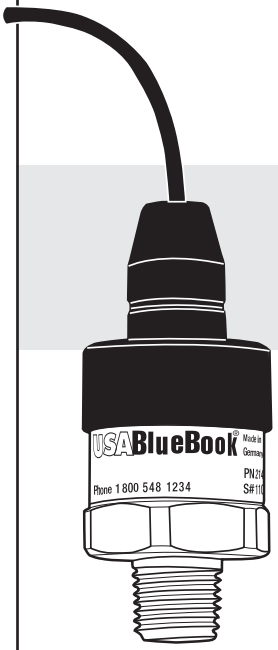
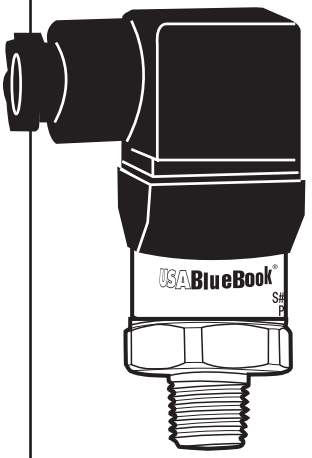


USABlueBook®

Industrial Pressure Transmitter



Operating instructions 2-11

USABlueBook®

1. General information

- The pressure transmitter described in the operating instructions has been designed and manufactured using state-of-the-art technology. All components are subject to stringent quality and environmental criteria during production.
- These operating instructions contain important information on handling the instrument. Working safely requires that all safety instructions and work instructions are observed.
- Observe the relevant local accident prevention regulations and general safety regulations for the instrument's range of use.
- The operating instructions are part of the product and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time.
- Skilled personnel must have carefully read and understood the operating instructions, prior to beginning any work.
- The manufacturer's liability is void in the case of any damage caused by using the product contrary to its intended use, non-compliance with these operating instructions, assignment of insufficiently qualified skilled personnel or unauthorised modifications to the instrument.
- The general terms and conditions contained in the sales documentation shall apply.
- Subject to technical modifications.
- Further information
  - Internet address: www.usabluebook.com
  - Application consultant: Tel.: 800-548-1234
    Fax: 847-689-3030
    E-mail: tech@usabluebook.com

Explanation of symbols

WARNING!
... indicates a potentially dangerous situation which can result in serious injury or death if not avoided.

CAUTION!
... indicates a potentially dangerous situation which can result in light injuries or damage to the equipment or the environment if not avoided.

Information
… points out useful tips, recommendations and information for efficient and trouble-free operation.

Abbreviations

2-wire	The two connection lines are used for the voltage supply. The measurement signal also provides the supply current.
U_B	Positive power supply terminal
0V	Negative power supply terminal

2. Safety

WARNING!
Before installation, commissioning and operation, ensure that the appropriate pressure transmitter has been selected in terms of measuring range, design and specific measuring conditions.
Non-observance can result in serious injury and/or damage to the equipment.

WARNING!
- Open the connections only after the system has been depressurized.
- Observe the working conditions in accordance with Chapter 3 "Specifications".
- Always operate the pressure transmitter within the overpressure limit.

Further important safety instructions can be found in the individual chapters of these operating instructions.

2.1 Intended use

The pressure transmitter is used to convert pressure into an electrical signal.

The instrument has been designed and built solely for the intended use described here, and may only be used accordingly.

The technical specifications contained in these operating instructions must be observed. Improper handling or operation of the pressure transmitter outside of its technical specifications requires the instrument to be taken out of service immediately and inspected by an authorised USABlueBook service engineer.

The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

2.2 Personnel qualification

WARNING!
Risk of injury if qualification is insufficient!
Improper handling can result in considerable injury and damage to equipment.
The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications described below.

Skilled personnel

Skilled personnel are understood to be personnel who, based on their technical training, knowledge of measurement and control technology and on their experience and knowledge of country-specific regulations, current standards and directives, are capable of carrying out the work described and independently recognizing potential hazards.

Special operating conditions require further appropriate knowledge, e.g. of aggressive media.

Prior to starting any work, read the operating instructions! Keep for later use!

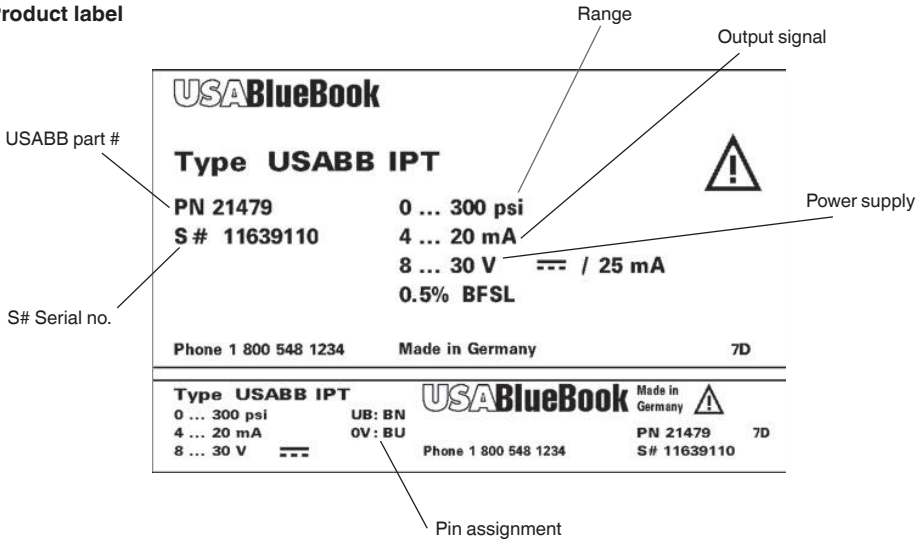
2.3 Special hazards

WARNING!
For hazardous media such as oxygen, acetylene, flammable or toxic gases or liquids, and refrigeration plants, compressors, etc., in addition to all standard regulations, the appropriate existing codes or regulations must also be followed.

WARNING!
Residual media in dismounted pressure transmitters can result in a risk to persons, the environment and equipment.
Take sufficient precautionary measures.

2.4 Labelling / safety marks

Product label



If the serial number becomes illegible (e.g. due to mechanical damage or overpainting), traceability will no longer be possible.

Explanation of symbols

General danger symbol

Voltage DC

3. Specifications

3.1 Measuring ranges

Absolute pressure					
psi	**Measuring range**	**0 ... 15**	**—**	**0 ... 30**	**0 ... 50**
	Overpressure limit	30	—	60	100
	Measuring range	**0 ... 100**	**0 ... 150**	**0 ... 200**	**0 ... 300**
	Overpressure limit	200	290	400	600

Vacuum and +/- measuring range		
psi	**Measuring range**	**-30 inHG ... +160**
	Overpressure limit	350

Vacuum resistance
Yes

3.2 Output signal

Signal type	Value	Load in Ω
Current (2-wire)	4 ... 20 mA	≤ (power supply - 8 V) / 0.02 A

3.3 Voltage supply

Power supply

Output signal	Power supply Standard
4 ... 20 mA	DC 8 ... 30 V

Total current consumption

Signal type	Total current consumption
Current (2-wire)	Signal current, max. 25 mA

3.4 Accuracy

Non-linearity per BFSL (IEC 61298-2)	Standard ≤ ±0.5 % of span
Non-repeatability	≤ 0.1 % of span
Long-term drift (per IEC 61298-2)	≤ ±0.1% of span
Signal noise	≤ ±0.3% of span
Settling time	< 4 ms
Temperature error at 0 ... 80 °C	Typical: 1 % of span Maximum: 2.5 % of span
Measuring deviation of the zero signal	Typical: ≤ ±0.5 % of span Maximum: ≤ ±0.8 % der Spanne
Accuracy at room temperature [1)]	≤ ±1 % of span

1) Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2). Calibrated in vertical mounting position with process connection facing downwards.

3.5 Reference conditions (per IEC 61298-1)

Temperature:	15 ... 25 °C
Atmospheric pressure:	860 ... 1,060 mbar
Humidity:	45 ... 75 % relative
Power supply:	DC 24 V
Mounting position:	as required

3.6 Operating conditions

Ingress protection (per IEC 60529)
The ingress protection depends on the type of electrical connection (see table under 3.7 "Electrical connections, specifications").

Vibration resistance
10 g (IEC 60068-2-27, under resonance)
20 g available on request

Shock resistance
500 g (IEC 60068-2-6, mechanical)

Service life
10 million load cycles

Temperatures

Permissible temperature range	Standard
Ambient	0 ... +80 °C
Medium	0 ... +80 °C
Storage	-20 ... +80 °C

3.7 Electrical connections

Designation	Ingress protection	Wire cross-section	Cable Ø	Cable material
Cable outlet				
■ OEM version, unshielded	IP 67	3 x 0.14 mm²	2.85 mm	TPU
Angular connector DIN 175301-803 A				
■ with mating connector	IP 65	up to max. 1.5 mm²	6 ... 8 mm	—
■ with solid laid cable	IP 65	3 x 0.75 mm²	6 mm	PUR

Short-circuit resistance
S_+ vs. 0V

Reverse polarity protection
U_B vs. 0V

Insulation voltage
DC 500 V

3.8 Materials

Wetted parts
Stainless steel 316L
from 10 bar 316L and 13-8 PH

Non-wetted parts
Stainless steel 316L, HNBR, PA66
For sealing materials see "Process connections"
Materials for electrical connections see "Electrical connections"

Pressure transmission medium

Synthetic oil:	to 0 ... 6 bar relative, to 0 ... 25 bar absolute
Dry measuring cell:	from 0 ... 10 bar relative

When designing the system, please note that the values given (e.g. burst pressure, overpressure limit) are dependent upon the material, thread and sealing used.

4. Design and function

4.1 Description

By means of a sensor element and by applying power, the prevailing pressure is converted into an amplified standardised electrical signal via the deformation of a diaphragm. This electrical signal varies in proportion to the pressure and can be evaluated accordingly.

4.2 Scope of delivery

Cross-check the scope of delivery with the delivery note.

5. Transport, packaging and storage

5.1 Transport

Check the pressure transmitter for any damage that may have been caused during transportation. Obvious damage must be reported immediately.

5.2 Packaging

Do not remove packaging until just before mounting.
Keep the packaging as it will provide optimum protection during transport (e.g. change in installation site, sending for repair).

5.3 Storage

Permissible conditions at the place of storage:

- Storage temperature: -20 ... +80 °C
- Humidity: 45 ... 75 % relative humidity (no condensation)

WARNING!
Before storing the pressure transmitter (following operation), remove any residual media. This is of particular importance if the medium is hazardous to health, e.g. caustic, toxic, carcinogenic, radioactive, etc.

6. Commissioning, operation

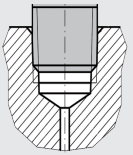
Required tool: Open-ended spanner (spanner width 27), screwdriver

CAUTION!
Prior to commissioning, the pressure transmitter must be subjected to a visual inspection.
- Leaking fluid is indicative of damage.
- Only use the pressure transmitter if it is in perfect condition with respect to safety.

Making the mechanical connection
- The model with parallel thread, the sealing ring is included in the delivery.
- During mounting, make sure that the sealing faces at the pressure transmitter and the measuring point are clean and undamaged.
- Only ever screw in, or unscrew, the instrument via the spanner-flats and to the prescribed torque using an appropriate tool. The correct torque depends on the dimensions of the pressure connection and the gasket used (form/material). When screwing in or unscrewing the pressure transmitter, do not use the housing for purchase.
- When screwing in, do not cross the threads.

Types of sealing

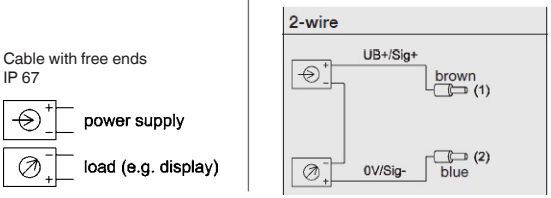
Tapered thread
NPT, R and PT

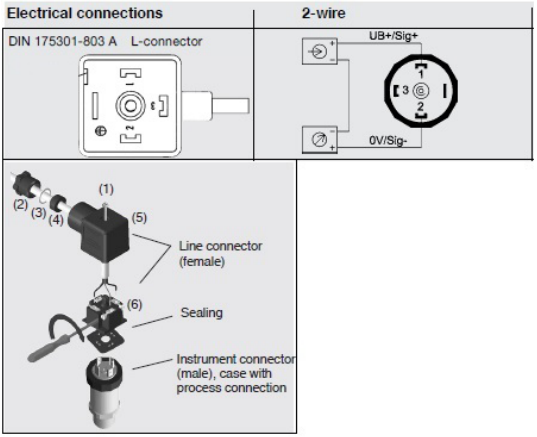


The sealing of tapered threads (e.g. NPT threads) is made by providing the thread with additional sealing material.

Making the electrical connection
- The instrument must be earthed via the process connection!
- The power supply for the pressure transmitter must be made via an energy-limited electrical circuit in accordance with section 9.3 of UL/EN/IEC 61010-1, or an LPS to UL/EN/IEC 60950-1, or class 2 in accordance with UL1310/UL1585 (NEC or CEC). The power supply must be suitable for operation above 2,000 m should the pressure transmitter be used at this altitude.
- Select a cable diameter that matches the cable gland of the plug. Make sure that the cable gland of the mounted plug has a tight fit and that the seals are present and undamaged. Tighten the threaded connection and check that the seal is correctly seated, in order to ensure a tight seal.
- For cable outlets, make sure that no moisture enters at the cable end.

Electrical Connections **2-wire**





7. Maintenance and cleaning

7.1 Maintenance

This pressure transmitter is maintenance-free.
Repairs must only be carried out by the manufacturer.

7.2 Cleaning

CAUTION!

- Before cleaning, correctly disconnect the pressure transmitter from the pressure supply, switch it off and disconnect it from the mains.
- Clean the instrument with a moist cloth.
- Wash or clean the dismounted instrument before returning it in order to protect personnel and the environment from exposure to residual media.
- Residual media in dismounted instruments can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.
- Do not use any pointed or hard objects for cleaning, as they may damage the diaphragm of the process connection.

For information on returning the instrument see chapter 9.2 "Return".

8. Faults

In the event of any faults, first check whether the pressure transmitter is mounted correctly, mechanically and electrically.

Faults	Causes	Measures
No output signal	Cable break	Check the continuity
Deviating zero point signal	Overpressure limit exceeded	Observe the permissible overpressure limit
Deviating zero point signal	Too high/low working temperature	Observe the permissible temperatures
Constant output signal upon change in pressure	Mechanical overload caused by overpressure	Replace instrument; if it fails repeatedly, contact the manufacturer
Signal span varies	EMC interference sources in the environment; for example, frequency converter	Shield instrument; cable shield; remove source of interference
Signal span varies/inaccurate	Too high/low working temperature	Observe the permissible temperatures
Signal span drops/too small	Mechanical overload caused by overpressure	Replace instrument; if it fails repeatedly, contact the manufacturer

If complaint is unjustified, we will charge you the complaint processing fees.

CAUTION!
If faults cannot be eliminated by means of the measures listed above, shut down the pressure transmitter immediately, and ensure that pressure and/or signal are no longer present, and secure the instrument from being put back into operation inadvertently. In this case, contact the manufacturer. If a return is needed, follow the instructions given in chapter 9.2 "Return".

9. Dismounting, return and disposal

WARNING!
Residual media in dismounted pressure transmitters can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.

9.1 Dismounting

Only disconnect the pressure transmitter once the system has been depressurized!

9.2 Return

WARNING!
When shipping the pressure transmitter:
All pressure transmitters delivered to USABlueBook must be free from any kind of hazardous substances (acids, bases, solutions, etc.).

When returning the instrument, use the original packaging or a suitable transport package.

Enclose the completed return form with the instrument.

9.3 Disposal

Incorrect disposal can put the environment at risk.
Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.

USABlueBook®

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