



**Operating & Maintenance Manual**  
**JEC JRZS Series**  
**Twin Screw Pumps**



**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 JRZS series Twin Screw 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;

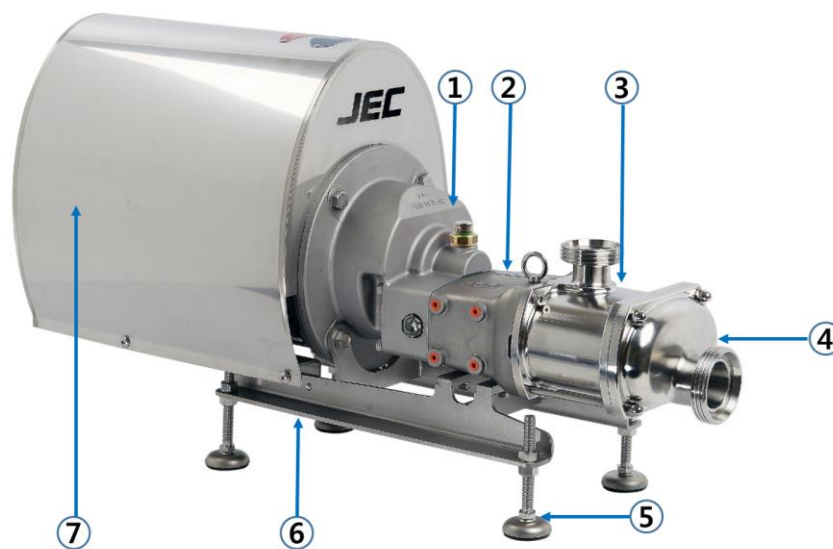
- Open the valves on the suction side completely to avoid cavitation and,
- Open the valves on the discharge side open completely to avoid exceeding the permitted differential pressure of the pump
- Discharge-side safety measures should be done (e.g. safety valve) to protect the pump from non-permitted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

## CONSTRUCTION

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



Or, can be ordered as an 'Integral type unit with B5 type motor' including integral adaptor, Common base and adjustable legs, motor cover & bracket. However, it can be changed optionally.

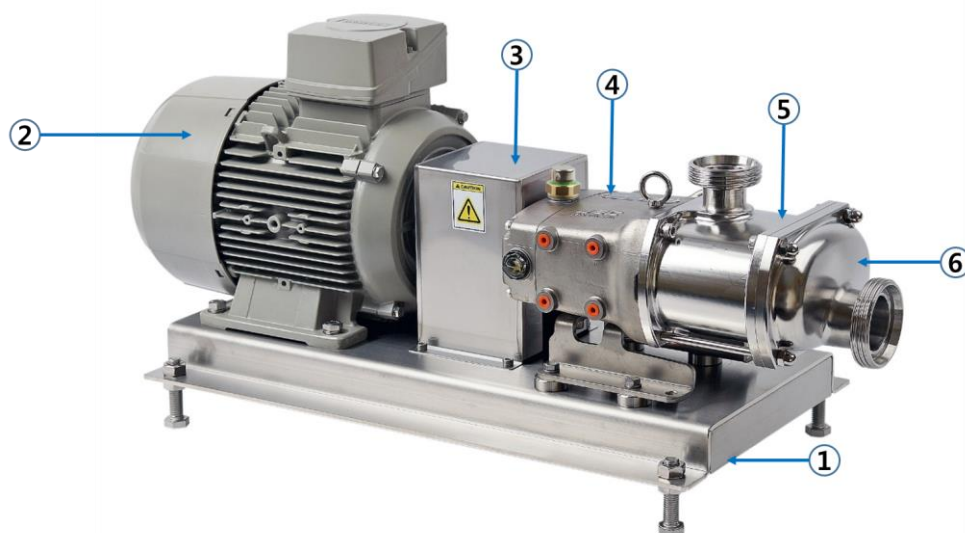


Example Layout of pumps with Integral type unit;

- ① Integral adaptor, ② Gearbox, ③ Screw case with outlet port (typically),
- ④ Front cover with Inlet port (typically), ⑤ Adjustable leg, ⑥ Common base,
- ⑦ Motor cover

\*Shaft length of Bare shaft and Integral type unit is different, therefore, please ask us before you replace the shaft.

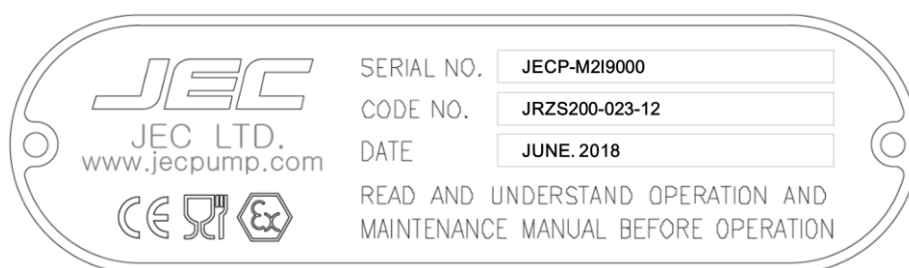
Or, ordered as a 'complete unit with B3 type drive motor, coupling & guard, common bed' and layout described as below.



Example Layout of pumps with complete unit

- ① Common bed, ② Drive unit, ③ Coupling & coupling guard, ④ Gearbox,  
⑤ Screw case with outlet port (typically), ⑥ Front cover with Inlet port (typically)

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

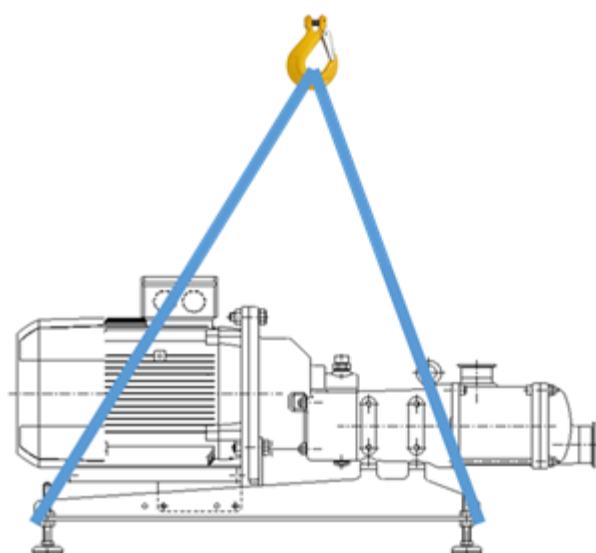


## PACKAGING & TRANSPORT

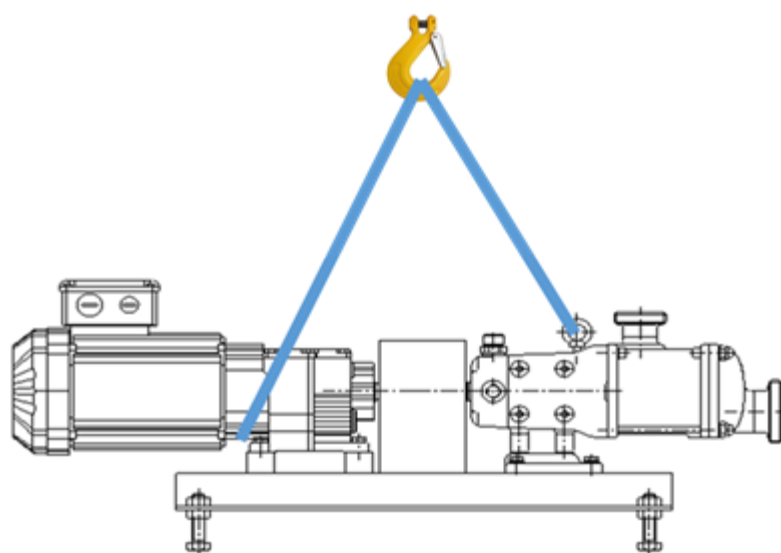
JRZS series are shipped in non-returnable wooden packaging. Unpack the pump/unit upon delivery and inspect it for visible transport damage. Any damage occurred during the transporting has to be immediately reported to the transport agent after receipt of the consignment. Do not put the damaged products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



Integral Motor Adaptor Type



Geared Motor Type

- Caution)**
- \*Do lift after dismantling the motor cover.
  - \*Do keep alignment between pump's and motor's shafts.
  - \*Do not lift the pump by the screw case, gearbox or integral adaptor.

## 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** checks 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 an 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.

## 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.

## MAINTENANCE

### SCREW 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.

Remove Front cover after removing the four cap nuts from the cover. If it is stuck, tap on the front cover with a soft mallet as shown Figure 6.



Fig. 1

Extract screw bolts and spring washers.



Fig.2

Pull out the twin screws from the shaft and treat carefully the screws to avoid damage. If it is stuck, can be pulled out by extraction tool.



Fig. 3

Pull out the both seal rings for stationary parts.



Fig. 4

Release wrench bolts on the screw case to be separated from gearbox.



If it is stuck tight, tap alternately on the rim of the screw case with soft hammer.



Slide along the stud bolt carefully and pull out the screw case from gearbox.



***If you want replace the seal ring only, you can easily dismantle and pull them out from screw case just after removing screws without dismantling screw case and replace new one pushed into the screw case.***

The seal ring for rotating parts can be easily removed by hand from screw.



Pull out the seal ring from screw and replace the new one.



## SCREW CASE ASSEMBLY

Before installation for screw case to the gearbox, make sure to clean the surface of screw case and gearbox and check the shim plate surely between screw case and gearbox. Assembly can be done reverse way against the disassembling procedure.

Slide and insert screw case along the stud bolt carefully to match the gearbox.



Fig. 10

Tighten bolts on the screw case using wrench with reference of below torque set value to be fixed to the gearbox.

Series	ZS100	ZS200	ZS300
Bolt size	M8	M10	M14
Torque value for bolt (N·m)	46	91	180



Fig. 11

Insert the both seal rings for rotating parts into the screw case matching the hole of seal rings to the pin of seal body in screw case.



Fig. 12

Assemble O-ring to seal ring and put on the screw by matching the hole of seal ring to the pin of screw.



Fig. 13

Before insert the twin screws, interdigitate carefully and checking the key in screw and groove in shaft to be matched. Slide and insert carefully the twin screws to the screw case and treat carefully the screws to avoid damage.



Fig. 14

Fasten screw bolts and spring washers with reference of below torque set value using wrench spanner.

Series	ZS100	ZS200	ZS300
Bolt size	M8	M14	M18
Torque value for Screw bolt (N·m)	22	40	53



Fig. 15

Covering and fasten four cap nuts with reference of below torque set value so that the Front cover and screw case can be assembled.

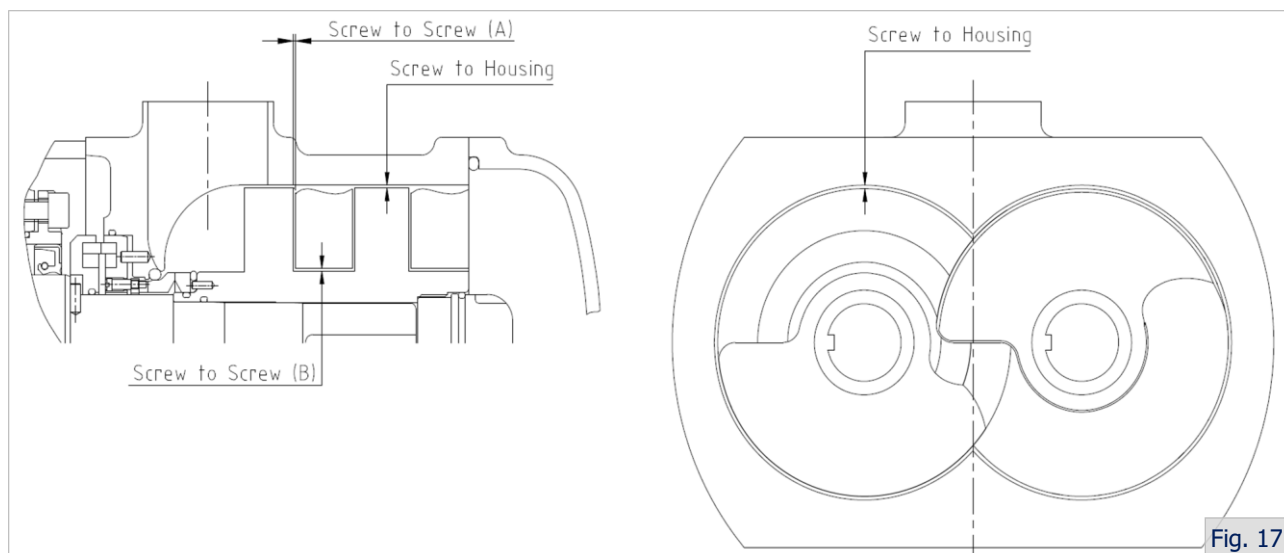
Series	ZS100	ZS200	ZS300
Nut size	M8	M10	M14
Torque value for Cap nut (N·m)	14	17	30



Fig. 16

## SCREW ROTOR CLEARANCE

Screw rotor clearance must be precisely maintained to provide maximum pumping efficiency, yet prevent contact between screw rotors, screw case, and front cover during operation. If pumping efficiency is lower than expected or if parts contact has occurred during operation (Within rated differential pressure), check the screw rotor clearances and adjust, if incorrect.



Model	Clearances for Standard (mm)		Clearances for High Pressure (mm)	
	Screw to Screw (A/B)	Screw to Housing	Screw to Screw (B)	Screw to Housing
ZS100 SERIES	0.1	0.1	0.2	0.2
ZS200 SERIES	0.12	0.12	0.24	0.24
ZS300 SERIES	0.15	0.15	0.3	0.3



## GEARBOX MAINTENANCE

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### Gearbox Disassembly

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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).

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.



To replace the timing gears (14, 14-1) for drive & idle shaft and power lock (181), straighten the locking tab of the bearing lock washer at drive shaft.

Remove the lock nut (12-1) and lock nut washer (12) from the drive shaft (8).



Release the setting wrench bolt and fasten jack bolts at power lock (181) to remove power lock and pull out the gear on the idle shaft (9).

See the detailed instruction of removal power lock in the 'APPENDIX'.



## 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.

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

Place the front bearing gland set on the both screws 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.

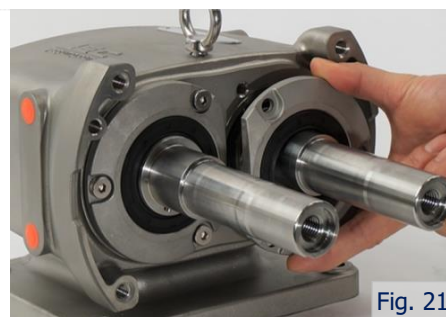


Fig. 21

3. Place the gear spacer (5mm) and insert gear key on the slots of drive shaft.

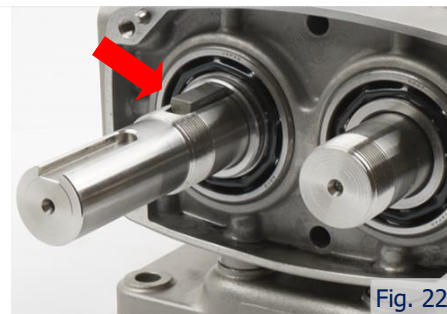


Fig. 22

4. Place the gear (14), lock washer (12) and lock nut (12-1) sequentially onto the drive shafts and hand tighten.

At this time, before insert lock washer, one sawtooth of lock washer should be bent and inserted into the hole of timing gear.



Fig. 23

5. Insert helical gear and power lock on the idle shaft and fasten power lock temporarily. Put the wedge between timing gears and tighten the gear lock nut on the drive shaft.

The other sawtooth also fitted in the lock nut to fasten each other and release the power lock in order to insert screws.



Fig. 24



6. On the opposite shafts, interdigitate carefully for both screws together with checking the key and groove in shaft to be matched, and insert properly to the shaft shoulder.



Fig. 25

7. Fasten the both screw bolts and insert 'Feeler gauge' with reference of below value to each series to secure screw timing.

Series	ZS100	ZS200	ZS300
Set Filler gauge value (mm)	0.10	0.12	0.15



Fig. 26

8. On the opposite timing gear after insert Feeler gauge, fasten wrench bolt of the power lock (181) sequentially with recommended below torque value.

Series	ZS100	ZS200	ZS300
Bolt size	M6	M6	M8
Torque value for Cap nut (N·m)	16.7	16.7	40.2



Fig. 27

See also in detail the installation manual of the power lock in the 'APPENDIX'.

9. 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.
10. Set the cover bolts, drain plug and fill the oil to the oil reservoir.

The detail instructions of the lubrications are mentioned on the 'APPENDIX'.



Fig. 28

## INTEGRAL TYPE UNIT ASSEMBLY

If ZS series ordered by 'Integral type unit', they will be provided with pump head with integral adaptor, Common base with adjustable leg, motor, motor cover and bracket. However, the contents can be changed optionally.

Seated the assembled pump head and integral adaptor on the Common base. Assemble the motor bracket on the Common base.



Fig. 29

Insert and assemble motor to the integral adaptor by adjusting between the motor shaft key and key way in integral stud shaft (192).

Assemble integral adaptor flange and motor by fastening bolt (198) and nut (199).

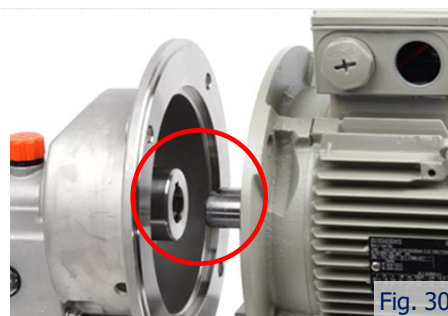


Fig. 30

Fasten socket set screw (197) inside of the hole by L-wrench.

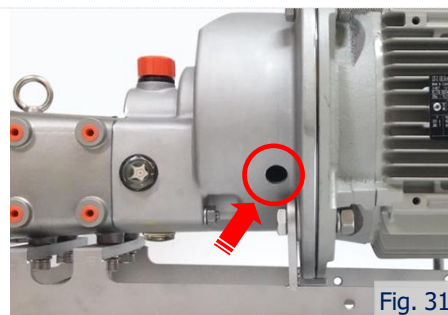


Fig. 31

Fit the motor cover at the integral adaptor flange and cover bracket. Fasten motor cover with bolt each side on the bracket.

Finally adjust the height and balance of the pumps by using adjustable legs. Fasten the nuts (203) of all adjustable legs.



Fig. 32

# 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. Screw-to-Screw 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 screws, replace twisted shafts, replace worn gears.
Pump overloads	Viscosity of product higher than expected. Higher pressure than expected.	Reduce pump speed, increase pipe size, Reduce pump speed, increase pipe size,
Play between gears	Worn gear teeth. Gear loose on shaft.	Replace gear. Inspect gear key, keyway and shaft. If all are undamaged, retighten the gear retaining nut. Check for backlash.

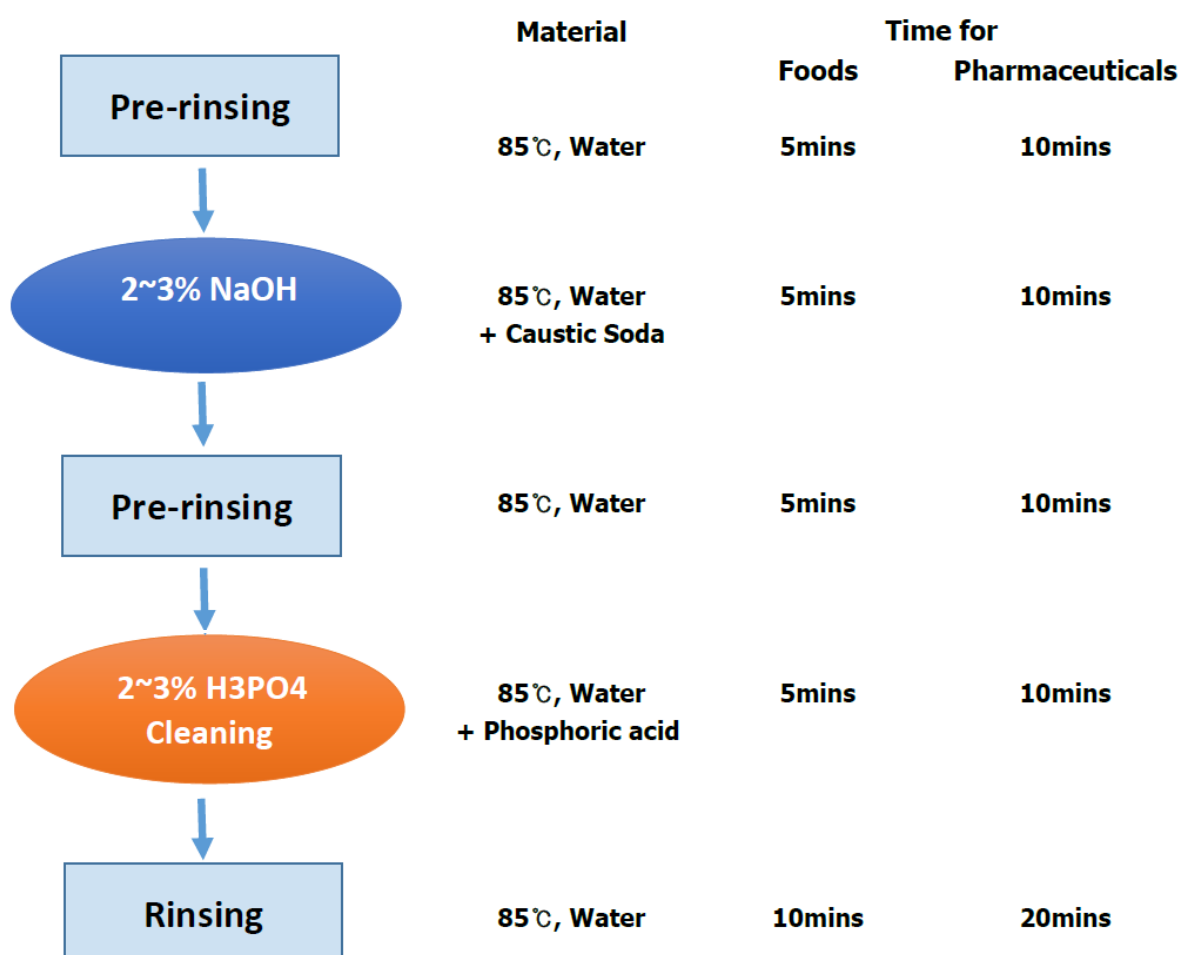
If assistance is required, please contact your local sales office with the following information:

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

## 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.

# TECHNICAL INFORMATION

## TECHNICAL DATA

### SPECIFICATIONS

Maximum Inlet Pressure .....	10 bar (1,000 kPa, 145 psi)
Maximum Differential Pressure .....	12 bar (1,200 kPa, 174 psi) Up to 16 bar available optionally
Maximum Flow Rate .....	100 m <sup>3</sup> /hr (440 US GPM) Please consult JEC incase over 100 m <sup>3</sup> /hr up to 450 m <sup>3</sup> /hr
Temperature Range .....	-10 °C to 150 °C (14 °F to 302 °F)
Viscosity Range .....	Up to 1,000,000 cPs
Noise Level .....	60 ~ 80 dB

### MATERIALS

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

### SHAFT SEALS

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

### SCREW INFORMATION

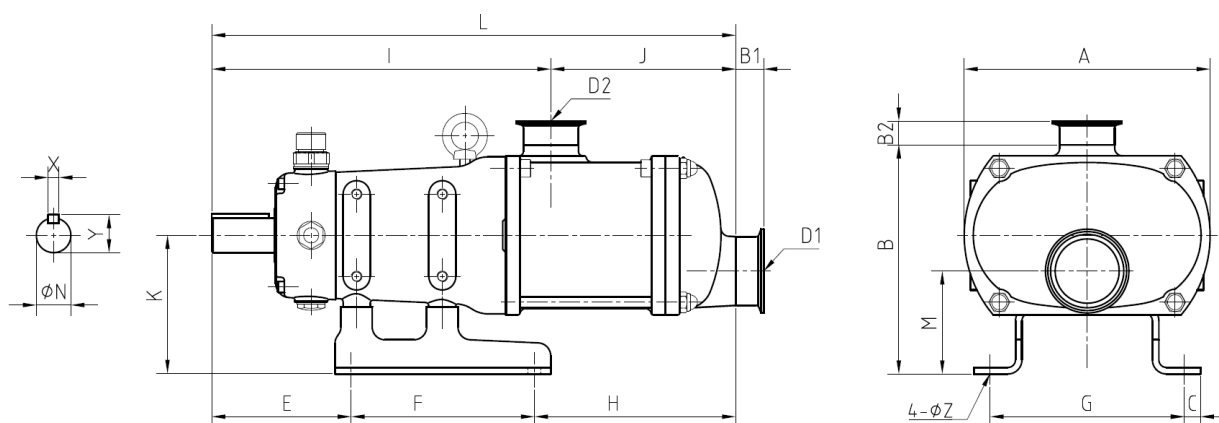
Different pitches available according to the more flow rate or pressure required  
P34 & P22 for ZS100 / P45 & P30 for ZS200 / P60 & P40 for ZS300 series

### OPTIONAL INFORMATION

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

## DIMENSIONAL DRAWING

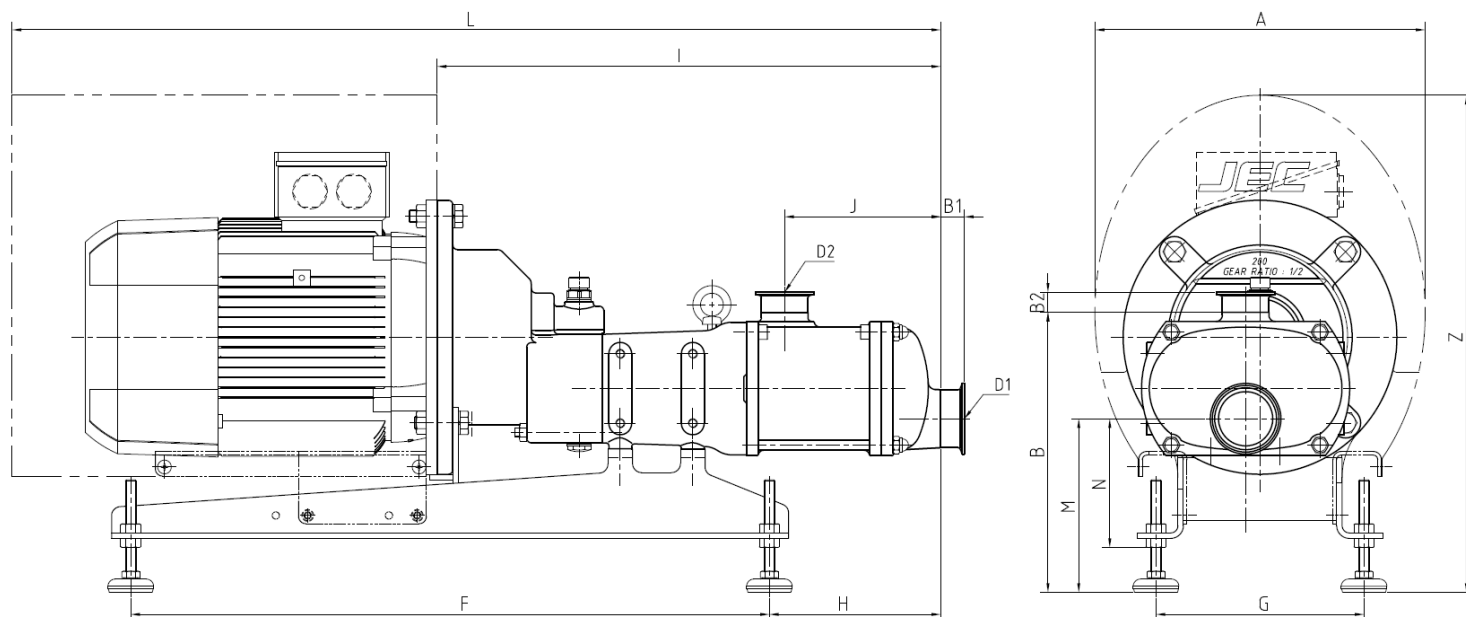
### FOR BARE SHAFT



Model No.	Dimension												
	A	B	C	E	F	G	H	K	L	N	X	Y	Z
<b>JRZS100</b>	115	168	12	96	124	134	141	101	360	22	8	25	9
<b>JRZS200</b>	228	212	15	129	170	180	186	128	486	32	10	35	11
<b>JRZS300</b>	315	297	21	158	215	242	245	181	618	45	14	49	13

Model No.	D1 x D2	I	J	M	Dimension B1 x B2						Weight	Volume
	Standard				CLAMP	IDF	BS	DIN	SMS	FLANGE	KG	CBM
<b>JRZS100</b>	2.5" x 2"	240	121	82	26 x 22	26 x 27	26 x 26	37 x 30	26 x 22	35 x 30	22	0.01
	2" x 1.5"	234	127	76	22 x 20	27 x 25	26 x 26	30 x 30	22 x 20	30 x 30	22	0.01
<b>JRZS200</b>	3" x 2.5"	320	165	102	28 x 26	28 x 26	26 x 26	42 x 37	28 x 26	40 x 35	48	0.03
	2.5" x 2"	314	171	95	26 x 22	26 x 27	26 x 26	37 x 30	26 x 22	35 x 30	48	0.03
<b>JRZS300</b>	4" x 3"	402	216	142	28 x 28	28 x 28	26 x 26	45 x 42	35 x 28	54 x 40	103	0.06
	3" x 2.5"	395	222	129	28 x 26	28 x 26	26 x 26	42 x 37	28 x 26	40 x 35	103	0.06

## FOR INTEGRAL TYPE



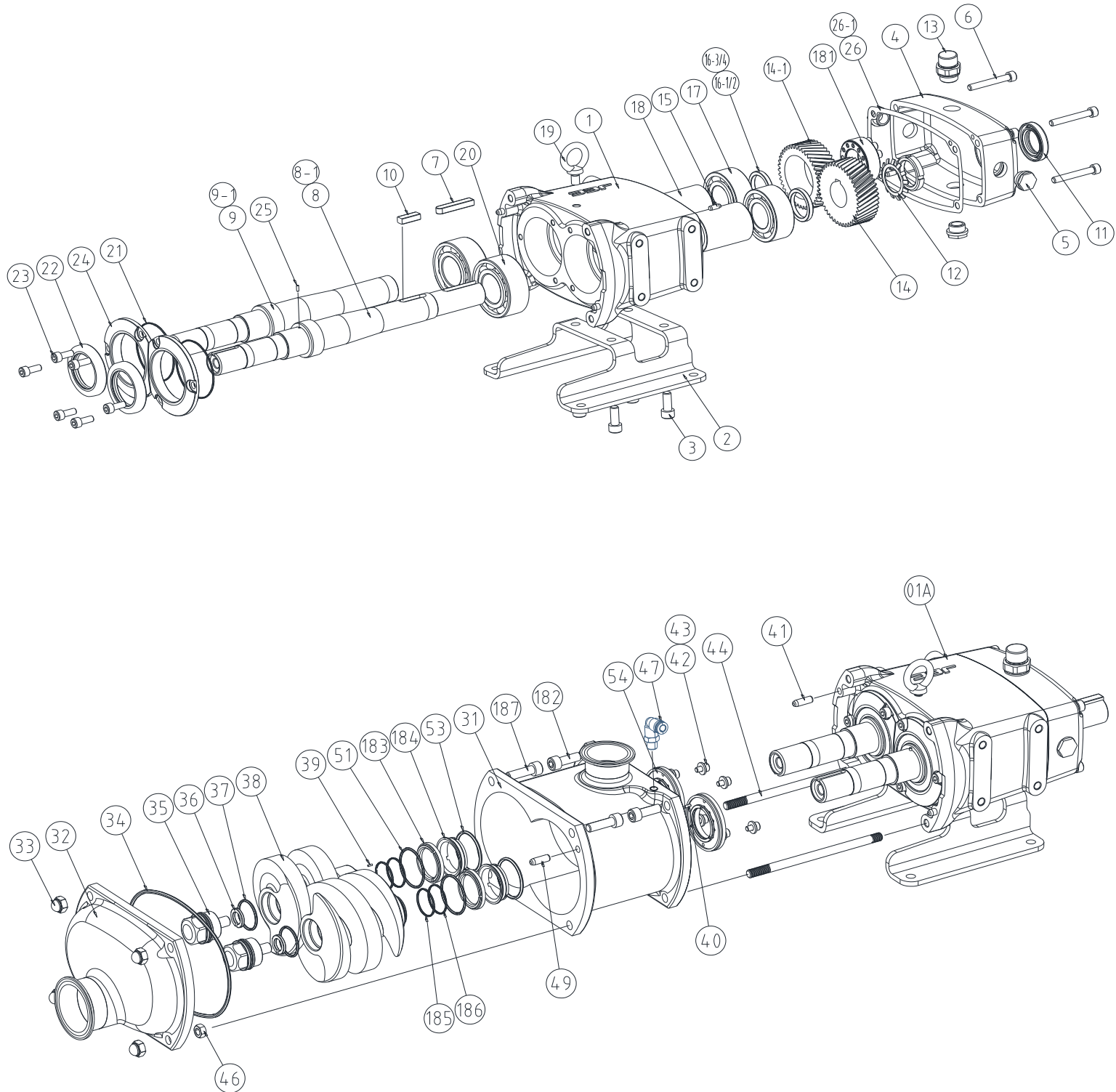
Model No.	Motor/kW	Dimension							
		A	B	F	G	H	I	L	Z
JRZS100	3.7	292	272	500	196	139	420	790	482
	5.5/7.5	362	272	500	196	139	440	880	512
JRZS200	5.5/7.5	362	307	700	228	188	552	1018	544
	11/15/18.5	412	307	700	228	188	552	1118	581
JRZS300	11/15/18.5	412	230	830	270	262	714	1252	714
	22	472	230	830	270	262	714	1343	661

Model No.	Motor/kW	D1 x D2	J	M±20	N	Dimension B1 x B2					
		Standard				CLAMP	IDF	BS	DIN	SMS	FLANGE
JRZS100	3.7	2.5" x 2"	121	186	129	26 x 22	26 x 27	26 x 26	37 x 30	26 x 22	35 x 30
		2" x 1.5"	127	180	123	22 x 20	27 x 25	26 x 26	30 x 30	22 x 20	30 x 30
	5.5/7.5	2.5" x 2"	121	186	129	26 x 22	26 x 27	26 x 26	37 x 30	26 x 22	35 x 30
		2" x 1.5"	127	180	123	22 x 20	27 x 25	26 x 26	30 x 30	22 x 20	30 x 30
JRZS200	5.5/7.5	3" x 2.5"	165	197	148	28 x 26	28 x 26	26 x 26	42 x 37	28 x 26	40 x 35
		2.5" x 2"	171	190	141	26 x 22	26 x 27	26 x 26	37 x 30	26 x 22	35 x 30
	11/15/18.5	3" x 2.5"	165	197	148	28 x 26	28 x 26	26 x 26	42 x 37	28 x 26	40 x 35
		2.5" x 2"	171	190	141	26 x 22	26 x 27	26 x 26	37 x 30	26 x 22	35 x 30
JRZS300	11/15/18.5	4" x 3"	216	243	173	28 x 28	28 x 28	26 x 26	45 x 42	35 x 28	54 x 40
		3" x 2.5"	222	230	160	28 x 26	28 x 26	26 x 26	42 x 37	28 x 26	40 x 35
	22	4" x 3"	216	243	173	28 x 28	28 x 28	26 x 26	45 x 42	35 x 28	54 x 40
		3" x 2.5"	222	230	160	28 x 26	28 x 26	26 x 26	42 x 37	28 x 26	40 x 35



# PARTS LIST

## EXPLODED VIEW





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.

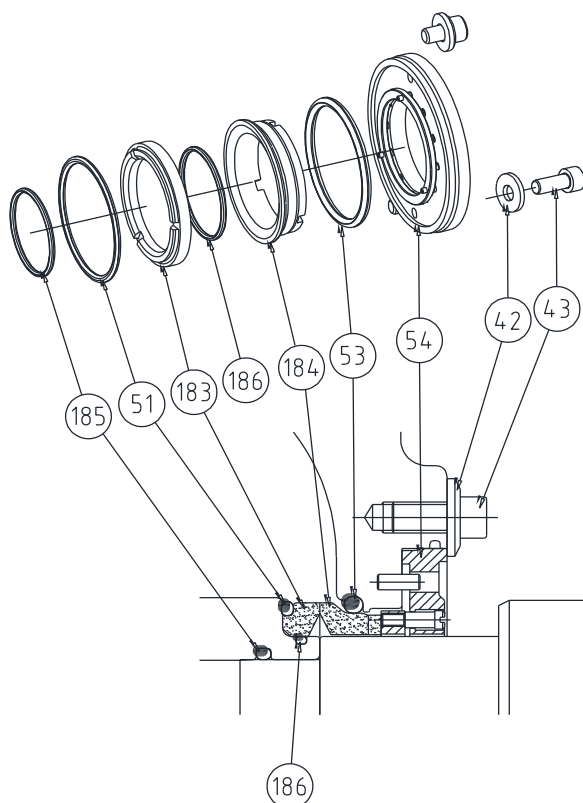
**Below parts list for ZS100 series only. Please ask the 'Parts list' to our distributor or us separately for your further reference.**

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB1A-SS	Gearbox	SCS13	1	1
	MMZL-GB1A-CS	Gearbox	FC20	1	1
2	MMZS-GBB1-SS	Base, Gearbox	SCS13	1	1
	MMZS-GBB1-CS	Base, Gearbox	FC20	1	1
3	PCWB-M08F-SS	Wrench Bolt, Base (M8x25L)	SUS304	1	4
4	MMZL-GBC1-SS	Cover, Gearbox	SCS13	1	1
	MMZL-GBC1-CS	Cover, Gearbox	FC20	1	1
5	PMZL-PT12-P2	Plug, Level, Drain PT 1/2"	PE	1	3
6	PCWB-M04F-SS	Wrench Bolt, Gearbox Cover (M4x45L)	SUS304	1	4
7	PCZL-KY1B-CS	Key, Shaft (8x7x34)	S45C	1	1
8	MMZS-SD10-SS	Shaft, Drive	Duplex	1	1
9	MMZS-SI10-SS	Shaft, Idle	Duplex	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"	Cu+SUS	1	1
14	PMZL-HG1X-CS	Helical Gear, Drive	S45C	1	1
14-1	PMZL-HG1X-DS	Helical Gear, Idle	S45C	1	1
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-BS1X-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 (M6x12L)	SUS304	3	6
24	MMZL-GD1C-SS	Gland, Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Seal set (Φ3)	SUS304	1	2
26	PMZL-GG1X-PA	Gasket	Paper	1	1
27	PMZL-M08X-PE	Plug (M8)	PE	1	8
	MMZS-ET00-S1	Screw bolt, Tool, Extraction	SUS304	1	1

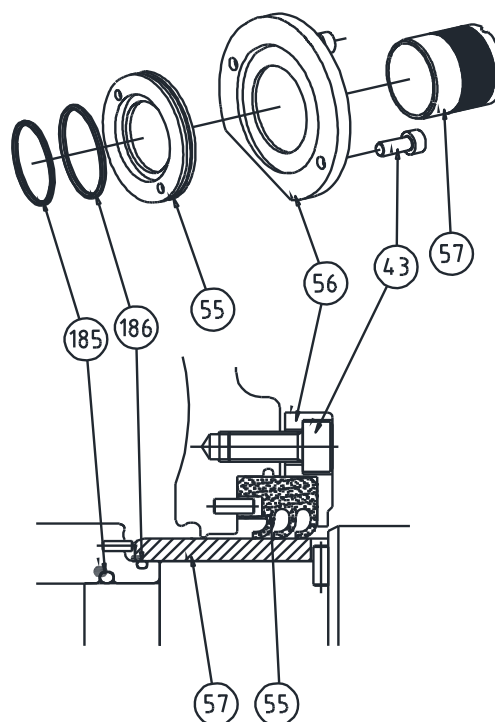
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZS100-GBXV-SS	Gearbox Ass'y - Stainless Steel	SCS13	1	1
	ZS100-GBXV-CW	Gearbox Ass'y - White	FC20	1	1
31	MMZS-115D-SS	Screw Case-1.5"DIN11851	SUS316L	1	1
	MMZS-115F-SS	Screw Case-1.5"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-115S-SS	Screw Case-1.5"DS722.1	SUS316L	1	1
	MMZS-115I-SS	Screw Case-1.5"ISOMALE(IDF)	SUS316L	1	1
	MMZS-115R-SS	Screw Case-1.5"RJT	SUS316L	1	1
	MMZS-115M-SS	Screw Case-1.5"SMS	SUS316L	1	1
	MMZS-115C-SS	Screw Case-1.5"TRICLAMP	SUS316L	1	1
	MMZS-115K-SS	Screw Case-1.5"FLANGE	SUS316L	1	1
	MMZS-120D-S1	Screw Case-2"DIN11851	SUS316L	1	1
	MMZS-120F-S1	Screw Case-2"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-120S-S1	Screw Case-2"DS722.1	SUS316L	1	1
	MMZS-120I-S1	Screw Case-2"ISOMALE(IDF)	SUS316L	1	1
	MMZS-120R-S1	Screw Case-2"RJT	SUS316L	1	1
	MMZS-120M-S1	Screw Case-2"SMS	SUS316L	1	1
	MMZS-120C-S1	Screw Case-2"TRICLAMP	SUS316L	1	1
	MMZS-120K-S1	Screw Case-2"FLANGE	SUS316L	1	1
32	MMZS-FC1B-SD	Front Cover -2"DIN11851	SUS316L	1	1
	MMZS-FC1B-SF	Front Cover -2"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-FC1B-SS	Front Cover -2"DS722.1	SUS316L	1	1
	MMZS-FC1B-SI	Front Cover -2"ISOMALE(IDF)	SUS316L	1	1
	MMZS-FC1B-SR	Front Cover -2"RJT	SUS316L	1	1
	MMZS-FC1B-SM	Front Cover -2"SMS	SUS316L	1	1
	MMZS-FC1B-SC	Front Cover -2"TRICLAMP	SUS316L	1	1
	MMZS-FC1B-SK	Front Cover -2"FLANGE	SUS316L	1	1
	MMZS-FC2B-SD	Front Cover -2.5"DIN11851	SUS316L	1	1
	MMZS-FC2B-SF	Front Cover -2.5"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-FC2B-SS	Front Cover -2.5"DS722.1	SUS316L	1	1
	MMZS-FC2B-SI	Front Cover -2.5"ISOMALE(IDF)	SUS316L	1	1
	MMZS-FC2B-SR	Front Cover -2.5"RJT	SUS316L	1	1
	MMZS-FC2B-SM	Front Cover -2.5"SMS	SUS316L	1	1
	MMZS-FC2B-SC	Front Cover -2.5"TRICLAMP	SUS316L	1	1
	MMZS-FC2B-SK	Front Cover -2.5"FLANGE	SUS316L	1	1
33	PCZL-M08X-SS	Cap Nut (M8)	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-KA	O-ring, Front Cover (AN251)	Kalrez	1	1
	PMOR-A251-PF	O-ring, Front Cover (AN251)	Perfluoro	1	1
35	MMZS-RB10-SS	Screw Bolt	SUS316L	1	2
36	PCZL-SRB1-SS	Spring Washer, Screw Bolt	SUS304	1	2

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
37	PCOR-A021-NB	O-ring, Screw Bolt (AN021)	NBR	1	2
	PCOR-A021-EP	O-ring, Screw Bolt (AN021)	EPDM	1	2
	PCOR-A021-FP	O-ring, Screw Bolt (AN021)	FPM	1	2
	PMOR-A021-KA	O-ring, Screw Bolt (AN021)	Kalrez	1	2
	PMOR-A021-PF	O-ring, Screw Bolt (AN021)	Perfluoro	1	2
38	MMZS-RT12-SS	Screw, P22	SUS316L	1	2
	MMZS-RT13-SS	Screw, P34	SUS316L	1	2
	MMZS-RT12-HS	Screw, P22 High temp clearance	SUS316L	1	2
	MMZS-RT13-HS	Screw, P34, High temp clearance	SUS316L	1	2
39	PCPI-N2X6-SS	Seal Pin, Screw (Φ2X6L)	SUS304	3	6
40	PCPI-N3X8-SS	Seal Pin, Screw Case (Φ3)	SUS304	2	4
41	PMZL-PN1C-SS	Dowel, Screw Case (Φ6)	SUS304	1	2
44	PMZL-M08H-SS	Stud Bolt, Screw Case (M8)	SUS304	1	2
45	ZS10-SP01-SS	Shim (0.05mm)	SUS304	1	2
	ZS10-SP02-SS	Shim (0.1mm)	SUS304	1	2
46	PCHN-M08X-SS	Hex nut, Stud Bolt (M8)	SUS304	1	2
47	PMNP-PT18-SS	Nipple, Flush (PT 1/8")	SUS304	1	2
48	PCZL-NA12-SS	Name Plate	SUS304	1	1
49	PMZL-PN1C-SS	Pin, Cover dowel (Φ6)	SUS304	1	2
51	PCOR-A124-NB	O-ring, Screw Seal (AN124)	NBR	1	2
	PCOR-A124-EP	O-ring, Screw Seal (AN124)	EPDM	1	2
	PCOR-A124-FP	O-ring, Screw Seal (AN124)	FPM	1	2
	PMOR-A124-KA	O-ring, Screw Seal (AN124)	Kalrez	1	2
	PMOR-A124-PF	O-ring, Screw Seal (AN124)	Perfluoro	1	2
53	PCOR-A220-NB	O-ring, Screw Case (AN220)	NBR	1	2
	PCOR-A220-EP	O-ring, Screw Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Screw Case (AN220)	FPM	1	2
	PMOR-A220-KA	O-ring, Screw Case (AN220)	Kalrez	1	2
	PMOR-A220-PF	O-ring, Screw Case (AN220)	Perfluoro	1	2
181	PMZS-PW10-CS	Power lock, Gear	S45C	1	1
182	PCWB-M08F-SS	Wrench, bolt (M8x25L)	SUS304	1	2
187	PCWB-M08G-SS	Wrench, bolt (M8x30L)	SUS304	1	2
Note: Flush tap holes on Screw case are standard					

## SINGLE MECHANICAL SEAL & TRIPLE LIP SEAL



Single Mech. Seal



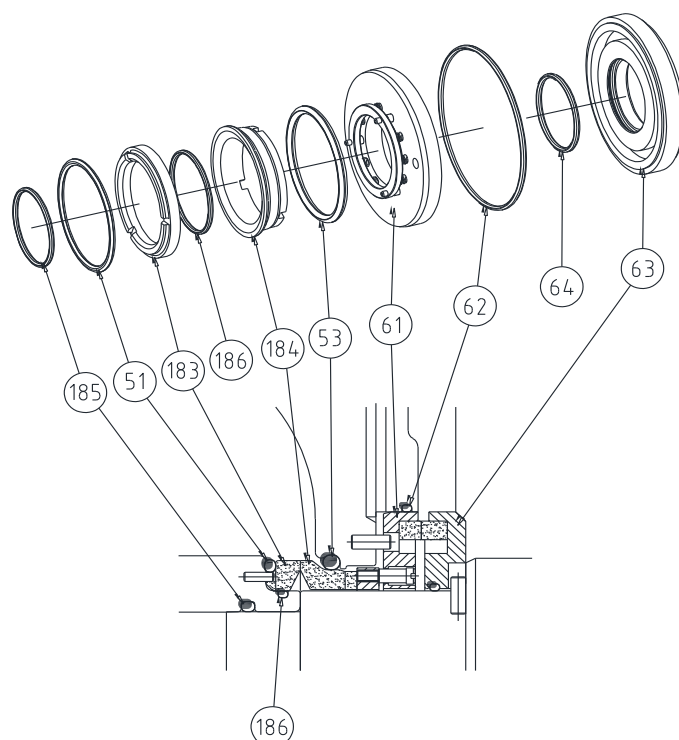
Triple Lip Seal

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-M06X-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	4
51	PCOR-A124-NB	O-ring, Screw Seal (AN124)	NBR	1	2
	PCOR-A124-EP	O-ring, Screw Seal (AN124)	EPDM	1	2
	PCOR-A124-FP	O-ring, Screw Seal (AN124)	FPM	1	2
	PMOR-A124-KA	O-ring, Screw Seal (AN124)	Kalrez	1	2
	PMOR-A124-PF	O-ring, Screw Seal (AN124)	Perfluoro	1	2
53	PCOR-A220-NB	O-ring, Screw Case (AN220)	NBR	1	2
	PCOR-A220-EP	O-ring, Screw Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Screw Case (AN220)	FPM	1	2
	PMOR-A220-KA	O-ring, Screw Case (AN220)	Kalrez	1	2
	PMOR-A220-PF	O-ring, Screw Case (AN220)	Perfluoro	1	2
54	PMZL-SSB1-LP	Single Seal Body, Case	SUS304	1	2
	PMZL-SSB1-HP	Single Seal Body, Case, High pressure	SUS304	1	2
55	MMZL-LS1T-PF	Triple Lip Seal, Product	PTFE+Glass	1	2
56	PMZL-GD1A-SS	Lip Seal Cover	SUS304	1	2
57	PMZS-CS1X-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2

● For more parts, please see next page.

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
183	PMZS-SR1R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR1R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR1C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR1C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A020-NB	O-ring, Screw Shaft (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw Shaft (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw Shaft (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw Shaft (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw Shaft (AN020)	Perfluoro	1	2
186	PCOR-A020-NB	O-ring, Screw (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw (AN020)	Perfluoro	1	2

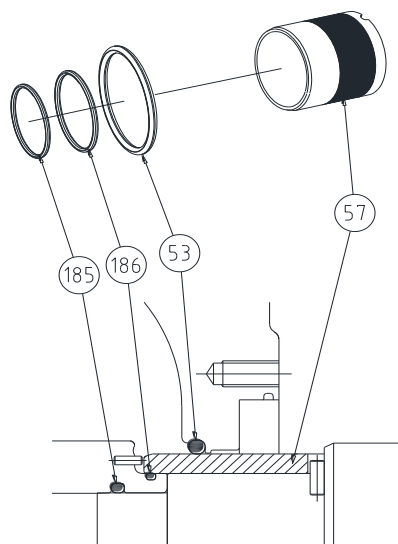
## DOUBLE MECHANICAL SEAL



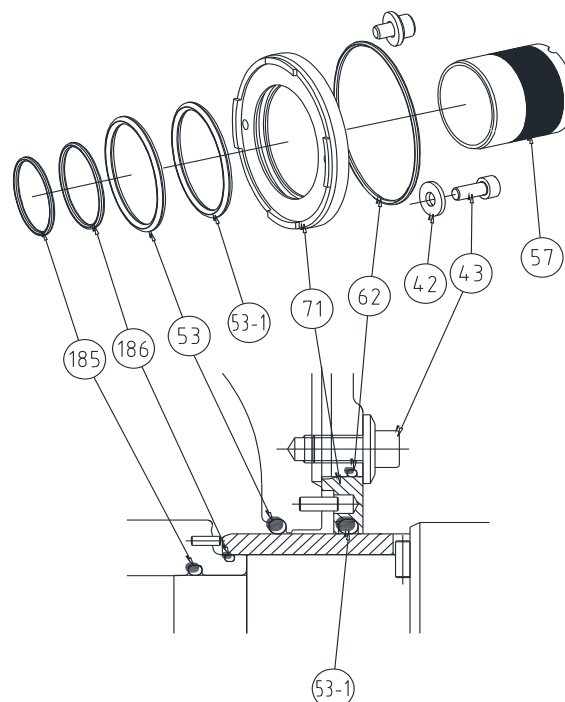
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
51	PCOR-A124-NB	O-ring, Screw Seal(AN124)	NBR	1	2
	PCOR-A124-EP	O-ring, Screw Seal(AN124)	EPDM	1	2
	PCOR-A124-FP	O-ring, Screw Seal(AN124)	FPM	1	2
	PMOR-A124-KA	O-ring, Screw Seal(AN124)	Kalrez	1	2
	PMOR-A124-PF	O-ring, Screw Seal(AN124)	Perfluoro	1	2
53	PCOR-A220-NB	O-ring, Screw Case (AN220)	NBR	1	2
	PCOR-A220-EP	O-ring, Screw Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Screw Case (AN220)	FPM	1	2
	PMOR-A220-KA	O-ring, Screw Case (AN220)	Kalrez	1	2
	PMOR-A220-PF	O-ring, Screw Case (AN220)	Perfluoro	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
	PMZL-DSB1-HT	Double Seal Body, Case, High pressure	TC/SUS304	1	2
	PMZL-DSB1-HS	Double Seal Body, Case, High pressure	SiC/SUS304	1	2
62	PCOR-A036-NB	O-ring, Case, Double seal (AN036)	NBR	1	2
	PCOR-A036-EP	O-ring, Case, Double seal (AN036)	EPDM	1	2
	PCOR-A036-FP	O-ring, Case, Double seal (AN036)	FPM	1	2
	PMOR-A036-KA	O-ring, Case, Double seal (AN036)	Kalrez	1	2
	PMOR-A036-PF	O-ring, Case, Double seal (AN036)	Perfluoro	1	2
● For more parts, please see next page.					

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
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
	PMZL-DRR1-SI	Rotation part, Double Seal, Shaft	SiC/SUS304	1	2
64	PCOR-A023-NB	O-ring, Shaft, Double Seal (AN023)	NBR	1	2
	PCOR-A023-EP	O-ring, Shaft, Double Seal (AN023)	EPDM	1	2
	PCOR-A023-FP	O-ring, Shaft, Double Seal (AN023)	FPM	1	2
	PMOR-A023-KA	O-ring, Shaft, Double Seal (AN023)	Kalrez	1	2
	PMOR-A023-PF	O-ring, Shaft, Double Seal (AN023)	Perfluoro	1	2
183	PMZS-SR1R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR1R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR1C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR1C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A020-NB	O-ring, Screw Shaft (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw Shaft (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw Shaft (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw Shaft (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw Shaft (AN020)	Perfluoro	1	2
186	PCOR-A020-NB	O-ring, Screw (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw (AN020)	Perfluoro	1	2

## O-RING SEAL & DOUBLE O-RING SEAL



O-ring Seal



Double O-ring Seal

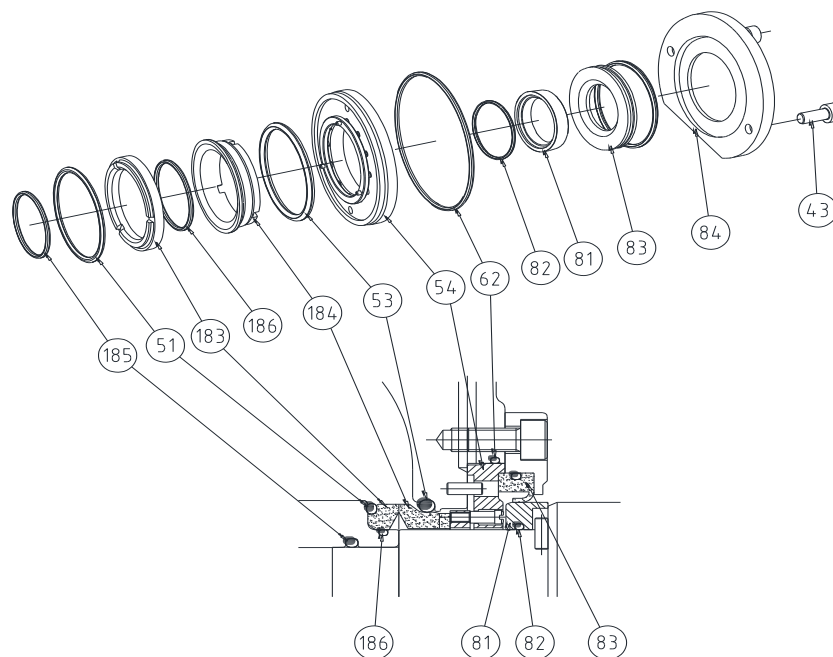
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland (Φ6)	SUS304	2	4
43	PCWB-M06X-SS	Wrench Bolt, Gland (M6x10L)	SUS304	2	4
51	PCOR-A124-NB	O-ring, Screw Seal(AN124)	NBR	1	2
	PCOR-A124-EP	O-ring, Screw Seal(AN124)	EPDM	1	2
	PCOR-A124-FP	O-ring, Screw Seal(AN124)	FPM	1	2
	PMOR-A124-KA	O-ring, Screw Seal(AN124)	Kalrez	1	2
	PMOR-A124-PF	O-ring, Screw Seal(AN124)	Perfluoro	1	2
53	PCOR-A220-NB	O-ring, Screw Case (AN220)	NBR	1	2
	PCOR-A220-EP	O-ring, Screw Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Screw Case (AN220)	FPM	1	2
	PMOR-A220-KA	O-ring, Screw Case (AN220)	Kalrez	1	2
	PMOR-A220-PF	O-ring, Screw Case (AN220)	Perfluoro	1	2
57	PMZS-CS1X-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
62	PCOR-A036-NB	O-ring, Case, Double seal (AN036)	NBR	1	2
	PCOR-A036-EP	O-ring, Case, Double seal (AN036)	EPDM	1	2
	PCOR-A036-FP	O-ring, Case, Double seal (AN036)	FPM	1	2
	PMOR-A036-KA	O-ring, Case, Double seal (AN036)	Kalrez	1	2
	PMOR-A036-PF	O-ring, Case, Double seal (AN036)	Perfluoro	1	2
71	MMZL-DSB1-SS	Body, Double O-ring Seal	SUS304	1	2

● For more parts, please see next page.



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
185	PCOR-A020-NB	O-ring, Screw Shaft (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw Shaft (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw Shaft (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw Shaft (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw Shaft (AN020)	Perfluoro	1	2
186	PCOR-A020-NB	O-ring, Screw (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw (AN020)	Perfluoro	1	2

## FLUSHED MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
43	PCWB-M06A-SS	Wrench Bolt, Gland (M6x10L)	SUS304	2	4
51	PCOR-A124-NB	O-ring, Screw Seal(AN124)	NBR	1	2
	PCOR-A124-EP	O-ring, Screw Seal(AN124)	EPDM	1	2
	PCOR-A124-FP	O-ring, Screw Seal(AN124)	FPM	1	2
	PMOR-A124-KA	O-ring, Screw Seal(AN124)	Kalrez	1	2
	PMOR-A124-PF	O-ring, Screw Seal(AN124)	Perfluoro	1	2
53	PCOR-A220-NB	O-ring, Screw Case (AN220)	NBR	1	2
	PCOR-A220-EP	O-ring, Screw Case (AN220)	EPDM	1	2
	PCOR-A220-FP	O-ring, Screw Case (AN220)	FPM	1	2
	PMOR-A220-KA	O-ring, Screw Case (AN220)	Kalrez	1	2
	PMOR-A220-PF	O-ring, Screw Case (AN220)	Perfluoro	1	2
54	PMZL-SSB1-LP	Single Seal Body, Case	SUS304	1	2
62	PCOR-A036-NB	O-ring, Case, Double seal (AN036)	NBR	1	2
	PCOR-A036-EP	O-ring, Case, Double seal (AN036)	EPDM	1	2
	PCOR-A036-FP	O-ring, Case, Double seal (AN036)	FPM	1	2
	PMOR-A036-KA	O-ring, Case, Double seal (AN036)	Kalrez	1	2
	PMOR-A036-PF	O-ring, Case, Double seal (AN036)	Perfluoro	1	2
● For more parts, please see next page.					

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
81	PMZL-CSF1-CE	Ceramic Sleeve for flushing	Ceramic	1	2
82	PCOR-A023-NB	O-ring, Ceramic Sleeve, Flushing (AN023)	NBR	1	2
	PCOR-A023-EP	O-ring, Ceramic Sleeve, Flushing (AN023)	EPDM	1	2
	PCOR-A023-FP	O-ring, Ceramic Sleeve, Flushing (AN023)	FPM	1	2
	PMOR-A023-KA	O-ring, Ceramic Sleeve, Flushing (AN023)	Kalrez	1	2
	PMOR-A023-PF	O-ring, Ceramic Sleeve, Flushing (AN023)	Perfluoro	1	2
83	PMZL-L13F-PF	PTFE- Lip seal for flushing	PTFE	1	2
84	MMZL-GD1B-SS	Seal/Lip seal Gland for Flushing	SUS304	1	2
183	PMZS-SR1R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR1R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR1C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR1C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A020-NB	O-ring, Screw Shaft (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw Shaft (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw Shaft (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw Shaft (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw Shaft (AN020)	Perfluoro	1	2
186	PCOR-A020-NB	O-ring, Screw (AN020)	NBR	1	2
	PCOR-A020-EP	O-ring, Screw (AN020)	EPDM	1	2
	PCOR-A020-FP	O-ring, Screw (AN020)	FPM	1	2
	PMOR-A020-KA	O-ring, Screw (AN020)	Kalrez	1	2
	PMOR-A020-PF	O-ring, Screw (AN020)	Perfluoro	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.

**Below parts list for ZS200 series only. Please ask the 'Parts list' to our distributor or us separately for your further reference.**

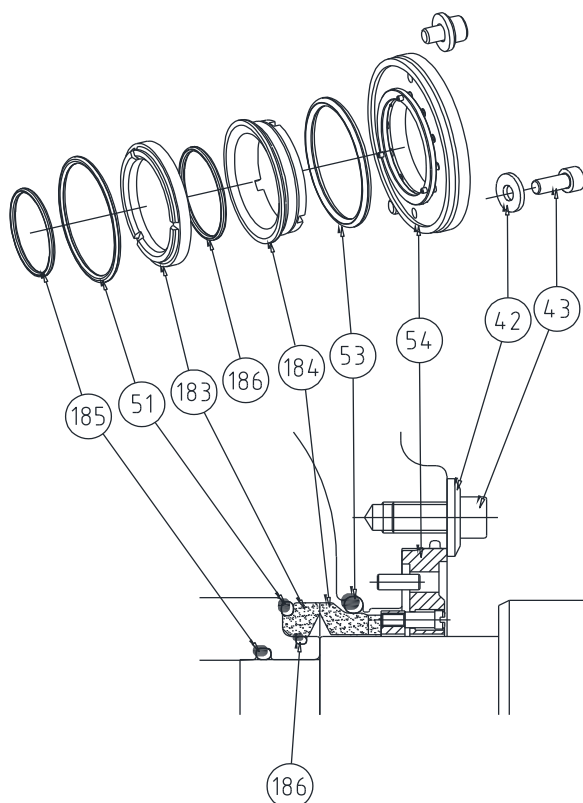
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB2A-SS	Gearbox	SCS13	1	1
	MMZL-GB2A-CS	Gearbox	FC20	1	1
2	MMZS-GBB2-SS	Base, Gearbox	SCS13	1	1
	MMZS-GBB2-CS	Base, Gearbox	FC20	1	1
3	PCWB-M10I-SS	Wrench Bolt, Base (M10x50L)	SUS304	1	4
4	MMZL-GBC2-SS	Cover, Gearbox	SCS13	1	1
	MMZL-GBC2-CS	Cover, Gearbox	FC20	1	1
5	PMZL-PT12-P2	Plug, Level, Drain PT 1/2"	PE	1	3
6	PCWB-M08I-CS	Wrench Bolt, Gearbox Cover (M8x60L)	SUS304	1	4
7	PCZL-KY2B-CS	Key, Shaft (10x8x53)	S45C	1	1
8	MMZS-SD20-SS	Shaft, Drive	Duplex	1	1
9	MMZS-SI20-SS	Shaft, Idle	Duplex	1	1
10	PCZL-KY2A-CS	Key, Gear (10x8x27)	S45C	1	2
11	PMZL-OS32-NB	Oil Seal, Cover (32x52x8t)	NBR	1	1
	PMZL-OS32-FP	Oil Seal, Cover (32x52x8t)	FPM	1	1
12	PMZL-LW07-CS	Lock Washer	S45C	1	2
12-1	PMZL-LN07-CS	Lock Nut	S45C	1	2
13	PMZL-PT12-P1	Breather, Gearbox PT 1/2"	Cu+SUS	1	1
14	PMZL-HG2X-CS	Helical Gear, Drive	S45C	1	1
14-1	PMZL-HG2X-DS	Helical Gear, Idle	S45C	1	1
15	PMZL-PN2G-SS	Dowel, Gearbox (Φ8)	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	S25C	1	2
19	PCZL-IM10-SS	I-bolt / M10	SUS304	1	2
20	PMZL-BE08-CS	Bearing, Front (#5208)	S45C	2	4
21	PCOR-A041-FP	O-ring, Oil Seal Gland (AN041)	FPM	1	2
22	PMZL-OS48-NB	Oil Seal, Gearbox (48x70x12t)	NBR	1	2
	PMZL-OS48-FP	Oil Seal, Gearbox (48x70x12t)	FPM	1	2
23	PCWB-M08E-SS	Wrench Bolt, Oil Seal Gland (M8x20L)	SUS304	3	6
24	MMZL-GD2C-SS	Gland, Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Seal set (Φ3)	SUS304	1	2
26	PMZL-GG2X-PA	Gasket	Paper	1	1
27	PMZL-M08X-PE	Plug (M8)	PE	1	8
	MMZS-ET00-S2	Screw bolt, Tool, Extraction	SUS304	1	1

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZS200-GBXV-SS	Gearbox Ass'y - Stainless Steel	SCS13	1	1
	ZS200-GBXV-CS	Gearbox Ass'y - White	FC20	1	1
31	MMZS-220D-SS	Screw Case-2"DIN11851	SUS316L	1	1
	MMZS-220F-SS	Screw Case-2"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-220S-SS	Screw Case-2"DS722.1	SUS316L	1	1
	MMZS-220I-SS	Screw Case-2"ISOMALE(IDF)	SUS316L	1	1
	MMZS-220R-SS	Screw Case-2"RJT	SUS316L	1	1
	MMZS-220M-SS	Screw Case-2"SMS	SUS316L	1	1
	MMZS-220C-SS	Screw Case-2"TRICLAMP	SUS316L	1	1
	MMZS-220K-SS	Screw Case-2"FLANGE	SUS316L	1	1
	MMZS-225D-S1	Screw Case-2.5"DIN11851	SUS316L	1	1
	MMZS-225F-S1	Screw Case-2.5"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-225S-S1	Screw Case-2.5"DS722.1	SUS316L	1	1
	MMZS-225I-S1	Screw Case-2.5"ISOMALE(IDF)	SUS316L	1	1
	MMZS-225R-S1	Screw Case-2.5"RJT	SUS316L	1	1
	MMZS-225M-S1	Screw Case-2.5"SMS	SUS316L	1	1
	MMZS-225C-S1	Screw Case-2.5"TRICLAMP	SUS316L	1	1
	MMZS-225K-S1	Screw Case-2.5"FLANGE	SUS316L	1	1
32	MMZS-FC2B-SD	Front Cover -2.5"DIN11851	SUS316L	1	1
	MMZS-FC2B-SF	Front Cover -2.5"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-FC2B-SS	Front Cover -2.5"DS722.1	SUS316L	1	1
	MMZS-FC2B-SI	Front Cover -2.5"ISOMALE(IDF)	SUS316L	1	1
	MMZS-FC2B-SR	Front Cover -2.5"RJT	SUS316L	1	1
	MMZS-FC2B-SM	Front Cover -2.5"SMS	SUS316L	1	1
	MMZS-FC2B-SC	Front Cover -2.5"TRICLAMP	SUS316L	1	1
	MMZS-FC2B-SK	Front Cover -2.5"FLANGE	SUS316L	1	1
	MMZS-FC3B-SD	Front Cover -3"DIN11851	SUS316L	1	1
	MMZS-FC3B-SF	Front Cover -3"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-FC3B-SS	Front Cover -3"DS722.1	SUS316L	1	1
	MMZS-FC3B-SI	Front Cover -3"ISOMALE(IDF)	SUS316L	1	1
	MMZS-FC3B-SR	Front Cover -3"RJT	SUS316L	1	1
	MMZS-FC3B-SM	Front Cover -3"SMS	SUS316L	1	1
	MMZS-FC3B-SC	Front Cover -3"TRICLAMP	SUS316L	1	1
	MMZS-FC3B-SK	Front Cover -3"FLANGE	SUS316L	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-KA	O-ring, Front Cover (AN261)	Kalrez	1	1
	PMOR-A261-PF	O-ring, Front Cover (AN261)	Perfluoro	1	1
35	MMZS-RB20-SS	Screw Bolt	SUS316L	1	2
36	PCZL-SRB2-SS	Spring Washer, Screw Bolt	SUS304	1	2

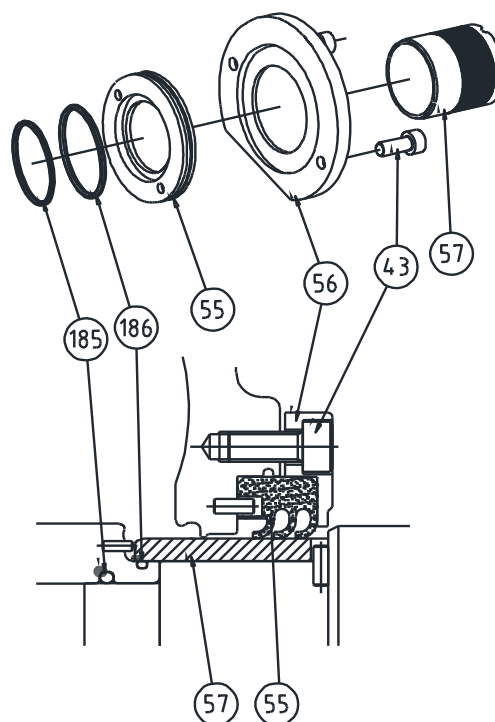
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
37	PCOR-A125-NB	O-ring, Screw Bolt (AN125)	NBR	1	2
	PCOR-A125-EP	O-ring, Screw Bolt (AN125)	EPDM	1	2
	PCOR-A125-FP	O-ring, Screw Bolt (AN125)	FPM	1	2
	PMOR-A125-KA	O-ring, Screw Bolt (AN125)	Kalrez	1	2
	PMOR-A125-PE	O-ring, Screw Bolt (AN125)	Perfluoro	1	2
38	MMZS-RT23-SS	Screw, P30	SUS316L	1	2
	MMZS-RT24-SS	Screw, P45	SUS316L	1	2
	MMZS-RT23-HS	Screw, P30, High temp clearance	SUS316L	1	2
	MMZS-RT24-HS	Screw, P45, High temp clearance	SUS316L	1	2
39	PCPI-N2X6-SS	Seal Pin, Screw (Φ2X6L)	SUS304	3	6
40	PCPI-N3X8-SS	Seal Pin, Screw Case (Φ3)	SUS304	2	4
41	PMZL-PN2C-SS	Dowel, Screw Case (Φ8)	SUS304	1	2
44	PMZL-M10E-SS	Stud Bolt, Screw Case (M10)	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")	SUS304	1	2
48	PCZL-NA12-SS	Name Plate	SUS304	1	1
49	PMZL-PN1C-SS	Pin, Cover dowel (Φ6)	SUS304	1	2
51	PCOR-A132-NB	O-ring, Screw Seal (AN132)	NBR	1	2
	PCOR-A132-EP	O-ring, Screw Seal (AN132)	EPDM	1	2
	PCOR-A132-FP	O-ring, Screw Seal (AN132)	FPM	1	2
	PMOR-A132-KA	O-ring, Screw Seal (AN132)	Kalrez	1	2
	PMOR-A132-PF	O-ring, Screw Seal (AN132)	Perfluoro	1	2
53	PCOR-A224-NB	O-ring, Screw Case (AN224)	NBR	1	2
	PCOR-A224-EP	O-ring, Screw Case (AN224)	EPDM	1	2
	PCOR-A224-FP	O-ring, Screw Case (AN224)	FPM	1	2
	PMOR-A224-KA	O-ring, Screw Case (AN224)	Kalrez	1	2
	PMOR-A224-PF	O-ring, Screw Case (AN224)	Perfluoro	1	2
181	PMZS-PW20-CS	Power lock, Gear	S45C	1	1
182	PCWB-M10B-SS	Wrench, bolt (M10x30L)	SUS304	1	2
187	PCWB-M10C-SS	Wrench, bolt (M10x35L)	SUS304	1	2

Note: Flush tap holes on Screw case are standard

## SINGLE MECHANICAL SEAL & TRIPLE LIP SEAL



Single Mech. Seal



Triple Lip Seal

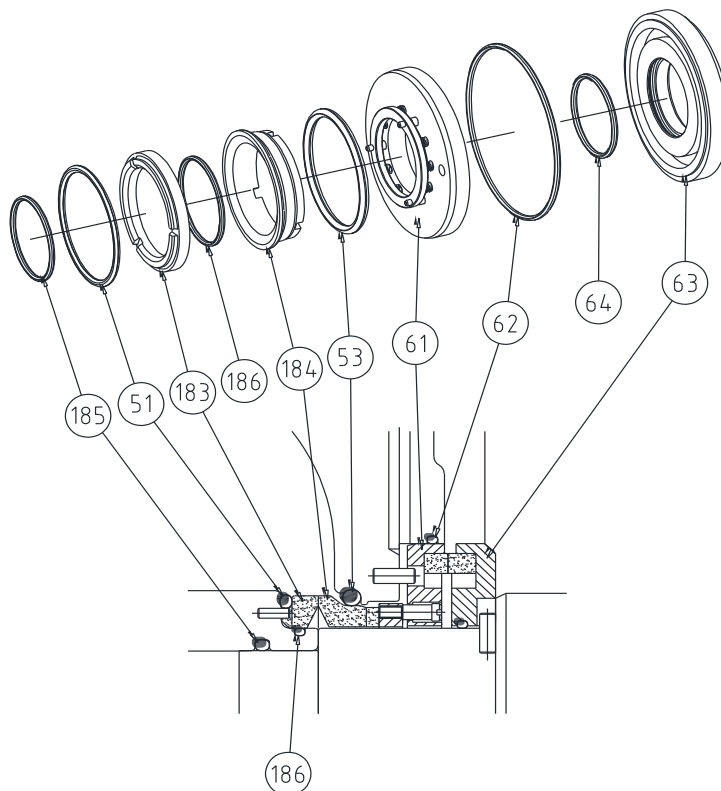
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, M/Seal Gland (Φ6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	2	4
51	PCOR-A132-NB	O-ring, Screw Seal (AN132)	NBR	1	2
	PCOR-A132-EP	O-ring, Screw Seal (AN132)	EPDM	1	2
	PCOR-A132-FP	O-ring, Screw Seal (AN132)	FPM	1	2
	PMOR-A132-KA	O-ring, Screw Seal (AN132)	Kalrez	1	2
	PMOR-A132-PF	O-ring, Screw Seal (AN132)	Perfluoro	1	2
53	PCOR-A224-NB	O-ring, Screw Case (AN224)	NBR	1	2
	PCOR-A224-EP	O-ring, Screw Case (AN224)	EPDM	1	2
	PCOR-A224-FP	O-ring, Screw Case (AN224)	FPM	1	2
	PMOR-A224-KA	O-ring, Screw Case (AN224)	Kalrez	1	2
	PMOR-A224-PF	O-ring, Screw Case (AN224)	Perfluoro	1	2
54	PMZL-SSB2-LP	Single Seal Body, Case	SUS304	1	2
	PMZL-SSB2-HP	Single Seal Body, Case, High pressure	SUS304	1	2
55	MMZL-LS2T-PF	Triple Lip Seal, Product	PTFE+Glass	1	2
56	PMZL-GD2A-SS	Lip Seal Cover	SUS304	1	2
57	PMZS-CS2X-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2

● For more parts, please see next page.

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
183	PMZS-SR2R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR2R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR2C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR2C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A027-NB	O-ring, Screw Shaft (AN027)	NBR	1	2
	PCOR-A027-EP	O-ring, Screw Shaft (AN027)	EPDM	1	2
	PCOR-A027-FP	O-ring, Screw Shaft (AN027)	FPM	1	2
	PMOR-A027-KA	O-ring, Screw Shaft (AN027)	Kalrez	1	2
	PMOR-A027-PF	O-ring, Screw Shaft (AN027)	Perfluoro	1	2
186	PCOR-A026-NB	O-ring, Screw (AN026)	NBR	1	2
	PCOR-A026-EP	O-ring, Screw (AN026)	EPDM	1	2
	PCOR-A026-FP	O-ring, Screw (AN026)	FPM	1	2
	PMOR-A026-KA	O-ring, Screw (AN026)	Kalrez	1	2
	PMOR-A026-PF	O-ring, Screw (AN026)	Perfluoro	1	2



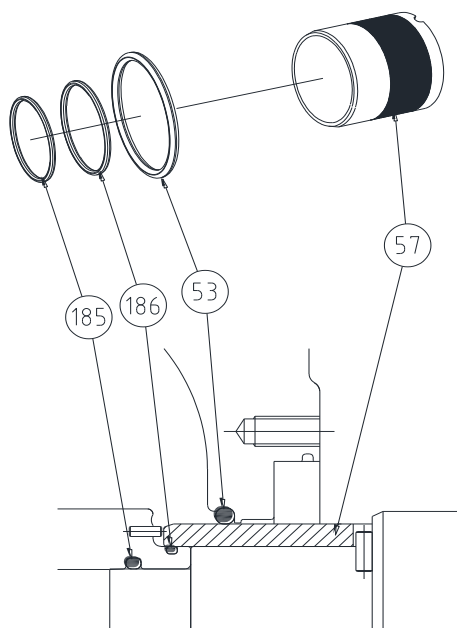
## DOUBLE MECHANICAL SEAL



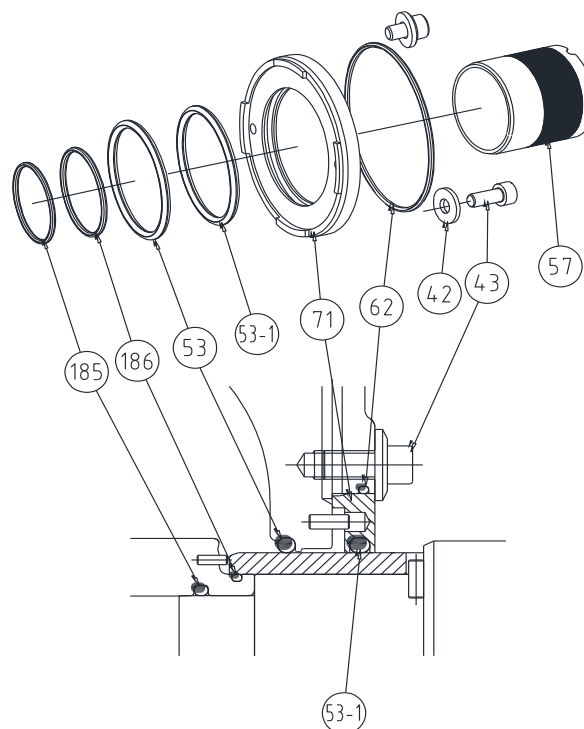
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
51	PCOR-A132-NB	O-ring, Screw Seal(AN132)	NBR	1	2
	PCOR-A132-EP	O-ring, Screw Seal(AN132)	EPDM	1	2
	PCOR-A132-FP	O-ring, Screw Seal(AN132)	FPM	1	2
	PMOR-A132-KA	O-ring, Screw Seal (AN132)	Kalrez	1	2
	PMOR-A132-PF	O-ring, Screw Seal(AN132)	Perfluoro	1	2
53	PCOR-A224-NB	O-ring, Screw Case (AN224)	NBR	1	2
	PCOR-A224-EP	O-ring, Screw Case (AN224)	EPDM	1	2
	PCOR-A224-FP	O-ring, Screw Case (AN224)	FPM	1	2
	PMOR-A224-KA	O-ring, Screw Case (AN224)	Kalrez	1	2
	PMOR-A224-PF	O-ring, Screw Case (AN224)	Perfluoro	1	2
61	PMZL-DSB2-TC	Double Seal Body, Case	TC/SUS304	1	2
	PMZL-DSB2-SI	Double Seal Body, Case	SiC/SUS304	1	2
	PMZL-DSB2-HT	Double Seal Body, Case, High pressure	TC/SUS304	1	2
	PMZL-DSB2-HS	Double Seal Body, Case, High pressure	SiC/SUS304	1	2
● For more parts, please see next page.					

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
62	PCOR-A039-NB	O-ring, Case, Double seal (AN039)	NBR	1	2
	PCOR-A039-EP	O-ring, Case, Double seal (AN039)	EPDM	1	2
	PCOR-A039-FP	O-ring, Case, Double seal (AN039)	FPM	1	2
	PMOR-A039-KA	O-ring, Case, Double seal (AN039)	Kalrez	1	2
	PMOR-A039-PF	O-ring, Case, Double seal (AN039)	Perfluoro	1	2
63	PMZL-DRR2-CA	Rotation part, Double Seal, Shaft	Carbon/SUS304	1	2
	PMZL-DRR2-TC	Rotation part, Double Seal, Shaft	TC/SUS304	1	2
	PMZL-DRR2-SI	Rotation part, Double Seal, Shaft	SiC/SUS304	1	2
64	PCOR-A029-NB	O-ring, Shaft, Double Seal (AN029)	NBR	1	2
	PCOR-A029-EP	O-ring, Shaft, Double Seal (AN029)	EPDM	1	2
	PCOR-A029-FP	O-ring, Shaft, Double Seal (AN029)	FPM	1	2
	PMOR-A029-KA	O-ring, Shaft, Double Seal (AN029)	Kalrez	1	2
	PMOR-A029-PF	O-ring, Shaft, Double Seal (AN029)	Perfluoro	1	2
183	PMZS-SR2R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR2R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR2C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR2C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A027-NB	O-ring, Screw Shaft (AN027)	NBR	1	2
	PCOR-A027-EP	O-ring, Screw Shaft (AN027)	EPDM	1	2
	PCOR-A027-FP	O-ring, Screw Shaft (AN027)	FPM	1	2
	PMOR-A027-KA	O-ring, Screw Shaft (AN027)	Kalrez	1	2
	PMOR-A027-PF	O-ring, Screw Shaft (AN027)	Perfluoro	1	2
186	PCOR-A026-NB	O-ring, Screw (AN026)	NBR	1	2
	PCOR-A026-EP	O-ring, Screw (AN026)	EPDM	1	2
	PCOR-A026-FP	O-ring, Screw (AN026)	FPM	1	2
	PMOR-A026-KA	O-ring, Screw (AN026)	Kalrez	1	2
	PMOR-A026-PF	O-ring, Screw (AN026)	Perfluoro	1	2

## O-RING SEAL & DOUBLE O-RING SEAL



O-ring Seal



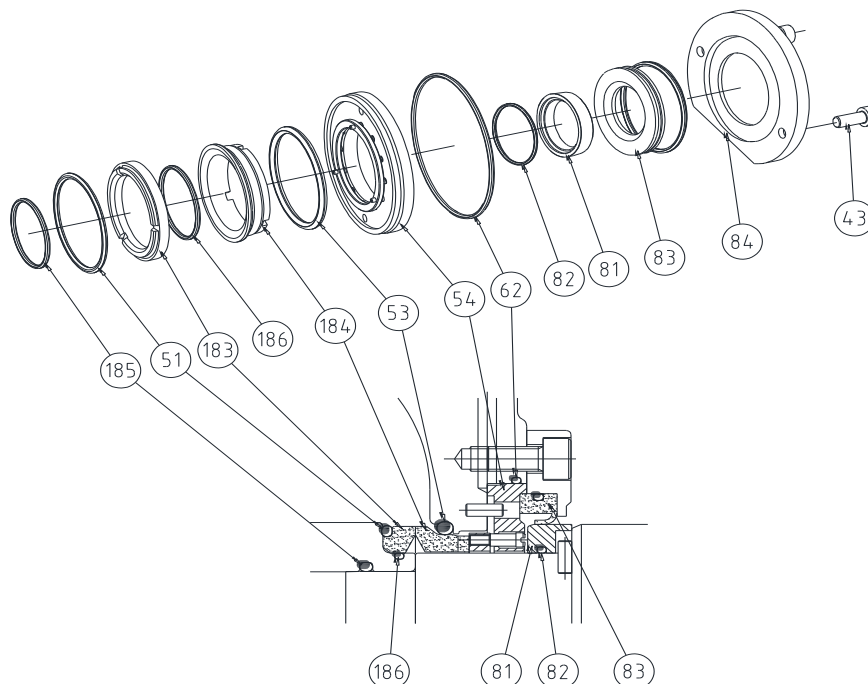
Double O-ring Seal

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland (Φ6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, Gland (M6x10L)	SUS304	2	4
51	PCOR-A132-NB	O-ring, Screw Seal(AN132)	NBR	1	2
	PCOR-A132-EP	O-ring, Screw Seal(AN132)	EPDM	1	2
	PCOR-A132-FP	O-ring, Screw Seal(AN132)	FPM	1	2
	PMOR-A132-KA	O-ring, Screw Seal (AN132)	Kalrez	1	2
	PMOR-A132-PF	O-ring, Screw Seal(AN132)	Perfluoro	1	2
53	PCOR-A224-NB	O-ring, Screw Case (AN224)	NBR	1	2
	PCOR-A224-EP	O-ring, Screw Case (AN224)	EPDM	1	2
	PCOR-A224-FP	O-ring, Screw Case (AN224)	FPM	1	2
	PMOR-A224-KA	O-ring, Screw Case (AN224)	Kalrez	1	2
	PMOR-A224-PF	O-ring, Screw Case (AN224)	Perfluoro	1	2
57	PMZS-CS2X-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
62	PCOR-A039-NB	O-ring, Case, Double Seal (AN039)	NBR	1	2
	PCOR-A039-EP	O-ring, Case, Double Seal (AN039)	EPDM	1	2
	PCOR-A039-FP	O-ring, Case, Double Seal (AN039)	FPM	1	2
	PMOR-A039-KA	O-ring, Case, Double Seal (AN039)	Kalrez	1	2
	PMOR-A039-PF	O-ring, Case, Double Seal (AN039)	Perfluoro	1	2
71	MMZL-DSB2-SS	Body, Double O-ring Seal	SUS304	1	2

● For more parts, please see next page.

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
185	PCOR-A027-NB	O-ring, Screw Shaft (AN027)	NBR	1	2
	PCOR-A027-EP	O-ring, Screw Shaft (AN027)	EPDM	1	2
	PCOR-A027-FP	O-ring, Screw Shaft (AN027)	FPM	1	2
	PMOR-A027-KA	O-ring, Screw Shaft (AN027)	Kalrez	1	2
	PMOR-A027-PF	O-ring, Screw Shaft (AN027)	Perfluoro	1	2
186	PCOR-A026-NB	O-ring, Screw (AN026)	NBR	1	2
	PCOR-A026-EP	O-ring, Screw (AN026)	EPDM	1	2
	PCOR-A026-FP	O-ring, Screw (AN026)	FPM	1	2
	PMOR-A026-KA	O-ring, Screw (AN026)	Kalrez	1	2
	PMOR-A026-PF	O-ring, Screw (AN026)	Perfluoro	1	2

## FLUSHED MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
43	PCWB-M06A-SS	Wrench Bolt, Gland (M6x10L)	SUS304	2	4
51	PCOR-A132-NB	O-ring, Screw Seal(AN132)	NBR	1	2
	PCOR-A132-EP	O-ring, Screw Seal(AN132)	EPDM	1	2
	PCOR-A132-FP	O-ring, Screw Seal(AN132)	FPM	1	2
	PMOR-A132-KA	O-ring, Screw Seal (AN132)	Kalrez	1	2
	PMOR-A132-PF	O-ring, Screw Seal(AN132)	Perfluoro	1	2
53	PCOR-A224-NB	O-ring, Screw Case (AN224)	NBR	1	2
	PCOR-A224-EP	O-ring, Screw Case (AN224)	EPDM	1	2
	PCOR-A224-FP	O-ring, Screw Case (AN224)	FPM	1	2
	PMOR-A224-KA	O-ring, Screw Case (AN224)	Kalrez	1	2
	PMOR-A224-PF	O-ring, Screw Case (AN224)	Perfluoro	1	2
54	PMZL-SSB2-LP	Single Seal Body, Case	SUS304	1	2
62	PCOR-A039-NB	O-ring, Case, Double seal (AN039)	NBR	1	2
	PCOR-A039-EP	O-ring, Case, Double seal (AN039)	EPDM	1	2
	PCOR-A039-FP	O-ring, Case, Double seal (AN039)	FPM	1	2
	PMOR-A039-KA	O-ring, Case, Double seal (AN039)	Kalrez	1	2
	PMOR-A039-PE	O-ring, Case, Double seal (AN039)	Perfluoro	1	2
81	PMZL-CSF2-CE	Ceramic Sleeve for flushing	Ceramic	1	2
● For more parts, please see next page.					

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
82	PCOR-A029-NB	O-ring, Ceramic Sleeve, Flushing (AN029)	NBR	1	2
	PCOR-A029-EP	O-ring, Ceramic Sleeve, Flushing (AN029)	EPDM	1	2
	PCOR-A029-FP	O-ring, Ceramic Sleeve, Flushing (AN029)	FPM	1	2
	PMOR-A029-KA	O-ring, Ceramic Sleeve, Flushing (AN029)	Kalrez	1	2
	PMOR-A029-PF	O-ring, Ceramic Sleeve, Flushing (AN029)	Perfluoro	1	2
83	PMZL-LS2F-PF	PTFE- Lip seal for flushing	PTFE	1	2
84	MMZL-GD2B-SS	Seal/Lip seal Gland for Flushing	SUS304	1	2
183	PMZS-SR2R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR2R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR2C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR2C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A027-NB	O-ring, Screw Shaft (AN027)	NBR	1	2
	PCOR-A027-EP	O-ring, Screw Shaft (AN027)	EPDM	1	2
	PCOR-A027-FP	O-ring, Screw Shaft (AN027)	FPM	1	2
	PMOR-A027-KA	O-ring, Screw Shaft (AN027)	Kalrez	1	2
	PMOR-A027-PF	O-ring, Screw Shaft (AN027)	Perfluoro	1	2
186	PCOR-A026-NB	O-ring, Screw (AN026)	NBR	1	2
	PCOR-A026-EP	O-ring, Screw (AN026)	EPDM	1	2
	PCOR-A026-FP	O-ring, Screw (AN026)	FPM	1	2
	PMOR-A026-KA	O-ring, Screw (AN026)	Kalrez	1	2
	PMOR-A026-PF	O-ring, Screw (AN026)	Perfluoro	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.

**Below parts list for ZS300 series only. Please ask the 'Parts list' to our distributor or us separately for your further reference.**

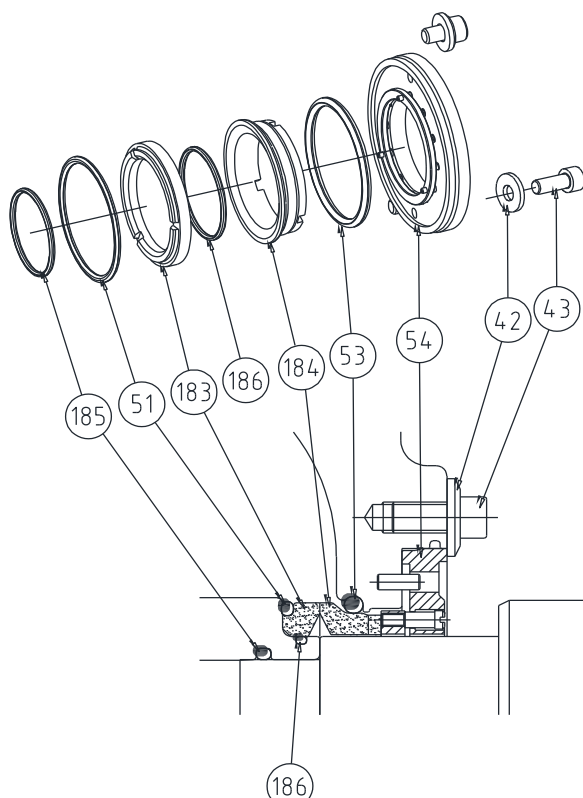
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1	MMZL-GB3A-SS	Gearbox	SCS13	1	1
	MMZL-GB3A-CS	Gearbox	FC20	1	1
2	MMZS-GBB3-SS	Base, Gearbox	SCS13	1	1
	MMZS-GBB3-CS	Base, Gearbox	FC20	1	1
3	PCWB-M12C-SS	Wrench Bolt, Base (M12x30L)	SUS304	1	4
4	MMZL-GBC3-SS	Cover, Gearbox	SCS13	1	1
	MMZL-GBC3-CS	Cover, Gearbox	FC20	1	1
5	PMZL-PT34-P2	Plug, Level, Drain PT 3/4"	PE	1	3
6	PCWB-M08J-CS	Wrench Bolt, Gearbox Cover (M8x70L)	SUS304	1	4
7	PCZL-KY3B-CS	Key, Shaft (14x9x53)	S45C	1	1
8	MMZS-SD30-SS	Shaft, Drive	Duplex	1	1
9	MMZS-SI30-SS	Shaft, Idle	Duplex	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'	Cu+SUS	1	1
14	PMZL-HG3X-CS	Helical Gear, Drive	S45C	1	1
14-1	PMZL-HG3X-DS	Helical Gear, Idle	S45C	1	1
15	PMZL-PN2G-SS	Dowel, Gearbox (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	S25C	1	2
19	PCZL-IM12-SS	I-bolt / M12	SUS304	1	2
20	PMZL-BE10-CS	Bearing, Front (#5210)	S45C	2	4
21	PCOR-A155-FP	O-ring, Oil Seal Gland (AN155)	FPM	1	2
22	PMZL-OS65-NB	Oil Seal, Gearbox (65x90x12t)	NBR	1	2
	PMZL-OS65-FP	Oil Seal, Gearbox (65x90x12t)	FPM	1	2
23	PCWB-M10E-SS	Wrench Bolt, Oil Seal Gland (M10x20L)	SUS304	4	8
24	MMZL-GD3C-SS	Gland, Oil Seal	SUS304	1	2
25	PCPI-N3X8-SS	Pin, Seal set (Φ3)	SUS304	1	2
26	PMZL-GG3X-PA	Gasket	Paper	1	1
27	PMZL-M12P-PE	Plug (M12)	PE	1	8
30	MMZS-ET00-S3	Screw bolt, Tool, Extraction	SUS304	1	1



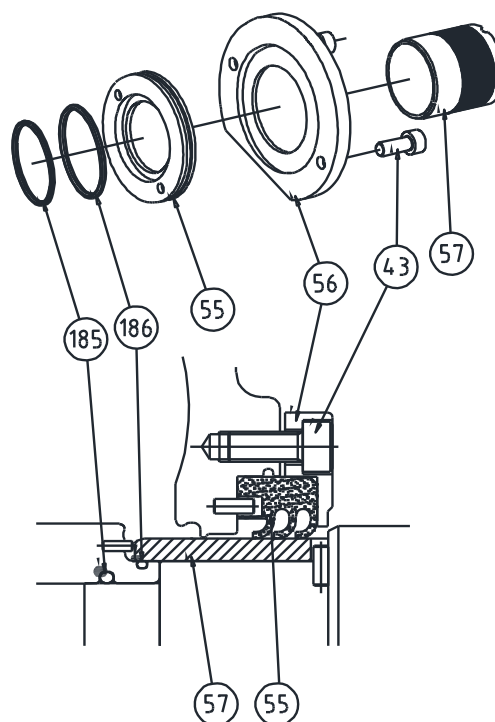
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
1A	ZS300-GBXV-SS	Gearbox Ass'y - Stainless Steel	SCS13	1	1
	ZS300-GBXV-CS	Gearbox Ass'y - White	FC20	1	1
31	MMZS-325D-SS	Screw Case-2.5"DIN11851	SUS316L	1	1
	MMZS-325F-SS	Screw Case-2.5"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-325S-SS	Screw Case-2.5"DS722.1	SUS316L	1	1
	MMZS-325I-SS	Screw Case-2.5"ISOMALE(IDF)	SUS316L	1	1
	MMZS-325R-SS	Screw Case-2.5"RJT	SUS316L	1	1
	MMZS-325M-SS	Screw Case-2.5"SMS	SUS316L	1	1
	MMZS-325C-SS	Screw Case-2.5"TRICLAMP	SUS316L	1	1
	MMZS-325K-SS	Screw Case-2.5"FLANGE	SUS316L	1	1
	MMZS-330D-S1	Screw Case-3"DIN11851	SUS316L	1	1
	MMZS-330F-S1	Screw Case-3"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-330S-S1	Screw Case-3"DS722.1	SUS316L	1	1
	MMZS-330I-S1	Screw Case-3"ISOMALE(IDF)	SUS316L	1	1
	MMZS-330R-S1	Screw Case-3"RJT	SUS316L	1	1
	MMZS-330M-S1	Screw Case-3"SMS	SUS316L	1	1
	MMZS-330C-S1	Screw Case-3"TRICLAMP	SUS316L	1	1
	MMZS-330K-S1	Screw Case-3"FLANGE	SUS316L	1	1
32	MMZS-FC3B-SD	Front Cover -3"DIN11851	SUS316L	1	1
	MMZS-FC3B-SF	Front Cover -3"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-FC3B-SS	Front Cover -3"DS722.1	SUS316L	1	1
	MMZS-FC3B-SI	Front Cover -3"ISOMALE(IDF)	SUS316L	1	1
	MMZS-FC3B-SR	Front Cover -3"RJT	SUS316L	1	1
	MMZS-FC3B-SM	Front Cover -3"SMS	SUS316L	1	1
	MMZS-FC3B-SC	Front Cover -3"TRICLAMP	SUS316L	1	1
	MMZS-FC3B-SK	Front Cover -3"FLANGE	SUS316L	1	1
	MMZS-FC4B-SD	Front Cover -4"DIN11851	SUS316L	1	1
	MMZS-FC4B-SF	Front Cover -4"DIN2633(FLANGE)	SUS316L	1	1
	MMZS-FC4B-SS	Front Cover -4"DS722.1	SUS316L	1	1
	MMZS-FC4B-SI	Front Cover -4"ISOMALE(IDF)	SUS316L	1	1
	MMZS-FC4B-SR	Front Cover -4"RJT	SUS316L	1	1
	MMZS-FC4B-SM	Front Cover -4"SMS	SUS316L	1	1
	MMZS-FC4B-SC	Front Cover -4"TRICLAMP	SUS316L	1	1
	MMZS-FC4B-SK	Front Cover -4"FLANGE	SUS316L	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-KA	O-ring, Front Cover (AN271)	Kalrez	1	1
	PMOR-A271-PF	O-ring, Front Cover (AN271)	Perfluoro	1	1
35	MMZS-RB30-SS	Screw Bolt	SUS316L	1	2
36	PCZL-SRB3-SS	Spring Washer, Screw Bolt	SUS304	1	2

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
37	PCOR-A225-NB	O-ring, Screw Bolt (AN225)	NBR	1	2
	PCOR-A225-EP	O-ring, Screw Bolt (AN225)	EPDM	1	2
	PCOR-A225-FP	O-ring, Screw Bolt (AN225)	FPM	1	2
	PMOR-A225-KA	O-ring, Screw Bolt (AN225)	Kalrez	1	2
	PMOR-A225-PF	O-ring, Screw Bolt (AN225)	Perfluoro	1	2
38	MMZS-RT34-SS	Screw, P40	SUS316L	1	2
	MMZS-RT36-SS	Screw, P60	SUS316L	1	2
	MMZS-RT34-HS	Screw, P40, High temp clearance	SUS316L	1	2
	MMZS-RT36-HS	Screw, P60, High temp clearance	SUS316L	1	2
39	PCPI-N2X6-SS	Seal Pin, Screw (Φ2X6L)	SUS304	3	6
40	PCPI-N3X8-SS	Seal Pin, Screw Case (Φ3)	SUS304	2	4
41	PMZL-PN3C-SS	Dowel, Screw Case (Φ13)	SUS304	1	2
44	PMZL-M14K-SS	Stud Bolt, Screw Case (M14)	SUS304	1	2
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")	SUS304	1	2
48	PCZL-NA34-SS	Name Plate	SUS304	1	1
49	PMZL-PN1C-SS	Pin, Cover dowel (Φ6)	SUS304	1	2
51	PCOR-A140-NB	O-ring, Screw Seal (AN140)	NBR	1	2
	PCOR-A140-EP	O-ring, Screw Seal (AN140)	EPDM	1	2
	PCOR-A140-FP	O-ring, Screw Seal (AN140)	FPM	1	2
	PMOR-A140-KA	O-ring, Screw Seal (AN140)	Kalrez	1	2
	PMOR-A140-PF	O-ring, Screw Seal (AN140)	Perfluoro	1	2
53	PCOR-A229-NB	O-ring, Screw Case (AN229)	NBR	1	2
	PCOR-A229-EP	O-ring, Screw Case (AN229)	EPDM	1	2
	PCOR-A229-FP	O-ring, Screw Case (AN229)	FPM	1	2
	PMOR-A229-KA	O-ring, Screw Case (AN229)	Kalrez	1	2
	PMOR-A229-PF	O-ring, Screw Case (AN229)	Perfluoro	1	2
181	PMZS-PW30-CS	Power lock, Gear	S45C	1	1
182	PCWB-M14B-SS	Wrench, bolt (M14x40L)	SUS304	1	2
187	PCWB-M14C-SS	Wrench, bolt (M14x50L)	SUS304	1	2
Note: Flush tap holes on Screw case are standard					

## SINGLE MECHANICAL SEAL & TRIPLE LIP SEAL



Single Mech. Seal



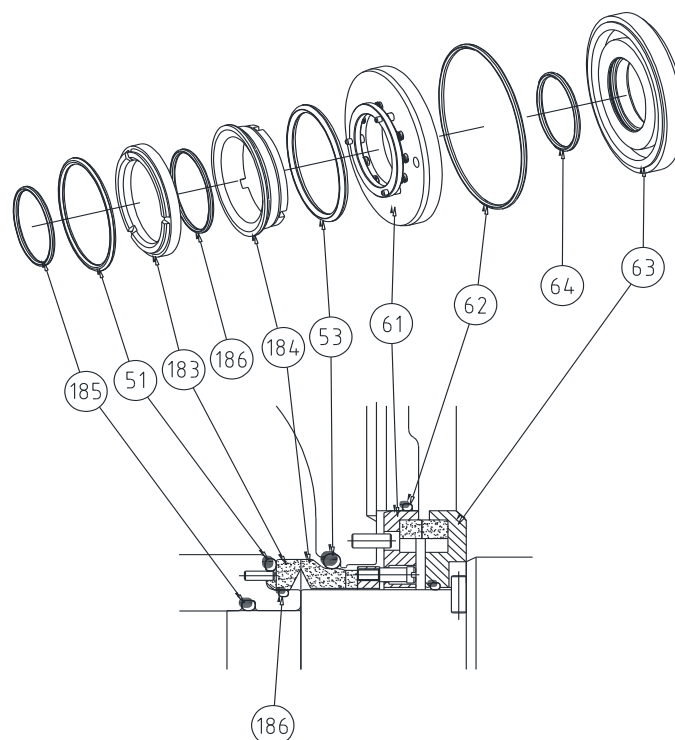
Triple Lip Seal

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
51	PCOR-A140-NB	O-ring, Screw Seal (AN140)	NBR	1	2
	PCOR-A140-EP	O-ring, Screw Seal (AN140)	EPDM	1	2
	PCOR-A140-FP	O-ring, Screw Seal (AN140)	FPM	1	2
	PCOR-A140-KA	O-ring, Screw Seal (AN140)	Kalrez	1	2
	PMOR-A140-PF	O-ring, Screw Seal (AN140)	Perfluoro	1	2
53	PCOR-A229-NB	O-ring, Screw Case (AN229)	NBR	1	2
	PCOR-A229-EP	O-ring, Screw Case (AN229)	EPDM	1	2
	PCOR-A229-FP	O-ring, Screw Case (AN229)	FPM	1	2
	PMOR-A229-KA	O-ring, Screw Case (AN229)	Kalrez	1	2
	PMOR-A229-PF	O-ring, Screw Case (AN229)	Perfluoro	1	2
54	PMZL-SSB3-LP	Single Seal Body, Case	SUS304	1	2
	PMZL-SSB3-HP	Single Seal Body, Case, High pressure	SUS304	1	2
55	MMZL-LS3T-PF	Triple Lip Seal, Product	PTFE+Glass	1	2
56	PMZL-GD3A-SS	Lip Seal Cover	SUS304	1	2
57	PMZS-CS3X-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2

● For more parts, please see next page.

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
183	PMZS-SR3R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR3R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR3C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR3C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A131-NB	O-ring, Screw Shaft (AN131)	NBR	1	2
	PCOR-A131-EP	O-ring, Screw Shaft (AN131)	EPDM	1	2
	PCOR-A131-FP	O-ring, Screw Shaft (AN131)	FPM	1	2
	PMOR-A131-KA	O-ring, Screw Shaft (AN131)	Kalrez	1	2
	PMOR-A131-PF	O-ring, Screw Shaft (AN131)	Perfluoro	1	2
186	PCOR-A032-NB	O-ring, Screw (AN032)	NBR	1	2
	PCOR-A032-EP	O-ring, Screw (AN032)	EPDM	1	2
	PCOR-A032-FP	O-ring, Screw (AN032)	FPM	1	2
	PMOR-A032-KA	O-ring, Screw (AN032)	Kalrez	1	2
	PMOR-A032-PF	O-ring, Screw (AN032)	Perfluoro	1	2

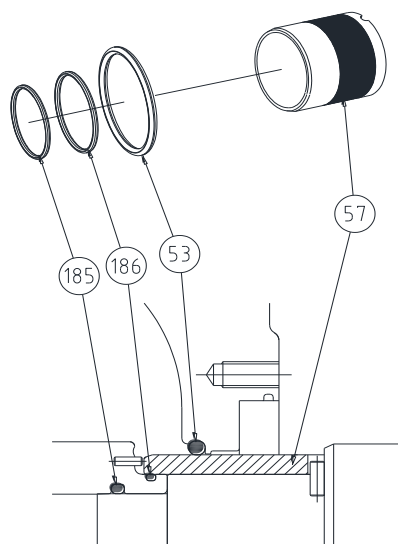
## DOUBLE MECHANICAL SEAL



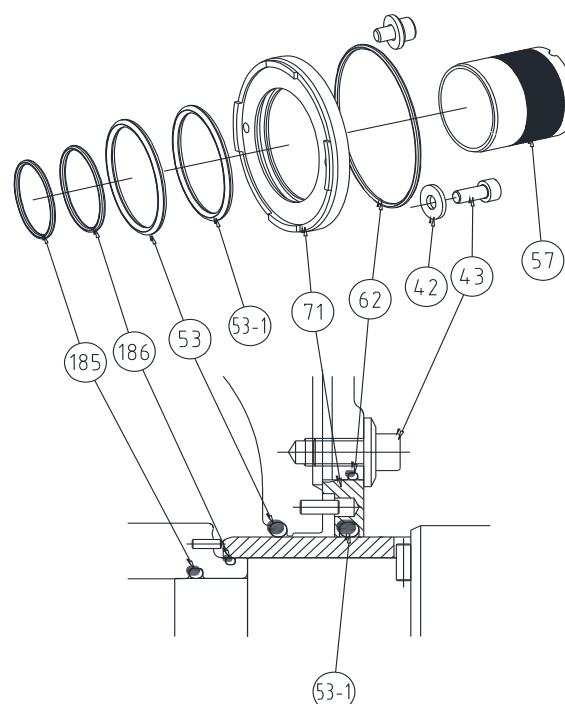
ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
51	PCOR-A140-NB	O-ring, Screw Seal (AN140)	NBR	1	2
	PCOR-A140-EP	O-ring, Screw Seal (AN140)	EPDM	1	2
	PCOR-A140-FP	O-ring, Screw Seal (AN140)	FPM	1	2
	PMOR-A140-KA	O-ring, Screw Seal (AN140)	Kalrez	1	2
	PMOR-A140-PF	O-ring, Screw Seal (AN140)	Perfluoro	1	2
53	PCOR-A229-NB	O-ring, Screw Case (AN229)	NBR	1	2
	PCOR-A229-EP	O-ring, Screw Case (AN229)	EPDM	1	2
	PCOR-A229-FP	O-ring, Screw Case (AN229)	FPM	1	2
	PMOR-A229-KA	O-ring, Screw Case (AN229)	Kalrez	1	2
	PMOR-A229-PF	O-ring, Screw Case (AN229)	Perfluoro	1	2
61	PMZL-DSB3-TC	Double Seal Body, Case	TC/SUS304	1	2
	PMZL-DSB3-SI	Double Seal Body, Case	SiC/SUS304	1	2
	PMZL-DSB3-HT	Double Seal Body, Case, High pressure	TC/SUS304	1	2
	PMZL-DSB3-HS	Double Seal Body, Case, High pressure	SiC/SUS304	1	2
62	PCOR-A043-NB	O-ring, Case, Double seal (AN043)	NBR	1	2
	PCOR-A043-EP	O-ring, Case, Double seal (AN043)	EPDM	1	2
	PCOR-A043-FP	O-ring, Case, Double seal (AN043)	FPM	1	2
	PMOR-A043-KA	O-ring, Case, Double seal (AN043)	Kalrez	1	2
	PMOR-A043-PF	O-ring, Case, Double seal (AN043)	Perfluoro	1	2
● For more parts, please see next page.					

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
64	PCOR-A033-NB	O-ring, Shaft, Double Seal (AN033)	NBR	1	2
	PCOR-A033-EP	O-ring, Shaft, Double Seal (AN033)	EPDM	1	2
	PCOR-A033-FP	O-ring, Shaft, Double Seal (AN033)	FPM	1	2
	PMOR-A033-PE	O-ring, Shaft, Double Seal (AN033)	Perfluoro	1	2
63	PMZL-DRR3-CA	Rotation part, Double Seal, Shaft	Carbon/SUS304	1	2
	PMZL-DRR3-TC	Rotation part, Double Seal, Shaft	TC/SUS304	1	2
	PMZL-DRR3-SI	Rotation part, Double Seal, Shaft	SiC/SUS304	1	2
64	PCOR-A033-NB	O-ring, Shaft, Double Seal (AN033)	NBR	1	2
	PCOR-A033-EP	O-ring, Shaft, Double Seal (AN033)	EPDM	1	2
	PCOR-A033-FP	O-ring, Shaft, Double Seal (AN033)	FPM	1	2
	PMOR-A033-KA	O-ring, Shaft, Double Seal (AN033)	Kalrez	1	2
	PMOR-A033-PE	O-ring, Shaft, Double Seal (AN033)	Perfluoro	1	2
183	PMZS-SR3R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR3R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR3C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR3C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A131-NB	O-ring, Screw Shaft (AN131)	NBR	1	2
	PCOR-A131-EP	O-ring, Screw Shaft (AN131)	EPDM	1	2
	PCOR-A131-FP	O-ring, Screw Shaft (AN131)	FPM	1	2
	PMOR-A131-KA	O-ring, Screw Shaft (AN131)	Kalrez	1	2
	PMOR-A131-PF	O-ring, Screw Shaft (AN131)	Perfluoro	1	2
186	PCOR-A032-NB	O-ring, Screw (AN032)	NBR	1	2
	PCOR-A032-EP	O-ring, Screw (AN032)	EPDM	1	2
	PCOR-A032-FP	O-ring, Screw (AN032)	FPM	1	2
	PMOR-A032-KA	O-ring, Screw (AN032)	Kalrez	1	2
	PMOR-A032-PF	O-ring, Screw (AN032)	Perfluoro	1	2

## O-RING SEAL & DOUBLE O-RING SEAL



O-ring Seal



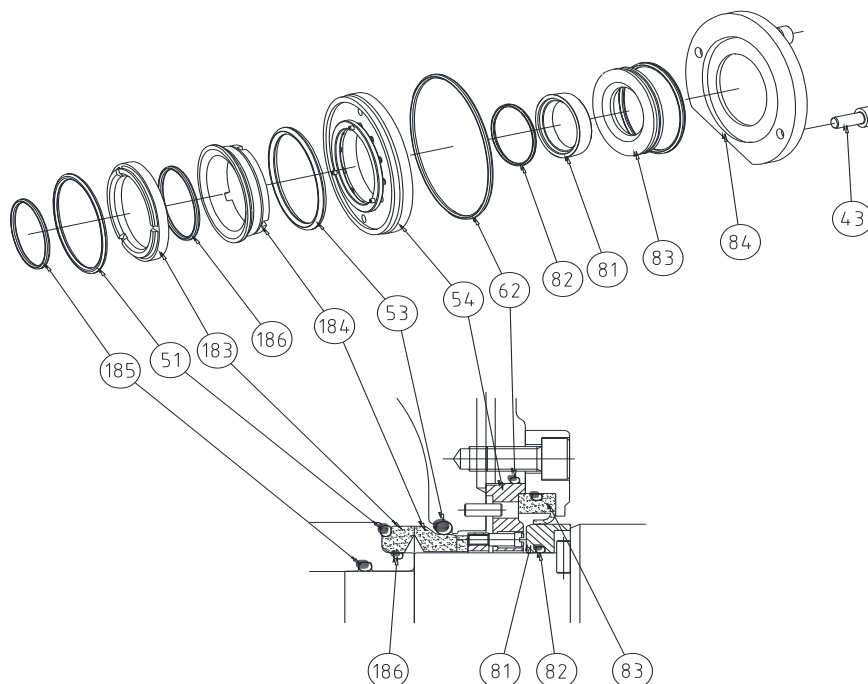
Double O-ring Seal

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
42	PCFW-P06X-SS	Flat Washer, Seal Gland (Φ6)	SUS304	2	4
43	PCWB-M06A-SS	Wrench Bolt, Gland (M6x10L)	SUS304	2	4
51	PCOR-A140-NB	O-ring, Screw Seal (AN140)	NBR	1	2
	PCOR-A140-EP	O-ring, Screw Seal (AN140)	EPDM	1	2
	PCOR-A140-FP	O-ring, Screw Seal (AN140)	FPM	1	2
	PMOR-A140-KA	O-ring, Screw Seal (AN140)	Kalrez	1	2
	PMOR-A140-PF	O-ring, Screw Seal (AN140)	Perfluoro	1	2
53	PCOR-A229-NB	O-ring, Screw Case (AN229)	NBR	1	2
	PCOR-A229-EP	O-ring, Screw Case (AN229)	EPDM	1	2
	PCOR-A229-FP	O-ring, Screw Case (AN229)	FPM	1	2
	PMOR-A229-KA	O-ring, Screw Case (AN229)	Kalrez	1	2
	PMOR-A229-PF	O-ring, Screw Case (AN229)	Perfluoro	1	2
57	PMZS-CS3X-CS	Ceramic Coated Sleeve, Product	CERAMIC/SUS304	1	2
62	PCOR-A043-NB	O-ring, Case, Double seal (AN043)	NBR	1	2
	PCOR-A043-EP	O-ring, Case, Double seal (AN043)	EPDM	1	2
	PCOR-A043-FP	O-ring, Case, Double seal (AN043)	FPM	1	2
	PMOR-A043-KA	O-ring, Case, Double seal (AN043)	Kalrez	1	2
	PMOR-A043-PF	O-ring, Case, Double seal (AN043)	Perfluoro	1	2
71	MMZL-DSB3-SS	Body, Double O-ring Seal	SUS304	1	2
● For more parts, please see next page.					



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
185	PCOR-A131-NB	O-ring, Screw Shaft (AN131)	NBR	1	2
	PCOR-A131-EP	O-ring, Screw Shaft (AN131)	EPDM	1	2
	PCOR-A131-FP	O-ring, Screw Shaft (AN131)	FPM	1	2
	PMOR-A131-KA	O-ring, Screw Shaft (AN131)	Kalrez	1	2
	PMOR-A131-PF	O-ring, Screw Shaft (AN131)	Perfluoro	1	2
186	PCOR-A032-NB	O-ring, Screw (AN032)	NBR	1	2
	PCOR-A032-EP	O-ring, Screw (AN032)	EPDM	1	2
	PCOR-A032-FP	O-ring, Screw (AN032)	FPM	1	2
	PMOR-A032-KA	O-ring, Screw (AN032)	Kalrez	1	2
	PMOR-A032-PF	O-ring, Screw (AN032)	Perfluoro	1	2

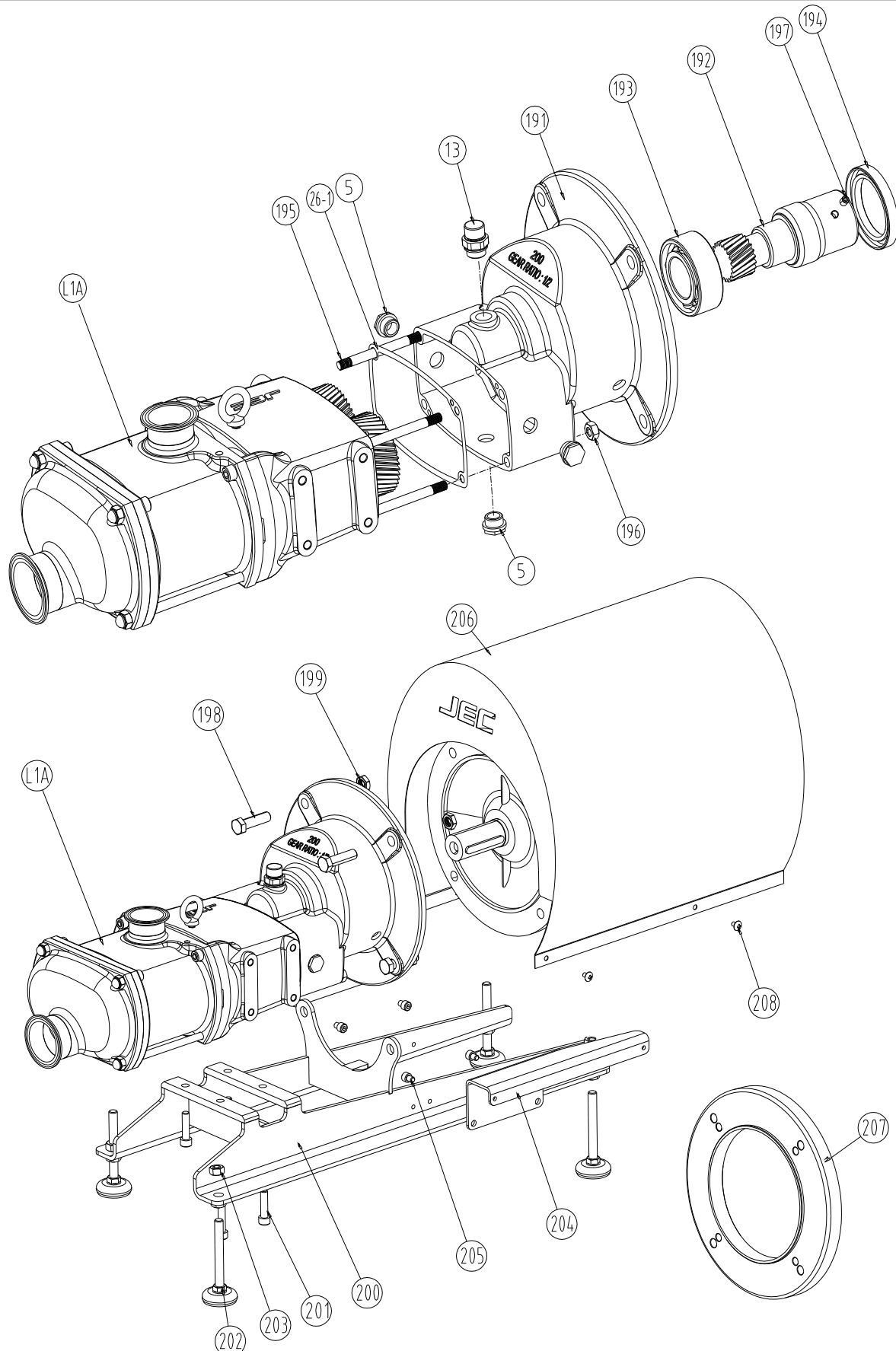
## FLUSHED MECHANICAL SEAL



ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
43	PCWB-M06A-SS	Wrench Bolt, Gland (M6x10L)	SUS304	2	4
51	PCOR-A140-NB	O-ring, Screw Seal (AN140)	NBR	1	2
	PCOR-A140-EP	O-ring, Screw Seal (AN140)	EPDM	1	2
	PCOR-A140-FP	O-ring, Screw Seal (AN140)	FPM	1	2
	PMOR-A140-KA	O-ring, Screw Seal (AN140)	Kalrez	1	2
	PMOR-A140-PF	O-ring, Screw Seal (AN140)	Perfluoro	1	2
53	PCOR-A229-NB	O-ring, Screw Case (AN229)	NBR	1	2
	PCOR-A229-EP	O-ring, Screw Case (AN229)	EPDM	1	2
	PCOR-A229-FP	O-ring, Screw Case (AN229)	FPM	1	2
	PMOR-A229-KA	O-ring, Screw Case (AN229)	Kalrez	1	2
	PMOR-A229-PF	O-ring, Screw Case (AN229)	Perfluoro	1	2
62	PCOR-A043-NB	O-ring, Case, Double seal (AN043)	NBR	1	2
	PCOR-A043-EP	O-ring, Case, Double seal (AN043)	EPDM	1	2
	PCOR-A043-FP	O-ring, Case, Double seal (AN043)	FPM	1	2
	PMOR-A043-KA	O-ring, Case, Double seal (AN043)	Kalrez	1	2
	PMOR-A043-PF	O-ring, Case, Double seal (AN043)	Perfluoro	1	2
54	PMZL-SSB3-LP	Single Seal Body, Case	SUS304	1	2
81	PMZL-CSF3-CE	Ceramic Sleeve for flushing	Ceramic	1	2
● For more parts, please see next page.					

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
82	PCOR-A033-NB	O-ring, Ceramic Sleeve, Flushing (AN033)	NBR	1	2
	PCOR-A033-EP	O-ring, Ceramic Sleeve, Flushing (AN033)	EPDM	1	2
	PCOR-A033-FP	O-ring, Ceramic Sleeve, Flushing (AN033)	FPM	1	2
	PMOR-A033-KA	O-ring, Ceramic Sleeve, Flushing (AN033)	Kalrez	1	2
	PMOR-A033-PE	O-ring, Ceramic Sleeve, Flushing (AN033)	Perfluoro	1	2
83	PMZL-LS3F-PF	PTFE- Lip seal for flushing	PTFE	1	2
84	MMZL-GD3B-SS	Seal/Lip seal Gland for Flushing	SUS304	1	2
183	PMZS-SR3R-TC	Seal Ring, Rotating	TC	1	2
	PMZS-SR3R-SI	Seal Ring, Rotating	SiC	1	2
184	PMZS-SR3C-TC	Seal Ring, Stationary	TC	1	2
	PMZS-SR3C-SI	Seal Ring, Stationary	SiC	1	2
185	PCOR-A131-NB	O-ring, Screw Shaft (AN131)	NBR	1	2
	PCOR-A131-EP	O-ring, Screw Shaft (AN131)	EPDM	1	2
	PCOR-A131-FP	O-ring, Screw Shaft (AN131)	FPM	1	2
	PMOR-A131-KA	O-ring, Screw Shaft (AN131)	Kalrez	1	2
	PMOR-A131-PF	O-ring, Screw Shaft (AN131)	Perfluoro	1	2
186	PCOR-A032-NB	O-ring, Screw (AN032)	NBR	1	2
	PCOR-A032-EP	O-ring, Screw (AN032)	EPDM	1	2
	PCOR-A032-FP	O-ring, Screw (AN032)	FPM	1	2
	PMOR-A032-KA	O-ring, Screw (AN032)	Kalrez	1	2
	PMOR-A032-PF	O-ring, Screw (AN032)	Perfluoro	1	2

## EXPLODED VIEW/ INTEGRAL TYPE UNIT



**Below parts list for **ZS100** series only. Please ask the 'Parts list' to our distributor or us separately for your further reference.**

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
L1A		Pump Ass'y, Integral type - SS gearbox	SCS13	1	1
		Pump Ass'y, Integral type - White	FC20	1	1
191	MMZS-GBC1-SS	Cover, Gearbox, Integral	SCS13	1	1
192	PMZS-GEAR-10	Gear, Integral	S45C	1	1
193	PMZL-BE08-CS	Bearing, Gear, Integral (#5208)	S45C	1	1
194	PMZL-OS60-NB	Oil Seal, Gear, Integral (85x60x12t)	NBR	1	1
195	PMZL-M08H-SS	Stud Bolt, Cover, Integral (M8x84L)	SUS304	4	4
196	PCHN-M08X-SS	Hex Nut / Washer, Cover, Integral (M8)	SUS304	4	4
197	PCWB-C06X-SS	Set screw(M6x10L), Integral cover	SUS304	1	1
198	PCHB-M12B-SS	Hex bolt(M12x45L), Integral cover	SUS304	4	4
199	PCHN-M12X-SS	Hex nut(M12), Integral cover	SUS304	4	4
200	PMZS-ICBA-10	Common Base, B5 Motor, Integral	SUS304	1	1
201	PCWB-M08F-SS	Wrench bolt(M8x25L), Base, B5 Motor, Integral	SUS304	4	4
202	PMLE-M12A-SS	Adjustable leg (M12x100L)	SUS304	4	4
203	PCHN-M12X-SS	Hex nut(M12), Adjust level foot	SUS304	4	4
204	PMZS-IMCB-10	Bracket(#112), Left, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-11	Bracket(#112), Right, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-20	Bracket(#132S / 132M), Left, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-21	Bracket(#132S / 132M), Right, B5 Motor cover, Integral	SUS304	1	1
205	PCWB-M08A-SS	Wrench bolt(M8x10L), Motor cover bracket	SUS304	4	4
206	MMZS-MC12-SS	Motor cover (#112)	SUS304	1	1
	MMZS-MC32-SS	Motor cover (#132S / 132M)	SUS304	1	1
207	MMZS-MA32-SS	Motor adaptor (#132S / 132M)	SUS304	1	1
208	PCWB-M06A-SS	Wrench bolt(M6x10L)	SUS304	1	4

**Note**

# Frame number, IEC Standard, B5 motor

\* Except for above frame number, consult to JEC.

**Below parts list for **ZS200** series only. Please ask the 'Parts list' to our distributor or us separately for your further reference.**

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
L1A		Pump Ass'y, Integral type - SS gearbox	SCS13	1	1
		Pump Ass'y, Integral type - White	FC20	1	1
191	MMZS-GBC2-SS	Cover, Gearbox, Integral	SCS13	1	1
192	PMZS-GEAR-20	Gear, Integral	S45C	1	1
193	PMZS-BE09-CS	Bearing, Gear, Integral (#5209)	S45C	1	1
194	PMZL-OS65-NB	Oil Seal, Gear, Integral (90x65x13t)	NBR	1	1
195	PMZL-M10A-SS	Stud Bolt, Cover, Integral (M10x110L)	SUS304	4	4
196	PCHN-M10X-SS	Hex Nut / Washer, Cover, Integral (M10)	SUS304	4	4
197	PCWB-C08A-SS	Set screw(M8x10L), Integral cover	SUS304	1	1
198	PCHB-M14A-SS	Hex bolt(M14x50L), Intergral cover	SUS304	4	4
199	PCHN-M14X-SS	Hex nut(M14), Intergral cover	SUS304	4	4
200	PMZS-ICBA-10	Common Base, B5 Motor, Integral	SUS304	1	1
201	PCWB-M10B-SS	Wrench bolt(M10x30L), Base, B5 Motor, Integral	SUS304	4	4
202	PMLE-M12A-SS	Adjustable leg (M12x100L)	SUS304	4	4
203	PCHN-M12X-SS	Hex nut(M12), Adjust level foot	SUS304	4	4
204	PMZS-IMCB-20	Bracket(#132S / 132M), Left, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-21	Bracket(#132S / 132M), Right, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-22	Bracket(#160M / 160L), Left, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-23	Bracket(#160M / 160L), Right, B5 Motor cover, Integral	SUS304	1	1
205	PCWB-M08A-SS	Wrench bolt(M08x10L), Motor cover bracket(L/R)	SUS304	4	4
206	MMZS-MC32-SS	Motor cover (#132S / 132M)	SUS304	1	1
	MMZS-MC60-SS	Motor cover (#160M / 160L)	SUS304	1	1
	MMZS-MC80-SS	Motor cover (#180M)	SUS304	1	1
207	PMZS-MA60-SS	Motor adaptor (#160M / 160L)	SUS304	1	1
208	PCWB-M06A-SS	Wrench bolt(M6x10L)	SUS304	1	4
<p>Note</p> <p># Frame number, IEC Standard, B5 motor</p> <p>* Except for above frame number, consult to JEC.</p>					

**Below parts list for **ZS300** series only. Please ask the 'Parts list' to our distributor or us separately for your further reference.**

ITEM	PART NO.	Description	Material	Q'ty	
				Per Ass'y	Per Pump
L1A		Pump Ass'y, Integral type - SS gearbox	SCS13	1	1
		Pump Ass'y, Integral type - White	FC20	1	1
191	MMZS-GBC3-SS	Cover, Gearbox, Integral	SCS13	1	1
192	PMZS-GEAR-30	Gear, Integral	S45C	1	1
193	PMJT-5211-CS	Bearing, Gear, Integral (#5211)	S45C	1	1
194	PMZL-OS90-NB	Oil Seal, Gear, Integral (115x90x13t)	NBR	1	1
195	PMZL-M10B-SS	Stud Bolt, Cover, Integral (M10x132L)	SUS304	4	4
196	PCHN-M10X-SS	Hex Nut / Washer, Cover, Integral (M10)	SUS304	4	4
197	PCWB-C08B-SS	Set screw(M8x15L), Integral cover	SUS304	1	1
198	PCHB-M16A-SS	Hex bolt(M16x50L), Intergral cover	SUS304	4	4
199	PCHN-M16X-SS	Hex nut(M16), Intergral cover	SUS304	4	4
200	PMZS-ICBA-10	Common Base, B5 Motor, Integral	SUS304	1	1
201	PCWB-M12D-SS	Wrench bolt(M12x40L), Base, B5 Motor, Integral	SUS304	4	4
202	PMLE-M16A-SS	Adjustable leg (M16x125L)	SUS304	4	4
203	PCHN-M16X-SS	Hex nut(M16), Adjust level foot	SUS304	4	4
204	PMZS-IMCB-22	Bracket(#160M / 160L), Left, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-23	Bracket(#160M / 160L), Right, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-24	Bracket(#180M / 180L), Left, B5 Motor cover, Integral	SUS304	1	1
	PMZS-IMCB-25	Bracket(#180M / 180L), Right, B5 Motor cover, Integral	SUS304	1	1
205	PCWB-M08A-SS	Wrench bolt(M08x10L), Motor cover bracket(L/R)	SUS304	4	4
206	MMZS-MC60-SS	Motor cover (#160M / 160L)	SUS304	1	1
	MMZS-MC80-SS	Motor cover (#180M / 180L)	SUS304	1	1
208	PCWB-M06A-SS	Wrench bolt(M6x10L)	SUS304	1	4

**Note**

# Frame number, IEC Standard, B5 motor

\* Except for above frame number, consult to JEC.



## **\* APPENDIX**

## LUBRICATION

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

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

- High temperature variations
- High pressure fluctuations

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

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

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

Filling quantities each series are shown as follow.

Series	ZS100	ZS200	ZS300
Q'ty(liter)	0.34	0.95	2.3

We recommend 'Shell Omala S4 GX150 or equivalent Synthetic gear oils' met below Qualifications/Specifications.

- Approved by Siemens MD for Flender gear units and gear motors T7300
- David Brown S1.53.106 except ISO 1000
- Approved for wind turbine gearboxes by: Gamesa, Dongfang Wind Turbines, Dalian Heavy Industries and Ninovel
- ISO 12925-1 Type CKD, except ISO 1000
- ANSI/AGMA 9005-E02 (EP), except ISO 1000
- US Steel 224, except ISO 1000
- DIN 51517-3 (CLP, except ISO 1000

### 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.

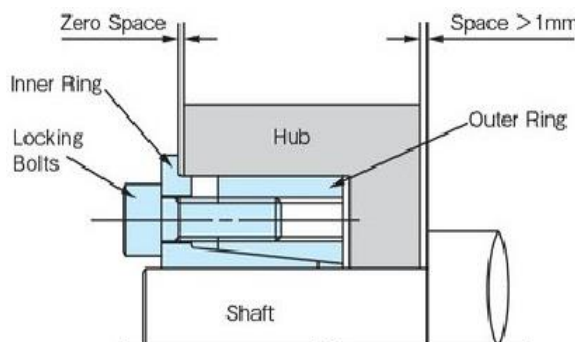
- The formulation of oils complies with the FDA chapter 21 CFR, 178.3570.
- NSF H1 registered (No 147305, No 147302, No 147303, No 147304)
- Kosher, Halal and ISO 21469 certified.
- International specification: ISO 12925-1 CKD.
- DIN 51517-3 CLP
- DIN 51354-2 - FZG A/8, 3/90°C - Fail stage > 12
- ASTM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

## POWER LOCK INSTALLATION, REMOVAL & REUSABILITY

### Installation

1. Verify that the shaft and the inner surface of the hub are clean and lightly oiled.
2. Remove the bolts and clean all contact surfaces. Lightly coat the bolts including their surfaces with oil or grease.
3. Tighten the bolts part way, and then preliminarily assemble the product.

**Note:** Pre-assemble by keeping the phases of the slit and the traps for removal out of synch.



4. Mount the hub on the shaft, and then lightly push the "Power-lock" shaft-hub locking device to the end of the hub. When the hub does not smoothly slide onto the shaft, either loosen the bolts or lightly tap on the hub until it is fixed into place.

**Note:** Do not hit the product with a hammer. This will severely damage the product and possibly lead to accidents.

5. Determine the position of the hub along the shaft circumference and length. Using a torque wrench, tighten one bolt to approximately quarter of the specified torque  $M_A$  (See below table) and then tighten the one diagonally across in the same manner. Repeat for the other bolts.
6. Using the torque wrench, tighten the bolts to one-half the specified torque  $M_A$  and repeat the tightening procedure in step 5.
7. Bring up to full tightening torque  $M_A$  and tighten as in step 5.
8. Tighten each bolt to full torque  $M_A$  in a circular order. Repeat a few times until the bolts are completely tightened.

**Notes: A torque wrench must be used to tighten the locking bolts.** Be sure to follow the above instructions to tighten the bolts to the specified torque. Hand-tightening or tightening with wrench other than a torque wrench result in incomplete installation, and lead to accidents.

- Exceeding the specified tightening torque  $M_A$  will damage the bolts. On the other hand, tightening to torque below  $M_A$  will cause the bolts to loosen during operation. Be sure to use the correct torque to tighten these bolts.

- Do not use bolts other than those provided. Otherwise, bolts may damage and cause accidents.

Series	ZS100	ZS200	ZS300
Torque value / $M_A$ (N·m)	16.7	16.7	40.2

## Removal

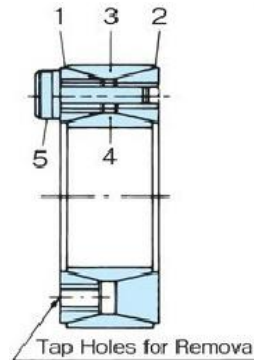
1. Verify that no torque or thrust is applied to the hub and shaft.

Note that in cases where a heavy shaft, hub or chain is used, disassembly may be slightly complicated.

After removing the load, disassemble the unit by loosening the bolts in the correct order described in installaion.

Loosening the bolts will release the locking function, which may cause the shaft to spin or jump out.

2. If the unit does not remove even after loosening all the bolts, thighten the bolts into the screw holes prepared for removal. This will instantly release the lock.



### Parts

- 1 : Taper Ring A
- 2 : Taper Ring B
- 3 : Outer Ring
- 4 : Inner Ring
- 5 : Locking Bolts

## Reusability

Assembly and disassembly of the products may be repeated a few times.

However, if the hub and shaft material yiled stress  $\sigma_{0.2}$  cannot tolerate the contact pressure  $P$  and  $P'$ , repeated assembly and disassembly may damage certain parts of the hub-shaft contact surfaces.

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, 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**

**CERTIFICATE OF COMPLIANCE**

Valid until end: December 2019



TUM Certification  
hereby declares that the product

twin screw pumps, JRS series in size 100, 200 and 300, with EPDM gaskets and  
SiC mechanical seal

from

JEC LTD., Hwaseong-si, Gyeonggi-do, 18578, Rep. of Korea

has been evaluated for compliance with the  
Hygienic Equipment Design Criteria of the EHEDG, by:  
TUM (Forschungszentrum für Brau- u. Lebensmittelqualität) at Weihenstephan, Germany  
and meets the criteria as demonstrated by:


Evaluation Report No. 556TUM2017

Signed

  
Dr. Jürgen Hofmann

Evaluation Officer

Signed

  
Prof. Dr. Fritz Jacob

Head of Department

Date of issue: 29 May 2017

Certificate No. 6/2017



**FORSCHUNGSZENTRUM  
WEIHENSTEPHAN**  
für Brau- und  
Lebensmittelqualität

85354 Freising-Weihenstephan, Germany  
©EHEDG


# 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: <i>Product:</i>	<b>Doppelschraubenpumpe</b> <b><i>Twin Screw Pump</i></b>
Model:	<b>JRZS100, JRZS200, JRZS300</b>
Max. Arbeitsdruck: <i>Max. working pressure:</i>	<b>bis 12 bar</b> <b><i>to 12 bar</i></b>
Max. Flüssigkeit temperatur: <i>Max. Liquid temperature:</i>	<b>bis 108°C</b> <b><i>to 108 °C</i></b>
Drehzahl: <i>Speed:</i>	<b>&lt;3000 min<sup>-1</sup> (+/-10%)</b>
Kennzeichnung: <i>Marking:</i>	 <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 **Twin Screw Pumps (Pump Head Only)**

Type: **JRZS series**

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



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# 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

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