

High voltage cables with heat-shrink terminations  
and push-on equipment connectors

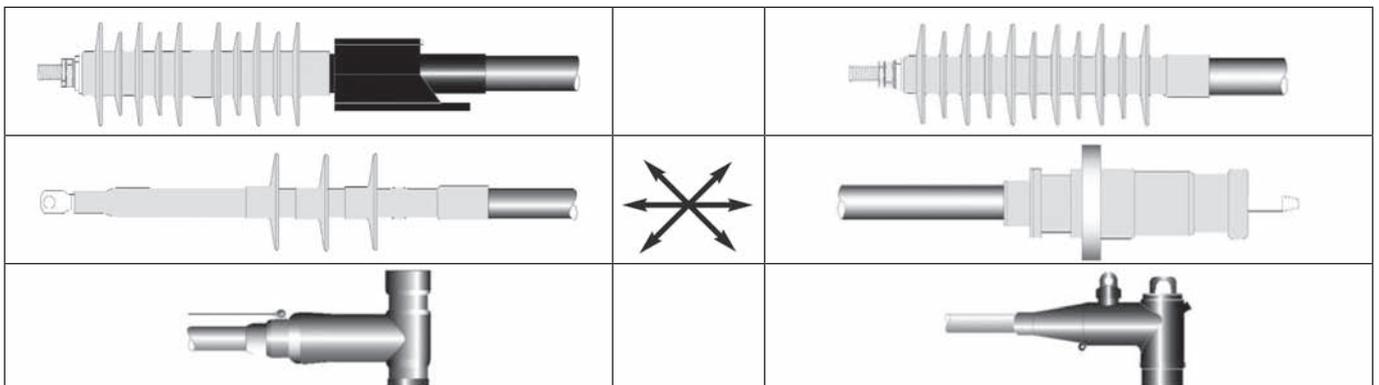
## High Voltage Power Distribution for Rail Vehicles HVTT/HVTE/HVEE 15/25kV cable assemblies

TE Connectivity HVTT and HVTE cable assemblies provide a 'straight from the box' solution for high voltage inter-connector cables on electric rail vehicles.

Industry-leading Raychem high voltage insulation and stress control materials are combined with flexible EPR insulated cable to make assemblies that are easy to install and completely reliable in the harsh rail environment.

### Key Features:

- 15 / 25 kV roof-line and equipment connection cables optimised for use in the rail environment
- Assembled and tested by TE to simplify the supply chain and give easy on site installation
- Custom designed for each application
- Reliability demonstrated by over 20 years service history on high speed trains
- Light weight and easy to handle compared to conventional ceramic alternatives
- Impact resistant and virtually unbreakable due to the use of polymeric materials
- Maintenance free minimising total life-cycle costs

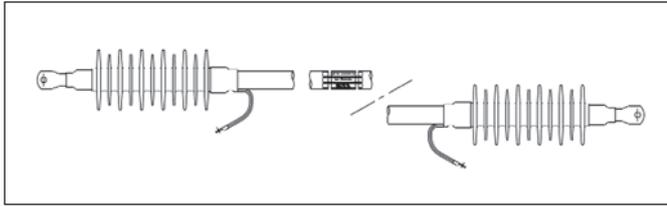


Different styles of terminations and equipment connectors are used depending on application

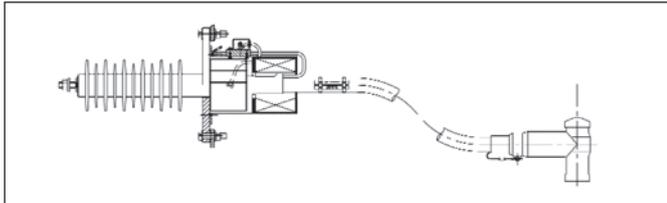
# High Voltage Power Distribution for Rail Vehicles

## HVTT/HVTE/HVEE 15/25kV cable assemblies

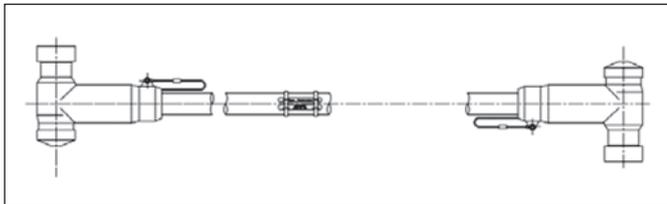
### Design:



Typical HVTT Cable Assembly



Typical HVTE Cable Assembly



Typical HVEE Cable Assembly

HVTT and HVTE cable assemblies are designed for the interconnection of high voltage electric equipment on locomotives, EMUs and high speed trains. HVTT cable assemblies have a heat-shrink type termination at each end: HVTE cable assemblies have a heat-shrink type termination at one end with a push-on type equipment connector at the other. HVEE cable assemblies have a push-on equipment connector at both ends. The product range is modular meaning that any combination of termination, push-on and cable can be put together.

Component	Standard products
Cable	Draka Tenax-train-plus (N)TMCW0EU 50 and 95 mm <sup>2</sup> (Tenax-train-plus 120, 185, 240, 400 mm <sup>2</sup> also available on special order) Nexans Rheyhalon (N)TMCGCHXOE 50 and 95 mm <sup>2</sup>
Push-on Connectors	TE Connectivity RSTI (IEC 50181 size C) Nexans 400 series (IEC 50181 size C) Nexans 750 series (IEC 50181 size E) Pfisterer Connex size 3 and 3S
Heatshrink Terminations	TE Connectivity self-supporting with stud fixing (M20, M16 or 5/8" UNC) TE Connectivity non-self-supporting with lug fixing (M12) TE Connectivity flexible with lug fixing (M12) - other fixing sizes are available as specials
Earth Connections	One or both ends, M8 or M10 fixing, 250, 500 or 750 mm long

### Typical Ratings:

Characteristic	Value
Working voltage	15 / 25 kV nom
AC withstand voltage	50 / 90 kV
Impulse withstand voltage	125 / 175 kV
Partial discharge	<5 pC @ 1.5 U <sub>0</sub>
Operating temperature	-40 to +80°C
Terminations	Raychem heat shrink - various designs
Typical strike distance	330 / 355 mm
Typical creepage	650 / 1000 mm
Typical diameter	90 – 135 mm
Equipment connectors	EN 50181 interfaces - Raychem RSTI and other industry standards
Cables	EPR insulation Class 5 flexible conductor Various designs and conductor cross-sections

### Custom Design Service:

Cable assemblies are designed to suit particular vehicle requirements for new build and retrofit purposes. In addition to the choice of termination and cable type other design options include: Dimensions and tolerances, mounting and clamping points, HV and earth connection types, arcing horns, current transformers, conduits and other accessories.

Individual designs can be modelled in most major 2D or 3D drawing packages.

An on-site trial fit supported by TE Connectivity technicians is normally available worldwide.

This table gives typical ratings for the range of cable assemblies.

Data sheets for specific applications are available on request.

### Testing

Cable assemblies have been subjected to a series of qualification tests to major rail standards. Test reports are available on request.

Each cable assembly is subjected to routine testing and certification before shipping. Assemblies are serial numbered to provide complete traceability.

For further information contact your local TE Connectivity sales office or:

te.com

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