

## Specification

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### General

The Powerex enclosed medical vacuum system is designed to create a suction to remove unwanted fluids or gases from hospital/laboratory working areas. The enclosed medical vacuum system package is compliant with the NFPA 99 requirements for Risk Category 1 systems. Each system is completely tested before shipment and includes:

- Multiple vacuum pumps and associated equipment.
- Sound reducing enclosure.
- AMSE air receiver.
- Medical control panel.
- Exhaust silencer(s).

Each pump is factory piped to a common intake manifold and exhaust manifold. Intake isolation valves are included. Each pump-motor assembly is isolation-mounted to the internal frame structure.

### Claw Vacuum Pump

Each pump shall be a rotary claw type vacuum pump, and shall be direct-driven through a shaft coupling by a C-face, TEFC electric motor.

- Each vacuum pump shall be dry-running, featuring two claw-type, non-contacting rotors and shall not require any sealing fluid in the pumping chamber, assuring virtually maintenance-free operation.
- Each vacuum pump assembly shall include an integral relief valve.
- Each pump within the system shall include a check valve, inlet and discharge flex connectors, a 5 micron inlet filter and a pump isolation valve on the intake connection.

### Motor

The motor is continuous duty, C-face, TEFC, suitable for 208-230, or 460V, 3 phase, 60 hertz electrical operation.

### Sound Reducing Enclosure

The system is constructed with an internal frame and steel base system with an individual vibration isolation mounted vacuum pump-motor module. The electrical controls are located in a NEMA 4/12 cabinet at the front of the unit and are accessed separately from the rest of the enclosure. Enclosure side and back panels are easily removed to perform routine maintenance and inspection. Internal cooling fans are guarded to minimize risk of injury during routine maintenance and inspection.

### Heat Management

The pumps shall be arranged in a vertical stack configuration so that each pump has its own individual bay that's isolated with sheet metal dividers. Heated air from the pump and motor will exhaust into the pump bay. Cooling air will enter each pump bay from the front/bottom of the system. An electric cooling fan shall be placed in each pump bay near the pump motor in an orientation that is perpendicular to the pump motor. Heated air will be forced out of each pump bay by the electric cooling fan through an integral duct

that connects each pump bay. The integral duct shall include baffling to further reduce the amount of noise that can escape. The heated air leaves the system through the top. The cooling system shall be properly sized and placed so that the vacuum pump motor is kept sufficiently cool under all expected operating conditions.

### Vacuum Receiver

The system shall include an ASME rated vacuum receiver. The tank shall be equipped with a vacuum gauge, a sight gauge, isolation valves, and a manual drain.

### Premium NFPA Control Panel

The control system provides automatic lead/lag sequencing and automatic alternation of all pumps in order to equalize the amount of usage among the available vacuum pumps. The Premium NFPA Control panel shall include a gateway server card and all features listed below:

- PLC controller and a color touch screen panel which displays the operating status of the unit
- Building automation communication gateway with BacNet® protocol and Web server features. Web server features include email notifications in case the system is in alarm or has achieved one its maintenance intervals and requires service.
- Ethernet port for connection to BacNet® server or direct connection to facility Ethernet for viewing of system operations and status via device IP-address
- UL508A listed control panel in a NEMA 12 enclosure. The panel door will include: the HMI touch screen, an audible and visual alarms with an acknowledge button, and an HOA switch for each pump
- Magnetic contactors with Motor protector circuit breaks featuring through-the-door operators with lockable control knobs. Motor protector circuit breakers feature high inrush capability.
- Vacuum transducer for process control
- Single point power connection
- Redundant 120Vac control transformers with fused primary and secondary protection
- System overload trip, high temperature conditions or maintenance intervals for the pump will result in visual and audible alarms.

### Optional VFD Control Panel

Variable Frequency Drive (VFD) control improves efficiency over a conventional "on/off" demand based system by more closely matching the pump speed to the changing load requirements. All VFD systems come standard with a Premium NFPA Control panel. The VFD and Premium NFPA Control Panel shall include a gateway server card and all features listed below:

- PLC controller and a color touch screen panel which displays the operating status of the unit
- Building automation communication gateway with BacNet® protocol and Web server features. Web server features include email notifications in case the system is in alarm or has achieved one its maintenance intervals and requires service.

- Ethernet port for connection to BacNet® server or direct connection to facility Ethernet for viewing of system operations and status via device IP-address
- UL508A listed control panel in a NEMA 12 enclosure. The panel door will include: the HMI touch screen, audible and visual alarms with an acknowledge button, VFD start/stop switch and an HOA switch for each pump
- Magnetic contactors with motor protector circuit breakers featuring through-the-door operators with lockable control knobs. Motor protector circuit breakers feature high inrush capability.
- Vacuum transducer for process control
- Single point power connection
- Redundant 120Vac control transformers with fused primary and secondary protection
- System overload trip, high temperature conditions or maintenance intervals for the pump will result in visual and audible alarms.

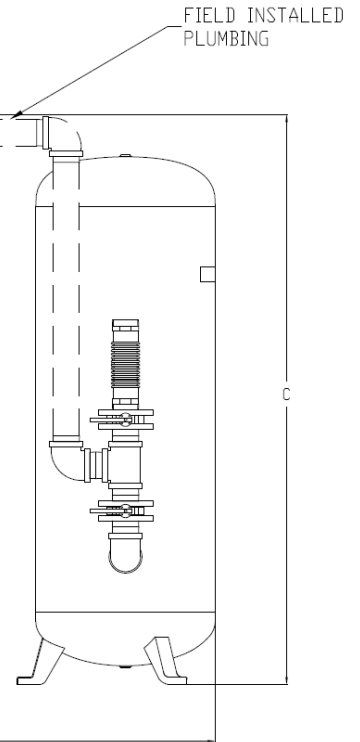
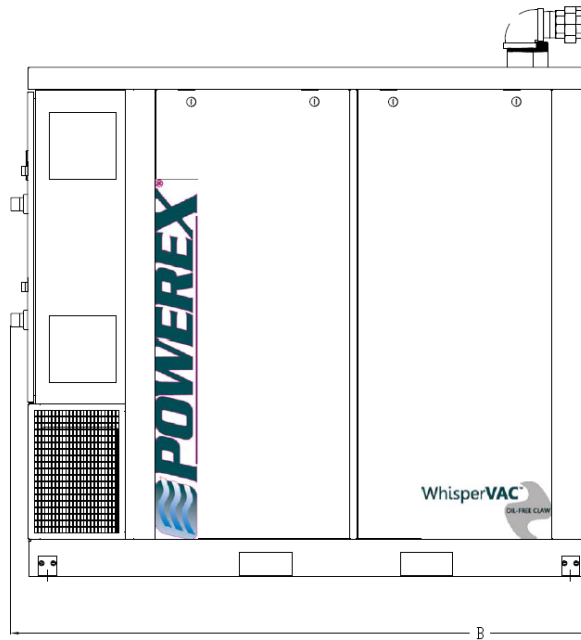
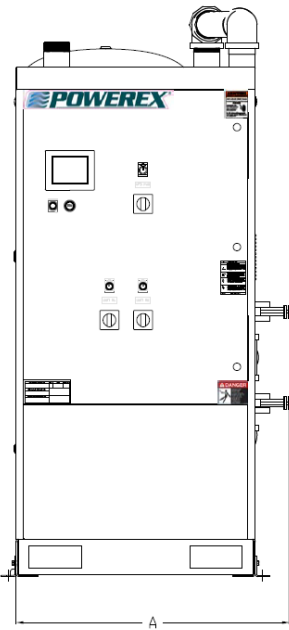
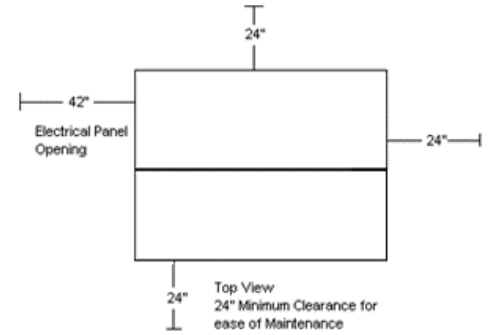
### Multiple Enclosures (Triplex through Hexaplex)

- Each Enclosure requires its own 3 phase electrical connection.
- The controls of multiple enclosures shall be based on Primary – Subordinate logic. The Primary enclosure shall include the HMI and the Primary PLC. The Primary PLC contains all logic to run the entire system.
- The Subordinate PLC contains the minimal amount of logic to respond to Primary PLC commands and operate independently in fail-safe mode.
- The only connection between Enclosures shall be an Ethernet cable.
- If inter-Enclosure connection is broken, each Enclosure shall operate independently. The Primary Enclosure will run the same as if it were connected and the Subordinate Enclosure will operate using a backup vacuum switch. Each PLC will attempt to reconnect multiple times per second. Once connection is re-established, the entire system shall operate normally.
- All Enclosed Vacuum systems shall be easily expandable to up to 6 pumps (2 pumps per Enclosure).
- VFD – a VFD controller shall be included with each Enclosure.

### Available Options

- Internal tank lining for corrosion resistance
- Variable Frequency Drive (VFD) Control Panel

Dimensions					
Model	Dim. A	Dim. B	Dim. C	Inlet	Outlet
MCED0504	34"	126"	75"	2"	2"
MCED0704	37"	126"	77"	3"	3"
MCED0754	37"	126"	77"	3"	3"

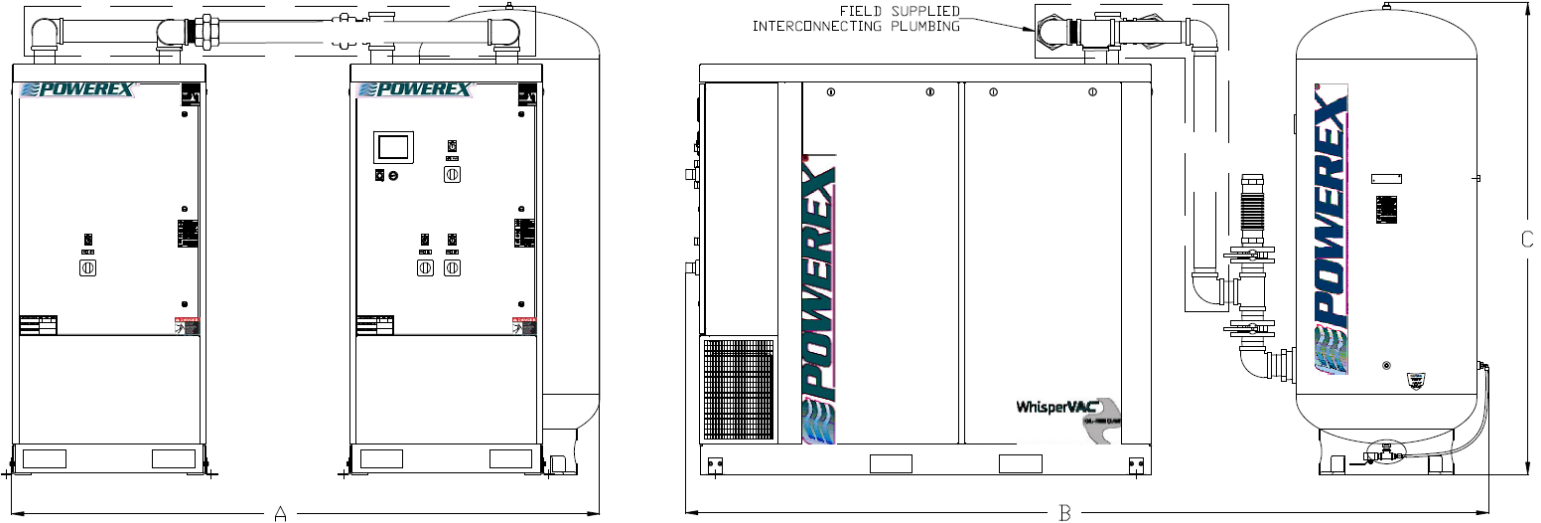
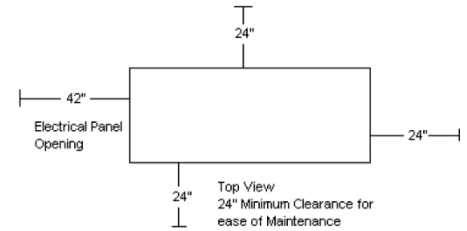


Medical Claw Enclosed Vacuum Systems										
Model <sup>3</sup>	Total System HP	Pump HP <sup>1</sup>	SCFM @ 19 Hg	Tank Size (gal)	BTU/Hr <sup>1</sup>	dB(A) Level <sup>2</sup>	System F.L.A.			System Weight (lbs)
							208V	230V	460V	
MCED0504	10	5 (2)	33	120	8,670	64	33.4	31.8	16.4	2,079
MCED0704	15	7.5 (2)	52.8	120	12,138	64	45.4	43.8	22.4	2,296
MCED0754	15	7.5 (2)	67.8	120	13,005	64	45.4	43.8	22.4	2,826

**Notes:**

- 1 – BTU/HR Levels are shown with reserve pump(s) on standby.
- 2 – dB(A) is shown with one pump in reserve per NFPA 99.
- 3 – 3 Year Limited Warranty

Dimensions					
Model	Dim. A <sup>1</sup>	Dim. B	Dim. C	Inlet <sup>2</sup>	Outlet <sup>2</sup>
MCET0505	98"	133"	78.5"	2"	2"
MCET0705	98"	133"	78.5"	3"	3"
MCET0755	98"	133"	78.5"	3"	3"

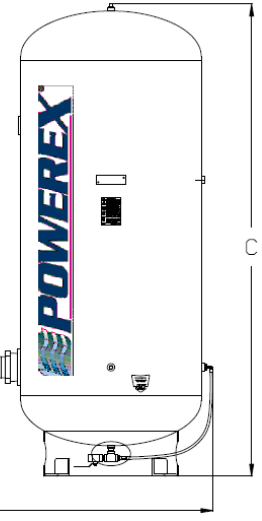
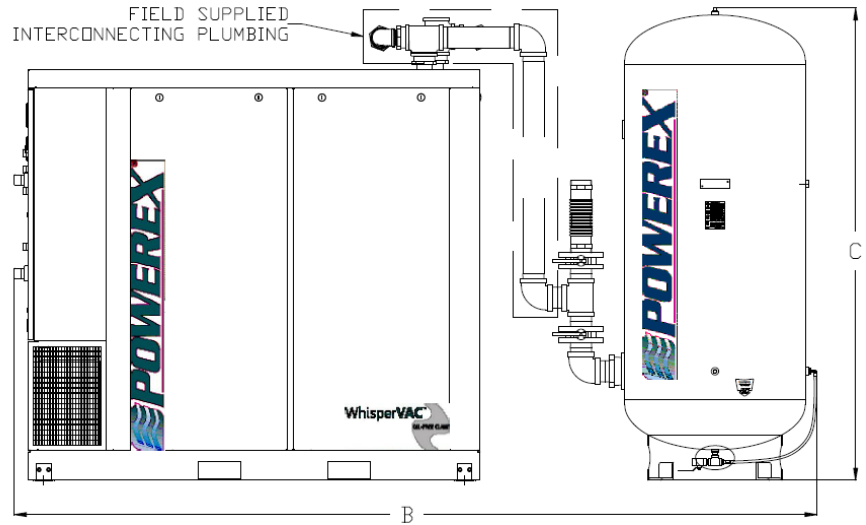
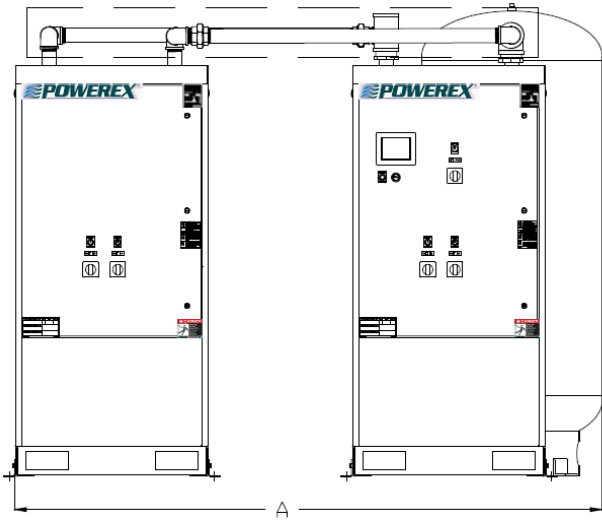
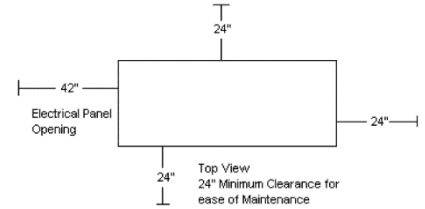


Medical Enclosed Claw Triplex										
Model	Total System HP	Pump HP	SCFM @ 19" Hg <sup>3</sup>	Tank Size (gal)	BTU/Hr <sup>3</sup>	dB(A) Level <sup>3</sup>	System F.L.A. <sup>4</sup>			Total System Weight (lbs)
							208V	230V	460V	
MCET0505	15	5	66	200	17,300	66	33.4(P) 16.7(S)	31.8(P) 15.9(S)	16.4(P) 8.2(S)	3435
MCET0705	22.5	7.5 (small)	106	200	24,300	66	45.4(P) 22.7(S)	43.8(P) 21.9(S)	22.4(P) 11.2(S)	3815
MCET0755	22.5	7.5 (big)	136	200	26,000	66	45.4(P) 22.7(S)	43.8(P) 21.9(S)	22.4(P) 11.2(S)	4560

Notes:

- 1 – Add 2" for extent of removable mounting bracket
- 2 – (m)NPT each enclosure
- 3 – SCFM, BTU/Hr levels, dB(A) levels shown with one or more pumps in reserve per NFPA 99.
- 4 – System F.L.A. values shown for one enclosure unit; each enclosure gets its own individual power feed.  
P = Primary Unit; S = Secondary Unit.
- 5 – 3 Year Limited Warranty

Dimensions					
Model	Dim. A <sup>1</sup>	Dim. B	Dim. C	Inlet <sup>2</sup>	Outlet <sup>2</sup>
MCEQ0505	98"	133"	78.5"	3"	3"
MCEQ0705	98"	133"	78.5"	3"	3"
MCEQ0755	98"	133"	78.5"	3"	3"

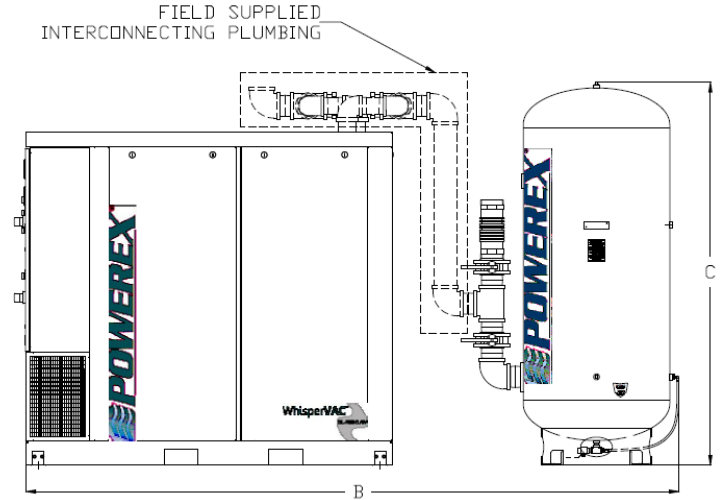
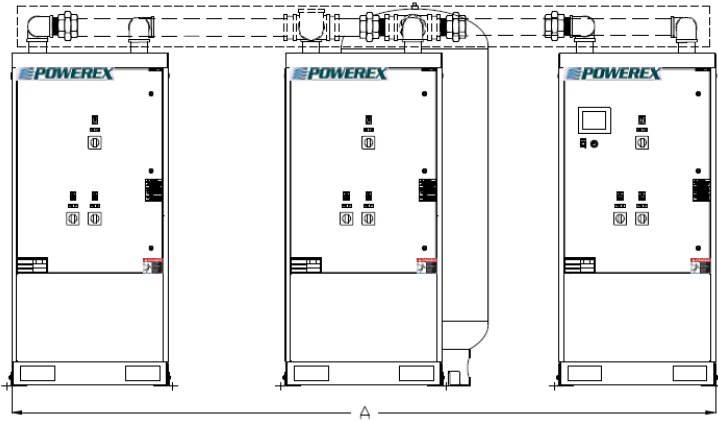
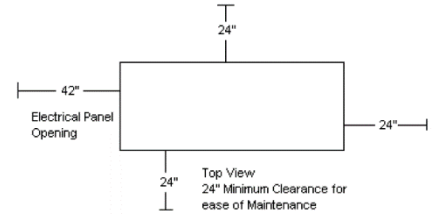


Medical Enclosed Claw Quadplex										
Model	Total System HP	Pump HP	SCFM @ 19" Hg <sup>3</sup>	Tank Size (gal)	BTU/Hr <sup>3</sup>	dB(A) Level <sup>3</sup>	System F.L.A. <sup>4</sup>			Total System Weight (lbs)
							208V	230V	460V	
MCEQ0505	20	5	99	200	26,000	68	33.4	31.8	16.4	4085
MCEQ0705	30	7.5 (small)	158	200	36,400	68	45.4	43.8	22.4	4505
MCEQ0755	30	7.5 (big)	203	200	39,000	68	45.4	43.8	22.4	5475

Notes:

- 1 – Add 2" for extent of removable mounting bracket
- 2 – (m)NPT each enclosure
- 3 – SCFM, BTU/Hr levels, dB(A) levels shown with one or more pumps in reserve per NFPA 99.
- 4 – System F.L.A. values shown for each enclosure unit; each enclosure gets its own individual power feed.
- 5 – 3 Year Limited Warranty

Dimensions					
Model	Dim. A <sup>1</sup>	Dim. B	Dim. C	Inlet <sup>2</sup>	Outlet <sup>2</sup>
MCEP0755	154"	133"	78.5"	3"	3"
MCEH0755	154"	133"	78.5"	3"	3"



Medical Enclosed Claw Pentaplex & Hexaplex										
Model	Total System HP	Pump HP	SCFM @ 19" Hg <sup>3</sup>	Tank Size (gal)	BTU/Hr <sup>3</sup>	dB(A) Level <sup>3</sup>	System F.L.A. <sup>4</sup>			Total System Weight (lbs)
							208V	230V	460V	
MCEP0755	37.5	7.5 (big)	272	200	52,000	69	45.4 (P, S1) 22.7 (S2)	43.8 (P, S1) 21.9 (S2)	22.4 (P, S1) 11.2 (S2)	8000
MCEH0755	45	7.5 (big)	340	200	65000	69	45.4	43.8	22.4	8000

**Notes:**

- 1 – Add 2" for extent of removable mounting bracket
- 2 – (m)NPT each enclosure
- 3 – SCFM, BTU/Hr levels, dB(A) levels shown with one or more pumps in reserve per NFPA 99.
- 4 – System F.L.A. values shown for one enclosure unit; each enclosure gets its own individual power feed.  
P = Primary Unit; S = Secondary Unit.
- 5 – 3 Year Limited Warranty