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RAIL ACADEMY

POWER AND SIGNAL GUIDE

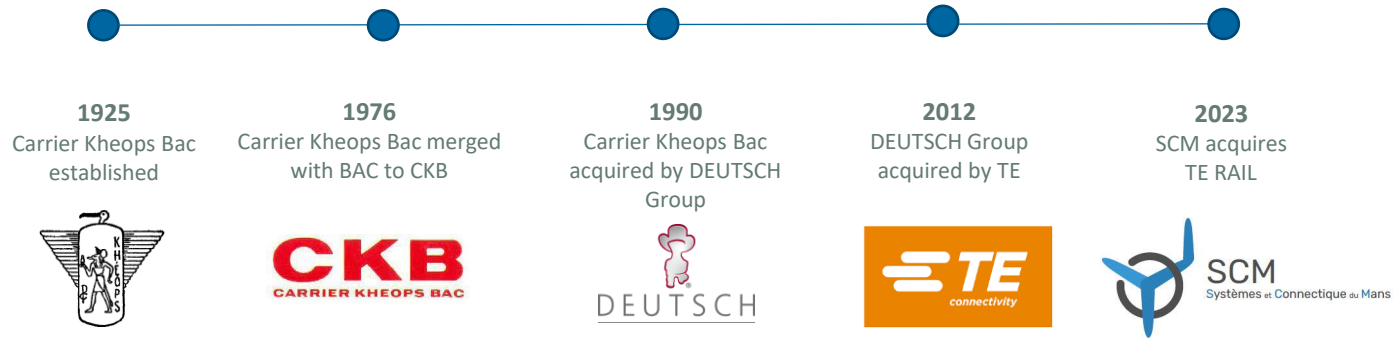


THE STORY

100 YEARS OF EXPERTISE

SCM

ALMOST 100 YEARS OF EXPERIENCE & HISTORY IN RAIL INDUSTRY



Founded in 1925 the **Carrier Kheops** product range continues to be used on the latest generation of trains. **CKB** (merged from Carrier Kheops and Bac in 1976) was acquired by the **Deutsch Group** in 1990 and the product range went from strength to strength. In 2012 , the expertise and innovation of the Rail team found home with **TE Connectivity** and the development of a new range of power connectors for the market of today and the future. Most recently, **SCM** was founded in 2021 by **Frederic Kleindienst** (former Deutsch board member and General Manager of the Le Mans facility).

SCM acquired TE Rail (former Deutsch/CKB product portfolio) in February 2023.





RAIL ACADEMY

POWER AND SIGNAL GUIDE



LOCATION



APPLICATIONS



FUNCTIONS



STANDARDS



PRODUCTS

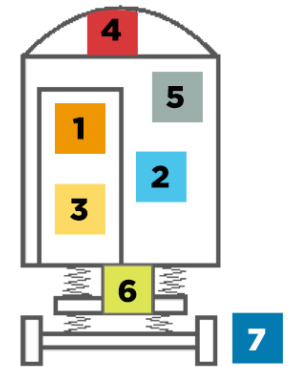
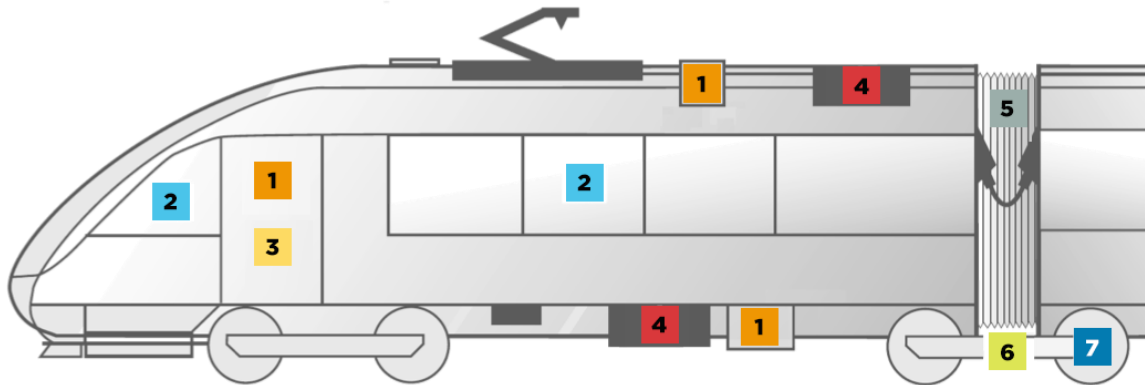




LOCATION

SERIES LOCATION ON BOARD ROLLING STOCK

APPLICATION TYPE	STATIC				DYNAMIC		
LOCATION	1	2	3	4	5	6	7
DEFINITION	Closed electrical operating area	Cabin and interiors	Closed electrical operating area; forced filtered ventilation with outside air	Outdoor static application	Outdoor dynamic application	Outdoor highly-dynamic application	Outdoor highly-dynamic application



CONNECTOR TYPOLOGY FOR STATIC APPLICATIONS



CONNECTOR TYPOLOGY FOR DYNAMIC APPLICATIONS



REQUIREMENTS PER LOCATION





REQUIREMENTS

LOCATION OF CONNECTOR ON BOARD ROLLING STOCK

	APPLICATION TYPE	STATIC				DYNAMIC		
	LOCATION	1	2	3	4	5	6	7
DEFINITION	STANDARD	Closed electrical operating area	Cabin and interiors	Closed electrical operating area; forced filtered ventilation with outside air	Outdoor static application	Outdoor dynamic application	Outdoor highly-dynamic Application	Outdoor highly-dynamic Application
OverVoltage Category	EN 50124-1: 2001	OV2	OV2	OV2	OV2	OV2	OV2	OV2
Pollution Degree	EN 50124-1: 2001	PD2	PD2	PD3	PD3	PD3	PD3	PD3
IP Index	EN 60529: 1991	-	IP2X	IP65	IP65	1P66	1P66	1P66
Chocks & Vibrations	EN 61373: 1999	Cat. 1B	Cat. 1B	Cat. 1B	Cat. 1B	Cat. 1B	Cat. 2	Cat. 3
Salt Spray Resistance	EN 60512-11-6: 2002	96 h	96 h	96 h	240 h	240 h	240 h	240 h
Resistance to Ozone	ISO 1431-1: 2004	NO	NO	YES	YES	YES	YES	YES
Resistance to UV	EN ISO 4892-2: 2006	NO	NO	NO	YES	YES	YES	YES
Resistant to Fluids	EN60512-19-3: 1997	NO	NO	YES	YES	YES	YES	YES
Fire & Smoke		YES	YES	YES	YES	YES	YES	YES



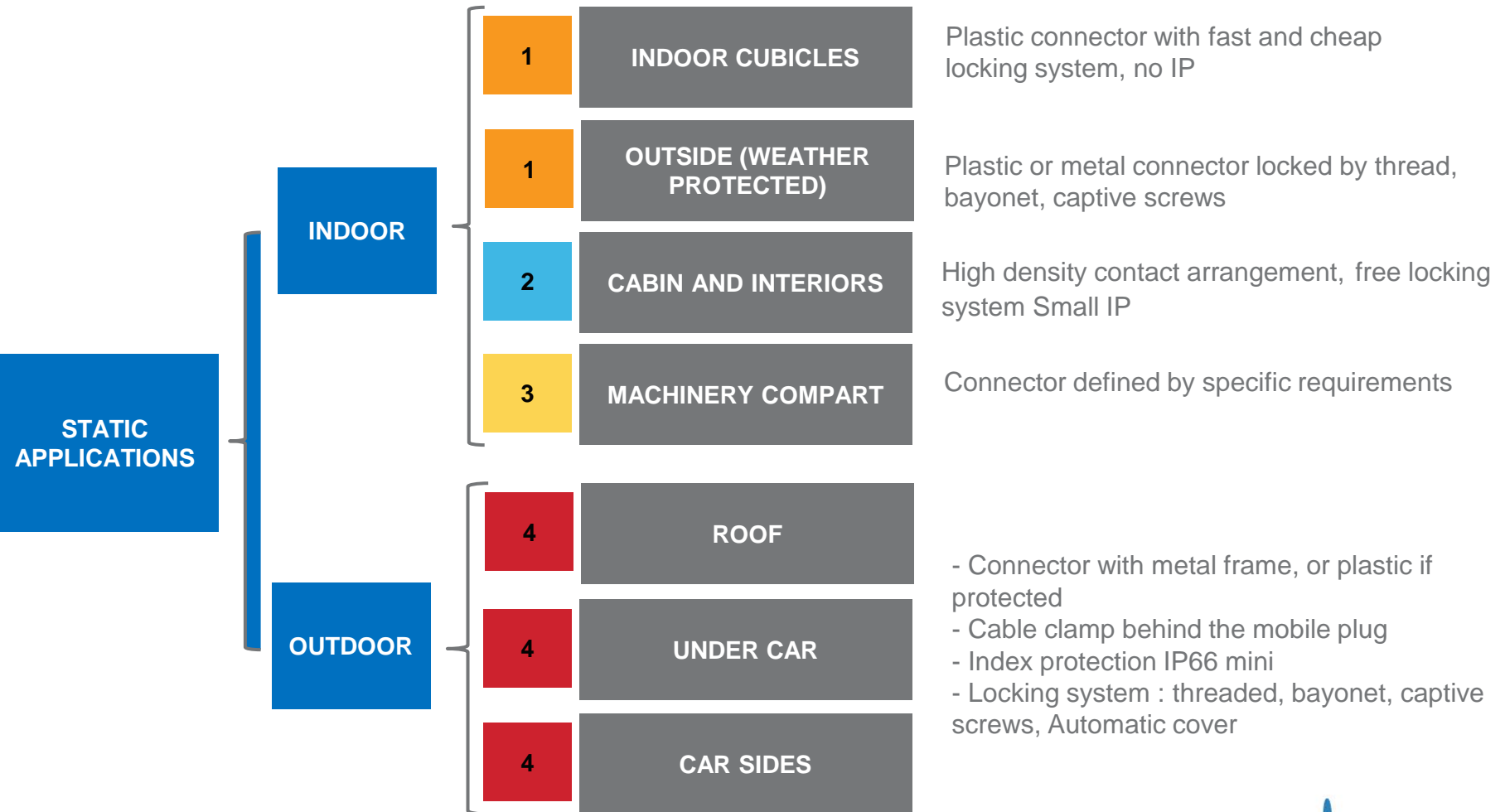


STATIC APPLICATIONS

APPLICATION TYPE

LOCATION

CONNECTOR TYPOLOGY



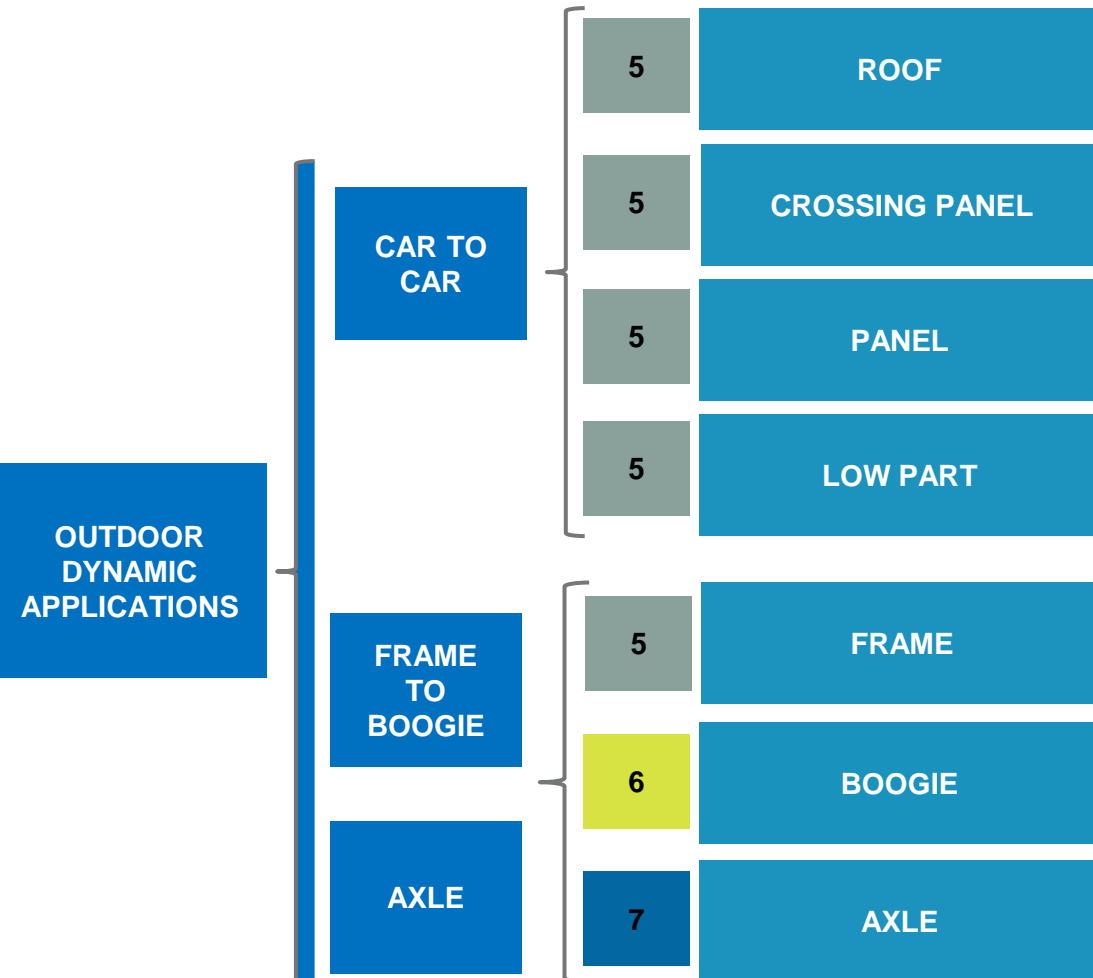


OUTDOOR DYNAMIC APPLICATIONS

APPLICATION TYPE

LOCATION

CONNECTOR TYPOLOGY



- Connector with metal shell
- Angled connector or bracket to guide
- Adapted cable outlet (clamping, water tightness, cone exit, or boot)
- Index protection; IP66 mini
- Locking system to select:

<500 mating cycles; threaded, Captive screws
>500 mating cycles; CAM, Automatic cover

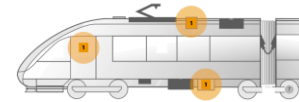
- Connector with metal shell
- Cable clamp behind the mobile plug
- Index protection; IP66 mini
- Locking system ; threaded, captive screws

- Connector defined by specific requirements





#1: CLOSED ELECTRICAL OPERATING AREA

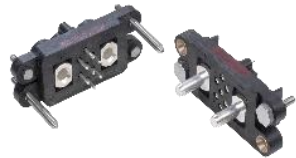


POWER



CPP

Circular Power Connector
Dynamic, many arrangements



CSR

Rack Power Supply
Up to 700V

SIGNAL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite connector
Up to 20A
4, 6, 12 or 28 poles



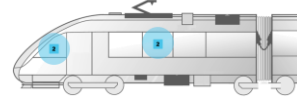
CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements





#2: CABIN AND INTERIORS

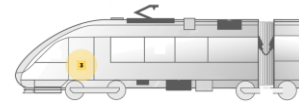


*This category is empty because IP 2X requested





#3: CLOSED ELECTRICAL OPERATING AREA (VENTILATED)



POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO

Power Composite Connector
800A / 3000V
Up to 4 poles



CSR

Rack Power Supply
Up to 700V

SIGNAL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite connector
Up to 20A
4, 6, 12 or 28 poles



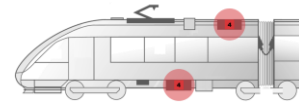
CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements





#4: OUTDOOR STATIC APPLICATION



POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO

Power Composite Connector
800A / 3000V
Up to 4 poles



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO D

Power Derivation Connector
Shielded or composite
800A / 1500V - 3000V
3 inlets → 2x3 outlets



CPP

Circular Power Connector
Dynamic, many arrangements



WYE

Derivation Composite Power
Dynamic, many arrangement

SIGNAL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite Connector
Up to 20A
4, 6, 12 or 28 poles



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements





#5: OUTDOOR DYNAMIC APPLICATION



POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO D

Power Derivation Connector
Shielded or composite
800A / 1500V - 3000V
3 inlets → 2x3 outlets



CPP

Circular Power Connector
Dynamic, many arrangements



EKO A

Power Intercar Connector
800A / 3000V
Modular connector



CAM

Assisted Locking Connector
Many arrangements

SIGNAL



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements



MU27P

Circular Dynamic Connector
Up to 600V – 30A
27 poles

UIC



UIC552

Heating
Coupler



UIC541

Electro – Pneumatic
Brake coupler



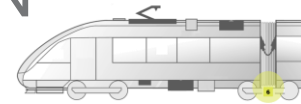
UIC558

Audio
Coupler





#6: OUTDOOR HIGHLY-DYNAMIC APPLICATION



POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO

Power Composite Connector
800A / 3000V
Up to 4 poles



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO D

Power Derivation Connector
Shielded or composite
800A / 1500V - 3000V
3 inlets → 2x3 outlets



CPP

Circular Power Connector
Dynamic, many arrangements



WYE

Derivation Composite Power
Dynamic, many arrangement

SIGNAL



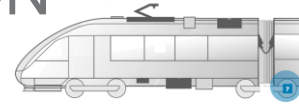
CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements





#7 : OUTDOOR HIGHLY DYNAMIC APPLICATION



POWER



CPP

Circular Power Connector
Dynamic, many arrangements

SIGNAL



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements





APPLICATIONS



INTER-VEHICLE

TRACTION POWER

TRAIN CONTROL

SUB SYSTEMS

PIS & SAFETY





INTER-VEHICLE

POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO A

Power Intercar connector
800A / 3000V
Modular connector



CPP

Circular Power Connector
Dynamic, many arrangements

SPECIFIC



CAM

Assisted Locking Connector
Many arrangements

SIGNAL



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements



MU27P

Circular Dynamic Connector
Up to 600V – 30A
27 poles

UIC



UIC552

Heating
Coupler



UIC541

Electro – Pneumatic
Brake coupler



UIC558

Audio
Coupler





TRACTION POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO D

Power Derivation Connector
Shielded or composite
800A / 1500V - 3000V
3 inlets → 2x3 outlets



EKO

Power Composite Connector
800A / 3000V
Up to 4 poles



CPP

Circular Power Connector
Dynamic, many arrangements



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



WYE

Derivation Composite Power
Dynamic, many arrangement





TRAIN CONTROL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite Connector
Up to 20A
4, 6, 12 or 28 poles





SUB SYSTEMS

POWER



CPP

Circular Power Connector
Dynamic, many arrangements

SIGNAL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite connector
Up to 20A
4, 6, 12 or 28 poles



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements





PIS AND SAFETY



SRC

Circular Static Connector
Derivated from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite connector
Up to 20A
4, 6, 12 or 28 poles



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements





FUNCTIONS



CAB CONTROL

**PROPULSION &
BREAKING**

**AUXILIARY
POWER SUPPLY**

LIGHTING

DOORS

AIR CONDITIONING

INTER-VEHICLE

BATTERY

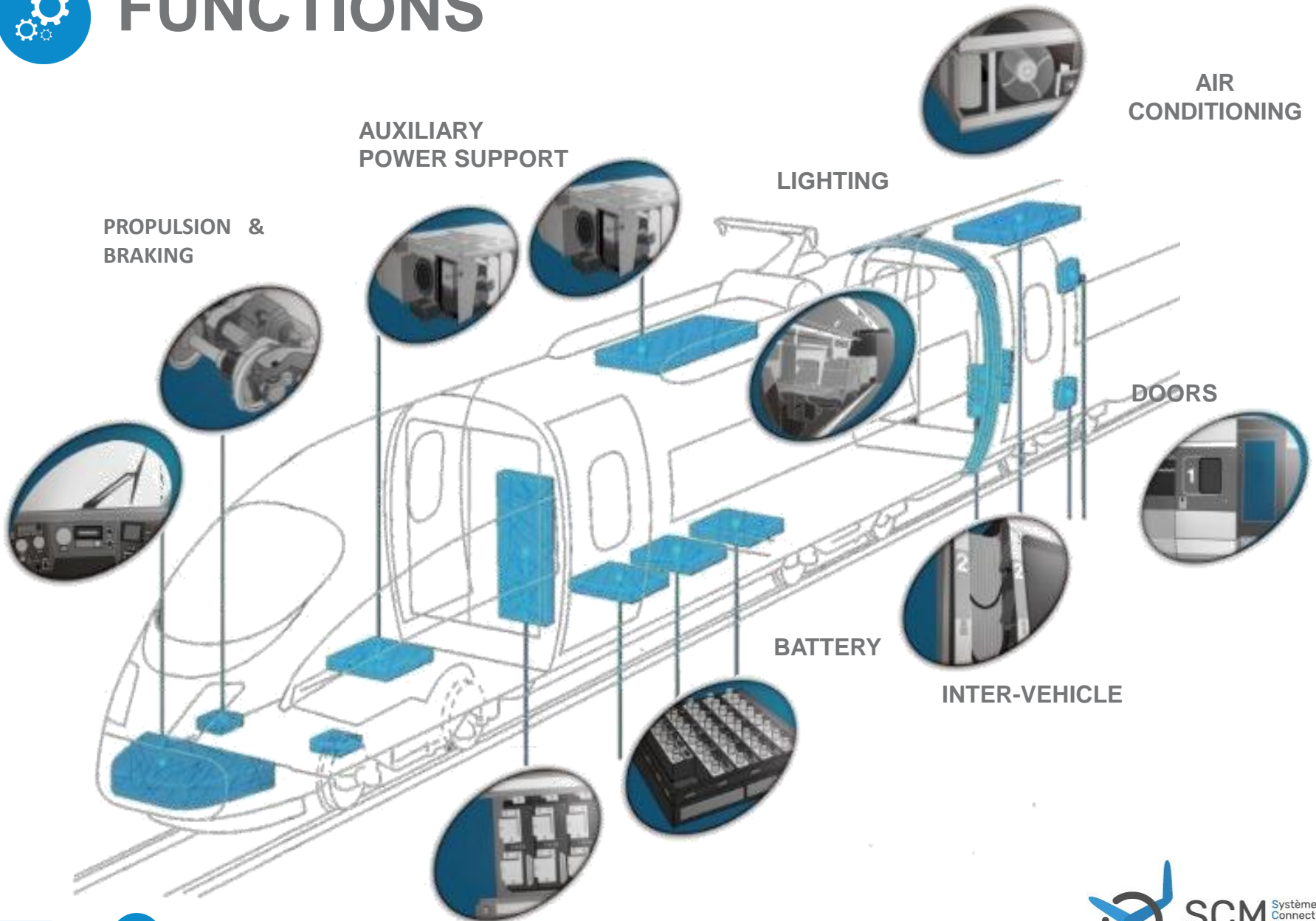
TRAIN CONTROL

ILLUSTRATION



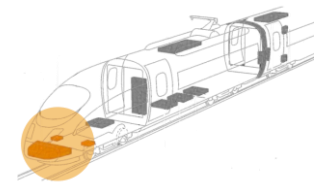


FUNCTIONS





CAB CONTROL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

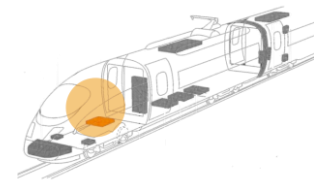
Rectangular Composite Connector
Up to 20A
4, 6, 12 or 28 poles



Illustration



PROPULSION & BRAKING



POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO

Power Composite Connector
800A / 3000V
Up to 4 poles



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO D

Power Derivation Connector
Shielded or composite
800A / 1500V - 3000V
3 inlets → 2x3 outlets



CPP

Circular Power Connector
Dynamic, many arrangements



WYE

Derivation Composite Power
Dynamic, many arrangement

SIGNAL



CMC

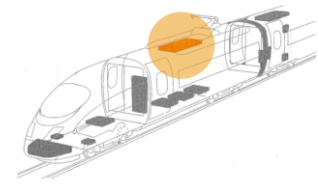
Circular Dynamic Connector
Up to 500V – 250A
Many arrangements



Illustration



AUXILIARY POWER SUPPLY



POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO

Power Composite Connector
800A / 3000V
Up to 4 poles



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



CPP

Circular Power Connector
Dynamic, many arrangements



WYE

Derivation Composite Power
Dynamic, many arrangement

SIGNAL



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements

SPECIFIC



CAM

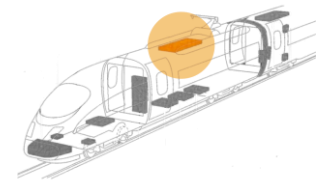
Assisted Locking Connector
Many arrangements



Illustration



LIGHTING



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

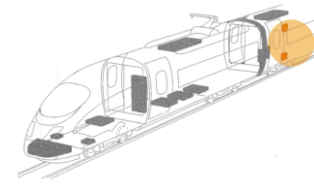
Rectangular Composite Connector
Up to 20A
4, 6, 12 or 28 poles



Illustration



DOORS



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

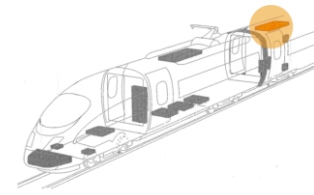
Rectangular Composite Connector
Up to 20A
4, 6, 12 or 28 poles



Illustration



AIR CONDITIONING



POWER



CPP

Circular Power Connector
Dynamic, many arrangements

SIGNAL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite connector
Up to 20A
4, 6, 12 or 28 poles



CMC

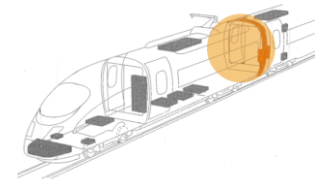
Circular Dynamic Connector
Up to 500V – 250A
Many arrangements



Illustration



INTER-VEHICLE



POWER



FXP

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO S

Power Shielded Connector
800A / 3000V
Up to 4 poles



EKO A

Power Intercar connector
800A / 3000V
Modular connector



CPP

Circular Power Connector
Dynamic, many arrangements

SPECIFIC



CAM

Assisted Locking Connector
Many arrangements

SIGNAL



CMC

Circular Dynamic Connector
Up to 500V – 250A
Many arrangements



MU27P

Circular Dynamic Connector
Up to 600V – 30A
27 poles

UIC



UIC552

Heating
Coupler



UIC541

Electro – Pneumatic
Brake coupler



UIC558

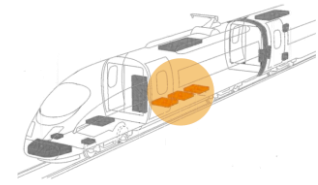
Audio
Coupler



Illustration



BATTERY



CSR

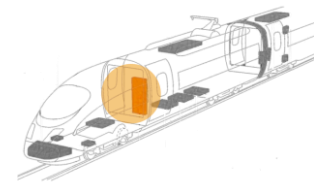
Rack Power Supply
Up to 700V



Illustration



TRAIN CONTROL



SRC

Circular Static Connector
Derived from
MIL DTL 5015 & VG 95234



NGC

Rectangular Composite Connector
Up to 20A
4, 6, 12 or 28 poles



Illustration



RAIL APPLICABLE STANDARDS

STANDARD	PRODUCT STANDARDS			FIRE & SMOKE					VIBRATION	METHOD PERFORMANCE TEST		
	PRODUCT	APTA AAR S512	UIC	MIL C 5015	EN 45545 (HL3 / R22-R23)	NFF 16 101 NFF 16 102 Exigency 2	DIN 5510	UNI CEI 11170	ASTM E662/E162 UL94, BSS7239	IEC 61373 EN 60068-2-6	NFF 61 030	EN 50 467
POWER	FXP				✓	✓	✓	✓		✓	✓	✓
	EKO				✓	✓	✓	✓		✓	✓	✓ Analogy Vs 61030
	EKO S				✓	✓	✓	✓		✓	✓	✓ Analogy Vs 61030
	EKO D				✓	✓	✓	✓		✓	✓	✓ Analogy Vs 61030
	EKO A				✓	✓	✓	✓		✓	✓	N/A
	CPP				✓	✓	✓	✓		✓	✓	N/A
	WYE				✓	✓	✓	✓		✓	✓	N/A
SIGNAL	SRC				HL2	✓				✓	✓	✓ Analogy Vs 61030
	NGC				✓	✓	✓	✓		✓	✓	✓ Analogy Vs 61030
	CMC				✓	✓				✓	✓	N/A
	MU27P	✓				✓				✓	N/A	N/A
SPECIFIC	CSR				✓	✓				✓	✓	N/A
	CAM				✓	✓				✓	✓	N/A
UIC	UIC552		✓		✓	✓				✓	✓	N/A
	UIC541		✓		✓	✓				✓	✓	N/A
	UIC558		✓		✓	✓				✓	✓	N/A





CONNECTORS



POWER SIGNAL

FXP SRC

EKO NGC

EKO S CMC

EKO D MU27P

CPP

EKO A

WYE

UIC

UIC552

UIC541

UIC558

SPECIFIC

CSR

CAM

TRACKSIDE

SIG





FXP⁽¹⁾

BENEFITS

- Designed according to EN50467
- Unshielded and shielded cables
- Static and dynamic applications
- Over voltage safety features (i.e Permanent Magnet Motor)
- Light, compact and high electrical performances
- Halogen-free

DESCRIPTION

- Locking system with captive screws
- Crimp contacts: cable cross-section from 10 to 300 mm²
- Copper and aluminum cables

MAIN CHARACTERISTICS

- Rated current: up to 700A
- Service voltage :
 - Up 3000V (OV3PD3 according to EN50467)
 - Up 4000V (OV3PD2 according to EN50467)
- Protection index: IP66/IP68/IP69K
- Service temperature: -40°C / +100°C
- Salt spray resistance: 500 hours



LOCATION



APPLICATIONS

INTER-VEHICLE

TRACTION POWER



FUNCTIONS

PROPULSION & BRAKING

AUXILIARY POWER SUPPLY

INTER-VEHICLE



STANDARDS

EN 50467

NFF 61030

EN 45545

DIN 5510

UNICEI 11170

UL94

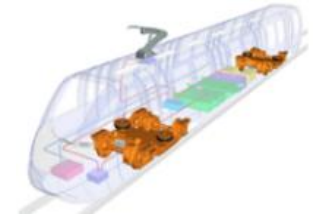


FXP (2)





FXP⁽²⁾



NEW MOTOR GENERATION: New Connector Generation

The next evolution in electric motor use is the **Permanent Magnet (PM) Motor**

- Uses less energy
- Facilitates motor cooling
- Improves motor performance
- Reduces vehicle life-cycle costs
- Shifts braking power from the mechanical to the electrical system

BENEFITS

- Standard platform
- Modularity
- EN & WW F&S compliant resin
- Compact: space saving
- Field proven
- Few components (50)
- Flexible installation
- Easy maintenance
- Protective against return currents

MODULARITY MADE EASY

POWER



HYBRID



FXP (1)



EKO

BENEFITS

- High level of performance
- Straight and 90° connection
- Compact and weight-saving
- Halogen free
- Field-proven

DESCRIPTION

- Connection suitable for unshielded cables
- Locking system with captive screws
- Configurations: 1, 3 or 4 poles
- Crimp contacts: cable cross-section from 10 to 240 mm²
- Copper and aluminum cables

MAIN CHARACTERISTICS

- Rated current: up to 800 A
- Service voltage: up to 3000 V DC/AC
- Withstand voltage: 9500 V
- Protection index: IP 67
- Salt spray: 500 hours
- Temperature range: -40°C +100°C
- Vibrations and shocks: EN 61373 category 1B



LOCATION

1

3

4



APPLICATIONS

TRACTION POWER



FUNCTIONS

PROPULSION & BRAKING

AUXILIARY POWER SUPPLY



STANDARDS

EN 50467

NFF 61030

EN 45545

DIN 5510

UNICEI 11170

UL94





EKO S

BENEFITS

- Unshielded and shielded cables
- Static and dynamic applications
- High mechanical resistance
- Compact and weight-saving
- Halogen free
- Field-proven

DESCRIPTION

- Straight and 90° connection
- Locking system with captive screws
- Configurations: 3 or 4 poles
- Crimp contacts: cable cross-section from 10 to 240 mm²
- Copper and aluminum cables

MAIN CHARACTERISTICS

- Rated current: up to 800 A
- Service voltage: up to 3000 V DC/AC
- Withstand voltage: 9500 V
- Protection index: IP 67
- Salt spray: 96 hours or 500 hours
- Temperature range: -40°C +100°C
- Vibrations and shocks: EN 61373 category 1B



LOCATION

3

4

5

6



APPLICATIONS

INTER-VEHICLE

TRACTION POWER



FUNCTIONS

PROPULSION & BRAKING

AUXILIARY POWER SUPPLY

INTER-VEHICLE



STANDARDS

EN 50467

NFF 61030

EN 45545

DIN 5510

UNICEI 11170

UL94





EKO D

BENEFITS

- Unshielded and shielded cables
- Static and dynamic applications
- High mechanical resistance
- Compact and weight-saving
- Halogen free
- Field-proven

DESCRIPTION

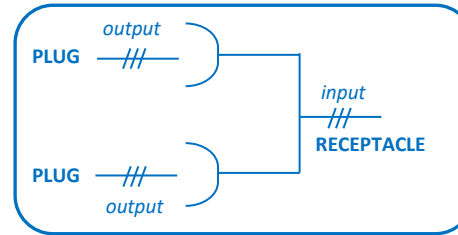
- Straight, 90° or «T» multi-pole derivation, shielded or not
- Locking system by 2 captive screws
- 3 inputs / 2x3 outputs
- Crimp contacts: cable-cross section from 25 to 240 mm²

MAIN CHARACTERISTICS

- Rated current: up to 800 A
- Service voltage: 1500 V or 3000 V DC/AC
- Withstand voltage: 9500 V
- Protection index: IP 67
- Salt spray: 96 hours or 500 hours
- Temperature range: -40°C +100°C
- Vibrations and shocks: EN 61373 category 1B



Concept



LOCATION

3

4

6



APPLICATIONS

TRACTION POWER



FUNCTIONS

PROPULSION & BRAKING

AUXILIARY POWER SUPPLY



STANDARDS

EN 50467

NFF 61030

EN 45545

DIN 5510

UNICEI 11170

UL94





EKO A

BENEFITS

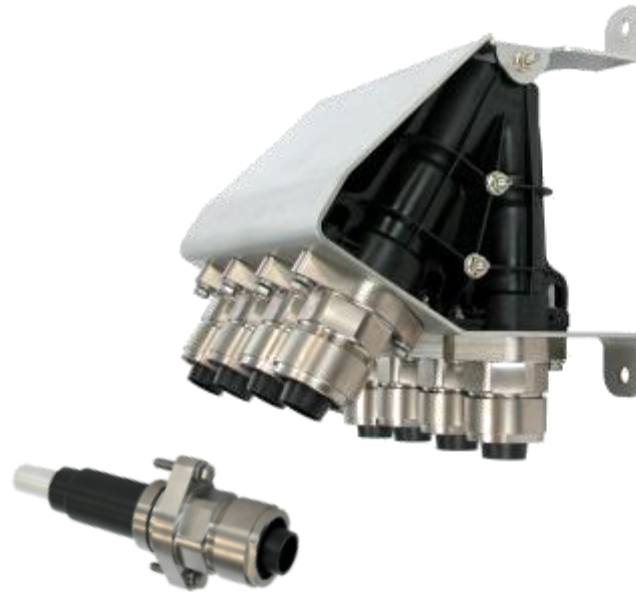
- Modular and dynamic applications
- Flexible assembling process
- High level of performance
- Compact and weight-saving
- Halogen free
- Field-proven

DESCRIPTION

- Modular connector from 2 to 8 angled modules into metal frame
- Locking system by 2 captive screws
- Crimp contacts caliber 12 and 20 in silver plated brass
- Cable cross-section from 50 to 240 mm²

MAIN CHARACTERISTICS

- Rated current: up to 700 A
- Service voltage: up to 3000V DC/AC
- Withstand voltage > 9,5 kV
- Protection index: IP 66
- Salt spray: 96 hours or 500 hours
- Temperature range: -40°C, +100°C
- Vibrations and shocks: EN 61373 category 1 class A



LOCATION

5



APPLICATIONS

INTER-VEHICLE



FUNCTIONS

INTER-VEHICLE



STANDARDS

NFF 61030

EN 45545

DIN 5510

UNICEI 11170

UL94





CPP

BENEFITS

- High dynamic applications
- High vibrations resistance
- Ruggedized power connector
- Field-proven solution from metro to high-speed train

DESCRIPTION

- Aluminium or bronze connector with screw locking system
- Single or multi-poles over 4 shells and 8 configurations
- Crimp contacts: cable cross-section up to 185 mm²
- EMI/RFI shielding protection

MAIN CHARACTERISTICS

- Rated current: from 15 to 500 A
- Service voltage: up to 2000 V
- Withstand voltage: up to 7500 V
- Protection index: IP66
- Salt spray: 96 hours or 500 hours
- Temperature range: -40°C +100°C
- Vibrations and shocks: EN61373 category 1B



LOCATION



APPLICATIONS

INTER-VEHICLE

TRACTION POWER



FUNCTIONS

PROPULSION & BRAKING

AUXILIARY POWER SUPPLY

INTER-VEHICLE

AIR CONDITIONING



STANDARDS

NFF 61030

DIN 5510

UNICEI 11170

UL94





WYE



BENEFITS

- Modular and stackable
- Compact and weight-saving
- Halogen free

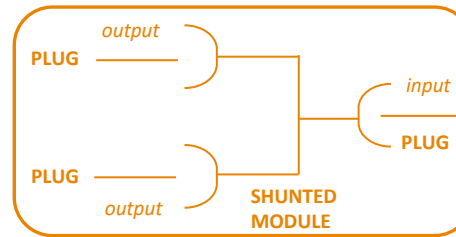
DESCRIPTION

- Single pole power derivation in composite, locking system by captive screws
- 1 input / 2 outputs
- Cable cross-section: from 35 to 120 mm²
- 6 keying positions

MAIN CHARACTERISTICS

- Rated current: 400 A max. (with cable 120 mm²)
- Service voltage: 3000 V
- Withstand voltage: 9500 V
- Protection index: IP66
- Salt spray: 500 hours
- Temperature range: -40°C, +100°C
- Vibrations and shocks: EN 61-373 category 2

Concept



LOCATION

4

6



APPLICATIONS

TRACTION POWER



FUNCTIONS

PROPULSION & BRAKING

AUXILIARY POWER SUPPLY



STANDARDS

EN 50467

NFF 61030

EN 45545

DIN 5510

UNICEI 11170

UL94



BENEFITS

- Quick positive locking system
- NF F 61030 standard compliant
- Broad range of accessories
- Field-proven

DESCRIPTION

- Aluminum connector with bayonet locking system
- From 6 to 60 crimp contacts over 9 shells and 11 configurations
- Crimp solid contacts AWG16, 12 and 8
- Connector design based on the MIL DTL 5015 & VG95234 specifications

MAIN CHARACTERISTICS

- Rated current: from 17 to 45 A
- Service voltage: up to 500 V
- Withstand voltage: up to 3250 V
- Protection index: IP66
- Salt spray: 250 or 500 hours
- Temperature range: -40°C +100°C



LOCATION

1

3

4



APPLICATIONS

TRAIN CONTROL

PIS & SAFETY

SUB SYSTEMS



FUNCTIONS

CAB CONTROL

TRAIN CONTROL

AIR CONDITIONING

DOORS



STANDARDS

NFF 61030

UL94



CMC

BENEFITS

- According to NFF 61030 standard
- High dynamic applications
- Ruggedized hybrid: signal/optic/data connector
- Field-proven solution from metro to high speed train

DESCRIPTION

- Aluminum or bronze connector with screw locking
- From 4 to 61 crimp contacts over 6 shells and 22 configurations
- Crimp solid contacts, coax twinax, quadrax cell or optical
- EMI/RFI shielding protection

MAIN CHARACTERISTICS

- Rated current: from 15 to 250 A
- Service voltage: up to 500 V
- Withstand voltage: 2550 V or 3250 V
- Protection index: IP66
- Salt spray: 96 hours or 500 hours
- Temperature range: -50°C +100°C
- Vibrations and shocks: EN61373 category 1B



LOCATION



APPLICATIONS

- INTER-VEHICLE
- TRACTION POWER
- TRAIN CONTROL
- SUB SYSTEMS



FUNCTIONS

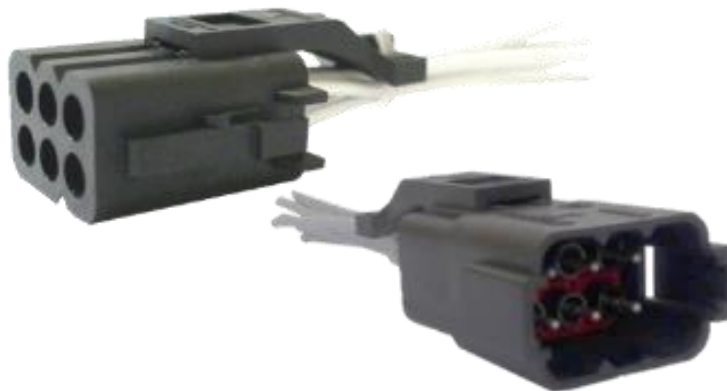
- PROPULSION & BRAKING
- AUXILIARY POWER SUPPLY
- INTER-VEHICLE



STANDARDS

- NFF 61030
- DIN 5510
- UNICEI 11170
- UL94





BENEFITS

- Compact and cost-effective solution
- High level of performance
- Halogen free
- Field-proven

DESCRIPTION

- Monobloc signal connector in 100% composite, Clip Locking System
- 4 arrangements 4, 6, 12 & 28 contacts
- Contacts: caliber 1,6 mm - Silver or gold plated
- Cable cross-sections: 0,5 to 2,5 mm²

MAIN CHARACTERISTICS

- Rated current: up to 20A
- Service voltage: 500 V AC/DC according to EN 50124-1/A2 (OV3-PD2)
- Protection index: IP 66 mated
- Temperature range: -40°C, +100°C
- Vibrations and shocks: category 1 class B according to EN 61373




LOCATION




APPLICATIONS

TRAIN CONTROL
PIS & SAFETY
SUB SYSTEMS



FUNCTIONS

CAB CONTROL
TRAIN CONTROL
AIR CONDITIONING
DOORS
LIGHTING



STANDARDS

NFF 61030
EN 45545
DIN 5510
UNICEI 11170
UL94



MU27P



BENEFITS

- Compliant to AAR-S-512 and APTA RP-E-019 99 standard

DESCRIPTION

- Aluminum shell with automatic push pull coupling system
- Arrangement: 27 poles
- 10, 12 or 14 AWG wire
- Mechanical coding
- 5 color codes to prevent intermating of any other 27 pole jumpers



MAIN CHARACTERISTICS

- Rated current: 30 A
- Service voltage: 600 V DC
- Salt spray: 250 hours
- Temperature range: -40°C, +110°C



LOCATION

5



APPLICATIONS

INTER-VEHICLE



FUNCTIONS

INTER-VEHICLE



STANDARDS

AAR-S-512
 APTA RP-E-019 99
 UL94





UIC552

BENEFITS

- Compliant to UIC552 standard
- Rail networks approved
- Full UIC package available
- Low maintenance cost
- Field-proven

DESCRIPTION

- Aluminum connector with automatic cover locking system
- Single pole caliber 25
- Cable cross-section: 185mm²
- Options: safety lock, self-disconnect pigtail

MAIN CHARACTERISTICS

- Rated current: 800 A
- Service voltage: 3000 V DC
- Protection index: IP 56
- Salt spray: 500 hours
- Temperature range: -50°C, +120°C



LOCATION

5



APPLICATIONS

INTER-VEHICLE



FUNCTIONS

INTER-VEHICLE



STANDARDS

UIC552
 NFF 61030
 DIN 5510
 UNICEI 11170
 UL94





UIC 541-5

BENEFITS

- Compliant to UIC541.5 standard
- Rail Networks approved
- Full UIC package available
- Low maintenance cost
- Field-proven

DESCRIPTION

- Aluminum alloy connector with assisted self locking system
- Configuration: 9 crimp contacts
- Option: version with switch

MAIN CHARACTERISTICS

- Service voltage: 400 V
- Withstand voltage: 1500V
- Protection index : IP66
- Salt Spray: 500 hours
- Temperature range: -40°C,+100°C



LOCATION

5



APPLICATIONS

INTER-VEHICLE



FUNCTIONS

INTER-VEHICLE



STANDARDS

UIC 541-5
NFF 61030
DIN 5510
UNICEI 11170
UL94





UIC558

BENEFITS

- Compliant to UIC558 standard
- Rail Networks approved
- Full UIC package available
- Low maintenance cost
- Field-proven

DESCRIPTION

- Aluminum shell with automatic cover locking system
- Arrangement: 13 and 18 poles and gigabit cell
- Silver or gold plated contacts

MAIN CHARACTERISTICS

- Service voltage: 110 V DC
- Test voltage: 2000 V
- Protection index: IP 67
- Salt spray: 500 hours
- Temperature range: -50°C, +120°C



LOCATION

5



APPLICATIONS

INTER-VEHICLE

PIS & SAFETY

TRAIN CONTROL



FUNCTIONS

INTER-VEHICLE



STANDARDS

UIC558

NFF 61030

DIN 5510

UNICEI 11170

UL94



SCM Systèmes et
Connectique au
Mans





CSR

BENEFITS

- Rackable and panel system
- Increased safety during operation
- According to railway standard
- Misalignment tolerance $\pm 2\text{mm}$

DESCRIPTION

- Rackable power connector
- Fixed socket and floating plug
- 2 power contacts for terminal lugs
 - Caliber 14 / M10 threaded or Caliber 18 / M12 threaded
- 7 auxiliary crimp contacts $\varnothing 4$

MAIN CHARACTERISTICS

- Rated current: - 350 A ($\varnothing 14$) - 500 A ($\varnothing 18$) and pilots 30 A ($\varnothing 4$)
- Service voltage: 700 V DC
- Withstand voltage: 3500 V
- Temperature range: -40°C , $+100^{\circ}\text{C}$



LOCATION

4



APPLICATIONS

SUB SYSTEMS



FUNCTIONS

BATTERY



STANDARDS

NFF 61030

EN 45545

UL94





CAM

BENEFITS

- Harsh environment
- High mechanical resistance
- Easy and fast connect
- Halogen Free
- Field-proven

DESCRIPTION

- Aluminum connector with safe cam locking system for harsh environment
- 6 shells and 21 configurations from 4 to 61 contacts + earth
- Crimp connections: cable cross-section up to 185 mm²
- Configuration: power or signal or hybrid
- Option: version with switch

MAIN CHARACTERISTICS

- Rated current: from 15 A up to 500 A
- Service voltage: up to 500 V
- Withstand voltage: up to 3250 V
- Protection index: IP54 (above in option)
- Salt spray: 96 hours or 500 hours
- Temperature Range: -40°C, +100°C



LOCATION

5



APPLICATIONS

INTER-VEHICLE



FUNCTIONS

INTER-VEHICLE



STANDARDS

NFF 16101

NFF 16102

UL94





SIG

BENEFITS

- Rugged and anti-vandalism design
- Secured by padlocking
- Rail networks approved
- Fully waterproof

DESCRIPTION

- Nickel plated brass shell with push pull coupling system
- Arrangements: 8 and 14 poles
- Crimp contacts suitable for 10, 12 or 14 AWG wire

MAIN CHARACTERISTICS

- Rated current: 10 A
- Service voltage: 400 V
- Withstand voltage: 3000 V
- Protection index: IP2X and scoop proof
- Salt spray: 500 hours
- Temperature range: -40°C, +110°C
- Vibrations: 15g (V.axis) - 6g (T.axis) – 4g (L.axis)
- Impact: 40g – 3 ms per axis



LOCATION



APPLICATIONS

RAILWAY SIGNALING



FUNCTIONS

WAYSIDE EQUIPMENT

TRACKSIDE EQUIPMENTS



STANDARDS

Network Rail Acceptance
RT/E/PS/00005 cable
UL94

