SECTION 23 23 00
REFRIGERANT PIPING

PART 1  GENERAL

1.01  HOTWORK
A. General Conditions of the Contract. Special note should be taken of Permitting requirements and HOTWORK regulations as identified in Article 4.

1.02  QUALITY ASSURANCE
A. Installer Qualifications: five (5) year minimum installation experience on projects with refrigeration piping system work similar in scope and nature to that required for the project.
B. Brazing Qualifications: certify operators, brazing procedures and brazers in accordance with ANSI B31.5 for shop and job-site brazing of refrigerant piping work.

1.03  SUBMITTALS
A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop, based on manufacturer's test data, for thermostatic expansion valves, solenoid valves, and pressure-regulating valves.
B. Welding Certificates: Copies of certificates for welding procedures and personnel.
C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
D. Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals specified in Division 1.

1.04  COORDINATION
A. Coordinate layout and installation of refrigerant piping and suspension system components with other construction, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.
B. Coordinate pipe sleeve installations for foundation wall penetrations.
C. Coordinate installation of roof curbs, equipment supports, and roof penetrations.
D. Coordinate pipe sleeve installations for penetrations in exterior walls and floor assemblies.

1.05  EXTRA MATERIALS
A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Refrigeration Oil Test Kits: Two each, containing everything required to conduct one test.
2. Refrigerant: Two containers each, with 20 lb (9 kg) of refrigerant.
3. Filter-Dryer Cartridges: Three of each type.

PART 2  PRODUCTS

2.01  PIPING MATERIALS
A. Tubes, Fittings and Joints
1. Tube material
   a) Size 3/4" and smaller: hard drawn temper copper tube.
   b) Size 3/4" through 4-1/8": hard drawn temper copper tube.
2. Type ACR.
4. Joints: brazed with material having shear strength of 10,000 psi or greater.
5. Hangers: unitstrut with insulated clamps
6. All condensate lines need to be at least 1” pipe.

**2.02 REFRIGERANT VALVES**

A. Globe and Check Valves
   1. Acceptable Manufacturers
      a) Henry Valve Co.
      b) Parker Hannifin Corp.
      c) Singer
      d) Sporlan Valve Co.

B. Solenoid Valves
   1. Acceptable Manufacturers
      a) Alco Controls Division, Emerson Electric Co.
      b) Automatic Switch Co.
      c) Sporlan Valve Co.

C. Refrigeration Accessories
   1. Including strainers, moisture-liquid indicators, filter dryers, evaporator pressure regulators, discharge line mufflers, expansion valves, superheat adjustment.
   2. Manufacturers
      a) Alco Controls Division, Emerson Electric Co.
      b) Henry Valve Co.
      c) Parker Hannifin Corp.
      d) Sporlan Valve Co.

**2.03 COMPRESSORS**

A. Specify a five (5)-year extended warranty.

**2.04 ACCESSORY EQUIPMENT TO INCLUDE**

A. Filter dryer for liquid line of adequate size, replaceable if available.
B. Sight glass moisture indicator installed in the liquid line at a convenient and accessible location.
C. Liquid solenoid valve located near the expansion valve on systems using coil pump-down.
D. Service hand valves shall be required on small and extensive or large refrigerant systems. They shall be located for component isolation purposes during normal maintenance.
E. Liquid charging port and service valve installed in the liquid line on large systems.
F. Oil separators required if evaporator is below 0°F and located below condensing unit.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Specify that it is not acceptable to vent to atmosphere when using refrigerant for testing systems.
B. Specify condensate pans that slope toward drain.
C. Install refrigerant piping according to ASHRAE 15.
D. Hanger, support, and anchor products are specified in Division 23.
E. Oil return lift traps on suction line every 15’ of vertical piping.

END OF SECTION 23 23 00