

JZ3单级均质泵

使用运行、维护说明书

OPERATING MANUAL
EMULSIFYING HOMOGENIZING PUMPS
TYPE JZ3



东正科技有限公司
DONJOY TECHNOLOGY CO., LTD.
REV.01

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1 Summarize

1.1 About the User Manual

Manual is composed of two parts, the text part and the appendix. The text part of the manual contains the general knowledge of the storage, installation, operation and maintenance of LX/KLX/CLX Centrifugal pump. The appendix of the manual includes the special debugging of this pump and the name of spare parts.

1.2 Safety warning symbol



Warning symbol

Warning you of personal danger



Warning symbol

Warning of falling objects



Attention symbol

Ensure security responsibilities



Warning symbol

Warning of electrical hazard



Warning symbol

Warning the danger of mechanical injury



Warning symbol

Warning risk of mechanical damage

1.3 Delivery content

- Package attached list
- Contain motor (Option to provide pump head only)
- Pump instruction
- Motor instruction

2 Safety precautions

2.1 Basic safety instructions

Before using the pump, please read this operation manual carefully and save the manual in the pump working area for easy viewing.

All pump-related work require careful operation by experienced person



2.2 Application range

- JZ3 pumps are commonly used in food, pharmaceutical, biopharmaceutical, daily chemical.
- JZ3 pumps have different stator and rotor are selected, according to different media requirements. (Contact DNJOY)

2.3 Common error operation

Improper media may cause damage to the pump

Impurities present in the media may cause the pump to get stuck or even be damaged



2.4 Safety instruction for pump

- Running without medium

Pump is strictly prohibited to run without medium

If using double mechanical seal , it is allowed to run without medium for a short time.



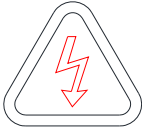
- Pump surface high temperature

It will cause high temperature after pump running , do not touch , it will hurt you

Check the surface temperature before touching pump



2.5 Name plate

 Danger electric shock		 DONJOY		DONJOY Technology Co.,Ltd No.25 Gangfu Road,Konggang New District,Wenzhou,China	
 Be careful with hand		Name: JZ Pump		Type: JZ3-130-C-A	
		Serial No.: DJ19LH0126		Date: 2019. 03. 16	
		380	:V	50	:Hz
		7.5	:kW	2900	:min ⁻¹
		4	:m ³ /h	10	:M
		1.5"/1.5" :Inlet/Outlet			
		   			
NOTES: MUST CONNECTION THE COOLING WATER BEFORE RUN THE DOUBLE SEAL PUMP					

2.6 Warning sign

Please set warning sign in the pump working area

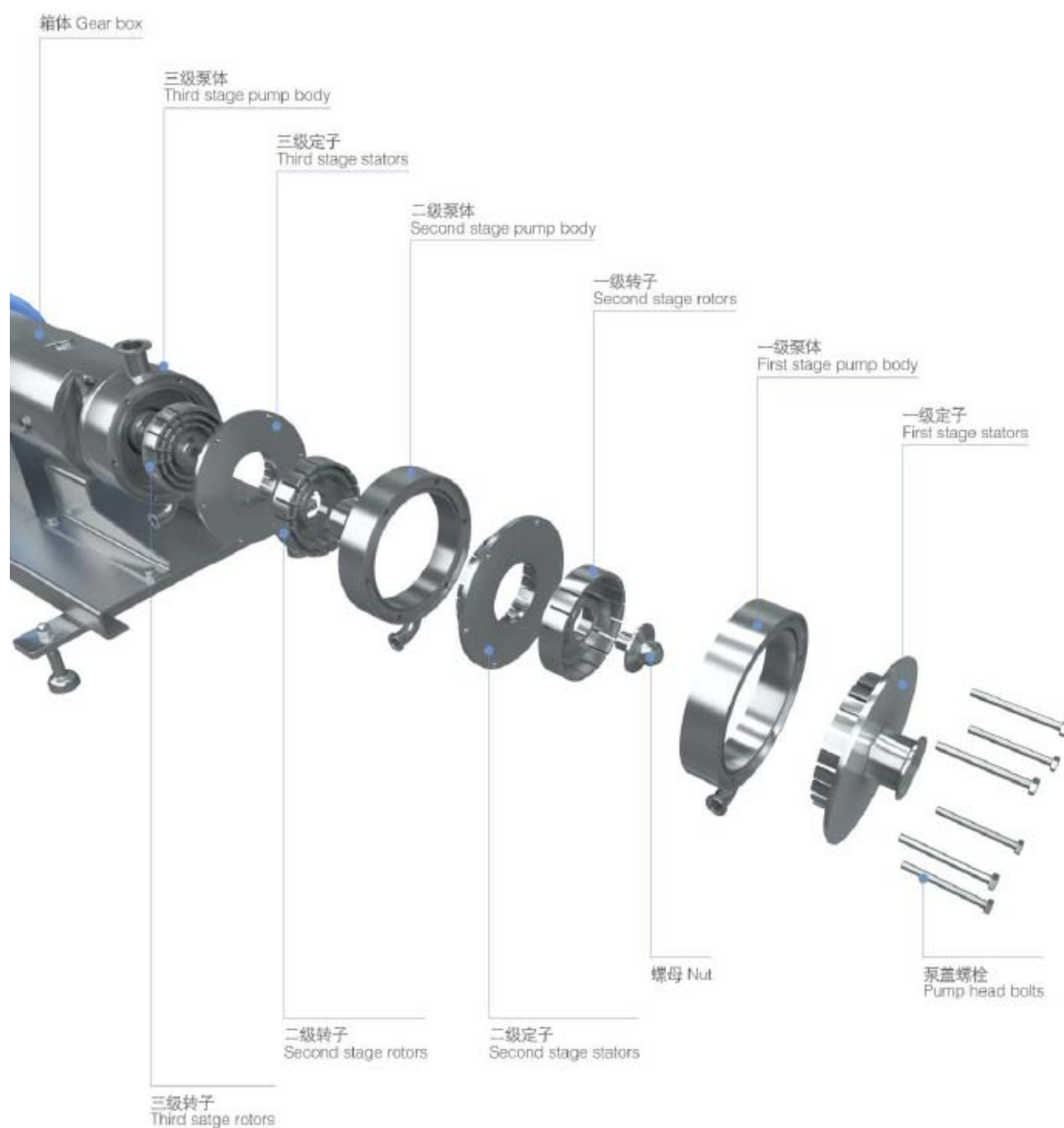
2.7 Waste treatment

Please follow the relevant regulations to dispose of the disassembled waste.



3 Structural feature and working principle

3.1 Basic structure



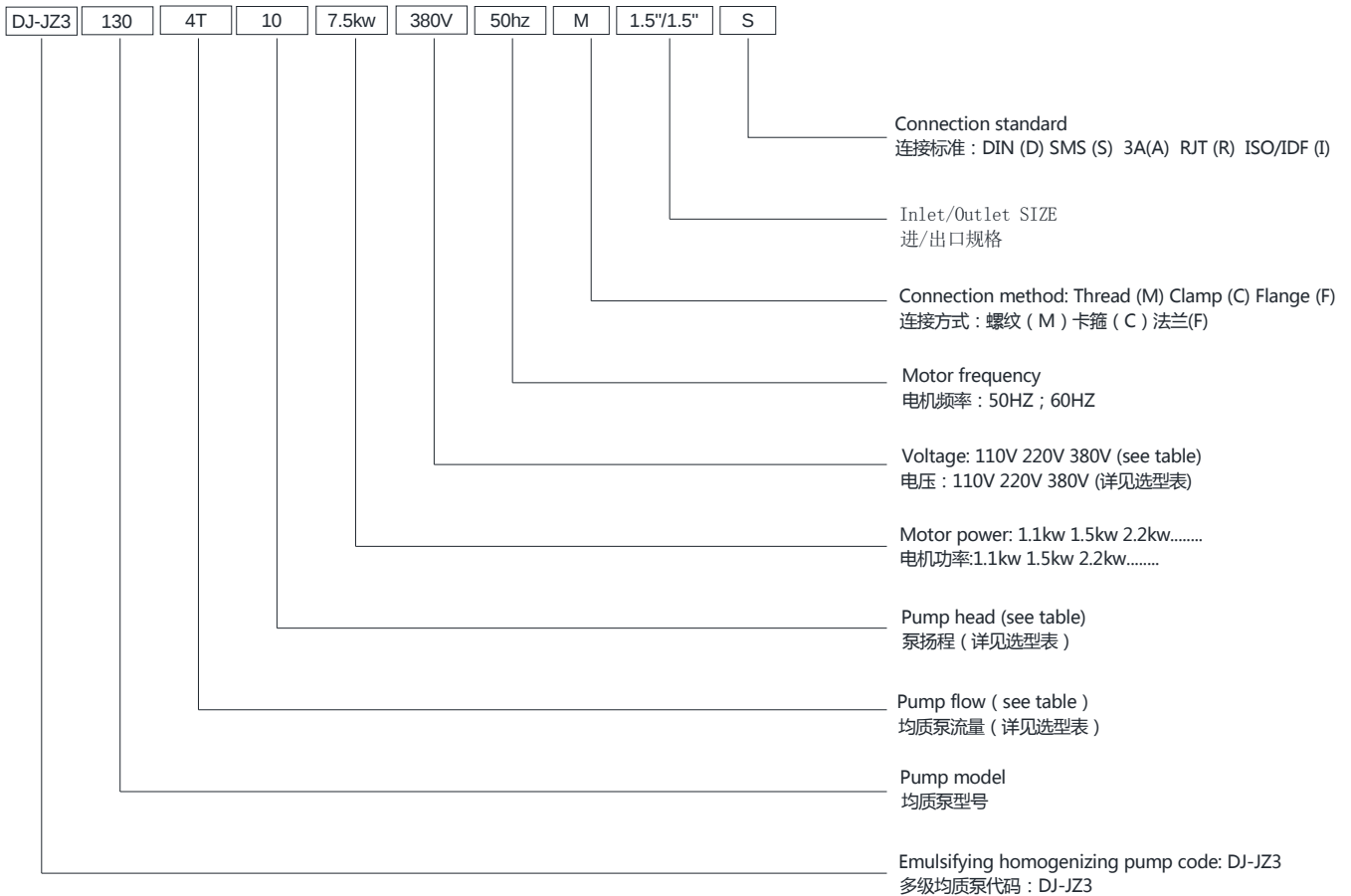
3.2 General configuration

- Double mechanical seal

3.3 Model

JZ1 Series
DJ-JZ3-130
DJ-JZ3-150
DJ-JZ3-170
DJ-JZ3-190
DJ-JZ3-210
DJ-JZ3-240

3.4 Model Description



For example: DJ-JZ3-130-4T-10-7.5KW-380V-50HZ-M-1.5"/1.5"-S

4 Transportation

Trained person are required to transport the pump

The complete set pump can be handled by forklift or crane



4.1 Safety instructions

- Be careful to drop or unfixed parts that can cause severe abrasions.
- Do not remove the inlet and outlet end caps of the pump until the piping is connected.

4.2 Forklift transportation instructions



- Pay attention to parts falling, which may cause serious injury and bruises on your hands and feet.
- To prevent rollover during transportation, use a conveyor belt or bolt to fix the plate

4.3 Crane transportation instructions



- "Warning", pay attention to parts falling, which may cause serious injury, bruises and even death.
To prevent falling during transportation, use a suitable lifting tool.
- Please make sure that the crane and the rope are strong enough.
- Make sure nobody stay under pump

5 Store

5.1 Storage environment of the pump

- The pump shall be stored according to the following procedures:
 1. Drain the pump medium and keep it dry. Store it in a dry environment.
 2. Storage temperature should not be too high or too low, suitable for storing temperature is 20 °C to 25 °C (normal temperature).
 3. The storage environment shall be ventilated and dust-free.
 4. All parts of the pump are required to rotate regularly (three months)



5.3 Restart to use

- After storage, please check the mechanical seal before restart to use.

6 Installation and use procedures

6.1 Installation safety instructions

- Make sure that each part is fixed during installation, falling parts may cause damage to the pump, as well as injury to personnel.
- please wear labor protection shoes when installing.
- Fix bolt according to the specified torque, please check 11.1 《Bolt Fixed Torque Table》
- Use a torque wrench



6.2 Precautions for pump installation

- Confirm the installation environment of the pump, explosion-proof pump should be used in the explosion-proof environment.
- The environment must be dust-free.
- Working environment temperature at -20 °C to 40 °C.
- The installation platform must be strong enough to support the whole pump.
- The installation platform must be horizontal.
- Sufficient maintenance space must be guaranteed.
- Ensure the air circulation of the installation environment and promote the heat dissipation of the motor.



6.3 Reduce noise and vibration

6.3.1 Main measures

- Operate in optimum working conditions to avoid cavitation.
- Avoid resonance of inlet and outlet pipeline.
- Fix inlet and outlet pipelines.

6.3.2 Auxiliary measures

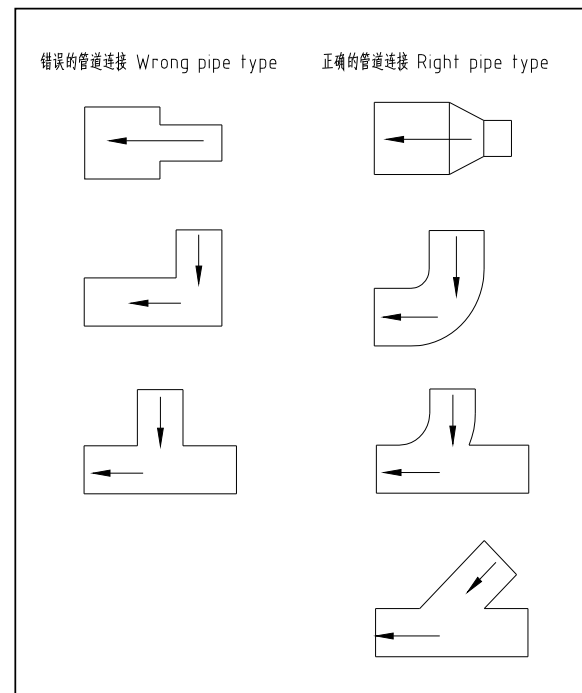
- Isolation measures can be used to isolate noise, such as sound insulation coverage, space isolation, etc.

6.4 Installation method

- Use base mounting to install the pump ,and the pump is mounted on a fixed mounting platform.
- Use base mounting to install (with adjustable support foot), the height of the support foot can be adjusted freely to ensure the stable installation of the pump.

6.5 Pipeline installation

- Reduce pipe resistance as much as possible and avoid to use unnecessary elbows and valves.
- When designing piping connection, try to avoid causing pressure loss and avoid cavitation caused by inhalation end
- The inlet and outlet control valves should be as close as possible to the inlet and outlet end.
- Inhalation end pipeline should be as short as possible
- The inlet end pipeline should be installed horizontally to reduce the possibility of residual air in the pipeline.
- Design pipeline reasonably according to pressure, temperature and medium characteristics.
- Avoid stress from pipes to pumps (pipes must be supported independently)

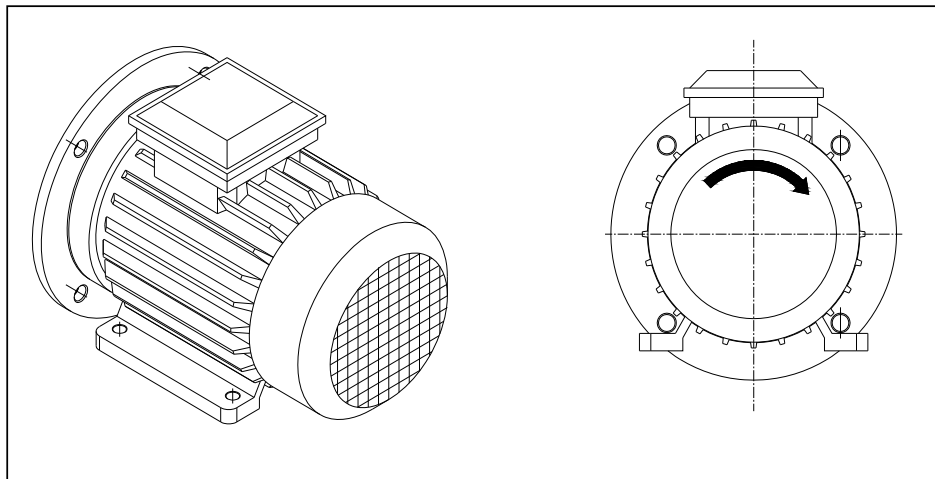


6.6 Electric Power Installation

- "Warning". Attention should be paid to using ground wire to connect pumps to eliminate static electricity
- Electrical connections need to be completed by qualified electrical engineers
 1. Check motor nameplate to confirm rated power, rated voltage and wiring mode.
 2. Follow the wiring diagram in the Motor junction box to connect the electricity.
 3. Click start motor with less than 1 second and check motor rotation direction.
 4. Rewiring is required if the rotation direction is wrong.



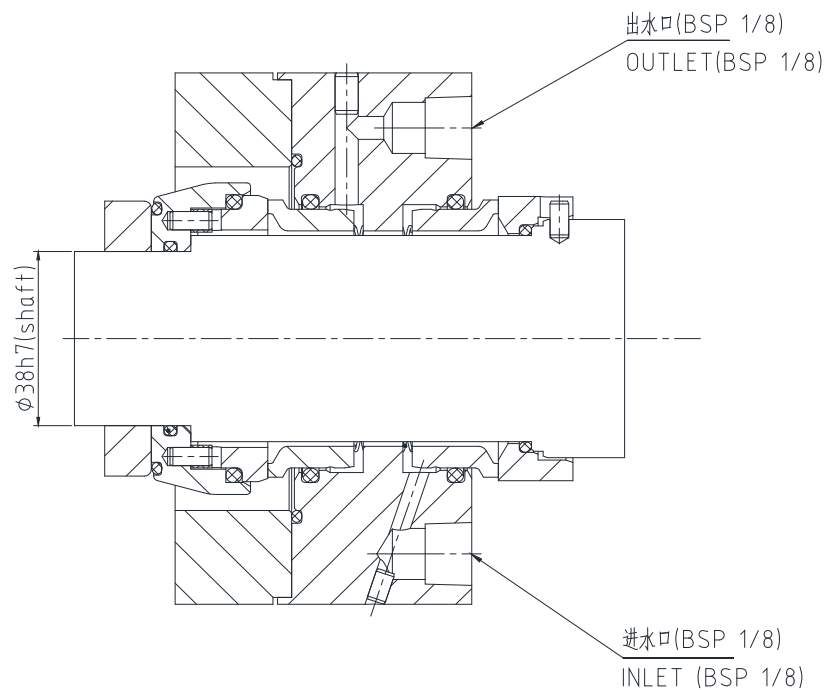
Attached image, correct rotation direction of motor



6.7 water flushing pipeline connection (double machine seal)

- pumps with double mechanical seals must be connected to water flushing lines and supplied with cooling water.

OD of Hose coupling connection	Inlet and outlet thread connection
6mm	G1/8



- It is recommended that the flushing water should be entered from below and discharged from the top.

6.8 Cleaning

1. Before cleaning, make sure there is no impurities in the pump chamber and pipeline.
2. Confirm that the pump is in the stop state.
3. Connecting the pipeline.
4. Before the first use, please thoroughly clean the pump and pipeline.



7. Running Operation

7.1 Safety Instruction

- Please confirm outlet valve has been opened when turning on pump and in operation.
In order to avoid overhigh outlet pressure,
it could be added with bypass line or safety valve etc. protective measures.
- Please confirm inlet valve has been opened when turning on pump.
If inlet valve is closed, will be occurred with idling, and mechanical seal will be damaged.
- Please confirm pump chamber has been full filled with liquid before turning on pump.
If without liquid in pump chamber, will be occurred with idling, and mechanical seal will be damaged.



7.2 Advance Preparation

1. Double mechanical seal: to confirm cooling water has been connected .
Note: cooling water temperature $< 70^{\circ}\text{C}$; to adjust the pressure of wash water $< 1\text{bar}$.
2. To open inlet valve.
3. To open outlet valve.
4. Waiting for a while, to confirm the pump chamber and inlet pipeline has been full filled with liquid.
5. Start motor.



7.3 Observe Operation

Safety Instruction in pump operation:

- Pump was stuck or damaged: there might be with impurity in your media.
- It's prohibited to close outlet valve in pump operation,
if not, will be caused with moment overhigh pressure and damage on pump.
- It's prohibited to close inlet valve in pump operation,
if not, will be caused with cavitation and idling and damage on mechanical seal.

7.4 Finish operation

1. To turn off motor.
2. To close inlet valve, to avoid idling in next operation.
3. To close outlet valve.

8. Cleaning

8.1 CIP Cleaning

- JZ3 Series pump is supported with CIP cleaning.

8.2 SIP Cleaning

- Note: Do not turn on pump in SIP sterilization, idling will be caused with damage on mechanical seal.
- Allow with max. steam temperature 145°C.



9. Common Fault and Removal

- See appendix 11.2 《Common Fault and Removal》.

10. Maintenance

10.1 Safety Instruction

- To confirm the motor has been turned off and powered off when touch pump.
- Please wear safety shoes, to avoid unnecessary damage.
- To close inlet and outlet valve.
- Double mechanical seal pump: to switch off wash water.
- To fully discharge liquid in pump chamber before separating pump.



10.2 To inspect wash water (double mechanical seal)

If choose double mechanical seal pump:

- To inspect wash water pressure < 1bar.
- To confirm wash water temperature < 70°C.

10.3 To replace mechanical seal

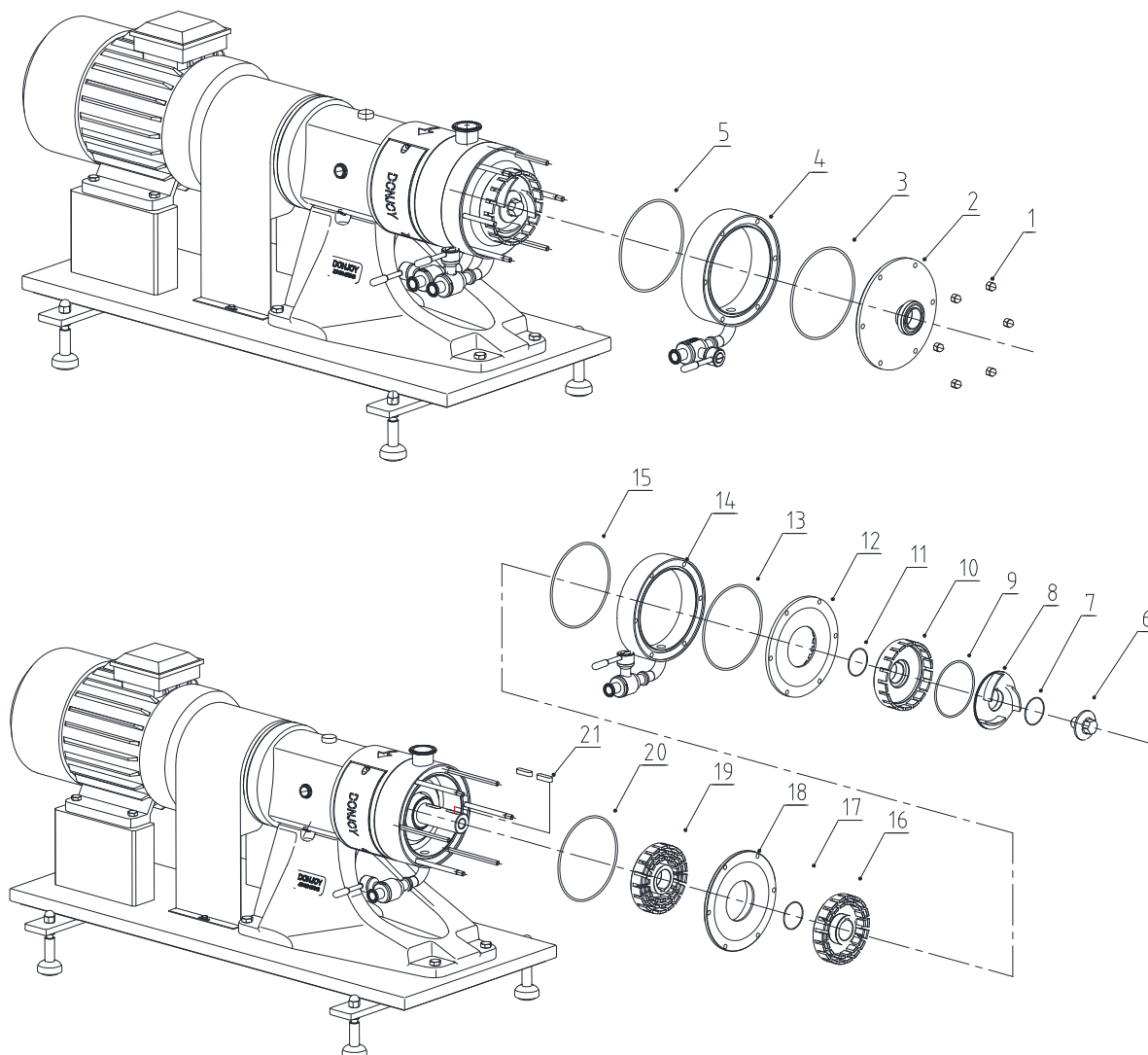
Need to replace mechanical seal in the following situation:

- When conveying media, with leakage.
- When conveying media, with leakage of wash water.
- When conveying media, wash water was into conveying liquid.

Please refer to the chapter of disassembly and installation of pump head -- mechanical seal, when to replace.

10.4 Pump head disassembly

10.4.1 Disassemble pump head and impeller



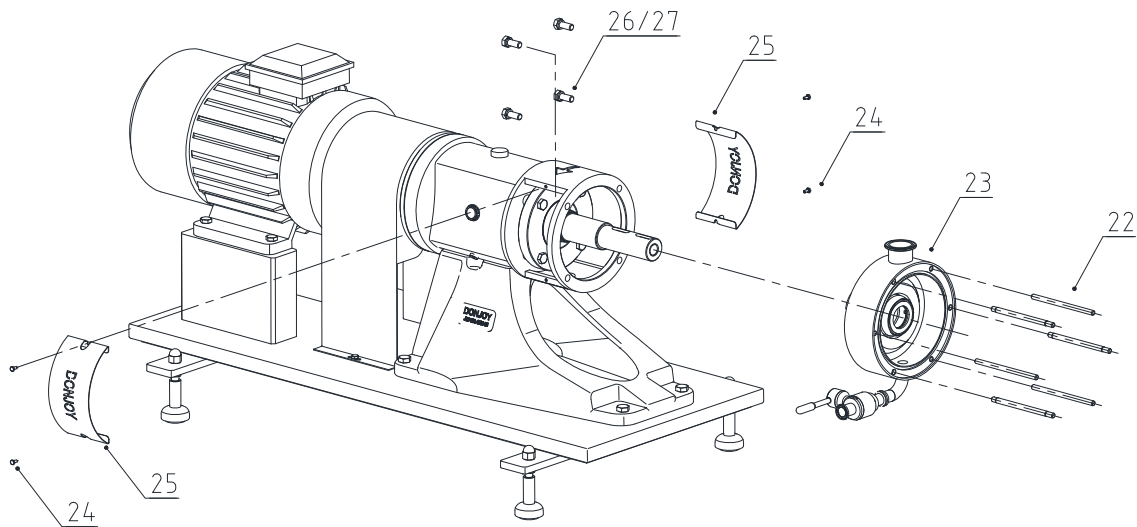
1. Turn counterclockwise to remove the front cover nut (part 1)
2. Dis-assembly the front cover (part 2) and front cover O-ring (Part 3) of the pump.
3. Dis-assembly the first stage pump body (part 4) and the pump body O-ring (Part 5)
4. Use tools to fix the pump shaft and rotate it counterclockwise to remove the impeller bolts (part 6).
5. Remove the Impeller bolt O-ring (Part 7)
6. In turn to Dis-assembly impeller (part 8), impeller O-ring (part 9), first stage rotor (part 10), O-ring (part 11), second stage stator (part 12), O-ring (part 13), second stage pump body (part 14), O-ring (part 15), Second stage rotor (part 16), O-ring (part 17), Third stage stator (part 18), Third stage rotor (part 19), O-ring (part 20)
7. Remove the flat key on the pump shaft (part 21)

10.4.2 Mechanical seal disassembly

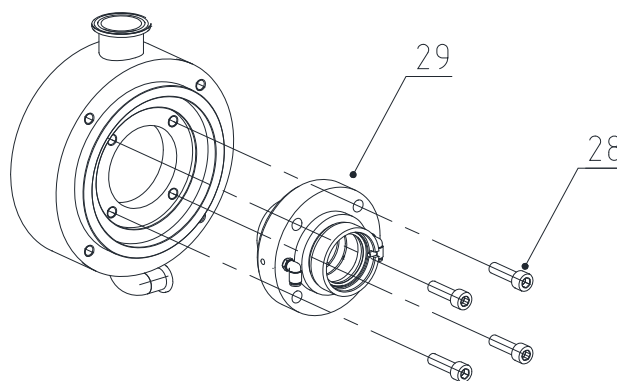
Only double mechanical seal construction

Double mechanical seal disassemble procedure

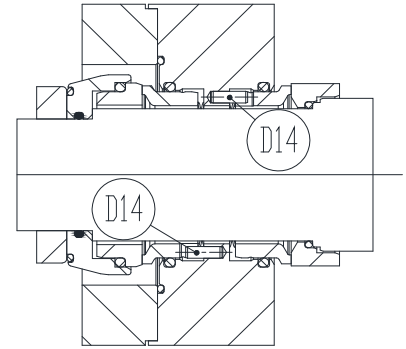
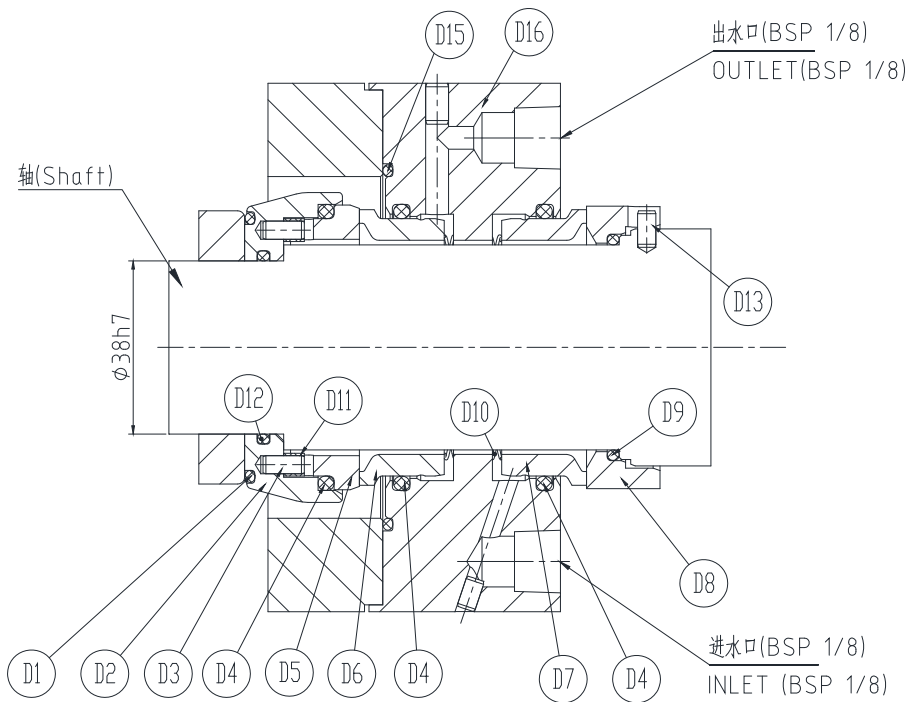
1. Dis-assembly the fixing screw of the side protection cover (part 24) and remove the side protection cover (part 25) as shown in the figure below.
2. Turn counterclockwise to remove the bolt (part 26) and remove the spring washer (part 27).
3. Remove the Third stage pump Components (part 23)



4. Turn counterclockwise to remove the bolt (part 28), and then take out the double mechanical seal assembly (part 29).



Attached pictures (structure sketch of double mechanical seal)



位置 Position	Description	零件描述	数量 Qty
D1	O-RING ID53.64*2.62	O 型圈 ID53.64*2.62	1
D2	ROTARY HOLDER	动环支架	1
D3	PIN $\phi 4 \times 9$	销钉 $\phi 4 \times 9$	2
D4	O-RING ID56.74*3.53	O 型圈 ID56.74*3.53	3
D5	ROTARY FACE	动环	1
D6	STATIC FACE	静环	1
D7	STATIC FACE	静环	1
D8	ROTARY FACE	动环	1
D9	O-RING ID45.69*2.62	O 型圈 ID45.69*2.62	1
D10	SPRING	弹簧	6
D11	PIN SLEEVE	销钉套	2
D12	O-RING ID37.77*2.62	O 型圈 ID37.77*2.62	1
D13	PIN $\phi 4 \times 8 \times 8$	销钉 $\phi 4 \times 8 \times 8$	1
D14	PIN $\phi 4 \times 8 \times 12$	销钉 $\phi 4 \times 8 \times 12$	4
D15	O-RING ID75*2.5	O 型圈 ID75*2.5	1
D16	Seal holder	水封座	1

10.5 Pump head assembly

Preparing before assembly

- Cleaning the component
- If there is some part to replace
- Please note that it should be assembled in a clean environment while the mechanical seal is easy to be damaged
- Please use water or lubricating grease to clean the mechanical seal before assembly
- Please do not touch after cleaning

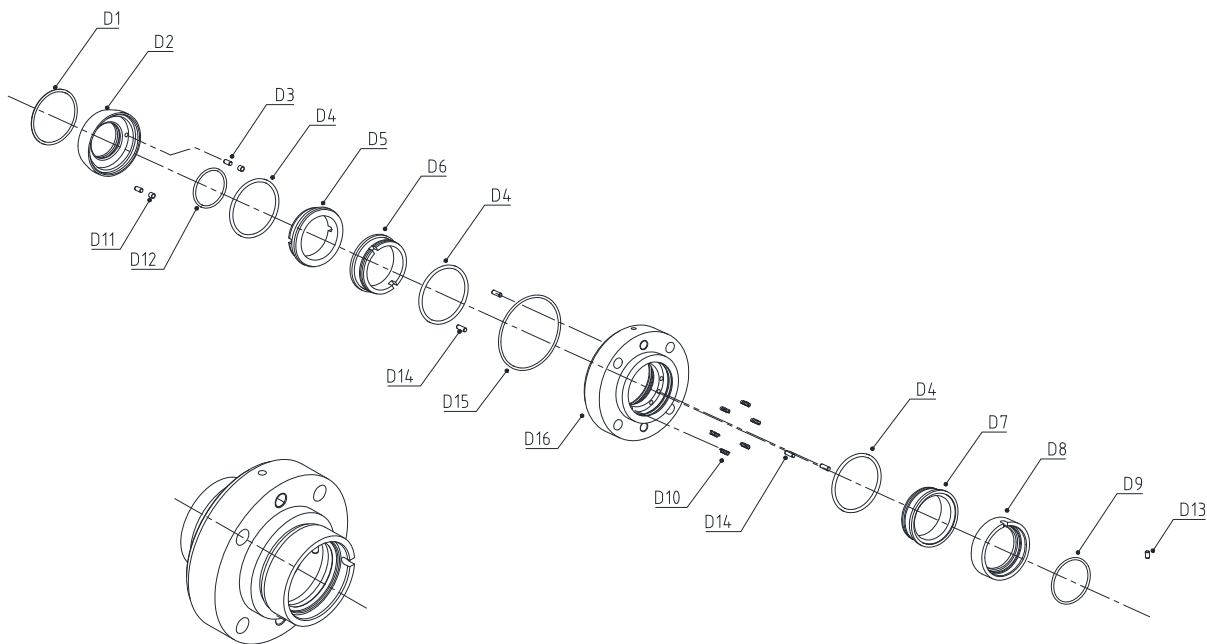
10.5.1 Adjust the clearance between rotor and back cover

1. Put the pin (part D13) into the pin hole of the pump shaft.

(Refer to the structure diagram of double mechanical seal)

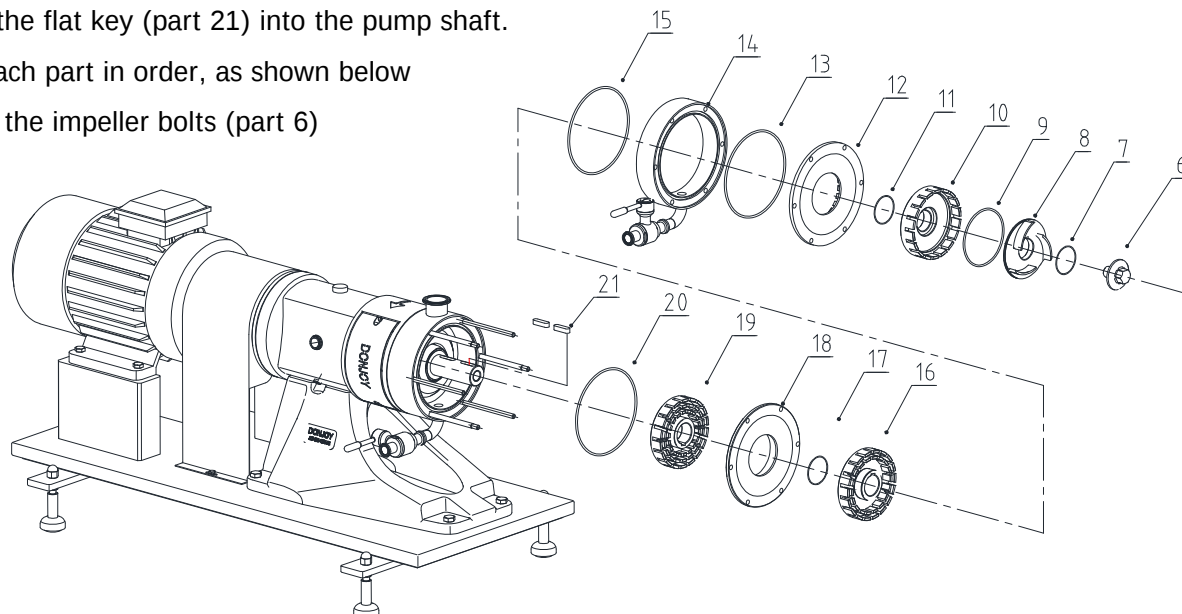
2. Refer to the mechanical seal structure diagram and install each part in turn

Note: Proper amount of lubricating oil or water shall be applied to the contact surfaces of static ring (part D7) and moving ring (part D8), static ring (part D6) and moving ring (part D5) before installation.



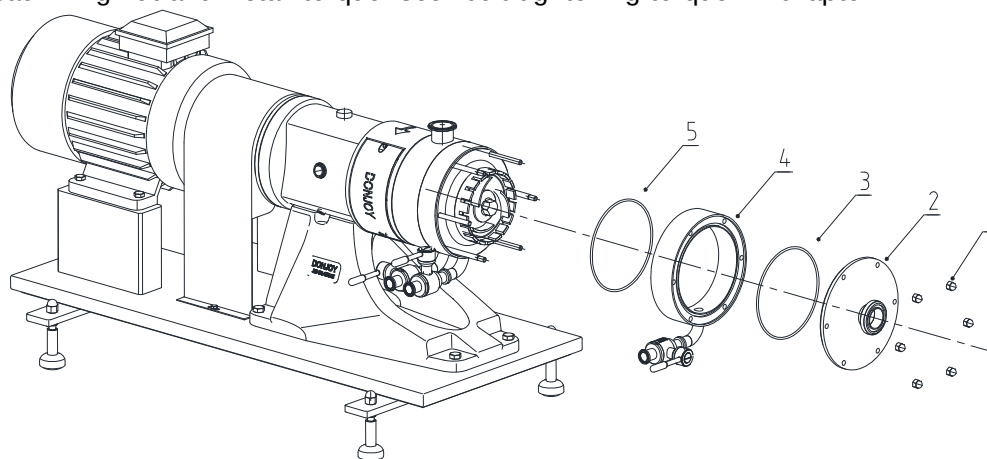
10.5.2 Pump body, stator and rotor installation

1. Connect the third-stage pump body Components (part 23) with the bracket
2. put the bolt (part 22) into the third-stage pump body (part 23).
3. Install the flat key (part 21) into the pump shaft.
4. Load each part in order, as shown below
5. Tighten the impeller bolts (part 6)



10.5.3 Install pump front cover and bolts

1. Install the O-ring (Part 3, Part 5) into the sealing groove of the first stage pump body (Part 4)
2. Install the front cover(part 2)
3. Tighten the pump head fixing nut and install torque. See "bolt tightening torque" in chapter 11.



11 Appendix

11.1 Bolt tightening torque

Set bolt and nut torque $\pm 15\%$

Materials grade A2-70

Nut/bolt	M6	M8	M10	M12	M16	M20
Tightening torque NM	7	18	36	63	143	262

11.2 Common fault and eliminating methods

work breakdown	Common cause of failure	Solution
No flow or unstable flow	pump chamber is not filled with liquid	filling of liquid
	outlet valve is closed	open outlet valve
	inlet pipe is closed or blocked	open inlet piping or wash
	pump stuck	clean the pump chamber and check if there is any foreign body entering
	medium viscosity is too high to be inhaled	Increase inlet pipe diameter and shorten pipe length
Flow and discharge too small	model of the pump is too small	contact Donjoy
	wrong direction of motor rotation	Adjust motor steering
	transport medium viscosity is too high, poor liquidity	Increase inlet pipe diameter and shorten pipe length
	too low speed (wrong voltage)	check power supply voltage according to motor nameplate
Noise and vibration	hard object in the pump chamber	exclude foreign body
	Impeller scratches	check impeller clearance and adjust
	suction line resistance is too large	Increase inlet pipe diameter and shorten pipe length
	pipe weight and pressure act directly on the pump	add pipeline support to eliminate resonance
Sudden increase in shaft power	too high viscosity of conveying medium	contact Donjoy
	bearing or motor damage	check and repair
	Damaged mechanical seal(wear)	change mechanical seal
	corrosion of mechanical seal material	contact Donjoy
	flushing circulation line is blocked cause dry rotate	check and repair

11.3 Explosion diagram and parts list

JZ3多级均质泵爆炸图清单(Rev. 01) JZ3 pump explosion chart list(Rev. 01)

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JZ3多级均质泵爆炸图清单(Rev. 01) JZ3 pump explosion chart list(Rev. 01)

[illegible]

JZ3多级均质泵爆炸图清单(Rev. 01)

JZ3 pump explosion chart list(Rev. 01)

序号 code	名称 Item	规 格specification						数量 Qty	材料 Material
		JZ3-130	JZ3-150	JZ3-170	JZ3-190	JZ3-210	JZ3-230		
28	六角头螺栓 Hexagon thread head	GB5783 M10X35	GB5783 M10X35	GB5783 M10X35	GB5783 M10X35	GB5783 M10X35	GB5783 M10X35	4	A2-70
29	轴承箱底座 Pedestal							1	304
30	平键 Flat key	GB1096 12X40	GB1096 12X40	GB1096 12X40	GB1096 14X40	GB1096 14X70	GB1096 14X70	1	304
31	内六角闷头螺塞 Plug screw	G1/8	G1/8	G1/8	G1/8	G1/8	G1/8	1	304
32	油位视镜 Oil level sight glass							1	
33	油塞 Oil plug							1	304
34	六角头螺栓 Hexagon thread head	GB5783 M4X8	GB5783 M4X8	GB5783 M4X8	GB5783 M4X8	GB5783 M4X8	GB5783 M4X8	4	A2-70
35	支架防护罩 Side cover							2	304
36	O型圈 O-ring	OD95X2	OD95X2	OD95X2	OD95X2	OD95X2	OD95X2	2	NBR
37	单轴承座 Bearing block							1	AL
38	双唇包胶油封 Oil seal	TC54X82X10	TC54X82X10	TC54X82X10	TC54X82X10	TC54X82X10	TC54X82X10	1	NBR
39	六角头螺栓 Hexagon thread head	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	6	A2-70
40	LM/XL联轴器 Coupling	LM-95(轴孔38)	LM-95(轴孔42)	LM-95(轴孔42)	LM-105(轴孔48)	XL9(轴孔48)	XL9(轴孔48)	1	AL

JZ3多级均质泵爆炸图清单(Rev. 01) JZ3 pump explosion chart list(Rev. 01)

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JZ3多级均质泵爆炸图清单(Rev. 01)
JZ3 pump explosion chart list(Rev. 01)

序号 code	名称 Item	规 格specification						数量 Qty	材料 Material
		JZ3-130	JZ3-150	JZ3-170	JZ3-190	JZ3-210	JZ3-230		
53	轴承箱 Bearing housing							1	304
54	卡箍 Clamp							3	304
55	卡箍垫圈(卡盘25) Clamp gasket							3	EPDM
56	弯头气嘴 Nozzle	QSL-1/8-6						2	
57	六角螺母 Hex nut	GB6170 M12	GB6170 M12	GB6170 M12	GB6170 M12	GB6170 M12	GB6170 M12	4	A2-70
58	联轴器缓冲垫 Coupling cushion							1	
59	六角螺母 Hex nut	GB6170 M10	GB6170 M12	GB6170 M12	GB6170 M12	GB6170 M16	GB6170 M20	4	A2-71