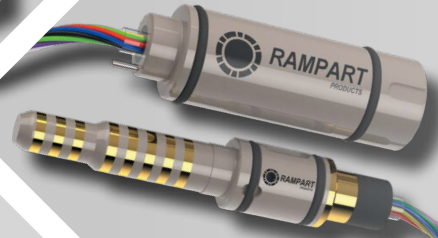




HERMETIC AND RUGGEDIZED INTERCONNECTS

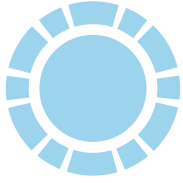


MADE IN USA



CUSTOM IS OUR STANDARD

rampartproducts.com



CONTENTS

Applications

Rampart Products provides hermetic & ruggedized interconnect systems and components to many industries including Under Water, Mil/Aero, Oil & Gas, Space, Medical, Pipeline Inspection & Nuclear.

By leveraging an engineering-centric staff from multiple disciplines, Rampart Products is always thinking about better ways to design, manufacture, and perform. The culture of “change for the better” at Rampart translates to the best products with **competitive pricing and shorter lead times**. We are committed to providing the best solution to help lead our valued customer’s success.

Under Water

Oil & Gas

Mil/Aero

Medical

Space



Products

Custom is our standard. More than 90% of our assemblies are custom engineered for only one user. The common element in our product line is extreme ruggedness.

07 - RP5 Under Water Series: Dry Mate - BCR - FCR - CCP - CCR - PBOF - Caps

20 - Mated Hermetic Inserts

22 - Contacts

26 - Custom Interconnects

28 - HPHT Hermetic: Booted Single Pin - Rotary Fit - Multi-Pin KTK - Multi-Pin Cup X Cup

ABOUT RAMPART PRODUCTS

Manufacturer - Made in USA

Rampart Products, founded in 2016, is a vertically integrated manufacturer that has experienced rapid growth due to our combination of cutting-edge technology and the highest level of customer satisfaction. In 2023, we acquired, fully refurbished, and relocated to a 42k square foot facility in the heart of Houston, Texas, USA to allow us to increase our output 5X! We still house all our corporate departments in the same facility to ensure strong collaboration between engineering, manufacturing and sales.

Distributors

Rampart has many partners worldwide with varying areas of expertise to assist with the process of sourcing our specialty products:



Global



Canada



AR | LA | OK | TX



China



China



United Kingdom



Germany & Norway



Singapore

Certifications

Rampart Products is fully certified to both AS9100 and ISO9001. We carry a US Cage Code as authorized suppliers to US defense agencies. Our QMS is a robust fully digital system.



Registrant Code: M49942

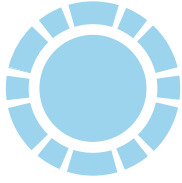


Certificate #AS0174



JCP Certification #0088796

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COMPARISON OF HERMETICALLY SEALED CONNECTOR TECHNOLOGIES

Three primary methods exist to create a hermetically sealed electrical connector: Glass to Metal, Molded Epoxy, and Molded PEEK. Each method has distinct **advantages and disadvantages**.

Glass-to-Metal (GTM)

There are two GTM methods with one superior at extreme temperatures and the other superior for higher pressures. Both seals are short, and the glass is brittle, so the seal is prone to failure from minor impacts on the end of the conductors such as during maintenance.

A matched thermal expansion method requires the housing, glass seal and conductor to have near equal coefficients of thermal expansion (CTE). A matched thermal expansion GTM is superior sealing at temperatures exceeding 400 °F but is limited to low conductivity materials for conductors.

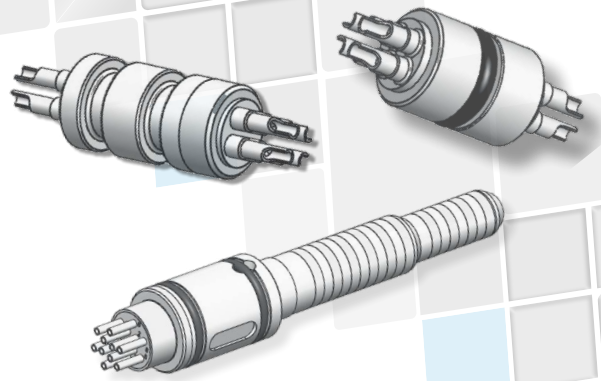
The compression seal method requires the housing to have a higher CTE thus compressing the glass onto the conductor after firing. The compression seal GTM is superior for sealing at pressures to 35,000 psi but is still limited to low conductivity materials for the conductors.

Epoxy

Epoxy seals are made in open cavity molds (aka potting) or in closed molds with injection molding. For low pressure applications epoxy with low amounts of filler and open molds are used. For high pressure applications epoxies filled with short glass fibers and closed molds are used. Both methods provide for a long seal and the epoxy is at least 2X more ductile than glass, so they are less prone to impact failures.

The open mold method allows for sealing odd shapes, requires low investment in manufacturing tooling but is costly due to the high amount of labor and slow cure time of the material. However, the main concern is the seal is very unreliable due to the absence of cavity pressure during molding.

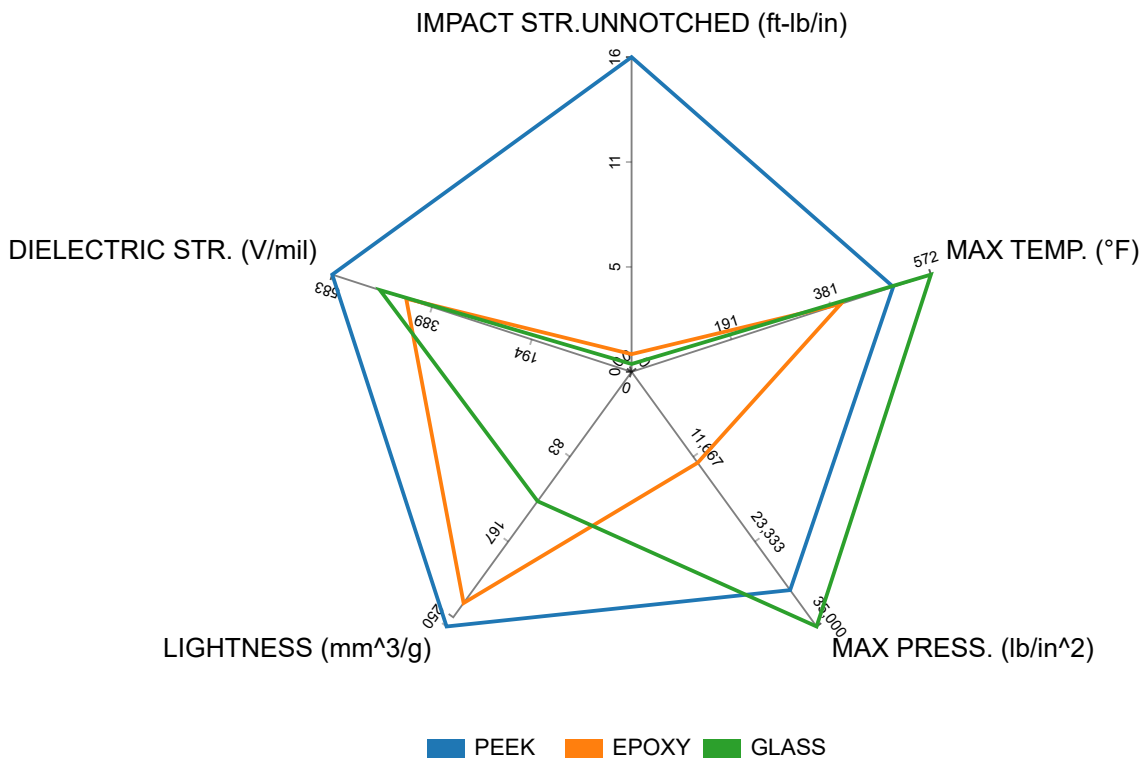
The closed mold method is always combined with glass reinforced epoxy (GRE) and requires more manufacturing tooling investment but a lower labor level and faster cure time. The seal is quite reliable, but the insulating body is still brittle and subject to damage during maintenance.

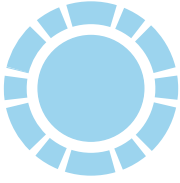


PEEK

PEEK is the new kid on the block, first used for a hermetic connector in the 1990's. Always made in expensive molds with high pressure injection so they are not low cost. PEEK, and PEK, a higher temperature variant, are 20-40X more impact resistant than epoxies and glasses. This impact resistance, and a long seal length provides the absolute most reliable and durable seal.

PEEK connectors are not limited to low conductivity conductors. A final trait of PEEK connectors, due to the material strength being near 300 series stainless steel or 6061-T6 aluminum, is mounting features can often be integrated into the insulator body thus providing a featherweight but super rugged electrical interconnect.





CAPABILITY STATEMENT



Rampart Products manufactures Hermetic and Ruggedized Electrical Interconnects for commercial and government applications. An agile, certified small business with an engineering-centric staff, Rampart quickly responds to marketplace demands. We consistently outperform our competitors' lead times, which translates to customer success and lower costs.

When considering total life cycle cost or if failure is not an option, know that Rampart is singularly focused on delivering the highest quality products. Our streamlined processes and a fully digital QMS are the cornerstone of our success.

What Sets Rampart Products Apart From the Competition?

- All products 100% made in the USA
- Certified Small Business
- Competitive pricing
- Customer has unprecedented access to a responsive engineering staff
- Shorter lead times and 90%+ on-time delivery even though large amount of our sales are development projects

Hermetic & High-Pressure Sealing

Rampart delivers a hermetic “airtight” seal that is helium leak rate tested and qualified to 10-8 cc/sec and liquid pressure tested up to 30,000 psi. This is accomplished by precise mold designs, PEEK material processing expertise and a staff with many years of experience and knowledge.

Harsh Environment Survivability

Rampart Products' founders have over 100 years' experience designing and manufacturing products used in oil/gas drilling applications. The combination of high temperature, high pressure, high shock and vibration (up to **500°F, 30,000 psi, 2000 G's**) – makes it one of the toughest environments known.

This experience allows Rampart to cross over into other applications and use our knowledge to diversify our customer base and product lines.

One example is our entry into Subsea interconnect systems that compete directly yet outperform the industry standard product.

Core Capabilities

Our staff are experts at mold design, molding processes, and precision machining, allowing us to deliver connectors which require:

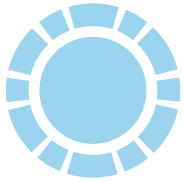
- Hermetic & High-Pressure Sealing
- Harsh Environment Survivability



UNDER WATER - RP5 SERIES

Rampart Products' RP5 Series is the **most rugged high pressure under-water connector** system available. Most variants are available from stock.





UNDER WATER RP5 SERIES - DRY MATE

Under water connectors with standard 15,000 psi pressure rating (open faced, closed faced and PBOF), redundant sealing, super rugged PEEK insulators & **reliable delivery dates**.

Injection Molded PEEK is the most rugged electrical insulator technology available; easily outperforming glass to metal seals or glass reinforced epoxy (GRE). This prevents electrical shorts due to cracked glass seals or chipped glass reinforced epoxy insulators.

The connectors can be sold in kit form, or as factory terminated assemblies.

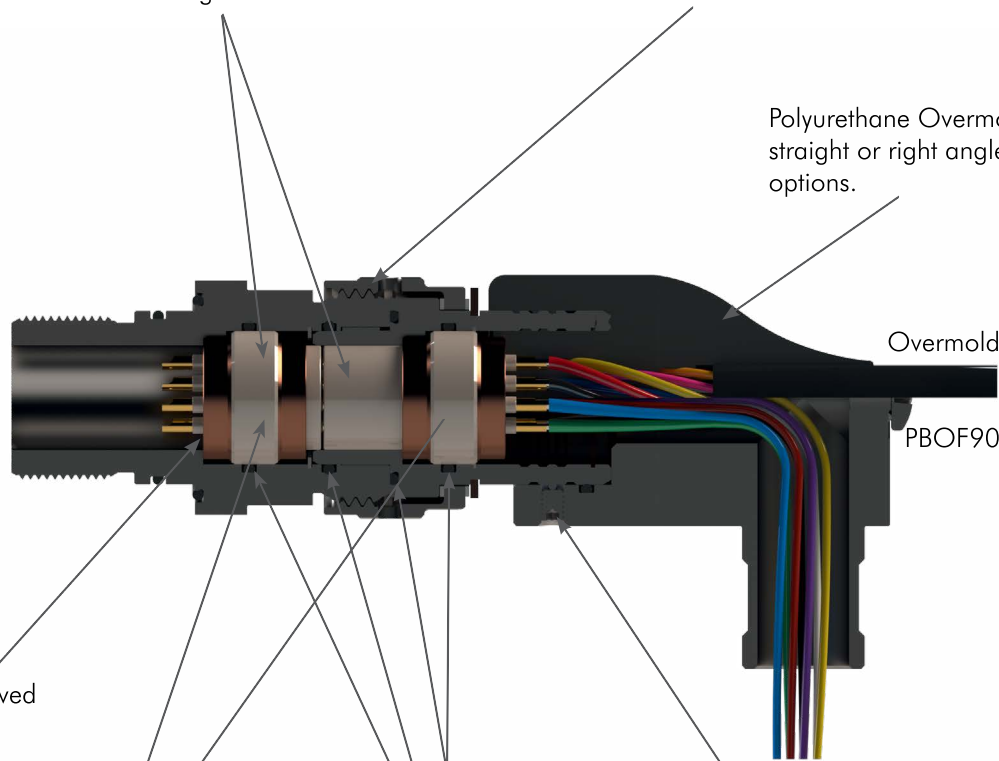
PEEK Inserts provide standard **15,000 psi open-face pressure** rating & ruggedness beyond glass seal or GRE technologies.

Visual full-mate indicator window

Polyurethane Overmold, straight or right angle options.

Overmold Option

PBOF90 Option



Bosses provide improved DWV/IR & easier harnessing.

Reversible inserts

Redundant Dry-Mate sealing

Rapid attach PBOF adjusts for any angle.

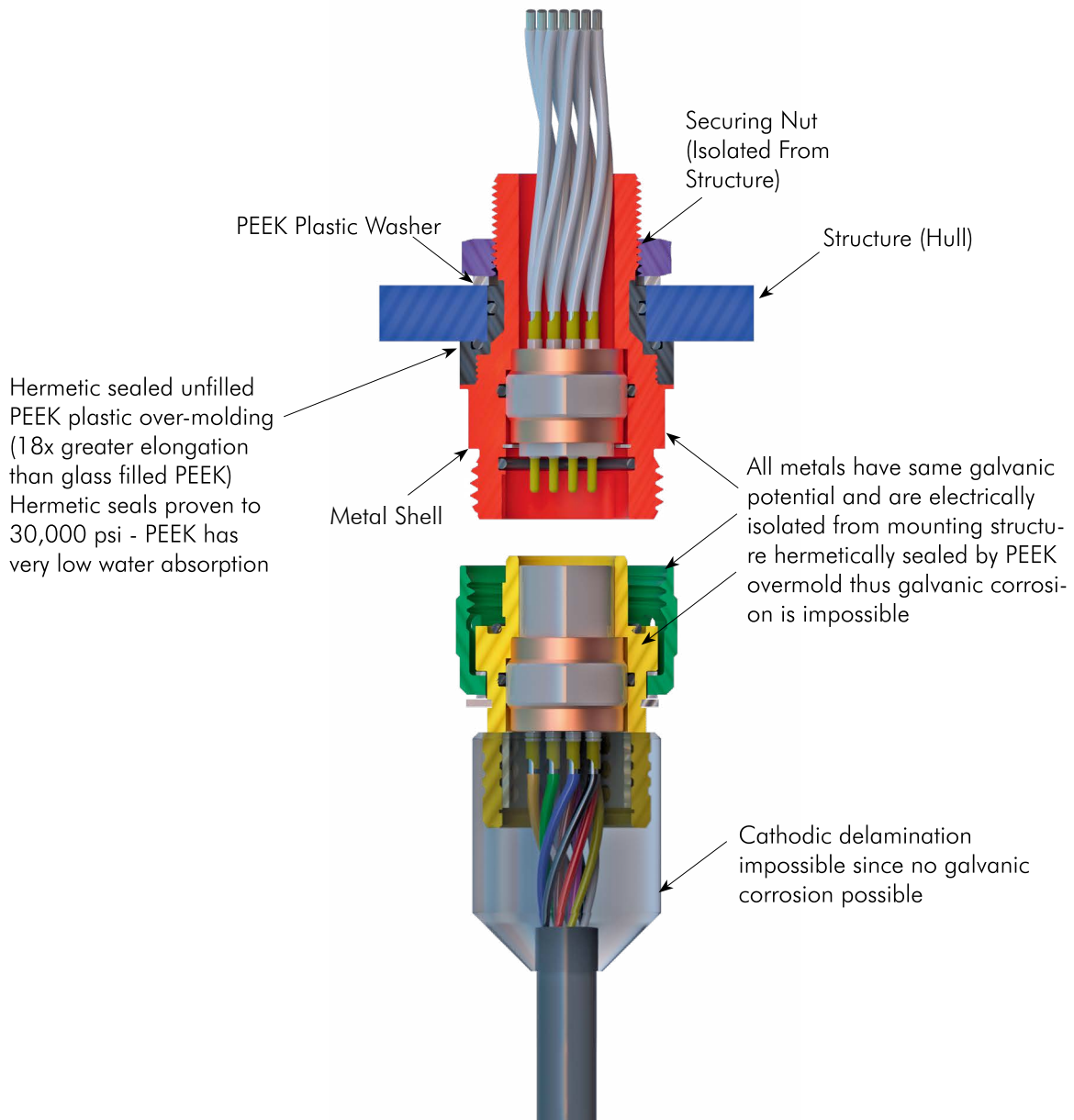


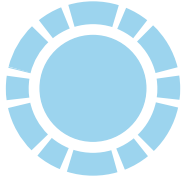
KAHUNA

CORROSION PROOF UNDERWATER CONNECTOR SYSTEM

100% ELIMINATES CATHODIC DELAMINATION

RP5 KAHUNA - DRY-MATE

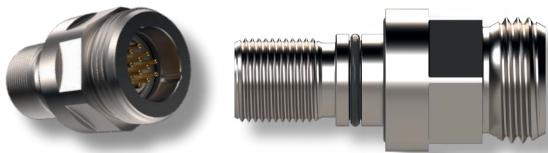




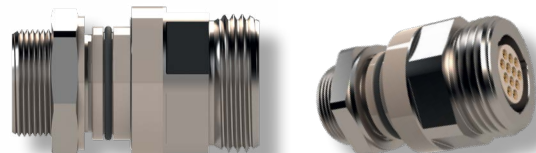
UNDER WATER RP5 SERIES - DRY MATE

Rampart Products Under Water connectors are **available in all common shell types as well as custom solutions.**

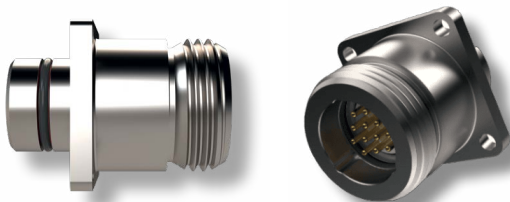
BCR - Bulkhead Connector, Receptacle



BCR - Kahuna - To eliminate cathodic delamination



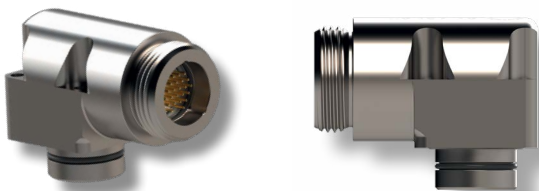
FCR - Flange Connector, Receptacle



FCR - Kahuna - To eliminate cathodic delamination



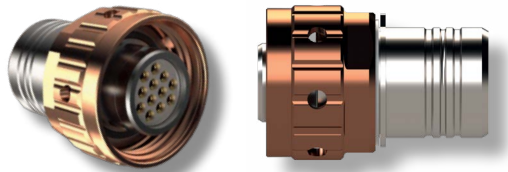
FCR90 - Flange Connector, Receptacle
Low Profile, 90 degrees



CCR - Cable Connector, Receptacle



CCP - Cable Connector, Plug



CCP - Kahuna - To eliminate cathodic delamination



PBOF - Pressure balanced oil filled, use with CCP and CCR.



PBOF90 - Pressure balanced oil filled, use with CCP and CCR



CAPS - SPLASH AND PRESSURE PROOF

Plug Protector Splash Proof



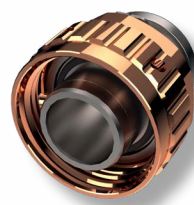
Plug Protector High Pressure



Receptacle Protector Splash Proof

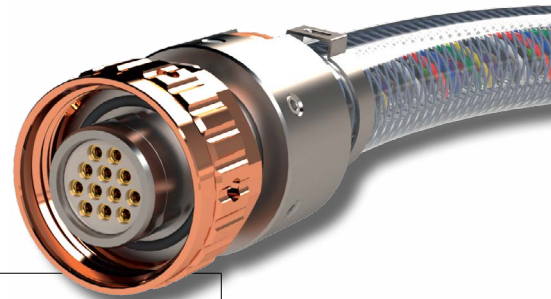


Receptacle Protector High Pressure





UNDER WATER RP5 SERIES - DRY MATE



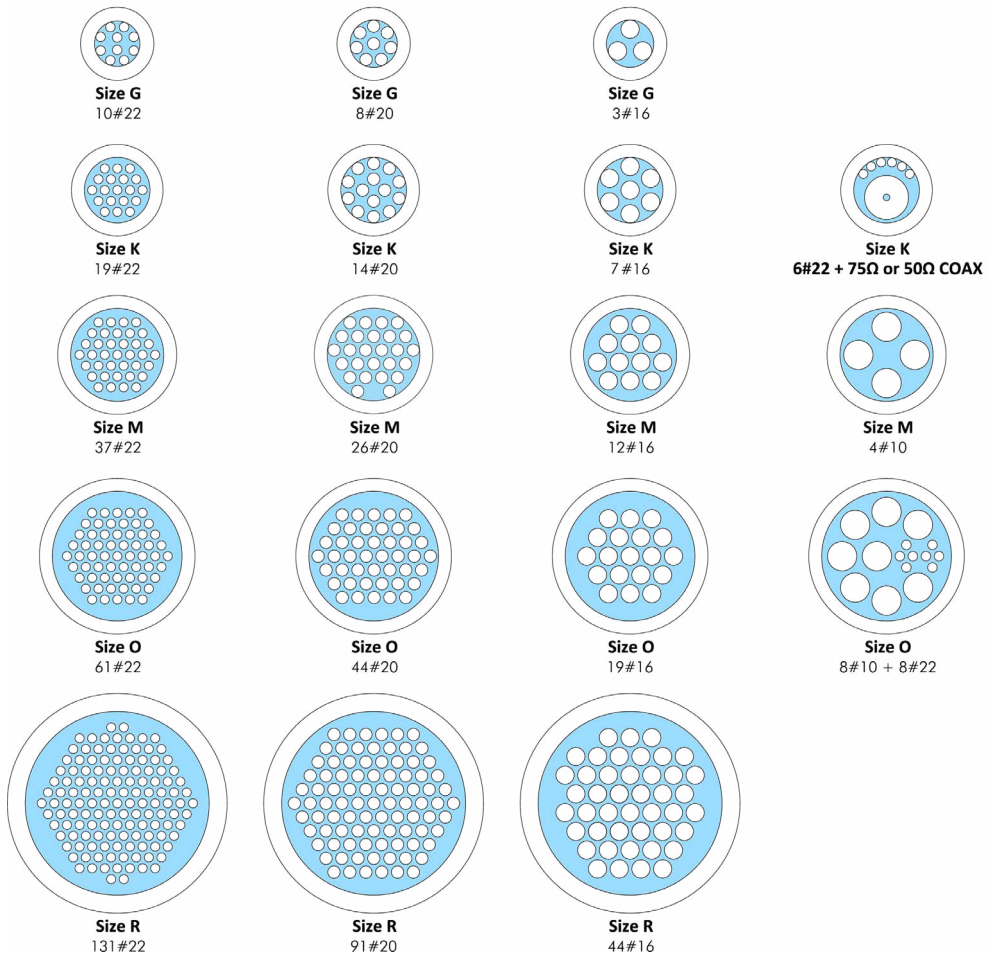
RP5 MATERIALS	
Shells	STD: 316 Stainless Steel - Passivated
	OPT: Titanium (other materials available upon request)
CCP Nut	STD: C630 Bronze
	Non-mag use: Inquire
Insert Body	PEEK
Support Disk	Copper Alloy
Electrical Contacts	Gold Plated Copper Alloy
Retaining Rings	
PBOF Locking Screws & Ring	316 Stainless Steel
CCP Nut Washers	Acetal
O-ring Seals	NBR 90A Durometer

RP5 PERFORMANCE SPECIFICATIONS	
Pressure	15,000 psi Open Faced, Closed Face and PBOF
Temperature	STD: -30°F to 350°F*
Voltage	STD: 600 VDC *
Amperage	#22: 7 Amps
	#20: 11 Amps
	#16: 22 Amps
	#10: 42 Amps
Insulation Resistance	5 GΩ @ 1000 VDC @ ambient

* Higher temperature and higher voltage available upon request, above 250°F an alternate FKM o-ring must be used.

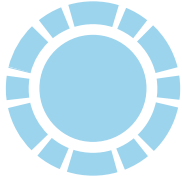
STANDARD INSERT CONFIGURATIONS

Standard insert configurations are **rapidly available and at low cost**. Custom configurations available. View shown is front of male.



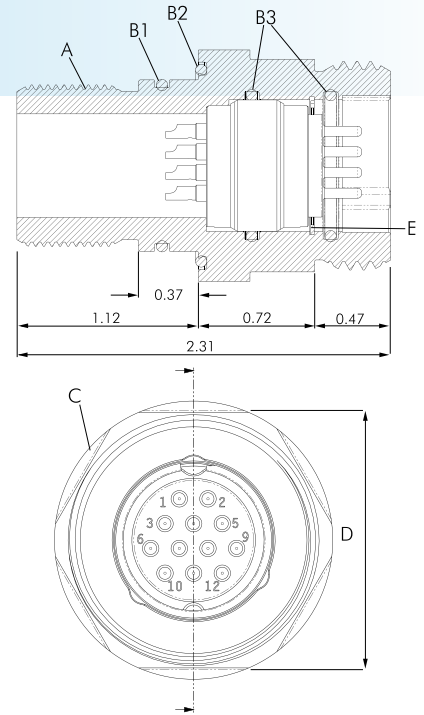
Rampart UWC - How to Order RP5BCR-K6#22-MSAX										
Sample Part number		RP5	BCR	-K	6#22	-M	S	A	X	
Series	RP5 (Metal Shell)									
Connector Style	FCR, FCR90, BCR, CCP, CCR									
Shell Size	G, K, M, O, R									
Contact Arrangement	See contact arrangement standard options in catalog.									
Contact Style	M = Male (Pins), F = Female (Sockets)									
Shell Material	S = 316 Stainless Steel, T = Titanium									
Key Position	A = Standard, B, C									
Standard:	NO OPTION									

Items quoted separately: BCR Nut and Washer; Cable and Overmold (CCP & CCR); Receptacle flying leads.



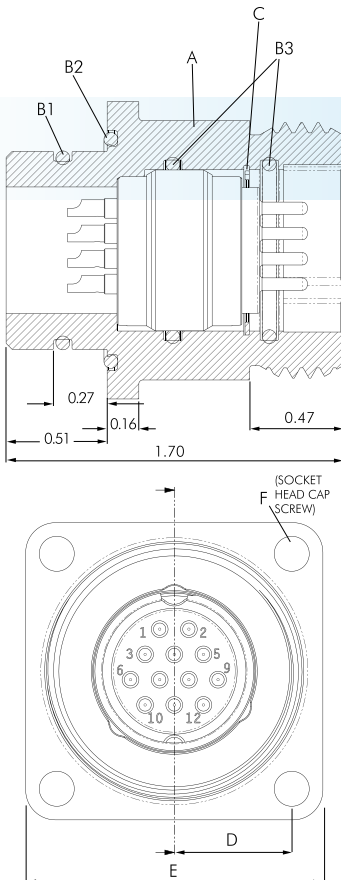
COMPONENTS / DIMENSIONS (INCHES)

UNDER WATER RP5 SERIES - BCR Bulkhead Connector, Receptacle



BCR COMPONENTS / DIMENSIONS (INCHES)

SIZE	A BULKHEAD THREAD (CL 2)	B1 EXTERNAL O-RING (RADIAL SEAL)	B2 EXTERNAL O-RING (FACE SEAL)	2X B3 INTERNAL O-RINGS	ϕ C	D (HEX FLATS)	E RETAINING RING
G	5/8 - 24 UNEF	2-015	2-019	2-014	1.06	0.938	VH-50
K	3/4 - 20 UNEF	2-017	2-020	2-016	1.18	1.063	VH-62
M	1 - 20 UNEF	2-021	2-024	2-019	1.43	1.313	VH-81
O	1 1/8 - 16 UN	2-023	2-027	2-023	1.68	1.563	VH-106
R	1 1/2 - 16 UN	2-029	2-031	2-029	2.06	1.938	VH-150

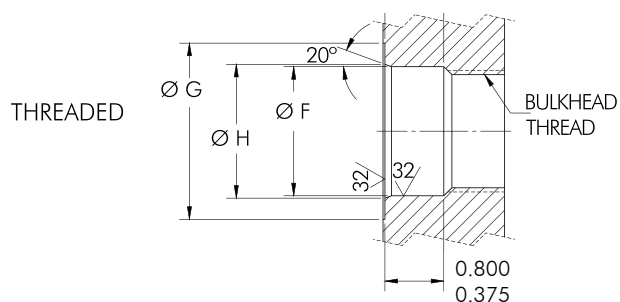
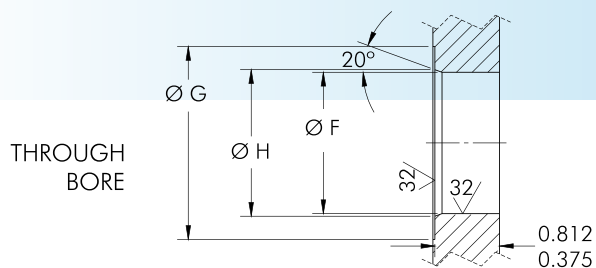


UNDER WATER RP5 SERIES - FCR Flange Connector, Receptacle

FCR COMPONENTS / DIMENSIONS (INCHES)

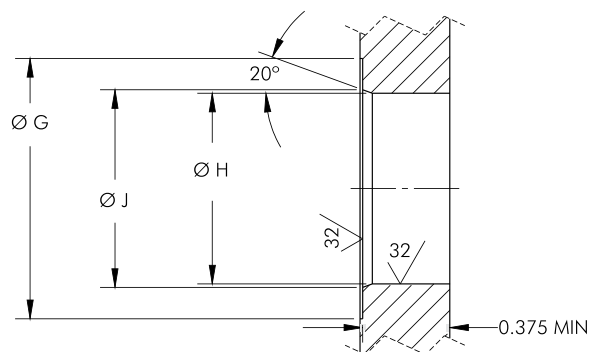
SIZE	ϕ A	B1 EXTERNAL O-RING (RADIAL SEAL)	B2 EXTERNAL O-RING (FACE SEAL)	2X B3 INTERNAL O-RINGS	C RETAINING RING	D	E SQUARE	4X ϕ F FITS SOCKET HEAD CAP SCREW
G	0.933	2-015	2-019	2-014	VH-50	0.453	1.12	4-40 UNC
K	1.058	2-016	2-020	2-016	VH-62	0.510	1.25	6-32 UNC
M	1.308	2-020	2-023	2-019	VH-81	0.593	1.50	8-32 UNC
O	1.558	2-022	2-026	2-023	VH-106	0.723	1.75	8-32 UNC
R	1.933	2-028	2-030	2-029	VH-150	0.884	2.12	10-24 UNC

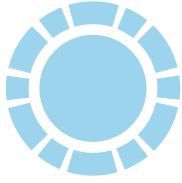
MOUNTING DIMENSIONS (INCHES)



BCR MOUNTING DIMENSIONS				
Nut / washer available for through bore mount.				
SIZE	ØF +002 -000	ØG MIN SPOTFACE	ØH +/- 0.01	MOUNTING TORQUE (UNLUBRICATED) FT-LB +/- 10%
G	0.687	1.08	0.737	30
K	0.812	1.20	0.862	35
M	1.062	1.45	1.112	35
O	1.187	1.70	1.237	50
R	1.625	2.08	1.675	60

FCR MOUNTING DIMENSIONS				
SIZE	ØG MIN SPOTFACE		ØH +002 -000	ØJ +/- 0.01
	DEPTH <0.001	DEPTH >0.001		
G	1.00	1.56	0.687	0.737
K	1.12	1.75	0.750	0.800
M	1.31	2.12	1.000	1.050
O	1.50	2.44	1.125	1.175
R	1.87	3.00	1.500	1.550

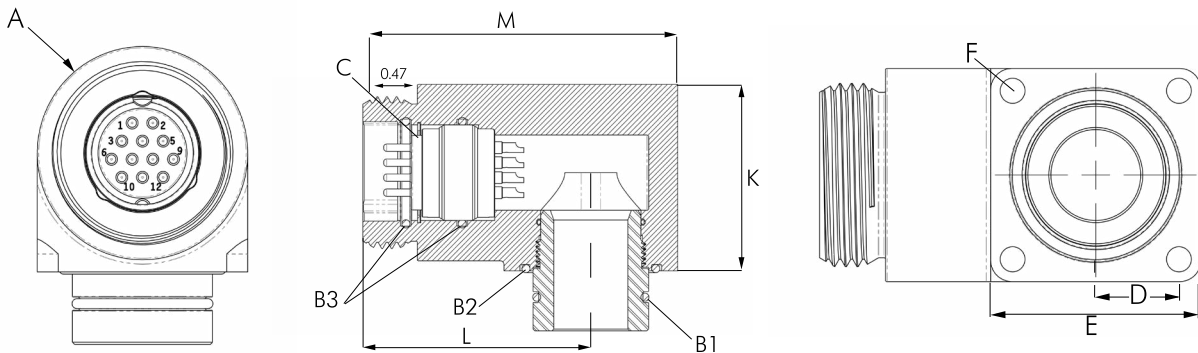




COMPONENTS / DIMENSIONS (INCHES)

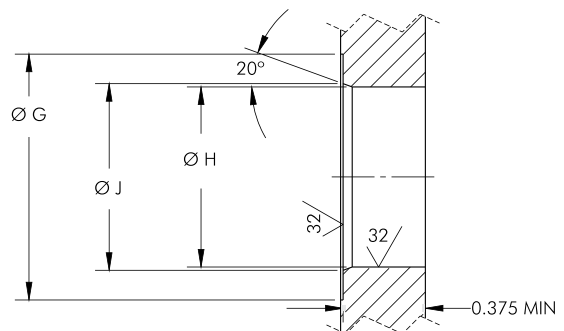
UNDER WATER RP5 SERIES - FCR90

Flange Connector, Receptacle - Right Angle, Low Profile



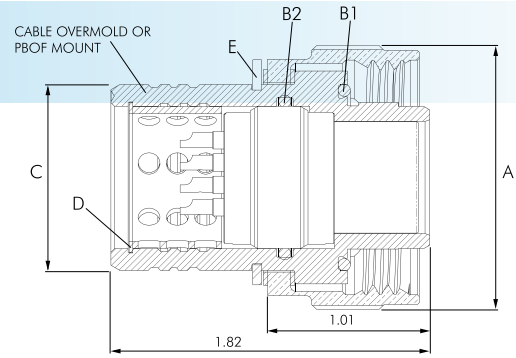
FCR COMPONENTS / DIMENSIONS (INCHES)											
SIZE	ϕA	B1 EXTERNAL O-RING (RADIAL SEAL)	B2 EXTERNAL O-RING (FACE SEAL)	2X B3 INTERNAL O-RINGS	C RETAINING RING	D	E SQUARE	4X ϕF FITS SOCKET HEAD CAP SCREW	K	L	M
G	1.120	2-015	2-019	2-014	VH-50	0.453	1.12	4-40 UNC	1.395	1.845	2.405
K	1.250	2-016	2-020	2-016	VH-62	0.510	1.25	6-32 UNC	1.460	1.845	2.47
M	1.500	2-020	2-023	2-019	VH-81	0.593	1.50	8-32 UNC	1.585	1.969	2.719
O	1.750	2-022	2-026	2-023	VH-106	0.723	1.75	8-32 UNC	1.710	2.032	2.907
R	2.120	2-028	2-030	2-029	VH-150	0.884	2.12	10-24 UNC	1.895	2.219	3.339

MOUNTING DIMENSIONS				
SIZE	ϕG MIN SPOTFACE		ϕH +002 - 000	ϕJ +/- 0.01
	DEPTH <0.001	DEPTH >0.001		
G	1.00	1.56	0.687	0.737
K	1.12	1.75	0.750	0.800
M	1.31	2.12	1.000	1.050
O	1.50	2.44	1.125	1.175
R	1.87	3.00	1.500	1.550



UNDER WATER RP5 SERIES - CCP

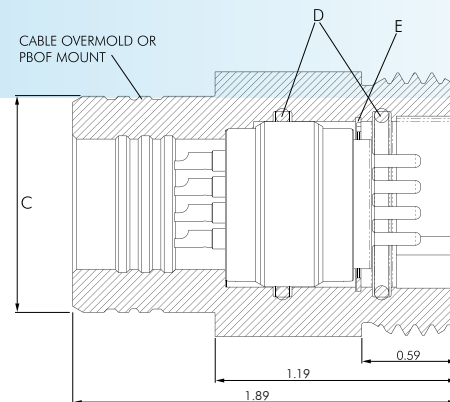
Cable Connector, Plug



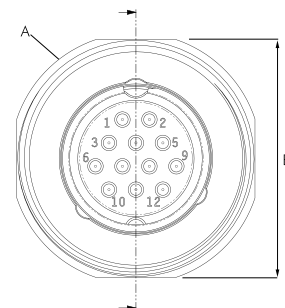
CCP COMPONENTS / DIMENSIONS (INCHES)						
SIZE	ϕA	B1 INTERNAL O-RING (FACE SEAL)	B2 INTERNAL O-RING (RADIAL SEAL)	ϕC	D RETAINING RING	E RETAINING RING
G	1.15	2-016	2-014	0.750	VH-50	RSSE-075-CSOP
K	1.27	2-018	2-016	0.875	VH-62	RSSE-087-CSOP
M	1.51	2-021	2-019	1.062	VH-81	RSSE-106-CSOP
O	1.74	2-025	2-023	1.250	VH-106	RSSE-125-CSOP
R	2.14	2-030	2-029	1.750	VH-150	RSSE-175-CSOP

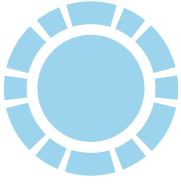
UNDER WATER RP5 SERIES - CCR

Cable Connector, Receptacle



CCR COMPONENTS / DIMENSIONS (INCHES)					
SIZE	ϕA	B (FLATS)	ϕC	2X D INTERNAL O-RING	E RETAINING RING
G	1.00	0.92	0.75	2-014	VH-50
K	1.12	1.05	0.875	2-016	VH-62
M	1.37	1.30	1.062	2-019	VH-81
O	1.62	1.55	1.250	2-023	VH-106
R	2.00	1.90	1.750	2-029	VH-150

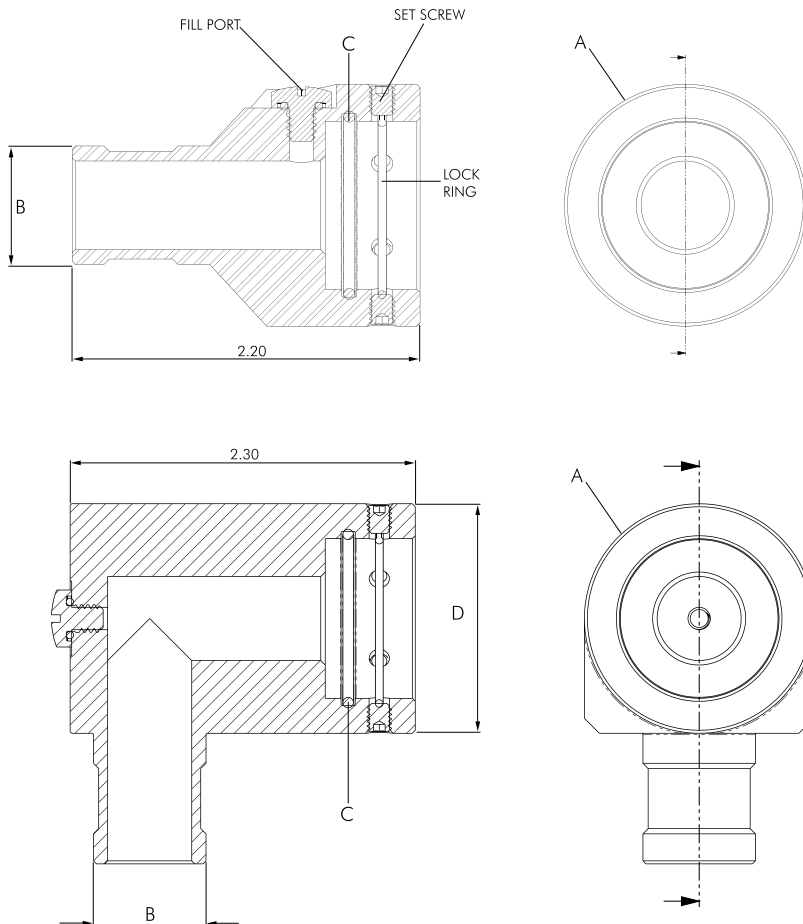




COMPONENTS / DIMENSIONS (INCHES)

UNDER WATER RP5 SERIES - PBOF ADAPTER

Pressure balanced oil filled, use with CCP and CCR.

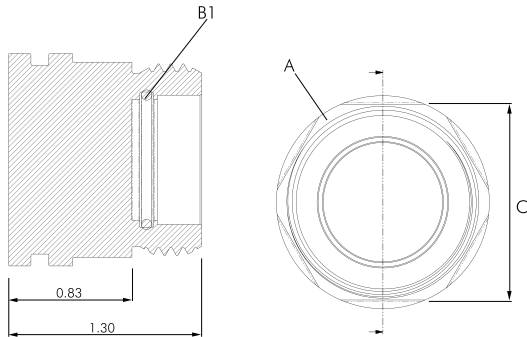


PBOF COMPONENTS / DIMENSIONS (INCHES)					P/N'S	
SIZE	øA	øB	C	D	STRAIGHT	RIGHT ANGLE
G	1.24	0.62	2-018	2.11	RP5PBOF-G	RP5PBOF-90-G
K	1.33	0.62	2-020	2.20	RP5PBOF-K	RP5PBOF-90-K
M	1.53	0.75	2-023	2.40	RP5PBOF-M	RP5PBOF-90-M
O	1.74	1.12	2-026	2.61	RP5PBOF-O	RP5PBOF-90-O
R	2.21	1.25	2-031	3.08	RP5PBOF-R	RP5PBOF-90-R

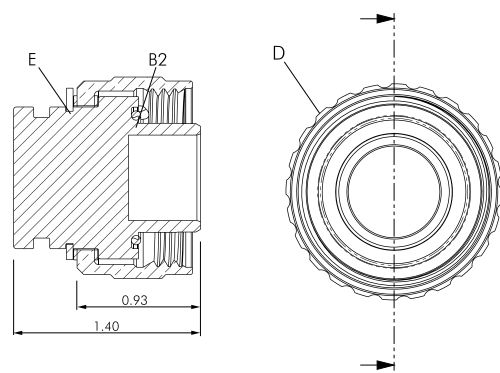


SPLASH AND PRESSURE PROOF

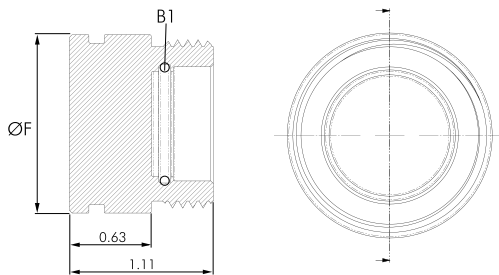
PLUG PROTECTOR HIGH PRESSURE



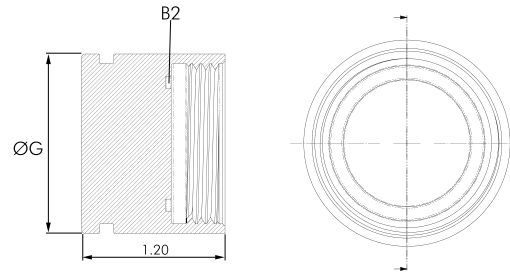
RECEPTACLE PROTECTOR HIGH PRESSURE



PLUG PROTECTOR SPLASH PROOF



RECEPTACLE PROTECTOR SPLASH PROOF

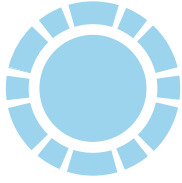


CAP DIMENSIONS (INCHES)

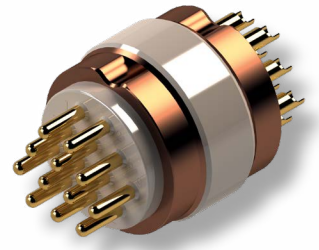
SIZE	A	B1 O-RING	B2 O-RING	C HEX	ØD	E RETAINING RING	ØF	ØG
G	1.06	2-014	2-016	0.938	1.15	RSSE-075-CSOP	1.25	1.10
K	1.18	2-016	2-018	1.063	1.27	RSSE-087-CSOP	1.40	1.25
M	1.43	2-019	2-021	1.313	1.51	RSSE-106-CSOP	1.50	1.43
O	1.68	2-023	2-025	1.563	1.74	RSSE-125-CSOP	1.80	1.68
R	2.06	2-029	2-030	1.938	2.14	RSSE-175-CSOP	2.38	2.12

PART NUMBERS

SIZE	PLUG PROTECTOR HIGH PRESSURE	RECEPTACLE PROTECTOR HIGH PRESSURE	PLUG PROTECTOR SPLASH PROOF	RECEPTACLE PROTECTOR SPLASH PROOF
G	RP5-PP-HP-G	RP5-RP-HP-G	RP5-PP-SP-G	RP5-RP-SP-G
K	RP5-PP-HP-K	RP5-RP-HP-K	RP5-PP-SP-K	RP5-RP-SP-K
M	RP5-PP-HP-M	RP5-RP-HP-M	RP5-PP-SP-M	RP5-RP-SP-M
O	RP5-PP-HP-O	RP5-RP-HP-O	RP5-PP-SP-O	RP5-RP-SP-O
R	RP5-PP-HP-R	RP5-RP-HP-R	RP5-PP-SP-R	RP5-RP-SP-R

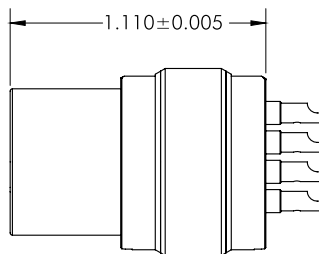
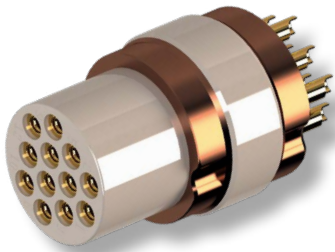
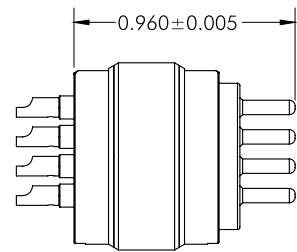
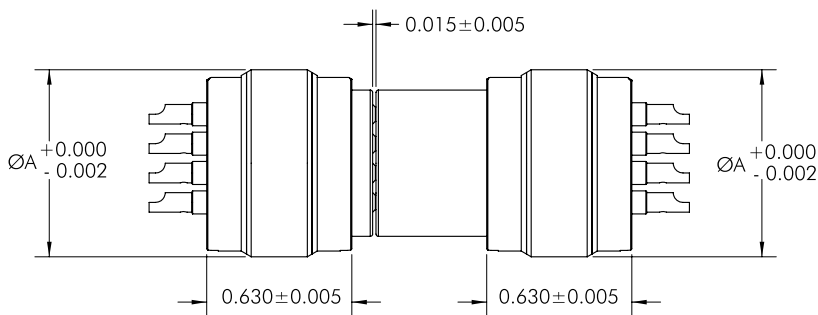


INSERTS



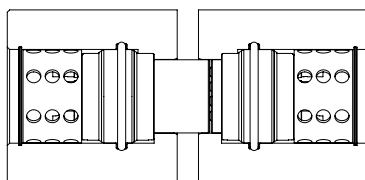
For the engineer that wants to control the design of their own interconnect, Rampart Products is **now offering our standard inserts from the RP5 Series** connector product line.

The inserts shown are all rated for high pressure (15,000 psi) and high temperature (200C), using an oring seal and integrated clocking features to fully realize your design's intent. Customer level drawings and STP files are available to aid the design process.



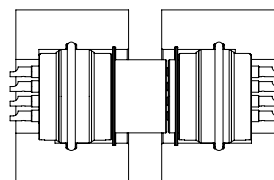
DIMENSIONS (INCHES)	
SIZE	$\varnothing A$
G	0.500
K	0.625
M	0.812
O	1.062
R	1.500

MOUNTING DETAIL MATE



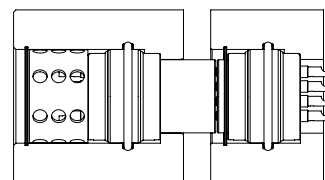
REAR LOAD

REAR LOAD



FRONT LOAD

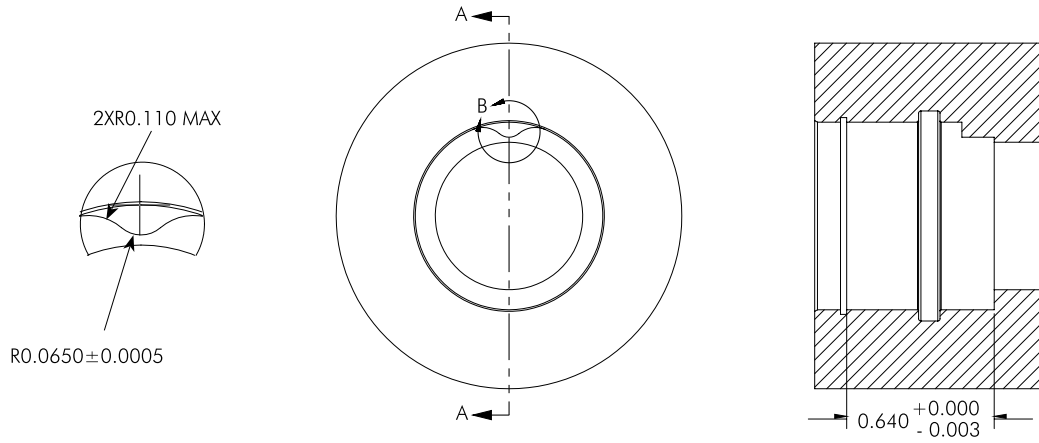
FRONT LOAD



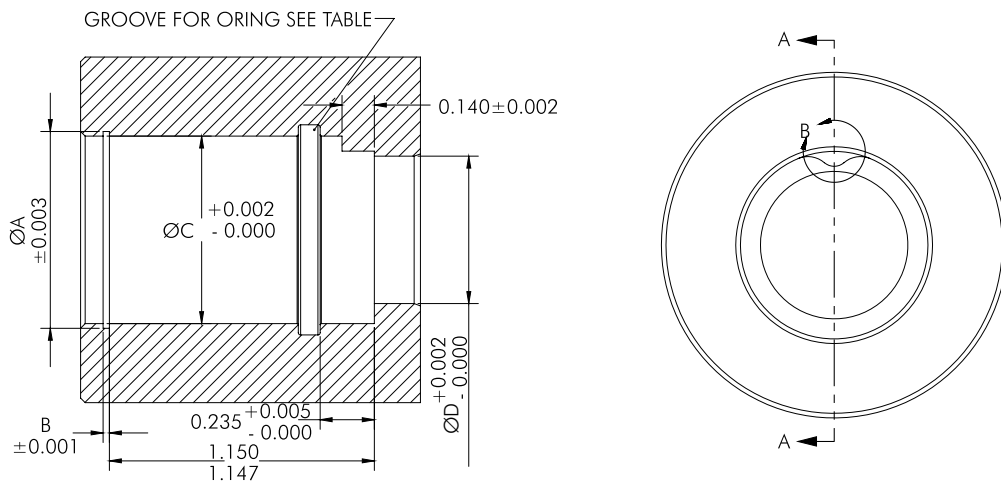
MIXED



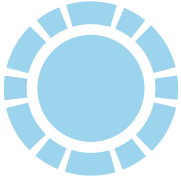
MOUNTING DETAIL FRONT LOAD



MOUNTING DETAIL REAR LOAD



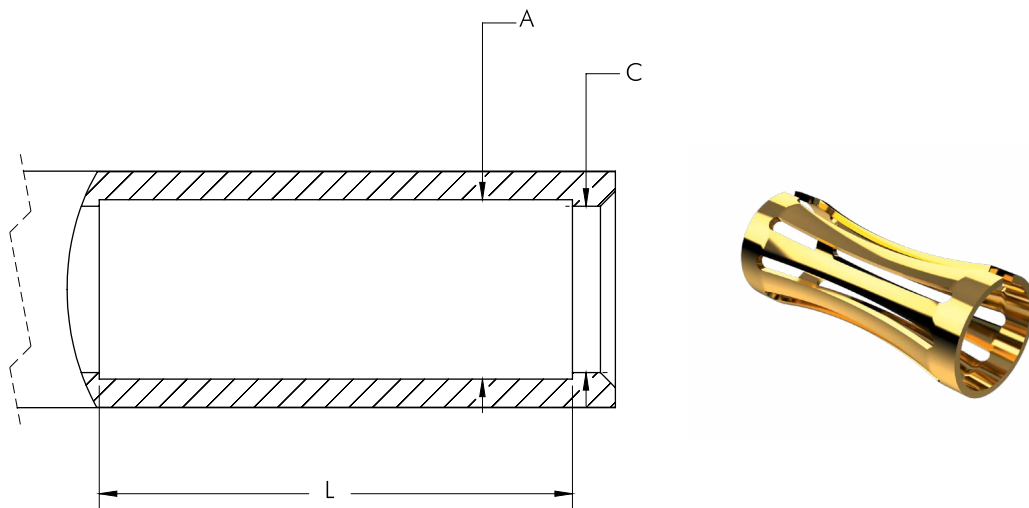
SIZE	O-RING	A	B	C	D
G	2-014	0.528	0.023	0.502	0.357
K	2-016	0.653	0.023	0.627	0.460
M	2-019	0.854	0.027	0.814	0.640
O	2-023	1.106	0.032	1.064	0.851
R	2-029	1.544	0.032	1.502	1.155



CONTACTS

For applications where reliability is paramount, space is limited, and high current is a requirement, the Rampart hourglass contact design offers an unparalleled solution.

By integrating improved current-carrying capacity and low resistance into a compact design, our products deliver exceptional performance while maximizing space efficiency. Enjoy consistent contact force and reliable connectivity that is field proven in the RP5 Series product line.



PERFORMANCE SPECIFICATIONS	
Material	C17200 Copper Beryllium
Finish	Gold Plate
Max. Temperature	400°F
Amperage	#22: 7 Amps
	#20: 11 Amps
	#16: 22 Amps

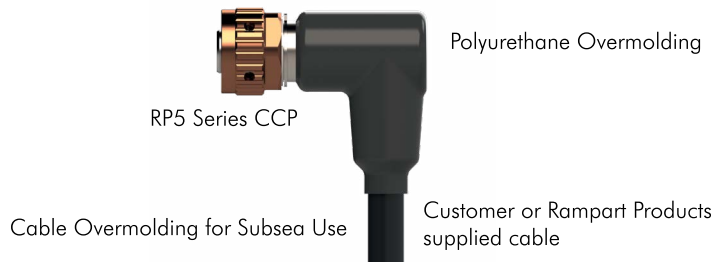
PART NUMBERS					
SIZE	MATING PIN Ø	PART NUMBER	ØA +0.0000 -0.0010	ØC ±0.0010	L ±0.0040
#22	0.031	C100417-22	0.0515	0.0380	0.2100
#20	0.040	C100417-20	0.0615	0.0480	0.2100
#16	0.063	C100417-16	0.0840	0.0705	0.2100

VALUE ADDED SERVICES

Rampart Products offers **additional services to complement our ruggedized connectors.**

This includes:

- Wire harnessing (tech certified to IPC-A-610)
- Cable assembly (polyurethane over-mold)
- Potting/Strain relieving



Standard 4-way Rotatable Set with Wire

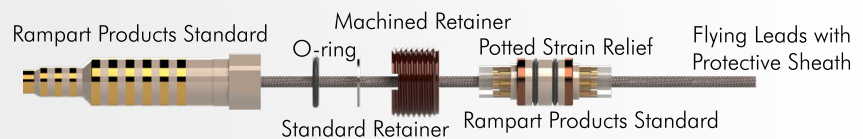


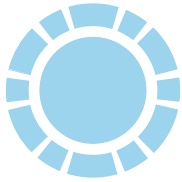
Rampart Products Custom



Custom 7-way Bulkhead with MDM

Assembly for BabelFish Interface





INNOVATION: RAMTAC™

Since its inception, we have put thousands of connectors in service, being subjected to the most rugged conditions – logging millions of hours in **extreme environments with no failures**. When the industry needed a more robust contact design – Rampart showed its innovative process and responded with RamTac™.

The design has passed the most stringent industry standard qualification test by an independent test facility, recorded many hours performing as advertised – but, the real test and measure of achievement, are the satisfied customers that keep coming back. Our company produces a variety of unique rotary connector designs, ranging from 3 to 10 contacts.



Key Features

- Extreme shock and vibration resistance.
- High temperature capable to 500°F.
- Very durable with no risk of damage during cleaning.
- High electrical current capacity.
- No elastomer energizer subject to compression set.



RamTac™ was first introduced in 2019 at the Offshore Technology Conference in Houston, Texas. After being granted its third patent, at the 2023's Offshore Technology Conference, Rampart won the American Society of Mechanical Engineers' Woelfel Best Mechanical Engineering Award for the Rotary-Fit Connector System containing RamTac™.

Oil & Gas

Mil/Aero

Medical

Space

Superior Contact Technology

- Our customer required an extreme pressure hermetic connector tolerant of angular misalignment, that could blind wet mate for an oil drilling application. Rampart developed a robust uni-body contact design versus competitors that use a less reliable multi-piece design. Qualified product delivered in only 12 weeks.



CUSTOMER EXPERIENCE

“Responsive to our needs and focused on the highest possible quality product”

What pains were you experiencing before working with Rampart Products?

The subsea cable industry has historically been a subset of the aerospace industry when it comes to interconnecting cabling systems. Our subsea applications are primarily a custom or one-off solution. This placed our subsea connection needs in a back seat to the more prevalent aerospace cabling needs and as such the industry is slow and unresponsive to **immediate needs**.

What made you choose Rampart Products?

Rampart has expressed a desire to not only focus their attention to the subsea connectivity market, but they have also made an open commitment to be the best at it. The people at Rampart truly have walked this claim and became an integral part of our team. They are **responsive to our needs and focused on the highest possible quality product**.

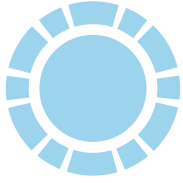
How has this made a difference in your business?

We have experienced a reduction in lead time for our subsea connectors and we have been **able to pursue more complex designs in our subsea applications**. We now have a new product ready for Failure Analysis Testing that we hope will meet our customers' stringent requirements.

What has surprised you most about the experience?

Rampart's **ability to rapidly move from concept design to finished product**, their willingness to develop new designs, and level of first-time quality.

Jason Wooldridge,
Oceaneering



CUSTOM INTERCONNECTS

Capacity and Service



Variable Separation Force Connector

- Customer specifies positive, zero, or negative force.
- Reliable in-flight electrical disconnect.
- Tapered mating eliminates binding.
- Blind engagement possible as the system allows for linear and angular misalignment.

Coaxial/RF - Custom

- Customer issued cable. Delivered in 12 weeks.
- Design per customer request: low profile envelope, 50 Ω impedance rating.
- Video transmit on Unmanned Under Water Vehicle (UUV).



Coaxial/RF - Standard

- Common in drilling applications.
- 2 lines of communication on single axis, but not used for matched impedance as above.
- Hermetic 20,000 psi at 400°F.



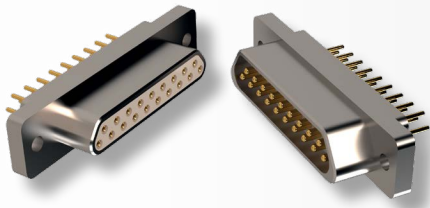
Autoclavable Connector

Due to long lead times, the customer's supply chain was disrupted, and could not deliver the product to the end user. Rampart delivered the solution in 12 weeks, which included customer inputs for improvements.



Circular Plastic Flange Mount Receptacle

Although this is an industry-standard solution, it was unavailable due to supply chain issues. Rampart delivered on time and offered a stocking program to guarantee a steady supply in the future.

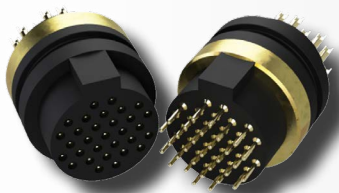


Rectangular Micro miniature Plug and Receptacle

- Robust PEEK insulator
- Lightweight
- Rapid development and delivery.
- Hermetic available upon request.

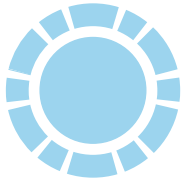
Sensor Probe

- Common in drilling applications.
- 2 lines of communication on single axis, but not used for matched impedance as above.
- High pressure / High temperature.



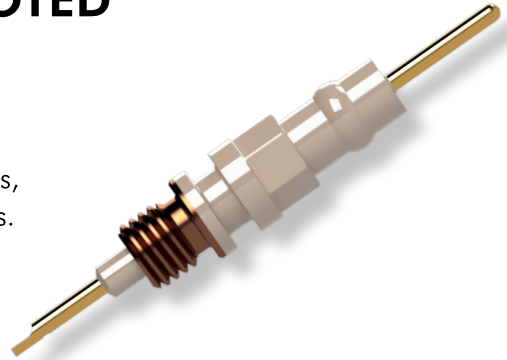
Multi-conductor mated Hermetic set

Custom packaged mated multi-conductor hermetic connector set. Special requirement to be non-magnetic.

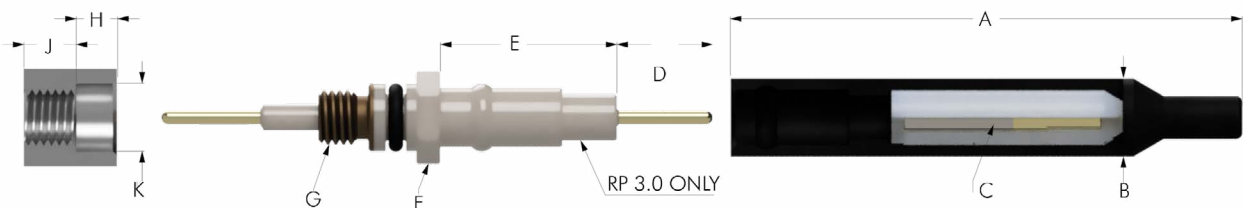


HPHT HERMETIC BOOTED

Rampart Products' Single Pin Connectors & Booted Contacts, **available from stock**, interchange with industry standards. Optional solder cup on low pressure end.

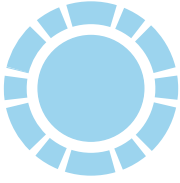


SPECIFICATIONS			
Temperature	Up to 500 °F	Pressure	Up to 30,000 psi
Voltage	up to 8,000 VDC	Current	18 Amps
MATERIALS			
Boot	FKM and HNBR		
Boot Insulator	PTFE		
Contacts	Copper Alloy		
Body	PEEK		
Thread	Copper Alloy		
DIMENSIONS (INCHES)			
	RP 1.X	RP 2.X	RP 3.X
A	1.75	1.75	2.35
B	0.26	0.31	0.36
C	20-24 AWG	14-24 AWG	12-24 AWG
D	0.44	0.44	0.44
E	0.37	0.37	0.71
F	1/4 Hex	1/4 Hex	3/8 Hex
G	10-32 UNF	1/4-28 UNF	1/4-28 UNF
H	0.17	0.20	0.19
J	0.20	0.24	0.24
K	0.250/0.251	0.312/0.313	0.312/0.313



PART NUMBERS

RP1.0		Contact:	PIN-PIN
		Thread:	10-32 UNF-2A
		O-Ring Size:	2-006
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	30,000
RP1.1		Contact:	CUP-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	20,000
RP2.0		Contact:	PIN-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	30,000
RP2.1		Contact:	PIN-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	20,000
RP2.3		Contact:	PIN-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	30,000
RP2.5		Contact:	THD-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	25,000

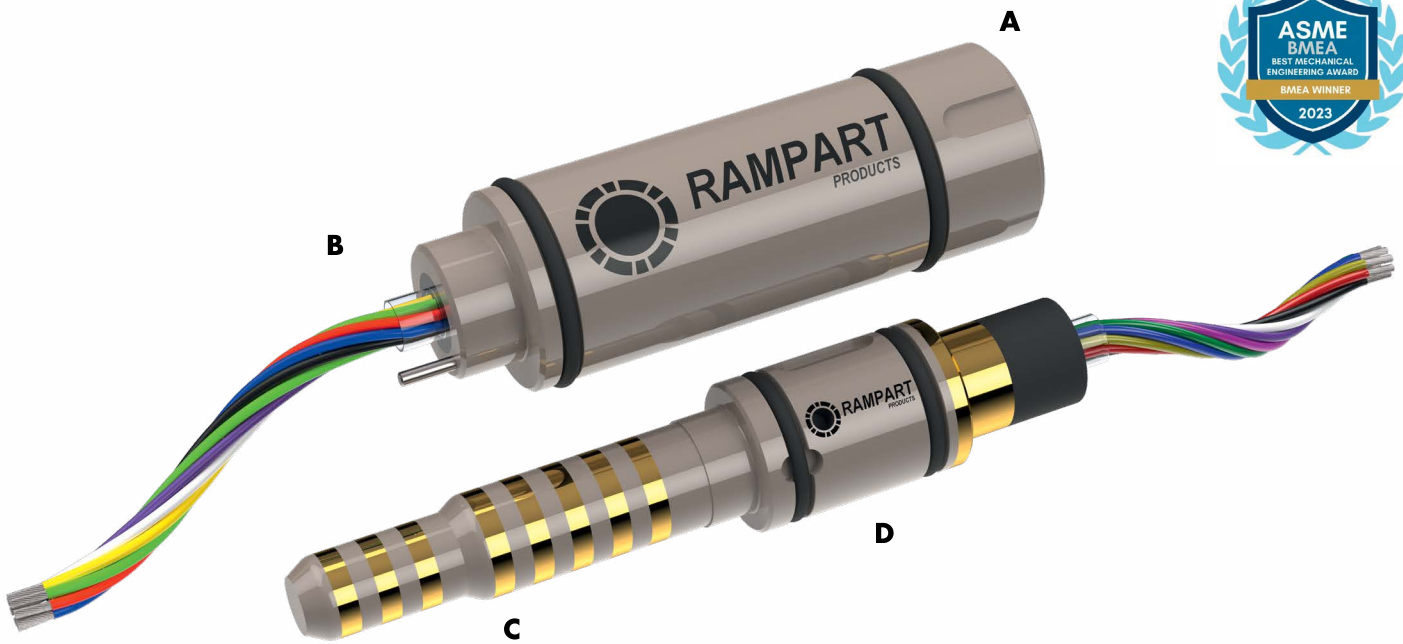


HPHT HERMETIC BOOTED

RP2.11		Contact:	CUP-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	20,000
RP2.13		Contact:	CUP-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	30,000
RP3.0		Contact:	PIN-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	25,000
RP3.11		Contact:	CUP-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	20,000
2A-6003-00		Contact:	CUP-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-008
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	30,000
2A-6012-00		Contact:	CUP-PIN
		Thread:	1/4-28 UNF-2A
		O-Ring Size:	2-006
		Max. Temperature at Max. Pressure (°F):	400°
		Max. Pressure at 400°F (psi):	30,000

HPHT HERMETIC ROTARY FIT

Head to head testing by customers has proven the innovation packed Rampart Products Rotary Fit connector system is unquestionably the highest performing and **most rugged available in the market.**



A. RamTac™* is superior in shock and vibration resistance; proven by rigorous lab and field testing performed by two of our major customers and DynaQual Labs.

B. Termination options:
- Flying leads
- Solder cups with HPHT hermetic bulkheads.

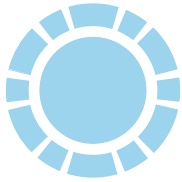
C. No solder joints that will fail under shock and vibration.

D. Molded PEEK bodies provide increased rigidity and insulation resistance versus others' assembled systems.

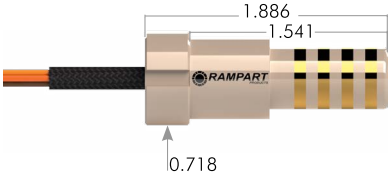
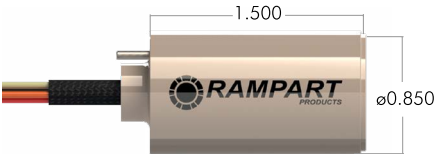
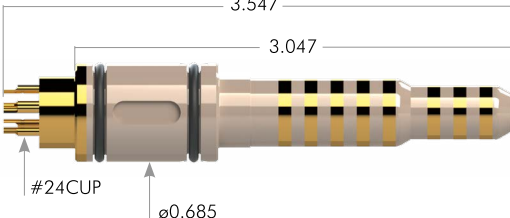

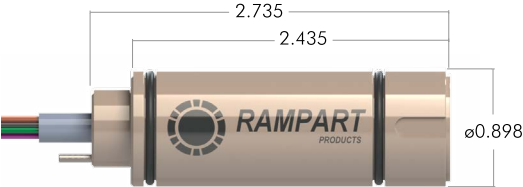
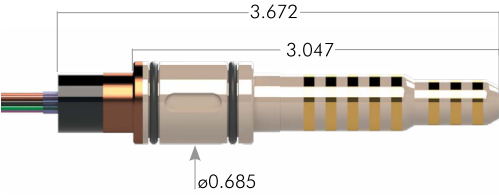
*US & International Patents apply.

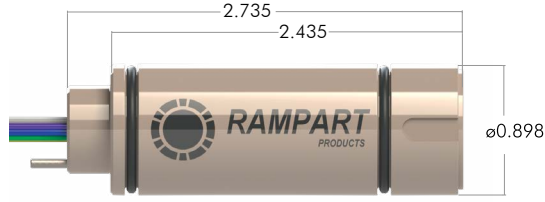
GENERAL		PERFORMANCE SPECIFICATIONS	
# Contacts	10, 8, 4	Current	Up to 8 Amps
Termination	Solder Cup or Flying Leads	Voltage	1000 VDC
Body Material	PEEK	Temperature	Up to 500 °F
Contact Material	C172 Beryllium Copper or Inconel	Pressure	Up to 30,000 psi
Support Disk Material	Copper alloy	Insulation Resistance	5 GΩ @ 1000 VDC @ ambient

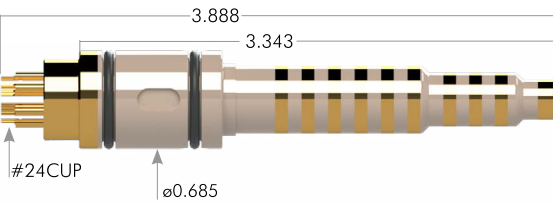
RamTac™ Contact Technology Patent No. 11,489,278 / 11,217,928 / 11,588,264

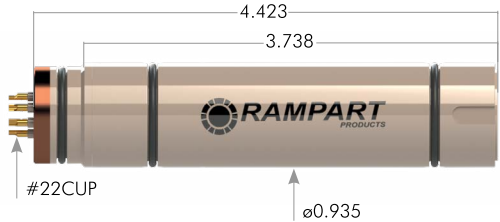


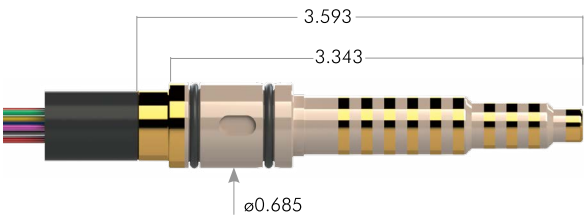
HPHT HERMETIC ROTARY FIT

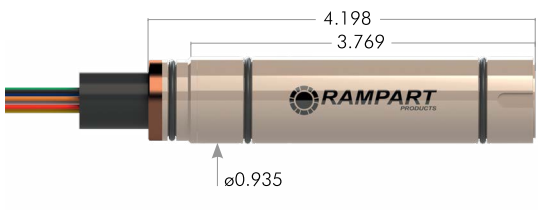
A100337		<p>MALE FLYING LEADS 4-WAY</p> <p># Contacts: 4</p> <p>O-Ring Size: N/A</p> <p>Max. Pressure at 400°F (psi): N/A</p> <p>Max. Temperature at Max. Pressure (°F): 500°</p>
A100338		<p>FEMALE FLYING LEADS 4-WAY</p> <p># Contacts: 4</p> <p>O-Ring Size: N/A</p> <p>Max. Pressure at 400°F (psi): N/A</p> <p>Max. Temperature at Max. Pressure (°F): 500° (SPECIAL)</p>
A100461		<p>MALE SOLDER CUPS 8-WAY</p> <p># Contacts: 8</p> <p>O-Ring Size: 2-015 FKM 90A DURO</p> <p>Max. Pressure at 400°F (psi): 20,000</p> <p>Max. Temperature at Max. Pressure (°F): 400°</p>
A100367		<p>FEMALE SOLDER CUPS 8-WAY</p> <p># Contacts: 8</p> <p>O-Ring Size: 2-018 FKM 90A DURO</p> <p>Max. Pressure at 400°F (psi): 20,000</p> <p>Max. Temperature at Max. Pressure (°F): 400°</p>
A100506		<p>FEMALE FLYING LEADS 8-WAY</p> <p># Contacts: 8</p> <p>O-Ring Size: 2-018 FKM 90A DURO</p> <p>Max. Pressure at 400°F (psi): N/A</p> <p>Max. Temperature at Max. Pressure (°F): 500° (SPECIAL)</p>
A100510		<p>MALE FLYING LEADS 8-WAY</p> <p># Contacts: 8</p> <p>O-Ring Size: 2-018 FKM 90A DURO</p> <p>Max. Pressure at 400°F (psi): 20,000</p> <p>Max. Temperature at Max. Pressure (°F): 400°</p>

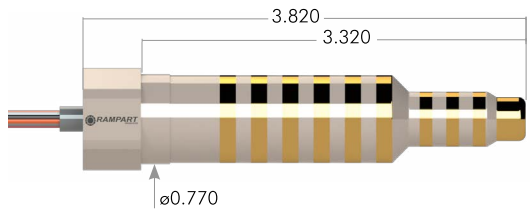
A100616		FEMALE FLYING LEADS 10-WAY
		# Contacts: 10
		O-Ring Size: 2-018 FKM 90A DURO
		Max. Pressure at 400°F (psi): N/A
		Max. Temperature at Max. Pressure (°F): 500° (SPECIAL)

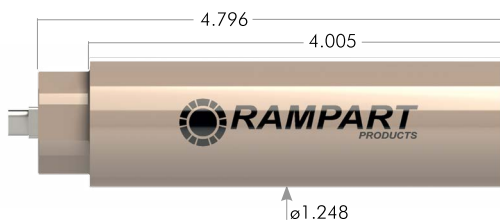
A100500		MALE SOLDER CUPS 10-WAY
		# Contacts: 10
		O-Ring Size: 2-015 FKM 90A DURO
		Max. Pressure at 400°F (psi): 30,000
		Max. Temperature at Max. Pressure (°F): 400°

A100577		FEMALE SOLDER CUPS 10-WAY
		# Contacts: 10
		O-Ring Size: 2-018 FKM 90A DURO
		Max. Pressure at 400°F (psi): 30,000
		Max. Temperature at Max. Pressure (°F): 400°

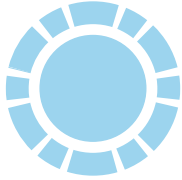
A100923		MALE FLYING LEADS 10-WAY
		# Contacts: 10
		O-Ring Size: 2-015 FKM 90A DURO
		Max. Pressure at 400°F (psi): 30,000
		Max. Temperature at Max. Pressure (°F): 400°

A100924		FEMALE FLYING LEADS 10-WAY
		# Contacts: 10
		O-Ring Size: 2-019 FKM 90A DURO
		Max. Pressure at 400°F (psi): 30,000
		Max. Temperature at Max. Pressure (°F): 400°

A101010		MALE FLYING LEADS 10-WAY
		# Contacts: 10
		O-Ring Size: N/A
		Max. Pressure at 400°F (psi): N/A
		Max. Temperature at Max. Pressure (°F): 500°

A100172		FEMALE FLYING LEADS 10-WAY
		# Contacts: 10
		O-Ring Size: N/A
		Max. Pressure at 400°F (psi): N/A
		Max. Temperature at Max. Pressure (°F): 500° (SPECIAL)

Babelfish Interface Compatible

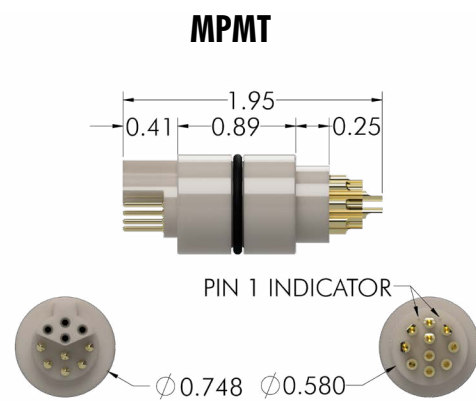
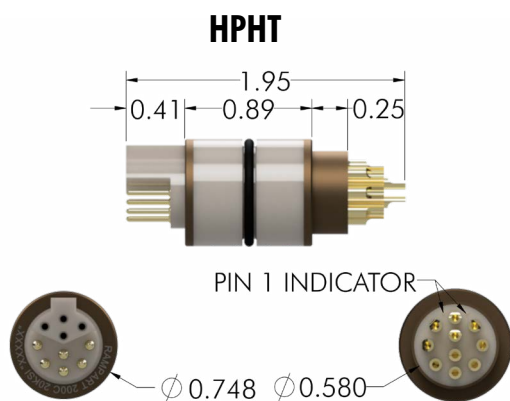
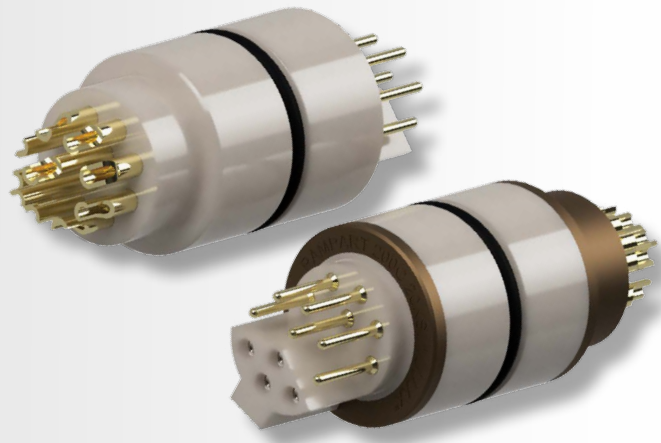


HPHT HERMETIC MULTI-PIN KTK

Rampart Products' KTK interchange with industry standards, and are constructed of superior PEEK eliminating epoxy fragments that cause electrical discontinuities.

Key Features

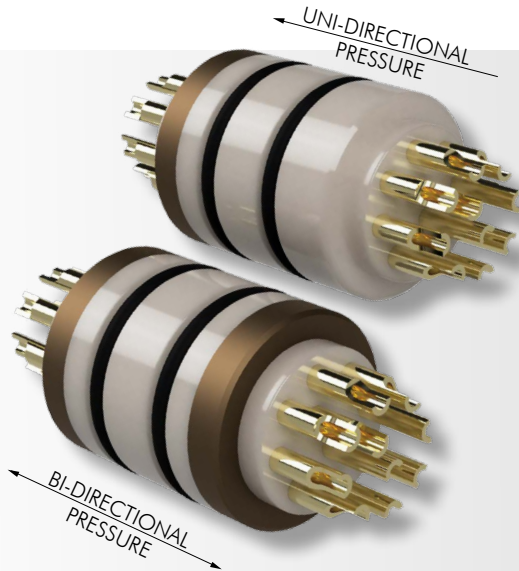
- Seamless integration with industry standard.
- Tiered solder cups for easy access.
- High contact force for reliable connection under shock & vibration.
- Permanent lot code marking.
- PEEK body is twice as durable vs glass reinforced epoxy.
- **Always in stock.**



MATERIALS		PERFORMANCE SPECIFICATIONS		
			HPHT	MPMT
Body	PEEK	Temperature	400 °F	329 °F
Contacts	Beryllium Copper	Pressure	20,000 psi	12,000 psi
Support Disk	Naval Brass	Insulation Resistance	500 MΩ @ 1000 VDC @ ambient	
PART NUMBERS		4 PIN / 6 SOCKET	3A-6018-00	3A-6020-00
		6 PIN / 4 SOCKET	3A-6019-00	3A-6021-00

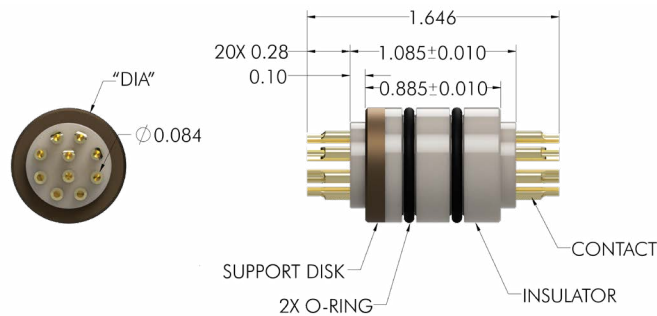
HPHT HERMETIC MULTI-PIN CUP X CUP

Pre-tooled standard configurations available from stock or **readily available for manufacture.**



PEEK body insulator is 20X as impact resistant vs glass reinforced epoxy and 40X more so than glass seals.

MATERIALS		PERFORMANCE SPECIFICATIONS	
Body	PEEK	Temperature	Up to 500 °F
Contacts	Beryllium Copper	Pressure	30,000 psi @ 400 °F
Support Disk	Beryllium Copper	Voltage	600 VDC



"DIA"	CONDUCTORS	PART NUMBERS	UNI-DIRECTION	BI-DIRECTION
0.750 in	10X 20AWG		A100003	A100004
0.750 in	8X 20AWG		A100081	A100080
0.687 in	10X 20AWG		A100085	A100084
0.687 in	8X 20AWG	A100083	A100082	

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