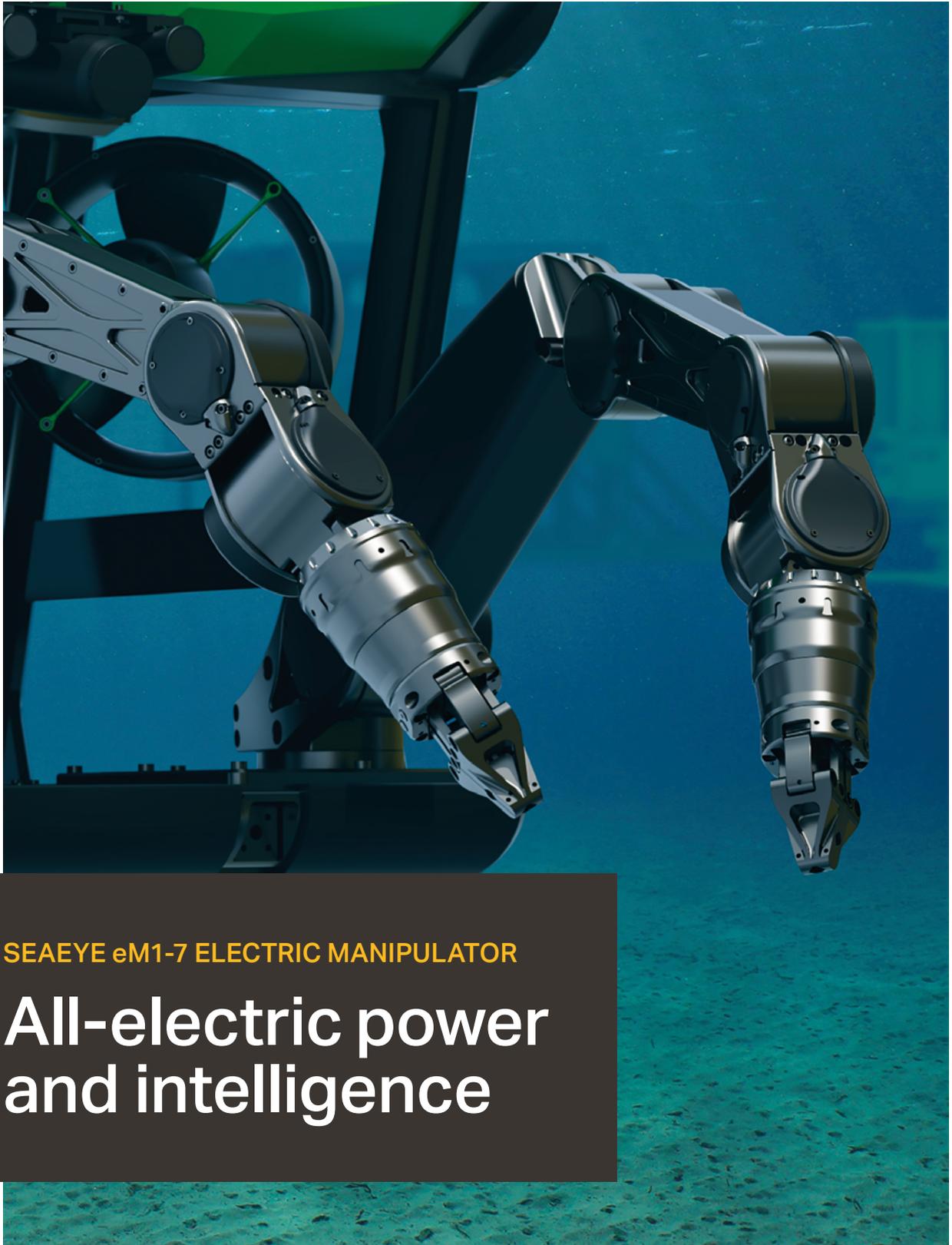




SAAB



SEA EYE eM1-7 ELECTRIC MANIPULATOR

**All-electric power
and intelligence**

Empowering electric manipulation

To fully realise the environmental and efficiency benefits of electric ROVs, Saab has developed the Seaeye eM1-7 Electric Manipulator, the world's most advanced electric manipulator yet.

While the value of electric ROVs has long been recognised, electric manipulators have traditionally posed a major obstacle.

To overcome this challenge, the Seaeye all-electric manipulator features an advanced control system, allowing both manual and automated operation. Highly accurate, modular electric joints enable enhanced arm control, path planning solutions and actuator reuse. Lift capacity and range of motion exceed the eM1-7 manipulator's hydraulic equivalents, while their titanium construction ensures high reliability.

Active power management helps regulate demand and manages the regenerative power created with free-fall loads. Dual seven-function electric manipulator configurations provide maximum dexterity.

The Seaeye eM1-7 offers significant advantages over hydraulic alternatives, including more precise positioning with force feedback, increased dexterity, lower water weight and greater reliability – expanding the potential for more autonomous and resident applications.



ON-BOARD PROCESSING FOR ADVANCED KINEMATICS



SUBSEA CHANGEABLE TOOLING



DIAGNOSTIC POWER AND STATUS LEDES



POSITION AND FORCE FEEDBACK



POWER AND DATA INTERFACE



INTEGRATED COMPENSATORS



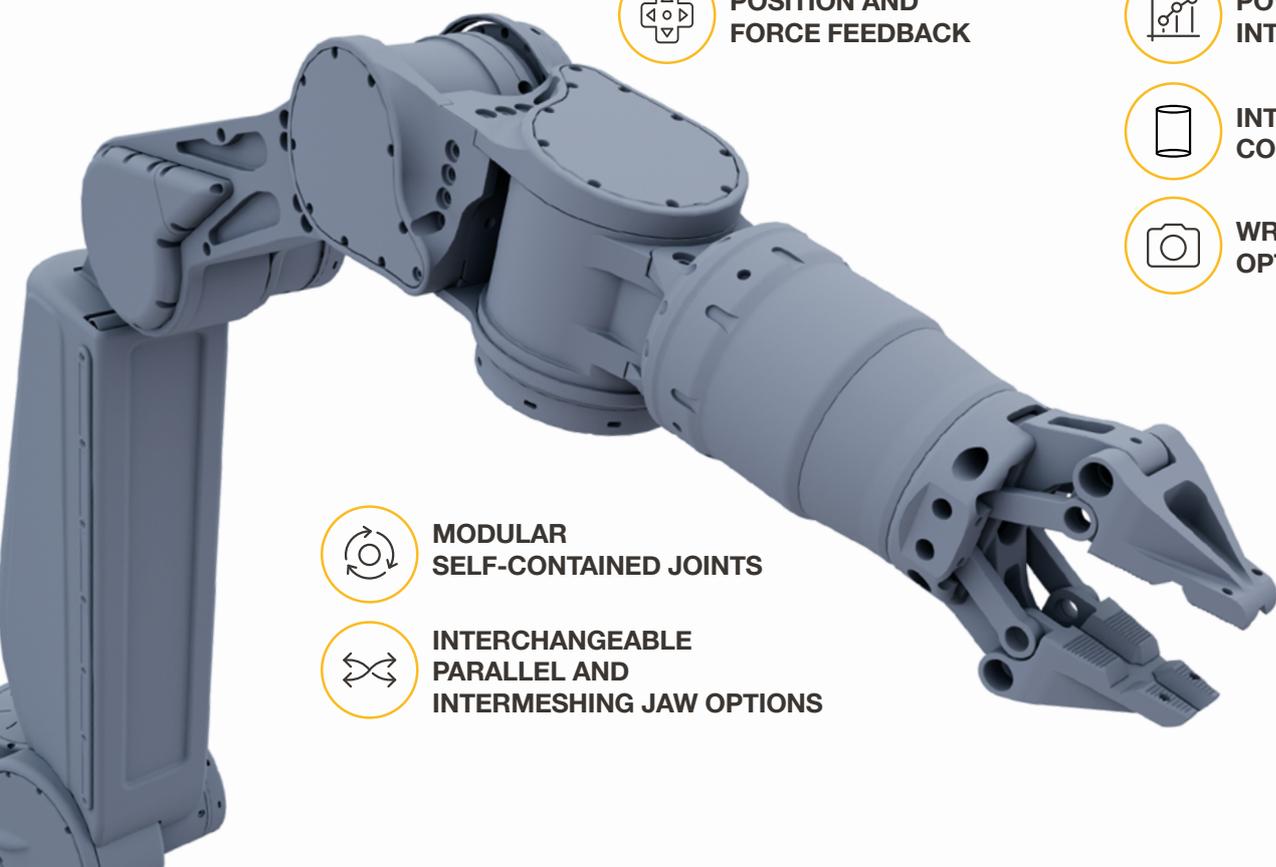
WRIST CAMERA OPTION



MODULAR SELF-CONTAINED JOINTS



INTERCHANGEABLE PARALLEL AND INTERMESHING JAW OPTIONS

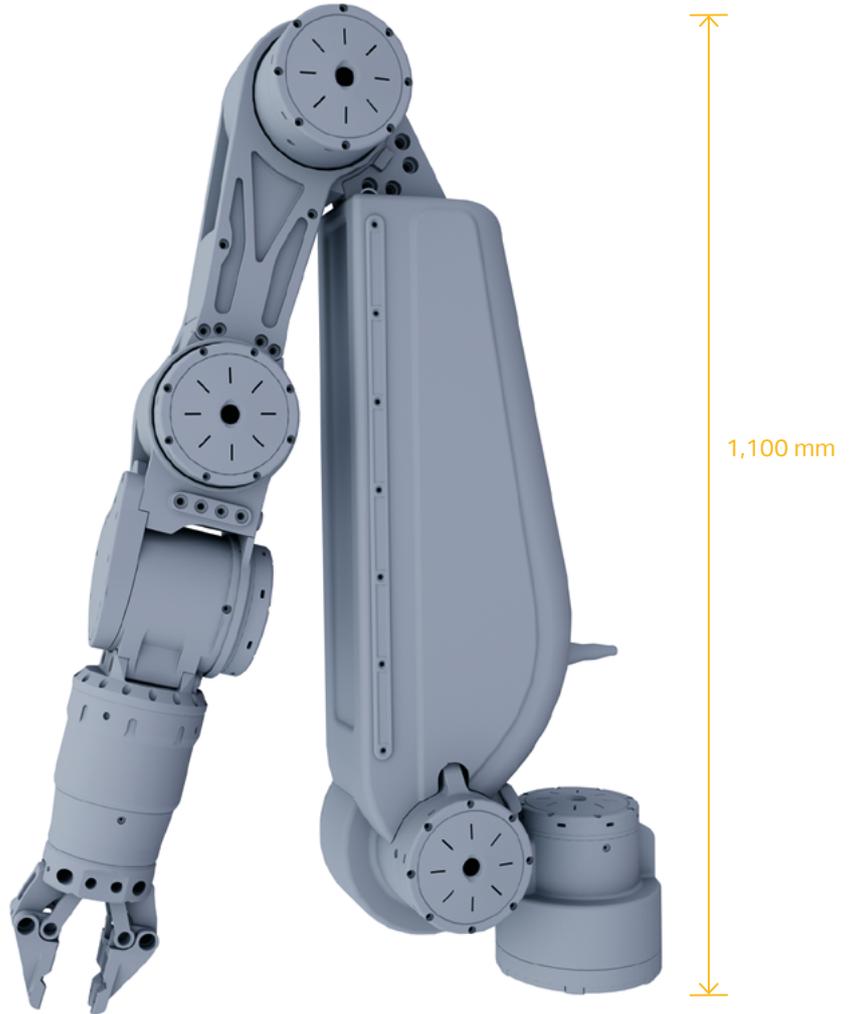


MECHANICAL CHARACTERISTICS

Material	Titanium
Dexterity	7 functions (6 degrees of freedom and jaws)
Maximum reach	1,990 mm
Lift capacity (full extension)	122 kg
Lift capacity (min. extension)	454 kg
Wrist torque	170 Nm
Weight (in water)	84 kg
Weight (in air)	116 kg
Depth	4,000 m (7,000 m option)

ELECTRICAL CHARACTERISTICS

Power	Compatible with a wide range of AC or DC voltages
Consumption	Intelligent power management to regulate demand to available power. Maximum unregulated demand 4 kW
Control	Ethernet 100 Mbit/s
Input device	Pendant master arm



JOINTS

Fully electric, mechanically braked

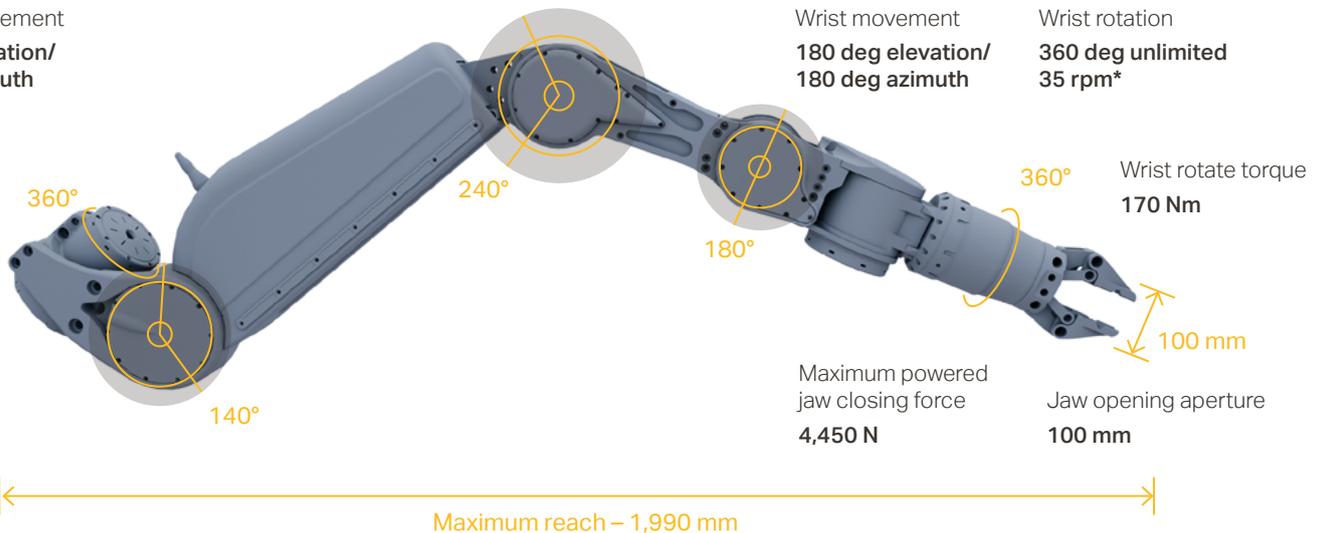
Repeatability/accuracy < 0.5 deg*

Elbow movement
240 deg

Shoulder movement
140 deg elevation/
360 deg azimuth

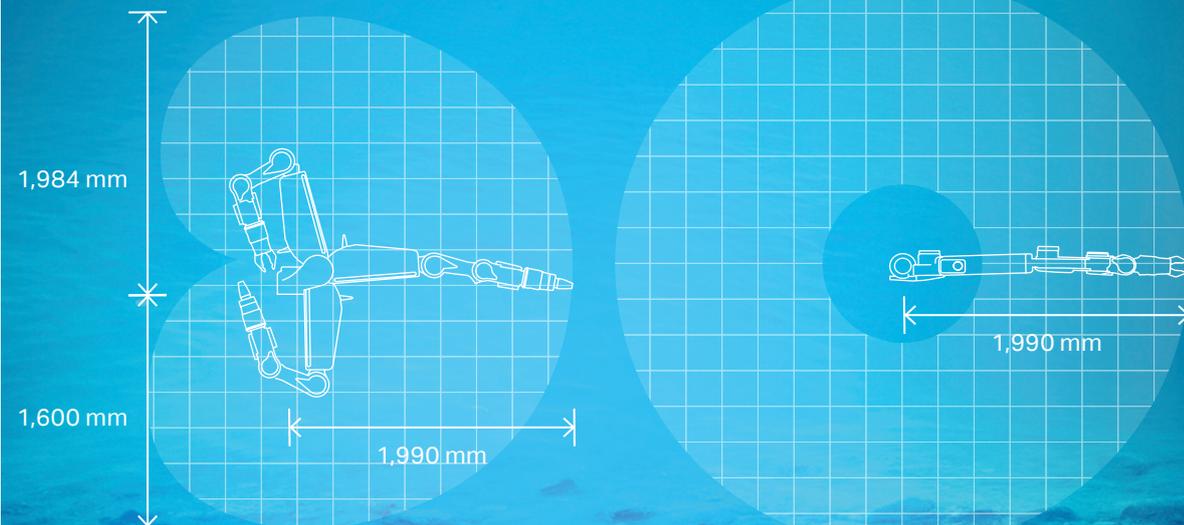
Wrist movement
180 deg elevation/
180 deg azimuth

Wrist rotation
360 deg unlimited
35 rpm*



* Nominal value, load dependent

Positioning at its **most precise**



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Advanced arm control

The Seaeeye eM1-7 manipulator has been designed to meet the needs of the future. Increasing manipulator automation will reduce the reliance on operator skill and ensure tasks are completed reliably and successfully every time.

The Seaeeye eM1-7 manipulator's position and force feedback, along with its high degree of repeatability and unrivalled in-built intelligence, enables advanced arm control.

Direct end effector control can be achieved when coupled with an intuitive human input device and an inverse kinematics system.

The addition of our advanced perception systems will lead to a blend of supervised and fully autonomous manipulation. These future control options will be backward compatible and available as upgrades to existing manipulators.

Note: Specifications may change without prior consent