**SECTION 40 73 29**

**DIFFERENTIAL PRESSURE TRANSMITTERS**

***PART 1 -GENERAL***

1. The Deltabar PMD75B is typically used in industrial fluid process applications for continuous measurement of differential pressure in liquids, vapors and gasses. Differential pressure measurements can used to calculate level, flow (when used with an engineered insert) or build-up across a filter. It allows for simple and reliable commissioning and operation. It is designed for use in SIL2 safety applications.
2. **1.02 SUBMITTALS**
3. Furnish complete Product Data, Shop Drawings, Test Reports, Operating Manuals, Record Drawings, Manufacturer’s certifications, Manufacturer’s Field Reports
4. Product Data:
   1. Dimensional Drawings.
   2. Materials of Construction.
   3. Measurement accuracy.
   4. Range and range ability.
   5. Enclosure Rating.
   6. Classification Rating.
   7. Power.
   8. Output options.

**1.03 QUALITY ASSURANCE**

1. Manufacture instruments facilities certified to the quality standards of ISO Standard 9001 - Quality Systems - Model for Quality Assurance in Design/Development, Production, Installation, and Servicing.

**1.04 DELIVERY, STORAGE, AND HANDLING**

1. Store all instruments in a dedicated structure with space conditioning to meet the recommended storage requirements provided by the manufacturer.

**1.05 PROJECT OR SITE CONDITIONS**

1. Provide instruments suitable for the installed site conditions including, but not limited to, material compatibility, site altitude, process and ambient temperature, and humidity conditions.
   1. **WARRANTY**
2. The transmitter shall have standard one year warranty from date of shipment and if the meter is commissioned by a factory certified technician, the warranty is extended to three years from the date of shipment.

**1.07 MAINTENANCE**

A. Provide all parts, materials, fluids, etc. necessary for maintenance and calibration purposes throughout the warranty period. Deliver all of these supplies before project substantial completion.

**1.08 LIFECYCLE MANAGEMENT**

A. Instrument documentation, like original calibration certificates, manuals and product status information shall be accessed via a web enabled system with a license. The instrument-specific information shall be accessed via its serial number. When services are provided by an authorized service provider the services information like subsequent field calibrations shall be archived and accessible via this web enabled system.

***PART 2 -PRODUCTS***

* 1. **MANUFACTURER**

1. Endress+Hauser- Deltabar S PMD75B

**2.02 MANUFACTURED UNITS**

A. The transmitter shall be 2-wire, optional capacitive; high-performance differential pressure transmitter with digital communications capabilities including HART.

B. The transmitter shall sense differential pressure and produce a standard 4-20mA DC output signal linear with pressure; Measure millivolt changes in the sensor as pressure varies and produces a linear 4-20mA DC output proportional to the pressure. The unit shall have self-diagnostic capability and a non-volatile memory; Histo-ROM memory module for monitoring of events, configuration changes and periodic recording of temperature/pressure values.

C. Where hazardous areas are indicated, the equipment shall be rated for that area (ATEX, FM, CSA or IECEx approvals as required)

D. Transmitter shall have ability to supply:

* static pressure limit at least 1.5 times pressure range;
* power supply: loop-powered 10.5 to 45 VDC
* output – 4-20mA
* self-diagnostic capability
* non-volatile memory
* totalizers – two standard with one user reset-able

E. The transmitter’s wetted parts shall have:

* 316L SS Process connection and membrane standard with other alloys available
* Transmitter body material – powder-coated NEMA6P/NEMA4X aluminum housing with FM approval
* process connection – NPT1/4-18 IEC61518 UNF7/16-20
* process temperature rating – minus 40 degrees F to 185 degrees F
* storage temperature rating – minus 40 degrees F to 194 degrees F
* ambient temperature rating –minus 40 degrees F to 185 degrees F

F. Reference accuracy comprised of non-linearity, hysteresis and non-reproducibility shall be in accordance with IEC 60770 (+/- 0.05% of set span); Total performance accuracy comprised of non-linearity, hysteresis and non-reproducibility in addition to thermal change of the zero point and influence of line pressure (+/- 0.07% of set span).

G. The transmitter shall include NSF 61 approval suitable for drinking water applications.

H. The transmitter shall be programmable via optical buttons without pressure source or handheld device, or shall have Bluetooth wireless technology interface and can be operated and configured via this interface using the SmartBlue app. The range under reference conditions is 33ft. The Bluetooth shall have both encrypted communication and password encryption for security purposes. The Bluetooth wireless technology interface can be deactivated.

I. The transmitter will incorporate internal advanced diagnostics allowing the use of a DTM based program using Heartbeat™ technology. Verification will provide in-situ testing and simulation and a final printable report documentation.

J. Unit shall have backlit display that changes from green to red when diagnostic messages occur.

K. Unit shall have ATEX, CSA or IECEx approvals as required.

**2.03 ACCESSORIES**

1. Mounting kit for installing transmitter onto a wall or various sizes of pipe

**2.04 SOURCE QUALITY CONTROL**

A. Factory calibrates each flow metering system at a facility that is traceable to the National Institute of Standards and Technology (NIST).

B. A real-time computer generated printout of the actual calibration data indicating apparent and actual pressure at 0 percent, 50 percent and 100 percent of the calibrated range shall be included with each device.

C. Provide ISA data sheet ISA-TR20.00.01. Use the latest revision of form 20P2301. Complete the form with all known data, and dash out the inapplicable fields. Incomplete data sheets submitted will be result in a rejected submittal.

**2.05 SAFETY**

A. All electrical equipment shall meet the requirements of ANSI/NFPA 70, NATIONAL ELECTRIC CODE, latest edition.

B. All devices shall be certified for use in hazardous areas: Class I, II, III; Div. 1, 2, Groups A-C; temperature rating T6 (85°C)

C. Electrical equipment housing shall conform to NEMA 4x/6p classification.

***PART 3 –EXECUTION***

3.01 EXAMINATION

1. Examine the complete set of plans, the process fluids, pressures, and temperatures and furnish instruments that are compatible with installed process condition.
2. Examine the installation location for the instrument and verify that the instrument will work properly when installed.

3.02 INSTALLATION

1. As shown on installation details and mechanical Drawings.
2. As recommended by the manufacturer’s installation and operation manual.

3.03 FIELD QUALITY CONTROL

1. Demonstrate the performance of all instruments to the ENGINEER before commissioning.
2. ENGINEER to witness all instrument calibration verification in the field.
3. Each instrument shall be tested before commissioning and the ENGINEER shall witness the response in the PLC control system and associated registers.
4. Manufacturer’s Field Services:
5. Manufacturers’ representative shall verify installation of all installed flow tubes and transmitters.
6. Notify the ENGINEER in writing of any problems or discrepancies and proposed solutions.

3.04 ADJUSTING

1. Verify factory calibration of all instruments in accordance with the Manufacturer’s instructions.

3.05 PROTECTION

1. All instruments shall be fully protected after installation and before commissioning. Replace any instruments damaged before commissioning:
2. The ENGINEER shall be the sole party responsible for determining the corrective measures.