

# Pressure Transmitter with CANopen output DMP2056

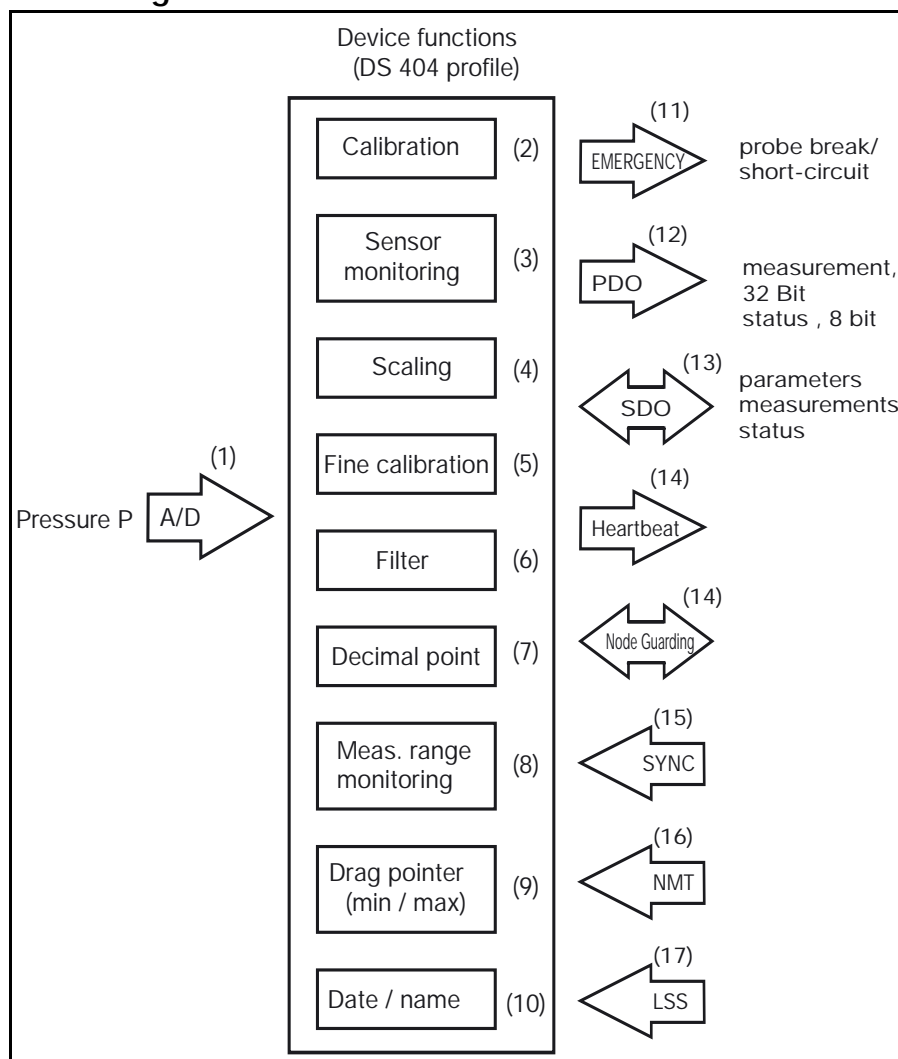
## General application

Pressure transmitters are used for measuring relative (gauge) and absolute pressures in liquids and gases. The pressure transmitter operates on the piezoresistive or thin-film strain gauge measuring principle. The pressure measurement is digitized and made available for further processing via the CANopen serial bus protocol (CAN slave). Several useful extra functions are implemented through the DS 404 device profile. All settings can be made using standard CANopen software tools.

Additional transmitters with CANopen output: see Data Sheets DMP2055 (pressure), DMP2057 (pressure + temperature) and WT081C (temperature).



## Block diagram



## Operation

- (1) The analog signal from the pressure cell is digitized with 12-bit resolution.
- (2) The pressure signal is digitally calibrated at the factory.
- (3) The sensor monitoring facility continuously checks the correct performance of the sensor signal and triggers high-priority emergency telegrams in the event of an error.
- (4) The pressure measurement can be scaled to any dimensional unit (or in % of range).
- (5) Fine calibration features an auto-zeroing function and a freely adjustable shift of the characteristic.
- (6) Undesirable signal fluctuations can be suppressed through the (adjustable) filter constant.
- (7) The measurement is output with a freely selectable decimal place.
- (8) Range monitoring features freely selectable upper and lower limits. The result is output as a status byte with the measurement in the PDO telegram.
- (9) The drag pointer function stores the minimum and maximum pressure measurements.
- (10) Date and name of the last servicing action can be stored.
- (11) An emergency telegram is triggered in the event of a sensor fault.
- (12) The PDO telegram contains the 32-bit measurement and the 8-bit status. The measurement that is output can be controlled by means of different trigger conditions.
- (13) Parameters can be set through SDO telegrams, and measurements and status can be requested.

(14) The heartbeat signal or Node Guarding can be used to additionally monitor the transmitter function.

(15) The transmission of measurements can additionally be controlled through the Sync command.

(16) NMT telegrams serve to control the operational state of the transmitter.

(17) The CAN module ID and CAN baud rate are set via LSS or SDO, as selected.

## Technical data

### Reference conditions

to DIN 16 086 and IEC 770/5.3

### Measurement ranges

see order details

### Overload limit

ranges

0 — 0.25 bar to 0 — 25 bar

3 x full scale

ranges

0 — 40 to 0 — 250 bar

2 x full scale

ranges

0 — 400 to 0 — 600 bar

1.5 x full scale

### Bursting pressure

ranges

0 — 0.25 bar to 0 — 40 bar

≤4 x full scale

ranges

0 — 60 to 0 — 100 bar

8 x full scale

ranges

0 — 160 to 0 — 400 bar

5 x full scale

ranges

0 — 600 bar

3 x full scale

### Parts in contact with medium

standard: stainless steel,  
Mat. Ref. 1.4571 / 1.4435

for range ≥ 60 bar,  
Mat. Ref. 1.4571 / 1.4542

### Output

CANopen as per CiA DS 301 V4.02  
measurement resolution: 12 bit

### Zero offset

≤0.3% of full scale

### Thermal hysteresis

±0.5% of full scale  
(within compensated temperature range)

±1% for ranges

0 — 250 mbar
0 — 400 mbar
0 — 600 mbar

### Ambient temperature effect

within range 0 to +100°C  
(compensated temperature range)

for ranges 250 and 400 mbar  
zero: ≤0.03%/°C typical,  
≤0.05%/°C max.

span: ≤0.02%/°C typical,  
≤0.04%/°C max.

for ranges above 600 mbar  
zero: ≤0.02%/°C typical,  
≤0.04%/°C max.

span: ≤0.02%/°C typical,  
≤0.04%/°C max.

### Deviation from characteristic

≤0.5% of full scale  
(limit point setting)

### Hysteresis

≤0.1% of full scale

### Repeatability

≤0.05% of full scale

### Cycle time

1 msec  
optionally 0.5 msec (11 bit)

### Stability per year

≤0.5% of full scale

### Supply

10 — 30 V DC  
max. current drawn: approx. 45 mA

### Supply voltage error

≤0.03% per V

### Permissible ambient temperature

-20 to +85°C

### Storage temperature

-40 to +85°C

### Permissible temperature of medium

standard version:

-40 to +125°C

with basic type extension 004:

-40 to +200°C

### Electromagnetic compatibility

EN 61 326

interference emission: Class B

immunity to interference: to industrial requirements

### Electrical connection

M12

recommended: screened 5-wire cable

### Mechanical shock

(to IEC 68-2-27)

100 g/5 msec

### Mechanical vibration

(to IEC 68-2-6)

20 g max. at 15 — 2000 Hz

### Enclosure protection

with connector screwed on:

IP67 to EN 60 529

### Housing

stainless steel, Mat. Ref. 1.4305

### Pressure connection

see order details;

other connections on request

### Nominal position

unrestricted

### Weight

95 gm (with pressure connection G 1/4)

## CANbus

### Protocol

CiA DS 301, V4.02, CANopen slave

### Profile

CiA DS 404, V1.2

Measuring devices and closed-loop controllers

### Baud rate

20 kbaud to 1 Mbaud  
setting via LSS or SDO

### Module (node) ID

1 — 127  
setting via LSS or SDO

### PDO

0 Rx, 1 Tx

### SDO

1Rx, 1 Tx

### Emergency

yes

### Heartbeat

yes

### Node Guarding

yes

### LSS

yes

### SYNC

yes

### Operation and project design

All parameters are accessible via the CANopen object directory (EDS) and can be set using standard CANopen software tools.

### EDS (electronic data sheet)

yes

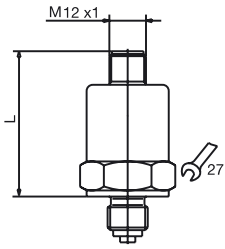
available free of charge as a download file

### Factory setting

see Operating Instructions B40.2055.0

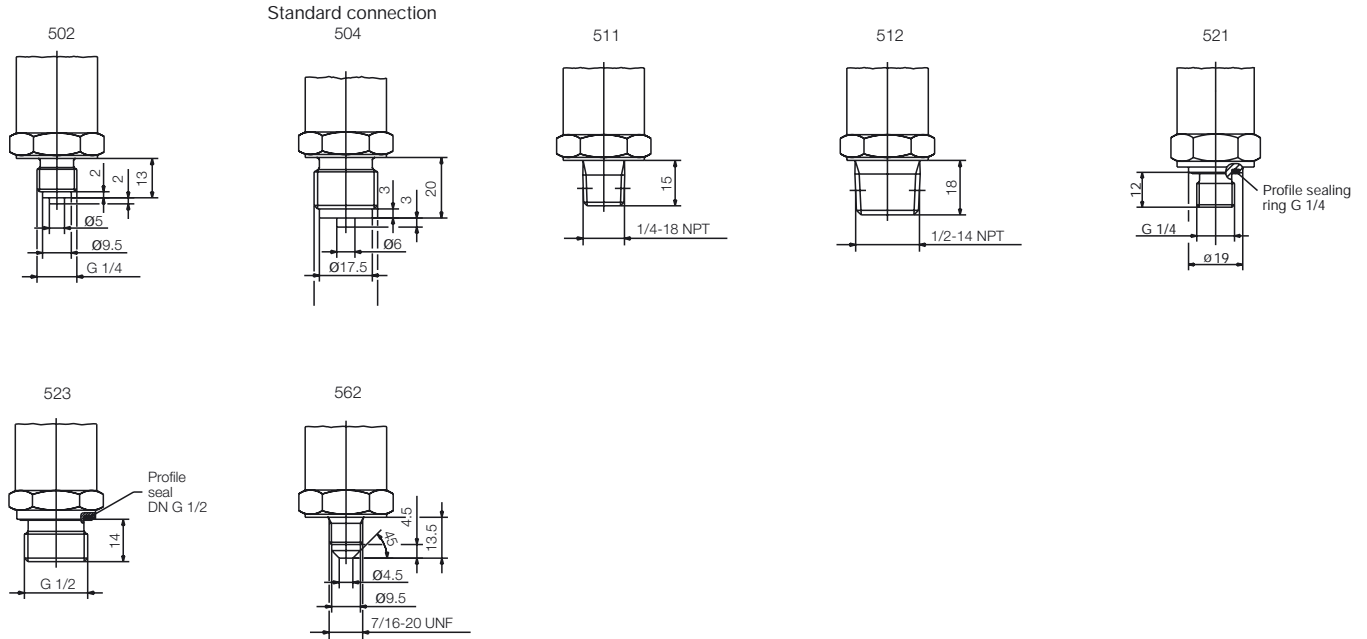
available free of charge as a download file

Dimension

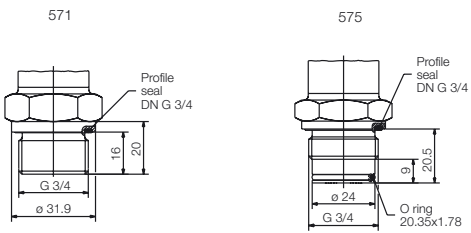


Basic type extension	Dim. "L"
000	48
004	xx
023	48
024	48


Connections, not front-flush



Connections, front-flush



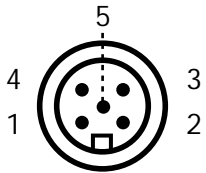
### Electrical connection

Connection		Terminal assignment	
		M12 connector	Terminal box with moulded cable Sales No. 40/00337625
Supply 10 — 30 V DC		V+ V-	white blue
Output CANopen		screen CAN_H CAN_L	brown black grey

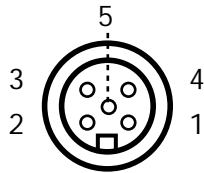
### Circular connector

M12 x 1; 5-pole to IEC 60 947-5-2

Plug



Socket



**Order details**

- DMP2056 (1) **Basic type**  
Pressure transmitter CANtrans p
- 000 (2) **Basic type extension**  
none
- 004 for elevated media temperatures up to 200°C <sup>1</sup>
- 999 special version
- (3) **Input**
- 451 0 to 0.25 bar gauge pressure
- 452 0 to 0.4 bar gauge pressure
- 453 0 to 0.6 bar gauge pressure
- 454 0 to 1.0 bar gauge pressure
- 455 0 to 1.6 bar gauge pressure
- 456 0 to 2.5 bar gauge pressure
- 457 0 to 4 bar gauge pressure
- 458 0 to 6 bar gauge pressure
- 459 0 to 10 bar gauge pressure
- 460 0 to 16 bar gauge pressure
- 461 0 to 25 bar gauge pressure
- 462 0 to 40 bar gauge pressure
- 463 0 to 60 bar gauge pressure
- 464 0 to 100 bar gauge pressure
- 465 0 to 160 bar gauge pressure
- 466 0 to 250 bar gauge pressure
- 467 0 to 400 bar gauge pressure
- 468 0 to 600 bar gauge pressure
- 478 -1 to 0 bar gauge pressure
- 479 -1 to 0.6 bar gauge pressure
- 480 -1 to 1.5 bar gauge pressure
- 481 -1 to 3 bar gauge pressure
- 482 -1 to 5 bar gauge pressure
- 483 -1 to 9 bar gauge pressure
- 484 -1 to 15 bar gauge pressure
- 485 -1 to 24 bar gauge pressure
- 487 0 to 0.6 bar absolute pressure
- 488 0 to 1.0 bar absolute pressure
- 489 0 to 1.6 bar absolute pressure
- 490 0 to 2.5 bar absolute pressure
- 491 0 to 4 bar absolute pressure
- 492 0 to 6 bar absolute pressure
- 493 0 to 10 bar absolute pressure
- 494 0 to 16 bar absolute pressure
- 495 0 to 25 bar absolute pressure
- 998 special range: absolute pressure
- 999 special range: gauge pressure
- (4) **Output**
- 450 CANopen
- (5) **Process connection (not front-flush)**
- 502 G 1/4 to EN 837
- 504 G 1/2 to EN 837 (standard connection)
- 511 1/4-18 NPT to DIN 837
- 512 1/2-14 NPT to DIN 837
- 523 G 1/2 to DIN 3852 T11 (with soft seal located at rear)
- 562 7/16-20 UNF
- 998 suitable for connection to chemical seals
- (5) **Process connection (front-flush)**
- 571 G<sup>3</sup>/<sub>4</sub><sup>2</sup>
- 575 G<sup>3</sup>/<sub>4</sub> front seal<sup>2</sup>
- (6) **Material of process connection**
- 20 stainless steel
- (7) **Electrical connection**
- 36 circular connector M 12x1 / 5-pole
- (8) **Extra code**
- 000 none

Order code                    (1)                    (2)                    (3)                    (4)                    (5)                    (6)                    (7)                    (8)  
 /  -  -  -  -  -  /   
 Order example            DMP2056            /            000            -            462            -            450            -            502            -            20            -            36            /            000

<sup>1</sup> only for ranges from 1 to 400 bar.  
<sup>2</sup> only for ranges up to 25 bar.