Technical specifications

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

Input				
Measured variable	Gauge pressure			
Span (fully adjustable) or measuring range, max. operating pressure and max. test pressure	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
	Span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	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
Lower measuring limit (For PMC-Style Minibolt no span < 500 mbar adjustable)	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. span			
Output	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal		
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-		
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-		
Load				
• Without HART communication	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-		
• With HART communication	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (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)			
Measuring accuracy	Acc. to IEC 60770-1			
Reference conditions (All error data refer always refer to the set span)	• 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 = max. measuring span/set measuring span or nom. pressure range			
Error in measurement at limit setting incl. hysteresis and reproducibility				
• Linear characteristic				
- r ≤ 5	≤ 0.075 %			
- 5 < r ≤ 100	≤ (0.005 · r + 0.05) %			
Influence of ambient temperature (in percent per 28 °C (50 °F))	≤ (0.08 · r + 0.16) %			
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % in 5 years			
Effect of mounting position	≤ 0.1 mbar/0.01 kPa/0.00145 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			

SITRANS P DS III with PMC connection

SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry	HART	PROFIBUS PA and FOUNDATION Fieldbus
Rated conditions		
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Temperature of medium	-40 ... +100 °C (-40 ... +212 °F)	
Ambient conditions		
• Ambient temperature	-20 ... +85 °C (-4 ... +185 °F)	
- Transmitter	-40 ... +85 °C (-40 ... +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)	≈ 1.5 kg (≈ 3.3 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Gasket (standard)	PTFE flat gasket	
• O-ring (minibolt)	FPM (Viton) or optionally: FFPM or NBR	
Measuring cell filling	Silicone oil or inert filling liquid	
Process connection (standard)	Flush-mounted, 1½", PMC Standard design	
Process connection (minibolt)	Flush-mounted, 1", minibolt design	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
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 ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
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)	

HART communication	
HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- 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

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

SITRANS P DS III with PMC connection

Selection and Ordering data		Article No.
SITRANS P pressure transmitters for gauge pressure, with PMC connection series DS III with HART		7MF4133-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell-cleaning**	
Silicone oil	normal	1
Inert liquid	grease-free to cleanliness level 2	3
Measuring span (min. ... max.)		
0.01 ... 1 bar[1]	(0.15 ... 14.5 psi)[1]	B
0.04 ... 4 bar	(0.58 ... 58 psi)	C
0.1.6 ... 16 bar	(2.32 ... 232 psi)	D
Wetted parts materials		
Seal diaphragm	Connection shank	
Hastelloy	Stainless steel	B
Process connection		
• PMC Style Standard: Thread 1½"		2
• PMC Style Minibolt: front-flush 1" (not with minimum span: 500 mbar (7.25 psi) - version "B")		3
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" [2]		D
- „Ex nA/ic (Zone 2)"[3]		E
• FM + CSA intrinsic safe (is)[4]		F
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[3][4]		NC
Electrical connection / cable entry		
• Female thread M20 x 1.5		B
• Female thread ½-14 NPT		C
• Device plugs M12 (stainless steel)[5] [6]		F
Display		
• Without display		0
• Without visible display (display concealed, setting: mA)		1
• With visible display (setting: mA)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:
- Quick-start guide
- Sealing ring

1) Only with "PMC Style Standard" process connection
2) Without cable gland, with blanking plug
3) Configurations with device plugs M12 are only available in Ex ic.
4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
5) Only in connection with Ex approval A, B, E or F.
6) M12 delivered without cable socket

Selection and Ordering data		Article No.
SITRANS P pressure transmitter for gauge pressure, with PMC connection		
DS III with PROFIBUS PA (PA)		7MF4134-
DS III with FOUNDATION Fieldbus (FF)		7MF4135-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Meas. cell cleaning**	
Silicone oil	normal	1
Inert liquid	grease-free to cleanliness level 2	3
Nominal measuring range		
1 bar[1]	(14.5 psi)[1]	B
4 bar	(58 psi)	C
16 bar	(232 psi)	D
Wetted parts materials		
Seal diaphragm	Connection shank	
Hastelloy	Stainless steel	B
Process connection[2]		
• PMC Style Standard: Thread 1½"		2
• PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))		3
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" [3]		D
- „Ex nA/ic (Zone 2)"[4]		E
• FM + CSA intrinsic safe (is)[5]		F
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[3][5]		NC
Electrical connection / cable entry		
• Female thread M20 x 1.5		B
• Female thread ½-14 NPT		C
• Device plugs M12 (stainless steel)[6] [7]		F
Display		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7

Included in delivery of the device:
- Quick-start guide
- Sealing ring

1) Only with "PMC Style Standard"process connection
2) Sealing is included in delivery.
3) Without cable gland, with blanking plug
4) Configurations with device plugs M12 are only available in Ex ic.
5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505
6) Only in connection with Ex approval A, B, E or F.
7) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Device plugs				
• Angled	**A32**	✓		
• Han 8D (metal, gray)	**A33**	✓		
M12 cable sockets (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in in$H_2$0 and/or psi	**B21**	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
"Functional safety (SIL2)" certificate acc. to IEC 61508	**C20**	✓		
"Functional safety (SIL2/3)" certificate acc. to IEC 61508	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[1]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[1]	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[1]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[1]	✓	✓	✓
Mounting				
• Weldable sockets for standard 1½" threaded connection	**P01**	✓	✓	✓
• Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	**P02**	✓	✓	✓

[1] 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	HART	PA	FF
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 (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1]	
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	**Y15**	✓	✓	✓
Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17:	**Y17**	✓		
Setting of pressure 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_2O*), inH_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or % *) ref. temperature 20 °C	**Y21**	✓	✓	✓
Setting of pressure indication in non-pressure units[2] Specify in plain text: Y22: ..... up to ..... l, m³, m, USg, ... (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 Max. 8 characters, specify in plain text: Y25:	**Y25**		✓	✓

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

✓ = available

ordering example

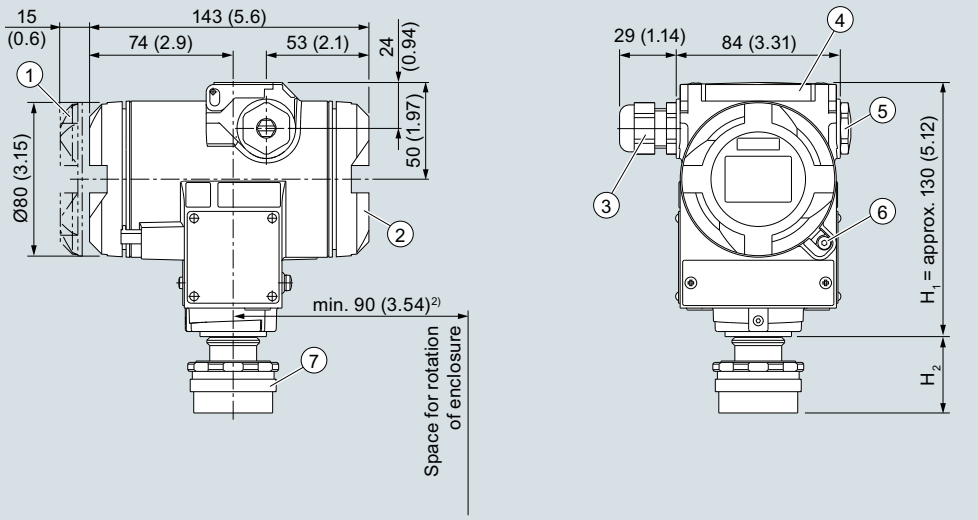
Item line:	7MF4133-1DB20-1AB7-Z
B line:	C11 + Y01 + Y21
C line:	Y01: 1 ... 10 bar (14.5 ... 145 psi)
C line:	Y21: bar (psi)

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

[2] Preset values can only be changed over SIMATIC PDM.

SITRANS P DS III with PMC connection

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with inspection window)[1]
2. Connection side[1]
3. Electrical connection:
   - M20 x 1,5 screw gland
   - ½-14 NPT screw gland
   - M12 device plug
4. Cover over buttons
5. Blanking plug
6. Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
7. Process connection: PMC standard

[1] In addition, allow approx. 20 mm (0.79 inch) for the thread length
[2] 92 mm (3.62 inch) minimum distance for rotating with indicator

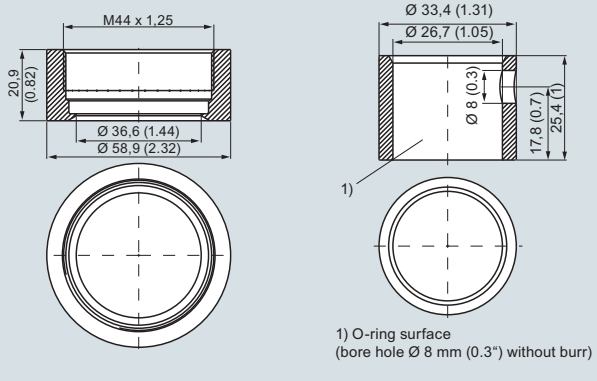
SITRANS P DS III pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

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

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

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

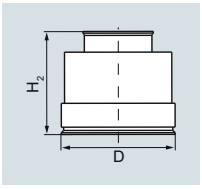
Only the height H_2 is indicated in the dimensions of the flanges.



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

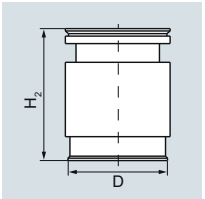
Material: Stainless steel, Mat. No. 1.4404/316L

PMC Style standard



DN	PN	∅D	H_2
		40.9 mm (1.6")	approx. 36.8 mm (1.4")

PMC Style minibolt



DN	PN	∅D	H_2
		26.3 mm (1.0")	approx. 33.1 mm (1.3")