

Catalog for underwater manipulator



QINGDAO MAEAER UNDERWATER TECH
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Castelldefel.

**We have focused on underwater
electrical manipulator for 7 years.**

Company Profile

Qingdao Maeaer Underwater Technology Co., Ltd. is a professional supplier of underwater electromechanical equipment. Based on zero-leakage dry dynamic sealing technology, transmission technology, drive integration technology and master-slave control technology, we have formed a series of underwater robotic arms, underwater motors and underwater electric cylinders, such as light-weight, medium-duty, heavy-duty and high-precision types. Maeaer's products are oriented to the domestic and international industrial markets, with excellent and stable performance, and have been widely and well applied in various underwater scenarios.

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Underwater electric manipulator

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Service Commitment

Service Quality Assurance

Pre-use counselling

All of our products has undergone the strict water pressure test, pressure test and all products have completed 100% quality inspection before being sent.

Our products are servo products and intelligent systems, when you open the box to use, please read the instructions and precautionscarefully, or contact your pre-sales engineer in time.Or contact your pre-sales engineer in time.

*Alarm : Please do not plug and unplug the waterproof connector with electricity.

Mechanical parameters

Weight (air)/water	2.55kg/1.58kg
Waterproof depth	≤300m
Main material	Alufer
Surface treatment	Hard anodizing
Installation	Base flange
Standard Cable Length	1m

Electrical parameters

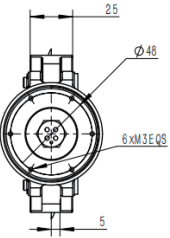
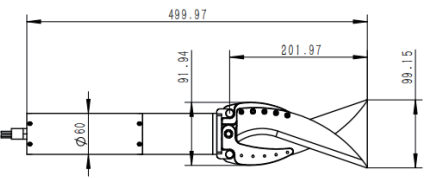
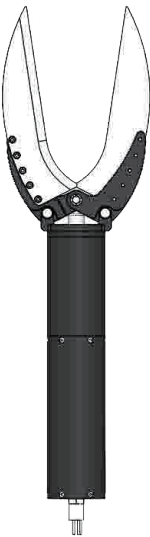
Drive Mode	Servo motor
Rated voltage	24VDC
Rated power	45W
Communication protocol	RS485/PWM

Operating method

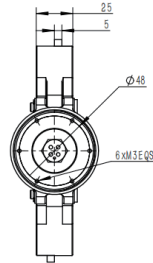
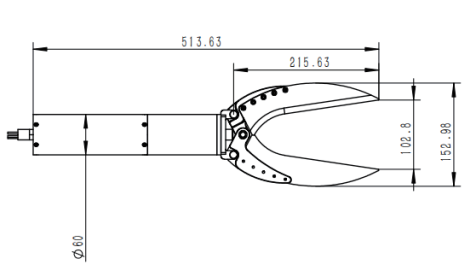
Mode1(RS485) IPC

Shearer

Maximum opening	54.5°
Clamping range	0-25mm
Clamping force	1000N



S1-shearing



S1-shear spreading

Mechanical parameters

Dexterity 1 degree of freedom and 1 jaw

Weight (air)/water 1kg/0.66kg

Load 3kg

Waterproof depth ≤300m

Main material Alufer

Surface treatment Hard anodizing

Installation Base flange

Standard Cable Length 1m

Electrical parameters

Drive Mode Servo motor

Rated voltage 24VDC

Rated power 48W

Communication protocol RS485/PWM

Operating method

Mode1 IPC

Gripper

Rated power 24w

Maximum opening 69°

Clamping range 0-100mm

Clamping force 250N

Opening & closing time ≤8s

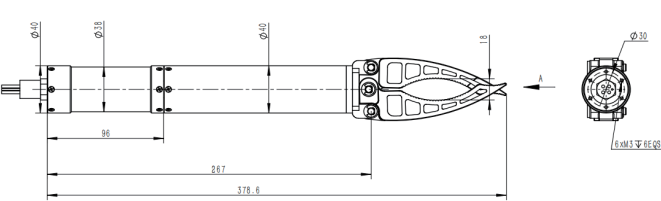
Rotating wrist

Rated power 24w

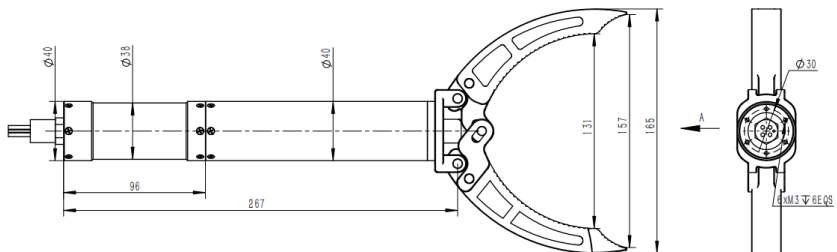
Rated speed 14.5RPM

Rated torque 0.5N·m

Scope of work ±360°

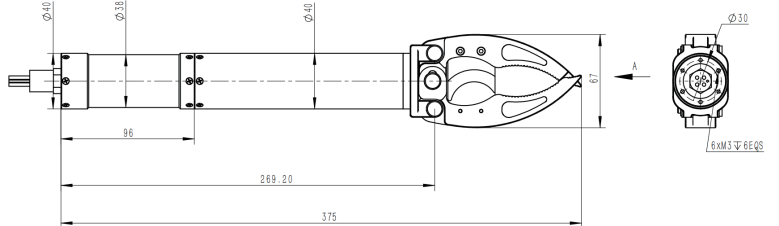
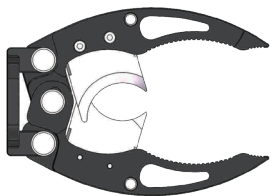


S2-130

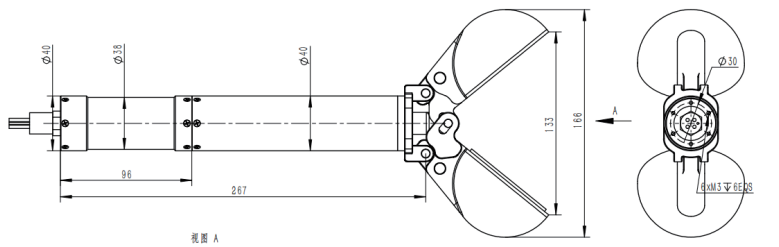


S2- shearing

Shear range : 0-25mm



S2- samplers



The maximum sediment or liquid sampling volume is 160ml.

Avoid subjecting the manipulator to impact or tension exceeding 3kg during use.

Mechanical parameters

Dexterity	2 degrees of freedom and 1 jaw	
Weight (air)/water	3.25kg/1.9kg	
Load	3kg	
Waterproof depth	≤300m	
Main material	Alufer	
Surface treatment	Hard anodizing	
Installation	Chassis Mount	
Control mode	Position	Speed
Standard Cable Length	1.5m	

Electrical parameters

Endpoint accuracy	Millimetrer level
Drive mode	Servo motor
Peak power	108W
Rated voltage	48VDC
Communication protocol	RS485/Ethernet

Operating method

Mode1	IPC
Mode2	Master

Axis data

Gripper

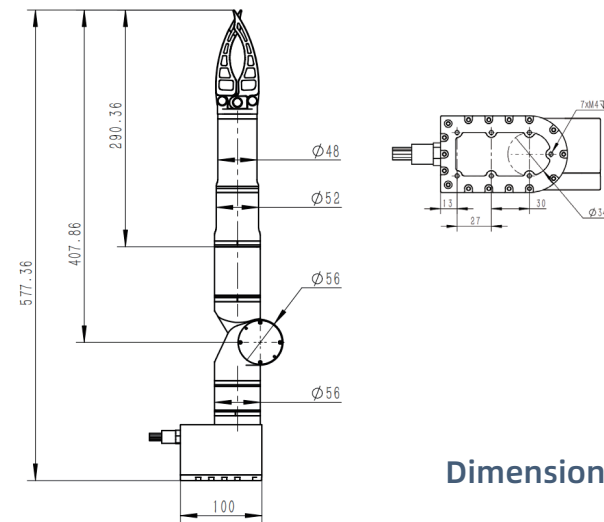
Rated power	36W
Maximum opening	69°
Clamping range	0-100mm
Clamping force	300N
Opening & closing time	≤5S

Rotary

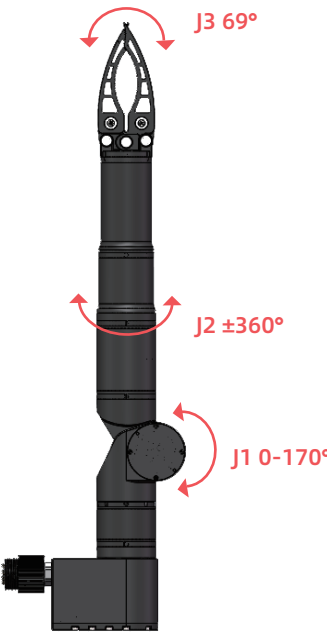
Rated power	36W
Rated speed	60°/S
Rated torque	1.8N·m
Scope of work	±360°

Pitch

Rated power	36W
Rated speed	13.5°/S
Rated torque	20N·m
Scope of work	0-170°



Dimension



Operation mode

Basic parameters

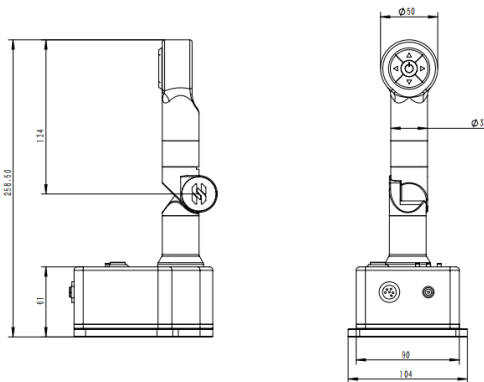
Weight	0.8kg
Number of axis	3
Number of keys	5
Base Size	75*70*72mm
Material	Alufer
Surface treatment	Black anodised
Mechanical configuration	Isomorphic to the robotic arm body
Input interface	Power & Signal Interface
Input Cable	Power & Signal Cables
Rated voltage	16-24VDC
Communication protocol	RS485



Isomorphic master

Range of motion

J1 Rotary	0-170° mechanical limit 17-position magnetic encoder
J2 Pitch	360° mechanical limit 17-position magnetic encoder
J3 Gripper	Keypad control



Dimension

Mechanical parameters

Dexterity	4 degrees of freedom and 1 jaw
Weight (air)/water	5kg/2.9kg
Load (air)/water	2kg/2.5kg
Waterproof depth	≤300m
Main material	Alufer
Surface treatment	Hard anodizing
Installation	Chassis Mount
Control mode	Position ROS support
Standard Cable Length	1.5m

Electrical parameters

Endpoint accuracy	Millimetre scale
Drive mode	Servo motor
Peak power	234W
Rated voltage	41-51VDC
Communication protocol	RS485/Ethernet

Operating method

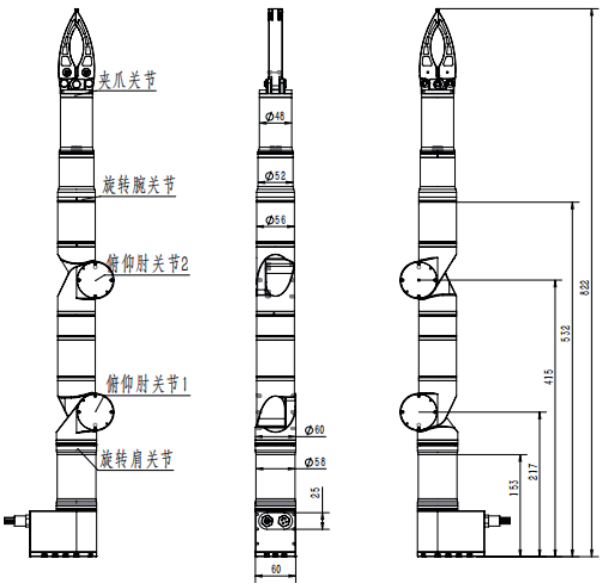
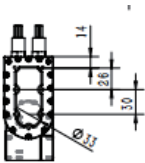
Mode1	IPC
Mode2	Master

Axis data

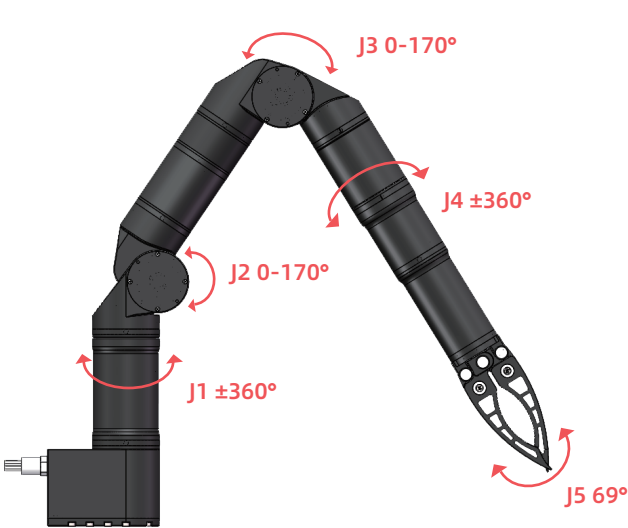
J5 - jaw	Gripper	J4 - rotate the wrist	Rotary
Rated power	36W	Rated power	36W
Maximum opening	69°	Rated speed	60°/S
Clamping range	0-100mm	Rated torque	1.8N·m
Clamping force	300N	Scope of work	±360°
Opening & closing time	≤5S		
Replaceable end tools			

J3 - pitch and roll elbow joint	Pitch	J2 - pitch and roll elbow joint	Pitch
Rated power	36W	Rated power	36W
Rated speed	13.5°/S	Rated speed	13.5°/S
Rated torque	20N·m	Rated torque	20N·m
Scope of work	0-170°	Scope of work	0-170°

J1 - Rotate the shoulder joint		Rotary	
Rated power	90W	Rated torque	6.5N·m
Rated speed	60°/S	Scope of work	±360°



Dimension

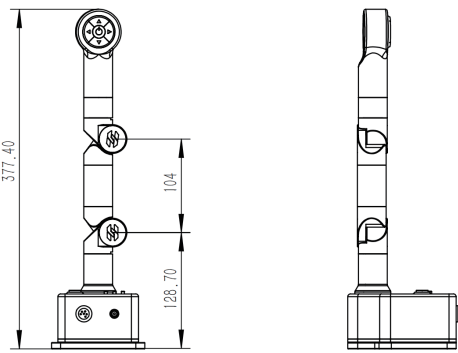


Operation mode

Basic parameters	
Weight	1.2kg
Number of axis	4
Number of keys	5
Base Size	101*80*39mm
Material	Alufer
Surface treatment	Black anodised
Mechanical configuration	Isomorphic to the robotic arm body
Input interface	Power & Signal Interface
Input Cable	Power & Signal Cables
Rated voltage	16-24VDC
Communication protocol(Adaptation)	RS485

Isomorphic master

Range of motion	
J1 Rotary	±360° mechanical limit 17-position magnetic encoder
J2 Pitch	0-170° mechanical limit 17-position magnetic encoder
J3 Gripper	0-170° mechanical limit 17-position magnetic encoder
J4 Rotary	±360° mechanical limit 17-position magnetic encoder/Keypad control
J5 Gripper	Keypad control



Dimension

Mechanical parameters

Dexterity	6 degrees of freedom and 1 jaw
Weight (air)/water	7.3kg/3.3kg
Load	2.5kg
Repeat Positioning Accuracy	≤0.1mm
Working radius	740mm
Waterproof depth	≤300m
Main material	Alufer
Surface treatment	Hard anodizing
Installation	Vertical, Inversion
Control mode	Position ROS support
Standard Cable Length	1.5m

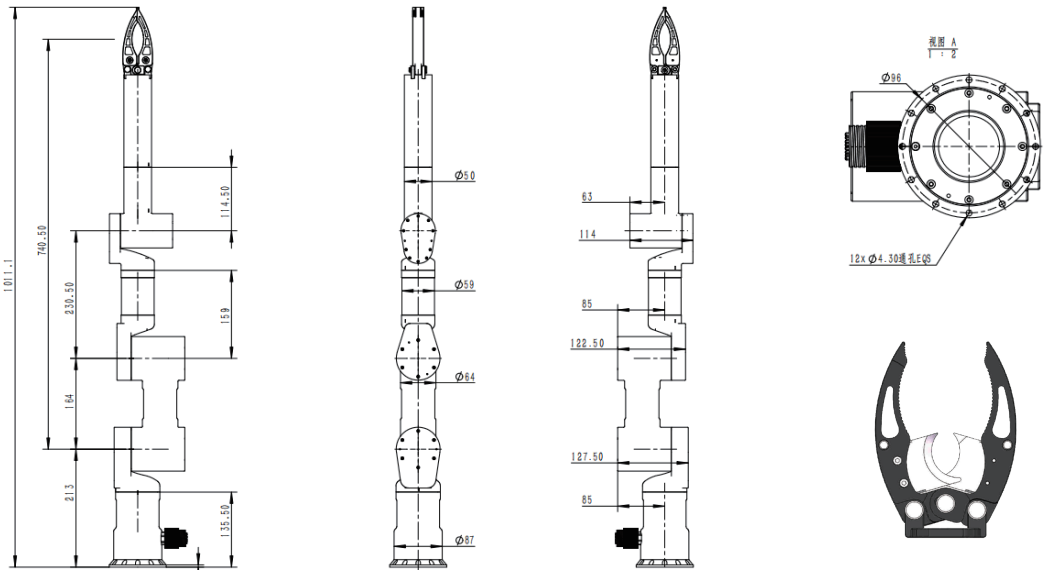
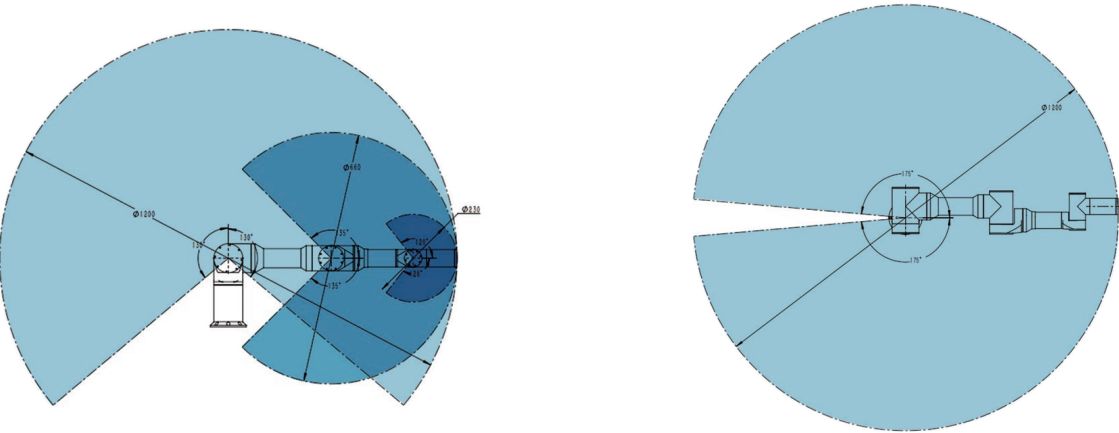
Electrical parameters

Drive mode	Servo motor
Peak power	1152W
Rated voltage	41-51VDC
Operating method	Master
Communication protocol	RS485/Ethernet

Range of motion

J1 Rotary	±175°
J2 Pitch	±130°
J3 Pitch	±135°
J4 Rotary	±175°
J5 Pitch	±124°
J6 Rotary	±360°
J7 Clamping range	0-100mm

Reachable rage



Cutting range : 0-25mm

S7-Clamping jaws (end tool can be replaced with shear)

Basic parameter	
Weight	1.8kg
Number of joints	6+1
Number of keys	5
Base Size	121*90*54mm
Material	Alufer
Surface treatment	Black anodised
Mechanical configuration	Isomorphic to the robotic arm body
Input interface	Power & Signal Interface
Input Cable	Power & Signal Cables
Rated voltage	16-24VDC
Communications protocol	RS485

Range of motion	
J1 Rotary	± 175° mechanical limit 17-position magnetic encoder
J2 Pitch	± 130° mechanical limit 17-position magnetic encoder
J3 Pitch	± 135° mechanical limit 17-position magnetic encoder
J4 Rotary	± 175° mechanical limit 17-position magnetic encoder
J5 Pitch	± 124° mechanical limit 17-position magnetic encoder
J6 Rotary	± 360° mechanical limit 17-position magnetic encoder
J7 Gripper	Keypad control

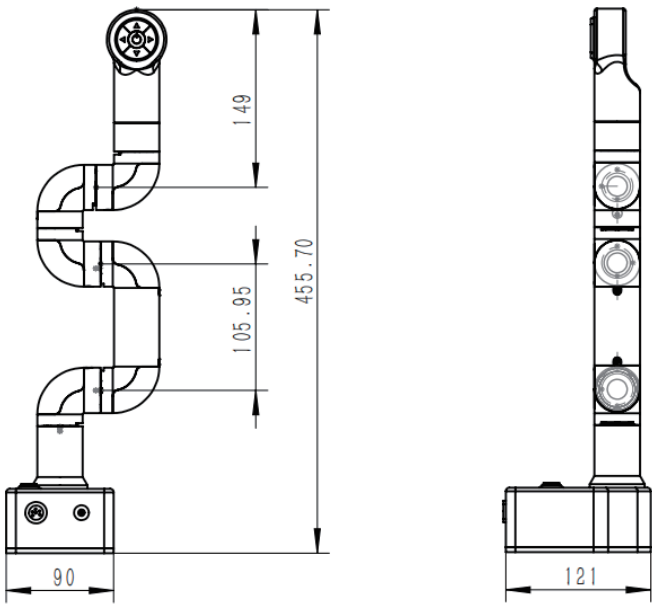
Controllers	Processor: X86 4-core Memory: 8G Storage: 32G	Motion Controls	Positive inverse solution control, motion trajectory planning, collision avoidance algorithms
Number of control axes	Standard: 6-axis vertically articulated robot	Coordinate systems	Joint coordinate system, robot coordinate system
Hardware interfaces	RS485/Ethernet/CAN	Programming method	C/C++/pythpn
Operating modes	Upper computer graphical drag-and-drop control mode, remote interface mode (ROS)	Installation method	Integrated at the bottom of the robot arm

Product Features

ROS has a wide range of applications in robotic arms, including but not limited to the following:

1. Path planning and controlling: helps programmers perform complex actions on robotic arms. The control system provides a software package for planning and controlling the manipulator, which is used for collision avoidance, trajectory planning and execution of the manipulator.
2. Visual perception: it can provide the library and tools related to the robot's visual perception, which can help the robot to realize the tasks of visual guidance, object recognition and grasping.
3. Capture and manipulation: provides a number of tools and libraries for robotic capture and manipulation to help the robotic arm perform precise capture and manipulation tasks.
4. Modularization and communication: through the message-passing system, communication and cooperation among different modules in the robot system are realized. Can support cross-machine operation, remote operation of the function.

Dimension



Mechanical parameters

Dexterity	2 degrees of freedom and 1 jaw
Weight (air)/water	11.5kg/5.5kg
Load	12kg
Waterproof depth	≤300m
Main material	Alufer
Surface treatment	Hard anodizing
Installation	Chassis Mount
Control mode	Position Speed
Standard Cable Length	1.5m

Electrical parameters

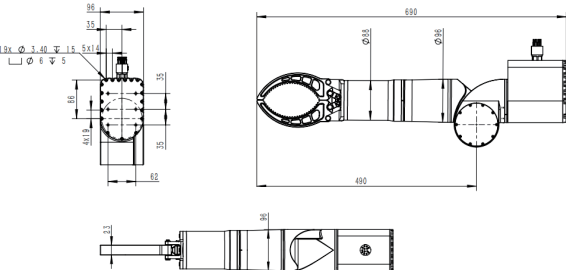
Drive mode	Servo motor
Peak Powers	750W
Rated voltage	41-51VDC
Communication protocol	RS485/Ethernet

Operating method

Mode1	IPC
Mode2	Master
Mode3	Remote controls

Clamping Jaws & Shear Knives

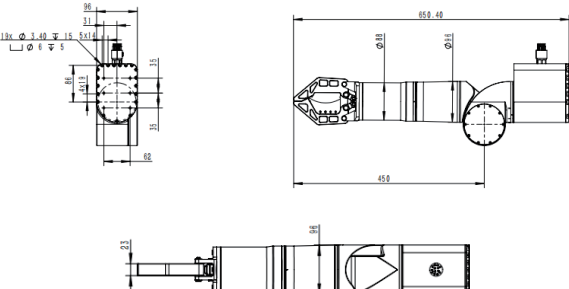
Gripper key power	150W
Maximum opening	100°
Clamping range	0-200mm
Jaw force	1000N
Jaw opening and closing time	≤11s
Shear range	0-20mm
shearing force	1500N
Shear opening and closing time	≤8s



M3 - jaw

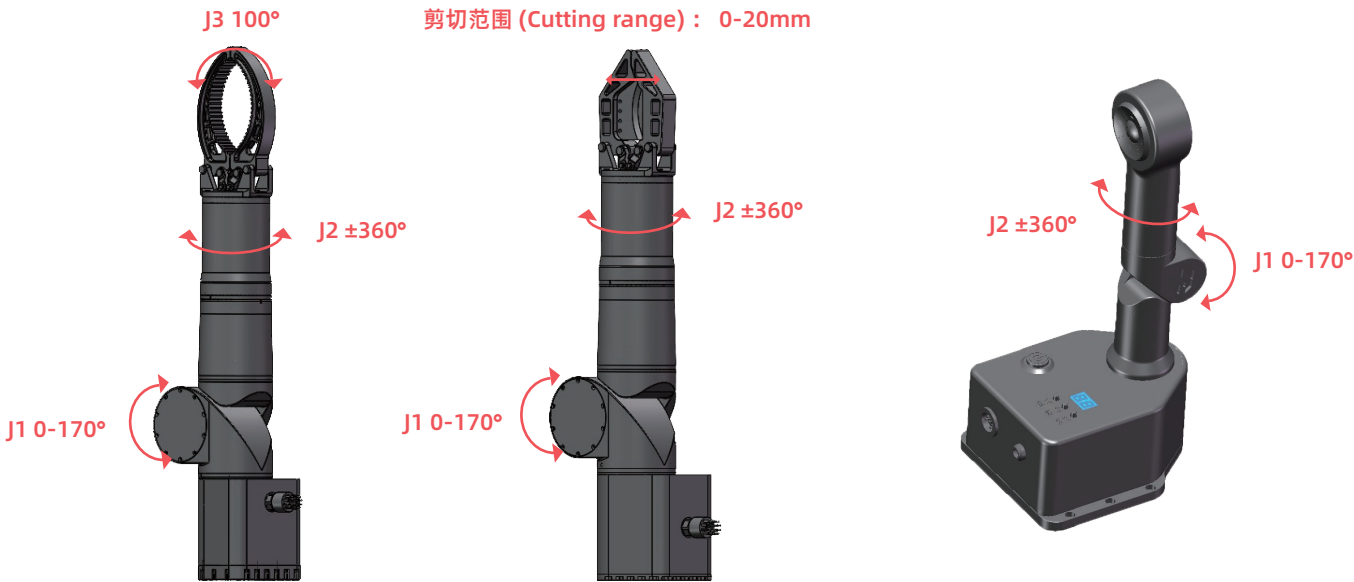
Turning wrist Tilt axis

Rated power	300W	300W
Rated RPM	60°/s	13.6°/s
Rated torque	30N·m	100N·m
Scope of work	±360°	0-170°



M3 - shearing

Dimensions



M3 - jaw

M3 - shearing

Operation mode

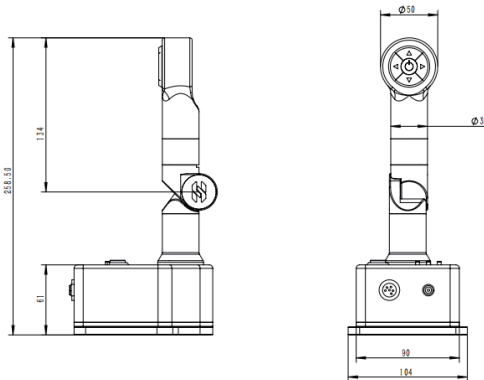
Isomorphic master

Basic parameters

Weight	0.8kg
Number of axis	3
Number of keys	5
Base Size	75*70*72mm
Material	Alufer
Surface treatment	Black anodised
Mechanical configuration	Isomorphic to the robotic arm body
Input interface	Power & Signal Interface
Input Cable	Power & Signal Cables
Rated voltage	16-24VDC
Communication protocol	RS485

Range of motion

J1 Rotary	0-170° mechanical limit 17-position magnetic encoder
J2 Pitch	360° mechanical limit 17-position magnetic encoder
J3 Gripper	Keypad control



Dimension

Mechanical parameters

Dexterity	4 degrees of freedom and 1 jaw
Weight (air)/water	15kg/8kg
Load	12kg
Waterproof depth	≤300m
Main material	Alufer
Surface treatment	Hard anodizing
Installation	Chassis Mount
Control mode	Position ROS support
Standard Cable Length	1.5m

Electrical parameters

Drive mode	Servo motor
Peak Powers	1675W
Rated voltage	41-51VDC
Communication protocol	Ethernet

Operating method

Mode1	IPC
Mode2	Master
Mode3	Remote controls

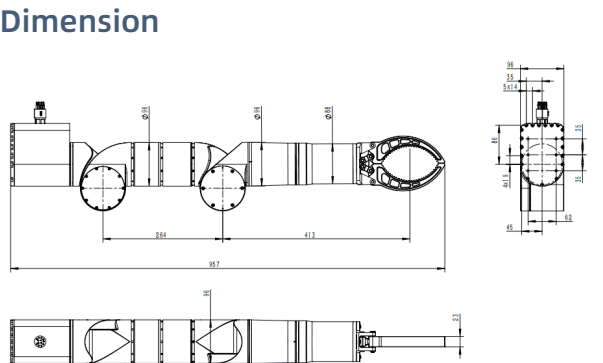
Clamping Jaws & Shear Knives

Clamping force	1000N
Jaw opening and closing time	≤11s
shearing force	1500N
Shear opening and closing time	≤8s
Elbow speed	13.6°/s
Rotational torque of the wrist joint	30N·m

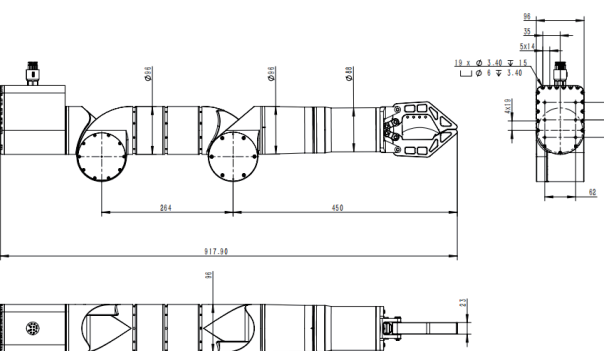
Scope of work

J1 Rotary	±360°
J2 Pitch	0~+170°
J3 Pitch	0~+170°
J4 Rotary	±360°
J5 Clamping range)	0-200mm
Cutting range	0-20mm

Dimension

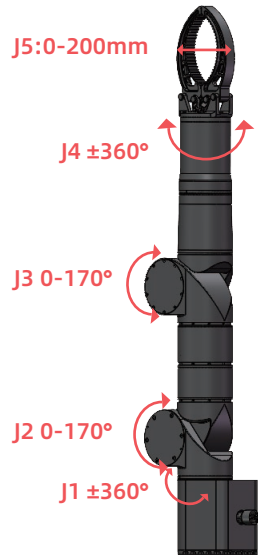


M5 - jaw

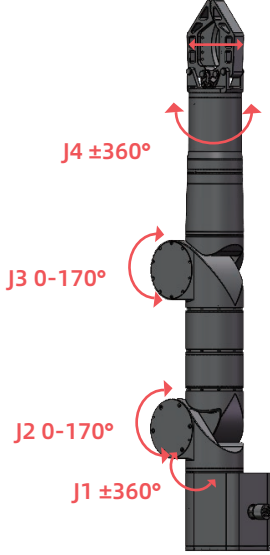


M5 - shearing

剪切范围 (Cutting range) : 0-20mm



M5 - jaw



M5- shearing

Operation mode



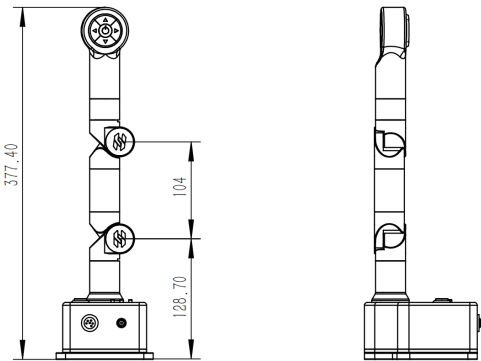
Isomorphic master

Basic parameters

Weight	1.2kg
Number of axis	5
Number of keys	5
Base Size	121*90*54mm
Material	Alufer
Surface treatment	Black anodised
Mechanical configuration	Isomorphic to the robotic arm body
Input interface	Power & Signal Interface
Input Cable	Power & Signal Cables
Rated voltage	16-24VDC
Communication protocol(Adaptation)	RS485

Range of motion

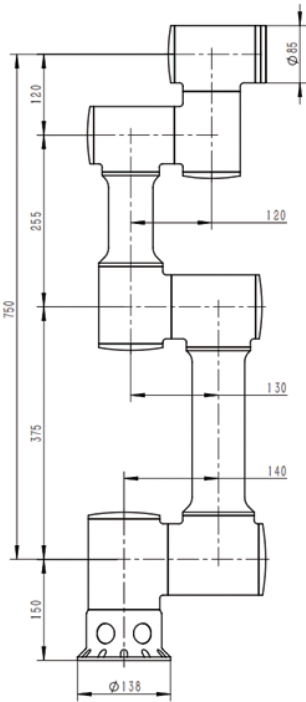
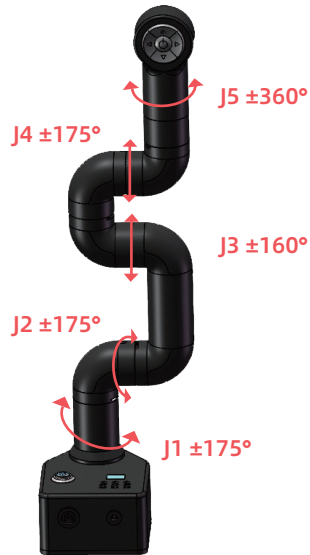
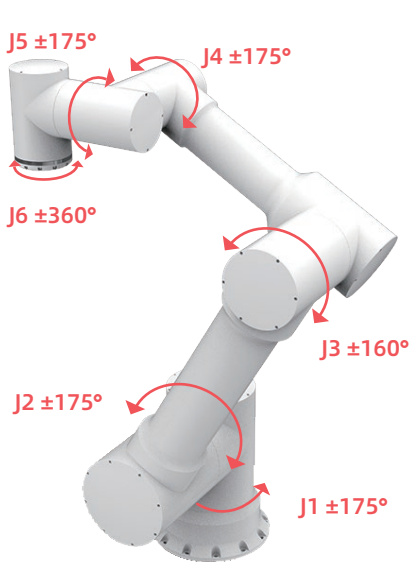
J1 Rotary	±360° mechanical limit 17-position magnetic encoder
J2 Pitch	0-170° mechanical limit 17-position magnetic encoder
J3 Gripper	0-170° mechanical limit 17-position magnetic encoder
J4 Rotary	±360° mechanical limit 17-position magnetic encoder/Keypad control
J5 Gripper	Keypad control



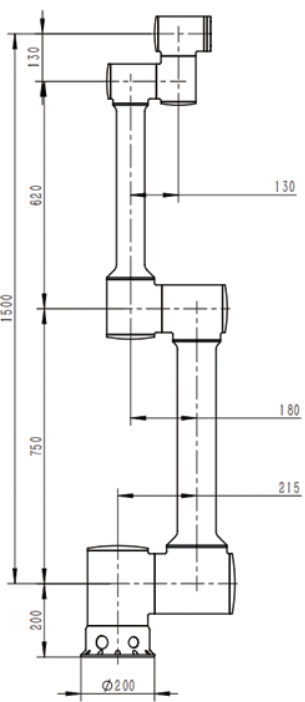
Dimension

Main parameters				
Models	X5	X10	X18	X25
Dexterity	6	6	6	6
Load	5kg	10kg	18kg	25kg
Weight (air)/water	20kg/9kg	49kg/20kg	50kg/23kg	82kg/31kg
Repeat Positioning Accuracy	±0.05mm	±0.05mm	±0.2mm	±0.2mm
Rated voltage	48VDC	48VDC	48VDC	48VDC
Power consumption (normal operating conditions)	450W	800W	850W	960W
Peak Powers	1.5KW	3.5KW	3.5KW	5.5KW
Working radius	750mm	1500mm	1000mm	1500mm
Waterproof depth	≤300m	≤300m	≤300m	≤300m
Standard Cable Length	2m	2m	2m	2m

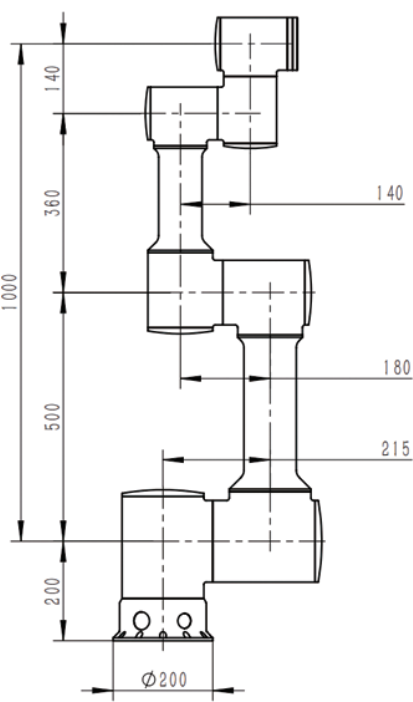
Range of motion & speed				
Models	X5	X10	X18	X25
J1 Rotary	±175° & 180°/s	±175° & 100°/s	±175° & 100°/s	±175° & 100°/s
J2 Pitch	±175° & 180°/s	±175° & 100°/s	±175° & 100°/s	±175° & 100°/s
J3 Pitch	±160° & 180°/s	±160° & 150°/s	±160° & 150°/s	±160° & 100°/s
J4 Rotary	±175° & 180°/s	±175° & 180°/s	±175° & 180°/s	±175° & 150°/s
J5 Pitch	±175° & 180°/s	±175° & 180°/s	±175° & 180°/s	±175° & 150°/s
J6 Rotary	±360° & 180°/s	±360° & 180°/s	±360° & 180°/s	±360° & 150°/s



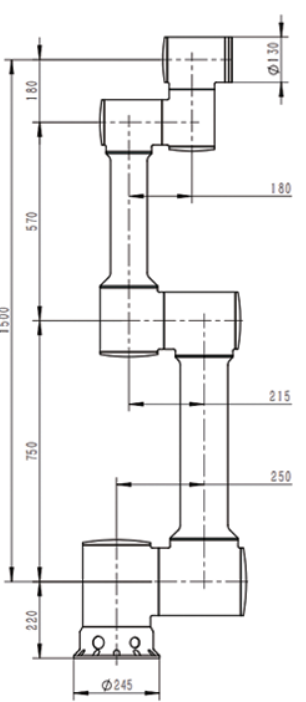
X5



X10



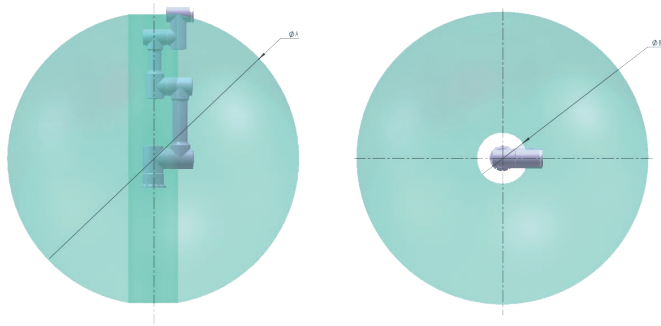
X18



X25

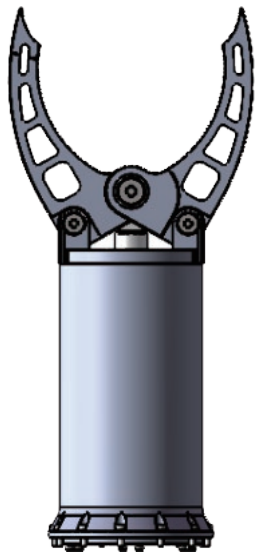
Reachable rage

	X5	X10	X18	X25
A	Ø1500	Ø3000	Ø2000	Ø3000
B	Ø260	Ø330	Ø350	Ø430

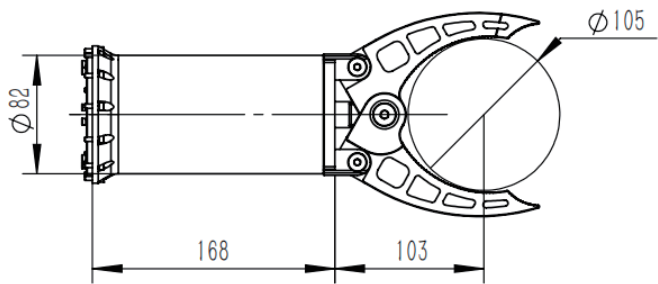


The seventh axis is a detachable gripper.

Modes	X-Series
Weight (air)/water	2.58kg/1.8kg
Rated voltage	48VDC
Rated Powers	100W
Clamping force	150N
Maximum grasping diameter	Ø105mm
Opening & closing time	≤5s



Overall dimensions



Basic parameter		Range of motion	
Weight	1.8kg	J1 Rotary	± 175° mechanical limit 17-position magnetic encoder
Number of axis	6+1	J2 Pitch	± 175° mechanical limit 17-position magnetic encoder
Number of keys	5	J3 Pitch	0-160° mechanical limit 17-position magnetic encoder
Base Size	121*90*54mm	J4 Rotary	± 175° mechanical limit 17-position magnetic encoder
Material	Alufer	J5 Pitch	± 175° mechanical limit 17-position magnetic encoder
Surface treatment	Black anodised	J6 Rotary	Keypad control
Mechanical configuration	Isomorphic to the robotic arm body		
Input interface	Power & Signal Interface		
Input Cable	Power & Signal Cables		
Rated voltage	16-24VDC		
Communication protocol	CAN		
		J7 Gripper	Keypad control

Dimension

Operation mode2		ROS Controller	
Controllers	Processor: linux 4-core Memory: 8G Storage: 32G	Motion Controls	Positive inverse solution control, motion trajectory planning, collision avoidance algorithms
Number of control axes	Standard: 6-axis vertically articulated robot	Coordinate systems	Joint coordinate system, robot coordinate system
Hardware interfaces	RS485/Ethernet/CAN	Programming method	C/C++/python
Operating modes	Upper computer graphical drag-and-drop control mode, remote interface mode (ROS)	Installation method	Integrated at the bottom of the robot arm

ROS has a wide range of applications in robotic arms, including but not limited to the following:

- 1. Path planning and control: helps programmers perform complex actions on robotic arms. The control system provides a software package for planning and controlling the manipulator, which is used for collision avoidance, trajectory planning and execution of the manipulator.
- 2. Visual perception: it can provide the library and tools related to the robot's visual perception, which can help the robot to realize the tasks of visual guidance, object recognition and grasping.
- 3. Capture and manipulation: provides a number of tools and libraries for robotic capture and manipulation to help the robotic arm perform precise capture and manipulation tasks.
- 4. Modularization and communication: through the message-passing system, communication and cooperation among different modules in the robot system are realized. Can support cross-machine operation, remote operation of the function.

Operation mode3

Teachers & Controllers

Controllers	Processor: X86 4-core Memory: 2.0G Storage: 32G	Movement Functions	Point-to-Point, Line, Arc, Spline Curve, Linear Swing, FLYBY
Number of control axes	Standard: 6-axis vertically articulated robot	Command system	Motion instructions, logic instructions, input/output instructions, arithmetic instructions
Control servo	EtherCAT/CANopen	Position control method	Point-to-point control Continuous trajectory control
Operating modes	Demonstration mode, reproduction mode, remote mode	Coordinate system	Joint coordinate system, robot coordinate system, tool coordinate system, user coordinate system
Programming method	Teach-In Programming, Offline Programming, Drag & Drop Teach-In	power supply	24V 60W (Controller power 30W, Teaching box 30W)
Installation	External Non-waterproof		

Product Features

It can support dual-machine collaboration mode, which can control 2 robotic arms independently at the same time, and can synchronise the start and stop of the two robots.

Can provide open API interface. Support the secondary development of integrated process based on C/C++/PYTHON/LUA, the core process experience in their own hands.

Support offline programming technology, support multiple offline programming manufacturers, SPRUT-CAM, ROBOTMASTER, ROBOTDK, a wide range of application areas.

Mechanical parameters

Models	L10	L20	L40
Dexterity	5	5	5
Rated load	10kg	20kg	40kg
Rated power	800W	1500W	2000W
Weight (air)/water	24kg/16kg	35kg/26kg	45kg/36kg
Waterproof depth	≤300m	≤300m	≤300m
Arm span	800mm	1000mm	1200mm
Rotational torque of the wrist joint	10N·m	10N·m	10N·m
Clamping force	600N	1500N	2500N
Clamping Diameter	100mm	100mm	100mm
Standard Cable Length	1.5m	1.5m	1.5m

Electrical parameters

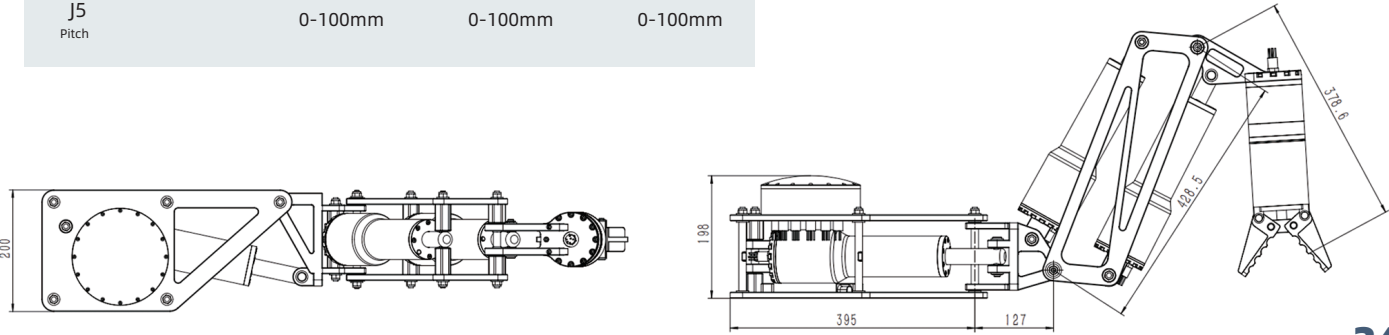
Driving method	Servo motor
Rated voltage	48VDC
Communication protocol	RS485/Ethernet



Range of motion & speed

Models	L10	L20	L40
J1 Rotary	±30°	±30°	±30°
J2 Pitch	±45°	±45°	±45°
J3 Pitch	±60°	±60°	±60°
J4 Rotary	±360°	±360°	±360°
J5 Pitch	0-100mm	0-100mm	0-100mm

Dimension

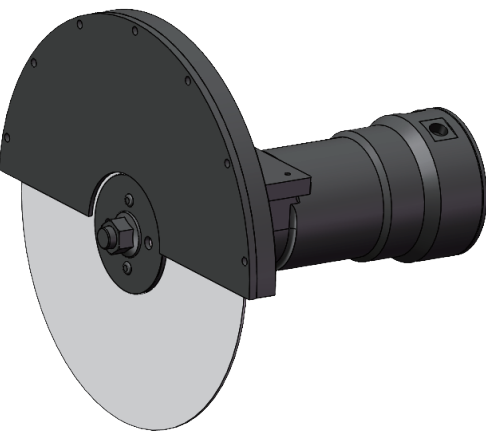


Optional tools



Often fitted to the end of the M5

Cutting Tools	
Shearing force	1700N
Cutting Diameter	16mm



Often fitted to the end of the M5

Circular saw	
Metal Cutting Thickness	40mm
Rated power	450w
Rated torque	20N·m
Rated speed	200rpm
Mass	10kg

Service Commitment

Service Quality Assurance

Pre-use counselling

All of our products has undergone the strict water pressure test, pressure test and all products have completed 100% quality inspection before being sent.

Our products are servo products and intelligent systems, when you open the box to use, please read the instructions and precautionscarefully, or contact your pre-sales engineer in time.Or contact your pre-sales engineer in time.

*Alarm : Please do not plug and unplug the waterproof connector with electricity.