

WONCHANG

**Installation
and
Operating Manual**

**PCX Series Compressor
Models 105 & 155**

INSTALLATION & OPERATING MANUAL

PCX-SERIES CLAW Compressors

PCX 105 & 155

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 105 & 155

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 shield and designed to have cooling air passed through the sound shield 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 of 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

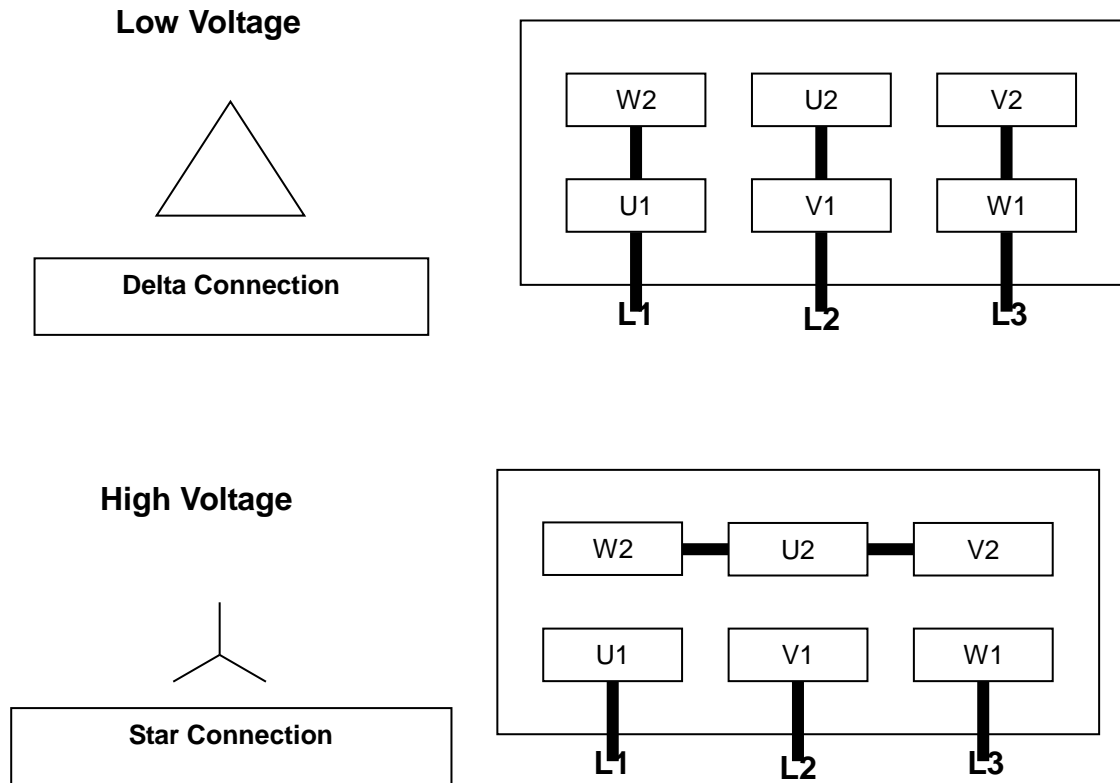
Install the compressor in a horizontal position on a level surface so that it can be evenly supported on its rubber feet. Leave 30 ~ 45 cm of access around the compressor to allow proper cooling. Also, adequate ventilation must be provided for the cooling for the compressor and motor.

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)

<u>Model</u>	<u>Inlet Size</u>	<u>Exhaust Size</u>
PCX 105 & 155	G 1-1/2" @ Inlet Silencer	G 1-1/2" @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.

<u>Pump Model</u>	<u>Capacity (liter)</u>
PCX 105 & 155	0.4

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



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 Inline (Inlet) Filter

Check inline (inlet) filter on a weekly basis. The filter cartridge should be cleaned or replaced when dirty. Consult service agent for replacement element information.

Caution: Depending on the mounting position of the filter, be careful not to allow accumulated foreign material to fall in the pump suction inlet when removing the filter cartridge. Horizontal filter installation is recommended to prevent this.

4.3 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



Inspection hole with G1" plug: Check the coupling and its insert, and fan through this hole regularly. (The endoscope(WireCam) can be used with Smart Phone software)

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 too 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..

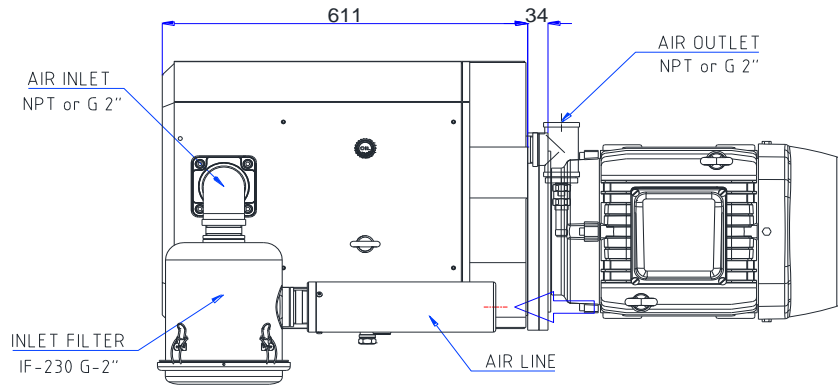
Remedy : Call service agent for service or exchange program

6.0 TECHNICAL DATA

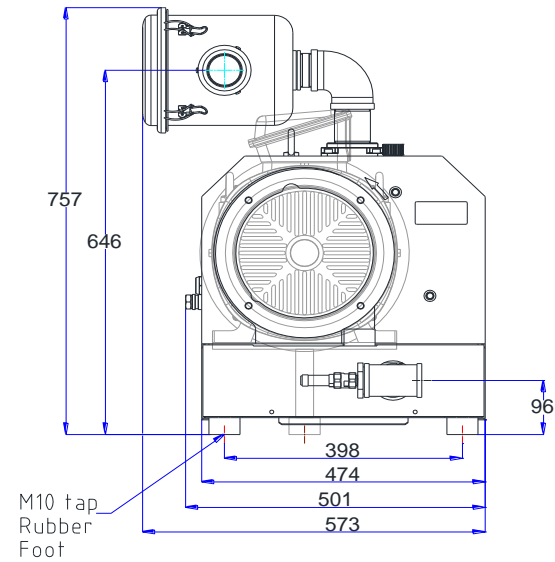
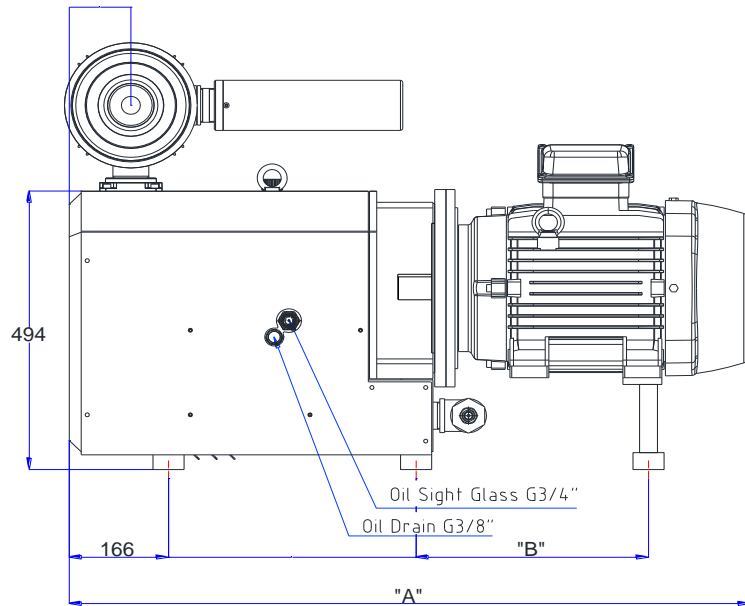
Model		PCX 105			PCX 155	
M3/ Hour	60Hz	120			180	
	50Hz	100			150	
Press. Conti., Bar	60Hz	~	1.4	2.2	1.2	2
	50Hz	0.8	1.4	2.2	1.2	2
Kw	60Hz	~	5.5	7.5	7.5	9.2
	50Hz	3	4	5.5	5.5	7.5
RPM - 60/50Hz	RPM	3450/2850				
Voltage, Available	V	208~230/460V, 220~240/380~420V, 400/690V				
dB(A), Max +- 3 tolerance	60Hz	80			82	
	50Hz	79			80	
Oil Capa (Gear box)	Ltr	0.4				
Inlet / Outlet Conn.	**BSP(G)	1-1/2"				
W x H (mm)		435 x 643				
L * (mm)	60Hz	~	903	903	903	941
	50Hz	837	862	903	903	903
Amb. Operating Temp	(°C)	5°C ~ 40°C				
Approx. *Weight (Kg).	60Hz	142			150	
	50Hz	139			142	
Accessories		Pressure Regulator, Safety Valve, Inlet Silencer, and Inlet Filter				

Note: 1) * Length varies to motor mfg 2) **NPT threads available upon request

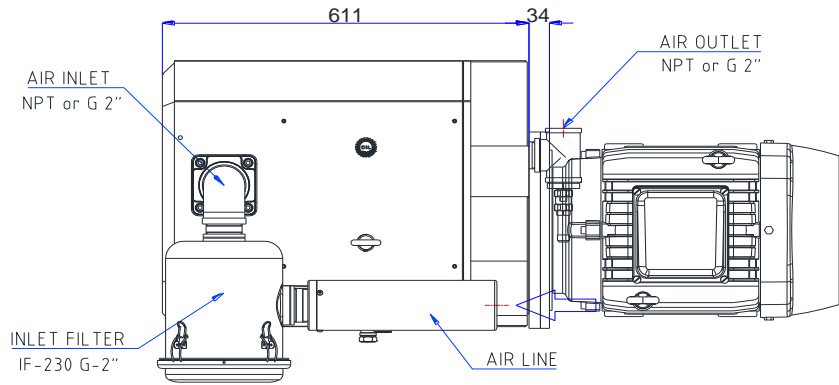
PCX-105



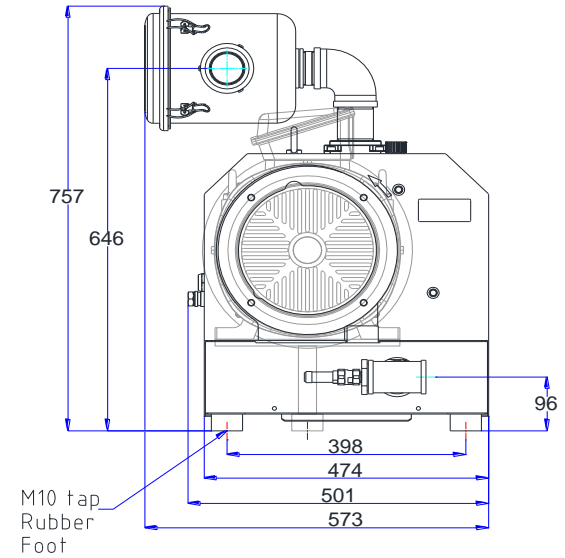
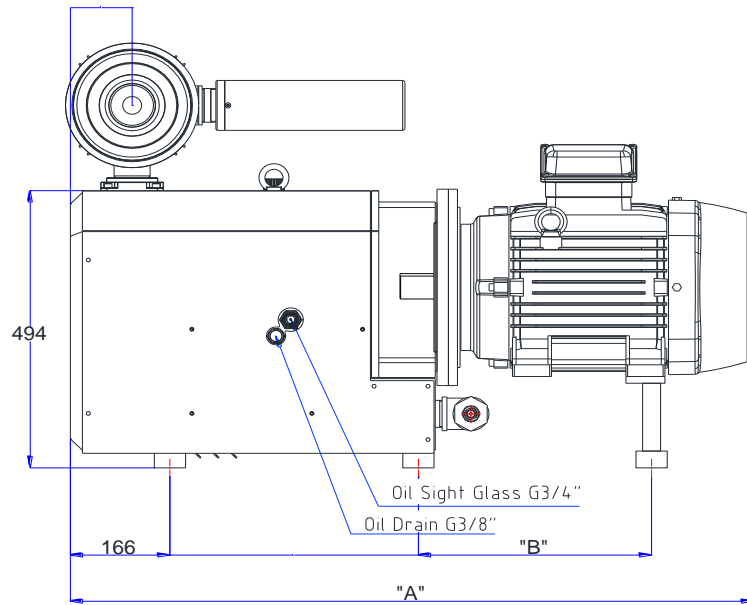
	"A"	"B"
50Hz, 7.5Kw	961mm	-
60Hz, 9.2Kw	1,001mm	-
50Hz, 11Kw	1,171mm	379mm
60Hz, 15Kw	1,171mm	379mm
60Hz, 15Hp	1,139mm	389mm
60Hz, 20Hp	1,183mm	433mm
60Hz, 25Hp	1,239mm	468mm



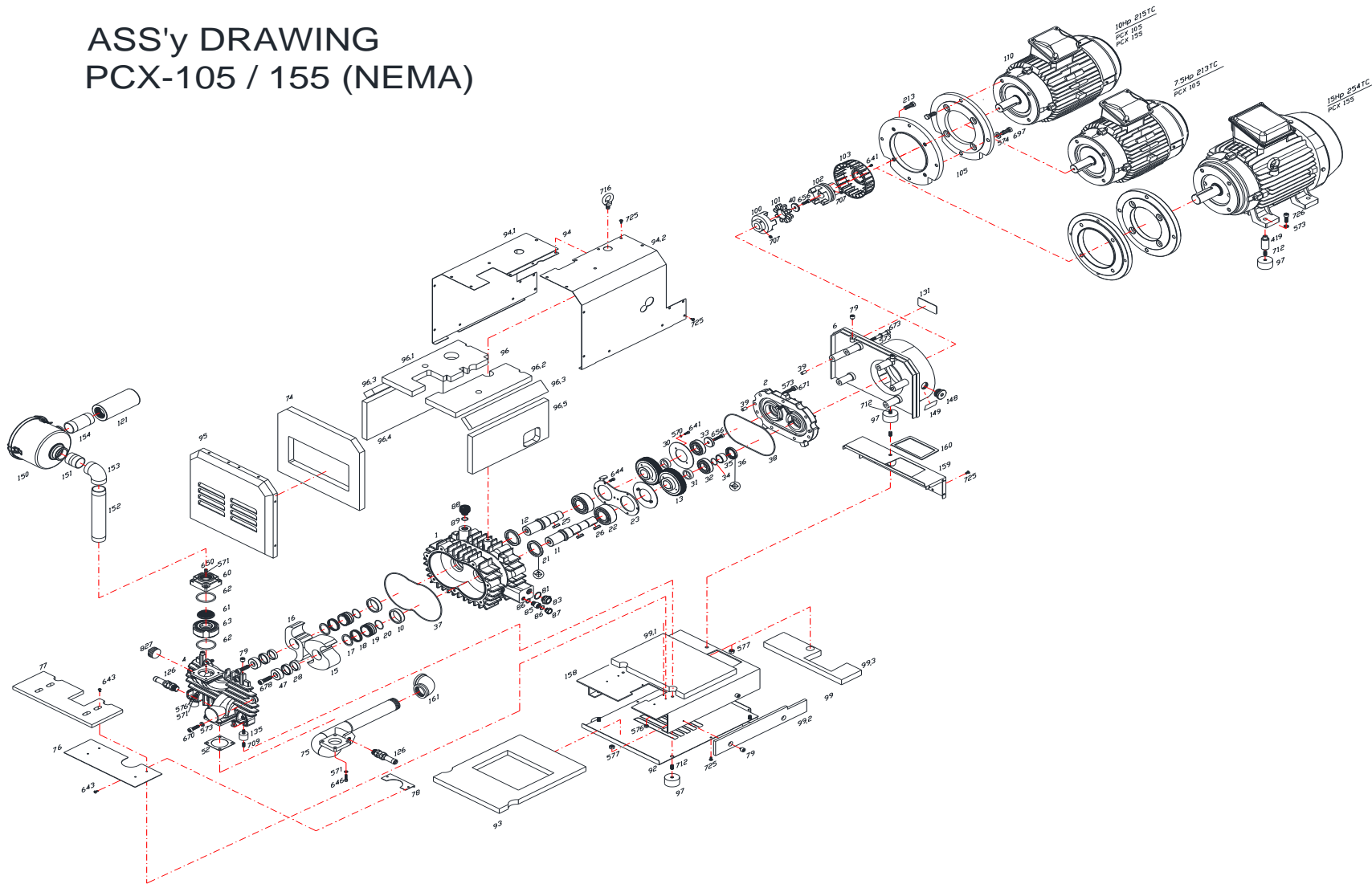
PCX-155



	"A"	"B"
50Hz, 60Hz 6.5Kw	903mm	280mm
50Hz, 7.5Kw	903mm	280mm
60Hz, 9.2Kw	941mm	321mm
60Hz, 10Hp	974mm	337mm
60Hz, 15Hp	1,064mm	394mm



ASS'y DRAWING PCX-105 / 155 (NEMA)



PCX-105/155 PART LIST

Pos. No.	Description	Q ty	Pos. No.	Description	Q ty	Pos. No.	Description	Q ty
1	Gear Box Housing	1	77	Accoustic mat	1	151	Pipe, extension, Short, inlet	1
2	Gear Box Cover (rear)	1	78	Plate (back)	1	152	Pipe, extension, Short, inlet	1
4	Pump Housing Cover 1 (End Plate)	1	79	Support isolator	8	153	Elbow	1
6	Fan Housing IEC 100 B5	1	81	Gasket, Oil Sight Glass	1	154	Pipe, extension, inlet	1
10	Sleeve	2	83	Oil Sight Glass	1	158	Base	1
11	Shaft 1	1	85	Pipe, for Drain Pulg	1	159	Cover, Exhaust	1
12	Shaft 2	1	86	O-ring, Drain Plug	2	160	Seal	1
13	Gear	2	87	Drain Plug	1	161	Tee, Exhaust	1
15	Rotor 1	1	88	Oil filler Breather, Plastic	1	166	Bushing	1
16	Rotor 2	1	89	O-Ring for Oil filler	1	419	Spscer for Foot, for IEC motor PCX (high)	2
17	Spacer	2	92	Shield Cover, Bottom	1	570	Washer, Spring Lock	4
18	Piston Ring	4	93	Accoustic Mat for Shield Cover, Bottom	1	571	Washer, Spring Lock	4
19	Sleeve	2	94	Shield Cover, Side (set)	1	572	Washer, Spring Lock	6
20	O-Ring	2	94.1	Shield Cover, Side (left)	1	573	Washer, Spring Lock	18
21	Shaft Seal,	2	94.2	Shield Cover, Side (right)	1	574	Washer, Spring Lock	4
22	Bearing,	2	95	Shield Cover, Front	1	576	Hexagon Nut	2
23	Bearing cover	1	96	Accoustic Mat for shield Cover, Side (set)	1	577	Hexagon Nut	5
25	Key, for Gear	2	96.1	Accoustic Mat for shield Cover, Side (left)	1	641	Hex. Socket Head Cap Screw	9
26	Key, for Coupling	1	96.2	Accoustic Mat for shield Cover, Side (right)	1	643	Hex. Socket Head Cap Screw	4 , 6
28	Power Lock	2	96.3	Accoustic Mat for shield Cover, Side (middle)	2	644	Hex. Socket Head Cap Screw	8
30	Flinger	2	96.4	Accoustic Mat for shield Cover, Side (under left)	1	646	Hex. Socket Head Cap Screw	4
31	Sleeve	2	96.5	Accoustic Mat for shield Cover, Side (under right)	1	650	Hex. Socket Head Cap Screw	4
32	Bearing,	2	97	Foot	5	656	Hex. Socket Head Cap Screw	2
33	Locking Disk, Shaft 2	1	99	Accoustic Mat for base (set)	1	670	Hex. Socket Head Cap Screw	7
34	O-Ring	1	99.1	Accoustic Mat for base (on the base)	1	671	Hex. Socket Head Cap Screw	7
35	Sleeve	1	99.2	Accoustic Mat for base (side)	2	673	Hex. Socket Head Cap Screw	4
36	Shaft Seal,	1	99.3	Accoustic Mat for base (inside)	1	678	Hex. Socket Head Cap Screw	2
37	O-Ring, Compressor cover	1	100	Coupling, Pump Side	1	695	Hexagon Bolt	4
38	O-Ring, Gear Box cover	1	101	Insert, Coupling	1	697	Hexagon Bolt	4
39	Dowel Pin	4	102	Coupling, Motor Side IEC	1	707	Set Screw	4
40	Locking Disk, Shaft 1	1	103	Fan	1	709	Set Screw	4
47	Locking Disk, side Rotor	2	105	Flange Adapter NEMA	1	712	Set Screw	6
52	Gasket, Exhaust Silencer	1	105	Flange Adapter IEC	1	716	Eye Bolt	1
60	Inlet flange, Upper Housing	1	110	Motor	1	725	Round Head Bolt	31 , 29
61	Inlet screen (Conical)	1	121	Silencer, Inlet	1	726	Hex. Socket Head Cap Screw	2
62	O-Ring, Inlet Flange, low and upper part	2	126	Safety valve	1	827	Plug 1-1/4"	1
63	Inlet flange, Lower housing	1	130	Label, Direction Arrow	1	102 + 103	Coupling, Motor Side IEC + FAN SET	1
74	Accoustic mat for PCX front cover	1	131	Name Plate	1	95.A	Shield Cover, Front	1
75	Bracket with Tee	1	135	Foot	2	95.B	Shield Cover, Front	1
76	Plate (front)	1	150	Inlet Filter	1			



Acquisition of Certification

ROHS **REACH**
COMPLIANT The new EU chemicals legislation

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