



## Reliable Solutions for Electrified Railway Systems

## Insulation Enhancement System

### 1. Raychem MVLC (Medium Voltage Line Cover)

Provides insulation for catenary, droppers and associated conductors against contact with trees, birds, wildlife or even vandalism. Simple, fast wraparound installation.

### 2. Raychem IBIC ('I' Beam Insulation Cover)

Prevents accidental bridging between 'I' section steelwork and live catenary or associated equipment by wildlife. Installation is clip-on, tool-free and fast.

### 3. BCIC (Bus Connection Insulating Cover)

A huge range of retro-fit parts that are used in substations, OHL's and catenary systems to insulate between phase and ground or phase to phase where accidental bridging can occur that causes power outages. Often caused by wildlife or vegetation these problems are easily preventable.

### 4. Raychem BISG (Bus Insulation Squirrel Guard)

Can be mounted horizontally or vertically on any MV insulator or bushing, to prevent wildlife bridging phase to ground. Designed to eliminate accidental flashover on trackside substations and all associated equipment.

## HV Connectors

### 5. Substation Connectors

A full range of HV connectors for substation applications is available, suitable for tubular and flexible conductors. Tee, derivation and termination available for aluminium, copper or bimetallic joins from 30kV to 330kV.

### 6. Simel Grounding Connectors

A range of copper compression connections is available for constitution of the earthing grid and connection of the grid to the frames.

## Catenary Dropper System

### 7. & 8. Catenary Dropper System

The catenary connection dropper provides mechanical and electrical binding between the carrier and the contact wire. An insulated version is also available for tunnel crossing. Custom designs are available on request. The examples shown are adjustable (picture 7) and fixed-length (picture 8).

### 9. Bowthorpe EMP Surge Arresters

Our DC & AC traction surge arresters are suitable for installing on rolling stock or at the track-side. The HE60MD, OCP2 and the HDA ranges have a rugged and compact design capable of withstanding mechanical forces experienced in such installations.

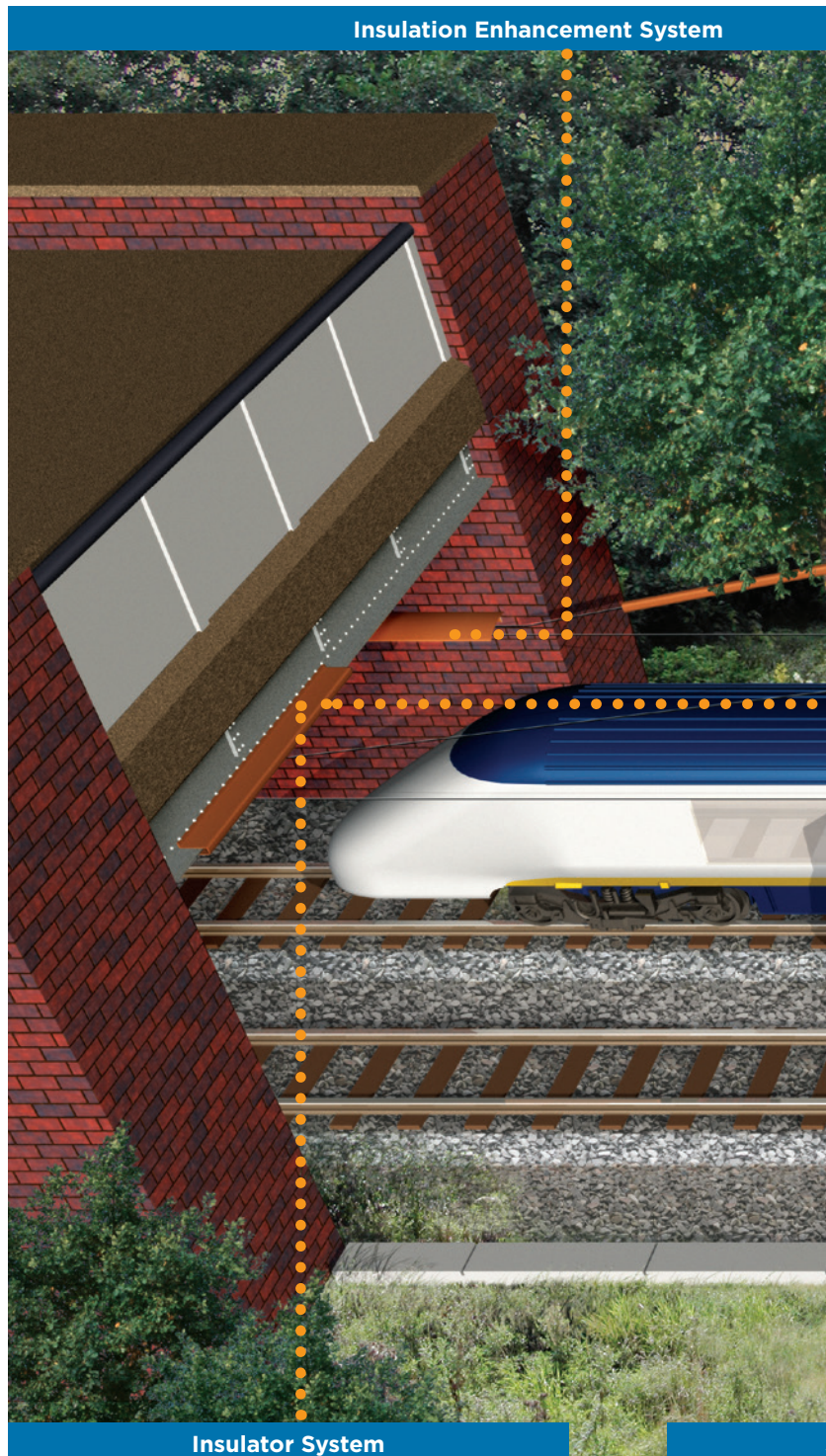
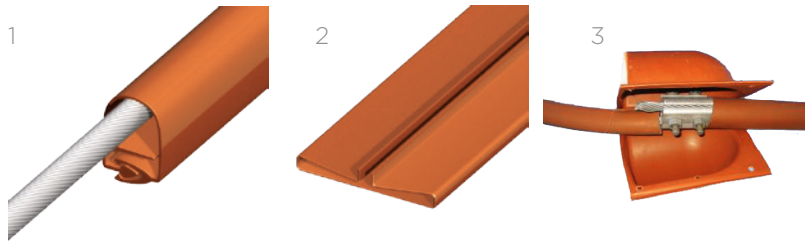
## HV/MV Cable Accessories

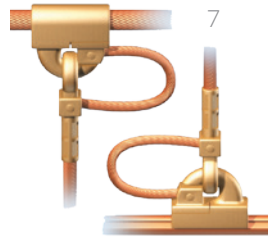
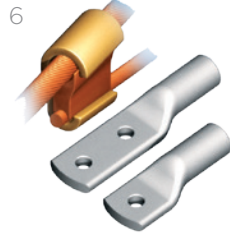
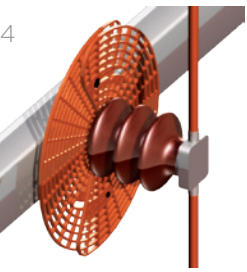
### 10. Raychem Cable Joints

Suitable for all common polymeric cables – cross-bonding, shield break and external grounding arrangements are easily accommodated. Link boxes can be easily attached, adopting the network design specification. Short installation time reduces outages, whilst extensive field experience and rigorous testing have proven the reliability of the technology used.

### 11. Raychem 52kV and 72kV Terminations

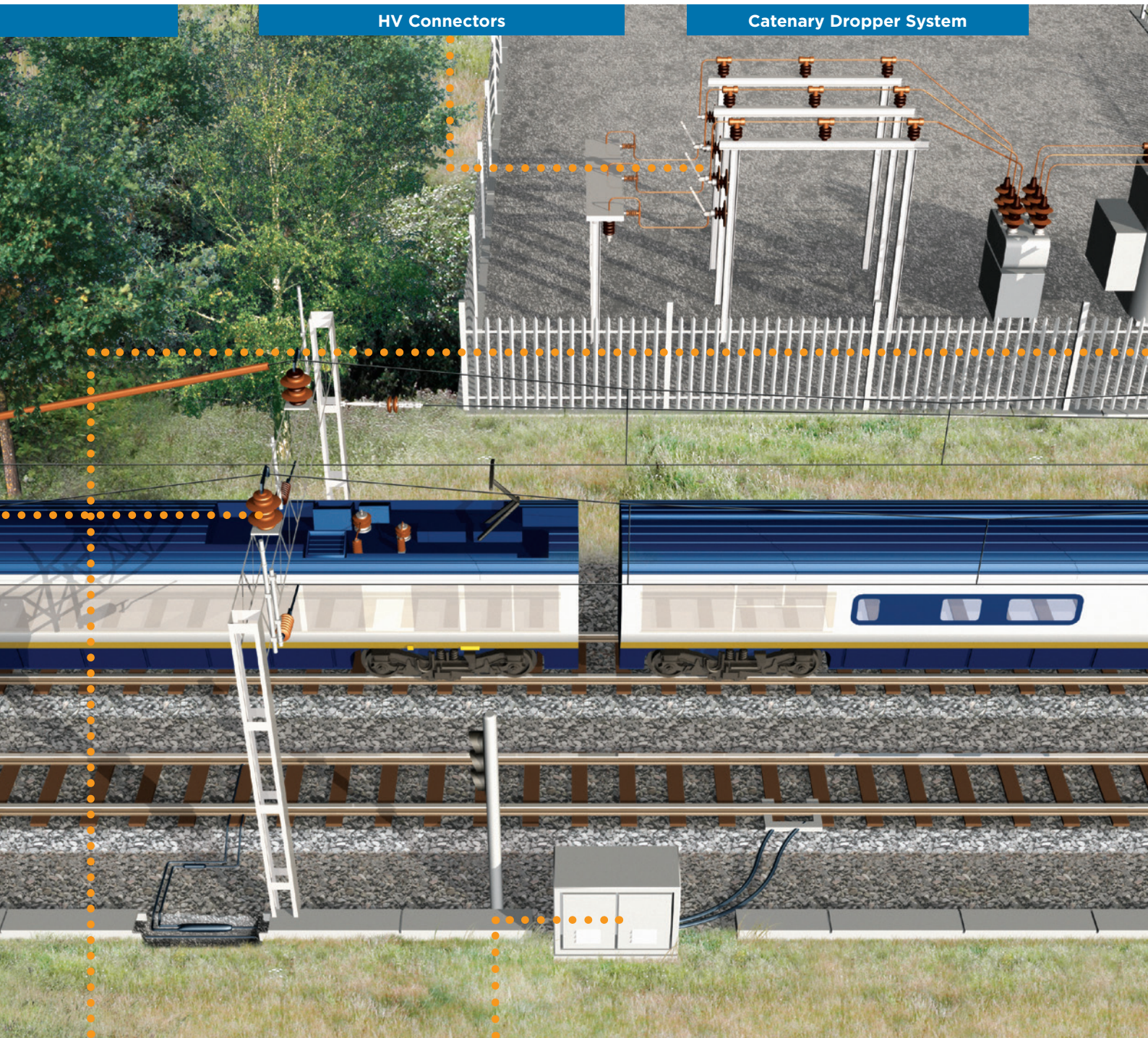
The slim, compound-free Raychem 52/72kV terminations are suitable for indoor and outdoor use on almost all polymeric cables. For higher voltage classes we offer 145kV to 170kV prefabricated joints and terminations for indoor and outdoor switchgear and transformers.





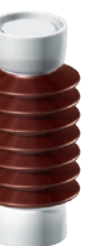
**HV Connectors**

**Catenary Dropper System**

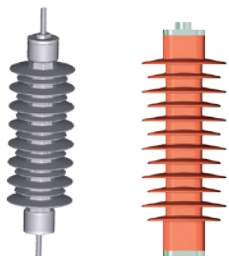


**Substation Insulators**

**Signalling and Telecom**



9



10

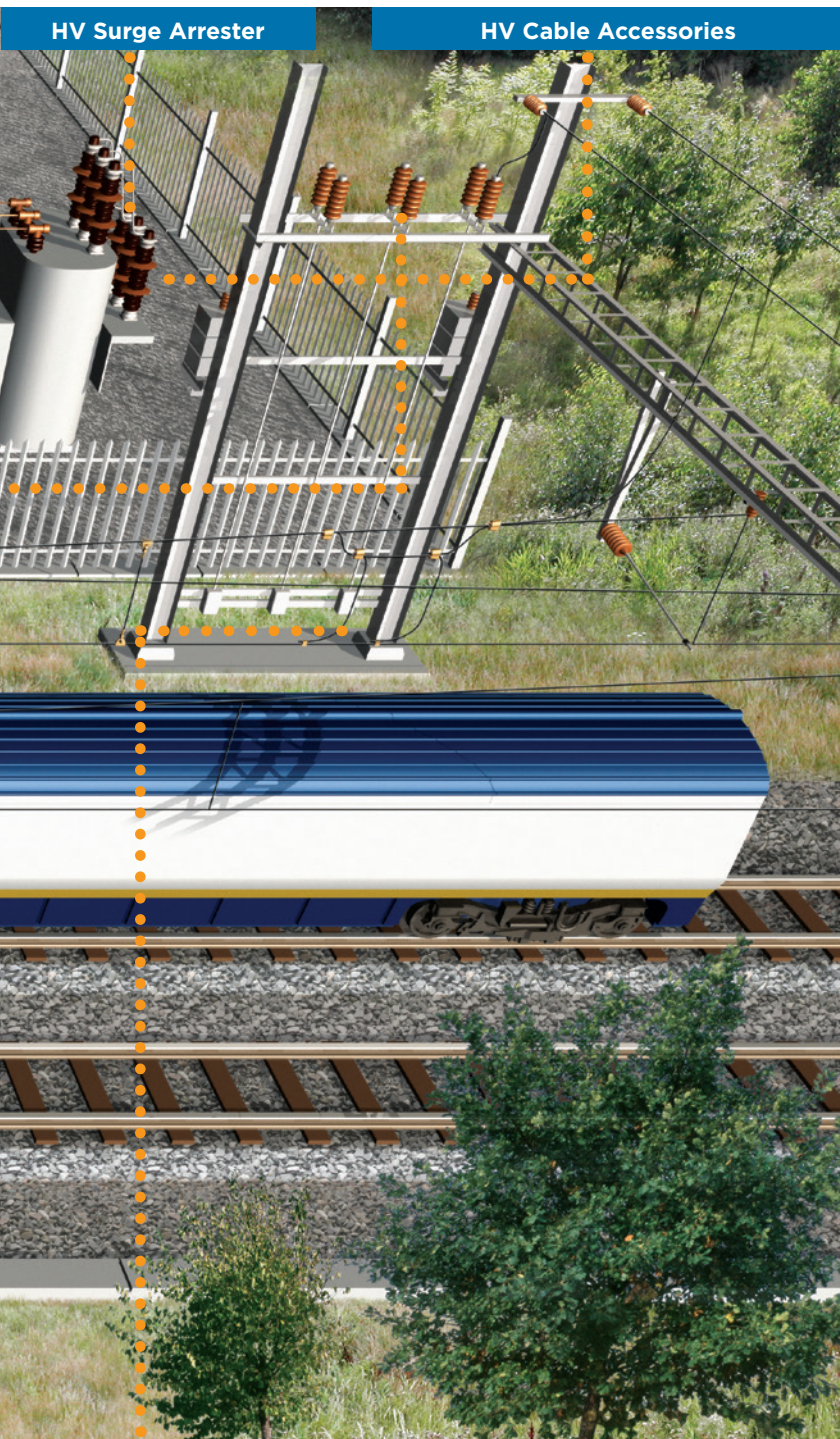


11



HV Surge Arrester

HV Cable Accessories



Connection Systems

## Insulator System

### 12. Raychem Catenary Insulators

Strut and tension applications using either porcelain, polymeric or hybrid technologies in catenary applications. Customers can specify required impact strength, handling, pollution resistance, cleaning and mechanical loading. The products range extends from 750V DC (mainly porcelain) up to 15/25kV AC (porcelain and polymeric) and also 50kV AC (hybrid).

### 13. Raychem Portal Insulators

High-strength porcelain (C120) and polymeric (e-glass or acid-resistant e-glass) cores designed for low deflection and single insulator support. A range of core diameters is available, based on long-term loading requirements, with housing, creepage and dry-arc distance as key design criteria.

## Substation Insulators

### 14. Raychem Substation Insulators

Porcelain and hybrid (porcelain core and polymeric housing) insulators for substation applications. Hybrids are generally specified where porcelain insulators have flashover issues or polymeric insulators have too much deflection under load in switching applications. Standard IEC or ANSI classifications are available.

### 15. Axicom Composite Insulators

Axicom composite insulators have been in service worldwide for two decades as important components of high voltage apparatus (up to 800 kV). The dedicated design for the tubes and the sheds allow for the combination of light, weight and high cantilever strength with a long term reliable capability.

## Signalling and Telecom

### 16. Bowthorpe EMP SPG (Spark Gap Device)

Designed for use with traction circuits to provide protection against lightning over-voltage on signalling and cable circuits.

## Connection Systems

### 17. Anchoring sleeve

A crimp-type anchor sleeve for the protected wire, which provides a waterproof mechanical and electrical connection from the copper-protected carrier wire to the pole.

### 18. Branch Connectors

A branch-crimped connector for copper, aluminium and bimetallic wires, which provides an electrical connection between the carrier wire and an intermediate cable.

### 19. End lugs: crimped end lugs

A copper, aluminium or bimetallic lug for an electrical connection from a copper or aluminium wire to an item of apparatus.

### 20. Branch Tee Connector

A copper or aluminium tee connector to make a mechanical and electrical connection between one end of a copper or aluminium conductor to a bare copper or aluminium bar.

### 21. Crimping Tools

Tools and tooling to crimp the catenary connectors. A wide range of hydraulic equipment is also available to crimp the connectors and droppers to the catenary.

Note: The catenary connectors listed above cover only the standard range, alternative and bespoke connector designs are available on request.

19

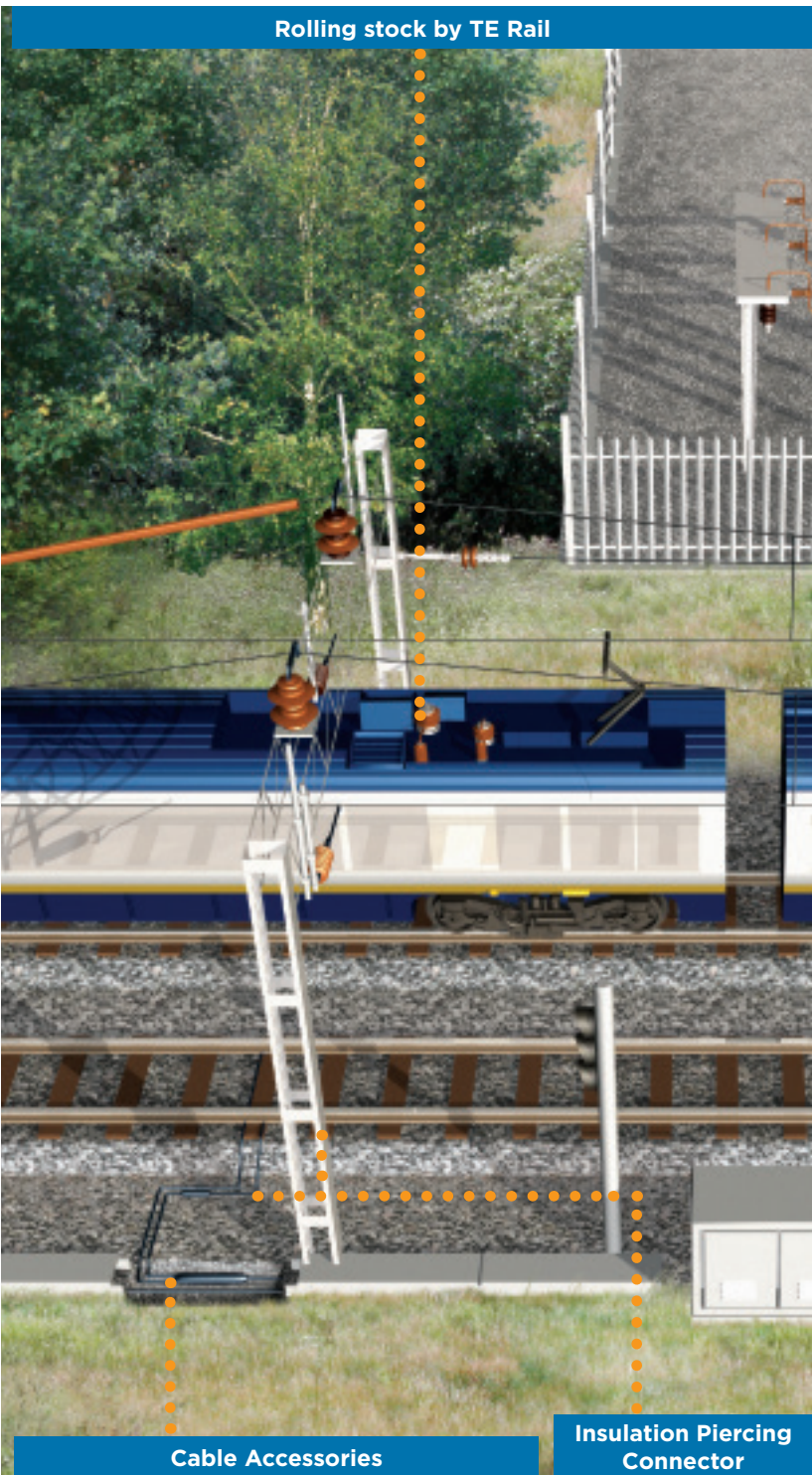


20



21





Rolling stock by TE Rail

Cable Accessories

Insulation Piercing Connector

**Rolling Stock by TE Rail**

**22. Bowthorpe EMP Surge Arresters**

DC & AC Traction Surge Arresters suitable for installation on rolling stock or at trackside. The HE60MD, OCP2 and the HDA ranges have a rugged and compact design capable of withstanding the mechanical forces experienced in such installations.

**23. VESA Cable Assemblies for Rooflines and Downleads**

Custom-designed cable assemblies employ compact, self-supporting polymeric terminations, bushings or screened T-connectors for rolling-stock power-distribution applications. Fully tested for over-voltage and partial discharge, flexible, insulated inter-car jumper leads are also available.

**24. VESA Polymeric Pantograph or Busbar Insulators**

Lightweight, low-maintenance polymeric insulators for customised applications. The tough polymeric housing and robust construction offer improved pollution performance and high reliability.

**Cable Accessories**

**25. Raychem LV Cable Accessories**

We offer cable accessories for almost all cable types. LV joints are available in polymeric, gel and resin technologies, LV terminations are available in heat-shrink technology. Sealing systems are offered in cold-applied technology for ducts and heat-shrink for feedthroughs. Breakouts, sealing caps, repair tape, wraparound, tubing in heat-shrink technology and insulating sleeves in cold-applied technology.

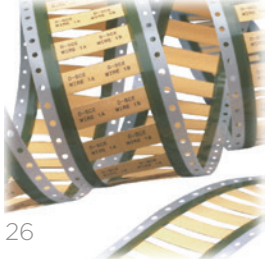
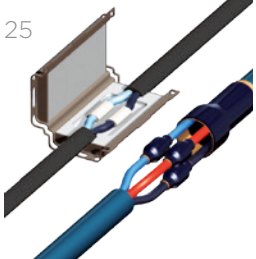
**26. Cable identification**

Heat-shrinkable cable identification marker sleeves in a wide variety of configurations, colors and sizes for high performance applications such as military grade, low-fire hazard (zero halogen), fluid resistant, high temperature and commercial use.

**Insulation Piercing Connector**

**27. P3X95**

These connectors have been designed to meet the rigid requirements of global power distribution companies. Ease of installation has been combined with excellent mechanical, electrical and environmental characteristics to provide a connector capable of terminating aluminium or copper stranded conductors.



## About TE Connectivity

TE Connectivity is a global, \$12.1 billion company that designs and manufactures over 500,000 products that connect and protect the flow of power and data inside the products that touch every aspect of our lives. Our nearly 100,000 employees partner with customers in virtually every industry – from consumer electronics, energy and healthcare, to automotive, aerospace and communication networks – enabling smarter, faster, better technologies to connect products to possibilities.

While TE has made every reasonable effort to ensure the accuracy of the information in this catalog, TE does not guarantee that it is error-free, nor does TE make any other representation, warranty or guarantee that the information is accurate, correct, reliable or current. TE reserves the right to make any adjustments to the information contained herein at any time without notice. TE expressly disclaims all implied warranties regarding the information contained herein, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose. The dimensions in this catalog are for reference purposes only and are subject to change without notice. Specifications are subject to change without notice. Consult TE for the latest dimensions and design specifications. Axicom, Bowthorpe EMP, Raychem, VESA, Simel, TE connectivity (logo) and TE Connectivity are trademarks of the TE Connectivity Ltd. family of companies. Other logos, product and Company names mentioned herein may be trademarks of their respective owners.

**TE Energy - innovative and economical solutions for the electrical power industry: cable accessories, connectors & fittings, insulators & insulation, surge arresters, switching equipment, street lighting, power measurement and control.**

Tyco Electronics Raychem GmbH  
ein Unternehmen der TE Connectivity Gruppe  
TE Energy  
Finsinger Feld 1  
85521 Ottobrunn/München

Telefon: 089-6089-413  
Telefax: 089-6089-585

[energy.te.com](http://energy.te.com)

