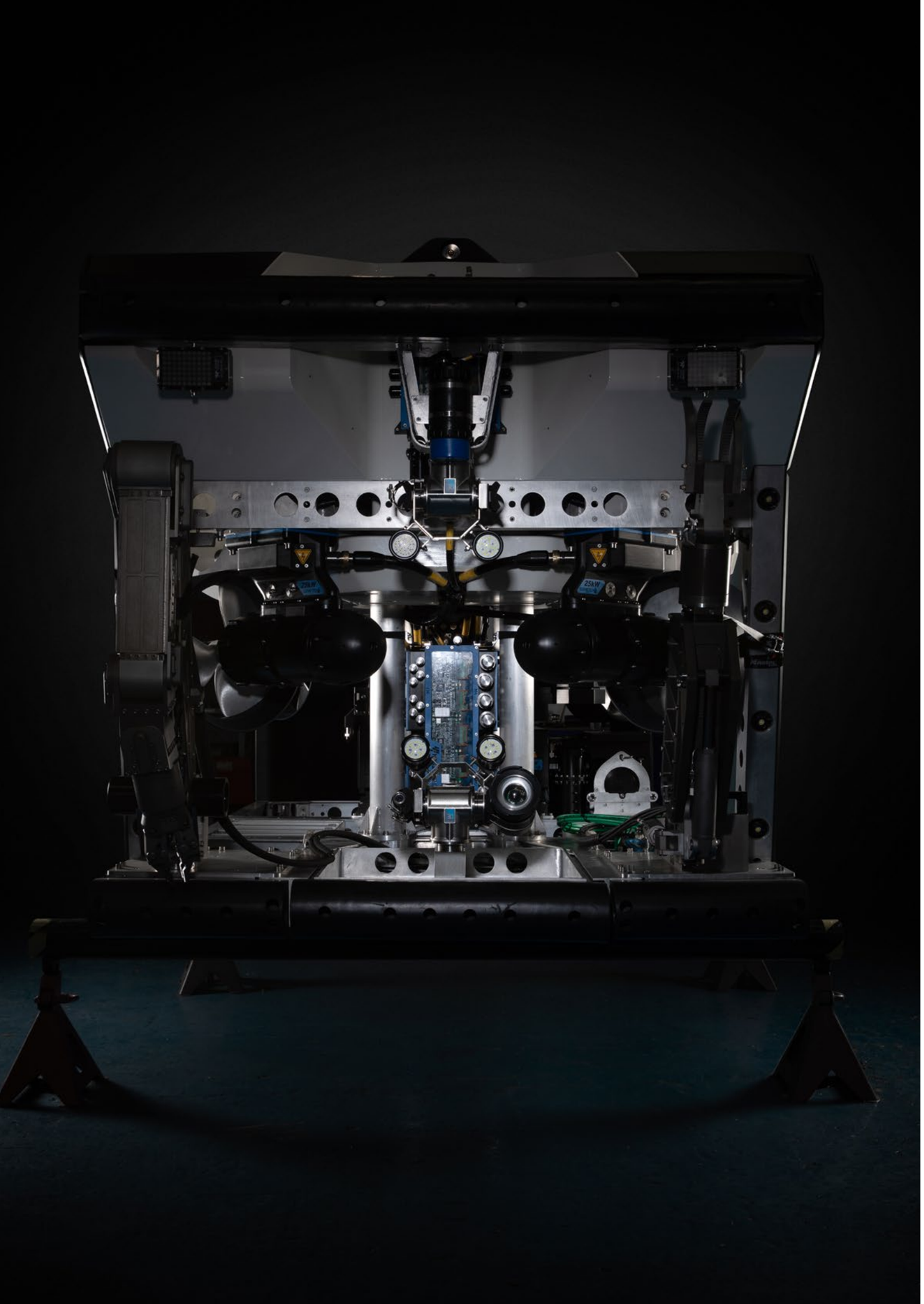
QUANTUM EV

SMD

ENGINEERING
EXCELLENCE
UNDERWATER



THE ROV. REIMAGINED.

A NEW PHILOSOPHY IN ROV DESIGN.

SMD's new future ready modular robotic platform has been optimised to give you better results with lower operational costs.

Innovations in propulsion and control offer new levels of stability, strength and reliability for winning across a wide range of subsea applications.

Modular design lets you optimise vehicle configuration for the job at hand and operate from a variety of motherships including conventional vessels, autonomous vessels and subsea resident docking stations.

THE ROV. REIMAGINED.

A NEW PHILOSOPHY IN ROV DESIGN.

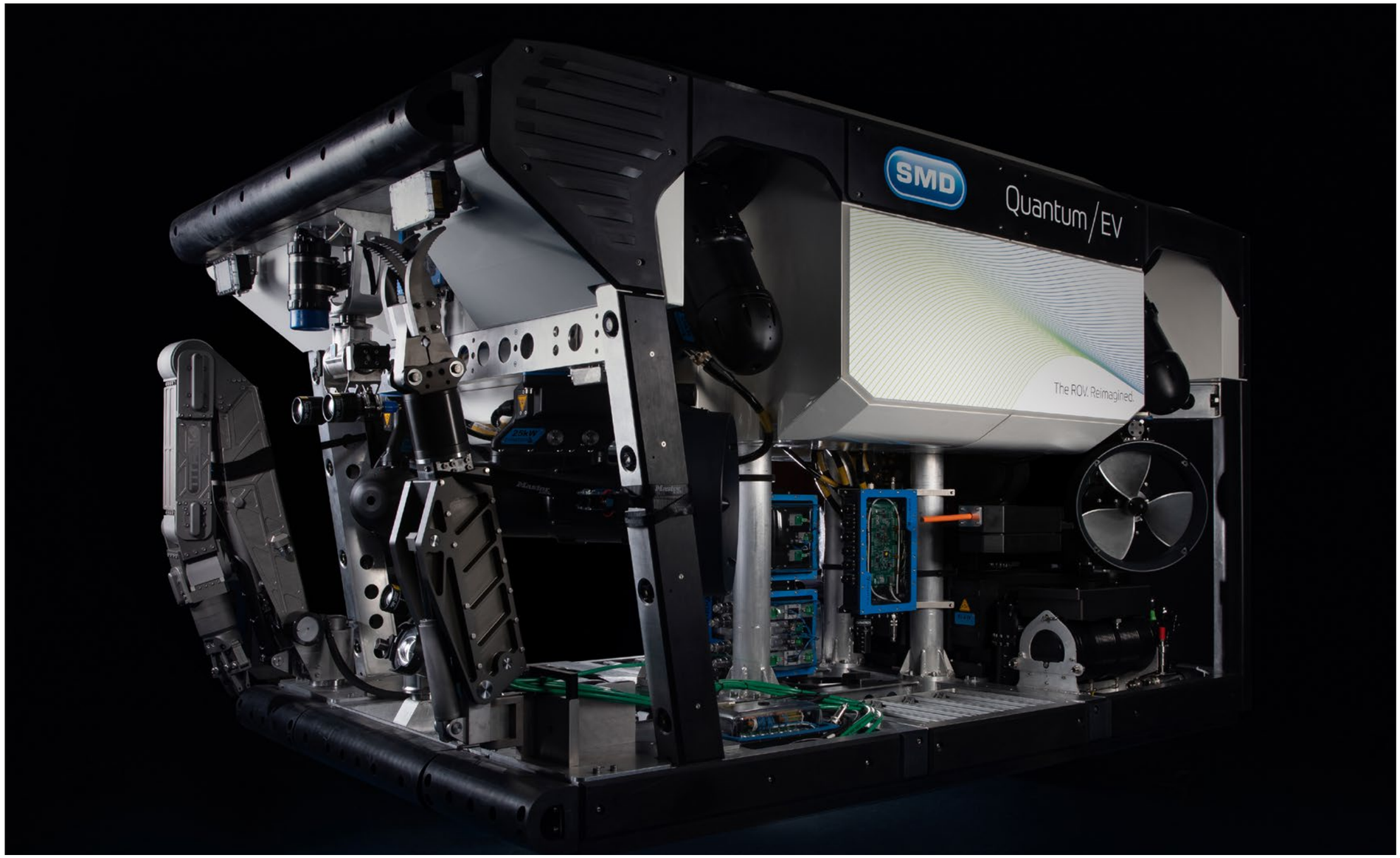
HIGH PERFORMANCE
Designed to work in the strongest currents, surpassing today's hydraulic ROVs.

MORE RELIABLE
Built for remote long-term submersion with longer service intervals.

SMALLER AND LIGHTER
Capable of full work class ROV activities from smaller vessels and rigs.

GREATER FLEXIBILITY
Cable or battery powered with a modular architecture and exceptional data handling capabilities.

EASY TO USE
Built-in flight stability system, AI compatible, designed for fast, intuitive maintenance.



SMALL
BUT MIGHTY

The Quantum EV is much smaller than its predecessor and similar in size to a traditional compact work class. The Atom EV is even smaller but still capable of handling full size manipulators and work class tooling. Both offer thrust outputs that surpass previous generation systems by a considerable amount taking in-water performance and current holding ability to the next level.

This makes either platform well suited to operating in challenging environments such as river basins and tidal areas. Or simply do tasks faster than before. The smaller size also means cheaper transportation costs and opens up the ability to operate from smaller vessels previously not considered suitable for work class operations, dramatically reducing your costs.

BETTER
FOR THE
ENVIRONMENT

The SMD modular robotics range is twice as efficient as an older generation hydraulic ROV. For a given input surface power a hydraulic ROV will only convert around 34% into usable thrust performance. Our new EV range is capable of converting 63% of the input power into useable thrust performance.

Our modular robotics range also doesn't need a large oversized generator on the vessel to cope with high start up currents normally associated with hydraulic ROVs. The vehicles can run from a generator half the size and more readily connect to a ships existing supply.

The EV range dramatically reduces your contamination risk, making your whole

BATTERY-POWERED FLEXIBILITY

The SMD EV range gives you the choice to operate on batteries, on an umbilical or even on both. For power intensive long duration work sometimes a continuous power supply via an umbilical is the best option. But if you wish to reduce the drag effects of an umbilical yet retain real time data connection, then a much lighter data-only umbilical and on-board battery module can be used. And if you want to perform complete autonomous operations without an umbilical then our EV architecture permits interface to an AI mission CPU.

For users who want a continuous power supply via an umbilical we have developed a new high efficiency, high voltage, deep water DC power transmission system. The main benefit is a smaller and lighter umbilical can be used for transferring

power to the platform, reducing the size and weight of the launch equipment. Other important benefits include much better tolerance to input power noise. The new range can cope with a wider range of input voltages with ship's frequency irrelevant. A reduction in umbilical conductors also enables fast plug and play mobilisation.

SMALLER LIGHTER LARS
Enabled by the smaller and lighter umbilical used to transfer power to the ROV.

PLUG AND PLAY BUILT IN
Technology designed with the end used in mind for faster mobilisation.

COMPATIBLE WITH EXISTING TOOLS

The EV range offers more tool space within the vehicle frame than ever before. All vehicle subsystems on both Quantum EV and Atom EV are contained in the central backbone of the vehicle leaving extensive free space for fitting of tools up both sides and across the front of the vehicle. Externally accessed twist lock skid retention system and sliding ballast trays enable quick and efficient tool setup.

Slide in DC tooling HPU modules are available for fitting to both the Atom EV and Quantum EV vehicles. And a modular quick-change hydraulic control manifold is included. This gives the EV range platforms full hydraulic tooling capability if required so there's no need to replace your existing tools or purchase expensive third party valve packs. The vehicles are designed with flexibility in mind so they can interface with emerging electric tools as they become available.

THE RELIABLE CHOICE

40+
Years of experience have gone into our most reliable design yet.

The best results
Superb connectvity, easy piloting and the stability needed to give the best results.

The SMD EV ROV uses a modular component ethos with far fewer moving parts than previous generation ROV systems. The high performance DC e-thrusters have hermetically-sealed magnetically coupled propeller shafts to prevent water ingress into the electrical section. The e-thruster unit also uses a non-contact magnetic gearbox, which offers better efficiency than mechanical units and doesn't suffer the same wear as there are no parts grinding against e ach other.

Built-in compensators permit fast module replacement and give fewer leak paths for compensation fluids. Cables and connectors have been carefully selected based on operational feedback and routings carefully considered. We have pulled upon 40+ years experience designing and manufacturing ROV equipment to ensure this is the most reliable system we have ever produced.

All of our new technology is being subjected to a thorough testing and qualification programme prior to official release. For more information talk to our sales team. You can contact us at rovs@smd.co.uk

ULTIMATE CONTROL

Our range of EV ROVs all use the same modules within the vehicle system. This includes the new control backbone, which consists of a miniature central hub, compact multifunction connection clusters, distributed processing ability and layered intelligence. The multifunction connection cluster can be a standalone control unit or daisy chained into a system for maximum connectivity and flexibility. It is mounted where needed and has the ability to handle video, Ethernet and serial data as well as control lights and camera focus and zoom.

Each e-thruster on the vehicle has a built-in drive that's microprocessor controlled to manage thruster function and communicate status to operators. All e-thrusters are connected back to an advanced flight control computer that looks after system stability and auto-functions. The system does a lot of processing subsea and minimises data flow to surface so it is well suited to 'over horizon' control applications. This all adds up to a vehicle system that has superb connectivity, is easy to fly and extremely stable giving you the very best operational results.

POWERED BY TEC

10
Decades of engineering experience.

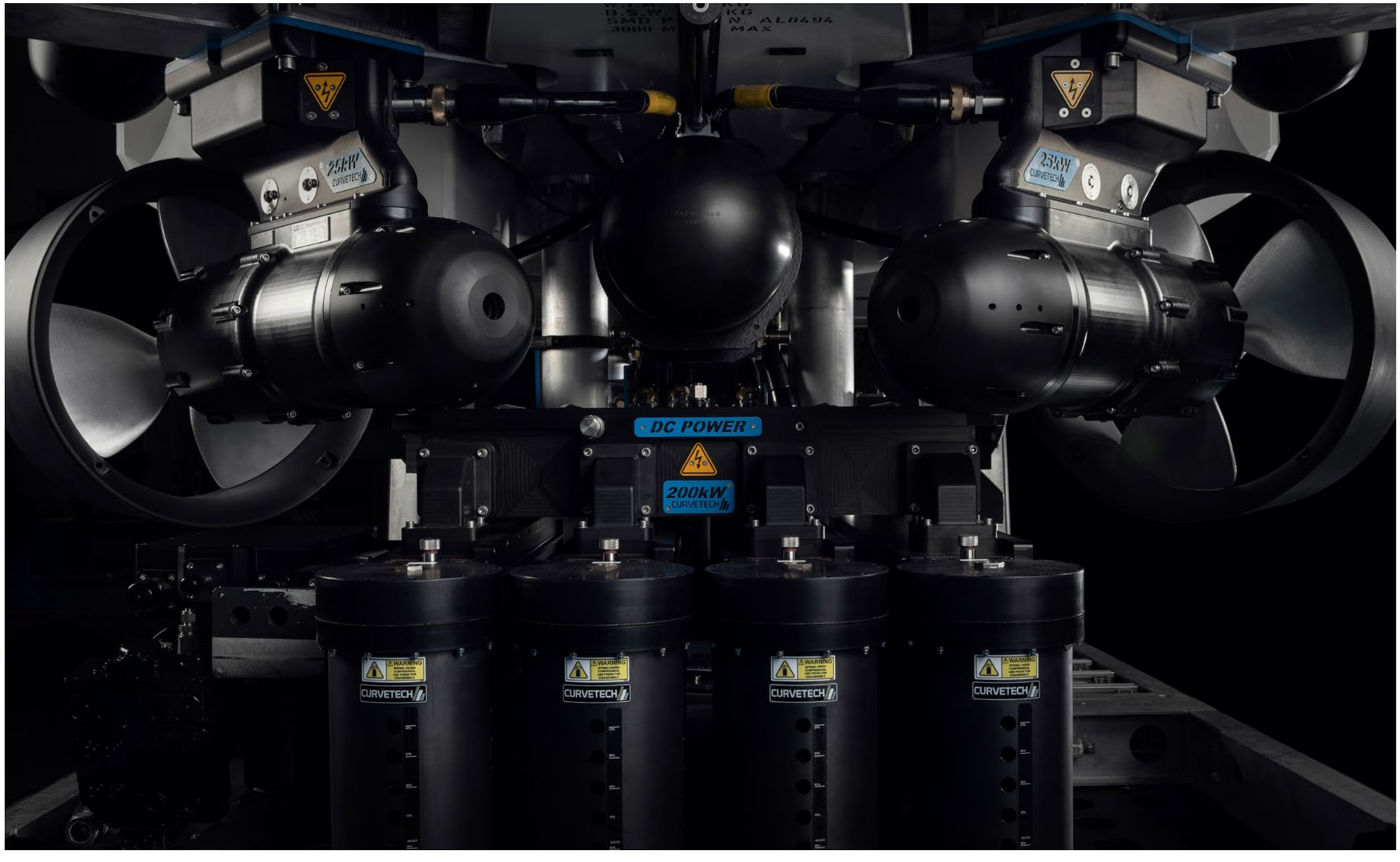
7000+
Number of employees..

A powerful partnership
Transferring skills and technology to the subsea sector.

Since 2015, SMD has had the backing of Zhuzhou CRRC Times Electric Co., Ltd. (TEC), a subsidiary of CRRC, a world leading propulsion and control systems provider. This relationship has enabled the transfer of skills and technology from a pioneering engineering powerhouse through SMD to the subsea sector.

TEC produce propulsion and control systems for trains and electric vehicles, power supply solutions, rail maintenance vehicles and marine engineering equipment for various applications. For more than five decades, TEC has shaped the transportation industry and today TEC operates internationally with over 7000 employees and 2.3 billion USD revenue in 2016.

The partnering of TEC's expertise in propulsion and controls and power supply systems with SMD's five decades of subsea engineering and ROV experience is a powerful combination. This has been instrumental in the development of our future ready modular robotics range.



QUANTUM EV

VEHICLE SPECIFICATION

GENERAL

Depth rating	
Standard	3000msw
Optional	4000, 6000msw
Dimensions	
Length	≤ 3306mm
Width	≤ 1800mm
Height	≤ 1900mm
Weight in air (full construction spec)	4050kg
Payload	400kg
Through frame lift	4000kg
Aft TDU mounting	TBC

PERFORMANCE

Bollard pull	(actual)
Forward/aft	1300kgf
Lateral	1300kgf
Vertical (up)	1500kgf
Surface performance	
Forward	4.5kn
Lateral	3.5kn
Vertical	3.7kn
Auto functions	Heading Depth Altitude ROV DP
Thruster configuration	
Horizontal vectored	4 x Curvetech®
Electric	390
Vertical	4 x Curvetech®
Electric	390

POWER

Vehicle power system	DC
Total vehicle power	200kW (268hp)
Battery compatible	Yes

TOOLING

Depth rating	
Standard hydraulic power unit	- 50kW (68hp)
Optional hydraulic power unit (200hp)	-100kW (136hp) 150kW (2x isolated circuits)
Spare hydraulic channels	
Standard	1 x Curvetech® 8ch MCU 1 x Curvetech® multifunction HCU 8ch LF module 4ch MF module 2ch HF module

INSTRUMENTS

Video capability	
Standard	6 x comp, 2 x HD
Optional	Up to 12 x comp, 4 x HD
Data	
Standard	8 x Ethernet 10/100T, 22 x serial RS232/485
Optional	6 x Ethernet 10/100T, 44 x serial RS232/485
Lighting	
Standard	Up to 16 dimmable LED
Gyro	
Standard	1 x Sonardyne Sprint
Camera pan/tilt	
Standard	Up to 2 Electric
Instrument power	
Standard	4kW
Manipulator	1 x 7F (pos feedback heavy duty)
Grabber	1 x 5F (rate, heavy duty)

CONTROL CABIN

Standard	20ft, A60 ISO, Zone II option
Control system	
Standard	SMD ROV control hardware Hybrid Cyberchair, dual touchscreens 4 x 32"TFT video wall with video suite
Incoming power supply	380V-480Vac
Optional	690Vac 3 phase 60Hz/50Hz
TMS control/Interface	MD GarageE

DECK EQUIPMENT OPTIONS

SMD lightweight compact LARS
Active or passive heave compensation
Aramid/SWA umbilical choice

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