

# HIGH RELIABILITY CERAMIC-TO-METAL BRAZED, HIGH VOLTAGE CONNECTORS



## INTRODUCTION

Teledyne Reynolds' ceramic-to-metal facility is a separate operating division co-located with the Connector Products Division in our Marina Del Rey facility.

The Ceramic Division has available to it the model shop, tooling, environmental testing, and Quality Assurance departments at the Marina Del Rey facilities. The division has programmable batch furnaces which provide highly repeatable brazing cycles.

High current vacuum trigger switches are brazed in a vacuum furnace with on-line mass spectrometer, cryogenic filter and a turbo molecular pump.

## TECHNOLOGY

High alumina ceramics, when properly metallized, plated, and brazed, exhibit excellent hermetic sealing and dielectric strength. These attributes make ceramic-to-metal assemblies ideal high voltage receptacles for containment of dielectric gases or fluids when subjected to the rigors of aerospace environments. Other severe environmental applications include high voltage connector feedthrough for cryogenic physics research and spaceborne electric propulsion.

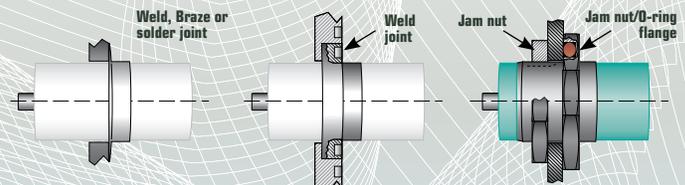
Teledyne Reynolds' ceramic-to-metal receptacles and header assemblies use only the best quality, 94% (minimum) alumina ceramic metallized with moly-manganese, and nickel plated. Only military standard metals are used for contacts, shells, bellows and braze materials.

## PRODUCT APPLICATIONS

Ceramic-to-metal connectors are finding more and more applications within high voltage power supplies and high vacuum assemblies because of the need for long term hermetic reliability. Teledyne Reynolds offers the component and system engineer various rear contact configurations, such as solder pot or turret for soldering and straight pin for flat cable weld attachment. The illustrations below depict different flange geometries and materials for hermetic and mechanical attachment, which need to be considered in the initial system design phase.

## FEATURES

- Facility equipment includes: Hydrogen and Vacuum brazing furnaces.
- 94% (min.) alumina ceramic metallized with moly-manganese & nickel plated
- Product leak rates are  $1 \times 10^{-8}$  cc/sec He at 1 ATM of differential pressure
- Both single-pin and multi-pin designs are available
- Custom designs available



**Weld, Braze or Solder Flange**  
A thin and flat configured flange allows for welding (Laser, TIG, Electron Beam etc.), brazing or soldering to a flat plate surface  
**Note:** For braze mount applications contact Teledyne Reynolds, Inc. for maximum allowable brazing temperature.

**Weld Flange with Relief Groove**  
A thick flange incorporating a weld relief groove is well suited for welding (Laser, TIG, Electron Beam, etc.) to a thick bulkhead with a similar weld relief groove.

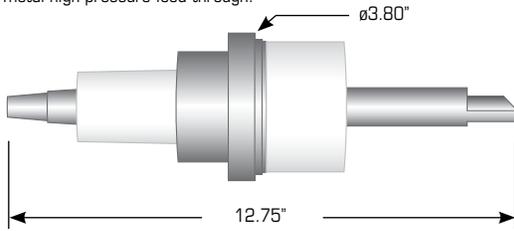
**Jam Nut/O-ring Flange**  
Standard o-ring sealing of receptacle body to a bulkhead where welding, brazing or soldering is not desirable.



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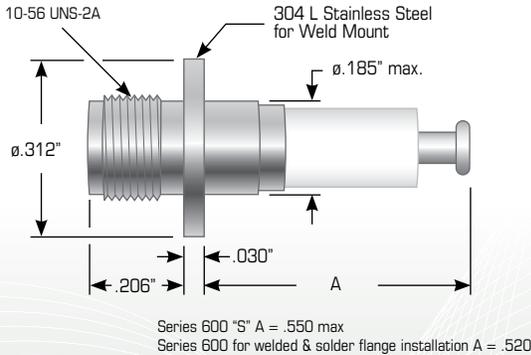
## HIGH PRESSURE, HIGH VOLTAGE

**Note:** Product is shown strictly to demonstrate a capability to design and produce a ceramic-to-metal high pressure feed through.



- Sealed for 1,000 PSI differential pressure
- Max. Leak Rate:  $2 \times 10^{-8}$  cc/sec. He. @ 2,000 PSI pressure
- High current, high voltage (4 kVDC)
- Copper electrodes
- Au/Cu/Ni braze material
- Stainless steel body/flange

## SERIES 600 & 600 "S" • 5 kVDC



### SERIES 600 "S" for Space Use

P/N 467-7094

- Sealed for 15 PSI differential pressure
- Vented interface when interface seal is removed
- **Max. Leak Rate:**  $1 \times 10^{-8}$  cc/sec. He. @1 ATM diff. pressure
- **Operating Voltage:** 5 kVDC @ 10 millorr maximum pressure.
- **Flange material:** 304 stainless steel
- **Mating connectors:** Cable assembly P/N 178-6027 and P/N 178-5996

### SERIES 600

- Sealed for 15 PSI differential pressure
- **Max. Leak Rate:**  $1 \times 10^{-8}$  cc/sec. He. @1 ATM diff. pressure
- **Operating Voltage:** 5 kVDC from sea level to 70,000 Ft.
- **Mating connectors:** All series 600 plug cable assemblies
- Welded flange installation - P/N 467-7029
  - Flange material: 304 stainless steel for welded installation.
- Solder flange installation - P/N 467-7009
  - Flange material: 304 stainless steel with tin plate for solder flange installation.

**Note:** Product part numbers, dimensions and specifications are subject to change without notice. Products listed represent only a small selection of Teledyne Reynolds' products. Please visit [www.teledynereynolds.com](http://www.teledynereynolds.com) for the most up to date product line. Contact Teledyne Reynolds Engineering to discuss custom designs.

**WARNING:** Connectors should NEVER be handled mated or unmated when voltage is applied.

## SERIES 730 • 10 kVDC & 720 • 20 kVDC

### SERIES 730

A: .312"-32 UNEF-2A

B: .655"

C:  $\emptyset$ .310"

D:  $\emptyset$ .500"

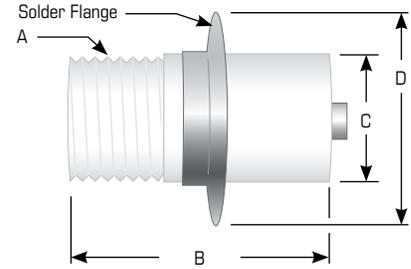
### SERIES 720

A: .50"-2 UNF-1A

B: 1.025"

C:  $\emptyset$ .510"

D:  $\emptyset$ .812"



### SERIES 730

P/N 167-8626

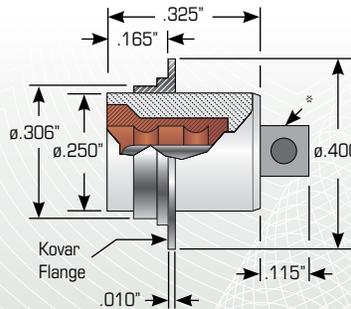
- Sealed for 15 PSI differential pressure
- **Max. Leak Rate:**  $1 \times 10^{-8}$  cc/sec. He. @1 ATM diff. pressure
- **Operating Voltage:** 10 kVDC rating to 70,000 Ft.
- **Flange material:** Iron nickel alloy with nickel plating
- **Mating Connectors:** series 730/830, C730 and LGH 1/2I lead assemblies

### SERIES 720

P/N 167-9803

- Sealed for 15 PSI differential pressure
- **Max. Leak Rate:**  $1 \times 10^{-8}$  cc/sec. He. @1 ATM diff. pressure
- **Operating Voltage:** 20 kVDC rating to 70,000 Ft.
- **Flange material:** Iron nickel alloy with nickel plating
- **Mating Connectors:** 720, C720 and LGH L1I lead assemblies

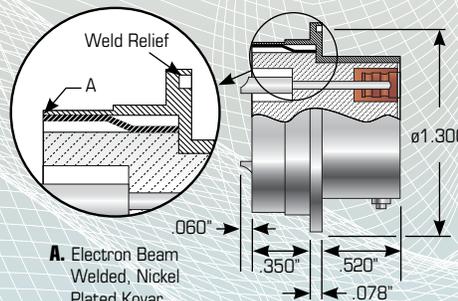
## ADVANCED SERIES PEE-WEE • 12 kVDC



- Sealed for 15 PSI differential pressure
- **Max. Leak Rate:**  $1 \times 10^{-8}$  cc/sec. He. @1 ATM diff. pressure
- **Operating Voltage:** 12 kVDC rating to 70,000 Ft.
- **Mating Connectors:** all non-threaded Pee-Wee series plug cable assemblies
- Welded flange install. - P/N 467-7022
- Solder flange install. - P/N 467-7024

\*Contact solder pot will accommodate 24 gauge wire. Do not exceed 400° F when soldering. Use SN 60 solder.

## ADVANCED SERIES MAGNUM PLUS<sup>†</sup> 12 TO 14 kVDC\*\*



A. Electron Beam Welded, Nickel Plated Kovar Bellows to CRES Body

- Sealed for 15 PSI differential pressure
- **Max. Leak Rate:**  $1 \times 10^{-8}$  cc/sec. He. @1 ATM diff. pressure
- **Voltage rating** (sea level to 70,000 Ft.):
  - \*\*Pins 1, 3, & 5: 14 kVDC
  - \*\*Pins 2, 4, & 6: 12 kVDC
- Nickel plated Kovar bellows welded to stainless steel body (See expanded view)
- **Mating Connectors:** only Magnum Plus plug cable assemblies having a 97° polarization
- Welded flange installation - P/N 467-7008
- Solder flange installation - P/N 467-7074

† The item depicted in this Marketing-Sales drawing is subject to the export jurisdiction of the U.S. Department of State and may require export license or other approval from the U.S. Department of State.

