



### WIDE RANGE

- Physical contact (PC) and expanded beam (EB) interface styles
- Suitable for use across multiple applications and markets, including as military ground, military and commercial aerospace, C5ISR and marine

### EASE OF USE

- Rear-removable optical termini
- Removable front inserts for ease of access to optical termini—helping to support simple, effective cleaning and maintenance of termini
- Lens protected EB inserts and termini help protect the fiber core behind the lens and help optimize the performance of the optical link

### PRECISION CONNECTIONS

- Dowel pin alignment
- Standard and tight-tolerance keying

### RUGGEDNESS

- Environmental sealing
- Anti-vibration coupling mechanisms

## Fiber Optic Connectors



### 38999 Series III Style

As a trusted leader in optical technology with over 40 years of experience in supplying optical solutions for harsh environments, TE offers high-performance 38999-style connector solutions that are also easy to maintain in the field. Our products are designed to operate reliably in harsh and challenging environments, and the company's technical specialists have an in-depth understanding of application requirements.

- **MC801 Connectors:** Industry-standard 1.25-mm ARINC 801 termini  
Up to 32 fibers
- **MC3 Mk II Connectors:** DEUTSCH 2.5-mm termini  
5, 8, 12 fibers
- **MC4 Connectors:** DEUTSCH 2.5-mm termini  
2 fibers in a size 9 shell
- **MC5 Connectors:** DEUTSCH 1.25-mm termini  
1, 2, 4, 6, 8, 10, 18, 24, 30 fibers
- **MC6 Connectors:** Single MT ferrule in size 11 shell  
2, 4, 8, 12, 24, 48 channels
- **AviMT Connectors:** Four MT ferrules in size 21 shell  
Up to 96 fibers
- **Qualified Connectors:** MIL-T- 29504/4 and /5 termini  
Fit standard size 16 cavities
- **PRO BEAM Connectors:** Use PRO BEAM EB inserts  
1, 2, 4, 8 fibers in size 11 or 15 shell
- **EB16 Termini:** EB termini  
Fit standard size 16 cavities



## Physical Contact (PC) Connectors

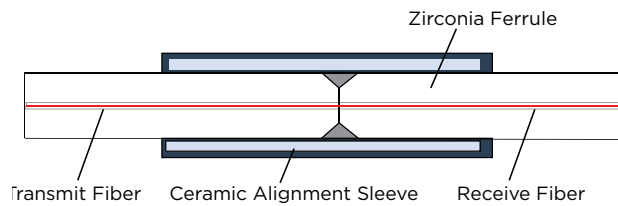
A PC connection uses optical ferrules that are mated within an alignment sleeve and holder to help ensure minimal optical losses and repeatable alignment. The termini can be incorporated into standard circular and rectangular connector to offer multi-channel solutions. PC connections offer

- Low insertion loss
- Low reflection
- High density

While most PC connectors use a ceramic ferrule for a single fiber, the MT ferrule is a multifiber variation typically holding 12 or 24 fibers.

PC solutions offer a higher optical density (Number of channels) and can be used in conjunction with EB interconnects to minimize system losses.

The majority of termini solutions available from TE are spring loaded to help prevent optical discontinuities under shock and vibration.



## Expanded Beam (EB) Connectors

EB connectors expand and re-focus light at the fiber end faces and allow an air gap in the optical pathway. The EB concept uses optical lenses (typically a 3-mm ball lens for dedicated inserts or 1.25-mm lens for EB16 termini) to expand and collimate the beam emitted from the launch fiber.

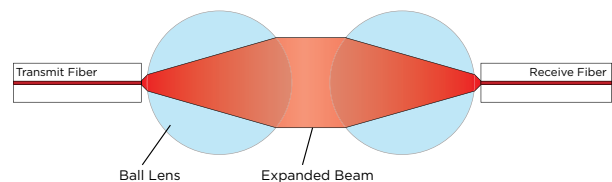
The expanded beam remains collimated across the mechanical interface until the receiving lens focuses the beam onto the receiving fiber.

Standard channel counts for EB-specific connectors are 1, 2, 4 and 8. Since these connectors are used in rugged and tactical environments, they are usually terminated on robust ruggedized, metal-tubed, and avionics/flight-grade cable.

The EB16 optical termini employs the same technology from the well-established dedicated inserts into a termini that can be used in 38999 Series III size 16 cavities to allow for flexibility and higher fiber counts.

The absence of physical fiber contact makes EB connectors very useful in demanding environments. They offer:

- Sealed optical interface
- High vibration and shock resistance
- High mating-cycle durability
- Tolerance to dirt and debris
- Easy cleaning



## Comparison of PC and EB Connector Technologies

Performance Criteria	PC	EB
Insertion Loss	★★★★	★★
Return Loss (SM)	★★★★	★★
Return Loss (SM)—Unmated	★	★★
Lateral Connector Misalignment	★	★★★★
Connector Angular Tilt	★★★★	★
Mating Durability	★★★	★★★★
Water Exposure	★★★	★★

Performance Criteria	PC	EB
Dust Exposure	★★★★	★★★
Vibration Susceptibility	★★	★★★
Repair	★★	★★
Cleanability	★★	★★★
Wear	★	★★★
Wavelength Range	★★★★	★★



### RELIABLE

- Genderless pull-proof contact design
- Precise alignment of optical interface
- Spring-loaded termini maintain optical contact during shock, vibration, and thermal extremes

### EASY TO USE

- Removable alignment insert for easy inspection and cleaning
- Field terminable
- Uses standard size 16 insertion/extraction tools

### HIGH PERFORMANCE

- Low loss
- PC and APC end face finishes for multimode and single mode applications
- Helps reduce overall system losses

### FLEXIBLE

- Eight shell sizes for 2 to 32 fibers
- Range of shell materials and finishes to help meet various application demands

### PROVEN PEDIGREE

- Widely used termini in aerospace and military applications
- Meets ARINC 801.3 requirements
- MIL-DTL-38999 Series III-style shells
- Use widely available 38999 backshells and accessories

### COMPATIBLE

- Fully intermateable with other qualified ARINC 801/38999 connectors

## MC801 Connectors



### 38999 Series III-Style Fiber Optic Connectors

The MC801 connector combines the high performance of ARINC 801 optical termini with the convenience of a familiar D38999 Series III connector style.

The connector's threaded coupling and the termini's spring-loaded design make an excellent solution for high-vibration applications. The compact 1.25-mm ferrule provides a high-density solution—with up to 32 fibers in a size 25 shell. The 38999-style connector offers scoop-proof mating, a wide selection of materials and finishes, six keying options, and compatibility with standard 38999 backshells and hardware.

Optical alignment is achieved with a thermoplastic insert containing precision zirconia alignment sleeves. Inserts, which are available for use with either the plug or receptacle, are removable to simplify cleaning. Stainless steel dowel pins also aid alignment during mating.



## MC801 Connectors

### 38999 Series III-Style Fiber Optic Connectors

## Specifications

### MATERIALS

- **Shell:** Aluminum, stainless steel, marine bronze, and composite
- **Finishes:** Nickel, black zinc nickel, passivated, olive drab cadmium
- **Insert and Alignment Sleeve Holder:** Thermoplastic
- **Alignment Dowel Pins:** Stainless steel
- **Alignment Sleeve:** Zirconia
- **Ferrule:** Zirconia
- **Terminus Body and Crimp Sleeve:** Nickel-plated copper
- **Spring:** Stainless steel

### OPTICAL PERFORMANCE

- **Insertion Loss:** 0.10 dB multimode  
0.20 dB single mode (APC finish)
- **Return Loss:** Up to -65 dB (single mode, APC finish)
- **Insertion loss tested against a reference patchcord:** IEC 61300-3-4 Method B; also described in ARINC 805 Return Loss: IEC 61300-3-6; also described in ARINC 805

### ENVIRONMENTAL/MECHANICAL PERFORMANCE

- **Temperature Range:** -65°C to +85°C
- **Durability:** 100 mating cycles
- **Random Vibration:** No discontinuities >1 dB in excess of 1  $\mu$ s (TIA/EIA-455-32 Test Condition B)
- **Mechanical Shock:** No discontinuities >1 dB in excess of 1  $\mu$ s (100 g, 6 ms half-sine pulse)
- **Altitude Immersion:** 50,000 ft. (15,200 m)

### SPECIFICATIONS

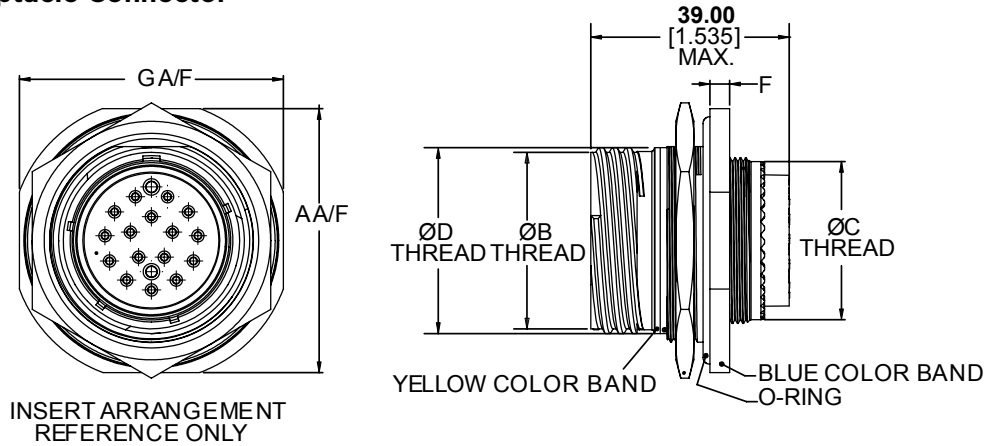
- **Product Specification:** D108-32105
- **Qualification Test Reports:** D501-32031 (Multimode)  
D501-32105 (Single Mode)



## MC801 Connectors

### 38999 Series III-Style Fiber Optic Connectors

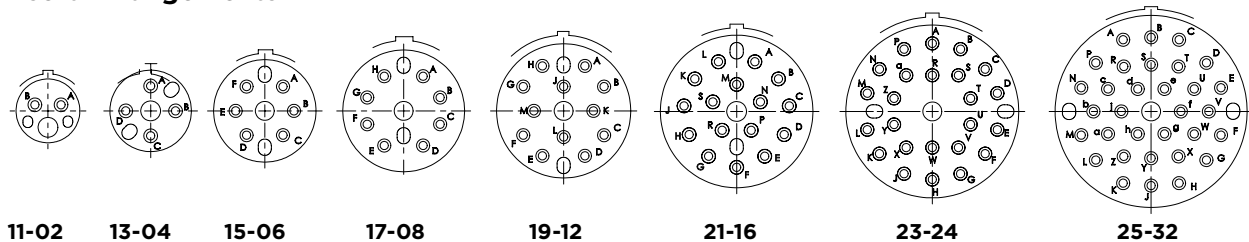
#### Jam Nut Receptacle Connector



Insert	ØA	B Thread Stub 60° Mod 1P-3L Class 2A (in)	ØC	ØD	ØE	F	G
<b>11-02</b>	<b>31.80</b> 1.252	0.7500	M15 x 1.0	M20 x 1.0	<b>34.90</b> 1.374		<b>26.75</b> 1.053
<b>13-04</b>	<b>34.90</b> 1.374	0.8750	M18 x 1.0	M25 x 1.0	<b>38.10</b> 1.500	<b>2.84</b> 0.112	<b>31.75</b> 1.250
<b>15-06</b>	<b>38.10</b> 1.500	1.0000	M22 x 1.0	M28 x 1.0	<b>41.30</b> 1.626		<b>35.74</b> 1.407
<b>17-08</b>	<b>41.30</b> 1.626	1.1875	M25 x 1.0	M32 x 1.0	<b>44.50</b> 1.752		<b>36.75</b> 1.447
<b>19-12</b>	<b>46.00</b> 1.811	1.2500	M28 x 1.0	M35 x 1.0	<b>49.20</b> 1.937		<b>40.74</b> 1.604
<b>21-16</b>	<b>49.20</b> 1.937	1.3750	M31 x 1.0	M38 x 1.0	<b>52.40</b> 2.063	<b>3.61</b> 0.143	<b>45.75</b> 1.801
<b>23-24</b>	<b>52.40</b> 2.063	1.5000	M34 x 1.0	M41 x 1.0	<b>55.60</b> 2.189		<b>49.76</b> 1.959
<b>25-32</b>	<b>55.60</b> 2.189	1.6250	M37 x 1.0	M44 x 1.0	<b>58.70</b> 2.311		<b>50.98</b> 2.007

Millimeters Inches

#### Insert Arrangements

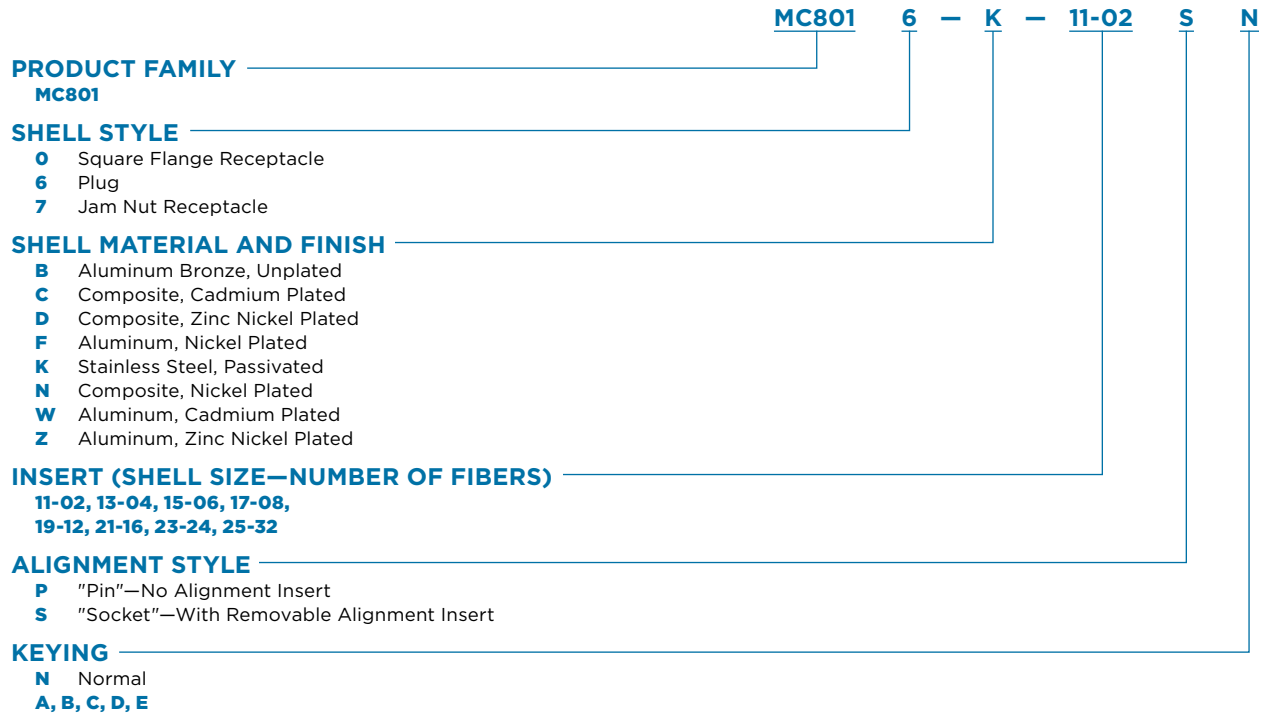




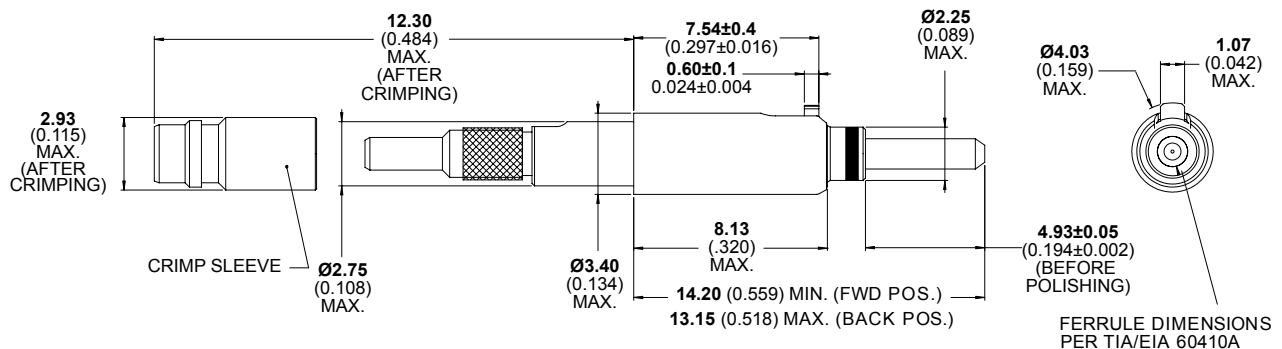
## MC801 Connectors

### 38999 Series III-Style Fiber Optic Connectors

#### Part Number/Ordering Information



#### ARINC 801 Termini



Fiber Type	Part No.			
	Tight Jacket		Loose Jacket	
	1.8 mm Cable	900µm Buffer Cable	1.8 mm Cable	900 µm Buffer Cable
<b>Single Mode</b>	459266-126S-02-1	459266-126S-00-1	459265-126S-02-1	459265-126S-00-1
<b>Single Mode, APC</b>	459266-125A-02-1	459266-125A-00-1	459265-125A-02-1	459265-125A-00-1
<b>Single Mode</b>	459266-126M-02-1	459266-126M-00-1	459265-126M-02-1	459265-126M-00-1

Note: Customer drawings, models, additional product information, and instruction sheets are available at [te.com](http://te.com).



### EASY TO USE

- Color band indicates full mating
- Insert-to-insert keying assists precision alignment
- Individual rear insertable/removable optical contacts enable easy assembly
- Removable alignment sleeve for easy cleaning
- Simple termination and tooling

### RUGGED RELIABILITY

- Spring loaded optical contacts maintain physical contact under severe shock or vibration conditions
- Precision 2.5 mm zirconia ferrules and alignment
- Excellent repeatable optical performance
- MIL-DTL-38999 Series III anti-vibration coupling mechanism and tri-start thread

### VERSATILE

- Backshells and adaptors available for most single and multifiber cable
- Alternative shell keyway orientations prevent mismatching
- Dynamic O-ring seal between mating shells for water submersion capability

## DEUTSCH MC3 MkII Fiber Optic Connectors



### MIL-DTL-38999 Series III Style Connectors

The DEUTSCH MC3 MkII Series ruggedized connectors incorporate individual rear-insertable optical contacts. The removable socket insert helps support easy access to the optical faces to help simplify cleaning and maintenance.

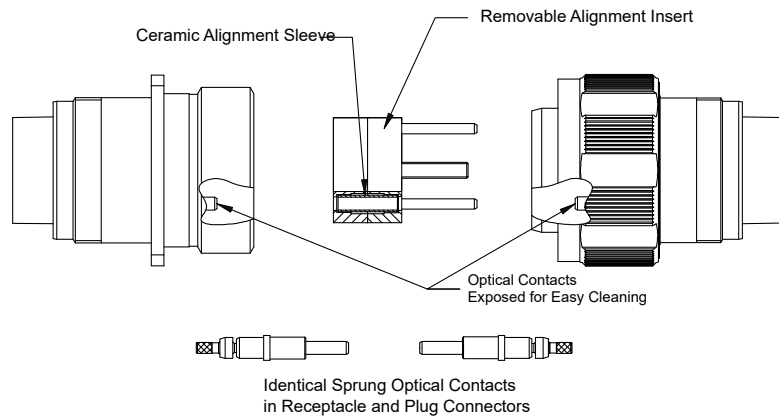
The MC3 MkII Series uses a removable alignment insert for easy cleaning (can be specified in both plug and receptacle shells), and is suitable for use with most single mode and multimode optical fibers with core diameters from 5 to 200  $\mu\text{m}$ . 5, 8, 12 optical channels are accommodated in the MIL-DTL-38999 Series III-style connector shells.

Featuring spring-loaded optical contacts, tri-start threads and anti-vibration couplings, MC3 MkII connectors are a rugged choice for use in many severe environments and tough application conditions.



## DEUTSCH MC3 MkII Fiber Optic Connectors

### MIL-DTL-38999 Series III Style Connectors



## Specifications

### FIBER TYPE

- **Channels:** 5, 8 and 12 optical channels
- **Cable Size:** 1.5 mm to 3.0 mm, outer jacket

### MATERIALS

- **Shell:** Aluminum, stainless steel, marine bronze
- **Finishes:** Nickel, olive drab cadmium, or black zinc nickel (aluminum shell)
- **Contact Body:** Arcap, Titanium
- **Ferrule:** Zirconia
- **Alignment Sleeve:** Zirconia
- **Alignment Pin:**
- **Seals:** Fluorosilicone or nitrile

### OPTICAL PERFORMANCE

- **Insertion Loss:** 0.25 dB typical\*
- **Return Loss:** 40 dB typical\*
- **Repeatability:** 0.1 dB with 50/125- $\mu$ m fiber

\*Fiber and polishing process dependent.

### ENVIRONMENTAL

- **Temperature Range:** -65°C to +155°C
- **Fluid Resistance:** Fluid immersion per EIA 364.10, including resistance to
  - MIL-PRF-5606: Hydraulic fluid
  - MIL-DTL-83133: JP-8 aviation fuel
  - MIL-PRF-7808: Lubricating oil
  - MIL-PRF-23699: Lubricating oil
  - MIL-A-8243: Deicing/defrosting fluid
  - MIL-C-25769: Aircraft cleaning compound
  - MIL-PRF-87937: Aircraft cleaning compound
  - MIL-G-3056: Gasoline
- **Salt Spray:** 48 hours (Nickel finish)  
500 hours (Cadmium finish)
- **Thermal Cycling:** -65° to 150°C





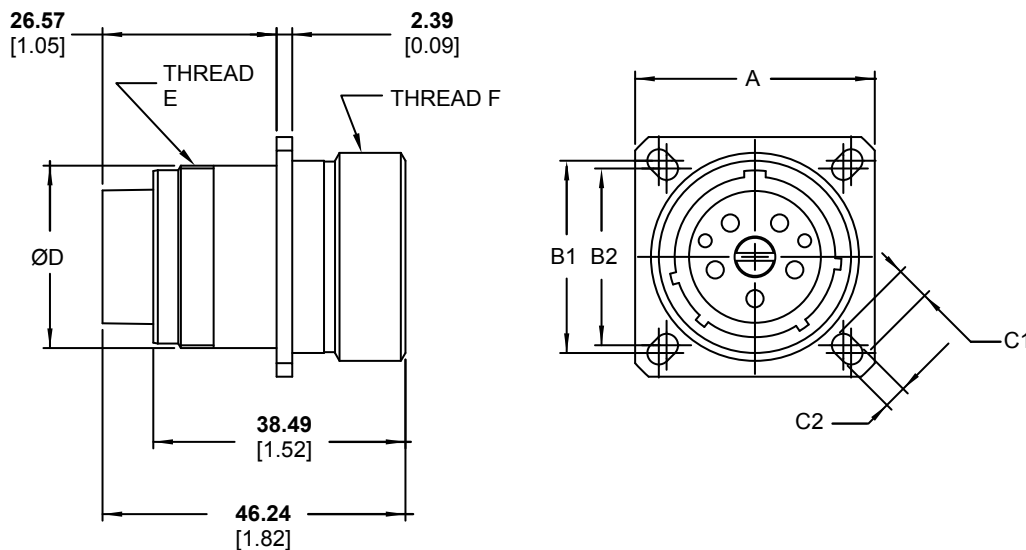
## DEUTSCH MC3 MkII Fiber Optic Connectors

### MIL-DTL-38999 Series III Style Connectors

#### MECHANICAL

- **Sine Vibration:** 5 to 3000 Hz, 30 g
- **Bump:** 4000 bumps, 40 g
- **Random Vibration:** Up to 41.7 g for 16 hr. at 175° C  
Up to 50 g for 16 hr. at ambient temperature
- **Shock:** 300 g, 3 ms in the 3 axes
- **Durability:** 500 mating cycles
- **Thermal Shock:** 10 cycles, 4°C max. to 90°C min.

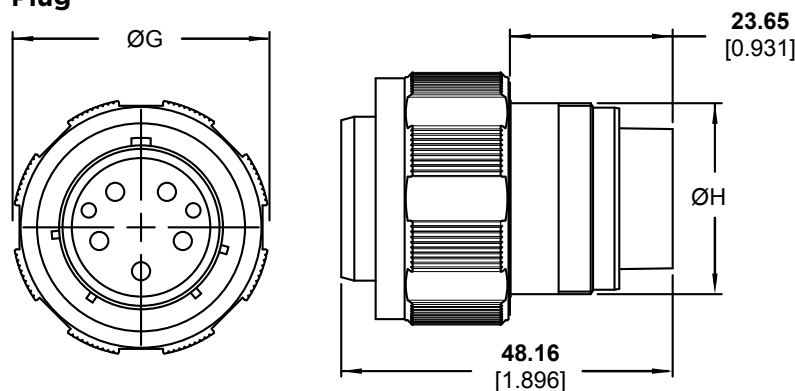
#### Square Flange Receptacle



Size/ Arrangement	A	B1	B2	C1	C2	D	Thread E	Thread F
<b>19-5</b>	<b>36.58</b> 1.440	<b>29.35</b> 1.156	<b>26.98</b> 1.062	<b>5.00</b> 0.197	<b>3.50</b> 0.138	<b>27.84</b> 1.096	M28 x 1.0	<b>31.75</b> 1.250
<b>23-8</b>	42.98 1.692	<b>34.92</b> 1.375	<b>31.75</b> 1.250	<b>6.23</b> 0.245	<b>4.00</b> 0.157	<b>33.84</b> 1.332	M34 x 1.0	<b>38.11</b> 1.500
<b>25-12</b>	46.02 1.812	<b>38.11</b> 1.500	<b>34.92</b> 1.375	<b>6.23</b> 0.245	<b>4.00</b> 0.157	<b>36.84</b> 1.450	M37 x 1.0	<b>41.28</b> 1.625

Millimeters Inches

#### Plug



Size/ Arrangement	ØG
<b>19-5</b>	<b>37.92</b> 1.493
<b>23-8</b>	<b>44.12</b> 1.737
<b>25-12</b>	<b>47.35</b> 1.864

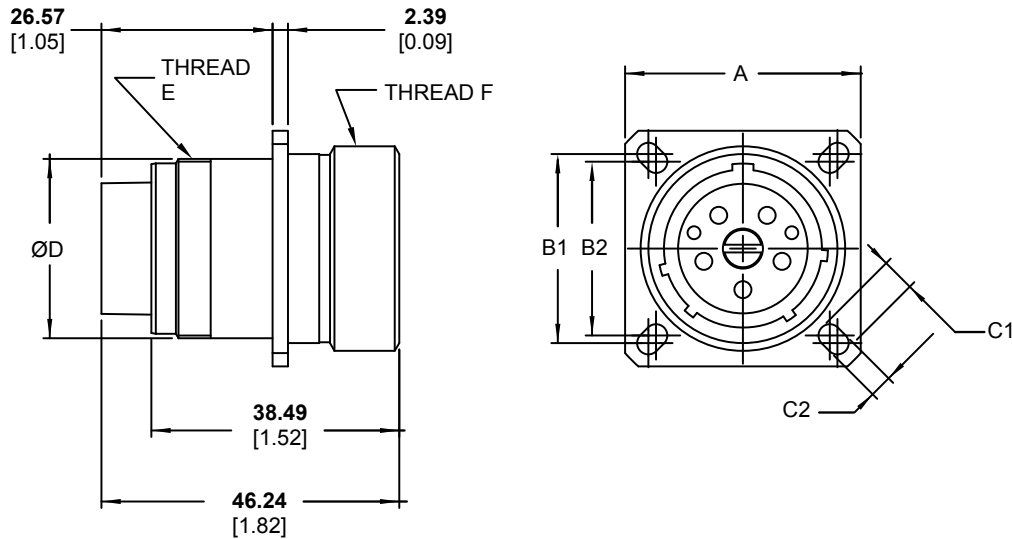
Millimeters Inches



## DEUTSCH MC3 MkII Fiber Optic Connectors

### MIL-DTL-38999 Series III Style Connectors

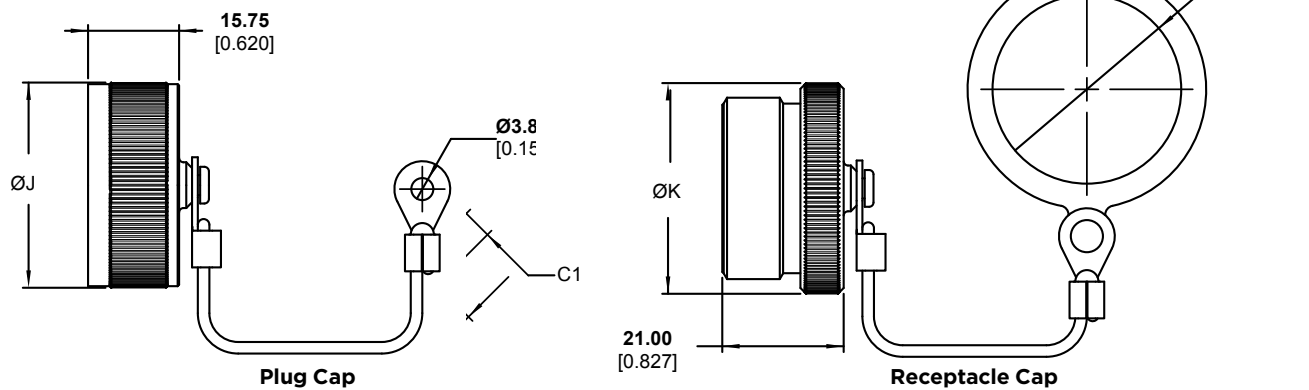
#### Dummy Receptacle



Size/ Arrangement	A	B1	B2	C1	C2
<b>19-5</b>	<b>36.58</b> 1.440	<b>29.35</b> 1.156	<b>26.98</b> 1.062	<b>5.00</b> 0.197	<b>3.50</b> 0.138
<b>23-8</b>	<b>42.98</b> 1.692	<b>34.92</b> 1.375	<b>31.75</b> 1.250	<b>6.23</b> 0.245	<b>4.00</b> 0.157
<b>25-12</b>	<b>46.02</b> 1.812	<b>38.11</b> 1.500	<b>34.92</b> 1.375	<b>6.23</b> 0.245	<b>4.00</b> 0.157

Millimeters Inches

#### Procaps



Size/ Arrangement	ØH	ØJ	ØK	ØL
<b>19-5</b>	<b>27.7</b> 1.091	<b>35.4</b> 1.394	<b>36.92</b> 1.454	<b>29.46</b> 1.160
<b>23-8</b>	<b>33.7</b> 1.327	<b>41.75</b> 1.664	<b>43.12</b> 1.698	<b>35.81</b> 1.410
<b>25-12</b>	<b>36.7</b> 1.445	<b>44.93</b> 1.769	<b>46.35</b> 1.825	<b>38.99</b> 1.535

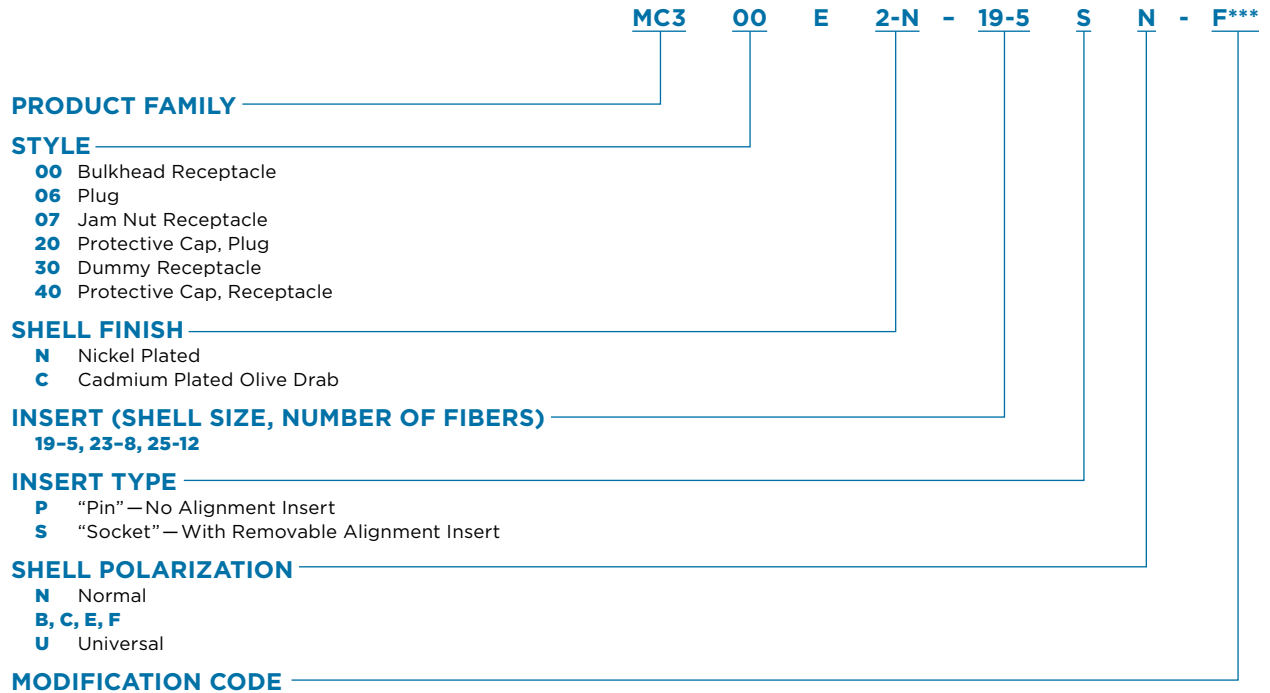
Millimeters Inches



## DEUTSCH MC3 MkII Fiber Optic Connectors

### MIL-DTL-38999 Series III Style Connectors

#### Ordering Information





## DEUTSCH MC3 MkII Fiber Optic Connectors

### MIL-DTL-38999 Series III Style Connectors

#### Optical Termini (ordered separately)

Optical termini are supplied with a profile-formed optical end face and are available for single-mode or multimode fibers. Contacts are available in either sprung or rigid versions, depending upon application (rigid contacts should be used in bulkhead receptacles only).



**Spring-Loaded Type**  
**455500**



**Rigid Type**  
**455494**

(Optional for bulkhead receptacles only)

#### Ordering Information

**455500 - 128 - 1-01**

#### TYPE

- 455500** Spring-Loaded Termini
- 455595** Rigid Termini (Bulkhead Receptacles Only)

#### FIBER HOLE SIZE

- 126**
- 127**
- 128**
- 145**
- 162**
- 176**
- 232**
- 283**
- 1MM** Plastic optical fiber

#### CABLE TYPE

- Tight Buffered**
- 1-00** 900 tight buffered
- Tight Jacketed**
- 1-01** 2.5 mm OD
- 1-02** 1.8 mm OD
- 1-03** 3.0 mm OD
- 1-04** 2.1 mm OD
- 00** 2.2 mm OD (1MM Fiber Size Only)

#### Crimp Sleeves and Crimp Dies

Cable OD	Sleeve Part No.	Crimp Dies Part No.	A/F
900 μm Tight Buffer	—	455608	<b>1.64/1.74</b> 0.065/0.069
2.5	455610-01	455608	<b>3.10/3.12</b> 0.122 / 0.123
1.8	455610-02	455608	<b>3.10/3.12</b> 0.122/0.123
2.0	455610-03	455608	<b>3.56/3.48</b> 0.140/0.137
2.1	455610-04	455608	<b>3.10/3.12</b> 0.122/0.123

Millimeters Inches



### SPACE SAVING

- Two optical channels in a size 9 shell

### HIGH PERFORMANCE

- Compact 2.5-mm precision zirconia ceramic ferrules
- Lightweight aluminum shells
- MIL-DTL-38999 Series III anti-vibration coupling mechanism and tri-start thread

### EASY TO USE

- Simple termination process and tooling
- Purpose designed inserts, and insert-to-insert keying aid precision alignment
- Identical spring loaded optical contacts help maintain contact under severe shock and vibration

## DEUTSCH MC4 Duplex Connectors



### MIL-DTL-38999 Style Series III Connectors

The MC4 Duplex optical fiber connector is based upon shell size 9 Mil-C-38999 Series III making this an extremely compact environmentally sealed 2-way connector. The MC4 is suitable for use with most multimode fibers with core diameters of 50 to 200  $\mu\text{m}$ . Simplex and duplex cable constructions can be accommodated with suitable connector backshells.

Precision ceramic ferrules and alignment sleeves help support optimum performance and reliability over the service life of the connector.

The optical termini are spring loaded in both the plug and receptacle shells. This helps provide an axial load equalization so that the contact can be maintained even when the connector is subjected to vibration levels in excess of 30 g.

The coupling nut has a built in antivibration clicker mechanism to help prevent inadvertent uncoupling under adverse vibration conditions.



## DEUTSCH MC4 Duplex Connectors

### MIL-DTL-38999 Style Series III Connectors

## Specifications

### OPTICAL

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- **Attenuation:** Less than 0.4 dB (50/125  $\mu\text{m}$ )
- **Repeatability:** Better than 0.2 dB
- **Fiber Types:** x/125, 100/140, 200/280  $\mu\text{m}$
- **Cable Types:**
  - 2.5 mm tight jacketed
  - 4.5 mm duplex
  - For other cable sizes consult TE

### MATERIALS

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- **Shell:** Aluminum alloy, nickel plated
- **Ferrule:** Zirconia
- **Alignment Sleeve:** Zirconia
- **Seals:** Fluorosilicone
- **Backshell:** Aluminum alloy, nickel plated

### MECHANICAL

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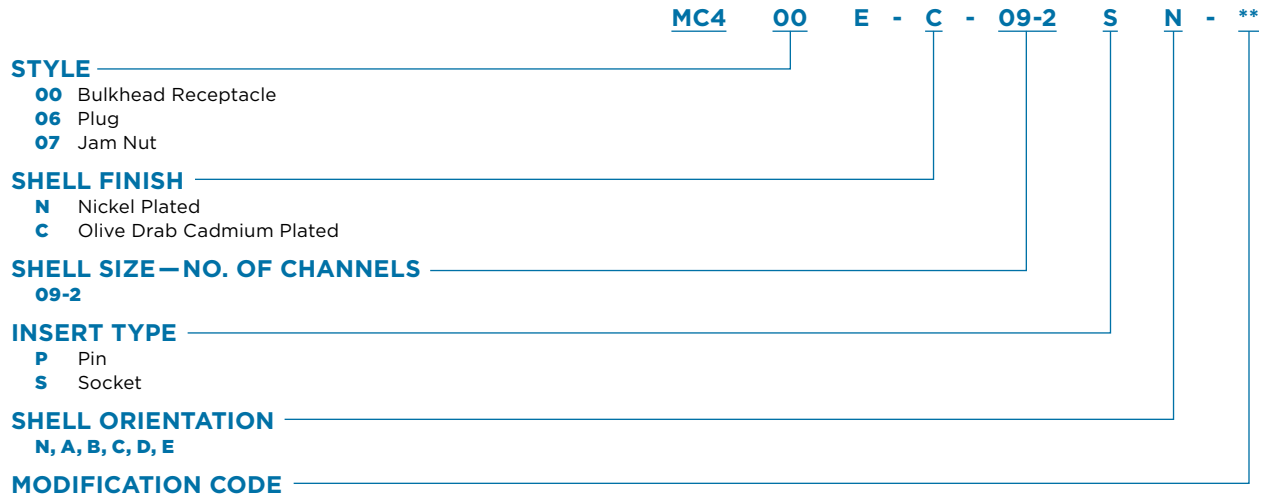
- **Temperature Range:** -65°C to +155°C  
(Cable and epoxy dependent)
- **Durability:** 500 mating cycles



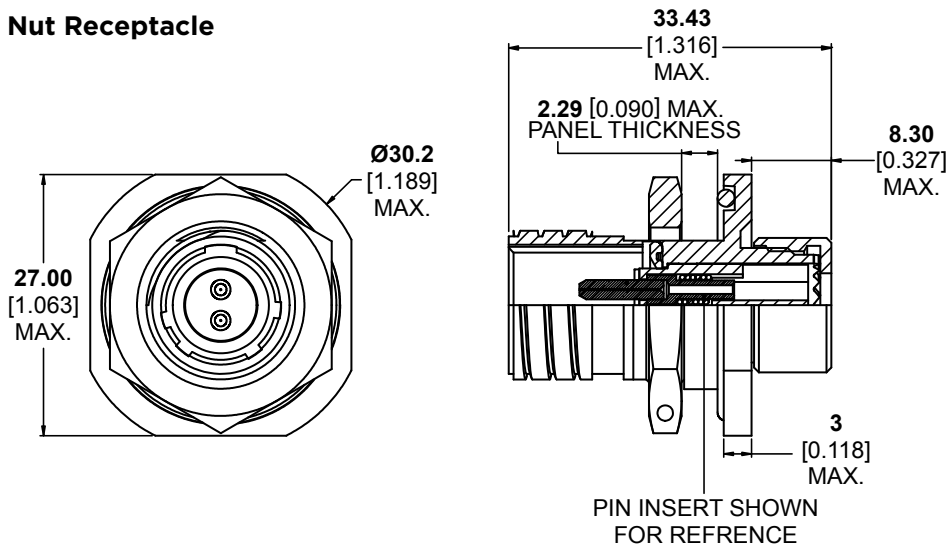
## DEUTSCH MC4 Duplex Connectors

### MIL-DTL-38999 Style Series III Connectors

#### Part Numbering System



#### Jam Nut Receptacle

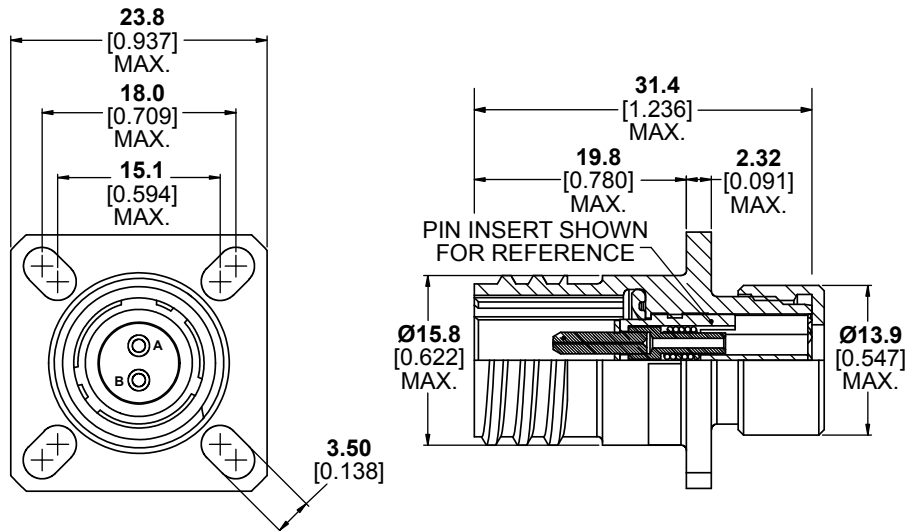




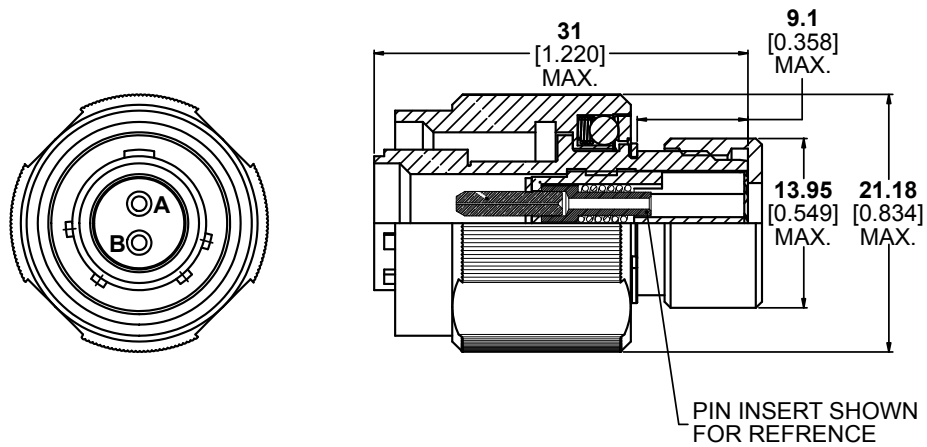
## DEUTSCH MC4 Duplex Connectors

### MIL-DTL-38999 Style Series III Connectors

#### Square Flange Receptacle



#### Plug







## DEUTSCH MC4 Duplex Connectors

### MIL-DTL-38999 Style Series III Connectors

#### Protective Cap for Receptacle Connectors

#### Part Numbering System

**MC420E - N - 09**

#### BASIC PART NUMBER

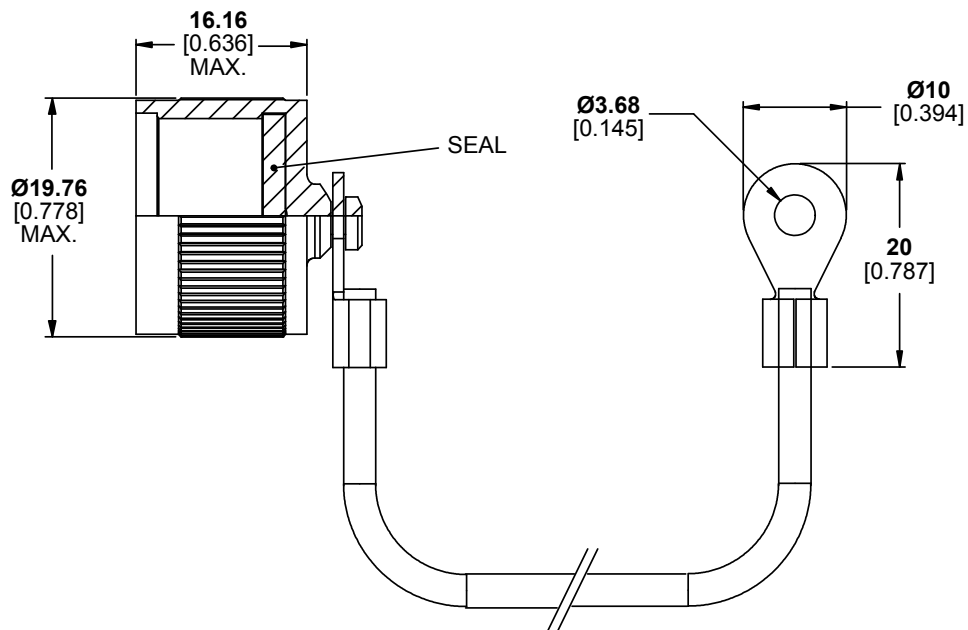
**MC440E** Pro Cap for Receptacle Connectors

#### MATERIAL/FINISH

- S** Stainless Steel
- N** Aluminum, Nickel Plated
- C** Aluminum, Cadmium Plated

#### SHELL SIZE

**09**





## DEUTSCH MC4 Duplex Connectors

### MIL-DTL-38999 Style Series III Connectors

#### Protective Caps for Plug Connectors

#### Part Numbering System

**MC420E - N - 09 - N**

**BASIC PART NUMBER**

**MC420E** Pro Cap for Plug Connectors

**KEYING**

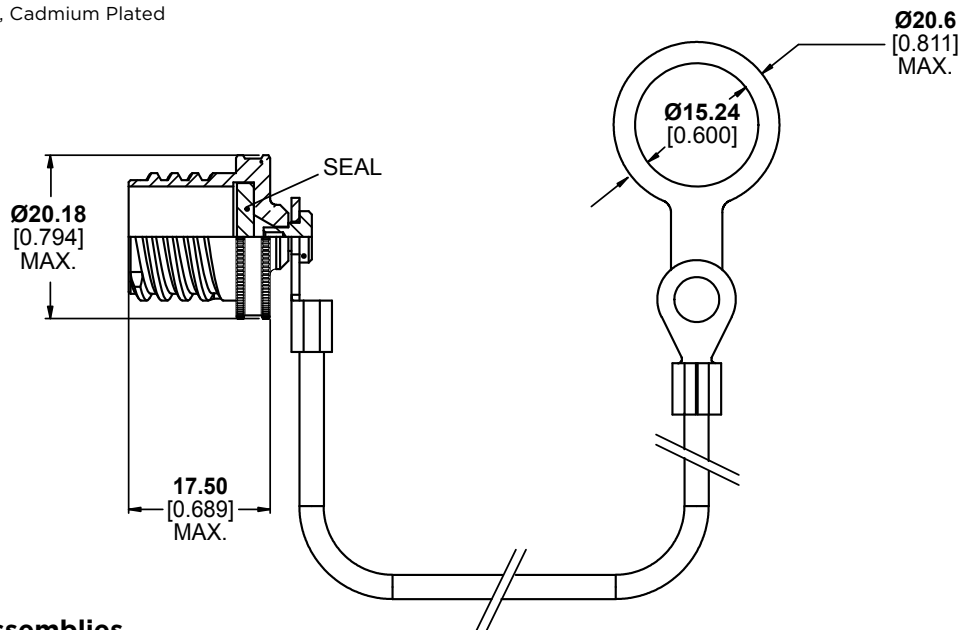
**N, A, B, C, D, E**

**SHELL SIZE**

**09**

**MATERIAL/FINISH**

- S** Stainless Steel
- N** Aluminum, Nickel Plated
- C** Aluminum, Cadmium Plated



#### Back End Assemblies



**HIGH PERFORMANCE**

- Compact 1.25 mm precision zirconia ceramic ferrules
- Composite lightweight, high strength, corrosion resistant connector shells
- MIL-DTL-38999 Series III anti-vibration coupling mechanism and tri-start thread

**EASY TO USE**

- Simple termination process and tooling
- Purpose designed inserts, and insert-to-insert keying aid precision alignment
- Identical spring loaded optical contacts help maintain contact under severe shock and vibration

**VERSATILE**

- Extensive range: 1, 2, 4, 6, 8, 10, 18, 24 and 30 way connectors
- Choose from plug socket/ receptacle pin or plug pin/ receptacle socket configurations
- Easily removable alignment sleeve insert facilitates simple cleaning and maintenance

DEUTSCH MC5 Connectors



**MIL-DTL-38999 Style Series III Connectors**

The DEUTSCH MC5 high-density fiber optic multiway connector series from TE Connectivity (TE) is capable of sustained performance over a wide range of tough environmental conditions.

The MC5 connector uses precision ceramic ferrules and lightweight MIL-DTL-38999 Series III connector shell materials, combined with purpose-designed inserts to help ensure the optical performance meets the requirements of high reliability optical systems.

Compact spring-loaded precision optical contacts are individually insertable/removable for ease of assembly and maintenance, and the color band indicates full mating. The alignment sleeves provide highly reliable, repeatable optical performance.

The MC5 Series connectors provide excellent performance under some of the most demanding environmental conditions, including military aircraft.



## DEUTSCH MC5 Connectors

### MIL-DTL-38999 Style Series III Connectors

## Specifications

### FIBER TYPE

---

- **Channels:** 2, 4, 6, 8, 10, 18, 24, and 30 channels
- **Cable Size:** 1.8 mm, 2.1 mm and 2.5 mm jacket

### MATERIALS

---

- **Shell:** Composite
- **Contact Body:** Arcap
- **Ferrules:** Zirconia
- **Alignment Sleeves:** Zirconia
- **Seals:** Fluorosilicone
- **Plating:** Nickel

### OPTICAL PERFORMANCE

---

- **Insertion Loss:** 0.25 dB typical
- **Return Loss:** -40 dB typical
- **Repeatability:** 0.1 dB (with 50/125  $\mu$ m fiber)

### TEMPERATURE

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- **High Temperature Endurance:** +150°C, 760 hours
- **Low Temperature Endurance:** -65°C, 500 hours

### MECHANICAL

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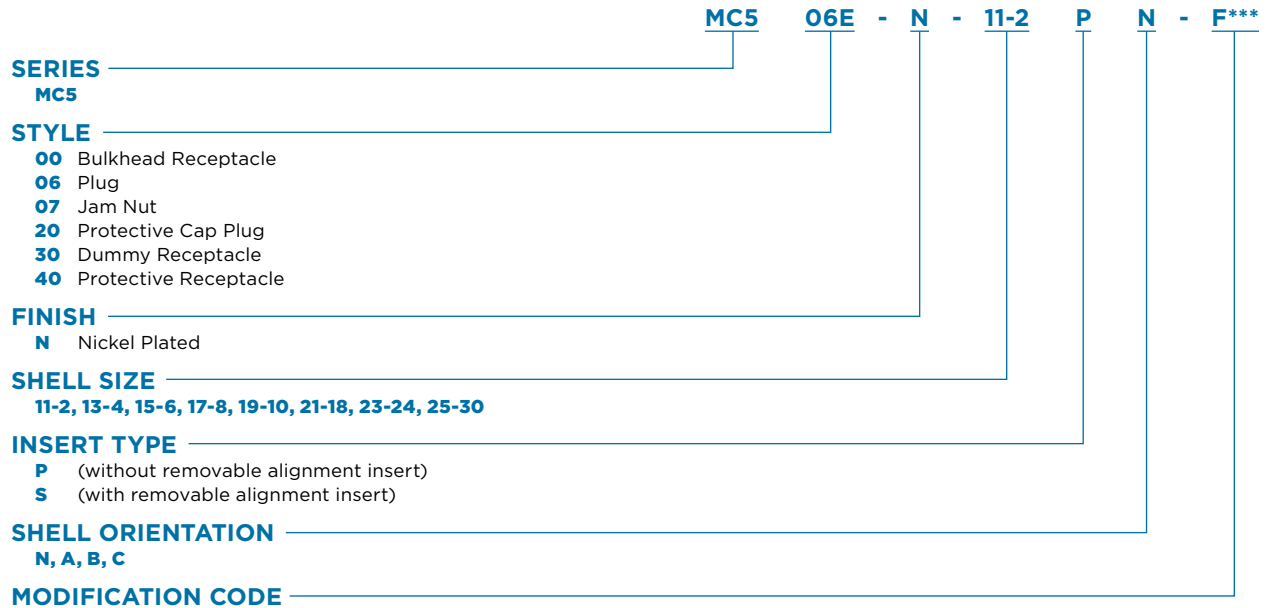
- **Sine Vibration:** 5-3000 Hz, 40 g, 10 hours
- **Random Vibration:** 25-2000 Hz, 5 g<sup>2</sup>/Hz (50 Grms), 16 hours



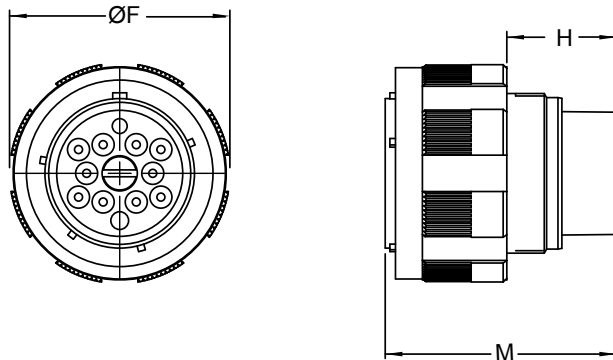
## DEUTSCH MC5 Connectors

### MIL-DTL-38999 Style Series III Connectors

#### Ordering Information



**Plug**  
MC506E



#### Dimensional Information

Size/ Arrangement	ØF Max.	H Max.	M Max.
<b>11-2</b>	<b>24.94</b> 0.982	<b>19.9</b> 0.783	<b>40.86</b> 1.609
<b>13-4</b>	<b>29.34</b> 1.155	<b>19.9</b> 0.783	<b>40.86</b> 1.609
<b>15-6</b>	<b>32.46</b> 1.278	<b>19.9</b> 0.783	<b>40.86</b> 1.609
<b>17-8</b>	<b>35.66</b> 1.404	<b>19.9</b> 0.783	<b>40.86</b> 1.609
<b>19-10</b>	<b>38.46</b> 1.514	<b>19.7</b> 0.776	<b>40.86</b> 1.609
<b>21-18</b>	<b>41.66</b> 1.640	<b>19.7</b> 0.776	<b>40.86</b> 1.609
<b>23-24</b>	<b>44.86</b> 1.766	<b>19.7</b> 0.776	<b>40.86</b> 1.609
<b>25-30</b>	<b>47.98</b> 1.889	<b>19.7</b> 0.776	<b>40.86</b> 1.609

Millimeters Inches



## DEUTSCH MC5 Connectors

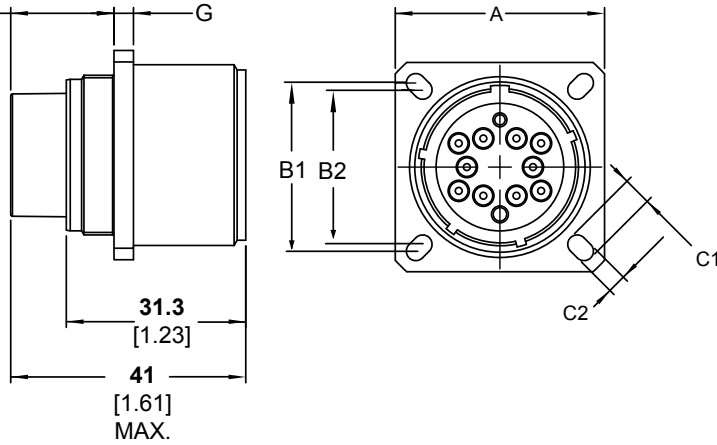
### MIL-DTL-38999 Style Series III Connectors

#### Receptacle

MC500E

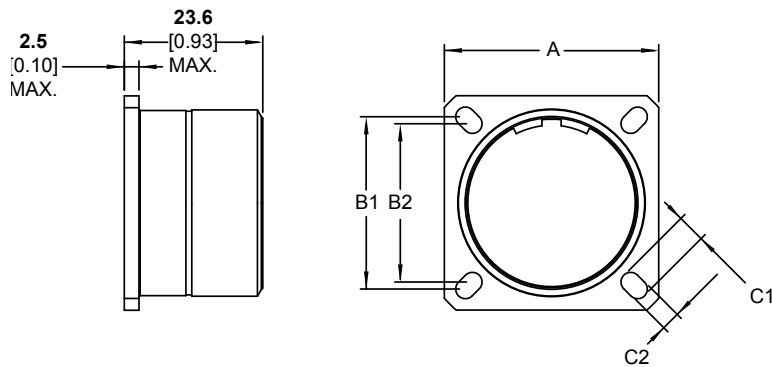
18.02

[0.71]  
MAX.



#### Dummy Receptacle

MC530E



Size/ Arrangement	A Max.	B1	B2	C1 Min.	C2 Min.	G Max.
11-2	26.4 1.039	20.62 0.812	18.26 0.719	4.84 0.191	3.16 0.124	3.52 0.139
13-4	28.81 1.134	23.01 0.906	20.62 0.812	4.84 0.191	3.16 0.124	3.52 0.139
15-6	31.2 1.228	24.61 0.969	23.01 0.906	4.31 0.170	3.16 0.124	3.52 0.139
17-8	33.51 1.319	26.97 1.062	24.61 0.969	4.84 0.191	3.16 0.124	3.52 0.139
19-10	36.71 1.445	29.36 1.156	26.97 1.062	4.84 0.191	3.16 0.124	3.52 0.139
21-18	39.91 1.571	31.75 1.250	29.36 1.156	4.84 0.191	3.16 0.124	4.33 0.170
23-24	43.11 1.697	34.93 1.375	31.75 1.250	6.06 0.239	3.83 0.151	4.33 0.170
25-30	46.21 1.819	38.1 1.500	34.93 1.375	6.06 0.239	3.83 0.151	4.33 0.170

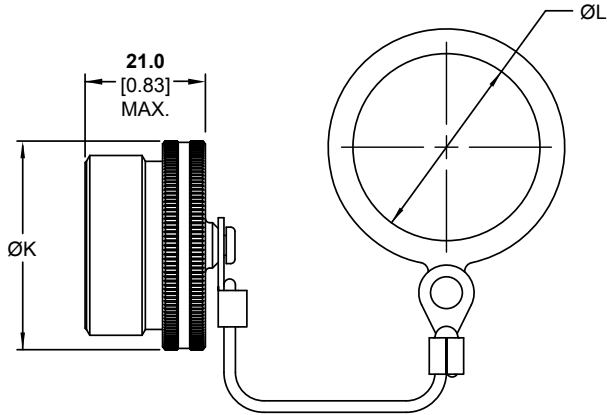
Millimeters Inches



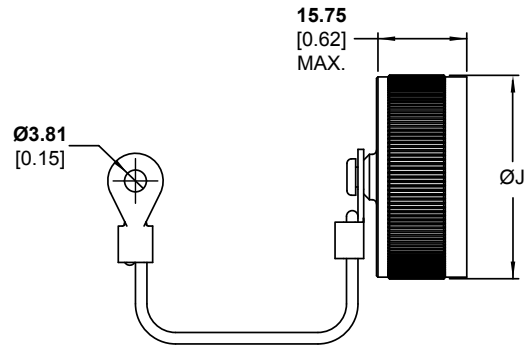
## DEUTSCH MC5 Connectors

### MIL-DTL-38999 Style Series III Connectors

**Procap**  
MC520E



**Procap**  
MC540E



Size/ Arrangement	ØJ Max.	ØK Max.	ØL Min.
11-2	22.96 0.094	24.00 0.945	16.51 0.650
13-4	26.06 1.206	27.56 1.085	19.56 0.770
15-6	29.26 1.152	31.10 1.224	22.86 0.900
17-8	34.16 1.345	35.46 1.396	26.04 1.025
19-10	35.66 1.404	37.16 1.463	29.21 1.150
21-18	38.75 1.526	40.10 1.579	32.39 1.275
23-24	42.06 1.656	43.36 1.707	35.56 1.400
25-30	44.96 1.770	46.6 1.835	38.74 1.525

Millimeters Inches



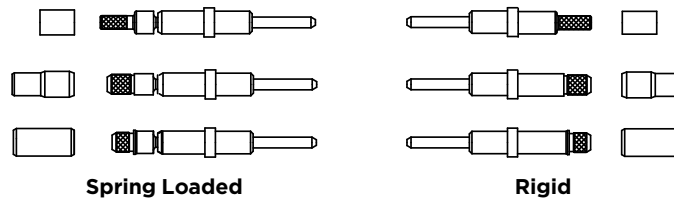
## DEUTSCH MC5 Connectors

### MIL-DTL-38999 Style Series III Connectors

#### MC5 Optical Termini (ordered separately)

Optical termini are supplied with a profile formed optical end face and are available for single-mode or multimode fibers. Contacts are available in either spring-loaded or rigid versions, depending upon application. Rigid contacts should be used in bulkhead receptacles only.

Note: A crimp sleeve is not included for terminating 900- $\mu$ m buffered cable.



#### Ordering Information

	<b>455335</b> - <b>126</b> <b>1-01</b>
<b>TERMINUS TYPE</b>	
<b>455335</b> Spring Loaded	
<b>455360</b> Rigid	
<b>FERRULE FIBER HOLE SIZE (<math>\mu</math>M)</b>	
<b>125</b>	
<b>126</b>	
<b>127</b>	
<b>128</b>	
<b>144</b>	
<b>159</b>	
<b>172</b>	
<b>175</b>	
<b>CABLE JACKET DIAMETER</b>	
<b>1-00</b> 900 $\mu$ m Buffer	
<b>1-01</b> 2.1 mm Dia.	
<b>1-02</b> 1.8 mm Dia.	
<b>1-03</b> 2.5 mm Dia.	

#### Tooling

- **Crimp Tool:** Part No. 471716
- **Crimping Dies:** 457440

#### MC5 Backshells for Multifiber Cables (ordered separately)

A variety of backshells are available for multifiber cables, with peripheral strain relief (for 900- $\mu$ m buffered cable) and central strain relief. Consult TE.





### EASY TO USE

- Insert-to-insert keying aids in precision alignment
- Individually rear insertable and removable optical contacts
- Color band indicates full mating
- Easily accessible APC and PC end faces for cleaning and maintenance

### VERSATILE

- Interchangeable with MIL-DTL-38999 Series III
- Backshells and adapters available for most single and multifiber cable types
- Insert accommodates 2 to 72 channels, and can be supplied pre-terminated
- Standard MT interface and multiple housing options help make integration into new and existing systems easy

### RUGGED

- Lightweight, corrosion-resistant metal-plated composite shell
- Strong, durable and environmentally sealed
- Anti-vibration coupling with tri-start thread

## DEUTSCH MC6 Fiber Optic Ribbon Cable Connectors



### 38999 Series III-Style Connectors

The DEUTSCH MC6 high-density fiber optic connector series is rugged, versatile, and easy to install and maintain. The connectors are compatible with standard MT ferrule inserts.

The MT ferrule inserts accommodate 2 to 72 channels and can be supplied pre-terminated, if required. The MC6 connector uses the compact MIL-DTL-38999 Series III, shell size 11 body, which is also used on the DEUTSCH MC5 connector.

MC6 connectors have a lightweight, corrosion resistant, metal-plated composite shell, which helps provide high strength and durability combined with excellent EMC shielding. MC6 connector shell are also available in aluminum and Marine Bronze materials

The result is a very compact, rugged, environmentally sealed solution for a wide range of applications, such as avionics, data bus and in-flight entertainment systems.



## DEUTSCH MC6 Fiber Optic Ribbon Cable Connectors

### 38999 Series III-Style Connectors

#### Specifications

##### MATERIALS

- **Shell:** Aluminum, composite or Marine Bronze
- **Contact Body:** Nickel/cadmium plated composite polymer
- **Ferrule:** Thermoplastic
- **Alignment Pin:** Stainless steel
- **Seals:** Fluorinated silicone elastomer
- **Plating:** Nickel (Back zinc nickel available for aluminum shells)

##### OPTICAL

- **Insertion Loss:** 0.25 dB typ. (fiber dependent)
- **Return Loss:** -40 dB typ.
- **Repeatability:** 0.2 dB typ.

##### ENVIRONMENTAL/MECHANICAL

- **Temperature Range:** -55°C to +150°C
- **Vibration:** 20 to 2000 Hz, 20 g
- **Durability:** 500 mating cycles

##### FIBER TYPE

- **Channels:** 2 to 72
- **Cable Type:** Telecom grade cable  
Aerospace grade cable

#### Thread Sizes

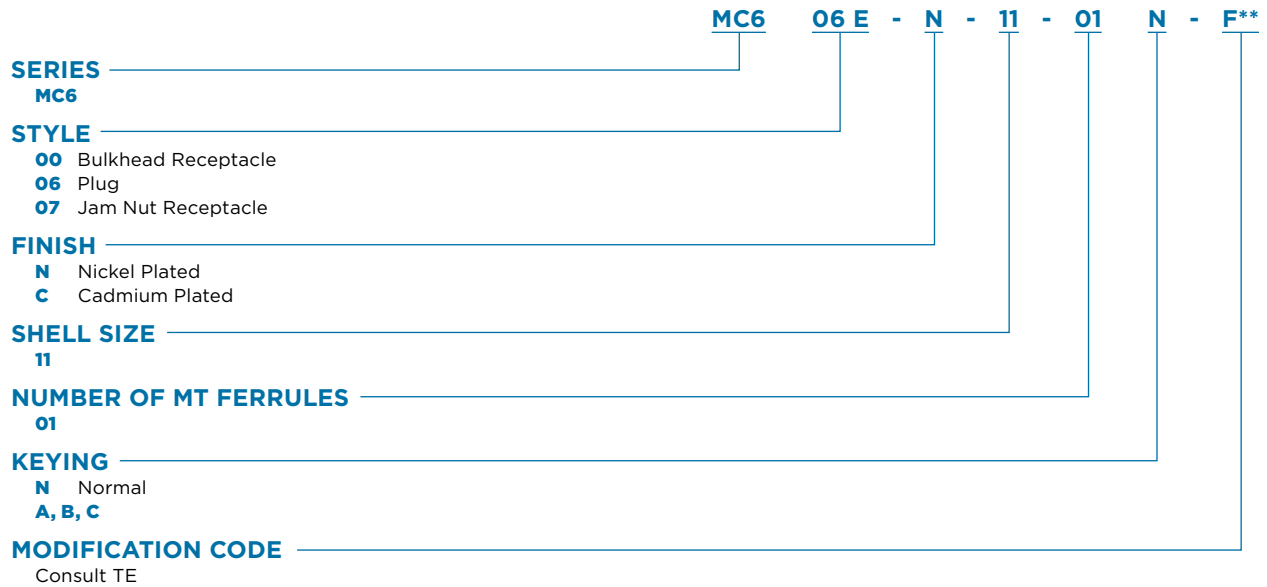
Shell Size	Accessory Thread (6g .100R)	Mating Thread (0.1P-0.3L)	Jam Nut Thread (6g .100R)
11	M15 x 1.0	.7500	M20 x 1.0



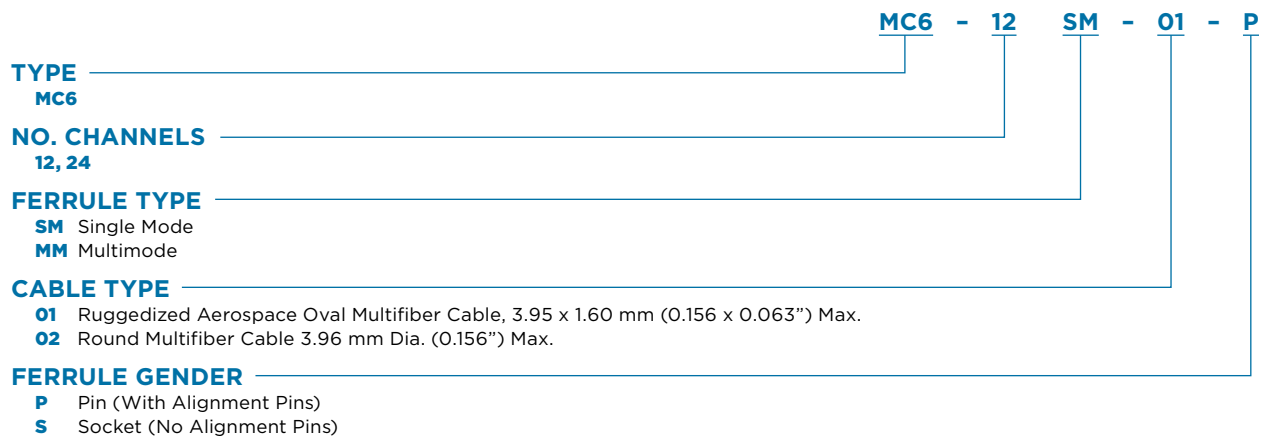
## DEUTSCH MC6 Fiber Optic Ribbon Cable Connectors

### 38999 Series III-Style Connectors

#### Connector Part Numbering



#### MT Ferrule Part Numbering

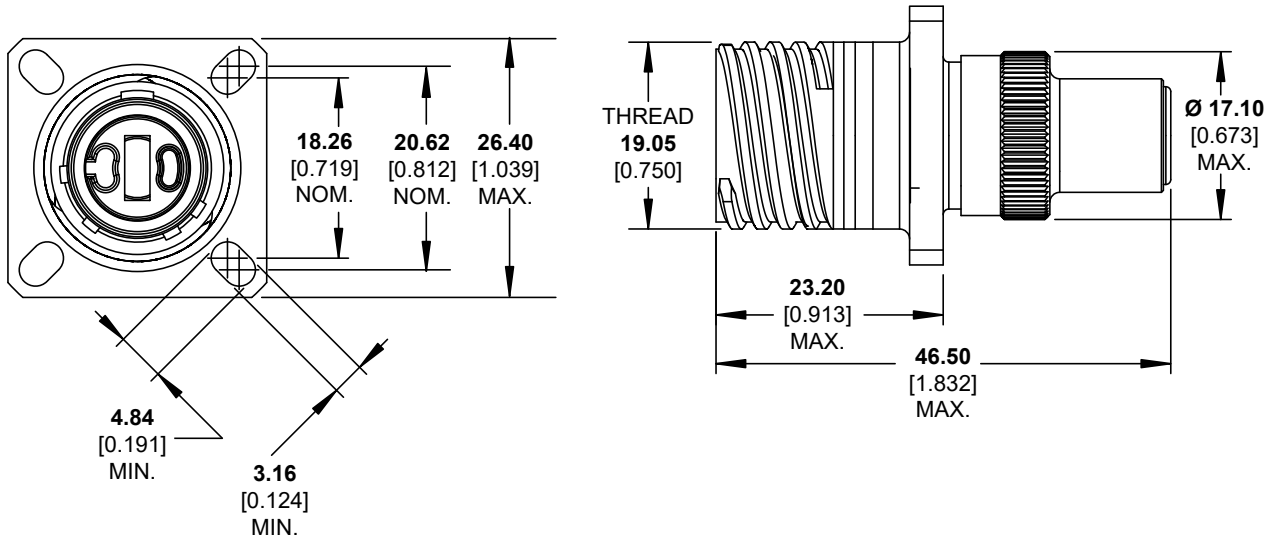




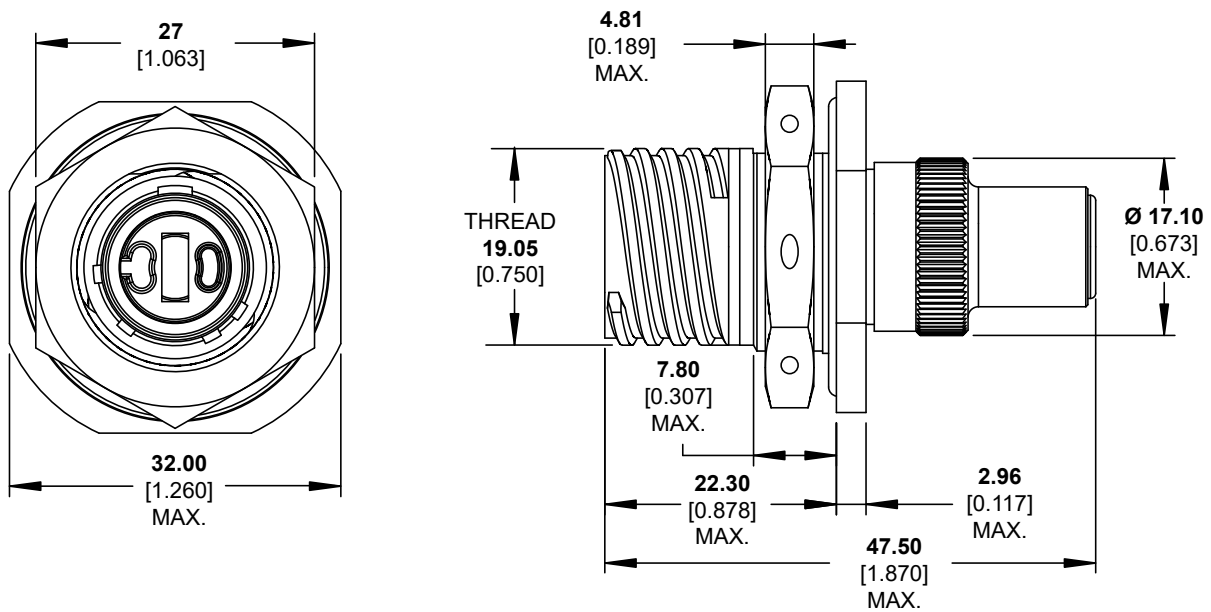
## DEUTSCH MC6 Fiber Optic Ribbon Cable Connectors

### 38999 Series III-Style Connectors

#### Square Flange Receptacle



#### Jam Nut Receptacle

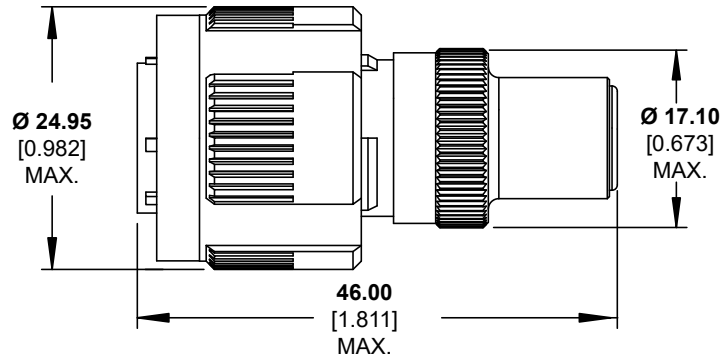
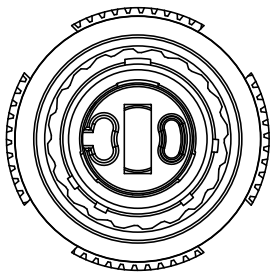




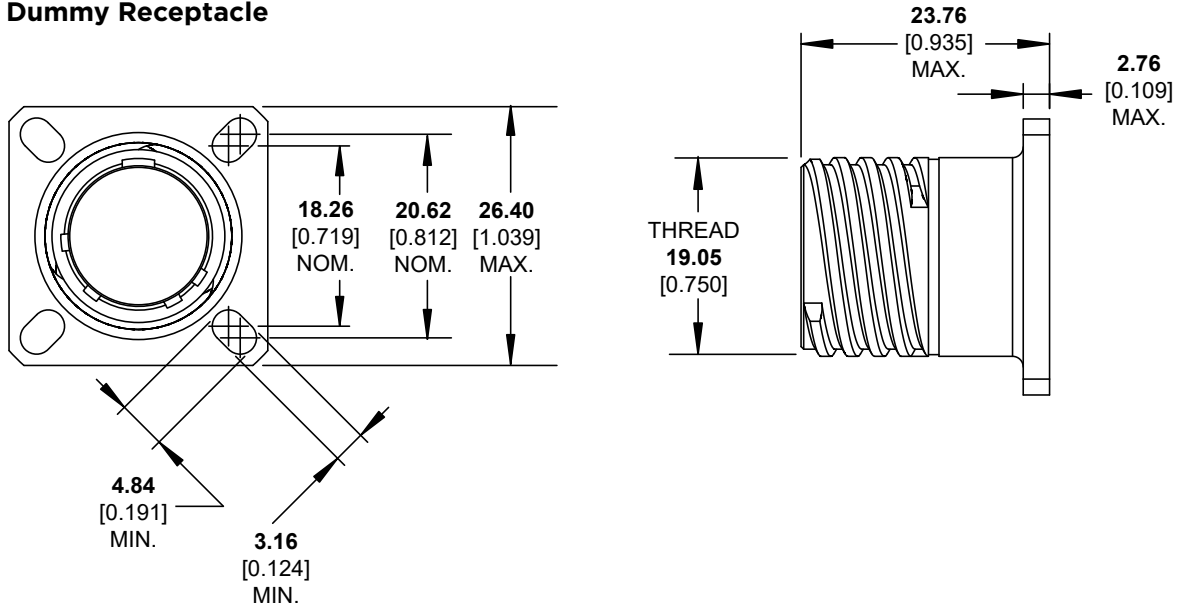
## DEUTSCH MC6 Fiber Optic Ribbon Cable Connectors

### 38999 Series III-Style Connectors

#### Plug



#### Dummy Receptacle

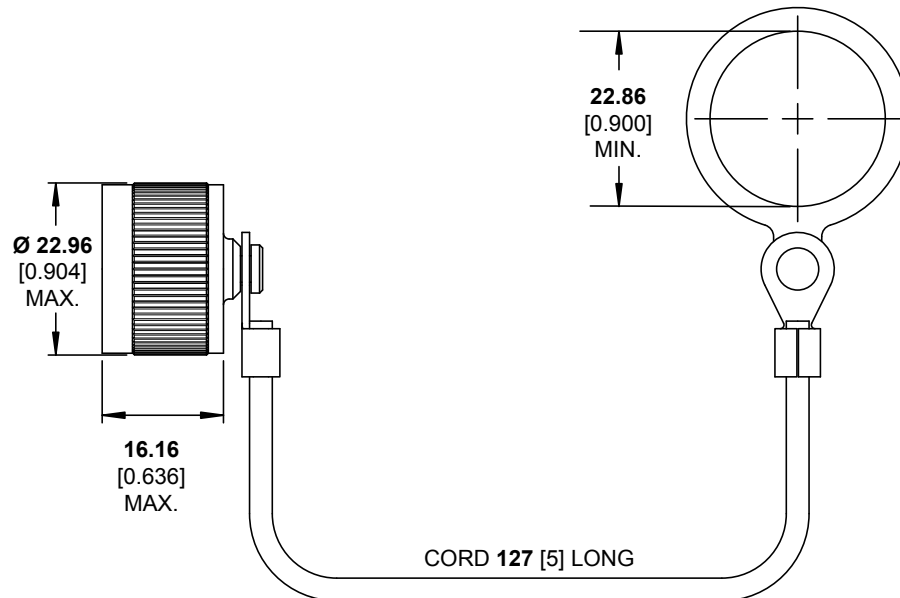
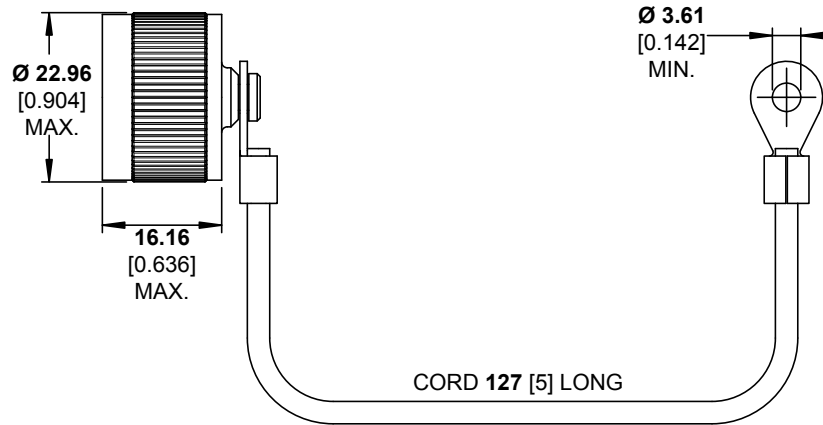




## DEUTSCH MC6 Fiber Optic Ribbon Cable Connectors

### 38999 Series III-Style Connectors

#### Protective Caps for Receptacles

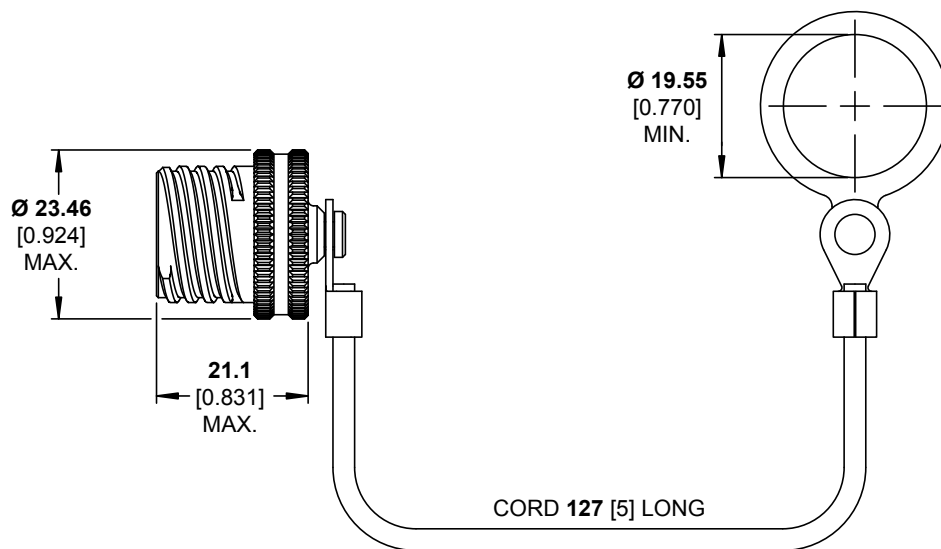




## DEUTSCH MC6 Fiber Optic Ribbon Cable Connectors

### 38999 Series III-Style Connectors

#### Protective Caps for Plugs





### HIGH CAPACITY

- Holds four 12 or 24-fiber MT ferrules
- Up to 96 optical channels per connector
- Size 21 shell

### EASY TO ASSEMBLE

- No special tools or fixtures required
- Only one part to assemble: the ferrule retainer to secure the ferrule
- Screwdriver is only tool required

### HIGH PERFORMANCE

- Precision alignment for excellent optical performance
- Vibration resistant

### COMPATIBLE

- Uses standard 38999 backshells

## AviMT Connector



### D38999 Series III Style Connector with Four MT Ferrules

The AviMT connector from TE Connectivity (TE) holds four MT ferrules—for up to 96 fibers—in a compact size 21 shell. The connector is well suited to applications requiring high fiber counts, such as UAV-based video surveillance, C5ISR, avionics, fiber backbone, radar and IFE systems.

#### Fast, Simple Assembly

The connector is very easily assembled, requiring only a screwdriver to fasten the ferrule retainer into place. The simple assembly contrasts dramatically with many connectors in the industry, which require special tools and fixtures to assemble multiple parts and subassemblies.

## Specifications

### MATERIALS

- **Shell:** Nickel-plated aluminum (Consult TE for other shell finishes)
- **Insert:** Thermoplastic
- **Front Retainer Ring:** Passivated stainless steel
- **Interfacial Seal:** Rubber
- **Ferrule Retainer:** Passivated stainless steel

### OPTICAL (Tested with OM3 multimode fiber)

- **Insertion Loss (Avg.)**  
12-Fiber Ferrule: 0.12 dB  
24 Fiber Ferrule: 0.17 dB
- **Return Loss (Avg.)**  
12-Fiber Ferrule: 29.3 dB  
24 Fiber Ferrule: 29.8 dB

### ENVIRONMENTAL/MECHANICAL

- **Low Temp Storage:** -50°C for 96 hours
- **High Temp Storage:** +85°C for 96 hours
- **Humidity Exposure:** Cycled to +55°C, 95% RH
- **Thermal Cycling:** -40°C to 70°C
- **Sine Sweep Vibration:** 10 Hz to 2000 Hz, 15 g peak
- **Random Vibration:** 16.91 grms
- **Mechanical Shock:** 50g

### APPLICATIONS

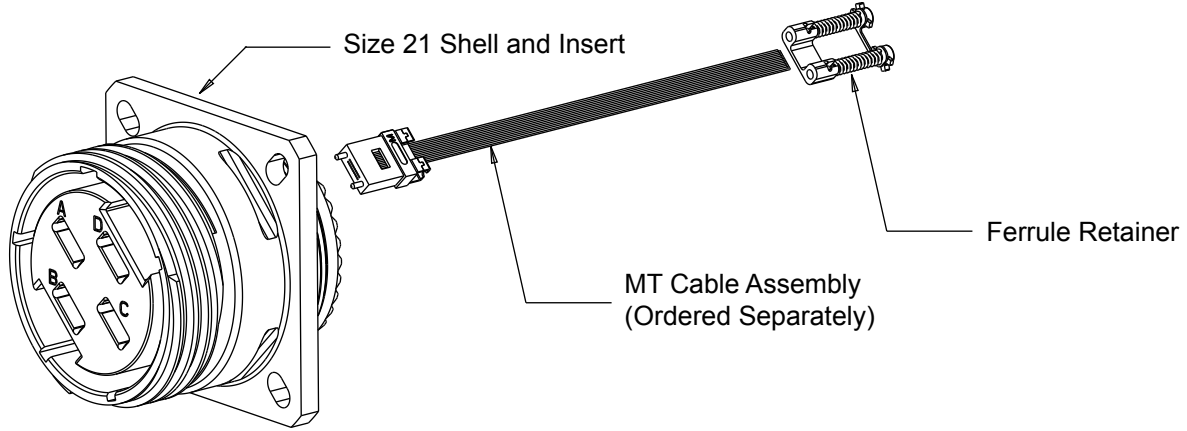
- C5ISR
- Avionics
- Military aerospace
- Commercial aerospace ground radar
- Fiber backbone
- IFE systems





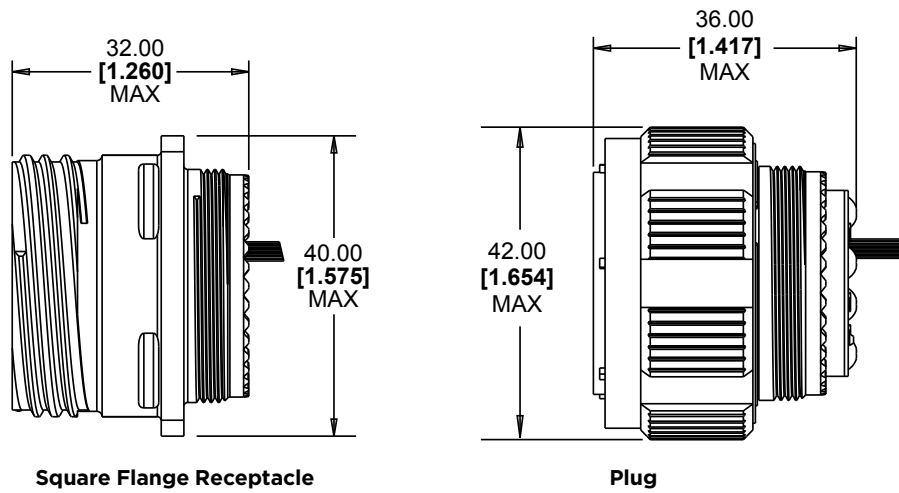
## AviMT Connector

### D38999 Series III Style Connector with Four MT Ferrules



#### Ordering Information

Style	Part No.
Plug	2828342-1
Square Flange Receptacle	2828343-1
Jam Nut Receptacle	2320289-1





**RUGGED**

- Noncontacting fiber interface
- Minimal wear on fiber optic interface
- Vibration resistant

**EASY TO USE**

- Easy to handle
- Easy to clean
- Highly resistant to dirt/debris

**CONSISTENT**

- Repeatable low-loss performance in harsh environments
- Low sensitivity to thermal fluctuations and interface contamination
- Consistent overall optical link budget

**VERSATILE**

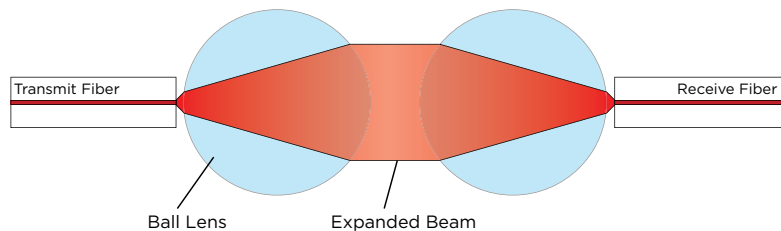
- Single mode or multimode
- Common 850/1300 dual, 1310, or 1550 nm wavelengths
- 2 or 4 optical channels in a size 15 shell
- 8 channels in a size 15 shell

38999-Style Connectors



Expanded beam inserts for 38999-style connectors use the same reliable insert technology as our PRO BEAM connectors. Available to accommodate 2 or 4 optical channels in a size 11 shell or 8 channels in a size 15 shell, the inserts give you many of the advantages of expanded beam interfaces in the familiar 38999 form factor.

Connector kits are available to accommodate popular fiber optic cable styles used in the military and aerospace industry—including tactical cable, 1.8 and 2.2-mm avionics cable, and buffered-only cable.

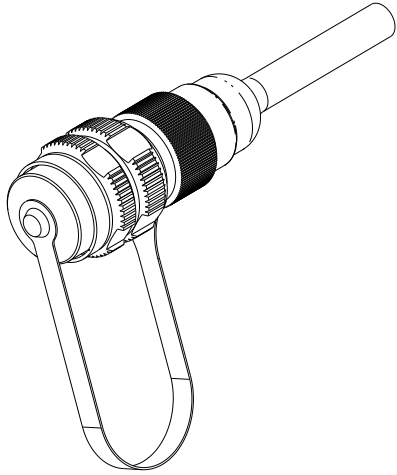


Expanded beam technology, which physically expands and collimates the transmission signal into an optical beam over 14 times its original diameter for multimode fiber and over 45 times for single-mode fiber. The beam is then refocused back down onto the core of the receiving fiber. This approach provides ease of alignment and low sensitivity to thermal changes and contamination.

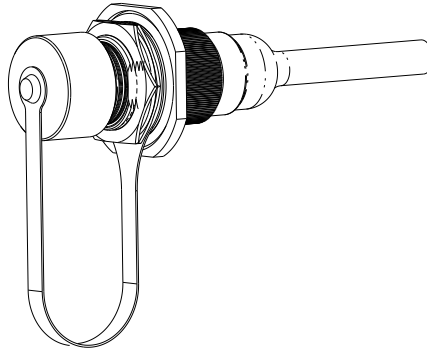


## 38999-Style Connectors with Expanded Beam Inserts

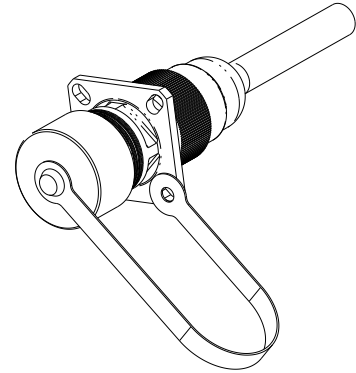
### Standard Styles



**Plug Connector**

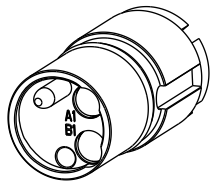


**Jam Nut Receptacle Connector**

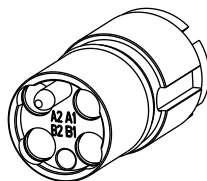


**Square Flange Receptacle**

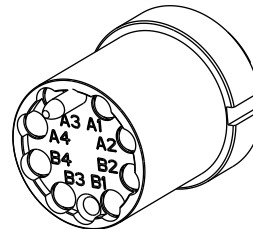
### Insert Kits



**2-Channel Mini Insert**  
(Size 11 Shell)



**4 Channel Mini Insert**  
(Size 11 Shell)



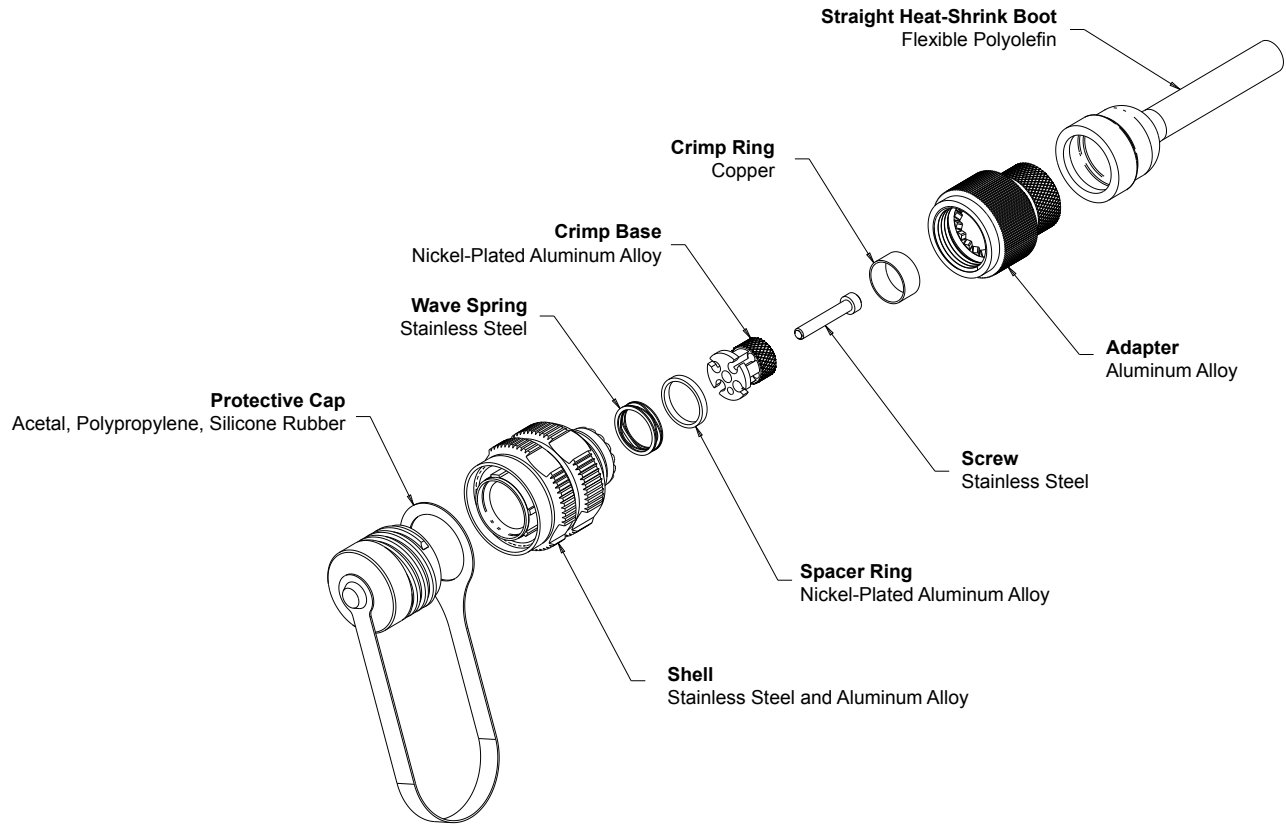
**8-Channel Sr. Insert**  
(Size 15 Shell)

EB Insert Type	No. of Fibers	Part No.		
		Multimode 850/1300 nm	Single Mode 1310 nm	Single Mode 1550 nm
Mini	2	1374759-4	1588129-2	1588128-2
	4	1374759-2	1588129-3	1588128-3
Sr.	8	1516256-1	1516258-1	1516258-2



## 38999-Style Connectors with Expanded Beam Inserts

### Shell Kits

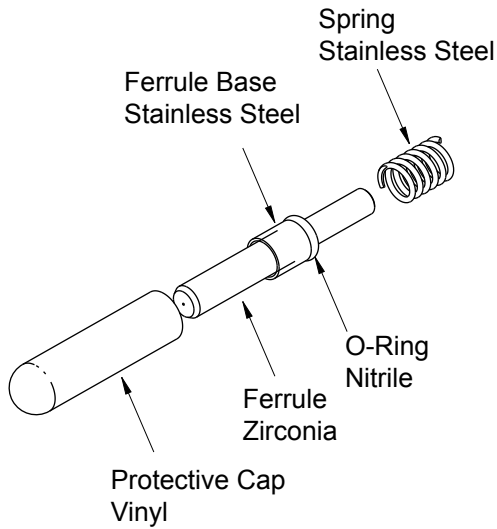


**Typical Configuration and Materials**  
(Plug Connector Shown)

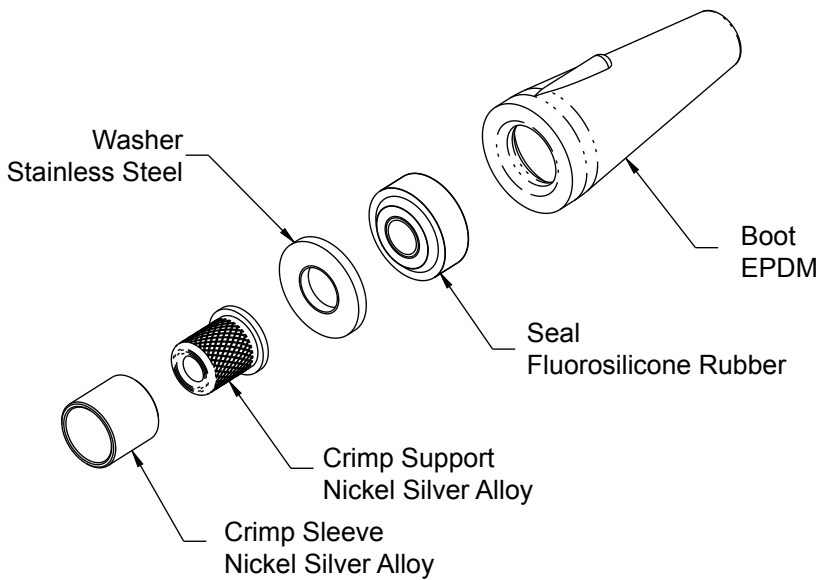


## 38999-Style Connectors with Expanded Beam Inserts

### Ferrule Kits



Fiber Hole Size (μm)	Fiber Type	Part No.	
		Mini	Sr.
125	Single Mode	1754700-1	1985635-1
126	Single Mode	1754700-2	1985635-2
	Multimode	1754699-1	1985107-1

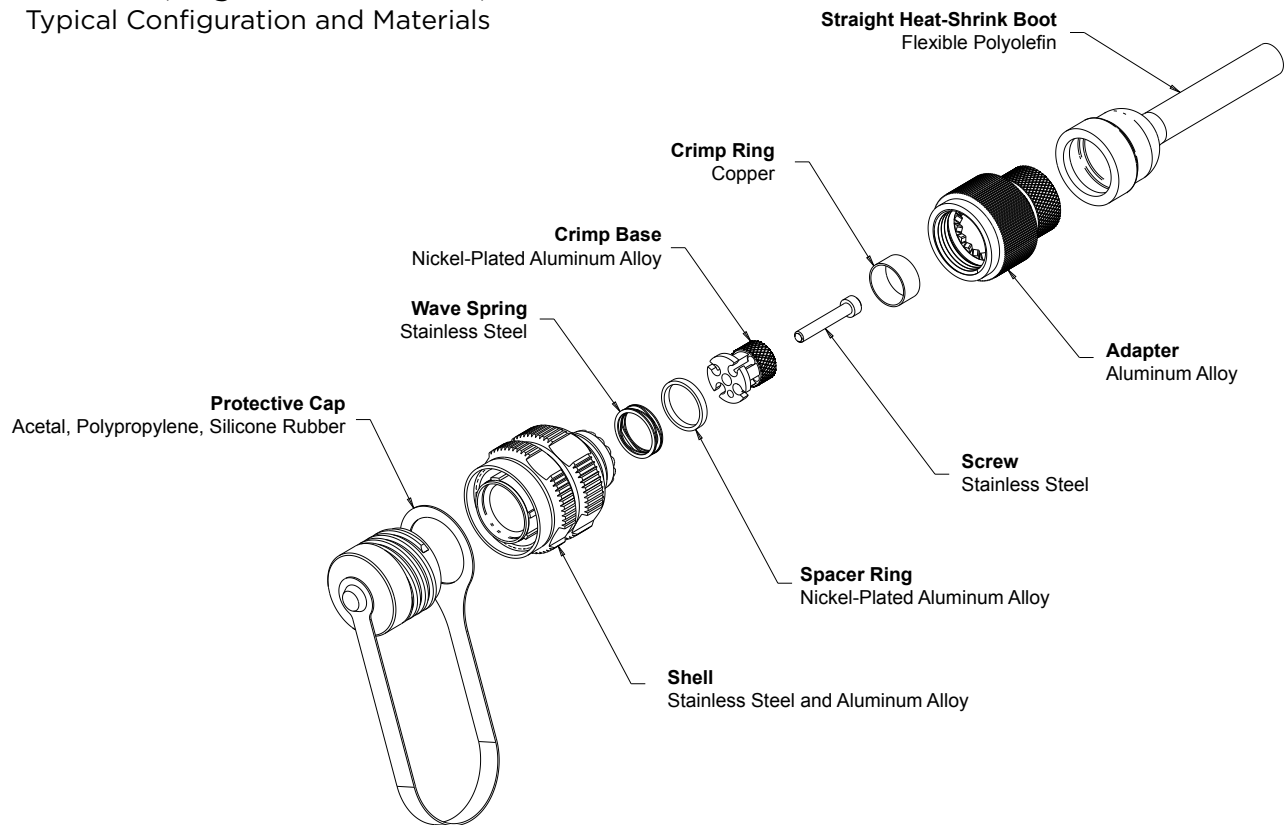


Cable Dia.	Part No.
5.1 mm	1516228-1
5.6 mm	1516228-2
6.2 mm	1516228-3



## 38999-Style Connectors with Expanded Beam Inserts

### Shell Kits (Plug Connector Shown) Typical Configuration and Materials



### Shell Kits

Part numbers are for N keyed connectors with black zinc nickel finish. Consult TE for other keying and plating options.

#### Shell Size 11 Kit

Connector Style	Part No.		
	1.8 mm Avionics Cable	Mil Tactical Distrib. Cable	Buffered Fiber
Plug	6754518-7	1-1985021-3	1-1918883-3
Jam Nut Receptacle	6754519-7	1-2064163-3	1-1918884-3
Flange-Mount Receptacle	—	1-2064166-3	1-1918885-3

#### Shell Size 15 Kit

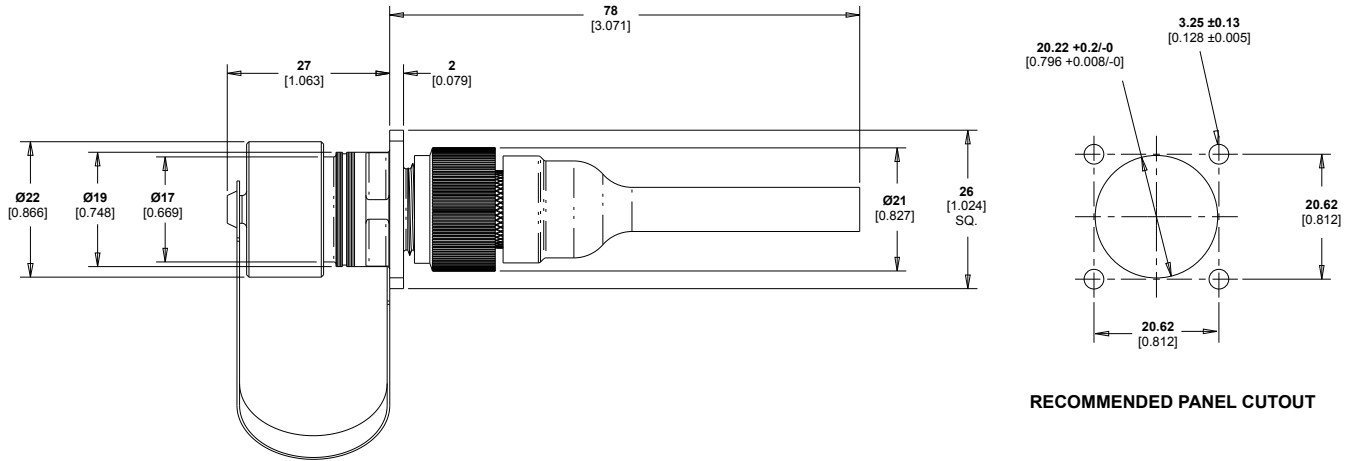
Connector Style	Part No.	
	2.2 mm Avionics Cable	End Nut Backshell for Non-Jacketed Cable
Plug	1516342-7	1516338-7
Jam Nut Receptacle	1516343-7	1516339-7
Flange-Mount Receptacle	1516344-7	1516340-7



## 38999-Style Connectors with Expanded Beam Inserts

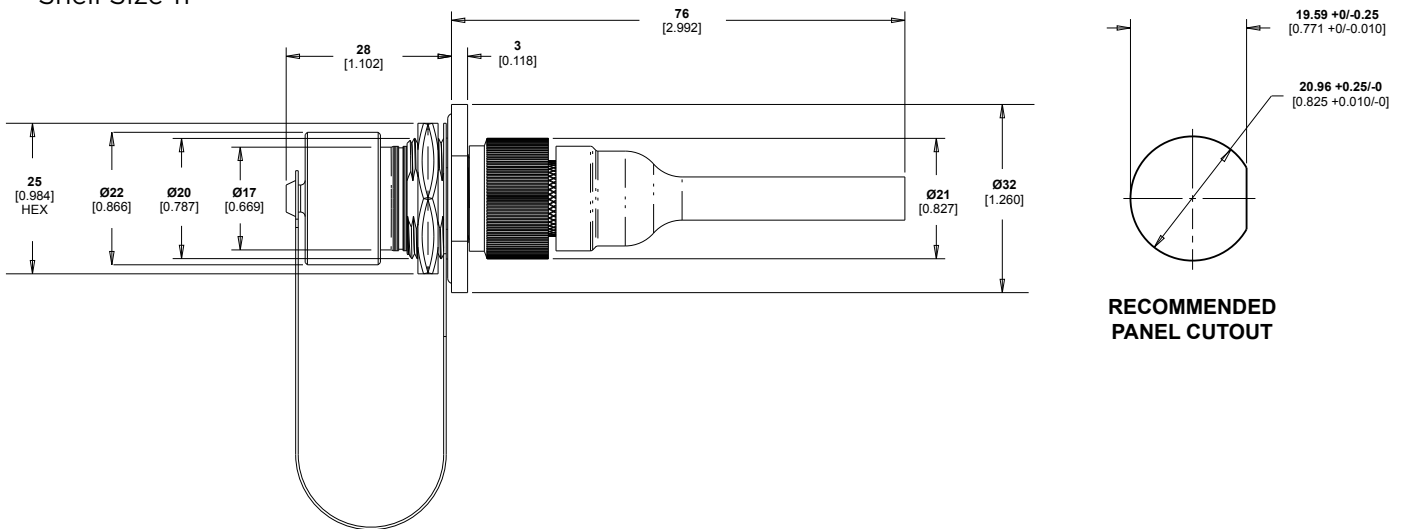
### Plug

Shell Size 11



### Jam Nut Receptacle

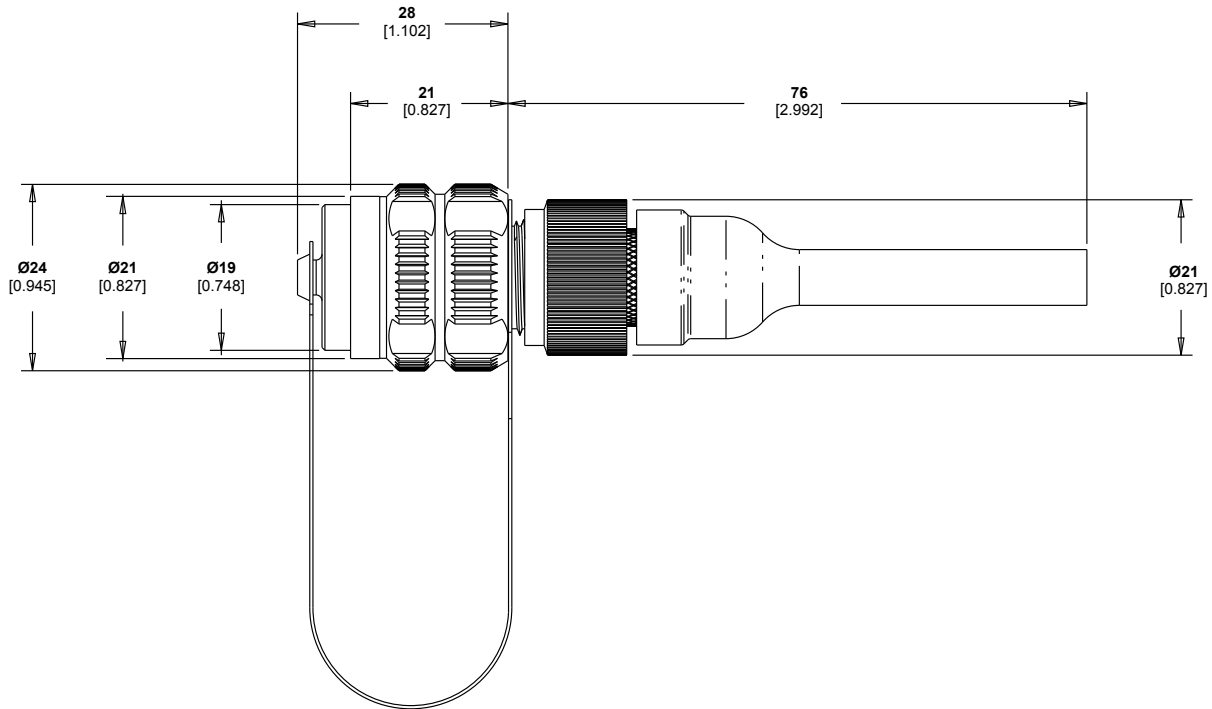
Shell Size 11



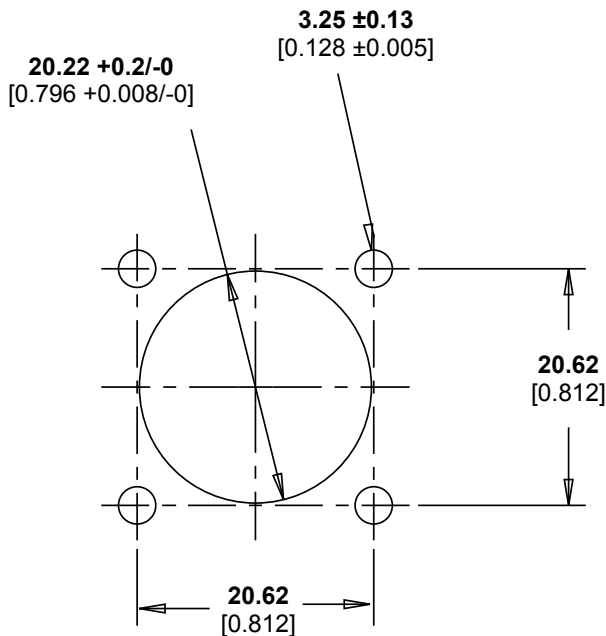


## 38999-Style Connectors with Expanded Beam Inserts

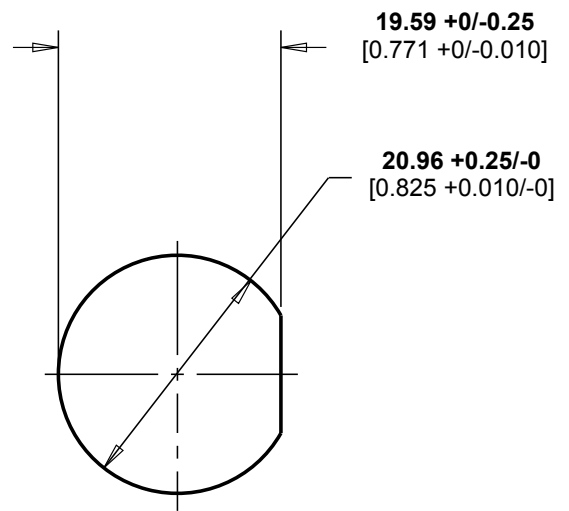
### Square Flange Receptacle Shell Size 11



### Recommended Panels Cutouts



Square Flange Receptacle



Jam Nut Receptacle





### INDUSTRY STANDARDIZATION

- Selected for the ARINC 845 standard

### DURABLE

- Minimal wear on fiber optic Interface
- Vibration resistant
- Resistant to dirt and debris

### REPEATABLE LOW-LOSS PERFORMANCE

- Low sensitivity to thermal fluctuations and interface contamination
- Consistent overall optical “link budget”
- Stable operation over life of system

### EASY TO USE

- Drop-in replacement for M29504/4 and /5 physical contact termini
- Durable non-contacting interface helps ensure ease of use/cleaning
- Simplified cleaning process

### VERSATILE

- Fit standard size 16 cavity
- Field terminable

## PRO BEAM EB16 Optical Termini



### Bring Rugged Optical Performance to Mil-Standard Connectors

Leveraging our industry-accepted PRO BEAM expanded beam technology, the PRO BEAM EB16 termini are adding rugged, reliable optical performance to familiar Mil Spec connectors. The EB16 termini are a size 16 optical contact, fit-form compliant to MIL-DTL-38999 Series III size 16 cavities. These termini are a drop-in replacement for the M29504/4 and /5 physical contact termini used in many ruggedized circular connector systems.

### Non-Contacting Interface

The non-contacting interface typically results in less wear and tear overall, especially in high-mating cycle or high-vibration applications.

The termini's ball lens physically expands and collimates the optical signal into an optical beam well beyond its original size to help provide easier optical alignment, lowers sensitivity to contamination, and helps provide consistent performance over thermal changes. The beam is then refocused back down onto the core of the receiving fiber.

The beam area is expanded 30 times between lenses. The signal will not deteriorate by airborne contamination particles of the same size that affect the performance of the PC connection. The termini's endface is easily cleaned.



## PRO BEAM EB16 Optical Termini



### Specifications

#### MATERIALS

- **Terminus Body and Crimp Sleeve:** Nickel-plated brass
- **Ferrule and Split Sleeve:** Zirconia
- **Ball Lens:** Glass, with antireflection coating
- **Spacer:** Stainless steel
- **Spring:** Stainless steel
- **Protective Cap:** Vinyl

#### MECHANICAL/ENVIRONMENTAL

- **Durability:** >1000 mating cycles
- **Operating Temperature:** -65°C to +165°C (Cable dependent)
- **Sinusoidal Vibration:** TIA/EIA-455-11C, Test Condition IV
- **Random Vibration:** TIA/EIA-455-11C, Test Condition VI-J
- **Mechanical Shock:** TIA/EIA-455-14A, Test Condition C
- **Thermal Cycling:** TIA/EIA-455-3B, Test Condition C-2
- **Thermal Shock:** TIA/EIA-455-71, Schedule C-0 (5 cycles)

#### OPTICAL

- **Insertion Loss:** 1.5 dB max. @ 850/1300 nm (Multimode fiber)

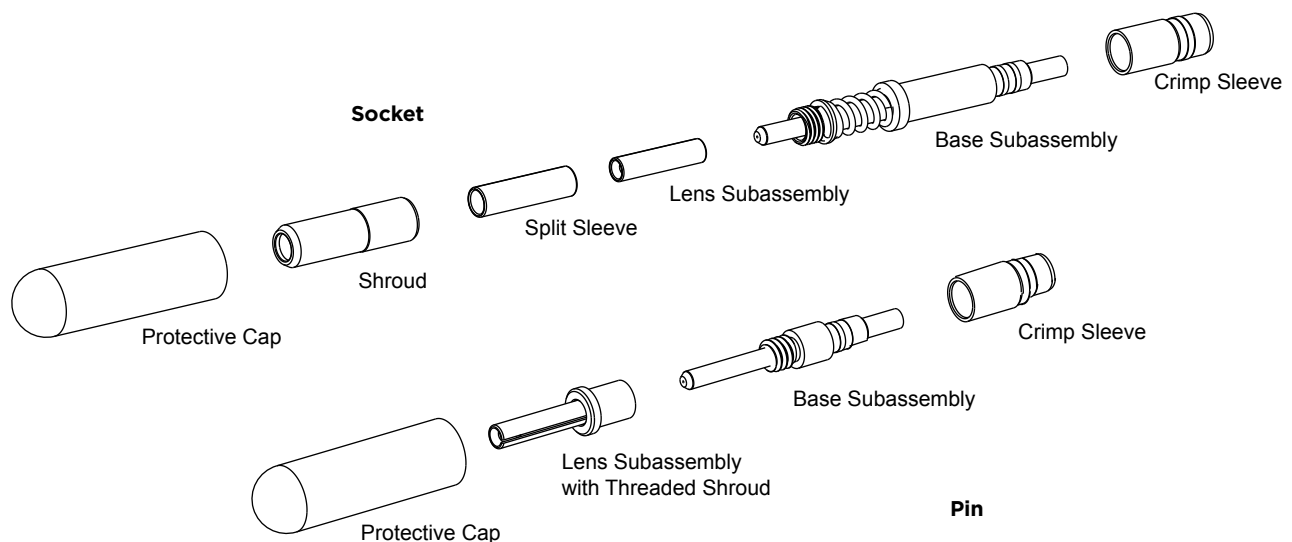
#### STANDARDS

- **Industry Standards:** SAE AS3 AS6250, AS6251, and ARINC 845
- **TE Application Specification:** 108-127013
- **TE Instruction Sheet:** 408-32132
- **TE Qualification Test Report:** 501-32028

#### APPLICATIONS

- Radar and Sensor Systems
- Rugged Network Applications
- Fixed Wing and Rotary Aircraft
- Unmanned Systems
- Commercial Aviation

Type	Part No.
Pin	2125059-1
Socket	2125046-1





### MIL SPEC

- Manufactured to meet the requirements of MIL-T-29504/4 and 5
- Designed for use in any MIL-DTL-38999 Size 16 cavity

### HIGH PERFORMANCE

- Widely used in both rotary and fixed-wing aerospace applications
- Spring-loaded socket contacts help ensure consistent mating pressure and performance levels

## MIL-T-29504 Style Optical Termini



Widely used in rotary and fixed-wing aerospace applications, our rugged optical termini is rated for 500 mating cycles and feature spring-loaded socket contacts to help ensure consistent mating pressure and performance levels. They are designed for use in any MIL-DTL-38999 Size 16 cavity, and manufactured to meet MIL-T-29504/4 and/5 requirements.

## Specifications

### FIBER TYPES

- **Single Mode:** 9/125  $\mu\text{m}$
- **Multimode:** 50/125, 62.5/125, 200/280  $\mu\text{m}$
- **Cable Size:** 1.8 mm, 2.5 mm

### OPTICAL PERFORMANCE

(Depends on fiber type and finish)

- **Insertion Loss:** 0.6 dB typical
- **Return Loss:** -40 dB typical
- **Repeatability:** 0.2 dB typical

### MATERIALS

- **Ferrule:** Zirconia
- **Alignment Sleeve:** Ceramic zirconia
- **Spring:** Stainless steel
- **Terminus Assembly:** ARCAP alloy
- **Heat Shrink Sleeve:** PVDF

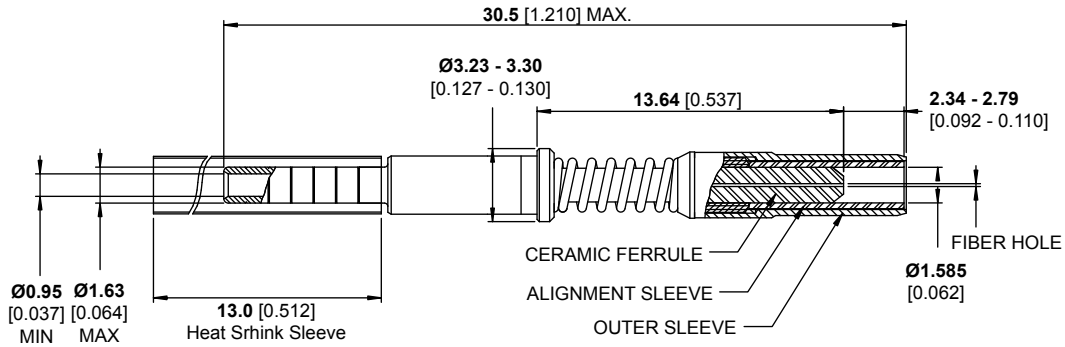
### ENVIRONMENTAL/MECHANICAL

- **Temperature Range:** -55°C to +150°C
- **Durability:** 500 mating cycles
- **Vibration:** 20 g, 20 to 2000 Hz

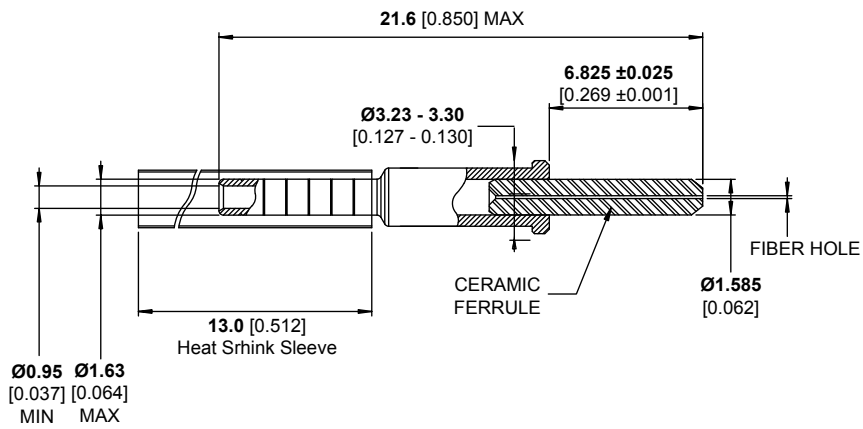


## MIL-T-29504 Style Optical Termini

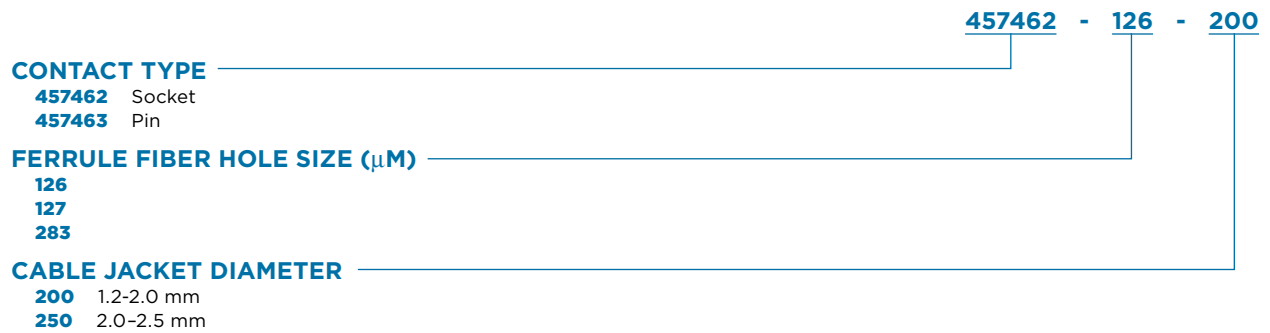
### Socket (457462)



### Pin (457463)



### Part Numbering



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