

1. DRY ROTARY VANE PUMPS

A. QUADRUPLEX STACK MOUNTED VACUUM SYSTEMS

1. Furnish and install, where shown on the drawings a prefabricated Quadruplex stack mounted dry rotary vane vacuum system model_____ as manufactured by EMSE Corporation, Fairfield, NJ (1-800-935-EMSE).
2. The unit furnished shall be a standard catalog item of the supplier regularly engaged in the business of providing packaged systems for hospitals and laboratories and shall meet and exceed the requirements of NFPA 99.
3. The package shall include four oil-less rotary vane vacuum pumps and associated equipment, one vertical ASME tank and one Quadruplex control panel. The only field connections required will be system intake, exhaust and power connection at the control panel. All components shall be completely pre-piped and pre-wired to single-point service connections. All interconnecting piping and wiring shall be completed and operationally tested prior to shipment. Provide liquid tight conduit, fittings and junction boxes for all control and power wiring.
4. The vacuum pumps shall be of the oil-less continuous duty rotary vane air-cooled design, equipped with long life, high performance compound vanes, driven by 40 degree C rise, 3 phase, 60 cycle, ODP, NEMA C-Face, design B induction type motors.
5. Each vacuum pump shall be driven by a ____ HP, 3 phase, 60 cycle, _____ volt, 1750 RPM, TEFC NEMA C-face, foot mounted motor. Each pump shall have a capacity of ____SCFM at 19 "HG.
6. The system shall include the following accessories for each pump: inlet check valve, inlet isolation valve, vacuum control switch, integral inlet filter, exhaust muffler and vacuum relief valve. Provide flexible connectors on inlet and exhaust of each pump, exhaust tee with union, drip-leg with cock valve as well as copper tubing with shut-off cock for gauge and vacuum switches. The system shall include a 200 gallon vacuum storage tank of ASME construction. The tank shall be rated for full vacuum service and shall be equipped with a valved by-pass, vacuum gauge and manual tank drain. The inside of the tank shall be coated for rust protection with a two component coating which provides a hard, durable lining.
7. Provide vibration mounting per NFPA 99.
8. The system shall include a UL listed control panel in a NEMA 12 enclosure with the following accessories for each pump:

- a. Externally operable circuit breaker with door interlock, control circuit transformer with fused primary and secondary coils, H-O-A switch, magnetic starter with 3 leg overload protection, hour meter, motor running light and minimum run timer to prevent short cycle operation.
 - b. Provide the panel with a plug-in type programmable controller with removable terminals to allow quick and easy replacement in the field. The system should be designed to function even if the programmable controller fails. If one of the pumps is out of service the system control shall omit the pump from the alternating cycle, automatically alternating between the remaining pumps only. The system shall revert to normal alternation automatically when the condition is corrected. In addition to standard automatic alternation, the system shall be equipped with forced time alternation in the event that the pump is unable to satisfy the demand in 30 minutes. The system shall be equipped with a flashing light pump failure alarm/shutdown at any of the following conditions: motor overload tripped, main disconnect is off, blown fuse, control transformer failure, starter coil failure, H-O-A is off.
 - c. Provide audible and visual local alarm (complete with indicating lights and individual sets of auxiliary contacts wired to the terminal strip for remote alarm indication) for reserve vacuum pump in use. All control and alarm functions shall remain energized while any vacuum pump in the system remains electrically on-line. The lag vacuum pump shall be able to start automatically if the lead vacuum pump fails to operate.
9. The vacuum system shall be guaranteed in writing by the manufacturer for a period of 12 months from the date of start-up or 18 months from the date of shipment (whichever comes first) against defects in design, materials, or construction.
 10. The service of a factory trained representative shall be made available at the jobsite to check installation, start-up and instruct operating personnel in the proper operation and maintenance.