# Part 1. SPECIFICATION

## General

### The specifications in this section define additional requirements to those set forth in Section 13105 – Process Control: General Instrumentation Requirements. Where a conflict exists, the more stringent requirement is to be provided.

### The contractor is to clearly identify on the shop drawings any deviation from the specification.

### This specification is for pressure transmitters for use in pipes and vessels. Applications include continuous measurement and absolute pressure in liquids, vapors and gasses.

### Contractor required to provide the following O&M documentation: manufacturers’ printed O&M documentation; installation instructions; specifications; operation manuals, including electrical drawings, and plumbing diagrams; sales literature; materials; and training materials as applicable.

### Contractor is to furnish copies of the manufacturer’s warranties.

### Contractor is to provide, through the Instrumentation Supplier, pressure measuring systems, complete and operable, in accordance with the Contract Documents.

## Measurement and Payment

### The work outlined in this section shall be included in the lump sum price for Section 13200 – Gauge Pressure Transmitter as indicated in the Bid Form.

## Sensor

### Microprocessor based electronics generates output proportional to pressure.

### Snubbers, when applicable, shall be standard equipment from the primary element supplier.

### Seals, when applicable, shall be standard equipment from the primary element supplier. Provide pancake or flanged seals as required to suit the process connections, 316 stainless steel housing, SS diaphragm material, Teflon coated, 50 mm process connection unless noted otherwise, 6 mm flushing connection in bottom housing, DC 200 fill fluid, 1.75 mm PVC coated armored capillary minimum 4 meters length, rated from vacuum to 2500 psig and –40oC to 200oC, continuous duty.

### On liquid level applications, provide diaphragm, diaphragm material and diaphragm extension length to suit application.

### Process flanges and adapters on flow applications:

#### General Purpose: 316 stainless steel

#### Corrosive or abrasive applications: Hasteloy C-276

### Wetted O-rings: Viton, Glass Filled TFE, or Graphite Filled PTFE

### Bolts: Cadmium‑plated carbon steel

### Isolating diaphragm & Drain and vent valves:

#### General Applications: 316 stainless steel

#### Chlorine, corrosive or abrasive applications: Hasteloy C‑276

### Cover O-rings: Buna‑N

### The diaphragm seal shall have a removable bottom housing to permit the servicing of the need to refill the fill fluid.

## Transmitter

### Provide operating range between 40 percent and 80 percent of maximum adjustable range.

### Internal security switch preventing unauthorized changes to calibrated configuration.

### Explosion proof (hazard area) rated instrument enclosure may be required depending upon installation location.

### 24 VDC loop powered with 4-20 mA @ 600 Ω output with superimposed digital signal based on HART protocol. Linear or square root output field selectable.

### SST tag wired to transmitter.

### Buttons for calibration and configuration without HART modem.

# INSTALLATION

## General

### The following installation requirements are in addition to or deviations from the requirements set forth for instrumentation in Section 13105 – Process Control: General Instrumentation Standard.

#### Provide universal mounting bracket for handrail or vertical surface or 50 mm (2 inch) pipe.

#### Provide stainless steel valve manifold assembly with line shutoff valves for pressure, c/w calibration port.

#### Locate such that indicator display is readily readable at 1.8 m from floor elevation.

#### Locate transmitter with adequate clearance and accessibility for service.

#### Locate transmitter as close as possible to the process connection.

#### Connect unit to liquid process lines horizontally. Slope lines 8 cm/meter (1 in/foot) downward to allow gas bubbles to bleed back to the process line.

#### Connect unit to gaseous process lines at the top of pipes or tanks to minimize moisture or solids entry to sensing line.

#### Provide for air or water flushing lines where contaminant fouling may occur.

#### Provide filled diaphragm seals for severe process fluids where contamination or fouling will occur.

#### Provide a local pressure gauge for gauge pressure and absolute pressure applications.

#### Transmitter/Electronics not mounted/installed indoors must be installed within fiberglass enclosure with viewing window, thermostat and heater. Panel heater to be powered from separate circuit than instrument.

# ACCEPTABLE MANUFACTURERS

### Acceptable manufacturers are listed in the following table in order of preference. The design has been completed around the first named supplier. The contractor is responsible for all costs associated with any changes required to the design to accommodate one of the other manufacturers.

|  |  |  |
| --- | --- | --- |
| Preference | Manufacturer | Model |
| 1 | Endress+Hauser | CERABAR S |
| 2 | Siemens | SITRANS P |

### The Contractor is to select the appropriate options to suit the application and the requirements of the specification.

### Where second and third named manufacturers are provided, they are to meet the performance specifications of the first named manufacturer.

## Gauge Pressure Transmitters

First Named Manufacturer

|  |  |  |
| --- | --- | --- |
| **Service:** | Water | Water |
| **Process:** |  |  |
| Tag Name: | TWR\_PIT1 | TWR\_LIT1 |
| Installation DWG: | I-401 | I-401 |
| Fluid: | Potable Water | Potable Water |
| Temp min/max: | 0-25 °C | 0-25 °C |
| Press min/max: | 0 - 1034 kPa | 0 - 1034 kPa |
| **Device Data:** |  |  |
| Span: | 0 – 1000 kPa | 282.1 – 382.0 kPa (0 – 10.25 m Tower Water Level) |
|  |  |  |
| Approval: | CSA I.S EX, NSF 61 Potable Water, CRN | CSA I.S EX, NSF 61 Potable Water, CRN |
| Output; Operation: | 4-20 mA HART, Operation Outside, LCD | 4-20 mA HART, Operation Outside, LCD |
| Hosing, Cable Entry, Protection: | Aluminum T14 Housing, Optional Display on the Side, IP 66/67/NEMA4X/6P, Thread ½ NPT | Aluminum T14 Housing, Optional Display on the Side, IP 66/67/NEMA4X/6P, Thread ½ NPT |
| Sensor Range, Sensor Overload Limit: | Sensor Nominal Value (URL):10bar/1MPa/150psi g  OPL (Over Pressure Limit): 40bar/4MPa/600psi g | Sensor Nominal Value (URL):10bar/1MPa/150psi g  OPL (Over Pressure Limit): 40bar/4MPa/600psi g |
| Calibration; Unit: | Sensor Range; kPa/MPa | Sensor Range; kPa/MPa |
| Process Connection; Material: | Thread ANSI ½ MNPT ¼ FNPT, AISI 316L (CRN) | Thread ANSI ½ MNPT ¼ FNPT, AISI 316L (CRN) |
| Seal: | EPDM | EPDM |
| Additional Option 1: | Not Selected | Not Selected |
| Additional Option 2: | Mounting Bracket for Wall/Pipe, AISI 304 | Mounting Bracket for Wall/Pipe, AISI 304 |
|  |  |  |
| Manufacturer: | Endress+Hauser | Endress+Hauser |
| Part Number: | PMC71-UAC1P2RABFU+Z1 | PMC71-UAC1P2RABFU+Z1 |
| **Accessories**: |  |  |
| 316 SS Block & Bleed Valve with Teflon Packing: | 7103610 | 7103610 |



Second Named Manufacturer

|  |  |  |
| --- | --- | --- |
| **Service:** | Water | Water |
| **Process:** |  |  |
| Tag Name: | TWR\_PIT1  Magna Elevated Tank Inlet/Outlet Pipe Pressure Indication Transmitter | TWR\_LIT1 |
| Installation DWG.: | I-401 | I-401 |
| Fluid: | Potable Water | Potable Water |
| Temp min/max: | 0-25 °C | 0-25 °C |
| Press min/max: | 0 - 1000 kPa | 0 - 1000 kPa |
| **Device Data:** |  |  |
| Span: | 16 – 1600 kPa (0.16 – 16 bar) | 282.1 – 382.0 kPa (0 – 10.25 m Tower Water Level) |
| Wetted Parts Material – Seal Diaphragm: | 316L Stainless Steel | 316L Stainless Steel |
| Wetted Parts Material – Parts of Measuring Cell: | 316L Stainless Steel | 316L Stainless Steel |
| Process Connection: | Male Thread ½-14 NPT | Male Thread ½-14 NPT |
| Non-Wetted Parts Materials: | Housing Diecast Aluminum | Housing Diecast Aluminum |
| Explosion Protection: | Without Explosion Protection | Without Explosion Protection |
| Electrical Connection/Cable Inlet: | Screwed Gland ½-14 NPT | Screwed Gland ½-14 NPT |
| Indicator: | Housing Cover with Window and Digital Display | Housing Cover with Window and Digital Display |
| **Further Designs:** |  |  |
| Transmitter with Mounting Bracket Made of: | 316L Stainless Steel | 316L Stainless Steel |
| Manufacturer: | Siemens | Siemens |
| Part Number: | 7MF4033-1DA60-1FC6-ZA02 | 7MF4033-1DA60-1FC6-ZA02 |
| **Accessories:** |  |  |
| Double Shut Off Valve Manifold: | 7MF9011-4FA | 7MF9011-4FA |
|  |  |  |



**END OF SECTION**