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**SPECIFICATIONS
ROOTS EasyAir™ 8000 STANDARD FACTORY DESIGNED PACKAGE
SPECIFICATON with 4” and 6” gear diameter
RAM® BLOWERS**

Part I – GENERAL

1.01 THE REQUIREMENT

- A: The contractor shall furnish, test, install and place in satisfactory operation in the manner shown on the contract plans, EasyAir™ 8000 ROOTS package with a RAM® frame size _____ rotary positive displacement air blower(s) as manufactured by Dresser Roots, Dresser, Inc.
- B: ALL equipment specified in this section shall be designed and furnished by the blower manufacture, Dresser ROOTS, Dresser Inc., who shall be responsible for the suitability and compatibility of all included equipment.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A: Division 1 (all sections)
- B: Equipment general provisions.
- C: Acoustical insulation for air piping.
- D: Electric motors.
- E: Starters for main drive motors.
- F: Instrumentation.

1.03 MANUFACTURE

- A: The ROOTS blower/motor assemblies, all accessories, controls and other accessories shall be supplied by a single manufacture who is fully experienced, reputable and qualified in the supply of the equipment specified. The manufacture of the blower shall have at least ten (10) installations of the ROOTS rotary lobe blower in operation for at least five years.

1.04 TESTING

- A: A 1 PSI slip test shall be performed on each blower. Blower manufacture’s certification shall be provided.



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1.05 SUBMITTAL & IO & M MANUALS

A: Submittals shall be provided prior to constructions as shall include, but not limited to the following:

- 1: Blower data sheet.
- 2: Blower octave band analysis.
- 3: V-belt drive data.
- 4: General arrangement drawing.
- 5: Motor data sheet.
- 6: PRV sizing data sheet.
- 7: Instrumentation data sheets.

1.06 START-UP AND TRAINING

A: The manufacturer or their representative shall furnish experienced start-up/service personnel to inspect the final installation and, if needed, supervise the field start-up of the equipment.

1.07 TOOLS AND SPARE PARTS

A: The manufacturer shall furnish all special tools and appliances necessary to service, repair and adjust the equipment. The following spare parts shall be furnished.

- 1: (1) Blower repair kit including bearings, seal and gaskets for each blower supplied.
- 2: (1) Spare filter elements.
- 3: (1) Spare set of v-belts for each blower.
- 4: (1) Set of spare motor bearings.

PART 2 -- PRODUCTS

2.01 CONFIGURATION

The air blower(s) shall be of the rotary positive displacement type, and shall be constructed with inlet and discharge connections oriented as shown on the contract drawings. Each blower shall be equipped with detachable rugged steel mounting feet for mounting in horizontal configuration.

2.02 DESIGN CONDITIONS

- Minimum inlet volume _____ ACFM (at blower inlet connection)
- Inlet temperature _____ °F
- Relative humidity _____ %
- Barometer _____ PSIA
- Inlet pressure _____ PSIA (at blower inlet connection)



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- Discharge pressure _____ PSIA (at blower discharge connection)
- Maximum rated pressure rise _____ PSI
- Maximum blower speed _____ RPM
- Maximum gear tip speed _____ fpm
- Maximum BHP at blower shaft _____
- Minimum motor HP _____
- Maximum discharge temperature _____ °F
- Minimum bearing B-10 life _____ hrs
- Maximum free field noise level _____ dba at 1 meter with noise enclosure

2.03 CONSTRUCTION

- A: Casing: The blower casing shall be one piece, with separate head plates, and shall be made of ASTM A48 Class 30B close-grained cast iron. Each head plate shall incorporate a vent to atmosphere. In a pressure application this vent prevents pressurization of the oil chambers. In a vacuum application the vent prevents oil carry over to the air stream.
- B: Impellers-Shaft Assembly: Each impeller-shaft assembly shall be made from high-strength ASTM A395-60-45-15 ductile iron. The shafts are cast integrally with the impellers. The impellers shall be of the straight, two-lobe involute type, and shall operate without rubbing, liquid seals or lubrication. The assembly shall be dynamically balanced by removing metal from the impeller body, and shall be center-timed to permit rotation in either direction. Each shaft is fitted with a cast iron ASTM A48 Class 30B sleeve and ductile iron piston ring, SAEJ929. The piston ring is located on the shaft at the point where the shaft passes through the head plate.
- C: Bearings: Each impeller and shaft assembly shall be supported by oversized anti-friction bearings engineered for long service life and fixed to control the axial location of the impeller/shaft in the unit. A roller bearing shall be provided at all four (4) locations. A wavy washer shall be installed on the gear end of both shafts between the bearing and bearing clamp to absorb axial thrust loading.
- D: Timing Gears: The impellers shall be timed by a pair of SAE 8620 carburized and hardened steel spur gears. The gears shall be hardened to 58-62 Rockwell hardness and mounted on the shafts with a tapered fit and secured by a locknut.
- E: Fasteners: All fasteners shall be SAE Grade 5, high strength material as a minimum.
- F: Lubrication: Each bearing housing shall include a positive lip type Viton oil seal designed to prevent lubricants from entering the air stream. A Viton lip seal shall be installed on the drive end of the drive shaft. The bearings timing gears are splash lubricated with a disc slinger.
- G: The blower will be a ROOTS RAM™ as manufactured by Dresser ROOTS, Dresser Inc.



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2.04 INLET FILTER/SILENCER

System shall include an inlet filter silencer for pressure applications. The inlet filter silencer shall be mounted within eight (8) inches of the blower inlet suction. Inlet filter/silencer for blowers with threaded inlet/outlets shall be mounted directly to the blower suction. Inlet filter/silencer for blowers with flanged inlet shall be mounted directly to the blower. The inlet/filter silencer shall be carbon steel with paper filter elements. 5” and 6” inlet filters shall have lateral access for element access. Vacuum filters, if required, to be installed outside of the noise enclosure. Dresser ROOTS, Dresser Inc shall supply the inlet/filter silencer.

2.05 COMBINATION BASE

Base shall be a combination type with discharge silencer. The base/discharge silencer will have a connection for a pressure relief valve built into the silencer. The base/discharge silencer will be supplied by Dresser ROOTS, Dresser Inc.

2.06 DRIVE SYSTEM

A v-belt drive will be provided. The v-belt drive system must incorporate a ROOTS patented v-belt tension system. A minimum service factor of 1.4 shall be applied on all v-belt systems. Drive selection program shall be supplied to verify 1.4 minimum drive service factor. Drive shall be selected to insure overhung load limits of motor and blower is not exceeded.

2.07 BELT GUARD

Guard shall be designed into the noise enclosure and meet OSHA standards.

2.08 DRIVE MOTOR

The motor shall be sized for appropriate horsepower, RPM and other appropriate electrical characteristics as determined for the application. The brake horsepower requirement with relief valve fully open shall not exceed the motor nameplate horsepower rating with service factor. Motors to be horizontal foot mounted, ball bearings, heavy-duty steel or cast iron frame, gasketed conduit boxes and manufactured to NEMA or IP standards. Motors to be RGZP or WWE1-18 as manufactured by Siemens Worldwide Electric Corp.

- Motor Horsepower _____.
- Motor RPM 1800.
- Motor Type TEFC.
- Motor Electrical 3 Phase, 60 Hertz, 230-460 or 460V only.
- Motor Service Factor 1.15.



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- Motor Full Load Efficiency per EPACT minimum.
- Motor Full Load Amps _____.
- Motor Space Heater _____ Phase _____ Voltage

2.09 STANDARD ACCESSORIES

- A: Blower oil drain manifold.
- B: The blower package shall include pressure/vacuum gauge, each with a throttle plug on both the suction and discharge of the blower and a discharge temperature gauge. Gauges will be mounted on the front of the noise enclosure for easy viewing. All gauges shall be supplied by Dresser ROOTS, Dresser Inc. or approved equal.
- C: Blower package shall include an inlet filter gauge to indicate filter change requirement.
- D: A spring type large nozzle design bronze relief valve shall be included. The relief valve shall be located in the discharge silencer for pressure applications and in the suction piping on blowers for vacuum application. Relief valve to be supplied by Dresser ROOTS, Dresser Inc.
- E: Check valves shall be supplied for pressure and vacuum applications. The check valve shall have threaded connections for 5” diameter and below and wafer style for 6” and above. Check valve shall be cast iron or carbon steel with silicone seal and stainless steel spring. The blower manufacture must insure the valve is of suitable for the application. Check valve to be supplied by Dresser ROOTS, Dresser Inc.
- F: Vibration mounts shall be supplied. Vibration mounts to be supplied by Dresser ROOTS, Dresser Inc. The blower manufacture must insure proper selection for the specific blower system offered.
- G: An 80 dBA or less free field guaranteed noise enclosure should be provided for each blower system. The enclosure must be suitable for outdoor installation, 20 lb per square foot snow load and 70 MPH wind speed. The enclosure shall include a vent system and removable panels for easy access and maintenance. The noise enclosure shall provide up to 22-dba attenuation, free field. The noise enclosure must be supplied by Dresser ROOTS, Dresser Inc.

2.10 OPTIONAL ACCESSORIES

- A: The blower package may include a NEMA 4 discharge pressure switch. Switch to be mounted on the outside of the noise enclosure. SS tubing to be used. Manufacture shall be Ashcroft Instruments model B424V or approved equal.
- B: The blower package may include a NEMA 4 discharge temperature switch. Switch to be mounted on the outside of the noise enclosure. The switch shall include 10 feet of 316 SS capillary with 75W SS well. Manufacture shall be Ashcroft Instruments model T424T10-303 or approved equal.
- C: Butterfly valves, if required by the purchaser, shall be cast iron with locking lever. Threaded valves for 4” and below shall be supplied. Wafer style shall be supplied for valves 6” and above. Butterfly valves to be supplied by Dresser ROOTS, Dresser Inc.
- D: Unloading valves, if required by the purchaser, shall be the ROOTS patent pending unloading type as manufacture by Dresser ROOTS, Dresser Inc.



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- E: UL Listed Control Panel including:
- NEMA 4 or 12, Fiberglass or Steel Enclosure.
 - Motor circuit protector.
 - NEMA or IEC Magnetic Motor Starter with overload relay and through the door reset.
 - On-OFF-Auto Selector Switch.
 - 120 V Control Circuit Transformer sized for panel.
 - Run Pilot Light.
 - Terminal Strip for switches.
 - UL/CUL labeled control panel. CUL certification upon request.

PART 3 INSTALLATION

- 3.1 All equipment will be factory painted in accordance with the manufacture's standard procedures.
- 3.2: The contractor, in accordance with the manufacture's instructions, shall install the blower package and appurtenances.

PART 4 WARRANTY AND SERVICE

Blower equipment supplier shall also be a factory authorized warranty and repair center. Supplier's service center shall be within 100 miles of equipment site. The blower package shall come with a full factory warranty, reference Dresser Roots document WP-5020.

END of Specification

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