DEHNnews
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Dimensioning of lightning protection systems considering wind loads as per DIN EN 1991-1-4/NA (Eurocode 1 Part 1-4/NA)

As a result of global warming, extreme weather conditions are increasing all over the world. Consequences such as higher wind speeds, increased number of storms and heavy rain cannot be ignored. Therefore, designers and installers will have to face new challenges, particularly with regard to wind loads.

In the future, wind loads will play a major role for dimensioning air-termination systems of lightning protection systems. Since structures are becoming more and more complex, increasingly complex air-termination systems ranging from simple air-termination rods over air-termination rods with a height of several metres to isolated air-termination systems must be installed on buildings. If these air-termination systems are firmly connected to the building construction, the substructure and air-terminations rods are also additionally stressed as a result of the increased area exposed to wind. Material dimensions and qualities play a major role with regard to the bending stress. In case of isolated air-termination systems such as air-termination masts, not only the bending stress, but also the tilting moment is decisive. In this context, particularly the standing surface and the weight of the base are important.

Various standards deal with wind loads. Up to now, the DIN 1055-4: 2005-03 and DIN 4131 standards were used as basis for dimensioning DEHN lightning protection products. The DIN 1055-4: 2005-03 standard refers to the effects of wind loads on supporting structures, while the DIN 4131: 2008 standard deals with the dimensioning of antenna supporting structures made of steel.

The Eurocodes, which were published in July 2012, replaced the standards used so far. Eurocodes are technical regulations which are used as a basis for designing supporting structures of buildings. As of 1st January 2015, the air-termination systems listed in the DEHN catalogue will be designed based on the DIN EN 1991-1-4/NA (Eurocode 1-1-4/NA) standard (General actions - Wind actions).

Wind load calculations according to DIN EN 1991-1-4/NA for DEHN products can already be requested.

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HVI®power Conductor

The patented HVI®power Conductor, a high-voltage-resistant insulated down conductor which safely conducts the lightning current from the air-termination system to the earth-termination system, is the latest continuation of lightning protection according to Benjamin Franklin.

Its special design allows installers to maintain equivalent separation distances of 90 cm (air) from earthed metal building installations. Uncontrolled flashover is thus prevented and the lightning current is systematically conducted to the earth-termination system. The HVI®power Conductor is tested with lightning impulse currents of 200 kA (10/350 µs) and can thus also be used for LPL I. In combination with a supporting tube and a stand, the conductor can form an isolated air-termination system and can thus be used more flexibly. Moreover, air-termination mast heights up to 7.5 m and large protected zones for roof-mounted structures are possible. If dimensioned properly, insulated conductors form an air-termination system which provides protection for future structural changes on and to the roof.

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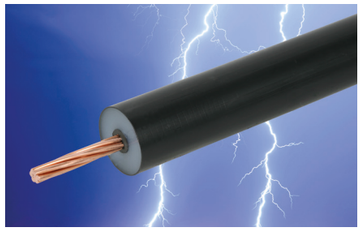

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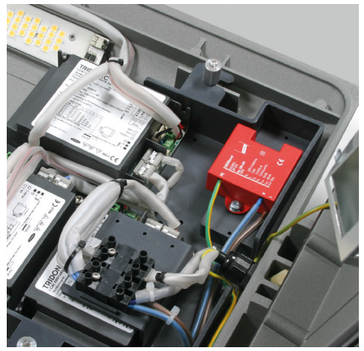
Simple protection for LED mast lights



LED mast lights for street, walkway and open space lighting are mounted at light point heights of several metres to ensure a large field of illumination. LEDs have a long service life, a low temperature sensitivity and allow individual settings for different scenes. Since LEDs ensure sustainable economic performance, they are the lighting system of the future.

Therefore, surge protection is essential. Although amortisation is to be expected over a transparent time frame due to the long service life of LED mast lights, the question arises whether the manufacturer guarantees the overall system (LED drivers and LEDs) since surges negatively affect the system-specific service life. The lighting industry has already responded to this with a higher dielectric strength of the LED drivers and a higher impulse current withstand capability and dielectric strength of new LED mast lights, however, the impulse currents and surges occurring in the mains can exceed these values many times over.

The flexible and space-saving DEHNcord type 2 surge protective device reliably protects outdoor LED lights from surges caused by lightning interference. Compact in design, this new surge protective device can be installed wherever the performance of a type 3 surge protective device for terminal equipment reaches its limits. In addition, DEHNcord ensures surge protection in line with the standard wherever space is restricted. Since according to the standard DEHNcord is a type 2 surge arrester, it can also be used according to the lightning protection zone concept (EN 62305) at the transition from LPZ 0_B to 1 or higher. The device complies with the requirements outlined in the EN 61643-11 standard. It has a short-circuit current withstand capability I_{sccr} of 25 kA_{rms} in case of mains-side overcurrent protection and a total discharge current I_{total} of 20 kA (8/20 µs).

Despite the compact design, the device houses a non-power consuming, mechanical operating, state/fault indication and a tried and tested thermal disconnector which does not disconnect the connected load as soon as it is tripped. DEHNcord can be ideally adapted to existing installation systems. It ensures flexible and space-saving type 2 surge protection at minimum expense.

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DEHNguard® SE H LI

DEHNguard® SE H LI sets new standards due to its early warning system (Lifetime Indication LI). This intelligent surge arrester informs the user of an arrester failure at an early stage and is thus ideally suited for all installations in industrial and commercial environments which require maximum reliability and availability, such as offshore wind turbines computer centres and power plants.

In addition to its discharge capacity up to 65 kA (8/20 µs) and Lifetime Indication, the surge arrester stands out due to its width of only 1.5 modules and versions from 75 V a.c. to 1000 V a.c. are available. All other benefits of the modular DEHNguard® family design such as the module locking system and the coded protection modules, which prevents the installation of an incorrect module, are also integrated in the DEHNguard® SE H LI products. In conjunction with a floating remote signalling changeover contact, the three-step Lifetime Indication with visual indicator <green–yellow–red> always shows the status of the surge protective device. If the varistor structure were irreversibly pre-damaged by an increased energy load, the yellow indicator and the remote signalling contact show that it is advisable to replace the protection module before the installation becomes unprotected since the arrester is fully operational until the red indicator flag appears. This allows easy integration of the arrester

in condition monitoring systems. Thus, preventive maintenance concepts can be easily implemented.
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DEHNcube YPV SCI

DEHNcube YPV SCI reliably protects the d.c. side of photovoltaic systems from surges caused by lightning interference.

This type 2 surge arrester with an IP 65 degree of protection houses the tried and tested Y circuit with patented SCI technology in a very small space. It is the first type 2 d.c. surge arrester for PV systems which can be installed outside of enclosures and is thus ideally suited for protecting string inverters. DEHNcube YPV SCI has a nominal discharge current In of 12.5 kA (8/20 µs) and a short-circuit current withstand capability I_{scpv} of 1000 A d.c. The device complies with the requirements of the prTS 50539-12 technical specification and is tested to the requirements of the EN 50539-11 product standard. The ready-to-install arrester can be installed by means of a connecting cable (accessory) and is available for one or two MPP trackers. Due to the compact dimensions of the enclosure, DEHNcube can be flexibly installed in close proximity to the inverter and is thus a cost-effective solution for protecting the inverter and the PV modules. Designed as a prewired box with an IP 65 degree of protection, the arrester can also be easily retrofitted.
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DEHNcombo YPV SCI

This arrester with a width of only 4 modules combines a type 1 lightning current arrester and a type 2 surge arrester in a single device and features the proven Y circuit with patented SCI technology in a very small space.

DEHNcombo YPV SCI is tailored to the requirements of the new prTS 50539-12 technical specification and Supplement 5 of the German DIN EN 62305-3 standard and meets the test requirements of the EN 50539-11 standard. The device, which can be used without additional

backup fuse up to a short-circuit current of 1000 A, has a total discharge current of 12.5 kA (10/350 µs) and a low voltage protection level, thus ensuring efficient protection of terminal equipment.

The proven SCI technology with a combined disconnection and short-circuiting device is the core of DEHNcombo which is available for voltages of 600 V, 1000 V and 1500 V. In addition, the arrester features a non-power consuming operating state / fault indication as well as a remote signalling contact.
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DEHNbox TC 180

The new DEHNbox TC 180 provides optimal surge protection for telecommunication systems (ISDN, analogue telephones, xDSL).

DEHNbox TC 180 protects one balanced data interface and has a high discharge capacity of 2.5 kA (10/350 µs) per core. Surges are limited to an acceptable level without interfering with the data signal. The device can be installed in conformity with the lightning protection zones concept at the boundaries from 0_A to 2 and higher. Its cut-off frequency up to 250 MHz ensures transmission of high-frequency signals. The compact arrester can be easily retrofitted

at any time thanks to its surface-mounted enclosure which is ideally suited for wall mounting. The cable cores (solid and flexible with wire end ferrule) and the earthing conductor can be inserted into the spring-loaded terminals of the fast connection system without tools. An additional separate terminal allows direct connection to the cable shield of the equipotential bonding system. Due to its IP 65 degree of protection, DEHNbox TC 180 can be used in almost all environments. Thus, DEHNbox TC 180 is an ideal surge protective device for information technology transmission systems such as in private homes, home offices, small businesses and small industrial businesses.
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BLITZDUCTOR® SP

The new BLITZDUCTOR® SP is a powerful surge arrester which increases safety of data, information technology as well as measuring and control systems.

The pluggable, multipole BLITZDUCTOR® SP surge arrester is designed for different voltage ranges, thus ensuring protection of information technology installations and systems such as measuring and control circuits and bus systems. Two universal base parts with or without signal disconnection when the protection module is removed, are optionally available. Thanks to its modular arrester concept, all protection modules of the BLITZDUCTOR® SP series can be easily and quickly plugged into the base part. The universal base parts optimise storage and ensure easy prewiring and service. The DIN rail mounted arrester with a width of only 12 mm allows protection of up to four signal cores. It has a high discharge capacity up to 20 kA (8/20 µs) and a low voltage protection level, it can thus be installed in conformity with the lightning protection zones concept at the boundaries from 0_B to 2 and higher. A wide range of accessories such as elements for earthing of unused lines or easy testing of signal cores makes the BLITZDUCTOR® SP arrester particularly user-friendly.
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DEHNshort – arc fault protection system for LV installations

DEHNshort – an arc fault protection system for low-voltage installations consisting of a detection system and short-circuiting unit – is an innovation for protecting installations.

The detection system can be integrated in the door of the switchgear cabinet and the short-circuiting unit takes up little space. DEHNshort provides a high degree of protection for installations and also takes up limited space. It allows fast and safe disconnection of installations in case of an arc fault. Long downtime and the resulting follow-up costs can thus be prevented. DEHNshort detects an arc fault at the early stages of development and it only takes a split second until the arc fault is extinguished so that its effects are limited to an acceptable level.
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