

# CANOPEN MINIATURE PRESSURE TRANSMITTER

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. 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.

CANopen



## 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)

06/2021

Data sheet H72614u

Technical Data			
Measuring principle	Thin-film-on-steel, piezoresistive	Accuracy @ 25°C typ.	± 0.5 % FS typ. ± 0.3 % FS typ. ± 0.15 % FS typ. ± 0.1 % FS typ.
Measuring range	0 ... 0.2 to 0 ... 600 bar 0 ... 3 to 0 ... 7500 psi	Media temperature	-50°C ... +135°C
Output signal	Bus protocol CANopen DS404	Ambient temperature	-40°C ... +125°C
NLH @ 25°C (BSL) typ.	± 0.3 % FS typ. ± 0.2 % FS typ. ± 0.15 % FS typ. ± 0.1 % FS typ.		

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]		8270 . XX	XX	XX	XX	XX	XX
	0 ... 0.2 <sup>2)</sup>	1.2	25	<b>68</b>	0 ... 3 <sup>2)</sup>	18	350	<b>F8</b>						
	0 ... 0.4 <sup>2)</sup>	1.2	25	<b>69</b>	0 ... 5 <sup>2)</sup>	18	350	<b>F9</b>						
	0 ... 0.6 <sup>2)</sup>	1.5	25	<b>70</b>	0 ... 10 <sup>2)</sup>	25	350	<b>G0</b>						
	0 ... 1 <sup>2)</sup>	2	25	<b>71</b>	0 ... 15 <sup>2)</sup>	30	350	<b>G1</b>						
	0 ... 1.6 <sup>2)</sup>	3.5	50	<b>73</b>	0 ... 25 <sup>2)</sup>	50	700	<b>G3</b>						
	0 ... 2.5 <sup>2)</sup>	5	50	<b>75</b>	0 ... 30 <sup>2)</sup>	60	700	<b>G5</b>						
	0 ... 4	12	100	<b>76</b>	0 ... 50	100	850	<b>G6</b>						
	0 ... 6	12	100	<b>77</b>	0 ... 100	200	1450	<b>G7</b>						
	0 ... 10	20	200	<b>78</b>	0 ... 150	300	2500	<b>G8</b>						
	0 ... 16	32	200	<b>79</b>	0 ... 200	400	2500	<b>GA</b>						
	0 ... 25	50	300	<b>80</b>	0 ... 250	500	2500	<b>G9</b>						
	0 ... 40	80	300	<b>81</b>	0 ... 300	600	4000	<b>HA</b>						
	0 ... 60	120	400	<b>82</b>	0 ... 400	800	4000	<b>H0</b>						
	0 ... 100	200	500	<b>83</b>	0 ... 500	1000	4000	<b>H1</b>						
	0 ... 160	320	750	<b>85</b>	0 ... 1000	2000	5000	<b>H2</b>						
	0 ... 250	500	1000	<b>74</b>	0 ... 1500	3000	7000	<b>H3</b>						
	0 ... 400	800	1500	<b>84</b>	0 ... 2000	4000	10000	<b>H5</b>						
	0 ... 600	1200	2000	<b>86</b>	0 ... 3000	6000	14500	<b>G4</b>						
	0.8 ... 1.2 <sup>8) 9)</sup>	2	4	<b>B1</b>	0 ... 5000	10000	21750	<b>H4</b>						
					0 ... 7500	15000	29000	<b>H6</b>						
<b>Sensor</b>	Relative pressure, accuracy: 0.5 % <sup>5)</sup>			<b>25</b>	Absolute pressure, accuracy: 0.5 % <sup>4) 5)</sup>			<b>45</b>						
	Relative pressure, accuracy: 0.3 %			<b>23</b>	Absolute pressure, accuracy: 0.3 % <sup>4) 6)</sup>			<b>43</b>						
	Relative pressure, accuracy: 0.15 % <sup>5)</sup>			<b>21</b>	Absolute pressure, accuracy: 0.15 % <sup>4) 5)</sup>			<b>41</b>						
	Relative pressure, accuracy: 0.1 % <sup>5)</sup>			<b>24</b>	Absolute pressure, accuracy: 0.1 % <sup>4) 5)</sup>			<b>44</b>						
<b>Pressure connection</b>	G1/4" male <sup>9)</sup>								<b>17</b>					
	1/4" NPT male								<b>30</b>					
	1/4" NPT female <sup>7)</sup>								<b>13</b>					
	7/16"-20UNF male <sup>3) 4)</sup>								<b>18</b>					
	7/16"-20UNF female, DIN3866 (valve opener) <sup>3) 4)</sup>								<b>24</b>					
	7/16"-20UNF male, SAE4 (J1926) <sup>3) 9)</sup>								<b>42</b>					
	9/16"-18UNF male, SAE6 (J1926) <sup>3) 7) 9)</sup>								<b>61</b>					
M10x1 male, DIN EN ISO 6149-2 <sup>3) 9)</sup>								<b>32</b>						
<b>Electrical connection</b>	Male electrical connector M12x1, 5-pol., Mat. PA												<b>35</b>	
<b>Output signal</b>	CANopen bus protocol with pre-adjustment, Node-ID = 1, baudrate = 20 kbps													<b>52</b>
	CANopen bus protocol with pre-adjustment, Node-ID = 1, automatic baudrate detection													<b>53</b>
<b>Accessories</b>	Female electrical plug M12x1, 5-pole													<b>33</b>
	Meets EN 50155 (railways)													<b>11</b>
	Pressure peak damping element ø 1.0 mm													<b>40</b>
	Pressure peak damping element ø 0.3 mm													<b>43</b>
	Pressure peak damping element ø 0.5 mm													<b>45</b>

<sup>1)</sup> Extended overpressure as well as customized pressure ranges upon request

<sup>2)</sup> Only with pressure connection 17 (G1/4") or 30 (1/4" NPT)

<sup>3)</sup> Only for relative pressure

<sup>4)</sup> Max. allowable pressure range 40 bar/600 psi

<sup>5)</sup> Only for pressure ranges  $\geq 4$  bar / 50 psi

<sup>6)</sup> Only for pressure ranges  $\geq 1$  bar / 15 psi

<sup>7)</sup> Upon request

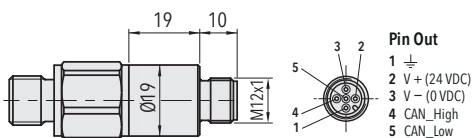
<sup>8)</sup> Only with sensor 43 and pressure connection 17, 13, measuring principle piezoresistive

<sup>9)</sup> Seal FKM, -18°C ... +125°C

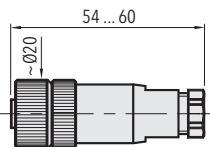
## Standard products (extra short lead time)

Product No.	Type Code	Pressure range [bar]	Over pressure max. [bar]	Supply [VDC]	Accuracy @ 25°C typ. [%]
CMP4.0M	8270 76 2517 35 0000 0000 52 43	0 ... 4	12	8 ... 32	± 0.5
CMP6.0M	8270 77 2517 35 0000 0000 52 43	0 ... 6	12	8 ... 32	± 0.5
CMP10.0M	8270 78 2517 35 0000 0000 52 43	0 ... 10	20	8 ... 32	± 0.5
CMP16.0M	8270 79 2517 35 0000 0000 52 43	0 ... 16	32	8 ... 32	± 0.5
CMP25.0M	8270 80 2517 35 0000 0000 52 43	0 ... 25	50	8 ... 32	± 0.5
CMP40.0M	8270 81 2517 35 0000 0000 52 43	0 ... 40	80	8 ... 32	± 0.5
CMP100.0M	8270 83 2517 35 0000 0000 52 43	0 ... 100	200	8 ... 32	± 0.5
CMP250.0M	8270 74 2517 35 0000 0000 52 43	0 ... 250	500	8 ... 32	± 0.5
CMP400.0M	8270 84 2517 35 0000 0000 52 43	0 ... 400	800	8 ... 32	± 0.5

## Dimensions

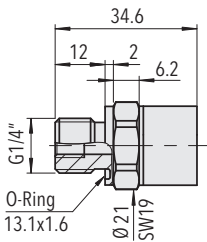


8270.XX.XXXX.35.XX.XX

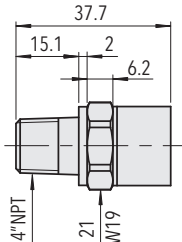


8270.XX.XXXX.XX.XX.33

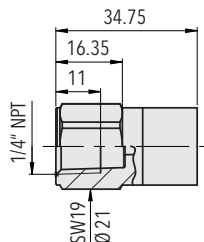
### Relative pressure $\leq 0 \dots 2.5$ bar



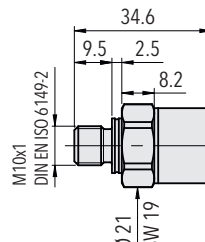
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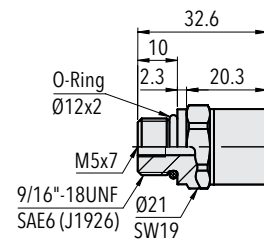
8270.XX.2X30.XX.XX.XX



8270.XX.2X13.XX.XX.XX

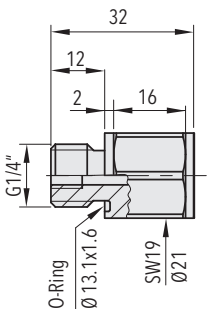


8270.XX.2X32.XX.XX.XX

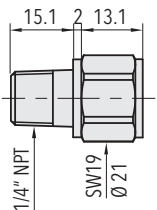


8270.XX.2X61.XX.XX.XX

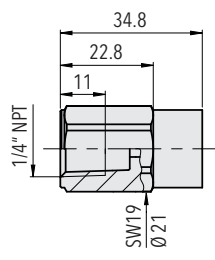
### Relative pressure $> 0 \dots 2.5$ bar



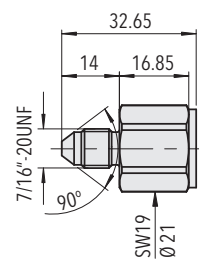
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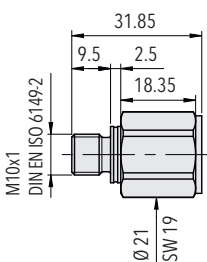
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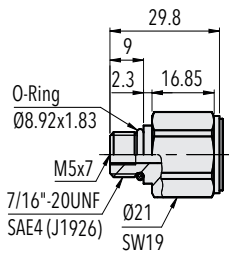
8270.XX.2X13.XX.XX.XX



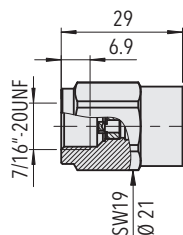
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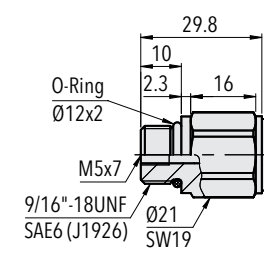
8270.XX.2X32.XX.XX.XX



8270.XX.2X42.XX.XX.XX

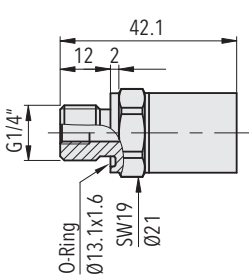


8270.XX.2X24.XX.XX.XX

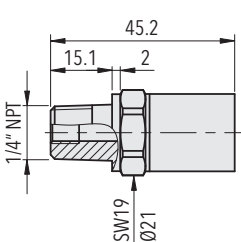


8270.XX.2X61.XX.XX.XX

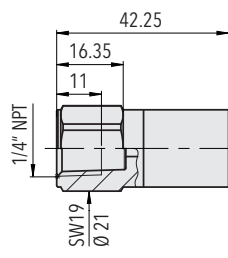
### Absolute pressure



8270.XX.4X17.XX.XX.XX



8270.XX.4X30.XX.XX.XX



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

Specifications <sup>3)</sup>		
<b>Electrical Data</b>	Output / supply voltage	Bus protocol CANopen / 12/24 (8...32)VDC
	Rise time	Typ. 1 ms / 10 ... 90 % nominal pressure
	Current consumption / power consumption	ca. 20 mA
<b>Environmental conditions</b>	Media temperature	-50°C ... +135°C
	Ambient temperature	-40°C ... +125°C
	Protection <sup>1)</sup>	Min. IP67
	Humidity	Max. 95 % relative
	Vibration	40 g (20 ... 2000 Hz)
	Shock	100 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) <sup>2)</sup>	1.4542 (AISI630)
	Pressure connection (wetted parts)	Pressure ranges ≤ 250 bar: 1.4542 (AISI630) Pressure ranges > 250 bar: 1.4301 (AISI304)
	Housing	1.4301 (AISI304)
	Sealing	FKM (-18°C ... +125°C)
	Male electrical connector	See ordering information
	Weight	~ 60 g
	Mounting torque	25 Nm

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

<sup>2)</sup> Measuring range B1:

Sensor (wetted parts): AISI316L

Pressure connection (wetted parts): 1.4301

<sup>3)</sup> For accessory code 11 see separate table

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
<b>Signal of pressure sensor</b>				
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
<b>Signal of temperature sensor</b>				
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
<b>Measuring range</b>		≥ 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
<b>Signal of pressure sensor</b>					
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
<b>Signal of temperature sensor</b>					
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)			
<b>Electrical data</b>	Output / supply voltage	EN50155	Bus protocol CANopen / 24 VDC
	Interruptions of the voltage supply	EN50155	Class S1
	Switching between two supply voltages	EN50155	Class C1
<b>Environmental conditions</b>	Media temperature	EN50155	OT6 (-40°C ... +85°C)
	Ambient temperature	EN50155	OT6 (-40°C ... +85°C)
	Startup at low temperature	EN50155	-40°C
	Dry heat	EN60068-2-2	Be: 85°C, 6 h (in operation)
	Damp heat, cyclic	EN60068-2-30	Db: 55°C, Variant 1, 2 cycles (2 x 24 h)
	Switch-on extended operating temperature	EN50155	Class ST0
	Rapid temperature variations	EN50155	Class H1
	Vibration and shock	EN61373	Vibration: category 3 Shock: category 3
	Dielectrical strength	EN50155	750 VDC
	Resistance of insulation	EN50155	> 100 MΩ, 500 VDC
	Behavior in case of fire	EN45545-2	Weight: < 10 g Surface: < 0.2 m <sup>2</sup>
<b>EMC Protection</b>	Emission	EN50121-3-2	-
	Immunity	EN50121-3-2 <sup>2)</sup>	-

<sup>2)</sup> Surge voltage on shield, shield connected on both sides

Additional information		
<b>Documents</b>	Data sheet	<a href="http://www.trafag.com/H72614">www.trafag.com/H72614</a>
	Instructions	<a href="http://www.trafag.com/H73614">www.trafag.com/H73614</a>
	Flyer	<a href="http://www.trafag.com/H70653">www.trafag.com/H70653</a>



## CANopen Features

- CiA conformance tested
- All CiA bus speeds: 10kbit/s...1Mbit/s
- Autobaud
- Supports 11/29 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 thresholds 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