HYPERGRIP® CONNECTOR SERIES

High Reliability Medical Connectors
HYPERBOLOID TECHNOLOGY

Smiths Connectors offers an extensive range of superior contact technologies suitable for standard and custom solutions. Hypertac® (HYPERboloid conTACT) is the original superior performing hyperboloid contact technology designed for use in all applications and in harsh and demanding environments where high reliability and safety are critical. The inherent electrical and mechanical characteristics of the Hypertac hyperboloid contact ensures unrivalled performance in terms of reliability, number of mating cycles, low contact force and minimal contact resistance. The shape of the contact sleeve is formed by hyperbolically arranged contact wires, which align themselves elastically as contact lines around the pin, providing a number of linear contact paths.

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOW INSERTION/EXTRACTION FORCES</strong></td>
<td><strong>HIGH DENSITY INTERCONNECT SYSTEMS</strong></td>
</tr>
<tr>
<td>The angle of the socket wires allows tight control of the pin</td>
<td>Significant reductions in size and weight of sub-system designs. No</td>
</tr>
<tr>
<td>insertion and extraction forces. The spring wires are smoothly</td>
<td>additional hardware is required to overcome mating and un-mating forces.</td>
</tr>
<tr>
<td>deflected to make line contact with the pin.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>LOW COST OF OWNERSHIP</strong></td>
</tr>
<tr>
<td><strong>LONG CONTACT LIFE</strong></td>
<td>The Hypertac contact technology will surpass most product</td>
</tr>
<tr>
<td>The smooth and light wiping action minimizes wear on the contact</td>
<td>requirements, thus eliminating the burden and cost of having to</td>
</tr>
<tr>
<td>surfaces. Contacts perform up to 100,000 insertion/extraction cycles</td>
<td>replace the connector or the entire subsystem.</td>
</tr>
<tr>
<td>with little degradation in performance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>LOW POWER CONSUMPTION</strong></td>
</tr>
<tr>
<td><strong>LOWER CONTACT RESISTANCE</strong></td>
<td>The lower contact resistance of our technology results in a lower</td>
</tr>
<tr>
<td>The design provides a far greater contact area and the wiping action</td>
<td>voltage drop across the connector reducing the power consumption</td>
</tr>
<tr>
<td>of the wires insures a clean and polished contact surface. Our contact</td>
<td>and heat generation within the system.</td>
</tr>
<tr>
<td>technology has half the resistance of conventional contact designs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>MAXIMUM CONTACT PERFORMANCE</strong></td>
</tr>
<tr>
<td><strong>HIGHER CURRENT RATINGS</strong></td>
<td>The lower contact resistance of the Hypertac contact reduces heat</td>
</tr>
<tr>
<td>The design parameters of the contact (e.g., the number, diameter</td>
<td>build-up; therefore Hypertac contacts are able to handle far greater</td>
</tr>
<tr>
<td>and angle of the wires) may be modified for any requirement. The</td>
<td>current in smaller contact assemblies without the detrimental effects</td>
</tr>
<tr>
<td>number of wires can be increased so the contact area is</td>
<td>of high temperature.</td>
</tr>
<tr>
<td>distributed over a larger surface. Thus, the high current carried by</td>
<td></td>
</tr>
<tr>
<td>each wire because of its intimate line contact, can be multiplied</td>
<td></td>
</tr>
<tr>
<td>many times.</td>
<td></td>
</tr>
<tr>
<td><strong>IMMUNITY TO SHOCK &amp; VIBRATION</strong></td>
<td><strong>RELIABILITY UNDER HARSH ENVIRONMENTS</strong></td>
</tr>
<tr>
<td>The low mass and resultant low inertia of the wires enable them</td>
<td>Harsh environmental conditions require connectors that will sustain</td>
</tr>
<tr>
<td>to follow the most abrupt or extreme excursions of the pin without</td>
<td>their electrical integrity even under the most demanding conditions</td>
</tr>
<tr>
<td>loss of contact. The contact area extends 360 degrees around the pin</td>
<td>such as shock and vibration. The Hypertac contact provides unmatched</td>
</tr>
<tr>
<td>and is uniform over its entire length. The 3 dimensional symmetry of</td>
<td>stability in demanding environments when failure is not an option.</td>
</tr>
<tr>
<td>the Hypertac contact design guarantees electrical continuity in all</td>
<td></td>
</tr>
<tr>
<td>circumstances.</td>
<td></td>
</tr>
</tbody>
</table>
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## FEATURES
- Push/Pull latching feature
- Innovative customer keyability
- Available in 5 color options
- Sleek, robust body
- Sealing to IP67 when mated
- Fingerproof
- Multiple contact technologies available
- Shielding option available in HG2, HG3 and HG4
- Autoclave, EtO, Gamma and Sterrad® sterilizable
- UL94 V-0 flammability rated materials
- Integrated strain relief
- Contacts shipped unloaded

## BENEFITS
- Quick connect - simple one-hand mating/unmating
- Easily keyed in 6 standard positions to prevent mismating
- Visually intuitive mating
- Designed to aesthetically complement medical devices
- Meets or exceeds typical medical sealing requirements
- Meets requirements of IEC 60601-1 specifications
- Flexibility for superior performance in high reliability, high speed, high density, high frequency and/or hybrid solutions
- Protection against EMI/RFI interference
- Meets typical medical sterilization requirements
- Meets medical industry safety requirements
- Prevents cable wire fatigue due to bending
- Easier termination for reduced cost of ownership: crimp and poke termination eliminates the need to pre-tin, solder or shrink boot

### HYPERGRIP® SERIES

HyperGrip Circular Connector Series is available with 5, 12, 19, or 33 pin positions and a user-configurable keying system. While competitive products require purchasing a different connector for each keying configuration needed, our advanced keying system allows customers to build connectors with six different keying options reducing lead time and inventory.

Specifically designed to meet medical industry requirements, the HyperGrip connector’s sleek, robust body delivers superior performance in the most crucial applications. Not only does the standard sealing offer IP67 protection when mated to prevent electrical shorts, but the available shielding feature supplies EMI/RFI protection providing the highest degree of safety and reliability.

By utilizing the unparalleled performance of Hypertac® hyperboloid contact technology, HyperGrip connectors are able to provide high cycle life, low power consumption, low insertion force, reliability under harsh conditions, maximum contact performance and excellent wiping action.

HyperGrip connectors are color-coded and range from 1/2 to 2 inches in diameter. The five available color options, along with our innovative keying system, make recognition effortless and incorrect mating impossible. This becomes essential for medical instrumentation applications where multiple connector interfaces are required.

Smiths Connectors offers custom options in order to meet application specific requirements. The flexible design of HyperGrip connectors allows for the use of alternate technologies including Fiber Optic (expanded beam or butt joint termini), Coaxial and Spring Probe contacts. Custom inserts, cable mount receptacles and cable assemblies (available in select sizes) can also be provided to optimize your connector solution.

*Sterrad® is a registered trademark of Advanced Sterilization Products (ASP)
# Technical Characteristics

<table>
<thead>
<tr>
<th></th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Contacts</td>
<td>5</td>
<td>12</td>
<td>19</td>
<td>33</td>
</tr>
<tr>
<td>Contact Diameter</td>
<td>0.012 [0.30]</td>
<td>0.016 [0.40]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Materials

<table>
<thead>
<tr>
<th>部位</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Polyetherimide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulators</td>
<td>Liquid crystal polymer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sealing</td>
<td>Silicone</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Contact Materials & Plating

<table>
<thead>
<tr>
<th>部位</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sockets</td>
<td>Beryllium copper wires</td>
<td>Brass body components</td>
<td>Gold over nickel plating on mating surface</td>
<td>Gold flash over nickel on termination</td>
</tr>
<tr>
<td>Pins</td>
<td>Phosphor bronze</td>
<td>Gold flash over nickel plated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Terminations

<table>
<thead>
<tr>
<th>部位</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimp (Pin &amp; Socket)</td>
<td>26 to 28 AWG</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optional terminations, including solder cup and straight-dip pc tails (for panel mount receptacles), are special order only. Please contact factory for availability.

## Shielding (optional)

<table>
<thead>
<tr>
<th>部位</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td>Up to 3 GHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attenuation</td>
<td>50 dB maximum at 3 GHz</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Mechanical

<table>
<thead>
<tr>
<th>部位</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mating Cycle Life</td>
<td>Up to 20,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Extraction Force</td>
<td>0.50 to 1.60 oz. per contact</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Electrical

<table>
<thead>
<tr>
<th>部位</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Rating</td>
<td>1.0 A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Resistance</td>
<td>&lt; 8.0 mΩ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakdown Voltage Between Contacts</td>
<td>1,000 V max.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dielectric Withstanding Voltage</td>
<td>750 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>&gt; 5 x 10^4 MΩ at 500 VDC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Physical and Environmental

<table>
<thead>
<tr>
<th>部位</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature Rating</td>
<td>-40º to 125º C</td>
<td>Up to 185º C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processing Temperature Range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sterilization</td>
<td>Steam Autoclave, Gamma, EtO, Sterrad™</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fingerproofing</td>
<td>Meets IEC 60601-1 requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sealing</td>
<td>IP67 (for temporary submersion)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1) HyperGrip is patented under US patent numbers: 7,326,091B2; 7,661,995B2; D596,127S; 7,938,670; D615,932; D616,825
Dimensions are in inches [mm]
DIMENSIONS
Standard HyperGrip® Connectors

STANDARD PLUG & RECEPTACLE
For HG0, HG2, HG3 and HG4

PLUG & RECEPTACLE MATED PAIR
with strain relief

<table>
<thead>
<tr>
<th></th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ø0.807 [20.50]</td>
<td>Ø1.014 [25.76]</td>
<td>Ø1.172 [29.77]</td>
<td>Ø1.250 [31.77]</td>
</tr>
<tr>
<td>C</td>
<td>Ø0.630 [16.00]</td>
<td>Ø.866 [22.00]</td>
<td>Ø1.007 [25.59]</td>
<td>Ø1.090 [27.80]</td>
</tr>
<tr>
<td>D</td>
<td>0.285 [7.25]</td>
<td>0.272 [6.91]</td>
<td>0.272 [6.91]</td>
<td>0.272 [6.91]</td>
</tr>
<tr>
<td>F</td>
<td>0.343 [8.71]</td>
<td>0.427 (10.84)</td>
<td>0.354 [9.00]</td>
<td>0.354 [9.00]</td>
</tr>
<tr>
<td>J</td>
<td>1.415 [35.94]</td>
<td>2.390 [60.65]</td>
<td>2.730 [69.33]</td>
<td>2.730 [69.33]</td>
</tr>
<tr>
<td>K</td>
<td>0.118 [3.00]</td>
<td>0.118 [3.00]</td>
<td>0.118 [3.00]</td>
<td>0.118 [3.00]</td>
</tr>
<tr>
<td>L</td>
<td>0.689 [17.50]</td>
<td>0.823 [20.90]</td>
<td>0.980 [24.90]</td>
<td>1.060 [76.90]</td>
</tr>
<tr>
<td>P</td>
<td>–</td>
<td>1.704 [43.27]</td>
<td>1.961 [49.82]</td>
<td>2.124 [53.95]</td>
</tr>
</tbody>
</table>

Dimensions are in inches [mm]
PLUG & CABLE RECEPTACLE
For HG2 only

Dimensions are in inches [mm]

PLUG & CABLE RECEPTACLE MATED PAIR
with strain relief

[C] CABLE RECEPTACLE
with shielding option

[P] PLUG
KEYING & MOUNTING
User Information

RECEPTACLE KEYING
HG2 shown. All other sizes are keyed in the same fashion. See Assembly Instructions for receptacle keying information:\(^1\):

- S50386: Panel Receptacles
- S50431: Cable Receptacles

```
KEYING POSITION A
Receptacle Wiring End
```

Notes:
1) Assembly Instructions also include plug keying information: S50387
Dimensions are in inches [mm]

PANEL CUTOUTS
All sizes

<table>
<thead>
<tr>
<th></th>
<th>A (Ø)</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG0</td>
<td>Ø0.555 [14.10]</td>
<td>0.240 [6.10]</td>
</tr>
<tr>
<td>HG2</td>
<td>Ø0.711 [18.06]</td>
<td>0.329 [8.36]</td>
</tr>
<tr>
<td>HG3</td>
<td>Ø0.870 [22.10]</td>
<td>0.393 [9.98]</td>
</tr>
<tr>
<td>HG4</td>
<td>Ø0.949 [24.10]</td>
<td>0.430 [10.92]</td>
</tr>
</tbody>
</table>
**RECEPTACLE MOUNTING OPTIONS**

1. **Assembly outside panel then install**

   - **CUSTOMER’S EQUIPMENT CASE OR BOX**
   - **CUSTOMER’S HARNESS OR WIRING**
   - **PANEL NUT SECURES RECEPTACLE ASSEMBLY FROM BACK**
   - **RECEPTACLE ASSEMBLY WITH INSULATOR INSTALLED AND KEYED TO CUSTOMER’S CHOSEN KEYING POSITION**

2. **Install receptacle body then assemble inside panel**

   - **CUSTOMER’S EQUIPMENT CASE OR BOX**
   - **CUSTOMER’S HARNESS OR WIRING**
   - **RECEPTACLE BODY INSTALLED IN CUSTOMER’S EQUIPMENT**
   - **RECEPTACLE INSULATOR WITH CUSTOMER’S HARNESS OR WIRING INSTALLED**

**Notes:**
Recommended tightening torque for panel mount receptacle for HG2, HG3 and HG4 is 0.452 to 0.678 N•m. For HG0 is 0.226 to 0.339 N•m.
**MARKETS & APPLICATIONS**

**Catheter**
- Disposable
- High density spring probe contacts
- High cycle life
- Low contact resistance
- Minimal insertion/extraction forces

**Home Healthcare**
- Hyperboloid and USB signal contacts
- IP67 sealing
- Simplistic operation
- Ergonomic, ideal for in-home patient use

**MRI/CT Scanning**
- Quick push/pull latching
- Hyperboloid signal contacts
- ESD finger-proof protection
- Multiple keying options

**Patient Monitoring**
- Hyperboloid signal contacts
- Custom creepage and clearance
- High reliability
- Cost effective
- Patient friendly application

**Portable Therapeutic**
- Custom cable solution
- Superior reliability for critical application
- Color coded
- Multiple keys to prevent mismating
- Intuitive design

**Surgical Imaging**
- Expanded beam Fiber Optic contact
- Easy cleaning and low susceptibility to contamination
- Fiber Optic video connection for easy mating to HD display system
- High speed data transmission
## HOW TO ORDER

### HYPERGRIP CONNECTOR SERIES  
**[Fixed]**

### SIZE

<table>
<thead>
<tr>
<th>Size</th>
<th>HG0</th>
<th>HG2</th>
<th>HG3</th>
<th>HG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### TYPE

- **P** PLUG
- **E** RECEPTACLE/PANEL
- **C** RECEPTACLE/CABLE  
  *(Available on HG2 only)*

### CONNECTOR OPTIONS

1. **1** SEALED
2. **2** SHIELDED *(Unsealed)*

### STRAIN RELIEF SIZE

*(Cable diameter ranges)*

<table>
<thead>
<tr>
<th>Size</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>NO STRAIN RELIEF</td>
<td>2.08 - 3.10 mm <em>(HG0 only)</em></td>
<td>4.50 - 6.50 mm <em>(HG2 only)</em></td>
<td>7.00 - 9.00 mm <em>(HG3 only)</em></td>
</tr>
</tbody>
</table>

### OUTER SHELL COLOR  
**[Fixed]**

- **C** LIGHT GRAY

### COLOR CODING

*(Strain relief only)*

- **G** LIGHT GRAY *(Standard)*
- **D** BLUE
- **R** RED
- **V** GREEN
- **Y** YELLOW

### POSITIONS

<table>
<thead>
<tr>
<th>Position</th>
<th>5</th>
<th>12</th>
<th>19</th>
<th>33</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG0</td>
<td>HG2</td>
<td>HG3</td>
<td>HG4</td>
<td></td>
</tr>
</tbody>
</table>

### CONTACT DIAMETER

<table>
<thead>
<tr>
<th>Diameter</th>
<th>03</th>
<th>04</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG0</td>
<td>0.3mm</td>
<td>HG2, HG3, HG4</td>
</tr>
</tbody>
</table>

### CONTACT GENDER

- **F** FEMALE SOCKETS *(Receptacles)*
- **M** MALE PINS *(Plugs)*

### TERMINATION  
**[Fixed]**

- **R** CRIMP/SOLDER *(26 - 28 AWG)*

  Contacts are shipped unloaded, may be crimped or soldered, then inserted into insulator.  
  For more information, please see Assembly Instructions.

### PLATING

*(Pins: Gold over nickel)*  
*(Sockets: Gold over nickel on contact surfaces, gold flash on terminations)*

- **G** HG2, HG3, HG4 pins
- **H** HG0 pins
- **ANH** HG2, HG3, HG4 sockets
- **AH** HG0 sockets

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*Available tooling: Crimp Tool: AFM8 or M22520/2-01,  
Crimp Positioner: K1775 *(HG0)* or T2030 *(HG2, HG3, HG4)*,  
Insertion Tool: T2080*
AVAILABLE CONTACT TECHNOLOGIES
Features & Benefits

HYPERTAC® HYPERBOLOID

- **Long Contact Life**
  Industry-leading mating cycles provide low cost of ownership
- **Low Insertion / Extraction Forces**
  Ergonomic mating without cost and size of mate assist hardware
- **Lower Contact Resistance**
  Low power consumption / lower voltage drop across connector
- **Higher Current Ratings**
  Smaller contacts needed to carry power for reduced size and weight
- **Immunity to Shock & Vibration**
  Reliability under harsh environmental conditions
- **360° Contact Wipe**
  Self-cleaning contacts assure uninterrupted connection

SPRING PROBE

- **Extremely High Density**
  Allows for connectors as dense as 2mm, while maintaining 0.5mm of compliance
- **Shock & Vibration Resistant**
  Ensures stable connection in rough handling
- **Exceptional Misalignment Tolerance**
  Simplifies connector design, reducing cost of limited use side
- **High Cycle Life**
  Maintains electrical continuity for life of the device
- **Z-Axis Compliance**
  Ideal for blind mate engagement

FIBER OPTIC

- **Two Standard Types**
  Size 16 Butt-Joint and Size 12 Expanded-Beam (EB) termini
- **Low Insertion Loss**
  Transmit high speed signals over longer distances without repeaters
- **Hermaphroditic Contacts (Butt Joint)**
  Same contact on both sides reduces total cost of ownership
- **Multi & Single-Mode Fiber Compatible (EB)**
  Ideal for high band width and voice signals
- **Low Susceptibility to Contamination (EB)**
  Reduced influence from dirt and debris across the connection
- **Immunity & Reliability**
  Resistant to EMI / RFI and crosstalk

COAXIAL

- **50Ω Characteristic Impedance**
  Meets application requirements for most RF interconnects
- **Crimp Termination for RG-405 Flex Cable**
  Faster termination to cable reduces applied costs
- **Low VSWR up to 40 GHz**
  Offers improved signal integrity
- **Magnetic Permeability: 30 x 10⁻⁵μ**
  Prevents image distortion in MRI environment applications
- **Immunity to Shock & Vibration**
  Reliability under harsh environmental conditions
- **Up to 20K Mating Cycles**
  Reduces cost of ownership in high cycle life applications
EXAMPLE CONTACT ARRANGEMENTS
For Fiber Optic, Coax, Spring Probe & Hypertac® Hyperboloid

HG0

- 12x SPRING PROBE CONTACTS

HG3

- 1x FIBER OPTIC CONTACT (Size 16 Butt-Joint or Size 12 Expanded Beam)
- 4x HYPERBOLOID CONTACTS

HG4

- 4x COAX CONTACTS
- 7x HYPERBOLOID CONTACTS
- 1x FIBER OPTIC CONTACT (Size 12 Expanded Beam)
- 85x SPRING PROBE CONTACTS (Custom Mating Face)
- 12x HYPERBOLOID CONTACTS

<table>
<thead>
<tr>
<th>EXAMPLE PART NUMBER</th>
<th>SIZE</th>
<th>TYPE</th>
<th>CONTACT ARRANGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG3P15GG1BF/0404MRG</td>
<td>HG3</td>
<td>Plug</td>
<td>1x Size 16 Butt-Joint FO and 4x Hyperboloid</td>
</tr>
<tr>
<td>HG3E10GG1BF/0404FRANH</td>
<td>HG3</td>
<td>Receptacle</td>
<td>1x Size 16 Butt-Joint FO and 4x Hyperboloid</td>
</tr>
<tr>
<td>HG3P15GG1EB/0404MRG</td>
<td>HG3</td>
<td>Plug</td>
<td>1x Size 12 Expanded Beam FO and 4x Hyperboloid</td>
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<tr>
<td>HG4P16GG4CX/0704MRG</td>
<td>HG4</td>
<td>Plug</td>
<td>4x Coax and 7x Hyperboloid</td>
</tr>
<tr>
<td>HG4E10GG4CX/0704FRANH</td>
<td>HG4</td>
<td>Receptacle</td>
<td>4x Coax and 7x Hyperboloid</td>
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<tr>
<td>HG4P16GG1EB/1204MRG</td>
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<td>Plug</td>
<td>1x Expanded Beam FO and 12x Hyperboloid</td>
</tr>
<tr>
<td>HG4E10GG1EB/1204FRANH</td>
<td>HG4</td>
<td>Receptacle</td>
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</tr>
</tbody>
</table>

Note:
For additional configurations using Fiber Optic, Coax, Spring Probe and/or Hypertac® Hyperboloid contacts, please consult factory.
### SMITHS CONNECTORS

#### PRODUCT LINES

<table>
<thead>
<tr>
<th>Circular</th>
<th>EMI / EMP Filter</th>
<th>Heavy Duty</th>
</tr>
</thead>
</table>
| - Metal and plastic  
- Industrial M12, M23, M40, M58  
- Crimp and solder terminations  
- Push/pull latch mechanism  
- Color coding | - EMI/RFI filtering and transient protection  
- RoHS compliant solderless filter connectors available  
- Filtered adapter for “bolt on” EMI/EMP solutions  
- Filter hybrid capability  
- Circular, ARINC, D-Subminiature, Micro-D | - Modular solution: signal, power, data contacts and fiber optics  
- EMC shielding  
- High pressure up to 35K PSI, 250°C  
- High temperature up to 440°C |

<table>
<thead>
<tr>
<th>High Power</th>
<th>High Speed Copper / Fiber</th>
<th>Mil / Aero Standards</th>
</tr>
</thead>
</table>
| - Single and multi-way  
- Circular and configurable rectangular  
- Power contact up to 1,200 Amps  
- Excellent performance in harsh environments | - Quadrax and Twinax connectors  
- Fiber Optic Butt Joint, Expanded Beam and Floating Fiber Termini available  
- ARINC and MIL-STD contacts | - Standard military interface  
- ARINC 801  
- ARINC interface  
- Custom inserts |

<table>
<thead>
<tr>
<th>Modular / Rectangular</th>
<th>PCB</th>
<th>Spring Probe</th>
</tr>
</thead>
</table>
| - Configurable modules for signal, power, coax, fiber optic and/or pneumatics  
- Guided hardware for blind mating  
- Easy configuration in a single frame  
- For rack & panel and cable applications | - Low, medium and high density board-to-board, cable to board and stacking  
- Signal, power, coax and high speed configurations  
- Numerous termination styles | - Z-axis compliant  
- Blind mate engagement  
- High density  
- Extreme miniaturization  
- High reliability, multi-cycle performance |
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