JEC **HYGIENIC PUMP SOLUTIONS**

JEC **JRZLF SERIES**

Hygienic rotary lobe pumps with front bearing cover

Operation and maintenance manual

JEC_ZLF_man rev01-2019_(uk)

Find you local supplier at **www.verderliquids.com**

A **VERDER** COMPANY

Contents

Thank you for purchasing JEC Products!

This manual contains installation, operation, 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.

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

EHEDG
EUROPEAN HYGIENIC EQUIPMENT DESIGN GROUP

TNO Certification
hereby declares that the product

JEC Rotary Lobe Pump JRZL series

From

JEC Ltd., Gunpo-City, Kyunggi-Do Korea

has been evaluated for compliance with the Hygienic Equipment Design Criteria of the EHEDG, Document No. 8, by:

TNO Nutrition and Food Research at Zeist, Netherlands
and meets the criteria of this document as demonstrated by:

Evaluation Report No. V3864

Signed _____ Date December 31 2001
Evaluation Officer

Signed _____ Date December 31 2001
Managing Director, TNO Certification

TNO CERTIFICATION

Certificate No. C01-3710

TNO Certification BV, P.O. Box 541, 7300 AM Apeldoorn, Netherlands
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JEC PUMPS

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: *Product:*	Kreiskolbenpumpe *Rotary Lobe Pump*
Modell: *Serial No :*	**JRZL series** *JECP-0000*
Max. Arbeitsdruck: *max. working pressure:*	**bis 12 bar** ***to 12 bar***
Drehzahl: *Speed:*	**<500 min^{-1} (+/-10%)**
Kennzeichnung: *Marking:*	**Ex 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, 445-843, South Korea
Tel : 82-31-355-0316, Fax : 82-31-355-0319

1935/2004 (EC) Declaration of conformity

Producer: JEC Ltd. (15-26, Beodeul-ro 1362, Hwaseong-Si, Gyeonggi-Do, South Korea)
Product: JEC Lotary lobe pump
Model: JRZL series

We, JEC, hereby guarantee that the materials are in direct contact with food as below,

SS316L, SiC seal ring, PTFE Glass filler and EPDM O-ring

Complies 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 following:

No.	Parts	Test requested	Test done
1	Wetted parts (SS316L)	German Food, Articles of Daily use and Feed Code of September1, 2005(LFGB),Section30	Extractable heavy metals
		German Food, Articles of Daily use and Feed Code of September1, 2005(LFGB),Section31	Sensorial examination odor and taste
2	Seal ring (SiC)	German Food, Articles of Daily use and Feed Code of September1, 2005(LFGB),Section30	Extractable heavy metals
		German Food, Articles of Daily use and Feed Code of September1, 2005(LFGB),Section31	Sensorial examination odor and taste
3	Lip seal (PTFE With Glass Filler)	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 September1, 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 Formaledehyde 5.Organotin content
		European Commission Directive 93/11EEC	Specific migration of Nitrosamines

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

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 **Lotary lobe pump (Pump Head Only)**
Type: **JRZL 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

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 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 only qualified personnel should operate this pump.
DO NOT start the pump until all personnel are clear.
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 front cover removed. The rotors and rotor case could be damaged or may cause severe injury.
DO NOT operates the pump with removed the safety guard or shroud.

SAFATY 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.

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 takeoff 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 filed 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 inlet line.
3. Pumping temperature is too high.
4. Pump is oversized.

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 sped. 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 Time rotors, replace twisted shafts, replace worn gears.
Pump overloads	Viscosity of product higher than expected. Higher pressure than expected.	Reduce pump speed, increase piping 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.

MAINTENANCE

PUMP HOUSING DISASSEMBLY

<u>This JRZLF series with front bearing cover high pressure application has a same design and structure with JRZL series, except bearing applied front cover. Therefore, except the maintenance for front cover side, all of procedure is same as standard rotary pump.</u>

Reference numbers are listed in parts list refer to the sectional view on pages 22~24

Loosen and remove the four cap nuts and two wrench bolts (Figure 2) from the cover. And use special 'Jack bolt' to loose stick front bearing cover. (Figure 3) And remove the cover. If it is stuck, tap on the cover with a soft hammer.

Figure 1

Figure 2

Figure 3

To remove extended shaft (rotor bolt), place the plastic dowel between the rotors to fix rotor rotation as shown in Figure 4 and turn the spanner Counter-Clock Wise for drive shaft.

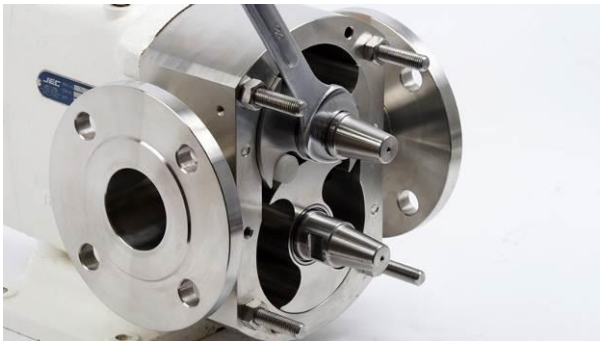


Figure 4-1

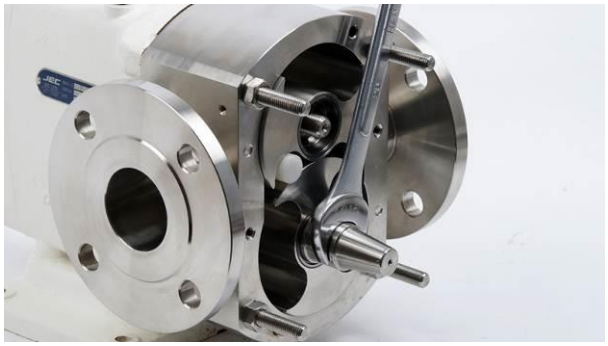


Figure 4-2

Note: JRZLF series has different screw thread for drive and idle shafts. (but ZL series has same screw thread for CW: tightening, CCW: loosening) The standard screw thread is CCW for loosening, and CW for tightening for drive shaft. But please check pump specification before maintenance because based on flow direction, extended shaft thread could be changed too.

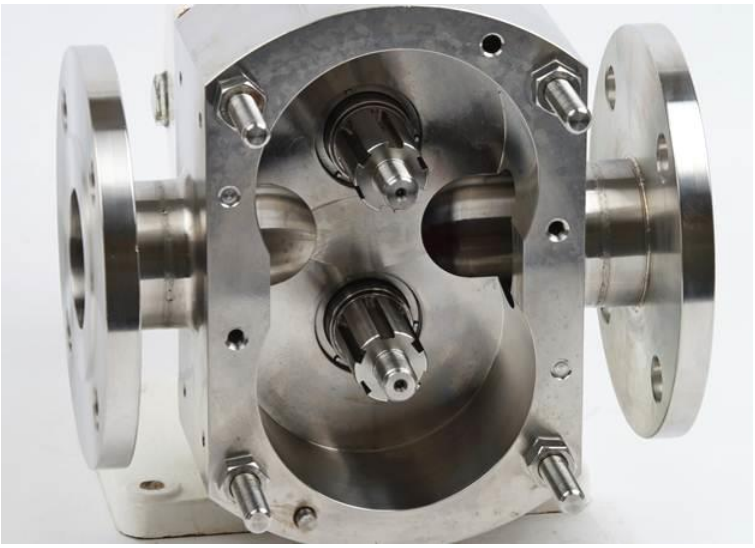


Figure 5-1

Remove the extended shafts, rotors, and seal ring in rotor casing as shown in figure 5.

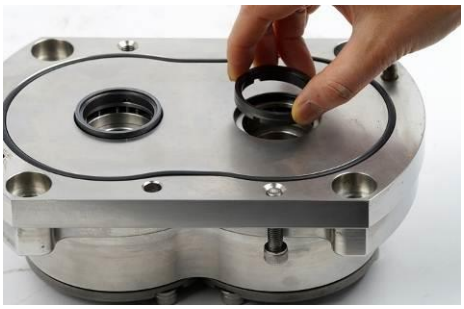


Figure 5-2

The rotors can be removed from the pump housing by pulling straight. If it is stuck tight, alternately tap on the back of the inlet and outlet ports with soft hammer. Handle the rotors with care to avoid damage.

The seal ring can be replaced without remove the pump housing and any pipe line by pulling straight. Please check the seal ring from the shaft and front cover as shown in Figure 6.

Figure 6-1

Figure 6-2

Remove the four stud bolt securing the pump housing to the gearbox.

Figure 7

Figure 8

Slide the pump housing away from the gear box. In this time, handle the shim(s) with care to avoid lost and damage. If the housing is stuck, alternately tap on the back of the inlet and outlet ports with a soft hammer.

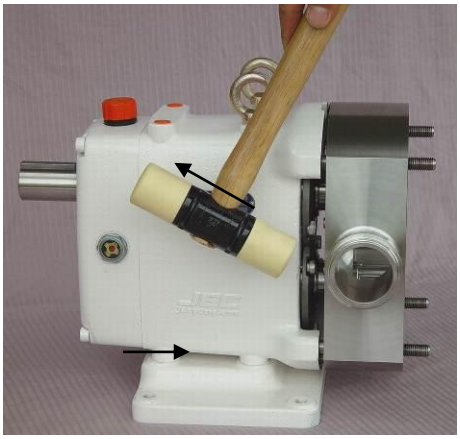


Figure 9

Please handle the shims with care to avoid lost and damage when assemble and disassemble.

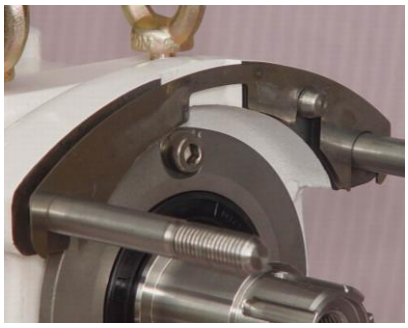


Figure 10

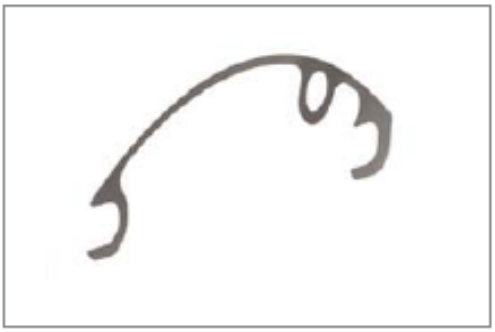


Figure 11

Figure 12

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

If you want replace the seal ring only, you can ease dismantle pull it off from pump housing just after removed rotors without dismantle the pump housing. And new one pushes in to pump housing.

The seal ring can be easily removed from rotor with small screw driver (-) or a pin as shown in Figure 13.

Figure 13

Figure 14

Pull the seal ring off from the rotor.

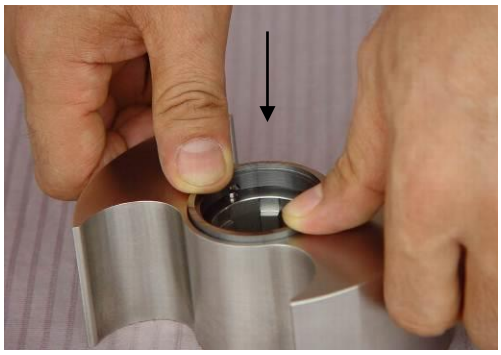


Figure 15

With the rotor lying face down on a table and push downward to press the seal ring in to the rotor in Figure 15.

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 shaft shoulder matched to rotors and other metal parts for wear or damage.
4. Inspect rotor galling sign among the rotor housing, front cover and rotors. Must be remove it or replaced.
5. Inspect bur of the rotor bolt groove. Must be remove it or replaced.

Seal Assembly

Inspect each piece of your seal replacement kit for damage before installing them.

Place the pump housing face down on a table, put new seal in to the pump housing and bolts tighten. (Figure 16, 17)

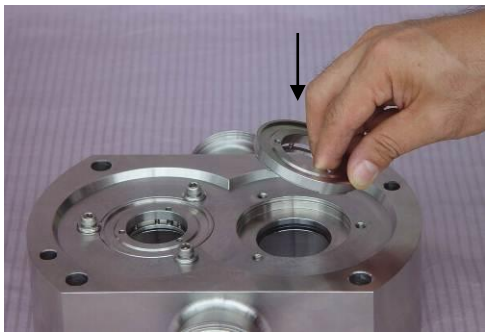
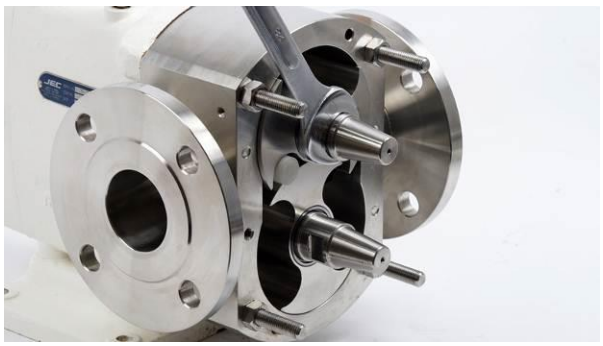


Figure 16

Figure 17

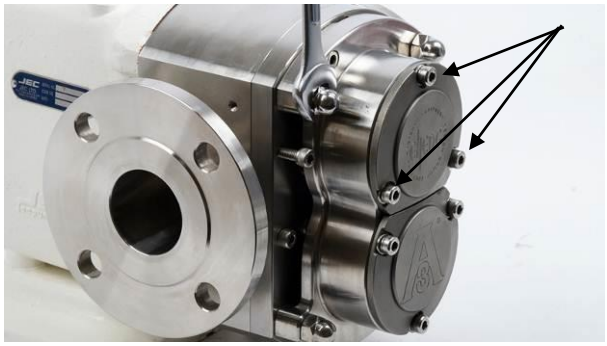
Pump Housing Assembly

Before install the pump housing to the gearbox make sure that cleaning on the surface of pump hosing and gear box and check to the shim plate between pump housing and gear box. And Install the pump housing onto the gear box and secure the four housing set nuts.



Place the plastic dowel between the rotors. Tighten the first rotor bolt with a spanner. To tighten the second rotor place the plastic dowel on the opposite side of the rotor and tighten the second rotor bolt to the proper torque.

Before tight four front cover nuts, wrench bolts should be loosen as shown arrow. After tighten for cover nuts, wrench bolts should be tighten slightly in order to avoid over load of bearing.



Use feeler gauges and depth micrometer to verify the back and redial clearances between the rotors and the housing. A depth gauge 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 housing, and front cover during operation. If pumping efficiency is below expectations, or if parts contact has occurred during operation (Within rated differential pressure), check, rotor clearances and adjust if incorrect.

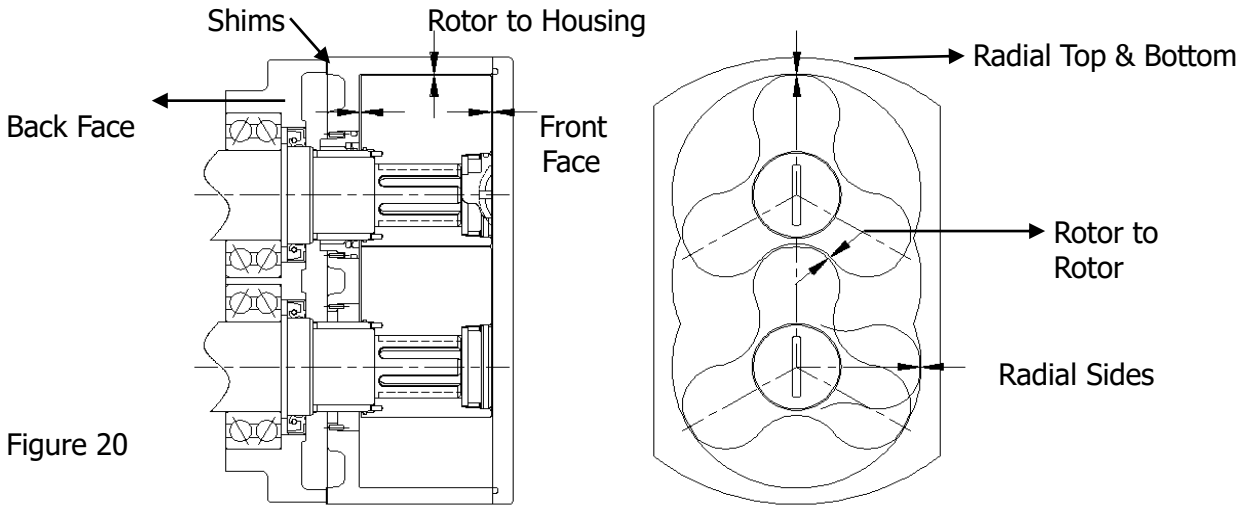


Figure 20

Standard Rotor Clearances (Millimeters)					
Model	Back Face	Front Face	Radial Sides	Radial Top & Bottom	Rotor to Rotor
ZLF120-021-21	0.15	0.15	0.3	0.15	0.15
ZLF220-040-25	0.2	0.2	0.3	0.15	0.2
ZLF225-062-21	0.2	0.2	0.4	0.2	0.2
ZLF330-102-25	0.3	0.3	0.4	0.2	0.3
ZLF340-144-21	0.3	0.3	0.5	0.3	0.3
ZLF440-227-25	0.45	0.45	0.55	0.3	0.4
ZLF450-334-21	0.45	0.45	0.7	0.45	0.4
ZLF580-700-12	0.45	0.45	0.7	0.45	0.4
ZLF5100-1000-08	0.45	0.45	0.7	0.45	0.4
ZLF5120-1200-06	0.45	0.45	0.7	0.45	0.4

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 width and body depth are fixed at manufacture. 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.
2. Check that the rotor housing is tight to gearbox. And check the rotor bolts are tight.
3. Measure the clearance between the back face of the pump housing and the back of the rotor with a feeler gauge. Check the reading with the recommended back face clearance.
4. If incorrect, adjust by adding or removing shim plates from behind the pump housing.
5. Check each rotor and adjust as necessary.

Rotor Timing

Rotor timing 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:

2. Assemble each rotor in its normal location on the drive shaft and the idle shaft. Assemble each rotor bolt and tighten hand tight.

3. Rotate the shafts 30 degrees and measure gap as illustrated by arrows. Rotate the shafts 60 degrees the opposite direction and measure gap as illustrated.

4. The Rotors are correctly timed when the gap measured at both locations are equal. If the gap is unequal, adjust the timing as follows.

5. Rotor timing is determined by the relative location of the two helical gears (18) on the shafts. Gear spacers (13) are used to adjust the location and the timing. When adjusting timing, move only one of the two gears.

6. Place the wooden dowel between the rotors.

7. Bend away the tab of the lock washer (19) on one shaft. Loosen the lock nut and temporarily insert shim stock between the gear and gear spacer. Tighten the lock nut, reassemble the rotor in its correct location, and recheck rotor timing.

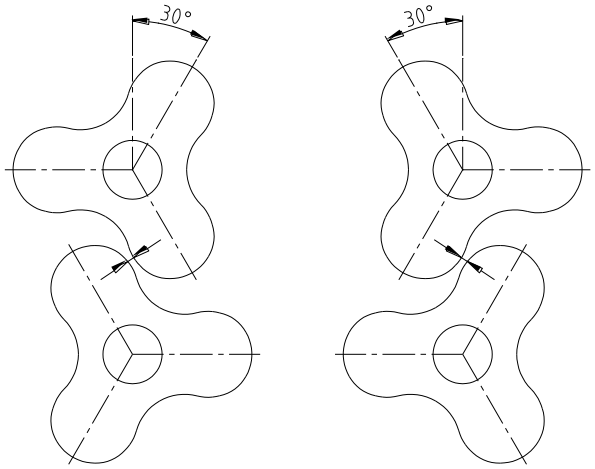


Figure 21

* If Rotor timing is correct, remove the gear and replace added other spacer or add a shim equal in thickness to the shim stock temporarily added. Reassembly the gear and gear nut, tighten to the correct torque, and check rotor timing again to confirm that it is correct.

* If rotor timing is incorrect, but closer to equal than original measurement, repeat previous step adding addition shim stock.

* If rotor timing is incorrect and more unequal than original measurement, remove temporary shim stock from one shaft and add instead to the other shaft.

8. Repeat above procedures until the timing gap is equal after gear spacers are in place and gear nuts are tightened to correct torque.

9. Reassemble pump.

Shaft and Bearing Replacement

Gearbox Disassembly

1. Remove the oil drain plug and drain the oil.

2. Remove the gear box cover bolts (33) from the gear box cover (2).

3. Pull the gear box cover off the drive shaft extension. If the cover stuck use a soft hammer carefully to loosen it. Heavy hitting the hammer may be cause damage to gear box cover (2) and dowel (27).

4. Remove the rear cover oil seal (22) from the gear box cover (2)

5. Remove the paper gasket from the gear box cover (2) or gear box (1).

6. Straighten the locking tab of the bearing lock washer. Reinstall the rotors (5) on the drive and idle shafts. Lock the rotor with a plastic dowel. Remove the lock nut (19) and lock nut washer from the drive shaft (7) and idle shaft (8).

7. Pull the two helical-gears (18) off the pump shafts. Remove the gear keys (14).

8. Remove the front bearing gland set bolts.

9. Place the gearbox (1), wet end (rotor side) down, on an arbor press.

10. Protect the shaft ends with a wood block and press the drive and idle shaft out of the gearbox.

11. Remove the bearings and spacers together by press the shaft out from the shafts.

12. Or remove bearings by puller.

13. The taper roller bearings for 400 series must be keep together with in-outside spacer and separated for drive and idle shafts.

Gearbox Assembly

1. Clean and lubricate the front and rear bearing areas of the drive and idle shafts with oil.
2. Fit the front bearing, spacer and rear bearing on the shaft by arbor press or heat 120C (250F) up by heater.
3. Lubricate and install the front bearing (16) and oil seals (21) in to the bearing gland.
4. Position the gearbox (1) with wet end up. Must be carefully placed gasket face of cover.
5. Clean and lubricate the front and rear bearing areas with oil.
6. Insert the shaft perpendicularly to the gearbox properly. There should be a tight sliding fit between the gearbox and the bearing outer rings. Press or soft hammer could be used.
7. Place the front bearing gland set bolt and washer and tightened.
8. Lubricate and install the rear oil seal gland (20) into gear box (1).
9. Place the gear spacer (13) over the shafts.
10. Clean and lubricate the gear area of the shaft and the face of the lock washer, with oil.
11. Position both shaft key (15) and gear keys (14) to the 12:00 position.
12. Place the gear, lock washer and lock nut (19) onto the shafts and hand tighten.
13. After the gears are installed, turn the shafts to make sure they turn freely and that the rotors (5) are timed correctly. (rotor alignments are required)
14. 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.
15. Tighten the locknut (19) on the idle shaft, following the previous steps.
16. Install the paper gasket (53) to gear box cover (2) and assembly over the drive shaft extension onto the gearbox.
17. Set the cover bolts, oil window and pressure relieve valve.
18. Fill the oil reservoir with oil to the middle of the oil wind.

TECHNICAL INFORMATION

TECHNICAL DATA

SPECIFICATIONS

Maximum Inlet Pressure ---------- 10 bar (1,000 kPa, 145 psi)
Maximum Differential Pressure --------25 bar (363psi) is available with 'Front bearing cover'
Maximum Flow Rate ---------- 100 m3/hr (440 US GPM)
---------- Please consult to JEC over 100 m3/hr up to 450 m3/hr
Temperature Range ---------- -10 C to 180 C (14 F to 356 F)
Viscosity Range ---------- 1,000,000 cPs
Noise Level ---------- 60 ~ 80 dB

MATERIALS

Product Wetted Steel Parts ---------- SUS316L (standard)
Product Wetted Seals ---------- EPDM (standard)
Alternative Seals ---------- NBR, VITON, PTFE Encapsulated, Perfluor elastomer

SHAFT SEALS

Seal type ---------- Single mechanical seal/Double mechanical seal
---------- Other seal option, please contact JEC
Maximum Flushing Water Pressure ---------- Maximum 0.5 bar (7 psi)
Flushing Water Consumption ---------- 0.25~0.5 liter/min (30~60 cubic inches/min)
Stationary Seal ring Material ---------- Tungsten Carbide
Rotating Seal Ring Material ----------Tungsten Carbide (standard) or Silicon Carbide
O-ring Material ---------- EPDM (standard)
Lip-seal Material ---------- PTFE(Polytetrafluoroethylene)

ROTOR INFORMATION

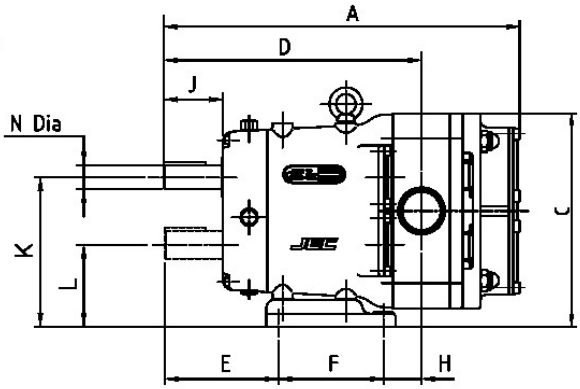
Single/Bi-wing and Bi-lobe/Tri-lobe/Heli-lobe are interchangeable.
Multi-lobe, Spur Gear-lobe optional.
Peek, Teflon coated and hardened rotors optional.
Rubber Heli-lobe rotors interchangeable and optional.

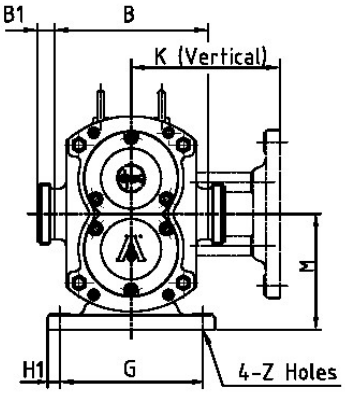
OPTIONAL INFORMATION

Heating jacket on rotor case (front cover heating jacket is not available)
Rectangular inlet version
Surface hardening

DIMENSIONAL DRAWING

Keyway details
X : Length
Y : Width



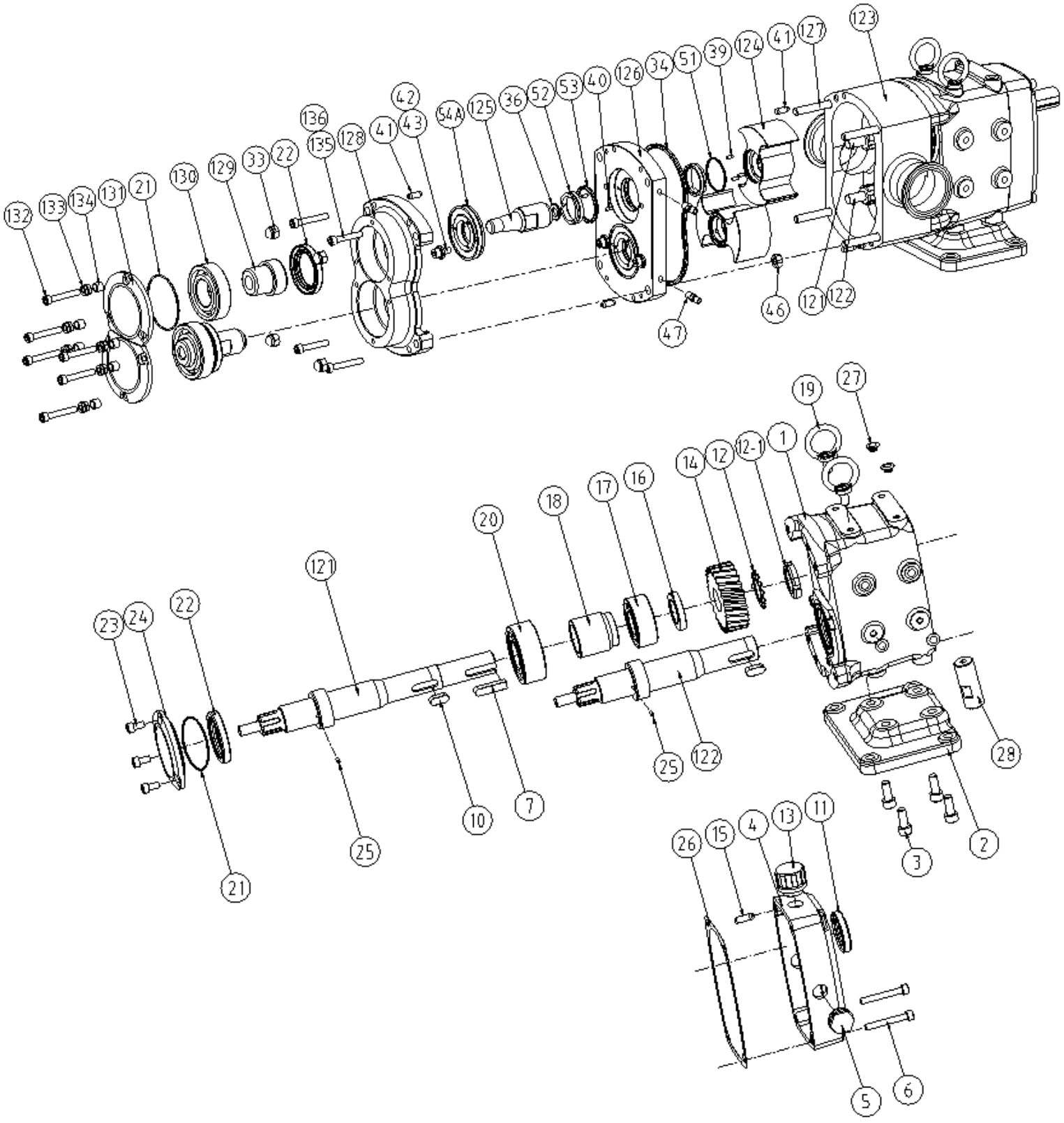


Model No.	Dimension (mm)																
	A	B	C	D	E	F	G	H	H1	J	K	L	M	N	X	Y	Z
ZLF120-021-21	325	152	198	229	96	84	134	49	12	47	141	77	109	22	34	8	9
ZLF220-040-25	433	188	257	307	129	132	180	46	15	59	185	101	143	32	53	10	11
ZLF225-062-21	455	188	257	320	129	132	180	54	15	59	185	101	143	32	53	10	11
ZLF330-102-25	537	242	344	389	154	160	242	75	22	70	243.5	128.5	186	45	57	14	13
ZLF340-144-21	561	242	344	402	154	160	242	88	22	70	243.5	128.5	186	45	57	14	13
ZLF440-227-25	672	324	458	505	198	210	320	97	30	80	324	170	247	55	67	14	15
ZLF450-334-21	713	324	458	522	198	210	320	121	30	80	324	170	247	55	67	14	15
ZLF560-700-12	818	470	458	587	198	210	320	178	30	80	324	170	247	55	67	14	15
ZLF580-1000-08	974	668	458	642	198	210	320	235	30	80	324	170	247	55	67	14	15
ZLF5100-1200-06	1014	660	458	662	198	210	320	255	30	80	324	170	247	55	67	14	15

Model No.	Ports	Dimension B1 (mm)					Weight	Volume
		ISO	BS	DIN	SMS	FLANGE	KG	CBM
ZLF120-021-21	2″	22	26	30	22	30	25	0.01
ZLF220-040-25	2″	22	26	30	22	30	50	0.03
ZLF225-062-21	2 1/2″	26	26	37	26	35	56	0.03
ZLF330-102-25	3″	28	26	42	28	40	105	0.06
ZLF340-144-21	4″	28	26	45	35	54	114	0.06
ZLF440-227-25	4″	28	26	45	35	54	245	0.15
ZLF450-334-21	5″	30	26	46	35	54	260	0.15
ZLF560-700-12	8″	Not available				24	286	0.25
ZLF580-1000-08	10″					26	336	0.32
ZLF5100-1200-06	12″					30	366	0.35

PARTS LIST

EXPLODED VIEW / ZLF120, ZLF200 and ZLF300



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.

Please refer the 'Parts list' separately for further reference.

Parts list / ZLF120

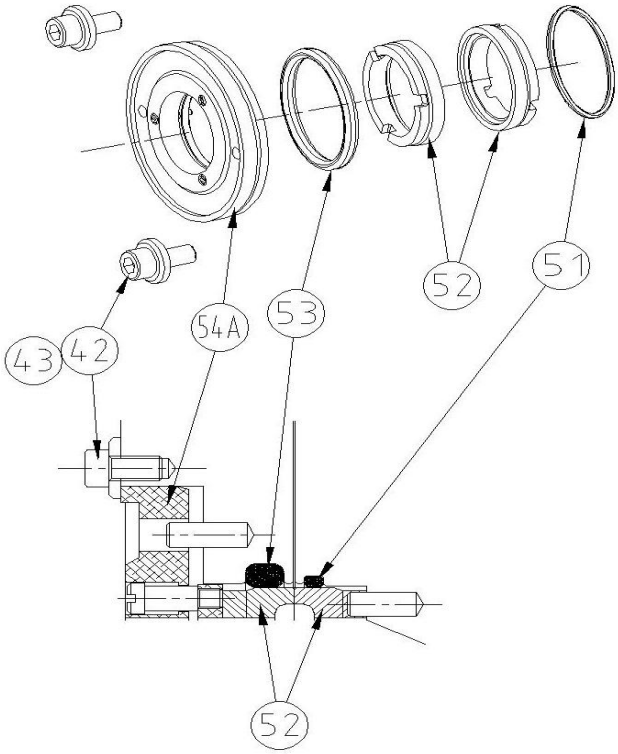
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB1A-CS	Gear Box	FCD40	1	1
	MMZL-GB1A-SS	Gear Box	SUS304	1	1
2	MMZL-GBB1-CS	Base, Gear Box	FCD40	1	1
	MMZL-GBB1-SS	Base, Gear Box	SUS304	1	1
3	PCWB-M08E-SS	Wrench Bolt, Base(M8x20L)	SUS304	1	4
4	MMZL-GBC1-CS	Cover, Gear Box	FCD40	1	1
	MMZL-GBC1-SS	Cover, Gear Box	SUS304	1	1
	MMZL-GBC1-C2	Cover, Gear Box, Flange integrated	FCD40	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)	SUS304	1	4
7	PCZL-KY1B-CS	Key, Shaft (8x7x34)	S45C	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)	S45C	1	2
18	MMZL-BS0X-CS	Spacer, Bearing	S45C	1	2
19	PCZL-IM08-SS	I-bolt / M8	SUS304	1	2
20	PMZL-BE06-CS	Bearing, Front (#5206)	S45C	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-M06B-SS	Wrench Bolt, Oil Seal Gland (M6x12L)	SUS304	3	6
24	MMZL-GD1C-SS	Gland, Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Double Seal, 3Φx8L	SUS304	1	2
26	PMZL-GG1X-PA	Gasket	Paper	1	1
27	PMZL-M08X-PE	Plug (M8)	PE	1	8
28	MMZL-GBA2-SS	Vertical adaptor	SUS304	1	4
30	MMZL-ET00-SS	Rotor bolt, Tool, Extraction	SUS304	1	1
121	MMZL-SD1A-1S	Shaft, Drive, High Pressure	SUS304	1	1
122	MMZL-SI1D-1S	Shaft, Idle, High Pressure	SUS304	1	1

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZLF120-GBXH-CW	Gear Box Ass'y - White	FCD40	1	1
	ZLF120-GBXH-CS	Gear Box Ass'y - Silver	FCD40	1	1
	ZLF120-GBXH-SS	Gear Box Ass'y - Stainless Steel	SUS304	1	1
33	PCZL-M08X-SS	Cap Nut	SUS304	1	4
34	PCOR-A251-NB	O-ring, Front Cover (AN251)	NBR	1	1
	PCOR-A251-EP	O-ring, Front Cover (AN251)	EPDM	1	1
	PCOR-A251-FP	O-ring, Front Cover (AN251)	FPM	1	1
	PMOR-A251-PF	O-ring, Front Cover (AN251)	Perfluoro	1	1
	PMOR-A251-PT	O-ring, Front Cover (AN251)	PTFE capsulated	1	1
36	PCZL-SM10-SS	Spring Washer (M10)	SUS304	1	2
39	PCPI-N3X8-SS	Seal pin, Rotor	SUS304	3	6
40	PCPI-N3X8-SS	Seal pin, Case	SUS304	2	4
41	PMZL-PN1C-SS	Dowel, Rotor Case (Φ6)	SUS304	1	2
45	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 Bolt (M8)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush (PT 1/8") for double seal	SUS304	1	2
48	PCZL-NA12-SS	Name Plate	SUS304	1	1
51	PCOR-A028-NB	O-ring, Rotor (AN028)	NBR	1	2
	PCOR-A028-EP	O-ring, Rotor (AN028)	EPDM	1	2
	PCOR-A028-FP	O-ring, Rotor (AN028)	FPM	1	2
	PMOR-A028-PF	O-ring, Rotor (AN028)	Perfluoro	1	2
53	PCOR-A220-NB	O-ring, Rotor Case (AN220)	NBR	1	2
	PCOR-A220-EP	O-ring, Rotor Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Rotor Case (AN220)	FPM	1	2
	PMOR-A220-PF	O-ring, Rotor Case (AN220)	Perfluoro	1	2
123	Refer to Rotor Case Section	Rotor Case, High Pressure *	SUS316L	1	1
124	Refer to Rotor Section	Rotor, High Pressure *	SUS316L	1	2
125	MMZL-SE1X-SS	Extend Shaft (Check Single or Double)	SUS304	1	2
126	MMZL-FC1H-SS	Front Cover, High Pressure, (Check Single or Double)	SUS316L	1	1
127	PMZL-M08E-SS	Stud Bolt, Case, High Pressure (Check Single or Double)	SUS304	1	4
128	MMZL-BB1H-SS	Bearing Block	SUS304	1	1
129	MMZL-SB1X-SS	Shaft Boss (Check Single or Double)	SUS304	1	2
130	PMZL-BE06-CS	Bearing, Front (#5206)	S45C	1	2
131	MMZL-BBC1-SS	Bearing Block Cover, High Pressure	SUS304	1	2
132	PCWB-M06E-SS	Wrench Bolt, M6x30L	SUS304	1	8
133	PMHN-M06L-SS	Lock Nut, M6	SUS304	1	8
134	PMZL-LB07-SS	Bush, Lock Nut, Ø10xØ7x8	SUS304	1	8
135	PCWB-M06H-SS	Wrench Bolt, M6x35L	SUS304	1	4
136	PCWB-M06I-SS	Wrench Bolt, M6x40L	SUS304	1	2

Note: 1. Please refer to appendix list for the parts with marked "*"
2. Please contact local distributor or JEC for purchased product before 2011 October.
- Rotor case, Front cover, Gear box, Stud bolt, and Shim.

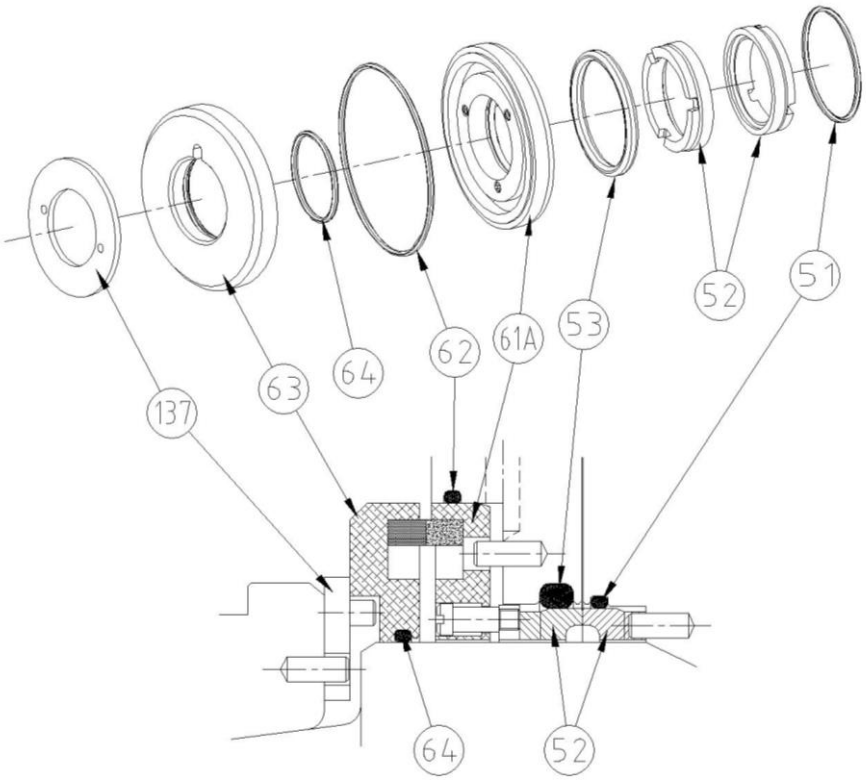
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
123	MMZF-120D-SS	Rotor Case-2"DIN11851	SUS316L	1	1
	MMZF-120F-SS	Rotor Case-2"DIN2633(FLANGE)	SUS316L	1	1
	MMZF-120S-SS	Rotor Case-2"DS722.1	SUS316L	1	1
	MMZF-120I-SS	Rotor Case-2"ISOMALE(IDF)	SUS316L	1	1
	MMZF-120R-SS	Rotor Case-2"RJT	SUS316L	1	1
	MMZF-120M-SS	Rotor Case-2"SMS	SUS316L	1	1
	MMZF-120C-SS	Rotor Case-2"TRICLAMP	SUS316L	1	1
	MMZF-120K-SS	Rotor Case-2"FLANGE	SUS316L	1	1
124	MMZF-SW1B-SS	Rotor, Single-Wing	SUS316L	1	2
	MMZF-BW1D-SS	Rotor, Bi-Wing	SUS316L	1	2
	MMZF-BW1H-SS	Rotor, Bi-Wing, high temp clearance	SUS316L	1	2
	MMZF-BL1D-SS	Rotor, Bi-Lobe	SUS316L	1	2
	MMZF-TL1D-SS	Rotor, Tri-Lobe	SUS316L	1	2
	MMZF-TL1H-SS	Rotor, Tri-Lobe, high temp clearance	SUS316L	1	2
	MMZF-HL1B-SS	Rotor, Heli-Lobe	SUS316L	1	2
	MMZF-HL1D-SS	Rotor, Heli-Lobe, high temp clearance	SUS316L	1	2
	MMZF-ML1D-SS	Rotor, Multi-Lobe	SUS316L	1	2
Note: All of standard rotor case doesn't have tap holes for flushing and jackets					

SINGLE MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, M/Seal Gland (Φ6)	SUS304	2	8
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	8
51	PCOR-A028-NB	O-ring, Rotor (AN028)	NBR	1	4
	PCOR-A028-EP	O-ring, Rotor (AN028)	EPDM	1	4
	PCOR-A028-FP	O-ring, Rotor (AN028)	FPM	1	4
	PMOR-A028-PF	O-ring, Rotor (AN028)	Perfluoro	1	4
52	PMZL-SR1X-TC	Seal Ring	TC	2	8
	PMZL-SR1X-SI	Seal Ring	SiC	2	8
53	PCOR-A220-NB	O-ring, Rotor Case (AN220)	NBR	1	4
	PCOR-A220-EP	O-ring, Rotor Case (AN220)	EPDM	1	4
	PCOR-A220-FP	O-ring, Rotor Case (AN220)	FPM	1	4
	PMOR-A220-PF	O-ring, Rotor Case (AN220)	Perfluoro	1	4
54A	PMZL-SSB1-HP	Single Seal Body, Case, High pressure	SUS304	1	4

DOUBLE MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
51	PCOR-A028-NB	O-ring, Rotor (AN028)	NBR	1	4
	PCOR-A028-EP	O-ring, Rotor (AN028)	EPDM	1	4
	PCOR-A028-FP	O-ring, Rotor (AN028)	FPM	1	4
	PMOR-A028-PF	O-ring, Rotor (AN028)	Perfluoro	1	4
52	PMZL-SR1X-TC	Seal Ring	TC	2	8
	PMZL-SR1X-SI	Seal Ring	SIC	2	8
53	PCOR-A220-NB	O-ring, Rotor Case (AN220)	NBR	1	4
	PCOR-A220-EP	O-ring, Rotor Case (AN220)	EPDM	1	4
	PCOR-A220-FP	O-ring, Rotor Case (AN220)	FPM	1	4
	PMOR-A220-PF	O-ring, Rotor Case (AN220)	Perfluoro	1	4
61A	PMZL-DSB1-HT	Double Seal Body, Case, High pressure	TC/SUS304	1	4
	PMZL-DSB1-HS	Double Seal Body, Case, High pressure	SiC/SUS304	1	4
62	PCOR-A036-NB	O-ring, Case, Double seal (AN036)	NBR	1	4
	PCOR-A036-EP	O-ring, Case, Double seal (AN036)	EPDM	1	4
	PCOR-A036-FP	O-ring, Case, Double seal (AN036)	FPM	1	4
	PMOR-A036-PF	O-ring, Case, Double seal (AN036)	Perfluoro	1	4
63	PMZL-DRR1-CA	Rotation part, Double Seal, Shaft	Carbon/SUS304	1	4
	PMZL-DRR1-TC	Rotation part, Double Seal, Shaft	TC/SUS304	1	4
	PMZL-DRR1-SI	Rotation part, Double Seal, Shaft	SiC/SUS304	1	4
64	PCOR-A023-NB	O-ring, Shaft, Double Seal (AN023)	NBR	1	4
	PCOR-A023-EP	O-ring, Shaft, Double Seal (AN023)	EPDM	1	4
	PCOR-A023-FP	O-ring, Shaft, Double Seal (AN023)	FPM	1	4
	PMOR-A023-PF	O-ring, Shaft, Double Seal (AN023)	Perfluoro	1	4
137	PMZL-SBR1-SS	Base Ring, Double Seal	SUS304	1	2

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.

Please refer the 'Parts list' separately for further reference.

Parts list / ZLF200

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-M10A-SS	Wrench Bolt, Base (M10x25L)	SUS304	1	4
4	MMZL-GBC2-CS	Cover, Gear Box	FCD40	1	1
	MMZL-GBC2-SS	Cover, Gear Box	SUS304	1	1
	MMZL-GBC2-C2	Cover, Gear Box, Flange integrated	FCD40	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)	SUS304	1	4
7	PCZL-KY2B-CS	Key, Shaft (10x8x53)	S45C	1	1
10	PCZL-KY2A-CS	Key, Gear (10*8*27)	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-PT12-P1	Breather, Gearbox PT 1/2"	PE	1	1
14	PMZL-HG2X-CS	Helical Gear	S45C	1	2
15	PMZL-PN2G-SS	Dowel, Gear Box (Φ10)	SUS304	1	2
16	MMZL-GS2X-CS	Spacer, Gear (Φ35x6L)	S45C	1	2
17	PMZL-BE07-CS	Bearing, Rear (#5207)	S45C	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)	S45C	1	2
21	PCOR-A041-FP	O-ring, Oil Seal Gland (AN041)	FPM	1	2
22	PMZL-OS48-NB	Oil Seal, Gear box (48x70x12t)	NBR	1	2
	PMZL-OS48-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, 3Φx8L	SUS304	1	2
26	PMZL-GG2X-PA	Gasket	Paper	1	1
27	PMZL-M10P-PE	Plug (M10)	PE	1	8
28	MMZL-GBA2-SS	Vertical adaptor	SUS304	1	4
30	MMZL-ET00-SS	Rotor bolt, Tool, Extraction	SUS304	1	1
121	MMZL-SD2A-1S	Shaft, Drive, High Pressure, ZLF220	SUS304	1	1
	MMZL-SD2B-1S	Shaft, Drive, High Pressure, ZLF225	SUS304	1	1
122	MMZL-SI2A-1S	Shaft, Idle, High Pressure, ZLF220	SUS304	1	1
	MMZL-SI2B-1S	Shaft, Idle, High Pressure, ZLF225	SUS304	1	1

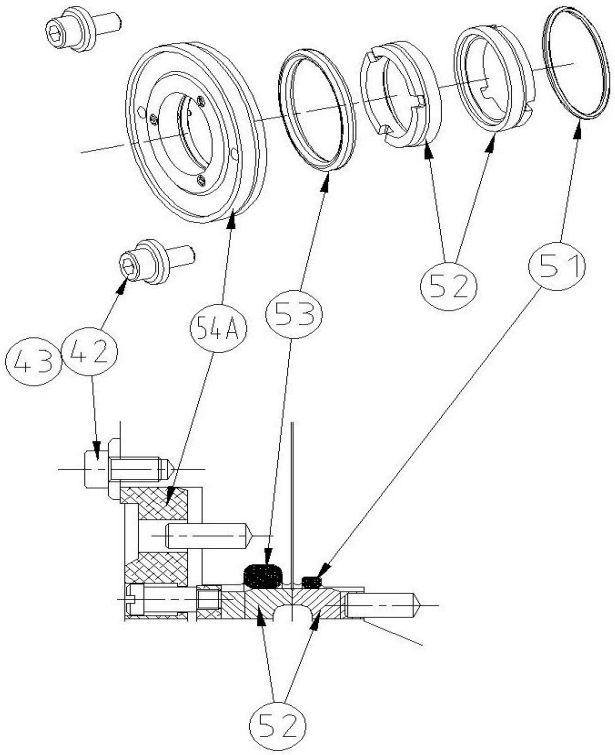
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZLF220-GBXH-CW	Gear Box Ass'y - White, ZLF220	FCD40	1	1
	ZLF220-GBXH-CS	Gear Box Ass'y - Silver, ZLF220	FCD40	1	1
	ZLF220-GBXH-SS	Gear Box Ass'y - Stainless Steel, ZLF220	SUS304	1	1
	ZLF225-GBXH-CW	Gear Box Ass'y - White, ZLF225	FCD40	1	1
	ZLF225-GBXH-CS	Gear Box Ass'y - Silver, ZLF225	FCD40	1	1
	ZLF225-GBXH-SS	Gear Box Ass'y - Stainless Steel, ZLF225	SUS304	1	1
33	PCZL-M10X-SS	Cap Nut(M10)	SUS304	1	4
34	PCOR-A261-NB	O-ring, Front Cover (AN261)	NBR	1	1
	PCOR-A261-EP	O-ring, Front Cover (AN261)	EPDM	1	1
	PCOR-A261-FP	O-ring, Front Cover (AN261)	FPM	1	1
	PMOR-A261-PF	O-ring, Front Cover (AN261)	Perfluoro	1	1
	PMOR-A261-PT	O-ring, Front Cover (AN261)	PTFE capsulated	1	1
39	PCPI-N3X8-SS	Seal Pin, Rotor	SUS304	3	6
40	PCPI-N3X8-SS	Seal Pin, Case	SUS304	2	4
41	PMZL-PN2C-SS	Dowel, Rotor Case (Φ8)	SUS304	1	2
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 Bolt (M10)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush (PT 1/8") for double seal	SUS304	1	2
48	PCZL-NA12-SS	Name Plate	SUS304	1	1
51	PCOR-A031-NB	O-ring, Rotor (AN031)	NBR	1	2
	PCOR-A031-EP	O-ring, Rotor (AN031)	EPDM	1	2
	PCOR-A031-FP	O-ring, Rotor (AN031)	FPM	1	2
	PMOR-A031-PE	O-ring, Rotor (AN031)	Perfluoro	1	2
53	PCOR-A225-NB	O-ring, Rotor Case (AN225)	NBR	1	2
	PCOR-A225-EP	O-ring, Rotor Case (AN225)	EPDM	1	2
	PCOR-A225-FP	O-ring, Rotor Case (AN225)	FPM	1	2
	PMOR-A225-PF	O-ring, Rotor Case (AN225)	Perfluoro	1	2
123		Rotor Case, High Pressure *	SUS316L	1	1
124		Rotor, High Pressure *	SUS316L	1	2
125	MMZL-SE2X-SS	Extend Shaft (Check Single or Double) ZLF220	SUS304	1	2
	~~MMZL-SE2B-SS~~	Extend Shaft (Check Single or Double) ZLF225	SUS304	1	2
126	PMZL-FC2H-SS	Front Cover, High Pressure, (Check Single or Double)	SUS316L	1	1
127	PMZL-M10B-SS	Stud Bolt, Case, High Pressure (Check Single or Double) ZLF220	SUS304	1	4
	PMZL-M10D-SS	Stud Bolt, Case, High Pressure (Check Single or Double) ZLF225	SUS304	1	4
128	MMZL-BB2H-SS	Bearing Block	SUS304	1	1
129	MMZL-SB2X-SS	Shaft Boss (Check Single or Double) ZLF220	SUS304	1	2
	~~MMZL-SB2B-SS~~	Shaft Boss (Check Single or Double) ZLF225	SUS304	1	2
130	PMZL-BE08-CS	Bearing, Front (#5208)	S45C	1	2

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
131	MMZL-BBC2-SS	Bearing Block Cover, High Pressure	SUS304	1	2
132	PCWB-M08C-SS	Wrench Bolt, M8x40L	SUS304	1	8
133	PMHN-M08L-SS	Lock Nut, M8	SUS304	1	8
134	PMZL-LB09-SS	Bush, Lock Nut, Ø13xØ9x13	SUS304	1	8
135	PCWB-M08G-SS	Wrench Bolt, M8x30L	SUS304	1	4
136	PCWB-M08H-SS	Wrench Bolt, M8x35L	SUS304	1	2

Note: 1. Please refer to appendix list for the parts with marked "*"
2. Please contact local distributor or JEC for purchased product before 2011 October.
- Rotor case, Front cover, Gear box, Stud bolt, and Shim.

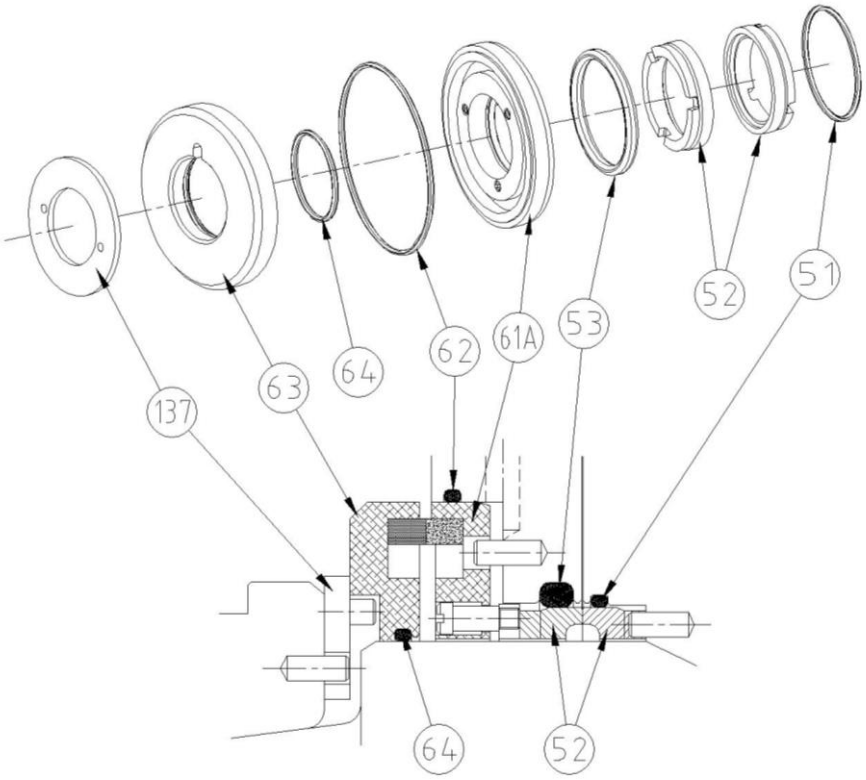
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
123	MMZF-220D-SS	Rotor Case-2"DIN11851, ZLF220	SUS316L	1	1
	MMZF-220F-SS	Rotor Case-2"DIN2633(FLANGE), ZLF220	SUS316L	1	1
	MMZF-220S-SS	Rotor Case-2"DS722.1, ZLF220	SUS316L	1	1
	MMZF-220I-SS	Rotor Case-2"ISOMALE(IDF), ZLF220	SUS316L	1	1
	MMZF-220R-SS	Rotor Case-2"RJT, ZLF220	SUS316L	1	1
	MMZF-220M-SS	Rotor Case-2"SMS, ZLF220	SUS316L	1	1
	MMZF-220C-SS	Rotor Case-2"TRICLAMP, ZLF220	SUS316L	1	1
	MMZF-220K-SS	Rotor Case-2"FLANGE, ZLF220	SUS316L	1	1
	MMZF-225D-SS	Rotor Case-2.5"DIN11851, ZLF225	SUS316L	1	1
	MMZF-225F-SS	Rotor Case-2.5"DIN2633(FLANGE), ZLF225	SUS316L	1	1
	MMZF-225S-SS	Rotor Case-2.5"DS722.1, ZLF225	SUS316L	1	1
	MMZF-225I-SS	Rotor Case-2.5"ISOMALE(IDF), ZLF225	SUS316L	1	1
	MMZF-225R-SS	Rotor Case-2.5"RJT, ZLF225	SUS316L	1	1
	MMZF-225M-SS	Rotor Case-2.5"SMS, ZLF225	SUS316L	1	1
	MMZF-225C-SS	Rotor Case-2.5"TRICLAMP, ZLF225	SUS316L	1	1
	MMZF-225K-SS	Rotor Case-2.5"FLANGE, ZLF225	SUS316L	1	1
124	MMZF-SW2A-SS	Rotor, Single-Wing, ZLF220	SUS316L	1	2
	MMZF-BW2A-SS	Rotor, Bi-Wing, ZLF220	SUS316L	1	2
	MMZF-BW2C-SS	Rotor, Bi-Wing, high temp clearance, ZLF220	SUS316L	1	2
	MMZF-BL2A-SS	Rotor, Bi-Lobe, ZLF220	SUS316L	1	2
	MMZF-TL2A-SS	Rotor, Tri-Lobe, ZLF220	SUS316L	1	2
	MMZF-TL2C-SS	Rotor, Tri-Lobe, high temp clearance, ZLF220	SUS316L	1	2
	MMZF-HL2A-SS	Rotor, Heli- Lobe, ZLF220	SUS316L	1	2
	MMZF-HL2C-SS	Rotor, Heli- Lobe, high temp clearance, ZLF220	SUS316L	1	2
	MMZF-SW2B-SS	Rotor, Single-Wing, ZLF225	SUS316L	1	2
	MMZF-BW2B-SS	Rotor, Bi-Wing, ZLF225	SUS316L	1	2
	MMZF-BW2D-SS	Rotor, Bi-Wing, high temp clearance, ZLF225	SUS316L	1	2
	MMZF-BL2B-SS	Rotor, Bi-Lobe, ZLF225	SUS316L	1	2
	MMZF-TL2B-SS	Rotor, Tri-Lobe, ZLF225	SUS316L	1	2
	MMZF-TL2D-SS	Rotor, Tri-Lobe, high temp clearance, ZLF225	SUS316L	1	2
	MMZF-HL2B-SS	Rotor, Heli- Lobe, ZLF225	SUS316L	1	2
	MMZF-HL2D-SS	Rotor, Heli- Lobe, high temp clearance, ZLF225	SUS316L	1	2
Note: All of standard rotor case doesn't have tap holes for flushing and jackets					

SINGLE MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, M/Seal Gland (Φ6)	SUS304	2	8
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	8
51	PCOR-A031-NB	O-ring, Rotor (AN031)	NBR	1	4
	PCOR-A031-EP	O-ring, Rotor (AN031)	EPDM	1	4
	PCOR-A031-FP	O-ring, Rotor (AN031)	FPM	1	4
	PMOR-A031-PF	O-ring, Rotor (AN031)	Perfluoro	1	4
52	PMZL-SR2X-TC	Seal Ring	TC	2	8
	PMZL-SR2X-SI	Seal Ring	SiC	2	8
53	PCOR-A225-NB	O-ring, Rotor Case (AN225)	NBR	1	4
	PCOR-A225-EP	O-ring, Rotor Case (AN225)	EPDM	1	4
	PCOR-A225-FP	O-ring, Rotor Case (AN225)	FPM	1	4
	PMOR-A225-PF	O-ring, Rotor Case (AN225)	Perfluoro	1	4
54A	PMZL-SSB2-HP	Single Seal Body, Case, High pressure	SUS304	1	4

DOUBLE MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
51	PCOR-A031-NB	O-ring, Rotor (AN031)	NBR	1	4
	PCOR-A031-EP	O-ring, Rotor (AN031)	EPDM	1	4
	PCOR-A031-FP	O-ring, Rotor (AN031)	FPM	1	4
	PMOR-A031-PF	O-ring, Rotor (AN031)	Perfluoro	1	4
52	PMZL-SR2X-TC	Seal Ring	TC	2	8
	PMZL-SR2X-SI	Seal Ring	SIC	2	8
53	PCOR-A225-NB	O-ring, Rotor Case (AN225)	NBR	1	4
	PCOR-A225-EP	O-ring, Rotor Case (AN225)	EPDM	1	4
	PCOR-A225-FP	O-ring, Rotor Case (AN225)	FPM	1	4
	PMOR-A225-PF	O-ring, Rotor Case (AN225)	Perfluoro	1	4
61A	PMZL-DSB2-HT	Double Seal Body, Case, High pressure	TC/SUS304	1	4
	PMZL-DSB2-HS	Double Seal Body, Case, High pressure	SiC/SUS304	1	4
62	PCOR-A039-NB	O-ring, Case, Double seal (AN039)	NBR	1	4
	PCOR-A039-EP	O-ring, Case, Double seal (AN039)	EPDM	1	4
	PCOR-A039-FP	O-ring, Case, Double seal (AN039)	FPM	1	4
	PMOR-A039-PE	O-ring, Case, Double seal (AN039)	Perfluoro	1	4
63	PMZL-DRR2-CA	Rotation part, Double Seal, Shaft	Carbon/SUS304	1	4
	PMZL-DRR2-TC	Rotation part, Double Seal, Shaft	TC/SUS304	1	4
	PMZL-DRR2-SI	Rotation part, Double Seal, Shaft	SiC/SUS304	1	4
64	PCOR-A029-NB	O-ring, Shaft, Double Seal (AN029)	NBR	1	4
	PCOR-A029-EP	O-ring, Shaft, Double Seal (AN029)	EPDM	1	4
	PCOR-A029-FP	O-ring, Shaft, Double Seal (AN029)	FPM	1	4
	PMOR-A029-PF	O-ring, Shaft, Double Seal (AN029)	Perfluoro	1	4
137	PMZL-SBR2-SS	Base Ring, Double Seal	SUS304	1	2

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.

Please refer the 'Parts list' separately for further reference.

Parts list / ZLF300

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)	SUS304	1	4
7	PCZL-KY3B-CS	Key, Shaft (14x9x53)	S45C	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	Helical Gear	S45C	1	2
15	PMZL-PN2G-SS	Dowel, Gear Box (Φ8)	SUS304	1	2
16	MMZL-GS3X-CS	Spacer, Gear (Φ35x6L)	S45C	1	2
17	PMZL-BE10-CS	Bearing, Rear (#5210)	S45C	1	2
18	MMZL-BS3X-CS	Spacer, Bearing	S45C	1	2
19	PCZL-IM12-SS	I-bolt / M8	SUS304	1	2
20	PMZL-BE12-CS	Bearing, Front (#5212)	S45C	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-M12A-SS	Wrench Bolt, Oil Seal Gland (M12x25L)	SUS304	3	6
24	MMZL-GD3C-SS	Gland, Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Double Seal, 3Φx8L	SUS304	1	2
26	PMZL-GG3X-PA	Gasket	Paper	1	1
27	PMZL-M12P-PE	Plug (M12)	PE	1	8
28	MMZL-GBA3-SS	Vertical adaptor	SUS304	1	4
121	MMZL-SD3A-1S	Shaft, Drive, High Pressure, ZLF330	SUS304	1	1
	MMZL-SD3B-1S	Shaft, Drive, High Pressure, ZLF340	SUS304	1	1
122	MMZL-SI3A-1S	Shaft, Idle, High Pressure, ZLF330	SUS304	1	1
	MMZL-SI3B-1S	Shaft, Idle, High Pressure, ZLF340	SUS304	1	1

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZLF330-GBXH-CW	Gear Box Ass'y - White, ZLF330	FCD40	1	1
	ZLF330-GBXH-CS	Gear Box Ass'y - Silver, ZLF330	FCD40	1	1
	ZLF330-GBXH-SS	Gear Box Ass'y - Stainless Steel, ZLF330	SUS304	1	1
	ZLF340-GBXH-CW	Gear Box Ass'y - White, ZLF340	FCD40	1	1
	ZLF340-GBXH-CS	Gear Box Ass'y - Silver, ZLF340	FCD40	1	1
	ZLF340-GBXH-SS	Gear Box Ass'y - Stainless Steel, ZLF340	SUS304	1	1
33	PCZL-M14X-SS	Cap Nut(M14)	SUS304	1	4
34	PCOR-A271-NB	O-ring, Front Cover (AN271)	NBR	1	1
	PCOR-A271-EP	O-ring, Front Cover (AN271)	EPDM	1	1
	PCOR-A271-FP	O-ring, Front Cover (AN271)	FPM	1	1
	PMOR-A271-PF	O-ring, Front Cover (AN271)	Perfluoro	1	1
	PMOR-A271-PT	O-ring, Front Cover (AN271)	PTFE capsulated	1	1
39	PCPI-N3X8-SS	Seal Pin , Rotor	SUS304	3	6
40	PCPI-N3X8-SS	Seal Pin, Case	SUS304	2	6
41	PMJT-PN3C-SS	Dowel, Rotor Case Φ10x30L	SUS304	1	6
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 Bolt (M14)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush (PT 1/8") for double seal	SUS304	1	4
48	PCZL-NA34-SS	Name Plate	SUS304	1	1
51	PCOR-A142-NB	O-ring, Rotor (AN142)	NBR	1	2
	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
53	PCOR-A230-NB	O-ring, Rotor Case (AN230)	NBR	1	2
	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
123		Rotor Case, High Pressure *	SUS316L	1	1
124		Rotor, High Pressure *	SUS316L	1	2
125	MMZL-SE3X-SS	Extend Shaft (Check Single or Double) ZLF330	SUS304	1	2
	~~MMZL-SE3B-SS~~	Extend Shaft (Check Single or Double) ZLF340	SUS304	1	2
126	PMZL-FC3H-SS	Front Cover, High Pressure (Check Single or Double)	SUS316L	1	1
127	PMZL-M14I-SS	Stud Bolt, Case, High Pressure, (Check Single or Double) ZLF330	SUS304	1	4
	PMZL-M14J-SS	Stud Bolt, Case, High Pressure (Check Single or Double) ZLF340	SUS304	1	4
128	MMZL-BB3H-SS	Bearing Block	SUS304	1	1
129	MMZL-SB3X-SS	Shaft Boss (Check Single or Double) ZLF330	SUS304	1	2
	~~MMZL-SB3B-SS~~	Shaft Boss (Check Single or Double) ZLF340	SUS304	1	2
130	PMZL-BE12-CS	Bearing, Front (#5212)	S45C	1	2

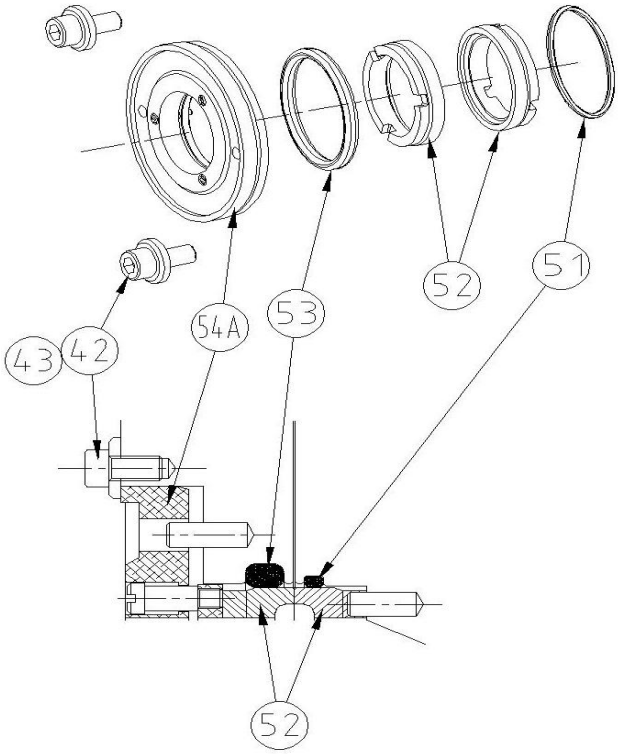
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
131	MMZL-BBC3-SS	Bearing Block Cover, High Pressure	SUS304	1	2
132	PCWB-M10I-SS	Wrench Bolt, M10x50L	SUS304	1	8
133	PMHN-M10L-SS	Lock Nut, M10	SUS304	1	8
134	PMZL-LB11-SS	Bush, Lock Nut, Ø16x12	SUS304	1	8
135	PCWB-M10F-SS	Wrench Bolt, M10x40L	SUS304	1	4
136	PCWB-M10G-SS	Wrench Bolt, M10x60L	SUS304	1	2

Note: 1. Please refer to appendix list for the parts with marked "*"
2. Please contact local distributor or JEC for purchased product before 2011 October.
- Rotor case, Front cover, Gear box, Stud bolt, and Shim.

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
123	MMZF-330D-SS	Rotor Case-3"DIN11851, ZLF330	SUS316L	1	1
	MMZF-330F-SS	Rotor Case-3"DIN2633(FLANGE), ZLF330	SUS316L	1	1
	MMZF-330S-SS	Rotor Case-3"DS722.1, ZLF330	SUS316L	1	1
	MMZF-330I-SS	Rotor Case-3"ISOMALE(IDF), ZLF330	SUS316L	1	1
	MMZF-330R-SS	Rotor Case-3"RJT, ZLF330	SUS316L	1	1
	MMZF-330M-SS	Rotor Case-3"SMS, ZLF330	SUS316L	1	1
	MMZF-330C-SS	Rotor Case-3"TRICLAMP, ZLF330	SUS316L	1	1
	MMZF-330K-SS	Rotor Case-3" FLANGE, ZLF330	SUS316L	1	1
	MMZF-340D-SS	Rotor Case-4"DIN11851, ZLF340	SUS316L	1	1
	MMZF-340F-SS	Rotor Case-4"DIN2633(FLANGE), ZLF340	SUS316L	1	1
	MMZF-340S-SS	Rotor Case-4"DS722.1, ZLF340	SUS316L	1	1
	MMZF-340I-SS	Rotor Case-4"ISOMALE(IDF), ZLF340	SUS316L	1	1
	MMZF-340R-SS	Rotor Case-4"RJT, ZLF340	SUS316L	1	1
	MMZF-340M-SS	Rotor Case-4"SMS, ZLF340	SUS316L	1	1
	MMZF-340C-SS	Rotor Case-4"TRICLAMP, ZLF340	SUS316L	1	1
	MMZF-340K-SS	Rotor Case-4" FLANGE, ZLF340	SUS316L	1	1
124	MMZF-SW3A-SS	Rotor, Single-Wing, ZLF330	SUS316L	1	2
	MMZF-BW3A-SS	Rotor, Bi-Wing, ZLF330	SUS316L	1	2
	MMZF-BW3C-SS	Rotor, Bi-Wing, high temp clearance, ZLF330	SUS316L	1	2
	MMZF-BL3A-SS	Rotor, Bi-Lobe, ZLF330	SUS316L	1	2
	MMZF-TL3A-SS	Rotor, Tri-Lobe, ZLF330	SUS316L	1	2
	MMZF-TL3C-SS	Rotor, Tri-Lobe, high temp clearance, ZLF330	SUS316L	1	2
	MMZF-HL3A-SS	Rotor, Heli-Lobe, ZLF330	SUS316L	1	2
	MMZF-HL3C-SS	Rotor, Heli-Lobe, high temp clearance, ZLF330	SUS316L	1	2
	MMZF-SW3B-SS	Rotor, Single-Wing, ZLF340	SUS316L	1	2
	MMZF-BW3B-SS	Rotor, Bi-Wing, ZLF340	SUS316L	1	2
	MMZF-BW3D-SS	Rotor, Bi-Wing, high temp clearance, ZLF340	SUS316L	1	2
	MMZF-BL3B-SS	Rotor, Bi-Lobe, ZLF340	SUS316L	1	2
	MMZF-TL3B-SS	Rotor, Tri-Lobe, ZLF340	SUS316L	1	2
	MMZF-TL3D-SS	Rotor, Tri-Lobe, high temp clearance, ZLF340	SUS316L	1	2
	MMZF-HL3B-SS	Rotor, Heli-Lobe, ZLF340	SUS316L	1	2
	MMZF-HL3D-SS	Rotor, Heli-Lobe, high temp clearance, ZLF340	SUS316L	1	2

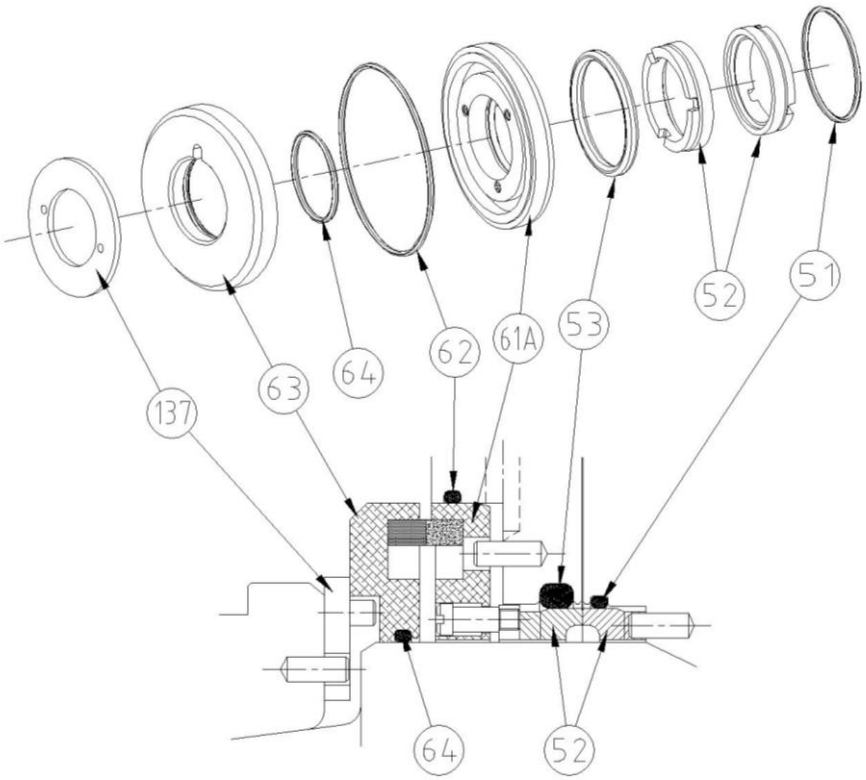
Note: All of standard rotor case doesn't have tap holes for flushing and jackets

SINGLE MECHANICAL SEAL



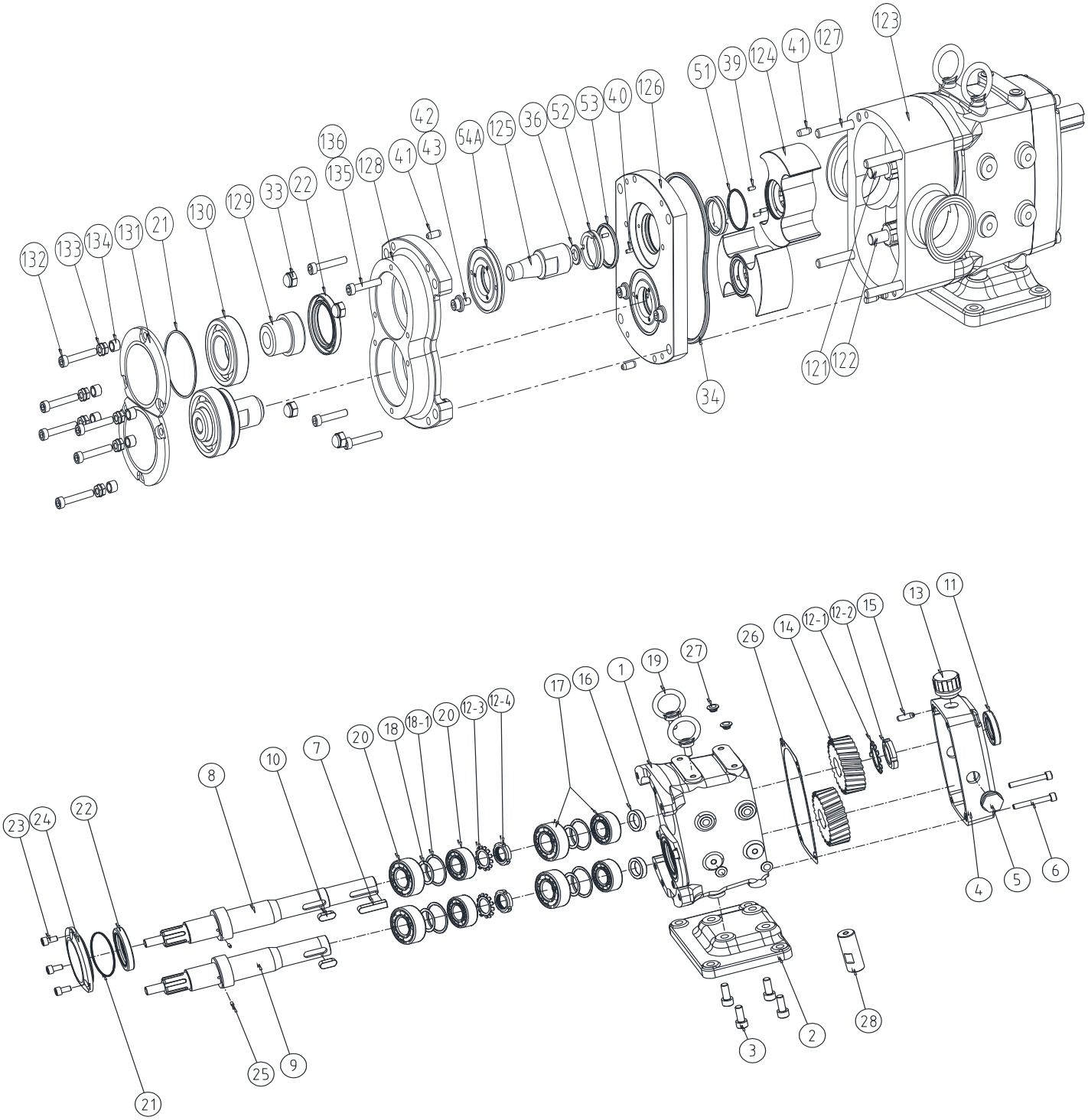
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, M/Seal Gland (Φ6)	SUS304	2	8
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	8
51	PCOR-A142-NB	O-ring, Rotor (AN142)	NBR	1	4
	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	4
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	4
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	4
52	PMZL-SR3C-TC	Seal Ring	TC	2	8
	PMZL-SR3C-SI	Seal Ring	SiC	2	8
53	PCOR-A230-NB	O-ring, Rotor Case (AN230)	NBR	1	4
	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	4
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	4
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	4
54A	PMZL-SSB3-HP	Single Seal Body, Case, High pressure	SUS304	1	4

DOUBLE MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
51	PCOR-A142-NB	O-ring, Rotor (AN142)	NBR	1	4
	PCOR-A142-EP	O-ring, Rotor (AN142)	EPDM	1	4
	PCOR-A142-FP	O-ring, Rotor (AN142)	FPM	1	4
	PMOR-A142-PF	O-ring, Rotor (AN142)	Perfluoro	1	4
52	PMZL-SR3C-TC	Seal Ring	TC	2	8
	PMZL-SR3C-SI	Seal Ring	SiC	2	8
53	PCOR-A230-NB	O-ring, Rotor Case (AN230)	NBR	1	4
	PCOR-A230-EP	O-ring, Rotor Case (AN230)	EPDM	1	4
	PCOR-A230-FP	O-ring, Rotor Case (AN230)	FPM	1	4
	PMOR-A230-PF	O-ring, Rotor Case (AN230)	Perfluoro	1	4
61A	PMZL-DSB3-HT	Double Seal Body, Case, High pressure	TC/SUS304	1	4
	PMZL-DSB3-HS	Double Seal Body, Case, High pressure	SiC/SUS304	1	4
62	PCOR-A042-NB	O-ring, Case, Double seal (AN042)	NBR	1	4
	PCOR-A042-EP	O-ring, Case, Double seal (AN042)	EPDM	1	4
	PCOR-A042-FP	O-ring, Case, Double seal (AN042)	FPM	1	4
	PMOR-A042-PF	O-ring, Case, Double seal (AN042)	Perfluoro	1	4
63	PMZL-DRR3-CA	Rotation part, Double Seal, Shaft	Carbon/SUS304	1	4
	PMZL-DRR3-TC	Rotation part, Double Seal, Shaft	TC/SUS304	1	4
	PMZL-DRR3-SI	Rotation part, Double Seal, Shaft	SiC/SUS304	1	4
64	PCOR-A033-NB	O-ring, Shaft, Double Seal (AN033)	NBR	1	4
	PCOR-A033-EP	O-ring, Shaft, Double Seal (AN033)	EPDM	1	4
	PCOR-A033-FP	O-ring, Shaft, Double Seal (AN033)	FPM	1	4
	PMOR-A033-PE	O-ring, Shaft, Double Seal (AN033)	Perfluoro	1	4
137	PMZL-SBR3-SS	Base Ring, Double Seal	SUS304	1	2

EXPLODED VIEW / ZLF400



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.

Please refer the 'Parts list' separately for further reference.

Parts list / ZLF400

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB4A-CS	Gear Box	FCD40	1	1
	MMZL-GB4A-SS	Gear Box	SUS304	1	1
2	MMZL-GBB4-CS	Base , Gear Box	FCD40	1	1
	MMZL-GBB4-SS	Base , Gear Box	SUS304	1	1
3	PCWB-M14A-SS	Wrench Bolt , Base(M14x35L)	SUS304	1	4
4	MMZL-GBC4-CS	Cover , Gear Box	FCD40	1	1
	MMZL-GBC4-SS	Cover , Gear Box	SUS304	1	1
5	PMZL-PT34-P2	Plug , Level , Drain PT 3/4"	PE	1	3
6	PCWB-M10D-CS	Wrench Bolt , Gear Box Cover(M10x90L)	SUS304	1	4
7	PCZL-KY4B-CS	Key , Shaft(14x9x67)	S45C	1	2
10	PCZL-KY4A-CS	Key, Gear(14x9x53)	S45C	1	2
11	PMZL-OS55-NB	Oil Seal , Cover (55x82x12t)	NBR	1	1
	PMZL-OS55-FP	Oil Seal , Cover (55x82x12t)	FPM	1	1
12-1	PMZL-LW13-CS	Lock Washer, drive shaft	S45C	1	2
12-2	PMZL-LN13-CS	Lock Nut, drive shaft	S45C	1	2
12-3	PMZL-LW15-CS	Lock Washer, idle shaft	S45C	1	2
12-4	PMZL-LN15-CS	Lock Nut, idle shaft	S45C	2	4
13	PMZL-PT34-P1	Breather, Gearbox PT 3/4"	PE	1	1
14	PMZL-HG4X-CS	Helical Gear	S45C	1	2
15	PMZL-PN2G-SS	Dowel, Gear Box (Φ8)	SUS304	1	2
16	MMZL-GS4X-CS	Spacer, Gear (Φ35x5L)	S45C	1	2
17	PMZL-BE13-CS	Bearing, Rear (#E32213J)	S45C	2	4
18	MMZL-BS4I-CS	Spacer, Bearing (inner)	S45C	2	4
18-1	MMZL-BS4O-CS	Spacer, Bearing (outer)	S45C	2	4
19	PCZL-IM14-SS	I-bolt / M14	SUS	1	2
20	PMZL-BE15-CS	Bearing , Front (#E32215J)	S45C	2	4
21	PCOR-A049-FP	O-ring , Oil Seal Gland (AN049)	FPM	1	2
22	PMZL-OS85-NB	Oil Seal , Gear box (85x110x13t)	NBR	1	2
	PMZL-OS85-FP	Oil Seal , Gear box (85x110x13t)	FPM	1	2
23	PCWB-M12A-SS	Wrench Bolt , Oil Seal Gland (M12x25L)	SUS304	4	8
24	MMZL-GD4C-SS	Gland , Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin , Double Seal	SUS304	2	4
26	PMZL-GG45-PA	Gasket	Paper	1	1
27	PMZL-M14P-PE	Plug (M14)	PE	1	8
28	MMZL-GBA4-SS	Vertical adaptor	SUS304	1	4
121	MMZL-SD4A-1S	Shaft, Drive, High Pressure, ZLF440	SUS304	1	1
	MMZL-SD4B-1S	Shaft, Drive, High Pressure, ZLF450	SUS304	1	1
122	MMZL-SI4A-1S	Shaft, Idle, High Pressure, ZLF440	SUS304	1	1
	MMZL-SI4B-SS	Shaft, Idle, High Pressure, ZLF450	SUS304	1	1

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZLF440-GBXH-CW	Gear Box Ass'y - White, ZLF440	FCD40	1	1
	ZLF440-GBXH-CS	Gear Box Ass'y - Silver, ZLF440	FCD40	1	1
	ZLF440-GBXH-SS	Gear Box Ass'y - Stainless Steel, ZLF440	SUS304	1	1
	ZLF450-GBXH-CW	Gear Box Ass'y - White, ZLF450	FCD40	1	1
	ZLF450-GBXH-CS	Gear Box Ass'y - Silver, ZLF450	FCD40	1	1
	ZLF450-GBXH-SS	Gear Box Ass'y - Stainless Steel, ZLF450	SUS304	1	1
33	PCZL-M20X-SS	Cap Nut(M20)	SUS304	1	4
34	PCOR-A278-NB	O-ring, Front Cover (AN278)	NBR	1	1
	PCOR-A278-EP	O-ring, Front Cover (AN278)	EPDM	1	1
	PCOR-A278-FP	O-ring, Front Cover (AN278)	FPM	1	1
	PMOR-A278-PF	O-ring, Front Cover (AN278)	Perfluoro	1	1
	PMOR-A278-PT	O-ring, Front Cover (AN278)	PTFE capsulated	1	1
39	PCPI-N3X8-SS	Seal Pin , Rotor	SUS304	3	6
40	PCPI-N3X8-SS	Seal pin, Case	SUS304	2	4
41	PMZL-PN4C-SS	Dowel, Rotor Case(Φ15)	SUS304	1	2
45	PMZL-SH4A-SS	Shim (0.05mm)	SUS304	1	2
	PMZL-SH4B-SS	Shim (0.1mm)	SUS304	1	2
	PMZL-SH4C-SS	Shim (0.2mm) for old type only	SUS304	1	2
46	PCHN-M10X-SS	Hex nut , Stud Bolt (M10,14mm)	SUS304	2	4
47	PMNP-PT18-SS	Nipple, Flush (PT 1/8") for double seal	SUS304	1	2
48	PCZL-NA34-SS	Name Plate	SUS304	1	1
51	PCOR-A151-NB	O-ring, Rotor (AN151)	NBR	1	2
	PCOR-A151-EP	O-ring, Rotor (AN151)	EPDM	1	2
	PCOR-A151-FP	O-ring, Rotor (AN151)	FPM	1	2
	PMOR-A151-PF	O-ring, Rotor (AN151)	Perfluoro	1	2
53	PCOR-A235-NB	O-ring, Rotor Case (AN235)	NBR	1	2
	PCOR-A235-EP	O-ring, Rotor Case (AN235)	EPDM	1	2
	PCOR-A235-FP	O-ring, Rotor Case (AN235)	FPM	1	2
	PMOR-A235-PF	O-ring, Rotor Case (AN235)	Perfluoro	1	2
123		Rotor Case, High Pressure *	SUS316L	1	1
124		Rotor, High Pressure *	SUS316L	1	2
125	MMZL-SE4X-SS	Extend Shaft (Check Single or Double) ZLF440	SUS304	1	2
	~~MMZL-SE4B-SS~~	Extend Shaft (Check Single or Double) ZLF450	SUS304	1	2
126	MMZL-FC4H-SS	Front Cover, High Pressure (Check Single or Double)	SUS316L	1	1
127	PMZL-M20B-SS	Stud Bolt, Case, High Pressure (Check Single or Double) ZLF440	SUS304	1	4
	PMZL-M20D-SS	Stud Bolt, Case, High Pressure (Check Single or Double) ZLF450	SUS304	1	4
128	MMZL-BB4H-SS	Bearing Block	SUS304	1	1
129	MMZL-SB4X-SS	Shaft Boss (Check Single or Double) ZLF440	SUS304	1	2
	~~MMZL-SB4B-SS~~	Shaft Boss (Check Single or Double) ZLF450	SUS304	1	2
130	PMZL-M20D-SS	Bearing , Front (#E32215J)	S45C	1	2

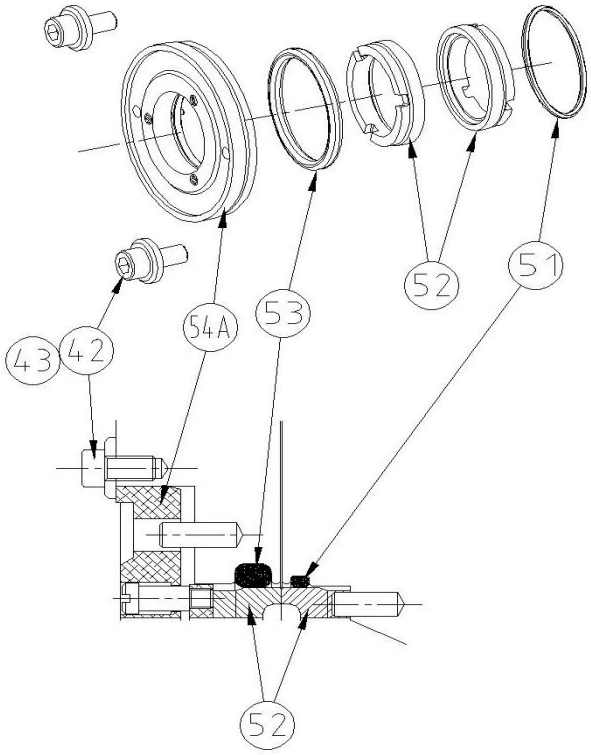
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
131	MMZF-BC40-SS	Bearing Block Cover, High Pressure	SUS304	1	2
132	PCWB-M10G-SS	Wrench Bolt, M10x60L	SUS304	1	8
133	PMHN-M10L-SS	Lock Nut, M10	SUS304	1	8
134	PMZL-LB11-SS	Bush, Lock Nut, Ø15xØ11x13	SUS304	1	8
135	PCWB-M12D-SS	Wrench Bolt, M12x40L	SUS304	1	4
136	PCWB-M12E-SS	Wrench Bolt, M12x80L	SUS304	1	2

Note: 1. Please refer to appendix list for the parts with marked "*"

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
123	MMZF-440D-SS	Rotor Case-4"DIN11851, ZLF440	SUS316L	1	1
	MMZF-440F-SS	Rotor Case-4"DIN2633(FLANGE), ZLF440	SUS316L	1	1
	MMZF-440S-SS	Rotor Case-4"DS722.1, ZLF440	SUS316L	1	1
	MMZF-440I-SS	Rotor Case-4"ISOMALE(IDF), ZLF440	SUS316L	1	1
	MMZF-440R-SS	Rotor Case-4"RJT, ZLF440	SUS316L	1	1
	MMZF-440M-SS	Rotor Case-4"SMS, ZLF440	SUS316L	1	1
	MMZF-440C-SS	Rotor Case-4"TRICLAMP, ZLF440	SUS316L	1	1
	MMZF-440K-SS	Rotor Case-4" FLANGE, ZLF440	SUS316L	1	1
	MMZF-450D-SS	Rotor Case-5"DIN11851, ZLF450	SUS316L	1	1
	MMZF-450F-SS	Rotor Case-5"DIN2633(FLANGE), ZLF450	SUS316L	1	1
	MMZF-450S-SS	Rotor Case-5"DS722.1, ZLF450	SUS316L	1	1
	MMZF-450I-SS	Rotor Case-5"ISOMALE(IDF), ZLF450	SUS316L	1	1
	MMZF-450R-SS	Rotor Case-5"RJT, ZLF450	SUS316L	1	1
	MMZF-450M-SS	Rotor Case-5"SMS, ZLF450	SUS316L	1	1
	MMZF-450C-SS	Rotor Case-5"TRICLAMP, ZLF450	SUS316L	1	1
124	MMZF-450K-SS	Rotor Case-5" FLANGE, ZLF450	SUS316L	1	1
	MMZF-SW4A-SS	Rotor, Single-Wing, ZLF440	SUS316L	1	2
	MMZF-BW4A-SS	Rotor, Bi-Wing, ZLF440	SUS316L	1	2
	MMZF-BW4C-SS	Rotor, Bi-Wing, high temp clearance, ZLF440	SUS316L	1	2
	MMZF-BL4A-SS	Rotor, Bi-Lobe, ZLF440	SUS316L	1	2
	MMZF-TL4A-SS	Rotor, Tri-Lobe, ZLF440	SUS316L	1	2
	MMZF-TL4C-SS	Rotor, Tri-Lobe, high temp clearance, ZLF440	SUS316L	1	2
	MMZF-HL4A-SS	Rotor, Heli-Lobe, ZLF440	SUS316L	1	2
	MMZF-HL4C-SS	Rotor, Heli-Lobe, high temp clearance, ZLF440	SUS316L	1	2
	MMZF-SW4B-SS	Rotor, Single-Wing, ZLF450	SUS316L	1	2
	MMZF-BW4B-SS	Rotor, Bi-Wing, ZLF450	SUS316L	1	2
	MMZF-BW4D-SS	Rotor, Bi-Wing, high temp clearance, ZLF450	SUS316L	1	2
	MMZF-BL4B-SS	Rotor, Bi-Lobe, ZLF450	SUS316L	1	2
	MMZF-TL4B-SS	Rotor, Tri-Lobe, ZLF450	SUS316L	1	2
	MMZF-TL4D-SS	Rotor, Tri-Lobe, high temp clearance, ZLF450	SUS316L	1	2
	MMZF-HL4B-SS	Rotor, Heli-Lobe, ZLF450	SUS316L	1	2
	MMZF-HL4D-SS	Rotor, Heli-Lobe, high temp clearance, ZLF450	SUS316L	1	2

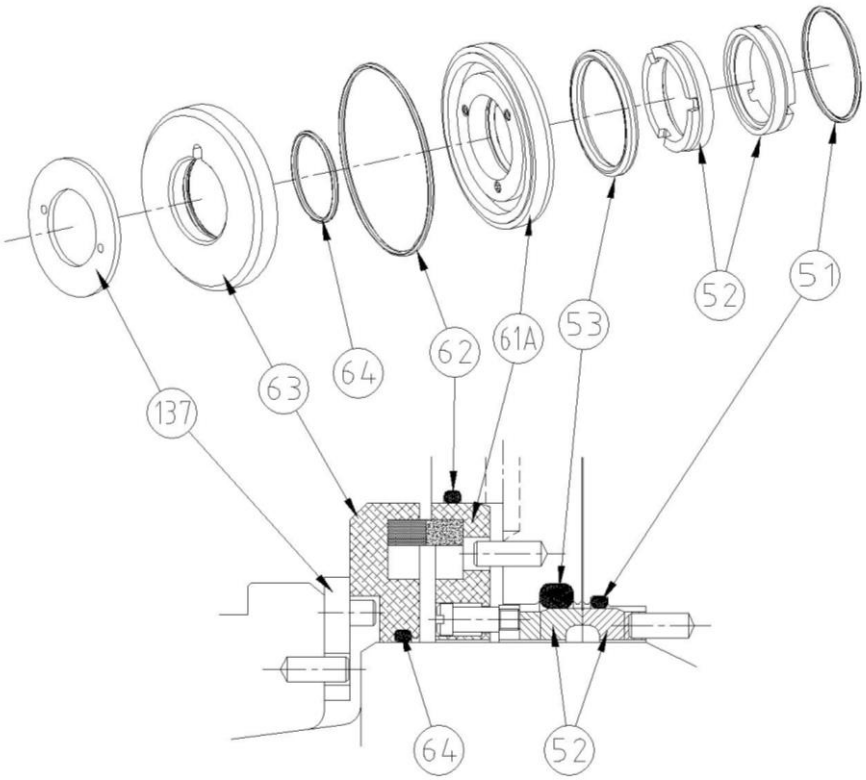
Note: All of standard rotor case doesn't have tap holes for flushing and jackets

SINGLE MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, M/Seal Gland (Φ6)	SUS304	2	8
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	8
51	PCOR-A151-NB	O-ring, Rotor (AN151)	NBR	1	4
	PCOR-A151-EP	O-ring, Rotor (AN151)	EPDM	1	4
	PCOR-A151-FP	O-ring, Rotor (AN151)	FPM	1	4
	PMOR-A151-PF	O-ring, Rotor (AN151)	Perfluoro	1	4
52	PMZL-SR4X-TC	Seal Ring	TC	2	8
	PMZL-SR4X-SI	Seal Ring	SiC	2	8
53	PCOR-A235-NB	O-ring, Rotor Case (AN235)	NBR	1	4
	PCOR-A235-EP	O-ring, Rotor Case (AN235)	EPDM	1	4
	PCOR-A235-FP	O-ring, Rotor Case (AN235)	FPM	1	4
	PMOR-A235-PF	O-ring, Rotor Case (AN235)	Perfluoro	1	4
54A	PMZL-SSB4-HP	Single Seal Body, Case, High pressure	SUS304	1	4

DOUBLE MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
51	PCOR-A151-NB	O-ring, Rotor (AN151)	NBR	1	4
	PCOR-A151-EP	O-ring, Rotor (AN151)	EPDM	1	4
	PCOR-A151-FP	O-ring, Rotor (AN151)	FPM	1	4
	PMOR-A151-PF	O-ring, Rotor (AN151)	Perfluoro	1	4
52	PMZL-SR4X-TC	Seal Ring	TC	2	8
	PMZL-SR4X-SI	Seal Ring	SiC	2	8
53	PCOR-A235-NB	O-ring, Rotor Case (AN235)	NBR	1	4
	PCOR-A235-EP	O-ring, Rotor Case (AN235)	EPDM	1	4
	PCOR-A235-FP	O-ring, Rotor Case (AN235)	FPM	1	4
	PMOR-A235-PF	O-ring, Rotor Case (AN235)	Perfluoro	1	4
61A	PMZL-DSB4-HT	Double Seal Body, Case, High pressure	TC/SUS304	1	4
	PMZL-DSB4-HS	Double Seal Body, Case, High pressure	SiC/SUS304	1	4
62	PCOR-A045-NB	O-ring, Case, Double seal (AN045)	NBR	1	4
	PCOR-A045-EP	O-ring, Case, Double seal (AN045)	EPDM	1	4
	PCOR-A045-FP	O-ring, Case, Double seal (AN045)	FPM	1	4
	PMOR-A045-PF	O-ring, Case, Double seal (AN045)	Perfluoro	1	4
63	PMZL-DRR4-CA	Rotation part, Double Seal, Shaft	Carbon/SUS304	1	4
	PMZL-DRR4-TC	Rotation part, Double Seal, Shaft	TC/SUS304	1	4
	PMZL-DRR4-SI	Rotation part, Double Seal, Shaft	SiC/SUS304	1	4
64	PCOR-A038-NB	O-ring,Shaft, Double Seal (AN038)	NBR	1	4
	PCOR-A038-EP	O-ring,Shaft, Double Seal (AN038)	EPDM	1	4
	PCOR-A038-FP	O-ring,Shaft, Double Seal (AN038)	FPM	1	4
	PMOR-A038-PE	O-ring Shaft, Double Seal (AN038)	Perfluoro	1	4
137	PMZL-SBR3-SS	Base Ring, Double Seal	SUS304	1	2

Ver. JRZLFM-1807

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