Harsh Environment Connectivity, with Military-Grade Custom Interconnects, Sensors, Shipboard Lighting, and Electrical Panels
TE Connectivity’s L.L. Rowe offers a range of products manufactured to customer requirements, NAVSEA drawings and to the latest military standards specifications. Many of our products can be found in MIL-HDBK-940, Standard Electrical Symbol List.

**Standard or Custom**
Beyond our standards-based products, we can provide you with custom designs to fit unique needs—in quantities from one to thousands.

**SUBSAFE Level One Approved**
Where required, our products are designed and manufactured to meet the requirements of the U.S. Navy’s SUBSAFE quality assurance program, which helps ensure that a sub’s hull stays watertight and can recover from unanticipated flooding.

L.L. Rowe standard product lines include:

**Pressure-Proof Connectivity***
- Hermetic connectors
- Hull connectors and penetrators
- Cable assemblies and molded parts

*Sensors and Lighting*
- Water-sensing electrodes
- Magnetic proximity switches
- Lighting

**Subsystems**
- On-board electrical panels
- Control panels

**Quality**
- MIL-I-45208A Quality System
- Tailored ISO 9001:2008 compliant
- SUBSAFE Level One compliant

**Engineering and Design**
Our engineering expertise extends to understanding your application and a commitment to realizing your vision.
- Custom one-off solutions
- Production-level products in the quantities you need

Our ability to create products precisely tailored to your application can mean higher performance and lower costs through the life of your program.

**Welding, Molding and Final Assembly**
We excel at turning concepts into high-quality reality.
- Welding and machining exotic alloys
- UNDEX compliant
- Materials encapsulation to withstand pressures up to 2000 psi

* Note: Pressure-Proof to customer’s design specifications
Testing  Our testing procedures exceed NAVSEA inspection requirements and all environmental testing is, at a minimum, accomplished in accordance with MIL-STD-810.

Test capabilities include:
- Hydrostatic testing to 2000 psi
- Mechanical inspection and testing
- Electrical testing, including testing under hydrostatic pressure
- Environmental testing, using HALT (Highly Accelerated Life Testing) and HASS (Highly Accelerated Stress Screening)

Designed for Harsh Marine Environments

Mil Spec Materials
- Nickel-copper alloys and stainless steel
- Polyurethane encapsulation
- Glass-to-metal hermetic sealing

High-Speed Data Delivery
- Up to 18 GHz with coaxial cable
- Single mode and multimode fiber capabilities

Pressure Sealed and Hydrostatically Tested
- Concurrent hydrostatic/electrical testing on fully automated equipment
- Up to 2000 psi, regulated to your requirements
- High capacity test chamber

Get your product to market faster with a smarter, better solution.
Having supplied single and multiple-hull connectors and multipin receptacles for virtually every class of U.S. submarine built in the last 60 years, we know penetrators. L.L. Rowe machines connector bodies from chemically and physically certified Monel 500 (per QQ-N-286 class A) bar stock to withstand the extreme pressures and harsh conditions, resulting in a product that performs reliably over a submarine’s service life of 40 or more years. Multiple-hull connectors are made to your specifications for size and receptacle configuration.

Single receptacles can carry from 1 to 120 conductors, depending on the type of wire and insert arrangement chosen.

QUALIFIED PRODUCTS . . . TIME-TESTED RELIABILITY

Our pressure-tested and hermetically sealed connectors are available in epoxy molded or glass-to-metal configurations for data and power interconnects. In addition, we meet the following Electric Boat specifications for submarine applications.

<table>
<thead>
<tr>
<th>Los Angeles Class</th>
<th>Ohio Class</th>
<th>Virginia Class</th>
<th>Sea Wolf Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-DTL-24231/5 thru /11</td>
<td>CPGI022</td>
<td>EB4210</td>
<td>PSSSN21C-305</td>
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<td>EB3004</td>
<td>CPGI025</td>
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<td>EB3648</td>
<td>CPGI027</td>
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<td>EG2982</td>
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<tr>
<td>EB2983</td>
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</tbody>
</table>
Our full line of MIL-DTL-24231 pressure-proof electrical fittings and connectors are built and tested to your specifications for cable type, length, number of conductors, and plug style. We support custom harness configurations, with multiple connector configurations and jacket options. Molded products are NAVSEA S9320-AM-PRO-020 capable, making us approved to fabricate, mold, and inspect outboard cable assemblies and components for the Navy.

**Applications**
- Penetrator-to-shipboard control panels
- In-board/outboard cable assemblies
- Underwater systems

**WATER-SENSING ELECTRODES**

L.L. Rowe electrodes help you safely and reliably sense the presence of water in floodable compartments. Our smart snorkel electrode, with automated on/off operation, features solid-state controls to extend operational life.

For snorkel applications, where ice build-up must be controlled, heated electrodes have an operating temperature range of 2°C to 21°C.

**Applications**
- Snorkels
- Missile tubes
- Torpedo tubes
- Ballast
- Lock-out chambers
We design a variety of lights qualified to MIL-DTL-24560 for shipboard navigation, signal, and warning lights suited to both surface and subsea applications. Submarine lights use tempered glass Fresnel globes to enhance light output, increase impact resistance, and withstand discoloration and etching at sea.

<table>
<thead>
<tr>
<th>Light Type</th>
<th>MIL-HDBK-290 Symbol</th>
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</thead>
<tbody>
<tr>
<td>Infrared Transmitter AN/SAT-2A</td>
<td>N/A</td>
</tr>
<tr>
<td>Approach Light</td>
<td>164.3</td>
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<tr>
<td>Signal Light</td>
<td>192.1</td>
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<tr>
<td>Submarine Navigational Lights</td>
<td>174, 188, 189</td>
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<tr>
<td>Submarine ID Light</td>
<td>177</td>
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<tr>
<td>Aircraft Warning Light</td>
<td>160.1</td>
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<tr>
<td>Sight Light</td>
<td>136, 156</td>
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<tr>
<td>Signal Lights</td>
<td>190</td>
</tr>
</tbody>
</table>

**Applications**

**Submarine**
- External pressure-proof to US Navy standards

**Surface Ships**
- Meets or exceeds US Navy standard 108 (MIL-STD-108)
- Infrared communication systems (AN/SAT-2A)
Solutions for Submarines and Surface Ships

MAGNETIC PROXIMITY SWITCHES

Pressure-proof magnetic proximity switches, which are commonly used to indicate mast and antenna position, feature rugged construction with molded polyurethane or glass-filled epoxy housings. Our second-generation switches use an epoxy-encapsulated glass reed switch to enable precise readings and help prevent operational failure. Operational life is 10 to 15 years. Our offerings include Symbols 2652, 2742, and 2744, as well as the latest generation of proximity switches.

Applications
- Submarines and surface ships
- Masts
- Antennas

SHIPBOARD ELECTRICAL PANELS

Our electrical panels for communications, testing, and power distribution are built to meet MIL-STD-461 EMC and MIL-S-901 shock requirements. They feature heavy-gauge construction and shielding as appropriate to create rugged panels that will neither interfere with sensitive electronics nor be susceptible to outside EMI.

Applications

Communication Systems
- Ship-to-ship
- Internal
- Infrared ship-to-satellite

Power Distribution
- Light, motor, and switch control

Test Panels
- System diagnostics/self-diagnostics
- Rugged general purpose

Hatch door proximity switch
Magnetic switch assembly
Submersible limit switch
Masthead proximity switch
Portable bridge control communications
Power distribution panel (Symbol 969)
General-purpose test panel
For More Information

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WITHSTAND HARSH ENVIRONMENTS WITH MILITARY-GRADE CUSTOM INTERCONNECTS, SENSORS, SHIPBOARD LIGHTING, AND ELECTRICAL PANELS