



# Section 221500

# General Service Compressed

# Air Systems

## DESIGN GUIDE

## 1 General

### 1.1 General

- A. At the end of design development, review major pipe routing and branch pipe isolation with the Mechanical Plumbing Manager (MPM).
- B. Show isolation valves for each room and branch piping in the construction documents on the floor plans.

### 1.2 Maintenance Materials

- A. For piping systems that require special tools for installation of joints and fittings, review tooling requirements with CWU Mechanical Plumbing Manager to determine if CWU has tools for repairs in their stock. If not, specialty tools will be required to be provided with the contract and incorporated in the project documents.

## 2 Materials

### 2.1 Compressed Air Piping

- A. Tubing: Type L, hard drawn
- B. Fittings: wrought copper and bronze



- C. Joints:
  - 1. Silver braze

## 2.2 Ball Valves

- A. Bronze body, three piece, double-seal, full-port, ball valves with replaceable neoprene or Teflon seat and stem seals, for minimum 400 psi or 29 inches HG cold working pressure, flange or union mounting, labeled for intended service

# 3 Execution

## 3.1 General

- A. For shops: Provide shut off valve and dirt leg at each service outlet.
- B. Provide service shut off valve in main branches for isolation.
- C. Compressor
  - 1. Provide redundancy for lab applications with multiple compressors manifolded to receiver. This also helps with compressor cycling associated with large compressor motors.
  - 2. Lab air compressors shall be oil free and dry with ISO classification as established by program.
  - 3. Water cooled compressors that utilize potable water cooling shall not be utilized.
  - 4. Size receiver to minimize cycling of compressor. Provide with motorized blow down and pipe to drain.
- D. Air Regulators
  - 1. Provide adjustable regulator at each laboratory as dictated by application.
  - 2. Provide adjustable regulator at each shop service outlet. Regulator shall have inlet and outlet pressure gauges.



- E. Point of use dryers
  - 1. Provide for shop where required for application.
- F. Cleaning and Testing
  - 1. After erection of pipe and tubing but prior to installation of service outlet valves, blow systems clear of free moisture and foreign matter with nitrogen gas.
  - 2. Install service outlet valves, subject system to test pressure of 150 psi with nitrogen or dry compressed air. Check with soapy water. Provide twenty-four (24) hour standing pressure test.

### **3.2 Flanges and Unions**

- A. Provide unions downstream of each valve, on each port of control valves, and at each equipment or piping specialty requiring service.
- B. Unions for serviceable equipment shall be installed in non-parallel lines to eliminate spreading of pipe assembly during servicing.

### **3.3 Start Up- Air Compressors**

- A. Contractor shall include factory authorized/warranted start-up.
- B. Submit start-up certificate with the O&M manuals.

## **4 Appendix**

### **4.1 Reserved for future.**

