



Enclosed Scroll Basemount Compressor Operating & Maintenance Manual

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 Oil-less 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 ensures 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.

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 from 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.

Specifications

Product	EBB
Performance	12.5 SCFM @ 145 psig - High Pressure 15.2 SCFM @ 115 psig - Standard
Compression Cycle	Scroll
Control Panel	Steel enclosure
Drive	Belt Driven
Lubrication	Grease filled bearings
Motor Overload Protection	IEC Motor overload relay
Operating Temperatures	-40 to 105°F (up to 140°F with limited duty cycles)
Operating Voltages	208-230 Volts, 60 Hz 24V DC Control Power required.
Overpressure Protection	ASME safety valve factory set and sealed
Pressure Settings	120-145 psig - High Pressure 95-115 psig - Standard
Enclosure	Powder coated corrosion resistant

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.

NOTE: Note indicates information that requires special attention.

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 μ 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.

Filter Change Indicator

This unit comes with a flow restriction indicator. As the air filter traps dust and debris, airflow through the filter will be reduced and the piston within the indicator will gradually make its way to the CHANGE FILTER position. Once this has happened, replace the air filter and press the yellow reset button on the indicator.

Isolation Mounts

Isolation mounts are supplied as standard equipment. The installer may substitute mounts of their own choosing. However, it is recommended that this substitution be reviewed with Powerex prior to installation.

Installation

Receiving the Unit

Immediately upon receipt of the scroll compressor, 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.

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

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. OEM installations must be reviewed with Powerex and suitable conditions met for warranty coverage to be in effect.
2. Ambient temperatures of -40°F to 140°F can be accommodated.
3. Protection from rain and water spray is provided by the integrated enclosure. Do not modify the enclosure without approval from Powerex.
4. Reasonable access for maintenance and repair is required.
5. The compressor system is designed to compress atmospheric air. Ingestion of liquids, corrosive or flammable gases or modified atmospheres of any kind is not intended, and damage may occur that is outside of warranty.
6. The unit must be secured to the vehicle before operation.
7. Ventilation openings must be kept clear and suitable ventilation maintained during operation. Damage to the unit may result if ventilation is obstructed. Ventilation is achieved through free air circulation under the unit.

Electrical Connection

⚠ DANGER Fire Hazard. The electrical system does not have built in short circuit protection on the mains or control circuit. Protection must be provided by the supply system.

The unit has built in automatic controls and is designed to be supplied with three phase electric power with voltage matching the model specifications. Conductors and power supply components must be sized so that voltage drop under load, especially at start-up is minimized. In no case may the start up voltage be less than 85% of the rated voltage and the running voltage must be maintained at no less than 90%. Best operation is achieved at or near rated voltage (+/- 3%). Over-voltage (more than 110%) may cause damage to the system.

Control power of 24VDC must be supplied to the unit as well. Voltage must be +/- 15%

Make sure power conductors are sized to handle the rated voltage, current and ambient conditions suitable for the service conditions. Power connection locations

are provided by Powerex on the bottom surface of the control box. Use suitable cable glands or conduit fittings and route the wires to the terminal locations provided in the control box. Tighten wire connections securely.

⚠ DANGER Electric Shock and Arc Flash Hazard! Always Lock Out and Tag out power sources when the cover is open or the electric control door is open. Hazard of injury from hot and moving parts. **DO NOT OPERATE** the unit with the cover removed. The compressor may start automatically any time the power is connected. Always vent stored compressed air or lock out using an isolation valve before performing any work on the compressor system.

Pneumatic Connection

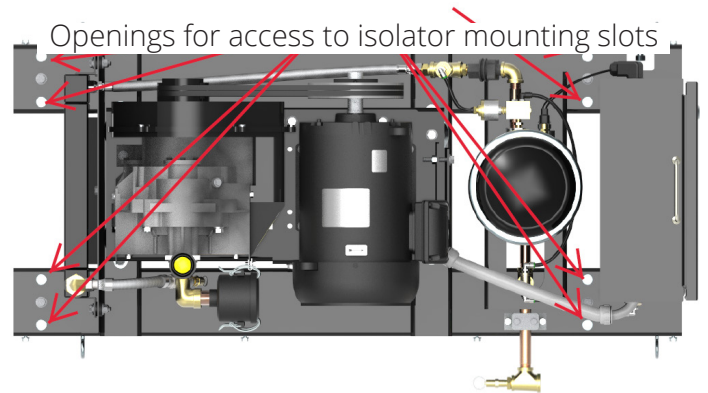
General Guidelines

1. Make sure the piping is lined up without being strained or twisted when connecting to the outlet of the compressor unit. A flexible hose with suitable pressure and temperature ratings is recommended.
2. Piping supports should be anchored separately from the compressor to reduce noise and vibration.
3. Never use any piping smaller than the compressor outlet connection.
4. A union or other easily disconnected fitting is recommended to facilitate maintenance and repair.

Securing the Compressor to the Vehicle

To mount the compressor:

1. Open or remove the enclosure.
2. Locate the 4 isolator mounts at the bottom of the unit.
3. Align the isolator's slots with the holes you wish to use on the vehicle.
4. Insert bolts through the slots in the isolator mounts. Tighten appropriately.
5. Reinstall enclosure.



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 electric power source and ground have been firmly connected.
4. Be sure all vacuum 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 necessary connection to the vehicle control for operation.
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 clockwise opposite shaft end.

Start Up & Operation

1. Follow all procedures under "Before Start-Up" before attempting operation of the vacuum pump.
2. Switch the electric source breaker on.
3. Check that the compressor operates without excessive vibration, unusual noises or leaks.

System Characteristics & Operations

The Powerex compressor takes in atmospheric air through the Air Filter, compresses it, and transfers the heat of compression out of the system by use of the fins on the pump and the aftercooler. The compressed air is piped to a Desiccant Dryer that removes water droplets and vapor. The compressed air is then connected to the vehicle's pneumatic system. A fan integrated into the compressor pump body cools the pump and the after cooler. A separate fan provides cooling air for the electric motor. The compressor-motor assembly is mounted on rubber isolators to minimize noise and vibration effects on the vehicle. The overall system is also mounted on rubber isolators which are to be bolted to the vehicle. The Air Filter has a replaceable pleated paper element to prevent abrasive dust from entering the compressor pump.

The system is supplied with pneumatic and electric controls and all required internal pressure hoses and connections. An adjustable pressure switch in the control system has contacts that close when the final output pressure is low and open when it is satisfactory. The pressure switch controls a magnetic relay or contactor that turns the 3 phase 60Hz AC main power to the motor on and off as needed. The overload relay in the electric control system senses the amount of current being delivered to the motor and if the current is too high turns off the contactor and sets a trip button. Pushing the button on the relay restores function. The system includes an Hour Meter that tracks the operating hours of the compressor.

Main power and 24V DC power is supplied to a terminal block in the control box. The control system uses 24V DC power to operate the magnetic contactor and to supply a heater built in to the dryer. A thermostat in the dryer automatically turns on the heater when conditions require it.

After the compressed air is generated and cooled in the after cooler, a check valve in the piping keeps the compressed air from escaping from the system when the pump is turned off. When power to the motor is switched off, it is normal for the pump to make a few reverse rotations as it vents compressed air that is trapped at the end of a run cycle. If reverse rotation continues for more than a few seconds, inspect the check valve and replace if faulty.

When the compressor is running, compressed

air flows through the dryer where water and water vapor are captured. When the compressor stops, the collected water and water vapor are expelled from the dryer and a small amount of dry compressed air that is stored in the dryer body is used to regenerate the dryer preparing it for the next use cycle. The water removal and regeneration action is triggered by the small brass control valve and piston assembly mounted to the side port of the dryer. The piston retracts when the pump stops and output line is at low pressure, allowing the dryer to cycle. The dryer makes a popping sound when it cycles and this is normal. If the unit is not regularly stopped, the dryer will not regenerate and dryer performance will be impaired.

Pressure relief valves are installed to prevent overpressure conditions. Do not modify or tamper with the relief valves. Check the function of the valves that have pull rings by making sure they are free to move when pulled during the 5,000 hour maintenance activity.

Maintenance Schedule

Item	Action Needed	Operating Hours						Remarks
		500	2500	5000	10000	15000	20000	
Inlet Air Filter	Inspect, Replace	o	Δ					Replace every 2500 hours or less
Blower Fan	Clean			o	o	o	o	Clean blades
Fan Duct	Clean			o	o	o	o	Clean duct
Compressor Fins	Clean		o					Every 2500 hours or less
Bearings (116 psig Scroll Units)	Grease				o			Replace every 10000 hours on 116 psig pumps
Bearings (145 psig Scroll Units)	Grease			o	o	o	o	Replace every 5000 hours on 145 psig pumps
Tip Seal (116 psig Scroll Units)	Replace				Δ			Replace every 10000 hours on 116 psig pumps
Tip Seal (145 psig Scroll Units)	Replace			Δ	Δ	Δ	Δ	Replace every 5000 hours on 145 psig pumps
Dust Seal	Replace				Δ		Δ	Replace every 10000 hours on 116 psig pumps Replace every 5000 hours on 145 psig pumps
V-Belt	Replace				Δ		Δ	See Note 3
Check Valve	Replace				Δ		Δ	
Heat Insulation Pipe	Replace				Δ		Δ	Replace every 10000 hours on 116 psig pumps Replace every 5000 hours on 145 psig pumps
Magnetic Starter	Inspect				Δ		Δ	Replace if contact points are deteriorated
Safety Valve	Confirm Operation				Δ		Δ	Every 2,500 hours or every 6 months; whichever comes first

Legend

o Inspect/Clean

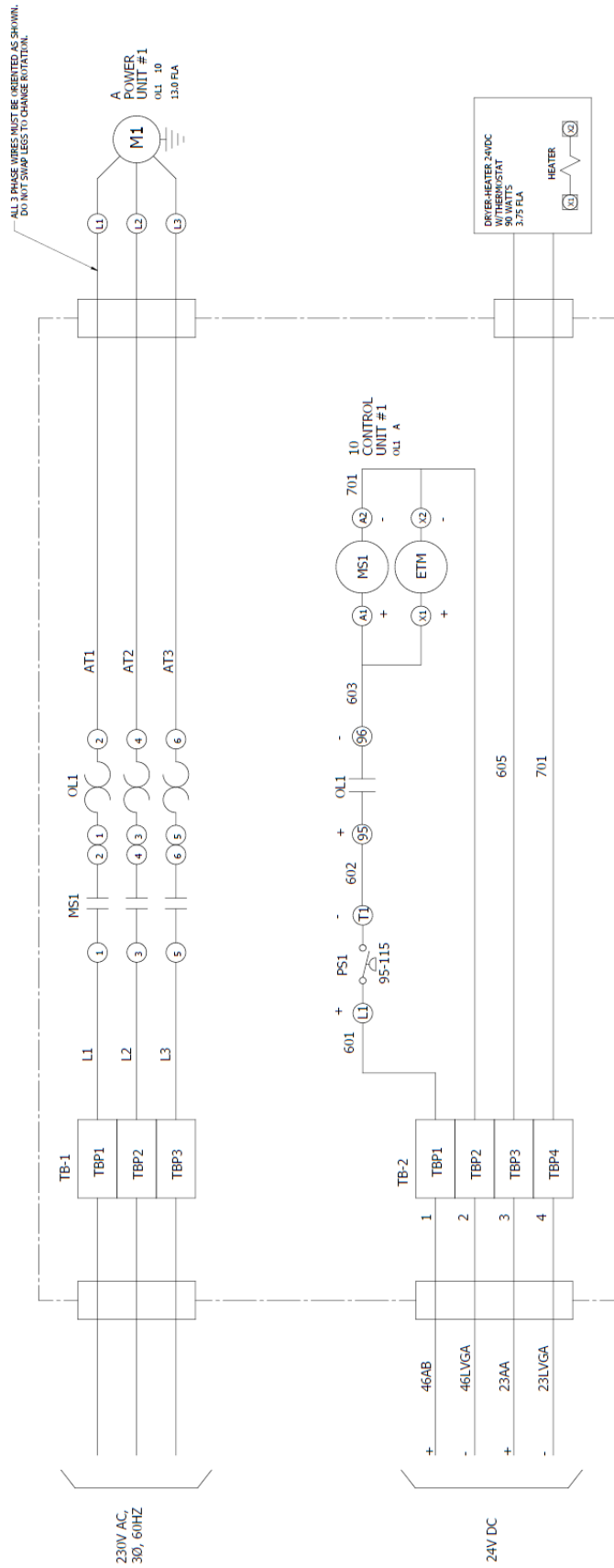
Δ Replace

NOTES:

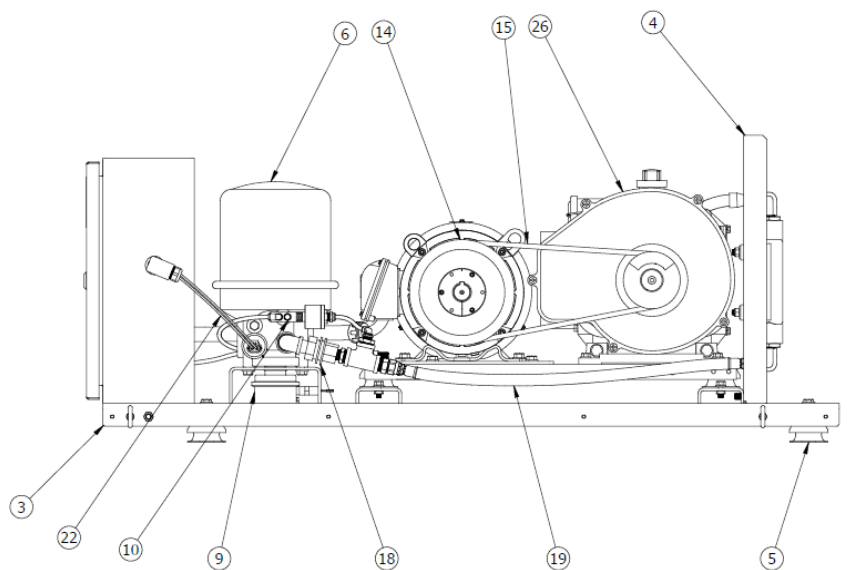
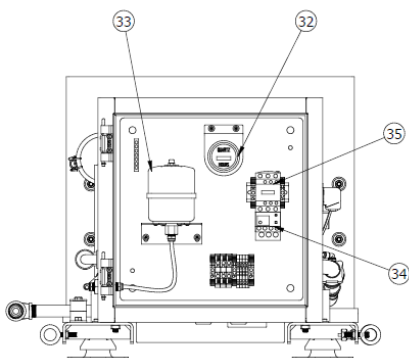
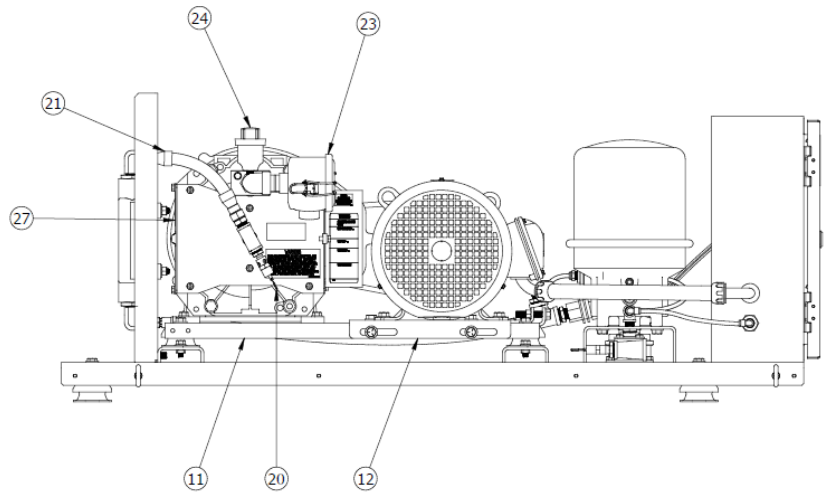
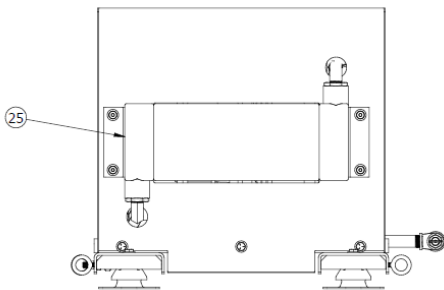
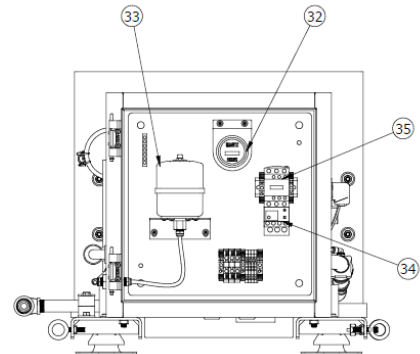
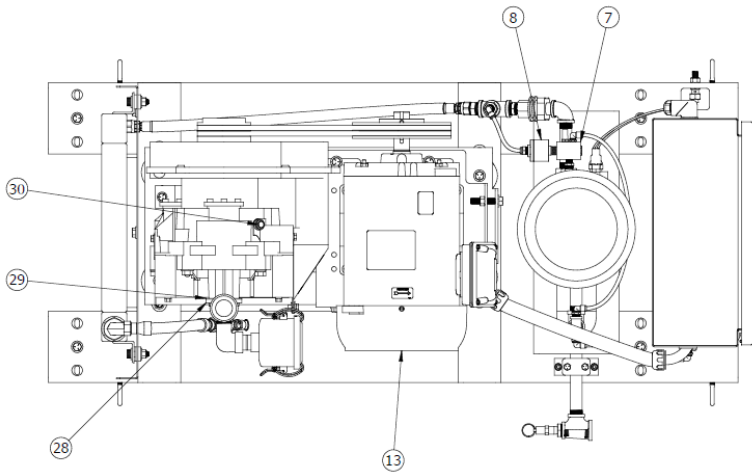
1. Inspect and perform maintenance periodically according to the maintenance schedule.
2. The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and perform maintenance accordingly.
3. Belts require no attention unless slippage is detected (chirping sound on start up or while running). Retension as indicated when tip seals are replaced for the first time. Proper belt tension should be 0.25 inch deflection when 6 pounds of force is applied on the center of the belt span.
4. For standard pressure pumps (116 psig), if the pumps reach 4 years and have not yet accumulated 10000 hours, perform the greasing operation for the bearings, with the number of pumps reduced by 25% (see details of pump grease operation). Tip seals do not require early replacement, but must be done before or at 10000 hours of run time for standard pressure pumps or 5000 hours of run time for high pressure pumps. For high pressure pumps (145 psig), if the pumps reach 2 years and have not yet accumulated 5000 hours of run time, perform the greasing operation for the bearings, with the number of pumps reduced by 25%.

Enclosed Scroll Basemount Compressor

Operating & Maintenance Manual



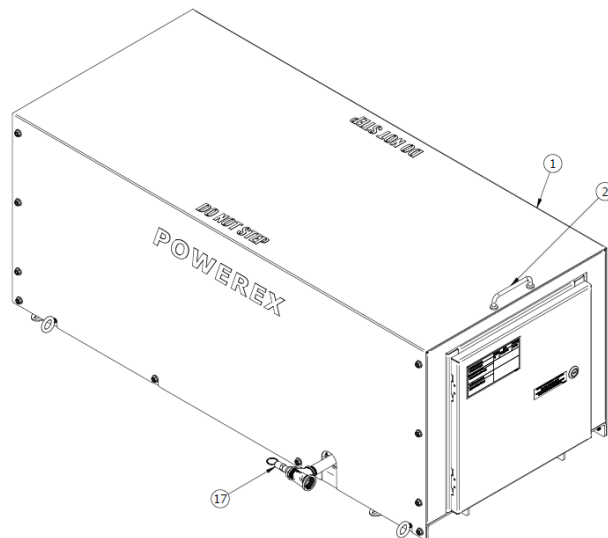
Ground wire not shown



Replacement Parts

Compressor

ITEM	PART NUMBER	DESCRIPTION	QTY
1	SM006702AV	RAIN ENCLOSURE, EBBS	1
2	ST205800AV	HANDLE, NICKEL PLATED BRASS	1
3	SM050610AV	EBBS UNIT BASE FRAME	1
4	SM006701AV	EBBS INSIDE PANEL, AFTERCOOLER BULKHEAD	1
5	IP639100AV	ISOLATOR FOOT MOUNT	8
6	ACD30100AV	DRYER, BENDIX AD-IP	1
7	ST206100AV	3 WAY CLIPPARD VALVE, PV-3P	1
8	ST206101AV	CLIPPARD ACTUATOR, MPA-10P	1
9	ACD30101AV	BENDIX AIR DRYER MUFFLER, AD-IP	1
10	ST207600AV	MUFFLER VENT PLUG; 1/8" NPT	1
11	SM001124PCD4	SUB BASE ASSEMBLY FOR PWX MSE, BELT DRIVE	1
12	SM001125PCD4	MOTOR SLIDE	1
13	MC304205AV	MTR 5HP, 3 PHASE, TEFC	1
14	PU009754AV	2/3V690SDS + SDS - 1-1/8	1
15	BTD12900AV	3VX-BELT XPZ-1060 41.7"	2
16	ST189301AV	.5IN NPT PIPE CLAMP ASSEMBLY	1
17	V-215410AV	165 PSI, 149 CFM, HI-FLOW ASME PSV, 1/4" W/ OVERSIZED PULL RING	1
18	IP087700AV	SCROLL CHECK VALVE (CV-157)	1
19	SM001510AJ	HOSE ASSEMBLY 1/2" ID X 24" L 1/2" JIC NUT	1
20	V-216000AV	PRESSURE RELIEF VALVE, 140PSI, 120 SCFM, 1/8" MNPT, HIGH TEMP	1
20 ALT	V-215900AV	PRESSURE RELIEF VALVE, 165PSI, 141 SCFM, 1/8" MNPT, HIGH TEMP	1
21	SM001506AV	FLEX HOSE SS	1
22	PE003200AV	WIRING HARNESS, BENDIX 109871N	1
23	VP000542AV	AIR FILTER ASSEMBLY	1
23 A	VP000543AV	REPLACEMENT FILTER ELEMENT	1
24	VP002503AV	AIR FILTER INDICATOR, DONALDSON	1
25	SL060000AV	AFTERCOOLER BAR AND PLATE 7.5/10 HP	1
26	SL016502AV	5HP SCROLL PUMP E TYPE CSL-165E STANDARD PRESSURE	1
26 ALT	SL016511AV	5HP SCROLL PUMP E TYPE CSL-1651E HIGH PRESSURE	1
27	SL206400AV	5HP FINGER GUARD, FAN	1
28	IP088400AV	SCRL ADPTR PLT NEW	1
29	IP088200AV	SCROLL ADAPTER PLATE GASKET	1
30	ST951005AJ	WELLNUT ASSEMBLY, COMPRESSOR GREASE PLUG, 1_4-20, .031-.187	1



Troubleshooting Guide

Problem	Possible Cause	Corrective Action
Compressor unit will not start	<ol style="list-style-type: none"> 1. Main disconnect is not ON 2. Open fuse or circuit breaker at customer provided power supply 3. Pressure switch is in the OPEN position 	<ol style="list-style-type: none"> 1. Switch disconnect to ON 2. Inspect for any fault replace fuse or trip disconnect to ON 3. Reduce pressure
Power is at supply connection and compressor will not start	<ol style="list-style-type: none"> 1. Motor overload has tripped 2. Wrong or low voltage 3. Starter has failed 4. Motor has failed 	<ol style="list-style-type: none"> 1. See the last entry of Troubleshooting Guide 2. Check incoming power supply and unit power rating 3. Replace contractor assembly 4. Replace motor
Compressor is running but will not make pressure	<ol style="list-style-type: none"> 1. Clogged intake filter element 2. Pressure relief valve has opened 3. Excessive tip seal wear 4. Unit is running in the wrong direction 5. Discharge air is leaking 	<ol style="list-style-type: none"> 1. Replace intake filter element 2. Pressure switch needs replaced or starter contacts welded shut 3. Replace tip seal 4. Correct power connections 5. Check discharge piping
Excessive noise or vibration	<ol style="list-style-type: none"> 1. Motor has failed 2. Pump is damaged 3. Cooling air fan is touching fan guard 	<ol style="list-style-type: none"> 1. Replace motor 2. Fix or replace pump 3. Check air fan daily
Compressor running hot	<ol style="list-style-type: none"> 1. Ventilation air path is obstructed 2. Pump running at high pressure 3. Aftercooler fins clogged 4. Intake filter damaged or clogged 5. Compressor is dirty 6. Duty cycle exceeds 40% 	<ol style="list-style-type: none"> 1. Remove obstruction or reposition unit to allow for cooling air 2. Confirm tank pressure and pump outlet are not obstructed 3. Clean aftercooler 4. Check intake filter 5. Clean unit 6. Check for leaks
Compressor turns on/off rapidly	<ol style="list-style-type: none"> 1. Receiver tank has high level of water 2. Compressor check valve has failed 3. Defective pressure switch 	<ol style="list-style-type: none"> 1. Replace electric tank drain/drain tank 2. Replace check valve 3. Replace pressure switch
Safety valve blows off	<ol style="list-style-type: none"> 1. Pressure switch has failed to open 2. Motor starter contacts welded shut 3. Blockage in downstream air line or closed isolation valve. 	<ol style="list-style-type: none"> 1. Replace pressure switch 2. Replace motor starter 3. Inspection downstream air system for closed isolation valves and pinched or clogged airlines. In freezing weather, condensate may collect and freeze if not removed from the airline which can create a blockage.
Motor overload has tripped	<ol style="list-style-type: none"> 1. Pump has failed 2. Motor has failed 3. Improper wiring 4. Wrong overload setting 5. Low voltage 	<ol style="list-style-type: none"> 1. Fix or replace pump 2. Replace motor 3. Check wiring 4. Check overload setting 5. Check incoming power supply

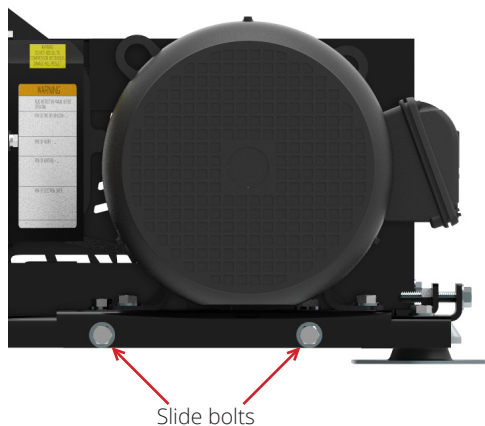
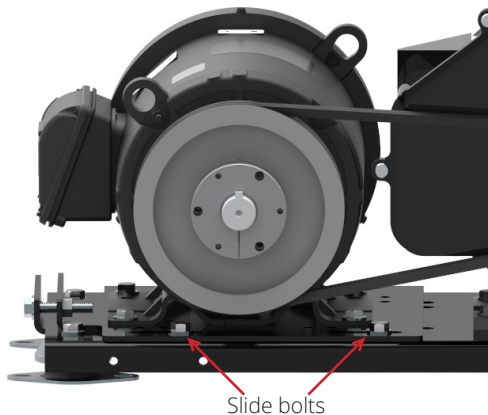
Adjusting Belt Tension

⚠ WARNING Moving Parts! Lock out power before servicing unit!

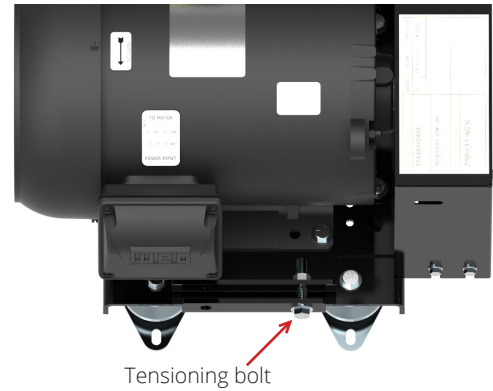
After the first 200 to 500 running hours, or at any time chirping is heard on startup, check the belt tension. If tension is below 25 pounds on either belt, increase the center distance using the motor slide base so that belt tension is 45 to 50 pounds. Follow the Belt Replacement Procedure below, skipping steps 3 and 4 to make this adjustment.

Belt Replacement Procedure

1. Remove the belt guard.
2. Loosen the two slide bolts near the motor pulley and the two slide bolts on the front edge of the base. Loosen the bolts just enough to allow the slide base to move. Do not fully remove the slide bolts.



3. Loosen the tensioning bolt until enough slack is available to remove the old belts.



4. Replace the old belts with new ones. Additional loosening of the tensioning bolt may be required to install the new belts.
5. Tighten the tensioning bolt using a torque wrench to 45 inch pounds. This will bring the belts to the proper tension.
6. Tighten the slider bolts, the two on the front edge of the base, then the two slider bolts closest to the motor pulley.
7. Re-install the belt guard.

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. This warranty shall apply only to Products that are purchased and used in the United States of America and in Canada. 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), 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 repair, or, at its option, replace, free of charge, any Product which it determines to have had a Defect; 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) (i) Standard Period of Warranty – Parts and Labor. The purchase of any system includes our 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 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 United States or Canada, 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.

(ii) Premium Period of Warranty – Parts and 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 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 United States or Canada, 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 forty-two (42) months from the date of shipment by Powerex, or thirty-six (36) months from the documented date of startup, or ten thousand (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 Representative only.

(d) Replacement Pumps – 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 thirty-six (36) months from the date of shipment by Powerex or ten thousand (10,000) hours of use, whichever comes first. For any replacement Air-End or Vacuum Pumps installed on a system 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 Air-End or Vacuum Pumps shall be free of Defects for the first twelve (12) months 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 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.

(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 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.

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.

Claims. Any non-warranty claims pertaining to the Products 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. Powerex shall not be liable for any delay or failure arising out of acts of the public enemy, fire, flood, or any disaster, labor trouble, riot or disorder, delay in the supply of materials or any other cause, whether similar or dissimilar, beyond the control of Company. 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, THE TERMS AND CONDITIONS CONTAINED IN THIS LIMITED WARRANTY 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 will not control. All orders are subject to acceptance by Powerex.