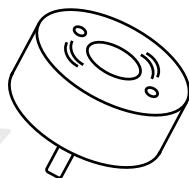


Solar Water Pump Assembly

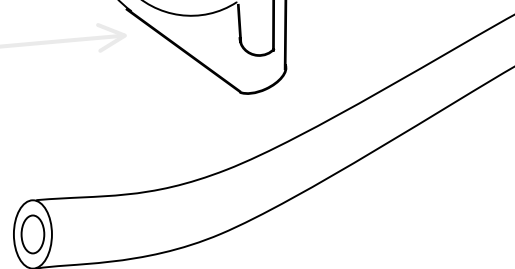
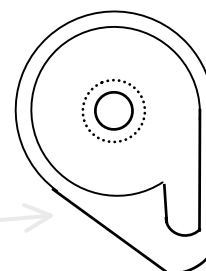
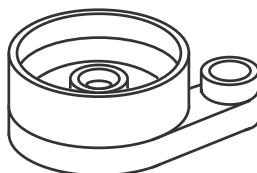
PARTS LIST:

solar motor



clear plastic parts:

- pump housing
- housing base
- curve-blade impeller
- drive wheel
- flexible tube



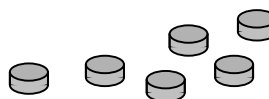
brass part:

- distance washer



ceramic parts:

- magnet (x6)



GLUE: Use a two-component glue (e.g. Araldite) or a super glue.

Follow the manufacturers instructions and allow enough time for the glue to cure.

TECHNICAL DATA

Working voltage 1.5-3V DC

Water head max. 10 cm (at 3V power supply)

Max. flow 13 litres/hour (at 3V power supply)

Temperature range +1 degrees Centigrade to 100 degrees C

Recommended working voltage 1.5V

MAGNETIC DRIVE

The pump uses a set of 6 identical permanent magnets to transfer a torque through the watertight pump housing.

The polarity of every magnet is crucial to the pump's operation.

How to tell the polarity of the magnets:

Magnets show attractive and repulsive forces.

Like poles (North & North or South & South) repel each other.

Unlike poles (North & South) attract each other.

Another term for a North pole is 'south-seeking'.

Another term for a South pole is 'north-seeking' (like the point of a compass needle).

Each tablet-shaped magnet has a North Pole & a South Pole



One circular side of each tablet magnet is a North Pole; the other is a South Pole.

When assembling the pump it is not important to know north from south but only whether two magnets are orientated the same way or not.

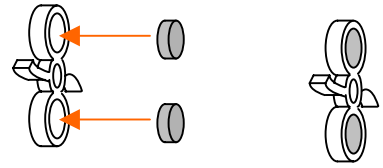
Allow the six magnets to pull each other together in a column, then you know they are orientated the same way.



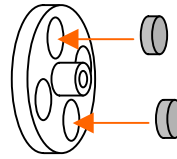
Where any two of the magnets attract each other like this there is a North Pole and South Pole in contact.

ASSEMBLY PROCEDURE

1 Glue 1st pair of magnets [with the same orientation as each other] into the impeller.

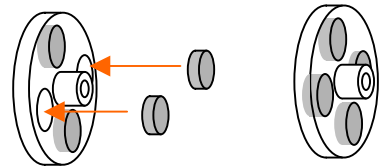


2 Glue 2nd pair of magnets [with the same orientation as each other] into two opposing holes in the drive wheel.



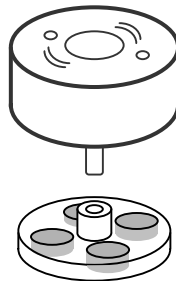
3 Glue 3rd pair magnets [with the same orientation as each other but the opposite orientation to the 2nd pair] into the remaining holes in the drive wheel.

Allow time for the glue to cure.

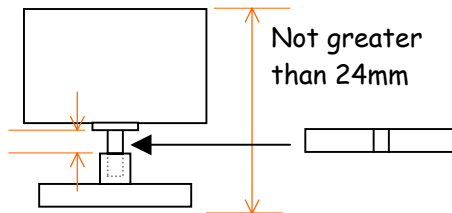


4 Push drive wheel onto motor shaft with flat side away from motor.

NOTE: Total length of motor and drive wheel must not exceed 24mm or drive wheel will foul pump housing. Measure with a ruler.



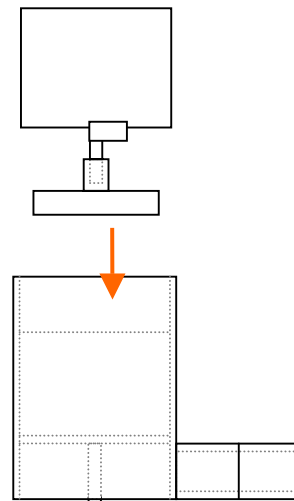
This gap is equal to the thickness of the impeller



Use the thickness of the impeller to find the correct gap between motor & drive wheel.

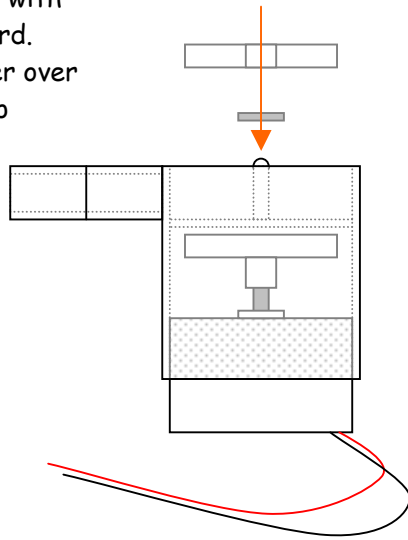
5 Push motor into pump housing until it meets locating edge [just visible]. The motor will be about half way into the housing. The motor is a loose fit in the pump housing. You can spread a bead of glue around the rim of the housing before fitting motor into housing.

TIP: If drive wheel touches pump housing; then remove motor and push drive wheel further down motor shaft.



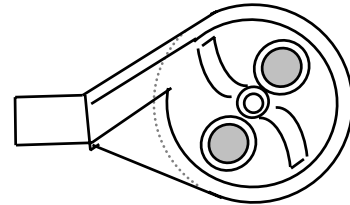
6

Turn the assembly with the motor downward. Fit distance washer over the spindle in pump housing.



7

Fit Impeller over the spindle in pump housing. Note the orientation of the impeller with the blades curving clockwise.

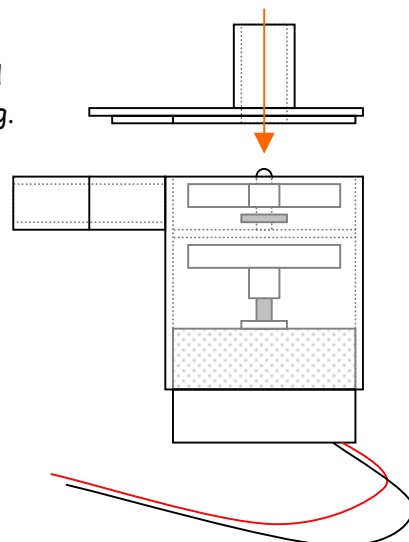


When the pump is working the impeller will spin anti-clockwise in this view. ↺

TIP: Check that motor, drive-wheel and impeller spin easily. Turn impeller with your finger so that it turns drive wheel on motor shaft.

8

Glue the housing lid to the pump housing. Allow time for the glue to cure.



9

Optional: Attach the brass tube to pump housing outlet. Attach clear plastic tube to pump housing inlet.

OPERATING THE PUMP

SAFETY:

Risk of electric shock. If an electric lamp is used to illuminate the solar cell then take great care to avoid splashing the lamp with water. **DO NOT HOLD ELECTRIC LAMPS OVER WATER.**

Do not place the entire pump underwater.

Remember that **the motor must be kept dry.**

The motor shaft must rotate anti-clockwise for the pump to work correctly so connect red motor wire to negative terminal on PV and black to positive.

Make sure there are no air pockets inside the pump or tubing

The pump will activate when there is enough light at the solar cell.

The pump functions with 1 flexible cell given sufficient light. Up to 3 cells connected in series may be used in bright light.

Problem Solving Guide

Problem	Possible cause	Solution
Motor & drive wheel do not spin	<ul style="list-style-type: none"> ▪ Drive wheel or excessive glue on drive wheel is in contact with pump housing. ▪ Electric current to the motor is insufficient. ▪ The motor has been damaged by contact with water. 	
Impeller does not spin when drive wheel spins	<ul style="list-style-type: none"> ▪ Magnets in impeller and/or drive wheel are not orientated correctly. ▪ Impeller or excessive glue on impeller is fouling the pump housing. 	
Water is not emerging from pump outlet	<ul style="list-style-type: none"> ▪ The head is too high. ▪ There are air bubbles in the pump. 	