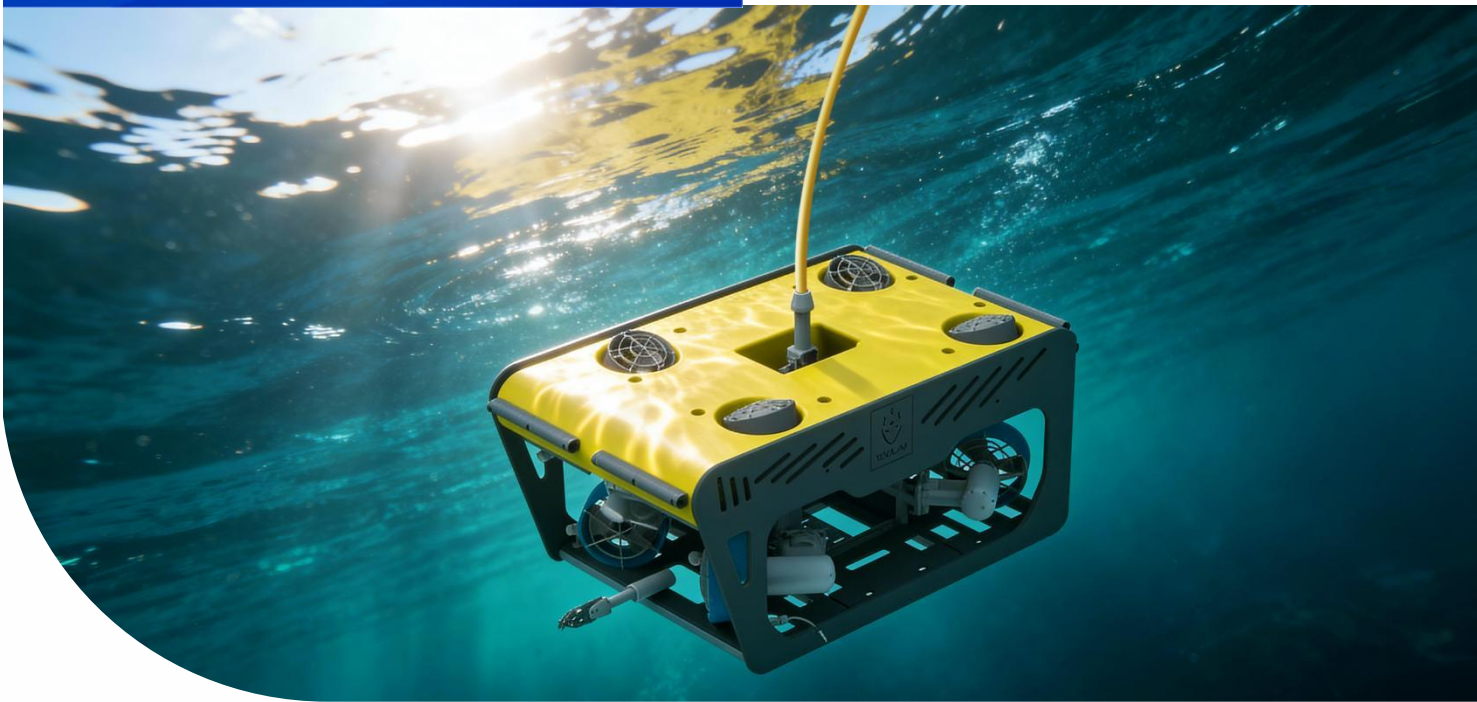


TOP NOTCH DEEP-SEA EQUIPMENT



X16 ROV

Technical Specifications

Technical Specifications

1.Product Overview

The X16K ROV, an independently R&D and manufactured compact work-class ROV by Shandong Future Robotics, Its core components achieve 100% domestic substitution, Equipped with technologies of high-efficiency operation, precise navigation and positioning, lightweight power matching, and flexible scenario adaptation, it features an add-on layer for a robotic arm, serving as a modular and integrable function expansion unit that can be flexibly mounted or dismounted according to mission requirements.



Fig. 1:X16K ROV+Articulated Manipulator Additional Layer

2. Technical Parameters

2.1 Robot System



Fig. 2: X16K ROV

Robot System	
Basic Parameters	
ROV Depth Rating	300msw
Dimensions (L×W×H)	1.6m×1.0m×0.8m
Weight (In Air)	360kg
Lifting Method	Self-releasing Hook
Power Supply System	380VAC, 50Hz, 25kW(ROV)
Robot Performance	
Propulsion Performance	- Equipped with 8 thrusters: 4 horizontal thrusters in vector arrangement and 4 vertical thrusters in vector arrangement - Overall forward thrust: 190kg; backward thrust: 190kg; left/right lateral thrust: 167kg; heave thrust: 112kg
Maximum Speed (Calm Water)	3.5 knots

Automatic Modes	- Course Hold - Depth Hold - Attitude Hold
Lighting, Camera & PTZ	
Lighting	- Total 6 sets of 50W lighting lamps - 4 sets of 50W lighting lamps at the front - 1 set of 50W lighting lamp at the rear - 1 set of 50W lighting lamp on the PTZ - Supports stepless brightness adjustment
Cameras	- Total 3 sets of cameras - PTZ-mounted: 1 set of black and white low-light camera and 1 set of HD fixed-focus 1080P camera - 1 set of HD camera at the rear
PTZ (Pan-Tilt-Zoom)	- 2-axis PTZ - Pan angle: $-60^{\circ} \sim +60^{\circ}$; Tilt angle: $-60^{\circ} \sim +60^{\circ}$ - Real-time angle feedback - Equipped with camera, lighting lamp and forward-looking sonar - Supports mounting of laser scale, etc.
Sensors & Instruments	
Sensors	Equipped with depth sensor, temperature sensor, water leakage monitoring sensor, etc.
Inertial Navigation System (INS)	- NAV-150 high-precision integrated navigation system - Attitude accuracy: Pitch $\pm 0.03^{\circ}$; Roll $\pm 0.03^{\circ}$; Heading $\pm 0.2^{\circ}$ - Measurement range: Pitch $\pm 90^{\circ}$; Roll $\pm 180^{\circ}$; Heading $\pm 180^{\circ}$
Forward-looking Sonar	- Operating frequency: 750KHz/1.2MHz - Maximum detection range: 120m@750KHz / 40m@1.2MHz - Blind zone: 0.1m - Range resolution: 4mm@750KHz / 2.5mm@1.2MHz - Angular resolution: 1°@750KHz / 0.6°@1.2MHz - Horizontal beam width: 130°@750KHz / 80°@1.2MHz - Vertical beam width: 20°@750KHz / 12°@1.2MHz - Number of beams: 512 - Refresh rate: ≥ 40Hz - Maximum operating depth: 500m - Continuous working time: 24h - Typical power consumption: 25W - Dimensions (L×W×H): 124×113×62mm - Weight: 1.1kg (In Air), 0.5kg (In Water)
Doppler Velocity Log (DVL) (Optional)	- Operating frequency: 1000KHz - Optimal speed measurement accuracy: $\pm 0.4\% \pm 5$mm/s

	- Speed measurement range: $\pm 5\text{m/s}$ - Maximum data update rate: 20Hz - Maximum bottom clearance: 50m (typical seabed, subject to seabed conditions) - Minimum bottom clearance: 0.05m
Expandability	- Supports optional expansion accessories, such as altimeter, baseline and manipulator add-on modules, cathodic protection probe (Contact CP), etc.

2.2 Articulated Manipulator Additional Layer

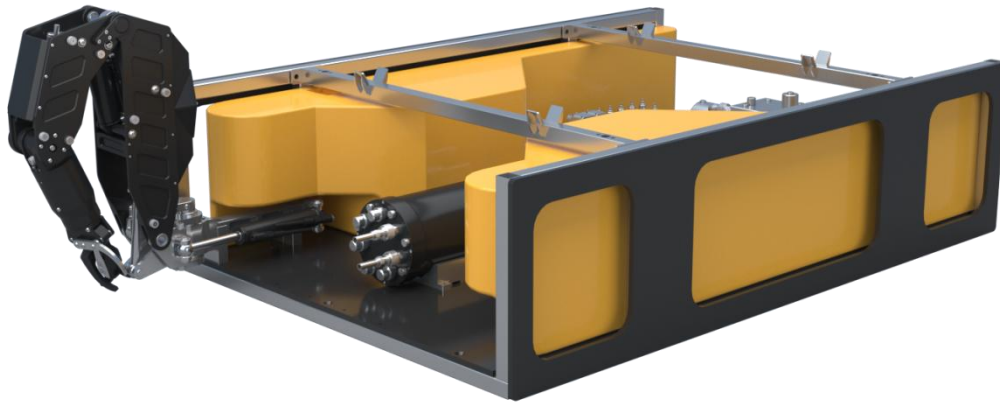


Fig. 3: Articulated Manipulator Additional Layer

Articulated Manipulator Additional Layer	
Six-axis manipulator	Equipped with 1 unit of multi-functional manipulator with 6 degrees of freedom Maximum reach distance: 1.0 m; Maximum lifting capacity: 30 kg; Maximum lifting capacity at full reach: 14 kg
Compensation system	Equipped with multiple units of compensators and supports liquid level feedback

2.3 Deck Support Unit

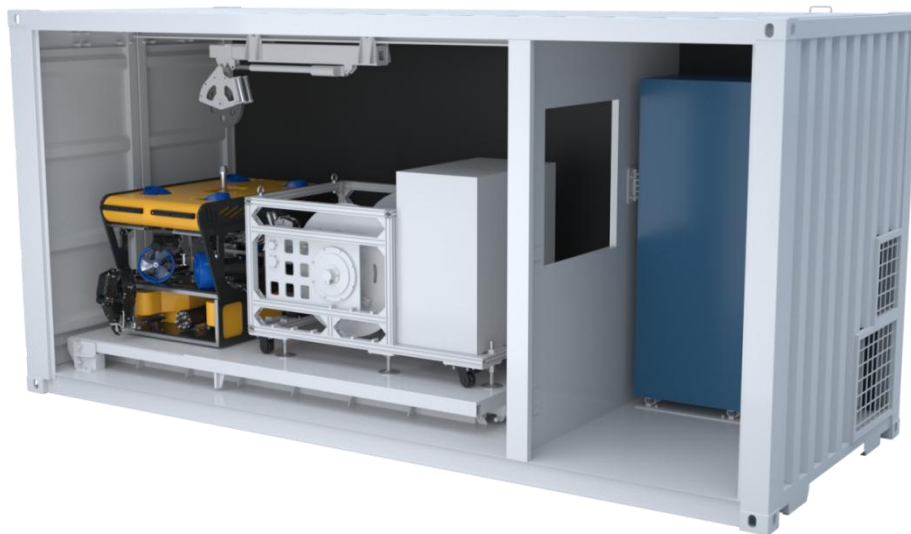


Fig.4: Deck Support Unit

Deck Support Unit	
Total system weight	9000kg
Total system power	55kw
Control cabin	-National standard container with modular design of internal components -Dimensions: 6058mm × 2438mm × 2896mm (L×W×H) -Components: Control cabin, ROV control system, ROV power distribution system, refrigeration system, dehumidification system, alarm system, etc.
ROV control system	Equipped with a triple-screen control computer Equipped with dual-station seats and worktables Control software: Visual graphic interface, supporting multiple languages (Chinese/English switchable) and video overlay function Equipped with an industrial-grade handheld controller, which can realize the control of ROV movement and other functions
ROV power distribution system	Integrated dedicated power distribution cabinet, including circuit breakers, contactors, overload relays, transformers, as well as terminals and isolation points for all high-voltage connections

2.4 Winch & Umbilical Cable

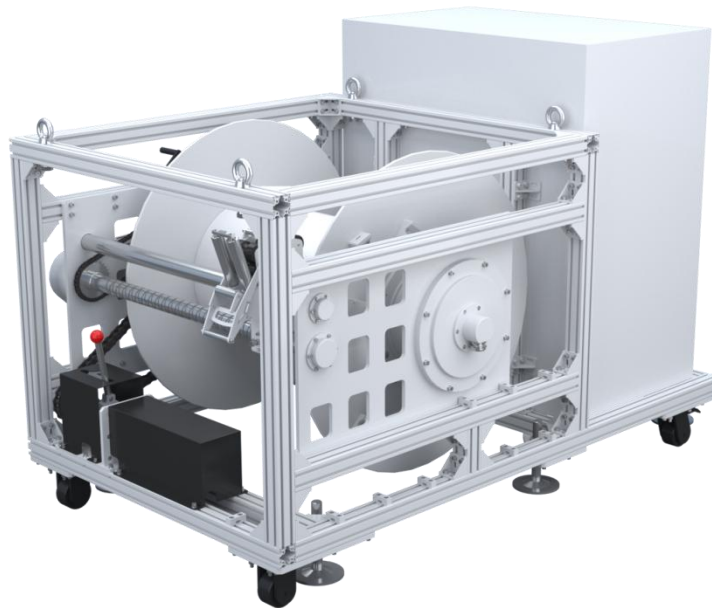


Fig.5: Winch

Winch & Umbilical Cable	
Winch	- Automatic cable winding function - Stepless speed adjustment for cable winding and unwinding
Umbilical Cable	- Neutral buoyancy umbilical cable - Length: 350m
Voltage & Power Consumption	220VAC , 4KW

2.5 Crane

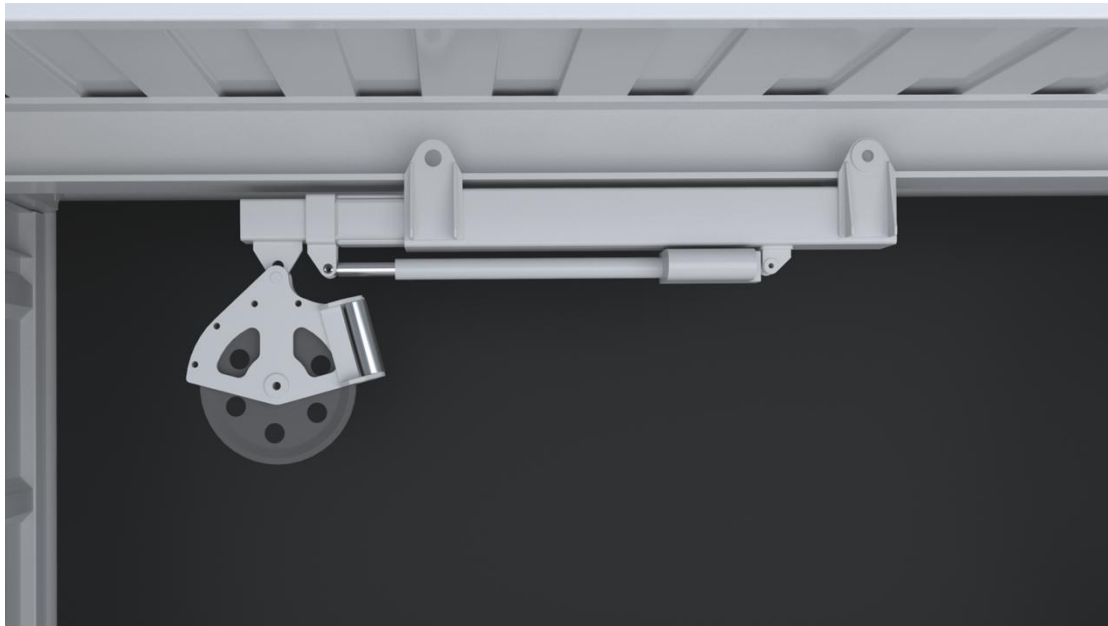


Fig6: Crane

Crane	
Lifting capacity	2t
Telescopic length	3m



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山东未来机器人股份有限公司
SHANDONG FUTURE ROBOT CO., LTD

Add: No.52,Chuangye Rd,Hi-tech Zone,Weihai,China
Tel: 0631-5326187 Mob: 13082680120 Fax: 0631-5326187
Email: robot2@vvlai.com www.vvlai.cn www.vvlai.com



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