Earth Power

Submersible Turbine Generator Unit

ST-0.55KW

User Manual

Ver 1.1

Bringing you a prosperous future with
clean,reliable,renewable enery.

Catalogue

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Ⅰ IMPORTANT SAFETY INSTRUCTIONS

This manual contains important instructions that shall be followed during installation and maintenance of the *ST-0.55KW.*

To reduce the risk of electrical shock, and to ensure the safe installation and operation of the *ST-0.55KW*, 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.

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II Main Technical Performance Parameters

Specifications	
Model	ST-0.55KW
Diameter of Runner	120mm
Nominal Power	0.55KW
Output Voltage	230V AC
Frequency	50 Hz
Phases	Single-phase
Generator Style	Rear Earth Permanent Magnet Synchronous Generator
Generator Mode	Vertical
Rotational Speed	1500RPM
Insulation Class	H(Temperature rise limit:125K)
Ingress Protection Waterproof Class	IP65
Efficiency (Max)	ηmax> 60 %
Power Factor	>0.98
Operation Surroundings Temperature	－25℃～＋60℃
Operation Surroundings Humidity	0～95%
Packaging Material	Fiberboard/ Wooden
Size & Weight	Size (L x W x H): mm (345×345×510)
	N.W. : 22KG G.W. : 30KG
Safety 	Short circuit Protection、Islanding Protection、Over Heat protection、Over Load Protection、Grounding Fault Protection

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

III Summary

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.

Submersible hydro turbine generators are standard serially produced units. It is a low head propeller design. Reaction turbines require a much larger amount of water flow than impulse styles, but can operate with as little as two feet of head, making them ideal for sites where there may be relatively flat land, but a large water flow. They use either a 'traditional' reaction style runner (propeller runner).a specially designed outlet tube increases the turbine power output by creating suction as the water exits the system.

In order to provide optimal performance over a wide range, eight (8) different fixed guide vane angles are available. Runners are available with either four (4)

blades. The runner blade angles have been set at the best degree. Induction generator is designed for submersible applications.

The turbine and generator are integrated into a single unit ready to be lowered down into simple compact structures. In a hydro turbine generator all components in the unit are designed to function together from the beginning. There are no transmission shafts to align when installing. Draft tubes, seats are prefabricated steel units, ready to be cast into the structure. While running, the generator is cooled by water flowing around it.

The construction is simple and fast; in most cases old structures can be adapted for use with small changes. The hydro turbine generator is not bolted into the structure. It is simply lowered down to a bottom seat for installation and it can be easily hoisted up for inspection and service. The submersible concept dramatically minimizes the impact on the environment, especially on the landscape, because most of the structure is placed either in the waterway or underground. In some applications the whole station is hidden, by being placed below the water surface. No more dominating power houses. But don't pull down old beautiful mills or stations, put the submersibles under them and use the place in them as a museum or for other activities.

Production and delivery time is short and spare parts are readily available. The unit is efficient and easy to service.

Finally the most impact factor; submersible hydro pays!

It is the most cost-efficient micro hydro concept!

1. Key Technical Data:

Water Head for installation:1.5—3.2m

Flow (m^3/s):0.025---0.055

Output Voltage (v): 230V(AC)

Output Power (kw): 0.55

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 3.2m. 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 15-25m.

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 (the best way is to install within house-yard when possible) in order to manage well and reduce the investment for power transmit line.

3) 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.

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 220v 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 220v 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 220v (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 200-220v directly for next running.

4. Maintenance:

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

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.

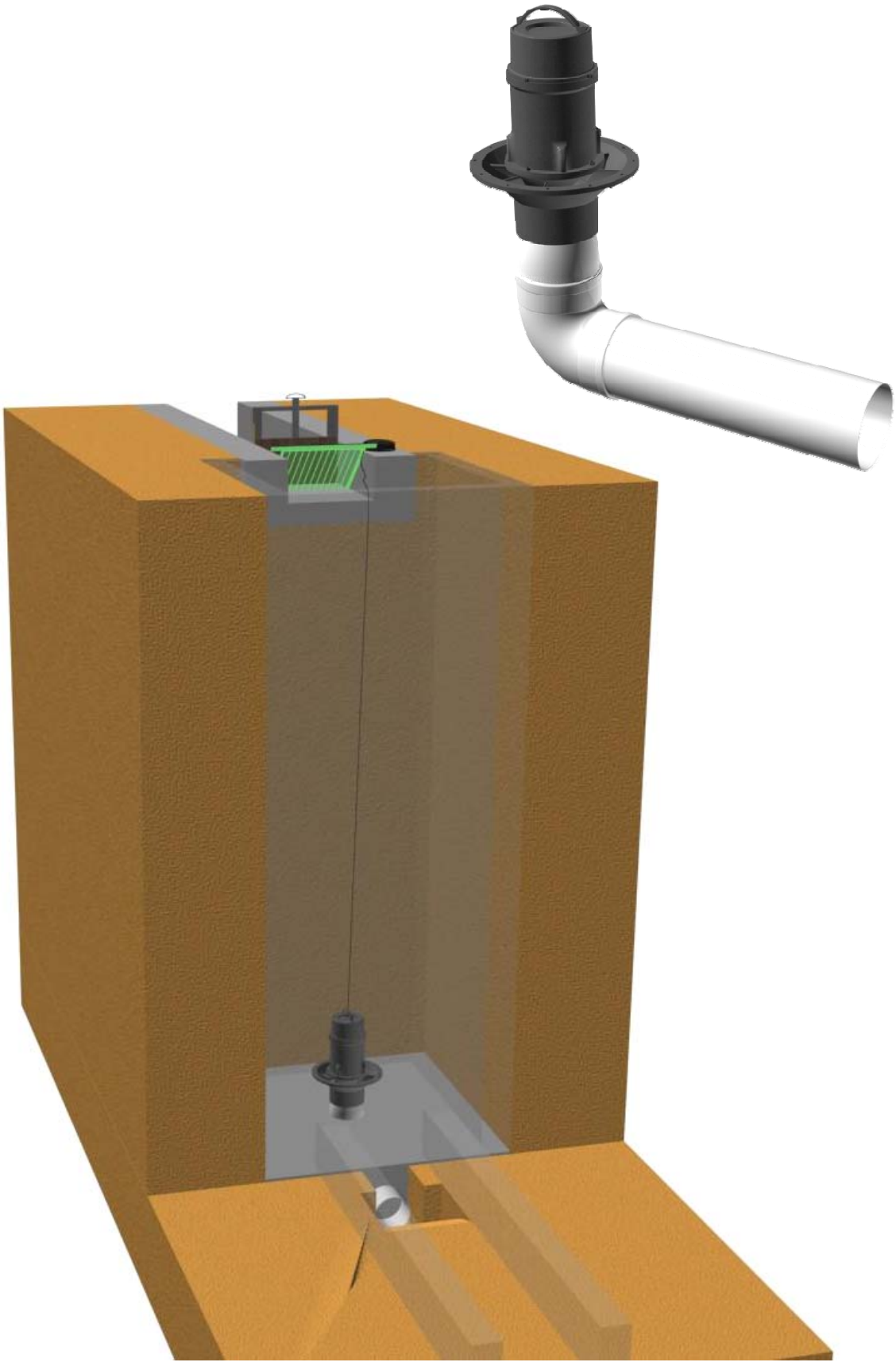
2) We will be responsible for the three guarantees of the unit for its quality faults during the first year's operation. If its damage is due to the customer's misuse, we may repair it on the condition of proper fee paid by user.

Faults	Cause and treatment
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.

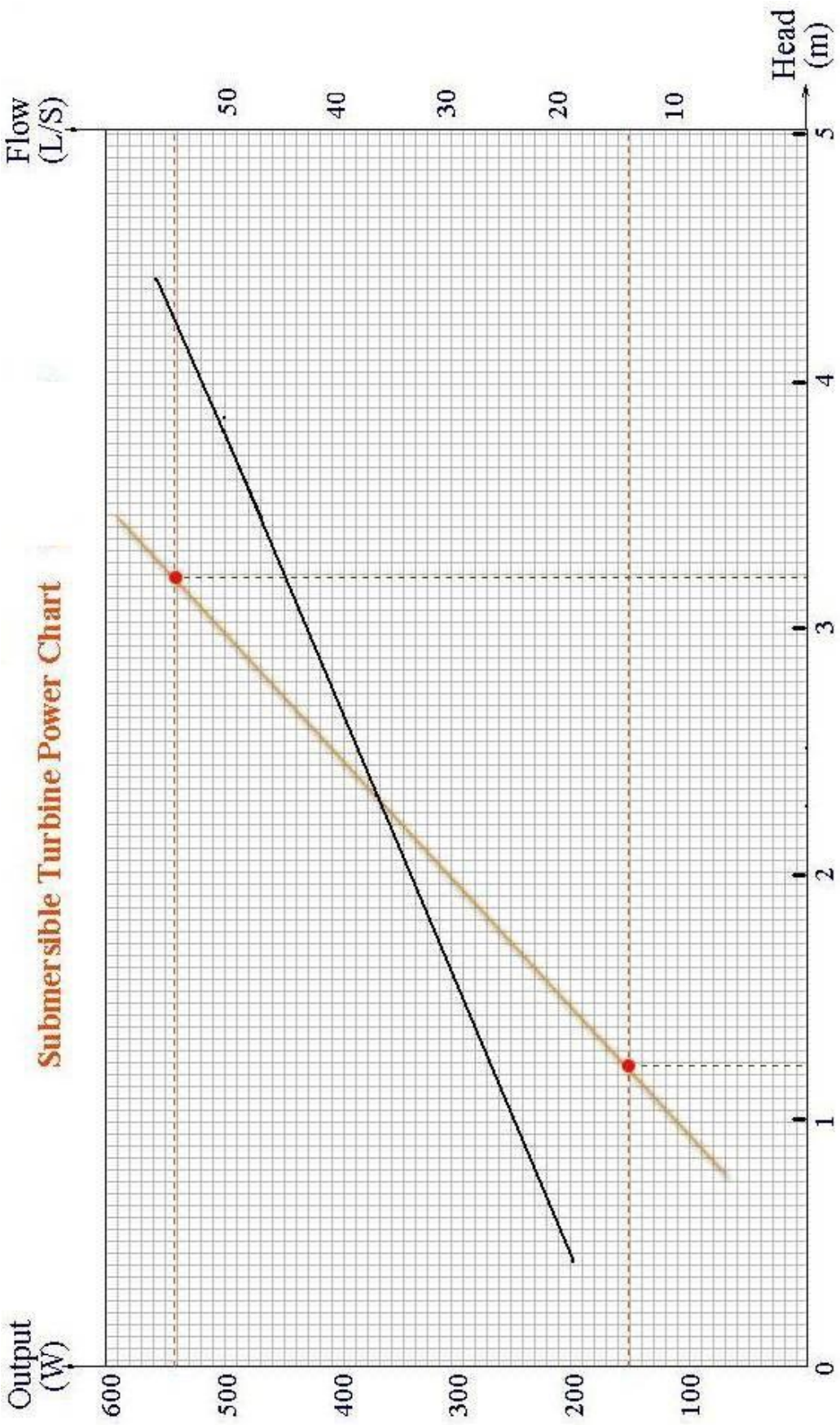
3) We guarantee a long stable period of the spare-parts supplying.

6. Routine Faults Treatment:

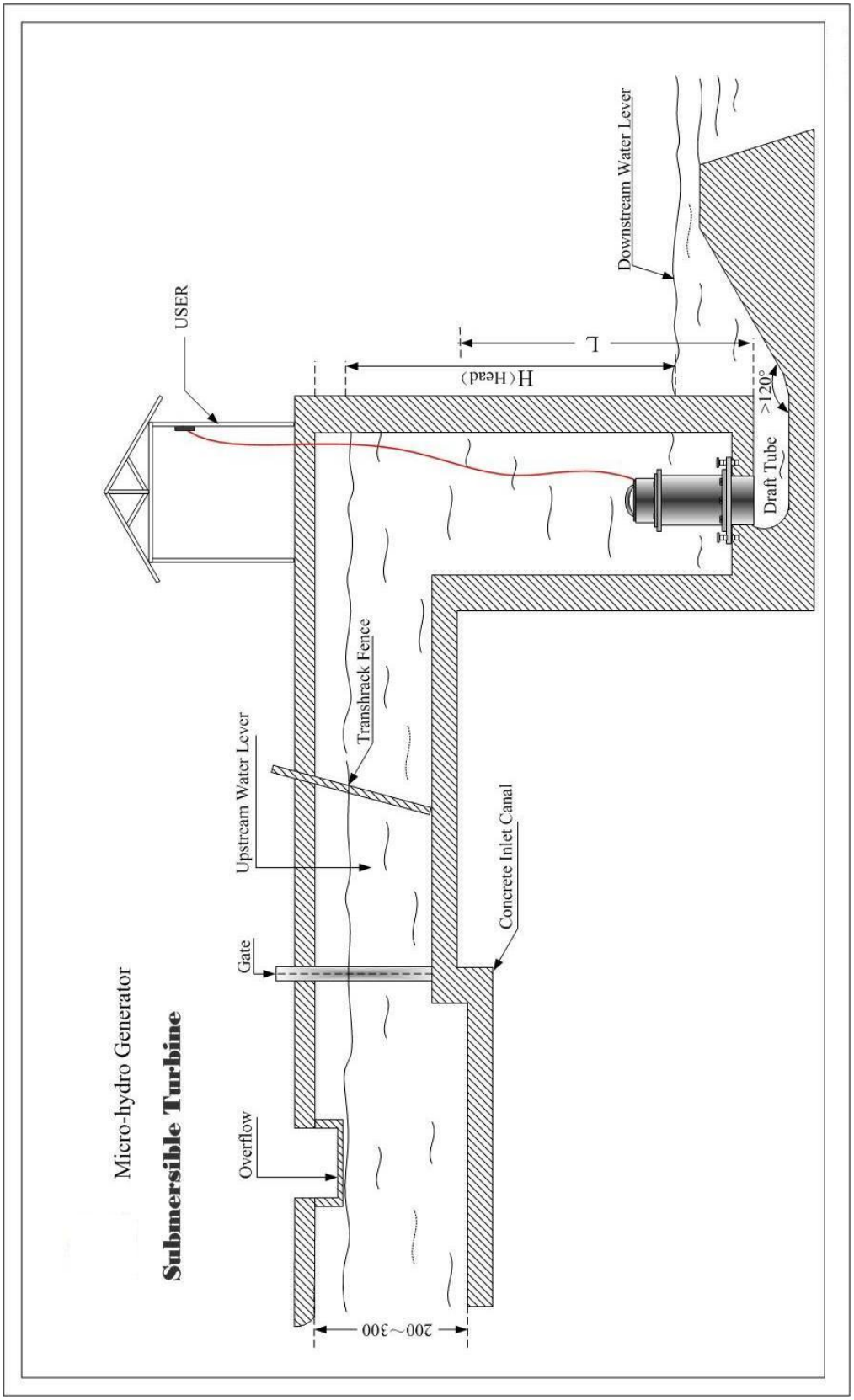
Attachment Ⅰ



Attachment II



Attachment Ⅲ---Installation ONE



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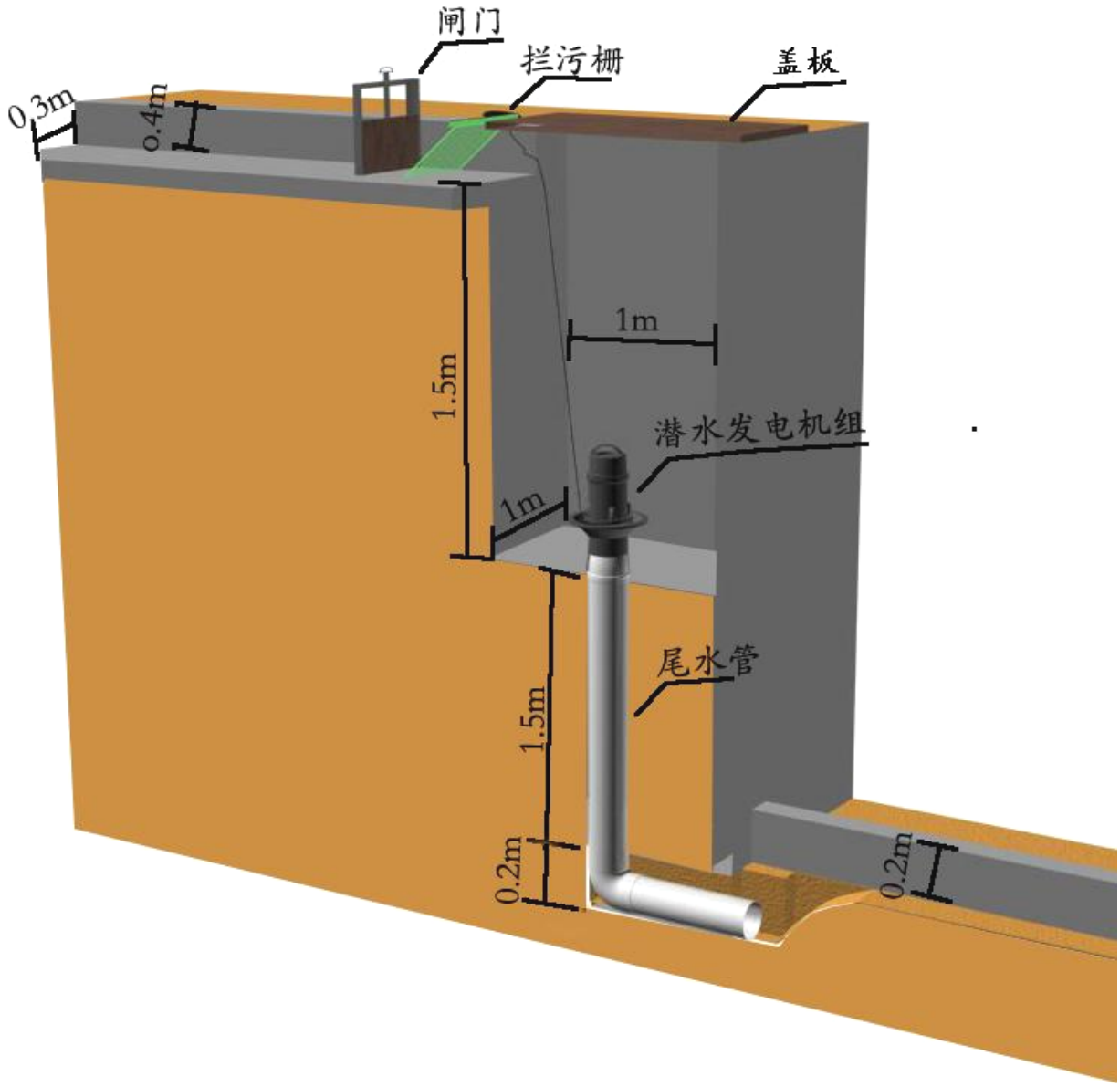

Attachment Ⅲ---Installation TWO