CMP 8270

CANopen Miniature Pressure Transmitter

Applications

- Engine manufacturing
- Railways
- Machine tools
- Hydraulics
- Process technology
- Test benches

Features

- Small and rugged construction
- Different accuracy classes
- Measurement of pressure and temperature
- CANopen bus protocol DS301/DS404 supports CAN 2.0A/B
- LSS (DS 305 V2.0)

Product description

The CANopen miniature pressure transmitter CMP is based on Trafag's own thin-film-on-steel technology which offers high accuracy and longterm stability even in harsh environments. The most compact design and the proven high-performance electronics with CiA-certified, comprehensive CANopen-functionality makes the CMP 8270 best-in-class pressure transmitter.

EMC: 2014/30/EU

S.I. 2016 No. 1091

Conformity EN 50155

Technical Data

Measuring principle	Thin-film-on-steel, piezoresistive
Measuring range	0 ... 0.2 to 0 ... 600 bar 0 ... 3 to 0 ... 7500 psi
Output signal	Bus protocol CANopen DS404
Media temperature	-50°C ... +135°C
Ambient temperature	-40°C ... +125°C

Additional information

Data sheet	www.trafag.com/H72614
Flyer	www.trafag.com/H70653
Instructions	www.trafag.com/H73614; H73615; H73616
Accessories	www.trafag.com/H72258
Video	https://youtu.be/FTGbY6nkN5w

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Ordering information/Type code

								8270	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 [2]	1.2	25	**68**	0 ... 3 [2]	18	350	**F8**						
	0 ... 0.4 [2]	1.2	25	**69**	0 ... 5 [2]	18	350	**F9**						
	0 ... 0.6 [2]	1.5	25	**70**	0 ... 10 [2]	25	350	**G0**						
	0 ... 1 [2]	2	25	**71**	0 ... 15 [2]	30	350	**G1**						
	0 ... 1.6 [2]	3.5	50	**73**	0 ... 25 [2]	50	700	**G3**						
	0 ... 2.5 [2]	5	50	**75**	0 ... 30 [2]	60	700	**G5**						
	0 ... 4	12	100	**76**	0 ... 50	100	850	**G6**						
	0 ... 6	12	100	**77**	0 ... 100	200	1450	**G7**						
	0 ... 10	20	200	**78**	0 ... 150	300	2500	**G8**						
	0 ... 16	32	200	**79**	0 ... 200	400	2500	**GA**						
	0 ... 25	50	300	**80**	0 ... 250	500	2500	**G9**						
	0 ... 40	80	300	**81**	0 ... 300	600	4000	**HA**						
	0 ... 60	120	400	**82**	0 ... 400	800	4000	**H0**						
	0 ... 100	200	500	**83**	0 ... 500	1000	4000	**H1**						
	0 ... 160	320	750	**85**	0 ... 1000	2000	5000	**H2**						
	0 ... 250	500	1000	**74**	0 ... 1500	3000	7000	**H3**						
	0 ... 400	800	1500	**84**	0 ... 2000	4000	10000	**H5**						
	0 ... 600	1200	2000	**86**	0 ... 3000	6000	14500	**G4**						
	0.8 ... 1.2 [3]	2	4	**B1**	0 ... 5000	10000	21750	**H4**						
					0 ... 7500	15000	29000	**H6**						
Sensor	Relative pressure, accuracy: 0.5 % [4]								**25**					
	Relative pressure, accuracy: 0.3 %								**23**					
	Relative pressure, accuracy: 0.15 % [4]								**21**					
	Relative pressure, accuracy: 0.1 % [4]								**24**					
	Absolute pressure, accuracy: 0.5 % [4] [5]								**45**					
	Absolute pressure, accuracy: 0.3 % [5] [6]								**43**					
	Absolute pressure, accuracy: 0.15 % [4] [5]								**41**					
	Absolute pressure, accuracy: 0.1 % [4] [5]								**44**					
Pressure connection	G1/4" male									**17**				
	1/4" NPT male									**30**				
	1/4" NPT female [7]									**13**				
	7/16"-20UNF male [5] [9]									**18**				
	7/16"-20UNF female, DIN 3866 (valve opener) [5] [9]									**24**				
	7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty) [8] [9]									**69**				
	9/16"-18UNF-2A male, SAE J1926-2 (Heavy Duty) [8] [9]									**67**				
	M10x1 male, DIN EN ISO 6149-2 [9]									**32**				
Electrical connection	Male electrical connector M12x1, 5-pole, Material PA										**35**			
Output signal	CANopen bus protocol with pre-adjustment, Node-ID = 1, baudrate = 20 kbps											**52**		
	CANopen bus protocol with pre-adjustment, Node-ID = 1, automatic baudrate detection											**53**		

		8270	XX	XX	XX	XX	XX	XX
Accessories	Female electrical plug M12x1, 5-pole							33
	Meets EN 50155 (Railway) [10]							11
	Pressure peak damping element ø 1.0 mm							40
	Pressure peak damping element ø 0.3 mm							43
	Pressure peak damping element ø 0.5 mm							45

[01] Extended overpressure as well as customized pressure ranges upon request
[02] Only with pressure connection 17 (G1/4") or 30 (1/4"NPT)
[03] Only with sensor 43 and pressure connection 17, 13, measuring principle piezoresistive
[04] Only for pressure ranges ≥ 4 bar / 50 psi
[05] max. allowable pressure range 40 bar/600 psi
[06] Only for pressure ranges ≥ 1 bar / 15 psi
[07] Upon request, whereas minimum order quantities may apply
[08] Measuring range max. 630 bar according to SAE J1926-2 (Heavy Duty)
[09] Only for relative pressure
[10] Available for relative pressure trasmitter only: Sensors 21, 23, 24, 25

Compatibility matrix pressure connector / damping / sealing

Code	Pressure connection	Ø 1.0 mm (Code 40)	Ø 0.3 mm (Code 43)	Ø 0.5 mm (Code 45)	Equipped with seal FKM -18°C … +125°C
17	G1/4" male	✓	✓	✓	✓
30	1/4" NPT male	✓	✓	✓	
13	1/4" NPT female	✓	✓	✓	
18	7/16"-20UNF male	✓	✓	✓	
24	7/16"-20UNF female, DIN 3866 (valve opener)	✓	✓	✓	
69	7/16"-20UNF-2A male, SAE J1926-2 (Heavy Duty)	✓	✓	✓	✓
67	9/16"-18UNF-2A male, SAE J1926-2 (Heavy Duty)	✓	✓	✓	✓
32	M10x1 male, DIN EN ISO 6149-2	✓	✓	✓	✓

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Specifications [1]

Electrical data	Output / supply voltage	Bus protocol CANopen/12/24 (8 ... 32) VDC
	Rise time of supply voltage	typ. 1 ms, 10 ... 90 % nominal pressure
	Current consumption / power consumption	ca. 20 mA
	Resistance of insulation	> 10 MΩ, 250 VDC
	Dielectric strength	250 VAC, 50 Hz
Environmental conditions	Media temperature	-50°C ... +135°C
	Ambient temperature	-40°C ... +125°C
	Storage temperature	-20°C ... +40°C
	Protection [2]	min. IP67
	Humidity	max. 95 % relative
	Vibration	40 g (20 ... 2000 Hz)
	Shock	100 g/11 ms
EMC protection	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
Mechanical data	Sensor (wetted parts) [3]	1.4542 (AISI 630)
	Pressure connection (wetted parts)	Pressure ranges ≤ 250 bar: 1.4542 (AISI 630) Pressure ranges > 250 bar: 1.4301 (AISI 304)
	Housing	1.4301 (AISI 304)
	Sealing	FKM (-18°C ... +125°C)
	Weight	~ 60 g
	Mounting torque	25 Nm

[1] For accessory code 11 see table: Railway specifications
[2] Provided female electrical plug is mounted according to instructions
[3] Measuring range B1; Sensor (wetted parts): AISI 316L, Pressure connection (wetted parts): 1.4301

Accuracy

		Measuring accuracy 0.5 % Ordering No. 25/45	Measuring accuracy 0.15 % Ordering No. 21/41	Measuring accuracy 0.1 % Ordering No. 24/44
TEB @ -25 ... +85°C	[% FS typ.]	± 2.0	± 0.2	± 0.1
Accuracy @ +25°C	[% FS typ.]	± 0.5	± 0.15	± 0.1
NLH @ +25°C (BSL)	[% FS typ.]	± 0.3	± 0.15	± 0.1
TC zero point and span	[% FS/K typ.]	± 0.03	± 0.002	± 0.002
Long term stability 1 year @ +25°C	[% FS typ.]	± 0.2	± 0.1	± 0.1
Mounting dependency with 180° rotation (vibration and shock)	[% FS max.]	0.5 mbar	0.5 mbar	0.5 mbar
Signal of pressure sensor				
Resolution		≥ 10 bit @ 1 ms 13 bit @ ≥ 5 ms	≥ 10 bit @ 1 ms 13 bit @ ≥ 5 ms	≥ 10 bit @ 1 ms 13 bit @ ≥ 5 ms
Sampling rate (fix)		1ms (1 kHz)	1ms (1 kHz)	1ms (1 kHz)
Measuring filter (moving average)	[ms]	1 ... 65'000	1 ... 65'000	1 ... 65'000
Signal of temperature sensor				
Total error @ -25 ... +85°C	[°C typ.]	Not calibrated	± 1	± 1
Sampling rate (fix)		10x100 ms (1 Hz)	10x100 ms (1 Hz)	10x100 ms (1 Hz)
Measuring filter (moving average)	[s]	0.1 ... 6500	0.1 ... 6500	0.1 ... 6500

Accuracy

		Measuring accuracy 0.3 % Ordering No. 23/43			Measuring accuracy 0.3 % Ordering No. 43
Measuring range		**≥ 0.2 bar ≤ 0.6 bar**	**> 0.6 bar < 2.0 bar**	**≥ 2.0 bar**	**0.8 ... 1.2 bar (Code B1)**
TEB @ -25 ... +85°C	[% FS typ.]	± 2.0	± 1.5	± 1.0	± 1.0
Accuracy @ +25°C	[% FS typ.]	± 0.8	± 0.6	± 0.3	± 0.3
NLH @ +25°C (BSL)	[% FS typ.]	± 0.2	± 0.2	± 0.2	± 0.2
TC zero point and span	[% FS/K typ.]	± 0.02	± 0.02	± 0.01	± 0.03
Long term stability 1 year @ +25°C	[% FS typ.]	± 0.3	± 0.2	± 0.1	± 0.3
Mounting dependency with 180° rotation (vibration and shock)	% FS max.]	0.5 mbar			0.5 mbar
Signal of pressure sensor					
Resolution		≥ 10 bit @ 1 ms 13 bit @ ≥ 5 ms			≥ 10 bit @ 1 ms 13 bit @ ≥ 5 ms
Sampling rate (fix)		1ms (1 kHz)			1ms (1 kHz)
Measuring filter (moving average)	[ms]	1 ... 65'000			1 ... 65'000
Signal of temperature sensor					
Total error @ -25 ... +85°C	[°C typ.]	± 2			± 2
Sampling rate (fix)		10x100 ms (1 Hz)			10x100 ms (1 Hz)
Measuring filter (moving average)	[s]	0.1 ... 6500			0.1 ... 6500

Railway specifications (type code 11) [1)]

Electrical data	Output / supply voltage	EN 50155	Bus protocol CANopen / 24 VDC
	Interruptions of the voltage supply	EN 50155	Class S1
	Switching between two supply voltages	EN 50155	Class C1
Environmental conditions	Media temperature	EN 50155	OT6 (-40°C ... +85°C)
	Ambient temperature	EN 50155	OT6 (-40°C ... +85°C)
	Startup at low temperature	EN 50155	-40°C
	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	EN 45545-2: 2015	Weight: < 10 g Surface: < 0.2 m²
EMC Protection	Emission	EN 50121-3-2	
	Immunity	EN 50121-3-2 [2)]	

[1)] Available for relative pressure trasmitter only: Sensors 21, 23, 24, 25
[2)] Surge voltage on shield, shield connected on both sides

CANopen Features

- CiA conformance tested
- All CiA bus speeds: 10kbit/s...1Mbit/s
- Autobaud
- Supports11/29 bit identifiers: CAN 2.0 A/B
- Frequency of measurement and transmission upto 1kHz
- Moving average filter: 1ms...65s (pressure)
- Additional PDO mode: delta and limit triggered
- All standardised data types for PDO's Floating point, integer with 32, 24, 16 bits
- Eligible, prefix adjustable units pressure: bar, Pa, psi, mmHg, mmWg, atm, at; temperature: °C, °F, K
- Auto-zero function
- Auto-Start-Mode for operation without master
- 4 Pressure - and 4 temperature tresholds with 8 free definable CAN messages
- Separate storage of parameters for communication and application
- Flash-Update
- Baudrate detection

CANopen- Bus Protocol

- Output signal: CAN BUS (ISO 118982)
- CANopen: DS301 V4.0
- Device profile: DS404 V1.2
- Baudrate (Autobaude): 10kbit/s...1Mbit/s
- Error control: Nodeguarding, Heartbeat
- Node ID: LSS (DSP 305 V2.0) fully implemented, proprietary
- No. of PDO's: 4 TX
- PDO modes: event-/time-triggered, remotely requested, sync (cyclic/acyclic)
- PDO linking: yes
- PDO mapping: yes
- No. of SDO's: 1 server
- Emergency message: yes

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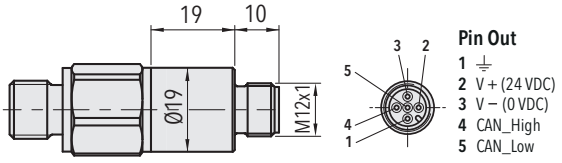
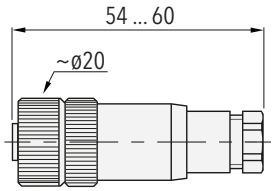
Dimensions

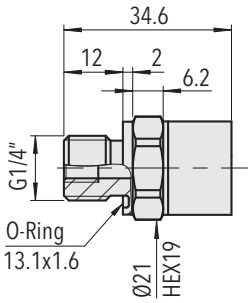


8270.XX.XXXX.**35**.XX.XX



8270.XX.XXXX.XX.XX.**33**

Relative pressure ≤ 0 ... 2.5 bar



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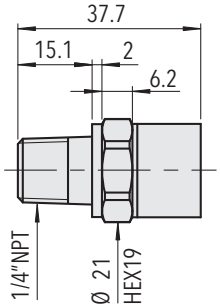

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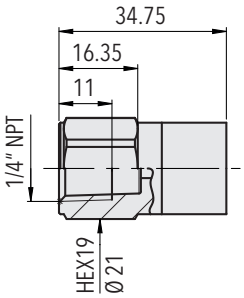

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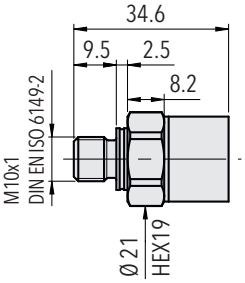

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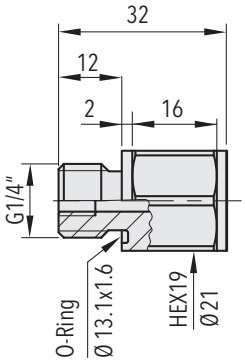
Relative pressure > 0 ... 2.5 bar



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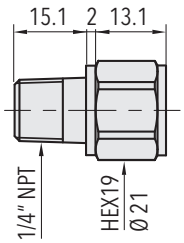

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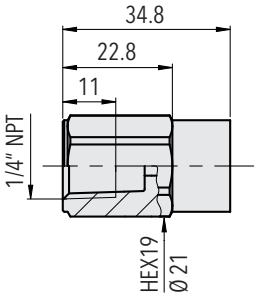

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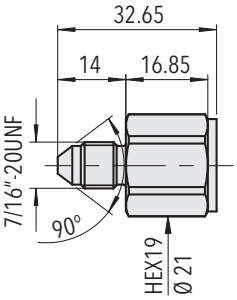

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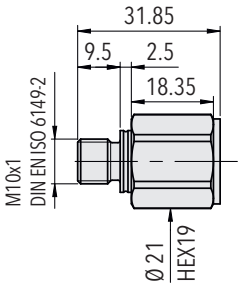

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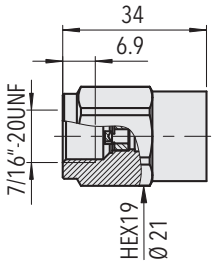

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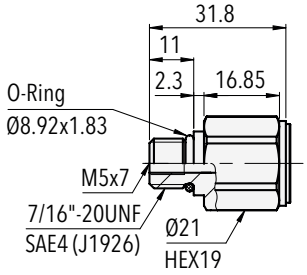

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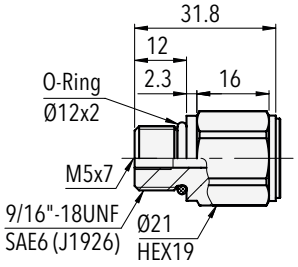

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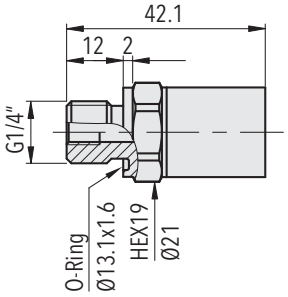
Absolute pressure



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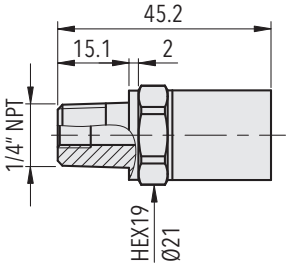

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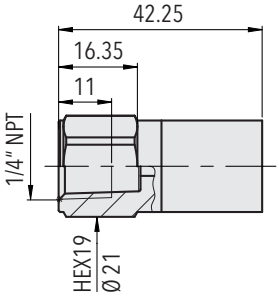
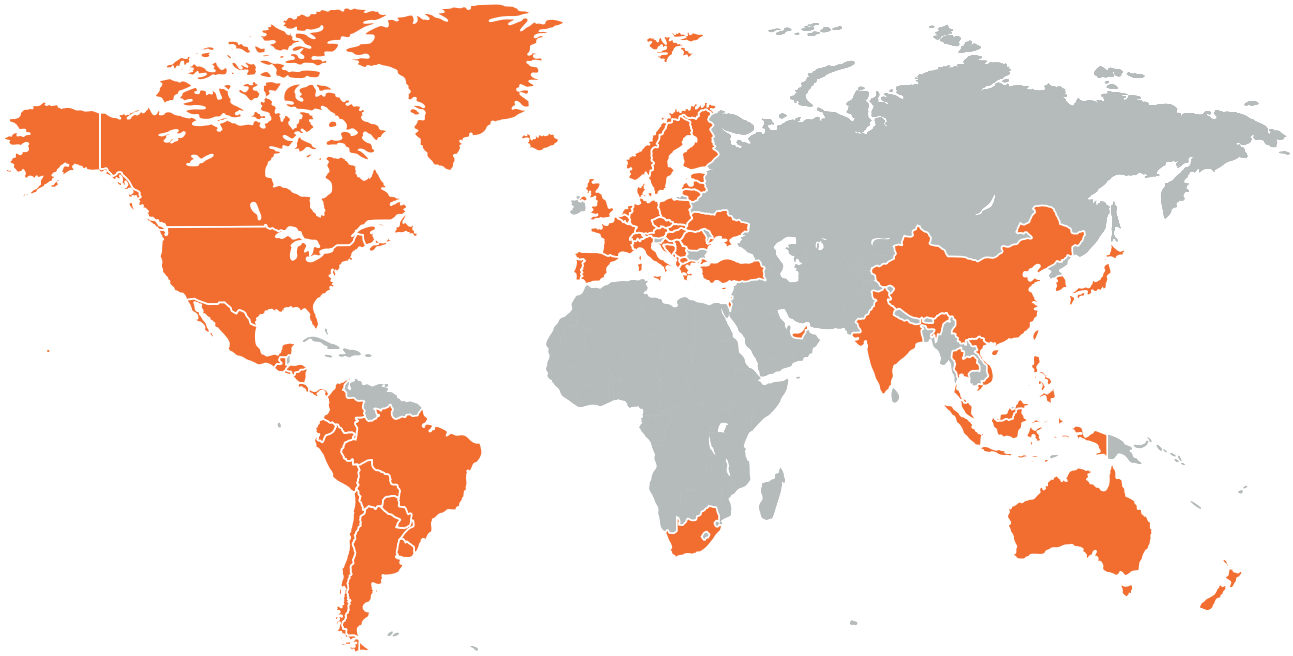


8270.XX.**4X13**.XX.XX.XX

Reliable quality

Worldwide represented, globally trusted, Swiss based

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 then manufactured in the production facilities in Switzerland, Germany, the Czech Republic, and India. Strict quality management according to ISO 9001 and ISO 14001 ensures that Trafag products meet the required quality and sustainability standards.
Trafag is headquartered in Switzerland, was founded in 1942 and has an extensive sales and service network in more than 40 countries worldwide.



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Pressure transmitters | Electronic pressure switches | Mechanical pressure switches | Pressure gauge | Thermostats | Temperature transmitters | Gas density