

# 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)

02/2018

Data sheet H72303q

Subject to change

## Ordering information/type code

				8252 . XX	XX	XX	XX	XX	XX
<b>Measuring range <sup>1)</sup></b>	<b>Pressure measurement range [bar]</b>	<b>Over pressure [bar]</b>	<b>Burst pressure [bar]</b>	<b>Pressure measurement range [psi]</b>	<b>Over pressure [psi]</b>	<b>Burst pressure [psi]</b>			
	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	
	<b>Option 5P:</b>	<b>Fivefold overpressure</b>			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						
<b>Sensor</b>	Relative pressure						25		
<b>Pressure connection</b>	G1/4" male, seal: DIN 3869 (accessories 61/63/83)						17		
	G1/4" male (Manometer) EN 871 <sup>8)</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		
	R1/4" male, DIN2999 <sup>5) 9)</sup>						20		
	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		
<b>Electrical connection</b>	Male electrical plug, industrial standard, contact distance 9.4 mm, Mat. PA						01		
	Male electrical plug M12x1, 4-pole, Mat. PA, IEC 61076-2-101						32		
	Male electrical plug M12x1, 5-pole, Mat. PA, IEC 61076-2-101						35		
	Male electrical plug MIL-C 26482, 6-pole, metal						02		
	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		

Output signal	Signal output	Load resistance	I (supply)	U (supply)	
	4 ... 20 mA	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
<b>Accessories</b>	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>4)</sup>				40
	Pressure peak damping element ø 0.4 mm <sup>4)</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 Out, Pin 4 - (only for output signals 13, 14, 16, 17, 20, 23, 25 and male electrical plug 32, M12x1, 4-pole)				95
	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
	Special electrical connection: Pin 1 Out, Pin 2 -, Pin 3 +, Pin 4 ground (only for output signals 13, 14, 16, 17, 20, 23, 25 and male electrical plug 01, industrial standard)				E3
	Special electrical connection: Pin 1 +, Pin 2 Ground, Pin 4 - (only for output signal 19 and male electrical plug 32, M12x1, 4-pole)				E6
	Cable length 0.5 m				EM
	Cable length 1.0 m				1M
	Cable length 2.0 m				2M
	Parameterisation according to customer specification for output signal PS, T1 (see table parameter)				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 <sup>x</sup> [ms], x = 3, 4 ... 16	dS1	
Switch point delay time SP2 / RP2 (hysteresis mode) Switch point delay time FH2 / FL2 (window mode)	0	0; 2 <sup>x</sup> [ms], x = 3, 4 ... 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	

## Parameterization of switching points

The switching points, delay times and output functions can be parameterized via Smartphone app (Android). The SMI Sensor Master Interface required for the parameterization as well as the Smartphone are not part of the delivery. The Android App is available for free in the Google Play Store.

- Ordering No. SMI Sensor Master Interface: F90170 (available from the 2nd quarter of 2018)
- Data sheet SMI Sensor Master Interface: H72618



Specifications		
<b>Electrical Data</b>	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% $U_{supply}$ : $5 \pm 0.25$ 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 $U_s = 32$ VDC 0.5...4.5 VDC, 0...5 VDC, 1...5 VDC, 1...6 VDC, 0...10 VDC, 0.1...10.1 VDC: to $U_s = 28$ VDC 0.5...4.5 VDC ratiometric: to $U_s = 14$ VDC 1 or 2 PNP transistors: to $U_s = 32$ VDC
<b>Environmental conditions</b>	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>
<b>EMC Protection</b>	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
<b>Mechanical Data</b>	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

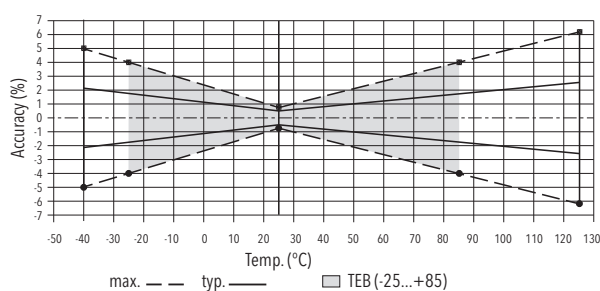
## Analogue output

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		

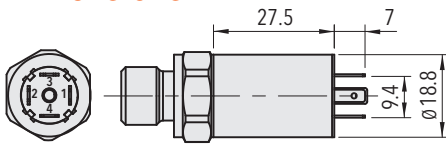
## Switching output

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 <sup>x</sup> [ms], x = 3, 4 ... 16		
Switching frequency	max. 60 Hz (at switching delay time = 0)		

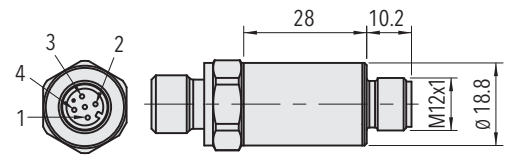
## Measuring accuracy



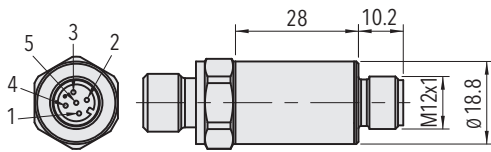
## Dimensions



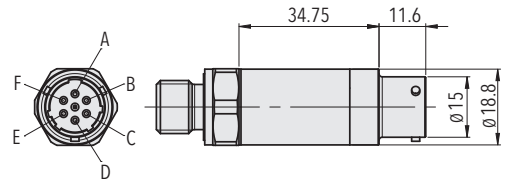
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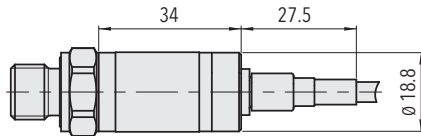
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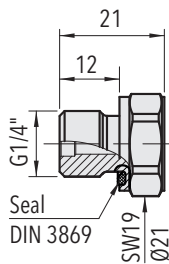
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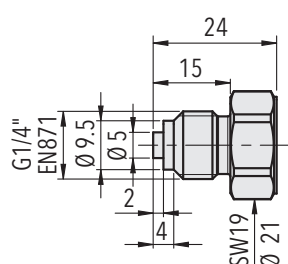
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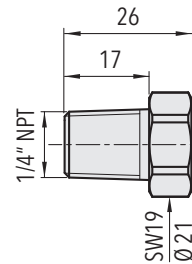
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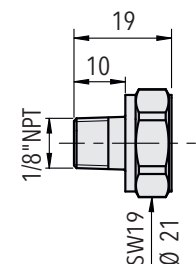
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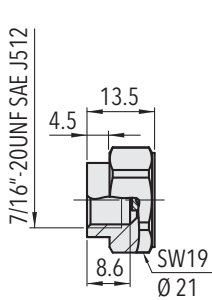
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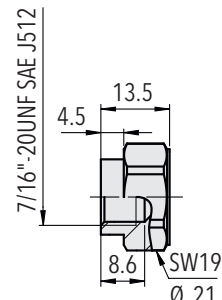
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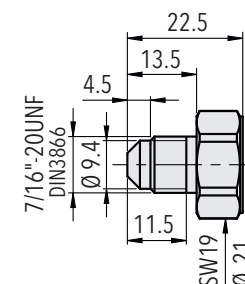
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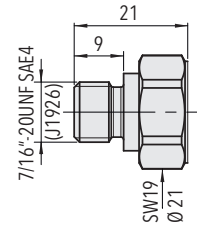
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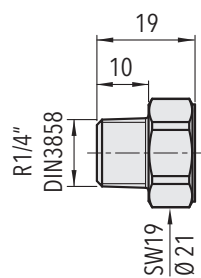
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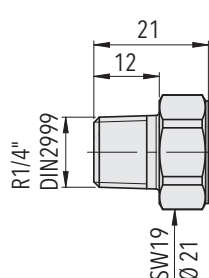
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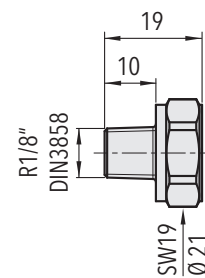
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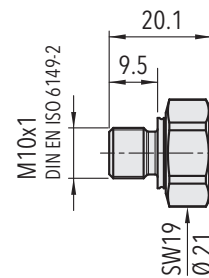
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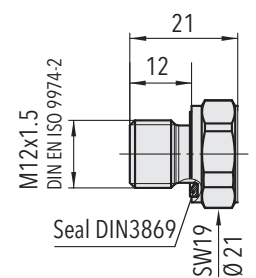
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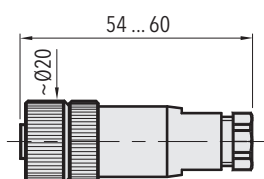
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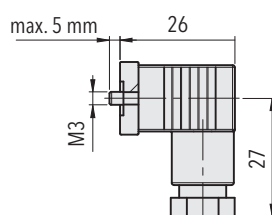
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8252.XX.XX49.XX.XX.XX



8252.XX.XXXX.XX.XX.33



8252.XX.XXXX.XX.XX.34



## Electrical connection

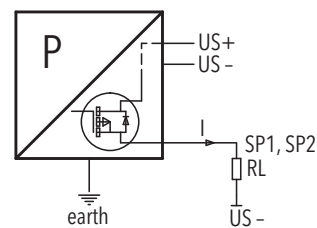
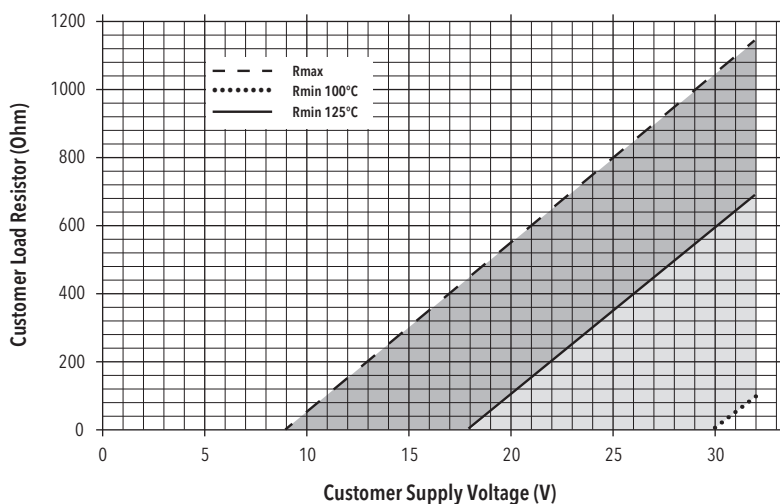
		Protection / electrical connection											
		IP65 *)**)		IP67 *)**)				IP67*)**)		IP67**)			
		Industrial standard Contact distance 9.4 mm		M12x1				MIL-C 26482		Cable			
		<b>01</b>		4-pole <b>32</b>		5-pole <b>35</b>		<b>02</b>		<b>22/24</b>		<b>08</b>	
Output signal	<p><b>8252.XX.XXXX.XX.19</b></p>	<b>90</b>	<b>92</b>	<b>E1</b>	<b>E6</b>								
	<p><b>8252.XX.XXXXX.13/14/16/17/20/23/25</b></p>	<b>91</b>	<b>E3</b>	<b>95</b>	<b>96</b>	<b>E2</b>							
		2	2	1	1	1	1	4	A	white	red		
		1	4	2	3	2	4	1	B	brown	black		
		4	3	4	4	4	2	5	E	yellow	green		
		1	2	3	1	1	1	2		white	red		
		2	1	1	2	3	4	4		green	white		
		3	4	2	3	4	3	3		brown	black		
		4	3	4	4	2	4	5		yellow	green		

		Protection / electrical connection					
		IP67 *)**)		IP67**)		IP67**)	
		M12x1 4-pole		Cable		Cable	
		<b>32</b>		<b>22/24</b>		<b>08</b>	
Output signal	<p><b>8252.XX.XXXX.XX.PS/T1</b></p>	<b>PS</b>	<b>T1</b>	<b>PS</b>	<b>T1</b>	<b>PS</b>	<b>T1</b>
		1	1	white	white	red	red
	4	4	green	green	white	white	
	2	-	yellow	-	green	green	
	3	3	brown	brown	black	black	

\*) Provided female connector is mounted according to instructions

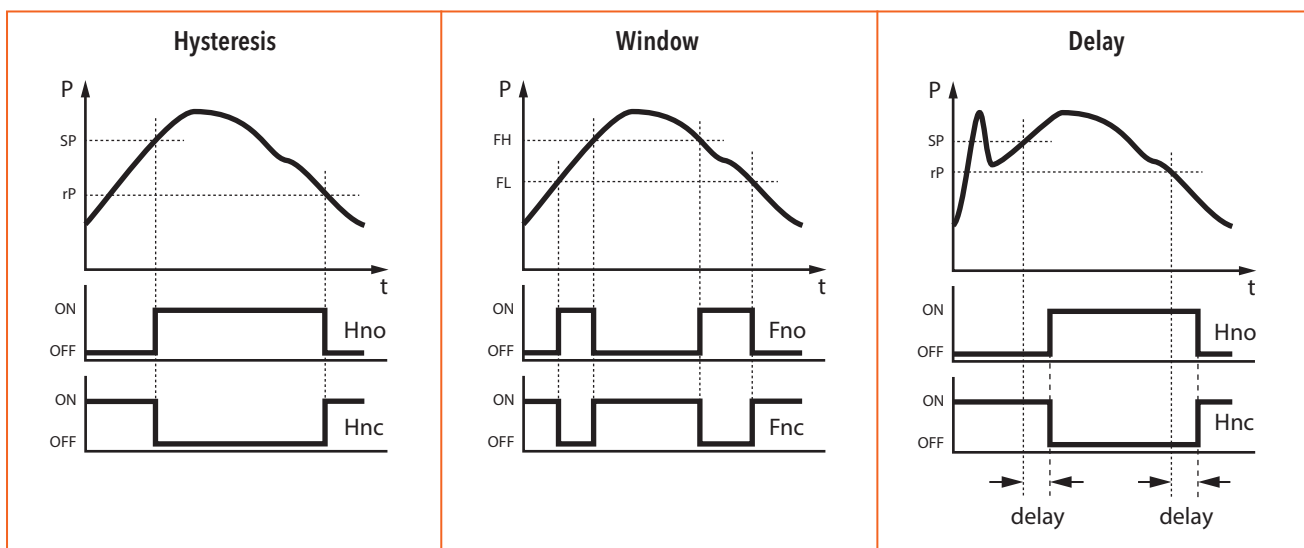
\*\*) Ventilation via male electric plug/cable end

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>