



**CONNECT AND PROTECT**

# Rail Surge Protection Guide

Railway Electrical Protection

  
nvent

**ERICO**

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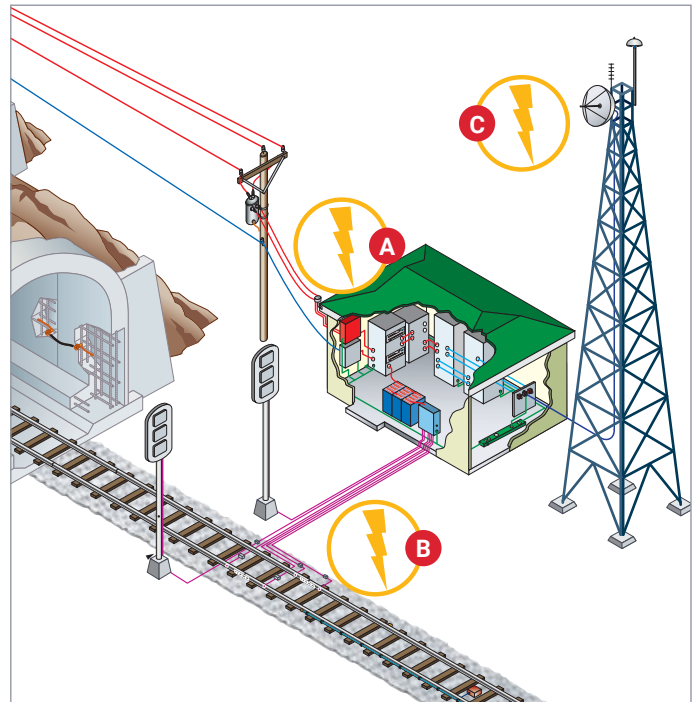
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# nVent ERICO Rail Surge Protection Guide

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 solutions that provide critical electrical protection for railway properties and assets including: classification yards, buildings and structures, bungalows, movable bridges and other areas throughout the network that contain sensitive equipment. This product range includes solutions for direct strike lightning protection, grounding and bonding, as well as surge protective devices (SPDs) for railway communication/signaling equipment and systems.

nVent ERICO is a leading global supplier of SPDs, serving a diverse range of industries throughout the world with surge protection solutions for equipment power, equipment inputs and outputs as well as data and telecom transmitting equipment. With our specialization in railway electrical protection, nVent ERICO offers many SPDs that are specifically designed for rail applications. We offer SPDs with conventional surge technologies such as: metal oxide varistors (MOVs), silicon avalanche diodes (SADs), gas discharge tube (GDT) and spark gap technologies. With a long-term commitment to R&D, and a world class electrical engineering lab, we have developed novel nVent ERICO surge suppression technologies that overcome the limitations of conventional methods to provide an enhanced level of protection.

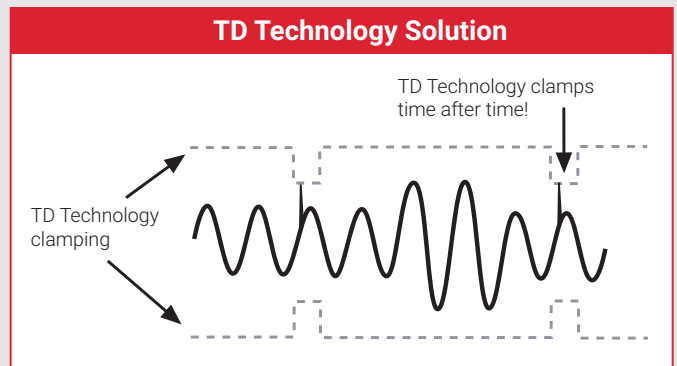
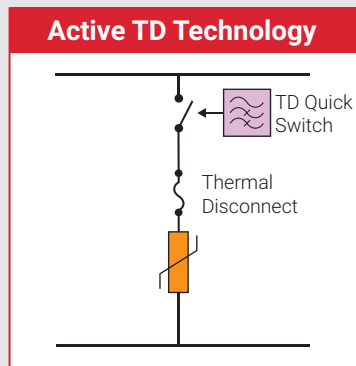


- A Power Protection**
- B Protection for Inputs and Outputs**
- C Protection for Rail Data and Telecom**

## NVENT ERICO TD TECHNOLOGY

**nVent ERICO Transient Discriminating (TD) Technology** is a hybrid surge protection design that provides greater operational safety under practical application and a longer service life for the SPD itself. At the core of the patented **nVent ERICO TD Technology** is its ability to differentiate

between the two types of damaging surge events, including a temporary over-voltage (TOV) condition vs. a very fast transient event that can be caused by lightning/switching induced surges. With its two protection modes,

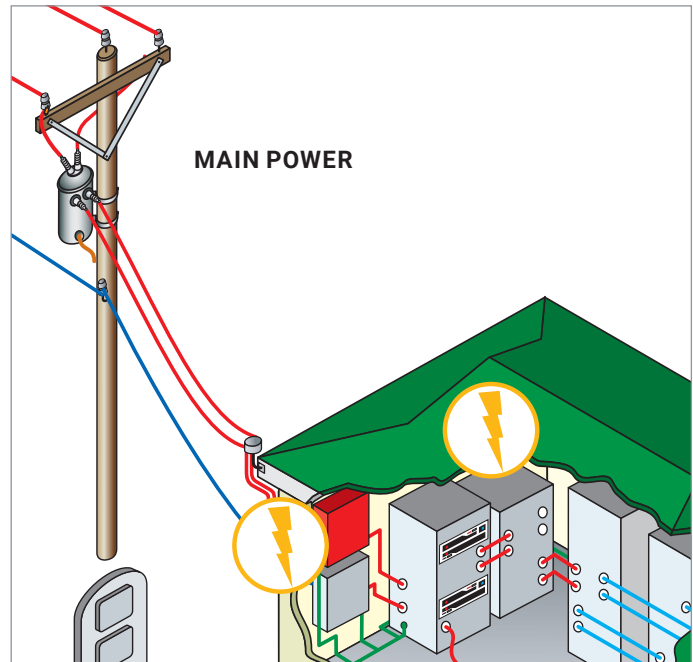


**TD Technology** quickly switches its clamping (or voltage limiting) levels to protect against the specific type of event while maintaining the ability to protect against the alternative condition should it happen in quick succession.



# Rail Power Surge Protection



Power supply protection is an important part of safe, reliable railways. Lightning can induce surges on main power lines, resulting in a power line fault that lasts much longer than a typical transient event, which can cause significant damage to network equipment. nVent ERICO offers a comprehensive range of surge protection devices for rail power supply, including devices that protect primary and secondary power distribution equipment. **Noted in each product is the application(s) it serves.** Visit the nVent ERICO website for more information on each product, including additional technical specifications, drawings, etc. You can follow the hyperlinks (in the PDF version) or the QR code in print to easily find the product selection featured on each page.



Application	Voltage
Wayside Electrical Panels <b>WAY</b>	120/240V
Onboard Electrical Panels <b>ONBD</b>	120/240V

Product	Description	Features	Technical Specifications
<b>EPD Series</b> 	Primary Power Surge Protector <b>Part Number</b> • <a href="#">EPD100HZ120240V</a> • <a href="#">EPD100HZ120S</a> • <a href="#">EPD100HZ120V</a>	Features a modular design for simple SPD module replacement, terminals included with panel, and a viewing window/mechanical flag status indication for easy inspection. <b>APPLICATIONS:</b> WAY / AC <b>SURGE RATING:</b> 40kA 8/20 μs per mode <b>CONNECTION TYPE:</b> Terminal connections	<b>Technology</b> • MOV with thermal disconnect <b>Complies With</b> • ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat C • AREMA® requirements
<b>EPD Series</b> 	Primary Power Surge Protector With Flying Lead <b>Part Number</b> • <a href="#">EPD120240TDFL</a>	Surge-Filter design using hybrid transient discriminating (TD) technology that provides high-energy surge suppression and removal of EMI/RFI disturbances, status monitoring of SPDs in each phase. <b>APPLICATIONS:</b> WAY / AC <b>SURGE RATING:</b> 206 kA 8/20 μs Aggregate <b>MOUNTING:</b> ½" straight nipple	<b>Technology</b> • Transient discriminating with EMI/RFI filter <b>Complies With</b> • ANSI/IEEE C62.41.2-2002 Cat A, Cat B, Cat C; ANSI/IEEE C62.41.2-2002 Scenario II, Exposure 2, 50 kA 8/20 μs • AREMA recommendations


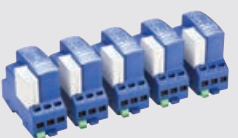
# Rail Power Surge Protection



Product	Description	Features	Technical Specifications
<b>EPD Series</b> 	Rail Secondary Power Surge Protection, AC Circuits <b>Part Number</b> <ul style="list-style-type: none"> <li>• <a href="#">EPD120TDAARB</a></li> <li>• <a href="#">EPD240TDAARB</a></li> </ul>	Surge-Filter design featuring the hybrid of Transient Discriminating (TD) that ensures safe operation during abnormal over-voltage events, as well as a sine wave filter for RFI/EMI attenuation. <b>APPLICATIONS:</b> WAY / AC <b>SURGE RATING:</b> 20 kA 8/20 $\mu$ s per mode <b>CONNECTION TYPE:</b> AAR Terminals	<b>Technology</b> <ul style="list-style-type: none"> <li>• TD with thermal disconnect EMI/RFI filter</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat C</li> </ul>
<b>EPD Series</b> 	Secondary Power Surge Protection, AC Circuits <b>Part Number</b> <ul style="list-style-type: none"> <li>• <a href="#">EPD1224ATAAR1</a></li> </ul>	Features surge protection technology that includes Hybrid TVSS, MOV, SAD and in-line filter that provides an overall high level of protection and operational life. <b>APPLICATIONS:</b> WAY / DC <b>SURGE RATING:</b> 20 kA 8/20 $\mu$ s per mode <b>CONNECTION TYPE:</b> AAR Terminals	<b>Technology</b> <ul style="list-style-type: none"> <li>• Metal Oxide Varistor (MOV)</li> <li>• Silicon Avalanche Diode (SAD) in-line series filter</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat CAREMA® requirements</li> </ul>
<b>TDP</b> 	Rail Trolley Protector <b>Part Number</b> <ul style="list-style-type: none"> <li>• <a href="#">TDP100750VOCS</a></li> </ul>	Featuring a rugged outdoor NEMA 4X rated enclosure and built in safety features, the TDP provides long lasting surge protection for 750 VDC systems, especially suitable for exposed locations an extended operational life. <b>APPLICATIONS:</b> 750Vdc Systems <b>SURGE RATING:</b> 100 kA 8/20 $\mu$ s per mode <b>CONNECTION TYPE:</b> Stranded, see online	<b>Technology</b> <ul style="list-style-type: none"> <li>• MOV with thermal disconnect</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Scenario II, Exposure 3, 100 kA 8/20 <math>\mu</math>s, 10 kA 10/350 <math>\mu</math>s</li> </ul>
<b>DT1 Series</b> 	DIN Rail Power Surge Protector <b>DT1 Product Class Protection Modes</b> <ul style="list-style-type: none"> <li>• <a href="#">Class I+II 12.5 kA, 1+0</a></li> <li>• <a href="#">Class I+II 12.5 kA, 1+1</a></li> <li>• <a href="#">Class I+II 12.5 kA, 2+0</a></li> <li>• <a href="#">Class I+II 12.5 kA, 3+0</a></li> <li>• <a href="#">Class I+II 12.5 kA, 4+0</a></li> </ul> <b>Replacement Modules</b> <ul style="list-style-type: none"> <li>• <a href="#">DT1 DIN Rail Surge Protection Replacement Module</a></li> <li>• <a href="#">SGT DIN Rail Surge Protection Replacement Module</a></li> </ul>	Tested and independently certified to the IEC and UL standards, the DT1 Series provides a range of compact, safe and high surge rated performance features for the harsh IEC Class I environment and suitable for protection within a wide range of applications. <b>APPLICATIONS:</b> High risk, power protection primary & secondary <b>SURGE RATING:</b> 100 kA 8/20 $\mu$ s per mode <b>MOUNTING:</b> 35 mm top hat DIN rail	<b>Technology</b> <ul style="list-style-type: none"> <li>• Thermal disconnect</li> </ul> <b>Certifications</b> <ul style="list-style-type: none"> <li>• IEC 61643-11 Class I+II</li> <li>• EN 61643-11 Type 1+2</li> <li>• UL 1449, 4th Edition Type 1CA</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• EN 61643-11 Type 1, Type 2</li> <li>• IEC® 61643-11 Class I, Class II</li> <li>• UL 1449, 4th Edition</li> <li>• CSA C22.2 No. 269-4</li> </ul>

# Rail Power Surge Protection



Product	Description	Features	Technical Specifications
<b>EDT2 Series</b> 	DIN Rail Power Surge Protector <b>ETD2 Product Class Protection Modes</b> <ul style="list-style-type: none"> <li>• <a href="#">Class II, 1+0</a></li> <li>• <a href="#">Class II, 1+1</a></li> <li>• <a href="#">Class II, 2+0</a></li> <li>• <a href="#">Class II, 3+0</a></li> <li>• <a href="#">Class II, 3+1</a></li> <li>• <a href="#">Class II, 4+0</a></li> <li>• <a href="#">Replacement Modules</a></li> </ul>	Featuring nVent ERICO TD Technology, the EDT2 Series ensures reliable surge protection throughout adverse voltage conditions. Additional features, including a shock resistant retaining clip, red/green status indication and a standard setup for remote monitoring make the EDT2 series well suited for the rail environment. <b>APPLICATIONS:</b> Power protection installed in the control cabinets <b>SURGE RATING:</b> 50kA to 100kA $\mu$ s per mode <b>MOUNTING:</b> 35 mm top hat DIN rail	<b>Technology</b> <ul style="list-style-type: none"> <li>• Thermal disconnect</li> <li>• nVent ERICO TD Technology</li> </ul> <b>Certifications</b> <ul style="list-style-type: none"> <li>• IEC 61643-11 Class I+II</li> <li>• EN 61643-11 Type 1+2</li> <li>• UL 1449, 4th Edition Type 1CA</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• IEC 61643-11:2011/EN 61643-11:2012</li> <li>• UL 1449, 4th Edition</li> <li>• CSA C22.2 No. 269-4</li> </ul> <b>Enclosure Rating</b> <ul style="list-style-type: none"> <li>• IP 20</li> </ul>
<b>TSF Series</b> 	Transient Surge Filter <b>Part Number(s)</b> <ul style="list-style-type: none"> <li>• <a href="#">TSF6A120V</a></li> <li>• <a href="#">TSF20A120V</a></li> <li>• <a href="#">TSF6A24V</a></li> <li>• <a href="#">TSF6A240V</a></li> </ul>	TSF series featuring nVent ERICO TD Technology, brings superior performance with a low let-through voltage on the critical line during neutral mode. Its replaceable surge module reduces downtime during maintenance. <b>APPLICATIONS:</b> Microprocessor based systems <b>SURGE RATING:</b> 20kA $\mu$ s per mode, 40kA/Ph <b>MOUNTING:</b> 35 mm top hat DIN rail	<b>Technology</b> <ul style="list-style-type: none"> <li>• nVent ERICO TD Technology</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• CE cURus,</li> <li>• UL® 1283, UL 1449, 4th Edition</li> <li>• 5 EMI Filter, IEC® 61643-11 Class II, UL 1449 Edition 4 and IEC 61643-11, UL 1283</li> </ul> <b>Enclosure Rating</b> <ul style="list-style-type: none"> <li>• IP 20</li> </ul>
<b>SGT Series</b> 	Spark Gap Diverter <b>Part Numbers</b> <b>Type 1</b> <ul style="list-style-type: none"> <li>• <a href="#">SGT15010</a></li> <li>• <a href="#">SGT110010</a></li> </ul> <b>Type 2</b> <ul style="list-style-type: none"> <li>• <a href="#">SGT24010R</a></li> </ul>	The nVent ERICO SGT Series Spark Gap Diverters are an effective means of equipotential bonding that provides and N-PE equalization protection bond on TT power distribution systems. <b>APPLICATIONS:</b> Equipment, panel and motors <b>SURGE RATING:</b> up to 150 kA 8/20 $\mu$ s per mode <b>MOUNTING:</b> 35 mm DIN Rail, EN 60715	<b>Technology</b> <ul style="list-style-type: none"> <li>• Spark Gap</li> </ul> <b>Certifications</b> <ul style="list-style-type: none"> <li>• VDE, UL® 1449 Edition 4 Type 1CA</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• IEC® 61643-11 Class I, Class I/EN 61643-11 Type 1, Type 2, VDESee product details for individual compliances</li> </ul>

# Rail Power Surge Protection

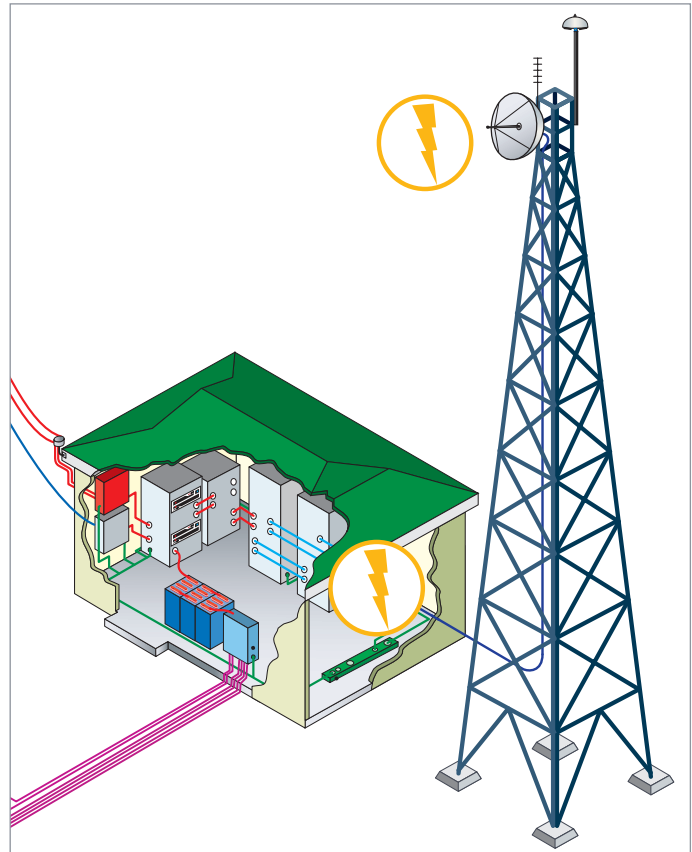


Product	Description	Features	Technical Specifications
<b>TDX Modular</b> 	Modular Transient Discriminating Panel Protector <b>Product Line Part Numbers</b> <b>Compact TDX</b> <ul style="list-style-type: none"> <li>• <a href="#">100 kA</a></li> <li>• <a href="#">100 kA with Surge Counter</a></li> <li>• <a href="#">200 kA</a></li> <li>• <a href="#">200 kA with Surge Counter</a></li> <li>• <a href="#">300 kA</a></li> <li>• <a href="#">400 kA</a></li> </ul>	nVent ERICO's line of Transient Discriminating Panel Protectors are designed for critical protection applications. This line is specifically designed for equipment, panel and motor protection applications and to provide long life, even under the most adverse over-voltage conditions. Features include replaceable modules, TD Technology for Temporary Overvoltage protection, thermal protection, short circuit current cartridge fusing, compact enclosures, voltage presence LEDs, status indication flag per mode, audible alarm, surge counter, filter, and voltage free contacts. <b>APPLICATIONS:</b> Equipment, panel and motors <b>SURGE RATING:</b> 100 kA 8/20 $\mu$ s per mode <b>MOUNTING:</b> ¾" straight nipple	<b>Technology</b> nVent ERICO TD Technology <b>Certifications</b> <ul style="list-style-type: none"> <li>• UL® 1449 Edition 4 Type 1 &amp; 2</li> <li>• (I<sub>n</sub>), Per 20 kA Mode</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat CANSI®/IEEE® C62.41.2-2002 Scenario II, Exposure 3, 100 kA 8/20 <math>\mu</math>s, 10 kA 10/350 <math>\mu</math>s IEC® 61643-1 Class I, Class II</li> </ul>
<b>TDX Compact</b> 	Compact Transient Discriminating Panel Protector <b>Product Line Part Numbers</b> <b>Modular TDX</b> <ul style="list-style-type: none"> <li>• <a href="#">50 kA</a></li> <li>• <a href="#">100 kA</a></li> <li>• <a href="#">200 kA</a></li> </ul>	nVent ERICO's line of Transient Discriminating Panel Protectors are designed for critical protection applications. This line is specifically designed for equipment, panel and motor protection applications and to provide long life, even under the most adverse over-voltage conditions. Product features include TD Technology for Temporary Overvoltage protection, thermal protection, short circuit current cartridge fusing, compact enclosures, voltage presence LEDs, and voltage free contacts. <b>APPLICATIONS:</b> Equipment, panel and motors <b>SURGE RATING:</b> 50 kA 8/20 $\mu$ s per mode <b>MOUNTING:</b> ¾" straight nipple	<b>Technology</b> <ul style="list-style-type: none"> <li>• nVent ERICO TD Technology</li> <li>• Over-current Fusing</li> </ul> <b>Certifications</b> <ul style="list-style-type: none"> <li>• UL® 1449 Edition 4 Type 1</li> <li>• (I<sub>n</sub>), 10kA – 20kA Per Mode</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat C</li> <li>• ANSI®/IEEE® C62.41.2-2002 Scenario II, Exposure 2, 50 kA 8/20 <math>\mu</math>s</li> <li>• IEC® 61643-1 Class I, Class II</li> </ul>


# Surge Protection for Data and Telecom Equipment



Rail communication equipment and systems are the foundation of railway signaling. Increasingly advanced technology is being introduced into rail networks, driving next-generation railway technology with new signaling systems such as communication based train control (CBTC), as well as safety overlays such as PTC (U.S.) and ERTMS (European /global). nVent ERICO is a surge protection leader in both the rail and telecom industries, offering a complete range of surge protection devices (SPDs) for sensitive equipment and systems used to transmit radio frequency and data across the network.



Application	Network Equipment
Communication Radio - Frequency <b>COM-RF</b>	Voice Radio <b>VR</b>
	PTC Radio <b>PR</b>
	Onboard Radio <b>OR</b>
	Wireless Network <b>WN</b>
Communication Radio - Data <b>COM-DAT</b>	Ethernet Switch <b>ES</b>
	Camera Data <b>CD</b>
	Radio Data <b>RD</b>

Product	Description	Features	Technical Specifications
<b>LAN Series</b> 	LAN Surge Protector <b>Part Number</b> • <a href="#">LANRJ45C6P</a>	Housed in a rugged, metallic enclosure, the LAN Series provides critical electrical and environmental shielding to railway communication equipment. This versatile unit protects cable up to CAT6, 10Gbps, and power over Ethernet, (PoE). <b>APPLICATIONS:</b> Communications/ networks, Power over Ethernet (PoE), cameras & radios <b>SURGE RATING:</b> 10kA L-G <b>MOUNTING:</b> 35 mm top hat DIN rail	<b>Technology</b> <ul style="list-style-type: none"> <li>• Silicon Avalanche Diode (SAD),</li> <li>• Gas Discharge Tube (GDT)</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• IEC® 61643-21</li> <li>• UL 497B</li> </ul>



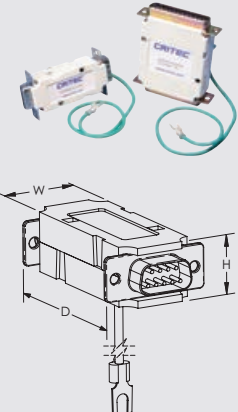
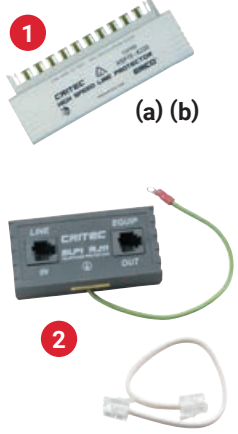
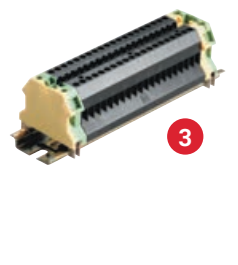
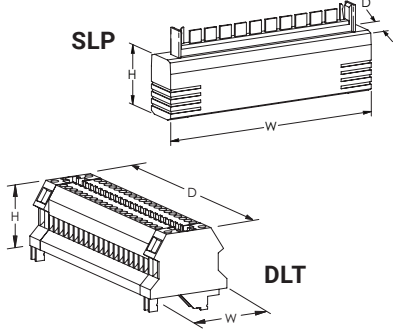
# Surge Protection for Data and Telecom Equipment



Product	Description	Features	Technical Specifications
<p><b>UTB Series</b></p>  <p><a href="#">View the nVent ERICO signal line protection guide for more information</a></p>	<p>Universal Transient Barrier Surge Protector for Data &amp; Signal Applications</p> <p><b>Part Number</b></p> <ul style="list-style-type: none"> <li>• <a href="#">UTB15DP</a></li> <li>• <a href="#">UTBTA</a></li> </ul> <p><b>UTB Series Solutions for the following Protocols/Standards</b></p> <ul style="list-style-type: none"> <li>• RS-422 (V.11)</li> <li>• RS-232 (V.24)</li> <li>• RS-485</li> </ul>	<p>The nVent ERICO UTB series for data and signal protection applications provides protection of low-voltage circuits and transducers. Its separate plug and base design allows for hot swappable module replacement. Another important feature is its multi-stage protection and fine over-voltage protection helps ensure lowest residual surge voltages reach sensitive equipment.</p> <p><b>APPLICATIONS:</b> Data and signaling</p> <p><b>SURGE RATING:</b> 10kA per Line , 20kA per Pair</p> <p><b>MOUNTING:</b> 35 mm top hat DIN rail</p> 	<p>• <b>Technology</b></p> <ul style="list-style-type: none"> <li>• Gas Discharge Tube (GDT)</li> <li>• Metal Oxide Varistor (MOV)</li> <li>• Silicon Avalanche Diode (SAD)</li> </ul> <p><b>Complies With:</b></p> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat C</li> <li>• UL497B</li> </ul> <p><b>Enclosure Rating:</b></p> <ul style="list-style-type: none"> <li>• IP 20</li> <li>• NEMA®-1</li> </ul>
<p><b>CSP Series</b></p> 	<p>Coaxial Surge Protector</p> <p><a href="#">Connection Types</a></p> <p><b>BNC, Male/Female</b></p> <ul style="list-style-type: none"> <li>• <a href="#">450 V / 1,100 V</a></li> </ul> <p><b>F-Type, Male/ Male/Female</b></p> <ul style="list-style-type: none"> <li>• <a href="#">450 V / 1,100 V</a></li> </ul> <p><b>N-Bulkhead, Male/Female</b></p> <ul style="list-style-type: none"> <li>• <a href="#">450 V / 1,100 V</a></li> </ul> <p><b>N-Type, Female/Female</b></p> <ul style="list-style-type: none"> <li>• <a href="#">450 V / 1,100 V</a></li> </ul> <p><b>N-Type, Male/Female</b></p> <ul style="list-style-type: none"> <li>• <a href="#">450 V / 1,100 V</a></li> </ul> <p><b>SMA, Male/Female</b></p> <ul style="list-style-type: none"> <li>• <a href="#">450 V / 1,100 V</a></li> </ul>	<p>The CSP Series Coaxial Surge Protector is an essential part of protecting telecom equipment, cameras and systems. Featuring a simple plug-in installation, low insertion / return loss, and wide operating frequency spectrum, this product line is well suited for the rail telecom ecosystem.</p> <p><b>APPLICATIONS:</b> COM-RF antenna, radio, cellular, VPN, camera</p> <p><b>SURGE RATING:</b> 20 kA 8/20 μs per mode/ see individual product details</p> <p><b>MOUNTING:</b> Supplied with mounting bracket, flying lead ground or ground lug</p>	<p><b>Technology</b></p> <ul style="list-style-type: none"> <li>• Gas Discharge Tube (GDT)</li> </ul> <p><b>Certifications</b></p> <ul style="list-style-type: none"> <li>• UL 497E</li> </ul> <p><b>Complies With</b></p> <ul style="list-style-type: none"> <li>• CE, UL</li> </ul> <p><b>Enclosure Rating</b></p> <ul style="list-style-type: none"> <li>• IP 20NEMA®-1</li> </ul>

# Surge Protection for Data and Telecom Equipment

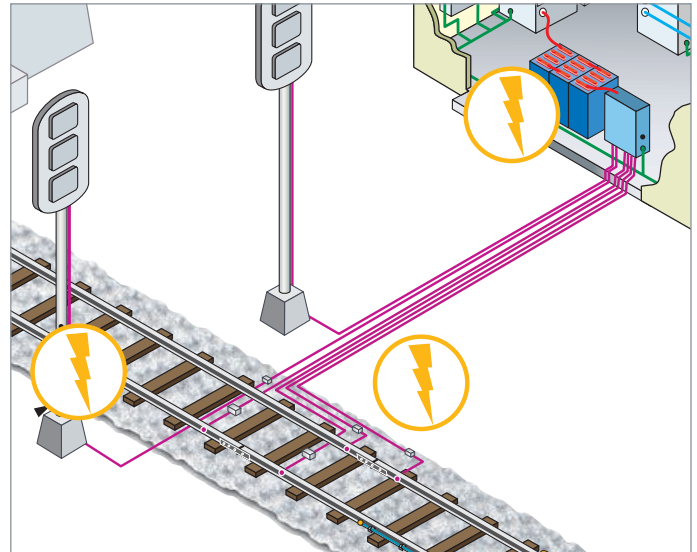


Product	Description	Features	Technical Specifications
<p><b>DEP Series</b></p> 	<p>Data Equipment Protector</p> <p><b>Part Number</b></p> <ul style="list-style-type: none"> <li>• <a href="#">DEPRS2322525D</a></li> <li>• <a href="#">DEPRS23299D</a></li> <li>• <a href="#">DEPRS42299D</a></li> </ul>	<p>The DEP Series model covers RS-232, RS-423, RS-422 and RS-485 protocols. It is designed to provide both line to signal-ground and signal-ground to protective-earth protection. This effective plug-in protection device is simple to install, making it well suited for rail applications.</p> <p><b>APPLICATIONS:</b> 9-Pin &amp; 25 Pin D-Sub, equipment communications</p> <p><b>SURGE RATING:</b> 200A – 400A/line</p> <p><b>CONNECTION:</b> Inline connection with ground wire</p>	<p><b>Technology</b></p> <ul style="list-style-type: none"> <li>• Silicon Avalanche Diode (SAD)</li> </ul>
<p><b>SLP</b></p> 	<p>Subscriber and High Speed Data Line Surge Protection</p> <p><b>Products</b></p> <ol style="list-style-type: none"> <li>1. Line Protector <ul style="list-style-type: none"> <li>a. <a href="#">High Speed Data Line Protector</a></li> <li>b. <a href="#">Subscriber Line, Single Stage</a></li> </ul> </li> <li>2. <a href="#">Telephone Line Protector</a></li> <li>3. <a href="#">Data Line Terminator</a></li> </ol>	<p>The nVent ERICO SLP Series provides data and signal surge protection multiple levels, protecting critical equipment from induced surges. Compact in size while delivering high surge carrying capacity, the SLP series is well suited for applications across many different industries, including rail. nVent ERICO data and signal surge protection offers a complete solution to eliminate damage, downtime, and power disruption.</p> <p><b>APPLICATIONS:</b> Modems, alarm systems</p> <p><b>SURGE RATING:</b> 500A to 20kA/Line</p> <p><b>CONNECTION:</b> Terminal, RJ 11</p>	<p><b>Technology</b></p> <ol style="list-style-type: none"> <li>1. Line Protector <ul style="list-style-type: none"> <li>a. Multi-stage</li> <li>b. Single-stage</li> </ul> </li> <li>2. Automatic over-current protection</li> </ol> <p><b>Complies With</b></p> <ul style="list-style-type: none"> <li>• CE, A-Tick, C-Tick</li> <li>• UL497A, UL497B</li> </ul> <p><b>Enclosure Material</b></p> <ul style="list-style-type: none"> <li>• SLP UL® 94V-0 Thermoplastic</li> </ul>
<p><b>DLT</b></p> 			



# SPDs for Railway Equipment I/Os (Inputs and Outputs)



The railway signaling ecosystem includes a large and diverse array of interconnected electrometrical and electronic equipment located along the wayside (adjacent to the tracks) as well as in nearby signal houses (bungalows). nVent ERICO offers a comprehensive range of SPDs to protect inputs and outputs (I/Os) of these critical railway signaling mechanisms.


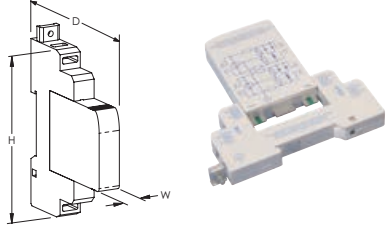



Application	Current
Track Circuits <b>TRCTS</b>	<b>AC / DC</b>
Switch Machines <b>SWM</b>	<b>AC / DC</b>
Crossing Equipment <b>XING</b>	<b>AC / DC</b>
Hot Box Detectors <b>HBD</b>	<b>AC / DC</b>
Signal Lights <b>SIGLTS</b>	<b>AC / DC</b>
Axel Counters <b>AXLCTS</b>	<b>AC / DC</b>
Line Circuits <b>LNCTS</b>	<b>AC / DC</b>

Product	Description	Features	Technical Specifications
<b>EPDF Series</b> 	Transient Surge Protection, AREMA® Stud-Type Terminals <b>Part Number</b> <ul style="list-style-type: none"> <li>• <a href="#">EPD2050F</a></li> <li>• <a href="#">EPD2170F</a></li> </ul>	The EPDF Series protects inputs and outputs for sensitive electronic equipment. A rail application specific SPD product, nVent ERICO F-Series design includes hybrid surge suppression technology (MOV/GDT) with two operating voltages, visual status indicator with open circuit end-of-life mode and a max surge rating of 50kA 8/20µs. <b>APPLICATIONS:</b> TRCTS - AC/DC <b>SURGE RATING:</b> 50 kA 8/20 <b>CONNECTION:</b> AREMA® Stud-Type Terminals – 2 Post Terminal Block	<b>Technology</b> <ul style="list-style-type: none"> <li>• Metal Oxide Varistor (MOV)</li> <li>• Gas Discharge Tube (GDT)</li> </ul> <b>Complies With</b> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat C</li> <li>• AREMA® requirements</li> <li>• Enclosure Rating</li> <li>• NEMA® 12 (IP55)</li> </ul>
<b>LCP</b> 	Load Cell Protector <b>Part Number</b> <ul style="list-style-type: none"> <li>• <a href="#">LCP01A</a></li> </ul>	The LCP device provides shield protection that works with both four wire and six wire systems. Featuring low series impedance, load cells do not need recalibration with the nVent ERICO LCP device. Protecting against excitation over-voltage and prevent loadcell damage, this SPD is perfect for the railway communication ecosystem. <b>APPLICATIONS:</b> Suitable for compression or tension cells <b>SURGE RATING:</b> See protection class mode	<b>Technology</b> <ul style="list-style-type: none"> <li>• Gas Discharge Tube (GDT)</li> <li>• Metal Oxide Varistor (MOV)</li> <li>• Silicon Avalanche Diode (SAD)</li> </ul> <b>Enclosure Rating</b> <ul style="list-style-type: none"> <li>• NEMA® 12 (IP55)</li> </ul>




# SPDs for Railway Equipment I/Os (Inputs and Outputs)



Product	Description	Features	Technical Specifications
<b>UTB Series</b>  <a href="#">View the nVent ERICO signal line protection guide for more information</a>	Universal Transient Barriers <b>Products</b> <ul style="list-style-type: none"> <li>• <a href="#">Single Pair</a></li> <li>• <a href="#">Single Pair Isolated Ground</a></li> <li>• <a href="#">Dual Pair</a></li> <li>• <a href="#">Dual Pair Single Power</a></li> <li>• <a href="#">Replacement Modules for Universal Transient Barriers</a></li> </ul>	The nVent ERICO UTB series for data and signal protection applications provides protection of low-voltage circuits and transducers. Its separate plug and base design allows for hot swappable module replacement. Another important feature is its multi-stage protection and fine over-voltage protection helps ensure lowest residual surge voltages reach sensitive equipment. <b>APPLICATIONS:</b> Data and signaling <b>SURGE RATING:</b> 10kA per Line , 20kA per Pair <b>MOUNTING:</b> 35 mm top hat DIN rail 	<b>Technology:</b> <ul style="list-style-type: none"> <li>• Gas Discharge Tube (GDT)</li> <li>• Metal Oxide Varistor (MOV)</li> <li>• Silicon Avalanche Diode (SAD)</li> </ul> <b>Complies With:</b> <ul style="list-style-type: none"> <li>• ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat C</li> <li>• UL497B</li> </ul> <b>Enclosure Rating:</b> <ul style="list-style-type: none"> <li>• IP 20</li> <li>• NEMA®-1</li> </ul>
<b>RTBN Series</b> 	Rail Transient Barrier Next Generation <b>Part Number</b> <ul style="list-style-type: none"> <li>• <a href="#">RTB12N</a></li> <li>• <a href="#">RTB130N</a></li> <li>• <a href="#">RTB30N</a></li> <li>• <a href="#">RTB50N</a></li> <li>• <a href="#">RTB12N</a></li> <li>• <a href="#">RTB130N</a></li> <li>• <a href="#">RTB50N</a></li> </ul>	The newest in nVent ERICO's line of dedicated rail SPDs, RTBN is designed to bring the most in terms of performance and safety. With its integration of GDT (gas discharge tube) technology and MOV (metal oxide varistors), RTBN is consistent, with the capability to protect against fast spikes. End-of-life safety features include a thermal disconnect, mechanical flat status indication and compatibility with remote monitoring functionality. <b>APPLICATIONS:</b> Signal, power and data <b>SURGE RATING:</b> 30 kA 8/20 μs per mode <b>MOUNTING:</b> 35 mm top hat DIN rail G type DIN rail	<b>Technology:</b> <ul style="list-style-type: none"> <li>• Integration of GDT (gas discharge tube) technology and MOV (metal oxide varistors)</li> </ul> <b>Complies With:</b> <ul style="list-style-type: none"> <li>• AREMA® C&amp;S Manual Parts 11.5.1, 11.3.2, 14.1.2.ANSI®/IEEE® C62.41.2-2002 Cat A, Cat B, Cat C</li> </ul>

# SPDs for Railway Equipment I/Os (Inputs and Outputs)




Product	Description	Features	Technical Specifications
<p><b>Accessories</b></p>  <p>1</p>  <p>2</p>  <p>3</p>	<p>1. Rail Surge Plane Strip Busbar</p> <p><b>Part Numbers</b></p> <p>2. Surge Plane Strip Busbar Hardware Kit</p> <p><b>Part Number</b></p> <ul style="list-style-type: none"> <li>• <a href="#">B2700HK</a></li> </ul> <p>3. Rail Four Post Terminal Block</p> <p><b>Part Number</b></p> <ul style="list-style-type: none"> <li>• <a href="#">B2700A2C1WH</a></li> <li>• <a href="#">SBB2700A2B10</a></li> </ul>	<p>1. The nVent ERICO Rail Surge Plane Strip Busbar meets AREMA® recommended design criteria. It is an improved low impedance busbar available in bare or tinned versions.</p> <p>2. Hardware kit is used to attach nVent Surge Plane Strip Busbar to terminal board ground ring in order to form a surge plane. Hardware is steel with electrogalvanized finish.</p> <p>3. The nVent ERICO Rail Four Post Terminal Block separates “clean” wiring from “dirty” wiring. Block meets AAR recommendations, features a modular design for field assembly and future expansion, and includes integrated test terminal as well as a slot for low-impedance busbar.</p>	<p><b>Complies With:</b></p> <ul style="list-style-type: none"> <li>• 1. AREMA®</li> <li>• 3. American Association of Railroads</li> </ul>

# 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/DC power feeders, **(6)** Low Voltage Surge Protection for **(a)** Wayside signaling equipment I/O, and **(b)** Surge protection for data and telecom equipment.


## RAIL SIX POINT PLAN OF PROTECTION




**1** nVent ERICO System 3000  
Dynasphere Air Terminal




**2** nVent ERICO System 3000  
(a) nVent ERICO Downconductor  
(b) nVent ERICO Lightning Event Counter



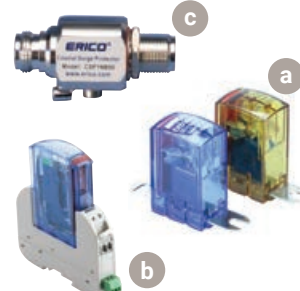
**3** (a) nVent ERICO Ground Rods and Mats  
(b) nVent ERICO GEM  
(Ground Enhancement Material)



**4** nVent ERICO Cadweld Plus  
Exothermic Weld Kit for earthing,  
signal bonds



**5** nVent EPD Series Primary Power  
Protection

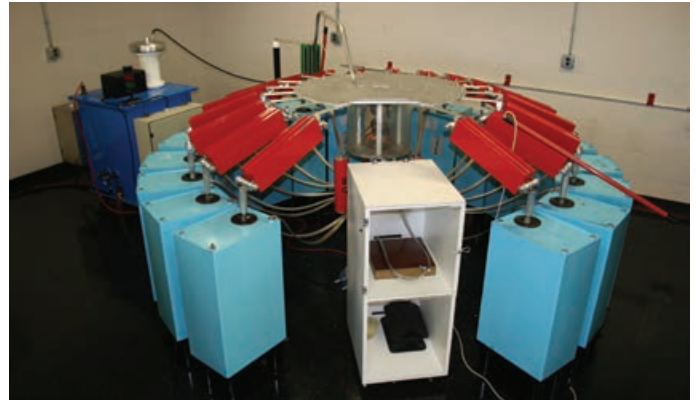


**6** (a) nVent ERICO EPDF Series  
(b) nVent ERICO RTBN  
(c) nVent ERICO CSP Series  
Coaxial Surge Protection

# World Class Electrical Engineering Lab

nVent ERICO is 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



We encourage our customers and rail industry professionals to schedule time with us in our electrical engineering lab (located in Solon, OH) to compare nVent ERICO products with the competition

## MORE RAILWAY ELECTRICAL SOLUTION FROM THE NVENT PORTFOLIO



**ENCLOSURES** nVent provides enclosures for railway signaling, communications and systems with its industry leading brands nVent HOFFMAN and nVent SCHROFF. Our expansive product portfolio includes; wall-mount / pole-mount enclosures, indoor/ outdoor cabinets for on-board and trackside applications, subracks and 19" chassis, embedded COM systems and small form factor case solutions, as well as enclosure cooling solutions.

**nVent SCHROFF  
Varistar Cabinet**



**nVent SCHROFF  
Outdoor Modular  
Cabinet**



**LOW VOLTAGE POWER DISTRIBUTION** nVent ERIFLEX provides solutions for electrical conduction and low voltage power distribution. With a product line that includes flexible busbars, insulated braided conductors, earthing braids, distribution blocks and power terminals, nVent ERIFLEX products are uniquely suited for railway electrical equipment. nVent ERIFLEX products are characterized by innovative material composition that contribute to safety and reliability in railway electrical systems.



**nVent ERIFLEX Flexibar Advanced**  
Flexible Busbar



**nVent ERIFLEX IBSB Advanced**  
Insulated Conductor

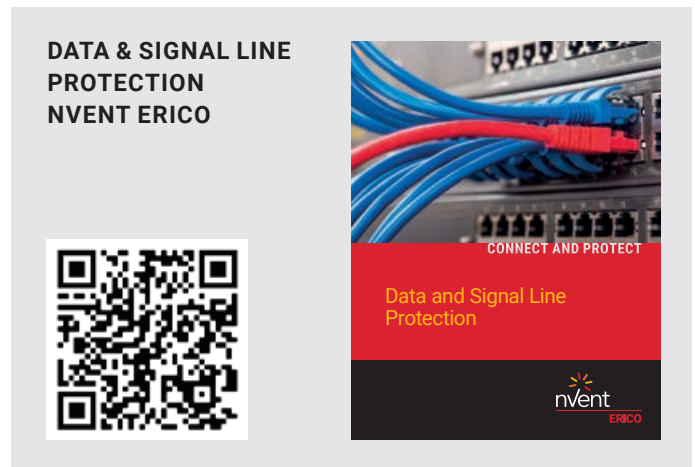
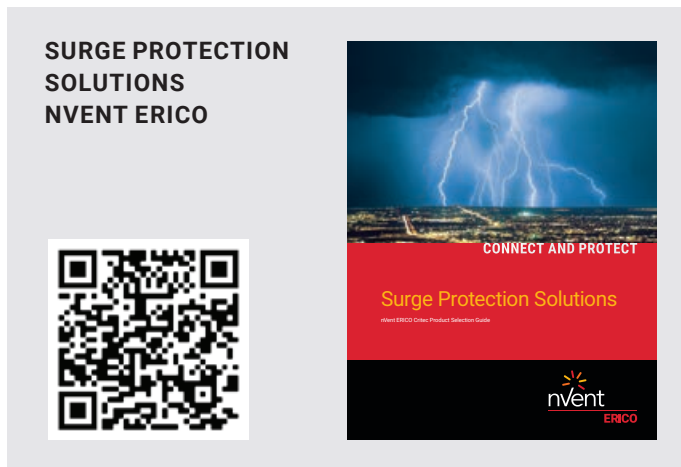


# Additional nVent Resources



nVent offers a comprehensive range of niche electrical solutions that are critical to railway networks. With our powerful portfolio of brands that includes nVent ERICO, ERIFLEX, HOFFMAN, RAYCHEM and SCHROFF, railways throughout the world have come to rely on our expertise, and high quality products that meet strict global rail standards such as AREMA and CENELEC. Our wide ranging portfolio includes electrical protection for rail infrastructure and equipment, connection solutions for wayside and onboard electrical infrastructure, enclosures for all types of railway signaling applications, and heating solutions that help railways operate in harsh winter conditions. Together, nVent makes an important contribution to safer, more reliable railway networks.

**Download the following brochures to learn or more information of railway solutions as well as the broader nVent ERICO surge protection product range.**



+1.800.447.RAIL      rail@nVent.com









Our powerful portfolio of brands:

**CADDY ERICO HOFFMAN RAYCHEM SCHROFF TRACER**



[nVent.com/ERICO](https://www.nVent.com/ERICO)