

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

1

Technical specifications

SITRANS P, DS III series for gauge pressure

| Input | | Gauge pressure | | | |
|--|--|--|--|-----------------------------------|--------------------------------|
| Measured variable | | HART | PROFIBUS PA/ FOUNDATION Fieldbus | | |
| 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) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature) | | Span | Nominal measuring range | Max. operating pressure MAWP (PS) | Max. perm. test pressure |
| | | 8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 ... 3.6 psi | 250 mbar 25 kPa 3.6 psi | 4 bar 400 kPa 58 psi | 6 bar 600 kPa 87 psi |
| | | 0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi | 1 bar 100 kPa 14.5 psi | 4 bar 400 kPa 58 psi | 6 bar 600 kPa 87 psi |
| | | 0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi | 4 bar 400 kPa 58 psi | 7 bar 0.7 MPa 102 psi | 10 bar 1 MPa 145 psi |
| | | 0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi | 16 bar 1600 kPa 232 psi | 21 bar 2.1 MPa 305 psi | 32 bar 3.2 MPa 464 psi |
| | | 0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi | 63 bar 6300 kPa 914 psi | 67 bar 6.7 MPa 972 psi | 100 bar 10 MPa 1450 psi |
| | | 1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi | 160 bar 16 MPa 2321 psi | 167 bar 16.7 MPa 2422 psi | 250 bar 25 MPa 3626 psi |
| | | 4 ... 400 bar 0.4 ... 40 MPa 58 ... 5802 psi | 400 bar 40 MPa 5802 psi | 400 bar 40 MPa 5802 psi | 600 bar 60 MPa 8702 psi |
| | | 7 ... 700 bar 0.7 ... 70 MPa 102 ... 10153 psi | 700 bar 70 MPa 10153 psi | 800 bar 80 MPa 11603 psi | 800 bar 80 MPa 11603 psi |
| Lower measuring limit (for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.) | | 30 mbar a/3 kPa a/0.44 psi a | | | |
| <ul style="list-style-type: none"> Measuring cell with silicone oil filling Measuring cell with inert filling liquid | | 30 mbar a/3 kPa a/0.44 psi a | | | |
| Upper measuring limit | | 100% of max. span (max. 100 bar/10 MPa/1450 psi for oxygen measurement) ambient temperature/process temperature 60 °C (140 °F) | | | |
| Output | | HART | PROFIBUS PA/FOUNDATION Fieldbus | | |
| Output signal | | 4 ... 20 mA | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | | |
| <ul style="list-style-type: none"> 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 | | - | | | |
| <ul style="list-style-type: none"> Without HART | | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V | | | |
| <ul style="list-style-type: none"> With HART | | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) bzw. $R_B = 230 \dots 1100 \Omega$ (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 series for gauge pressure**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

 $r \leq 1.25 :$ $\leq 0.065 \%$
 $1.25 < r \leq 30 :$ $\leq (0.008 \cdot r + 0.055) \%$

- 1 bar/100 kPa/14.5 psi
 4 bar/400 kPa/58 psi
 16 bar/1.6 MPa/232 psi
 63 bar/6.3 MPa/914 psi
 160 bar/16 MPa/2321 psi

 $r \leq 5 :$ $\leq 0.065 \%$
 $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$

- 400 bar/40 MPa/5802 psi
 700 bar/70 MPa/10152 psi

 $r \leq 3 :$ $\leq 0.075 \%$
 $3 < r \leq 10 :$ $\leq (0.0029 \cdot r + 0.071) \%$
 $10 < r \leq 100 :$ $\leq (0.005 \cdot r + 0.05) \%$
Influence of ambient temperature
(in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.16 \cdot r + 0.1) \%$

- 1 bar/100 kPa/14.5 psi

 $\leq (0.05 \cdot r + 0.1) \%$

- 4 bar/400 kPa/58 psi
 16 bar/1.6 MPa/232 psi
 63 bar/6.3 MPa/914 psi
 160 bar/16 MPa/2321 psi
 400 bar/40 MPa/5802 psi

 $\leq (0.025 \cdot r + 0.125) \%$

- 700 bar/70 MPa/10152 psi

 $\leq (0.08 \cdot r + 0.16) \%$ Long-term stability (temperature change ± 30 °C (± 54 °F))

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.25 \cdot r) \%$ per year

- 1 bar/100 kPa/14.5 psi
 4 bar/400 kPa/58 psi

 $\leq (0.25 \cdot r) \%$ in 5 years

- 16 bar/1.6 MPa/232 psi
 63 bar/6.3 MPa/914 psi
 160 bar/16 MPa/2321 psi
 400 bar/40 MPa/5802 psi

 $\leq (0.125 \cdot r) \%$ in 5 years

- 700 bar/70 MPa/10152 psi

 $\leq (0.25 \cdot r) \%$ in 5 years

Effect of mounting position

 ≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination
 (zero point correction is possible with position error compensation)
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

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1

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Rated conditions

| | |
|---|---|
| Degree of protection | IP66 (optional IP66/IP68) Type 4X |
| • according to EN 60529 | |
| • according to NEMA 250 | |
| Temperature of medium | |
| • Measuring cell with silicone oil filling | -40 ... +100 °C (-40 ... +212 °F) |
| • Measuring cell with inert filling liquid | |
| - 1 bar/100 kPa/14.5 psi | -40 ... +85 °C (-40 ... +185 °F) |
| 4 bar/400 kPa/58 psi | |
| 16 bar/1.6 MPa/232 psi | |
| 63 bar/6.3 MPa/914 psi | |
| - 160 bar/16 MPa/2321 psi | -20 ... +100 °C (-4 ... +212 °F) |
| 400 bar/40 MPa/5802 psi | |
| 700 bar/70 MPa/10152 psi | |
| • Measuring cell with Neobee fill fluid (FDA-compliant) | -10 ... +100 °C (+14 ... +212 °F) |
| • In conjunction with dust explosion protection | -20 ... +60 °C (-4 ... +140 °F) |
| Ambient conditions | |
| • Ambient temperature (silicone oil and inert oil) | |
| - Transmitter | -40 ... +85 °C (-40 ... +185 °F) |
| - Display readable | -30 ... +85 °C (-22 ... +185 °F) |
| • Ambient temperature (Neobee fill fluid) | |
| - Transmitter | -10 ... +85 °C (+14 ... +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 |

Design

| | |
|------------------------------|---|
| Weight (without options) | Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb) Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb) |
| Enclosure material | Low-copper die-cast aluminum, GD-AISI 12 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. 2.4602 |
| • 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 (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F)) |
| Process connection | Connection shank G $\frac{1}{2}$ B to DIN EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518 |
| Material of mounting bracket | |
| • Steel | Sheet-steel, Mat. No. 1.0330, chrome-plated |
| • Stainless steel 304 | Sheet stainless steel, mat. no. 1.4301 (SS 304) |
| • Stainless steel 316L | Sheet stainless steel, mat. no. 1.4404 (SS 316L) |

Power supply U_H

| | HART | PROFIBUS PA/FOUNDATION Fieldbus |
|---|---|---------------------------------|
| Terminal voltage on transmitter | 10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode | - |
| Power supply | - | Supplied through bus |
| Separate 24 V power supply | - | Not necessary |
| Bus voltage | | |
| • Not Ex | - | 9 ... 32 V |
| • With intrinsically-safe operation | - | 9 ... 24 V |
| Current consumption | | |
| • Basic current (max.) | - | 12.5 mA |
| • Start-up current \leq basic current | - | Yes |
| • Max. current in event of fault | - | 15.5 mA |
| Fault disconnection electronics (FDE) available | - | Yes |

| SITRANS P, DS III series for gauge pressure | HART | PROFIBUS PA/ FOUNDATION Fieldbus |
|---|---|--|
| Certificates and approvals | | |
| Classification according to PED 2014/68/EU | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) | |
| Explosion protection | | |
| • Intrinsic safety "i" | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb | |
| - 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 peak 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: $U_o = 24 \text{ V}$, $I_o = 174 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - 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 | |
| - Marking | Ex II 1/2 G Ex d IIC T4/T6 Gb | |
| - 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 | |
| - Marking | Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) | |
| - Max. surface temperature | 120 °C (248 °F) | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - 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 | |
| - Marking | Ex II 2 D Ex tb IIIC T120°C Db | |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$ |
| • Type of protection "n" (zone 2) | PTB 13 ATEX 2007 X | |
| - Marking | 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 | |
| - Connection (Ex nA) | $U_m = 45 \text{ V}$ | $U_m = 32 \text{ V}$ |
| - Connections (Ex ic) | To circuits with values: $U_i = 45 \text{ V}$ | FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - 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 protection acc. 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 | |

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1

| 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 | | |
| - Failure mode | parameterizable (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 | | |


| Selection and Ordering data | | Article No. | Selection and Ordering data | | Article No. | |
|---|------------------------------------|----------------|--|---|----------------|--|
| Pressure transmitter for gauge pressure, SITRANS P DS III with HART | | 7 MF 4 0 3 3 - | Pressure transmitter for gauge pressure, SITRANS P DS III with HART | | 7 MF 4 0 3 3 - | |
| <p>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p> | | | <p>Explosion protection</p> <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)⁸⁾ - "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)⁹⁾ - "Ex nA/ic (Zone 2)¹⁰⁾ - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)⁹⁾¹¹⁾ • FM + CSA intrinsic safe (is)¹²⁾ • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D⁹⁾¹¹⁾¹²⁾ • With FM + CSA, Type of protection: <ul style="list-style-type: none"> - "Intrinsic Safe and Explosion Proof (is + xp)⁸⁾¹²⁾ | | | |
| Measuring cell filling | Measuring cell cleaning | | Electrical connection / cable entry | | | |
| Silicone oil | normal | 1 | • Screwed gland M20 x1 .5 | B | | |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 | • Screwed gland ½-14 NPT | C | | |
| FDA compliant fill fluid ²⁾ | | | • Device plug Han 7D (plastic housing) incl. mating connector ¹³⁾ | D | | |
| • Neobee oil | normal | 4 | • Device plugs M12 (stainless steel) ¹³⁾¹⁴⁾ | F | | |
| Measuring span (min. ... max.) | | | Display | | | |
| 8.3 ... 250 mbar (0.12 ... 3.6 psi) | | A | • Without display | 0 | | |
| 0.01 ... 1 bar (0.15 ... 14.5 psi) | | B | • Without visible display (display concealed, setting: mA) | 1 | | |
| 0.04 ... 4 bar (0.58 ... 58 psi) | | C | • With visible display (setting: mA) | 6 | | |
| 0.16 ... 16 bar (2.32 ... 232 psi) | | D | • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | 7 | | |
| 0.63 ... 63 bar (9.14 ... 914 psi) | | E | | | | |
| 1.6 ... 160 bar (23.2 ... 2320 psi) | | F | | | | |
| 4.0 ... 400 bar (58.0 ... 5802 psi) | | G | | | | |
| 7.0 ... 700 bar (102.0 ... 10153 psi) | | J | | | | |
| Wetted parts materials | | | Power supply units see Chap. 7 "Supplementary Components". | | | |
| Seal diaphragm | Process connection | | A quick-start guide is included in the scope of delivery of the device. | | | |
| Stainless steel | Stainless steel | A | | | | |
| Hastelloy | Stainless steel | B | | | | |
| Hastelloy | Hastelloy | C | | | | |
| Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) ^{3) 4) 5) 6)} | | Y 1 | | | | |
| Version for diaphragm seals in conjunction with process connector "G½B connection shank" ^{3) 4) 5) 6)} | | Y 0 | | | | |
| Process connection | | | | | | |
| • Connection shank G½B to EN 837-1 | | 0 | | | | |
| • Female thread ½-14 NPT | | 1 | | | | |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) | | | | | | |
| - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 | | 2 | | | | |
| - Mounting thread M10 to DIN 19213 | | 3 | | | | |
| - Mounting thread M12 to DIN 19213 | | 4 | | | | |
| • Male thread M20 x 1.5 | | 5 | | | | |
| • Male thread ½ -14 NPT | | 6 | | | | |
| Non-wetted parts materials | | | | | | |
| • Housing made of die-cast aluminium | | 0 | | | | |
| • Housing stainless steel precision casting ⁷⁾ | | 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. | | | | | | |
| | | | <p>¹⁾ For oxygen application, add Order code E10.</p> <p>²⁾ Available for measuring ranges 1 ... 63 bar.</p> <p>³⁾ When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, 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.</p> <p>⁴⁾ If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.</p> <p>⁵⁾ The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403.-.Y.-... and 7MF4900-1....-B</p> <p>⁶⁾ The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.</p> <p>⁷⁾ Not in conjunction with Electrical connection "Device plug Han 7D".</p> <p>⁸⁾ Without cable gland, with blanking plug</p> <p>⁹⁾ With enclosed cable gland Ex ia and blanking plug</p> <p>¹⁰⁾ Configurations with device plugs Han and M12 are only available in Ex ic.</p> <p>¹¹⁾ Only in connection with IP66.</p> <p>¹²⁾ Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.</p> <p>¹³⁾ Only in connection with Ex approval A, B or E.</p> <p>¹⁴⁾ M12 delivered without cable socket</p> | | | |

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1

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|---|------------------------------------|-------------|--|--|-------------|
| Pressure transmitter for gauge pressure | | | Pressure transmitter for gauge pressure | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | | SITRANS P DS III with PROFIBUS PA (PA) | | |
| 7 MF 4 0 3 4 - | | | 7 MF 4 0 3 4 - | | |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | | SITRANS P DS III with FOUNDATION Fieldbus (FF) | | |
| 7 MF 4 0 3 5 - | | | 7 MF 4 0 3 5 - | | |
| Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |  | | |
| Measuring cell filling | Measuring cell cleaning | | Explosion protection | | |
| Silicone oil | normal | 1 | • None | | A |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 | • With ATEX, Type of protection: | | B |
| FDA compliant fill fluid ²⁾ | | 4 | - "Intrinsic safety (Ex ia)" | | D |
| • Neobee oil | normal | | - "Explosion-proof (Ex d) ⁸⁾ " | | P |
| | | | - "Intrinsic safety and flameproof enclosure (Ex ia + Ex d) ⁹⁾ " | | E |
| | | | - "Ex nA/ic (Zone 2) ¹⁰⁾ " | | R |
| | | | - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D) ^{9) 11)} " | | S |
| | | | • FM + CSA intrinsic safe (is) ¹²⁾ | | NC |
| | | | • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ^{9) 11) 12)} | | |
| | | | • With FM + CSA, Type of protection: | | |
| | | | - "Intrinsic Safe and Explosion Proof (is + xp) ^{8) 12)} " | | |
| Nominal measuring range | | | Electrical connection/cable entry | | |
| 250 mbar (3.6 psi) | | A | • Screwed gland M20 x 1.5 | | B |
| 1 bar (14.5 psi) | | B | • Screwed gland ½-14 NPT | | C |
| 4 bar (58 psi) | | C | • Device plugs M12 (stainless steel) ^{13) 14)} | | F |
| 16 bar (232 psi) | | D | | | |
| 63 bar (914 psi) | | E | | | |
| 160 bar (2320 psi) | | F | | | |
| 400 bar (5802 psi) | | G | | | |
| 700 bar (10153 psi) | | J | | | |
| Wetted parts materials | | | Display | | |
| Seal diaphragm | Process connection | | • Without display | | 0 |
| Stainless steel | Stainless steel | A | • Without visible display (display concealed, setting: bar) | | 1 |
| Hastelloy | Stainless steel | B | • With visible display (setting: bar) | | 6 |
| Hastelloy | Hastelloy | C | • with customer-specific display (setting as specified, Order code "Y21" required) | | 7 |
| Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) ^{3) 4) 5) 6)} | | Y 1 | | | |
| Version for diaphragm seals in conjunction with process connector "G½B connection shank" ^{3) 4) 5) 6)} | | Y 0 | | | |
| Process connection | | | A quick-start guide is included in the scope of delivery of the device. | | |
| • Connection shank G½B to EN 837-1 | | 0 | 1) For oxygen application, add Order code E10. | | |
| • Female thread ½-14 NPT | | 1 | 2) Available for measuring ranges 1 ... 63 bar. | | |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) ⁷⁾ | | 2 | 3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, 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. | | |
| - Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518 | | 3 | 4) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. | | |
| - Mounting thread M10 to DIN 19213 | | 4 | 5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403.-.Y.-... and 7MF4900-1...-B | | |
| - Mounting thread M12 to DIN 19213 | | 5 | 6) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil. | | |
| • Male thread M20 x 1.5 | | 6 | 7) M10 fastening thread: Max. span 160 bar (2320 psi) 7/16"-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi) | | |
| • Male thread ½ -14 NPT | | | 8) Without cable gland, with blanking plug. | | |
| Non-wetted parts materials | | | 9) With enclosed cable gland Ex ia and blanking plug. | | |
| • Housing made of die-cast aluminium | | 0 | 10) Configurations with device plugs Han and M12 are only available in Ex ic. | | |
| • Housing stainless steel precision casting | | 3 | 11) Only in connection with IP66. | | |
| Version | | | 12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505. | | |
| • Standard version, German label inscription, setting of pressure unit: bar | | 1 | 13) M12 delivered without cable socket. | | |
| • International version, English label inscription, setting of pressure unit: psi | | 2 | 14) Only in connection with Ex approval A, B, E or F. | | |
| • Chinese version, English label inscription, setting of pressure unit: kPa | | 3 | | | |
| All versions include DVD with compact operating instructions in various EU languages. | | | | | |

| Selection and Ordering data | Order code | | | | Selection and Ordering data | Order code | | | |
|--|-------------------|------|----|----|---|-------------------|------|----|----|
| <i>Further designs</i> Add "-Z" to Article No. and specify Order code. | | HART | PA | FF | <i>Further designs</i> Add "-Z" to Article No. and specify Order code. | | HART | PA | FF |
| Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of: | | | | | CRN approval Canada (Canadian Registration Number) | E22 ⁶⁾ | ✓ | ✓ | ✓ |
| • Steel | A01 | ✓ | ✓ | ✓ | Dual seal | E24 | ✓ | ✓ | ✓ |
| • Stainless steel 304 | A02 | ✓ | ✓ | ✓ | Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25 ⁷⁾ | ✓ | ✓ | ✓ |
| • Stainless steel 316L | A03 | ✓ | ✓ | ✓ | "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26 ⁷⁾ | ✓ | ✓ | ✓ |
| Device plugs¹⁾ | | | | | Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28 ⁷⁾ | ✓ | ✓ | |
| • Han 7D (metal) | A30 | ✓ | | | Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45 ⁷⁾ | ✓ | ✓ | ✓ |
| • Han 8D (instead of Han 7D) | A31 | ✓ | | | Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-D..) | E46 ⁷⁾ | ✓ | ✓ | ✓ |
| • Angled | A32 | ✓ | | | Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..) | E5 ⁷⁾ | ✓ | ✓ | ✓ |
| • Han 8D (metal) | A33 | ✓ | | | Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..) | E56 ⁷⁾ | ✓ | ✓ | ✓ |
| Cable sockets for device plugs M12 (metal (CuZn)) | A50 | ✓ | ✓ | ✓ | Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..) | E57 ⁷⁾ | ✓ | ✓ | ✓ |
| Rating plate inscription (instead of German) | | | | | Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..) | E58 ⁷⁾ | ✓ | ✓ | ✓ |
| • English | B11 | ✓ | ✓ | ✓ | "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 ⁷⁾ | ✓ | ✓ | ✓ |
| • French | B12 | ✓ | ✓ | ✓ | Ex-protection Ex ia according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-B..) | E80 | ✓ | ✓ | ✓ |
| • Spanish | B13 | ✓ | ✓ | ✓ | Ex-protection Ex d according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-D..) | E81 | ✓ | ✓ | ✓ |
| • Italian | B14 | ✓ | ✓ | ✓ | Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-E..) | E82 | ✓ | ✓ | ✓ |
| • Cyrillic (russian) | B16 | ✓ | ✓ | ✓ | Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-R..) | E83 | ✓ | ✓ | ✓ |
| English rating plate Pressure units in inH ₂ O and/or psi | B21 | ✓ | ✓ | ✓ | Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ | ✓ |
| Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾ | C11 | ✓ | ✓ | ✓ | Transient protector 6 kV (lightning protection) | J01 | ✓ | ✓ | ✓ |
| Inspection certificate³⁾ Acc. to EN 10204-3.1 | C12 | ✓ | ✓ | ✓ | Process connection Astava | J06 | ✓ | ✓ | ✓ |
| 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 ⁴⁾ | | ✓ | | | | | | |
| 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 | ✓ | | | | | | | |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) | D07 | ✓ | ✓ | ✓ | | | | | |
| 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 oval flange | D37 | ✓ | ✓ | ✓ | | | | | |
| Capri cable gland 4F CrNi and clamping device (848699 + 810634) included | D59 | ✓ | ✓ | ✓ | | | | | |
| Use in or on zone 1D/2D⁵⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.., Ex ia)* and IP66) | E01 | ✓ | ✓ | ✓ | | | | | |
| Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F)) | E10 | ✓ | ✓ | ✓ | | | | | |
| Export approval Korea | E11 | ✓ | ✓ | ✓ | | | | | |

Pressure Measurement

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

for gauge pressure

1

| Selection and Ordering data | Order code | | |
|---|------------|----|----|
| <i>Further designs</i> | HART | PA | FF |
| Marine approvals | | | |
| • Det Norske Veritas Germanischer Lloyd (DNV-GL) | S10 | ✓ | ✓ |
| • Lloyds Register (LR) | S11 | ✓ | ✓ |
| • French marine classification society Bureau Veritas (BV) | S12 | ✓ | ✓ |
| • American Bureau of Shipping (ABS) | S14 | ✓ | ✓ |
| • Russian Maritime Register (RMR) | S16 | ✓ | ✓ |
| • Korean Register of Shipping (KR) | S17 | ✓ | ✓ |

1) Device plug Han IP65

2) When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

3) If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

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

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

6) Cannot be ordered with remote seal.

7) 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.

| Selection and Ordering data | Order code | | |
|--|-------------------------|----|-----------------|
| <i>Additional data</i> | HART | PA | FF |
| 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: | Y15²⁾ | ✓ | ✓ |
| 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 indication 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 indication in non-pressure units³⁾ 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) | Y22 + Y01 | ✓ | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ |
| Damping adjustment in seconds (0 ... 100 s) Factory mounting of valve manifolds, see accessories. Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset ✓ = available | Y30 | ✓ | ✓ |

Ordering example

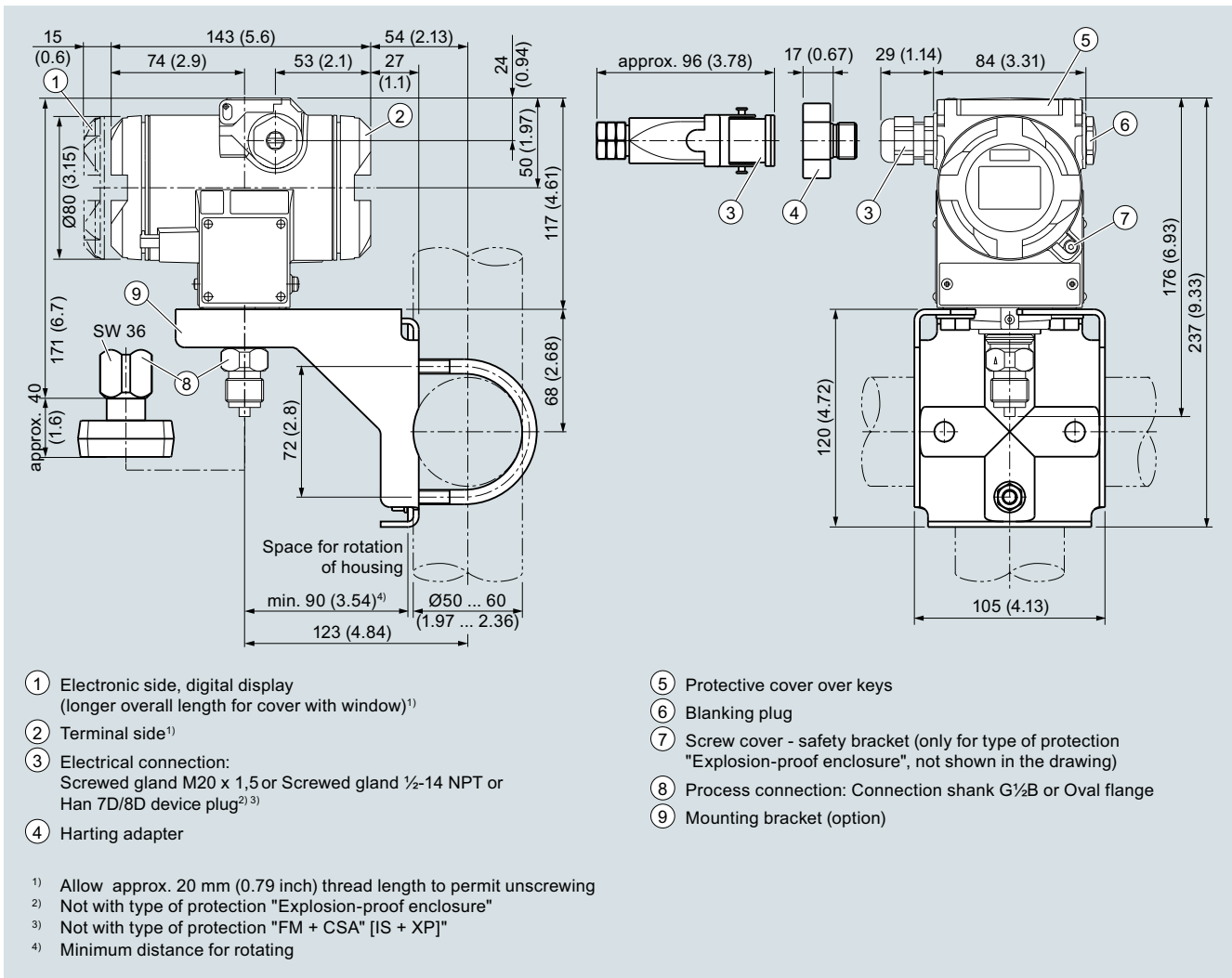
Item line: 7MF4033-1EA00-1AA7-Z
B line: A01 + Y01 + Y21
C line: Y01: 10 ... 20 bar (145 ... 290 psi)
C line: Y21: bar (psi)

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

2) If you do not wish to have any text engraved for Y15, then do not make any further text entries as "Y15:".

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

Dimensional drawings



SITRANS P DS III pressure transmitters for gauge pressure, dimensions in mm (inch)