

JEC **JRZP SERIES**

Hygienic circumferential piston pumps

Operation and maintenance manual

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GENERAL

GENERAL INFORMATION

Thank you for your purchasing JEC products!

This manual is a part of the JRZP series Circumferential Piston Pumps describes safe and appropriate operation during operating and in all life cycles.

This contains instructions for installation, operation, disassembly and assembly, maintenance procedures, troubleshooting and a complete parts list for all.

Read and completely understand this manual to learn how to service these pumps prior to operating or servicing product and observe to pay special attention to the warnings.

This must always be available at the installation location since no liability will be assumed for any damage or operational malfunctions arising from non-compliance with these operating instructions.

INTENDED USE

The pump is only to be used for the media pumping agreed in the applicable data sheet or specification. Any other application beyond the intended use or conversion of the pump without written agreement with the manufacturer shall be deemed to be not in accordance with the intended use.

The pump may only be started up for the first time if it has been ensured that all safety devices are completely fitted and functional.

If any areas are subject to have the risk of explosion, the relevant explosion-proof designed pumps to be used.

Intended use also covers compliance with the conditions of operation, servicing and maintenance specified by the manufacturer.

The pump is only to be put into operation filled with medium to be pumped.

Before starting up ensure that;

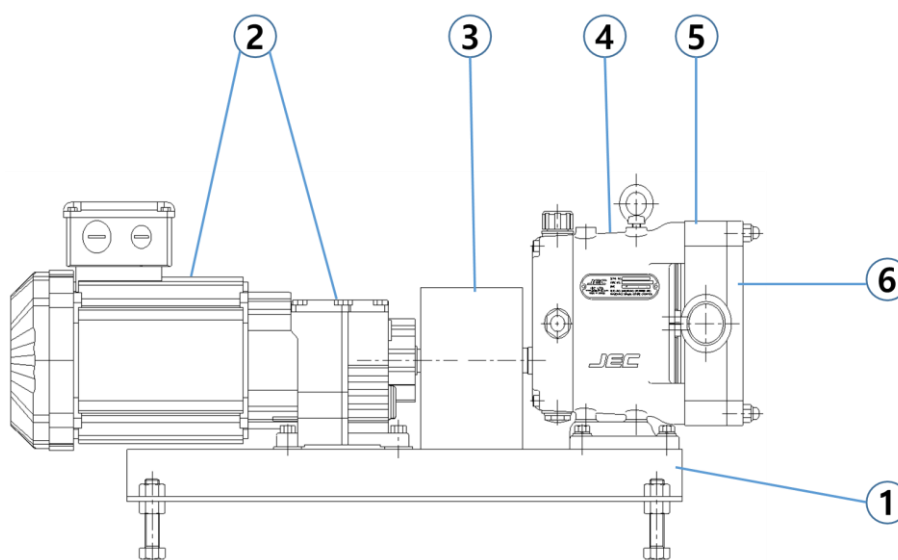
- Open the valves on the suction side completely to avoid cavitation and,
- Open the valves on the discharge side open completely to avoid exceeding the permitted differential pressure of the pump
- Discharge-side safety measures should be done (e.g. safety valve) to protect the pump from non-permitted excess pressure
- Protection against contact for hot, cold and moving parts must not be removed during operation

CONSTRUCTION

JRZP series Circumferential Piston Pumps can be ordered with bare shaft, i.e. pumps without motor or common bed.



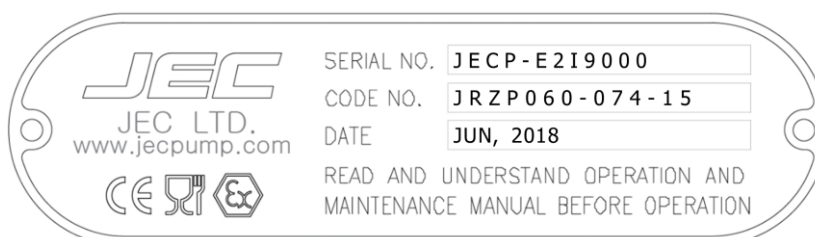
Or, ordered as a complete unit with drive motor, coupling & guard, common bed (or trolley) and layout described as below.



Example Layout of pumps with complete unit

- ① Common bed, ② Drive unit, ③ Coupling & coupling guard, ④ Gearbox,
- ⑤ Rotor case with inlet & outlet ports, ⑥ Front cover

The nameplate is fixed on the gearbox shown an example as below.

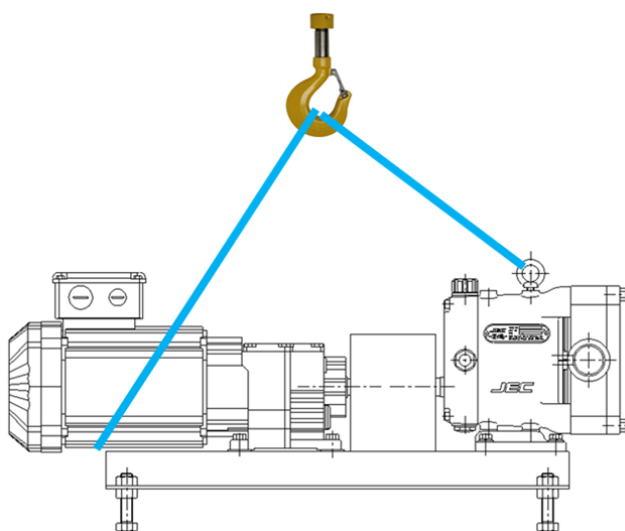


PACKAGING & TRANSPORT

JRZP series are shipped in non-returnable wooden packaging. Unpack the pump/unit upon delivery and inspect it for visible transport damage. Any damage occurred during the transporting has to be immediately reported to the transport agent after receipt of the consignment. Do not put the damaged products into operation.

The pumps need to be transported and secured with care to ensure no damage caused. Lifting equipment (hoist) and load securing straps must be placed with sufficient load capacity. Make sure you sent the pump down on a sufficient table, horizontal surface.

Below picture of complete unit with drive & common bed is shown for the example.



STORAGE

If the pumps need to be stored temporarily, it should be sufficiently preserved under normal environmental conditions and must not be exposed to the weather for any significant period of time. Heed below measures when required to be stored longer period.

1. Protect pumps with dust, dirt, water or any other harmful environmental factors. Coat all non-painted surfaces with acid-free and resin-free grease.
2. Do not grease stainless steel parts and non-metallic parts.
3. Cover all openings of pressure and suction ports.
4. Drain water when using it as flushing/quench medium for shaft seal.

SAFETY

DO'S & DON'TS

- DO** read and understand these instructions before installing or using the pump.
- DO** use JEC spare parts when replacing a component of the pump.
- DO NOT** service the pump while it is running.
- DO NOT** place the pump in an application where the service ratings are exceeded.
- DO NOT** modify 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** install a throttling valve in the suction line.

SAFETY PRECAUTIONS WHEN OPERATING PUMP

- DO** only qualified personnel should operate this pump.
- DO NOT** start the pump until all personnel are clear.
- DO NOT** touch 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 blocked will cause serious damage to the pump.
- DO NOT** check pump rotation with liquid in the pump.
- DO NOT** run the pump with the front cover removed. The screws and screw case could be damaged or may cause severe injury.
- DO NOT** operate the pump with removed the safety guard or 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.

WARRANTY

TERMS & CONDITIONS

All terms & conditions and prices of sale are based on the applicable JEC price list at the time an order from Customer is received by JEC and are subject to change without notice. No assignment of the purchaser's rights may be made without consent of JEC.

JEC warrants its Product from defects in materials and workmanship for a period of one (1) year from the shipment date, providing it has been used as recommended and in accordance with recognized piping practice, and providing it has not been worn out due to severe service, normal tea and wear or subjected to accident, misuse or improper maintenance. This warranty extends only to the original Buyer.

This warranty is expressly in lieu of any other warranties expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose.

All claims must be in writing and must be mailed or delivered by purchaser within thirty (30) days after purchaser learns of the facts upon which such claim is based. Any claim not made in writing and within the time period specified above shall be deemed waived.

Purchaser's sole and exclusive remedy and JEC Ltd.'s maximum liability for claims arising hereunder or for negligence for any and all losses and damages resulting from any cause shall be either the repair or replacement of defective components or pumps verified by JEC.

In no event, including in the case of a claim for negligence, shall JEC Ltd. be liable for incidental or consequential damages including loss of profits.

No person, including any representative, employee or agent of JEC, is authorized to assume on behalf of JEC, any liability or responsibility in addition to or different from that described in this provision. Any and all representations, promises, warranties or statements that are in addition to or different from the terms of this provision are of no force or effects.

RECEIVING INSPECTION

Ports are rubber capped at the factory to keep out foreign objects. If covers are missing or damaged, a thorough inspection of fluid head, by removing pump cover, is recommended. Be sure pumping head is clean and free of foreign material before rotating shaft.

LOSS OR DAMAGE

If your pump has been lost or damaged in transit, immediately file a claim at once with the delivering carrier and ask for inspector to call. The carrier has signed the Bill of Lading acknowledging that the shipment has been received from us in good condition.

We shall assist you in every way in collecting claims for loss, or damage, however, we are not responsible for the collection of claims or replacement of material.

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 a bad influence.
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 count-clockwise when seen from the motor back. If the motor fan cannot be seen, look through the pump case adaptor after takeoff motor shroud. (Bump means to momentarily apply power to the motor and then immediately remove power).
3. Direction of rotating 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 cavitation;

1. Low pressure in the suction line due to bad suction conditions.
2. Air in the suction-line.
3. Pumping temperature is too high.
4. Pump is oversized.

MAINTENANCE

ROTOR CASE DISASSEMBLY

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 be hardened, crystallized or frozen in the pump, it should be thoroughly drained and cleaned immediately after use. Similar attention must be applied to the seal flushing system. Remove power before servicing to prevent from any unintended start of the pump by authorized electrician.

Remove Front cover and O-ring after removing the four cap nuts from the front cover. If it is stuck, tap on the front cover with a soft mallet and pull out.

If the front cover was stuck at dowels, insert flat driver at the two groove of between front cover and rotor case to be separated.



Fig. 1

Place the plastic round bar between the rotors and remove rotor bolts with the rotor bolt extraction tool. To avoid damage rotor bolt, the extraction tool should be position in the groove properly and pushed by left hand strongly.

Turn the first rotor bolt as counter-clockwise and remove both of rotor bolts.



Fig. 2

The rotors can be removed from the pump case by pulling straight.

If it is stuck tight, alternately tap on the back of the inlet and outlet ports with soft mallet after removing the four hex nuts of stud bolts securing the case to the gearbox.

Treat carefully the rotors to avoid damage.

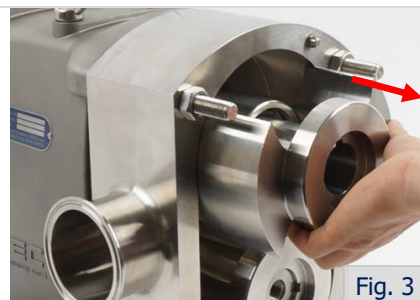


Fig. 3

Remove rotating seal rings from the backside of the rotors as shown in Figure 4. Then, O-ring for rotors can be removed.



Fig. 4

Clean and examine all of the pump components for damage. Replace damaged components as required. JEC recommends replacing all the wetted elastomers during reassembly.

If you want to replace the seal ring only, you can remove the old one & insert the new one easily just after removing rotors without dismantling rotor case.

Refer to 'Page 12' for the further procedure.

In case of removing seal body, it can be easily dismantled from rotor case after removing stationary seal ring and O-ring of the rotor case.

Remove four hex nuts of the stud bolts securing the rotor case to the gearbox.



Fig. 5

After pulling out both rotors and four hex nuts, rotor case can be separated by sliding along the stud bolt and pulling out from the gearbox. Inspect the rotor case for wear, clean and continue to seal maintenance (Refer to 'Page 11'), if needed.



Fig. 6

If it is stuck tight, tap alternately on the back of the inlet and outlet ports using soft mallet as shown in Figure 7.



Fig. 7

After rotor case removed, handle and place carefully the top & bottom shim(s) which shafts are associated to keep the right track of position to avoid lost, damaged or misalignment. They are installed accordingly at the factory for that particular body.



Fig. 8

INSPECTION

While performing standard maintenance or cleaning, check for signs of damage or extreme wear. A simple inspection may show signs of a problem long before it becomes serious. Detection of such problems can avoid costly repairs and reduce down time.

1. Inspect O-rings and seals for re-use. Worn O-rings and seals should be replaced.
2. Inspect seal faces for chipping, scratches or cracks. Replace any seal faces if damaged.
3. Inspect shaft shoulder matched to rotors and other metal parts worn or damaged.
4. Inspect rotor galling sign among the rotor case, front cover and rotors. It must be removed or replaced.
5. Inspect bur of the rotor bolt groove. It must be removed or replaced.

SEAL MAINTENANCE

JRZP series is designed by 'Front Loading Seal' that the mechanical seal system can be changed or replaced without removing rotor case.

Check & inspect all components of seal replacement kit carefully whether there is any damage or defect before installing. If any chipping, crack or scratch found during inspection, do not reuse them and replace the damaged one.

Below shows the Single mechanical seal (Figure 9), Double mechanical seal (Figure 10) and PTFE Triple lip seal with ceramic coated sleeve (Figure 11).



Fig. 9



Fig. 10



Fig. 11

The seal ring can be easily removed from rotor by hand. This is common for the Single mechanical and Double mechanical seal. Put rotor face down on the table and pull out the seal ring and O-ring from rotor.



Fig. 12

Pre-assemble NEW O-ring and seal ring then insert into the rotor. When inserting seal ring, the pin of rotor has to be into the hole of seal ring.



Fig. 13

Single Mechanical Seal Maintenance

Remove the Seal ring from the rotor case & rotor and inspect them. If any seal is damaged, do not re-use and replace it.

Clean both shaft ends and the rotor case before assembling. Push the replacing NEW Seal ring into the rotor case O-ring and turn fit into the seal pins on the seal body after Rotor Case Assembly (Refer to 'Page 15').



Fig. 14

In order to disassemble current seal body, pull out the current O-ring and seal body sequentially. Upside down the rotor case, then remove 'SET RING' for seal body. But, we don't remove it normally.



Fig. 15

Replace NEW 'SET RING' for seal body into the rotor case.



Fig. 16

Insert NEW 'SET RING' by hammering as shown Figure 17.



Fig. 17

Insert the replacing NEW seal body and O-ring into the rotor case sequentially.

See 'Rotor Case Assembly' on 'Page 15' to continue.



Fig. 18

Double Mechanical Seal Maintenance

Remove the Seal ring from the rotor case & rotor (shown in Figure 19) and inspect them. If any seal is damaged, do not re-use and replace it.

Clean both shaft ends and the rotor case before assembling. Push the replacing NEW Seal ring into the rotor case O-ring and turn fit into the seal pins on the seal body after Rotor Case Assembly on page 15.



Fig. 19

In order to replace the product side of mechanical seal, refer to Figure 16~18.

While, in order to replace the flushing side of mechanical seal, refer to Figure 20~22.

After rotor case removed ('Page 9 & 10'), pull out and remove the Double seal rotating part from the shaft and inspect them.

If any Double seal rotating part, Seal face and O-ring is damaged, do not re-use and replace it.

Clean both shaft ends and the rotor case before assembling. Lubricate the replacing NEW Double seal rotating part O-ring and install it in the Double seal rotating part. Slide and insert the Double seal rotating part on the shaft making sure to line the slot on the Double seal rotating part to the pin in the shaft.



Fig. 20

Place the rotor case face down on the table and pull out carefully the Double seal ring (53) out of rotor case by hands shown in Figure 21. Carefully treat Double seal ring (53) because carbon is fragile material.

Lubricate the replacing double seal ring or O-ring and insert it into the rotor case and fit into the Seal pin properly.



Fig. 21

After remove Double seal ring (53), check whether wave spring (61) has been damaged or not. If wave springs (61) were damaged, replace it as shown Figure 22.

See 'Rotor Case Assembly' on 'Page 15' to continue.



Fig. 22

Triple Lip Seal Maintenance

After removing rotor case ('Page 9 & 10'), pull out and remove Ceramic coated sleeves from the shaft and inspect them. If any of them is damaged, do not re-use and replace it.

Clean both shaft ends and the rotor case before assembling. Slide & insert the sleeves onto the shafts until it seats on the shaft shoulder. Align the slot in the shaft sleeve to the drive pin on the shaft.



Fig. 23

Place the rotor case face down on the table and loosening the wrench bolts and washers using appropriate wrench as shown in Figure 24.

Pull the Lip seal out of the rotor case.

And insert the replacing NEW Lip seal, making sure the holes in the seal to be lined up with the pins in the rotor case. Recap and tighten the Lip seal gland with wrench bolts.

See 'Rotor Case Assembly' on 'Page 15' to continue.



Fig. 24

When assembling Lip seal, the pin of rotor case has to be into the hole of Lip seal. **Before assembling it to rotor case, the food grade grease should be applied between each lips.**



Fig. 25

During the assembly the rotor case to the gearbox, Lip seal caused the tight insert to the sleeve. In this case, tap rotor case using soft mallet or fasten the Stud nut can make it easier to insert for assembly between the rotor case and the gearbox.

ROTOR CASE ASSEMBLY

Before installing the rotor case (31) to the gearbox (1A), make sure to clean the surface of rotor case & gearbox and check the shim plates surely between rotor case and gearbox as originally.

Assemble the rotor case (31) onto the gearbox (1A) and secure the four hexa-nuts (46) with reference of below torque value.

Series	ZP015	ZP030	ZP060	ZP130
Nut size	M8	M10	M14	M14
Torque (N·m)	30	34	80	80



Fig. 26

Insert stationary seal body inside hub in pump case as Figure 27, and make sure of that pins on the seal body should be engaged firmly inside seal pins on seal set ring.

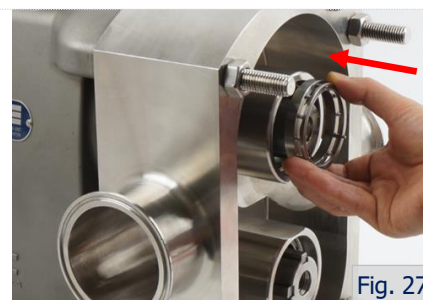


Fig. 27

Insert new case O-ring inside groove with lube.



Fig. 28

Assemble seal ring inside hub of pump case.

Put rotor O-ring in advance and the rotating seal rings on the back of rotors.

Be sure that notch of seal ring should be engaged into seal pin firmly.



Fig. 29

Insert rotors along the shaft carefully without seal ring separated from rotor as Figure 30.



Fig. 30

Tighten rotor bolts with the rotor bolt extraction tool firmly. Be sure not to make any bur on the rotor bolt groove during this process. It may cause the serious problem such as galling on the rotor case and if it happened, it must be removed.

Series	ZP015	ZP030	ZP060	ZP130
Bolt size	M10	M14	M18	M18
Torque (N·m)	20	40	100	100



Fig. 31

Install the NEW O-ring inside of the front cover (32) and slide the front cover over the stud. Thread cap nuts (33) on the studs and tighten using an appropriate wrench in an opposing manner shown in Figure 33.

Series	ZP015	ZP030	ZP060	ZP130
Nut size	M8	M10	M14	M14
Torque (N·m)	14	17	30	30



Fig. 32

Use feeler gauges and depth micrometer to verify the back and radial clearances between the rotors and the rotor case. A depth micrometer should be used to verify the front clearance.

ROTOR CLEARANCE

Rotor clearance must be precisely maintained to provide maximum pumping efficiency, yet prevent contact between rotors, rotor case, and front cover during operation.

If pumping efficiency is lower than expected or if parts contact has occurred during operation (Within rated differential pressure), check the rotor clearances and adjust, if incorrect.

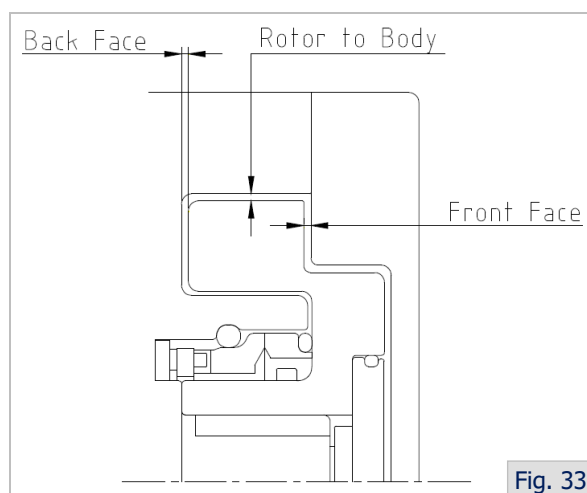


Fig. 33

Standard Rotor Clearances (mm)					
Material	Clearance □ Model No.	ZP015	ZP030	ZP060	ZP130
Illium8	Back Face	0.05	0.05	0.10	0.10
	Rotor to Body	0.05	0.05	0.13	0.13
	Front Face	0.13	0.13	0.20	0.20
SUS316L	Back Face	0.15	0.15	0.25	0.25
	Rotor to Body	0.15	0.15	0.28	0.28
	Front Face	0.23	0.23	0.35	0.35

There are two areas of rotor clearances as illustrated following:

- Rotor tip clearance; not adjustable set by manufacturer
- Front and back face clearance; adjustable by shim

Rotor thickness and body depth are fixed at manufacturer. Therefore, with the correct rotor size selected, the only maintenance adjustment that can be made is the proportion of front and rear clearance. Measure the front clearance as follows:

1. The rotor to rotor housing back face clearance is maintained by the shim(s) (45).
2. Check that the rotor case is tight to the gearbox (1A). And check the rotor bolts (35) are tight.
3. Measure the clearance between the back face of the rotor case and the back of the rotor with a feeler gauge with reference of the above recommended back face clearance.
4. If incorrect, adjust by adding or removing shim(s) (45) from behind the rotor case.
5. Check each rotor and adjust as necessary.

ROTOR TIMING

Rotor timing is critical for the pump operation and must be precisely maintained to provide maximum pumping efficiency, yet prevent contact between rotors during operation. If pumping efficiency is below expectations, or if rotors contact during operation (within rated differential pressure), check rotor timing and adjust if incorrect. Also check rotor timing after any gearbox dismantling when the gears are removed and/or replaced.

Check Rotor timing as follows:

1. Assemble each rotor in its normal location on the drive shaft and the idle shaft. Assemble each rotor bolt and tighten hand tight.
2. Rotate the shafts 30 degrees and measure gap as illustrated by arrows in Figure 34. Rotate the shafts 60 degrees to the opposite direction and measure the gap as illustrated.
3. The Rotors are correctly timed when the gap measured at both locations are equal. If the gap is unequal, adjust the timing as follows.
4. Rotor timing is determined by the relative location of the two helical gears (14) on the shafts. Gear spacers (16) are used to adjust the location and the timing. When adjusting timing, move only one of the two gears.

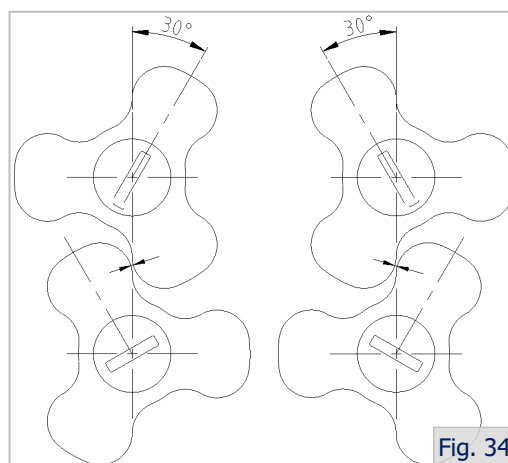


Fig. 34

5. Bend away the tab of the lock washer (12) on drive shaft, loosen the lock nut and remove gear. Insert a NEW gear spacer(6mm) on drive shaft, gear, lock nut and lock washer consequently and tighten referring the 'Gearbox Assembly' in page 22. Finally, adjust the rotor timing to be correct.

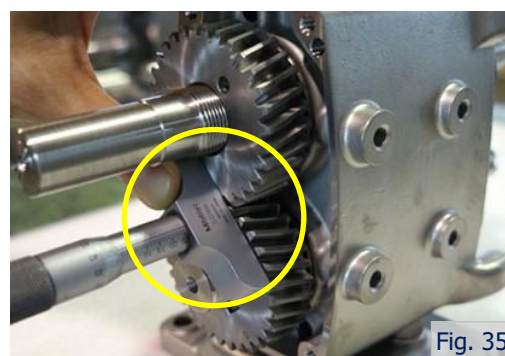


Fig. 35

6. If the rotor timing is correct, measure the gap of the gear between drive shaft and idle shaft using depth micrometer shown in Figure 35. Adjust the gap using spacer and shim(s) according to the below cases.

- * If the gap is (+) value (idle shaft is more embossed than drive shaft) as shown in Figure 36, combined 6mm spacer & shim(s) and add on the idle shaft to make the gap equal.
- * If the gap is (-) value (drive shaft is more embossed than idle shaft) as shown in Figure 37, combined 5mm spacer & shim(s) and add on the idle shaft to make the gap equal.

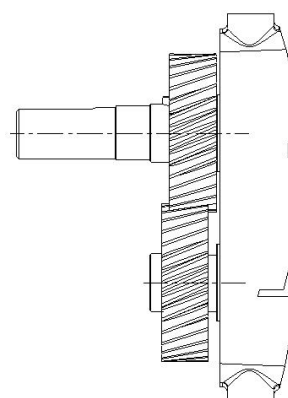
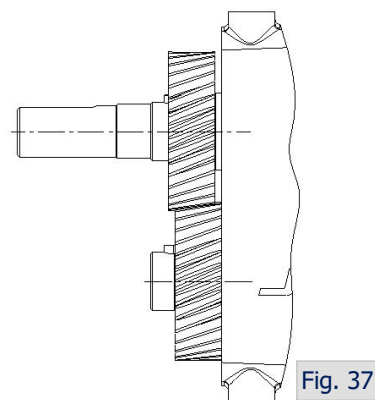


Fig. 36

Above cases of combinations (5mm & 6mm spacer, 0.1mm shim(s)) can be applied for ZP015 & 030 series only. While the other bigger size of shim(s) & spacer combination, but same concept, can be applied for ZP060 & 130 series.



7. Reassemble the idle shaft by the same procedure as drive shaft after adjustment.

GEARBOX MAINTENANCE

Gearbox Disassembly

1. Remove the drain plug and drain the oil.
Remove the shaft key (7) on the drive shaft and gearbox cover bolts (6) from the rear cover (4).

2. Pull the cover off the drive shaft extension. If the cover stuck, use a soft mallet carefully to loosen it. Heavy hitting by mallet may be caused damage to the cover and dowel (15).

Remove the rear cover oil seal (11) from the rear cover if the oil seal is needed to be replaced. Remove the paper gasket from the cover or gearbox



Fig. 38

3. Straighten the locking tab of the bearing lock washer. Remove the lock nut (12-1) and lock nut washer (12) from the drive shaft (8) & idle shaft (9).
4. Pull the two helical-gears (14) off from the drive shaft (8) & idle shaft (9).



Fig. 39

5. Remove the gear keys (10) for both drive & idle shafts.



Fig. 40

6. Remove the front bearing gland set bolts (23) as shown in Figure 41.
7. Place the gearbox (1), wet end (rotor side) down, on the arbor press.

Protect the shaft ends with a wooden block and press the drive & idle shafts to pull out of the gearbox.



Fig. 41

-
8. Or pull out the drive & idle shafts by hitting with soft mallet the rear-end of each shaft on the gasket face of the gearbox.



Fig. 42

-
9. Remove the bearings and spacers (16) together from the shafts by pressing the shaft separated with them. Or remove bearings by puller shown in Figure 43.



Fig. 43

Gearbox Assembly

1. Clean and lubricate the front & rear bearing areas of the drive & idle shafts with oil.

Fit the front bearing, spacer and rear bearing on the shaft sequentially by arbor press (or heat 120°C(250F) up by heater).

Position the gearbox (1) with wet end side facing up and be sure to place carefully for the gasket face(downside) of cover during this time.

Clean and lubricate the front and rear bearing areas with oil.

Insert the shaft perpendicularly one by one to the gearbox properly. There should be a tight sliding fit between the gearbox and the bearing outer rings. Press the shaft into gear case until bearings are fully seated.



Fig. 44



Fig. 45

2. Lubricate and install the front bearing oil seals set (21, 22, 24 into the bearing gland) on the gearbox.

Place the front bearing gland set on the both rotors and insert carefully for the Oil seal spring inside of the gland set would not be deflected during insert. Set the Bolt & washer, and tighten.



Fig. 46

3. Place the gear spacer (16) over the shafts.

Clean and lubricate the gear area of the shaft and the face of the lock washer with oil.

Align both shafts so that the gear keys (10) slots are on to the 12 o'clock position shown in Figure 48.

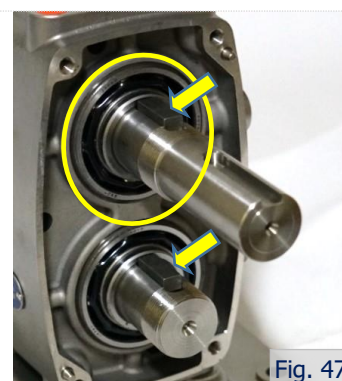


Fig. 47

4. Place the gear, lock washer (12) and lock nut (12-1) sequentially onto the shafts and hand tighten.

In order to ensure proper rotor timing the gears must be installed along with the rotors. Slide the gears on the shafts aligning the slot on the gear with the gear key



Fig. 48

5. After the gears are installed, turn the shafts to make sure they turn freely and that the rotors (38) are timed correctly. (Rotor alignments are required)

See 'Page 18 Rotor timing' for reference.



Fig. 49

6. Use a spanner wrench to tighten the gear lock nut on the drive shaft. You can install the rotors to hold the shafts in place while you tighten the nut.

Tighten the locknut (12-1) on the idle shaft, following the previous steps.

7. Lubricate and install the rear oil seal cover (11) into gearbox (1). Install the paper gasket (26) to the gasket face of the gearbox and mount the rear cover assembly over the drive shaft extension onto the gearbox.



Fig. 50

8. Set the cover bolts & oil window and fill the oil to the oil reservoir up to the middle range of the oil window.

See the 'LUBRICATION' for further in APPENDIX.

9. Set the pressure relief valve (13).

TROUBLESHOOTING

Problem	Cause	Solution
Pump not turning	Interruption of electrical power. Key sheared or missing. Coupler or belts are not connected. Pump shaft or gears sheared. Wrong rotation. Relief valve not properly adjusted.	Reset circuit breaker, check fuses. Replace. Replace or adjust. Replace. Reverse. Adjust valve.
Pump not priming	Valve closed in suction lines. Suction line clogged or restricted. Air leak in connections or seal. Pump speed too slow. Suction line does not remain flooded. Air lock. Excessive clearances in pump. Net inlet pressure low.	Open valve. Clear suction line. Repair leak. Increase speed. Install foot valve. Bleed suction line. Replace out of tolerance parts Increase suction pressure
Insufficient flow	Speed too low. Air leak.	Adjust speed as required. Repair leak.
Noisy operation	Cavitation. Viscous product. High vapor pressure, high temp. Leaks in piping or pump. Dissolved gas in product. Mechanical noise. Excessive weight from piping, Pump body distorted. Excessive discharge pressure. Worn bearing. Worn gears. Rotor-to-Rotor contact.	Increase net inlet pressure. Slow pump, reduce product. Reduce temperature. Repair leaks. Reduce discharge pressure. Check tolerances. Support piping. Check align and level Reduce discharge pressure. Replace bearing. Replace gears Timing rotors, replace twisted shafts, replace worn gears.
Pump overloads	Viscosity of product higher than expected. Higher pressure than expected.	Reduce pump speed, increase pipe size, Reduce pump speed, increase pipe size,
Play between gears	Worn gear teeth. Gear loose on shaft.	Replace gear. Inspect gear key, keyway and shaft. If all are undamaged, retighten the gear retaining nut. Check for backlash.

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.

TECHNICAL INFORMATION

TECHNICAL DATA

SPECIFICATIONS

Maximum Inlet Pressure	10 bar (1,000 kPa, 145 psi)
Maximum Differential Pressure	15 bar (1,500 kPa, 218 psi)
Maximum Flow Rate	92 m ³ /hr (405 US GPM)
	Please consult JEC incase over 92 m ³ /hr up to 450 m ³ /hr
Temperature Range	-10 °C to 180 °C (14 °F to 356 °F)
Viscosity Range	Up to 1,000,000 cPs
Noise Level	60 ~ 80 dB

MATERIALS

Product Wetted Steel Parts	SUS316L (standard)
Product Wetted Seals	EPDM (standard)
Alternative Seals	NBR, FPM, PTFE Encapsulated, Perfluoro elastomer

SHAFT SEALS

Seal type	Single and Double Mech., O-ring and Lip-seal
Flushing Water Pressure	Recommended less than 0.5 bar (7 psi)
Flushing Water Consumption	0.25~0.5 ℓ /min (30~60 cubic inches/min)
Stationary Seal Ring Material	Tungsten Carbide (standard) or Silicon Carbide
Rotating Seal Ring Material	Tungsten Carbide (standard) or Silicon Carbide
O-ring Material	EPDM (standard)
Lip-seal Material	PTFE(Polytetrafluoroethylene)

ROTOR INFORMATION

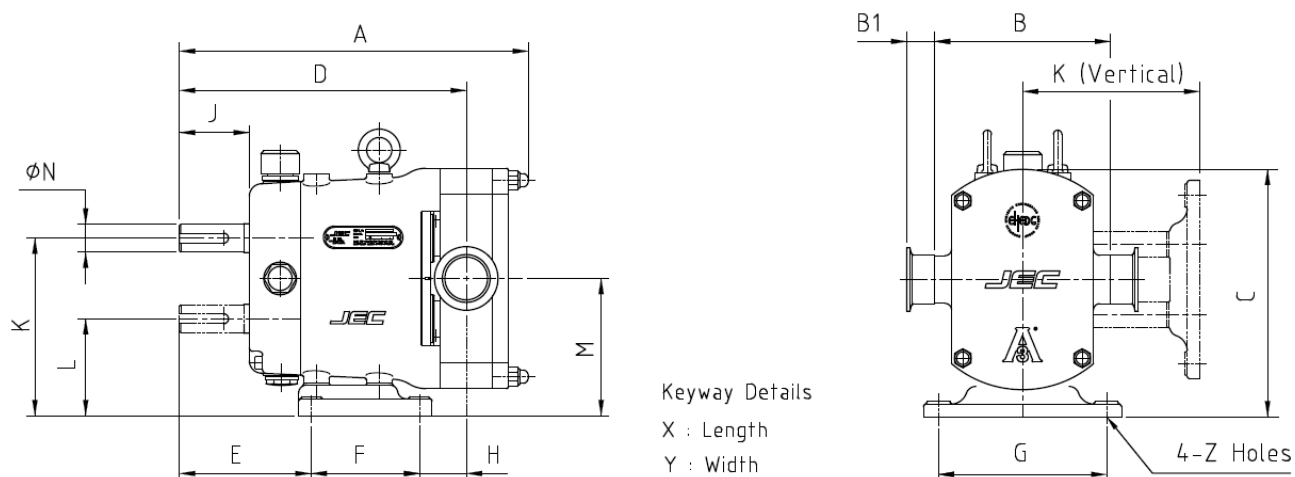
316L Stainless steel Bi-wing rotor (standard)
Non-galling (Illium8) Bi-wing rotor (option)

OPTIONAL INFORMATION

Heating jacket on rotor case and front cover
Horizontal type, Rectangular inlet version
Surface hardening (CrN/TiN)

DIMENSIONAL DRAWING

FOR BARE SHAFT



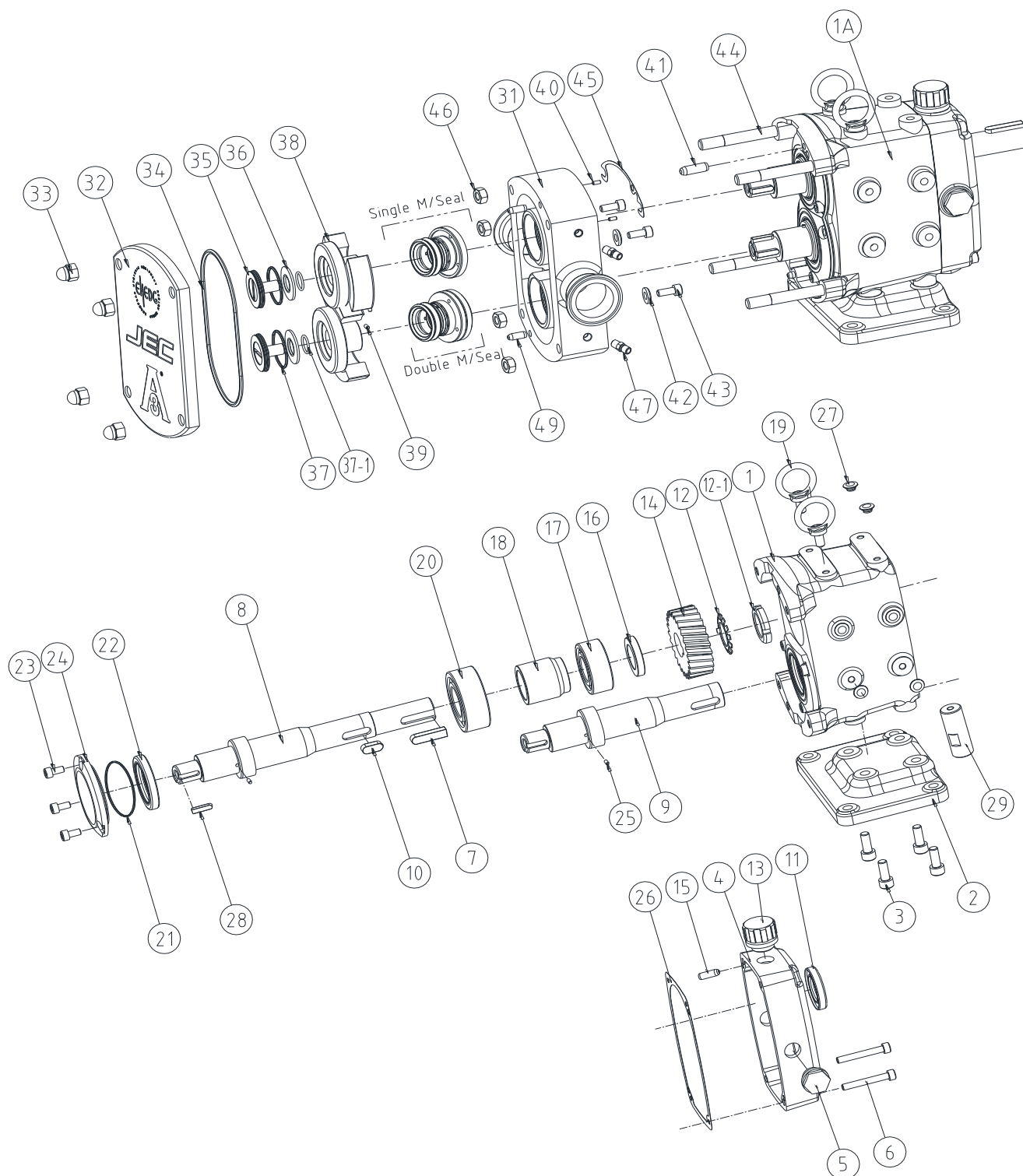
Model No.	Dimension (mm)															
	A	B	C	D	E	F	G	H	J	K	L	M	N	X	Y	Z
JRZP015-0063-15	281	152	222	228	105	84	134	39	55	141	77	109	22	34	8	9
JRZP030-026-10	372	188	264.5	305	129	132	180	44	60	185	101	143	32	52	10	12
JRZP060-074-15	471	242	347.5	380	158	160	242	67	68	243.5	128.5	186	45	57	14	13
JRZP130-118-08	497	242	347.5	393	158	160	242	80	68	243.5	128.5	186	45	57	14	13
JRZP220-204-12	631	324	458	504	198	210	320	97	80	324	170	247	55	67	14	15
JRZP320-307-08	666	324	458	522	198	210	320	114	80	324	170	247	55	67	14	15

Model No	Ports	Dimension B1 (mm)						Weight	Volume
		CLAMP	IDF	DIN	BS	SMS	FLANGE	KG	CBM
JRZP015-0063-15	1.5"	20	25	30	26	20	30	21	0.01
JRZP030-026-10	2"	22	27	30	26	22	30	41	0.03
JRZP060-074-15	2.5"	26	26	37	26	26	35	85	0.05
JRZP130-118-08	3"	28	28	42	26	28	40	97	0.06
JRZP220-204-12	4"	28	28	45	26	35	54	181	0.15
JRZP320-307-08	6"	Please consult to JEC.						213	0.15

***Note: For JRZP220 & 320, please consult to JEC.**

PARTS LIST

EXPLODED VIEW / ZP015



All orders for repair parts must be contained the following;

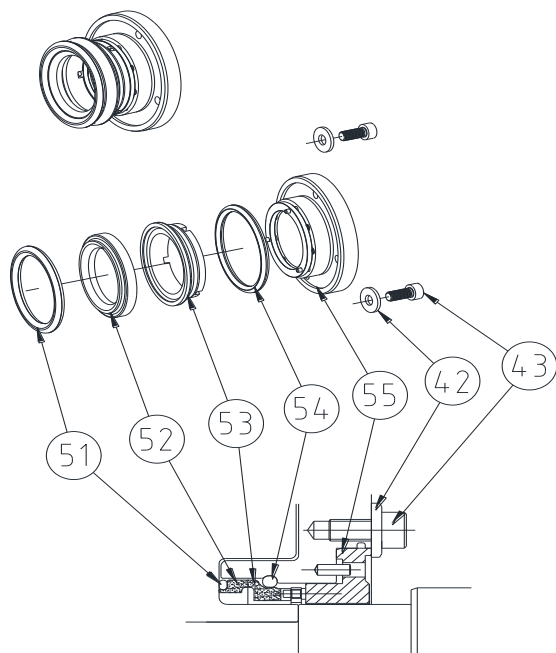
1. Complete model number (located on nameplate).
2. Pump serial number (located on nameplate).
3. Description and part number from the parts list.

Parts list / ZP015

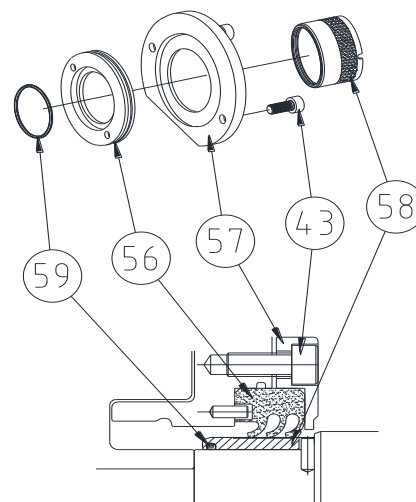
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB1A-CS	Gear Box	FCD40	1	1
	MMZL-GB1A-SS	Gear Box	SUS304	1	1
2	MMZL-GBB1-CS	Base,Gear Box	FCD40	1	1
	MMZL-GBB1-SS	Base,Gear Box	SUS304	1	1
3	PCWB-M08E-SS	Wrench Bolt, Base (M8x20L)	SUS304	1	4
4	MMZL-GBC1-CS	Cover,Gear Box	FCD40	1	1
	MMZL-GBC1-SS	Cover,Gear Box	SUS304	1	1
5	PMZL-PT12-P2	Plug, Level, Drain, PT 1/2"	PE	1	3
6	PCWB-M06F-CS	Wrench Bolt, Gear Box Cover (M6x45L)	S45C	1	4
7	PCZL-KY1B-CS	Key,Shaft (8x7x34)	S45C	1	1
8	MMZP-SD15-SS	Shaft, Drive	SUS304	1	1
9	MMZP-SI15-SS	Shaft, Idle	SUS304	1	1
10	PCZL-KY1A-CS	Key, Gear (8x7x21)	S45C	1	2
11	PMZL-OS23-NB	Oil Seal, Cover(23x43x7t)	NBR	1	1
	PMZL-OS23-FP	Oil Seal, Cover(23x43x7t)	FPM	1	1
12	PMZL-LW05-CS	Lock Washer	S45C	1	2
12-1	PMZL-LN05-CS	Lock Nut	S45C	1	2
13	PMZL-PT12-P1	Breather, Gearbox PT 1/2"	PE	1	1
14	PMZL-HG1X-CS	Helical Gear	S45C	1	2
15	PMZL-PN1G-SS	Dowel, Gear Box (Φ6)	SUS304	1	2
16	MMZL-GS1X-CS	Spacer, Gear (Φ35x5L)	S45C	1	2
17	PMZL-BE05-CS	Bearing, Rear (#5205)		1	2
18	MMZL-BS1X-CS	Spacer ,Bearing	S45C	1	2
19	PCZL-IM08-SS	I-bolt / M8	SUS304	1	2
20	PMZL-BE06-CS	Bearing, Front (#5206)		1	2
21	PCOR-A035-FP	O-Ring, Oil Seal Gland (AN035)	FPM	1	2
22	PMZL-OS38-NB	Oil Seal, Gear box (38x55x9t)	NBR	1	2
	PMZL-OS38-FP	Oil Seal, Gear box (38x55x9t)	FPM	1	2
23	PCWB-M06A-SS	Wrench Bolt, Oil Seal Gland (M6x10L)	SUS304	3	6
24	MMZL-GD1C-SS	Gland,Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Double Seal (Φ3)	SUS304	1	2
26	PMZL-GG1X-PA	Gasket	Paper	1	1
27	PMZL-M08X-PE	Plug (M8)	PE	1	8
28	PCZL-KY1C-SS	Key, Rotor (5x5x20)	SUS304	2	4
29	MMZL-GBA1-SS	Vertical adaptor	SUS304	1	4

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZP015-GBXH-SS	Gear Box Ass'y	SUS304	1	1
	ZP015-GBXH-CS	Gear Box Ass'y	FCD40	1	1
31	MMZP-015D-SS	Rotor Case-1.5"DIN11851	SUS316L	1	1
	MMZP-015F-SS	Rotor Case-1.5"DIN2633	SUS316L	1	1
	MMZP-015S-SS	Rotor Case-1.5"DS722.1	SUS316L	1	1
	MMZP-015I-SS	Rotor Case-1.5"ISOMALE	SUS316L	1	1
	MMZP-015R-SS	Rotor Case-1.5"RJT	SUS316L	1	1
	MMZP-015M-SS	Rotor Case-1.5"SMS	SUS316L	1	1
	MMZP-015C-SS	Rotor Case-1.5"TRICLAMP	SUS316L	1	1
	MMZP-015W-SS	Rotor Case-1.5"Welding neck	SUS316L	1	1
	MMZP-015K-SS	Rotor Case-1.5" FLANGE	SUS316L	1	1
32	MMZP-FC15-SS	Front Cover	SUS316L	1	1
33	PCZL-M08X-SS	Cap Nut	SUS304	1	4
34	PCOR-A248-NB	O-ring, Front Cover (AN248)	NBR	1	1
	PCOR-A248-EP	O-ring, Front Cover (AN248)	EPDM	1	1
	PCOR-A248-FP	O-ring, Front Cover (AN248)	FPM	1	1
	PMOR-A248-PF	O-ring, Front Cover (AN248)	Perfluoro	1	1
	PMOR-A248-KA	O-ring, Front Cover (AN248)	Kalrez	1	1
	PMOR-A248-PE	O-ring, Front Cover (AN248)	PTFE capsulated	1	1
35	MMZP-RB15-SS	Rotor Bolt	SUS316L	1	2
36	PCZP-CW15-SS	Disk Washer , Rotor Bolt	SUS304	1	2
37	PCOR-A026-EP	O-ring, Rotor Bolt(AN026)	EPDM	1	2
	PCOR-A026-FP	O-ring, Rotor Bolt(AN026)	FPM	1	2
	PMOR-A026-PF	O-ring, Rotor Bolt(AN026)	Perfluoro	1	2
	PMOR-A015-EP	O-ring, Disk Washer(AN015)	EPDM	1	2
37-1	PMOR-A015-FP	O-ring, Disk Washer(AN015)	FPM	1	2
	PMOR-A015-PF	O-ring, Disk Washer(AN015)	Perfluoro	1	2
38	MMZP-RT15-SS	Rotor	Illium 8	1	2
	MMZP-RT15-S1	Rotor	SUS316L	1	2
39	PCPI-N3X8-S1	Seal pin, Rotor (Φ3 X 6)	SUS304	1	2
40	PCPI-N3X8-SS	Seal pin, Case, Double (Φ3 X 8)	SUS304	2	4
41	PMZL-PN1C-SS	Dowel, Rotor Case (Φ6)	SUS304	1	2
42	PCFW-P06X-SS	Flat Washer, M/seal Gland (Φ6)	SUS304	2	4
43	PCWB-M06X-SS	Wrench bolt, M/seal Gland (M6x10L)	SUS304	2	4
44	PMZL-M08B-SS	Stud Bolt, Case (M8 x 78L)	SUS304	1	4
45	PMZL-SH1C-SS	Shim, 0.03mm	SUS304	1	2
	PMZL-SH1A-SS	Shim, 0.05mm	SUS304	1	2
	PMZL-SH1B-SS	Shim, 0.1mm	SUS304	1	2
46	PCHN-M08X-SS	Hex nut, Stud (M8)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush / Double Seal (PT 1/8")	SUS304	1	2
48	PCZL-NA12-SS	Name Plate	SUS304	1	1
49	PMZL-PN1C-SS	Pin, Dowel (Φ6)	SUS304	1	4

SINGLE MECHANICAL SEAL & TRIPLE LIP SEAL / ZP015



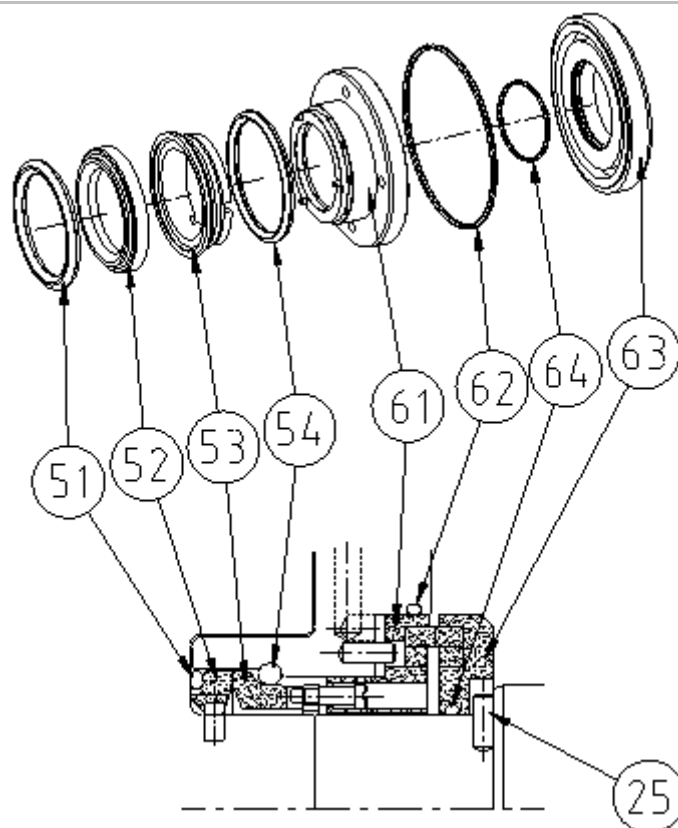
Single Mech. Seal



Triple Lip Seal

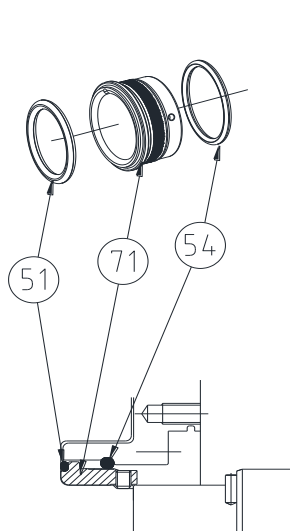
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
43	PCWB-M06X-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	4
51	PCOR-A127-EP	O-ring, Rotor (AN127)	EPDM	1	2
	PCOR-A127-FP	O-ring, Rotor (AN127)	FPM	1	2
	PMOR-A127-PE	O-ring, Rotor (AN127)	Perfluoro	1	2
52	PMZP-SR1R-TC	Seal Ring, Rotor	TC	1	2
	PMZP-SR1R-SI	Seal Ring, Rotor	SiC	1	2
53	PMZP-SR1F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR1F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A222-EP	O-ring, Rotor Case (AN222)	EPDM	1	2
	PCOR-A222-FP	O-ring, Rotor Case (AN222)	FPM	1	2
	PMOR-A222-PF	O-ring, Rotor Case (AN222)	Perfluoro	1	2
55	PMZP-SSB1-LP	Single Seal Body, Case	SUS304	1	2
56	MMZL-LS1T-PF	Triple Lip Seal, Product	PTFE+Glass	1	2
57	PMZL-GD1A-SS	Gland, Lip Seal	SUS304	1	2
58	PMZP-CS15-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
59	PCOR-A024-EP	O-ring, C/Coated Sleeve(AN024)	EPDM	1	2
	PCOR-A024-FP	O-ring, C/Coated Sleeve(AN024)	FPM	1	2
	PMOR-A024-PF	O-ring, C/Coated Sleeve(AN024)	Perfluoro	1	2

DOUBLE MECHANICAL SEAL / ZP015

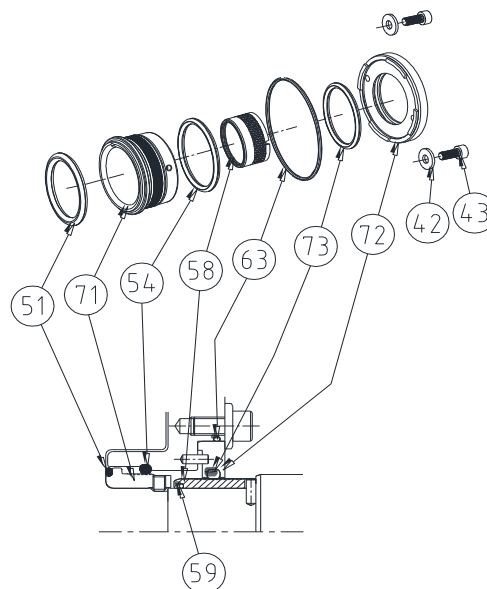


ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
25	PCPI-N3X8-SS	Pin, Double Seal (Φ3)	SUS304	2	4
51	PCOR-A127-EP	O-ring, Rotor (AN127)	EPDM	1	2
	PCOR-A127-FP	O-ring, Rotor (AN127)	FPM	1	2
	PMOR-A127-PE	O-ring, Rotor (AN127)	Perfluoro	1	2
52	PMZP-SR1R-TC	Seal Ring, Rotor	TC	1	2
	PMZP-SR1R-SI	Seal Ring, Rotor	SiC	1	2
53	PMZP-SR1F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR1F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A222-EP	O-ring, Rotor Case (AN222)	EPDM	1	2
	PCOR-A222-FP	O-ring, Rotor Case (AN222)	FPM	1	2
	PMOR-A222-PF	O-ring, Rotor Case (AN222)	Perfluoro	1	2
61	PMZP-DSB1-CA	Double Seal Body, Case	C/SUS304	1	2
	PMZP-DSB1-TC	Double Seal Body, Case	TC/SUS304	1	2
62	PCOR-A036-EP	O-ring, Case, Double seal (AN036)	EPDM	1	2
	PCOR-A036-FP	O-ring, Case, Double seal (AN036)	FPM	1	2
	PMOR-A036-PF	O-ring, Case, Double seal (AN036)	Perfluoro	1	2
63	PMZP-DRR1-TC	Double Mech Base, Shaft	TC/SUS304	1	2
64	PCOR-A024-EP	O-ring, Shaft, Double Seal (AN024)	EPDM	1	2
	PCOR-A024-FP	O-ring, Shaft, Double Seal (AN024)	FPM	1	2
	PMOR-A024-PF	O-ring, Shaft, Double Seal (AN024)	Perfluoro	1	2

O-RING SEAL & DOUBLE O-RING SEAL / ZP015



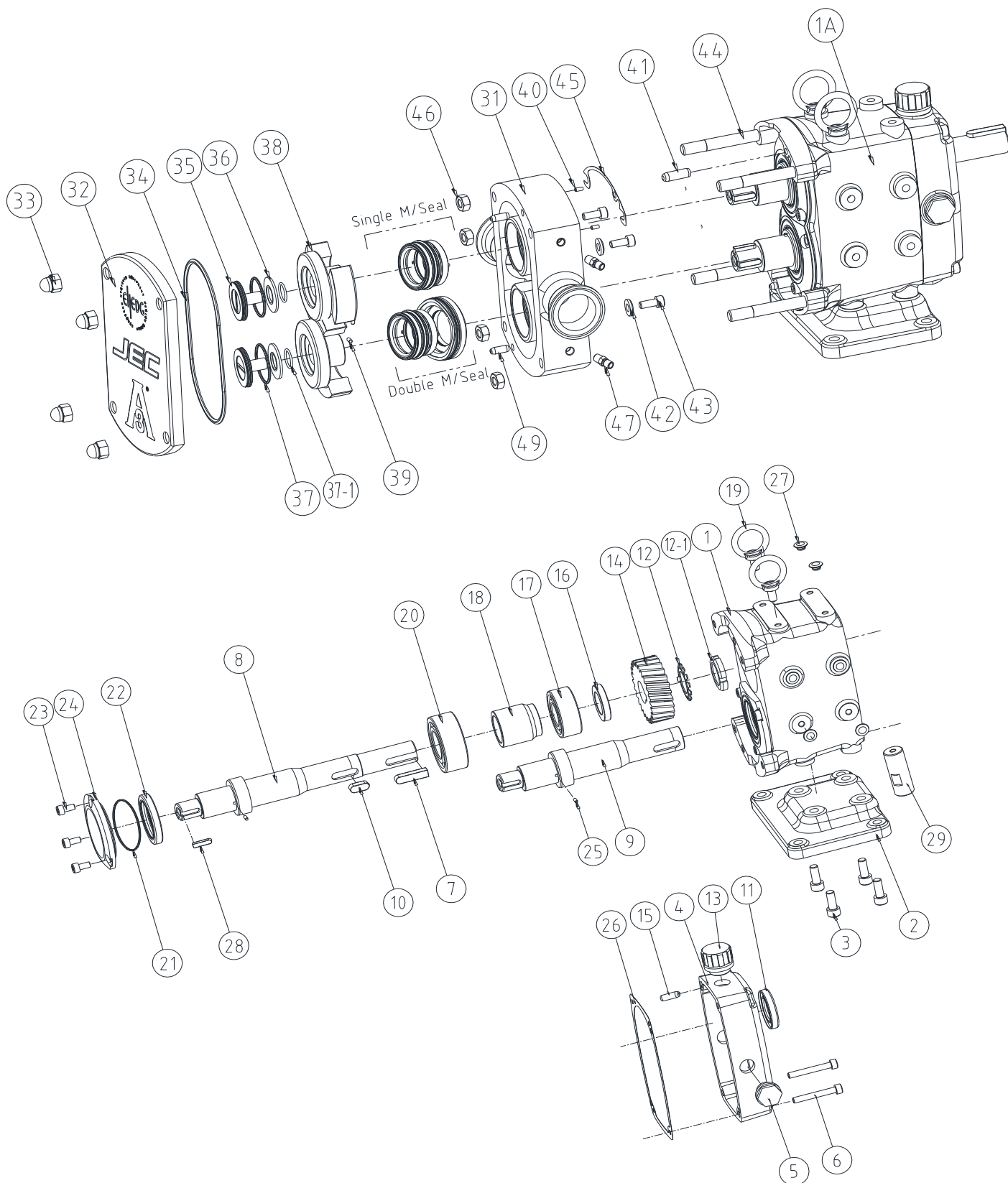
O-ring Seal



Double O-ring Seal

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, M/Seal Gland (M6)	SUS304	2	4
43	PCWB-M06X-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	4
51	PCOR-A127-EP	O-ring, Rotor (AN127)	EPDM	1	2
	PCOR-A127-FP	O-ring, Rotor (AN127)	FPM	1	2
	PMOR-A127-PF	O-ring, Rotor (AN127)	Perfluoro	1	2
54	PCOR-A222-EP	O-ring, Rotor Case (AN222)	EPDM	1	2
	PCOR-A222-FP	O-ring, Rotor Case (AN222)	FPM	1	2
	PMOR-A222-PF	O-ring, Rotor Case (AN222)	Perfluoro	1	2
58	PMZP-CS15-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
59	PCOR-A024-EP	O-ring, C/Coated Sleeve (AN024)	EPDM	1	2
	PCOR-A024-FP	O-ring, C/Coated Sleeve (AN024)	FPM	1	2
	PMOR-A024-PF	O-ring, C/Coated Sleeve (AN024)	Perfluoro	1	2
62	PCOR-A036-EP	O-ring, Case, Double seal (AN036)	EPDM	1	2
	PCOR-A036-FP	O-ring, Case, Double seal (AN036)	FPM	1	2
	PMOR-A036-PF	O-ring, Case, Double seal (AN036)	Perfluoro	1	2
71	PMZP-OSS1-SS	Sleeve, O-ring Seal	CERAMIC/SUS304	1	2
72	MMZL-DSB1-SS	Body, Double O-ring Seal	SUS304	1	2
73	PCOR-A222-EP	O-ring, Body, D/O-ring Seal (AN222)	EPDM	1	2
	PCOR-A222-FP	O-ring, Body, D/O-ring Seal (AN222)	FPM	1	2

EXPLODED VIEW / ZP030, ZP060, ZP130

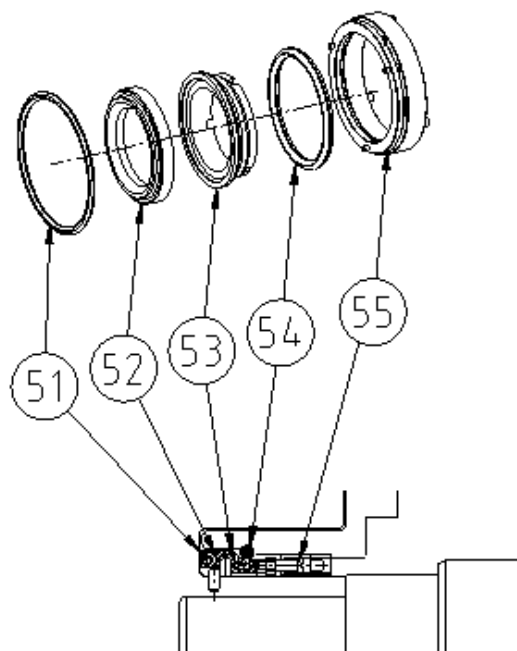


Parts list / ZP030

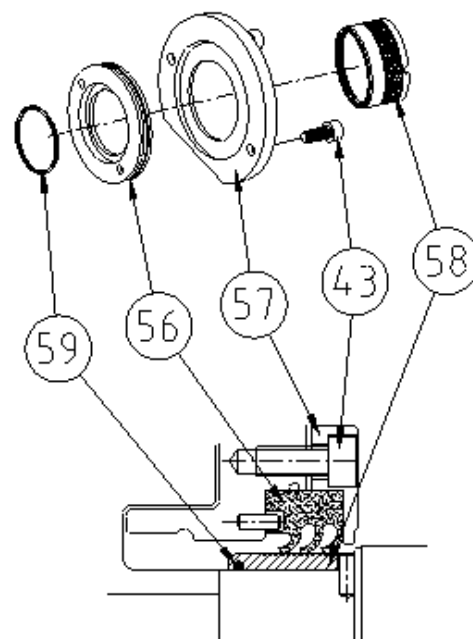
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB2A-CS	Gear Box	FCD40	1	1
	MMZL-GB2A-SS	Gear Box	SUS304	1	1
2	MMZL-GBB2-CS	Base,Gear Box	FCD40	1	1
	MMZL-GBB2-SS	Base,Gear Box	SUS304	1	1
3	PCWB-M10E-SS	Wrench Bolt, Base (M10x20L)	SUS304	1	4
4	MMZL-GBC2-CS	Cover,Gear Box	FCD40	1	1
	MMZL-GBC2-SS	Cover,Gear Box	SUS304	1	1
5	PMZL-PT12-P2	Plug, Level, Drain, PT 1/2"	PE	1	3
6	PCWB-M08I-CS	Wrench Bolt, Gear Box Cover(M8x65L)	S45C	1	4
7	PCZL-KY2B-CS	Key,Shaft(10x8x52)	S45C	1	1
8	MMZP-SD30-SS	Shaft, Drive	SUS304	1	1
9	MMZP-SI30-SS	Shaft, Idle	SUS304	1	1
10	PCZL-KY2A-CS	Key, Gear(10x8x27)	S45C	1	2
11	PMZL-OS32-NB	Oil Seal, Cover(32x52x8t)	NBR	1	1
	PMZL-OS32-FP	Oil Seal, Cover(32x52x8t)	FPM	1	1
12	PMZL-LW07-CS	Lock Washer	S45C	1	2
12-1	PMZL-LN07-CS	Lock Nut	S45C	1	2
13	PMZL-PT34-P1	Breather, Gearbox PT 1/2"	PE	1	1
14	PMZL-HG2X-CS	Helical Gear	S45C	1	2
15	PMZL-PN1G-SS	Dowel, Gear Box(Φ6)	SUS304	1	2
16	MMZL-GS2X-CS	Spacer, Gear (Φ45x6L)	S45C	1	2
17	PMZL-BE07-CS	Bearing, Rear (#5207)		1	2
18	MMZL-BS2X-CS	Spacer, Bearing	S45C	1	2
19	PCZL-IM10-SS	I-bolt / M10	SUS304	1	2
20	PMZL-BE08-CS	Bearing, Front (#5208)		1	2
21	PCOR-A041-FP	O-Ring, Oil Seal Gland (AN041)	FPM	1	2
22	PMZL-OS45-NB	Oil Seal, Gear box (48x70x12t)	NBR	1	2
	PMZL-OS45-FP	Oil Seal, Gear box (48x70x12t)	FPM	1	2
23	PCWB-M08B-SS	Wrench Bolt, Oil Seal Gland(M8x15L)	SUS304	3	6
24	MMZL-GD2C-SS	Gland,Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Double Seal(Φ3)	SUS304	1	2
26	PMZL-GG2X-PA	Gasket	Paper	1	1
27	PMZL-M10P-PE	Plug(M10)	PE	1	8
28	PCZL-KY2C-SS	Key, Rotor(6x6x39)	SUS304	2	4
29	MMZL-GBA2-SS	Vertical adaptor	SUS304	1	4

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZP030-GBXH-SS	Gear Box Ass'y	SUS304	1	1
	ZP030-GBXH-CS	Gear Box Ass'y	FCD40	1	1
31	MMZP-030D-SS	Rotor Case-2"DIN11851	SUS316L	1	1
	MMZP-030F-SS	Rotor Case-2"DIN2633	SUS316L	1	1
	MMZP-030S-SS	Rotor Case-2"DS722.1	SUS316L	1	1
	MMZP-030I-SS	Rotor Case-2"ISOMALE	SUS316L	1	1
	MMZP-030R-SS	Rotor Case-2"RJT	SUS316L	1	1
	MMZP-030M-SS	Rotor Case-2"SMS	SUS316L	1	1
	MMZP-030C-SS	Rotor Case-2"TRICLAMP	SUS316L	1	1
	MMZP-030W-SS	Rotor Case-2"Welding neck	SUS316L	1	1
	MMZP-030K-SS	Rotor Case-2" FLANGE	SUS316L	1	1
32	MMZP-FC30-SS	Front Cover	SUS316L	1	1
33	PCZL-M10X-SS	Cap Nut	SUS304	1	4
34	PCOR-A260-NB	O-ring, Front Cover (AN260)	NBR	1	1
	PCOR-A260-EP	O-ring, Front Cover (AN260)	EPDM	1	1
	PCOR-A260-FP	O-ring, Front Cover (AN260)	FPM	1	1
	PMOR-A260-PF	O-ring, Front Cover (AN260)	Perfluoro	1	1
	PMOR-A260-KA	O-ring, Front Cover (AN260)	Kalrez	1	1
	PMOR-A260-PT	O-ring, Front Cover (AN260)	PTFE capsulated	1	1
35	MMZP-RB30-SS	Rotor Bolt	SUS316L	1	2
36	PCZP-CW30-SS	Disk Washer, Rotor Bolt	SUS304	1	2
37	PCOR-A131-EP	O-ring, Rotor Bolt(AN131)	EPDM	1	2
	PCOR-A131-FP	O-ring, Rotor Bolt(AN131)	FPM	1	2
	PMOR-A131-PF	O-ring, Rotor Bolt(AN131)	Perfluoro	1	2
37-1	PCOR-A018-EP	O-ring, Disk Washer(AN018)	EPDM	1	2
	PCOR-A018-EP	O-ring, Disk Washer(AN018)	FPM	1	2
	PCOR-A018-EP	O-ring, Disk Washer(AN018)	Perfluoro	1	2
38	MMZP-RT30-SS	Rotor	Illium 8	1	2
	MMZP-RT30-S1	Rotor	SUS316L	1	2
39	PCPI-N3X8-S1	Seal pin, Rotor (Φ3 X 6)	SUS304	1	2
40	PCPI-N3X8-SS	Seal pin, Case, Double (Φ3 X 8)	SUS304	1	2
41	PMZL-PN2C-SS	Dowel, Rotor Case(Φ8)	SUS304	1	2
42	PMFW-P06X-SS	Flat Washer, M/seal Gland (Φ6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench bolt, M/seal Gland (M6x10L)	SUS304	2	4
44	PMZL-M10A-SS	Stud Bolt, Case (M10 x 100L)	SUS304	1	4
45	PMZL-SH2A-SS	Shim, 0.05mm	SUS304	1	2
	PMZL-SH2B-SS	Shim, 0.1mm	SUS304	1	2
46	PCHN-M10X-SS	Hex nut, Stud (M10)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush / Double Seal(PT 1/8")	SUS304	1	2
48	PCZL-NA12-SS	Name Plate	SUS304	1	1
49	PMZL-PN2G-SS	Pin, Dowel (Φ8)	SUS304	1	4

SINGLE MECHANICAL SEAL & TRIPLE LIP SEAL / ZP030



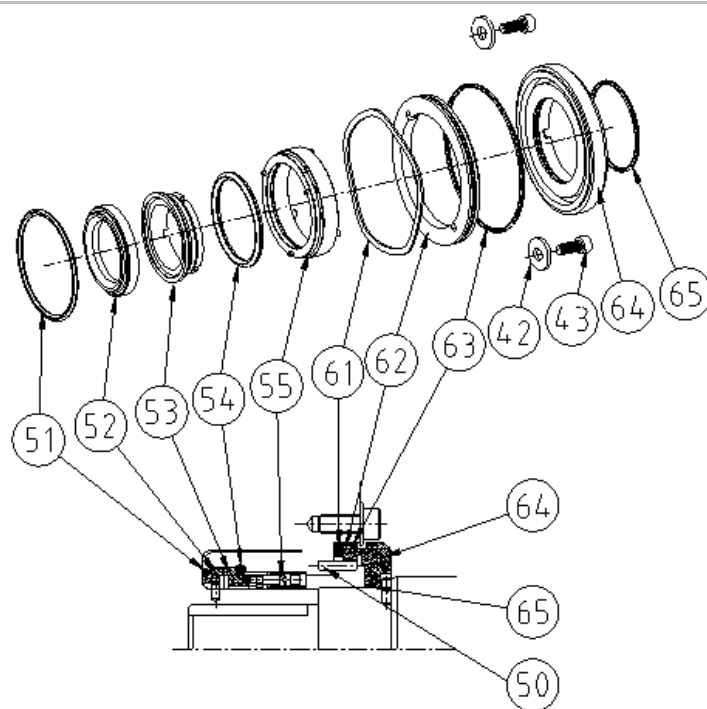
Single Mech. Seal



Triple Lip Seal

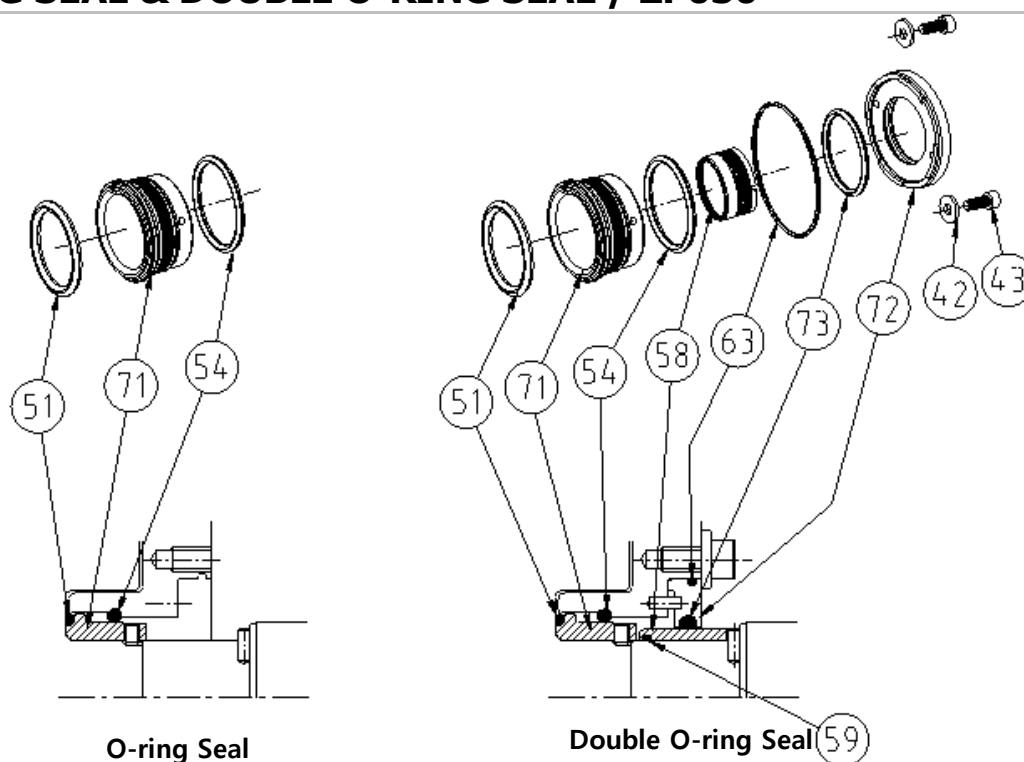
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	4
51	PCOR-A134-EP	O-ring, Rotor (AN134)	EPDM	1	2
	PCOR-A134-FP	O-ring, Rotor (AN134)	FPM	1	2
	PMOR-A134-PF	O-ring, Rotor (AN134)	Perfluoro	1	2
52	PMZP-SR3R-TC	Seal Ring, Rotor	TC	2	4
	PMZP-SR3R-SI	Seal Ring, Rotor	SiC	2	4
53	PMZP-SR3F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR3F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A226-EP	O-ring, Rotor Case (AN226)	EPDM	1	2
	PCOR-A226-FP	O-ring, Rotor Case (AN226)	FPM	1	2
	PMOR-A226-PF	O-ring, Rotor Case (AN226)	Perfluoro	1	2
55	PMZP-SSB3-LP	Single Seal Body, Case	SUS304	1	2
56	MMZL-LS2T-PF	Triple Lip Seal, Product	PTFE+Glass	1	2
57	PMZL-GD2A-SS	Gland, Lip Seal	SUS304	1	2
58	PMZP-CS30-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
59	PCOR-A027-EP	O-ring, C/Coated Sleeve(AN030)	EPDM	1	2
	PCOR-A027-FP	O-ring, C/Coated Sleeve(AN030)	FPM	1	2
	PMOR-A027-PF	O-ring, C/Coated Sleeve(AN030)	Perfluoro	1	2

DOUBLE MECHANICAL SEAL / ZP030



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PMFW-P06X-SS	Flat Washer, M/seal Gland (Φ6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench bolt, M/seal Gland (M6x10L)	SUS304	2	4
50	PCPI-N3X8-SS	Seal Pin, Case, Double Seal(Φ3X12)	SUS304	2	4
51	PCOR-A134-EP	O-ring, Rotor (AN134)	EPDM	1	2
	PCOR-A134-FP	O-ring, Rotor (AN134)	FPM	1	2
	PMOR-A134-PF	O-ring, Rotor (AN134)	Perfluoro	1	2
52	PMZP-SR3R-TC	Seal Ring, Rotor	TC	2	4
	PMZP-SR3R-SI	Seal Ring, Rotor	SiC	2	4
53	PMZP-SR3F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR3F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A226-EP	O-ring, Rotor Case (AN226)	EPDM	1	2
	PCOR-A226-FP	O-ring, Rotor Case (AN226)	FPM	1	2
	PMOR-A226-PF	O-ring, Rotor Case (AN226)	Perfluoro	1	2
55	PMZP-SSB3-LP	Seal Base, Single Mech.	SUS304	1	2
61	PMZP-WAV3-SS	Wave Spring	SUS304	1	2
62	PMZP-DSB2-CA	Double Seal Body, case	Carbon	1	2
	PMZP-DSB2-TC	Double Seal Body, Case	TC/SUS304	1	2
63	PCOR-A039-EP	O-ring, Case, Double seal (AN038)	EPDM	1	2
	PCOR-A039-FP	O-ring, Case, Double seal (AN038)	FPM	1	2
	PMOR-A039-PE	O-ring, Case, Double seal (AN038)	Perfluoro	1	2
64	PMZP-DRR3-TC	Double Mech Base, Shaft	TC/SUS304	1	2
65	PCOR-A030-EP	O-ring, Shaft, Double Seal (AN030)	EPDM	1	2
	PCOR-A030-FP	O-ring, Shaft, Double Seal (AN030)	FPM	1	2
	PMOR-A030-PE	O-ring, Shaft, Double Seal (AN030)	Perfluoro	1	2

O-RING SEAL & DOUBLE O-RING SEAL / ZP030



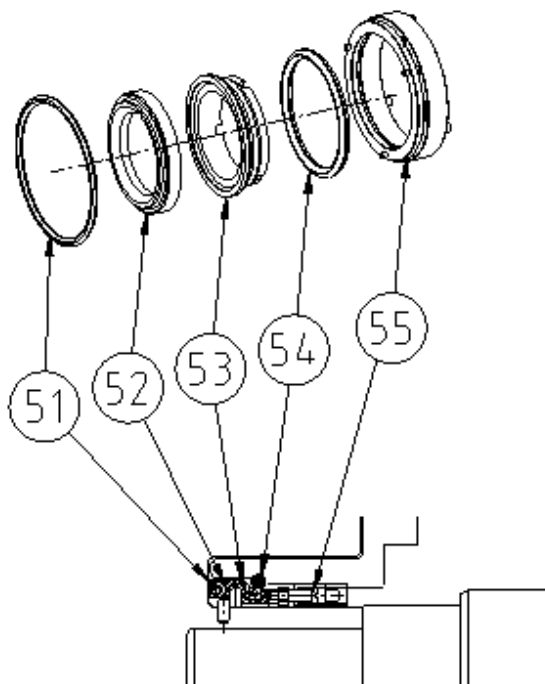
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland (M6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, Gland (M6x10L)	SUS304	2	4
51	PCOR-A134-EP	O-ring, Rotor (AN134)	EPDM	1	2
	PCOR-A134-FP	O-ring, Rotor (AN134)	FPM	1	2
	PMOR-A134-PF	O-ring, Rotor (AN134)	Perfluoro	1	2
54	PCOR-A226-EP	O-ring, Rotor Case (AN226)	EPDM	1	2
	PCOR-A226-FP	O-ring, Rotor Case (AN226)	FPM	1	2
	PMOR-A226-PF	O-ring, Rotor Case (AN226)	Perfluoro	1	2
58	PMZP-CS30-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
59	PCOR-A027-EP	O-ring, C/Coated Sleeve(AN030)	EPDM	1	2
	PCOR-A027-FP	O-ring, C/Coated Sleeve(AN030)	FPM	1	2
	PMOR-A027-PF	O-ring, C/Coated Sleeve(AN030)	Perfluoro	1	2
63	PCOR-A039-EP	O-ring, Case, Double Seal(AN038)	EPDM	1	2
	PCOR-A039-FP	O-ring, Case, Double Seal(AN038)	FPM	1	2
	PMOR-A039-PE	O-ring, Case, Double Seal(AN038)	Perfluoro	1	2
71	PMZP-OSS3-SS	Sleeve, O-ring Seal	CERAMIC/SUS304	1	2
72	MMZL-DSB2-SS	Body, Double O-ring Seal	SUS304	1	2
73	PCOR-A224-EP	O-ring, Body, D/O-ring Seal(AN224)	EPDM	1	2
	PCOR-A224-FP	O-ring, Body, D/O-ring Seal(AN224)	FPM	1	2

Parts list / ZP060

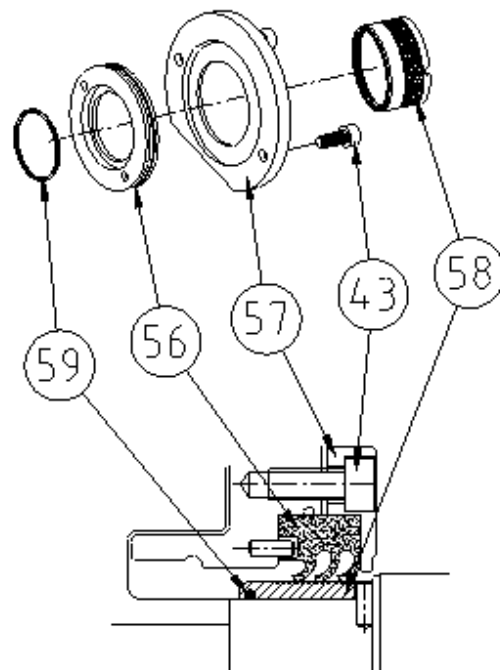
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB3A-CS	Gear Box	FCD40	1	1
	MMZL-GB3A-SS	Gear Box	SUS304	1	1
2	MMZL-GBB3-CS	Base,Gear Box	FCD40	1	1
	MMZL-GBB3-SS	Base,Gear Box	SUS304	1	1
3	PCWB-M12C-SS	Wrench Bolt, Base(M12x30L)	SUS304	1	4
4	MMZL-GBC3-CS	Cover, Gear Box	FCD40	1	1
	MMZL-GBC3-SS	Cover, Gear Box	SUS304	1	1
5	PMZL-PT34-P2	Plug, Level, Drain, PT 3/4"	PE	1	3
6	PCWB-M08J-CS	Wrench Bolt, Gear Box Cover(M8x70L)	S45C	1	4
7	PCZL-KY3B-CS	Key,Shaft(8x7x34)	S45C	1	1
8	MMZP-SD60-SS	Shaft, Drive	SUS304	1	1
9	MMZP-SI60-SS	Shaft, Idle	SUS304	1	1
10	PCZL-KY3A-CS	Key, Gear(14x9x35)	S45C	1	2
11	PMZL-OS45-NB	Oil Seal, Cover(45x70x12t)	NBR	1	1
	PMZL-OS45-FP	Oil Seal, Cover(45x70x12t)	FPM	1	1
12	PMZL-LW10-CS	Lock Washer	S45C	1	2
12-1	PMZL-LN10-CS	Lock Nut	S45C	1	2
13	PMZL-PT34-P1	Breather, Gearbox PT 3/4"	PE	1	1
14	PMZL-HG3X-CS	Hellical Gear	S45C	1	2
15	PMZL-PN2G-SS	Dowel, Gear Box(Φ8)	SUS304	1	2
16	MMZL-GS3X-CS	Spacer, Gear(Φ60x6L)	S45C	1	2
17	PMZL-BE10-CS	Bearing, Rear (#5210)		1	2
18	MMZL-BS3X-CS	Spacer, Bearing	S45C	1	2
19	PCZL-IM12-SS	I-bolt / M12	SUS304	1	2
20	PMZL-BE12-CS	Bearing, Front (#5212)		1	2
21	PCOR-A155-FP	O-Ring, Oil Seal Gland (AN155)	FPM	1	2
22	PMZL-OS65-NB	Oil Seal, Gear box (65x90x12t)	NBR	1	2
	PMZL-OS65-FP	Oil Seal, Gear box (65x90x12t)	FPM	1	2
23	PCWB-M10E-SS	Wrench Bolt, Oil Seal Gland(M10x20L)	SUS304	3	6
24	MMZL-GD3C-SS	Gland, Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Double Seal(Φ3)	SUS304	1	2
26	PMZL-GG3X-PA	Gasket	Paper	1	1
27	PMZL-M12P-PE	Plug(M12x30L)	PE	1	8
28	PCZP-KY2C-SS	Key, Rotor(8x7x46)	SUS304	2	4
29	MMZL-GBA3-SS	Vertical adaptor	SUS304	1	4

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZP060-GBXH-SS	Gear Box Ass'y	SUS304	1	1
	ZP060-GBXH-CS	Gear Box Ass'y	FCD40	1	1
31	MMZP-060D-SS	Rotor Case-2.5"DIN11851	SUS316L	1	1
	MMZP-060F-SS	Rotor Case-2.5"DIN2633	SUS316L	1	1
	MMZP-060S-SS	Rotor Case-2.5"DS722.1	SUS316L	1	1
	MMZP-060I-SS	Rotor Case-2.5"ISOMALE	SUS316L	1	1
	MMZP-060R-SS	Rotor Case-2.5"RJT	SUS316L	1	1
	MMZP-060M-SS	Rotor Case-2.5"SMS	SUS316L	1	1
	MMZP-060C-SS	Rotor Case-2.5"TRICLAMP	SUS316L	1	1
	MMZP-060W-SS	Rotor Case-2.5" Welding neck	SUS316L	1	1
	MMZP-060K-SS	Rotor Case-2.5" FLANGE	SUS316L	1	1
32	MMZP-FC60-SS	Front Cover	SUS316L	1	1
33	PCZL-M14X-SS	Cap Nut	SUS304	1	4
34	PCOR-A270-NB	O-ring, Front Cover (AN270)	NBR	1	1
	PCOR-A270-EP	O-ring, Front Cover (AN270)	EPDM	1	1
	PCOR-A270-FP	O-ring, Front Cover (AN270)	FPM	1	1
	PMOR-A270-PF	O-ring, Front Cover (AN270)	Perfluoro	1	1
	PMOR-A270-KA	O-ring, Front Cover (AN270)	Kalrez	1	1
	PMOR-A270-PT	O-ring, Front Cover (AN270)	PTFE capsulated	1	1
35	MMZP-RB60-SS	Rotor Bolt	SUS316L	1	2
36	PCZP-CW60-SS	Disk Washer, Rotor Bolt	SUS304	1	2
37	PCOR-A227-EP	O-ring, Rotor Bolt(AN227)	EPDM	1	2
	PCOR-A227-FP	O-ring, Rotor Bolt(AN227)	FPM	1	2
	PMOR-A227-PF	O-ring, Rotor Bolt(AN227)	Perfluoro	1	2
37-1	PCOR-A021-EP	O-ring, Disk Washer(AN020)	EPDM	1	2
	PCOR-A021-EP	O-ring, Disk Washer(AN020)	FPM	1	2
	PCOR-A021-EP	O-ring, Disk Washer(AN020)	Perfluoro	1	2
38	MMZP-RT60-SS	Rotor	Illium 8	1	2
	MMZP-RT60-S1	Rotor	SUS316L	1	2
39	PCPI-N3X8-S1	Seal pin, Rotor (Φ3 X 6)	SUS304	1	2
40	PCPI-N3X8-SS	Seal pin, Case, Double (Φ3 X 8)	SUS304	2	4
41	PMZL-PN3C-SS	Dowel, Rotor Case(Φ8)	SUS304	1	2
42	PCFW-P06X-CS	Flat Washer, M/seal Gland	SUS304	3	6
43	PCWB-M06A-SS	Wrench bolt, M/seal Gland (M06 X 10L)	SUS304	3	6
44	PMZL-M14C-SS	Stud Bolt, Case(M14 x 142L)	SUS304	1	4
45	PMZL-SH3A-SS	Shim, 0.05mm	SUS304	1	2
	PMZL-SH3B-SS	Shim, 0.1mm	SUS304	1	2
46	PCHN-M14X-SS	Hex nut, Stud(M14)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush / Double Seal(PT 1/8")	SUS304	1	2
48	PCZL-NA34-SS	Name Plate	SUS304	1	1
49	PMJT-PN3C-SS	Pin, Dowel (Φ10)	SUS304	1	4

SINGLE MECHANICAL SEAL & TRIPLE LIP SEAL / ZP060



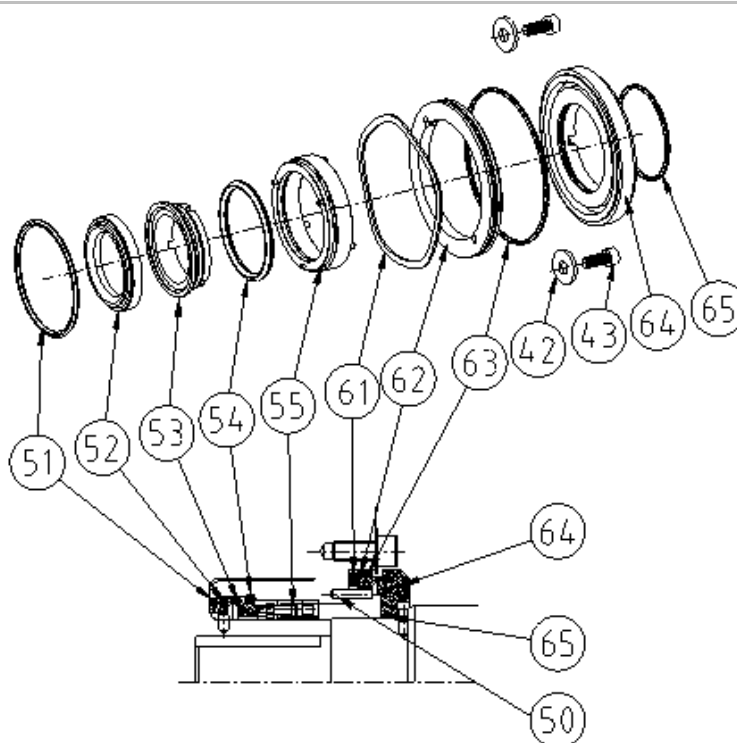
Single Mech. Seal



Triple Lip Seal

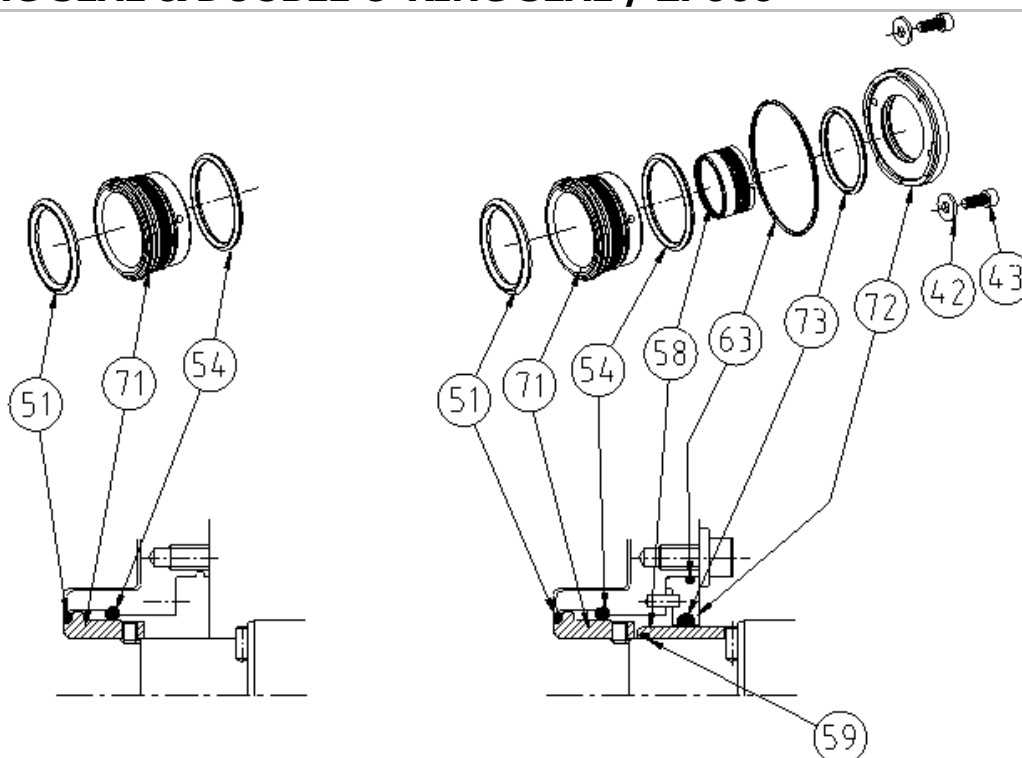
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland(M6x10L)	SUS304	2	4
51	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	2
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	2
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	2
52	PMZP-SR6R-TC	Seal Ring, Rotor	TC	1	2
	PMZP-SR6R-SI	Seal Ring, Rotor	SiC	1	2
53	PMZP-SR6F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR6F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	2
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	2
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	2
55	PMZP-SSB6-LP	Single Seal Body, Case	SUS304	1	2
56	MMZL-LS3T-PF	Triple Lip Seal, Product	PTFE+Glass	1	2
57	PMZL-GD3A-SS	Gland, Lip Seal	SUS304	1	2
58	PMZP-CS60-CS	Ceramic Coated Sleeve , Product	CERAMIC/SUS304	1	2
59	PCOR-A033-EP	O-ring, C/Coated Sleeve(AN033)	EPDM	1	2
	PCOR-A033-FP	O-ring, C/Coated Sleeve(AN033)	FPM	1	2
	PMOR-A033-PE	O-ring, C/Coated Sleeve(AN033)	Perfluoro	1	2

DOUBLE MECHANICAL SEAL / ZP060



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland(M6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, Gland(M6x10L)	SUS304	2	4
50	PCPI-N3X8-SS	Seal Pin, Case, Double Seal(Φ3X12)	SUS304	2	4
51	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	2
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	2
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	2
52	PMZP-SR6R-TC	Seal Ring, Rotor	TC	1	2
	PMZP-SR6R-SI	Seal Ring, Rotor	SiC	1	2
53	PMZP-SR6F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR6F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	2
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	2
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	2
55	PMZP-SSB6-LP	Seal Base, Single Mech.	SUS304	1	2
61	PMZP-WAV6-SS	Wave Spring	SUS304	1	2
62	PMZP-DSB3-CA	Double Seal Body, case	Carbon	1	2
	PMZP-DSB3-TC	Double Seal Body, Case	TC/SUS304	1	2
63	PCOR-A042-EP	O-ring, Case, Double seal (AN041)	EPDM	1	2
	PCOR-A042-FP	O-ring, Case, Double seal (AN041)	FPM	1	2
	PMOR-A042-PE	O-ring, Case, Double seal (AN041)	Perfluoro	1	2
64	PMZP-DRR6-TC	Double Mech Base, Shaft	TC/SUS304	1	2
65	PCOR-A034-EP	O-ring, Shaft, Double Seal (AN034)	EPDM	1	2
	PCOR-A034-FP	O-ring, Shaft, Double Seal (AN034)	FPM	1	2
	PMOR-A034-PE	O-ring, Shaft, Double Seal (AN034)	Perfluoro	1	2

O-RING SEAL & DOUBLE O-RING SEAL / ZP060



O-ring Seal

Double O-ring Seal

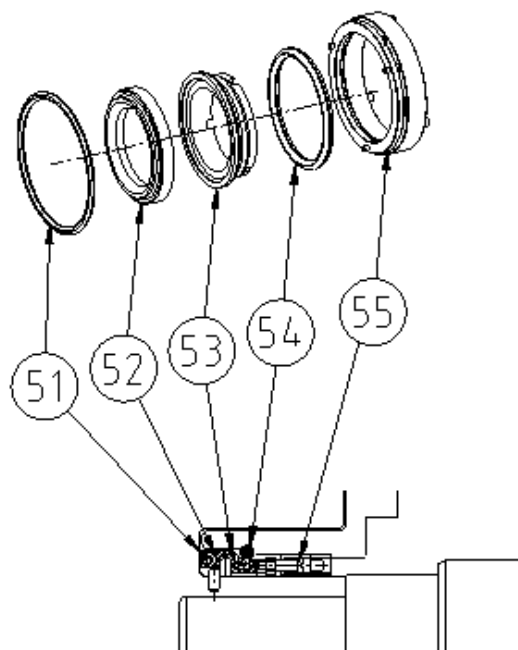
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland(M6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, Gland(M6x10L)	SUS304	2	4
51	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	2
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	2
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	2
54	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	2
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	2
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	2
58	PMZP-CS60-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
59	PCOR-A033-EP	O-ring, C/Coated Sleeve(AN033)	EPDM	1	2
	PCOR-A033-FP	O-ring, C/Coated Sleeve(AN033)	FPM	1	2
	PMOR-A033-PF	O-ring, C/Coated Sleeve(AN033)	Perfluoro	1	2
63	PCOR-A042-EP	O-ring, Case, Double Seal(AN041)	EPDM	1	2
	PCOR-A042-FP	O-ring, Case, Double Seal(AN041)	FPM	1	2
	PMOR-A042-PE	O-ring, Case, Double Seal(AN041)	Perfluoro	1	2
71	PMZP-OSS6-SS	Sleeve, O-ring Seal	CERAMIC/SUS304	1	2
72	MMZL-DSB3-SS	Body, Double O-ring Seal	SUS304	1	2
73	PCOR-A229-EP	O-ring, Body, D/O-ring Seal(AN229)	EPDM	1	2
	PCOR-A229-FP	O-ring, Body, D/O-ring Seal(AN229)	FPM	1	2

Parts list / ZP130

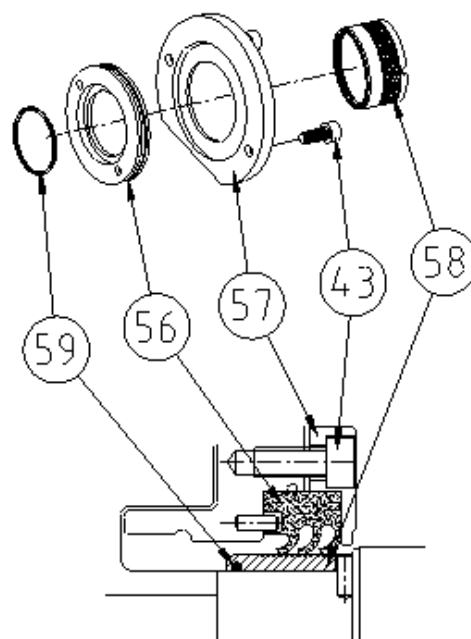
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB3A-CS	Gear Box	FCD40	1	1
	MMZL-GB3A-SS	Gear Box	SUS304	1	1
2	MMZL-GBB3-CS	Base, Gear Box	FCD40	1	1
	MMZL-GBB3-SS	Base, Gear Box	SUS304	1	1
3	PCWB-M12C-SS	Wrench Bolt, Base(M12x30L)	SUS304	1	4
4	MMZL-GBC3-CS	Cover, Gear Box	FCD40	1	1
	MMZL-GBC3-SS	Cover, Gear Box	SUS304	1	1
5	PMZL-PT34-P2	Plug, Level, Drain, PT 3/4"	PE	1	3
6	PCWB-M08J-CS	Wrench Bolt, Gear Box Cover(M8x70L)	S45C	1	4
7	PCZL-KY3B-CS	Key, Shaft(8x7x34)	S45C	1	1
8	MMZP-SD13-SS	Shaft, Drive	SUS304	1	1
9	MMZP-SI13-SS	Shaft, Idle	SUS304	1	1
10	PCZL-KY3A-CS	Key, Gear(14x9x35)	S45C	1	2
11	PMZL-OS45-NB	Oil Seal, Cover(45x70x12t)	NBR	1	1
	PMZL-OS45-FP	Oil Seal, Cover(45x70x12t)	FPM	1	1
12	PMZL-LW10-CS	Lock Washer	S45C	1	2
12-1	PMZL-LN10-CS	Lock Nut	S45C	1	2
13	PMZL-PT34-P1	Breather, Gearbox PT 3/4"	PE	1	1
14	PMZL-HG3X-CS	Hellical Gear	S45C	1	2
15	PMZL-PN2G-SS	Dowel, Gear Box(Φ8)	SUS304	1	2
16	MMZL-GS3X-CS	Spacer, Gear(Φ35x5L)	S45C	1	2
17	PMZL-BE10-CS	Bearing, Rear (#5210)		1	2
18	MMZL-BS3X-CS	Spacer, Bearing	S45C	1	2
19	PCZL-IM12-SS	I-bolt / M12	SUS304	1	2
20	PMZL-BE12-CS	Bearing, Front (#5212)		1	2
21	PCOR-A046-FP	O-Ring, Oil Seal Gland (AN046)	FPM	1	2
22	PMZL-OS65-NB	Oil Seal, Gear box (65x90x12t)	NBR	1	2
	PMZL-OS65-FP	Oil Seal, Gear box (65x90x12t)	FPM	1	2
23	PCWB-M10E-SS	Wrench Bolt, Oil Seal Gland(M10x20L)	SUS304	3	6
24	MMZL-GD3C-SS	Gland, Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Double Seal(Φ3)	SUS304	1	2
26	PMZL-GG3X-PA	Gasket	Paper	1	1
27	PMZL-M12P-PE	Plug(M12)	PE	1	8
28	PCZP-KY2C-SS	Key, Rotor(8x7x72)	SUS304	2	4
29	MMZL-GBA4-SS	Vertical adaptor	SUS304	1	4

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZP130-GBXH-SS	Gear Box Ass'y	SUS304	1	1
	ZP130-GBXH-CS	Gear Box Ass'y	FCD40	1	1
31	MMZP-130D-SS	Rotor Case-3"DIN11851	SUS316L	1	1
	MMZP-130F-SS	Rotor Case-3"DIN2633(FLANGE)	SUS316L	1	1
	MMZP-130S-SS	Rotor Case-3"DS722.1	SUS316L	1	1
	MMZP-130I-SS	Rotor Case-3"ISOMALE	SUS316L	1	1
	MMZP-130R-SS	Rotor Case-3"RJT	SUS316L	1	1
	MMZP-130M-SS	Rotor Case-3"SMS	SUS316L	1	1
	MMZP-130C-SS	Rotor Case-3"TRICLAMP	SUS316L	1	1
	MMZP-130W-SS	Rotor Case-3"Welding neck	SUS316L	1	1
	MMZP-130K-SS	Rotor Case-3"JIS FLANGE	SUS316L	1	1
32	MMZP-FC60-SS	Front Cover	SUS316L	1	1
33	PCZL-M14X-SS	Cap Nut	SUS304	1	4
34	PCOR-A270-NB	O-ring, Front Cover (AN270)	NBR	1	1
	PCOR-A270-EP	O-ring, Front Cover (AN270)	EPDM	1	1
	PCOR-A270-FP	O-ring, Front Cover (AN270)	FPM	1	1
	PMOR-A270-PF	O-ring, Front Cover (AN270)	Perfluoro	1	1
	PMOR-A270-KA	O-ring, Front Cover (AN270)	Kalrez	1	1
	PMOR-A270-PT	O-ring, Front Cover (AN270)	PTFE capsulated	1	1
35	MMZP-RB60-SS	Rotor Bolt	SUS316L	1	2
36	PCZP-CW60-SS	Disk Washer, Rotor Bolt	SUS304	1	2
37	PCOR-A227-EP	O-ring, Rotor Bolt(AN227)	EPDM	1	2
	PCOR-A227-FP	O-ring, Rotor Bolt(AN227)	FPM	1	2
	PMOR-A227-PF	O-ring, Rotor Bolt(AN227)	Perfluoro	1	2
37-1	PCOR-A021-EP	O-ring, Disk Washer(AN020)	EPDM	1	2
	PCOR-A021-EP	O-ring, Disk Washer(AN020)	FPM	1	2
	PCOR-A021-EP	O-ring, Disk Washer(AN020)	Perfluoro	1	2
38	MMZP-RT13-SS	Rotor	Illium 8	1	2
	MMZP-RT13-S1	Rotor	SUS316L	1	2
39	PCPI-N3X8-S1	Seal pin, Rotor (Φ3 X 6)	SUS304	1	2
40	PCPI-N3X8-SS	Seal pin, Case, Double (Φ3 X 8)	SUS304	2	4
41	PMZL-PN3C-SS	Dowel, Rotor Case(Φ8)	SUS304	1	2
42	PCFW-P06X-CS	Flat Washer, M/seal Gland	SUS304	3	6
43	PCWB-M06A-SS	Wrench bolt, M/seal Gland	SUS304	3	6
44	PMZL-M14G-SS	Stud Bolt, Case(M14 x 169L)	SUS304	1	4
45	PMZL-SH4A-SS	Shim, 0.05mm	SUS304	1	2
	PMZL-SH4B-SS	Shim, 0.1mm	SUS304	1	2
46	PCHN-M14X-SS	Hex nut, Stud(M14)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush / Double Seal(PT 1/8")	SUS304	1	2
48	PCZL-NA34-SS	Name Plate	SUS304	1	1
49	PMJT-PN3C-SS	Pin, Dowel (Φ10)	SUS304	1	4

SINGLE MECHANICAL SEAL & TRIPLE LIP SEAL / ZP130



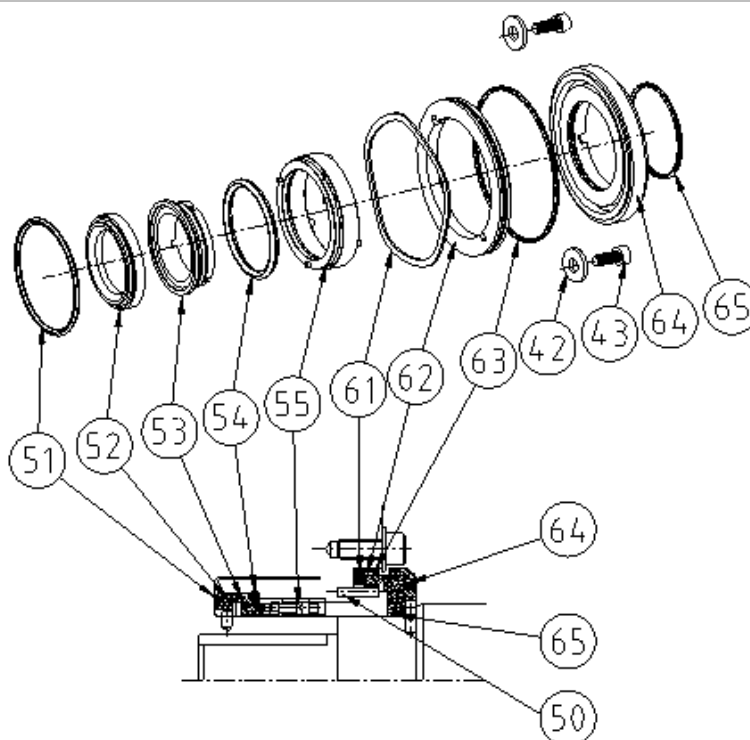
Single Mech. Seal



Triple Lip Seal

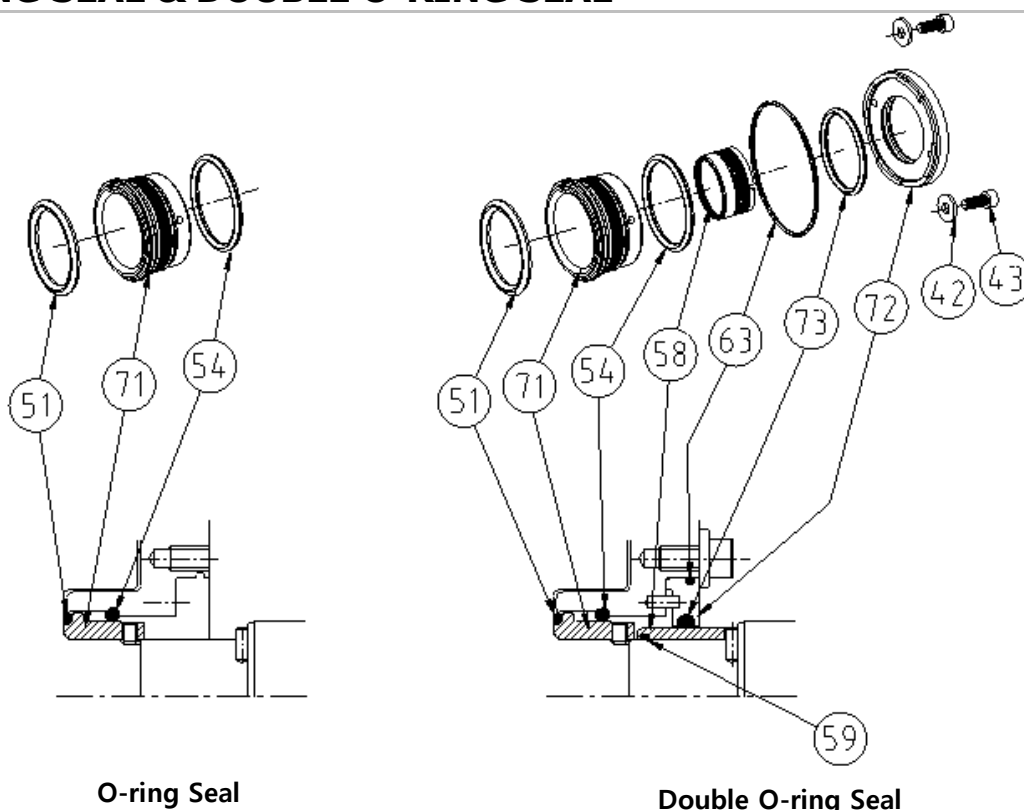
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	4
51	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	2
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	2
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	2
52	PMZP-SR6R-TC	Seal Ring, Rotor	TC	2	4
	PMZP-SR6R-SI	Seal Ring, Rotor	SiC	2	4
53	PMZP-SR6F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR6F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	2
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	2
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	2
55	PMZP-SSB6-LP	Single Seal Body, Case	SUS304	1	2
56	MMZL-LS3T-PF	Triple Lip Seal, Product	PTFE+Glass	1	2
57	PMZL-GD3A-SS	Gland, Lip Seal	SUS304	1	2
58	PMZP-CS13-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
59	PCOR-A033-EP	O-ring, C/Coated Sleeve(AN033)	EPDM	1	2
	PCOR-A033-FP	O-ring, C/Coated Sleeve(AN033)	FPM	1	2
	PMOR-A033-PE	O-ring, C/Coated Sleeve(AN033)	Perfluoro	1	2

DOUBLE MECHANICAL SEAL / ZP130



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland(M6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, Gland(M6x10L)	SUS304	2	4
50	PCPI-N3X8-SS	Seal Pin, Case, Double Seal(Φ3X12)	SUS304	2	4
51	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	2
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	2
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	2
52	PMZP-SR6R-TC	Seal Ring, Rotor	TC	1	2
	PMZP-SR6R-SI	Seal Ring, Rotor	SiC	1	2
53	PMZP-SR6F-TC	Seal Ring, Case	TC	1	2
	PMZP-SR6F-SI	Seal Ring, Case	SiC	1	2
54	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	2
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	2
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	2
55	PMZP-SSB6-LP	Seal Base, Single Mech.	SUS304	1	2
61	PMZP-WAV6-SS	Wave Spring	SUS304	1	2
62	PMZP-PSB4-CA	Double Seal Body, Case	Carbon	1	2
	PMZP-DSB4-TC	Double Seal Body, Case	TC/SUS304	1	2
63	PCOR-A042-EP	O-ring, Case, Double seal (AN041)	EPDM	1	2
	PCOR-A042-FP	O-ring, Case, Double seal (AN041)	FPM	1	2
	PMOR-A042-PE	O-ring, Case, Double seal (AN041)	Perfluoro	1	2
64	PMZP-DRR6-TC	Double Mech Base, Shaft	TC/SUS304	1	2
65	PCOR-A034-EP	O-ring, Shaft, Double Seal (AN034)	EPDM	1	2
	PCOR-A034-FP	O-ring, Shaft, Double Seal (AN034)	FPM	1	2
	PMOR-A034-PE	O-ring, Shaft, Double Seal (AN034)	Perfluoro	1	2

O-RING SEAL & DOUBLE O-RING SEAL



O-ring Seal

Double O-ring Seal

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland(M6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, Gland(M6x10L)	SUS304	2	4
51	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	2
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	2
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	2
54	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	2
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	2
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	2
58	PMZP-CS60-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
59	PCOR-A033-EP	O-ring, C/Coated Sleeve(AN033)	EPDM	1	2
	PCOR-A033-FP	O-ring, C/Coated Sleeve(AN033)	FPM	1	2
	PMOR-A033-PF	O-ring, C/Coated Sleeve(AN033)	Perfluoro	1	2
63	PCOR-A042-EP	O-ring, Case, Double Seal(AN041)	EPDM	1	2
	PCOR-A042-FP	O-ring, Case, Double Seal(AN041)	FPM	1	2
	PMOR-A042-PE	O-ring, Case, Double Seal(AN041)	Perfluoro	1	2
71	PMZP-OSS6-SS	Sleeve, O-ring Seal	CERAMIC/SUS304	1	2
72	MMZL-DSB3-SS	Body, Double O-ring Seal	SUS304	1	2
73	PCOR-A229-EP	O-ring, Body, D/O-ring Seal(AN229)	EPDM	1	2
	PCOR-A229-FP	O-ring, Body, D/O-ring Seal(AN229)	FPM	1	2

*** APPENDIX**

LUBRICATION

Pump bearings and gear should run in an oil bath. Replacement of these bearings and gear wheels is recommended after 20,000 hours of operation.

However, the shorter change intervals required for particularly difficult operating conditions, such as:

- High temperature variations
- High pressure fluctuations

Oil in gearbox is recommended to be changed once a year or every 2,000 operating hours.

However, the interval of changing oil should be adjusted according to the operating conditions.

Check the oil level in the gearbox weekly and top up the gear oil if necessary.

Filling quantities each series are shown as follow.

Series	ZP015	ZP030	ZP060	ZP130
Q'ty(liter)	0.34	0.95	2.30	2.30

We recommend 'Shell Omala S2 G150 or equivalent Synthetic gear oils' met below Qualifications/Specifications.

- David Brown S1.53.101, 102, 103, 104
- Meets MAG (Cincinatti Machine) P34, 35, 59, 63, 74, 76-78
- ISO 12925-1 Type CKD, except ISO 680-1000. OSP 680 meets CKC
- DIN 51517-Part 3 (CLP), except ISO 1000
- AGMA 9005-EO2 (EP)
- US Steel 224

Food Grade Gear Oil

We recommend 'NEVASTANE XSH (150 to 460) or equivalent Synthetic (PAO) gear oils' suitable for incidental food contact met below Qualifications/Specifications.

- The formulation of oils complies with the FDA chapter 21 CFR, 178.3570.
- NSF H1 registered (No 147305, No 147302, No 147303, No 147304)
- Kosher, Halal and ISO 21469 certified.
- International specification: ISO 12925-1 CKD.
- DIN 51517-3 CLP
- DIN 51354-2 - FZG A/8, 3/90°C - Fail stage > 12
- ASTM D 4172 - 4 ball test - wear (scar diameter) - 0.3 mm.

ISSUE DATE: November 29, 2005

CERTIFICATE AUTHORIZATION NUMBER: 1397



THIS IS TO CERTIFY THAT

JEC Ltd.

15-26 Beodeul-ro 1362, Paltan-myun, Hwaseong-Si 445-971 , Republic of Korea

is hereby authorized to continue to apply the
3-A Symbol to the models of equipment, conforming to 3-A Sanitary Standards for:

Number 02-11
02-11 (Centrifugal and Positive Rotary Pumps)

set forth below

CIP Models: Pumps with single mechanical seal:

Rotary Lobe Pumps: JRZL105, JRZL110, JRZL115, JRZL120, JRZL220, JRZL225, JRZL330, JRZL340, JRZL440, JRZL450, JRZW120;

Centrifugal Pumps: JCP508, JCP510, JCP 809, JCP812, JCP2210, JCP2214;

Centrifugal (WFI) Pumps: JWP508, JWP510, JWP809, JWP812, JWP2210, JWP2214;

Circumferential Piston Pump: JRZP015, JRZP030, JRZP060, JRZP130, JRZP220;

Twin Screw Pumps: JRZS100, JRZS200, JRZS300;

All pumps provided with Tri-Clamp, DIN 11851, or SMS sanitary fittings

VALID THROUGH: **December 31, 2019**

Timothy R. Rugh
Executive Director
3-A Sanitary Standards, Inc.

The issuance of this authorization for the use of the 3-A Symbol is based upon the voluntary certification, by the applicant for it, that the equipment listed above complies fully with the 3-A Sanitary Standard(s) designated. Legal responsibility for compliance is solely that of the holder of this Certificate of Authorization, and 3-A Sanitary Standards, Inc. does not warrant that the holder of an authorization at all times complies with the provisions of the said 3-A Sanitary Standards. This in no way affects the responsibility of 3-A Sanitary Standards, Inc. to take appropriate action in such cases in which evidence of nonconformance has been established.

NEXT TPV INSPECTION/REPORT DUE: **May 2022**

CERTIFICATE OF COMPLIANCE



TYPE EL - CLASS I

*TUM Certification
hereby declares that the product*

**JEC Circumferential Piston Pumps JRZP series
with EPDM gasket**

from

JEC LTD., Gyeonggi-do, 445-971, South-Korea

*has been evaluated for compliance with the
Hygienic Equipment Design Criteria of the EHEDG, by:*

*TUM (Forschungszentrum für Brau- u. Lebensmittelqualität) at Weihenstephan, Germany
and meets the criteria as demonstrated by:*

Evaluation Report No. 265/24.09.2010

Signed Jürgen Hofmann
Evaluation Officer

Date 25. January 2011

Signed Dirk Jell
Head of Department

Date 25. January 2011

Certificate No. 05/2011



**FORSCHUNGSZENTRUM
WEIHENSTEPHAN**
für Brau- und
Lebensmittelqualität

**85354 Freising-Weihenstephan, Germany
©EHEDG**

ATEX Certificate



Konformitätserklärung

EC declaration of conformity

im Sinne der EG-Maschinenrichtlinie 98 / 37 / EG, Anhang IIA
as defined by EC machinery directive 98 / 37 / EC, Annex II A

Produkt: <i>Product:</i>	Circumferential Kolben Pomp <i>Circumferential Piston Pump</i>
Modell: <i>Serial No :</i>	JRZP series ZP-0000
Max. Arbeitsdruck: <i>max. working pressure:</i>	bis 15 bar <i>to 15 bar</i>
Drehzahl: <i>Speed:</i>	<500 min ⁻¹ (+/-10%)
Kennzeichnung: <i>Marking:</i>	 II 2G c T4

Hiermit erklären wir, dass die Pumpentypen, mit den folgenden Richtlinien übereinstimmen:
We declares that the pump types, complies with the following relevant regulations:

EG - Maschinenrichtlinie 98 / 37 / EG, Anhang I Nr.1
EC machinery directive 98 / 37 / EG, Annex I No. 1

EG - Richtlinie 94 / 9 / EC für Geräte in explosionsgefährdeten Bereichen
EC directive 94 / 9 / EC for equipment for the use in potentially explosive atmospheres

Entsprechend Artikel 8(1)b)ii) der Richtlinie 94/9/EG ist die technische Dokumentation bei der benannten Stelle hinterlegt:
IBExU, Institut für Sicherheitstechnik, Fuchsmühlenweg 7, 09599 Freiberg

According to article 8(1)b)ii) of guide line 94 / 9 / EC the technical documentation is deposited at the nominated location:
IBExU, Institute for Safety Technology, Fuchsmuehlenweg 7, 09599 Freiberg, Germany

Angewandte harmonisierte Normen:
Applicable harmonized standards:

EN 292-1, EN 292-2, EN 809, EN 294, EN 563, EN 953

EN1127-1, EN 13463-1, EN 13463-5

Die Sicherheitshinweise der Betriebsanleitung sind zu beachten!
The safety instructions of the operating manual must be followed!

July 28 2009
Date


James Song / President

JEC LTD. 32-8, Hwadang-ri, Paltan-myun, Hwaseong-si, Gyeonggi-do, 443-043, South Korea
Tel : 82-31-355-0316, Fax : 82-31-355-0319

1935/2004 (EC) Declaration of Conformity

Manufacturer: JEC Ltd. 15-26, Beodeul-ro 1362, Hwaseong-Si, Gyeonggi-Do, South Korea

Products: Rotary pumps, Twin Screw pumps, Centrifugal pumps and Blenders

We, JEC, hereby guarantee that the materials are contacted directly with food as below:


Wetted parts, Seal ring, Triple Lip-seal and O-rings

Comply with the following relevant regulations:

- **1935/2004 (EC)**
- **Annex IV of Regulation (EC) 10/2011**
- **BfR Recommendation XXI**

This declaration of conformity has been established on the basis of the followings:

No.	Parts	Test requested	Test done
1	Wetted parts /SS316L	German Food, Articles of Daily use and Feed Code of September 1, 2005 (LFGB), Section30	Extractable heavy metals
		German Food, Articles of Daily use and Feed Code of September 1, 2005 (LFGB), Section31	Sensorial examination odor and taste
2	Seal ring /SiC	German Food, Articles of Daily use and Feed Code of September 1, 2005 (LFGB), Section30	Extractable heavy metals
		German Food, Articles of Daily use and Feed Code of September 1, 2005 (LFGB), Section31	Sensorial examination odor and taste
3	Lip seal /Glass filled PTFE	Commission Regulation (EC) No 10/2011 and Hence Article 3 of European Regulation No. 1935/2004	1. Overall Migration 2. Specific Migration of Heavy metal
		German Food, Articles of Daily use and Feed Code of September 1, 2005 (LFGB), Section31	Sensorial examination odor and taste
4	O-ring /EPDM	BfR Recommendation XXI	1. Overall Migration 2. Specific migration of Primary Aromatic Amine 3. Lead and Zinc content 4. Specific migration of Formaldehyde 5. Organotin content
		European Commission Directive 93/11EEC	Specific migration of Nitrosamines



James Song / President



EC-Declaration of conformity
(as per EC's Machinery Directive 2006/42/EC, Annex IIA)

Producer

JEC LTD
15-26, Beodeul-ro 1362, Hwasung-Shi,
Kyunggi-do, South Korea

We hereby guarantee that **Circumferential Piston Pumps(Pump Head Only)** and
Type: **JRZP series**

are in conformity with the essential requirements of the EC's Machinery Directive
2006/42/CE(latest modifications included) and according the following Council Directives
and harmonized norms:

- **2006/95/EC Directive "low voltage"**
- **UNI EN ISO 12100-2:2005**


Manufacturer Declaration

(as per EC's Machinery Directive 2006/42/CE, Annex IIB)

We hereby declares that the above pumps,
Comply with the pertinent disposition, in the execution supplied by JEC LTD for the
incorporation in a machine or installation, or for the assembly with other machines as a
subunit of other higher order machine. Harmonized norms used, particularly:

UNI EN ISO 12100-2:2005

The machine above must not be put into service until the machinery into which it has been
incorporated have been declared in conformity with the EC Machinery Directive. It must
meet, particularly, the standards ISO 23857:2008, ISO 13732-1:2007 in its respective
current editions.



James Song / President

JEC LTD. 15-26 , Beodeul-ro, Paltan-myun, Hwaseong-si, Gyeonggi-do, 445-843, South Korea
Tel : 82-31-355-0316, Fax : 82-31-355-0319

FDA Declaration of Conformity

Manufacturer:

JEC Ltd.
15-26, Beodeul-ro 1362, Paltan-Myeon Hwaseong-Si, Gyeonggi-Do, Rep. Of Korea

Products:

Rotary pumps, Twin Screw pumps, Centrifugal pumps and Blenders

We, JEC, hereby announce that the O-ring materials of **FPM & EPDM** in our above mentioned products meet the requirement of FDA qualification for directly contacted with food from tested by SGS as below listed:

Comply with the following relevant regulations:

- US FDA 21 CFR 177.2600 (Rubber Articles)

This declaration of conformity has been established on the basis SGS test result:

No.	Parts	Test Condition	Extractants
1	O-ring / FPM	Reflux temperature for 7 hours	Distilled water
		Succeeding 2 hours of extraction	
		Reflux temperature for 7 hours	n - Hexane
		Succeeding 2 hours of extraction	
2	O-ring / EPDM	Reflux temperature for 7 hours	Distilled water
		Succeeding 2 hours of extraction	



James Song / President

JEC LTD. 15-26 , Beodeul-ro 1362, Paltan-myeon, Hwaseong-si, Gyeonggi-do, 445-843, Rep. Of Korea
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Ver. JRZPM-1807

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