DEHN protects the railway infrastructure

www.dehn-international.com

DEHN protects the railway infrastructure

Avoid system downtime and disruptions

What is the most sustainable form of transportation for passengers and goods? Rail. Worldwide, the focus is increasingly on "green mobility".
As a result, massive expansion of the railway infrastructure is already underway and will continue in the future, with expectations running high. In order to ensure punctual and smooth rail operations, it is important to have as many disruptive factors as possible under control. Threats to the railway infrastructure include

- Direct lightning strikes and induced voltage
- Railway specific sources of electromagnetic interference
- Switching overvoltage

The problem: Modern signalling and control systems are increasingly electronic, as are telecommunications, and thus susceptible to disturbances and damage.

The result: System failures due to lightning strikes or surges disrupt rail traffic. These disruptions mean dissatisfied customers, harm to one's image and high costs.

The solution: In the railway infrastructure in specific, the following applications need reliable protection:

- All railway buildings, e.g. stations and maintenance sheds
- Signalling and control systems
- Telecommunications and GSM-R
- Point heaters
- LED track field illumination and conveyor systems

The DEHN product range provides everything you need to protect the railway infrastructure, staff and passengers "all from a single source". Here you will find coordinated products and solutions on the topics of

- External and internal lightning protection
- Surge protection
- Equipotential bonding
- Building and traction system earthing
- Safety equipment
- Services (lightning protection design, laboratory tests)

DEHN protection concepts – for smooth operations.

More information at: **de.hn/8G14c**


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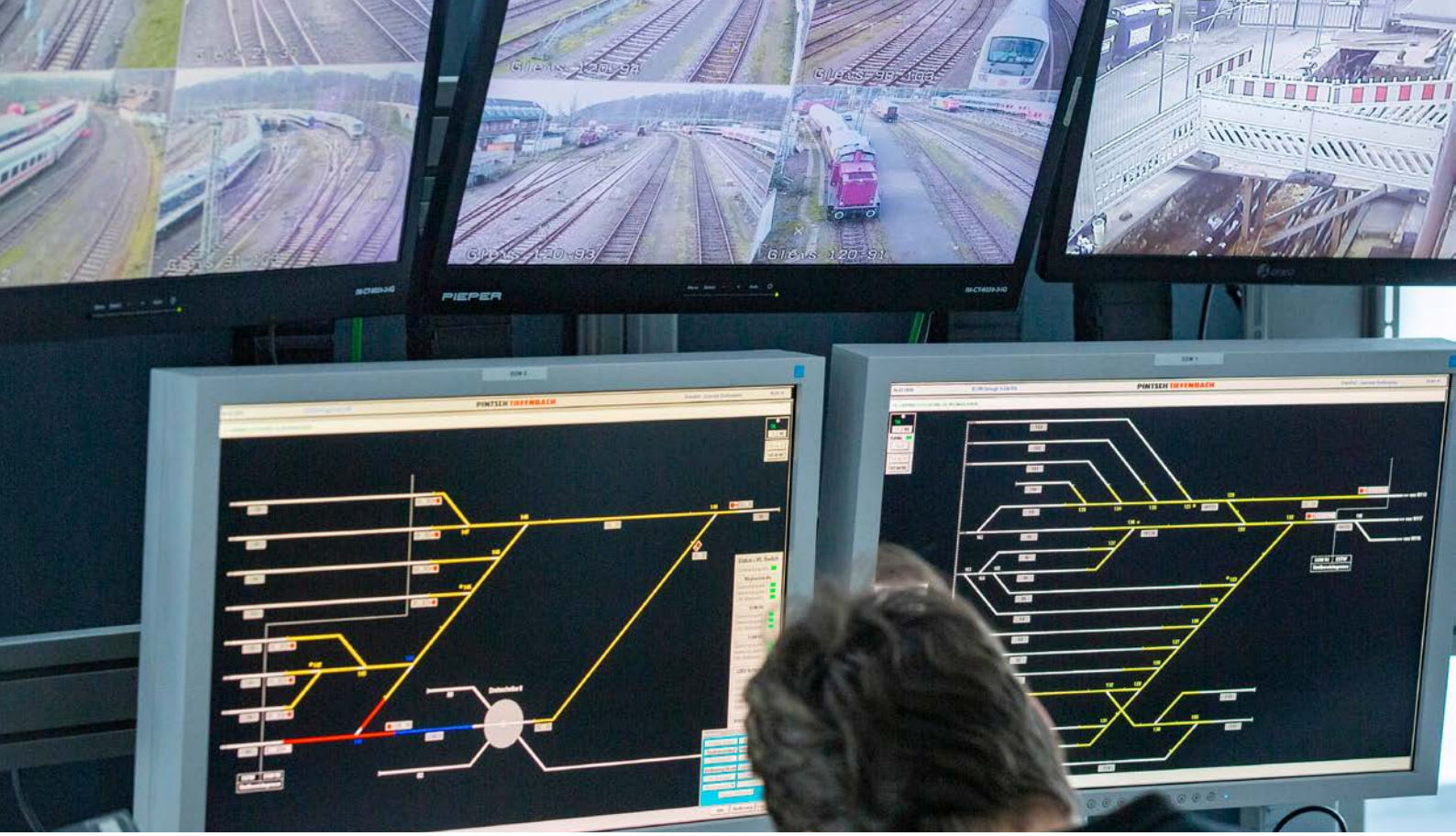


Protection of signalling and control and telecommunication systems – for seamless operation

Establishing operational safety, ensuring system availability, protecting passengers and employees – that is the purpose of telecommunications systems and signalling and control systems.

Signalling and control systems
Interlocking technology forms the basis for disruption-free train traffic. More and more electronic components are being used to improve performance. However, this makes the technology increasingly susceptible to disruptive influences such as surges.

Telecommunication systems
The permanent exchange of information between technical systems and trains is the basis for safe rail traffic. This is where alarm, communication and safety systems come into play. They make it possible for systems to exchange information, for operating units to communicate and passengers to be kept informed.

What are the threats to be avoided?
Damage and disruptions caused by lightning strikes and surges, but also by permanent and short-time interference from the overhead contact line.

What needs protecting?

- Signalling and control systems (e.g. interlockings, level crossings)
- Telecommunication systems (e.g. telephone systems, transmission paths for cable systems or radio technology)

Surge protection concepts according to Ril 819.0808
Ril 819.0808 sets specific requirements for surge protection concepts for signalling and control/telecommunication systems.
SPDs should maximise signal availability and minimise downtime resulting from damaged or disrupted electrical systems.
These special features must be taken into account when protecting signalling and control/telecommunication systems:

Non-interaction with the signalling technology
SPDs must not impair the signalling technology in any way. This means that arresters must be removed or plugged in **without influencing the signal circuit**.

Consider the railway environment
In this environment, surge protection concepts must be set up in such a way that they can handle voltages due to permanent interference of 250 V as well as voltages due to short-time interference of up to 1500 V @ 100 ms (e.g. in the event of an overhead line break).

More information at: **de.hn/6zpuQ**

BLITZDUCTORconnect has all the requirements well under control

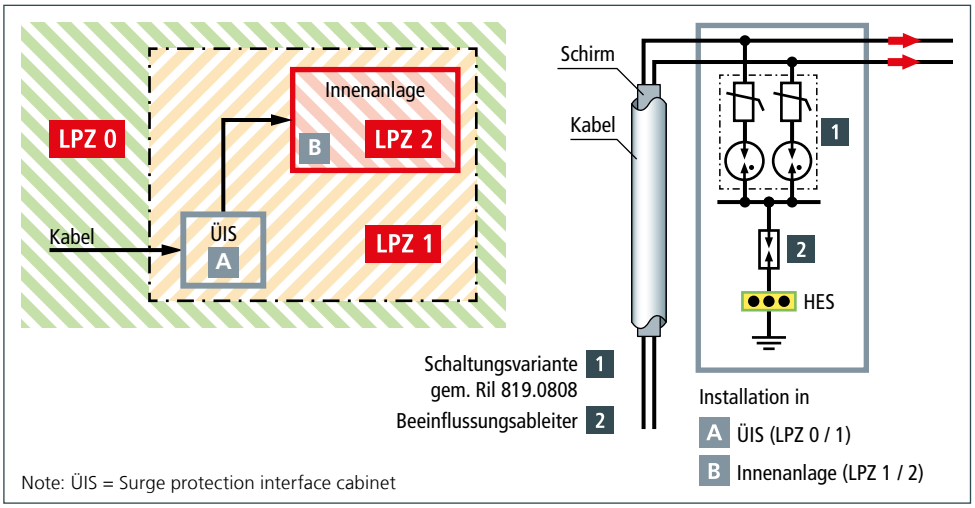
With its particularly slim design of only 6 mm, this surge arrester was specially designed for use in the railway environment. Its performance parameters are directly adjusted to the requirements of Ril 819.0808. This makes BLITZDUCTORconnect an important component in the protection concept, especially with regard to the railway's own interference voltage.

- **No interaction / no leakage current**
  The signal circuit is not affected when the impedance-neutral arrester is removed or plugged in.
- **Narrow design**
  Two signal lines in a unit which is just 6mm wide solves space issues in the switchgear cabinet.
- **Remote signalling function**
  The required remote signalling function facilitates remote maintenance. Since the signals are transmitted to a higher-level control system such as DB MAS, there is often no need for personnel to be deployed on site
- **Visual status indication**
  The "red-green" condition indicator saves time during on-site maintenance.

Practical tip

In order to reliably control permanent and short-time interference, a circuit combination of arresters from the Red/Line product series and BLITZDUCTORconnect MVG is recommended.

Questions about selecting the right arrester? railway.technology@dehn.de



Note: ÜIS = Surge protection interface cabinet

- Easy
- Safe
- Robust

Protection systems for signalling and control and telecommunication systems		Type	Part no.
	**BLITZDUCTORconnect** Modular lightning current arrester for protecting signal lines in accordance with Ril 819.0808. Non-interacting signal path and visual status indication, remote monitoring/ group message as per Ril 819.0808 can be implemented.	**BCO ML2 MVG 230** **DRC IRCM**	**927 290** **910 710**
	**DEHNguard** Modular surge arrester for indirect shield connection Protection against permanent interference (250 V) Leakage-current-free series connection of a varistor and a spark gap in the plug-in protection module	**DG S 275 VA FM**	**952 087**
	**DEHNbloc Maxi** Coordinated lightning current arrester in combination with BLITZDUCTORconnect ML2 MVG 230; for protection against permanent and short-time interference voltage (250 V / 1500 V @ 100 ms).	**DBM 1 440 SN1885 FM**	**961 148**
	**DEHNventil** Combined lightning current and surge arrester type 1 + 2 for protecting the power supply 230/400 V, 16.7 bis 60 Hz. Compact design: Width 4 DIN modules	**DV M2 TT 255 FM**	**954 315**

More protection solutions are available on request. Please contact info@dehn.de

Protection of GSM-R transmitting and receiving systems

Safety for all mobile communication sites.

A mobile communication system specially for the railway? That's GSM-R. Among other things, this system forms the basis for communication and data transmission in the railway infrastructure. Reliable GSM data transmission is also the basis for ETCS, an optimally functioning, future-oriented train control system.

Prerequisites for this are good radio coverage and the longest possible transmission ranges. As a result, the masts are usually in exposed locations alongside the railway tracks.

However, it is precisely this exposed location that means the masts are at greater risk of being struck directly by lightning. Without surge protection, there is a high probability of damage and operational downtime.

DEHN develops protective devices and solutions especially for mobile radio sites. These make it easy to achieve and sustain protection goals such as personal safety and maximum system availability.

Protection solutions for GSM-R transmitting and receiving systems		Type	Part no.
	**DEHNvap** Modular combined arrester (type 1 + 2). For protecting the 230/400 V power supply of cell sites in the main distribution board	**DVA M NG 3P 100 FM** More information at: **de.hn/7h1A1**	**900 352**
	**DEHNsecure** Modular, coordinated lightning current arrester (type 1) for protecting the power supply and 48 V DC remote radio units.	**DSE M 1 60 FM**	**971 126**
	**DEHNpatch** Universal surge arrester for PoE radio link. For use in- and outdoors (IP66)	**DPA CLE IP66**	**929 221**
	**HVI Lightning Protection** Separation distances are important when installing an external lightning protection system on cell sites. The risk of flashovers between the external lightning protection system and components of the radio system (e. g. antennae, RRUs) is reliably prevented using adequate spacing **or** with a high-voltage-resistant, insulated HVI Conductor from DEHN.	You can find further information on the Internet More information at: **de.hn/2Xmrr**	

More protection solutions are available on request. Please contact info@dehn.de

Protection of point heaters

Staying safely on track.

Staying safely on track
Points must always work. Even in ice and snow. That's exactly what point heaters are for. A complex system in the background ensures that these are only activated then when the weather conditions require it. Sensitive electronics are required to collect the relevant environmental data, evaluate the data in a control cabinet and activate the heating. Lightning strikes, surges and electromagnetic interference pose a threat to this complex point heating system

Ensure reliable operation
A comprehensive lightning and surge protection system prevents point heaters from failing. In order to optimally coordinate protective measures, the lightning protection zone concept is used at the planning phase. This holistic approach to all measures combines the best protection with economic efficiency and planning reliability.

Protection solutions for point heaters		Type	Part no.
	**DEHNventil** Combined arrester type 1 + 2 + 3 for protecting the 462 V / 16.7 Hz power supply in the railway network. Compact design: Width 4 DIN modules	**DV M2 TT 255 FM**	**954 315**
	**DEHNguard** Modular, coordinated surge arrester (type 2 + 3). For protecting 230/400 V / 50 Hz AC heating circuits.	**DG M TT 275 FM**	**952 315**
	**BLITZDUCTORconnect** Modular lightning current arrester with a width of 6°mm. For protecting the data and information technology interfaces, e.g. RS232 / RS 485 / I/O interface 24 V. Non-interacting signal path and visual status indication, remote monitoring/group message as per Ril 819.0808 can be implemented.	**BCO ML2 MVG 230** **DRC IRCM** More information at: **de.hn/6zpuQ**	**927 290** **910 710**
	**earth rod** For earthing point heaters	**TE 20 1500 AZ V4A**	**620 902**

More protection solutions are available on request. Please contact info@dehn.de

Protection of LED track field illumination

Staff safety, optimal operating procedures.

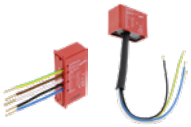
Experts know that the illumination of railway facilities is a complex system. Many very different areas must be lit: level crossings, parking areas, marshalling yards...

Intact luminaires protect staff and optimise operating procedures
Obviously, good illumination can prevent accidents at work because obstacles or areas that are difficult to make out can be seen better. In addition, many jobs require a particularly well illuminated field of vision.

Intact luminaires save time and money
A decisive advantage of LED luminaires is their low energy consumption, the disadvantage is their relatively low dielectric strength. Unfortunately, the cost advantage dwindles in relation to the number of lamps damaged because the purchase price is relatively high. In order to illuminate as much area as possible, these lamps are often mounted in an elevated position. This makes them particularly vulnerable during thunderstorms. Repairs and lamp replacement are costly and time-consuming. A good reason to take precautions and prevent damage as far as possible.

Conclusion: Damage due to surges must be averted. For this reason, Ril 954.9103 contains principles for planning and installing lighting systems in safety-relevant areas of DB Netz AG.

DEHN protects luminaires in the railway environment
The DEHN product range includes combined lightning and surge arresters for protection against direct lightning strikes and surges. The protective devices intended for the railway sector are capable of both 16.7 Hz and 50 Hz. They are equipped with a remote signalling contact and optical monitoring. All arresters are modular and resistant to vibrations.

Protection solutions for LED track field illumination		Type	Part no.
	**DEHNventil** Type 1 + 2 + 3 combined arrester for protecting the sub-distribution board. Compact design: Width 4 DIN modules	**DV M2 TT 255 FM**	**954 315**
	**DEHNcord** Multipole type 2 surge arrester in compact design. For use in LED mast light fuse boxes.	**DCOR L 3P 275 SO LTG** **DCOR L 2P 275 SO IP**	**900 445** **900 448**
	Fuse box for surge protection of LED mast lights. With transparent cover and three-pole DEHNcord (type 2) surge arrester, already integrated in the fuse box.	**SK EK480 G2S 2d LM DCOR**	**900 443**
	**DEHN traction system earthing** Mast earthing with products from the DEHN traction system earthing range.	More information at: **de.hn/4fjia**	

More protection solutions are available on request. Please contact info@dehn.de

Protection of conveyor systems

Keeping lifts and escalators on the move.

Transporting people and loads is the task of lifts and escalators. Special focus is placed on safety because many people are dependent on reliably functioning lifts.

The German railway guideline Ril 813.0460 applies to conveyor systems (FTA) in the railway environment. It regulates the planning, installation and use of equipotential bonding and surge protection in this area.

Comprehensive protection for conveyor systems
According to Ril 813.0460, a type 1 + 2 combined arrester with protective effect should be used at the connection between the conveyor system and the electrical power system. This protects the system in case of direct lightning strikes. For lift manufacturers, the minimum requirement is to use type 2 + 3 surge protective devices.

Specifications for arresters for the protection of conveyor systems
According to Ril 813.0460, surge protective devices for conveyor systems must

- be modular,
- have an operating state and status indication
- have a floating contact
- as a general rule, be operated in the 3+1 configuration (TT network)
- include type 1 lightning current arresters

Protection solutions for conveyor systems		Type	Part no.
	**DEHNventil** Type 1 + 2 + 3 combined arrester for three-phase TT and TN-S systems (3+1 configuration) in the control cabinet of the conveyor system. Compact design: Width 4 DIN modules	**DV M2 TT 255 FM**	**954 315**
	**DEHNguard** Modular type 2 + 3 surge arrester for three-phase TT and TN-S systems (3+1 configuration) in the control cabinet of the conveyor system.	**DG M TT 275 FM**	**952 315**
	**DEHNcord** Compact type 2 + 3 surge arrester for three-phase TT and TN-S systems. Space-optimised use in the control cabinet of the conveyor system.	**DCOR 3P TT 275 FM**	**900 439**
	**BLITZDUCTORconnect** Modular lightning current arrester to protect two single lines for lightning equipotential bonding.	**BCO ML2 B 180** **DRC IRCM**	**927 210** **910 710**
	**DEHN traction system earthing** Mast earthing with products from the DEHN traction system earthing range.	More information at: **de.hn/4fjia**	

More protection solutions are available on request. Please contact info@dehn.de

Stationary traction system earthing

Protecting people, securing rail operations

Traction system earthing protects people and equipment in the rail environment. In the event of damage, such as a broken contact wire, it is required to protect people on the platform from injury and equipment from being damaged.

The normative background is from RIL 997, Untergruppe 02" (German Rail Directive RIL 997, Subgroup 02), with the title "Rückstromführung, Bahnerdung und Potentialausgleich" (Return Circuits, Traction System Earthing and Equipotential Bonding).

Which products for traction system earthing?
Electrically conductive metal parts and partially conductive parts such as noise barriers and metal constructions of tunnels or retaining walls must be electrically conductively connected to other works in the vicinity of the railway line. This is done using earthing bridges and connectors. The earthing bridges cast in concrete serve to connect the internal and external earthing equipment. Earthing connectors are bolted onto earthing bridges. They continue the invisible, internal traction system earthing. For inspection purposes, once established this bolted connection must always be accessible from the outside.

All the products in the DEHN railway earthing range have been technically approved by DB Netz AG.

With a variety of end caps and connecting elements in a modular system, they offer full flexibility in a wide range of construction situations.

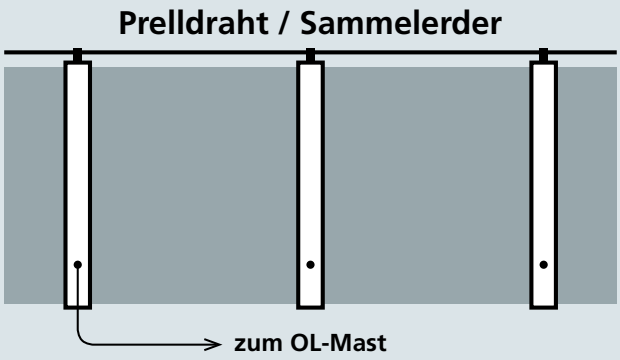
More information at: **de.hn/9F1eR**

Approvals

of DB Netz AG on the basis of
Ebs approval drawings

Stationary traction system earthing		Type	Part no.
	**Earth bridges – the internal, invisible connection** The earthing bridges cast in concrete are intended for earthing, return circuits and equipotential bonding. They serve to connect internal and external earthing equipment.	More information at: **de.hn/4fjia**	
	**Earthing connectors – the external, visible earthing** Earthing connectors are bolted onto earthing bridges that are embedded in concrete. They continue the invisible, internal traction system earthing. For inspection purposes, once established the bolted connection must always be accessible from the outside.		

More protection solutions are available on request. Please contact info@dehn.de



Short-circuit wire on a noise barrier or grating fence

Short-circuit wire

Defined short-circuit in the event of a fault.

During the implementation of railway earthing projects, it has transpired that there are always objects on railway lines that cannot carry short-circuit currents in the event of an overhead contact line break. Objects in the area where the overhead contact line breaks that do not have sufficient short-circuit current carrying capacity put people and installations at risk. These conductive bodies, e.g., metal boundaries or fences, must be reinforced with an additional, sufficiently dimensioned conductors. This is done using a short-circuit wire.
It is installed on fences or boundaries and triggers a defined short-circuit in the event of a broken overhead contact line. Short-circuit wires are also used in tunnel building and for noise barriers.

When is a short-circuit wire required?
A short-circuit wire is always needed then when the conductive body (e.g. grating fence) cannot carry the required short-circuit current. The object is connected to the railway earthing according to the specifications of Ril 997.02 via a short-circuit wire with a suitable diameter. The dimensioning of the short-circuit wire depends on the short-circuit current that must be discharged in the event of a fault.

Dimensioning short-circuit wires – Calculation example for short-circuit currents

$I_K \leq 15$ kA* = short-circuit wire (round wire, St/tZn) ⇨ min. Ø10 mm

$I_K > 15$ kA* = short-circuit wire (round wire, St/tZn) ⇨ min. Ø16 mm

* In this specific application, the I_K limit of 25 kA commonly used in the railway sector was changed to a value of 15 kA, because standard steel wire variants are available from a diameter of Ø10 mm or Ø16 mm.

Protect people and systems

Be it with safety equipment for use on overhead contact lines, in substations, in electrical installations or DC railway systems, or be it personal, high-visibility protective clothing for your team.

Personal protective clothing DEHNcare ArcFit

Certified safety in case of arc faults
DEHNcare ArcFit is the light, comfortable and safe protective clothing in the high-visibility colours signal yellow and signal orange. It meets arc flash protection class APC°2, fulfils high-visibility clothing class 3 and promises excellent visibility thanks to the generous use of reflective strips.

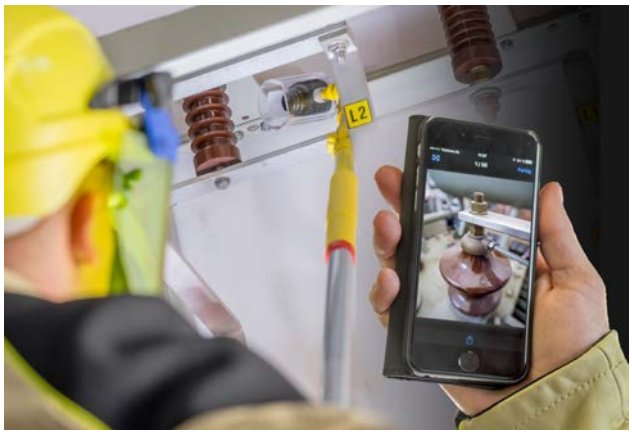
The special feature: this personal protective equipment (PPE) is easily put together online. Customised, with the name of the wearer and the company logo.

DEHNcare ArcFit complies with all standards relating to work on electrical installations. The basis for this is the course of action recommended by BG ETEM for selecting the right protective clothing against the thermal risks caused by arc faults DGUV I 203 077.

More information at **de.hn/cCN5x**

Wireless inspection camera

Safe inspection – easy handling
This practical inspection camera with DB Netz AG approval facilitates the regular visual inspection and documentation of the condition of electrical systems up to 123 kV / 15-60 Hz. Reading the information on hidden rating plates, detecting breakage early on, assessing the degree of soiling and simply taking and archiving photos and films for documentation is child's play with this camera. Even areas that are difficult to access can be safely inspected on a smartphone or tablet, and the LED lighting **helps in poorly lit environments.**



More information at: **de.hn/2cgYy**

Set		Type	Part no.
	**Wireless inspection camera**	**SET DIGIK**	**766 390**
	**LED lighting** For mounting on the housing of the digital camera.	**LED DIGIK ISO**	**766 395**

You will always find the right solution in the DEHN range. All products have been tried and tested in practice. The relevant safety devices are marked with material and drawing numbers and thus have the approval of DB Netz AG.

Mobile traction system earthing

Protecting people working in the track area
Whether it is maintenance or fault rectification, it is imperative that the electrical overhead contact line with its 15,000 volts does not pose a threat to workers or deployed personnel working in the track area. Merely switching off the current in the control room will not suffice. Therefore, the specification of DB Netz AG is that overhead contact lines must be isolated from the power supply according to the five safety rules.

The "earthing device for railways for overhead lines" kit is ideally suited for **these additional earthing measures**. The space-saving version for easy transportation by car consists of telescopic earthing sticks and single-pole EaS devices. The earthing sticks are quickly put together for use thanks to the practical plug-in system. The kit also includes a rail earth clamp with removable ratchet for profile-free earthing of track profiles S49, S54, S64 and UIC60.

Source: Thomas Giehl

More information at: **de.hn/3TesL**

Set		Type	Part no.
	**Profile-free railway earthing equipment for overhead contact lines** (Version for passenger cars, detachable)	**BEV OL PF PKW R**	**750 217**

PHE voltage detector kit

Reliable verification of isolation from supply voltage
The capacitive voltage detector verifies safe isolation from the supply voltage by making contact with the overhead line of electric railways at 15 kV / 16.7 Hz. This robust voltage detector is also suitable for use in wet weather.

The compact version for cars consists of six individual parts and is therefore particularly easy to transport.
For use, the individual parts are easily joined together using a simple plug-in system.

Set		Type	Part no.
	**PHE voltage detector kit** (Version for passenger cars, detachable)	**PHE 15 16.7 6T TA**	**766 617**

More information at: **de.hn/92wjr**

Protection of local transport railways

Safely on the move by suburban train, underground, tram.

Local transport railway systems are becoming increasingly important, especially in conurbations – as a result, the transport network is undergoing continuous expansion. To prevent sources of interference such as lightning and surges or switching operations in the supply network from causing disruptions, these systems are equipped with overvoltage protection.

The challenge of finding a suitable protection solution lies in the different DC voltages with which direct current railway systems are operated. They range from 220 to 1,500 V. A list of these operating voltages and the permissible surges that occur in the DC railway system can be found in DIN EN 50163.

These specifications must be strictly observed when dimensioning surge arresters.
In order to achieve a consistent protection system, all other systems such as 50 Hz, signalling and control and telecommunication are considered holistically. The lightning protection zone concept according to DIN EN 62305 provides an optimal basis for planning.

Future mobility will be digital and intelligent. Issues such as personal safety, system safety and seamless availability are of key importance to public transport operators. The electronic devices and systems used here have only a low dielectric strength. That is why they are particularly susceptible to damage from lightning and surges. All systems are therefore specifically protected to suit the voltage and system type.

Protection solutions for local transport railway systems (tram, suburban train, underground)		Type	Part no.
	**DEHNventil** Type 1 + 2 + 3 combined arrester for protecting the power supply for 400/230 V, 50 Hz. supply systems. Compact design: Width 4 DIN modules	**DV M2 TT 255 FM**	**954 315**
	**DEHNguard** Multipole type 2 surge arrester. To protect the (type 2) power supply. Single-phase: 230 V, 50 Hz AC Three-phase 400/230 V, 50 Hz AC	**DG M TT 275 FM**	**952 315**
	**BLITZDUCTORconnect** Modular lightning current arrester with a width of 6°mm. For protecting the data and information technology interfaces (e.g. I/O interface 24 V). Non-interacting signal path and visual status indication, and option of remote monitoring/group message.	**BCO ML2 MVG 230** **DRC IRCM** More information **de.hn/6zpuQ**	**927 290** **910 710**

More protection solutions are available on request. Please contact info@dehn.de

Insulated and directly earthed earthing systems

Prevent stray current corrosion, protect people.

A specific characteristic in direct current railway systems is the insulated track installation. It aims at reducing stray current corrosion More details can be found in VDV 507. Earthing and potential control is also a very important topic when planning covered facilities,
e.g. train stops. Detailed information on this can be found in DIN EN 62305.
The earthing system protects people from touch voltages. Lightning strikes to the earth pose a further danger. People may be exposed to life-threateningly high step voltage.

Good to know:

Publications issued by the Association of German Transport Companies (VDV) provide basic information on a wide range of subjects in the field of local public transport. They are based on the current DIN, EN and VDE standards.

The VDV publications consider, among other things, the topic of lightning and surge protection specifically in the context of public transport. The topic of earthing is also dealt with here. This is an important point as we are predominantly dealing with **insulated earthing systems** in the public transport environment.

Further information at: knowhow.vdv.de

Indirect traction system earthing

Protecting people in the event of a broken overhead contact line.

Touch voltages are also a problem in the rare case of an overhead contact line break. Dangerous surges occur here between the insulated tracks of the electric railway and the earthed system parts.
The EN 50122 standard refers to the application of VLD-F voltage limiting devices for so-called "open traction system earthing". They connect system parts in the overhead contact line and the pantograph zones with the return circuit as soon as the threshold voltage is exceeded. Here, DEHN offers lightning current-proof voltage-limiting devices of type SDS. A special advantage of these products: Once the lightning current has been discharged, they return to their original state and are ready for action again.

Protection solutions for local transport railway systems (tram, suburban train, underground)		Type	Part no.
	**Voltage-limiting devices (VLD-F)** Safe equipotential bonding in case of a short-circuit or earth fault at the overhead contact line. Discharge of lightning surges without short-circuit formation, thanks to the lightning-resistant SDS voltage limiting device in combination with an appropriate mast adapter. **Siemens product information:** We are also happy to offer you rail adapters of the type Sicat 8WL6503 (Siemens). Please direct your enquiry to railway.technology@dehn.de	**SDS 5** **MA SDS M12**	**923 119** **723 199**
	**DEHN traction system earthing** Earthing with short-circuit tested products from the DEHN traction system earthing range.	More information **de.hn/4fjia**	
 	**Earthing components** Mesh mat and earth rod StSt V4A for protection against step voltage, for earthing buildings and the infrastructure.	**GMA 250 2000X1000X4 V4A** **TE 20 1500 AZ V4A**	**618 214** **620 902**

More protection solutions are available on request. Please contact info@dehn.de

DEHNconcept – 3D lightning protection planning for the central interlocking of the main railway junction in Cologne

All from a single source with DEHNconcept.

Cologne central station is one of the busiest railway stations in Germany. It is an important hub in the Cologne region – but also for train traffic across Germany and Europe. Extensive infrastructure measures are being implemented so as to be well equipped for future requirements. Electronic interlockings form the basis for digitisation in the railway sector. Signalling technology thus becomes more efficient and highly available, which enormously improves the punctuality of trains. The focus is therefore on establishing a central interlocking for the Cologne railway junction.

The new central interlocking will be housed in an existing building. Due to its importance for local and long-distance railway operations and the conversion to the latest electronic interlocking technology, the lightning protection must also reflect the current state of the art The basis for this is the lightning protection standard DIN EN 62305 (Part 3) and the DB guideline Ril 819.0808. In accordance with this guideline, lightning protection must be planned and installed in accordance with lightning protection class I.

For an effective lightning protection concept, a holistic view of the existing building, especially the specific structural conditions, is crucial. With DEHNconcept 3D planning, lightning protection concepts can also be integrated into complex, existing building architecture.

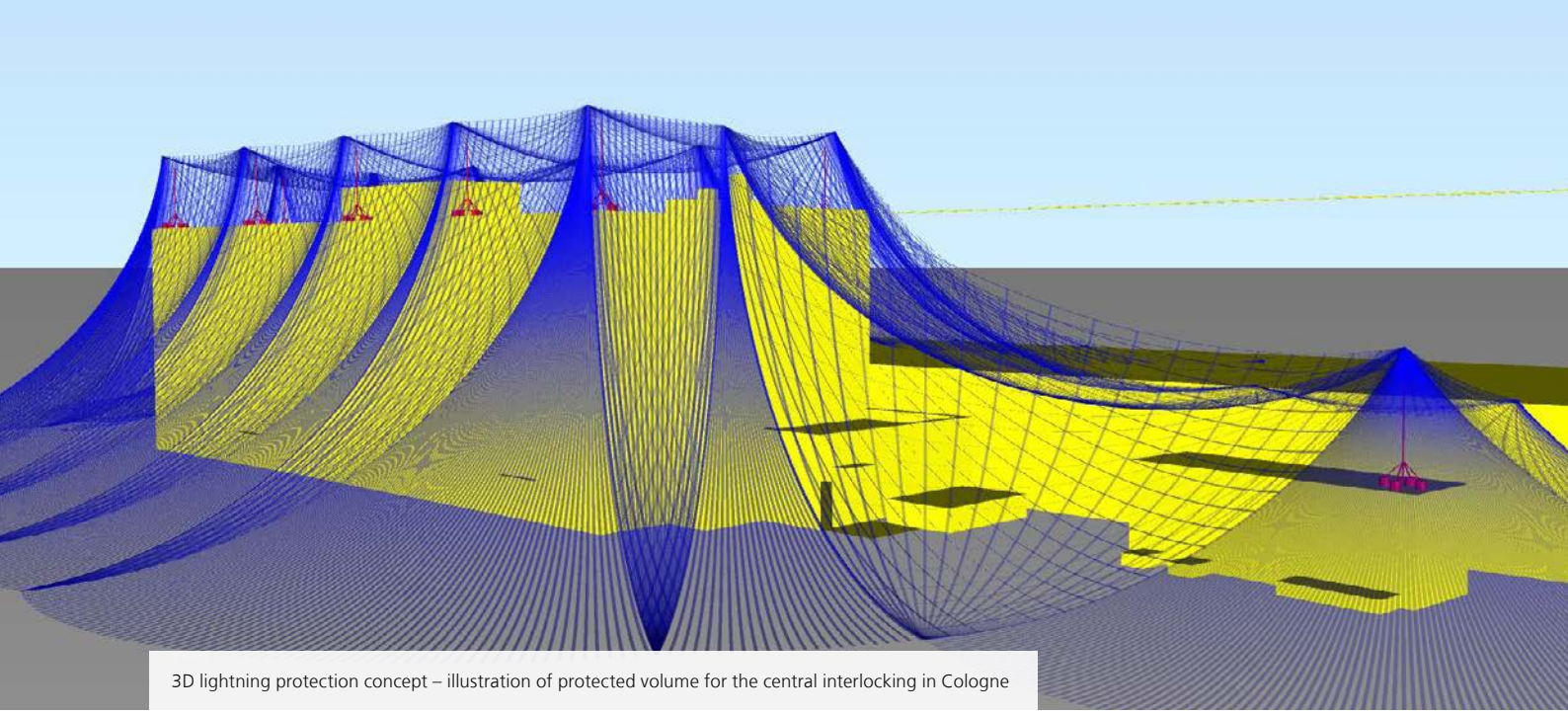
More information at: **de.hn/WcSJK**

This involves digitally recording the entire object. This digitisation is performed on the basis of as-built 3D drawings or, alternatively, by means of 3D laser scanning. In this way, all protected volumes are presented clearly and spatially. This allows the optimum placement of air-termination systems – the corresponding DB guideline Ril 819.0808 is observed right from the start.

Benefits of 3D planning

- The precise positioning of the air-termination systems optimises material expenses and installation work. Another aspect which reduces the material expenses is that the 3D visualisation makes it quickly noticeable where existing parts of the building might serve as elements of the protection concept.
- Bills of materials with detailed drawings simplify purchasing.
- Basic principle sketches facilitate construction.
- Once the system has been digitised, all future expansions, modifications and annexes can be added to the 3D model at any time.
- An acceptance report is created to document the 3D lightning protection planning.

We look forward to hearing from you.
Team DEHNconcept
Tel. +49 9181 906-1600
Email: dehnconcept@dehn.de



3D lightning protection concept – illustration of protected volume for the central interlocking in Cologne

Planning with DEHNconcept – step by step

Step 1 Recording

The building data is recorded based on as-built drawings or 3D laser scans from DEHN.

Step 2 Creating the concept

DEHNconcept planning includes the entire protection concept. This involves: As-built drawings, detailed drawings, written descriptions with images and design documentation, as well as bills of materials.

Step 3 Implementation and approval

An isolated HVI-based lightning protection system was planned for the central interlocking in Cologne. GRP/aluminium supporting tubes on four-legged stands were used as air-termination systems, HVI Conductors were installed as down conductors to the earth-termination system. This was followed by the connection to the existing earthing system and its upgrading.

DEHNconcept, the professional planning service for comprehensive lightning protection systems. An immense simplification of the complex planning involved in converting or extending existing buildings.

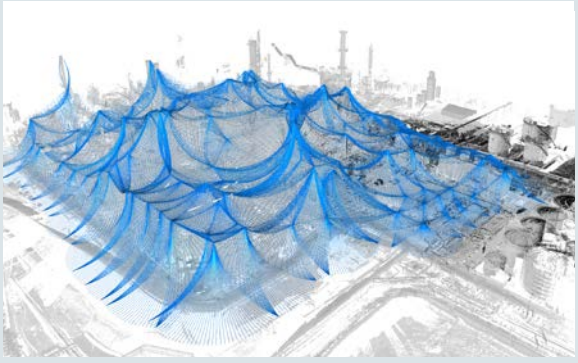
Good to know:
Precise planning with laser scanning

With this special technology, your plant will be recorded and digitised in detail – the result is a quick and precise quantity survey of complex buildings and installations in the form of a 3D model. This can then be incorporated directly into a 3D lightning protection plan.

Benefits of 3D laser scanning

- Practical: With this procedure, there is no need for the customer to provide plans of the facility. Laborious reconstructions using as-built drawings are done away with entirely with this method.
- Digitisation takes place while the system is in operation.

3D laser scanning – the ideal basis for precise 3D lightning protection planning!



Surge Protection
Lightning Protection / Earthing
Safety Equipment
DEHN protects.

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