SEAETE 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.
MECHANICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Material</th>
<th>Titanium</th>
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<tbody>
<tr>
<td>Dexterity</td>
<td>7 functions (6 degrees of freedom and jaws)</td>
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<tr>
<td>Maximum reach</td>
<td>1,990 mm</td>
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<tr>
<td>Lift capacity (full extension)</td>
<td>122 kg</td>
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<tr>
<td>Lift capacity (min. extension)</td>
<td>454 kg</td>
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<tr>
<td>Wrist torque</td>
<td>170 Nm</td>
</tr>
<tr>
<td>Weight (in water)</td>
<td>84 kg</td>
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<tr>
<td>Weight (in air)</td>
<td>116 kg</td>
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<tr>
<td>Depth</td>
<td>4,000 m (7,000 m option)</td>
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ELECTRICAL CHARACTERISTICS

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<tr>
<th>Power</th>
<th>Compatible with a wide range of AC or DC voltages</th>
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<tr>
<td>Control</td>
<td>Ethernet 100 Mbit/s</td>
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Input device Pendant master arm

JOINTS

- Fully electric, mechanically braked
- Shoulder movement
  - 140 deg elevation/
  - 360 deg azimuth
- Elbow movement
  - 240 deg
- Wrist movement
  - 180 deg elevation/180 deg azimuth
- Wrist rotation
  - 360 deg unlimited
  - 35 rpm*
- Wrist rotate torque
  - 170 Nm
- Jaw opening aperture
  - 100 mm
- Maximum powered jaw closing force
  - 4,450 N

* Nominal value, load dependent
Positioning at its most precise

Advanced arm control

The Seaeye 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 Seaeye 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