

Series JZ1 Catalog

JZ1 series emulsifying homogenizing pump
Operation and maintenance manual

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Summarize

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 JZ1 Series pump. The appendix of the manual includes the special debugging of this pump and the name of spare parts.

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



Attention symbol
Warning risk of mechanical damage

Delivery content

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

Safety precautions

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.



Application range

- JZ1 pumps are commonly used in food, pharmaceutical, biopharmaceutical, daily chemical
- JZ1 pumps have different stator and rotor are selected, according to different media requirements (contact Stursan)

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.



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.
If using single mechanical seal , short time dry rotation may also cause damage to the mechanical seal.

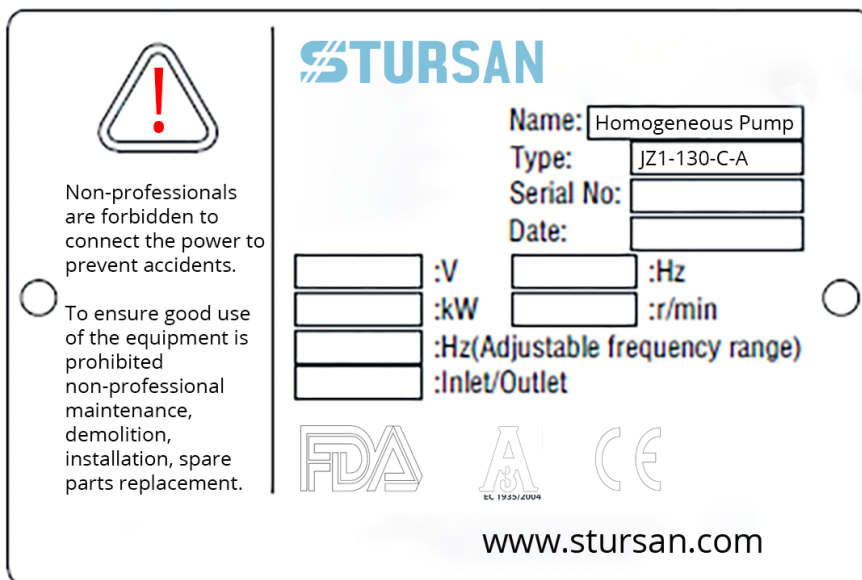


- Pump surface high temperature

It will cause high temperature after pump running , do not touch , it will hurt you.
Check the surface temperature before touching pump.



Nameplate



Warning sign

Please set warning sign in the pump working area.

Waste treatment

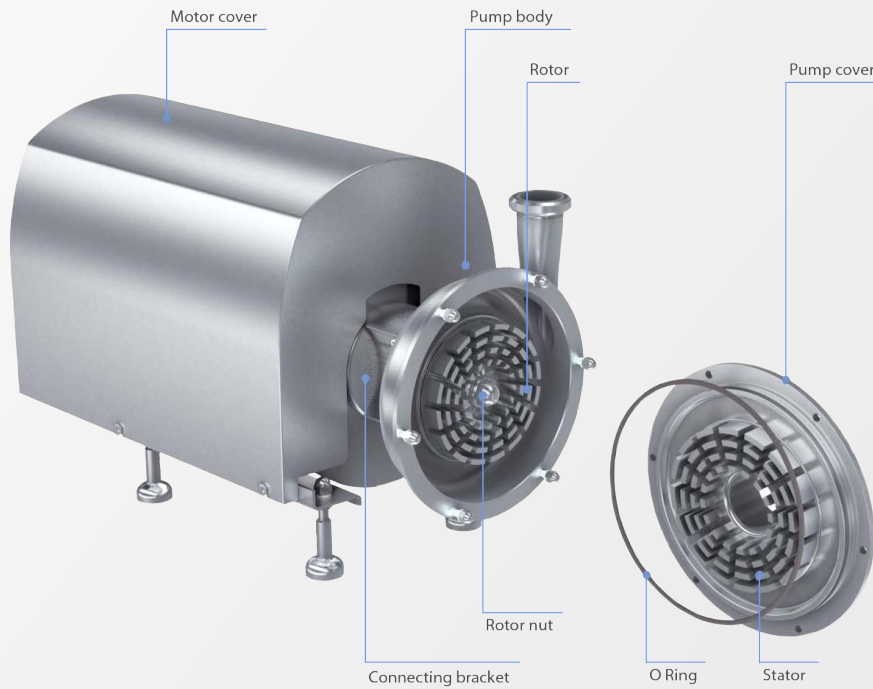
Please follow the relevant regulations to dispose of the disassembled waste.





Structural feature and working principle

Basic structure



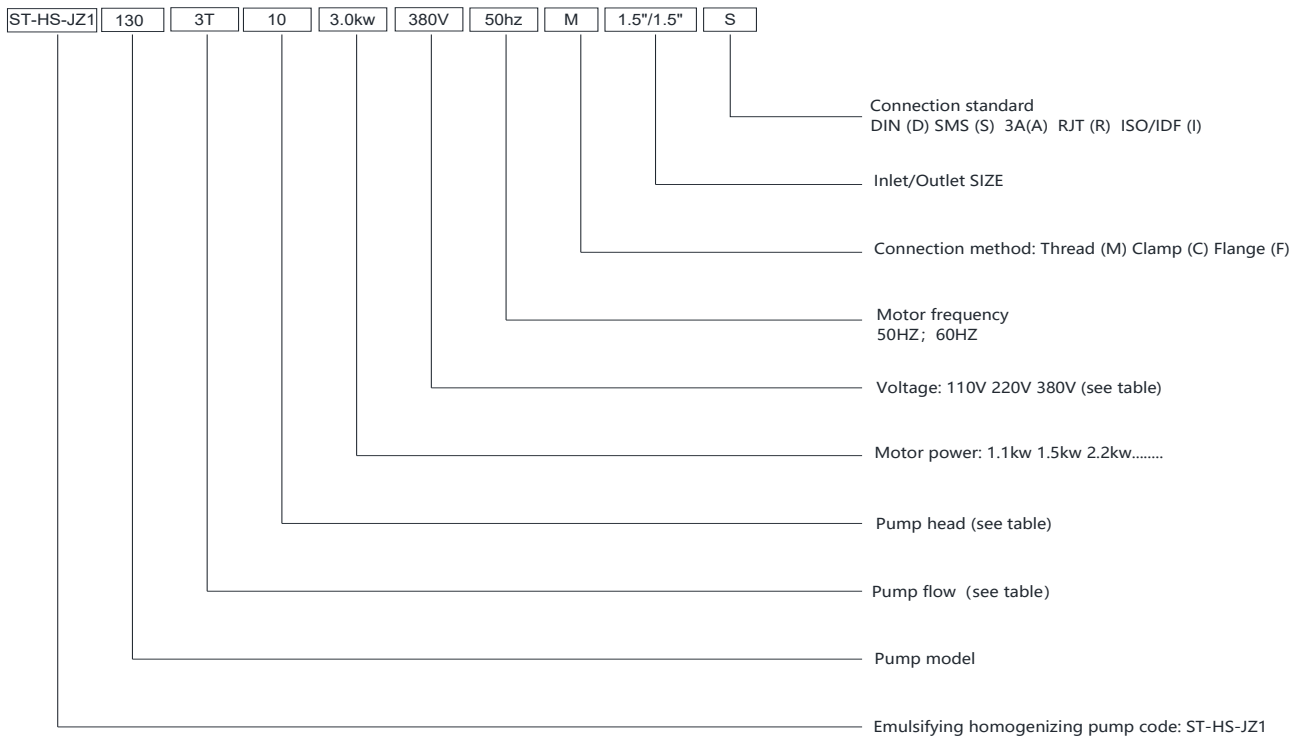
General configuration

- Single mechanical or double mechanical seal (double mechanical seal recommended)
- With discharge outlet (option)

Model

JZ1 Series
ST-HC-JZ1-130
ST-HC-JZ1-150
ST-HC-JZ1-170
ST-HC-JZ1-190
ST-HC-JZ1-210
ST-HC-JZ1-240

Model Description



Transportation



- Trained person are required to transport the pump
- The complete set pump can be handled by forklift or crane

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

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.

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 have enough bearing and strength
- Make sure nobody stay under pump



Storage

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)



Restart to use

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

Installation and use procedures

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



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



Reduce noise and vibration

Main measures

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

Auxiliary measures

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

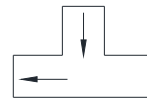
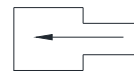
Installation method

- 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

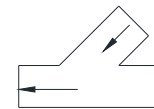
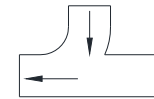
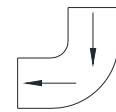
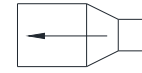
Pipeline installation

- 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)

Wrong pipe type



Right pipe type

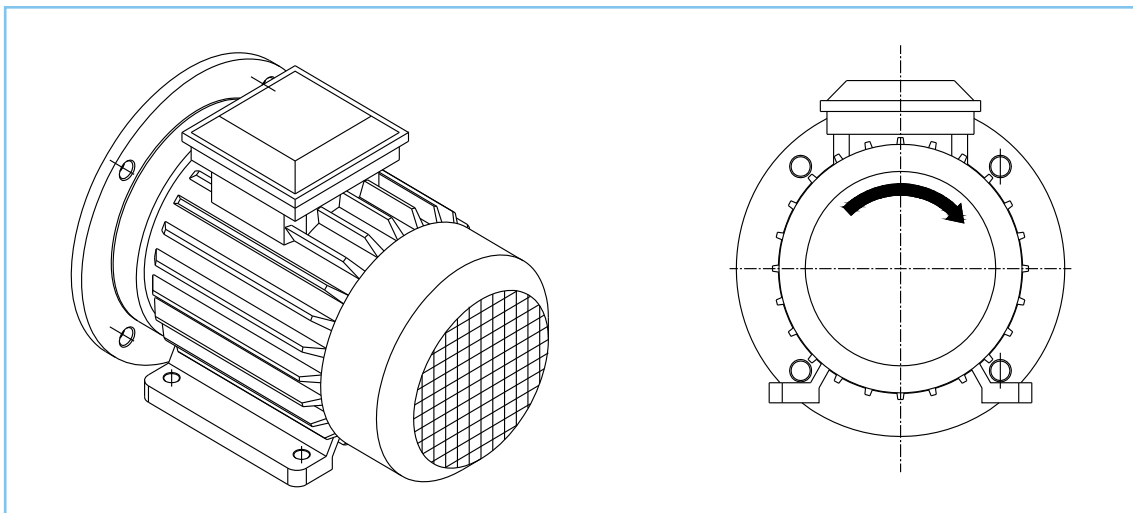


Mechanical Seal Configurations

- “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

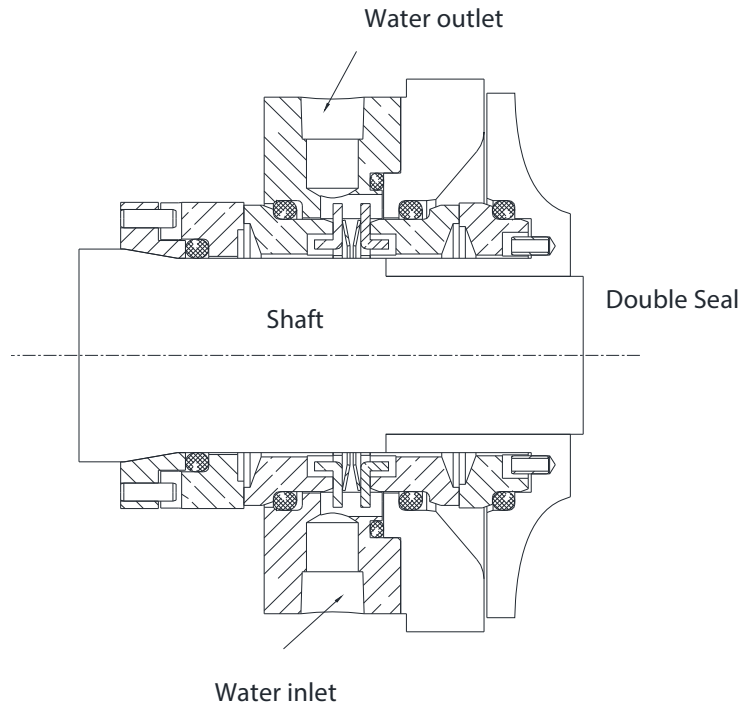




Water flushing pipeline connection (double machine seal)

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.

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.



Running Operation

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.



Advance preparation

1. Double mechanical seal: to confirm cooling water has been connected
Note: cooling water temperature <70°C; to adjust the pressure of wash water <1bar.
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



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

Finish operation

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

Cleaning

CIP Cleaning

- JZ1 Series pump is supported with CIP cleaning.

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.



Common Fault and Removal

- See appendix 11.2 (Common Fault and Removal).



Maintenance

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



To inspect wash water (double mechanical seal)

If choose double mechanical seal pump:

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

To replace mechanical seal

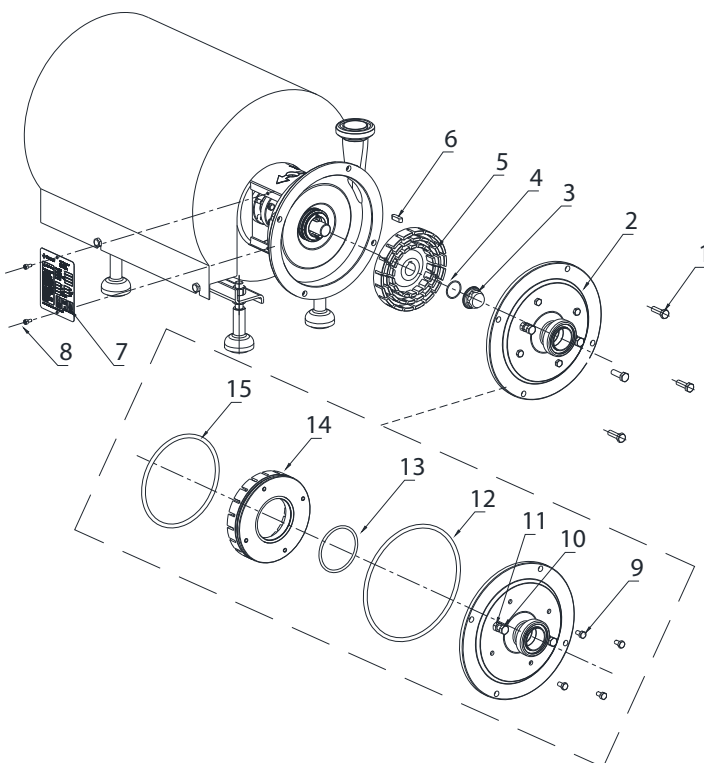
Need to replace mechanical seal in the following situation:

- 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.

JZ pump head disassembly

Disassemble pump head and impeller



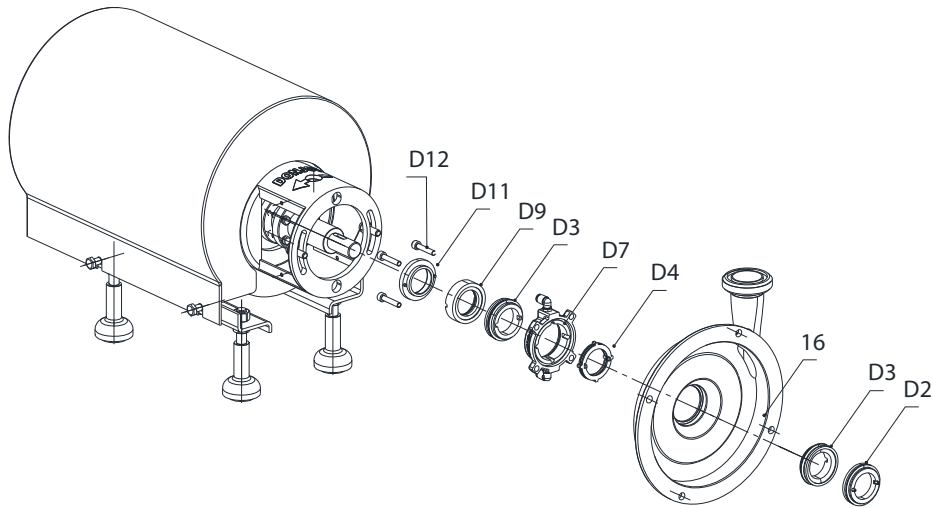
1. Disassemble head cover bolts (part 1)
2. Disassemble pump cover (part 2)
3. Disassemble side signs (part 7), bolt (part 8)
4. Fixed the pump shaft with tools, rotate counterclockwise, and remove the rotor nut (part 3)
5. Take down rotor nut O-ring (part 4)
6. Disassemble rotor (part 5)
7. Take down pump shaft on the flat key (part 6)
8. Remove the bolts (part 9) from the pump cover
9. Loosen the nut (part 11) counterclockwise
10. Remove the bolts (part 10) clockwise, and remove the stator (part 14)
11. Remove the O ring (13) from the stator (14)
12. Remove the O ring (12) from the pump cover (part 2)

Mechanical seal disassembly

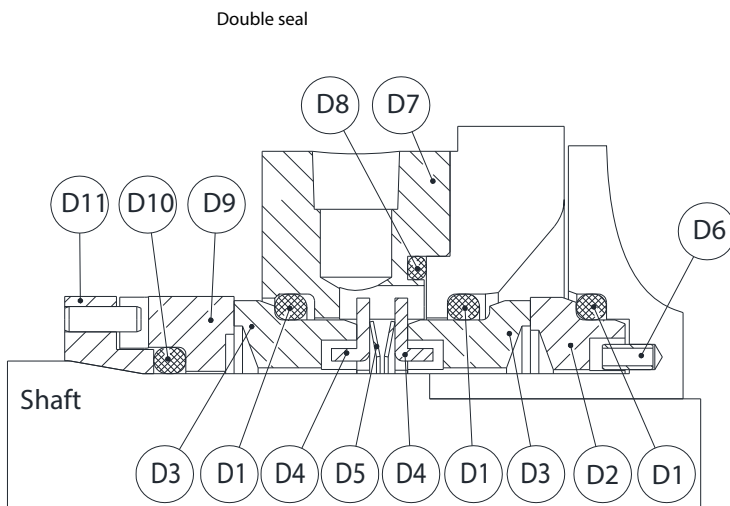
Only double mechanical seal construction

Double mechanical seal disassemble procedure

1. Take out the inner sealing ring, static ring, as shown on the right (Part D2, D3)
2. Take down back cover (part 16)
3. Take down bolt (part D12), water seal (part D7), spring components (part D4)
4. Take down the external seal static ring (part D3), moving ring (part D9) and support (part D11) successively



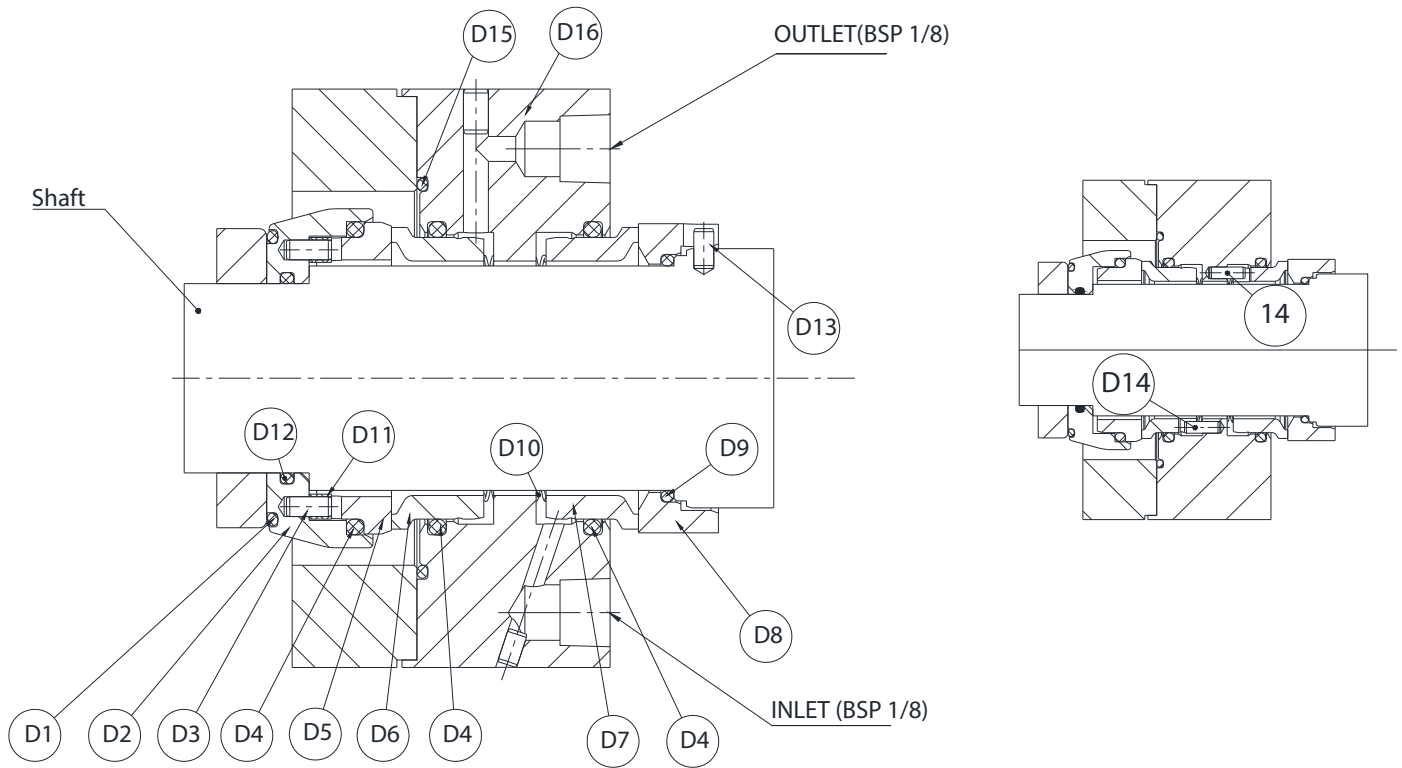
Attached pictures (structure sketch of double mechanical seal for JZ1-130 to JZ1-170)



Position	Description	Qty
D1	O-ring ID44.04X3.53	2
D2	Rotary Face	1
D3	Static Face	2
D4	Washer	2
D5	Coil Spring	1
D6	Pin $\phi 3 \times 6$	2
D7	Hosing	1
D8	O-ring ID53.64x2.62	1
D9	Rotary Face	1
D10	O-ring ID32.92x3.53	1
D11	Drive ring	1



Attached pictures (structure sketch of double mechanical seal for JZ1-190 to JZ1-240)



Position	Description	Qty
D1	O-ring ID53.64x2.62	1
D2	Rotary holder	1
D3	Pin ϕ 4x9	2
D4	O-ring ID56.74x3.53	3
D5	Rotary face	1
D6	Static face	1
D7	Static face	1
D8	Rotary face	1
D9	O-ring ID45.69x2.62	1
D10	Spring	6
D11	Pin sleeve	2
D12	O-ring ID37.77x2.62	1
D13	Pin ϕ 4 h8x8	1
D14	Pin ϕ 4 h8x12	4
D15	O-ring ID75x2.5	1
D16	Seal holder	1

Lobe Pumps, Various Configurations

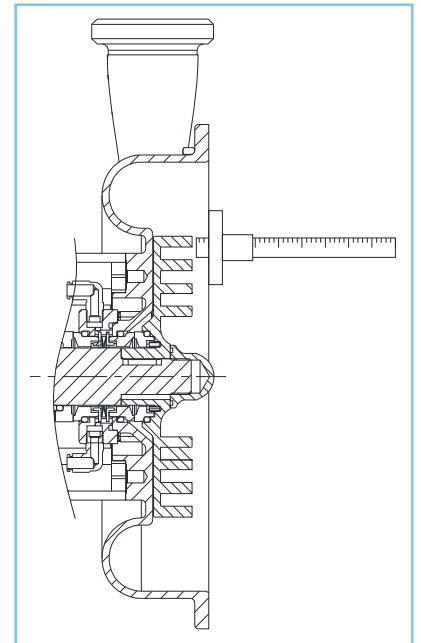
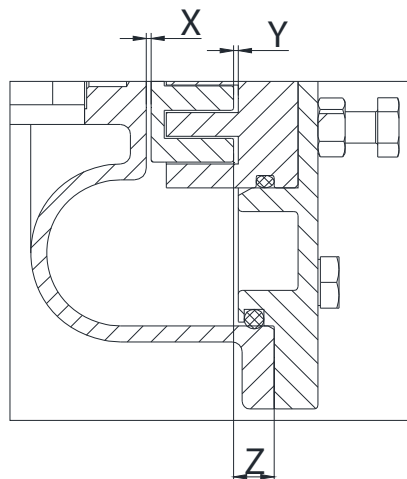
Preparing before assembly

- 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

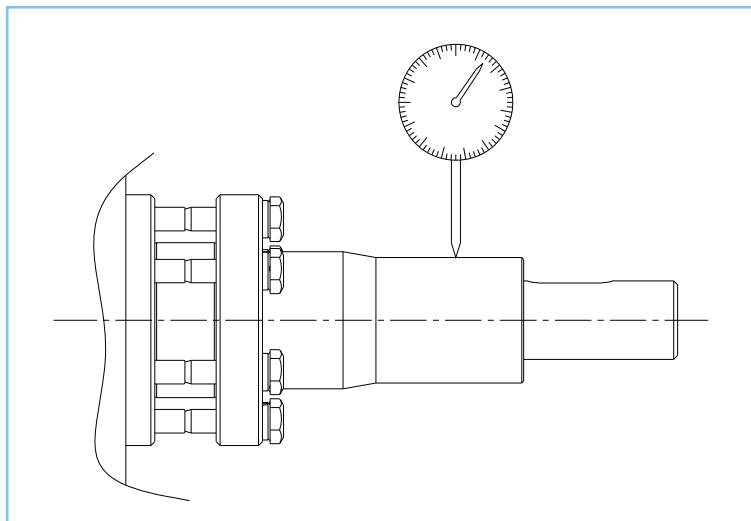
Adjust the clearance between rotor and back cover

1. Install the pump shaft assembly into the motor shaft, pretighten the sleeve screw, but do not tighten it completely.
2. Mount the connecting bracket, back cover, impeller and impeller nut successively.
Adjust the distances "X" between impeller and back cover, usually controlled at 0.5mm.
Use depth ruler to measure the distance "Z" between rotor and end face.

SIZE	Distances (mm)		
	X	Y	Z
JZ1-130	0.5	0.5	5.5
JZ1-150			5.0
JZ1-170			9.5
JZ1-190			5.5
JZ1-210			5.5
JZ1-240			5.5



3. Take down the rotor nut, rotor, back cover, connecting bracket, and lock the fastening screw.
4. Use dial indicator to check pump shaft circular runout, which should be controlled below 0.05mm.





Install bracket and back cover

1. Install connection bracket
2. Machine seal press plate, machine seal spring into the back cover
3. Install back cover

Mechanical seal installation

Reverse assembly according to the disassembly steps of mechanical seal (refer to the schematic diagram of mechanical seal structure for mechanical seal structure).

Install impeller

1. Put the flat key into the pump shaft
2. Insert the impeller into the pump shaft
3. Install O - ring on impeller nut and tighten with 120NM

Install pump front cover and bolts

1. Put O - ring(part 12) into pump head(part 2) sealing groove
2. Install O-rings(part 13,part 15) in the stator(part 14)
3. Instal the stator assembly into the pump head(part 2),and tight with bolts(part 9)
4. Tight the bolts(part 10),nut(part 11)
5. Install the pump head assembly
6. Tighten the pump head fixing nut and install torque. See "bolt tightening torque" in chapter 11

Appendix

Bolt tightening torque

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

Materials grade A2-70

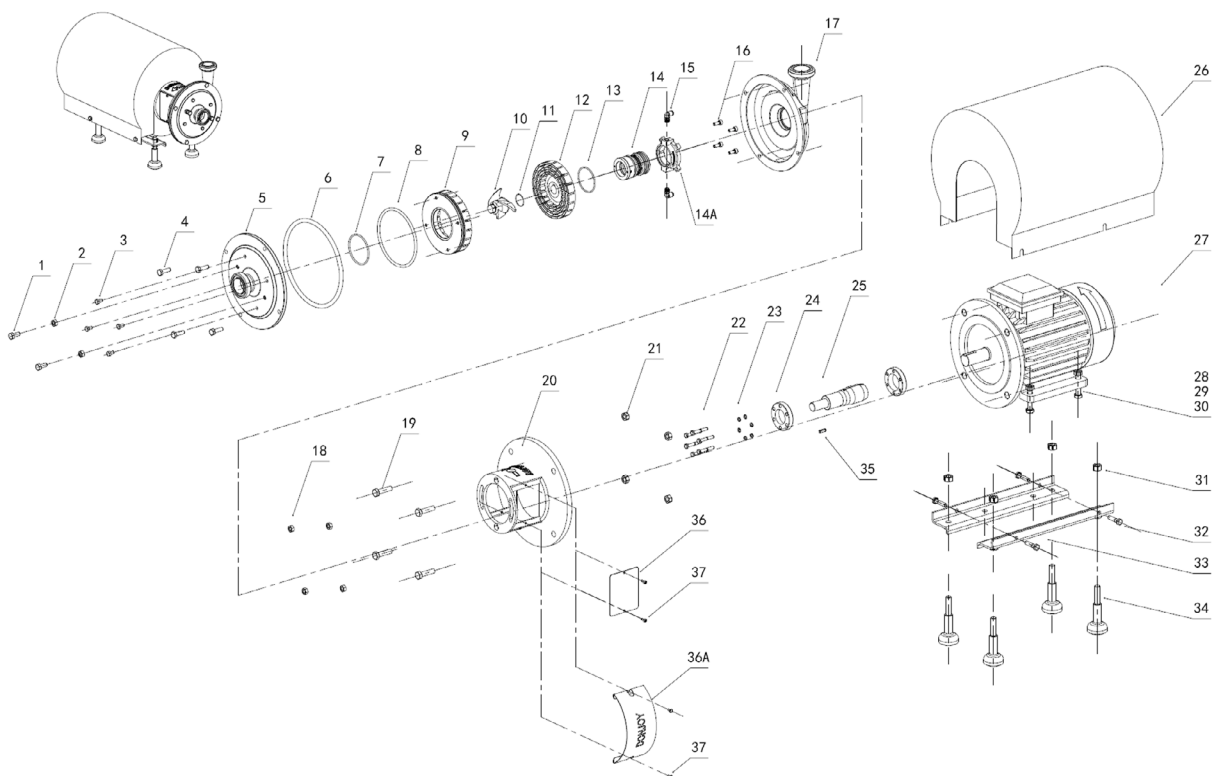
Nut/bolt	M6	M8	M10	M12	M16	M20
Tightening torque NM	7	18	36	63	143	262

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
Mechanical seal leakage	Damaged mechanical seal (wear)	change mechanical seal
	mechanical seal dry rotation, medium temperature is too high	Double mechanical seals are recommended
	corrosion of mechanical seal material	contact Donjoy
	flushing circulation line is blocked cause dry rotate	check and repair

Explosion diagram and parts list

Exploded view of JZ1 series emulsifying homoqenizing pump-Rev. 02 (2021-09)





Exploded diagram list of JZ1 series emulsifying homogenizing pump-Rev.02(2021-09)

code	Item	Specification						Qty	Material
		JZ1-130	JZ1-150	JZ1-170	JZ1-190	JZ1-210	JZ1-240		
1	Hexagon thread head bolt	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	GB5783 M8X20	2	A2-70
2	Hex nut	GB6170 M8	GB6170 M8	GB6170 M8	GB6170 M8	GB6170 M8	GB6170 M8	2	A2-70
3	Hexagon thread head bolt	GB5783 M6X12	GB5783 M6X12	GB5783 M6X12	GB5783 M6X12	GB5783 M6X12	GB5783 M6X12	4	A2-70
4	Hexagon thread head bolt	GB5783 M8X25	GB5783 M8X25	/	/	/	/	4	A2-70
		/	/	GB5783 M8X25	GB5783 M8X25	GB5783 M10X35	GB5783 M10X35	6	A2-70
5	Pump cover							1	304/316L
6	O ring	OD178X4	OD225X5	OD235X5	OD280X5	OD306X8	OD306X8	1	EPDM
7	O ring	OD76X4	OD76X4	OD76X4	OD100X4	OD104X4	OD104X4	1	EPDM
8	O ring	OD130X4	OD160X4	OD178X4	OD200X5	OD235X5	OD235X5	1	EPDM
9	Stator							1	304/316L
10	Rotor nut							1	316L
11	O ring	OD32X2	OD32X2	OD32X2	OD32X2	OD32X2	OD32X2	1	EPDM
12	Rotor							1	304/316L
13	O ring	OD60X2.5			OD81X2.5			1	EPDM
14	Double mechanical seal	DONJOY.R.PL32D			DONJOY.R.PJ45D			1	
	Single mechanical seal	DONJOY.R.PL32S			/			1	
14A	Seal holder							1	304
15	Nozzle	QSL-1/8-6						2	FESTO
16	Hexagon socket cap screw	GB70.1 M6X16						4	A2-70
17	Rear cover							1	304/316L
18	Hex nut	GB6170 M8	GB6170 M8	/	/	/	/	4	A2-70
		/	/	GB6170 M10	GB6170 M10	GB6170 M10	GB6170 M10	6	A2-70


Exploded diagram list of JZ1 series emulsifying homogenizing pump-Rev.02(2021-09)

code	Item	Specification						Qty	Material
		JZ1-130	JZ1-150	JZ1-170	JZ1-190	JZ1-210	JZ1-240		
19	Hexagon thread head bolt	GB5783 M10X40	GB5783 M12X40	GB5783 M12X40	GB5783 M12X40	GB5783 M12X50	GB5783 M12X50	4	A2-70
20	Bracket							1	304
21	Hex nut	GB6170 M10	GB6170 M12	GB6170 M12	GB6170 M12	GB6170 M12	GB6170 M12	4	A2-70
22	Hexagon thread head bolt	GB5783 M6X40	GB5783 M6X40	GB5783 M6X80	GB5783 M6X80	GB5783 M6X80	GB5783 M6X80	6	A2-70
23	Spring washer	GB93 φ6	GB93 φ6	GB93 φ6	GB93 φ6	GB93 φ6	GB93 φ6	6	A2-70
24	Tight ring component							1	304
25	Pump shaft							1	304
26	Pump cover							1	304
27	Motor							1	
28	Motor support	only use with motor of 3kw						4	PA
29	Hex nut	GB6170 M12						4	A2-70
30	Hexagon thread head bolt	GB5783 M12X35	GB5783 M12X35	GB5783 M12X40	GB5783 M12X40	GB5783 M12X40	GB5783 M12X40	4	A2-70
31	Hex nut	GB6170 M12						4	A2-70
32	Hexagon thread head bolt	GB5783 M8X10	GB5783 M8X10	GB5783 M8X35	GB5783 M8X35	GB5783 M8X35	GB5783 M8X35	4	A2-70
33	Under-chassis							2	304
34	Under-chassis bolt							4	304
35	Flat key	GB1096 6X22	GB1096 6X22	GB1096 6X22	GB1096 10X22	GB1096 10X22	GB1096 10X22	1	304
36	Nameplate				/			2	304
36A	Protective cover	/						2	304
37	Hexagon socket cap screw	GB70.1 M4X8						4	A2-70

Note: 1, part 14A, part 15, part16 only use with Double mechanical seal.



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