WONCHANG

Installation
and
Operating Manual

PCX Series Compressor
Model 60

www. wonchangvacuum.com
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INSTALLATION & OPERATING MANUAL

PCX-SERIES CLAW
Compressors

PCX 60

Please read the manual before operating the compressor.

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INSTALLATION AND OPERATING MANUAL

This manual is written to cover following contact-less operating claw type compressor. The model number is stamped into the nameplate with serial number: PCX 60.

Please identify the model number and serial number when ordering parts.

1.0 INSTALLATION

1.1 General description

The PCX compressor is dry and contactless machines, enclosed in acoustic sound shied and designed to have cooling air passed through the sound shied by fan. The warm air is exhausted through the vent. The PCX is constructed in modular construction consisting of two compartments: pumping and gear chambers separated by using labyrinth seals. In the pump chamber, as two rotary claws rotate in opposite direction, the air sucked in, shall be compressed and discharged under pressure. In the gear chamber (box), two gears for synchronizing of claws rotation will be located with oil lubrication. For reduction of the noise, inlet silencer shall be installed in compressor inlet side. For a protection of overload, a pressure safety valve or regulating valve is installed in exhaust. The compressors are directly driven by a flanged motor via a coupling. The PCX Series compressors are identical in internal construction to VCX vacuum pump, but are outfitted with different inlet and outlet accessories to allow for operation as a compressor.

1.2 Unpacking

Inspect the box and compressor carefully for any signs of damage incurred in transit. Since all compressors are ordinarily shipped F. O. B. from our factory or regional warehouse, such damage is the normal responsibility of the carrier and should be reported to them.

The compressor is bolted to the skid with studs that are connected through the rubber feet of the pump. Remove the nuts from the underside do the crate and remove the compressor. Unscrew the studs from the rubber feet.

The inlet and exhaust of the compressor are covered with plastic caps to prevent dirt and other foreign substances from entering to it . Leave these caps in place until you are ready to pipe the compressor to your equipment.

1.3 Location

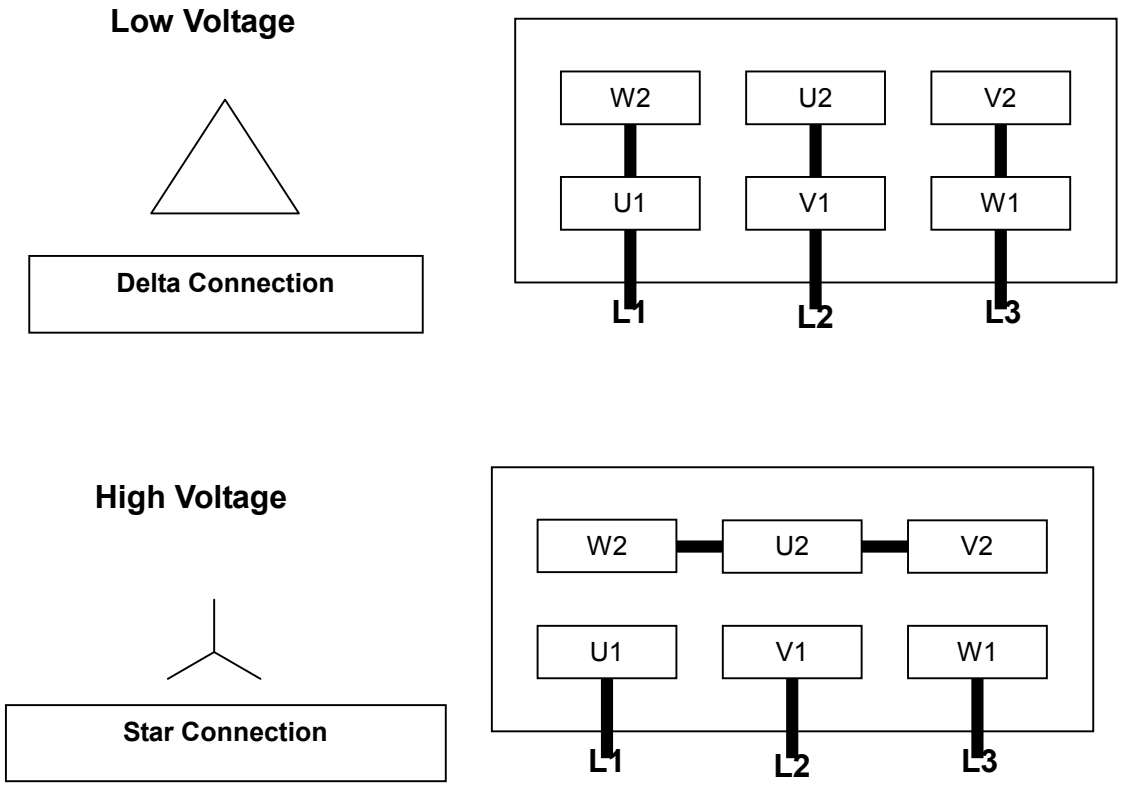
Install the compressor in a horizontal position on a level surface so that it can be evenly supported on its rubber feet. Leave 30 ~ 45 cm of access around the compressor to allow proper cooling. Also, adequate ventilation must be provided for the cooling for the compressor and motor.

Allow access to the oil sight glass in order to inspect the oil level regularly, and the oil fill and oil drain port for easy service.

1.4 Power Requirements

A schematic diagram for the electrical motor terminal connections is located in the junction box of the motor or on the motor nameplate. Typical wirings for Three Phase Motors are as below:

Wiring Scheme- Three Phase Motor



The motor must be connected according to the electrical codes through a fused switch in order to protect the motor against electrical or mechanical overload conditions. The overload of the motor starter must be set at a level equal to the full load motor current listed on the motor nameplate.

If the compressor is supplied with a motor starter, it is preset at the factory according to customer specifications. It is advisable to check that these settings are in line with the voltage at your location. If the voltage is different, please contact Wonchang for motor and starter information.

Correct direction of rotation is marked by an arrow on the motor fan housing and is counterclockwise when looking at the motor from the motor's fan side.

After electrical connections have been made, the rotation of the motor should be checked. If backward, reverse any two leads of the three at the power connection.

1.5 Pressure Connections

Use a pipe size that is at least the size of the compressor outlet connection. Smaller and long pipe lines result in a reduced compressor capacity.

Compressors operating in parallel on a common main line should have a manual or automatic operated shut-off valve or positive action check valve, installed in the pressure line.
Remove the plastic protective cap from the exhaust port prior to connection of compressor to the system.

Should process gas contain dust or other foreign particles, a suitable in line (inlet) filter should be connected to the inlet port. Consult Wonchang for recommendations.

The following thread sizes are standard on the compressors (NPT thread is available upon request)

Model	Inlet Size	Exhaust Size
PCX 60	G 1-1/4" @ Inlet Silencer	G 1" @Exhaust Connection Housing

1.6 Oil Filling on Gear Box

The pump is shipped without oil in gear box. After level installation and correct rotation has been established, fill the pump with recommended gear oil through the oil fill port. Oil level should be over 3/4 position on the oil sight glass as shown on the label.

We recommend ISO VG150 gear oil or equivalent oils.

- **Shell OMALA HD 150 or Amsoil GEAR LUBE 150 or ANDEROL # 4150**

The following table gives the approximate quantities of oil required for each model.

Pump Model	Capacity (liter)
PCX 60	0.60

Do not add fill oil with pump running! Do not overfill.

2.0 SAFETY

Please read the following safety notice carefully before operating the compressor.

2.1 General Notices

- Understand fully this installation and operating manual before operation.
- The other person except authorized operator should not operate the compressor.
- When the compressor is not properly working, it should be stopped immediately.
- Wonchang shall have no liability for any accident and failure arising from no compliance with instructions in this manual.

2.2 Warning labels and its explanation

Following warning labels are shown and attached on PCX series compressor.

2.2.1 Read and Understand a manual:

Read and understand operator's manual before using this machine.

2.2.2 Burn Hazard:

Hot surface. Do not touch.

2.2.3 Loud noise Hazard

Loud noise hazard. Ear protection must be worn.

2.2.4 Hazardous Voltage:

Disconnect power before opening. Contact causes severe electrical shock

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2.3 Location of the labels

The labels of 2.2.1 Read and Understand a manual, 2.2.2 Burn Hazard, and 2.2.3 Loud noise Hazard shall be shown on the top of sound shield of the compressor.
The label of 2.2.4 Hazardous Voltage shall be shown on the cover of motor's terminal box.

3.0 OPERATION

3.1 Start-up

Check rotation of the motor as described in paragraph 1.4 Power Requirements.
Fill the compressor with oil as described in paragraph 1.5 - Oil Filling

Run the compressor for a few minutes and then shut down. Check the oil level again and make sure the oil level is 1/2 position of oil sight glass at stop status.

Add oil though oil fill port on the top, if necessary. Compressor oil should only be added when the compressor is off

3.2 Stopping the compressor

To stop the compressor, turn off the power.

3.3 Operating Conditions

The ambient and suction air temperature must be between 5 and 40 C deg. The standard versions may not be used in hazardous areas. Also it is recommended for operating personnel who is working near compressor to wear ear protectors.

Caution: Any non compliance may lead to severe injury to persons and damage to the pump.

The pressure can be adjusted by turning knob of pressure regulating valve as marked on the top of valve. The regulating valve or safety valve is set at permissible operating pressure and will be opened to

discharge the pressure if the compressor runs over the setting pressure for a safety operation.

Caution: Do not run the compressor without regulating valve or safety valve. Do not set the regulating valve or safety valve at over permissible pressure. The compressor may be damaged severely.

4.0 MAINTENANCE

PCX-Series compressors require very little maintenance. To ensure optimum performance, the following maintenance steps should be followed:

4.1 Compressor Lube Oil

4.1.1 Oil Level

Check the oil level on monthly basis. Under normal circumstances it should not be necessary to add oil between oil changes. A significant drop in oil level means there is an oil leak. Please check the o-rings, drain plug or oil sight glass.

Check the oil level only when the compressor is shut off. Replenish oil if it drops below bottom position of the sight glass.

Caution: Do not add oil while the compressor is running, since hot oil can escape from the oil fill port.

4.1.2 Oil Type and Quantity

See section 1.5 - Oil Filling - for details on oil type and quantity

4.1.3 Oil Change

Under normal ambient conditions with proper Gear Oil, it is recommended to change the oil every 10,000 operating hours. It is necessary to make the first oil change between 500 ~1000 operating hours..

Caution: If different brand oil is being filled, the old oil must be drained completely from the gear box.

4.2 Maintenance Chart

Weekly: Check inline inlet filter element / Mesh. More often if high particulates in inlet stream
Monthly: Check the oil level, Protective Mesh.
Semi-Annually: Check cooling fans and coupling
Annually: Check Bearings / Shaft Seals, More frequently if operated at ambient temperature exceeding 20°C
Every 5,000 operating hours: Check the gear oil conditions, and if necessary, change the oils.

5.0 PROBLEM SOLVING

5.1 Problem

Compressor does not reach capacity.

5.1.1 Possible Cause

Inlet screen (mesh) of the inlet filter clogged with debris.

Remedy : check inlet filter element and clean screen (mesh) by compressed air or wash it.

5.1.2 Possible Cause

Pipe work is too long or small.
Remedy : Use the bigger diameter pipe and shorten the lines length if possible.

5.2 Problem

Compressor runs over set pressure.

5.2.1 Possible Cause

Pressure Regulator or Safety Valve set over the set point, or is out of order.
Remedy : Set the point again or replace it with new one.

5.3 Problem

Compressor does not reach the set pressure.

5.3.1 Possible Cause

Leak on the compressor or system.
Remedy : Check the leak on the compressor or system.

5.4 Problem

Compressor runs very noisy.

5.4.1 Possible cause

Contamination of the claws or chamber.
Remedy : Clean the pumping chamber and the claws.

5.4.2 Possible cause

Coupling insert is worn.
Remedy : replace coupling insert in motor/compressor coupling.

5.4.3 Possible Cause

Bearing noise
Remedy : replace bearings or call service agent for service or exchange program.

5.4.4 Possible Cause

Pressure regulator or safety valve noise
Remedy : replace Pressure regulator or Safety valve

5.5 Problem

Compressor will not start.

5.5.1 Possible Cause

Supply voltage is not proper or is overloaded. Motor starter overload settings are too low or improper; fuses are burned; wire size is to small or too long causing a voltage drop.

Remedy : check voltage supply; overload settings in motor starter for size and settings according to motor nameplate. Install proper size wire. If ambient temperature is high, use the next larger size overloads, or adjust settings 5% above motor nameplate value. *Remedy*. Repair or replace if needed or call service agent for service or exchange program.

5. 6 Problem

Compressor is running too hot abnormally.

5.6.1 Possible Cause

Not enough air ventilation to compressor.

Remedy : Make certain a sufficient amount of fresh air is supplied to the compressor.

5.7 Problem

Compressor will not operate (seized up).

5.7.1 Possible cause

Rotary Claws, Bearings or Gears stuck on..

Remedy : Call service agent for service or exchange program

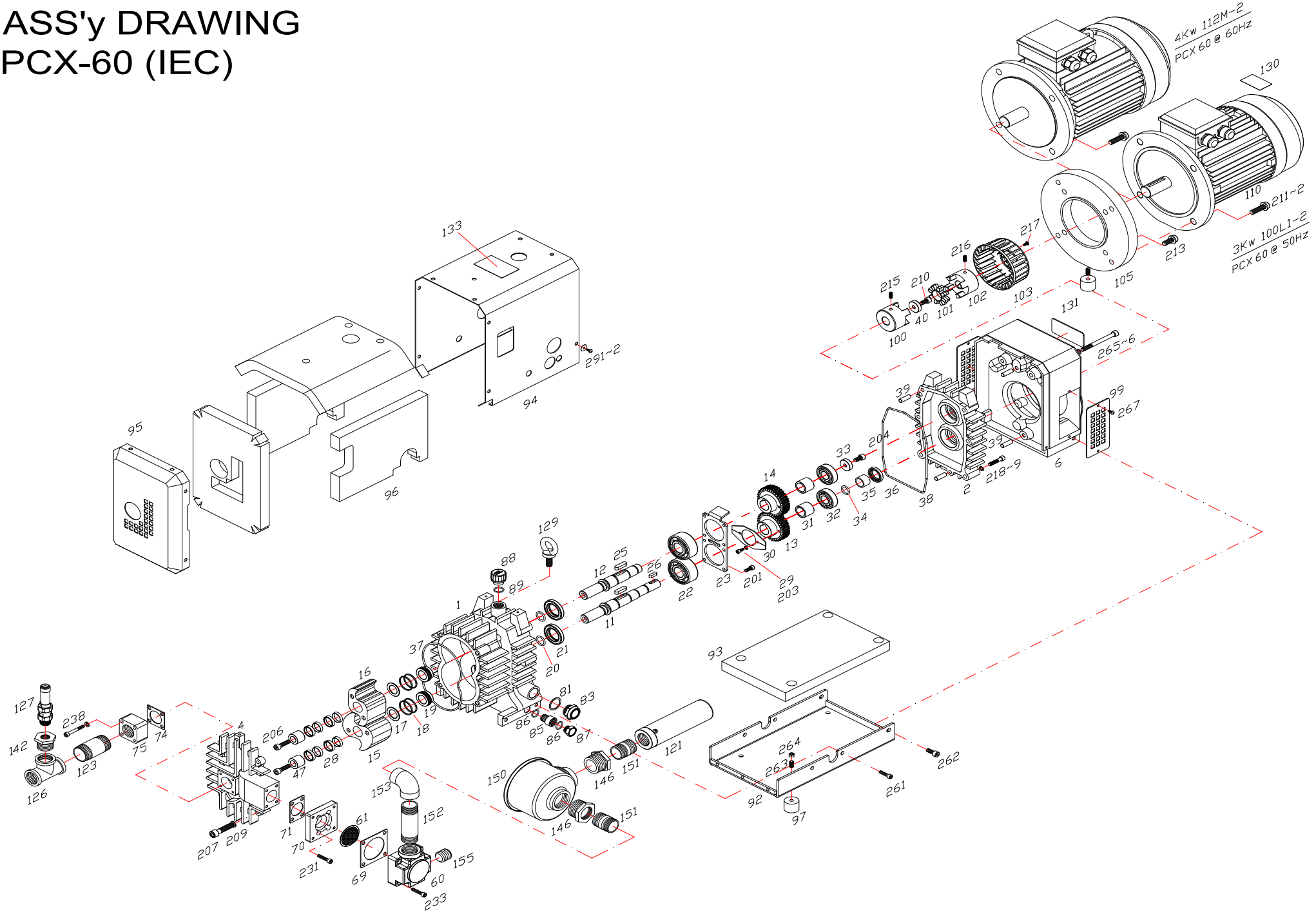
6.0 TECHNICAL DATA

Model		PCX 60
M3/ Hour	60Hz	68
	50Hz	56
Press., conti., Bar	60Hz	2
	50Hz	2
Kw	60Hz	4
	50Hz	3
RPM - 60/50Hz	RPM	3450/2850
Voltage, Available	V	208~230/460V, 220/380V. 230/400V, 400/690V
dB(A), Ave	60Hz	80
	50Hz	78
Oil Capacity (Gear box)	Ltr	0.6
Inlet/Outlet Connections	BSP(G)	1"
L* x W x H (mm)	60Hz	806 x 297 x 461
	50Hz	781 x 297 x 461
Amb. Operating Temp(ºC)	5ºC ~40ºC	
Approx. *Weight (Kg).	60Hz	75
	50Hz	69
Accessories	Pressure Regulator, Safety Valve, Inlet Silencer, and Inlet Filter	

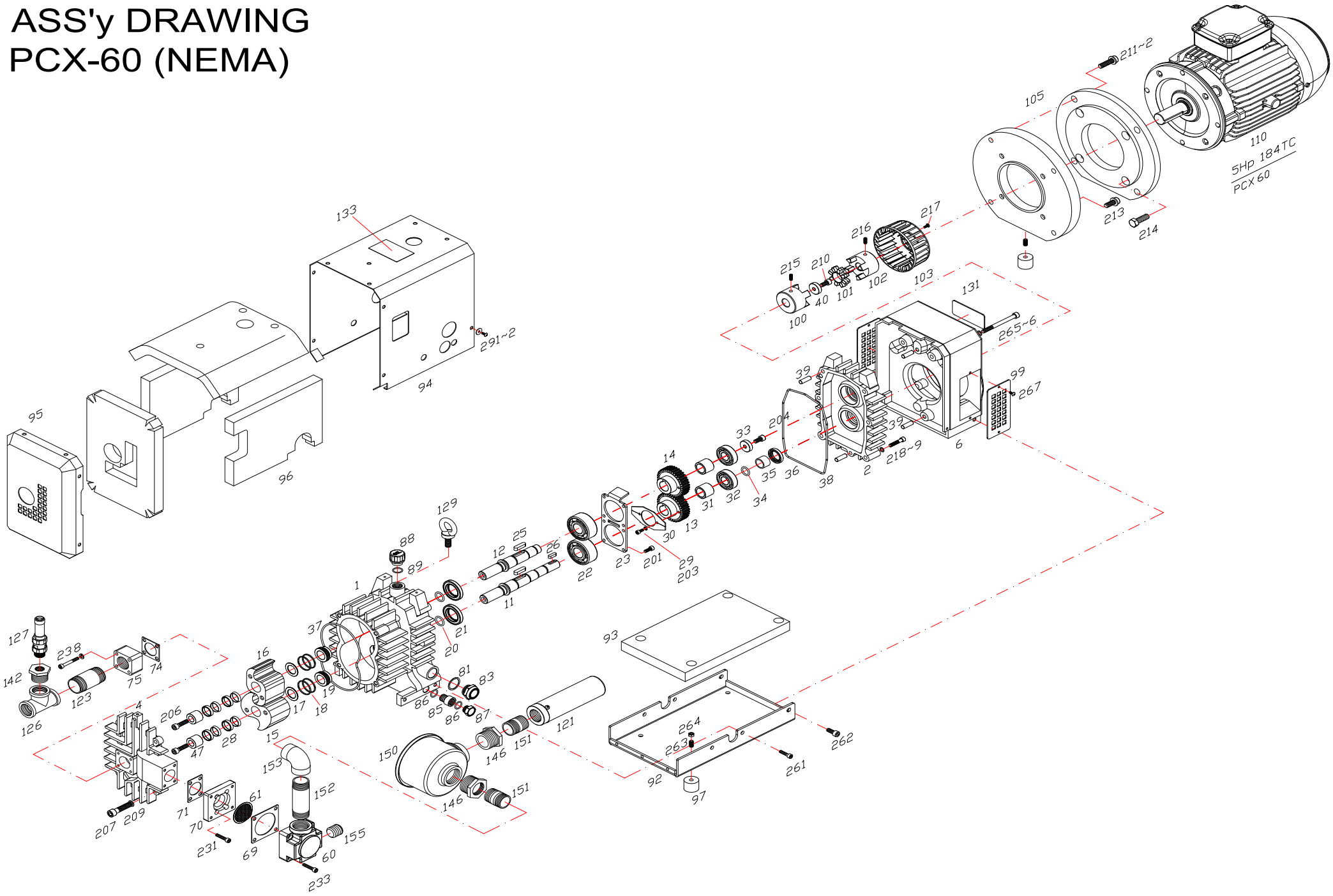
* Varies to motor mfg / NPT threads available upon request

Note: Ultimate Continuous vacuum operation will be possible within ambient operating temperature between 5~40ºC.

ASS'y DRAWING
PCX-60 (IEC)



ASS'y DRAWING
PCX-60 (NEMA)



PCX 60 PART LIST

POS#	Description	Q'ty	POS#	Description	Q'ty	POS#	Description	Q'ty
1	Gear Box Housing	1	69	Gasket, Inlet Connection Housing	1	150	Inlet Filter, IF-130	1
2	Gear Box Cover (rear)	1	70	Flange Adapter, Inlet	1	151	Pipe, extension, Short, inlet 1"	2
4	Pump Housing Cover 1 (End Plate)	1	71	Gasket, Flange	1	152	Pipe, extension, inlet 1'	1
6	Fan Housing	1	74	Gasket, Silencer	1	153	Elbow 1"	1
11	Shaft 1	1	75	Spacer, block	1	155	Plug 3/4"	1
12	Shaft 2	1	81	Gasket, Oil Sight Glass	2	201	Hex. Socket Head Cap Screw / M16 x 15	8
13	Gear 1	1	83	Oil Sight Glass	2	203	Hex. Socket Head Cap Screw / M5 x 12	2
14	Gear 2	1	85	Pipe, for Drain Pulg	1	204	Hex. Socket Head Cap Screw / M8 x 25	1
15	Rotor 1	1	86	O-ring, Drain Plug	2	206	Hex. Socket Head Cap Screw / M8 x 25	2
16	Rotor 2	1	87	Drain Plug	1	207	Hex. Socket Head Cap Screw / M10 x 100	4
17	Spacer	2	88	Oil filler Breather, Plastic	1	209	Washer, Spring Lock, 10mm	4
18	Piston Ring	4	89	O-Ring for Oil filler	1	210	Hex. Socket Head Cap Screw / M8 x 25	1
19	Sleeve	2	92	Shield Cover, Bottom	1	211	Hexagon Bolt / M12 x 35	4
20	O-Ring	2	93	Accoustic Mat for Shield Cover, Bottom	1	212	Washer, Spring Lock, 12mm	4
21	Shaft Seal,	2	94	Shield Cover, Side (PCX)	1	213	Hexagon Bolt / M12 x 25	4
22	Bearing,	2	95	Shield Cover, Front (PCX)	1	214	Hexagon Bolt (NEMA only)	4
23	Bearing cover	1	96	Accoustic Mat for Shield Cover, front and Side (PCX)	1	215	Set Screw / M8 x 10	2
25	Key, for Gear	2	97	Foot, Rubber	3	216	Set Screw / M8 x 10	2
26	Key, for Coupling	1	99	Grill for Fan	2	217	Round Head Bolt / M5 x 12	5
28	Power Lock	4	100	Coupling, Pump Side	1	218	Hex. Socket Head Cap Screw / M10 x 60	6
29	Washer, Spring Lock, 6mm	2	101	Insert, Coupling	1	219	Washer, Spring Lock, 10mm	6
30	Flinger	1	102	Coupling, Motor Side	1	231	Hex. Socket Head Cap Screw / M8 x 20	4
31	Sleeve	2	103	Fan, new, Plastic	1	233	Hex. Socket Head Cap Screw / M6 x 65	4
32	Bearing,	2	105	Flange Adapter	1	238	Hex. Socket Head Cap Screw / M6 x 35	4
33	Locking Disk	1	110	Motor	1	261	Hex. Socket Head Cap Screw / M10 x 15	4
34	O-Ring	1	121	Silencer, Inlet	1	262	Hex. Socket Head Cap Screw / M x	2
35	Sleeve	1	123	Pipe, extension, medium, exhaust 1"	1	263	Set Screw / M8 x 20	4
36	Shaft Seal,	1	126	Tee 1"	1	264	Hexagon Nut / M8	4
37	O-Ring, Compressor cover	1	127	Press Regulator (relief valve)	1	265	Hex. Socket Head Cap Screw / M10 x 110	2
38	O-Ring, Gear Box cover	1	129	Eye Bolt	1	266	Washer, Spring Lock, 10mm	2
39	Dowel Pin	4	130	Label, Direction Arrow	1	267	Round Head Bolt/ M5 x 10	4
40	Locking Disk	1	131	Name Plate	1	291	Round Head Bolt / M5 x 10	11
47	Locking Disk, side Rotor	2	133	Lable, read manul	1	292	Washer, Flat, 5mm	11
60	Inlet flange, Upper Housing	1	142	Bushing 1" x 1/2"	1			
61	Inlet screen (Conical)	1	146	Bushing 1-1/4" x 1"	2			

Acquisition of Certification

Registered ISO 9001:2008 / 14001:2004

RoHS COMPLIANT

REACH The new EU chemicals legislation

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