

**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

#### General

The Powerex Oil-less Rotary Scroll Air Compressor has advanced scroll compressor technology through the development of a completely oil-less unit. The Powerex Scroll Compressor offers a dynamically balanced air end which insures vibration free operation. No oil separation, oil filtration, or inlet valves are required on the Powerex scroll unit.

#### Compression Cycle

The Powerex oil-less rotary scroll air compressor is based on the theory of scroll compression. A scroll is a free standing, intricate spiral bounded on one side by a solid, flat plane or base. A scroll set, the basic compression element of a scroll compressor, is made up of two identical spirals which form right and left hand parts. One of these scroll components is indexed or phased 180° with respect to the other so the scrolls can mesh. Crescent-shaped gas pockets are formed and bounded by the spirals and the base plate of both scrolls. As the moving scroll is orbited around the fixed scroll, the pockets formed by the meshed scrolls follow the spiral toward the center and diminish in size. The moving scroll is prevented from rotating during this process so the 180° phase relationship of the scrolls is maintained. The compressor's inlet is at the outer boundary of the scrolls. The compressed gas is discharged through the outlet at the center of the fixed scroll so no valves are needed.

#### Tip Seal

The tip seal on the scroll compressor is self-lubricated and allows the unit to operate efficiently without oil and expensive filtration.

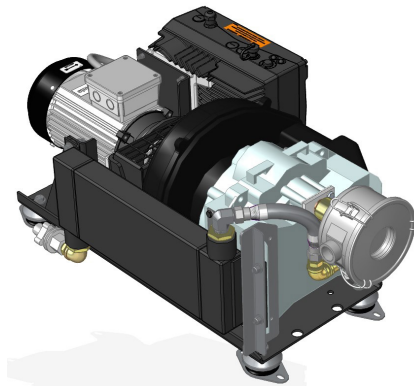
#### Bearings

The bearings on the scroll compressor are regreaseable to allow extended compressor life.

#### Intended Usage

This Powerex Oil-less Scroll set is intended for use as part of a system. The compressor set provides compressed air from the oil-less scroll pump when the electric motor is powered. The set includes the intake air filter, pump, motor, coupling assembly, appropriate safety guards, with the optional aftercooler, check valve, safety relief valve, and inter connecting piping and tubing. Do not operate if the components are missing and do not modify or remove any components without approval from Powerex.

The Powerex module may be supplied with an intake filter installed



PMAC Air Compressor shown with optional aftercooler assembly

on the pump or the set may be intended for piping to a remote filter. Always make sure that an inlet filter is in place and has a maximum filtration of 2 micron and that the inlet air system is not restricted.

**Operating the scroll pump with a restricted inlet will result in pump damage. Do not modify or remove the Powerex check valve or relief valve. The relief valve will open if the set is accidentally operated with an isolation valve closed.**

### Safety Guidelines

A SEPARATE SAFETY BOOKLET IS PROVIDED ALONG WITH THIS MANUAL. READ AND UNDERSTAND THE SAFETY BOOKLET. 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. MAKE SURE EVERYONE OPERATING OR SERVICING THE COMPRESSOR READS AND UNDERSTANDS ALL THE INFORMATION PROVIDED. The operator must install equipment in a safe location and is responsible for following all related local work safety requirements and regulations.

**⚠ 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.

**NOTE:** Note indicates information that requires special attention.

### **⚠ WARNING** Breathable Air Warning

This compressor/pump is NOT equipped and should NOT be used “as is” to supply breathing quality air. For any application of air for human consumption, you must fit the air compressor/pump with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet minimal specifications for Grade D breathing as described in Compressed Gas Association Commodity Specification G 7.1 - 1966, OSHA 29 CFR 1910. 134, ANSI and/or Canadian Standards Associations (CSA).

**DISCLAIMER OF WARRANTIES IN THE EVENT THE COMPRESSOR IS USED FOR THE PURPOSE OF BREATHING AIR APPLICATION AND PROPER IN-LINE SAFETY AND ALARM EQUIPMENT IS NOT SIMULTANEOUSLY USED, EXISTING WARRANTIES ARE VOIDED, AND POWEREX DISCLAIMS ANY LIABILITY WHATSOEVER FOR ANY LOSS, PERSONAL INJURY OR DAMAGE.**

## Components

### Oil-less Scroll Compressor Pumps

The Powerex scroll compressor offers a dynamically balanced air end which insures vibration-free operation. The rotary design permits a continuous 100% duty cycle. No oil separation, oil filtration, or inlet valves are required on the Powerex Scroll unit.

### Dry Type Inlet Filter

The 2 $\mu$  filter provides protection for the precision components within the compressor. This filter must be serviced at regular intervals to maintain compressor performance. See page 4 for the recommended maintenance schedule.

### Isolation Mounts

The basic unit is supplied with isolation mounts. The installer may substitute these mounts for a set of their own choosing. However, it is recommended that Powerex review these alternate isolation mounts that will be used in place of the supplied mounts.

### Permanent Magnet AC Motor

The permanent magnet motor is very compact and is more efficient compared with traditional induction motors.

### Inverter

The inverter accepts 500 to 750 Volts DC which and changes it into 3 Phase 350 Volt AC to power the electric motor. This inverter also provides data outputs which may interface with other systems via analog and digital signals.

#### Default outputs:

Analog:	Power Consumption	0 to 10 V or 0 to 20 mA
Fault Signal:	Normally Closed	24V
Fieldbus:	MODBus	

## Installation

### Unpacking & Receiving the Unit

Immediately upon receipt of the compressor system, the unit should be inspected for any damage which may have occurred in shipment. Any shipping damage must be immediately filed with the freight carrier. Repair or replace damaged items before use.

The compressor nameplate should be checked to see if the unit is the correct model and voltage as ordered.

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

### Application

When the scroll compressor is to be used in applications other than the compressing of atmospheric air, please contact a Powerex representative for engineering and warranty information at 1-888-769-7979.

### Installation Site

1. The scroll compressor must be located in an environment compliant with the compressor's intended use. If being installed in an alternate location, please obtain prior approval for change of location from Powerex.
2. The area should be free of excessive dust, toxic or flammable gases, moisture, water and direct sunlight.
3. Ambient temperatures of  $-35^{\circ}\text{F}$  to  $+104^{\circ}\text{F}$  are allowed. The upper range of  $+104^{\circ}\text{F}$  has a maximum on time of 4 minutes. This is to ensure proper operation and prevent overheating.
4. Ambient Relative Humidity below 96% is allowed. Condensation is not permitted.
5. Clearance must allow for safe, effective inspection and maintenance.
6. Systems supplied without an aftercooler require an approved check valve and safety valve to be installed downstream of the compressor's exhaust.
7. Air receiver(s) or alternate drive devices may be used to ensure that the motor manufacturer's recommended number of starts and stops are not exceeded. Please refer to manufacturer for details.

**NOTE:** Contact Powerex for evaluation of ambient conditions beyond the parameters above for special reduced duty cycle and product life requirements.

### Ventilation

1. If the scroll compressor system is located in an enclosed area, an exhaust fan or other means with access to outside air and make up air must be installed.
2. Never restrict the cooling fan exhaust air.
3. Never locate the compressor where hot exhaust air from other heat generating units may increase the compressor's operating temperature.

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

### Wiring

Use solderless terminals to connect the electric power source provided. Various electrical connections may be provided in accordance with customer requirements. Always ensure the connections are proper and that when installing the final connection that proper rotation of the compressor is witnessed.

### Piping

Connect compressed air pipeline to the outlet of the check valve. Do not modify check valve or replace with any other type. The scroll compressor does not require a discharge pressure release valve for shut down unloading. When the electric motor is de-energized, the compressed air in the outlet pipe and after cooler will self relieve by driving the pump in reverse a few turns. This is normal operation.

Do not modify or restrict the air flow to or from the after cooler without review by Powerex Engineering. Improper cooling could lead to damage of the scroll pump.

### Direct Coupled Models

The Powerex Scroll Compressor assembly is designed to accommodate a variety of mounting options by utilizing the main baseplate. Standard mounting uses rubber stud isolation mounts. Special models may vary.

## Operation

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### 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 and are the correct voltage for the motor.
4. Be sure all pressure connections are tight.
5. Check to be certain all safety relief valves, check valves, etc. are correctly installed.
6. Check that all fuses, circuit breakers, overloads, etc. are the proper size.
7. Make sure the inlet filter is properly installed.
8. Once power is connected to the unit, visually check the rotation of the compressor pump. If the rotation is incorrect, have a qualified electrician correct the motor wiring. Motor should turn counter clockwise looking at motor end of cooling fan.

**NOTICE** *If pump is running in the wrong direction, change the incoming power leads to correct rotation. Operation in reverse for more than a few seconds will damage the pump and is not covered under warranty.*

## Maintenance Schedule

Item	Action Needed	Operating Hours						Remarks
		500	2,500	5,000	10,000	15,000	20,000	
Inlet Air Filter	Inspect, Replace	●	▲					Replace every 2000 hours of operation or sooner
Blower Fan	Clean			●	●	●	●	Clean blades
Fan Duct	Clean			●	●	●	●	Clean duct
Compressor Fins	Clean		●					Every 2,000 hours or less
Bearings (116 psig Scroll Units)	Grease				●		●	Grease every 8,000 hrs. on 116 psig pumps
Bearings (145 psig Scroll Units)	Grease			●	●	●	●	Grease every 4,000 hrs. on 145 psig pumps
Tip Seal (116 psig Scroll Units)	Replace				▲		▲	Replace every 8,000 hrs. on 116 psig pumps
Tip Seal (145 psig Scroll Units)	Replace			▲	▲	▲	▲	Replace every 4,000 hrs. on 145 psig pumps
Check Valve	Replace						▲	
Heat Insulation Pipe	Replace			▲	▲		▲	Replace every 4,000 hrs. on 145 psig pumps
Pump/Coupling	Replace						▲	Replace

### LEGEND

- Inspect/Clean
- ▲ Replace

### NOTES:

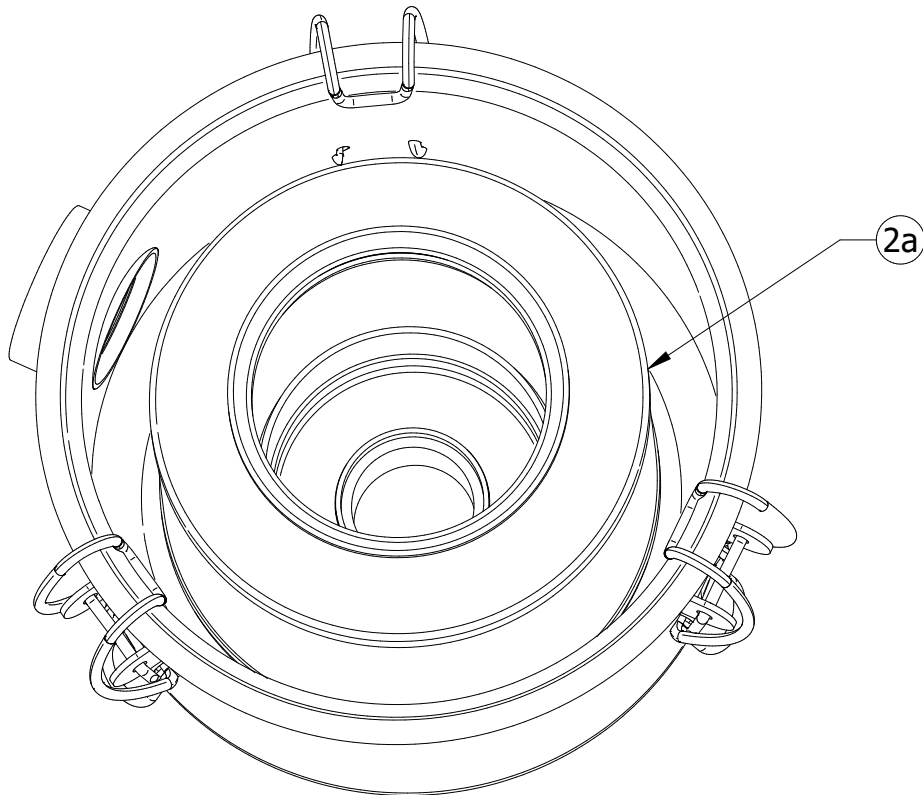
1. Inspect and perform maintenance periodically according to the maintenance schedule.
2. The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and perform maintenance accordingly.
3. Tip seals do not require early replacement, but must be done before or at 4,000 hours of run time for high pressure pumps. For standard pressure pumps (116 psig), maintenance must be done before or at 8,000 hours of run time. If the pumps reach 3 years and have not yet accumulated the minimum run hours mentioned above (4,000 hours for high pressure, 8,000 hours for standard pressure), perform the greasing operation for the bearings, with the amount of grease reduced by 25%.
4. Under adverse conditions, more frequent preventative maintenance may be beneficial. Consult Powerex for special arrangements.

For details of compressor pump service procedures, see scroll pump maintenance instruction manual.

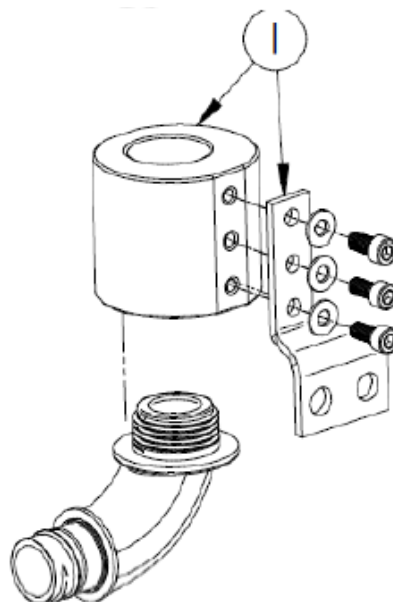
## Troubleshooting Guide

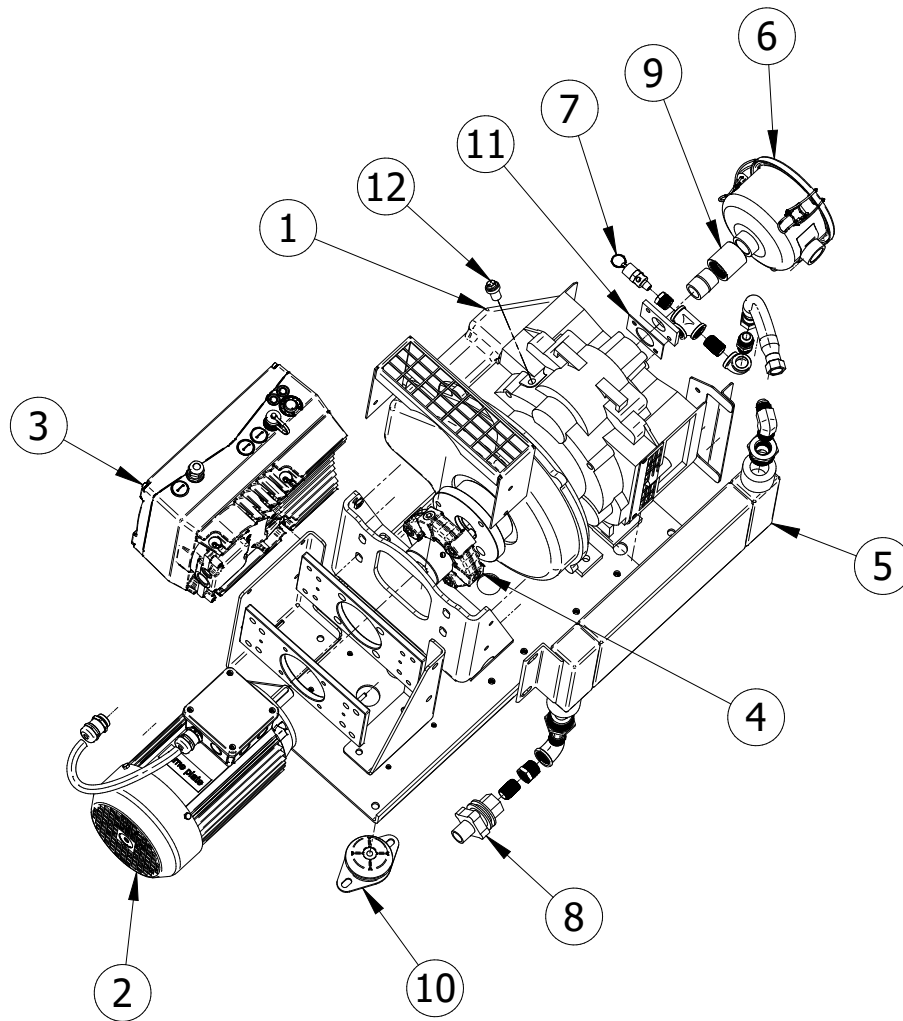
Problem	Corrective Action
Motor does not run, runs slowly or is excessively noisy	<ol style="list-style-type: none"> <li>1. Check wiring—make sure minimum voltage requirement is met and lead wires are connected properly. Correct as needed.</li> <li>2. Check to make sure motor is not overloaded. Remove coupling and determine if no-load operation of motor is correct. Check rotation of pump by hand. It should turn smoothly. If not, check for pump damage or obstruction in the pump.</li> </ol>
Pump is noisy or rough, or puts too much load on the motor	<ol style="list-style-type: none"> <li>1. If amp draw and vibration are normal, allow the pump to run for a few minutes and determine if noise diminishes and disappears. If not, contact Powerex at 1-888-769-7979.</li> <li>2. Check to make sure isolation valves are open. Open ASME safety relief valve at the after cooler. Stop unit and correct valve installation or setting.</li> <li>3. Check to make sure that the pump is open to intake air. If isolation valves are used on intake and are accidentally closed when pump is running, pump damage can occur. This is not covered under warranty. Powerex recommends using a three-way valve if isolation is desired so that no matter the valve position, a path to intake air is always open.</li> </ol>
Amp draw is high	<ol style="list-style-type: none"> <li>1. Check wiring—make sure voltage is within specified range and lead wires are connected properly. Correct as needed.</li> <li>2. Check to make sure motor is not overloaded. Check rotation of pump by hand. It should turn smoothly. If not, check for pump damage or obstruction in the pump.</li> </ol>
Excessive vibration	<ol style="list-style-type: none"> <li>1. Check for damage. If the motor shaft becomes bent due to shipping, the mass of the pulley will be off-center and generate vibrations. Replace the motor.</li> <li>2. If the pump is damaged, the fan may rub and cause noise. It is possible to replace just the fan. Contact Powerex at 1-888-769-7979 for instructions.</li> <li>3. Some variation in vibrations profile is normal.</li> </ol>
Pump rotates in reverse for more than a few seconds when power is off.	<ol style="list-style-type: none"> <li>1. Check valve is leaking, allowing compressed air to vent through the pump. If allowed to continue, pump damage may occur. Replace check valve.</li> <li>2. Do not use check valve other than Powerex original equipment.</li> </ol>

Ref #	Description	Part #
1	REMOTE MOUNT ASSEMBLY (OPTIONAL)	ST980210AJ
2	INTAKE FILTER ASSEMBLY	VP000501AV
2a	FILTER ELEMENT	VP000508AV



COVER REMOVED





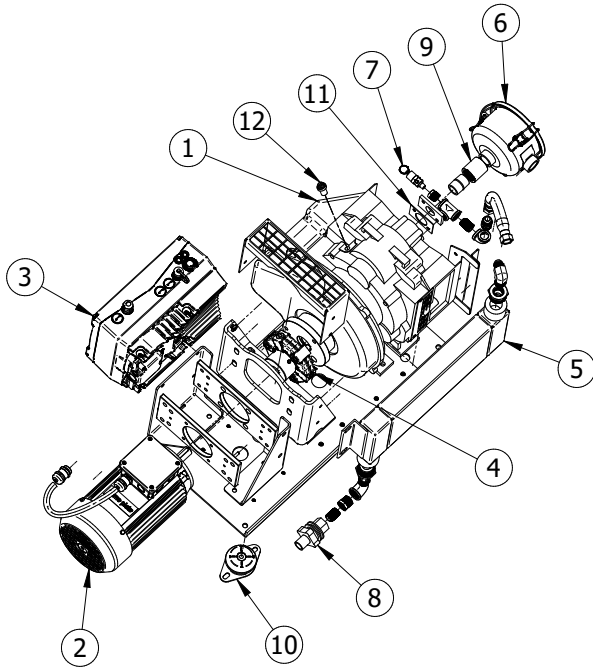
Ref #	Description	Part #
1	PUMP	
1a	5 HP High Pressure Pump (SLAE05EHP)	SDC016511AV
1b	5 HP Standard Pressure Pump (SLAE05E)	SL016502AV
2	PERMANENT MAGNET AC MOTOR	MC305000AV
3	INVERTER	N/A
4	COUPLING - PUMP TO MOTOR	SL500300AV
5	AFTERCOOLER	SL060000AV
6	INTAKE FILTER ASSEMBLY	VP000501AV
7	SAFETY VALVE	
7a	High Pressure Safety Valve, 165 PSIG	V-215900AV
7b	Standard Pressure Safety Valve, 140 PSIG	V-215400AV
8	CHECK VALVE	IP087700AV
9	COUPLING, 3/4" NPT, BRASS	ST071515AV
10	ISOLATOR FOOT MOUNT	IP639100AV
11	SCROLL ADAPTER PLATE GASKET	IP088200AV
12	WELLNUT ASSEMBLY	ST951005AJ

### Maintenance

**⚠ WARNING** Before performing service, lock out and tag any electric power source. Vent all air pressure from the system and lock out and tag any other air sources.

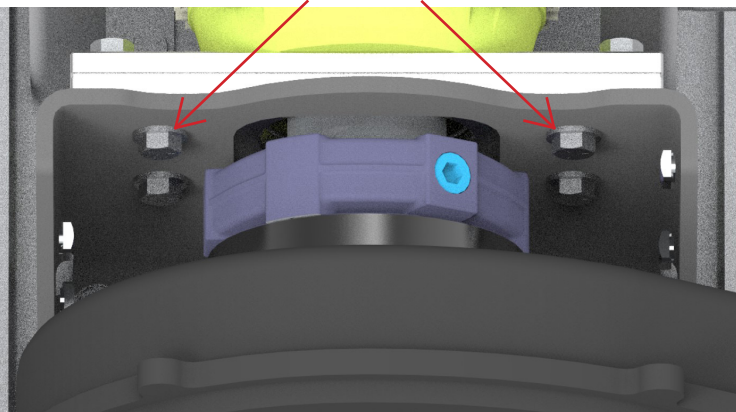
### Coupling Element Replacement

The coupling element is designed to last for the life of the scroll pump. If replacement does become necessary, remove the coupling guard to gain access to the coupling rubber element (4). The photo below shows the coupling guard separated from the assembly.

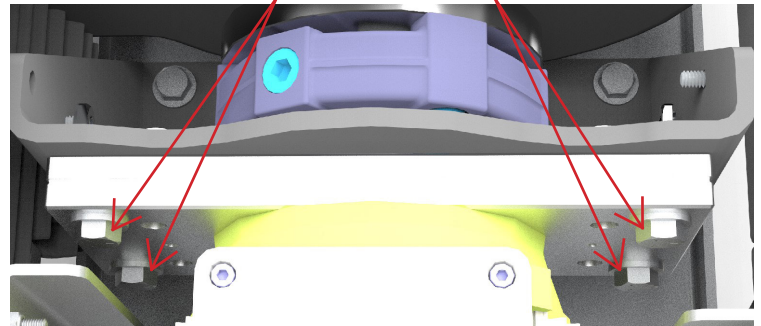


1. Loosen the screws that secure the coupling rubber element radially to the drive hubs.
2. DO NOT LOOSEN THE SETSCREW THAT SECURES THE DRIVE HUB TO THE MOTOR SHAFT.

**NOTICE** Do not loosen the hexagon screws that secure the motor adapter plate to the faceplate.



3. Loosen the hex head screws that hold motor adapter plate 1 to motor adapter plate 2 (see image below). The motor must be supported during this process to prevent damaging the assembly. Pull the motor straight back to disengage.



**NOTICE** Do not lose the 4 alignment pins installed in the two motor adapter plates. These pins are required to maintain alignment between the motor and the pump.

4. Now the axial bolts securing the rubber coupling element to the compressor drive hub can be removed. Do not remove or reposition the drive hubs. **Do not move or reposition the motor mounting plate.** Installation is the reverse of removal. Tightening torque for the bolts that secure the rubber coupling element to the hubs is 37 ft-lbs.
5. To install coupling insert, lightly lubricate the body and underside of the element securing bolts with light oil or a clean grease.



6. Insert the Powerex supplied screws with pre-applied Inbus Plus thread locker into the coupling element holes and tighten the element securing screws to 37 ft-lbs.

**NOTICE** Do not use liquid thread lockers or adhesives. Do not allow the element to become twisted while tightening.

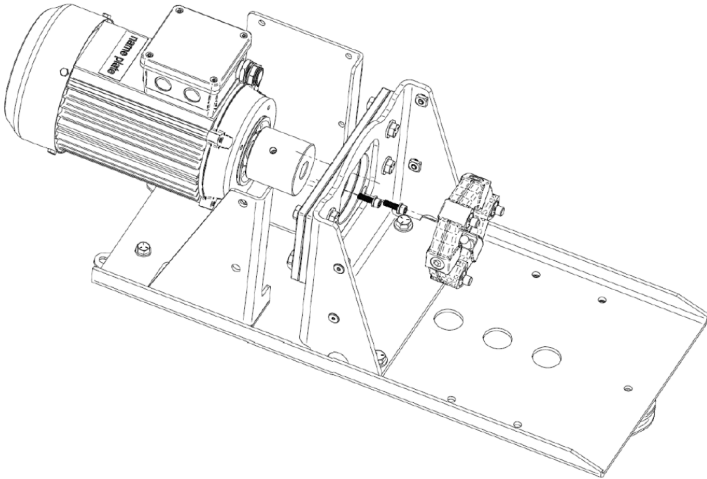


**Motor Replacement**

**NOTICE**

*Lock out and tag out electric power. Vent all air pressure from the system and lock out and tag.*

1. Remove the electric connections from the motor.
2. Remove coupling guard. Loosen the screws that secure the coupling rubber element radially to the drive hubs.



4. Remove motor adapter plate 1 from the motor by removing the 4 hex head screws that secure the motor to the adapter plate.
5. If the motor is being replaced, measure the position of the motor slide drive hub relative to the existing motor shaft. Loosen the setscrew and place the hub on the new motor and position the new hub in the same location on the new motor. Make sure the key is in place. Tighten the set screw to 7.5 ft-lbs with Blue 242 Loctite.
6. Installation is the reverse of removal. Be sure the key is in place on the motor shaft and that the 4 alignment pins are in place in the adapter plates.
7. Install and tighten the screws to secure the rubber element to the motor drive hub.
8. Replace the coupling guard.
9. Reconnect the electric power and verify proper rotation before running the compressor more than a few seconds.

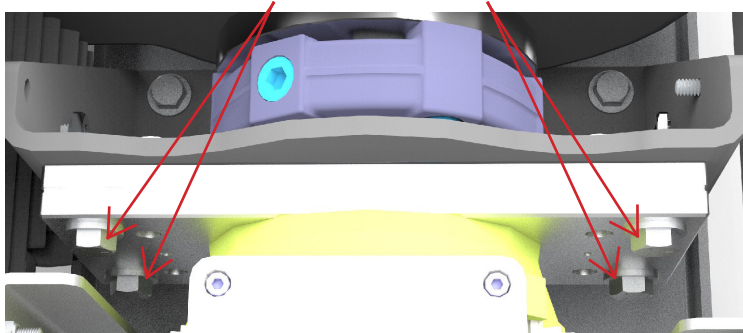
**NOTICE**

*Pump replacement is not feasible for technical reasons. If a pump experiences catastrophic failure or reaches the end of its useful life replace the complete compressor assembly.*

**NOTICE**

*DO NOT LOOSEN THE SET SCREW THAT SECURES THE DRIVE HUB TO THE MOTOR SHAFT.*

3. Loosen the hex head screws that hold motor adapter plate 1 to motor adapter plate 2 (see image below). Support the body of the motor so it can be pulled straight back. The drive coupling hub will come free with the motor.

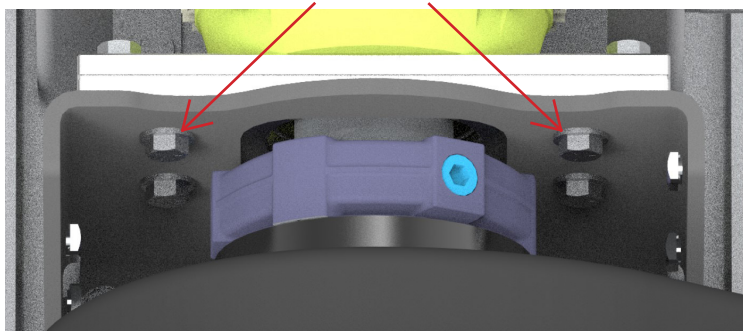


**NOTICE**

*Do not lose the 4 alignment pins installed in the two motor adapter plates. These pins are required to maintain alignment between the motor and the pump.*

**NOTICE**

*DO NOT LOOSEN THE HEXHEAD SCREW THAT SECURES THE ADAPTING PLATE TO THE FACEPLATE.*



Notes

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## Powerex Limited Warranty – Applicable to OEM Customer Only

### 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. This warranty shall apply only to Products that are purchased by Original Equipment Manufacturers (OEMs) and the applications for which are approved in advance in writing by Powerex’s Director of Engineering. If the applications for the Products are not approved in advance in writing by Powerex’s Director of Engineering then Powerex makes no warranties regarding the Products. 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 warranty claims must be made in writing and delivered to Powerex in accordance with the procedures set forth on its website ([www.powerexinc.com](http://www.powerexinc.com)), or such claim shall be barred. Upon timely receipt of a warranty claim, Powerex shall inspect the Product claimed to have a Defect, and Powerex shall replace any Product which it determines to have had a Defect; provided, however, that Powerex may elect, upon return of the Product, to refund to buyer any part of the purchase price of such Products paid to Powerex. In no circumstances will Powerex be required or obligated to pay for labor costs to repair any Defect. Freight for returning Products to Powerex for inspection or for shipping warranty parts shall be paid by buyer where permitted by applicable law. Powerex is not responsible for any import fees, taxes, duties, licenses or other fees imposed by any governmental authority upon the production, sale, shipment and/or use of Products covered hereunder. 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) (i) Standard Period of Warranty – Parts Only (No Labor).** The purchase of any system includes Powerex’s standard warranty. Powerex warrants and represents all Products shall be free from Defects for the first eighteen (18) months from the date of shipment by Powerex, or twelve (12) months from the documented date of startup, or five thousand (5,000) hours of use, whichever occurs first. During such warranty period, Powerex shall be liable for all Defects in the Products (the “Product Defects”). 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 Representative only.

**(ii) Premium Period of Warranty – Parts Only (No Labor).** In order to be eligible for premium warranty coverage, a premium warranty for each system must be purchased when order is placed. Powerex warrants and represents all Products shall be free from Defects for the first thirty (30) months from the date of shipment by Powerex, or twenty-four (24) months from the documented date of startup, or seven thousand five hundred (7,500) hours of use, whichever occurs first. During such warranty period, Powerex shall be liable for all Defects in the Products (the “Product Defects”). 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 Representative only.

**(c) Replacement Pumps – Parts Only (No Labor).** Parts Only (No Labor). For any replacement Air-End or Vacuum Pumps installed on a Powerex manufactured system or unit after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that the Air-End or Vacuum Pumps shall be free of Defects for a period of twelve (12) months from the date of shipment by Powerex or five thousand (5,000) hours of use, whichever comes first.

**(d) Replacement Motors – Parts Only (No Labor).** For any replacement motor installed on a Powerex manufactured system or unit after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that the replacement motor shall be free of Defects for the first twelve (12) months from the date of shipment by Powerex. For any replacement motor installed on a system or unit that was not manufactured by Powerex after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that the replacement motor shall be free of Defects for the first ninety (90) days from the date of shipment by Powerex. 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 Representative only.

**(e) Replacement Parts – Parts Only (No Labor).** For other replacement parts besides motors, Air-End or Vacuum Pumps installed on a Powerex manufactured system or unit after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that such replacement parts will be free from Defects for the first twelve (12) months from the date of shipment by Powerex. For other replacement parts besides motors, Air-End or Vacuum Pumps installed on a system or unit that was not manufactured by Powerex after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex makes no warranties. 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 Representative only.

**(f) Replacement Parts – Parts Only (No Labor).** For other replacement parts besides motors, Air-End or Vacuum Pumps installed on a Powerex manufactured system or unit after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that such replacement parts will be free from Defects for the first twelve (12) months from the date of shipment by Powerex. For other replacement parts besides motors, Air-End or Vacuum Pumps installed on a system or unit that was not manufactured by Powerex after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex makes no warranties. 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 Representative only.

**(g) Coverage.** The warranty provided herein applies to Powerex manufactured units or systems only.

**(h) 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.

**(i)** 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.** NOTWITHSTANDING ANYTHING TO THE CONTRARY HEREIN, TO THE EXTENT ALLOWABLE UNDER APPLICABLE LAW, 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 its literature, including its Price Book, 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.

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