

Axial Flow Propeller Turbine Generator Unit

LH-1KW

User Manual

Ver 1.1



**Bringing you a prosperous future with
clean, reliable and renewable energy.**



Catalogue

I IMPORTANT SAFETY INSTRUCTIONS	03
II Main Technical Performance Parameters.....	04
III Summary	05
1. Key Technical Data.....	07
2. Station Site and Installation.....	07
3. Operation Method.....	08
4. Maintenance.....	10
5. Service Rule.....	10
6. Routine Faults Treatment.....	11
Appendix I	12
Appendix II	13

I IMPORTANT SAFETY INSTRUCTIONS

This manual contains important instructions that shall be followed during installation and maintenance of the *LH-1KW*.

To reduce the risk of electrical shock, and to ensure the safe installation and operation of the *LH-1KW*, the following safety symbols are used to indicate dangerous conditions and important safety instructions.

	WARNING: This indicates a fact or feature very important for the safety of the user and / or which can cause serious hardware damage if not applied appropriately. Use extreme caution when performing this task.
	NOTE: This indicates a feature that is important either for optimal and efficient use or optimal system operation.

II Turgo Turbine Unit Main Technical Performance Parameters

Main Specifications				
Turbine			Remarks	
Type	LH-1KW		Turbine	
Reted Head	2.5 m			
Rated Flow	50 l/s			
Power	1 KW			
Efficiency	60%			
Generator			Remarks	
Type	SF-1.0-4/430		Conforms to the IEC international electrician committee standard	
Rated Power	1KW			
Rated Voltage	230V			
Rated Current	5.65A			
FQCY	50Hz			
Rated Rotational	1500r/min			
Phase	1			
P.F.	1.0			
Altitude	≤3000m			
Insulation Grade	B/B			
Antisepticise Grade	IP44			
Ambient Temperature	−25℃~+50℃			
Relative Humidity	≤90%			
Control Panel			Remarks	
Safety Protection	Short circuit Protection			
	Islanding Protection			
	Over Load Protection			
	Grounding Fault Protection			
Packing Material	Fiberboard			
Packing Size	90×34×29 cm			
Packing Weight	Net	kg		40
	Gross	kg		46
Stated: This product presents or the technical parameter revision is the technical improvement result, no other explanation.				

Note: The modification of the product appearance or technical parameters, which is a result of technique improvement, Will not be announced additionally.

III Summary

Greet you to use LH series of micro hydro generator unit. This series of generator unit consists of the LH series of turbine and SF series of Rear Earth Permanent Magnet brushless synchronization generator, which includes 5 types of single and three phases generator unit whose power output is from 200W to 1KW. The user can choose the type fits for the amount of coulomb and the flows of the water head.

The series of units is provided with the automatism control voltage and frequency. The user can turn on or off the electric appliances (TV sets, recorders, etc) as wish on condition that the amount of coulomb does not exceed the nominal power output, and the user will feel it as convenient as the electrical net.

Before you use the generator units, please make sure that you read this instruction manual carefully. And you choose the installation position of units, ditch construction, the inlet conduit installation, the electrical wire span and the adjustment of generator unit by the direction of the professional.

After the generator unit can work continuously or in preset time, you had better arrange the career man to do some manage work and maintenance according to the instruction manual and the safety electrical precautions.

1)Micro Hydro Station General Description

The typical micro hydro generator station is as follows (figure 1), which consists of earthwork (inlet conduit construction, unit room and drain etc), the micro hydro generator, electrical wires and the users wires.

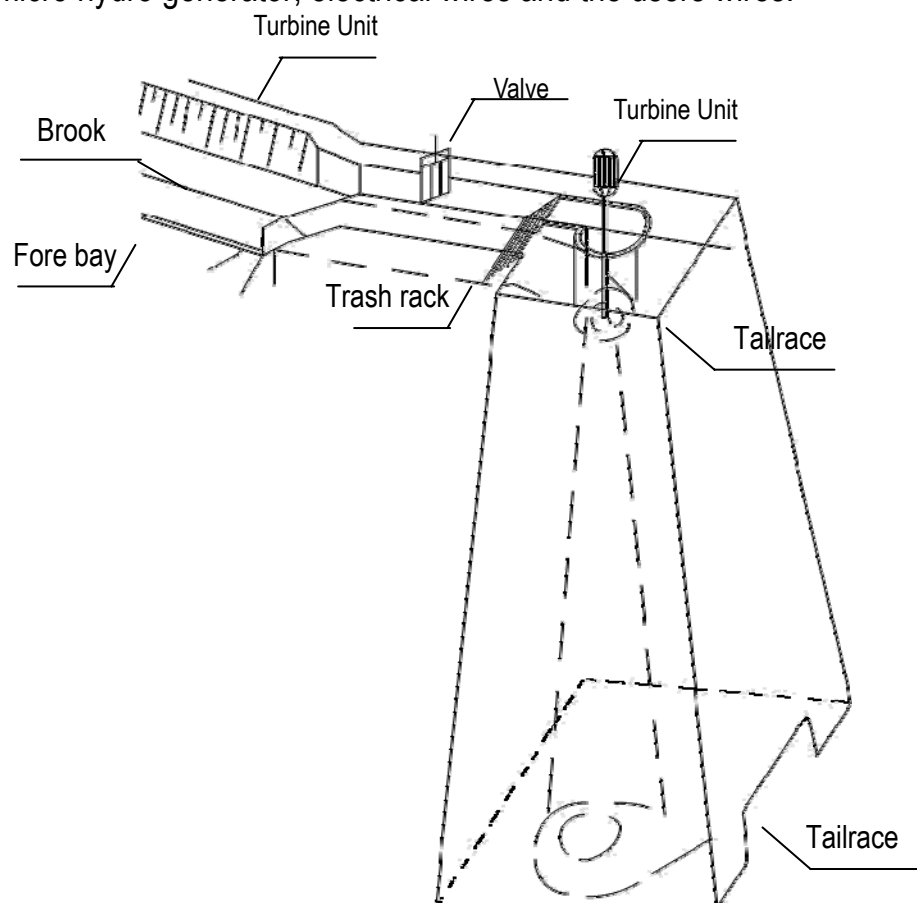


Figure1: The project of micro hydro generator using pipe

The work process is as follows: Collecting the water of stream by reservoir, the water inflow the pressure poor through the inlet conduit, they go into the micro hydro generator which is installed in the unit room through the guide blade, force the runner to gate, which drives the generator to generate electricity. At the same time, the adjustment machine auto adjust the voltage and the frequency to meet the requirements for power supply, and then the user can use the electricity

transmitted electrical wires.

2) This kind of Micro-hydro Generator is consisted of an inclined impulse turbine and a set of direct connected AC single-phase / three-phase generator. With the characteristics of small body, lightweight, simple structure, reliable operation and convenient assembly, and serving as the power source of lighting, TVs and recorders, it is most suitable for the households in mountain areas with scattered and small hydroelectric sources. The consumers can do easily themselves the installation and operation. This product has been thoroughly strengthened in the special technical measures to good quality, stable function and easy operation for women and children. Much less investment may add more happiness to your family.

1. Key Technical Data:

Water Head for installation:2.5m

Flow (m³/s):0.050

Output Voltage (v): 230V(AC)50HZ

Output Power (kw): 1.0

2. Station Site and Installation:

1) The site should be chose according to the flow and drop of water source.

Commonly, the drop should not be less than 2.0m. A water storage pond can be build when the flow is not enough, storing at daytime and generating at night, but the volume should not be less than 5 m³.

2) The unit should be installed in the place where it is convenient to charge and no danger of flooding. It is much better to install close to the user's house in order to manage well and reduce the investment for power transmit line.

3) According to attach the diagram , you can construct the penstock , turbo room tail pipe and tail water room.

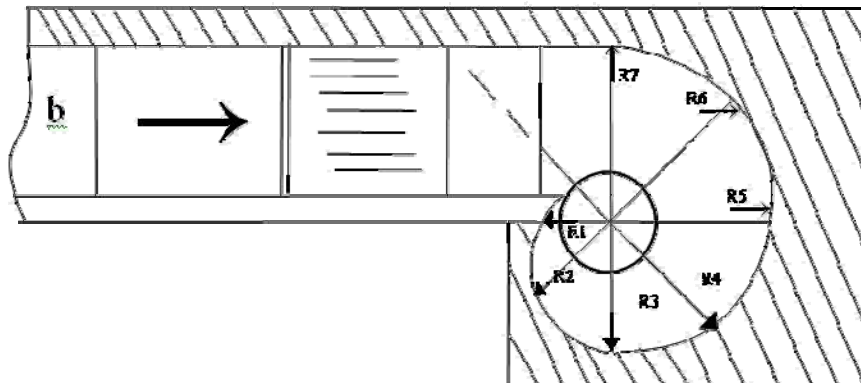
A. The elucidation of penstock: The wide of the penstock is 20 – 30 cm and the high is about 30 – 35 cm .It is made of brick or rock and cement. You can do it according to the two figures and the table.

B. The building of turbo room:

According to the figure and table , draw the sample with a paper first. The step is as follows:

- a) To draw the basic garden: to see the table for the size.
- b) It can be divided into eight same parts.
- c) Please look at the attach figure and table.

You make seven points (R1 – R7) on the bisectrix respectively.



The Reference Table of Whorl Type 1

Diameter (mm)	Ditch b×h	Size of whorl type (mm)						
		R1	R2	R3	R4	R5	R6	R7
1200	600×600	210	250	280	310	340	380	450

d) You connect the seven points with a smooth curve.

This is the line of lumen of turbo room. After doing this, the blocking water wall can be built around the line and this is the turbo room.

C. The construction of the tail pipe: The tail pipe is a subuliform circinal tube. It can be made with bricks (rocks or concrete). Its bottom is bigger than upper part. The upper is fixed with the turbine and the bottom is connected with the tail pipe. The inside face of subuliform circinal tube must be smoothness.

Tail water pipe size	L	d	D
(mm)	(m)	(mm)	(mm)
Diameter100	2~2.8	120	300
Diameter120	1.6~2.8	140	400
Diameter150	1.6~3.5	170	500

The Key Problem of Building the Tail Pipe:

- a) Must guarantee to seal completely, gastight ;
- b) Must be uprightness with horizontal
- c) Do not tilt or the magneto can not work well.
- d) It is better to make a model with the sheet iron for the tail pipe. And the sheet iron is together with the concrete.

D. The function of the tail water room is a purpose to guarantee tail pipe export to usually immerse into the water roughly 20-30 CM attains to seal completely the tail pipe. (seen the figure 1)

4) The base structure may be built from local material. You can make a round hole which has the diameter as same as the lower inner circle of the turbine frame by using cement, wood-board, etc, and fasten it in screw or round nail, also it should be positioned horizontally. The surface of drainage must be away from the bottom of base for 20-30cm. It must be covered with proper shelter to prevent from raining and sunlight when the unit is installed outdoors.

3. Operation Method:

- 1) Firstly, check whether all components are completed and the intake of penstock is blocked.
- 2) Then check whether the runner of turbine can be easily rotated, and rotated in by hand to ensure the voltage meter has readings (put the output switch in OFF position).
- 3) For the first starting, the output switch should be put in the voltage-stabilized control position (A), then open the gate to let water out from small to large, observe the readings meter till 230v or so continue enhancing water volume, the voltage device is reliable if the reading keep still. At this time the load can be connected, then adjust the water volume to hold the output of 230v or so. Once the stabilizing device break down, put the switch in B, then the voltage of unit will be under manual-controlled, you may follow the next procedure to control by valve.
- 4) During the operation, the load should be kept stable as possible as can be.

Don't shut off the load suddenly, or else the high voltage will burn out the rest load, if you must is connect the load, you may decrease water to small volume at first, then disconnect the most part of load when the voltage has dropped to below 230v (you must do as this even you run the unit under the using of voltage-stabilizing device).

5) It need only close the valve to switch off the unit when the load has been stable after first operation, the power switch may hold on so that you may adjust voltage up to 230v directly for next running.

4. Maintenance:

1) To check and clean the mud and foreign material blocking in the intake house and trash rack.

2) The frame of unit should be injected water-proof grease by using grease cup in every three month, each time rotating for three times. The upper bearing also should be added waterproof grease for every six months.

3) The generator must be conducted the dry treatment before next start if it became wet.

5. Service Rule:

1) When the unit breaks down, please handle it according to the Routine Faults Treatment List if only it has a slight error; please send it to professionals or manufacturer if it must be dismantled.

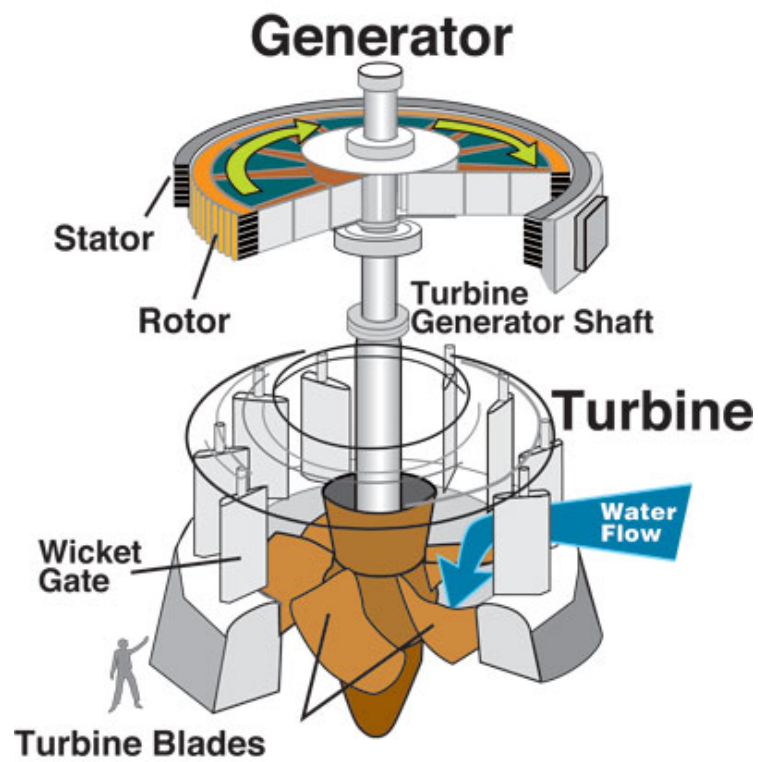
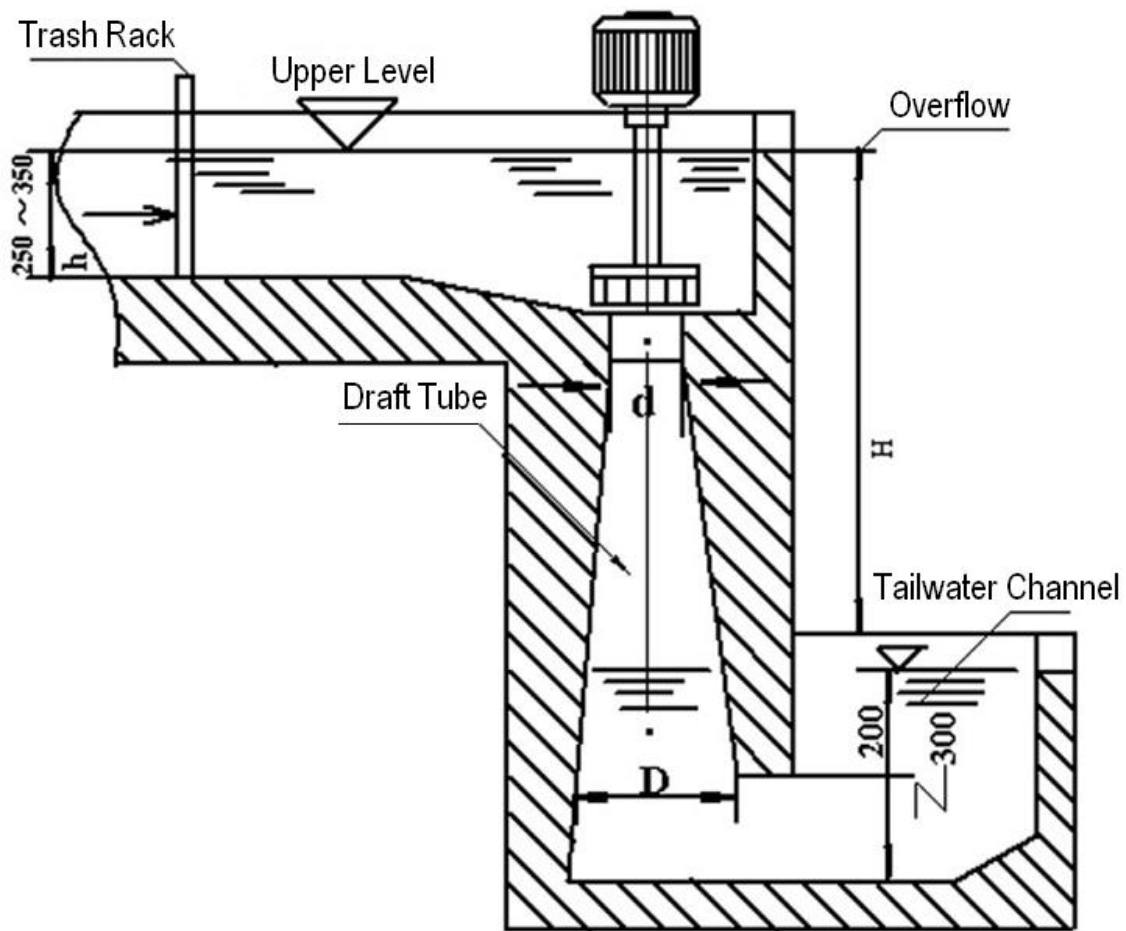
2) We will be responsible for the three guarantees of the unit for its quality faults during the first year's operation. If its damage is due to the customer's misuse, we may repair it on the condition of proper fee paid by user.

3) We guarantee a long stable period of the spare-parts supplying.

6. Routine Faults Treatment:

Faults	Cause and treatment
Low water volume when switch on the unit. The generator cannot be started.	1. There is foreign material blocking the nozzle. Clear it. 2. Open the valve to reject air.
The voltage meter display reading, but the indicator and load lamp does not light.	The fuse has been burned out, replace it
Voltage can not be rose up	1.The water volume is too low, increase it 2.Reduce the heavy load
The fuse is burned out	Short-circuit. Check and repair it.
The load cannot be entirely carried.	The drop is too low. Replace the nozzle by a larger one if water volume is proper.

Appendix I



Appendix II

Add lubricant

