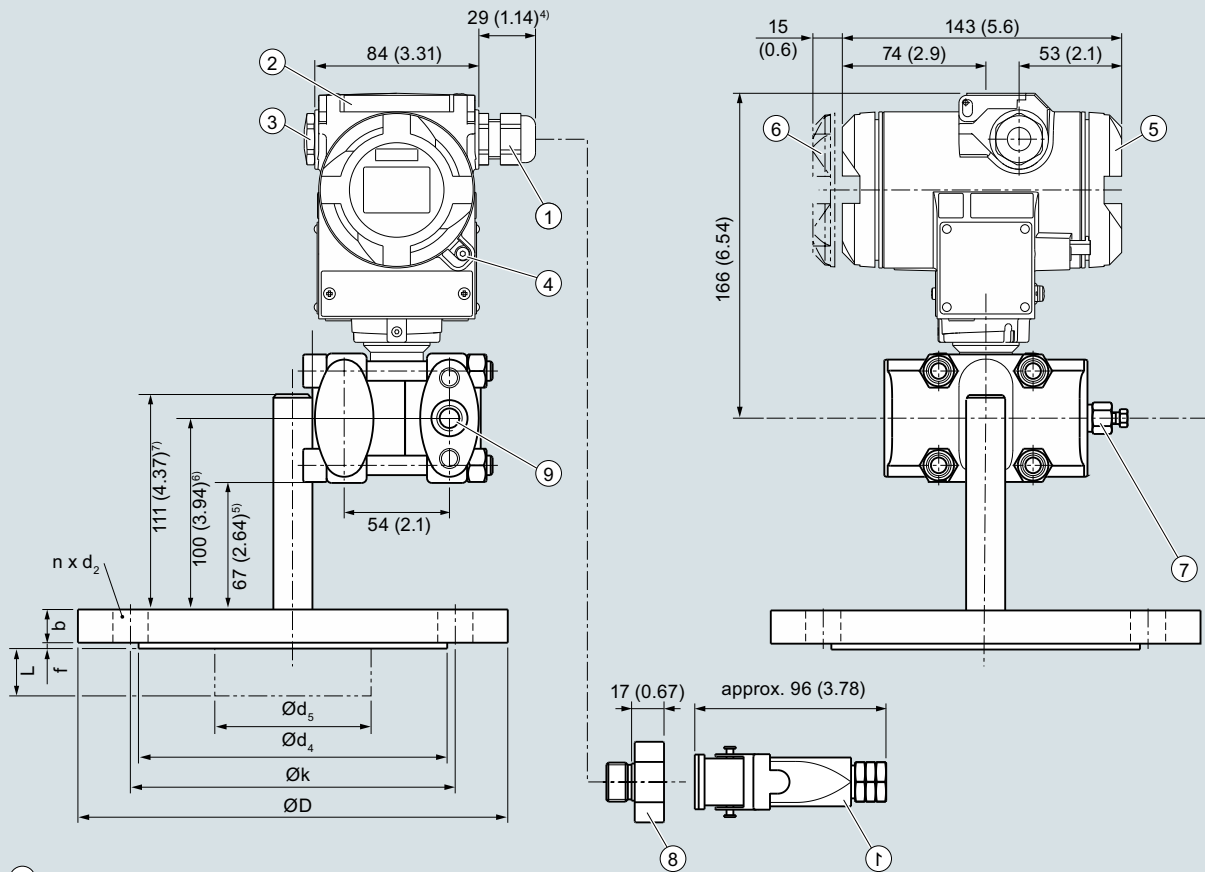


SITRANS P DS III with HART pressure transmitters for level, including mounting flange, dimensions in mm (inch)

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for level



- ① Electrical connection:
Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/8D device plug^{2) 3)}
- ② Protective cover over keys
- ③ Blanking plug
- ④ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- ⑤ Terminal side¹⁾
- ⑥ Electronic side, digital display (longer overall length for cover with window)¹⁾
- ⑦ Sealing screw with valve (option)
- ⑧ Harting adapter
- ⑨ Process connection of low pressure side ¼-18 NPT (IEC 61518)

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⁾ 117 (4.61) with Order Code R15, 167 (6.57) with Order Code R20

⁶⁾ 150 (5.91) with Order Code R15, 200 (7.87) with Order Code R20

⁷⁾ 161 (6.34) with Order Code R15, 211 (8.31) with Order Code R20

SITRANS P DS III with HART pressure transmitters for level, including mounting flange, one sided-mounting, sealing surface below (order code H20), dimensions in mm (inch)

Connection to EN 1092-1

Nominal diameter	Nominal pressure	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 50	PN 10/16/25/40	20	165	90	18	102	48.3	45 ¹⁾	2	125	4	0, 50, 100, 150 or 200
	PN 100	28	195	90	26	102	48.3	45 ¹⁾	2	145	8	
DN 80	PN 10/16/25/40	24	200	90	18	138	76	72 ²⁾	2	160	8	
	PN 100	32	230	90	26	138	76	72 ²⁾	2	180	8	
DN 100	PN 10/16	20	220	115	18	158	94	89	2	180	8	
	PN 25/40	24	235	115	22	162	94	89	2	190	8	

Connection to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d ₂	d ₄	d ₅	d _M	f	k	n	L
		lb./sq.in	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)
2 inch	150	0.77 (19.5)	5.91 (150)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77 ¹⁾ (45)	0.08 (2)	4.74 (120.5)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.89 (22.7)	6.5 (165)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77 ¹⁾ (45)	0.08 (2)	5 (127)	8	
	400/600	1.28 (32.4)	6.5 (165)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77 ¹⁾ (45)	0.28 (7)	5 (127)	8	
	900/1500	1.78 (45.1)	8.46 (215)	1.02 (26)	5 (127)	1.9 (48.3)	1.77 ¹⁾ (45)	0.28 (7)	6.5 (165)	8	
3 inch	150	0.96 (24.3)	7.48 (190)	0.79 (20)	5 (127)	3 (76)	2.83 ²⁾ (72)	0.08 (2)	6 (152.5)	4	
	300	1.14 (29)	8.27 (210)	0.87 (22)	5 (127)	3 (76)	2.83 ²⁾ (72)	0.08 (2)	6.63 (168.5)	8	
	600	1.53 (38.8)	8.27 (210)	0.87 (22)	5 (127)	3 (76)	2.83 ²⁾ (72)	0.28 (7)	6.63 (168.5)	8	
4 inch	150	0.96 (24.3)	9.06 (230)	0.79 (20)	6.22 (158)	3.69 (94)	3.5 (89)	0.08 (2)	7.5 (190.5)	8	
	300	1.27 (32.2)	10.04 (255)	0.87 (22)	6.22 (158)	3.69 (94)	3.5 (89)	0.08 (2)	7.87 (200)	8	
	400	1.65 (42)	10.04 (255)	1.02 (26)	6.22 (158)	3.69 (94)	3.5 (89)	0.28 (7)	7.87 (200)	8	

d: Internal diameter of gasket to DIN 2690

d_M: Effective diaphragm diameter

1) 59 mm = 2.32 inch with tube length L=0.

2) 89 mm = 3½ inch with tube length L=0.