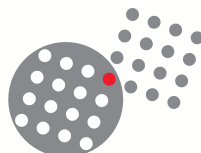




# Ethernet 100 Mbps Quadrax Technology

MIL-DTL-38999 / ARINC 600 / EN2997 / EN3646



**SOURIAU**  
Connection Technology

# Quadrax Technology

## Quadrax Contact



### Background

Today's technology for Aeronautic and Military equipment is more and more complex, requiring the management of an increasing flow of information at greater speeds.

In response to this need, SOURIAU offers a wide range of electrical and fiber optic solutions for high speed networks in harsh environments. These solutions can handle data speeds from several Mbit/s up to several Gbit/s using a wide array of communication protocols (Ethernet, ATM...).

Quadrax is the best electrical solution for: High speed electrical network applications, excellent network performances, crosstalk, return loss, high density of links, harsh environment use...

Typical network applications are 100Mbit/s Ethernet, Gigabit Ethernet, IEEE 1394, Fibre Channel, ...

### Contents

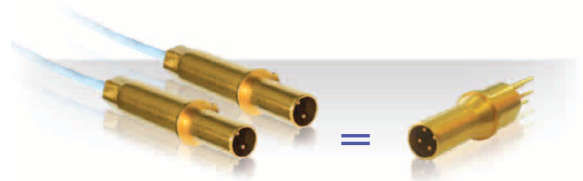
<b>Quadrax contact</b>		<b>MIL-DTL-38999</b>	
• Quadrax contact overview .....	03	• Technical features .....	09
• Technical features .....	05	• Contact layouts .....	09
• Ordering information .....	06	• Ordering information .....	09
• Sealing boot .....	07	<b>EN2997</b>	
• Quadrax tools .....	07	• Technical features .....	10
• Recommended cable .....	07	• Contact layouts .....	10
<b>Arinc 600</b>		• Ordering information .....	10
• Technical features .....	08	<b>EN3646</b>	
• Contact layouts .....	08	• Technical features .....	11
• Ordering information .....	08	• Contact layouts .....	11
		• Ordering information .....	11



### Quadrax contact overview

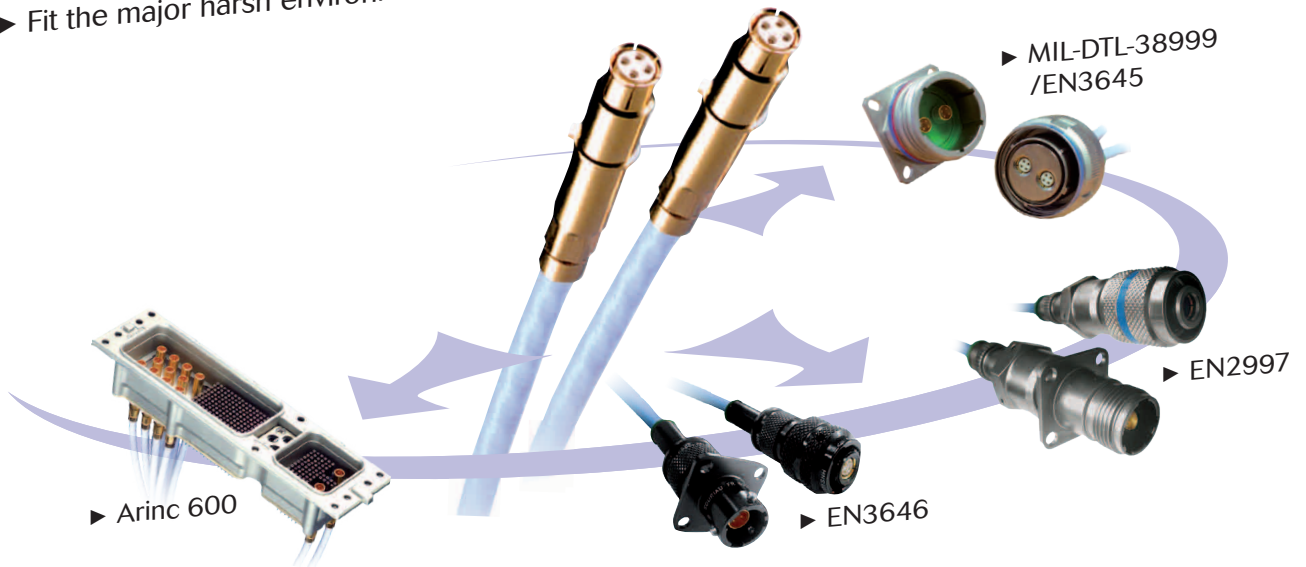
#### An optimized high speed electrical contact

- ▶ **Size 8** outer contact with 4 strategically spaced size 24 inner contacts forming two **100Ω** or **150Ω** matched impedance pairs with excellent 360° shielding.
- ▶ Equivalent to **two twinax** contacts with:
  - better performance (reduced cross talk)
  - shorter cabling time
  - compact profile
  - lighter weight
- ▶ One contact provides a **full duplex 100 Mbps ethernet** link, and fulfills the ISO/IEC 11801 **category 6** requirements.



#### A versatile technology

- ▶ Fit the major harsh environment **MilAero** connectors:



- ▶ **Ground connection** of the cable braid to the connector shell on:
  - All Arinc 600 layouts
  - MIL-DTL-38999 Series I & III - EN3645
  - EN2997
  - EN3646

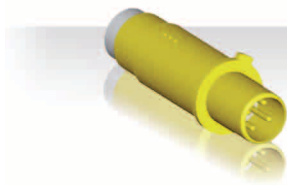


### Quadrax contact overview

#### A standardized technology

- ▶ 2 designs for 2 standards:

- **Protruding alignment key**  
for Arinc 600, EN2997, EN3646



ABS  
Qualified  
ARINC 664  
compliant

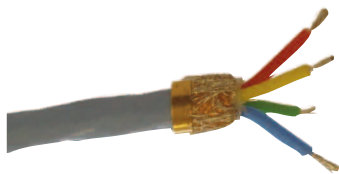
- **In-line alignment key**  
for MIL-DTL-38999



EN3155  
Qualified

#### Superior signal integrity performance thanks to an innovative insert

- ▶ Insert design enabling radial insertion of inner crimped contacts.



- ▶ Radial insertion of contacts in insert enabling minimum untwisting of the cable for wiring operation.
- ▶ Minimum untwisting of the cable = improved cross talk performance.

**BAD**

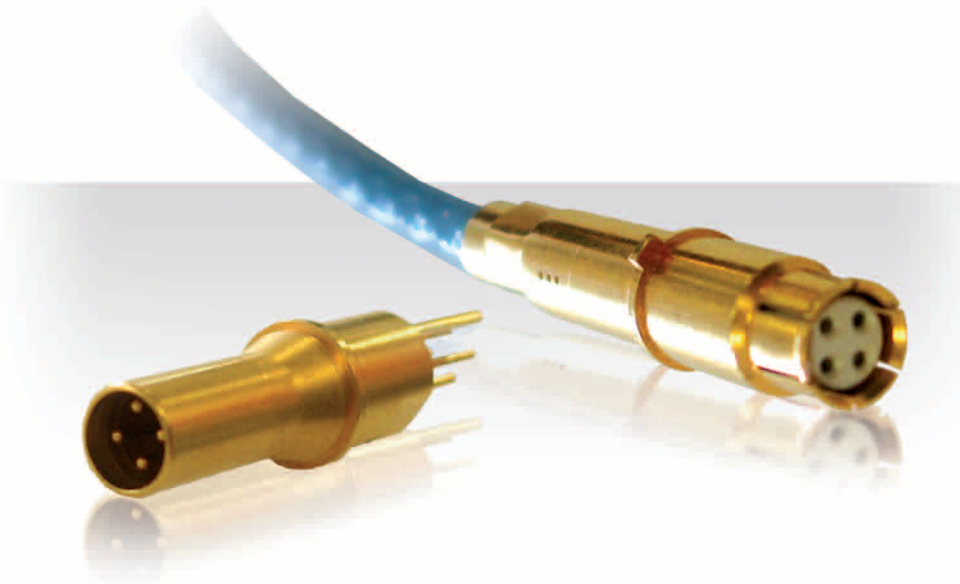


**GOOD**



# Quadrax Technology

## Quadrax Contact



### Description

- Front and rear removable versions available.
- 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.

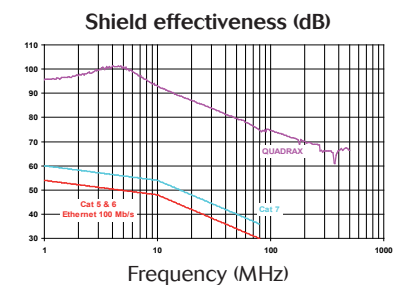
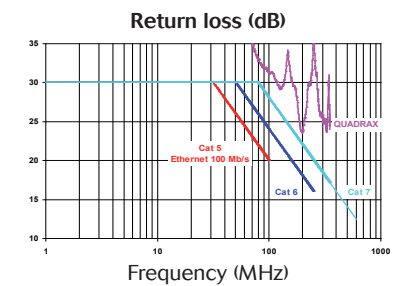
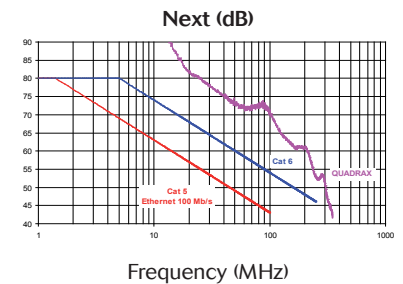
### Technical features

#### Mechanical

- **Operating temperature:**  
-65°C up to 200°C  
stainless steel (class K, E, Y and YE)
- **Inner contact:**  
copper alloy
- **Contact body:**  
copper alloy
- **Insulator:**  
thermoplastic resin
- **Contact plating:**  
gold over nickel

#### 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 (ARINC 600)
  - **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





## Ordering information

### 38999 Series I & III contacts

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
PC tail 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	200°C
		ETH1-1503A	-	150Ω	Rear	200°C
	Socket	ETH1-1346A	EN 3155-075	100Ω	Rear	200°C
		ETH1-1504A	-	150Ω	Rear	200°C

### ARINC 600, EN2997, EN3646 contacts

Protruding alignment key.

All crimp contacts are unsealed. Sealing boots are available.

All contacts delivered without boot.

Contact type		SOURIAU part number	ABS part number	Impedance	Release	T° Max	Arinc 600	EN2997	EN3646
PC tail L= 6.35 mm	Pin	ETH1-1110A	-	100Ω	Front	125°C	✓		
Tinned PC tail L= 6.35 mm	Pin	ETH1-1123A	-	100Ω	Front	125°C	✓		
PC tail L= 4.45 mm	Pin	ETH1-1137A	-	100Ω	Rear	200°C		✓	
Crimp	Pin	ETH1-1100A	ABS0973 M08A	100Ω	Rear	125°C	✓		✓
		ETH1-1126A	-	100Ω	Rear	200°C		✓	
	Socket	ETH1-1101A	ABS0974 F08A	100Ω	Rear	125°C	✓		✓
		ETH1-1127A	-	100Ω	Rear	200°C		✓	

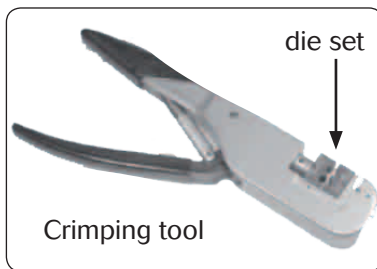


### Sealing boot

Connector	T° Max	# Cable	SOURIAU part number	ABS part number
EN2997	200°C	8	8533-8236	ABS0992B01
	260°C		8533-8307	
Arinc 600	200°C	10/12	8533-8287	ABS0992B02
		Quadrax cable	8660-6053	

### Quadrax tools

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



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



### Recommanded cable

impedance	Reference	Cable type	Number of pairs
100Ω	ABS 1503 KD24	Star quad	2

# Quadrax Technology

## ARINC 600 with Quadrax Contact



### Description

- High density solution:
  - . Blind mate, clearance device for better rackability
  - . Low insertion force
- Rackable solution:
  - . Up to 56 #8 quadrax contacts
- Modular solution:
  - . Build your own connector matching your exact needs
- Repairable solution:
  - . EMI RFI shielding solution
  - . Nickel and alodine plating
  - . 100A power capability
  - . Fixing type
  - . Grounding
  - . Filtering

### Contact layout - Arinc 600 size 2&3

Cavity A, B, D, E				
<b>Q11*</b>  11 #8 Quadrax	<b>Q10*</b>  10 #8 Quadrax	<b>118Q2</b>  118 #22 2 #8 Quadrax		
Cavity C, F				
<b>Q6*</b>  6 #8 Quadrax	<b>68Q2</b>  68 #22 2 #8 Quadrax	<b>11Q2</b>  4 #20 3 #16 4 #12 2 #8 Quadrax	<b>62Q2</b>  60 #22 2 #16 2 #8 Quadrax	<b>20Q4</b>  20 #20 4 #8 Quadrax

\* Grounded metal insert

### Ordering information

Please consult "Arinc 600 Series" catalog.

# Quadrax Technology

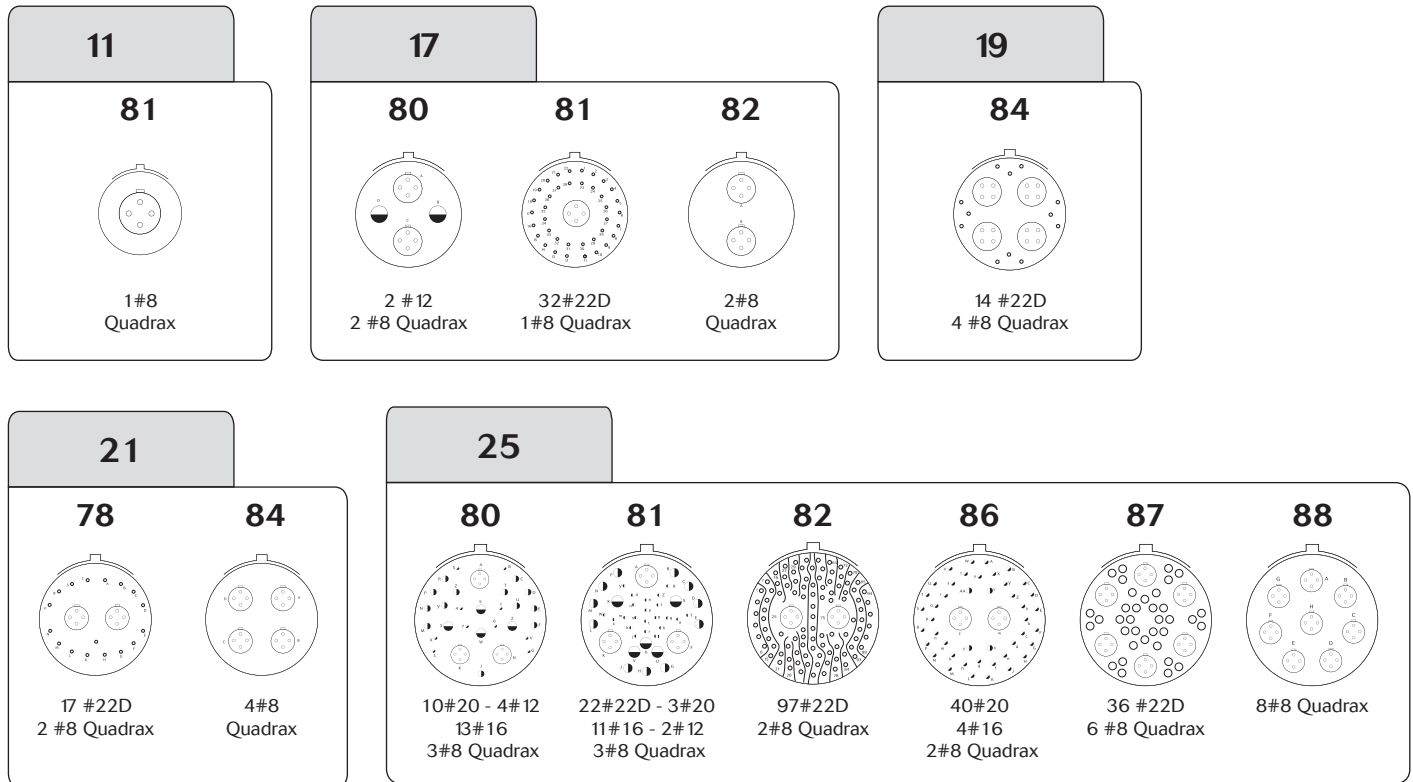
## MIL-DTL-38999 with Quadrax Contact



### Description

- High contact density
- MIL-DTL-38999 Series I: Bayonet coupling
- MIL-DTL-38999 Series III: Quick screw coupling - 1<sup>1</sup>/<sub>4</sub> turn to mate
- Numerous layouts
- 100% scoop proof
- RFI - EMI shielding and shell to shell continuity
- MIL-DTL-38999 Series I: nickel or cadmium plated
- MIL-DTL-38999 Series III: nickel, cadmium, green zinc cobalt or black zinc nickel plated

### Contact layout



### Ordering information

Please consult "8LT Series - MIL-DTL-38999 Series I" catalog & "8D Series - MIL-DTL-38999 Series III" catalog.

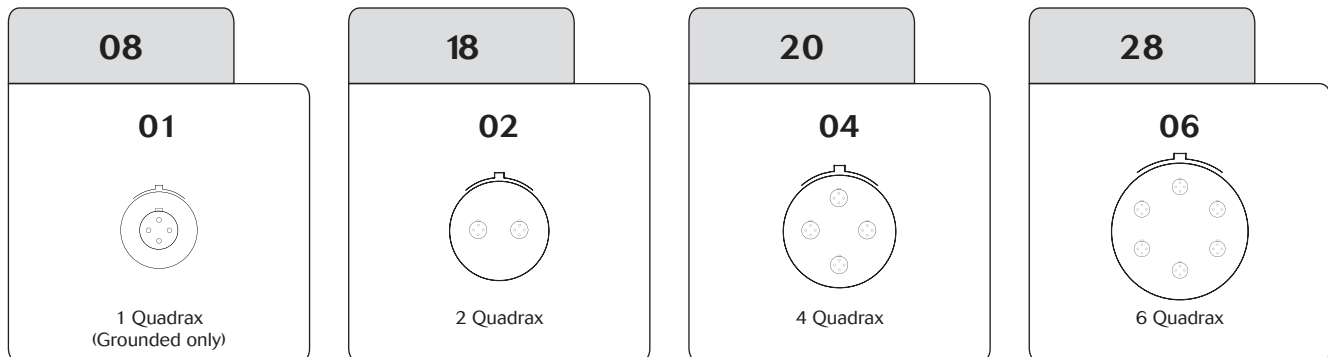
# Quadrax Technology EN2997 with Quadrax Contact



## Description

- Robust aluminum or stainless steel screw coupling connector
- ABS Airbus qualified design
- Available for 1 to 6 contacts per connector
- PC tail as well as crimp contacts available
- Grounded insert option for perfect shielding

## Contact layout



## Ordering information

Please consult "8533 Series - EN2997/ESC Qualified - Fire Wall Connectors" catalog.

# Quadrax Technology EN3646 with Quadrax Contact

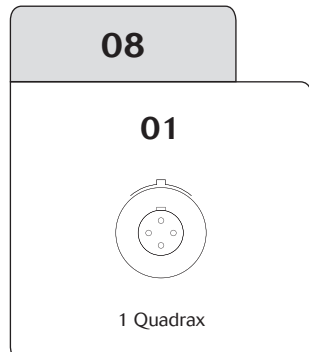


## Description

- ABS qualified design derived from EN3645/MIL 26482 Series 2
- Environmental stainless steel version or aluminum shell
- Smallest aeronautical quadrax on the market



## Contact layout

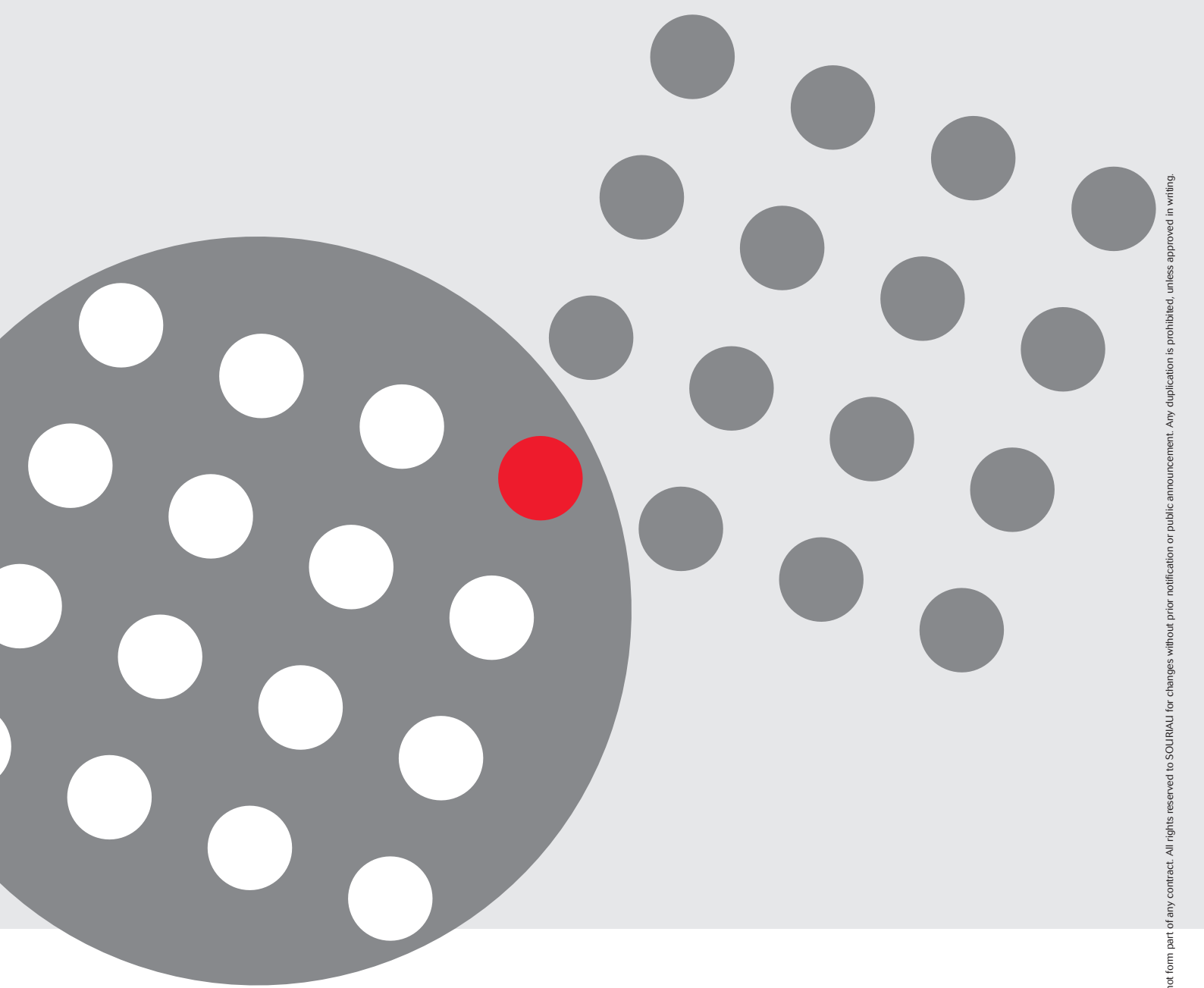


## Ordering information

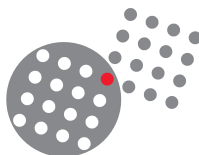
	Layout	SOURIAU PN	ABS PN
Circular plug	0801 (8B01)	8525 16R8B01SNHL164 <sup>(1)</sup>	ABS 1054 A60801 BN + ABS 1057-08A01
		8525 16R8B01SNH164 <sup>(2)</sup>	ABS 1054 A60801 FN + ABS 1057-08A01
Square flange receptacle	0801 (8B01)	8525 16R8B01PNHL164 <sup>(1)</sup>	ABS 1054 A00801 AN + ABS 1057-08A01
		8525 16R8B01PNH164 <sup>(2)</sup>	ABS 1054 A00801 MN + ABS 1057-08A01

(1) mono quadrax connector delivered with backshell and without contact

(2) mono quadrax connector delivered with backshell and with quadrax contact



[www.souriau.com](http://www.souriau.com)  
[contactmilaero@souriau.com](mailto:contactmilaero@souriau.com)



**SOURIAU**  
Connection Technology