



# Instruction manual for ZLH



四川中瑛工业泵有限公司  
Sichuan Zhongying Industrial Pump Co., Ltd

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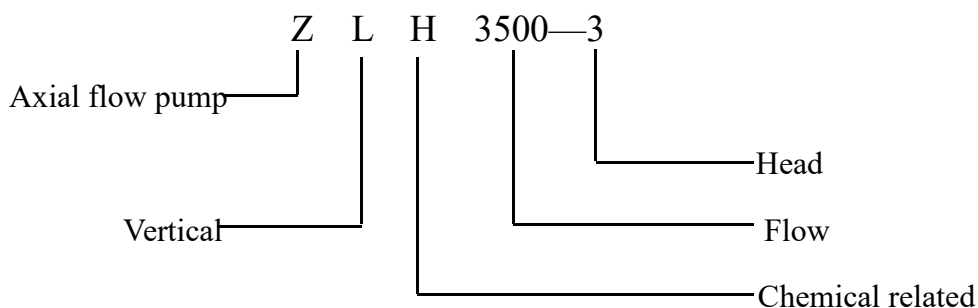
## 1. Overview

ZLH type pump is a typical vertical axial flow pump, suitable for low head and large flow liquid transportation with a wide range of conveying media such as fresh water, sewage containing small particles, or chemical process media containing trace amount of small particles. The maximum temperature of its conveying fluid can reach 50°C or 122.0 °F.

Due to the special design of the ZLH pump, it can be used at different work stations to increase system pressure and liquid level accordingly to effect functions like forced circulation, etc., boasting a wide range of application.

After more than 30 years of production and manufacturing, the product has been continuously improved based on the characteristics of the industry. The product performance is excellent, the operation is safe and reliable, and the trouble-free operation time can last more than one year with low usage and spare parts cost. The manufacturing technology of this pump has reached the leading level in China.

Model type instruction, e.g., ZLH3500-3



The following materials can be provided as the flow-passing parts material of the

pump:

<b>Material</b>		
	Cast steel	Stainless steel
Grey cast iron Cast aluminum	ASTM  WCA WCB	ASTM  CA-15 CA-15M CF-3(304L) 321 CF-8(304) CF-8M(316) CF-3M(316L) 904 CD-4MCu 904L



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## 2. Structure description

ZLH pump is mainly composed of pump body and the drive pars.

The hydraulic design of the impeller takes into account the influence of hub and rim boundaries and inlet pre-rotation, and adopts a variable circulation design method to reduce the hub airfoil placement angle and increase the rim airfoil placement angle. After comparative experiments with several types of blades, the pump efficiency is greatly improved and the range of high efficiency area is also expanded. The same diameter impeller is used to meet a wide flow range of several manufacturers.

The impellers of some large pumps use adjustable blades. When the installation angle of the blades is changed, only the flow rate will change, but the maximum efficiency and the lift at the highest efficiency point will not change. This allows the impeller of the same specification to change within a larger flow range. Efficient operation and more economical than speed regulation.

The original pump shaft is made of high carbon steel, with a stainless steel sleeve for anti-corrosion. Failure of any one of the multiple sealing surfaces will cause medium to leak in, corrode the carbon steel shaft, and make it difficult to disassemble the impeller. If stainless steel is used, the cost is high and the hardness and strength cannot meet the requirements. The pump shaft now adopts a butt-welded shaft structure (45 steel + B or M material), which makes the structure simpler, easier to assemble and disassemble, and improves reliability.

The pump with this structure can repair the impeller and rotor components of the pump without moving the inlet and outlet pipelines, which reduces the labor intensity of workers and shortens the maintenance cycle.

### **3. Installation/Start/Operation/Stop**

#### **1. Before installation**

- (1) Check to make sure that the pump body, drive part and motor are intact. If the pump shaft is bent, it must be straightened.
- (2) Tools and lifting equipment must be prepared.
- (3) Refer to the pump installation structure diagram and check whether the pump

matches the diagram.

(4) The structure of the inlet pool and the number of pumps installed in the same pool determine the water suction performance of the axial flow pump. The following work conditions must be noted:

①The pump impeller should have sufficient immersion depth, and the judgment is based on whether the transported liquid can enter the pump evenly without vortex.

②The required distance between the pump suction pipe and the bottom of the pool should usually be twice longer than the diameter of the suction pipe.

③When several pumps are running in the same pool, they should not interfere with each other.

④There must be a trash rack in front of the water inlet or water channel.

## **2. Installation**

(1) Use a spirit level to correct the pump level. Tighten each of the nuts of the anchor bolts, fill the anchor screw holes with cement, and check the levelness after the cement dries.

(2) The rotating shaft must be installed on the lead vertical line so that the radial gap between the outer circle of the impeller and the wear ring should be even along the circumference.

(3) After installation, check whether the nuts of each coupling and anchor bolts are tightened

## **3. Connection of pump and motor**

- (1) The direction of rotation of the motor should be consistent with that of the pump, and the direction of rotation of the pump should be clearly marked on the pump.
- (2) Install the motor, correct the concentricity of the motor shaft and the pump shaft, and make the two shafts in a straight line. At the same time, leave a certain end gap between the pump and motor couplings, usually 3-4 mm, between the two couplings. The non-axiality of the outer circle along the circumference should be controlled within 0.1 mm.

#### **4. Installation of water outlet pipes**

The water outlet pipeline should be equipped with a separate bracket and should not be supported by the pump body; the water outlet pipeline should be able to withstand the reaction force of the water outlet.

#### **5. Start and Stop**

- (1) Before starting the pump, fresh water should be introduced into the pipe on the stuffing box, and the pump can only be started after the water is discharged normally.
- (2) After the pump is put into trial operation, check each connection part to see if there is any looseness.
- (3) During operation, if the pump makes abnormal vibrations and sounds, it should be stopped immediately. If the inlet water level drops below the specified minimum water level, the machine should be shut down.
- (4) After shutting down during the freezing season, care should be taken to prevent the water in the pump from freezing and damaging components.

## 6. Operation

- (1) During operation, the packing should be pressed tightly enough to allow water droplets to drip out.
- (2) Note that the bearing temperature rise cannot exceed 35°C when working, and grease should be added regularly.

## 4. Possible breakdown and solution

Problem	Cause	Solution
No water coming out of the pump	opposite direction of rotation of the motor	change direction of rotation of the motor
	impeller not immersed deep enough	increase liquid level or lower installation height
	impeller damage	replace the impeller
	device head too high	lower the outlet water level and shorten the pipeline
Not enough flow	speed-adjustable motor having not enough speed	meet required speed
	impeller clearance getting too large and serious corrosion	change impeller or wear ring
	system drag too strong	clear pipeline debris
Vibration	motor shaft and the pump shaft not concentric	adjust to concentric
	poor foundation rigidity and loose bolts	reinforce foundation and tighten bolts
	impeller wear ring unevenly worn and impeller part breaking	change impeller or wear ring
	pump shaft bent	straighten or replace the shaft with a new one



Excessive power	Shaft	bearings and packing pressed too tightly	loose gland
		impeller or wear ring damage	adjust or install impeller or wear ring
		system drag too strong	remove blockage
		motor shaft and the pump shaft not concentric	adjust to concentric
Bearing overheating		too little grease or with debris	add grease or change oil
		bearings damage	replace bearings
		spindle bent	straighten or change one
		motor shaft and the pump shaft not concentric	adjust to concentric
Packing leakage		Loose gland	tighten the packing gland
		packing damage	replace packing

## 5. Pump sets of supply range

(1) Axial flow pump 1 unit;

(2) Motor 1 unit;

(3) Spare parts(impellers, sealing rings, etc.) are supplied according to contract

## 6. Parameters

Model	Q capacity	head H (m)	speed n (r/min)	P <sub>mot</sub> (kW)	weight G (kg)
ZLH300-5	300	5	970	Y160L-6/11	800
ZLH450-1.5	450	1.5	720	Y160L-8/7.5	830
ZLH450-2	450	2	720	Y160L-8/7.5	830
ZLH600-2	600	2	970	Y200L-8/15	840

ZLH750-4	600/750/900	4.2/4.0/3.4	1450	Y200L-4/30	900
ZLH750-6	750	6	1450	Y225S-4/37	900
ZLH1000-3	1000	3	730	Y280S-8/37	1600
ZLH1000-4	1000	4	730	Y280M-8/45	1250
ZLH1200-4.5	1200	4.5	730	Y280M-8/45	1620
ZLH1775-2.5	1775	2.5	730	Y280M-8/45	1620
ZLH2000-2.5	2000	2.5	400	Y225M-4/45	3500
ZLH2300-2.5	2300	2.5	400	Y225M-4/45	3500
ZLH2500-2.5 II	2500	2.5	400	Y225M-4/45	3500
ZLH2500-4	2500	4	730	Y315M-8/75	2800
ZLH2500-4 II	2500	4	730	Y315M-8/75	2800
ZLH2500-4III	2500	4	730	Y315M-8/75	2800
ZLH3000-2.5 II	3000	2.5	970	Y315S-6/75	2400
ZLH3400-4	3400	4	980	Y315M-6/90	2500
ZLH3400-4 II	3400	4	980	Y315M-6/90	2500
ZLH3400-4III	3400	4	980	Y315M-6/90	2500
ZLH3400-4.5	3400	4.5	980	Y315M-6/90	2500
ZLH3500-3 II	3500	3	585	Y315L2-10/75	3950
ZLH3600-2.5	3600	2.5	970	Y315S-6/75	2500
ZLH3600-2.5 II	3600	2.5	970	Y280M-6/55	2500
ZLH3700-4	3700	4	970	Y315M-6/90	3000
ZLH3700-4 II	3700	4	970	Y315M-6/90	3000
ZLH4000-3 II	4000	3	970	Y315M-6/90	3000
ZLH4500-2.5	4500	2.5	585	Y355M1-10/90	4450
ZLH5000-4	5000	4	730	Y355L2-8/185	4900
ZLH5000-6	5000	6	730	Y355L2-8/185	5060
ZLH6500-2.5	6500	2.5	585	Y355M2-10/11	4500
ZLH6500-3 II	6500	3	585	Y355M2-10/11	4500
ZLH450BD-2	450	2	720	Y160L-8/7.5	830
ZLH600-1.6	600	1.6	970	Y160L-8/7.5	690
ZLH600-2	600	2	970	Y180L-8/11	710

ZLH2800-1	2800	1	200	Y200L-4/30	2500
ZLH3700-3	3700	3	585	Y315L2-10/75	2800
ZLH4500-1	4500	1	180	Y200L-4/30	3950
ZLH4500-1.3	4500	1.3	180	Y200L-4/30	3950
ZLH5700-1	5700	1	180	Y225S-4/37	4200
ZLH6500-1	6500	1	180	Y225S-4/37	4200
ZLH6500-1.3	6500	1.3	180	Y225S-4/37	4200
ZLH6500-1.5	6500	1.5	180	Y225M-4/45	4300
ZLH7300-1	7300	1	180	Y225M-4/45	4300
ZLH7300-1.2	7300	1.2	200	Y250M-4/55	4400
ZLH7300-1.3	7300	1.3	185	Y250M-4/55	4400



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