SECTION 22 0519 - METERS AND GAGES

ALL LIBRARIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 22 0548 “Seismic Protection,” and Section 22 0500 "Common Work Results for Plumbing" all apply to the work of this Section as if fully repeated herein.

1.2 SUMMARY

A. This Section includes thermometers and gages used in mechanical systems.

B. Related Sections: Division 22 piping Sections contain requirements that relate to this Section.

1. Meters, thermometers and gages furnished as part of factory-fabricated equipment are specified as part of the equipment assembly in other Division 22 Sections.

1.3 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract.

B. Product data for each type of meter, gage, and fitting specified: Include scale range, ratings, and calibrated performance curves. Submit a meter and gage schedule showing manufacturer's figure number, scale range, location, and accessories for each meter and gage. All meters and gauges shall be from the same manufacturer.

1.4 QUALITY ASSURANCE

A. Comply with applicable portions of American Society of Mechanical Engineers (ASME) and Instrument Society of America (ISA) standards pertaining to construction and installation of thermometers and gages.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:

1. Thermometers and Pressure Gages:

a. Dresser Industries, Inc.; Instrument Div.
b. Ernst Gage Co.
c. Marsh Bellofram.
d. H.O. Trerice Co.
e. Weiss Instruments, Inc.

f. Weksler Glass Thermometer Corp.

2. Test Plugs:

a. Flow Design, Inc.
b. MG Piping Products Co.
c. Peterson Equipment Co., Inc.
d. Sisco Co., Spedco, Inc.
e. H.O. Trerice Co.
f. Watts Regulator Co.

2.2 THERMOMETERS

A. Description: Battery-free, mercury-free, light-powered digital thermometer with glass-passivated thermistor. One foot-candle ambient light shall be sufficient to power the thermometer. Recalibration with internal potentiometer.

1. Example of Acceptable Device: "Vari-Angle DVU Series" by Weiss Instruments, Inc.

B. Case: Hi-impact ABS.

C. Adjustable Joint: Finish to match case, 180-degree adjustment in vertical plane, 360-degree adjustment in horizontal plane, with locking device.

D. Ambient: Suitable for error-free operation when installed in an environment of -30°F to 140°F and 0% to 100% relative humidity.

E. Scale Range: Provide C/F switch for dual-scale temperature; range -40°F to 300°F.

F. Display: 3/8-inch LCD digits with readout in increments of 0.1°F; updated every 10 seconds.

G. Accuracy: Plus or minus 1 percent of range span, or plus or minus 1°F, whichever is greater.

H. Stem: Copper-plated steel, aluminum, or brass for separable socket; of length to suit installation; full conformance with Fed Spec GG-T-321D; fully interchangeable with industrial liquid-in-glass thermometers.

2.3 PRESSURE GAGES

A. Description: ASME B40.1, Grade A phosphor-bronze Bourdon-tube pressure gage with bottom connection.

B. Case: Drawn steel, brass, or aluminum with 41/2-inch-diameter glass lens.

C. Connector: Brass, 1/4-inch NPS.

D. Scale: White-coated aluminum, with permanently etched markings.

E. Accuracy: Plus or minus 1 percent of range span.

F. Range: Two times operating pressure, dual scale psig.

G. Pressure-Gage Accessories:

1. Valves: NPS 1/4 brass or stainless steel needle type.
2. Trumpet Valve: NPS 1/4 brass or stainless-steel type with 4 ports and 4 cocks, such that the pressure differential between any two ports can be indicated.
3. Syphon: 1/4-inch straight coil of brass tubing with threads on each end.
4. Snubbers: 1/4-inch brass bushing with corrosion-resistant porous-metal disc of material suitable for system fluid and working pressure.

2.4 TEST PLUGS

A. Description: Nickel-plated brass-body test plug in 1/2-inch fitting.

B. Body: Length as required to extend beyond insulation.

C. Pressure Rating: 500-psig, minimum.

D. Core Inserts: Two (2) self-sealing valve types, suitable for inserting a 1/8-inch outside-diameter probe from a dial thermometer or pressure gage.

E. Core Material: According to the following for fluid and temperature range:

1. Air, Water and Gas: 20 to 200°F neoprene rubber.
2. Domestic Hot Water: Minus 30 to 275°F ethylene-propylene-diene-terpolymer (EPDM) rubber.

F. Test-Plug Cap: Gasketed and threaded cap, with retention chain.

G. Test Kit: Provide test kit consisting of 1 pressure gage and gage adapter with probe, 2 insertion dial thermometers and a carrying case.

H. Pressure Gage and Thermometer Ranges: Approximately two (2) times systems operating conditions.

PART 3 - EXECUTION

3.1 GAGE APPLICATIONS

A. General: Where indicated, install gages of types, sizes, capacities, and with features indicated.

B. Install gages, and accessories according to manufacturers' written instructions for applications where used.

3.2 THERMOMETER INSTALLATION

A. Install thermometers and adjust vertical and tilted positions.

B. Install in the following locations:

1. At inlet and outlet of each hydronic water pump.
2. Wherever indicated on the Drawings.

3.3 PRESSURE GAGE INSTALLATION

A. Install pressure gages in piping tee with pressure gage valve located on pipe at most readable position.

B. Install in the following locations and elsewhere as indicated:

1. Across suction and discharge of each pump with trumpet valve.
2. Wherever indicated on the Drawings.
3. Top of each riser.

C. Pressure Gage Needle Valves: Install in piping tee with snubber.

D. Install valve and snubber in piping for each pressure gage for fluids (except steam).

E. Install valve and siphon fitting in piping for each pressure gage for steam.

3.4 TEST PLUG INSTALLATION

A. Install test plugs in piping tees where indicated, located on pipe at most readable position. Secure cap.

3.5 METER INSTALLATION

A. Install meter per manufacturer's instructions.

B. Provide ten pipe diameters of straight length upstream and downstream of flow meter.

C. Sensors and flow meter to be installed in Schedule 40 pipe.

3.6 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. The Drawings indicate the general arrangement of piping, fittings, and specialties.

B. Install thermometers and gages adjacent to machines and equipment to allow servicing and maintenance.

3.7 ADJUSTING AND CLEANING

A. Adjusting: Adjust faces of thermometers and gages to proper angle for best visibility.

B. Cleaning: Clean windows of thermometers and gages and factory-finished surfaces. Replace cracked and broken windows and repair scratched and marred surfaces with manufacturer's touchup paint.

END OF SECTION 22 0519