QwikConnect®

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Sneak Peek:
SeaKing™ WetMate

Glenair®

FROM OUTER SPACE TO INNER SPACE: THE MIL-AERO PEDIGREE OF GLENAIR UNDERWATER CONNECTORS

FROM OUTER SPACE TO INNER SPACE: THE MIL-AERO PEDIGREE OF GLENAIR UNDERWATER CONNECTORS

This special issue of *QwikConnect* zeroes in on an interesting fact—that interconnect technology originally developed for outer space can be directly applied to inner space with great benefit to the user. The flow of ideas and processes from one application area to another is a common occurrence at Glenair. We have found the practice is a major contributor to new product development, adding speed and velocity to the creative process.

We are all familiar with the flow of ideas and technologies across different realms of science. Technology such as the X-ray—from the world of applied physics—ultimately becomes a critical diagnostic tool in the medical life sciences. There are countless other examples from microwave ovens to Velcro, to Teflon, and GPS.

The transfer of technology and ideas across disciplinary boundaries is a powerful driver of innovation. At Glenair, where the pace of change is nothing short of relentless, openness to accepting materials, engineering practices, and technologies from one field to another has become a best practice for meeting customer performance requirements.

Let's take a look now at the many commercial and military aerospace interconnect innovations that have made the deep dive all the way from outer space into the ultra harsh environment world of dry-mate, splash-mate, and wet-mate underwater connectors.

Complex Interconnect Cables

Glenair's history of interconnect innovation for space-based applications began with our design and fabrication of the golden umbilical life-support cable used by Commander Ed White in the first American Gemini program space walk in 1965. This was a complex cable assembly with an exacting set of performance requirements. Even though this application is now over 50 years old, it still reflects Glenair's unique skill set as both a manufacturer of high-performance connectors and wire protection products as well as a provider of turnkey assemblies incorporating Glenair signature interconnect technology.

Glenair-made flight-proven Golden Umbilical Cable Assembly: Commander Ed White, first American space walk, 1965. On display Smithsonian Air and Space Museum, photo courtesy NASA.

Complex interconnect cable assemblies made by Glenair have traveled to and from orbit dozens of times on the Space Shuttle, and historically, we were also responsible for producing the long-length umbilical cables used on the original Titan II launch vehicle for all twelve Gemini missions. For this application, Glenair developed some truly unique fabrication fixtures and processes that still find direct application decades later, only now in the fabrication of underwater ROV umbilical cabling.

Glass-Sealed Hermetic Interconnects

Hermetic connectors are a special class of sealed Mil-Aero interconnects that incorporate glass-to-metal or other highly-engineered sealing technology. Hermetic connectors have been specified for aerospace applications that must be able to operate in severe weather conditions, at high altitudes, under extremes of atmospheric pressure, and in rapidly changing temperature gradients.

Hermetic connectors, such as the Glenair SuperNine® MIL-DTL-38999 are principally designed for use in military aerospace—in fact, the sealing requirement for connector hermeticity was originally driven by military electronic applications. But the products can be equally at home in Oil & Gas industry applications such as control equipment, riser control monitors, ROVs, and so on. High-pressure glass-to-metal seal inserts are now standard technology on SeaKing™ 700 series connectors delivering 10K psi sealing performance in deep water applications.

Assisted Separation Force and Blind-Mate Quick-Disconnect Connectors, Cables, and Conduits

Umbilical cables and ruggedized conduit assemblies used during rocket launch and interstage separation require blind-mate and assisted-release connectors for reliable engagement and disengagement of the interconnect from the launch vehicle. Problems associated with poorly designed connectors of this type have long plagued launch events, even for manned space programs. An original Titan (Missile C-2), for example, which had already been selected for use in early Gemini programs, suffered catastrophic failures due to non-separation of umbilical interconnects during launch. These problems have been completely resolved in launch systems through the use of purpose-designed Glenair SuperNine connectors with accommodation for mating misalignment and spring-loaded assisted release. Glenair SeaKing™ WetMate connectors (currently under qualification testing and slated for roll-out in 2025) will be supplied in a stab-plate configuration that leverages Glenair's expertise in blind-mate connector design and construction, including misalignment accommodation, chamfered roll-on/roll-off nose configuration, and robust plug-to-receptacle keyway features.

SuperNine® blind-mate feed-thru pair with kick-off assist

FROM OUTER SPACE TO INNER SPACE: THE MIL-AERO PEDIGREE OF GLENAIR UNDERWATER CONNECTORS

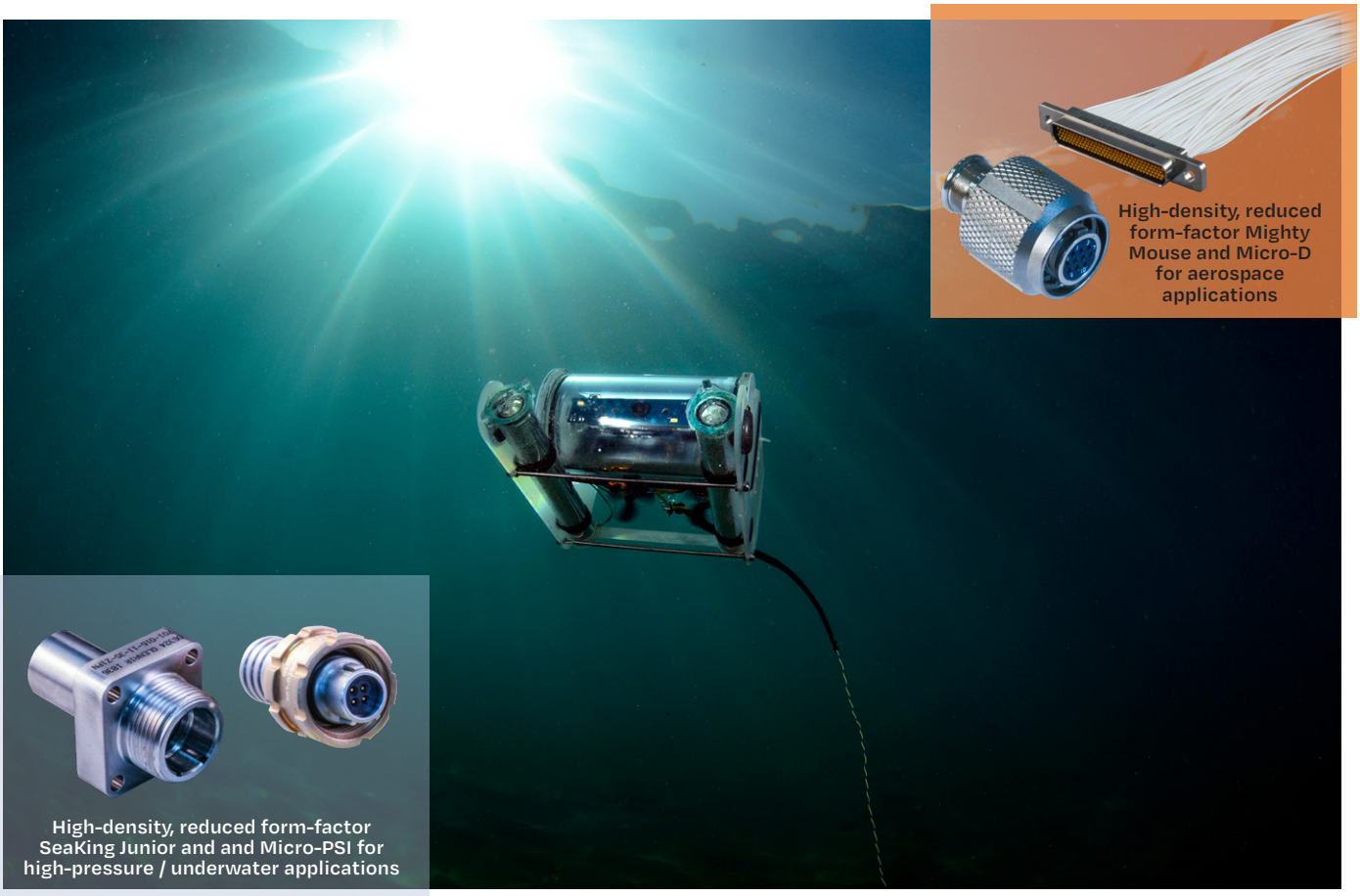
High-Density, Small Form-Factor Connectors

Glenair recognized a growing need in tactical military, aerospace, and deep-space markets for a connector series that mimicked the electrical and mechanical performance of high-reliability mil-standard connectors, such as MIL-DTL-38999, but in a smaller and lighter package. Glenair's high-density Series 80 Mighty Mouse connector and missile-grade Micro-D connector were both designed for high contact density and overall reduced package size. Both series have been used for the wide range of aerospace power and signal applications that depend on reliable environmental and mechanical performance, as well as electromagnetic compatibility. Various contact types are employed including mil-standard M39029 type.

Glenair has now brought this same high-density design discipline to the SeaKing™ 700 series, as well as SeaKing™ Junior, and Micro-PSI™ high-pressure underwater connectors. Proven-performance contacts, dielectric inserts, environmental sealing, and EMI/RFI shielding now enable Oil & Gas industry users to significantly reduce the size and weight of cables and equipment enclosures on ROVs, riser control modules, and equipment panels.

High-Speed Data Links

Octaxial contacts are high-speed shielded designs, pioneered by Glenair in harsh-environment military and aerospace data networks. The contacts are principally designed for high-speed Ethernet applications and provide up to 50% total weight savings and 20 times faster data rates compared to legacy quadrax-based solutions. Special designs have also been developed for SuperSpeed USB and multi gigabit 100 ohm protocols such as HDMI and SATA.



High-density, reduced form-factor Mighty Mouse and Micro-D for aerospace applications

High-density, reduced form-factor SeaKing Junior and and Micro-PSI for high-pressure / underwater applications

This same high-speed Ethernet contact technology used in flight-grade space applications has been modified for incorporation into Glenair SeaKing and SeaKing Junior series underwater connectors for 10K psi underwater Ethernet applications.

Recognizing the need for similar high-speed datalinks in subsea applications, Glenair perfected the use of high-pressure sealed SpeedMaster-equipped solutions for use in the SeaKing 700 and SeaKing Junior connector series—bringing up to 10 Gbps Ethernet performance to underwater Oil & Gas industry applications. SpeedMaster-equipped connectors are uniquely able to accommodate pressure-rated subsea cables.

Tight-Tolerance Fiber Optic Interconnects

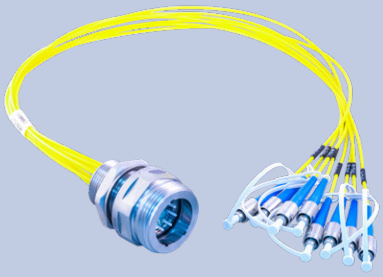
Glenair SuperNine high-performance MIL-DTL-38999 type fiber optic interconnects with qualified MIL-PRF-29504/4 and /5 termini have been successfully deployed in hundreds of commercial and military aerospace applications—from F-16 upgrade systems to the revolutionary F-35 Joint Strike Fighter. Special-purpose fiber optic cable is extruded by Glenair for the range of space and aerospace environmental requirements including broad temperature resistance, radiation resistance, and rough handling.

Our 30+ years of supplying high-performance fiber optics for aerospace applications directly contributed to the rapid development of our high-pressure underwater SeaKing™ Fiber Optic series (see sidebar).

Composite Thermoplastics for Corrosion Resistance and Weight Reduction

Glenair is a leader in the use of composite thermoplastics in connector and backshell fabrication, primarily for commercial and military aerospace applications. Polyether ether ketone (PEEK) is a high-performance engineering thermoplastic well-suited for aerospace due to its high strength, structural integrity, electrical insulation, and resistance to temperature extremes. The non-corrosive nature of the material and its immunity from chemical damage makes it well-suited for use in harsh-environment subsea applications as well—both in commercial Oil & Gas as well as military/defense. Glenair has introduced its SeaKing PEEK series of high-pressure underwater interconnects in a dry-mate configuration. The development of the series was possible due to Glenair's many years of experience with the material for aerospace customers.

SeaKing™ Fiber Optic



10K psi open-face connectors, cables, and jumpers are ideal for data-intensive subsea applications: towed-array sonar, well logging and monitoring, and ILI sensors. Overmolded and PBOF butt-joint assemblies with full hydrostatic qualification test report available. Wide range of fiber and hybrid fiber/electric layouts. Single and multimode.

SeaKing™
SEVEN HUNDRED

About SeaKing 700

The SeaKing 700 is Glenair's flagship dry-mate underwater connector. Built for optimal durability and reliability, SeaKing is ideally suited for deep water Oil & Gas, military/defense, oceanographic research, and other harsh-environment subsea applications.

SeaKing 700 is an extreme-environment, high-performance connector that resolves many of the durability and performance problems that are common in harsh-environment underwater connectors of this type.

Glenair brought our 60+ year history of manufacturing mission-critical interconnects for military and commercial aerospace applications into the design of the SeaKing, including the use of multiple compression and peripheral seal O-rings, multi-key connector polarization, glass-to-metal seal high-pressure inserts, composite material shell construction, high-density contact arrangements, high-speed fiber optic and electrical Ethernet solutions, and ruggedized back-end interfaces for overmolded and PBOF cable attachment. This application of aerospace design and material principles to underwater connectors is a unique capability, practiced only at Glenair.

SeaKing 700 is a 10K psi working pressure connector. Both bulkhead connector receptacles and flange connector receptacles provide dual O-ring and glass-to-metal seal insert open-face sealing protection of critical subsea equipment in the event of connector de-mating or cable damage. Both of these sealing technologies were perfected in harsh exoatmospheric applications on Glenair aerospace connectors including our signature Series 806 Mighty Mouse and SuperNine D38999. Let's take a deeper look at this innovative approach to O-ring material selection and placement for optimal sealing and maintenance.

O-Rings

SeaKing series connectors utilize multiple Nitrile or Buna-N (NBR) O-ring seals for high-reliability, redundant sealing. O-rings are user-accessible for fast and trouble-free field replacement.

Revolutionary PBOF swivel assembly features kink-proof hose swivel, straight, 45° and 90° routing, and superfast assembly

Revolutionary O-Ring Sealing

O-rings are in many respects the unsung hero of sealing, and when properly applied can yield reliable, high pressure sealing results. O-rings are small, cheap, suitable for high-mating cycle applications, easy to inspect, easily serviced, and extremely effective when proper attention is applied to engineering best-practices. These practices focus on gland design (or the relative advantages and disadvantages of axial face seals compared to radial piston or rod seals), as well as careful attention to metal-to-metal extrusion gaps and O-ring groove widths.

Shore hardness is a particularly critical material selection criterion in high-pressure sealing applications as it directly impacts material performance under pressure. Extrusion gaps in the clearance between metal subassemblies, for example, can be problematic for O-rings with Shore hardness ratings under 90. Many legacy subsea connector series were originally designed for shallower, lower pressure applications with shorter deployments. But today's requirements for 10K psi high-pressure performance and deployments measured in weeks, not hours, call for both better mechanical design and harder 90 Shore-rated seals.

PBOF Assemblies

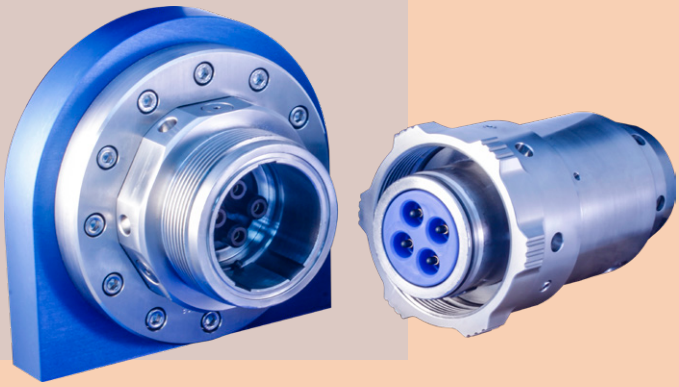
Many subsea applications utilize electrical and optical Pressure Balanced Oil Filled (PBOF) cables. PBOF cables use a compensating fluid-filled elastomeric tube as a conduit for the electrical and fiber optic lines. The elastomeric conduit allows the ocean pressure to transfer to the compensating fluid, equalizing the pressure differential. PBOF technology has been widely utilized in ocean science exploration, drilling systems, production control systems, towed arrays, and most importantly, for the interconnection of subsea floor structures and equipment. Special PBOF connectors are employed to enable the ROV to connect and disconnect flying lead PBOF cables for maintenance or equipment replacement. Glenair has developed a superior PBOF technology design that allows for faster, easier assembly and ease-of-repair in the field, and the utilization of both straight and sweeping, non-constricting 45° and 90° elbows. These are, again, design elements taken directly from our aerospace-grade connector series.

Hose barb fittings for PBOF assemblies are another weak link in many subsea Oil & Gas connectors. Kinked and twisted hoses, leaky fittings, corroded hose clamps, and other trouble spots are costly maintenance issues of the first order in subsea Oil & Gas installations. Series 700 SeaKing PBOF swivel hose attachments solve these many problems. Other features include:

- Straight, 45°, and 90° full radius routing configurations with angle adjustment feature that prevents the risk of oil leakage.
- Corrosion resistant materials
- Threaded couplers with set screws for decoupling protection.
- Unique compact PBOF compression fitting with 340° swivel action.
- No special tools required for assembly.

High-Density Contact Arrangements

A principal design focus of the SeaKing team has been the increase in contact density and the reduction of connector package size to the smallest form-factor possible, resulting in mounted connectors, cables, and PBOF assemblies that are easier to handle and require much smaller bulkhead penetrations.



SeaKing Power

- Glenair signature pressure sealed high-voltage power connector design
- Rugged overmolded or PBOF cable configurations are ideal for deployment in drilling rigs, offshore oil platform pumps and machinery, as well as subsea wellheads, manifolds, and processing equipment.

Other mechanical design features include a unique indexable flange for receptacle clocking, robust wrench flats and knurling for easy handling with and without gloves, rear overmold delamination ring, as well as backshell indexing points, easily-replaceable O-rings, and accommodation for our revolutionary PBOF swivel assemblies.

Insert Sealing Technology

Tested to 15,000 psi and rated to 10,000 psi, the Series 700 SeaKing is today's most advanced high-reliability dry mate underwater connector. SeaKing sealing architecture is in fact the most important technical feature of the series. All critical interfaces, including bulkhead seals, glass-to-metal insert seals, and mating interface bore seals, are fully redundant to ensure the rated 10K psi protection—even in the event of a single-seal failure. High-pressure glass-to-metal (hermetic) inserts (again, with proven harsh environment aerospace performance) protect critical equipment from water ingress.

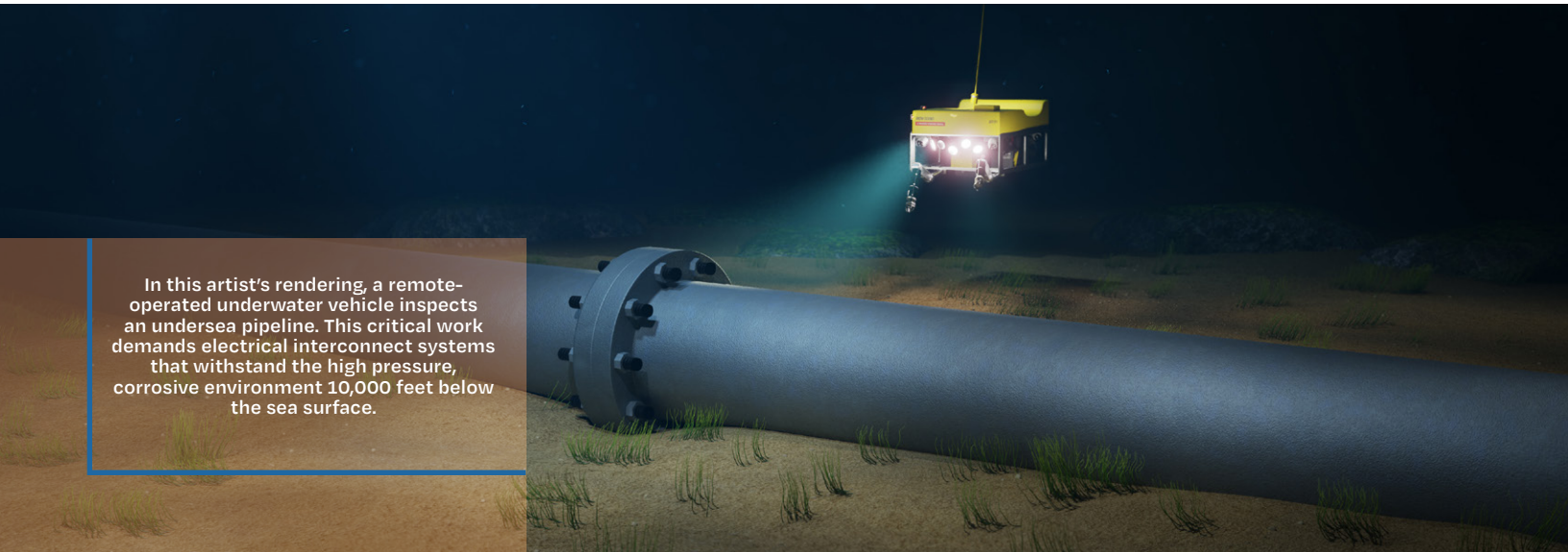
Connector mating interface design is also optimized for sealing performance and utilizes a modified UNC mating thread with added clearance to reduce bio-fouling and facilitate rapid-advance mating. The marine bronze coupler (plug side) is far less susceptible to galling than standard steel engaging nuts, ensuring reliable mating and sealing for the entire service life of the connector.

SeaKing PEEK

For applications subject to cathodic delamination, Glenair produces its 10K psi open-faced seal SeaKing in a composite thermoplastic configuration called SeaKing PEEK. SeaKing PEEK is made from a 30% glass-filled polymer composite material that delivers the same high-pressure performance as Stainless Steel, with superior corrosion protection, life-of-system durability, and complete immunity from cathodic delamination—a common failure mechanism in polymer-to-metal bonds in cathodically-polarized subsea equipment.

Metal-connector overmolded cable assemblies that have been deployed subsea for more than 3 to 5 years routinely suffer delamination between the overmold and the conductive metal shell, resulting in cable failure. An additional advantage of SeaKing PEEK is lighter weight, which allows for a smaller deployment infrastructure (operations jargon for a smaller boat)—translating to reduced deployment costs—a critical concern considering deployment can be as much as 50%-60% of the overall cost of the system.

In military/defense applications, such as sonar-based underwater detection and tracking systems, the replacement of metal connectors with composite plastic offers the critical benefit



In this artist's rendering, a remote-operated underwater vehicle inspects an undersea pipeline. This critical work demands electrical interconnect systems that withstand the high pressure, corrosive environment 10,000 feet below the sea surface.

of a reduced magnetic signature, rendering equipment invisible to sensors that easily detect metallic equipment. Importantly, PEEK material is galvanically compatible with metal housing materials including aluminum, SST, titanium, and bronze, eliminating the need to galvanically match SeaKing PEEK with other components in the system.

SeaKing Power

SeaKing 700 is also available in a high-voltage power connector configuration for use in API 16D and 17E-compliant test ports. These high-voltage (1–3kV) and high-amperage (up to 350 Amp) solder-cup-contact connectors are designed for deployment in both overmolded or PBOF configurations for primary power junction applications. Like all connectors in the SeaKing series, these are 10K psi open-face systems with the complete range of innovative design features as found throughout the family.

SeaKing Fiber

Data-intensive applications such as towed array sonar systems, well logging and monitoring equipment, digital seismic streamers, as well as magnetic flux leakage and ultrasonic inspection sensors used in intelligent pipeline inspection, are ideally suited for ruggedized high-pressure fiber optics. Fiber optic interconnect systems deliver ultra-fast data rates, immunity from RFI and other forms of electromagnetic interference, as well as reduced size and weight compared to high-speed copper. Glenair SeaKing™ Fiber Optic solutions include harsh-environment overmolded cable assemblies and multi-branch inside-the-box jumpers. Pressure-Balanced Oil-Filled (PBOF) cable assemblies are also available for deep subsea applications.

Applications

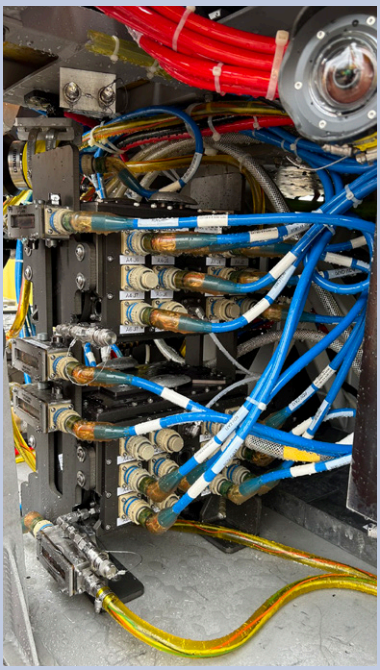
As mentioned, the SeaKing 700 is ideally suited for deep-water subsea-floor Oil & Gas industry electronic equipment, as well as all classes of inspection, work, and resident ROVs.

ROVs are the backbone of all deepwater offshore operations: From installing assets and bringing wells online, to the complex business of decommissioning end-of life fields. ROV equipment sets are pressure resistant, making it possible for the submersible to function and operate in harsh and remote depths up to 10,000 feet. In the demanding deep-water operations environment, electrical engineers specifying interconnect technology must consider extremes in temperature, pressure, and corrosion when choosing appropriate cables and connector sets to bring power and data to equipment and tools. Connectors must be evaluated for mating durability and wire-to-connector termination durability by considering working conditions including cathodic delamination, corrosion due to dissimilar metals, and mechanical stress due to cable routing and wave action. Pressure-resistant connectors are required on all ROVs for electrical and optical circuits interconnecting payload components and/or for umbilical connectivity topside. 10K psi is the standard for ROV connectors. Connectors typically employ front-end sealing technology that allows for wet underwater mating and/or open-face exposure of connector halves to subsea pressures.

SeaKing™ PEEK

Corrosion-free / cathodic-delamination free SeaKing PEEK connectors utilize an innovative indexable flange and rugged overmolding for optimized cable routing in complex installations such as on the next-generation Remote Operated Vechicle shown below.

These Glenair signature connectors are constructed with a glass-filled polymer composite that delivers the same high-pressure performance as stainless steel, but at a fraction of the weight. A lighter-weight system allows operators to reduce deployment costs.



Mechanical and Environmental Design Features: SeaKing™ 700 Dry-Mate Underwater Connectors

10K psi / 700 bar / 7000m open-face or mated, dual O-ring equipped, high-density, high-voltage, fiber optic and hybrid electrical/optical subsea connectors

SeaKing 700 is an innovative underwater connector series that eliminates a broad range of mechanical design weaknesses found in many of today's high-pressure subsea connector families. From its double O-ring seals and retractable engaging nut, to its multi-keyed mating interface, the SeaKing underwater connector represents a far more reliable approach to subsea power and signal connectivity.

Design: Ideally suited for deep water offshore Oil & Gas, military/defense, oceanographic research, and other harsh-environment subsea applications, the dry-mate connector series is built for optimal durability and reliability. Tested to 15,000 psi (open face and mated), and equipped with integrated dual O-ring seals, marine bronze coupling nuts, corrosion-resistant stainless steel shells, and high-pressure contact inserts with gold-plated signal contacts, special RF and fiber optic solutions, the Series 700 SeaKing is today's most advanced high-density signal and standard-density power underwater connector.

Sealing: SeaKing 700 is the best-sealed subsea connector on the market. All critical interfaces, including bulkhead seals, glass-to-metal insert seals, mating interface bore seals, and face seals are fully redundant ensuring 10K psi protection, even in the event of a single-seal failure.

Mating: SeaKing utilizes a modified UNC mating interface with added clearance to reduce bio-fouling and facilitate rapid-advance mating. The marine bronze coupler on the plug is equipped with wrench flats as well as knurling and is less susceptible to galling than stainless steel engaging nuts. Polarized keys and keyways prevent both thread damage and mismating.

Ease-of-Use: Multiple PBOF backshell indexing points, indexable flange FCRs, full-mate inspection ports, retractable engaging nuts, and other features make SeaKing the most user-friendly subsea connector on the market.

SeaKing™
SEVEN HUNDRED

TECHNICAL FEATURES

- **High density, small form-factor connector**
- **Dual O-ring seals ensure high-pressure performance for every leak path**
- **Signal, power, RF, and optical insert arrangements**
- **Stainless steel with anti-galling marine bronze engaging nut or cathodic delamination-free PEEK**
- **Full-mate inspection ports**
- **Easy O-ring replacement**
- **Key and keyway polarization**

CUSTOMER SERVICE AND SUPPORT

- **Most aggressive lead times in the industry**
- **Vertically integrated and made in the USA**
- **Custom solutions, no miniumum order quantities**
- **Accessible and responsive engineering support**
- **Obsessed with quality and qualification**
- **Superior technical designs for extended durability and performance**

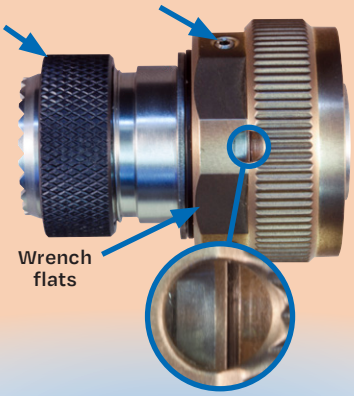
Retractable engaging nut retention ring for easy O-ring inspection/replacement

Optional overmold delamination ring accessory

Engaging nut set screw (3 places)

Accessory thread and overmold features

Multiple PBOF backshell indexing points

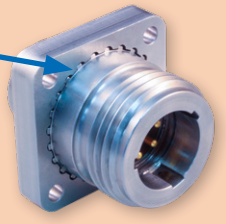


Wrench flats

Full-mate inspection port

SeaKing Flange Connector Receptacles feature a removable spoked body and indexable flange

Indexable flange



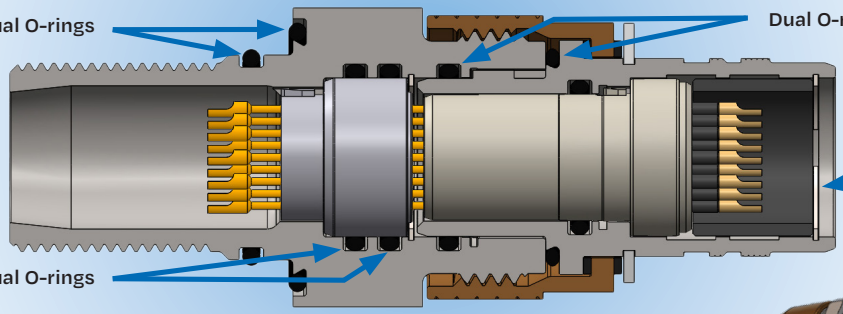
Disengage flange to rotate body for multiple clocking positions

Available in both metal and PEEK

Replaceable Nitrile or Buna-N (NBR) O-ring seals facilitate fast and trouble-free field replacement

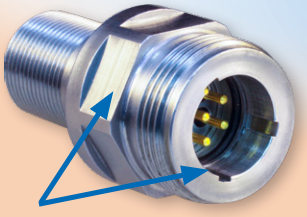
Dual O-rings

Dual O-rings

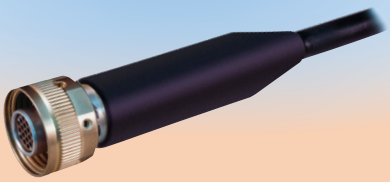


Dual O-rings

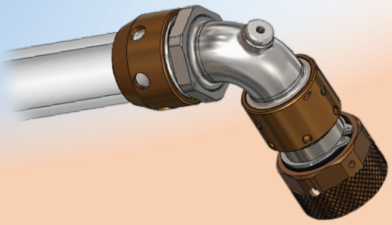
Available pressure-balanced oil filled (PBOF) back end for use with oil-filled cables



BCR showing keyway-assisted mating and polarization feature and wrench flats for reliable, secure attachment to pressure bulkheads.

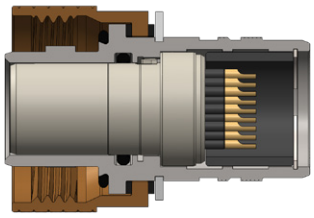


SeaKing™ 700 overmolded and receptacle pigtail "HotShot" cable assemblies are available from the factory with accelerated lead times as short as 2 weeks.

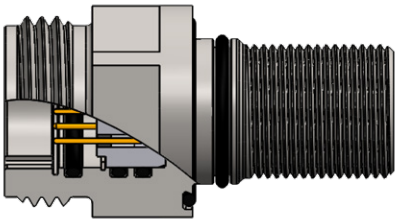


Revolutionary PBOF swivel assembly features kink-proof hose swivel, straight, 45° and 90° routing, and superfast assembly.

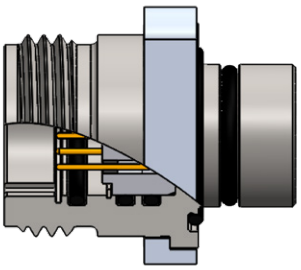
STANDARD CONFIGURATIONS



Cable Connector Plug (CCP)



Bulkhead Connector Receptacle (BCR)



Flange Connector Receptacle (FCR)

Pre-Release Announcement: Glenair SeaKing WetMate Interconnect Now in Final Qualification Testing

The SeaKing 700 series of high-pressure Oil & Gas industry underwater connectors will see a major expansion in 2025 with the introduction of an oil-bladder filled, field-serviceable wet mate connector compliant to API Standard 17F. The new series will be supplied in diver, stab-plate, and ROV-mate connectors, and is uniquely engineered for use with aerospace-grade split-tine crimp contacts with state-of-the-industry sealing and Glenair's commitment to quality, reliability, and service. SeaKing WetMate features a solder-free rear crimp contact body with field-replaceable insert stack and 10K psi mated and open-face rating. Supplied in stainless steel with marine bronze coupler, or glass-filled composite thermoplastic PEEK for advanced deep-sea corrosion protection and cathodic delamination protection.

SeaKing™ WetMate

TECHNICAL FEATURES

- 1KV AC-rated
- #10 AWG wet-mate contacts, bladder type
- Stainless Steel / Titanium shell bodies with PEEK inner insert molded assemblies
- Natural rubber inner/ outer bladders and cable boots
- 4, 8, and 12 contact arrangements
- 10K psi mated and open-face rating
- Multiple mounting configurations (rear/front/ flange/bulkhead style) and indexable flange
- Operating depth up to 20,000 ft. (10K psi)
- Field-replaceable insert stack, contacts, and sealed wire termination zone

Innovative crimp kit wire termination: fully sealed and field-replaceable with precision-machined spanner retention nut and individual wire sealing boots

Sneak Peek:

SeaKing™ WetMate

Diver-Mate ▪ Stab-Plate ▪ ROV-Mate
10K psi Open-Face Rated Wet Mate Connector

GLENAIR QwikConnect

SEAKING WETMATE DESIGN FEATURES AND ADVANTAGES

- **Precision spanner nut retention plates**
- **Socket insert module (factory oil-filled) removable for field maintenance**
- **Crimp contact materials and design IAW aerospace specifications**
- **Field-replaceable overmolded pin contacts with dual O-rings**
- **Split-tine socket contacts with Glenair low-resistance Crown Ring feature**
- **Indexable flange for top mating position clocking**
- **High-conductivity copper alloy provides lower contact resistance and higher heat dissipation**
- **Cable assembly termination rear crimp kit (factory or field)**
- **Proven crimp contact used throughout military / commercial industry. (No soldering required)**
- **Utilizes standard crimp tooling providing a robust termination every time**
- **Rugged Stub-ACME mating thread**

PERFORMANCE SPECIFICATIONS	
Requirement	**SeaKing WetMate**
Operating Depth	20,000 ft, 6500 m, 10,000 psi
Test Pressure	15,000 psi (1.5 X over operating pressure)
Operational Temperature	Seawater: -5°C to +60°C Air: +20°C to +50°C
Storage Temperature	40°C to 70°C
Mate/Demate Cycles	1000 total, 200 in turbid seawater
Mating Force	112 lbf max (reference)
Demate Force	112 lbf max (reference)
Design Life	30 years
Circuit Count	4, 8, or 12
Max Operating Current	30 – 35 Amps at depth, 15 – 18 Amps in Air
Max Operating Voltage AC	1.0 kVAC (P-G), 1.73 kVAC (P-P)
Max Operating Voltage DC	3.3 kVDC
Insulation Resistance	> 10 g ohm @ 1000 V
Contact Resistance	< 10 m ohm, per contact
Max Wire Conductor size	4mm² (12 AWG)

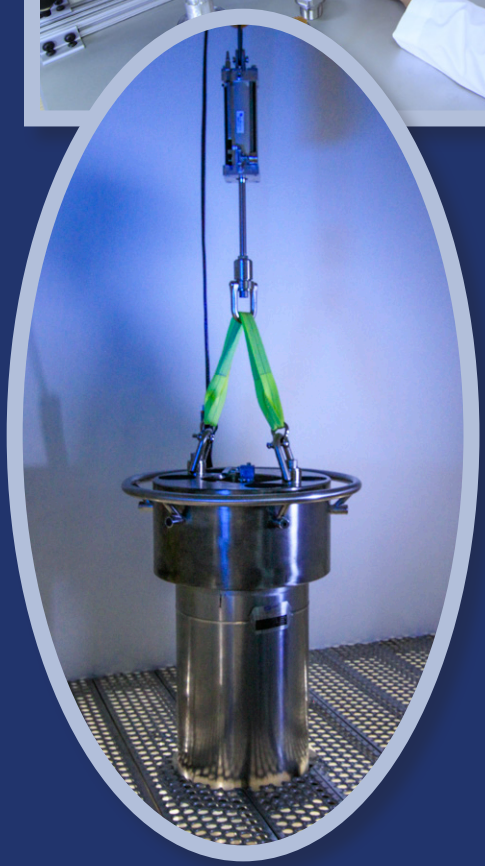
Specification for 4-way, 3mm pin prototype, Crimp version - 30 amps, Voltage 1.0 kVAC (P-G), 1.73 kVAC (P-P), 3.3 kVAC 10,000 psi Rated (7000M depth) Test 1.5 MOS (15,000 psi)

HYDROSTATIC TEST LAB
GLENDALE, CALIFORNIA

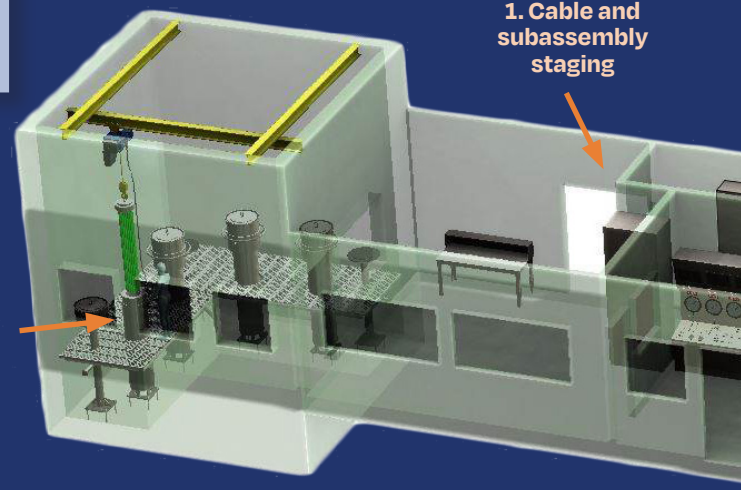
Special behind-the-scenes tour of Glenair's hydrostatic test lab for high-pressure electrical and fiber optic interconnects

DISCRETE CONNECTOR TESTING: All Glenair high-pressure interconnects are subjected to 100% inspection and test

GLENAIR • GLENDALE FACTORY TOUR



LARGE PRESSURE VESSELS: Built to accommodate complete cable assemblies, mated connectors, and customer-supplied subassemblies



TECHNICAL STAFF: Knowledgable and trained subsea specialists perform both in-house product qualification testing, as well as customer subassembly testing.

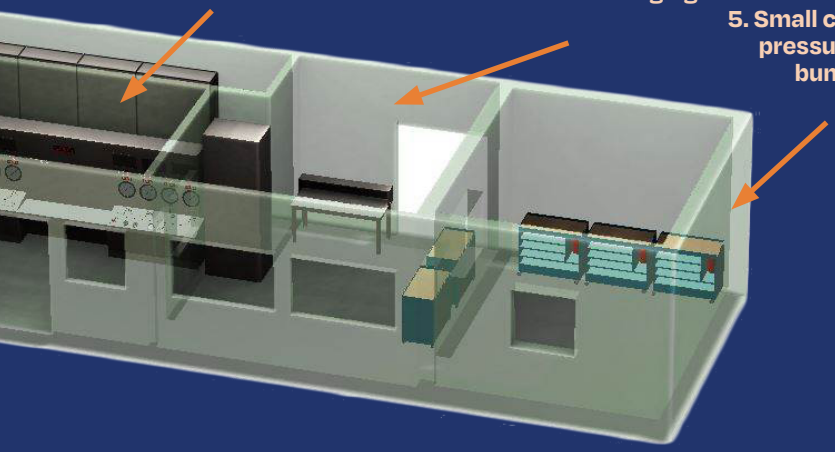
SAFETY MOMENT: This technician is in the early process of a complex test setup so we will cut him some slack. Otherwise, safety glasses should always be worn in the lab.

CONTROL ROOM: The modular consoles in the control room provide for up to 8 pressure circuits, operating in manual mode or automated. Each circuit is capable of a maximum of 16.5K psi. Monitors display: automated test profiles, data acquisition, remote viewing of test rooms and more. System is network connected for access to profiles and distribution of test reports.

3. Hydrostatic test lab control room

4. Production connector staging

5. Small connector pressure test bunker



SeaKing™ and SuperG55™ QUALIFICATION TESTING: Both Glenair Series 70 SeaKing and SuperG55 rugged dry-mate subsea connectors have been tested and qualified to their 10K psi pressure rating—open-face and mated—in Glenair's state-of-the-art hydrostatic test lab. Additional testing included mating cycles, salt spray, and electrical continuity.

GLENAIR HYDROSTATIC TEST LAB TECHNICAL SPECIFICATIONS AND PRESSURE TEST STANDARDS	
Pressure test profiles	Automated or manual
Maximum test pressure	16.5K psi
Data acquisition types	Pressure, time, temperature, and electrical performance
Performance monitoring under pressure	I/R, continuity, insertion loss, and backreflection (optical)
Industry profiles	All major Oil & Gas standards
Custom profiles	Yes, including customer-supplied subassemblies
Capacity (large pressure vessels)	Working volume = 12" diameter x 72" depth; Test specimen weight up to 1500 lbs.

What do you call the perfect submarine movie?

Sub-Optimal

___ Das Boot

___ The Hunt for Red October

___ 20,000 Leagues Under the Sea

___ The Life Aquatic with Steve Zissou

___ Greyhound

___ Assault on a Queen

___ Yellow Submarine

___ The Abyss

___ Crimson Tide

___ Run Silent Run Deep

___ Voyage to the Bottom of the Sea

___ Titanic

___ The Russians Are Coming

___ Ice Station Zebra

___ Down Periscope

___ K-19: The Widowmaker

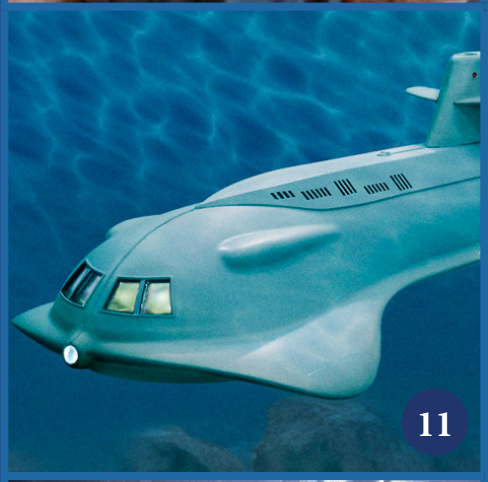
___ U-571

___ The Enemy Below

___ Destination Tokyo

___ Under Siege

Match the movie stills and titles.
Answers at www.glenair.com/qwikconnect

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DEEP WATER

SeaKing SEVEN HUNDRED PEEK

Composite Thermoplastic SeaKing™ PEEK for use in anti-cathodic delamination applications

SeaKing 700 is an innovative underwater connector series that eliminates a broad range of mechanical design weaknesses found in many of today's high-pressure subsea connector families. From its double O-ring seals and retractable engaging nut, to its multi-keyed mating interface, the SeaKing underwater connector represents a far more reliable approach to subsea power and signal connectivity.

The series is available in stainless steel, titanium, and PEEK composite plastic shell materials designed for galvanic compatibility in mixed material applications, and superior corrosion resistance durability and immunity from cathodic delamination. The SeaKing PEEK shares all the same insert arrangements, wire support, cabling, and PBOF capabilities as metal versions.

- **Superior corrosion resistance, durability, and immunity from cathodic delamination**
- **Same high-pressure performance as stainless steel**
- **Lighter weight with lower deployment costs**
- **Zero magnetic signature**
- **Galvanically compatible with all metal materials**
- **Full range of SeaKing 700 series insert arrangements: power, signal, and high-speed**

700 Series with non-metallic PEEK shells

700-201 CABLE CONNECTOR PLUG (CCP), PEEK

SEAKING PEEK - HOW TO ORDER						
Sample Part Number	**700**	**-201**	**-M12**	**-K**	**S**	**N**
Product Series	**700** = SeaKing™					
Shell Style	**201** = non-metallic PEEK cable connector plug (CCP)					
Shell Size-Insert Arrangement	(See SeaKing catalog)					
Shell Material	**K** = glass-reinforced PEEK					
Contact Style	**S** = socket					
Polarization	**A**, **B**, **C**, **N** = normal (see sales drawing for details)					

10K psi available in smaller shell sizes. Contact factory for details.

700-206 GLASS REINFORCED EPOXY OR GLASS HERMETIC SEAL INSERT, FLANGE CONNECTOR RECEPTACLES (FCR), PEEK

SEAKING PEEK - HOW TO ORDER						
Sample Part Number	**700**	**-206**	**-E4**	**-K**	**P**	**N**
Product Series	**700** = SeaKing™					
Shell Style	**206** = non-metallic PEEK FCR, Glass Hermetic Seal Insert (GTMS) **226** = non-metallic PEEK FCR, Glass Reinforced Epoxy Insert (GRE)					
Shell Size-Insert Arrangement	(See SeaKing catalog)					
Shell Material	**K** = glass-reinforced PEEK					
Contact Style	**P** = pin					
Polarization	**A**, **B**, **C**, **N** = normal (see sales drawing for details)					

10K psi available in smaller shell sizes. Contact factory for details.

700-207 GLASS REINFORCED EPOXY OR GLASS-TO-METAL SEAL INSERT, BULKHEAD CONNECTOR RECEPTACLE (BCR), PEEK

SEAKING PEEK - HOW TO ORDER						
Sample Part Number	**700**	**-207**	**-E4**	**-K**	**P**	**N**
Product Series	**700** = SeaKing™					
Shell Style	**207** = non-metallic PEEK BCR, Glass Hermetic Seal Insert (GTMS) **227** = non-metallic PEEK BCR, Glass Reinforced Epoxy Insert (GRE)					
Shell Size-Insert Arrangement	(See SeaKing catalog)					
Shell Material	**K** = glass-reinforced PEEK					
Contact Style	**P** = pin					
Polarization	**A**, **B**, **C**, **N** = normal (see sales drawing for details)					

10K psi available in smaller shell sizes. Contact factory for details.

DEEP WATER

SeaKing™ Junior

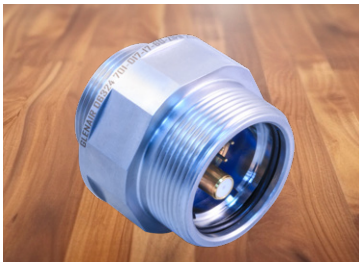
High-density, dry-mate, harsh-environment connectors and cables for lighter-duty ROV applications such as lights and sensors

High-density Series 701 SeaKing Junior connectors are the perfect choice for harsh-environment Oil & Gas industry equipment. All designs are equipped with single piston seal nitrile O-rings to withstand exposure to corrosive chemicals and high-pressure environments. These 5K psi pressure-rated connectors feature high-density crimp-contact or solder cup inserts, and are significantly smaller than heavy-duty series 700 SeaKing interconnects. Connectors are backfilled with epoxy potting compound for easy incorporation into overmolded cables. Crimp-contact versions for field installation and repair are also available. SeaKing Junior is specifically designed for high-pressure, mated condition applications that do not require the extra fail-safe features and cost of an open-face rated solution.

- **5000 psi (mated condition) pressure rated connector for overmolded (non-PBOF) applications**
- **High density, small form-factor solution—up to 50% reduction in size and weight compared to industry standard solutions**
- **Ultraminiature high-density pin configurations: #22D, #20, #20HD, #16, #12, #8 signal, power, fiber optic and high-speed datalink shielded contacts**

SEAKING™ JUNIOR HIGH-SPEED AND RF ASSEMBLIES

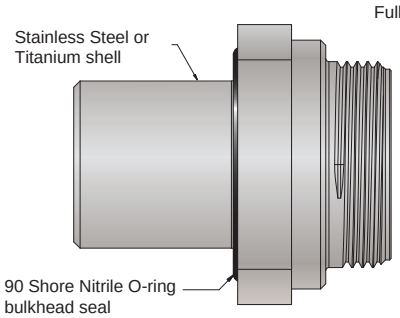
Harsh-environment polyurethane overmolded point-to-point cables with 10 GbE SpeedMaster insert



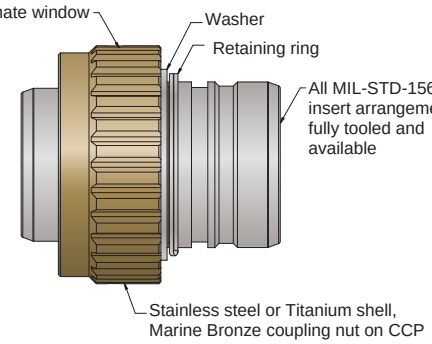
SeaKing Junior Bulkhead Connector Receptacle with hybrid signal and high-frequency RF contacts

5000 psi piston-sealed connectors and cables

SERIES 701 SEAKING™ JUNIOR MECHANICAL FEATURES AND CONFIGURATIONS



Flange Connector Receptacle



Cable Connector Plug

Series 701-011 Cable Connector Plug (CCP) supplied as overmolded cables only

Series 701-016 Flange Connector Receptacle (FCR) supplied as discrete connectors or in pigtail assemblies

Series 701-017 Bulkhead Connector Receptacle (BCR) supplied as discrete connectors or in pigtail assemblies

Stainless Steel or Titanium shells, Marine Bronze coupling nuts

Available in nine sizes from 2 to 128 contacts, Series 701 connectors feature stainless steel or marine bronze shells. Nitrile O-rings resist high temperature and corrosive chemicals.

5,000 psi

These connectors withstand up to 5,000 psi hydrostatic pressure in a mated condition.

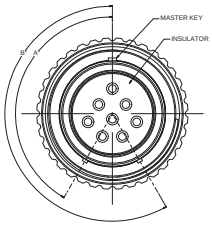
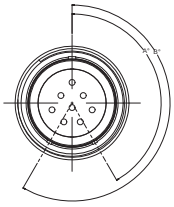
SEAKING™ JUNIOR CONTACT SPECIFICATIONS, MATERIALS AND FINISHES, AND CRIMP TOOLS

SERVICE RATINGS			
Service Rating	Sea Level DWV (VAC)	Operational	
		VAC	VDC
M	1300	433.3	612.8
N	1000	333.3	471.4
I	1800	600.0	484.5
II	2300	766.7	1084.2

CURRENT RATING		
Contact Size	Amps	Wire Size
#8	46.0	8 AWG
#10	33.0	10 AWG
#12	23.0	12-14 AWG
#16	13.0	16-20 AWG
#20	7.5	20-24 AWG
#22D	5.0	22-28 AWG

PERFORMANCE SPECIFICATIONS	
Insulation Resistance	5000 megohms at 500 VDC
Operating Temperature	-65° C to +175° C
Hydrostatic Pressure	5,000 psi mated condition, tested per ISO 13628-6
Durability	300 mating cycles

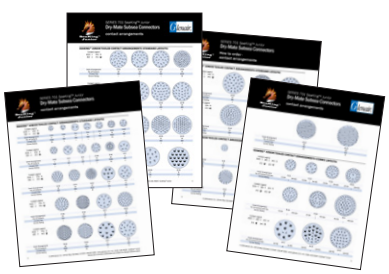
SERIES 701 POLARIZATION

Plug	Receptacle
	

Key Position	Key Rotation	
	A°	B°
Normal (N)	150°	210°
A	75°	210°
B	95°	230°
C	140°	275°

MATERIAL AND FINISH	
Shells, Jam Nuts	Stainless steel or Titanium
CCP Coupling Nuts	Marine bronze, unplated
Contacts	Copper alloy, gold plated.
Insulators	Composite thermoplastic
Retaining ring and hardware	Stainless steel
Interfacial Seal (pin inserts only) and Grommet	Fluorosilicone
O-rings and Seals	Nitrile, 90 shore Viton®, 90 shore Viton® O-rings offer wider temperature range

CONTACT CRIMP TOOLS		
Contact Size	Crimp Tool	Positioner
#12	809-136	809-137
#16	809-136	809-137
#20	809-136	809-137
#22D	809-015	K42 Pin
		K40 Skt

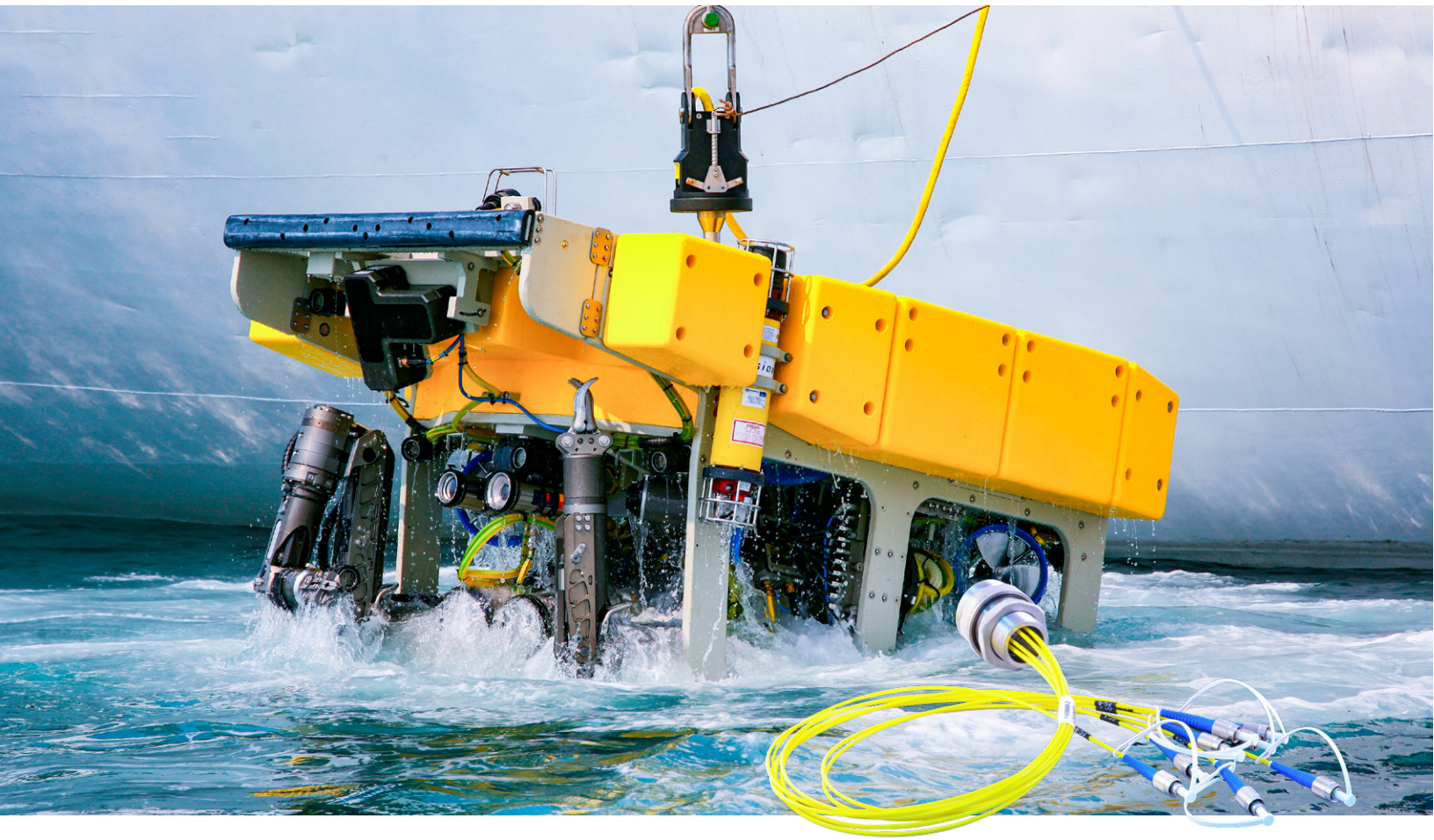


Tooled insert arrangements include high-density and combo layouts for Coax, Twinax, and El Ochito® contacts

DEEP WATER

SeaKing™ Fiber

10K psi open-face pressure rated fiber optic connectors, cables and jumpers—singlemode and multimode with low dB data loss

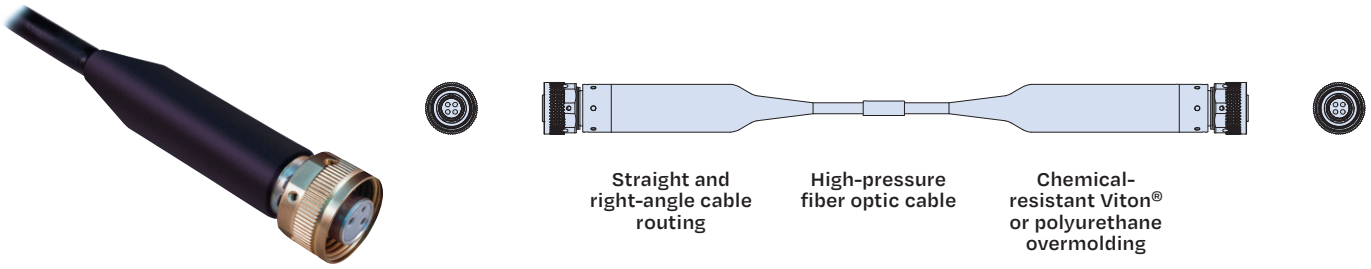


Data-intensive applications such as towed array sonar systems, well logging and monitoring equipment, digital seismic streamers, as well as magnetic flux leakage and ultrasonic inspection sensors used in intelligent pipeline inspection are ideally suited for ruggedized high-pressure fiber optics. Fiber optic interconnect systems deliver ultra-high data bandwidth, immunity from RFI and other forms of electromagnetic interference, as well as reduced size and weight compared to high-speed copper. Glenair SeaKing™ Fiber Optic solutions include harsh-environment overmolded cable assemblies, multibranch inside-the-box jumpers, as well as Glenair signature Pressure-balanced oil-filled (PBOF) cable assemblies with fiber optic media optimized for deep sea applications.

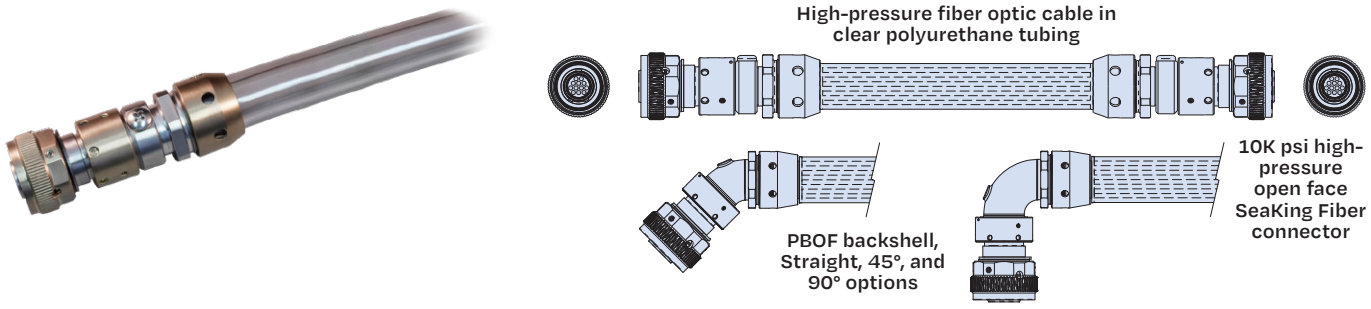
- **Environmental overmolded, pigtail, and PBOF butt-joint assemblies**
- **Full hydrostatic qualification test report available**
- **Wide range of fiber and hybrid fiber/electric layouts**
- **Singlemode and multimode**
- **Optical performance: <1.0dB insertion loss per mated connection when measured @ 1310nm wavelength**

10K psi open-face pressure-rated fiber optic connectors and cables

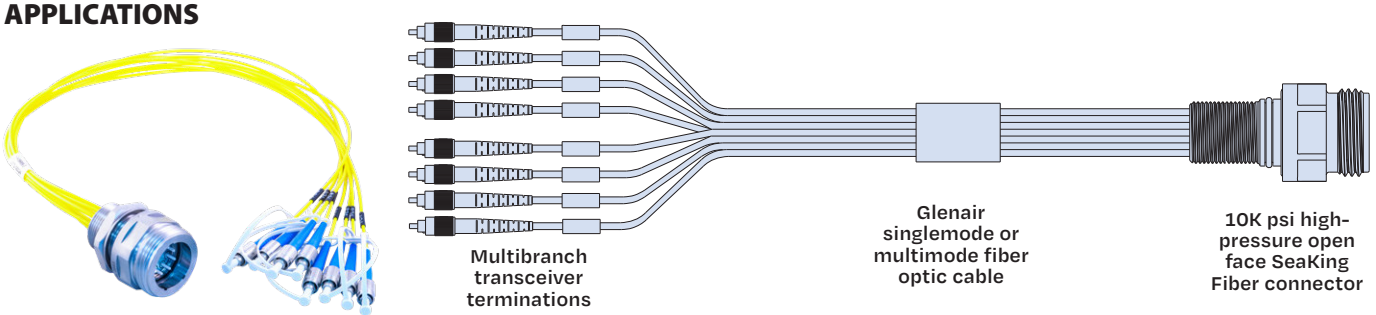
ENVIRONMENTAL OVERMOLDED FIBER OPTIC JUMPERS



PRESSURE-BALANCED OIL-FILLED (PBOF) HIGH-PRESSURE FIBER OPTIC ASSEMBLIES

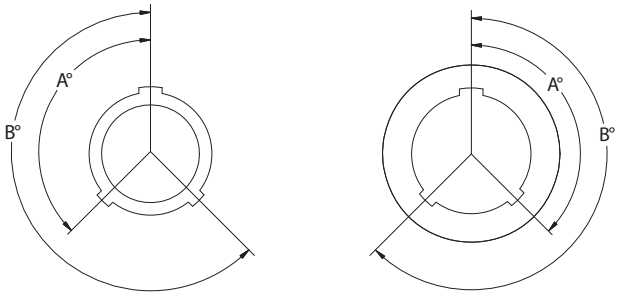


SEAKING™ BCR OR FCR TO COMMERCIAL FIBER OPTIC PIGTAIL ASSEMBLY FOR I/O-TO-BOARD MODULE APPLICATIONS



KEY AND KEYWAY POSITONS

ALTERNATE KEYWAY POSITIONS		
Key Position	Key Rotation A°	Key Rotation B°
Normal (N)	150°	210°
A	75°	210°
B	95°	230°
C	140°	275°



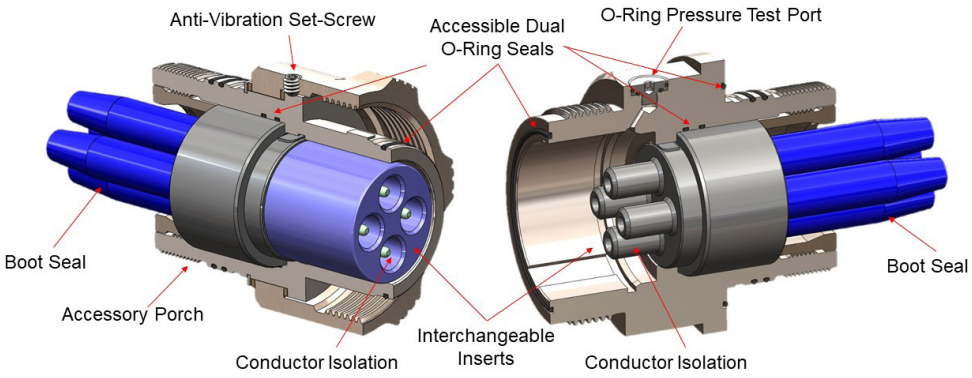
DEEP WATER

SeaKing™ POWER

1–6.6kV connectors for deep sea Oil & Gas primary power junctions

Blow Out Preventer (BOP)
Photo: Bureau of Safety and Environmental Enforcement

Glenair's SeaKing Power connector family is rated to 10K psi in open-face or mated condition. These high-voltage (1–6.6kV) and high-amperage (up to 350 Amps) solder cup contact connectors are ready for immediate deployment in overmolded or PBOF configurations for primary power junction applications. Test reports available upon request. A range of shell sizes and contact inserts are available.



- **API 16D and 17E-compliant test ports**
- **Fully redundant dual O-ring sealing**
- **Indexable flange or threaded bulkhead designs**
- **O-ring pressure inspection ports available on all BCR and FCR designs**
- **Factory acceptance testing in both mated and open-face conditions**
- **Keyed mating interface for mismate prevention**

Available configurations and applications

CABLE CONNECTOR PLUG (CCP)

SeaKing™ Power
API 16D and 17E-Compliant
Cable Connector Plug (CCP)

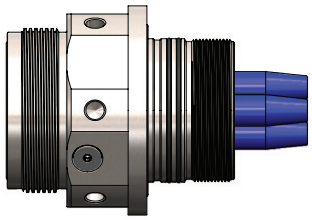
- PBOF and overmold compatible cable connector plug
- Super duplex stainless steel or titanium construction with glass-reinforced thermoplastic insulator
- Accepts various backshell accessories
- Aggressive coupling nut knurling for easy field mating
- Inspection ports, spanner wrench holes, and coupling nut lock set screws ensure reliable foolproof performance
- Conductor sealing boots protect solder cup wire-to-contact terminations in the event of a flooded hose

FLANGE CONNECTOR RECEPTACLE (FCR)

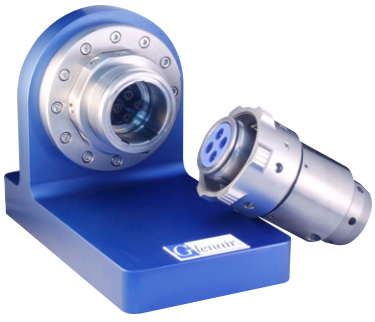
SeaKing™ Power
API 16D and 17E-Compliant
Flange Connector Receptacle (FCR)

- FCR delivers 10K psi sealing in both mated and open-face condition
- Indexable flange allows receptacle shell rotation for 360° routing flexibility of right-angle-mating cable plugs
- Available API O-ring pressure test ports ensure reliability prior to deployment to ocean floor
- Super duplex stainless steel or titanium shells for complete compatibility with mating CCP
- Wire sealing boots ensure reliable environmental protection of cable-to-connector interface

BULKHEAD CONNECTOR RECEPTACLE (BCR)



SeaKing™ Power
API 16D and 17E-Compliant
Bulkhead Connector Receptacle (BCR)



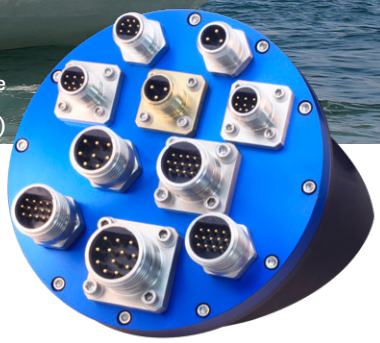
- BCR is designed for direct threaded bulkhead mounting
- Supplied washer, mounting nut, and bulkhead-mate O-ring seals ensure secure sealing and grounding to equipment housing
- BCR shell equipped with both wrench flats and spanner wrench holes for convenient installation regardless of tool choice
- Available API O-ring pressure test ports ensure reliability prior to deployment

SEAKING™ POWER PERFORMANCE SPECIFICATIONS		
Pressure Rating	Plug: 10,000 psi, mated condition Receptacles: 10,000 psi mated and open face	per ISO 13628-6
Electrical	1–6.6kV, 350 Amps max per contact	per MIL-STD-202, Method 301
Materials	Salt Spray (corrosion) Humidity (steady state) Thermal Cycle	MIL-STD-202, Method 101 MIL-STD-202, Method 103 ISO 13628-6
Power Ratings	3kV, 50 Amp / contact 1kV, 50 Amp / contact 1kV, 150 Amp / contact 1kV, 350 Amp / contact	P/N 700-101-48, 700-106-48 P/N 707-0065, 707-0066 P/N 707-0088, 707-0089 P/N 707-0142

DEEP WATER

SUPER G55

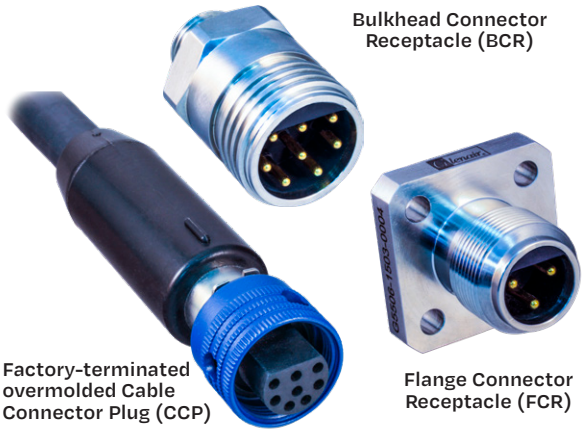
Advanced-Performance Series 55 type 10K psi Connectors and Cables



High-pressure open-face bulkhead (BCR) and flange receptacles (FCR)

The SuperG55™ family of dry-mate underwater deep-sea high-pressure connectors is a revolutionary upgrade of the popular industry standard used in countless ROV, underwater camera, diver communications, lights, pan and tilts, and other deep subsea applications.

Available in multiple shell sizes , the SuperG55™ is manufactured from 316L Stainless Steel with insert molded contact assemblies designed for pressure-sealed applications up to 10K psi mated and unmated. Intermateable and intermountable with other "55" series connectors, the Glenair solution introduces a long list of product innovations designed to improve performance and durability. Our PBOF versions, for example, utilize easy-to-assemble threaded fittings that deliver superior sealing performance while reducing installation time. Other innovations include full-mate inspection ports, improved solder cup contact design and more. Cable plugs and receptacles are available in attachable (user-terminatable) versions as well as factory overmolded single-ended whips.



Bulkhead Connector Receptacle (BCR)

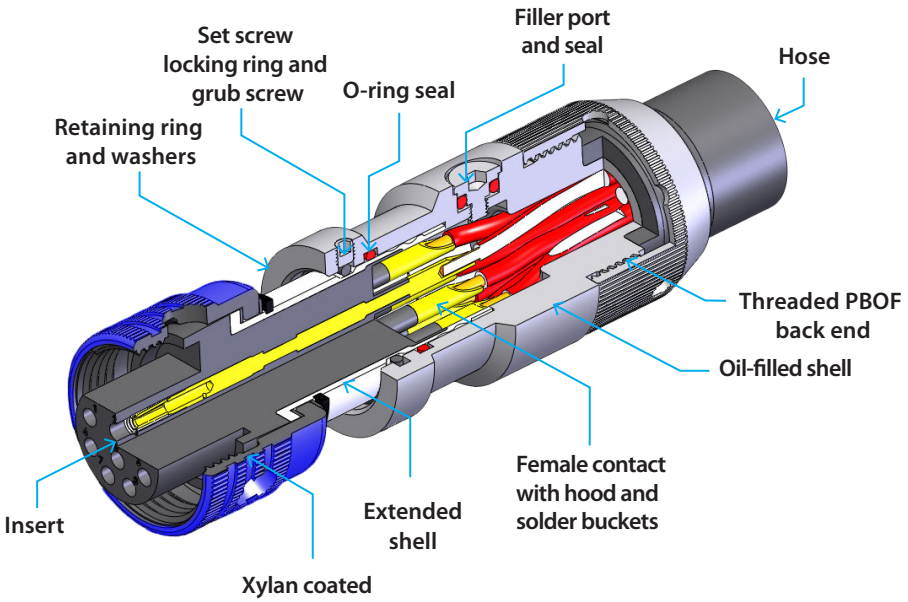
Factory-terminated overmolded Cable Connector Plug (CCP)

Flange Connector Receptacle (FCR)

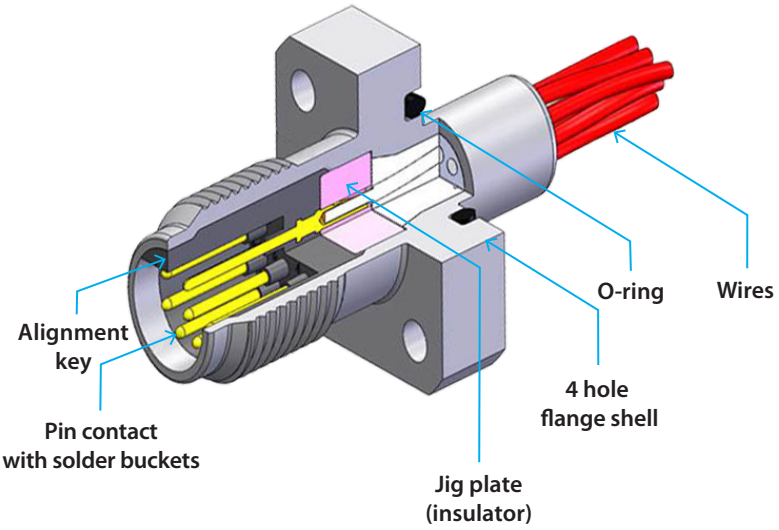
- **10,000 psi mated/ unmated (approx. 22,500ft/7,000m)**
- **Recessed socket contacts in plugs for electrical safety**
- **Intermateable and intermountable with other "55" series connectors**
- **4 shell sizes — 15, 20, 24 and 32 with 3 to 39 contacts**
- **PBOF versions available**
- **600 VDC, 5 to 18 Amps (dependent on conductor and cable size and make-up)**

Key mechanical and environmental features

SUPER G55™ PRESSURE-BALANCED OIL-FILLED CABLE CONNECTOR PLUG (CCP)



SUPER G55™ FLANGE CONNECTOR RECEPTACLE (FCR)



MATERIAL FINISH CODES			
Code	Material/Finish	Code	Material/Finish
	Anodized Aluminum	PK	Composite Thermoplastic (PEEK)
NAB2	Aluminum Bronze	B	Brass
T	Titanium	Alternative materials available, contact factory	

SUPER G55™ PERFORMANCE SPECIFICATIONS	
Mating Cycles	500
Pressure	689 bar (10,000 psi) Mated and Un-mated
Operating Temperature	-20°C to +90°C
Voltage Rating	600 VDC / 440 Vac
Current (max.)	5 to 18 Amps (dependant on contact and cable conductor sizes)

SUPER G55™ MATERIAL/FINISH	
Shells	316L Stainless Steel/ Passivated
Insulator	PEEK/NA
Insert	Neoprene/NA
Contacts	Copper Alloy/Gold Plated
O-rings	Nitrile/NA
Overmold and Cable	Polyurethane or Neoprene/NA
Coupling Nut	316L Stainless Steel/ Protective Coating Blue
Bulkhead Receptacle Tails	PTFE Insulated 16 AWG Wire/NA
Cable	Polyurethane or Neoprene Jacketed/NA

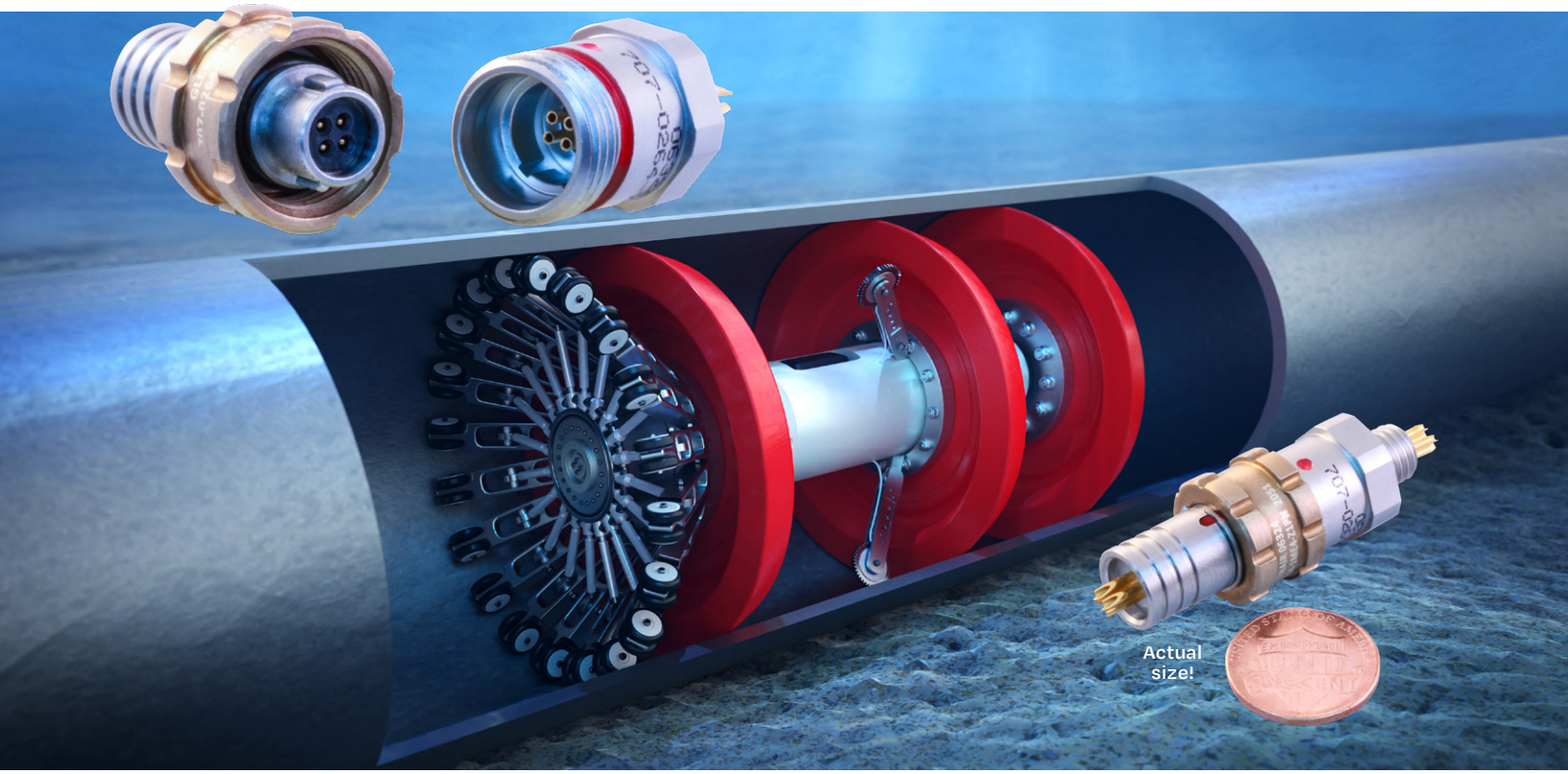
NON-STANDARD MATERIALS: Other material options are available as part of our non-catalog offerings including anodized aluminum, titanium, and aluminum bronze. Glenair is also able to supply SuperG55™ interconnects in composite thermoplastic (PEEK) to meet application requirements for reduced cathodic corrosion as well as weight reduction without affecting connector performance.

HIGH-SPEED ETHERNET: The SuperG55™ Ethernet option is available in the 1508, 2013, and 2022 contact configurations and provides both high speed (Up to 1GB) and power (600 Volts) in a full subsea environment (10,000 psi). Gigabit speed data transfer up to a distance of 75 meters.

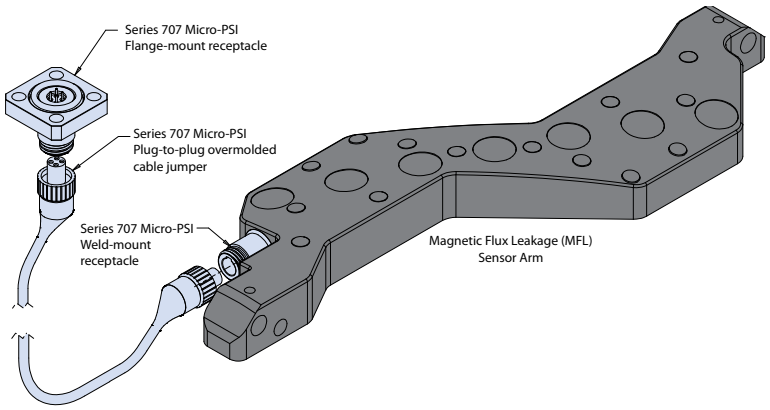
DEEP WATER

MICRO-PSI™

10K psi High-Pressure Micro Miniature, High-Speed Interconnect Solution



The Series 707 Micro-PSI is a micro miniature 10K psi high-pressure, high-temperature interconnect designed specifically for pipeline inspection applications in Magnetic Flux Leakage and ultrasonic pipeline inspection PIGs. The Micro-PSI insert arrangements feature high-density micro TwistPin layouts for sensor applications and high-speed Gigabit Ethernet, and a coax contact layout for 3 GHz performance. Micro-PSI connectors are supplied as discrete plugs, or overmolded plug cordsets with rugged Viton or Polyurethane jacketing. Bulkhead and flange mount receptacles are 10K psi open-face pressure sealed, and incorporate fused vitreous glass inserts for <1X10^{-7} scc He/sec hermetic performance. Serviceable O-rings on plugs and face O-rings on receptacles provide high-reliability sealing.



Application example shows the 707 Micro-PSI used to interconnect an MFL sensor to on-board PIG data storage.

- **High-density, high-pressure, small form-factor interconnect, ideal for In Line Inspection (ILI) and pipeline PIG inspection tools**
- **10,000 psi pressure rated**
- **Less than 1 x 10^{-7} scc He/sec @ 1 ATM pressure differential**
- **Special-purpose high density (.056" contact spacing)**
- **3 GHz Coax contact arrangements**
- **2 Amp high-speed Gigabit Ethernet-ready**
- **-20° to +150°C temperature range**
- **Field-serviceable O-rings**

Specifications and insert arrangements

MICRO PSI HOW TO ORDER, SPECIFICATIONS, MATERIALS AND FINISHES

MICRO-PSI - HOW TO ORDER						
Sample Part Number	**707-0264**	**-7**	**ME4**	**Z1**	**S**	**N**
Series / Basic P/N	**707-0264** = Series and Basic Part Number					
Connector Style	**1** = CCP (Cable Connector Plug) **5** = CCR (Cable Connector Receptacle) **6** = FCR (Flange Mount Receptacle) **7** = BCR (Bulkhead Mount Receptacle)					
Shell Size / Layout	**ME1**, **ME4**, **ME6**, **MG10**, **MK19** (See Insert Arrangements diagram)					
Shell Material	**Z1** = Stainless Steel					
Contact Type and Termination Style	**Plugs** **P** = Pin / Solder Cups **C** = Pin / PCB Terminals **Receptacles** **S** = Socket / Solder Cups **D** = Socket / PCB Terminals					
Clocking Position	**N** = Normal, **A**, **B**, **C** (See Key and Keyway Positions table below)					

Performance Ratings

Connector Pressure Ratings:
10,000 psi (Open face receptacle)
10,000 psi (Mated CCP)

Pressure Tested To:
10,000 psi per ISO 13628-6

Electrical Performance:
Insulation Resistance: 1000 Meghohms at 500 VDC per EIA-364-21
Coax Performance: DC to 3 GHz
Temperature Range: -20°C to +150°C

Hermeticity:
<1 x 10^{-7} scc He / sec @ 1 ATM pressure differential; receptacles only

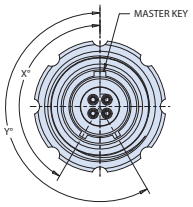
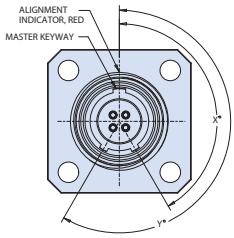
Connector Material / Finish

Connector Shell: 316L SST / passivated
Coupling Ring: nickel bronze / None
O-rings: Viton 90 durometer / none
Contacts: nickel-iron alloy / gold over nickel
Hermetic Seal: vitreous glass / none

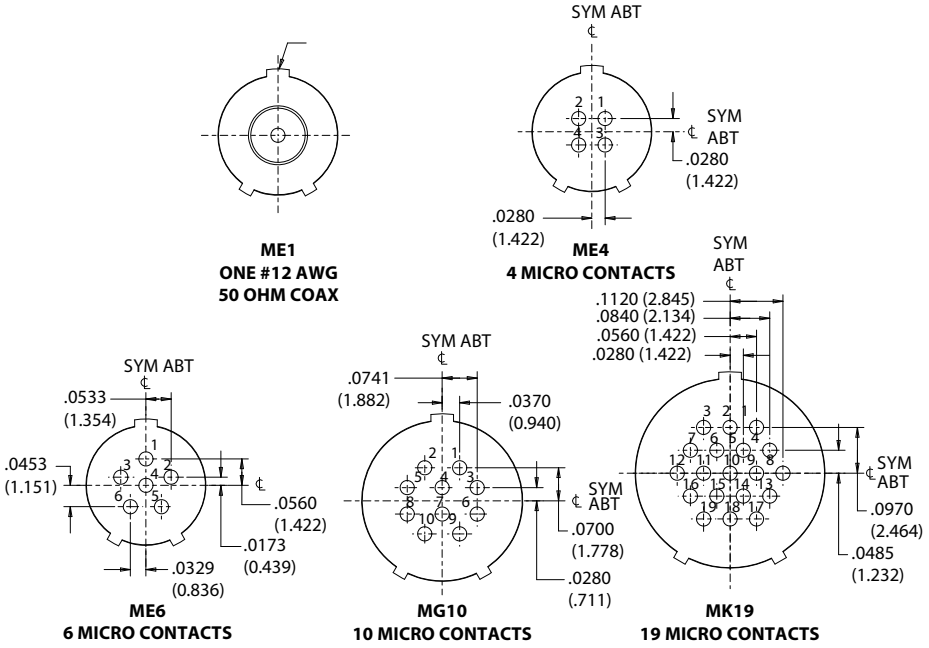
NOTES

- Plug connectors typically supplied as prewired factory cable assemblies with Viton® overmolding for caustic chemical resistance
- Receptacle connectors commonly supplied as prewired pigtails or flex jumpers for direct connection to printed circuit boards and / or data drives
- High-speed Ethernet up to 1Gbps

MICRO-PSI KEY AND KEYWAY POSITIONS

Key Position	Key Rotation X°	Key Rotation Y°	Plug	Receptacle
Normal (N)	150°	210°		
A	75°	210°		
B	95°	230°		
C	140°	275°		

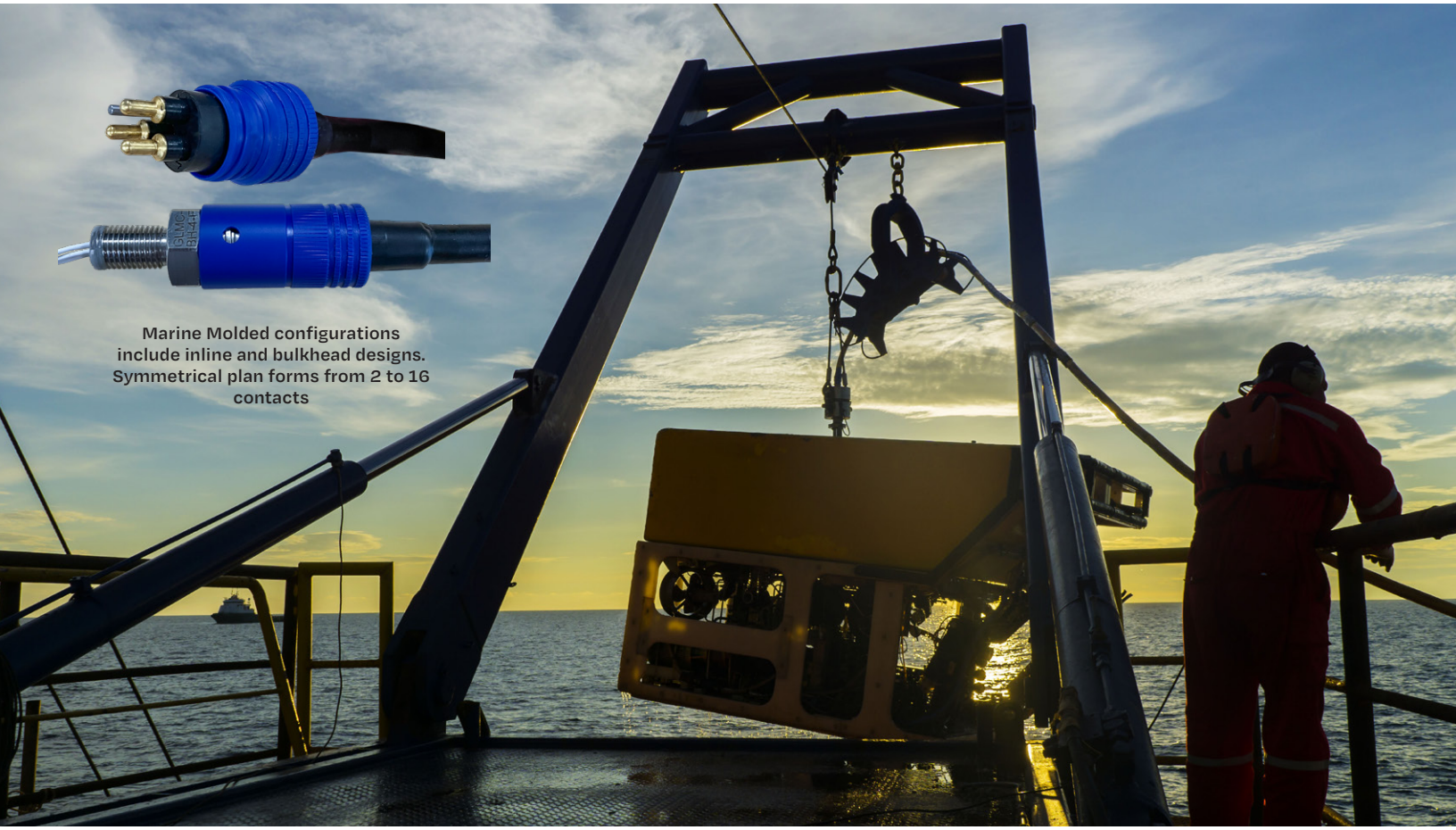
INSERT ARRANGEMENTS



DEEP WATER

MARINE MOLDED™

Industry-standard wet-pluggable rubber molded connectors



Marine Molded configurations include inline and bulkhead designs. Symmetrical plan forms from 2 to 16 contacts

Intermateable and intermountable industry-standard rubber molded connectors for ROVs and other Oil & Gas applications

Glenair Marine Molded (Series GLMC) rubber molded connectors are fabricated using only the highest-grade materials and quality controls. Prewired inline and bulkhead connectors are supplied in symmetrical layouts from two to sixteen contacts for subsea ROV, towed-array, offshore oil, and other harsh oil and gas industry applications. The industry-standard connector series is fully compatible (intermountable and intermateable) with other connector series of this type.

KEY FEATURES

- **Wet pluggable**
- **Up to 10,000psi / 690bar (6,800m/22,500ft) mated and open face**
- **2 to 16 contacts**
- **Anti-galling locking sleeve, blue Delrin**
- **Stainless steel bulkhead (standard), brass and PEEK available**
- **600 Volts for 2-4 way, 300 Volts for 5-16 way**
- **Up to 10 Amps per contact**
- **Overmolded with standard Polyurethane, Neoprene, or high-performance Duralectric**

Marine Molded™ Wet-Pluggable

GLENAIR MARINE MOLDED (GLMC) - AVAILABLE CONFIGURATIONS

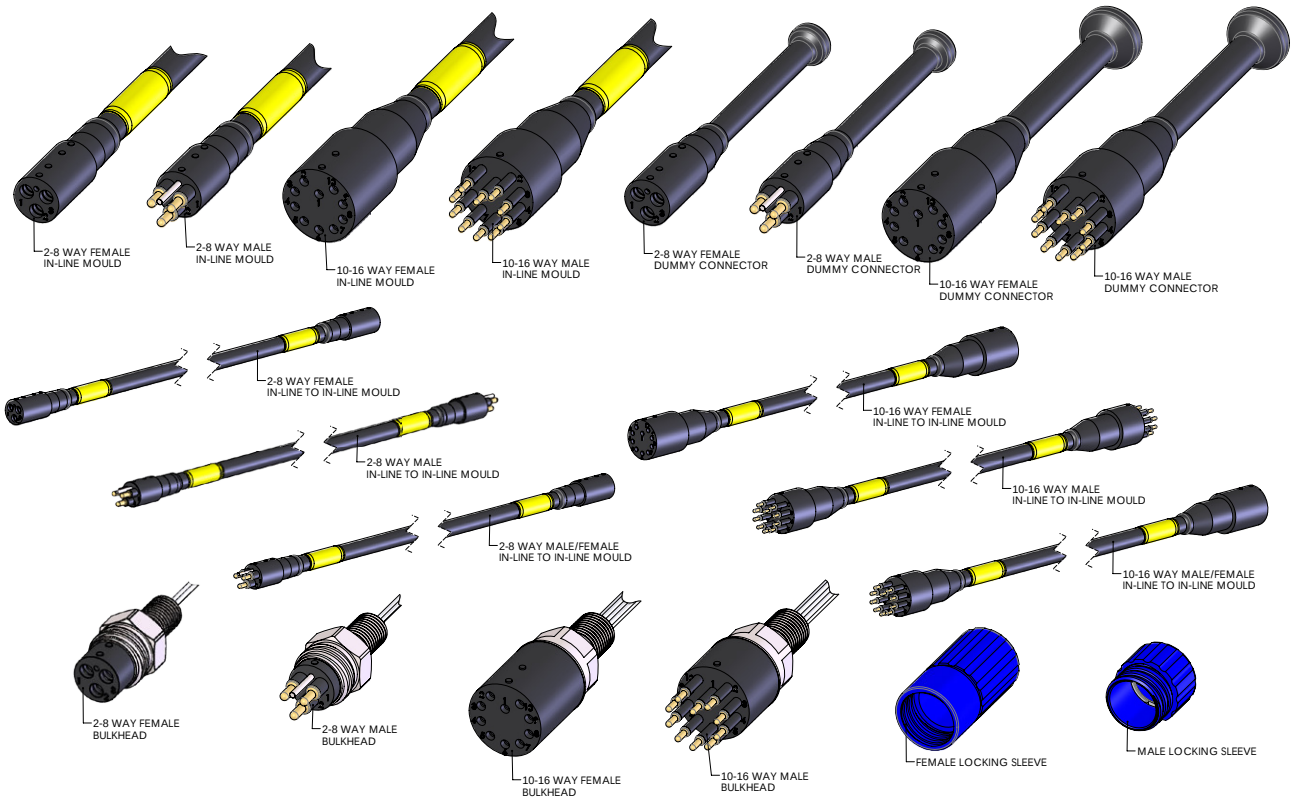
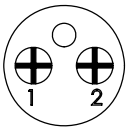
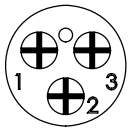
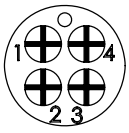
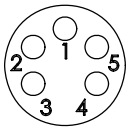
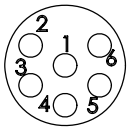
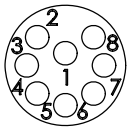
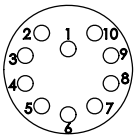
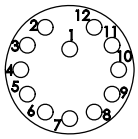
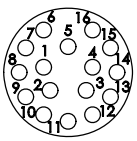


TABLE 4 - MATERIALS / FINISH		
COMPONENT	MATERIAL	FINISH
CONNECTOR SHELL(S)	316L STAINLESS STEEL	PASSIVATION.
INSULATOR	PEEK	N/A
INSERT	NEOPRENE	N/A
CONTACTS	COPPER ALLOY	GOLD PER OVER NICKEL.
O RINGS	NITRILE	N/A
OVERMOULD	POLYURETHANE OR NEOPRENE	N/A
LOCKING SLEEVE	POLYOXYMETHYLENE	VARIOUS
BULKHEAD RECEPTACLE TAILS	P.T.F.E. INSULATED 20/22 AWG WIRE.	N/A
CABLE	POLYURETHANE OR NEOPRENE JACKETED	N/A
GUIDE PIN	STAINLESS STEEL 303	N/A

TABLE 2 - PERFORMANCE DATA	
MATING CYCLES	500
PRESSURE (MATED)	689 BAR [7000m] (10,000 PSI) [23000ft]
PRESSURE (UNMATED)	68.9 BAR [700m] (1,000 PSI) [2300ft]
TEMPERATURE RATING (WATER)	-4°C TO 60°C (25°F TO 140°F)
TEMPERATURE RATING (AIR)	-40°C TO 60°C (-40°F TO 140°F)
STORAGE TEMPERATURE RATING	-40°C TO 60°C (-40°F TO 140°F)

TABLE 3 - CONTACT CONFIGURATIONS.			
SHELL SIZE	CONTACT CONFIGURATION (FACE VIEW OF MALE BULKHEAD CONNECTOR) NOT TO SCALE		
2 - 8 WAY	 2 WAY **2 x 20 AWG (0.50mm²)**	 3 WAY **3 x 20 AWG (0.50mm²)**	 4 WAY **4 x 20 AWG (0.50mm²)**
	 5 WAY **5 x 22 AWG (0.34mm²)**	 6 WAY **6 x 22 AWG (0.34mm²)**	 8 WAY **8 x 22 AWG (0.34mm²)**
10 - 16 WAY	 10 WAY **10 x 22 AWG (0.34mm²)**	 12 WAY **12 x 22 AWG (0.34mm²)**	 16 WAY **16 x 22 AWG (0.34mm²)**

Outlook

Saying Yes to Oil & Gas

This issue of *QwikConnect* highlights the incredible growth and diversity of our SeaKing underwater connector series, including a sneak-peek at our new "WetMate" SeaKing. I am told the wet-mate product, when we roll it out next year, will be user serviceable in the field and fully tested for compliance to API-17F. In the meantime, SeaKing WetMate is getting some real-world testing with our pals in the Oil & Gas industry—an industry that once again finds itself at the center of contentious debate. Glenair couldn't be prouder to support this market sector with problem-solving interconnect technologies. Beyond our own business interests, I'd like to share a few reasons why this is so.

Economically, Oil & Gas is a powerhouse, creating a substantial number of jobs not only directly but in related fields such as manufacturing, transportation, and retail. It significantly contributes to the GDP of many countries, providing revenue to fund public services, infrastructure projects, and social programs. Additionally, domestic oil and gas production enhances national security by reducing reliance on foreign energy sources and minimizing vulnerability to geopolitical conflicts.

Technologically, the Oil & Gas industry is a driver of innovation. Advances in techniques like hydraulic fracturing and deep-sea drilling have expanded knowledge in engineering and geosciences, often leading to technological advancements in other sectors—a popular theme here at Glenair. These innovations also improve energy efficiency, reducing consumption and waste. Further, the industry plays a crucial role in developing infrastructure such as roads, pipelines, and ports, which benefits other market sectors and supports overall economic development.

Perhaps most importantly, Oil & Gas provides a reliable, stable, and abundant energy supply essential for industries, transportation, and households worldwide. This reliability is particularly crucial for developing countries, where affordable available energy can significantly improve living standards. At the production level, taxes and royalties from this sector are a substantial revenue source for many governments, funding public services such as education, healthcare, and social welfare. The industry's investment in training and education programs enhances workforce skills, contributing to human capital development.

I could go on and on. But the point is life is better thanks to the men and women of the Oil & Gas industry, and we are proud to be part of their world. As our underwater connector team loves to point out, we offer Oil & Gas customers the most aggressive lead times in the industry for quality products packed with superior design, durability, and performance. As our new SeaKing WetMate connector makes its way out into the field, we trust its reliable sealing performance and serviceability will make life just a little bit easier for hard-working Oil & Gas crews worldwide.

QwikConnect

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