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 +125°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 transistors
- Excellent long-term stability
- Meets EN 50155 (railways)

04/2020
Data sheet H72307i
Subject to change

Technical Data			
Measuring principle	Thin-film-on-steel	Accuracy @ 25°C typ.	± 0.3 % FS typ.
Measuring range	0 ... 6 to 0 ... 600 bar 0 ... 100 to 0 ... 7500 psi	Media temperature	–40°C ... +85°C
Output signal	4 ... 20 mA, Switching output: 1 or 2 PNP transistors	Ambient temperature	EN 50155: OT6 (–40°C ... +85°C)
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)

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Ordering information/type code

8258 . XX XX XX XX XX XX

Measuring range [1]

Pressure measurement range [bar]	Over pressure [bar]	Burst pressure [bar]	
0 ... 6	18	100	77
0 ... 10	30	200	78
0 ... 16	48	200	79
0 ... 25 [5]	75	300	80
0 ... 40 [5]	120	300	81
0 ... 60 [5]	180	400	82
0 ... 100 [5]	300	500	83
0 ... 160 [5]	480	750	85
0 ... 250	750	1000	74
0 ... 400	1000	2000	84
0 ... 600	1500	2500	86

Pressure measurement range [psi]	Over pressure [psi]	Burst pressure [psi]	
0 ... 100	300	1450	G7
0 ... 150	450	2500	G8
0 ... 200	600	2500	GA
0 ... 250	750	2500	G9
0 ... 300 [5]	900	4000	HA
0 ... 400 [5]	1200	4000	H0
0 ... 1000 [5]	3000	5000	H2
0 ... 1500 [5]	4500	7000	H3
0 ... 2000 [5]	6000	10000	H5
0 ... 3000	9000	14500	G4
0 ... 5000	12500	21750	H4
0 ... 7500	18750	29000	H6

Sensor

Relative pressure, accuracy: 0.3 %	23

Pressure connection

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 [5]	53
1/4" NPT male	30
7/16"-20UNF SAE4 male (J1926), seal: accessory 61	42
R1/4" male, DIN2999 [5]	20
M10x1 male, DIN EN ISO 6149-2, seal: accessory 61	32
M12x1.5 male, DIN EN ISO 9974-2, seal: accessory 61 [5]	49

Electrical connection

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 mm²	88

Output signal

Signal output	Load resistance	I (supply)	U (supply)	
4 ... 20 mA	See graphic		24 (9 ... 32) VDC	19
2 PNP transistors [3]		≤ 10 mA	24 (9 ... 32) VDC	PS
1 PNP transistor [3]		≤ 10 mA	24 (9 ... 32) VDC	T1

Accessories

Female electrical plug M12x1, 5-pole [2]	33
Female electrical plug industrial standard (for electrical connection 01)	34
Pressure peak damping element ø 1.0 mm [4]	40
Pressure peak damping element ø 0.4 mm [4]	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 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
Parameterization according to customer specification for output signal PS, T1 (see table "Parameters")	ZC
Parameterization standard for output signal PS, T1 (see table "Parameters")	ZS

[1] Customized pressure ranges upon request
[2] For electrical connections 32 and 35
[3] Only with electrical connection 32
[4] Not for pressure connection 53
[5] Upon request

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 ≥ 1 % FS	SP1	
Reset point RP1 (hysteresis mode) Lower switch point FL1 (window mode)	25 % Measuring range	< SP1, FH1 (1 ... 98 %) Hysteresis ≥ 1 % FS	RP1	
Switch point SP2 (hysteresis mode) Upper switch point FH2 (window mode)	75 % Measuring range	> RP2, FL2 (2 ... 99 %) Hysteresis ≥ 1 % FS	SP2	
Reset point RP2 (hysteresis mode) Lower switch point FL2 (window mode)	25 % Measuring range	< SP2, FH2 (1 ... 98 %) Hysteresis ≥ 1 % FS	RP2	
Switch point delay time SP1 / RP1 (hysteresis mode) Switch point delay time FH1 / FL1 (window mode)	0	0; approx. 2^x[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^x[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
- Data sheet SMI Sensor Master Interface: H72618

Specifications [4]		
Electrical Data	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
Environmental conditions	Media temperature	–40°C ... +85°C
	Ambient temperature	EN 50155: OT6 (–40°C ... +85°C)
	Protection [1]	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) [3]
EMC Protection	Emission	EN/IEC 61000-6-3 EN50121-3-2
	Immunity	EN50121-3-2 [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 connector	See ordering information
	Weight	appr. 50 g
	Mounting torque	25 Nm

[1] See electrical connection

[2] Surge voltage on shield, shield connected on both sides

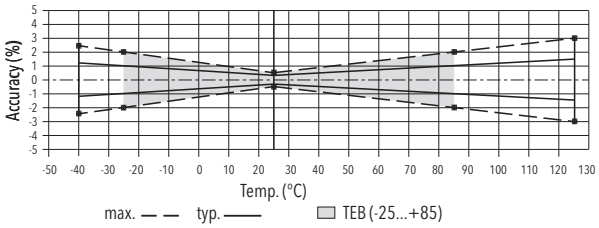
[3] For electrical connections 32 and 35

[4] 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	[% FS typ.]	± 0.1
Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure		

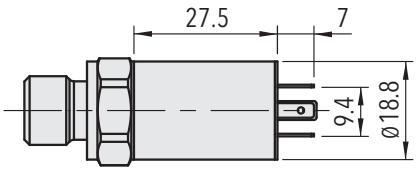
Switching output			
Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.3
	Long term stability 1 year	[% FS typ.]	± 0.1
Adjustment range of switchpoints	1 ... 99 % FS		
Distance switch point Switch point > reset point	≥ 1.0 % FS Switchpoint > reset point		
Switching resistance	≤ 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		
Delay time	0; approx.2^x[ms], x = 3, 4 ... 16		
Switching frequency	max. 60 Hz (at switching delay time = 0)		

Measuring accuracy

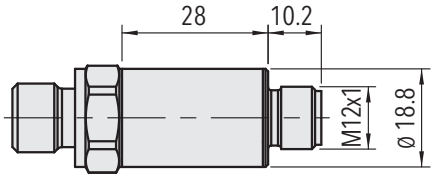


Details railways specifications			
Electrical data	Interruptions of the voltage supply	EN 50155	Class S1
	Switching between two supply voltages	EN 50155	Class C1
Environmental conditions	Cold	EN 60068-2-1	Ab: -40°C, 2 h (not in operation) Ae: -40°C, 1 h (in operation)
	Dry heat	EN 60068-2-2	Be: 85°C, 6 h (in operation)
	Damp heat, cyclic	EN 60068-2-30	Db: 55°C, Variant 1, 2 cycles (2 x 24 h)
	Switch-on extended operating temperature	EN 50155	Class ST0
	Rapid temperature variations	EN 50155	Class H1
	Vibration and shock	EN 61373	Vibration: category 3 Shock: category 3
	Dielectrical 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	Weight: < 10 g Surface: < 0.2 m^2

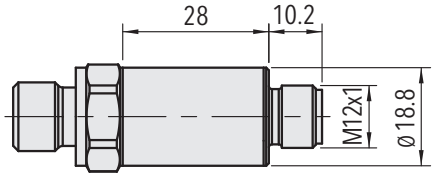
Dimensions



8258.XX.XXXX.**01**.XX.XX



8258.XX.XXXX.**32**.XX.XX



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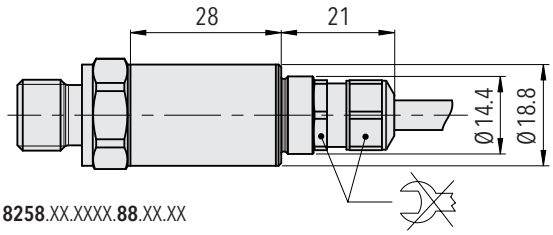

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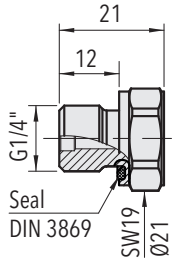
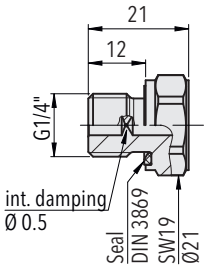


8258.XX.XX**17**.XX.XX.XX



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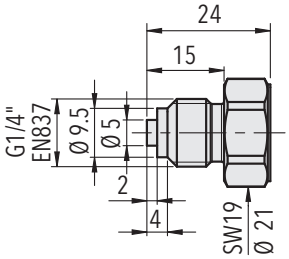

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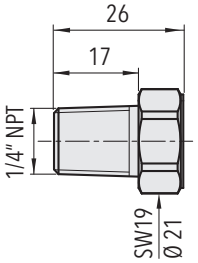
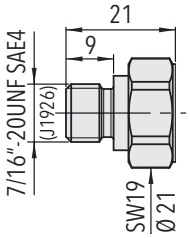


8258.XX.XX**30**.XX.XX.XX



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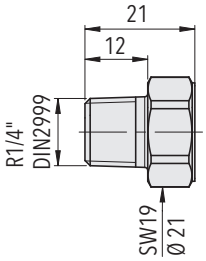

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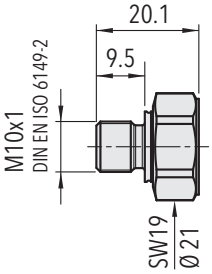
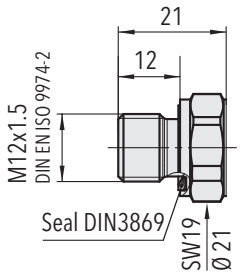
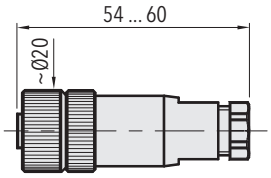


8258.XX.XX**32**.XX.XX.XX



8258.XX.XX**49**.XX.XX.XX



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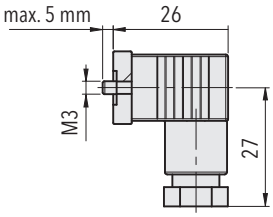
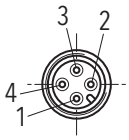
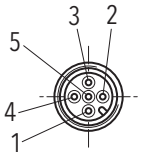
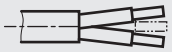
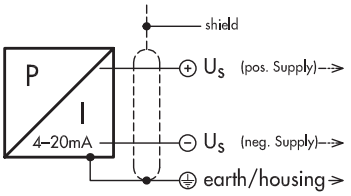
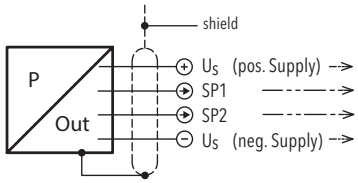


8258.XX.XXXX.XX.XX.**34**

Electrical connection

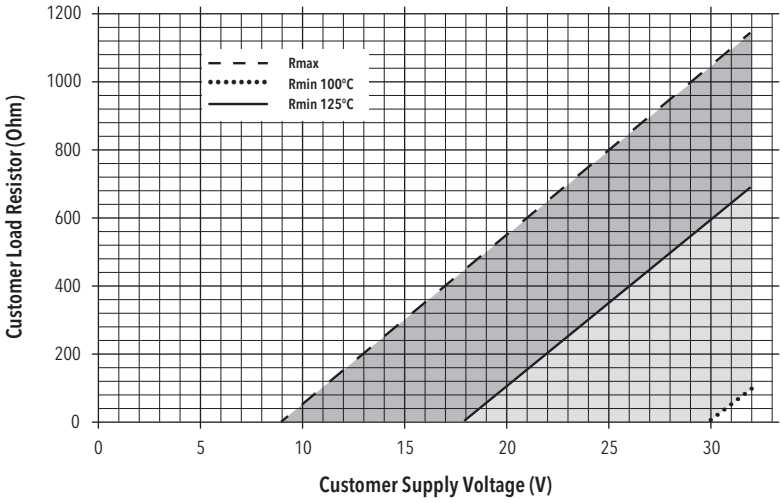
		Protection / electrical connection							
		IP65 [1)2)]			IP67 [1)2)]			IP67, IP68 [2)3)]	
		Industrial standard Contact distance 9.4 mm			M12x1 4-pole		M12x1 5-pole	Cable	
		01			**32**		**35**	**88**	
									
Output signal	 **8258**.xx.xxxx.xx.**19**		**90**	**92**		**E1**			
	shield								
	U_S (pos. Supply)	2	2	1	1	1	4	brown	
	U_S (neg. Supply)	1	4	2	3	2	1	black	
	earth/housing	4	3	4	4	4	5	yellow / green	
	 **8258**.xx.xxxx.xx.**PS/T1**				**PS**	**T1**		**PS**	**T1**
	shield								
	U_S (pos. Supply)				1	1		brown	brown
	SP1				4	4		blue	blue
	SP2				2	–		yellow / green	–
	U_S (neg. Supply)				3	3		black	black

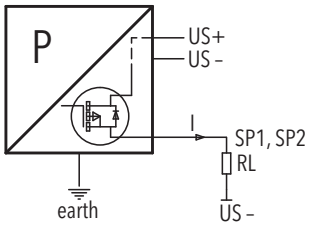
[1)] Provided female electrical plug is mounted according to instructions

[2)] Ventilation via male electric plug/cable end

[3)] IP68, 20 bar, 30 min.

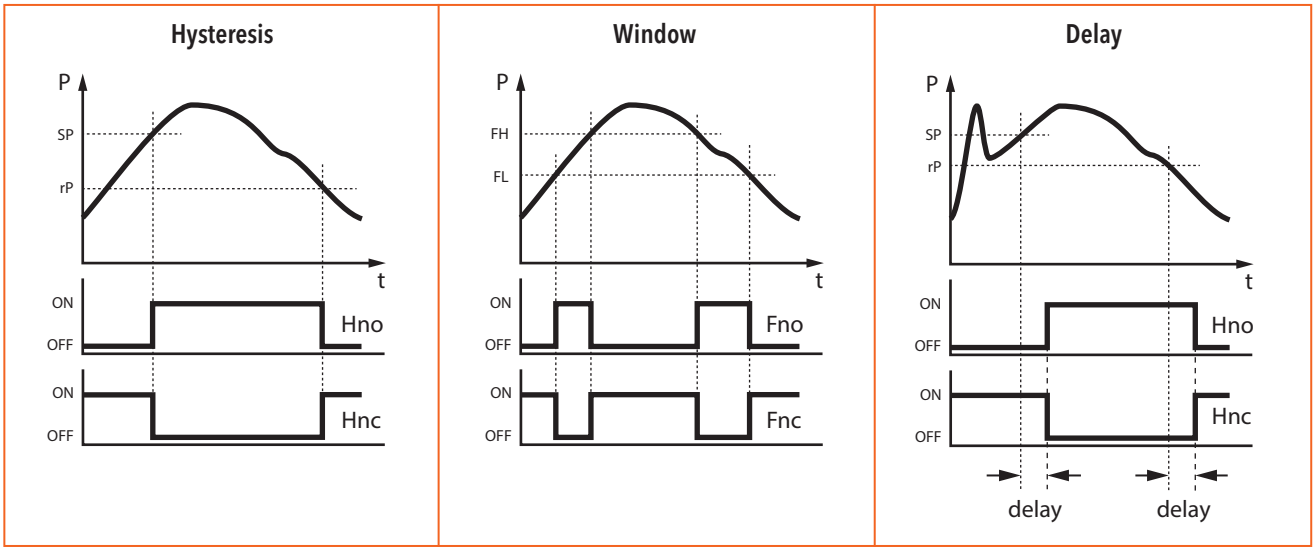
4...20mA: min./max resistor vs. supply voltage @ Pmax = 100%





Connection of loads to switching output

Functions switching output



Additional information		
Documents	Data sheet	www.trafag.com/H72307
	Instructions	www.trafag.com/H73303
	Flyer	www.trafag.com/H70697