

WATER SUPPLIES DEPARTMENT
STANDARD SPECIFICATION E-82-01
PRESSURE TRANSMITTERS

1. GENERAL

Pressure transmitters are used to measure liquid or gas pressure and translate the measured signals into another form that are suitable for transmission and processing. Unless otherwise specified, gauge pressure transmitters are used for measuring reservoir levels and pipeline pressures, whereas differential pressure transmitters are used for measuring water flows in differential pressure flowmeters. The output of the differential pressure flow transmitter shall be proportional to the measured flow rate with the square root extraction unit integrated with the transmitter.

The supply of the pressure transmitters shall include the power supply units and valve manifolds.

2. DESIGN

2.1 Transmitter

(a) General Requirement

Unless stated otherwise in the Particular Specification, the pressure transmitters shall meet the following requirements :

Accuracy : Better than 0.25% of calibrated span, including combined effects of linearity, hysteresis and repeatability

Operating temperature : 0 – 65 °C

Supply voltage effect : Better than 0.01% of calibrated span per volt

Temperature effect : Better than 0.03% of calibrated span per °C

Static pressure effect : Zero error better than 0.25% of maximum measurement range

(b) Input

Range : Pressure input as specified in the Particular Specification

Surge pressure : Over-pressure of up to 10 MPa on either side of the port without damage, except for level measurement applications where over-pressure rating shall be at least 200kPa

(c) Output

- Span adjustment : Continuously adjustable between 25 and 100% of maximum measurement range
- Zero adjustment : Continuously adjustable between 0 and 10% of the calibrated span
- Damping : The output damping shall be adjustable between 0.2 and 2 sec.

2.1.1 Gauge Pressure Transmitter

Gauge pressure transmitter measures pressure with respect to the atmospheric pressure and translates the measured pressure into an electrical signal ranged from 4-20mA d.c. which is directly proportional to the gauge pressure input.

Each pressure transmitter shall incorporate an isolation valve with material suitable for the specified application.

2.1.2 Differential Pressure Transmitter

Differential pressure transmitter measures the pressure difference between two input pressures applied to either side of a flexible diaphragm and translates the differential pressure into an electrical signal 4-20mA d.c. directly proportional to the differential pressure input.

An application of the differential pressure transmitters is used for measuring water flows in differential pressure flowmeters and their outputs shall be proportional to the measured flow rates with the square root extraction units integrated with the transmitters.

Each differential pressure transmitter shall incorporate a valve assembly comprising two isolating valves, one equalizing valve and two drain / vent valves to facilitate maintenance. The material of construction of the valve assembly shall be suitable for the specified application.

2.2 Power Supply Unit

The power supply unit of the pressure transmitters supplied shall comply with WSD Standard Specification E-86-03.

3. CONSTRUCTION

The transmitter enclosure shall be of die-cast aluminium alloy suitable for outdoor installation. The wetted parts of the measuring element and valves shall be manufactured from stainless steel 316 for fresh water or air, and Monel or Hastelloy C for salt water or chemical applications. Flanges, bolts and nuts shall be stainless steel 316.

4. AUXILIARIES

When specified, the transmitter shall be provided with an indicator for local indication and calibration purposes. The requirements for the local indicator shall comply with WSD Standard Specification E-81-07.

5. EQUIPMENT PARTICULARS

The contractor should refer to the Particular Specification for the following particulars of the equipment :-

- (a) Type of pressure transmitter : Gauge / Differential
- (b) Media to be measured : Liquid (fresh water, raw-water, sea water) / Gas (air)
- (c) Working pressure : Head of water (m) / kPa
- (d) Local indicator, if required
- (e) Communication Protocol / Field Bus : HART / Profibus / Fieldbus ... etc
- (f) Mounting requirements
- (g) Power supply