PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Lubricated, reciprocating air compressors.
2. Oil-flooded, rotary-screw air compressors.
3. Receiver tanks.
4. Particulate air filters.
5. Air-cooled, compressed-air after-coolers.
6. Refrigerant compressed-air dryers.
7. Coalescing air filters.
8. Automatic drain valves.

1.2 PERFORMANCE REQUIREMENTS

A. The performance of the air compressor shall be third party verified by the Compressed Air and Gas Institute (CAGI) with data sheets published by CAGI.

B. Seismic Performance: Compressed-air equipment shall withstand the effects of earthquake motions determined according to SEI/ASCE 7 (i.e., the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event).

1.3 SUBMITTALS

A. Product Data: For each model indicated, provided dimensions, weights, capacities at scheduled conditions, electrical requirements, required clearances, methods for assembling components, accessories, and location and size of each field connection.

B. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASME Compliance: Fabricate and label receivers to comply with ASME Boiler and Pressure Vessel Code.
2.1 GENERAL REQUIREMENTS FOR PACKAGED AIR COMPRESSORS

A. General Description: Factory-assembled, -wired, -piped, and -tested; electric-motor-driven; air-cooled; continuous-duty air compressors and receivers that deliver air of quality equal to intake air.

B. Control Panels: Automatic control station with load control and protection functions. Comply with NEMA ICS 2 and UL 508.

1. Enclosure: NEMA ICS 6, Type 12 control panel unless otherwise indicated.
2. Motor Controllers: Full-voltage, combination magnetic type with under-voltage release feature and motor-circuit-protector-type disconnecting means and short-circuit protective device or variable speed drive.
3. Control Voltage: 120-V ac or less, using integral control power transformer.
5. Starting Devices: Hand-off-automatic selector switch in cover of control panel, plus pilot device for automatic control.
6. Automatic control switches to sequence lead-lag compressors for multiplex air compressors.
7. Instrumentation: Include discharge-air pressure gage, air-filter maintenance indicator, hour meter, compressor discharge-air and coolant temperature gages, and control transformer.
8. Alarm Signal Device: For connection to alarm system to indicate when backup air compressor is operating.

C. Receivers: Steel tank constructed according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

1. Pressure Rating: At least as high as highest discharge pressure of connected compressors, and bearing appropriate code symbols.
2. Interior Finish: Corrosion-resistant coating.
3. Accessories: Include safety valve, pressure gage, drain, and pressure-reducing valve.

D. Mounting Frame: Fabricate mounting and attachment to pressure vessel with reinforcement strong enough to resist packaged equipment movement during a seismic event when base is anchored to building structure.

2.2 LUBRICATED, RECIPROCATING AIR COMPRESSORS

A. Basis of Design: The air compressor shall be an Ingersoll Rand Model 2475N5 or approved equivalent by Ingersoll Rand, Quincy, or Gardner Denver.

B. Compressor(s): Lubricated, reciprocating-piston type with lubricated compression chamber and crankcase.

1. Cast iron construction.
2. Positive displacement gear-type oil pump.
3. Oil filter.
4. Low lubrication-oil pressure switch.
5. Belt guard totally enclosing pulleys and belts.
6. Automatic drain valve.
7. Coalescing filter.
8. Air inlet filters.
10. High ambient temperature operation.
11. Base plate or legs with mounting holes.
12. Air cooled after cooler.

2.3 OIL-FLOODED, ROTARY-SCREW AIR COMPRESSORS

A. Basis of Design: The air compressor shall be an Ingersoll Rand Model RS18IE or approved equivalent by Ingersoll Rand, Quincy, or Sullair.

B. Compressor(s): Oil-flooded, rotary-screw type with lubricated helical screws and lubricated gear box.
   2. Cooling/Lubrication System: Unit-mounted, air-cooled exchanger package pre-piped to unit; with air pressure circulation system with coolant stop valve, full-flow coolant filter, and thermal bypass valve.
   3. Air Filter: Dry type, with maintenance indicator and cleanable replaceable filter element.
   5. Capacity Control: Capacity modulation between zero and 100 percent air delivery, with operating pressures between 50 and 100 percent of maximum pressure. Include necessary control to hold constant pressure. When air demand is zero, unload compressor by using pressure switch and blowdown valve.
   6. Steel enclosure with hinged access doors and sound-attenuating material lining.
   7. Automatic drain valve
   8. Coalescing filter
   10. High ambient temperature operation.
   11. Low ambient temperature operation.
   12. Base plate or legs with mounting holes.

2.4 AIR-COOLED, COMPRESSED-AIR AFTERCOOLERS (NON-INTEGRAL TO UNIT)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Air/Tak, Inc.
   2. Gardner Denver, Inc.
   3. Hankison International.
   4. Ingersoll-Rand; Air Solutions Group.
B. Description: Electric-motor-driven, fan-operation, finned-tube unit; rated at 250 psig and leak tested at 350-psig minimum air pressure; in capacities indicated. Size units to cool compressed air in compressor-rated capacities to 10°F above summertime maximum ambient temperature. Include moisture separator and automatic drain.

2.5 REFRIGERANT COMPRESSED-AIR DRYERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Kaiser
   2. Great Lakes
   3. Hankison International.
   4. Ingersoll-Rand; Air Solutions Group.
   5. Wilkerson Operations; Pneumatic Division.

B. Description: Cycling, air-cooled, electric-motor-driven unit with steel enclosure and capability to deliver 35°F, 100psig air at dew point. Include automatic ejection of condensate from airstream, step-down transformers, disconnect switches, inlet and outlet pressure gages, thermometers, automatic controls, and filters.

2.6 COALESCING FILTERS

A. Coalescing compressed air filter, 250 psig, 150°F temperature, 0.01 micron filtration, flow rate to exceed that of flow in pipe, Speedaire Model #4ZL20 or approved equal.

2.7 PARTICULATE FILTERS

A. Compressed air particulate filter, 0.1 micron, 290 psig, 175°F temperature, flow rate to exceed that of flow in pipe, Speedaire Model #4GNU2 or approved equal.

2.8 AUTOMATIC DRAIN VALVES

A. Automatic drain valve, electric, time on setting, time off setting, 120v power cord and plug. Speedaire Model 6Z948B or approved equal.

2.9 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 22 Section "Common Motor Requirements for Plumbing Equipment."

   1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
   2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Division 26 Sections.
PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. Install units, level, plumb, and anchored to structure in locations indicated. Maintain manufacturer’s recommended clearances. Orient equipment so controls and devices are accessible for servicing.

B. Equipment Mounting: Install equipment on concrete bases in accordance with the manufacturer’s published instructions.

C. Install the following devices on compressed-air equipment:
   1. Thermometer, Pressure Gage, and Safety Valve: Install on each compressed-air receiver.
   2. Pressure Regulators: Install downstream from air compressors or dryers, whichever is the last item downstream.

D. Engage a factory-authorized service representative to perform startup service.
   1. Complete installation and startup checks according to manufacturer’s written instructions.
   2. Check for lubricating oil in lubricated-type equipment.
   3. Check belt drives for proper tension.
   4. Verify that air-compressor inlet filters and piping are clear.
   5. Check for equipment vibration-control supports and flexible pipe connectors and verify that equipment is properly attached to substrate.
   6. Check safety valves for correct settings. Ensure that settings are higher than air-compressor discharge pressure but not higher than rating of system components.
   7. Drain receiver tanks.
   8. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
   9. Test and adjust controls and safeties.

3.2 CONNECTIONS

A. Comply with requirements for piping specified in Division 22 Section "General-Service Compressed-Air Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to machine to allow service and maintenance.

C. Connect piping to air compressors and receivers, except safety relief valve connections, with flexible pipe connectors of materials suitable for service. Flexible pipe connectors and their installation are specified in Division 22 Section "General-Service Compressed-Air Piping."

D. Ground equipment according to Division 26.
E. Connect wiring according to Division 26.

3.3 IDENTIFICATION

A. Identify general-service air compressors and components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the equipment.

END OF SECTION