



**CONNECT AND PROTECT**

# nVent Railway Solutions

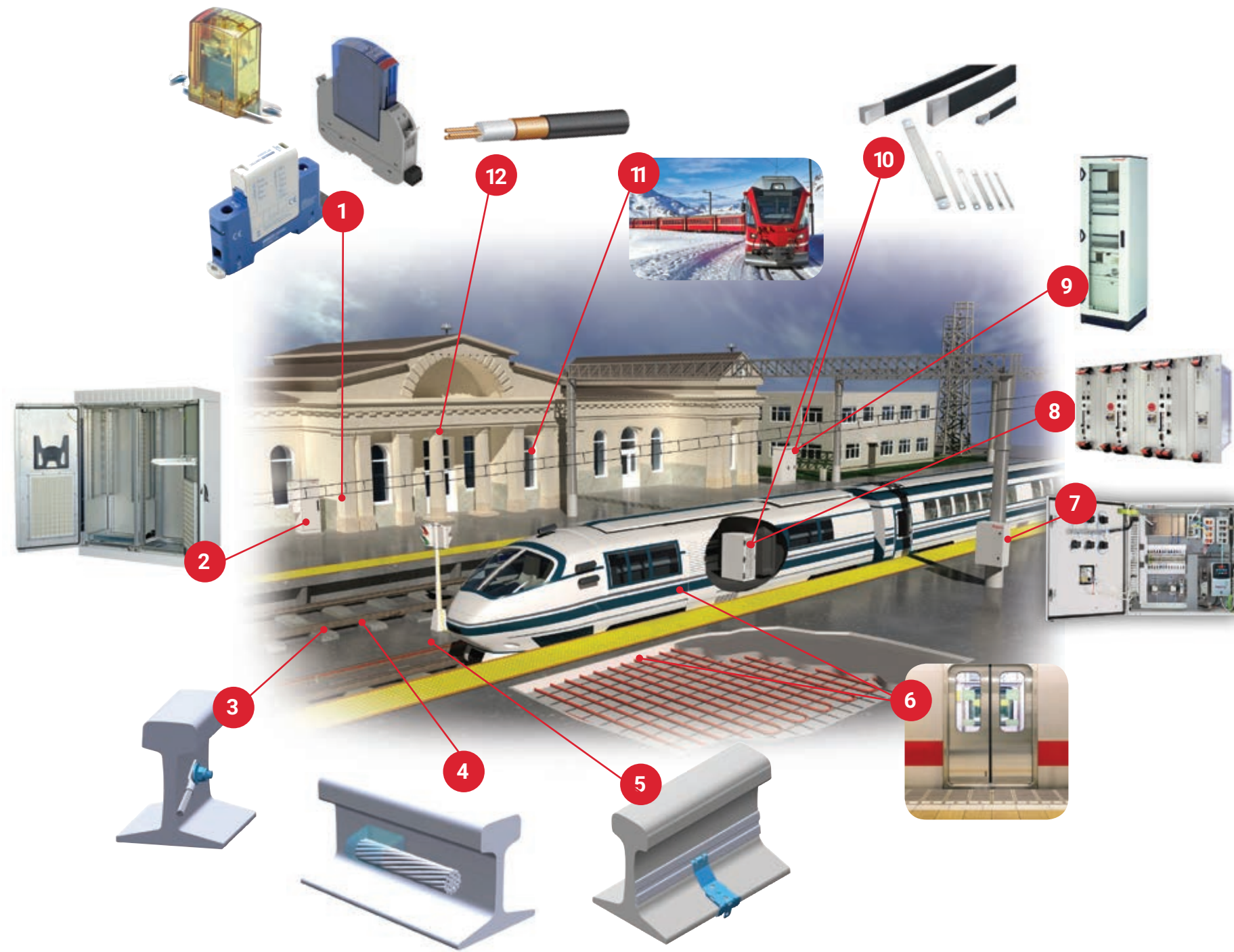
Improving Rail Safety and Reliability for More Than a Century

CADDY ERICO HOFFMAN RAYCHEM SCHROFF TRACER



# For solutions that connect, protect railway systems, the world turns to **nVent**.

nVent is the new name of a familiar face in the railway industry. Our legacy in rail dates back to 1903 with the establishment of the Electric Railway Improvement Company, commonly known as ERICO. Today, the nVent rail product portfolio includes a diverse range of electrical solutions that improve railway safety and reliability. These include cable-to-rail connection products, surge and lightning protection solutions, signaling enclosures for electric and electronic components, low voltage power distribution solutions, and thermal solutions that allow rail networks to operate safely in extremely cold climates. nVent provides solutions through the trusted products of nVent ERICO, ERIFLEX, HOFFMAN, RAYCHEM and SCHROFF. With this unique portfolio, nVent connects and protects critical systems throughout the railway network.



## nVent Railway System Solutions

1. nVent ERICO Surge Protection
2. nVent SCHROFF Outdoor Trackside Cabinet with nVent HOFFMAN Air Conditioner
3. nVent ERICO Mechanical Rail Electrical Connections
4. nVent ERICO Welded Rail Bond Electrical Connections
5. Contact Rail, Third Rail & Switch Heating Solutions, featuring nVent ERICO and nVent RAYCHEM technologies
6. nVent RAYCHEM Heating Systems for Rail Vehicle Thresholds and Rider Platforms
7. nVent HOFFMAN Pole Mount Integrated Enclosure
8. nVent SCHROFF Subracks for Onboard and Trackside Communications and Signaling
9. nVent SCHROFF Indoor Trackside Signaling EMC Cabinet
10. nVent ERIFLEX Flexibar Advanced flexible bus bar and nVent ERIFLEX MBJ grounding braid
11. nVent RAYCHEM CATHeat, for Catenary Wire Heating System
12. nVent RAYCHEM PYROTENAX Fire Rated Wiring for Emergency Safety Systems in Stations and Tunnels



## SECURE CONNECTIONS, RELIABLE NETWORKS

Rail networks rely on the secure connections of electrical systems and electronic components for safe, reliable operations. Critical connections link infrastructure throughout the network to control traffic and power railway systems. nVent provides solutions that secure these critical connections with products for track, trackside structures and rail vehicles.

On track, nVent ERICO is the worldwide leader in connecting cables to rails for signaling, grounding and traction power. We offer a wide range of solutions for electrical connections and conductors that solve common reliability problems like loosening from constant vibration or corrosion that leads to deterioration and physical damage. One way that we ensure secure connections is through solutions like nVent ERICO Cadweld, a simple and safe method of installing welded cable to rail bonds in the field. These bonds are critical to safe railway operations, especially signal bonds that detect and indicate broken rails and other network flaws.

For trackside structures and rail vehicles, we offer a wide range of solutions for protecting critical equipment and electronics. nVent HOFFMAN and nVent SCHROFF signaling enclosures ensure network components stay connected with products that are designed and built to meet the requirements of each individual project. While highly customizable, our products are based on globally standardized platforms and meet the relevant railway industry certifications and requirements throughout the world.

nVent HOFFMAN products include wall mounted and freestanding enclosures for outdoor, trackside, applications as well as indoor enclosures for applications on-board rail vehicles and network buildings. nVent SCHROFF products include innovative indoor and outdoor cabinets, racks and subracks for trackside, rolling stock and network structure applications. These enclosure solutions seamlessly integrate and protect the components critical to safe and reliable railways.



**nVent ERICO Cadweld**



**nVent HOFFMAN and SCHROFF Signaling Enclosures**

## PROTECTION FROM THE ELEMENTS

Railways throughout the world operate in all types of environmental conditions, from extreme climates to severe weather. All railroads face constant exposure to the elements, which pose immediate and long-term challenges to the network. nVent provides innovative solutions that help rail network electronics and circuitry withstand the elements, as well as thermal solutions that harness the energy of the network to enable operations in extreme cold conditions.

Railway electronics and circuitry used in signaling systems are highly susceptible to damage from lightning surges and other transient over voltages. Lightning transients and surges are a major cause of expensive electronic equipment failure and downtime for global railways. nVent ERICO provides industry leading lightning and surge protection for track circuits and railway facilities. These solutions include devices that protect power sources and circuits, as well as grounding and bonding systems that capture direct lightning strikes and dissipate the energy.

With our line of enclosure solutions, comprised of the nVent HOFFMAN and SCHROFF product lines, we protect critical system components from the elements. nVent enclosures, cabinets, and racks are designed to withstand harsh environments and endure the shock and vibration of trains on track. These enclosures feature solutions for internal temperature regulation including cooling and heat exchange systems.

nVent also provides numerous solutions for winter safety, comfort and performance for railways operating in extreme cold conditions. Icy tracks are no match for our contact rail and switch heating systems, featuring innovative technology from the nVent ERICO and RAYCHEM products. nVent thermal solutions go beyond the track to include railway structures, such as rider platform heating, as well as onboard rail vehicles, with solutions for threshold (door way) heating. In addition to heating systems, nVent thermal solutions include fire rated wiring for applications in railway stations and tunnels.



**nVent ERICO Lightning Surge Protection**



**nVent ERICO and RAYCHEM Switch Heating Systems**



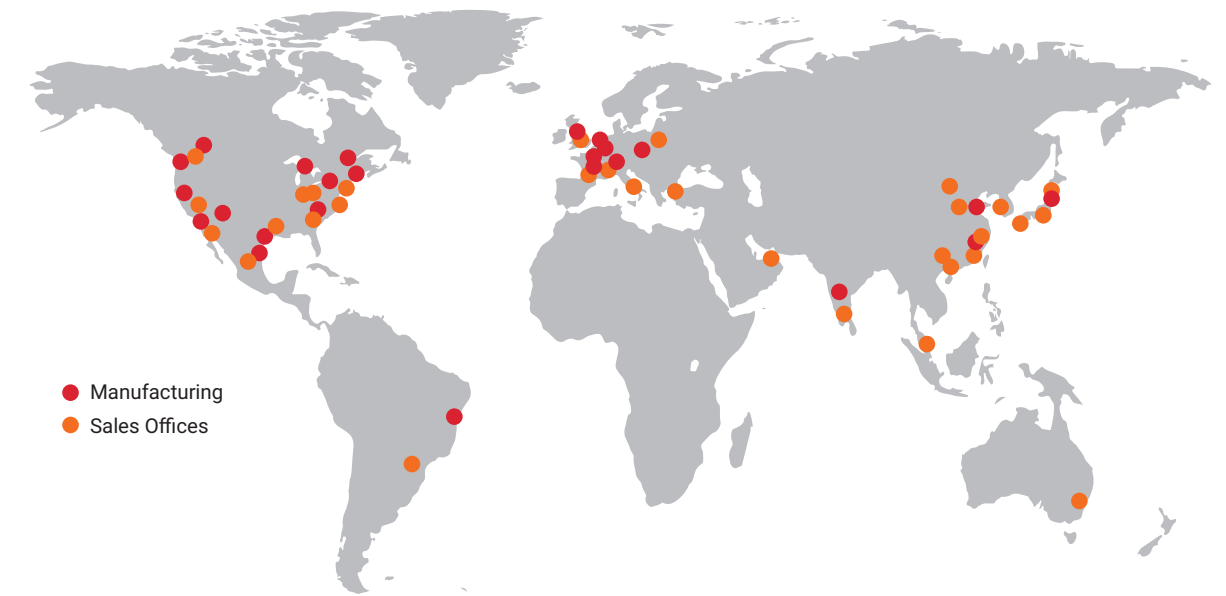
## GLOBAL EXPERTISE

We serve global railway markets with trusted solutions from nVent ERICO, ERIFLEX, HOFFMAN, RAYCHEM and SCHROFF. Our customers include major freight and transit railroads as well as global transportation companies that build rail vehicles and operate railway networks. We are well-versed in the design criteria of rail networks, from railway engineering standards like AREMA (American Railway Engineering and Maintenance-of-Way Association), as well as CENELEC (European Committee for Electrotechnical Standardization). nVent products meet and exceed global electrical and electronic engineering standards set forth by the IEEE (Institute of Electrical and Electronics Engineers) and UL electrical product safety standards. nVent produces railway products at over 15 locations, part of a manufacturing footprint that includes a total of 23 sites spread over a dozen countries. nVent facilities maintain the highest standards for production quality, with certifications that include ISO 9000, ISO 9001 and IRIS REV 02.

## ABOUT NVENT

At nVent, we believe that safer systems ensure a more secure world. We improve the safety and reliability of assets across a wide range of industries through inventive electrical solutions that securely connect and protect mission critical systems. Maximize your productivity. Minimize downtime. Reduce operating costs. Trust nVent to connect and protect your electrical infrastructure.

## NVENT WORLDWIDE PRESENCE



## QUALIFIED IN RAILWAY DESIGN AND QUALITY STANDARDS THROUGHOUT THE WORLD

- nVent ERICO bonds, connectors, and conductor products and ERICO ERICONTACT are designed to meet or exceed design criteria described in American Railway Engineering and Maintenance-of-Way Association, Inc. (AREMA) Manual Parts 8.1.20, 8.1.25, 8.1.30, 8.1.31, 8.1.32, 8.1.33, 8.1.35, 8.1.36 and 10.3.12.
- nVent ERICO surge protection for Rail applications meet or exceed AREMA recommendations.
- All nVent ERICO products and solutions are manufactured in accordance with ISO 9000 series accreditation and are backed by superior technical support and product warranties.
- Many nVent ERICO Cadweld connections are UL listed and meet or exceed IEEE 837 recommendations.
- nVent ERICO ERICONTACT meets recommendations of SNCF, ADIF, REFER, Jernbaneverket and DB for rail connections.
- nVent ERICO SYSTEM 2000 series of air terminals, down-conductors and fittings are in accordance with national and international standards such as Australian-AS1768, Singaporean-CP33, IEC/EN 62305-3 and USA-NFPA 780.
- nVent ERICO protection devices for primary AC power comply with ANSI/IEEE C62.41.2-2002 Cat A, Cat B, Cat C; ANSI/IEEE C62.41.2-2002 ScenarioII, Exposure 2, 50 kA 8/20  $\mu$ s.
- nVent RAYCHEM third rail heating system is installed on hundreds of miles of tracks and meet IEEE 515 requirements.
- nVent RAYCHEM switch point heating systems are service proven for thousands of switches worldwide.
- nVent RAYCHEM heating solutions are in operation at many large transit authorities in North America and around the world.
- nVent RAYCHEM PYROTENAX SYSTEM 1850 meets stringent NFPA, UL and CSA Codes and Standards.
- nVent HOFFMAN enclosures certified by UL, CSA, NEMA 4X, Protection class up to IP66.
- nVent SCHROFF onboard products welded per EN15085 and AWS requirements to meet shock & vibration requirements EN61373 Cat 1 Class A&B, AREMA 11.5.1, Low Smoke Zero Halogen per EN45455 HL2.
- nVent SCHROFF outdoor cabinets designed to meet EN50125-3 requirements for track side use, Protection class up to IP66 / NEMA 4X
- nVent SCHROFF indoor cabinets designed to meet EN50125-3, AREMA 11-5-1 class C requirements for requirements for track side use, Protection class IP55, EMC per EN61000-5-7.
- nVent SCHROFF subracks conform to IEC 60297-3-100 to IEC 60297-3-105, IEEE 1101.1, 1101.10 and 1101.11. Tested to BN 411002, NF F 67-012, NF F 60-002, EN 50155 and IEC 61587-2. EMC tested to IEC 61587-3, VG 95373 T.15.

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