

Type 402004

Multiple-range pressure and differential pressure transmitter

1 General

JUMO GmbH & Co. KG is a DIN ISO 9001 certified company. The pressure transmitter described below meets the requirements according to DIN and VDE. You have purchased a product that satisfies even very stringent requirements and meets or even exceeds all the given specifications.

Should there nonetheless be any reason for dissatisfaction, please send the instrument back to us with as detailed a description as possible of the shortcoming found.



Please read the operating manual before you commission the device.

We reserve the right to make technical changes. Please help us to improve this operating manual; we would be grateful for your suggestions.



This operating manual also contains assembly instructions for the pressure transmitter. Should there still be any difficulties at the time of commissioning or during use please contact your local JUMO branch or JUMO Fulda.

Telephone: (06 61) 60 03-7 15
Fax: (06 61) 60 03-6 06
Internet: www.jumo.net

The pressure transmitter described in this operating manual is maintenance-free. It does not contain any components that can be repaired or replaced by you. Repairs can be carried out only at the factory!

Installation, commissioning and operation can only be done by trained technical persons.

The instrument may only be used within its specifications.

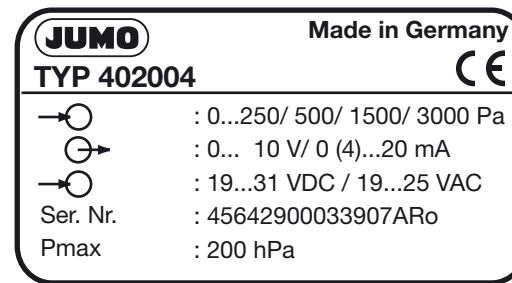
Do not blow into the pressure connections. The instrument could get damaged.

2 Technical Description

Should you require detailed technical data about the instrument, please ask for the data sheet 40.2004.

Internet: www.jumo.net Telephone (06 61) 60 03-7 15

You can see the model of your pressure transmitter from the type plate.



- (1) Pressure inlet
- (2) Output signal
- (3) Voltage supply
- (4) Series number
- (5) Maximum pressure

3 Installation

3.1 Safety instruction



Caution

The instrument does not conform to the requirements "Plant component with safety function" according to the Pressurized Devices Directive 97/23/EC.

In the case of dangerous measurement media, such as oxygen, acetylene, flammable and poisonous materials, as well as refrigeration equipment, pressurized tanks etc, the relevant existing specifications must be met!

Ignoring these specifications and regulations can result in injuries to persons and damage to property.

Only suitably qualified personnel may work on these instruments.

3.2 Deployment conditions

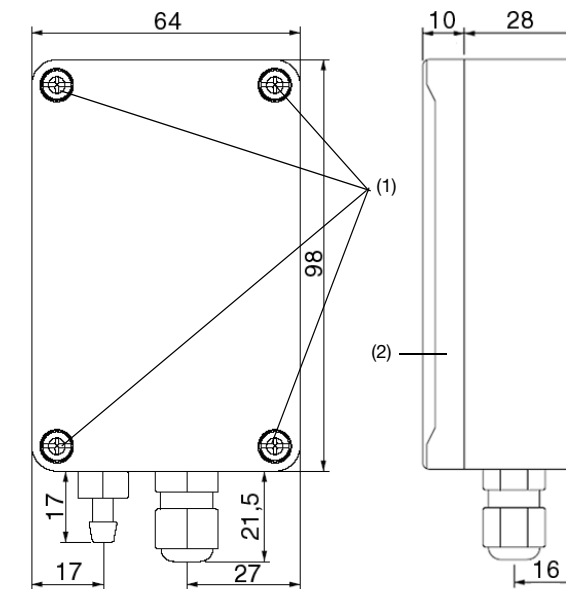
The instrument is suitable for the acquisition of overpressure, underpressure or differential pressure of non-aggressive gases

The instrument must not be installed in the vicinity of sources of noise (transformers, transmitters, electrical motors) and heat.

Shocks or vibrations at the installation site can result in measurement errors.

The instrument was set with an ambient temperature of 20°C, vertically with the pressure connection downwards. Deviations from this installation position and ambient temperature result in measurement errors.

3.3 Fastening



* Unscrew the four screws (1) and remove the cover (2) of the instrument.

B 40.2004.0
Operating manual



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Internet: www.jumo.us
e-mail: info@jumo.us
Fax: 315-697-5867

Phone: 1-800-554-JUMO
Phone: 315-697-JUMO
Canastota, NY 13032, USA
8 Technology Boulevard

JUMO Process Control, Inc.

Internet: www.jumo.co.uk
e-mail: sales@jumo.co.uk
Fax: +44 1279 635262

Phone: +44 1279 635533
Hardow, Essex CM 20 2 TT, UK
Temple Bank, Riverway

JUMO Instrument Co. Ltd.

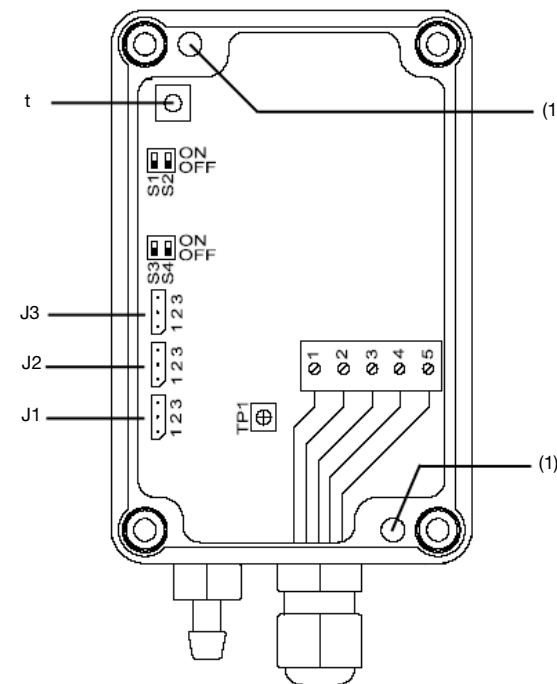
Internet: www.jumo.net
e-mail: mail@jumo.net
Fax: +49 661 6003-500

Phone: +49 661 6003-0
36035 Fulda, Germany
Postal address:

36039 Fulda, Germany
Mackenrodtstraße 14
Delivery address:

36039 Fulda, Germany
Mortiz-Juchheim-Strabe 1
Street address:

JUMO GmbH & Co. KG



* Fasten the instrument with 2 screws to the fastening holes (1).

4 Electrical connection



Pressure transmitters may only be connected by suitably qualified technical personnel!

Please comply with the specifications and safety regulations for electrical, light current and heavy current systems, and especially the country-specific specifications applicable (e.g. VDE 0100).

4.1 Connection diagram

| Connection | | | Connection lay-out Terminal block |
|--------------------------------------|--|-----|-----------------------------------|
| Voltage supply 19 ... 31 V DC | | L - | 5 |
| | | L + | 4 |
| Voltage supply 19 ... 25 V AC | | N | 5 |
| | | L1 | 4 |
| Output 0 ... 10 V | | - | 1 |
| | | + | 3 |
| Output 0(4) ... 20 mA, three-wire | | - | 1 |
| | | + | 2 |

5 Commissioning



Caution

Jumper J1 must not be reconnected elsewhere and must remain in position 2-3.

The potentiometer TP1 must not be adjusted

5.1 Pressure connection

Positive overpressure at the "+" terminal
Negative overpressure (underpressure) at "-" terminal

5.2 Setting the measurement range

| | Switch 1 | Switch 2 | MEASUREMENT RANGE |
|-----|----------|----------|-------------------|
| | ON | ON | 3000 Pa |
| ON | OFF | 1500 Pa | |
| OFF | ON | 500 Pa | |
| OFF | OFF | 250 Pa | |

5.3 Setting the time constant

In order to get a stable signal even with greatly varying pressure, the time constant can be set with the DIP switches 3 and 4.

| | Switch 3 | Switch 4 | Time constant |
|-----|----------|---------------|---------------|
| | ON | ON | approx. 30 ms |
| ON | OFF | 4 s | |
| OFF | ON | 2 s | |
| OFF | OFF | approx. 30 ms | |

6 Setting the output signal

6.1 0 ... 20 mA

* Insert jumper J3 in position 2-3.

6.2 4 ... 20 mA

* Insert jumper J3 in position 1-2.

6.3 0 ... 10 mA

The voltage signal is always available (terminals 1 - 3).

7 Calibrate

7.1 Setting the zero point

- Remove the pressure pipes from the instrument.
- Open the instrument.
- Insert jumper J2 in position 2-3.
- Press the T key.

7.2 Set the final value

- Supply the corresponding rated pressure to the instrument through the pressure pipes.
- Open the instrument.
- Insert jumper J2 in position 1-2.
- Press the T key.
- Insert jumper J2 again in position 2-3.

8 Technical Data

Reference conditions

in accordance with DIN 16 086 and DIN IEC 770/5.3

Measurement ranges

adjustable via DIP-switches:

0 ... 250 Pa

0 ... 500 Pa

0 ... 1500 Pa

0 ... 3000 Pa

Overload limit

In case of relative pressure measurement :

10 times the final measurement value.

For measurement range 0 ... 3000 Pa:

5 times the final measurement value at

Maximum system pressure

200 hPa

Bursting pressure

300 hPa

Parts coming in contact with the pressure medium

Al, Au, Ni, Ni-Co-steel, glass, PEI, PU,

silicon

Output

see the ordering data

Influence of the working resistance

For output voltage:

R_L ≥ 2 kΩ

For output current:

R_L ≤ 500 Ω

Influence of ambient temperature

in the range +10...+50°C

(compensated temperature range)

Zero point: ≤0.12%/K

Measurement spread:≤0.12%/K

Characteristic curve

linear

Characteristic curve deviation

≤ ± 2% v. EW

(limit point setting)

Hysteresis

≤ ± 0.2% v. EW

Setting time/ Filtering time

adjustable to 30 ms or 2 s or 4 s

Stability per year

± 2%

Output signal

can be toggled with coding:

0 ... 10 V or 0 ... 20 mA

Voltage supply

DC 19 ... 31 V or

AC 19 ... 25

Residual ripple

≤ 60 mV

Max. current drawn

≤ 20 mA (without load)

Influence of voltage supply

In the range from 19 ... 31 V DC:

≤0.05%

Permissible ambient temperature

+10...+50°C

Bearing temperature

-10...+70°C

Permissible medium temperature

+10 ... +50°C

Electromagnetic compatibility

EN 61 326

Noise transmission:Class B

Resistance to jamming/noise:Industrial requirements

Mechanical shock

10 g/0.1 ms

Mechanical vibrations

maximum 5 g at 15 ... 2000 Hz

Degree of protection

IP 54 according to EN 60 529

Housing

ABS

Process connection

ø 6,6 x 10 mm

(for flexible hoses ø 6 mm)

Electrical connection

Terminal screws on the inside,

for conductor cross-sections up to 1.5 mm²

Nominal position

vertical ⊥

Weight

approx. 170 kg

9 Fault

| Type of fault | Possible cause | Measure |
|--|---|--|
| No output signal | No supply voltage | Check the supply voltage |
| | Cable rupture, wrong connections | Check the connections of the conductors |
| | No input pressure | Check measurement medium connection |
| Output signal constant even when there is a change in pressure | Fault at the pressure transmitter owing to impermissible usage conditions | Send the transmitter with a description of the fault to the supplier |
| | Measurement system of the instrument faulty damaged by overpressure | Provide the correct voltage supply |
| | Output signal of the pressure transmitter gets falsified owing to overvoltage from the current limiter | Measurement range too small – send transmitter with description of fault to the supplier |
| Output signal is too high | Measurement point is blocked | Check the measurement point and clean or replace if required |
| | Selected measurement range is too small | Send the transmitter with a description of the fault to the supplier |
| Output signal is too low | The electronics of the pressure transmitter is faulty or the supply voltage is too high | |
| | Output signal is too low | In case of output current signal: Load is too big |
| In case of output voltage signal: Load is too small | | |
| Zero-point of the output signal is erroneous | Supply voltage is too low | Change the supply voltage |
| | Pressure transmitter setting has been disturbed by impermissible usage conditions (for example, overpressure) | |
| Characteristic curve of the output signal is not linear | Pressure transmitter setting has been disturbed by impermissible usage conditions (for example, overpressure) | Send the transmitter with a description of the fault to the supplier |
| | Pressure transmitter setting has been disturbed by impermissible usage conditions (for example, overpressure) | |

10 Service

- JUMO pressure recorders and pressure transmitters are maintenance-free.

- In case of faults, no components or assemblies can be replaced or repaired at the customer site. Please send the instrument with as detailed a description as possible of the fault to the supplier.

- We recommend calibrating the pressure transmitter annually.