TC Direct 4~20mA Output Pressure Transmitter Operating Instructions, Wiring Diagram & Datasheet

TC Direct
www.tcdirect.com

List of Contents

1. General Information

The pressure transmitter described in these operating instructions has been designed and manufactured using cutting edge technology. All component parts are tested and evaluated due to our strict quality and environmental system. TC Ltd, also trading as TC Direct, are ISO 9001 certified.

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.

General terms and conditions which are available from TC Direct shall apply.

Subject to technical modifications.

For further information, please contact TC Direct (see front cover for contact details).

Explanation of symbols

WARNING!
- A potentially dangerous situation that can result in serious injury or death, if not avoided.

CAUTION!
- A potentially dangerous situation that can result in light injuries or damage to equipment of the environment, if not avoided.

Information
- Potentially useful tips, recommendations and information for efficient and trouble-free operation.

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 depressurised. 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 the 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 operating of the pressure transmitter outside of its technical specifications requires the instrument to be taken out of service immediately to avoid damage to the product or application. The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

2.2 Personnel Qualification

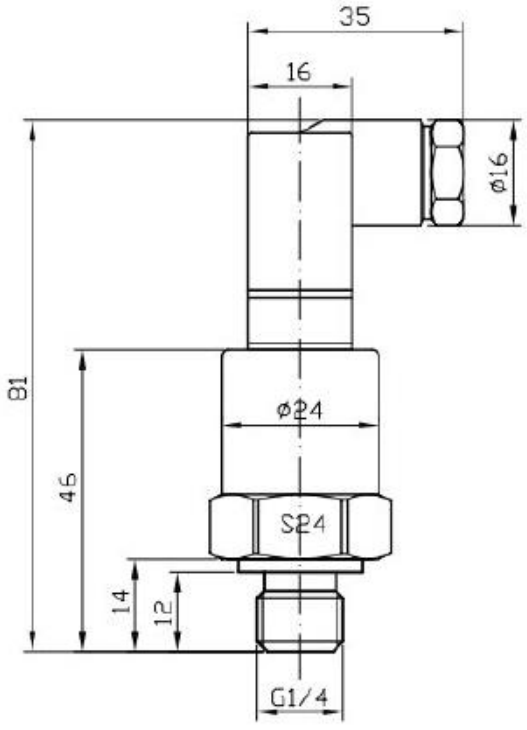
WARNING - Risk of injury should qualification be insufficient
Improper handling can result in considerable injury and damage to equipment. The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications listed below.

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

WARNING!
For hazardous media such as oxygen, acetylene, flammable or toxic gases and liquids and refrigeration plants, compressors etc., in addition to all regulations, the appropriate existing codes or regulations must also be followed. Residual media in dismounted pressure transmitters can result in a risk to persons, the environment & equipment. Take sufficient precautionary measures.

3. Specifications

Parameter	Value	Note
Measurement Range	-1 -0bar…600bar	1bar=100kpa
Overload Pressure	1.5 x pressure range	
Broken Pressure	3 x pressure range	
Accuracy	±0.5% F.S, maximum: 1% F.S	
Stability	Typical 0.5% F.S, maximum: 1% F.S	
Operating Temperature	-40ºC to 100ºC	
Compensation Temperature	-10ºC to 80ºC	
Medium Compatibility	Corrosive medium compatible with 1Cr18Ni9Ti, Ceramic	
Output Signal	4~20mA	
Supply Voltage	10~30Vdc	
Load Resistance	(U-10)/0.02 (Ω)	
Insulation	>100MΩ @ 50V	
Electrical Connection	DIN43650C	
Shell/Wire Protection	IP65	
Pressure Form	Gauge G, Absolute A	
Pressure Port	1/4" BSPP	
Response Time	10ms	
EMC	EMI:EN50081-1/2, EMS:EN50082-2	



4. Design & Function

4.1 Description

By means of a sensor element and by supplying 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.

5. Transport, Packaging & Storage

5.1 Transport

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

5.2 Packaging

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

5.3 Storage

Permissible conditions at the place of storage:
Storage temperature: -20…+80ºC
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 tools: open-ended spanner (spanner width 27), screwdriver

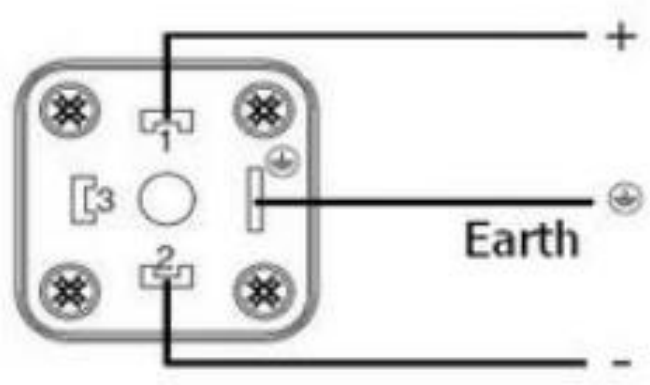
CAUTION
Prior to commissioning, the pressure transmitter must be subjected to a visual inspection. Leaking fluid is indicative of damage. Only use the pressure transmitter if it is in perfect condition with respect to safety.

Making the mechanical connection
During mounting, make sure that the sealing faces at the instrument 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 process connection and the gasket used (form/material). When screwing in or unscrewing the pressure transmitter, do not use the housing as a contact surface. When screwing in, do not cross the threads.

Types of sealing
Correct sealing of the process connections with parallel threads at the sealing face must be made using suitable flat gaskets or sealing rings. The sealing of tapered threads is made by providing the thread with additional sealing material such as PTFE tape.

Making the electrical connection
The instrument must be grounded 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 per 60950-1, or class 2 in accordance with UL1310/UL1585 (NEC or CEC). The voltage supply must be suitable for operation above 2,000m, 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 the ingress protection. For cable outlets, make sure that no moisture enters at the cable end. For the wiring diagram, please see below:

Pin	2-Wire	
	Definition	Cable color
1	Power supply	Red
2	Output signal	Green/Blue
3		
⏚	Shield	Black



7. Maintenance and Cleaning

7.1 Maintenance

This pressure transmitter is maintenance-free. Repairs should not be carried out by the user, please contact TC Direct if there are any faults.

7.2 Cleaning

CAUTION

Before cleaning, correctly disconnect the pressure transmitter from the pressure supply, switch it off and disconnect it from the power supply. Clean the instrument with a moist cloth. Wash or clean the dismounted instrument before returning it, in order to protect persons 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.

8. Faults

In the event of any faults, first check whether the pressure transmitter is mounted correctly, mechanically and electrically. If the complaint is unjustified, handling costs will be charged.

Faults	Possible 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 temp.	Observe the permissible temperatures
Constant output signal upon change in pressure	Mechanical overload caused by overpressure	Replace instrument
Signal span varies	EMC interference sources in the environment; for example, frequency calculator	Shield the instrument, remove source of interference.
Signal span varies/inaccurate	Too high/low working temp.	Observe the permissible temperatures
Signal span drops/too small	Mechanical overload caused by overpressure	Replace instrument

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, then secure the instrument from being put back into operation inadvertently. In this case, return to the manufacturer.

9. Dismounting, Return & 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 dismount the pressure transmitter once the system has been depressurised.

9.2 Return

WARNING
Strictly observe the following when shipping the pressure transmitter:
All pressure transmitters returned 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 packaging.

Please contact TC Direct prior to any returns as we will advise the best plan of action which is most suitable.

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.

9.4 Waste Electrical and Electronic Equipment (WEEE) Directive

TC Direct can now recycle your old electrical products for you. If you're buying a new electrical item, we will recycle your old one for free. All returned items will be put into our segregated waste area. They will then be periodically collected by a certified waste recycling body that will take the appropriate course of action and issue the correct certificate for approved disposal.