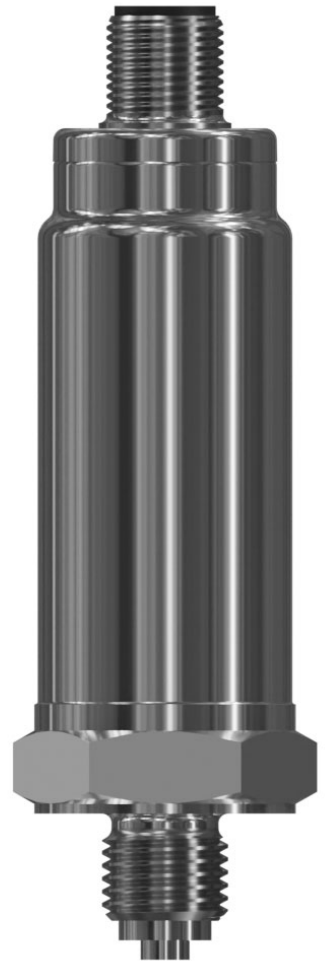


JUMO TAROS H48 Ex

Pressure transmitter

H2 ready



Operating Manual



40474000T90Z001K000

V1.00/EN/2026-05-19

Further information and downloads



jmo.to/404740-en

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1 About this documentation

1.1 Purpose

This documentation is part of the device and includes all information to ensure that it is used safely and as intended across all phases of the product lifecycle.

If you do not follow the documentation and safety information, this may result in risk to life and damage to property due to improper use.

- Read and follow the documentation and the safety information and warnings.
- Store the document in its entirety, in an easily accessible location, and so that it can be read in full at all times.
- Contact the manufacturer if you have any questions about the device and documentation.

1.2 Target group

This documentation is intended for trained electrical, mechanical, and plant engineering personnel.

⇒ chapter 2.2 "Qualification of personnel", Page 7

1.3 Definition of terms

Use in the documentation	Definition
Pressure transmitter, sensor, device	JUMO TAROS H48 Ex H2 ready pressure transmitter
Medium, measurement medium	Liquid or gas (mixture), in which the pressure is measured
Product lifecycle	Overall consideration of product identification, acceptance of the goods, storage, mounting, connection, operation, troubleshooting, maintenance to disposal
Nameplate	Laser engraving on the device housing

1.4 Trademark information

All trademarks and trade and company names used are the property of their rightful owners or authors.

1.5 Symbols



DANGER!

The signal word "DANGER" indicates an immediate danger.

Non-observance will lead to death or serious injury.

- The instructions in the warning notice must be observed and followed!



WARNING!

The signal word "WARNING" indicates an imminent danger.

Non-observance can lead to death or serious injury.

- The instructions in the warning notice must be observed and followed!

1 About this documentation



CAUTION!

The signal word **"CAUTION"** indicates an imminent danger.

Non-observance can lead to minor or moderate injury.

- The instructions in the warning notice must be observed and followed!
-

NOTICE!

The signal word **"NOTICE"** indicates possible damage to property.

Non-observance can lead to damage to devices, systems or the environment.

- Observe the instructions in the note for avoiding damage!
-



NOTE!

This symbol is used in tables and indicates that further information is provided after the table.



REFERENCE!

This symbol refers to **further information** in other sections, chapters, or other manuals.

2.1 Intended use

The pressure transmitter measures the relative pressure of liquid, steam, and gaseous media. The device is suitable for installation in pipes and containers. It can also be used in applications which require explosion protection or in shipbuilding. It is mounted using individual process connections.

The device meets the requirements of explosion group II for the categories 2 G and 2 D if it is connected to intrinsically safe electrical circuits. For this, a certified, intrinsically safe [Ex i] transmitter supply unit must be used. The device is suitable for use in potentially explosive areas:

- Zone 1 and 2 for gas (G)
- Zone 21 and 22 for dust (D)

The documentation is part of the device. The device is only intended for use according to this documentation.

2.2 Qualification of personnel

The personnel deployed must meet the following requirements in all phases of the product lifecycle:

- Trained electrical, mechanical, and plant engineering personnel.
- Members of personnel are familiar with this documentation and the safety information and warnings it contains.

2.3 Explosion protection

The specifications in the declaration of conformity and the type examination certificate (both found at the end of this operating manual), and the relevant regulations for sensors and supply units in potentially explosive areas must be observed!

As the operator, create the Ex-protection document for the plant and carry out the zoning and risk assessment (e.g. based on the ATEX 137 guide).

Only operate the device in intrinsically safe electrical circuits.

The Ex approval becomes null and void if the device is used contrary to its intended use or if the safety-relevant requirements in this operating manual are not complied with.

2.4 Hot surfaces

Hot media may result in the device surfaces becoming hot and presenting a risk of injury.

- Allow the device and plant to cool down.
- Wear suitable protective equipment.
- If required, install contact protection.

2 Safety

2.5 Hazardous materials

Using hazardous materials as a medium may result in abrasive and corrosive damage to components of the product that come into contact with the medium. The medium may leak and present a fire hazard and a risk to health.

Carry out a risk assessment taking into consideration the safety data sheet for the relevant hazardous substance for mounting, operation, maintenance, cleaning, and disposal:

- Comparison and systematic checking of the durability of the components of the product that come into contact with the medium and the admissible environmental influences.
- Assessment of the risk to people and the environment.
- Assessment of the fire hazard due to the product materials, the admissible environmental influences, and the voltage supply.

2.6 Mechanical loads

Mechanical load on the device and process connections can lead to leaks.

- Do not place the device and the process connections under mechanical load.
- Do not insert any articles into the pressure connection borehole.
- Do not direct the pressure blast at the membrane.
- Keep the pressure to be measured, including pressure peaks, below the admissible overpressure. If necessary, take suitable precautions (e.g. install a damping element).
- Systematically check that the process connections are leak-tight.

2.7 Hybrid mixtures

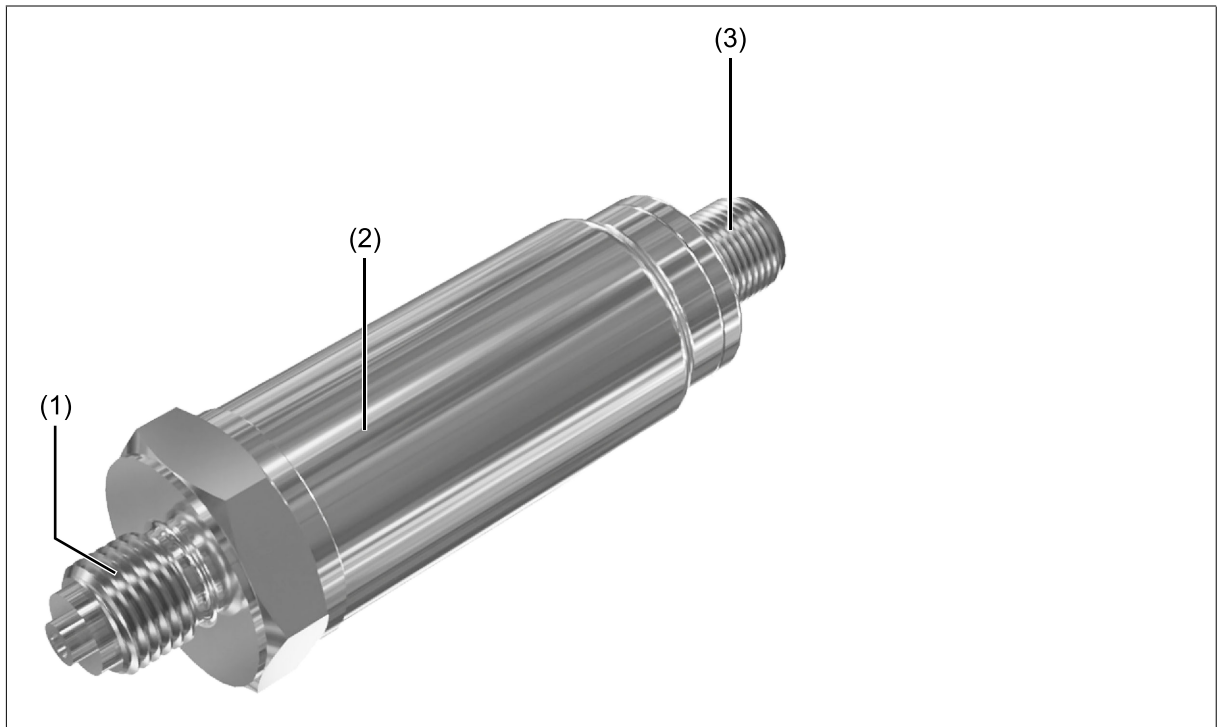
Hybrid mixtures are explosive mixtures of flammable gases, vapors, or mists with flammable dusts. In particular, equipment used in potentially explosive areas where hybrid mixtures are present must be checked. The operator is responsible for checking that the equipment is suitable for such uses.

2.8 Transport and storage damage

The device can be damaged if it is insufficiently protected during transport and/or improperly stored.

- Transport the device protected from moisture and dirt in shockproof packaging.
- Protect all electrical and mechanical connections from damage.
- Observe the admissible storage temperature of the device.
- Store the device in a dry and dust-free environment.

3.1 Structure



- 1 Process connection
(example: G 1/4)
- 2 Device housing

- 3 Electrical connection
(example: round plug M12 × 1)

3.2 Functions

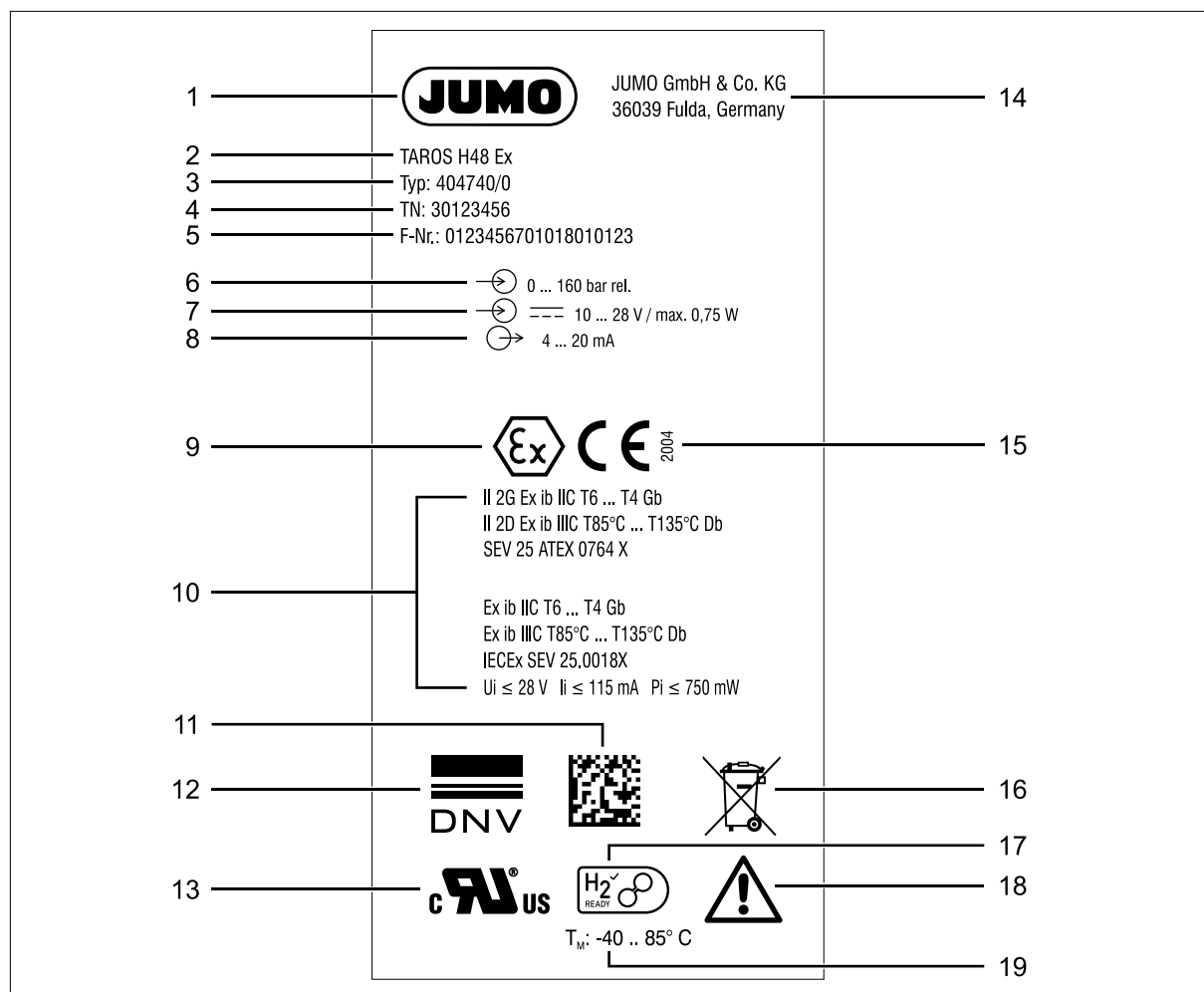
The device measures the relative process pressure in liquid or gaseous media. Via a membrane, the process pressure exerts a force on a metallic thin film sensor and deforms its substrate. The electrical resistance of the material changes due to deformation. This change in resistance is proportional to the mechanical deformation and therefore to the pressure exerted. The measured pressure is converted into a 4 to 20 mA standard signal and is output via various electrical connections.

3 Description

3.3 Nameplate

Position

The nameplate is laser-etched on the device surface.



1	Manufacturer's name	11	Data Matrix Code
2	Device designation	12	Ship approval according to DNV®
3	Device type	13	UL approval
4	Part no.	14	Manufacturer's address
5	Fabrication number	15	CE identification marking
6	Measuring range	16	Disposal
7	Voltage supply (DC)	17	H2 ready
8	Output signal	18	Observe device documentation!
9	Ex approval	19	Temperature range for H2 applications
10	Ex approval identification marking		

Date of manufacture

The date of manufacture (year and calendar week) of the device is encoded in the manufacturing number. The numbers 12 to 15 identify the year of manufacture and the calendar week.

3.4 Approval marks and certificates



Observe "Special conditions for safe use" in hazardous areas.
Certificates for approved device versions are available for download on the manufacturer's website.

3.5 Scope of delivery

Device in the ordered version
Operating manual

4 Technical data

4.1 Ex identification markings

ATEX, intrinsically safe, Ex i	II 2G Ex ib IIC T6 to T4 Gb II 2D Ex ib IIIC T85 °C to T135 °C Db
IECEx, intrinsically safe, Ex i	Ex ib IIC T6 to T4 Gb Ex ib IIIC T85 °C to T135 °C Db

4.2 Electrical safety

Requirements	DIN EN 61010-1:2020 The device must be equipped with an electrical circuit that meets the requirements with regard to "Limited-energy circuits".
--------------	---

4.3 Electrical data

Voltage supply	DC 10 to 28 V SELV
Nominal voltage	DC 24 V
Voltage supply influence	$\leq 0.02 \% / V$
Protection	Reverse-polarity protection
Insulation resistance	$> 100 \text{ M}\Omega$ at DC 500 V
Insulation voltage	AC 500 V
Overvoltage category	II
Pollution degree	2
Electrical connection	
Connection elements	Round plug M12 $\times$ 1 (IEC 61076-2-101, 4-pole) or line socket ^a

^a Cables used must have a conductor cross section of a maximum of AWG 16 and a diameter of 6 to 8 mm.

4.3.1 Intrinsic safety parameters

Permissible input voltage U_i	$\leq 28 \text{ V}$
Permissible input current I_i	$\leq 115 \text{ mA}$
Permissible input power P_i	$\leq 750 \text{ mW}$
Internal capacitance C_i	$\leq 40 \text{ nF}$
Internal inductance L_i	$\leq 1,5 \text{ }\mu\text{H}$

4.4 Inputs

4.4.1 Sensor system

Measuring principle	Thin-film technology
Admissible load changes	>10 million

4.4.2 Measuring range and accuracy

Reference conditions

Basic principles	DIN EN 60770, DIN EN 61298
Ambient temperature	25 °C ±5 °C (77 °F ±9 °F)
Humidity	45 to 75 % RH
Ambient pressure	Constant, 860 to 1060 mbar (12.47 to 15.37 psi)
Installation position	Any
Voltage supply	DC 24 V ±3 V

Relative pressure

Measuring range	Linearity ^a	Accuracy at		Long-term stability ^b	Overload capability ^c	Burst pressure
bar	% MSP ^f	20 °C ^d % MSP	-20 to +75 °C ^e % MSP	% MSP per year	bar	bar
0 to 100	0.15	0.4	0.7	≤ 0.2	200	500
0 to 160	0.15	0.3	0.6	≤ 0.2	320	800
0 to 200	0.25	0.3	1.0	≤ 0.2	500	1250
0 to 250	0.1	0.3	0.45	≤ 0.2	500	1250
0 to 350	0.1	0.3	0.7	≤ 0.2	800	2000
0 to 400	0.1	0.3	0.55	≤ 0.2	800	2000
0 to 600	0.15	0.3	0.6	≤ 0.2	1200	3000
0 to 800	0.25	0.3	0.55	≤ 0.2	2000	3000
0 to 1000	0.25	0.4	0.7	≤ 0.2	2000	3000

^a According to limit point setting.

^b Reference conditions according to EN 61298-1.

^c The pressure transmitters for all measuring ranges are vacuum proof.

^d Includes: linearity, hysteresis, repeatability, deviation of measuring range start value (offset), and measuring range end value.

^e Includes: linearity, hysteresis, repeatability, deviation of measuring range start value (offset), measuring range end value, thermal effect on measuring range start (offset), and measuring span.

^f MSP = measuring span.

4 Technical data

Measuring range psi	Linearity ^a % MSP ^f	Accuracy at		Long-term stability ^b % MSP per year	Overload ca- pability ^c psi	Burst pres- sure psi
		68 °F ^d % MSP	-4 to 167 °F ^e % MSP			
0 to 2000	0.15	0.4	0.7	≤ 0.2	4600	11600
0 to 3000	0.25	0.3	1.0	≤ 0.2	7200	18100
0 to 5000	0.1	0.3	0.7	≤ 0.2	11600	29000
0 to 8000	0.15	0.3	0.6	≤ 0.2	17400	43500
0 to 10000	0.25	0.3	0.55	≤ 0.2	17400	43500
0 to 15000	0.25	0.4	0.7	≤ 0.2	29000	43500

^a According to limit point setting.

^b Reference conditions according to EN 61298-1.

^c The pressure transmitters for all measuring ranges are vacuum proof.

^d Includes: linearity, hysteresis, repeatability, deviation of measuring range start value (offset), and measuring range end value.

^e Includes: linearity, hysteresis, repeatability, deviation of measuring range start value (offset), measuring range end value, thermal effect on measuring range start (offset), and measuring span.

^f MSP = measuring span.

For special measuring ranges, the accuracy of the next higher standard measuring range applies.

Example: Special measuring range 0 to 650 bar
 Next higher standard measuring range 0 to 800 bar
 → Linearity: 0.25 %
 → Accuracy at 20 °C: 0.3 %

4.5 Outputs

4.5.1 Analog output

Type	Current output
Function	Output of the process value, output of a signal for error messaging
Signal range	4 to 20 mA
Error signal in the case of	≤ 3.6 mA and ≥ 21.5 mA
Linear exceedance according to NAMUR NE 43	3.8 to 20.5 mA
Burden	$R_L \leq (U_B - 10 \text{ V}) \div 0.022 \text{ A } (\Omega)$
Burden influence	0.02 % per 100 Ω
Accuracy	±0.1 % referring to 16 mA
Temperature influence	75 ppm/K
Step response time 90 %	< 5 ms
Warm-up time	< 0.2 s

4.6 Environmental influences

Admissible ambient temperature	
Equipment protection level Gb	
T4	-40 to +85 °C (-40 to +185 °F)
T5	-40 to +70 °C (-40 to +158 °F)
T6	-40 to +55 °C (-40 to +131 °F)
Equipment protection level Db	
T135 °C	-40 to +85 °C (-40 to +185 °F)
T100 °C	-40 to +70 °C (-40 to +158 °F)
T85 °C	-40 to +55 °C (-40 to +131 °F)
Admissible process temperature	
T4	-40 to +85 °C (-40 to +185 °F)
T5	-40 to +70 °C (-40 to +158 °F)
T6	-40 to +55 °C (-40 to +131 °F)
Admissible storage temperature	-40 to +100 °C (-40 to +212 °F)
Protection type	DIN EN 60529
Device with round plug	IP66/IP67
Device with line socket	IP65
Electromagnetic compatibility (EMC)	DIN EN 61326-2-3:2022
Interference emission	Class B ^a
Interference immunity	Industrial requirement
Mechanical load	DIN EN 60068-2-27, DIN EN 60068-2-6
Shock resistance	100 g/1 ms
Vibration resistance	20 g at 15 to 2000 Hz
Climatic conditions	
Relative humidity	
Without condensation	≤ 90 %
Including condensation	≤ 100 %
Site altitude	≤ 2000 m above sea level
Operating location per UL approval	Indoors

^a The product is suitable for industrial use as well as for households and small businesses.

4.7 Mechanical features

Materials	
Parts in contact with the medium	
Process connection	Stainless steel 316Ti
Membrane	Stainless steel 630
Parts not in contact with the medium	
Housing	Stainless steel 304
Electrical connection	
Round plug M12 × 1	Threaded bushing: Stainless steel 304
Line socket	Holding ring: PA6 GF30
	Device-side connector: PA GF
	Cable-side socket: PA6

4 Technical data

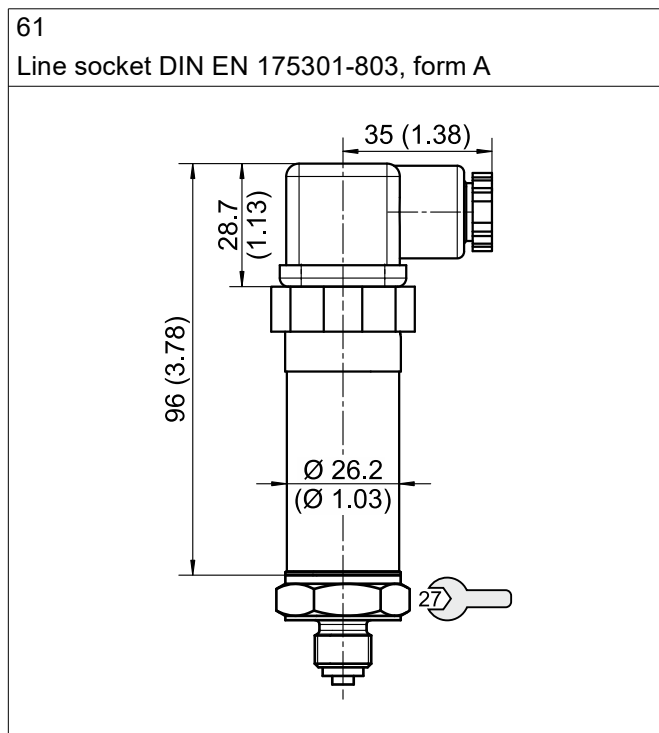
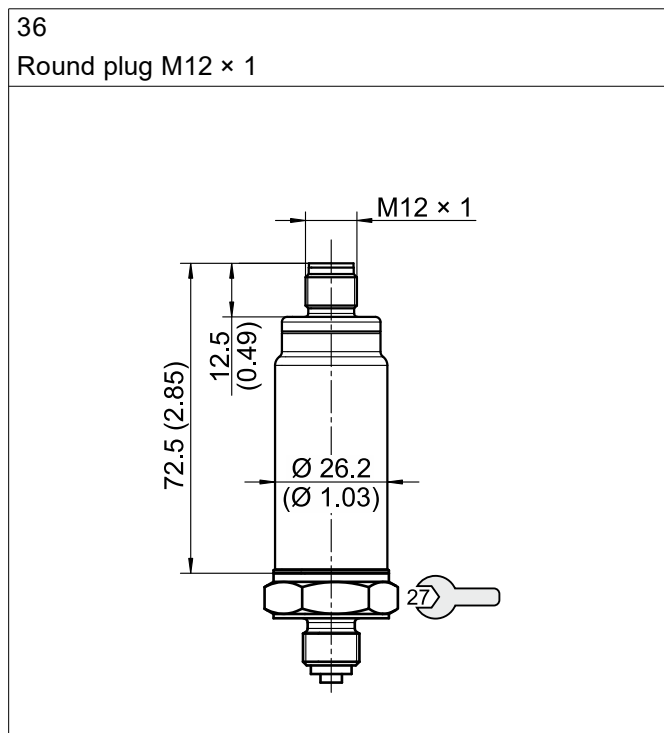
Installation position	Any
Weight	Approx. 100 g (0.22 lb) ^a

^a For version with process connection G 1/4 and electrical connection M12.

4.8 Dimensions

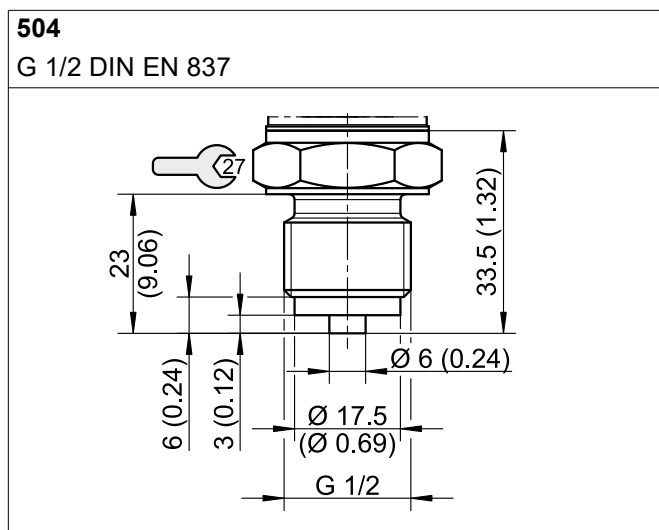
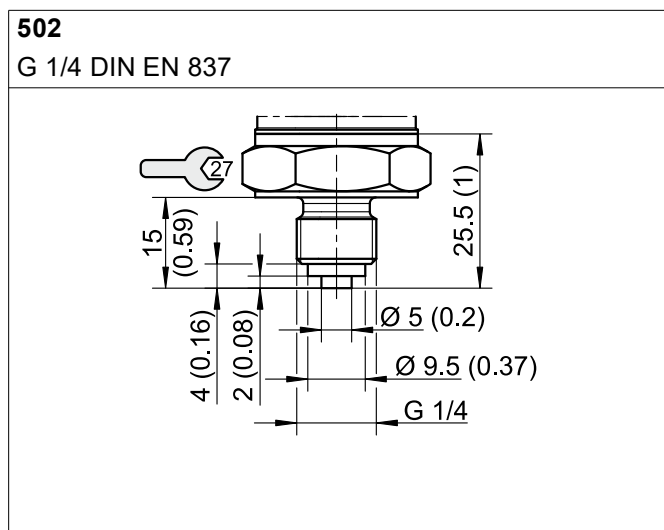
4.8.1 Device

Measurements in mm (inches)



4.8.2 Process connections

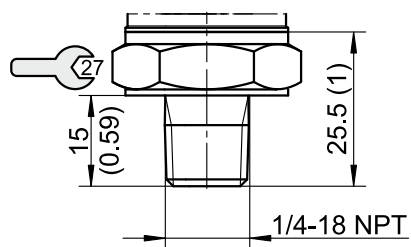
Measurements in mm (inches)



4 Technical data

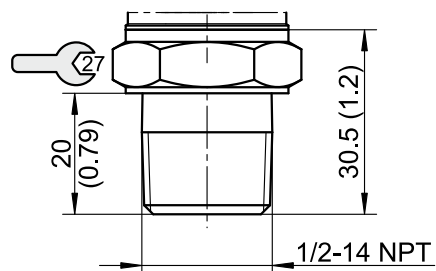
511

1/4-18 NPT DIN EN 837



512

1/2-14 NPT DIN EN 837



5 Installation

5.1 Preparing for installation



WARNING!

Danger due to lack of safety function

The pressure transmitter does not meet the "Equipment with safety function" requirements according to the Pressure Equipment Directive 2014/68/EU.

For dangerous media, e.g. oxygen, acetylene, flammable and poisonous substances, as well as for refrigeration plants and pressure tanks etc.:

- ▶ The relevant regulations concerning handling must be observed
 - ▶ Observe national and international safety and accident prevention regulations
 - ▶ Only have installation performed by appropriately qualified personnel
-



WARNING!

Danger due to high pressure

There is a danger to life when installing a pressure transmitter in a **non-pressure-free** pipe!

- ▶ Before installation, strictly make sure that the pipe is pressure-free.
-

NOTICE!

Danger due to corrosion

Measured media that the membrane of the device is not sufficiently resistant to may result in corrosion.

- ▶ Check the device is compatible with the measurement medium ⇨ chapter 4.6 "Environmental influences", Page 15
-



NOTE!

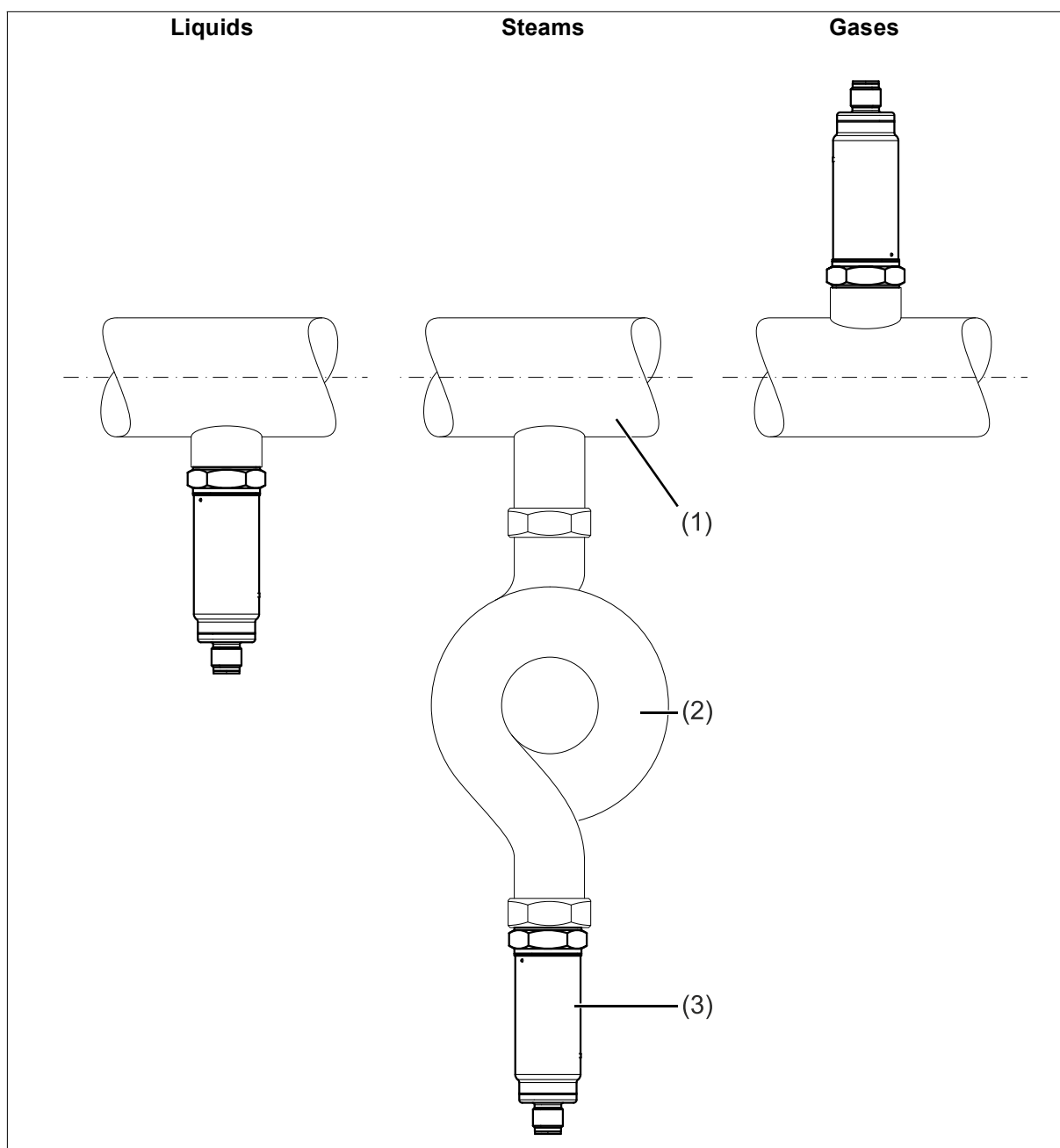
When using the device with UL approval, the user must make sure that the accessory he uses is also approved for a UL application (e. g. cable with UL approval AVL2/8 and/or cable with UL approval CYJV/7 or CYJV/8 or PVVA/7 or PVVA2/8, in each case approved for ambient temperatures > 90 °C).

5.1.1 Installation site

- Only install indoors and in outdoor areas protected against the weather.
- Install at an easily accessible location.
- Mount securely and with minimum exposure to vibration.
- Avoid direct sunlight at the installation location.
- Install vertically if possible. Installation is also possible in any other position if the conditions require this.
- Observe the admissible ambient temperatures at the installation position.
⇨ chapter 4.6 "Environmental influences", Page 15

5.1.2 Installation position

The device can be installed in any position. Depending on the type of measurement medium, the following installation positions are recommended for pressure measurement:



- 1 Pipe
- 2 Siphon
- 3 Device

5 Installation

5.2 Installing the device

Auxiliary equipment during installation depends on the selected process connection.

Select the tightening torque, taking the following criteria into consideration:

- Relevant process connection
- Material pairing between process connection and container material
- Lubrication
- Seal
- Environmental influences (e.g. pressure, temperature)

The technical regulation VDI 2230 provides assistance here.

Example for the installation of the device version with process connection 504 (G 1/2 DIN EN 837) in a pipe with port:

Auxiliary equipment	Torque wrench with open-ended insert, wrench size 27
---------------------	--

Requirements

- ✓ The plant has been de-energized and secured against being switched on again.
- ✓ Medium circulation in the plant is stopped.
- ✓ The pipe is emptied and flushed.
- ✓ Suitable protective equipment has been set up.
- ✓ The pipe is prepared for installation.

Procedure

1. Manually screw the device into the port and tighten with suitable auxiliary equipment.
Tightening torque: 30 Nm.
2. Switch on the system.
3. Fill pipes.
4. Check the tightness of the process connections under operating conditions.
The device is now installed in the pipe.

6.1 Connection instructions



NOTE!

The electrical connection must only be performed by qualified personnel.

The electromagnetic compatibility of the device meets standard DIN EN 61326.

Do not connect any additional loads to the voltage supply of the device.

6.2 Terminal assignment

6.2.1 M12 plug connector

Function	Pin	View on the device
+24 V (S+)	1	
Not used	2	
GND (S-)	3	
Functional bonding conductor (FB) ^a	4	

^a As a basic principle, the device is grounded via the process connection. Alternatively, the device can also be grounded via the electrical connection. However, grounding via both the process connection **and** the electrical connection is not admissible.

6.2.2 Line socket

Function	Pin	View on the device
+24 V (S+)	1	
GND (S-)	2	
Not used	3	
Functional bonding conductor (FB) ^a		

^a As a basic principle, the device is grounded via the process connection. Alternatively, the device can also be grounded via the electrical connection. However, grounding via both the process connection **and** the electrical connection is not admissible.

7 Operation

7.1 Zero point adjustment

Using a magnetic pin, a pressure zero point adjustment (offset) can be performed for the device. This provides a way to correct zero point offsets caused by the installation, for example.

Auxiliary equipment	Magnetic pin (remanence $B_R \geq 1 \text{ T}$, e.g. NdFeB $\varnothing 4 \times 10 \text{ mm}$), available as accessories under part no. 00736330
---------------------	--

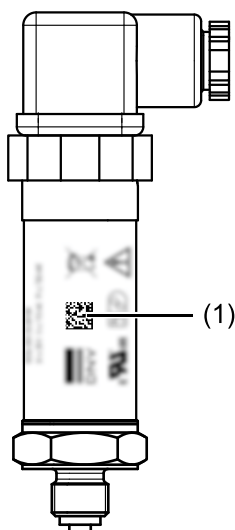
Requirements

- ✓ The adjustment takes place within a **maximum of 2 seconds** once the device is switched on.
- ✓ The pressure at the device at the time of the zero point adjustment must deviate by a **maximum of $\pm 10 \%$** from the positive pressure measuring range of the device¹.

Procedure

1. Hold the magnetic pin on the Data Matrix code (1).

Timeframe for adjustment	2 seconds after applying the voltage supply
Distance between magnet and device	Max. 2 cm



2. Switch on the voltage supply of the device.
The device recognizes the magnetic pin and automatically readjusts the zero point.
3. Remove the magnetic pin from the housing.
The new zero point is permanently saved.
4. Switch off the device for a new zero point adjustment and start back at step 1.



NOTE!

A magnet field which is applied later than around 2 seconds after switch-on of the device has no impact on the device zero point.

A further zero point adjustment is only possible when the device has been switched off and back on again.

¹ Example 1: Measuring range 0 to 160 bar, zero point is at 10 bar. Magnetic pin is held on the housing: Zero point goes to 0 bar.

Example 2: Measuring range 0 to 160 bar, zero point is at 18 bar. Magnetic pin is held on the housing: Zero point adjustment does not work; zero point remains at 18 bar.

8 Troubleshooting

Fault	Possible cause	Remedy
No 4 to 20 mA signal.	The electrical connection is faulty.	Check the connection and correct if necessary. ⇒ chapter 6 "Electrical connection", Page 21
	No voltage supply.	Check lines for disconnection and repair if necessary.
	The operating voltage is too low.	Check operating voltage and adjust if necessary. ⇒ chapter 4.3 "Electrical data", Page 12
	The load resistance is too high.	Check load resistance and adjust if necessary. ⇒ chapter 4.5.1 "Analog output", Page 14
	There is a line short-circuit.	Check lines and repair if necessary.
The current signal is ≥ 21.5 mA or ≤ 3.6 mA.	The electronic components of the device are faulty.	Replace the device or return to the manufacturer. ⇒ chapter 10.2 "Returns", Page 25
Leaks occur during the process.	The seal is faulty.	Check the sealing area for contamination and replace the seal if necessary.

9 Maintenance and cleaning

9.1 Maintenance

The device is maintenance-free.

If repairs are needed, please return the device to the manufacturer

- stating the precise fault
- in clean condition and in its entirety
- in the original packaging or other suitable packaging

9.2 Cleaning



WARNING!

Risk of burning due to hot surfaces

Hot device surfaces due to hot media may cause injuries.

- ▶ Allow the device and plant to cool down before work.

Observe the following points when cleaning:

- Do not damage the device.
- Observe the protection type of the device.
- Only use cleaning agents that do not attack the surfaces and seals.
- Do not damage the membrane if the device is removed for cleaning.

10.1 Dismounting



WARNING!

Danger due to high pressure

There is a danger to life when removing a pressure transmitter from a **non-pressure-free pipe!**

- ▶ Before removal, strictly make sure that the pipe is pressure-free.



WARNING!

Risk of burning due to hot surfaces

Hot device surfaces due to hot media may cause injuries.

- ▶ Allow the plant to cool down before removing the pressure transmitter.



WARNING!

Risk of poisoning and suffocation due to the leakage of corrosive and toxic media

When working on pipes or containers, media may leak that could result in poisoning or suffocation.

- ▶ Only perform work using suitable protective measures (e.g. wearing respiratory masks, breathing devices or protective clothing, discharging corrosive, toxic gases).

Auxiliary equipment	Wrench with wrench size 27
---------------------	----------------------------

Requirements

- ✓ Medium circulation in the plant is stopped.
- ✓ The pipe or container is emptied.

Procedure

1. Remove the electrical connection of the device.
2. Set up suitable protective equipment.
3. Remove the device from the pipe or the container.
Dismounting is complete.

10.2 Returns

Procedure:

1. The [supplementary sheet for product returns](#) must first be completed correctly and signed. Then enclose it with the shipping documents and attach it to the packaging, ideally on the outside.
2. Use the original packaging or a suitably secure container for sending the device.

10 Shutdown

10.3 Disposal



- Do not dispose of the device or replaced parts in the trash after use.
- Delete programs and data stored on the device.
- Remove batteries, if any, if this can be done without damaging the device.
- Dispose of the device and the packaging material in a responsible and environmentally friendly manner.
- Observe the country-specific laws and regulations for waste treatment and disposal.

In accordance with Directive 2012/19/EU on Waste from Electrical and Electronic Equipment, manufacturers are obliged to offer the option of returning waste equipment. Request the return from the manufacturer.

11.1 With UL approval

Designation	Part no.
Cable PUR, 4 × 0.34, black, length 2 m	00776248
Cable PUR, 4 × 0.34, black, length 5 m	00776250
Cable PUR, 4 × 0.34, black, length 10 m	00776252

11.2 Without UL approval

Designation	Part no.
Magnetic pen for teach function	00736330
Ex-i repeater power supply and input isolating amplifier (product group 707530)	00577948
Line socket, 4-pole, M12 × 1, angled, length 2 m	00409334
Line socket, 4-pole, M12 × 1, straight, length 2 m	00404585
Calibration of the mechanical measurement value pressure on site (also DAkkS)	00758363
Service deployment	00427970

11 Accessories



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