



## Operating & Maintenance Manual

### JEC JRZW120

#### Wine Pump



**ALWAYS A STEP AHEAD**

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# GENERAL

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## GENERAL INFORMATION

Thank you for your purchasing JEC products!

This manual is a part of the JRZW series Wine 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;

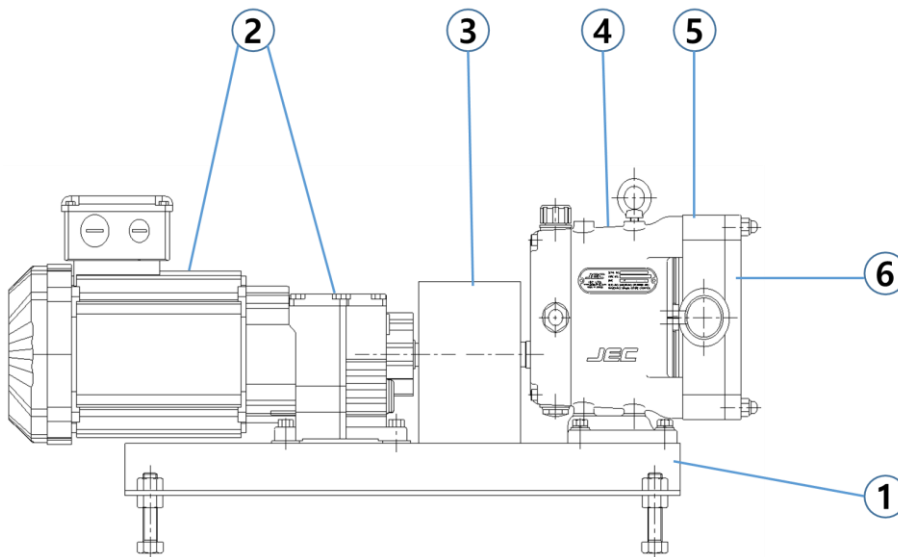
- Open the valves on the suction side completely to avoid cavitation and,
- Open the valves on the discharge side open completely to avoid exceeding the permitted differential pressure of the pump
- Discharge-side safety measures should be done (e.g. safety valve) to protect the pump from non-permitted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

## CONSTRUCTION

JRZW series Wine Pumps can be ordered with bare shaft, i.e. pumps without motor or common bed.



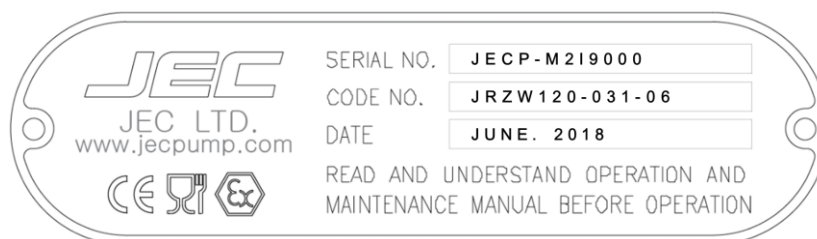
Or, ordered as a complete unit with drive motor, coupling & guard, common bed (or trolley) and layout described as below.



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

JRZW series are shipped in non-returnable wooden packaging.

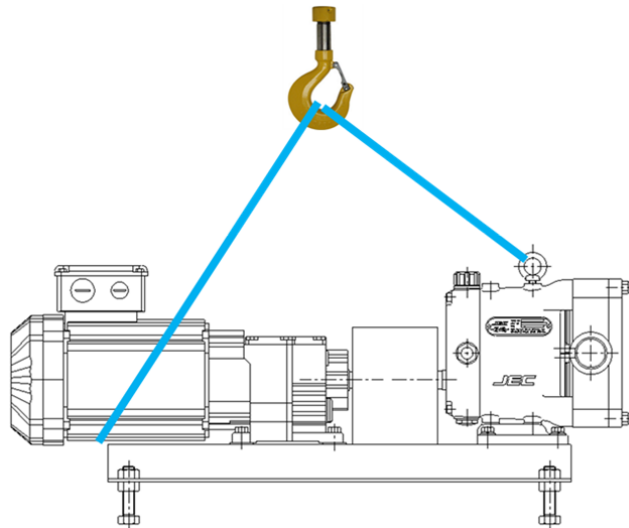
Unpack the pump/unit upon delivery and inspect it for visible transport damage.

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

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## 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** earth the base plate of pump to avoid the potential build up of static electricity.
- 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 the 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**

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### **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

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## 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.
5. Before connecting pipelines, check the location of suction and discharge.
6. Ensure the pipelines are connecting correctly and tightly.
7. The suction line should be kept as short as possible and present minimum friction loss.
8. 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.
9. 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 or counterclockwise 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.





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, 2020**

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**


# ATEX Certificate



## Konformitätserklärung

### **EC declaration of conformity**

im Sinne der EC-Maschinenrichtlinie 2006/42/EC, Anhang I Nr. 1  
as defined by EC machinery directive 2006/42/EC, Annex I No. 1

Produkte: Product:	<b>Verdrängerpumpen</b> Rotary Lobe Pump
Model:	<b>JRZW120</b>
Max. Arbeitsdruck: Max. working pressure:	<b>bis 6 bar</b> <b>to 6 bar</b>
Max. Flüssigkeit temperatur: Max. Liquid temperature:	<b>bis 108°C</b> <b>to 108 °C</b>
Drehzahl: Speed:	<b>&lt;500 min<sup>-1</sup> (+/-10%)</b>
Kennzeichnung: Marking:	 <b>II 2Gh T4</b>

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

**EC - Maschinenrichtlinie 2006 / 42 / EC, Anhang I Nr.1**  
**EC machinery directive 2006 / 42 / EC, Annex I No. 1**

**EC - Richtlinie 2014 / 34 / EU für Geräte in explosionsgefährdeten Bereichen**  
**EC directive 2014 / 34 / EU for equipment for the use in potentially explosive atmospheres**

Entsprechend Artikel 8(1)b)ii) der Richtlinie 2014 / 34 / EU 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 2014 / 34 / EU 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 ISO 12100, EN 809:1998+A1:2009, EN 13857, EN 13732-1, EN ISO 14120:2015**

**EN 1127-1:2011, EN ISO 80079-36:2016, EN ISO 80079-37:2016**

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

**February 1<sup>st</sup>, 2019**  
Date

Mr. John Hoorneman / CEO

**JEC LTD.**, 15-26, Beodeul-ro 1362, Paltan-myun, Hwaseong-si, Gyeonggi-do, 18578, Rep. of 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-Si,  
Gyeonggi-do, 18578, Rep. Korea

We hereby guarantee that **Rotary Lobe Pumps (Pump Head Only)**

Type: **JRZW120-031-06**

Serial No.: **JECP-X2X0000** <- This is a sample number, please mention the actual serial number for each model.

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

- **2014/35/EU Directive "low voltage"**
- **EN ISO 12100:2010**

## **Manufacturer Declaration**

(as per EC's Machinery Directive 2006/42/EC, 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:

**EN ISO 12100:2010, EN 809:1998+A1:2009**

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 12100:2010, EN 809:1998+A1:2009 in its respective current editions.

**February 1<sup>st</sup>, 2019**

Date



Mr. John Hoorneman / CEO

**JEC LTD.** 15-26, Beodeul-ro 1362, Paltan-myun, Hwaseong-si, Gyeonggi-do, 18578, Rep. of 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 directly contacted 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**
- **84/500/EEC**

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	Seal ring / Carbon	European Commission Directive 84/500/EEC	Extractable Lead&Cadmium
4	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
5	O-ring /EPDM & FPM	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



Mr. John Hoorneman / CEO

**JEC LTD.** 15-26 , Beodeul-ro, Paltan-myun, Hwaseong-si, Gyeonggi-do, 18578, 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	



Mr. John Hoorneman / CEO

**JEC LTD.** 15-26 , Beodeul-ro, Paltan-myun, Hwaseong-si, Gyeonggi-do, 18578, Rep. Of Korea  
Tel : 82-31-355-0316, Fax : 82-31-355-0319

# OPERATION

## 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 and pressure 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:

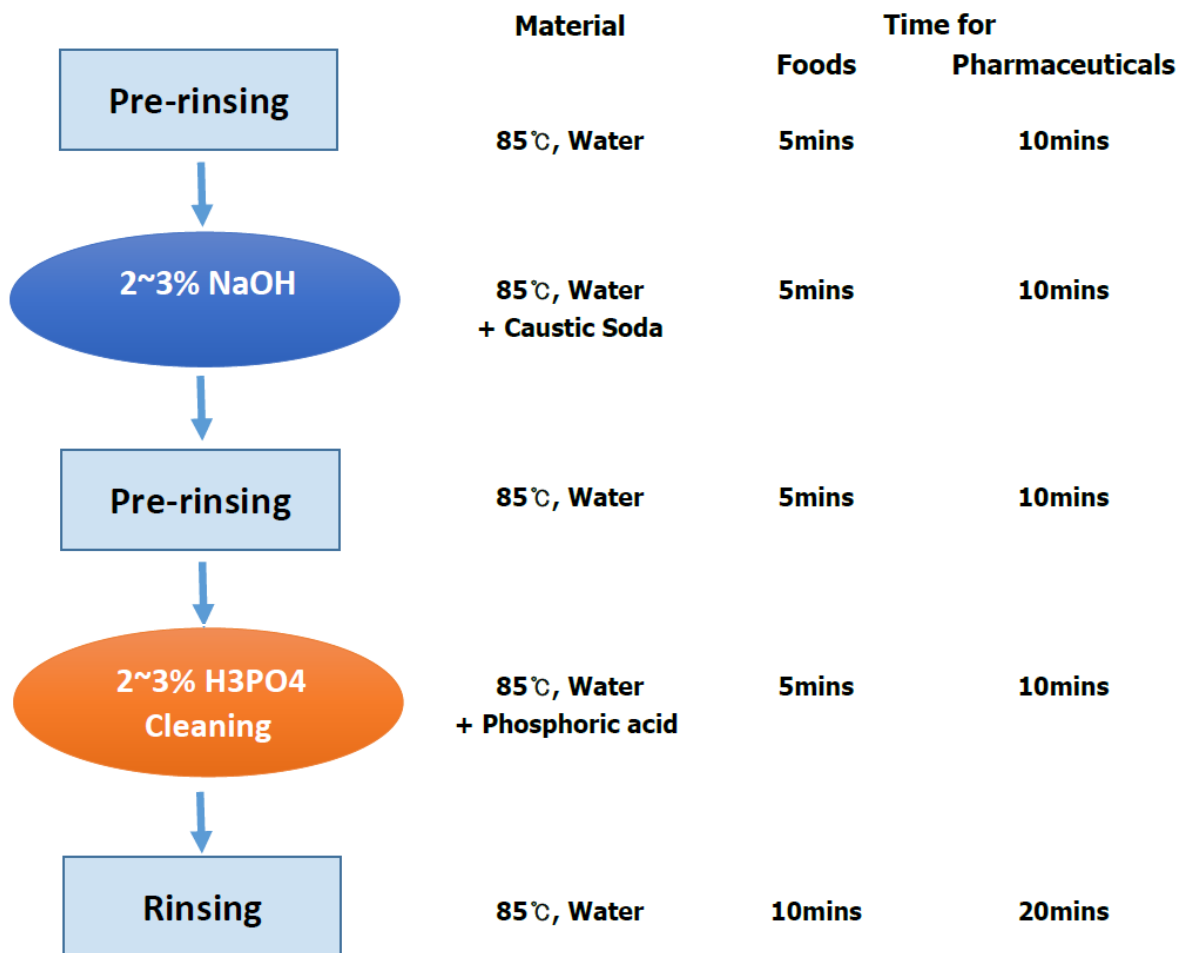
1. Operating conditions.
2. Accurate description of default.
3. Model of pump and serial number.
4. If possible, installations sketch of pump system.



## CLEANING

1. Before cleaning the pump, wear rubber gloves and protective glasses.
2. While CIP and SIP process, do not touch the pump and pipelines.
3. Ensure velocity rate of CIP solutions is adequate to clean entire circuit. For most applications a velocity of 1.52 m/sec is sufficient. For the CIP solution to achieve the proper velocity, the pump drive must have enough speed range and horsepower. The required inlet pressure also must be satisfied. If the pump does not supply enough CIP solution velocity, a separate CIP supply pump with an installed bypass may be used.
4. Refer to the below CIP and SIP process.

### General C.I.P (Clean In Place) Process



\* The working time is minimum time, the working time can be longer than indicated time, depends on the working conditions.

### General S.I.P (Sterilization In Place) Process

1. Stop the pump's operation.
2. After cleaning the pump, sterilize it by using the steam as 115~120°C for 20-30 minutes.

\* The working time is minimum time, the working time can be longer than indicated time, depends on the working conditions.

# 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 an authorized electrician.

Reference numbers are listed in the 'PARTS LIST' refer to the exploded view on pages 28-31.

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet. And then, remove the cover O-ring and inspect.



Fig. 1

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet. And then, remove the cover O-ring and inspect.



Fig. 2

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet. And then, remove the cover O-ring and inspect.



Fig. 3



Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet. And then, remove the cover O-ring and inspect.



Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet. And then, remove the cover O-ring and inspect.



Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet. And then, remove the cover O-ring and inspect.



## 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 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 MAINTENANCE

JRZW 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.

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet.

And then, remove the cover O-ring and inspect.



Fig. 7

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet.

And then, remove the cover O-ring and inspect.



Fig. 8

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet.

And then, remove the cover O-ring and inspect.



Fig. 9

## 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.

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

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet.

And then, remove the cover O-ring and inspect.



Fig. 10

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet.

And then, remove the cover O-ring and inspect.



Fig. 11

Start by removing the front cover after removing the cap nuts using the appropriate wrench from the cover. During this process, place all parts on a clean, protected surface with finished surfaces and seal faces facing up. If it is stuck, tap the cover off using a soft mallet.

And then, remove the cover O-ring and inspect.



Fig. 12

**Use feeler gauges and depth micrometer to verify the back and radial 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.

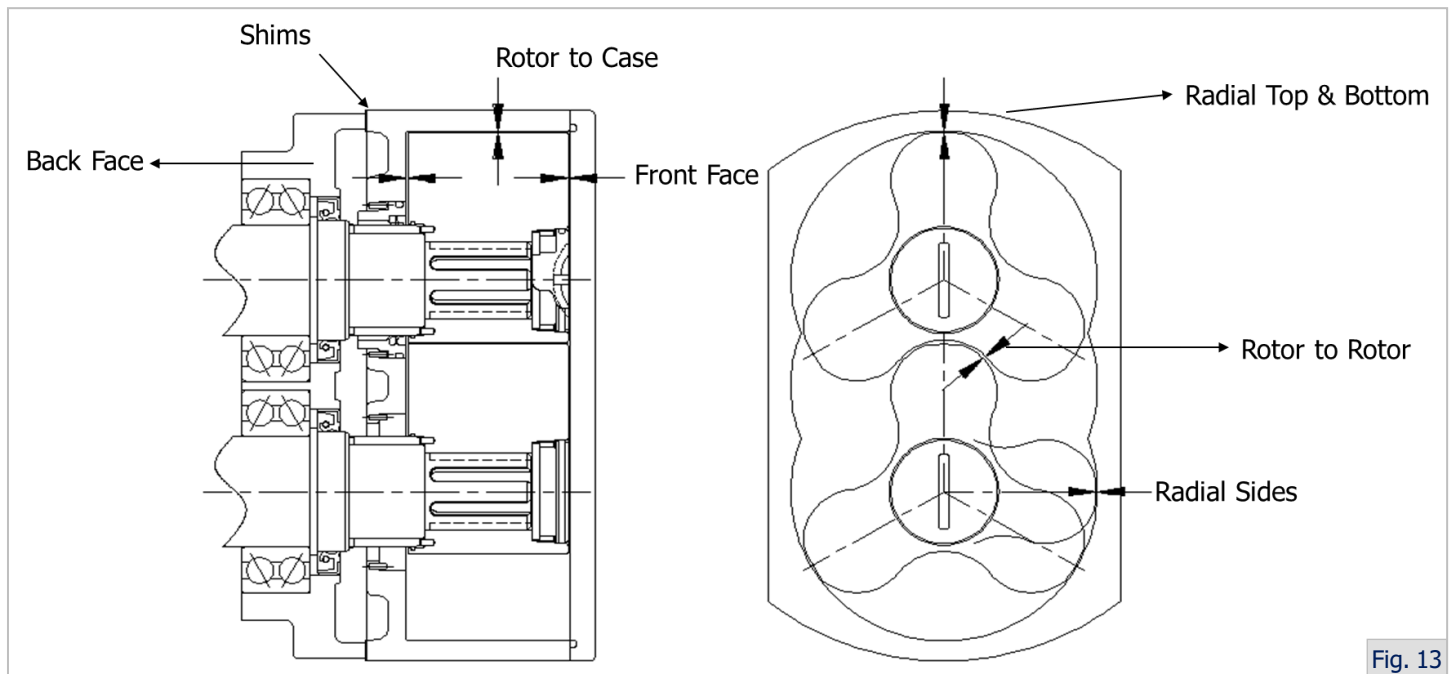


Fig. 13

Standard Rotor Clearances (mm)					
Model	Back Face	Front Face	Radial Sides	Radial Top & Bottom	Rotor to Rotor
JRZW120-031-06	0~0.05	0~0.05	0~0.05	0~0.05	0~0.05

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 case back face clearance is maintained by the shim (60).
2. Check that the rotor housing is tight to Gearbox (1). And check the rotor bolts (6) 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 (45) 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:

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. Rotate the shafts 60 degrees the opposite direction and measure 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.

5. Place the wooden dowel between the rotors.

6. Bend away the tab of the lock washer (12) 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.

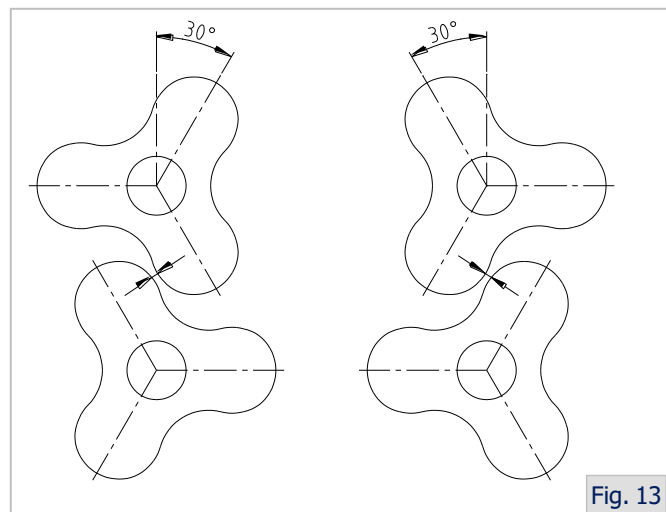


Fig. 13

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

8. Reassemble pump.



## 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).



Fig. 14

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

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).



Fig. 15

4. Pull the two helical-gears (14) off from the drive shaft (8) & idle shaft (9).

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



Fig. 16

6. Remove the front bearing gland set bolts (23) as shown in Figure 17.

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.

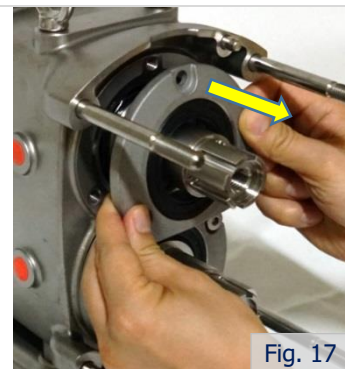


Fig. 17

- 
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. 18

- 
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 19.



Fig. 19

## 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. 20



Fig. 21

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. 22

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 23.

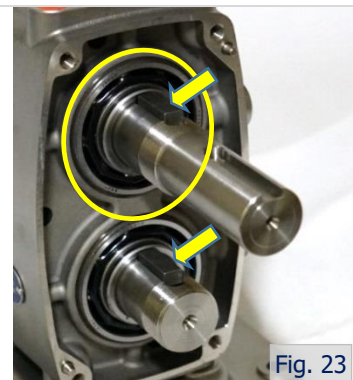


Fig. 23



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



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 20 'Rotor timing' for reference.



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.

Lubricate and install the rear oil seal cover (22) into Gearbox (1).



7. 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.
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 next page 'Lubrication' in detail.
9. Set the pressure relief valve.

## 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.

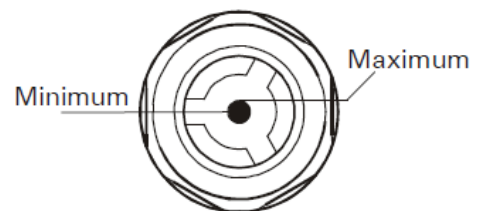
However, the shorter change intervals required for particularly difficult operating conditions, such as:

- High temperature variations
- High pressure fluctuations

Oil in Gearbox is recommended to be changed once a year or every 3,000 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	ZW120
Q'ty(liter)	0.34



'Shell Omala S2 G 150 or equivalent grade lubricants' are recommendable 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.

# TECHNICAL INFORMATION

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## TECHNICAL DATA

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### SPECIFICATIONS

Maximum Inlet Pressure .....	1 bar (100 kPa, 14.5 psi)
Maximum Differential Pressure .....	6 bar (600 kPa, 87 psi)
Maximum Flow Rate .....	15 m <sup>3</sup> /hr (66 US GPM)
.....	Please consult to JEC over 15 m <sup>3</sup> /hr
Temperature Range .....	-5 C to 120 C (23 F to 248 F)
Viscosity Range .....	100,000 cPs
Noise Level .....	60 ~ 80 dB

### MATERIALS

Product Wetted Parts .....	EPDM, 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
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

Rubber Heli-lobe rotors.

### OPTIONAL INFORMATION

Thermal jacket on rotor housing and front cover  
 Surface hardened rotor housing  
 Trolley version

## DIMENSIONAL DRAWING

### FOR BARE SHAFT

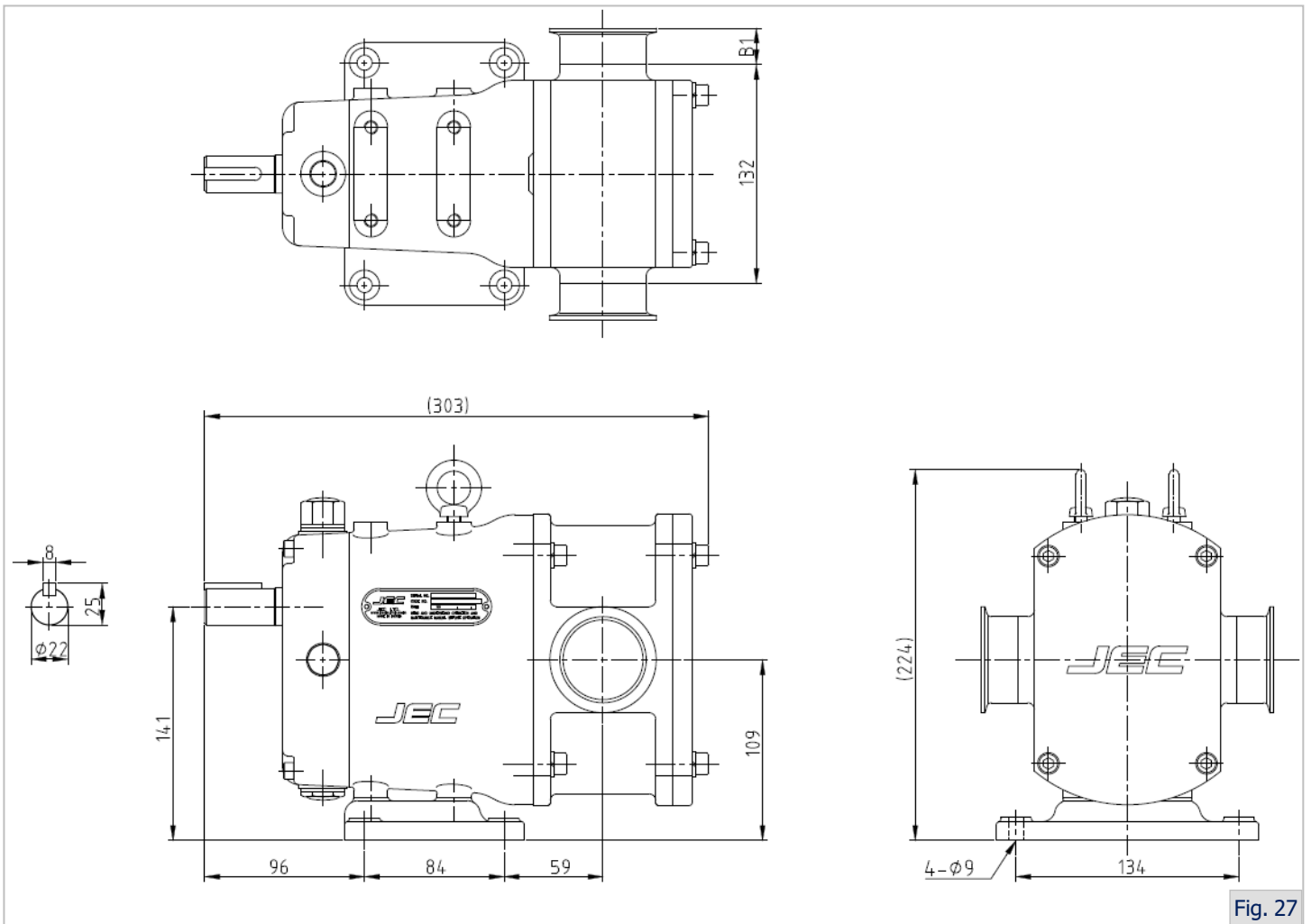
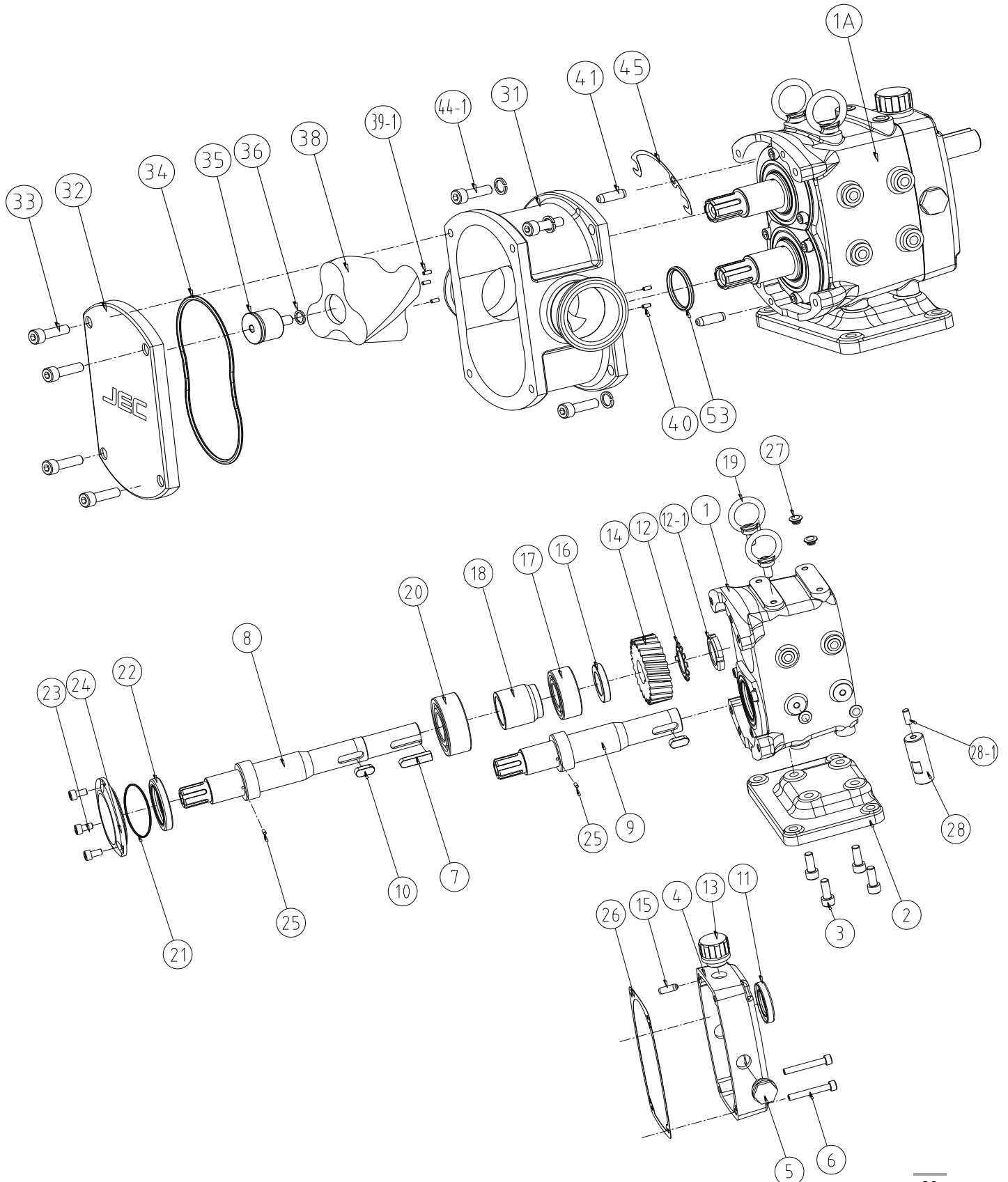


Fig. 27

Model No	Ports	Dimension B1 (mm)						Weight	Volume
		CLAMP	IDF	DIN	BS	SMS	FLANGE	KG	CBM
<b>ZW120-031-06</b>	2"	22	27	30	26	22	30	20	0.01

# PARTS LIST

## EXPLODED VIEW



All orders for repair parts must contain the following;

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

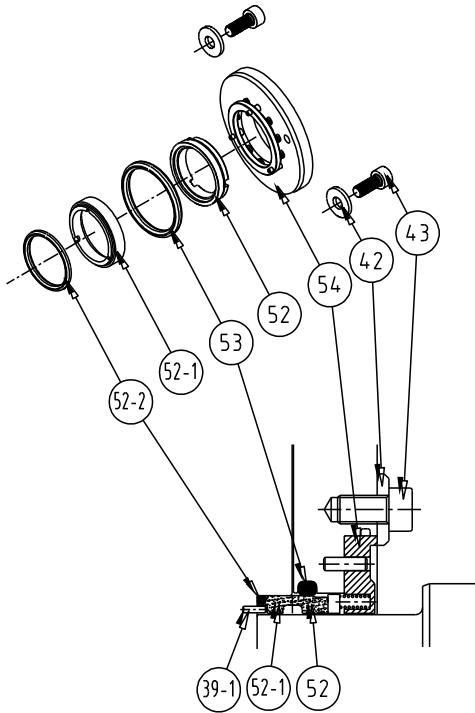
## Parts list / ZW120

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB1A-CS	Gearbox	FCD40	1	1
	MMZL-GB1A-SS	Gearbox	SUS304	1	1
2	MMZL-GBB1-CS	Base, Gearbox	FCD40	1	1
	MMZL-GBB1-SS	Base, Gearbox	SUS304	1	1
3	PCWB-M08E-SS	Wrench Bolt, Base(M8x20L)	SUS304	1	4
4	MMZL-GBC1-CS	Cover, Gearbox	FCD40	1	1
	MMZL-GBC1-SS	Cover, Gearbox	SUS304	1	1
5	PMZL-PT12-P3	Plug, Level, Drain		1	3
6	PCWB-M06F-CS	Wrench Bolt, Gearbox Cover (M6x45L)	S45C	1	4
7	PCZL-KY1B-CS	Key, Shaft (8x7x34)	S45C	1	1
8	MMZL-SD1D-SS	Shaft, Drive	SUS304	1	1
9	MMZL-SI1D-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	Valve, Relief	PE	1	1
14	PMZL-HG1X-CS	Helical Gear	S45C	1	2
15	PMZL-PN1G-SS	Dowel, Gearbox (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, Gearbox (38x55x9t)	NBR	1	2
	PMZL-OS38-FP	Oil Seal, Gearbox (38x55x9t)	FPM	1	2
23	PCWB-M06B-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	SUS304	1	2
26	PMZL-GG1X-PA	Gasket	Paper	1	1
27	PMZL-M08X-PE	Plug (M8)	PE	1	8
28	MMZL-GBA1-SS	Vertical adaptor	SUS304	1	4
28-1	PCWB-C08X-CS	CM W-Bolt M08x20L	S45C	1	4

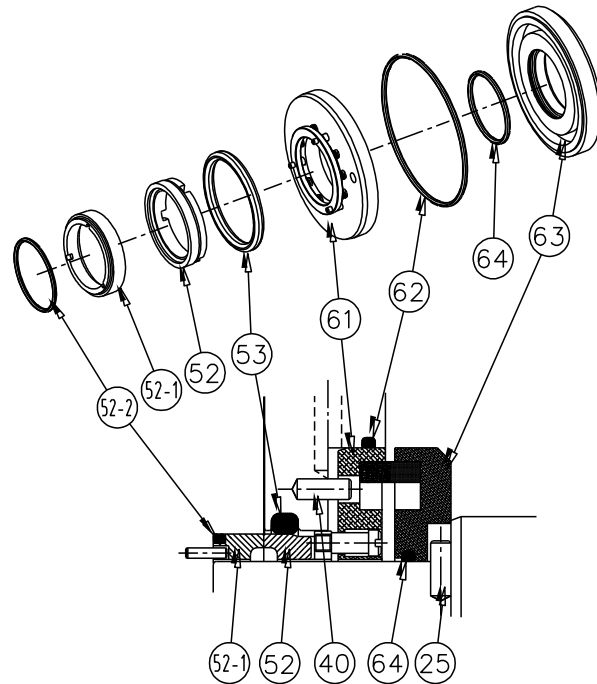
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZL120-GBXH-CW	Gearbox Ass'y - White	FCD40	1	1
	ZL120-GBXH-CS	Gearbox Ass'y - Silver	FCD40	1	1
	ZL120-GBXH-SS	Gearbox Ass'y - Stainless Steel	SUS304	1	1
31		Rotor Case	SUS316L	1	1
32	MMZW-FC12-SS	Front Cover	SUS316L	1	1
33	PCWB-M08E-SS	Wrench Bolt M08x20L	SUS304	1	4
34	PCOR-A251-EP	O-ring, Front Cover (AN251)	EPDM	1	1
	PCOR-A251-FP	O-ring, Front Cover (AN251)	FPM	1	1
	PCOR-A251-PF	O-ring, Front Cover (AN251)	Perfluoro	1	1
	PCOR-A251-PT	O-ring, Front Cover (AN251)	PTFE capsulated	1	1
35	MMZL-RB1X-SS	Rotor Bolt	SUS316L	1	2
36	PCZL-SRB1-SS	Spring Washer, Rotor Bolt	SUS304	1	2
38	MMZW-HL1W-E1	Rotor, Heli-Lobe, Top	EPDM	1	1
	MMZW-HL1W-ES	Rotor, Heli-Lobe, Bottom	EPDM	1	1
39-1	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
44-1	PCHB-M08D-SS	Hex Bolt (M8x25L)	SUS304	1	4
45	PMZL-SH1A-SS	Shim, 0.05mm	SUS304	1	2
	PMZL-SH1B-SS	Shim, 0.1mm	SUS304	1	2
47	PMNP-PT18-SS	Nipple, Flush (PT 1/8")	SUS304	1	2
48	PCZL-NA12-SS	Name Plate	SUS304	1	1
51	PCOR-A028-EP	O-ring, Rotor (AN028)	EPDM	1	2
	PCOR-A028-FP	O-ring, Rotor (AN028)	FPM	1	2
	PCOR-A028-PF	O-ring, Rotor (AN028)	Perfluoro	1	2
53	PCOR-A220-EP	O-ring, Rotor Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Rotor Case (AN220)	FPM	1	2
	PCOR-A220-PT	O-ring, Rotor Case (AN220)	Perfluoro	1	2
31	MMZW-RC12-SD	Rotor Case-2"DIN11851	SUS316L	1	1
	MMZW-RC12-SF	Rotor Case-2"DIN2633(FLANGE)	SUS316L	1	1
	MMZW-RC12-S7	Rotor Case-2"DS722.1	SUS316L	1	1
	MMZW-RC12-SI	Rotor Case-2"ISOMALE(IDF)	SUS316L	1	1
	MMZW-RC12-SR	Rotor Case-2"RJT	SUS316L	1	1
	MMZW-RC12-SM	Rotor Case-2"SMS	SUS316L	1	1
	MMZW-RC12-SC	Rotor Case-2"TRICLAMP	SUS316L	1	1
	MMZW-RC12-SK	Rotor Case-2"FLANGE	SUS316L	1	1



## SINGLE & DOUBLE MECHANICAL SEAL



Single Mech. Seal



Double Mech. 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	4
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	4
52-2	PCOR-A027-EP	O-ring, Rotor (AN027)	EPDM	1	2
	PCOR-A027-FP	O-ring, Rotor (AN027)	FPM	1	2
	PCOR-A027-PF	O-ring, Rotor (AN027)	Perfluoro	1	2
52-1	PMZW-SR1B-TC	Seal Ring, Rotating	TC	2	4
	PMZW-SR1B-SI	Seal Ring, Rotating	SiC	2	4
52	PMZL-SR1X-TC	Seal Ring	TC	2	4
	PMZL-SR1X-SI	Seal Ring	SiC	2	4
53	PCOR-A220-EP	O-ring, Rotor Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Rotor Case (AN220)	FPM	1	2
	PCOR-A220-PF	O-ring, Rotor Case (AN220)	Perfluoro	1	2
54	PMZL-SSB1-LP	Single Seal Body, Case	SUS304	1	2
	PMZL-SSB1-HP	Single Seal Body, Case (w/20 springs)	SUS304	1	2
39-1	PCPI-N3X8-SS	Seal pin, Rotor	SUS304	1	2
61	PMZL-DSB1-TC	Double Seal Body, Case	TC/SUS304	1	2
	PMZL-DSB1-SI	Double Seal Body, Case	SiC/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
	PCOR-A036-PF	O-ring, Case, Double seal (AN036)	Perfluoro	1	2
63	PMZL-DRR1-CA	Rotation part, Double Seal, Shaft	Carbon/SUS304	1	2
	PMZL-DRR1-TC	Rotation part, Double Seal, Shaft	TC/SUS304	1	2
64	PCOR-A023-EP	O-ring, Case, Double seal (AN023)	EPDM	1	2
	PCOR-A023-FP	O-ring, Case, Double seal (AN023)	FPM	1	2
	PCOR-A023-PF	O-ring, Case, Double seal (AN023)	Perfluoro	1	2





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Ver. JRZWM-1909

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