



# Pressure and Temperature Transmitter with CANopen output JUMO CANtrans pT Type 402057

## General application

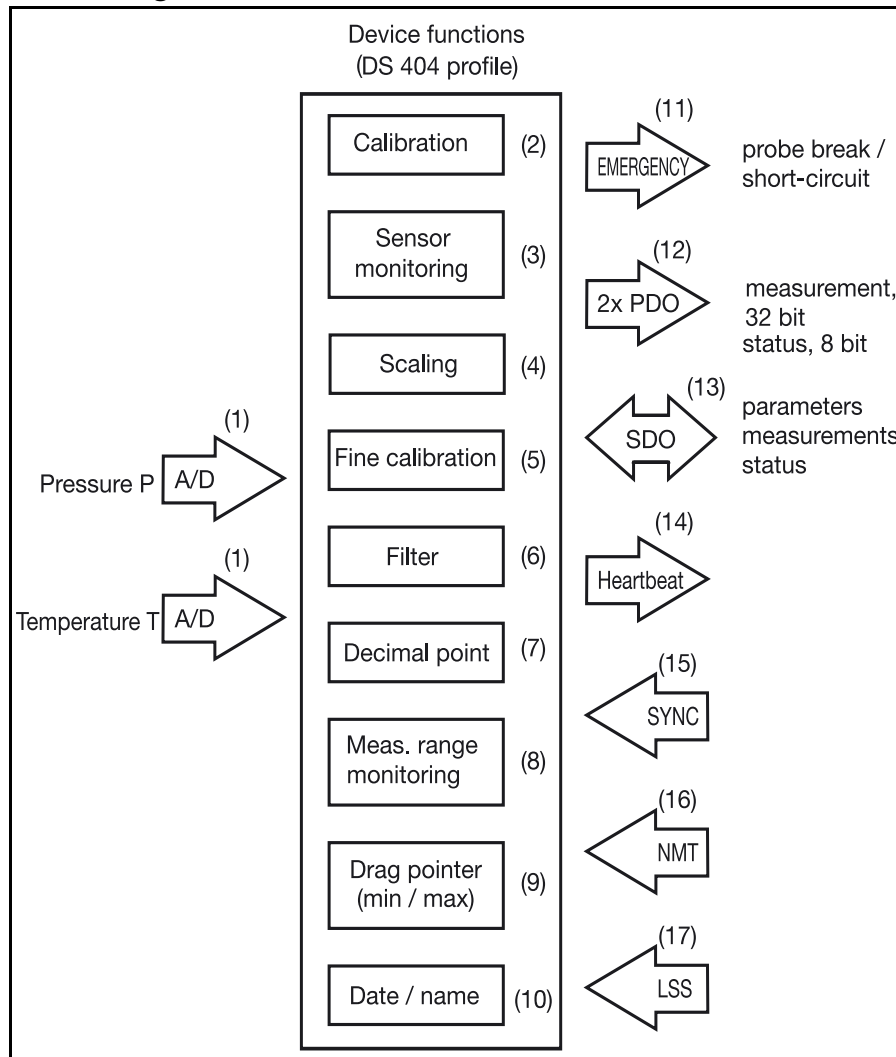
This pressure and temperature transmitter is used for measuring relative (gauge) and absolute pressures in liquids and gases. In addition, the integrated temperature sensor measures the temperature of the medium directly at the pressure diaphragm.

The pressure transmitter operates on the piezoresistive or thin-film strain gauge measuring principle. The temperature transmitter obtains the measurements from a Pt1000 sensor. The pressure and temperature measurements are 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 setting can be made using standard CANopen software tools.

Further transmitters with CANopen output: see Data Sheets 40.2055 (pressure), 40.2056 (pressure) and 90.2910 (temperature).



## Block diagram



## Operation

- (1) The analog signals from the pressure cell and the temperature sensor are digitized.
- (2) The pressure and temperature signals are 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). The temperature can be switched from °C to °F.
- (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 measurements are 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 and temperature 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 two PDO telegrams contain the 32-bit measurement and the 8-bit status for pressure and temperature respectively. 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 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, pressure

### 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

### 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

can be switched to any dimensional unit and %

### 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

## Technical data, temperature

### Temperature sensor

Pt1000, EN 60 751

### Range limits

-50 to +125°C

### Cycle time

250 msec

### Accuracy

Class B to EN 60 751

±0.2% of full scale

### Output

CANopen as per CiA DS 301 V4.02

linear with temperature, in °C,

can be switched over to °F or K

## Technical data, general

### 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

EN 61 326

interference emission: Class B

immunity to interference: to industrial requirements

### Electrical connection

5-pole terminal box M 12x1

recommended connecting cable:

screened 5-wire cable

### Supply

10 – 30 V DC

max. current drawn: approx. 45 mA

### Supply voltage error

≤ 0.03% per V

### Mechanical shock

(to IEC 68-2-27)

100 g/5 msec

### Mechanical vibration

(to IEC 68-2-6)

max. 20 g at 15 – 2000 Hz

### Enclosure protection

with connector screwed on:

IP67 to EN 60 529

### Housing

stainless steel, Mat. Ref. 1.4305

### Process connection

see order details;

other connections on request

### Nominal position

unrestricted

### Weight

approx. 120 gm

(with pressure connection G 3/4)

## 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, 2 Tx

### SDO

1Rx, 1 Tx

### Emergency

yes

### Heartbeat

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:

[www.jumo.net](http://www.jumo.net) -> Product information

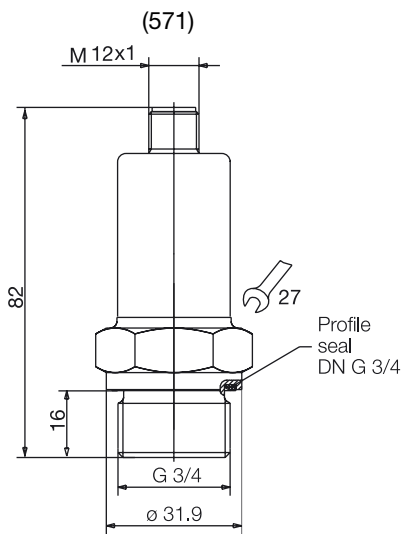
### Factory setting

see Operating Instructions B40.2055.0

available free of charge as a download file:

[www.jumo.net](http://www.jumo.net) -> Product information

### Dimensions

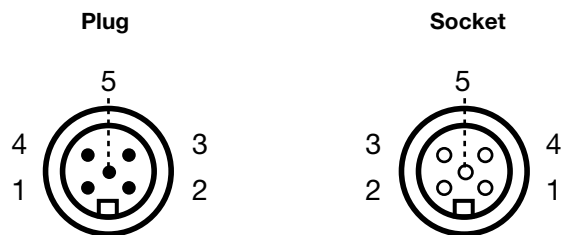


### Electrical connection

Connection		Terminal assignment	
		M12 connector	Terminal box with moulded cable Sales No. 40/00337625
Supply 10 – 30 V DC		V+	2 white
		V-	3 blue
Output CANopen	screen	1	brown
	CAN_H	4	black
	CAN_L	5	grey

### Circular connector

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



### Accessories

Designation	Sales No.
5-pole terminal box M 12x1, straight, with 5 m moulded cable	40/00337625
5-pole terminal box M 12x1, angled, with 2m moulded cable	40/00375164
5-pole terminal box M 12x1, straight, no cable, assembly by customer	40/00419130
5-pole terminal box M 12x1, angled, no cable, assembly by customer	40/00419133
Tee	40/00419129
Termination resistor for CAN bus, with plug	40/00461591
Extension cable 2m, 5-pole, M 12x1	40/00461589
PC CAN interface USB	40/00449941
PC configuration software for CANopen	40/00449942
EDS file, for download (www.jumo.net -> Product information)	for download
Operating Instructions, for download (www.jumo.net -> Product information)	for download

**Order details**

- (1) Basic type**  
402057 Pressure and temperature transmitter JUMO CANtrans pT
- (2) Basic type extension**  
000 none
- (3) Input, pressure**
  - 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
  - 478 -1 to 0 bar gauge pressure
  - 479 -1 to 0.6 bar gauge pressure
  - 480 -1 to 1.6 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) Input, temperature**  
999 -50 to +125°C (can be switched to °F or K)
- (5) Output**  
450 CANopen
- (6) Process connection (front-flush)**
  - 571 G<sup>3</sup>/<sub>4</sub>
  - 999 special connection (only front-flush)
- (7) Material of process connection**  
20 stainless steel
- (8) Electrical connection**  
36 circular connector M 12x1 / 5-pole
- (9) Extra code**  
000 none

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)							
<b>Order code</b>	402057	/ 000	-		-	999	-	450	-	571	-	20	-	36	/	000
<b>Order example</b>	402057	/ 000	-	462	-	999	-	450	-	571	-	20	-	36	/	000