

Marine Pressure Transmitter



Product description

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

 EMC: 2014/30/EU

 S.I. 2016 No. 1091

 RoHS/Reach compliant

 BV, DNV

Technical Data

Measuring principle	Thin-film-on-steel
Measuring range	0 ... 0.2 to 0 ... 700 bar 0 ... 3 to 0 ... 10'000 psi
Output signal	4 ... 20 mA, Switching output: 1 or 2 PNP
Media temperature	-40°C ... +125°C
Ambient temperature	-40°C ... +125°C (Cable Radox Tenuis 88: -40°C ... +100°C)

Additional information

Data sheet www.trafag.com/H72305
 Instructions www.trafag.com/H73303
 Accessories www.trafag.com/H72258
 Video <https://youtu.be/KoyQUW8K1RU>

Ordering information/Type code

Ordering information/Type code				8256	XX	XX	XX	XX	XX	XX	
Measuring range ¹⁾	Pressure measurement range [bar]	Over pressure [bar]	Burst pressure [bar]	Pressure-measurement-range [psi]	Over pressure [psi]	Burst pressure [psi]					
	0 ... 0.2	1.2	25	68	0 ... 3	15	350	F8			
	0 ... 0.4	1.2	25	69	0 ... 5	15	350	F9			
	0 ... 0.6	1.2	25	70	0 ... 10	20	350	G0			
	0 ... 1.0	2	25	71	0 ... 15	30	350	G1			
	0 ... 1.6	3.2	50	73	0 ... 25	50	700	G3			
	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	1200	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			
	0 ... 700	1500	2500	87	0 ... 5000	12500	21750	H4			
					0 ... 7500	18750	29000	H6			
					0 ... 10000	18750	29000	H7			
Sensor	Relative pressure, accuracy: 0.3 %									23	
Pressure connection	G1/4" male, Seal: DIN 3869										17
	G1/4" male, with integrated damping Ø 0.5 mm, Seal: DIN 3869										15
	G1/4" male (Manometer) EN 837										53
	G1/8" male DIN 3852-E ²⁾										54
	1/4" NPT male										30
	M10x1 male, DIN EN ISO 6149-2										32
Electrical connection	Male electrical connector M12x1, 4-pole, Material PA, IEC 61076-2-101										32
	Male electrical connector M12x1, 5-pole, Material PA, IEC 61076-2-101										35
	Cable material Radox Tenuis, IP67/IP68, 4 x 0.5 mm ^{2 3)}										88
Output signal	Output signal	Load resistance	I (supply)		U (supply)						
	4 ... 20 mA	See graphic	(= signal output)		24 (9 ... 32) VDC					19	
	2 PNP transistors ⁴⁾		≤ 10 mA		24 (9 ... 32) VDC					P5	
	1 PNP transistor ⁴⁾		≤ 10 mA		24 (9 ... 32) VDC					T1	

8256 XX XX XX XX XX XX

Accessories		
Female electrical plug M12x1, 4-pole ⁵⁾		33
Pressure peak damping element \varnothing 0.4 mm		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 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

⁰¹⁾ Customized pressure ranges upon request

⁰²⁾ max. allowable pressure range 160 bar (2320 psi) at 480 bar (6961 psi) overpressure

⁰³⁾ Cable length, see Accessories

⁰⁴⁾ Only with electrical connections 32 and 88

⁰⁵⁾ For electrical connections 32 and 35

Compatibility matrix pressure connection and accessories

Code	Pressure connection	Damping	Seal		
		\varnothing 0.4 mm (Code 44)	FKM (Code 61)	EPDM (Code 63)	NBR (Code 83)
17	G1/4" male, Seal: DIN 3869	✓	✓	✓	✓
15	G1/4" male, with integrated damping \varnothing 0.5 mm, Seal: DIN 3869		✓	✓	✓
53	G1/4" male (Manometer) EN 837				
54	G1/8" male DIN3852-E	✓	✓	✓	
30	1/4" NPT male	✓			
32	M10x1 male, DIN EN ISO 6149-2	✓	✓		

Standard products (extra short lead time)

Product No.	Type Code	Pressure range [bar]	Overpressure 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 of switching output

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	

Specifications

Electrical data	Output / supply voltage	4 ... 20 mA: 24 (9 ... 32) VDC 1 or 2 PNP transistors 24 (9 ... 32) VDC
	Power-on delay time	100 ms
	Rise time of supply voltage	typ. 1 ms, 10 ... 90 % nominal pressure
	Inverse-polarity protection, short-circuit strength @ 25°C during 5 min.	4 ... 20 mA: to $U_s = 32$ V 1 or 2 PNP transistors: to $U_s = 32$ VDC
	Resistance of insulation	> 10 M Ω , 50 VDC
	Dielectric strength	50 VAC, 50 Hz
	Current limiting output signal	4 ... 20 mA: 24 mA (Overload)
Environmental conditions	Media temperature	-40°C ... +125°C
	Ambient temperature	-40°C ... +125°C (Cable Radox Tenuis 88: -40°C ... +100°C)
	Storage temperature	-20°C ... +40°C
	Protection ¹⁾	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
EMC protection	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
Mechanical data	Sensor (wetted parts)	1.4542 (AISI 630)
	Pressure connection (wetted parts)	1.4542 (AISI 630)
	Housing	1.4301 (AISI 304)
	Sealing	FKM, NBR, EPDM
	Male electrical connector	See ordering information
	Weight	~ 50 g
	Mounting torque	25 Nm

¹⁾ See electrical connection

Analogue output

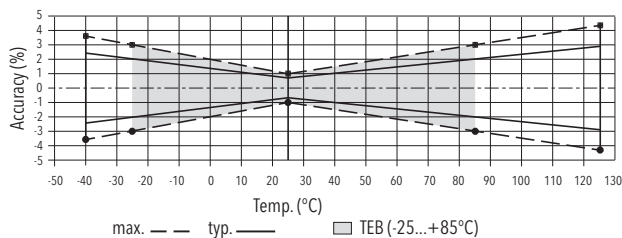
			Sensor 23 (0.3 %)		
			≥ 0.2 bar ≤ 0.6 bar	> 0.6 bar < 2.0 bar	≥ 2.0 bar
Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 2.0	± 1.5	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.8	± 0.6	± 0.3
	NLH @ +25°C (BSL)	[% FS typ.]	± 0.2	± 0.2	± 0.2
	TC zero point and span	[% FS/K typ.]	± 0.02	± 0.02	± 0.01
	Long term stability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

Switching output

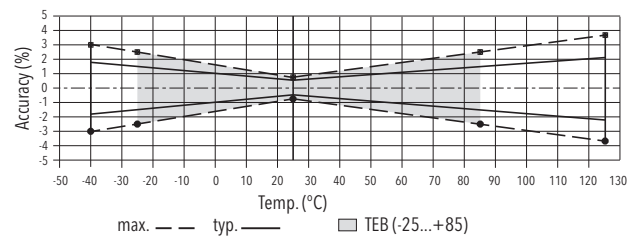
			Sensor 23 (0.3 %)		
			≥ 0.2 bar ≤ 0.6 bar	> 0.6 bar < 2.0 bar	≥ 2.0 bar
Accuracy	TEB @ -25 ... +85°C	[% FS typ.]	± 2.0	± 1.5	± 1.0
	Accuracy @ +25°C	[% FS typ.]	± 0.8	± 0.6	± 0.3
	Long term stability 1 year @ +25°C	[% FS typ.]	± 0.3	± 0.2	± 0.1
Setting range of switchpoints	1 ... 99 % FS				
Distance switch point	≥ 1.0 % FS				
Switch point > reset point	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: ≤ 400 mA, total of both switching outputs Ambient and media temperature +85°C ... +125°C: ≤ 200 mA, total of both switching outputs				
Current limiting	Integrated				
Lifetime	$> 100 \times 10^6$ cycles				
Delay time	0; ca. 2^x [ms], x = 3, 4 ... 16				
Switching frequency	max. 60 Hz (at switching delay time = 0)				

Accuracy class 0.3 %

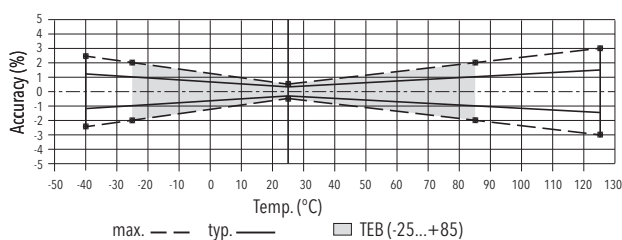
≥ 0.2 bar ... ≤ 0.6 bar



> 0.6 bar ... < 2.0 bar

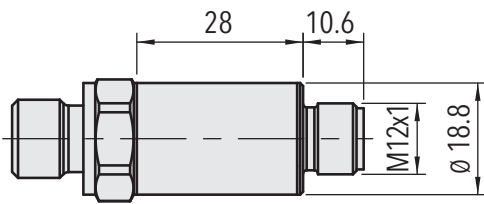


≥ 2.0 bar

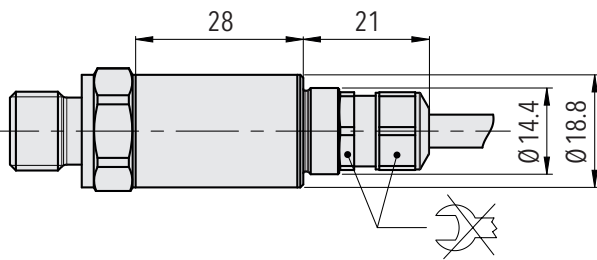


NAE 8256

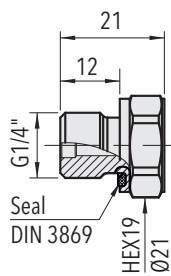
Dimensions



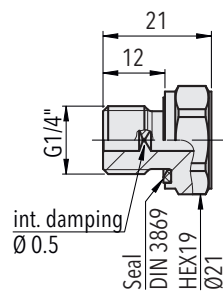
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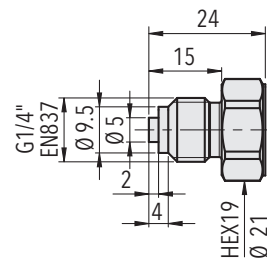
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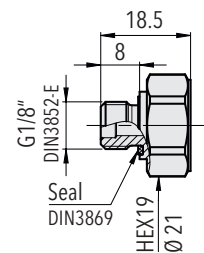
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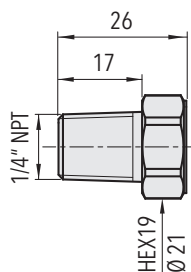
8256.XX.XX15.XX.XX.XX



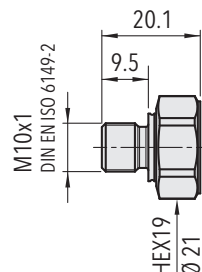
8256.XX.XX53.XX.XX.XX



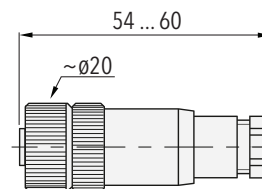
8256.XX.XX54.XX.XX.XX



8256.XX.XX30.XX.XX.XX



8256.XX.XX32.XX.XX.XX



8256.XX.XXXX.XX.XX.33

Electrical connection

	M12x1, 4-pole	M12x1, 5-pole	Cable
Electrical connection type code	32	35	88
IP protection	IP65, IP67 ^{1) 2)}	IP65, IP67 ^{1) 2)}	IP65, IP67, IP68 ^{2) 3)}
Ambient temperature	-40°C ... +125°C	-40°C ... +125°C	-40°C ... +100°C
Pin assignment type code		E1	
Output signal 8256.xx.xxxx.xx.19 	1 3 4	1 2 4 4	4 1 5 Brown Black Yellow/Green
Pin assignment type code	PS	T1	PS T1
Output signal 8256.xx.xxxx.xx.PS/T1 	1 4 2 3	1 4 - 3	Brown Blue Yellow/Green Black Brown Blue - Black

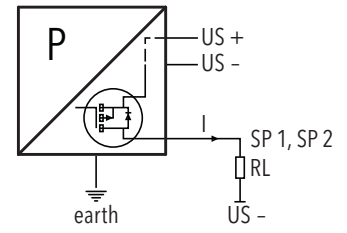
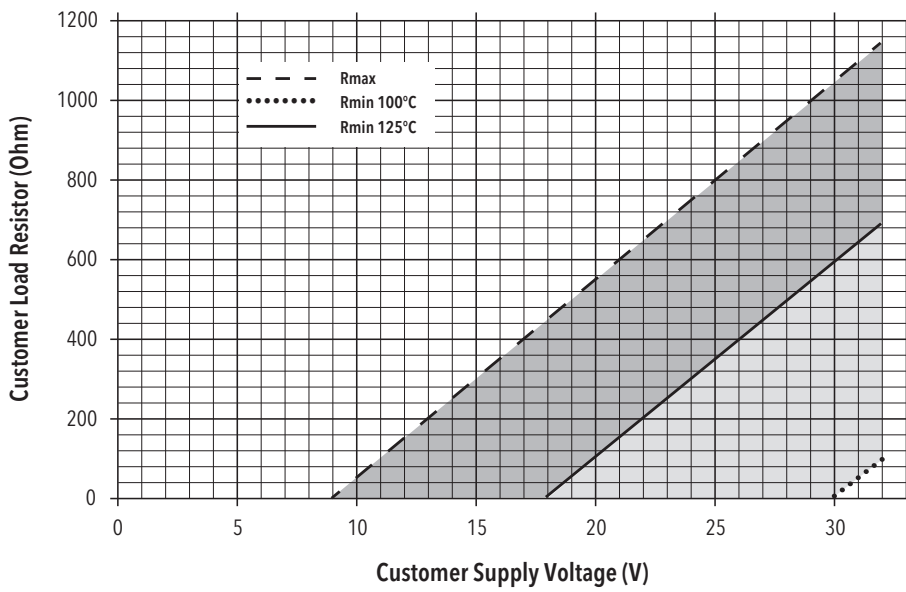
¹⁾ Provided female electrical plug is mounted according to instructions

²⁾ Ventilation via male electric plug/cable end

³⁾ IP68, 20 bar, 30 min.

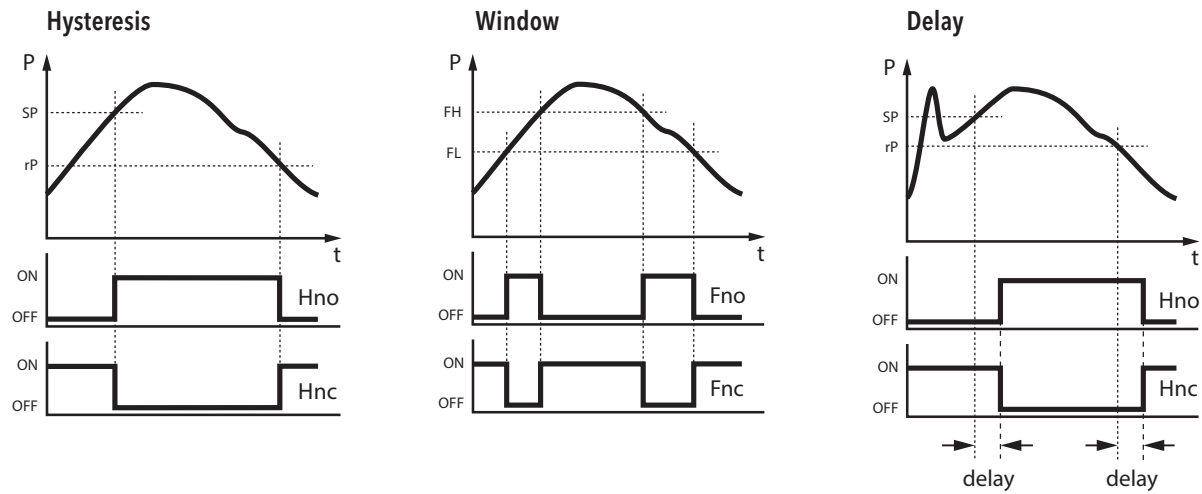
i Empty 'Pin Assignment Type Code' field: Default pinout

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



Connection of loads to switching contacts

Functions switching output



Reliable quality

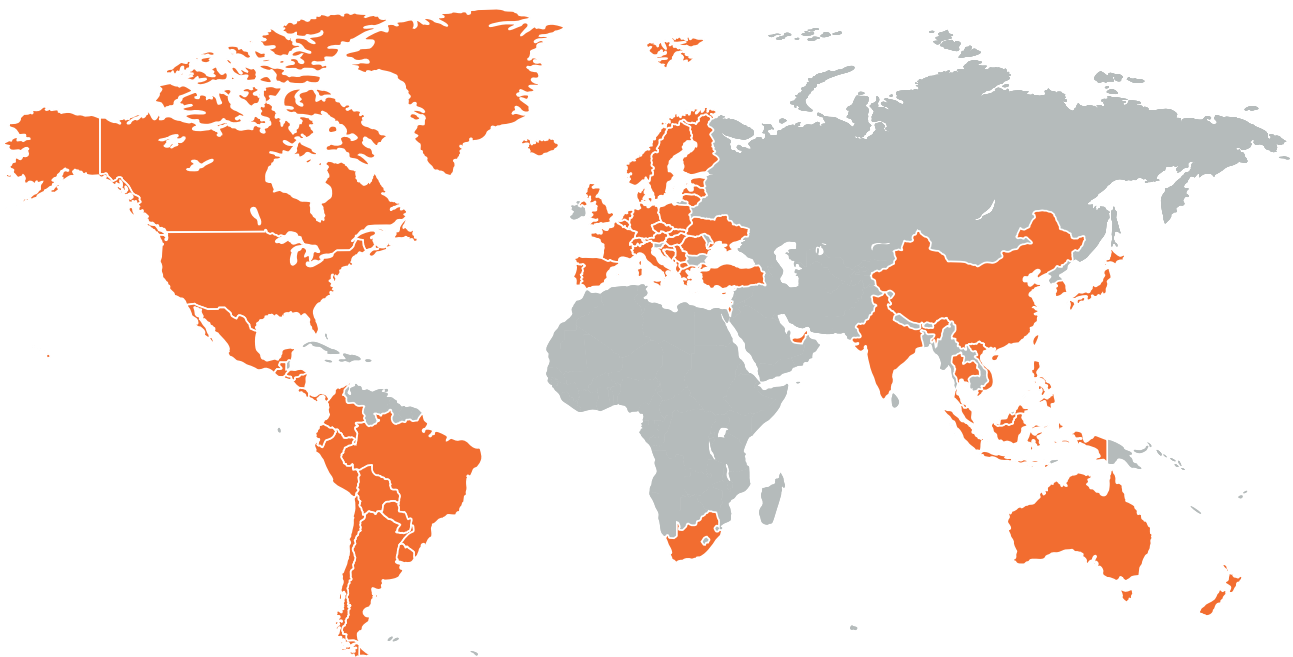
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Trafag develops, produces and distributes robust, reliable and precise instruments for monitoring pressure, temperature and gas density.

The broad portfolio of pressure and temperature measuring instruments is tailored for use in test benches through to applications in harsh environments. The research and development departments in Switzerland and Germany develop all important components from the sensor to the application-specific microchip, which are

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Pressure transmitters



Electronic pressure switches



Mechanical pressure switches



Pressure gauge



Thermostats



Temperature transmitters



Gas density