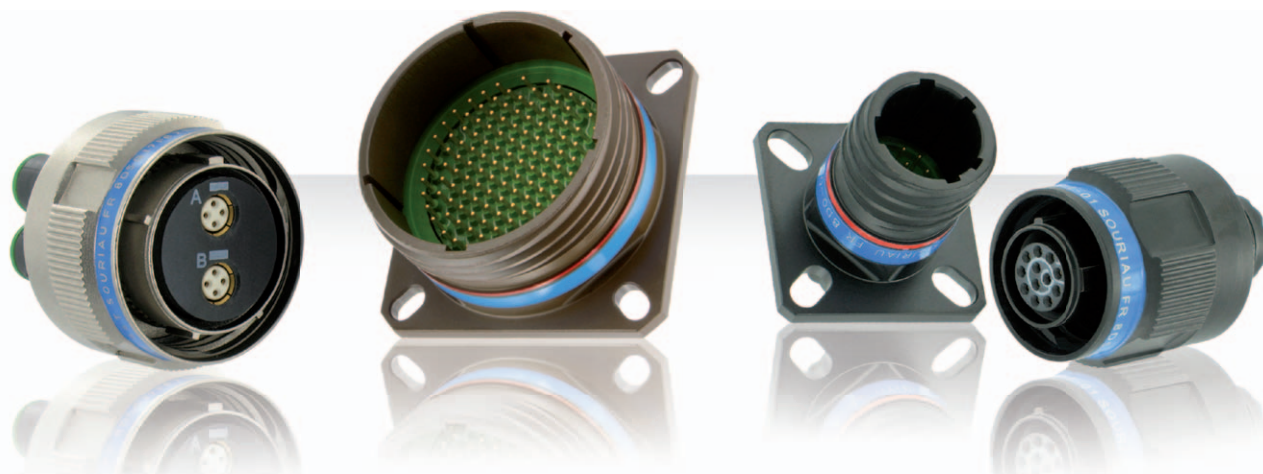




## Standard Aerospace & Military Connectors

MIL-DTL-38999 Series III / EN3645





## Presentation

Since the early 80's, **SOURIAU** is a major supplier of 38999 Series III, the screw-coupled version of MIL-C-38999. Present on the main international programs, **SOURIAU** has developed a range of products that meet the performance required in extreme environments. This product family is in accordance with MIL-DTL-38999 Series III, EN3645, CECC (standard for bronze shell), and also meets many customers' standards (Rolls Royce, ABS, BACC, ...)

This evolution of MIL-C-38999 allows:

- A high contact density up to 128 contacts #22D
- A quick screw coupling with self locking mechanism
- High resistance to harsh environments (vibration, 200°C)

Always at the cutting edge of innovation, **SOURIAU**'s teams have continuously improved this range of connectors:

- Composite version in the 90's (Its choice is recommended wherever weight is critical)
- Titanium version for weight saving and very high and mechanical resistance
- Today **SOURIAU** remains innovative with cadmium free and RoHS solutions.

In 2009 **SOURIAU** was the first to be QPL qualified for Zinc Nickel plating.

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### Standard Series

|                              |    |
|------------------------------|----|
| Aluminum Series .....        | 22 |
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| Bronze Series .....          | 52 |

### Common Section

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### Derived Series

### Range Extension

85

145

# 8D SERIES

8D Series

# Overview

|                                                                       |    |
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## Typical applications



Civil Aeronautics



Military Aeronautics



Defense



Ground Military



Industrial - Railway



Marine - Offshore

## Features & Benefits

### QPL

#### MIL-DTL-38999 Qualified

54 qualified layouts.  
Qualified protective caps.

### ROBUST

#### High reliability

Temperature up to 200°C.  
High vibration withstanding (44g).  
500 mating/unmating cycles.

### LIGHT WEIGHT

#### High end materials

Aluminum (D38999 & EN3645 qualified).  
Composite (D38999, EN3645 & BACC qualified).  
Titanium version.

### LARGE OFFER

#### Versatility

RoHS platings, high density layouts, ...  
Contacts: signal, high speed (optical, quadrax), high power, ...  
Specific shells: double flange, clinch nuts, integrated backshell, ...

### FIRE SEAL

#### Class K

Stainless steel (D38999, EN3645 & BACC qualified).  
Hermetic version.

## A superior concept

5

Materials & Platings



### Aluminum

Black zinc nickel RoHS,  
Nickel RoHS,  
Green zinc cobalt,  
Olive drab cadmium



### Composite

Nickel RoHS,  
Olive drab cadmium,  
Without plating



### Stainless Steel

Passivated RoHS,  
Nickel RoHS



### Titanium

Nickel RoHS,  
Without plating



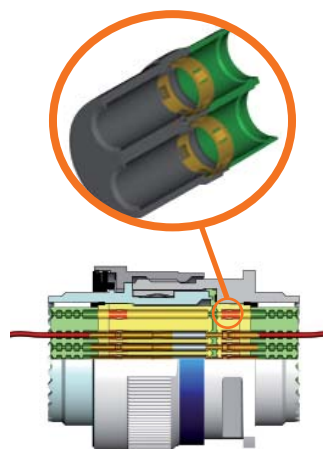
### Bronze

Without plating

Versatile  
& Robust

### Metallic clips retention

**Unique** technology,  
High performance **contact retention**,  
**High temperature** and **high vibrations** withstanding



### Accessories

Full **backshells** offer,  
Protective **caps**,  
**Tooling**

### High sealing

**IP67**,  
Each contact cavity is  
individually sealed

Full  
Contact  
offer

### Versatility

**PC Tail** contacts with or  
without shoulder,  
**Crimp** contacts,  
**Solder cup** contacts,  
**Wire wrap** contacts

### High density

**#26 contact** layouts

### Adaptability

Common cavity for  
all **#8 contacts**

### Multi-contact technology

**Signal** transmission,  
**High power** up to 850A,  
**High speed** data transmission:

- . Quadrax
- . Coax
- . Twinax
- . Triax (= concentric twinax)
- . ELIO® fiber optic
- . Expanded beam



## Derived Series

Various possibilities of range extension and shell variant from Standard Series.  
The only limit is your imagination: Consult us !

### HIGH SPEED SOLUTIONS



Twinax and Quadrax contacts  
see page 86



BMA coaxial contacts  
see page 92



ELIO® fiber optic contacts  
see page 96



ELIOBEAM fiber optic contacts  
see page 102

### POWER SOLUTIONS



Power contacts  
see page 106



High power contacts  
see page 111

### COMPACT SOLUTIONS



High density  
see page 116



Plug with integrated backshell  
see page 118

### SMART DESIGN SOLUTIONS



High vibration: 8DV Series  
see page 122



Clinch nuts or helicoils  
see page 126

### PC TAIL CONTACTS SOLUTIONS



Double flange receptacle  
see page 129



PC tail contact without shoulder  
see page 132

### REINFORCED SEALING



Resin sealed connector  
see page 134



Glass sealed connector  
see page 137

### INTERCONNECT SOLUTIONS

**SUNBANK** provides a large variety of interconnect solutions to vector and secure the cable routing. Consult us for more information.



Backshells



Flexible conduits



Protective caps



Accessories

## A performing MIL standard connector design

### Quick coupling

1 1/4 turn to mate



### Scoop proof

No risk of damaging contacts during the coupling operation



### Fully shielded

Shell to shell bottoming  
= perfect shield continuity

360° shielding

360° teeth for optimum shield continuity with accessories

EMI Ring



### Self locking

Mechanism patented by SOURIAU.  
Connector will never unscrew even under high vibration (44 g)

### Visual mating

Red band visible  
= not correctly mated



Red band hidden  
= correctly mated



## A universal product platform

### 38999 Series I

MIL-DTL-38999  
8LT Series



- . High density MIL-spec circular
- . Scoop proof
- . Bayonet coupling
- . Mounting: screws or jam nut
- . Shell: Aluminum alloy
- . Plating: Cadmium or nickel
- . QPL approved
- . Numerous layouts

### 38999 Series II

MIL-DTL-38999  
8T Series



- . Short version of 38999 Series I
- . High density MIL-spec circular
- . Bayonet coupling
- . Mounting: screws or jam nut
- . Shell: Aluminum alloy
- . Plating: Cadmium, nickel or hard anodized
- . QPL approved

VG96912 &  
JN1003  
8ST Series



- . High density
- . Lightweight version of Series I
- . Scoop proof, bayonet coupling
- . Mounting: screws or jam nut
- . Shell: Aluminum alloy
- . Plating: Cadmium or nickel
- . VG 96912 German specification
- . JN 1003 Typhoon specification



## Description

- High contact density layouts available
- Screw coupling, Shell size from 9 to 25
- Contact protection: 100% Scoop proof
- Protected by cadmium, nickel, green zinc cobalt or black zinc nickel plating
- RFI - EMI shielding and shell to shell continuity
- Accessories (protective caps, backshells, etc...)
- Hermetic versions
- High power up to 850A
- Optical layouts
- 230V layouts available (ABS22-19, ABS22-20, ABS22-21 & ABS22-22 qualified)
- Standards:
  - . MIL-DTL-38999 Series III
  - . EN3645
  - . BACC63CT/CU; BACC63DB/DC

## Technical features

### Mechanical

- **Shell:**  
Aluminum, composite, stainless steel, bronze
  - **Shell plating:**
    - . Aluminum shell:
      - Cadmium olive drab (W)
      - Nickel (F)
      - Black zinc nickel (Z)
      - Green zinc cobalt (ZC)
    - . Composite shell:
      - Cadmium olive drab (J)
      - Nickel (M)
      - Without plating (X)
    - . Stainless steel shell:
      - Passivated (K)
      - Nickel (S)
    - . Titanium shell:
      - Without plating (TT)
      - Nickel (TF)
    - . Bronze shell:
      - Without plating
  - **Insulator:** Thermoplastic
  - **Grommet and interfacial seal:**  
Silicone elastomer
  - **Contacts:** Copper alloy
  - **Contacts plating:** Gold over nickel plated
  - **Endurance:**
    - . 500 mating cycles all materials
    - . 1500 mating cycles for composite connectors with specifics contacts
  - **Shock:**  
300 g, 3 ms according EN2591-D2 method A
  - **Vibration:**
    - . Sinus:
      - . 10 à 2000 Hz, 3x12 hrs
      - (60 g, 140 - 2000 Hz) with T° cycling
    - . Random:
      - . 50 to 2000 Hz, 2x8 Hrs
      - (1 g2/ Hz, 100 - 2000 Hz) at T° max.
      - . 25 to 2000 Hz, 2x8 Hrs
      - (5 g2/ Hz, 100 - 300 Hz) at ambient T°
- Test with accessories in acc with EN2591-D3

| Contacts size  | 26 | 22 | 20 | 16  | 12  | 8   | 4   |
|----------------|----|----|----|-----|-----|-----|-----|
| Min force in N | 30 | 44 | 67 | 111 | 111 | 111 | 200 |

### Weight comparison

Example for a plug shell size 15

| Materials       | Weight  |             |
|-----------------|---------|-------------|
| Stainless steel | 58.80 g |             |
| Titanium        | 33.90 g | 42% lighter |
| Aluminum        | 20.35 g | 40% lighter |
| Composite       | 14.30 g | 30% lighter |

## Electrical

### • Test voltage rating (Vrms)

| Service | sea level | at 21000 m |
|---------|-----------|------------|
| R       | 400       | N/A        |
| M       | 1 300     | 800        |
| N       | 1 000     | 600        |
| I       | 1 800     | 1 000      |
| II      | 2 300     | 1 000      |

### • Contact resistance

| Contacts size | 26 | 22   | 20  | 16  | 12  | 8 | 4 |
|---------------|----|------|-----|-----|-----|---|---|
| Resistance mΩ | 16 | 14.6 | 7.3 | 3.8 | 3.5 | 3 | 2 |

### • Insulation resistance:

≥ 5 000 MΩ (under 500 Vdc)

### • Contact rating:

| Contacts size | 26 | 22 | 20  | 16 | 12 | 10 | 8  | 4  |
|---------------|----|----|-----|----|----|----|----|----|
| Rating (A)    | 3  | 5  | 7.5 | 13 | 23 | 33 | 45 | 80 |

### • Shell continuity

- . Aluminum shell:
  - Cadmium olive drab (W): 2.5 mΩ
  - Nickel (F): 1 mΩ
  - Black zinc nickel (Z): 2.5 mΩ
  - Green zinc cobalt (ZC): 2.5 mΩ
- . Composite shell:
  - Cadmium olive drab (J): 3 mΩ
  - Nickel (M): 3 mΩ
- . Stainless steel shell:
  - Passivated (K): 10 mΩ
  - Nickel (S): 1 mΩ
- . Titanium shell:
  - Without plating (TT): 10 mΩ
  - Nickel (TF): 1 mΩ
- . Bronze shell:
  - Without plating: 5 mΩ

### • Shielding:

- . Aluminum shell:
  - F: 65 db at 10 GHz
  - Z, F & W: 85 db at 1 GHz
  - Z & W: 50 db at 10 GHz
  - ZC: Consult us
- . Composite shell:
  - J & M: 85 db at 1 GHz
- . Stainless steel shell:
  - K: 45 db at 10 GHz
  - S: 65 db at 10 GHz
- . Titanium shell:
  - TT: 45 db at 10 GHz
  - TF: 65 db at 10 GHz
- . Bronze shell:
  - 85 db at 10 GHz

## Environmental

### • Temperature range:

- . Aluminum shell:
  - W: -65°C +175°C
  - F: -65°C +200°C
  - Z: -65°C +200°C
  - ZC: -65°C +175°C
- . Composite shell:
  - J: -65°C +175°C
  - M: -65°C +200°C
  - Without plating (X): -65°C +175°C
- . Stainless steel shell:
  - K: -65°C +200°C
  - S: -65°C +200°C
- . Titanium shell:
  - TT: -65°C +200°C
  - TF: -65°C +200°C
- . Bronze shell:
  - Without plating: -65°C +175°C

### • Sealing:

Mated connectors meet altitude immersion requirements of MIL-DTL-38999.

### • Salt spray:

- . Aluminum shell:
  - W: 500 Hrs
  - F: 48 Hrs
  - Z: 500 Hrs
  - ZC: 250 Hrs
- . Composite shell:
  - J: 2000 Hrs
  - M: 2000 Hrs
  - Without plating (X): 2000 Hrs
- . Stainless steel shell:
  - K: 500 Hrs
  - S: 500 Hrs
- . Titanium shell:
  - TT: 500 Hrs
  - TF: 48 Hrs
- . Bronze shell:
  - Without plating: 500 Hrs

## Resistance to fluids

### • According to MIL-DTL-38999 standard

- . Gasoline: JP5 (OTAN F44)
- . Mineral hydraulic fluid: MIL-H-5606 (OTAN H515)
- . Synthetic hydraulic fluid: Skydrol 500 B4

### • LD4 (SAE AS 1241)

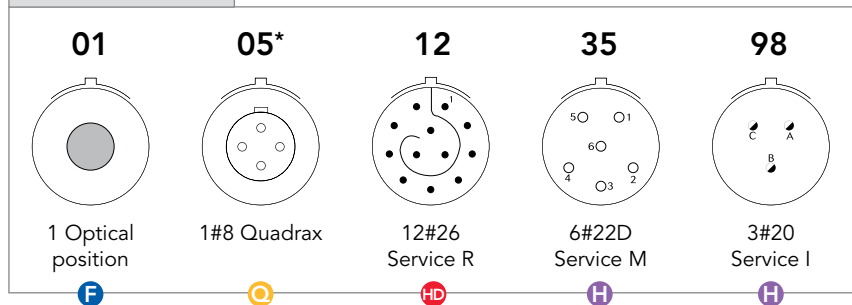
- . Mineral lubricating: MIL-L-7870A (OTAN 0142)
- . Synthetic lubricating: MIL-L-23699 (OTAN 0156), MIL-L-7808
- . Cleaning fluid: MIL-C-87936 diluted
- . De-icing fluid: MIL-A-8243
- . Extinguishing fluid: Bromochloromethane
- . Cooling fluid: Coolanol

## Contact layouts

P Power or High Power 
 Q Quadrax or Twinax 
 C Concentric Twinax (=Triax) or Coax 
 HD High Density 
 H Hermetic version developed 
 F Fiber optic ELIO® or Expanded beam

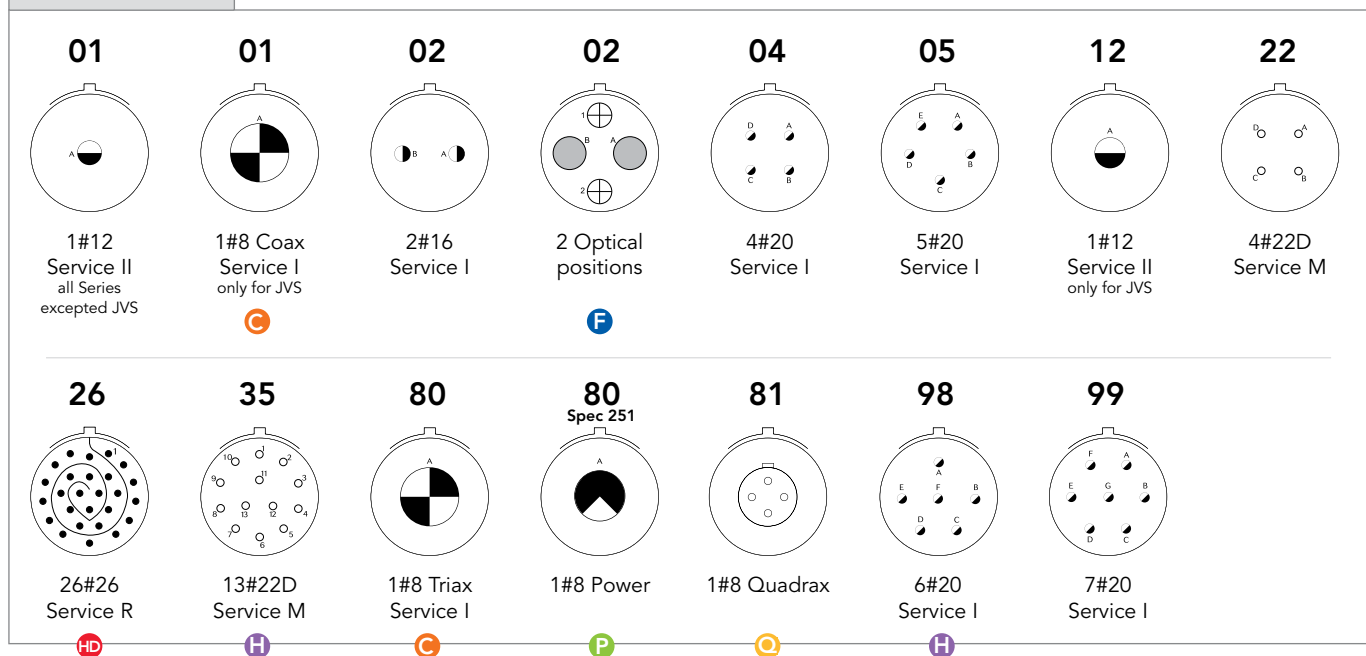
Contact sizes 
 ● #26 
 ○ #22D 
 ◐ #20 
 ◑ #16 
 ◒ #12 
 ◓ #10 
 ◔ #8 Quadrax or Twinax 
 ◕ Fiber optic ELIO® or Expanded beam  
 ◖ #8 Triax (=Concentric Twinax) or Coax - consult us 
 ◗ #8 Power 
 ◘ #4 Power 
 ◙ High Power

### 09 / A



\* 09-05 layout:  
 - Grounded version only (spec. 620)  
 - Plug with female contact & receptacle with male contact only

### 11 / B



As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadrax, ...) should not be used in firewall applications.

## Contact layouts

P Power or High Power 
 Q Quadrax or Twinax 
 C Concentric Twinax (=Triax) or Coax 
 HD High Density 
 H Hermetic version developed 
 F Fiber optic ELIO® or Expanded beam

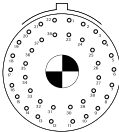
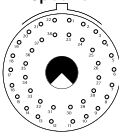
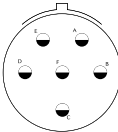
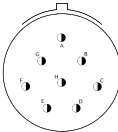
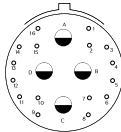
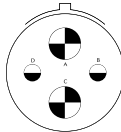
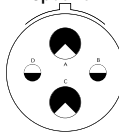
### 13 / C

|                                    |                                                      |                                                           |                                                      |                                           |                                                        |                                                        |                                                       |
|------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|-------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|
| <b>03</b><br><br>3#16<br>Service I | <b>04</b><br><br>4#16<br>Service I<br><span>H</span> | <b>04</b><br><br>4 Optical<br>positions<br><span>F</span> | <b>08</b><br><br>8#20<br>Service I<br><span>H</span> | <b>26</b><br><br>2#12, 6#22D<br>Service M | <b>35</b><br><br>22#22D<br>Service M<br><span>H</span> | <b>43</b><br><br>43#26<br>Service R<br><span>HD</span> | <b>98</b><br><br>10#20<br>Service I<br><span>H</span> |
|------------------------------------|------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|-------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|

### 15 / D

|                                     |                                                           |                                           |                                                       |                                                       |                                                        |                                                            |
|-------------------------------------|-----------------------------------------------------------|-------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------|
| <b>05</b><br><br>5#16<br>Service II | <b>06</b><br><br>6 Optical<br>positions<br><span>F</span> | <b>15</b><br><br>1#16, 14#20<br>Service I | <b>18</b><br><br>18#20<br>Service I<br><span>H</span> | <b>19</b><br><br>19#20<br>Service I<br><span>H</span> | <b>35</b><br><br>37#22D<br>Service M<br><span>H</span> | <b>97</b><br><br>4#16, 8#20<br>Service I<br><span>H</span> |
|-------------------------------------|-----------------------------------------------------------|-------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------|

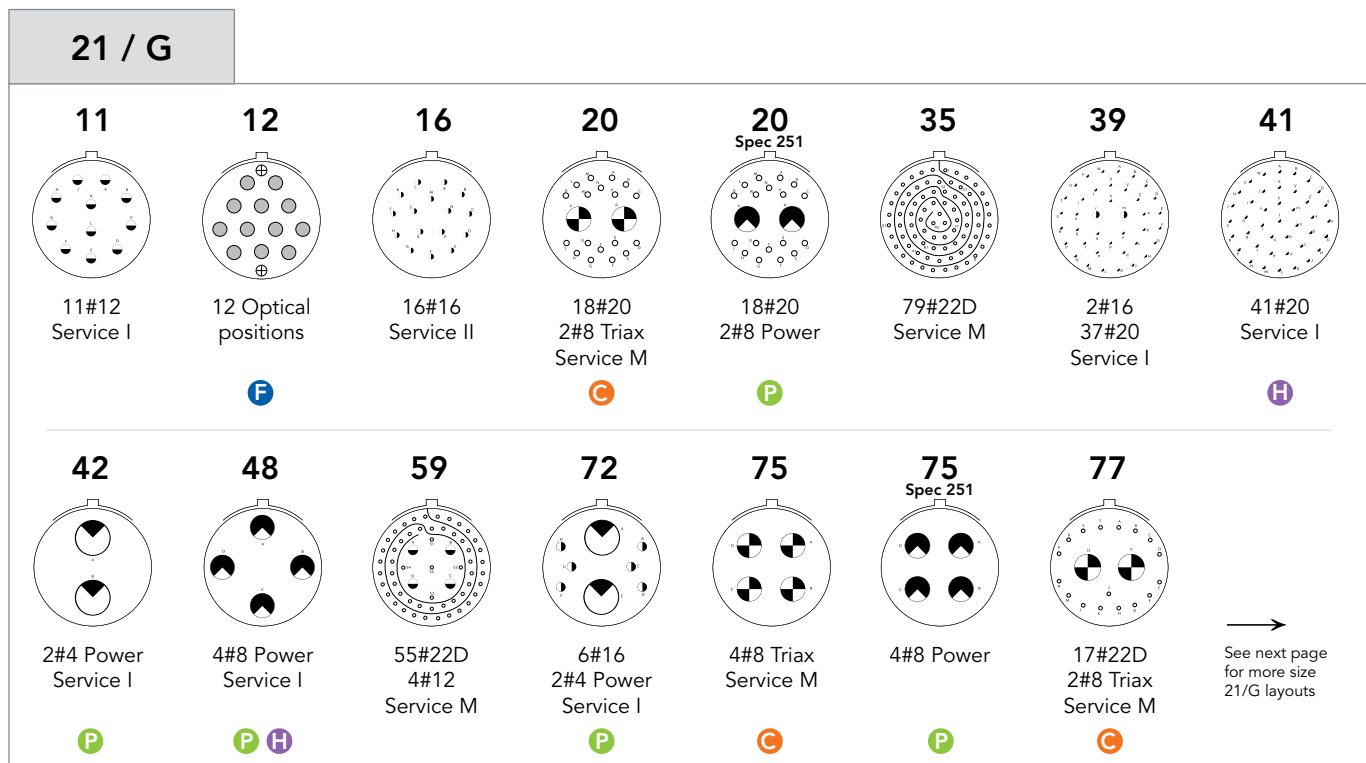
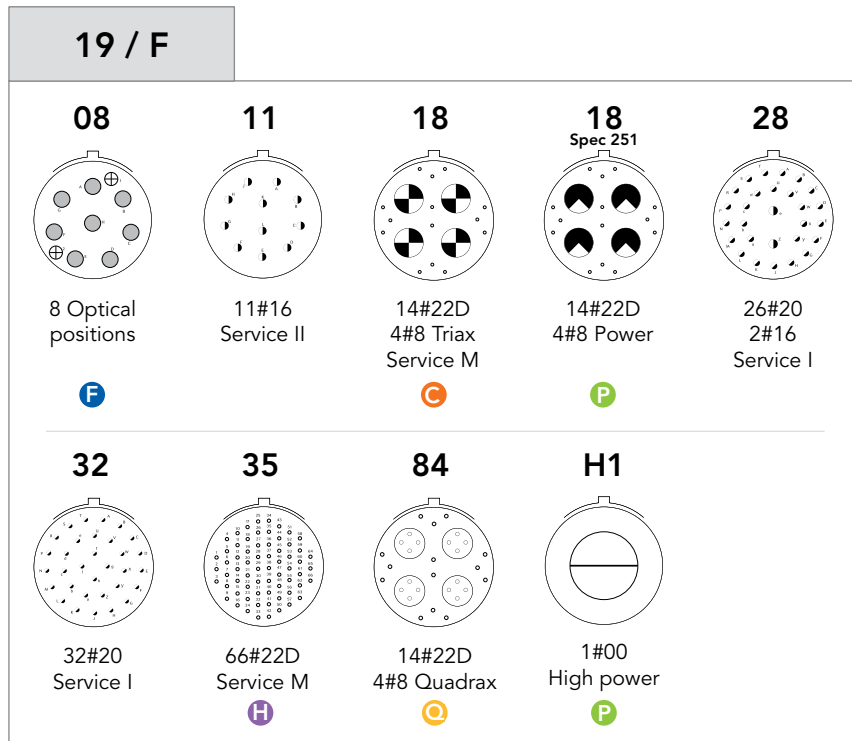
### 17 / E

|                                                                                                                                                                         |                                                                                                                                                                        |                                                                                                                                                         |                                                                                                                                                          |                                                                                                                                                                    |                                                                                                                                                                        |                                                                                                                                                                        |                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <div>02</div> <div></div> <div>38#22D<br/>1#8 Triax<br/>Service M</div> <div>C</div> | <div>02<br/>Spec 251</div> <div></div> <div>38#22D<br/>1#8 Power</div> <div>P</div> | <div>06</div> <div></div> <div>6#12<br/>Service I</div> <div>H</div> | <div>08</div> <div></div> <div>8#16<br/>Service II</div> <div>H</div> | <div>20</div> <div></div> <div>4#12<br/>16#22D<br/>Service M</div> <div>C</div> | <div>22</div> <div></div> <div>2#12<br/>2#8 Triax<br/>Service M</div> <div>C</div> | <div>22<br/>Spec 251</div> <div></div> <div>2#12<br/>2#8 Power</div> <div>P</div> | <div>26</div> <div></div> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|

As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadrax, ...) should not be used in firewall applications.

## Contact layouts

P Power or High Power 
 Q Quadrax or Twinax 
 C Concentric Twinax (=Triax) or Coax 
 HD High Density 
 H Hermetic version developed 
 F Fiber optic ELIO® or Expanded beam

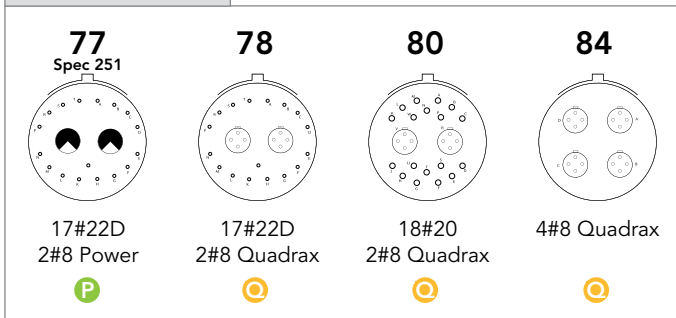


As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadrax, ...) should not be used in firewall applications.

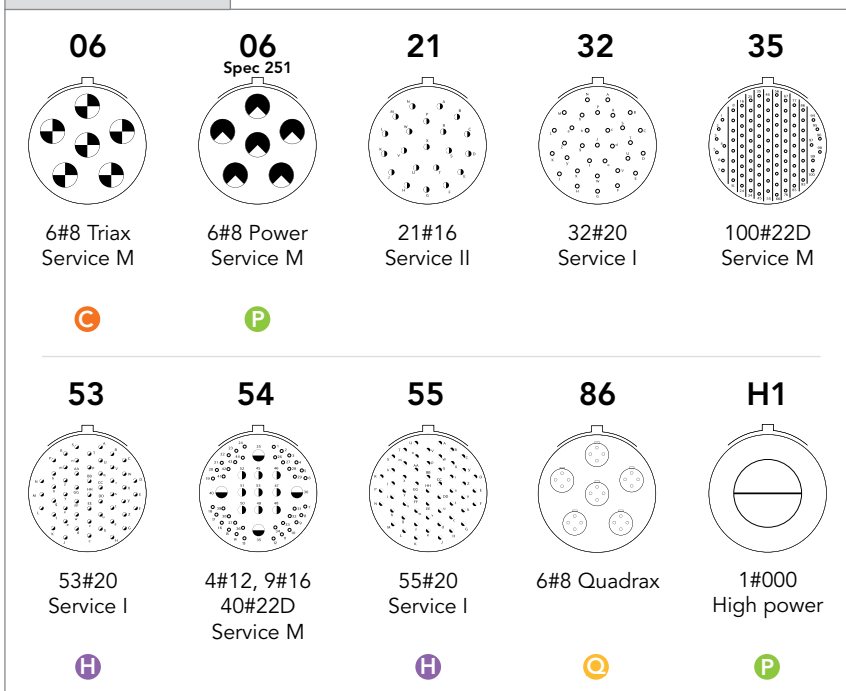
## Contact layouts

P Power or High Power 
 Q Quadrax or Twinax 
 C Concentric Twinax (=Triax) or Coax 
 HD High Density 
 H Hermetic version developed 
 F Fiber optic ELIO® or Expanded beam

### 21 / G



### 23 / H



As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadrax, ...) should not be used in firewall applications.

## Contact layouts

P Power or High Power 
 Q Quadrax or Twinax 
 C Concentric Twinax (=Triax) or Coax 
 HD High Density 
 H Hermetic version developed 
 F Fiber optic ELIO® or Expanded beam

25 / J

|                                                                                          |                                                                                         |                                                                                   |                                                                   |                                                                         |                                                                                      |                                                         |                                                                            |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------|
| <b>04</b><br><br>48#20<br>8#16<br>Service I<br><span>H</span>                            | <b>07</b><br><br>97#22D<br>2#8 Triax<br>Service M<br><span>C</span>                     | <b>07</b><br>Spec 251<br><br>97#22D<br>2#8 Power<br><span>P</span>                | <b>08</b><br><br>8#8 Triax<br>Service M<br><span>C</span>         | <b>08</b><br>Spec 251<br><br>8#8 Power<br><span>P</span>                | <b>11</b><br><br>2#20<br>9#10<br>Service N<br>                                       | <b>17</b><br><br>36#22D<br>6#8 Triax<br><span>C</span>  | <b>17</b><br>Spec 251<br><br>36#22D<br>6#8 Power<br><span>P</span>         |
| <b>19</b><br><br>19#12<br>Service I<br><span>H</span>                                    | <b>20*</b><br><br>10#20, 13#16<br>4#12 Coax<br>3#8 Triax<br>Service N<br><span>C</span> | <b>20*</b><br>Spec 251<br><br>10#20<br>13#16, 4#12<br>3#8 Power<br><span>P</span> | <b>24</b><br><br>12#16<br>12#12<br>Service I<br>                  | <b>24</b><br><br>24 Optical<br>positions<br><span>F</span>              | <b>29</b><br><br>29#16<br>Service I<br>                                              | <b>35</b><br><br>128#22D<br>Service M<br>               | <b>37</b><br><br>37#16<br>Service II<br>                                   |
| <b>41</b><br><br>22#22D, 3#20<br>11#16, 2#12<br>3#8 Triax<br>Service M<br><span>C</span> | <b>41</b><br>Spec 251<br><br>22#22D, 3#20<br>11#16, 2#12<br>3#8 Power<br><span>P</span> | <b>43</b><br><br>23#20<br>20#16<br>Service I<br>                                  | <b>44</b><br><br>4#16<br>4#4 Power<br>Service I<br><span>P</span> | <b>46</b><br><br>40#20, 4#16<br>2#8 Coax<br>Service I<br><span>C</span> | <b>46</b><br>Spec 251<br><br>40#20, 4#16<br>2#8 Power<br>Service I<br><span>P</span> | <b>61</b><br><br>61#20<br>Service I<br>                 | <b>80</b><br><br>10#20 13#16<br>4#12 Coax<br>3#8 Quadrax<br><span>Q</span> |
| <b>81</b><br><br>22#22D<br>3#20, 11#16<br>2#12<br>3#8 Quadrax<br><span>Q</span>          | <b>82</b><br><br>97#22D<br>2#8 Quadrax<br><span>Q</span>                                | <b>86</b><br><br>40#20<br>4#16<br>2#8 Quadrax<br><span>Q</span>                   | <b>87</b><br><br>36#22D<br>6#8 Quadrax<br><span>Q</span>          | <b>88</b><br><br>8#8 Quadrax<br><span>Q</span>                          | <b>90</b><br><br>40#20, 4#16<br>2#8 Triax<br>Service I<br><span>C</span>             | <b>H1</b><br><br>1#0000<br>High power<br><span>P</span> |                                                                            |

As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadrax, ...) should not be used in firewall applications.

## Contact layouts (matrix)

| Shell size | Layout               | MIL-DTL-38999 (QPL) Aluminum, Stainless steel & Composite | 8D Titanium | JVS-CECC Bronze connector | Hermetics | EN3645 | BACC63 CT/CU DB/DC | Number of contacts | #26 | #22D | #20 | #16 | #12 | #10 | #8     | #4 | Fiber optic or High power |
|------------|----------------------|-----------------------------------------------------------|-------------|---------------------------|-----------|--------|--------------------|--------------------|-----|------|-----|-----|-----|-----|--------|----|---------------------------|
| 09 / A     | 09-01                | OK                                                        | OK          | OK                        |           |        |                    | 1                  |     |      |     |     |     |     |        |    | 1 Optic.                  |
|            | 09-05 <sup>(1)</sup> | OK                                                        | OK          | OK                        |           |        |                    | 1                  |     |      |     |     |     |     | 1 Qdx  |    |                           |
|            | 09-12                | OK                                                        |             |                           |           |        |                    | 12                 | 12  |      |     |     |     |     |        |    |                           |
|            | 09-35                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 6                  |     | 6    |     |     |     |     |        |    |                           |
|            | 09-98                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 3                  |     |      | 3   |     |     |     |        |    |                           |
| 11 / B     | 11-01                | OK                                                        | OK          |                           |           |        |                    | 1                  |     |      |     |     | 1   |     |        |    |                           |
|            | 11-01                | OK                                                        | OK          | OK                        |           |        |                    | 1                  |     |      |     |     |     |     | 1 Coax |    |                           |
|            | 11-02                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 2                  |     |      |     | 2   |     |     |        |    |                           |
|            | 11-02                | OK                                                        | OK          | OK                        |           |        |                    | 2                  |     |      |     |     |     |     |        |    | 2 Optic.                  |
|            | 11-04                | Q                                                         | OK          | OK                        |           |        | Q                  | 4                  |     |      | 4   |     |     |     |        |    |                           |
|            | 11-05                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 5                  |     |      | 5   |     |     |     |        |    |                           |
|            | 11-12                |                                                           |             | OK                        |           |        |                    | 1                  |     |      |     |     | 1   |     |        |    |                           |
|            | 11-22                | OK                                                        | OK          | OK                        |           |        |                    | 4                  |     | 4    |     |     |     |     |        |    |                           |
|            | 11-26                | OK                                                        |             |                           |           |        |                    | 26                 | 26  |      |     |     |     |     |        |    |                           |
|            | 11-35                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 13                 |     | 13   |     |     |     |     |        |    |                           |
|            | 11-80                | OK                                                        | OK          | OK                        |           |        |                    | 1                  |     |      |     |     |     |     | 1 Twx  |    |                           |
|            | 11-80 sp.251         | OK                                                        | OK          | OK                        |           |        |                    | 1                  |     |      |     |     |     |     | 1 Pow  |    |                           |
|            | 11-81                | OK                                                        | OK          | OK                        |           |        |                    | 1                  |     |      |     |     |     |     | 1 Qdx  |    |                           |
|            | 11-98                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 6                  |     |      | 6   |     |     |     |        |    |                           |
|            | 11-99                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 7                  |     |      | 7   |     |     |     |        |    |                           |
| 13 / C     | 13-03                | OK                                                        | OK          | OK                        |           |        |                    | 3                  |     |      |     |     |     |     |        |    |                           |
|            | 13-04                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 4                  |     |      |     | 4   |     |     |        |    |                           |
|            | 13-04                | OK                                                        | OK          | OK                        |           |        |                    | 4                  |     |      |     |     |     |     |        |    | 4 Optic.                  |
|            | 13-08                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 8                  |     |      | 8   |     |     |     |        |    |                           |
|            | 13-26                | OK                                                        | OK          | Q                         |           | Q      |                    | 8                  |     | 6    |     |     | 2   |     |        |    |                           |
|            | 13-35                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 22                 |     | 22   |     |     |     |     |        |    |                           |
|            | 13-43                | OK                                                        |             |                           |           |        |                    | 43                 | 43  |      |     |     |     |     |        |    |                           |
| 15 / D     | 13-98                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 10                 |     |      | 10  |     |     |     |        |    |                           |
|            | 15-05                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 5                  |     |      |     | 5   |     |     |        |    |                           |
|            | 15-06                | OK                                                        | OK          | OK                        |           |        |                    | 6                  |     |      |     |     |     |     |        |    | 6 Optic.                  |
|            | 15-15                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 15                 |     |      | 14  | 1   |     |     |        |    |                           |
|            | 15-18                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 18                 |     |      | 18  |     |     |     |        |    |                           |
|            | 15-19                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 19                 |     |      | 19  |     |     |     |        |    |                           |
|            | 15-35                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 37                 |     | 37   |     |     |     |     |        |    |                           |
| 17 / E     | 15-97                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 12                 |     |      | 8   | 4   |     |     |        |    |                           |
|            | 17-02                | Q                                                         | OK          | OK                        |           | Q      | Q                  | 39                 |     | 38   |     |     |     |     | 1 Twx  |    |                           |
|            | 17-02 sp.251         | OK                                                        | OK          | OK                        |           |        |                    | 39                 |     | 38   |     |     |     |     | 1 Pow  |    |                           |
|            | 17-06                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 6                  |     |      |     |     | 6   |     |        |    |                           |
|            | 17-08                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 8                  |     |      |     | 8   |     |     |        |    |                           |
|            | 17-20                | OK                                                        | OK          | OK                        |           |        |                    | 20                 |     | 16   |     |     | 4   |     |        |    |                           |
|            | 17-22                | OK                                                        | OK          | OK                        |           |        |                    | 4                  |     |      |     |     | 2   |     | 2 Twx  |    |                           |
|            | 17-22 sp.251         | OK                                                        | OK          | OK                        |           |        |                    | 4                  |     |      |     |     | 2   |     | 2 Pow  |    |                           |
|            | 17-26                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 26                 |     |      | 26  |     |     |     |        |    |                           |
|            | 17-35                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 55                 |     | 55   |     |     |     |     |        |    |                           |
|            | 17-75                | OK                                                        | OK          | OK                        |           |        |                    | 2                  |     |      |     |     |     |     | 2 Twx  |    |                           |
|            | 17-75 sp.251         | OK                                                        | OK          | OK                        |           |        |                    | 2                  |     |      |     |     |     |     | 2 Pow  |    |                           |
|            | 17-80                | OK                                                        | OK          | OK                        |           |        |                    | 4                  |     |      |     |     | 2   |     | 2 Qdx  |    |                           |
|            | 17-81                | OK                                                        | OK          | OK                        |           |        |                    | 39                 |     | 38   |     |     |     |     | 1 Qdx  |    |                           |
|            | 17-82                | OK                                                        | OK          | OK                        |           |        | Q                  | 2                  |     |      |     |     |     |     | 2 Qdx  |    |                           |
|            | 17-99                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 23                 |     |      | 21  | 2   |     |     |        |    |                           |
| 19 / F     | 19-08                | OK                                                        | OK          | OK                        |           |        |                    | 8                  |     |      |     |     |     |     |        |    | 8 Optic.                  |
|            | 19-11                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 11                 |     |      |     | 11  |     |     |        |    |                           |
|            | 19-18                | Q                                                         | OK          | OK                        |           |        | Q                  | 18                 |     | 14   |     |     |     |     | 4 Twx  |    |                           |
|            | 19-18 sp.251         | OK                                                        | OK          | OK                        |           |        |                    |                    |     |      |     |     |     |     |        |    |                           |
|            | 19-28                | Q                                                         | OK          | Q                         |           |        | Q                  | 28                 |     |      | 26  | 2   |     |     |        |    |                           |
|            | 19-32                | Q                                                         | OK          | Q                         |           | Q      | Q                  | 32                 |     |      | 32  |     |     |     |        |    |                           |
|            | 19-35                | Q                                                         | OK          | Q                         | OK        | Q      | Q                  | 66                 |     | 66   |     |     |     |     |        |    |                           |
|            | 19-84                | OK                                                        | OK          | OK                        |           |        |                    | 18                 |     | 14   |     |     |     |     | 4 Qdx  |    |                           |
|            | 19-H1                | OK                                                        |             |                           |           |        |                    | 1                  |     |      |     |     |     |     |        |    | 1 #00                     |

OK SOURIAU's layout

Q SOURIAU's layout & Layout according to corresponding norm

(1) Grounded insert only - Please consult us

#8 Pow: Power; Qdx: Quadrax; Twx: Concentric Twinax

As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadrax, ...) should not be used in firewall applications.

## Contact layouts (matrix)

| Shell size | Layout       | MIL-DTL-38999 (QPL) Aluminum, Stainless steel & Composite | 8D Titanium | JVS-CECC Bronze connector | Hermetics | EN3645           | BACC63 CT/CU DB/DC | Number of contacts | #26 | #22D | #20 | #16 | #12              | #10 | #8     | #4    | Fiber optic or High power |
|------------|--------------|-----------------------------------------------------------|-------------|---------------------------|-----------|------------------|--------------------|--------------------|-----|------|-----|-----|------------------|-----|--------|-------|---------------------------|
| 21 / G     | 21-11        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 11                 |     |      |     |     | 11               |     |        |       |                           |
|            | 21-12        | OK                                                        | OK          | OK                        |           |                  |                    | 12                 |     |      |     |     |                  |     |        |       | 12 Optic                  |
|            | 21-16        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 16                 |     |      |     | 16  |                  |     |        |       |                           |
|            | 21-20        | OK                                                        | OK          | OK                        |           |                  |                    | 20                 |     |      | 18  |     |                  |     | 2 Twx  |       |                           |
|            | 21-20 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 20                 |     |      | 18  |     |                  |     | 2 Pow  |       |                           |
|            | 21-35        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 79                 | 79  |      |     |     |                  |     |        |       |                           |
|            | 21-39        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 39                 |     |      | 37  | 2   |                  |     |        |       |                           |
|            | 21-41        | Q                                                         | OK          | Q                         | OK        | Q                | Q                  | 41                 |     |      | 41  |     |                  |     |        |       |                           |
|            | 21-42        | OK                                                        | OK          | OK                        |           |                  |                    | 2                  |     |      |     |     |                  |     |        | 2 Pow |                           |
|            | 21-48        | OK                                                        | OK          | Q                         | OK        |                  |                    | 4                  |     |      |     |     |                  |     | 4 Pow  |       |                           |
|            | 21-59        | OK                                                        | OK          | OK                        |           |                  |                    | 59                 | 55  |      |     |     | 4                |     |        |       |                           |
|            | 21-72        | OK                                                        | OK          | OK                        |           |                  |                    | 8                  |     |      |     | 6   |                  |     |        |       | 2 Pow                     |
|            | 21-75        | Q                                                         | OK          | OK                        |           | Q                | Q                  | 4                  |     |      |     |     |                  |     | 4 Twx  |       |                           |
|            | 21-75 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 4                  |     |      |     |     |                  |     | 4 Pow  |       |                           |
|            | 21-77        | OK                                                        | OK          |                           |           |                  |                    | 19                 | 17  |      |     |     |                  |     | 2 Twx  |       |                           |
|            | 21-77 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 19                 | 17  |      |     |     |                  |     | 2 Pow  |       |                           |
| 23 / H     | 21-78        | OK                                                        | OK          |                           |           |                  | Q                  | 19                 | 17  |      |     |     |                  |     | 2 Qdx  |       |                           |
|            | 21-80        | OK                                                        | OK          | OK                        |           |                  |                    | 20                 |     |      | 18  |     |                  |     | 2 Qdx  |       |                           |
|            | 21-84        | OK                                                        | OK          | OK                        |           |                  | Q                  | 4                  |     |      |     |     |                  |     | 4 Qdx  |       |                           |
|            | 23-06        | OK                                                        | OK          | OK                        |           |                  |                    | 6                  |     |      |     |     |                  |     | 6 Twx  |       |                           |
|            | 23-06 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 6                  |     |      |     |     |                  |     | 6 Pow  |       |                           |
|            | 23-21        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 21                 |     |      |     | 21  |                  |     |        |       |                           |
|            | 23-32        | Q                                                         | OK          | OK                        |           |                  |                    | 32                 |     |      | 32  |     |                  |     |        |       |                           |
|            | 23-35        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 100                | 100 |      |     |     |                  |     |        |       |                           |
| 25 / J     | 23-53        | Q                                                         | OK          | Q                         | OK        | Q                | Q                  | 53                 |     |      | 53  |     |                  |     |        |       |                           |
|            | 23-54        | OK                                                        | OK          | OK                        |           | Q                |                    | 53                 | 40  |      | 9   | 4   |                  |     |        |       |                           |
|            | 23-55        | Q                                                         | OK          | Q                         | OK        | Q                | Q                  | 55                 |     |      | 55  |     |                  |     |        |       |                           |
|            | 23-86        | OK                                                        | OK          | OK                        |           |                  |                    | 6                  |     |      |     |     |                  |     | 6 Qdx  |       |                           |
|            | 23-H1        | OK                                                        |             |                           |           |                  |                    | 1                  |     |      |     |     |                  |     |        |       | 1 #000                    |
|            | 25-04        | Q                                                         | OK          | OK                        | OK        | Q                | Q                  | 56                 |     |      | 48  | 8   |                  |     |        |       |                           |
|            | 25-07        | Q                                                         | OK          | OK                        |           | Q                | Q                  | 99                 | 97  |      |     |     |                  |     | 2 Twx  |       |                           |
|            | 25-07 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 99                 | 97  |      |     |     |                  |     | 2 Pow  |       |                           |
|            | 25-08        | Q                                                         | OK          | Q <sup>(2)</sup>          |           | Q                | Q                  | 8                  |     |      |     |     |                  |     | 8 Twx  |       |                           |
|            | 25-08 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 8                  |     |      |     |     |                  |     | 8 Pow  |       |                           |
|            | 25-11        | Q                                                         | OK          | OK                        |           | Q                | Q                  | 11                 |     |      | 2   |     |                  | 9   |        |       |                           |
|            | 25-17        | OK                                                        | OK          | OK                        |           |                  |                    | 42                 | 36  |      |     |     |                  |     | 6 Twx  |       |                           |
|            | 25-17 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 42                 | 36  |      |     |     |                  |     | 6 Pow  |       |                           |
|            | 25-19        | Q                                                         | OK          | Q                         | OK        | Q                | Q                  | 19                 |     |      |     |     | 19               |     |        |       |                           |
|            | 25-20        | Q                                                         | OK          | OK <sup>(3)</sup>         |           | Q <sup>(4)</sup> | Q <sup>(5)</sup>   | 30                 |     |      | 10  | 13  | 4 <sup>(6)</sup> |     | 3 Twx  |       |                           |
|            | 25-20 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 30                 |     |      | 10  | 3   | 4                |     | 3 Pow  |       |                           |
|            | 25-24        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 24                 |     |      |     | 12  | 12               |     |        |       |                           |
|            | 25-24        | OK                                                        | OK          | OK                        |           |                  |                    | 24                 |     |      |     |     |                  |     |        |       | 24 Optic.                 |
|            | 25-29        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 29                 |     |      |     | 29  |                  |     |        |       |                           |
|            | 25-35        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 128                | 128 |      |     |     |                  |     |        |       |                           |
|            | 25-37        | Q                                                         | OK          | OK                        |           | Q                | Q                  | 37                 |     |      |     | 37  |                  |     |        |       |                           |
|            | 25-41        | OK                                                        | OK          | OK                        |           |                  |                    | 41                 | 22  | 3    | 11  | 2   |                  |     | 3 Twx  |       |                           |
|            | 25-41 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 41                 | 22  | 3    | 11  | 2   |                  |     | 3 Pow  |       |                           |
|            | 25-43        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 43                 |     |      | 23  | 20  |                  |     |        |       |                           |
|            | 25-44        | OK                                                        | OK          | OK                        |           |                  |                    | 8                  |     |      |     | 4   |                  |     |        | 4 Pow |                           |
|            | 25-46        | Q                                                         | OK          | OK                        |           | Q                | Q                  | 46                 |     |      | 40  | 4   |                  |     | 2 Coax |       |                           |
|            | 25-46 sp.251 | OK                                                        | OK          | OK                        |           |                  |                    | 46                 |     |      | 40  | 4   |                  |     | 2 Pow  |       |                           |
|            | 25-61        | Q                                                         | OK          | Q                         |           | Q                | Q                  | 61                 |     |      | 61  |     |                  |     |        |       |                           |
|            | 25-80        | OK                                                        | OK          | OK                        |           |                  |                    | 30                 |     |      | 10  | 13  | 4                |     | 3 Qdx  |       |                           |
|            | 25-81        | OK                                                        | OK          | OK                        |           |                  |                    | 41                 | 22  | 3    | 11  | 2   |                  |     | 3 Qdx  |       |                           |
|            | 25-82        | OK                                                        | OK          | OK                        |           |                  |                    | 99                 | 97  |      |     |     |                  |     | 2 Qdx  |       |                           |
|            | 25-86        | OK                                                        | OK          | OK                        |           |                  |                    | 46                 |     |      | 40  | 4   |                  |     | 2 Qdx  |       |                           |
|            | 25-87        | OK                                                        | OK          | OK                        |           |                  |                    | 42                 | 36  |      |     |     |                  |     | 6 Qdx  |       |                           |
|            | 25-88        | OK                                                        | OK          | OK                        |           |                  |                    | 8                  |     |      |     |     |                  |     | 8 Qdx  |       |                           |
|            | 25-90        | Q                                                         | OK          | OK                        |           |                  |                    | 46                 |     |      | 40  | 4   |                  |     | 2 Twx  |       |                           |
|            | 25-H1        | OK                                                        |             |                           |           |                  |                    | 1                  |     |      |     |     |                  |     |        |       | 1 #0000                   |

OK SOURIAU's layout

Q SOURIAU's layout & Layout according to corresponding norm

(2) For CECC, layout 25-08 only delivered without contact

(3) For classes F, W, S, K only

(4) For classes F, W, K only

(5) Qualified BACC63DB/DC only

(6) 4 #12 coax (2+2)

#8 Pow: Power; Qdx: Quadrax; Twx: Concentric Twinax

As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadrax, ...) should not be used in firewall applications.

# 8D SERIES

## 8D Series

# Standard Series

|                           |    |
|---------------------------|----|
| ■ Aluminum Series:        |    |
| Part numbers .....        | 22 |
| Dimensions .....          | 24 |
| Connectors weight .....   | 27 |
| Backshells .....          | 28 |
| Metallic caps .....       | 34 |
| ■ Composite Series:       |    |
| Part numbers .....        | 35 |
| Dimensions .....          | 37 |
| Connectors weight .....   | 39 |
| Backshells .....          | 40 |
| ■ Stainless Steel Series: |    |
| Part numbers .....        | 41 |
| Dimensions .....          | 43 |
| Connectors weight .....   | 46 |
| ■ Titanium Series:        |    |
| Part numbers .....        | 47 |
| Dimensions .....          | 48 |
| Connectors weight .....   | 51 |
| ■ Bronze Series:          |    |
| Part numbers .....        | 52 |
| Dimensions .....          | 53 |
| Connectors weight .....   | 56 |
| Backshells .....          | 57 |
| Metallic caps .....       | 61 |

## Connector part numbers

| Basic Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 8D | 0 | - | 11 | W | 35 | P | N |  |  | L |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|---|----|---|----|---|---|--|--|---|
| <b>Shell style:</b><br><b>0:</b> Square flange receptacle<br><b>1:</b> In line receptacle<br><b>7:</b> Jam nut receptacle<br><b>5:</b> Plug with RFI shielding<br>Also available:<br>. Square flange receptacle with clinch nuts or helicoils (see page 126)<br>. Jam nut receptacle with double flange (see page 129)                                                                                                                                                                                                                                                                                                                           |    |   |   |    |   |    |   |   |  |  |   |
| <b>Type:</b><br>- : Connectors with standard crimp contacts.<br><b>L:</b> Receptacle with long PC tail (male and female size #22D, #20).<br><b>C:</b> Receptacle with short PC tail (male and female #22D, #20, #16, #12).<br><b>S:</b> Receptacle with specific PC tail (male et female #22D)<br><b>W:</b> Receptacle with male contacts #22D for wire wrap (3 wraps)<br><b>T:</b> Receptacle with male contacts #20 for wire wrap (2 wraps)<br><b>P:</b> Receptacle with solder cup contacts - please consult us<br>. see page 134 for Reinforced sealing Series with solder cup contacts<br>. see page 68 for solder cup contacts information |    |   |   |    |   |    |   |   |  |  |   |
| <b>Shell size: 09, 11, 13, 15, 17, 19, 21, 23, 25</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |   |   |    |   |    |   |   |  |  |   |
| <b>Plating:</b><br><b>W:</b> Olive drab cadmium<br><b>F:</b> Nickel<br><b>ZC:</b> Green zinc cobalt<br><b>Z:</b> Black zinc nickel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |   |   |    |   |    |   |   |  |  |   |
| <b>Contact layout:</b> See pages 13 to 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |   |   |    |   |    |   |   |  |  |   |
| <b>Contact type:</b><br><b>P:</b> Pin<br><b>A:</b> Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)<br><b>S:</b> Socket<br><b>B:</b> Connector supplied less socket contact or with specific contacts (connector marking: B + orientation)                                                                                                                                                                                                                                                                                                                                                     |    |   |   |    |   |    |   |   |  |  |   |
| <b>Orientation: N, A, B, C, D, E</b> (see page 75)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |   |   |    |   |    |   |   |  |  |   |
| <b>Specification:</b><br><b>046:</b> Tinned straight PC tail<br><b>251:</b> Connector provided with power contacts (layouts with contact #8)<br><b>022:</b> Fuel tank                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |   |   |    |   |    |   |   |  |  |   |
| <b>Special custom:</b><br><b>None:</b> Standard plastic cap<br><b>M:</b> Antistatic plastic cap<br><b>L:</b> For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation                                                                                                                                                                                                                                                                                                                                                                                                                     |    |   |   |    |   |    |   |   |  |  |   |

Note: PC tail contacts without shoulder also available. Please see page 132.

## MIL-DTL-38999 part numbers

| Basic Series                                                                                                | D38999/ | 20 | W | B | 35 | P | N | L |
|-------------------------------------------------------------------------------------------------------------|---------|----|---|---|----|---|---|---|
| <b>Shell style:</b>                                                                                         |         |    |   |   |    |   |   |   |
| 20: Square flange receptacle                                                                                |         |    |   |   |    |   |   |   |
| 24: Jam nut receptacle                                                                                      |         |    |   |   |    |   |   |   |
| 26: Plug with RFI shielding.                                                                                |         |    |   |   |    |   |   |   |
| <b>Plating:</b>                                                                                             |         |    |   |   |    |   |   |   |
| Z: Black zinc nickel                                                                                        |         |    |   |   |    |   |   |   |
| W: Olive drab cadmium                                                                                       |         |    |   |   |    |   |   |   |
| F: Nickel                                                                                                   |         |    |   |   |    |   |   |   |
| <b>Shell size: A, B, C, D, E, F, G, H, J</b>                                                                |         |    |   |   |    |   |   |   |
| <b>Contact layout:</b> See page 18 for layout according to MIL-DTL-38999                                    |         |    |   |   |    |   |   |   |
| <b>Contact type:</b>                                                                                        |         |    |   |   |    |   |   |   |
| P: Pin                                                                                                      |         |    |   |   |    |   |   |   |
| A: Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)       |         |    |   |   |    |   |   |   |
| S: Socket                                                                                                   |         |    |   |   |    |   |   |   |
| B: Connector supplied less socket contact or with specific contacts (connector marking: B + orientation)    |         |    |   |   |    |   |   |   |
| <b>Orientation: N, A, B, C, D, E</b> (see page 75)                                                          |         |    |   |   |    |   |   |   |
| L: For P or S contact type only, connector delivered without contacts, connector marking P or S (without L) |         |    |   |   |    |   |   |   |

Note: To place an order of MIL connectors delivered without MIL removable crimp contacts and keep P or S plus orientation marking, it must be specified clearly on the order (by adding a suffix L at the end of the P/N or specified in comment).

Delivered with MIL contacts mandatory.

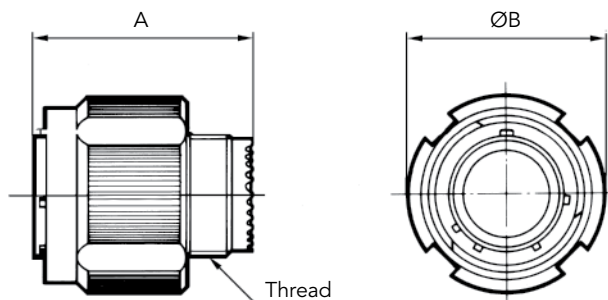
As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadax, ...) should not be used in firewall applications.

## EN3645 part numbers

| Basic Series                                         | EN3645 | W | 6 | G | N | 35 | B | N |
|------------------------------------------------------|--------|---|---|---|---|----|---|---|
| <b>Plating:</b>                                      |        |   |   |   |   |    |   |   |
| W: Olive drab cadmium                                |        |   |   |   |   |    |   |   |
| F: Nickel                                            |        |   |   |   |   |    |   |   |
| <b>Shell style:</b>                                  |        |   |   |   |   |    |   |   |
| 0: Square flange receptacle                          |        |   |   |   |   |    |   |   |
| 6: Plug                                              |        |   |   |   |   |    |   |   |
| 7: Jam nut receptacle                                |        |   |   |   |   |    |   |   |
| <b>Shell size:</b>                                   |        |   |   |   |   |    |   |   |
| 09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J |        |   |   |   |   |    |   |   |
| <b>Grounding:</b>                                    |        |   |   |   |   |    |   |   |
| N: Standard insert not grounded                      |        |   |   |   |   |    |   |   |
| <b>Contact layout:</b>                               |        |   |   |   |   |    |   |   |
| See page 18 for layout according to EN3645           |        |   |   |   |   |    |   |   |
| <b>Contact type:</b>                                 |        |   |   |   |   |    |   |   |
| A: Connector supplied less pin contact               |        |   |   |   |   |    |   |   |
| B: Connector supplied less socket contact            |        |   |   |   |   |    |   |   |
| F: Socket                                            |        |   |   |   |   |    |   |   |
| M: Pin                                               |        |   |   |   |   |    |   |   |
| <b>Orientation:</b>                                  |        |   |   |   |   |    |   |   |
| N, A, B, C, D, E (see page 75)                       |        |   |   |   |   |    |   |   |

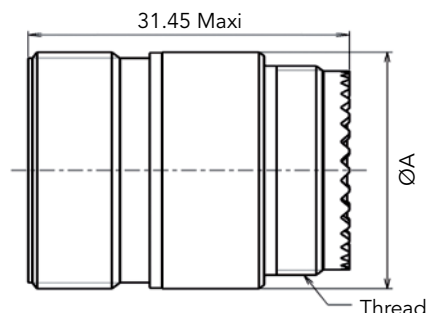
## Dimensions

### Plug type 5



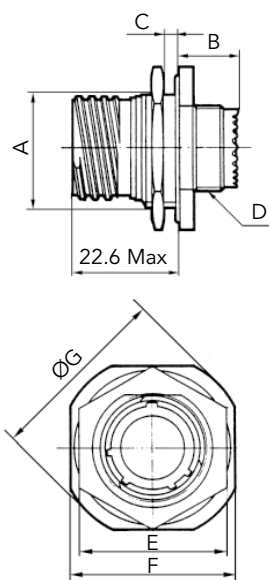
| Shell size | A Max | Thread     | ØB Max |
|------------|-------|------------|--------|
| 09 (A)     | 31.00 | M12 x 1-6g | 21.80  |
| 11 (B)     |       | M15 x 1-6g | 25.00  |
| 13 (C)     |       | M18 x 1-6g | 29.40  |
| 15 (D)     |       | M22 x 1-6g | 32.50  |
| 17 (E)     |       | M25 x 1-6g | 35.70  |
| 19 (F)     |       | M28 x 1-6g | 38.50  |
| 21 (G)     |       | M31 x 1-6g | 41.70  |
| 23 (H)     |       | M34 x 1-6g | 44.90  |
| 25 (J)     |       | M37 x 1-6g | 48.00  |

### Receptacle type 1



| Shell size | Thread     | ØA    |
|------------|------------|-------|
| 09 (A)     | M12 x 1-6g | 15.90 |
| 11 (B)     | M15 x 1-6g | 19.00 |
| 13 (C)     | M18 x 1-6g | 22.25 |
| 15 (D)     | M22 x 1-6g | 25.45 |
| 17 (E)     | M25 x 1-6g | 30.20 |
| 19 (F)     | M28 x 1-6g | 31.75 |
| 21 (G)     | M31 x 1-6g | 34.95 |
| 23 (H)     | M34 x 1-6g | 38.10 |
| 25 (J)     | M37 x 1-6g | 41.30 |

### Receptacle type 7



| Shell size | A <sup>±0.15</sup> | B Max | C Max | D Thread   | E Max | F <sup>±0.4</sup> | ØG Max |
|------------|--------------------|-------|-------|------------|-------|-------------------|--------|
| 09 (A)     | 16.53              | 9.9   | 3.2   | M12 x 1-6g | 23    | 27                | 30.5   |
| 11 (B)     | 19.07              |       |       | M15 x 1-6g | 26    | 31.8              | 35.2   |
| 13 (C)     | 23.82              |       |       | M18 x 1-6g | 31    | 34.9              | 38.4   |
| 15 (D)     | 26.97              |       |       | M22 x 1-6g | 34    | 38.1              | 41.6   |
| 17 (E)     | 30.15              |       |       | M25 x 1-6g | 37    | 41.3              | 44.8   |
| 19 (F)     | 33.32              |       |       | M28 x 1-6g | 41    | 46                | 49.5   |
| 21 (G)     | 36.50              |       |       | M31 x 1-6g | 46    | 49.2              | 52.7   |
| 23 (H)     | 39.67              |       |       | M34 x 1-6g | 47    | 52.4              | 55.9   |
| 25 (J)     | 42.85              |       |       | M37 x 1-6g | 51.23 | 55.6              | 59     |

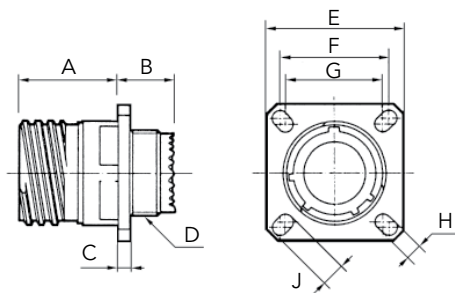
Recommended coupling torque on panel for jam nut receptacle (type 7)

| Shell                      | 09 (A) | 11 (B) | 13 (C) | 15 (D) | 17 (E) | 19 (F) | 21 (G) | 23 (H) | 25 (J) |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Coupling torque (±0.5 N.m) | 4      | 5      | 7      | 8      | 9      | 10     | 12     | 13     | 14     |

Note: All dimensions are in millimeters (mm)

## Dimensions

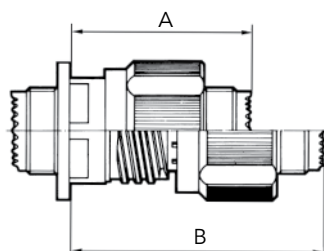
### Receptacle type 0



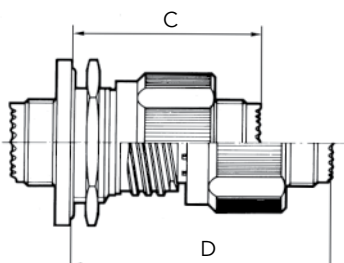
| Shell size | A Max | B Max | C Max | D Thread   | E $\pm 0.3$ | F     | G     | H $\pm 0.2$ | J $\pm 0.2$ |
|------------|-------|-------|-------|------------|-------------|-------|-------|-------------|-------------|
| 09 (A)     | 20.9  | 10.72 | 2.5   | M12 x 1-6g | 23.8        | 18.26 | 15.09 | 3.25        | 5.49        |
| 11 (B)     |       |       |       | M15 x 1-6g | 26.2        | 20.62 | 18.26 |             | 4.93        |
| 13 (C)     |       |       |       | M18 x 1-6g | 28.6        | 23.01 | 20.62 |             | 4.45        |
| 15 (D)     |       |       |       | M22 x 1-6g | 31          | 24.61 | 23.01 |             | 4.93        |
| 17 (E)     |       |       |       | M25 x 1-6g | 33.3        | 26.97 | 24.61 |             | 4.93        |
| 19 (F)     | 20.07 | 11.54 | 3.2   | M28 x 1-6g | 36.5        | 29.36 | 26.97 | 3.91        | 6.15        |
| 21 (G)     |       |       |       | M31 x 1-6g | 39.7        | 31.75 | 29.36 |             |             |
| 23 (H)     |       |       |       | M34 x 1-6g | 42.9        | 34.93 | 31.75 |             |             |
| 25 (J)     |       |       |       | M37 x 1-6g | 46          | 38.1  | 34.93 |             |             |

### Mated connectors

Type 0 with plug

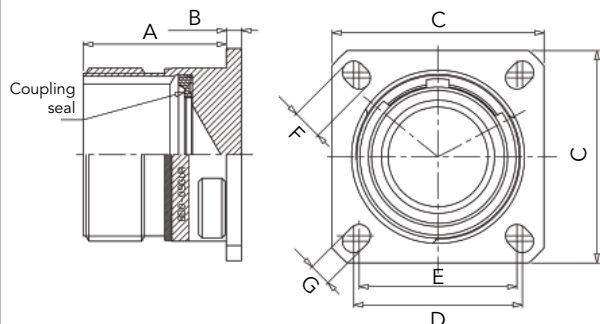


Type 7 with plug



| Shell size | A Max | B Max | C Max | D Max |
|------------|-------|-------|-------|-------|
| 09 to 11   | 37.00 | 52.30 | 38.30 | 53.60 |
| 13 to 19   | 37.00 | 52.30 | 38.50 | 53.80 |
| 21 to 25   | 36.00 | 51.30 | 38.50 | 53.80 |

### Dummy receptacle



| Shell size | Part number | A Max | B Max | C $\pm 0.30$ | D     | E     | F $\pm 0.20$ | G $\pm 0.20$ |
|------------|-------------|-------|-------|--------------|-------|-------|--------------|--------------|
| 09         | 8D0-09•UR   | 20.90 | 2.50  | 23.80        | 18.26 | 15.09 | 4.49         | 3.25         |
| 11         | 8D0-11•UR   | 20.90 | 2.50  | 26.20        | 20.62 | 18.26 | 4.93         | 3.25         |
| 13         | 8D0-13•UR   | 20.90 | 2.50  | 28.60        | 23.01 | 20.62 | 4.93         | 3.25         |
| 15         | 8D0-15•UR   | 20.90 | 2.50  | 31.00        | 24.61 | 23.01 | 4.93         | 3.25         |
| 17         | 8D0-17•UR   | 20.90 | 2.50  | 33.30        | 26.97 | 24.61 | 4.93         | 3.25         |
| 19         | 8D0-19•UR   | 20.90 | 2.50  | 36.50        | 26.97 | 24.61 | 4.93         | 3.25         |
| 21         | 8D0-21•UR   | 20.10 | 3.20  | 39.70        | 31.75 | 29.36 | 4.93         | 3.25         |
| 23         | 8D0-23•UR   | 20.10 | 3.20  | 42.90        | 34.93 | 31.75 | 6.15         | 3.91         |
| 25         | 8D0-25•UR   | 20.10 | 3.20  | 46.00        | 38.10 | 34.93 | 6.15         | 3.91         |

•: "G" for Olive green cadmium; "F" for Nickel.

Note: All dimensions are in millimeters (mm)

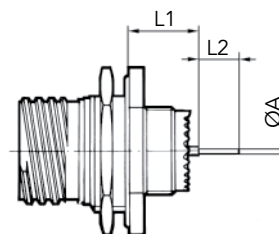
# PC tail contacts lengths

|    | Contact size | Contact type |     | PC tail type | Shell size |        |        |        |        |        |        |        |        |
|----|--------------|--------------|-----|--------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|
|    |              |              |     |              | 09 (A)     | 11 (B) | 13 (C) | 15 (C) | 17 (E) | 19 (F) | 21 (G) | 23 (H) | 25 (J) |
| ØA | #22D         | M & F        | Max | L & C        | 0.70       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 0.50       |        |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 0.70       |        |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 1.15       |        |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 1.65       |        |        |        |        |        |        |        |        |
| L1 | #22D         | M            | Min | L & C        | 10.52      |        | 10.34  |        |        |        |        |        |        |
|    |              | M            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | F            | Min | L & C        | 10.19      |        | 10.01  |        |        |        |        |        |        |
|    |              | F            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | M            | Min | S            | 10.19      |        | 10.01  |        |        |        |        |        |        |
|    |              | M            | Max | S            | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | F            | Min | S            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | S            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #20          | M            | Min | C            | 10.36      |        | 10.18  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #16          | M            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #12          | M            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |        |
| L2 | #22D         | M & F        | Max | L            | 8.50       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | C            | 4.00       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 5.10       |        |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
| L3 | #22D         | M            | Min | L & C        | 9.48       |        |        |        |        |        | 9.59   |        |        |
|    |              | M            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |        |
|    |              | F            | Min | L & C        | 9.15       |        |        |        |        |        | 9.26   |        |        |
|    |              | F            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |        |
|    |              | M            | Min | S            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | M            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | S            | 9.15       |        |        |        |        |        | 9.26   |        |        |
|    |              | F            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #20          | M            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #16          | M            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #12          | M            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |        |
|    |              | M            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |        |
|    |              | F            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |        |
|    |              | F            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |        |

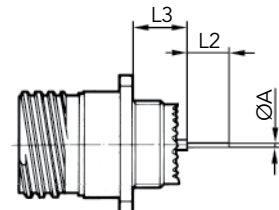
M: Male contact  
F: Female contact

L: Long PC tail  
C: Short PC tail  
S: Specific PC tail

Receptacle type 7



Receptacle type 0



Note: All dimensions are in millimeters (mm)

# Connectors weight - in gram (±15%)

| Shell size & Layout |    | With contacts |        |                     |        |                     |        | Without contacts |        |                     |        |                     |        |
|---------------------|----|---------------|--------|---------------------|--------|---------------------|--------|------------------|--------|---------------------|--------|---------------------|--------|
|                     |    | Plug (type 5) |        | Receptacle (type 0) |        | Receptacle (type 7) |        | Plug (type 5)    |        | Receptacle (type 0) |        | Receptacle (type 7) |        |
|                     |    | Male          | Female | Male                | Female | Male                | Female | Male             | Female | Male                | Female | Male                | Female |
| 09                  | 35 | 11.47         | 13.05  | 9.15                | 10.73  | 13.91               | 15.49  | 11.05            | 11.55  | 8.73                | 9.23   | 13.49               | 13.99  |
|                     | 98 | 11.47         | 12.77  | 9.15                | 10.45  | 13.91               | 15.21  | 11.05            | 11.57  | 8.73                | 9.25   | 13.49               | 14.01  |
| 11                  | 01 | 14.98         | 17.92  | 12.01               | 14.95  | 18.17               | 21.11  | 14.32            | 16.32  | 11.35               | 13.35  | 17.51               | 19.51  |
|                     | 02 | 14.61         | 17.15  | 11.64               | 14.18  | 17.80               | 20.34  | 13.99            | 15.59  | 11.02               | 12.62  | 17.18               | 18.78  |
|                     | 04 | 14.80         | 17.86  | 11.83               | 14.89  | 17.99               | 21.05  | 14.24            | 16.26  | 11.27               | 13.29  | 17.43               | 19.45  |
|                     | 05 | 14.83         | 18.04  | 11.86               | 15.07  | 19.48               | 21.23  | 14.13            | 16.04  | 11.16               | 13.07  | 17.32               | 19.23  |
|                     | 22 | 14.47         | 16.89  | 11.50               | 13.92  | 17.66               | 20.08  | 14.19            | 15.89  | 11.22               | 12.92  | 17.38               | 19.08  |
|                     | 35 | 14.73         | 18.20  | 11.76               | 15.30  | 17.68               | 21.39  | 13.82            | 14.95  | 10.85               | 12.05  | 17.01               | 18.14  |
|                     | 80 | 18.30         | 21.90  | 15.30               | 18.90  | 21.50               | 28.39  | 13.80            | 14.90  | 10.80               | 11.90  | 17.00               | 18.10  |
|                     | 98 | 14.70         | 17.46  | 11.73               | 14.49  | 17.89               | 20.65  | 13.86            | 15.06  | 10.89               | 12.09  | 17.05               | 18.25  |
|                     | 99 | 14.87         | 18.09  | 11.90               | 15.12  | 18.06               | 21.28  | 13.89            | 15.29  | 10.92               | 12.32  | 17.08               | 18.48  |
| 13                  | 04 | 21.04         | 24.82  | 15.71               | 19.29  | 24.14               | 27.92  | 19.80            | 21.70  | 14.47               | 16.17  | 22.90               | 24.80  |
|                     | 08 | 21.42         | 26.60  | 16.09               | 21.27  | 24.52               | 29.70  | 20.30            | 23.40  | 14.97               | 18.07  | 23.40               | 26.50  |
|                     | 26 | 21.79         | 27.44  | 16.46               | 22.11  | 24.89               | 30.54  | 20.05            | 22.74  | 14.72               | 17.41  | 23.15               | 25.84  |
|                     | 35 | 21.22         | 26.99  | 15.89               | 21.46  | 24.32               | 30.09  | 19.68            | 21.49  | 14.35               | 15.96  | 22.78               | 24.59  |
|                     | 98 | 21.08         | 25.70  | 15.75               | 20.37  | 24.18               | 28.80  | 19.68            | 21.70  | 14.35               | 16.37  | 22.78               | 24.80  |
| 15                  | 05 | 26.04         | 31.38  | 19.54               | 24.88  | 29.62               | 34.96  | 24.49            | 27.48  | 17.99               | 20.98  | 28.07               | 31.06  |
|                     | 15 | 26.84         | 34.00  | 20.34               | 27.22  | 30.42               | 37.58  | 24.57            | 27.62  | 18.07               | 20.84  | 28.15               | 31.20  |
|                     | 18 | 27.05         | 35.93  | 20.55               | 29.43  | 30.63               | 39.51  | 24.53            | 28.73  | 18.03               | 22.23  | 28.11               | 32.31  |
|                     | 19 | 26.58         | 34.31  | 20.08               | 27.81  | 30.16               | 37.89  | 23.92            | 26.71  | 17.42               | 20.21  | 27.50               | 30.29  |
|                     | 35 | 26.68         | 35.92  | 20.18               | 29.42  | 30.26               | 39.50  | 24.09            | 26.67  | 17.59               | 20.17  | 27.67               | 30.25  |
|                     | 97 | 26.51         | 33.56  | 20.01               | 27.06  | 30.09               | 37.14  | 24.15            | 27.24  | 17.65               | 20.74  | 27.73               | 30.82  |
|                     | 02 | 32.96         | 46.30  | 31.26               | 44.60  | 42.06               | 55.40  | 25.80            | 29.80  | 24.10               | 28.10  | 34.90               | 38.90  |
| 17                  | 06 | 29.90         | 39.50  | 28.21               | 37.81  | 39.00               | 48.60  | 25.94            | 29.90  | 24.25               | 28.21  | 35.04               | 39.00  |
|                     | 08 | 28.89         | 37.62  | 27.20               | 35.93  | 37.99               | 46.72  | 26.41            | 31.38  | 24.72               | 29.69  | 35.51               | 40.48  |
|                     | 26 | 29.47         | 40.26  | 27.78               | 38.57  | 38.57               | 49.36  | 25.83            | 29.86  | 24.14               | 28.17  | 34.93               | 38.96  |
|                     | 35 | 29.71         | 43.26  | 28.02               | 41.57  | 38.81               | 52.36  | 25.86            | 29.51  | 24.17               | 27.82  | 34.96               | 38.61  |
|                     | 75 | 35.31         | 46.60  | 33.62               | 44.91  | 44.41               | 55.70  | 26.31            | 32.60  | 24.62               | 30.91  | 35.41               | 41.70  |
|                     | 99 | 29.52         | 40.08  | 27.83               | 38.39  | 38.62               | 49.18  | 25.96            | 30.12  | 24.27               | 28.43  | 35.06               | 39.22  |
|                     | 11 | 37.77         | 51.36  | 31.07               | 44.66  | 44.62               | 58.21  | 34.36            | 42.78  | 27.66               | 46.43  | 30.86               | 49.63  |
| 19                  | 32 | 36.98         | 50.38  | 30.28               | 43.68  | 43.83               | 57.23  | 32.50            | 37.58  | 25.80               | 41.23  | 29.00               | 44.43  |
|                     | 35 | 37.29         | 53.74  | 30.59               | 47.04  | 44.14               | 44.09  | 32.67            | 37.24  | 25.97               | 40.89  | 29.17               | 44.09  |
|                     | 11 | 45.51         | 65.35  | 39.31               | 59.05  | 53.19               | 73.03  | 38.25            | 47.75  | 32.05               | 41.45  | 35.55               | 55.43  |
| 21                  | 16 | 42.61         | 57.89  | 36.41               | 51.69  | 50.29               | 65.57  | 37.65            | 45.41  | 31.45               | 49.59  | 34.95               | 53.09  |
|                     | 35 | 42.89         | 63.55  | 36.69               | 57.25  | 50.57               | 71.23  | 37.36            | 43.80  | 31.16               | 37.50  | 34.66               | 51.48  |
|                     | 39 | 44.27         | 64.60  | 38.07               | 58.40  | 51.95               | 72.28  | 38.47            | 48.24  | 32.27               | 52.42  | 35.77               | 55.92  |
|                     | 41 | 42.81         | 60.18  | 36.61               | 64.36  | 50.49               | 67.86  | 37.07            | 43.78  | 30.87               | 47.96  | 34.37               | 51.46  |
|                     | 48 | 49.59         | 49.93  | 43.39               | 63.62  | 55.27               | 57.61  | 36.48            | 43.38  | 30.28               | 36.70  | 44.16               | 51.06  |
|                     | 75 | 54.48         | 71.38  | 48.28               | 65.18  | 62.16               | 79.06  | 36.48            | 43.38  | 30.28               | 37.18  | 44.16               | 51.06  |
|                     | 21 | 50.49         | 73.74  | 44.19               | 67.44  | 59.23               | 82.48  | 43.98            | 57.36  | 37.68               | 62.20  | 41.58               | 66.10  |
| 23                  | 35 | 48.85         | 75.00  | 42.55               | 68.70  | 57.59               | 83.74  | 41.85            | 50.00  | 35.55               | 54.84  | 39.45               | 58.74  |
|                     | 53 | 48.91         | 71.10  | 42.61               | 64.80  | 57.65               | 79.84  | 41.49            | 49.90  | 35.19               | 54.74  | 39.09               | 58.64  |
|                     | 55 | 49.66         | 72.73  | 43.36               | 66.43  | 58.40               | 81.47  | 41.96            | 50.73  | 35.66               | 55.57  | 39.56               | 59.47  |
|                     | 07 | 61.89         | 90.70  | 55.73               | 85.10  | 71.15               | 99.10  | 46.41            | 56.20  | 40.25               | 61.26  | 44.45               | 65.46  |
| 25                  | 11 | 54.48         | 71.38  | 48.28               | 79.90  | 62.16               | 79.06  | 36.48            | 43.38  | 42.94               | 56.60  | 58.36               | 71.36  |
|                     | 19 | 59.76         | 91.77  | 53.60               | 85.61  | 69.02               | 101.03 | 47.22            | 61.37  | 41.06               | 66.43  | 45.26               | 70.63  |
|                     | 24 | 59.26         | 90.62  | 53.10               | 84.46  | 68.52               | 99.88  | 47.62            | 62.06  | 41.46               | 67.12  | 45.66               | 71.32  |
|                     | 29 | 57.58         | 86.55  | 51.42               | 80.39  | 66.84               | 95.81  | 48.59            | 63.93  | 42.43               | 68.99  | 46.63               | 73.19  |
|                     | 35 | 55.37         | 88.20  | 49.21               | 82.04  | 64.63               | 97.46  | 46.41            | 56.20  | 40.25               | 61.26  | 44.45               | 65.46  |
|                     | 37 | 57.57         | 89.86  | 51.41               | 59.36  | 66.83               | 90.06  | 46.10            | 61.00  | 39.94               | 60.50  | 55.36               | 61.20  |
|                     | 44 | 52.80         | 67.61  | 46.53               | 65.39  | 62.05               | 83.39  | 44.40            | 59.22  | 38.14               | 57.00  | 53.66               | 75.00  |
|                     | 43 | 57.62         | 88.30  | 51.46               | 82.14  | 66.88               | 97.56  | 48.20            | 63.50  | 42.04               | 68.56  | 46.24               | 72.76  |
|                     | 46 | 59.92         | 83.76  | 53.76               | 77.60  | 69.18               | 93.02  | 45.28            | 55.44  | 39.12               | 60.50  | 43.32               | 64.70  |
|                     | 61 | 54.67         | 81.42  | 48.51               | 75.26  | 63.93               | 90.68  | 46.13            | 57.02  | 39.97               | 62.08  | 44.17               | 66.28  |
|                     | 08 | 81.00         | 112.83 | 74.84               | 106.67 | 90.26               | 122.09 | 45.00            | 56.83  | 38.84               | 61.69  | 43.04               | 66.09  |
|                     | 20 | 66.02         | 96.24  | 59.86               | 90.08  | 75.28               | 105.50 | 44.45            | 54.70  | 38.29               | 59.76  | 42.49               | 63.96  |
|                     | 04 | 58.42         | 88.27  | 52.26               | 82.11  | 67.68               | 97.53  | 49.22            | 62.83  | 43.06               | 67.89  | 47.26               | 72.09  |

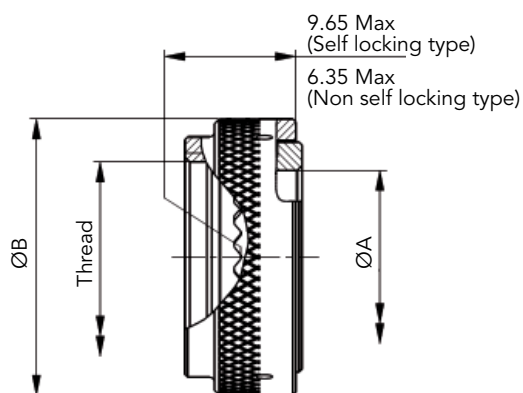
## SOURIAU aluminum backshells

### Ordering information

|                                                                       |    |                |    |   |    |   |   |    |   |
|-----------------------------------------------------------------------|----|----------------|----|---|----|---|---|----|---|
| Basic Series                                                          | 8D | AB             | 05 | A | 17 | W | S | 02 | - |
| Accessories type                                                      |    |                |    |   |    |   |   |    |   |
| Type:                                                                 |    |                |    |   |    |   |   |    |   |
| 01: Backnut                                                           |    | 04: Crimp ring |    |   |    |   |   |    |   |
| 02: Cable clamp                                                       |    | 05: Band lock  |    |   |    |   |   |    |   |
| 03: Shrink boot                                                       |    |                |    |   |    |   |   |    |   |
| Angle:                                                                |    |                |    |   |    |   |   |    |   |
| A: Straight                                                           |    |                |    |   |    |   |   |    |   |
| B: 90° (Type 02 only)                                                 |    |                |    |   |    |   |   |    |   |
| Shell size:                                                           |    |                |    |   |    |   |   |    |   |
| 09, 11, 13, 15, 17, 19, 21, 23, 25                                    |    |                |    |   |    |   |   |    |   |
| Finish:                                                               |    |                |    |   |    |   |   |    |   |
| Z: Black zinc nickel                                                  |    |                |    |   |    |   |   |    |   |
| W: Olive green cadmium                                                |    |                |    |   |    |   |   |    |   |
| F: Nickel                                                             |    |                |    |   |    |   |   |    |   |
| A: Black anodized                                                     |    |                |    |   |    |   |   |    |   |
| Self locking option:                                                  |    |                |    |   |    |   |   |    |   |
| None                                                                  |    |                |    |   |    |   |   |    |   |
| S: Self locking (available for Types 01 & 02 - mandatory for Type 05) |    |                |    |   |    |   |   |    |   |
| Cable entry (Type 05 only):                                           |    |                |    |   |    |   |   |    |   |
| 02, 03 (03 mandatory for shell size 09 & 11)                          |    |                |    |   |    |   |   |    |   |
| Drain hole option:                                                    |    |                |    |   |    |   |   |    |   |
| None                                                                  |    |                |    |   |    |   |   |    |   |
| D: Drain hole (Type 03 only)                                          |    |                |    |   |    |   |   |    |   |

### Dimensions

#### Aluminum backshell Type 01 - Backnut

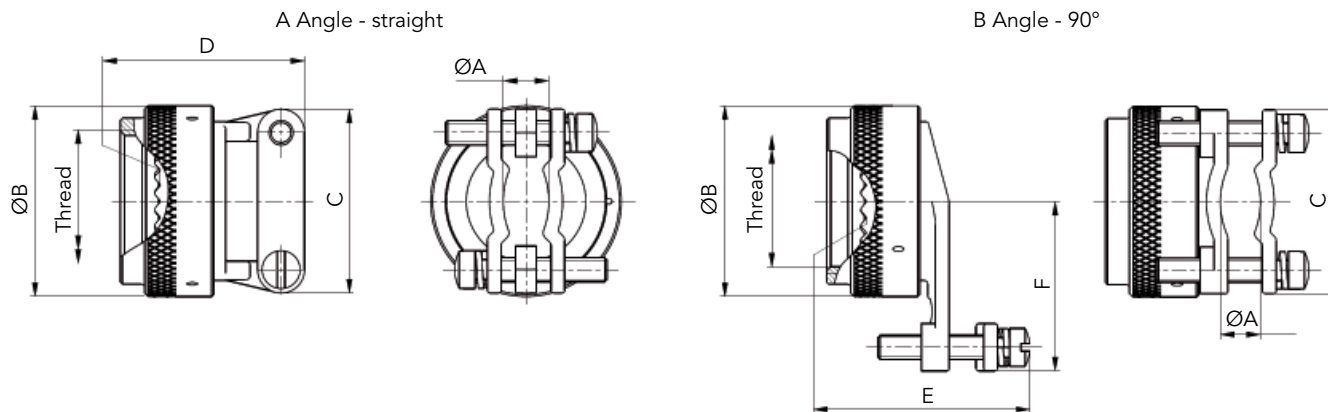


| Shell size | ØA Min | ØB Max |
|------------|--------|--------|
| 09         | 6.7    | 17.9   |
| 11         | 9.95   | 20.9   |
| 13         | 12.85  | 24.3   |
| 15         | 17.0   | 27.9   |
| 17         | 19.25  | 31.3   |
| 19         | 21.7   | 35.3   |
| 21         | 24.7   | 38.1   |
| 23         | 27.8   | 41.5   |
| 25         | 32.0   | 44.5   |

Thread: See page 30 for information.

## SOURIAU aluminum backshells

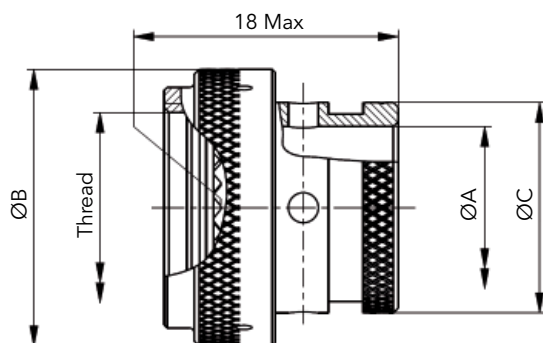
## Aluminum backshell Type 02 - Cable clamp



| Shell size | ØA    |       | ØB Max | C Max | D Max | E Max | F Max |
|------------|-------|-------|--------|-------|-------|-------|-------|
|            | Min   | Max   |        |       |       |       |       |
| 09         | 2.49  | 5.94  | 17.9   | 21.5  | 23.1  | 29.5  | 20    |
| 11         | 3.89  | 5.94  | 20.9   | 21.5  | 23.1  | 29.5  | 21.5  |
| 13         | 4.83  | 8.33  | 24.3   | 24.5  | 25.6  | 31.5  | 23.5  |
| 15         | 6.60  | 11.61 | 27.9   | 27.5  | 26.9  | 35.8  | 25.5  |
| 17         | 7.19  | 15.6  | 31.3   | 31.5  | 29.4  | 40.1  | 27.5  |
| 19         | 8.26  | 16.1  | 35.3   | 35.5  | 35.8  | 40.6  | 30.5  |
| 21         | 8.71  | 17.73 | 38.1   | 37    | 38.3  | 42.7  | 31.5  |
| 23         | 9.68  | 20.9  | 41.5   | 40.5  | 42.1  | 46.2  | 34.5  |
| 25         | 10.62 | 21.67 | 44.5   | 45    | 44.7  | 49    | 36.5  |

Thread: See page 30 for information.

## Aluminum backshell Type 03 - Shrink boot



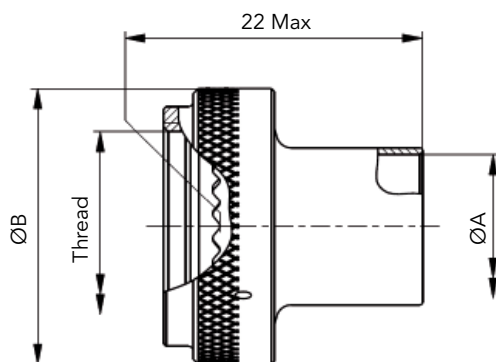
| Shell size | ØA Min | ØB Max | C Max |
|------------|--------|--------|-------|
| 09         | 6.7    | 19.0   | 11.3  |
| 11         | 9.95   | 21.5   | 14.9  |
| 13         | 12.85  | 25.3   | 17.8  |
| 15         | 16.05  | 29.1   | 21.27 |
| 17         | 19.2   | 31.7   | 24.3  |
| 19         | 21.5   | 35.5   | 26.4  |
| 21         | 24.7   | 39.3   | 30.8  |
| 23         | 27.8   | 41.8   | 34.1  |
| 25         | 31     | 46.9   | 36.6  |

Thread: See page 30 for information.

Note: All dimensions are in millimeters (mm)

## SOURIAU aluminum backshells

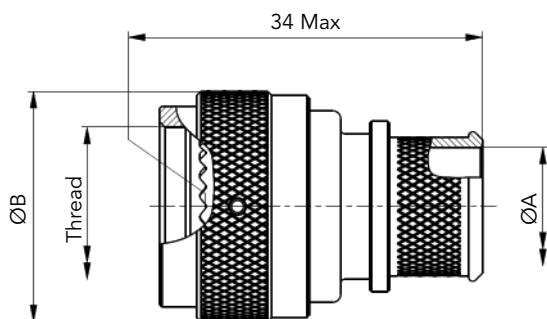
### Aluminum backshell Type 04 - Crimp ring



| Shell size | ØA Min | ØB Max |
|------------|--------|--------|
| 09         | 6      | 17.9   |
| 11         | 8.2    | 20.9   |
| 13         | 10.5   | 24.3   |
| 15         | 13.6   | 27.9   |
| 17         | 16.9   | 31.3   |
| 19         | 20     | 34.3   |
| 21         | 23.2   | 38.1   |
| 23         | 26.1   | 41.5   |
| 25         | 28.1   | 44.4   |

Thread: See below for information.

### Aluminum backshell Type 05 - Band lock



| Shell size | ØA Max - Entry size |      | ØB Max |
|------------|---------------------|------|--------|
|            | 02                  | 03   |        |
| 09         | -                   | 6.6  | 17.9   |
| 11         | -                   | 8    | 24.9   |
| 13         | 8                   | 11.2 | 29.3   |
| 15         | 11.2                | 14.4 | 32.4   |
| 17         | 12.8                | 16   | 35.6   |
| 19         | 16                  | 19.1 | 38.4   |
| 21         | 16                  | 20.7 | 41.6   |
| 23         | 17.6                | 23.9 | 44.8   |
| 25         | 19.1                | 25.5 | 47.9   |

Thread: See below for information.

### Recommended installation torque

| Shell Size              | Installation Torque (Inch-Pounds) |
|-------------------------|-----------------------------------|
| 09, 11, 13, 15, 17 & 19 | 40                                |
| 21, 23 & 25             | 80                                |

Note: Torque values are based on 80% of the coupling thread strength specified in SAE-AS85049 standard.

### Thread information

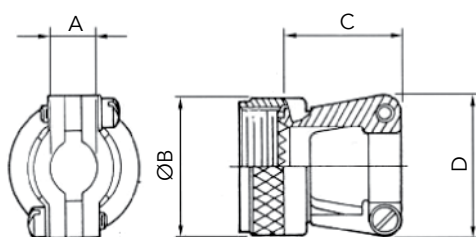
| Shell size | UNEF Thread      |
|------------|------------------|
| 09         | M12x1.0-6H-0.10R |
| 11         | M15x1.0-6H-0.10R |
| 13         | M18x1.0-6H-0.10R |
| 15         | M22x1.0-6H-0.10R |
| 17         | M25x1.0-6H-0.10R |
| 19         | M28x1.0-6H-0.10R |
| 21         | M31x1.0-6H-0.10R |
| 23         | M34x1.0-6H-0.10R |
| 25         | M37x1.0-6H-0.10R |

Note: All dimensions are in millimeters (mm)

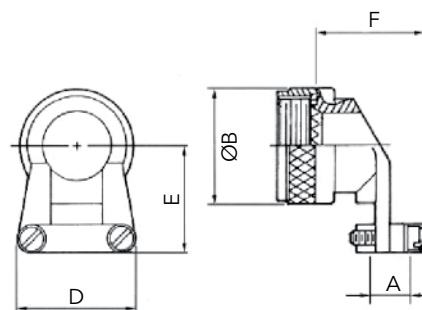
## M85049 aluminum backshells

## Backshells - Cable clamp

Straight cable clamp (Type 38)



90° cable clamp (Type 39)



| Shell size | A     |       | ØB Max | C Max | D Max | E     | F     |
|------------|-------|-------|--------|-------|-------|-------|-------|
|            | Min   | Max   |        |       |       |       |       |
| 09         | 2.50  | 5.90  | 21.80  | 23.10 | 21.60 | 25.40 | 25.70 |
| 11         | 3.90  | 5.90  | 25.00  | 23.10 | 22.90 | 27.90 | 25.70 |
| 13         | 4.80  | 8.30  | 29.40  | 25.70 | 27.90 | 27.90 | 30.70 |
| 15         | 6.60  | 11.60 | 32.50  | 26.90 | 29.20 | 31.80 | 32.00 |
| 17         | 7.20  | 15.60 | 35.70  | 29.50 | 33.00 | 33.00 | 35.80 |
| 19         | 8.30  | 16.10 | 38.50  | 35.80 | 38.10 | 34.30 | 38.40 |
| 21         | 8.70  | 17.70 | 41.70  | 38.40 | 40.60 | 40.60 | 42.20 |
| 23         | 9.70  | 20.90 | 44.90  | 42.20 | 43.20 | 44.50 | 44.70 |
| 25         | 10.60 | 21.70 | 48.00  | 44.70 | 45.70 | 47.00 | 48.50 |

Basic Series

M85049

38

-

11

W

Backshell type:

38: Straight cable clamp

39: 90° cable clamp

Nut type:

- : Without self-locking

S: With self-locking

Shell size:

09, 11, 13, 15, 17, 19, 21, 23, 25

Plating:

Type 38 &amp; 39:

A: Black anodized (500 hours salt spray)

W: Olive drab cadmium over nickel (500 hours salt spray)

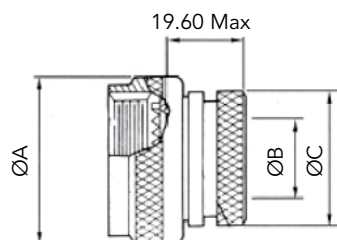
Type 38S &amp; 39S:

W: Olive drab cadmium over nickel (500 hours salt spray)

N: Nickel (48 hours salt spray)

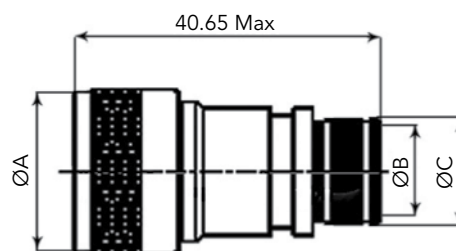
## M85049 aluminum backshells

## Backshells for heat shrink boots

Backshell for heat shrink boots  
(Type 69)

| Shell size | ØA Max | ØB Max | ØC Max |
|------------|--------|--------|--------|
| 09         | 19.10  | 6.35   | 13.55  |
| 11         | 21.60  | 9.50   | 15.40  |
| 13         | 25.40  | 12.70  | 19.70  |
| 15         | 29.20  | 15.90  | 21.30  |
| 17         | 31.80  | 19.00  | 24.50  |
| 19         | 35.60  | 20.60  | 26.50  |
| 21         | 39.40  | 23.80  | 30.90  |
| 23         | 41.90  | 27.00  | 34.40  |
| 25         | 47.00  | 30.20  | 36.65  |

## Straight backshell for EMI/RFI heat shrink boots (Type 88)



| Shell size | ØA Max | ØB <sup>±0.10</sup> Entry size |       | ØC    |       |
|------------|--------|--------------------------------|-------|-------|-------|
|            |        | 02                             | 03    | 02    | 03    |
| 09         | 21.79  | -                              | 6.35  | -     | 10.03 |
| 11         | 24.99  | -                              | 7.92  | -     | 11.61 |
| 13         | 29.39  | 7.92                           | 11.13 | 11.61 | 14.81 |
| 15         | 32.49  | 11.13                          | 14.27 | 14.81 | 17.96 |
| 17         | 35.71  | 12.70                          | 15.88 | 16.38 | 19.56 |
| 19         | 38.51  | 15.88                          | 19.05 | 19.56 | 22.73 |
| 21         | 41.71  | 15.88                          | 20.62 | 19.56 | 24.30 |
| 23         | 44.91  | 17.47                          | 23.83 | 21.06 | 27.51 |
| 25         | 47.98  | 19.05                          | 25.40 | 22.73 | 29.08 |

## Basic Series

M85049

69

11

A

D

## Backshell type:

69: Backshell for heat shrink boots

88: Straight backshell for EMI/RFI heat shrink boots

## Shell size:

09, 11, 13, 15, 17, 19, 21, 23, 25

## Plating:

## Type 69:

A: Black anodised (500 hours salt spray)

## Type 88:

W: Olive drab cadmium

N: Nickel

## Option (Type 69 only):

Empty: Without drain hole

D: With drain hole

## Entry size (Type 88 only):

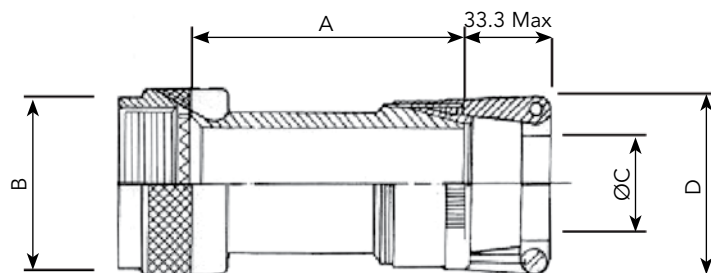
02: See table above

03: See table above

## M85049 aluminum backshells

## Backshell for screen termination and cable clamp

## Backshell for screen termination and cable clamp (Type 19)



| Shell size | A Max | B Max | Clamp indicator base on shell size |
|------------|-------|-------|------------------------------------|
| 09         | 38.10 | 19.10 | 01 - 02                            |
| 11         |       | 21.60 | 01 - 02 - 03                       |
| 13         |       | 25.40 | 02 - 03 - 04                       |
| 15         |       | 27.90 | 02 - 03 - 04 - 05                  |
| 17         |       | 31.80 | 02 - 03 - 04 - 05 - 06             |
| 19         |       | 35.60 | 03 - 04 - 05 - 06 - 07             |
| 21         |       | 38.10 | 03 - 04 - 05 - 06 - 07 - 08        |
| 23         |       | 41.90 | 03 - 04 - 05 - 06 - 07 - 08        |
| 25         |       | 44.50 | 04 - 05 - 06 - 07 - 08 - 10        |

| Clamp size indicator | C     |       | D     |
|----------------------|-------|-------|-------|
|                      | Min   | Max   |       |
| 01                   | 1.60  | 3.20  | 20.30 |
| 02                   | 3.20  | 6.35  | 25.40 |
| 03                   | 6.35  | 9.50  | 27.90 |
| 04                   | 7.90  | 12.70 | 30.50 |
| 05                   | 11.10 | 15.90 | 31.80 |
| 06                   | 14.30 | 19.00 | 35.60 |
| 07                   | 17.45 | 22.20 | 38.10 |
| 08                   | 20.60 | 24.40 | 41.90 |
| 09                   | 23.80 | 28.60 | 44.50 |
| 10                   | 27.00 | 31.75 | 48.30 |

Basic Series M85049 19 11 W 03

## Shell style:

19: Backshell for screen termination and cable clamp

Shell size: 09, 11, 13, 15, 17, 19, 21, 23, 25

## Plating:

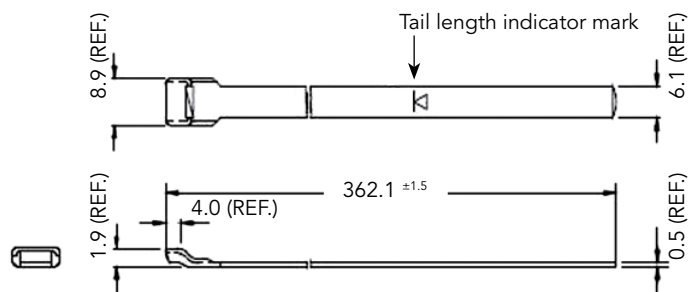
W: Olive drab cadmium

N: Nickel

Clamp size indicator: See tables above

## Band-it

|             | Flat stainless steel standard band | Pre-coiled stainless steel standard band | Hand banding tool |
|-------------|------------------------------------|------------------------------------------|-------------------|
| Part number | 8599-9344                          | 8599-9345                                | 8599-9346         |



Note: All dimensions are in millimeters (mm)

## Aluminum caps

### SOURIAU part number

| Basic Series                                          | 8D | AC | 5 | R | 09 | W |
|-------------------------------------------------------|----|----|---|---|----|---|
| <b>AC:</b> Aluminum caps                              |    |    |   |   |    |   |
| <b>Caps style:</b>                                    |    |    |   |   |    |   |
| 5: Plug caps                                          |    |    |   |   |    |   |
| 0: Receptacle caps                                    |    |    |   |   |    |   |
| <b>Accessories</b>                                    |    |    |   |   |    |   |
| N: With stainless steel rope and ring                 |    |    |   |   |    |   |
| R: With stainless steel rope and eyelet               |    |    |   |   |    |   |
| <b>Shell size: 09, 11, 13, 15, 17, 19, 21, 23, 25</b> |    |    |   |   |    |   |
| <b>Finish</b>                                         |    |    |   |   |    |   |
| W: Olive drab cadmium                                 |    |    |   |   |    |   |
| F: Nickel                                             |    |    |   |   |    |   |
| Z: Black zinc nickel                                  |    |    |   |   |    |   |
| A: Black anodized                                     |    |    |   |   |    |   |

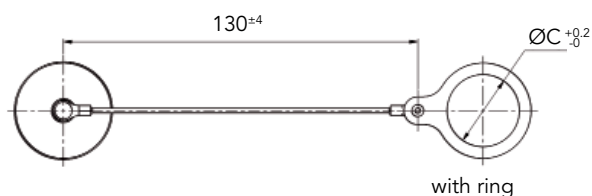
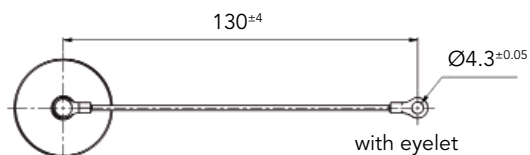
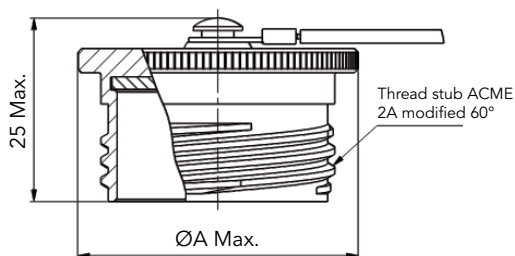
### MIL-DTL-38999 part number

| Basic Series                                          | D38999 / | 32 | W | 09 | R |
|-------------------------------------------------------|----------|----|---|----|---|
| <b>Caps style</b>                                     |          |    |   |    |   |
| 32: Plug caps                                         |          |    |   |    |   |
| 33: Receptacle caps                                   |          |    |   |    |   |
| <b>Finish</b>                                         |          |    |   |    |   |
| W: Olive drab cadmium                                 |          |    |   |    |   |
| F: Nickel                                             |          |    |   |    |   |
| Z: Black zinc nickel                                  |          |    |   |    |   |
| <b>Shell size: 09, 11, 13, 15, 17, 19, 21, 23, 25</b> |          |    |   |    |   |
| <b>Accessories</b>                                    |          |    |   |    |   |
| N: With stainless steel rope and ring                 |          |    |   |    |   |
| R: With stainless steel rope and eyelet               |          |    |   |    |   |

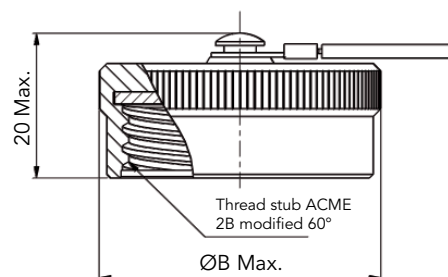
## Dimensions

### Aluminum caps with stainless steel rope

#### For plug



#### For receptacle



| Size | ØA   | ØB   | ØC for plug | ØC for receptacle | Thread              |
|------|------|------|-------------|-------------------|---------------------|
| 09   | 22.6 | 22.8 | 15          | 18.4              | 0.6250-0.1P-0.3L-TS |
| 11   | 25.8 | 26.5 | 18.4        | 23.2              | 0.7500-0.1P-0.3L-TS |
| 13   | 30   | 30   | 23.2        | 26.5              | 0.8750-0.1P-0.3L-TS |
| 15   | 33   | 31.8 | 23.2        | 30.3              | 1.0000-0.1P-0.3L-TS |
| 17   | 36.5 | 36.8 | 26.5        | 32.6              | 1.1875-0.1P-0.3L-TS |
| 19   | 39.2 | 38.8 | 30.3        | 36.5              | 1.2500-0.1P-0.3L-TS |
| 21   | 42.5 | 41.8 | 32.6        | 39.3              | 1.3750-0.1P-0.3L-TS |
| 23   | 45.8 | 44.8 | 36.5        | 42.9              | 1.5000-0.1P-0.3L-TS |
| 25   | 48.9 | 48.8 | 39.3        | 45                | 1.6250-0.1P-0.3L-TS |

Note: All dimensions are in millimeters (mm)

## Connector part numbers

|                                                                                                                            |           |          |          |           |          |           |          |          |  |  |          |
|----------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|-----------|----------|-----------|----------|----------|--|--|----------|
| <b>Basic Series</b>                                                                                                        | <b>8D</b> | <b>0</b> | <b>-</b> | <b>11</b> | <b>J</b> | <b>35</b> | <b>P</b> | <b>N</b> |  |  | <b>L</b> |
| <b>Shell style:</b>                                                                                                        |           |          |          |           |          |           |          |          |  |  |          |
| 0: Square flange receptacle                                                                                                |           |          |          |           |          |           |          |          |  |  |          |
| 5: Plug with RFI shielding                                                                                                 |           |          |          |           |          |           |          |          |  |  |          |
| <b>Type:</b>                                                                                                               |           |          |          |           |          |           |          |          |  |  |          |
| - : Connectors with standard crimp contacts.                                                                               |           |          |          |           |          |           |          |          |  |  |          |
| L: Receptacle with long PC tail (male and female size #22D, #20).                                                          |           |          |          |           |          |           |          |          |  |  |          |
| C: Receptacle with short PC tail (male and female #22D, #20, #16, #12).                                                    |           |          |          |           |          |           |          |          |  |  |          |
| S: Receptacle with specific PC tail (male et female #22D)                                                                  |           |          |          |           |          |           |          |          |  |  |          |
| W: Receptacle with male contacts #22D for wire wrap (3 wraps)                                                              |           |          |          |           |          |           |          |          |  |  |          |
| T: Receptacle with male contacts #20 for wire wrap (2 wraps)                                                               |           |          |          |           |          |           |          |          |  |  |          |
| P: Receptacle with solder cup contacts - see page 69, please consult us                                                    |           |          |          |           |          |           |          |          |  |  |          |
| <b>Shell size: 09, 11, 13, 15, 17, 19, 21, 23, 25</b>                                                                      |           |          |          |           |          |           |          |          |  |  |          |
| <b>Plating:</b>                                                                                                            |           |          |          |           |          |           |          |          |  |  |          |
| J: Olive drab cadmium                                                                                                      |           |          |          |           |          |           |          |          |  |  |          |
| M: Nickel                                                                                                                  |           |          |          |           |          |           |          |          |  |  |          |
| X: Without plating                                                                                                         |           |          |          |           |          |           |          |          |  |  |          |
| <b>Contact layout:</b> See pages 13 to 19                                                                                  |           |          |          |           |          |           |          |          |  |  |          |
| <b>Contact type:</b>                                                                                                       |           |          |          |           |          |           |          |          |  |  |          |
| P: Pin (500 mating/unmating)                                                                                               |           |          |          |           |          |           |          |          |  |  |          |
| H: Pin (1500 mating/unmating)                                                                                              |           |          |          |           |          |           |          |          |  |  |          |
| A: Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)                      |           |          |          |           |          |           |          |          |  |  |          |
| S: Socket (500 mating/unmating)                                                                                            |           |          |          |           |          |           |          |          |  |  |          |
| J: Socket (1500 mating/unmating)                                                                                           |           |          |          |           |          |           |          |          |  |  |          |
| B: Connector supplied less socket contact or with specific contacts (connector marking: B + orientation)                   |           |          |          |           |          |           |          |          |  |  |          |
| <b>Orientation: N, A, B, C, D, E, T, V</b> (see page 75)                                                                   |           |          |          |           |          |           |          |          |  |  |          |
| <b>Specification:</b>                                                                                                      |           |          |          |           |          |           |          |          |  |  |          |
| 046: Tinned straight PC tail                                                                                               |           |          |          |           |          |           |          |          |  |  |          |
| 251: Connector provided with power contacts (layouts with contact #8)                                                      |           |          |          |           |          |           |          |          |  |  |          |
| 022: Fuel tank                                                                                                             |           |          |          |           |          |           |          |          |  |  |          |
| 600: 230V qualified connector (T or V orientation mandatory - Consult us for available layouts)                            |           |          |          |           |          |           |          |          |  |  |          |
| <b>Special custom:</b>                                                                                                     |           |          |          |           |          |           |          |          |  |  |          |
| None: Standard plastic cap                                                                                                 |           |          |          |           |          |           |          |          |  |  |          |
| M: Antistatic plastic cap                                                                                                  |           |          |          |           |          |           |          |          |  |  |          |
| <b>L:</b> For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation. |           |          |          |           |          |           |          |          |  |  |          |

Note: PC tail contacts without shoulder also available. Please see page 132.

## BACC part numbers

|                                                                         |                 |           |          |           |          |          |          |
|-------------------------------------------------------------------------|-----------------|-----------|----------|-----------|----------|----------|----------|
| <b>Basic Series:</b>                                                    | <b>BACC63CT</b> | <b>13</b> | <b>-</b> | <b>98</b> | <b>P</b> | <b>N</b> | <b>H</b> |
| BACC63CT: 8D5*M (composite plug)                                        |                 |           |          |           |          |          |          |
| BACC63CU: 8D0*M (composite square flange receptacle)                    |                 |           |          |           |          |          |          |
| <b>Shell size: 09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J</b> |                 |           |          |           |          |          |          |
| <b>Plating &amp; grounding:</b>                                         |                 |           |          |           |          |          |          |
| - : Nickel plated, ungrounded                                           |                 |           |          |           |          |          |          |
| G: Nickel plated, grounded                                              |                 |           |          |           |          |          |          |
| D: Cadmium plated, ungrounded                                           |                 |           |          |           |          |          |          |
| C: Cadmium plated, grounded                                             |                 |           |          |           |          |          |          |
| <b>Contact layout:</b> See page 18 for layout according to BACC         |                 |           |          |           |          |          |          |
| <b>Contact type:</b>                                                    |                 |           |          |           |          |          |          |
| P: Pin                                                                  |                 |           |          |           |          |          |          |
| S: Socket                                                               |                 |           |          |           |          |          |          |
| <b>Orientation: N, A, B, C, D, E</b> (see page 75)                      |                 |           |          |           |          |          |          |
| <b>Specification:</b>                                                   |                 |           |          |           |          |          |          |
| None: With contacts                                                     |                 |           |          |           |          |          |          |
| H: Without contact & without filler plug                                |                 |           |          |           |          |          |          |

## MIL-DTL-38999 part numbers

| Basic Series                                                                                                                                                                                                                                                                                                                                                                                                                | D38999/ | 20 | M | B | 35 | P | N | L |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|---|---|----|---|---|---|
| <b>Shell style:</b><br><b>20:</b> Square flange receptacle<br><b>26:</b> Plug with RFI shielding.                                                                                                                                                                                                                                                                                                                           |         |    |   |   |    |   |   |   |
| <b>Plating:</b><br><b>J:</b> Olive drab cadmium<br><b>M:</b> Nickel                                                                                                                                                                                                                                                                                                                                                         |         |    |   |   |    |   |   |   |
| <b>Shell size:</b><br>09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J                                                                                                                                                                                                                                                                                                                                                  |         |    |   |   |    |   |   |   |
| <b>Contact layout:</b><br>See page 18 for layout according to MIL-DTL-38999                                                                                                                                                                                                                                                                                                                                                 |         |    |   |   |    |   |   |   |
| <b>Contact type:</b><br><b>P:</b> Pin (500 mating/unmating)<br><b>H:</b> Pin (1500 mating/unmating)<br><b>A:</b> Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)<br><b>S:</b> Socket (500 mating/unmating)<br><b>J:</b> Socket (1500 mating/unmating)<br><b>B:</b> Connector supplied less socket contact or with specific contacts (connector marking: B + orientation) |         |    |   |   |    |   |   |   |
| <b>Orientation:</b><br><b>N, A, B, C, D, E</b> (see page 75)                                                                                                                                                                                                                                                                                                                                                                |         |    |   |   |    |   |   |   |
| <b>L:</b> For P or S contact type only, connector delivered without contacts, connector marking P or S (without L)                                                                                                                                                                                                                                                                                                          |         |    |   |   |    |   |   |   |

Note: To place an order of MIL connectors delivered without MIL removable crimp contacts and keep P or S plus orientation marking, it must be specified clearly on the order (by adding a suffix L at the end of the P/N or specified in comment).

Delivered with MIL contacts mandatory.

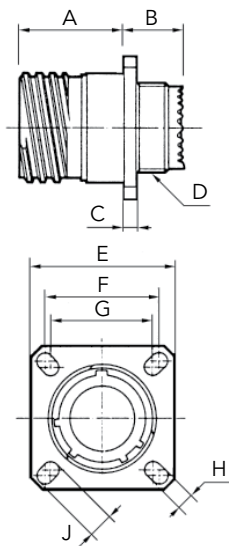
As stated in MIL-DTL-38999 standard, insert arrangements using multi-axial contacts (coax, twinax, quadax, ...) should not be used in firewall applications.

## EN3645 part numbers

| Basic Series                                                                                                                                                   | EN3645 | J | 6 | G | N | 35 | B | N |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|---|---|---|----|---|---|
| <b>Plating:</b><br><b>J:</b> Olive drab cadmium<br><b>M:</b> Nickel                                                                                            |        |   |   |   |   |    |   |   |
| <b>Shell style:</b><br><b>0:</b> Square flange receptacle<br><b>6:</b> Plug                                                                                    |        |   |   |   |   |    |   |   |
| <b>Shell size:</b><br>09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J                                                                                     |        |   |   |   |   |    |   |   |
| <b>Grounding:</b><br><b>N:</b> Standard insert not grounded                                                                                                    |        |   |   |   |   |    |   |   |
| <b>Contact layout:</b><br>See page 18 for layout according to EN3645                                                                                           |        |   |   |   |   |    |   |   |
| <b>Contact type:</b><br><b>A:</b> Connector supplied less pin contact<br><b>B:</b> Connector supplied less socket contact<br><b>F:</b> Socket<br><b>M:</b> Pin |        |   |   |   |   |    |   |   |
| <b>Orientation:</b><br><b>N, A, B, C, D, E</b> (see page 75)                                                                                                   |        |   |   |   |   |    |   |   |

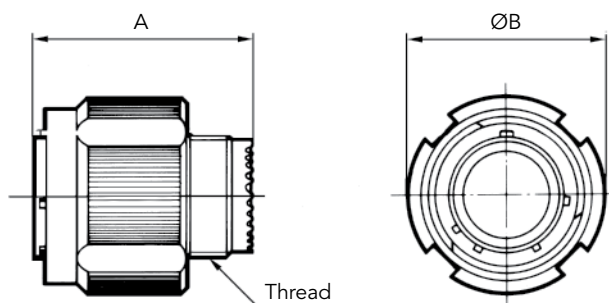
## Dimensions

### Receptacle type 0



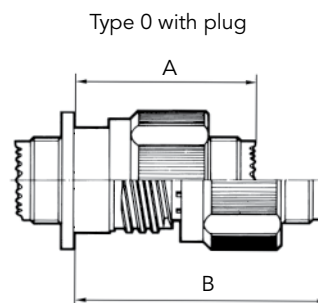
| Shell size | A Max | B Max | C Max | D Thread   | E $\pm 0.3$ | F     | G     | H $\pm 0.2$ | J $\pm 0.2$ |
|------------|-------|-------|-------|------------|-------------|-------|-------|-------------|-------------|
| 09 (A)     | 19.65 | 11.96 | 3.65  | M12 x 1-6g | 23.8        | 18.26 | 15.09 | 3.25        | 5.49        |
| 11 (B)     |       |       |       | M15 x 1-6g | 26.2        | 20.62 | 18.26 |             | 4.93        |
| 13 (C)     |       |       |       | M18 x 1-6g | 28.6        | 23.01 | 20.62 |             | 4.39        |
| 15 (D)     |       |       |       | M22 x 1-6g | 31          | 24.61 | 23.01 |             | 4.39        |
| 17 (E)     |       |       |       | M25 x 1-6g | 33.3        | 26.97 | 24.61 |             | 4.93        |
| 19 (F)     | 18.85 | 12.76 | 3.7   | M28 x 1-6g | 36.5        | 29.36 | 26.97 | 3.91        | 6.15        |
| 21 (G)     |       |       | 4.35  | M31 x 1-6g | 39.7        | 31.75 | 29.36 |             | 6.15        |
| 23 (H)     |       |       | 4.4   | M34 x 1-6g | 42.9        | 34.93 | 31.75 |             | 6.15        |
| 25 (J)     |       |       |       | M37 x 1-6g | 46          | 38.1  | 34.93 |             | 6.15        |

### Plug type 5



| Shell size | A Max | Thread     | ØB Max |
|------------|-------|------------|--------|
| 09 (A)     | 31.00 | M12 x 1-6g | 21.80  |
| 11 (B)     |       | M15 x 1-6g | 25.00  |
| 13 (C)     |       | M18 x 1-6g | 29.40  |
| 15 (D)     |       | M22 x 1-6g | 32.50  |
| 17 (E)     |       | M25 x 1-6g | 35.70  |
| 19 (F)     |       | M28 x 1-6g | 38.50  |
| 21 (G)     |       | M31 x 1-6g | 41.70  |
| 23 (H)     |       | M34 x 1-6g | 44.90  |
| 25 (J)     |       | M37 x 1-6g | 48.00  |

### Mated connectors



| Shell size | A Max | B Max |
|------------|-------|-------|
| 09 (A)     | 37.00 | 52.30 |
| 11 (B)     |       |       |
| 13 (C)     |       |       |
| 15 (D)     |       |       |
| 17 (E)     |       |       |
| 19 (F)     | 36.00 | 51.30 |
| 21 (G)     |       |       |
| 23 (H)     |       |       |
| 25 (J)     |       |       |

Note: All dimensions are in millimeters (mm)

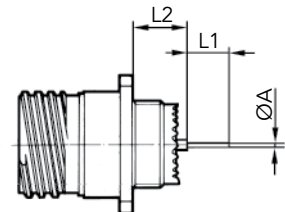
## PC tail contacts lengths

|    | Contact size | Contact type |     | PC tail type | Shell size |        |        |        |        |        |        |        |
|----|--------------|--------------|-----|--------------|------------|--------|--------|--------|--------|--------|--------|--------|
|    |              |              |     |              | 09 (A)     | 11 (B) | 13 (C) | 15 (C) | 17 (E) | 19 (F) | 21 (G) | 23 (H) |
| ØA | #22D         | M & F        | Max | L & C        | 0.70       |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 0.50       |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 0.70       |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 1.15       |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 1.65       |        |        |        |        |        |        |        |
| L1 | #22D         | M & F        | Max | L            | 8.50       |        |        |        |        |        |        |        |
|    |              | M & F        | Max | C            | 4.00       |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 5.10       |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |
| L2 | #22D         | M            | Min | L & C        | 9.48       |        |        |        | 9.59   |        |        |        |
|    |              | M            | Max | L & C        | 10.38      |        |        |        | 10.48  |        |        |        |
|    |              | F            | Min | L & C        | 9.15       |        |        |        | 9.26   |        |        |        |
|    |              | F            | Max | L & C        | 10.38      |        |        |        | 10.48  |        |        |        |
|    |              | M            | Min | S            | 9.65       |        |        |        | 9.76   |        |        |        |
|    |              | M            | Max | S            | 10.55      |        |        |        | 10.65  |        |        |        |
|    |              | F            | Min | S            | 9.32       |        |        |        | 9.42   |        |        |        |
|    |              | F            | Max | S            | 10.55      |        |        |        | 10.65  |        |        |        |
|    | #20          | M            | Min | C            | 9.65       |        |        |        | 9.76   |        |        |        |
|    |              | M            | Max | C            | 10.55      |        |        |        | 10.65  |        |        |        |
|    |              | F            | Min | C            | 9.65       |        |        |        | 9.76   |        |        |        |
|    |              | F            | Max | C            | 10.55      |        |        |        | 10.65  |        |        |        |
|    | #16          | M            | Min | C            | 9.65       |        |        |        | 9.76   |        |        |        |
|    |              | M            | Max | C            | 10.55      |        |        |        | 10.65  |        |        |        |
|    |              | F            | Min | C            | 9.65       |        |        |        | 9.76   |        |        |        |
|    |              | F            | Max | C            | 10.55      |        |        |        | 10.65  |        |        |        |
|    | #12          | M            | Min | C            | 9.66       |        |        |        | 9.76   |        |        |        |
|    |              | M            | Max | C            | 10.53      |        |        |        | 10.63  |        |        |        |
|    |              | F            | Min | C            | 9.66       |        |        |        | 9.76   |        |        |        |
|    |              | F            | Max | C            | 10.53      |        |        |        | 10.63  |        |        |        |

**M:** Male contact  
**F:** Female contact

**L:** Long PC tail  
**C:** Short PC tail  
**S:** Specific PC tail

Receptacle type 0



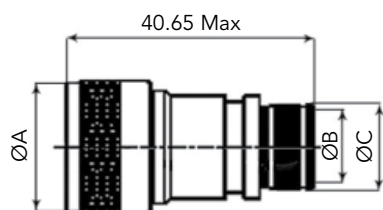
# Connectors weight - in gram (±15%)

| Shell size & Layout |    | With contacts |        |                     |        | Without contacts |        |                     |        |
|---------------------|----|---------------|--------|---------------------|--------|------------------|--------|---------------------|--------|
|                     |    | Plug (type 5) |        | Receptacle (type 0) |        | Plug (type 5)    |        | Receptacle (type 0) |        |
|                     |    | Male          | Female | Male                | Female | Male             | Female | Male                | Female |
| 09                  | 35 | 8.5           | 10.1   | 7.8                 | 9.4    | 8.1              | 8.6    | 7.4                 | 7.9    |
|                     | 98 | 8.5           | 9.8    | 7.8                 | 9.1    | 8.1              | 8.6    | 7.4                 | 7.9    |
| 11                  | 01 | 12.8          | 15.7   | 10.4                | 13.3   | 12.1             | 14.1   | 9.7                 | 11.7   |
|                     | 02 | 11.5          | 14.1   | 09.3                | 11.8   | 10.9             | 12.5   | 8.7                 | 10.3   |
|                     | 04 | 12.6          | 15.7   | 10.2                | 13.3   | 12.0             | 14.1   | 9.7                 | 11.7   |
|                     | 05 | 12.6          | 15.8   | 10.2                | 13.4   | 11.9             | 13.8   | 9.5                 | 11.5   |
|                     | 22 | 11.4          | 13.8   | 9.1                 | 11.6   | 11.1             | 12.8   | 8.8                 | 10.6   |
|                     | 35 | 12.5          | 16.0   | 10.1                | 13.61  | 11.6             | 12.8   | 9.2                 | 10.36  |
|                     | 80 | 15.2          | 18.6   | 13.4                | 10.4   | 10.7             | 11.6   | 8.9                 | 9.4    |
|                     | 98 | 12.5          | 15.3   | 10.1                | 12.9   | 11.7             | 12.8   | 9.3                 | 10.5   |
|                     | 99 | 11.8          | 15.0   | 9.6                 | 12.8   | 10.8             | 12.2   | 8.6                 | 10.0   |
| 13                  | 04 | 17.2          | 20.9   | 13.7                | 17.44  | 15.6             | 17.9   | 12.4                | 14.32  |
|                     | 08 | 17.6          | 22.8   | 14.1                | 19.2   | 16.5             | 19.6   | 12.9                | 16.1   |
|                     | 26 | 17.9          | 23.6   | 14.4                | 20.1   | 16.2             | 18.9   | 12.7                | 15.4   |
|                     | 35 | 17.4          | 23.1   | 13.8                | 19.61  | 15.8             | 17.6   | 12.3                | 14.11  |
|                     | 98 | 17.2          | 21.8   | 13.7                | 18.3   | 15.8             | 17.9   | 12.3                | 14.3   |
| 15                  | 05 | 21.4          | 26.7   | 16.6                | 21.9   | 19.8             | 22.8   | 15.0                | 18.0   |
|                     | 15 | 22.2          | 29.3   | 17.4                | 24.51  | 19.9             | 23.0   | 15.1                | 18.13  |
|                     | 18 | 22.4          | 31.3   | 17.6                | 26.5   | 19.9             | 24.0   | 15.0                | 19.2   |
|                     | 19 | 22.0          | 29.6   | 17.1                | 24.8   | 19.2             | 22.0   | 14.5                | 17.2   |
|                     | 35 | 22.0          | 31.3   | 17.2                | 26.5   | 19.4             | 22.0   | 14.6                | 17.2   |
|                     | 97 | 21.8          | 28.9   | 17.1                | 24.1   | 19.4             | 22.6   | 14.7                | 17.8   |
| 17                  | 02 | 26.5          | 38.8   | 25.2                | 37.6   | 19.3             | 22.3   | 18.1                | 21.1   |
|                     | 06 | 25.9          | 35.5   | 23.2                | 32.8   | 21.9             | 25.9   | 19.2                | 23.2   |
|                     | 08 | 24.9          | 33.6   | 22.2                | 30.1   | 22.4             | 27.4   | 19.7                | 24.7   |
|                     | 26 | 25.5          | 36.3   | 22.8                | 33.6   | 21.8             | 25.9   | 19.2                | 23.1   |
|                     | 35 | 25.7          | 39.3   | 23.0                | 36.6   | 21.9             | 25.5   | 19.2                | 22.8   |
|                     | 75 | 31.3          | 42.6   | 28.6                | 39.9   | 22.3             | 28.6   | 19.6                | 25.9   |
|                     | 99 | 25.5          | 36.1   | 22.8                | 33.4   | 22.0             | 26.1   | 19.3                | 23.4   |
| 19                  | 11 | 32.1          | 45.7   | 26.1                | 39.7   | 28.7             | 37.1   | 22.7                | 31.1   |
|                     | 32 | 31.3          | 44.7   | 25.3                | 38.7   | 26.8             | 31.9   | 20.8                | 25.9   |
|                     | 35 | 31.6          | 48.1   | 25.6                | 42.0   | 27.1             | 31.6   | 21.0                | 25.6   |
| 21                  | 11 | 38.0          | 57.9   | 32.8                | 52.62  | 30.8             | 40.3   | 25.5                | 35.02  |
|                     | 16 | 35.1          | 50.4   | 29.9                | 45.2   | 30.2             | 37.9   | 24.9                | 32.7   |
|                     | 35 | 35.4          | 56.1   | 30.1                | 50.82  | 29.9             | 36.3   | 24.6                | 31.07  |
|                     | 39 | 36.8          | 57.1   | 31.5                | 51.9   | 31.0             | 40.8   | 25.7                | 35.5   |
|                     | 41 | 35.3          | 52.7   | 30.1                | 47.5   | 29.6             | 36.3   | 24.3                | 31.0   |
|                     | 48 | 42.4          | 62.4   | 37.7                | 57.19  | 29.3             | 36.2   | 24.6                | 30.27  |
|                     | 75 | 47.3          | 64.2   | 42.6                | 59.50  | 29.3             | 36.2   | 24.6                | 31.5   |
| 23                  | 21 | 43.1          | 66.3   | 38.0                | 61.2   | 36.5             | 49.9   | 31.5                | 44.8   |
|                     | 35 | 41.4          | 67.5   | 36.3                | 62.5   | 34.4             | 42.5   | 29.3                | 37.5   |
|                     | 53 | 41.5          | 63.6   | 36.4                | 58.6   | 34.1             | 42.4   | 29.0                | 37.4   |
|                     | 55 | 42.2          | 65.3   | 42.2                | 60.2   | 34.5             | 43.3   | 29.4                | 38.2   |
| 25                  | 07 | 53.6          | 90.05  | 49.0                | 84.8   | 37.8             | 51.8   | 33.2                | 46.6   |
|                     | 11 | 59.1          | 81.6   | 54.5                | 72.79  | 40.8             | 53.8   | 36.2                | 49.49  |
|                     | 19 | 51.7          | 83.7   | 46.6                | 78.6   | 39.2             | 53.3   | 34.0                | 48.2   |
|                     | 24 | 51.2          | 82.5   | 46.1                | 77.4   | 39.6             | 54.0   | 34.4                | 48.9   |
|                     | 29 | 49.5          | 78.5   | 44.4                | 73.4   | 40.5             | 55.9   | 35.4                | 50.7   |
|                     | 35 | 47.3          | 80.1   | 42.2                | 75.0   | 38.4             | 48.1   | 33.2                | 43.0   |
|                     | 37 | 49.3          | 80.4   | 45.5                | 76.2   | 37.8             | 51.5   | 34.0                | 47.3   |
|                     | 44 | 69.6          | 93.7   | 65.0                | 94.6   | 36.1             | 45.8   | 31.5                | 46.7   |
|                     | 43 | 49.6          | 80.2   | 44.4                | 75.1   | 40.1             | 55.4   | 35.0                | 50.3   |
|                     | 46 | 51.9          | 75.7   | 46.7                | 70.1   | 37.2             | 47.4   | 32.1                | 42.2   |
|                     | 61 | 46.6          | 73.4   | 41.5                | 68.2   | 38.1             | 48.9   | 32.9                | 43.8   |
|                     | 08 | 72.9          | 104.8  | 67.8                | 99.6   | 36.9             | 48.8   | 31.8                | 43.6   |
|                     | 20 | 57.9          | 88.2   | 52.8                | 83.0   | 36.4             | 46.6   | 31.3                | 41.5   |
|                     | 04 | 50.4          | 80.2   | 45.3                | 75.0   | 41.2             | 54.8   | 36.1                | 49.6   |

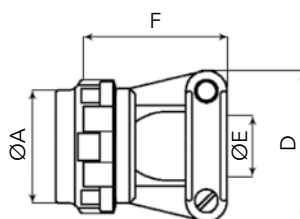
## M85049 composite backshells

## Dimensions &amp; Ordering

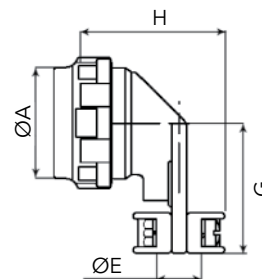
Straight backshell for EMI/RFI heat shrink boots (Type 88)



Straight cable clamp (Type 91)



90° cable clamp (Type 92)



| Shell size | ØA Max | ØB <sup>±0.10</sup> Entry size |       | ØC Entry size |       | D Max | E Max | F Max | G     | H     |
|------------|--------|--------------------------------|-------|---------------|-------|-------|-------|-------|-------|-------|
|            |        | 02                             | 03    | 02            | 03    |       |       |       |       |       |
| 09         | 21.80  | N/A                            | 6.35  | N/A           | 10.03 | 24.90 | 5.55  | 21.25 | 22.20 | 26.95 |
| 11         | 25.00  | N/A                            | 7.92  | N/A           | 11.61 | 26.00 | 6.70  | 24.30 | 23.80 | 27.95 |
| 13         | 29.40  | 7.92                           | 11.13 | 11.61         | 14.81 | 30.50 | 8.75  | 27.95 | 26.20 | 30.00 |
| 15         | 32.50  | 11.13                          | 14.27 | 14.81         | 17.96 | 33.00 | 11.70 | 27.95 | 28.60 | 33.00 |
| 17         | 35.70  | 12.70                          | 15.88 | 16.38         | 19.56 | 36.10 | 13.85 | 31.25 | 33.30 | 35.05 |
| 19         | 38.50  | 15.88                          | 19.05 | 19.56         | 22.73 | 38.60 | 15.60 | 35.80 | 34.95 | 36.85 |
| 21         | 41.70  | 15.88                          | 20.62 | 19.56         | 24.30 | 41.65 | 17.75 | 38.35 | 38.10 | 39.15 |
| 23         | 44.90  | 17.47                          | 23.83 | 21.06         | 27.51 | 45.00 | 19.80 | 42.15 | 41.30 | 41.15 |
| 25         | 48.00  | 19.05                          | 25.40 | 22.73         | 29.08 | 48.00 | 21.60 | 44.70 | 44.45 | 42.95 |

## Basic Series

M85049

91

11

M

## Backshell type:

88: Straight backshell for EMI/RFI heat shrink boots

91: Straight cable clamp

92: 90° cable clamp

## Shell size:

09, 11, 13, 15, 17, 19, 21, 23, 25

## Plating:

J: Olive drab cadmium over electroless nickel

M: Electroless nickel

T: Without plating (Type 91 &amp; 92 only)

## Entry size (Type 88 only):

02: See table above

03: See table above

## Connector part numbers

|                                                                                                                     |           |          |          |           |          |           |          |          |  |  |          |
|---------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|-----------|----------|-----------|----------|----------|--|--|----------|
| <b>Basic Series</b>                                                                                                 | <b>8D</b> | <b>0</b> | <b>-</b> | <b>11</b> | <b>K</b> | <b>35</b> | <b>P</b> | <b>N</b> |  |  | <b>L</b> |
| <b>Shell style:</b>                                                                                                 |           |          |          |           |          |           |          |          |  |  |          |
| 0: Square flange receptacle                                                                                         |           |          |          |           |          |           |          |          |  |  |          |
| 7: Jam nut receptacle                                                                                               |           |          |          |           |          |           |          |          |  |  |          |
| 5: Plug with RFI shielding                                                                                          |           |          |          |           |          |           |          |          |  |  |          |
| <b>Type:</b>                                                                                                        |           |          |          |           |          |           |          |          |  |  |          |
| - : Connectors with standard crimp contacts                                                                         |           |          |          |           |          |           |          |          |  |  |          |
| L: Receptacle with long PC tail (male and female size #22D, #20)                                                    |           |          |          |           |          |           |          |          |  |  |          |
| C: Receptacle with short PC tail (male and female #22D, #20, #16, #12)                                              |           |          |          |           |          |           |          |          |  |  |          |
| S: Receptacle with specific PC tail (male et female #22D)                                                           |           |          |          |           |          |           |          |          |  |  |          |
| W: Receptacle with male contacts #22D for wire wrap (3 wraps)                                                       |           |          |          |           |          |           |          |          |  |  |          |
| T: Receptacle with male contacts #20 for wire wrap (2 wraps)                                                        |           |          |          |           |          |           |          |          |  |  |          |
| P: Receptacle with solder cup contacts - see page 68, please consult us                                             |           |          |          |           |          |           |          |          |  |  |          |
| <b>Shell size: 09, 11, 13, 15, 17, 19, 21, 23, 25</b>                                                               |           |          |          |           |          |           |          |          |  |  |          |
| <b>Plating:</b>                                                                                                     |           |          |          |           |          |           |          |          |  |  |          |
| K: Passivated                                                                                                       |           |          |          |           |          |           |          |          |  |  |          |
| S: Nickel                                                                                                           |           |          |          |           |          |           |          |          |  |  |          |
| <b>Contact layout:</b> See pages 13 to 19                                                                           |           |          |          |           |          |           |          |          |  |  |          |
| <b>Contact type:</b>                                                                                                |           |          |          |           |          |           |          |          |  |  |          |
| P: Pin                                                                                                              |           |          |          |           |          |           |          |          |  |  |          |
| A: Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)               |           |          |          |           |          |           |          |          |  |  |          |
| S: Socket                                                                                                           |           |          |          |           |          |           |          |          |  |  |          |
| B: Connector supplied less socket contact or with specific contacts (connector marking: B + orientation)            |           |          |          |           |          |           |          |          |  |  |          |
| <b>Orientation: N, A, B, C, D, E, T, V</b> (see page 75)                                                            |           |          |          |           |          |           |          |          |  |  |          |
| <b>Specification:</b>                                                                                               |           |          |          |           |          |           |          |          |  |  |          |
| 046: Tinned straight PC tail                                                                                        |           |          |          |           |          |           |          |          |  |  |          |
| 251: Connector provided with power contacts (layouts with contact #8)                                               |           |          |          |           |          |           |          |          |  |  |          |
| 022: Fuel tank                                                                                                      |           |          |          |           |          |           |          |          |  |  |          |
| 600: 230V qualified connector (T or V orientation mandatory - Consult us for available layouts)                     |           |          |          |           |          |           |          |          |  |  |          |
| <b>Special custom:</b>                                                                                              |           |          |          |           |          |           |          |          |  |  |          |
| None: Standard plastic cap                                                                                          |           |          |          |           |          |           |          |          |  |  |          |
| M: Antistatic plastic cap                                                                                           |           |          |          |           |          |           |          |          |  |  |          |
| L: For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation. |           |          |          |           |          |           |          |          |  |  |          |

Note: PC tail contacts without shoulder also available. Please see page 132.

8DV plug with reinforced locking available. Please see page 122.

## BACC part numbers

|                                                            |                 |           |          |           |          |          |          |
|------------------------------------------------------------|-----------------|-----------|----------|-----------|----------|----------|----------|
| <b>Basic Series:</b>                                       | <b>BACC63DB</b> | <b>13</b> | <b>-</b> | <b>98</b> | <b>P</b> | <b>N</b> | <b>H</b> |
| BACC63DB: 8D5*K (stainless steel plug)                     |                 |           |          |           |          |          |          |
| BACC63DC: 8D0*K (stainless steel square flange receptacle) |                 |           |          |           |          |          |          |
| <b>Shell size:</b>                                         |                 |           |          |           |          |          |          |
| 09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J       |                 |           |          |           |          |          |          |
| - : Separator (mandatory)                                  |                 |           |          |           |          |          |          |
| <b>Contact layout:</b>                                     |                 |           |          |           |          |          |          |
| See page 18 for layout according to BACC                   |                 |           |          |           |          |          |          |
| <b>Contact type:</b>                                       |                 |           |          |           |          |          |          |
| P: Pin                                                     |                 |           |          |           |          |          |          |
| S: Socket                                                  |                 |           |          |           |          |          |          |
| <b>Orientation:</b>                                        |                 |           |          |           |          |          |          |
| N, A, B, C, D, E (see page 75)                             |                 |           |          |           |          |          |          |
| <b>Specification:</b>                                      |                 |           |          |           |          |          |          |
| None: With contacts                                        |                 |           |          |           |          |          |          |
| H: Without contact & without filler plug                   |                 |           |          |           |          |          |          |

## MIL-DTL-38999 part numbers

| Basic Series                                                                                                                                                                                                                                                     | D38999/ | 20 | K | B | 35 | P | N | L |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|---|---|----|---|---|---|
| <b>Shell style:</b><br>20: Square flange receptacle<br>24: Jam nut receptacle<br>26: Plug with RFI shielding                                                                                                                                                     |         |    |   |   |    |   |   |   |
| <b>Plating:</b><br>K: Passivated<br>S: Nickel                                                                                                                                                                                                                    |         |    |   |   |    |   |   |   |
| <b>Shell size:</b><br>09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J                                                                                                                                                                                       |         |    |   |   |    |   |   |   |
| <b>Contact layout:</b><br>See page 18 for layout according to MIL-DTL-38999                                                                                                                                                                                      |         |    |   |   |    |   |   |   |
| <b>Contact type:</b><br>P: Pin<br>A: Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)<br>S: Socket<br>B: Connector supplied less socket contact or with specific contacts (connector marking: B + orientation) |         |    |   |   |    |   |   |   |
| <b>Orientation:</b><br>N, A, B, C, D, E (see page 75)                                                                                                                                                                                                            |         |    |   |   |    |   |   |   |
| L: For P or S contact type only, connector delivered without contacts, connector marking P or S (without L)                                                                                                                                                      |         |    |   |   |    |   |   |   |

Note: To place an order of MIL connectors delivered without MIL removable crimp contacts and keep P or S plus orientation marking, it must be specify clearly on the order (by adding a suffix L at the end of the P/N or specified in comment).

Delivered with MIL contacts mandatory.

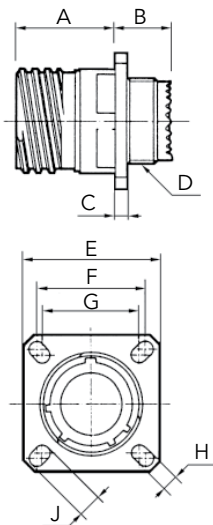
As stated in MIL-DTL-38999, class K connectors with #8 cavities may not meet the firewall requirement.

## EN3645 part numbers

| Basic Series                                                                                                                       | EN3645 | K | 6 | G | N | 35 | B | N |
|------------------------------------------------------------------------------------------------------------------------------------|--------|---|---|---|---|----|---|---|
| <b>Plating:</b><br>K: Stainless steel passivated                                                                                   |        |   |   |   |   |    |   |   |
| <b>Shell style:</b><br>0: Square flange receptacle<br>6: Plug<br>7: Jam nut receptacle                                             |        |   |   |   |   |    |   |   |
| <b>Shell size:</b><br>09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J                                                         |        |   |   |   |   |    |   |   |
| <b>Grounding:</b><br>N: Standard insert not grounded                                                                               |        |   |   |   |   |    |   |   |
| <b>Contact layout:</b><br>See page 18 for layout according to EN3645                                                               |        |   |   |   |   |    |   |   |
| <b>Contact type:</b><br>A: Connector supplied less pin contact<br>B: Connector supplied less socket contact<br>F: Socket<br>M: Pin |        |   |   |   |   |    |   |   |
| <b>Orientation:</b><br>N, A, B, C, D, E (see page 75)                                                                              |        |   |   |   |   |    |   |   |

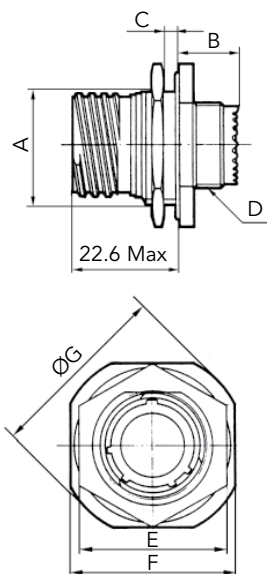
## Dimensions

### Receptacle type 0 (8D) or type 20 (D38999)



| Shell size | A Max | B Max | C Max | D Thread   | E $\pm 0.3$ | F     | G     | H $\pm 0.2$ | J $\pm 0.2$ |
|------------|-------|-------|-------|------------|-------------|-------|-------|-------------|-------------|
| 09 (A)     | 20.2  | 11.4  | 2.5   | M12 x 1-6g | 23.8        | 18.26 | 15.09 | 3.25        | 5.49        |
| 11 (B)     |       |       |       | M15 x 1-6g | 26.2        | 20.62 | 18.26 |             | 4.93        |
| 13 (C)     |       |       |       | M18 x 1-6g | 28.6        | 23.01 | 20.62 |             | 4.4         |
| 15 (D)     |       |       |       | M22 x 1-6g | 31          | 24.61 | 23.01 |             | 4.93        |
| 17 (E)     |       |       |       | M25 x 1-6g | 33.3        | 26.97 | 24.61 |             | 4.93        |
| 19 (F)     |       |       |       | M28 x 1-6g | 36.5        | 29.36 | 26.97 |             | 4.93        |
| 21 (G)     | 19.8  | 11.8  | 3.2   | M31 x 1-6g | 39.7        | 31.75 | 29.36 | 3.91        | 6.15        |
| 23 (H)     |       |       |       | M34 x 1-6g | 42.9        | 34.93 | 31.75 |             |             |
| 25 (J)     |       |       |       | M37 x 1-6g | 46          | 38.1  | 34.93 |             |             |

### Receptacle type 7 (8D) or type 24 (D38999)



| Shell size | A $\pm 0.15$ | B Max | C Max | D Thread   | E Max | F $\pm 0.4$ | ØG Max |
|------------|--------------|-------|-------|------------|-------|-------------|--------|
| 09 (A)     | 16.53        | 9.9   | 3.2   | M12 x 1-6g | 23    | 27          | 30.5   |
| 11 (B)     | 19.07        |       |       | M15 x 1-6g | 26    | 31.8        | 35.2   |
| 13 (C)     | 23.82        |       |       | M18 x 1-6g | 31    | 34.9        | 38.4   |
| 15 (D)     | 26.97        |       |       | M22 x 1-6g | 34    | 38.1        | 41.6   |
| 17 (E)     | 30.15        |       |       | M25 x 1-6g | 37    | 41.3        | 44.8   |
| 19 (F)     | 33.32        |       |       | M28 x 1-6g | 41    | 46          | 49.5   |
| 21 (G)     | 36.50        |       |       | M31 x 1-6g | 46    | 49.2        | 52.7   |
| 23 (H)     | 39.67        |       |       | M34 x 1-6g | 47    | 52.4        | 55.9   |
| 25 (J)     | 42.85        |       |       | M37 x 1-6g | 51.23 | 55.6        | 59     |

#### Recommended coupling torque on panel for jam nut receptacle (type 7)

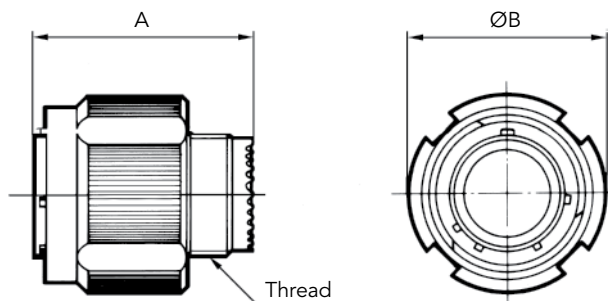
| Shell                            | 09 (A) | 11 (B) | 13 (C) | 15 (D) | 17 (E) | 19 (F) | 21 (G) | 23 (H) | 25 (J) |
|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Coupling torque ( $\pm 0.5$ N.m) | 4      | 5      | 7      | 8      | 9      | 10     | 12     | 13     | 14     |

Note: All dimensions are in millimeters (mm)

## Dimensions

### Plug type 5 (8D) or type 26 (D38999)

8D type 5 & D38999 type 26

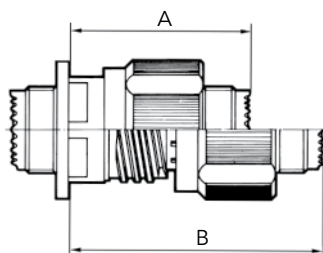


| Shell size | A Max | Thread     | ØB Max |
|------------|-------|------------|--------|
| 09 (A)     | 31.00 | M12 x 1-6g | 21.80  |
| 11 (B)     |       | M15 x 1-6g | 25.00  |
| 13 (C)     |       | M18 x 1-6g | 29.40  |
| 15 (D)     |       | M22 x 1-6g | 32.50  |
| 17 (E)     |       | M25 x 1-6g | 35.70  |
| 19 (F)     |       | M28 x 1-6g | 38.50  |
| 21 (G)     |       | M31 x 1-6g | 41.70  |
| 23 (H)     |       | M34 x 1-6g | 44.90  |
| 25 (J)     |       | M37 x 1-6g | 48.00  |

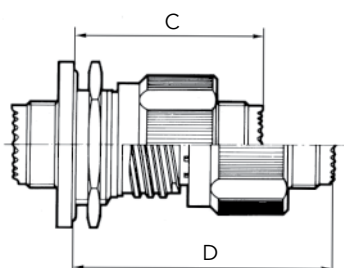
8DV plug with reinforced locking available. Please see page 122.

### Mated connectors dimensions

Type 0 with plug



Type 7 with plug



| Shell size | A Max | B Max | C Max | D Max |
|------------|-------|-------|-------|-------|
| 09 (A)     | 37.00 | 52.30 | 38.30 | 53.60 |
| 11 (B)     |       |       | 38.50 | 53.80 |
| 13 (C)     |       |       |       |       |
| 15 (D)     |       |       |       |       |
| 17 (E)     |       |       |       |       |
| 19 (F)     |       |       |       |       |
| 21 (G)     | 36.00 | 51.30 |       |       |
| 23 (H)     |       |       |       |       |
| 25 (J)     |       |       |       |       |

Note: All dimensions are in millimeters (mm)

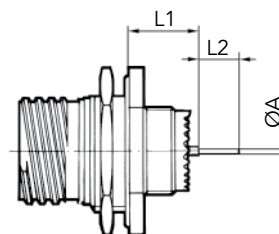
# PC tail contacts lengths

|    | Contact size | Contact type |     | PC tail type | Shell size |        |        |        |        |        |        |        |
|----|--------------|--------------|-----|--------------|------------|--------|--------|--------|--------|--------|--------|--------|
|    |              |              |     |              | 09 (A)     | 11 (B) | 13 (C) | 15 (C) | 17 (E) | 19 (F) | 21 (G) | 23 (H) |
| ØA | #22D         | M & F        | Max | L & C        | 0.70       |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 0.50       |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 0.70       |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 1.15       |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 1.65       |        |        |        |        |        |        |        |
| L1 | #22D         | M            | Min | L & C        | 10.52      |        | 10.34  |        |        |        |        |        |
|    |              | M            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |
|    |              | F            | Min | L & C        | 10.19      |        | 10.01  |        |        |        |        |        |
|    |              | F            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |
|    |              | M            | Min | S            | 10.19      |        | 10.01  |        |        |        |        |        |
|    |              | M            | Max | S            | 11.46      |        | 11.28  |        |        |        |        |        |
|    |              | F            | Min | S            | 10.69      |        | 10.51  |        |        |        |        |        |
|    |              | F            | Max | S            | 11.63      |        | 11.45  |        |        |        |        |        |
|    | #20          | M            | Min | C            | 10.36      |        | 10.18  |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |
|    | #16          | M            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |
|    | #12          | M            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |
|    |              | M            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |
|    |              | F            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |
|    |              | F            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |
| L2 | #22D         | M & F        | Max | L            | 8.50       |        |        |        |        |        |        |        |
|    |              | M & F        | Max | C            | 4.00       |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 5.10       |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |
| L3 | #22D         | M            | Min | L & C        | 9.48       |        |        |        |        |        | 9.59   |        |
|    |              | M            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |
|    |              | F            | Min | L & C        | 9.15       |        |        |        |        |        | 9.26   |        |
|    |              | F            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |
|    |              | M            | Min | S            | 9.65       |        |        |        |        |        | 9.76   |        |
|    |              | M            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |
|    |              | F            | Min | S            | 9.15       |        |        |        |        |        | 9.26   |        |
|    |              | F            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |
|    | #20          | M            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |
|    |              | F            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |
|    | #16          | M            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |
|    |              | F            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |
|    | #12          | M            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |
|    |              | M            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |
|    |              | F            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |
|    |              | F            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |

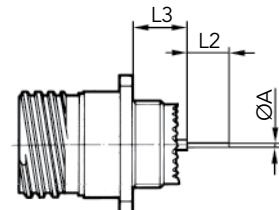
M: Male contact  
F: Female contact

L: Long PC tail  
C: Short PC tail  
S: Specific PC tail

Receptacle type 7



Receptacle type 0



Note: All dimensions are in millimeters (mm)

## Connectors weight - in gram (±15%)

| Shell size & Layout |    | With contacts    |        |                   |        |                 |        |                 |        | Without contacts |        |                   |        |                 |        |                 |        |
|---------------------|----|------------------|--------|-------------------|--------|-----------------|--------|-----------------|--------|------------------|--------|-------------------|--------|-----------------|--------|-----------------|--------|
|                     |    | Plug 8D (type 5) |        | Plug 8DV (type 5) |        | Recep. (type 0) |        | Recep. (type 7) |        | Plug 8D (type 5) |        | Plug 8DV (type 5) |        | Recep. (type 0) |        | Recep. (type 7) |        |
|                     |    | Male             | Female | Male              | Female | Male            | Female | Male            | Female | Male             | Female | Male              | Female | Male            | Female | Male            | Female |
| 09                  | 35 | 30.63            | 32.21  | 32.53             | 34.11  | 23.93           | 25.51  | 33.93           | 35.51  | 30.21            | 30.71  | 32.11             | 32.61  | 23.51           | 24.01  | 33.51           | 34.01  |
|                     | 98 | 30.63            | 31.93  | 32.53             | 33.83  | 23.93           | 25.23  | 33.93           | 35.23  | 30.21            | 30.73  | 32.11             | 32.63  | 23.51           | 24.03  | 33.51           | 34.03  |
| 11                  | 01 | 38.13            | 41.07  | 41.53             | 44.47  | 29.53           | 32.47  | 42.43           | 45.37  | 37.47            | 39.47  | 40.87             | 42.87  | 28.87           | 30.87  | 41.77           | 43.77  |
|                     | 02 | 37.76            | 40.30  | 41.16             | 43.70  | 39.36           | 30.12  | 46.98           | 49.52  | 37.14            | 38.74  | 40.54             | 42.14  | 28.56           | 30.16  | 46.36           | 47.96  |
|                     | 04 | 37.95            | 41.01  | 41.35             | 44.41  | 29.35           | 32.41  | 42.25           | 45.31  | 37.39            | 39.41  | 40.79             | 42.81  | 28.79           | 30.81  | 41.69           | 43.71  |
|                     | 05 | 37.98            | 41.19  | 41.38             | 44.59  | 29.38           | 32.59  | 42.04           | 45.49  | 37.28            | 39.19  | 40.68             | 42.59  | 28.68           | 30.59  | 41.58           | 43.49  |
|                     | 22 | 37.48            | 39.54  | 40.88             | 42.94  | 28.90           | 30.86  | 46.70           | 48.76  | 37.34            | 39.04  | 40.74             | 42.44  | 28.76           | 30.36  | 46.56           | 48.26  |
|                     | 35 | 37.88            | 41.35  | 41.28             | 44.75  | 29.28           | 32.75  | 41.94           | 45.65  | 36.97            | 38.10  | 40.37             | 41.50  | 28.37           | 29.50  | 41.27           | 42.40  |
|                     | 80 | 38.12            | 44.84  | 41.52             | 48.24  | 29.73           | 36.26  | 47.78           | 54.06  | 34.86            | 37.84  | 38.26             | 41.24  | 26.45           | 29.26  | 44.51           | 47.06  |
|                     | 98 | 37.85            | 40.61  | 41.25             | 44.01  | 29.25           | 32.01  | 42.15           | 44.91  | 37.01            | 38.21  | 40.41             | 41.61  | 28.41           | 29.61  | 41.31           | 42.51  |
|                     | 99 | 38.02            | 41.24  | 41.42             | 44.64  | 29.44           | 32.66  | 47.24           | 50.46  | 37.04            | 38.44  | 40.44             | 41.84  | 28.46           | 29.86  | 46.26           | 47.66  |
| 13                  | 04 | 53.34            | 57.12  | 56.64             | 60.42  | 37.94           | 41.72  | 56.24           | 60.02  | 52.10            | 54.00  | 55.40             | 57.30  | 36.70           | 38.60  | 55.00           | 56.90  |
|                     | 08 | 53.72            | 58.90  | 57.02             | 62.20  | 38.32           | 43.50  | 56.62           | 61.80  | 52.60            | 55.70  | 55.90             | 59.00  | 37.20           | 40.30  | 55.50           | 58.60  |
|                     | 26 | 54.09            | 59.74  | 57.39             | 63.04  | 38.69           | 44.34  | 56.99           | 62.64  | 52.35            | 55.04  | 55.65             | 58.34  | 36.95           | 39.64  | 55.25           | 57.94  |
|                     | 35 | 53.52            | 59.29  | 56.82             | 62.59  | 38.12           | 43.89  | 56.42           | 62.19  | 51.98            | 53.79  | 55.28             | 57.09  | 36.58           | 38.39  | 54.88           | 56.69  |
| 15                  | 05 | 64.49            | 69.83  | 68.49             | 73.83  | 45.69           | 51.03  | 67.59           | 72.93  | 62.94            | 65.93  | 66.94             | 69.93  | 44.14           | 47.13  | 66.04           | 69.03  |
|                     | 15 | 65.29            | 72.45  | 69.29             | 76.45  | 46.49           | 53.65  | 68.39           | 75.55  | 63.02            | 66.07  | 67.02             | 70.07  | 44.22           | 47.27  | 66.12           | 69.17  |
|                     | 18 | 65.50            | 74.38  | 69.50             | 78.38  | 46.70           | 55.58  | 68.60           | 77.48  | 62.98            | 67.18  | 66.98             | 71.18  | 44.18           | 48.38  | 66.08           | 70.28  |
|                     | 19 | 65.03            | 72.76  | 69.03             | 76.76  | 46.23           | 53.96  | 68.13           | 75.86  | 62.37            | 65.16  | 66.37             | 69.16  | 43.57           | 46.36  | 65.47           | 68.26  |
|                     | 35 | 65.13            | 74.37  | 69.13             | 78.37  | 46.33           | 55.57  | 68.23           | 77.47  | 62.54            | 65.12  | 66.54             | 69.12  | 43.74           | 46.32  | 65.64           | 68.22  |
|                     | 97 | 64.96            | 72.01  | 68.96             | 76.01  | 46.16           | 53.21  | 68.06           | 75.11  | 62.60            | 65.69  | 66.60             | 69.69  | 43.80           | 46.89  | 65.70           | 68.79  |
| 17                  | 02 | 77.80            | 92.64  | 82.70             | 97.54  | 72.89           | 87.73  | 104.09          | 118.95 | 74.53            | 86.09  | 79.43             | 90.99  | 69.62           | 81.18  | 100.82          | 112.38 |
|                     | 06 | 69.07            | 78.67  | 73.97             | 83.57  | 64.17           | 73.77  | 87.27           | 96.87  | 65.11            | 69.07  | 70.01             | 73.97  | 60.21           | 64.17  | 83.31           | 87.27  |
|                     | 08 | 68.06            | 76.79  | 72.96             | 81.69  | 63.16           | 71.89  | 86.26           | 94.99  | 65.58            | 70.55  | 70.48             | 75.45  | 60.68           | 65.65  | 83.78           | 88.75  |
|                     | 26 | 68.64            | 79.43  | 73.54             | 84.33  | 63.74           | 74.53  | 86.84           | 97.63  | 65.00            | 69.03  | 69.90             | 73.93  | 60.10           | 64.13  | 83.20           | 87.23  |
|                     | 35 | 68.88            | 82.43  | 73.78             | 87.33  | 63.98           | 77.53  | 87.08           | 100.63 | 65.03            | 68.68  | 69.93             | 73.58  | 60.13           | 63.78  | 83.23           | 86.88  |
|                     | 75 | 74.48            | 85.77  | 79.38             | 90.67  | 69.58           | 80.87  | 92.68           | 103.97 | 65.48            | 71.77  | 70.38             | 76.67  | 60.58           | 66.87  | 83.68           | 89.97  |
| 19                  | 11 | 87.04            | 100.63 | 87.99             | 101.58 | 67.69           | 81.28  | 97.59           | 111.18 | 83.63            | 92.05  | 84.58             | 93.00  | 64.28           | 73.45  | 94.18           | 103.35 |
|                     | 32 | 86.25            | 99.65  | 87.20             | 100.60 | 66.90           | 80.30  | 96.80           | 110.20 | 81.77            | 86.85  | 82.72             | 87.80  | 62.42           | 67.50  | 92.32           | 97.40  |
|                     | 35 | 86.56            | 103.01 | 87.51             | 103.96 | 67.21           | 83.66  | 97.11           | 113.56 | 81.94            | 86.51  | 82.89             | 87.46  | 62.59           | 67.16  | 92.49           | 97.06  |
| 21                  | 11 | 99.71            | 119.55 | 101.71            | 121.55 | 81.81           | 101.65 | 111.81          | 131.65 | 92.45            | 101.95 | 94.45             | 103.95 | 74.55           | 84.05  | 104.55          | 114.05 |
|                     | 16 | 96.81            | 112.09 | 98.81             | 114.09 | 78.91           | 94.19  | 108.91          | 124.19 | 91.85            | 99.61  | 93.85             | 101.61 | 73.95           | 81.71  | 103.95          | 111.71 |
|                     | 35 | 97.09            | 117.75 | 99.09             | 119.75 | 79.19           | 99.85  | 109.19          | 129.85 | 91.56            | 98.00  | 93.56             | 100.00 | 73.66           | 80.10  | 103.66          | 110.10 |
|                     | 39 | 98.47            | 118.80 | 100.47            | 120.8  | 80.57           | 100.90 | 110.57          | 130.90 | 92.67            | 102.44 | 94.67             | 104.44 | 74.77           | 84.54  | 104.77          | 114.54 |
|                     | 41 | 97.01            | 114.38 | 99.01             | 116.38 | 79.11           | 126.48 | 109.11          | 126.48 | 91.27            | 97.98  | 93.27             | 99.98  | 73.37           | 80.08  | 103.37          | 80.08  |
|                     | 48 | 103.84           | 123.82 | 105.84            | 125.82 | 85.93           | 105.91 | 126.02          | 146.02 | 90.72            | 97.62  | 92.72             | 99.62  | 72.81           | 79.71  | 112.92          | 119.82 |
| 23                  | 75 | 108.72           | 125.62 | 110.72            | 127.62 | 90.81           | 107.71 | 130.92          | 147.82 | 90.72            | 97.62  | 92.72             | 99.62  | 72.81           | 79.71  | 112.92          | 119.82 |
|                     | 21 | 108.81           | 132.06 | 118.01            | 141.26 | 90.61           | 113.86 | 122.81          | 146.06 | 102.30           | 115.68 | 111.5             | 124.88 | 84.10           | 97.48  | 116.30          | 129.68 |
|                     | 35 | 107.17           | 133.32 | 116.37            | 142.52 | 88.97           | 115.12 | 121.17          | 147.32 | 100.17           | 108.32 | 109.37            | 117.52 | 81.97           | 90.12  | 114.17          | 122.32 |
|                     | 53 | 107.23           | 129.42 | 116.43            | 138.62 | 89.03           | 111.22 | 121.23          | 143.42 | 99.81            | 108.22 | 109.01            | 117.42 | 81.61           | 90.02  | 113.81          | 122.22 |
| 25                  | 55 | 107.98           | 131.05 | 117.18            | 140.25 | 89.78           | 112.85 | 121.98          | 145.05 | 100.28           | 109.05 | 109.48            | 118.25 | 82.08           | 90.85  | 114.28          | 123.05 |
|                     | 07 | 133.3            | 157.7  | 141.50            | 165.90 | 115.50          | 172.25 | 160.06          | 172.25 | 108.51           | 119.45 | 116.71            | 127.65 | 90.71           | 101.65 | 135.27          | 101.65 |
|                     | 11 | 132.31           | 152.31 | 140.51            | 160.51 | 114.51          | 134.51 | 159.71          | 179.07 | 111.51           | 124.51 | 119.71            | 132.71 | 93.71           | 106.71 | 138.91          | 151.27 |
|                     | 19 | 122.14           | 154.15 | 130.34            | 162.35 | 104.34          | 136.35 | 136.74          | 168.75 | 109.60           | 123.75 | 117.80            | 131.95 | 91.80           | 105.95 | 124.20          | 138.35 |
|                     | 24 | 121.64           | 153.00 | 129.84            | 161.20 | 103.84          | 135.20 | 136.24          | 167.60 | 110.00           | 124.44 | 118.20            | 132.64 | 92.20           | 106.64 | 124.60          | 139.04 |
|                     | 29 | 119.96           | 148.93 | 128.16            | 157.13 | 102.16          | 131.13 | 134.56          | 163.53 | 110.97           | 126.31 | 119.17            | 134.51 | 93.17           | 108.51 | 125.57          | 140.91 |
|                     | 35 | 117.75           | 150.58 | 125.95            | 158.78 | 99.95           | 132.78 | 132.35          | 165.18 | 108.79           | 118.58 | 116.99            | 126.78 | 90.99           | 100.78 | 123.39          | 133.18 |
|                     | 37 | 119.98           | 148.26 | 128.18            | 156.46 | 102.18          | 162.67 | 146.74          | 162.67 | 108.51           | 119.40 | 116.71            | 127.60 | 90.71           | 101.60 | 135.27          | 101.60 |
|                     | 44 | 140.35           | 164.98 | 148.55            | 173.18 | 122.55          | 179.58 | 167.11          | 179.71 | 106.81           | 117.08 | 115.01            | 125.28 | 89.01           | 99.28  | 133.57          | 99.41  |
|                     | 43 | 120.00           | 150.68 | 128.20            | 158.88 | 102.20          | 132.88 | 134.60          | 165.28 | 110.58           | 125.88 | 118.78            | 134.08 | 92.78           | 108.08 | 125.18          | 140.48 |
|                     | 46 | 122.30           | 146.14 | 130.50            | 154.34 | 104.50          | 128.34 | 136.90          | 160.74 | 107.66           | 117.82 | 115.86            | 126.02 | 89.86           | 100.02 | 122.26          | 132.42 |
|                     | 61 | 117.05           | 143.80 | 125.25            | 152.00 | 99.25           | 126.00 | 131.65          | 158.40 | 108.51           | 119.40 | 116.71            | 127.60 | 90.71           | 101.60 | 123.11          | 155.51 |
|                     | 08 | 143.38           | 175.21 | 151.58            | 183.41 | 125.58          | 157.41 | 157.98          | 189.81 | 107.38           | 119.21 | 115.58            | 127.41 | 89.58           | 101.41 | 121.98          | 133.81 |
|                     | 20 | 128.40           | 158.62 | 136.60            | 166.82 | 110.60          | 140.82 | 143.00          | 173.22 | 106.83           | 117.08 | 115.03            | 125.28 | 89.03           | 99.28  | 121.43          | 131.68 |
|                     | 04 | 120.80           | 150.65 | 129.00            | 158.85 | 103.00          | 132.85 | 135.40          | 165.25 | 111.60           | 125.21 | 119.80            | 133.41 | 93.80           | 107.41 | 126.20          | 139.81 |

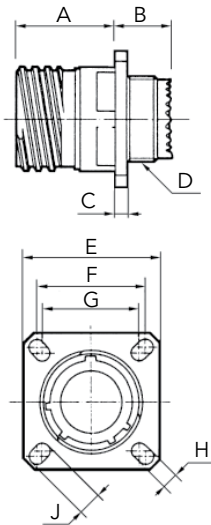
## Connector part numbers

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |          |          |           |           |           |          |          |  |  |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|-----------|-----------|-----------|----------|----------|--|--|----------|
| <b>Basic Series</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>8D</b> | <b>0</b> | <b>-</b> | <b>11</b> | <b>TT</b> | <b>35</b> | <b>P</b> | <b>N</b> |  |  | <b>L</b> |
| <b>Shell style:</b><br>0: Square flange receptacle<br>7: Jam nut receptacle<br>5: Plug with RFI shielding                                                                                                                                                                                                                                                                                                                                                                                                                    |           |          |          |           |           |           |          |          |  |  |          |
| <b>Type:</b><br>- : Connectors with standard crimp contacts<br><b>L:</b> Receptacle with long PC tail (male and female size #22D, #20)<br><b>C:</b> Receptacle with short PC tail (male and female #22D, #20, #16, #12)<br><b>S:</b> Receptacle with specific PC tail (male et female #22D)<br><b>W:</b> Receptacle with male contacts #22D for wire wrap (3 wraps)<br><b>T:</b> Receptacle with male contacts #20 for wire wrap (2 wraps)<br><b>P:</b> Receptacle with solder cup contacts - see page 68, please consult us |           |          |          |           |           |           |          |          |  |  |          |
| <b>Shell size:</b><br>09, 11, 13, 15, 17, 19, 21, 23, 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |          |          |           |           |           |          |          |  |  |          |
| <b>Plating:</b><br>TT: Without plating<br>TF: Nickel                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |          |          |           |           |           |          |          |  |  |          |
| <b>Contact layout:</b><br>See pages 13 to 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |          |          |           |           |           |          |          |  |  |          |
| <b>Contact type:</b><br><b>P:</b> Pin<br><b>A:</b> Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)<br><b>S:</b> Socket<br><b>B:</b> Connector supplied less socket contact or with specific contacts (connector marking: B + orientation)                                                                                                                                                                                                                                 |           |          |          |           |           |           |          |          |  |  |          |
| <b>Orientation:</b><br>N, A, B, C, D, E (see page 75)                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |          |          |           |           |           |          |          |  |  |          |
| <b>Specification:</b><br>046: Tinned straight PC tail<br>251: Connector provided with power contacts (layouts with contact #8)<br>022: Fuel tank                                                                                                                                                                                                                                                                                                                                                                             |           |          |          |           |           |           |          |          |  |  |          |
| <b>Special custom</b><br><b>None:</b> Standard plastic cap<br><b>M:</b> Antistatic plastic cap                                                                                                                                                                                                                                                                                                                                                                                                                               |           |          |          |           |           |           |          |          |  |  |          |
| <b>L:</b> For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation                                                                                                                                                                                                                                                                                                                                                                                                    |           |          |          |           |           |           |          |          |  |  |          |

Note: PC tail contacts without shoulder also available. Please see page 132.

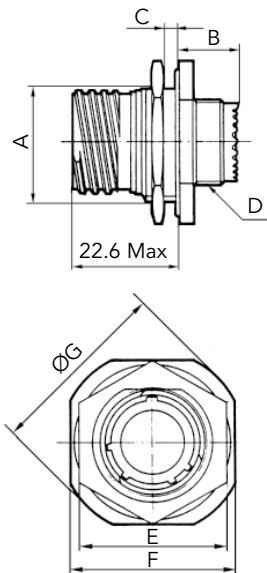
## Dimensions

### Receptacle type 0



| Shell size | A Max | B Max | C Max | D Thread   | E $\pm 0.3$ | F     | G     | H $\pm 0.2$ | J $\pm 0.2$ |
|------------|-------|-------|-------|------------|-------------|-------|-------|-------------|-------------|
| 09 (A)     | 20.2  | 11.4  | 2.5   | M12 x 1-6g | 23.8        | 18.26 | 15.09 | 3.25        | 5.49        |
| 11 (B)     |       |       |       | M15 x 1-6g | 26.2        | 20.62 | 18.26 |             | 4.93        |
| 13 (C)     |       |       |       | M18 x 1-6g | 28.6        | 23.01 | 20.62 |             | 4.4         |
| 15 (D)     |       |       |       | M22 x 1-6g | 31          | 24.61 | 23.01 |             |             |
| 17 (E)     |       |       |       | M25 x 1-6g | 33.3        | 26.97 | 24.61 |             |             |
| 19 (F)     |       |       |       | M28 x 1-6g | 36.5        | 29.36 | 26.97 |             |             |
| 21 (G)     | 19.8  | 11.8  | 3.2   | M31 x 1-6g | 39.7        | 31.75 | 29.36 | 3.91        | 6.15        |
| 23 (H)     |       | 11.4  |       | M34 x 1-6g | 42.9        | 34.93 | 31.75 |             |             |
| 25 (J)     |       |       |       | M37 x 1-6g | 46          | 38.1  | 34.93 |             |             |

### Receptacle type 7



| Shell size | A $\pm 0.15$ | B Max | C Max | D Thread   | E Max | F $\pm 0.4$ | $\varnothing G$ Max |
|------------|--------------|-------|-------|------------|-------|-------------|---------------------|
| 09 (A)     | 16.53        | 9.9   | 3.2   | M12 x 1-6g | 23    | 27          | 30.5                |
| 11 (B)     | 19.07        |       |       | M15 x 1-6g | 26    | 31.8        | 35.2                |
| 13 (C)     | 23.82        |       |       | M18 x 1-6g | 31    | 34.9        | 38.4                |
| 15 (D)     | 26.97        |       |       | M22 x 1-6g | 34    | 38.1        | 41.6                |
| 17 (E)     | 30.15        |       |       | M25 x 1-6g | 37    | 41.3        | 44.8                |
| 19 (F)     | 33.32        |       |       | M28 x 1-6g | 41    | 46          | 49.5                |
| 21 (G)     | 36.50        |       |       | M31 x 1-6g | 46    | 49.2        | 52.7                |
| 23 (H)     | 39.67        |       |       | M34 x 1-6g | 47    | 52.4        | 55.9                |
| 25 (J)     | 42.85        |       |       | M37 x 1-6g | 51.23 | 55.6        | 59                  |

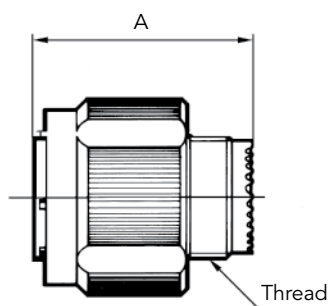
#### Recommended coupling torque on panel for jam nut receptacle (type 7)

| Shell                            | 09 (A) | 11 (B) | 13 (C) | 15 (D) | 17 (E) | 19 (F) | 21 (G) | 23 (H) | 25 (J) |
|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Coupling torque ( $\pm 0.5$ N.m) | 4      | 5      | 7      | 8      | 9      | 10     | 12     | 13     | 14     |

Note: All dimensions are in millimeters (mm)

## Dimensions

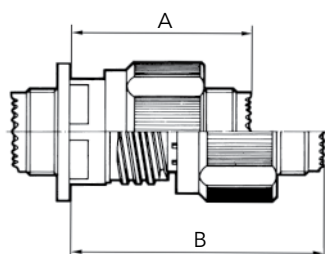
### Plug type 5



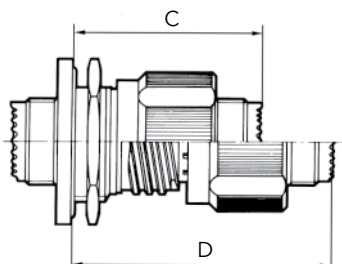
| Shell size | A Max | Thread     | ØB Max |
|------------|-------|------------|--------|
| 09 (A)     | 31.00 | M12 x 1-6g | 21.80  |
| 11 (B)     |       | M15 x 1-6g | 25.00  |
| 13 (C)     |       | M18 x 1-6g | 29.40  |
| 15 (D)     |       | M22 x 1-6g | 32.50  |
| 17 (E)     |       | M25 x 1-6g | 35.70  |
| 19 (F)     |       | M28 x 1-6g | 38.50  |
| 21 (G)     |       | M31 x 1-6g | 41.70  |
| 23 (H)     |       | M34 x 1-6g | 44.90  |
| 25 (J)     |       | M37 x 1-6g | 48.00  |

### Mated connectors dimensions

Type 0 with plug



Type 7 with plug



| Shell size | A Max | B Max | C Max | D Max |
|------------|-------|-------|-------|-------|
| 09 (A)     | 37.00 | 52.30 | 38.30 | 53.60 |
| 11 (B)     |       |       | 38.50 | 53.80 |
| 13 (C)     |       |       |       |       |
| 15 (D)     |       |       |       |       |
| 17 (E)     |       |       |       |       |
| 19 (F)     |       |       |       |       |
| 21 (G)     | 36.00 | 51.30 |       |       |
| 23 (H)     |       |       |       |       |
| 25 (J)     |       |       |       |       |

Note: All dimensions are in millimeters (mm)

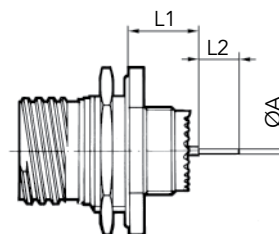
# PC tail contacts lengths

|    | Contact size | Contact type |     | PC tail type | Shell size |        |        |        |        |        |        |        |        |
|----|--------------|--------------|-----|--------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|
|    |              |              |     |              | 09 (A)     | 11 (B) | 13 (C) | 15 (C) | 17 (E) | 19 (F) | 21 (G) | 23 (H) | 25 (J) |
| ØA | #22D         | M & F        | Max | L & C        | 0.70       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 0.50       |        |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 0.70       |        |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 1.15       |        |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 1.65       |        |        |        |        |        |        |        |        |
| L1 | #22D         | M            | Min | L & C        | 10.52      |        | 10.34  |        |        |        |        |        |        |
|    |              | M            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | F            | Min | L & C        | 10.19      |        | 10.01  |        |        |        |        |        |        |
|    |              | F            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | M            | Min | S            | 10.19      |        | 10.01  |        |        |        |        |        |        |
|    |              | M            | Max | S            | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | F            | Min | S            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | S            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #20          | M            | Min | C            | 10.36      |        | 10.18  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #16          | M            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #12          | M            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |        |
| L2 | #22D         | M & F        | Max | L            | 8.50       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | C            | 4.00       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 5.10       |        |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
| L3 | #22D         | M            | Min | L & C        | 9.48       |        |        |        |        |        | 9.59   |        |        |
|    |              | M            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |        |
|    |              | F            | Min | L & C        | 9.15       |        |        |        |        |        | 9.26   |        |        |
|    |              | F            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |        |
|    |              | M            | Min | S            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | M            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | S            | 9.15       |        |        |        |        |        | 9.26   |        |        |
|    |              | F            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #20          | M            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #16          | M            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #12          | M            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |        |
|    |              | M            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |        |
|    |              | F            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |        |
|    |              | F            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |        |

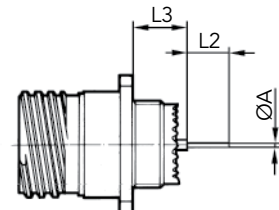
M: Male contact  
F: Female contact

L: Long PC tail  
C: Short PC tail  
S: Specific PC tail

Receptacle type 7



Receptacle type 0



Note: All dimensions are in millimeters (mm)

# Connectors weight - in gram (±15%)

| Shell size & Layout |    | With contacts |        |                     |        |                     |        | Without contacts |        |                     |        |                     |        |
|---------------------|----|---------------|--------|---------------------|--------|---------------------|--------|------------------|--------|---------------------|--------|---------------------|--------|
|                     |    | Plug (type 5) |        | Receptacle (type 0) |        | Receptacle (type 7) |        | Plug (type 5)    |        | Receptacle (type 0) |        | Receptacle (type 7) |        |
|                     |    | Male          | Female | Male                | Female | Male                | Female | Male             | Female | Male                | Female | Male                | Female |
| 09                  | 35 | 18.23         | 19.81  | 14.37               | 15.95  | 20.14               | 21.72  | 17.81            | 18.31  | 13.95               | 14.45  | 19.72               | 20.22  |
|                     | 98 | 18.23         | 19.53  | 14.37               | 15.67  | 20.14               | 21.44  | 17.81            | 18.33  | 13.95               | 14.47  | 19.72               | 20.24  |
| 11                  | 01 | 23.15         | 26.09  | 18.19               | 21.13  | 25.63               | 28.57  | 22.49            | 24.49  | 17.53               | 19.53  | 24.97               | 26.97  |
|                     | 02 | 22.78         | 25.32  | 17.82               | 20.36  | 28.1                | 30.64  | 22.16            | 23.76  | 17.2                | 18.8   | 27.48               | 29.08  |
|                     | 04 | 22.97         | 26.03  | 18.01               | 21.07  | 25.45               | 28.51  | 22.41            | 24.43  | 17.45               | 19.47  | 24.89               | 26.91  |
|                     | 05 | 23.00         | 26.21  | 18.04               | 21.25  | 25.24               | 28.69  | 22.30            | 24.21  | 17.34               | 19.25  | 24.78               | 26.69  |
|                     | 22 | 22.64         | 25.06  | 17.68               | 20.10  | 27.96               | 30.38  | 22.36            | 24.06  | 17.40               | 19.10  | 27.68               | 29.38  |
|                     | 35 | 22.90         | 26.37  | 17.94               | 21.41  | 25.14               | 28.85  | 21.99            | 23.12  | 17.03               | 18.16  | 24.47               | 25.60  |
|                     | 80 | 25.38         | 29.86  | 20.08               | 24.88  | 30.66               | 35.78  | 22.10            | 22.86  | 16.80               | 17.88  | 27.38               | 28.78  |
|                     | 98 | 22.87         | 25.63  | 17.91               | 20.67  | 25.35               | 28.11  | 22.03            | 23.23  | 17.07               | 18.27  | 24.51               | 25.71  |
|                     | 99 | 23.04         | 26.26  | 18.06               | 21.28  | 25.53               | 28.75  | 22.06            | 23.46  | 17.08               | 18.48  | 24.55               | 25.95  |
| 13                  | 04 | 32.44         | 36.22  | 23.56               | 27.34  | 34.11               | 37.89  | 31.20            | 33.10  | 22.32               | 24.22  | 32.87               | 34.77  |
|                     | 08 | 32.82         | 38.00  | 23.94               | 29.12  | 34.49               | 39.67  | 31.70            | 34.80  | 22.82               | 25.92  | 33.37               | 36.47  |
|                     | 26 | 33.19         | 38.84  | 24.31               | 29.96  | 34.86               | 40.51  | 31.45            | 34.14  | 22.57               | 25.26  | 33.12               | 35.81  |
|                     | 35 | 32.62         | 38.39  | 23.74               | 29.51  | 34.29               | 40.06  | 31.08            | 32.89  | 22.20               | 24.01  | 32.75               | 34.56  |
|                     | 98 | 32.48         | 37.10  | 23.60               | 28.22  | 34.15               | 38.77  | 31.08            | 33.10  | 22.20               | 24.22  | 32.75               | 34.77  |
| 15                  | 05 | 39.61         | 44.95  | 28.77               | 34.11  | 41.40               | 46.74  | 38.06            | 41.05  | 27.22               | 30.21  | 39.85               | 42.84  |
|                     | 15 | 40.41         | 47.57  | 29.57               | 36.73  | 42.20               | 49.36  | 38.14            | 41.19  | 27.30               | 30.35  | 39.93               | 42.98  |
|                     | 18 | 40.62         | 49.50  | 29.78               | 38.66  | 42.41               | 51.29  | 38.10            | 42.30  | 27.26               | 31.46  | 39.89               | 44.09  |
|                     | 19 | 40.15         | 47.88  | 29.31               | 37.04  | 41.94               | 49.67  | 37.49            | 40.28  | 26.65               | 29.44  | 39.28               | 42.07  |
|                     | 35 | 40.25         | 49.49  | 29.41               | 38.65  | 42.04               | 51.28  | 37.66            | 40.24  | 26.82               | 29.40  | 39.45               | 42.03  |
|                     | 97 | 40.08         | 47.13  | 29.24               | 36.29  | 41.87               | 48.92  | 37.72            | 40.81  | 26.88               | 29.97  | 39.51               | 42.60  |
| 17                  | 02 | 48.16         | 58.40  | 45.20               | 55.44  | 63.99               | 74.23  | 44.89            | 51.85  | 41.93               | 48.89  | 60.72               | 67.68  |
|                     | 06 | 43.73         | 53.33  | 40.90               | 50.50  | 54.23               | 63.83  | 39.77            | 43.73  | 36.94               | 40.90  | 50.27               | 54.23  |
|                     | 08 | 42.72         | 51.45  | 39.89               | 48.62  | 53.22               | 61.95  | 40.24            | 45.21  | 37.41               | 42.38  | 50.74               | 55.71  |
|                     | 26 | 43.30         | 54.09  | 40.47               | 51.26  | 53.80               | 64.59  | 39.66            | 43.69  | 36.83               | 40.86  | 50.16               | 54.19  |
|                     | 35 | 43.54         | 57.09  | 40.71               | 54.26  | 54.04               | 67.59  | 39.69            | 43.34  | 36.86               | 40.51  | 50.19               | 53.84  |
|                     | 75 | 49.14         | 60.43  | 46.31               | 57.60  | 59.64               | 70.93  | 40.14            | 46.43  | 37.31               | 43.60  | 50.64               | 56.93  |
| 19                  | 99 | 43.35         | 53.91  | 40.52               | 51.08  | 53.85               | 64.41  | 39.79            | 43.95  | 36.96               | 41.12  | 50.29               | 54.45  |
|                     | 11 | 55.16         | 68.75  | 44.00               | 57.59  | 61.25               | 74.84  | 51.75            | 60.17  | 40.59               | 66.26  | 40.59               | 66.26  |
|                     | 32 | 54.37         | 67.77  | 43.21               | 56.61  | 60.46               | 73.86  | 49.89            | 54.97  | 38.73               | 61.06  | 38.73               | 61.06  |
| 21                  | 35 | 54.68         | 71.13  | 43.52               | 59.97  | 60.77               | 77.22  | 50.06            | 54.63  | 38.90               | 60.72  | 38.90               | 60.72  |
|                     | 11 | 64.64         | 84.48  | 54.31               | 74.15  | 71.62               | 91.46  | 57.38            | 66.88  | 47.05               | 73.86  | 47.05               | 73.86  |
|                     | 16 | 61.74         | 77.02  | 51.41               | 66.69  | 68.72               | 84.00  | 56.78            | 64.54  | 46.45               | 71.52  | 46.45               | 71.52  |
|                     | 35 | 62.02         | 82.68  | 51.69               | 72.35  | 69.00               | 89.66  | 56.49            | 62.93  | 46.16               | 69.91  | 46.16               | 69.91  |
|                     | 39 | 63.40         | 83.73  | 53.07               | 73.40  | 70.38               | 90.71  | 57.60            | 67.37  | 47.27               | 74.35  | 47.27               | 74.35  |
|                     | 41 | 61.94         | 79.31  | 51.61               | 66.29  | 68.92               | 86.29  | 56.20            | 62.91  | 45.87               | 69.89  | 45.87               | 69.89  |
|                     | 48 | 68.73         | 88.71  | 58.4                | 78.38  | 81.56               | 101.54 | 55.61            | 62.51  | 45.28               | 72.18  | 45.28               | 72.18  |
| 23                  | 75 | 73.61         | 90.51  | 63.28               | 80.18  | 86.44               | 103.34 | 55.61            | 62.51  | 45.28               | 72.18  | 45.28               | 72.18  |
|                     | 21 | 71.07         | 94.32  | 60.57               | 83.82  | 79.15               | 102.40 | 64.56            | 77.94  | 54.06               | 86.02  | 54.06               | 86.02  |
|                     | 35 | 69.43         | 95.58  | 58.93               | 85.08  | 77.51               | 103.66 | 62.43            | 70.58  | 51.93               | 78.66  | 51.93               | 78.66  |
|                     | 53 | 69.49         | 91.68  | 58.99               | 81.18  | 77.57               | 99.76  | 62.07            | 70.48  | 51.57               | 78.56  | 51.57               | 78.56  |
| 25                  | 55 | 70.24         | 93.31  | 59.74               | 82.81  | 78.32               | 101.39 | 62.54            | 71.31  | 52.04               | 79.39  | 52.04               | 79.39  |
|                     | 07 | 83.91         | 117.09 | 73.64               | 123.58 | 99.34               | 121.8  | 68.12            | 78.84  | 57.85               | 85.33  | 57.85               | 85.33  |
|                     | 11 | 91.92         | 111.92 | 81.65               | 101.65 | 94.65               | 127.35 | 71.12            | 84.12  | 60.85               | 73.85  | 60.85               | 73.85  |
|                     | 19 | 81.78         | 113.79 | 71.51               | 103.52 | 90.20               | 122.21 | 69.24            | 83.39  | 58.97               | 91.81  | 58.97               | 91.81  |
|                     | 24 | 81.28         | 112.64 | 71.01               | 102.37 | 89.70               | 121.06 | 69.64            | 84.08  | 59.37               | 92.50  | 59.37               | 92.50  |
|                     | 29 | 79.60         | 108.57 | 69.33               | 98.30  | 88.02               | 116.99 | 70.61            | 85.95  | 60.34               | 94.37  | 60.34               | 94.37  |
|                     | 35 | 77.39         | 110.22 | 67.12               | 99.95  | 85.81               | 118.64 | 68.43            | 78.22  | 58.16               | 86.64  | 58.16               | 86.64  |
|                     | 37 | 79.59         | 107.09 | 69.32               | 116.12 | 95.02               | 113.36 | 68.12            | 79.04  | 57.85               | 87.26  | 57.85               | 87.26  |
|                     | 44 | 99.96         | 127.50 | 89.69               | 134.23 | 115.39              | 134.44 | 66.42            | 77.85  | 56.15               | 86.33  | 56.15               | 86.33  |
|                     | 43 | 79.64         | 110.32 | 69.37               | 100.05 | 88.06               | 118.74 | 70.22            | 85.52  | 59.95               | 93.94  | 59.95               | 93.94  |
|                     | 46 | 81.94         | 105.78 | 71.67               | 95.51  | 90.36               | 114.20 | 67.30            | 77.46  | 57.03               | 85.88  | 57.03               | 85.88  |
|                     | 61 | 76.69         | 103.44 | 66.42               | 93.17  | 85.11               | 111.86 | 68.15            | 79.04  | 57.88               | 87.46  | 57.88               | 87.46  |
|                     | 08 | 103.02        | 134.85 | 92.75               | 124.58 | 111.44              | 143.27 | 67.02            | 78.85  | 56.75               | 87.27  | 56.75               | 87.27  |
|                     | 20 | 88.04         | 118.26 | 77.77               | 107.99 | 96.46               | 126.68 | 66.47            | 76.72  | 56.20               | 85.14  | 56.20               | 85.14  |
|                     | 04 | 80.44         | 110.29 | 70.17               | 100.02 | 88.86               | 118.71 | 71.24            | 84.85  | 60.97               | 93.27  | 60.97               | 93.27  |

## Connector part numbers

|                                                                                                                         |            |           |          |           |           |          |          |
|-------------------------------------------------------------------------------------------------------------------------|------------|-----------|----------|-----------|-----------|----------|----------|
| <b>Basic Series</b>                                                                                                     | <b>JVS</b> | <b>16</b> | <b>A</b> | <b>11</b> | <b>35</b> | <b>P</b> | <b>N</b> |
| <b>Shell style:</b>                                                                                                     |            |           |          |           |           |          |          |
| 00: Square flange receptacle                                                                                            |            |           |          |           |           |          |          |
| 07: Jam nut receptacle                                                                                                  |            |           |          |           |           |          |          |
| 16: Plug with RFI shielding                                                                                             |            |           |          |           |           |          |          |
| <b>Material:</b>                                                                                                        |            |           |          |           |           |          |          |
| A: Bronze housing material                                                                                              |            |           |          |           |           |          |          |
| <b>Shell size:</b>                                                                                                      |            |           |          |           |           |          |          |
| 09, 11, 13, 15, 17, 19, 21, 23, 25                                                                                      |            |           |          |           |           |          |          |
| <b>Contact layout:</b>                                                                                                  |            |           |          |           |           |          |          |
| See pages 13 to 19                                                                                                      |            |           |          |           |           |          |          |
| <b>Contact type:</b>                                                                                                    |            |           |          |           |           |          |          |
| P: Pin      A: Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)       |            |           |          |           |           |          |          |
| S: Socket      B: Connector supplied less socket contact or with specific contacts (connector marking: B + orientation) |            |           |          |           |           |          |          |
| <b>Orientation:</b>                                                                                                     |            |           |          |           |           |          |          |
| N, A, B, C, D, E (see page 75)                                                                                          |            |           |          |           |           |          |          |
| <b>Specification:</b>                                                                                                   |            |           |          |           |           |          |          |
| 251: Connector provides with power contacts (layouts with contacts #8)                                                  |            |           |          |           |           |          |          |
| CI: Printed board mounting contacts                                                                                     |            |           |          |           |           |          |          |
| LI: Receptacle with long PC tail (pin or socket #22D)                                                                   |            |           |          |           |           |          |          |
| L: For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation      |            |           |          |           |           |          |          |

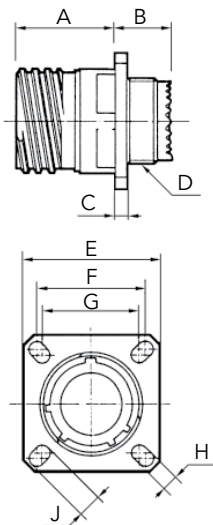
## CECC part numbers

|                                                      |                  |          |          |           |          |          |          |          |          |          |          |
|------------------------------------------------------|------------------|----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|
| <b>Basic Series</b>                                  | <b>C 752 002</b> | <b>B</b> | <b>B</b> | <b>98</b> | <b>M</b> | <b>C</b> | <b>N</b> | <b>A</b> | <b>0</b> | <b>1</b> | <b>G</b> |
| <b>Shell style:</b>                                  |                  |          |          |           |          |          |          |          |          |          |          |
| A: Plug                                              |                  |          |          |           |          |          |          |          |          |          |          |
| B: Square flange receptacle                          |                  |          |          |           |          |          |          |          |          |          |          |
| C: Jam nut receptacle                                |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Shell size:</b>                                   |                  |          |          |           |          |          |          |          |          |          |          |
| 09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Contact layout:</b>                               |                  |          |          |           |          |          |          |          |          |          |          |
| See pages 13 to 19                                   |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Contact type:</b>                                 |                  |          |          |           |          |          |          |          |          |          |          |
| M: Pin                                               |                  |          |          |           |          |          |          |          |          |          |          |
| F: Socket                                            |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Type of contact termination:</b>                  |                  |          |          |           |          |          |          |          |          |          |          |
| C: Crimp contact                                     |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Orientation:</b>                                  |                  |          |          |           |          |          |          |          |          |          |          |
| N, A, B, C, D, E (see page 75)                       |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Shell material:</b>                               |                  |          |          |           |          |          |          |          |          |          |          |
| A: Aluminum bronze                                   |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Supply code:</b>                                  |                  |          |          |           |          |          |          |          |          |          |          |
| 0: Connectors supplied with contacts                 |                  |          |          |           |          |          |          |          |          |          |          |
| 1: Connectors supplied without contacts              |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Assessment level:</b>                             |                  |          |          |           |          |          |          |          |          |          |          |
| 1: Level 1                                           |                  |          |          |           |          |          |          |          |          |          |          |
| <b>Performance level:</b>                            |                  |          |          |           |          |          |          |          |          |          |          |
| G: Level G                                           |                  |          |          |           |          |          |          |          |          |          |          |

Note: C 752 002 refers to the abbreviated form of the CECC 75 201-002 type designation.

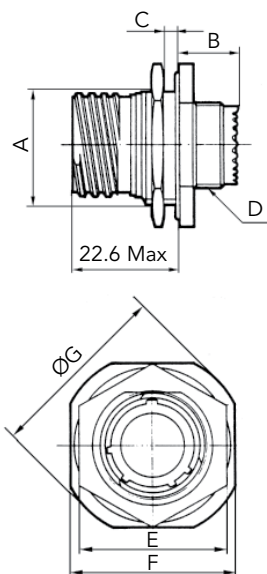
## Dimensions

### Receptacle type 00 (JVS) or type B (CECC)



| Shell size | A Max | B Max | C Max | D Thread   | E±0.3 | F     | G     | H±0.2 | J±0.2 |
|------------|-------|-------|-------|------------|-------|-------|-------|-------|-------|
| 09 (A)     | 20.2  | 11.4  | 2.5   | M12 x 1-6g | 23.8  | 18.26 | 15.09 | 3.25  | 5.49  |
| 11 (B)     |       |       |       | M15 x 1-6g | 26.2  | 20.62 | 18.26 |       | 4.93  |
| 13 (C)     |       |       |       | M18 x 1-6g | 28.6  | 23.01 | 20.62 |       |       |
| 15 (D)     |       |       |       | M22 x 1-6g | 31    | 24.61 | 23.01 |       | 4.4   |
| 17 (E)     |       |       |       | M25 x 1-6g | 33.3  | 26.97 | 24.61 |       | 4.93  |
| 19 (F)     |       |       |       | M28 x 1-6g | 36.5  | 29.36 | 26.97 |       |       |
| 21 (G)     | 19.8  | 11.8  | 3.2   | M31 x 1-6g | 39.7  | 31.75 | 29.36 | 3.91  | 6.15  |
| 23 (H)     |       | 11.4  |       | M34 x 1-6g | 42.9  | 34.93 | 31.75 |       |       |
| 25 (J)     |       |       |       | M37 x 1-6g | 46    | 38.1  | 34.93 |       |       |

### Receptacle type 07 (JVS) or type C (CECC)



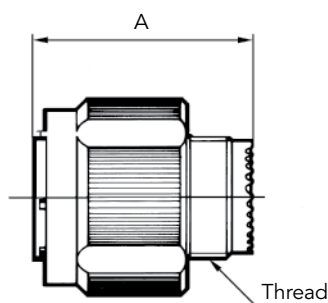
| Shell size | A $\pm 0.15$ | B Max | C Max | D Thread   | E Max | F $\pm 0.4$ | ØG Max |
|------------|--------------|-------|-------|------------|-------|-------------|--------|
| 09 (A)     | 16.53        | 9.9   | 3.2   | M12 x 1-6g | 23    | 27          | 30.5   |
| 11 (B)     | 19.07        |       |       | M15 x 1-6g | 26    | 31.8        | 35.2   |
| 13 (C)     | 23.82        |       |       | M18 x 1-6g | 31    | 34.9        | 38.4   |
| 15 (D)     | 26.97        |       |       | M22 x 1-6g | 34    | 38.1        | 41.6   |
| 17 (E)     | 30.15        |       |       | M25 x 1-6g | 37    | 41.3        | 44.8   |
| 19 (F)     | 33.32        |       |       | M28 x 1-6g | 41    | 46          | 49.5   |
| 21 (G)     | 36.50        |       |       | M31 x 1-6g | 46    | 49.2        | 52.7   |
| 23 (H)     | 39.67        |       |       | M34 x 1-6g | 47    | 52.4        | 55.9   |
| 25 (J)     | 42.85        |       |       | M37 x 1-6g | 51.23 | 55.6        | 59     |

#### Recommended coupling torque on panel for jam nut receptacle (type 7)

| Shell                            | 09 (A) | 11 (B) | 13 (C) | 15 (D) | 17 (E) | 19 (F) | 21 (G) | 23 (H) | 25 (J) |
|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Coupling torque ( $\pm 0.5$ N.m) | 4      | 5      | 7      | 8      | 9      | 10     | 12     | 13     | 14     |

## Dimensions

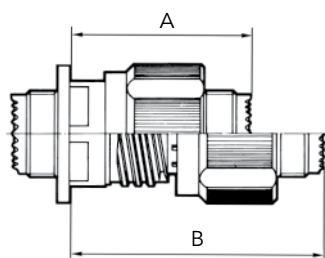
### Plug type 16 (JVS) or type A (CECC)



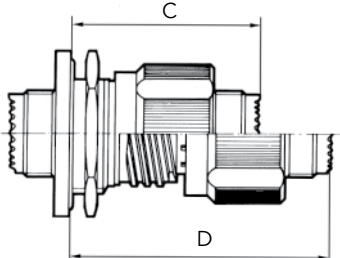
| Shell size | A Max | Thread     | ØB Max |
|------------|-------|------------|--------|
| 09 (A)     | 31.00 | M12 x 1-6g | 21.10  |
| 11 (B)     |       | M15 x 1-6g | 23.80  |
| 13 (C)     |       | M18 x 1-6g | 28.20  |
| 15 (D)     |       | M22 x 1-6g | 31.40  |
| 17 (E)     |       | M25 x 1-6g | 36.50  |
| 19 (F)     |       | M28 x 1-6g | 39.30  |
| 21 (G)     |       | M31 x 1-6g | 42.50  |
| 23 (H)     |       | M34 x 1-6g | 45.30  |
| 25 (J)     |       | M37 x 1-6g | 48.40  |

### Mated connectors dimensions

Type 0 with plug

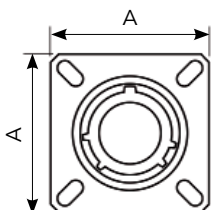
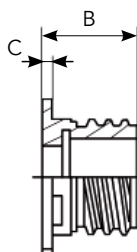
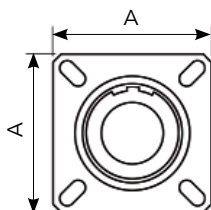


Type 7 with plug



| Shell size | A Max | B Max | C Max | D Max |
|------------|-------|-------|-------|-------|
| 09 (A)     | 37.00 | 52.30 | 38.30 | 53.60 |
| 11 (B)     |       |       |       |       |
| 13 (C)     |       |       |       |       |
| 15 (D)     |       |       |       |       |
| 17 (E)     |       |       |       |       |
| 19 (F)     |       |       |       |       |
| 21 (G)     | 36.00 | 51.30 |       |       |
| 23 (H)     |       |       |       |       |
| 25 (J)     |       |       |       |       |

### Dummy receptacle

Orientation:  
N, A, B, C, D, E

Orientation: DU  
(= all orientations)


#### Examples of Part Number:

. JVS BN 02 A 17 N  
. JVS BN 02 A 17 DU

└─ N, DU: Orientation  
└─ 17: Shell size  
└─ A: Bronze

Equivalent to CECC blind hole. For information only:  
CECC75201002AxA00A (x = shell size A, B, C, D, ...) = JVSBN02A17DU (through hole)  
(no correspondence CECC with N, A, B, C, D, E orientations)

| Shell size                        | 9    | 11   | 13   | 15   | 17   | 19   | 21   | 23   | 25   |
|-----------------------------------|------|------|------|------|------|------|------|------|------|
| A <sup>+0.3</sup> <sub>-0.3</sub> | 23.8 | 26.2 | 28.6 | 31   | 33.3 | 36.5 | 39.7 | 42.9 | 46   |
| B maxi                            | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.1 | 24.1 | 24.1 |
| C maxi                            | 2.5  | 2.5  | 2.5  | 2.5  | 2.5  | 2.5  | 3.2  | 3.2  | 3.2  |

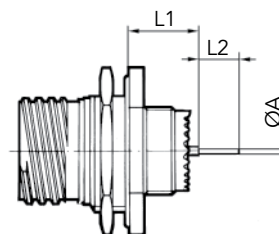
# PC tail contacts lengths

|    | Contact size | Contact type |     | PC tail type | Shell size |        |        |        |        |        |        |        |        |
|----|--------------|--------------|-----|--------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|
|    |              |              |     |              | 09 (A)     | 11 (B) | 13 (C) | 15 (C) | 17 (E) | 19 (F) | 21 (G) | 23 (H) | 25 (J) |
| ØA | #22D         | M & F        | Max | L & C        | 0.70       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 0.50       |        |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 0.70       |        |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 1.15       |        |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 1.65       |        |        |        |        |        |        |        |        |
| L1 | #22D         | M            | Min | L & C        | 10.52      |        | 10.34  |        |        |        |        |        |        |
|    |              | M            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | F            | Min | L & C        | 10.19      |        | 10.01  |        |        |        |        |        |        |
|    |              | F            | Max | L & C        | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | M            | Min | S            | 10.19      |        | 10.01  |        |        |        |        |        |        |
|    |              | M            | Max | S            | 11.46      |        | 11.28  |        |        |        |        |        |        |
|    |              | F            | Min | S            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | S            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #20          | M            | Min | C            | 10.36      |        | 10.18  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #16          | M            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.69      |        | 10.51  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.63      |        | 11.45  |        |        |        |        |        |        |
|    | #12          | M            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |        |
|    |              | M            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |        |
|    |              | F            | Min | C            | 10.63      |        | 10.45  |        |        |        |        |        |        |
|    |              | F            | Max | C            | 11.56      |        | 11.38  |        |        |        |        |        |        |
| L2 | #22D         | M & F        | Max | L            | 8.50       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | C            | 4.00       |        |        |        |        |        |        |        |        |
|    |              | M & F        | Max | S            | 5.10       |        |        |        |        |        |        |        |        |
|    | #20          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
|    | #16          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
|    | #12          | M & F        | Max | C            | 5.10       |        |        |        |        |        |        |        |        |
| L3 | #22D         | M            | Min | L & C        | 9.48       |        |        |        |        |        | 9.59   |        |        |
|    |              | M            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |        |
|    |              | F            | Min | L & C        | 9.15       |        |        |        |        |        | 9.26   |        |        |
|    |              | F            | Max | L & C        | 10.58      |        |        |        |        |        | 10.69  |        |        |
|    |              | M            | Min | S            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | M            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | S            | 9.15       |        |        |        |        |        | 9.26   |        |        |
|    |              | F            | Max | S            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #20          | M            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | C            | 9.65       |        |        |        |        |        | 9.76   |        |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #16          | M            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |        |
|    |              | M            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    |              | F            | Min | C            | 9.64       |        |        |        |        |        | 9.75   |        |        |
|    |              | F            | Max | C            | 10.75      |        |        |        |        |        | 10.86  |        |        |
|    | #12          | M            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |        |
|    |              | M            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |        |
|    |              | F            | Min | C            | 10.25      |        |        |        |        |        | 9.95   |        |        |
|    |              | F            | Max | C            | 11.21      |        |        |        |        |        | 10.91  |        |        |

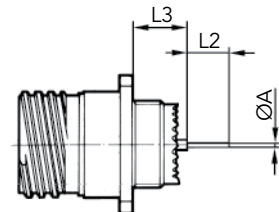
M: Male contact  
F: Female contact

L: Long PC tail  
C: Short PC tail  
S: Specific PC tail

Receptacle type 7



Receptacle type 0



Note: All dimensions are in millimeters (mm)

Connectors weight - in gram ( $\pm 15\%$ )

| Shell size & Layout |    | With contacts |        |                     |        |                     |        | Without contacts |        |                     |        |                     |        |
|---------------------|----|---------------|--------|---------------------|--------|---------------------|--------|------------------|--------|---------------------|--------|---------------------|--------|
|                     |    | Plug (type 5) |        | Receptacle (type 0) |        | Receptacle (type 7) |        | Plug (type 5)    |        | Receptacle (type 0) |        | Receptacle (type 7) |        |
|                     |    | Male          | Female | Male                | Female | Male                | Female | Male             | Female | Male                | Female | Male                | Female |
| 09                  | 35 | 28.46         | 32.38  | 22.70               | 26.62  | 34.51               | 38.43  | 27.42            | 28.66  | 21.66               | 22.90  | 33.47               | 34.71  |
|                     | 98 | 28.46         | 31.68  | 22.70               | 25.93  | 34.51               | 37.74  | 27.42            | 28.71  | 21.66               | 22.95  | 33.47               | 34.76  |
| 11                  | 01 | 37.17         | 44.46  | 29.80               | 37.09  | 45.08               | 52.37  | 35.53            | 40.49  | 28.16               | 33.12  | 43.44               | 48.40  |
|                     | 02 | 36.25         | 42.55  | 28.88               | 35.18  | 44.17               | 50.47  | 34.71            | 38.68  | 27.34               | 31.32  | 42.63               | 46.60  |
|                     | 04 | 36.72         | 44.31  | 29.35               | 36.94  | 44.63               | 52.23  | 35.33            | 40.34  | 27.96               | 32.97  | 43.24               | 48.26  |
|                     | 05 | 36.79         | 44.76  | 29.42               | 37.39  | 48.33               | 52.67  | 35.06            | 39.80  | 27.69               | 32.43  | 42.97               | 47.71  |
|                     | 22 | 35.90         | 41.91  | 28.53               | 34.54  | 43.82               | 49.82  | 35.21            | 39.43  | 27.84               | 32.06  | 43.13               | 47.34  |
|                     | 35 | 36.55         | 45.15  | 29.18               | 37.79  | 43.86               | 53.07  | 34.29            | 37.09  | 26.92               | 29.72  | 42.20               | 45.01  |
|                     | 80 | 45.40         | 54.33  | 37.96               | 46.89  | 53.35               | 70.43  | 34.23            | 36.45  | 26.79               | 29.08  | 42.77               | 44.37  |
|                     | 98 | 36.47         | 43.32  | 29.10               | 35.95  | 44.39               | 51.23  | 34.39            | 37.36  | 27.02               | 30.00  | 42.30               | 45.28  |
|                     | 99 | 36.90         | 44.89  | 29.53               | 37.52  | 44.81               | 52.80  | 34.46            | 37.94  | 27.09               | 30.57  | 42.38               | 45.86  |
| 13                  | 04 | 52.20         | 61.58  | 38.98               | 48.35  | 59.89               | 69.27  | 49.12            | 53.84  | 35.90               | 40.61  | 56.81               | 61.53  |
|                     | 08 | 53.14         | 65.99  | 39.92               | 52.77  | 60.83               | 73.69  | 50.36            | 58.06  | 37.14               | 44.83  | 58.06               | 65.75  |
|                     | 26 | 54.06         | 68.08  | 40.84               | 54.85  | 61.75               | 75.77  | 49.74            | 56.42  | 36.52               | 43.19  | 57.44               | 64.11  |
|                     | 35 | 52.65         | 66.96  | 39.42               | 53.74  | 60.34               | 74.65  | 48.83            | 53.32  | 35.60               | 40.09  | 56.52               | 61.01  |
|                     | 98 | 52.30         | 63.76  | 39.08               | 50.54  | 59.99               | 71.45  | 48.83            | 53.84  | 35.60               | 40.61  | 56.52               | 61.53  |
| 15                  | 05 | 64.61         | 77.85  | 48.48               | 61.73  | 73.49               | 86.74  | 60.76            | 68.18  | 44.63               | 52.05  | 69.64               | 77.06  |
|                     | 15 | 66.59         | 84.35  | 50.46               | 68.23  | 75.47               | 93.24  | 60.96            | 68.53  | 44.83               | 52.40  | 69.84               | 77.41  |
|                     | 18 | 67.11         | 89.14  | 50.98               | 73.02  | 75.99               | 98.02  | 60.86            | 71.28  | 44.73               | 55.15  | 69.74               | 80.16  |
|                     | 19 | 65.94         | 85.12  | 49.82               | 69.00  | 74.83               | 94.01  | 59.35            | 66.27  | 43.22               | 50.14  | 68.23               | 75.15  |
|                     | 35 | 66.19         | 89.12  | 50.07               | 72.99  | 75.08               | 98.00  | 59.77            | 66.17  | 43.64               | 50.04  | 68.65               | 75.05  |
|                     | 97 | 65.77         | 83.26  | 49.64               | 67.14  | 74.65               | 92.14  | 59.92            | 67.58  | 43.79               | 51.46  | 68.80               | 76.46  |
|                     | 02 | 71.16         | 103.09 | 66.95               | 86.21  | 93.75               | 113.01 | 64.00            | 73.93  | 59.79               | 69.71  | 86.59               | 96.51  |
| 17                  | 06 | 74.18         | 98.00  | 69.99               | 93.81  | 96.76               | 120.58 | 64.36            | 74.18  | 60.16               | 69.99  | 86.93               | 96.76  |
|                     | 08 | 71.68         | 93.34  | 67.48               | 89.14  | 94.25               | 115.91 | 65.52            | 77.85  | 61.33               | 73.66  | 88.10               | 100.43 |
|                     | 26 | 73.12         | 99.89  | 68.92               | 95.69  | 95.69               | 122.46 | 64.08            | 74.08  | 59.89               | 69.89  | 86.66               | 96.66  |
|                     | 35 | 73.71         | 107.33 | 69.52               | 103.14 | 96.29               | 129.91 | 64.16            | 73.21  | 59.97               | 69.02  | 86.74               | 95.79  |
|                     | 75 | 87.60         | 115.61 | 83.41               | 111.42 | 110.18              | 138.19 | 65.28            | 80.88  | 61.08               | 76.69  | 87.85               | 103.46 |
|                     | 99 | 73.24         | 99.44  | 69.05               | 95.25  | 95.82               | 122.02 | 64.41            | 74.73  | 60.21               | 70.53  | 86.98               | 97.30  |
|                     | 11 | 93.71         | 127.42 | 77.08               | 110.8  | 110.70              | 144.42 | 85.25            | 106.14 | 68.62               | 115.19 | 76.56               | 123.13 |
| 19                  | 32 | 91.75         | 124.99 | 75.12               | 108.37 | 108.74              | 141.99 | 80.63            | 93.24  | 64.01               | 102.29 | 71.95               | 110.23 |
|                     | 35 | 92.52         | 133.33 | 75.89               | 116.71 | 109.51              | 109.39 | 81.05            | 92.39  | 64.43               | 101.45 | 72.37               | 109.39 |
|                     | 11 | 112.91        | 162.13 | 97.53               | 146.75 | 131.96              | 181.19 | 94.90            | 118.47 | 79.52               | 128.84 | 88.20               | 137.52 |
| 21                  | 16 | 105.72        | 143.63 | 90.33               | 128.24 | 124.77              | 162.68 | 93.41            | 112.66 | 78.03               | 123.03 | 86.71               | 131.72 |
|                     | 35 | 106.41        | 157.67 | 91.03               | 142.29 | 125.46              | 176.72 | 92.69            | 108.67 | 77.31               | 119.04 | 85.99               | 127.72 |
|                     | 39 | 109.83        | 160.27 | 94.45               | 144.89 | 128.89              | 179.33 | 95.44            | 119.68 | 80.06               | 130.05 | 88.75               | 138.74 |
|                     | 41 | 106.21        | 149.31 | 90.83               | 159.68 | 125.27              | 168.36 | 91.97            | 108.62 | 76.59               | 118.99 | 85.27               | 127.67 |
|                     | 48 | 103.63        | 133.84 | 88.25               | 118.46 | 122.61              | 152.90 | 90.52            | 107.64 | 75.14               | 92.26  | 109.58              | 126.70 |
|                     | 75 | 135.19        | 177.13 | 119.80              | 161.74 | 154.25              | 196.18 | 90.52            | 107.64 | 75.14               | 92.26  | 109.58              | 126.70 |
|                     | 21 | 125.27        | 182.95 | 109.64              | 167.32 | 146.95              | 204.63 | 109.11           | 142.31 | 93.48               | 154.32 | 103.16              | 163.99 |
| 23                  | 35 | 121.20        | 186.08 | 105.57              | 170.44 | 142.88              | 207.76 | 103.83           | 124.05 | 88.20               | 136.06 | 97.88               | 145.73 |
|                     | 53 | 121.35        | 176.40 | 105.72              | 160.77 | 143.03              | 198.08 | 102.94           | 123.8  | 87.31               | 135.81 | 96.98               | 145.49 |
|                     | 55 | 123.21        | 180.44 | 107.58              | 164.81 | 144.89              | 202.13 | 104.10           | 125.86 | 88.47               | 137.87 | 98.15               | 147.55 |
|                     | 07 | 153.58        | 179.40 | 138.29              | 186.55 | 176.55              | 202.05 | 114.40           | 141.15 | 99.11               | 148.3  | 137.37              | 163.70 |
| 25                  | 11 | 142.64        | 181.90 | 127.35              | 166.61 | 165.62              | 204.80 | 121.84           | 154.10 | 106.55              | 138.81 | 144.82              | 177.08 |
|                     | 19 | 148.26        | 227.68 | 132.98              | 212.40 | 171.24              | 250.66 | 117.15           | 152.26 | 101.87              | 164.81 | 112.29              | 175.23 |
|                     | 24 | 147.02        | 224.83 | 131.74              | 209.55 | 170.00              | 247.80 | 118.15           | 153.97 | 102.86              | 166.52 | 113.28              | 176.94 |
|                     | 29 | 142.86        | 214.73 | 127.57              | 199.45 | 165.83              | 237.70 | 120.55           | 158.61 | 105.27              | 171.16 | 115.69              | 181.58 |
|                     | 35 | 137.37        | 218.82 | 122.09              | 203.54 | 160.35              | 241.80 | 115.14           | 139.43 | 99.86               | 151.99 | 110.28              | 162.41 |
|                     | 37 | 153.57        | 170.01 | 138.29              | 177.20 | 176.55              | 192.56 | 114.40           | 141.15 | 99.11               | 148.30 | 137.37              | 163.70 |
|                     | 44 | 143.71        | 183.40 | 128.18              | 195.16 | 166.69              | 206.58 | 110.17           | 135.50 | 94.64               | 147.50 | 133.15              | 158.68 |
|                     | 43 | 142.96        | 219.07 | 127.67              | 203.79 | 165.93              | 242.05 | 119.58           | 157.54 | 104.30              | 170.10 | 114.72              | 180.52 |
|                     | 46 | 148.66        | 207.81 | 133.38              | 192.53 | 171.64              | 230.78 | 112.34           | 137.55 | 97.06               | 150.10 | 107.48              | 160.52 |
|                     | 61 | 135.64        | 202.00 | 120.35              | 186.72 | 158.61              | 224.98 | 114.45           | 141.47 | 99.17               | 154.02 | 109.59              | 164.44 |
|                     | 08 | 200.96        | 279.93 | 185.68              | 264.65 | 223.94              | 302.91 | 111.65           | 141.00 | 96.36               | 153.55 | 106.78              | 163.97 |
|                     | 20 | 163.80        | 238.77 | 148.51              | 223.49 | 186.77              | 261.75 | 110.28           | 135.71 | 95.00               | 148.26 | 105.42              | 158.68 |
|                     | 04 | 144.94        | 219.00 | 129.66              | 203.71 | 167.91              | 241.97 | 122.11           | 155.88 | 106.83              | 168.44 | 117.25              | 178.86 |

## Bronze backshells

### Part number

|                                                                            |            |          |           |          |           |          |           |
|----------------------------------------------------------------------------|------------|----------|-----------|----------|-----------|----------|-----------|
| <b>Basic Series</b>                                                        | <b>JVS</b> | <b>A</b> | <b>11</b> | <b>E</b> | <b>00</b> | <b>C</b> | <b>CC</b> |
| <b>Accessory style</b>                                                     |            |          |           |          |           |          |           |
| A : Rear accessory (backshell)                                             |            |          |           |          |           |          |           |
| <b>Shell size:</b>                                                         |            |          |           |          |           |          |           |
| 09, 11, 13, 15, 17, 19, 21, 23, 25                                         |            |          |           |          |           |          |           |
| <b>Accessory type:</b>                                                     |            |          |           |          |           |          |           |
| A: Screened adaptor for use with compression spring or band strap          |            |          |           |          |           |          |           |
| B: Adaptor with strain relief cable clamp                                  |            |          |           |          |           |          |           |
| E: Screened adaptor with braid trap                                        |            |          |           |          |           |          |           |
| G: Environmental cone clamp screened adaptor                               |            |          |           |          |           |          |           |
| P: Adaptor for heat shrink boot                                            |            |          |           |          |           |          |           |
| X: Cone clamp screened adaptor                                             |            |          |           |          |           |          |           |
| <b>Cable entry codification (see table below):</b>                         |            |          |           |          |           |          |           |
| <b>For B, P and X type:</b>                                                |            |          |           |          |           |          |           |
| 00: Standard, by default choice                                            |            |          |           |          |           |          |           |
| <b>For other types:</b>                                                    |            |          |           |          |           |          |           |
| 00: Standard, by default choice                                            |            |          |           |          |           |          |           |
| 03 to 32: Depending on backshell type, please refer to corresponding table |            |          |           |          |           |          |           |
| <b>Angle:</b>                                                              |            |          |           |          |           |          |           |
| A: Straight backshell (orientation by default)                             |            |          |           |          |           |          |           |
| B: 45° backshell (except for «B Type» accessory)                           |            |          |           |          |           |          |           |
| C: 90° right angle backshell                                               |            |          |           |          |           |          |           |
| <b>Variant:</b>                                                            |            |          |           |          |           |          |           |
| <b>For all types:</b>                                                      |            |          |           |          |           |          |           |
| None: Supplied without any other accessory                                 |            |          |           |          |           |          |           |
| <b>For E and X type:</b>                                                   |            |          |           |          |           |          |           |
| CC: Cable clamp variant                                                    |            |          |           |          |           |          |           |

### How to built a backshell reference for types A, E or G

| Backshell type | Shell size | Standard correspondance |                      | Specific               |
|----------------|------------|-------------------------|----------------------|------------------------|
|                |            | Entry codification      | Entry size backshell | Other entry codication |
| Type A & E     | 09         | 00                      | 04                   | 03                     |
|                | 11         | 00                      | 06                   | 05 to 03               |
|                | 13         | 00                      | 08                   | 07 to 04               |
|                | 15         | 00                      | 10                   | 09 to 06               |
|                | 17         | 00                      | 12                   | 11 to 08               |
|                | 19         | 00                      | 13                   | 12 to 09               |
|                | 21         | 00                      | 16                   | 15 to 12               |
|                | 23         | 00                      | 18                   | 17 to 14               |
|                | 25         | 00                      | 20                   | 19 to 16               |

| Backshell type | Shell size | Standard correspondance |                      | Specific               |
|----------------|------------|-------------------------|----------------------|------------------------|
|                |            | Entry codification      | Entry size backshell | Other entry codication |
| Type G         | 09         | 00                      | -                    | -                      |
|                | 11         | 00                      | 04                   | -                      |
|                | 13         | 00                      | 06                   | 04                     |
|                | 15         | 00                      | 10                   | 08 to 04               |
|                | 17         | 00                      | 12                   | 10 to 04               |
|                | 19         | 00                      | 12                   | 10 to 04               |
|                | 21         | 00                      | 16                   | 12 to 04               |
|                | 23         | 00                      | 16                   | 12 to 04               |
|                | 25         | 00                      | 16                   | 12 to 04               |

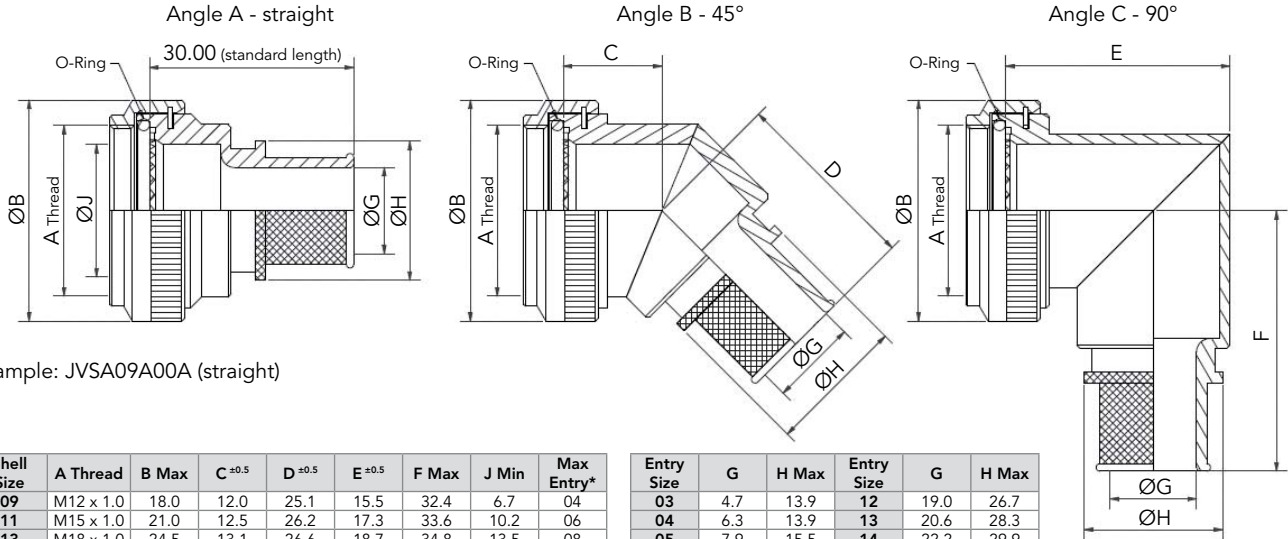
Examples:

To order a right angle backshell type "A" size 15 with entry size 10, placed your order with: JVS15G00C

To order a right angle backshell type "A" size 15 with entry size 06, placed your order with: JVS15G06C

## Bronze backshells

### Type A - Screened adaptor for use with compression spring or band strap

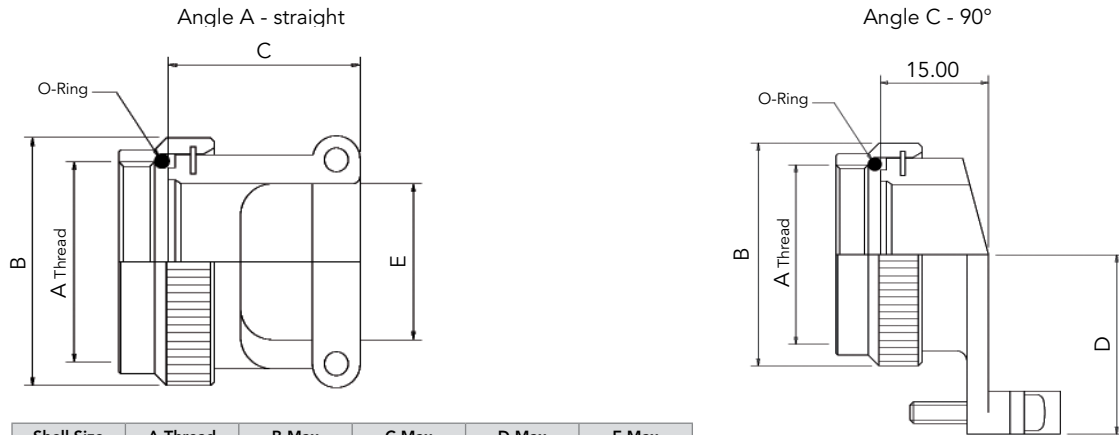


| Shell Size | A Thread  | B Max | C ±0.5 | D ±0.5 | E ±0.5 | F Max | J Min | Max Entry* |
|------------|-----------|-------|--------|--------|--------|-------|-------|------------|
| 09         | M12 x 1.0 | 18.0  | 12.0   | 25.1   | 15.5   | 32.4  | 6.7   | 04         |
| 11         | M15 x 1.0 | 21.0  | 12.5   | 26.2   | 17.3   | 33.6  | 10.2  | 06         |
| 13         | M18 x 1.0 | 24.5  | 13.1   | 26.6   | 18.7   | 34.8  | 13.5  | 08         |
| 15         | M22 x 1.0 | 29.0  | 13.5   | 27.5   | 21.3   | 36.6  | 16.2  | 10         |
| 17         | M25 x 1.0 | 32.5  | 14.5   | 28.3   | 22.8   | 38.5  | 19.4  | 12         |
| 19         | M28 x 1.0 | 35.5  | 15.5   | 28.8   | 24.4   | 40.3  | 21.8  | 13         |
| 21         | M31 x 1.0 | 37.0  | 16.0   | 29.7   | 25.1   | 42.0  | 25.1  | 16         |
| 23         | M34 x 1.0 | 40.0  | 16.5   | 30.0   | 26.6   | 43.4  | 28.2  | 18         |
| 25         | M37 x 1.0 | 43.5  | 17.1   | 30.9   | 28.1   | 44.8  | 31.4  | 20         |

| Entry Size | G    | H Max | Entry Size | G    | H Max |
|------------|------|-------|------------|------|-------|
| 03         | 4.7  | 13.9  | 12         | 19.0 | 26.7  |
| 04         | 6.3  | 13.9  | 13         | 20.6 | 28.3  |
| 05         | 7.9  | 15.5  | 14         | 22.2 | 29.9  |
| 06         | 9.5  | 17.2  | 15         | 23.8 | 31.5  |
| 07         | 11.1 | 18.7  | 16         | 25.4 | 33.1  |
| 08         | 12.7 | 20.3  | 17         | 27.0 | 34.7  |
| 09         | 14.2 | 21.9  | 18         | 28.6 | 36.3  |
| 10         | 15.8 | 23.5  | 19         | 30.2 | 37.9  |
| 11         | 17.4 | 25.1  | 20         | 31.8 | 39.5  |

\* Recommendation only, please consult us for outside entry size

### Type B - Adaptor with strain relief cable clamp

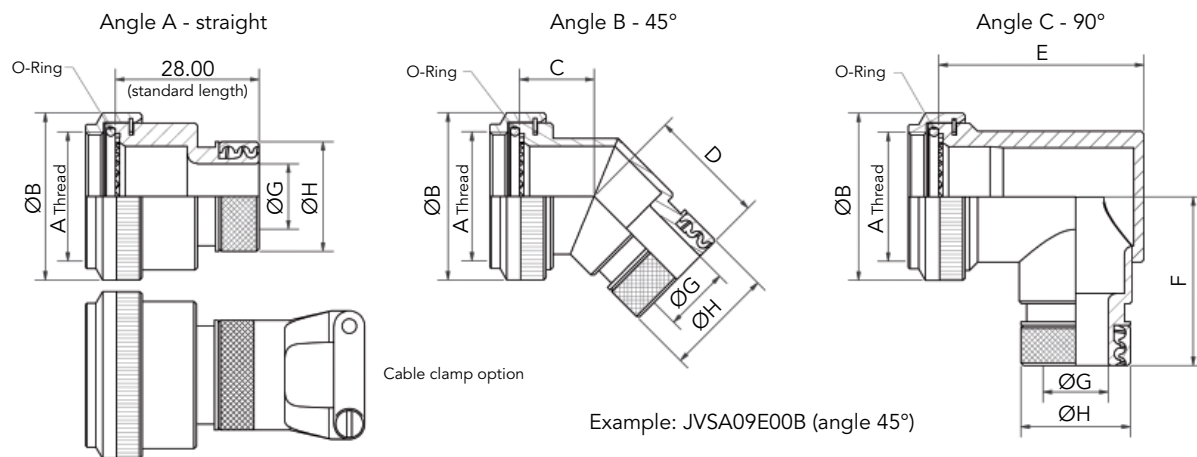


| Shell Size | A Thread  | B Max | C Max | D Max | E Max |
|------------|-----------|-------|-------|-------|-------|
| 09         | M12 x 1.0 | 18.0  | 21.5  | 20.0  | 7.0   |
| 11         | M15 x 1.0 | 21.0  | 21.5  | 21.0  | 10.5  |
| 13         | M18 x 1.0 | 24.5  | 23.5  | 22.0  | 13.4  |
| 15         | M22 x 1.0 | 29    | 23.5  | 23.0  | 16.5  |
| 17         | M25 x 1.0 | 32.5  | 24.5  | 25.0  | 19.7  |
| 19         | M28 x 1.0 | 35.5  | 27.5  | 27.5  | 22.2  |
| 21         | M31 x 1.0 | 37.0  | 34.5  | 30.0  | 25.6  |
| 23         | M34 x 1.0 | 40.0  | 37.5  | 31.5  | 28.5  |
| 25         | M37 x 1.0 | 43.5  | 37.5  | 34.5  | 31.7  |

Note: All dimensions are in millimeters (mm)

## Bronze backshells

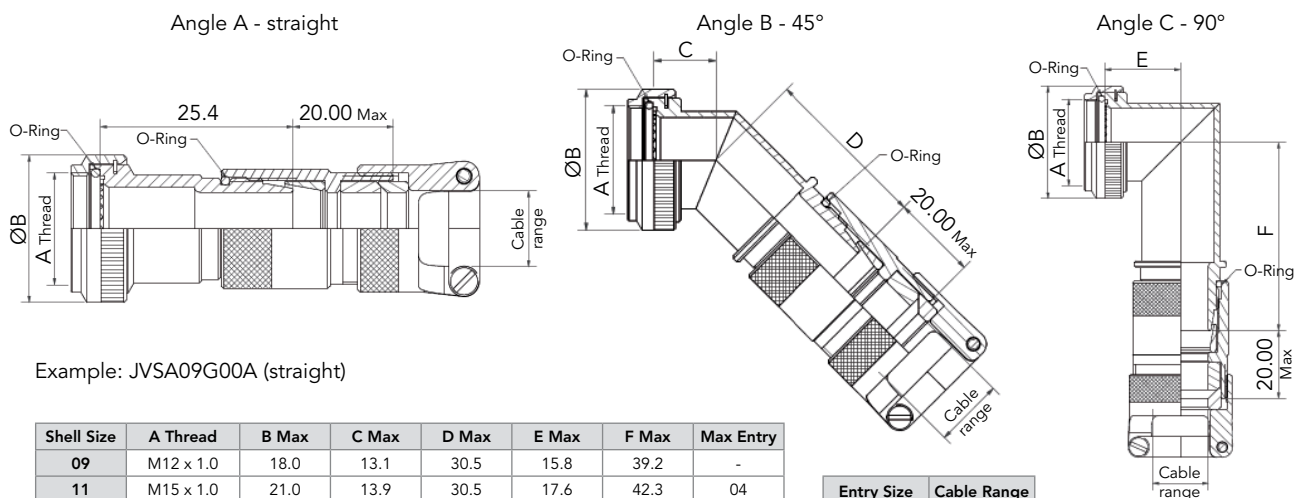
### Type E - Screened adaptor with braid trap



| Shell Size | A Thread  | B Max | C Max | D Max | E Max | F Max | Max Entry |
|------------|-----------|-------|-------|-------|-------|-------|-----------|
| 09         | M12 x 1.0 | 18.0  | 13.1  | 23.6  | 25.7  | 30.5  | 04        |
| 11         | M15 x 1.0 | 21.0  | 13.9  | 24.4  | 26.7  | 32.2  | 06        |
| 13         | M18 x 1.0 | 24.5  | 14.5  | 24.8  | 31.2  | 33.7  | 08        |
| 15         | M22 x 1.0 | 29.0  | 15.5  | 25.6  | 37.2  | 35.2  | 10        |
| 17         | M25 x 1.0 | 32.5  | 16.1  | 26.4  | 40.2  | 36.9  | 12        |
| 19         | M28 x 1.0 | 35.5  | 16.8  | 26.8  | 44.7  | 38.5  | 13        |
| 21         | M31 x 1.0 | 37.0  | 17.1  | 27.6  | 49.2  | 40.1  | 16        |
| 23         | M34 x 1.0 | 40.0  | 17.7  | 28.0  | 51.7  | 41.6  | 18        |
| 25         | M37 x 1.0 | 43.5  | 18.4  | 29.0  | 53.2  | 43.1  | 20        |

| Entry Size | G     | H Max | Entry Size | G     | H Max |
|------------|-------|-------|------------|-------|-------|
| 03         | 4.77  | 15.0  | 12         | 19.05 | 27.7  |
| 04         | 6.35  | 15.0  | 13         | 20.62 | 29.3  |
| 05         | 7.92  | 16.6  | 14         | 22.23 | 30.9  |
| 06         | 9.52  | 18.2  | 15         | 23.82 | 32.5  |
| 07         | 11.10 | 19.8  | 16         | 25.40 | 34.1  |
| 08         | 12.70 | 21.4  | 17         | 27.00 | 35.7  |
| 09         | 14.27 | 23.0  | 18         | 28.60 | 37.3  |
| 10         | 15.88 | 24.6  | 19         | 30.20 | 39.1  |
| 11         | 17.47 | 26.2  | 20         | 31.80 | 40.4  |

### Type G - Environmental cone clamp screened adaptor



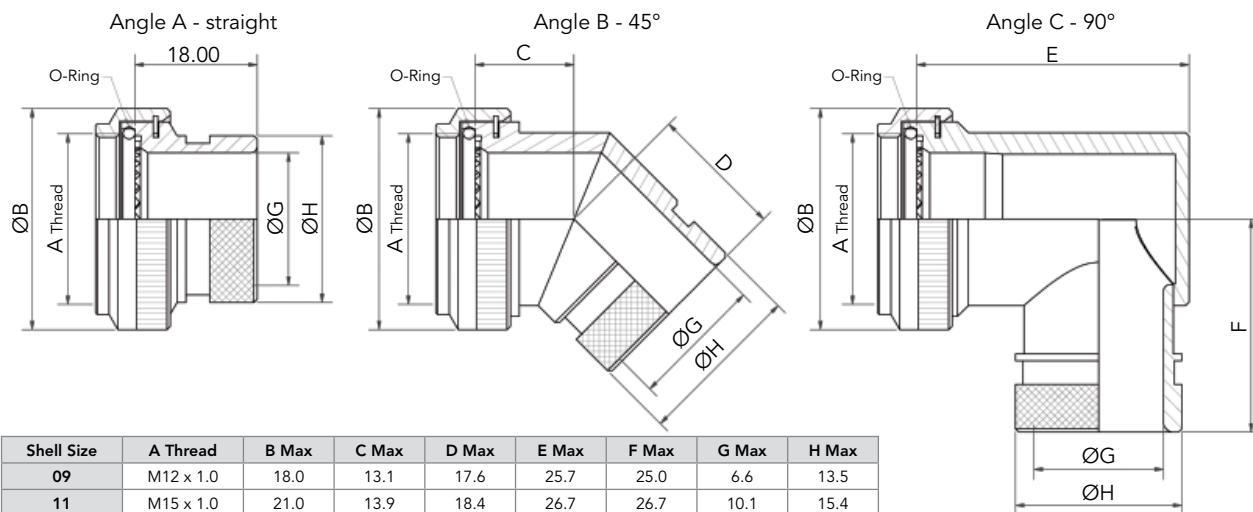
| Shell Size | A Thread  | B Max | C Max | D Max | E Max | F Max | Max Entry |
|------------|-----------|-------|-------|-------|-------|-------|-----------|
| 09         | M12 x 1.0 | 18.0  | 13.1  | 30.5  | 15.8  | 39.2  | -         |
| 11         | M15 x 1.0 | 21.0  | 13.9  | 30.5  | 17.6  | 42.3  | 04        |
| 13         | M18 x 1.0 | 24.5  | 14.5  | 32.5  | 19.0  | 42.8  | 06        |
| 15         | M22 x 1.0 | 29.0  | 15.5  | 40.3  | 21.5  | 50.5  | 10        |
| 17         | M25 x 1.0 | 32.5  | 16.1  | 43.1  | 23.1  | 52.8  | 12        |
| 19         | M28 x 1.0 | 35.5  | 16.8  | 47.9  | 24.5  | 57.1  | 12        |
| 21         | M31 x 1.0 | 37.0  | 17.1  | 47.9  | 25.3  | 57.1  | 16        |
| 23         | M34 x 1.0 | 40.0  | 17.7  | 56.5  | 27.5  | 64.7  | 16        |
| 25         | M37 x 1.0 | 43.5  | 18.4  | 56.5  | 28.3  | 64.7  | 16        |

| Entry Size | Cable Range |
|------------|-------------|
| 04         | 3.2 - 7.9   |
| 06         | 6.4 - 11.1  |
| 08         | 9.8 - 14.3  |
| 10         | 8.9 - 15.9  |
| 12         | 12.7 - 19.1 |
| 16         | 15.9 - 23.8 |

Note: All dimensions are in millimeters (mm)

## Bronze backshells

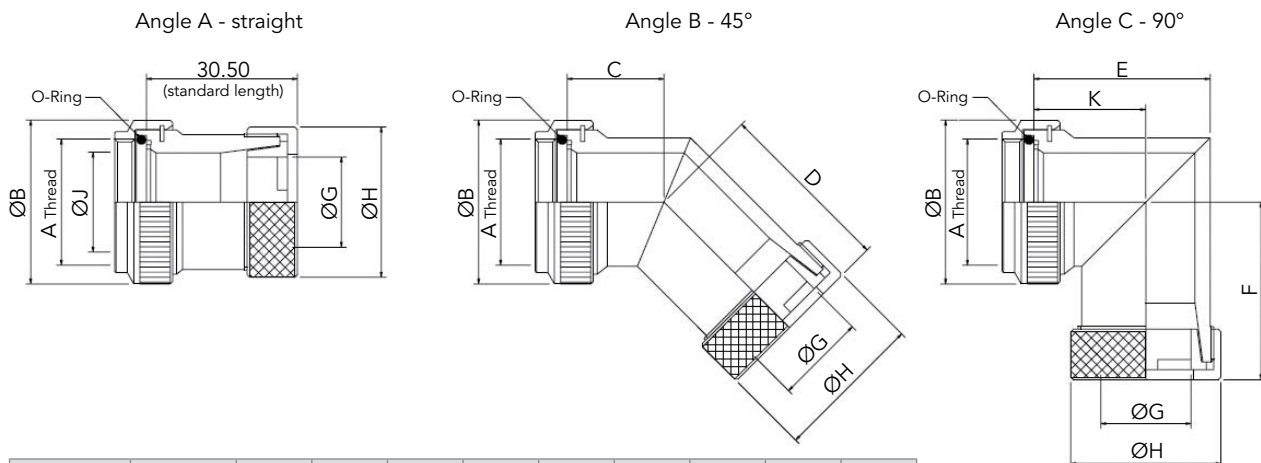
### Type P - Adaptor for heat shrink boot



| Shell Size | A Thread  | B Max | C Max | D Max | E Max | F Max | G Max | H Max |
|------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| 09         | M12 x 1.0 | 18.0  | 13.1  | 17.6  | 25.7  | 25.0  | 6.6   | 13.5  |
| 11         | M15 x 1.0 | 21.0  | 13.9  | 18.4  | 26.7  | 26.7  | 10.1  | 15.4  |
| 13         | M18 x 1.0 | 24.5  | 14.5  | 19.3  | 31.2  | 28.2  | 13.4  | 19.7  |
| 15         | M22 x 1.0 | 29    | 15.5  | 19.6  | 37.2  | 29.7  | 16.1  | 21.3  |
| 17         | M25 x 1.0 | 32.5  | 16.1  | 20.4  | 40.2  | 31.4  | 19.3  | 24.5  |
| 19         | M28 x 1.0 | 35.5  | 16.8  | 20.8  | 44.7  | 33.0  | 21.7  | 26.5  |
| 21         | M31 x 1.0 | 37.0  | 17.1  | 21.6  | 49.2  | 34.6  | 25    | 31.0  |
| 23         | M34 x 1.0 | 40.0  | 17.7  | 22.5  | 51.7  | 36.1  | 28.1  | 34.4  |
| 25         | M37 x 1.0 | 43.5  | 18.4  | 22.9  | 53.2  | 37.6  | 31.3  | 36.6  |

Example: JVSA09P00C (angle 90°)

### Type X - Cone clamp screened adaptor



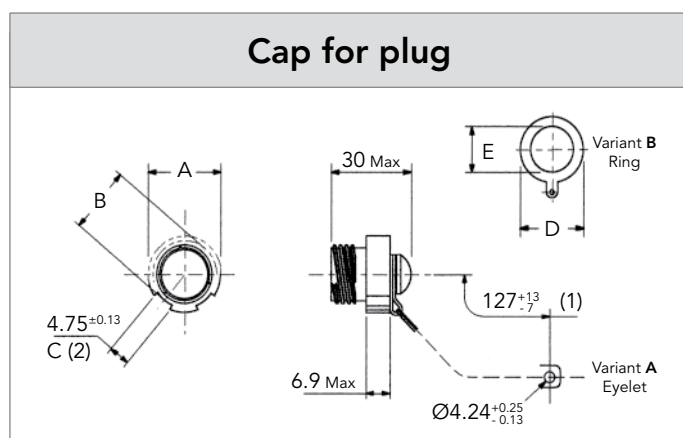
| Shell Size | A Thread  | B Max | C Max | D Max | E Max | F Max | G Min | H Max | J Min | K ±0.5 |
|------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 09         | M12 x 1.0 | 18.0  | 12.0  | 33.3  | 21.1  | 35.2  | 6.9   | 18.4  | 6.7   | 15.5   |
| 11         | M15 x 1.0 | 21.0  | 12.5  | 34.5  | 24.2  | 37.0  | 9.6   | 22.0  | 10.2  | 17.3   |
| 13         | M18 x 1.0 | 24.5  | 13.1  | 34.9  | 27.4  | 38.5  | 12.7  | 24.0  | 13.5  | 18.7   |
| 15         | M22 x 1.0 | 27.5  | 13.5  | 35.8  | 31.2  | 40.0  | 14.8  | 27.0  | 16.2  | 21.3   |
| 17         | M25 x 1.0 | 31.0  | 14.5  | 36.6  | 34.3  | 41.2  | 17.9  | 29.5  | 19.4  | 22.8   |
| 19         | M28 x 1.0 | 34.0  | 15.5  | 36.6  | 37.1  | 43.3  | 19.9  | 33.9  | 21.8  | 24.4   |
| 21         | M31 x 1.0 | 37.0  | 16.0  | 37.7  | 39.4  | 44.9  | 23.1  | 37.0  | 25.1  | 25.1   |
| 23         | M34 x 1.0 | 40.0  | 16.5  | 38.1  | 42.5  | 46.4  | 26.2  | 40.8  | 28.2  | 26.6   |
| 25         | M37 x 1.0 | 43.5  | 17.1  | 39.0  | 45.6  | 47.9  | 28.8  | 43.0  | 31.4  | 28.1   |

Example: JVSA09X00B (angle 45°)

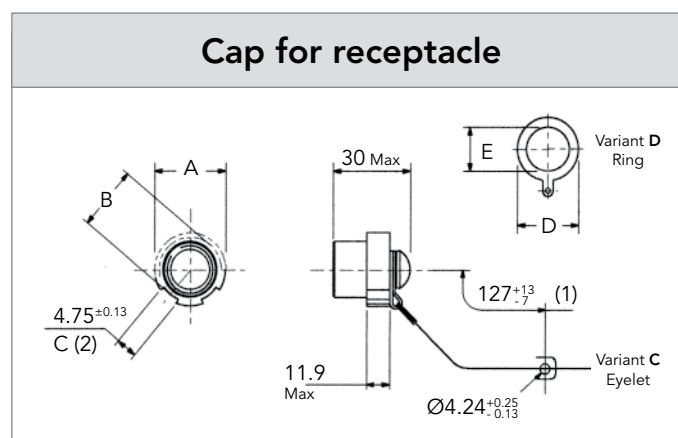
Note: All dimensions are in millimeters (mm)

## Bronze caps

|                                                       |            |          |           |          |           |          |
|-------------------------------------------------------|------------|----------|-----------|----------|-----------|----------|
| <b>Basic Series</b>                                   | <b>JVS</b> | <b>B</b> | <b>09</b> | <b>B</b> | <b>00</b> | <b>A</b> |
| <b>Accessory style:</b>                               |            |          |           |          |           |          |
| B: Protective cap                                     |            |          |           |          |           |          |
| <b>Shell size:</b>                                    |            |          |           |          |           |          |
| 09, 11, 13, 15, 17, 19, 21, 23, 25                    |            |          |           |          |           |          |
| <b>Variant:</b>                                       |            |          |           |          |           |          |
| A: Cap for plug with eyelet (see drawing below)       |            |          |           |          |           |          |
| B: Cap for plug with ring (see drawing below)         |            |          |           |          |           |          |
| C: Cap for receptacle with eyelet (see drawing below) |            |          |           |          |           |          |
| D: Cap for receptacle with ring (see drawing below)   |            |          |           |          |           |          |
| <b>Sub variant:</b>                                   |            |          |           |          |           |          |
| Not applicable                                        |            |          |           |          |           |          |
| <b>Material:</b>                                      |            |          |           |          |           |          |
| A: Bronze                                             |            |          |           |          |           |          |



(1) Flexible metal link - (2) Number of notch on A diameter



(1) Flexible metal link - (2) Number of notch on A diameter

| Shell size | A Max | B Max | C  | Cap for Plug |       | Cap for Receptacle |       |
|------------|-------|-------|----|--------------|-------|--------------------|-------|
|            |       |       |    | D Max        | E Min | D Max              | E Min |
| 09 (A)     | 21.1  | 19.20 | 8  | 24.20        | 13.50 | 26.80              | 18.40 |
| 11 (B)     | 23.8  | 21.80 |    | 26.80        | 18.40 | 31.60              | 23.00 |
| 13 (C)     | 28.2  | 26.10 | 10 | 30.50        | 19.80 | 36.90              | 26.20 |
| 15 (D)     | 31.4  | 29.30 |    | 31.60        | 23.00 | 40.10              | 29.40 |
| 17 (E)     | 36.5  | 34.40 | 12 | 36.90        | 26.20 | 43.20              | 32.50 |
| 19 (F)     | 39.3  | 37.20 |    | 40.10        | 29.40 | 46.40              | 35.70 |
| 21 (G)     | 42.5  | 40.50 | 16 | 43.20        | 32.50 | 49.20              | 39.10 |
| 23 (H)     | 45.3  | 43.10 |    | 46.40        | 35.70 | 52.80              | 42.10 |
| 25 (J)     | 48.4  | 46.10 | 18 | 49.20        | 39.10 | 55.50              | 45.30 |

Equivalent to CECC, for information CECC75201002Bxy00A (x = shell size, y = variant)

Example: CECC75201002BAC00A = JVS09C00A

Note: All dimensions are in millimeters (mm)

# 8D SERIES

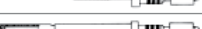
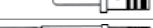
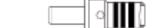
# Common Section

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# MIL-DTL-38999 qualified crimp contacts - 1.27µm gold plated

| Contact size                   | Contact type | Part number    | Contact Ø | Conductor section AWG                                                                         |     | Conductor section mm² |      | External Ø over insulator |      |      |
|--------------------------------|--------------|----------------|-----------|-----------------------------------------------------------------------------------------------|-----|-----------------------|------|---------------------------|------|------|
|                                |              |                |           | Min                                                                                           | Max | Min                   | Max  | Min                       | Max  |      |
| #22D                           | Pin          | M39029/58 360  | 0.76      | 26                                                                                            | 22  | 0.12                  | 0.34 | 0.76                      | 1.37 |      |
|                                | Socket       | M39029/56 348  |           |                                                                                               |     |                       |      |                           |      |      |
| #20                            | Pin          | M39029/58 363  | 1.00      | 24                                                                                            | 20  | 0.21                  | 0.60 | 1.02                      | 2.11 |      |
|                                | Socket       | M39029/56 351  |           |                                                                                               |     |                       |      |                           |      |      |
| #16                            | Pin          | M39029/58 364  | 1.60      | 20                                                                                            | 16  | 0.60                  | 1.34 | 1.65                      | 2.77 |      |
|                                | Socket       | M39029/56 352  |           |                                                                                               |     |                       |      |                           |      |      |
| #16 Coax                       | Pin          | M39029/76 424  |           | RG 174<br>RG 179<br>RG 316                                                                    |     |                       |      |                           | 1.65 | 2.60 |
|                                | Socket       | M39029/77 428  |           |                                                                                               |     |                       |      |                           |      |      |
| #12                            | Pin          | M39029/58 365  | 2.40      | 14                                                                                            | 12  | 1.91                  | 3.18 | 2.46                      | 3.61 |      |
|                                | Socket       | M39029/56 353  |           |                                                                                               |     |                       |      |                           |      |      |
| #12 Coax                       | Pin          | M39029/102 558 |           | RG 174<br>RG 179<br>RG 316                                                                    |     |                       |      |                           | 2.40 | 2.60 |
|                                | Socket       | M39029/103 559 |           |                                                                                               |     |                       |      |                           |      |      |
|                                | Pin          | M39029/28 211  |           |                                                                                               |     |                       |      |                           |      |      |
|                                | Socket       | M39029/75 416  |           |                                                                                               |     |                       |      |                           |      |      |
| #10 Power                      | Pin          | M39029/58 528  | 3.20      | Please consult us                                                                             |     |                       |      |                           | -    | 2.95 |
|                                | Socket       | M39029/56 527  |           |                                                                                               |     |                       |      |                           |      |      |
| #8 Coax                        | Pin          | M39029/60 367  | 3.64      | RG 180 A/U                                                                                    |     |                       |      |                           | -    | 2.80 |
|                                | Socket       | M39029/59 366  |           |                                                                                               |     |                       |      |                           |      |      |
| #8 Concentric Twinax (= Triax) | Pin          | M39029/90 529  | 5.50      | 0,76MIL-C17/176 00002<br>FILECA F.2703/14<br>RAYCHEM CHEMINAX 10612<br>FILOTEX M 17/176 00002 |     |                       |      |                           | 3.15 | 3.40 |
|                                | Socket       | M39029/91 530  |           |                                                                                               |     |                       |      |                           |      |      |

## MIL-DTL-38999 qualified crimp contacts - 1.27µm gold plated

| Contact size                   | Contact type | Profile                                                                             | Color code              |
|--------------------------------|--------------|-------------------------------------------------------------------------------------|-------------------------|
| #22D                           | Pin          |    | Black / Blue / Orange   |
|                                | Socket       |    | Gray / Yellow / Orange  |
| #20                            | Pin          |    | Orange / Blue / Orange  |
|                                | Socket       |    | Brown / Green / Orange  |
| #16                            | Pin          |    | Yellow / Blue / Orange  |
|                                | Socket       |    | Red / Green / Orange    |
| #16 Coax                       | Pin          |    | Yellow / Red / Yellow   |
|                                | Socket       |    | Gray / Red / Yellow     |
| #12                            | Pin          |    | Green / Blue / Orange   |
|                                | Socket       |    | Orange / Green / Orange |
| #12 Coax                       | Pin          |    | Gray / Green / Green    |
|                                | Socket       |    | White / Green / Green   |
|                                | Pin          |    | Brown / Brown / Red     |
|                                | Socket       |    | Blue / Brown / Yellow   |
| #10 Power                      | Pin          |    | Gray / Red / Green      |
|                                | Socket       |  | Violet / Red / Green    |
| #8 Coax                        | Pin          |  | Violet / Blue / Orange  |
|                                | Socket       |  | Blue / Blue / Orange    |
| #8 Concentric Twinax (= Triax) | Pin          |  | White / Red / Green     |
|                                | Socket       |  | Black / Orange / Green  |

## Crimp contacts compatibility

1.27µm gold plated = MIL-DTL-38999 qualified crimp contacts

0.8µm gold plated = SOURIAU crimp contacts

| Contact plating thickness     | T° cycling | Vibration         |                |                 | Shock | High T° exposure |
|-------------------------------|------------|-------------------|----------------|-----------------|-------|------------------|
|                               |            | Random vib. 200°C | Sine vib. 20°C | Sine vib. 200°C |       |                  |
| Pin 0.8µm with Socket 1.27µm  | OK         | OK                | -              | -               | -     | OK               |
| Pin 0.8µm with Socket 0.8µm   | OK         | OK                | -              | -               | OK    | OK               |
| Pin 1.27µm with Socket 1.27µm | OK         | OK                | OK             | OK              | OK    | OK               |

# SOURIAU crimp contacts - 0.8µm gold plated, without color code

| Contact size                                              | Contact type | Part number   | Contact Ø  | Conductor section AWG                                                                         |     | Conductor section mm² |       | External Ø over insulator |      |
|-----------------------------------------------------------|--------------|---------------|------------|-----------------------------------------------------------------------------------------------|-----|-----------------------|-------|---------------------------|------|
|                                                           |              |               |            | Min                                                                                           | Max | Min                   | Max   | Min                       | Max  |
| #22D                                                      | Pin          | 8599-0702 JJ  | 0.76       | 26                                                                                            | 22  | 0.12                  | 0.34  | 0.76                      | 1.37 |
|                                                           | Socket       | 8599-0706 900 |            |                                                                                               |     |                       |       |                           |      |
| #20                                                       | Pin          | 8599-0703 SA  | 1.00       | 24                                                                                            | 20  | 0.21                  | 0.60  | 1.02                      | 2.11 |
|                                                           | Socket       | 8599-0707 900 |            |                                                                                               |     |                       |       |                           |      |
| #16                                                       | Pin          | 8599-0704 MJ  | 1.60       | 20                                                                                            | 16  | 0.60                  | 1.34  | 1.65                      | 2.77 |
|                                                           | Socket       | 8599-0708 900 |            |                                                                                               |     |                       |       |                           |      |
| #12                                                       | Pin          | 8599-0705 MJ  | 2.40       | 14                                                                                            | 12  | 1.91                  | 3.18  | 2.46                      | 3.61 |
|                                                           | Socket       | 8599-0709 900 |            |                                                                                               |     |                       |       |                           |      |
| #8 Power<br><br>For more information,<br>please see p.106 | Pin          | 8599-7544     | 3.64       | -                                                                                             | 8   | -                     | 8.98  | 4.10                      | 4.40 |
|                                                           | Socket       | 8599-7541     |            |                                                                                               |     |                       |       |                           |      |
|                                                           | Pin          | 8599-7580     |            | -                                                                                             | -   | -                     | -     | 4.50                      | 6.50 |
|                                                           | Socket       | 8599-7581     |            |                                                                                               |     |                       |       |                           |      |
|                                                           |              | Boot          |            |                                                                                               |     |                       |       |                           |      |
|                                                           | 8599-4547    |               |            |                                                                                               |     |                       |       |                           |      |
|                                                           | Reductor     | 8599-7645     |            | 10                                                                                            |     | 2.73                  | 2.77  | 3.13                      | 3.33 |
| #8 Coax                                                   | Boot         | 8590-4571     | RG 180 A/U |                                                                                               |     |                       |       | -                         | 2.80 |
| #8 Concentric<br>Twinax (= Triax)                         | Boot         | 8590-4571     | 5.50       | 0,76MIL-C17/176 00002<br>FILECA F.2703/14<br>RAYCHEM CHEMINAX 10612<br>FILOTEX M 17/176 00002 |     |                       |       | 3.15                      | 3.40 |
| #4 Power<br><br>For more information,<br>please see p.106 | Pin          | 8599-7598 900 | 5.74       | -                                                                                             | 3   | -                     | 25    | -                         | -    |
|                                                           | Socket       | 8599-7599 900 |            |                                                                                               |     |                       |       |                           |      |
|                                                           | Pin          | 8599-7534     |            | 5                                                                                             | 4   | 16                    | 21.15 | -                         | -    |
|                                                           | Socket       | 8599-7535     |            |                                                                                               |     |                       |       |                           |      |
|                                                           | Boot         | 8599-4594     |            | -                                                                                             | -   | -                     | -     | 6.35                      | 7.50 |
|                                                           |              | 8599-4593     |            | -                                                                                             | -   | -                     | -     | 4                         | 5.80 |
|                                                           | Reductor     | 8593-2000A    |            | 6                                                                                             |     | 13.30                 |       | 5.30                      | 5.70 |
| #4 Power<br>with reduced<br>barrel                        | Pin          | 8599-7528 900 |            | 6                                                                                             |     | 13.30                 |       | 5.30                      | 5.70 |
|                                                           | Socket       | 8599-7529 900 |            |                                                                                               |     |                       |       |                           |      |
|                                                           | Boot         | 8599-4593     |            | -                                                                                             | -   | -                     | -     | 4                         | 5.80 |

**SOURIAU crimp contacts** - 0.8µm gold plated, without color code

| Contact size                                              | Contact type | Information                                                                                  |
|-----------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------|
| #22D                                                      | Pin          | -                                                                                            |
|                                                           | Socket       | -                                                                                            |
| #20                                                       | Pin          | -                                                                                            |
|                                                           | Socket       | -                                                                                            |
| #16                                                       | Pin          | -                                                                                            |
|                                                           | Socket       | -                                                                                            |
| #12                                                       | Pin          | -                                                                                            |
|                                                           | Socket       | -                                                                                            |
| <b>#8 Power</b><br>For more information, please see p.106 | Pin          | JVS only                                                                                     |
|                                                           | Socket       | JVS only                                                                                     |
|                                                           | Pin          | -                                                                                            |
|                                                           | Socket       | -                                                                                            |
|                                                           | Boot         | For wire #8                                                                                  |
|                                                           |              | For wire #10                                                                                 |
|                                                           | Reductor     | For wire #10                                                                                 |
| #8 Coax                                                   | Boot         | -                                                                                            |
| #8 Concentric Twinax (= Triax)                            | Boot         | -                                                                                            |
| <b>#4 Power</b><br>For more information, please see p.106 | Pin          | For wire 21.15 mm².<br>Not included in connector Part number.<br>Must be ordered separately. |
|                                                           | Socket       |                                                                                              |
|                                                           | Pin          | For wire 21.15 mm²                                                                           |
|                                                           | Socket       |                                                                                              |
|                                                           | Boot         | For wire 16 mm²                                                                              |
|                                                           |              | For wire 10 mm²                                                                              |
|                                                           | Reductor     | For wire 10 mm²                                                                              |
| <b>#4 Power with reduced barrel</b>                       | Pin          | Mating part #4 / Barrel #6                                                                   |
|                                                           | Socket       |                                                                                              |
|                                                           | Boot         | -                                                                                            |

## Straight PC tail contacts

| Contact size | Contact type | PC tail type | Part number    |
|--------------|--------------|--------------|----------------|
| #22D         | Pin          | L            | 8599-0720 900  |
|              | Pin          | M            | 8599-8028 900  |
|              | Pin          | C            | 8599-0730 900  |
|              | Pin          | S            | 8599-0796 900  |
|              | Socket       | L            | 8599-0721 900  |
|              | Socket       | C            | 8599-0731 900  |
|              | Socket       | S            | 8599-0797 900  |
| #20          | Pin          | M            | 8599-0658 JJ   |
|              | Socket       | M            | 8599-0759 900  |
|              | Pin          | C            | 8599-0724 900  |
|              | Socket       | C            | 8599-0725 900  |
|              | Pin          | L            | 8599-0771 900  |
|              | Socket       | L            | 8599-0772 900  |
| #16          | Pin          | C            | 8599-0726 900  |
|              | Socket       | C            | 8599-0727 900  |
| Coax #16     | Pin          | C            | 8599-1000A 900 |
| #12          | Pin          | C            | 8599-7929 900  |
|              | Socket       | C            | 8599-7932 900  |

S: Specific PC tail  
 L: Long PC tail  
 M: Medium PC tail  
 C: Short PC tail

Note: PC tail contacts without shoulder also available.  
 Please see page 132.

## Coax contacts #12

| Designation                    | Part number |
|--------------------------------|-------------|
| Coax socket solder contact #12 | THA1-0151A  |
| Coax pin solder contact #12    | THA1-0152A  |
| Coax pin crimp contact #12     | THA1-0155A  |
| Coax socket crimp contact #12  | THA1-0156A  |

## Solder cup

| Contact size | Contact type | Part number    |
|--------------|--------------|----------------|
| #22D         | Pin          | 8599-0750 900  |
| #20          | Pin          | 8599-0077A 900 |
| #16          | Pin          | 8599-7482A 900 |
| #12          | Socket       | 8599-7485A 900 |

For other contacts type please consult us.

## Crimp contacts: 1500 mating

| Contact size | MIL-DTL-38999 contacts |                |                       |
|--------------|------------------------|----------------|-----------------------|
|              | Contact type           | Part number    | Color code            |
| #22D         | Pin (H)                | M39029/107 620 | Blue / Red / Black    |
|              | Socket (J)             | M39029/106 614 | Blue / Brown / Yellow |
| #20          | Pin (H)                | M39029/107 621 | Blue / Red / Brown    |
|              | Socket (J)             | M39029/106 615 | Blue / Brown / Green  |
| #16          | Pin (H)                | M39029/107 622 | Blue / Red / Red      |
|              | Socket (J)             | M39029/106 616 | Blue / Brown / Blue   |
| #12          | Pin (H)                | M39029/107 623 | Blue / Red / Orange   |
|              | Socket (J)             | M39029/106 617 | Blue / Brown / Gray   |

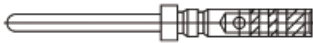
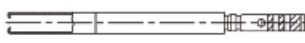
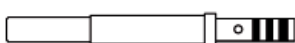
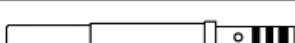
## Wire wrap contacts

| Contact size | Contact type | Part number   | Contact Ø (mm) | Profile                                                                              |  (mm) |
|--------------|--------------|---------------|----------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| #22D         | Pin          | 8599-0790 JJ  | 0.76           |   | 0.86                                                                                     |
| #20          | Pin          | 8599-0791 900 | 1              |  | 0.86                                                                                     |

## Quadrax #8 contacts

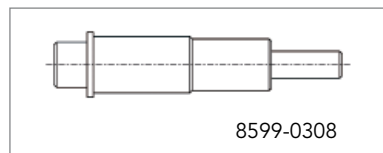
| Contact type                |        | SOURIAU part number | Cross Norm  | Impedance | Release | T° Max |
|-----------------------------|--------|---------------------|-------------|-----------|---------|--------|
| PC tail<br>L= 4 $\pm$ 0.1mm | Pin    | ETH1-1237A          | -           | 100Ω      | Rear    | 125°C  |
|                             |        | ETH1-1501A          | -           | 150Ω      | Rear    | 125°C  |
|                             | Socket | ETH1-1238A          | -           | 100Ω      | Rear    | 125°C  |
|                             |        | ETH1-1502A          | -           | 150Ω      | Rear    | 125°C  |
| Crimp                       | Pin    | ETH1-1345A          | EN 3155-074 | 100Ω      | Rear    | 150°C  |
|                             |        | ETH1-1503A          | -           | 150Ω      | Rear    | 150°C  |
|                             | Socket | ETH1-1346A          | EN 3155-075 | 100Ω      | Rear    | 150°C  |
|                             |        | ETH1-1504A          | -           | 150Ω      | Rear    | 150°C  |

## Thermocouple contacts

| Contact size | Contact type | SOURIAU part numbers (without color code) | MIL-DTL-38999 contacts |                                                                                                                | Ø Contact (mm) | Wire section |     |       |      | Ø Over insulation (mm) |      |
|--------------|--------------|-------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------|----------------|--------------|-----|-------|------|------------------------|------|
|              |              |                                           | Part numbers           | Profile and color code                                                                                         |                | Awg          |     | mm²   |      |                        |      |
|              |              |                                           |                        |                                                                                                                |                | min          | max | min   | max  | min                    | max  |
| #22D Chromel | Pin          | -                                         | M39029/87-472          | <br>Red / Violet / Yellow    | 0.75           | 28           | 22  | 0.095 | 0.34 | 0.76                   | 1.37 |
|              | Socket       | -                                         | M39029/88-484          | <br>Yellow / Grey / Yellow   |                |              |     |       |      |                        |      |
| #22D Alumel  | Pin          | -                                         | M39029/87-471          | <br>Brown / Violet / Yellow  |                |              |     |       |      |                        |      |
|              | Socket       | -                                         | M39029/88-483          | <br>Orange / Grey / Yellow   |                |              |     |       |      |                        |      |
| #20 Chromel  | Pin          | 8599-0749 900                             | 8599-0949 900          | <br>Blue / Violet / Yellow   | 1              | 24           | 20  | 0.21  | 0.6  | 1.02                   | 2.11 |
|              | Socket       | 8599-0753 900                             | 8599-0953 900          | <br>Grey / Grey / Yellow     |                |              |     |       |      |                        |      |
| #20 Alumel   | Pin          | 8599-0761 900                             | 8599-0961 900          | <br>Green / Violet / Yellow |                |              |     |       |      |                        |      |
|              | Socket       | 8599-0765 900                             | 8599-0965 900          | <br>Violet / Grey / Yellow |                |              |     |       |      |                        |      |

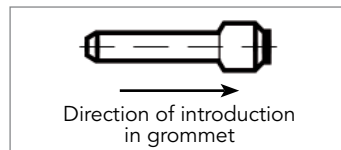
## Dummy contacts

| Size | Part number    |
|------|----------------|
| #16  | 8599-6A016001A |
| #8   | 8599-0308      |
| #4   | 8599-0310      |



## Filler plugs

| Contact size | MS Part number (Rev. N) | Color  | SOURIAU Part number | Color  |
|--------------|-------------------------|--------|---------------------|--------|
| #22D         | MS27488-22-2            | Black  | 8660-212            | Black  |
| #20          | MS27488-20-2            | Red    | 8522-389A           | Red    |
| #16          | MS27488-16-2            | Green  | 8522-390A           | Blue   |
| #12          | MS27488-12-2            | Orange | 8522-391A           | Orange |

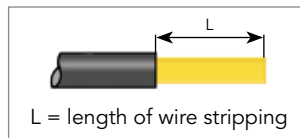


These filler plugs are installed at the rear of unwired contact to maintain connector sealing.

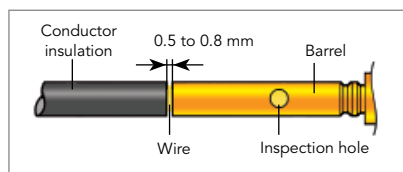
## Wiring instruction

### Cable preparation and wire stripping

| Contact size | #26 | #22D | #20 | #16 | #12 | #8 | #4 |
|--------------|-----|------|-----|-----|-----|----|----|
| L            | 4   |      | 6   |     |     |    | 12 |



### Insertion of wire in contact barrel



When inserting the stripped wire into the contact barrel check that no strands are left outside and that the wire is visible through the wire inspection hole in the barrel.

Important:

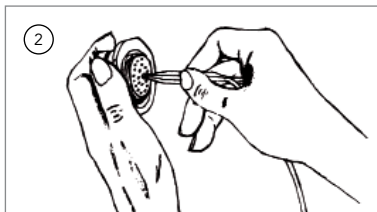
- Slide any accessories over wire strands before carrying out the following operations.
- Contacts are inserted and extracted from the rear of the connector.

### Insertion of the contacts

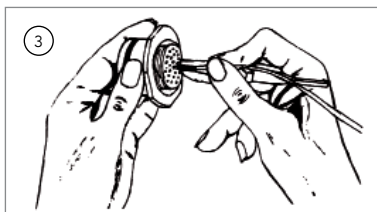
1 - Engage the crimp cable / contact assembly into the longitudinal slot of the plastic tool (coloured tip). Slide the tool down the cable until the tip of the tool abuts the contact retention shoulder.



2 - Introduce the contact into the required contact cavity in the insulator, pushing tool axially, until the contact snaps into position in clip.

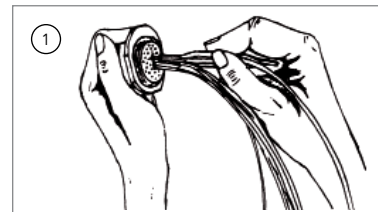


3 - Withdraw the tool from rear. Check that contact is firmly locked by pulling wire gently. When connector is fully loaded, check the position of contact tips. They should all be in the same plane.  
Nota: For larger sizes of cable which are stiff enough manual insertion without tool is preferable.

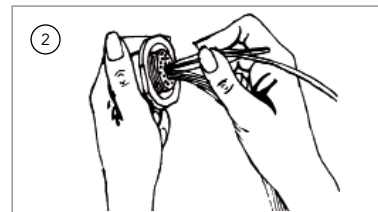


### Extraction of the contacts

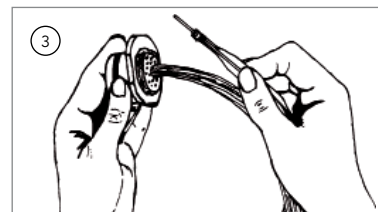
1 - Engage the appropriate cable into the longitudinal slot of the tool with the white tip towards connector.



2 - Slide the tool down towards the contact. Insert the tool in the insulator until it abuts the contact shoulder.



3 - Holding the tool-contact and cable assembly together, remove them simultaneously.



## Tooling

### Crimping tools

| Contact size | Contact type | Plier M22520/1-01  | Plier M22520/2-01 (SOURIAU 8476-01) |           | Plier M300BT        | Pneumatic plier M22520/23-01 |                     |
|--------------|--------------|--------------------|-------------------------------------|-----------|---------------------|------------------------------|---------------------|
|              |              | Turret Part number | Locator Part number                 |           | Locator Part number | Turret Part number           | Locator Part number |
|              |              |                    | Norm                                | SOURIAU   |                     |                              |                     |
| #26          | Pin          | -                  | -                                   | 8599-0397 | -                   | -                            | -                   |
|              | Socket       | -                  | -                                   | 8599-0398 | -                   | -                            | -                   |
| #22D         | Pin          | -                  | M22520/2-09                         | -         | -                   | -                            | -                   |
|              | Socket       | -                  | M22520/2-06                         | -         | -                   | -                            | -                   |
| #20          | Pin          | M22520/1-04        | M22520/2-10                         | -         | -                   | -                            | -                   |
|              | Socket       |                    |                                     | -         | -                   | -                            | -                   |
| #16          | Pin          | M22520/1-04        | -                                   | -         | -                   | -                            | -                   |
|              | Socket       |                    | -                                   | -         | -                   | -                            | -                   |
| #12          | Pin          | M22520/1-04        | -                                   | -         | -                   | -                            | -                   |
|              | Socket       |                    | -                                   | -         | -                   | -                            | -                   |
| #8 Power     | Pin          | -                  | -                                   | -         | SP 593              | M22520/23-02                 | 8599-9601           |
|              | Socket       | -                  | -                                   | -         |                     |                              |                     |
| #4 Power     | pin          | -                  | -                                   | -         | -                   | M22520/23-04                 | M22520/23-11        |
|              | Socket       | -                  | -                                   | -         | -                   |                              |                     |

| Contact size                                 | Contact type | Plier M22520/2-01 (SOURIAU 8476-01) | Plier M22520/31-01  | Plier M22520/4-01   | Plier M22520/5-01     |
|----------------------------------------------|--------------|-------------------------------------|---------------------|---------------------|-----------------------|
|                                              |              | Locator Part Number                 | Locator Part number | Locator Part Number | Die set Part Number   |
| #12 Coax<br>M39029/102-558<br>M39029/103-559 | Inner        | -                                   | -                   | -                   | M22520/5-03           |
|                                              | Outer        | -                                   | -                   | -                   |                       |
| #12 Coax<br>M39029/28-211<br>M39029/75-416   | Inner        | M22520/2-34                         | -                   | -                   | -                     |
|                                              | Outer        | -                                   | M22520/31-02        | -                   | -                     |
| #16 Coax                                     | Inner        | M22520/2-35                         | -                   | -                   | -                     |
|                                              | Outer        | -                                   | -                   | M22520/4-02         | -                     |
| #8 Coax                                      | Inner        | M22520/2-31                         | -                   | -                   | -                     |
|                                              | Outer        | -                                   | -                   | -                   | M22520/5-05 closure B |
| #8 Concentric<br>Twinax<br>( = Triax )       | Inner        | K709                                | -                   | -                   | -                     |
|                                              | Middle       | -                                   | -                   | -                   | Y631 closure B        |
|                                              | Ferrule      | -                                   | -                   | -                   | Y631 closure A        |

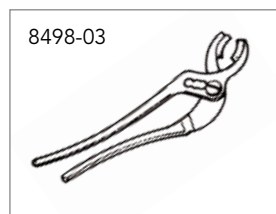
Note: for the #10 contact's plier and locator, please consult us.

## Tooling

### Insertion & extraction tools

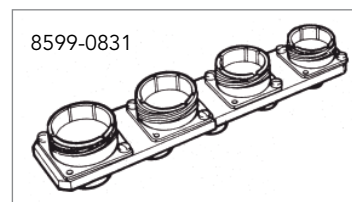
| Contact size | Material | Part number  |               | Color     |            |
|--------------|----------|--------------|---------------|-----------|------------|
|              |          | MIL standard | SOURIAU       | Insertion | Extraction |
| #26          | Plastic  | -            | 8599-0399 900 | Black     | White      |
| #22D         | Plastic  | M81969/14-01 | -             | Green     | White      |
| #20          | Plastic  | M81969/14-10 | -             | Red       | Orange     |
| #16          | Plastic  | M81969/14-03 | -             | Blue      | White      |
| #12          | Plastic  | M81969/14-04 | -             | Yellow    | White      |
| #10          | Plastic  | M81969/14-05 | -             | Grey      | -          |
| #8           | Plastic  | M81969/14-12 | -             | -         | Green      |
|              | Metallic | -            | 8660-197      | -         | -          |
| #4           | Plastic  | M81969/14-07 | -             | -         | Blue       |
|              | Metallic | -            | 8533-8175     | -         | -          |

### Backshell tightening tools



Backshell tightening pliers,  
part number: 8498-03  
Square jaws (order 2 jaws),  
part number: 8500-1015

### Tightening support

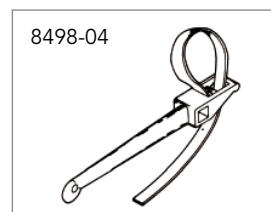


Part number: 8599-0831  
This tool is made up of  
dummy receptacles  
 housings of all 9 sizes for all  
key polarisation, and secures  
free connectors during wiring  
and fitting of rear accessories.

### Tightening of rear accessories:

| Shell size             | 9    | 11 | 13 | 15 | 17 | 19 | 21   | 23 | 25 |
|------------------------|------|----|----|----|----|----|------|----|----|
| Max torque<br>in m/daN | 0.62 |    |    |    |    |    | 1.24 |    |    |

### Slackening tools



Strap clamp,  
part number: 8498-04  
Spare strap,  
part number: 8498-103

## Accessories

### Plastic protective caps\*

| Shell size | Caps for receptacles | Caps for plugs | Caps for composite plugs only (J & M) | Antistatic caps for receptacles | Antistatic caps for plugs | Antistatic caps for composite plugs only (J & M) |
|------------|----------------------|----------------|---------------------------------------|---------------------------------|---------------------------|--------------------------------------------------|
| 9 (A)      | MS90376-10R          | 8500-5587 A    | MS90376-12R                           | MS90376-10RF                    | 8500-5587N                | 8500-5587N                                       |
| 11 (B)     | MS90376-12R          | 8500-5588A     | 8500-5598                             | MS90376-12RF                    | 70198N                    | 8500-5598N                                       |
| 13 (C)     | MS90376-14R          | 8500-5600      | 8500-5600                             | MS90376-14RF                    | 8500-5600N                | 8500-5600N                                       |
| 15 (D)     | MS90376-16R          | 8500-5601      | 8500-5601                             | MS90376-16RF                    | 8500-5601N                | 8500-5601N                                       |
| 17 (E)     | MS90376-19R          | 8500-5602      | 8500-5602                             | MS90376-18RF                    | 8500-5602N                | 8500-5602N                                       |
| 19 (F)     | MS90376-20R          | 8500-5592 A    | 8500-5592 A                           | MS90376-20RF                    | 8500-5592N                | 8500-5592N                                       |
| 21 (G)     | MS90376-22R          | 8500-5593 A    | 8500-5593 A                           | MS90376-22RF                    | 8500-5593N                | 8500-5593N                                       |
| 23 (H)     | MS90376-24R          | 8500-5593 A    | MS90376-28R                           | MS90376-24RF                    | 8500-5593N                | 70472N                                           |
| 25 (J)     | 8599-0029            | J599ABC6009A00 | J599ABC6009A00                        | 8500-5593N                      | MS90376-28RF              | MS90376-28RF                                     |

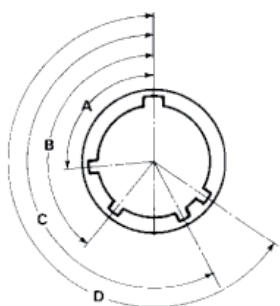
\* Excepted 8D composite version (X): supplied without cap

### Gaskets

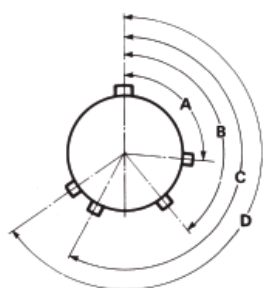
| Shell size | Gasket for receptacles Type 0* (ordered separately) | O ring for receptacle Type 7 |
|------------|-----------------------------------------------------|------------------------------|
| 9 (A)      | 8599-5541                                           | AS3582-019                   |
| 11 (B)     | 8599-5542                                           | AS3582-022                   |
| 13 (C)     | 8599-5543                                           | AS3582-024                   |
| 15 (D)     | 8599-5544                                           | AS3582-026                   |
| 17 (E)     | 8599-5545                                           | AS3582-028                   |
| 19 (F)     | 8599-5546                                           | AS3582-128                   |
| 21 (G)     | 8599-5547                                           | AS3582-130                   |
| 23 (H)     | 8599-5548                                           | AS3582-132                   |
| 25 (J)     | 8599-5549                                           | AS3582-134                   |

\* For front mounting

## Orientations



Viewed from front face of receptacle

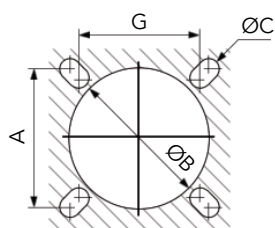


Viewed from front face of plug

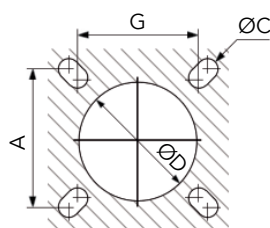
| Shell size                 | Angles | N   | A   | B   | C   | D   | E   | T   | V   |
|----------------------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|
| 9 (A)                      | A°     | 105 | 102 | 80  | 35  | 64  | 91  | -   | -   |
|                            | B°     | 140 | 132 | 118 | 140 | 155 | 131 |     |     |
|                            | C°     | 215 | 248 | 230 | 205 | 234 | 197 |     |     |
|                            | D°     | 265 | 320 | 312 | 275 | 304 | 240 |     |     |
| 11 (B)<br>15 (D)           | A°     | 95  | 113 | 90  | 53  | 119 | 51  | -   | -   |
|                            | B°     | 141 | 156 | 145 | 156 | 146 | 141 |     |     |
|                            | C°     | 208 | 182 | 195 | 220 | 176 | 184 |     |     |
|                            | D°     | 236 | 292 | 252 | 255 | 298 | 242 |     |     |
| 13 (C)                     | A°     | 95  | 113 | 90  | 53  | 119 | 51  | 70  | 75  |
|                            | B°     | 141 | 156 | 145 | 156 | 146 | 141 | 136 | 138 |
|                            | C°     | 208 | 182 | 195 | 220 | 176 | 184 | 218 | 224 |
|                            | D°     | 236 | 292 | 252 | 255 | 298 | 242 | 261 | 268 |
| 17 (E)<br>21 (G)           | A°     | 80  | 135 | 49  | 66  | 62  | 79  | 58  | 85  |
|                            | B°     | 142 | 170 | 169 | 140 | 145 | 153 | 162 | 150 |
|                            | C°     | 196 | 200 | 200 | 200 | 180 | 197 | 188 | 191 |
|                            | D°     | 293 | 310 | 244 | 257 | 280 | 272 | 316 | 307 |
| 19 (F)<br>23 (H)<br>25 (J) | A°     | 80  | 135 | 49  | 66  | 62  | 79  | -   | -   |
|                            | B°     | 142 | 170 | 169 | 140 | 145 | 153 |     |     |
|                            | C°     | 196 | 200 | 200 | 200 | 180 | 197 |     |     |
|                            | D°     | 293 | 310 | 244 | 257 | 280 | 272 |     |     |

## Panel cut-out

Square flange receptacle (Type 0)

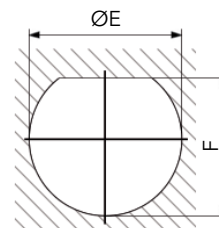


Rear mounting\*



Front mounting

Jam nut receptacle (Type 7)



| Shell size | A     | G     | B min. | C ±0.13 | D min. | E +0.25<br>-0 | F     |
|------------|-------|-------|--------|---------|--------|---------------|-------|
| 9 (A)      | 18.26 | 15.09 | 16.66  | 3.25    | 13.11  | 17.78         | 17.02 |
| 11 (B)     | 20.62 | 18.26 | 20.22  |         | 15.88  | 20.96         | 19.59 |
| 13 (C)     | 23.01 | 20.62 | 23.42  |         | 19.05  | 25.65         | 24.26 |
| 15 (D)     | 24.61 | 23.01 | 26.59  |         | 23.01  | 28.83         | 27.56 |
| 17 (E)     | 26.97 | 24.61 | 30.96  |         | 25.81  | 32.01         | 30.73 |
| 19 (F)     | 29.36 | 26.97 | 32.94  |         | 28.98  | 35.18         | 33.91 |
| 21 (G)     | 31.75 | 29.36 | 36.12  | 3.91    | 32.16  | 38.35         | 37.08 |
| 23 (H)     | 34.93 | 31.75 | 39.29  |         | 34.93  | 41.53         | 40.26 |
| 25 (J)     | 38.10 | 34.94 | 42.47* |         | 37.69  | 44.70         | 43.43 |

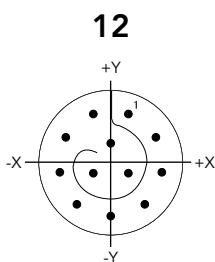
\* For Type 0 composite shell rear mounting: 43.77 mm.

Max. thickness panel for receptacle: Type 0: front mounting = 3.2 mm, rear mounting = 2.5 mm  
Type 7: 3.2 mm

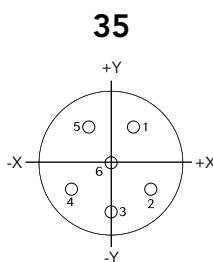
## Coordinates for straight PC tail terminations

### Viewed from front face of male insulator

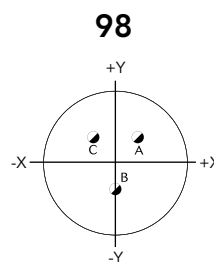
Hole sizes: 1mm min. (#22 and #20 contacts) and 1.3mm min. (#16 contact) coordinates in mm.

**09 / A**


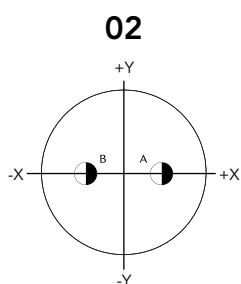
| Ctc | X     | Y     | Ctc | X     | Y     |
|-----|-------|-------|-----|-------|-------|
| 1   | +0.92 | +2.54 | 7   | -2.66 | -0.47 |
| 2   | +2.34 | +1.35 | 8   | -2.34 | +1.35 |
| 3   | +2.66 | -0.47 | 9   | -0.92 | +2.54 |
| 4   | +1.74 | -2.07 | 10  | 0.00  | +1.03 |
| 5   | 0.00  | -2.70 | 11  | +0.89 | -0.51 |
| 6   | -1.74 | -2.07 | 12  | -0.89 | -0.51 |



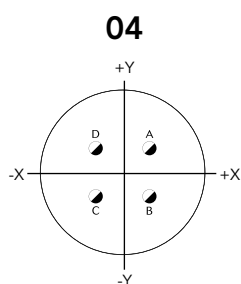
| Ctc | X     | Y     |
|-----|-------|-------|
| 1   | +1.14 | +1.98 |
| 2   | +1.98 | -1.14 |
| 3   | 0.00  | -2.29 |
| 4   | -1.98 | -1.14 |
| 5   | -1.14 | +1.98 |
| 6   | 0.00  | 0.00  |



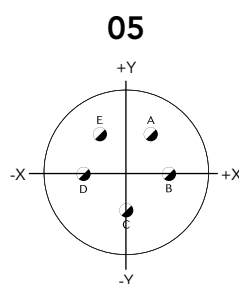
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.65 | +0.97 |
| B   | 0.00  | -1.90 |
| C   | -1.65 | +0.97 |

**11 / B**


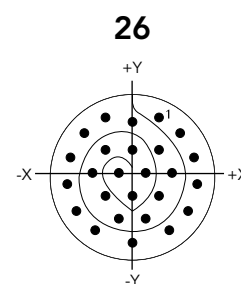
| Ctc | X    | Y     |
|-----|------|-------|
| A   | 0.00 | +2.41 |
| B   | 0.00 | -2.41 |



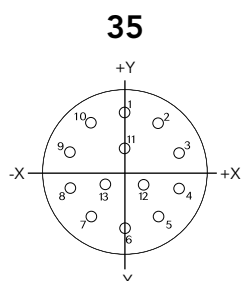
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.65 | +1.65 |
| B   | +1.65 | -1.65 |
| C   | -1.65 | -1.65 |
| D   | -1.65 | +1.65 |



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.65 | +1.42 |
| B   | +2.86 | -1.65 |
| C   | 0.00  | -3.30 |
| D   | -2.86 | -1.65 |
| E   | -1.65 | +1.42 |



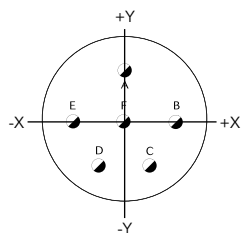
| Ctc | X     | Y     | Ctc | X     | Y     |
|-----|-------|-------|-----|-------|-------|
| 1   | +1.69 | +3.79 | 14  | 0.00  | +3.50 |
| 2   | +3.09 | +2.77 | 15  | +1.70 | +1.76 |
| 3   | +3.95 | +1.28 | 16  | +2.55 | +0.29 |
| 4   | +4.13 | -0.44 | 17  | +1.70 | -1.18 |
| 5   | +3.58 | -2.10 | 18  | +0.85 | -2.65 |
| 6   | +2.40 | -3.37 | 19  | -0.85 | -2.65 |
| 7   | 0.00  | -4.13 | 20  | -1.70 | -1.18 |
| 8   | -2.40 | -3.37 | 21  | -2.55 | +0.29 |
| 9   | -3.58 | -2.10 | 22  | -1.70 | +1.76 |
| 10  | -4.13 | -0.44 | 23  | 0.00  | +1.76 |
| 11  | -3.95 | +1.28 | 24  | +0.85 | +0.29 |
| 12  | -3.09 | +2.77 | 25  | 0.00  | -1.18 |
| 13  | -1.69 | +3.79 | 26  | -0.85 | +0.29 |



| Ctc | X     | Y     | Ctc | X     | Y     | Ctc | X     | Y     |
|-----|-------|-------|-----|-------|-------|-----|-------|-------|
| 1   | 0.00  | +3.71 | 6   | 0.00  | -3.71 | 10  | -2.16 | +3.00 |
| 2   | +2.16 | +3.00 | 7   | -2.16 | -3.00 | 11  | 0     | +1.42 |
| 3   | +3.51 | +1.14 | 8   | -3.51 | -1.14 | 12  | +1.24 | -0.89 |
| 4   | +3.51 | -1.14 | 9   | -3.51 | +1.14 | 13  | -1.24 | -0.89 |
| 5   | +2.16 | -3.00 |     |       |       |     |       |       |

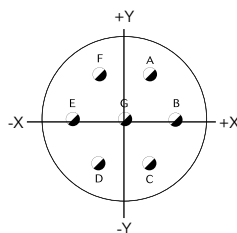
11 / B

98



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0.00  | +3.30 |
| B   | +3.30 | 0.00  |
| C   | +1.65 | -2.87 |
| D   | -1.65 | -2.87 |
| E   | -3.30 | 0.00  |
| F   | 0.00  | 0.00  |

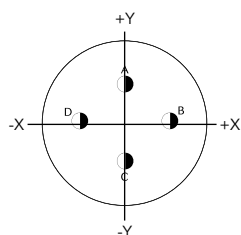
99



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.65 | +2.85 |
| B   | +3.30 | 0.00  |
| C   | +1.65 | -2.87 |
| D   | -1.65 | -2.87 |
| E   | -3.30 | 0.00  |
| F   | -1.65 | +2.87 |
| G   | 0.00  | 0.00  |

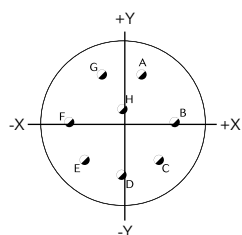
13 / C

04



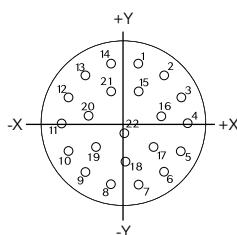
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0.00  | +3.81 |
| B   | +3.71 | +0.89 |
| C   | 0.00  | -2.11 |
| D   | -3.71 | +0.89 |

08



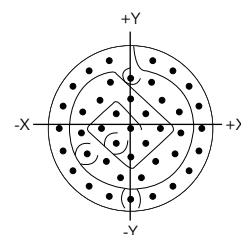
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.65 | +3.99 |
| B   | +4.32 | 0.00  |
| C   | +3.05 | -3.05 |
| D   | 0.00  | -4.32 |
| E   | -3.05 | -3.05 |
| F   | -4.32 | 0.00  |
| G   | -1.65 | +3.99 |
| H   | 0.00  | +1.12 |

35



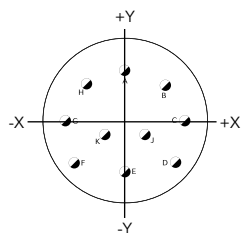
| Ctc | X     | Y     |
|-----|-------|-------|
| 1   | +1.14 | +5.00 |
| 2   | +3.20 | +4.01 |
| 3   | +4.62 | +2.24 |
| 4   | +5.16 | 0.00  |
| 5   | +4.62 | -2.24 |
| 6   | +3.20 | -4.01 |
| 7   | +1.14 | -5.00 |
| 8   | -1.14 | -5.00 |
| 9   | -3.20 | -4.01 |
| 10  | -4.62 | -2.24 |
| 11  | -5.16 | 0.00  |
| 12  | -4.62 | +2.24 |
| 13  | -3.20 | +4.01 |
| 14  | -1.14 | +5.00 |
| 15  | +1.14 | +2.72 |
| 16  | +2.97 | +0.66 |
| 17  | +2.36 | -1.91 |
| 18  | 0.00  | -3.05 |
| 19  | -2.36 | -1.91 |
| 20  | -2.97 | +0.66 |
| 21  | -1.24 | +2.72 |
| 22  | 0.00  | -0.76 |

43



| Ctc | X     | Y     |
|-----|-------|-------|
| 1   | +1.80 | +5.54 |
| 2   | +3.42 | +4.71 |
| 3   | +4.71 | +3.42 |
| 4   | +5.54 | +1.80 |
| 5   | +5.82 | 0.00  |
| 6   | +5.54 | -1.80 |
| 7   | +4.71 | -3.42 |
| 8   | +3.42 | -4.71 |
| 9   | +1.80 | -5.54 |
| 10  | 0.00  | -5.82 |
| 11  | -1.80 | -5.54 |
| 12  | -3.42 | -4.71 |
| 13  | -4.71 | -3.42 |
| 14  | -5.54 | -1.80 |
| 15  | -5.82 | 0.00  |
| 16  | -5.54 | +1.80 |
| 17  | -4.71 | +3.42 |
| 18  | -3.42 | +4.71 |
| 19  | -1.80 | +5.54 |
| 20  | 0.00  | +4.12 |
| 21  | +1.68 | +3.76 |
| 22  | +2.54 | +2.28 |
| 23  | +3.92 | +1.27 |
| 24  | +4.10 | -0.43 |
| 25  | +3.57 | -2.06 |
| 26  | +1.99 | -2.74 |
| 27  | +0.86 | -4.03 |
| 28  | -0.86 | -4.03 |
| 29  | -1.99 | -2.74 |
| 30  | -3.57 | -2.06 |
| 31  | -4.10 | -0.43 |
| 32  | -3.92 | +1.27 |
| 33  | -2.54 | +2.28 |
| 34  | -1.68 | +3.76 |
| 35  | 0.00  | +2.42 |
| 36  | +1.21 | +1.21 |
| 37  | +2.42 | 0.00  |
| 38  | +1.21 | -1.21 |
| 39  | 0.00  | -2.42 |
| 40  | -1.21 | -1.21 |
| 41  | -2.42 | 0.00  |
| 42  | -1.21 | +1.21 |
| 43  | 0.00  | 0.00  |

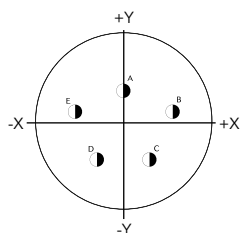
98



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0.00  | +4.95 |
| B   | +3.18 | +3.81 |
| C   | +4.90 | +0.76 |
| D   | +4.17 | -2.67 |
| E   | 0.00  | -3.43 |
| F   | -4.17 | -2.67 |
| G   | -4.90 | +0.76 |
| H   | -3.18 | +3.81 |
| I   | -0.47 | +2.67 |
| J   | +1.65 | -0.38 |
| K   | -1.65 | -0.38 |

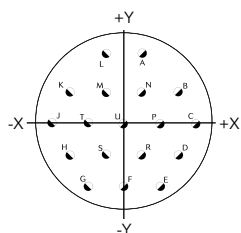
15 / D

05



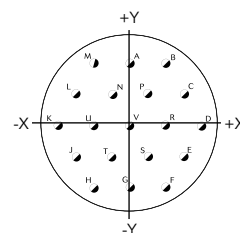
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0     | +2.54 |
| B   | +4.42 | +0.61 |
| C   | +2.39 | +3.76 |
| D   | -2.39 | -3.76 |
| E   | -4.42 | +0.61 |

18



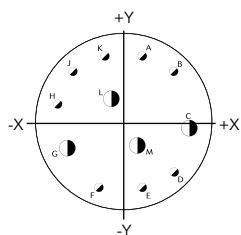
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.65 | +6.40 |
| B   | +4.95 | +2.87 |
| C   | +6.60 | 0.00  |
| D   | +4.95 | -2.87 |
| E   | +3.30 | -5.72 |
| F   | 0.00  | -5.72 |
| G   | -3.30 | -5.72 |
| H   | -4.95 | -2.87 |
| J   | -6.60 | 0.00  |
| K   | -4.95 | +2.87 |
| L   | -1.65 | +6.40 |
| M   | -1.65 | +2.87 |
| N   | +1.65 | +2.87 |
| P   | +3.30 | 0.00  |
| R   | +1.65 | -2.87 |
| S   | -1.65 | -2.87 |
| T   | -3.30 | 0.00  |
| U   | 0.00  | 0.00  |

19



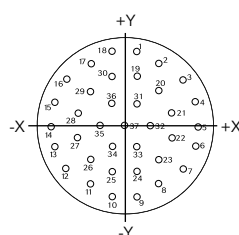
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0.00  | +5.72 |
| B   | +3.30 | +5.72 |
| C   | +4.95 | +2.87 |
| D   | +6.60 | 0.00  |
| E   | +4.95 | -2.87 |
| F   | +3.30 | -5.72 |
| G   | 0.00  | -5.72 |
| H   | -3.30 | -5.72 |
| J   | -4.95 | -2.87 |
| K   | -6.60 | 0.00  |
| L   | -4.95 | +2.87 |
| M   | -3.30 | +5.72 |
| N   | -1.65 | +2.87 |
| P   | +1.65 | +2.87 |
| R   | +3.30 | 0.00  |
| S   | +1.65 | -2.87 |
| T   | -1.65 | -2.87 |
| U   | -3.30 | 0.00  |
| V   | 0.00  | 0.00  |

97



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.65 | +5.94 |
| B   | +4.52 | +4.52 |
| C   | +5.84 | -0.58 |
| D   | +4.52 | -4.52 |
| E   | +1.65 | -5.94 |
| F   | -2.26 | -5.97 |
| G   | -5.26 | -2.41 |
| H   | -5.94 | +1.65 |
| J   | -4.52 | +4.52 |
| K   | -1.65 | +5.94 |
| L   | -1.19 | +2.06 |
| M   | +1.19 | -2.06 |

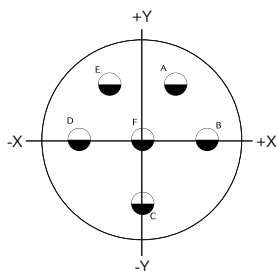
35



| Ctc | X     | Y     |
|-----|-------|-------|
| 1   | +1.14 | +6.65 |
| 2   | +3.12 | +5.51 |
| 3   | +5.36 | +4.06 |
| 4   | +6.45 | +2.03 |
| 5   | +6.76 | -0.25 |
| 6   | +6.27 | -2.49 |
| 7   | +5.08 | -4.45 |
| 8   | +3.30 | -5.89 |
| 9   | +1.14 | -6.65 |
| 10  | -1.14 | -6.65 |
| 11  | -3.30 | -5.89 |
| 12  | -5.08 | -4.45 |
| 13  | -6.27 | -2.49 |
| 14  | -6.76 | -0.25 |
| 15  | -6.45 | +2.03 |
| 16  | -5.36 | +4.06 |
| 17  | -3.12 | +5.51 |
| 18  | -1.14 | +6.65 |
| 19  | +1.14 | +4.37 |
| 20  | +3.12 | +3.02 |
| 21  | +4.32 | +1.02 |
| 22  | +4.32 | -1.27 |
| 23  | +3.12 | -3.23 |
| 24  | +1.14 | -4.37 |
| 25  | -1.14 | -4.37 |
| 26  | -3.12 | -3.23 |
| 27  | -4.32 | -1.27 |
| 28  | -4.32 | +1.02 |
| 29  | -3.12 | +3.02 |
| 30  | -1.14 | +4.37 |
| 31  | +1.14 | +1.88 |
| 32  | +2.29 | -0.10 |
| 33  | +1.14 | -2.08 |
| 34  | -1.14 | -2.08 |
| 35  | -2.29 | -0.10 |
| 36  | -1.14 | +1.88 |
| 37  | 0.00  | -0.10 |

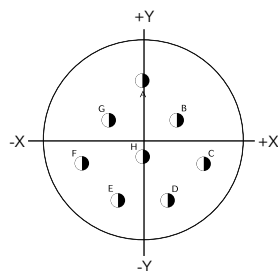
17 / E

06



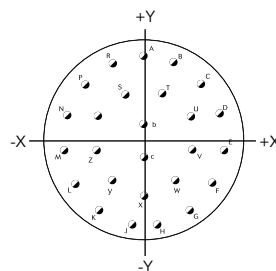
| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +3.07 | +5.31 |
| B   | +6.12 | 0.00  |
| C   | 0.00  | -6.12 |
| D   | -6.12 | 0.00  |
| E   | -3.07 | +5.31 |
| F   | 0.00  | 0.00  |

08



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0.00  | +5.99 |
| B   | +3.25 | +2.18 |
| C   | +5.84 | -1.98 |
| D   | +2.39 | -5.49 |
| E   | -2.39 | -5.49 |
| F   | -5.84 | -1.98 |
| G   | -3.25 | +2.18 |
| H   | 0.00  | -1.32 |

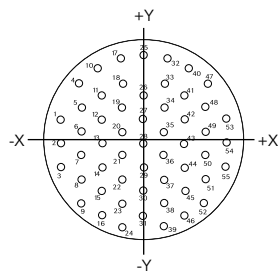
26



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0.00  | +8.15 |
| B   | +3.33 | +7.44 |
| C   | +6.07 | +5.44 |
| D   | +7.75 | +2.51 |
| E   | +8.10 | -0.86 |
| F   | +7.06 | -4.09 |
| G   | +4.80 | -6.60 |
| H   | +1.70 | -7.98 |

| Ctc | X     | Y     |
|-----|-------|-------|
| J   | -1.70 | -7.98 |
| K   | -4.80 | -6.60 |
| L   | -7.06 | -4.09 |
| M   | -8.10 | -0.86 |
| N   | -7.75 | +2.51 |
| P   | -6.07 | +5.44 |
| R   | -3.33 | +7.44 |
| S   | -1.78 | +4.50 |
| T   | +1.78 | +4.50 |
| U   | +4.45 | +2.39 |
| V   | +4.53 | -0.91 |
| W   | +3.02 | -3.84 |
| X   | 0.00  | -5.16 |
| Y   | -3.02 | -3.84 |
| Z   | -4.53 | -0.91 |
| a   | -4.45 | +2.39 |
| b   | 0.00  | +1.65 |
| c   | 0.00  | -1.65 |

35

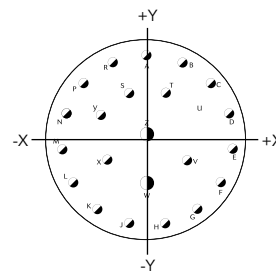


| Ctc | X     | Y     |
|-----|-------|-------|
| 1   | -7.92 | +2.18 |
| 2   | -7.92 | -0.10 |
| 3   | -7.92 | -2.39 |
| 4   | -6.15 | +5.61 |
| 5   | -5.94 | +3.33 |
| 6   | -5.94 | +1.04 |
| 7   | -5.94 | -1.24 |
| 8   | -5.94 | -3.53 |
| 9   | -5.94 | -5.82 |
| 10  | -4.37 | +7.09 |
| 11  | -3.96 | +4.47 |
| 12  | -3.96 | +2.18 |

| Ctc | X     | Y     |
|-----|-------|-------|
| 25  | 0.00  | +8.36 |
| 26  | 0.00  | +4.47 |
| 27  | 0.00  | +2.18 |
| 28  | 0.00  | -0.10 |
| 29  | 0.00  | -2.39 |
| 30  | 0.00  | +4.67 |
| 31  | 0.00  | -6.96 |
| 32  | +2.26 | +8.03 |
| 33  | +1.98 | +5.61 |
| 34  | +1.98 | +3.33 |
| 35  | +1.98 | +1.04 |
| 36  | +1.98 | -1.24 |
| 37  | +1.98 | -3.53 |
| 38  | +1.98 | -5.82 |
| 39  | +1.98 | -8.10 |
| 40  | +4.37 | +7.09 |

| Ctc | X     | Y     |
|-----|-------|-------|
| 41  | +3.96 | +4.47 |
| 42  | +3.96 | +2.18 |
| 43  | +3.96 | -0.10 |
| 44  | +3.96 | -2.39 |
| 45  | +3.96 | -4.67 |
| 46  | +3.96 | -6.96 |
| 47  | +6.15 | +5.61 |
| 48  | +5.94 | +3.33 |
| 49  | +5.94 | +1.04 |
| 50  | +5.94 | -1.24 |
| 51  | +5.94 | -3.53 |
| 52  | +5.94 | -5.82 |
| 53  | +7.92 | +2.18 |
| 54  | +7.92 | -0.10 |
| 55  | +7.92 | -2.39 |

99

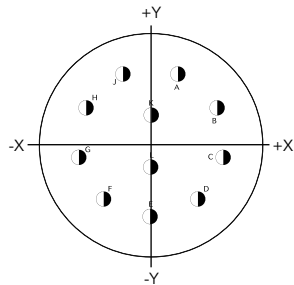


| Ctc | X     | Y     |
|-----|-------|-------|
| A   | 0.00  | +8.15 |
| B   | +3.33 | +7.44 |
| C   | +6.07 | +5.44 |
| D   | +7.75 | +2.51 |
| E   | +8.10 | -0.86 |
| F   | +7.06 | -4.09 |
| G   | +4.80 | -6.60 |
| H   | +1.70 | -7.98 |
| J   | -1.70 | -7.98 |
| K   | -4.80 | -6.60 |
| L   | -7.06 | -4.09 |
| M   | -8.10 | -0.86 |

| Ctc | X     | Y     |
|-----|-------|-------|
| N   | -7.75 | +2.51 |
| P   | -6.07 | +5.44 |
| R   | -3.33 | +7.44 |
| S   | -1.78 | +4.50 |
| T   | +1.78 | +4.50 |
| U   | +4.45 | +2.39 |
| V   | +3.81 | -1.91 |
| W   | 0.00  | -4.09 |
| X   | -3.81 | -1.91 |
| Y   | -4.45 | +2.39 |
| Z   | 0.00  | +0.64 |

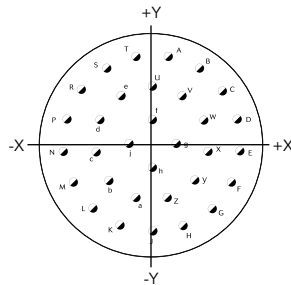
19 / F

11



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +2.67 | +6.60 |
| B   | +6.35 | +3.35 |
| C   | +6.99 | -1.35 |
| D   | +4.55 | -5.46 |
| E   | 0.00  | -7.14 |
| F   | -4.55 | -5.46 |
| G   | -6.99 | -1.35 |
| H   | -6.35 | +3.35 |
| J   | -2.67 | +6.60 |
| K   | 0.00  | +2.67 |
| L   | 0.00  | -2.34 |

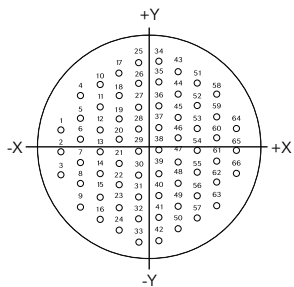
32



| Ctc | X     | Y     |
|-----|-------|-------|
| A   | +1.68 | +8.97 |
| B   | +4.80 | +7.75 |
| C   | +7.26 | +5.51 |
| D   | +8.76 | +2.49 |
| E   | +9.07 | -0.84 |
| F   | +8.15 | -4.06 |
| G   | +6.15 | -6.73 |
| H   | +3.30 | -8.51 |
| J   | 0.00  | -9.12 |
| K   | -3.30 | -8.51 |
| L   | -6.15 | -6.73 |
| M   | -8.15 | -4.06 |
| N   | -9.07 | -0.84 |
| P   | -8.76 | +2.49 |
| R   | -7.26 | +5.51 |
| S   | -4.80 | +7.75 |

| Ctc | X     | Y     |
|-----|-------|-------|
| T   | -1.68 | +8.97 |
| U   | 0.00  | +5.84 |
| V   | +3.15 | +4.90 |
| W   | +5.31 | +2.41 |
| X   | +5.79 | -0.84 |
| Y   | +4.42 | -3.84 |
| Z   | +1.65 | -5.61 |
| a   | -1.65 | -5.61 |
| b   | -4.42 | -3.84 |
| c   | -5.79 | -0.84 |
| d   | -5.31 | +2.41 |
| e   | -3.15 | +4.90 |
| f   | 0.00  | +2.44 |
| g   | +2.44 | 0.00  |
| h   | 0.00  | -2.44 |
| j   | -2.44 | 0.00  |

35



| Ctc | X     | Y     |
|-----|-------|-------|
| 1   | -9.07 | +2.29 |
| 2   | -9.07 | 0.00  |
| 3   | -9.07 | -2.29 |
| 4   | -7.09 | +5.71 |
| 5   | -7.09 | +3.43 |
| 6   | -7.09 | +1.14 |
| 7   | -7.09 | -1.14 |
| 8   | -7.09 | -3.43 |
| 9   | -7.09 | -5.71 |
| 10  | -5.11 | +6.86 |
| 11  | -5.11 | +4.57 |
| 12  | -5.11 | +2.29 |
| 13  | -5.11 | 0.00  |
| 14  | -5.11 | -2.29 |

| Ctc | X     | Y     |
|-----|-------|-------|
| 15  | -5.11 | -4.57 |
| 16  | -5.11 | -6.86 |
| 17  | -3.12 | +8.00 |
| 18  | -3.12 | +5.71 |
| 19  | -3.12 | +3.43 |
| 20  | -3.12 | +1.14 |
| 21  | -3.12 | -1.14 |
| 22  | -3.12 | -3.43 |
| 23  | -3.12 | -5.71 |
| 24  | -3.12 | -8.00 |
| 25  | -1.14 | +9.14 |
| 26  | -1.14 | +6.86 |
| 27  | -1.14 | +4.57 |

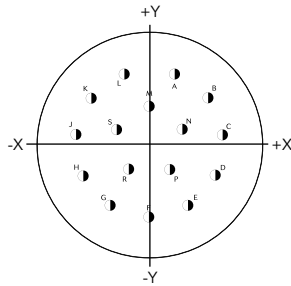
| Ctc | X     | Y     |
|-----|-------|-------|
| 28  | -1.14 | +2.29 |
| 29  | -1.14 | 0.00  |
| 30  | -1.14 | -2.29 |
| 31  | -1.14 | -4.57 |
| 32  | -1.14 | -6.86 |
| 33  | -1.14 | -9.14 |
| 34  | +1.14 | +9.14 |
| 35  | +1.14 | +6.86 |
| 36  | +1.14 | +4.57 |
| 37  | +1.14 | +2.29 |
| 38  | +1.14 | 0.00  |
| 39  | +1.14 | -2.29 |
| 40  | +1.14 | -4.57 |

| Ctc | X     | Y     |
|-----|-------|-------|
| 41  | +1.14 | -6.86 |
| 42  | +1.14 | -9.14 |
| 43  | +3.12 | +8.00 |
| 44  | +3.12 | +5.71 |
| 45  | +3.12 | +3.43 |
| 46  | +3.12 | +1.14 |
| 47  | +3.12 | -1.14 |
| 48  | +3.12 | -3.43 |
| 49  | +3.12 | -5.71 |
| 50  | +3.12 | -8.00 |
| 51  | +5.11 | +6.86 |
| 52  | +5.11 | +4.57 |
| 53  | +5.11 | +2.29 |

| Ctc | X     | Y     |
|-----|-------|-------|
| 54  | +5.11 | 0.00  |
| 55  | +5.11 | -2.29 |
| 56  | +5.11 | -4.57 |
| 57  | +5.11 | -6.86 |
| 58  | +7.09 | +5.71 |
| 59  | +7.09 | +3.43 |
| 60  | +7.09 | +1.14 |
| 61  | +7.09 | -1.14 |
| 62  | +7.09 | -3.43 |
| 63  | +7.09 | -5.71 |
| 64  | +9.07 | +2.29 |
| 65  | +9.07 | 0.00  |
| 66  | +9.07 | -2.29 |

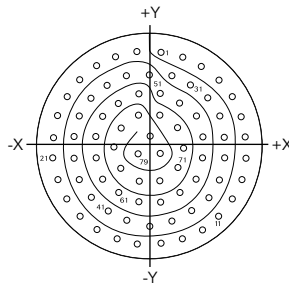
21 / G

16



| Ctc | X     | Y     | Ctc | X     | Y     |
|-----|-------|-------|-----|-------|-------|
| A   | +3.00 | +8.18 | J   | -8.66 | +0.91 |
| B   | +6.88 | +5.36 | K   | -6.88 | +5.36 |
| C   | +8.66 | +0.91 | L   | -3.00 | +8.18 |
| D   | +7.82 | -3.81 | M   | 0.00  | +4.45 |
| E   | +4.62 | -7.37 | N   | +3.91 | +1.57 |
| F   | 0.00  | -8.71 | P   | +2.39 | -3.10 |
| G   | -4.62 | -7.37 | R   | -2.39 | -3.10 |
| H   | -7.82 | -3.81 | S   | -3.91 | +1.57 |

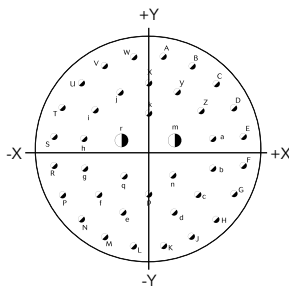
35



| Ctc | X      | Y      |
|-----|--------|--------|
| 1   | +1.35  | +10.82 |
| 2   | +3.71  | +10.26 |
| 3   | +5.89  | +9.19  |
| 4   | +7.77  | +7.67  |
| 5   | +9.27  | +5.77  |
| 6   | +10.31 | +3.58  |
| 7   | +10.85 | +1.22  |
| 8   | +10.85 | -1.22  |
| 9   | +10.31 | -3.58  |
| 10  | +9.27  | -5.77  |
| 11  | +7.77  | -7.67  |
| 12  | +5.89  | -9.19  |
| 13  | +3.71  | -10.26 |

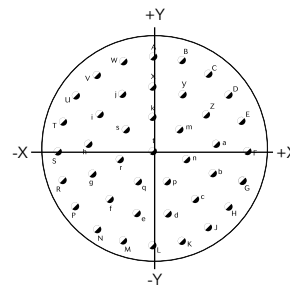
| Ctc | X      | Y      | Ctc | X     | Y     | Ctc | X     | Y     |
|-----|--------|--------|-----|-------|-------|-----|-------|-------|
| 14  | +1.35  | -10.82 | 36  | +7.90 | -3.58 | 58  | +3.40 | -5.05 |
| 15  | -1.35  | -10.82 | 37  | +6.55 | -5.59 | 59  | +1.22 | -6.12 |
| 16  | -3.71  | -10.26 | 38  | +4.67 | -7.11 | 60  | -1.22 | -6.12 |
| 17  | -5.89  | -9.19  | 39  | +2.49 | -8.18 | 61  | -3.40 | -5.05 |
| 18  | -7.77  | -7.67  | 40  | 0.00  | -8.81 | 62  | -5.28 | -3.53 |
| 19  | -9.27  | -5.77  | 41  | -2.49 | -8.18 | 63  | -6.02 | -1.22 |
| 20  | -10.31 | -3.58  | 42  | -4.67 | -7.11 | 64  | -6.02 | +1.22 |
| 21  | -10.85 | -1.22  | 43  | -6.55 | -5.59 | 65  | -5.28 | +3.53 |
| 22  | -10.85 | +1.22  | 44  | -7.90 | -3.58 | 66  | -3.40 | +5.05 |
| 23  | -10.31 | +3.58  | 45  | -8.43 | -1.22 | 67  | -1.22 | +3.71 |
| 24  | -9.27  | +5.77  | 46  | -8.43 | +1.22 | 68  | +1.22 | +3.71 |
| 25  | -7.77  | +7.67  | 47  | -7.90 | +3.58 | 69  | +3.18 | +2.29 |
| 26  | -5.89  | +9.19  | 48  | -6.55 | +5.59 | 70  | +3.94 | 0.00  |
| 27  | -3.71  | +10.26 | 49  | -4.67 | +7.11 | 71  | +3.18 | -2.29 |
| 28  | -1.35  | +10.82 | 50  | -2.49 | +8.18 | 72  | +1.22 | -3.71 |
| 29  | 0.00   | +8.20  | 51  | -1.22 | +6.12 | 73  | -1.22 | -3.71 |
| 30  | +2.49  | +8.18  | 52  | +1.22 | +6.12 | 74  | -3.18 | -2.29 |
| 31  | +4.67  | +7.11  | 53  | +3.40 | +5.05 | 75  | -3.94 | 0.00  |
| 32  | +6.55  | +5.59  | 54  | +5.28 | +3.53 | 76  | -3.18 | +2.29 |
| 33  | +7.90  | +3.58  | 55  | +6.02 | +1.22 | 77  | 0.00  | +1.35 |
| 34  | +8.43  | +1.22  | 56  | +6.02 | -1.22 | 78  | +1.22 | -0.74 |
| 35  | +8.43  | -1.22  | 57  | +5.28 | -3.53 | 79  | -1.22 | -0.74 |

39



| Ctc | X      | Y      | Ctc | X      | Y      | Ctc | X     | Y     |
|-----|--------|--------|-----|--------|--------|-----|-------|-------|
| A   | +1.65  | +10.44 | P   | -9.42  | -4.80  | d   | +2.84 | -6.73 |
| B   | +4.80  | +9.42  | R   | -10.44 | -1.65  | e   | -2.84 | -6.73 |
| C   | +7.47  | +7.47  | S   | -10.44 | +1.65  | f   | -5.51 | -4.80 |
| D   | +9.42  | +4.80  | T   | -9.42  | +4.80  | g   | -7.11 | -1.88 |
| E   | +10.44 | +1.65  | U   | -7.47  | +7.47  | h   | -7.11 | +1.45 |
| F   | +10.44 | -1.65  | V   | -4.80  | +9.42  | i   | -5.89 | +4.55 |
| G   | +9.42  | -4.80  | W   | -1.65  | +10.44 | j   | -3.20 | +6.50 |
| H   | +7.47  | -7.47  | X   | 0.00   | +7.49  | k   | 0.00  | +4.17 |
| J   | +4.80  | -9.42  | Y   | +3.20  | +6.50  | m   | +2.90 | +1.22 |
| K   | +1.65  | -10.44 | Z   | +5.89  | +4.55  | n   | +2.69 | -2.72 |
| L   | -1.65  | -10.44 | a   | +7.11  | +1.45  | p   | 0.00  | -4.80 |
| M   | -4.80  | -9.42  | b   | +7.11  | -1.88  | q   | -2.69 | -2.72 |
| N   | -7.47  | -7.47  | c   | +5.51  | -4.80  | r   | -2.90 | +1.22 |

41

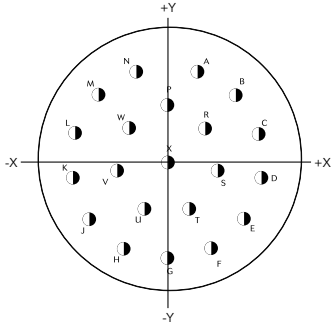


| Ctc | X      | Y      | Ctc | X      | Y      |
|-----|--------|--------|-----|--------|--------|
| A   | 0.00   | +10.60 | M   | -3.26  | -10.09 |
| B   | +3.28  | +10.09 | N   | -6.23  | -8.58  |
| C   | +6.23  | +8.58  | P   | -8.58  | -6.23  |
| D   | +8.58  | +6.23  | R   | -10.09 | -3.28  |
| E   | +10.09 | +3.28  | S   | -10.60 | 0.00   |
| F   | +10.60 | 0.00   | T   | -10.09 | +3.28  |
| G   | +10.09 | -3.28  | U   | -8.58  | +6.23  |
| H   | +8.58  | -6.23  | V   | -6.23  | +8.58  |
| J   | +6.23  | -8.58  | W   | -3.28  | +10.09 |
| K   | +3.28  | -10.09 | X   | 0.00   | +7.20  |
| L   | 0.00   | -10.60 | Y   | +3.35  | +6.38  |

| Ctc | X     | Y     |
|-----|-------|-------|
| Z   | +5.92 | +4.09 |
| a   | +7.15 | +0.87 |
| b   | +6.73 | -2.55 |
| c   | +4.78 | -5.39 |
| d   | +1.73 | -6.99 |
| e   | -1.73 | -6.99 |
| f   | -4.78 | -5.39 |
| g   | -6.73 | -2.55 |
| h   | -7.15 | +0.87 |
| i   | -5.92 | +4.09 |
| j   | -3.35 | +6.38 |
| k   | 0.00  | +3.81 |
| m   | +2.98 | +2.38 |
| n   | +3.71 | -0.85 |
| p   | +1.66 | -3.43 |
| q   | -1.66 | -3.43 |
| r   | -3.71 | -0.85 |
| s   | -2.98 | +2.38 |
| t   | 0.00  | 0.00  |

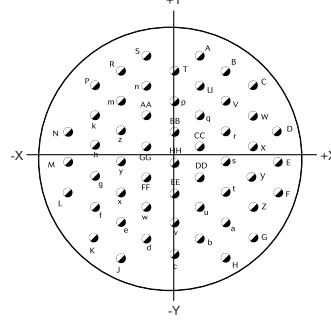
23 / H

21



| Ctc | X      | Y      |
|-----|--------|--------|
| A   | +3.25  | +9.78  |
| B   | +7.34  | +7.24  |
| C   | +9.80  | +3.12  |
| D   | +10.16 | -1.65  |
| E   | +8.33  | -6.07  |
| F   | +4.65  | -9.19  |
| G   | 0.00   | -10.31 |
| H   | -4.65  | -9.19  |
| J   | -8.33  | -6.07  |
| K   | -10.16 | -1.65  |
| L   | -9.80  | +3.12  |
| M   | -7.34  | +7.24  |
| N   | -3.25  | +9.78  |
| P   | 0.00   | +6.22  |
| R   | +4.06  | +3.71  |
| S   | +5.44  | -0.89  |
| T   | +2.39  | -4.93  |
| U   | -2.39  | -4.93  |
| V   | -5.44  | -0.89  |
| W   | -4.06  | +3.71  |
| X   | 0.00   | 0.00   |

53



| Ctc | X      | Y      |
|-----|--------|--------|
| A   | +2.84  | +11.56 |
| B   | +5.72  | +9.91  |
| C   | +8.53  | +8.26  |
| D   | +11.43 | +3.30  |
| E   | +11.43 | 0.00   |
| F   | +11.43 | -3.30  |

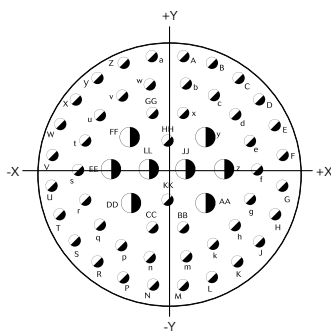
| Ctc | X      | Y      |
|-----|--------|--------|
| G   | +8.53  | -8.26  |
| H   | +5.72  | -10.41 |
| J   | -5.72  | -10.41 |
| K   | -8.53  | -8.26  |
| L   | -11.43 | -3.30  |
| M   | -11.43 | 0.00   |

| Ctc | X      | Y      |
|-----|--------|--------|
| N   | -11.43 | +3.30  |
| P   | -8.53  | +8.26  |
| R   | -5.72  | +9.91  |
| S   | -2.84  | +11.56 |
| T   | 0.00   | +9.91  |
| U   | +2.84  | +8.26  |
| V   | +5.72  | +6.60  |
| W   | +8.53  | +4.95  |
| X   | +8.53  | +1.65  |
| Y   | +8.53  | -1.65  |
| Z   | +8.53  | -4.95  |
| a   | +5.72  | -6.60  |
| b   | +2.84  | -8.26  |
| c   | 0.00   | -9.91  |
| d   | -2.84  | -8.26  |
| e   | -5.72  | -6.60  |
| f   | -8.53  | -4.95  |
| g   | -8.53  | -1.65  |
| h   | -8.53  | +1.65  |
| k   | -8.53  | +4.95  |

| Ctc | X     | Y     |
|-----|-------|-------|
| m   | -5.72 | +6.60 |
| n   | -2.84 | +8.26 |
| p   | 0.00  | +6.60 |
| q   | +2.84 | +4.95 |
| r   | +5.72 | +3.30 |
| s   | +5.72 | 0.00  |
| t   | +5.72 | -3.30 |
| u   | +2.84 | -4.95 |
| v   | 0.00  | -6.60 |
| w   | -2.84 | -4.95 |
| x   | -5.72 | -3.30 |
| y   | -5.72 | 0.00  |
| z   | -5.72 | +3.30 |
| AA  | -2.84 | +4.95 |
| BB  | 0.00  | +3.30 |
| CC  | +2.84 | +1.65 |
| DD  | +2.84 | -1.65 |
| EE  | 0.00  | -3.30 |
| FF  | -2.84 | -1.65 |
| GG  | -2.84 | +1.65 |
| HH  | 0.00  | 0.00  |

25 / J

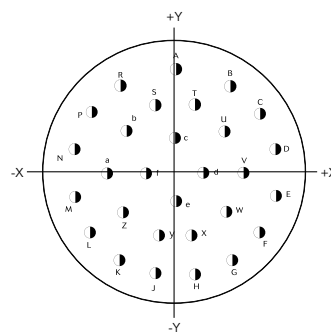
04



| Ctc | X      | Y      |
|-----|--------|--------|
| A   | +1.75  | +13.49 |
| B   | +5.16  | +12.57 |
| C   | +8.23  | +10.80 |
| D   | +10.77 | +8.28  |
| E   | +12.52 | +5.21  |
| F   | +13.49 | +1.75  |
| G   | +13.49 | -1.75  |
| H   | +12.52 | -5.21  |
| J   | +10.77 | -8.28  |
| K   | +8.23  | -10.80 |
| L   | +5.16  | -12.57 |
| M   | +1.75  | -13.49 |
| N   | -1.75  | -13.49 |
| P   | -5.16  | -12.57 |

| Ctc | X      | Y      |
|-----|--------|--------|
| R   | -8.23  | -10.80 |
| S   | -10.77 | -8.28  |
| T   | -12.52 | -5.21  |
| U   | -13.49 | -1.75  |
| V   | -13.49 | +1.75  |
| W   | -12.52 | +5.21  |
| X   | -10.77 | +8.28  |
| Y   | -8.23  | +10.80 |
| Z   | -5.16  | +12.57 |
| a   | -1.75  | +13.49 |
| b   | +2.18  | +10.08 |
| c   | +5.38  | +8.78  |
| d   | +7.90  | +6.38  |
| e   | +9.58  | +3.35  |
| f   | +10.46 | 0.00   |
| g   | +9.58  | -3.35  |
| h   | +7.90  | -6.38  |
| k   | +5.38  | -8.78  |
| m   | +2.18  | -10.08 |
| n   | -2.18  | -10.08 |
| p   | -5.38  | -8.78  |
| q   | -7.90  | -6.38  |
| r   | -9.58  | -3.35  |
| s   | -10.46 | 0.00   |
| t   | -9.58  | +3.35  |
| u   | -7.90  | +6.38  |
| v   | -5.38  | +8.78  |
| w   | -2.18  | +10.08 |
| x   | +1.75  | +6.66  |
| y   | +4.37  | +3.78  |
| z   | +6.55  | 0.00   |
| AA  | +4.37  | -3.78  |
| BB  | +1.75  | -6.66  |
| CC  | -1.75  | -6.66  |
| DD  | -4.37  | -3.78  |
| EE  | -6.55  | 0.00   |
| FF  | -4.37  | -3.78  |
| GG  | -1.75  | -6.66  |
| HH  | 0.00   | +3.35  |
| JJ  | +2.18  | 0.00   |
| KK  | 0.00   | -3.35  |
| LL  | -2.18  | 0.00   |

29

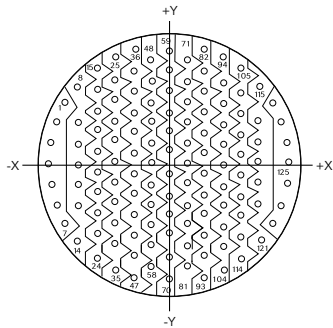


| Ctc | X      | Y      |
|-----|--------|--------|
| A   | 0.00   | +12.22 |
| B   | +6.55  | +10.31 |
| C   | +10.03 | +7.04  |
| D   | +11.91 | +2.77  |
| E   | +11.91 | -2.77  |
| F   | +10.03 | -7.04  |
| G   | +6.68  | -10.31 |
| H   | +2.31  | -11.99 |

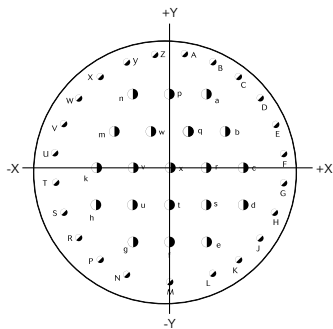
| Ctc | X      | Y      |
|-----|--------|--------|
| J   | -2.31  | -11.99 |
| K   | -6.68  | -10.31 |
| L   | -10.03 | -7.04  |
| M   | -11.91 | -2.77  |
| N   | -11.91 | +2.77  |
| P   | -10.03 | +7.04  |
| R   | -6.55  | +10.31 |
| S   | -2.31  | +8.15  |
| T   | +2.31  | +8.15  |
| U   | +5.79  | +4.93  |
| V   | +8.10  | 0.00   |
| W   | +6.10  | -4.60  |
| X   | +2.31  | -7.37  |
| Y   | -2.31  | -7.37  |
| Z   | -6.10  | -4.60  |
| a   | -8.10  | 0.00   |
| b   | -5.79  | +4.93  |
| c   | 0.00   | +4.09  |
| d   | +3.40  | 0.00   |
| e   | 0.00   | -3.30  |
| f   | -3.40  | 0.00   |

25 / J

35



43



| Ctc | X      | Y      |
|-----|--------|--------|
| 1   | -12.17 | +7.09  |
| 2   | -13.21 | +4.83  |
| 3   | -13.87 | +2.41  |
| 4   | -14.10 | 0.00   |
| 5   | -13.87 | -2.41  |
| 6   | -13.21 | -4.83  |
| 7   | -12.17 | -7.09  |
| 8   | -10.77 | +9.07  |
| 9   | -10.54 | +4.83  |
| 10  | -10.54 | +2.41  |
| 11  | -10.54 | 0.00   |
| 12  | -10.54 | -2.41  |
| 13  | -10.54 | -4.83  |
| 14  | -10.77 | -9.07  |
| 15  | -8.43  | +11.28 |
| 16  | -8.43  | +8.43  |
| 17  | -8.43  | +6.02  |
| 18  | -8.43  | +3.61  |
| 19  | -8.43  | +1.19  |
| 20  | -8.43  | -1.19  |
| 21  | -8.43  | -3.61  |
| 22  | -8.43  | -6.02  |
| 23  | -8.43  | -8.43  |
| 24  | -8.43  | -10.85 |
| 25  | -6.32  | +12.60 |
| 26  | -6.32  | +9.65  |

| Ctc | X     | Y      |
|-----|-------|--------|
| 27  | -6.32 | +7.24  |
| 28  | -6.32 | +4.83  |
| 29  | -6.32 | +2.41  |
| 30  | -6.32 | 0.00   |
| 31  | -6.32 | -2.41  |
| 32  | -6.32 | -4.83  |
| 33  | -6.32 | -7.24  |
| 34  | -6.32 | -9.65  |
| 35  | -6.32 | -12.07 |
| 36  | -4.06 | +13.49 |
| 37  | -4.22 | +10.85 |
| 38  | -4.22 | +8.43  |
| 39  | -4.22 | +6.02  |
| 40  | -4.22 | +3.61  |
| 41  | -4.22 | +1.19  |
| 42  | -4.22 | -1.19  |
| 43  | -4.22 | -3.61  |
| 44  | -4.22 | -6.02  |
| 45  | -4.22 | -8.43  |
| 46  | -4.22 | -10.85 |
| 47  | -4.22 | -13.26 |
| 48  | -2.11 | +12.07 |
| 49  | -2.11 | +9.65  |
| 50  | -2.11 | +7.24  |
| 51  | -2.11 | +4.83  |
| 52  | -2.11 | +2.41  |

| Ctc | X     | Y      |
|-----|-------|--------|
| 53  | -2.11 | 0.00   |
| 54  | -2.11 | -2.41  |
| 55  | -2.11 | -4.83  |
| 56  | -2.11 | -7.24  |
| 57  | -2.11 | -9.65  |
| 58  | -2.11 | -12.07 |
| 59  | 0.00  | +13.26 |
| 60  | 0.00  | +10.85 |
| 61  | 0.00  | +8.43  |
| 62  | 0.00  | +6.02  |
| 63  | 0.00  | +3.61  |
| 64  | 0.00  | +1.19  |
| 65  | 0.00  | -1.19  |
| 66  | 0.00  | -3.61  |
| 67  | 0.00  | -6.02  |
| 68  | 0.00  | -8.43  |
| 69  | 0.00  | -10.85 |
| 70  | 0.00  | -14.10 |
| 71  | +2.11 | +12.07 |
| 72  | +2.11 | +9.65  |
| 73  | +2.11 | +7.24  |
| 74  | +2.11 | +4.83  |
| 75  | +2.11 | +2.41  |
| 76  | +2.11 | 0.00   |
| 77  | +2.11 | -2.41  |
| 78  | +2.11 | -4.83  |

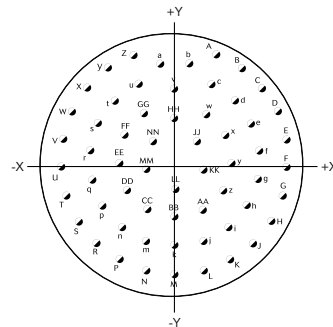
| Ctc | X     | Y      |
|-----|-------|--------|
| 79  | +2.11 | -7.24  |
| 80  | +2.11 | -9.65  |
| 81  | +2.11 | -12.07 |
| 82  | +4.06 | +13.49 |
| 83  | +4.22 | +10.85 |
| 84  | +4.22 | +8.43  |
| 85  | +4.22 | +6.02  |
| 86  | +4.22 | +3.61  |
| 87  | +4.22 | +1.19  |
| 88  | +4.22 | -1.19  |
| 89  | +4.22 | -3.61  |
| 90  | +4.22 | -6.02  |
| 91  | +4.22 | -8.43  |
| 92  | +4.22 | -10.85 |
| 93  | +4.22 | -13.26 |
| 94  | +6.32 | +12.60 |
| 95  | +6.32 | +9.65  |
| 96  | +6.32 | +7.24  |
| 97  | +6.32 | +4.83  |
| 98  | +6.32 | +2.41  |
| 99  | +6.32 | 0.00   |
| 100 | +6.32 | -2.41  |
| 101 | +6.32 | -4.83  |
| 102 | +6.32 | -7.24  |
| 103 | +6.32 | -9.65  |

| Ctc | X      | Y      |
|-----|--------|--------|
| 104 | +6.32  | -12.07 |
| 105 | +8.43  | +11.28 |
| 106 | +8.43  | +8.43  |
| 107 | +8.43  | +6.02  |
| 108 | +8.43  | +3.61  |
| 109 | +8.43  | +1.19  |
| 110 | +8.43  | -1.19  |
| 111 | +8.43  | -3.61  |
| 112 | +8.43  | -6.02  |
| 113 | +8.43  | -8.43  |
| 114 | +8.43  | -10.85 |
| 115 | +10.77 | +9.07  |
| 116 | +10.54 | +4.83  |
| 117 | +10.54 | +2.41  |
| 118 | +10.54 | 0.00   |
| 119 | +10.54 | -2.41  |
| 120 | +10.54 | -4.83  |
| 121 | +10.77 | -9.07  |
| 122 | +12.17 | +7.09  |
| 123 | +13.21 | +4.83  |
| 124 | +13.87 | +2.41  |
| 125 | +14.10 | 0.00   |
| 126 | +13.87 | -2.41  |
| 127 | +13.21 | -4.83  |
| 128 | +12.17 | -7.09  |

| Ctc | X      | Y      |
|-----|--------|--------|
| A   | +1.75  | +13.49 |
| B   | +5.16  | +12.57 |
| C   | +8.23  | +10.80 |
| D   | +10.77 | +8.28  |
| E   | +12.52 | +5.21  |
| F   | +13.49 | +1.75  |
| G   | +13.49 | -1.75  |
| H   | +12.52 | -5.21  |
| J   | +10.77 | -8.28  |
| K   | +8.23  | -10.80 |
| L   | +5.16  | -12.57 |
| M   | 0.00   | -13.49 |
| N   | -5.16  | -12.57 |
| P   | -8.23  | -10.80 |
| R   | -10.77 | -8.28  |
| S   | -12.52 | -5.21  |
| T   | -13.49 | -1.75  |
| U   | -13.49 | +1.75  |
| V   | -12.52 | +5.21  |
| W   | -10.77 | +8.28  |
| X   | -8.23  | +10.80 |
| Y   | -5.16  | +12.57 |

| Ctc | X     | Y     |
|-----|-------|-------|
| Z   | -1.75 | +13.4 |
| a   | +4.37 | +8.74 |
| b   | +6.55 | +4.37 |
| c   | +8.74 | 0.00  |
| d   | +8.74 | -4.37 |
| e   | +4.37 | -8.74 |
| f   | 0.00  | -8.74 |
| g   | -4.37 | -8.74 |
| h   | -8.74 | -4.37 |
| k   | -8.74 | 0.00  |
| m   | -6.55 | +4.37 |
| n   | -4.37 | +8.74 |
| p   | 0.00  | +8.74 |
| q   | +2.18 | +4.37 |
| r   | +4.37 | 0.00  |
| s   | +4.37 | -4.37 |
| t   | 0.00  | -4.37 |
| u   | -4.37 | -4.37 |
| v   | -4.37 | 0.00  |
| w   | -2.18 | +4.37 |
| x   | 0.00  | 0.00  |

61



| Ctc | X      | Y      |
|-----|--------|--------|
| A   | +4.98  | +12.70 |
| B   | +7.98  | +11.05 |
| C   | +10.49 | +8.71  |
| D   | +12.32 | +5.84  |
| E   | +13.39 | +2.57  |
| F   | +13.61 | -0.76  |
| G   | +12.98 | -4.17  |
| H   | +11.53 | -7.29  |
| J   | +9.35  | -9.93  |

| Ctc | X      | Y      |
|-----|--------|--------|
| K   | +6.58  | -11.94 |
| L   | +3.40  | -13.18 |
| M   | 0.00   | -13.64 |
| N   | -3.40  | -13.18 |
| P   | -6.58  | -11.94 |
| R   | -9.35  | -9.93  |
| S   | -11.53 | -7.29  |
| T   | -12.98 | -4.17  |
| U   | -13.61 | -0.76  |

| Ctc | X      | Y      |
|-----|--------|--------|
| V   | -13.39 | +2.57  |
| W   | -12.32 | +5.84  |
| X   | -10.49 | +8.71  |
| Y   | -7.98  | +11.05 |
| Z   | -4.98  | +12.70 |
| a   | -1.73  | +11.53 |
| b   | +1.73  | +11.53 |
| c   | +4.39  | +9.22  |
| d   | +7.24  | +7.19  |
| e   | +9.19  | +4.45  |
| f   | +10.13 | +1.17  |
| g   | +9.96  | -2.24  |
| h   | +8.66  | -5.41  |
| i   | +6.38  | -7.98  |
| j   | +3.38  | -9.63  |
| k   | 0.00   | -10.21 |
| m   | -3.38  | -9.63  |
| n   | -6.38  | -7.98  |
| p   | -8.66  | -5.41  |
| q   | -9.96  | -2.24  |
| r   | -10.13 | +1.17  |
| s   | -9.19  | +4.45  |

| Ctc | X     | Y     |
|-----|-------|-------|
| t   | -7.24 | +7.19 |
| u   | -4.39 | +9.22 |
| v   | 0.00  | +8.59 |
| w   | +3.73 | +5.66 |
| x   | +6.02 | +3.10 |
| y   | +6.78 | -0.25 |
| z   | +5.79 | -3.53 |
| AA  | +3.33 | -5.92 |
| BB  | 0.00  | -6.78 |
| CC  | -3.33 | -5.92 |
| DD  | -5.79 | -3.53 |
| EE  | -6.78 | -0.25 |
| FF  | -6.02 | +3.10 |
| GG  | -3.73 | +5.66 |
| HH  | 0.00  | +5.08 |
| JJ  | +2.67 | +2.39 |
| KK  | +3.43 | -1.04 |
| LL  | 0.00  | -3.35 |
| MM  | -3.43 | -1.04 |
| NN  | -2.67 | +2.39 |
| PP  | 0.00  | 0.00  |

# 8D SERIES

## 8D Series

# Derived Series

|                                                |     |
|------------------------------------------------|-----|
| ■ High speed solutions:                        |     |
| Twinax and Quadrax contacts .....              | 86  |
| BMA coaxial contacts .....                     | 92  |
| ELIO® fiber optic contacts .....               | 96  |
| ELIOBEAM fiber optic contacts .....            | 102 |
| ■ Power solutions:                             |     |
| Power contacts .....                           | 106 |
| High power contacts .....                      | 111 |
| ■ Compact solutions:                           |     |
| High density .....                             | 116 |
| Plug with integrated backshell .....           | 118 |
| ■ Smart design solutions:                      |     |
| High vibration plug: 8DV Series .....          | 122 |
| Receptacle with clinch nuts or helicoils ..... | 126 |
| ■ PC tail contacts solutions:                  |     |
| Double flange receptacle .....                 | 129 |
| PCB contacts without shoulder .....            | 132 |
| ■ Reinforced sealing:                          |     |
| Resin sealed connector .....                   | 134 |
| Glass sealed connector .....                   | 137 |



## Description

- Front and rear removable versions available
- Twinax: crimp version available
- Quadrax: crimp and PC tail versions available
- Standard #8 cavity insertion and removal tools
- Ground connection of the cable braid to the shell possible through the external shell of the #8 contact
- Compatible with star quad cable
- Characteristic impedance of 100 Ohms
- Mixed layouts not grounded

## Technical features

### Mechanical

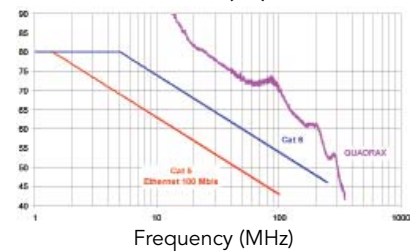
- **Operating temperature:**  
-65°C up to 150°C
- **Inner contact:**  
copper alloy
- **Contact body:**  
copper alloy
- **Contact insulator:**  
thermoplastic resin
- **Contact plating:**  
gold over nickel
- **Shell plating:**
  - . Aluminum shell:
    - Cadmium olive drab (W)
    - Nickel (F)
    - Black zinc nickel (Z)
    - Green zinc cobalt (ZC)
  - . Composite shell:
    - Cadmium olive drab (J)
    - Nickel (M)
    - Without plating (X)
  - . Stainless steel shell:
    - Passivated (K)
    - Nickel (S)
  - . Titanium shell:
    - Without plating (TT)
    - Nickel (TF)
  - . Bronze shell:
    - Without plating

### Electrical

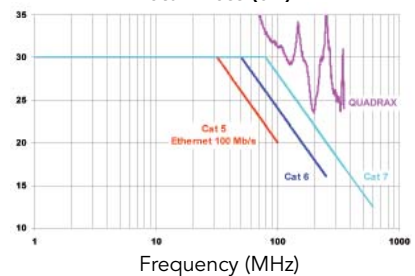
- **ISO/IEC 11801 category 6 compliant:**
  - . Next (cross talk): > 46 db at 250 MHz
  - . Return loss: > 16 db at 250 MHz
  - . Shield effectiveness: > 36 db at 80 MHz
- **Contact to shell continuity:**  
< 10 mΩ
- **Contact resistance (low level):**
  - . Initial 15 mΩ
  - . After tests 30 mΩ
- **Dielectric withstanding voltage:**

| Altitude  | Service I |
|-----------|-----------|
| sea level | 500 Vrms  |
| 21 000 m  | 125 Vrms  |
- **Insulation resistance:**
  - . At ambient temperature: > 5000 MΩ
  - . At high temperature: > 1000 MΩ
- **#24 contact cable size acceptance:**  
AWG 22 to AWG 26

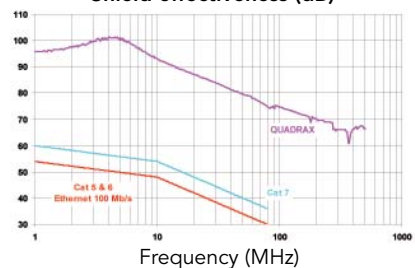
Next (dB)



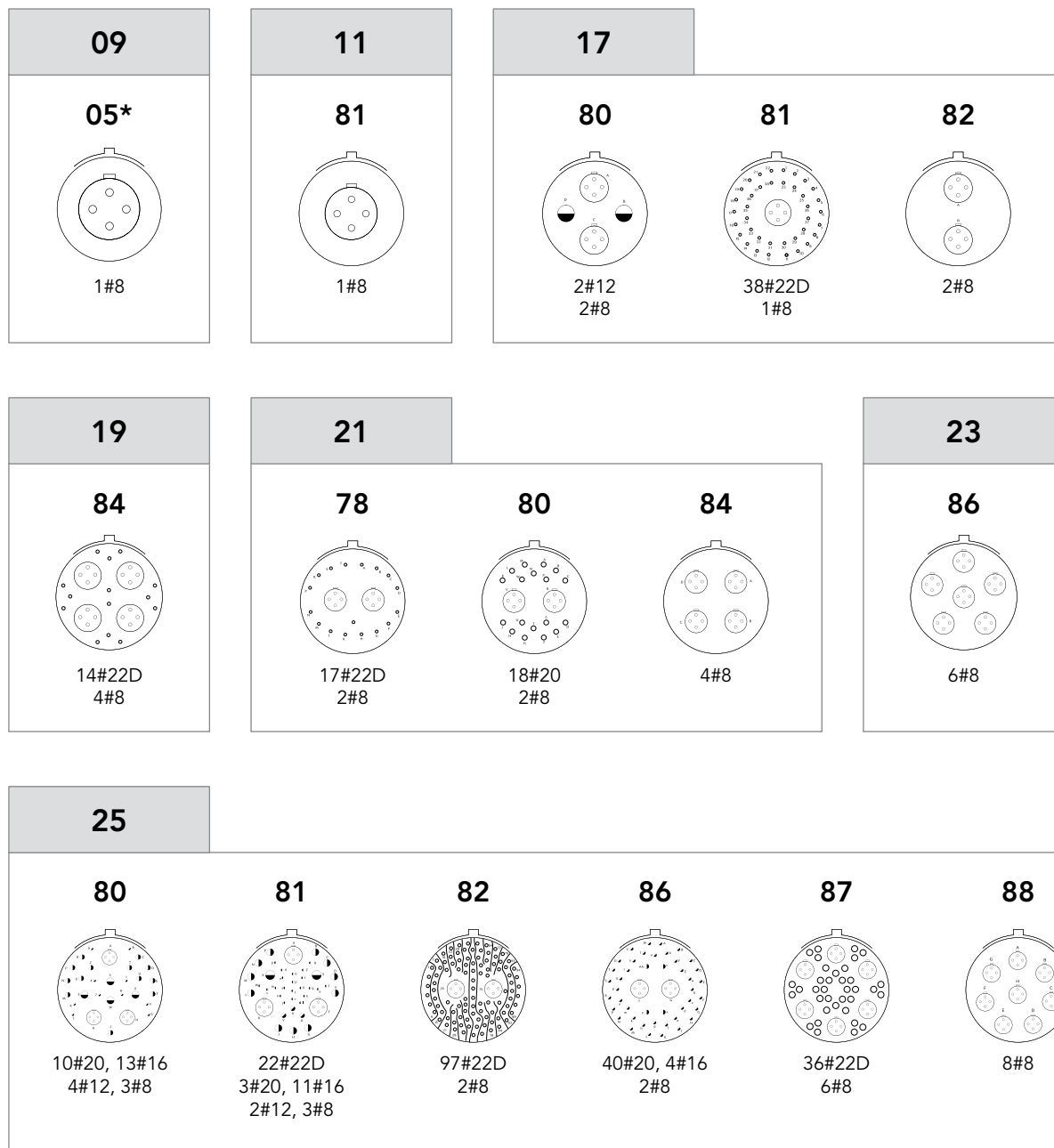
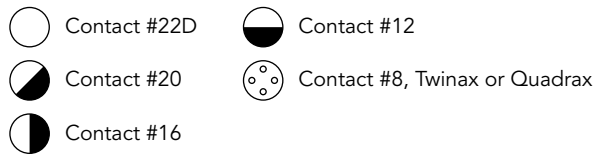
Return loss (dB)



Shield effectiveness (dB)



## Contact layouts



\* 09-05 layout with twinax or quadrax contact:  
 - grounded version only  
 - plug with female contact & receptacle with male contact only

Note: Mixed layouts not grounded.

## Ordering information

### Aluminum, Composite, Stainless steel & Titanium connector

| Basic Series                                                                                                       | 8D | 0 | Q | 11 | W                                                        | 81 | P | N | 284 | L |
|--------------------------------------------------------------------------------------------------------------------|----|---|---|----|----------------------------------------------------------|----|---|---|-----|---|
| <b>Shell style:</b>                                                                                                |    |   |   |    |                                                          |    |   |   |     |   |
| 0: Square flange receptacle                                                                                        |    |   |   |    |                                                          |    |   |   |     |   |
| 5: Plug                                                                                                            |    |   |   |    |                                                          |    |   |   |     |   |
| 7: Jam nut receptacle                                                                                              |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Type:</b>                                                                                                       |    |   |   |    |                                                          |    |   |   |     |   |
| C: Quadrax PC tail contacts*                                                                                       |    |   |   |    |                                                          |    |   |   |     |   |
| Q: Quadrax crimp contacts                                                                                          |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Shell size: 9 - 11 - 17 - 19 - 21 - 23 - 25</b> (see next page)                                                 |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Plating:</b>                                                                                                    |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Aluminum shell:</b>                                                                                             |    |   |   |    | <b>Composite shell:</b>                                  |    |   |   |     |   |
| W: Olive green cadmium                                                                                             |    |   |   |    | J: Olive green cadmium                                   |    |   |   |     |   |
| F: Nickel                                                                                                          |    |   |   |    | M: Nickel                                                |    |   |   |     |   |
| Z: Black zinc nickel                                                                                               |    |   |   |    | X: Without plating                                       |    |   |   |     |   |
| ZC: Green zinc cobalt                                                                                              |    |   |   |    | <b>Titanium shell:</b>                                   |    |   |   |     |   |
| <b>Stainless steel shell:</b>                                                                                      |    |   |   |    | TF: Nickel                                               |    |   |   |     |   |
| K: Passivated                                                                                                      |    |   |   |    | TT: Without plating                                      |    |   |   |     |   |
| S: Nickel                                                                                                          |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Contact layout:</b> See previous page                                                                           |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Contact type:</b>                                                                                               |    |   |   |    |                                                          |    |   |   |     |   |
| P: Pin                                                                                                             |    |   |   |    |                                                          |    |   |   |     |   |
| S: Socket                                                                                                          |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Orientation: N, A, B, C, D &amp; E</b>                                                                          |    |   |   |    |                                                          |    |   |   |     |   |
| <b>Specification:</b>                                                                                              |    |   |   |    |                                                          |    |   |   |     |   |
| 284: Quadrax grounded PC tail contact (100Ω)*                                                                      |    |   |   |    | 550: Tin plated Quadrax not grounded PCB contact SnPb    |    |   |   |     |   |
| 308: Quadrax not grounded PC tail contact (100Ω)                                                                   |    |   |   |    | 550S: Tin plated Quadrax not grounded PCB contact SAC305 |    |   |   |     |   |
| 384: Quadrax grounded crimp contact (150Ω)*                                                                        |    |   |   |    | 550E: Tin plated Quadrax not grounded PCB contact Sn pur |    |   |   |     |   |
| 408: Quadrax not grounded crimp contact (150Ω)                                                                     |    |   |   |    |                                                          |    |   |   |     |   |
| 620: Quadrax grounded crimp contact (100Ω)*                                                                        |    |   |   |    |                                                          |    |   |   |     |   |
| 621: Quadrax not grounded crimp contact (100Ω)                                                                     |    |   |   |    |                                                          |    |   |   |     |   |
| L: For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation |    |   |   |    |                                                          |    |   |   |     |   |

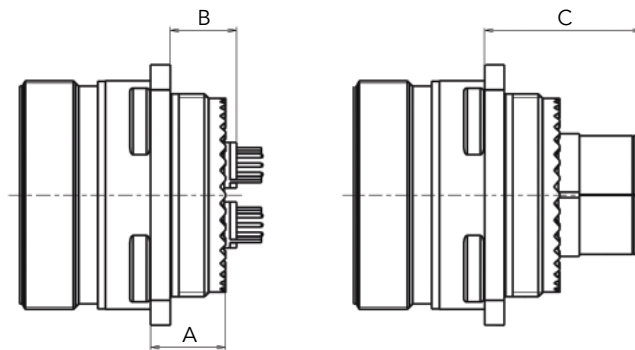
### Bronze connector

| Basic Series                                                                                                       | JVS | C | 00A | 09 | 35                                                       | P | N | 284 | L |
|--------------------------------------------------------------------------------------------------------------------|-----|---|-----|----|----------------------------------------------------------|---|---|-----|---|
| <b>Type:</b>                                                                                                       |     |   |     |    |                                                          |   |   |     |   |
| C: Quadrax PC tail contacts*                                                                                       |     |   |     |    |                                                          |   |   |     |   |
| Q: Quadrax crimp contacts                                                                                          |     |   |     |    |                                                          |   |   |     |   |
| <b>Shell style:</b>                                                                                                |     |   |     |    |                                                          |   |   |     |   |
| 00A: Square flange receptacle                                                                                      |     |   |     |    |                                                          |   |   |     |   |
| 16A: Plug                                                                                                          |     |   |     |    |                                                          |   |   |     |   |
| 07A: Jam nut receptacle                                                                                            |     |   |     |    |                                                          |   |   |     |   |
| <b>Shell size: 9 - 11 - 17 - 19 - 21 - 23 - 25</b> (see next page)                                                 |     |   |     |    |                                                          |   |   |     |   |
| <b>Contact layout:</b> See previous page                                                                           |     |   |     |    |                                                          |   |   |     |   |
| <b>Contact type:</b>                                                                                               |     |   |     |    |                                                          |   |   |     |   |
| P: Pin                                                                                                             |     |   |     |    |                                                          |   |   |     |   |
| S: Socket                                                                                                          |     |   |     |    |                                                          |   |   |     |   |
| <b>Orientation: N, A, B, C, D &amp; E</b>                                                                          |     |   |     |    |                                                          |   |   |     |   |
| <b>Specification:</b>                                                                                              |     |   |     |    |                                                          |   |   |     |   |
| 284: Quadrax grounded PC tail contact (100Ω)*                                                                      |     |   |     |    | 550: Tin plated Quadrax not grounded PCB contact SnPb    |   |   |     |   |
| 308: Quadrax not grounded PC tail contact (100Ω)                                                                   |     |   |     |    | 550S: Tin plated Quadrax not grounded PCB contact SAC305 |   |   |     |   |
| 384: Quadrax grounded crimp contact (150Ω)*                                                                        |     |   |     |    | 550E: Tin plated Quadrax not grounded PCB contact Sn pur |   |   |     |   |
| 408: Quadrax not grounded crimp contact (150Ω)                                                                     |     |   |     |    |                                                          |   |   |     |   |
| 620: Quadrax grounded crimp contact (100Ω)*                                                                        |     |   |     |    |                                                          |   |   |     |   |
| 621: Quadrax not grounded crimp contact (100Ω)                                                                     |     |   |     |    |                                                          |   |   |     |   |
| L: For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation |     |   |     |    |                                                          |   |   |     |   |

\* For PC tail contacts or grounded versions please consult us.

## Dimensions

### Square flange receptacle - Type 0

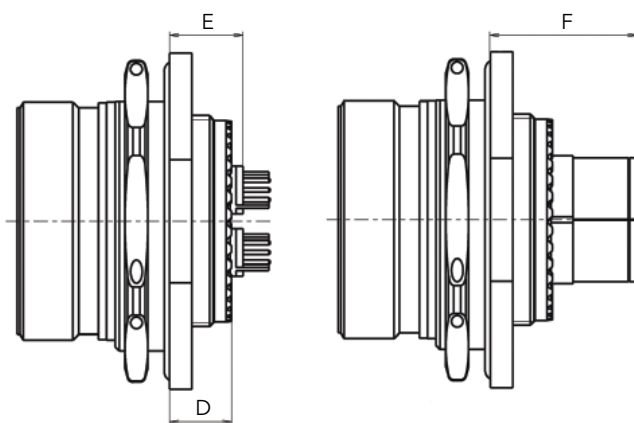


PC Tail contacts

Crimp contacts

| Shell size | A Max    |           |                                    | B Min    |           |                                    | B Max    |           |                                    | C Max         |
|------------|----------|-----------|------------------------------------|----------|-----------|------------------------------------|----------|-----------|------------------------------------|---------------|
|            | Aluminum | Composite | Stainless steel, Titanium & Bronze | Aluminum | Composite | Stainless steel, Titanium & Bronze | Aluminum | Composite | Stainless steel, Titanium & Bronze | All materials |
| 11 to 19   | 10.72    | 11.96     | 11.4                               | 11.5     | 12.5      | 12                                 | 13.5     | 13.5      | 14                                 | 29            |
| 21 to 25   | 11.54    | 12.76     | 11.8                               | 12       | 14.5      | 12.5                               | 14       | 15.5      | 14.5                               | 30            |

### Jam nut receptacle - Type 7

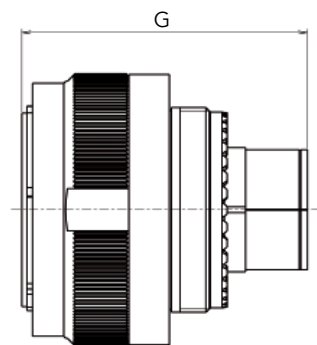


PC Tail contacts

Crimp contacts

| Material   | Aluminum, Stainless steel, Titanium & Bronze |       |       |       |
|------------|----------------------------------------------|-------|-------|-------|
| Shell size | D Max                                        | E Min | E Max | F Max |
| 11 to 25   | 9.9                                          | 9.5   | 12    | 27    |

### Plug - Type 5

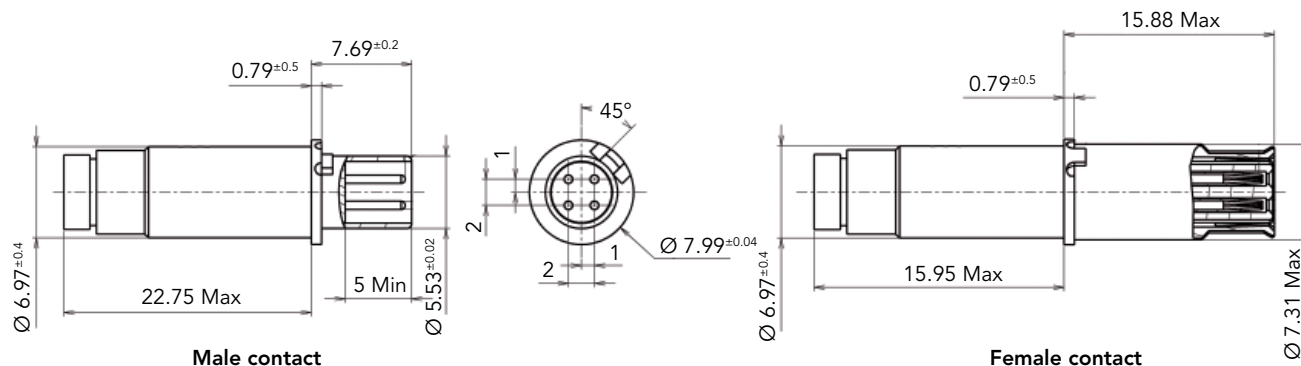


| All materials |       |
|---------------|-------|
| Shell size    | G Max |
| 11 to 25      | 48    |

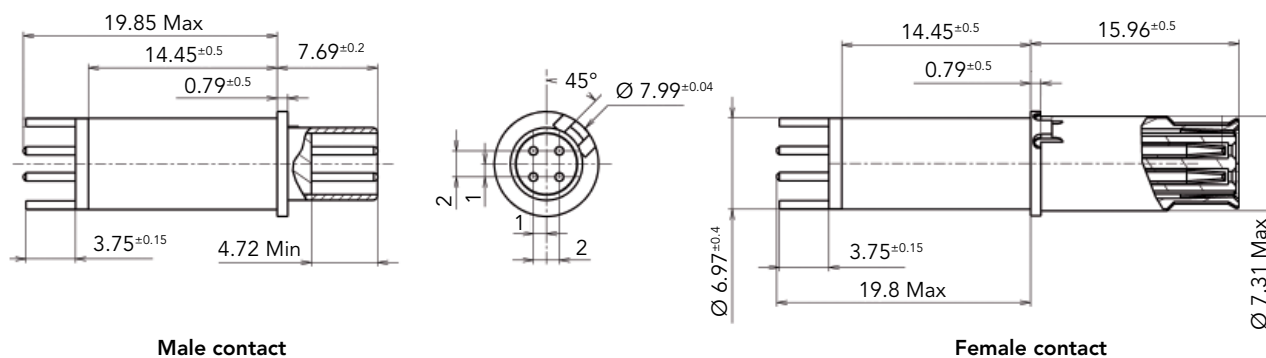
Note: All dimensions are in millimeters (mm)

## Dimensions

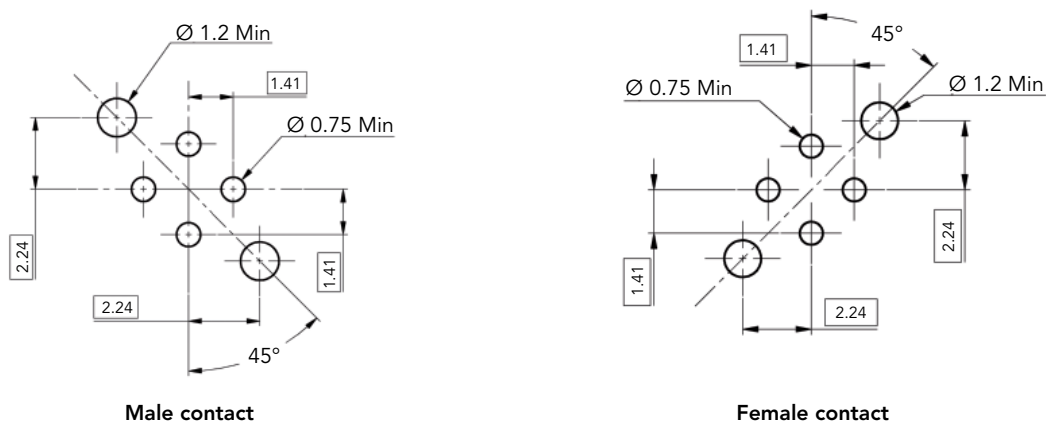
### Quadrax crimp contact



### Quadrax PCB contact

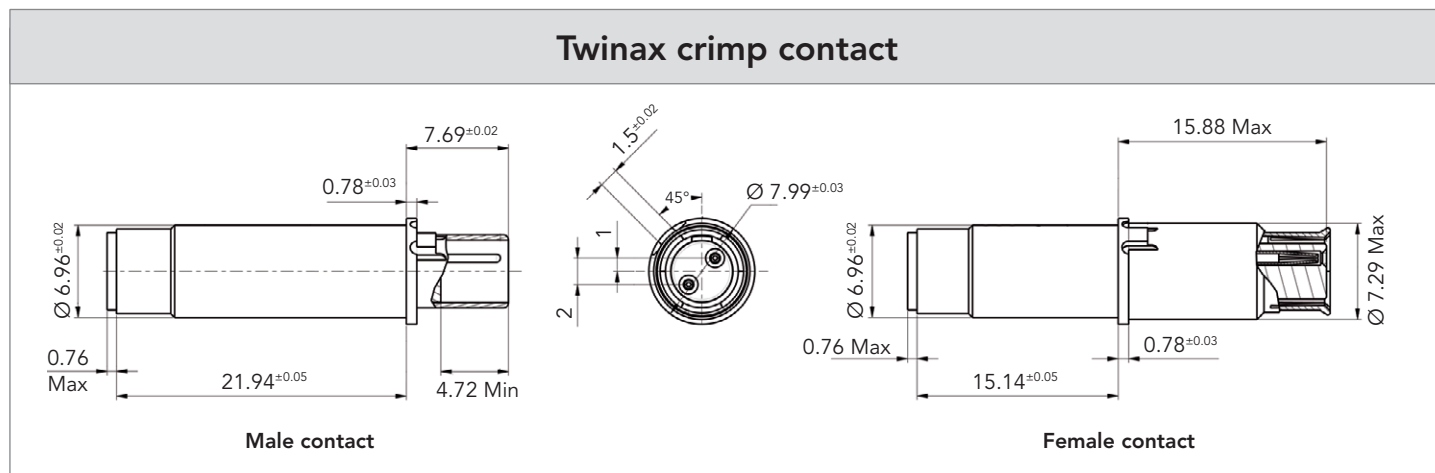


### Drill dimensions for PCB mount



Note: All dimensions are in millimeters (mm)

## Dimensions



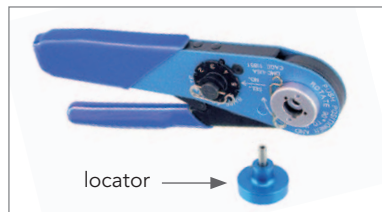
## Contact ordering information

In-line alignment key. All crimp contacts are sealed thru a sealing boot. Crimp contacts ordered separately are delivered with sealing boot.

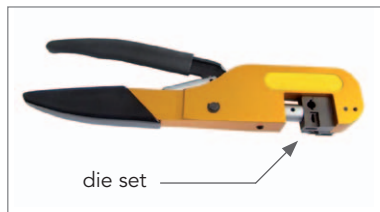
| Contact type    |                                    |        | SOURIAU part number | Cross Norm  | Impedance | Release | T° Max |
|-----------------|------------------------------------|--------|---------------------|-------------|-----------|---------|--------|
| Quadrax contact | PC tail<br>L= 4 <sup>±0.1</sup> mm | Pin    | ETH1-1237A          | -           | 100Ω      | Rear    | 125°C  |
|                 |                                    |        | ETH1-1501A          | -           | 150Ω      | Rear    | 125°C  |
|                 |                                    | Socket | ETH1-1238A          | -           | 100Ω      | Rear    | 125°C  |
|                 |                                    |        | ETH1-1502A          | -           | 150Ω      | Rear    | 125°C  |
|                 | Crimp                              | Pin    | ETH1-1345A          | EN 3155-074 | 100Ω      | Rear    | 150°C  |
|                 |                                    |        | ETH1-1503A          | -           | 150Ω      | Rear    | 150°C  |
|                 |                                    | Socket | ETH1-1346A          | EN 3155-075 | 100Ω      | Rear    | 150°C  |
|                 |                                    |        | ETH1-1504A          | -           | 150Ω      | Rear    | 150°C  |
| Twinax contact  | Crimp                              | Pin    | ETH2-110A           | -           | 100Ω      | Rear    | 150°C  |
|                 |                                    | Socket | ETH2-111A           | -           | 100Ω      | Rear    | 150°C  |

## Tooling

- Inner contacts: M22520/2-01 crimping tool and K709 locator



- Outer body: M22520/5-01 crimping tool and M22520/5-45 die set



- Insertion/extraction tool, standard size 8 cavity tools: 8660-197 (metallic) or M81969/14-06 (plastic)



## Recommended cable

| Impedance | Reference     | Cable type | Number of pairs |
|-----------|---------------|------------|-----------------|
| 100Ω      | ABS 1503 KD24 | Star quad  | 2               |

Note: All dimensions are in millimeters (mm)

## Description

- Quick screw coupling D38999 connector
- Shell available in aluminum, composite, Stainless steel, Titanium & Bronze
- 16 layouts available with coaxial contact
- High Frequency coaxial contact: DC 18GHz
- Qualified coaxial contact according to MIL-STD-348A/321
- Removable coaxial contact
- Contacts delivered with boots

## Technical features

### BMA contact features



### Electrical

- **Impedance:** 50Ω
- **Frequency range:** DC 18GHz
- **Dielectric withstanding voltage:** 1.5 kVrms, 50Hz (at sea level)
- **Insulation resistance:** ≥ 5 000 MΩ
- **Contact resistance:**
  - . center contact: ≤ 2 mΩ
  - . outer contact: ≤ 2 mΩ
- **Return loss (DC-18GHz):** < -17dB (mated connector)
- **RF leakage interface only (fully mated):** ≥ 90 dB f (GHz) measured at interface with reference planes being in true alignment.
- **RF testing voltage:** 1.0 kVrms, 5 MHz (at sea level)
- **Admissible power:** ≤ 300 W at 3 GHz (at sea level & room T°)

### Environmental

- **Temperature range:** -65°C +125°C
- **Thermal shock:** MIL-STD-202, method 107, condition B

- **Moisture resistance:** MIL-STD-202, method 106
- **Corrosion:** Salt spray test according to MIL-STD-202, method 101, condition B
- **Vibration:** MIL-STD-202, method 204, condition D
- **Shock:** MIL-STD-202, method 213, condition I

/!\ Caution: be careful that your application doesn't exceed contact specification.

## Connector features

### Mechanical

- **Shell material & plating:**
  - . Aluminum: Cadmium olive drab (W)  
Nickel (F)  
Black zinc nickel (Z)  
Green zinc cobalt (ZC)
  - . Composite: Cadmium olive drab (J)  
Nickel (M)  
Without plating (X)
  - . Stainless steel: Passivated (K)  
Nickel (S)
  - . Titanium: Without plating (TT)  
Nickel (TF)
  - . Bronze: Without plating
- **Insulator:** Thermoplastic
- **Grommet and interfacial seal:** Silicone elastomer
- **Contact endurance:** 1000 mating cycles
- **Connector endurance:** 500 mating cycles

- **Shock:** 300g, 3 ms (EN 2591-D2 method A)
- **Vibration:**
  - . Sinus:
    - . 10 à 2000 Hz, 3x12 hrs  
(60g, 140 - 2000 Hz) with T° cycling
  - . Random:
    - . 50 to 2000 Hz, 2x8 Hrs  
(1g2/ Hz, 100 - 2000Hz) at T° max.
    - . 25 to 2000 Hz, 2x8 Hrs  
(5g2/ Hz, 100 - 300Hz) at ambient T°

### Electrical

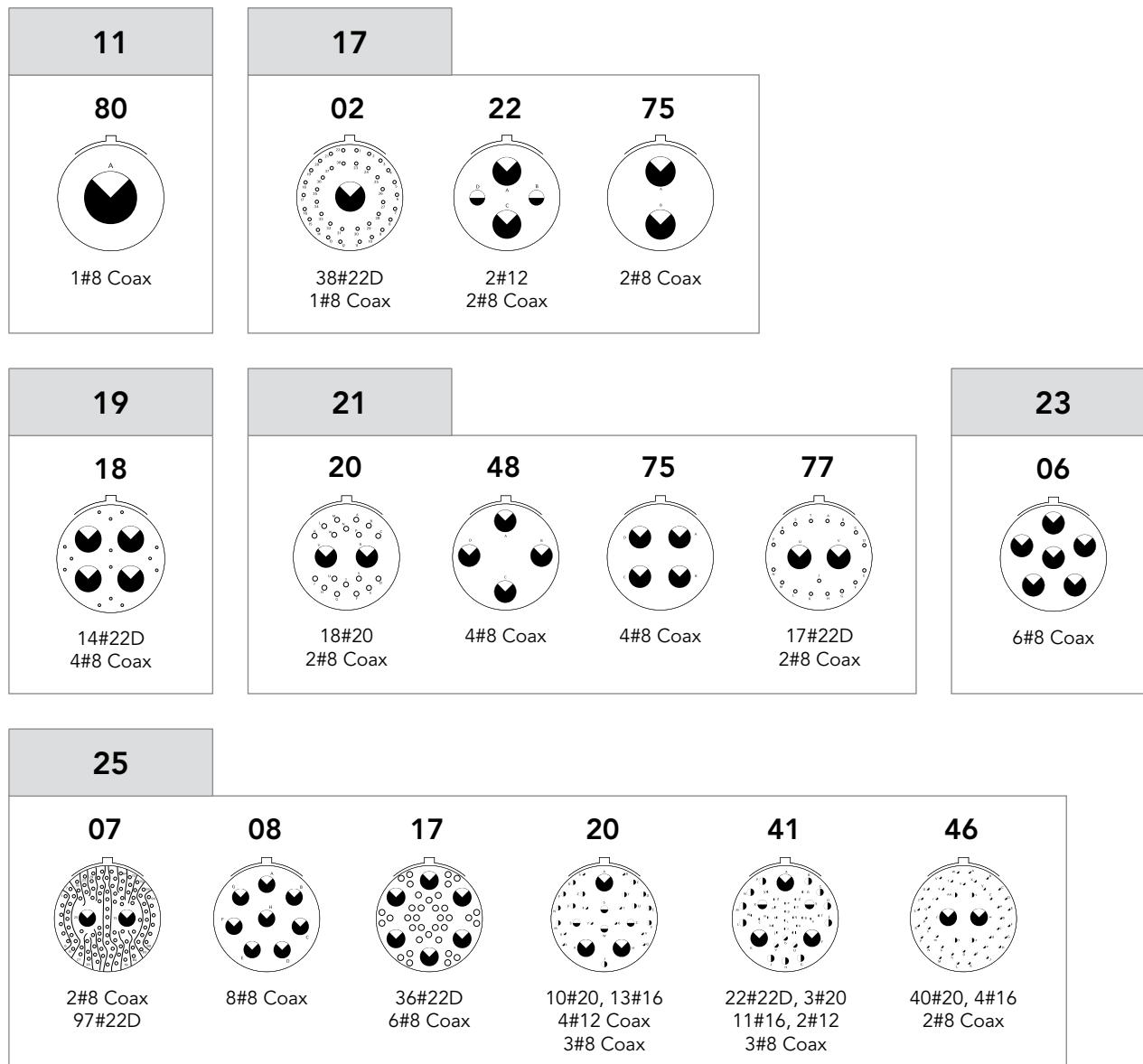
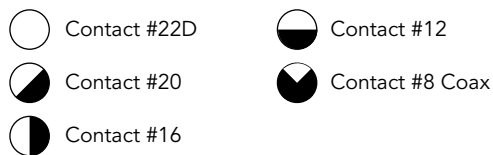
- **Shell continuity:**
  - . F, S & TF: 1 mΩ . J & M: 3 mΩ
  - . W, Z & ZC: 2.5 mΩ . Bronze: 5 mΩ
  - . K & TT: 10 mΩ
- **Shielding:**
  - . F & M: 85 db at 1 GHz
  - . K & TT: 45 db at 10 GHz
  - . W & Z: 50 db at 10 GHz
  - . F, S & TF: 65 db at 10 GHz
  - . Bronze: 85 db at 10 GHz
  - . J: 90 db at 10 GHz
  - . ZC: Consult us

### Environmental

- **Temperature range:**
  - . W, ZC, J, X & bronze: -65°C +175°C
  - . F, Z, M, K, S, TT & TF: -65°C +200°C
- **Salt spray:**
  - . F, S & TF: 48 Hours
  - . ZC: 250 Hours
  - . W, Z, K, TT & bronze: 500 Hours
  - . J, M & X: 2000 Hours

## Contact layouts

Specification 737 mandatory



## Ordering information

|                                                  |           |          |           |          |           |          |          |            |
|--------------------------------------------------|-----------|----------|-----------|----------|-----------|----------|----------|------------|
| <b>Basic Series</b>                              | <b>8D</b> | <b>0</b> | <b>25</b> | <b>W</b> | <b>46</b> | <b>P</b> | <b>N</b> | <b>737</b> |
| <b>Shell style:</b>                              |           |          |           |          |           |          |          |            |
| 0: Square flange receptacle                      |           |          |           |          |           |          |          |            |
| 1: In line receptacle                            |           |          |           |          |           |          |          |            |
| 7: Jam nut receptacle                            |           |          |           |          |           |          |          |            |
| 5: Plug with RFI shielding                       |           |          |           |          |           |          |          |            |
| <b>Shell size:</b>                               |           |          |           |          |           |          |          |            |
| 11, 17, 19, 21, 23, 25                           |           |          |           |          |           |          |          |            |
| <b>Aluminum plating:</b>                         |           |          |           |          |           |          |          |            |
| W: Olive drab cadmium                            |           |          |           |          |           |          |          |            |
| F: Nickel                                        |           |          |           |          |           |          |          |            |
| Z: Black zinc nickel                             |           |          |           |          |           |          |          |            |
| <b>Contact layout:</b>                           |           |          |           |          |           |          |          |            |
| See previous page                                |           |          |           |          |           |          |          |            |
| <b>Contact type:</b>                             |           |          |           |          |           |          |          |            |
| P: Pin                                           |           |          |           |          |           |          |          |            |
| S: Socket                                        |           |          |           |          |           |          |          |            |
| <b>Orientation:</b>                              |           |          |           |          |           |          |          |            |
| N, A, B, C, D, E                                 |           |          |           |          |           |          |          |            |
| <b>Specification (mandatory):</b>                |           |          |           |          |           |          |          |            |
| 737: Coaxial contacts - for .086" flexible cable |           |          |           |          |           |          |          |            |
| 747: Coaxial contacts - for .141" flexible cable |           |          |           |          |           |          |          |            |

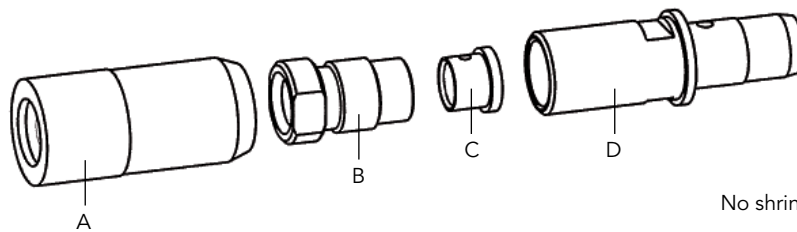
For other material and configuration (integrated clinch nuts, double flange, other cables, ...) please consult us.

## Recommended cables

| Designation          | Part number   | Description             |          |
|----------------------|---------------|-------------------------|----------|
| .086" flexible cable | Multiflex 86  | Outer conductor contact | Soldered |
| .141" flexible cable | Multiflex 141 |                         |          |

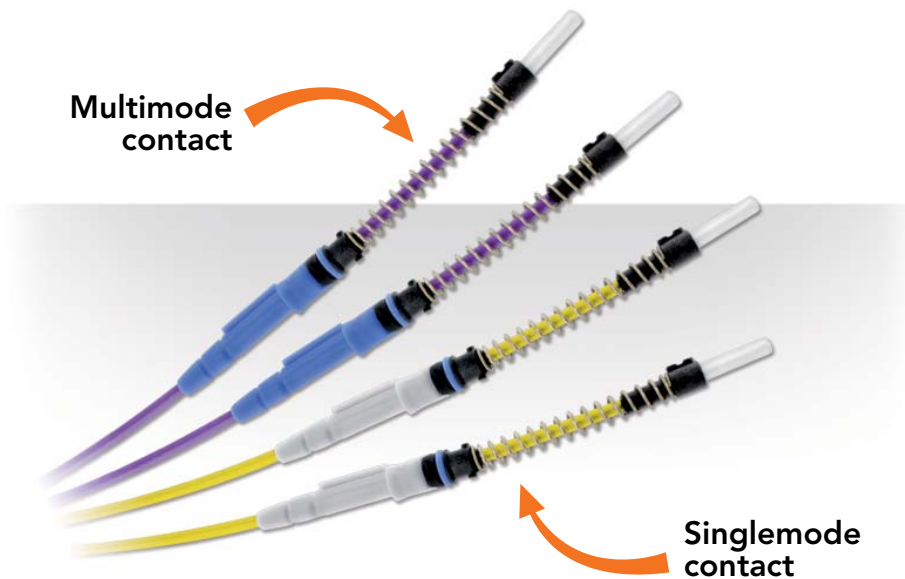
For other cables please consult us.

## Assembly instruction



No shrinking sleeve allowed.

| Picture | Process                                                                                                                                                                     | Feature / Check                                                                                                                                                 | Tools required                                                                                                                              |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|         | <p>Dip the cut length of cable in flux and tin.</p> <p>Cut the jacket to the braid. Remove jacket.</p>                                                                      | <p>The solder must flow at rear for min. 7 mm.</p>                                                                                                              | Stanley blade                                                                                                                               |
|         | <p>Remove cable dielectric and tinned braid according to diagram.</p> <p>Form tip of centre contact to a 90° cone.</p> <p>Slide Taper sleeve A and nipple B over cable.</p> | <p>Do not damage inner conductor, dielectric and braid of cable.</p>                                                                                            | Stanley blade<br>Tip trimmer                                                                                                                |
|         | <p>Slide ferrule C over cable, flush to dielectric.</p> <p>Solder at X.</p> <p>Avoid excessive heat, immediately cool down and clean with alcohol.</p>                      | <p>If the cable does not fit into the cable entry, use a flat-nose plier to calibrate the braid.</p> <p>Center conductor of cable must be exactly centered.</p> | Soldering iron<br>Solder<br>Flat-nose pliers                                                                                                |
|         | <p>Push prepared cable into connector body D and tighten nipple B.</p> <p>Taper sleeve A will be used for MIL-connector.</p>                                                | <p>Torque: 3 Nm.</p>                                                                                                                                            | <p>Male contact:<br/>Torque wrench AF.6 (3 Nm)<br/>Spanner AF.5.5</p> <p>Female contact:<br/>Torque wrench AF.6 (3 Nm)<br/>Spanner AF.6</p> |



## Description

- Robust spring-loaded butt-joint optical contact using ST style ferrule (diameter 2.5mm)
- Contact size equivalent to a #16 contact
- Anti-rotation of the contact for better vibration withstanding and optical performance
- Boot-grommet for rear sealing and protection of the cable against excessive bending
- Compatibility with loose and tight structure cables
- High level optical performance even after aging
- Bayonet locking system: no tool needed for mounting/dismounting
- Compatible with singlemode, multimode and POF cable

## Technical features

### Optical

- **Multimode contact - Insertion Loss (IL):**  
0.1dB typical  
< 0.3dB over 95% of the samples as per EN2591-601,  
< 0.7dB maximum on 100% of the samples after tests
- **Multimode contact - Return Loss (RL):**  
> 21dB before and after tests as per EN2591-605
- **Singlemode contact - Insertion Loss (IL):**  
0.3dB typical  
< 0.5dB over 95% of the samples as per EN2591-601,  
< 0.9dB maximum on 100% of the samples after tests
- **Singlemode contact - Return Loss (RL):**  
> 55dB typical and > 50dB minimum

### Mechanical

- **Endurance:**  
Minimum 500 mating/unmating operations
- **Vibration:**  
In MIL-DTL-38999 Series III/EN3645 connectors:  
• Sine 5Hz to 3000Hz as per EN2591-6403 method A  
• Random as per EN2591-6403 method B

- **Shock:**  
300g, 3 ms as per EN 2591-6402 method A
- **Cable cyclic flexing\*:**  
100 cycles, load 40N as per EN2591-609
- **Cable pulling\*:** 111N
- **Cable torsion\*:**  
100 cycles, load 40N as per EN2591-611

\* With multimode EN4641-100 cable and following the cabling process described in the "Technical Bulletin N°204 - ELIO® assembly wiring instructions" and the maintenance procedure in the document "Technical Bulletin N°170 - Fiber optics installation and maintenance procedure".

### Environmental

- **Salt spray:** See the connector standard
- **Temperature range\*:**  
- 65°C to +125°C (1000 hours)
- **Rapid temperature change:**  
10 cycles - 65°C / +150°C (30min/30min)
- **Air leakage:**  
Max leakage 16 cm³/h, 2 hours, 40kPa differential pressure
- **Damp heat and low temperature:**  
5 cycles of 48h -65°C/+70°C with stage at 40°C with 95% of humidity as per EN2591- 6303 method A

### Resistance to fluids

as per MIL-DTL-38999/EN3645 standard

- **Fuel:** JP5
- **Mineral Hydraulic fluid:**  
MIL-PRF-5606 ( NATO H-515)
- **Synthetic hydraulic fluid:**  
AS1241 (Skydrol 500B4, LD4)
- **Mineral lubricant:**  
MIL-PRF-7870 (NATO O-142)
- **Synthetic lubricant:**  
MIL-PRF-23699 (NATO O-156),  
MIL-PRF-7808 ( NATO O-148)
- **Cleaning fluid:**  
MIL-PRF-87937 diluted, Propanol, white spirit, Azeotrope R113 + Methanol
- **De-icing fluid:** AMS 1424 ( NATO S-742)
- **Extinguishing fluid:** Bromochloromethane
- **Cooling fluid:** Coolanol

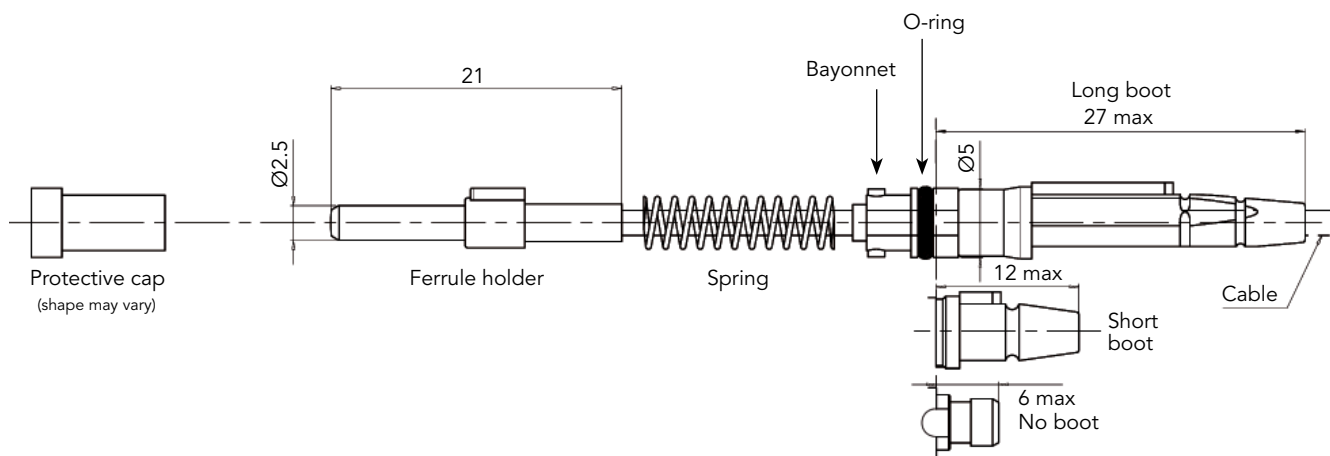
## Ordering information

### ELIO® multimode & singlemode contact

|                                                       | ELIO | 09N | G | L | A |
|-------------------------------------------------------|------|-----|---|---|---|
| <b>Cable external diameter &amp; Contact sealing:</b> |      |     |   |   |   |
| 09N: 0.9±0.1mm. Non waterproof                        |      |     |   |   |   |
| 18N: from 1.5mm to 1.9mm. Non waterproof              |      |     |   |   |   |
| 18W: 1.8±0.1mm. Waterproof                            |      |     |   |   |   |
| 20N: from 1.7mm to 2.1mm. Non waterproof              |      |     |   |   |   |
| 20W: 2.0±0.1mm. Waterproof                            |      |     |   |   |   |
| <b>Fibre type:</b>                                    |      |     |   |   |   |
| G: ELIO® Multimode                                    |      |     |   |   |   |
| E: ELIO® Singlemode                                   |      |     |   |   |   |
| <b>Boot type:</b>                                     |      |     |   |   |   |
| L: Long boot                                          |      |     |   |   |   |
| S: Short boot                                         |      |     |   |   |   |
| N: No boot (non waterproof version only)              |      |     |   |   |   |
| <b>Contact version index</b>                          |      |     |   |   |   |

Note: For ABS1379/EN4531 cross reference, please consult us.

### ELIO® contact dimensions



### Recommended cables

SOURIAU can offer a wide range of cables in its assemblies, from low cost to high performance aeronautical cables. ELIO® contact is compatible with singlemode and multimode cable, with tactical and breakout cable. ELIO® contact is suitable with loose and tight structure cable.

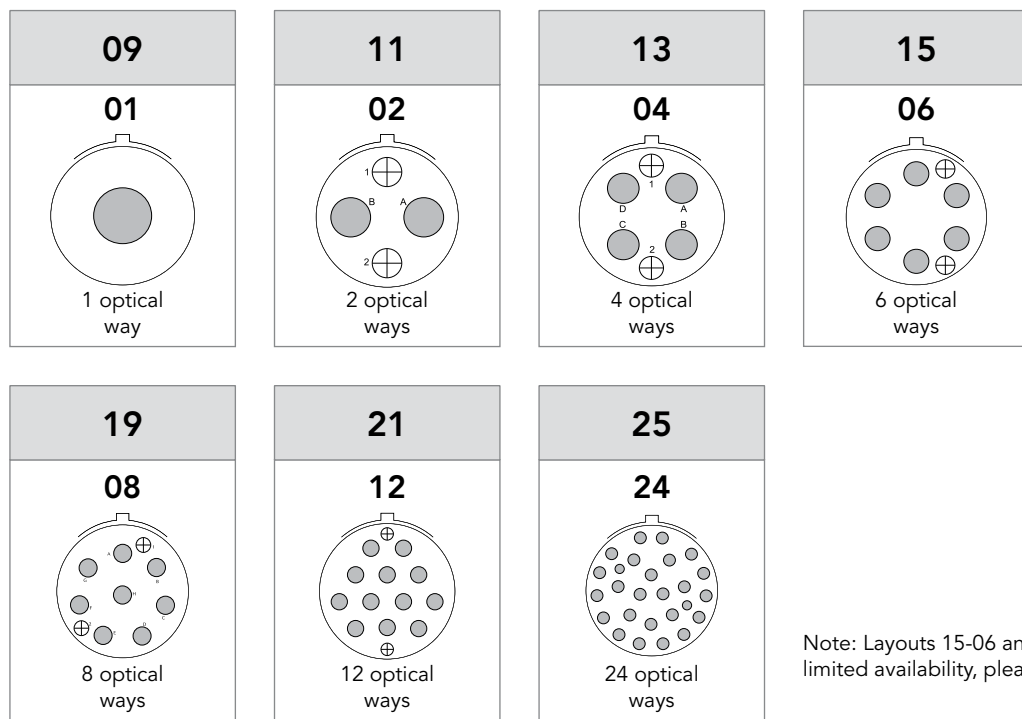
See SOURIAU "ELIO® Fiber Optic Technology» catalog.



## MIL-DTL-38999 Series III/EN3645 with ELIO® high density insert

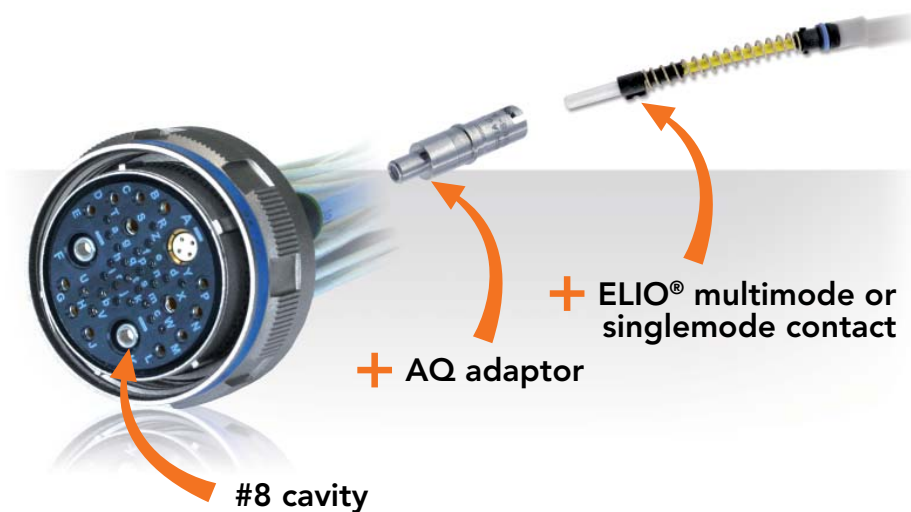
- Standard MIL-DTL-38999/EN3645 shells without shielding ring (aluminum, composite, stainless steel, bronze)
- Environmental performance as per EN4531 based on MIL-DTL-38999/EN3645
- Temperature range: - 65°C to +125°C (cable limitation)

## Contact layouts



## Ordering information, Accessories & Tooling

See SOURIAU "ELIO® Fiber Optic Technology» catalog.

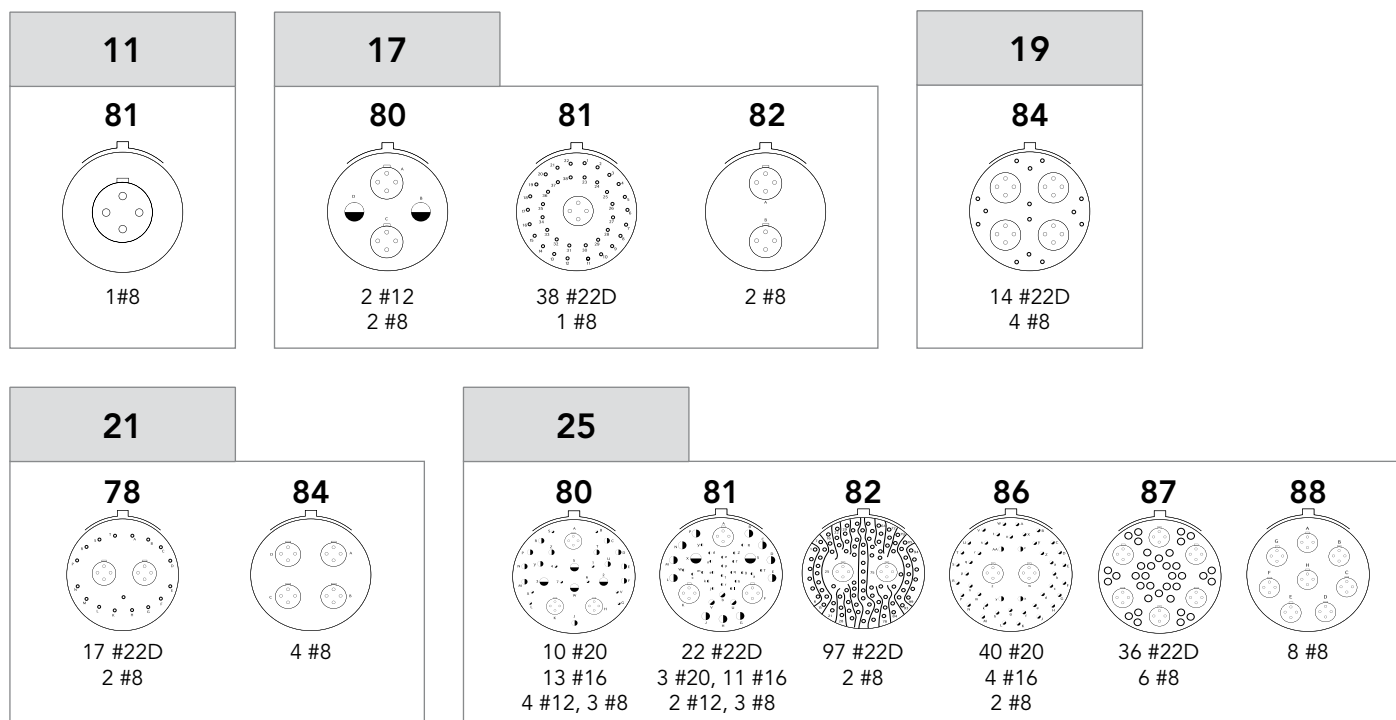


## MIL-DTL-38999 Series III/EN3645

with ELIO® contact multimode or singlemode + ELIO® AQ Adaptor for Quadrax #8 cavities

- ELIO® AQ is an adaptor to enable the ELIO® contact to fit in any #8 cavities
- Multiple possibilities to mix optical and electrical signals in the same insert
- Compatible with standard MIL-DTL-38999 Series III/EN3645 connectors (aluminum, composite, stainless steel, bronze)
- Design ensures ELIO® optical performance
- Environmental performance as per MIL-DTL-38999 and EN3645 standard
- Temperature range: - 65°C to +150°C (cable limitation)

## Contact layouts

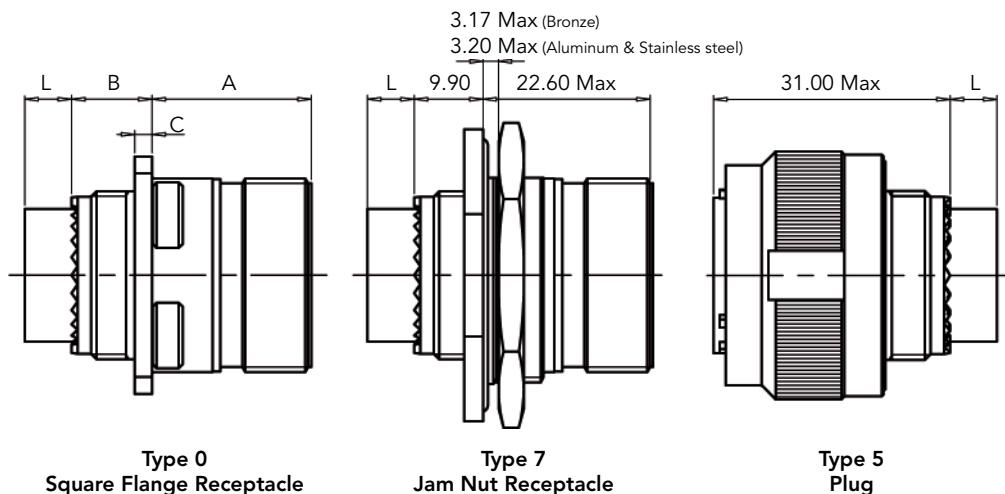


## Ordering information, Accessories & Tooling

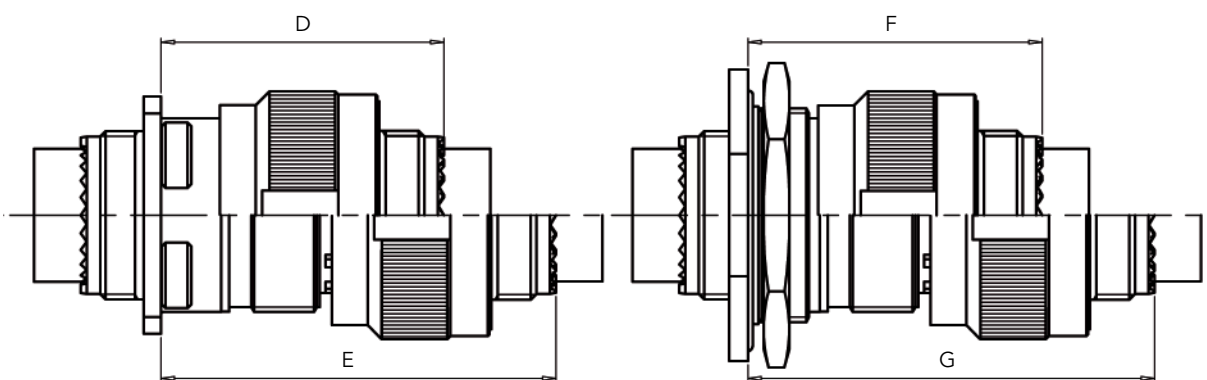
See SOURIAU "ELIO® Fiber Optic Technology» catalog.

## Dimensions

### Plug and receptacles - mated / unmated



|                             | A                   |               | B                   |               | C                   |               | L              |                  |
|-----------------------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|----------------|------------------|
|                             | Shell size 09 to 19 | Shell size 25 | Shell size 09 to 19 | Shell size 25 | Shell size 09 to 19 | Shell size 25 | Male insulator | Female insulator |
| Receptacle Type 0 & 7 Metal | 20.90 Max           | 20.10 Max     | 12.50 Max           | 13.00 Max     | 2.50 Max            | 3.20 Max      | 4 Max          | 6.60 Max         |
| Receptacle Type 0 Composite | 20.90 Max           | 20.10 Max     | 12.50 Max           | 13.00 Max     | 3.65 Max            | 4.35 Max      |                |                  |

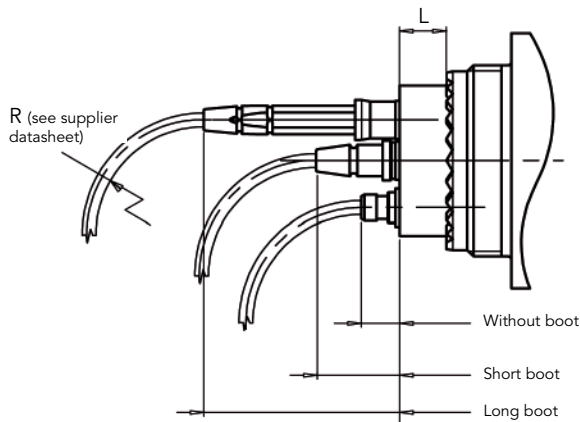


|                                    | D                   |               | E                   |               | F                   |                     | G                   |                     |
|------------------------------------|---------------------|---------------|---------------------|---------------|---------------------|---------------------|---------------------|---------------------|
|                                    | Shell size 09 to 19 | Shell size 25 | Shell size 09 to 19 | Shell size 25 | Shell size 09 to 11 | Shell size 13 to 25 | Shell size 09 to 11 | Shell size 13 to 25 |
| Plug + Receptacle Type 0 & 7 Metal | 37.00 Max           | 36.50 Max     | 52.30 Max           | 51.50 Max     | 39.00 Max           | 39.00 Max           | 54.00 Max           | 54.00 Max           |
| Plug + Receptacle Type 0 Composite | 37.00 Max           | 36.50 Max     | 52.30 Max           | 51.50 Max     | N/A                 | N/A                 | N/A                 | N/A                 |

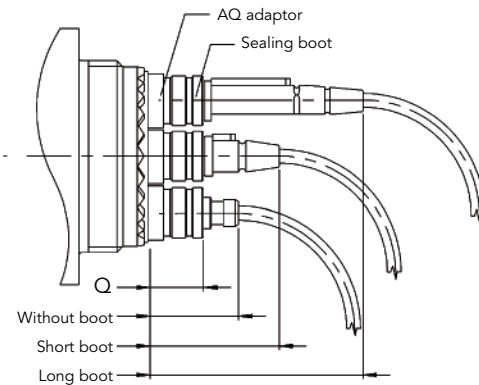
Note: All dimensions are in millimeters (mm)

## Lengths - connectors with contacts

### 38999 Series III/EN3645 with ELIO® contacts in ELIO® high-density insert



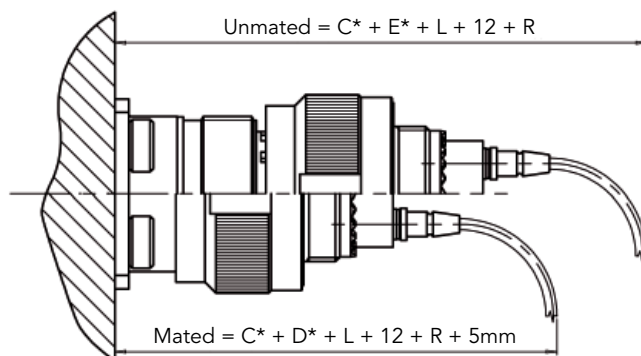
### 38999 Series III/EN3645 with ELIO® contacts in ELIO® AQ adaptors



|                          | ELIO® high density insert |                  |                |            |           | ELIO® AQ adaptors |                  |                |                  |                |                  |                |                  |
|--------------------------|---------------------------|------------------|----------------|------------|-----------|-------------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|
|                          | L                         |                  | Contact length |            |           | Q                 |                  | Contact length |                  |                |                  |                |                  |
|                          | Male insulator            | Female insulator | Without boot   | Short boot | Long boot | Male insulator    | Female insulator | Long boot      |                  | Short boot     |                  | Without boot   |                  |
|                          |                           |                  |                |            |           |                   |                  | Male insulator | Female insulator | Male insulator | Female insulator | Male insulator | Female insulator |
| Plug                     |                           |                  |                |            |           | 12 Max            | 9.5 Max          | 34.5 Max       | 32 Max           | 19.5 Max       | 17 Max           | 12.5 Max       | 10 Max           |
| Square flange receptacle | 4 Max                     | 6.60 Max         | 6 Max          | 12 Max     | 27 Max    | 12.5 Max          | 10 Max           | 35 Max         | 32.5 Max         | 20 Max         | 17.5 Max         | 13 Max         | 10.5 Max         |
| Jam nut receptacle       |                           |                  |                |            |           | 12 Max            | 9.5 Max          | 34.5 Max       | 32 Max           | 19.5 Max       | 17 Max           | 12.5 Max       | 10 Max           |

### Total length example

Square flange receptacle + plug + ELIO® contacts in ELIO® high-density insert



\* See previous page

## ELIOBEAM contacts

- Anti-rotation of the contact for better vibration withstanding and optical performance
- Boot-grommet for rear sealing and protection of the cable against excessive bending
- Compatibility with loose and tight structure cables
- High level optical performance even after aging
- Bayonet locking system: no tool needed for mounting/dismounting
- Compatible with singlemode and multimode cables



EN4531 Style

ABS1379 Style

## Technical features

### Mechanical

- **Endurance:**  
Minimum 500 mating/unmating operations
- **Shock:**  
300 g, 3ms as per EN 2591-6402 method A
- **Vibration:**  
In MIL-DTL-38999 Series III/EN3645 connectors:  
- Sine 5Hz to 3000Hz as per EN2591-6403 method A  
- Random as per EN2591-6403 method B
- **Cable cyclic flexing\*:**  
100 cycles, load 40N as per EN2591-609
- **Cable pulling\*:** 111N
- **Cable torsion\*:**  
100 cycles, load 40N as per EN2591-611

### Environmental

- **Salt spray:** See the connector standard
- **Temperature range\*:**  
- 65°C to +125°C (1000 hours)
- **Rapid temperature change:**  
10 cycles - 65°C / +150°C (30min/30min)
- **Air leakage:**  
Max leakage 16 cm<sup>3</sup>/h, 2 hours, 40kPa differential pressure
- **Damp heat and low temperature:**  
5 cycles of 48h -65°C/+70°C with stage at 40°C with 95% of humidity as per EN2591- 6303 method A

### Optical

- **Multimode contact - Insertion Loss (IL):**  
< 0.7dB mean 95% of the samples as per EN2591-601,  
< 1.0dB maximum on 100% of the samples after tests
- **Multimode contact - Return Loss (RL):**  
> 16dB before and after tests as per EN2591-605

### Resistance to fluids as per MIL-DTL-38999/EN3645 standard

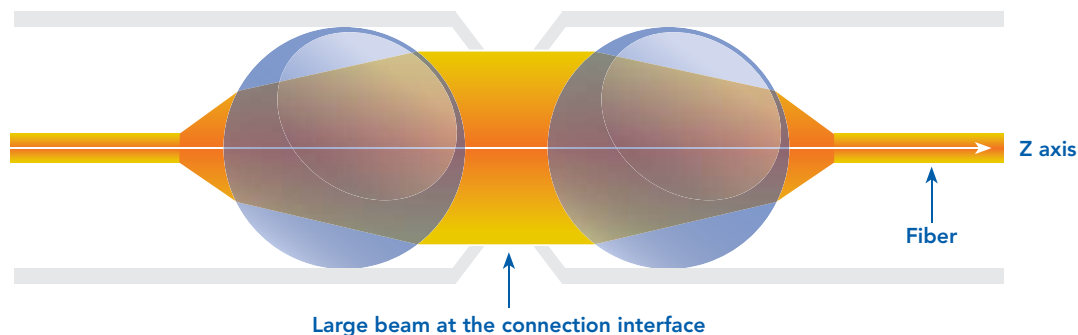
- **Fuel:** JP5
- **Mineral Hydraulic fluid:**  
MIL-PRF-5606 ( NATO H-515)
- **Synthetic hydraulic fluid:**  
AS1241 (Skydrol 500B4, LD4)
- **Mineral lubricant:**  
MIL-PRF-7870 (NATO O-142)
- **Synthetic lubricant:**  
MIL-PRF-23699 (NATO O-156),  
MIL-PRF-7808 ( NATO O-148)
- **Cleaning fluid:**  
MIL-PRF-87937 diluted, Propanol, white spirit, Azeotrope R113 + Methanol
- **De-icing fluid:** AMS 1424 ( NATO S-742)
- **Extinguishing fluid:** Chlorobromomethane
- **Cooling fluid:** Coolanol

\* With multimode EN4641-100 and EN4641-301 cables and following the maintenance procedure in the document "Technical Bulletin N°170 - Fiber optics installation and maintenance procedure".

## Principle of expanded beam

The **expanded beam** concept expands and collimates the beam from the launch fiber. Without mechanical contact of the optical elements, the beam remains collimated until it is focused down to the receiving fiber.

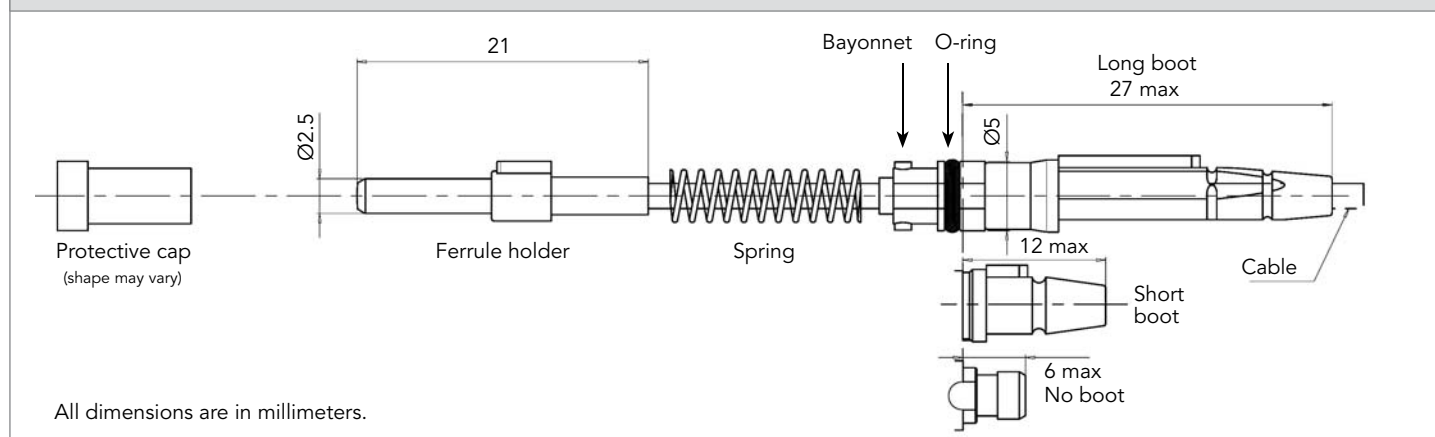
The beam expansion at the interface provides **protection** of the fiber from **contaminants**.



## ELIOBEAM ordering information

|                                                       | EOB1 | 09N                                           | G | L | A |
|-------------------------------------------------------|------|-----------------------------------------------|---|---|---|
| <b>Cable external diameter &amp; Contact sealing:</b> |      |                                               |   |   |   |
| 09N:                                                  |      | 0.9 $\pm$ 0.1mm. Non waterproof               |   |   |   |
| 18N:                                                  |      | from 1.5mm to 1.9mm. Non waterproof           |   |   |   |
| 18W:                                                  |      | 1.8 $\pm$ 0.1mm. Waterproof                   |   |   |   |
| 20N:                                                  |      | from 1.7mm to 2.1mm. Non waterproof           |   |   |   |
| 20W:                                                  |      | 2.0 $\pm$ 0.1mm. Waterproof                   |   |   |   |
| <b>Fibre type:</b>                                    |      |                                               |   |   |   |
| G:                                                    |      | ELIOBEAM® Multimode fibre, 50/125 or 62.5/125 |   |   |   |
| <b>Boot type:</b>                                     |      |                                               |   |   |   |
| L:                                                    |      | Long boot                                     |   |   |   |
| S:                                                    |      | Short boot                                    |   |   |   |
| N:                                                    |      | No boot (non waterproof version only)         |   |   |   |
| <b>Contact version index</b>                          |      |                                               |   |   |   |

## ELIOBEAM contact dimensions



## Recommended cables

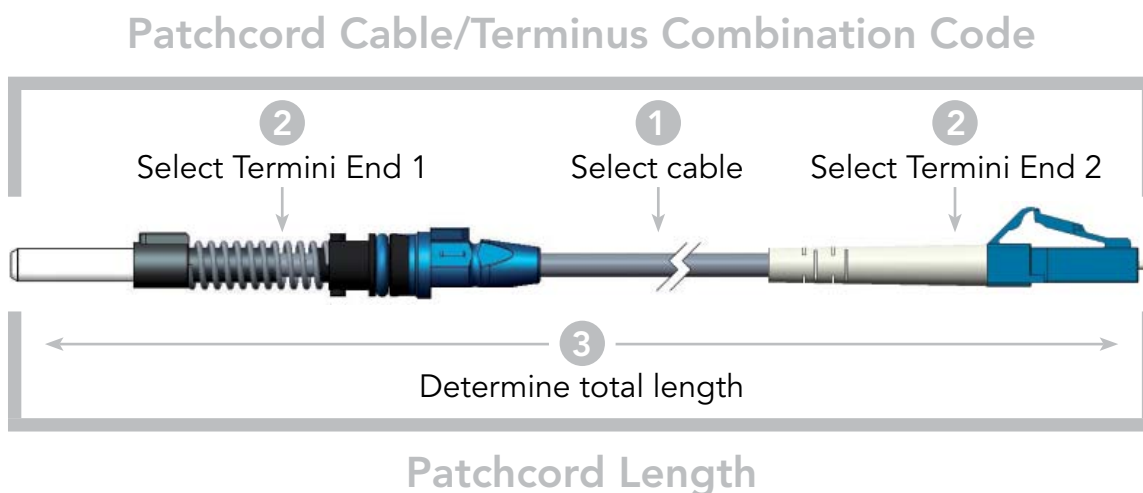
SOURIAU can offer a wide range of cables in its assemblies, from low cost to high performance aeronautical cables. ELIOBEAM contact is compatible with singlemode and multimode cables, with tactical and breakout cables. ELIOBEAM contact is suitable with loose and tight structure cable.

See next page and SOURIAU "ELIO® Fiber Optic Technology" catalog.

## #8 Adaptors, Accessories & Tooling

See SOURIAU "ELIO® Fiber Optic Technology" catalog.

## Your optical patchcord in 3 steps!



## Optical patchcord ordering information

|                                                                                                                                                                               |  |                             |     |             |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------|-----|-------------|---|
| HA02                                                                                                                                                                          |  | XXXX                        | XXX | M           | A |
| Patchcord cable/terminus combination code:                                                                                                                                    |  |                             |     |             |   |
| XXXX: See tables next page                                                                                                                                                    |  |                             |     |             |   |
| Patchcord length:                                                                                                                                                             |  | Standard length tolerances  |     |             |   |
| <div>In meter when possible. Examples:</div> <div>- for a 3 meter assembly, use <b>003(M)</b> and not 300(CM)</div> <div>- for a 3.5 meter assembly, use <b>350(CM)</b></div> |  | Patchcord from 30 cm to 1 m |     | 0 / + 5 cm  |   |
|                                                                                                                                                                               |  | Patchcord from 1 m to 4 m   |     | 0 / + 10 cm |   |
|                                                                                                                                                                               |  | Patchcord from 4 m to 15 m  |     | 0 / + 20 cm |   |
|                                                                                                                                                                               |  | Patchcord > 15 m            |     | 0 / + 30 cm |   |
| Length unit:                                                                                                                                                                  |  |                             |     |             |   |
| M: Meter                                                                                                                                                                      |  |                             |     |             |   |
| CM: Centimeter                                                                                                                                                                |  |                             |     |             |   |
| Patchcord version index                                                                                                                                                       |  |                             |     |             |   |

## 1 Select cable

SOURIAU offers a wide range of cables, from cost efficient to high performance aeronautical cables. Select your optical fiber's properties. Temperature range can be critical for your applications. If you need any help on a criteria selection, please contact us.

| Application                                    | Fiber type | Cable diameter | Temperature range | Tensile strength (N) | OM class | Attenuation (dB.km-1)* | Min. bend radius (mm) | Weight (kg.km-1) | Structure outer jacket | Standard                  | Cable type |
|------------------------------------------------|------------|----------------|-------------------|----------------------|----------|------------------------|-----------------------|------------------|------------------------|---------------------------|------------|
| FOR FLYING USE<br>High performance cables      | 62.5/125   | 1.8            | -55°C to +125°C   | 250                  | OM2      | 4.0/2.0                | 20                    | 4                | Tight                  | ABS0963-003LF, EN4641-102 | FCABLE11   |
|                                                | 62.5/125   | 0.9            | -55°C to +125°C   | 20                   | OM2      | 4.0/2.0                | 10                    | 1                | NA                     | EN4641-101                | FCABLE41   |
|                                                | 50/125     | 1.8            | -65°C to +135°C   | 200                  | OM3      | 4.0/2.0                | 5                     | 4                | Tight                  | EN4641-301                | FCABLE22   |
| FOR HARSH ENVIRONMENT<br>Cost efficient cables | 50/125     | 1.8            | -40°C to +85°C    | 130                  | OM3      | 3.0/1.0                | 25                    | 2.2              | Loose                  | -                         | FCABLE42   |
|                                                | 62.5/125   | 1.8            | -40°C to +85°C    | 130                  | OM1      | 3.5/1.5                | 25                    | 2.2              | Loose                  | -                         | FCABLE61   |

\* 1st value @850nm for multimode cable, 2nd value @1300nm for multimode (respectively 1300nm and 1550nm for singlemode)  
Consult us for other harsh environment cables.

## 2 Select termini end 1 & 2 according to your selected cable, and get your final Patchcord cable/Terminus combination code

Most common cables with most common contacts - For other combinations please consult us.  
All contacts are UPC polished otherwise specified.

| Termini<br>End 1 \ Termini<br>End 2 | EOB118WGLA  |          |          |          | EOB109NGLA |
|-------------------------------------|-------------|----------|----------|----------|------------|
|                                     | Cable types |          |          |          | Cable type |
|                                     | FCABLE11    | FCABLE22 | FCABLE42 | FCABLE61 | FCABLE41   |
| ELIO18NGLA                          | 3060        | 3071     | 3091     | 3102     | N/A        |
| ELIO18NGNA                          | 3061        | 3072     | 3092     | 3103     | N/A        |
| ELIO18NGSA                          | 3062        | 3073     | 3093     | 3104     | N/A        |
| ELIO18WGLA                          | 3063        | 3074     | 3094     | 3105     | N/A        |
| ELIO18WGSA                          | 3064        | 3075     | 3095     | 3106     | N/A        |
| LC Simplex                          | 3065        | 3076     | 3097     | 3108     | 3086       |
| ARINC801 1.25mm                     | 3066        | 3077     | 3098     | 3109     | 3087       |
| FC/PC                               | 3067        | 3078     | 3096     | 3107     | 3085       |
| SC                                  | 3068        | 3079     | 3099     | 3110     | 3088       |
| ST                                  | 3069        | N/A      | 3100     | 3111     | 3089       |
| ST2                                 | N/A         | 3080     | N/A      | N/A      | N/A        |
| EOB118WGLA                          | 3070        | 3081     | 3101     | 3112     | N/A        |
| ELIO09NGLA                          | N/A         | N/A      | N/A      | N/A      | 3082       |
| ELIO09NGNA                          | N/A         | N/A      | N/A      | N/A      | 3083       |
| ELIO09NGSA                          | N/A         | N/A      | N/A      | N/A      | 3084       |
| EOB109NGLA                          | N/A         | N/A      | N/A      | N/A      | 3090       |



## Description

- Quick screw coupling connector with removable crimp contact
- Shell available in aluminum, composite, Stainless steel, Titanium & Bronze
- Six layouts with different current rating
- Consult us for power hermetic version
- High Power offer available on demand

## Technical features

### Mechanical

- **Shell:** Aluminum alloy, Composite, Bronze, Stainless steel, Titanium
- **Plating:**
  - . Olive green cadmium (W/J)
  - . Nickel (F/M/TF/S)
  - . Without plating (X for composite, TT for titanium and JVS for Bronze)
  - . Passivated (K)
- **Grommet and seal:** Silicon elastomer
- **Insulator:** Thermoset
- **Contact body:** Copper Alloy
- **Contact retention:**
  - . #4 = 200N
  - . #8 = 111N
- **Shock:** 300g during 3ms
- **Endurance:** 500 mating / unmating operations
- **Vibration:** As per MIL DTL 38999

### Electrical

- **Dielectric withstanding:** Test voltage rating (Vrms)

| Service | Sea level | at 21 000 m |
|---------|-----------|-------------|
| M       | 1 300     | 800         |
| I       | 1 800     | 1 000       |

- **Insulation Resistance:** 5000 MΩ under 500 Vdc
- **Max current rating per contact:**
  - . #4 = 80A
  - . #8 = 45A
- **Contact resistance:**
  - . #4 = 2mΩ
  - . #8 = 3mΩ
- **Shielding:** As per MIL DTL 38999
- **Shell continuity:**
  - . W = 2.5 mΩ
  - . F = 1mΩ
  - . J, M = 3 mΩ
  - . JVS = 5 mΩ

### Environmental

- **Temperature range:**
  - . W, J, X, JVS = - 65°C +175°C
  - . F, M, K, S, TT, TF = - 65°C +200°C
- **Sealing:** As per MIL DTL 38999
- **Damp Heat:** As per MIL DTL 38999
- **Salt Spray:**
  - . W, TT, TF, K, JVS = 500 hours
  - . F, S = 48 hours
  - . J,M,X = 2000 hours
- **Fire resistance:** As per EN 2591 - C 17 method A
- **Resistance to fluid:** As per MIL DTL 38999

## Connector part numbers

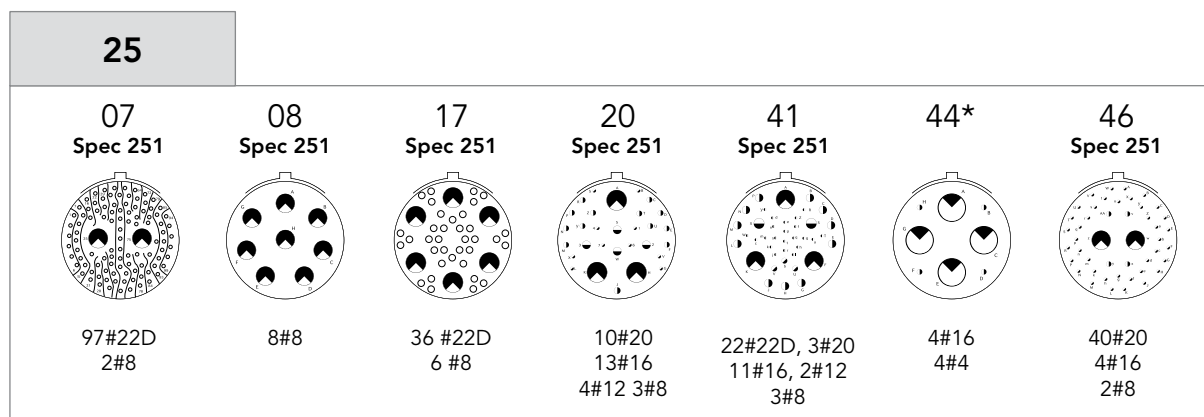
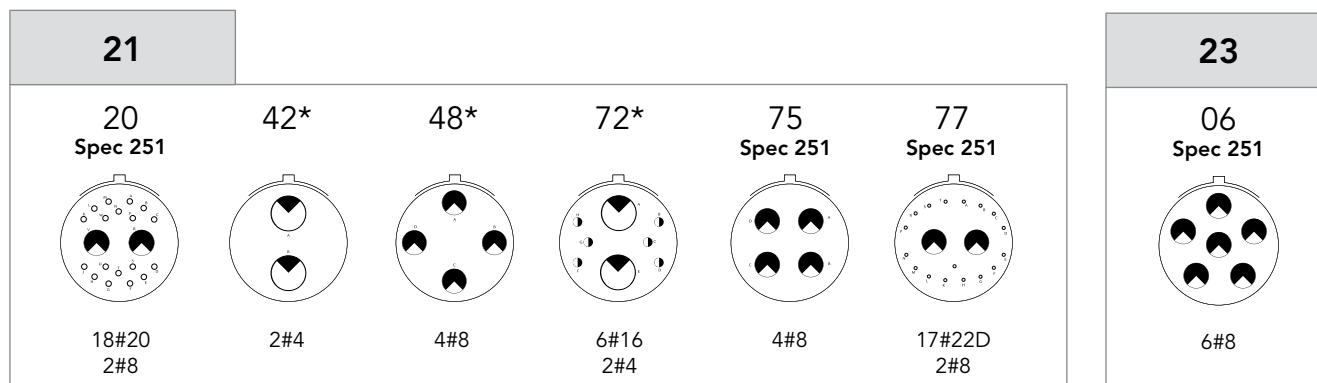
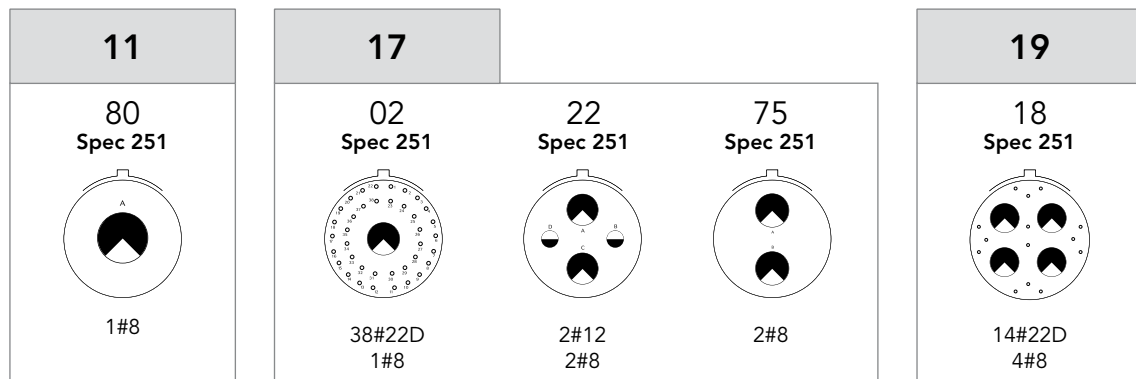
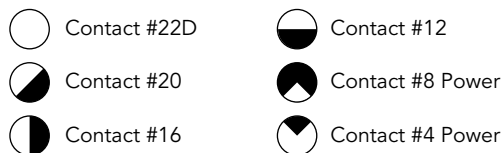
### Aluminum, Composite, Stainless steel & Titanium connector

|                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |          |          |           |          |           |          |          |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|-----------|----------|-----------|----------|----------|------------|
| <b>Basic Series</b>                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>8D</b> | <b>0</b> | <b>-</b> | <b>11</b> | <b>W</b> | <b>80</b> | <b>P</b> | <b>N</b> | <b>251</b> |
| <b>Style:</b><br><b>0:</b> Square flange receptacle<br><b>5:</b> Plug with RFI shielding<br><b>7:</b> Jam nut receptacle                                                                                                                                                                                                                                                                                                                     |           |          |          |           |          |           |          |          |            |
| <b>Type:</b> Crimp contact                                                                                                                                                                                                                                                                                                                                                                                                                   |           |          |          |           |          |           |          |          |            |
| <b>Shell size:</b> 11, 17, 19, 21, 23, 25                                                                                                                                                                                                                                                                                                                                                                                                    |           |          |          |           |          |           |          |          |            |
| <b>Plating:</b><br><b>Aluminum shell:</b><br><b>W:</b> Olive drab cadmium<br><b>F:</b> Nickel<br><b>ZC:</b> Green zinc cobalt<br><b>Z:</b> Black zinc nickel<br><b>Composite shell:</b><br><b>J:</b> Olive green cadmium<br><b>M:</b> Nickel<br><b>X:</b> Without plating<br><b>Stainless steel shell:</b><br><b>K:</b> Corrosion resistant<br><b>S:</b> Nickel<br><b>Titanium shell:</b><br><b>TT:</b> Without plating<br><b>TF:</b> Nickel |           |          |          |           |          |           |          |          |            |
| <b>Contact layouts:</b> See next page                                                                                                                                                                                                                                                                                                                                                                                                        |           |          |          |           |          |           |          |          |            |
| <b>Contact style:</b><br><b>P:</b> Pin contact <b>A:</b> Male connector supplied without contact<br><b>S:</b> Socket contact <b>B:</b> Female connector supplied without contact                                                                                                                                                                                                                                                             |           |          |          |           |          |           |          |          |            |
| <b>Orientation:</b> N, A, B, C, D, E                                                                                                                                                                                                                                                                                                                                                                                                         |           |          |          |           |          |           |          |          |            |
| <b>Specification:</b><br><b>251:</b> Mandatory for some layouts supplied with power contacts (see next page)                                                                                                                                                                                                                                                                                                                                 |           |          |          |           |          |           |          |          |            |

### Bronze connector

|                                                                                                                                                                                  |            |           |          |           |           |          |          |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|----------|-----------|-----------|----------|----------|------------|
| <b>Basic Series</b>                                                                                                                                                              | <b>JVS</b> | <b>16</b> | <b>A</b> | <b>11</b> | <b>80</b> | <b>P</b> | <b>N</b> | <b>251</b> |
| <b>Style:</b><br><b>00:</b> Square flange receptacle<br><b>07:</b> Jam nut receptacle<br><b>16:</b> Plug                                                                         |            |           |          |           |           |          |          |            |
| <b>Material:</b><br><b>A:</b> Bronze shell material                                                                                                                              |            |           |          |           |           |          |          |            |
| <b>Shell size:</b> 11, 17, 19, 21, 23, 25                                                                                                                                        |            |           |          |           |           |          |          |            |
| <b>Contact layouts:</b> See next page                                                                                                                                            |            |           |          |           |           |          |          |            |
| <b>Contact style:</b><br><b>P:</b> Pin contact <b>A:</b> Male connector supplied without contact<br><b>S:</b> Socket contact <b>B:</b> Female connector supplied without contact |            |           |          |           |           |          |          |            |
| <b>Orientation:</b> N, A, B, C, D, E                                                                                                                                             |            |           |          |           |           |          |          |            |
| <b>Specification:</b><br><b>251:</b> Mandatory for some layouts supplied with power contacts (see next page)                                                                     |            |           |          |           |           |          |          |            |

## Contact layouts



\* Power contacts on standard, no spec. 251 needed.

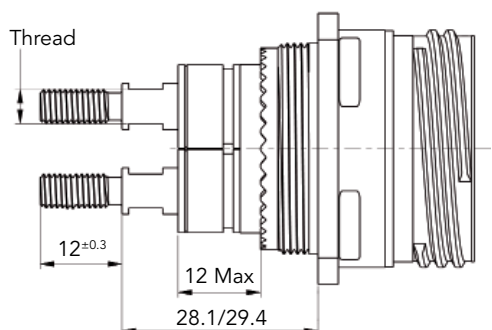
## Power contacts

| Contact size                  | Contact type | Part number  | Reducer   | Cable size max. |              | Boot                        |
|-------------------------------|--------------|--------------|-----------|-----------------|--------------|-----------------------------|
|                               |              |              |           | AWG             | mm²          |                             |
| #4                            | Male         | 85997598900* | Without   | N/A             | 25 mm²       | N/A<br>not sealed           |
|                               | Female       | 85997599900* |           |                 |              |                             |
|                               | Male         | 85997534     |           | AWG 4           | 16 to 21 mm² | 85994594<br>for cable 16mm² |
|                               | Female       | 85997535     |           |                 |              |                             |
|                               | Male         | 85997524     |           | AWG8            | 9 mm²        | N/A<br>not sealed           |
|                               | Female       | 85997525     |           |                 |              |                             |
|                               | Male         | 85997534     | 85932000A | AWG6            | 10 mm²       | 85994593                    |
|                               | Female       | 85997535     |           |                 |              |                             |
|                               | Male         | 85997528900  | Without   | AWG6            | 10 mm²       |                             |
|                               | Female       | 85997529900  |           |                 |              |                             |
| #8                            | Male         | 85997580     | Without   | AWG8            | 9 mm²        | 85994542                    |
|                               | Female       | 85997581     |           |                 |              |                             |
|                               | Male         | 85997580     | 85997645  | AWG10           | 6 mm²        | 85994547                    |
|                               | Female       | 85997581     |           |                 |              |                             |
| #8<br>according to<br>EN 3155 | Male         | 85996215900  | Without   | AWG8            | 9 mm²        | 85994542                    |
|                               | Female       | 85996217900  |           |                 |              |                             |
|                               | Male         | 85996216900  |           | AWG10           | 6 mm²        | 85994547                    |
|                               | Female       | 85996218900  |           |                 |              |                             |
| #8<br>JVS only                | Male         | 85997544     | Without   | AWG8            | 9 mm²        | 85994542                    |
|                               | Female       | 85997541     |           |                 |              |                             |
|                               | Male         | 85997544     | 85997645  | AWG10           | 6 mm²        | 85994547                    |
|                               | Female       | 85997541     |           |                 |              |                             |

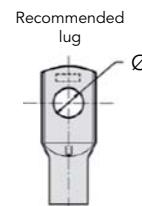
| Cable section<br>AWG | #22   | #20  | #16  | #12  | #10 | #8  | #4 |
|----------------------|-------|------|------|------|-----|-----|----|
| mm <sup>2</sup> maxi | 0.34  | 0.6  | 1.34 | 3.18 | 5.8 | 9   | 21 |
| mm <sup>2</sup> mini | 0.095 | 0.21 | 0.6  | 1.91 | 3.8 | 5.8 | 16 |

\* Not included in connector P/N.  
Must be ordered separately.

## Bus bar contact



| Contact size | Thread | Part number  |              |          | Lug Ø |
|--------------|--------|--------------|--------------|----------|-------|
|              |        | Male         | Female       | Boots    |       |
| #4           | M5x0.8 | 85930873A900 | 85930875A900 | 85994594 | 5.2   |
| #8           | M3x0.5 | 85930872A900 | 85930874A900 | 85994542 | 3.2   |



Contacts available separately only.  
Lug: tin over copper recommended. Dimensions for indication only.

Note: All dimensions are in millimeters (mm)

## Power tools

| Contact size | Contact type | Contact reference | Cable AWG                     | Crimping tool                |              |                           | Contact extraction tool (metallic) | Contact extraction tool (plastic) |
|--------------|--------------|-------------------|-------------------------------|------------------------------|--------------|---------------------------|------------------------------------|-----------------------------------|
|              |              |                   |                               | Automatic tool: M22520/23-01 |              | Manual hand tool: M300 BT |                                    |                                   |
|              |              |                   |                               | Die set                      | Locator      | Locator                   |                                    |                                   |
| #4           | Male         | 8599-7534         | #4-5 or #10-16mm <sup>2</sup> | M22520/23-04                 | M22520/23-11 | N/A                       | 8533-8175                          | M81969/14-07                      |
|              | Female       | 8599-7535         |                               |                              |              |                           |                                    |                                   |
| #8 JVS only  | Male         | 8599-7544         | #8 or #10                     | M22520/23-02                 | 8599-9601    | SP 593                    | 8660-197                           | M81969/14-12                      |
|              | Female       | 8599-7541         |                               |                              |              |                           |                                    |                                   |
| #8           | Male         | 8599-7580         |                               |                              |              |                           |                                    |                                   |
|              | Female       | 8599-7581         |                               |                              |              |                           |                                    |                                   |

### Automatic tool for contacts #4 & #8



Crimping tool  
M22520/23-01



Die set



Locator

### Manual hand tool for contacts #8



Crimping tool  
M300 BT



Locator

### Extraction tool



Metallic tool

## Description

- Threaded coupling connector with single power contact
- Aluminum shell
- 3 shell sizes available:
  - size 19: Up to 450 A at 40°C
  - size 23: Up to 650 A at 40°C
  - size 25: Up to 850 A at 40°C
- Silver plated contact
- Pin contact is equipped with a plastic cap to prevent electrical shock
- Modular design:
  - . Removable backshell: straight, right angle or threaded contact
  - . Backshell termination: shrink boot

## Technical features

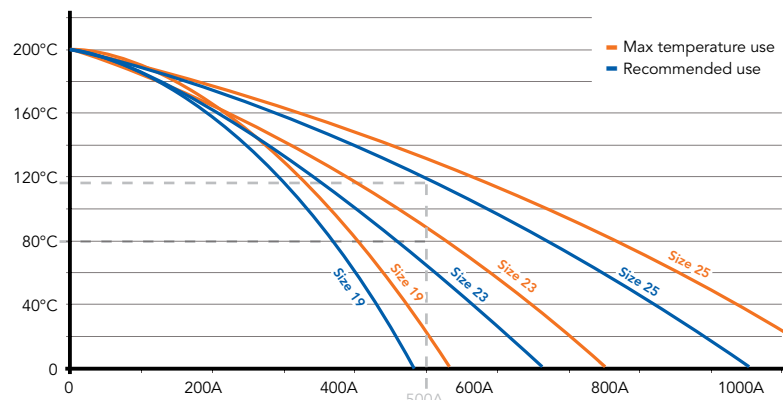
### Mechanical

- **Shell:** Aluminum alloy
- **Shell plating:**
  - Black zinc nickel (Z)
  - Cadmium olive drab (W)
- **Insulator:** Thermoplastic
- **Grommet and interfacial seal:** Silicone elastomer
- **Contact body:** Copper alloy
- **Endurance:** 500 mating/unmating operations
- **Vibration:**
  - According Def Stan 00-35
  - 4.2 g rms vert - 6h/3 axes

### Electrical

- **Test voltage** > 1500 V
- **Shell to shell continuity** (no backshell) < 2.5 mΩ
- **EMI** 85 dB @ 1GHz (F)

### • Connector rating



Example for 500A:

Shell size 25 with contact diameter 20: max temperature 135°C; recommended 120°C

Shell size 23 with contact diameter 18: max temperature 90°C; recommended 80°C

Shell size 19 with contact diameter 14: not recommended

Wire must be compatible with current and temperature used for the connector.

### Environmental

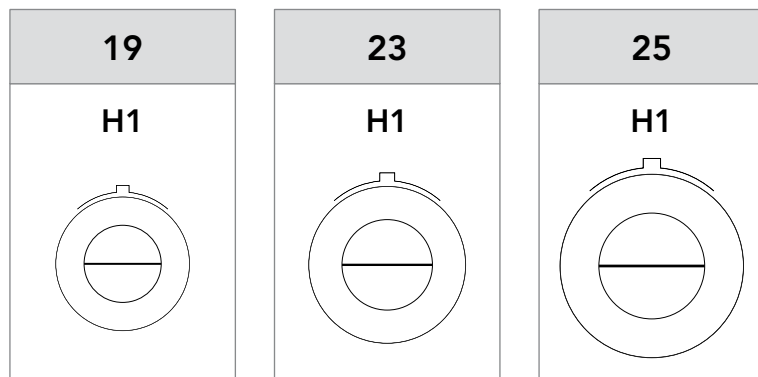
- **Temperature range:** -65°C +175°C
- **Sealing:** IP67 on mated connector (1 meter/30 min)
- **Salt spray:** 500 hours
- **Creepage and clearance:** Min length in mm according to IEC60664-1

| Shell size | Creepage | Clearance |
|------------|----------|-----------|
| 19         | 2.805    | 2.492     |
| 23         | 2.830    | 4.492     |
| 25         | 2.715    | 4.492     |

### Resistance to fluids

- **According to MIL-DTL-38999 standard**
  - . Gasoline: JP5 (OTAN F44)
  - . Mineral hydraulic fluid: MIL-H-5606 (OTAN H515)
  - . Synthetic hydraulic fluid: Skydrol 500 B4
- **LD4 (SAE AS 1241)**
  - . Mineral lubricating: MIL-L-7870A (OTAN 0142)
  - . Synthetic lubricating: MIL-L-23699 (OTAN 0156), MIL-L-7808
  - . Cleaning fluid: MIL-C-87936 diluted
  - . De-icing fluid: MIL-A-8243
  - . Extinguishing fluid: Bromochloromethane
  - . Cooling fluid: Coolanol

## Contact layouts



Other size: Please consult us.

## Ordering information

|                                                             |  |    |   |    |   |    |   |   |    |   |
|-------------------------------------------------------------|--|----|---|----|---|----|---|---|----|---|
| Basic Series                                                |  | 8D | 0 | 25 | W | H1 | P | N | R1 | A |
| Style:                                                      |  |    |   |    |   |    |   |   |    |   |
| 0: Square flange receptacle                                 |  |    |   |    |   |    |   |   |    |   |
| 5: Plug (available with backshell D1, R1, G0 & W0 Types)    |  |    |   |    |   |    |   |   |    |   |
| 7: Jam nut receptacle                                       |  |    |   |    |   |    |   |   |    |   |
| Shell size: 19, 23, 25                                      |  |    |   |    |   |    |   |   |    |   |
| Plating:                                                    |  |    |   |    |   |    |   |   |    |   |
| Z: Zinc Nickel                                              |  |    |   |    |   |    |   |   |    |   |
| W: Olive green cadmium                                      |  |    |   |    |   |    |   |   |    |   |
| H1: Single power                                            |  |    |   |    |   |    |   |   |    |   |
| Contact style:                                              |  |    |   |    |   |    |   |   |    |   |
| P: Pin contact                                              |  |    |   |    |   |    |   |   |    |   |
| S: Socket contact                                           |  |    |   |    |   |    |   |   |    |   |
| Orientation: N, A, B, C, D, E                               |  |    |   |    |   |    |   |   |    |   |
| Backshell type:                                             |  |    |   |    |   |    |   |   |    |   |
| D1: Straight backshell shrink boot & EMI (crimp version)    |  |    |   |    |   |    |   |   |    |   |
| R1: Right angle backshell shrink boot & EMI (crimp version) |  |    |   |    |   |    |   |   |    |   |
| G0: Backshell low profile (threaded termination)            |  |    |   |    |   |    |   |   |    |   |
| W0: Without backshell (threaded termination)                |  |    |   |    |   |    |   |   |    |   |

Specification for backshells D1 & R1 Types (crimp version):

| Specification | Shell size | Admissible cable (mm) |                | Barrel diameter<br>(mm <sup>±0.05</sup> ) |
|---------------|------------|-----------------------|----------------|-------------------------------------------|
|               |            | Outer Ø max           | Nominal core Ø |                                           |
| A             | 19         | 17                    | 10.15          | 10.8                                      |
| B             | 19         | 17                    | 11.1           | 11.8                                      |
| C             | 19         | 17                    | 12             | 12.5                                      |
| D             | 23         | 22                    | 14.05          | 15                                        |
| E             | 23         | 22                    | 16.3           | 17                                        |
|               | 25         | 26.5                  |                |                                           |
| F             | 25         | 26.5                  | 19             | 20.5                                      |

Specification for backshells G0 & W0 Types (only threaded termination):

| Specification | Shell size  | Thread |
|---------------|-------------|--------|
| C             | 19, 23 & 25 | M12    |

Note: Plug not available with backshell W0 Type. Other thread, please consult us.

Note: For other configuration, please consult us.

## Backshell type

| Description                                              |                                                  |                                                             |
|----------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------|
|                                                          |                                                  |                                                             |
| D1: Straight backshell shrink boot & EMI (crimp version) | G0: Backshell low profile (threaded termination) | R1: Right angle backshell shrink boot & EMI (crimp version) |
|                                                          | W0: Without backshell (threaded termination)     |                                                             |

## Dimensions

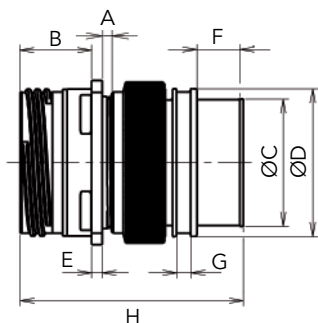
| Plug & receptacles           |             |             |             |             |             |                        |        |              |               |
|------------------------------|-------------|-------------|-------------|-------------|-------------|------------------------|--------|--------------|---------------|
| 8D0 Square flange receptacle |             |             | 8D5 Plug    |             |             | 8D7 Jam nut receptacle |        |              |               |
|                              |             |             |             |             |             |                        |        |              |               |
| Shell size                   | A $\pm 0.1$ | B $\pm 0.1$ | C $\pm 0.1$ | D $\pm 0.1$ | E $\pm 0.1$ | F Max                  | ØG Max | H $\pm 0.25$ | ØJ $\pm 0.25$ |
| 19                           | 36.5        | 26.97       | 29.36       | 3.29        | 4.98        | 41                     | 38.5   | 45.95        | 49.15         |
| 23                           | 42.9        | 31.75       | 34.93       | 3.96        | 6.2         | 47                     | 44.9   | 52.35        | 55.55         |
| 25                           | 46          | 34.93       | 38.1        |             |             | 52                     | 48     | 55.55        | 58.65         |

Note: All dimensions are in millimeters (mm)

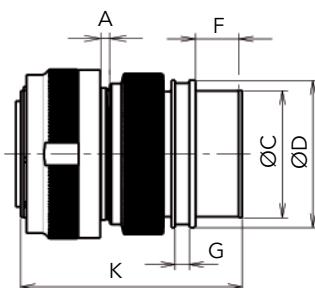
## Dimensions

### Backshell D1 type

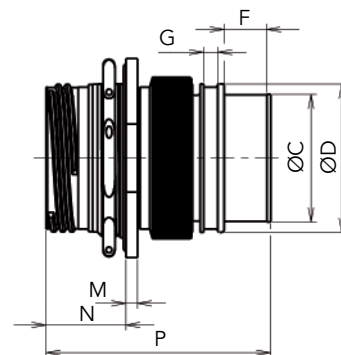
With 8D0  
(square flange receptacle)



With 8D5  
(plug)



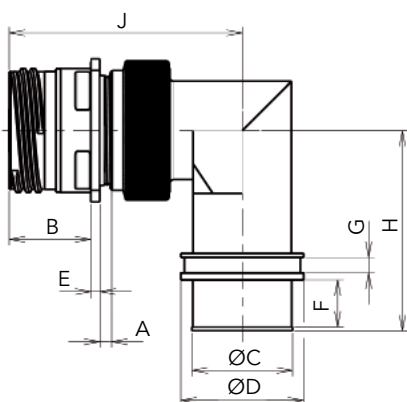
With 8D7  
(jam nut receptacle)



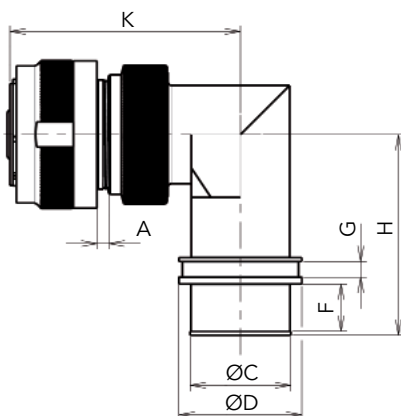
| Shell size | A Max | B Max | ØC±0.1 | ØD±0.1 | E±0.1 | F±0.2 | G±0.2 | H Max | K Max | M±0.25 | N Max | P Max |
|------------|-------|-------|--------|--------|-------|-------|-------|-------|-------|--------|-------|-------|
| 19         | 2.65  | 20.9  | 25.6   | 31.6   | 2.26  | 12    | 4     | 62.5  | 62    | 3.25   | 22.8  | 63    |
| 23         |       | 20.1  | 32.4   | 38.6   | 2.97  |       |       |       |       |        |       |       |
| 25         |       |       | 35.6   | 42.1   |       |       |       |       |       |        |       |       |

### Backshell R1 type

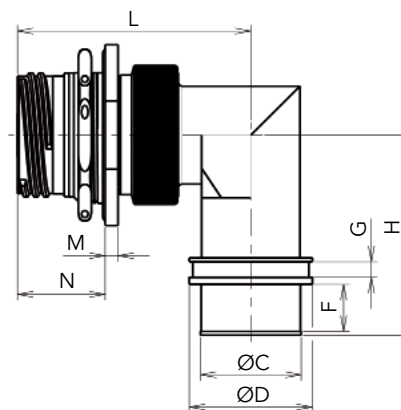
With 8D0  
(square flange receptacle)



With 8D5  
(plug)



With 8D7  
(jam nut receptacle)



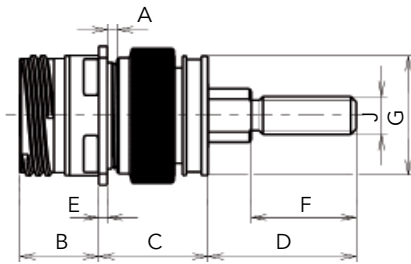
| Shell size | A Max | B Max | ØC±0.1 | ØD±0.1 | E±0.1 | F±0.2 | G±0.2 | H Max | J Max | K Max | L Max | M±0.25 | N Max |  |  |
|------------|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--|--|
| 19         | 2.85  | 20.9  | 25.6   | 31.3   | 2.26  | 12    | 4     | 51.1  | 59.8  | 59.3  | 59.8  | 3.25   | 22.8  |  |  |
| 23         |       | 20.1  | 32.4   | 38.1   | 2.97  |       |       | 54.4  | 63.2  | 62.7  | 63.2  |        |       |  |  |
| 25         |       |       | 35.6   | 41.3   |       |       |       | 56.1  | 64.8  | 64.3  | 64.8  |        |       |  |  |

Note: All dimensions are in millimeters (mm)

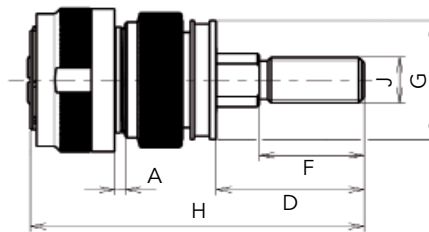
## Dimensions

### Backshell G0 type

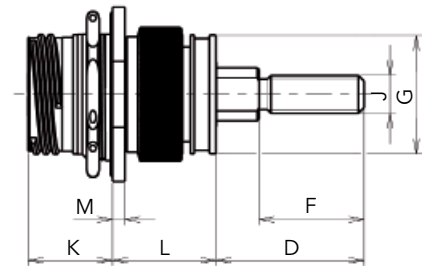
With 8D0  
(square flange receptacle)



With 8D5  
(plug)



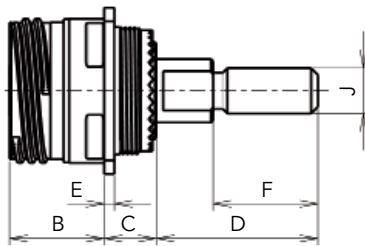
With 8D7  
(jam nut receptacle)



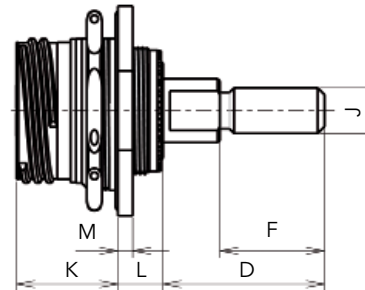
| Shell size | A Max | B Max | C Max | D Max | E $\pm 0.1$ | F $\pm 0.2$ | ØG $\pm 0.1$ | H Max | J Max      | K Max | L Max | M $\pm 0.25$ |
|------------|-------|-------|-------|-------|-------------|-------------|--------------|-------|------------|-------|-------|--------------|
| 19         | 2.65  | 20.9  | 29    | 39.4  | 2.26        | 25          | 31.3         | 88.1  | M12 x 1.75 | 22.6  | 27.6  | 3.25         |
| 23         |       | 20.1  | 29.8  |       | 2.97        |             | 38.1         |       |            |       | 28.4  |              |
| 25         |       |       |       |       |             |             | 41.3         |       |            |       |       |              |

### Backshell W0 type

With 8D0  
(square flange receptacle)



With 8D7  
(jam nut receptacle)



| Shell size | B Max | C Max | D Max | E $\pm 0.1$ | F $\pm 0.2$ | J Max      | K Max | L Max | M $\pm 0.25$ |
|------------|-------|-------|-------|-------------|-------------|------------|-------|-------|--------------|
| 19         | 20.9  | 14    | 40    | 2.26        | 25          | M12 x 1.75 | 22.6  | 12    | 3.25         |
| 23         | 20.1  |       |       | 2.97        |             |            |       |       |              |
| 25         |       |       |       |             |             |            |       |       |              |

Note: All dimensions are in millimeters (mm)



## Description

- Derived from standards:
  - MIL-DTL-38999 Series III (8D)
- 100% scoop proof
- Available in 3 shell sizes
- Contacts #26 for cable AWG 26 to 30 (24 to 30 under request)
- Double flange & clinch nut version available

## Technical features

### Mechanical

- **Shell:**
  - . Aluminium, Composite, Stainless steel
- **Shell plating:**
  - . 8D Aluminum:
    - Cadmium olive drab (W)
    - Nickel (F)
    - Black zinc nickel (Z)
  - . 8D Composite:
    - Cadmium olive drab (J)
    - Nickel (M)
- **Insulator:** Thermoplastic
- **Seal:** Liquid Silicone rubber
- **Contact:** Copper alloy
- **Contact plating:** Gold
- **Endurance:** 500 matings/unmatings
- **Shock & Vibration:**
  - According to 38999 specification

### Electrical

- **Contact resistance:**
  - Size 26: 16 mΩ
- **Insulation resistance:**
  - ≥5000MΩ (at 500Vdc)
- **Contact rating:**
  - Size 26: 3Amp
- **Shell continuity:**
  - . Aluminum shell:
    - Cadmium olive drab (W): 2.5 mΩ
    - Nickel (F): 1 mΩ
    - Black zinc nickel (Z): 2.5 mΩ
  - . Composite shell:
    - Cadmium olive drab (J): 3 mΩ
    - Nickel (M): 3 mΩ
  - . Stainless steel shell:
    - Passivated (K): 10 mΩ
    - Nickel (S): 1 mΩ

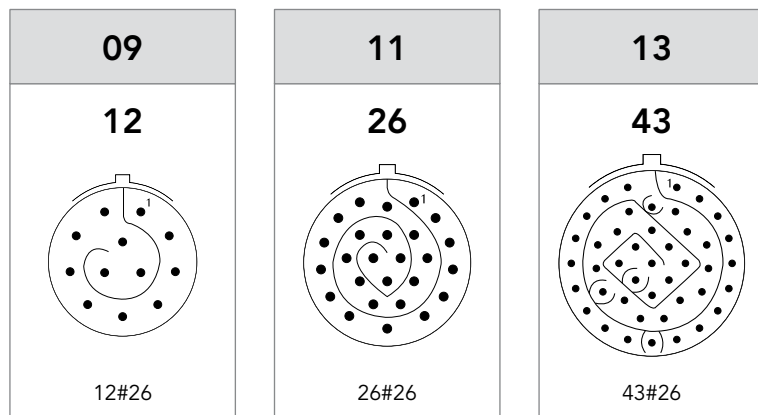
### Environmental

- **Temperature range:**
  - 55°C to +175°C
  - 55°C to +200°C (Nickel version)
- **Sealing mated connectors:**
  - IP 67 (1 metre for 30 min minimum)
- **Salt spray:**
  - . Aluminum shell:
    - W: 500 Hrs
    - F: 48 Hrs
    - Z: 500 Hrs
  - . Composite shell: 2000 Hrs
  - . Stainless steel shell: 500 Hrs

### Resistance to fluids

- **According to MIL-DTL-38999 standard**
  - . Gasoline: JP5 (OTAN F44)
  - . Mineral hydraulic fluid: MIL-H-5606 (OTAN H515)
  - . Synthetic hydraulic fluid: Skydrol 500 B4
- **LD4 (SAE AS 1241)**
  - . Mineral lubricating: MIL-L-7870A (OTAN 0142)
  - . Synthetic lubricating: MIL-L-23699 (OTAN 0156), MIL-L-7808
  - . Cleaning fluid: MIL-C-87936 diluted
  - . De-icing fluid: MIL-A-8243
  - . Extinguishing fluid: Bromochloromethane
  - . Cooling fluid: Coolanol

## Contact layouts



PCB hole drilling and position information  
See pages 76 & 77.

## Ordering information

|                                                                                                                                                                                                                       |           |          |          |           |          |           |          |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|-----------|----------|-----------|----------|----------|
| <b>Basic Series</b>                                                                                                                                                                                                   | <b>8D</b> | <b>0</b> | <b>-</b> | <b>11</b> | <b>W</b> | <b>26</b> | <b>P</b> | <b>N</b> |
| <b>Shell style:</b><br>0: Square flange receptacle<br>1: In line receptacle (Aluminum only)<br>7: Jam nut receptacle (Aluminum, Stainless steel & Titanium only)<br>5: Plug with RFI shielding                        |           |          |          |           |          |           |          |          |
| <b>Type:</b><br>- : Connectors with standard crimp contacts<br>L: Receptacle with PC tail (available with Pin contact only)                                                                                           |           |          |          |           |          |           |          |          |
| <b>Shell size: 09, 11, 13</b>                                                                                                                                                                                         |           |          |          |           |          |           |          |          |
| <b>Plating:</b><br>W: Olive drab cadmium (Aluminum only)<br>F: Nickel (Aluminum only)<br>Z: Black zinc nickel (Aluminum only)<br>J: Olive drab cadmium (Composite only)<br>M: Nickel (Composite only)                 |           |          |          |           |          |           |          |          |
| <b>Contact layout:</b> See above                                                                                                                                                                                      |           |          |          |           |          |           |          |          |
| <b>Contact type:</b><br>P: Pin<br>S: Socket                                                                                                                                                                           |           |          |          |           |          |           |          |          |
| <b>Orientation: N, A, B, C, D, E</b>                                                                                                                                                                                  |           |          |          |           |          |           |          |          |
| <b>Specifications:</b><br>L: Delivered without contact<br>900 (mandatory for PC tail version): PC tail contacts without shoulder<br>901 (mandatory for PC tail version): Tin plated PC tail contacts without shoulder |           |          |          |           |          |           |          |          |

## Contact, tooling & accessories

See «Common Section» page 63.

## Recommended cable

Standard military cable as M22759 or EN2267 and derivated.



## Description

- Derived from standard MIL-DTL-38999 Series III
- Plug in 9 sizes (from size 09 to 25)
- Black zinc nickel, cadmium and nickel plating

## Technical features

### Mechanical

- **Shell:** Aluminum
- **Shell plating:**
  - . Nickel (F)
  - . Black zinc nickel (Z)
  - . Olive drab cadmium: (W)
- **Insulator:** Thermoplastic
- **Seal:** Silicone elastomer
- **Contact:** Copper alloy
- **Contact plating:** Gold over nickel
- **Endurance:** 500 matings/unmatings
- **Shock & Vibration:**
  - According to 38999 specification

### Electrical

- **Contact resistance:**

| Contacts size | 22   | 20  | 16  | 12  | 8 | 4 |
|---------------|------|-----|-----|-----|---|---|
| Resistance mΩ | 14.6 | 7.3 | 3.8 | 3.5 | 3 | 2 |

- **Insulation resistance:**
  - ≥5000mΩ (at 500Vdc)

- **Contact rating:**

| Contacts size | 22 | 20  | 16 | 12 | 8  | 4  |
|---------------|----|-----|----|----|----|----|
| Rating (A)    | 5  | 7.5 | 13 | 23 | 45 | 80 |

- **Shell continuity**
  - . Nickel (F): 1 mΩ
  - . Black zinc nickel (Z): 2.5 mΩ
  - . Olive drab cadmium (W): 2.5 mΩ

### Environmental

- **Temperature range:**
  - 55°C to +175°C (Z & W)
  - 55°C to +200°C (F)
- **Sealing mated connectors:**
  - IP 67 (1 meter for 30 min minimum)
- **Salt spray:**
  - . 48 hours (F)
  - . 500 hours (Z & W)

### Resistance to fluids

- **According to MIL-DTL-38999 standard**
  - . Gasoline: JP5 (OTAN F44)
  - . Mineral hydraulic fluid: MIL-H-5606 (OTAN H515)
  - . Synthetic hydraulic fluid: Skydrol 500 B4
- **LD4 (SAE AS 1241)**
  - . Mineral lubricating: MIL-L-7870A (OTAN 0142)
  - . Synthetic lubricating: MIL-L-23699 (OTAN 0156), MIL-L-7808
  - . Cleaning fluid: MIL-C-87936 diluted
  - . De-icing fluid: MIL-A-8243
  - . Extinguishing fluid: Bromochloromethane
  - . Cooling fluid: Coolanol

## Ordering information

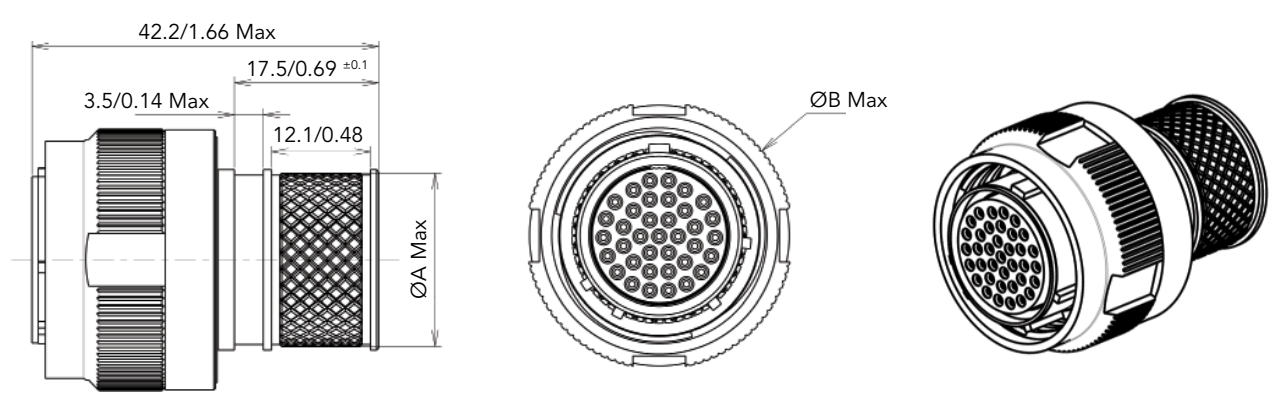
|                                            |     |   |   |    |   |    |   |   |
|--------------------------------------------|-----|---|---|----|---|----|---|---|
| Basic series                               | 8DA | 5 | - | 13 | Z | 35 | P | N |
| Shell type:                                |     |   |   |    |   |    |   |   |
| 5: Plug with RFI shielding                 |     |   |   |    |   |    |   |   |
| Style:                                     |     |   |   |    |   |    |   |   |
| --: Connector with standard crimp contacts |     |   |   |    |   |    |   |   |
| Shell size:                                |     |   |   |    |   |    |   |   |
| 09, 11, 13, 15, 17, 19, 21, 23, 25         |     |   |   |    |   |    |   |   |
| Plating:                                   |     |   |   |    |   |    |   |   |
| Z: Black zinc nickel                       |     |   |   |    |   |    |   |   |
| F: Nickel                                  |     |   |   |    |   |    |   |   |
| W: Olive drab cadmium                      |     |   |   |    |   |    |   |   |
| Contact layout:                            |     |   |   |    |   |    |   |   |
| See pages 13 to 17                         |     |   |   |    |   |    |   |   |
| Contact type:                              |     |   |   |    |   |    |   |   |
| P: Male                                    |     |   |   |    |   |    |   |   |
| S: Female                                  |     |   |   |    |   |    |   |   |
| Orientation:                               |     |   |   |    |   |    |   |   |
| N, A, B, C, D, E                           |     |   |   |    |   |    |   |   |
| L: Without contact                         |     |   |   |    |   |    |   |   |

Note: Power, Quadrax and Optical layouts, please consult us. Type 0 and Type 7 on request.

## 3D models

8D Integrated Backshell 3D models are available on [www.traceparts.online.net](http://www.traceparts.online.net)  
Registration is quick and the downloads are free!

## Dimensions

| Plug Type 5                                                                          |           |           |           |           |           |           |           |           |           |
|--------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|  |           |           |           |           |           |           |           |           |           |
|                                                                                      | 09        | 11        | 13        | 15        | 17        | 19        | 21        | 23        | 25        |
| ØA                                                                                   | 11.1/0.44 | 14.1/0.55 | 17.1/0.67 | 21.1/0.83 | 24.1/0.95 | 27.1/1.07 | 30.1/1.18 | 33.1/1.30 | 36.1/1.42 |
| ØB                                                                                   | 21.8/0.86 | 25.0/0.98 | 29.4/1.16 | 32.5/1.28 | 35.7/1.41 | 38.5/1.52 | 41.7/1.64 | 44.9/1.77 | 48.0/1.89 |

Note: All dimensions are in millimeters (md)inches (mm/inch)

## Connectors weight - in gram ( $\pm 15\%$ )

| Shell size & layout  | 9-35  | 11-35 | 13-35 | 15-35 | 17-35 | 19-35 | 21-35 | 23-35 | 25-35 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Weight with contacts | 14.92 | 20.62 | 29.82 | 40.37 | 48.33 | 59.51 | 70.23 | 82.41 | 96.86 |

## Accessories & Tooling

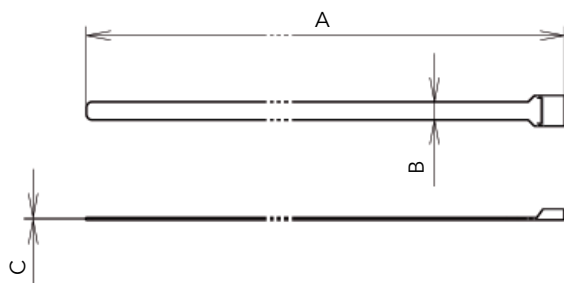
### Recommended accessories for wiring

| Shell size | Shield band (recommended)                                              | Hand banding tool | Rear diameter to fit with boot |
|------------|------------------------------------------------------------------------|-------------------|--------------------------------|
| 9          | 85930337A (individually coiled)<br>85930338A (not individually coiled) | 85930339A         | 11.1/0.44                      |
| 11         |                                                                        |                   | 14.1/0.55                      |
| 13         |                                                                        |                   | 17.1/0.67                      |
| 15         |                                                                        |                   | 21.1/0.83                      |
| 17         |                                                                        |                   | 24.1/0.95                      |
| 19         |                                                                        |                   | 27.1/1.07                      |
| 21         |                                                                        |                   | 30.1/1.18                      |
| 23         | 85999344 (not individually coiled)<br>85999345 (individually coiled)   | 85999346          | 33.1/1.30                      |
| 25         |                                                                        |                   | 36.1/1.42                      |



To order braid, boot or other accessories, please contact your SOURIAU distributor.

### Shield Band Dimension



|   | 85930337A<br>or 85930338A | 85999344<br>or 85999345 |
|---|---------------------------|-------------------------|
| A | 200/7.87 Min              | 362.1/14.26 $\pm 1.5$   |
| B | 3.0/0.12                  | 6.0/0.24                |
| C | 0.4/0.016 Max             | 0.5/0.019               |

Note: All dimensions are in millimeters and inches (mm/inch)

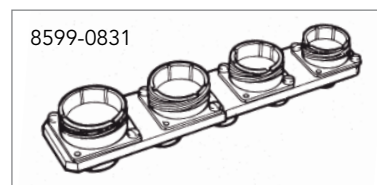
## Accessories & Tooling

### Recommended installation torque

| Shell Size              | Installation Torque<br>(Inch-Pounds) |
|-------------------------|--------------------------------------|
| 09, 11, 13, 15, 17 & 19 | 40                                   |
| 21, 23 & 25             | 80                                   |

Note: Torque values are based on 80% of the coupling thread strength specified in SAE-AS85049 standard.

### Tightening support



Part number: **8599-0831**

This tool is made up of dummy receptacle housings of all 9 sizes for all key polarisation, and secures free connectors during wiring and fitting of rear accessories.

### Crimping tools - for standard contacts

| Contact size | Contact type | Contact Part number | Plier M22520/1-01           | Plier M22520/2-01 (SOURIAU 8476-01) |
|--------------|--------------|---------------------|-----------------------------|-------------------------------------|
|              |              |                     | Turret Part number MIL Spec | Locator Part number MIL Spec        |
| #22D         | Pin          | 8599-0702 JJ        | -                           | M22520/2-09                         |
|              | Socket       | 8599-0706 900       | -                           | M22520/2-06                         |
| #20          | Pin          | 8599-0703 SA        | M22520/1-04                 | M22520/2-10                         |
|              | Socket       | 8599-0707 900       |                             |                                     |
| #16          | Pin          | 8599-0704 MJ        | M22520/1-04                 | -                                   |
|              | Socket       | 8599-0708 900       |                             | -                                   |
| #12          | Pin          | 8599-0705 MJ        | M22520/1-04                 | -                                   |
|              | Socket       | 8599-0709 900       |                             | -                                   |

### Insertion & extraction tools - for standard contacts

| Contact size | Material | Part number  | Color     |            |
|--------------|----------|--------------|-----------|------------|
|              |          |              | Insertion | Extraction |
| #22D         | Plastic  | M81969/14-01 | Green     | White      |
| #20          | Plastic  | M81969/14-10 | Red       | Orange     |
| #16          | Plastic  | M81969/14-03 | Blue      | White      |
| #12          | Plastic  | M81969/14-04 | Yellow    | White      |
| #10          | Plastic  | M81969/14-05 | Grey      | -          |

### Other Accessories, Tooling & Contacts

See "Common Section" page 63.



## Description

- Threaded coupling
- Shell sizes from 9 to 25
- Contact protection: 100% Scoop proof
- RFI - EMI shielding and shell-to-shell conductivity
- Contact fretting minimized
- Accessories available (protective caps, backshells, etc... )
- Intermatable with Standards:
  - . MIL-DTL-38999 Series III
  - . EN3645
  - . BACC63DC

## Technical features

### Mechanical

- **Shell:** Stainless steel
- **Shell plating:**  
Passivated (K)  
Nickel (S)
- **Insulator:** Thermoplastic
- **Grommet and interfacial seal:**  
Silicone elastomer
- **Contacts:** Copper alloy
- **Contacts plating:** Gold over nickel plated
- **Endurance:** 500 mating cycles
- **Shock:**  
300g, 3ms according EN2591-402 method A and EIA-364-27
- **Vibration:**  
Sinusoidal:  
. 10 à 2000 Hz, 3x12 hrs  
(60g, 140 - 2000 Hz) with T° cycling  
Random:  
. 50 to 2000 Hz, 2x8 Hrs  
(1g2/ Hz, 100 - 2000Hz) at T° max.  
. 25 to 2000 Hz, 2x8 Hrs  
(5g2/ Hz, 100 - 300Hz) at ambient T°  
Test with accessories in accordance with EN2591-403 and EIA-364-28

#### • Contact retention:

| Contacts size  | 22 | 20 | 16  | 12  | 8   | 4   |
|----------------|----|----|-----|-----|-----|-----|
| Min force in N | 44 | 67 | 111 | 111 | 111 | 200 |

### Electrical

#### • Test voltage rating (Vrms):

| Service | Sea level | 21 000 m<br>70,000 ft |
|---------|-----------|-----------------------|
| R       | 400       | N/A                   |
| M       | 1 300     | 800                   |
| N       | 1 000     | 600                   |
| I       | 1 800     | 1 000                 |
| II      | 2 300     | 1 000                 |

#### • Contact resistance:

| Contact size  | 22   | 20  | 16  | 12  | 8 | 4 |
|---------------|------|-----|-----|-----|---|---|
| Resistance mΩ | 14.6 | 7.3 | 3.8 | 3.5 | 3 | 2 |

#### • Insulation resistance:

≥ 5,000 MΩ (under 500 Vdc)

#### • Contact rating:

| Contact size | 22 | 20  | 16 | 12 | 8  | 4  |
|--------------|----|-----|----|----|----|----|
| Rating (A)   | 5  | 7.5 | 13 | 23 | 45 | 80 |

#### • Shell continuity:

K: 10 mΩ

S: 1 mΩ

#### • Shielding:

K: 45 db at 10 GHz

S: 65 db at 10 GHz

### Environmental

#### • Temperature range:

K: -65°C +200°C

S: -65°C +200°C

Peak temperature: 260°C

#### • Sealing:

Mated connectors meet altitude immersion requirements of MIL-DTL-38999.

#### • Salt spray:

K: 500 Hrs

S: 500 Hrs

### Resistance to fluids

#### • According to MIL-DTL-38999 standard:

. Gasoline: JP5 (OTAN F44)

. Mineral hydraulic fluid: MIL-H-5606

(OTAN H515)

. Synthetic hydraulic fluid: Skydrol 500 B4

#### • LD4 (SAE AS 1241):

. Mineral lubricating: MIL-L-7870A

(OTAN 0142)

. Synthetic lubricating: MIL-L-23699

(OTAN 0156), MIL-L-7808

. Cleaning fluid: MIL-DTL-25769 diluted

. De-icing fluid: MIL-A-8243

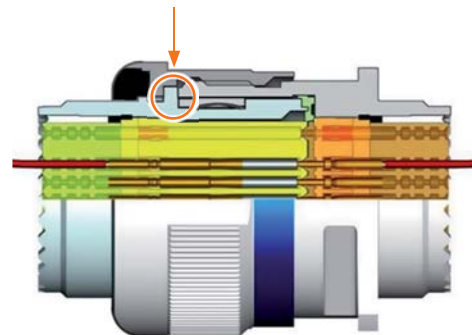
. Extinguishing fluid: Bromochloromethane

. Cooling fluid: Coolanol

## 8DV overview

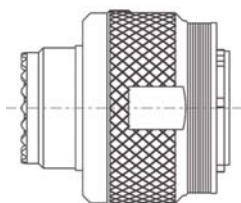
- Full stainless steel design giving the plug the necessary robustness for harsh environments: vibration, fire resistance, corrosion, temperature peak up to 260°C.
- Coupling with all types of D38999 receptacles and M85049 backshells.
- Reduced contact fretting, contact conductivity guaranteed.
- Security lock with vibration levels beyond D38999 standards values. The lock-on system increases the pressure force between plug and receptacle: excellent electrical conductivity between boxes coupled.
- Easy implementation of rear accessories at high temperatures when harnessed.
- Basic mechanical, electrical and environmental characteristics are identical to stainless steel D38999 connectors.

The metallic stop of plug to receptacle maintains the continuity of electrical ground regardless of the level of vibration.



## 8DV coupling possibilities

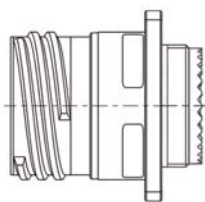
### 8DV Plug



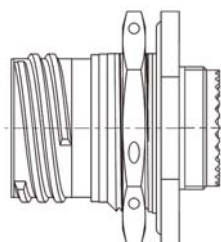
Type 5  
Reinforced locking



### Sealed receptacles



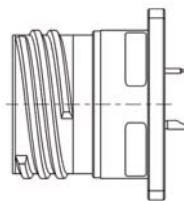
Type 0  
Square flange



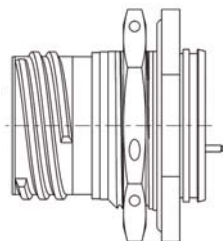
Type 7  
Jam nut

or

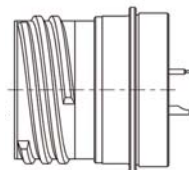
### Hermetic receptacles



Type 21  
Square flange



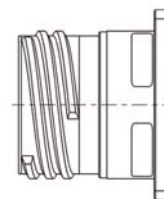
Type 23  
Jam nut



Type 25  
Solder mount

or

### Dummy receptacle



## Connector part numbers

| Basic Series                                                                                                                                                                                                                                                     | 8D | V5 | 11 | K | 35 | P | N |  |  | L |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---|----|---|---|--|--|---|
| <b>Shell style:</b><br>V5: Plug with RFI shielding & reinforced locking                                                                                                                                                                                          |    |    |    |   |    |   |   |  |  |   |
| <b>Shell size:</b><br>09, 11, 13, 15, 17, 19, 21, 23, 25                                                                                                                                                                                                         |    |    |    |   |    |   |   |  |  |   |
| <b>Plating:</b><br>K: Passivated<br>S: Nickel                                                                                                                                                                                                                    |    |    |    |   |    |   |   |  |  |   |
| <b>Contact layout:</b> See pages 13 to 17                                                                                                                                                                                                                        |    |    |    |   |    |   |   |  |  |   |
| <b>Contact type:</b><br>P: Pin<br>A: Connector supplied less pin contact or with specific contacts (connector marking: A + orientation)<br>S: Socket<br>B: Connector supplied less socket contact or with specific contacts (connector marking: B + orientation) |    |    |    |   |    |   |   |  |  |   |
| <b>Orientation:</b><br>N, A, B, C, D, E                                                                                                                                                                                                                          |    |    |    |   |    |   |   |  |  |   |
| <b>Specification:</b><br>251: Connector provided with power contacts (layouts with contact #8)<br>022: Fuel tank                                                                                                                                                 |    |    |    |   |    |   |   |  |  |   |
| <b>Special custom:</b><br>None: Standard plastic cap<br>M: Anti-static plastic cap                                                                                                                                                                               |    |    |    |   |    |   |   |  |  |   |
| L: For P or S contact type only, connectors delivered without contacts, connectors marking P or S plus orientation.                                                                                                                                              |    |    |    |   |    |   |   |  |  |   |

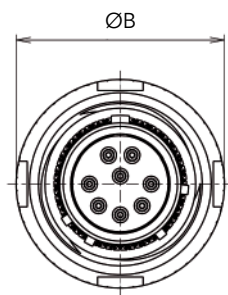
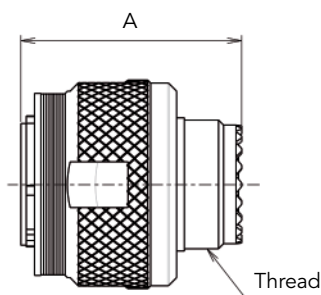
## Connectors weight - in gram (±10%)

| Layout | with contacts |        | without contacts |        |
|--------|---------------|--------|------------------|--------|
|        | Male          | Female | Male             | Female |
| 9-35   | 32.53         | 34.11  | 32.11            | 32.61  |
| 9-98   | 32.53         | 33.83  | 32.11            | 32.63  |
| 11-01  | 41.53         | 44.47  | 40.87            | 42.87  |
| 11-04  | 41.35         | 44.41  | 40.79            | 42.81  |
| 11-05  | 41.38         | 44.59  | 40.68            | 42.59  |
| 11-35  | 41.28         | 44.75  | 40.37            | 41.50  |
| 11-98  | 41.25         | 44.01  | 40.41            | 41.61  |
| 13-04  | 56.64         | 60.42  | 55.40            | 57.30  |
| 13-08  | 57.02         | 62.20  | 55.90            | 59.00  |
| 13-26  | 57.39         | 63.04  | 55.65            | 58.34  |
| 13-35  | 56.82         | 62.59  | 55.28            | 57.09  |
| 13-98  | 56.68         | 61.30  | 55.28            | 57.30  |
| 15-05  | 68.49         | 73.83  | 66.94            | 69.93  |
| 15-15  | 69.29         | 76.45  | 67.02            | 70.07  |
| 15-18  | 69.50         | 78.38  | 66.98            | 71.18  |
| 15-19  | 69.03         | 76.76  | 66.37            | 69.16  |
| 15-35  | 69.13         | 78.37  | 66.54            | 69.12  |
| 15-97  | 68.96         | 76.01  | 66.60            | 69.69  |
| 17-06  | 73.97         | 83.57  | 70.01            | 73.97  |
| 17-08  | 72.96         | 81.69  | 70.48            | 75.45  |
| 17-26  | 73.54         | 84.33  | 69.90            | 73.93  |
| 17-35  | 73.78         | 87.33  | 69.93            | 73.58  |
| 17-75  | 79.38         | 90.67  | 70.38            | 76.67  |
| 17-99  | 73.59         | 84.15  | 70.03            | 74.19  |

| Layout | with contacts |        | without contacts |        |
|--------|---------------|--------|------------------|--------|
|        | Male          | Female | Male             | Female |
| 19-11  | 87.99         | 101.58 | 84.58            | 93.00  |
| 19-32  | 87.20         | 100.60 | 82.72            | 87.80  |
| 19-35  | 87.51         | 103.96 | 82.89            | 87.46  |
| 21-11  | 101.71        | 121.55 | 94.45            | 103.95 |
| 21-16  | 98.81         | 114.09 | 93.85            | 101.61 |
| 21-35  | 99.09         | 119.75 | 93.56            | 100.00 |
| 21-39  | 100.47        | 120.80 | 94.67            | 104.44 |
| 21-41  | 99.01         | 116.38 | 93.27            | 99.98  |
| 23-21  | 118.01        | 141.26 | 111.50           | 124.88 |
| 23-35  | 116.37        | 142.52 | 109.37           | 117.52 |
| 23-53  | 116.43        | 138.62 | 109.01           | 117.42 |
| 23-55  | 117.18        | 140.25 | 109.48           | 118.25 |
| 25-19  | 130.34        | 162.35 | 117.80           | 131.95 |
| 25-24  | 129.84        | 161.20 | 118.20           | 132.64 |
| 25-29  | 128.16        | 157.13 | 119.17           | 134.51 |
| 25-35  | 125.95        | 158.78 | 116.99           | 126.78 |
| 25-43  | 128.20        | 158.88 | 118.78           | 134.08 |
| 25-46  | 130.50        | 154.34 | 115.86           | 126.02 |
| 25-61  | 125.25        | 152.00 | 116.71           | 127.60 |
| 25-08  | 151.58        | 183.41 | 115.58           | 127.41 |
| 25-20  | 136.60        | 166.82 | 115.03           | 125.28 |
| 25-04  | 129.00        | 158.85 | 119.80           | 133.41 |

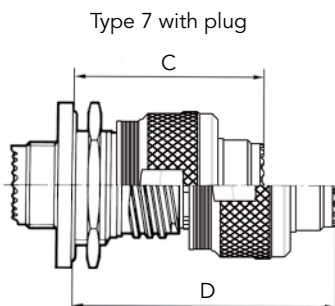
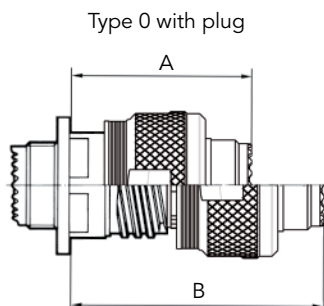
## Dimensions

### Plug type 5 reinforced locking (8DV)



| Shell size | A Max | Thread     | ØB Max |
|------------|-------|------------|--------|
| 09 (A)     | 31.00 | M12 x 1-6g | 21.80  |
| 11 (B)     |       | M15 x 1-6g | 25.00  |
| 13 (C)     |       | M18 x 1-6g | 29.40  |
| 15 (D)     |       | M22 x 1-6g | 32.50  |
| 17 (E)     |       | M25 x 1-6g | 35.70  |
| 19 (F)     |       | M28 x 1-6g | 38.50  |
| 21 (G)     |       | M31 x 1-6g | 41.70  |
| 23 (H)     |       | M34 x 1-6g | 44.90  |
| 25 (J)     |       | M37 x 1-6g | 48.00  |

### Mated connectors dimensions



| Shell size | A Max | B Max | C Max | D Max |
|------------|-------|-------|-------|-------|
| 09 (A)     | 37.00 | 52.30 | 38.30 | 53.60 |
| 11 (B)     |       |       | 38.50 | 53.80 |
| 13 (C)     |       |       |       |       |
| 15 (D)     |       |       |       |       |
| 17 (E)     |       |       |       |       |
| 19 (F)     |       |       |       |       |
| 21 (G)     |       |       |       |       |
| 23 (H)     |       |       |       |       |
| 25 (J)     |       |       |       |       |
|            | 36.00 | 51.30 |       |       |

Note: All dimensions are in millimeters (mm)



## Description

- Square flange receptacle with 4 clinch nuts or 4 helicoils
- Clinch nut & helicoils are self-locking
- Rear mounting
- Easy to install, time saving
- Equivalent MIL level qualification as 38999 Series III
- Clinch nut & helicoil tested:
  - . Impact test (drop 0.4kg from height of 100mm)
  - . Push out test (130N during 15s max)
  - . Wrench out test (1N/m)

## Technical features

### Mechanical

- **Shell:** Aluminum
- **Shells plating:**
  - Black zinc nickel (Z)
  - Cadmium olive drab (W)
  - Nickel (F)
- **Insulator:** Thermoplastic
- **Grommet and interfacial seal:**
  - Silicone elastomer
- **Contact:** Copper alloy
- **Contact plating:** Gold over nickel plated
- **Endurance:**
  - . 500 mating/unmating operations
- **Shock:**
  - 300g, 3ms according EN2591-D2 method A
- **Vibration:**
  - . Sinus:
    - . 10 à 2000 Hz, 3x12 hrs
    - (60g, 140 - 2000 Hz) with T° cycling
  - . Random:
    - . 50 to 2000 Hz, 2x8 Hrs
    - (1g2/ Hz, 100 - 2000Hz) at T° max.
    - . 25 to 2000 Hz, 2x8 Hrs
    - (5g2/ Hz, 100 - 300Hz) at ambient T°

| Contacts size  | 26 | 22 | 20 | 16  | 12  | 8   | 4   |
|----------------|----|----|----|-----|-----|-----|-----|
| Min force in N | 30 | 44 | 67 | 111 | 111 | 111 | 200 |

### Electrical

- **Test voltage rating (Vrms)**

| Service   | sea level | at 21000 m |
|-----------|-----------|------------|
| <b>R</b>  | 400       | N/A        |
| <b>M</b>  | 1 300     | 800        |
| <b>N</b>  | 1 000     | 600        |
| <b>I</b>  | 1 800     | 1 000      |
| <b>II</b> | 2 300     | 1 000      |

- **Contact resistance**

| Contacts size | 26 | 22   | 20  | 16  | 12  | 8 | 4 |
|---------------|----|------|-----|-----|-----|---|---|
| Resistance mΩ | 16 | 14.6 | 7.3 | 3.8 | 3.5 | 3 | 2 |

- **Insulation resistance:**
  - ≥ 5 000 MΩ (under 500 Vdc)

- **Contact rating:**

| Contacts size | 26 | 22 | 20  | 16 | 12 | 8  | 4  |
|---------------|----|----|-----|----|----|----|----|
| Rating (A)    | 3  | 5  | 7.5 | 13 | 23 | 45 | 80 |

- **Shell continuity**
  - Black zinc nickel (Z): 2.5 mΩ
  - Cadmium olive drab (W): 2.5 mΩ
  - Nickel (F): 1 mΩ

- **Shielding:**
  - F: 65 db at 10 GHz
  - Z, F & W: 85 db at 1 GHz
  - Z & W: 50 db at 10 GHz

### Environmental

- **Temperature range:**
  - W: -65°C +175°C
  - Z & F: -65°C +200°C
- **Sealing:**
  - Mated connectors meet altitude immersion requirements of MIL-DTL-38999.
- **Salt spray:**
  - Z & W: 500 Hours
  - F: 48 Hours

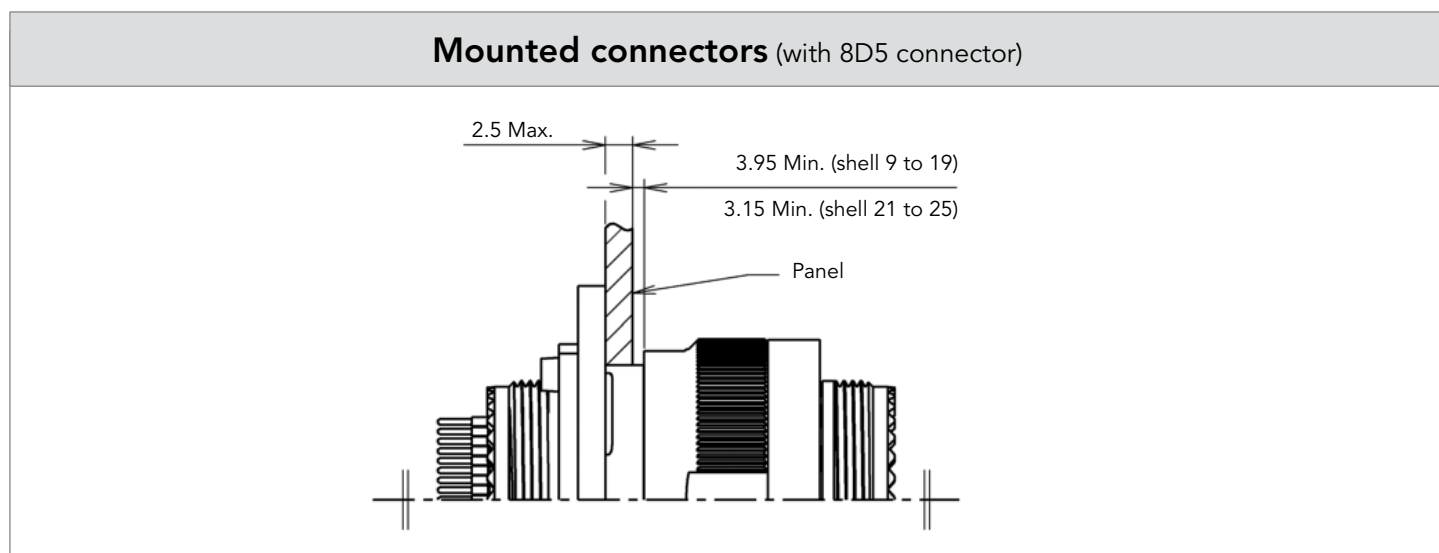
### Resistance to fluids

- **According to MIL-DTL-38999 standard**
  - . Gasoline: JP5 (OTAN F44)
  - . Mineral hydrolic fluid: MIL-H-5606 (OTAN H515)
  - . Synthetic hydraulic fluid: Skydrol 500 B4
- **LD4 (SAE AS 1241)**
  - . Mineral lubricating: MIL-L-7870A (OTAN 0142)
  - . Synthetic lubricating: MIL-L-23699 (OTAN 0156), MIL-L-7808
  - . Cleaning fluid: MIL-C-87936 diluted
  - . De-icing fluid: MIL-A-8243
  - . Extinguishing fluid: Bromochloromethane
  - . Cooling fluid: Coolanol

## Ordering information

| Basic Series                                                                                                                                                                                                                                                                                                                                                                           | 8D | 34 | - | 19 | F | 35 | S | N |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|---|----|---|----|---|---|
| <b>Shell style:</b><br><b>34:</b> Square flange receptacle with M3 clinch nuts, F & W only<br><b>35:</b> Square flange receptacle with M3 helicoils, Z only<br><b>37:</b> Square flange receptacle with UNC 4-40 helicoils, Z only<br><b>39:</b> Square flange receptacle with UNC 4-40 clinch nuts, F & W only                                                                        |    |    |   |    |   |    |   |   |
| <b>Contact length:</b> (consult us)<br>- : Connectors with standard crimp contacts<br><b>C:</b> Short PC tail<br><b>L:</b> Long PC tail                                                                                                                                                                                                                                                |    |    |   |    |   |    |   |   |
| <b>Shell size:</b><br><b>9 - 11 - 13 - 15 - 17 - 19 - 21 - 23 - 25</b>                                                                                                                                                                                                                                                                                                                 |    |    |   |    |   |    |   |   |
| <b>Plating:</b><br><b>Z:</b> Black zinc nickel<br><b>F:</b> Nickel<br><b>W:</b> Olive green cadmium                                                                                                                                                                                                                                                                                    |    |    |   |    |   |    |   |   |
| <b>Contact layout:</b><br>See pages 13 to 17                                                                                                                                                                                                                                                                                                                                           |    |    |   |    |   |    |   |   |
| <b>Contact type:</b><br><b>P:</b> Pin<br><b>S:</b> Socket                                                                                                                                                                                                                                                                                                                              |    |    |   |    |   |    |   |   |
| <b>Orientation:</b><br><b>N, A, B, C, D, E</b>                                                                                                                                                                                                                                                                                                                                         |    |    |   |    |   |    |   |   |
| <b>Specification:</b><br><b>046:</b> Tin plated contact SnPb<br><b>046E:</b> Tin plated contact Sn pure<br><b>046S:</b> Tin plated contact SAC305<br><b>900:</b> Contact without shoulder (gold plated)<br><b>901:</b> Tin plated contact without shoulder SnPb<br><b>901E:</b> Tin plated contact without shoulder Sn pure<br><b>901S:</b> Tin plated contact without shoulder SAC305 |    |    |   |    |   |    |   |   |

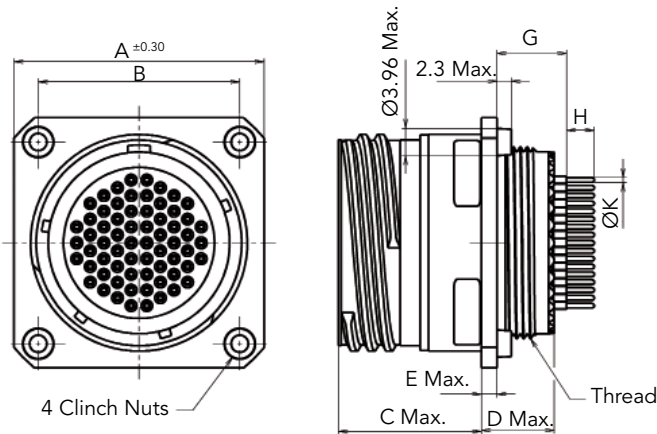
## Dimensions



Note: All dimensions are in millimeters (mm)

## Dimensions

### Square flange receptacle - type 34 & type 39



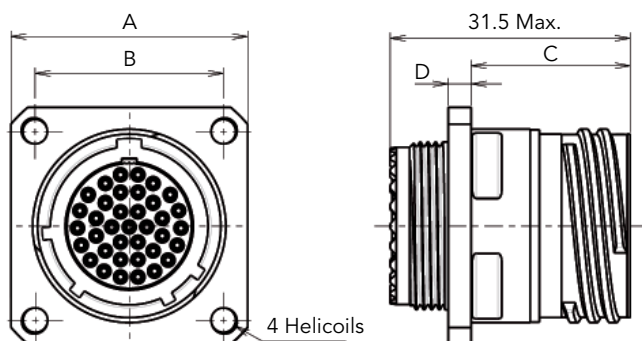
| Shell Size | A ±0.3 | B     | C Max | D Max | E Max | Thread   |
|------------|--------|-------|-------|-------|-------|----------|
| 9          | 27.79  | 18.26 | 20.90 | 10.60 | 2.50  | M12x1-6g |
| 11         | 30.15  | 20.62 |       |       |       | M15x1-6g |
| 13         | 32.54  | 23.01 |       |       |       | M18x1-6g |
| 15         | 34.14  | 24.61 |       |       |       | M22x1-6g |
| 17         | 36.5   | 26.97 |       |       |       | M25x1-6g |
| 19         | 38.89  | 29.36 |       |       |       | M28x1-6g |
| 21         | 41.27  | 31.75 | 20.10 | 11.40 | 3.20  | M31x1-6g |
| 23         | 44.45  | 34.93 |       |       |       | M34x1-6g |
| 25         | 47.62  | 38.1  |       |       |       | M37x1-6g |

### Short contact length

Min / Max - For other length please consult us

| Shell size | G            |              |              |              |              | H         |           | K           |             |
|------------|--------------|--------------|--------------|--------------|--------------|-----------|-----------|-------------|-------------|
|            | #22D         |              | #20          |              | #16          | #22D      | #20 & #16 | #22D & #20  | #16         |
|            | P            | S            | P            | S            | P & S        | P & S     | P & S     | P & S       | P & S       |
| 9 to 19    | 9.47 / 10.54 | 9.09 / 10.54 | 9.64 / 10.71 | 9.26 / 10.71 | 9.64 / 10.75 | 3.8 / 4.0 | 4.9 / 5.1 | 0.65 / 0.70 | 1.09 / 1.15 |
| 21 to 25   | 9.58 / 10.65 | 9.20 / 10.65 | 9.75 / 10.82 | 9.37 / 10.82 | 9.75 / 10.86 |           |           |             |             |

### Square flange receptacle - type 35 & type 37



| Shell Size | A    | B     | C     | D |
|------------|------|-------|-------|---|
| 9          | 23.8 | 18.26 | 20.83 | 3 |
| 11         | 26.2 | 20.62 |       |   |
| 13         | 28.6 | 23.01 |       |   |
| 15         | 31   | 24.61 |       |   |
| 17         | 33.3 | 26.97 |       |   |
| 19         | 36.5 | 29.36 |       |   |
| 21         | 39.7 | 31.75 | 20.07 |   |
| 23         | 42.9 | 34.93 |       |   |
| 25         | 46   | 38.1  |       |   |

### Short contact length

See table above.



## Description

- High level vibration resistance in harsh environments
- Offers the same level of performance as the MIL-DTL-38999 Series III connector
- Jam nut or square flange receptacle
- No risk of breaking contacts
- No risk of micro-cuts
- Allow direct grounding from PCB to the flange
- PC tails contacts without shoulder: #16, #20 and #22
- Resin sealed version, please consult us

## Technical features

### Mechanical

- **Shell:** Aluminum
- **Shell plating:**
  - . Cadmium olive drab (W)
  - . Nickel (F)
  - . Black zinc nickel (Z)
- **Insulator:** Thermoplastic
- **Grommet and interfacial seal:** Silicone elastomer
- **Contacts:** Copper alloy
- **Contacts plating:** Gold over nickel plated
- **Endurance:** 500 mating cycles
- **Shock:** 300g, 3ms according EN2591-D2 method A
- **Vibration:**
  - . Sinus:
    - . 10 à 2000 Hz, 3x12 hrs
    - . (60g, 140 - 2000 Hz) with T° cycling
  - . Random:
    - . 50 to 2000 Hz, 2x8 Hrs
    - . (1g2/ Hz, 100 - 2000Hz) at T° max.
    - . 25 to 2000 Hz, 2x8 Hrs
    - . (5g2/ Hz, 100 - 300Hz) at ambient T°

Test with accessories in acc with EN2591-D3

#### • Contact retention:

| Contacts size  | 22 | 20 | 16  | 12  |
|----------------|----|----|-----|-----|
| Min force in N | 44 | 67 | 111 | 111 |

### Electrical

#### • Test voltage rating (Vrms)

| Service | sea level | at 21000 m |
|---------|-----------|------------|
| M       | 1 300     | 800        |
| N       | 1 000     | 600        |
| I       | 1 800     | 1 000      |
| II      | 2 300     | 1 000      |

#### • Contact resistance

| Contacts size | 22   | 20  | 16  | 12  |
|---------------|------|-----|-----|-----|
| Resistance mΩ | 14.6 | 7.3 | 3.8 | 3.5 |

#### • Insulation resistance:

≥ 5 000 MΩ (under 500 Vdc)

#### • Contact rating:

| Contacts size | 22 | 20  | 16 | 12 |
|---------------|----|-----|----|----|
| Rating (A)    | 5  | 7.5 | 13 | 23 |

#### • Shell continuity:

- . Cadmium olive drab (W): 2.5 Ωh
- . Nickel (F): 1 Ωh
- . Black zinc nickel (Z): 2.5 Ωh

#### • Shielding:

- . F: 65 db at 10 GHz; 85 db at 1 GHz
- . W: 50 db at 10 GHz
- . Z: Consult us

### Environmental

#### • Temperature range:

- . W: -65°C +175°C
- . F: -65°C +200°C
- . Z: -65°C +200°C

#### • Sealing:

Mated connectors meet altitude immersion requirements of MIL-DTL-38999.

#### • Salt spray:

- . W: 500 Hrs
- . F: 48 Hrs
- . Z: 500 Hrs

### Resistance to fluids

#### • According to MIL-DTL-38999 standard

- . Gasoline: JP5 (OTAN F44)
- . Mineral hydrolic fluid: MIL-H-5606 (OTAN H515)
- . Synthetic hydraulic fluid: Skydrol 500 B4

#### • LD4 (SAE AS 1241)

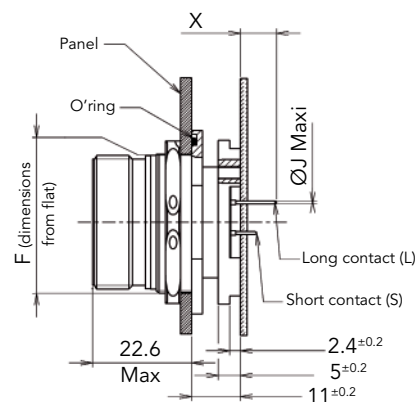
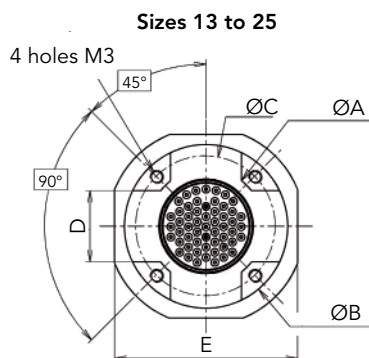
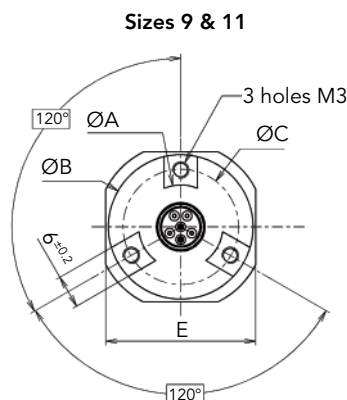
- . Mineral lubricating: MIL-L-7870A (OTAN 0142)
- . Synthetic lubricating: MIL-L-23699 (OTAN 0156), MIL-L-7808
- . Cleaning fluid: MIL-C-87936 diluted
- . De-icing fluid: MIL-A-8243
- . Extinguishing fluid: Bromochloromethane
- . Cooling fluid: Coolanol

## Ordering information

|                                                                                    |    |    |    |   |    |   |    |   |   |   |
|------------------------------------------------------------------------------------|----|----|----|---|----|---|----|---|---|---|
| Basic Series                                                                       | 8D | 87 | 11 | C | 17 | W | 35 | P | N | L |
| <b>Shell type:</b>                                                                 |    |    |    |   |    |   |    |   |   |   |
| 80: Square flange receptacle                                                       |    |    |    |   |    |   |    |   |   |   |
| 87: Jam nut receptacle                                                             |    |    |    |   |    |   |    |   |   |   |
| <b>Length between panel &amp; PCB (in mm)</b> For other length, please consult us. |    |    |    |   |    |   |    |   |   |   |
| <b>Type:</b>                                                                       |    |    |    |   |    |   |    |   |   |   |
| C: Receptacle with short PC tail                                                   |    |    |    |   |    |   |    |   |   |   |
| L: Receptacle with long PC tail                                                    |    |    |    |   |    |   |    |   |   |   |
| <b>Shell size: 09, 11, 13, 15, 17, 19, 21, 23, 25</b>                              |    |    |    |   |    |   |    |   |   |   |
| <b>Plating:</b>                                                                    |    |    |    |   |    |   |    |   |   |   |
| W: Olive green cadmium                                                             |    |    |    |   |    |   |    |   |   |   |
| F: Nickel (RoHS)                                                                   |    |    |    |   |    |   |    |   |   |   |
| Z: Zinc nickel (RoHS)                                                              |    |    |    |   |    |   |    |   |   |   |
| <b>Contact layout:</b> Consult us for available layouts                            |    |    |    |   |    |   |    |   |   |   |
| <b>Contact type:</b>                                                               |    |    |    |   |    |   |    |   |   |   |
| P: Pin                                                                             |    |    |    |   |    |   |    |   |   |   |
| S: Socket                                                                          |    |    |    |   |    |   |    |   |   |   |
| <b>Orientation: N, A, B, C, D, E</b>                                               |    |    |    |   |    |   |    |   |   |   |
| <b>Specification:</b>                                                              |    |    |    |   |    |   |    |   |   |   |
| None: Standard                                                                     |    |    |    |   |    |   |    |   |   |   |
| L: Without contacts                                                                |    |    |    |   |    |   |    |   |   |   |
| For other specification, please contact us                                         |    |    |    |   |    |   |    |   |   |   |
| 046: Tin plated contact SnPb                                                       |    |    |    |   |    |   |    |   |   |   |
| 046E: Tin plated contact Sn pure (RoHS)                                            |    |    |    |   |    |   |    |   |   |   |
| 046S: Tin plated contact SAC305 (RoHS)                                             |    |    |    |   |    |   |    |   |   |   |

## Dimensions

### Jam nut receptacle (type 87)



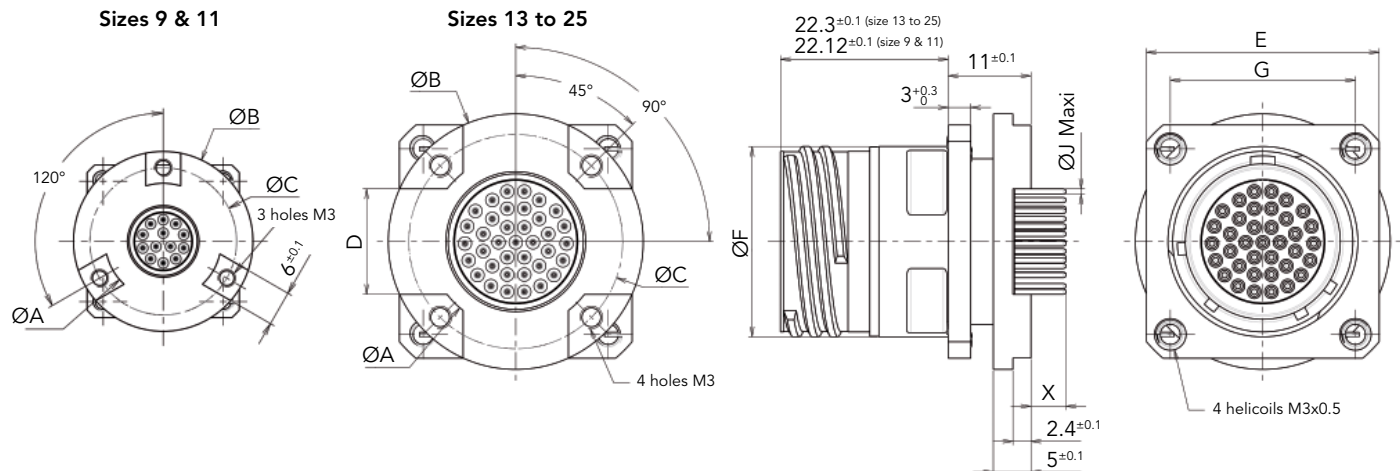
| Shell size | ØA ± 0.15 | ØB ± 0.15 | ØC    | D <sup>+0</sup> <sub>-0.2</sub> | E ± 0.4 | F ± 0.15 |
|------------|-----------|-----------|-------|---------------------------------|---------|----------|
| 9          | 15.10     | 26.00     | 20.50 | -                               | 27.00   | 16.53    |
| 11         | 19.90     | 30.80     | 25.20 | -                               | 31.80   | 19.07    |
| 13         | 19.90     | 30.80     | 25.25 | 12                              | 34.90   | 23.82    |
| 15         | 23.00     | 33.90     | 28.42 | 14                              | 38.10   | 26.97    |
| 17         | 26.00     | 36.80     | 31.42 | 16                              | 41.30   | 30.15    |
| 19         | 29.50     | 40.40     | 35.03 | 18                              | 46.00   | 33.32    |
| 21         | 32.50     | 43.20     | 37.82 | 20                              | 49.20   | 36.50    |
| 23         | 35.50     | 46.50     | 41.12 | 23                              | 52.40   | 39.67    |
| 25         | 38.60     | 49.60     | 44.30 | 25                              | 55.60   | 42.85    |

| Contact size | Contact type | PC tail length | Size 09 & 11<br>X Min | Size 13 to 25<br>X Min | ØJ max |
|--------------|--------------|----------------|-----------------------|------------------------|--------|
| 22D          | M & F        | Long           | 7.1                   | 7.1                    | 0.7    |
|              | M & F        | Short          | 3.6                   | 3.6                    |        |
| 20           | M & F        | Long           | 7.1                   | 7.1                    | 0.9    |
|              | M & F        | Short          | 3.6                   | 4.2                    |        |
| 16           | M & F        | Long           | 7.1                   | 7.1                    | 1.35   |
|              | M & F        | Short          | 3.6                   | 4.2                    |        |

Note: All dimensions are in millimeters (mm)

## Dimensions

### Square flange receptacle (type 80)

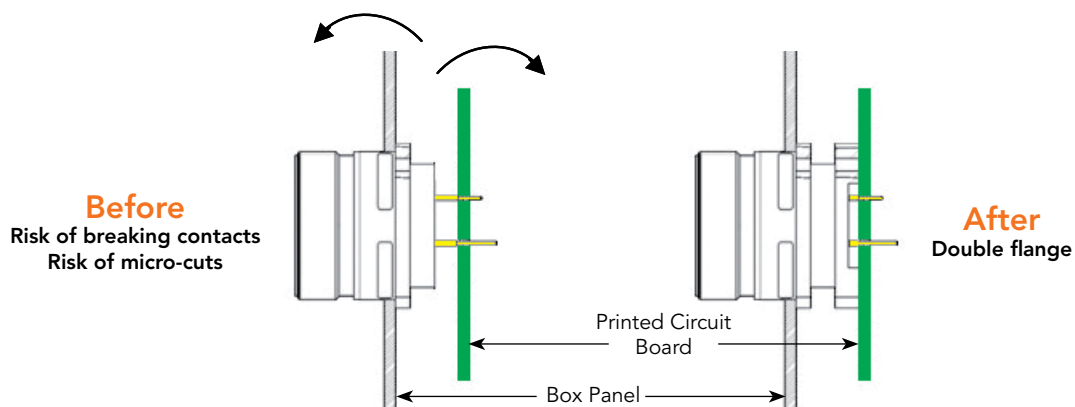


| Shell size | $\varnothing A \pm 0.1$ | $\varnothing B \pm 0.1$ | $\varnothing C \pm 0.1$ | $D \pm 0.1$ | $E \pm 0.2$ | $\varnothing F \pm 0.1$ | $G \pm 0.1$ |
|------------|-------------------------|-------------------------|-------------------------|-------------|-------------|-------------------------|-------------|
| 9          | 15.1                    | 26                      | 20.5                    | -           | 23.75       | 15.67                   | 18.26       |
| 11         | 19.9                    | 30.8                    | 25.2                    | -           | 26.14       | 18.67                   | 20.62       |
| 13         | 19.9                    | 30.8                    | 25.25                   | 12          | 28.55       | 22.07                   | 23.01       |
| 15         | 23                      | 33.9                    | 28.42                   | 14          | 30.94       | 25.25                   | 24.61       |
| 17         | 26                      | 36.8                    | 31.42                   | 16          | 33.25       | 30                      | 26.97       |
| 19         | 29.5                    | 40.4                    | 35.03                   | 18          | 36.45       | 31.57                   | 29.36       |
| 21         | 32.5                    | 43.2                    | 37.82                   | 20          | 39.65       | 34.75                   | 31.75       |
| 23         | 35.5                    | 46.5                    | 41.12                   | 23          | 42.85       | 37.92                   | 34.93       |
| 25         | 38.6                    | 49.6                    | 44.3                    | 25          | 45.95       | 41.1                    | 38.1        |

| Contact size | Contact type | PC tail length | Size 09 & 11 | Size 13 to 25 | $\varnothing J$ max |
|--------------|--------------|----------------|--------------|---------------|---------------------|
|              |              |                | X Min        | X Min         |                     |
| 22D          | M            | Long           | 7.39         | 7.21          | 0.70                |
|              |              | Short          | 4.39         | 4.21          |                     |
|              | F            | Long           | 7.12         | 6.94          |                     |
|              |              | Short          | 4.12         | 3.94          |                     |
| 20           | M            | Long           | 7.39         | 7.21          | 0.90                |
|              |              | Short          | 4.39         | 4.21          |                     |
|              | F            | Long           | 7.40         | 7.22          |                     |
|              |              | Short          | 4.40         | 4.22          |                     |
| 16           | M            | Long           | 7.39         | 7.21          | 1.35                |
|              |              | Short          | 4.39         | 4.21          |                     |
|              | F            | Long           | 7.34         | 7.16          |                     |
|              |              | Short          | 7.34         | 4.16          |                     |

Note: All dimensions are in millimeters (mm)

## Comparison





## Description

- Pin & socket PCB contacts without shoulder #20 & #22D as per MIL-DTL-38999 Series I, II & III. Contacts without shoulder allows a more flexible mounting on variable PCB thicknesses or depths.
- Ruggedized contacts:
  - . Material: copper alloy
  - . Finish: gold per MIL-G-45204 type I class 1 over nickel plate
  - . Sleeve: stainless steel
- Flexible mounting:
  - . Various PCB thicknesses
  - . Multiple PCB positioning

## Ordering information

### 8D Series connector with PCB contacts without shoulder

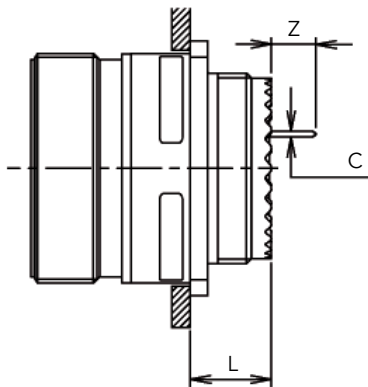
|                                                                                             |  |           |          |          |           |          |           |          |          |            |
|---------------------------------------------------------------------------------------------|--|-----------|----------|----------|-----------|----------|-----------|----------|----------|------------|
| <b>Basic Series:</b>                                                                        |  | <b>8D</b> | <b>0</b> | <b>C</b> | <b>11</b> | <b>F</b> | <b>35</b> | <b>P</b> | <b>N</b> | <b>900</b> |
| <b>Shell type</b>                                                                           |  |           |          |          |           |          |           |          |          |            |
| 0: Square flange receptacle                                                                 |  |           |          |          |           |          |           |          |          |            |
| 7: Jam nut receptacle                                                                       |  |           |          |          |           |          |           |          |          |            |
| 34: Square flange receptacle with M3 clinch nut (F or W plating, aluminum shell only)       |  |           |          |          |           |          |           |          |          |            |
| 35: Square flange receptacle with M3 helicoils (Z plating, aluminum shell only)             |  |           |          |          |           |          |           |          |          |            |
| 37: Square flange receptacle with UNC 4-40 helicoils (Z plating, aluminum shell only)       |  |           |          |          |           |          |           |          |          |            |
| 39: Square flange receptacle with UNC 4-40 clinch nut (F or W plating, aluminum shell only) |  |           |          |          |           |          |           |          |          |            |
| <b>PCB contact without shoulder type</b> (see next page for information & dimensions)       |  |           |          |          |           |          |           |          |          |            |
| C: Short PC tail                                                                            |  |           |          |          |           |          |           |          |          |            |
| M: Medium PC tail                                                                           |  |           |          |          |           |          |           |          |          |            |
| L: Long PC tail                                                                             |  |           |          |          |           |          |           |          |          |            |
| <b>shell size:</b> 09, 11, 13, 15, 17, 19, 21, 23, 25                                       |  |           |          |          |           |          |           |          |          |            |
| <b>8D aluminum plating</b>                                                                  |  |           |          |          |           |          |           |          |          |            |
| F: Nickel                                                                                   |  |           |          |          |           |          |           |          |          |            |
| Z: Black zinc nickel                                                                        |  |           |          |          |           |          |           |          |          |            |
| W: Olive green cadmium                                                                      |  |           |          |          |           |          |           |          |          |            |
| ZC: Green zinc cobalt                                                                       |  |           |          |          |           |          |           |          |          |            |
| <b>8D stainless steel plating</b>                                                           |  |           |          |          |           |          |           |          |          |            |
| K: Passivated                                                                               |  |           |          |          |           |          |           |          |          |            |
| S: Nickel                                                                                   |  |           |          |          |           |          |           |          |          |            |
| <b>8D composite plating</b>                                                                 |  |           |          |          |           |          |           |          |          |            |
| J: Olive green cadmium                                                                      |  |           |          |          |           |          |           |          |          |            |
| M: Nickel                                                                                   |  |           |          |          |           |          |           |          |          |            |
| X: Without plating                                                                          |  |           |          |          |           |          |           |          |          |            |
| <b>8D titanium plating</b>                                                                  |  |           |          |          |           |          |           |          |          |            |
| TT: Without plating                                                                         |  |           |          |          |           |          |           |          |          |            |
| TF: Nickel                                                                                  |  |           |          |          |           |          |           |          |          |            |
| <b>Contact layout:</b> See pages 13 to 17                                                   |  |           |          |          |           |          |           |          |          |            |
| <b>Contact type</b>                                                                         |  |           |          |          |           |          |           |          |          |            |
| P: Male                                                                                     |  |           |          |          |           |          |           |          |          |            |
| S: Female                                                                                   |  |           |          |          |           |          |           |          |          |            |
| <b>Orientation:</b> N, A, B, C, D, E                                                        |  |           |          |          |           |          |           |          |          |            |
| <b>Specification</b>                                                                        |  |           |          |          |           |          |           |          |          |            |
| 900: Contact without shoulder with gold plated barrel (termination area)                    |  |           |          |          |           |          |           |          |          |            |
| 901: Contact without shoulder with tin plated SnPb barrel (termination area)                |  |           |          |          |           |          |           |          |          |            |
| 901E: Contact without shoulder with tin plated Sn pure barrel (termination area)            |  |           |          |          |           |          |           |          |          |            |
| 901S: Contact without shoulder with tin plated SAC305 barrel (termination area)             |  |           |          |          |           |          |           |          |          |            |
| <b>Special custom</b>                                                                       |  |           |          |          |           |          |           |          |          |            |
| None: Standard plastic cap                                                                  |  |           |          |          |           |          |           |          |          |            |
| M: Antistatic plastic cap                                                                   |  |           |          |          |           |          |           |          |          |            |

Note: For JVS (8D Bronze Series, please consult us)

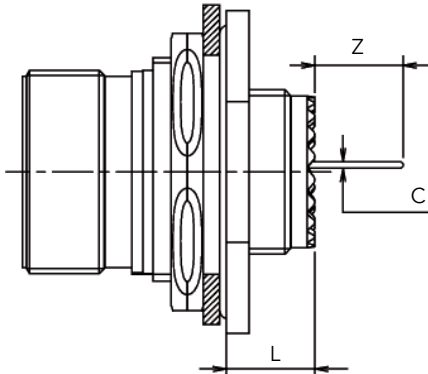
## Dimensions

### Type 0 & type 7

Square flange receptacle  
8D0  
(8D34 / 8D35 / 8D37 / 8D39)



Jam nut receptacle  
8D7



| Contact size | Contact Type |                   | Ø C Max | Square flange receptacle<br>8D0 / 8D34 / 8D35 / 8D37 / 8D39 |       | Jam nut receptacle<br>8D7 |       |
|--------------|--------------|-------------------|---------|-------------------------------------------------------------|-------|---------------------------|-------|
|              |              |                   |         | Z Min                                                       | Z Max | Z Min                     | Z Max |
| #22D & #20   | Pin          | C: Short PC tail  | 0.50    | 3.96                                                        | 4.88  | 3.56                      | 4.63  |
|              |              | M: Medium PC tail | 0.50    | 5.99                                                        | 6.91  | 5.59                      | 6.66  |
|              |              | L: Long PC tail   | 0.50    | 7.51                                                        | 8.43  | 7.11                      | 8.18  |
| #22D & #20   | Socket       | C: Short PC tail  | 0.50    | 3.96                                                        | 5.21  | 3.56                      | 4.81  |
|              |              | M: Medium PC tail | 0.50    | 5.99                                                        | 7.24  | 5.59                      | 6.84  |
|              |              | L: Long PC tail   | 0.50    | 7.51                                                        | 8.76  | 7.11                      | 8.36  |

| Shell type | Square flange receptacle<br>8D0 / 8D34 / 8D35 / 8D37 / 8D39 |          | Jam nut receptacle<br>8D7 |
|------------|-------------------------------------------------------------|----------|---------------------------|
| Shell size | 9 to 19                                                     | 21 to 25 | 9 to 25                   |
| L Max      | 10.7                                                        | 11.5     | 9.90                      |

Note: All dimensions are in millimeters (mm)



## Description

- Reinforced sealed receptacle with male or female straight PC tail contacts
- Strong sealing performance:  $10^{-7}$  atm.cm<sup>3</sup>/s
- Designed for unpressurized area
- 125°C max (operational temperature)
- 100 % scoop proof
- Full RoHS solution
- High density connectors
- Weight saving compared to hermetic version
- Other **SOURIAU** ranges on request

## Technical features

### Mechanical

- **Shell plating:**
  - . 8D aluminum shell:
    - . Black zinc nickel (Z)
    - . Olive drab cadmium (W)
    - . Nickel (F)
  - . 8D composite shell:
    - . Olive drab cadmium (J)
    - . Nickel (M)
  - . 8D stainless steel shell:
    - . Nickel (S)
    - . Passivated (K)
  - . 8D titanium shell:
    - . Nickel (TF)
    - . Without plating (TT)
- **Insulator:** Thermoplastic
- **Interfacial seal:** Silicone elastomer
- **Contacts:** Copper alloy
- **Contacts plating:** Gold over nickel plated
- **Endurance:**
  - 500 mating/unmating operations

### Electrical

- **Contact resistance:**

| Contacts size | 22   | 20  | 16  |
|---------------|------|-----|-----|
| Resistance mΩ | 14.6 | 7.3 | 3.8 |
- **Shielding:**
  - . F; S; TF: 65db - 10GHz
  - . F; Z; W; J; M: 85db - 1GHz
  - . Z; W: 50db - 10GHz
  - . K; TT: 45db - 10GHz
- **Shell continuity:**
  - . F; TF; S: 1mΩ
  - . Z; ZC; W: 2.5mΩ
  - . J; M: 3mΩ
  - . JVS: 5mΩ
  - . TT; K: 10mΩ

### Environmental

- **Temperature range:** -55°C +125°C
- **Sealing (initial):**  $10^{-7}$  atm.cm<sup>3</sup>/s
- **Salt spray:**
  - . F; S; TF: 48h
  - . Z; W; JVS; TT; K; S: 500h
  - . J; M: 2000h

## Ordering information

## 8D part number

| Basic Series:                                                                                                                                                                                                                                                                                                                                                                                                                           | 8DR | 0 | C | 09 | Z | 35 | P | N |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|----|---|----|---|---|
| <b>Shell type:</b><br><b>0:</b> Square flange receptacle<br><b>1:</b> In line receptacle (8D aluminum only)<br><b>7:</b> Jam nut receptacle (except 8D Composite)                                                                                                                                                                                                                                                                       |     |   |   |    |   |    |   |   |
| <b>Contact type:</b><br><b>C:</b> Receptacle with short PC tail (male and female #22D, #20, #16, #12)<br><b>L:</b> Connector with long PC tail (male and female #22D)<br><b>S:</b> Connector with specific PC Tail (male and female #22D)<br><b>M:</b> Connector with medium PC tail (male #22D)<br><b>P:</b> Connector with solder cup: . Pin: #22D, #20 & #16; Socket: #12<br>. Socket: #22D, #20 & #16; Pin: #12 - Please consult us |     |   |   |    |   |    |   |   |
| <b>Shell size</b><br><b>09, 11, 13, 15, 17, 19, 21, 23, 25</b>                                                                                                                                                                                                                                                                                                                                                                          |     |   |   |    |   |    |   |   |
| <b>Aluminum plating:</b><br><b>F:</b> Nickel<br><b>Z:</b> Black zinc nickel<br><b>W:</b> Olive drab cadmium                                                                                                                                                                                                                                                                                                                             |     |   |   |    |   |    |   |   |
| <b>Composite plating:</b><br><b>J:</b> Olive drab cadmium<br><b>M:</b> Nickel                                                                                                                                                                                                                                                                                                                                                           |     |   |   |    |   |    |   |   |
| <b>Stainless steel plating:</b><br><b>K:</b> Passivated<br><b>S:</b> Nickel                                                                                                                                                                                                                                                                                                                                                             |     |   |   |    |   |    |   |   |
| <b>Titanium plating:</b><br><b>TT:</b> Without plating<br><b>TF:</b> Nickel                                                                                                                                                                                                                                                                                                                                                             |     |   |   |    |   |    |   |   |
| <b>Contact layout</b><br>See next page                                                                                                                                                                                                                                                                                                                                                                                                  |     |   |   |    |   |    |   |   |
| <b>Contact type:</b><br><b>P:</b> Male<br><b>S:</b> Female                                                                                                                                                                                                                                                                                                                                                                              |     |   |   |    |   |    |   |   |
| <b>Orientation</b><br><b>N, A, B, C, D, E</b>                                                                                                                                                                                                                                                                                                                                                                                           |     |   |   |    |   |    |   |   |

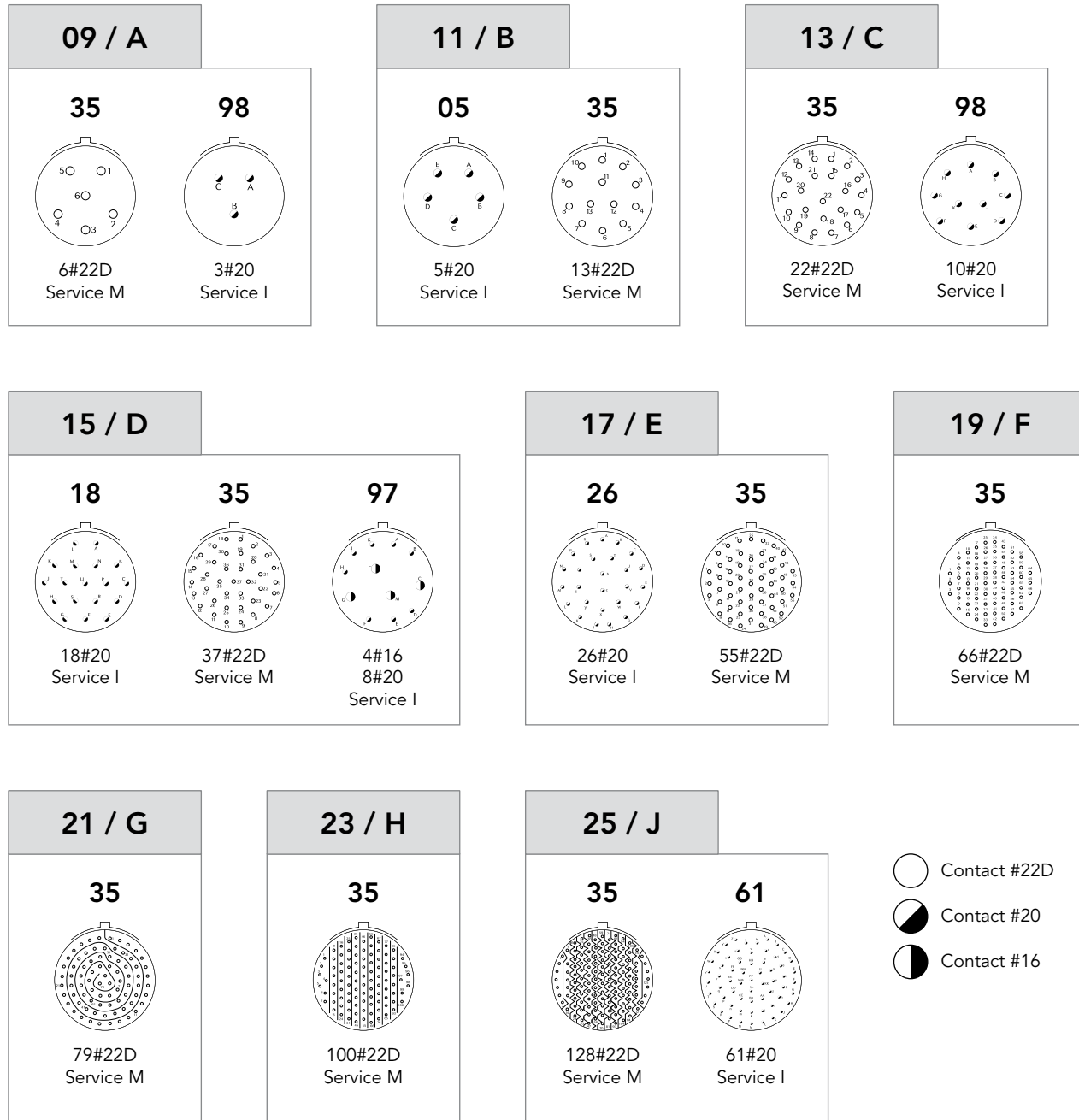
Double flange receptacle available, please consult us.

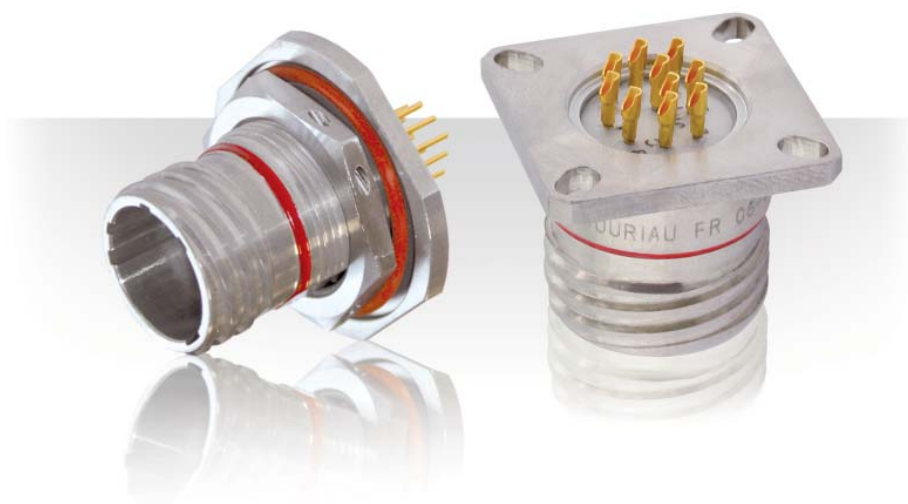
Receptacle with integrated clinch nuts or helicoils available, please consult us.

Contacts without shoulder available, please consult us.

## Contact layouts

For C or L contact type. For other contact type or layouts, please consult us.





## Description

- Glass sealed hermetic:
  - . high hermeticity performance
  - . compact low profile
- Quick screw coupling according to EN3645 and MIL-DTL-38999 Series III standards
- Robust stainless steel adapted for any weld or solder operation
- Various mounting styles:
  - . compact solder mount receptacle
  - . easy to install square flange receptacle
  - . easy to replace jam nut receptacle
- Signal and power contacts
- Various PCB contact versions available
- Special fuel tank versions for long term fuel immersion
- 230V qualified versions where higher voltage is used to reduce cable weight

## Technical features

### Mechanical

- **Shell:**
  - . Class Y: passivated stainless steel
  - . Class N: nickel plated stainless steel
- **Seals:**
  - . Silicone elastomer
- **Contact:**
  - . Gold plated ferrous alloy
- **Endurance:**
  - . 500 mating/unmating operations

### Electrical

- **Max current rating per contact:**

| Contact size | 22D | 20 | 16 | 12 | 8  | 4  |
|--------------|-----|----|----|----|----|----|
| Rating (A)   | 3   | 5  | 10 | 17 | 33 | 60 |

- **Dielectric withstanding voltage:**

| Service | Sea level  | 30 000 m   |
|---------|------------|------------|
| M       | 1 300 Vrms | 800 Vrms   |
| I       | 1 800 Vrms | 1 000 Vrms |
| II      | 2 300 Vrms | 1 000 Vrms |

- **Shielding:**
  - . Class Y: 45 dB min at 10 GHz
  - . Class N: 65 dB min at 10 GHz
- **Insulation resistance:**
  - . 5000 MΩ (under 500 Vdc)

### Environmental

- **Operating temperature:** -65°C to 200°C
- **Hermeticity:** leak rate  $<10^{-7}$  atm.cm<sup>3</sup>/s (helium gas test)
- **Salt spray:**
  - . Class Y: 500 hours
  - . Class N: 48 hours
- **Resistance to fluids per MIL-DTL-38999:**
  - . Gasoline JP5 (OTAN 44) - short immersion
  - . Mineral hydraulic fluid MIL-H-5606 (OTAN H515)
  - . Synthetic hydraulic fluid Skydrol 500 B4
- **Fuel immersion version:**
  - . JP5 - long term immersion
  - . 105°C max

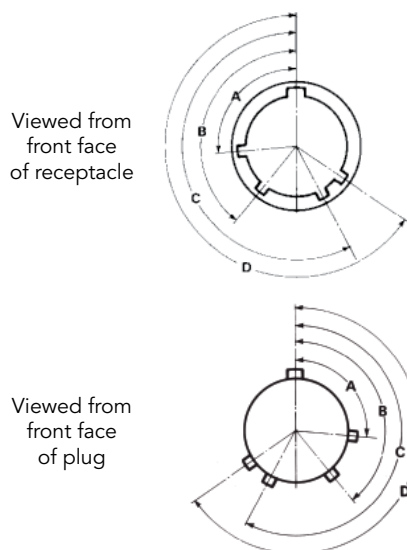
## Contact layouts (matrix)

| Shell size | Layout | 8D type 21<br>Spec. 600* | 8D<br>Spec. 022* | 8D Spec.<br>840 & 850 | Number of contacts |     |     |     |    |
|------------|--------|--------------------------|------------------|-----------------------|--------------------|-----|-----|-----|----|
|            |        |                          |                  |                       | #22D               | #20 | #16 | #12 | #8 |
| 09         | 09-35  |                          | OK               | OK                    | 6                  |     |     |     |    |
|            | 09-98  |                          | OK               | OK                    |                    | 3   |     |     |    |
| 11         | 11-35  |                          | OK               | OK                    | 13                 |     |     |     |    |
|            | 11-98  |                          |                  | OK                    |                    | 6   |     |     |    |
| 13         | 13-04  | OK                       |                  |                       |                    |     | 4   |     |    |
|            | 13-08  |                          |                  | OK                    |                    | 8   |     |     |    |
|            | 13-35  |                          | OK               | OK                    | 22                 |     |     |     |    |
|            | 13-98  |                          |                  | OK                    |                    | 10  |     |     |    |
| 15         | 15-18  |                          |                  | OK                    |                    | 18  |     |     |    |
|            | 15-19  |                          | OK               | OK                    |                    | 19  |     |     |    |
|            | 15-35  |                          | OK               | OK                    | 37                 |     |     |     |    |
|            | 15-97  |                          |                  |                       |                    | 8   | 4   |     |    |
| 17         | 17-06  | OK                       | OK               |                       |                    |     |     | 6   |    |
|            | 17-08  | OK                       |                  |                       |                    |     | 8   |     |    |
|            | 17-26  |                          |                  | OK                    |                    | 26  |     |     |    |
|            | 17-35  |                          | OK               | OK                    | 55                 |     |     |     |    |
| 19         | 19-35  |                          |                  | OK                    | 66                 |     |     |     |    |
| 21         | 21-41  |                          |                  | OK                    |                    | 41  |     |     |    |
|            | 21-48  | OK                       | OK               |                       |                    |     |     |     | 4  |
| 23         | 23-53  |                          |                  | OK                    |                    | 53  |     |     |    |
|            | 23-55  |                          |                  | OK                    |                    | 55  |     |     |    |
| 25         | 25-04  |                          |                  |                       |                    | 48  | 8   |     |    |
|            | 25-19  |                          |                  |                       |                    |     |     | 19  |    |

OK SOURIAU's layout

\* Spec. 600 = 230V qualified connector; Spec. 022 = Fuel tank version; Spec. 840 & 850 = PC tail lengths, see page 143.

## Orientations



| Shell size                 | Angles | N   | A   | B   | C   | D   | E   | T   | V   |
|----------------------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|
| 9 (A)                      | A°     | 105 | 102 | 80  | 35  | 64  | 91  | -   | -   |
|                            | B°     | 140 | 132 | 118 | 140 | 155 | 131 | -   | -   |
|                            | C°     | 215 | 248 | 230 | 205 | 234 | 197 | -   | -   |
|                            | D°     | 265 | 320 | 312 | 275 | 304 | 240 | -   | -   |
| 11 (B)<br>15 (D)           | A°     | 95  | 113 | 90  | 53  | 119 | 51  | -   | -   |
|                            | B°     | 141 | 156 | 145 | 156 | 146 | 141 | -   | -   |
|                            | C°     | 208 | 182 | 195 | 220 | 176 | 184 | -   | -   |
|                            | D°     | 236 | 292 | 252 | 255 | 298 | 242 | -   | -   |
| 13 (C)                     | A°     | 95  | 113 | 90  | 53  | 119 | 51  | 70  | 75  |
|                            | B°     | 141 | 156 | 145 | 156 | 146 | 141 | 136 | 138 |
|                            | C°     | 208 | 182 | 195 | 220 | 176 | 184 | 218 | 224 |
|                            | D°     | 236 | 292 | 252 | 255 | 298 | 242 | 261 | 268 |
| 17 (E)<br>21 (G)           | A°     | 80  | 135 | 49  | 66  | 62  | 79  | 58  | 85  |
|                            | B°     | 142 | 170 | 169 | 140 | 145 | 153 | 162 | 150 |
|                            | C°     | 196 | 200 | 200 | 200 | 180 | 197 | 188 | 191 |
|                            | D°     | 293 | 310 | 244 | 257 | 280 | 272 | 316 | 307 |
| 19 (F)<br>23 (H)<br>25 (J) | A°     | 80  | 135 | 49  | 66  | 62  | 79  | -   | -   |
|                            | B°     | 142 | 170 | 169 | 140 | 145 | 153 | -   | -   |
|                            | C°     | 196 | 200 | 200 | 200 | 180 | 197 | -   | -   |
|                            | D°     | 293 | 310 | 244 | 257 | 280 | 272 | -   | -   |

## Connector part numbers

### Standard configuration

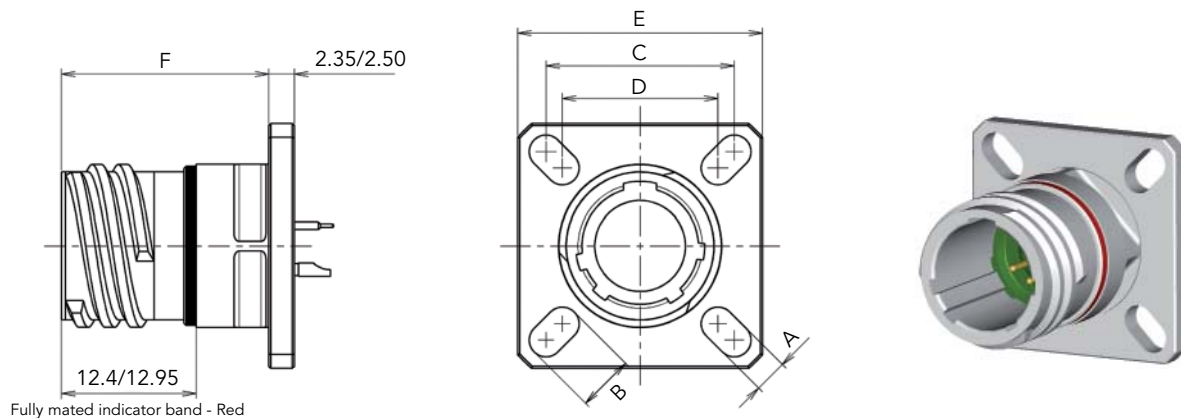
|                                                                                                                                                 |               |           |          |          |           |          |          |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|----------|----------|-----------|----------|----------|-----------|
| <b>Basic Series</b>                                                                                                                             | <b>F38999</b> | <b>21</b> | <b>Y</b> | <b>A</b> | <b>35</b> | <b>P</b> | <b>N</b> | <b>WF</b> |
| <b>Shell style:</b><br>21: Square flange receptacle<br>23: Jam nut receptacle<br>25: Solder mounting receptacle<br>27: Weld mounting receptacle |               |           |          |          |           |          |          |           |
| <b>Class:</b><br>Y: Passivated stainless steel<br>N: Nickel plated stainless steel                                                              |               |           |          |          |           |          |          |           |
| <b>Shell size:</b><br>09=A, 11=B, 13=C, 15=D, 17=E, 19=F, 21=G, 23=H, 25=J                                                                      |               |           |          |          |           |          |          |           |
| <b>Contact layout:</b><br>See previous page and pages 13 to 17                                                                                  |               |           |          |          |           |          |          |           |
| <b>Contact type:</b><br>P: Male solder cup<br>C: Male PCB contacts                                                                              |               |           |          |          |           |          |          |           |
| <b>Orientation:</b><br>N, A, B, C, D, E, T, V                                                                                                   |               |           |          |          |           |          |          |           |
| <b>Specification:</b><br>WF: Standard<br>600: 230V qualified connector (layouts 13-04, 17-08, 21-11 & 21-48 - orientation T & V)                |               |           |          |          |           |          |          |           |

### Specific configuration

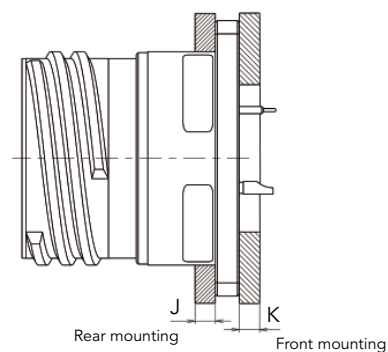
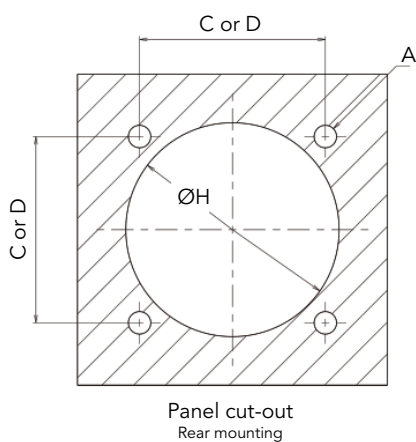
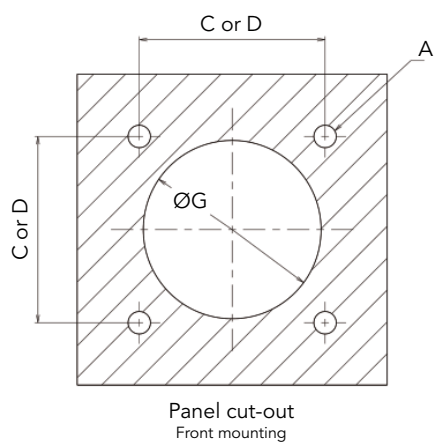
|                                                                                                           |           |          |          |           |           |          |          |            |
|-----------------------------------------------------------------------------------------------------------|-----------|----------|----------|-----------|-----------|----------|----------|------------|
| <b>Basic Series</b>                                                                                       | <b>8D</b> | <b>0</b> | <b>Y</b> | <b>13</b> | <b>35</b> | <b>P</b> | <b>N</b> | <b>022</b> |
| <b>Shell style:</b><br>0: Square flange receptacle<br>1: Solder mount receptacle<br>7: Jam nut receptacle |           |          |          |           |           |          |          |            |
| <b>Class:</b><br>Y: Passivated stainless steel<br>N: Nickel plated stainless steel                        |           |          |          |           |           |          |          |            |
| <b>Shell size:</b><br>09, 11, 13, 15, 17, 19, 21, 23, 25                                                  |           |          |          |           |           |          |          |            |
| <b>Contact layout:</b><br>See previous page and pages 13 to 17                                            |           |          |          |           |           |          |          |            |
| <b>Contact type:</b><br>P: Male solder cup<br>C: Male PCB contacts                                        |           |          |          |           |           |          |          |            |
| <b>Orientation:</b><br>N, A, B, C, D, E                                                                   |           |          |          |           |           |          |          |            |
| <b>Specification:</b><br>022: Fuel tank<br>840: Short PCB contact<br>850: Long PCB contact                |           |          |          |           |           |          |          |            |

## Dimensions

### Square flange receptacle (type 21)



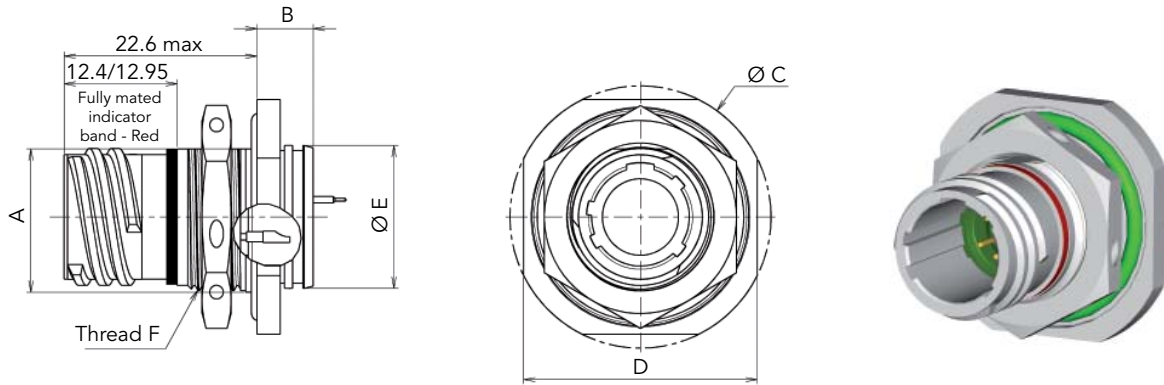
| Shell size | A ± 0.20 | B ± 0.20 | C     | D     | E ± 0.30 | F max | Ø G   | Ø H   | J max | K max |
|------------|----------|----------|-------|-------|----------|-------|-------|-------|-------|-------|
| A (9)      | 3.25     | 5.49     | 18.26 | 15.09 | 23.80    | 20.40 | 13.11 | 16.66 | 2.5   | 3.2   |
| B (11)     |          | 4.93     | 20.62 | 18.26 | 26.20    |       | 15.88 | 20.22 |       |       |
| C (13)     |          |          | 23.01 | 20.62 | 28.60    |       | 19.05 | 23.42 |       |       |
| D (15)     |          | 4.39     | 24.61 | 23.01 | 31.00    |       | 23.01 | 26.59 |       |       |
| E (17)     |          | 4.93     | 26.97 | 24.61 | 33.30    |       | 25.81 | 30.96 |       |       |
| F (19)     |          |          | 29.36 | 26.97 | 36.50    |       | 28.98 | 32.94 |       |       |
| G (21)     |          |          | 31.75 | 29.36 | 39.70    |       | 32.16 | 36.12 |       |       |
| H (23)     | 3.91     | 6.15     | 34.93 | 31.75 | 42.90    |       | 34.93 | 39.29 |       |       |
| J (25)     |          |          | 38.10 | 34.93 | 46.00    |       | 37.69 | 42.47 |       |       |



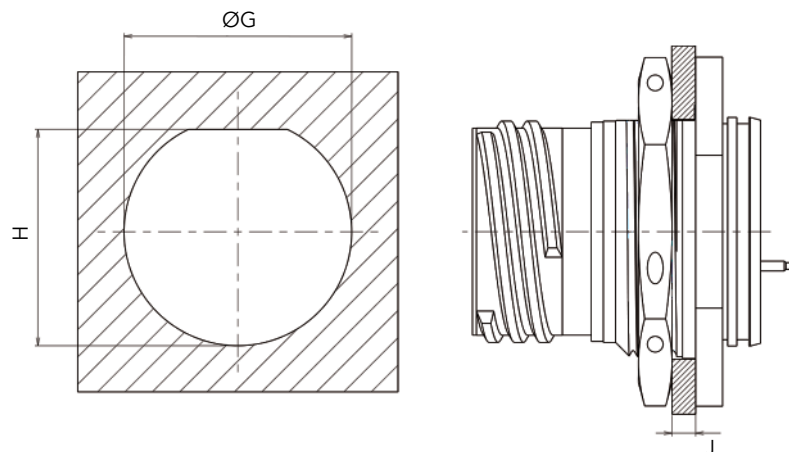
Note: All dimensions are in millimeters (mm)

## Dimensions

### Jam nut receptacle (type 23)



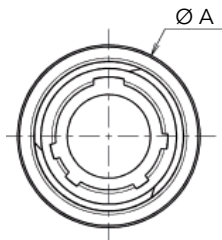
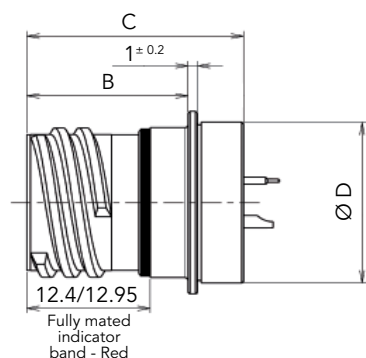
| Shell size | A flat $^{+0.10}_{-0.15}$ | B max | Ø C $\pm 0.30$ | D $\pm 0.40$ | Ø E $\pm 0.30/0$ | F thread   | Ø G $^{+0}_{-0.25}$ | H $^{+0.25}_{-0}$ | J   |
|------------|---------------------------|-------|----------------|--------------|------------------|------------|---------------------|-------------------|-----|
| A (9)      | 16.53                     | 9.10  | 30.20          | 27.00        | 16.30            | M17 x 1-6g | 17.60               | 16.70             | 3.2 |
| B (11)     | 19.07                     |       | 34.90          | 31.80        | 19.40            | M20 x 1-6g | 20.96               | 19.59             |     |
| C (13)     | 23.82                     |       | 38.10          | 34.90        | 22.70            | M25 x 1-6g | 25.65               | 24.26             |     |
| D (15)     | 26.97                     |       | 41.30          | 38.10        | 25.90            | M28 x 1-6g | 28.83               | 27.56             |     |
| E (17)     | 30.15                     |       | 44.50          | 41.30        | 29.00            | M32 x 1-6g | 32.01               | 30.73             |     |
| F (19)     | 33.32                     | 9.70  | 49.20          | 46.00        | 32.20            | M35 x 1-6g | 35.18               | 33.91             |     |
| G (21)     | 36.50                     |       | 52.40          | 49.20        | 35.40            | M38 x 1-6g | 38.35               | 37.08             |     |
| H (23)     | 39.67                     |       | 55.60          | 52.40        | 38.60            | M41 x 1-6g | 41.53               | 40.26             |     |
| J (25)     | 42.85                     |       | 58.70          | 55.60        | 41.70            | M44 x 1-6g | 44.70               | 43.43             |     |



Note: All dimensions are in millimeters (mm)

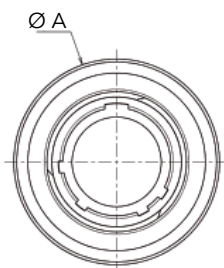
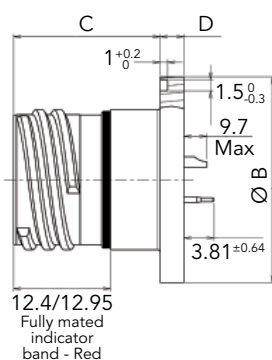
## Dimensions

### Solder mounting receptacle (type 25)



| Shell size | Ø A max | B max | C max | D max |
|------------|---------|-------|-------|-------|
| A (9)      | 19.40   | 17.20 | 23.80 | 17.10 |
| B (11)     | 21.80   |       |       | 19.90 |
| C (13)     | 24.90   |       |       | 23.10 |
| D (15)     | 28.10   |       |       | 26.20 |
| E (17)     | 31.30   |       |       | 29.40 |
| F (19)     | 33.60   |       |       | 31.80 |
| G (21)     | 36.80   |       |       | 35.00 |
| H (23)     | 40.00   | 24.60 | 24.60 | 38.20 |
| J (25)     | 43.20   |       |       | 41.30 |

### Weld mounting receptacle (type 27)



| Shell size | Ø A <sup>+0.3</sup> <sub>-0</sub> | Ø B ±0.3 | C max | D ±0.2 |
|------------|-----------------------------------|----------|-------|--------|
| A (9)      | 24.70                             | 23.90    | 23.20 | 3.20   |
| B (11)     | 27.80                             | 27.00    |       |        |
| C (13)     | 31.00                             | 30.20    |       |        |
| D (15)     | 34.20                             | 33.40    |       |        |
| E (17)     | 36.40                             | 35.60    |       |        |
| F (19)     | 40.10                             | 39.30    |       |        |
| G (21)     | 43.70                             | 42.90    |       |        |
| H (23)     | 47.90                             | 47.10    | 24.00 | 4.00   |
| J (25)     | 50.10                             | 49.30    |       |        |

## Maximum connector weight (in grams)

| Shell size | Square flange receptacle | Jam nut receptacle | Solder mount receptacle |
|------------|--------------------------|--------------------|-------------------------|
| 09 (A)     | 23                       | 39                 | 21                      |
| 11 (B)     | 28                       | 53                 | 25                      |
| 13 (C)     | 35                       | 63                 | 31                      |
| 15 (D)     | 41                       | 73                 | 38                      |
| 17 (E)     | 57                       | 92                 | 53                      |
| 19 (F)     | 60                       | 106                | 55                      |
| 21 (G)     | 65                       | 118                | 57                      |
| 23 (H)     | 75                       | 132                | 68                      |
| 25 (J)     | 91                       | 154                | 83                      |

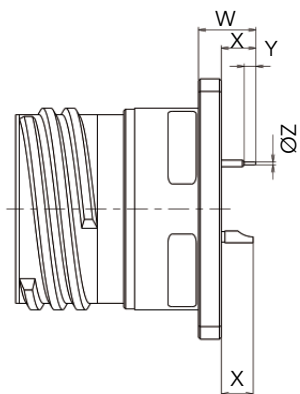
Note: All dimensions are in millimeters (mm)

## Gaskets

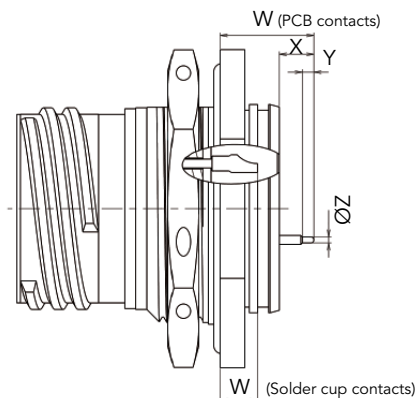
| Shell size | Gasket for receptacle Type 0 |                 | O ring for receptacle Type 7 |          |
|------------|------------------------------|-----------------|------------------------------|----------|
|            | Part number                  | Material        | Part number                  | Material |
| 09 (A)     | 85995541                     | Fluoro silicone | AS3582-019                   | Silicone |
| 11 (B)     | 85995542                     | Fluoro silicone | AS3582-022                   | Silicone |
| 13 (C)     | 85995543                     | Fluoro silicone | AS3582-024                   | Silicone |
| 15 (D)     | 85995544                     | Fluoro silicone | AS3582-026                   | Silicone |
| 17 (E)     | 85995545                     | Fluoro silicone | AS3582-028                   | Silicone |
| 19 (F)     | 85995546                     | Fluoro silicone | AS3582-128                   | Silicone |
| 21 (G)     | 85995547                     | Fluoro silicone | AS3582-130                   | Silicone |
| 23 (H)     | 85995548                     | Fluoro silicone | AS3582-132                   | Silicone |
| 25 (J)     | 85995549                     | Fluoro silicone | AS3582-134                   | Silicone |

## Contact variations

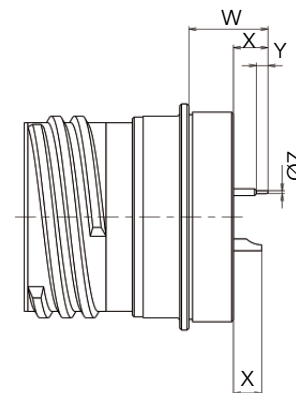
## Contact variations summary



Type 21: Square flange receptacle



Type 23: Jam nut receptacle



Type 25: Solder mount receptacle

| Type of contact     | Specification  | Type of shell | Contact size | W max | X min | Y min | ØZ max |
|---------------------|----------------|---------------|--------------|-------|-------|-------|--------|
| Solder cup<br>( P ) | WF<br>(F38999) | 21            | 20 & 22      | N/A   | 3.45  | N/A   | N/A    |
|                     |                | 23            | 20 & 22      | 4.5   | N/A   | N/A   | N/A    |
|                     |                | 25            | 20 & 22      | N/A   | 2.3   | N/A   | N/A    |
| PCB<br>( C )        | WF<br>(F38999) | 21            | 16           | 6.65  | 3.45  | N/A   | N/A    |
|                     |                |               | 20           |       |       | 0.89  | 0.71   |
|                     |                |               | 22           |       |       | 0.89  | 0.38   |
|                     |                | 23            | 16           | 11.5  | 3.3   | N/A   | N/A    |
|                     |                |               | 20           |       |       | 0.89  | 0.71   |
|                     |                |               | 22           |       |       | 0.89  | 0.38   |
|                     |                | 25            | 16           | 10.75 | 3.4   | N/A   | N/A    |
|                     |                |               | 20           | 12.15 |       | 0.89  | 0.71   |
|                     |                |               | 22           | 13.55 |       | 0.89  | 0.38   |
|                     | 840<br>(8D)    | 21            | 20           | 8.05  | 4.85  | 4.5   | 0.62   |
|                     |                |               | 22           | 7.32  | 4.12  | 3.82  | 0.53   |
|                     |                | 23            | 20           | 11.8  | 3.6   | 4.5   | 0.62   |
|                     |                |               | 22           | 10.6  | 2.4   | 5.75  | 0.53   |
|                     |                | 25            | 20           | 10.15 | 3.7   | 4.5   | 0.62   |
|                     |                |               | 22           | 9.42  | 2.97  | 3.82  | 0.53   |
|                     | 850<br>(8D)    | 21            | 20           | 13    | 9.8   | 6     | 0.62   |
|                     |                |               | 22           | 10.69 | 7.49  | 7.35  | 0.53   |
|                     |                | 23            | 20           | 15.3  | 7.1   | 6.25  | 0.62   |
|                     |                |               | 22           | 16.2  | 8     | 9.25  | 0.45   |
|                     |                | 25            | 20           | 15.1  | 8.65  | 6     | 0.62   |
|                     |                |               | 22           | 12.79 | 6.34  | 7.35  | 0.53   |

Note: All dimensions are in millimeters (mm)

# 8D SERIES

## 8D Series

# Range Extension

|                                    |     |
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## Product range extension

### micr 38999

**A complete miniature range: threaded (8DA), break away (8BA) & bayonet (8LTA). Space saving with scoop proof connector for harsh applications.**

**A compact solution:**

- . Diameter up to 45% smaller than size 9 (D38999).
- . Up to 50% shorter.
- . Integrated backshell: Cost and space saving.

**A high density solution:**

- . With #26 contacts (according to 39029).
- . 5 layouts (size 3, 5 and 7 with #22 & #26).

**Excellent features:**

- . Designed for D38999 requirements.
- . IP67 sealing when mated.
- . Stainless steel shell (1500 matings) & aluminum shell (500 matings).

**RoHS and Cadmium free:**

- . Available in zinc nickel (RoHS) plating, as well as nickel and olive drab cadmium.



See «micro38999 Series, High Vibration Miniature Connectors» catalog on [www.souriau.com](http://www.souriau.com)

### ELIO® Fiber Optic Hermetic

**Hermetic receptacles or feedthrough based on 38999 shells, intermateable with 38999 Series III plug populated ELIO® contacts.**

**Truly hermetic:**

- . Leak rate:  $< 10^{-9}$  atm.cm<sup>3</sup>/s.
- . Temperature range: -55°C to 200°C.

**Wide range of layouts:**

- . From 1 to 24 fiber optic channels.

**Customs:**

- . Versatile technology that can be adapted to your needs.



## Product range extension

### Rack & Panel

**Sealed rack & panel for blind connection. A 100% scoop proof connector with quick connection in hard-to-reach areas.**

#### Blind connection:

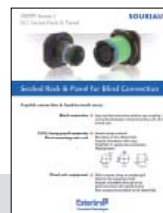
- . Easy & fast connection without any coupling/uncoupling between a float-mounting unit & a fixed unit.

#### Float-mounting unit - rack:

- . Female crimp contacts.
- . Mounting on the cabinet side.
- . Angular orientation with a key.
- . Possibility to supply rear accessories.

#### Misalignment catching:

- . Longitudinal, axial and angular.



See «38999 Series I - Rack & Panel 8LT» product news on [www.souriau.com](http://www.souriau.com)

### 230V Connector

**The use of higher voltage to reduce cable weight has lead to the development of double voltage connectors.**

#### Robust design and materials:

- . In high altitude un-pressurized areas, higher voltages increase electrical partial discharges: Risk of contact short circuits. Our 230V connector avoids this risk!

#### No possible mismatch:

- . Specific T and V clocking to avoid mating with a non 230V qualified counterpart.

#### Flexible offering:

- . Available in standard watertight and hermetic connectors with the same performance.
- . Available in composite and stainless steel shells.



See «230 Volt EN3645 Derived Connectors» product news on [www.souriau.com](http://www.souriau.com)

## Product range extension

### 8D8/8D9 Series

**8D8: high vibration push-pull connector.**  
**8D9: lanyard release, high performance 38999 quick release.**

**A wide range with excellent performances:**

- . MIL-DTL-38999 layouts and contacts.
- . MIL-DTL-38999 Series electric performances.
- . Scoop proof.
- . Compatible with standard backshells 38999 Series III.
- . Very high performance coupling with ball locking concept, check of locking by free ring when mated.

**Easy to connect-disconnect:**

- . 8D8: ideal for restricted space mating.
- . 8D9: simple push to connect - pull to disconnect.

**High vibration performance:**

- . Up to 44g
- . 8D8: ideal for mil-aero and space applications.
- . 8D9: ideal for missiles, inter-stage separation, UAVs, space probes.



### 8DB Bulkhead Feedthrough

**Double Receptacle mounted on panel allows cable plug connection on both sides of the bulkhead.**  
**Create a permanent sealed barrier on your panel suitable for pressurized or depressurized areas.**

**Easy integration:**

- . Standard 38999 mounting interface (square flange, jam nut).
- . Easy modular assembly and connection.
- . Time saving for maintenance.
- . The ideal interconnect solution for aircraft pressurized/non pressurized panels.

**Reinforced sealing:**

- . Feedthrough sealing even when unmated ( $10^{-6}$  atm.cm<sup>3</sup>/s).
- . Permanent sealing barrier on panel (O'rings).
- . Glass fused hermetic version available ( $<10^{-8}$  atm.cm<sup>3</sup>/s) for fuel tanks/space systems.

**A large platform available:**

- . All 38999 Series III layouts (signal and power contacts).



See «Bulkhead Feedthrough Solutions» catalog on [www.souriau.com](http://www.souriau.com)

### Product range extension

#### 8PS Series

**Sealed cable feedthrough. Allows a bundle of cables to cross through the bulkhead without any contact junctions.**

**All cables are individually sealed inside the feedthrough:**

- . For maximum MTBF by eliminating cable termination and contact junction.
- . When maximum continuity is required for copper cables.
- . To suppress contact attenuation with Fiber optic cables.

**Easy and safe installation.**

**Reinforced sealing.**



See «Bulkhead Feedthrough Solutions» catalog on  
[www.souriau.com](http://www.souriau.com)

#### 8TFD Filter Connector

**EMI-RFI filters and lightning protection in composite light-weight shell.**

**Space saving:**

- . Complete filter solution in standard shell.
- . No need for filter PCB inside equipment.
- . Smaller equipment envelope required.

**Excellent filter performance:**

- . Excellent performance, comparable to aluminum shell EMI-RFI filter connectors.

**Highly corrosion resistant:**

- . 2000 hours salt spray in either nickel or olive drab finish.

**Wide range of layouts available:**

- . SOURIAU EMI-RFI Filter 38999 Series III connectors are available in aluminum, marine bronze, and stainless steel shells.



## Product range extension

### 8D36 Lanyard Release

**Field repairable / MIL-STD-1760 umbilical.  
Self-alignment, blind connector mating & safe  
operational solution to weapon releases.**

**Safe quick disconnect at high speed:**

- . Robust unlocking system : 9.15m/s  $\pm$ 10%.

**Field repairable:**

- . Damaged coupling mechanism can be removed and fully replaced without need to disassemble the electric harness or cable backshell.

**High vibration performances:**

- . Random: 44 G RMS, Sine: 60G with angular separation up to 20° (maximum)





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Your local contact



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