IO-LINK FLUSH MEMBRANE TRANSMITTER AND SWITCH

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. The FPI 8237 IO-Link Flush Membrane pressure transmitter impresses with an absolutely smooth and robust flush-mounted measuring diaphragm made of corrosion-resistant duplex steel. The transmitter is designed as a smart sensor and provides application-relevant information in addition to the process data. Trafag's proprietary thin-film-on-steel sensor technology ensures a wide temperature range and excellent long-term stability.

IO-Link

Applications

- Machine tools
- Food Industry
- Process technology
- Water treatment
- Hydraulics

Features

- Flush membrane with smooth and plain surface, Duplex steel 1.4462
- Media temperature measurement
- Completely welded sensor system
- Excellent long-term stability
- 2 Switching outputs PNP/NPN/Push-Pull configurable

08/2024

Data sheet H72622b

Technical Data			
Measuring principle	Thin-film-on-steel	Accuracy @ 25°C typ.	± 0.5 % FS typ.
Measuring range	-0.5 ... 0.5 to 0 ... 100 bar correlation with -7.2 ... 7.2 to 1500 psi	Media temperature	–10°C ... +125°C
Output signal	IO-Link 1.1, COM3, min. process cycle time 1 ms, Smart Sensor Profile ED2, 2 Switching outputs PNP/NPN/ Push-Pull configurable	Ambient temperature	–10°C ... +105°C
NLH @ 25°C (BSL) typ.	± 0.1 % FS typ.		

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trafag sensors controls

Ordering information/type code

							8237 . XX	XX	XX	XX	XX	XX
Measuring range	**Pressure measurement range [bar]**	**Over pressure [bar]**	**Burst pressure [bar]**	**Pressure measurement range [psi] 1)**	**Over pressure [psi]**	**Burst pressure [psi]**						
	-0.5 ... 0.5	5	7.5	-7.2 ... 7.2	60	91	**A7**					
	-1 ... 0	5	7.5	-14.5 ... 0	60	90	**D4**					
	-1 ... 1	5	7.5	-14.5 ... 14.5	60	90	**B1**					
	-1 ... 1.6	5	7.5	-14.5 ... 23.2	60	90	**B3**					
	-1 ... 2.5	5	7.5	-14.5 ... 36.2	60	90	**B4**					
	-1 ... 4	8	12	-14.5 ... 58	100	150	**B6**					
	-1 ... 6	12	15	-14.5 ... 87	200	250	**B7**					
	-1 ... 10	20	25	-14.5 ... 145	300	375	**B8**					
	-1 ... 16	32	40	-14.5 ... 232	500	625	**B9**					
	-1 ... 25	50	40	-14.5 ... 362	500	625	**C0**					
	0 ... 1	5	7.5	0 ... 14.5	60	90	**71**					
	0 ... 1.6	5	7.5	0 ... 23.2	60	90	**73**					
	0 ... 2.5	5	7.5	0 ... 36.2	60	90	**75**					
	0 ... 4	8	12	0 ... 58	100	150	**76**					
	0 ... 6	12	15	0 ... 87	200	250	**77**					
	0 ... 10	20	25	0 ... 145	300	375	**78**					
	0 ... 16	32	40	0 ... 232	500	625	**79**					
	0 ... 25	50	75	0 ... 362	800	1200	**80**					
	0 ... 40	80	100	0 ... 580	1000	1250	**81**					
	0 ... 100	200	300	0 ... 1500	3000	4500	**83**					
Sensor	Relative pressure 0.5 %, process data includes the media temperature							**23**				
Pressure connection	G1/2" male, flush membrane								**93**			
	G1/2" male, flush membrane, 30 mm length 2)								**94**			
Electrical connection	Male electrical connector M12x1, 5-pol., Mat. PA									**35**		
Output signal	IO-Link										**50**	
Accessories	Seal FKM											**61**
	Female electrical plug M12x1, 5-pole											**33**
	Standard electrical connection: Pin 1 L+, Pin 2 Out 2 I/Q, Pin 3 L-, Pin 4 Out 1 C/Q, Pin 5 n/c (for male electrical connector .35, M12x1, 5-pole)											**0K**
	Parameterization according to customer specification (refer to the interface description)											**ZC**
	Parametrization standard (refer to the interface description)											**ZS**

1) Pressure values in [psi] are given for information and correspond to the pressure values in [bar]
2) Upon request

Parameters			
Name	**Standard setting (accessory ZS)**	**Value range**	**Customer adjustment (accessory ZC)**
Switching output OUT1			
Source of measured value	Pressure		Pressure
Switching output polarity	PNP	PNP, NPN	
Switch point SP1 [2]	75 %	[bar], > SP2, 1 ... 100 % nominal pressure	
Switch point SP2 [3]	25 %	[bar], < SP1, 0 ... 99 % nominal pressure Hysteresis SP1 – SP2 ≥ 1 % nominal pressure	
Switching output logic	0 = high active	0 = high active (normally open) 1 = low active (normally closed)	
Function mode	3 = Two Point Mode	0 = Deactivated 1 = Single Point Mode 2 = Window Mode 3 = Two Point Mode	
Hysteresis [1]	0	[bar] Hysteresis ≥ 1 % nominal pressure	
Activation Delay	0	0…. 65535 [ms]	
Deactivation Delay	0	0…. 65535 [ms]	
Error behaviour	0	0 = Tri-State 1 = NPN/PNP: Open / Push-Pull: High 2 = NPN/PNP: Closed / Push-Pull: Low 3 = Last valid state	
Switching output OUT2			
Source of measured value	P = Pressure	P = Pressure, T = Temperature	
Switching output polarity	PNP	PNP, NPN	
Switch point SP1 [2]	75 %	> SP2 [bar] 0 ... 100 % nominal pressure [°C] -40 … 125°C	
Switch point SP2 [3]	25 %	< SP1 [bar] 0 ... 99 % nominal pressure Hysteresis SP1 – SP2 ≥ 1 % nominal pressure [°C] -40 … 125°C, Hysteresis SP1 – SP2 ≥ 1°C	
Switching output logic	0 = high active	0 = high active (normally open) 1 = low active (normally closed)	
Function mode	3 = Two Point Mode	0 = Deactivated 1 = Single Point Mode 2 = Window Mode 3 = Two Point Mode	
Hysteresis [1]	0	[bar] Hysteresis ≥ 1 % nominal pressure [°C] ≥ 1°C	
Activation Delay	0	0…. 65535 [ms]	
Deactivation Delay	0	0…. 65535 [ms]	
Error behaviour	0	0 = Tri-State 1 = NPN/PNP: Open / Push-Pull: High 2 = NPN/PNP: Closed / Push-Pull: Low 3 = Last valid state	
Signal processing			
Pressure measurement signal damping for switching outputs	0	0 = Deactivated 0; 1 ... 65536 [ms], time constant "tau"	

1) Applicable for functions modes "Single Point Mode" and "Window Mode"
2) Applicable for all functions modes
3) Applicable for functions modes "Two Point Mode" and "Window Mode"

Specifications		
Electrical data	Output / supply voltage	Switching output PNP/NPN: 24 (9…32) VDC IO-Link: 24 (18…32) VDC
	Power-on delay time	IO-Link readiness: 300ms Data readiness: ca. 700ms
	Inverse-polarity protection, short-circuit strength @ 25°C during 5 min.	IO-Link/Out 1 or Out 2: to Us = 32 VDC
	Current consumption / power consumption [2)]	< 0.5 W
Environmental conditions	Media temperature	–10°C ... +125°C
	Ambient temperature	–10°C ... +105°C
	Protection [1)]	IP65, IP67
	Vibration	15 g RMS (20...2000 Hz) acc.to EN 60068-2-64 25 g sin (80...2000 Hz), 1 oct./min, (1x @ 25°C) acc.to EN 60068-2-6
	Shock	50 g / 11 ms
EMC protection	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
Mechanical data	Sensor (wetted parts)	1.4462 (AISI318 LN)
	Pressure connection (wetted parts)	1.4462 (AISI318 LN), 1.4542
	Housing	1.4542
	Sealing	FKM
	Weight	~ 80 ... 110 g (without cable)
	Mounting torque	20 ... 25 Nm not lubricated 15 ... 20 Nm lubricated

[1)] See electrical connection
[2)] Without load on the switching outputs

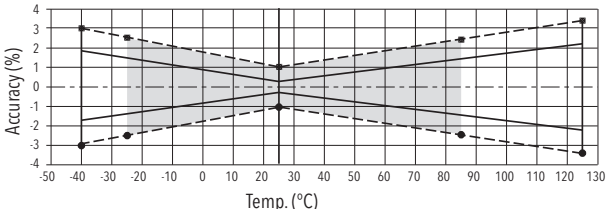
Pressure measuring accuracy			
Measuring range		**≥ 0 ... 2.5 bar**	**< 0 ... 2.5 bar**
TEB @ -25 ... +85°C	[% FS typ.]	± 1.5	± 3.0
Accuracy @ +25°C	[% FS typ.]	± 0.5 [1)]	± 1.0 [2)]
Additional mounting torque offset	[% FS typ.]	± 0.2	± 0.5
NLH @ +25°C (BSL)	[% FS typ.]	± 0.1	± 0.2
TC zero point and span Additional TC for zero point and span at different media and ambient temperatures [*)]	[% FS/K typ.] [% FS/K typ.]	± 0.01 ± 0.08	± 0.025 ± 0.25
Long term stability 1 year @ +25°C	[% FS typ.]	± 0.2	± 0.5

1) Additional mounting torque offset 0.2 %
2) Additional mounting torque offset 0.5 %

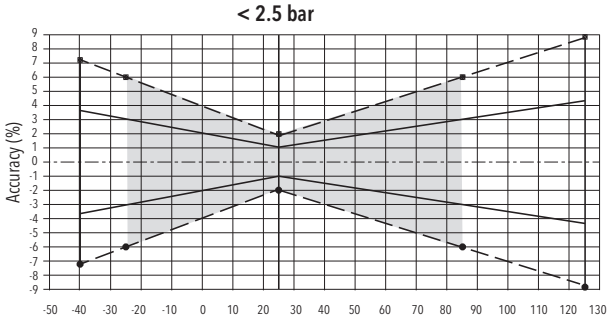
*) Applies to a stationary condition. If there is a sudden change in the temperature of the media, a considerable deviation in the measured value must be expected until thermal balance is re-established.

Measuring accuracy

2.5 ... 100 bar



< 2.5 bar

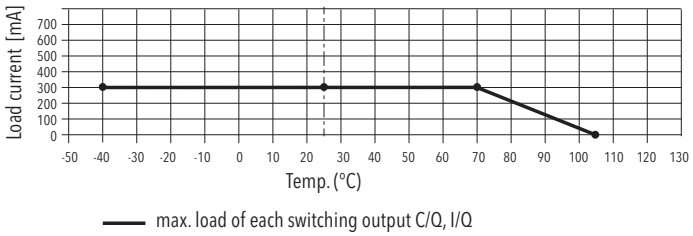


Temperature measurement		
Media temperature	**@ Media temperature**	**Accuracy**
Accuracy [typ.]	-10°C	± 3K + 0.1 x (T ambient - T media)
	0°C	± 3K + 0.1 x (T ambient - T media)
	+25°C	± 2K + 0.1 x (T ambient - T media)
	+50°C	± 2K + 0.1 x (T ambient - T media)
	+85°C	± 4K + 0.1 x (T ambient - T media)
	+125°C	± 10K + 0.1 x (T ambient - T media)
Temperature range	-40°C...+125°C	
Device temperature		
Accuracy	@ 0°C ... +80°C	± 1.5°C
Temperature range		-40°C ... +125°C

Switching output			
Accuracy	refer to table "Pressure measurement accuracy"		
Number of outputs	2 outputs for switching operation (SIO mode; SIO = standard IO)		Out1, Out2
Source of measured value	Pressure and temperature (Out1 and Out2)		
Output polarity	PNP, NPN, configurable		
Output function	Function modes: Single Point Mode, Two Point Mode, Window Mode; normally closed (NO), normally open (NC); switch-on/switch-off delay; Damping; configurable via IO-Link interface		
Switching current	-10°C ... +70°C > +70°C ... +105°C	Ambient temperature Ambient temperature	max. 300 mA each switching output refer to the graphic "Switching current"
Switching resistance	≤ 11Ω		
Current limiting	integrated		
Lifetime	> 100 x 10^6 cycles		
Switching frequency	< 300 Hz		
Response time	1.6 ms		

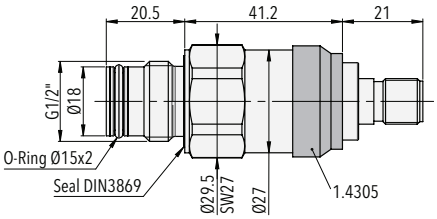
Switching current

Load depending on ambient temperature

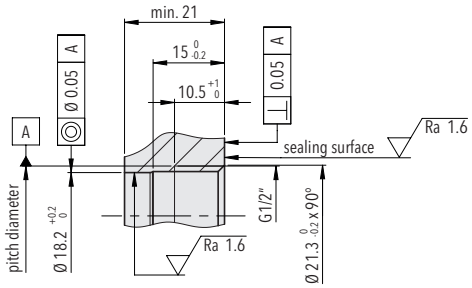


Interface description		
Communication interface	SDCI Standard IEC 61131-9	IO-Link
Transmission type		COM3 (230,4 kBaud)
IO-Link revision		V1.1
Profiles / funtion classes		Identification and Diagnosis (0x4000), Measurement Data Channel (0x800A) Measuring and Switching Sensor (DMSS), SSP4.1.2
SIO mode		Yes
Required master port class		Class A
Min. process cycle time	[ms]	1
Resolution pressure measurand	Refer to the interface description	
Resolution temperature measurand	[K]	0.01K
IO-Link process data (cyclical)	Pressure [Pa]	16 bit
	Switching signal for pressure	2 bit
	Temperatur [°C]	16 bit Media temperature with sensor 23
	Switching signal for temperature	2 bit
	Device status	4 bit
IO-Link functions (acyclical)	Application specific tag; media temperature, device temperature; operating hours counter; min./max. pressure value; min./max. temperature value; pressure overload counter; temperature overload counter	
IODD download	https://ioddfinder.io-link.com	

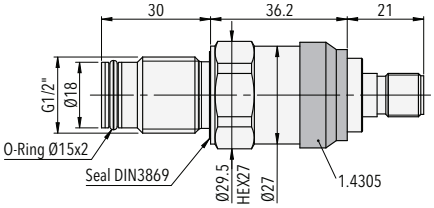
Dimensionen



8237.XX.XX.93.**35**.XX.XX



Mounting thread G1/2" standard length (Process connection 93)
DIN EN ISO 1179-1



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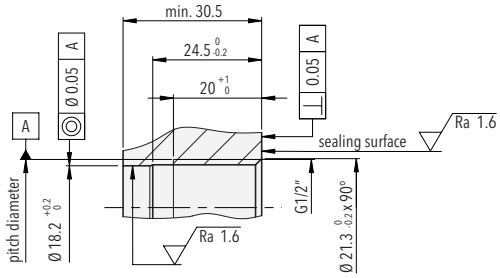
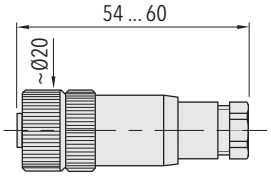


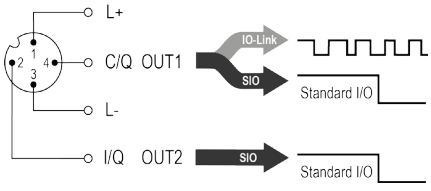
Mounting thread G1/2" 30 mm length (Process connection 94)
DIN EN ISO 1179-1



8237.XX.XXXX.XX.XX.**33**

Electrical connection

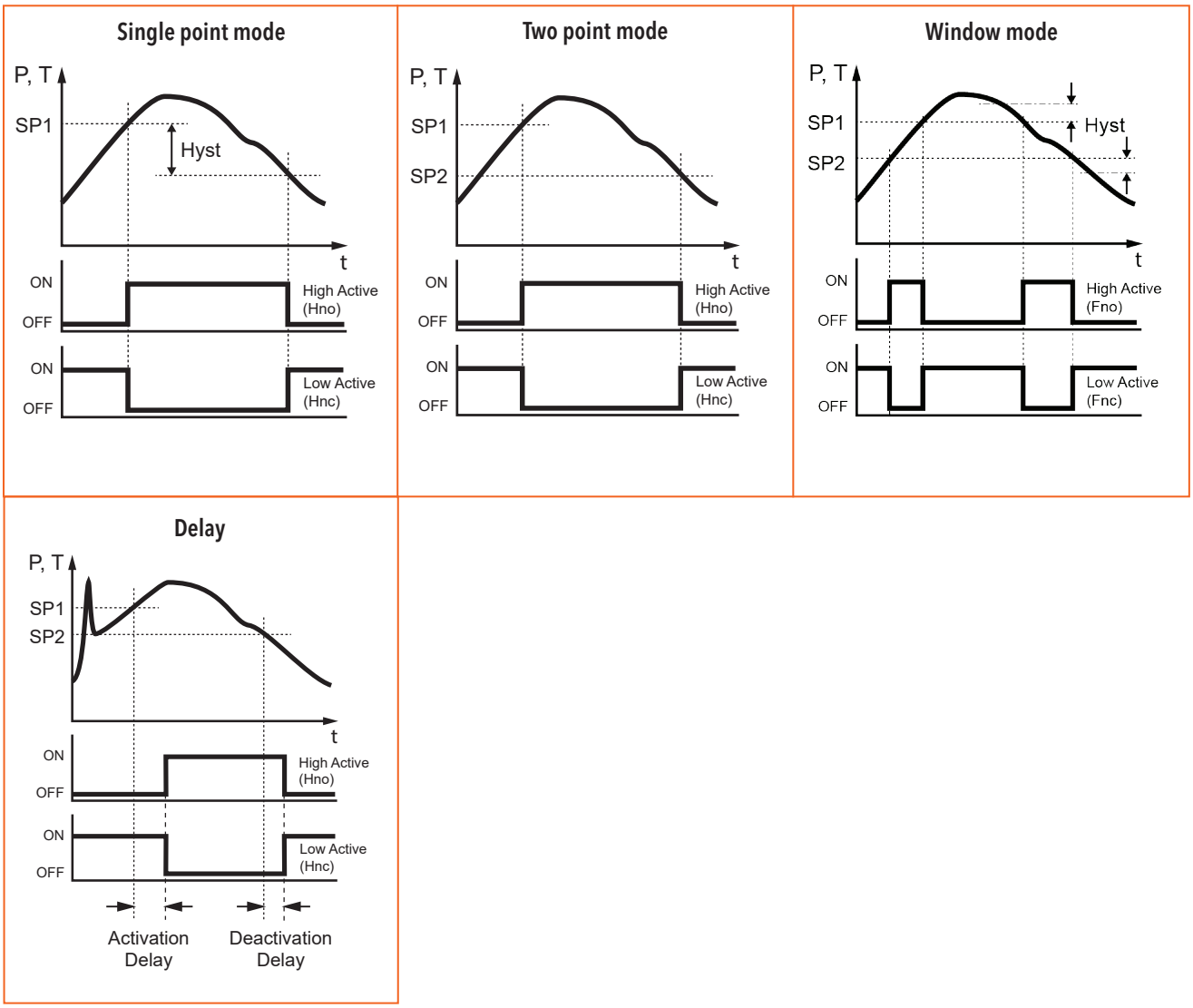
	Protection / electrical connection
	IP65, IP67*) **)
	M12x1 5-pole **35**
Output signal P / T / Out L+ (pos. Supply) Out 2 : I/Q Out 1 : C/Q L– (neg. Supply) NC **8237**.XX.XXXX.XX.**50**	**OK** 1 2 4 3 5



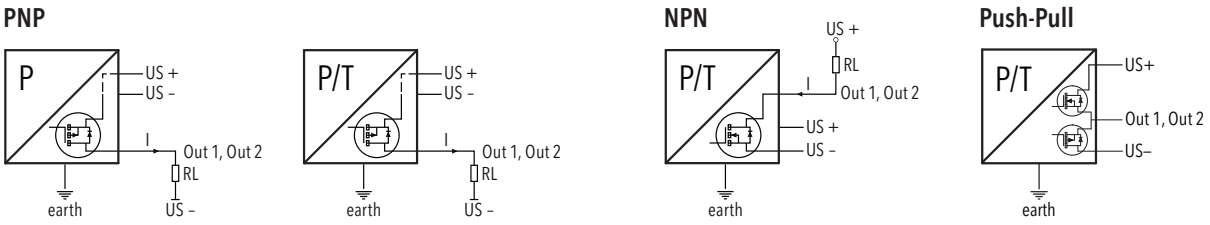
*) Electrical connections 35: provided female electrical plug is mounted according to instructions

**) Ventilation integrated

Functions switching output



Switching output polarity



Connection of loads to switching output

Additional information		
Documents	Data sheet	www.trafag.com/H72622
	Instructions	www.trafag.com/H73621
	Flyer	www.trafag.com/H70622
	Interface description	www.trafag.com/H73664

Additional specifications		
Electrical data	Resistance of insulation	>100 MΩ, 50 VDC
	Dielectric strength	50 VAC, 50 Hz
Environmental conditions	Storage temperature	–25°C ... +60°C

Accuracy			
Pressure measuring range		**≥ 0 ... 2.5 bar**	**< 0...2.5 bar**
TEB @ -25 ... +85°C	[% FS max.]	± 2.5	± 6.0
Accuracy @ +25°C	[% FS max.]	± 1.0 [3)]	± 2.0 [4)]
Additional mounting torque offset	[% FS max.]	± 1.0	± 2.5
NLH @ +25°C (BSL)	[% FS max.]	± 0.25	± 0.3
NLH @ +25°C (BSL through 0)	[% FS typ.]	± 0.1	± 0.2
NLH @ +25°C (BSL through 0)	[% FS max.]	± 0.25	± 0.3
Repeatability	[% FS typ.]	± 0.05	± 0.1
TC zero point and span Additional TC for zero point and span at different media and ambient temperatures [*)]	[% FS/K max.] [% FS/K typ.]	± 0.03 ± 0.08	± 0.075 ± 0.25
Long term stability 1000h @ 85°C	[% FS typ.]	± 0.1	± 0.25
Temperature hysteresis	[% FS typ.] [% FS max.]	± 0.2 ± 0.35	± 0.5 ± 0.875
Deviation of zero signal and final value @ 25°C	[FS typ. @ +25°C] [FS max. @ +25°C]	± 0.5 [1)] ± 1.0 [3)]	± 0.75 [2)] ± 1.5 [4)]

1) Additional mounting torque offset 0.3 %
2) Additional mounting torque offset 0.5 %
3) Additional mounting torque offset 1.0 %
4) Additional mounting torque offset 2.5 %
*) Applies to a stationary condition. If there is a sudden change in the temperature of the media, a considerable deviation in the measured value must be expected until thermal balance is re-established.