



Product parameter of Pathfinder-E Underwater robot



April 2020

1、Product brief introduction

The robot is a small underwater vehicle that can be quickly moved and deployed by two or three people.

The device is equipped with 2 vertical thrusters and 4 horizontal thrusters with vector arrangement. It is compact in structure, has stronger dynamic performance, and has more powerful expansibility. It is powered by lithium battery, and can work normally in the field without power supply to complete the corresponding tasks.

The machine has a strong mobility, can work under a certain water flow, widely applicable to underwater engineering, underwater building detection and other applications.

Although small in size, the device is extremely scalable, allowing users to choose between additional cameras, sonar, robotic arms or other sensors and tools for different tasks.

Our company is equipped with rovs of different grades according to different operating conditions, suitable for use in different waters.

2、Product configuration

2.1 Underwater robot

1) The submersible adopts an integrated streamlined appearance design, and the professional Fluent software is used to establish a 3d model for fluid simulation, so as to minimize the fluid resistance of the device when it is running underwater.

The size of the submersible (length x width x height) is 430mm*380mm*335mm, and the total weight of the submersible is 15kg.

The shell material is anodized alumina, the floating body is made of high-strength and low-density corrosion resistant material, and the protection frame is made of high-strength compressed polypropylene, which has excellent impact resistance and corrosion resistance. The pressure depth can reach 150m.

The body adopts the waterproof design of overall open partial seal, and the equipment USES external power supply to realize uninterrupted operation throughout the day.



Picture 1 - Pathfinder-E Underwater robot

2) Propulsion device adopts large thrust brushless dc propulsion, the built-in retarding mechanism, benefit at the propeller thrust and control in all directions to be able to obtain the best position, accurately adjust size of the thrust, the vector layout level 4 thrusters, vertical thrusters 2, 7 kg, the largest single propeller thrust powerful force control system enables efficient underwater operation equipment, for high-risk waters, and zero visibility conditions instead of manual work to provide for a long period of time will underwater.



Picture 2 - Thruster

3) Equipped with starlight level image module, the camera system is packaged in a watertight cabin, with 200W effective pixels, 4x optical zoom, 110° wide Angle camera range, and support for 1080P real-time video transmission. The vertical pitching Angle of the camera head is $\pm 60^\circ$,

which can effectively expand the range of video data acquired by the camera.



Picture 3 - camera system

4) Equipped with 2 multi-level brightness adjustable LED lights, the total illumination can reach 3000LM, can greatly expand the underwater observation range, assist the underwater camera to obtain hd video data.

5) Integration of multiple sensors, among which, the temperature sensor, for real-time monitoring of water temperature. Temperature and humidity sensor, real-time monitoring of the internal temperature and humidity of the submersible, real-time leakage detection function. Millimeter pressure (depth) sensor, together with the high-precision attitude compass course sensor, can monitor the heading and underwater attitude in real time, so as to realize the accurate automatic depth determination, automatic orientation and other functions of the equipment, as well as the basic requirements of navigation and operation.

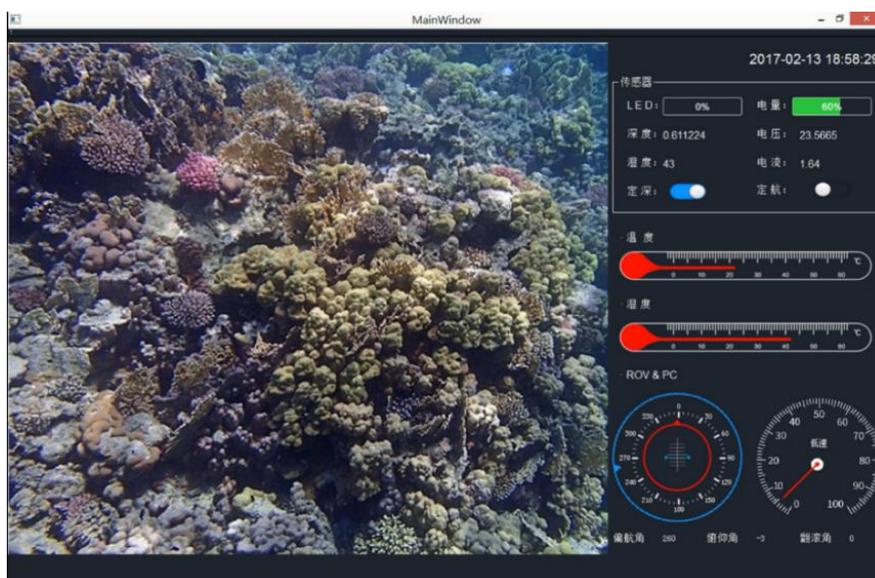
2.2 Ground control station

1) The control box adopts PC operating system, equipped with i5 processor, 4G memory, 1T hard disk, Window operating system, pre-installed system control software and driver, and the monitor adopts 15-inch hd display screen.



Picture 4 - Control station

2) The upper computer display platform can accurately and real-time display the data information collected by the equipment, such as video, date, time, water depth, temperature and humidity, attitude yaw Angle, pitch Angle, current motion mode, LED display and current device power display.



Picture 5 - Device control terminal display

3) Equipped with professional controller: industrial control handle, 2.4g wireless connection, 4 meters effective distance, ROV motion control,

depth locking, light brightness adjustment, manipulator control, camera focus, pitch control, ROV motion mode switching and other functions.



Picture 6 - Control handle

2.3 Signal transmission system

Diving device umbilical cable system is equipped with water: zero buoyancy tensile and manual winch wire cable, wire cable with kevlar, degree of 100 KGF, the standard length of 200 m (length can be customized), for unmanned underwater coupled with the power and signal and manual winch material with high strength and corrosion resistant materials, according to actual demand custom cable length and special hoist.



Picture 7 - Cable with hand winch

3、Product parameter

Underwater robot	
Boundary dimension	Length × width × height: 430mm*380mm*335mm
Weight	15kg
Pressure water depth	150m
operating environment	Both seawater and fresh water can be used
Navigational speed	Multi-stage adjustable, maximum speed 1.6m/s
canning material	Anodised aluminium
floating body	High strength low density corrosion resistant material
Protect the framework	High strength compressed polypropylene
Camera	4x optical zoom, starlight camera, 200W pixels, 110° field Angle Real-time transmission of 1080P hd video
PTZ	Vertical pitching Angle ±60°
Light	2 LED lights with adjustable brightness, total illumination 3000Lm
Impeller	Total 6: 4 horizontal, 2 vertical, vector distribution The maximum thrust of a single propeller is 6kg.
Built-in sensor	Temperature sensor, humidity sensor, depth sensor, electronic compass
Function	Fixed depth, directional function
Ground control station	
LCD(Liquid Crystal Display)	15inch
Processor	I5 processor, 4G memory, 1T hard disk, Windows operating system, pre-installed system control software and drivers
Controller	2.4g wireless connection, 4-meter effective distance, industrial-grade handle controller, controlling underwater motion of submersible, etc
Status display	Display video, date, time, water depth, heading, temperature and humidity, current operating mode, etc
Power supply	Large capacity lithium battery power supply
Cables and winches	
The length of the cable	Standard 150m zero buoyancy cable (length customizable)
Operating temperature	-20℃—65℃
Strength of extension	≥100Kgf, Containing kevlar reinforcement
Hand winch	Corrosion-resistant, winch with wheels for easy handling, wheels with buckle