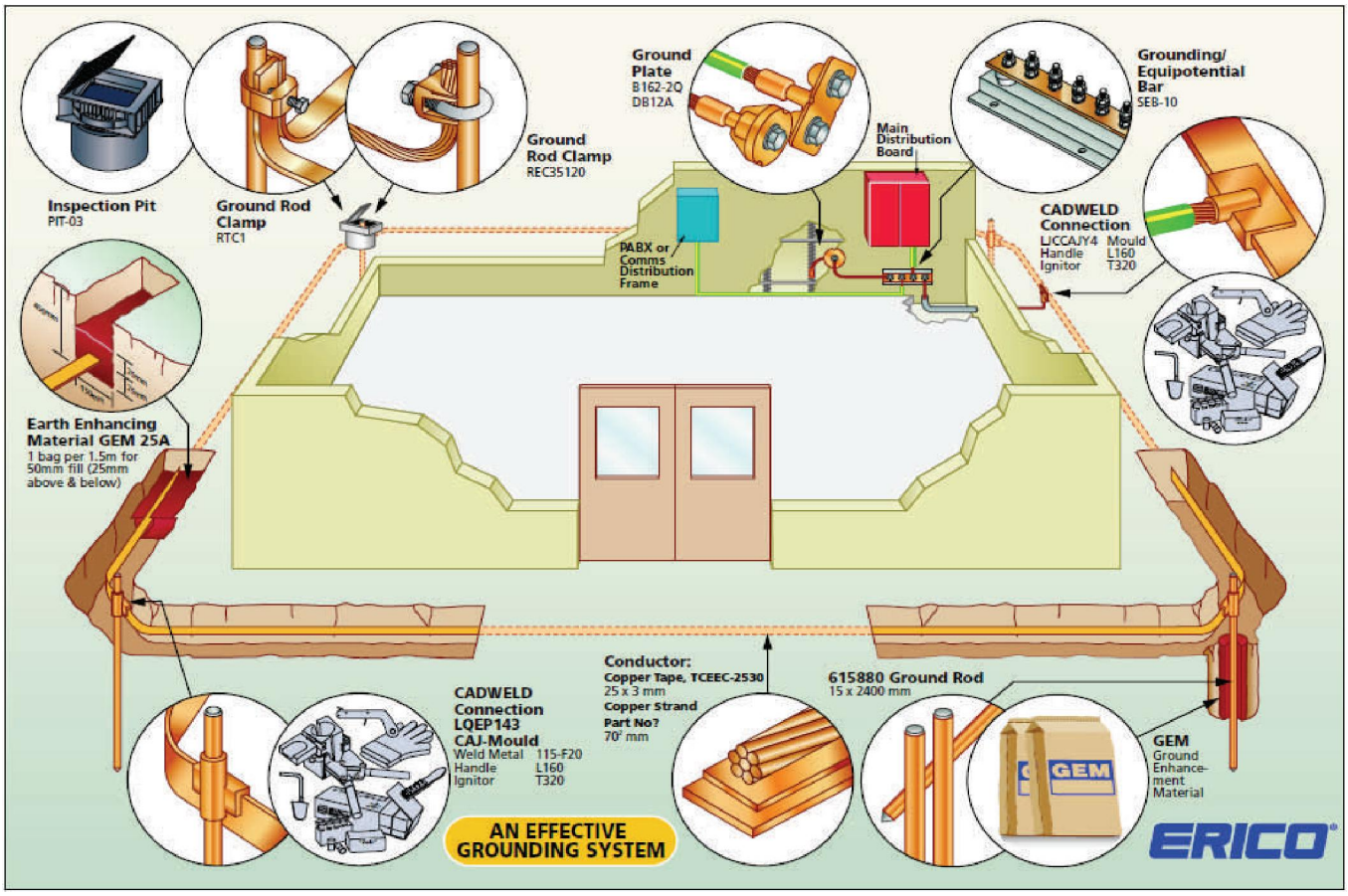
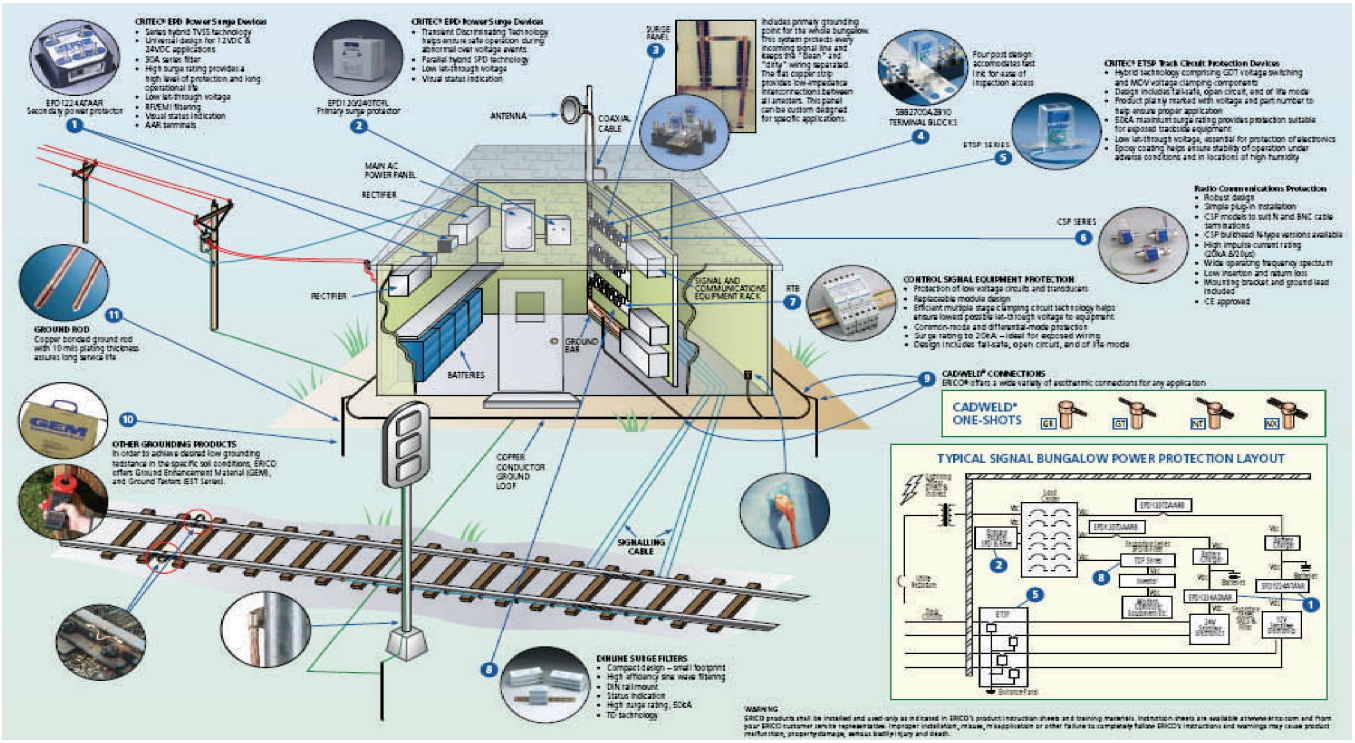
TYPICAL EARTHING SYSTEM PRODUCTS

Used on Rail Networks Worldwide



TYPICAL RAIL SIGNAL EQUIPMENT HUT

Showing Surge & Earthing Layout



Railway Electrical Protection

The consequences of an unexpected lightning strike or power surge can be catastrophic for a facility:

- Risk to personnel
- Critical equipment may be damaged, or destroyed
- Data can be corrupted
- The costs of operational downtime and lost revenue can be very substantial

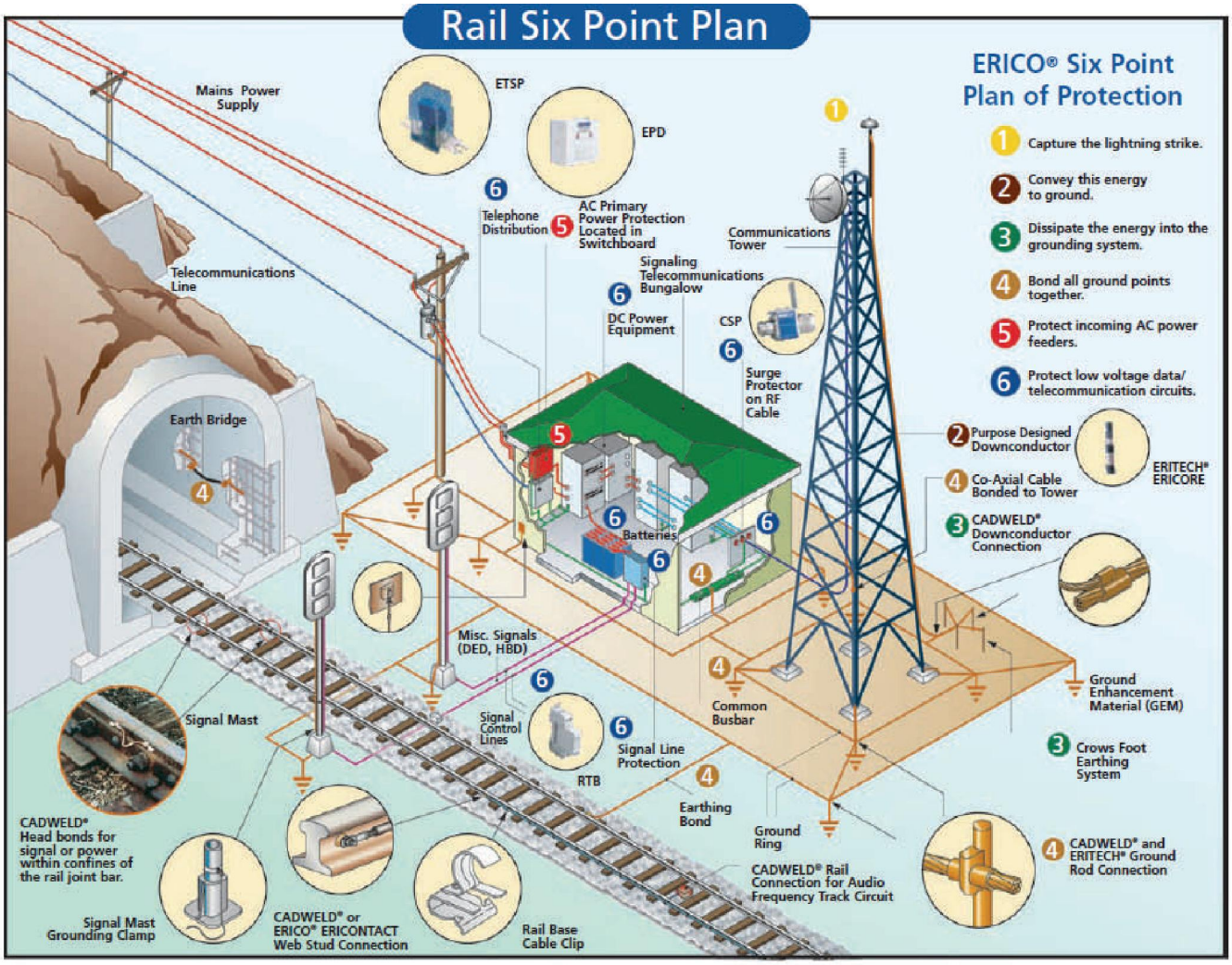
As the railway industry becomes more dependent on increasingly sensitive equipment, proper protection from lightning and dangerous over-voltage transients is necessary.

With more than 100 years of research, testing and product development, ERICO® has acknowledged that no single technology can totally eliminate vulnerability to lightning and power surges.

The ERICO Six Point Plan of Protection provides facility protection by integrating several concepts.

The Six Point Plan will minimize the risk of damage to facilities through:

- Direct Strike Protection
- Grounding and Bonding
- Surge and Over-Voltage Transient Protection



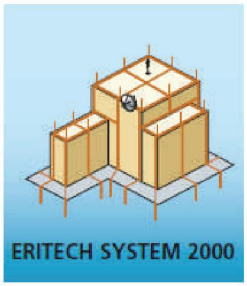
Direct Strike Protection

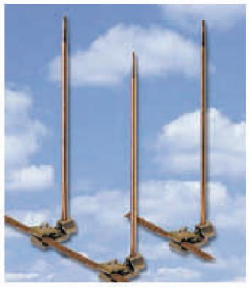
ERICO's innovative technology provides two systems for capturing lightning energy. The ERITECH® SYSTEM 2000 provides conventional air terminal technology to meet traditional needs.

A more advanced approach to lightning protection is the ERITECH® SYSTEM 3000, which relies on the collection volume principle to determine the effective placement of lightning protection to ensure the safe conveyance and dissipation of the lightning energy into the ground.

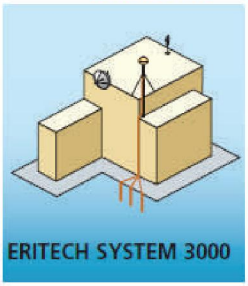
More than 15,000 facilities, including the tallest and most vulnerable buildings in the world, are protected by ERICO's ERITECH SYSTEM 3000.

ERITECH® SYSTEM 2000





ERITECH® SYSTEM 3000



Grounding and Bonding

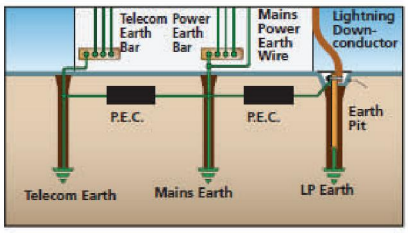
For the efficient performance of a lightning protection system, it is essential that a low impedance ground be provided to facilitate the dissipation of the lightning energy into the earth mass.

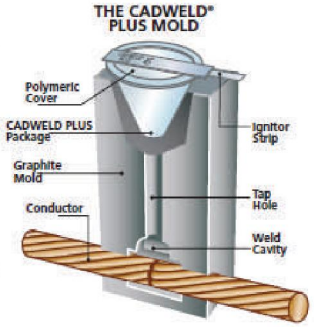
As a grounding specialist, ERICO® provides a range of grounding systems to suit any application.

ERITECH® copper-bonded and stainless steel ground rods and GEM facilitate the transfer of surges and fault currents into the earth and provide a long service life due to superior construction and quality.

ERICO's equipotential mesh, ground bars, signal reference grids, ground plates and Potential Earth Clamps create a safe equipotential ground plane for the protection of personnel and equipment.

Connections are often the most critical element of grounding systems, so the preferred method of connection is the CADWELD® exothermic welding process.





Connections to the Rail

For more than 60 years, the CADWELD process has been providing for a wide range of cable sizes and rail types. CADWELD is a molecular bond which – when properly applied – cannot loosen, resists corrosion and produces a maintenance-free electrical connection.

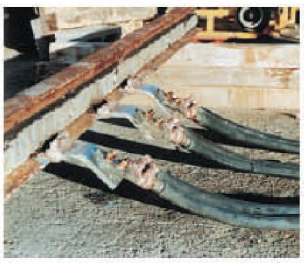
Tinned copper alloy bonds allow for high tensile strength and electrical conductivity without being attractive to theft.

With additional equipment such as rail clips, drilling machines and copper inserts, ERICO can supply various types of connections to meet specific requirements.

CADWELD® SIGNAL BONDS

CADWELD® POWER BONDS

CADWELD® THIRD RAIL CONNECTION

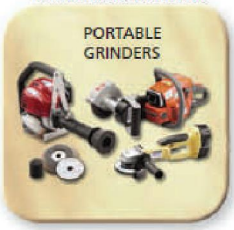


RAIL CLIPS

DRILLING MACHINE AND RAIL CONTACTS

BONDING

GRINDERS & WELDERS



Power Protection

Modern electronics and circuitry used in signalling, computing, communications and control/alarm installations are highly susceptible to damage from lightning surges and other transient over-voltages. ERICO® specializes in providing both primary and secondary protection:

PRIMARY PROTECTION

At the point of entry of power lines to buildings and signal locations, high energy shunt diverters rapidly limit surges into the facility, directing the excess surge energy safely to ground.

SECONDARY PROTECTION

The CRITEC® DIN-rail-mounted SPDs, including shunt diverter and series filter models, provide various levels of protection from surges on power lines with the convenience of easy installation on 35 mm DIN-rail mounting.

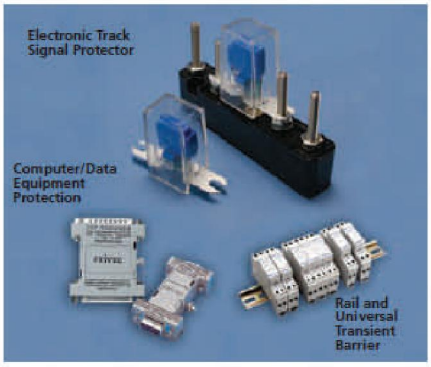
The CRITEC EPD120/240TDFL provides surge protection that exceeds AREMA® requirements and industry standards. Specially designed for the railway industry, the EPD incorporates patented surge protection technology from ERICO®, providing proven protection from transient surges and electrical line noise.

- For sensitive electronic equipment protection, or when high performance protection is required, Surge Reduction Filters (SRF's) are recommended. They reduce the peak residual voltage to suitably low levels and dramatically reduce the rate of current and voltage rise to downstream equipment.

The CRITEC SRF family uses suitably designed low-pass filter technologies coordinated with shunt diversion stages incorporating the ERICO Transient Discriminating (TD) Technology. The coordination of each of the above technologies within one package provides the ultimate hybrid-technology performance resulting in a robust surge rating and extremely low residual voltages with a high Maximum Continuous Operating Voltage (MCOV), designed to withstand sustained over-voltage conditions.

The EPD secondary protection products for both AC and DC power applications provides robust and reliable protection closer to the connected equipment.

Signaling and Telecommunications Protection



With the increased use of sensitive electronics in communications, signal and data management, effective surge clamping is essential to prevent data corruption, component damage, operational downtime, loss of revenue, customer dissatisfaction and risk to human safety.

ERICO provides comprehensive protection against surges in the most harsh electronic environments.

Technical Services to the Railways

As a protection solutions provider, ERICO offers specific technical services to suit specific applications such as:

- General grounding and bonding
- Signal locations
- Weighbridge
- Level Crossings
- Hot Box Detectors
- Communication sites
- Classification yard
- Movable Bridges
- AEI locations
- Defect detection locations

And issue specific recommendations aiming at continuous and reliable operations for the railways.