

Pressure Transmitter with CANopen output DMP2055

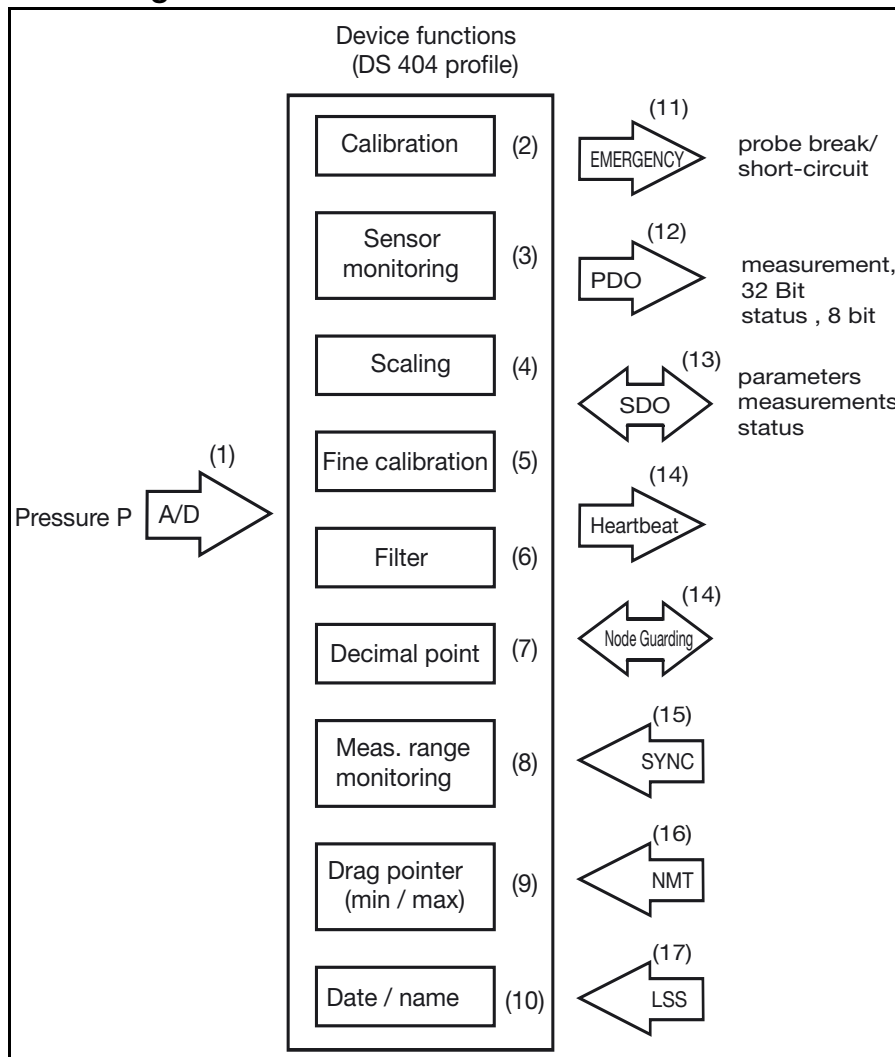
General application

Pressure transmitters are used for measuring relative (gauge) and absolute pressures in liquids and gases. The pressure transmitter operates on the thick-film strain gauge measuring principle. An alumina ceramic (Al₂O₃) is used as the base material for the sensing element. The pressure measurement is digitized and made available for further processing via the CANopen serial bus protocol (CAN slave). Several useful extra functions have been implemented through the DS 404 device profile. All settings can be made using standard CANopen software tools.

Further transmitters with CANopen output: see Data Sheets DMP2056 (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, according to choice.

Technical data

Reference conditions

to DIN 16 086 and IEC 770/5.3

Measurement ranges

see order details

Overload limit

on ranges

0 — 1.6 mbar to 0 — 40 bar

3 x full scale

on ranges

0 — 60 to 0 — 100 bar

2 x full scale

Bursting pressure

on ranges

0 — 1.6 mbar to 40 bar

4 x full scale

on ranges

0 — 60 to 0 — 100 bar

3 x full scale

Parts in contact with medium

standard: st. steel, Mat. Ref. 1.4305,
(Al₂O₃) 96%

seal: FPM or
FFPM

Output

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

Zero offset

≤ 0.3% of full scale

Thermal hysteresis

≤ ± 0.4% of full scale

Ambient temperature effect

within range -20 to +85°C
(compensated temperature range)

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

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

Deviation from characteristic

≤ 0.5% of full scale
(limit point adjustment)

Hysteresis

≤ 0.2% of full scale

Repeatability

≤ 0.1% of full scale

Cycle time

1 msec
optionally 0.5 msec (11 bit)

Stability per year

≤ 1% of full scale

Supply

10 — 30 V DC

max. current drawn: approx. 45 mA

Supply voltage error

reference voltage 24 V DC
≤ 0.0005% per V

Permissible ambient temperature

-20 to +85°C

Storage temperature

-40 to +85°C

Permissible temperature of medium

-20 to +85°C

Electromagnetic compatibility

EN 61326

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

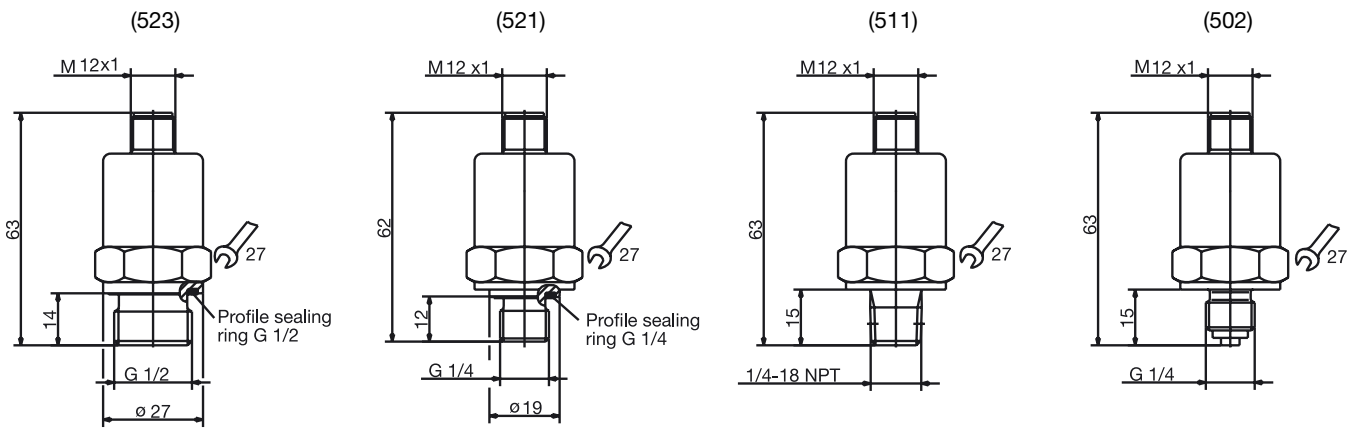
available free of charge as a download file

Factory setting

see Operating Instructions B40.2055.0

available free of charge as a download file

Dimensions



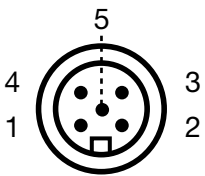
Electrical connection

Connection		Terminal assignment	
		M12 connector	Terminal box with moulded cable Mat. Ref. 40/00337625
Supply 10 – 30 V DC		V+ 2 V- 3	white blue
Output CANopen		screen 1 CAN_H 4 CAN_L 5	brown black grey

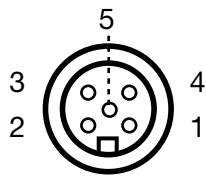
Circular connector

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

Plug



Socket



Order details

- (1) Basic type**
DMP2055 Pressure transmitter p Ceramic
- (2) Basic type extensions**
000 none
999 special version
- (3) Input**
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
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
999 special range: gauge pressure
- (4) Output**
450 CANopen
- (5) Process connection (not front-flush)**
502 G 1/4 to EN 837
511 1/4-18 NPT to DIN 837
521 G1/4 to DIN 3852 T11 (with soft seal located at rear)
523 G 1/2 to DIN 3852 T11 (with soft seal located at rear)
562 7/16-20 UNF
999 special process connection
- (6) Material of process connection**
20 stainless steel
- (7) Material of seal**
601 FPM
604 FFPM¹
999 special material
- (8) Electrical connection**
36 circular connector M 12x1 / 5-pole
- (9) Extra codes**
000 none

Order code DMP

(1)	2055
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(2)	000
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(3)	
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(4)	450
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(5)	
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(6)	20
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(7)	
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(8)	36
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(9)	000
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Order example DMP

(1)	2055
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(2)	000
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(3)	462
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(4)	450
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(5)	502
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(6)	20
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(7)	601
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(8)	36
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(9)	000
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¹ Product characteristics similar to PTFE.