



# SOURIAU

## VGE1/FER1 Series

Railway Connectors





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VEGET/FEER1

# Overview

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## SOURIAU's railway connector range overview

### For outdoor equipments

#### VGE1 / FER1



Up to 60 contacts  
Signal, Quadrax and Fiber Optics layouts  
Tested following EN 50 467 and NF F 61-030

#### 838



Up to 61 contacts  
Signal, Quadrax and Fiber Optics layouts  
Compliant to NF F 61-030 and tested following EN 50 467

### For indoor equipments

#### SMS Flame retardant



Up to 36 contacts #16  
Up to 220V  
Tested following EN 50 467 and NF F 61-030

#### SMS IP



Tested following EN 50 467 and NF F 61-030  
Compliant up to 500V

#### UTS



Up to 23 contacts #16  
Up to 120V



## SOURIAU on the railway market

*SOURIAU is a recognised worldwide market leader in the design and manufacture of connectors and interconnect systems for severe environments. SOURIAU has developed a dedicated range of ruggedised and reliable connectors for the railway market, fully compliant with railway standards, RoHS, as well as fire and smoke requirements.*

*For more than 50 years, SOURIAU has become a trusted name by major railway equipment manufacturers, their subcontractors, also signalling and infrastructure companies.*

*SOURIAU connectors are designed to integrate new functions such as Ethernet network, weight reduction, mixed signal-power in compliance with environmental protection. This offer is the best compromise between technology, safety, reliability and cost.*

SOURIAU has been awarded IRIS certification since 2009.



- ✓ Standard contacts for 8 railway ranges
- + Same crimping tools
- + Simplified process
- = Best compromise between technology and cost



- ✓ Fiber optic
- + Quadrax technology
- = High speed solutions for real-time information



- ✓ Eco-conception & process
- + Safety international standards
- + Lightweight material
- = Safe railway equipments



## General technical

### Mechanical

- Design:  
Derivate from MIL-DTL-5015 & VG 95234
- Durability:  
500 mating/unmating cycles  
An audible "click" and a yellow point indicating end of coupling (VGE1 series only)
- Shock and vibration resistance:  
According to EN 61 373 - Cat.2
- Drop:  
Free fall of plug at a height of 0.75m: no mechanical damage  
Following NF F 61-030

### Environmental

- ROHS compliant
- Operating temperature:  
From -40°C to +100°C
- Dry heat test:  
100 ° for 96 hours
- Salt spray resistance:  
500 hours
- Damp heat:  
21 days, 40°C, 95% relative humidity
- Sealing level:  
IP67, 1m deep for 30 minutes max, coupled with appropriate backshell and grommet or accessories
- Dynamic sealing:  
IP67 guaranteed when cable is moving
- Fire and smoke:  
Insert material: HL3/R22 and HL3/R23 following EN 45 545,  
NFPA 130 compliant
- Resistance to fluids:  
Gas oil, mineral oil, acid bath, basic bath, following NF F 61-030,  
oxalic acid







## characteristics



### Material

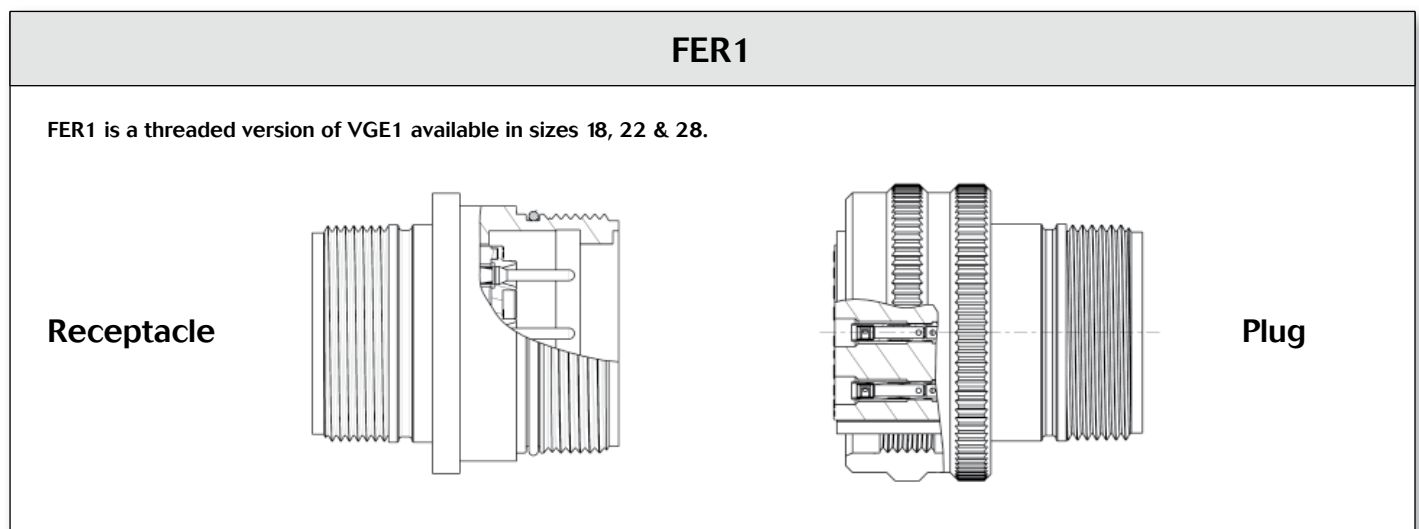
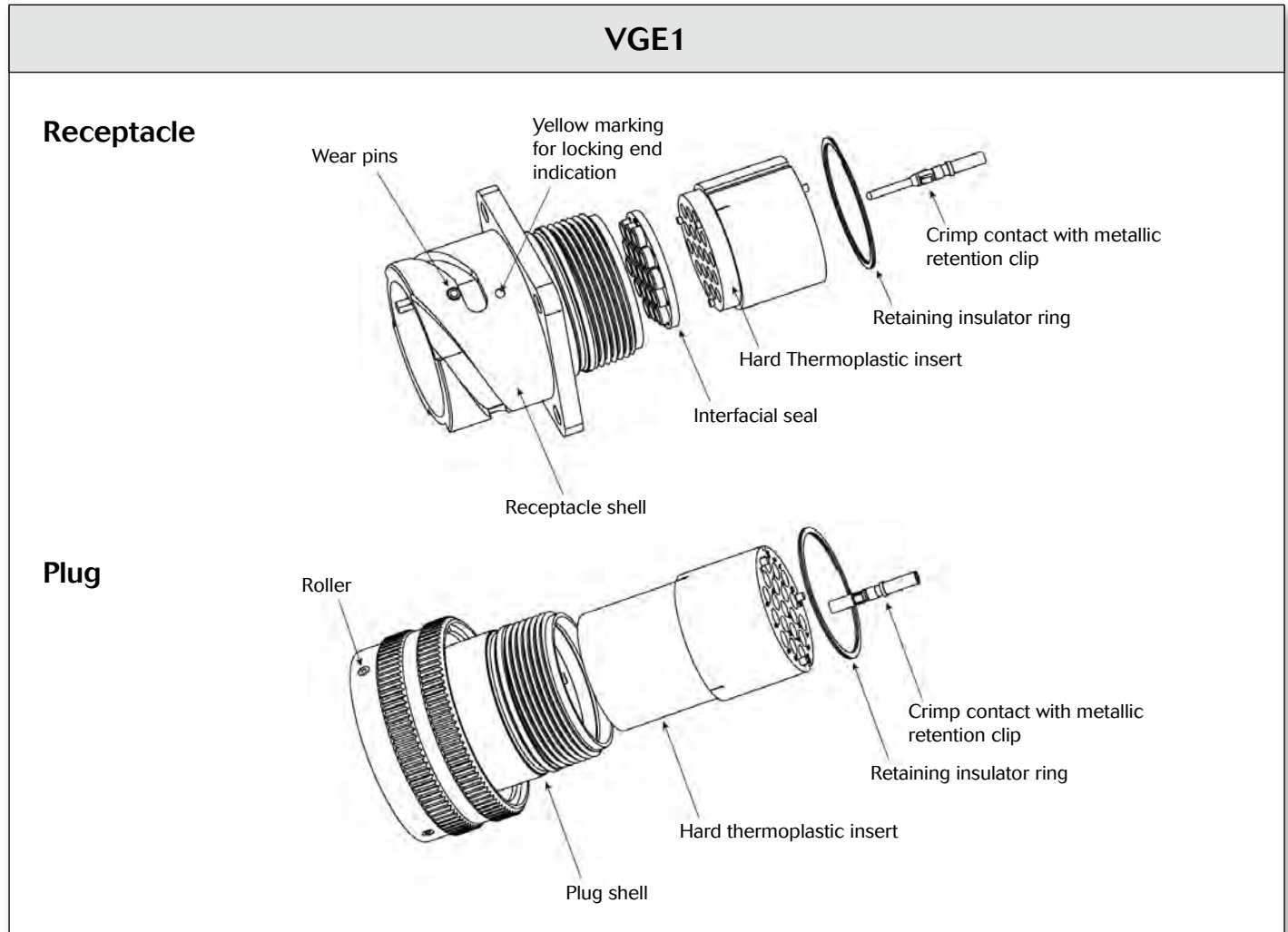
- Shell:  
Aluminum alloy  
Conductive plating - 500 hours salt spray resistant
- Insert:  
Hard thermoplastic: HL3/R22 and HL3/R23 following EN 45 545, NFPA 130 compliant
- Contacts:  
Machined crimp contacts / PCB contacts

### Electrical

- Contacts resistance, following NF F 61-030:  
Contact #20: 6 m $\Omega$  max, Contact #16: 2.5 m $\Omega$  max,  
Contact #12: 1.3 m $\Omega$  max, Contact #8: 0.9 m $\Omega$  max  
Quadrax Contacts #20:  $\leq 6$  m $\Omega$ ,  $\leq 2$  m $\Omega$  (cell)
- Contact rating:  
Contact #20: 7A, Contact #16: 15A, Contact #12: 20A,  
Contact #8: 30A
- Dielectric resistance:  
Contact #20: 1500 Veff, Contact #16: 2550 Veff,  
Contact #12: 3250 Veff, Contact #8: 3250 Veff  
Quadrax between contacts #20:  $\geq 1000V$   
Quadrax between cell / contacts #20 :  $\geq 500V$
- Insulation resistance:  
 $\geq 3\ 000$  M $\Omega$  (under 100 Vdc)  
 $\geq 5\ 000$  M $\Omega$  (under 500 Vdc)  
 $\geq 4\ 000$  M $\Omega$  (under 220 Vdc)  
Quadrax:  $\geq 3000$  M $\Omega$  (contacts #20)
- Creepage and clearance:  
6 mm creepage, 2 mm clearance for layout 14A6  
2.1mm creepage, 0.8mm clearance for layout 14A10  
9 mm mini for layouts 18-19, 22-14, 28-21, 40A60  
12 mm mini for layouts using #12 and #8 contacts
- Operating voltage:  
110 V following NF F 61-030 for layout 14A6  
110V following EN 50-124 for layout 14A10  
220 V following NF F 61-030 for layouts 18-19, 22-14,  
28-21, 40A60  
500 Vcc following NF F 61-030 for layouts #12 and #8
- Shell continuity:  
20 m $\Omega$  max
- High Speed data Transmission performances, IEC11-801:  
Standard contact: cat. 5, Quadrax contact: cat. 6



## Description





## Layouts overview

<p><b>Size 14</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>14A6</b></p> <p>6 Contacts Ø1.6 mm (#16) 110 V following NF F 61-030 for layout 14A6 110 V following EN50-124 for layout 14A10</p> </div> <div style="text-align: center;"> <p><b>14A10</b></p> <p>10 Contacts Ø1 mm (#20) 110 V following EN50-124 for layout 14A10</p> </div> <div style="text-align: center;"> <p><b>Quadrax 14R</b></p> <p>4 Contacts Ø1 mm (#20)</p> </div> </div>	<p><b>Size 18</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>18-19</b></p> <p>10 Contacts Ø1.6 mm (#16) 220 V following NF F 61-030 for layout 18-19</p> </div> <div style="text-align: center;"> <p><b>Quadrax 18A1</b></p> <p>4 Contacts Ø1 mm (#20)</p> </div> </div>		
<p><b>Size 20</b></p> <div style="text-align: center;"> <p><b>20-15</b></p> <p>7 Contacts Ø2.4 mm (#12) Max. operating voltage: 500 Vcc following NF F 61-030</p> </div>	<p><b>Size 22</b></p> <div style="text-align: center;"> <p><b>22-14</b></p> <p>19 Contacts Ø1.6 mm (#16) Max. operating voltage: 220 V following NF F 61-030</p> </div>	<p><b>Size 24</b></p> <div style="text-align: center;"> <p><b>24-10</b></p> <p>7 Contacts Ø3.6 mm (#8) Max. operating voltage: 500 Vcc following NF F 61-030</p> </div>	
<p><b>Size 28</b></p> <div style="text-align: center;"> <p><b>28-21</b></p> <p>37 Contacts Ø1.6 mm (#16) Max. operating voltage: 220 V following NF F 61-030</p> </div>	<p><b>Size 32</b></p> <div style="text-align: center;"> <p><b>32A13</b></p> <p>13 Contacts Ø2.4 mm (#12) Max. operating voltage: 220 V following NF F 61-030</p> </div>	<p><b>Size 36</b></p> <div style="text-align: center;"> <p><b>36A22</b></p> <p>22 Contacts Ø2.4 mm (#12) Max. operating voltage: 500 Vcc following NF F 61-030</p> </div>	
<p><b>Size 40</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>40A35</b></p> <p>35 Contacts Ø2.4 mm (#12) Max. operating voltage: 500 Vcc following NF F 61-030</p> </div> <div style="text-align: center;"> <p><b>40A60</b></p> <p>60 Contacts Ø1.6 mm (#16) Max. operating voltage: 220 V following NF F 61-030</p> </div> </div>			

n = VGE1 standard version

s = FER1 standard version



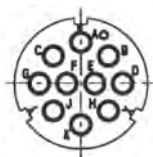
## Heating curves

### Test conditions:

- Current per contact
- All contacts loaded
- Max heating in C° allowed following NF F 61-030: 50°C

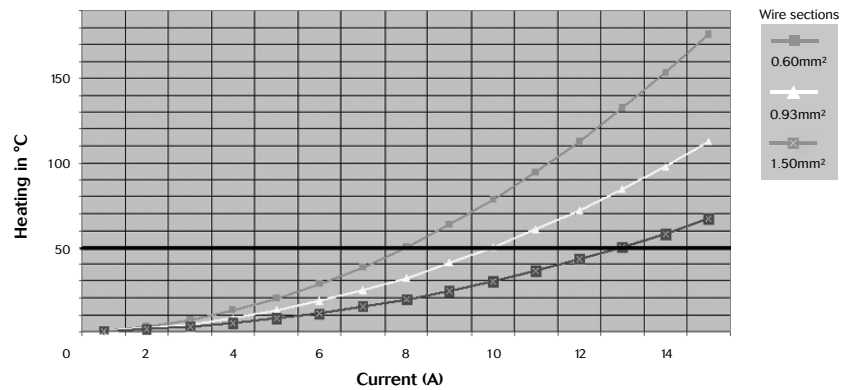
### Size 18

#### 18-19



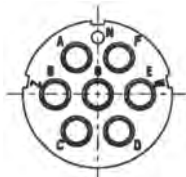
10 Contacts  
Ø1.6 mm (#16)

18-19 only Max. operating voltage: 220 V following NF F 61-030



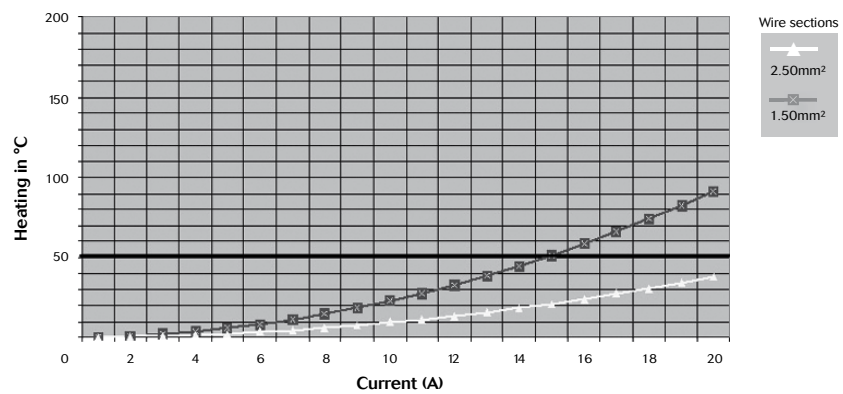
### Size 20

#### 20-15



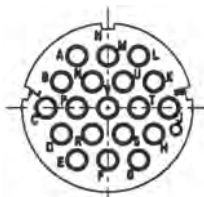
7 Contacts  
Ø2.4 mm (#12)

Max. operating voltage: 500 Vcc following NF F 61-030



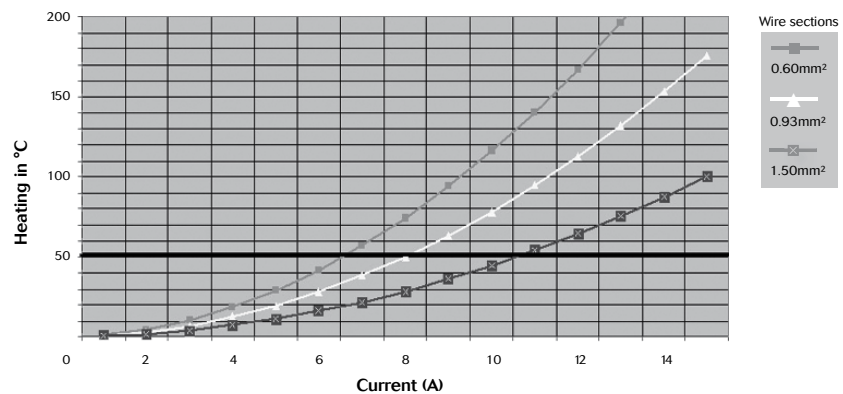
### Size 22

#### 22-14



19 Contacts  
Ø1.6 mm (#16)

Max. operating voltage: 220 V following NF F 61-030

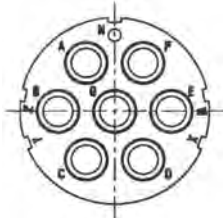


# VGE1/FER1 Series



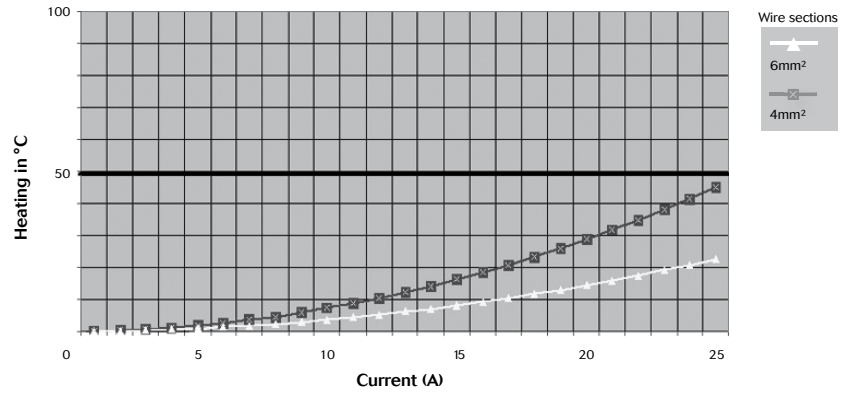
## Size 24

### 24-10



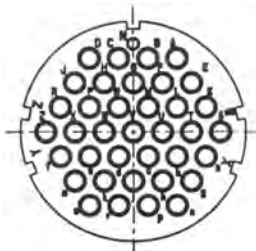
7 Contacts  
Ø3.6 mm (#8)

Max. operating voltage: 500 Vcc  
following NF F 61-030



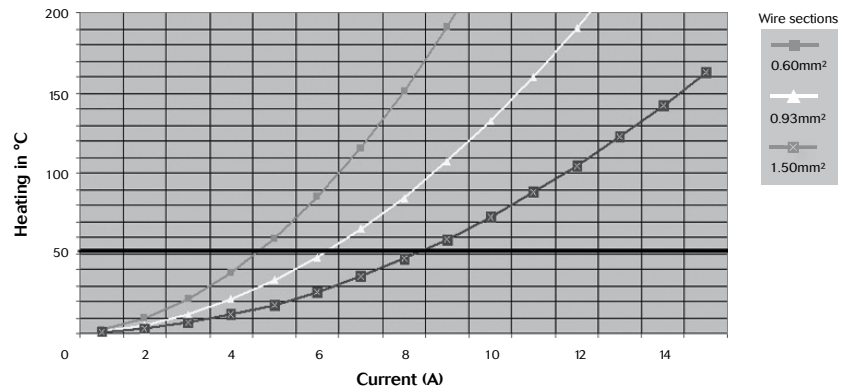
## Size 28

### 28-21



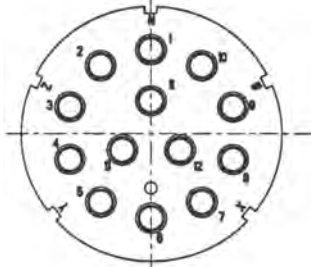
37 Contacts  
Ø1.6 mm (#16)

Max. operating voltage: 220 V  
following NF F 61-030



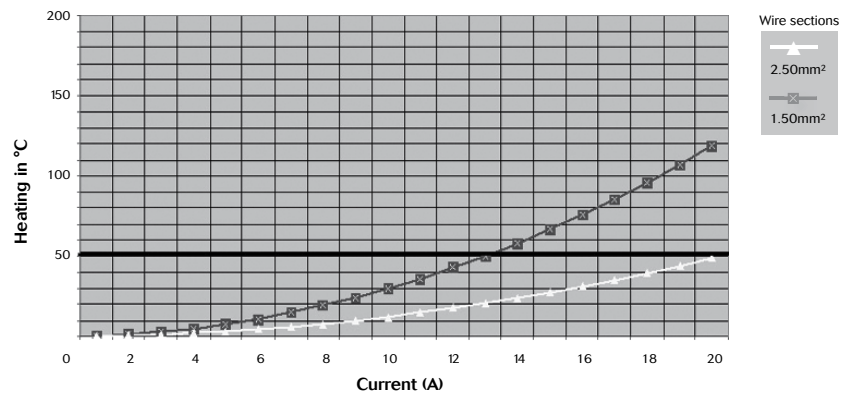
## Size 32

### 32A13



13 Contacts  
Ø2.4 mm (#12)

Max. operating voltage: 220 V  
following NF F 61-030

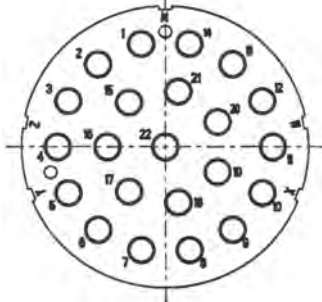


# VGE1/FER1 Series



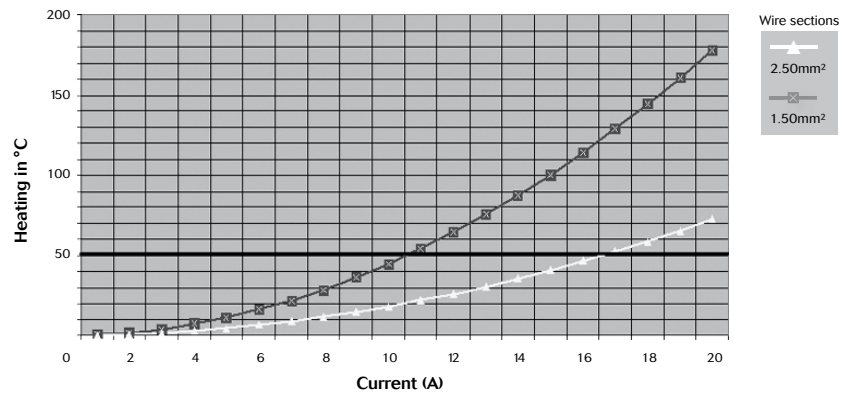
## Size 36

### 36A22



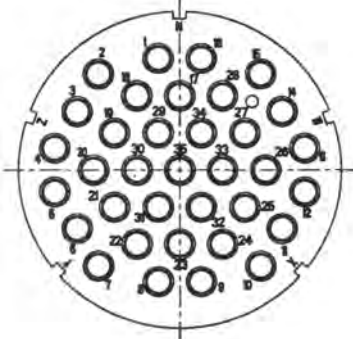
22 Contacts  
Ø2.4 mm (#12)

Max. operating voltage: 500 Vcc  
following NF F 61-030



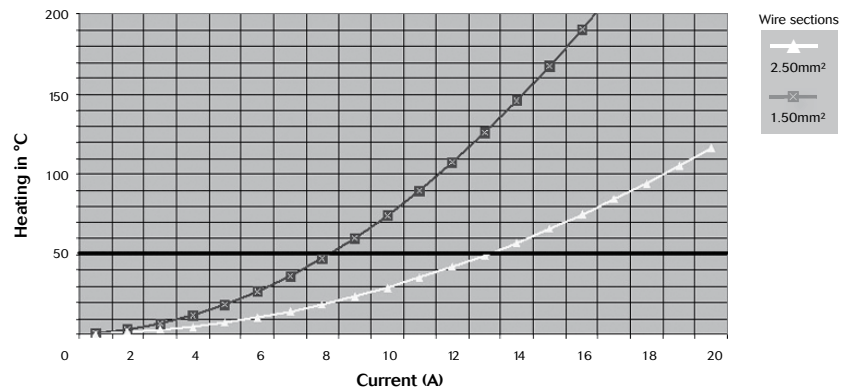
## Size 40

### 40A35

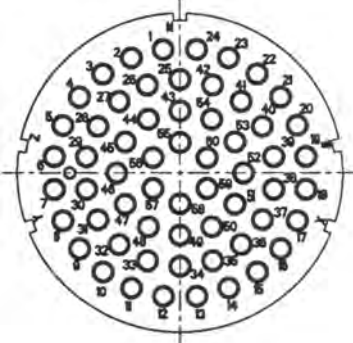


35 Contacts  
Ø2.4 mm (#12)

Max. operating voltage: 500 Vcc  
following NF F 61-030

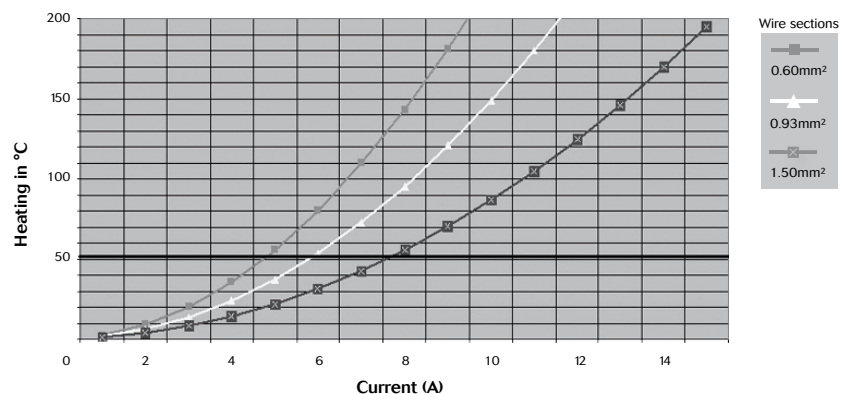


### 40A60



60 Contacts  
Ø1.6 mm (#16)

Max. operating voltage: 220 V  
following NF F 61-030





## Data transmission performances

### High speed data transmissions with layouts 18-19, 14R and 18A1

Tests following IEC 11-801

For cabling specifications please contact us.

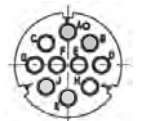
#### 18-19

Cat. 5 level obtained with 4 contacts #16

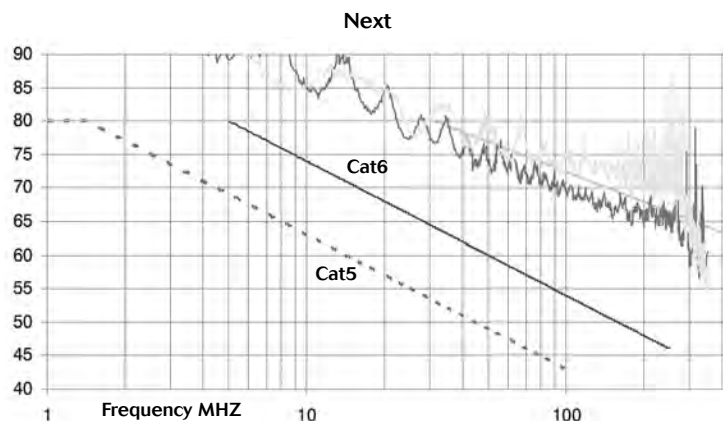
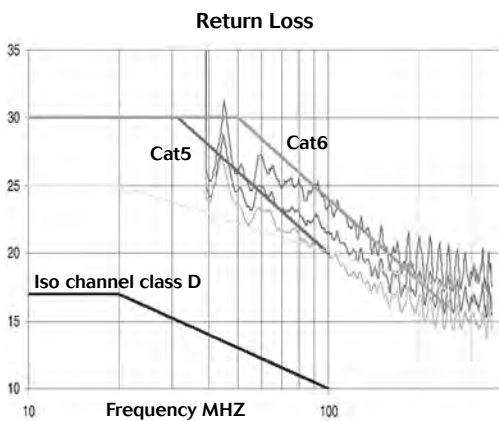
Exemple of performances with a 18-19 connector and a 2 pairs cable, for cabling specification, consult us:

Standard version with 4 contacts #16: Cat. 5 / IEC11-801

#### 18-19



4 Contacts  
Ø1.6 mm (#16)



#### Quadrax-14R & 18A1

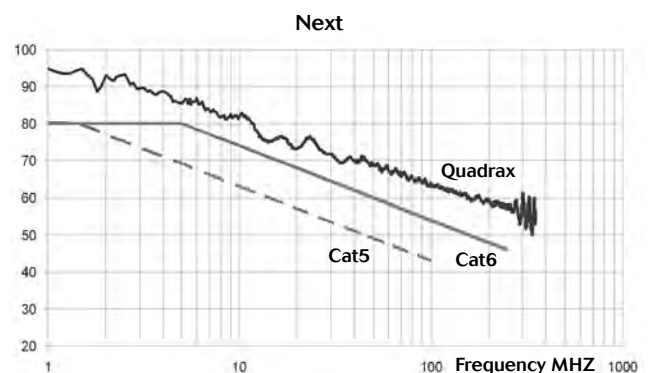
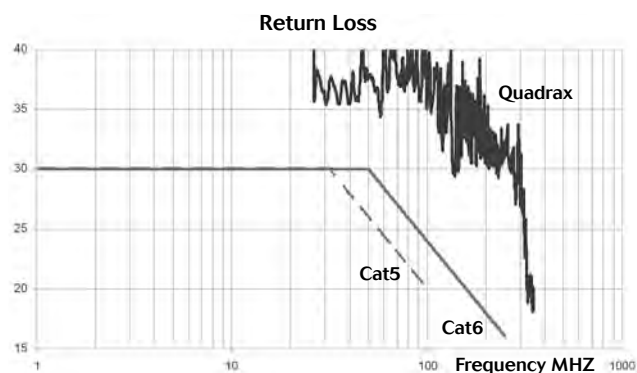
Cat. 6 level obtained with 1 contact Quadrax

Exemple of performances with a 18A1 connector and a quarte cable:

Quadrax version: Cat. 6 / IEC11-801

#### 14R

#### 18A1





## Ordering information

Receptacle, plug, backshells, contacts and accessories have to be ordered separately.

### VGE1 (page 20-29)

Basic Series	VGE1	B	22	14	P	N	--
<b>Shell type:</b>							
B: Rear mounting receptacle							
D: Plug							
C: Rear mounting receptacle for PC tails contact # 16							
H: Jam Nut Receptacle with shielding ring - only available for sizes 18 and 22							
<b>Shell size:</b>							
14; 18; 20; 22; 24; 28; 32; 36; 40							
Layouts: see page 11							
<b>Contact type:</b>							
P: Pin							
S: Socket							
<b>Insert Orientation:</b> see page 76							
N; W; X; Y; Z or Ø							
(Ø = insert not installed in the shell)							
<b>Specification Code:</b>							
Ø4: Receptacle delivered with non conductive panel gasket							
Ø5: Receptacle delivered with conductive panel gasket							
11: Receptacle and plug delivered with plastic cap							

Connector marking example: VGE1B2214PN

### FER1 (page 30-31)

Basic Series	FER1	B	22	14	P	N	--
<b>Shell type:</b>							
B: Rear mounting receptacle							
D: Plug							
<b>Shell size:</b>							
18; 22; 28 (Other sizes: please consult us)							
Layouts: see page 11							
<b>Contact type:</b>							
P: Pin							
S: Socket							
<b>Insert Orientation:</b> see page 76							
N; W; X; Y; Z or Ø							
(Ø = insert not installed in the shell)							
<b>Specification Code:</b>							
Ø4: Receptacle delivered with non conductive panel gasket							
Ø5: Receptacle delivered with conductive panel gasket							
11: Receptacle and plug delivered with plastic cap							

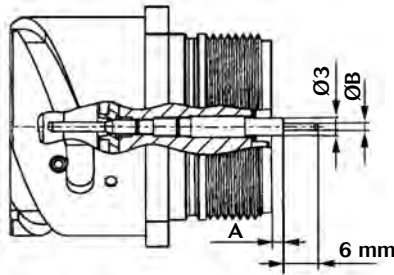
Connector marking example: FER1D2821SN





## VGE1 specific receptacle - Dimensions

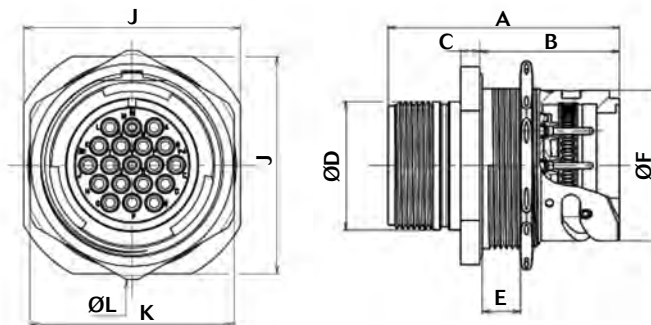
### Receptacle with PC tails contacts



Part numbers <sup>(2)</sup>	Shell size	A max	ØB max*		
VGE1 C 1819 PN...	18	2.00	Gold plating standard (-) Ø 1.2	Gold plating specific (01) Ø 1	Tin plating (14) Ø 1
VGE1 C 2214 PN...	22				
VGE1 C 2821 PN...	28	- 0.40			

\*: example of Part numbers with Gold plating standard VGE1C1819PN, with Gold plating specific VGE1C1819PN01, with Tin plating VGE1C1819PN14

### Jam nut receptacle with shielding ring



Part numbers <sup>(2)</sup>	Shell size	A max	B	C	ØD max	E max	ØF	J	K	ØL	Weight <sup>(3)</sup>
VGE1 H 1819 ...N	18	57.70	34.50	4.80	25.50	10.00	30.80	42.00	39.90	44.50	70 g
VGE1 H 2214 ...N	22	57.70	34.50	4.80	31.90	10.00	37.40	49.00	46.00	51.30	105 g

2: example of Part numbers with orientation "N", "N" can be replaced by other orientation - see column orientation  
3: weight for indication - receptacle + insert without contact

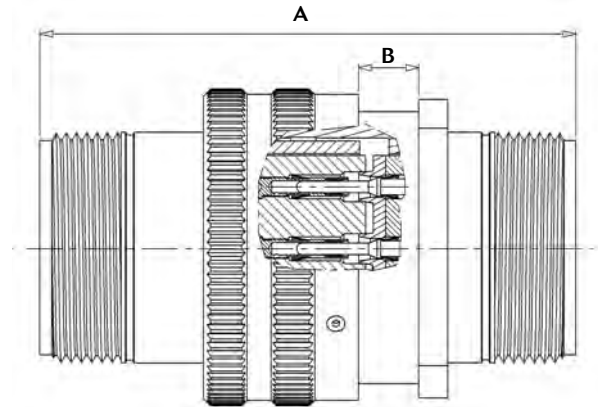
Note: max dimensions in mm  
Dimensions are not contractual and may be subject to modifications



## Connector mated length

### VGE1 plug & receptacle

Shell size	A max	B max
14	70	7
18	75.50	7.80
20		
22		
24		
28	80.50	8.80
32		
36		
40		



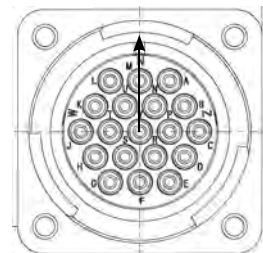
Note: max dimensions in mm  
Dimensions are not contractual and may be subject to modifications

## Insert orientations

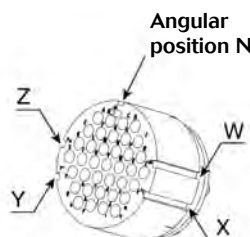
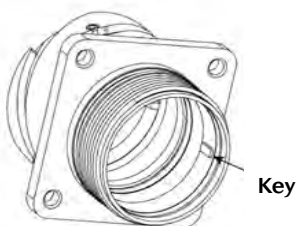
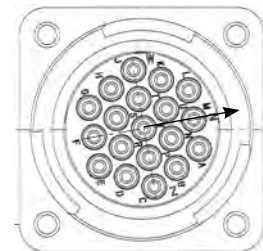
### Alternative insert orientation positions

Layouts	N	W	X	y	Z
14A6 / 14A10 14R	0°	-	-	108°	-
18-19	0°	-	120°	240°	-
20-15	0°	80°	-	-	280°
22-14	0°	80°	-	-	280°
24-10	0°	80°	110°	250°	280°
28-21	0°	80°	110°	250°	280°
32A13	0°	65°	130°	230°	295°
36A22	0°	80°	110°	250°	280°
40A35	0°	70°	130°	230°	290°
40A60	0°	80°	110°	250°	280°

22-14 position N



22-14 position W



0°: insert not mounted in the shell

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Souriau:

[VGE1C2821PX](#) [VGE1C2821PY](#) [VGE1C2821PN](#)