# Reciprocating Medical Air Compressor System

**Rev. 4/09/12**

## GENERAL

The Powerex Tank Mount Medical Air System is designed to provide medical breathing air for hospital and medical institutions. This system meets NFPA 99 requirements for Risk Category 1 systems. Each system is completely tested before shipment and includes:

- Multiple oil-less reciprocating air compressors and associated equipment
- Corrosion resistant air receiver
- Redundant medical desiccant air dryers with purge control
- Medical control panel
- Dew point and CO monitors

The only field connections required will be system intake, exhaust, and power connection at the control panel. All interconnecting piping, wiring, and vibration isolation pads are included with the system.

## OIL-LESS COMPRESSOR PUMP

Each compressor shall be belt-driven reciprocating, Single-Stage (1-3HP), Two-Stage (5-15 HP), single acting, air-cooled oil-less design with no oil needed for operation.

- Main bearings shall be permanently sealed and the wrist-pin bearings shall be lip sealed and field serviceable.
- Pistons shall be constructed of a heat rejecting composite graphite material with PTFE base resin rings. Piston rings shall have a minimum life of 10,000 run hours.
- Compressor design shall also include stainless steel valves with PTFE coated aluminum die-cast valve plates, precision bore die-cast anodized aluminum cylinders, and anodized inter-stage intercooler(s). Compressors shall utilize a dual cooling system which consists of a radial flow fan, and flywheel that are attached to the compressor pumps crankshaft. All 7.5, 10, and 15 HP model compressors shall have spring type vibration isolation mounts.
- Each compressor shall include a discharge check valve of brass construction, an ASME safety relief valve, intake and discharge flexible connectors, a solenoid valve discharge line unloader, an isolation valve, an air cooled aftercooler, a moisture separator with automatic drain, and a high discharge temperature shut down switch on each cylinder.

## MOTORS

Each compressor shall be belt driven by an ODP, NEMA construction motor. Belt guards that meet OSHA requirements shall be provided.

## AIR RECEIVER

The system shall include an ASME air receiver rated for 200 PSI MAWP. The tank shall be equipped with:

- A pressure gauge and a safety relief valve
- By-pass valves to allow tank isolation without system shutdown
- An automatic electronic tank drain with manual override

The receiver shall be internally lined with an FDA approved material for corrosion resistance.

## INTAKE FILTERS

Duplex systems of 5 HP or below have individual pump filters. Otherwise, the medical air system shall include a dual inlet filter system with one filter on-line and one filter in reserve to enable servicing of the filter elements without shutting down any of the air compressors units or disrupting service to the facility. The inlet filter system shall be located on the compressor package and plumbed up-stream of the compressor pumps.

## DESICCANT AIR DRYERS

Each desiccant dryer shall be sized for the peak calculated system demand to provide a pressure dew point to meet NFPA 99 standards.

- Dryer controls shall include a re-pressurization cycle to prevent shocking of the desiccant bed prior to switching towers.
- An integral purge saving control system shall be provided and shall suspend the purge air loss during periods of low demand. When the dryer is in purge control mode, the tower switching valves shall not operate, and only one desiccant bank shall be on-line. Dryers continue to operate the switching valves in the fixed cycle.

## FILTRATION AND PRESSURE REDUCING STATION

Each filter/dryer/regulator assembly shall be plumbed with bypass valves to enable service without disrupting air flow to the facility. Each assembly also includes a sample air port. The filtration systems consist of two stages of filtration.

- The first stage of filtration shall include dual pre-filters with element change indicators and automatic condensate drains, installed up-stream of the air dryers.
- The second stage shall include dual particulate filters with element change indicators installed downstream of the air dryers.
- A dual set of pressure reducing valves with pressure gauges shall be installed downstream of the final filters and shall be adjusted to an outlet pressure of 55 psig.

## STANDARD CONTROL SYSTEM

The control system provides automatic lead/lag sequencing and automatic alternation of all compressors in order to equalize the amount of usage among the available compressors. The control system shall include:

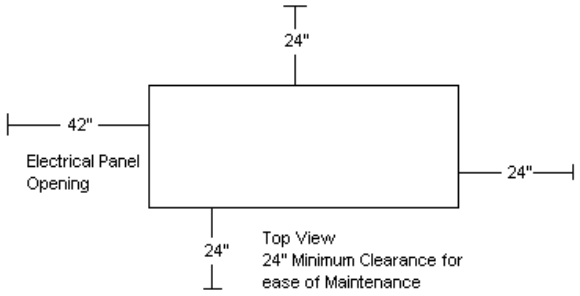
- UL508A listed control panel in a NEMA 12 enclosure with the following accessories for each pump: H-O-A switch, a magnetic starter with 3 leg overload protection, a high temperature shutdown with audible and visual alarm, an hour meter and a compressor run light. Standard features also include:
  - PLC controller or a timing alternator, a reserve compressor in-use alarm with visual and audible alarms, and redundant control circuit transformers with visual indication of a main transformer failure.
  - Dry contacts on a labeled terminal strip for remote

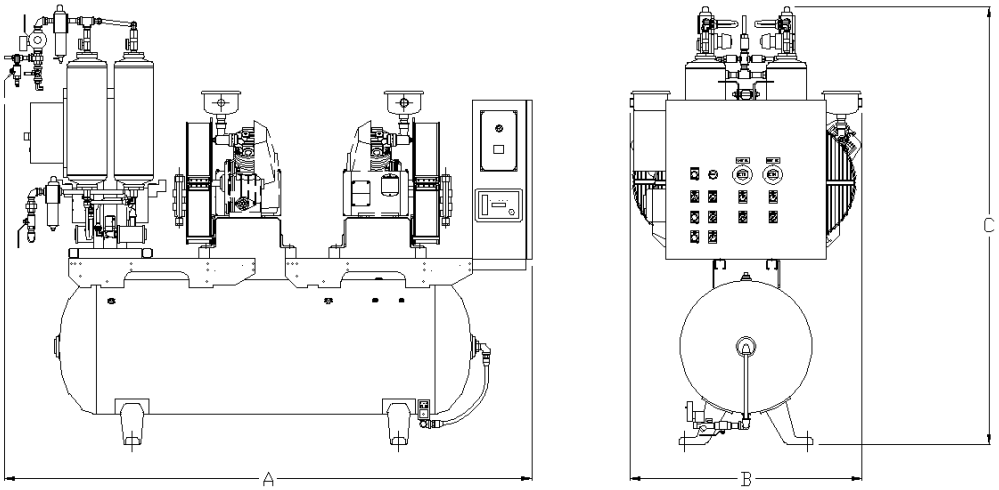
alarm monitoring and an acknowledge pushbutton for horn silencing.
  - Control logic to start the lag compressor automatically if the lead compressor fails to operate.
- Dew point monitor equipped with an LCD dew point display and high dew point alarm with dry contacts for remote monitoring. The dew point sensor (probe) shall be installed so that the monitored airflow is downstream of the pressure regulator assembly. The sensor shall include an auto calibration feature to ensure the accuracy of the dew point measurement without the need to return the sensor to the factory for calibration.
- Carbon monoxide (CO) monitor in an enclosure with LCD display of CO concentrations. The monitor shall continuously display the CO content of the discharge air and shall provide audible and visual high CO alarms. High alarm is set at 10 ppm per NFPA99. Dry contacts are provided for remote monitoring of the high CO alarm.

# Medical Tankmount Compressor 1-5HP

Rev. 2/6/12

| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| MODEL | DIM. A | DIM. B | DIM. C | Inlet | Outlet |
| MTD0103 | 64" | 29" | 61" | 3/4" | 1/2" |
| MTD0203 | 65" | 32" | 48" | 3/4" | 1/2" |
| MTD0303 | 67" | 32" | 48" | 3/4" | 1/2" |
| MTD0304 | 73" | 35" | 52" | 3/4" | 1/2" |
| MTD0504 | 73" | 36" | 56" | 1" | 1/2" |
| MTD0505 | 80" | 41" | 61" | 1" | 1/2" |




| Medical Tankmount Compressor | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MODEL | HP[1] | SCFM @ 100 PSIG[1,3] | NFPA System Capacity[1] | TANK SIZE | BTU/HR[2] | dB(A)[4] LEVEL | F.L.A./MOTOR* | | | SYSTEM WEIGHT |
| | | | | | | | 208V | 230V | 460V | |
| MTD0103 | 1 | 3.6 | 3.6 | 80 gal. | 2,546 | 71 | 4.6 | 4.2 | 2.1 | 710 |
| MTD0203 | 2 | 6.6 | 6.6 | 80 gal. | 5,092 | 71 | 7.5 | 6.8 | 3.4 | 750 |
| MTD0303 | 3 | 10.1 | 10.1 | 80 gal. | 7,638 | 71 | 10.6 | 9.6 | 4.8 | 775 |
| MTD0304 | 3 | 10.1 | 10.1 | 120 gal. | 7,638 | 71 | 10.6 | 9.6 | 4.8 | 825 |
| MTD0504 | 5 | 17.2 | 17.2 | 120 gal. | 12,730 | 75 | 16.7 | 15.2 | 7.6 | 930 |
| MTD0505 | 5 | 17.2 | 17.2 | 200 gal. | 12,730 | 75 | 16.7 | 15.2 | 7.6 | 1,050 |

Notes:

1- HP and System Capacity is shown with one or more compressors in reserve per NFPA 99

2 - BTU/HR Levels are shown with reserve compressor(s) on standby

3 - Powerex recommends using performance ratings in SCFM (Standard Cubic Feet per Minute) when sizing medical air systems.

4 - dB(A) is shown with one compressor in reserve per NFPA99

5 - 3 Year Limited Warranty

*NEC (National Electric Code) F.L.A./motor listed. Actual values are less than stated. If actual values are needed, please contact the factory.

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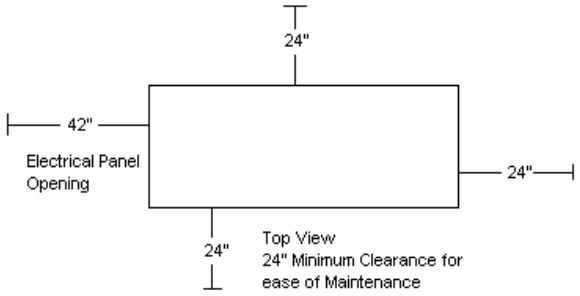
**Powerex - 150 Production Dr. - Harrison, OH 45030 - Phone: 888-769-7979 - Fax: 513-367-3125**

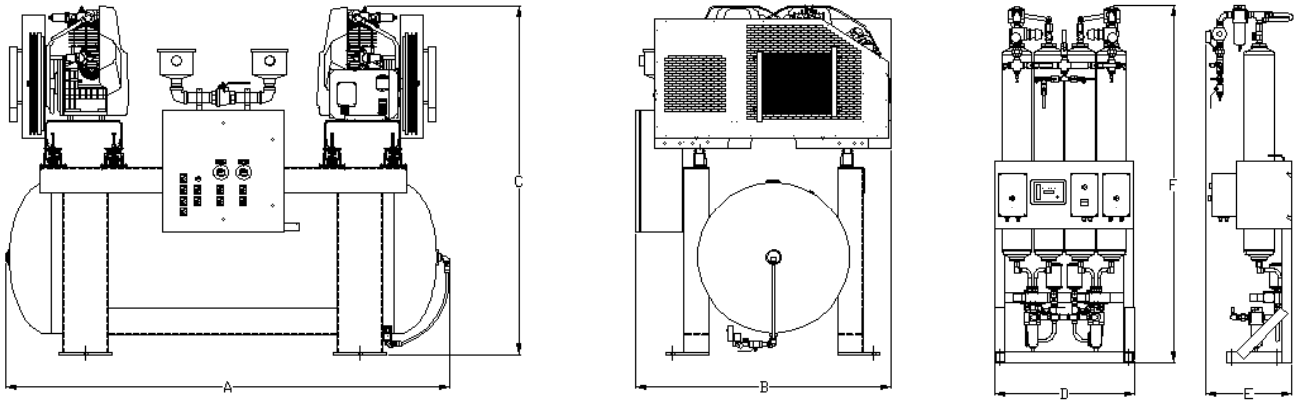
# Medical Tankmount Compressor 7.5-15 HP

Rev. 5/29/12

| SYSTEM DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| MODEL | DIM. A | DIM. B | DIM. C | Inlet | Outlet |
| MTD0756 | 87" | 51" | 69" | 1-1/2" | 1/2" |
| MTD1006 | 87" | 51" | 69" | 1-1/2" | 1/2" |
| MTD1506 | 87" | 51" | 69" | 1-1/2" | 3/4" |

| DRYER SKID DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| MODEL | DIM. D | DIM. E | DIM. F | Dryer Inlet | Dryer Outlet |
| MTD0756 | 29" | 18" | 65" | 1/2" | 3/4" |
| MTD1006 | 29" | 18" | 65" | 1/2" | 3/4" |
| MTD1506 | 29" | 18" | 73" | 3/4" | 1" |




| Medical Tankmount Compressor | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MODEL | HP[1] | SCFM @ 100 PSIG[1,3] | NFPA System Capacity[1] | TANK SIZE | BTU/HR[2] | dB(A)[4] LEVEL | F.L.A./MOTOR* | | | SYSTEM WT. (w/Dryer) |
| | | | | | | | 208V | 230V | 460V | |
| MTD0756 | 7.5 | 27.5 | 27.5 | 240 gal. | 19,095 | 76 | 24.2 | 22 | 11 | 1,675 |
| MTD1006 | 10 | 35 | 35 | 240 gal. | 25,460 | 77 | 30.8 | 28 | 14 | 1,825 |
| MTD1506 | 15 | 54.2 | 54.2 | 240 gal. | 38,190 | 80 | 46.2 | 42 | 21 | 1,925 |

Notes:

1- HP and System Capacity is shown with one or more compressors in reserve per NFPA 99

2 - BTU/HR Levels are shown with reserve compressor(s) on standby

3 - Powerex recommends using performance ratings in SCFM (Standard Cubic Feet per Minute) when sizing medical air systems.

4 - dB(A) is shown with one compressor in reserve per NFPA99

5 - 3 Year Limited Warranty

*NEC (National Electric Code) F.L.A./motor listed. Actual values are less than stated. If actual values are needed, please contact the factory.

**Dimensions and drawing shown with desiccant dryer package (on separate skid). For dimensions and drawing with refrigerated dryer package, please consult factory.

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**Powerex - 150 Production Dr. - Harrison, OH 45030 - Phone: 888-769-7979 - Fax: 513-367-3125**