Technical specifications

SITRANS P, DS III for differential pressure and	flow			
	HART		PROFIBUS PA and FO	UNDATION Fieldbus
Input				
Measured variable	Differential pressure and	d flow		
Spans (infinitely adjustable) or nominal measuring range and	Span	Maximum operating pressure	Nominal measuring range	Maximum operating pressure
max. permissible operating pressure	0.4 8 inH ₂ O (1 20 mbar)	464 psi (32 bar)	8 inH ₂ O (20 mbar g)	464 psi (32 bar)
	0.4 24 inH ₂ O (1 60 mbar)	2320 psi (160 bar)	24 inH ₂ O (60 mbar)	2320 psi (160 bar)
	1 100 inH ₂ O (2.5 250 mbar)		100 inH ₂ O (250 mbar)	
	2.4 240 inH ₂ O (6 600 mbar)		240 inH ₂ O (600 mbar)	
	6.4 642 inH ₂ O (16 1600 mbar)		642 inH ₂ O (1600 mbar)	
	20 2000 inH ₂ O (50 5000 mbar)		2000 inH ₂ O (5 bar)	
	4.35 435 psi (0.3 30 bar)		435 psi (30 bar)	
	1 100 inH ₂ O (2.5 250 mbar)	6091 psi (420 bar)	100 inH ₂ O (250 mbar)	6091 psi (420 bar)
	2.4 240 inH ₂ O (6 600 mbar)		240 inH ₂ O (600 mbar)	
	6.4 642 inH ₂ O (16 1600 mbar)		642 inH ₂ O (1600 mbar)	
	20 2000 inH ₂ O (50 5000 mbar)		2000 inH ₂ O (5 bar)	
	4.35 435 psi (0.3 30 bar)		435 psi (30 bar)	
Lower measuring limit		1		1
 Measuring cell with silicone oil filling 	-100% of max. spa	n (-33% with 435 psi (30	bar) measuring cell or 0	.44 psi (30 mbar a))
Upper measuring limit	100% of max. span	(for oxygen version and i	nert filling liquid; max. 23	320 psi g (160 bar g))
Output				
Output signal	4 20 mA		Digital PROFIBUS PA a FOUNDATION Fieldbus	nd s signal
 Lower limit (infinitely adjustable) 	3.55 mA, factory preset	to 3.84 mA	-	
Upper limit (infinitely adjustable)	23 mA, factory preset to set to 22.0 mA	20.5 mA or optionally	-	
Load				
Without HART communication	$R_{\rm B} \le (U_{\rm H} - 10.5 \text{ V})/0.02$ $U_{\rm H}$: Power supply in V	3 A in Ω,	-	
With HART communication	$R_{\rm B} = 230 \dots 500 \Omega$ (SIM $R_{\rm B} = 230 \dots 1100 \Omega$ (HA	IATIC PDM) or ART Communicator)	-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short	-circuit and polarity rever supply	sal. Each connection ag voltage.	ainst the other with max.
Measuring accuracy		Acc. to El	N 60770-1	
Reference conditions (All error data refer always refer to the set span)	Increasing characteristi ing, room ten	c, start-of-scale value 0 k nperature 25 °C (77 °F)) r	oar, stainless steel seal d r: Span ratio (r = max. sp	liaphragm, silicone oil fill- ban / set span)
Error in measurement and fixed-point setting (including hysteresis and repeatability)				
Linear characteristic			≤ 0.075 %	
- r ≤ 10	$\leq (0.0029 \cdot r + 0.071) \%$			
- i∪ < r ≤ 30 - 30 < r < 100	$\leq (0.0045 \cdot r + 0.071) \%$ $\leq (0.005 \cdot r + 0.05) \%$			
Square-rooted characteristic (flow > 50 %)	_ (0.000 + 1 0.00) /0		< 0.1 %	
- r ≤ 10	≤0.1 %		_ 0,1 /0	
- 10 < r ≤ 30	≤ 0.2 %			

2

SITRANS P, DS III for differential pressure and	I flow		
	HART	PROFIBUS PA and FOUNDATION Fieldbus	
• Square-rooted characteristic (flow > 25 50 %)		≤0.2	
- r ≤ 10	≤ 0.2 %		
- 10 < r ≤ 30	≤ 0.4 %		
Long-term drift (temperature change \pm 30 °C (\pm 5 4 °F))	≤ (0.25 · r)% every 5 years static pressure max. 1015 psi g (70 bar g)	≤ 0.25 % every 5 years static pressure max. 1015 psi g (70 bar g)	
• 0.29 psi (20 mbar)-measuring cell	\leq (0.2 · r) per year	≤ 0.2 per year	
• 0.29, 0.87, 2.32 and 7.25 psi (250, 600, 1600 and 5000 mbar)-measuring cell	\leq (0.125 · r) per year	≤ 0.125 per year	
Influence of ambient temperature			
• at -10 +60 °C (14 140 °F)	≤ (0.08 · r + 0.1) %	≤ 0.3 %	
• at -4010 °C and 60 85 °C (-40 +14 °F and 140 185 °F)	\leq (0.1 · r + 0.15)%/10 K (Twice the value with 0.29 psi (20-mbar) measuring cell)	≤ 0.25 %/10 K	
Influence of static pressure			
 on the zero point (PKN) 	≤ (0.15 · r)% per 1015 psi (70 bar)	≤0.15 % per 1015 psi (70 bar)	
- 0.29 psi (20 mbar)-measuring cell	\leq (0.15 · r)% per 464 psi (32 bar)	≤0.15 % per 464 psi (32 bar)	
• on the span (PKS)	≤ 0.2 % per 1015 psi (70 bar)	-	
- 0.29 psi (20 mbar)-measuring cell	\leq 0.2 % per 464 psi (32 bar)	-	
Measured Value Resolution	-	$3 \cdot 10^{-5}$ of nominal measuring range	
Rated conditions			
Degree of protection (to EN 60529)	IF	P65	
Temperature of medium			
 Measuring cell with silicone oil filling 	-40 +100 °C	(-40 +212 °F)	
 Measuring cell with inert filling liquid 	-20 +100 °C (-4 +212 °F)		
 In conjunction with dust explosion protection 	-20 +60 °C	(-4 +140 °F)	
Ambient conditions			
Ambient temperature			
- Digital indicator	-30 +85 °C	(-22 +185 °F)	
Storage temperature	-50 +85 °C	(-58 +185 °F)	
Climatic class			
- Condensation	Relative humi Condensation permissible,	dity 0 100 % suitable for use in the tropics	
 Electromagnetic Compatibility 			
- Emitted interference and interference immunity	Acc. to EN 61326	and NAMUR NE 21	
Design			
Weight (without options)	≈ 4.5 kg	(≈ 9.9 (lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or s	stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials			
Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastello tantalur	by C276, mat. no. 2.4819, Monel, mat. no. 2.4360, n or gold	
Measuring cell filling	Silicone oil or inert filling liquid (maximum value (120 bar a)) at	e with oxigen measurement pressure 1740 psi a) : 60 °C (140 °F))	
Process connection	Female thread ¼-18 NPT and flange connec // ₁₆ -20 UNF	tion with mounting thread M10 to DIN 19213 or to EN 61518	
Material of mounting bracket			
• Steel	Sheet-steel, Mat. No.	1.0330, chrome-plated	
Stainless steel	Sheet stainless steel, r	nat. no. 1.4301 (SS 304)	
Power supply $oldsymbol{U}_{ ext{H}}$		Supplied through bus	
Terminal voltage on transmitter	10.5 45 V DC 10.5 30 V DC in intrinsically-safe mode	-	
Separate 24 V power supply necessary	-	No	
Bus voltage			
• Not Ex	-	9 32 V	
 With intrinsically-safe operation 	-	9 24 V	

	HART PROFIBUS PA and FOUNDATION Fieldb			
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 97/23/EC				
PN 32/160 (MWP 464/2320 psi)	For gases of fluid group 1 and liquids of fluid gragraph 3 (sound	group 1; complies with requirements of article 3, engineering practice)		
PN 420 (MWP 6092 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with basic safety requirements Article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H the TÜV Nord.			
Explosion protection				
Intrinsic safety "i"	PTB 99 /	ATEX 2122		
- Marking	Ex II 1/2 G EE	x ia/ib IIB/IIC T6		
- Permissible ambient temperature	-40 +85 °C (-40 +185 °F) temperature class T4; -40 +70 °C (-40 +158 °F) temperature class T5; -40 +60 °C (-40 +140 °F) temperature class T6			
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}, I_i = 100 \text{ mA},$	FISCO supply unit: $U_0 = 17.5 \text{ V}$, $I_0 = 380 \text{ mA}$, $P_0 = 5.32 \text{ W}$ Linear barrier:		
	$P_{\rm i} = 750 \; {\rm mW}; \; R_{\rm i} = 300 \; \Omega$	$U_0 = 24$ V, $I_0 = 250$ mA, $P_0 = 1.2$ W		
- Effective internal inductance/capacitance	$L_{\rm i}$ = 0.4 mH, $C_{\rm i}$ = 6 nF	$L_{\rm i} = 7 \ \mu {\rm H}, \ C_{\rm i} = 1.1 \ {\rm nF}$		
• Explosion-proof "d"	PTB 99 /	ATEX 1160		
- Marking	Ex II 1/2 G E	Ex d IIC T4/T6		
- Permissible ambient temperature	-40 +85 °C (-40 +18 -40 +60 °C (-40 +14	5 °F) temperature class T4; 10 °F) temperature class T6		
- Connection	To circuits with values: $U_{\rm H}$ = 10.5 45 V DC	To circuits with values: $U_{\rm H}$ = 9 32 V DC		
Dust explosion protection for zone 20	PTB 01 /	ATEX 2055		
- Marking	Ex II 1 D IF Ex II 1/2 D	P65 T 120 ℃ IP65 T 120 ℃		
- Permissible ambient temperature	-40 +85 °C	(-40 +185 °F)		
- Max. surface temperature	120 °C	C (248 °F)		
- Connection	To certified intrinsically-safe circuits with peak values: U = 20 V L = 100 mA	FISCO supply unit: $U_{\rm o}$ = 17.5 V, $I_{\rm o}$ = 380 mA, $P_{\rm o}$ = 5.32 W		
	$D_i = 30 \text{ V}, r_i = 100 \text{ mA}, P_i = 750 \text{ mW}, R_i = 300 \Omega$	Linear barrier: $U_0 = 24 \text{ V}, I_0 = 250 \text{ mA}, P_0 = 1.2 \text{ W}$		
- Effective internal inductance/capacitance	$L_{\rm i} = 0.4 {\rm mH}, C_{\rm i} = 6 {\rm nF}$	$L_{\rm i} = 7 \ \mu {\rm H}, \ C_{\rm i} = 1.1 \ {\rm nF}$		
Dust explosion protection for zone 21/22	PTB 01 /	ATEX 2055		
- Marking	Ex II 2 D IF	P65 T 120 °C		
- Connection	To circuits with values: $U_{\rm H}$ = 10.5 45 V DC; $P_{\rm max}$ = 1.2 W	To circuits with values: $U_{\rm H}$ = 9 32 V DC; $P_{\rm max}$ = 1.2 W		
Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned		
- Marking	Ex II 3 G EEx nA L IIC T4/T5/T6 -			
 Explosion protection acc. to FM 	Certificate of Compliance 3008490			
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4T6; CL II, DIV 1, CL I, DIV 2, GP ABCD T4	GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4T6; T6; CL II, DIV 2, GP FG; CL III		
 Explosion protection to CSA 	Certificate of Co	mpliance 1153651		
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4T6; CL II, DIV 1, GP E T4T6; CL II, D	FG; CL III; Ex ia IIC T4T6; CL I, DIV 2, GP ABCD IV 2, GP FG; CL III		

SITRANS P DS III for differential pressure and flow

HART communication	
HART communication	230 1100 Ω
Protocol	HART Version 5.x
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local opera- tion (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-specif- ic process variables 	Yes, linearly rising or falling characteristic
 Electrical damping T₆₃, adjust- able 	0 100 s
- Simulation function	Input /Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warn- ing 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 sum- mation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respec- tively
 Physical block 	1
Transducer blocks	2
 Pressure transducer block 	
 Can be calibrated by applying two pressures 	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
 Square-rooted characteristic for flow measurement 	Yes
 Gradual volume suppression and implementation point of square-root extraction 	Parameterizable
 Simulation function for mea- sured pressure value and sen- 	Constant value or over parame- terizable ramp function

FOUNDATION Fieldbus communication

Function blocks

- Analog input
 - Adaptation to customerspecific process variables

3 function blocks analog input, 1 function block PID

Yes, linearly rising or falling char-

Output/input (can be locked

ing limit and one alarm limit

Standard FF function block

1 transducer block Pressure with calibration, 1 transducer block

Constant value or over parame-

terizable ramp function

within the device with a bridge)

parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warn-

acteristic

0... 100 s

respectively

1 resource block

Yes

LCD

Yes

Yes

- Electrical damping T₆₃, adjustable
- Simulation function
- Failure mode
- Limit monitoring
- Square-rooted characteristic for flow measurement
- PID

Physical block

Transducer blocks

- Pressure transducer block
- Can be calibrated by applying two pressures
- Monitoring of sensor limits
- Simulation function: Measured pressure value, sensor temperature and electronics temperature

2

sor temperature

Selection and Ordering	g data	Order No.	Selection and Ordering data	Order No.
SITRANS P DS III HAR	T pressure transmitters	7 M F 4 4 3 3 -	SITRANS P DS III HART pressure transmitters	7 M F 4 4 3 3 -
for differential pressur MWP 464/2320 psi (PN	e and flow, 32/160)		for differential pressure and flow, MWP 464/2320 psi (PN 32/160)	
Measuring cell filling Silicone oil Inert liquid ¹⁾	Measuring cell clean- ing normal Grease-free	1 3	Electrical connection / cable entry • Screwed gland Pg 13.5 ⁹⁾ • Screwed gland M20 x 1.5 • ½-14 NPT • Han ZD plug (plastic bousing) incl. mating	A B C D
MWP 464 psi (PN 32) 0.4015 8.03 inH ₂ O ²⁾	(1 20 mbar) ²⁾	в	• M12 connectors (metal) ¹¹⁾	F
MWP 2320 psi (PN 160) 0.4015 24.09 inH ₂ O 1.004 100.4 inH ₂ O 2.409 240.9 inH ₂ O 6.424 642.4 inH ₂ O 20.08 2008 inH ₂ O 4.35 435 psi	(1 60 mbar) (2.5 250 mbar) (6 600 mbar) (16 1600 mbar) (50 5000 mbar) (0.3 30 bar)	C D E F G H	 Indicator Without indicator Without indicator (digital display hidden, setting: mA) With indicator (digital display visible, setting: mA) With indicator (digital display visible, settings as specified, Order Code "Y21"/Y22" required) 	0 1 6 7
Wetted parts materials (stainless steel process Seal diaphragm	flanges) Parts of measuring cell		Power supply units see Chap. 8 "Supplementary Co Included in delivery of the device: • Brief instructions (Leporello) • CD-ROM with detailed documentation	omponents".
Stainless steel Hastelloy Hastelloy Tantalum ³⁾ Monel ³⁾ Gold ³⁾ Version for diaphragm s	Stainless steel Stainless steel Hastelloy Tantalum Monel Gold eeal ⁴⁾⁵⁾	A B C E H L Y	 Sealing plug(s) or sealing screw(s) for the proces ¹⁾ For oxygen cleaning application, add Order code E⁻² Not suitable for connection of remote seal. Position of the process flanges (see dimensional drawing). ³⁾ Not in conjunction with max. span 20 and 60 mbar (6 ⁴⁾ When the manufacture's certificate (calibration certific ordered for transmitters with diaphragm seals accord 	s flanges(s) 10. of the top vent valve in 3.03 und 24.09 inH ₂ O)) icate) has to be ding to IEC 60770-2, it
Process connection Female thread ¼-18 NP • Sealing screw opposit - Mounting thread 7/ ₁₆ • Mounting thread M10 (only for replacement • Vent on side of proces - Mounting thread 7/ ₁₆ • Mounting thread M11	T with flange connection e process connection y-20 UNF to EN 61518 0 to DIN 19213 it requirement) ss flange ²⁾ y-20 UNF to EN 61518 0 to DIN 19213 it requirement)	2 0 6 4	 is recommended only to order this certificate exclusion phragm seals. The measuring accuracy of the <u>total</u> or here. f) If the acceptance test certificate 3.1 is ordered for the mounted diaphragm seals this certificate must also be respective remote seals. Not in conjunction with Electrical connection "Screwer "Han7D plug". Without cable gland, with blanking plug With enclosed cable gland EEx ia and blanking plug Not in conjunction with types of protection "Explosion "Intrinsic safety" and "Explosion-proof". 	vely with the dia- ombination is certified he transmitter with be ordered with the ed gland Pg 13.5" and h-proof" and "Ex nA",
Non-wetted parts mate process flange screws Stainless steel Stainless steel	Electronics housing Die-cast aluminum Stainless steel precision casting ⁶⁾	2 3	¹⁰⁾ Permissible only for crimp-contact of conductor cros ¹¹⁾ M12 delivered without cable socket	ss-section 1 mm ²
 Version Standard versions International version, E documentation in 5 lar 	English label inscriptions, nguages on CD	1 2		
Hazardous area rating • General purpose • ATEX Hazardous appr - "Intrinsically safe (EE - "Explosion-proof (EE - "Intrinsically safe and (EEx ia + EEx d)" ⁸⁾ - use in zone 2 - "Intrinsically safe, ex and dust explosion p + zone 1D/2D)" ⁸⁾ • FM/CSA Hazardous a - "Intrinsically Safe und	oval Ex ia)" xd)" ⁷⁾ d explosion-proof plosion-proof enclosure protection (EEx ia + EEx d approval explosion proof (is + xp)" ⁷⁾	A B D P E R N C		

Selection and Ordering	j data	Order No.				Selection	and Orderi	ing data			Order No.		Ī
Pressure transmitters f and flow MWP 464/2320	for differential pressure 0 psi (PN 32/160)					Pressure t and flow N	transmitter AWP 464/23	rs for diffe 320 psi (P	erential pr N 32/160	ressure)			
SITRANS P DS III PA (P	PROFIBUS PA)	7 M F 4 4 3	4 -		:	SITRANS	P DS III PA	(PROFIB	US PA)		7 M F 4 4 3 4 -		
SITRANS P DS III FF (F	OUNDATION Fieldbus)	7 M F 4 4 3	5 -		:	SITRANS	P DS III FF	(FOUNDA	ATION Fie	ldbus)	7 M F 4 4 3 5 -		
Measuring cell filling	Measuring cell cleaning					Electrical	connection	n / cable e	entry			в	
Silicone oil	normal	1				• ½-14 NP	giana mzo T	· X 1.0				c	
Inert liquid ¹⁾	Grease-free	3				• M12 con	nectors (me	etal) ⁸⁾				F	
Nominal measuring rar	nge				i	Indicator							
MWP 464 psi (PN 32) 8.03 inH ₂ O ²⁾	(20 mbar) ²⁾	в				Without inWithout in	ndicator ndicator (di	gital displ	ay hidden	١,		0 1	
MWP 2320 psi (PN 160)						setting: n	nA)			• >			
24.09 inH ₂ O	(60 mbar)	С				With indic	cator (digital	l display vi	sible, settii	ng: mA)		6	
100.4 inH ₂ O	(250 mbar)	D				specified	l. Order Co	de "Y21"/Y	22" reauir	ed)		'	
240.9 inH ₂ O	(600 mbar (1000 mbar)	E				Included in	, delivery o	f the devic	<u>م</u> .	/			
	(1600 mbar) (E bor)	F				Brief insti	ructions (Le	eporello)					
2000 IIIII ₂ 0 125 poi	(3 Dal) (20 bor)	u u				• CD-ROM	l with detail	ed docúm	entation				
455 psi	(30 bar)	- "				 Sealing p 	olug(s) or se	ealing scre	ew(s) for tl	he process	s flanges(s)		
wetted parts materials	flangen)					¹⁾ For oxyg	en cleaning	application	n, add Ord	ler code E1	0.		
Seal diaphragm	Parts of measuring cell				:	2) Not suita the proc	able for conr ess flanges	nection of r (see dime	emote sea ensional dra	I. Position c awing).	f the top vent va	alve i	n
Stainless steel	Stainless steel	A			;	³⁾ Not in co	njunction wi	ith max. sp	an 20 and	60 mbar (8	.03 und 24.09 ir	nH ₂ C	י))
Hastelloy	Stainless steel	В				⁴⁾ When the	e manufactu	re's certific	ate (calibr	ation certifi	cate) has to be	20 0	:+
Hastelloy	Hastelloy	C				is recom	mended onl	v to order t	his certific	ate exclusiv	vely with the dia	°0-∠, a-	Iι
Monol ³⁾	Monol	Б Ц				phragm	seals. The m	neasuring a	iccuracy of	f the <u>total</u> co	ombination is ce	ertifie	d
	Gold					here.							
Version as dianhradm se	al ⁴⁾⁵⁾	v				⁵⁾ If the acc	ceptance tes	st certificat	e 3.1.is ord	dered for th	e transmitter wi	th tho	
						respectiv	/e remote se	eals.	centincate	must also t	le ordered with	uie	
Process connection	T with flange connection					⁶⁾ Without o	cable gland.	with blank	ing plug				
						7) With enc	losed cable	aland EEx	ia and bla	ankina plua			
 Sealing screw opposite Mounting throad ⁷/ 	20 LINE to EN 61518	2			1	⁸⁾ M12 deli	vered withou	ut cable so	cket	510-5			
- Mounting thread M10	-20 0101 10 213 0 to DIN 19213	2											
(only for replacement	t requirement)	v											
 Venting on side of proc 	cess flanges ²⁾												
- Mounting thread 7/16	-20 UNF to EN 61518	6											
- Mounting thread M10) to DIN 19213	4											
(only for replacement	t requirement)												
Non-wetted parts mate	rials												
process flange screws	Electronics housing												
Stainless steel	Die-cast aluminum	2											
Stainless steel	casting	3											
Version													
 Standard versions 			1										
 International version F 	nalish label inscriptions		2										
documentation in 5 lan	iguages on CD		-										
Hazardous area rating		-											
General purpose			Α										
 ATEX Hazardous approx 	oval												
- "Intrinsically safe (EE	x ia)"		В										
- "Explosion-proof (EE>	×d)" ⁶⁾		D										
- "Intrinsically safe and	explosion-proof		Ρ										
(EEx ia + EEx d)"') - use in zone 2			Е										
- "Intrinsically safe, exp	olosion-proof enclosure		R										
and dust explosion p	rotection (EEx ia + EEx d												
 FM/CSA Hazardous or 	nnroval												
- Intrinsically Safe und	explosion proof (is $\pm vn^{(6)}$)		NC										
- mumbically sale unu	$e^{h_{10}}$		NC	·									

SITRANS P DS III for differential pressure and flow

Selection and Ordering data	Order	code		
Further designs		HART	PA	FF
Add "-Z" to Order No. and				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of:				
• Steel	A01	1	1	1
Stainless steel	A02	~	~	~
O-rings for process flanges (instead of FPM (Viton)) • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez, compound 4079) • NBR (Buna N)	A20 A21 A22 A23	* * * * *	* * * *	\checkmark \checkmark \checkmark
plug • Han 7D (metal, gray) • Han 8U (instead of Han 7D) • Angled	A30 A31 A32	* * * *		
Sealing screws (2 unit(s) 1/4-18 NPT, with valve in mat. of process flanges	A40	*	~	~
Cable sockets for M12 connectors (metal)	A50	✓	✓	1
Rating plate inscription (instead of German)	544		,	,
English French	B11 B12	* •	¥	× -
Spanish	B13	¥	1	1
• Italian	B14	✓	✓	✓
English rating plate Pressure units in inH ₂ O and/or psi	B21	~	✓	*
Factory calibration certificate ¹⁾	C11	✓	✓	✓
Material traceability certificate ²⁾	C12	✓	✓	✓
Factory certificate of conformance	C14	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	C20	✓		
PROFIsafe certificate and protocol	C21		✓	
Setting of upper limit of output signal to 22.0 mA	D05	1		
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	*	~	~
Degree of protection IP68 (only for M20 x 1.5 and ½-14 NPT)	D12	1	1	~
Process flange screws made of Monel (max. nominal pressure PN20)	D34	~	~	1
Supplied with oval flange set	D37	✓	✓	1
(2 items), PTFE packings and screws in thread of process flanges				
Brad Harrison Connector	D40	1	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	1	1	1
TÜV approval to AD/TRD (only together with type of protection "Intrinsic safety (EEx ia)")	E06	1		

Selection and Ordering data	Order code			
Further designs		HART	PA	FF
Add "-Z" to Order No. and specify Order Code.				
Overfilling safety device for flammable and non-flammable liquids	E08	~	1	1
(max. PN 32 (MVWP 464 psi), basic device with type of protection "Intrinsic safety (EEx ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")				
Oxygen application	E10	✓	✓	✓
(In the case of oxygen measurement and inert liquid max. 120 bar a (1740 psi a) at 60°C (140 °F))				
Two coats of lacquer on casing and cover (PU on epoxy)	G10	1	1	*
Interchanging of process connection side	H01	✓	✓	✓
Vent on side for gas measurements	H02	✓	✓	✓
Stainless steel process flanges for vertical	H03	✓	✓	✓
differential pressure lines (not together with K01, K02 and K04) ³⁾				
Process flange				
Hastelloy	K01	✓	✓	✓
 Monel Stainless steel with PVDF insert max. PN 10 (MWP 145 psi), max. temperature of medium 90 °C (194 °F) 	K02 K04	✓ ✓	√ √	√ √
Surge Protection				
External, ½" NPT	J01			
Manifold Mounting				
Assembled for 3-valve manifold 7MF9411-5BA-Z+K36, Chromized steel screws, PTFE-gaskets, and pressure test	U01			
Assembled for 3-valve manifold 7MF9411-5BA-Z+K46, Stainless steel screws, PTFE-gaskets, and pressure test	U02			
Assembled for 5-valve manifold 7MF9411-5CA-Z+K36, Chromized steel screws, PTFE-gaskets, and pressure test	U03			
Assembled for 5-valve manifold 7MF9411-5CA-Z+K46, Stainless steel screws, PTFE-gaskets, and pressure test	U04			
Factory mounting of valve manifolds, see acc	essories	6.		
Supplementary electronics for 4-wire connect	ion, see	acces	sories	
For 1/2-14 NPT inner process connection on th process flanges, vent valve not possible	e side ir	n the mi	iddle (of the

- \checkmark = available
- ¹⁾ 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.
- ²⁾ 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.

³⁾ Not suitable for connection of remote seal

Selection and Ordering data	Order	code		
Additional data Please add "-Z" to Order No. and specify Order code(s) and plain text.		HART	PA	FF
Calibrated range Specify in plain text: • in the case of linear characteristic curve (max. 5 characters): Y01: X to Y psi, inH ₂ 0, ftH ₂ 0 • in the case of square rooted characteristic	Y01 Y02	*		
(max. 5 characters): Y02: up to mbar, bar, kPa, MPa, psi				
Tag number/Identification(max. 16 characters), specify in plain text:Y15:	Y15	*	~	~
Tag description(max. 27 characters), specify in plain text:Y16:	Y16	~	1	1
Entry of HART (TAG)	Y17	✓		
(max. 8 characters), specify in plain text: Y17:				
Pressure units for digital display	Y21	✓	✓	✓
specify in plain text: Y21: psi, inH ₂ 0, ftH ₂ 0				
Pressure units for digital display				
Non-Pressure units for digital display ¹⁾	Y22 ²⁾ +			
(measuring range in pressure units ("Y01"/"Y02") mandatory) specify in plain text: Y22: X to y GPM, MGD, Feet	Y01 or Y02			
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	Y25		~	

Factory mounting of valve manifolds, see accessories.

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

✓ = available

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

²⁾ Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order Code "E08")

SITRANS P DS III for differential pressure and flow

Selection and Orderin	g data	Order No.	Selection and Ordering data	Order No.
SITRANS P DS III HAR	T pressure transmitters	7 M F 4 5 3 3 -	SITRANS P DS III HART pressure transmitters	7 M F 4 5 3 3 -
for differential pressu MWP 6092 psi (PN 420	re and flow,))		for differential pressure and flow, MWP 6092 psi (PN 420)	
Measuring cell filling	Measuring cell cleaning		Indicator • Without indicator	0
Silicone oil	normal	1	 Without indicator (digital display hidden, opting: ma) 	1
Measuring span 1.004 100.4 inH ₂ O 2.409 240.9 inH ₂ O 6.424 642.4 inH ₂ O 20.08 2008 inH ₂ O 4.35 435 psi	(2.5 250 mbar) (6 600 mbar) (16 1600 mbar) (50 5000 mbar) (0.3 30 bar)	D E F G	 With indicator (digital display visible, setting: mA) With indicator (digital display visible, settings as specified, Order Code "Y21"/Y22" required) Power supply units see Chap. 8 "Supplementary Coscope of delivery: Pressure transmitter as ordered (6 7 omponents". (Instruction Manual is
Wetted narts materials	2		extra ordering item)	
(stainless steel process Seal diaphragm	flanges) Parts of measuring cell		 Not in conjunction with max. span 600 mbar (240.9 Not in conjunction with Electrical connection "Screw "Hap 70 plus" 	inH ₂ O) ed gland Pg 13.5" and
Stainless steel Hastelloy Gold ¹⁾ Connection of remote se	Stainless steel Stainless steel Gold eal possible on request	A B L	 ³⁾ Without cable gland, with blanking plug ⁴⁾ With enclosed cable gland EEx ia and blanking plug ⁵⁾ Not in conjunction with types of protection "Explosion" (Explosion - proof)) n-proof" and "Ex nA",
 Frocess connection Female thread ¼-18 NF Sealing screw opposition Mounting thread ⁷/₁₆ Mounting thread M1 (only for replacement Venting on side of provident valve at top of provident valve at to	PT with flange connection te process connection 5-20 UNF to EN 61518 2 to DIN 19213 at requirement) access flanges, location of occess flanges (see dimen- 5-20 UNF to EN 61518 2 to DIN 19213 at requirement)	3 1 7 5	 ⁶⁾ Permissible only for crimp-contact of conductor cros ⁷⁾ M12 delivered without cable socket 	ss-section 1 mm ²
Non-wetted parts mate process flange screws	erials Electronics housing			
Stainless steel Stainless steel	Die-cast aluminum Stainless steel precision casting ²⁾	2 3		
 Version Standard versions International version, I documentation in 5 la 	English label inscriptions, nguages on CD	1 2		
Hazardous area rating		-		
General purpose ATEX Hazardous appi "Intrinsically safe (EE "Explosion-proof (EE "Intrinsically safe am (EEx ia + EEx d)"4) ""	roval Ex ia)" Exd)" ³⁾ d explosion-proof	A B D P		
 use in zone 2 "Intrinsically safe, ex and dust explosion p + zone 1D/2D)^{*4} FM/CSA Hazardous a 	xplosion-proof enclosure protection (EEx ia + EEx d approval	R		
- Intrinsically Safe und	explosion proof (IS + Xp)")	NC		
Electrical connection / • Screwed gland Pg 13 • Screwed gland M20x: • ½-14 NPT • Han 7D plug (plastic H connector)(b)	/ cable entry .5 ⁵⁾ 1.5 nousing) incl. mating	A B C D		
 IVED connectors (meta) 	ai): /	F		

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Selection and Ordering	ı data	Orde	r No.	
Pressure transmitters and flow, MWP 6092 ps	for differential pressure si (PN 420)			
SITRANS P DS III PA (P	PROFIBUS PA)	7 M F	4534	ļ -
SITRANS P DS III FF (F	OUNDATION Fieldbus)	7 M F	4 5 3 5	5 -
		1		
Nominal measuring ran	nge			
100.4 inH ₂ O	(250 mbar)	D		
240.9 inH ₂ O	(600 mbar)	E		
642.4 inH ₂ O	(1600 mbar)	F		
2008 inH ₂ O	(5 bar)	G		
435 psi	(30 bar)	н		
Wetted parts materials	florence)			
(stainless steer process	Parts of measuring cell			
	Staiplage steel			
Hastellov	Stainless steel	R		
Gold ¹⁾	Gold	I		
Connection of remote se	al possible on request	-		
Process connection				
Female thread 1/4-18 NP	T with flange connection			
Sealing screw opposite	e process connection			
- Mounting thread 7/16	-20 UNF to EN 61518		3	
- Mounting thread M12	2 to DIN 19213		1	
(only for replacemen	t requirement)			
 Venting on side of proc vent velve at top of proc 	cess flanges, location of			
sional drawing).	cess hanges (see dimen-			
- Mounting thread ⁷ / ₁₆	-20 UNF to EN 61518		7	
- Mounting thread M12	2 to DIN 19213		5	
(only for replacement	t requirement)		-	
Non-wetted parts mate	rials			
Process flange screws	Electronics housing			
Stainless steel	Die-cast aluminum		2	
Stainless steel	Stainless steel precision		3	
	casting			
Version				
Standard versions	nalish labol inscriptions			
documentation in 5 lar	iguages on CD		4	-
Hazardous area rating	0 0			
General purpose				Α
ATEX Hazardous appre	oval			
- "Intrinsically safe (EE	x ia)"			в
- "Explosion-proof (EE	xd)" ²⁾			D
- "Intrinsically safe and	explosion-proof			P
$(EEx ia + EEx d)^{(0)}$				
- use in zone z	alogion proof anglogura			D
and dust explosion p	rotection (EEx ia + EEx d			n
+ zone 1D/2D)"3)				
• FM/CSA Hazardous a	pproval			
- "Intrinsically Safe und	explosion proof (is + xp)" ²⁾			NC
Electrical connection /	cable entry			
Screwed gland M20 x	1.5			В
• ½-14 NPT				C
 M12 connectors (meta 	!) ^{-,}			F

Selection and Ordering data	Order No.
Pressure transmitters for differential pressure and flow, MWP 6092 psi (PN 420)	
SITRANS P DS III PA (PROFIBUS PA)	7 M F 4 5 3 4 -
SITRANS P DS III FF (FOUNDATION Fieldbus)	7 M F 4 5 3 5 -
	1
Indicator	
Without indicator	0
 Without indicator (digital display hidden, setting: mA) 	1
With indicator (digital display visible, setting: mA)	6
With indicator (digital display visible, settings as specified, Order Code "Y21" required)	7
Included in delivery of the device:	

Brief instructions (Leporello)
CD-ROM with detailed documentation

• Sealing plug(s) or sealing screw(s) for the process flanges(s)

 $^{1)}$ Not in conjunction with max. span 600 mbar (240.9 inH_2O)

²⁾ Without cable gland, with blanking plug

³⁾ With enclosed cable gland EEx ia and blanking plug

 $^{\rm 4)}\,$ M12 delivered without cable socket

Pressure Measurement Transmitters for general requirements SITRANS P DS III

for differential pressure and flow

Selection and Ordering data	Order	Order code				
Further designs		HART	PA	FF		
Add "-Z" to Order No. and specify Order Code.						
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of:	A 01					
Steel Stainless steel	A01 A02	↓	↓	¥ √		
O-rings for process flanges (instead of FPM (Viton)) • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez, compound 4079) • NBR (Buna N)	A20 A21 A22 A23	* * *	* * *	* * *		
plug • Han 7D (metal, gray) • Han 8U (instead of Han 7D) • Angled	A30 A31 A32	* * *				
Sealing screws (2 unit(s) ¼-18 NPT, with valve in mat. of process flanges	A40	~	1	1		
Cable sockets for M12 connectors (metal)	A50	~	✓	✓		
Rating plate inscription (instead of German)						
• English	B11	4	4	4		
Spanish	B12	¥ √	¥.	¥		
• Italian	B14	✓	✓	✓		
English rating plate Pressure units in inH ₂ O and/or psi	B21	*	~	~		
Factory calibration certificate	C11	✓	✓	✓		
Material traceability certificate	C12	✓	✓	✓		
Factory certificate of conformance	C14	✓	✓	✓		
SIL2 certificate per IEC 61508 / 61511	C20	✓				
PROFIsafe certificate and protocol	C21		~			
Setting of upper limit of output signal to 22.0 mA	D05	1				
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	1	1	1		
Degree of protection IP68 (only for M20 x 1.5 and ½-14 NPT)	D12	1	~	1		
Brad Harrison Connector	D40	1	1	1		
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	1	1	✓		

Selection and Ordering data	Order	Order code				
Further designs		HART	PA	FF		
Add "-Z" to Order No. and specify Order Code.						
Two coats of lacquer on casing and cover (PU on epoxy)	G10	1	✓	1		
Interchanging of process connection side	H01	✓	✓	✓		
Stainless steel process flanges for vertical differential pressure lines	H03	~	~	~		
Surge Protection						
External, 1/2" NPT	J01					
Manifold Mounting						
Assembled for 3-valve manifold	U01					
7MF9411-5BA-Z+K36, Chromized steel						
Assembled for 3-valve manifold	U02					
7MF9411-5BA-Z+K46, Stainless steel screws,						
PTFE-gaskets, and pressure test	1102					
7MF9411-5CA-Z+K36, Chromized steel	003					
screws, PTFE-gaskets, and pressure test						
Assembled for 5-valve manifold 7ME9411-5CA-7+K46. Stainless steel screws	U04					
PTFE-gaskets, and pressure test						
Additional data						
Please add "-Z" to Order No. and specify						
Order code(s) and plain text.						
Calibrated range						
 in the case of linear characteristic curve 	V01	1				
(max. 5 characters):	101	·				
Y01: X to Y psi, inH ₂ 0, ftH ₂ 0						
 In the case of square rooted characteristic (max 5 characters); 	Y02	~				
Y02: up to mbar, bar, kPa, MPa, psi						
Tag number/Identification	Y15	✓	✓	✓		
(max. 16 characters), specify in plain text:						
Y 15:			,			
Tag description	Y16	~	~	~		
Y16:						
Entry of HART (TAG)	Y17	~				
(max. 8 characters), specify in plain text:						
Ý17:						
Pressure units for digital display	Y21	~	~	~		
specify in plain text: Y21: psi, inH20, ftH20						
Pressure units for digital display						
Non-Pressure units for digital display ¹⁾	Y22 +	✓				
(measuring range in pressure units ("Y01"/"Y02") mandatory)	Y01 or Y02					
Specify in plain text:						
Y22: .X to Y GPM, MGD, Feet						
Preset bus address	Y25		1			
possible between 1 and 126						
Specily in plain text: Y25:						

Factory mounting of valve manifolds, see accessories.

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

✓ = available

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

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Pressure Measurement Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

Dimensional drawings





- Process connection: 1/4-18 NPT (EN 61518) 1
- 2 Blanking plug
- 3 Electrical connection:
 - Screwed gland Pg 13,5 (adapter)^{2) 3)}, only DS III HART,
 - Screwed gland M20x1,5³⁾

 - Screwed gland ½-14 NPT, Han 7D/Han 8D^{2) 3)} plug, only DS III HART, or
 - M12 connector
- 4 Terminal side
- Electronics side, digital display (longer overall length for cover with 5 window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing) 10 Lateral venting for liquid measurement (Standard)
- 11 Lateral venting for gas measurement (suffix H02)

- Allow approx. 20 mm (0.79 inch) thread length to permit 1) unscrewing
- Not with type of protection "explosion-proof enclosure" 2)
- 3) Not with type of protection "FM + CSA [is + xp]"
- 92 mm (3.62 inch) for minimum distance to permit rotation 4) with indicator
- 5) 45 mm (1.8 inch) for Pg 13,5 with adapter

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

SITRANS P DS III for differential pressure and flow



- Process connection: 1/4-18 NPT (EN 61518) 1
- 2 Blanking plug
- 3 Electrical connection:
 - Screwed gland Pg 13,5 (adapter)^{2) 3)}, only DS III HART,
 - Screwed gland M20x1,5³⁾
 - Screwed gland 1/2-14 NPT,
 - Han 7D/Han 8D^{2) 3)} plug, only DS III HART, or
 - M12 connector
 - Terminal side

4

- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- Mounting bracket (option) 7
- 8 Sealing screw with valve (option)
- 9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)



- Allow approx. 20 mm (0.79 inch) thread length to 1) permit unscrewing
- 2) Not with type of protection "explosion-proof enclosure"
- Not with type of protection "FM + CSA [is + xp]" 92 mm (3.6 inch) for minimum distance to permit 3)
- 4) rotation with indicator
- 74 mm (2.9 inch) for PN \leq 420 (MWP \leq 6092 psi) 5)
- 6) 91 mm (3.6 inch) for PN ≤ 420 (MWP ≤ 6092 psi)
- 219 mm (8.62 inch) for PN ≤ 420 (MWP ≤ 6092 psi) 7)
- 8) 45 mm (1.8 inch) for Pg 13,5 with adapter

SITRANS P DS Illpressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03", dimensional drawing, dimensions in mm (inch)



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