

SLR / SLR-S/N
Instruction Manual



Walrus America Inc

1. Installation and Connection

1.1. Pump Installation

- The pump should be sited in a well ventilated and frost-free position. The distance between pumps-motors and other objects should be kept at least 150mm (0.49 feet), in order to provide enough air for cooling the motor. To reduce the head loss of inlet as least as possible, the inlet pipe length shall be as short as possible.
- Ensure the check valve is installed in pipe line system before the pump installation. If pump is used for boiler water supply, a check valve must be installed in the piping between pump and boiler.
- Pump shall be installed in concrete bases or other rigid and solid bases. It can also be installed in fixed grounds or fixed brackets on wall. It should be avoided to put the weight of pipe system on pump to prevent pump from damage.

Caution: *When moving the motor, it is not allowed to hang it upside down.*

- “Arrow” on the inlet and outlet chamber indicates the flow direction through the pump. Check for smooth liquid flow before starting pump.
- Before pump installation, the inlet pipe line shall be cleaned. If there are impurities in the pipe, it is necessary to install a strainer at 0.5-1mm in front of the pump inlet (particularly recommended for pump with flow less than 8 m³/h).
- The air locks shall be avoided when installing the inlet pipe line. (See Figure 1. on the next page)
- If the outlet globe valve might be closed (or the flow is decreased to be zero), a bypass shall be installed in outlet pipeline to ensure adequate lubricating and cooling water to pass the pump.

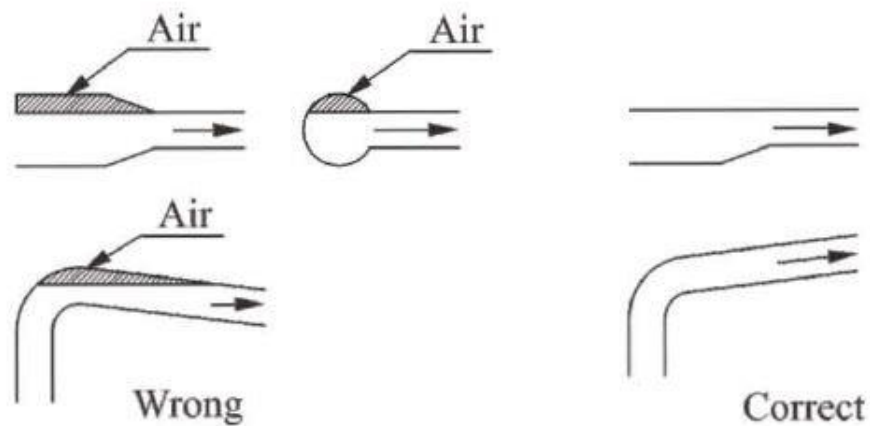


Figure 1. Flow direction

1.2. Electrical Connection

- The electrical connections should be carried out by the authorized electrician.
- Check the motor nameplate to make sure the motor is confine to the power source.
- Make the electrical connection according to the connection diagram inside the terminal box.
- Select a suitable motor starter to protect the motor against single phase run, unstable voltage and overload. The motor shall be properly grounded to prevent electric shock.

Caution: Before taking apart the terminal box cover or dismantling pump, make sure that the power is disconnected.

2. Start-up, Operation and Maintenance

2.1. Do not start the pump until it has been primed

- Fill water in pump in inverse pouring system. Close the pump outlet valve, release air vent screw on the pump head, and open the inlet valve slowly until stable water flows out from the air vent screw. Then tighten the screw. Open the check valve completely in the inlet pipeline.
- In open system, fill water in pump when liquid surface is lower than pump.
Caution: *A check valve shall be installed in the inlet pipe. Close the pump outlet valve, release air vent screw and fill the liquid in pump through the air vent screw hole until the pump and inlet pipe line are filled with water. Tighten the air vent screw again.*
Caution: *Do not start the pump until it has been primed and air vented. Be careful not to position the air vent screw to the installer because the flowing out water may cause personal body injury, especially when the pump is used for hot water system.*

2.2. Check the rotary direction

- Switch on the power supply and make sure the motor rotates the same direction of the rotating direction “Arrows” sticker which is affixed on the motor fan cover. If the “Arrow” sticker has been removed, make sure that viewing from the motor end, the pump should rotate counter-clockwise. When it is rotated in the wrong direction, it can be corrected by changing any two of the cable connection (for 3-phase power).

2.3. Check before pump start-up

- Check whether the foundation bolts are fastened.
- Check whether pump is primed.
- Check whether the voltage of power supply is matched.
- Check whether it turns correctly.
- To make sure all pipe lines are connected tightly and water flow is normal.
- The valves in the inlet pipe line are completely opened and the outlet valve shall be opened slowly after the pump is started up.
- Check the operation pressure if pressure gauge is installed.

- Check if all controls work normally. If the pump is controlled by pressure switch, check and adjust the starting pressure and stopping pressure. Check the full load current to make sure it not surpasses the max current.

2.4. Frequency of pump starts

- Frequent start should be avoided. The max allowable start for 4KW and smaller motors is 100 times per hour while 20 times per hour for motors larger than 4KW.

2.5. Pump installed according to this installation manual will work effectively and require minimum maintenance

- The moving part and stationary part of the mechanical seal are lubricated and cooled by the conveying liquid. When replacing mechanical seal, it requires removing the motors from the pump for sizes smaller than 5.5KW. For pump sizes with motor larger than 7.5KW, it can be directly replaced.
- The bearing within pump is lubricated by the conveying liquid.
- Motor has self-lubricating ball bearing and does not require extra lubrication.

2.6. Frost Protecting

- Pump can be used in the system with anti-frozen measures. If the pump is installed in easily frozen environment, the anti-freeze coolant should be added to the conveying liquid to prevent pump from being damaged. If antifreeze coolant is not used, pump shall be stopped from operation when possible frozen period will occur. When pump is stopped for operation for a long time, the liquid should be drained.

2.7. The following should be checked regularly for pump

- Pump working and operation pressure
- Possible leakage
- Possible motor overheat
- Cleaning/ replacement of all strainers
- The trip off time of motor overload
- Frequency of starts per hour
- Normal function of all starters or controllers

If malfunction is found, please refer to “Fault Finding and Solution chart” for the suggested solution.

2.8. Pump shall be cleaned and stored appropriately when it is not used for a long time

3. Structure

- The pump is mainly composed of motor, pump head, diffuser, impeller, cylinder, inlet & outlet chamber, pump shaft, mechanical seal and so on. Refer to Figure 2, 3, & 4.
- Key parts of the pump, diffuser, impeller, cylinder, shaft, are all made of stainless steel. For SLR series, material of pump head and inlet & outlet chamber are made of cast iron. While for SLR-S/N series, they are made of stainless steel.
- Mechanical seal is a single face seal. Seal part is cemented carbides/carbon. Support part of support diffuser is made of tungsten carbide.
- Normally, pipes are connected by round flanges. Different types of connections are also available on demand of customer.

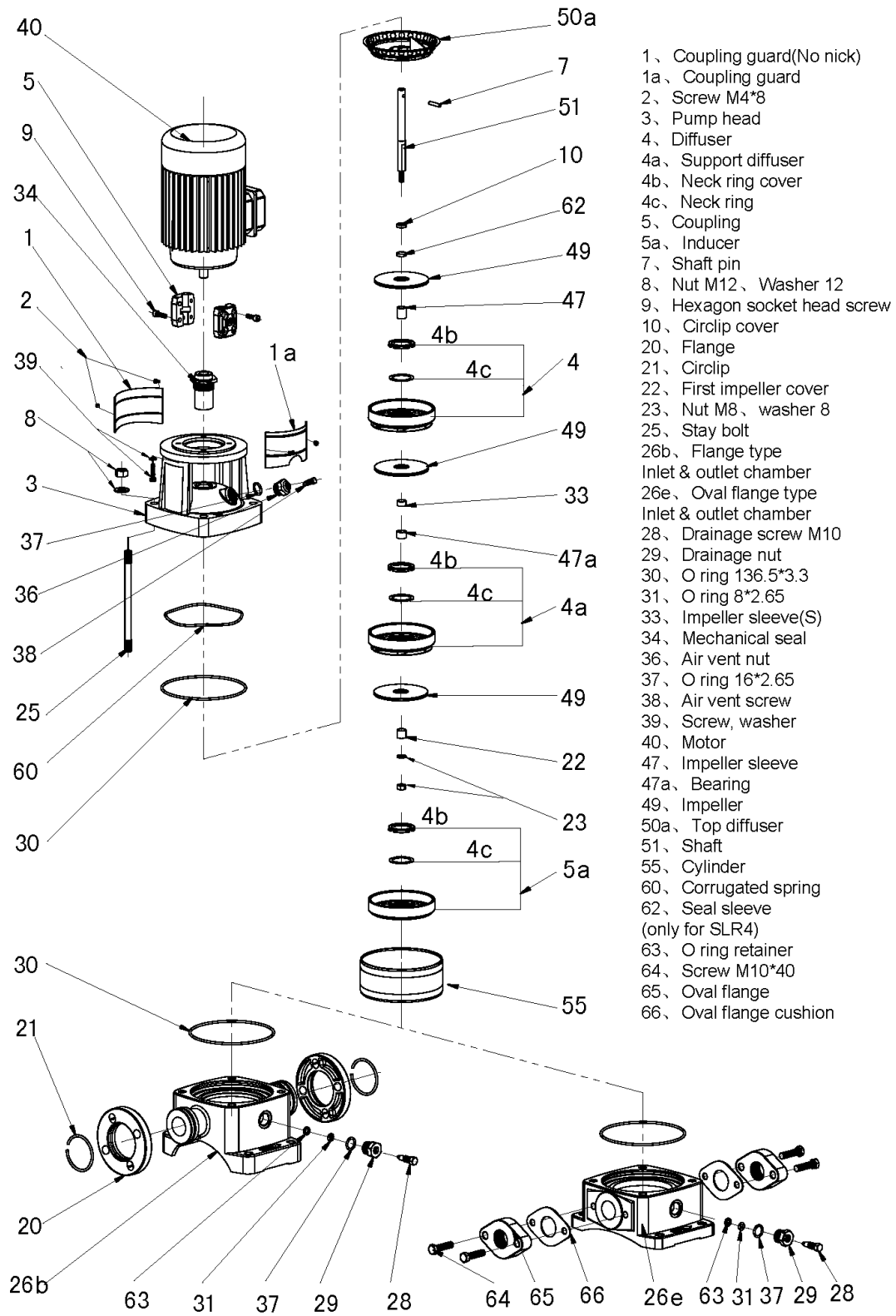


Figure 2. SLR 1, 2, 3 & 4

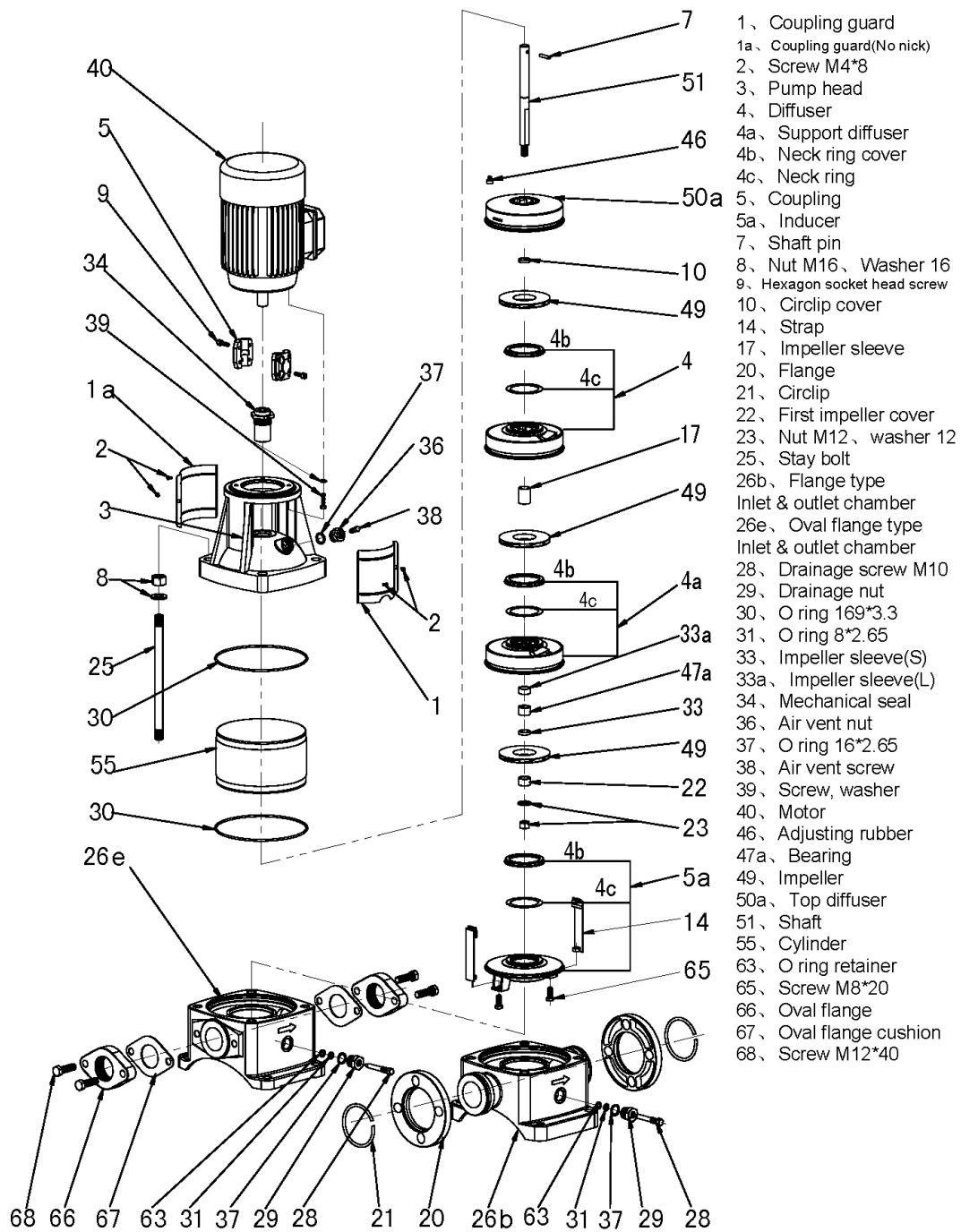


Figure 3. SLR 8, 12, 16 & 20

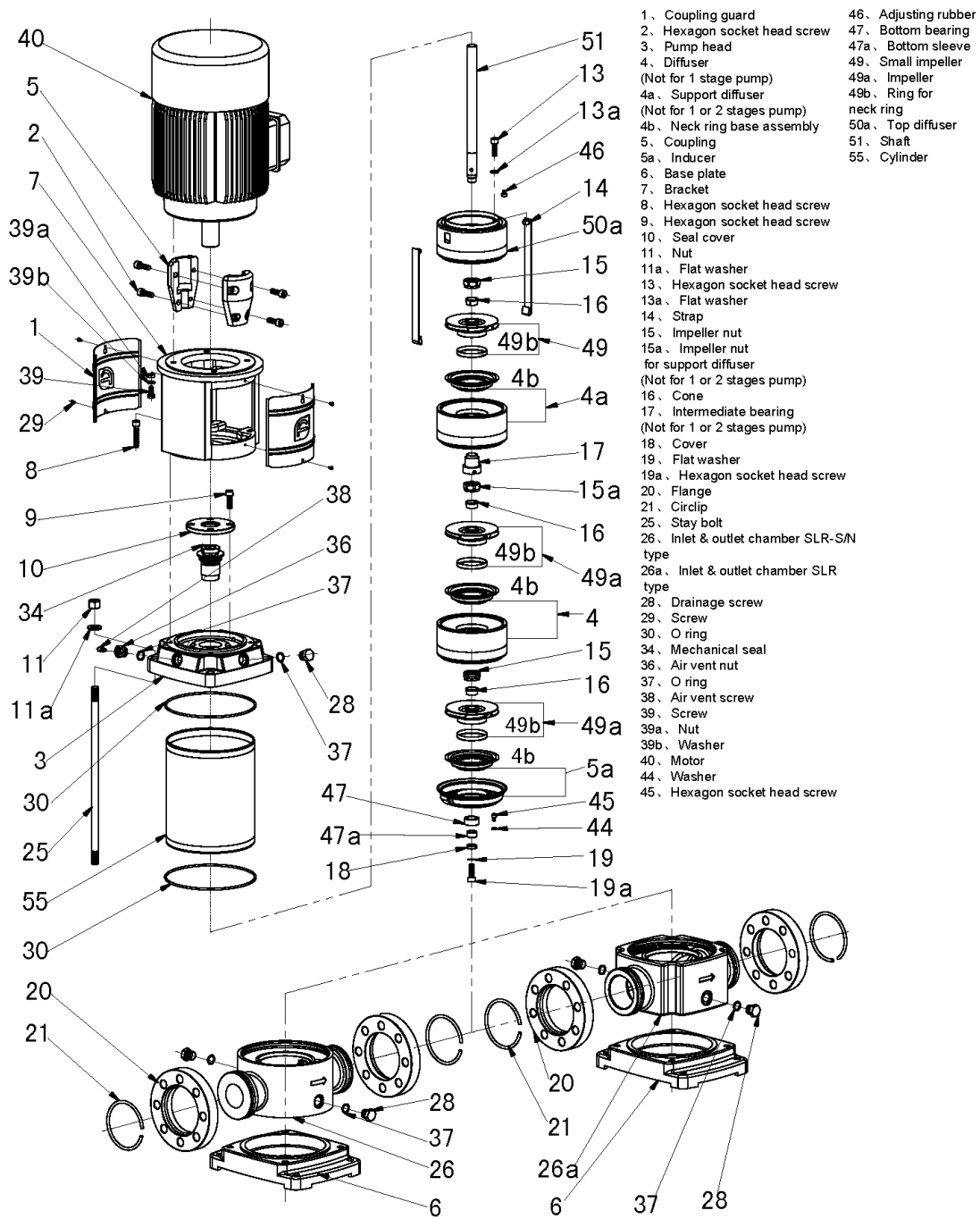


Figure 4. SLR (-S/N) 32, 42, 65 & 85

4. Assemble and Disassemble

4.1. SLR and SLR-S/N 1, 2, 3, 4

- Put the circlip on the shaft, and then fit the sleeve, impeller, impeller sleeve, diffuser, support diffuser. Continue the assemble order till the last impeller is fitted. Then fit the impeller cover, washer, screw the nut. Pay attention to the position of the support diffuser, for low stage pump, the last one is support diffuser. For high stage pump, support diffuser increase accordingly, keep the equal space, and put on the support sleeve and bearing with support diffuser.
- Put the inducer on the inlet & outlet chamber, and then fit the finished parts as above on the inducer.
- Fit the O-ring on the inlet & outlet chamber, put on the cylinder and the top diffuser.
- Put the pump head installed with O-ring, lining and rubber adjusting rubber on the cylinder. Screw the four nuts of the stay bolts on the base plate. Do not tighten one nut completely at one time, but tighten them symmetrically in turn.
- Fit the mechanical seal and tighten it, then install motor and coupling, screw the bolts in coupling (but not tightly), press the coupling and shaft down to the direction of the base plate. Then lift it about 1mm in reverse direction, tighten the screws. Note that the space of the two covers of coupling should be equal.
- Tighten fixing bolts in mechanical seal, rotate the coupling to ensure that the shaft can rotate freely and not be choked. Reverse the process above can disassemble a pump.

4.2. SLR and SLR-S/N 8, 16, 20

- Put the circlip on the shaft, and then fit the sleeve, impeller, impeller sleeve, diffuser, support diffuser, bearing, support sleeve. Continue the assemble order till the last impeller is fitted, and then install the impeller cover, washer, tighten the nuts.

- Put the inlet & outlet chamber on the base plate, then put the O-ring, clamp plate, inducer on inlet & outlet chamber, then put the finished parts on the inducer, and put the top diffuser on the top, tighten nuts of straps. At last, put on the cylinder.
- Put the pump head installed with O-ring, lining and adjusting rubber on the cylinder, then tighten the four stay bolts symmetrically in turn.
- Fit and tighten the mechanical seal, press the shaft to the bottom, then, tighten the fixing bolt in the mechanical seal. Lift the shaft, and insert the adjusting slice.
- Put on the motor, fit coupling, tighten bolts, then take out the adjusting slice.
- Rotate the coupling to ensure that the shaft can rotate freely and not be choked. Reverse the above process to disassemble a pump.

4.3. SLR and SLR-S/N 32, 42, 65, 85

- Put the inlet & outlet chamber on the base plate, fit flanges on inlet & outlet chamber at two sides, and fit the inducer.
- Put the first impeller on the shaft, tighten the nuts and put the impeller on the neck ring seat of inducer, then put on the diffuser, impeller, support diffuser, until the top diffuser, then fix all the diffuser with the straps.
- Shaft parts: fit the bottom shaft sleeve, impeller cover, washer on the shaft, tighten the bolts, fit lower sliding bearing on the inlet & outlet chamber, fit gasket. Then put the shaft parts on the inlet & outlet chamber, fit on O-ring, paint it with lubricating oil and then put on the cylinder.
- Fit stay bolts on the base plate, then fit the O-ring, adjusting rubber, air vent screw on the pump head, and put the pump head on the stay bolts, then put on the washer and tighten all the nuts.
- Fit the mechanical seal on the pump head, then fit the seal cover, tighten the bolts, and the bolts in the seal. Lift the shaft and insert the adjusting slice.
- Fit the bracket and motor on the pump head.
- Finally fit the coupling, tighten the bolts, and take out the adjusting slice. Rotate the coupling to ensure that the shaft can rotate freely and not be choked. Reverse the above process to disassemble a pump.

5. Fault Finding and Solution Chart

Caution: Before removing the terminal box cover and before any removal/ dismantling of the pump, make sure that the electricity power has been switched off.

Fault	Cause	Solution	Remarks
Motor does not start	a) Power supply failure	a) Check power supply	
	b) Fuses blown	b) Replace fuses	
	c) Motor is overloaded	c) Check system	
	d) Main contacts in motor starter are not connected well or the coil is defective	d) Replace motor starter	
	e) Control circuit is defective	e) Check control circuit	
	f) Motor is defective	f) Repair	
Overload device of motor starter trips off immediately when power is connected	a) One fuse is blown	a) Replace fuses	In the case of d) and e), users shall not disassemble the pump by themselves
	b) Contacts in motor starter overload are faulty	b) Check motor starter	
	c) Loose connections or poor power supply	c) Check cable connection and power supply	
	d) Motor coil is defective	d) Replace motor	
	e) Mechanical part of pump is blocked	e) Check and repair pump	
Overload device of motor starter trips off occasionally	a) The setting of overload is too low	a) Reset overload setting	
	b) Periodic power supply fault	b) Check power supply	
	c) Low voltage at peak time	c) Add regulator	
Motor starter has not tripped off but the pump does not run	a) Main contacts in motor starter are not contacted or the coil is faulty	a) Change motor starter	
	b) Control circuit are defective	b) Check control circuit	

Fault	Cause	Solution	Remarks
Discharge flow is not constant	a) Suction pipe is too small	a) Enlarge inlet pipeline	
	b) Inadequate inlet water source	b) Improve system and increase water	
	c) Liquid level is low	c) Try to lift liquid level	
	d) Pump inlet pressure is too low compared with water temperature, pipeline loss and flow	d) Improve system and try to increase the inlet pressure	
	e) Suction pipe/ pump is partially blocked by impurities	e) Check and clear impurities	
Pump runs but no discharge water	a) Suction pipe is blocked by impurities	a) Check and clean suction pipe	
	b) Foot valve or check valve is closed	b) Check and repair foot valve or check valve	
	c) Leakage in suction pipe	c) Check and repair suction pipe	
	d) There is air in suction pipe or pump	d) Re-prime the pump to release air	
Pump loss of prime	a) Leakage in suction pipe	a) Check suction pipe	
	b) Foot valve or check valve is defective	b) Check and repair foot valve or check valve	
	c) Foot valve is blocked when opened or partially opened	c) Check and repair foot valve	
	d) There is air in suction pipe	d) Check and repair suction pipe and release air	

Fault	Cause	Solution	Remarks
Abnormal vibration or noise from pump	a) Leakage in suction pipe	a) Check and repair suction pipe	In the case of e), users shall not disassemble the pump by themselves
	b) Suction pipe is too small or suction pipe is partially blocked by impurities	b) Enlarge or check suction pipe	
	c) There is air in suction pipe or pump	c) Re-prime the pump to release air	
	d) Pump discharge pressure is lower than the required head (pressure)	d) Improve system or choose another pump model	
	e) Mechanical part of pump is rubbed	e) Check and repair pump	

Limited Warranty

SLR series pumps are warranted to the first user only to be free of defects in material and workmanship for a period of 12 months from date of installation, but no more than 24 months from date of shipment. Walrus' liability under this warranty shall be limited to repairing or replacing at our election, without charge, FOB Walrus' distribution center or authorized service agent. Walrus will not be liable for any cost of removal, installation, transportation or any other charges that may arise in connection with warranty claim.

The warranty period commences on the date of original purchase of the equipment. Proof of purchase and installation date, failure date, and supporting installation data must be provided when claiming repairs under warranty.

This warranty is subject to due compliance by the original purchaser with all directions and conditions set out in the installation and operating instructions. Failure to comply with these instructions, damage or breakdown caused by fair wear and tear, negligence, misuse, incorrect installation, inappropriate chemicals or additives in the water, inadequate protection against freezing, rain or other adverse weather conditions, corrosive or abrasive water, lightning or high voltage spikes or through unauthorized persons attempting repairs are not covered under warranty.

Walrus will not be liable for any incidental or consequential damages, losses, or expenses, arising from installation, use, or any other causes. There are no express or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above.

Certain states do not permit the exclusion or limitation of incidental or consequential damages or the placing of limitations on the duration of an implied warranty, therefore, the limitations or exclusions herein may not apply. This warranty sets forth specific legal rights and obligations, however, additional rights may exist, which may vary from state to state.

Supersedes all previous publications



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