

VVLAI Subsea Technology - Master Product Catalogue

This is the editable master copy of the VVLAI Subsea Technology Product Catalogue. It contains full technical specifications, features, and operational scenarios for the complete subsea product line. Image placeholders have been embedded within each section. You can directly replace these placeholders with your high-resolution product photographs, 3D CAD renders, or diagrams natively inside Google Docs.

1. Heavy Work Class ROV Series

Explorers VY150 Heavy Work Class ROV

Primary Work Scenarios: Offshore oil well installation, offshore wind power operations, underwater search and rescue, underwater archaeology.

[IMAGE PLACEHOLDER: Insert Explorers VY150 Product Photo or Engineering Render Here]

Key Features

- **Deep Water Operation:** Equipped with a self-developed Tether Management System (TMS), enabling stable and reliable operation down to depths of 3,500 meters.
- **Strong Load Capacity:** High effective payload capacity of up to 400 kg (including the weight of the robotic arms and valve compartment), allowing it to carry heavy operational tooling.
- **Integrated Control Platform:** Supports advanced navigation positioning, high-capacity power management, gigabit fiber communication transmission, and collaborative multi-equipment synchronization.
- **Multi-Tasking Tooling:** Concurrently equipped with high-precision 5-axis and 7-axis hydraulic robotic arms to handle complex deep-sea mechanical operations.

Technical Specifications

Parameter Category	Technical Specification Values
Basic & Structural Parameters	
System Power Core	150 hp (115 kW)
Maximum Depth Rating	3,500 meters
Dimensions (L x W x H)	3,200 x 1,900 x 2,000 mm
Weight in Air	3.7 T - 4.5 T (Configuration dependent)
Net Payload Capacity	400 kg (Including manipulator arms and valve chamber)
Operational & Thrust Performance	
Bollard Pull Force	Forward-Backward: 700 kg Lateral: 600 kg Vertical Upward: 600 kg Downward: 650 kg
Maximum Speed Profile	Forward: 3.4 knots Lateral: 2.2 knots
Integrated Toolkit & Interface	
Robotic Manipulators	1x 7-axis articulated arm + 1x 5-axis articulated arm
Hydraulic Interfaces	10 sets of bidirectional valves x 2
Auxiliary System Capacity	220 bar @ 120 liters/min
Vision & Control Module	
Camera System Interface	8-channel multi-angle camera inputs
Pan-Tilt Platform (PTZ)	Dual-axis high-torque PTZ x 2
Illumination Array	9x independent high-intensity dimmable LED arrays
Control Room Pod	Standard ISO offshore shipping container configuration

Explorers VY250 Ultra Deep Work Class ROV

Primary Work Scenarios: Offshore oil well platform interventions, offshore wind power deep construction, high-depth search and rescue, deep-ocean scientific research and archaeology.

[IMAGE PLACEHOLDER: Insert Explorers VY250 Product Photo or Engineering Render Here]

Parameter Category	Technical Specification Values
Basic & Structural Parameters	
System Power Core	250 hp (185 kW)
Maximum Depth Rating	6,000 meters (Ultra Deep-Sea configuration)
Dimensions (L x W x H)	3,700 x 2,000 x 2,200 mm
Weight in Air	4.7 T - 5.5 T (Configuration dependent)
Net Payload Capacity	450 kg (Including manipulator arms and valve chamber)
Operational & Thrust Performance	
Bollard Pull Force	Forward-Backward: 1,100 kg Lateral: 1,100 kg Vertical Upward: 1,050 kg Downward: 1,050 kg
Maximum Speed Profile	Forward: 3.4 knots Lateral: 2.2 knots
Integrated Toolkit & Infrastructure	
Robotic Manipulators	1x 7-axis articulated arm + 1x 5-axis articulated arm
Hydraulic Interfaces	10 sets of bidirectional valves x 2
Auxiliary System Capacity	220 bar @ 120 liters/min
Telemetry & Cameras	8 inputs, Dual axis PTZ x 2, 9 dimmable LED arrays, neutral-buoyancy umbilical control

2. Light Work Class & Inspection ROVs

Light Work Class ROV VP16K

Primary Work Scenarios: Shallow water resource surveys, subsea archaeology, maintenance of water conservancy facilities.

[IMAGE PLACEHOLDER: Insert Light Work Class VP16K Product Photo Here]

- **Dual Robot Arm Dexterity:** Uniquely pairs a seven-axis and five-axis dual hydraulic manipulator arm combination on a mid-weight vehicle frame, suited for delicate mechanical tasks.
- **Customizable Sensor Interface:** Highly scalable infrastructure allowing effortless field installation of sonars, environment data loggers, or multi-frequency transducers.

Light Work Class ROV VP12

Primary Work Scenarios: Deep-sea resource surveys, marine archaeological logging, subsea pipeline inspection.

[IMAGE PLACEHOLDER: Insert Light Work Class VP12 Product Photo Here]

Inspection ROV VP08

Primary Work Scenarios: Dam and bridge pier inspections, exploration of deep sunken shipwrecks, underwater search and rescue.

[IMAGE PLACEHOLDER: Insert Inspection ROV VP08 Product Photo Here]

Comparison Matrix: Tactical Light Class ROVs

Technical Parameter	Model VP16K	Model VP12	Model VP08
Dimensions (L x W x H)	1,800 x 1,000 x 1,100 mm	1,200 x 700 x 550 mm	680 x 480 x 410 mm
Operating Depth Rating	500 meters	500 meters	300 meters
Total Weight in Air	500 kg	120 kg	38 kg (Ultra-lightweight)
Maximum Forward Speed	3.0 knots	2.5 knots	3.0 knots
Camera Unit Payload	3x HD Cameras	2x HD Cameras	2x Synchronous Cameras

3. Specialized Subsea Vehicles & Heavy Robots

Subsea Tracked Trencher VYL1100

Primary Work Scenarios: Subsea oil and gas pipeline burial, submarine high-voltage cable laying, telecom marine cable trenching and maintenance.

[IMAGE PLACEHOLDER: Insert Subsea Tracked Trencher VYL1100 Blueprint or Action Photo Here]

Technical Parameter	Specifications (VYL1100)
System Power Module	1,100 hp / 820 kW (410 kW × 2 dual systems)
Standard Operating Depth	2,000 meters (3,000 meters customizable)
Locomotion Tracking Speed	0 - 2.2 km/h
Dimensions (L x W x H)	6,300 x 5,400 x 3,800 mm
Weight Metrics	Weight in Air: 24.5 T Weight in Water: 2.4 T (Buoyancy optimized)
Propulsion Thrusters	THR.Y500 x 10 units for subsea positioning

Technical Parameter	Specifications (VYL1100)
High-Pressure Jetting System	Dual main injection jet loops with independent operations and front DN40/DN50 jet nozzles
Trench Dimensions	Burial Width: 100 - 600 mm Burial Depth: 0 - 3 meters
Mechanical Tool Interfaces	2x 7-axis heavy-duty manipulator arms + modular subsea cable tool kits

Grasping and Cutting Heavy ROV VDL150P

Primary Work Scenarios: Subsea pipeline maintenance, decommissioning and dismantling of offshore platforms, structural subsea obstacle removal.

[IMAGE PLACEHOLDER: Insert Grasping & Cutting ROV VDL150P Photo Here]

Technical Parameter Description	Submodel VDL150P-A (Pipelines)	Submodel VDL150P-B (Cables)
Power & Platform Base Parameters		
Base Platform Power	120 kW	120 kW
Platform Dimensions (L x W x H)	2,000 × 2,000 × 2,300 mm	2,000 × 2,000 × 2,300 mm
Platform Net Weight	2 tons	2 tons
Interchangeable Structural Tool Modules		
Module Dimensions (L x W x H)	1,450 × 1,900 × 2,100 mm	960 × 1,400 × 1,700 mm
Interchangeable Module Weight	1.5 tons	1.2 tons
Subsea Operation Performance Metrics		
Operating Depth Limit	3,000 meters	3,000 meters
Grip Open Structural Size	1.2 meters	1.2 meters
Cutting Target Diameter	0 - 600 mm	0 - 400 mm

Technical Parameter Description	Submodel VDL150P-A (Pipelines)	Submodel VDL150P-B (Cables)
Heavy Lifting Weight Capacity	10 Tons	20 Tons
Target Subsea Medium	Marine Steel Pipelines (海管)	Armored Umbilicals / Cables (海缆)

Deep Sea Drilling & Sampling ROV VZT150

Primary Work Scenarios: Geotechnical subsea core drilling, stratigraphic marine sampling, seabed mineral surveys.

[IMAGE PLACEHOLDER: Insert Subsea Rig VZT150 Core Drill Photo Here]

- **System Power & Mass:** Total vehicle power of 150 hp with an engineered low weight profile under 9 tons, supporting vessel-of-opportunity mobilization.
- **Geotechnical Core Yield:** High rotating coring power of 120 hp, capable of driving drill tools down to a 32-meter extraction depth, pulling uniform samples with a 64mm diameter and 1.5m segment lengths.

Subsea Excavator VWJ400

Primary Work Scenarios: Underwater seabed excavation, mass silt dredging, marine rock/gravel bed layout.

Hydraulic Drive Power	280 kW
Maximum Operating Depth	1,500 meters
Physical Sizing (L x W x H)	8,000 × 3,000 × 3,000 mm
Total Dry Weight in Air	12 tons
Massive Mud Displacement	900 cubic meters / hour
Sediment Through Particle Size	150 mm solid rocks
Max Excavation Weight Limit	600 kg per bucket scoop
Horizontal Reach Envelope	6,000 meters tracking reach 4 meters digging depth 3 meters dumping clearance

Deep Sea Mining ROV VLD600

Primary Work Scenarios: High-depth nodule harvesting, deep ocean mineral extraction, seabed slurry gathering.

Operates stably across abyssal ranges of 600 - 3,000 meters, utilizing its robust 5-ton ballast layout to secure floor cohesion. Features a wide-bore dual suction pump layout, paired with an integrated 2-axis hydraulic preparatory arm extending 2.5m with a 500 kg lift profile. Supports optional high-torque 360° rotating mixing hand units and a 60mm caliber fluid jet pump to break compacted aggregates.

4. Automated Ship Hull Cleaning ROVs

VVLAI Ship Hull Maintenance robots provide rapid biofouling removal under anchorage conditions. Driven by heavy magnetic arrays and high-capacity thrusters, these machines climb vertical steel plating to clear barnacles and slime layer complexes, improving fleet fuel economy profiles.

[IMAGE PLACEHOLDER: Insert Hull Cleaning Robot Matrix Chart or Operation Diagram Here]

Specification Metric	Model CML100 (Brush)	Model CML200 (Brush)	Model CLK300 (Cavitation)
Performance Yield Parameters			
Cleaning Output Yield	400 - 600 m ² / hour	1,400 - 1,600 m² / hour	1,000 - 1,200 m ² / hour
Sweeping Speed Limit	0 - 15 meters / min	0 - 25 meters / min	0 - 25 meters / min
Depth and Video Specs	100m depth 4x 2.0MP cams	100m depth 4x 2.0MP cams	100m depth 4x 2.0MP cams + DVI
Actuation & Adsorption Mechanics			
Cleaning Mechanism	3x brush discs (400 rpm)	6x hydraulic brush discs (400 rpm)	6x Cavitation water jet discs

Specification Metric	Model CML100 (Brush)	Model CML200 (Brush)	Model CLK300 (Cavitation)
Locomotion Base Drive	3x active driving wheels	Heavy duty Tracked Crawler	Heavy duty Tracked Crawler
Adsorption Method	Magnets + THR.D150 × 8	Magnets + THR.D210L × 8	Magnets + 4x vertical high-power thrusters
Debris Disintegration	Standard flow thru	Pump + active crushing tool	Pump + active crushing tool
Dimensions & Support Systems			
Physical Dimensions	1,500 x 1,100 x 450 mm	2,250 x 1,380 x 600 mm	2,250 x 1,380 x 600 mm
Total Vehicle Dry Mass	245 kg	850 kg	850 kg
Launch Support Crane	Height: 3m Span: 3.5m SWL: 400kg	Height: 3.4m SWL: 1.5 Tons	Height: 3.4m Span: 4m SWL: 1.5 Tons

5. Articulated Hydraulic Manipulator Arms

VVLAI high-precision master-slave manipulator systems provide micro-positioning mechanical force feedback equivalents down to full ocean deep regimes. Engineered for effortless fitment across any commercial work class ROV or heavy seafloor skid.

[IMAGE PLACEHOLDER: Insert Mechanical Arm Diagram or Kinematic Reach Blueprint Here]

Technical Parameter Category	Premium Model V7S	Standard Model V7	Heavy Duty Model V5L
Kinematic & Material Structural Properties			
Joint Layout Configuration	6 Axes + 1 grab function	6 Axes + 1 grab function	4 Axes + 1 grab function
Degrees of Freedom (DOF)	7 DOF	7 DOF	5 DOF

Technical Parameter Category	Premium Model V7S	Standard Model V7	Heavy Duty Model V5L
Primary Structure Material	Titanium Alloy + Stainless Steel	Aluminum Alloy Boom + Stainless Steel	Aluminum Alloy Boom + Stainless Steel
Weight Mass (Air / Water)	100 kg / 78 kg	85 kg / 70 kg	64 kg / 48 kg (Ultra-lightweight)
Load Capabilities & Performance Limits			
Maximum Operational Reach	1,922 mm	1,900 mm	1,372 mm
Full Extension Lift Force	122 kg	100 kg	181 kg (Heavy-duty lift)
Jaw Actuation Gripping Force	4,092 N	3,900 N	4,448 N
Wrist Rotational Torque	170 Nm @ 6-35 rpm	170 Nm @ 6-35 rpm	205 Nm @ 6-35 rpm (360° continuous)
Standard Jaw Max Aperture	99 mm (Pincer standard)	150 mm (Pincer standard)	284 mm (3-finger standard)
Joint Articulation Angles			
Azimuth Joint (Swing)	240° Swing	75° Swing	105° Swing
Shoulder Joint (Pitch)	120° Pitch	111° Pitch	100° Pitch
Elbow Joint Articulation	270° Pitch	131° Pitch	0 - 368 mm Active Telescoping
Wrist Orientation Joint	180° Pitch	120° Pitch	N × 360° continuous rotation