SECTION 23 21 16 - HYDRONIC PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

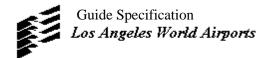
- A. Section Includes:
 - Pressure gages.
 - 2. Pressure gage taps.
 - 3. Thermometers.
 - 4. Thermometer supports.
 - 5. Test plugs.
 - 6. Air vents.
 - 7. Strainers.
 - 8. Flow controls.

1.2 REFERENCES

- A. American Society of Mechanical Engineers:
 - 1. ASME B40.1 Gauges Pressure Indicating Dial Type Elastic Element.
 - 2. ASME Section VIII Boiler and Pressure Vessel Code Pressure Vessels.
- B. ASTM International:
 - 1. ASTM E1 Standard Specification for ASTM Thermometers.
 - 2. ASTM E77 Standard Test Method for Inspection and Verification of Thermometers.

1.3 SUBMITTALS

- A. Product Data: Submit for manufactured products and assemblies used in this Project.
 - 1. Manufacturer's data and list indicating use, operating range, total range, accuracy, and location for manufactured components.
 - 2. Submit product description, model, dimensions, component sizes, rough-in requirements, service sizes, and finishes.
 - 3. Submit schedule indicating manufacturer, model number, size, location, rated capacity, load served, and features for each piping specialty.
 - 4. Submit electrical characteristics and connection requirements where appropriate.



1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit instructions for calibrating instruments, installation instructions, assembly views, servicing requirements, lubrication instruction, and replacement parts list.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary protective coating on cast iron and steel valves.
- B. Protect systems from entry of foreign materials by temporary covers, caps and closures, completing sections of the work, and isolating parts of completed system until installation.

PART 2 - PRODUCTS

2.1 PRESSURE GAGES

- A. Manufacturers:
 - 1. Trerice.
 - 2. Dwyer.
 - 3. Ashcroft.
- B. Gage: ASME B40.1, UL Listed with bourdon tube, rotary brass movement, brass socket, front calibration adjustment, black scale on white background.
 - 1. Case: Steel.
 - 2. Bourdon Tube: Brass.
 - 3. Dial Size: 2 inch diameter minimum.
 - 4. Mid-Scale Accuracy: One percent.
 - 5. Scale: PSI.

2.2 PRESSURE GAGE TAPS

- A. Manufacturers:
 - 1. Trerice.
 - 2. Dwyer
 - 3. Ashcroft.
- B. Valve: Brass, 1/4 inch NPT for minimum 300 psi.
- C. Ball Valve: Brass 1/4 inch NPT for 250 psi.
- D. Pulsation Damper: Pressure snubber, brass with 1/4 inch NPT connections.



2.3 STEM TYPE THERMOMETERS

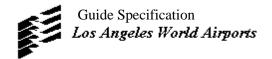
- A. Manufacturers:
 - 1. Trerice.
 - 2. Dwyer
 - 3. Ashcroft
- B. Thermometer: ASTM E1, red appearing mercury, lens front tube, cast aluminum case with enamel finish.
 - 1. Size: 9 inch scale.
 - 2. Window: Clear glass or Lexan.
 - 3. Stem: Brass, 3/4 inch NPT long.
 - 4. Accuracy: ASTM E77 2 percent.
 - 5. Calibration: Degrees F.
- C. Thermometer: ASTM E1, adjustable angle, red appearing mercury, lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device.
 - 1. Size: 9 inch scale.
 - 2. Window: Clear glass or Lexan.
 - 3. Stem: Brass, 3/4 inch NPT long.
 - 4. Accuracy: ASTM E77 2 percent.
 - 5. Calibration: Degrees F.

2.4 THERMOMETER SUPPORTS

- A. Socket: Brass separable sockets for thermometer stems with or without extensions, and with cap and chain.
- B. Flange: 3 inch outside diameter reversible flange, designed to fasten to sheet metal air ducts, with brass perforated stem.

2.5 TEST PLUGS

- A. Manufacturers:
 - 1. Trerice.
 - 2. Peterson Equipment.
 - 3. Watts Industries.
- B. 1/4 inch NPT or 1/2 inch NPT brass fitting and cap for receiving 1/8 inch outside diameter pressure or temperature probe with:
 - 1. Neoprene core for temperatures up to 200 degrees F.
 - 2. Nordel core for temperatures up to 350 degrees F.
 - 3. Viton core for temperatures up to 400 degrees F.



C. Test Kit:

- 1. Carrying case, internally padded and fitted containing:
 - a. Two 2-1/2 inch diameter pressure gages.

2.6 AIR VENTS

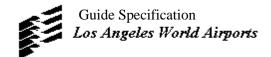
- A. Manufacturers:
 - 1. Trerice.
 - 2. Peterson Equipment.
 - 3. Watts Industries.
- B. Manual Type: Short vertical sections of 2 inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.
- C. Float Type:
 - 1. Brass or semi-steel body, copper, polypropylene, or solid non-metallic float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.
 - 2. Cast iron body and cover, float, bronze pilot valve mechanism suitable for system operating temperature and pressure; with isolating valve.

D. Washer Type:

1. Brass with hydroscopic fiber discs, vent ports, adjustable cap for manual shut-off, and integral spring loaded ball check valve.

2.7 STRAINERS

- A. Manufacturers:
 - 1. Nibco.
 - 2. Milwaukee.
 - 3. Zurn-Wilkins.
- B. Size 2 inch and Smaller:
 - 1. Screwed brass or iron body for 175 psig working pressure, Y pattern with 1/32 inch stainless steel perforated screen.
- C. Size 2-1/2 inch to 4 inch:
 - 1. Flanged iron body for 175 psig working pressure, Y pattern with 3/64 inch stainless steel perforated screen.
- D. Size 5 inch and Larger:
 - 1. Flanged iron body for 175 psig working pressure, basket pattern with 1/8 inch stainless steel perforated screen.



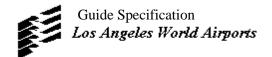
2.8 FLOW CONTROLS

- A. Manufacturers:
 - 1. Griswold.
 - 2. Bell & Gossett.
 - 3. Tour and Andersson
- B. Construction: Brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet combination blow-down and back-flush drain.
- C. Calibration: Control within 5 percent of design flow over entire operating pressure.
- D. Control Mechanism: Stainless steel or nickel plated brass piston or regulator cup, operating against stainless steel helical or wave formed spring.
- E. Accessories: In-line strainer on inlet and ball valve on outlet.

PART 3 - EXECUTION

3.1 INSTALLATION - THERMOMETERS AND GAGES

- A. Install one pressure gage for each pump, locate taps before strainers and on suction and discharge of pump; pipe to gage.
- B. Install gage taps in piping
- C. Install pressure gages with pulsation dampers. Provide needle valve or ball valve to isolate each gage. Extend nipples to allow clearance from insulation.
- D. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inches for installation of thermometer sockets. Allow clearance from insulation.
- E. Install thermometer sockets adjacent to controls systems thermostat, transmitter, or sensor sockets. Where thermometers are provided on local panels, pipe mounted thermometers are not required.
- F. Coil and conceal excess capillary on remote element instruments.
- G. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- H. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
- I. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate to zero.



3.2 INSTALLATION - HYDRONIC PIPING SPECIALTIES

- A. Where large air quantities accumulate, provide enlarged air collection standpipes.
- B. Install manual air vents at system high points.
- C. For automatic air vents in ceiling spaces or other concealed locations, install vent tubing to nearest drain.
- D. Provide drain and hose connection with valve on strainer blow down connection.

3.3 PROTECTION OF INSTALLED CONSTRUCTION

A. Do not install hydronic pressure gauges until after systems are pressure tested.

END OF SECTION 23 21 16