



# Space Grade Circular Connectors Selector Guide

## Typical applications



Satellite



Space Station



Launcher



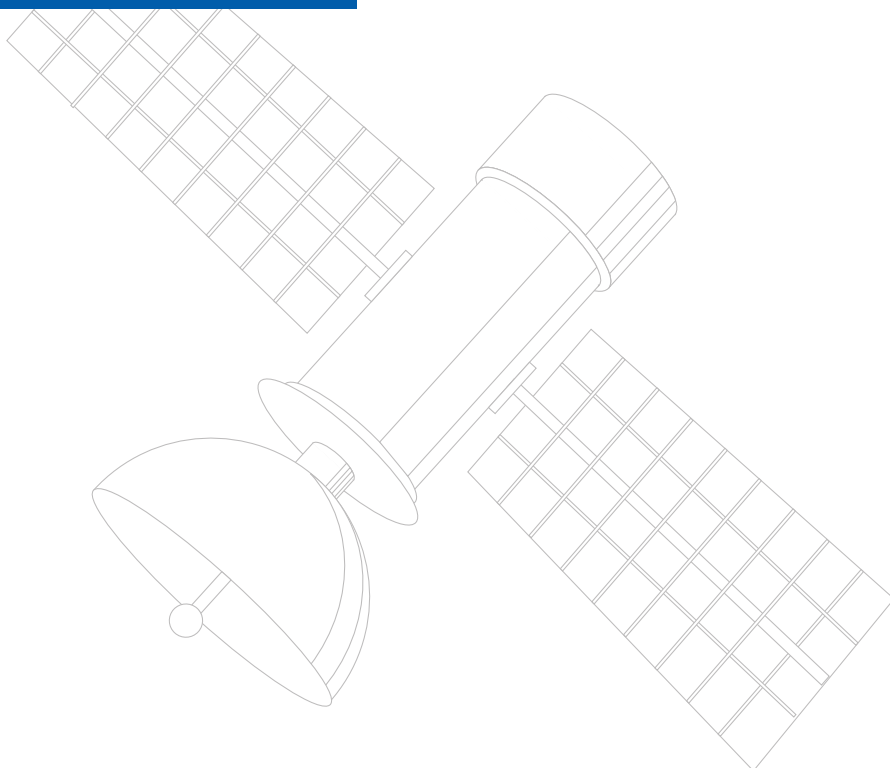
Spacecraft



Space Mission



Pressurized Module



## Features & Benefits

### QPL

#### MIL and ESCC qualified

ESA/ESCC 3401 qualified.  
MIL-DTL-38999 qualified.  
No LAT required.

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### QUICK & ROBUST

#### Safe, quick and easy mating

Scoop proof design to prevent bent contact.  
Keying and self-locking mechanism to secure the right connection.  
Quick manual locking, no tools, bolts or loose items required.

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### HIGH RATINGS

#### Highest space standards performances

Highest voltage withstanding.  
Highest temperature withstanding.  
Highest shock and vibration withstanding.

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### NON OUTGASSING

#### Space environment compatible materials

Rigorous material selection and qualification.  
Non-outgassing materials.

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### LARGE OFFER

#### Broad range

Large choice of sizes and standard layouts, to gather connection points and enable different ratings.  
Rear removable contacts.  
Qualified backshells.

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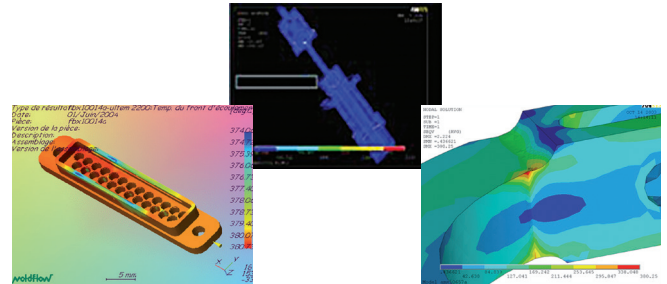


Thanks to more than 50 years of experience in the space industry, we have accumulated a very rich know-how to support our customers.

This expertise goes from product definition to solution validation and stringent production processes, to follow our motto: *reliable people, reliable solutions!*

## Product definition

- **Material Choice:** Atomic Oxygen corrosion resistance, cold welding prevention, limited outgassing, etc.
- **Product design:** expertise on launching systems design as well as robotic operated connections
- Know-how to support specific needs



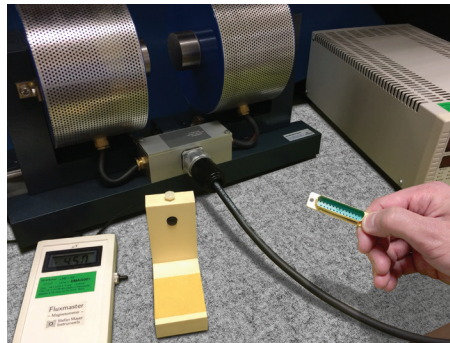
Stress and heat dissipation analysis

## Validation & qualification

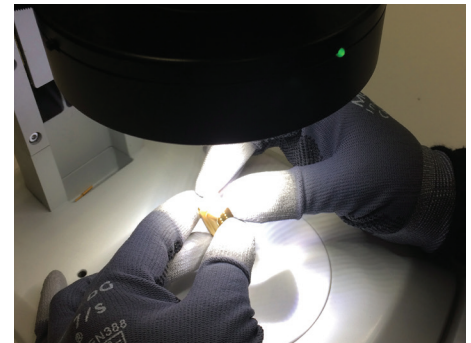
- In-house certified independent laboratory
- Capability to simulate various environments as well as to measure any key parameters



Vacuum bell for robotic operating testing  
-170°C/+200°C temperature gradient



Residual magnetism and magnetic permeability measurement



Binocular controls

## Production processes

- Stringent production process
- Controlled environment
- Binocular inspection
- Rigorous traceability procedures and documentation



Clean Room handling

## Serving space industry...

- Space environment compatible
  - Non-outgassing and qualified components materials
  - Dedicated process and consumables to enable product's space environment compatibility
  - Burr free and non-reflective



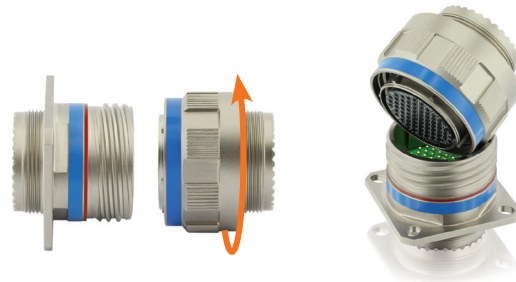
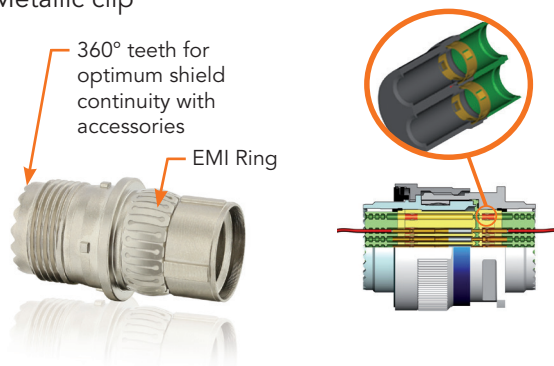
- Space industry highest requirements
  - QPL, no LAT required
  - Materials, processes and supply chain fully approved by Qualification authorities
  - Thorough in-production and final controls
  - Deep traceability



## ... with high-end products

- Strong design
  - High performances in harsh conditions
  - Fully shielded connector
  - Patented self-locking mechanisms
  - Metallic clip

- Quick and easy to use
  - Quick screw and bayonet coupling
  - Scoop proof: 5-position polarization, correct mating indication
  - No risk of damaging contacts during the coupling operation



## Quality assurance testing

- Qualification
  - European Source approved to ESA/ESCC circular connectors specifications and USA MIL-DTL-38999 Class G QPL Source

- Final production tests
  - Visual (100%)
  - Intermateability
  - Dimensional (by sampling)

- Production control
  - Visual (100%)
  - Insulation resistance (100%)
  - Contact retention (100%)
  - Dimensional (by sampling)
  - Dielectric withstanding voltage (100%)
  - Female contact capability (100%)

- Lot acceptance tests
  - ESCC 3401 Chart IV qualified
  - Periodic requalification through ESCC 3401 Chart V
  - MIL-DTL-38999 qualification and periodic tests

# Space Grade 38999 Series | Range Presentation

**+50**  
Layouts  
(mixed, HD, ...)

**2**  
Locking  
Systems

**3**  
Mounting  
Styles

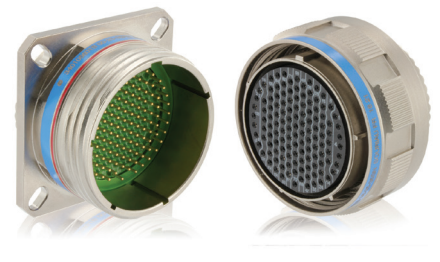
## QPL STANDARD SERIES



8LTS SERIES - 38999 Series I  
Bayonet Coupling



8TS SERIES - 38999 Series II  
Low Profile Bayonet Coupling



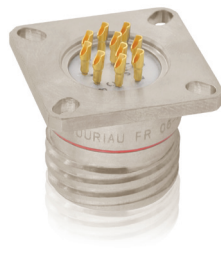
8DS SERIES - 38999 Series III  
Screw Coupling

- ESA/ESCC and MIL (Class G) QPL versions available
- RoHS and REACH compliant
- 8TS low profile version, lighter and 30% shorter
- Extended capabilities and benefits compared to standard rectangular solutions
- Various possibilities of customization

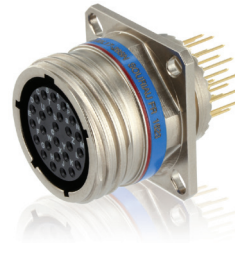
## QPL 8DS DERIVED SERIES



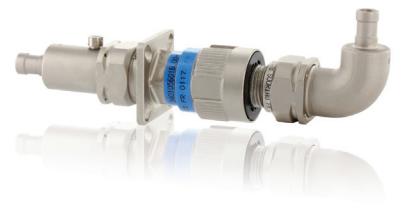
HERMETIC FEEDTHROUGHS



HERMETIC RECEPTACLES



STRAIGHT PC TAILS



MONO-TRIAx

## BACKSHELLS



BACKSHELL NUTS



STRAIGHT CABLE CLAMPS



90° CABLE CLAMPS



## Description

- Quick 3 point bayonet locking or screw coupling with self locking system
- Low profile connectors
- High density, high power layouts
- Shell sizes from 9 to 25
- PC tail receptacle versions
- Hermetic versions
- Bulkhead feedthrough versions
- Contact protection: 100% scoop proof (Series I and III)
- RFI-EMI shielding and shell to shell continuity
- ESA/ESCC QPL backshells, in accordance with SAE AS85049
- Standards
  - . ESA/ESCC 3401 QPL
  - . MIL-DTL-38999 class G QPL
  - . NASA SSQ 21635 NATC intermateable



## Technical features

### Material

- **Shell:**
  - Non-hermetic version
    - . Aluminum alloy
    - . Dull low reflective electroless nickel plated, burr free
  - Hermetic version
    - . Passivated stainless steel
- **Grounding:**
  - Beryllium copper
- **Insulator:**
  - Non-hermetic version:
    - . Bonded sandwich thermoplastic
  - Hermetic version
    - . Sintered glass
- **Grommet and interfacial seal:**
  - Non-outgassing silicone
- **Contacts retaining clip:**
  - Beryllium copper
- **Contacts:**
  - Copper Alloy
  - Gold over nickel plating
- **Backshell:**
  - Aluminium alloy
  - Dull low reflective electroless nickel plated, burr free

### Mechanical

As per ESA/ESCC 3401 test methods and applicable ESA/ESCC detail specifications

- **Endurance:** 500 mating cycles
- **Shock:** 75g, 11 milliseconds, half sine wave
- **Vibration:**
  - Sinus
    - . 10-55Hz at 8,25mm double amplitude displacement
    - . 56-2000Hz at 50g
  - Random
    - . 20-100Hz at +6dB per octave
    - . 100-2000Hz, constant at 1g2/Hz

#### • Contact retention:

Contacts size	22	20	16	12	8	4
Max force in N	44	67	111	111	150	180

#### • Tightening torque for mounting nut:

Receptacle size	8	10	12	14	16	18	20	22	24
	9	11	13	15	17	19	21	23	25
Torque Max. (Nm)	S. I 6	S. III 8	10	13	16	18	20	22	24
	S. II 9	11	14	16	18	20	22	24	27

### Environmental

As per ESA/ESCC 3401 test methods and applicable ESA/ESCC detail specifications

- **Operating temperature:** -65°C to +200°C
- **Storage temperature:** 1000h/200°C
- **Outgassing:** TML < 1% ; CVCM < 0.1%
- **Hermeticity (8DS-H version):** 10<sup>-8</sup> cm<sup>3</sup>/s of helium under a vacuum of 10<sup>-5</sup> Torr

### Electrical

As per ESA/ESCC 3401 test methods and applicable ESA/ESCC detail specifications

#### • Voltage proof (sea level):

Service Rating	II	I	M	N
Vrms	2300	1800	1300	1000

#### • Working voltage (sea level):

Service Rating	II	I	M	N
Vrms	575	450	325	250

#### • Mated shell conductivity:

Voltage drop max. 1 mV

#### • Rated current:

Contacts size	22	20	16	12	8	4
Rating (A)	5	7.5	13	23	46	80

#### • Contact resistance Rcl max. (under 10 mA):

All contacts sizes: 8.0 mΩ

#### • Contact resistance Rcr max. (at rated current):

Contacts size	22	20	16	12	8	4
Resistance mΩ	14	7	4	3.5	0.55	0.45

#### • Insulation resistance:

RI ≥ 10 000 MΩ

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Your local contact



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