

Specification

General

The Powerex Rotary Tooth Air Compressor Systems are designed to supply continuous oil-free air by using the most advanced pump technology available. These turn-key packages are extremely quiet. Each unit includes a 2-stage rotary tooth compressor mounted inside of a rigid steel sound enclosure. Enclosure shall have a powder coated finish, and shall include sound deadening insulation.

Oilless Rotary Tooth Compressor Pump

The compressors shall be shaft driven oil-less dual stage, air-cooled rotary tooth. The rotary design shall be rated for 100% continuous duty. The inlet and outlet for the air ends are located on symmetric faces, preventing axial loading and prolonging the life of the bearing. The rotors are made of stainless steel and highly resistant to corrosion. The air end assembly is rated for 40,000 hours of continuous use operation with regular maintenance. The pump is fully air-cooled requiring no external cooling fluid. An intercooler removes heat between the first and second compression stages, allowing for efficient performance. Compressors are rated for 109 psig (125 psig optional high pressure) maximum pressure at sea level.

Motor

The compressor shall be shaft-driven by a 2 pole, TEFC, IP55 rated, 3 phase induction motor with a squirrel cage rotor and cast iron frame. The motor shall run at 3565 RPM at full load and have a rated current of 57.7 Amps.

Compressor Cabinet Controls

Operation of the compressor and display of essential compressor systems is accomplished with a PLC and a touch screen color display for each compressor. This Programmable Logic Controller and display can easily be programmed to meet varying operating requirements.

Compressor Control Features

Compressor status indication

- Power on
- Standby mode
- Compressor loaded
- Compressor unloaded
- Real time clock

Hour meter

- Total operating hours
- Total loaded hours

Pressure indicators

- Package discharge air
- First stage discharge
- Inlet air filter
- Unload pressure set point
- Loaded pressure set point

Temperature indicators

- First stage air discharge
- Second stage air inlet
- Second stage air outlet

Service requirement indicators

- Routine maintenance

Pre-alarm indicators

- High 1st stage discharge temperature
- High 2nd stage suction temperature
- High 2nd stage outlet temperature
- Drain valve

Compressor safety shutdown indications

- High 1st stage outlet temperature
- High 2nd stage inlet temperature
- High 2nd stage outlet temperature
- Low oil pressure
- Drive motor overload
- Main starter fault
- Fan motor overload
- Oil pump motor overload
- Intake vacuum switch
- Maintenance interval

Additional devices

- Emergency stop button
- Event alarm log w/ ability to extract via USB
- Real time graphs of temperature and pressure data from each sensor
- Manual load/unload switch
- System auto restart

Remote input commands (optional)

- Start/stop
- Load/Unload

Remote output status

- Unit operating
- Loaded/unloaded
- Standby
- General alarm
- BACnet gateway for building management integration (optional)

Inlet Filter

The system includes a 2 stage inlet air filter with a star-pleated main element and an integrated high-efficiency pre-separator that promotes long element life. A silencer box with internal baffles is located prior to the inlet filter to reduce sound. The filter and the silencer box are located inside the sound reducing cabinet.

Oil Mist Catcher

The compressor pump will include an integrated oil mist catcher. The oil mist catcher eliminates oil mist from the gear casing and recycles the oil back into the sump.

Moisture Separator

The compressor comes equipped with two liquid separators with automatic no-loss electronic drains. The first is installed between the first and second stage air ends and the second separator is installed prior to the final discharge of the air compressor.

Heat Exchangers

Each compressor unit contains 3 different heat exchangers. An aluminum intercooler will be located between pump stages 1 and 2. An aluminum aftercooler will be located prior to the 2nd water separator and discharge. An aluminum oil cooler will be oriented next to the two air heat exchangers. A single cooling fan will remove the heat from the top of the system.

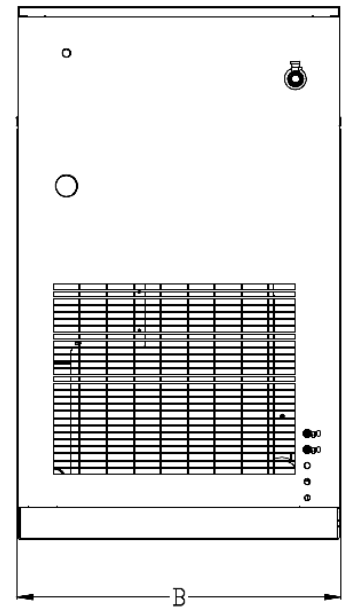
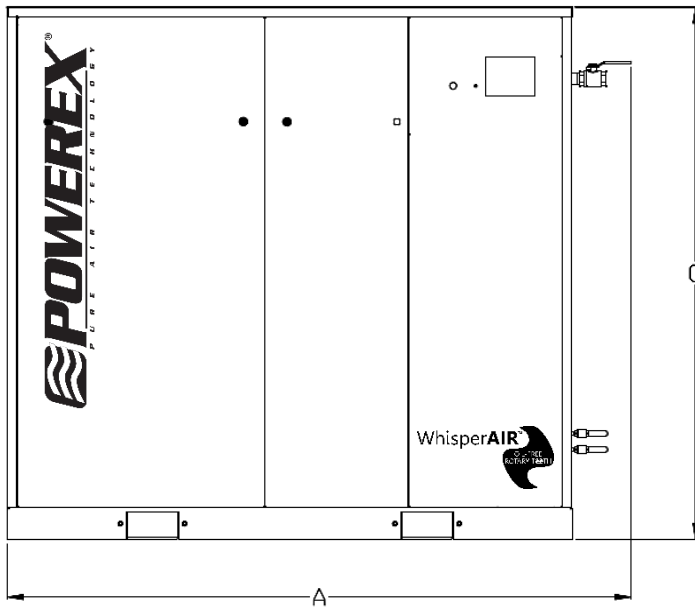
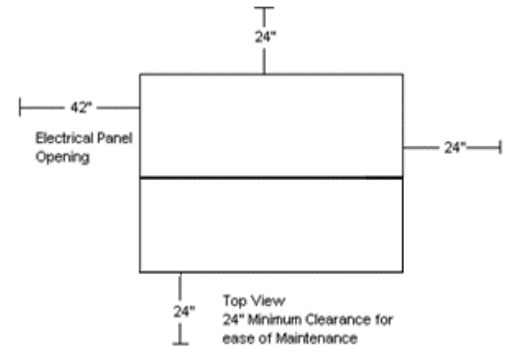
Sound Reducing Enclosure

The system is constructed with an internal frame and steel base system with individual vibration isolation mounted compressor modules. The sound reducing enclosure has access panels to allow service of the major components and electrical controls.

Optional VFD Controller

Compressor to be equipped with an integrated VFD motor control to maximize energy efficiency of the compressor under partial load conditions.

Dimensions				
Model	Dim. A	Dim. B	Dim. C	Outlet
PCC50074K2	77"	40"	65"	1 ½"
PCC50073K2	77"	40"	65"	1 ½"
PCC50072K2	77"	40"	65"	1 ½"
PCC50074K2HP	77"	40"	65"	1 ½"
PCC50073K2HP	77"	40"	65"	1 ½"
PCC50072K2HP	77"	40"	65"	1 ½"



Rotary Tooth Compressor – Load/Unload									
Model	HP	Maximum Pressure (PSIG)	SCFM @ 100 PSIG	BTU/Hr	dB(A) Level	System F.L.A.			System Weight (lbs)
						208V	230V	460V	
PCC50074K2	50	109	204	127250	68	-	-	64	2940
PCC50073K2	50	109	204	127250	68	-	128	-	2940
PCC50072K2	50	109	204	127250	68	147	-	-	2940
PCC50074K2HP	50	123	179	127250	68	-	-	64	2940
PCC50073K2HP	50	123	179	127250	68	-	128	-	2940
PCC50072K2HP	50	123	179	127250	68	147	-	-	2940

Model Data for Compressed Air – Fixed Speed		
Manufacturer: Powerex, Inc.		
Model Number:	Date:	5/28/15
<input checked="" type="checkbox"/> Air-cooled <input type="checkbox"/> Water-cooled	Type:	Other
<input type="checkbox"/> Oil-injected <input checked="" type="checkbox"/> Oil-free	# of Stages:	2
Rated Capacity at Full Load Operating Pressure:	204	acfm
Full Load Operating Pressure:	100	psig
Maximum Full Flow Operating Pressure:	109	psig
Drive Motor Nominal Rating:	50	hp
Drive Motor Nominal Efficiency:	94	percent
Fan Motor Nominal Rating (if applicable):	1.0	hp
Fan Motor Nominal Efficiency:	75	percent
Total Package Input Power at Zero Flow:		kW
Total Package Input Power at Rated Capacity and Full Load Operating Pressure:		kW
Specific Package Input Power at Rated Capacity and Full Load Operating Pressure:		kW/100 cfm

Notes:

- 1 – Measured at the discharge terminal point of the compressor package in accordance with ISO 1217, Annex C; ACFM is actual cubic feet per minute at inlet conditions.
- 2 – The operating pressure at which the Capacity and Electrical Consumption were measured for this data sheet.
- 3 – Maximum pressure attainable at full flow, usually the unload pressure setting for load/no load control or the maximum pressure attainable before capacity control begins. May require additional power.
- 4 – Total package input power at other than reported operating points will vary with control strategy.
- 5 – Tolerance is specified in ISO 1217, Annex C, as shown in table below:

Volume Flow Rate at Specified Conditions		Volume Flow Rate (%)	Specific Energy Consumption (%)	No Load/Zero Flow Power (%)
(m3/min)	(ft3/min)			
Below 0.5	Below 15	+/- 7	+/- 8	+/- 10
0.5 to 1.5	15 to 50	+/- 6	+/- 7	
1.5 to 15	50 to 500	+/- 5	+/- 6	
Above 15	Above 500	+/- 4	+/- 5	

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Service Requirement Indicators

- Routine maintenance

Pre-alarm Indicators

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Compressor Safety Shutdown Indicators

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Heat Exchanges

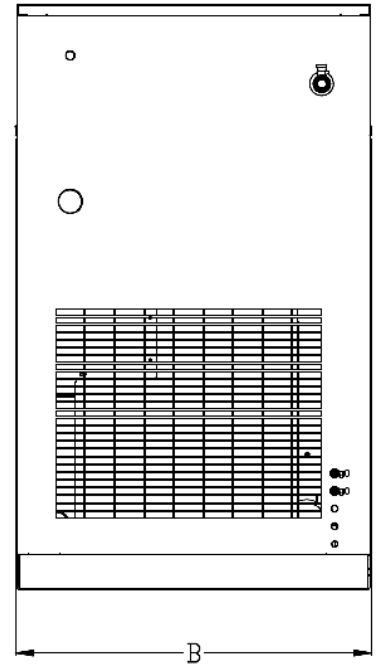
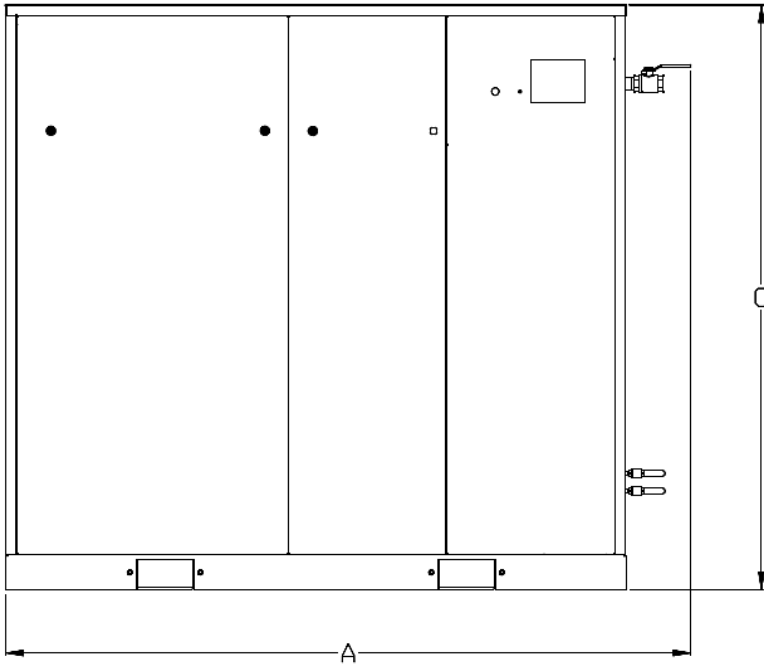
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Sound Reducing Enclosure

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Optional VFD Controller

Compressor to be equipped with an integrated VFD motor control to maximize energy efficiency of the compressor under partial load conditions.



Rotary Tooth Compressor Specification – VFD

Model	HP	Max. Pressure (PSIG)	SCFM @ 100 PSIG	Min. VFD Speed	Max. VFD Speed	BTU/Hr	dB(A) Level	System F.L.A.			Weight	Dimensions (in)			
								208V	230V	460V		A	B	C	Outlet
PCC50074R2	50	109	67-207	40%	105%	127,250	68	-	-	66	2940	77	40	65	1 ½
PCC50073R2	50	109	67-207	40%	105%	127,250	68	-	132	-	2940	77	40	65	1 ½
PCC50072R2	50	109	67-207	40%	105%	127,250	68	152	-	-	2940	77	40	65	1 ½
PCC50074R2HP	50	125	100-179	60%	100%	127,250	68	-	-	66	2940	77	40	65	1 ½
PCC50073R2HP	50	125	100-179	60%	100%	127,250	68	-	132	-	2940	77	40	65	1 ½
PCC50072R2HP	50	125	100-179	60%	100%	127,250	68	152	-	-	2940	77	40	65	1 ½

Oil-free Rotary Tooth Compressor

Standard Pressure (109 PSIG Max.) VFD – 50 HP



Model Data for Compressed Air – VFD		
Manufacturer: Powerex		
Model Number:	Date:	5/27/15
<input checked="" type="checkbox"/> Air-cooled <input type="checkbox"/> Water-cooled	Type:	Other
<input type="checkbox"/> Oil-injected <input checked="" type="checkbox"/> Oil-free	# of Stages:	2
Rated Operating Pressure:	109 psig ²	
Drive Motor Nominal Rating:	50 hp	
Drive Motor Nominal Efficiency:	94%	
Fan Motor Nominal Rating (if applicable):	1.0 hp	
Fan Motor Nominal Efficiency:	75%	
Input Power (kW)	Capacity (acfm) ^{1,4}	Specific Power (kW/100 acfm) ⁴
49.9	197	25.3
47.7	194	24.6
38.4	146	26.3
30.1	113	26.7
20.6	67	30.9
Total Package Input Power at Zero Flow: ^{3,4}	13.0 kW	

- Notes:
- 1) Measured at the discharge terminal point of the compressor package in accordance with ISO 1217, Annex C; ACFM is actual cubic feet per minute at inlet conditions.
 - 2) The operating pressure at which the Capacity and Electrical Consumption were measured for this data sheet.
 - 3) Maximum pressure attainable at full flow, usually the unload pressure setting for load/no load control or the maximum pressure attainable before capacity control begins. May require additional power.
 - 4) Tolerance is specified in ISO 1217, Annex C, as shown in table below:

Volume Flow Rate at Specified Conditions		Volume Flow Rate (%)	Specific Energy Consumption (%)	No Load/Zero Flow Power (%)
(m3/min)	(ft3/min)			
Below 0.5	Below 15	+/- 7	+/- 8	+/- 10
0.5 to 1.5	15 to 50	+/- 6	+/- 7	+/- 10
1.5 to 15	50 to 500	+/- 5	+/- 6	+/- 10
Above 15	Above 500	+/- 4	+/- 5	+/- 10

Model Data for Compressed Air – VFD		
Manufacturer: Powerex		
Model Number:	Date:	2/1/16
<input checked="" type="checkbox"/> Air-cooled <input type="checkbox"/> Water-cooled	Type:	Other
<input type="checkbox"/> Oil-injected <input checked="" type="checkbox"/> Oil-free	# of Stages:	2
Rated Operating Pressure:	125 psig ²	
Drive Motor Nominal Rating:	50 hp	
Drive Motor Nominal Efficiency:	94%	
Fan Motor Nominal Rating (if applicable):	1.0 hp	
Fan Motor Nominal Efficiency:	75%	
Input Power (kW)	Capacity (acfm) ^{1,4}	Specific Power (kW/100 acfm) ⁴
49.9	174	27.7
47.7	173	27.6
38.4	125	30.7
30.1	101	29.8
Total Package Input Power at Zero Flow: ^{3,4}	13.0 kW	

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1.5 to 15	50 to 500	+/- 5	+/- 6	+/- 10
Above 15	Above 500	+/- 4	+/- 5	+/- 10