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## Hypergrip® Flex Connectors

June 2021 | Product Training – Customer presentation

BEYOND  
CONNECTIVITY

# Table of Content

1. Compelling Story
2. Value proposition
3. Applications
4. Product features
5. Alternative contact technologies
6. MR socket contact
7. Tables of comparison
8. How to order
9. Next Best Alternative
10. Marcom Collateral
11. IP protection



## Hypergrip® Series



- Hypergrip® series is a well known and proven high reliability circular connector series specifically designed for the medical industry.
- Throughout the years since the first product launch at the beginning of the 2000s the product has had a good response from the market and Smiths Interconnect was able to establish a recognized product reputation in the marketplace thanks to its reliability, versatility, customer keying system and quick and accurate connections. In addition it was recognized for the finger-proofing to IEC60601, flammability rated to UL94 V0, and compliance with most sterilization requirements.
- Today the market has increased the offering for these type of connectors through similar products with a value aligned price and with performances that reach a satisfactory technical level without exceeding expectations.



**Improved value alignment to the market** for standard cycle life applications with the use of the MR Contact solution

**Reduced inventory and lead times** with patented keying system allowing customers to build connectors with 6 different keying options

**Increased reliability and chemical resistance** (including autoclave, EtO, Sterrad, VHP, and most common cleaning agents) due to engineering-grade polymers

**Reduced risks** to fail device qualification testing due to existing connector qualifications

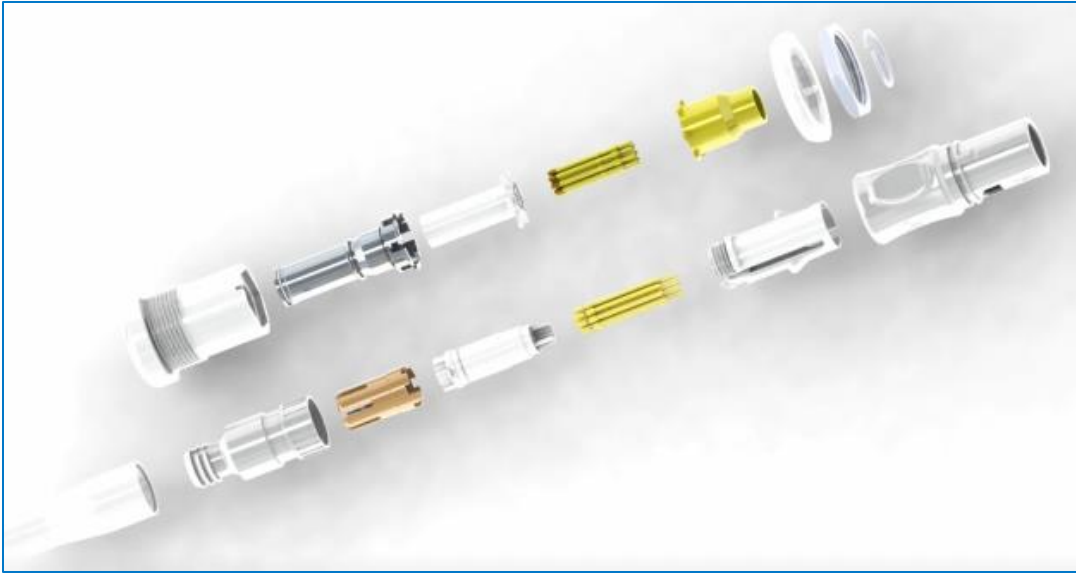
**Improved total cost of ownership** with the use of crimp and poke contacts vs. traditional tested contacts.

**Improved value** for final device due to premium medical look and feel, fool proof mating, easy cleaning, and reduced chances of cut or torn gloves

## Target Applications



- Patient monitoring
- Electrosurgical / Endoscopic tools
- Catheter
- Home healthcare
- Portable therapeutic



## EMI/RFI shielding option available

- Plastic shell with internal shield provides non-conductive touch surfaces for user and patient safety
- Effective up to 3 GHz, 50 dB max attenuation
- Internal shield extends the cable shield through to the system

## Mechanically & Visually Intuitive

- Innovative keying system allows customers to build connectors with 6 different keying options reducing lead time and inventory
- Available in 5 color options for effortless mating recognition

## Aesthetic, User-friendly Design

- Sleek and light-colored body; blends well with medical equipment
- Smooth contours with no sharp edges
  - Easy cleaning
  - Safety – won't cut surgical gloves
- Push / pull ergonomic disconnect for easy, one-hand mating

## Medical Quality

- Sealed when mated
- Flammability: UL94 V-0 rated
- Fingerproof: Meets requirements of IEC 60601-1
- Sterilizable: Autoclave, EtO, VHP, and Sterrad®
- Processing Temperatures up to 185°C
- Integrated strain relief

# HyperGrip® connectors with alternative contact technologies

## Potential Custom Configurations with new insulators:

### Fiber Optic

- **Expanded Beam Fiber Optic**
  - Less chance of degraded optical performance due to dirt, debris, or mechanical vibration
- **Butt Joint (Arinc 801) Fiber Optic**
  - Superior return loss performance on angle polished termini
- **Floating Fiber Optic**
  - Self aligns into standard connector formats

### Spring Probe Technology

- Extreme High Density
- > 10,000 mating cycles

### Coaxial Technology

- 50  $\Omega$  characteristic impedance
- Low VSWR up to 40 GHz



## MR socket contact features



- Screw machined crimp contact
- 0,4 mm diameter
- RoHS compliant:
  - ✓ Beryllium copper clip
  - ✓ Copper-zinc-lead body component
  - ✓ Gold plating over Nickel underplating

- **Tested and qualified according to:**

- ✓ EIA-364-23 for Low Level Contact Resistance (LLCR): target below 12 milliohms - Minimum resistance: 3.03 milliohms, Maximum resistance: 4.63 milliohms
- ✓ EIA-364-05B for Installation force: lower than 20 lbs.
- ✓ EIA-364-37C for Contact Insertion/Extraction force: lower than 0,75 newtons.
- ✓ EIA-364-20E for Dielectric Withstanding Voltage (DWV): no evidence of breakdown or flashover with target of 1125 peak voltage and max leakage current of 2 milliamperes. Hypergrip with HC is also qualified to 1125 peak voltage.



# Hypergrip® with Hyperboloid socket contact vs Hypergrip Flex with MR socket contact



Technical features	Hypergrip	Hypergrip Flex
Mating cycles	>20,000	>2,000
6 different keying options	✓	✓
HG0 size	✓	✗
HG2, HG3, & HG4 sizes	✓	✓
5 color options	✓	✓
IP65 sealed when mated	✓	✓
Push/pull latching design	✓	✓
1 A per contact	✓	✓
Shielded in HG2, HG3, & HG4 sizes	✓	✓

# Hypergrip® with Hyperboloid socket contact vs Hypergrip Flex with MR socket contact



Applications	Hypergrip	Hypergrip Flex
Patient monitoring	✓	✓
Electrosurgical / Endoscopic tools	✓	✓
Catheter	✓	✓
Home healthcare	✓	✓
Portable therapeutic	✓	✓
Imaging	✓	✗

# Hypergrip® Flex | How to order: additions

	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid gray; padding: 2px;">HG</div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; padding: 2px;">G</div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> <div style="border: 1px solid gray; padding: 2px;">R</div> <div style="border: 1px solid gray; width: 15px; height: 15px; margin: 0 5px;"></div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>1</span> <span>2</span> <span>3</span> <span>4</span> <span>5</span> <span>6</span> <span>7</span> <span>8</span> <span>9</span> <span>10</span> <span>11</span> <span>12</span> </div>
<b>1 Series</b>	HG Series
<b>2 Size</b>	HG0 2 HG2 3 HG3 4 HG4
<b>3 Type</b>	P Plug E Receptacle/Panel C Receptacle/Cable (Available on HG2 only)
<b>4 Connector options</b>	1 Sealed 2 shielded (Unsealed) HG2, HG3, HG4 only / plugs "P" and panel receptacles "E" only
<b>5 Strain relief size</b> <small>(Cable diameter ranges)</small>	0 No strain relief (Panel receptacles only) 4 4.50 - 6.50 mm (HG2 only) 6 9.00 - 11.00 mm (HG4 only) (Shielded: 9.50 - 11.00 mm) 1 2.08 - 3.10 mm (HG0 only) 5 7.00 - 9.00 mm (HG3 only)
<b>6 Outer shell color</b> <small>(Fixed)</small>	G Light gray
<b>7 Color coding</b> <small>(Strain relief or panel seal only)</small>	G Light gray (Standard) D Blue R Red V Green Y Yellow
<b>8 Positions</b>	5 HG0 1 2 HG2 1 9 HG3 3 3 HG4
<b>9 Contact diameter</b>	0 3 0.3mm (HG0) 0 4 0.4mm (HG2, HG3, HG4)
<b>10 Contact gender</b>	F Female sockets (Receptacles only) M Male pins (Plugs only) C MR contact Female sockets <small>(Receptacles only)</small>
<b>11 Termination</b> <small>(Fixed)</small>	R Crimp/Solder (26-28 AWG) <small>(Contacts are shipped unloaded, may be crimped or soldered, then inserted into insulator. For more information, please see Assembly Instructions.)</small>
<b>12 Plating</b> <small>(Pins: Gold over nickel Sockets: Gold over nickel on contact surfaces, gold flash on terminations)</small>	G HG2, HG3, HG4 pins H HGO pins A N H HG2, HG3, HG4 HC sockets A H HGO HC sockets I HG2, HG3, HG4 MR sockets

## 10 Contact gender

F Female sockets (Receptacles only) M Male pins (Plugs only) C MR contact Female sockets  
(Receptacles only)

## 12 Plating

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


G HG2, HG3, HG4 pins H HGO pins  
A N H HG2, HG3, HG4 HC sockets A H HGO HC sockets I HG2, HG3, HG4 MR sockets

Features	Benefits	Smiths Interconnect HG	Smiths Interconnect HG Flex	Next Best Alternative
• <b>Customer keyability</b>	Easily keyed / prevents mismatching – 1 part / 6 keys	✓	✓	✗ <i>(must buy differently keyed parts)</i>
• <b>Long Cycle life</b>	Provides up to 2k connector mates and <12 mΩ resistance	✓ <i>(High 20k mates)</i>	✓ <i>(Medium 2k mates)</i>	✓ <i>(Medium 2k mates)</i>
• <b>Contacts shipped unloaded</b>	Easier termination – reduced cost of ownership	✓	✓	✗ <i>(solder cup nest is std)</i>
• <b>Shielding option available in plastic housing (HG2,3,4)</b>	Protection against EMI/RFI	✓	✓	✗ <i>(must go to metal version)</i>
• <b>Push/Pull latching</b>	Quick connect / disconnect – simple one-hand mate / unmate	✓	✓	✓
• <b>Color coding</b>	Visually intuitive mating	✓	✓	✓

# Hypergrip® Flex - Marketing Collateral and samples

## Website Product Page with:

- Updated Product Brochure
- New Qualification Test Report
- New product animations



### HyperGrip® Series

HyperGrip is a circular plastic, user-configurable, color coded connector with push/pull latching design allowing for one-hand disconnect. HyperGrip is designed to meet medical industry requirements such as finger-proofing to IEC60601, flammability rated to UL94 V0, and is compatible with most sterilization requirements.

[PRODUCT DETAILS](#) [Download Brochure](#)



- **Press Release available for media starting end of June 2021**
- **Sample package in distribution Mid-July 2021**

### Smiths Interconnect expands its product offering for medical applications

[Circular](#) [Patient Monitoring](#) [Portable & Wearable Devices](#) [Home Health Monitors](#) [Electrophysiology Catheters](#)

[Hyperboloid](#)

Jun 28 2021

Hypergrip® Flex connectors offer a cost-effective design for standard cycle life applications

Smiths Interconnect announced today the extension of its Hypergrip® connector series for the medical market with the addition of the new Hypergrip® Flex connectors.



Hypergrip®Flex

Thanks to its recognized market successes the Hypergrip series has established a strong reputation of reliability, versatility, and ease-of-use.

# Hypergrip Flex - Website product page and related documents

Home > Products > Connectors > Circular > [HyperGrip® Series](#)


<https://www.smithsinterconnect.com/products/connectors/circular/hypergrip%C2%AE-series/>

## HyperGrip® Series

High Reliability Medical Connectors

HyperGrip is a circular plastic, user-configurable, color coded connector with push/pull latching design allowing for one-hand disconnect. HyperGrip is designed to meet medical industry requirements such as finger-proofing to IEC60601, flammability rated to UL94 V0, and is compatible with most sterilization requirements.

[Request a Quote](#) [Download Brochure](#)




[Features & Benefits](#) [Overview](#) [Documents & Literature](#) [Related Products](#) [Related News](#)

### Features & Benefits

- 5, 12, 19 and 33 contact positions
- 1 A per contact
- IP65 sealed when mated
- EM/RFI shielding option
- Push/pull latching design
- Ideal for disposable applications
- 6 Keyable positions
- 5 color options

[Request a Quote](#) [Technical Specification](#) [Request More Info](#) [3D Configure](#) [Distributor Stock Check](#)



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# HyperGrip® Series

High Reliability Medical Circular Connectors



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## Qualification Test Report

**HYPERGRIP SERIES – Qualification of MR contact in HG4 Receptacle Connector**

June 2nd, 2021



HYPERGRIP SERIES - MR contact - Qualification Test Report - 06/02/2021

## **US7,326,091: US Patent, active**

## **US7,661,995: US Patent, active**

Claim: A connector for electrical or optical conduits that provides a field configurable keying of the insulator plugs relative to each other and relative to the connector casings. A separate relative keying means is included that is separate from the case keying or locating mechanism. The connector also utilizes a retention means for example, a one-way snap apron, to retain the insulator within the receptacle case.

## **D596,127: US Design Patent, active**

Claim: The ornamental design for an electrical connector, as shown and described.

## **US7,938,670: US Patent, active**

Claim: A method of mounting a connector assembly to an equipment case, the connector assembly connecting together a first conduit and a second conduit, the method including: inserting a receptacle insulator into a receptacle case to form a receptacle assembly of a female receptacle connector of the connector assembly; retaining the receptacle insulator within the receptacle case using a retainer that axially positions the receptacle insulator in the receptacle case using a snap fit connection; passing a plurality of leads of the first conduit into corresponding bores in the receptacle insulator; inserting an end portion of the receptacle assembly into an opening in the equipment case; and securing the receptacle assembly to the equipment case.

## **D615,932: US Design Patent, active**

## **D616,825: US Design Patent, active**

Claim: The ornamental design for an electrical connector, as shown and described.



Hypergrip is a registered US trademark

**more > [keiconn.com/featuredproducts.php](https://keiconn.com/featuredproducts.php)**



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