PART 1 - GENERAL REQUIREMENTS

1.01 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specifications Sections.

1. Product data for the following products:

a) Simulation vacuum pump

PART 2 - PRODUCTS AND MATERIALS

2.01 MANUFACTURERS

A. The manufacturer's products listed herein shall be approved by the Owner.

B. One manufacturer, unless otherwise specified herein or on the Drawings, shall supply the equipment, components, and devices as listed below. Refer to the Drawings for model numbers.

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Vacuum Pump Systems:

a) Allied Healthcare Products, Chemetron Div.
b) Amico Corp.
c) Beacon Medaes
d) Ohio Medical Corp., Squire-Cogswell Div.
e) Patton's Medical
f) Powerex

2.02 SIMULATION VACUUM PUMP:

A. General: Duplex, packaged, continuous on-demand type consisting of two mounted electric motor driven vacuum pumps, partial recirculation type, a single tank receiver, electrical control panel, inlet and discharge flexible stainless steel corrugated type connectors, vibration mounting pads, and system isolation valve. The components shall be factory assembled on a heavy duty steel base with interconnecting Type L copper tubing with brazed joints and wiring ready for single-point connections in the field. Unit shall be configured as shown on the Drawings and tested prior to shipment.

B. Pumps: Oil-less rotary, positive displacement, non-pulsating dry rotary vane type of cast iron construction with stainless steel rotor shaft supported by two external grease lubricated ball type bearings enclosed in packed stuffing boxes. Each pump

shall have self-lubricating carbon/graphite vanes, and shall be direct driven by a drip-proof, continuous duty, ball bearing, induction type motor.

C. Receiver: Vertical ASME stamped and certified for full vacuum constructed of galvanized steel with system isolation valve, sight glass, vacuum gauge, automatic drain, valved by-pass and system flexible connector

D. Accessories: Pump suction shall include inlet check valves, isolation valves, intake filter, and inlet flexible connector. Pump discharge shall include flexible connector.

E. Control Panel: Control panel shall be mounted on the vacuum pump package and shall include a duplex electrical control system NEMA 12 dustproof enclosure with main through door disconnect, individual disconnect switches with motor protection fuses, magnetic motor starters with thermal overload relays and thru door "Test-Off-Automatic" switches for each motor, high temperature switch, 120 volt control circuit transformers with fused primary and secondary, vacuum control switches, audible alarm with through door "Test-Off-Automatic" switch and automatic alternator to ally change the operating sequence of the vacuum pumps. Touchscreen operator interface for monitoring and adjustment of the programmable controller variables with vacuum pump running indicators, hour meter for each vacuum pump, audible and visual alarms for high system temperature and lag vacuum pump operating. Controls shall be arranged for termination of 1 incoming power feeder. Control panel shall have a unit short circuit current rating equal to or greater than the available short circuit current as indicated on the electrical drawings.

F. Refer to the Drawings for schedule of capacity, horsepower rating, receiver tank size, and additional information.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Install equipment, alarms, accessories, piping, valves and specialties in accordance with manufacturer's installation instructions.

3.02 CONNECTIONS

A. General: Install valves that are same size as the piping connecting the equipment.

B. Where piping to source equipment connections are dissimilar metals, install dielectric unions for joints 2" and smaller and install dielectric flanges for joints 2-1/2" and larger. Dielectric unions and flanges are specified in Division 22 Section "Basic Piping Materials and Methods." Provide unions or flanges downstream of shutoff valves. Provide unions or flanges upstream of shutoff valves for vacuum.

1. Install flexible pipe (tubing) connectors on vacuum tubing connections to vacuum pumps, and where indicated. Flexible tube connectors are specified in Division 22 Section “Basic Piping Material and Methods”.
2. Install thermometers on vacuum receiver tanks, and where indicated. Thermometers are specified in Division 22 Section "Meters and Gauges for Plumbing Piping."
3. Install pressure gauges vacuum receiver tanks and where indicated. Pressure gauges are specified in Division 22 Section "Meters and Gauges for Plumbing Piping."

C. Electrical wiring and connections are specified in Division 26 section “Common Work Results for Electrical”.

3.03 EQUIPMENT INSTALLATION:

A. General: Install vacuum pump per the manufacturer’s published recommendations. Install units plumb and level, firmly anchor to the locations indicated, and maintain manufacturer’s clearances.

B. Supports: Install packaged units on a 4” high concrete housekeeping pad, 4” larger than the outside dimension of the base. Mount units on concrete inertia bases.

C. Electrical wiring: Install devices furnished by the manufacturer, but, not specified to be factory installed. Furnish a copy of wiring diagram submittal to the Electrical Contractor. Verify that electrical wiring installation is in accordance with the manufacturer’s submittal requirements. Do not proceed with equipment start-up until wiring installation is acceptable to the equipment manufacturer’s representative.

D. Equipment Connections: Provide connections to the vacuum systems as indicated and comply with the equipment manufacturer’s instructions. Install valves that are same size as the piping connecting the equipment. Install tubing and piping adjacent to equipment to allow servicing and maintenance.

1. Vacuum Pump Exhaust: Comply with equipment manufacturer’s sizing requirements and clearance requirements.

E. Testing and Start-up: The equipment manufacturer’s representative shall conduct factory tests and inspect installation. The equipment manufacturer’s representative shall provide to the architect documentation that the equipment installation meets factory installation requirements, and that the equipment performance meets factory specifications.

F. Provide equipment pad and vibration isolation for each and vacuum pump, refer to Division 22 Section “Vibration Isolation for Plumbing Piping and Equipment”.

G. Provide equipment pad, concrete inertia base and vibration isolation for each vacuum pump, refer to Division 22 Section “Vibration Isolation for Plumbing Piping and Equipment”.

3.04 COMMISSIONING

A. Provide the services of a factory-authorized service representative to inspect system installation and to provide start-up service.

B. Operate and adjust operating and safety controls. Replace damaged and malfunctioning controls and equipment discovered by the service representative.

C. Checks before Start-up: Perform the following final checks before start-up:

1. Verify that specified tests of piping systems are complete.
2. Check that safety (pressure-relief) valves have correct setting.

3.05 DEMONSTRATION

A. Provide the services of a factory-authorized service representative to demonstrate system start-up and shut-down procedures, preventative maintenance and servicing procedures, and troubleshooting procedures. Review operating and maintenance information.

B. Provide 7-day written notice in advance of demonstration.