



CONNECT AND PROTECT

Railway Electrical Protection

Improving Railway Safety and Reliability for More Than a Century

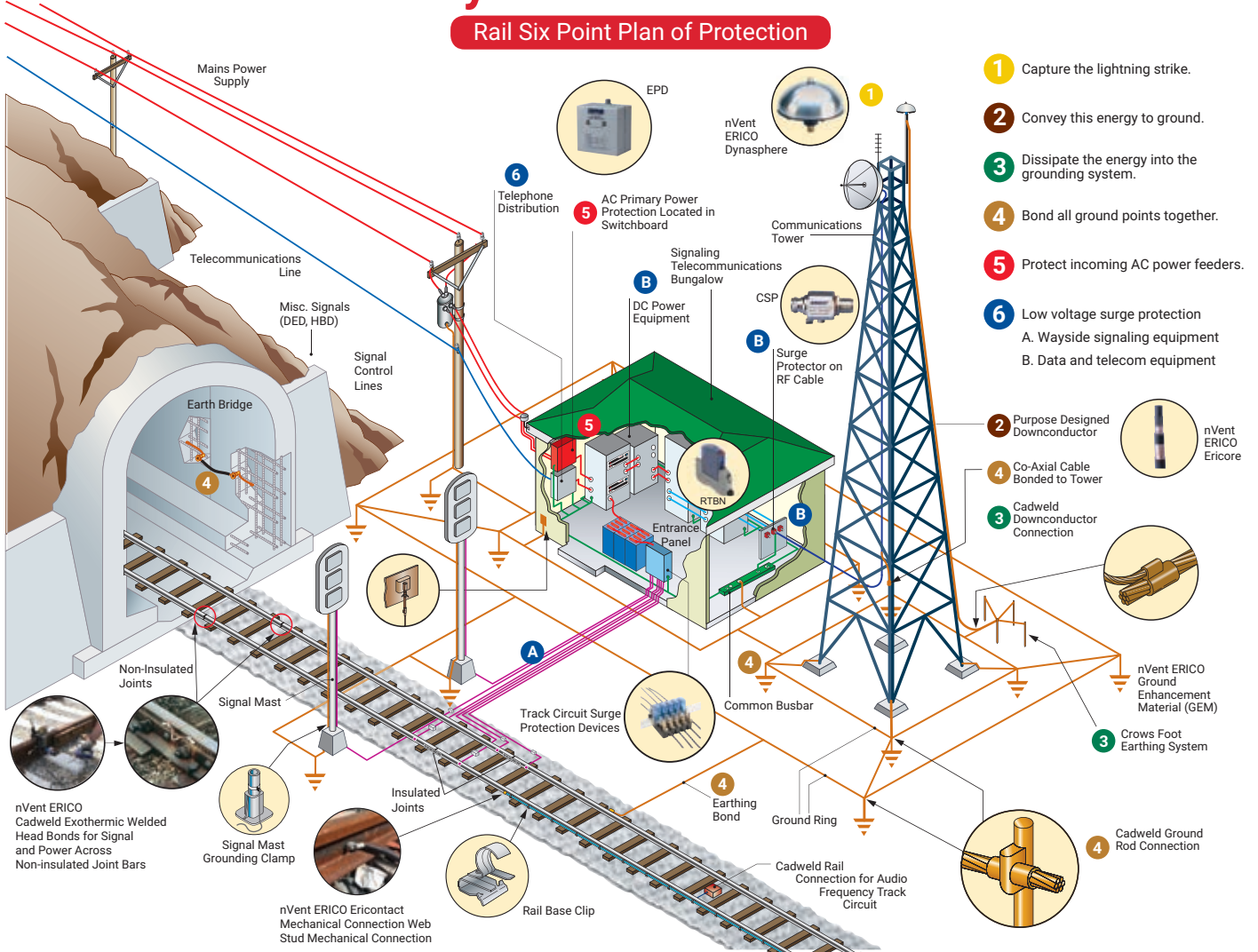

nvent

ERICO

RAILWAY ELECTRICAL PROTECTION

Lightning strikes can cause catastrophic damage to critical rail infrastructure and equipment. Unexpected transient events, or momentary bursts of extremely high voltages, can occur even during normal operations, which is why railway electrical protection is an important part of safe, reliable operations. nVent ERICO offers a comprehensive portfolio of products that combine to provide comprehensive electrical protection for railway properties and assets including classification yards, buildings and structures, bungalows, movable bridges and other areas throughout the network that contain critical equipment.

Railway Electrical Protection



NVENT ERICO SIX POINT PLAN OF PROTECTION

The nVent ERICO Six Point Plan of Protection is a system that provides comprehensive electrical protection for railway infrastructure and assets by integrating solutions for lightning protection, grounding and bonding, and surge protection. Each solution is comprised of a custom combination of nVent ERICO products arranged to meet the unique electrical protection requirements of each site. Together, these solutions bring a coordinated approach preventing many types of electrical damage, including lightning strikes and transient over-voltages, and provide general best practice electrical protection during normal operations.

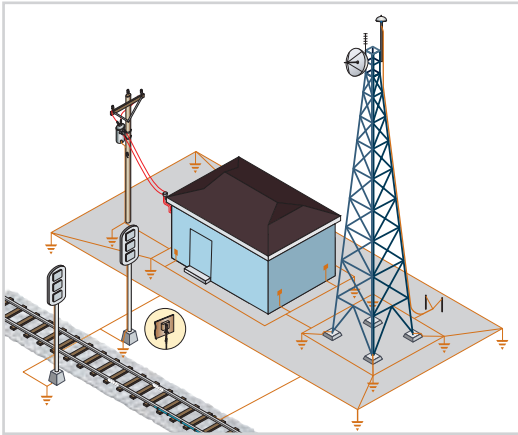
The nVent ERICO Six Point Plan of Protection provides an approach to:

1. Capture the lightning strike.
2. Convey this energy to ground.
3. Dissipate the energy into the grounding system.
4. Bond all ground points together.
5. Protect incoming AC power feeders.
6. Protect low voltage wayside signaling equipment as well as data/telecommunication circuits.

LIGHTNING: DIRECT STRIKE PROTECTION

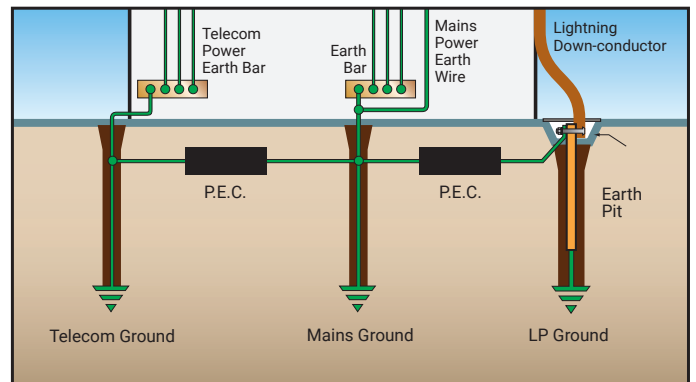
From the comprehensive nVent ERICO portfolio we provide two systems for capturing lightning energy. The System 2000 brings air terminal technology to meet traditional lightning protection needs. A more advanced approach to lightning protection is the nVent ERICO System 3000, which relies on the collection volume principle to determine the most effective placement of lightning

protection equipment to ensure safe conveyance and dissipation of the lightning energy into the ground. The nVent ERICO System 3000 currently protects 15,000 facilities, including the tallest and most vulnerable buildings in the world. System 3000 also protects many rail properties, with references that include classification yards, microwave installations, and wayside signal locations.



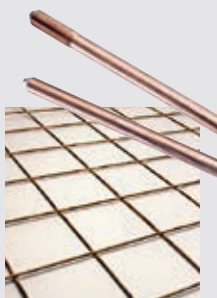
GROUNDING AND BONDING

As the railway electrical protection experts, nVent ERICO offers a wide-range of grounding and bonding products to protect railway properties. Grounding is required for wayside structures and facilities, and essential to employee and public safety. Grounding and bonding is also essential to the nVent ERICO Six Point Plan of Protection, which provides a system of capturing, conveying and dissipating energy into the ground. To effectively dissipate energy into the ground, nVent ERICO provides ground rods and mats that bury into the earth, ground enhancement materials, as well as bonding solutions such as P.E.C. (Potential Earth Clamps) that protect the system. The diagram pictured right shows how these nVent ERICO products integrate to efficiently dissipate energy into the ground.



GROUND RODS AND GROUND MATS

nVent ERICO is a leading manufacturer of ground rods offering copper-bonded, solid copper, stainless steel, and galvanized ground rods. In addition, nVent ERICO provides a complete line of ground mats, plates and accessories that create a safe, equipotential ground plane.



P.E.C. – POTENTIAL EQUALIZATION CLAMP

nVent ERICO PEC100 is an equipotential bonding device that is designed to minimize damage in applications where separate ground systems are required. Its high surge rating is perfect for more exposed locations subject to potential lightning strikes.



GROUND ENHANCEMENT MATERIALS

nVent ERICO GEM (Ground Enhancement Material) provides superior conductivity that enhances ground soil in areas with poor conductivity such as rocky ground, mountain tops, and sandy soil.



GROUND RESISTANCE TESTER KITS

An important first step in installing a grounding systems is assessing the ground conductivity. nVent ERICO offers a complete range of ground resistance tester kits. The units are lightweight and portable for ease of use in the field. The large LCD displays show required test connections and features a complete automatic test sequence for selected operations.

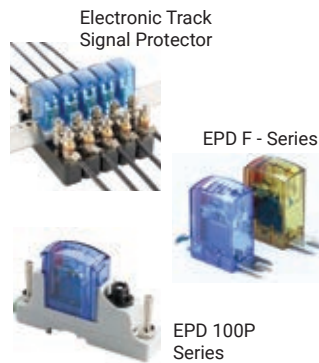


RAILWAY SURGE PROTECTION

nVent ERICO specializes in both primary and secondary surge protection products for sophisticated railway signaling infrastructure, with solutions that protect track signals, equipment power as well as telecommunication systems data and equipment.

TRACK SIGNAL PROTECTION

Devices that protect trackside signaling equipment from surges induced or conducted onto low-voltage signal circuits, critical for train control and zone occupancy systems such as highway crossings. Product line includes solutions for DIN rail mounted devices, as well as AAR four post terminal block style mounting.



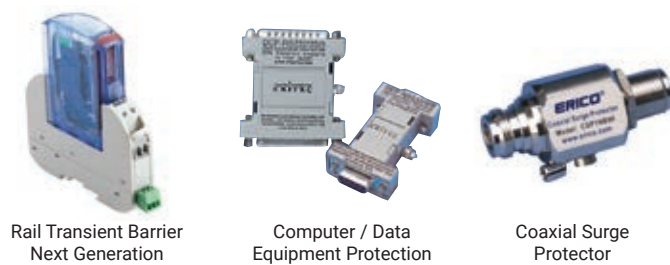
RAIL POWER SURGE PROTECTION

The nVent ERICO EPD family of surge protection devices protects power supplied to critical signaling equipment, ensuring lightning transients and surge over-voltages won't cause expensive equipment failure and downtimes.



SIGNAL DATA AND TELECOM PROTECTION

Lightning or induced surges can destroy or compromise telecommunications systems, interrupting the transmission of railway signal data. nVent ERICO offers a full line of surge protection device that protect these critical systems.



NVENT ERICO ELECTRICAL ENGINEERING LAB

At nVent ERICO, we're committed to not just being a provider, but also a partner. With our own in-house Electrical Engineering Lab and state-of-the-art equipment (including the largest 100kA 10/350µs Impulse Generator in the United States), nVent ERICO is uniquely suited in the market to test and validate solutions for development and commercial opportunities. The electrical lab has significantly expanded its scope of test authorizations to include tests from:

- UL 1059 (terminal blocks)
- UL 486A-B-E (wire connectors)
- UL 1449 (surge protective devices)
- UL 467 (grounding/bonding devices)
- UL 96 (lightning protection components)
- UL 486A-B-E (secureness machine and impact energy fixture)
- UL 1059/UL 486A-B-E (automated thermal feedback program and current cycling rack)
- UL 1059/UL 1449 (oven for accelerated aging and mold stress relief)

nVent ERICO surge protection products also meet all applicable AREMA requirements.



Our powerful portfolio of brands:

CADDY ERICO HOFFMAN RAYCHEM SCHROFF TRACER

WARNING: nVent products shall be installed and used only as indicated in nVent's product instruction sheets and training materials. Instruction sheets are available at nVent.com/ERICO and from your nVent customer service representative. Improper installation, misuse, misapplication or other failure to completely follow nVent's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death and/or void your warranty.

©2019 nVent. All nVent marks and logos are owned or licensed by nVent Services GmbH or its affiliates. All other trademarks are the property of their respective owners. nVent reserves the right to change specifications without notice. ERICO-SB-H84762-LightningSurgeOverview-UKEN-1905

nVent.com/ERICO