

Operating Instructions



Type PST31

Pressure Transmitter

tuhlen
CONTROL SYSTEMS

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1. General information

1. General information

The resistance thermometer 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.tuhlen.com

- Relevant data sheet: DS-PST31-Standard-EN.pdf

- Application consultant: info@tuhlen.com

1. General information

Explanation of symbols



WARNING!

... indicates a potentially dangerous situation that can result in serious injury or death, if not avoided.



CAUTION!

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



Information

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



DANGER!

... identifies hazards caused by electrical power. Should the safety instructions not be observed, there is a risk of serious or fatal injury.



WARNING!

... indicates a potentially dangerous situation that can result in burns, caused by hot surfaces or liquids, if not avoided.

Abbreviations

2-wire	The two connection lines are used for the voltage supply. The measurement signal also provides the supply current.
3-wire	Two connection lines are used for the power supply. One connection line is used for the measurement signal.
U ₊	Positive power supply terminal
U ₋	Reference potential
S+	Analogue output

2. Safety

2. Safety



WARNING!

Before installation, commissioning and operation, ensure that the appropriate resistance thermometer has been selected in terms of measuring range, design, specific measuring conditions and appropriate wetted parts' materials (corrosion).

Non-observance can result in serious injury and/or damage to the equipment.



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 indoors and outdoors.

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 tuhlen service engineer.

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

2. Safety

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.
- Keep unqualified personnel away from hazardous areas.

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 recognising potential hazards.

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

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 the dismantled pressure transmitter can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.

2. Safety



To ensure safe working on the instrument, the operating company must ensure

- that suitable first-aid equipment is available and aid is provided whenever required,
- that the operating personnel are regularly instructed in all topics regarding work safety, first aid and environmental protection, and know the operating instructions, in particular the section on safety instructions.



DANGER!

Danger of death caused by electric current

Upon contact with live parts, there is a direct danger of death.

- The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications described below.
- Keep unqualified personnel away from hazardous areas.



WARNING!

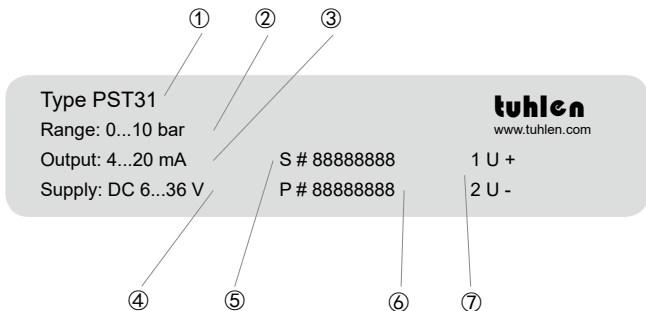
Residual media in dismantled instruments can result in a risk to personnel, the environment and equipment.
Take sufficient precautionary measures.

Do not use this instrument in safety or Emergency Stop devices.
Incorrect use of the instrument can result in injury.

Should a failure occur, aggressive media with extremely high temperature and under high pressure or vacuum may be present at the instrument.

2. Safety

2.4 Labelling



- ① Type
- ② Measuring range
- ③ Output signal
- ④ Power supply
- ⑤ Serial number
- ⑥ Product number
- ⑦ Electrical connection

3. Specifications

Specifications	
Measuring range	0 ...25 bar to 0 ... 1200bar
Accuracy	0,5% F.S. (Option: 0,25% F.S.)
Output signal	4 ... 20 mA, 2-wire 0... 10V DC, 3-wire
Power supply	DC 9 ... 30 V for 4 ... 20 mA output DC 12 ... 30 V for 0 ... 10 V output
Reference conditions	
Ambient temperature	15 ... 25 °C
Atmospheric pressure	860 ... 1060 mbar
Humidity	45 ... 75 %r.h.
Power supply	DC 24 V
Mounting position	as required
Case	stainless steel 316L
Wetted parts	17-4PH
Temperature	
Ambient	-30 ... +100 °C
Storage	-40 ... +100 °C
Medium	-20 ... +85 °C (Option: -40 ... +100 °C)
Temperature influence	
on zero-point	±1.50%/10K
on span	±0.50%/10K
Electrical connection	Plug per DIN 43650 with junction box
Ingress protection	IP65

4. Design and function

4. Design and function

The prevailing pressure is measured at the sensor element through the deformation of a diaphragm. By supplying power, this deformation of the diaphragm is converted into an electrical signal. The output signal from the pressure transmitter is amplified and standardised. The output signal is proportional to the measured pressure.

5. Transport, packaging and storage

5. Transport, packaging and storage

5.1 Transport

Check the instrument 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: 0 ... 70 °C
- Humidity: 35 ... 85 % relative humidity (no condensation)

Avoid exposure to the following factors:

- Direct sunlight or proximity to hot objects
- Mechanical vibration, mechanical shock (putting it down hard)
- Soot, vapour, dust and corrosive gases
- Potentially explosive environments, flammable atmospheres

Store the instrument in its original packaging in a location that fulfils the conditions listed above. If the original packaging is not available, pack and store the instrument as described below:

1. Wrap the instrument in an antistatic plastic film.
2. Place the instrument, along with shock-absorbent material, in the packaging.
3. If stored for a prolonged period of time (more than 30 days), place a bag containing a desiccant inside the packaging.



WARNING!

Before storing the instrument (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.

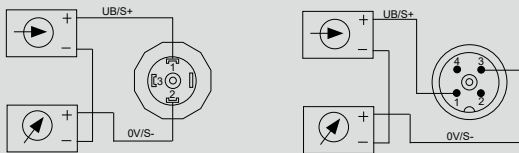
6. Commissioning, operation

6.1 Mechanical Mounting

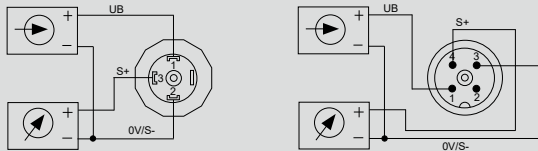
- Remove the protection cap not until shortly before installation.
- Ensure that the diaphragm of the process connection is not damaged during installation.
- The sealing faces at the pressure transmitter and the measuring point always have to be clean.
- Only ever screw in, or unscrew, the instrument using the spanner flats.
- Never use the case or the cooling element as a working surface.
- The correct torque depends on the dimensions of the process connection and the gasket used (form/material).
- When screwing in, do not cross the threads.

6.2 Electrical connection

Two-wires system



Three-wires system



7. Maintenance and cleaning

7. Maintenance and cleaning

7.1 Maintenance

The resistance thermometers described here require absolutely no maintenance and contain no components which could be repaired or replaced.

7.2 Cleaning



CAUTION!

- Before cleaning the instrument disconnect the electrical connections.
- Clean the instrument with a moist cloth.
- Electrical connections must not come into contact with moisture.
- Wash or clean the dismantled instrument before returning it in order to protect personnel and the environment from exposure to residual media.
- Residual media in dismantled instruments can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.

8. Dismounting, return and disposal

8. Dismounting, return and disposal



WARNING!

Residual media in dismantled instruments can result in a risk to personnel, the environment and equipment.

Take sufficient precautionary measures.

8.1 Dismounting



WARNING!

Risk of burns!

Let the instrument cool down sufficiently before dismantling!
During dismantling there is a risk of dangerously hot pressure media escaping.

Only disconnect the resistance thermometer once the system has been depressurised!

8.2 Return



WARNING!

Absolutely observe when shipping the instrument:

All instruments delivered to tuhlen must be free from any kind of hazardous substances (acids, leachate, solutions, etc.).

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

To avoid damage:

1. Wrap the instrument in an antistatic plastic film.
2. Place the instrument, along with shock-absorbent material, in the packaging. Place shock-absorbent material evenly on all sides of the shipping box.
3. If possible, place a bag containing a desiccant inside the packaging.
4. Label the shipment as carriage of a highly sensitive measuring instrument.

8. Dismounting, return and disposal



Information on returns can be found under the heading “Service” on our local website.

8.3 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 countryspecific waste disposal regulations.