

MULTISTAGE CENTRIFUGAL BLOWER

PART1 – GENERAL

1.1 SCOPE OF WORK

- A. This specification covers the supply of multistage centrifugal air blower(s) systems to be used to provide air scour during backwash of the filters. The principal items to be furnished shall include:
 - 1. XXX (X) multistage centrifugal blower(s)
 - 2. Electric motor drivers.
 - 3. All accessory items and blower control panels as described herein and as shown on the plans, which are required for proper operation of the centrifugal blower(s).

1.2 SUBMITTALS

- A. Drawings and Documentation
 - 1. Three (3) sets of submittals shall be provided including drawings, documentation and equipment catalog cut sheets indication the selection of size and model where appropriate. Submittals shall include all dimensions for blower and accessories such as filters, silencers, expansion joints, couplings, valves, and other equipment that would affect equipment package layout at installation. Submittals shall be in accordance with Section XXXX.
- B. Operation and Maintenance Manuals
 - 1. The blower manufacturer shall furnish up to six (6) copies of custom-made Operation & Maintenance manuals for all of the equipment specified. All manuals shall consist of Continental standard drawings, vendor drawings, and all applicable instructions for the proper installation and operation of the equipment.

1.3 WARRANTY

- A. The manufacturer shall warrant the products of its manufacture to be free from defects in material and/or workmanship under normal use and service for a period of one (1) year from date of operation. Motor, accessories, and other equipment not manufactured by the blower manufacturer shall be guaranteed by their own individual manufacturer's warranties. O&M Manuals for blowers shall be in accordance with Section XXXX.

PART 2 – PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. The equipment covered by this specification is intended to be standard equipment of proven reliability as manufactured by a reputable manufacturer having experience in the production of such equipment. The equipment furnished shall be designed, manufactured, and installed following the best practices and methods and shall operate properly when installed in accordance with the contract drawings and operated per manufacturer's recommendations.
- B. Each blower unit shall be of the multistage centrifugal type, as manufactured by Continental Blower, LLC. Or approved equal.

- C. The impellers shall be mounted on a single shaft supported on each end by ball bearings mounted in outboard bearing housings. The blower shall be built from parts cast in patterns from which previous units have been built and tested. The blower shall be of the manufacturer's standard design.

2.2 PERFORMANCE

- A. Each Centrifugal Blower shall be designed for a capacity of xxxx SCFM. Discharge pressure at the specified capacity shall be x.x PSIG, when operating at site conditions of xxx feet above mean sea level, and a temperature range of x ° F to xxx ° F, xx% relative humidity.

2.3 COMPONENTS

A. Blower Housings

1. The blower housings shall consist of vertically split cast iron or cast aluminum intermediate sections held securely between cast iron inlet and outlet heads with high strength steel tie rods. Two-piece fabricated construction with rope packing is not acceptable.
2. No contact shall be made between the shaft rotor and the housing, other than through the bearings. Where the blower shaft passes through the inlet and outlet heads, suitable carbon graphite ring seals shall be provided to prevent air leakage.
3. Inlet and outlet connections shall match ASA 125-pound drilling pattern.

B. Impellers

1. The impellers shall be high strength cast aluminum or fabricated composite aluminum construction. Impellers shall butt together directly or through one-piece metal spacers and be securely keyed to the blower shaft.
2. Impellers shall be individually statically balanced, then assembled to the shaft and the entire rotating element shall be dynamically balanced as an assembly. Blower shall be designed to operate at a maximum vibration level of 1.25 mils in the vertical plane when measured on the bearing housing.

C. Diffusers

1. Diffuser sections that receive air from the impeller and guide the air to the eye of the next impeller shall be provided. Diffusing vanes shall be provided and be an integral part of the intermediate section casting.

D. Baffle Rings

1. Units incorporating baffle rings at the inlet and intermediate sections shall be provided with one-piece stainless steel baffle rings, securely mounted to the head and sections either directly or through one-piece stainless steel mounting brackets.

E. Shaft

1. Blower shaft shall be fully ground high-grade carbon steel of sufficient diameter to operate at a minimum of 20% below first critical speed. Shaft speed shall not exceed 3600 RPM.

F. Bearings

1. Each blower shall be provided with two grease or oil lubricated anti-friction ball bearings.

2. Bearings shall be sized to provide a bearing life of minimum 10 years per AFBMA B-10 standards.

G. Bearing Housing

1. Bearings shall be mounted in cast iron outboard mounted bearing housings designed to isolate the bearings from blower temperature. Bearing housings shall be designed to allow removal and replacement of the bearings without dismantling the machine or disconnecting piping.

H. Flexible Coupling

1. The blower shall be connected to the motor through a suitable flexible coupling. The installing contractor shall check, and if necessary, adjust the coupling alignment in accordance with manufacturer's instructions. Each coupling shall be provided with a suitable coupling guard in compliance with OSHA standards.

I. Baseplate

1. Each blower and motor shall be mounted on a single full-length structural steel baseplate designed for resilient mounting on suitable vibration pads supplied by the blower manufacturer. Baseplate shall not be grouted or bolted to the concrete foundation.

J. Motor

1. Electric motors shall be constant speed, squirrel cage design in accordance with NEMA and IEEE standards. Motors shall be designed to operate at 3600 RPM on 3 phase, 60 cycle, 460-volt electrical supply. Motor shall have a 1.15 service factor and be sized to operate below motor nameplate rating at the specified capacity and design conditions. Motor enclosure shall be TEFC.

2.4 ACCESSORIES

- A. Reinforced flexible connectors shall be provided for both inlet and outlet piping.
- B. Wafer style lever operated butterfly valve designed for low pressure air throttling service shall be provided for mounting in the blower inlet piping.
- C. Wafer style check valve for low-pressure air service shall be provided for mounting in the blower discharge piping.
- D. Suitable inlet filter/silencer shall be provided. Filter element shall be cleanable and replaceable. Filter shall be sized for the specified flow. Filter efficiency shall be minimum 90% on 10-micron particles.
- E. Optional accessories: Surge/overload protection panel; Bearing temperature protection panel; Bearing vibration protection panel.

PART 3 - EXECUTION

3.1 TESTING

- A. Each blower shall be given a mechanical run test at the manufacturer's facility for a minimum of four hours. Blower bearing vibration and temperature shall be checked to ensure compliance with manufacturers standards.

- B. All tests shall conform to ASME Power Test Code and shall extend from surge to beyond rated design flow. ASME tests are not required for blowers built from parts cast in patterns from which previous units have been cast, built and tested.

3.2 INSTALLATION

- A. Blower shall be installed in accordance with manufacturer's recommendations. The installing contractor shall provide qualified personnel to check the coupling alignment and make any necessary adjustments. All piping and accessories shall be fully supported to prevent the transmission of excessive forces to the blower connections. Blower shall be installed on suitable resilient foundation pads supplied by the blower manufacturer.

END OF SECTION