

# INDUSTRIAL PRESSURE TRANSMITTER

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. The industrial pressure transmitter NAT 8252 features an exceptionally long-term stable thin-film-on-steel sensor cell with triple (optionally 5-fold) overpressure safety. Optionally, the NAT 8252 is available as a pressure switch with 1 or 2 switching outputs. The robust design and the wide temperature range from -40°C to +125°C qualify the NAT 8252 as the ideal solution for a wide range of demanding applications.



## Applications

- Machine tools
- Hydraulics
- HVAC
- Refrigeration
- Process technology
- Water treatment

## Features

- Smallest design
- Completely welded steel sensor system without additional seals
- Excellent long-term stability
- Optional: fivefold overpressure resistance
- Optional: Switching output 1 or 2 PNP transistors

## Technical Data

Measuring principle	Thin film on steel	Accuracy @ 25°C typ.	± 0.5 % FS typ.
Measuring range	0 ... 2.5 to 0 ... 600 bar 0 ... 30 to 0 ... 7500 psi	Media temperature	-40°C ... +125°C
Output signal	4 ... 20 mA, 0.5 ... 4.5 VDC, 0 ... 5 VDC, 1 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, 0.1 ... 10.1 VDC, 0.5 ... 4.5 VDC ratiometric, Switching output: 1 or 2 PNP transistors	Ambient temperature	-40°C ... +125°C (Cable PVC 22: -5°C ... +60°C) (Cable PUR 24: -40°C ... +70°C)

10/2017

Data sheet H723030

Subject to change

## Ordering information/type code

				8252 .	XX	XX	XX	XX	XX
Measuring range <sup>1)</sup>	Pressure measurement range [bar]	Over pressure [bar]	Burst pressure [bar]	Pressure measurement range [psi]	Over pressure [psi]	Burst pressure [psi]			
	0 ... 2.5	7.5	50	75	0 ... 30	90	700	G5	
	0 ... 4	12	60	76	0 ... 50	150	850	G6	
	0 ... 6	18	100	77	0 ... 100	300	1450	G7	
	0 ... 10	30	200	78	0 ... 150	450	2500	G8	
	0 ... 16	48	200	79	0 ... 200	600	2500	GA	
	0 ... 25	75	300	80	0 ... 250	750	2500	G9	
	0 ... 40	120	300	81	0 ... 300	900	4000	HA	
	0 ... 60	180	400	82	0 ... 400	1200	4000	H0	
	0 ... 100	300	500	83	0 ... 500	1500	4000	H1	
	0 ... 160	480	750	85	0 ... 1000	3000	5000	H2	
	0 ... 250	750	1000	74	0 ... 1500	4500	7000	H3	
	0 ... 400	1000	2000	84	0 ... 2000	6000	10000	H5	
	0 ... 600	1500	2500	86	0 ... 3000	9000	14500	G4	
	Option 5P: Fivefold overpressure				0 ... 5000	12500	21750	H4	
	0 ... 2.5	12.5	60	55	0 ... 7500	18750	29000	H6	
	0 ... 4	20	100	56					
	0 ... 6	30	200	57					
	0 ... 10	50	200	58					
	0 ... 16	80	300	59					
	0 ... 25	125	300	60					
	0 ... 40	200	400	61					
	0 ... 60	300	500	62					
	0 ... 100	500	750	63					
	0 ... 160	800	1000	65					
Sensor	Relative pressure						25		
Pressure connection	G1/4" male, seal: DIN 3869 (accessories 61/63/83)						17		
	G1/4" male (Manometer) EN 871 <sup>9)</sup>						53		
	1/4" NPT male						30		
	1/8" NPT male <sup>5) 9)</sup>						43		
	7/16"-20UNF female SAE J512 with valve opener <sup>4)</sup>						24		
	7/16"-20UNF female SAE J512 without valve opener <sup>4)</sup>						44		
	7/16"-20UNF male, DIN3866 <sup>4)</sup>						18		
	7/16"-20UNF SAE4 male, seal: accessory 61 <sup>8)</sup>						42		
	R1/4" male, DIN3858 <sup>5)</sup>						19		
	R1/8" male, DIN3858 <sup>5)</sup>						16		
	M10x1 male, DIN EN ISO 6149-2						32		
	M12x1.5 male, DIN EN ISO 9974-2 <sup>9)</sup>						49		
Electrical connection	Male electrical plug, industrial standard, contact distance 9.4 mm, Mat. PA						01		
	Male electrical plug M12x1, 4-pole, Mat. PA						32		
	Male electrical plug M12x1, 5-pole, Mat. PA						35		
	Cable IP67, Mat. PVC <sup>7)</sup>						22		
	Cable IP67, Mat. PUR <sup>7)</sup>						24		
	Cable IP67, Mat. EPD Raychem FDR25 <sup>7)</sup>						08		

8252 . XX XX XX XX XX XX					
Output signal	Signal output	Load resistance	I (supply)	U (supply)	
	4 ... 20mA	See graphic		24 (9 ... 32) VDC	19
	0.5 ... 4.5 VDC	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC	20
	0 ... 5 VDC	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC	14
	1 ... 5 VDC	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC	25
	1 ... 6 VDC	≥ 5.0 kΩ to Us-	≤ 20 mA	24 (9 ... 32) VDC	16
	0 ... 10 VDC	≥ 5.0 kΩ to Us-	≤ 15 mA	24 (15 ... 32) VDC	17
	0.1 ... 10.1 VDC	≥ 5.0 kΩ to Us-	≤ 15 mA	24 (15 ... 32) VDC	13
	0.5 ... 4.5 VDC ratiometric	≥ 5.0 kΩ to Us-	≤ 10 mA	5 (4.75 ... 5.25) VDC	23
	2 PNP transistors <sup>3)</sup>		≤ 10 mA	24 (9 ... 32) VDC	PS
	1 PNP transistor <sup>3)</sup>		≤ 10 mA	24 (9 ... 32) VDC	T1
Accessories	Female electrical plug M12x1, 5-pole <sup>2)</sup>				33
	Female electrical connector industrial standard (for electrical connection 01)				34
	Pressure peak damping element ø 1.0 mm <sup>6)</sup>				40
	Pressure peak damping element ø 0.4 mm <sup>6)</sup>				44
	Seal FPM, -18°C ... +125°C				61
	Seal EPDM, -40°C ... +125°C				63
	Seal NBR, -25°C ... +100°C				83
	Special electrical connection: Pin 2 +, Pin 3 ground, Pin 4 - (only for output signal 19 and male electrical plug 01, industrial standard)				90
	Special electrical connection: Pin 1 out, Pin 2 +, Pin 3 ground, Pin 4 - (only for output signals 14, 16, 17, 23 and male electrical plug 01, industrial standard)				91
	Special electrical connection: Pin 1 +, Pin 2 Ground, Pin 3 -, Pin 4 Out (only for output signals 14, 16, 17, 23 and male electrical plug 32, M12x1, 4-pole)				96
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 ground (only for output signal 19 and male electrical plug 01, industrial standard)				92
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 ground (only for output signal 19 and male electrical plug 32, M12x1, 4-pole)				E1
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 3 out, Pin 4 ground (only for output signals 14, 16, 17, 23 and male electrical plug 32, M12x1, 4-pole)				E2
	Cable length 0.5 m				EM
	Cable length 1.0 m				1M
	Cable length 2.0 m				2M
	Parameterisation according to customer specification (see table parameter), for output signal PS, T1				ZC

<sup>1)</sup> Customized pressure ranges upon request

<sup>2)</sup> For electrical connections 32 and 35

<sup>3)</sup> Only with electrical connections 32, 22, 24, 08

<sup>4)</sup> Max. allowable pressure range 60 bar at 120 bar overpressure

<sup>5)</sup> Max. allowable pressure range 160 bar at 500 bar overpressure

<sup>6)</sup> Only for pressure connections 17, 30, 32

<sup>7)</sup> Cable length see accessories

<sup>8)</sup> According to norm J1926, max. 35 MPa

<sup>9)</sup> Upon request

## Standard products (extra short lead time)

Product No.	Type Code	Pressure range [bar]	Over pressure max. [bar]	Supply [VDC]	Accuracy @ 25°C typ. [%]
NAT2.5A	8252 75 2517 01 0000 0000 19 34 44 61	0 ... 2.5	7.5	9 ... 32	±0.5
NAT4.0A	8252 76 2517 01 0000 0000 19 34 44 61	0 ... 4	12	9 ... 32	±0.5
NAT6.0A	8252 77 2517 01 0000 0000 19 34 44 61	0 ... 6	18	9...32	±0.5
NAT10.0A	8252 78 2517 01 0000 0000 19 34 44 61	0 ... 10	30	9...32	±0.5
NAT16.0A	8252 79 2517 01 0000 0000 19 34 44 61	0 ... 16	48	9 ... 32	±0.5
NAT25.0A	8252 80 2517 01 0000 0000 19 34 44 61	0 ... 25	75	9 ... 32	±0.5
NAT40.0A	8252 81 2517 01 0000 0000 19 34 44 61	0 ... 40	120	9 ... 32	±0.5
NAT100.0A	8252 83 2517 01 0000 0000 19 34 44 61	0 ... 100	300	9 ... 32	±0.5
NAT250.0A	8252 74 2517 01 0000 0000 19 34 44 61	0 ... 250	750	9 ... 32	±0.5
NAT400.0A	8252 84 2517 01 0000 0000 19 34 44 61	0 ... 400	1000	9 ... 32	±0.5
NAT600.0A	8252 86 2517 01 0000 0000 19 34 44 61	0 ... 600	1500	9 ... 32	±0.5
NAT2.5V	8252 75 2517 01 0000 0000 17 34 44 61	0 ... 2.5	7.5	15 ... 32	±0.5
NAT4.0V	8252 76 2517 01 0000 0000 17 34 44 61	0 ... 4	12	15 ... 32	±0.5
NAT6.0V	8252 77 2517 01 0000 0000 17 34 44 61	0 ... 6	18	15 ... 32	±0.5
NAT10.0V	8252 78 2517 01 0000 0000 17 34 44 61	0 ... 10	30	15 ... 32	±0.5
NAT16.0V	8252 79 2517 01 0000 0000 17 34 44 61	0 ... 16	48	15 ... 32	±0.5
NAT25.0V	8252 80 2517 01 0000 0000 17 34 44 61	0 ... 25	75	15 ... 32	±0.5
NAT40.0V	8252 81 2517 01 0000 0000 17 34 44 61	0 ... 40	120	15 ... 32	±0.5
NAT100.0V	8252 83 2517 01 0000 0000 17 34 44 61	0 ... 100	300	15 ... 32	±0.5
NAT250.0V	8252 74 2517 01 0000 0000 17 34 44 61	0 ... 250	750	15 ... 32	±0.5
NAT400.0V	8252 84 2517 01 0000 0000 17 34 44 61	0 ... 400	1000	15 ... 32	±0.5
NAT600.0V	8252 86 2517 01 0000 0000 17 34 44 61	0 ... 600	1500	15 ... 32	±0.5

Parameter				
Name	Standard setting (accessory ZS)	Value range	Short name	Customer adjustment (accessory ZC)
Switch point SP1 (hysteresis mode) Upper switch point FH1 (window mode)	75 % Measuring range	> RP1, FL1 Hysteresis $\geq 1\%$ FS	SP1	
Reset point RP1 (hysteresis mode) Lower switch point FL1 (window mode)	25 % Measuring range	< SP1, FH1 Hysteresis $\geq 1\%$ FS	RP1	
Switch point SP2 (hysteresis mode) Upper switch point FH2 (window mode)	75 % Measuring range	> RP2, FL2 Hysteresis $\geq 1\%$ FS	SP2	
Reset point RP2 (hysteresis mode) Lower switch point FL2 (window mode)	25 % Measuring range	< SP2, FH2 Hysteresis $\geq 1\%$ FS	RP2	
Switch point delay time SP1 / RP1 (hysteresis mode) Switch point delay time FH1 / FL1 (window mode)	0	0; $2^x[\text{ms}]$ , $x = 3, 4 \dots 16$	dS1	
Switch point delay time SP2 / RP2 (hysteresis mode) Switch point delay time FH2 / FL2 (window mode)	0	0; $2^x[\text{ms}]$ , $x = 3, 4 \dots 16$	dS2	
Functions switching output 1	Hysteresis, closer (Hno)	Hysteresis NO (Hno), Hysteresis NC (Hnc) Window NO (Fno), Window NC (Fnc)	ou1	
Functions switching output 2	Hysteresis, closer (Hno)	Hysteresis NO (Hno), Hysteresis NC (Hnc) Window NO (Fno), Window NC (Fnc) Device ready	ou2	

Specifications		
Electrical Data	Output / supply voltage	4 ... 20 mA: 24 (9...32) VDC 0.5 ... 4.5 VDC: 24 (9...32) VDC 0 ... 5 VDC: 24 (9...32) VDC 1 ... 5 VDC: 24 (9...32) VDC 1 ... 6 VDC: 24 (9...32) VDC 0 ... 10 VDC: 24 (15...32) VDC 0.1 ... 10.1 VDC: 24 (15...32) VDC 0.5 ... 4.5 VDC ratiom., 10 ... 90% U <sub>supply</sub> : 5 ± 0.25 VDC 1 or 2 PNP transistors: 24 (9...32) VDC
	Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure
	Switch-on-delay pressure transmitters	100 ms
	Switch-on-delay pressure switches	50 ms + switching delay time
	Inverse-polarity protection, short-circuit strenght @ 25°C during 5 min.	4...20 mA: to U <sub>s</sub> = 32 VDC 0.5...4.5 VDC, 0...5 VDC, 1...5 VDC, 1...6 VDC, 0...10 VDC, 0.1...10.1 VDC: to U <sub>s</sub> = 28 VDC 0.5...4.5 VDC ratiometric: to U <sub>s</sub> = 14 VDC 1 or 2 PNP transistors: to U <sub>s</sub> = 32 VDC
Environmental conditions	Media temperature	-40°C ... +125°C
	Ambient temperature	-40°C ... +125°C (Cable PVC 22: -5°C ... +60°C) (Cable PUR 24: -40°C ... +70°C)
	Protection <sup>1)</sup>	IP65, IP67
	Humidity	Max. 95 % relative
	Vibration	15 g RMS (20...2000 Hz) (EN60068-2-64) 25 g sin (80...2000 Hz), 1 oct./min, (1x @ 25°C) (EN60068-2-6)
	Shock	50 g / 11 ms 100 g / 6 ms Male electrical plug M12x1 (EN60068-2-27) <sup>2)</sup>
EMC Protection	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
Mechanical Data	Sensor (wetted parts)	1.4542 (AISI630)
	Pressure connection (wetted parts)	1.4542 (AISI630)
	Housing	1.4301 (AISI304)
	Sealing	FPM/EPDM/NBR
	Male electrical plug	See ordering information
	Weight	appr. 50 g
	Mounting torque	25 Nm

<sup>1)</sup> See electrical connection

<sup>2)</sup> For electrical connections 32 and 35

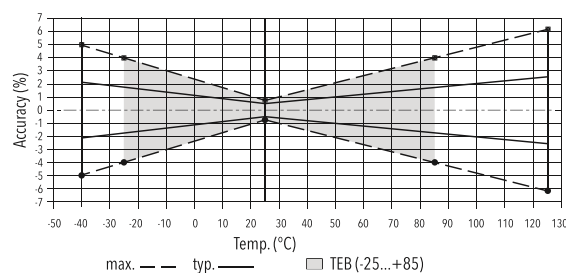
## Analogue output

Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 1.75
	Accuracy @ +25°C	[% FS typ.]	± 0.5
	NLH @ +25°C (BSL)	[% FS typ.]	± 0.2
	TC zero point and span	[% FS/K typ.]	± 0.03
	Long term stability 1 year	[% FS typ.]	± 0.1
Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure		

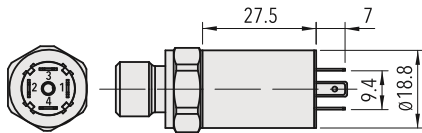
## Switching output

Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 1.75
	Accuracy @ +25°C	[% FS typ.]	± 0.5
	Long term stability 1 year	[% FS typ.]	± 0.1
Adjustment range of switchpoints	1 ... 99 % FS		
Distance switch point	≥ 1.0 % FS		
Switch point > reset point	Switchpoint > reset point		
Switching resistance	≤ 3 Ω		
Output function	Hysteresis, Window; normally closed (NO), normally open (NC)		
Switching current	-40°C ... +85°C	(Ambient and media temperature)	≤ 400 mA, total of both switching outputs
	+85°C ... +125°C	(Ambient and media temperature)	≤ 200 mA, total of both switching outputs
Current limiting	integrated		
Delay time	0; 2*[ms], x = 3, 4 ... 16		
Switching frequency	max. 60 Hz (at switching delay time = 0)		

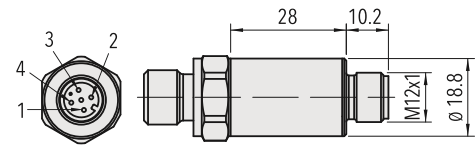
## Measuring accuracy



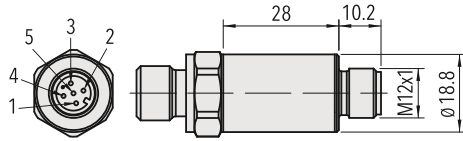
## Dimensions



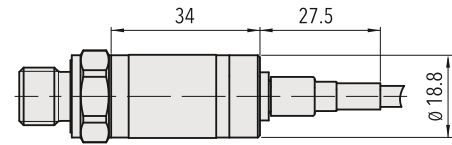
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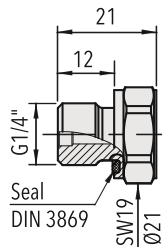
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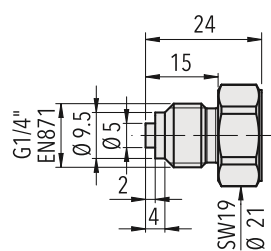
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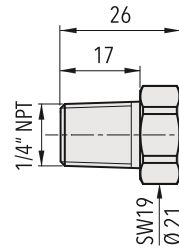
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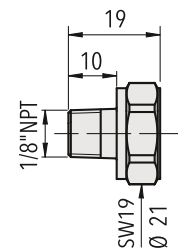
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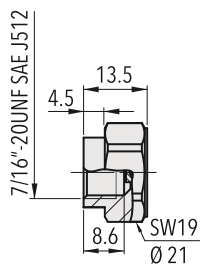
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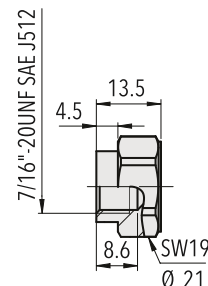
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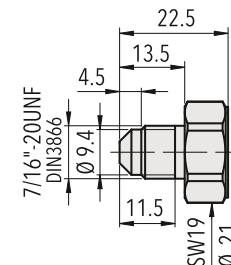
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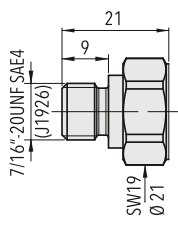
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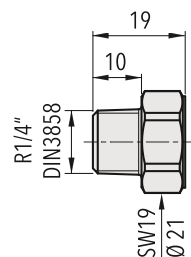
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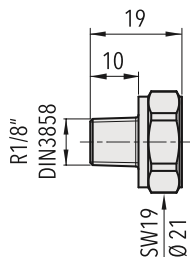
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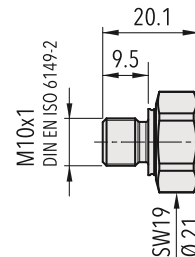
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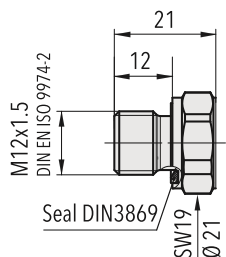
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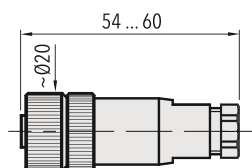
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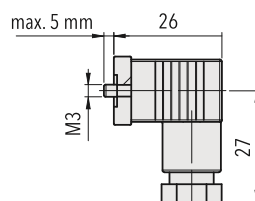
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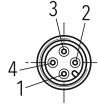
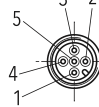

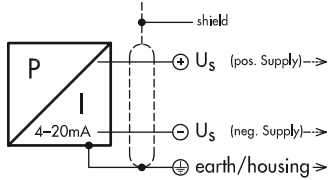
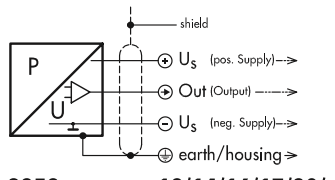
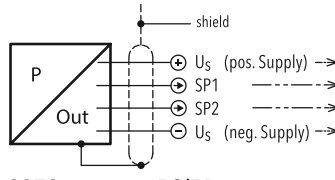
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8252.XX.XXXX.XX.XX.34



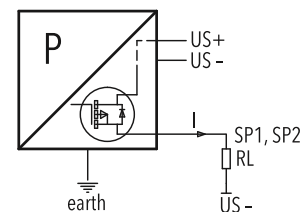
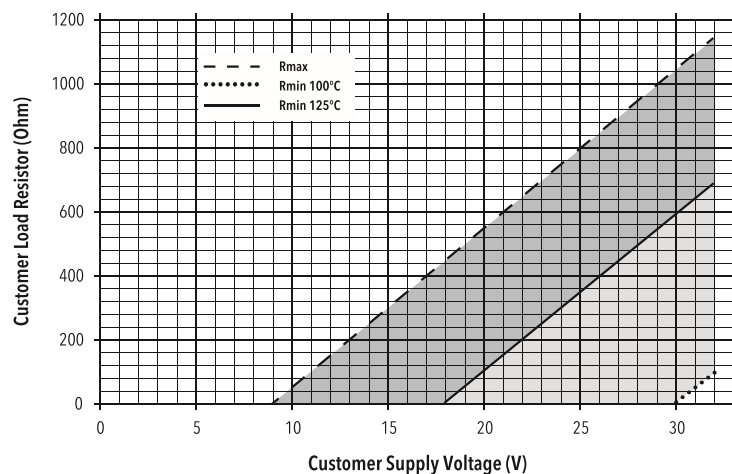
## Electrical connection

Protection / electrical connection									
IP65 *)**)			IP67 *)**)			IP67**)		IP67**)	
Industrial standard Contact distance 9.4 mm <b>01</b>			M12x1 4-pole <b>32</b>			5-pole <b>35</b>		Cable <b>22/24</b>	
									
Output signal			<b>90</b>		<b>92</b>	<b>E1</b>			
	2	2	1	1	1	4	white	red	
	1	4	2	3	2	1	brown	black	
			4	3	4	5	yellow	green	
			<b>91</b>		<b>96</b>	<b>E2</b>			
	1	2	1	1	1	2	white	red	
	2	1	2	4	3	4	green	white	
			3	3	2	3	brown	black	
			4	3	4	5	yellow	green	
			<b>PS</b>		<b>T1</b>				
	1	4	2	1	4	white	white	red	red
	2	2	3	-	-	green	green	white	white
			3	3	3	yellow	-	green	-
						brown	brown	black	black

\*) Provided female connector is mounted according to instructions

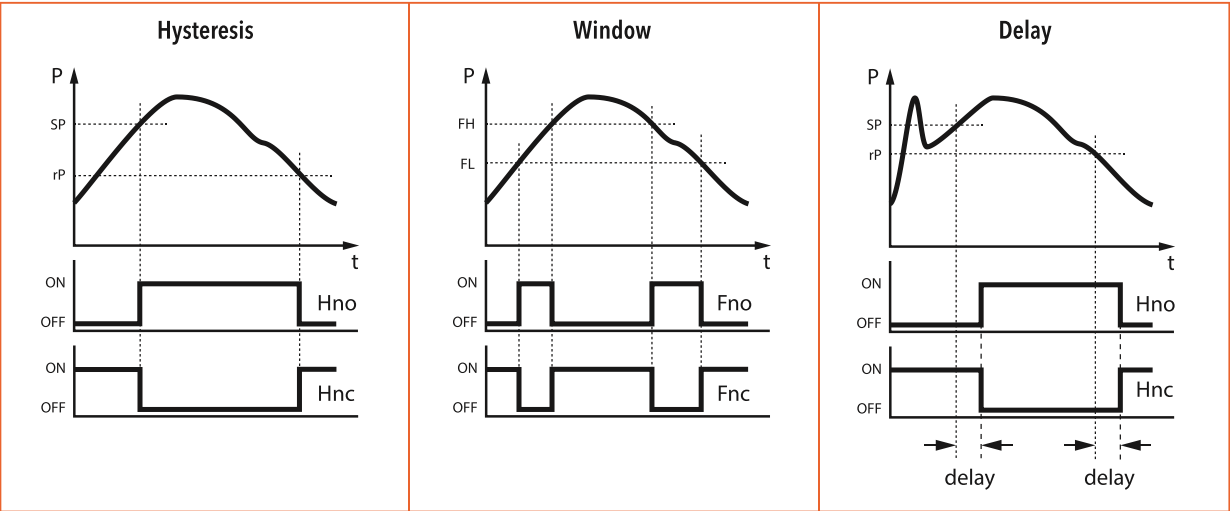
\*\*) Ventilation via male electric plug/cable end

4...20mA: min./max resistor vs. supply voltage @ Pmax = 100%



Connection of loads to switch contacts

Functions switching output



Additional information

Documents

Data sheet	<a href="http://www.trafag.com/H72303">www.trafag.com/H72303</a>
Instructions	<a href="http://www.trafag.com/H73303">www.trafag.com/H73303</a>
Flyer	<a href="http://www.trafag.com/H70666">www.trafag.com/H70666</a>