SECTION 221519

GENERAL-SERVICE PACKAGED AIR COMPRESSORS AND RECEIVERS

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**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 1 Specification with completely editable text; therefore, any portion of the text can be modified by the A/E preparing the Solicitation Package to suit the project.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

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1. GENERAL
   1. SUMMARY
      1. Section Includes:
         1. Lubricated, reciprocating air compressors.
         2. Oil-flooded, rotary-screw air compressors.
         3. Inlet-air filters.
         4. Refrigerant compressed-air dryers.
   2. SUBMITTALS
      1. Product Data: For each type of product indicated.
         1. Wiring Diagrams: For power, signal, and control wiring.

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**NOTE TO SPECIFIER**

Retain subparagraph below for facilities located in seismic zones.

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* + 1. Seismic Qualification Certificates: For compressed-air equipment, accessories, and components, from manufacturers.
    2. Operation and maintenance data.
  1. QUALITY ASSURANCE
     1. 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.
     2. ASME Compliance: Fabricate and label receivers to comply with ASME Boiler and Pressure Vessel Code.

1. PRODUCTS
   1. GENERAL REQUIREMENTS FOR PACKAGED AIR COMPRESSORS AND RECEIVERS
      1. 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.
      2. 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 undervoltage release feature and motor-circuit-protector-type disconnecting means and short-circuit protective device.
         3. Control Voltage: 120-V ac or less, using integral control power transformer.
         4. Motor Overload Protection: Overload relay in each phase.
         5. Starting Devices: Hand-off-automatic selector switch in cover of control panel, plus pilot device for automatic control.

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**NOTE TO SPECIFIER**

Retain first subparagraph below if Project has duplex and multiplex air compressors.

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* + - 1. Automatic control switches to [alternate lead-lag compressors for duplex] [sequence lead-lag compressors for multiplex] air compressors.
      2. Instrumentation: Include discharge-air pressure gage, air-filter maintenance indicator, hour meter, compressor discharge-air and coolant temperature gages, and control transformer.
      3. Alarm Signal Device: For connection to alarm system to indicate when backup air compressor is operating.
    1. 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.

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* + 1. 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.
  1. LUBRICATED, RECIPROCATING AIR COMPRESSORS
     1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. CompAir, Ltd.
        2. Curtis-Toledo.
        3. Gardner Denver, Inc.
        4. General Air Products, Inc.
        5. Ingersoll-Rand; Air Solutions Group.
        6. Kaeser Compressors, Inc.
        7. Powerex, Inc.
        8. Quincy Compressor; an EnPro Industries company.
     2. Compressor(s): Lubricated, reciprocating-piston type with lubricated compression chamber and crankcase.
        1. Submerged gear-type oil pump.
        2. Oil filter.
        3. Combined high discharge-air temperature and low lubrication-oil pressure switch.
        4. Belt guard totally enclosing pulleys and belts.
     3. Capacities and Characteristics:
        1. Refer to drawings.
  2. OIL-FLOODED, ROTARY-SCREW AIR COMPRESSORS
     1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. CompAir, Ltd.
        2. Gardner Denver, Inc.
        3. Ingersoll-Rand; Air Solutions Group.
        4. Kaeser Compressors, Inc.
        5. Quincy Compressor; an EnPro Industries company.
        6. Sullair Corporation.
     2. Compressor(s): Oil-flooded, rotary-screw type with lubricated helical screws and lubricated gear box.
        1. Coupling: Nonlubricated, flexible type.
        2. Cooling/Lubrication System: Unit-mounted, air-cooled exchanger package prepiped 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.
        4. Air/Coolant Receiver and Separation System: 150-psig-rated steel tank with ASME safety valve, coolant-level gage, multistage air-coolant separator element, minimum pressure valve, blowdown valve, discharge check valve, coolant stop valve, full-flow coolant filter, and thermal bypass valve.
        5. Capacity Control: Capacity modulation between zero and 100 percent air delivery, with operating pressures between 50 and 100 psig. Include necessary control to hold constant pressure. When air demand is zero, unload compressor by using pressure switch and blowdown valve.
     3. Capacities and Characteristics:
        1. Refer to drawings
  3. INLET-AIR FILTERS
     1. Description: Combination inlet-air filter-silencer, suitable for remote installation, for each air compressor.

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**NOTE TO SPECIFIER**

Revise first subparagraph below if filter is in-line type and installed in an interior space. Install gooseneck with screen on exterior air inlet.

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* + - 1. Construction: Weatherproof housing for replaceable, dry-type filter element, with silencer tubes or other method of sound reduction.
      2. Capacity: Match capacity of air compressor, with filter having collection efficiency of 99 percent retention of particles larger than 10 micrometers.
    1. Description: Combination inlet-air filter-silencer, suitable for remote installation, for multiple air compressors.

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* + - 1. Construction: Weatherproof housing for replaceable, dry-type filter element, with silencer tubes or other method of sound reduction.
      2. Capacity: Match total capacity of connected air compressors, with filter having collection efficiency of 99 percent retention of particles larger than 10 micrometers.
  1. REFRIGERANT COMPRESSED-AIR DRYERS
     1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. Air/Tak, Inc.
        2. Arrow Pneumatics, Inc.
        3. Atlas Copco.
        4. Curtis-Toledo.
        5. Domnick Hunter Limited; ZANDER, Inc.
        6. Donaldson Company, Inc.; Donaldson Ultrafilter Co.
        7. Hankison International.
        8. Ingersoll-Rand; Air Solutions Group.
        9. Kaeser Compressors, Inc.
        10. Numatics, Incorporated.
        11. SPX Air Treatment.
        12. Van Air Systems, Inc.
        13. Wilkerson Operations; Pneumatic Division.
        14. Zeks Compressed Air Solutions.
     2. Description: Noncycling, air-cooled, electric-motor-driven unit with steel enclosure and capability to deliver 35 deg F, 100-psig 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.
     3. Capacities and Characteristics:
        1. Refer to drawings.
  2. MOTORS
     1. 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.

1. EXECUTION
   1. EQUIPMENT INSTALLATION
      1. Equipment Mounting: Install air compressors and air dryers on concrete bases using elastomeric pads. Comply with requirements in Division 03 Sections.
         1. Minimum Deflection: 1/4 inch.
      2. Install compressed-air equipment anchored to substrate.
      3. 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.
         3. Automatic Drain Valves: Install on aftercoolers, receivers, and dryers. Discharge condensate over nearest floor drain.

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**NOTE TO SPECIFIER**

Retain paragraph below if a factory-authorized service representative is required.

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* + 1. 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. Check for proper seismic restraints, if required.
       8. Drain receiver tanks.
       9. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
       10. Test and adjust controls and safeties.
  1. CONNECTIONS
     1. Comply with requirements for piping specified in Division 22 Section "General-Service Compressed-Air Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
     2. Install piping adjacent to machine to allow service and maintenance.
  2. IDENTIFICATION
     1. Identify general-service air compressors and components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."
  3. DEMONSTRATION
     1. Train Owner's maintenance personnel to adjust, operate, and maintain air compressors and air dryers.

END OF SECTION

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