

# MARINE PRESSURE TRANSMITTER

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. The engine and shipbuilding pressure transmitter NAE 8256 features the extremely robust and stable thin-film-on-steel sensor element. The NAE 8256 is the smallest pressure transmitter of its kind with ship approvals. The wide temperature range from -40°C up to +125°C and triple overpressure safety makes it the first choice in rough environments such as marine applications.



## Applications

- Shipbuilding
- Engine manufacturing
- Hydraulics

## Features

- Measuring accuracy 0.3 %
- Completely welded steel sensor system without additional seals
- High resistance to over pressure
- Excellent long-term stability
- Optional: Switching output 1 or 2 PNP

Technical Data			
Measuring principle	Thin-film-on-steel	Accuracy @ 25°C typ.	0.3 %: ± 0.3 % FS typ.
Measuring range	0 ... 0.2 to 0 ... 700 bar 0 ... 3 to 0 ... 10'000 psi	Media temperature	-40°C ... +125°C
Output signal	4 ... 20 mA, Switching output: 1 or 2 PNP	Ambient temperature	-40°C ... +125°C (cable Radox Tenuis 88: -40°C ... +100°C)
NLH @ 25°C (BSL) typ.	0.3 %: ± 0.2 % FS typ.	Approval / conformity	DNV EU RO Mutual Recognition Type Approval Certificate

09/2023

Data sheet H723050

Subject to change

## Ordering information/type code

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]		8256 .	XX	XX	XX	XX	XX	
	0 ... 0.2	1.2	25	<b>68</b>	0 ... 3	15	350	<b>F8</b>							
	0 ... 0.4	1.2	25	<b>69</b>	0 ... 5	15	350	<b>F9</b>							
	0 ... 0.6	1.2	25	<b>70</b>	0 ... 10	20	350	<b>G0</b>							
	0 ... 1.0	2	25	<b>71</b>	0 ... 15	30	350	<b>G1</b>							
	0 ... 1.6	3.2	50	<b>73</b>	0 ... 25	50	700	<b>G3</b>							
	0 ... 2.5	7.5	50	<b>75</b>	0 ... 30	90	700	<b>G5</b>							
	0 ... 4	12	60	<b>76</b>	0 ... 50	150	850	<b>G6</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	75	300	<b>80</b>	0 ... 250	750	2500	<b>G9</b>							
	0 ... 40	120	300	<b>81</b>	0 ... 300	900	4000	<b>HA</b>							
	0 ... 60	180	400	<b>82</b>	0 ... 400	1200	4000	<b>H0</b>							
	0 ... 100	300	500	<b>83</b>	0 ... 500	1200	4000	<b>H1</b>							
	0 ... 160	480	750	<b>85</b>	0 ... 1000	3000	5000	<b>H2</b>							
	0 ... 250	750	1000	<b>74</b>	0 ... 1500	4500	7000	<b>H3</b>							
	0 ... 400	1000	2000	<b>84</b>	0 ... 2000	6000	10000	<b>H5</b>							
	0 ... 600	1500	2500	<b>86</b>	0 ... 3000	9000	14500	<b>G4</b>							
	0 ... 700	1500	2500	<b>87</b>	0 ... 5000	12500	21750	<b>H4</b>							
					0 ... 7500	18750	29000	<b>H6</b>							
					0 ... 10000	18750	29000	<b>H7</b>							
<b>Sensor</b>	Relative pressure, accuracy: 0.3 %									<b>23</b>					
<b>Pressure connection</b>	G1/4" male, seal: DIN 3869 (accessories 61/63/83)										<b>17</b>				
	G1/4" male, with integrated damping Ø 0.5 mm, Seal: DIN 3869 (accessories 61/63/83)										<b>15</b>				
	G1/4" male (Manometer) EN 837										<b>53</b>				
	1/4" NPT male										<b>30</b>				
	M10x1 male, DIN EN ISO 6149-2, seal: accessory 61										<b>32</b>				
<b>Electrical connection</b>	Male electrical connector M12x1, 4-pole, Mat. PA, IEC 61076-2-101										<b>32</b>				
	Male electrical connector M12x1, 5-pole, Mat. PA, IEC 61076-2-101										<b>35</b>				
	Cable Mat. Radox Tenuis, IP67/IP68, 4 x 0.5 mm <sup>2 4)</sup>										<b>88</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			(= signal output)			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>		

Accessories		
Female electrical plug M12x1, 5-pole <sup>6)</sup>		33
Pressure peak damping element $\varnothing$ 0.4 mm		44
Seal FPM, -18°C ... +125°C <sup>2)</sup>		61
Seal EPDM, -40°C ... +125°C <sup>7)</sup>		63
Seal NBR, -25°C ... +100°C <sup>7)</sup>		83
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

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

<sup>2)</sup> Only for pressure connections 17 and 32

<sup>4)</sup> Cable length see accessories

<sup>5)</sup> Only with electrical connections 32 and 88

<sup>6)</sup> For electrical connections 32 and 35

<sup>7)</sup> Only with pressure connection 17 (G1/4")

## Standard products (extra short lead time)

Product No.	Type Code	Pressure range [bar]	Over pressure max. [bar]	Supply [VDC]	Accuracy @ 25°C typ. [%]
NAE6.0A	8256 77 2317 32 0000 0000 19 33 44 61	0 ... 6	18	9 ... 32	± 0.3
NAE10.0A	8256 78 2317 32 0000 0000 19 33 44 61	0 ... 10	30	9 ... 32	± 0.3
NAE16.0A	8256 79 2317 32 0000 0000 19 33 44 61	0 ... 16	48	9 ... 32	± 0.3
NAE25.0A	8256 80 2317 32 0000 0000 19 33 44 61	0 ... 25	75	9 ... 32	± 0.3
NAE40.0A	8256 81 2317 32 0000 0000 19 33 44 61	0 ... 40	120	9 ... 32	± 0.3
NAE100.0A	8256 83 2317 32 0000 0000 19 33 44 61	0 ... 100	300	9 ... 32	± 0.3
NAE250.0A	8256 74 2317 32 0000 0000 19 33 44 61	0 ... 250	750	9 ... 32	± 0.3
NAE400.0A	8256 84 2317 32 0000 0000 19 33 44 61	0 ... 400	1000	9 ... 32	± 0.3
NAE600.0A	8256 86 2317 32 0000 0000 19 33 44 61	0 ... 600	1500	9 ... 32	± 0.3

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. $2^x$ [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 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		
<b>Electrical data</b>	Output / supply voltage	4 ... 20 mA: 24 (9...32) VDC 1 or 2 PNP transistors 24 (9...32) VDC
	Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure
	Power-on delay time	100 ms
	Inverse-polarity protection, short-circuit strength @ 25°C during 5 min.	4 ... 20 mA: to $U_{\text{supply}} = 32 \text{ V}$ 1 or 2 PNP transistors: to $U_s = 32 \text{ VDC}$
	<b>Environmental conditions</b>	
	Media temperature	-40°C ... +125°C
	Ambient temperature	-40°C ... +125°C (cable Radox Tenuis 88: -40°C ... +100°C)
	Protection <sup>1)</sup>	IP65, IP67, IP68
	Humidity	IEC 60068-2-30 (damp heat, cyclic, 100 % RH @ +55°C)
	Vibration	15 g RMS (20...2000 Hz) 25 g sin (80...2000 Hz), 1 oct./min, (1x @ 25°C)
	Shock	50 g / 11 ms
<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/NBR/EPDM
	Male electrical connector	See ordering information
	Weight	~ 50 g
	Mounting torque	25 Nm

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

## Analogue output

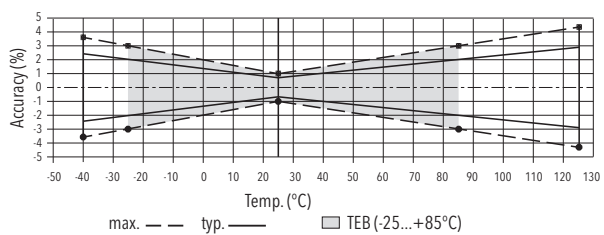
			Sensor 23 (0.3 %)		
			$\geq 0.2 \text{ bar}$ $\leq 0.6 \text{ bar}$	$> 0.6 \text{ bar}$ $< 2.0 \text{ bar}$	$\geq 2.0 \text{ bar}$
Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 2.0	± 1.5	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.8	± 0.6	± 0.3
	NLH @ +25°C (BSL)	[% FS typ.]	± 0.2	± 0.2	± 0.2
	TC zero point and span	[% FS/K typ.]	± 0.02	± 0.02	± 0.01
	Long term stability 1 year @ +25°C	[% FS typ.]	± 0.3	± 0.2	± 0.1

## Switching output

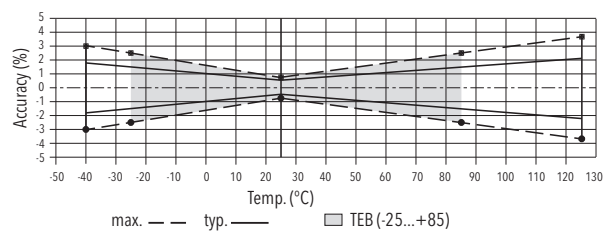
			Sensor 23 (0.3 %)		
			$\geq 0.2 \text{ bar}$ $\leq 0.6 \text{ bar}$	$> 0.6 \text{ bar}$ $< 2.0 \text{ bar}$	$\geq 2.0 \text{ bar}$
Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 2.0	± 1.5	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.8	± 0.6	± 0.3
	Long term stability 1 year @ +25°C	[% FS typ.]	± 0.3	± 0.2	± 0.1
Setting range of switchpoints	1 ... 99 % FS				
Distance switch point Switch point > reset point	$\geq 1.0 \text{ % FS}$ Switchpoint > reset point				
Switching resistance	$\leq 3 \Omega$				
Output function	Hysteresis, Window; normally closed (NO), normally open (NC)				
Switching current	Ambient and media temperature -40°C ... + 85°C: $\leq 400 \text{ mA}$ , total of both switching outputs Ambient and media temperature +85°C ... +125°C: $\leq 200 \text{ mA}$ , total of both switching outputs				
Current limiting	integrated				
Lifetime	$> 100 \times 10^6 \text{ cycles}$				
Delay time	0; ca. $2x \text{ [ms]}$ , $x = 3, 4 \dots 16$				
Switching frequency	max. 60 Hz (at switching delay time = 0)				

## Measuring accuracy 0.3 %

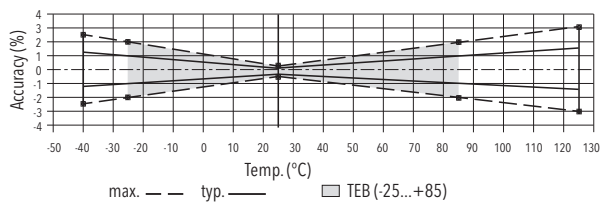
≥ 0.2 bar ... ≤ 0.6 bar



≥ 0.2 bar ... ≤ 0.6 bar

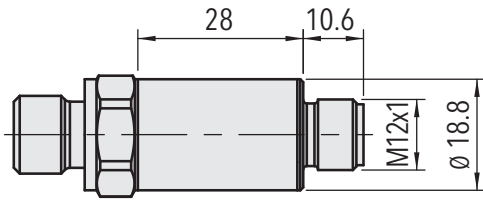


≥ 2.0 bar

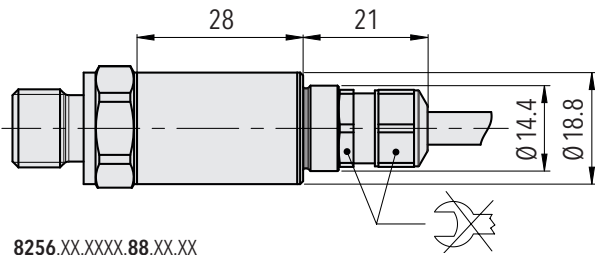




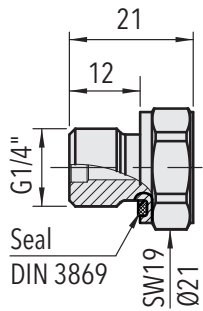
## Dimensions



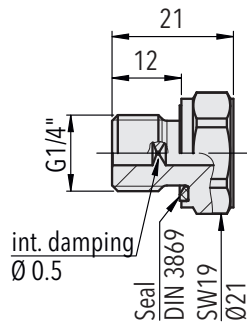
8256.XX.XXXX.32/35.XX.XX



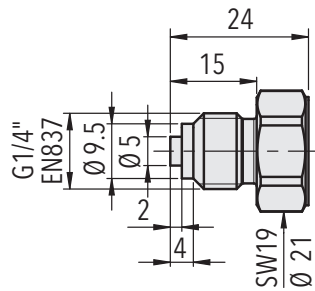
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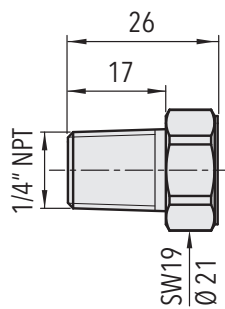
8256.XX.XX17.XX.XX.XX



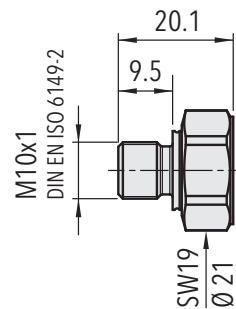
8256.XX.XX15.XX.XX.XX



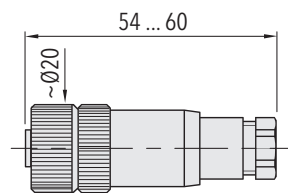
8256.XX.XX53.XX.XX.XX



8256.XX.XX30.XX.XX.XX

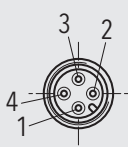
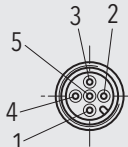
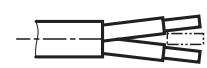
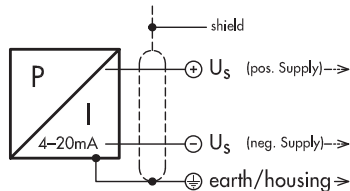
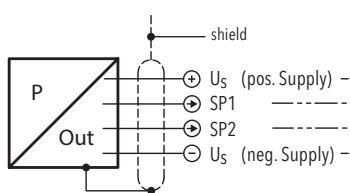


8256.XX.XX32.XX.XX.XX



8256.XX.XXXX.XX.XX.33

## Electrical connection

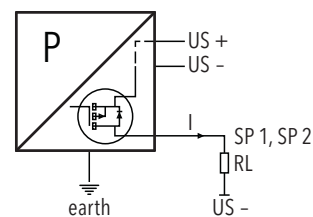
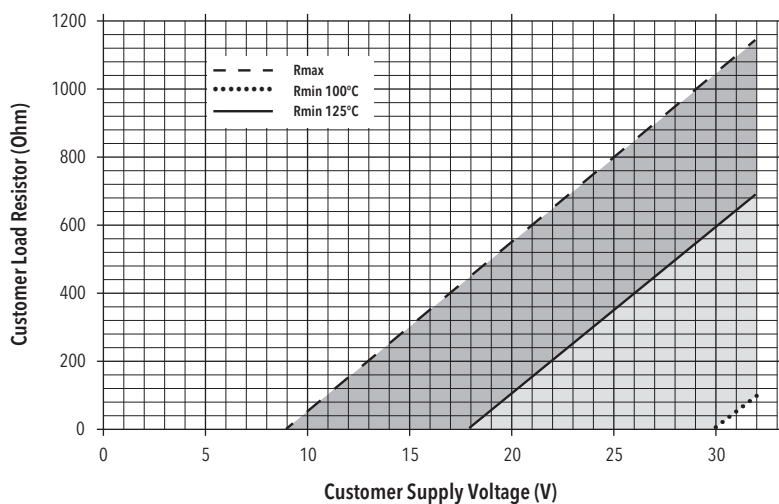
		Protection / electrical connection			
		IP65, IP67 <sup>1) 2)</sup>		IP65, IP67, IP68 <sup>2) 3)</sup>	
		M12x1		Cable	
		4-pole <b>32</b>	5-pole <b>35</b>	<b>88</b>	
					
Output signal	 <p><b>8256.xx.xxxx.xx.19</b></p>	<p><b>E1</b></p>			
	 <p><b>8256.xx.xxxx.xx.PS/T1</b></p>	<p><b>PS</b>      <b>T1</b></p>		<p><b>PS</b>      <b>T1</b></p>	
		<p>1</p> <p>3</p> <p>4</p>	<p>1</p> <p>2</p> <p>4</p>	<p>4</p> <p>1</p> <p>5</p>	<p>brown</p> <p>black</p> <p>yellow / green</p>
		<p>1</p> <p>4</p> <p>2</p> <p>3</p>	<p>1</p> <p>4</p> <p>-</p> <p>3</p>		<p>brown</p> <p>blue</p> <p>yellow / green</p> <p>black</p>

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

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

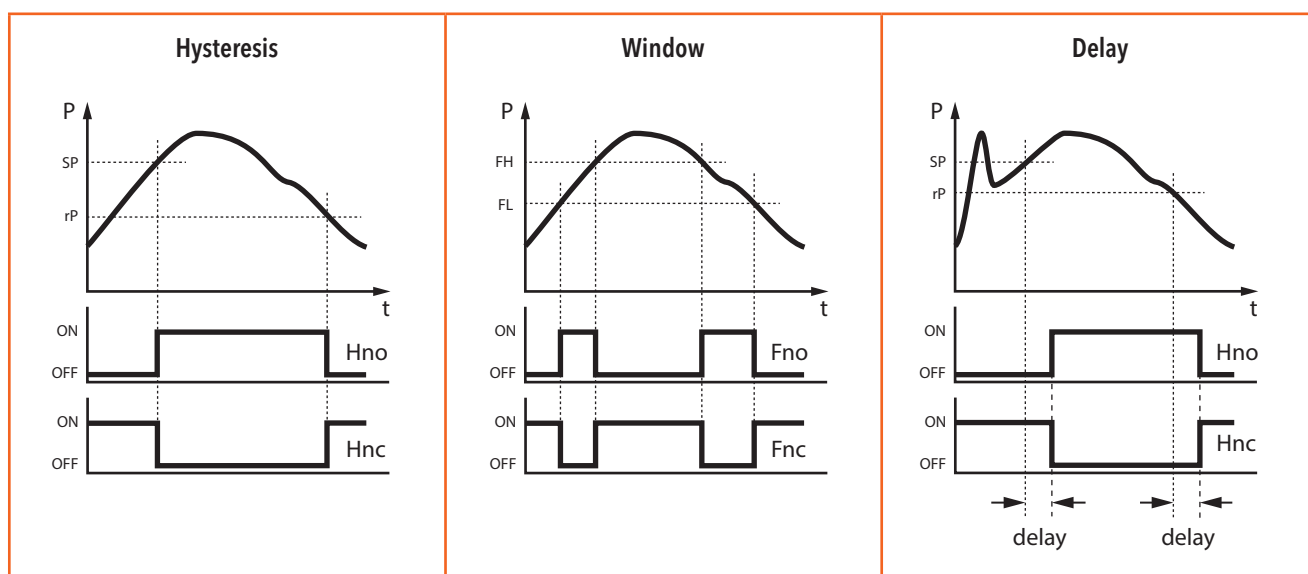
<sup>3)</sup> IP68, 20 bar, 30 min.

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/H72305">www.trafag.com/H72305</a>
Instructions	<a href="http://www.trafag.com/H73303">www.trafag.com/H73303</a>
Flyer	<a href="http://www.trafag.com/H70684">www.trafag.com/H70684</a>