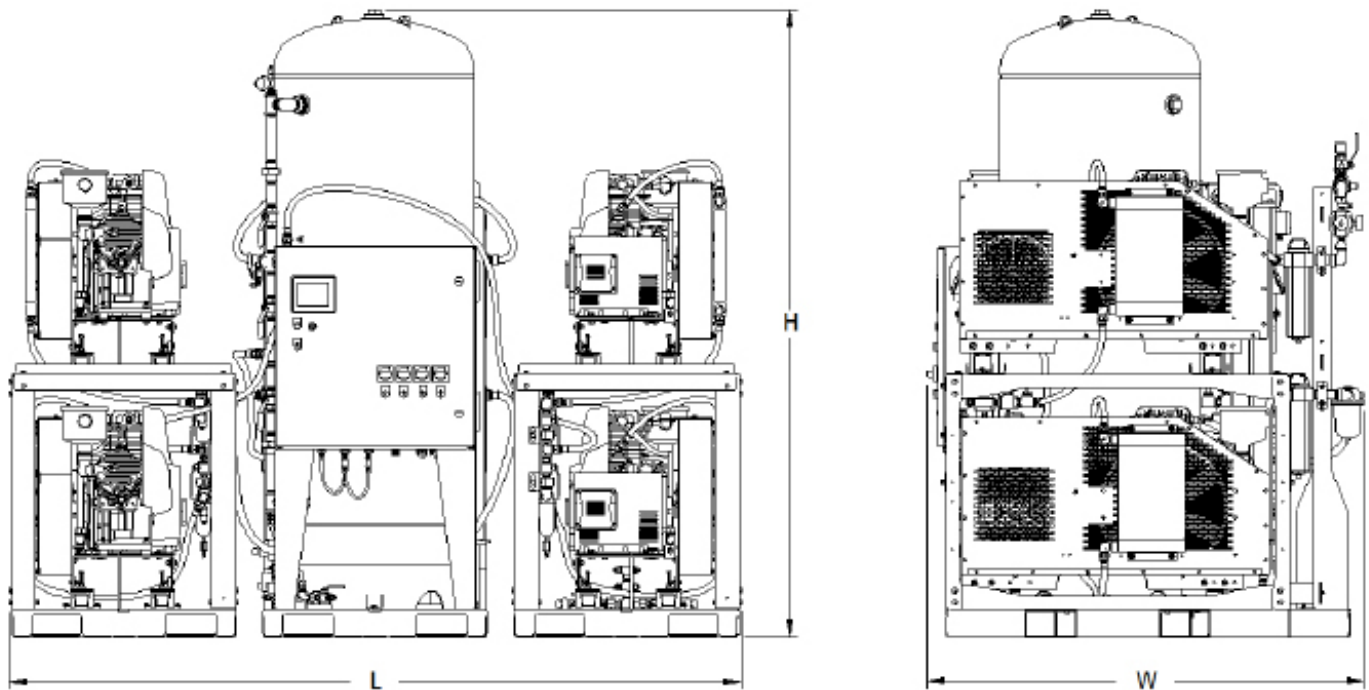


# Oil-less Instrument Air System

## General Product 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.*





## Performance Specifications\*

Model(1)	HP	Phase	Voltage	SCFM @ 185 PSIG(2)	Tank Size (gal)	BTU/ Hr	dB(A) Level	System F.L.A.			Dimensions (L x W x H) (in)	Shipping Weight (lbs)
								208V	230V	460V		
Duplex - Model IOPD												
IOPD0754xP5	7.5	3	208/230/460	20.4	120	16,030	76	44.6	39.0	20.5	70x55x82	2210
IOPD1004xP5	10	3	208/230/460	26	120	23,918	76	59.0	51.6	26.8	70x55x82	2316
IOPD1504xP5	15	3	208/230/460	34.3	120	32,060	79	87.8	76.4	39.2	70x55x82	2407
Triplex - Model IOPT												
IOPT0754xP5	7.5	3	208/230/460	40.8	120	32,060	79	65.9	57.5	29.75	105x65x82	2978
IOPT1005xP5	10	3	208/230/460	52	200	47,835	79	87.5	76.4	39.2	105x65x82	3073
IOPT1506xP5	15	3	208/230/460	68.6	240	64,120	82	130.7	113.6	57.8	109x65x93	3590
Quadplex - Model IOPQ												
IOPQ0755xP5	7.5	3	208/230/460	61.2	200	48,090	81	87.2	76.0	39.0	109x65x82	3728
IOPQ1006xP5	10	3	208/230/460	78	240	71,753	81	116.0	101.2	51.6	109x65x93	4081
IOPQ1506xP5	15	3	208/230/460	102.9	240	96,180	84	173.5	150.8	76.4	109x65x93	4263

### Notes:

\* Table specifications are defined at sea level conditions with reserve pump(s) on standby per NFPA 99. Consult factory for installations above 3,000 ft. elevation.

1 - "X" in model number defines system voltage. "2", "3", & "4", signify 208, 230, & 460 volt systems, respectively.

2 - Powerex recommends using performance ratings in SCFM (Standard Cubic Feet per Minute) when sizing medical air systems. System is designed to deliver line pressure at 185 PSIG.

## Description

The Powerex Instrument Air system package is designed to provide clean dry air for hospitals and medical institutes. This system is designed to use properly sized dryers that meet dew point and flow specifications, along with an appropriate filter and monitor package, to comply with requirements for NFPA 99 for Category 1 Instrument Air systems.

## 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.

### Warning 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.

### Specifications

Performance	See page 3			
Lubrication	Grease-filled bearing			
Operating Voltages	3Ø	208 / 230 / 460 Volts, 60 Hz		
Compression Cycle	Oil-less Piston Reciprocating			
Motor Overload Protection	Motor protector with adjustable overload			
Overpressure Protection	ASME Safety Valve Factory Set and Sealed			
		IOPD	IOPT	IOPQ
Outlet Air	7.5	3/4"	3/4"	1"
Connections (NPT)	10	3/4"	3/4"	1"
	15	3/4"	1"	1"
California Ordinance 462 (L) (2)	Meets Requirements of this Ordinance			

## Unpacking

Immediately upon receipt of the oil-less compressor, inspect for any damage which may have occurred during shipment. The compressor nameplate should be checked to verify the correct model and voltage as ordered.

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

## General Safety Information

### California Proposition 65

**⚠ WARNING** This product or its power cord may contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

### General Safety

Since the air compressor and other components (material pump, filters, lubricators, hoses, etc.) used make up a high pressure pumping system, the following safety precautions must be observed at all times:

1. Read all manuals included with this product carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
2. Follow all local electrical and safety codes as well as the United States National Electrical Codes

(NEC) and Occupational Safety and Health Act (OSHA).

3. Only persons well acquainted with these rules of safe operation should be allowed to use the equipment.
4. Keep visitors away and NEVER allow children in the work area.
5. Wear safety glasses and use hearing protection when operating the unit.
6. Do not stand on or use the unit as a handhold.
7. Before each use, inspect compressed air system and electrical components for signs of damage, deterioration, weakness or leakage. Repair or replace defective items before using.
8. Check all fasteners at frequent intervals for proper tightness.

**⚠ WARNING** Electrical equipment and controls can cause electrical arcs that will ignite a flammable gas or vapor. Never operate or repair in or near a flammable gas or vapor. Never store flammable liquids or gases in the vicinity of the compressor.

**⚠ WARNING** An ASME code safety relief valve, with a setting no higher than the tank maximum allowable working pressure, MUST be installed in the air lines or in the tank. The ASME safety valve must have sufficient flow and pressure ratings to protect the pressurized components from bursting. The flow rating can be found in the parts manual.

**⚠ CAUTION** Do not operate with pressure switch or pilot valves set higher than the tank maximum allowable working pressure.

9. Never attempt to adjust ASME safety valve. Keep safety valve free from paint and other accumulations.

**⚠ DANGER** Never attempt to repair or modify a tank! Welding, drilling or any other modification will weaken the tank resulting in damage from rupture or explosion. Always replace worn, cracked or damaged tanks.

**NOTICE** Drain liquid from tank daily.

10. Tanks rust from moisture build-up, which weakens the tank. Make sure to drain tank regularly and

inspect periodically for unsafe conditions such as rust formation and corrosion.

11. Fast moving air will stir up dust and debris which may be harmful. Release air slowly when draining moisture or depressurizing.

## Glossary of Terms

### Oil-less OPT / OPS Compressor

The Powerex oil-less reciprocating air compressor has advanced compressor technology through the development of a completely oil-less compressor. The Powerex reciprocating compressor is provided in duplex, triplex or quadplex configurations with solenoid unloaders to provide start / stop operation. Composite piston technology and continuously lubricating bearings provide oil-free air reliability for years to come.

### Receiver Tank

The ASME, National Board registered air receiver is provided in sizes from 80 to 240 gallons. Each receiver is rated at 300 psig working pressure. Receivers are provided with sight gauge, moisture drain (manual and electric), and internal lining to prevent corrosion.

### Control Panel

The NEMA 12 control panel is provided in duplex, triplex or quadplex configurations and meets NFPA 99 requirements for medical air. Control transformer power is 115 volts and protected by primary and secondary fusing. A Transducer signals the compressors on and off cycle and signal lag compressor(s) to come on if air demand increases. This alternator is factory set to alternate the compressors every 60 minutes.

### Air Cooled Aftercooler

Beltguard aftercoolers are sized to provide an approach of 14°F. Constructed of copper tubing and aluminum headers for a rugged construction.

### Dew Point Monitor

The Powerex dew point monitor provides indication of dew point temperature. It is microprocessor controlled with alarm and self-calibration sensor.

Regenerative dryers paired with the Powerex dew point monitor may be operated in Econ Mode where the dew point monitor would signal the dryer to cease purge if system dew point is below the set point.

## Air Dryer (Desiccant)

The Powerex air drying system provides air at -40°F at 185 psig. Each dual desiccant dryer system consists of 2 complete desiccant dryers. Each dryer is to be switched ON and OFF LINE each six months because of service requirements, to prolong the dryer life cycle and to provide redundant back-up.

The regenerative desiccant consists of two (dual) towers filled with desiccant. Each tower is switched on and off stream, alternating the air system stream and then being regenerated. Dry purge air pulls moisture from the desiccant and carries the moisture out of the air.

## Instrument Air Filter System

The filter system consists of a duplex series of filters and pressure regulators. Air enters the system and is directed to either bank of filters controlled by a ball valve. The first stage filter removes solids and liquid particles. The second and third stages of filtration are combined in a carbon filter which removes unpleasant odors and submicronic particles. Maximum temperature is 125°F and maximum pressure is 232 psig.

## Condensate Drain Valve

A condensate drain valve is installed on all tanks. This valve removes liquid that collects during compressor operation.

Drain liquid from tank daily.

## 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** Installation of inlet/outlet air plumbing from the compressor flange and electrical connection must be in accordance with National Fire Protection Association (NFPA 99) Code Compliance for Instrument Air Supply Systems (Category 1 Support Gas).

## Installation Site

1. The compressor system 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 and moisture.
3. Never install the system 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	24 in
Control Panel side	42 in
Other sides	24 in

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

## Ventilation

1. If the oil-less compressor system is located in a totally enclosed room, an exhaust fan with access to outside or make up air, must be installed. Room temperature must remain below 104°F. Circulation must be sufficient to prevent local hot spots.
2. Never restrict the cooling fan exhaust air. Refer to Minimum Clearances table above.
3. Never locate the compressor where hot exhaust air from other heat generating units may be pulled into the system.

## Wiring

All electrical hook-ups must be performed by a qualified electrician. Installations must be in accordance with local and national electric codes. Make sure power supply conductors are sized adequately for full system demand.

Use solder-less terminals to connect the electrical power source.

## Piping

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 system.

2. Appropriate expansion loops or bends should be installed at the system to avoid stresses caused by changes in hot and cold conditions.
3. Piping supports should be anchored separately from the system to reduce noise and vibration.
4. Never use any piping smaller than the system outlet connection.
5. Use flexible hose to connect the outlet of the system to the piping so that the vibration of the system does not transfer to the piping.

### Safety Valves

Package systems are shipped from the factory with safety valves installed in the tank assembly. The flow capacity of the safety valve is equal to or greater than the flow capacity of the compressor system. There are also safety valves installed where compressor modules isolate from the system, and safety valves are installed where the air purification system isolates.

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

## Assembling Modular Instrument Air System

### Modular Placement

1. Unpack each module and discard all wood shipping materials.
2. Locate loose parts pack [Includes: isolation pads and outlet flex line].
3. Place modules at location designated (see drawings provided with unit for proper arrangement of modules). Provide sufficient clearance around unit for servicing (see minimum clearance section).
4. Lift corners of each frame assembly and install isolation pads provided.

**NOTE:** Remove shipping bolts located at the base plate of each compressor module. This will allow spring

isolators to free up reducing noise and vibration of the unit.

### 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.

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

4. Connect outlet source from filter package located on dryer module to outlet source piping.

**⚠ WARNING** Attach all outlet source piping in accordance with NFPA 99 for instrument air.

### Connecting Wiring

**⚠ 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 the temperature switch from each compressor to contacts located in the control panel as marked for each temperature switch. Temperature switches shut down the compressor when the temperature is above 450°F in 7-1/2 HP systems and above 425°F in 10 HP and 15 HP systems.
3. Connect unloader solenoid to wiring contacts located in the control panel. The unloader solenoid provides loadless starting of each compressor on/off cycle.
4. Connect wiring from Dew Point Monitor. A wire set is provided for power and the other for alarm. Wiring is marked for easy attachment.

**NOTE:** Units provided with desiccant drying systems are wired directly to the control panel provided.

5. Connect the incoming power to the incoming terminal blocks inside of the main electrical control panel. Make sure this is performed by a qualified electrician, following all NEC, OSHA, and



local codes. Make sure the unit ground is secured to the earth ground.

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

## Operation

Powerex package Instrument Air systems operate at a maximum pressure of 200 psig. Compressor RPM's are established by Powerex based on horsepower and operating pressure.

### Before Start Up

1. Make sure all safety warnings, labels and instructions have been read and understood before continuing.
2. Confirm that the electric power source and ground have been firmly connected.
3. Be sure all pressure connections are tight.
4. Check to be certain all safety relief valves, etc., are correctly installed.
5. Check that all fuses, circuit breakers, etc., are the proper size.
6. Make sure the inlet is properly connected.
7. Confirm that the tank drain valve is closed.

### Start Up and Operation

1. Follow all the procedures under "Before start-up" before attempting operation of the compressor.
2. Switch the electric source breaker on.
3. Both dryers should be plugged in and set at the on position.
4. Dewpoint Monitors should be on and the sampling valves open.
5. Compressor unit isolation valves are preset at the factory in the open position except for tank by-pass which must remain closed during normal operation.
6. Dryer and filter isolation valves: Valves should be open to one dryer and one filter bank.
7. Close the valve leading to the Instrument Air System from receiver on the compressor unit.
  - a. With all the compressor HOA switches in the OFF position, turn the electric power source

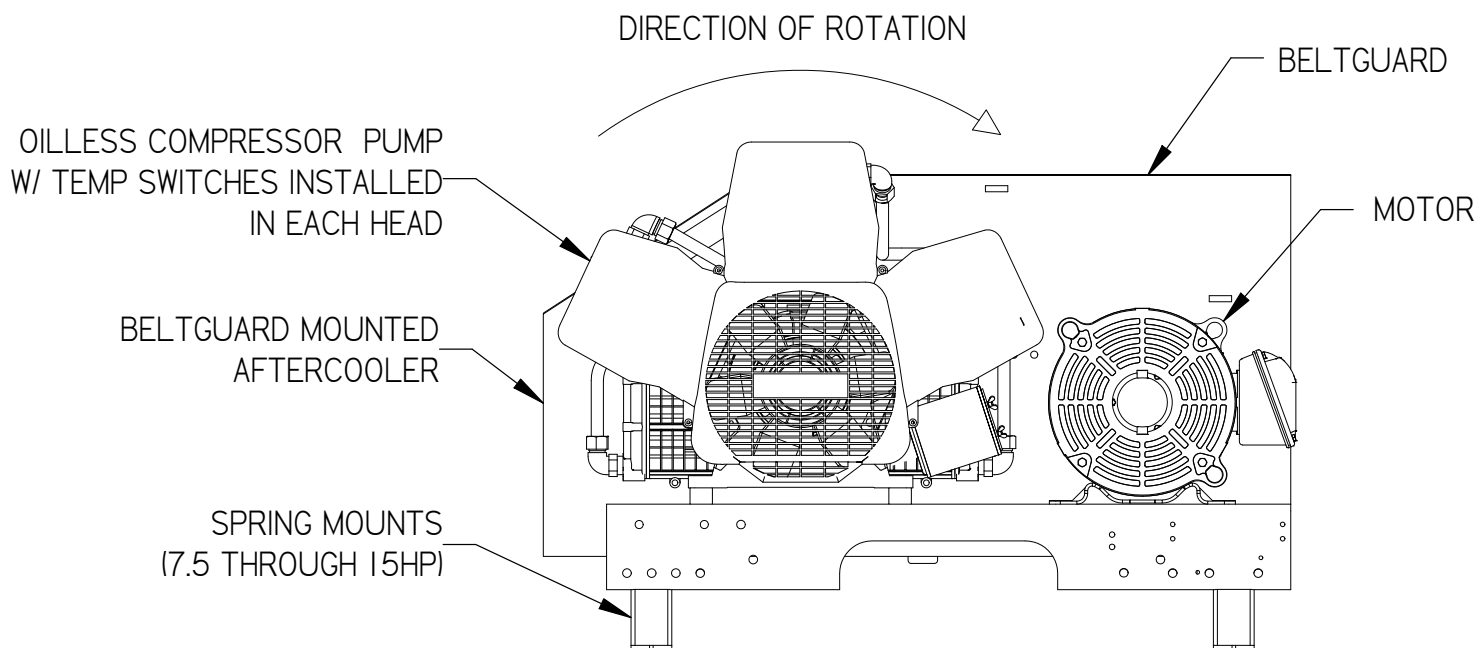
to the ON position. The low pressure alarm will sound. Silence the alarm by pushing Alarm Acknowledge button.

- b. Jog each compressor in the manual position with the HOA switch to check for rotation. (Clockwise if facing the black fan shroud and counterclockwise if facing the compressor flywheel.) Visually check the rotation of each compressor pump. If the rotation is incorrect, have a qualified electrician correct the motor wiring.
  - c. Set all selector switches to the AUTO position. Each compressor will run until the lead pressure setting is met.
  - d. Open valve at the air receiver leading to Medical Air System.
  - e. Check for air leaks at the connections.
8. Check that the unit operates without excessive vibration, unusual noises or leaks.
  9. Check the discharge pressure. Also make sure the air pressure rises to the designated pressure setting by checking the discharge pressure gauge.
  10. Check the operation of the pressure switch or the pilot valve for continuous run units by opening the stop valve and confirming the compressor starts or reloads as pressure drops.



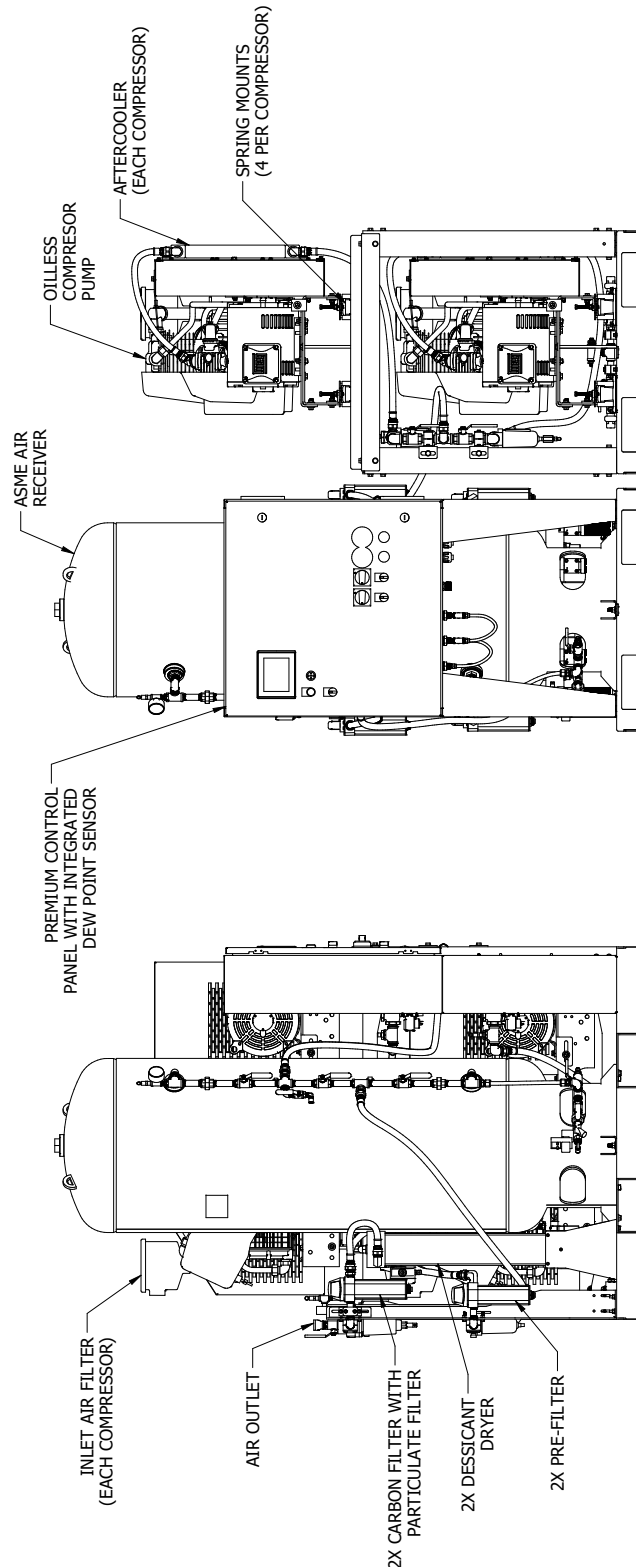
## System Drawings

### Basemount Unit



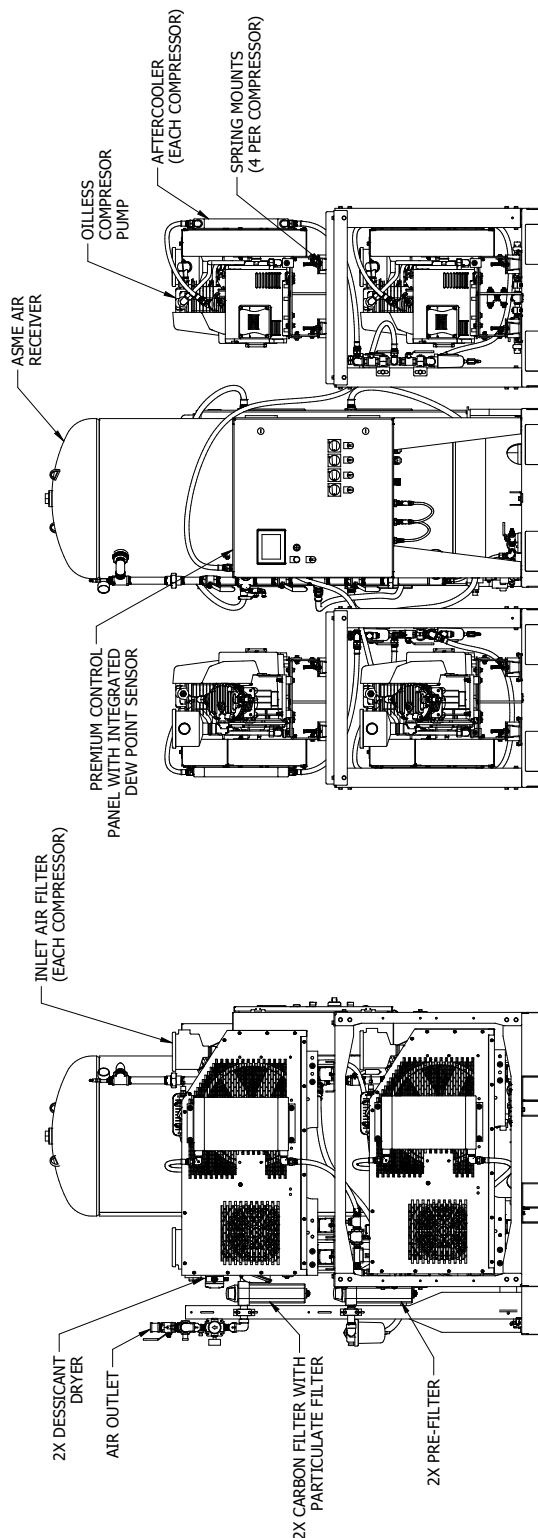
## System Drawings

### Duplex Unit - Premium Panel Desiccant Dryers



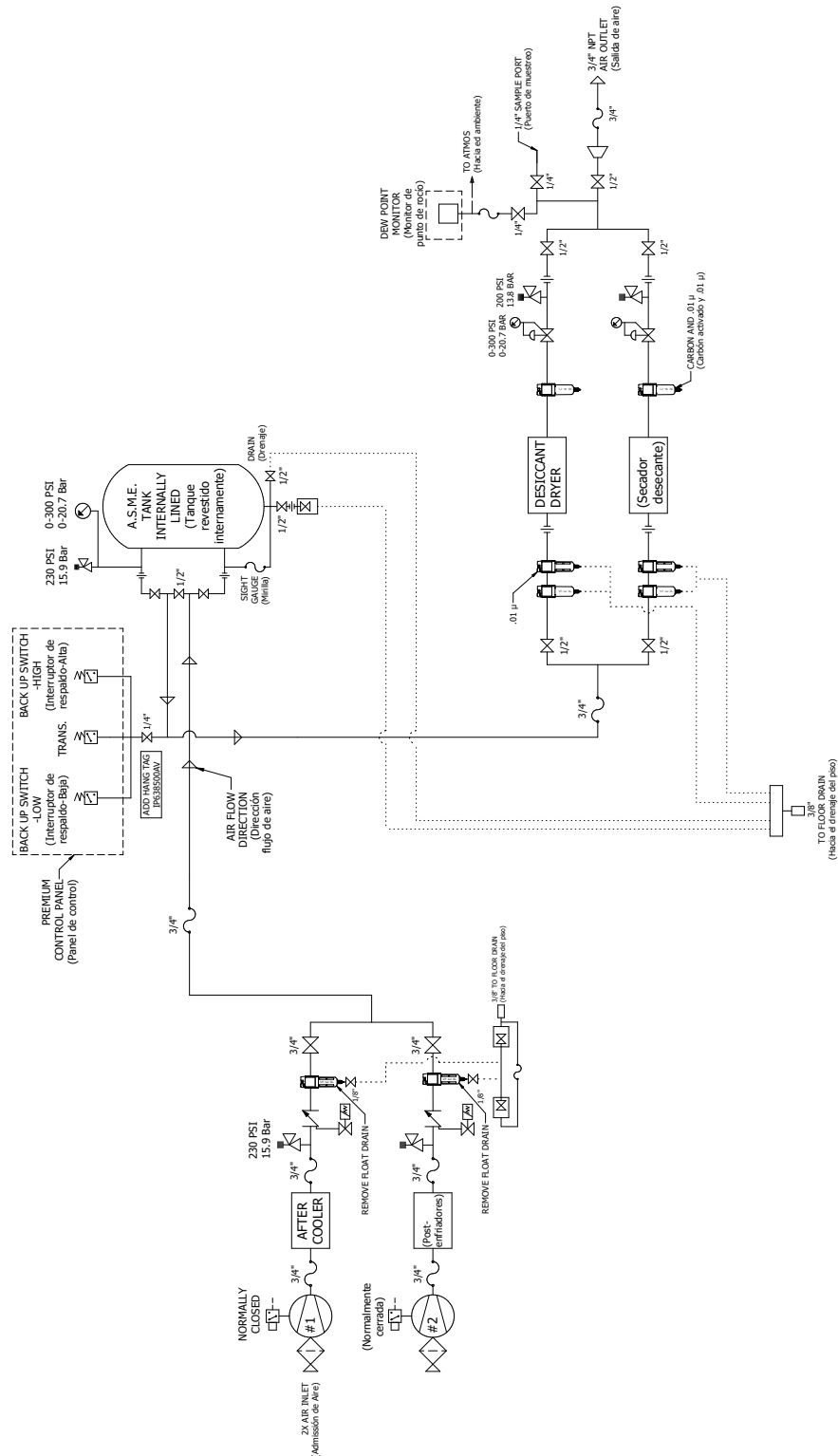
## System Drawings

### Quadplex Unit - Premium Panel Desiccant Dryers



## System Flow Schematics

### Duplex Unit



## Replacement Parts

### System

Description	Part Number	Qty
Compressor Pump:		
7.5 HP	OPT075	1
10 HP	OPT100	1
15 HP	OPT150	1
Corrosion Resistant Vertical Tank:		
120 Gal.	Consult factory for number	1
200 Gal.	Consult factory for number	1
240 Gal.	Consult factory for number	1
Dew Point Sensor	ACO500110	1
Safety Relief Valve	Consult factory for number	1
Control Panel	Consult factory for parts and availability. Call 1-888-769-7979.	
Pressure Gauge	Consult factory for number	1
Auto Tank Drain:		
Electric	SL300701AV	1
Spring Mounts	Consult factory for parts and availability. Call 1-888-769-7979	
Isolation Mounts	Consult factory for parts and availability. Call 1-888-769-7979	
Temperature Switch		
7.5 HP		
450° N/C Switch	AM003034AV	
10-15 HP		
425° N/C Switch	AM003033AV	
Aftercooler	SL200401AV	1

## Power Transmission

Description	Part Number	Qty
Drive Belts:		
7-1/2 HP	BT011600AV	2
10 HP	BT009202AV	2
15 HP	BT009201AV	2
Pulley (Motor):		
7.5 HP	PU009775AV	1
10 HP	PU009775AV	1
15 HP	PU009782AV	1
Motor:		
7.5 HP		
208V	MC304608AV	1
230V / 460V	MC304208AV	1
10 HP		
208V	MC304549AV	1
230V / 460V	MC304210AV	1
15 HP		
208V	MC304615AV	1
230V / 460V	MC304212AV	1
Belt Guard (Back):		
7-1/2 HP	BG218400AV	1
10 HP	BG218400AV	1
15 HP	BG218400AV	1
Belt Guard (Front):		
7-1/2 HP	BG218500AV	1
10 HP	BG218500AV	1
15 HP	BG218500AV	1

## Dryers

Description	Part Number	Qty
Desiccant Dryer:		
20 CFM	PD205A	2
30 CFM	PD206A	2
45 CFM	PD207A	2
60 CFM	PD208A	2
100 CF	PD209A	2



### Maintenance Schedule

Item	Action Needed	Operating Hours						Remarks
		500	2500	5000	10000	15000	20000	
Tank	Drain moisture	Daily						Drain tank daily
Inlet air filter	Inspect Replace	o	Δ	Δ	Δ	Δ	Δ	Every 2,500 hours or less
Blower fan	Clean			o	o	o	o	
Fan duct	Clean			o	o	o	o	
Compressor fins	Clean		Δ	Δ	Δ	Δ	Δ	Every 2,500 hours or less
Bearings – HP Wrist Pin	Inspect Replace Pin Regrease		Δ	Δ	Δ	Δ	Δ	Every 2,500 hours
Compression Rings	Inspect Replace			Δ	Δ	Δ	Δ	Every 2,500 hours
Bearings – LP Wrist Pin	Regrease	Note 4	Δ	Δ	Δ	Δ	Δ	Every 2,500 hours
Piston Set	Replace				Δ		Δ	
Cylinder	Inspect Replace			o	o	o	o	
Unloader Set	Inspect Replace			o	Δ	o	Δ	
Gasket Set	Replace				Δ		Δ	
Bearing Deal Wrist Pin	Replace				Δ		Δ	
V-Belt	Inspect Replace	Note 3	o	Δ	Δ	Δ	Δ	
Pressure Gauge	Inspect		o	Every 2,500 hrs. or less)				
Air Leaks	Inspect		o		o		o	
Dryer Filters	Replace		Δ	Δ	Δ	Δ	Δ (View delta pressure indica- tion)	
Moisture Drain Traps	Inspect	o		o			o	
Heat Exchanger		o	o	o	o	o	o	
Dryers	Alternate Montly							

o – Inspect

Δ – Replace or perform action

### 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. The tension of the V-belt should be adjusted during the initial stage and inspected every 1,500 hours afterwards. Proper belt tension; for 7.5 to 15 HP units, 16 lbs. / 1.5 inch deflection.
4. FOR LOW PRESSURE WRIST PIN BEARINGS ONLY: Use Powerex Oil-less Reciprocating Grease, 6 Grams, Part # IP634500AJ.



## Troubleshooting Guide

Item	Action Needed	Remarks
Panel power ON light does not appear	1. Main disconnect is not ON 2. Blown fuse or circuit breaker at customer provided power supply 3. Blown fuse at primary side of transformer	1. Switch disconnect to ON 2. Inspect for any fault replace fuse or trip disconnect to ON 3. Replace fuse on primary side be sure use same type and size
Power On light is on but unit will not start	1. Blown fuse on secondary side of transformer 2. Motor overload has tripped 3. Wrong or low voltage 4. Starter has failed 5. Motor has failed	1. Replace fuse on secondary side be sure use same type and size 2. See last entry of Troubleshooting Guide 3. Check incoming power supply and unit power rating 4. Replace contactor assembly 5. Replace motor
Compressor is running but will not maintain pressure	1. Drive belts came off or too loose 2. Clogged intake filter element 3. Solenoid unloader open 4. Electric tank drain is open continuously 5. Discharge air is leaking	1. Replace drive belts and (or) tighten 2. Replace intake filter element 3. Replace solenoid unloader 4. Replace tank drain 5. Check discharge piping
Excessive noise or vibration	1. Drive belt has separated or flat spot 2. Motor has failed 3. Pump is damaged 4. Cooling air fan is touching fan guard	1. Replace drive belt 2. Replace motor 3. Fix or replace pump 4. Check air fan daily
Compressor shuts down on high temperature	1. Room temperature is above 104°F 2. Aftercooler fins clogged 3. Intake filter clogged 4. Compressor is dirty	1. Add ventilation or air conditioning to room 2. Clean aftercooler 3. Check intake filter 4. Clean unit
Compressor turns on / off rapidly	1. Receiver tank has high level of water 2. Defective pressure switch Tank has been by-passed	1. Replace electric tank drain; drain water from tank 2. Replace pressure switch Open proper ball valve
Safety valve blows off	1. Pressure switch has failed to open 2. Motor starter contacts welded shut 3. Pump selector switch in HAND position 4. Pump isolation ball valve is CLOSED position	1. Replace pressure switch 2. Replace motor starter 3. Move pump selector switch to AUTO position 4. Open ball valve to proper position
Motor Overload has tripped	1. Pump has failed 2. Motor has failed 3. Improper wiring 4. Wrong overload setting 5. Low voltage 6. Contactor or overload bad	1. Fix or replace pump 2. Replace motor 3. Check wiring 4. Check overload setting 5. Check incoming power supply 6. Replace contactor or overload
Solenoid unloader constantly bleeds after compressor shuts off	Check valve has failed	Replace check valve
CO monitor in alarm	High CO alarm	Check compressor inlet / route inlet away from CO source
Dew point monitor in alarm	1. High dew point 2. Dryer pre-filter drain failure	1. Check dryer operation 2. Replace pre-filter drain

## This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

### Applicable to Non-OEM Customers in the U.S. & Canada Only

*The limited warranty below supersedes any other documentation provided. In the event of a conflict between these terms and conditions and any other document provided, the terms and conditions below shall control.*

#### 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](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 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 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.

**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.