



LYNN Engineered Systems

VACUUM PRIMING SYSTEM

PART 1 GENERAL

1.01 SCOPE

Furnish one duplex automatic vacuum priming system consisting of two vacuum pumps, control panel, and accessories all mounted on a horizontal receiver. Single point design shall require only one electrical and one mechanical connection for installation.

1.02 OPERATING CONDITIONS AND PERFORMANCE REQUIREMENTS

- A. Number of Vacuum Pumps: 2
- B. Volume: ____ ACFM (each)
- C. Design Vacuum: ____ in. Hg absolute
- D. Maximum Pump Speed: ____ RPM
- E. Pump Cycle Time: 10 minutes (a maximum of 6 start/stop/starts per hour per pump under actual load conditions).

1.03 SUBMITTALS

- A. **SHOP DRAWINGS & SYSTEM COMPONENTS:**
Contract specific system general arrangement and control schematic drawings for vacuum priming system, together with detailed specifications and data covering materials used, and component parts forming a part of the equipment furnished, shall be submitted for review in accordance with the procedures and requirements set forth in Division 1.
- B. **SERVICE MANUALS:**
Submit complete service manuals including copies of all drawings, description of operation, maintenance data and schedules, and replacement parts lists. Submit manuals in 3-ring binders including table of contents, and heavy duty tab section dividers.

1.04 QUALITY ASSURANCE

- A. **Standardization:** The entire vacuum priming system, including vacuum pumps, and all valves and appurtenances described herein are to be provided by a single vendor.
- B. **Source Quality:** Manufacturer to have a minimum of Ten years experience in the design and manufacture of automatic vacuum priming systems. Prior to shipment, all equipment to be tested at manufacturer's plant to demonstrate suitability of the equipment.



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PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Vacuum priming system shall be equal to model APD-____RV-____H Duplex Automatic Vacuum Priming system as manufactured by Lynn Engineered Systems or approved equal.

2.02 VACUUM PRIMING SYSTEM

- A. The vacuum pumps shall be mounted on the air receiver.
- B. Vacuum pumps shall be oil lubricated rotary vane shall have an open flow (@ 0" HgV) of no less than ____ SCFM, and an ultimate vacuum of 7.5 Torr (29.6" Hg gage). Each pump shall be direct coupled to a ____ HP, TEFC motor wired for operation on a 230/460V three phase power supply. Belt drives shall not be permitted.
- C. Vacuum pumps shall be constructed primarily of cast iron with ductile iron rotor and shaft. Each pump shall be equipped with three cast aluminum alloy vanes for maximum life. Multiple stages of liquid and aerosol oil separation shall be integral to the pump to ensure clean discharge air. An oil drain valve shall be piped to the edge of priming system for ease of maintenance. Maximum noise level of each pump shall be ____ dB(A) or less.
- D. Each pump assembly shall be supplied with the following equipment connected to the inlet: a 5-micron inlet filter; an inlet check valve; isolation valve; and a flexible connector shall be used between vacuum pumps and receiver tank for a vibration free attachment.

2.03 RECEIVER

The receiver shall have a capacity of ____ gallons and be designed in accordance with the latest edition of ASME Section XIII, Division 1 code for unfired pressure vessels. The receiver shall be horizontal and have two vacuum pumps mounted on top. It shall include the following equipment pre-piped and mounted: a sight gauge for visual inspection of water accumulation within the receiver; a protective high water level switch to shut down the system and provide an alarm during a high water condition; a liquid filled vacuum gauge with gauge valve to monitor system vacuum level; a vacuum relief valve to limit tank vacuum; a vent valve to facilitate draining; a manual drain valve for draining accumulated water and condensation; separate vacuum pump isolation ball valves; an inlet ball valve to isolate the priming system from the process vacuum line; and field adjustable vacuum switches for automatic operation of system between preset vacuum levels. The receiver shall have supports for permanently anchoring to the floor.



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2.04 CONTROLS

Automatic controls shall be housed in a NEMA 4/12 enclosure and shall include: two combination motor starters with thermal, magnetic and short-circuit protection; 120V control transformer; separate H-O-A control switches for manual or automatic pump operation; alternator and pump selector switch for alternating lead-lag operation or specified lead-lag pump operation; minimum run timers; individual pump run lights; low vacuum alarm; high-water alarm light with automatic shutdown; and a single thru-the-door disconnect. Form C dry contacts shall be provided for remote annunciation of alarm conditions.

Automatic controls shall be utilized for maintaining operating vacuum levels between the low vacuum and high vacuum set points, and to ensure optimum system operation and safety. Low vacuum alarm switch is to be provided to initiate start-up of lag vacuum pump and alarm of low vacuum status. Switch to be set to provide alarm indication prior to loss of prime to the connected system.

2.05 PRIMING VALVE

A separate priming valve shall be furnished at each centrifugal pump served by the priming system. Priming valves are to be constructed of cast iron with stainless steel internals with a 2" inlet and 1/2" vacuum connection. Priming valves shall be furnished with Nema-4X enclosed water level control switch with DPDT contacts for proof of prime interlock with centrifugal pump start-up and remote alarm annunciation, and a 2" NPT suction isolation and 1/2" NPT vacuum isolation ball valve..

2.06 CONSTRUCTION

All component valves and gauges shall be provided in brass or bronze construction. All interconnecting pipe and fittings shall be schedule 40 class 150 T304/304L stainless steel.

2.07 SHOP PAINTING

Receiver tank exterior is to be primed and finished with manufacturer's standard enamel coating. Vacuum pump and component equipment to furnished with manufacturer's standard finish.