#### www.dehn-international.com/partners



Surge Protection Lightning Protection Safety Equipment DEHN protects.®

DEHN + SÖHNE GmbH + Co.KG.

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www.dehn-international.com



Lightning and surge protection secures the supply – today and tomorrow



# Focus on safe operation – solutions for intelligent power grids

The top priority for utilities companies, charging post manufacturers and fleet operators is safe and secure operation. Compliance with normative requirements is also an important aspect. DEHN products and solutions make it easy to achieve high system availability and the related security of supply – our satisfied customers confirm it.

Lightning and surge protection is elementary when it comes to grid and supply reliability. A power outage is a huge problem for both corporate and private customers. Power failure can lead to high costs, for example, due to production downtime, and to a reduced standard of living – which means loss of image for the network operators and municipalities.

Availability also takes first place for electromobility. Charging posts must be protected against failure and their ongoing operation secured. Breakdowns due to lightning, surges or electromagnetic interference cost the operator time, money and manpower.

So, make sure you opt for a comprehensive protection concept with DEHN solutions for surge protection, lightning protection and safety equipment – all from a single source. For high system availability and thus supply reliability.



### Power grid in transition

Power generation in the grid of the future will be primarily decentralised. Distribution networks are already taking green power from PV systems and wind turbines and transporting it in all directions. The resulting multi-directional flow of energy brings new challenges for the network operator. The continued safe operation of the networks requires their intelligent expansion and control.

The development of an intelligent network involves an increasing number of sensitive electronic components. The risk of power supply outages due to system failure resulting from lightning, surges and electromagnetic interference is growing. Modern protection concepts can protect the central facilities and systems in the power sector. This brochure will provide you with more information.

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# DEHN protects substations



Substations are a central part of the power supply network. Technical safety is the top priority. The equipment must be state of the art. The current normative requirements according to IEC 62305 and IEC 61936-1 apply for lighting and surge protection <sup>1</sup>).

A risk analysis of the potential local risk is important when planning the lightning and surge protection concept. The potential danger must be examined, analysed and evaluated for each individual case. Take advantage of the DEHNconcept planning service and have a comprehensive protection concept planned for you.

<sup>1)</sup> IEC 62305: Protection against lightning

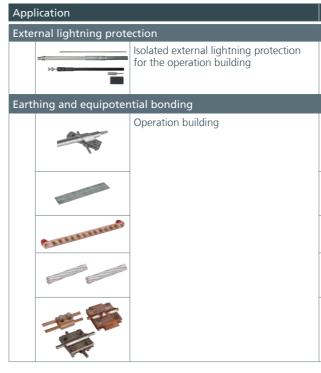
Common rules

IEC 61936-1: Power installations exceeding 1 kV a.c. - Part 1:

This consists of lightning protection, surge protection, earthing and equipotential bonding. A further benefit for you is less maintenance and repair work, which means lower costs. Your systems are stable and security of supply increases.

Power supply systems Protection of the low-voltage main Α distribution board in the operation building 11 Protection of the LED outdoor lighting В Protection of DC control lines С Information technology systems Protection of data and D communication lines Arrester monitoring Protection of telecommunication lines Protection of Ethernet applications Ε Protection of IP outdoor cameras Protection of coaxial connection systems 2

Application



Further **information** is available on the Internet:

**> > >** Short link: <u>de.hn/spg18is</u>

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Туре	Part No.
<b>DEHNventil®</b> Modular spark-gap-based type 1 and type 2 combined arrester for three-phase TT and TN-S systems with 230 / 400 V	951 315
<b>DEHNcord L</b> Type 2 arrester. Universal use thanks to IP 65 degree of protection	900 448
<b>DEHNguard® SE DC</b> Type 2 arrester for DC applications up to 60 V DC	972 115
BLITZDUCTOR® XT Space-saving TYPE 1 combined arrester module with LifeCheck® for protecting two pairs	920 347
Base part BXT BAS	920 300
<b>DEHNrecord Alert MODBUS</b> Modbus TCP / RTU communication module for integrating SPDs into a monitoring system	910 694
<b>DEHNrecord Alert MCM</b> Monitoring of up to 10 BXT. Transmission of the sta- tus, bus address and part numbers to the DEHNrecord Alert communication unit.	910 698
DEHNrapid <sup>®</sup> LSA	
Lightning current arrester (TYPE 1) Earthing frame Surge arrester (TYPE 3) TYPE 1 combined arrester for LSA Plus systems for protecting 10 pairs	907 401 907 498 907 470
DEHNpatch M	929 121
<b>DEHNpatch Outdoor</b> Universal TYPE 2 arrester for Ethernet and structured cabling systems up to 250 MHz	929 221
<b>DEHNgate G</b> TYPE 2 arrester with SMA connection technology	929 039

Туре		Part No.
HVI®light Conductor / DEHNcon-H Isolated lightning protection in the supporting tube with air-termination tip		819 255
Earth rods	StSt V4A Galvanised steel	620 902 625 151
Connection brackets for earth rods	StSt V4A Galvanised steel	620 915 620 015
Ring earth electrode (30 x 3.5 m	nm strip steel)	
	StSt V4A Galvanised steel	860 335 810 335
<b>Equipotential busbar industry design</b> 12 terminals		472 237
Copper cable	tinned 70 mm <sup>2</sup> tinned 95 mm <sup>2</sup> tinned 120 mm <sup>2</sup>	832 202 832 295 832 320
Connecting clamps Parallel connector Cross unit Cross unit	copper copper StSt V4A	306 101 321 047 319 209

# DEHN protects intelligent transformer substations

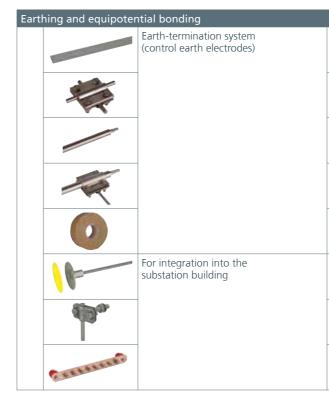


Transformer substations are an important link at the interface between medium and low voltage. If they have core components such as remotely controlled switch disconnectors and circuit breakers, regulated distribution transformers, telecontrols, communication and control devices, they are known as intelligent transformer substations.

DEHN provides the systems and components required to protect the sensitive electronics in intelligent transformer substations from being damaged by lightning and surges. You safeguard constant availability, avoid economic losses and save on personnel. Earthing and equipotential bonding also ensure personal safety.



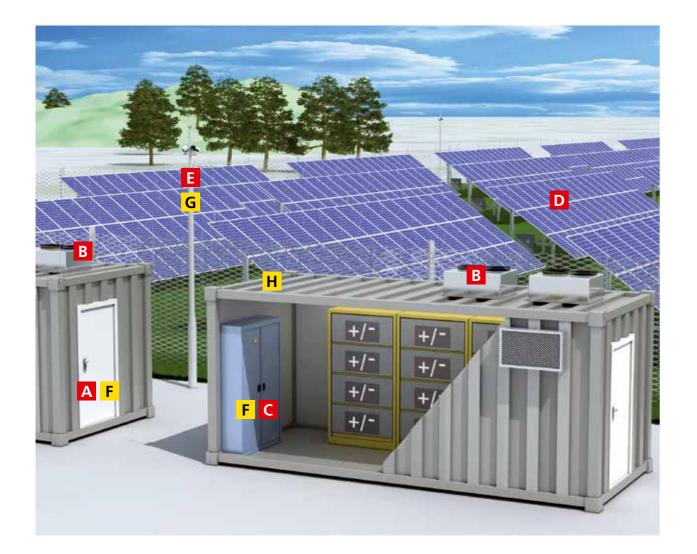
Application		Туре	Part No.
Power supply systems			
	Protection of the low-voltage main distribution board	DEHNvenCl Type 1 + type 2 combined arrester with integrated backup fuse alternative: DEHNguard® M ACI	961 205 952 341
		Type 2 arrester with integrated switch / spark gap combination; can be used without backup fuse alternative: <b>VA NH00</b> Type 2 arrester with integrated backup fuse in NH 00 design	900 262
B	Protection of the monitoring and telecontrol system	<b>DEHNrail</b> Type 3 arrester. Additional protection of the power supply of terminal devices	953 405
C	Protection of the transformers on the medium-voltage side	<b>DEHNmid</b> Medium voltage arrester	990 010
-		<b>Disconnector</b> Disconnector for DEHNmid arresters	994 003
Information technolog	y systems		
D	Protection of data and communication lines	BLITZDUCTOR® XT Space-saving TYPE 1 combined arrester module with LifeCheck® for protecting two pairs	920 375
<b>1</b>		BLITZDUCTOR® SP Space-saving TYPE 2 surge arrester module for protecting two pairs	926 375
		Base part BXT BAS	920 300
	Protection of Ethernet applications	<b>DEHNpatch</b> Universal TYPE 2 arrester for Ethernet and structured cabling systems up to 250 MHz	929 121
E	Protection of coaxial connection systems	<b>DEHNgate G</b> TYPE 2 arrester with SMA connection technology	929 039





Strip steel (30 x 3.5 mm)	
StSt V4A	860 325
Galvanised steel	852 335
Cross units	
StSt V4A	319 209
Galvanised steel	319 201
Earth rod	
StSt V4A	620 902
Galvanised steel	625 151
Connection clamp for earth rods	
StSt V4A	610 020
Galvanised steel	610 010
Anti-corrosion tape	556 130
Fixed contains point	478 011
Fixed earthing point StSt V4A	478 011
Connection clamp	478 129
For fixed earthing points	
Equipotential busbar industry design	472 237
12 terminals	

# DEHN protects electric battery storage systems



Lightning discharge jeopardises the sensitive electronics required for the process of charging and discharging. The surges which occur often exceed the dielectric strength of the electronic components installed many times over. Network-related voltage peaks can also damage electronic parts.

A comprehensive protection concept ensures that the battery storage system can do what it is there to do, e.g. peak shaving, energy management and maintenance of the voltage quality. DEHN lightning and surge protection considerably reduces the risk of damage. You need less personnel for maintenance and repair work and get a better operating result.



Appli	ication		Туре	Part No
Powe	er supply systems			
Α		Protection of the AC infeed of the low-voltage main distribution board	<b>DEHNventil®</b> Protection of the AC infeed of the low-voltage main distribution board	951 315
В	IIIB	Protection of air-conditioning systems	<b>DEHNguard® M</b> Type 2 arrester	952 31
С	88 50	Protection of DC supply lines	<b>DEHNguard® ME DC</b> Combined arrester type 1 and 2 for direct current applications up to 950 V with powerful DC switching device DCD	972 146
	THE O		alternative: <b>DEHNguard® SE DC</b> Type 2 arrester for direct current applications up to 900 V with powerful DC switching device DCD	972 14
D	185	Protection of PV power supply systems	<b>DEHNcombo</b> Type 1 combined arrester for photovoltaic systems up to 1500 V DC	900 06
E	<b>†</b>	Protection of the LED outdoor lighting	<b>DEHNcord L</b> Type 2 arrester. Universal use thanks to IP 65 degree of protection.	900 448
Infor	mation technolog	y systems		
F	4	Protection of data and communication lines	BLITZDUCTOR <sup>®</sup> XT Space-saving TYPE 1 combined arrester module with LifeCheck <sup>®</sup> for protecting one pair	920 244
	<b>1</b>		BLITZDUCTOR <sup>®</sup> SP Space-saving TYPE 2 surge arrester module for protecting one pair	926 24
			Base part BXT BAS	920 30
	( Section of the sect	Protection of Ethernet applications	<b>DEHNpatch</b> Universal TYPE 2 arrester for Ethernet and structured cabling systems up to 250 MHz	929 12 <sup>-</sup>
G		Protection of IP outdoor cameras	<b>DEHNpatch Outdoor</b> TYPE 2 arrester for outdoor use	929 22
H		Protection of coaxial connection systems	<b>DEHNgate G</b> TYPE 2 arrester with SMA connection technology	929 03





Туре	Part No.
HVI®light Conductor / DEHNcon-H Isolated lightning protection in the supporting tube with air-termination tip	819 255
<b>Strip steel</b> (30 x 3.5 m) StSt V4A Galvanised steel	860 325 852 335
Cross units StSt V4A Galvanised steel	319 209 319 201
<b>Equipotential busbars industry design</b> 12 terminals	472 227

# DEHN protects the charging infrastructure and electric vehicles

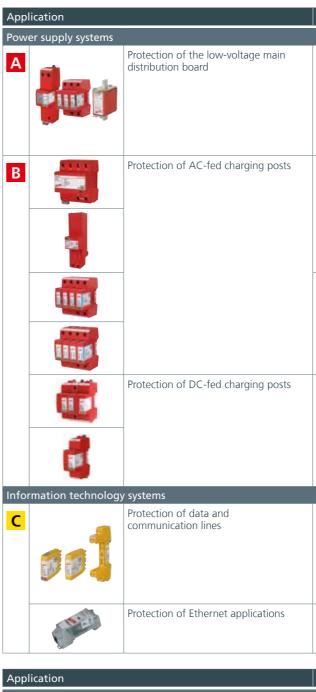


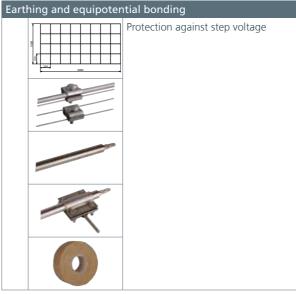
A storm is never planned and, what few electric vehicles owners and charging station operators know, charging posts require lightning and surge protection to prevent damage both to the posts themselves and the vehicle when charging during a storm.

Protect your investment and yourself against the expense of damaged charging controllers, batteries and electronics in the charging facilities (control and communication) by implementing high quality, tested DEHN protective solutions. This gives the owners of electric vehicles a safe and reliable way of charging their vehicles and polishes up the image of charging post operators in terms of increased availability and vehicle protection. With DEHN lightning and surge protection, you also fulfil the current standards <sup>1)</sup>, e.g. IEC 60364-7-722 and IEC 60364-4-44.

DEHN lightning and surge protection

- protects the charging infrastructure
- protects the electric vehicle during charging
- increases the availability of charging posts
- fulfils the normative requirements





<sup>1)</sup> IEC 60364-7-722: Low-voltage electrical installations – Part 7-722: Requirements for special installations or locations – Supplies for electric vehicles

IEC 60364-4-44: Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances Further information is available on the Internet:

**> > >** Short link: <u>de.hn/ew19emob</u>



Туре	Part No.
DEHNvenCl	961 205
Spark-gap-based type 1 + type 2 combined arrester	501 205
alternative: <b>DEHNguard® M ACI</b>	952 341
Type 2 arrester with integrated switch / spark gap	
combination; can be used without backup fuse alternative: VA NH00	900 262
Type 2 arrester with integrated backup fuse in	500 202
NH 00 design	
DEHNshield®	941 315
Type 1 + type 2 spark-gap-based combined arrester	
for three-phase TT and TN-S systems for 230 / 400 V, DIN rail mounted	
alternative:	
DEHNshield <sup>®</sup> ZP	900 397
Type 1 + type 2 combined arrester for three-phase TT	
and TN-S systems; snapped on 40 mm busbar systems	
DEHNguard <sup>®</sup> ACI	952 341
Type 2 arrester with integrated switch / spark gap	
combination; can be used without backup fuse	
alternative:	
DEHNguard®	952 315
Type 2 arrester	
DEHNguard <sup>®</sup> ME DC	972 146
Combined arrester type 1 and 2 for direct current	
applications up to 950 V with powerful DC switching device DCD	
alternative:	
DEHNguard <sup>®</sup> SE DC	972 145
Type 2 arrester for direct current applications up to	
900 V with powerful DC switching device DCD	
BLITZDUCTOR® XT	920 244
Space-saving TYPE 1 combined arrester module with LifeCheck <sup>®</sup> for protecting one pair	
BLITZDUCTOR® SP	926 244
Space-saving TYPE 2 surge arrester module for	
protecting one pair	
Base part BXT BAS	920 300
DEHNpatch	929 121
Universal TYPE 2 arrester for Ethernet and structured cabling systems up to 250 MHz	
cubing systems up to 250 WILZ	
÷	
Туре	Part No.
Mesh mat	
StSt V4A	618 214

StSt V4A	618 214
Connecting clamp	540 270
For mesh mats	
Earth rod	
StSt V4A	620 902
Galvanised steel	625 151
Connection clamp for earth rods	
StSt V4A	610 020
Galvanised steel	610 010
Anti-corrosion tape	556 130

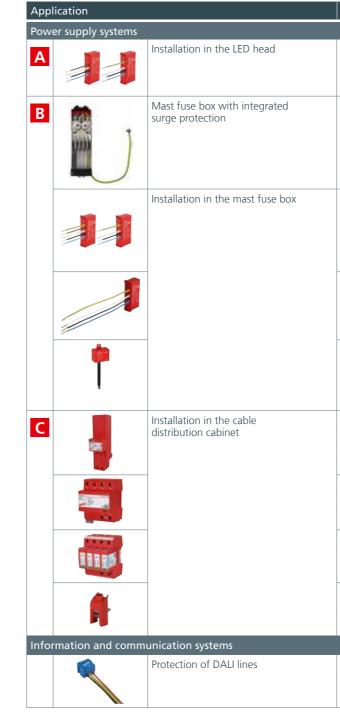
# DEHN protects LED street lighting



Indirect lightning discharge produces surges which far exceed the surge immunity of LED luminaires. This can lead to partial or complete failure of the LED module and defective LED drivers. Surges in the grid may result in the premature ageing of LED modules.

This can be combatted with high-performance surge protection. DEHN surge arresters prevent the failure of lighting which means more safety and happier residents. At the same time, surge protection can increase the service life of LED lights – for the sustained protection of your investment. Some good reasons for DEHN lightning and surge protection

- LED lights are sensitive electric consumers with a lower surge immunity than conventional luminaires
- A protection concept avoids maintenance jobs due to surge damage
- DEHN arresters ensure the longevity and availability of LED technology
- DEHN arresters are high-quality products made in Germany which offer reliable protection against surges









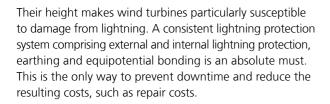
Туре	Part No.
<b>DEHNcord L 2P</b> (for class II LEDs) <b>DEHNcord L 2P</b> (for class I LEDs) Compact type 2 arrester. With disconnection of the load circuit in the event of a fault	999 906 900 446
Mast fuse box EK480 with integrated DEHNcord	900 443
DEHNcord L 3P (including protection of the control phase) DEHNcord L 2P Compact type 2 arrester. With disconnection of the load circuit in the event of a fault. IP 20 degree of protection	900 445 900 446
<b>DEHNcord L 2P</b> (with long connecting cables) Compact type 2 arrester. With disconnection of the load circuit in the event of a fault. IP 20 degree of protection	999 937
DEHNcord L 3P (including protection of the control phase) DEHNcord L 2P Universal retrofit version with IP 65 degree of protection	900 447 900 448
<b>DEHNshield® ZP</b> Type 1 + type 2 spark-gap-based combined arrester, for three-phase TT and TN-S systems. Snapped on 40 mm busbar systems	900 397
<b>DEHNshield</b> <sup>®</sup> (for TT and TN-S systems) Type 1 + type 2 spark-gap-based combined arres- ter, for three-phase TT and TN-S systems. DIN rail mounting	941 315
<b>DEHNguard® M</b> Type 2 arrester	952 315
STAK 25 Accessory: Pin-shaped terminal for EMC-optimised series connection (for DEHNshield® and DEHNguard®)	952 589
<b>BT 24</b> TYPE 2 arrester with KNX bus terminal design	925 001

Туре	Part No.
Earth rod StSt V4A Galvanised steel	620 902 625 151
Connection clamp for earth rods StSt V4A	540 121

# From the safe generation....

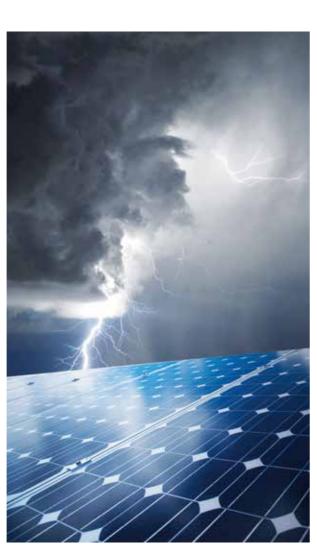
## ... to the safe utilisation of power





Decide in favour of safety. Put your trust in DEHN when it comes to lightning and surge protection and profit from our long experience. Take advantage of DEHN services, such as

- risk analysis
- customised protection concepts and product solutions
- system tests in the DEHN Test Centre



Surges as a result of storms are one of the most frequent causes of damage in PV systems. They frequently destroy system parts such as modules, inverters and monitoring systems.

The financial impact is substantial. The replacement of a faulty inverter, new installation and loss of revenue resulting from downtime all mean that the break-even point and thus the profit zone is reached much later.

Decide in favour of a professional and comprehensive lightning protection system consisting of external and internal lightning protection. In doing so, you increase system availability and secure your revenue in the long term.

Further information is available on the Internet:

Further information is available on the Internet:

Short link: <u>de.hn/pvps</u>

**> > >** Short link: <u>de.hn/office-buildings</u>

Further information is available on the Internet:

• Short link: <u>de.hn/wind-turbines</u>



Sensitive, interconnected technological equipment forms the basis of the modern working world and smart buildings. Building automation, KNX systems, LED lighting, sensitive safety, data and communications technology are just a few examples.

Lightning and surges can have grave consequences. They put people at risk and can damage buildings and equipment, paralysing them and entire work processes. These are unnecessary outages and dangers which can easily be prevented by installing a lightning protection system. This consists of external lightning protection, surge protection, earthing and equipotential bonding.



Digital devices increasingly define our modern lifestyle: intelligent home technology, burglar alarms, smart TV, electromobility, to name but a few. Smart technology in the home is standard for many people nowadays. At the same time, it means that the devices are more sensitive and susceptible to disturbance.

The more we use the opportunities presented by digitalisation, the more important it becomes to ensure that residential buildings have the best possible protection. This safeguards the availability of smart building and home office technology, keeping both the heating and the WLAN router up and running.

Whether a new building, modernisation or retrofit: modern residential buildings require comprehensive protection!

Further information is available on the Internet:

**> > >** Short link: <u>e.hn/pvrb</u>

# Safe service and maintenance

#### DEHN safety equipment



### Safe right down the line...

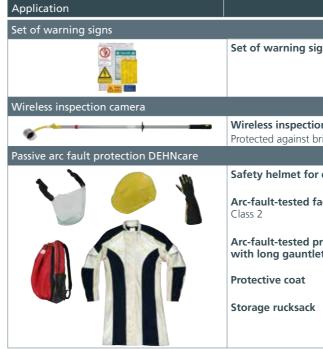
Work on electrical systems is becoming more and more demanding. Make sure you use safe and reliable equipment.

DEHN offers tested products and reliable services which protect you against injury caused by arc faults and secure the availability of your systems. This gives you, as the employer, legal certainty.

#### ... and on the job!

- Insulated sticks
- Voltage detectors
- Earthing and short-circuiting devices
- Covering material and blankets
- Arc fault tested personal protective equipment









	Part No.
N): 136 kV	763 611
I <sub>N</sub> ): 136 kV	765 042
	785 640 785 642 785 637
e <b>indicator</b> I <sub>N</sub> ): 110420 kV, for high-voltage overhead lines	767 539
tector $I_N$ ): 60132 kV, for switchgear installations	783 280
<b>kit</b> <sub>N</sub> ): 20 kV, for switchgear installations and nsport case included.	767 724
<b>rt-circuiting devices</b> onfiguration of individual earthing devices for your installation at: <u>fety-rules</u>	
	761 016
tive shutters	763 211
ling areas	785 458

	Part No.
gns	700 050
on camera pridging up to 123 kV	766 390
r electricians	785 705
ace shield	785 722
protective gloves et	785 810
	785 756
	785 443



#### More than just a product

Safe technology and comprehensive services all from a single source. As your partner, we are pleased to be at your side providing protection solutions and know how in all areas of the energy sector.

#### Intelligent planning

Simple and safe planning with the help of the DEHNsupport Toolbox software. With DEHNconcept you save even more time when planning integrated protection solutions for intelligent power networks.

Get hold of practical information on all topics relating to lightning and

surge protection and safety equipment at our DEHNacademy seminars



You have questions about the technology or applications? Get in touch with our technical support: Phone: +49 9181 906 1774, E-mail: itss@dehn.de



Easily acquire knowledge

and other training events.

#### Play it safe

#### **DEHN** Test Centre

Take advantage of our know-how to ensure that your solutions really are practicable. In the long-term, tested protection concepts promise greater operational reliability and availability of your systems. Have the lightning current carrying capability of your components tested using the most modern methods available. The DEHN Test Centre with a floor space of 800  $\ensuremath{m^2}$ offers engineering and testing services. The testing facility in our lightning current laboratory is able to generate lightning currents of up to 400 kA (10/350 µs) and is one of the most powerful of its kind in the world.

By the way, the DEHN Test Centre is accredited by the German Accreditation Body (DAkkS) according to IEC 17025.

Further information is available on the Internet:

#### **•** • Short link: <u>de.hn/test-centre</u>



Should you have any questions about our engineering and testing services in the area of utilities, please contact Team Test Centre Phone: +49 9181 906 1812 Email: labor@dehn.de



#### Our testing services:

- System-level immunity test according to IEC 62305
- Testing of customer-specific connection units, e.g. charging posts, LED street lights, measuring and control systems in intelligent transformer substations
- Immunity test of components and systems according to IEC 61000-4-5
- Immunity test for telecommunication systems according to ITU-T and CCITT<sup>1)</sup>
- Lightning current tests for low-voltage switchgear installations
- Other test services are available on request

<sup>1)</sup> ITU-T: Telecommunication Standardization Sector, a unit of the International Telecommunication Union (ITU)

CCITT: The Comité Consultatif International Télephonique et Télegraphique is a technical committee of the ITU



#### Fair partnership for the best solution

Our goal is to be a reliable, fair partner for our industrial, commercial and technical customers all over the world. To this end, we always focus on the best protection solution. Proximity to and close contact with our customers is of great importance to us, be it on-site support by our experienced team, our telephone hotline or personal contact at trade fairs.

## Worldwide presence with subsidiaries, representative offices and partners

Our sales teams in our global network in Germany, in our 20 subsidiaries and offices as well as more than 70 international partners ensure the competent and customer-oriented marketing of our products.

Subsidiaries and representative offices		
Austria	DEHN AUSTRIA GmbH	www.dehn.at
China	DEHN Surge Protection (Shanghai) Co. Ltd.	www.dehn.cn
Czech Republic	DEHN s.r.o.	www.dehn.cz
Denmark	DESITEK A/S	www.desitek.dk
France	DEHN FRANCE S.à.r.l.	www.dehn.fr
Great Britain	DEHN (U.K.) LTD.	www.dehn.co.uk
Hungary	DEHN office Budapest	www.dehn.hu
India	DEHN India Pvt. Ltd.	www.dehn.in
Italy	DEHN ITALIA S.p.A.	www.dehn.it
Mexico	DEHN PROTECTION MÉXICO, S.A. de C.V.	www.dehn.mx
Netherlands	DEHN NEDERLAND B.V.	www.dehn.nl
Poland	DEHN POLSKA Sp.z.o.o.	www.dehn.pl
Russia	OOO DEHN RUS	www.dehn-ru.com
Singapore	DEHN (SEA) PTE. LTD.	www.dehn.sg
South Africa	DEHN AFRICA (Pty) Ltd.	www.dehn-africa.com
Spain	DEHN IBÉRICA Protecciones Eléctricas, S.A. Unipersonal	www.dehn.es
Switzerland	ELVATEC AG	www.elvatec.ch
Turkey	DEHN office Istanbul	www.dehn.com.tr
United Arab Emirates:	DEHN MIDDLE EAST FZE	www.dehn.ae
USA	DEHN Inc.	www.dehn-usa.com

You can find your local contact person on the Internet at:

Short link: <u>de.hn/contact</u>