

SECTION 221519
PACKAGED AIR COMPRESSOR AND RECEIVERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
 - 2. Review these documents for coordination with additional requirements and information that apply to work under this Section.
- B. Section Includes:
 - 1. Air compressor.
 - 2. Dew point monitor.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM) - ASME BPVC Boiler and Pressure Vessel Code Section VIII Pressure Vessels.

1.03 ABBREVIATIONS

- A. SCFM – Standard Cubic Feet per Minute
- B. PSI – Pounds per Square Inch

1.04 SUBMITTALS

- A. Product Data: For each type and size of domestic-water heater indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: Wiring Diagrams: For power, signal, and control wiring.
- C. Submit inspector's certificate for Air Receiver with Operating and Maintenance Manuals.

1.05 QUALITY ASSURANCE

- A. Air receivers shall meet requirements of ASME BPVC, Section VIII, and shall carry ASME approval stamp.

1.06 WARRANTY

- A. The warranty on the air ends will be three years from date of shipment, and one year from the date of shipment on the overall system.

PART 2 - PRODUCTS**2.01 ACCEPTABLE MANUFACTURERS**

- A. Saylor-Beall
- B. Champion
- C. Ingersoll Rand
- D. Atlas Copco

2.02 AIR COMPRESSOR SYSTEM

- A. Provide enclosed oil-less scroll air high pressure compressors and associated equipment and one ASME tank with FDA approved internal lining. Scroll Enclosed Series system shall be complete with multiple oil less scroll compressors, mounted inside of a rigid steel enclosure. Enclosures shall have a powder coated finish, and include sound deadening insulation. Noise levels shall not exceed 58 dBa with all compressor units in operation. Each compressor pump shall have a 1,725-rpm TEFC motor, V-belt drive, and air-cooled after cooler. System shall include the Powerex SOS (Scroll Operating System) controller for energy efficiency with a PBMI touch screen as standard.
- B. Two separate packages shall be provided, designed to provide 37.5 SCFM total each at 145 PSIG.
- C. Noise level shall not exceed 56 dBa with compressor in operation.
- D. System shall include a solid state controller to operate the necessary compressor to maintain the pressure requirement and to minimize the operating cost.

2.03 PBMI SCREEN DISPLAY

- A. The PBMI screens shall display the following:
 - 1. System pressure
 - 2. Compressor type
 - 3. Compressor status (for each compressor)
 - 4. Compressor run hours (per compressor)
 - 5. Model and Serial number of the unit
 - 6. Sequence of Operation
 - 7. Alarm screens
 - 8. Fault indication
 - 9. Alarm history
 - 10. Maintenance screens to include the following:
 - a. Run hours (total and per compressor)
 - b. Hours until scheduled maintenance alert
 - c. A message window with required maintenance at set intervals for each compressor
 - 11. Alerts will be displayed and email notification sent for any of the following:
 - 12. Compressor maintenance
 - 13. Any general fault alarm

2.04 OIL-LESS SCROLL HP COMPRESSOR PUMP

- A. The compressors shall be belt driven oil less rotary scroll single stage, air-cooled oilless construction with absolutely no oil needed for operation. The rotary design shall not require any inlet or exhaust valves and shall be rated for 100% continuous duty. Direct drive compressors

shall not be used. Tip seals shall be of a composite PTFE material and be rated for 10,000 hours operation. Compressor bearings shall be external to the air compression chamber and shall all be serviceable for extended compressor life. Bearing maintenance shall not be required until 5,000 run hours. Compressors with bearings that are not accessible for service have a limited life span and shall not be accepted. Compressors shall have an integral radial flow fan for cooling and shall not require any additional electric cooling fans. Each compressor shall have flexible connectors on intake and discharge.

- B. Each compressor shall include a discharge check valve, a diverter isolation valve, an air-cooled after cooler and a high discharge temperature shut down switch. The discharge of the enclosure shall be fitted with a liquid separator.

2.05 MOTORS

- A. Each compressor shall be belt driven by a 1.750 RPM, TEFC NEMA construction motor. Motors running at speeds higher than 1.750 RPM shall not be acceptable.

2.06 AIR RECEIVER

- A. The system shall include vertical ASME air receivers rated for 200 PSI MAWP. Each tank shall be equipped with a pressure gauge, safety relief valve and automatic electronic tank drain with manual override. The receivers shall be internally lined with an FDA approved material for corrosion resistance.

2.07 DESICCANT AIR DRYER

- A. The system shall include desiccant air dryers. The desiccant dryers shall provide a pressure dew point of -10 degrees F. Dryer controls shall include a re-pressurization cycle to prevent shocking of the desiccant bed prior to switching towers. An integral purge economizer control system shall be provided and shall reduce the purge air loss during periods of low demand. When the dryers are in the purge economizer mode, the time of the purge cycle is reduced to correspond with actual flow. The dryers shall be fitted with a .01 micron pre filter, a 1 micron after filter and a pressure regulating valve with gauge.

2.08 DEW POINT MONITOR

- A. The system shall be supplied with an LCD dewpoint display and high dewpoint alarm with dry contacts for remote monitoring. The dew point sensor (probe) shall be of a rugged Hyper-Thin-Film Aluminum Oxide type, and installed so that the monitored airflow is downstream of the pressure regulator assembly. The monitor shall include a self-calibration mode to enable calibration of the dewpoint sensor without the need to return the sensor to the factory for calibration. The dew point monitor shall be Powerex model no. PDPM1001JJ with a dew point reading range of -60F to +54 deg. F.

2.09 COMPRESSED AIR CONDENSATE TRAPS

- A. The system shall include two (2) Water Hog energy-saving, zero-loss fully automatic condensate traps capable of operating up to 200 PSI.

2.10 SYSTEM REGULATOR

- A. The system shall be supplied with one (1) Watts Model # R119-08CG compressed air pressure regulator with gauge.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install compressor unit on a concrete foundation with a sole plate and isolators. Level, grout, and bolt in place.
- B. Provide an air cock and drain connection on the horizontal casing.
- C. Install full bore ball valve and anti-return valve on the compressor discharge.
- D. Install replaceable cartridge-type filter silencer of adequate capacity for each compressor.
- E. Place shut-off valve on the water inlet to the aftercooler. Pipe the drain to floor drain.
- F. Pipe condensate drains to nearest floor drain.
- G. Install valved bypass around air dryer. Factory-insulate the inlet and outlet connections of the dryer.
- H. Install valved drip connections at low points of piping system.
- I. Install branches to outlets from the top of the main line, with a shut-off valve after the branch take-off.
- J. Install compressed air couplings, 3/8-inch (9.5 mm) female speed couplers, and pressure gauges where outlets are indicated.
- K. Install tee pieces in lieu of elbows at changes in the direction of piping. Fit open end of each tee with plug.

3.02 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
 - 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Prepare test and inspection reports.

3.03 DEMONSTRATION

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

END OF SECTION 221519