

DEHN



EMERGENCIES

DEHN protects technical building equipment

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Good reasons for protection measures

An effective lightning protection concept eliminates risks for intelligent building systems and closes security gaps in the power and data supply. This is a must, especially in case of sensitive, networked technology.

Lightning and surge protection measures ensure that the basic supply structures of buildings are stable and reliable in case of atmospheric lightning effects. Heating, sanitary engineering, air-conditioning or electrical engineering,

all fall under the heading of technical building equipment - The lifelines of the building. If central devices fail, the entire „organism of the building“ may be at risk.

Avoiding danger

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 loss of availability of important technical building equipment also have serious

consequences – especially for intelligent building systems. The malfunction of individual networked components, e.g. due to surge damage, may lead to total system failure and paralyse entire buildings.

Closing safety gaps

All technical building equipment falls back on the central power and data system. This also means that operators often rely on the upstream protection measures for the electric devices in these systems. But what happens if there are gaps in the lightning protection concept? Central components of the technical building equipment then face surges without any protection whatsoever. As a result, nothing works anymore after a thunderstorm. An unnecessary risk!

Take precautions in the form of an effective protection concept!

This consists of:

- **Earthing**
- **Equipotential bonding / surge protection**
- **External lightning protection**



Protection of vital technology

In hospitals, maximum availability of building technology and medical equipment is an absolute must since human lives directly depend on reliably functioning technology. This means that preventive lightning and surge protection measures are vital. These protection measures are based on legal and normative regulations.

Another important aspect is that the requirements for hospitals are becoming more and more complex. This also applies to technical equipment and the necessary interaction of the individual components. An effective and complete lightning protection concept is therefore particularly important for hospitals.

Risk assessment

A lightning protection risk analysis allows you to assess and determine the risk potential for structures. This risk analysis forms the basis for minimising risks and defining economically optimal protection measures – Tailored to the existing structures and their use.

Predictive risk management involves calculating risks for the company. It provides the basis for decisions to limit these risks and shows which risks should reasonably be covered by insurance.

The risk of lightning strikes must also be specifically considered for companies using extensive electronic equipment for production or providing services. It should be noted that losses incurred due to the lack of availability of electronic systems and, as a result, production or services, coupled with the potential loss of data often by far exceed the physical damage to the hardware of the relevant system.

Lightning protection risk analyses aim to objectify and quantify the risk posed by direct and indirect lightning strikes to structures and their contents.

The risk analysis specified in IEC 62305-2 ensures that a lightning protection concept can be drawn up that is comprehensible to all parties involved and technically and economically optimised, i.e. can ensure the protection required at the lowest possible cost. The protection measures resulting from the risk analysis are described in detail in parts 3 and 4 of the IEC 62305 series.

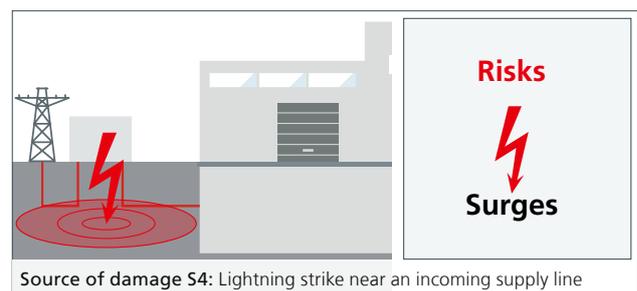
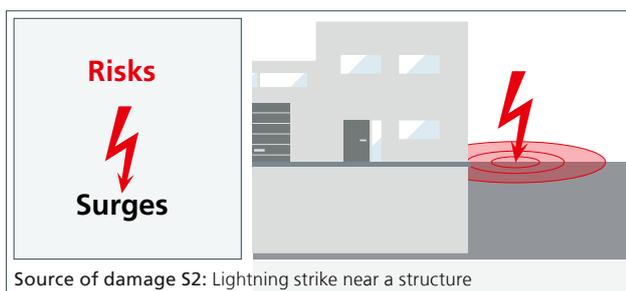
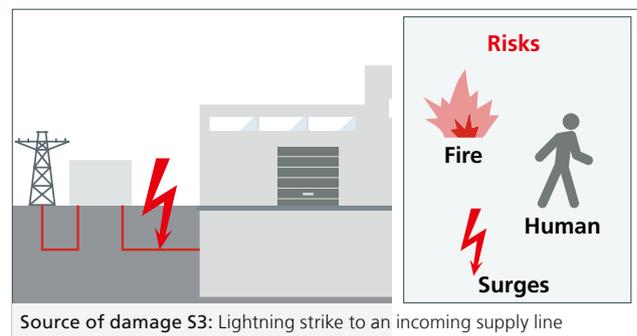
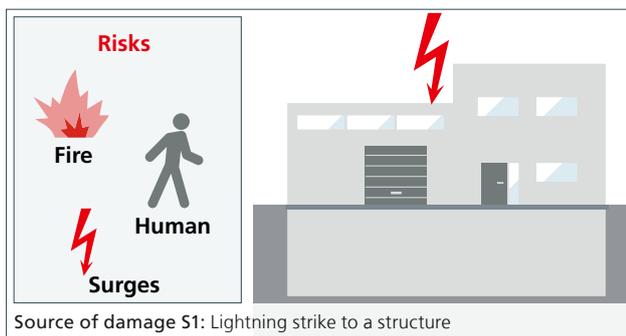
Procedure:

Assessment of the structure

In a first step, the building is assessed based on its equipment, location and risk potential. The result of this assessment is a so-called risk R / whether the determined risk exceeds a tolerable value R_t . The figures below show a simplified representation of the relationship between the type of damage, source of damage and type of loss and provide an initial overview of the risk potential.

Definition of protection measures

The protection measures are defined based on the determined risk. These include, for example various equipotential bonding measures or definition of a class of LPS (LPL, Lightning Protection Level) and thus external lightning protection measures. The aim is to reduce the risk to an acceptable level. After that, internal lightning protection measures (surge protection) are then taken. These are based on the so-called lightning protection zone concept.



Lightning protection zone concept

In case of the lightning protection zone concept, the building is divided into zones with different risk potential. Inner and outer lightning protection zones are defined depending on the lightning threat. Based on these zones, it is determined where which measures are required.

Modern structures and buildings are becoming smart. They are based on a variety of networked technical components: Building management, telecommunication, control and security systems to name but a few. Failure of individual technical building equipment components can have far-reaching consequences and even bring the entire building to a standstill.

Although external lightning protection protects people and material assets in buildings from the risk of fire, it does not protect the electrical and electronic systems from failure due

to surges caused by lightning discharge. The principle of lightning protection zones (LPZ) according to IEC 62305-4 describes effective protection against surges caused by lightning electromagnetic impulse (LEMP).

According to this principle, the structure to be protected should be divided into inner lightning protection zones of different LEMP threat values. Suitable LPZ can be defined depending on the number, type and sensitivity of the electronic devices / systems.

Outer zones:

LPZ 0_A: Zone where the threat is due to direct lightning strikes and the unattenuated lightning electromagnetic field. The systems affected, such as lines extending beyond buildings, may be subjected to the full lightning current.

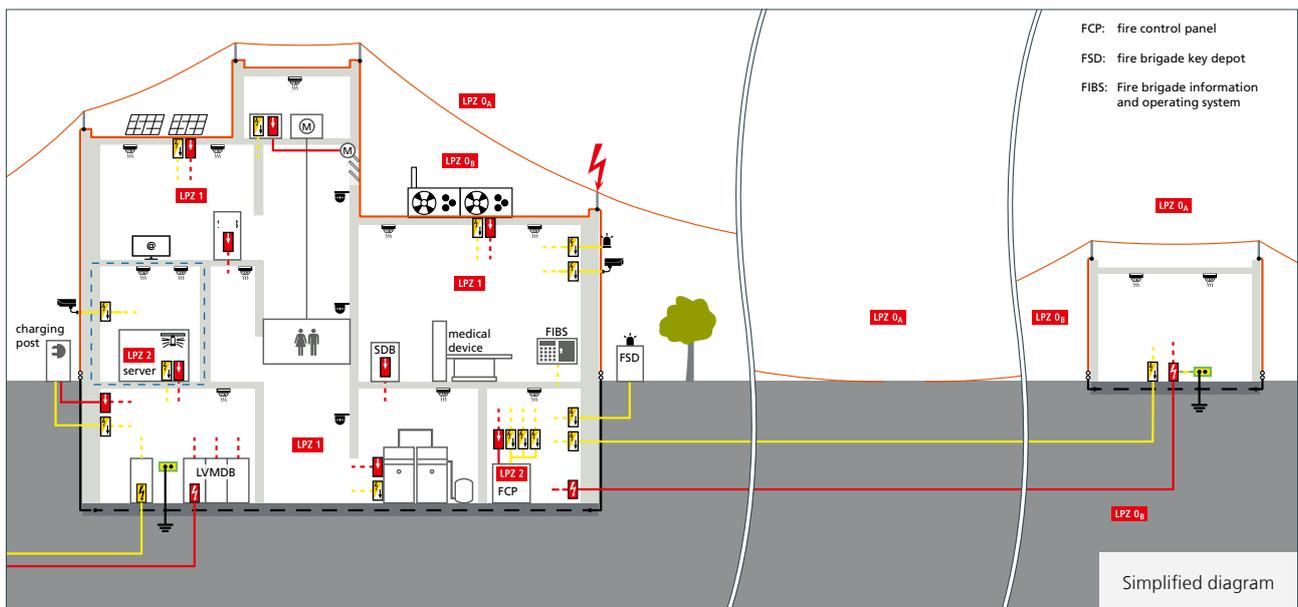
LPZ 0_B: Zone protected against direct lightning strikes, but where the threat is the unattenuated lightning electromagnetic field. The systems affected, such as alarm lights or sirens, may be subjected to partial lightning currents.

Inner zones:

Inner zones are protected against direct lightning strikes. They are divided into:

LPZ 1: Zone where impulse currents are limited by current sharing and surge protective devices at the zone boundaries. Spatial shielding may attenuate the lightning electromagnetic field. Ring lines with detectors are often installed in LPZ 1.

LPZ 2-n: Zone which, compared to LPZ 1, is additionally protected against impulse currents and the lightning electromagnetic field and is therefore subject to less interference.



Experience has shown that hospitals are designed according to class of LPS 2. This includes a defined risk as well as the necessary external lightning protection, equipotential bonding and surge protection measures. In addition to risk management, statutory and normative regulations such as the relevant building regulations, IEC (or EN) specifications or fire protection requirements must also be observed for hospitals.

External lightning protection / earthing

Lightning protection is protection against fire and, above all, personal injury. Lightning protection systems form a protective sheath around the building by intercepting direct lightning strikes and safely discharging them to the ground.

Lightning and surge protection measures are essential components of the protection concept for modern buildings. They form the basis for preventing fire, protecting people from injury and avoiding damage to vital but sensitive technology. Protection goals that are also based on

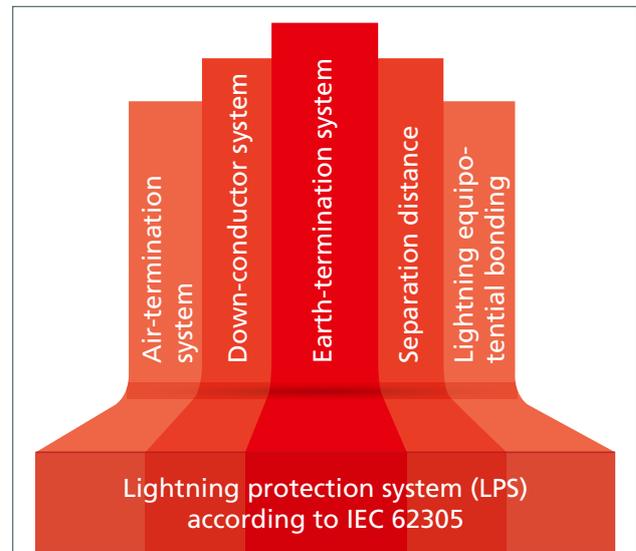
normative requirements and statutory provisions. IEC 62305 deals with external lightning protection and protects buildings against the effects of a direct lightning strike.

Components of a lightning protection system

A complete lightning protection system (LPS) consists of the elements shown in the adjacent figure:

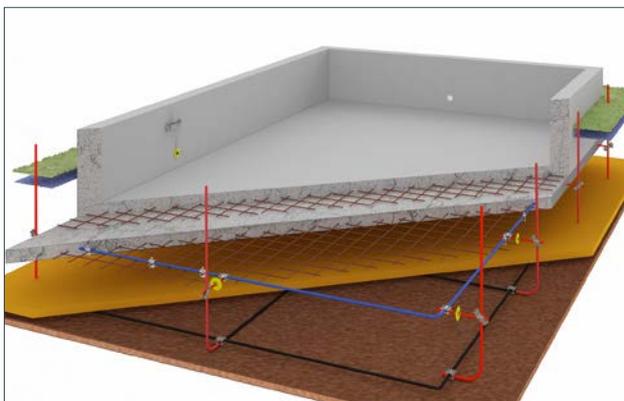
External lightning protection: E.g. with HVI system

A lightning protection system consists of an air-termination system installed on the roof, which is connected to the earth-termination system via down conductors. To avoid dangerous flashover and thus sparking, separation distances must be kept to conductive metal parts. It is often not possible to maintain these separation distances consistently. Using a high-voltage-resistant insulated down conductor (HVI Conductor), however, allows you to forget about separation distances while still safely discharging lightning currents to the earth-termination system. An HVI system thus offers optimum safety and maximum flexibility as compared to conventional lightning protection.



Earthing

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.



Combined functional equipotential bonding system

Foundations with increased earth contact resistance, ring earth electrode with functional bonding conductor according to DIN 18014 (German standard)

Foundation and/or ring earth electrode

Combined equipotential bonding systems are a safe and cost-effective earth-termination system – for as long as the building stands. Installation of a foundation earth electrode in new buildings is required by IEC 61364-5-54 and DIN 18015-1 (German standard). The German DIN 18014 deals with the technical implementation. The foundation earth electrode is installed into the concrete foundations 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 foundations and connected to the functional bonding conductor in the foundations. For buildings with external lightning protection systems, additional connection lugs must be positioned at intervals corresponding to the relevant class of LPS in line with IEC 62305 and connected to the ring earth electrodes. The connection lugs should protrude at least 1.5 m above ground level.



More information at:
de.hn/earthing

More information at:
de.hn/expert-pe

Lightning protection			Part No.
1		Supporting tube GRP / Al with air-termination tip	105 325
2		Tripod, StSt Concrete base, 17 kg	105 397 102 012
3		HVI-long Conductor, black	819 135
4		Roof conductor holder for HVI Conductors Adapter for installing HVI Conductors	253 015 253 026
5		Conductor holder for HVI Conductors	275 250
6		UNI disconnecting clamp, StSt	459 129
Earthing			Part No.
7		Strip steel 30 x 3.5 mm, galvanised, 25 m long	852 335
8		Connecting clamp, St/tZn	308 026
9		Rebar clamp DEHNclip Rd 8 mm / Fl 30 x 3-4 mm	308 141
10		Water-pressure-tight wall bushing for buildings made of waterproof concrete Connecting clamps with threaded bolt, light version	478 540 478 129
11		Round steel, StSt V4A	860 010
12		Cross clamp, StSt V4A	319 209
13		Anti-corrosion tape Tape width: 50 mm	556 125

Lightning equipotential protection bonding / surge protection

Consistent lightning equipotential bonding is an important basis for the safe functioning of the entire lightning protection system. For an effective surge protection concept, it is important to ensure that the three-stage protection principle is observed.

The consequences of a lightning strike are particularly serious in buildings designed in accordance with Industry 4.0, in systems for renewable energy generation or in systems with a modern building infrastructure. It is not only a matter of destroying valuable system technology, but also of damage resulting from the interruption of operations such as failure of work processes, IT systems and manufacturing systems. An important basis for the necessary system availability of such modern building equipment as well as for the safe functioning of the entire lightning protection system is a consistent lightning equipotential bonding for all electrical cables entering the building from outside.

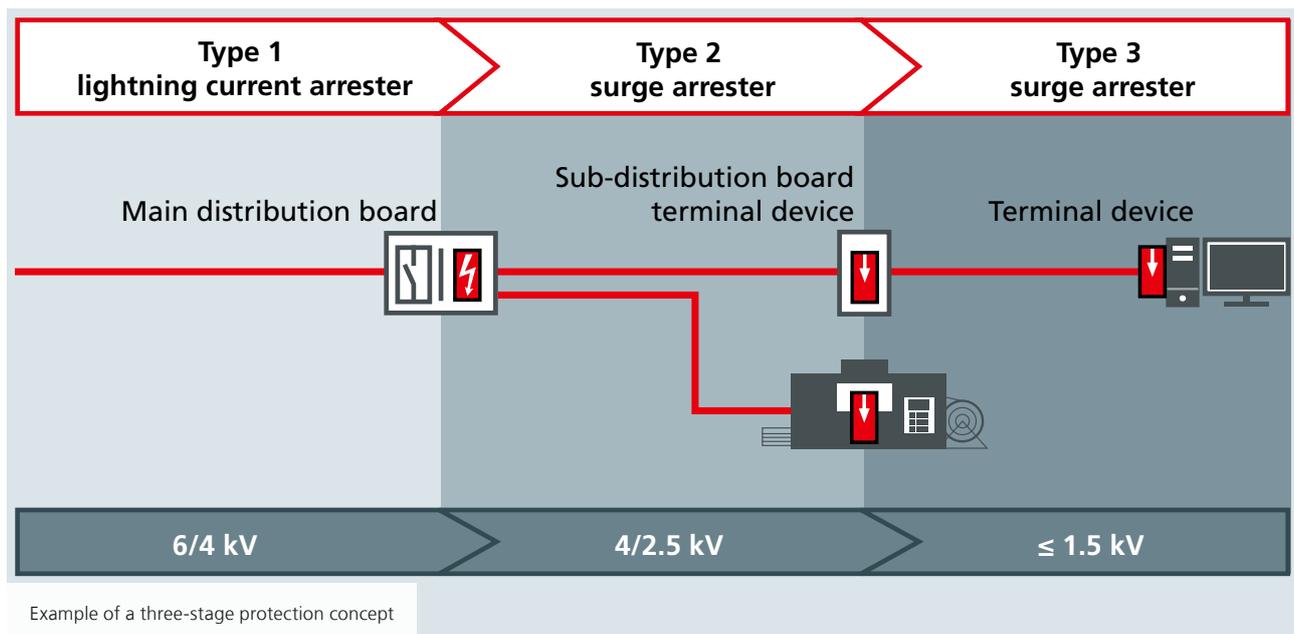
Lightning equipotential bonding (according to IEC 62305-3) is an extension of protective equipotential bonding according to IEC 60364-4-41. In addition to all those extraneous conductive parts which are directly connected to the equipotential bonding, the lightning equipotential bonding must also encompass the supply lines of the network operator, communication lines and other electrical interfaces and systems which inject lightning currents into the building. The connection must be made as closely as possible to the entrance point into the building by way of type 1 lightning current arresters.

Three-stage protection principle

In addition to taking the different lightning protection zones into account, an effective surge protection concept is also based on three protection stages, in which the incoming energy is gradually reduced to a low level that is safe for terminal devices:

- **Stage 1:** Type 1 lightning current arresters / combined arresters at the entrance point into the building (lightning equipotential bonding).
- **Stage 2:** Type 2 surge arresters usually installed in the downstream sub-distribution boards.
- **Stage 3:** Type 3 surge arresters, which can be installed directly at the terminal device or in socket outlets.

Interaction of the individual protection stages ensures the best possible protective effect. To this end, the relevant arresters must be energy coordinated according to IEC 60364-5-53 clause 534.





	Lightning equipotential bonding / surge protection	Application / interface	Type	Part No.
1	 <p>DEHNvenCI 1 255 FM Spark-gap-based combined arrester with integrated lightning current arrester backup fuse.</p>	Power supply line 230 / 400 V	DVCI 1 255 FM	961 205
2	 <p>LSA-plus technology Modular system of lightning current and surge arresters, can be combined to a single combined arrester.</p>	Telecommunication line	DRL 10 B 180 FSD EF 10 DRL DRL PD 180	907 401 907 498 907 430
3	 <p>DEHNgate The DEHNgate GFF TV combined arrester protects the SAT system / radio-relay antenna at the entrance point into the building.</p>	SAT system / radio-relay system / BOS (emergency service) radio	DGA GFF TV	909 705
4	 <p>High-performance isolating spark gap For indirect connection/earthing of functionally isolated system parts.</p>	Gas network	TFS	923 023
5	 <p>DEHNshield TNS Allows compact lightning equipotential bonding including protection of terminal devices.</p>	AC-supplied charging post or outdoor lighting system 230 / 400 V Supply line	DSH TNS 255	941 400
6	 <p>DEHNshield TN Prewired, application-optimised combined arrester for single-phase TN systems.</p>	Power supply toll barrier	DSH TN 255	941 200
7	 <p>BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.</p>	Data and communication line Charging post or toll barrier	BCO ML2 BD 24	927 244



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Technical equipment and server rooms

Servers, fire alarm systems, fire extinguishing systems, UPS, air-conditioning and cooling systems

Effective room shielding and a coherent surge protection concept based on the lightning protection zone concept for power supply and communication lines prevent the loss of sensitive data and ensure safe operation of online systems in case of lightning strikes and surges.

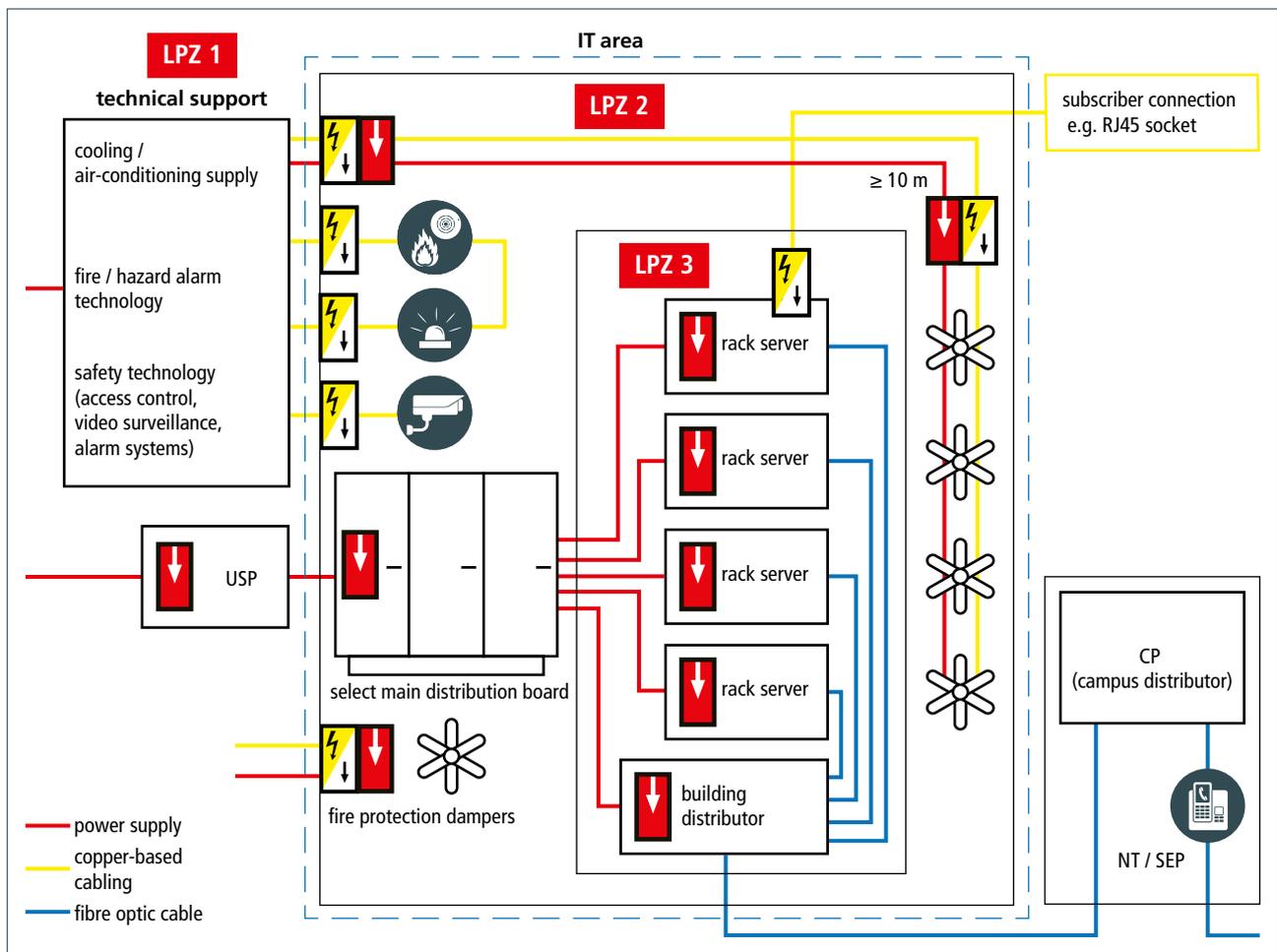
Today, digitally networked technologies are increasingly determining the quality of life and social participation in all sections of the population and will continue to do so in the future. In this context, a needs-based data infrastructure is the basic prerequisite for modern buildings. But, at the same time, networking also means that the failure of individual, central components can bring the entire system to a standstill.

In addition to server equipment, the infrastructure of server rooms includes other systems designed to ensure safety and continuous operation such as UPS, fire extinguishing and

alarm systems, as well as air-conditioning and cooling systems. To ensure safe and uninterrupted operation, all components must be protected against surges and their consequences. Possible protection measures to reduce the failure of electrical and electronic systems in a building are described, for example, in IEC 62305-4.

A combination of earthing, equipotential bonding, spatial shielding, cable routing / shielding, and installation of coordinated surge arresters provides reliable protection against failures.

Due to its central importance, we recommend treating the server room as lightning protection zone 2 and designing it as a Faraday cage. In addition, all incoming and outgoing electrical lines should be protected by installing surge arresters.



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Surge protection		Application / interface	Type	Part No.
1		DEHNGuard M ACI FM Modular surge arrester for TN systems with integrated ACI technology.	Power supply UPS system 230/400 V	DG MTNS ACI 275 FM 952 440
2		DEHncord 3P TT 275 FM Compact three-phase arrester for all installation systems. Mounted on DIN rails or, in confined spaces, using screw lugs.	Protection of terminal devices 230/400 V (measuring and control systems)	DCOR 3P TT 275 FM 900 439
3		DEHNpatch Class EA Universal arrester for Industrial Ethernet, PoE+.	Server / network	DPA CL8 EA 4PPOE 929 161
4		Mounting set DEHNpatch For mounting DEHNpatch in 19" data cabinets.	Server / network	MS DPA 929 199
5		SFL Protector Multiple socket outlet with integrated surge protection and mains filter for data cabinets.	Protection of terminal devices 230 V (server racks)	SFL PRO 6X 19" 909 251
6		BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Measuring and control data lines	BCO ML2 BD HF 5 927 271
7		BUSstector BT 24 Surge arrester with minimal space requirements, can be easily plugged onto, e.g., a bus coupler instead of a standard bus terminal.	KNX bus systems	BT 24 925 001
Equipotential bonding / shielding				Part No.
8		Mesh mat EMC shielding measures possible, mounted in ceilings and walls.		618 214
9		Connecting clamp for mesh mats For interconnecting mesh mats / connecting mesh mats to equipotential bonding systems.		540 271



Basic elements according to IEC 62305-3:



Earthing



External lightning protection



Lightning equipotential bonding



Measuring and control systems / building automation – Heating / air-conditioning / ventilation

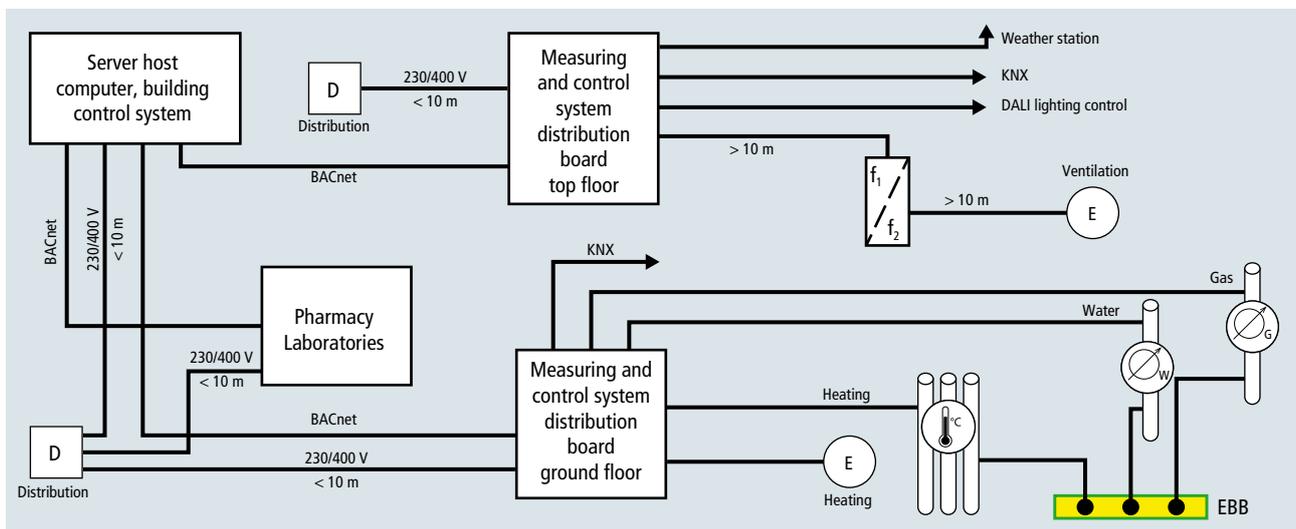
Surge protective devices ensure that the basic supply structures of technical building equipment are stable and reliable.

Closing security gaps

Technical building equipment (TBE) encompasses heating, ventilation, sanitary engineering, air-conditioning, but also fire prevention and electrical installations, or measuring and control systems. Whatever its type, all technical building equipment falls back on the central power and data systems of the building. However, this frequently also means that one relies on the protection measures for the electric devices in these systems. But what happens if there are gaps? Central components of the technical building equipment then face lightning currents and surges without any protection whatsoever. With the consequence that in the aftermath of a thunderstorm the heating and ventilation no longer function, and important measuring equipment is destroyed.

Observing framework conditions

IEC 60364-5-53, clause 534 calls for separate surge arresters directly at the consumer (e.g. air-conditioning container or heating sensor) if the cable to the last upstream surge protective device is longer than 10 m. This is an important aspect which is often neglected in technical building facilities. Technical building equipment in modern buildings is interconnected and interdependent. Many interfaces interact to optimise consumption and save resources. Specified temperatures or solar radiation control shading, heating, air-conditioning and ventilation processes. If just a single component fails, it impairs the function of the entire system.



Lightning Equipotential Bonding / Surge protection	Application / interface	Type	Part No.
Power supply systems - 230 / 400 V power supply, frequency converter, heating / air-conditioning / ventilation			
	DEHNgard M TNS This surge arrester protects the 230 / 400 V side of measuring and control systems and building automation in subordinate sub-distributions.	Frequency converter ventilation Power supply 230/400 V	DG M TNS 275 952 400
	DEHNgard M WE Modular surge arrester with remote signalling contact for monitoring system.	Ventilation motor fed by frequency converter	DG M WE 600 FM 952 307
	DEHNrail Two-pole surge arrester consisting of a base part and plug-in protection module.	Power supply to host computer Building control system	DR M 2P 255 953 200
	DEHNflex M Surge arrester for all installation systems at terminal device level and acoustic fault indication.	Power supply for terminal devices (e.g. in cable ducts / sockets)	DFL M 255 924 396
Information technology - Measuring and control systems, building automation, heating / air-conditioning / ventilation			
	BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Measurement: Flow temperature heating system (4-20 mA) Measurement: Gas consumption Gas supply (0-10V)	BCO ML2 BE 24 927 224
	BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Measurement: Water consumption, water supply (M-Bus)	BCO ML2 BD 48 927 245
	BUSTector BT 24 Surge arrester with minimal space requirements, can be easily plugged onto, e.g., a bus coupler instead of a standard bus terminal.	Can be used for KNX / EIB systems	BT 24 925 001
	DEHNpatch Class EA Universal arrester for Industrial Ethernet, PoE+.	BACnet data line	DPA CL8 EA 4PPOE 929 161
	BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Lighting control DALI bus	BCO ML2 BD 24 927 244
	BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Ex zones / intrinsically safe measuring circuits	BCO ML2 BD EX 24 927 284
	Condition Monitoring-System For monitoring the condition of BLITZDUCTORconnect arresters with LifeCheck.	IRCM LifeCheck	DRC IRCM 910 710
Equipotential bonding - pipes heating - air conditioning - ventilation			
	Earthing pipe clamp For integrating pipes into the protective and functional equipotential bonding	Earthing pipe clamp Equipotential bonding	BRS 27.168 AQ4 25 V2A 540 912
	Equipotential bonding bar R15 For protective and functional equipotential bonding and lightning equipotential bonding.	Equipotential bonding bar	PAS AH RK 7x25 2x8.10 1xFL30 563 010
	Earthing pipe clamp lightning protection For integrating pipes into the protective and functional equipotential bonding.	Earthing pipe clamp Equipotential bonding	ERS 48 AS4.10 TG STTZN 407 112

Smoke / heat extraction systems, fire alarm systems, voice alarm systems

Technical fire protection equipment and especially fire alarm systems are of vital importance. They enable modern buildings with elaborate architecture and both a complex infrastructure and purpose to easily meet today's fire protection and safety requirements.

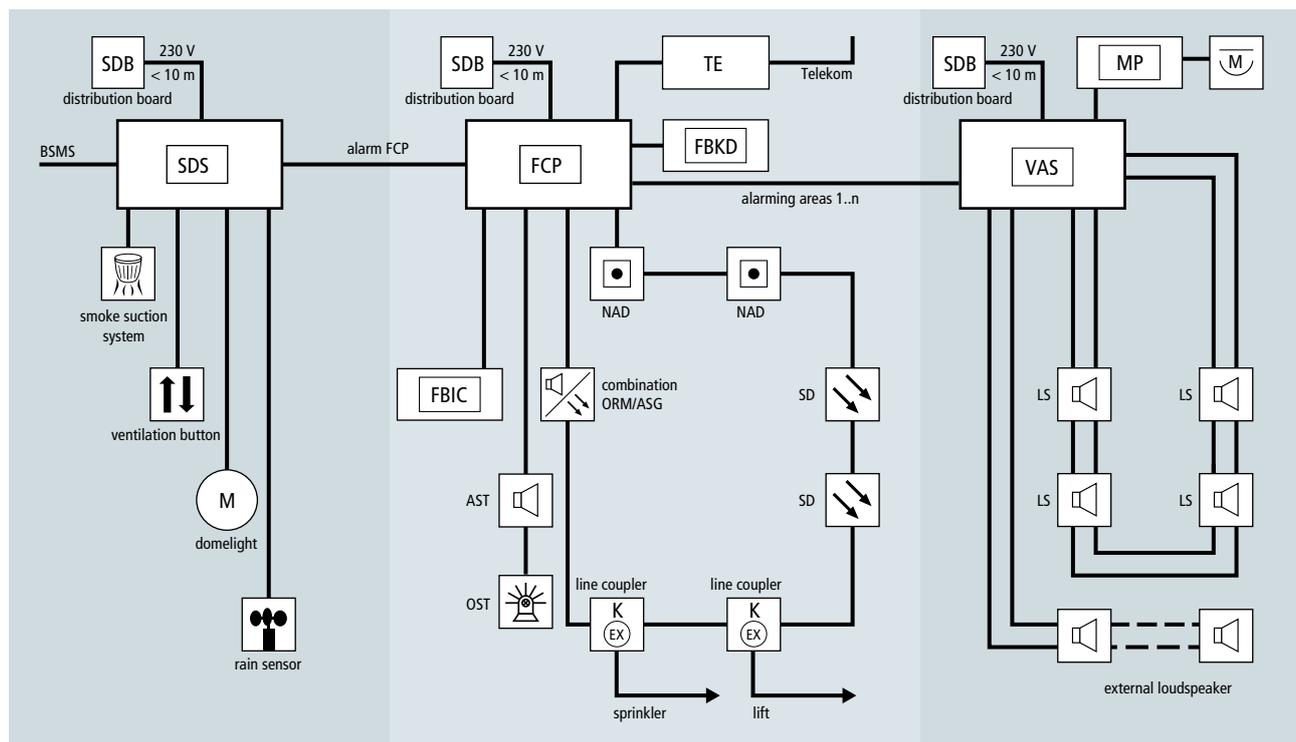
The systems are used for fire detection, alarming and evacuation and thus serve the protection of people and material assets. A further critical task as a superordinate system element is to take over the central function of the control systems of other safety-related systems and equipment in the event of fire.

Lightning strikes and voltage surges can cause irreparable damage to electrical and electronic equipment that is not adequately protected. In addition to electrical consumers and telecommunications equipment, this applies to safety systems such as fire alarms, voice alarms or heat/smoke extraction systems. The damage not only includes purely

material losses but, above all, consequential damage such as production downtime, loss of data or the appointment of a fire watch should the fire alarm system fail.

Coordinated lightning and surge protection according to IEC 62305-4 prevents false alarms or destruction resulting from atmospheric discharges or switching overvoltages at the corresponding transitions of the relevant lightning protection zone and increases system availability.

Additional shielding and earthing measures for hazard alarm systems should be taken in accordance with the VdS¹⁾ 2833 guideline (see also DIN VDE 0845 - appendix 1). Moreover, it should be checked whether additional surge arresters are required due to the indicators listed in the VdS 2833 guidelines. If this is the case, the operator of the hazard alarm system must be informed of the necessity for protection measures.



BMS: Building management system
SDB: Sub distribution board
SHE: Smoke and heat extraction system

AST: Acoustic signal transmitter
FACP: Fire Alarm Control Panel
FBIOS: Fire brigade information / operating system
FBKD: Fire brigade key depot
NAD: Not automatic detector
OST: Optical signal transmitter
OSD: Optical smoke detector
SD: Smoke detector
TE: Telecoms

LS: Loudspeaker
MP: Micro phone
VAS: Voice alarm system

¹⁾ VdS: German Property Insurers' Association

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Surge protection	Application / interface	Type	Part No.
Smoke / heat extraction system			
	DEHNpatch Class EA Universal arrester for Industrial Ethernet, PoE+.	LAN connection to building services management system	DPA CL8 EA 4PPOE 929 161
	DEHNgard M TT 2P Modular surge arrester for single-phase TT and TN systems.	Power supply smoke extraction system	DG M TT 2P 275 952 110
	BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Actuator, air intake dampers, alarms	BCO ML2 BD 24 927 244
	BLITZDUCTOR XT Combined arrester with RFID LifeCheck for protecting 4 single lines sharing a common reference potential. or DEHNgard S Universal surge arrester	Actuator air intake dampers (24 V DC/AC; 5 W)	BXT ML4 BE 36 BXT BAS (Application up to max. 1.8 A) or DG S 48 FM or 952 098
Fire alarm system			
	DEHNgard M TN Modular surge arrester for single-phase TN systems.	Power supply alarm panel 230 V	DG M TN 275 952 200
	BLITZDUCTOR XT Combined arrester with RFID LifeCheck for protecting 4 single lines sharing a common reference potential.	Ring bus fire alarm system	BXT ML4 BE 24 BXT BAS 920 324 920 300
	DEHNrail Two-pole surge arrester consisting of a base part and plug-in protection module.	Alarm contact e.g. to lift control, ventilation, sprinkler	DR M 2P 255 953 200
	BLITZDUCTOR XT or -VT Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Conductor key depot Heating	BXT ML2 BD S 24 BXT BAS or BVT ALD 920 244 920 300 or 918 408
	BLITZDUCTOR XT Space-saving four-pole lightning current arrester with RFID LifeCheck for almost all applications.	Telecommunication connection	BXT ML4 B 180 BXT BAS 920 310 920 300
Public address systems - voice alarm			
	DEHNvario Combined arrester for protecting electro-acoustic systems.	Public address systems - line loudspeaker	DVR 2 BY S 150 FM 928 430

Security systems: Access control, burglary protection, video surveillance, perimeter protection, emergency / safety lighting

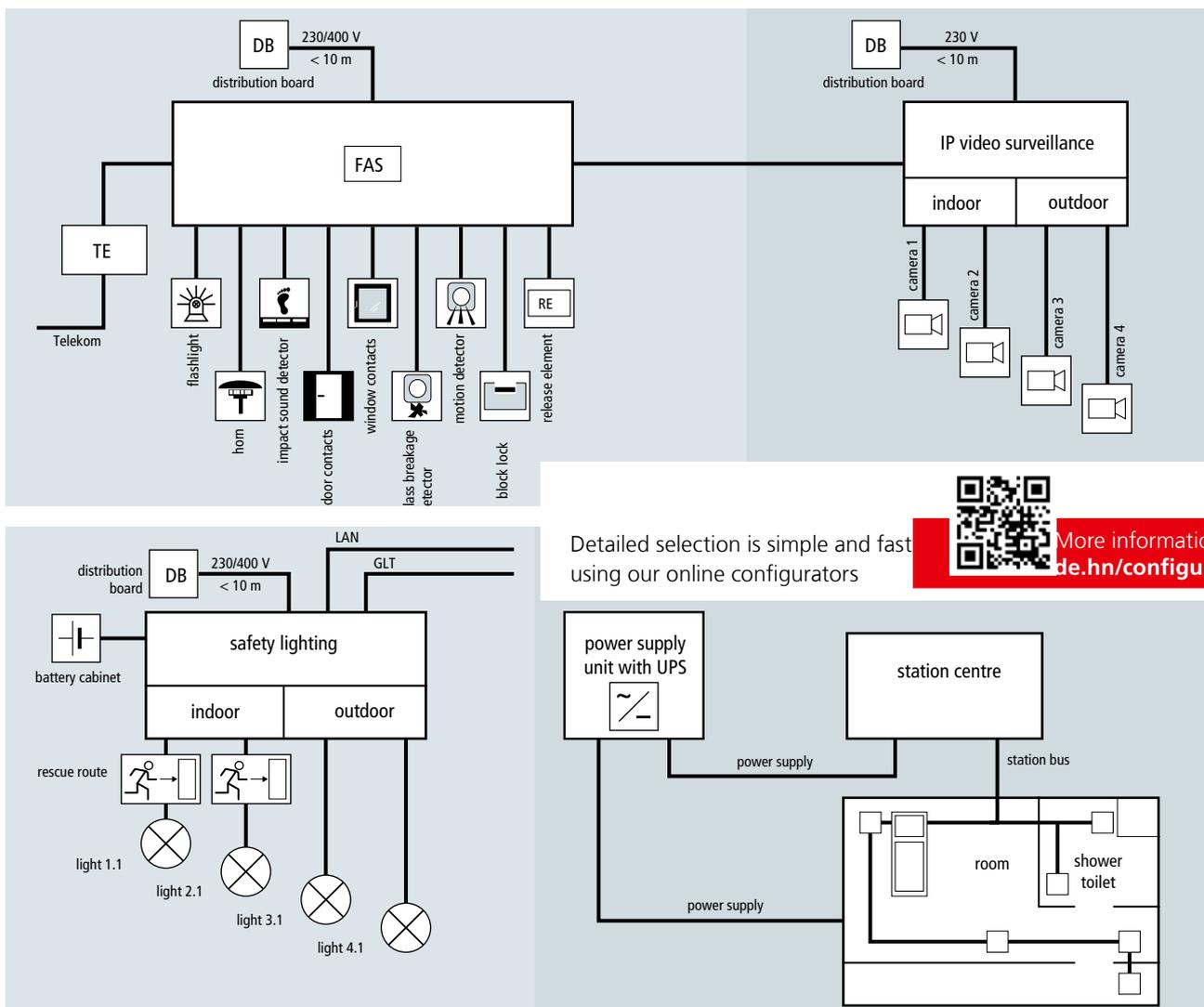
Electrical security systems are only truly reliable if they do not fail during thunderstorms. A lightning protection concept prevents damage and failure.

Ensuring availability

Whether fire and burglary protection or emergency exit and escape route lighting – Security and safety systems must always be functional. If lightning strikes and surges destroy security systems or safety-relevant equipment no longer functions, human lives are at risk. An important economic aspect: Surges can cause false alarms, resulting in high follow-up costs. Therefore, be sure to integrate all security systems in your lightning and surge protection concept and make sure that sensitive security and safety technology always functions reliably.

Meeting requirements

Meeting legal and normative requirements is a must for manufacturers, planners and installers. The specifications for the protection of safety-related equipment are often complex. For example, the legal duty to maintain safety, normative requirements, technical regulations, particularly building law and construction product law of the federal states, as well as the generally acknowledged rules of technology or insurance requirements have to be considered. The ZVEI¹⁾ leaflet (82025:2017-02) "Rechtliche Bedeutung technischer Standards und technischer Regelwerke" (legal significance of technical standards and technical regulations) provides a good overview.



¹⁾ ZVEI: German Electrical and Electronic Manufacturers' Association



Surge protection	Application / interface	Type	Part No.
Burglar alarm system:			
	DEHNrail Two-pole surge arrester consisting of a base part and plug-in protection module.	Power supply burglar alarm panel	DR M 2P 255 953 200
	BLITZDUCTOR XT Combined arrester with RFID LifeCheck for protecting 4 single lines sharing a common reference potential.	Detector group lines	BXT ML2 BD S 12 BXT BAS 920 242 920 300
	DEHNgate G Surge arrester with integrated gas discharge tube.	Transmission device, GSM antenna	DGA G SMA 929 039
	BLITZDUCTORconnect Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology.	Transmission device, VDSL, DSL	BCO ML2 B 180 927 210
IP video surveillance:			
	DEHNvario Compact 3-in-1 surge arrester for protecting analogue camera systems.	Access control including video surveillance	DVR BNC RS485 230 928 440
	DEHNpatch outdoor Surge arrester for indoor and outdoor use.	IP camera surveillance systems	DPA CLE IP66 929 221
Emergency / safety lighting:			
	DEHNsecure Modular and coordinated single-pole lightning current arrester for DC applications.	Lighting, rescue routes (outdoor)	DSE M 1 242 FM 971 127
	DEHNguard SE Modular single-pole surge arrester for DC applications.	Lighting, rescue routes (indoor) DC supply (battery) Safety lighting	DG SE DC 242 FM 972 125
	DEHNguard M TN Modular surge arrester for single-phase TN systems.	AC supply (LVMDB) Safety lighting	DG M TN 275 952 200
	BLITZDUCTOR XT Combined arrester with RFID LifeCheck for protecting 2 pairs.	Sensor and signal line	BXT ML4 BD HF 24 BXT BAS 920 375 920 300

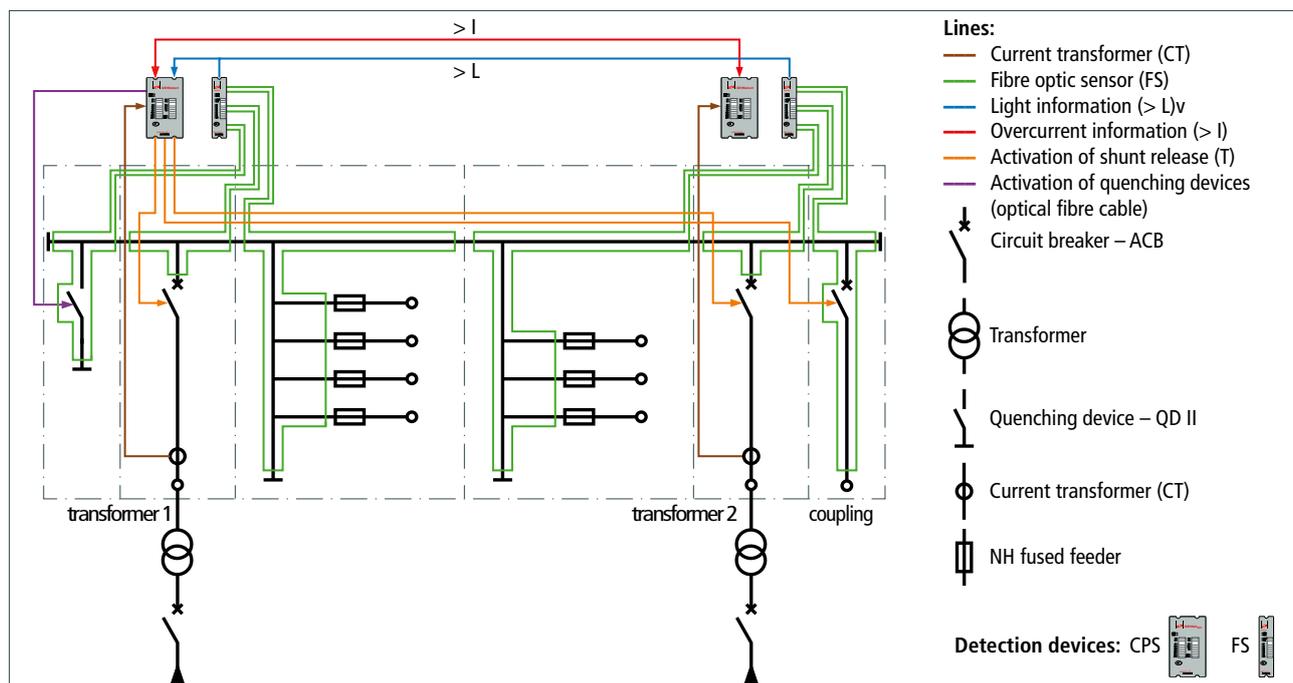


Personal and system protection – Arc fault protection system DEHNshort

Active arc fault protection - This means protection of employees working on electrotechnical systems and maximum system availability.

In a hospital, a power failure is immediately life-threatening. The top priority is system availability. A power failure must never happen in a hospital. Think of patients in the operating theatre, on artificial respiration or other life-supporting measures. The active arc fault protection system DEHNshort supports your system concept and reduces downtime resulting from arc faults to a minimum.

In addition, people working in and on electrical installations must be protected. The operator must eliminate all accident risks and prevent personal injury. To prevent electrical accidents, the five safety rules defined in the EN 50110-1 standard apply. DEHN offers suitable products for applying the five safety rules as well as the personal protective equipment necessary to protect people from arc faults.



Safety equipment	Application	Type	Part No.
Arc fault protection system DEHNshort – components:			
1	 Quenching device QD II Quenching device unit for direct connection to the detection devices	Quenching of the arc fault < 5 ms	DSRT QD II 782 002
2	 Fibre optical cable Connecting cable 4 m	Connection between the central and quenching device	DSRT LWL 4.00 782 024
3	 Detection device (current and light)	Connection of the current transformers and activation of the quenching devices	DSRT DD CPS BACA 782 030
4	 Detection device For light detection	Connection of the fibre optical sensors	DSRT DD FS BAAA 782 050
5	 Fibre optic sensor Sensor length 12 m	Monitoring of a panel (example)	DSRT FS 12 1.5 782 085
Safety equipment according to the 5 safety rules in line with EN 50110-1			
	Disconnect completely	Switching stick up to 36 kV	SCS 36 2000 763 612
		Fuse tong for HH fuses	SZ HH W20 1500 765 052
	Secure against re-connection	Insulating blade for NH2 and NH3 for distribution blocks	SE NH2 3 785 644
	Verify that the installation is dead	Voltage detector for medium-voltage installations 6-20 kV	PHE4 6 20 S 783 235
	Carry out earthing and short-circuiting	Earthing and short-circuiting device with earthing stick for transformer substations	EKV3+1 120 G ES SK STK 1000 VAAG-7KZ 761 001
Personal protective equipment DEHNcare (PPE against the thermal effects of an arc fault)			
	Safety helmet for electricians	white	ESH U 1000 S SW 785 706
	Face shield	With active protection, arc-fault-tested	APS T AS CL2 SC 785 821
	Protective gloves	With long gauntlet, arc-fault-tested	APG 10 L 785 810
	Protective coat	Arc-fault-tested	APC 52 54 785 756





Photovoltaics / e-mobility

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

Protect 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 necessary and consists of:

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

Tip: 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.

By the way: With the publication of the amended IEC 60364-4-44 clause 443, IEC 60364-5-53 clause 534 and IEC 60364-7-712, the installation of surge protection measures becomes mandatory - even if there is no external lightning protection system!

Protecting charging posts and vehicles

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

In case of a thunderstorm, the sensitive electronic circuitry for the controller, meter 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.

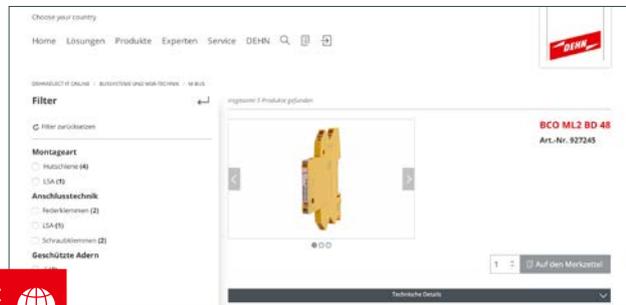
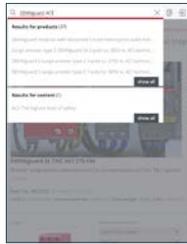
Electric vehicles generally have an electric strength protection level of up to 2,500 V. However, the voltage occurring during a lightning strike may be 20 times higher. Therefore, prevent damage and meet the normative requirements according to IEC 60364-4-44 clause 443, IEC 60364-5-53 clause 534 and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

Services and information

Whether support with planning or specific help with a query – take advantages of DEHN's range of services.



Online product data base and configurators

You will find further information, data sheets, planning documents for our products online.

Simply enter the part number or description in the search field.



More information at:
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More detailed information

Specific concepts can be found in numerous white papers alongside industry and practical solutions. Or, in our LIGHTNING PROTECTION GUIDE, a lightning and surge protection planning manual. This means that you quickly have all relevant information and solutions at your fingertips.



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Answering questions

If you have commercial or specific technical questions, please contact our commercial customer services or our experts for lightning protection, earthing, surge protection, safety equipment and arc fault protection:



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