

SECTION 15215

SCREW TYPE AIR COMPRESSOR

PART 1 GENERAL

1.1 SUMMARY

- A. Provide labor, materials and equipment necessary to furnish the indicated factory assembled and tested, packaged, self-contained, ROTARY SCREW AIR COMPRESSOR, including accessories as required for a complete, properly functioning, installation.
- B. Related Work Specified Under Other Sections
 - 1. General Mechanical Requirement - SECTION 15050.
 - 2. Aboveground Piping Systems - SECTION 15105.
 - 3. Electrical Work - 16000 Series SECTIONS

1.2 QUALITY ASSURANCE

- A. Requirements Of Regulatory Agencies
 - 1. Provide materials and equipment and execute the WORK, including test and inspections, per applicable provisions of Federal, State and local Government laws and ordinances and referenced codes and standards. Governing laws, ordinances, codes and standards constitute minimum requirements.
- B. Source Quality Control
 - 1. Perform standard shop tests for each component to ensure compliance with intent of these SPECIFICATIONS.
 - 2. The compressor shall be given a factory “run-in” at rated load.
 - 3. Materials and equipment shall be the products of manufacturers regularly engaged in the manufacture of such products, shall essentially duplicate equipment that has been in satisfactory service at prior to issue date of this CONTRACT and shall be supported by a service organization that is reasonable convenient to the site.
- C. Vibration Control Design
 - 1. Under installed, operating conditions, equipment and piping vibration measured at specified or approved points in mils peak-to-peak displacement or velocity in inches/second shall not exceed the following:
 - a. Double amplitude vibration of the rotary screw compressor in any plane measured on each shaft of each bearing housing shall not exceed 0.75 mils.
- D. Noise Control Design
 - 1. Equipment noise in this section shall not exceed 67 level in dBA five feet from the unit measured in the free field per applicable standards.

1.3 SUBMITTALS

A. Shop Drawings And Product Data

1. Furnish submittals for items that are identified in this SECTION by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to Division 01 Section “Shop Drawings, Product Data, and Samples” for definition of codes for types of submittals and the administrative requirements governing submittal procedure. Additional submittal requirements pertaining to this SECTION are specified herein under this Article.
2. Shop drawings shall delineate provisions for obtaining required performance under project service conditions. Performance data shall be certified to be applicable to project service conditions.
3. Shop drawings submittals shall include: Clearly delineated verification of compliance with the elements of the CONTRACT DOCUMENTS, performance, details of configuration, construction, support, functional ancillary provisions, utilities including power connections, wiring diagrams and sequence of operations, installation details for construction field conditions, and vibration amplitude limits for rotating equipment.
4. Submit integrated electrical drawings indicating power, control and instrument wiring interfacing with work under separate contracts for field work as well as factory assembled work. CONTRACTOR’S electrical drawings are acceptable only when modified and supplemented to exactly reflect CONTRACT conditions. The “system” of drawings shall include: Overall schematic (elementary) diagram of the entire system of power circuitry detailing the number of and the wire and conduit sizes, wiring diagrams showing the wiring layout of component assemblies of systems, interconnection wiring diagrams showing terminations of interconnecting conductors between component assemblies, systems, control devices, and control panels with interconnections, and sequence of operation for components, assemblies or systems.

B. Certificates

1. Certificate: Submit manufacturer’s data report, Form U-1.
2. *Test reports [T]*: Submit shop tests.

C. Guarantee

1. Guarantee the unit to meet the operating conditions, capacity and performance conditions as specified and to remain serviceable for the following specified period. If either the unit or accessories fail to meet operating requirements or if failure of any part occurs during the guarantee period, rework or replace the affected items promptly to meet the CONTRACT requirements at no cost to the OWNER.
2. The OWNER reserves the option to request a performance test throughout the warranty period.
3. Based on no performance test, warranty shall extend for two years from date of initial operation. If a performance test is made and the machine meets its guaranty, the warranty shall be as above. If unit fails to meet its guaranteed performance, then warranty shall extend twenty-four months from date of acceptance of modified unit.

1.4 OPERATING AND MAINTENANCE DATA

- A. Furnish, per Division 01 Section “Operating and Maintenance Data,” three copies of installation, operation, lubrication and maintenance instructions and spare parts data manuals for equipment provided under this CONTRACT.
- B. Manuals shall incorporate data to enable operators and maintenance personnel to understand the equipment, its potentialities, limitations and maintenance needs. Data on design, construction, installation and operating features shall be included. Data submitted shall exclude content, which is not applicable to equipment purchased under this CONTRACT. Manuals shall include the following:
 - 1. Diagrams (See Shop Drawing requirements).
 - 2. System OEM Components and assembly drawings as-built.
 - 3. Equipment brochures, data and catalog cuts including:
 - a. Performance: Normal and abnormal conditions.
 - b. Installation.
 - c. Operation.
 - d. Trouble-shooting.
 - e. Safety precautions.
 - f. Maintenance and repair.
 - g. Nearest authorized representative and stocking spare parts source.
 - h. Recommended spare parts.
 - i. Certified Bid Evaluation Form.

1.5 PERSONNEL INSTRUCTION

- A. Provide necessary instruction to OWNER’S installing CONTRACTOR.
- B. Provide, prior to start-up, not less than 8 “classroom” and necessary field training hours for OWNER’S operating and maintenance personnel, upon mutually satisfactory arrangement with OWNER.

1.6 TOOLS

- A. Provide one complete set of special tools as recommended by the CONTRACTOR for field maintenance. Tools shall be contained in a locked toolbox and four keys shall be provided.

PART 2 PRODUCTS

2.1 SCREW TYPE AIR COMPRESSOR

- A. General
 - 1. *Packaged, oil-free, screw type air compressor [D]*: Provide with motor and variable speed drive on a common steel base, enclosed in a silencing canopy, with intake filter-silencer, intercooler and aftercooler, outlet silencer, single point inlet and outlet connections, complete pre-piped lubricating oil circuit, built-in oil breather system,

complete pre-piped cooling water circuit, blow-off silencer and control valve, inlet valve and control, by-pass valve, check valve, hot compressed air outlet with horizontal and vertical bellows expansion joints, motor starters, and control panel with micro processor based control and monitoring.

2. Wherever possible, install, wire, pipe, test, and ship all components and accessories as a ready-to-run package.
3. For all components requiring hoisting for installation and/or maintenance, provide suitable lifting attachments.
4. Manufacturers:
 - a. Atlas Copco, Model ZR 160.
 - b. Ingersoll-Rand.
 - c. Sullair Corp.
 - d. Gardner-Denver.

B. Controls And Control Panel

1. Panel shall be manufacturer's standard compressor mounted NEMA 1 enclosure modified as necessary to contain specified operating controls and supervisory controls.
2. Control system shall perform the following functions:
 - a. Compressor start-stop.
 - b. Compressor protection by means of service and warning indications.
 - c. Compressor shut down in the event of a fault.
 - d. Pressure maintenance for optimum efficiency.
 - e. Display the following data:
 - 1) Working pressure.
 - 2) Operating temperatures.
 - 3) Number of motor starts.
 - 4) Operating hours.
 - 5) Compressor status during last five shutdowns and emergency stops.
 - f. Indicating lights to monitor the following conditions:
 - 1) Power on.
 - 2) Permissive compressor start.
3. Safety switches wired to common terminal block to shut down the compressor and sound alarm for any of the following conditions:
 - a. Excessive vibration.
 - b. Low lubricating oil pressure.
 - c. High lubricating oil temperature.
 - d. High air temperature between stages.
4. Provide safety switches to sound alarm for high vibration conditions.
5. Single isolated SPDT switch to activate a remote annunciating device in the event of an alarm or safety shutdown.
6. All control circuits shall be 120 volts, 60 hertz.
7. Adjustable motor overload controller capable of limiting compressor capacity to prevent overloading the drive motor.
8. Wiring shall be per ANSI C1 with intercomponent wiring in conduit.

- C. Motors
 - 1. Compressor drive motor: Squirrel cage, open drip-proof, 460 volt, 3 phase, 60 hertz, 1.15 service factor, 90 degC temperature rise over 40 degC ambient per NEMA MG-1.
 - 2. Auxiliary lubricating oil pump motor: Base mounted, open drip-proof, 460 volt, 3 phase, 60 hertz, design B induction type.
 - 3. Motor noise shall not exceed limits specified for compressor. Test procedure for determining noise levels shall be in accordance with IEEE No. 85. Ref: 0.0002 Microbars-Microphone distance three feet from source.

- D. Motor Starters
 - 1. Combination across-the-line type, 5kV, fused motor starter [D] in NEMA 12 enclosure.

PART 3 EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Install equipment per scheduled and specified requirements.
- B. Install equipment under the direction of the manufacturer's authorized field representative.
- C. Perform field start-up and run-in under the direction of an authorized representative of the manufacturer who shall inspect, make critical adjustments of equipment and calibration of controls, to verify a complete, properly functioning installation with capacity as scheduled.

3.2 QUALITY CONTROL

- A. Equipment Testing
 - 1. Demonstrate correct functioning of equipment, controls, safety devices and alarms.
 - 2. OWNER reserves the right to request a performance test in accordance with CAGI-PNEUROP/ASME Code PTC-9 or PTC-10 as applicable on the unit after installation in the field. Compressor test will not be requested until after a run-in period of approximately 500 hours. If the compressor and related equipment fail to meet the guaranteed performance, the CONTRACTOR shall assume all costs and furnish all necessary labor, material, test equipment, and supervision for the installation and removal of the equipment before and after completion. If compressor and related equipment meets guaranteed performance, OWNER will assume all costs for the field test.

3. In the event the compressor fails to meet the guaranteed performance, furnish labor and materials to make the necessary revisions and re-test the unit until it meets the guarantee and is accepted by the OWNER. The guarantee shall then extend 12 months from the date of acceptance of the modified machine by the OWNER.
4. OWNER reserves the right to engage the services of a qualified independent testing laboratory to check vibration and noise levels.

END OF SECTION

Revision History	
Date	Rev. No.
A	0
B	0
C	0
D	0
E	0
F	0
02-19-09	0

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