

# 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 overpressure 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
- Dielectrical strength: 710 VDC, meets EN 50155 (Railways)

08/2018

Data sheet H72307e

Technical Data			
Measuring principle	Thin film on steel	Media temperature	-40°C ... +125°C
Measuring range	0 ... 6 to 0 ... 600 bar 0 ... 100 to 0 ... 7500 psi	Ambient temperature	-40°C ... +125°C
Output signal	4 ... 20 mA, Switching output: 1 or 2 PNP transistors	Approval / conformity	EN 50155 (Railway) EN 45545-2 (Fire protection) EN 61373 (Shock, vibration) EN 50121-3-2 (EMC)
Accuracy @ 25°C typ.	± 0.3 % FS typ.		

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	<b>77</b>	0 ... 100	300	1450	<b>G7</b>				
	0 ... 10	30	200	<b>78</b>	0 ... 150	450	2500	<b>G8</b>				
	0 ... 16	48	200	<b>79</b>	0 ... 200	600	2500	<b>GA</b>				
	0 ... 25 <sup>8)</sup>	75	300	<b>80</b>	0 ... 250	750	2500	<b>G9</b>				
	0 ... 40 <sup>8)</sup>	120	300	<b>81</b>	0 ... 300 <sup>8)</sup>	900	4000	<b>HA</b>				
	0 ... 60 <sup>8)</sup>	180	400	<b>82</b>	0 ... 400 <sup>8)</sup>	1200	4000	<b>H0</b>				
	0 ... 100 <sup>8)</sup>	300	500	<b>83</b>	0 ... 1000 <sup>8)</sup>	3000	5000	<b>H2</b>				
	0 ... 160 <sup>8)</sup>	480	750	<b>85</b>	0 ... 1500 <sup>8)</sup>	4500	7000	<b>H3</b>				
	0 ... 250	750	1000	<b>74</b>	0 ... 2000 <sup>8)</sup>	6000	10000	<b>H5</b>				
	0 ... 400	1000	2000	<b>84</b>	0 ... 3000	9000	14500	<b>G4</b>				
	0 ... 600	1500	2500	<b>86</b>	0 ... 5000	12500	21750	<b>H4</b>				
					0 ... 7500	18750	29000	<b>H6</b>				
<b>Sensor</b>	Relative pressure, accuracy: 0.3 %								<b>23</b>			
<b>Pressure connection</b>	G1/4" male, seal: DIN 3869 (accessory 61/63/83)								<b>17</b>			
	G1/4" male (Manometer) EN 871 <sup>8)</sup>								<b>53</b>			
	1/4" NPT male								<b>30</b>			
	7/16"-20UNF SAE4 male, seal: accessory 61 <sup>7)</sup>								<b>42</b>			
	R1/4" male, DIN2999 <sup>8)</sup>								<b>20</b>			
	M10x1 male, DIN EN ISO 6149-2, seal: accessory 61								<b>32</b>			
	M12x1.5 male, DIN EN ISO 9974-2, seal: accessory 61 <sup>8)</sup>								<b>49</b>			
<b>Electrical connection</b>	Male electrical plug, industrial standard, contact distance 9.4 mm, Mat. PA								<b>01</b>			
	Male electrical plug M12x1, 4-pole, Mat. PA, IEC 61076-2-101								<b>32</b>			
	Male electrical plug M12x1, 5-pole, Mat. PA, IEC 61076-2-101								<b>35</b>			
<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			24 (9 ... 32) VDC			<b>19</b>				
	2 PNP transistors <sup>5)</sup>		≤ 10 mA		24 (9 ... 32) VDC			<b>PS</b>				
	1 PNP transistor <sup>5)</sup>		≤ 10 mA		24 (9 ... 32) VDC			<b>T1</b>				
<b>Accessories</b>	Female electrical plug M12x1, 5-pole <sup>2)</sup>								<b>33</b>			
	Female electrical connector industrial standard (for electrical connection 01)								<b>34</b>			
	Pressure peak damping element ø 1.0 mm <sup>6)</sup>								<b>40</b>			
	Pressure peak damping element ø 0.4 mm <sup>6)</sup>								<b>44</b>			
	Seal FPM, -18°C ... +125°C								<b>61</b>			
	Seal EPDM, -40°C ... +125°C								<b>63</b>			
	Seal NBR, -25°C ... +100°C								<b>83</b>			
	Special electrical connection: Pin 2 +, Pin 3 Ground, Pin 4 - (only for output signal 19 and male electrical plug 01, industrial standard)								<b>90</b>			
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 Ground (only for output signal 19 and male electrical plug 01, industrial standard)								<b>92</b>			
	Special electrical connection: Pin 1 +, Pin 2 -, Pin 4 Ground (only for output signal 19 and male electrical plug 32, M12x1, 4-pole)								<b>E1</b>			
	Parameterization according to customer specification for output signal PS, T1 (see table "Parameters")								<b>ZC</b>			
	Parameterization standard for output signal PS, T1 (see table "Parameters")								<b>ZS</b>			

<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> 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> Not for pressure connection 53

<sup>7)</sup> According to norm J1926, max. 35 MPa

<sup>8)</sup> 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 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	

## **i** 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		
<b>Electrical Data</b>	Output / supply voltage	4 ... 20 mA: 24 (9...32) VDC 1 or 2 PNP transistors: 24 (9...32) VDC
	Switch-on-delay pressure transmitters	100 ms
	Switch-on-delay 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 ... +125°C
	Ambient temperature	-40°C ... +125°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>3)</sup>
<b>EMC Protection</b>	Emission	EN/IEC 61000-6-3 EN50121-3-2
	Immunity	EN/IEC 61000-6-2 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 plug	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

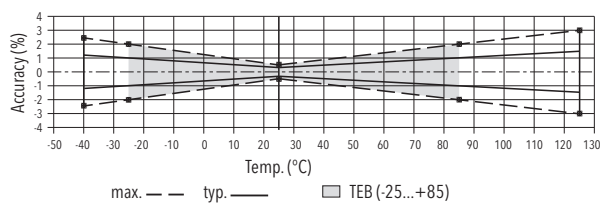
## Analogue output

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	≥ 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

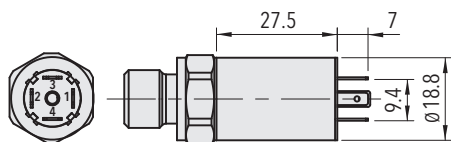


Additional specifications railways			
Environmental conditions	Cold	EN 60068-2-1	Ab: -40°C, 2 h (not in operation) Ae: -40°C, 1 h (in operation)
	Dry heat	EN 60068-2-2	Be: 85°C, 6 h (in operation)
	Damp heat, cyclic	EN 60068-2-30	Db: 55°C, variant 1, 2 cycles (2 x 24 h)
	Ambient temperature	EN 50155	Class TX
	Vibration and shock	EN 61373	Vibration: category 3 <sup>1)</sup> Shock: category 3 <sup>1)</sup>
	Dielectrical strength	EN 50155	710 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 <sup>2</sup>
Supply	Nominal voltage	EN 50155 <sup>2)</sup>	24 V
	Interruptions of the voltage supply	EN 50155 <sup>2)</sup>	Class S1
	Switching between two supply voltages	EN 50155 <sup>2)</sup>	Class C1

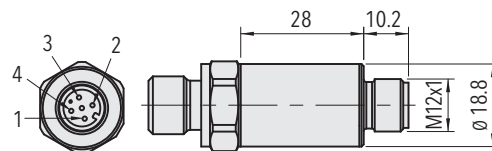
<sup>1)</sup> In Category 3 the 2010 versions' higher severity levels apply in each case

<sup>2)</sup> Chapter 5.1 Voltage supply

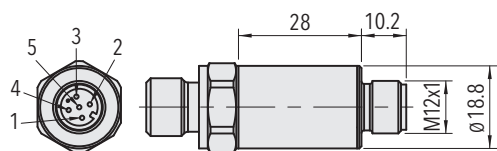
## Dimensions



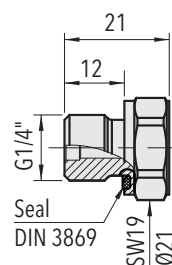
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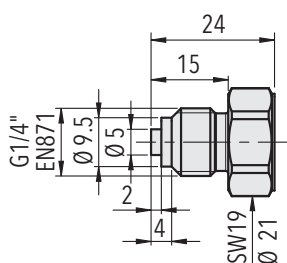
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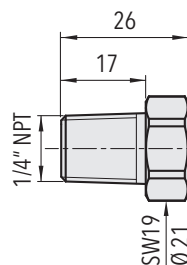
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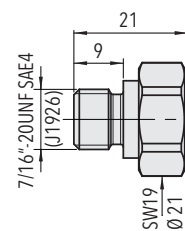
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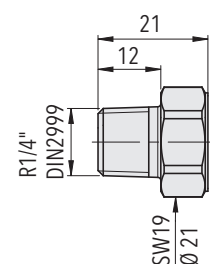
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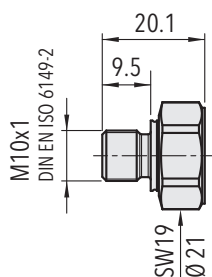
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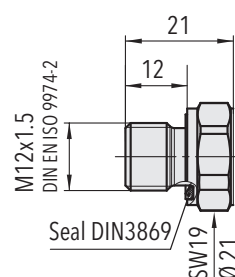
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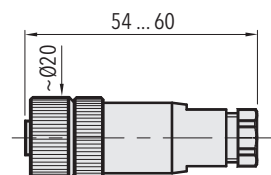
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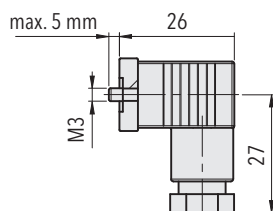
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8258.XX.XX49.XX.XX.XX


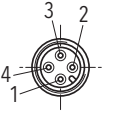
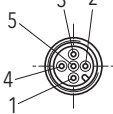
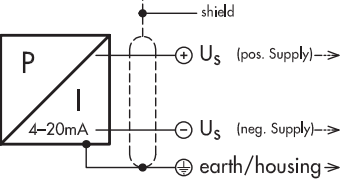
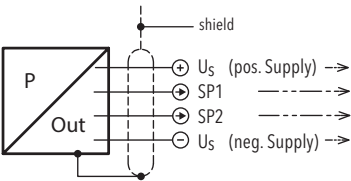


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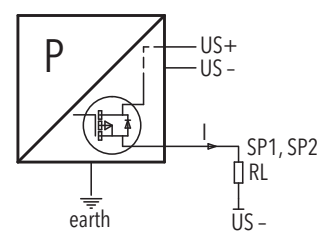
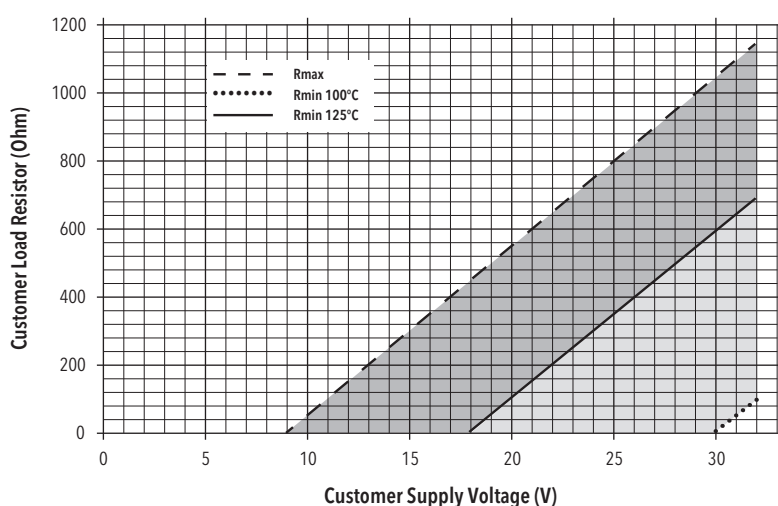
## Electrical connection

		Protection / electrical connection					
		IP65 *)**)			IP67 *)**)		
		Industrial standard Contact distance 9.4 mm <b>01</b>			M12x1 4-pole <b>32</b>		5-pole <b>35</b>
							
Output signal	 <p><b>8258.XX.XXXX.XX.19</b></p>		<b>90</b>	<b>92</b>		<b>E1</b>	
		2	2	1	1	1	4
	1	4	2	3	2	1	
	4	3	4	4	4	5	
	 <p><b>8258.XX.XXXX.XX.PS/T1</b></p>				<b>PS</b>	<b>T1</b>	
					1	1	
					4	4	
					2	-	
					3	3	

\*) Provided female connector is mounted according to instructions

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

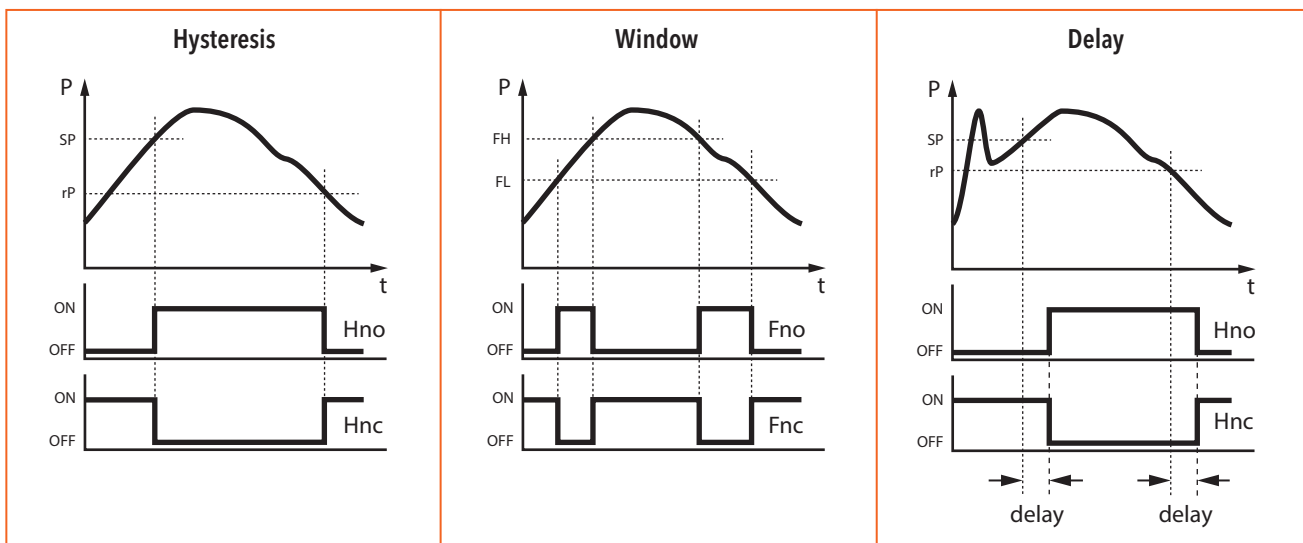
4...20mA: min./max resistor vs. supply voltage @ Pmax = 100%



Connection of loads to 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>