

# CITY OF PENDLETON

## Request for Quotes

### WWTRRF Blower



**July 2023**

**Public Works Department  
500 SW Dorion Avenue  
Pendleton, OR 97801**

**[www.pendleton.or.us](http://www.pendleton.or.us)**

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**CITY OF PENDLETON**  
**Public Works Department**  
**Wastewater Treatment Resource Recovery Facility**  
**Blower Package**  
**Request for Quotes**

The City of Pendleton Public Works Department is requesting quotes to supply a low pulsation rotary lobe blower package capable of 60-80 CFM low end and 240-300 CFM high end at 10.8 psi continuous operating pressure for the Wastewater Treatment Resource Recovery Facility (WWTRRF). Package is to include sound enclosure, inlet filter/silencer, outlet silencer, VFD, breaker, and control panel. Hand/Off/Auto option, local control and, in Auto, the ability for control from a SCADA system. Length and width of unit will be smaller than 7' x 5'.

A copy of the request for quotes (RFQ) may be obtained from the Public Works Director's office at 500 SW Dorion Avenue, Pendleton, Oregon 97801 or by calling (541) 966-0202. The document is also available online at the City website: <https://pendleton.or.us/rfps> and the OregonBuys website at: <https://oregonbuys.gov/bsa/view/login/login.xhtml>.

**Signed quotes shall be on Proposer's letterhead and returned to the City of Pendleton, c/o Bob Patterson, Public Works Director, 500 SW Dorion Avenue, Pendleton, OR 97801 no later than 2:00 pm local time, Thursday, August 3, 2023. The envelope shall be plainly marked "WWTRRF Blower".** Quotes may also be submitted via email to [mark.milne@ci.pendleton.or.us](mailto:mark.milne@ci.pendleton.or.us) or [kyle.willman@ci.pendleton.or.us](mailto:kyle.willman@ci.pendleton.or.us) clearly marked "WWTRRF Blower". For more information, contact Mark Milne, WWTRRF Superintendent, [mark.milne@ci.pendleton.or.us](mailto:mark.milne@ci.pendleton.or.us) or Kyle Willman, WWTRRF Technician, [kyle.willman@ci.pendleton.or.us](mailto:kyle.willman@ci.pendleton.or.us) or 541 276-3372.

Bidder may provide more than one quote in meeting the Special Specifications for City's consideration. Bidder should note any considerations, such as "or equal," with the quote submittal. City reserves, at its sole discretion, the right to select equipment based on a combination of cost and anticipated performance.

Delivery of this equipment covered by this specification shall be FOB Pendleton Waste Water Treatment Resource Recovery Facility, 4300 SW Houtama Road, Pendleton, OR 97801.

The Bidder agrees to indemnify and save harmless the City of Pendleton from any and all defects appearing or developing in the workmanship or materials furnished under this RFQ for a period of one (1) year from the date of commissioning, or a maximum of 30 months from date of shipment and Final Acceptance by the City.

All warranty and inspection certificates shall be included with delivery. Full details of the equipment, including warranty, shall be supplied with the quote.

**If the equipment being proposed does not meet a portion(s) of the applicable specifications, it must be noted and fully explained in order to be considered.**

The City of Pendleton reserves the right to reject any or all quotes, or portions of, waive any informalities and/or accept the quote which is in the best interest of the City of Pendleton.

**Attachments:**

Special Specifications

## **SPECIAL SPECIFICATIONS**

The Proposer agrees to indemnify and save harmless the City of Pendleton, herein referred to as City, from any and all defects appearing or developing in the workmanship or materials furnished under this RFQ for a period of twenty-four (24) months from the date of commissioning, or a maximum of thirty (30) months from date of shipment and Final Acceptance by the City.

### **General Description:**

The City of Pendleton is requesting proposals to supply a low pulsation rotary lobe blower package capable of 60-80 CFM low end and 240-300 CFM high end at 10.8 psi continuous operating pressure. Package is to include sound enclosure, inlet filter/silencer, outlet silencer, VFD, breaker, and control panel. Hand/Off/Auto switch, local control and, in Auto, the ability for control from a SCADA system. Length and width of unit will be smaller than 7' x 5'.

### **Qualifications:**

1. Regardless of manufacturer, the package will be produced by the manufacturer of the blower stage, to ensure single source responsibility for blower performance and compatibility of associated accessories. Packagers not permitted to bid.
2. The equipment shall be designed, constructed, and installed in accordance with the best practices and methods and shall operate satisfactorily when installed.
3. The blower(s) shall be covered by a warranty for 24 months from date of commissioning, or a maximum of 30 months from date of shipment.
4. The performance data and manufacturing methods shall achieve a Declaration of Conformity, per Machinery Directive 2006/42/EC, Annex II, No.1 A.
5. The blower components must be rebuildable on site, preferred, or the ability to order a rebuilt stage and return the used stage for credit.

### **Blower Performance Criteria:**

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| 1. Quantity of Machines            | 1                                     |
| 2. Design Inlet Temperature        | 40-100 °F                             |
| 3. Site Elevation                  | 1004 feet above sea level             |
| 4. Design Inlet Pressure           | 14.07 psia                            |
| 5. Design Relative Humidity (%)    | 60-90 %                               |
| 6. Design Flow minimum setting VFD | 60-80 scfm                            |
| 7. Design Flow                     | 240-300 scfm                          |
| 8. Design Discharge Pressure       | 10.8 psig                             |
| 9. Brake Horsepower (Max)          | 47.5 bHp                              |
| 10. Motor Size (Max)               | 60 Hp                                 |
| 11. Free Field Noise Guarantee     | 76 dB(A) at 1 meter (at design point) |
- a. Package BHP to include pressure loss through a clean inlet filter / silencer, pressure loss of the exhaust silencer and check valve.
  - b. Package Performance shall be guaranteed to ISO 1217 with a tolerance is +/- 5% on volume flow and +/- 5% on package horsepower. Manufacturer of blower must provide data for purchased machine.
  - c. Sound data shall be from an ISO 2151 method of measurement, in an ISO 3745 qualified test facility. Sound data shall be compliant with a Declaration of Conformity assessment standard.

### **Delivery, storage and handling:**

1. All equipment shall be completely factory assembled, skid mounted, and crated to protect against damage during shipment.

## **SPECIAL SPECIFICATIONS**

2. All exposed flanges shall be covered and sealed with shrink-wrap to prevent the entrance of moisture. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.
3. All equipment delivered to the site shall be stored as specified in accordance with the manufacturer's instructions.

### **Maintenance:**

1. Furnish the following spare parts for each blower package specified:
  - a. Complete set of matched V-belts
  - b. One filter element
  - c. Volume of oil change for first service interval
2. Spare parts shall be properly bound and labeled for easy identification without opening the packaging.
3. List of tools required for rebuilding and maintaining. Any specialty tools needed shall be included with the purchase.
4. Provide a list of all replacement parts required for a rebuild.
5. Furnish a detailed maintenance manual with complete rebuild section.

### **General:**

1. Blower packages shall be designed to minimize the life-cycle costs and maximize plant reliability. The design and the selection of the components shall be based on a minimum useful life of 15 years and a Mean Time Between Overhauls of 5 years of continuous operation. Bearing life must be submitted by manufacturer, based on specified conditions.
2. No special foundations shall be required. The blower packages will be installed directly on a concrete slab without grouting the base frame. There shall only be 4 easily accessible anchor points.
3. Manufacturer shall guarantee that the rotary lobe blower shall provide oil-free operation and be certified to ISO 8573-1 Class Zero.
4. Blower Casing:
  - a. The blower casing shall be of one-piece construction, with separate side plates that are bolted and pinned to the housing.
  - b. Materials shall be close-grained cast iron ASTM A48 suitably ribbed to prevent distortion under the specified operating conditions.
  - c. Minimum blower casing pressure rating shall be 36 psig.
  - d. Inlet and outlet shall be flanged connections.
  - e. The casing shall incorporate a proven means of pulsation cancellation which achieves 90% of better reduction in vibration. Systems without a means of pulsation cancellation shall not be accepted.
  - f. The vibration level as measured at the blower casing, in the X/Y planes of the bearings, shall not exceed ½ "/sec RMS when operating at the specified maximum operating pressure and speed in the actual blower package.
5. Factory Testing:
  - a. Each blower stage shall be factory tested in accordance with ISO 1217 performance test to verify flow and brake horsepower at blower maximum conditions. A slip test shall not be acceptable, nor is average data for the manufactured size.
  - b. The acceptance criteria are +5% tolerance on power and -5% tolerance on flow regardless of the size of the machine.
6. Rotors:
  - a. Each rotor shall be of the "stiff" design with first lateral critical speed at least 120% of the maximum allowable operating speed.
  - b. The rotors shall be of the straight, three-lobe type, and shall operate without rubbing or liquid seals or lubrication.

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- c. Rotor/shaft shall be one single piece. Cast, hollow rotors shall be capped, dust tight. Open rotors are not acceptable.
- d. The rotors shall be statically and dynamically balanced per ISO1940/ANSI S2.19 G6.3.
- 7. Bearings:
  - a. Each rotor/shaft shall be supported by anti-friction bearings and fixed to control the axial location of the rotor/shaft in the unit.
  - b. Regardless of theoretical bearing life calculations, the bearings shall be sized for a minimum expected life of 5 years between overhauls. Calculated bearing life shall be submitted, based on specified operating conditions.
- 8. Timing Gears:
  - a. The rotors shall be timed by a pair of single helical AGMA 12 quality gears with hardened and ground teeth; minimum AGMA service factor of 1.70. Spur cut gears are unacceptable
  - b. Gears shall be mounted on the shafts with a tapered interference fit and secured by a locknut. Pinned gears are unacceptable.
- 9. Seals:
  - a. Seal shall be designed to prevent lubricant from leaking into the air stream as well as to prevent oil from leaking out of the machine.
  - b. Four rotary piston ring shaft seals, an oil slinger and an O-ring seal shall be provided at the point where the shaft passes through the side plates.
  - c. Further provision shall be made to vent the rotor side of the oil seal to atmosphere to eliminate any possible carry-over of lubricant into the air stream.
- 10. Lubrication:
  - a. The timing gears and the bearings shall be splash lubricated. Grease lubrication shall be not acceptable.
- 11. Oil Sight Glass:
  - a. An oil sight glass must be provided on each oil sump.
- 12. Painting:
  - a. Painting shall be per supplier's standard meeting the following criteria:
    - 1) Except for machined sealing and machined mounting surfaces, the package shall be painted.
    - 2) Aluminum, stainless steel, and brass shall not be painted.
    - 3) The supplied motor shall not be over sprayed and will be supplied with the motor manufacturer's standard protection and paint color.
    - 4) Painted Cast Iron and Carbon Steel shall be Alkyd Resin Primer and Final coat with a total dry film thickness of 70µm. Surface preparation SSPC10 or better.
    - 5) Sound enclosure shall be powder-coated polyester base total dry film thickness 80µm.
    - 6) Galvanized components shall only be painted with appropriate surface preparation.

### **Blower Accessories:**

- 1. Inlet Filter/Silencer:
  - a. Each package shall be supplied with one combination inlet filter silencer.
  - b. The inlet filter silencer shall be mounted directly to the inlet flange of the blower.
  - c. The filter media efficiency must meet the requirements of ASHRAE 52.2 MERV7 50-70% @ 3-10 microns corresponding to EN779 G4.
  - d. The silencer portion shall be located upstream of the inlet filter.
  - e. Filter and silencer performance losses shall be included in the blower performance calculation.
  - f. The filter element shall be designed to trap dirt on the inside so that upon changing, dirt does not fall into the machinery. Filters where dirt accumulates on the external surface of the filter will not be permitted.
- 2. Base Frame/Discharge Silencer:
  - a. Each package shall be supplied with one combination base frame/discharge silencer.

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- b. The silencer shall be a chamber type design for maximum sound attenuation and shall not use fibrous or absorption materials of any kind. Internal absorption material has been shown to degrade and internally foul diffusers and will not be permitted.
  - c. The silencer shall be fabricated of a single shell of pressure vessel quality steel with continuous welds.
  - d. The silencer shall be subject to a pressure test for tightness and strength at a minimum of 1.65 times the maximum blower operating pressure.
  - e. The silencer shall have a machined inlet connection where the discharge flange of the blower stage bolts directly to, with no intermediary pieces. Threaded connection between the compressor stage and the discharge silencer is subject to leakage and misalignment and will not be permitted.
  - f. Discharge silencer performance losses shall be included by the blower vendor in the blower performance calculation. This is another reason why the blower accessories must be supplied by the manufacturer of the blower stage.
  - g. The base frame shall be constructed from welded carbon steel or cast iron that shall be designed to maintain alignment of the blower internal components and the drive during operation.
  - h. The base frame shall be designed to resist distortion while being installed on vibration isolating mounts.
  - i. The blower manufacturer shall supply a stainless-steel grounding lug fully welded to the base.
3. Flexible Connectors:
- a. Each package shall be connected to the plant piping via flexible connector(s) located downstream of the discharge silencer.
  - b. Flexible connectors shall prevent the transmission of noise and vibrations from the blower package into the piping.
  - c. Flexible discharge connectors shall be Proco Style 240, Type EE, EPDM, with a standard ANSI flange discharge connection, rated for 300 °F at 20 psig.
4. Electric Motor:
- a. Each package shall be supplied TEFC motor that shall operate on 460 Volts, 3 Phase, 60 Hertz current.
    - 1) Torque NEMA B
    - 2) Temperature Rise Class B
    - 3) Dust tight enclosures (Severe Duty)
    - 4) Class F inverter rated insulation with Class H applied varnish
    - 5) 3:1 constant torque
    - 6) All cast iron construction, including frame, end bells, conduit box and fan cover
    - 7) NPT threaded and gasketed F3 top mounted conduit box
    - 8) Copper windings
    - 9) Regreasable bearings, positive pressure lubrication system with automatic drawn plugs – pressure compensated (Frame sizes 254T and larger).
  - b. All frame sizes shall be NEMA standard, suitable for overhung belt drive and with the conduit box location on top of the motor. IEC frame motors shall not be allowed.
  - c. The motor shall be mounted on a pivoting base to provide automatic tensioning of the belts.
  - d. The motor nominal rating after any corrections for ambient conditions shall be 10% above the maximum operating bHp.
  - e. The motor shall have a 1.15 service factor.
  - f. Motor windings shall be supplied with a normally closed thermostat, one per phase, wired in series to form a fail-safe motor protection circuit for the external fault circuit of the motor controller.
  - g. Motors shall be equipped with an Aegis ring to mitigate the effects of stray motor currents.
  - h. Blower manufacturer shall be responsible for coordinating the starting torque requirement of the blower and the motor.

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5. V-Belt Drive:
  - a. Each package shall be supplied with a V-belt drive that shall be of the high-capacity type, oil and heat resistant. Drive shall be designed for a minimum service factor of 1.4 times operating power (bHp), or 1.1 times the motor nameplate Hp, whichever is larger to allow a minimum of 1.4-service factor based on the maximum blower bHp.
  - b. Belt tensioning shall be automatic without the use of any devices or interaction on the part of the operator. Neither slide rails nor load-adjusting springs shall be used.
  - c. Sheaves shall be dynamically balanced regardless of the operating speed.
6. Belt Guard:
  - a. The belt drive shall be guarded in compliance with OSHA regulations.
  - b. Portions of the guard shall be easily removable allowing for belt inspection and replacement.
  - c. Guard material shall be perforated carbon steel.
7. Vibration Isolators:
  - a. Each package shall be supplied with vibration isolating feet with a minimum efficiency of 80%.
  - b. Blower manufacture shall be responsible for attenuating noise and vibration in the blower package such that no special installation base shall be required, nor shall any additional measures be required to reduce vibrations from the blower package being transmitted to the base or the piping.
8. Pressure Safety Valve:
  - a. Each package shall be supplied with a single pressure safety valve on the discharge side of the blower mounted downstream of the discharge silencer and upstream of the check valve.
  - b. The safety valve shall be set to protect the blower from exceeding its maximum pressure rating and shall be sized to pass 100% of the design flow.
  - c. The safety valve shall be field adjustable, spring loaded, and have a certificate of conformity to PED.
  - d. The pressure relief valve shall be housed by the sound enclosure and shall relieve into a segmented section of the sound enclosure. Weighted relief valves inside in the enclosure are not permitted.
9. Check Valve:
  - a. Each package shall be supplied with one check valve that shall be installed on the discharge line.
  - b. The check valve shall be of the full-bore low pressure-drop, flapper type design with a steel body, and steel flap embedded in EPDM with full-contact seal.
  - c. The valve shall be removable without disturbing the piping. Pressure losses produced by the check valve shall be included in the blower performance calculation. Check valves requiring installation in the discharge piping shall not be considered unless installation cost of the external valve is included in supplier's proposal.
10. Instrumentation:
  - a. Each package shall be supplied with the following instrumentation:
    - 1) Inlet Vacuum Gauge (4" Gauges)
      - i. Standard gauge with 4" dial and scale from 0 to -40 inches of water column.
      - ii. Gauge to function as a filter maintenance indicator.
    - 2) Discharge Pressure Gauge (4" Gauges)
      - i. 4" dial and scale from 0 to 20 psig.
      - ii. The pressure gauge shall have a stainless-steel case.
      - iii. Gauge shall be dry (no fill) with no pulsation snubber required.
    - 3) Discharge Temperature Gauge/Switch (4" Gauges)
      - i. 4" dial and scale from 32°F to 397°F
      - ii. NEMA 4 enclosure, 5A @ 250 volt, SA 28 SPDT microswitch
      - iii. UL & CSA approved.
11. Each blower shall receive its initial oil filling at the factory. Oil to be fully synthetic.

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12. Acoustical Sound Enclosure:
  - a. Each package shall be supplied with a sound enclosure covering the entire blower package.
  - b. The enclosure shall provide suitable protection for indoor installation
  - c. The enclosure shall be designed so as to be able to install them side-by-side with all maintenance done from the front or back of the package.
  - d. Details shall be as follows:
    - 1) Panels shall be made of galvanized steel sheet, powder coated. The skid shall be of the same color.
    - 2) The enclosure and the blower package shall both be mounted on a skid / oil-drip pan designed for meeting environment protection standards and for easy transportation and installation.
    - 3) A grounding strap shall be installed between the blower base and the package skid to bypass any vibration isolating mounts.
    - 4) Quick release panels, each less than 50 lb (as mandated by OSHA) must provide easy and quick access for routine maintenance of the blower and the package components.
    - 5) Enclosure Cooling Fan:
      - i. A high efficiency blower shaft driven ventilation fan shall provide ventilation and cooling integral to the sound enclosure.
      - ii. Cooling fan shall be sized for sufficient heat removal from the sound enclosure, even when the blower is operated with a VFD.
    - 6) Electrical components, instrumentation and instrument connections shall not be mounted or interface with moving panels of the sound enclosure.
    - 7) Both blower oil sumps shall be piped to a common fill and drain, located at the front of the package for easy maintenance. An oil level indicator shall be mounted on the outside of the enclosure, which gives an accurate oil level indication while the blower is in operation. All oil lines to be hydraulic hose with fittings. No plastic tubing with compression fittings is allowed.
    - 8) An emergency stop shall be supplied near the control panel. Press to stop, pull to reset.
13. Variable Frequency Drive:
  - a. Each blower package shall include a factory mounted, 6-pulse, constant torque, variable frequency drive.
  - b. Drive shall operate on 460 VAC, 3 phase, 60 hertz power and shall be integrated with the local blower permissive switches.
  - c. The drive shall include the following features and accessories:
    - 1) NEMA 12 enclosure for indoor installation
    - 2) Rotary fused disconnect
    - 3) Method to minimize power line harmonics while providing a near unity power factor.
    - 4) Input surge protection to withstand surges of 2.3 times line voltage for 1.5 msec.
    - 5) Modbus communication over CAT5 cable
    - 6) Minimum 100kA SCCR safety rating
    - 7) VFD shall be a Allen-Bradley 755 Series sized 10% over motor horse power rating.
14. Blower Control Panel:
  - a. Minimum 7" full touchscreen display.
  - b. Display of all measured parameters.
  - c. Display of warnings, faults, and maintenance.
  - d. Local/ Remote control input, machine control from start signal.
  - e. Automatic emergency shutdown in case of machine malfunction.
  - f. Process control connection via TCP.
  - g. Visualization of the measurements data via trend graphs.



## **SPECIAL SPECIFICATIONS**

### **Field Testing:**

1. After installation of all equipment has been completed and as soon as conditions permit, the manufacturer shall provide ONE (2) trip for a total of TWO (2) 8-hour days to verify the installation and conduct an acceptance test under actual operating conditions.
  - a. The Manufacturer shall perform a physical check of the blower installation, perform safety checks, power up the equipment and perform functional testing.
  - b. The functional test shall consist of 4 hours of operation of each blower with vibration, temperature, and pressure readings as well as motor amp readings taken and recorded at 60-minute intervals.
  - c. The Manufacturer shall provide operations and maintenance training to the plant personnel. The training shall consist of 1 hour of classroom training using the Operation and Maintenance Manual for reference and 2 hours of hands-on training at the blower package.
2. Manufacturer shall provide a written field test/start up report after completion of testing.