

INSTRUMENTATION SPECIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes instrumentation for process piping systems.
- B. Related Sections include the following:
 - 1. Division Five Section 05500 for Metal Fabrications.
 - 2. Division Fifteen Section 15050 for Basic Mechanical Materials and Methods.
 - 3. Division Fifteen Section 15075 for Mechanical Identification.
 - 4. Division Fifteen Section 15194 for LNG and Natural Gas Piping.

1.3 DEFINITIONS

(Not Used)

1.4 ASSEMBLY DESCRIPTION

- A. Process Piping Contractor shall mechanically install instrumentation in accordance with Contract drawings. Site Electrical Contractor shall be responsible for wiring of all instrumentation devices.

1.5 PERFORMANCE REQUIREMENTS

- A. All instrumentation shall meet, as a minimum, the Manufacturer's standard performance specifications.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated. Five copies of data listed below shall be submitted to Engineer.
- B. Product Data: For the following:
 - 1. Transmitters (pressure & differential pressure).
 - 2. Solenoid Valves.
 - 3. Digital Loop-Powered Indicators.

4. Panel-Mounted Loading Regulators.
 - C. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.
 - D. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 1. Wiring Diagrams: Power, signal, and control wiring.
 - E. Product Certificates: For each type of instrumentation listed above, signed by product manufacturer.
 - F. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.
 - G. Operation and Maintenance Data: For instrumentation listed above to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Instrumentation shall be provided as specified unless substitutions are approved by Engineer.
- B. Product Options: Drawings indicate size, profiles, and dimensional requirements of instrumentation described in the Section and are based on the specific system indicated.
 1. Modifications will not be accepted without Engineer's prior approval. If modifications are proposed, comprehensive explanatory data must be submitted to Engineer for review.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 3. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 4. Store products to allow for inspection and measurement of quantity or counting of units.

5. Store products under cover in a weather-tight enclosure above ground, with ventilation adequate to prevent condensation.
 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 7. Protect stored products from damage.
- B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment. Coordinate location with Engineer's site representative.

1.9 PROJECT CONDITIONS

(Not Used)

1.10 COORDINATION

- A. Coordinate layout and installation of instrumentation with Engineer's site representative.
- B. Coordinate size and location of concrete bases for instrumentation with Engineer's site representative.

PART 2 - PRODUCTS

2.1 PRESSURE TRANSMITTERS

- A. Manufacturer: Emerson - Rosemount
- B. Medium: Natural Gas
- C. Model No.: 3051T-G-2-A-2B-2-1-A-S5-E5-B4-Q4-M5-T1-S5
- D. Description:
 - G Transmitter Type: Gage Pressure
 - 2 Pressure Range: -14.7 to 150 psi/1.5 psi
 - A Output: 4-20 mA with Digital Signal Based on Hart Protocol
 - 2B Process Connection Style: ½-14 NPT Female
 - 2 Isolating Diaphragm/Process Connection Wetted Parts Material: 316L SST
 - 1 Fill Fluid: Silicone
 - A Housing Material/Conduit Entry Size: Polyurethane-covered Aluminum/ ½-14 NPT

Options:

- S5 Assemble to Model 306 Manifold
 - E5 FM Explosion-Proof Approval
 - B4 Bracket for 2-in. Pipe or Panel Mounting, All SST
 - Q4 Calibration Data Sheet
 - M5 LCD Meter for Aluminum Housing
 - T1 Transient Protection Terminal Block
1. Calibration: 0 to 150 psig

2. Tags: "PIT-C-1", "PIT-D-1"

2.2 DIFFERENTIAL PRESSURE TRANSMITTERS

- A. Manufacturer: Fisher-Rosemount
- B. Medium: Natural Gas
- C. Model No.: 3051CD-2-A-0-2-A-1-A-S5-E5-Q4-M5-T1
- D. Description:

CD Transmitter Type: Differential Pressure
2 Pressure Range: -250 to 250 inH₂O/25 inH₂O
A Output: 4-20 mA with Digital Signal Based on Hart Protocol
0 Process Flange Type: Alternate Flange (see options)
2 Isolating Diaphragm: 316L SST
A O-Ring: Glass-filled TFE
1 Fill Fluid: Silicone
A Housing Material/Conduit Entry Size: Polyurethane-covered Aluminum/ ½-14 NPT

Options:

S5 Assemble to Model 305 Integral Manifold
E5 FM Explosion-Proof Approval
Q4 Calibration Data Sheet
M5 LCD Meter for Aluminum Housing
T1 Transient Protection Terminal Block

1. Calibration: 0 to 100 inH₂O
2. Tags: "DPIT-C-1", "DPIT-D-1"

2.3 SOLENIOD VALVES

- A. Manufacturer: ASCO Red-Hat
- B. Medium: Instrument Air
- C. Operating Pressure: 80 psig
- D. Model No.: EF8321G001-24 VDC
- E. Description:
 1. Type: 3-way Pilot Operated, Quick Exhaust
 2. Solenoid Enclosure: Molded Epoxy, Explosion Proof & Watertight
 3. Electrical: 24 VDC
 4. Coil: Continuous Duty Molded Class F
 5. Operating Position: Normally Closed (closed when de-energized)
 6. Body: Brass

7. Process Connection: ¼-in. NPT, Female
8. Approvals: CSA & UL Listed
9. Tags: “SOV-A-116”, “SOV-B-116”, “SOV-C-116”, “SOV-D-116”

2.4 DIGITAL LOOP POWERED INDICATORS

- A. Manufacturer: DEVAR Inc.
- B. Model No.: LD-LPIX
- C. Description:
 1. Input: 4 to 20 mA
 2. Display Type: 3 ½ Active Digits (fixed R.H. zero) LCD
 3. Character Height: 1.0 in.
 4. Characters: 1.8.8.8
 5. Decimal Points: 4 Position (or absent)
 6. Polarity Indication: Negative Sign or none, switch selectable
 7. Overall Blanks: 4 Digits
 8. Housing: explosion proof & watertight, panel surface mount, corrosion resistant
 9. Approvals: Factory Mutual (FM)

2.5 PANEL-MOUNTED LOADING REGULATORS

- A. Manufacturer: Fisher
- B. Medium: Instrument Air
- C. Inlet Pressure: 80 psig (max.)
- D. Description:
 1. Type: 670G, 2-Gauge Panel; Regulator has Filter
 2. End Connections:
 - a. Inlet: ¼-18 NPT Female
 - b. Outlet: ¼-18 NPT Female
 3. Outlet Pressure Range: 3 to 18 psig
 4. Construction Materials:
 - a. Panel Tubing: 316 SS
 - b. Regulator Body: Die-cast Aluminum
 - c. Regulator Spring Case: Die-cast Zinc/Stainless Steel
 - d. Panel: Zinc
 - e. Filter Cartridge: Cellulose
 5. Pressure Gauge Range:
 - a. Inlet: 0 to 160 psig
 - b. Outlet: 0 to 30 psig

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine areas of installation with Engineer's site representative for compliance with requirements for installation, and other conditions affecting performance of work.

3.2 PREPARATION

(Not Used)

3.3 INSTALLATION

- A. Instrumentation shall be installed as indicated on Contract drawings and/or Engineer's site representative's direction.

3.4 APPLICATION

(Not Used)

3.5 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, tubing, fittings, and specialties.
- B. Tighten tubing connections according to manufacturer's published torque values and/or tightening instructions.
- C. All electrical housings and connections shall be left weather-tight after installation.

3.6 FIELD QUALITY CONTROL

- A. Testing: Engineer will perform field quality control testing.
- B. Remove malfunctioning units and replace with new units.

3.7 STARTUP SERVICE

- A. Engineer will perform startup services.

3.8 ADJUSTING

- A. Adjust LCD displays of transmitters to proper angle for best visibility.

3.9 CLEANING

- A. Clean windows of LCD displays and clean factory finished surfaces. Replaced cracked and broken windows, and repair scratched and marred surfaces with Manufacturer's touchup paint.
- B. After completing system installation, remove burrs, dirt, and construction debris.

3.10 PROTECTION

(Not Used)

3.11 DEMONSTRATION

(Not Used)

END OF SECTION