

# SEACON

## SEACON PRODUCTS 2014/15

*Leaders in Underwater Connector Technology and System Solutions*



 **TE**  
connectivity

This brochure contains many of our standard product lines which can be customized for higher pressures, different materials and higher electrical ratings or other parameters. Please contact SEACON for your special order requirements.

## ELECTRICAL DRY-MATE PRODUCTS

SEACON's electrical dry-mate connectors are mated in air with the mating interfaces being kept dry and sealed from the external environment. Once properly mated, the connector can be submerged to it's rated depth.



### RUBBER MOLDED (XS)

- 4 connector sizes (A, F, G, K)
- Up to 12 contacts
- Up to 20,000 psig (approx.45,000ft/13,700m)
- Up to 600 VDC (on standard cable)
- Up to 300 amps
- Neoprene rubber, Glass Reinforced Epoxy, Stainless Steel, Delrin® (DuPont trademark for Acetal Resin)
- SO cable as standard
- Typical uses; Lights, cameras, swimming pool lighting & ROV's



Please see our RUBBER MOLDED brochure for more details.



### GRE (GLASS REINFORCED EPOXY)

- 4 connector sizes
- Up to 36 contacts including coax
- Optic & oil filled available
- Up to 20,000 psig (approx.45,000ft/13,700m)
- Up to 2,800 VDC
- Up to 200 amps
- Glass Reinforced Epoxy, Stainless Steel, Delrin® (DuPont trademark for Acetal Resin)
- Typical uses; Lights, cameras and ROV's



Please see our GRE brochure for more details.



### CS-MS

- 2 shell sizes (J & K)
- Up to 10 contacts
- Up to 7,000 psig (approx.16,000ft/4,780m) mated or open face
- Insulation resistance >1 Gohms @ 500 VDC
- Dielectric with standing voltage <0.5 mA @ 1,000 VAC
- Up to 13 amps
- Optic, oil filled & ethernet versions available
- Aluminum, Glass Reinforced Epoxy
- Stainless Steel, Copper Alloy also available
- Typical uses; ROV's, cameras, lights and where size and weight is restricted



Please see our CS-MS brochure for more details.



### 55 & 66 SERIES

- 5 shell sizes (15, 16, 20, 24, 32)
- Up to 24 contacts
- Up to 10,000 psig mated/unmated (approx.22,500ft/7,000m)
- 600 VDC
- 5 to 18 amps (dependent on contact size and cable)
- Oil filled options available
- Higher current/voltages available
- Stainless Steel, Neoprene
- Non metallic PEEK version available
- Typical uses; UWTV, lights & ROV's



Please see our 55 & 66 SERIES brochure for more details.



### HUMMER

- 3 shell sizes (G, K, L)
- Up to 28 contacts
- Up to 10,000 psig mated (approx.22,500ft/7,000m). Open face by special order.
- 300 VDC
- Up to 2.5 amps
- Ethernet versions available
- Copper Alloy, Glass Reinforced Epoxy, Neoprene Rubber, Delrin® (DuPont Trademark for Acetal Resin)
- Rubber jacketed cable as standard
- Typical uses; Lights, cameras and ROV's



Please see our HUMMER brochure for more details.



### MINI-CON / Micro MINI-CON

- 17 shell sizes
- Up to 203 contacts including coax (MINI-CON)/up to 26 contacts, no coax (Micro MINI-CON)
- Up to 16,000 psig (approx.36,000ft/10,500m)
- Up to 5,000 VDC (MINI-CON)/300 VDC (Micro MINI-CON)
- Up to 23 amps dependent on cable (MINI-CON)/up to 4 amps (Micro MINI-CON)
- Glass sealed inserts available
- Optics & hybrid available
- Oil filled available
- Ethernet version available
- Stainless Steel, Glass Reinforced Epoxy, Copper Alloy (MINI-CON)
- Titanium, Glass Reinforced Epoxy (Micro MINI-CON)
- Typical uses; Drilling systems, umbilical links & submarines



Please see our MINI-CON / Micro MINI-CON brochure for more details



### MSS (METAL SHELL SERIES)

- 8 shell sizes (G, K, L, M, O, P, Q, S)
- Up to 156 contacts including coax
- Glass sealed inserts available
- Optics & hybrid available
- API (American Petroleum Institute) versions available
- Positive keying
- PBOF available
- Up to 20,000 psig (approx.45,000ft/13,700m)
- Up to 600 VDC standard (higher ratings available)
- Up to 300 amps (dependent on cable)
- Stainless Steel, Glass Reinforced Epoxy, Copper Alloy
- Typical uses; Drilling systems, umbilical links for ROV's & submarines



Please see our MSS brochure for more details.



### GLOBE-CON

- 2 shell sizes (G, K) & currently 3 different contact configurations up to 12#28 contacts
- Up to 12 contacts
- Up to 10,000 psig mated (approx.22,500ft/7,000m)
- 300 VDC
- Up to 2.5 amps
- Wet-mate version available
- Materials suitable for caustic environments
- Stainless Steel, Glass Reinforced Epoxy, Neoprene Rubber, Copper Alloy
- Rubber jacketed cable as standard
- Suitable for use in high vibration applications
- Typical uses; Lights, cameras and ROV's or where size is an issue



Please see our GLOBE-CON brochure for more details.



### MIL-SPEC

- Military specification and design
- Up to 10,000 psig (approx.22,500ft/7,000m)
- Voltage: contact SEACON for details
- Current: contact SEACON for details
- Stainless Steel, MoneI®
- Typical uses; Defense, energy, security, geophysical and telecommunication applications



Please see our SEACON Phoenix brochure for more details.

## ELECTRICAL WET-MATE PRODUCTS

Our electrical wet-mate connectors enable the user to make and break connections both on the surface and underwater. Many of these connectors have been used successfully over the years for a variety of applications including underwater cameras, diver communications and ROV systems.



### ALL-WET

- Round, split and flat configurations
- Up to 42 contact
- Flat **ALL-WET** water blocked version available
- Up to 20,000 psig (approx.45,000ft/13,700m) for round configurations
- Up to 10,000 psig (approx.22,500ft/7,000m) for split & flat configurations
- Up to 600 VDC (with standard cable)
- Up to 50 amps
- Copper Alloy, Neoprene Rubber, Delrin® (DuPont trademark for Acetal Resin)
- SO cable as standard
- Typical uses; Diver communications, UWTV, lights, ROV's

Please see our **ALL-WET** brochure for more details



### SEA-MATE

- Second generation **U-MATE**
- 4 Shell sizes (G, K, L, M)
- Up to 37 contacts
- Oil filled option available
- ROV mateable version available
- Ethernet version available
- Up to 7,500 psig mated & open face (approx.16,900ft/5,200m)
- Up to 600 VDC
- Up to 10 amps/50 amps (for new high power version)
- Stainless Steel, Glass Reinforced Epoxy, Hypalon Rubber, Copper Alloy
- Typical uses; Diver communications, UWTV, lights, ROV's & ship to shore communications

Please see our **SEA-MATE** brochure for more details



### WET-CON

#### Micro WET-CON Micro WET-CON Split

- Round, low profile and split configurations
- Up to 16 contacts
- Water blocked / single pin / metal shell / high power / ethernet options available
- Up to 20,000 psig (approx.45,000ft/13,700m) for **WET-CON**
- Up to 10,000 psig (approx.22,500ft/7,000m) for **Micro** and **Split** versions
- Up to 600 VDC with standard cable
- Up to 19 amps
- Copper Alloy, Neoprene rubber, Delrin® (Dupont trademark for Acetal Resin), SO cable as standard, Rubber jacketed cable as standard for **Micro** and **Split** connectors
- Typical uses; Diver communications, UWTV, lights & ROV's

Please see our **WET-CON / Micro WET-CON / Micro WET-CON Split** brochure for more details



### U-MATE

- Still available but superseded by **SEA-MATE**
- 3 Shell sizes (G, K, L)
- Up to 12 contacts
- Up to 5,000 psig mated (approx.11,250ft/3,500m)
- Up to 600 VDC
- Up to 10 amps
- Positive keying
- Stainless Steel, NES 833 engaging nut as standard
- Typical uses; Diver communications, UWTV, lights, ROV's & ship to shore communications

Please see our **U-MATE** catalogue section via our website for more details - [www.seaconworldwide.com](http://www.seaconworldwide.com)

## OPTICAL HYBRID DRY-MATE PRODUCTS

As fiber optic communication continues to evolve, the **SEACON** Group are able to offer a comprehensive and extensive range of fiber optic products which are designed and manufactured to meet the specific and varied environmental conditions demanded today.



### DRY-MATE FIBER OPTICS

- Single-mode & multi-mode
- Using Standard Connector Ranges:  
**MINI-CON, MSS, OPTI-CON**
- Insertion loss < 1.0dB (or < 0.5dB)
- Up to 20,000 psig (approx.45,000ft/13,700m)
- Glass sealed options available in some connector styles and types
- Typical uses; Sonar & surveillance systems, ROV's/AUV's, BOP monitoring equipment, neutrino detection, stress monitoring, subsea camera systems & downhole applications

Please see our **FIBER OPTIC** brochure for more details



### HP/HT (DOWNHOLE)

- Optical, electrical and hybrid (electro/optic) versions available: 2-channel optical only version  
2-channel electrical only version  
4-channel hybrid (2 electro/2 optic)
- Up to 10,000 psig (approx.22,500ft/7,000m)
- Up to 600 VAC
- Up to 2.5 amps
- Less than 1 inch in diameter
- Field installable termination
- Maximum optical attenuation: 0.3dB
- Maximum optical back reflection: -50dB
- Inconel 625
- Typical uses; High-pressure and high-temperature applications, Downhole & tree/tubing hanger systems

Please see our **HP/HT** Connectors datasheet for more details - **SAPL-DS-0012**



### OPTI-CON

- 5 Shell sizes (F=1 Way, G=4 Way, M=8 Way, Q=12 Way, T=20 Way)
- 1, 4, 8, 12 & 20 channels in any electrical or optical configuration, single or multi-mode
- Single way right angle version available
- Up to 7,500 psig (approx.16,900ft/5,200m) dependent on cable, shell material & configuration
- 600 VDC
- 4 amps
- Oil filled hose as standard with molded unit as a cost option
- Stainless Steel
- Typical uses; Cameras, monitoring equipment, sonars, towed arrays and any applications requiring high data transfer rates

Please see our **OPTI-CON** brochure for more details

## ELECTRICAL UNDERWATER MATEABLE PRODUCTS

SEACON's underwater mateable electrical connectors have features that protect the electrical contacts from the external environment. In addition, pressure compensated fluid-filled chambers allow repeated mates/de-mates underwater without servicing.



### CM2000

- Simple & unique design features combining superior electrical isolation ensuring high connector reliability
- Stab, diver and ROV configurations
- Individual modular pin & socket contacts
- Oil filled & pressure balanced socket contacts
- No single point failures
- Redundant: O-Rings, Seals, Bladders, Bladder closures
- Standard 4, 7 & 12 contacts
- Other configurations up to 19 contacts
- Up to 10,000 psig (approx.22,500ft/7,000m)
- Up to 3.3kVAC
- Up to 100 amps / 250 amps 3.3kVAC versions
- Titanium, 17-4 PH, Nitronic 50, Inconel®. Others available on request.
- Typical uses; Production control, drilling control, ROV, AUV systems, communications & power

Please see our **CM2000** datasheet for more details - SAPL-DS-0061

Please see our **CM2001** datasheet for more details - SAPL-DS-0005

Please see our **CM2000 3.3kVAC** datasheet for more details - SAPL-DS-0014

Please see our **CM2000 3.3kVAC 250 amp** datasheet for more details - SAPL-DS-0063

## OPTICAL UNDERWATER MATEABLE PRODUCTS

Our underwater mateable optical connectors manufactured by SEACON Advanced Products, LLC., of Bellville, Texas, USA include the field proven **HYDRALIGHT** second generation fiber optic connector, the **S-SERIES**, **MICROSTAR** and new **G3** third generation connector suitable for downhole applications.



### HYDRALIGHT

- 2nd generation, field proven, underwater mateable connector
- 8-channel optic only / UPC & APC versions available
- 8-channel hybrid connector (4 electro / 4 optic) & 48 channel
- Up to 10,000 psig (approx.22,500ft/7,000m)
- Oil filled & pressure balanced
- Qualified for 7,000m
- Average single-mode insertion loss better than 0.2dB (0.5dB max)
- Average single mode back reflection of -50dB over mated cycle life (min -30dB)
- Titanium
- Design life of 30 years
- Typical uses; High speed communications, long-distance, production control, pumping systems, sensing systems, Riser and PRM systems

Please see our **HYDRALIGHT** datasheet for more details - SAPL-DS-0001

Please see our **HYDRALIGHT-APC** datasheet for more details - SAPL-DS-0009

Please see our **48 CHANNEL HYDRALIGHT** datasheet for more details - SAPL-DS-0016

Please see our **HYBRALIGHT** datasheet for more details - SAPL-DS-0018

Please see our **PORTABLE OIL-FILLED STATION** datasheet for more details - SAPL-DS-0512



### MICROSTAR

- Vertical tree connector
- 4-channel optic only
- Up to 10,000 psig (approx.22,500ft/7,000m)
- To be qualified for 7,000m
- Insertion loss of better than -0.5dB
- Back reflection of better than -30dB
- Operating temperature -5°C to 121°C (23°F to 250°F)
- Design life of 25 years
- Super Duplex Stainless Steel
- Typical uses; High speed communications, long-distance, production control, space-restricted applications, tree/tubing hanger systems

Please see our **MICROSTAR** datasheet for more details - SAPL-DS-0006



### G3

- 3rd generation connector utilizing **HYDRALIGHT** technology
- Very small form factor, with low loss optical performance
- Matched pairs not required
- Internal pressure compensated
- Suitable for stab, diver and ROV operations
- 6-channel optic (single-mode, multi-mode)
- Up to 15,000 psig (approx.35,000ft/10,000m)
- Operating temperature 150°C (302°F)
- Few internal moving parts
- Simplicity of operation
- Patented 'Joined Chamber' concept
- Stainless Steel, Titanium
- Typical uses; High speed communications & fiber sensing, long-distance, production control, space-restricted applications, tree/tubing hanger systems, DTS, DPS, DAS systems

Please see our **G3** datasheet for more details - SAPL-DS-0013

## OPTICAL & ELECTRICAL PENETRATORS



We manufacture a wide range of penetrators for use in applications in which a waterproof seal needs to be made between a cable and a pressure vessel. This is often accomplished using a connector set, but if there is no requirement to separate the cable from the equipment a penetrator can be used. Typical uses; high speed communications, long-distance, production control.

Please see our **OPTICAL FIBER PENETRATORS** datasheet for more details - SAPL-DS-0008 or see our **PENETRATORS** catalog section via our website - [www.seaconworldwide.com](http://www.seaconworldwide.com)

## FIELD INSTALLABLE PRODUCTS

In recent years the search for oil has required operations in progressively deeper waters by mobile offshore drilling units. Drilling at these depths places strong demands on equipment, particularly the cable and connectors that link subsea operations to the surface. SEACON addressed the equipment problem by developing an underwater connector system with high reliability, improved condition assessment capability and better maintainability. SEACON's next-generation multiplex (MUX) cable termination system is the tangible result of the company's ability to apply real-world operator field experience to its product design and produce a step-change improvement in connector performance.

SEACON's range of MUX systems consist of 1 Atmosphere and Positively Pressurized (RUFF-NEK) connector solutions as well as the new underwater cable termination system which consists of the **ARMOR TERMINATION ASSEMBLY (ATA)**, **BREAKAWAY UNIT** and **RUFF-NEK** connector.

The **RUFF-NEK** connector is an electro/optical/mechanical termination that contains an integral system that does not rely on separate external compensator systems to apply a constant overpressure (internal pressure greater than external pressure) to the end of the cable and termination volume. The overpressure is maintained at 15 pounds per square inch (psi) over ambient pressure and helps to prevent water intrusion into the termination chamber that could be caused by flooding of the conductor strands (in the event of cable jacket and conductor insulation breach) or by seal failure. In the cable termination system the **ATA** is affixed to a clevis mount (padeye) at a convenient location on the BOP (Blow Out Prevention) stack while the **RUFF-NEK** connector mates to either a transformer module, crossover or directly to the subsea electronics module (pod). The orientation aspect that can be a problem with a conventional connector is eliminated due to the breakaway unit that interfaces the **ATA** with the BOP, enabling a connection in 90-degree intervals.

There are many benefits to the cable termination system including a lighter, more manageable connector, separate armor termination function from electrical connector function and a controlled breakaway function.

Every seal is redundant (e.g., dual versus single o-ring) for maximum reliability, and everywhere possible, the seals are testable to enable verification of seal integrity off the critical path. The **RUFF-NEK** connector provides visual verification of correct pressure over ambient. It also includes the ability to electrically check for fluid contamination without opening the connector.

**ARMOR TERMINATION ASSEMBLY (ATA)**  
Please see our **ATA** datasheet for more details - SAPL-DS-0107.

**BREAKAWAY UNIT**  
Please see our **BREAKAWAY UNIT** datasheet for more details - SAPL-DS-0106.

**MSSQ RUFF-NEK**  
Please see our **MSSQ RUFF-NEK** datasheet for more details - SAPL-DS-0111.

**SBP SERIES FIELD INSTALLABLE & TESTABLE ASSEMBLY (FITA)**  
Please see our **SBP SERIES FITA** datasheet for more details - SAPL-DS-0113.

**FIELD INSTALLABLE & TESTABLE ASSEMBLY (FITA)**  
Please see our **FITA** datasheet for more details - SAPL-DS-0108.

**SUBSEA UMBILICAL TERMINATION ASSEMBLY (SUTA)**  
Please see our **SUTA** datasheet for more details - SAPL-DS-0112.

**RIGHT ANGLE FLANGED CONNECTOR RECEPTACLE (FCR)**  
Please see our **RA-FCR** datasheet for more details - SAPL-DS-0109.

**MSSQ FLANGED CONNECTOR RECEPTACLE (FCR)**  
Please see our **MSSQ FCR** datasheet for more details - SAPL-DS-0110.

**ATA FITA Termination System**

## DOWNHOLE PRODUCTS

Our range of products for downhole applications include the **HP/HT** connector available in either electrical, optical or hybrid versions and recently developed **G3** 3rd Generation 6-channel optic which combines the strength of the **HYDRALIGHT** design with the latest technology from the telecommunications industry. For further information please see our **DOWNHOLE** catalog section via our website - [www.seaconworldwide.com](http://www.seaconworldwide.com) or see the individual datasheets below;

### G3



- 3rd generation connector utilizing **HYDRALIGHT** technology
- Very small form factor, with low loss optical performance
- Matched pairs not required
- Internal pressure compensated
- Suitable for stab, diver and ROV operations
- 6-channel optic (single-mode, multi-mode)
- Up to 15,000 psig (approx.35,000ft/10,000m)
- Operating temperature 150°C (302°F)
- Few internal moving parts
- Simplicity of operation
- Patented 'Joined Chamber' concept
- Stainless Steel, Titanium
- Typical uses; High speed communications & fiber sensing, long-distance, production control, space-restricted applications, tree/tubing hanger systems, DTS, DPS, DAS systems

Please see our **G3** datasheet for more details - SAPL-DS-0013

### HP/HT (DOWNHOLE)



- Optical, electrical and hybrid (electro/optic) versions available: 2-channel optical only version  
2-channel electrical only version  
4-channel hybrid (2 electro/2 optic)
- Up to 10,000 psig (approx.22,500ft/7,000m)
- Up to 600 VAC
- Up to 2.5 amps
- Less than 1 inch in diameter
- Field installable termination
- Maximum optical attenuation: 0.3dB
- Maximum optical back reflection: -50dB
- Inconel 625
- Typical uses; High-pressure and high-temperature applications, Downhole & tree/tubing hanger systems

Please see our **HP/HT** Connectors datasheet for more details - SAPL-DS-0012

### CM2001



- High integrity, single pin, electrical connector
- Less than 1 inch diameter
- Up to 10,000 psig (approx.22,500ft/7,000m)
- 1,000 VAC
- Up to 10 amps
- Rated to 7,000m
- Oil filled, molded cable, customer specific terminations
- Extensive qualification testing data available
- Titanium, 17-4 PH, Nitronic® 50, others available upon request
- Typical uses; Production control systems, communications, space-restricted applications, Downhole & XT's

Please see our **CM2001** datasheet for more details - SAPL-DS-0005

### MICROSTAR



- Vertical tree connector
- 4-channel optic only
- Up to 10,000 psig (approx.22,500ft/7,000m)
- To be qualified for 7,000m
- Insertion loss of better than -0.5dB
- Back reflection of better than -30dB
- Operating temperature -5°C to 121°C (23°F to 250°F)
- Design life of 25 years
- Super Duplex Stainless Steel
- Typical uses; High speed communications, long-distance, production control, space-restricted applications, tree/tubing hanger systems

Please see our **MICROSTAR** datasheet for more details - SAPL-DS-0006

### 4 CHANNEL DRY-MATE FIBER OPTIC CONNECTOR



- Small compact connector
- 4-channel optic
- Up to 10,000 psig (approx.22,500ft/7,000m)
- Single-mode or multi-mode fiber accommodated
- Dual "O" seals
- PBOF available
- Field installable (in certain environments)
- Operating temperature -20° to 150°C (-4°F to 300°F)
- Titanium or 17-4 PH. Others available to suit different specification/compatibility requirements
- Typical uses; Downhole applications

Please see our **4 Channel Dry-Mate Fiber Optic Connector** datasheet for more details - SCE-DS-0001

### VITON®



- High temperature, small diameter and weight
- 8 electrical contacts
- Up to 20,000 psi (approx.45,000ft/13,700m)
- 600 VDC
- 2.5 amps
- Harsh environment compatible
- Positive external grip for disconnection
- Field installable free halves
- Wet mateable
- Operating temperature +200°C (392°F)
- Body material; DuPont VITON®
- Typical uses; Downhole applications

Please see our **VITON®** datasheet for more details - SCE-DS-0009

## ETHERNET PRODUCTS



With ever increasing inquiries for connectors to be used for Ethernet applications and our continuous program of specifying suitable connectors from our standard range for use on these systems, **SEACON** has identified a number of standard connector ranges suitable for Ethernet use. These include;

- **HUMMER:** Dry-mate, up to 1Gbps, up to 100m cable length, 10,000 psi/690 bar
- **Micro WET-CON:** Wet-mate, up to 1Gbps, up to 100m cable length, 10,000 psi/690 bar
- **MINI-CON:** Dry-mate, up to 1Gbps, up to 90m cable length, 16,000 psi/1,200 bar
- **CS-MS:** Dry-mate, up to 1Gbps, up to 50m cable length, 7,000 psi/480 bar
- **55 SERIES:** Dry-mate, up to 1Gbps, up to 80m cable length, 10,000 psi/690 bar
- **SEA-MATE:** Wet-mate, up to 1Gbps, 10,000 psi/690 bar

The initial examination consisted of mating pairs of each connector range and testing against the requirements for the various Ethernet communications standards with a Validator NT955 high speed certifier. Following these tests, the cable/connector assemblies were subjected to pressure testing and certified under pressure. The above tests are for the first products qualified. Additional testing is on-going on a variety of **SEACON** products for Ethernet use. Please see our **ETHERNET** news bulletin for more details via our website - [www.seaconworldwide.com](http://www.seaconworldwide.com)

## SPECIALTY PRODUCTS

The SEACON Group has produced many specialty products for customers over the years. These include the VITON® connector developed for a high temperature and high pressure application, cable protection products such as the Universal Joint Bend Restrictor and a range of fiber optics. For further information please see our **SPECIALTY PRODUCTS** catalog section via our website - [www.seaconworldwide.com](http://www.seaconworldwide.com) or see the individual datasheets below;

### SUTA (SUBSEA UMBILICAL TERMINATION ASSEMBLY)

- Integral Fiber Management System
- High Pressure Fiber Optic Feed through Penetrations
- Dual cone, mechanical armor plug
- Overall boot sealed
- Depth rating: Full Ocean Depth
- Oil filled & pressure compensated
- Compatible with embedded & non-embedded MUX cables
- Field installable (no compounds)
- Options for multiple cable entry/multiple connections

Please see our **SUTA** datasheet for more details - SAPL-DS-0112

### 75 OHM COAX

- Design based around SEACON's MINL-CCP shell size
- Bulkhead has a MINL front end interface with a SEACON 5515-FCR mounting interface
- CCP insert manufactured from molded PEEK with a Stainless Steel shell
- FCR has a glass-to-metal seal insert
- Also available with the bulkhead having the standard MINL mounting interface
- Up to 8,400 psig (approx. 19,000ft/5,900m)
- Up to 3-4 amps
- Suitable for a variety of applications

Please see our **75 OHM COAX** datasheet for more details - SCE-DS-0013

### SUBSEA JUMPER ASSEMBLY & DISTRIBUTION HARNESS

- Fiber management
- Good cable flexibility (typical 5" bend radius)
- Deployment techniques similar to jacketed cable
- Good ROV maneuverability during connector mating
- Easy interface to connector
- Early leak detection; some hoses are designed for over-pressure & may be used to offer visible leak paths
- Double barrier against water ingress
- Temperature & pressure compensated
- Size 8mm, 13mm & 20mm ID (Other sizes available upon request)
- Multi-mode & single-mode available
- Typical uses; Ocean science observatories, towed arrays, drilling systems, production control systems and ROV's

Please see our **SUBSEA JUMPER AND DISTRIBUTION HARNESS** datasheet for more details - SAPL-DS-0117

### UNIVERSAL JOINT BEND RESTRICTOR

- Utilizes a universal joint design that allows cable bending through restricted space areas whilst still providing an adequate level of strain relief & bend restriction
- Suitable for MSS, MINI-CON & Micro MINI-CON
- Operating Tensile Load: 267 kN (60,000 lbf)
- Dynamic Cyclic Bend Load: 50 kN (11,000 lbf)
- Depth Rating: 1,500m (5,000 feet)
- Typical uses; Deepwater applications, small bore modular arrays

Please see our **UNIVERSAL JOINT BEND RESTRICTOR** datasheet for more details - SEACON-DS-0001

## UNDERWATER SWITCH PRODUCTS

Our variety of versatile and robust switches include Limit, Positive Action and Proximity which are available in a range of materials including Titanium, Plastic and Stainless Steel. In addition we also offer a Modular Proximity Switch that has been integrated with the Micro WET-CON electrical wet-mate connector. Typical uses; position and limit indication, Hall effect, diver communications, dead-switches, communications. For further information please see our **SWITCHES** catalog section via our website - [www.seaconworldwide.com](http://www.seaconworldwide.com) or see the individual datasheets below;

### LIMIT & PLASTIC LIMIT

- Hermetically sealed
- Up to 6,000 psig (approx. 13,840ft/4,200m)
- Rated for > 50,000 cycles
- Load capacities; 1 & 7 amps
- Single pole, double throw
- Plastic Limit switch; Black Acetal (Delrin® - Dupont trademark for Acetal Resin) construction
- Stainless Steel or Titanium
- Non-metal options available

Please see our Limit Switches datasheet for more details - SAPL-DS-0020

Please see our Plastic Limit Switches datasheet for more details - SAPL-DS-0021

### POSITIVE ACTION

- Hermetically sealed
- Up to 6,000 psig (approx. 13,840ft/4,200m)
- Rated for > 50,000 cycles
- Load capacities; 1 & 7 amps
- Single pole, double throw
- Stainless Steel or Titanium

Please see our Positive Action Switches datasheet for more details - SAPL-DS-0022

### PROXIMITY & MODULAR PROXIMITY

- Hermetically sealed
- No o-rings or gaskets
- Up to 6,000 psig (approx. 13,840ft/4,200m)
- Rated for > 50,000 cycles
- Load capacities; 1 & 7 amps
- Standard proximity and hall effect
- Proximity switch meets NAVSEA requirements for part number 5162424-101-11
- Magnet retainer meets NAVSEA requirements for part number 5062424-102-11
- Stainless Steel or Titanium

Please see our Proximity Switches datasheet for more details - SAPL-DS-0023

Please see our Modular Proximity Switches datasheet for more details - SAPL-DS-0024

New switch products now available including Proximity Micro Switch, Bulkhead/Panel Mount Reed Sensor Products & Hall Effect Sensors.

Please see our New Switches Products news bulletin for more details via our website - [www.seaconworldwide.com](http://www.seaconworldwide.com)

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