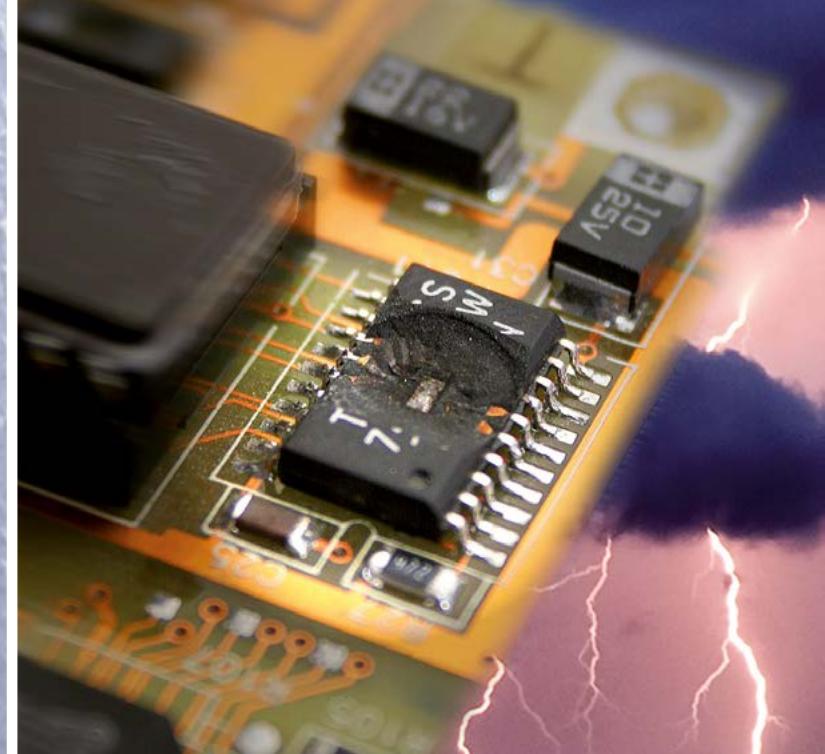




DEHN stops Surges





Lightning strikes and surges: A hazard for buildings and installations

Thunderstorms are fascinating and frightening and cause both awe and insecurity. They often do not only indicate a change in weather, but present considerable risks for persons, animals and material assets such as buildings and installations. Therefore, in this highly technical age protection from the possible effects of a thunderstorm is indispensable.

What type of damage can occur in residential buildings?

Expensive electronic and information technology devices as well as heating, air-conditioning and ventilation systems are used in residential buildings and private households. Surges can damage or even completely destroy these devices and systems, which may result in a financial damage of some 1,000 euros.

What if operation comes to a standstill?

If no protection measures are taken, this can have fatal consequences for a company. A thunderstorm can put information technology, telecommunication and automation systems out of operation. As a result, customers may not be served for a longer period of time, which is disastrous for every company. In highly competitive industries with just-in-time production, this can even threaten the existence of a company.

As a consequence, surge damage must be prevented!

What is understood by surges and how are they formed?

Surges are made up of short-time voltage impulses, also referred to as transients, which last less than a second. The following systems may be subjected to the interfering or even destructive effects of these transients:

- Power supply systems
- Information technology and telecommunication systems
- Machine and system controllers
- Heating, air-conditioning and ventilation systems

Protection pays off

A comprehensive protection concept is indispensable for protecting sensitive electrical and electronic devices and systems. In this context, the coordinate use of surge protective devices (lightning current, surge and combined arresters) is essential. Lightning current arresters discharge high energies without being destroyed and must be installed as close as possible to the entry point of the electrical system into the building. Surge arresters protect terminal devices and are installed as close as possible to the device they are supposed to protect. Combined arresters combine the high discharge capacity of lightning current arresters and the low voltage protection level of surge arresters and are thus capable of protecting terminal devices. Therefore they are used to protect compact installations.

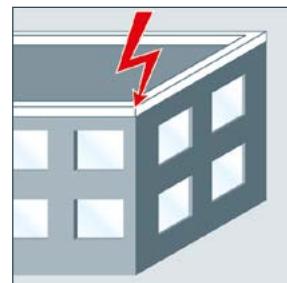
The modular surge protective devices of the Red/Line® product line for power supply systems and the Yellow/Line product line for data and information technology systems allow to implement technically and economically sound made-to-measure protection concepts.

Protect residential, functional and industrial buildings by means of coordinated lightning current and surge arresters from DEHN.



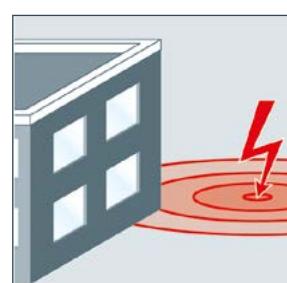
Direct lightning strikes

are a common cause for building fires and mechanical damage to buildings. This can be prevented by an external lightning protection system. Nevertheless, the lightning currents flowing in case of a direct lightning strike cause a local potential rise of the earth potential in the protected building. As a result, flashover to supply systems entering the building may occur. Therefore, lightning current arresters must be installed to protect electrical installations and systems.



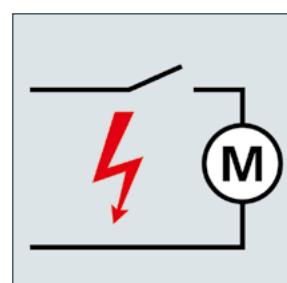
Nearby lightning strikes

cause transient voltage impulses on the supply lines of the building due to the high lightning electromagnetic field (LEMP)*. These voltage impulses can reach peak values of several 1,000 volts. Surge arresters for power supply and information technology systems are required to protect electrical installations and systems.



Switching operations

during switching high loads cause switching overvoltages (SEMP)** of several 1,000 volts in electrical systems. These switching overvoltages can interfere with or even destroy electrical devices. If power supply and data lines are routed in parallel over long distances, switching overvoltages can also be injected into data lines and interfere with or destroy electrical devices.



* LEMP: Lightning Electromagnetic Pulse

** SEMP: Switching Electromagnetic Pulse

Protect your valuables in residential buildings

In modern households, electrical devices and systems make life easier:

- TVs, stereo and video equipment, satellite systems
- Electric cookers, dish washers and washing machines, driers, refrigerators / freezers, coffee machines, etc.
- Laptops / PCs / tablet PCs, printers, smartphones, etc.
- Heating, air-conditioning and ventilation systems

Insurance coverage alone is not enough

Surges can damage or even completely destroy these devices, resulting in a financial damage of some 1,000 euros. In addition to this financial damage, surges often cause immaterial damage such as loss of personal data (photo, video or music files). The consequences of surges are also unpleasant if the heating system, shutters or lighting system fails due to damaged controllers. Even if the household insurance settles the claim, personal data is lost forever. Claim settlement and replacement take up time and are annoying. Therefore, it is essential to take surge protection measures!

First step: System protection

The first step is to consider all lines leaving or entering the building: Power supply / telephone / lighting lines, TV / SAT connections, connections for PV systems, etc.

In residential buildings, meters and sub-circuit distribution boards are often placed in one enclosure. For this purpose, DEHNshield **1** comes in different versions to protect both the installation and the terminal devices on the power supply side, even in case of direct lightning strikes. DEHNbox **2** can be provided for the telephone connection e.g. via DSL / ISDN. This arrester is sufficient to ensure safe operation of the DSL router. DEHNrail **3** and BLITZDUCTOR® XT **4** protect the controller of the heating system, which is often located in the basement.

If there are further distribution boards, DEHNgard® **6** surge arresters are to be installed.

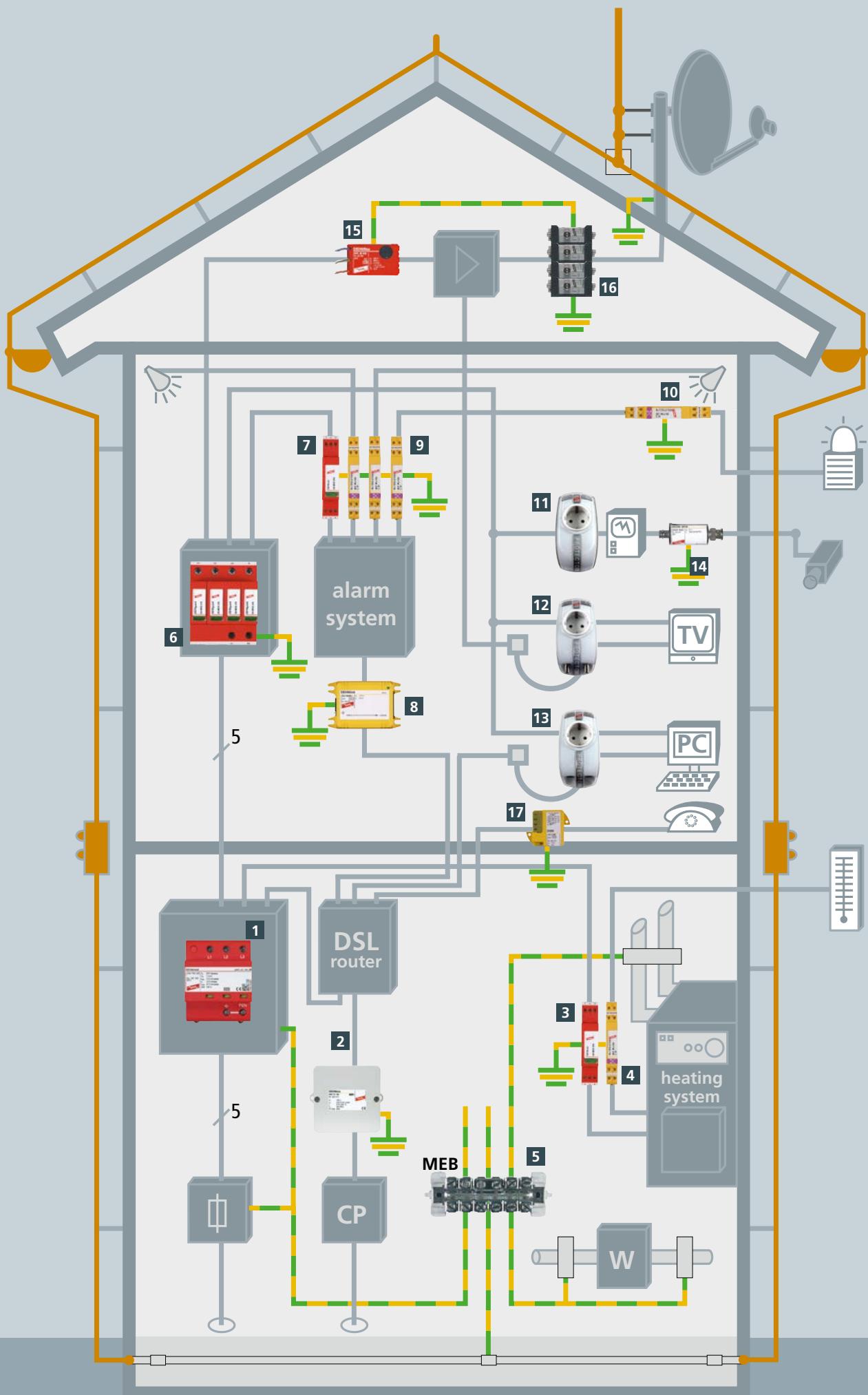
Second step: Protection of terminal devices

The next step is to protect all terminal devices, which are fed by several power supply systems, by installing surge protective devices right at their inputs. These terminal devices include TVs, video and stereo equipment as well as alarm and video surveillance systems. The picture on the right side shows an example of a residential building. The antenna amplifiers can be protected by means of DEHNgate **16**.

The cascaded use of surge protective devices prevents damage and is more economical than you may think.

Surge protective device	Part No.
DEHNshield TNC 255 alternative: DEHNventil® modular TNC	941 300 951 300
1 DEHNshield TT 255 alternative: DEHNventil® modular TT	941 310 951 310
2 DEHNbox TC 180	922 210
3 7 DEHNrail modular 2P	953 200
4 BLITZDUCTOR® XT ML2 BE S 5 BLITZDUCTOR® XT base part	920 220 920 300
5 K 12 equipotential bonding bar	563 200
6 DEHNgard® modular TNS alternative: DEHNgard® modular TT alternativ: DEHNgard® modular TNC	952 400 952 310 952 300
8 DEHNlink ISDN I	929 024
9 BLITZDUCTOR® XT ML4 BE XX* BLITZDUCTOR® XT base part	920 32X 920 300
10 BLITZDUCTOR® XT ML2 BE XX* BLITZDUCTOR® XT base part	920 22X 920 300
11 DEHNprotector 230	909 230
12 DEHNprotector 230 TV	909 300
13 DEHNprotector 230 LAN100	909 321
14 UGKF BNC	929 010
15 DEHNflex M	924 396
16 DEHNgate FF TV	909 703
17 Data protection module	924 272

* Selection of types depending on the system technology used



CP: Point of connection
 MEB: Main earthing busbar
 W: Water meter

Ensure undisturbed operation in office and administration buildings

Office and administration buildings are at least equipped with PCs, servers, networks and telecommunication systems. Failure of these systems would bring operation to a standstill since all work processes depend on these systems. Moreover, building automation systems linked via bus systems such as KNX and LON are used in these buildings.

Protection of power supply systems

The picture on the right side shows an example of an administrative building. Combined arresters such as DEHNvenCI **1** and DEHNgard® **4** surge arresters can be used to protect power supply systems.

DEHNrail **5**, SFL Protector **9** or DEHNsafe **11** protect terminal devices from surges and reduce induced voltages and switching overvoltages to safe values.

Protection of information and telecommunication systems

To ensure safe operation, both data and voice transmission require adequate protection elements. Networks are typically designed in the form of universal cabling systems as per EN 50173. Even if fibre optic cables between building and floor distributors are standard today, copper cables are typically installed between the floor distributor and the terminal device. Therefore, the HUBs, bridges or switches must be protected by NET Protector LSA 4TP **8**.

DEHNpatch **6** cables are used to protect terminal devices. The DEHN equipotential bonding enclosure **2**, which can be fitted with LSA disconnection blocks and lightning current carrying DEHNrapid® LSA plug-in SPD blocks, can be provided for information technology lines extending beyond the building.

To protect the telecommunication system, NET Protector **10** can be installed in the floor distributor to protect the outgoing lines to the system telephones. A data protection module **12**, for example, can be used for the system telephones.

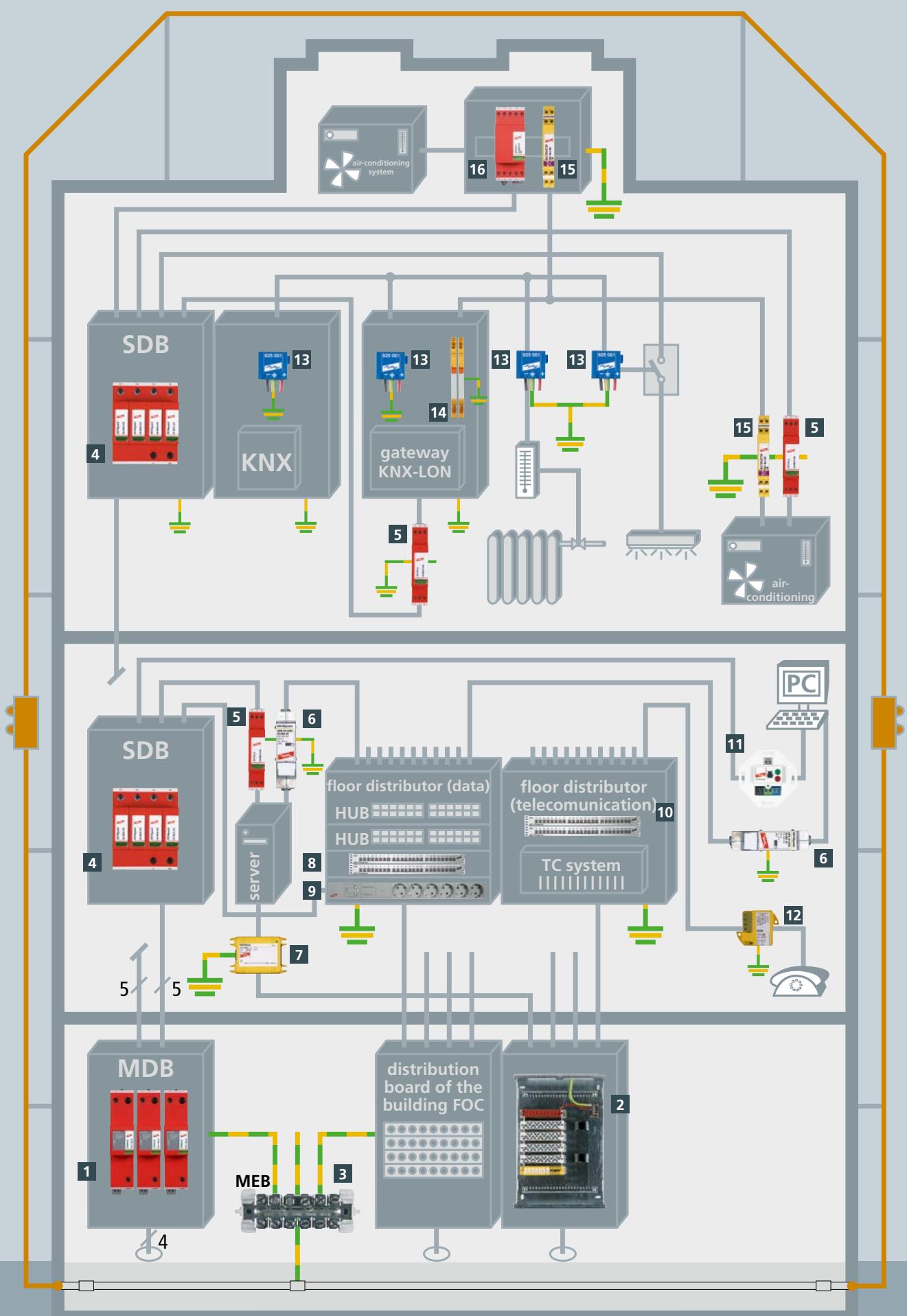
Protection of building automation systems

Failure of building automation systems can have fatal consequences. If the air-conditioning system fails as a result of surges, a data centre may have to be disconnected or a server may have to be shut down.

As shown in the picture, bus systems such as KNX / EIB or LON can be protected by BUStector **13**, DEHNconnect **14** or BLITZDUCTOR® XT **15**.

Availability is increased if surge protective devices are installed according to the particular system and concept.

Surge protective device	Part No.
1 DEHNvenCI DVCI 1 255 FM	961 205
2 DEHN equipotential bonding enclosure LSA disconnection block DEHNrapid LSA	906 101 907 996 907 401
3 Equipotential bonding bar	563 200
4 DEHNgard® modular TNS	952 405
5 DEHNrail modular	953 205
6 DEHNpatch	929 100
7 DEHNgard ISDN I	929 024
8 NET Protector LSA 4 TP for 8 ports 19" enclosure for 3x NET Pro	929 036 929 034
9 SFL Protector 19"	909 251
10 NET Protector TC 2 LSA 19" enclosure for 3x NET Pro	929 072 929 034
11 DEHNsafe	924 370
12 Data protection module DSM TC 1 SK	924 271
13 BUStector	925 001
14 DEHNconnect SD2 MD 48	919 942
15 BLITZDUCTOR® XT ML4 BD 48 BLITZDUCTOR® XT base part	920 345 920 300
16 DEHNrail modular	953 405



FOC: Fibre optic cable

HES: Main earthing busbar

MDB: Main distribution board

SDB: Sub-distribution board

TC: Telecommunication

Increase operational safety in industrial companies

Automation systems are standard in most industrial companies. If the automation system fails, production comes to a halt. This can bring a company to the verge of ruin.

Surge protection increases operational safety

To increase operational safety, lines extending beyond the building should be located and protected. The picture on the right side shows an example of the power supply system and information transmission via Profibus and Industrial Ethernet.

The prospective short-circuit current must be particularly taken into account for the power supply system. Coordinated DEHNbloc® Maxi S **1** lightning current arresters are tested with short-circuit currents up to 100 kA_{rms} and are therefore ideally suited for industrial applications.

BLITZDUCTOR® XT **2** protects information technology lines, even in case of a direct lightning strike.

Potential islanding

The following applies to PLCs, AS interfaces, sensors, actuators and Ex barriers: Surges must be compensated in the device with all connected lines (potential islanding).

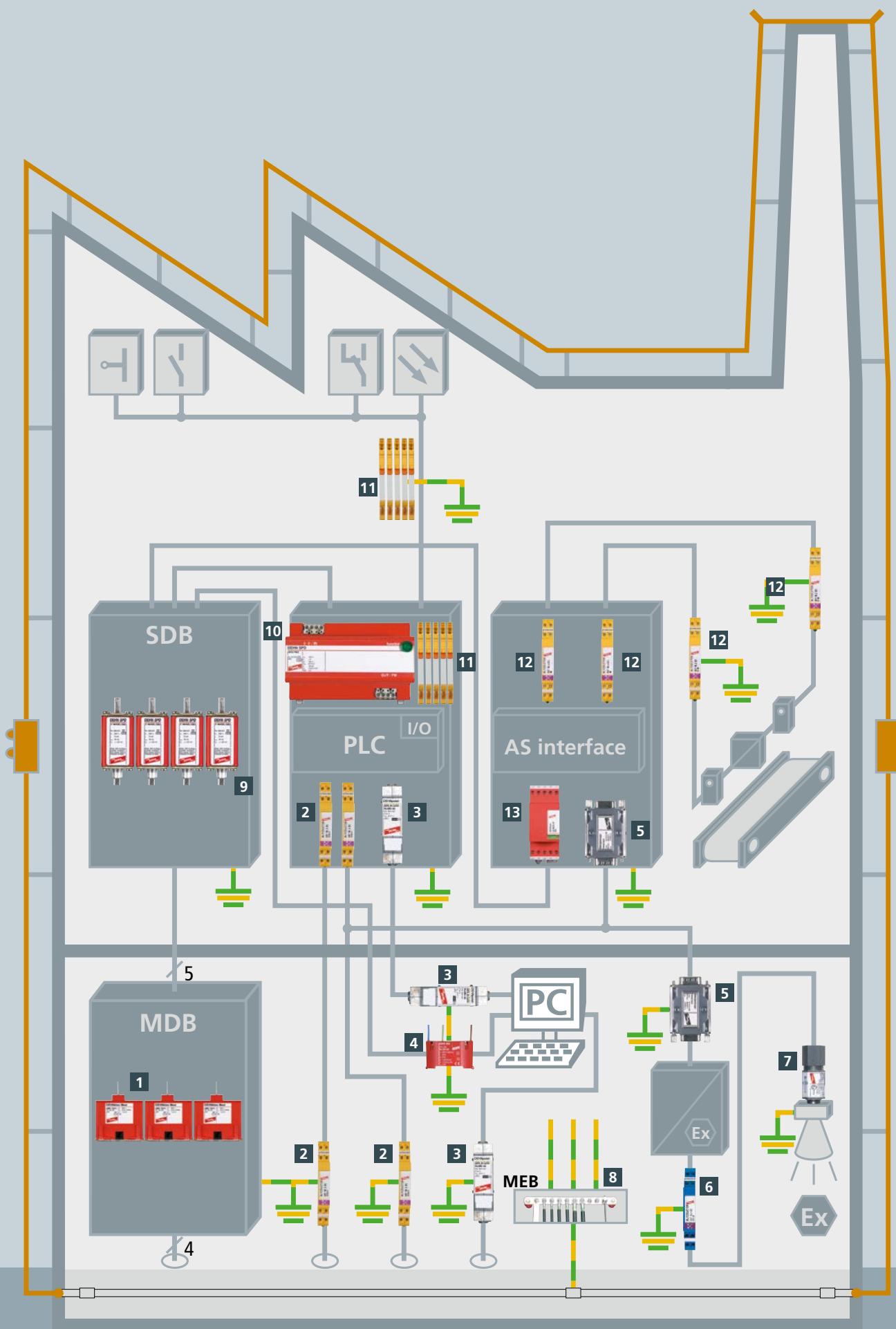
Surge protective devices such as VNH **9**, SPS Protector **10** and DEHNrail **13** modular master this task on the power supply side.

DEHNconnect **11**, DEHNpatch **3**, BLITZDUCTOR® XT **12** or surge arresters for Profibus DP **5**, which are capable of compensating surges within a matter of microseconds, can be used for information technology lines.

In conjunction with an intermeshed equipotential bonding and earth-termination system, surge-related downtime and interruption of operations can thus be prevented.

Lightning and surge protection is an investment that quickly pays off.

Surge protective device	Part No.
DEHNbloc® Maxi S	900 220
1 alternative: DEHNbloc® M	961 125
alternative: DIN rail-mounted DEHNbloc®	900 120
2 BLITZDUCTOR® XT ML4 BD HF 5	920 371
BLITZDUCTOR® XT base part	920 300
3 DEHNpatch	929 100
4 STC surge protection module	924 350
5 Arrester for SUB-D connection, 9-pin	924 017
6 BLITZDUCTOR® XT ML4 BD EX	920 381
BLITZDUCTOR® XT Ex base part	920 301
7 DEHNpipe MD EX	929 960
8 Equipotential bonding bar 10 CU	472 217
Cover (stainless steel)	472 289
9 VNH surge arrester	900 261
alternative: DEHNgard® M TNS CI FM	952 406
10 SPS-Protector	912 253
11 DEHNconnect SD2 ME	917 921
12 BLITZDUCTOR® XT ML4 BD	920 345
BLITZDUCTOR® XT base part	920 300
13 DEHNrail modular	953 405



MDB: Main distribution board

MEB: Main earthing busbar

PLC: Programmable logic controller

SDB: Sub-distribution board

Information on lightning and surge protection

I would like to order the following information material:

- Lightning Protection Guide
- Surge Protection Main Catalogue
- Lightning Protection / Earthing Main Catalogue



[www.dehn-international.com/
en/downloads](http://www.dehn-international.com/en/downloads)



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E-mail

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D-92306 Neumarkt

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+49 9181 906-0

Fax

+49 9181 906-1478

E-mail

info@dehn.de

Your product selection

Residential buildings

Surge protective device	Part No.	QTY
DEHNshield TNC 255	941 300	
alternative: DEHNventil® modular TNC	951 300	
DEHNshield TT 255	941 310	
alternative: DEHNventil® modular TT	951 310	
DEHNbox TC 180	922 210	
DEHNrail modular 2P	953 200	
BLITZDUCTOR® XT ML2 BE S 5	920 220	
BLITZDUCTOR® XT base part	920 300	
K 12 equipotential bonding bar	563 200	
DEHNgard® modular TNS	952 400	
alternative: DEHNgard® modular TT	952 310	
alternative: DEHNgard® modular TNC	952 300	
DEHNlink ISDN I	929 024	
BLITZDUCTOR® XT ML4 BE XX*	920 32X	
BLITZDUCTOR® XT base part	920 300	
BLITZDUCTOR® XT ML2 BE XX*	920 22X	
BLITZDUCTOR® XT base part	920 300	
DEHNprotector 230	909 230	
DEHNprotector 230 TV	909 300	
DEHNprotector 230 LAN100	909 321	
UGKF BNC	929 010	
DEHNflex M	924 396	
DEHNgate	909 703	
Data protection module	924 272	

Office and administration buildings

Surge protective device	Part No.	QTY
DEHNvenCI DVC1 1 255 FM	961 205	
DEHN equipotential bonding enclosure	906 101	
LSA disconnection block	907 996	
DEHNrapid LSA	907 401	
Equipotential bonding bar	563 200	
DEHNgard® modular TNS	952 405	
DEHNrail modular	953 205	
DEHNpatch	929 100	
DEHNlink ISDN I	929 024	
NET Protector 4 TP for 8 ports 19" enclosure for 3x NET Pro	929 036	
	929 034	
SFL Protector 19"	909 251	
NET Protector TC 2 LSA 19" enclosure for 3x NET Pro	929 072	
	929 034	
DEHNsafe	924 370	
Data protection module DSM TC 1 SK	924 271	
BUSTector	925 001	
DEHNconnect SD2 MD 48	919 942	
BLITZDUCTOR® XT ML4 BD 48	920 345	
BLITZDUCTOR® XT base part	920 300	
DEHNrail modular	953 405	

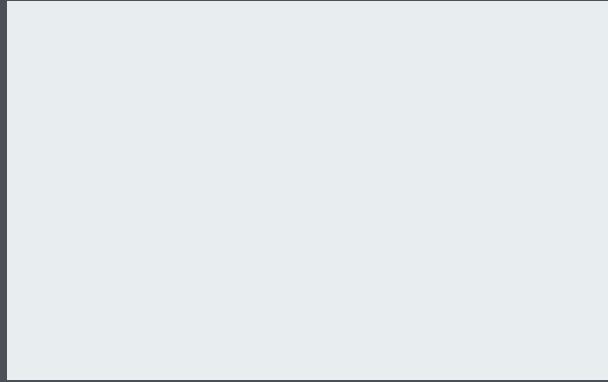
Industrial buildings

Surge protective device	Part No.	QTY
DEHNbloc® Maxi S	900 220	
alternative: DEHNbloc® M	961 125	
alternative: DIN rail-mounted DEHNbloc®	900 120	
BLITZDUCTOR® XT ML4 BD HF 5	920 371	
BLITZDUCTOR® XT base part	920 300	
DEHNpatch	929 100	
STC surge protection module	924 350	
Arrester for SUB-D connection, 9-pin	924 017	
BLITZDUCTOR® XT ML4 BD EX	920 381	
BLITZDUCTOR® XT Ex base part	920 301	
DEHNpipe MD Ex	929 960	
Equipotential bonding bar 10 CU Cover (stainless steel)	472 217	
	472 289	
VNH surge arrester	900 261	
alternative: DEHNgard® M TNS CI FM	952 406	
SPS Protector	912 253	
DEHNconnect SD2 ME	917 921	
BLITZDUCTOR® XT ML4 BD	920 345	
BLITZDUCTOR® XT base part	920 300	
DEHNrail modular	953 405	

* Selection of types depending on the system technology used



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