Enhanced safety
Lightning and surge protection from DEHN

DEHN protects.
Safety from a single source

The family-run company offers safety from a single source – as a full-range supplier of coordinated system solutions for earthing, lightning protection and surge protection.

Eliminating risks
Lightning and surge protection are essential components when it comes to preventing fire, guarding against the failure of important networked systems and protecting people. These protection measures are becoming more and more important in our modern work environment with Industry 4.0 and intelligent buildings.

Prevent unnecessary risks:
- **For people, buildings and sensitive technology** – mit einem wirksamen Schutzkonzept gegen Blitzschlagwirkungen und gefährliche Überspannungen
- **For your planning** – mit Unterstützung, Beratung und Know-How vom Experten DEHN

Always a good feeling
DEHN is your partner for all aspects of lightning and surge protection. Whether planning support, technical consultation, risk analysis or product selection, DEHN is at your side – competent, reliable and “Made in Germany”.

Good reasons to act
Lightning and surge protection

Earthing
Functional from scratch

External lightning protection
Coping with direct lightning strikes

Protection concepts for buildings
Residential, functional and industrial buildings

Surge protection
Security systems, photovoltaic systems, electromobility, LED lights and technical building services equipment

Range of services
Easy planning

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DEHN makes you and your customers feel safe – with services which far exceed the standard:
- **DEHN is competent**: The family-run company has over 100 years of experience in the field of earthing, lightning protection and surge protection
- **DEHN deals in safety**: The full-range supplier offers coordinated system solutions “Made in Germany”
- **DEHN provides services**: Including special software, planning and risk analysis services, not to mention prompt answers to your technical queries
- **DEHN supplies data as Eplan, Datanorm, Product macros, multi dimensional drawings, CAD, product specifications for tenders ... etc.**

Safety from a single source
Make use of the benefits and synergies presented by a wide range of products and services:
Good reasons to act
Requirements and risks

Why do professional protection measures make sense? There are many good reasons: Technology, system and services must be permanently available, climatic conditions are changing, standards and risks, systems and services must be considered.

Considering changes

Our climate is changing and extreme weather is becoming more common. The risk of lightning strikes and fire or damage due to surges is increasing, lightning strikes even in winter seasons. At the same time, living comfort and modern work and production processes are dependent on sensitive networked technology, e.g. lightning strikes even in winter seasons.

Standards and federal or municipal building regulations call for protection against lightning and surge damage. A detailed overview of the relevant standards and legal stipulations can be found in chapter 1 of our Lightning Protection Guide (de.hn/lpg).

Fulfilling requirements

Standards and federal or municipal building regulations call for lightning and surge protection measures. There are different requirements for buildings with and without an external lightning protection system. A detailed overview of the relevant standards and legal stipulations can be found in chapter 1 of our Lightning Protection Guide (de.hn/lpg).

Overview of the most important standards:
- Lightning protection: IEC 62305, 1-4
- Surge protection:
  - IEC 60364-4-44 clause 443
  - IEC 60364-4-44 clause 444
  - IEC 60364-5-53 clause 534
  - IEC 60364-5-54
- Earthing: DIN 18014, IEC 61936-1

Identification of risks and determination of the risk potential

Risk management according to IEC 62305-2

A risk analysis allows you to assess and determine the risk potential for structures. This risk analysis forms the basis for specific measures to minimise the risks.

The aim of risk management is to define economically optimal protection measures – tailored to the building characteristics and use.

Lightning protection zone concept

The lightning protection zone concept according to IEC 62305-4 makes it easier to plan, implement and monitor surge protection measures. A building is divided into zones with different risk potential. Inner and outer lightning protection zones are defined according to IEC 62305-4 depending on the lightning threat. Based on these zones, it is determined where measures or arresters are required.

- LPZ 0: Zones outside the building subjected to direct lightning effects, no shielding against LEMP
- LPZ 1: Zone inside the building with a low risk of partial lightning energies
- LPZ 2 – LPZ n: Further zones inside the building with decreasing surge-related risks

More information at short link: de.hn/lpg.

Effective protection concept

Avoid taking unnecessary risks by way of an effective lightning and surge protection concept. This means including the following measures in your designs and planning right from the start:
- Earthing/equipotential bonding
- External lightning protection
- Surge protection

Provides safety

Failure to take proper lightning and surge protection precautions can, in the worst case, result in serious injury or even loss of life. Fires, malfunctions or lack of availability of important systems also have serious consequences – especially for intelligent building systems. Failure of individual networked components, e.g. due to surge damage, may cause entire systems to collapse, paralysing whole buildings or work and production processes. For companies, downtime is not just a matter of high costs and the effort involved in repairing the damage, it may threaten their very existence.

Lightning and surge protection are indispensable when it comes to protecting people, preventing fires and guarding important networked systems against failure.
Earthing

Whether existing or new buildings, a functioning earth-termination system is the pre-requisite for the safe operation of electric systems in buildings and for protecting people from dangerous high voltages.

The design and implementation of the earth-termination system are of central importance. After the concrete has set, it is no longer possible to retrofit this vital component, e.g. in the form of a foundation earth electrode. Omissions or errors during the construction phase cannot be corrected later or, at least, not without a great deal of effort and expense.

Foundation or ring earth electrodes

Foundation or ring earth electrodes are a safe and cost-effective earth-termination system – over the entire lifetime of the building.

The foundation earth electrode is installed in the concrete foundation and covered by at least 5 cm of concrete to ensure corrosion protection. However, in some cases this conductive earth connection may no longer be ensured (foundations with increased earth contact resistance) due to various building construction measures (e.g. when constructing a building made of waterproof concrete). A corrosion-resistant ring earth electrode must then be installed in the ground outside the building foundation and connected to a ring equipotential conductor in the foundation.

Components of the earth-termination system

A Foundation and ring earth electrode

High-quality earthing materials from DEHN provide a solid foundation for the building’s earth-termination system. Depending on the type of building, a foundation earth electrode is installed in the foundation and, if required, an additional ring earth electrode outside the foundations.

Product examples

- Foundation earth electrode
  - Strip steel, hot-dip galvanised
  - Round steel, hot-dip galvanised
  - DEHNclip – Rd B-9/Rd 10
  - Rd B-9/Fl 30 x 3.4
- Ring earth electrode
  - Round steel, StSt V4A
  - Cross clamp

Part No.

- 852 335
- 308 131
- 308 141
- 860 010
- 319 209

B Main earthing busbar and fixed earthing terminal

If a ring earth electrode is installed, it must be connected to the functional bonding conductor in the foundation, thus ensuring a professional earth-termination system.

Product examples

- Wall bushing
- Equipotential bonding bar

Part No.

- 478 540
- 963 200

C Connections to the lightning protection system

It is advisable to provide connections for an external lightning protection system when constructing a new building. If terminal lugs are installed already, an external protection system can be installed already, retrofitted more easily at lower cost.

Product examples

- Earth entry V4A
- Rod holder V4A
- Anti-corrosion tape
- MV clamp V4A

Part No.

- 860 130
- 274 160
- 556 125
- 390 079

Pad foundation

Buildings with pad foundations (e.g. for columns) must be connected to a foundation earth electrode with a length of at least 2.5 m in each foundation. To establish equipotential between the pad foundations, these pad foundations must be interconnected in such a way that they are electrically conductive and corrosion-resistant.
External lightning protection

External lightning protection is set out in the IEC 62305 standard and protects buildings from the effects of a direct lightning strike. A complete lightning protection system consists of the following elements: air-termination system, down conductor system, earth-termination system, lightning equipotential bonding or separation distances.

The lightning current flows into the down conductors via the air-termination system and is conducted to the ground in a controlled manner. The important thing here is that the separation distances from conductive metal parts are maintained. Otherwise, dangerous flashover can occur which may cause sparking and start a fire. Lightning equipotential bonding reduces the potential differences caused by the lightning current. This is achieved by connecting all isolated conductive system parts directly by means of conductors or by means of surge protective devices (SPDs).

There are two types of external lightning protection system for a building:

Conventional lightning protection system

If the separation distances from metal and/or earthed installations is maintained consistently, the air-termination and down-conductor systems – for example round wires or air-termination rods – can be installed on the surface of the building. Please note: Special requirements must be observed for buildings with thatched roofs!

If separation distances cannot be maintained due to the properties of the building, consistent lightning equipotential bonding is required. As an alternative, an isolated lightning protection system can be installed.

Isolated lightning protection

In case of an isolated lightning protection system, air-termination rods, air-termination masts or masts spanned with cables protect the entire building against the effects of a direct lightning strike. The separation distance between the lightning protection system, the building and installations as pipes, chimneys, coolers, wires and antennas etc. must be maintained.

HVI Lightning Protection

HVI Lightning Protection comprises a high-voltage-resistant insulated down conductor which, in combination with the relevant supporting tubes and air-terminations rods, forms the isolated lightning protection system. The special feature is that the lightning current carrying conductor is wrapped in semi-conductive insulating material so that the necessary separation distance – be it from other conductive parts of the building or electrical lines and pipes – can be easily maintained. Consequently, further measures such as the additional connection of a braided shield are not required.

HVI Conductors also cater to the desire for a modern appearance and design. The conductors can be painted to match the colour of the building or even installed behind the façade. The system can thus be optimally adapted to the architecture of a building and offers entirely new design possibilities.

Glass-fibre reinforced plastic (GRP)

As an alternative, air-termination and down-conductor systems made of electrically insulating material such as GRP can be mounted on the object to be protected.
Nowadays, smart technology forms the basis for modern living. It offers comfort, security and independence. Surge protection is instrumental in ensuring that this technology is reliable.

Safeguarding living comfort in smart homes

Modern lifestyle is increasingly defined by digital devices: Smart TV, intelligent home automation, burglary protection systems, home office or electromobility to name but a few. A lot of us already take the comfort of smart homes for granted. The downside of smart is that devices are becoming increasingly sensitive and more susceptible to interference. Surges can cause serious interference and damage or even destroy important networked technology. This may cause the entire smart system to collapse leading to a drop in the accustomed standard of living.

Availability 24/7 h is a must!

Observing surge protection requirements

Vital technology is becoming more and more sensitive but, at the same time, requires higher protection. For this reason, the IEC 60634-4-44 clause 443 and IEC 60364-5-53 clause 534 standards were revised and adapted accordingly. IEC 60634-4-44 clause 443 describes when surge protection measures need be taken in systems and buildings - IEC 60364-5-53 clause 534 explains how to select arresters and install them in the electrical installation. Upon the issue of the new edition of IEC 60364-4-44 clause 443, surge protection became mandatory for new residential buildings.

Surge protection is important to ensure that all the devices in modern homes work reliably since there is more at stake than just functioning devices: It is about protecting families, preserving a modern way of life and, for freelancers, securing their home office and their livelihood.

Find out about further protection measures:

<table>
<thead>
<tr>
<th>Earthing</th>
<th>External lightning protection</th>
<th>Photovoltaics / e-mobility</th>
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</table>

Protection proposals for residential buildings can be found in our brochure “Thrilling Times” - Relax: DEHN protects residential buildings.
Keeping working environments up and running
Lightning and surge protection solutions

Whether modern work stations, office buildings or commercial premises – they all require reliable technical components to fulfil their function. Outages must be prevented.

Modern work environments are becoming increasingly sensitive

Buildings are becoming smart. They are based on networked technical components which require a permanent supply of power and data. Today modern commercial buildings such as hotels, medical facilities or office buildings are defined by smart building equipment. As an example, intelligent systems automatically control and optimise the energy requirement, arrange for the cleaning of only those areas which have really been used and control access via sensitive security technology.

Failure of individual components, e.g., following lightning strikes and surges, may cause the collapse of all networked systems, bringing entire buildings and work environments to a standstill, access control cannot be assured – these horror scenarios can be avoided! Lightning and surge protection precautions ensure that important technology always works safely and reliably.

The surge protection requirements of the IEC 60364-4-44 clause 443 and IEC 60364-5-53 clause 534 standards mentioned before also apply to office and commercial buildings. As far as the protection of people is concerned, further building regulations must be observed, e.g., fire protection regulations. Here, lightning and surge protection also makes a significant contribution towards preventing people from sustaining serious injuries and buildings from catching fire.

If medical premises such as diagnosis rooms with MRI or X-ray devices, dental surgeries or day surgery centres are located in commercial buildings, IEC 60364-7-710 also applies. The focus here is on the safety of patients and medical staff. The standard specifies requirements for electrical safety and the uninterrupted power supply in these areas.

Regulations call for protection measures

The surge protection requirements of the IEC 60364-4-44 clause 443 and IEC 60364-5-53 clause 534 standards mentioned before also apply to office and commercial buildings. As far as the protection of people is concerned, further building regulations must be observed, e.g., fire protection regulations. Here, lightning and surge protection also makes a significant contribution towards preventing people from sustaining serious injuries and buildings from catching fire.

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Functional buildings
Example with external lightning protection

External lightning protection
A Air-termination system
B Roof conductor holder for flat roofs
C Down conductor
D Terminal lug
E Self-supporting air-termination rod with tripod
Part No. 105 351 / 102 010
Part No. 253 050
Part No. 840 028
Part No. 860 115

Surge protection – Power supply (Red/Line)
T Main distribution board
F Sub-distribution board
I Protection of terminal devices
H Photovoltaics

Surge protection – Data and information technology (Yellow/Line)
T Data technology / Fire detection technology
J LSA system
K Ethernet, PoE++
L KNX / EIB bus

Find out about further protection measures:

More info: de.hn/functional
Industry Examples with HVI Lightning Protection

Keeping production rolling
Lightning and surge protection solutions

Lightning and surge protection concepts ensure that the sensitive networked automation systems of Industry 4.0 are protected, and that plants and production processes are permanently available.

Keeping production rolling
Trouble-free communication of machines and plants in modern production environments requires the consistent flow of both power and information. Machines must run reliably and work processes function smoothly – even in case of thunderstorms and surges. A production outage can have severe, sometimes even existential, financial consequences. Environmental issues may occur. Risks easily avoided by a carefully planned lightning protection concept.

Considering power and data technology
For industrial companies, it is advisable to install an isolated external lightning protection system. Separation distances are reliably maintained, and lightning energies are safely discharged along the outside of the building. This prevents sensitive electric components inside the building from disturbance and destruction.

Combining external lightning protection with internal protection provides additional protection. Protective devices such as ACI or CI arresters secure the power supply and, at the same time, save valuable space. Since these arresters do not require a backup fuse, errors when dimensioning an upstream fuse are automatically excluded. It is also easier to keep connecting cables within the prescribed lengths.

In addition to the power supply, data lines are an important lifeline of modern production plants. Data exchange and networked communication structures are the core components of Industry 4.0. Therefore, all data networks must be protected against dangerous surges. The main issue here is to choose adequate data and information technology arresters for the relevant system – i.e. ones which are compatible with bus systems such as KNX, DALI.

Find out about further protection measures:

External lightning protection
Alarm / security systems
LED lights
Technical building services equipment
Ensuring security

Protection measures for security systems

So that security systems always work: Electric security systems are only truly reliable if they do not fail during thunderstorms. Surge protection prevents damage and failure.

Ensuring availability

Whether fire precautions, burglary protection, control access or emergency and escape route lighting – security systems must be permanently available. If lightning strikes and surges destroy security systems or safety systems no longer work, lives are at risk.

An important economic aspect: Surges can cause incorrect signals or false alarms, resulting in high follow-up costs. Make sure you integrate all these sensitive safety and security systems in your lightning and surge protection concept to ensure that they always function perfectly.

Meeting requirements

Fulfilling legal and normative requirements is a must for manufacturers, planners and installers. At the same time, requirements for protecting security systems are often complex. One must observe all applicable rules and regulations in the relevant countries and states, e.g. the legal duty to maintain safety, normative requirements, the technical building regulations law and construction product directives, as well as generally accepted rules of technology and insurance company requirements.

Example of networked safety and security technology

Surge protection for power supply and lighting systems

<table>
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<tr>
<th>Voltage supply for the central fire alarm system</th>
<th>Safety lighting</th>
<th>Safety lighting</th>
<th>LED lights</th>
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<tr>
<td>DEHNrail M 2P</td>
<td>DEHNsecure M</td>
<td>DEHNguard SE</td>
<td>DEHNcord IP</td>
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<tr>
<td>Part No. 953 205</td>
<td>Part No. 971 122</td>
<td>Part No. 972 110</td>
<td>Part No. 900 447</td>
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Surge protection for BUS, signalling and data technology

<table>
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<tr>
<th>Public address system</th>
<th>Ethernet, LAN connection, video</th>
<th>Input and output of the fire alarm system</th>
<th>Information technology for RS 485 interface</th>
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<tr>
<td>DEHNvario</td>
<td>DEHNwatch Class E</td>
<td>BUTZDUCTOR XT 8E</td>
<td>BUTZDUCTOR XT 8D HFS</td>
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<tr>
<td>Part No. 928 430 / 928 440</td>
<td>Part No. 929 121</td>
<td>Part No. 920 300 / 920 224</td>
<td>Part No. 920 300 / 920 271</td>
</tr>
</tbody>
</table>

More info: de.hn/security
Ensuring power generation
Protection for photovoltaic systems

Surge damage due to thunderstorms is one of the most frequent causes of damage to photovoltaic systems. Protection measures increase the availability of your system and secure the yield in the long term.

Protection of rooftop systems
One of the most common forms of PV systems is the rooftop system. Due to its exposed position, it is particularly prone to damage caused by direct and indirect lightning effects. Comprehensive protection is therefore required and consists of:

- **External lightning protection** including air-termination and down-conductor system
- **Internal lightning protection** for lightning equipotential bonding using type 1 arresters for electrical systems

For economic reasons, lightning and surge protection should be incorporated at the design stage of PV systems – subsequent installation is much more expensive and time consuming.

Preventing surge damage
Surges resulting from thunderstorms frequently destroy system parts such as modules, inverters and the monitoring system. The resulting financial loss and costs are considerable, e.g., replacement of a faulty inverter, new installation or loss of revenue during downtime. This can easily be prevented by a lightning protection concept.

For economic reasons, lightning and surge protection should be incorporated at the design stage of PV systems – subsequent installation is much more expensive and time consuming.

In general, we recommend considering IEC 60364-7-712 which defines lightning and surge protection required for PV systems. Especially the DC site is focused on.

In addition, the IEC TR 63227 ED 1 has been approved by TC 82 – Solar Photovoltaic Energy Systems – and will be published within 2019. This informs about the requirements for external lightning and surge protection of PV systems.

Surge protection for buildings with external lightning protection

<table>
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<tr>
<th>Main distribution board – AC</th>
<th>Photovoltaic system – DC separation distance is kept</th>
<th>Photovoltaic system – DC separation distance is not kept</th>
<th>AC side of the inverter</th>
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<tr>
<td>DEHNventil M TNS</td>
<td>DEHNguard M YPV</td>
<td>DEHNcombo YPV</td>
<td>DEHNguard M TNS</td>
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<tr>
<td>Part No. 951 405</td>
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<td>Part No. 900 075</td>
<td>Part No. 952 405</td>
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</table>

Staying mobile
Surge protection for E-mobility

Mobility is changing rapidly. In the future, charging posts for electric vehicles will be an integral part of the transport infrastructure. These charging posts need to be protected to ensure that electric vehicles are fit for use, even after a thunderstorm.

Protecting charging stations and vehicles
Charging posts are required wherever electric vehicles are parked for a prolonged period of time, e.g., in car parks for residents, visitors, customers, patients or employees. Lightning effects and surges pose a risk for the sensitive electronics of the charging post and the vehicle visitors themselves.

In case of a thunderstorm, the sensitive electronic circuitry for the controller, counter and communication system is particularly at risk. Satellite systems with interconnected charging points can be completely destroyed by a single lightning strike. Surges during the charging process frequently not only damage the charging post, but also the electric vehicle connected to it.

Electric vehicles generally have an electric strength protection level of up to 2,500 V. However, the voltage occurring during a lighting strike may be 20 times higher. Therefore, prevent damage protection level and meet the normative requirements according to IEC 60364-4-44 clause 443, IEC 60364-5-53 clause 534 and IEC 60364-7-722.

Protect charging systems and electric vehicles from costly damage:
- To the charge controller and battery
- To the control, meter and communication electronics of the charging system
- To the electrical system of the vehicle itself.

Surge protection for charging systems and electric vehicles

<table>
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<tr>
<th>Charging post: Power supply</th>
<th>Charging post: Information technology Universal cabling</th>
<th>Charging post: Information technology for RS 485</th>
<th>Wall box in the protected volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEHNshield TNS</td>
<td>DEHNpatch Class E</td>
<td>BLITZDUCTOR XT 8D HF</td>
<td>DEHNguard M TNS</td>
</tr>
<tr>
<td>Part No. 941 405</td>
<td>Part No. 929 121</td>
<td>Part No. 929 300 / 920 371</td>
<td>Part No. 952 405</td>
</tr>
</tbody>
</table>

TIP
More info: de.hn/pv-systems

More info: de.hn/safety-emob
Protection of lighting systems
Surge protection for LED lights

Surge arresters protect sensitive LED technology from damage, thus preventing cost-intensive failure, time-consuming repair and expensive replacement of the LED light.

Damage caused by surges

Although LED lights have many advantages, their shortcomings over traditional luminaires are that they are more susceptible to surge damage and that the cost of replacement is higher. Such unnecessary costs are easily avoided!

It is not only direct lightning strikes that cause damage. Indirect lightning effects often cause surges which exceed the immunity of sensitive LED lights many times over. This results in partial or complete failure of the LED modules and destruction of the LED drivers. Another risk factor for LED lights is network-generated surges caused by, for example, switching operations which lead to premature ageing of the LED light.

Protective devices prevent failure

Powerful surge arresters protect sensitive LED technology, preventing damage and ensuring the long service life of LED lights. This reduces replacement costs and avoids time-consuming and costly maintenance work. Another advantage: reliable LED lighting ensures uninterrupted work and production processes and, therefore, satisfied users.

Prevent damage and implement a comprehensive surge protection concept:

- Directly at the LED light / light strip
- In the upstream sub-distribution board.

Upholding the infrastructure
Surge protection for technical building services

Surge arresters ensure that the basic supply structures of technical building services are stable and reliable.

Closing security gaps

Technical building services include heating, ventilation, sanitary engineering, air-conditioning and electrical engineering, as well as measuring, control and regulation technology. All these services access the power and data systems of the building. However, this also means that operators rely on the protection measures for the electric devices in these systems. But what happens if there are gaps? Central components of the technical building services are then vulnerable to, e.g., dangerous surges. As a result, the heating or ventilation system might no longer work after a thunderstorm and important measuring and / or control technology could be destroyed.

Observing framework conditions

IEC 60364-5-53 clause 534 calls for separate surge arresters directly at the consumer (e.g. air-conditioning containers or heating sensor) if the cable length from the upstream electrical connection exceeds 10 m. This is an important aspect which is often neglected in technical building services equipment.

Technical building services equipment in modern buildings is interconnected and interdependent. Many components interact, for example, in the power system, to optimise consumption and save resources. Shading and heating systems or air-conditioning and ventilation processes are controlled by specified temperatures or solar radiation. If a single component fails, the function of the entire system is affected.

More info:
de.hn/led-en
dehn/tbse
Easy planning
Services and information

Whether you require support from our planning specialists or you simply have a question – take advantage of our services to facilitate your work and save time.

Planning support
You require professional planning and implementation of a comprehensive lightning and surge protection concept? This is a complex task, particularly if it is not your day-to-day business. Facilitate your work and fall back on DEHN services:

DEHNconcept – Have your lightning protection systems designed for you
Our DEHNconcept team will be happy to plan a comprehensive lightning protection and earth-termination system for you. This saves you the time you would otherwise spend on complex designs and clarifying details and, at the same time, gives you peace of mind. The planned concept is available in an open format (dxf/dwg) and as a 3D model (nwd format). This allows you to integrate the concept in your documentation.

Our portfolio includes e.g.:
- Complete planning of the lightning protection and earthing concept according to IEC 62305
- Risk analysis according to IEC 62305-2: Protection against lightning – Part 2: Risk management
- Dimensioning of earth-termination systems at transformer substations

DEHNsupport toolbox – Digital planning of lightning protection systems
Whether risk management, calculation of air-termination rod and earth electrode lengths or determination of separation distances – this software helps you to plan your lightning protection concept. Five modules allow you to assess the risk potential of structures. You can create a risk analysis and calculate air-termination rod lengths, earth electrode lengths and separation distances. You will receive a clearly structured plan including adequate surge protective devices.

Finding planning data
TIP
CAD data, tender specifications or data sheets – planning data for our entire product portfolio can be found in our online product database – at the click of a button.

Additional information
and services for consultants

More detailed information
Specific concepts can be found in numerous white papers, industry and practical solutions. Or in our Lightning Protection Guide, a lightning and surge protection planning manual. You quickly have all relevant information and solutions at your fingertips.

Good to know:
Everything is available online, at a glance and in a nutshell: www.dehn.de/consult

Answering questions
If you have commercial or specific technical questions, please contact our commercial service or lightning protection, earthing, surge protection, safety equipment or arc fault protection experts:

TIP