

## Scroll Medical Air Package

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

### Description

The Powerex scroll medical air package is designed to provide medical breathing air for hospital and medical institutes. This system meets NFPA 99 requirements for Level 1 breathing air.

### Safety Guidelines

This manual contains information that is very important to know and understand. This information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols.

**⚠ DANGER** *Danger indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.*

**⚠ WARNING** *Warning indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.*

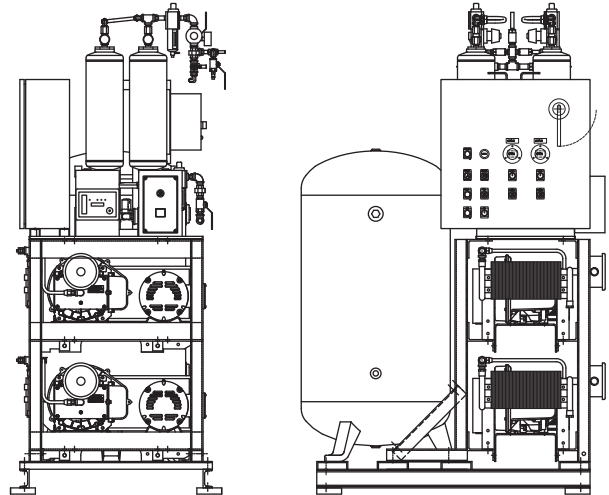
**⚠ CAUTION** *Caution indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.*

**NOTICE** *Notice indicates important information, that if not followed, may cause damage to equipment.*

### Unpacking

Immediately upon receipt of the system, inspect for any damage which may have occurred during shipment. Repair or replace damaged items before use. The name-plate should be checked to verify the correct model and voltage.

**⚠ WARNING** *Do not operate unit if damaged during shipping, handling or use. Damage may result in unsafe conditions and cause injury or property damage.*



### Specifications

Product	MS Series Powerex Multiplex Air Compressors
Performance Specifications	See Page 2
Lubrication	Grease-filled Bearing
Operating Voltages	3Ø 208-230 / 460 Volts, 60 Hz
Compression Cycle	Scroll
Motor Overload Protection	IEC Magnetic Starter
Maximum System Pressure	Standard: 116 psi High Pressure: 145 psi
Overpressure Protection	ASME Safety Valve Factory Set and Sealed
Outlet Air Connections	1/2 through 1-1/2 inch NPT
Tank Sizes	80, 120, 200 Gallon ASME Rated 200 psig
California Ordinance 462 (L) (2)	Meets Requirements of this Ordinance
Tank Isolation	Standard All Units
Drive	V Belt
Control Panel	UL508A Listed

## Specifications (Continued)

### Compressor Performance (per base mount)

HP	Air End	Discharge Pressure (PSIG)	Air Delivery (SCFM)	Motor Voltage	Dimensions In Inches (L x W x H)	Approximate Weight
3	SLAE03EB	95 - 115 (125 - 145 optional)	8.8 @ 100 PSIG 7.5 @ 145 PSIG	208 - 230/460	29 x 19 x 19	138 lbs.
5	SLAE05E		15.2 @ 100 PSIG			161 lbs.
	SLAE05EHP		12.5 @ 145 PSIG			161 lbs.

**NOTE:** For system electrical information, see wiring diagram shipped with unit.

## Installation

### ⚠ WARNING

**Disconnect, tag and lock out power source then release all pressure from the system before attempting to install, service, relocate or perform any maintenance.**



### ⚠ CAUTION

**Do not lift or move unit without appropriately rated equipment. Be sure the unit is securely attached to lifting device used. Do not lift unit by holding onto tubes or coolers. Do not use unit to lift other attached equipment.**

### ⚠ WARNING

**Warning indicates a potentially installation of inlet / outlet air plumbing from the compressor flange and electrical connection must be in accordance with National Fire Protection Association (NFPA99) Code Compliance for Medical Gas Breathing Air (Level 1).**

### INSTALLATION SITE

1. The oilless compressor must be located in a clean, well lit and **well ventilated** area.
2. The area should be free of excessive dust, toxic or flammable gases, moisture, water, and direct sunlight.
3. Never install the compressor where the surrounding temperature is higher than 104° F or where humidity is high.
4. Clearance must allow for safe, effective inspection and maintenance.

#### Minimum Clearances

Above	36 inches
Other sides	36 inches

5. If necessary, use metal shims or leveling pads to level the compressor. Never use wood to shim the compressor.

### VENTILATION

1. If the oilless compressor is located in a totally enclosed room, an exhaust fan and make up vent with access to outside air must be installed.
2. Never restrict the cooling fan exhaust air. Maintain a minimum of 3 feet of clearance around entire unit.
3. Never locate the compressor where hot exhaust air from other heat generating units may be pulled into the unit.

### WIRING

All electrical hook-ups must be performed by a qualified electrician. Installations must be in accordance with local and national electrical codes.

Use solderless terminals to connect the electric power source.

### PIPING

#### General Guidelines

Refer to the general product manual.

1. Make sure the piping is lined up without being strained or twisted when assembling the piping for the compressor.
2. Appropriate expansion loops or bends should be installed at the compressor to avoid stresses caused by changes in hot and cold conditions.
3. Piping supports should be anchored separately from the compressor to reduce noise and vibration.
4. Never use any piping smaller than the compressor outlet connection.
5. Use flexible hose to connect the outlet of the compressor to the piping so that the vibration of the compressor does not transfer to the piping.

#### Remote Intake Piping

Powerex Compressor Systems with pipe thread connectors on the intake filters are intended for installation with remote air intake. Piping for the remote intake system must be installed at the final operating site.

Under some conditions, the intake piping may facilitate the condensation of humidity in the intake air stream into liquid water.

### NOTICE

**The intake filters supplied by Powerex will not stop ingestion of liquid water by the pumps. Liquid water going into the pumps will damage the pumps and void the warranty.**

Always install drip legs with sufficient capacity to capture liquid water in the intake piping before the air filters. Drip legs must be sized with low enough air velocity to make sure they are effective at capturing liquid water in the intake air and must be maintained (drained) at frequent intervals to make sure they remain effective.

## Installation (Continued)

### SAFETY VALVES

Our tanks are shipped from the factory with safety valves installed in the tank. The flow capacity of the safety valve is equal to or greater than the capacity of the compressor system.

1. The pressure setting of the safety valve must be no higher than the maximum working pressure of the tank.
2. Safety valves should be placed ahead of any possible blockage point in the system, i.e. shutoff valve.
3. Avoid connecting the safety valve with any tubing or piping.
4. Manually operate the safety valve every six months to avoid sticking or freezing.

### MODULAR PLACEMENT

1. Unpack each module and discard all wood shipping materials.
2. Locate frame assembly fasteners provided in parts pack [includes: fasteners, isolation pads and inlet flex line].
3. Place modules at location designated. Provide sufficient clearance around unit for servicing (see minimum clearance section).
4. Install frame assembly fasteners to each frame joining the frames together.
5. Lift corners of each frame assembly and install isolation pads provided.

### CONNECTING PIPING

1. Locate connection for piping at rear of unit for compressors module to receiver tank module.
2. Remove plastic caps that protect piping against contamination.
3. Connect flex joint to frame securely making sure flex line is not pinched or kinked.
4. Follow steps 1 to 3 for flex line from dryer package to outlet of receiver tank.

**NOTE:** All piping is provided and sealed for this portion of installation.

5. Locate and attach intake inline air filter to outside source air or header. Flex line is provided when attaching intake of compressors to rigid piping.
6. Connect outlet source from filter package located on dryer module to outlet source piping.

### **⚠ WARNING**

**Attach all inlet and outlet source piping in accordance with NFPA 99 for Medical Gas.**

### ELECTRICAL WIRING OF UNIT SHIPPED IN SEPARATE MODULES

#### **⚠ CAUTION**

**Provide electrical power in accordance to NEC and local codes. Connection of wiring should be performed by a qualified electrician.**

1. Connect wiring and flex conduit provided from each motor junction box to correct hole in bottom of control panel and starter.
2. Connect each temperature switch from the compressors to contacts located in control panel as marked for each temperature switch. Temperature switches shutdown the compressor when temperature reaches above a pre-set limit (425°F for high pressure units; 450°F for standard pressure units). Connect dryer power cords, electric drain power cord, dew point and CO monitor power cords, and alarm wiring to the main control panel.

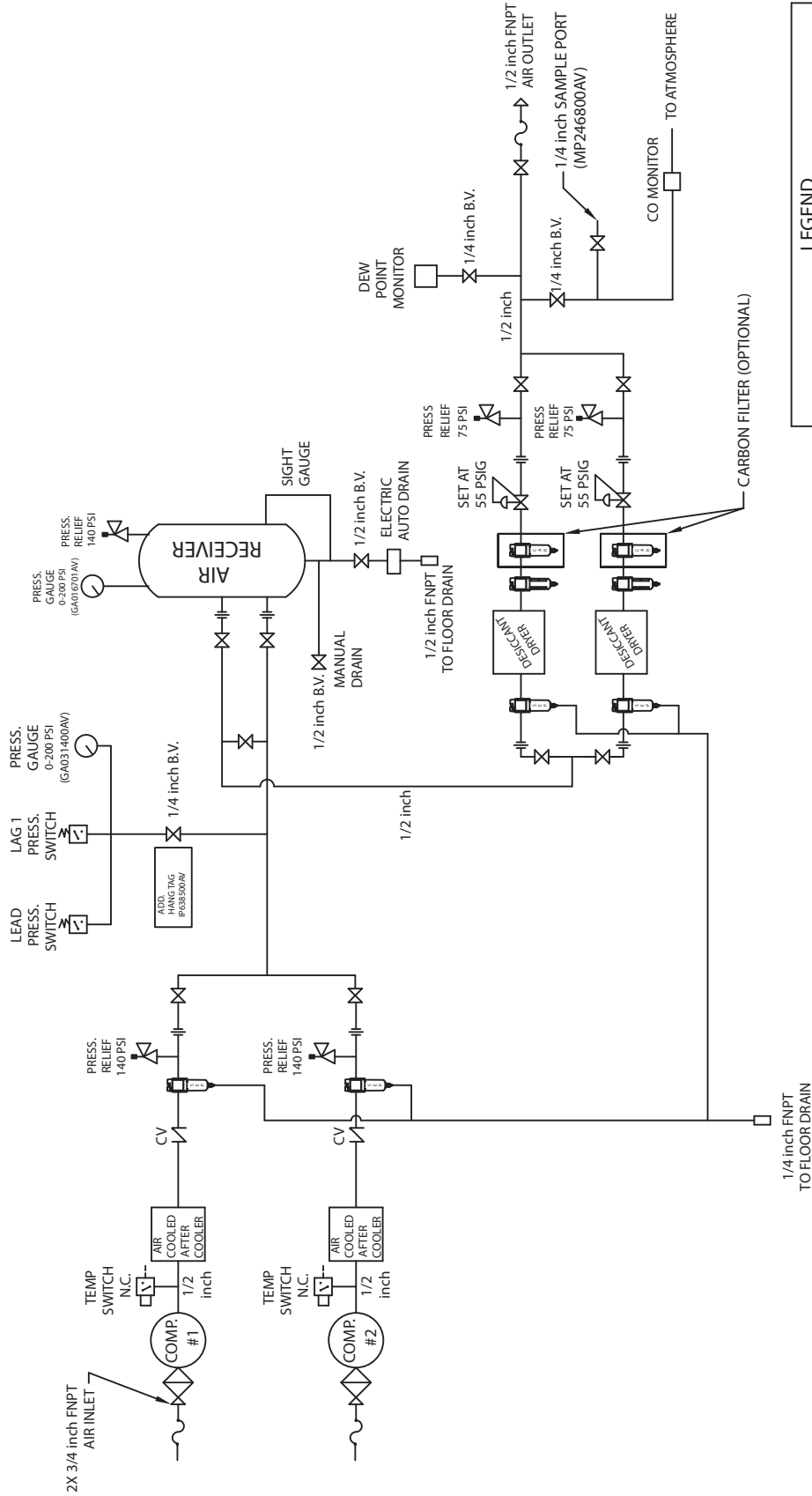
For questions concerning assembling and start-up, contact Powerex at 1-888-769-7979 for technical assistance.

## Operation

### BEFORE START UP

1. Make sure all safety warnings, labels and instructions have been read and understood before continuing.
2. Remove any shipping materials, brackets, etc.
3. Confirm that the electric power source and ground have been firmly connected.
4. Be sure all pressure connections are tight.
5. Check to be certain all safety relief valves, etc., are correctly installed.
6. Check that all fuses, circuit breakers, etc., are the proper size.
7. Make sure the inlet filter is properly installed.
8. Confirm that the drain valve is closed.
9. Once power is connected to unit, visually check the rotation of the compressor pump. If the rotation is incorrect, have a qualified electrician correct the motor wiring.

MEDICAL AIR SCHEMATIC (THIS IS A REPRESENTATIVE SCHEMATIC DIAGRAM FOR A LOW PRESSURE MULTIPLE SCROLL MEDICAL SYSTEM)



LEGEND	
	RELIEF VALVE
	REGULATOR
	PRESSURE SWITCH
	SEPARATOR
	AIR FILTER
	CARBON FILTER
	INTAKE FILTER
	3 WAY VALVE
	BALL VALVE
	CHECK VALVE
	FLEX LINE
	HIGH TEMP SWITCH
	UNION

- NOTES:
- 1) IF LAG 1 COMPRESSOR IS ENERGIZED ALARM WILL OCCUR.
  - 2) PIPING TO THE INLET BY OTHERS AND TO BE PER NFPA99 4-3.1.1.9(b)
  - 3) INSTRUMENTS DOWN STREAM OF SOURCE VALVE TO BE SUPPLIED BY OTHERS.
  - 4) THIS DRAWING COVERS PART#S -25, -35, AND -45.

**Maintenance Schedule**

<b>COMPRESSOR</b>		<b>Operating Hours</b>						
<b>Item</b>	<b>Action needed</b>	<b>500</b>	<b>2500</b>	<b>5000</b>	<b>10,000</b>	<b>15,000</b>	<b>20,000</b>	<b>Remarks</b>
Tank	Drain moisture	Daily						Verify proper drain operation
Inlet air filter	Replace	●		▲				Replace both at 5000 hours; alternate monthly
Blower fan	Clean			●	●	●	●	
Fan duct	Clean			●	●	●	●	
Compressor fins	Clean		●					Every 2500 hours or less
Bearings	Grease				▲		▲	Service Center ONLY
Bearings (145 psig scroll units)	Grease			▲	▲	▲	▲	Service Center ONLY; EVERY 5000 hours
Tip seal	Replace				▲		▲	
Tip seal (145 psig scroll units)	Replace			▲	▲	▲	▲	EVERY 5000 hours
Dust Seal	Replace				▲		▲	
V-belt	Inspect, Replace	Note 3	●	●	▲	●	▲	
Pressure switch	Confirm operation				●		●	
Magnetic starter	Inspect				●		●	Replace is contact point is deteriorated

<b>PIPING SYSTEM</b>		<b>Operating Hours</b>						
<b>Item</b>	<b>Action needed</b>	<b>500</b>	<b>2500</b>	<b>5000</b>	<b>10,000</b>	<b>15,000</b>	<b>20,000</b>	<b>Remarks</b>
Safety valve	Confirm operation		●					Every 2500 hours or less
Pressure gauge	Inspect		●					Every 2500 hours or less
Air leaks	Inspect		●		●		●	
Filter element	Replace		▲	▲	▲	▲	▲	
Moisture drain traps	Inspect	●		●		●		View delta pressure indication

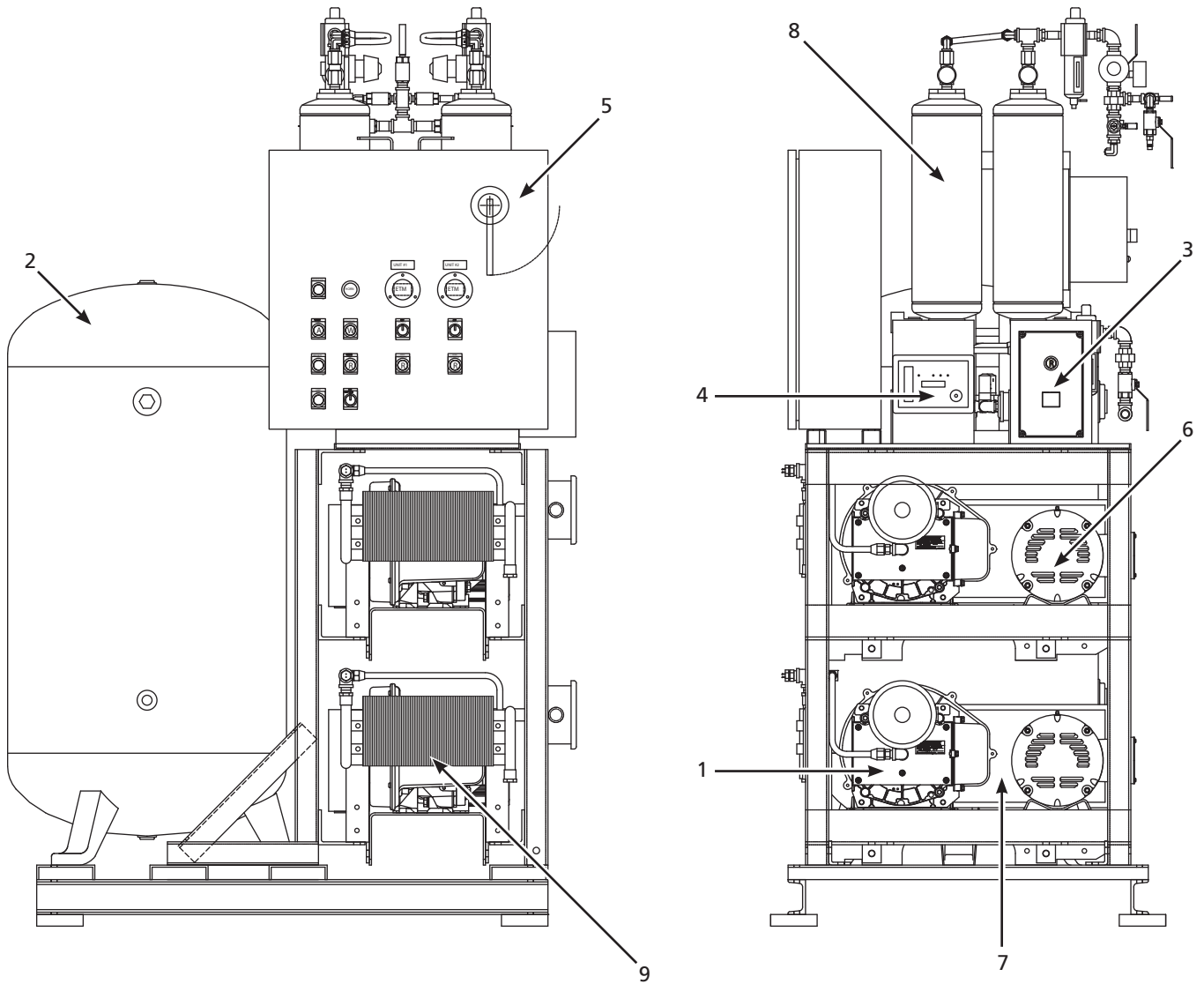
<b>AIR DRYERS</b>		<b>Operating Hours</b>						
<b>Item</b>	<b>Action needed</b>	<b>500</b>	<b>2500</b>	<b>5000</b>	<b>10,000</b>	<b>15,000</b>	<b>20,000</b>	<b>Remarks</b>
Suction pressure (refrigerated)	Inspect	●	●	●	●	●		
Heat exchange	Inspect	●	●	●	●	●		

- Inspect
- ▲ Replace

**Notes:**

1. Inspect and perform maintenance periodically according to maintenance schedule.
2. The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and do maintenance accordingly.
3. The tension of the V-belt should be adjusted during the initial stage and inspected every 1,500 hours afterwards. Proper belt tension should be 0.25 inch deflection when 6 pounds of force is applied on the center of the belt span.

# Replacement Parts Illustration



## Replacement Parts List

Ref. No.	Description	Part Number	Qty.
1	Scroll pump		
	2HP Scroll: MSD0203	SLAE03EB	2
	3HP Scroll: MSD0303, MTSD0303	SLAE03EB	2
	5HP Scroll: MSD0503, MST0503, MSQ0504, MSH0504, MSN0505, MSL0505, MTSD0503	SLAE05E	1 (per base mount)
	<i>For 145 psig Optional Units</i>		
	5HP Scroll	SLAE05EHP	1 (per base mount)
2	Vertical tank		
	80 Gallon	AR027300ST	1
	120 Gallon	AR027400ST	1
	200 Gallon	AR051201AJ	1
3	Dew point monitor / probe dessicant	PDPM1001AJ	1
4	Carbon monoxide monitor / sensor	ACO600105	1
5	Control panel (Consult factory for parts and availability. Call 1-888-769-7979)	--	1
6	Motor (ODP)		
	2HP Motor: MSD0203	MC303300AV	2
	3HP Motor: MSD0303, MTSD0303	MC303301AV	2
	5HP Motor: MSD0503, MST0503, MSQ0504, MSH0504, MSN0505, MSL0505, MTSD0503	MC303303AV	1 (per base mount)
7	Belt guard		
	Front (all models)	BG303900AV	1 (per base mount)
	Back (all models)	BG303800AV	1 (per base mount)
8	Dryer		
	MSD0203	PMD07T00AJ	2
	MSD0303, MTSD0303	PMD10T00AJ	2
	MSD0503, MTSD0503	PMD17T00AJ	2
	MST0503, MSD1004	PMD30000AJ	2
	MST1005	PMD55000AJ	2
	MST1505	PMD11100AJ	2
	MSQ1005	ACO20801AV	2
	MSQ0504, MSD1504	PMD45000AJ	2
	MSO0505	ACO3002AJ	2
	MSH0504	PMD71000AJ	2
	MSN0505, MSQ1505	ACO20802AV	2
	MSL0505	ACO20803AV	2
9	Aftercooler (not shown on all models)	SL300100AV	1 (per base mount)
▲	Pressure gauge	GA031400AV	1
▲	Pulley		
	2HP Motor: MSD0203	PU202606AV	2
	3HP Motor: MSD0303, MTSD0303	PU202625AV	2
	5HP Motor: MSD0503, MST0503, MSQ0504, MSH0504, MSN0504, MSL0505, MTSD0503	PU009754AV	1 (per base mount)
	<i>For 145 psig Optional Units</i>		
	3HP Motor	PU202624AV	1 (per base mount)
	5HP Motor	PU009754AV	1 (per base mount)
▲	Belt		
	2HP Motor: MSD0203	BT012001AV	4
	3HP Motor: MSD0303, MTSD0303	BT012001AV	4
	5HP Motor: MSD0503, MST0503, MSQ0504, MSH0504, MSN0504, MSL0505, MSD1004, MSD1505, MST1005, MST1505, MSQ1505, MSO0505, MSQ1005, MTSD0503	BT010701AV	1 (per base mount)
▲	Intake filter elements		
	MSD0203, MSD0303, MSD0503, MST0503, MTSD0303, MTSD0503	VP000508AV	2
	MSQ0504, MSH0504, MSD1004, MSD1504, MST1005	VP000509AV	2
	MSN0504, MST1505, MSQ1005, MSQ1505, MSL0505, MSO0505	VP000510AV	2
▲	Check valve	IP087700AV	1 (per base mount)
▲	Moisture separator	ST178507AV	1 (per base mount)

▲ = Not shown



### Powerex Limited Warranty

#### **Warranty and Remedies.**

**(a) General.** Powerex warrants each Compressor System, Vacuum System, Vacuum Pump, Compressor Air-End, or Powerex branded Accessory (collectively "Products", individually each a "Product") to be free from defects in material and workmanship ("Defects") at the date of shipment. EXCEPT AS SET FORTH BELOW, NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF SUCH PRODUCTS. TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. All claims under this warranty must be made in writing and delivered to Powerex, or such claim shall be barred. Upon timely receipt of a claim, Powerex shall inspect the Product claimed to have a Defect, and Powerex shall repair, or, at its option, replace, free of charge, any Product which it determines to have had a Defect at the time of shipment from Powerex; provided, however, that if circumstances are such as to preclude the remedying of Defect by repair or replacement, Powerex shall, upon return of the Product, refund to buyer any part of the purchase price of such Products paid to Powerex. Freight for returning Products to Powerex for inspection shall be paid by buyer. The warranties and remedies herein are the sole and exclusive remedy for any breach of warranty or for any other claim based on any Defect, or non-performance of the Products, whether based upon contract, warranty or negligence.

**b) Initial Period of Warranty – Parts and Labor.** Powerex warrants and represents all Products shall be free from Defects for the first twelve (12) months from the date of shipment by Powerex, or five thousand (5,000) hours of use, whichever occurs first. During such warranty period, Powerex shall be fully liable for all Defects in the Products (the "Product Defects"), i.e., all costs of repair or replacement, which may include "in and out" charges, so long as the Products are located in the continental United States, and the Products are reasonably located and accessible by service personnel for removal. "In and out" charges include the costs of removing a Product from buyer's equipment for repair or replacement.

**(c) Additional Period of Warranty – Parts Only (No Labor).** In addition to the above, Powerex warrants each Powerex branded Compressor Air-End, and Vacuum Pump shall be free of Defects for a period of thirty-six months from the date of shipment of Product, or 10,000 hours of use, whichever occurs first. Supplier's repair or replacement of any Product shall not extend the period of any warranty of any Product. This warranty applies to the exchange of part(s) found to be defective by an Authorized Powerex Service Center only.

**(d) Coverage.** The above mentioned warranty applies to Powerex manufactured units or systems only.

**(e) Exceptions.** Notwithstanding anything to the contrary herein, Powerex shall have no warranty obligations with respect to Products:

- (i) that have not been installed in accordance with Powerex's written specifications and instructions;
- (ii) that have not been maintained in accordance with Powerex's written instructions;
- (iii) that have been materially modified without the prior written approval of Powerex; or
- (iv) that experience failures resulting from operation, either intentional or otherwise, in excess of rated capacities or in an otherwise improper manner.

**(f)** The warranty provided herein shall not apply to: (i) any defects arising from corrosion, abrasion, use of insoluble lubricants, or negligent attendance to or faulty operation of the Products; (ii) ordinary wear and tear of the Products; or (iii) defects arising from abnormal conditions of temperature, dirt or corrosive matter; (iv) any OEM component which is shipped by Powerex with the original manufacturer's warranty, which shall be the sole applicable warranty for such component.

**Limitation of Liability.** TO THE EXTENT ALLOWABLE UNDER APPLICABLE LAW, NOTWITHSTANDING ANYTHING TO THE CONTRARY HEREIN, UNDER NO CIRCUMSTANCES SHALL POWEREX BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, PUNITIVE, SPECULATIVE OR INDIRECT LOSSES OR DAMAGES WHATSOEVER ARISING OUT OF OR IN ANY WAY RELATED TO ANY OF THE PRODUCTS OR GOODS SOLD OR AGREED TO BE SOLD BY POWEREX TO BUYER. TO THE EXTENT ALLOWABLE UNDER APPLICABLE LAW, POWEREX'S LIABILITY IN ALL EVENTS IS LIMITED TO, AND SHALL NOT EXCEED, THE PURCHASE PRICE PAID.

**Warranty Disclaimer.** Powerex has made a diligent effort to illustrate and describe the Products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the Products are merchantable, or fit for a particular purpose, or that the Products will necessarily conform to the illustrations or descriptions.

**Product Suitability.** Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of Products for certain purposes, which may vary from those in neighboring areas. While Powerex attempts to assure that its Products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a Product, please review the Product applications, and national and local codes and regulations, and be sure that the Product, installation, and use will comply with them.

**Claims.** Claims pertaining to the Products, with the exception of warranty claims, must be filed with Powerex within 6 months of the invoice date, or they will not be honored. Prices, discounts, and terms are subject to change without notice or as stipulated in specific Product quotations. All agreements are contingent upon strikes, accidents, or other causes beyond our control. All shipments are carefully inspected and counted before leaving the factory. Please inspect carefully any receipt of Products noting any discrepancy or damage on the carrier's freight bill at the time of delivery. Discrepancies or damage which obviously occurred in transit are the carrier's responsibility and related claims should be made promptly directly to the carrier. Returned Products will not be accepted without prior written authorization by Powerex and deductions from invoices for shortage or damage claims will not be allowed. **UNLESS OTHERWISE AGREED TO IN WRITING, THESE TERMS AND CONDITIONS WILL CONTROL IN ANY TRANSACTION WITH POWEREX** any different or conflicting terms as may appear on any order form now or later submitted by the buyer. All orders are subject to acceptance by Powerex.