

Operating & Maintenance Manual

JEC JP Series

Centrifugal Pumps



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Thank you for purchasing a JEC Product!

This manual contains disassembly and assembly instructions, maintenance procedures, troubleshooting and a complete parts list for all JP series Centrifugal Pumps designed and manufactured by JEC Ltd. South Korea.

READ THIS MANUAL carefully to learn how to service these pumps. Failure to do so could result in person injury or equipment damage.

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SAFETY

DO'S & DON'TS

- DO** read and understand these instructions before installing or using the pump.
- DO** use JES spare parts when replacing a component of the pump.
- DO NOT** services the pump while it is running.
- DO NOT** place the pump in an application where the service ratings are exceed.
- DO NOT** modifies the pump. Modifying the pump creates unsafe conditions and voids all warranties.

SAFETY PRECAUTIONS WHEN INSTALLING PUMP

- DO** use an authorized electrician when connecting the pump.
- DO** observe the mechanical limits of the pump (refer to the pump performance sheet).
- DO** install a throttling valve in the discharge line.
- DO NOT** installs a throttling valve in the suction line.

SAFETY PRECAUTIONS WHEN OPERATING PUMP

- DO NOT** touches the pump or the lines when pumping hot fluids or when performing Clean In Place (CIP) procedures.
- DO NOT** run the pump with BOTH the suction inlet and discharge outlet blocked. Running the pump with the inlet the blocked will cause serious damage to the pump.
- DO NOT** checks pump rotation with liquid in the pump.
- DO NOT** runs the pump with the impeller rotating in the wrong direction. Rotating the impeller in the wrong direction may cause damage to the pump.
- DO NOT** operates the pump without the motor shroud.

SAFETY PRECAUTIONS WHEN SERVICING PUMP

- DO** ensure the pump is cool to touch before performing service.
- DO** relieve all pressure and drain all fluids from pump and connected piping before performing service.
- DO ENSURE POWER TO THE UNIT HAS BEEN UNPLUGGED PRIOR TO PERFORMING ANY PUMP MAINTENANCE OR CLEANING.**
- DO** exercise caution and wear protective clothing when using lye or acid for cleaning.

TECHNICAL INFORMATION

TECHNICAL DATA

SPECIFICATIONS

Maximum Inlet Pressure -----	10 bar (1,000 kpa, 145 PSI)
Maximum Discharge Pressure -----	8 bar (800 kpa, 116 PSI)
Maximum Flow rate -----	100 m ³ /hr (440 US GPM)
Temperature Range -----	-10 C to 150 C (14 F to 302 F)
Noise Level -----	60 ~ 80 db

MATERIALS

Product Wetted Steel Parts -----	AISI 316 (standard)
Product Wetted Seals -----	EPDM (standard)
Alternative Seals -----	NBR, VITON, PTFE Encapsulated, Perfluoroelastomer

SHAFT SEALS

Seal type -----	Single and Double Flushed
Maximum Flushing Water Pressure -----	Maximum 1 bar (14 PSI)
Flushing Water Consumption -----	0.25~0.5 liter/min (30~60 cubic inches/min)
Stationary Seal ring Material -----	Silicone Carbide
Rotating Seal Ring Material -----	Carbon (standard) or Silicone Carbide
O-ring material -----	EPDM (standard)

MOTOR INFORMATION

Uses standard IEC B5 flange motors up to 7.5Kw and over uses B3 B5 flange motors.
Options include drip proof, explosion proof motors.

VOLTAGE AND FREQUENCY

3 phase, 50Hz, 220/415 VAC -----	1,500/3,000 RPM
3 phase, 60Hz, 220/440 VAC -----	1,800/3,600 RPM

INSTALLATION

INSTALLATION

1. Mounting surface should be flat and level.
2. The suction line should be kept as short as possible and present minimum friction loss.
3. Suction and discharge lines must be fully supported and installed so that no expansion or shock forces act on the pump which could lead to distortion.
4. Ensure sufficient clearance around the motor and pump.

START UP

1. Before connecting the suction and discharge pipe work the entire system must be thoroughly cleaned to prevent damage from welding, grinding and other residues.
2. Before starting, bump the motor to check if the motor fan is rotating clockwise when seen from the motor back. If the motor fan cannot be seen, look through the pump case adaptor after take off motor shroud. (Bump means to momentarily apply power to the motor and then immediately remove power).
3. Direction of rotation must only be checked with a completely filled system. Where double mechanical shaft seals are installed the flush supply must be operational. Any dry running will result in seal damage.
4. The motor rating plate should be checked to ensure that it is in accordance with the available electrical supply. It is essential that the full load current is not exceeded to prevent motor overload.
5. Before start up any safety guards required by local statutory regulations should be fitted.

Pay attention to circumstances that could indicate pump cavitations:

1. Low pressure in the suction line due to line restrictions.
2. Air in the suction inlet line.
3. Pumping temperature is too high.
4. Pump is over sized.

MAINTENANCE

DISASSEMBLY

REMOVING PUMP PARTS

Prior to removal of pump, the shut-off valves in the suction and discharge pipe work must be closed. If there is any risk that product may harden, crystallize or freeze in the pump it should be thoroughly drained and cleaned immediately after use. Similar attention must apply to the seal flush system. Remove power before servicing to prevent unintended start of the pump by an authorized electrician.

1. Remove casing (1) after remove case clamp (6).



2. Remove impeller cap nut (4) from stub shaft by wrench. Wrench size is 22mm.



3. Remove impeller (5).



4. Remove rotating seal part and spring



5. Remove back plate (2) from case adaptor (7) by removing three screws (30) securing back plate to adaptor.

6. Do carefully remove back plate from adaptor so that do not have stationary seal damage from stub shaft.



7. Remove seal gland (12) on back of casing by removing four screws (28).



8. Remove stationary seal and O-ring (14, 18).



9. If disassembling stub shaft from motor: loosen screws (25) by 5mm Allen wrench (6mm from 5.5kw motor) remove it from motor shaft after tightened a screw (26) oppositely.



For JP205 model only,



17mm spanner

In case of single seal,
As shown in left, Motor shaft shall be fixed with 17mm spanner without moving and then, impeller can be disassembled.
(JP205 has an extend motor shaft which is directly connected to impeller)

In case of double seal,
As shown in above, after disassembling cooling fan cover and cooling fan, fix a motor shaft with a vise. And then, impeller can be disassembled.

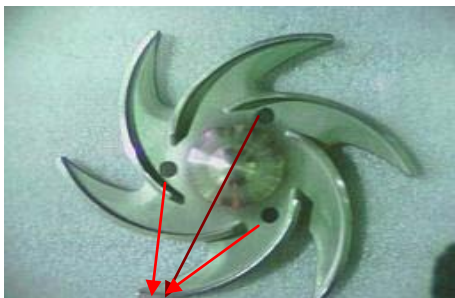


Cooling fan



Vise

* Special tool for impeller remove would be useful to disassemble the impeller as shown below.



Hole for tool



INSPECTION

1. Inspect O-rings and seals for reuse. Worn O-rings and seals should be replaced.
2. Inspect seal faces for scoring or cracks. Replace any seal faces that are damaged.
3. Inspect stub shaft and other metal parts for wear or damage.
4. Inspect impeller for damage from cavitations. Cavitations damage appears as pitting on the impeller surfaces.

ASSEMBLY

PUMP PARTS ASSEMBLY

“JEC pumps must only be operated with genuine JEC spares”.

1. Loosen screws (25) and slightly tighten jack screw (26) in stub shaft.
2. Place stub shaft with parts assembled on the shaft.
3. Tighten screws (25) evenly after loosen jack screw (26) but not more than to allow the stub shaft to be moved by gently tapping with a rubber or plastic tipped mallet. This will allow for possible adjustment during setting of impeller clearance.



4. Assemble back plate (2) to pump adaptor with three screws (30). **Do not assemble stationary seal components into back plate. These parts should be assembled after the impeller clearance has been adjusted. Perform impeller clearance adjustment without seals to prevent any damage to the stationary seals.**

5. Place impeller (5) and screw cap nut (4) without shaft O-ring (22).

SETTING IMPELLER CLEARANCES WITHOUT SEALS

7. Using a feeler gauge set the clearance between impeller back and back plate (2) to 0.6~0.7mm.



8. Remove impeller after tighten screws (25) securing the stub shaft to 15Nm.
9. Remove back plate (2).
11. Place front cover of motor shroud and screws (29).

12. Install O-ring (18), stationary seal (14) and seal gland (12) into back plate using four Allen screws (28) and washers.
13. Install back plate (2) to shaft and pump adaptor carefully and tighten screws (30) securing to pump adaptor. If flushed seal should be place flush seal to stub shaft before place back plate. **Before assembly, lubricate O-rings and gaskets with a food grade silicone spray or equivalent. And it is important that the surface of the rotating seal be wiped clean of any foreign matter (dirt, dust, oil from fingers, etc.) prior to assembly. Clean surface in accordance with good shop practice.**
14. Install rotating seal parts onto the stub shaft and impeller. Ensure the drive pin of spring enters not only the notch on the rotating seal ring but back of the impeller also when the spring is compressed.



15. Install impeller cap nut (4) on stub shaft after place spring washer (31) and O-ring (23). Note that impeller cap nut is metric. Wrench size is 22mm and torque need to 21Nm.
16. Install case O-ring (21) in back plate.
17. Install case (1) on back plate and clamp (6) tighten.

TROUBLESHOOTING

JEC pumps are high-quality products designed for trouble-free operation and long operating life. However, occasional problems can arise. The troubleshooting chart, figure 4, provides a means of determining and correcting most of your pump problems. Should problem arise where the remedies listed in the troubleshooting chart do not cure the situation, pump cavitations, such as noisy operation, insufficient discharge and vibration, can result when a pump is not properly applied. If these conditions are present, check the system and re-evaluate the application.

Trouble	Problem Cause	Remedy
1. No or insufficient discharge	a. Pump speed too slow.	a. Correct wrong or poor electrical connections.
	b. Wrong direction of rotation.	b. Reverse a three-phase motor by switching any two of the three power leads at the motor or controller.
	c. Closed valve, obstruction in discharge piping.	c. Open valve and clear obstruction.
	d. Impeller diameter too small.	d. Replace impeller.
2. Excessive power consumption	a. Products viscosity too high.	a. Check the application.
	b. Impeller contact to case.	b. Re-set clearance according to the in these instructions.
	c. High pump capacity.	c. Check the application.
	d. Bearings are damage.	d. Replace bearing.
3. Pump is noisy	a. Impeller contact to case.	b. Re-set clearance according to the in these instructions
	b. Bearings are damage.	b. Replace bearing.
	c. NPSHa is too low.	c. Check the system and re-evaluate the application.
	d. Pressure loss in suction line too high.	d. Check the system and re-evaluate the application.
	e. Pump cavitation.	e. See cavitation clause in the start-up section.
	f. Solid particles in pump.	f. Remove case and check for particles in the pump.
4. Pump leaks	a. O-ring seal is worn or defective.	a. Replace O-ring seal.
	b. Mechanical seal is worn or defective.	b. Replace mechanical seal.

If assistance is required, please contact your local sales office with the following information:

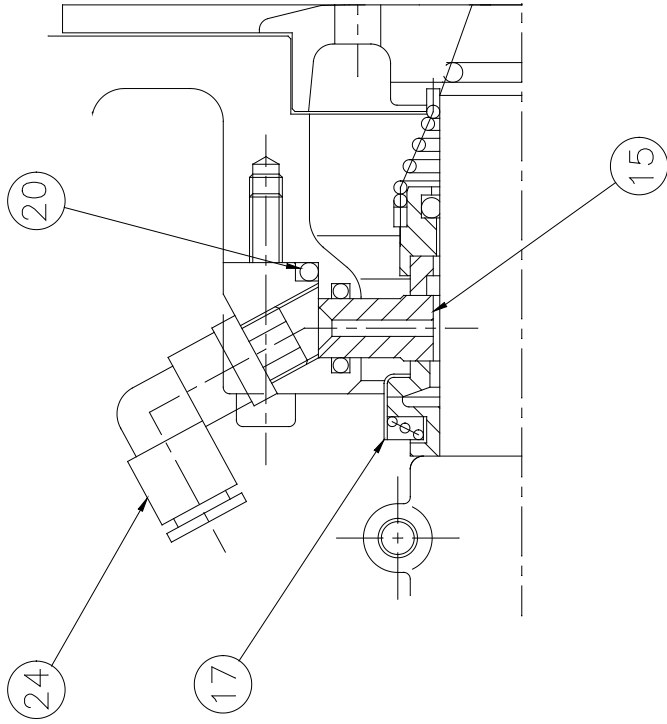
1. Operating conditions.
2. Accurate description of default.
3. Model of pump and serial number.
4. If possible installations sketch of pump system.

PARTS LIST

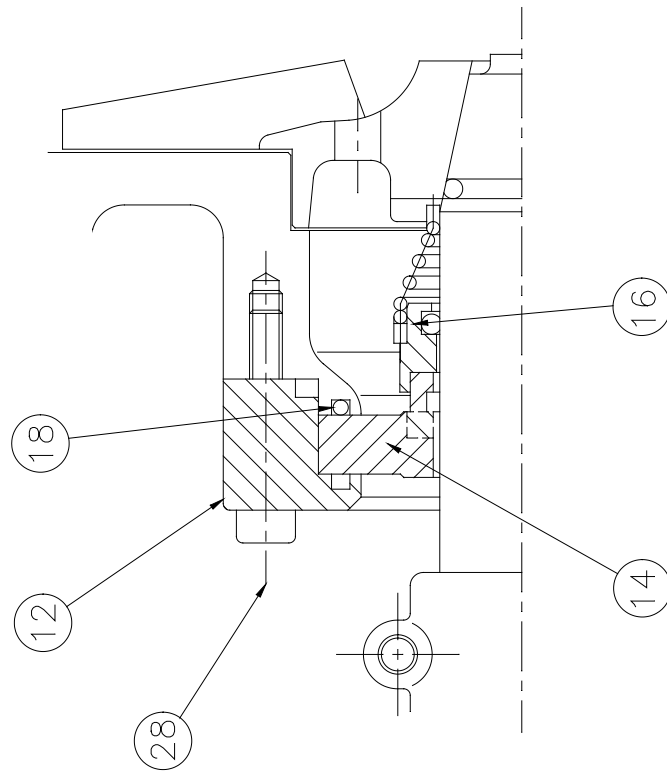
All orders for repair parts must contain the following.

1. Complete model number (located on nameplate).
2. Pump serial number (located on nameplate).
3. Description and part number from the parts list.

No.	Description	Q'ty	No.	Description	Q'ty
1	Case	1	18	O-ring for single seal	1
2	Back plate	1	19	O-ring for double seal	1
3	Shaft	1	20	O-ring for seal gland	1
4	Cap nut	1	21	O-ring for case	1
5	Impeller	1	22	O-ring for shaft	1
6	Clamp	1	23	O-ring for cap nut	1
7	Adaptor	1	24	Flush connector	2
8	Tripod leg	1	25	Wrench bolt	2~4
9	Leg feet	1	26	Wrench bolt	1
10	Front cover	1	27	Hex bolt	4
11	Motor cover	1	28	Wrench bolt	4
12	Single seal gland	1	29	Wrench bolt	3
13	Double seal gland	1	30	Wrench bolt	3
14	Stationary seal for single	1	31	Spring washer	1
15	Stationary seal for double	1	32	Motor	1
16	Rotating seal	1	35	Round head screw	3
17	Rotating seal for flush	1			



Water flushed version



Standard version