

# RAILWAY PRESSURE TRANSMITTER

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. The pressure transmitter NAR 8258 with increased accuracy of 0.3 % was specifically designed for railway vehicles (EN 50155) and has a long-term stable thin-film-on-steel sensor cell. The wide temperature range from -40°C to +85°C and the triple over-pressure protection make the NAR 8258 the ideal choice for railway vehicles in rough environmental conditions.



## Applications

- Railways



## Features

- Measuring accuracy 0.3 %
- Optional: Switching output 1 or 2 PNP
- Excellent long-term stability
- Meets EN 50155 (Railway)

Technical Data			
Measuring principle	Thin-film-on-steel	Accuracy @ 25°C typ.	± 0.3 % FS typ.
Measuring range	0 ... 6 to 0 ... 700 bar 0 ... 100 to 0 ... 10000 psi	Media temperature	-40°C ... +85°C
Output signal	4 ... 20 mA, Switching output: 1 or 2 PNP	Ambient temperature	-40°C ... +85°C (EN 50155: OT6)
NLH @ 25°C (BSL) typ.	± 0.2 % FS typ.	Approval / conformity	EN 50155 (Railway) EN 45545-2 (Fire protection) EN 61373 (Shock, vibration) EN 50121-3-2 (EMC)

08/2023

Data sheet H72307p

Subject to change

## Ordering information/type code

				8258 . XX				XX	XX	XX	XX	XX
<b>Measuring range</b> <sup>1)</sup>	<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 ... 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 <sup>5)</sup>	75	300	80	0 ... 250	750	2500	G9				
	0 ... 40 <sup>5)</sup>	120	300	81	0 ... 300 <sup>5)</sup>	900	4000	HA				
	0 ... 60 <sup>5)</sup>	180	400	82	0 ... 400 <sup>5)</sup>	1200	4000	H0				
	0 ... 100 <sup>5)</sup>	300	500	83	0 ... 1000 <sup>5)</sup>	3000	5000	H2				
	0 ... 160 <sup>5)</sup>	480	750	85	0 ... 1500 <sup>5)</sup>	4500	7000	H3				
	0 ... 250	750	1000	74	0 ... 2000 <sup>5)</sup>	6000	10000	H5				
	0 ... 400	1000	2000	84	0 ... 3000	9000	14500	G4				
	0 ... 600	1500	2500	86	0 ... 5000	12500	21750	H4				
	0 ... 700	1500	2500	87	0 ... 7500	18750	29000	H6				
					0 ... 10000	18750	29000	H7				
	<b>Sensor</b>	Relative pressure, accuracy: 0.3 %								23		
<b>Pressure connection</b>	G1/4" male, seal: DIN 3869 (accessory 61/63/83)								17			
	G1/4" male, with integrated damping Ø 0.5 mm, Seal: DIN 3869 (accessories 61/63/83)								15			
	G1/4" male (Manometer) EN 837 <sup>5)</sup>								53			
	1/4" NPT male								30			
	7/16"-20UNF-2A male, SAE J1926-3 (Light Duty), seal: accessory 61/63 <sup>8)</sup>								42			
	7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty), seal: accessory 61/63 <sup>9)</sup>								69			
	7/16"-20UNF female, SAE J512 with valve opener <sup>7)</sup>								24			
	7/16"-20UNF female, SAE J512 without valve opener <sup>7)</sup>								44			
	R1/4" male, DIN2999 <sup>5)</sup>								20			
	M10x1 male, DIN EN ISO 6149-2, seal: accessory 61								32			
	M12x1 male, seal: accessory 61 <sup>6)</sup>								64			
	M12x1.25 male, seal: accessory 61 <sup>6)</sup>								65			
M12x1.5 male, DIN EN ISO 9974-2, seal: accessory 61 <sup>5)</sup>								49				
<b>Electrical connection</b>	Male electrical connector, industrial standard, contact distance 9.4 mm, Mat. PA								01			
	Male electrical connector M12x1, 4-pole, Mat. PA, IEC 61076-2-101								32			
	Male electrical connector M12x1, 5-pole, Mat. PA, IEC 61076-2-101								35			
	Cable Mat. Radox Tenuis, IP67/IP68, 4 x 0.5 mm <sup>2</sup>								88			
<b>Output signal</b>	<b>Signal output</b>	<b>Load resistance</b>	<b>I (supply)</b>	<b>U (supply)</b>								
	4 ... 20 mA	See graphic	(= signal output)	24 (9 ... 32) VDC						19		
	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 plug 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 connector 01, industrial standard)		90
Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 Ground (only for output signal 19 and male electrical connector 01, industrial standard)		92
Special electrical connection: Pin 1 +, Pin 3 - (only for output signal 19 and male electrical connector 32, M12x1, 4-pole)		F5
Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 Ground (only for output signal 19 and male electrical connector 32, M12x1, 4-pole)		E1
Cable length 0.5 m		EM
Cable length 1.0 m		1M
Cable length 2.0 m		2M
Parametrisation according to customer specification for output signal PS, T1 (see table "Parameters")		ZC
Parametrisation standard for output signal PS, T1 (see table "Parameters")		ZS

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

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

<sup>3)</sup> Only with electrical connection 32

<sup>4)</sup> Not for pressure connection 53

<sup>5)</sup> Upon request

<sup>6)</sup> Without seal, use seal geometry according DIN EN ISO 6149-2

<sup>7)</sup> Max. allowable pressure range 60 bar (870 psi) at 180 bar (2610 psi) overpressure

<sup>8)</sup> Measuring range max. 350 bar according to SAE J1926-3 (Light Duty). Do not use for new designs, will be replaced by design according to SAE J1926-2 (Heavy Duty) in 2023

<sup>9)</sup> Measuring range max. 630 bar according to SAE J1926-2 (Heavy Duty)

Parameters				
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 (2 ... 99 %) Hysteresis $\geq$ 1 % FS	SP1	
Reset point RP1 (hysteresis mode) Lower switch point FL1 (window mode)	25 % Measuring range	< SP1, FH1 (1 ... 98 %) Hysteresis $\geq$ 1 % FS	RP1	
Switch point SP2 (hysteresis mode) Upper switch point FH2 (window mode)	75 % Measuring range	> RP2, FL2 (2 ... 99 %) Hysteresis $\geq$ 1 % FS	SP2	
Reset point RP2 (hysteresis mode) Lower switch point FL2 (window mode)	25 % Measuring range	< SP2, FH2 (1 ... 98 %) Hysteresis $\geq$ 1 % FS	RP2	
Switch point delay time SP1 / RP1 (hysteresis mode) Switch point delay time FH1 / FL1 (window mode)	0	0; approx. 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; approx. 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	

## **i** Parameterization of switching points

The switching points, delay times and output functions can be parameterised quickly and easily with the Sensor Master Communicator (SMC) application, which is available for Windows (PC) and Android smartphone. The Android app is available in the Google Play Store and the Windows app is available in the Microsoft Store. The apps are free of charge.



- Data sheet SMI Sensor Master Interface: [www.trafag.com/H72618](http://www.trafag.com/H72618)
- Instruction for the Sensor Master Communicator App (SMC) and the Sensor Master Interface (SMI): [www.trafag.com/H73618](http://www.trafag.com/H73618)



Specifications <sup>4)</sup>		
<b>Electrical data</b>	Output / supply voltage	4 ... 20 mA: 24 VDC (EN 50155) 1 or 2 PNP transistors: 24 VDC (EN 50155)
	Power-on delay time pressure transmitters	100 ms
	Power-on delay time pressure switches	50 ms + switching delay time
	Inverse-polarity protection, short-circuit strength @ 25°C during 5 min.	4...20 mA: to $U_s = 32$ VDC 1 or 2 PNP transistors: to $U_s = 32$ VDC
<b>Environmental conditions</b>	Media temperature	-40°C ... +85°C
	Ambient temperature	-40°C ... +85°C (EN 50155: OT6)
	Protection <sup>1)</sup>	IP65, IP67, IP68
	Humidity	Max. 95 % relative
	Vibration	14.4 g RMS (10...500 Hz) (EN60068-2-64) 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	100 g / 6 ms Male electrical plug M12x1 (EN60068-2-27) <sup>3)</sup>
<b>EMC protection</b>	Emission	EN/IEC 61000-6-3 EN50121-3-2
	Immunity	EN50121-3-2 <sup>2)</sup>
<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 connector	See ordering information
	Weight	appr. 50 g
	Mounting torque	25 Nm

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

<sup>2)</sup> Surge voltage on shield, shield connected on both sides

<sup>3)</sup> For electrical connections 32 and 35

<sup>4)</sup> Details see table "Details railway specifications"

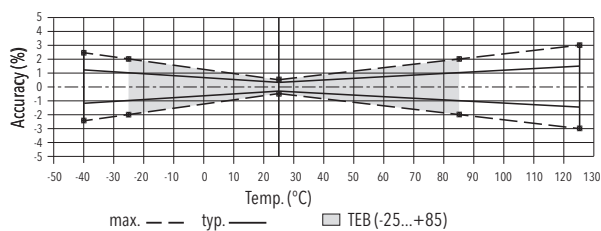
## Analogue output

Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.3
	NLH @ +25°C (BSL)	[% FS typ.]	± 0.2
	TC zero point and span	[% FS/K typ.]	± 0.01
	Long term stability 1 year @ +25°C	[% FS typ.]	± 0.1
Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure		

## Switching output

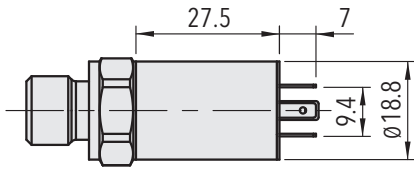
Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.3
	Long term stability 1 year	[% FS typ.]	± 0.1
Setting range of switchpoints	1 ... 99 % FS		
Distance switch point	≥ 1.0 % FS		
Switch point > reset point	Switchpoint > reset point		
Switching resistance	≤ 3 Ω		
Output 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
Current limiting	integrated		
Life time	> 100 x 10 <sup>6</sup> cycles		
Delay time	0; approx. 2 <sup>x</sup> [ms], x = 3, 4 ... 16		
Switching frequency	max. 60 Hz (at switching delay time = 0)		

## Measuring accuracy

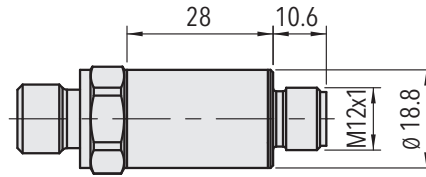


Details railways specifications			
Electrical data	Interruptions of the voltage supply	EN 50155	Class S1
	Switching between two supply voltages	EN 50155	Class C1
Environmental conditions	Cold	EN 60068-2-1	Ab: -40°C, 2 h (not in operation) Ae: -40°C, 1 h (in operation)
	Dry heat	EN 60068-2-2	Be: 85°C, 6 h (in operation)
	Damp heat, cyclic	EN 60068-2-30	Db: 55°C, Variant 1, 2 cycles (2 x 24 h)
	Class of altitude	EN 50125-1	AX (max. 2000 m ASL)
	Class of air temperature	EN 50125-1	refer to the specified ambient temperature in table "Specification"
	Switch-on extended operating temperature	EN 50155	Class ST0
	Rapid temperature variations	EN 50155	Class H1
	Salt mist	EN 60068-2-11	Ka: 480 h
	Vibration and shock	EN 61373	Vibration: category 3 Shock: category 3
	Dielectric strength	EN 50155	750 VDC
Resistance of insulation	EN 50155	>100 MΩ, 500 VDC	
Behavior in case of fire (electrical connections 01, 32, 35)	EN 45545-2	HL1, HL2, HL3	
Life class	EN50155	L4	

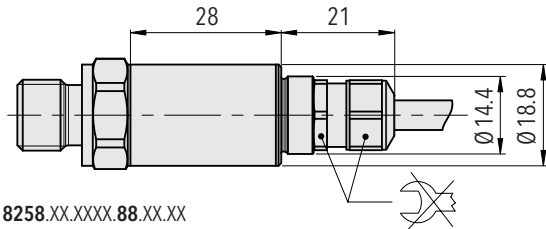
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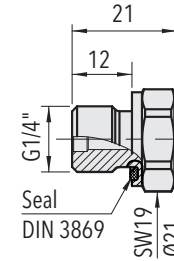
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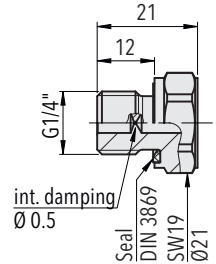
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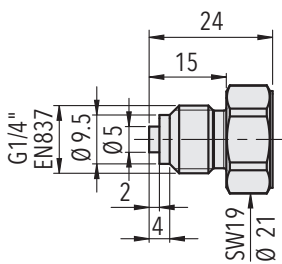
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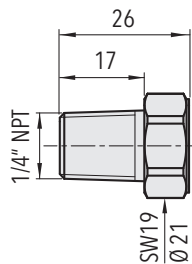
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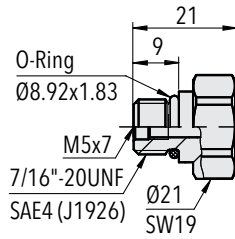
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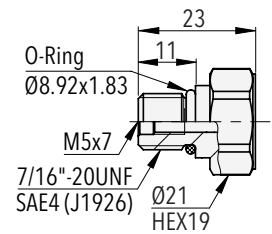
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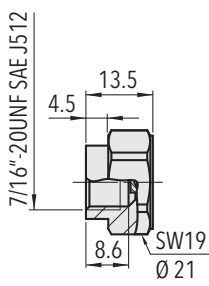
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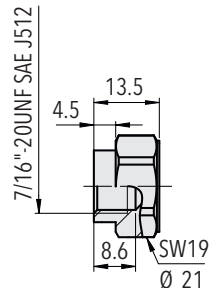
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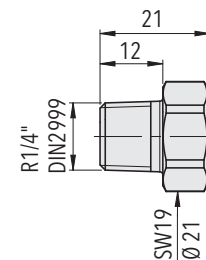
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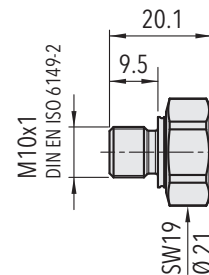
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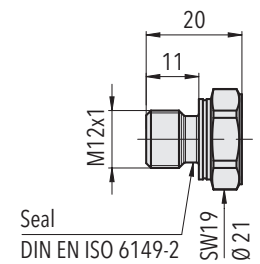
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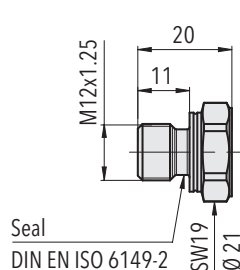
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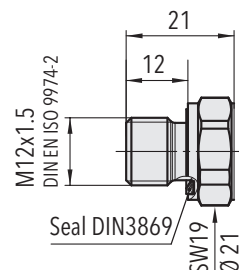
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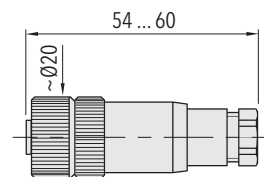
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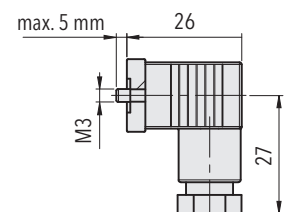
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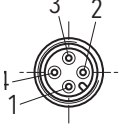
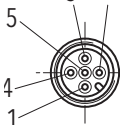
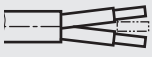
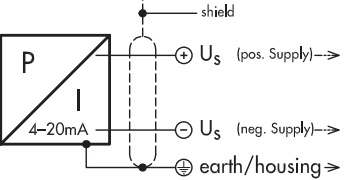
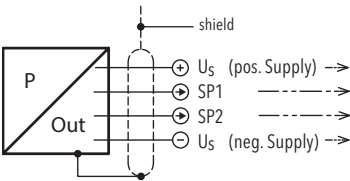


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## Electrical connection

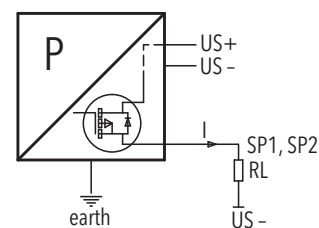
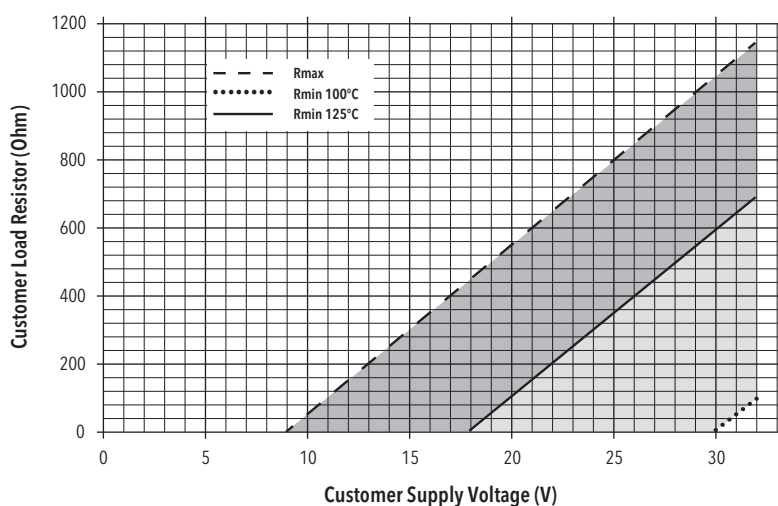
		Protection / electrical connection						
		IP65 <sup>1)2)</sup>		IP67 <sup>1)2)</sup>			IP67, IP68 <sup>2)3)</sup>	
		Industrial standard Contact distance 9.4 mm		M12x1			Cable	
		<b>01</b>		4-pole <b>32</b>		5-pole <b>35</b>		<b>88</b>
								
Output signal	 <p><b>8258.XX.XXXX.XX.19</b></p>		<b>90</b>	<b>92</b>	<b>F5</b>	<b>E1</b>		
		2	2	1	1	1	1	4
	1	4	2	3	3	2	1	brown
	4	3	4	4	4	4	5	black yellow / green
Output signal	 <p><b>8258.XX.XXXX.XX.PS/T1</b></p>				<b>PS</b>	<b>T1</b>		
					1	1		
				4	4			brown
				2	-			blue
				3	3			yellow / green
								black
								brown
								blue
								-
								black

<sup>1)</sup> Provided female electrical plug is mounted according to instructions

<sup>2)</sup> Ventilation via male electric plug/cable end

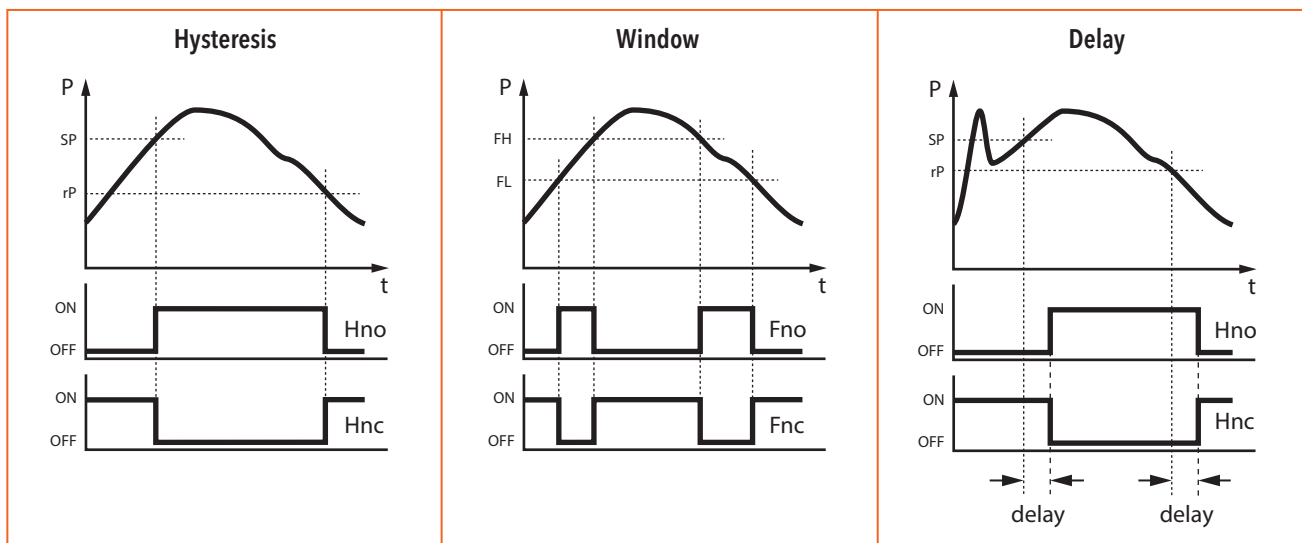
<sup>3)</sup> IP68, 20 bar, 30 min.

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



Connection of loads to switching output

## Functions switching output



### Additional information

#### Documents

Data sheet	<a href="http://www.trafag.com/H72307">www.trafag.com/H72307</a>
Instructions	<a href="http://www.trafag.com/H73303">www.trafag.com/H73303</a>
Flyer	<a href="http://www.trafag.com/H70697">www.trafag.com/H70697</a>