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JUMO CANtrans p

Pressure Transmitter with CANopen output

Short description

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.

Further transmitters with CANopen output: Data Sheet 402055, Data Sheet 902910.

Type 402056

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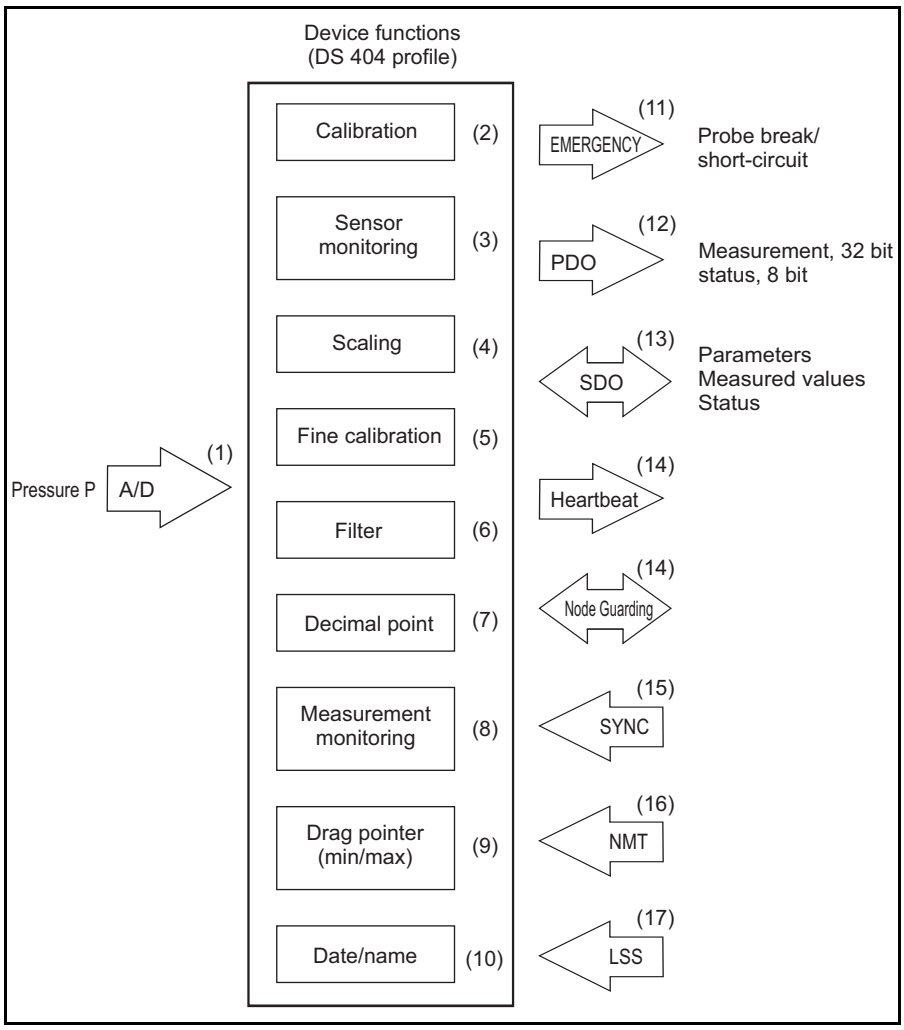
Block diagram



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.

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Technical data

Reference conditions
DIN 16086, IEC 770/5.3

Measurement ranges
0 to 0.25 bar relative pressure,
0 to 0.4 bar relative pressure,
0 to 0.6 bar relative pressure,
0 to 1.0 bar relative pressure,
0 to 1.6 bar relative pressure,
0 to 2.5 bar relative pressure,
0 to 4 bar relative pressure,
0 to 6 bar relative pressure,
0 to 10 bar relative pressure,
0 to 16 bar relative pressure,
0 to 25 bar relative pressure,
0 to 40 bar relative pressure,
0 to 60 bar relative pressure,
0 to 100 bar relative pressure,
0 to 160 bar relative pressure,
0 to 250 bar relative pressure,
0 to 400 bar relative pressure,
0 to 600 bar relative pressure,
-1 to 0 bar relative pressure,
-1 to +0.6 bar relative pressure,
-1 to +1.5 bar relative pressure,
-1 to +3 bar relative pressure,
-1 to +5 bar relative pressure,
-1 to +9 bar relative pressure,
-1 to +15 bar relative pressure,
-1 to +24 bar relative pressure,
0 to 0.6 bar absolute pressure,
0 to 1.0 bar absolute pressure,
0 to 1.6 bar absolute pressure,
0 to 2.5 bar absolute pressure,
0 to 4 bar absolute pressure,
0 to 6 bar absolute pressure,
0 to 10 bar absolute pressure,
0 to 16 bar absolute pressure,
0 to 25 bar absolute pressure

Overload limit
For ranges
0 to 0.25 bar to 0 to 25 bar: 3 x MSP[1]
For ranges
0 to 40 to 0 to 250 bar: 2 x MSP
For ranges
0 to 400 to 0 to 600 bar:1.5 x MSP

Bursting pressure
For ranges
0 to 0.25 bar to 0 to 40 bar: ≤ 4 x MSP
For ranges
0 to 60 to 0 to 100 bar: 8 x MSP
For ranges
0 to 160 to 0 to 400 bar: 5 x MSP
For ranges 0 to 600 bar: 3 x MSP

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 % MSP

Thermal hysteresis
≤ ±0.5 % MSP
(within compensated temperature range)
≤ ±1 % for ranges 0 to 0.25 bar, 0 to 0.4 bar, 0 to 0.6 bar

Ambient temperature effect
Within range 0 to 100 °C
(compensated temperature range)
For ranges 0.25 and 0.4 bar
Zero: ≤ 0.03 %/°C typical,
≤ 0.05 %/°C max.
Span: ≤ 0.02 %/°C typical,
≤ 0.04 %/°C max.
For ranges above 0.6 bar
Zero: ≤ 0,02 %/°C typical,
≤ 0.04 %/°C max.
Span: ≤ 0.02 %/°C typical,
≤ 0.04 %/°C max.

Deviation from characteristic
≤ 0.5 % MSP (limit point setting)

Hysteresis
≤ 0.1 % MSP

Repeatability
≤ 0.05 % MSP

Cycle time
1 msec
Optionally 0.5 msec (11 bit)

Stability per year
≤ 0.5 % MSP

Supply
DC 10 to 30 V
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

Electromagnetic compatibility
DIN EN 61326-1:2013
DIN EN 61326-2-3:2013
Interference emission: Class B[2]
Immunity to interference: to industrial requirements

Electrical connection
M12 plug connector
Recommended: screened 5-wire cable

Mechanical shock
DIN IEC 68-2-27
100 g/5 msec

Mechanical vibration
DIN IEC 68-2-6
20 g max. at 15 to 2000 Hz

Enclosure protection
DIN EN 60529
With connector screwed on IP67

Housing
Stainless steel, mat. ref. 1.4305

Process connection
G 1/4" according to DIN EN 837,
G 1/2" according to DIN EN 837,
1/4-18 NPT according to DIN 837,
1/2-14 NPT according to DIN 837,
G 1/2" according to DIN 3852-11,
7/16-20 UNF,
G 3/4" front-flush DIN EN ISO 228-1,
G 3/4" front-flush with double gasket,
other connections upon request

Nominal position
Unrestricted

Weight
95 g with process 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 to 127
Setting via LSS or SDO

PDO
0 Rx, 1 Tx

SDO
1 Rx, 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 for download at www.jumo.net.

Factory setting
Operating Instructions B 402055.0.
Available for download at www.jumo.net.

[1] MSP = measuring span

[2] The product is suitable for industrial use as well as for households and small businesses.

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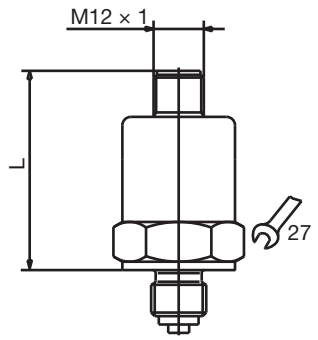
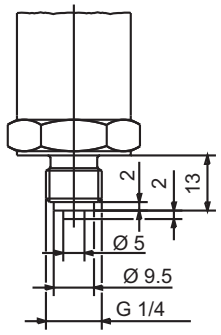
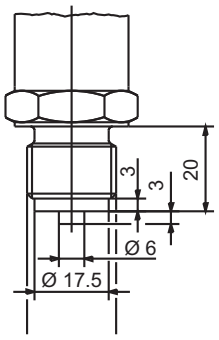
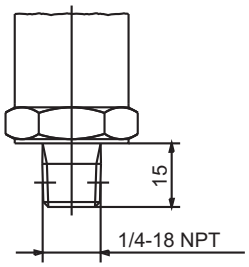
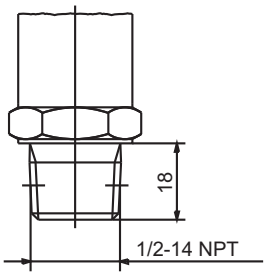
Dimensions

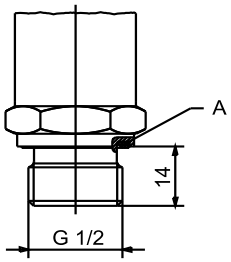
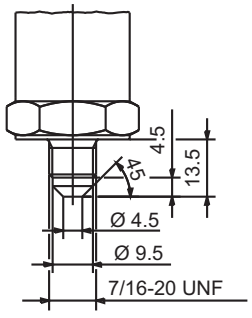
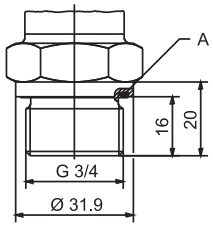
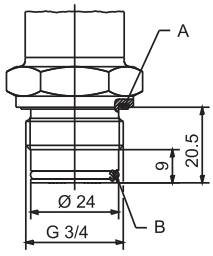
Gerät



Basic type extension	L [mm]
000	48

Process connections

502 G 1/4"	504 G 1/2"	511 1/4-18 NPT	512 1/2-14 NPT
			

523 G 1/2"	562 7/16-20 UNF	571 G 3/4" ´front-flush	575 G 3/4" front-flush with double gasket
			
A Profile seal G 1/2"		A Profile seal G 3/4"	A Profile seal G 3/4" B O-ring

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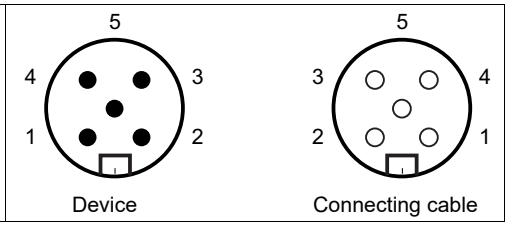
Connection elements

The connection elements in the data sheet provide information on product selection.

For the electrical connection, only use the installation instructions or the operating manual.

M12 plug connector



Terminal assignment

Designation	Description	Assignment
Voltage supply DC 10 to 30 V	V+ V-	2 3
Output CANopen	Screen CAN_H CAN_L	1 4 5

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Order details

	(1)	**Basic type**
402056/000		JUMO CANtrans p – Pressure transmitter with CANopen output
402056/999		JUMO CANtrans p – Pressure transmitter with CANopen output, special version
	(2)	**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 measuring range absolute pressure
999		Special measuring range gauge pressure
	(3)	**Output**
450		CANopen
	(4)	**Process connections**
502		G 1/4" according to DIN EN 837
504		G 1/2" according to DIN EN 837
511		1/4-18NPT according to DIN EN 837
512		1/2-14NPT according to DIN EN 837
523		G 1/2" according to DIN 3852-11
562		7/16-20UNF

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571		G 3/4" front-flush DIN EN ISO 228-1[a]
575		G 3/4" front-flush with double gasket[a]
	(5)	**Process connection material**
20		CrNi (stainless steel)
	(6)	**Electrical connection**
36		M12 plug connector
	(7)	**Extra code**
000		None
100		Customer-specific configuration (specifications in plain text)

[a] Front-flush process connections are only available for measuring spans up to 25 bars.

	(1)		**(2)**		**(3)**		**(4)**		**(5)**		**(6)**		**(7)**
Order code		-		-		-		-		-		/	
Order example	402056/000	-	462	-	450	-	502	-	20	-	36	/	000

Accessories

Designation	**Part No.**
Line socket, 5-pole, M12 × 1, straight, 5 m	00337625
Line socket, 5-pole, M12 × 1, angled, with moulded connecting cable, 2 m	00375164
Tee piece, 5-pole, M12 × 1	00419129
Line socket, 5-pole, M12 × 1, straight, without connecting cable, assembly by customer	00419130
Line socket, 5-pole, M12 × 1, angled, without connecting cable, assembly by customer	00419133
PC CAN interface for USB interface (configurations software included)	00449941
Extension cable, 5-pole, with connector and plug M12 × 1, 2 m	00461589
Termination resistor for CAN bus/digiLine, M12 × 1	00461591