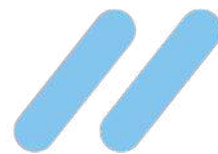


Operating and Maintenance Manual

Serie L





Catalogue

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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 Serie L lobe 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 electrical hazard



Warning symbol
Warning of falling objects



Warning symbol
Warning the danger of mechanical injury



Attention symbol
Ensure security responsibilities



Warning symbol
Warning risk of mechanical damage

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

- Serie L lobe pumps are commonly used in food, pharmaceutical, biopharmaceutical, daily chemical and CIP applications
- Serie L lobe pumps are available in different operating temperature and pressure range depending on different design and model
- Serie L lobe pumps need choose suitable mechanical seal material according to different media

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



- Exceed the working pressure range or exceed the working temperature range
May cause explosion or leakage of pump, resulting in personal and property damage



- 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

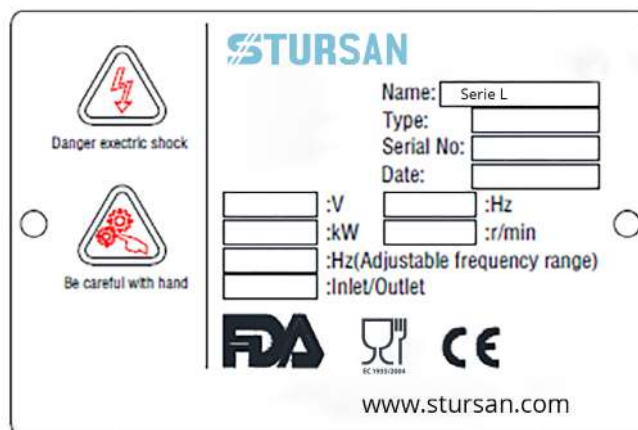
It will cause high temperature after pump running, do not touch, it will hurt you
Check the surface temperature before touching pump.



- Revolution speed of pump

Model	Suggested speed	Max speed
L-12	50rpm-450rpm	700rpm
L-17		
L-24		
L-39	50rpm-400rpm	
L-48		
L-55	50rpm-350rpm	
L-61		
L-141		
L-41-2		
L-181		
L-230		

2.5. Name plate



2.6. Warning sign

Please set warning sign in the pump working area

2.7. Waste treatment



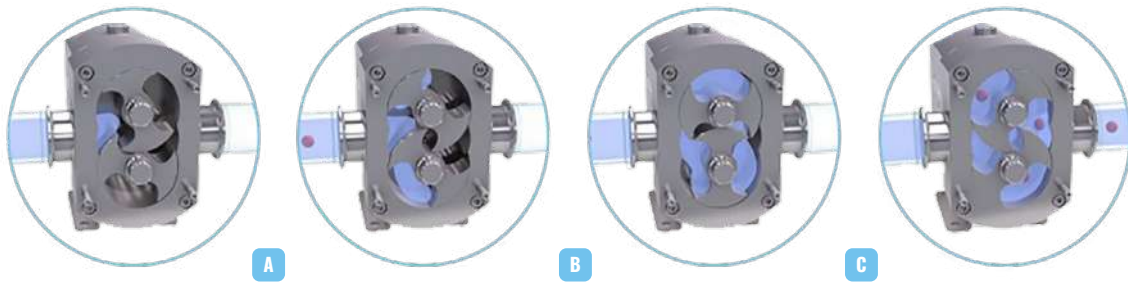
Please follow the relevant regulations to dispose of the disassembled waste



3 Structural feature and working principle

3.1. Working principles

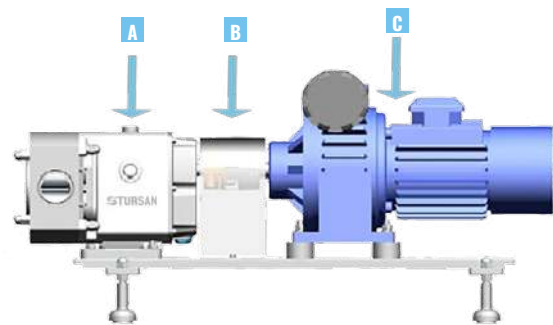
The Lobe pump relies on two synchronous and counter-rotating rotors. When the rotor rotates, the cavity formed by the rotor and the rotor box will transport the medium from the inlet end to the outlet end. A certain suction force will be formed in the inlet end as the medium is continuously transported away. The suction force continuously sucks the medium into the pump cavity, so that the medium is continuously transported out. As shown below



3.2. Basic structure

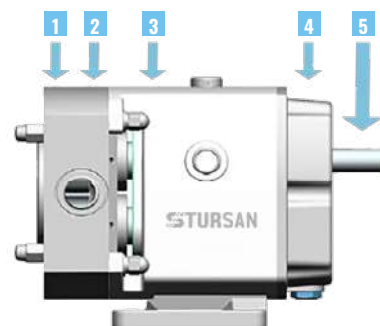
• Figure 1

- A. Serie L lobe pump
- B. Coupling and coupling over
- C. Gear reducer & motor



• Figure 2

- Part#1 Front cover of pump
- Part#2 Rotor box
- Part#3 Gear box
- Part#4 Back cover of gear box
- Part#5 Drive shaft



• Coupling

Coupling use to connect motor shaft and pump drive shaft (Part #5)

• Gear reducer or motor

The motor is fixedly mounted on the base plate using a fixed speed or variable speed motor

3.3. General configuration

- Single mechanical or double mechanical seal (double mechanical seal recommended)
- Horizontal or vertical inlet and outlet direction

3.4. Model

Model
L-12
L-17
L-24
L-39
L-48
L-55
L-61
L-141
L-141-2
L-181
L-230

3.5. Model Description

L25S-1200E

Pump Size	PORT SIZES = Last of base code (e.g. L25L-)	CODE	PORT STANDARD = First digit of build code	CODE	SEAL OPTIONS = Second digit	CODE	ROTOR OPTIONS = Third digit	CODE	END COVER OPTIONS = Fourth digit	CODE	PUMP HEAD ELASTOMER OPTIONS=Suffix letters	CODE	MISCELLANEOUS OPTIONS	CODE
SL03	Standard ports	S	DIN 11851	1	Double mechanical seal, Flushed SiC/SiC primary, C/SiC secondary	1	Butterfly (Scimitar)	0	Plain	0	EPDM	E	Horizontal ports / bottom shaft drive	B
L12	Reduced ports	R	SMS	2	Single front-loaded SiC/SiC mechanical seal	2	3-Leaves	1	Pressure Relief Valve	1	FKM	F	Stainless steel bearing & gear housing	S
L24	Enlarged ports	L	DIN 11864-1-A	3	Single front-loaded C/SiC mechanical seal	3	3-Leaves Spiral	2	End Cover and Pumphead jackets	2	HNBR	H	Vertical ports & self drain rotorcase	U
L39			Flange DIN 11864-2	4	Double mechanical seal, Flushed TC/TC primary, TC/TC secondary	4	Single Butterfly	3	Heating / cooling jacket on end cover (Not available with Pressure Relief Valve)	3			Electro-polish to 0.6 micron	Y
L48			Clamp DIN 11864-3	5	Single front-loaded TC/TC mechanical seal	5	2-Leaves	4	Pumphead jackets (mounted on endcover)	4			Internal polish & electro-polish to 0.5 micron	Z
L55			SMS	6	Single front-loaded Flushed SiC/SiC mechanical seal	7	5-Leaves	5	Relief Valve and Pumphead jackets (both mounted on endcover)	5			Certification (Cert. of Conformance, 3.1B material certs, test curve)	&
L61			Other Requirement	X			6-Leaves	6					Atex (Group 2, category 2) (Pumps must be supplied with flush seals)	A
L141							Flexible Spiral Rotor FKM	7						
L141-2							Flexible Spiral Rotor EPDM	8						
L181							Flexible Spiral Rotor HNBR	9						
L230														

Basic part number 316L with standard ports and Upper Shaft / Electro-polish to 0.8 micron



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

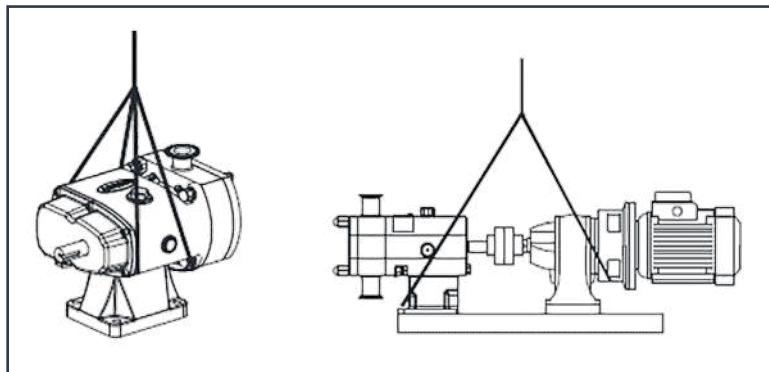


- Pay attention to parts falling, which may cause serious injury and bruises on your hands and feet. To prevent rollover during transportation, use a conveyor belt or bolt to fix the plate

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
- Do not transport the complete set pump only through pump head or the swinging ring of motor. Because the swinging ring of pump head & motor are not designed according to the weight of whole pump.
- Make sure nobody stay under pump
- Correct hoisting method



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)

5.2. Long-term storage

- If the storage time is more than six months, please follow the following procedures:
 1. Before storing the pump, remove the mechanical seal and store it independently.
 2. Add lubricating oil to the gear box, and the gear should be completely immersed by lubricating oil

5.3. Restart to use

- After storage, please check the mechanical seal and lubrication oil 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

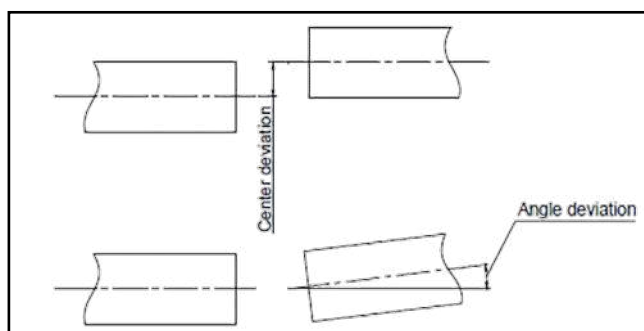
- Isolation measures can be used to isolate noise, such as sound insulation coverage, space isolation, etc

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. Coupling installation

1. Check the center deviation and angle deviation between the drive shaft of the pump and the motor shaft

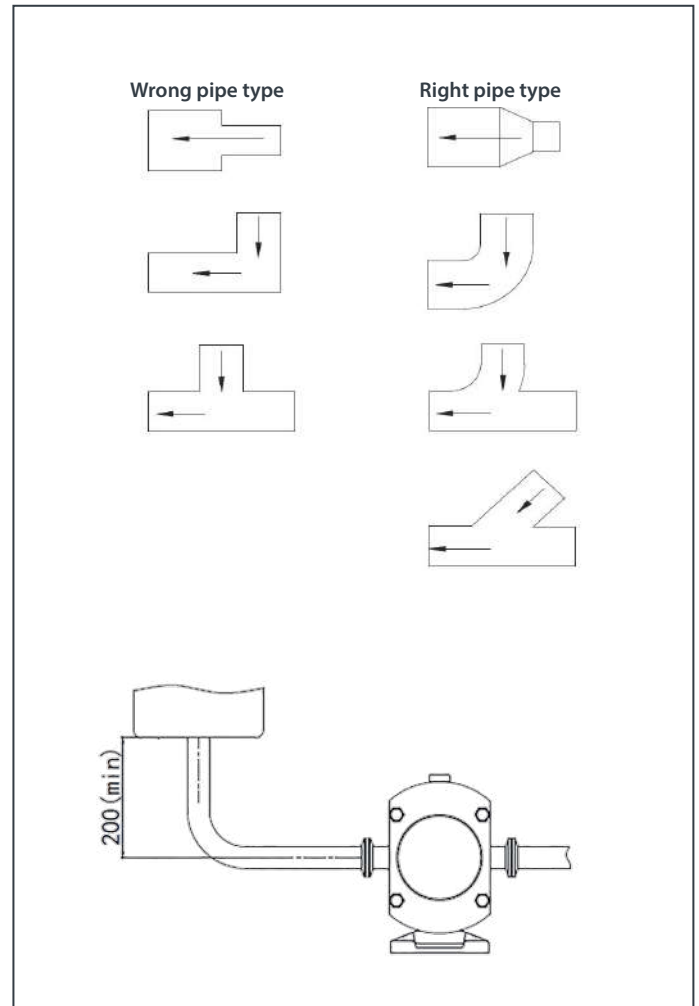




2. Adjust the coaxiality of the shaft so that the two shafts are aligned

6.6. 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)
- In order to ensure stable operation and prolong the service life of lobe pump, the liquid level must be higher than pump inlet about 200mm, otherwise it will easily cause pump mechanical seal dry mill or damage.



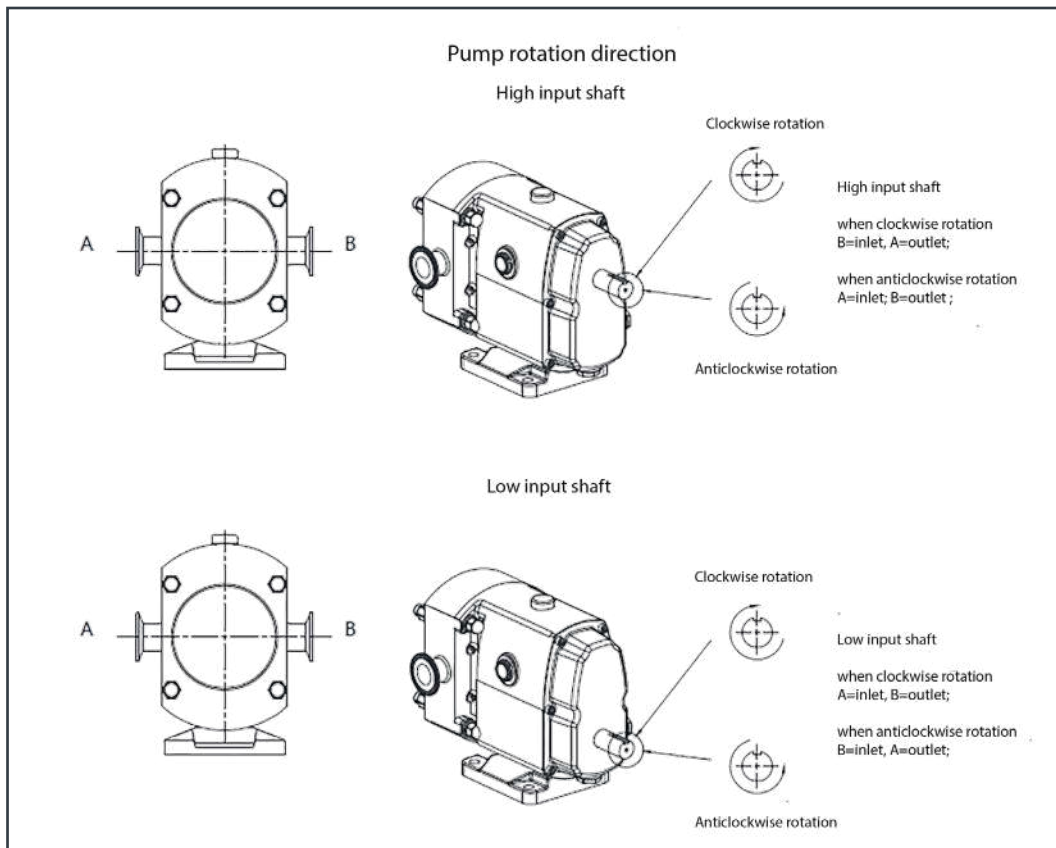
6.7. Electric Power Installation



- «**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

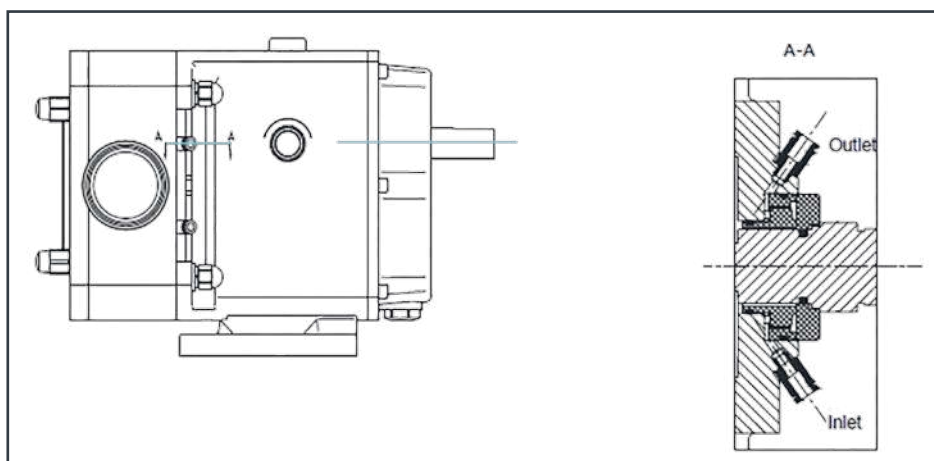
Note:

Pay attention to the direction of rotation when the rotor pump is installed and debugged.
The rotor pump input shaft has two types: high-position input shaft and low-position input shaft.



6.8. Water Flushing Pipeline Connection (Double Machine Seal)

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



Model	Connect OD of the hose	Thread of inlet&outlet
L12-24	6mm	G1/8
L39-61	6mm	G1/8
L141-230	6mm	G1/8



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

6.9. 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 °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

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

- Serie L pump is supported with CIP cleaning

CIP Cleaning Solvents

Only mix the cleaning solution with clean (chlorine-free) water

a. Alkaline solution:

1% Caustic soda T70°C(150°F)

1kg NaOH + 100 L Water=Cleaning Solvents

2.2L 33% NaOH + 100L Water=Cleaning Solvents

b) Acid solution:

0.5% Nitric acid(HNO₃) T 70°C(150°F)

0.7L 53% HNO₃ + 100L Water=Cleaning Solvents

- Controlling the concentration of detergent may cause damage to seals

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 11.3 (Common Fault and Removal)

10 Maintenance

- See appendix 11.2 (Maintenance Periodic Table)

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

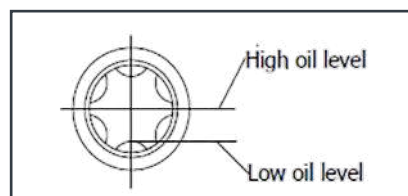
10.2. To inspect wash water (double mechanical seal)

If choose double mechanical seal pump:

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

10.3. Check the oil level

- To see the height of oil level by sight glass, to confirm oil level is within normal range.

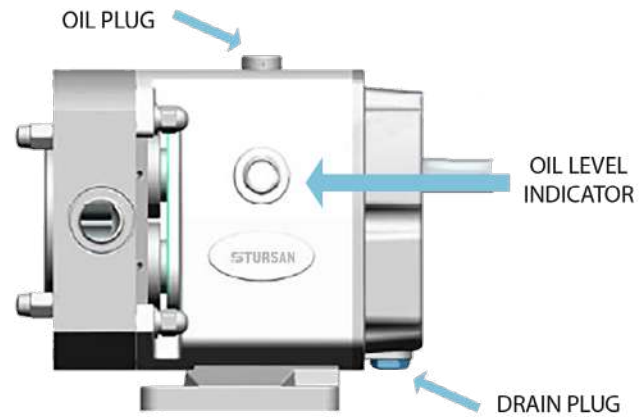




10.4. Change oil

- Change the oil after the first 150 hours of use
- To replace lubricating oil regularly: every 6 months or 2000 hours.
- Extreme condition such as high temperature, humid environment: every 1000 hours.
- Recommended brand: Mobil, Shell
- Recommended oil model: ISO VG320

MODEL	Oil volume
L12-24	0.8L
L12-24-U	0.5L
L39-61	2.0L
L39-61-U	1.4L
L141-230	3.6L
L41-230-U	2.5L



10.5. To replace mechanical seal

Need to replace mechanical seal in the following situation:

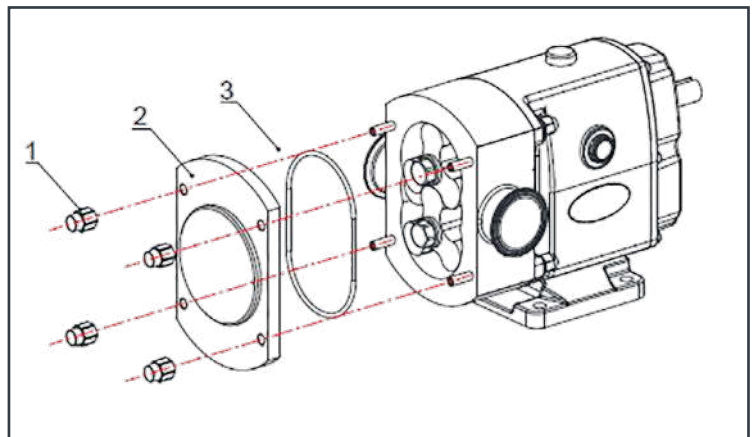
- When conveying media, with leakage
- When conveying media, with leakage of wash water
- When conveying media, wash water was into conveying liquid

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

10.6. Disassembly of the rotor pump head

10.6.1. Front cover disassembly

1. Remove the front cover nut (part 1), remove the pump front cover (part 2), and the front cover O-ring gasket (part 3)



10.6.2. Rotor disassembly

1. Use a plastic rod to clamp the rotor (as shown in the figure), remove the lock nut (part 4),

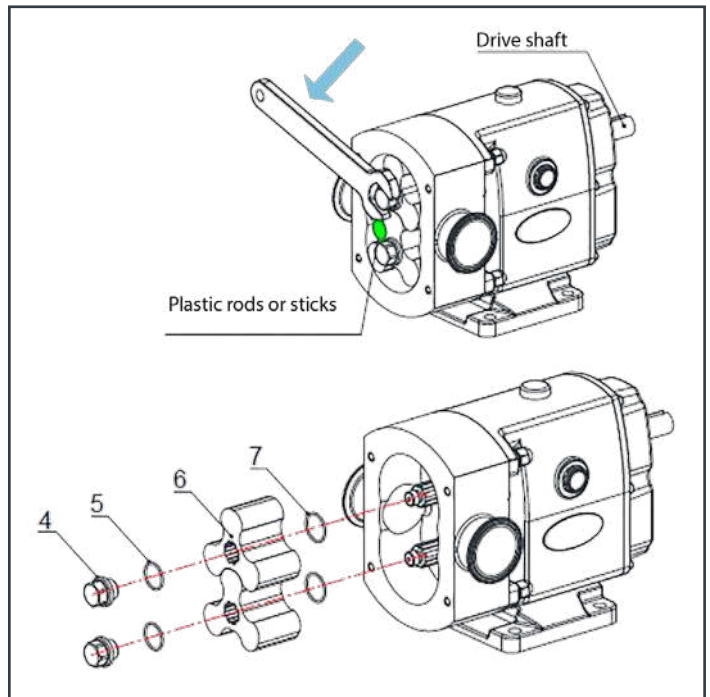
Attention:

The nut on the drive shaft must be removed in a counterclockwise direction
 The nut on the driven shaft must be removed in the clockwise direction

Warning:

the rotating screw may cause injury to hands

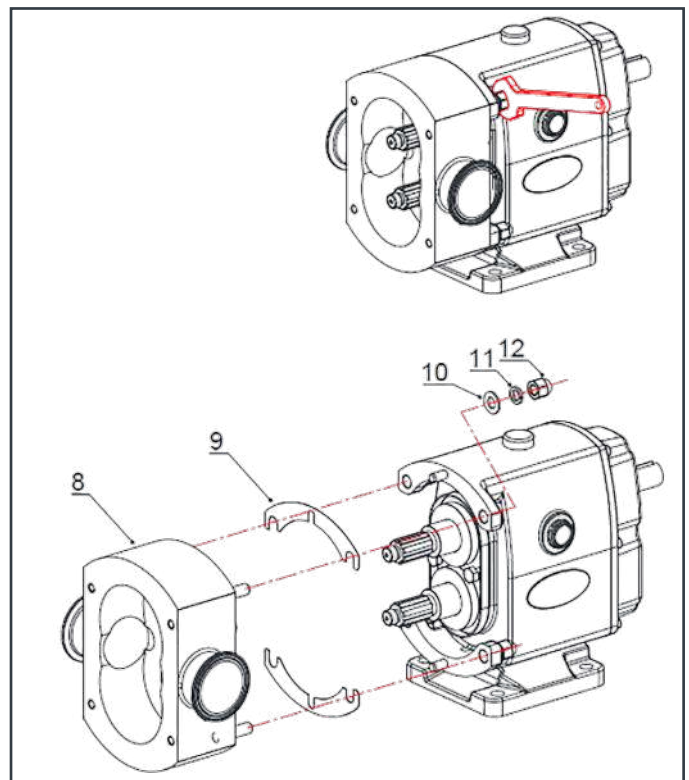
2. Remove O-ring gasket (part 5), rotor (part 6), O-ring gasket (part 7) in turn



10.6.3. Rotor box disassembly

1. Using an open-end wrench, remove the nut (part 12), Remove the elastic gasket (part 11) and the flat gasket (part 10)

2. Remove the rotor box (part 8), and remove the adjusting gasket (part 9)





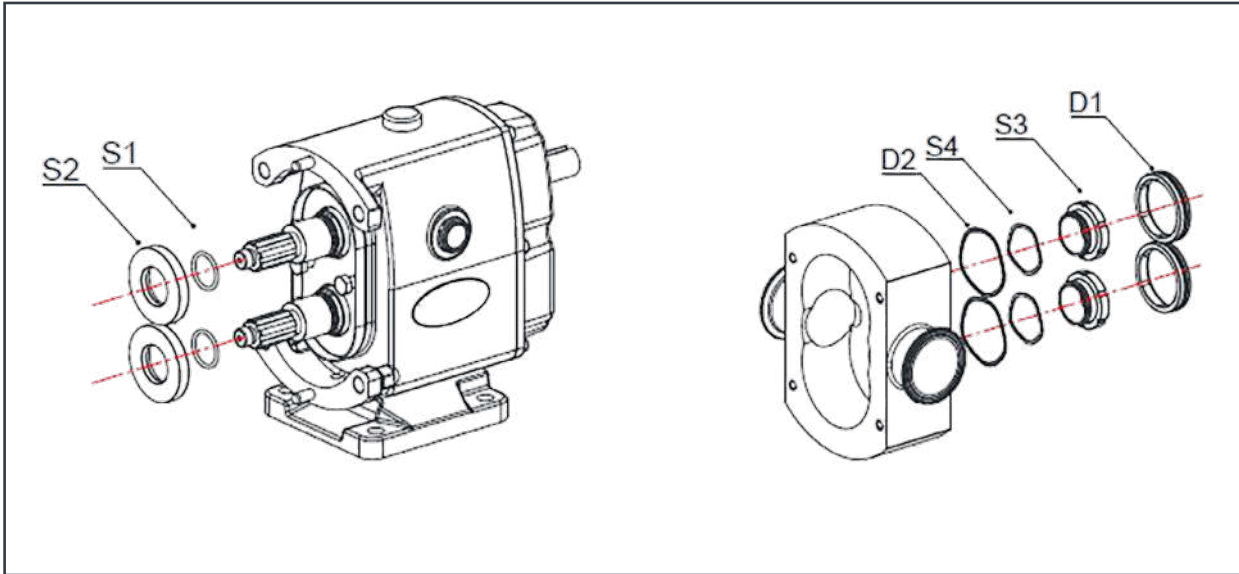
10.6.4. Disassembly of mechanical seal

There are two configurations of mechanical seal: single mechanical seal and double mechanical seal

Disassembly steps of mechanical seal:

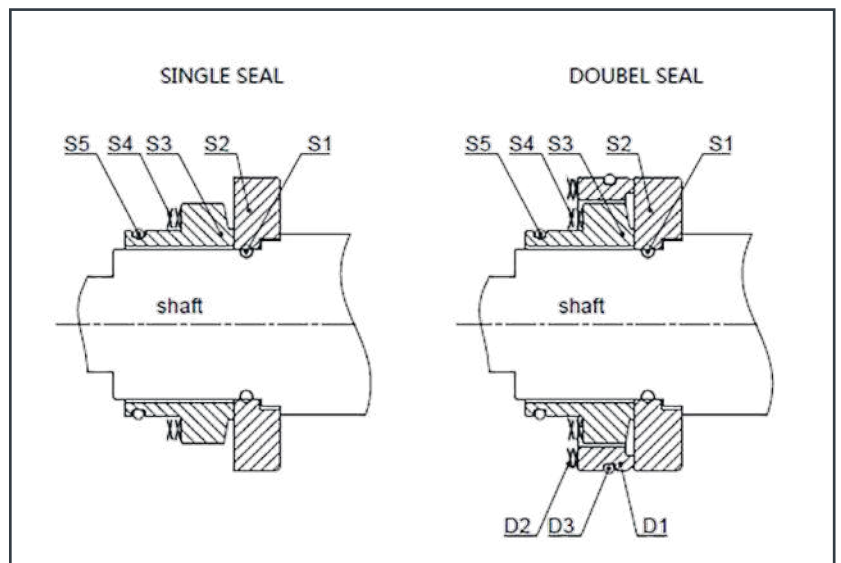
1. Take out the mechanical seal moving ring (part S2) and O-ring gasket(part S1) from the pump shaft
2. Take out the outer mechanical sealing stationary ring (part D1), inner mechanical sealing stationary ring S3, outer mechanical sealing wave spring (part D2), and inner mechanical sealing wave spring (part S4) from the pump head assembly

(Note: Parts D1, D2 only use in double mechanical seal)



Attached pictures (structure sketch of single and double mechanical seal)

NO.	Item	Qty.
S1	O-ring	1
S2	moving ring	1
S3	stationary ring	1
S4	wave spring	1
S5	O-ring	1
D1	stationary ring	1
D2	wave spring	1
D3	O-ring	1



10.7. Screw pump head assembly

Preparing before assembly

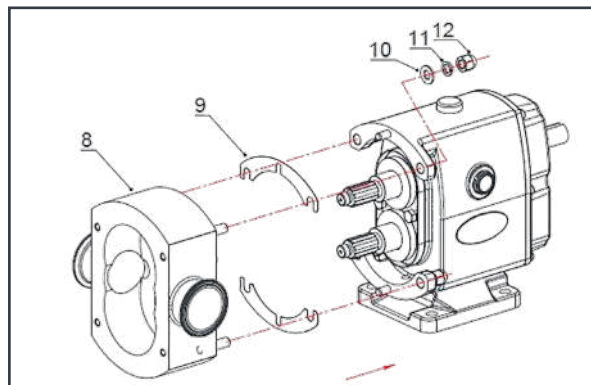
- Cleaning the component
- If there is some part to replace
- Please note that it should be assembled in a clean environment while the mechanical seal is easy to be damaged
- Please use water or lubricating grease to clean the mechanical seal before assembly
- Please do not touch after cleaning

10.7.1. Mechanical seal assembly

In accordance with the disassembly steps of the mechanical seal can be installed after the reverse.
(Mechanical seal structure refer to mechanical seal structure diagram)

10.7.2. Rotor box installation

- Follow the rotor box disassembly steps and assembly reversely



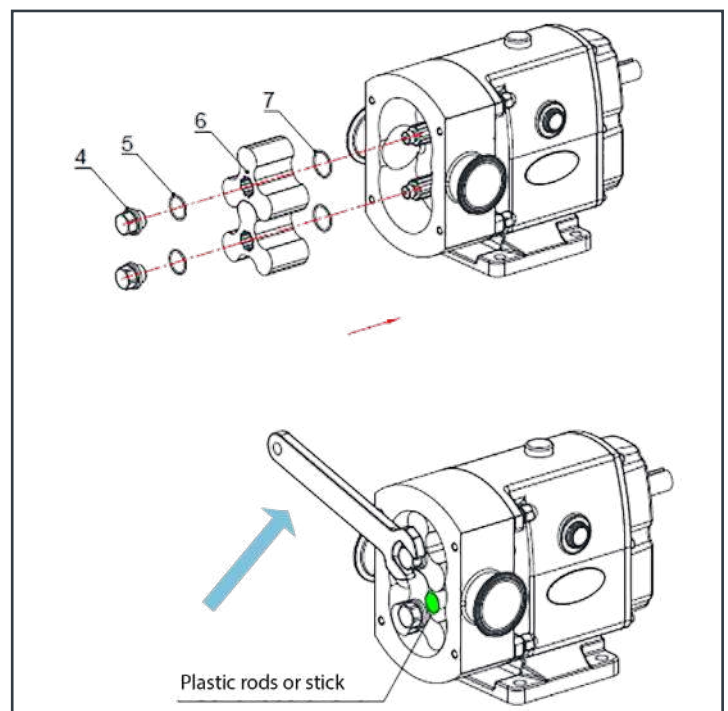
10.7.3. Rotor installation

1. Install O-ring gasket (part 7), rotor (part 6), O-ring gasket (part 5), cam lock nut (part 4) into the pump shaft in turn.

2. Insert a plastic rod or wooden stick into the position shown in the figure to block the rotor, and use a wrench to tighten the cam lock nut (part 4)

Attention:

Tighten the nut on the drive shaft in the clockwise direction;
Tighten the nut on the driven shaft counterclockwise.

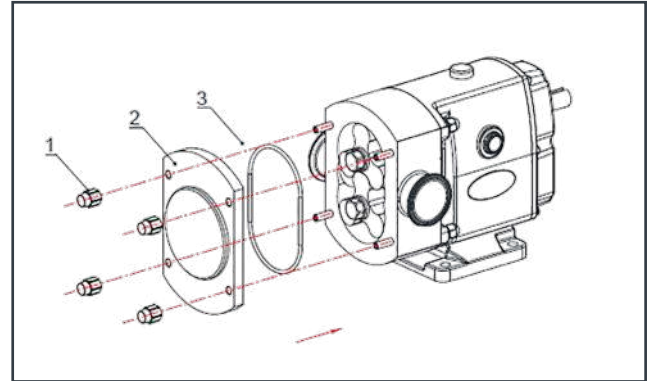


Before tightening the nut, check the rotor clearance, see Chapter 10.7.5



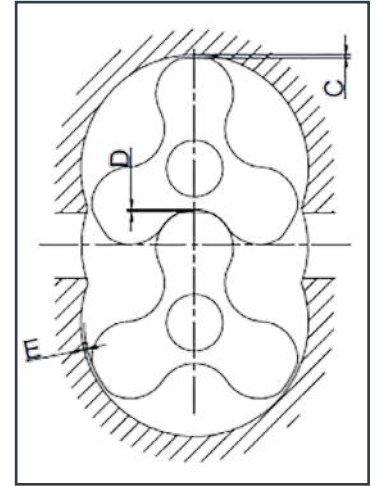
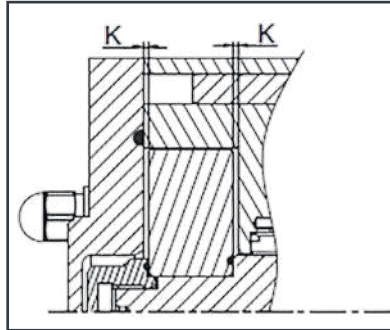
10.7.4. Install the pump front cover

1. Put the O-ring gasket into the sealing groove of the front cover
2. Install the front cover
3. Tighten the front cover and fix nut



10.7.5. Checklist for rotor clearance

Check the rotor clearance according to the following table



- C : Clearance between the outer circle of the rotor and the top and bottom of the rotor box
- D : Clearance between rotor and rotor
- E : Clearance between the outer circle of the rotor and the edge of the rotor box
- K : Clearance between the rotor end face and the front and rear ends of the rotor box

SIZE	C (mm)	D (mm)	E (mm)	K(mm)
L12	0.25 ±0.05	0.20 ±0.05	0.25 ±0.05	0.20 ±0.03
L17	0.25 ±0.05	0.20 ±0.05	0.25 ±0.05	0.20 ±0.03
L24	0.25 ±0.05	0.20 ±0.05	0.25 ±0.05	0.20 ±0.03
L39	0.30 ±0.05	0.20 ±0.05	0.30 ±0.05	0.30 ±0.05
L48	0.30 ±0.05	0.20 ±0.05	0.30 ±0.05	0.30 ±0.05
L55	0.35 ±0.05	0.30 ±0.05	0.35 ±0.05	0.30 ±0.05
L61	0.35 ±0.05	0.30 ±0.05	0.35 ±0.05	0.30 ±0.05
L141	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05
L141-2	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05
L181	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05
L230	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05	0.50 ±0.05

11 Appendix

11.1. Bolt torque

Tighten the bolt and nut torque $\pm 15\%$

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

11.2. Maintenance period

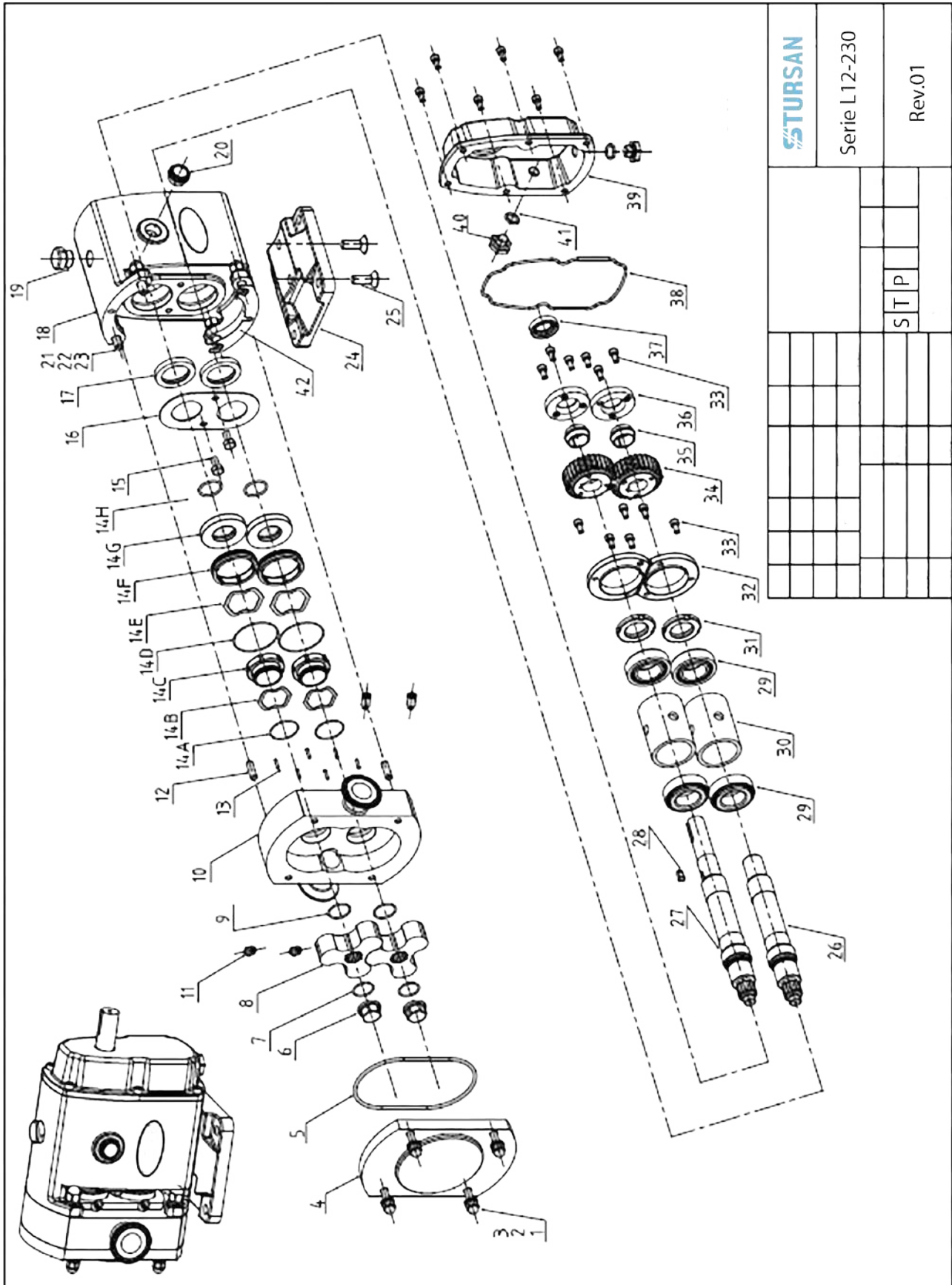
Maintenance period	Applicable working condition	Maintenance operations	Detail Information
Routine maintenance	All working conditions	Check lubricating oil level	Refer to 10.3
Routine maintenance	Double mechanical seal	Check the rinse solution	Refer to 10.2
1000 hours	Extreme operating condition	Replace the lubricating oil	Refer to 10.4
2000 hours	Normal working condition	Replace the lubricating oil	Refer to 10.4
According to requirements	All working conditions	Replace the mechanical seals	Refer to 10.5

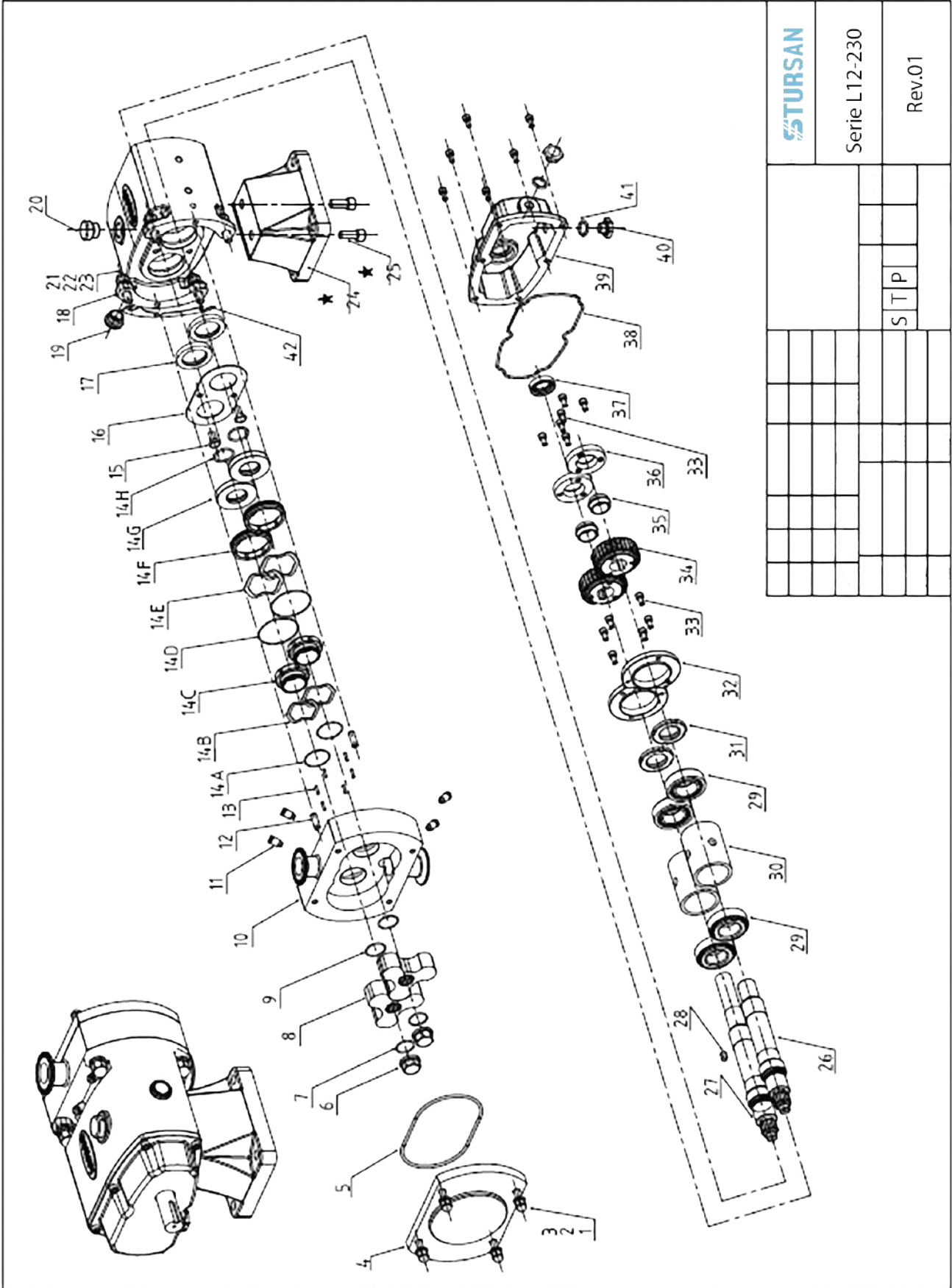


11.3. Common operating problem and troubleshooting

Operating problems	Usual causes problems	Solutions
No flow rate or flow rate instability	The pump cavity is not filled with liquid	Fill up with liquid
	The outlet valve is closed	Open the outlet valve
	The inlet pipe is closed or blocked	Open the inlet pipe or clean
	Inlet pipe leaking and pump cover leaked into the gas	Repair of inlet line and replace the pump cover o-ring
	There is retention gas in the inlet pipe	Raise the inlet line so that there is no gas in the pipe
	The pump is stuck	Clean the pump cavity and check for foreign bodies
	Wrong operate direction	Adjust the motor rotation direction
	The viscosity of the media is too high to be sucked	Increase the diameter of the inlet pipe and shorten pipe
Flow rate is high	The type of pump is too large	Contact Stursan
	The revolving speed is too high	Reduce the revolving speed
Flow rate and head is too low	The type of pump is too small.	Contact Stursan
	Leakage at the suction of the pipe or pump	Check and repair piping
	The media is hard to flow because of the high viscosity	Increase the diameter of the inlet pipe and shorten pipe
	Lobe spacing is over because of the wear	Repair or replace the screw
	Low revolving speed	Improve revolving speed
	The installation position is over than the suction capacity of pump	Reduce the sucked height and sucked resistance of the pipe
Mechanical noise	There are hard objects in the pump cavity	Eliminate foreign body
	Pump overload or lack of lubrication resulting in gear wear	Check,repair or replace the gear
	The revolving speed is too high	Contact Stursan
	Suction pipe obstructed	Check and clear blockages
Shake	Pipe weight and pressure act directly on the pump	Add pipe holder to eliminate resonance
	Wrong assembly for the coupling	Adjust coupling coaxiality
	Not enough strength for the baseplate	Strengthen the baseplate
Temperature of the pump gearbox is too high	Damaged bearing	Replace the bearing
	Lack of lubricating oil	Fill up with oil or change oil
	Wrong assembly for the coupling	Adjust coupling coaxiality
The shaft power increased suddenly	The back pressure of the outlet is too high(low flow rate)	Increase the outlet pipe diameter
	The viscosity of the pumped medium is too high	Contact Stursan
	Bearing or motor is damaged	Check and repair
Mechanical seal leaked	Damaged mechanical seal(wear)	Replace the mechanical seal
	Mechanical seal rotate with out lubrication, the medium's temperature is too high.	Suggest to use double mechanical seal
	Mechanical seal is corroded	Contact Stursan
	The flushing circulation run with out lubrication because of blocked pipe.	Check and repair

11.4. Exploded view and parts list





STURSAN

Serie L12-230

Rev.01

S T P

Code	Item	Specification			Qty	Material
		L12-24	L39-61	L141-230		
1	Front cover hex nut	M8(4pcs)	M10(8pcs)	M12(8pcs)	\	304
2	O ring	OD15X1.5(4pcs)	OD15X1.5(8pcs)	OD17X2(8pcs)	\	NBR
3	Hexagon socket set screw	GB77 M8X40(4pcs)	GB77 M10X40(8pcs)	GB77 M12X60(8pcs)	\	A2
4	Front cover				1	316L
5	O ring	OD135X3.5	OD167.1X3.55	OD250X3.5	1	EPDM
6	Cam lock nut				2	316L
7	O ring	OD25X2	OD35X2	OD55X2.5	2	EPDM
8	Lobe rotor				2	316L
9	O ring	OD29X2	OD32X2	OD49X3.5	2	EPDM
10	Rotor case				1	316L
11	Gas pope joint	KQ2506-M6N	KQ2506-M6N	QS-1/8-6-I	2	SMC/FESTO
	Gas pope joint	KQ2L06-M6N	KQ2L06-M6N	QSL-1/8-6	2	SMC/FESTO
12	Cylindrical pin	GB119.1 8X45	GB119.2 8X26	GB119.2 12X40	2	304
13	Elastic cylindrical pin	GB879.1 3X12	GB879.1 3X15	GB879.1 5X20	6	304
14A	O ring(interior mechanical seal)	ID32X2	ID39X2	ID56X2	2	EPDM
14B	Wave spring (interior mechanical seal)	OD45XID37X6	OD50XID46X6	OD73.5XID67X12	2	304
14C	Static ring (interior mechanical seal)				2	SIC/C/TC
14D	O ring(exterior mechanical seal)	ID53.7X1.78	ID64.77X2.62	ID90.81X2.62	2	EPDM
14E	Wave spring (exterior mechanical seal)	OD57XID52X4	OD64.5XID59X8	OD95XID87X9	2	304
14F	Static ring (exterior mechanical seal)				2	SIC/C/TC
14G	Rotating ring (exterior mechanical seal)				2	SIC/C/TC
14H	O ring(exterior mechanical seal)	ID23.47X2.62	GB5781 M10X12	ID47.29X2.62	2	EPDM
15	Hexagonal head bolt	GB5781 M8X12		GB5781 M10X12	2	A2-70
16	Oil seal limited board				1	304
17	Oil seal	TC35X50X7	TC45X62X7	TC63X80X9	2	NBR
18	Gear case				1	QT450-10
19	Oil level sight glass				1	
20	Oil plug				1	304
21	Hexagon nut	GB802 M10		GB802 M16	4	A2-70
22	Elastic washer	GB93 10		GB93 16	4	A2-70
23	Hexagon socket flat end set screw	GB77 M10X40	GB77 M10X50	GB77 M16X60	4	A2-70
24	Low base				1	QT450-10
*24	High base				1	QT450-10
25	Hexagon socket sunk screw	GB70.3 M10X30	GB70.3 M10X40	GB70.3 M12X35	2	A2-70
*25	Hexagon socket cap screws	GB70.1 M10X30	GB70.1 M10X40	GB70.1 M12X35	2	A2-70
26	Short drive shaft				1	304
27	Long drive shaft				1	304
28	Flat key	B6x14	B6x14	B8x22	1	45
29	Bearing	GB297 32006	GB297 32207/P5	GB297 32210/P5	4	45




Code	Item	Specification			Qty	Material
		L12-24	L39-61	L141-230		
30	Bearing locating sleeve				2	Q235
31	Lock nut				2	304
32	Bearing gland	GB70.1 M6X16(6pcs)	GB70.1 M6X16(6pcs)	GB70.1 M8X20(8pcs)	2	304
33	Hexagon socket cap screws				\	A2-70
34	Gear				2	20Cr
35	Gear tight bushing				2	45
36	Gear gland				2	45
37	Oil seal	TC22X35X7	TC28X40X7	TC42X62X8	1	NBR
38	O ring	OD159*3	OD193*4	OD243*4	1	NBR
39	Gear case rear cover				1	304
40	Oil drain bolt				2	304
41	O ring	OD18X2.5			2	NBR
42	Adjusting shim				2	NBR

Note: Serie L (horizontal type) and Serie L(vertical type) differ from part no. 24 &25 while other parts remain same. When lobe pump is single mechanical seal, part no. 14D,14E,14F needn't be installed.



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