EMSE Lab Vacuum System

The EMSE Corporation lab vacuum system is a completely packaged NFPA 99 and NEC compliant assembly featuring the following: vacuum pumps, skid mounted layout, ASME receiver, U.L. listed control cabinet with HMI, and the accessories required to meet and exceed the current code requirements.

All components are piped and wired to single-point service connections. All interconnecting piping as well as wiring is complete and operationally tested prior to shipment. The only field connections are air intake, air discharge and power at the control panel. The lab vacuum system and its component parts undergo a complete electric and pneumatic test prior to shipment.

Dry Rotary Vane Vacuum Pumps

The lab vacuum pumps are continuous duty, high efficiency, oil-less, rotary vane, air-cooled. Each vacuum pump is driven by a 3 phase, 60 cycle, TEFC NEMA C-face motor. Each vacuum pump is supplied with an inlet check valve, inlet isolation valve, safety relief valve, 2-micron inlet filter, vacuum switch, high discharge temperature switch, inlet and discharge flexible connectors and a shut-off cock for gauge and vacuum switches.

Receiver

The system includes a vacuum receiver of ASME construction rated for 200PSI MWP. The tank is equipped with a vacuum gauge, three-way valved bypass and manual tank drain.

Control Panel

The system includes a UL listed control panel built in a NEMA 12 enclosure.

A plug-in type of programmable controller with removable terminals allows quick and easy replacement in the field. The system is designed to function even if the PLC fails. If one of the pumps is out of service the system control shall omit that pump from the alternating cycle, automatically alternating between the remaining pumps. The system shall revert to normal automatic alternation when the condition is corrected. The system is also supplied with minimum run timers, and equipped with forced time alternation in the event the pump is unable to satisfy the demand in 30 minutes.

The vacuum pumps are controlled via a vacuum transducer. Lead / Lag back-up vacuum switches are included in the event of PLC or transducer failure.

Local audible and visual alarms are provided per NFPA 99. The alarm includes an indicating light and horn. The audible alarm can be cancelled with the "Silence" button. The visual alarm remains energized until the problem is corrected. All control and alarm functions remain energized while any vacuum pump remains electrically on-line. Each alarm function includes dry contacts for connection to the master alarm panel.

The panel includes the additional following standard accessories for each pump:

- Externally operable circuit breakers with door interlocks
- Control circuit transformer with fused primary and secondary coils
- Lighted H-O-A switches
- Magnetic starter with 3 leg overload protection and reset switch
- Circuit breaker disconnects for each motor with external operators
- Full voltage motor starters with overload protection
- Vacuum switches are provided as a back-up to the vacuum transducer in the event of failure

Human Machine Interface (HMI)

Each control panel features a state of the art, 7" touchscreen HMI with easy navigation through several screens. This provides current statuses and performance to the user, aids with troubleshooting, and houses important information about the system.

The HMI navigates to the following standard screens:
- Main screen with runtime hours, system status, pump status(es), system vacuum level
- Alarm screen with current and past alarms
- Settings screen to see pump on and off, minimum run time, forced alternation time, and maintenance service reminder setpoints
- Service screen which includes the service reminder reset, spare parts requests, rotation tests, and maintenance mode
- Ethernet connectivity, email notifications, Modbus protocol, and BACnet gateway capabilities
- Data collection trending for key values such as vacuum level, motor amperage, and equipment states
- Information page with PDF readable tabs which include the O&M manual, wiring diagram, and spare parts

Optional Control Panel Accessories

- 65kVa SCCR control panel ratings
- Soft starter
- 24V control panel circuit
- VFD
- Basic control panel with relay logic, vacuum switch control
- Remote access system monitoring

Optional System Accessories

- Rust protection receiver lining
- Galvanized receiver
- Exhaust piping silencer
- Receiver gauge glass
- Bacteria inlet filter with flask

Please consult your EMSE representative for pricing and to see which optional add-ons are right for you. Custom requests will always be considered but not guaranteed to be fulfilled.

Warranty

The lab vacuum system is guaranteed by the manufacturer for a period of 30 months from date of shipment from the factory or 24 months from date of start-up, (whichever comes first) against defects in design, materials, or construction. Please see the signed submittal for further warranty details.

Dry Rotary Vane Pump Specifications

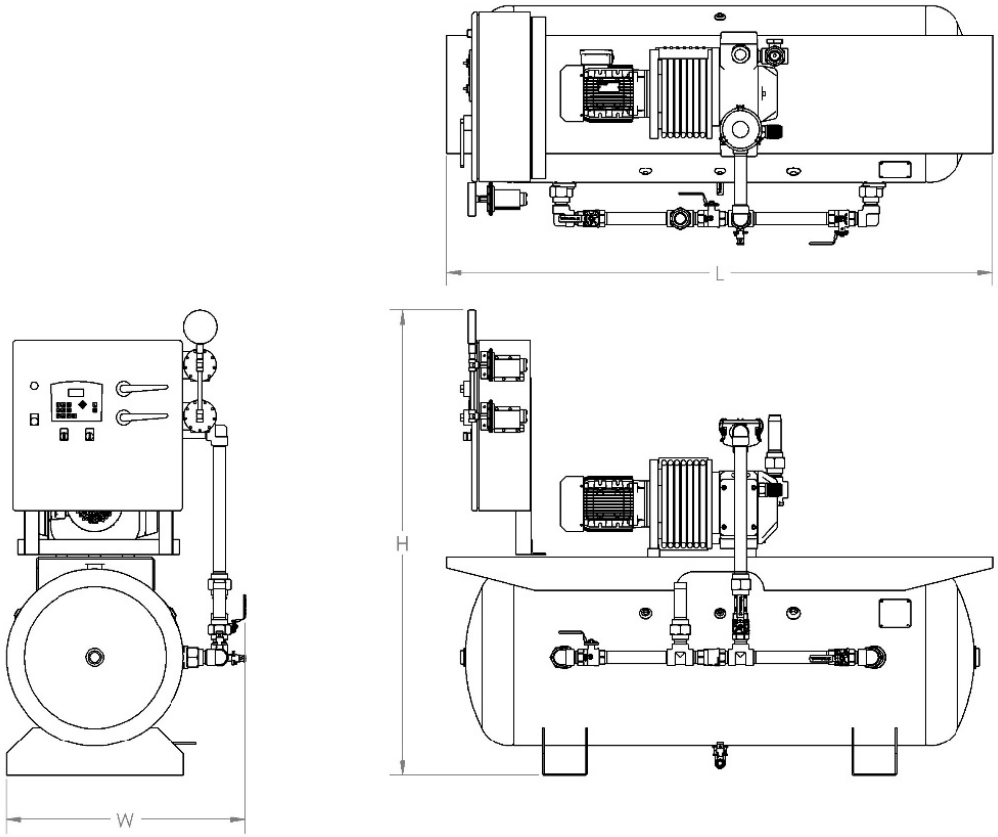
Pump Horsepower	Capacity (SCFM) @ 19"Hg		System Btu/hr	System dB(A) Level	System FLA			
	Pump	System			208V	230V	460V	380V (50 Hz)
Simplex								
1.5	6	6	3,818	66	4.3	4.1	2.4	2.6
2	10	10	5,090	70	7.8	7.5	3.4	4.0
3	14	14	7,635	76	9.4	8.7	4.3	4.9
4	16	16	10,180	77	13.7	13.3	6.6	6.3
5	21	21	12,725	78	16.4	15.8	7.9	8.5
5 [HC]	24	24	12,725	77	16.4	15.8	7.9	8.4
7.5	33	33	19,088	79	26.3	23.8	12.0	12.6
10	62	62	25,450	79	35.1	34.4	17.3	18.7
12	82	82	30,540	79	44.3	40.1	20.1	23.4
15	98	98	38,175	80	54.3	51.9	26.0	29.1

Notes:

- System capacity shown is with one pump in reserve, per NFPA 99
- All values assume 60Hz motors
- To convert free air capacity (SCFM) to expanded air capacity (ACFM) at 19”Hg, multiply SCFM by 2.74
- Maximum recommended ambient temperature: 95°F for standard systems

Model Dimensions

Simplex, Dry Rotary Vane Pumps, Horizontal Tank Mounted
1.5-5 Horsepower Pump, 30-120 Gallon Tank



System Model Number	Pump hp	System Inlet Connection	System Exhaust Connection	Tank (gal)	Dimensions (inches)			Weight (pounds)
					L	W	H	
2SDV1.5HT30	1.5	1"	3/4"	30	43	30	53	470
2SDV1.5HT80	1.5	1"	3/4"	80	68	30	58	610
2SDV2HT30	2	1"	3/4"	30	43	30	53	490
2SDV2HT60	2	1"	3/4"	60	53	30	58	570
2SDV2HT80	2	1"	3/4"	80	68	30	58	630
2SDV3HT30	3	1 1/4"	1 1/4"	30	43	30	53	590
2SDV3HT60	3	1 1/4"	1 1/4"	60	53	30	58	670
2SDV3HT80	3	1 1/4"	1 1/4"	80	68	30	58	720
2SDV4HT30	4	1 1/4"	1 1/4"	30	43	30	53	610
2SDV4HT60	4	1 1/4"	1 1/4"	60	53	30	58	700
2SDV4HT80	4	1 1/4"	1 1/4"	80	68	30	58	750
2SDV5HT80-HC	5 [HC]	1 1/2"	1 1/2"	80	68	30	58	780
2SDV5HT80	5	1 1/4"	1 1/4"	80	68	30	58	850
2SDV5HT120	5	1 1/4"	1 1/4"	120	72	30	62	1,040
2SDV5HT120-HC	5 [HC]	1 1/2"	1 1/2"	120	72	30	62	970

Notes:

- Dimensions are subject to change
- Allow 36" clearance in front of control panel and 24" clearance on all other sides
- Custom dimensions/models will be considered upon request, but not guaranteed
- Maximum recommended ambient temperature: 95°F for standard systems