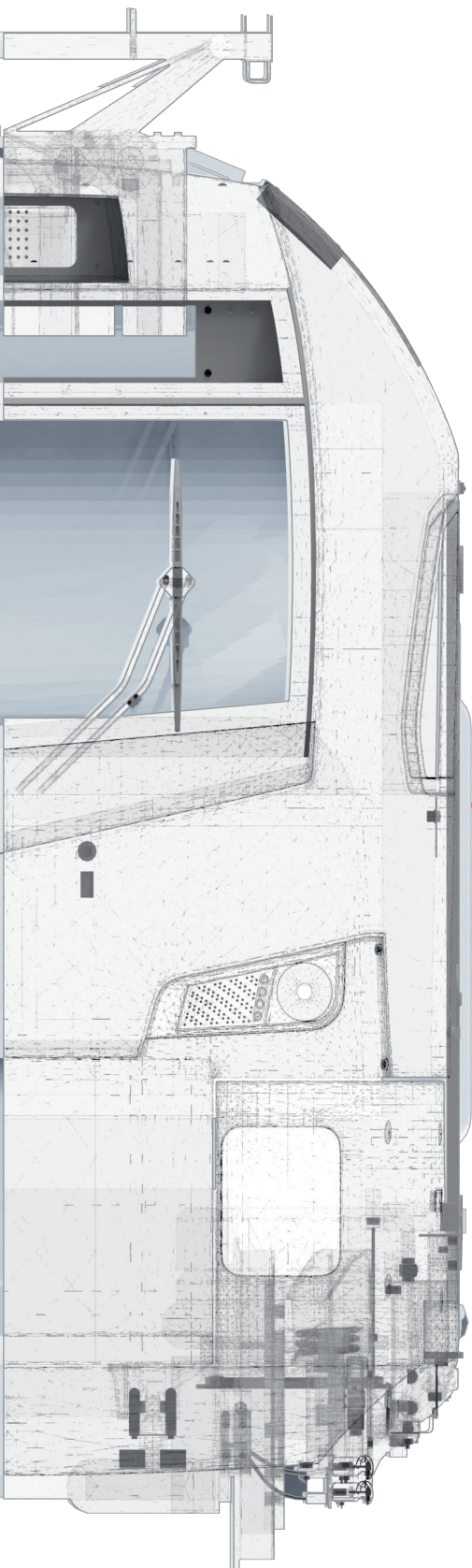




RAILWAY SOLUTIONS

Multipole connectors
for rolling stock applications

THE TRADITION OF INNOVATION SINCE 1945

ILME designs and manufactures complete solutions for industrial connections.

Headquartered in Milan and with subsidiaries in the key countries driving the progress of automation, ILME is an industry leader in the main world markets.

People are vital to success and growth at ILME, sharing a passion for innovation, utmost responsibility and participation.

The Company is committed to developing technology in the areas that most impact the future of the industries it serves: safe and high quality wiring, research on the most suitable materials, rapid delivery time and readily available services while striving for energy saving and environmental protection.



COMMITMENT TO TRANSPORTATION INDUSTRY



Technological innovation is the main pillar of **ILME's** competitiveness.

ILME's wide range of rectangular connectors offers return of experience and tremendous advantages to the rail industry which is characterized by a notoriously tough and uncompromising environment.

With over 20 years of experience in the railway sector, **ILME** is credited with more than 80 projects in

rolling stock, signalling and infrastructure, is an active member of **CENELEC SC 9XB committee**, designing and manufacturing according to the latest railway directives and standards, fully up to date with the markets requests and certifications.

Always providing a high level of customer service with local relationships and logistic support with a perfect quality-price ratio.





ROLLING STOCK AT A GLANCE

FOCUS ON LOCATIONS

Classification according to EN 50467 ($\approx$ IEC 62847)

APPLICATION TYPE	STATIC				DYNAMIC	
LOCATIONS	1	2	3	4	5	6
DEFINITIONS	Closed electrical operating area	Cabin and interiors	Closed electrical operating area; forced filtered ventilation with outside air	Outdoor static applications	Outdoor dynamic applications	Outdoor highly dynamic applications

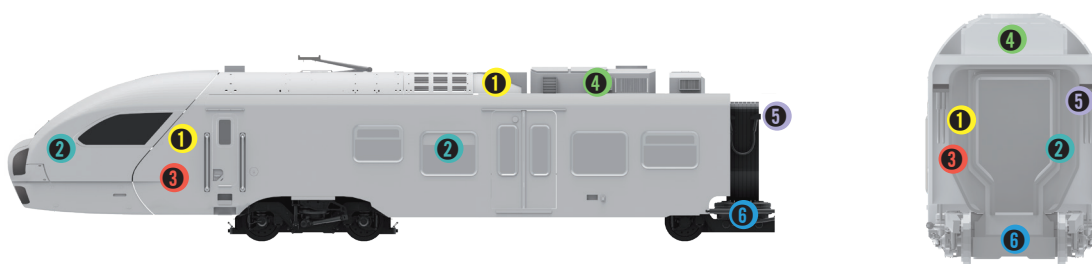


Figure A*: Typical connector locations on board rolling stock

FOCUS ON REQUIREMENTS

Classification according to EN 50467 ($\approx$ IEC 62847)

APPLICATION TYPE		STATIC				DYNAMIC	
LOCATIONS (see Figure A)*		1	2	3	4	5	6
REQUIREMENTS	STANDARDS						
Over Voltage Category	EN 50124-1	OV2	OV2	OV2	OV2	OV2	OV2
Pollution Degree ¹	EN 50124-1	PD2	PD2	PD3	PD3	PD3	PD3
IP Index	EN 60529	²	IP2X ²	IP65	IP55	IP66	IP66
Shock & Vibration	EN 61373	Cat. 1B	Cat. 1B	Cat. 1B	Cat. 1B	Cat. 1B	Cat. 2 ³
Salt Spray Resistance	EN 60512-11-6	96 h	96 h	96 h	240 h	240 h	240 h
Resistance to Ozone ⁴	ISO 1431-1	NO ⁵	NO	YES ⁴	YES ⁴	YES ⁴	YES ⁴
Resistance to UV	EN ISO 4892-2	NO	NO	NO	YES ⁶	YES ⁶	YES ⁶
Resistance to Fluids	EN 60512-19-3	NO	NO	YES ⁷	YES ⁷	YES ⁷	YES ⁷
Fire and Smoke	EN 45545-2 NF F 16-101/102	YES	YES	YES	YES	YES	YES

¹ PD3 for all series except CDD; PD2 for CDD.

² The relevant requirements of EN 50153 apply.

³ Please contact ILME commercial office for enquiries.

⁴ Only for exposed rubber and plastic parts sealing, housing boots used outside.

⁵ Yes in case of power switching.

⁶ Only for exposed rubber and plastic parts.

⁷ Fluids to be used could be those listed in EN 50306 series (IRM 902 Oil, Oxalic acid, Sodium hydroxide). Requirements to be agreed between manufacturer and user due to different environmental conditions and chemically active substances (e.g. detergents) or contaminating fluids (e.g. sulphur content or diesel fuel) used by the various railway operators in different countries.

MULTIPOLE CONNECTORS FOR ROLLING STOCK

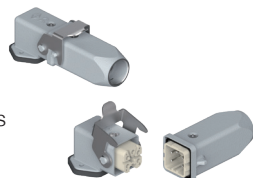
Examples of possible applications

STATIC

1

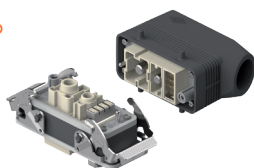
A Lights

- CKA enclosures
- CKS / CKSH / CQ inserts



B Heating, Ventilation and Air Conditioning (HVAC)

- IP67 V-TYPE **E-Xtreme®**
- MIXO data and power



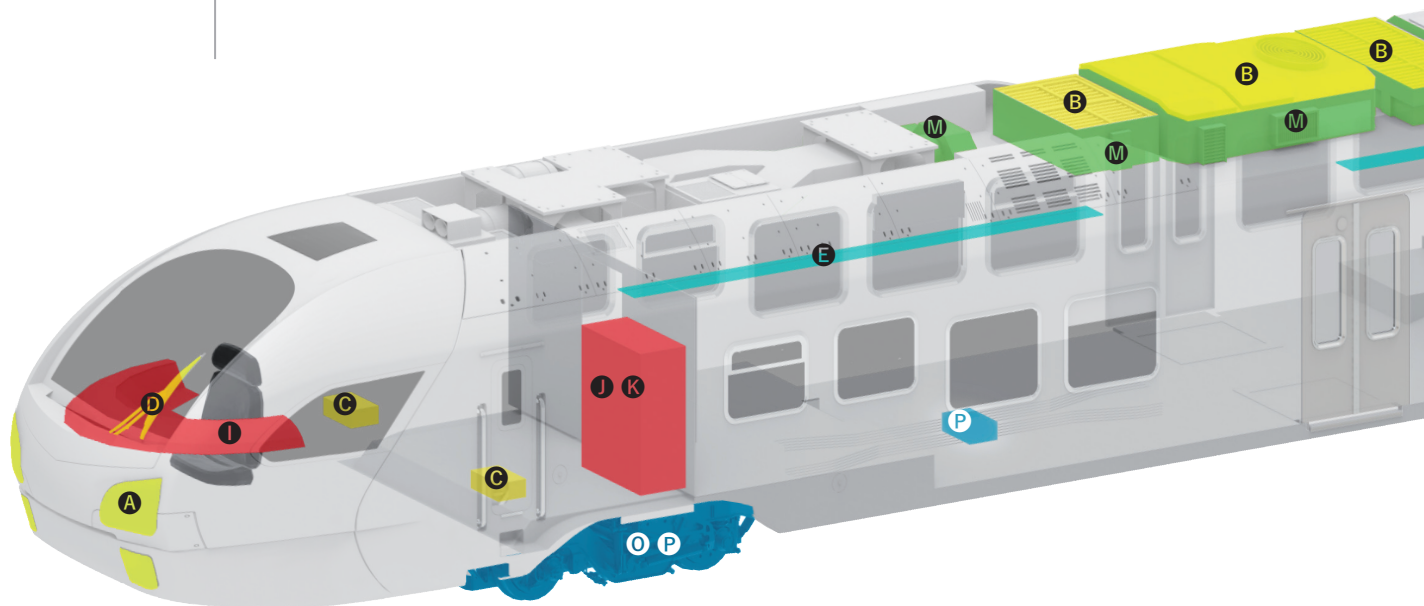
C Auxiliary Power Supply Systems (APS)

- IP68 "21.21" enclosures
- CQ / CX 1/2 BD adapters
- W-TYPE enclosures
- MIXO / CQEE inserts



D Windscreen wipers

- CKA enclosures
- CKS / CKSH / CQ inserts
- IP68 enclosures
- CQ / CD inserts



STATIC

2

E Lighting

- CKA Enclosures
- CKS / CKSH / CQ inserts



F On board distribution panels

- CR SP + CR..FS / SS / SSD anchorages for panel installations
- MIXO data and signals modules



G Door controls

- CKA enclosures
- CKS / CKSH / CQ inserts



H Passengers Information Systems (PIS)

- CR SP+ CR..FS / SS / SSD anchorages for panel installations
- MIXO data and signals modules

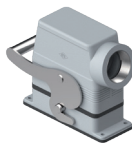


STATIC

3

1 Driver cabins

- CLASS Standard enclosures with dual/single or central lever
- CDD / CQEE / MIXO inserts



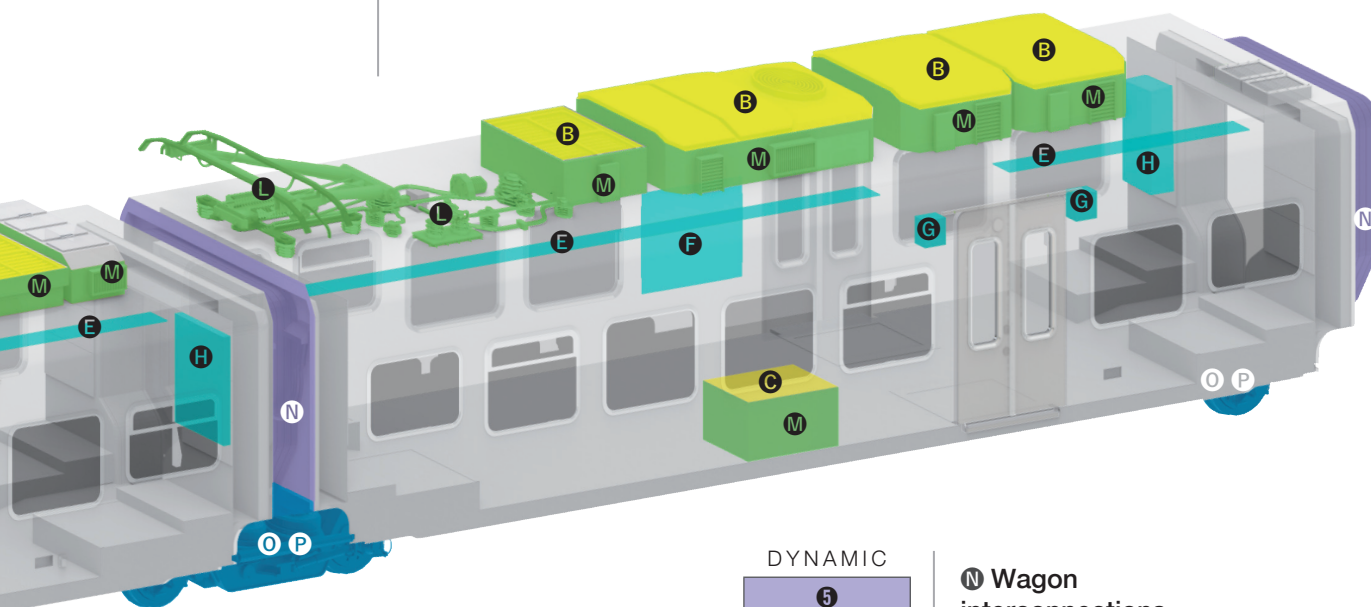
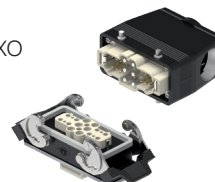
2 Train control power signal

- Class or V-TYPE Standard enclosures with dual/single or central lever
- BIG hoods for M50 or multiple entries
- CDD / CQEE / MIXO inserts



K Battery chargers Auxiliary converters Inverters

- W or **E-Xtreme®** IP66 enclosures
- CQEE / CX and MIXO power inserts



DYNAMIC

5

N Wagon interconnections

- IP68 enclosures, screw or bayonet locking
- CDD / CQEE / MIXO signal and power inserts



STATIC

4

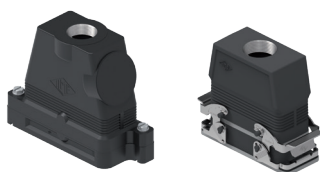
L Pantographs

- IP68 enclosures
- CQ signal and power inserts



M Sub-systems power & control sensor

- IP68 or IP67 V-TYPE **E-Xtreme®** enclosures
- CQEE and MIXO signal and power inserts



DYNAMIC

6

O Power installations

- IP68 / IP67 V-TYPE **E-Xtreme®** enclosures
- CX / MIXO power inserts



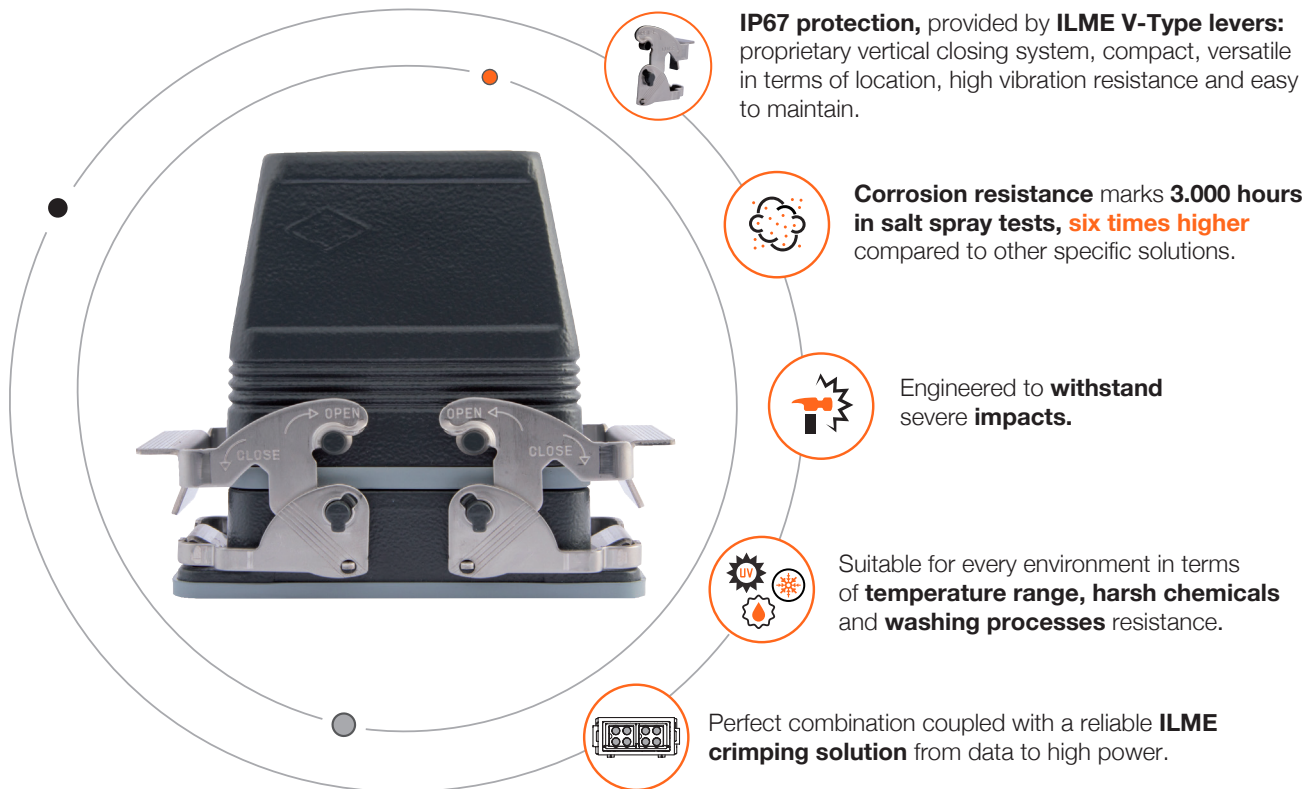
P Brake control systems

- IP68 or IP67 V-TYPE **E-Xtreme®** enclosures
- signal and power inserts



E-Xtreme®

Special conditions require special solutions.



ILME E-Xtreme® enclosures, with their **patented titanium plasma coating**, meet the challenge of durable protection in extremely demanding environments.

TEST STANDARDS

EN 50467 (≈ IEC 62847)

Railway applications - Rolling stock
- Electrical connectors - Requirements and test methods

EN 60529

Degrees of protection provided by enclosures (IP code)

EN ISO 9227

Corrosion tests in artificial atmospheres
- Salt spray tests

EN 45545-2, NF F16-101/102

Opacity and toxicity of the materials in case of fire

EN 60512 (series)

Connectors for electronic equipment
- Tests and measurement

EN 60068-2-68

Environmental testing - Part 2-68: Tests
- Test L: Dust and sand

EN ISO 20567-1

Paints and varnishes - Determination of stone-chip resistance of coatings
- Part 1: Multi-impact testing



ILME S.p.A.
Via M.A. Colonna, 9
20149 Milano - Italy
www.ilme.com



Catalogues

XDG RAIL 620

