

SECTION 15123S
METERS AND GAGES

	Page
PART 1 GENERAL.....	2
1.01 SECTION INCLUDES.....	2
1.02 RELATED SECTIONS.....	2
1.03 SUBMITTALS.....	2
PART 2 PRODUCTS.....	3
2.01 MERCURY-IN-GLASS THERMOMETERS.....	3
2.02 DIRECT-MOUNT FILLED-SYSTEM DIAL THERMOMETERS.....	3
2.03 BIMETAL DIAL THERMOMETERS.....	4
2.04 THERMOMETER WELLS.....	5
2.05 PRESSURE GAGES.....	5
2.06 PRESSURE GAGE ACCESSORIES.....	5
2.07 WINDOW-TYPE FLOW METERS.....	6
2.08 TEST PLUGS.....	6
PART 3 EXECUTION.....	7
3.01 THERMOMETERS INSTALLATION.....	7
3.02 INSTALLATION OF PRESSURE GAGES.....	7
3.03 INSTALLATION OF TEST PLUGS.....	7
3.04 INSTALLATION OF FLOW-MEASURING METERS.....	7
3.05 ADJUSTING AND CLEANING.....	7

SECTION 15123S

METERS AND GAGES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Meters and gages.
- B. Meters and gages furnished as part of factory-fabricated equipment are specified as part of equipment assembly in other Division 15 sections.

1.02 RELATED SECTIONS

- A. Section 15010 - Basic Mechanical Requirements.
- B. Section 15050 - Basic Mechanical Materials and Methods.

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 15050 - Basic Mechanical Materials and Methods requirements.
- B. Product data for each type of meter and gage. Include scale range, ratings, and calibrated performance curves, certified where indicated. Submit meter and gage schedule showing manufacturers figure number, scale range, location, and accessories for each meter and gage.
- C. Product certificates signed by manufacturers of meters and gages certifying accuracies under specified operating conditions and products' compliance with specified requirements.
- D. Maintenance data for each type of meter and gage for inclusion in Operating and Maintenance Manuals specified in Section 15050 - Basic Mechanical Materials and Methods.

PART 2 PRODUCTS

2.01 MERCURY-IN-GLASS THERMOMETERS

- A. Case: Die cast, aluminum finished, in baked epoxy enamel, glass front, spring secured, 9 inches long.
- B. Adjustable Joint: Finished to match case, 180-degree adjustment in vertical plane, 360-degree adjustment in horizontal plane, with locking device.
- C. Tube: Red reading, mercury filled, magnifying lens.
- D. Scale: Satin-faced, non-reflective aluminum, with permanently etched markings.
- E. Stem: Copper-plated steel, aluminum or brass, for separable socket, length to suit installation.
- F. Accuracy: 1 percent of scale.
- G. Manufacturers:
 - 1. Ashcroft Dresser Industries/Instrument Division
 - 2. Marsh Instrument Company, Unit of General Signal
 - 3. Trerice (H.O.) Company
 - 4. Weiss Instruments, Inc.
 - 5. Weksler Instruments Corp.

2.02 DIRECT-MOUNT FILLED-SYSTEM DIAL THERMOMETERS

- A. Type: Vapor actuated, universal angle.
- B. Case: Drawn steel or cast aluminum, glass lens, 4-1/2-inch diameter.
- C. Adjustable Joint: Finish to match case, 180-degree adjustment in vertical plane, 360-degree adjustment in horizontal plane, with locking device.
- D. Thermal Bulb: Copper with phosphor bronze bourdon pressure tube.
- E. Movement: Brass, precision geared.
- F. Scale: Progressive, satin faced, non-reflective aluminum, permanently etched markings.

- G. Stem: Copper-plated steel, aluminum, or brass, for separable socket, length to suit installation.
- H. Accuracy: 1 percent of scale.
- I. Manufacturers:
 - 1. Ashcroft Dresser Industries/Instrument Division
 - 2. Marsh Instrument Company, Unit of General Signal
 - 3. Trerice (H.O.) Company
 - 4. Weiss Instruments, Inc.
 - 5. Weksler Instruments Corp.

2.03 BIMETAL DIAL THERMOMETERS

- A. Type: Direct mounted, bimetal, and universal angle.
- B. Case: Stainless steel, glass lens, 5-inch diameter.
- C. Adjustable Joint: Finish to match case, 180-degree adjustment in vertical plane, 360-degree adjustment in horizontal plane, with locking device.
- D. Element: Bimetal coil.
- E. Scale: Satin faced, non-reflective aluminum, permanently etched marking.
- F. Stem: Stainless steel for separable socket, length to suit installation.
- G. Accuracy: 1 percent of scale.
- H. Manufacturers:
 - 1. Ashcroft Dresser Industries/Instrument Division
 - 2. Marsh Instrument Company, Unit of General Signal
 - 3. Trerice (H.O.) Company
 - 4. Weiss Instruments, Inc.
 - 5. Weksler Instruments Corp.

2.04 THERMOMETER WELLS

- A. Thermometer Wells: Brass or stainless steel, pressure rated to match piping system design pressure with 2-inch extension for insulated piping and threaded cap nut with chain permanently fastened to well and cap.

2.05 PRESSURE GAGES

- A. Type: General use, ANSI B40.1, Grade A, phosphor bronze bourdon-tube type, bottom connection.
- B. Case: Drawn steel or brass, glass lens, 4-1/2-inches diameter with safety blow-out plug.
- 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: Conform to the following:
 - 1. Vacuum: 30 inches Hg to 15 psi.
 - 2. All fluids: 2 times operating pressure.
- G. Manufacturers:
 - 1. Ashcroft Dresser Industries/Instrument Division
 - 2. Marsh Instrument Company, Unit of General Signal
 - 3. Trerice (H.O.) Company
 - 4. Weiss Instruments, Inc.
 - 5. Weksler Instruments Corp.

2.06 PRESSURE GAGE ACCESSORIES

- A. Syphon: 1/4-inch NPS straight coil constructed of brass tubing with threads on each end.
- B. Snubber: 1/4-inch NPS brass bushing with corrosion-resistant porous metal disc. Disc material shall be suitable for fluid served and rated pressure.

2.07 WINDOW-TYPE FLOW METERS

- A. Type: Window-type flow meters designed for installation on hydronic and natural gas piping and measure flow directly in gpm. Output: 4-20 MA (24VOC).
- B. Construction: Bronze body and impact tube, integral self-closing valve, glass calibrated tube with indicator ball, and protection shield. Meters shall be pressure rated for 150 psig and temperature rated for 240 degrees F (116 degrees C).
- C. Accuracy: Plus or minus 5 percent.
- D. Manufacturers:
 - 1. Armstrong Pumps, Inc.
 - 2. Metraflex Company
 - 3. Badger Meter, Inc.

2.08 TEST PLUGS

- A. Test plugs shall be nickel-plated brass body, with 1/4-inch or 1/2-inch NPS fitting and a 2 self-sealing valve-type core inserts, suitable for inserting a 1/8 inch OD probe assembly from a dial-type thermometer or pressure gage. Test plug shall have gasketed and threaded cap with retention chain and body of length to extend beyond insulation. Pressure rating shall be 500 psig.
- B. Core Material: EPDM for temperature range minus 30 degrees F to 275 degrees F.
- C. Test Kit: Provide test kit consisting of 2 pressure gages, 2 gage adapters with probe, 2 bimetal dial thermometers, and carrying case.
- D. Ranges of pressure gage and thermometers shall be approximately 2 times systems operating conditions.
- E. Manufacturers:
 - 1. MG Piping Products Company
 - 2. Peterson Equipment Company, Inc.
 - 3. Trerice

PART 3 EXECUTION

3.01 THERMOMETERS INSTALLATION

- A. Install thermometers in vertical and tilted positions to allow reading by observer standing on floor.
- B. Thermometer Wells: Install in piping tee where thermometers are indicated, in vertical position. Fill well with oil or graphite and secure cap.

3.02 INSTALLATION OF PRESSURE GAGES

- A. Install pressure gages in piping tee with pressure gage valve, located on pipe at most readable position.
- B. Pressure Gage Needle Valves: Install in piping tee with snubber. Install syphon in lieu of snubber for steam pressure gages.

3.03 INSTALLATION OF TEST PLUGS

- A. Test Plugs: Install in piping tee where indicated, located on pipe at most readable position. Secure cap.

3.04 INSTALLATION OF FLOW-MEASURING METERS

- A. Window Flow Meters: Install in vertical upward position with impact tube mounted in bushing centered on pipe with 10 pipe diameters upstream and 5 pipe diameters downstream of straight unrestricted piping for 1-1/4 inches and smaller, 20 pipe diameters upstream and 10 pipe diameters downstream for 1-1/2 inches and larger. Calibrate meter after installation in accordance with manufacturer's installation instructions.

3.05 ADJUSTING AND CLEANING

- A. Adjusting: Adjust faces of meters and gages to proper angle for best visibility.
- B. Cleaning: Clean windows of meters and gages and factory-finished surfaces. Replace cracked and broken windows, and repair scratched and marred surfaces with manufacturer's touch-up paint.

END OF SECTION