SECTION 40 91 19.29 – PRESSURE MEASURING SYSTEMS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. General: The CONTRACTOR shall provide pressure measuring systems, complete and operable, in accordance with the Contract Documents.

B. The requirements of Section 40 90 00 – Process Control and Instrumentation Systems apply to the WORK of this Section.

C. All instruments shall be FM-approved, or equal.

1.2 SUBMITTALS

A. General: Shop Drawings, Owner's Manual, and Record Drawings shall be submitted in conformance with the requirements of Section 40 90 00 – Process Control and Instrumentation Systems, and MASS Section 10.05 Article 5.6.

PART 2 - PRODUCTS

2.1 GENERAL

A. Electrical interface and code compliance shall conform to the requirements of Section 40 90 00 – Process Control and Instrumentation Systems.

2.2 ELECTRONIC PRESSURE TRANSMITTERS

A. Components: Electronic gauge and differential pressure transmitters shall consist of a capsule assembly, process connector and connection, amplifier unit, integral indicator, terminal box with cover, block and bleed valves, and conduit connections. Process connection shall be 1/2” NPT. Each transmitter installation shall include a manifold system and gauge as shown on the drawings. Process sensing lines shall be 1/4-inch stainless steel tubing.

B. Operating Principles: Pressure applied to the unit shall be transmitted to a sensing diaphragm made of ceramic sensor or polysilicone. Performance Requirements are:
   1. The amplifier unit shall convert the change in capacitance to a 4-20 mA DC signal, 2-wire type, with an allowable loop load of no less than 600 ohms.
   2. Static pressure rating shall be a minimum of 600 psig.
   3. The maximum over range pressure limit shall be a minimum of 150 percent of the minimum range.
   4. Span shall be adjustable over a minimum of 5:1 range.
   5. Damping shall be provided as an internal adjustment.

6. All equipment shall be suitable for an ambient operating range of minus 40 degree F to plus 100 degrees F.
7. Integral indicators shall be calibrated in process units.
8. Power supply shall be 24 VDC, loop powered.
9. Accuracy, including linearity and repeatability, shall be a plus or minus 0.2 percent of span.
10. Any solution in the probe shall be food grade.

C. Materials: All wetted parts shall be constructed of 316 stainless steel. Exposed parts shall be stainless steel or aluminum with polyurethane coating.

D. The devices shall be smart devices that can be calibrated with a **Fluke 744 HART protocol calibrator**.

E. Pressure transmitter housing shall be rated for NEMA 4X.

F. Manufacturer's Gauge Pressure Transmitters: **Rosemount Model 2088**, or equal.

The following electronic gauge pressure transmitters shall be provided:

Tag No.	Location	Range (psi)	Service	Process Connection

2.3 ELECTRONIC ACTUATED PILOT CONTROL

A. Electronic actuated pressure reducing or pressure sustaining pilot control is required to be retrofitted to existing hydraulic operated valves to allow remote setpoint change. Performance requirements are:
1. Pressure reducing or sustaining control is to be achieved by utilizing a hydraulic pilot with integral controller that accepts a 4-20 mA remote setpoint to precisely position the pilot within a predetermined zero and span setting.
2. Set minimum spring range adjustment at 4 mA and maximum of 20 mA. Pressure settings are to be linear between these values.
3. Operate on 24 VDC and consume less than 100 mA underload (occurring only during setpoint change) and 25 mA at no load.

4. Continuous internal monitoring of actuator position is to be used to ensure accurate pressure changes with no backlash or dithering. Built-in electronic limits are to be used to prevent over ranging.
5. In the event of a power or control input failure, the pilot is to remain in last position.
6. The electronic actuated pilot control shall have an integral hydraulic pilot and electronic controller contained in a NEMA 4X enclosure to provide interface between remote telemetry and valve setpoint control.
7. The actuator will compare a remote analog command signal with an internal position sensor signal and adjust the hydraulic pilot control spring mechanism to a new setpoint position.
8. The actuator speed will be field adjustable to less than 1 RPM with a range of 2 turns centered on the operating range or setpoint. The range shall be field adjustable from 1 to 7 turns.
9. If the Remote Setpoint signal is lost or power fails, the valve shall remain under control of the pressure reducing hydraulic control sub-assembly.
10. No adjustments shall be necessary to the actuator except to the low and high position range adjustment.
11. The electronic actuated pressure reducing pilot control shall be **Cla-Val Model CRD-32**, or equal.
12. Provide (4) programming cables and PC software for field adjustments and firmware upgrades.
13. Provide one spare electronic actuator.

B. The following pressure reducing controllers shall be provided:

Tag No.	Location	Pilot Spring (psi)

PART 3 - EXECUTION

3.1 GENERAL

A. Pressure measuring and control systems shall be handled, installed, calibrated, loop-tested, precommissioned, and performance tested according to Section 40 90 00 – Process Control and Instrumentation Systems.

B. Mounting hardware and sensing lines shall be stainless steel in accordance with Section 22 11 19 – Piping and Tubing Systems.

END OF SECTION 40 91 19.29