

Solar - Submersible Pump type: LJ1012 / LJ2012 / LJ3012

Operating instructions

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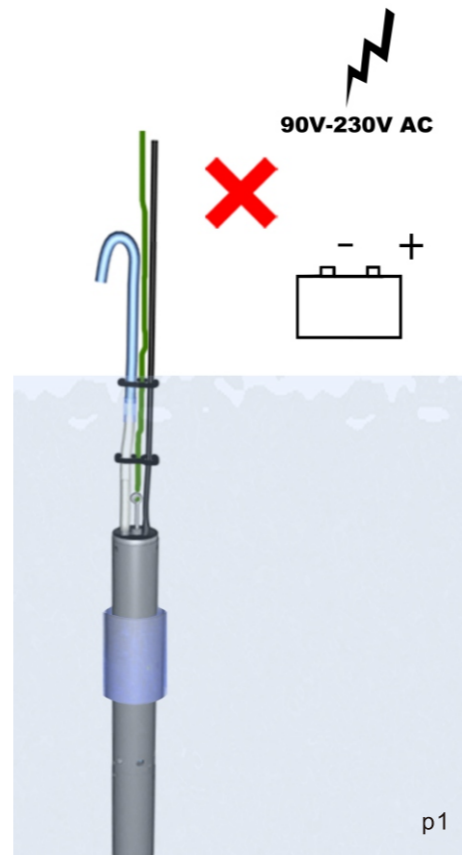
Congratulations on purchasing this environmentally friendly solar pump. To maintain trouble-free operation of the solar pump, please pay close attention to the following points.

Security advice

For ordinary user, this pump is only operated by a suitable solar panel. The solar pump **must not** be operated directly with a battery, a power supply unit or with an alternating voltage in any case. Disregard of this advice will damage the pump and also cause the exclusion of any warranty. See picture p1.

The procedure described in the manual only covers the direct operation of the pump with a suitable solar panel. Under special conditions, if this solar pump is operated by other energy sources, the specific valid regulations for the particular country have to be considered. The installation, maintenance, and repair of this product may only be carried out by a skilled person, who has obtained written authorization.

Non-compliance with these operating instructions will negate the pump manufacturer ACLIMA Technology Ltd from any liability claims for personal and material damages.



A. General advices

A1.0) The ACLIMA solar pump is a product, which is easy to install, maintain and operate, for self-sufficient application in connection with a suitable solar panel even in remote places. The operating instructions explain the installation, the maintenance and the possible trouble shooting as detailed as possible, so that you as a user can repair the pump in most cases.

Note: If the pump works well from the start, open to avoid the pump out of curiosity. Many errors were caused by curious customers even at the beginning of use.

A2.0) ACLIMA solar pump works only during the daytime. The pump, designed for this working condition, is directly powered by solar panels. As its mechanical part is perfectly adapted to the changeful environment of low-density solar energy, the pump realizes multiple novel applications that were formerly technically impossible. Whether using a single pump or a combination of more pumps, the user may utilize this product with ease and at will.

A3.0) The operation of our solar pumps in connection with solar panels is absolutely safe due to the compliance of the so-called safety extra-low voltage (working voltage < 60 volts). The installation, the maintenance or the repair of the pump, according to the rules given in the manual, can be undertaken without special safety measures.

A4.0) The pump integrates a polarity reversal guard circuit.

A5.0) The pump integrates a fuse protection circuit and a self-insurance recovery circuit to protect the control unit.

A6.0) The pump is safe for "dry running" for many hours as long as it is exclusively operated by the suited solar panel. This function is especially advantageous when water supply replenishes slowly.

A7.0) The springs, submersible cable, as well as the filters are wear parts and are not subject of the guarantee. These components can wear out during a certain time span of operation (according to the water quality) and must be exchanged every now and then. The abrasion depends predominantly on the actual composition and pollution level of the water. Spare parts like springs, submersible cable, as well as the filters can be bought from the dealer or directly from us: service@liujia.com.

A8.0) Clients, who need special-performance submersible cable may contact ACLIMA . Ltd. beforehand for a joint solution.

B. Solar panels – for energy supply

B1.0) Every pump type has been optimized for a certain solar energy amount by the mechanical principle. This is why the customers should always use the provided solar panel.

However, the solar pump can also operate with available bigger solar panels to deliver enough water in unfavorable weather conditions. If special problems occur in this case, please refer to B13.0 or ask for advice at the solar company or contact us directly.

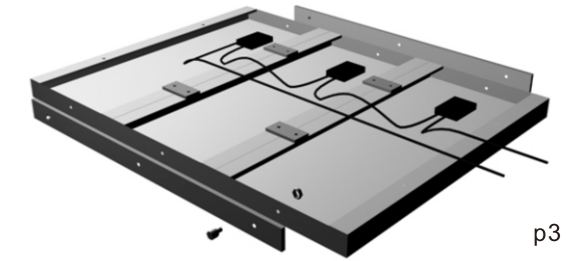
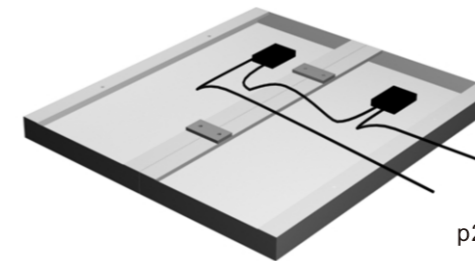
B2.0) The solar panel dissipates (SO) attacking sunlight in current and drives the ACLIMA pump. The power of the solar panel will substantially be decreased by shades, dust and even bird manure. Therefore, it is very important

that solar panels remain always clean. The solar panel should be mounted in an accessible and clean location.

B3.0) Only for type LJ1012-S: For the operation of the solar pump the solar panel model LJ-C12/18 to maximum 13 Wp (Vmp 18.00 V, Imp 0,75A) are suitable.

B4.0) **NOTE:** The peak voltage (Vmp; 18V) cannot be measured with a multimeter. Only a 20-22V no-load voltage (Voc) of the solar panel, which is not connected to the pump, can be measured. The pump may not work if the voltage is below this value.

B5.0) Only for type LJ2012-D: For the operation of the solar pump, two solar panel models LJ-C12/18 (for Vmp 36.00 V, Imp 0,75A) up to maximum 26 Wp are very suitable, if electrically switched in a row. See picture p2.



B6.0) With a multimeter a 40-44V no-load voltage (Voc) of the solar panel, which is not connected to the pump, can be measured. The pump may not work if the voltage is below this value.



B7.0) Only for type LJ3012-T: To operate the pump, the serial installation of the 3 solar panel models LJ-C12/308 to a maximum 39 Wp are best suited by switching them electrically in a row. These solar panels are packed together with the pump, See picture p3.

B8.0) With a multimeter a 40-44V no-load voltage (Voc) of the solar panel, which is not connected to the pump, can be measured. The pump may not work if the voltage is below this value.

B9.0) For LJ3012-B: Two solar panels, each up to a maximum 20 Wp, Vmp18.00V, Imp 1.10A, electrically switched in a row (for Vmp 36.00 V, Imp 1,10A and up to 40 Wp) are also suitable.

B10.0) If an extension cable is necessary between the solar panel and the diving cable (TA) of the pump, the distance should not be longer than 10 m. Use a suitable cable cross section to minimize the power loss in the cable. If the power loss through the extension cable is too large, the pump may not be able to operate normally or even cannot be started.

B11.0) If the extension cable has to exceed 10m in length, e.g. in cases where the pump is submerged in deepwater for operation, the voltage may be boosted by adding more solar panels in series to compensate for the losses caused by the extension cable.

- a. Refer to B3.0, B5.0. The addition of one solar panel LJ-C12/18 can boost the voltage by 17,5V.
- b. Refer to B7.0. The addition of one solar panel LJ-C12/308 can boost the voltage by 12,0V.
- c. **Note:** Nevertheless, this method cannot boost the pumping capacity of the pump under normal solar radiation conditions.

B12.0) The maximum power of the pump indicates the optimized performance of mechanical motion. If more input power is added to the maximum power, the pump will become overloaded and the pumping capacity will drop until zero. In the end, the circuit of control unit will start self-protection to stop the pump. Therefore, if you continually boost the power of solar panels regardless of the local solar radiation condition, you may get the reverse of what you expect. In more serious cases, the pump may break down.

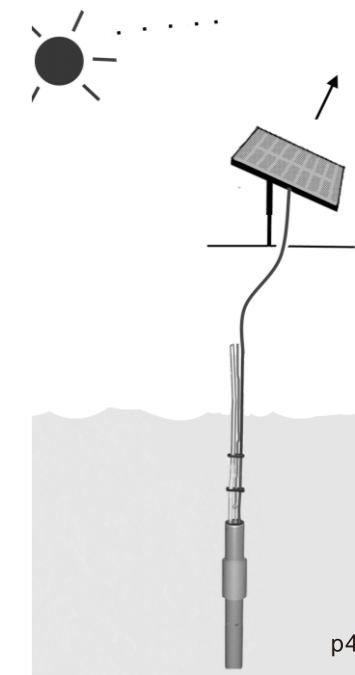
B13.0) However, in some special environments such as high latitudes, forests and canyons, the user may use high-power solar panels to employ the energy of diffused light to drive the pump. In this case, the user must seek from the distributor and ACLIMA special technical guidance on how to gradually increase the power of solar panels until the optimal power is identified for different stages and climatologic conditions. See picture p4

C. Water quality and related conditions

C1.0) The ACLIMA pumps are designed for following delivery heights:

- LJ1012: max. Pumping height 10 meters
- LJ2012: max. Pumping height 20 meters
- LJ3012: max. Pumping height 30 meters

C2.0) Reasonable and efficient delivery heights:
LJ1012 suits best for a height of 2m to 7m



LJ2012 suits best for a height of 7m to 15m
LJ3012 suits best for a height of 15m to 25m

Regarding the actual water output, it brings no advantage, e.g. to use the LJ3012 for a delivery height of less than 10m or the LJ2012 for a delivery height of less than 5m.

C3.0) Only for type LJ1012, LJ2012!! When exceeding the maximum delivery height (LJ1012-> 10m, LJ2012-> 20m) the output of water nearly reaches zero in each case. It still continues to work, however, no damage will occur.

C4.0) Example: A pump delivers water in a closed container, which is mounted on a house roof. Sometimes the pressure in the water tank is so high that the pump will not deliver water. To insert a switch here is not necessary since it still continues working, however, no damage from high pressure will occur.

However, when the switch was damaged or someone forgot to turn the pump on, the pump would otherwise silent for a long time in water. In this case, different types of damage to the pump could be caused.

C5.0) The pump should not be left idle in the water for a long time without operation, because the pump might be damaged. If it is foreseeable that no water is required for some days, either take the pump completely out of the water or make sure that the pump can operate all the time.

C6.0) The term "delivery height" or "water column" stands for the vertical distance (H) between the surface of the

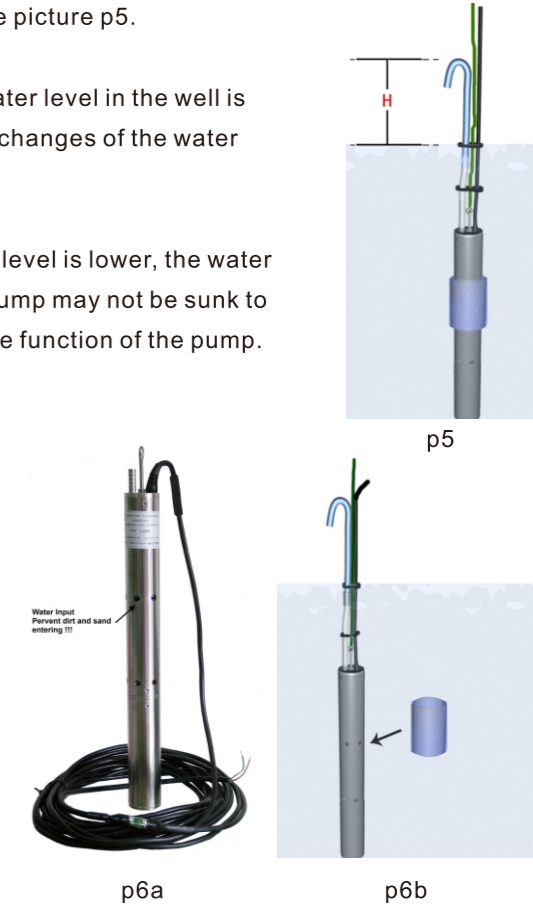
water of the water source to the highest place of the water hose. See picture p5.

C7.0) Before the installation it should be ascertained how high the water level in the well is right now and how deep the water reaches to the ground, as well as changes of the water level connected to the seasons.

C8.0) The lowest submerged depth of the pump is 50 cm. If the water level is lower, the water will not reach the entrance (OE) of the pump. At the same time the pump may not be sunk to the ground of the water source. The mud at the ground can impair the function of the pump.

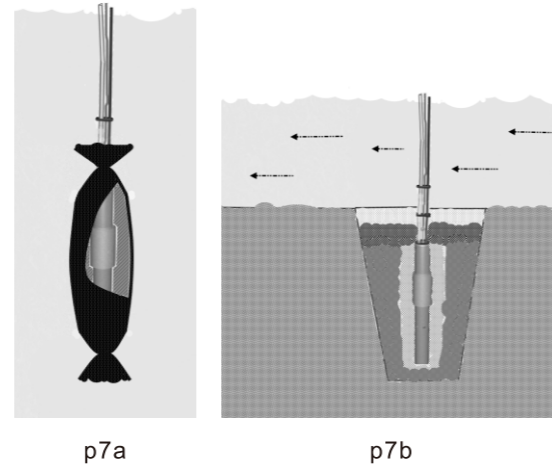
C9.0) The maximum temperature of the delivering medium (e.g., water) should not exceed 25°C. Higher temperatures can cause damage to the pump mechanics. Particular strong temperature variations of the delivering medium can cause short-term failure of the pump. For such special applications please pre notify us.

C10.0) For a frictionless function and a long life span of the pump, dirty water or chemical loaded water should never be pumped. Basically the pump is designed for clean water only. In particular for newly built wells you should wait before the utilization of the pump until the water is clear and the airborne particles in the water are deposited. See picture p6a, p6b.



C11.0) The ideal underwater working conditions for the pump include a flow rate of less than 2m/min, a sand grain diameter of over 0,03mm and a sand content of less than 30g/m³.

C12.0) For working conditions exceeding the above conditions, if the water is not always clean, e.g., operation in a river, lake or a tank where rainwater with sand can flow in, the filter is very important. The method shown in pictures and various locally available measures must be adopted to protect the pump to avoid possible damage of the pump mechanics. For details, please contact the distributor or send e-mails to us at service@liujia.com. See picture p7a, p7b.



C13.0) The user may also bind the water inlet of the pump with corrosion-resistant fibrous material, such as strips of coat sleeves or trouser legs. After the pump is securely bound and fixed in place, a good filtration effect can be achieved.

C14.0) The maximum pumping capacity is 2L/min. When the effective filtration area of the filter is sufficiently large, the user does not have to worry that the filter will reduce the pumping capacity.

C15.0) If sand grain enters the pump accidentally, the pumping capacity will experience a remarkable drop. Please clean the pump valve and piston as instructed by F16.0-F19.0.

C16.0) If between the water tank and the pump a tube lengthening is necessary, you can connect other tubes for the crossing. Please consider the longer the connection tube becomes, the greater the friction losses of water become in the tube. A tube length of 100 m corresponds to a reduction of the available conveyor height of about 1 m.

D. System setup:

Usually the following tools are necessary for the installation:

- A 40-cm-deep bucket with clean water
- A thin rope to measure the water depth
- Screwdriver
- Side cutters
- Wire stripper
- Soft brush
- Soft cloths
- Insulating tape

D1.0) The external diameter of the pump amounts 52 mm. In this case you must pay absolute attention that no objects fall into the well, because these could become stuck between the pump and the well wall. If this occurs the pump will not function properly.

D2.0) The solar pump can only operate in a vertical position. The pump must not be positioned at the bottom of the well, otherwise mud or other dirt particles might stop the pump from working normally. See picture p8, p9.

D3.0) Only hang up the pump on the intended metal insert and definitely do not use the connecting cable and the water pipe of the pump.

D4.0) Before the installation you should test the system in a suitable container with water during a sunny day. First connect the enclosed cable

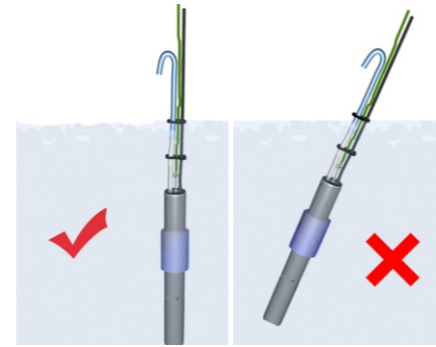
(KA) with the solar panel and pay attention to the correct polarity. According to solar intensity you must wait approx. 10 seconds until the solar pump starts working. Then you should hear a clear tact and the water will be pumped out. See picture p10.

D5.0) At the end of the submersible cable, there is a tester (TE) located to check if there are any defects in the protection of the pump. See picture p11.



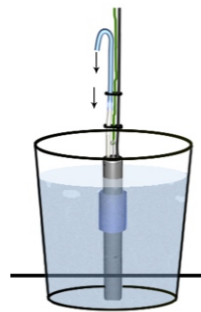
p11

D6.0) In the tester two LED's are integrated: LED 1 (green), LED 2 (red). If the solar panel delivers the right voltage and



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the pump functions correctly, you must see: LED 1 (green) "**BLINKING LIGHT**" and LED 2 (red) be "**ON**". If this is not the case, please see G. for defect removal.

D7.0) In accidental or incorrect cases, such as lightning strike and connection of storage batteries without prior approval, the fuse tube may be blown. As shown in E2.1a, the LED 2 (red) will be off and the pump will not be electrically connectible to the power supply.

D8.0) **CAUTION:** The fuse tube in the speedy tester can withstand a current equal to more than 2,0 times the rated pump working current. If the fuse tube in the speedy tester is blown, it indicates that the pump worked under unpermitted operating conditions. In this case, the pump will not be entitled to a warranty.

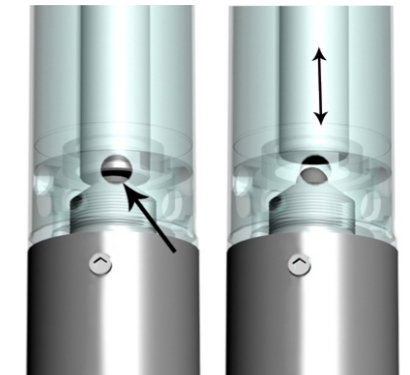
D9.0) If you are not able to change the protection, you can cut off the tester. Indeed, the pump is protected by the second protection in the control unit.

D10.0) These problems may occur during the initial installation of the pump.

a. Defect in the power supply-----control to pt. G6.0

b. Blocked piston---an easy method to test is described below:

On the lower opening you can note a small piece of the piston. If it cannot be seen, the piston has become stuck on the top of the inside pipe (IR). If small pieces of the piston are to be seen, the piston should be pushed carefully upwards with a small level screwdriver. The piston must be able to move. If this is not the case, the piston has blocked itself. See picture p12.



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If a defect is ascertained, the maintenance work must be carried out first like described in pt. F13.0-F15.0.

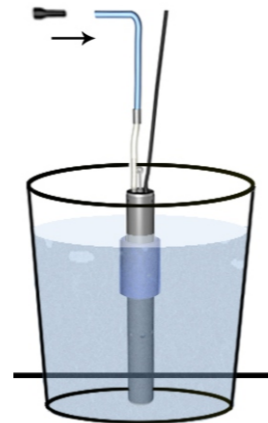
D11.0) An end of the water hose (WA) is already premounted with a silicone balance tube (AU). You only have to fasten the silicone tube (AU) with the help of an O ring (OR) on the pump. Seal the exit of the water pipe. Let the pump run in a bucket to check the density of the water pipe and the silicone tube. The tube is soft and elastic. The O-ring will not tighten the screws too tight, in order to avoid damage of the tube.

D11.1) Seal the exit of the water pipe. Let the pump run in a bucket for a short time to check the density of the water pipe, in particular of the silicone tube. See picture p13

D12.0) If everything is OK, fix the hose at one end of the transition piece reliably to the hanging rope (HA) along with the watertight cable. The working pump will generate an up-and-down vibration with a range of about 2mm. It is necessary to take steps to prevent the outlet pipe, pressure compensation hose or watertight cable, from being damaged by rubbing against the narrow wall of the well. This is also intended to prevent the metal casing of the pump from rubbing against the plastic well wall.

D13.0) Install the filter properly on the pump.

D14.0) Pay attention to the fact that if the pump is lowered into a well shaft, the filter may



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slip off because of the narrow well wall.

D15.0) Solar pump and water hose should be dropped slowly into the water source. Because the pump is insensitive to dry run, it can be lowered during the operation into the water without causing damage. According to solar intensity the water can be promoted quickly or slowly. If after one minutes no water is pumped up, the pump should be lowered deeper down to the water spring until it is reached.

D16.0) Afterwards the water hose should be fastened tightly beyond the well, so that it cannot fall into it.

D17.0) After choosing a suitable place for the solar panel (SO), check whether it is well protected against falling down, lightning and theft.

D18.0) The electric connections in the solar panel and in the pump must be well isolated against penetrating humidity to prevent short circuits.

E. System dismantling:

Usually for the dismantling the following tools are necessary:

- Screwdriver
- Hexagonal key 8mm (accessories)
- Hexagonal key 3mm (accessories)
- Cross screwdriver
- Soft brush and cloth

-- Oil, free of resin (accessories)

If the solar pump has to be taken out of the water and is not used for a period of one week, you must follow the dismantling steps laid out below to allow a frictionless commissioning.

E1.0) The dismantling should be carried out during a sunny day. If this is not the case, the following steps described have to be repeated briefly before the storage of the pump.

E2.0) First take the running pump from the water and remove the water hose incl. the balance tube from the pump. Take off the filter carefully, clean it in clear water and let it dry afterwards.

E3.0) The pump must continue operating for at least 30 minutes, so that through the winding warmth any water evaporates in the internal parts of the pump. Then the electricity supply can be separated.

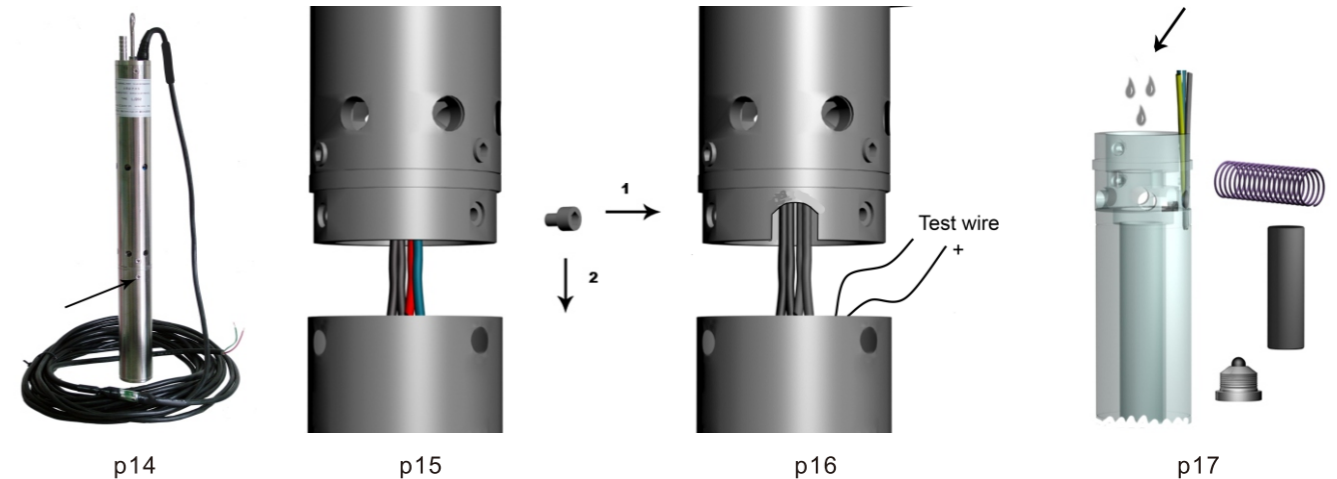
E4.0) Interrupt first only the positive connection (+) between the cable of the solar panel and the pump. After an at least 2-minutes break, the deficit connection (-) can be interrupted. The reason is to prevent a short circuit because of the unloading of the pump electronics.

A short circuit in the connecting lead of the pump is absolutely to be avoided. The pump's electronics can be damaged by the electric unloading (short circuit).

Demolition of the lower part of the pump

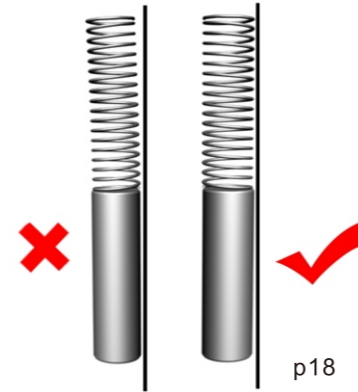
E5.0) First unscrew three screws (US) with the cross screwdriver on the underside of the solar pump. Put the control unit (OH) aside carefully. See picture p14, p15, p16.

E6.0) Open the ground screw (SE) in the pump (BO) with the enclosed hexagonal key. Take out the piston (KO) with the main spring (HF) carefully. Clean the piston with a soft brush and clear water. If it is necessary renew piston and main spring. Afterwards oil the piston with a very light thin layer and at the same time let 3-4 drops of oil drop into the inside pipe (IR). The corrosion of the mechanical parts is thereby prevented during the storage. See picture p17.



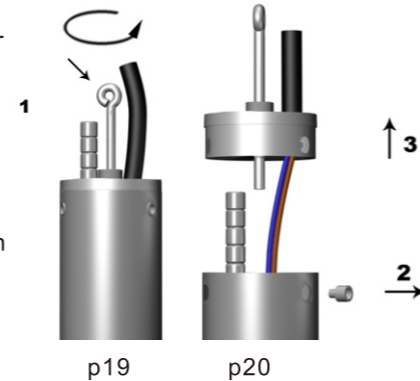
Use only oils exclusively free of resin, no fat or similar lubricants!

E7.0) After the oiling the piston is inserted into the pump again. Attach first the piston spring to the piston and then insert it back into the pump with the spring ahead. The spring must be placed as straight as possible just right on the piston. A deformed spring can suffer from early abrasion and be broken. See picture p18.



E8.0) Test with finger pressure whether the piston moves in the pump easily. Then screw the screw again and tighten it with the hexagonal key. Afterwards the control unit is assembled with the pump.

E9.0) It is recommended to let the pump run once more for a few minutes after completion of the above steps. The oil will thereby spread well inside the pump. Then the pump can be stored in a dry place.

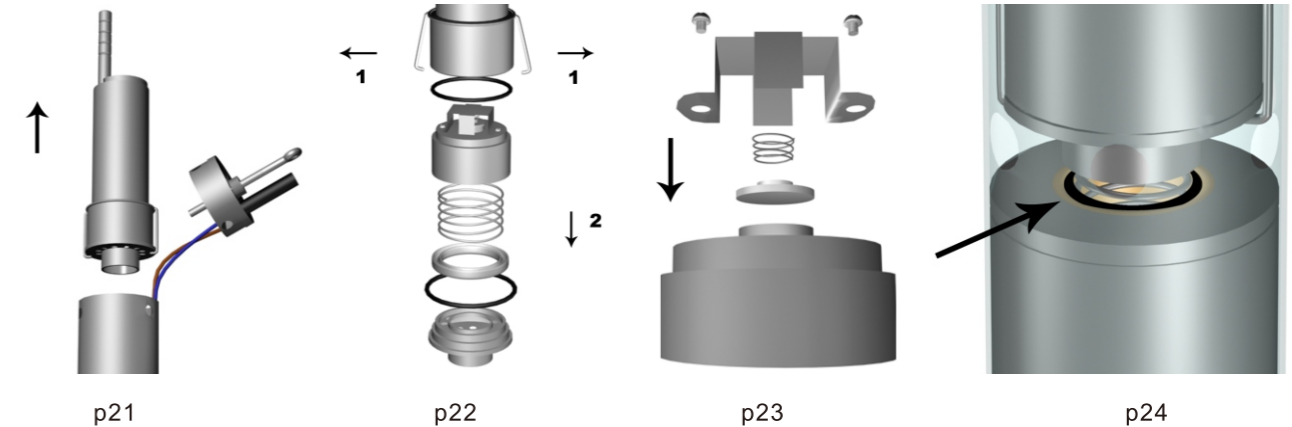


Demolition of the upper part of the pump

E10.0) First remove the silicon balance tube. Then remove the metal insert on the top and open 3 screws (OS) in the upper body (OB) of the pump. Raise the upper part (OT) of the pump carefully till the water output (WA) detaches from the upper part. Afterwards take out the water output carefully. You can

see the valve body (VK). Avoid damaging the cables!! See picture p19, p20.

E11.0) With a top tong the bracket (KI) will be separated from the valve body (VK). Carefully remove the valves (VE1) (VE2) (VE3), spring (FE1) and the seal washer (DI1) (DI2) one by one from the valve body. See picture p21, p22, p23



E12.0) After the work is completed insert the valve components to the valve body in the opposite order.

E13.0) **Attention!** There is an important seal washer (DI3) in the pump. The valve body must sit exactly on this seal washer; otherwise the pump will not generate any pressure. See picture p24.

E14.0) Afterwards the valve body should be inserted into the pump again. The upper part (OT) should be put in the pump on the valve body. First 3 screws (OS) are fastened on the upper body (OT), then the metal insert should be screwed. Through the pressure of the metal on the valve body, it will firmly connect with the seal washer (DI3).

F. Maintenance

The following tools are usually necessary for the maintenance:

- A 40-cm-deep bucket with clean water
- Hexagonal key (accessories)
- Cross screwdriver
- Screwdriver
- Top tongs
- Around stick of plastic or wood with a diameter of 16 mms, length 30 cm
- Hammer
- Soft brush
- Soft cloth
- Oil, free of resin

F1.0) In the following situations the pump should be waited during a sunny day:

- a: After 6-months operation duration
- b: Before hibernation
- c: Presumably sand in the pump
- d: Slow decreased conveyor achievement

Preparation

F2.0) The pump should be taken out of water while being in operation. First the metal insert should be checked to see whether it has become loose during the operation by vibration. If this is the case, it must be screwed again. See picture p25

F3.0) The filter should be checked to see whether the reduced conveyor achievement results from soiling. Clean the filter in clean water or renew the filter.

F4.0) Seal the exit of the water pipe. Let the pump run in a bucket for a short time to check the density of the water pipe, in particular of the silicone tube. If a draft has been caused in the silicone tube, the faulty piece can be cut off. The pump can go on working with a shortened silicone tube. Ordering a spare tube from our distributor is highly recommendable. See picture p13.

F5.0) Afterwards open the water pipe, lead back the water into the bucket and let the pump run for the necessary time. This will rinse the valves without pressure by quick flowing water. See picture p10.

F6.0) Pumps that have been in underwater service for many years may have scale deposits on their internal pipe walls and valves. The scale deposits may impact adversely on the pumping capacity. In this case, you may add kitchen or toilet cleaners into a pail of water to clean the internal pipe and valve interior.



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F7.0) If the pumping capacity still fails to recover, you should maintain or repair the pump as directed in F13.0-F19.0.

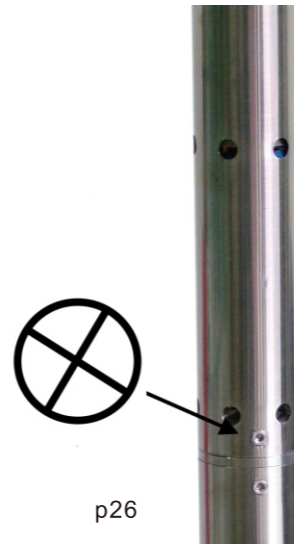
F8.0) Before the maintenance or servicing of the pump, it is suggested to carefully determine the error source first. Avoid to blindly disassemble the pump. This could lead to irreparable damages.

F9.0) If the problem is suspected in the piston, first open the lower part of the pump with a bolt as described in F13.0-F15.0. The piston can be taken out from the bottom. If this is not possible, open the screws of the upper parts of the pump and remove the piston as directed in F10.0-F14.0.

F10.0) If a problem is suspected in the valve body component, the screws of the upper part of the pump (in accordance with F16.0-F19.0) needs to be opened in order to find the problem and eliminate it.

F11.0) If the problem is believed to be in the electronics, the pump needs to be opened in its lower part to be examined as described in G8.0-G30.0. If necessary, the control unit need to be checked or replaced.

F12.0) People other than specially appointed servicemen are strictly forbidden to loosen the three screws in the middle of the pump. Loosening the three screws may cause permanent damage to the pump. See picture p26.



Cleaning of the piston and the inside pipe (IR)

F13.0) Like in E5.0-E9.0 described, take apart and clean the piston.

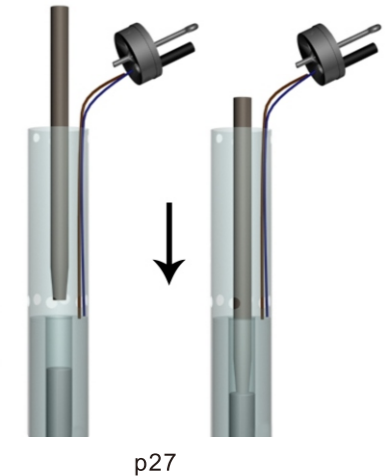
F14.0) If the piston (KO) is stuck in the inside pipe (IR), open the upper side (OB) of the pump like in pt. E10.0-E14.0 described. With the help of a round stick and a small hammer the piston should be loosened carefully from above. This should be an easy task since the piston usually becomes stuck only because of some dirt deposit inside the pipe. Then the piston has to be cleaned. If necessary, replace the piston or the main spring. See picture p27.

F15.0) Ensure that the inside pipe (IR) of the pump is made smooth. **Be very careful!** Avoid strong pushing or coarse tools, as there is a real danger that damage could be caused to the internal pipe and cable connections, and it is possible that the pump could be damaged beyond repair.

Clean the valves

F16.0) Take out and clean the valve as directed in E10.0-E14.0.

F17.0) Clean all parts with water and polish the depositions. If it is necessary you should change the worn parts. After the cleaning reassemble the parts in the reverse order again.



F18.0) **Please pay particular attention:** There is an important seal washer in the pump (DI3). The valve body must be placed straightly on the seal washer and must be screwed. Otherwise the pump will not generate any pressure. See picture p24, p25.

F19.0) Afterwards the valve body should be inserted into the pump again. The upper part (OT) should be put in the pump on the valve body again. First three screws (OS) are fastened on the upper body (OT). Then the metal insert should be screwed. Because of the pressure of the metal insert on the valve body, it will firmly connect with the seal washer (DI3).

G. Defect removal

Usually the following tools are necessary for the defect removal:

- Multimeter
- Wire stripper
- Insulating tape
- Top tongs
- Cross screwdriver
- Screwdriver
- Guts tongs
- Hot-air device or lighter

Different defects appear at different times

G1.0) The different defects of the pump often appear in certain phases. Please follow the suitable situations and control the following points.

a. Installation:

Faulty installation, the energy supply does not exist, the voltage of the Solar panels is not sufficient and is too strong or too weak, the pump has not reached the water yet.....

b. After the maintenance work:

Energy supply interrupted, wrong assembly, outlet pipe is not correctly connected, leaking, screw ring at the top is not tightened.....

c. During the running operation:

By theft, rain, hail, wind, humidity in free nature as well as bolt of lightning, the energy supply can be interrupted. Sand or dirt in the water has entered the pump and blocked piston and valve. The main spring or small spring is broken. The water pipe is leaky or the screw ring at the top is loose....

d. After the storage:

Before the storage the pump was not dried properly. Piston or valve has jammed. Contact of the current connection oxidized during the long storage time.



Defect check

G2.0) In case of a defect in the pump system, it is important to first check the connection of the solar panel and whether a sufficient electricity supply is given.

G3.0) The control unit in the pump is protected by a protection against voltage reversal. If the connection becomes voltage reversal by the electric installation, the electronic interrupts the current of the pump. After a few minutes you can restore the right pole connection and let the pump run again as directed in pt. D4.0.

G4.0) The electric circuit in the pump is protected by an automatic protection. If an overloading, caused by a too strong solar panel or another energy source, occurs, the current supply will automatically be interrupted or limited to a decreased value. When this defect appears interrupt the interwiring between solar panel and pump. Put the solar panel in half-shade to reduce the voltage. After a few minutes you can connect the interwiring again and the pump should work again as described in pt. D4.0.

G5.0) At the end of the diving cable there is a tester (TE) with fuse protection and LED Diodes for the quick examination of defects in the pump.

Test steps

G6.0) There are two LED lights in the tester. LED 1 (green), LED 2 (red).

a. If LED 2 (red):

ON = A tension care of the solar panel is available

OFF = A tension care does not exist; The protection has broken; The cable suffered a short circuit.

Solution: Check the connection to the solar panel or if there is a defect of the solar panel. Also consider a possible short circuit in the cable.

G7.0) Only if LED 2 (red) "**ON**" after approx. 1-10 seconds,

b. LED 1 (green) "**FLASHES**"

= Control unit works, defect lies in the mechanical parts (e.g., valve or piston blocked, valve leaking, the main spring is broken, the water pipe is leaky or stoppage).

Solution: According to manual maintenance, inspection and maintenance of the mechanical portion of the pump.

G8.0) LED 1 (green) "**ON**", but **NO FLASH**

= - The voltage of the solar pump is slightly less than the prescribed value

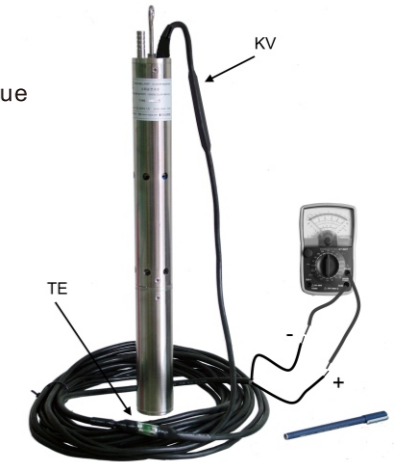
- Power polarity reverse

- The submersible cable of the pump is interrupted

- Defect lies in the control unit or the magnet of the pump

Solution: Check the input voltage according to manual find the broken piece in the cable or exchange the control unit as directed.

G9.0) Use the resistance measurement range of a multimeter to measure the resistance of the two input terminals of the pump. See picture p28.



p28



G10.0) The positive pole of multimeter to positive terminal of the pump and the negative pole of multimeter to negative terminal of the pump and the readings are supposed to be about 50-500k Ohm, conversely;

G11.0) The negative pole of multimeter to positive terminal of the pump and the positive pole of multimeter to negative terminal of the pump and the readings are supposed to be about 0,5-5k Ohm. The reading is supposed to gradually increase.

G12.0) If the reading is **"OK"**, then the submersible cable is all right
The control unit or the magnet has broken down.

Solution: Check if the magnet or control unit has broken down as directed in E4.1. Replace the defective component.

G13.0) If it is **"NO"**, the reading is higher than 1M Ohm or close to 0 Ohm, and unchanging. It means that the cable has broken down or there is a shortage or the control unit is damaged.

Solution: Check the pump cable carefully if the internal conductor has been cut off or there is an invisible circuit break. It is particularly recommended that you pull the cable at 50cm intervals during measurement, or as instructed in G16.0-G19.0 to check the control unit.

G14.0) LED 1 (green) **"OFF"**
= Voltage of the solar pump is too low.

Solution: The power loss through the extension cable is too large; Check the wrong connection of the solar panel. Some bad solar panels cause the voltage to drop during a sunny, hot day so strongly that the pump cannot run any more.

G15.0) The broken pump must be taken out of water as quickly as possible. Dry the piston as described under pt.F13.0-F15.0. Staying in the water without working for several days will cause other mechanical problems such as corrosion and deposition of particles in the pump.

Investigation of the failure from submersible cable or pump drive

G16.0) Disconnect the lead wire between the pump and the solar panel to judge if the fault originated from the control unit or a pump cable short-circuit.

G17.0) Open three screws (US) of the control unit (OH) and put it carefully to the side. The single cables should be cleaned and dried. Here it concerns the four cables with Glass fiber tube and two cables with a diameter of 2mm. See picture p16.

G18.0) There are two test wires with a diameter of 2mm to measure the positive and negative poles. The other end of the test wire should be hung in the air.

1. Black = the negative input wire of the pump
2. The positive pole relative to the positive pole of the input wire of the pump. Different control unit is indicated with different colors.

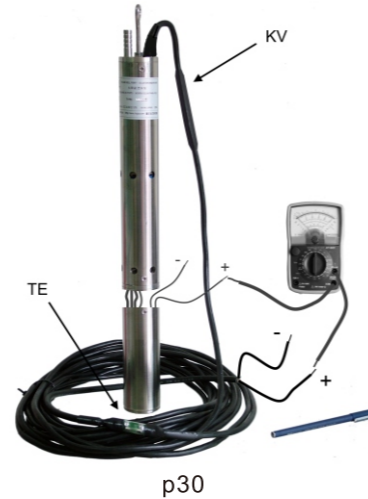
Brown = LJ1012 Green = LJ2012 Red = LJ3012

G19.0) At first, strip off the insulation of the two test wires.

-- Measure the negative pole of the input wire of the pump with a multimeter to negative pole of the test wire; then

-- Measure the positive pole of the input wire of the pump with a multimeter to positive pole of the test wire, to find if there is any breakage circuit in the cable.

Longtime experience proves that quite a lot of faults are contributable to pump cable damage. The two test wires can help with rapid fault analysis without disconnecting the four cable of control unit. See picture p30.



G20.0) Sometimes, it seems that the submersible cable to be in a recessive state. Usually when the pump is taken out of the water for a checking, the cable is still turned on and the pump is working normally. Afterwards when the pump is submerged into the water again, the cable internal recessive might break and the pump stops working. Therefore it is particularly recommended that you pull the cable at 50cm intervals during measurement to check if there are any invisible circuit breaks.

G21.0) If the defect was found in the submersible cable, you can cut the place off and connect this once more. Isolate it with a special watertight shrink tubing (SC1). The heat shrink tubing as replace parts are available at your local dealer or directly from us (service@liujia.com).

G22.0) Treat the metal heads of two test wires carefully for insulated protection. To do this, there are several waterproof heat shrink tubing's (SC3) are in the spare parts box.

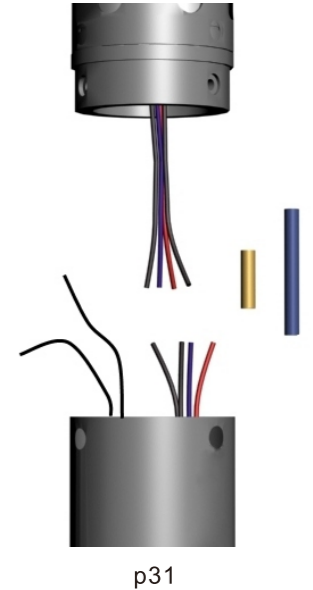
G23.0) If the defect in the cable was ascertained, there is unlikely a defect in the control unit. The control unit can be used in the further process.

Exchange of the control unit

G24.0) There are four cables outside with glass fiber tubing and the inner envelope with silicone wire to connect the pump to the electronic control unit. First, insert carefully with pliers and open the middle of the glass fiber tube, cut both sides 3 cm in each direction and let the 6.0 cm silicone cable open. Shear out of the middle of the silicone cables, strip four cables each 0.8 mm long. The four colored silicone cables have different meanings: See picture p31.

- Red = The positive input wire of the pump
- Black = Magnet leads, unsigned
- Blue = The negative input wire of the pump

G25.0) Control unit of different models are indicated only by the positive pole color of the test wire.
LJ1012 = brown LJ2012 = Green LJ3012 = Red



Compare the new control unit with the defect. If the color of the test wire does not agree, it must be exchanged by the distributor.

G26.0) Use a multimeter to check the two black magnet wires for the pump part. The resistance value is supposed to be 1,5-3,0 Ohm. If this value is exceeded, it indicates that the magnet has broken down.

G27.0) For the new connection of the control unit, you should put the heat-shrinkable tubing (SC2) in the cables of the control unit. According to the colored coding you should connect the single cable of the new control unit and fasten this well with the tongs and solder them.

G28.0) At the end you put the shrink tubing (SC2) above the connection piece. With hot air the tube should shrink to isolate them well and to make it watertight.

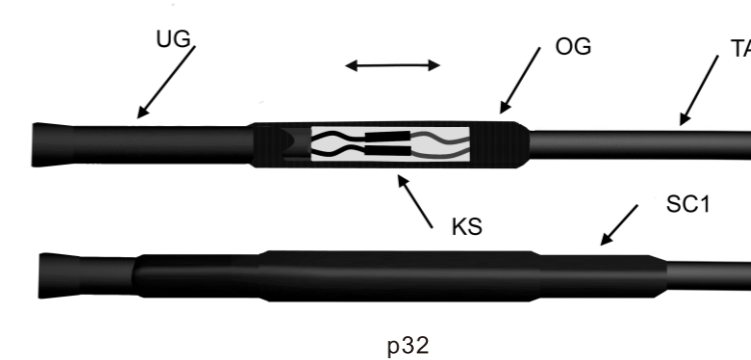
G29.0) **NOTE:** Never wind special heat-shrinkable tubing around the glass fiber tubes; otherwise water may infiltrate between the glass fiber and the cable insulation sheath and corrode the connections.

G30.0) Insert the new control unit in the reverse step into the pump as directed in pt. E5.0-E8.0.

G31.0) The function of the pump can be checked immediately. After the bandaging of the cable between solar panel and the pump as described in pt. D4.0, the pump should start working again.

Replacement of the submersible cable

G32.0) Without dismantling the pump, you can replace the submersible cable to the cable connection points (KV). See picture p32.



G33.0) Carefully strip off the outer of the heat-shrinkable tubing (SC1) on the cable sheath end on the pump side. Take care not to damage the rubber cable sheath. The waterproof cable sheath consists of the upper and lower part. After the upper end of the rubber sheath is stripped off, you can see the cable end inside. See picture p32.

G34.0) After the cable is replaced, secure the cable end in the reversed sequence. Use the heat-shrinkable tubing (SC1) to seal the end.

G35.0) Please contact the distributor or ACLIMA (service@liujia.com). for such spares as submersible cable, upper/lower parts of the rubber sheath and watertight heat-shrinkable tubing (SC1).

G36.0) If it was not possible to repair the pump by yourself according to the described instruction for maintenance and repair, please send the pump without the water pipe and with all other accessories, electric cable, control unit, as soon as possible to the dealer to initiate a professional repair. Usage without authorized expertise can cause other defects and may lead to the loss of the guarantee.

If you pay close attention to the points marked with a hand, you will be able to enjoy this new technical acquisition for a long time. No matter whether you need the product for drinking water, water for the garden, the country house or the garden pond or for other opportunities, the solar pump will always supply you with enough water if used properly.

It is important for you to introduce this environmentally friendly product to your relatives and friends so that more people understand the benefits of this pump. We hope this pump brings awareness to people on the importance of protecting our environment and the usage of renewable energy.

Changes of the technical data can occur!!