



BOREHOLE PUMP

Instruction Manual



Congratulations on your purchase of a LEO Borehole Pump



It is important that you read, fully understand and observe the following safety precautions and warnings. Careless or improper use of the machine may cause serious or fatal injury. The user is responsible for any accidents involving other people or other people's property.



This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Attention!

If the appliance or the supply cord is damaged, it must be repaired by manufacturer, its service agent or a qualified person.



Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available.



WARNING!

1. Read this instruction manual carefully before operation to ensure that the pump work safely and smoothly.
2. Pump shall be reliably grounded and must be equipped with a leakage protection switch to prevent leakage of electricity. For the sake of safety, do not wet the plug or the socket. The plug and socket should be located in an area where it cannot be affected by humidity.
3. Connect the pump strictly according to the diagram; otherwise, it might result in electric shock, personal injury or damage to the pump.
4. When the pump is in operation, avoid contact with water in pump's working area.
5. Never lift or carry pump by the electrical cable. Use a chain or rope to install/remove pump.
6. Cable joints immersed in the water shall be strictly sealed. Apply water

repellent and check for leakage.

7. When the protector trips frequently during operation, shut off the pump to check and restart the pump.
8. Carry out repairs or maintenance when pump is shut down and that only can be done by professional.

General Introduction

This deep well submersible pump is produced according to the China national standard, which consists of YQ series submersible motor and XR series multi-stage pump. Owing to its high lift and flow rate, efficient, simple structure and easy to use & maintain. Therefore, it is widely applied to water pumping project in river, dam and canal etc. It is mainly use for farm irrigation, water supply for human being and animals with drinking water in plateau or mountain areas as well as drainage in city, factory, railway, mines and construction site.

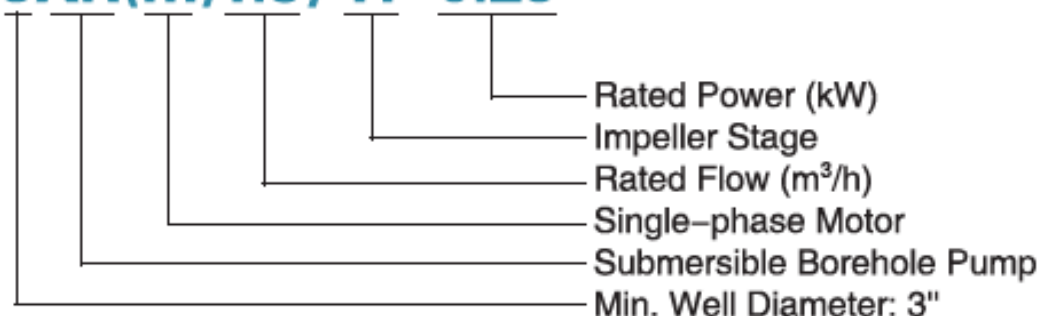
Conditions of Use

- Electricity Supply:
 - Single-phase: 110V±5%, 220V±5%, 50Hz±1%,60Hz±1%
 - Three-phase:380V±5%, 50Hz±1%
- Water Property
 - The water temperature should not be over 35°C;
 - The Maximum solid particles should not be over 2mm and the content of the impurities should not be over 0.02% by weight.
 - The acid-balance of the water should be between 6.5 and 8.5 PH. The content of H₂S should not more than 1.5mg/l;
 - The content of chloridion should not more than 400mg/l;
- It needs to install guiding cover for high-power and high flow rate deep well submersible pump which is used for pool, large diameter well or conditions alike. Pump should ideally be installed vertically, with a maximum of 30 degrees from vertical if necessary. Horizontal installation is strictly prohibited.
- The deep well submersible must be submerged completely to function properly. Allowing it to run while not under water can damage the unit.

Descriptions of Model, specification and performance

Model Meaning

3XR(m)1.8/11-0.25



Type	3XRm2.5/16-0.55	3XRm3.5/16-0.75	4XRm4/10-0.75	4XRm4/14-1.1
Power	550 W / 0,75 HP	750 W / 1,0 HP	750 W / 1,0 HP	1100 W / 1,5 HP
Outlet diameter	1" / 1.25"	1" / 1.25"	1,25" / 1,5"	1,25" / 1,5"
Q. max	3,6 m ³ /h	5,4 m ³ /h	6,0 m ³ /h	6,0 m ³ /h
H. max	64 m	62 m	70 m	98 m
Max. immersion depth	80 m	80 m	80 m	80 m
Min. well diameter	3"	3"	4"	4"
Gross weight	15 kg	16 kg	17 kg	19 kg
Package	170x165x1200mm	170x165x1200mm	225x165x865mm	225x165x990mm

Selection of Pump

- Condition of Deep Well
 - 1..1 Requirements in the process of pumping
 - 1..2 Well diameter and well depth
 - 1..3 Static water level and dynamic water level of well
 - 1..4 Water Output and guarantee of water source
- Calculation of Pump Total Head

Formula:

$$H = H_1 + H_2 + \frac{V^2}{2g} + h$$

H ---Total Head for the whole unit: (m)

H₁---Vertical distance from dynamic water level to the mouth of a well

H₂---Pressure value in the outlet of pump base X 102. It is pump head.

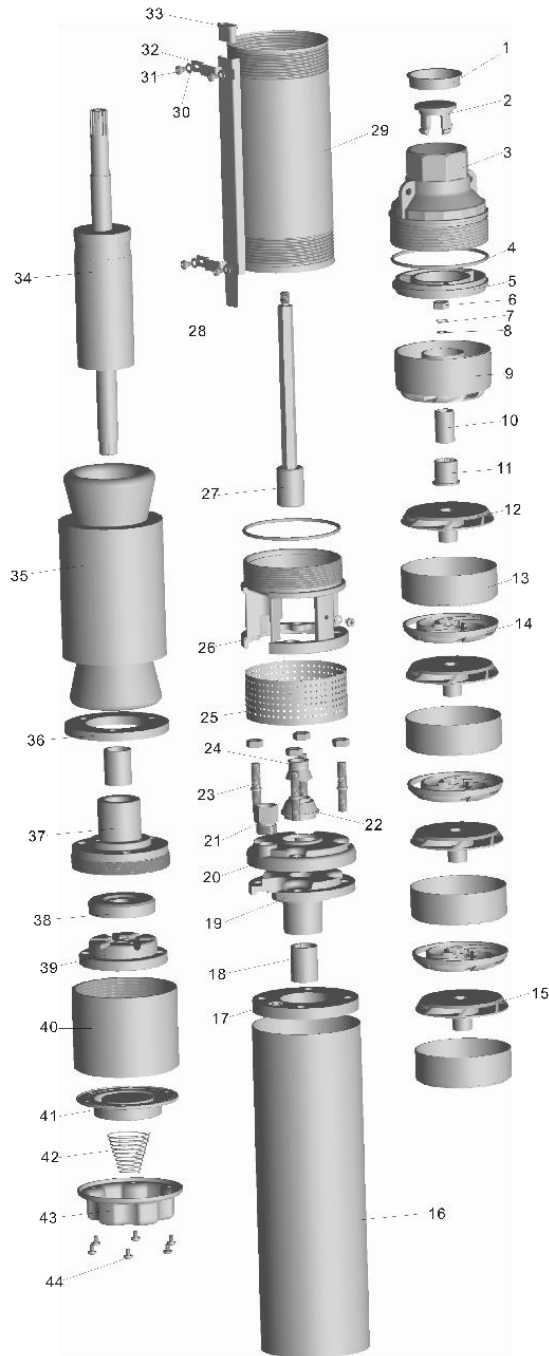
$V^2/2g$ ---Head of pump base

h ---Head loss in the pump pipe inside the well, refer to the table below

Pipe Diameter (mm)	Flow Rate(m ³ /h)													
	3	4	5	6	7	8	9	10	12	14	16	18	20	25
Head Loss(m)														
25	15.8	28	40											
32	5	8.5	13	17.5	24	30	38							
40	2.2	3.8	5.5	7.8	10.2	13	16.5	20	28	38				
50	0.6	1	1.5	2	2.8	3.5	4.3	5.2	7.3	10	12.5	15.5	18.8	28.5
65	0.2	0.3	0.4	0.6	0.8	1	1.2	1.5	2	2.8	3.5	4.5	5.3	7.8

Structure Description

This deep well submersible pump consists of pump working part, pump power part (submersible motor), pipe part, gate valve and control box etc. Connecting pump with motor with the shaft coupling to work under water. See the figure below for its structure.



No.	Part	Material
1	Dust cover	PE
2	Check valve	ABS
3	Outlet joint	AISI304
4	O-ring	NBR
5	Locating sleeve	PPO-GF30
6	Nut M8	AISI304
7	Spring washer 8	AISI304
8	Plain washer 8	AISI304
9	Fixed bracket	PPO-GF30
10	Bushing	AISI304
11	Rubber bearing	NBR
12	Impeller	POM-GF20
13	Pump casing	AISI304
14	Guide vane	PPO-GF30
15	Primary impeller	POM-GF20
16	Motor barrel	AISI301
17	Top dead mouth	HT200
18	Bearing	Ceramic
19	Upper bearing seal part	HT200
20	Cover	AISI301
21	Nut	3Cr13
22	Sand protecting ring	304
23	Double-screw bolt	AISI301
24	Water thrower	NBR
25	Screen	AISI301
26	Inlet joint	AISI304
27	Pump shaft part	AISI304
28	Cable guard plate	AISI301
29	Pump barrel	AISI301
30	Plain washer 5	AISI301
31	Cross-head screw	AISI301
32	Cable guard plate clip	AISI301
33	Cable jacket	NBR
34	Rotator part	
35	Stator part	
36	Bottom dead mouth	HT200
37	Lower bearing seal part	HT200
38	Thrust plate	3Cr13
39	Thrust bearing	Babbitt
40	Pump base	HT200
41	Extension part	NBR
42	Spring	2Cr13
43	Footing	304
44	Cross-head Screw M5X16	304

Installation & Use and Maintenance

Unit Installation

1..1 Check the Well

- (1) Check the well diameter: Before purchasing and installing the pump, check to see if the well's internal diameter complies with the minimum dimensions of our deep well submersible pump.
- (2) Washing the internal well: if it is a new well, sundries and mud should be removed by air compressor or old submersible electric pump. When the water in the well meets the pumping standard, then install the pump into the well.
- (3) Check the well water: check to see if the water quality and temperature comply with the conditions described for our pump.

1..2 Assembly of pump and motor

The products we produce can be divided into two types, integral type and detachable type. According to their configurations, for products with high power and high head, motor and pump are packed separately. If it is a detachable type, assemble the pump according to the following

- (1) Before assembly, check to see if the specifications of the motor and accessories match that of the pump.
- (2) Respectively check the axial float distances of motor and pump component. As for pump, it needs a 2-3mm axial float distance; as for water filling motor, it needs a 0.5-1mm axial float distance. Be sure that the pump shaft and motor shaft rotate freely without problems.
- (3) The motor and pump should be kept horizontal. Open the screen and cable guard plate in the pump. Then connect the motor to the pump. Rotate pump and motor during the connection to make sure they are connected correctly. Then tighten the coupling nuts.
- (4) Connect the cables as specified in this manual.

1..3 Splicing of pump cable and control box

- (1) Three-phase pump: The pump cable can be connected to any wire holder on the control box. When the pump rotates in reverse, you can exchange any two wires.
- (2) Single-phase pump: The color of pump cables must be in accord with that specified in the wiring diagram on the control box. If not, make sure that the cable numbers are in accord with that in the wiring diagram; otherwise, it can cause damage to the pump.

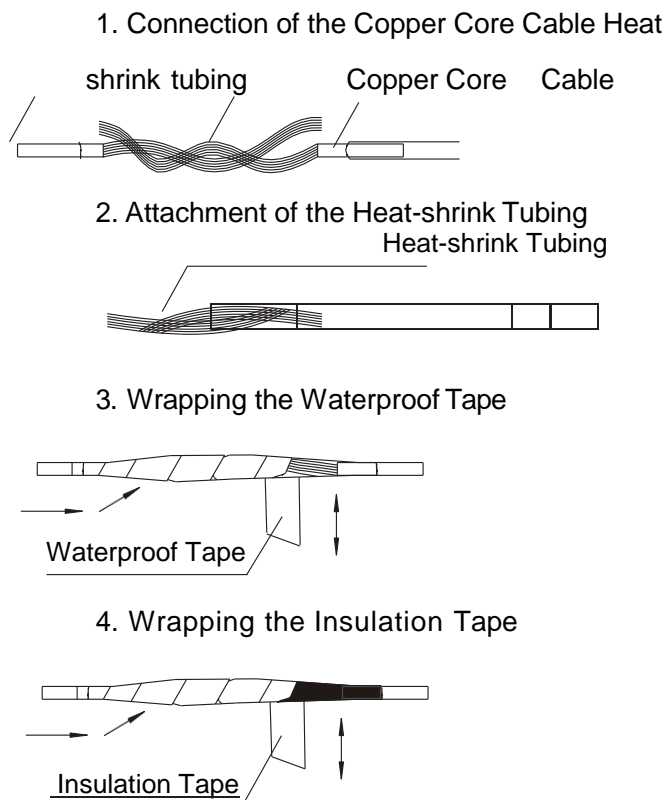
1..4 Method of attachment for cables

- (1) Peel the coating of the cable about 50-60mm by wire stripper, then strip the rubber hose of each core to expose the copper bare wire about 20-30mm.
- (2) Respectively attach heat-shrink tubing to the stripped cable. Firmly Twist two cables of the same color into a spiral shape to ensure a firm connection.
- (3) Cover the bare copper wire fully with heat-shrink tubing. Use the heat gun to strengthen the connection. Be sure there is no damage to the heat-shrink tubing.
- (4) Wrap the connected wire core separately with waterproof tape. The

waterproof tape should cover more than 10mm of the heat shrink tubing on both the start and end sides. The waterproof tape should be elongated by pulling in 200% before wrapping and apply as per normal wrapping tape.

(5) Use the waterproof tape to bind that three-wrapped wire core together. The waterproof tape should be elongated by pulling in 200% and should cover more than 50mm of the cable rubber coating on both the start and end sides.

(6) Cover the wrapped cable again with the electrical insulation tape, which should cover the waterproof tape fully. As shown:



1..5 Selection of cable:

Motor Power (kW)	Cable Standard							
	4×1	4×1.5	4×2.5	4×4	4×6	4×10	4×16	4×25
	Cable length(m)							
Single -Phase	0.37	55	80	130				
	0.55	35	55	90	140			
	0.75	25	40	65	105	160		
	1.1	20	30	50	75	115	190	
	1.5		22	36	60	90	145	230
	2.2			25	40	60	100	165
Three -Phase	0.37	280						
	0.55	210	315					
	0.75	165	240					
	1.1	120	180	285				
	1.5	90	135	225	360			
	2.2	65	400	165	255	390		
	3.0	45	65	110	180	255	420	
	4.0	35	50	85	135	195	330	520
5.5		42	70	110	165	270	430	
7.5				80	130	200	320	585

1..6 Check the pump

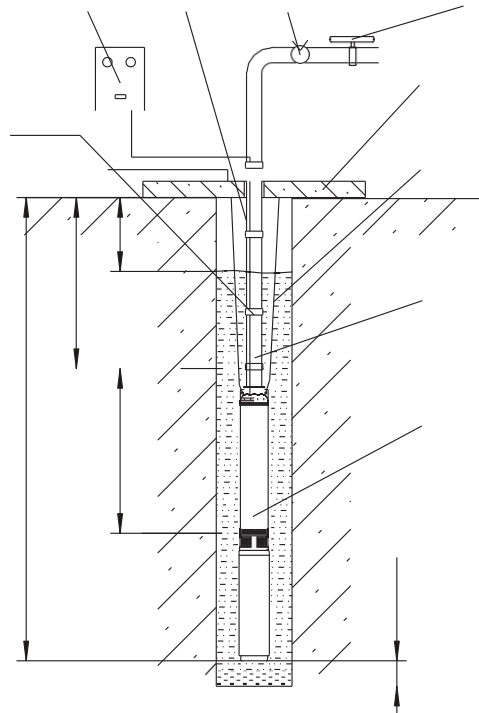
- (1) Check to see if all the connections of the pump are firm. Be sure that the pump shaft rotates freely without problems.
- (2) Be sure that all cables are undamaged and comply with requirements. Carry out the insulation leakage test. Dip the cable joints into the water for 12 hours. Use a 500V megaohm meter to test cable's insulation resistance. The cold resistance should not be less than 50 M.
- (3) Start the pump to see if the running direction complies with that specified. Pay close attention that the idle running time is not more than 2 seconds.
- (4) After checking, attach the screen and cable guard plate to the inlet joint.

1..7 Unit Installation

- (1) First fix the prepared rope to the lifting ring on the outlet joint. If the distance is less than 30m, the cord can be made of nylon, which has good strength. The joints with the pump must be wear-resistant; otherwise, the rope could be damaged due to vibration of the pump. When the distance is over 30m, fix it with steel wire.
- (2) Connect pipes to the pump with the accessories, such as the thread adaptor. Use wrench and pipe wrench to ensure the connection is tight.
- (3) Slowly place pump into the well and keep the pump upright. Bind the cable to the pipe with the binding tape every two meters. Make sure that cables are not pressed to the well wall during movement of the pump, which will cause damage to the cable.

1..8 Warning for the installation

- (1) During the process of lowering the pump, if it becomes clogged, do not force it down any further. This will avoid blockages and possible damage to the pump.
- (2) Determine the depth of the pump below the surface according to the mud and content condition of the well. Do not place the pump into the mud. The distance between pump and the bottom of a well should not be more than 3 meters.
- (3) The distance from the submerged pump to the dynamic water level should be less than 1 meter. Otherwise, it will cause damage to the pump due to the idle running.
- (4) If the pump is installed too low a valve should be used on the pipeline, outside the well, to control the flow rate and protect against tripping of the control box or burnout of the motor caused by a too large flow rate.
- (5) Connect the motor earth line correctly to avoid causing electric shock due to electric leakage. Install the pump as illustrated.



6.2 Use and Maintenance

- 2.1 After setting up the pump, check the insulation resistance again and make sure there is no damage to the cable. Turn the pump on to test after making sure everything is ok. Check to see if the voltage and current on the control box comply with that on the specified technical parameter of the pump. After checking the flow rate and there is no vibration and noise, the unit can be used.
- 2.2 After the pump has run for 5 hours first time, the pump should be shut down immediately to check the hot insulation resistance. It should not be less than 0.5M
- 2.3 The time interval between shut down and restart is better to be 30 minutes to prevent damage to the pump due to the incomplete backflow. The startup times in 24 hours are better to be less than 10 times.
- 2.4 After normal operation, regular inspection of the voltage, working current and insulation resistance may extend the pump's service life. If any of the situations listed below exist, immediately shut the pump down for troubleshooting.
 - (1) The current exceeds 20% of the rate current under rated head and flow rate.
 - (2) When the dynamic water level is below the inlet joint, it will result in water pumped intermittently or running idly.
 - (3) Violent vibration of the pump and pipeline.
 - (4) The voltage is too low.
 - (5) Fuse in the control box is burned out.
 - (6) The hot insulation resistance for motor to the earth is less than 0.5M
 - (7) After the pump has been working for a year, or after it has been submerged for two years, take the pump out to clear sundries or replace worn parts.

Troubleshooting

Symptoms	Main Causes	Correction
Water cannot be pumped up or water flow is too small	The motor cannot start	<ul style="list-style-type: none"> ● Check to see if there is a phase failure or a poor contact ● Check to see if it is caused by an undersized cable. If so, use a bigger diameter cable. ● Check to see if it is a suitable control box. ● Choose a suitable control box.
	Blocked in pipeline or screen	Clean the pipeline and screen
	Impeller blockage or wearing in floating wear ring or sealing ring for guide vane	Remove the sundries inside the pump or replace the impeller, guide vane and sealing ring
	Pipeline broken or water leakage	Repair or replace the pipeline.
	The three-phase pump rotates in reverse	Change any two-phase cables positions
Excessive current or trips off frequently	Too large flow rate. Too low head and motor is under overload operation	Adjust the flow valve to decrease the flow. Diminish the motor load or replace a low head pump
	The pump shaft bends. The Impeller is blocked.	Replace the pump shaft or rubber bearing
	The rotator is blocked or the thrust bearing wears badly.	Replace the thrust bearing or thrust disc.
The hot resistance of the motor is too low or tripping of the earth leakage protector	There is a breakage in rubber cable	Replace the cable
	Sealing failure in motor	Shut down the pump to do the maintenance and check for tightness
The motor cannot start but it seems has current	Phase failure	Check the power cord and connect the fuse
	Too low voltage	Adjust the voltage to meet the specified requirements

Guarantee terms

Please carefully retain the guarantee card completed by the seller, or the proof of purchase.

Pre-conditions for the 24-month guarantee entitlement:

- Deployment of the device solely for private use.

The guarantee is reduced to 12 months in the commercial sector or leasing business.

- Proper handling and observance of all information given in the operating manual, which forms part of our guarantee terms.

- Observance of the prescribed maintenance intervals

- No unauthorized alteration of the design.

- Presentation of the completed guarantee card and/or proof of purchase.

Any guarantee claim shall be immediately void in the event of unauthorized repairs. Faults and defects, which can be traced to material or manufacturing faults will be rectified exclusively by our contracted workshops (the seller has the right to remedy a defect) in your vicinity or by the manufacturer if the latter is closer. Any claims going beyond the provision of a guarantee are ruled out. Any transport damage should be reported not to us but to the shipper in question since, otherwise, any compensation claims the shipper would be voided.

Information concerning the packaging materials

The used packaging materials must be thrown into the relevant waste collector.

In case of the need of any parts, questions or service instructions please contact:

- szerviz@gamagarden.eu
- +36 30 508-6563

Acquaer Ltd., 4900 Fehérgyarmat, Szatmári u. 11 certifies CE conformity of the above-mentioned product and that it complies with the technical data specified in the data plate and the "Operating instructions".

You can get detailed information about the CE declarations at: www.gamagarden.eu

