

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

Technical description

Overview



SITRANS P500 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and which fulfil the most stringent demands of accuracy, long-term stability, speed and lots more.

Extensive functionality allows you to set the pressure transmitter specifically to your own requirements. Despite their many settings options, local set-up is easy. A multi-lingual menu with clear text instructions guides you through the process. There are also help texts available.

The innovative EDD with integrated QuickStart assistance is also quick and easy to configure by computer using the HART protocol.

Extensive diagnostic functions, e.g. min/max pointer for pressure and temperature, or limit value indicator, make sure you always have the process under control. You can also display additional process values such as temperature or static pressure. The simultaneous display of mass, resulting from a volume, is also easy.

The SITRANS P500 pressure transmitters can be configured to measure:

- Differential pressure
- Level
- Volume
- Mass
- Volume flow
- Mass flow

Benefits

- High measuring accuracy
- Very fast response time
- Extremely good long-term stability
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions which can be used both on site as well as via HART.
- Optional separate replacement of measuring cell and electronics without recalibration.
- Extremely low conformity error values

- Infinitely adjustable spans of 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH₂O)
- Extremely good total performance and conformity error values with no loss of performance up to a turndown of 10 guaranteed.
- Additional integrated sensor for static pressure
- Parameterization via on-site control keys or HART
- Short process flanges enable space-saving installation.

Application

The SITRANS P500 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes them suitable for locations with high electromagnetic emissions.

Pressure transmitters with ratings "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitter comes with a CE-declaration of conformity and fulfils the corresponding unified European directives (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".

With newly designed measuring cell, it is possible to work with process temperatures of -40 to 125 °C (-40 to +257 °F)) without having to use a remote seal.

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

The pressure transmitter can be fully parameterized locally via the three operating keys and externally via HART.

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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 element (see Chapter "Flow Meters"))
- Span (freely adjustable)
for SITRANS P500: 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH₂O)

Pressure transmitters for level

- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Span (freely adjustable)
for SITRANS P500: 1.25 to 6250 mbar (0.5 to 2509 inH₂O)

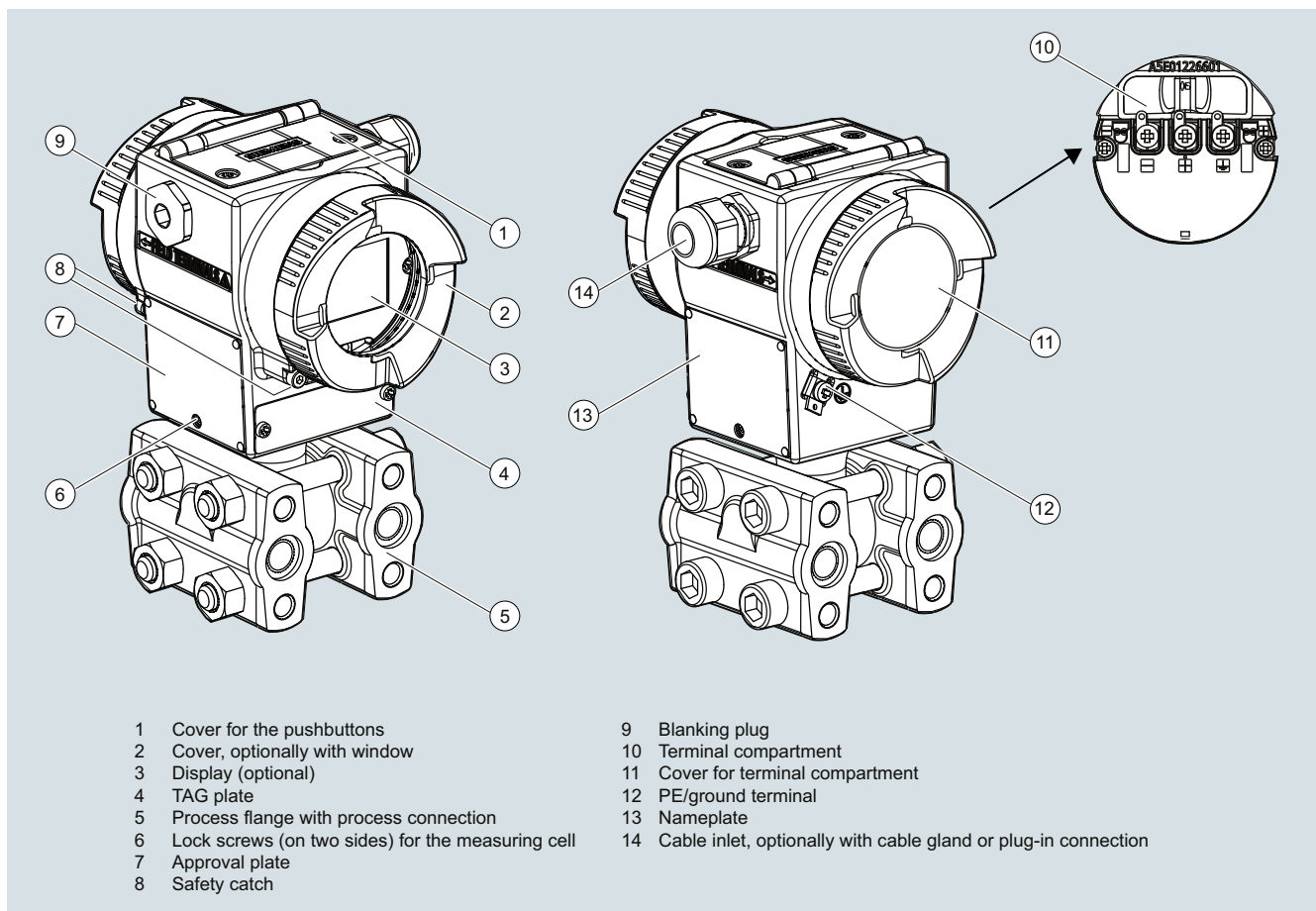
- Nominal diameter of the mounting flange
 - DN 50 / PN 40
 - DN 80 / PN 40
 - DN 100/ PN 16, PN 40
 - 2 inch/class 150, class 300
 - 3 inch/class 150, class 300
 - 4 inch/ class 150, class 300
 - customized special version

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

In the case of measurements in closed vessels, the lower-pressure connection has to be connected to the vessel 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



View of transmitter

- The electronics housing is made of coated die-cast aluminum.
- The casing has round screwed covers front and back.
- Depending on the design the front cover is fitted with an inspection window. You can read off the measured value directly from the optional display through the window.
- The inlet to the terminal compartment is located either on the left or right side. The unused opening in each case is sealed by a blanking plug.
- The PE/ground terminal is on the back of the housing.
- Access to the terminal compartment for auxiliary power and shielding by unscrewing the cover.
- Beneath the electronic housing is the measuring cell with its process flanges at which the process connections are available. The modular design of the pressure transmitter lets you replace the measuring cell, electronics and connection board as required.
- On the top of the housing you can see the screwed cover of the three local pushbuttons of the transmitter.

Pressure Measurement

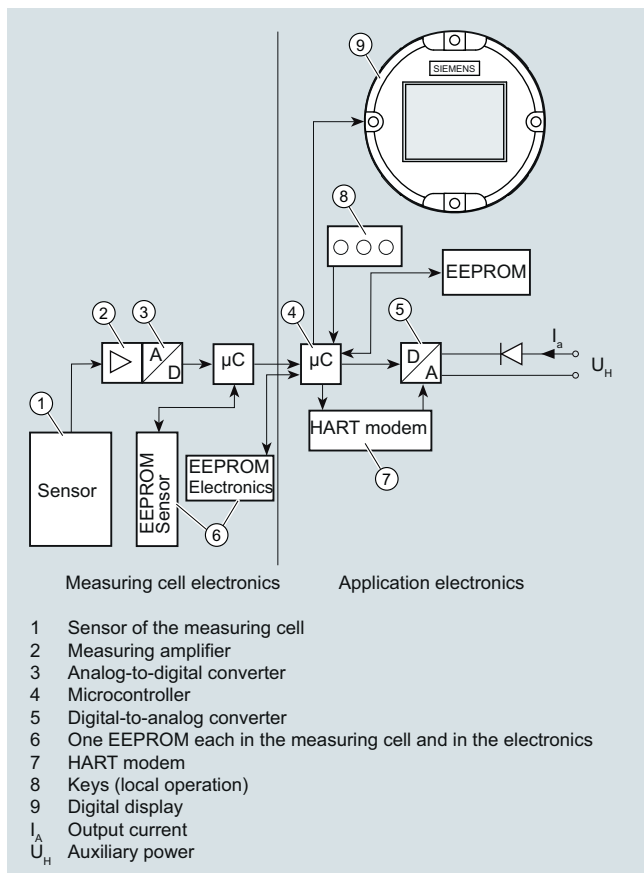
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Function

Operation of electronics with HART communication



Function diagram of electronics

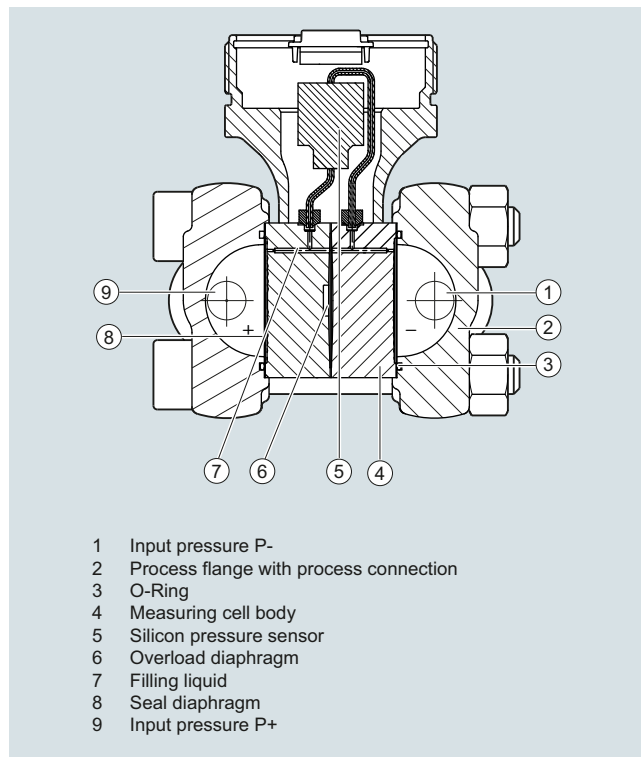
- The input pressure is converted into an electrical signal by the sensor.
- This signal is amplified by the measuring amplifier and digitalized in an analog-to-digital converter.
- The digital signal is analyzed in a microcontroller and corrected according to linearity and thermal characteristics.
- In a digital-to-analog converter it is then converted into the output current of 4 to 20 mA. When connected to supply lines, a diode circuit provides reverse polarity protection.
- The measuring cell-specific data, the electronic data and the parameterization data is held in two EEPROMs. One EEPROM is incorporated into the measuring cell electronics, the other is incorporated into the application electronics.

Operation

- The three local pushbuttons enable you both to navigate and carry out configuration and to visually track messages and process values, provided a display is available.
- If you have a device without a display, you can carry out zero adjustment using the three local pushbuttons. It is possible to retrofit a display at any time.
- You can also carry out settings by computer via a HART modem.

Mode of operation of the measuring cells

Measuring cell for differential pressure and flow



Measuring cell for differential pressure and flow, function diagram

- The differential pressure is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until the seal diaphragm touches the body of the measuring cell. This protects the sensor module from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 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.

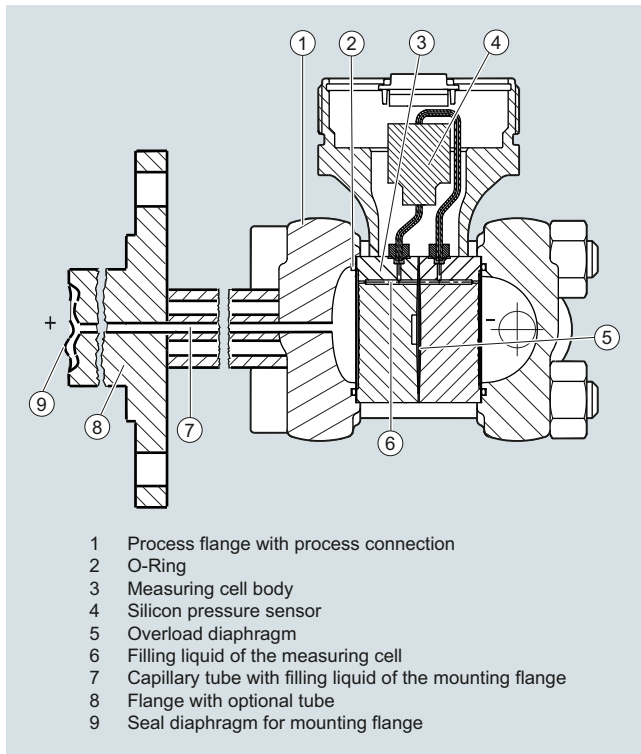
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Measuring cell for level



- 1 Process flange with process connection
- 2 O-Ring
- 3 Measuring cell body
- 4 Silicon pressure sensor
- 5 Overload diaphragm
- 6 Filling liquid of the measuring cell
- 7 Capillary tube with filling liquid of the mounting flange
- 8 Flange with optional tube
- 9 Seal diaphragm for mounting flange

Measuring cell for level, function diagram

- The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell via the seal diaphragm on the mounting flange.
- The differential pressure applied to the measuring cell is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until the seal diaphragm touches the body of the measuring cell. This protects the sensor module from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 piezo resistors in the measuring diaphragm in a bridge circuit.
- The change in the resistance causes a differential pressure proportional to the input pressure.

Configuration of SITRANS P500 HART

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

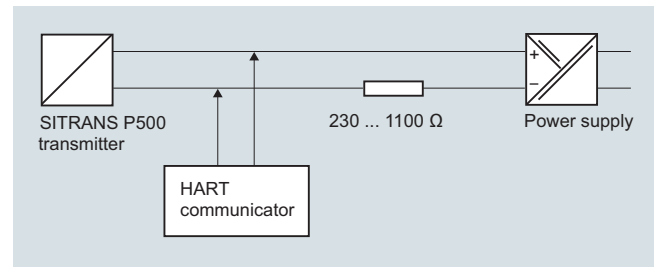
Configuration using the pushbuttons (local operation)

You can configure the transmitter in situ using the three keys provided a display is available. If you have no display, you can only carry out zero adjustment.

It is possible to retrofit a display. See accessories.

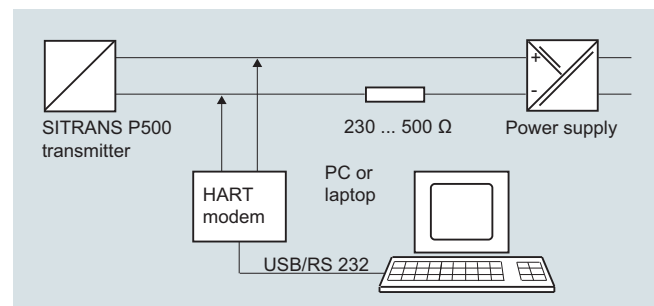
Configuration using HART

Parameterization using HART is carried out using a HART Communicator or a PC in conjunction with a HART modem.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

For configuring via PC a HART modem is used which connects the transmitter to the PC.

The signals needed for communication in conformity with the HART 6.0 protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

The necessary device files are available for download on the Internet.

SITRANS P500 configuration options

The transmission offers you full configuring options both via HART as well as in situ provided the optional display is available.

For simple parameterizing we also offer the easy to understand QuickStart function with guided commissioning.

SITRANS P500 diagnostic functions

- Maintenance timer
- Min/Max pointer (both resetable and non-resetable)
 - Pressure (incl. time and temperature stamp)
 - Static pressure (incl. time and temperature stamp)
 - Sensor temperature (incl. time stamp)
 - Electronic temperature (incl. time stamp)
- Limit monitor block
- Diagnostic warning
- Diagnostic alarm
- Simulation functions
- Display of trends and histograms
- Operating hours meter

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Physical dimensions available for the SITRANS P500 HART display

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 , mmH ₂ O (4 °C), inH ₂ O (4 °C), inH ₂ O (20 °C), mmH ₂ O, mmH ₂ O (4 °C), ftH ₂ O (20 °C), inHg, mmHg, hPA
Level	m, cm, mm, ft, in
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , gallon, Imp. gallon, bushel, barrel, barrel liquid, l; Norm (standard) l; Norm (standard) m ³ , Norm (standard) feet ³
Mass	g, kg, t (metric), 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, gallon/s, l/h, milL/d, gallon/d, gallon/h, milgallon/d, Imp.gallon/s, Imp.gallon/m, Imp.gallon/h, Imp.gallon/d, Norm (standard) m ³ /h, Norm (standard) l/h, Norm (standard) ft ³ /h, Norm (standard) ft ³ /m, barrel liquid/s, barrel liquid/m, barrel liquid/h
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/h, g/min, g/s, lb/d, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

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Input		Measuring accuracy							
Measured variable	Differential pressure and flow	Reference conditions (in accordance with IEC 60770-1)	<ul style="list-style-type: none"> • Rising characteristic curve • Start of scale 0 bar • Stainless steel seal diaphragm • Measuring cell with silicone oil filling • Room temperature (25 °C (77 °F)) 						
Span (infinitely adjustable)	Span (min. ... max.)	All error information always refers to the set span.							
	Maximum operating pressure (static pressure)	Error in measurement at limit setting incl. hysteresis and reproducibility							
	1.00 ... 50 mbar (0.4 ... 20 inH ₂ O) 1.25 ... 250 mbar (0.5 ... 100 inH ₂ O) 6.25 ... 1250 mbar (2.5 ... 502 inH ₂ O) 31.25 ... 6250 mbar (12.54 ... 2509 inH ₂ O) 0.16 ... 32 bar (2.33 ... 465 psi)	r: Span ratio (r = max. span / set span)							
Lower range limit	-100 % of max. span and/or 30 mbar a (0.44 psi a)	Linear characteristic	<table border="1" style="width: 100%;"> <tr> <td>r ≤ 10</td> <td>r ≥ 10</td> </tr> <tr> <td>≤ 0.06 %</td> <td>≤ (0.006 · r) %</td> </tr> <tr> <td>≤ 0.03 %</td> <td>≤ (0.003 · r) %</td> </tr> </table>	r ≤ 10	r ≥ 10	≤ 0.06 %	≤ (0.006 · r) %	≤ 0.03 %	≤ (0.003 · r) %
r ≤ 10	r ≥ 10								
≤ 0.06 %	≤ (0.006 · r) %								
≤ 0.03 %	≤ (0.003 · r) %								
• Measuring cell with silicone oil filling		• 50 mbar (20 inH ₂ O) • 250 mbar (100 inH ₂ O) 1250 mbar (502 inH ₂ O) 6250 mbar (2509 inH ₂ O) 32 bar (465 psi)							
Upper range limit	100 % of max. span	Square-rooted characteristic	<table border="1" style="width: 100%;"> <tr> <td>r ≤ 10</td> <td>r ≥ 10</td> </tr> <tr> <td>≤ 0.06 %</td> <td>≤ (0.006 · r) %</td> </tr> <tr> <td>≤ 0.03 %</td> <td>≤ (0.003 · r) %</td> </tr> </table>	r ≤ 10	r ≥ 10	≤ 0.06 %	≤ (0.006 · r) %	≤ 0.03 %	≤ (0.003 · r) %
r ≤ 10	r ≥ 10								
≤ 0.06 %	≤ (0.006 · r) %								
≤ 0.03 %	≤ (0.003 · r) %								
Start of scale	Between measuring limits (freely adjustable)	• Flow > 50 % - 50 mbar (20 inH ₂ O) - 250 mbar (100 inH ₂ O) 1250 mbar (502 inH ₂ O) 6250 mbar (2509 inH ₂ O) 32 bar (465 psi)							
Output		• Flow 25 % ... 50 % - 50 mbar (20 inH ₂ O) - 250 mbar (100 inH ₂ O) 1250 mbar (502 inH ₂ O) 6250 mbar (2509 inH ₂ O) 32 bar (465 psi)	<table border="1" style="width: 100%;"> <tr> <td>r ≤ 10</td> <td>r ≥ 10</td> </tr> <tr> <td>≤ 0.12 %</td> <td>≤ (0.012 · r) %</td> </tr> <tr> <td>≤ 0.06 %</td> <td>≤ (0.006 · r) %</td> </tr> </table>	r ≤ 10	r ≥ 10	≤ 0.12 %	≤ (0.012 · r) %	≤ 0.06 %	≤ (0.006 · r) %
r ≤ 10	r ≥ 10								
≤ 0.12 %	≤ (0.012 · r) %								
≤ 0.06 %	≤ (0.006 · r) %								
Output current signal	4 ... 20 mA	Influence of ambient temperature per 28 °C (50 °F)	<ul style="list-style-type: none"> • 50 mbar (20 inH₂O) ≤ (0.04 · r + 0.05) % • 250 mbar (100 inH₂O) ≤ (0.025 · r + 0.014) % • 1250 mbar (502 inH₂O) ≤ (0.006 · r + 0.03) % • 6250 mbar (2509 inH₂O) ≤ (0.006 · r + 0.03) % • 32 bar (465 psi) ≤ (0.006 · r + 0.03) % 						
• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA	Influence of static pressure	<ul style="list-style-type: none"> • At the start of scale value (PKN) <ul style="list-style-type: none"> - 50 mbar (20 inH₂O) ≤ (0.1 · r) % per 70 bar (1015 psi) correction via zero point correction - 250 mbar (100 inH₂O) ≤ (0.035 · r) % per 70 bar (1015 psi) correction via zero point correction - 1250 mbar (502 inH₂O) ≤ (0.007 · r) % per 70 bar (1015 psi) correction via zero point correction - 6250 mbar (2509 inH₂O) ≤ (0.007 · r) % per 70 bar (1015 psi) correction via zero point correction - 32 bar (465 psi) ≤ (0.007 · r) % per 70 bar (1015 psi) correction via zero point correction 						
• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA	• On the span (PKS)	<ul style="list-style-type: none"> - 50 mbar (20 inH₂O) ≤ 0.13 % per 70 bar (1015 psi) - 250 mbar (100 inH₂O) ≤ 0.03 % per 70 bar (1015 psi) - 1250 mbar (502 inH₂O) ≤ 0.03 % per 70 bar (1015 psi) - 6250 mbar (2509 inH₂O) ≤ 0.09 % per 70 bar (1015 psi) - 32 bar (465 psi) ≤ 0.05 % per 70 bar (1015 psi) 						
• Ripple (without HART communication)	I _{pp} ≤ 0.4 % of max. output current								
• adjustable damping	0... 100 s in steps of 0.1 s, factory-setting: 2 s								
• current transmitter	3.55 ... 23 mA								
• Failure signal	adjustable within limits: <ul style="list-style-type: none"> • Bottom: 3.55 ... 3.7 mA (default value: 3.6 mA) • Top: 21.0 ... 23 mA (default value: 22.8 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									
- HART Communicator	$R_B = 230 \dots 1100 \Omega$								
- HART modem	$R_B = 230 \dots 500 \Omega$								
Characteristic curve	Linearly rising, linearly falling, square rooted characteristic rising, bidirectional square rooted characteristic and user-specific								

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Total Performance ¹⁾		Design	
<ul style="list-style-type: none"> Linear characteristic - 50 mbar (20 inH₂O) - 250 mbar (100 inH₂O) - 1250 mbar (502 inH₂O) 6250 mbar (2509 inH₂O) 32 bar (465 psi) 	$r \leq 5$ $\leq 0.27\%$ $\leq 0.14\%$ $\leq 0.09\%$	$5 < r \leq 10$ $\leq 0.46\%$ $\leq 0.27\%$ $\leq 0.14\%$	Weight (without options) Approx. 3.3 kg (7.3 lb)
Square rooted characteristic <ul style="list-style-type: none"> Flow > 50 % - 50 mbar (20 inH₂O) - 250 mbar (100 inH₂O) - 1250 mbar (502 inH₂O) 6250 mbar (2509 inH₂O) 32 bar (465 psi) 	$r \leq 5$ $\leq 0.27\%$ $\leq 0.14\%$ $\leq 0.09\%$	$5 < r \leq 10$ $\leq 0.46\%$ $\leq 0.27\%$ $\leq 0.14\%$	Material of parts in contact with the medium <ul style="list-style-type: none"> Seal diaphragm Process connection and sealing screw Sealing material in the process connections - O-Ring
<ul style="list-style-type: none"> Flow 25 % ... 50 % - 50 mbar (20 inH₂O) - 250 mbar (100 inH₂O) - 1250 mbar (502 inH₂O) 6250 mbar (2509 inH₂O) 32 bar (465 psi) 	$r \leq 5$ $\leq 0.54\%$ $\leq 0.28\%$ $\leq 0.18\%$	$5 < r \leq 10$ $\leq 0.92\%$ $\leq 0.54\%$ $\leq 0.28\%$	Material of parts not in contact with media Die-cast aluminum housing <ul style="list-style-type: none"> Low copper die-cast aluminum AC-AISI12 (Fe) or AC-AISI 10 Mg (Fe) to DIN EN 1706 Lacquer on polyurethane base, optional epoxy-based primer Stainless steel name plates (mat. no. 1.4404/316L)
Step response time T_{63} without electrical damping <ul style="list-style-type: none"> 50 mbar (20 inH₂O) 250 mbar (100 inH₂O) 1250 mbar (502 inH₂O) 6250 mbar (2509 inH₂O) 32 bar (465 psi) 	≤ 140 ms, contains a dead time of ≤ 45 ms ≤ 88 ms, contains a dead time of ≤ 45 ms	≤ 140 ms, contains a dead time of ≤ 45 ms ≤ 88 ms, contains a dead time of ≤ 45 ms	Stainless steel precision cast housing Process connection screws Mounting bracket Measuring cell filling Process connection
Long-term stability	$\leq (0.05 \cdot r)\%$ per 5 years $\leq (0.08 \cdot r)\%$ per 10 years	$\leq (0.05 \cdot r)\%$ per 5 years $\leq (0.08 \cdot r)\%$ per 10 years	Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4404/316L Steel or stainless steel mat. no. 1.4301 Silicone oil
Influence of power supply	$\leq 0.005\%/1$ V	$\leq 0.005\%/1$ V	1/4-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518
Rated conditions			
Mounting position	Any		
Ambient conditions <ul style="list-style-type: none"> Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.) - Total device - Readable display - Storage temperature 	-40 ... +85 °C (-40 ... +185 °F) -20 ... +85 °C (-4 ... +185 °F) -50 ... +90 °C (-58 ... +194 °F)		
Climatic class <ul style="list-style-type: none"> Condensation 	Relative humidity 0 ... 100 % (condensation permissible)		
Degree of protection (to IEC 60529)	IP66/IP 68 and NEMA 4X (with corresponding cable gland)		
Electromagnetic Compatibility <ul style="list-style-type: none"> Emitted interference and interference immunity 	Acc. to IEC 61326 and NAMUR NE 21		
Permissible pressures	According to 2014/68/EU pressure equipment directive		
Temperature of medium <ul style="list-style-type: none"> Measuring cell with silicone oil filling 	-40 ... +125 °C (-40 ... +257 °F)		
Auxiliary power supply			
Terminal voltage on transmitter	<ul style="list-style-type: none"> DC 10.6 ... 44 V With intrinsically-safe operation DC 10.6 ... 30 V 		

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Certificates and approvals

Classification according to PED 2014/68/EU

- PN 160 (MAWP 2320 psi) 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

Explosion protection for Europe (to ATEX)

- Intrinsic safety "i"
 - Marking PTB 09 ATEX 2004 X
 - Permissible ambient temperature Ex II 1/2 G Ex ia/ib IIC T4
 - Connection -40 ... +85 °C (-40 ... +185 °F)
 - Effective internal inductance: To certified intrinsically-safe circuits with peak values:
 $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 750\text{ mW}$; $R_i = 300\ \Omega$
 - Effective inner capacitance: $L_i = 400\ \mu\text{H}$
 - Effective inner capacitance: $C_i = 6\text{ nF}$
- Explosion-proof "d"
 - Marking BVS 09 ATEX E 027
 - Permissible ambient temperature Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb
 - Connection -40 ... +85 °C (-40 ... +185 °F)
 - Effective internal inductance: -40 ... +60 °C (-40 ... +140 °F)
 - Effective inner capacitance: temperature class T6
 - Connection To circuits with values:
 $U_m = \text{DC } 10.5 \dots 45\text{ V}$
- Dust explosion protection for zone 20
 - Marking BVS 09 ATEX E 027
 - Permissible ambient temperature Ex II 1 D Ex ta ia IIIC T120°C Da
 - Max. surface temperature -40 ... +85 °C (-40 ... +185 °F)
 - Connection 120 °C (248 °F)
 - Effective internal inductance: To certified intrinsically-safe circuits with peak values:
 $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 750\text{ mW}$, $R_i = 300\ \Omega$
 - Effective inner capacitance: $L_i = 400\ \mu\text{H}$
 - Effective inner capacitance: $C_i = 6\text{ nF}$
- Dust explosion protection for zone 21/22
 - Marking BVS 09 ATEX E 027
 - Connection Ex II 2D Ex tb ia IIIC T120°C Db
 - Effective internal inductance: To circuits with values:
 $U_m = 10.5 \dots 45\text{ V DC}$; $P_{\text{max}} = 1.2\text{ W}$
- Type of protection "n" (zone 2)
 - Marking PTB 09 ATEX 2004 X
 - "nA" connection Ex II 3 G Ex nA II T4/T6
 - "nL, ic" connection Ex II 2/3 G Ex ib/nL IIC T4/T6
 - Effective internal inductance: Ex II 2/3 G Ex ib/ic IIC T4/T6
 - Effective inner capacitance: $U_m = 45\text{ V DC}$
 - Effective inner capacitance: $U_i = 45\text{ V}$
 - Effective inner capacitance: $L_i = 400\ \mu\text{H}$
 - Effective inner capacitance: $C_i = 6\text{ nF}$

Explosion protection for USA (to FM)

Certificate of Compliance

- Identification (XP/DIP) or (IS)

- Permissible Ambient Temperature

- Entity parameters

- Marking (NI/NO)

- Permissible Ambient Temperature

- (NI/S) parameters

Explosion protection for Canada (to cCSA US)

Certificate of Compliance

- Marking (XP/DIP)

- Permissible ambient temperature

- Entity parameters

- Marking (ia/ib)

- Permissible ambient temperature

- Entity parameters

- Marking (NI/n)

- Permissible ambient temperature

- NI/nA parameters

- nL parameters

No. 3033013

XP CL I, DIV 1, GP ABCDEFG T4 / T6
DIP CL II, III, DIV1, GP EFG T4/T6
IS CL I, II, III, DIV1, GP ABCDEFG T4
CL I, Zone 0, AEx ia IIC T4
CL I, Zone 1, AEx ib IIC T4

$T_a = T4: -40 \dots +85\text{ °C}$
(-40 ... +185 °F)

$T_a = T6: -40 \dots +60\text{ °C}$
(-40 ... +140 °F)

According to "control drawing":
A5E02189134N

$U_m = 30\text{ V}$, $I_m = 100\text{ mA}$,
 $P_i = 750\text{ mW}$, $L_i = 400\ \mu\text{H}$, $C_i = 6\text{ nF}$

NI CL I, DIV 2, GP ABCD T4/T6
NI CL I, Zone 2, GP IIC T4/T6
S CL II, III, GPFG T4/T6
NI CL I, DIV 2, GP ABCD T4/T6, NIFW
NI CL I, Zone 2, GP IIC T4/T6, NIFW
NI CL II, III, DIV 2, GP FG T4/T6, NIFW

$T_a = T4: -40 \dots +85\text{ °C}$
(-40 ... +185 °F)

$T_a = T6: -40 \dots +60\text{ °C}$
(-40 ... +140 °F)

According to "control drawing":
A5E02189134N

$U_m = 45\text{ V}$, $L_i = 400\ \mu\text{H}$, $C_i = 6\text{ nF}$,

No. 2280963

CL I, DIV 1, GP ABCD T4 /T6;
CL II, DIV 1, GP EFG T4/T6

$T_a = T4: -40 \dots +85\text{ °C}$ (-40 ... +185 °F)
 $T_a = T6: -40 \dots +60\text{ °C}$ (-40 ... +140 °F)

According to "control drawing":
A5E02189134N

$U_m = 45\text{ V}$

CL I, Ex ia/Ex ib IIC, T4
CL II, III, Ex ia/Ex ib, GP EFG, T4
CL I, AEx ia/AEx ib IIC, T4
CL II, III, AEx ia/ AEx ib, GP EFG, T4

$T_a = T4: -40 \dots +85\text{ °C}$
(-40 ... +185 °F)

$U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 750\text{ mW}$,
 $R_i = 300\ \Omega$, $L_i = 400\ \mu\text{H}$, $C_i = 6\text{ nF}$

CL I, DIV 2, GP ABCD T4/T6
CL II, III, DIV 2, GP FG T4/T6

Ex nA IIC T4/T6
AEx nA IIC T4/T6
Ex nL IIC T4/T6
AEx nL IIC T4/T6

$T_a = T4: -40 \dots +85\text{ °C}$ (-40 ... +185 °F)
 $T_a = T6: -40 \dots +60\text{ °C}$ (-40 ... +140 °F)

According to "control drawing":
A5E02189134N

$U_m = 45\text{ V}$

According to "control drawing":
A5E02189134N

$U_i = 45\text{ V}$, $I_i = 100\text{ mA}$, $L_i = 400\ \mu\text{H}$,
 $C_i = 6\text{ nF}$

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

for differential pressure and flow

Explosion protection for China (acc. to NEPSI)

• Intrinsic safety "i"	GYJ111111X
- Marking	Ex ia/ib IIB/IIC T4
- Perm. ambient temperature	40 ... +85 °C (-40 ... +185 °F)
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$
• Explosion-proof "d"	GYJ111112
- Marking	Ex dia 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: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Dust explosion protection for zone 21/22	GYJ111112
- Marking	DIP A21 TA,T120 °C IP68 D21
- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Type of protection "n" (zone 2)	GYJ111111X
- Marking	Ex nL IIB/IIC T4/T6 Ex nA II T4/T6
- Connection	$U_i = 45 \text{ V DC}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$

1) The total performance includes the errors caused by temperature effects, static pressure effects and conformity error, including hysteresis and repeatability.

2) Not in combination with span "G".

HART communication

Load with connection of	
• HART communicator	$R_B = 230 \dots 1100 \Omega$
• HART modem	$R_B = 230 \dots 500 \Omega$
Cable	2 wire shielded: $\leq 3.0 \text{ km}$ (1.86 miles), multiwire shielded: $\leq 1.5 \text{ km}$ (0.93 miles)
Protocol	HART Version 6.0
PC/laptop requirements	IBM compatible, RAM > 32 MByte, hard disk > 70 MByte, depending on modem type: RS 232-interface or USB connection, VGA graphics
Software for computer	SIMATIC PDM 6.0

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

for differential pressure and flow

1

Selection and Ordering data

Article No.

Pressure transmitters for differential pressure and flow, SITRANS P500 HART, PN 160 (MAWP 2320 psi)

➤ 7 MF 5 4 - - - - 0

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Enclosure

Die-cast aluminum, dual compartment

Die-cast aluminum, dual compartment

Stainless steel precision casting, two-chamber housing

Stainless steel precision casting, two-chamber housing

Thread for cable gland¹⁾

M20x1.5

½-14 NPT

M20x1.5

½-14 NPT

Output

4 ... 20 mA, HART

Measuring cell filling

Silicone oil

Measuring cell cleaning

normal

Measuring span1.00 ... 50 mbar (0.4 ... 20 inH₂O)1.25 ... 250 mbar (0.5 ... 100.4 inH₂O)6.25 ... 1250 mbar (2.5 ... 502 inH₂O)31.25 ... 6250 mbar (12.54 ... 2509 inH₂O)

0.16 ... 32 bar (2.33 ... 465 psi)

Wetted parts materials

Seal diaphragm Process flange

Stainless steel 1.4404/316L Stainless steel 1.4404/316L

Hastelloy C276²⁾ Stainless steel 1.4404/316LMonel 400²⁾ Stainless steel 1.4404/316L

Hastelloy Hastelloy

Process connection

Female thread ¼-18 NPT

• Sealing screw opposite process connection

- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518
- Mounting thread M10 to DIN 19213

• Vent on side of process flange³⁾

- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518
- Mounting thread M10 to DIN 19213

1) Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

2) Not together with Measuring span "C".

2) Not in conjunction with remote seals (option V00).

0

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D

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B

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R

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Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

for differential pressure and flow

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Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs Add "-Z" to Article No. and specify Order code.		Further designs Add "-Z" to Article No. and specify Order code.	
Attachments		Degree of protection approvals: Ex ia/ib (intrinsic safety)	
Mounting bracket made of steel	A01	Ex ia/ib protection (ATEX) (T4)	E00
Mounting bracket made of stainless steel 304	A02	Ex IS protection (FM) (T4)	E01
Mounting bracket made of stainless steel 316L	A03	Ex IS protection (cCSA _{US}) (T4)	E02
Display (Standard: no display, cover closed)		Ex ia/ib protection (NEPSI) (T4)	E06
With display and blanking cover	A10	Degree of protection approvals: Ex d (flameproof)	
With display and glass cover	A11	Ex d explosion-proof (ATEX)(T4/T6)	E20
Special casing / cover version		Ex XP explosion-proof and DIP (FM)(T4/T6)	E21
Two coats of lacquer on casing, cover (PU on epoxy)	A20	Ex XP explosion-proof and DIP (cCSA _{US})(T4/T6)	E22
Electrical connection and cable entry (Standard: no cable gland, only dust protection caps)		Ex d explosion-proof (NEPSI)(T4/T6)	E26
Cable gland made of plastic (IP66/68) ⁴⁾	A50	Degree of protection approvals: n/NI	
Cable glands made of metal (IP66/68)	A51	Zone 2 (nA, nL, ic) (ATEX) (T4/T6)	E40
Cable glands made of stainless steel (IP66/68)	A52	Div2 NI, Div2 NI-field wiring (FM) (T4/T6)	E41
M12 device plug without cable socket (IP66/67) ⁴⁾	A60	Zone 2 (nA, nL), Div2 NI (cCSA _{US}) (T4/T6)	E42
M12 device plug complete with cable socket (IP66/67) ⁴⁾	A61	Zone 2 (nA, nL) (NEPSI) (T4/T6)	E46
Han 7D device plug, plastic, straight (with cable socket) (IP65) ⁴⁾	A71	Degree of protection approvals: Dust Zone 20/21/22	
Han 7D device plug, plastic, angled (with cable socket) (IP65) ⁴⁾	A72	Use in Zone 21/22 (Ex tD) (ATEX) Ex tb	E60
Han 7D device plug, metal enclosure, straight (with cable socket) (IP65) ⁴⁾	A73	Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta	E61
Han 7D device plug, metal enclosure, angled (with cable socket) (IP65) ⁴⁾	A74	Use in Zone 21/22 (Ex DIP) (NEPSI)	E66
Han 8D device plug, plastic, straight (with cable socket) (IP65) ⁴⁾⁷⁾	A75	Degree of protection approvals: Combinations	
Han 8D device plug, plastic, angled (with cable socket) (IP65) ⁴⁾⁷⁾	A76	IS protection and XP and DIP (FM)	E71
Han 8D device plug, metal enclosure, straight (with cable socket) (IP65) ⁴⁾⁷⁾	A77	IS protection and XP and DIP (cCSA _{US})	E72
Han 8D device plug, metal enclosure, angled (with cable socket) (IP65) ⁴⁾⁷⁾	A78	IS protection and XP and DIP (FM/cCSA _{US})	E73
PG 13.5 adapters ⁴⁾	A82	Supplementary approvals/degree of protection	
Language for labels, quick-start guide, menu language default ⁹⁾ (instead of English as standard)		Ex-protection Ex ia according to EAC Ex (Russia)	E80
German	B10	Ex-protection Ex d according to EAC Ex (Russia)	E81
French	B12	Dual Seal approval ⁵⁾	E85
Spanish	B13	Export approval Korea	E86
Italian	B14	Special process connection versions (diff. pressure)	
Chinese	B15	Side vents for gas measurements ⁹⁾	L32
Russian	B16	Swap process connection: high-pressure side at front	L33
Japanese	B17	Mosquito protection	
English with units psi/inH ₂ O/°F	B21	4 pcs. for ¼-18 NPT thread	L36
Special version: Supplementary menu languages (Standard: English, German, French, Spanish, Italian)		Process flanges, O-rings, special material	
Asia language package (in addition: Chinese, Japanese, Russian)	B80	Standard: Viton (FKM) (FPM)	
Certificates (available online for downloading) ¹⁾		Process conn. sealing rings made of PTFE (Teflon), virginal	L60
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2 ²⁾	C11	Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced	L61
Acceptance test certificate according to EN 10204-3.1 ³⁾	C12	Process connection sealing rings made of FFPM (Kalrez) ¹⁰⁾	L62
Acceptance certificate (EN 10204-3.1); PMI test of parts in contact with medium	C15	Process connection sealing rings made of NBR	L63
Functional Safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	Process connection sealing rings made of graphite	L64
		Drain/Vent valve (1 set = 2 units)	
		2 ventilation valves ¼- 18 NPT, in material of process flanges)	L80
		Remote seals	
		Transmitters with connection of remote seal ⁶⁾ (For premounted valve manifolds see page 1/349)	V00

1) Enclosed in print or as DVD: see page 1/347.

2) When also ordering the quality inspection certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

3) When also ordering the acceptance test certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

4) Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

5) Only in conjunction with FM and/or cCSA_{US}

6) Please select a remote seal separately. Also refer to the information under footnote 2). Remote seals see page 1/422.

7) The Han 8D device plug is identical with the former Han 8U version.

8) For option B15, B16 and B17 the menu language default is english. Otherwise the Option B80 (Asia language package) is necessary.

9) Only in conjunction with process connection "Vent on side".

10) Not together with Measuring span "G".

Selection and Ordering data	Order code
Additional data	
Please add "-Z" to Article No. and specify Order code(s) and plain text.	
Measuring range to be set	
Specify in plain text:	
<ul style="list-style-type: none"> In the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi 	Y01
<ul style="list-style-type: none"> In the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi 	Y02
Measuring point number and measuring point identifier (only standard ASCII character set)	
Specify in plain text:	
Measuring point number (TAG No.), max. 16 characters Y15:	Y15
Measuring point text (max. 27 char.) Y16:	Y16
Entry of HART address (TAG), max. 32 characters Y17:	Y17
Setting of pressure indication in pressure units	
Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ...	
Note: The following pressure units are selectable: bar, mbar, mm H ₂ O*, in H ₂ O*, ftH ₂ O*, mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM, % or mA	
*) Reference temperature 20 °C	
Setting of pressure indication in non-pressure units¹⁾	
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)	
Customer-specific settings	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	Y30

¹⁾ Preset values can only be changed over SIMATIC PDM.

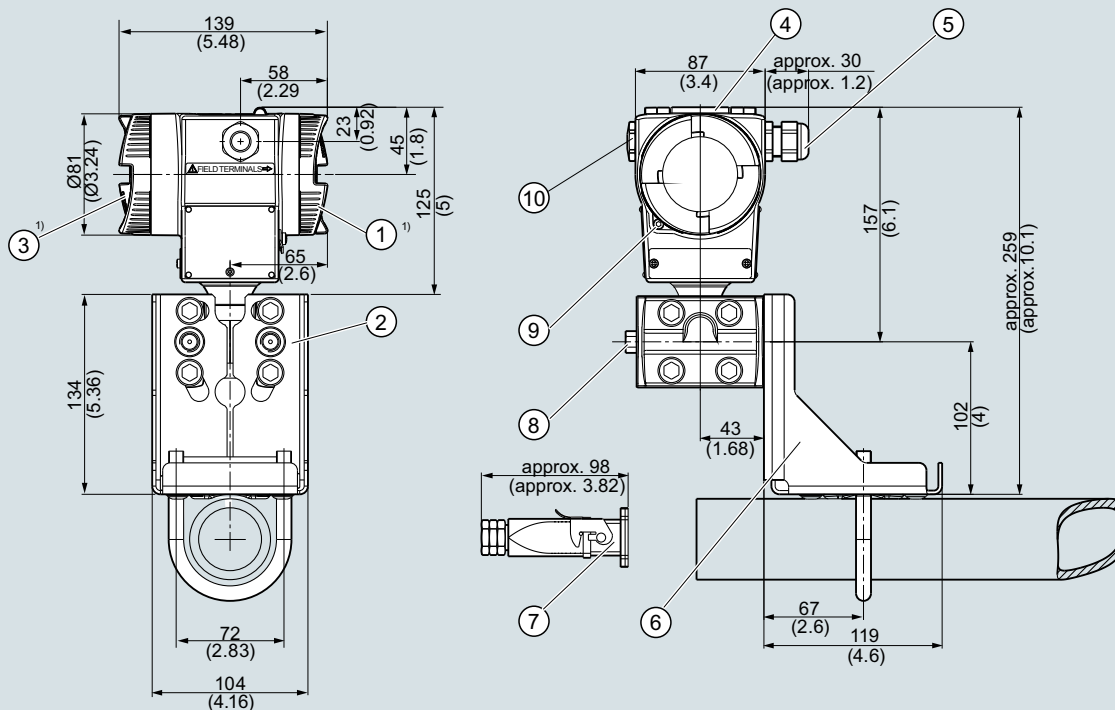
Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

for differential pressure and flow

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Dimensional drawings



- 1 Terminal side
- 2 Process connection: 1/4"-18 NPT (EN 61518)
- 3 Electronics side, digital display
- 4 Protective cover for the pushbuttons
- 5 Cable entry:
 - Screwed gland M20 x 1.5³⁾
 - Screwed gland 1/2"-14 NPT
 - Han 7D/8D device plug²⁾³⁾
 - M12 device plug
- 6 Mounting bracket (optional)

- 7 Electrical connection:
 - Han 7D/Han 8D device plug/socket²⁾³⁾
- 8 Vent valve (optional)
- 9 Safety catch
- 10 Blanking plug

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

²⁾ Not with type of protection "Explosion-proof"

³⁾ Not with type of protection "FM + cCSA_{US} [IS + XP]"

SITRANS P pressure transmitter for differential pressure and flow, P500 series, measurements in mm (inch)

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

for level

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Technical specifications

Input			
Measured variable	Level		
Span (infinitely adjustable)	Span (min. ... max.)	Maximum operating pressure	
	1.25 ... 250 mbar (0.5 ... 100 inH ₂ O)	See "Mounting flange"	
	6.25 ... 1250 mbar (2.5 ... 500 inH ₂ O)		
	31.25 ... 6250 mbar (12.54 ... 2509 inH ₂ O)		
Lower range limit			
• Measuring cell with silicone oil filling	-100 % of max. span or 500 mbar a (7.25 psi a) vacuum resistance		
	Also available as vacuum-resistant remote seal: 30 mbar a (0.44 psi a)		
Upper range limit	100% of max. span		
Start of scale	Between measuring limits (freely adjustable)		
Output			
Output current signal	4 ... 20 mA		
• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA		
• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.4$ of max. output current		
• adjustable damping	0... 100 s in steps of 0.1 s, factory setting 2 s		
• current transmitter	3.55 ... 23 mA		
• Failure signal	Adjustable within limits:		
	• Lower: 3.55 ... 3.7 mA (factory setting 3.6 mA)		
	• Upper: 21.0 ... 23 mA (factory setting 22.8 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			
- HART Communicator	$R_B = 230 \dots 1100 \Omega$		
- HART modem	$R_B = 230 \dots 500 \Omega$		
Characteristic curve	Linearly rising or linearly falling and user-specific		
Measuring accuracy			
Reference conditions (in accordance with IEC 60770-1)	• Rising characteristic curve		
All error information always refers to the set span.	• Start of scale 0 bar		
	• Stainless steel seal diaphragm		
	• Measuring cell with silicone oil filling		
	• Room temperature (25 °C (77 °F))		
Error in measurement at limit setting incl. hysteresis and reproducibility			
r: Span ratio ($r = \text{max. span} / \text{set span}$)			
Linear characteristic	$r \leq 10$	$r \geq 10$	
• 250 mbar (100 inH ₂ O)	$\leq 0.03 \%$	$\leq (0.003 \cdot r) \%$	
• 1250 mbar (502 inH ₂ O)			
• 6250 mbar (2509 inH ₂ O)			
			Long-term stability
			$\leq (0.05 \cdot r) \%$ per 5 years
			$\leq (0.08 \cdot r) \%$ per 10 years
			Influence of ambient temperature per 28 °C (50 °F) ¹⁾
			• 250 mbar (100 inH ₂ O)
			$\leq (0.025 \cdot r + 0.014) \%$
			• 1250 mbar (502 inH ₂ O)
			$\leq (0.006 \cdot r + 0.03) \%$
			• 6250 mbar (2509 inH ₂ O)
			Influence of static pressure
			• At the start of scale value (PKN) ^{1) 2)}
			- 250 mbar (100 inH ₂ O)
			$\leq (0.035 \cdot r) \%$ je 70 bar (1015 psi) correction via zero point correction
			- 1250 mbar (502 inH ₂ O)
			$\leq (0.007 \cdot r) \%$ je 70 bar (1015 psi) correction via zero point correction
			- 6250 mbar (2509 inH ₂ O)
			• On the span (PKS) ¹⁾
			- 250 mbar (100 inH ₂ O)
			$\leq 0.03 \%$ je 70 bar (1015 psi)
			- 1250 mbar (502 inH ₂ O)
			$\leq 0.09 \%$ je 70 bar (1015 psi)
			- 6250 mbar (2509 inH ₂ O)
			Influence of power supply
			$\leq 0.005 \%$ /1 V
		Rated conditions	
		Mounting position	Defined by flange
		Ambient conditions	
		• Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)	
		- total device	-40 ... +85 °C (-40 ... +185 °F)
		- Readable display	-20 ... +85 °C (-4 ... +185 °F)
		- Storage temperature	-50 ... +90 °C (-58 ... +194 °F)
		Climatic class	
		• Condensation	Relative humidity 0 ... 100 % (condensation permissible)
		Degree of protection to IEC 60529	IP66/IP68 and NEMA 4X (with corresponding cable gland)
		Electromagnetic Compatibility	
		• Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21
		Permissible pressures	According to 2014/68/EU pressure equipment directive
		Medium temperature of high-pressure side	
		• Measuring cell with silicone oil filling	
		- $p_{abs} \geq 1 \text{ bar}$	-40 ... +175 ³⁾ °C (-40 ... +347 ³⁾ °F)
		- $p_{abs} < 1 \text{ bar}$	-40 ... +80 °C (-40 ... +176 °F)
		Design	
		Weight	
		• To EN (pressure transmitter with mounting flange, without tube)	approx. 9.8 ... 11.8 kg (21.6... 26.0 (lb)
		• To ASME (pressure transmitter with mounting flange, without tube)	approx. 9.8 ... 16.8 kg (21.6 ... 37.0 lb)

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

for level

Material of wetted parts at the high-pressure side		Auxiliary power supply	
• Seal diaphragm of mounting flange	Stainless steel 1.4404/316L, Hastelloy C276, mat. no. 2.4819, Monel 400, mat. no. 2.4360, Tantal, PFA auf Edelstahl 1.4404/316L, PTFE auf Edelstahl 1.4404/316L	Terminal voltage on transmitter	<ul style="list-style-type: none"> • DC 10.6 ... 44 V • With intrinsically-safe operation DC 10.6 ... 30 V
• Sealing face	Smooth to EN 1092-1, Form B1 and/or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 1092-1 Form B2 and/or ASME B16.5 RF SF in the case of other materials	Certificates and approvals	
• Sealing material in the process connection		Classification according to PED 2014/68/EU	
- O-Ring	<ul style="list-style-type: none"> • Standard: Viton (FKM (FPM)) • Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FFPM (Kalrez), Graphite 	• PN 160 (MAWP 2320 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
- For vacuum application of mounting flange	Copper	Explosion protection	
Material of wetted parts at the low-pressure side		<u>Explosion protection for Europe (to ATEX)</u>	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400	• Intrinsic safety "i"	PTB 09 ATEX 2004 X
• Process connection and sealing screw	• Stainless steel, mat. no. 1.4404/316L	- Marking	Ex II 1/2 G Ex ia/ib IIC T4
• Sealing material in the process connection		- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
- O-Ring	<ul style="list-style-type: none"> • Standard: Viton (FKM (FPM)) • Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FFPM (Kalrez), Graphite 	- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$
Material of parts not in contact with media		- Effective internal inductance:	$L_i = 400 \mu\text{H}$
Die-cast aluminum housing	<ul style="list-style-type: none"> • Low copper die-cast aluminum AC-AISI12 (Fe) or AC-AISI 10 Mg (Fe) to DIN EN 1706 • Lacquer on polyurethane base, optional epoxy-based primer • Stainless steel serial plate 	- Effective inner capacitance:	$C_i = 6 \text{ nF}$
Stainless steel precision cast housing	Stainless steel, mat. no. 1.4404/316L	• Explosion-proof "d"	BVS 09 ATEX E 027
Process connection screws	Stainless steel	- Marking	Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb
Measuring cell filling	Silicone oil	- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) -40 ... +60 °C (-40 ... +140 °F) temperature class T6
• Liquid mounting flange	Silicone oil or other material	- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
Process connection		• Dust explosion protection for zone 20	BVS 09 ATEX E 027
• High-pressure side	Flange to EN and ASME	- Marking	Ex II 1 D Ex ta ia IIC T120°C Da
• Low-pressure side	¼-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518	- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
Electrical connection	<ul style="list-style-type: none"> • Screw terminals • Cable entry via the following screwed glands: <ul style="list-style-type: none"> - M20 x 1.5 - ½-14 NPT - Han 7D/Han 8D device plug - M12 plug device 	- Max. surface temperature	120 °C (248 °F)
Displays and controls		- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$
Push buttons	3; for operation directly on the device	- Effective internal inductance:	$L_i = 400 \mu\text{H}$
Display	<ul style="list-style-type: none"> • With or without integrated display • Cover with or without window 	- Effective inner capacitance:	$C_i = 6 \text{ nF}$
		• Dust explosion protection for zone 21/22	BVS 09 ATEX E 027
		- Marking	Ex II 2 D Ex tb ia IIIC T120°C Db
		- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$
		• Type of protection "n" (zone 2)	PTB 09 ATEX 2004 X
		- Marking	Ex II 3 G Ex nA II T4/T6 Ex II 2/3 G Ex ib/nL IIC T4/T6 Ex II 2/3 G Ex ib/ic IIC T4/T6
		- "nA" connection	$U_m = 45 \text{ V DC}$
		- "nL, ic" connection	$U_i = 45 \text{ V}$
		- Effective internal inductance	$L_i = 400 \mu\text{H}$
		- Effective inner capacitance	$C_i = 6 \text{ nF}$

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

for level

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Explosion protection for USA (to FM)	Explosion protection for China (acc. to NEPSI)
Certificate of Compliance	No. 3033013
• Identification (XP/DIP) or (IS)	XP CL I, DIV 1, GP ABCDEFG T4 / T6 DIP CL II, III, DIV1, GP EFG T4/T6 IS CL I, II, III, DIV1, GP ABCDEFG T4 CL I, Zone 0, AEx ia IIC T4 CL I, Zone 1, AEx ib IIC T4
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N $U_m = 30 \text{ V}$, $I_m = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $L_i = 400 \text{ μH}$, $C_i = 6 \text{ nF}$
• Marking (NI/NO)	NI CL I, DIV 2, GP ABCD T4/T6 NI CL I, Zone 2, GP IIC T4/T6 S CL II, III, GPFG T4/T6 NI CL I, DIV 2, GP ABCD T4/T6, NIFW NI CL I, Zone 2, GP IIC T4/T6, NIFW NI CLII, III, DIV 2, GP FG T4/T6, NIFW
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- (NI/S) parameters	According to "control drawing": A5E02189134N $U_m = 45 \text{ V}$, $L_i = 400 \text{ μH}$, $C_i = 6 \text{ nF}$
Explosion protection for Canada (to cCSA _{US})	Explosion protection for USA (to FM)
Certificate of Compliance	No. 2280963
• Marking (XP/DIP)	CL I, DIV 1, GP ABCD T4 /T6; CL II, DIV 1, GP EFG T4/T6
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N, $U_m = 45 \text{ V}$
• Marking (ia/ib)	CL I, Ex ia/Ex ib IIC, T4 CL II, III, Ex ia/Ex ib, GP EFG, T4 CL I, AEx ia/AEx ib IIC, T4 CL II, III, AEx ia/ AEx ib, GP EFG, T4
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F)
- Entity parameters	$U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \text{ Ω}$, $L_i = 400 \text{ μH}$, $C_i = 6 \text{ nF}$
• Marking (NI/n)	CL I, DIV2, GP ABCD T4/T6 CL II, III, DIV2, GP FG T4/T6 Ex nA IIC T4/T6 AEx nA IIC T4/T6 Ex nL IIC T4/T6 AEx nL IIC T4/T6
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- NI/nA parameters	According to "control drawing": A5E02189134N, $U_m = 45 \text{ V}$
- nL parameters	According to "control drawing": A5E02189134N, $U_i = 45 \text{ V}$, $I_i = 100 \text{ mA}$, $L_i = 400 \text{ μH}$, $C_i = 6 \text{ nF}$
	<ul style="list-style-type: none"> • Intrinsic safety "i" GYJ111111X - Marking Ex ia/ib IIB/IIC T4 - Permissible ambient temperature 40 ... +85 °C (-40 ... +185 °F) - Connection To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$ - Effective internal inductance $L_i = 400 \text{ mH}$ - Effective inner capacitance $C_i = 6 \text{ nF}$ • Explosion-proof "d" GYJ111112 - Marking Ex dia 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: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$ • Dust explosion protection for zone 21/22 GYJ111112 - Marking DIP A21 TA,T120 °C IP68 D21 - Connection To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$ • Type of protection "n" (zone 2) GYJ111111X - Marking Ex nL IIB/IIC T4/T6 Ex nA II T4/T6 - Connection $U_i = 45 \text{ V DC}$ - Effective internal inductance $L_i = 400 \text{ mH}$ - Effective inner capacitance $C_i = 6 \text{ nF}$
	<ol style="list-style-type: none"> 1) Only relevant for the pressure transmitter. The temperature error of the remote seal must be calculated separately. 2) If the Type "D" measuring cell is used, the error should be increased by a factor of 5. This error can be reduced to 0 by a means of a zero adjustment. 3) This value may be increased if the process connection is sufficiently insulated.
HART communication	
Load with connection of	
• HART Communicator	$R_B = 230 \dots 1100 \text{ Ω}$
• HART modem	$R_B = 230 \dots 500 \text{ Ω}$
Cable	2 wire shielded: ≤ 3.0 km (1.86 miles), multiwire shielded: ≤ 1.5 km (0.93 miles)
Protocol	HART Version 6.0
PC/laptop requirements	IBM compatible, RAM > 32 MByte, hard disk > 70 MByte, depending on modem type: RS 232-interface or USB connection, VGA graphics
Software for computer	SIMATIC PDM 6.0

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

for level

1

Selection and Ordering data		Article No.	Order code
Pressure transmitters for level, SITRANS P500 HART		7MF56	0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Enclosure	Thread for cable gland⁹⁾		
Die-cast aluminum, dual compartment	M20x1.5	0	
Die-cast aluminum, dual compartment	½-14 NPT	1	
Stainless steel precision casting, two-chamber housing	M20x1.5	2	
Stainless steel precision casting, two-chamber housing	½-14 NPT	3	
Output			
4 ... 20 mA, HART		3	
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal	1	
Measuring span (min. ... max.)			
1.25 ... 250 mbar	(0.5 ... 100 inH ₂ O)	D	
6.25 ... 1250 mbar	(2.5 ... 500 inH ₂ O)	E	
31.25 ... 6250 mbar	(12.54 ... 2509 inH ₂ O)	F	
Wetted parts of the low-pressure side (stainless steel process flanges)			
Seal diaphragm	Process connection		
Stainless steel 1.4404/316L	Stainless steel 1.4404/316L	A	
Hastelloy C276	Stainless steel 1.4404/316L	B	
Monel 400	Stainless steel 1.4404/316L	C	
Process connection of low-pressure side			
Female thread ¼-18 NPT			
• Sealing screw opposite process connection			
- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518		0	
- Mounting thread M10 to DIN 19213		1	
• Vent on side of process flange			
- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518		4	
- Mounting thread M10 to DIN 19213		5	
Wetted parts materials (high-pressure side)			
Stainless steel 1.4404/316L		0	
Hastelloy C276 mat. no. 2.4819		1	
Monel 400 mat. no. 2.4360		2	
Tantalum		3	
PFA coated on stainless steel		4	
PTFE on stainless steel 1.4404/316L (not in combination with an extension)		6 A	
Other version		9 Y	N 1 Y
Add Order code and plain text: Material: ... ; Extension length: ...			
Process connection on high-pressure side: Extension length			
None			A
50 mm (1.97 inch)			B
100 mm (3.94 inch)			C
150 mm (5.90 inch)			D
200 mm (7.87 inch)			E
Other version: See option "9" for "Wetted parts materials"			
Process connection on high-pressure side: Nominal diameter/Nominal pressure			
DN 50, PN 40 ⁶⁾			B
DN 80, PN 40			D
DN 100, PN 16			G
DN 100, PN 40			H
2", class 150 ⁶⁾			L
2", class 300 ⁶⁾			M
3", class 150			Q
3", class 300			R
4", class 150			T
4", class 300			U
Other version, add Order code and plain text: Nominal diameter: ... ; Nominal pressure: ...			Z
			Q 1 Y

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

for level

1

Selection and Ordering data	Article No.	Order code
Pressure transmitters for level, SITRANS P500 HART	7MF56 - - - - - 0 - - - - -	
Process connection on high-pressure side: Filling liquid		
Silicone oil M5		0
Silicone oil M50		1
High-temperature oil		2
Halocarbon (for oxygen measurement)		3
FDA compliant oil		4
Other version, add		9
Order code and plain text:		R 1 Y
Filling liquid: ...		

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

for level

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs Add "-Z" to Article No. and specify Order code.		Further designs Add "-Z" to Article No. and specify Order code.	
Display (Standard: no display, cover closed)		Degree of protection approvals: Ex d (flameproof)	
With display and blanking cover	A10	Ex d explosion-proof (ATEX)(T4/T6)	E20
With display and glass cover	A11	Ex XP explosion-proof and DIP (FM)(T4/T6)	E21
Special version: cover/casing		Ex XP explosion-proof and DIP (C _{CSA} US)(T4/T6)	E22
Two coats of lacquer on casing, cover (PU on epoxy)	A20	Ex d explosion-proof (NEPSI)(T4/T6)	E26
Electrical connection and cable entry (Standard: no cable gland, only dust protection caps)		Degree of protection approvals: n/NI	
Cable gland made of plastic (IP66/68) ⁴⁾	A50	Zone 2 (nA, nL, ic) (ATEX) (T4/T6)	E40
Cable glands made of metal (IP66/68)	A51	Div2 NI, Div2 NI-field wiring (FM) (T4/T6)	E41
Cable glands made of stainless steel (IP66/68)	A52	Zone 2 (nA, nL), Div2 NI (C _{CSA} US) (T4/T6)	E42
M12 device plug without cable socket (IP66/67) ⁴⁾	A60	Zone 2 (nA, nL) (NEPSI) (T4/T6)	E46
M12 device plug, cable socket (IP66/67) ⁴⁾	A61	Degree of protection approvals: Zone 20/21/22	
Han 7D device plug, plastic, straight (with cable socket) (IP65) ⁴⁾	A71	Use in Zone 21/22 (Ex tD) (ATEX) Ex tb	E60
Han 7D device plug, plastic, angled (with cable socket) (IP65) ⁴⁾	A72	Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta	E61
Han 7D device plug, metal enclosure, straight (with cable socket) (IP65) ⁴⁾	A73	Use in Zone (Ex DIP) (ATEX) (NEPSI)	E66
Han 7D device plug, metal enclosure, angled (with cable socket) (IP65) ⁴⁾	A74	Degree of protection approvals: Combinations	
Han 8D device plug, plastic, straight (with cable socket) (IP65) ⁴⁾⁷⁾	A75	IS protection and XP and DIP (FM)	E71
Han 8D device plug, plastic, angled (with cable socket) (IP65) ⁴⁾⁷⁾	A76	IS protection and XP and DIP (C _{CSA} US)	E72
Han 8D device plug, metal enclosure, straight (with cable socket) (IP65) ⁴⁾⁷⁾	A77	IS protection and XP and DIP (FM/C _{CSA} US)	E73
Han 8D device plug, metal enclosure, angled (with cable socket) (IP65) ⁴⁾⁷⁾	A78	Supplementary approvals / degree of protection	
PG 13.5 adapters ⁴⁾	A82	Ex-protection Ex ia according to EAC Ex (Russia)	E80
Language for labels, quick-start guide and menu language default⁸⁾ (instead of English as standard)		Ex-protection Ex d according to EAC Ex (Russia)	E81
German	B10	Dual Seal approval ⁵⁾	E85
French	B12	Export approval Korea	E86
Spanish	B13	Special process connection versions (diff. pressure)	
Italian	B14	Swap process connection: high-pressure side at front	L33
Chinese	B15	Mosquito protection	
Russian	B16	4 pcs. for ¼-18 NPT thread	L36
Japanese	B17	Process flanges, O-rings, special material	
English with units: psi/inH ₂ O	B21	Standard: Viton (FKM (FPM))	
Special version: Supplementary menu languages (Standard: English, German, French, Spanish, Italian)		Process connection sealing rings made of PTFE (Teflon), virginal	L60
Asia language package (in addition: Chinese, Japanese, Russian)	B80	Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced	L61
Certificates (available online for downloading)¹⁾		Process connection sealing rings made of FFKM (Kalrez)	L62
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2 ²⁾	C11	Process connection sealing rings made of NBR	L63
Acceptance test certificate according to EN 10204-3.1 ³⁾	C12	Process connection sealing rings made of graphite	L64
Acceptance certificate (EN 10204-3.1); PMI test of parts in contact with medium	C15	Drain/Vent valve (1 set = 2 units)	
Functional Safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	2 ventilation valves ¼- 18 NPT, in material of process flange)	L80
Degree of protection approvals: Ex ia/ib (intrinsic safety)		Vacuum-proof design	
Ex ia/ib protection (ATEX) (T4)	E00	Vacuum service	V04
Ex IS protection (FM) (T4)	E01	Spark arrester	V05
Ex IS protection (C _{CSA} US) (T4)	E02	For mounting on zone 0 (including documentation)	
Ex ia/ib protection (NEPSI) (T4)	E06		

1) Enclosed in print or as DVD: see page 1/347.

2) When also ordering the quality inspection certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

3) When also ordering the acceptance test certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

4) Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

5) Only in conjunction with FM and/or C_{CSA}US

6) Not recommended for Measuring span "D"

7) The Han 8D device plug is identical with the former Han 8U version.

8) For option B15, B16 and B17 the menu language default is English. Otherwise the Option B80 (Asia language package) is necessary.

9) Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

Selection and ordering data	Order code
Additional data	
Please add "-Z" to Article No. and specify Order code(s) and plain text.	
Measuring range to be set	
Specify in plain text:	
Linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, kPa, MPa, psi	Y01
Measuring point number and measuring point identifier (only standard ASCII character set)	
Specify in plain text:	
Measuring point number (TAG No.), max. 16 characters Y15:	Y15
Measuring point text (max. 27 char.) Y16:	Y16
Entry of HART address (TAG), max. 32 characters Y17:	Y17
Setting of pressure indication in pressure units	Y21
Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ...	
Note: The following pressure units are selectable: bar, mbar, mm H ₂ O [*] , in H ₂ O [*] , ftH ₂ O [*] , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM, % or mA	
*) Reference temperature 20 °C	
Setting of pressure indication in non-pressure units¹⁾	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)	
Customer-specific settings	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	Y30

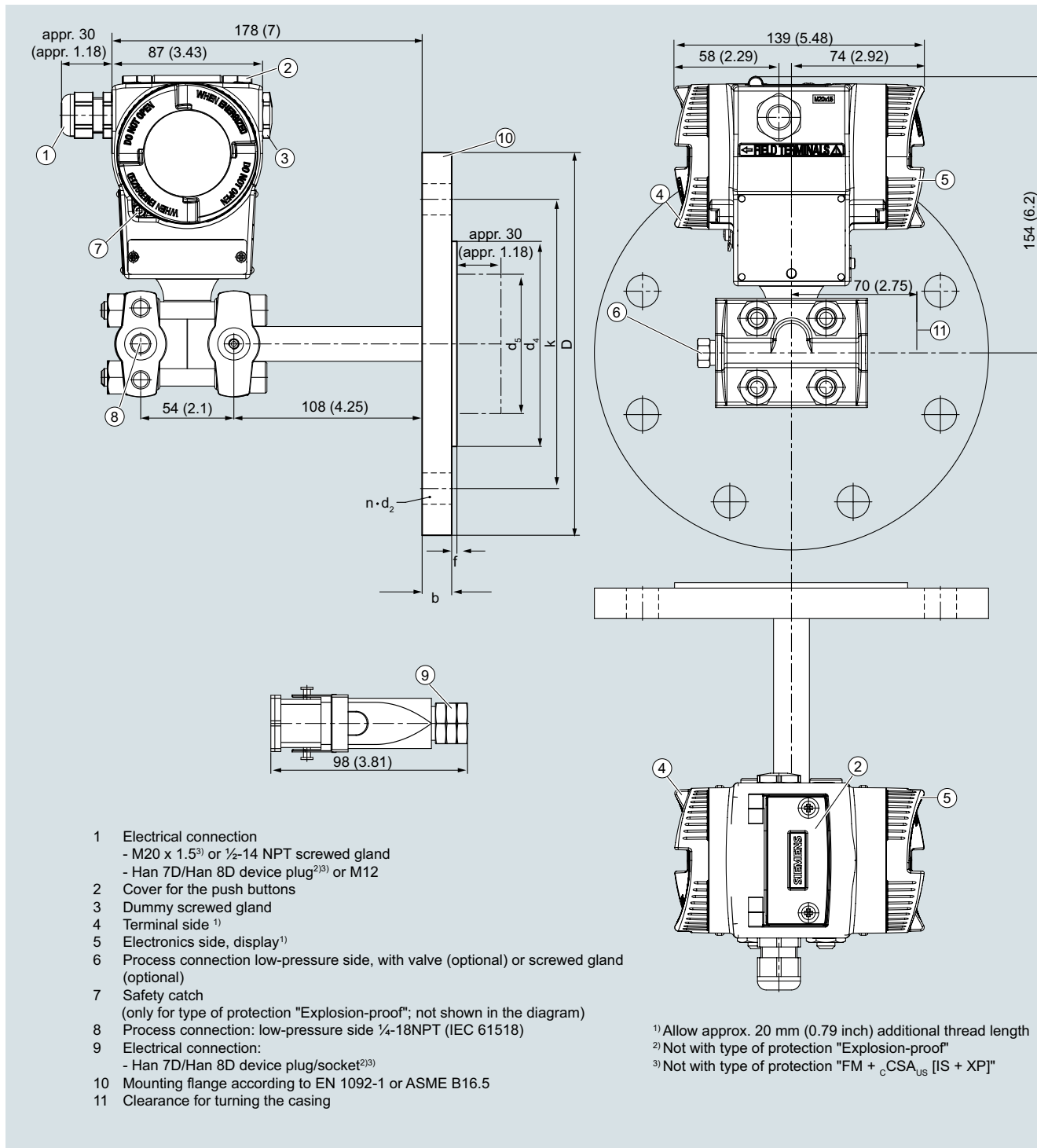
¹⁾ Preset values can only be changed over SIMATIC PDM.

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

for level

Dimensional drawings



SITRANS P pressure transmitter for filling level, P500 series, measurements in mm (inch)

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

for level

1

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
DN50	PN 40	20	165	61	18	102	48.3	45 ¹⁾	2	125	4	0, 50, 100, 150 or 200
DN 80	PN 40	24	200	90	18	138	76	72 ²⁾	2	160	8	
DN 100	PN 16	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

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	class 150	0.77 (19.5)	5.91 (150)	0.75 (19.0)	3.62 (92)	1.9 (48.3)	1.77 (45) ¹⁾	0.079 (2.0)	4.75 (120.7)	4	0, 2, 3.94, 5.94 or 7.87
	class 300	0.89 (22.7)	6.49 (165)	0.75 (19.0)	3.62 (92)	1.9 (48.3)	1.77 (45) ¹⁾	0.079 (2.0)	5.0 (127)	8	
3 inch	class 150	0.96 (24.3)	7.5 (190.5)	0.75 (19.0)	5 (127)	3.0 (76)	2.83 (72) ²⁾	0.079 (2.0)	6 (152.4)	4	
	class 300	1.14 (29.0)	8.27 (210)	0.87 (22.2)	5 (127)	3.0 (76)	2.83 (72) ²⁾	0.079 (2.0)	6.69 (168.3)	8	
4 inch	class 150	0.96 (24.3)	9.06 (230)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.079 (2.0)	7.5 (190.5)	8	
	class 300	1.27 (32.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.079 (2.0)	7.88 (200)	8	

Explanations of tables:

d: Internal diameter of gasket to DIN 2690

d_M: Effective diaphragm diameter

d₅: Diameter of extension

f: Milling edge

L: Extension length

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

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

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

Accessories/Spare parts

1

Selection and ordering data		Article No.
Replacement measuring cells for differential pressure SITRANS P pressure transmitters for differential pressure and flow, P500 HART PN 160 series (MAWP 2320 psi)		7MF5994-1
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling Silicone oil	Measuring cell cleaning normal	1
Measuring span (min. ... max.)		
1.00 ... 50 mbar	(0.4 ... 20 inH ₂ O)	C
1.25 ... 250 mbar	(0.5 ... 100 inH ₂ O)	D
6.25 ... 1250 mbar	(2.5 ... 502 inH ₂ O)	E
31.25 ... 6250 mbar	(12.54 ... 2509 inH ₂ O)	F
0.16 ... 32 bar	(2.33 ... 465 psi)	G
Wetted parts materials (stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel 1.4404/316L	Stainless steel 1.4404/316L	A
Hastelloy C276 ¹⁾	Stainless steel 1.4404/316L	B
Monel 400 ¹⁾	Stainless steel 1.4404/316L	C
Process connection Female thread 1/4-18 NPT		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		0
- Mounting thread M10 to DIN 19213		1
• Vent on side of process flange		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		4
- Mounting thread M10 to DIN 19213		5
Further designs		Order code
Add "-Z" to Article No. and specify Order code.		
Acceptance test certificate		C12
Acc. to EN 10204-3.1		
Without process flanges		K00
Vent on side for gas measurements ²⁾		L32
Process flanges, O-ring, special material Standard: Viton (FKM (FPM))		
Process connection sealing rings made of PTFE (Teflon), virginal		L60
Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced		L61
Process connection sealing rings made of FFPM (Kalrez) ²⁾		L62
Process flanges, O-rings made of NBR		L63
Process flanges, O-rings made of graphite		L64

¹⁾ Not together with Measuring span "C".

²⁾ Only in conjunction with process connection code 4 or 5.

²⁾ Not together with Measuring span "G".

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

Accessories/Spare parts

1

Selection and Ordering data

	Article No.
Mounting brackets For differential pressure transmitters with flange thread M10 (7MF54...10 and 7MF54...50) <ul style="list-style-type: none"> Made of steel Made of stainless steel Made of stainless steel 	7MF5987-1AA 7MF5987-1AD 7MF5987-1AG
Mounting brackets for differential pressure transmitter with flange thread 7/16-20 UNF (7MF54...00 and 7MF54...40) <ul style="list-style-type: none"> Made of steel Made of stainless steel Made of stainless steel 	7MF5987-1AC 7MF5987-1AF 7MF5987-1AJ
Cover Made of die-cast aluminum, including O-ring <ul style="list-style-type: none"> Without inspection window With inspection window Made of stainless steel, including seal <ul style="list-style-type: none"> Without inspection window With inspection window 	7MF5987-1BE 7MF5987-1BF 7MF5987-1BG 7MF5987-1BH
Digital indicator Including mounting material	7MF5987-1BR
TAG plate (incl. fastening material) Without inscription (5 pcs.) Printed (1 pc.) Data according to Y01 or Y02, Y15 and Y16 (see "SITRANS P transmitters")	7MF5987-1CA 7MF5987-1CB-Z Y.:
Mounting screws For TAG plate, grounding and connection terminals and securing and locking screws (30 units)	7MF5987-1CC
Sealing plugs for process flange (1 set = 2 units) <ul style="list-style-type: none"> Made of stainless steel Made of Hastelloy 	7MF4997-1CG 7MF4997-1CH
Vent valve Complete (1 set = 2 units) <ul style="list-style-type: none"> Made of stainless steel Made of Hastelloy 	7MF4997-1CP 7MF4997-1CQ
Electronics module HART, intrinsically safe Ex ia for installation in transmitter casing (observe warranty conditions)	7MF5987-1DC
Connection board (incl. fastening material) HART, intrinsically safe Ex ia for installation in transmitter casing (observe warranty conditions)	7MF5987-1DM
Push buttons assembly (incl. fastening material) For replacement of operating keys for on-site operation of the transmitter	7MF5987-2AF
Sealing ring for <ul style="list-style-type: none"> Process connection NBR sealing ring for screw cover (10 pcs.) NBR sealing ring for interface measuring cell/housing (10 pcs.) 	See catalog FI01, "Fittings" 7MF4997-2EA 7MF4997-2EB

Selection and Ordering data

	Article No.
Documentation The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation Compact operating instructions <ul style="list-style-type: none"> German, Spanish, French, Italian, Dutch Estonian, Latvian, Lithuanian, Polish, Romanian Bulgarian, Czech, Finnish, Slovakian, Slovenian Danish, Greek, Portuguese, Swedish, Hungarian Russian 	A5E02344532 A5E02307339 A5E02307340 A5E02307341 A5E02307338
HART modem With USB interface	7MF4997-1DB
Certificates (order only via SAP) additional to internet download <ul style="list-style-type: none"> Hard copy (to order) On DVD (to order) 	A5E03252406 A5E03252407

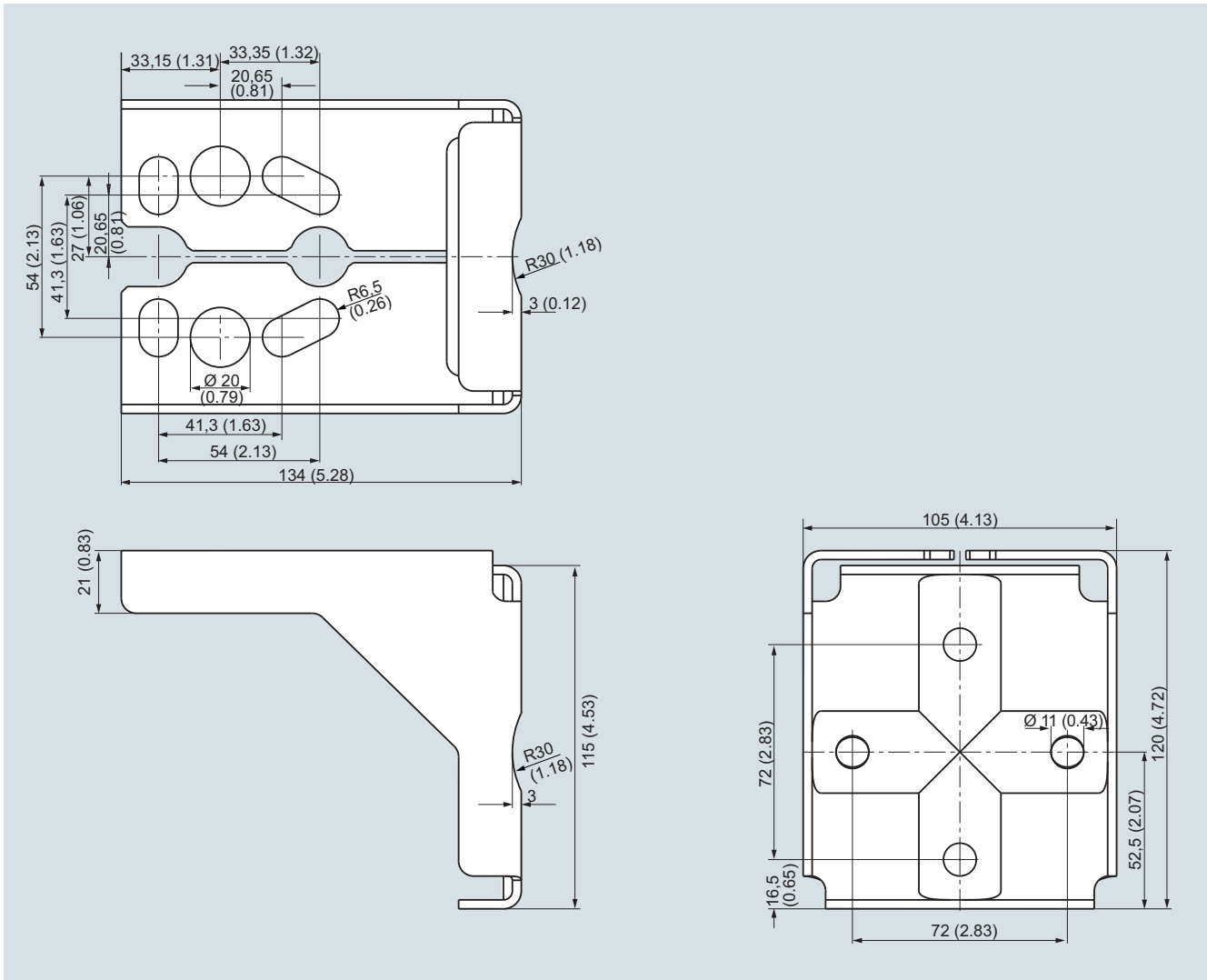
For power supply units, see catalog FI01 "Supplementary Components".

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

Accessories/Spare parts

Dimensional drawings



Mounting bracket for SITRANS P pressure transmitter, P500 series, measurements in mm (inch)
Mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)

Pressure Measurement

Transmitters for applications with highest requirements (Premium)

SITRANS P500

Factory-mounting of valve manifolds on transmitters

1

Overview

The SITRANS P500 transmitter can be delivered factory-fitted with the following manifolds:

- Valve manifolds 7MF9411-5BA: Three valve manifold for differential pressure transmitter
- Valve manifolds 7MF9411-5CA: Three valve manifold for differential pressure transmitter

Design

The 7MF9411-5BA and 7MF9411-5CA manifolds are sealed with PTFE sealing rings between the transmitter and the manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (2411 inH₂O)) and is certified leak-proof with a test report to EN 10204 - 2.2.


All manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of manifolds", you will receive a mounting bracket for the manifold instead of a bracket for mounting the transmitter.


If you order an acceptance test certificate 3.1 to EN 10204 when choosing the option "Factory mounting of manifolds", a separate certificate is provided for the transmitters and the manifolds respectively.

Selection and ordering Data

Manifold 7MF9411-5BA on SITRANS P pressure transmitter P500 for differential pressure and flow

	Add -Z to the Article No. of the transmitter and add Order codes	Order code
	SITRANS P500 7MF54...-...	
	mounted with gaskets made of PTFE and screws made of	
	<ul style="list-style-type: none"> • Chromized steel • Stainless steel 	U01 U02
	Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2	
	Further designs:	
	Delivery includes mounting bracket and mounting clips made of	
	<ul style="list-style-type: none"> • Steel • Stainless steel 	A01 A02
	(instead of the mounting bracket supplied with the transmitter)	
	Supplied acceptance test certificate to EN 10204-3.1 for transmitters and mounted valve manifold	C12

Manifold 7MF9411-5CA on SITRANS P500 pressure transmitter for differential pressure and flow

	Add -Z to the Article No. of the transmitter and add Order codes	Order code
	SITRANS P500 7MF54...-...	
	mounted with gaskets made of PTFE and screws made of	
	<ul style="list-style-type: none"> • Chromized steel • Stainless steel 	U03 U04
	Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2	
	Further designs:	
	Delivery includes mounting bracket and mounting clips made of	
	<ul style="list-style-type: none"> • Steel • Stainless steel 	A01 A02
	(instead of the mounting bracket supplied with the transmitter)	
	Supplied acceptance test certificate to EN 10204-3.1 for transmitters and mounted valve manifold	C12

Pressure Measurement

Transmitters for applications with highest requirements (Premium)
SITRANS P500

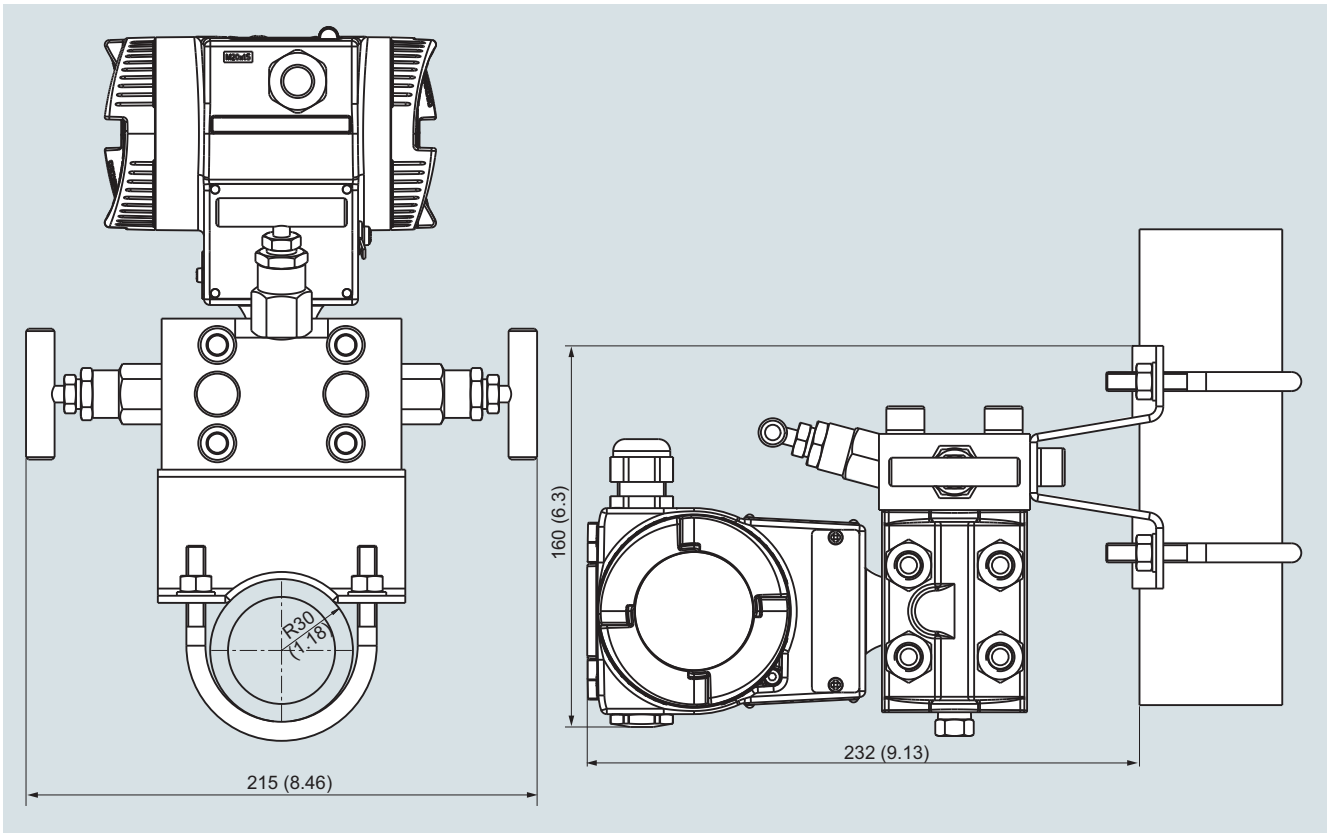
1

Factory-mounting of valve manifolds on transmitters

Dimensional drawings



Manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



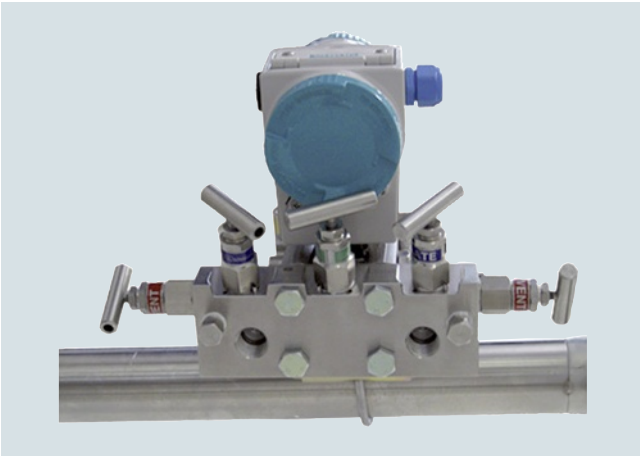
Manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)

Pressure Measurement

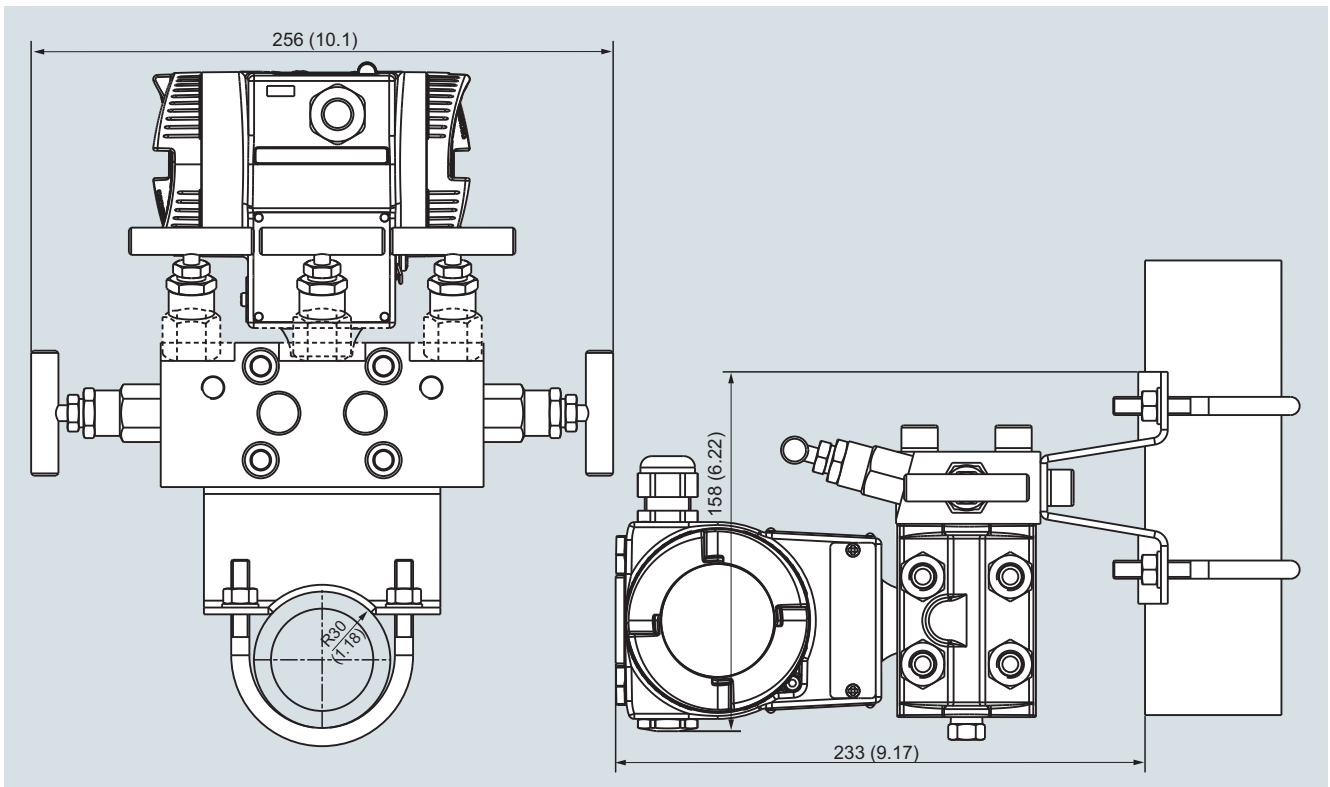
Transmitters for applications with highest requirements (Premium)
SITRANS P500

Factory-mounting of valve manifolds on transmitters

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Manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)