

Safety Equipment

Catalogue

2026

DEHN protects.

www.dehn-international.com

Solutions for safe working on electrical installations



Safe when it matters most

Protect people and systems from electrical accidents. You can mitigate the risks posed by arc faults with the help of a comprehensive vprotection concept.

You will find an overview on our **webseite**.

Go to comprehensive arc fault protection website:
https://de.hn/2wntv



Working safely amid the new challenges of the energy transition

The energy transition is fundamentally changing infrastructure – and presenting new challenges for high-voltage specialists. Especially when expanding the grid or maintaining complex systems, it is essential to maintain a safe distance from existing systems and the hazardous voltages they carry. Smart products such as the voltage alarm are designed to help.

Learn more about the DEHNsense EFD:

To the DEHNsense EFD website:
https://de.hn/6MUHZ



Safe handling of high-voltage installations

The solution portfolio includes protective equipment for safe working on high-voltage installations such as charging posts, e-vehicles, bus charging stations, etc.
You can find an overview on our **website**.

Go to safe working in electric mobility website:
https://de.hn/8MtpD



Safe working on electric railways

The portfolio of solutions for safe working specifically for railway applications has been further enhanced.

Products for rail customers can be found here in a special chapter of this catalogue **from page 163** and on the **website**.

Go to website on protection of people and systems in the rail environment:
https://de.hn/aThFc

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DEHN Safety Equipment – Pioneers in electrical safety

As experts in electrical engineering, we accompany you step by step on the way to Vision ZERO with innovative products and services that combine safety, ease of use and quality. Our networked protection modules make electrical safety measurable, traceable – and future-proof.

From well thought-out technical, organisational and personal safety measures to smart safety devices – our solutions help you prevent electrical accidents at work, make processes more efficient and ensure compliance with legal requirements.



1910
DEHN electrical installation

1951
"That must never happen again!"
Richard Dehn takes note of a fatal accident caused by an EaS device



1952
Initial development activities "Earthing and short-circuiting"

***1952**
DEHN safety equipment is born

1953
Legendary fixed ball point is patented

2010
DEHNcare protective clothing

2014
Introduction of the DEHNshort arc fault protection system



2021
DEHNarX Risk Assessment

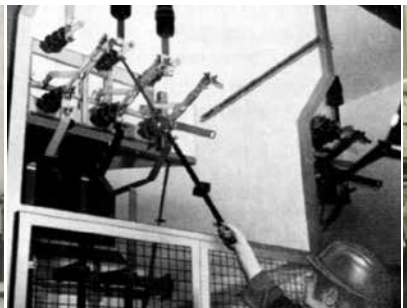
2023
Protective measures according to the TOP principle (ArbSchG)

2025
Smart product world around the DEHNwork app



How it all began – and why we are not standing still













Aware of the risks

DEHNarX, page 22



Smart

DEHNsense EFD, page 26



Flexible!

DEHNproX HVD, page 44

Safe person. Safe system. Your path to electrical safety.

Working on electrical systems is not without danger – even a small error can have serious consequences. Over 70 years ago in 1951, a fatal electrical accident, which came to the attention of our managing director at the time, prompted DEHN to enter the field of occupational safety.
Since then, we have been developing comprehensive protection solutions that combine**technology**, **organisation**, **and personal protective equipment** with **smart products** and **services**. We are thus making a decisive contribution to **Vision Zero**: maximum safety for people and systems.

What makes DEHN special:

- **Holistic thinking:** We combine technical, organisational, personal and NEW smart protective measures (TOP+S principle) to create a seamless safety concept.
- **Smart networking:** With innovative devices such as DEHNsense EFD or DEHNproX HVD and the DEHNwork app, we create digital security that thinks for itself.
- **Developed with practical application in mind:** Our products are the result of decades of experience in electrical engineering and direct dialogue with users.
- **Reliably protected:** From PPE and protection systems against arc faults to smart services – DEHN offers tested quality you can rely on.

DEHN Safety Equipment – Your partner for electrical safety.

DEHN protects.

That is our promise.
DEHN safety equipment extends this promise beyond lightning and surge protection to the most important component when working on electrical installations: people.



Strong
DEHNcare ArcFit HLP, page 139

Be responsible –

Protect employees from electrical accidents

T – Technical measures

Combat hazards at the source.

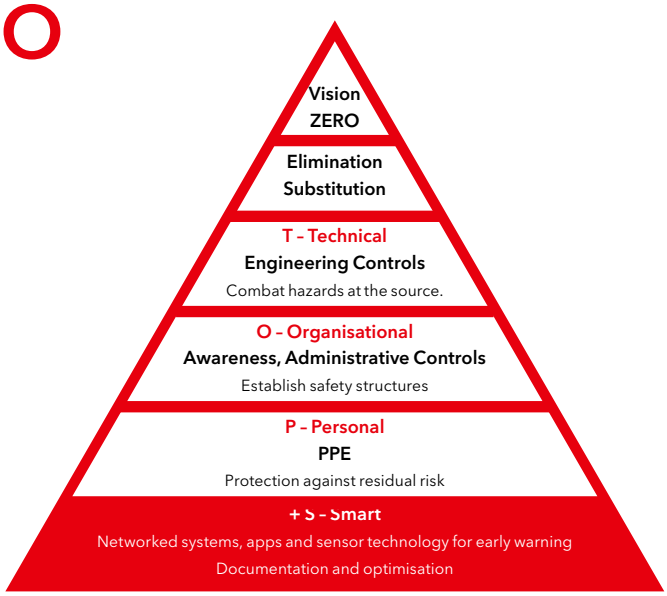


DEHNshort
Quenches arcs as soon as they occur and drastically minimises the energy of an arc fault. From page 157.

DEHNproX
Safety devices and equipment for compliance with the 5 safety rules of electrical engineering as well as products for live working. From page 29.

Enabling Vision ZERO

Technical, organizational, and personal measures supplemented with smart technology



Safety according to the TOP+S principle: The pyramid is the DEHN-specific version of the internationally recognised **Hierarchy of Risk Control** – extended by smart protective measures – for even more safety when working on electrical installations.

Safety according to the TOP+S principle – internationally compatible

The TOP principle (Technical – Organisational – Personal) is enshrined in the German Occupational Health and Safety Act and forms the basis of our protection portfolio. The Hierarchy of Risk Control applies internationally – both models follow the same logic:

1. Avoid / eliminate hazards at source
2. Technical measures
3. Organisational measures
4. Personal protective equipment to mitigate the residual risk

DEHN combines these approaches and supplements them with smart protective measures (S).

"Our smart and networked solutions increase the level of protection, create transparency and support responsible managers worldwide in implementing Vision ZERO."

Vision Zero is the vision of a world without occupational accidents and work-related illnesses. With a comprehensive TOP+S protection concept from DEHN Arbeitsschutz, you can prevent accidents when working on electrical installations.

O – Organisational measures

Establish and implement safety structures.



DEHNarX
Regularly assess hazards and develop a protection concept for your electrical installations. From page 21.

DEHNacademy
Raise awareness of the dangers of electricity and provide information on compliance with standards and specifications when working on electrical installations. Page 20.

Periodic inspections
Regular inspection and maintenance of voltage detectors and EaS devices. Page 10.

P – Personal measures

Protect against the residual risk.



DEHNcare protective clothing
Personal protective equipment against arc faults reduces the residual risk of injury/burns and protects body areas in the danger zone of the electrical installation. From Page 123.

DEHNcare face protection and gloves
For body areas that are even closer to the points of danger in the work area. From Page 142.

+ S – Smart measures

Optimise protection through networking.



DEHNwork App
Document safety and responsibility seamlessly via app. Page 28.

DEHNsense EFD
Detects electric fields in real time and provides early warning of dangerous situations before a risk arises. From Page 25.

DEHNproX HVD
Online configurable and app-supported, the voltage detector provides an intelligent system for voltage testing that ensures maximum safety in medium and high-voltage installations. From Page 44.

On the following pages, you will find basic information which helps you find your way around the DEHN Safety Equipment catalogue and presents important additional information on the product in a structured way.

In the 1st part you will find all relevant standards and in the 2nd part practical additional information.

Detailed structure of the DEHN informative pages:

STANDARDS
1. Standards for tools, equipment, protective and auxiliary equipment
2. Standards and test principles for personal protective equipment
3. Standards for active protection against arc faults
4. Provisions for periodic inspections

PRACTICAL Additional Information
5. Short descriptions
5.1 Materials
5.2 Surface treatment
5.3 Conductor types
6. Minimum lengths of insulating elements
7. Explanation of symbols

STANDARDS

1. Standards for tools, equipment, protective and auxiliary equipment

DIN VDE 0671-213 (IEC/EN 62271-213)
Voltage detection and indication systems

DIN VDE 0671-215 (IEC/EN 62271-215)
Phase comparator in combination with a voltage detection and indication device

DIN VDE 0680
Personal protective equipment, protective equipment and devices for working on live parts up to 1000 V

Part 1:	Insulating protective devices
Part 4	NH fuse puller
Part 7	Fuse handles for low-tension HRC-fuses

DIN VDE V 0681
Operating, testing and safeguarding devices for work on electrically energized systems with rated voltages exceeding 1 kV

Part 1:	General specifications for DIN VDE V 0681 Part 2-3
Part 2	Switching sticks
Part 3	Fuse tongs
Part 6	Voltage detectors for the overhead contact line systems of electric railways (DIN VDE 0681-6)

DIN VDE 0682
Devices and equipment for working on live parts

Part 201	Live working – Hand tools for use up to 1000 V AC and 1500 V DC (IEC/EN 60900)
Part 211	Live working – Insulating sticks and interchangeable operating heads – Part 1: Insulating sticks
Part 212	Live working – Insulating sticks and interchangeable operating heads – Part 2: Interchangeable operating heads
Part 213	Multipurpose insulating sticks for electrical operations in high-voltage installations (EN 50508)
Part 401	Two-pole voltage detector for low-voltage system (IEC/EN 61243-3)
Part 411	Voltage detector, capacitive type for voltages exceeding 1 kV AC (IEC/EN 61243-1)
Part 412	Voltage detector, resistive (ohmic) type for voltages of 1 kV to 36 kV AC (IEC/EN 61243-2)
Part 415	Voltage detecting systems (IEC/EN 61243-5)
Part 417	Voltage detectors, distance voltage detectors (preliminary standard DIN VDE 0682-417)
Part 421	Voltage detectors, capacitive type for voltages exceeding 1 kV AC and a frequency of 16.7 Hz (preliminary standard DIN VDE V 0682-421)
Part 431	Part 1: Phase comparator Capacitive type for voltages exceeding 1 kV AC (IEC/EN 61481-1)
Part 431	Part 2: Phase comparator Resistive (ohmic) type for voltages exceeding 1 kV to 36 kV AC (IEC/EN 61481-2)
Part 511	Electrically insulating blankets (IEC/EN 61112)
Part 512	Electrically insulating mats (IEC/EN 61111)
Part 552	Insulating protective shutters over 1 kV
Part 603	Telescopic sticks and telescopic measuring sticks (IEC/EN 62193)
Part 621:	Equipment for suction cleaning of live parts with a rated voltage from 1 kV to 36 kV

DIN VDE 0683
Portable equipment for earthing or earthing and short-circuiting

Part 100, Suppl. 1	Portable equipment for earthing or earthing and short-circuiting (IEC/EN 61230) Supplement 1: Notes on the selection and application (e.g. maintenance checks)
Part 200	Earthing or earthing and short-circuiting equipment using lances as a short-circuiting device – Lance earthing (IEC/EN 61219)

2. Standards and test principles for personal protective equipment

EN ISO 11611	Protective clothing for welding and related processes
EN ISO 11612	Clothing to protect against heat and flame – Minimum performance requirements
EN ISO 13688	Protective clothing – General requirements
EN ISO 14116	Protective clothing – Protection against flame – Limited flame spread materials, material assemblies and clothing
EN ISO 20345	Personal protective equipment – Safety footwear
EN ISO 20471+A1	High-visibility clothing – Test methods and requirements
EN ISO 21420	Protective gloves – General requirements and test methods
EN 166	Personal eye protection – Specifications
EN 170	Personal eye protection – Ultraviolet filters – Transmittance requirements and recommended use
EN 388+A1	Protective gloves against mechanical risks
EN 407	Protective gloves and other hand protection equipment against thermal risks (heat and/or fire)
EN 1149	Protective clothing – Electrostatic properties
EN 13034+A1	Protective clothing against liquid chemicals – Performance requirements for chemical protective clothing offering limited protective performance against liquid chemicals (type 6 and type PB [6] equipment)
EN 17353	Protective clothing – Enhanced visibility equipment for medium risk situations – Test methods and requirements
EN 50365	Electrically insulating helmets for use on low voltage installations
EN 60903	Live working – gloves of insulating material
EN 61482-1-1	Protective clothing against the thermal hazards of an electric arc – Part 1-1: Test methods – Method 1: Determination of the arc rating (ELIM, ATPV and/or EBT) of clothing materials and of protective clothing using an open arc
EN 61482-1-2	Protective clothing against the thermal hazards of an electric arc – Part 1-2: Test methods – Method 2: Determination of arc protection class of material and clothing by using a constrained and directed arc (box test)
GS-ET 29	Principles of testing and certification of face shields for electrical work
GS-ET 42-2	Additional requirements for the testing and certification of heat-protective gloves for protection against the thermal effects of an arc fault
ASTM F1959	Standard Test Method for Determining the Arc Rating of Materials for Clothing
ASTM F2178	Standard Specification for Arc Rated Eye or Face Protective Products
ASTM F2675	Standard Test Method for Determining Arc Ratings of Hand Protective Products Developed and Used for Electrical Arc Flash Protection

3. Standards for active protection against arc faults

DIN EN IEC 60947-9-1	Low-voltage switchgear and controlgear – Active arc-fault mitigation systems – Part 9-1: Arc quenching devices
DIN EN IEC 60947-9-2	Low-voltage switchgear and controlgear – Active arc-fault mitigation systems – Part 9-2: Optical-based internal arc-detection and mitigation devices
IEC 60364-4-42	Low-voltage electrical installations Part 4-42: Protection for safety – Protection against thermal effects (E DIN VDE 0100-420)
IEC TS 63107	Integration of internal arc-fault mitigation systems in power switchgear and controlgear assemblies (PSC-Assemblies) according to IEC 61439-2 (DIN VDE 0660-600-2-1)
DIN EN 61439-2, Suppl. 1 1	Low-voltage switchgear and controlgear assemblies – Part 2: Energy switchgear assemblies; Supplement 1: Guide for testing under conditions of arcing due to internal fault (IEC/TR 61641) (VDE 0660-600-2 Suppl.1)

4. Provisions for periodic inspections



2032

Criteria for maintenance tests			
	German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations (BGV A3)	**VDE 0105-100**	**Equipment standard**
Earthing and short-circuiting devices	§ 5 (1) [... equipment is to be checked for proper condition ...] (2) [... at specific intervals. The intervals shall be selected such that defects which are to be anticipated are detected in good time!]	4.6, Note 2 [Maintenance of proper condition via e.g. working aids of the BG ETEM professional association for visual inspection during everyday work (1)] 5.3.3.101 [Periodic inspections, general information.]	EN 61230 Annex C (informative) C.3.2.2 [It is recommended to perform an inspection at least every five years in case of outdoor use and every ten years in case of indoor use.] DIN EN 61230 supplement 1, paragraph 4.2 Maintenance inspections [Regular inspection using a non-destructive, multi-stage method (LoRe measurement method) that detects possible internal cable damage without destroying the EaS device (2)].
Voltage detectors, phase comparators and voltage detecting systems	§ 5: Table 1C [Tests for compliance with the limit values specified in the electrotechnical rules must be carried out at least every six years]	6.2.4 [Test at least before and, if possible, after each use], 5.3.3.101 [Periodic inspections, general information.]	DIN EN 61243-1 Appendix G (informative) Tests for capacitive testers > 1 kV [No voltage tester should be used that has not been retested for 6 years.] DIN EN 61243-5 Description of tests for voltage detecting system (VDS) DIN EN 61481 Appendix G (informative) Tests for phase comparators 1-36 kV AC. [The maximum interval for maintenance tests is 6 years]
Operating and earthing sticks	§ 5: Table 1C [A visual inspection for signs of damage or defect must be carried out prior to each use.]	5.3.3.101 [Periodic inspections, general information.]	VDE 0681-1 to 3: Description of tests for operating sticks Note: Operating sticks must also be subjected to electrotechnical tests, so that we, DEHN, recommend the test intervals for voltage testers. E DIN VDE V 0681-1-3 Appendix B (informative) [Maintenance tests of operating sticks within 6 years.]

(1) BG ETEM "Visual inspection of portable earthing and short-circuiting devices (portable EaS devices) before installation"; flyer order no. S034 and S035; dated November 2020

(2) BG ETEM "Testing of portable earthing and short-circuiting devices (EaS) Sighting + measuring = testing!" from the magazine "etem", issue 04.2014

PRACTICAL Additional Information

5. Short descriptions

5.1 Materials

Short designation	Materials
Al	Aluminium
AlMgSi	Aluminium alloy
Cu	E-copper, copper
Ms	Brass
StSt	Stainless steel
St	Steel
MCI	Malleable-cast iron
ZDC	Zinc die casting
GRP	Glass-fibre reinforced plastic
PP	Polypropylene
PUR	Polyurethane

5.2 Surface treatment

Short designation	Surface treatment
gal Sn	tin-plated
gal Zn	zinc-plated
HDG	hot-dip galvanised
Bronze gal Sn	Bronze tin-plated

5.3 Conductor types

Short designation	Conductor types
Fl	Flat conductor
Rd	Round conductor

6. Minimum length of the insulating element for

1) Operating sticks as per DIN VDE 0681

2) Voltage detectors as per DIN VDE 0682-411 (IEC/EN 61243-1)

3) Phase comparator as per DIN VDE 0682-431 (IEC/EN 61481)

Nominal voltage	Rated voltage	Minimum length of the insulating element / $L_{l\,min}$		
U_N *)	U_r	1)	2)	3)
up to 10 kV	12 kV	500 mm	360 mm	360 mm
20 kV	24 kV	500 mm	470 mm	470 mm
30 kV	36 kV	525 mm	520 mm	520 mm
45 kV	52 kV	720 mm	830 mm	–
60 kV	72.5 kV	900 mm	830 mm	–
110 kV	123 kV	1300 mm	1300 mm	–
150 kV	170 kV	1750 mm	1700 mm	–
220 kV	245 kV	2400 mm	2300 mm	–
380 kV	420 kV	3200 mm	3600 mm	–

*) For nominal voltages outside the proferred values of the nominal voltages listed here, the rated voltage next highest to the nominal voltage should be applied.
In borderline cases the nominal voltage is the same as the rated voltage.

7. Explanation of symbols

Symbol	Application
	**Installation instructions, see www.dehn-international.com**
	**Not for use in wet weather conditions** **For indoor and outdoor installations** For use in indoor and outdoor installations, but not in wet weather.
	**for use in wet weather conditions** **For indoor and outdoor installations** For use in indoor and outdoor installations in all weathers (including weather in which the operating sticks might get damp).
	**Use in indoor installations only**
	**Switchgear installations**
	**Overhead lines**
	**Kits for railway applications**
	**New products**

Sustainability
at DEHN

Assuming economic, ecological and social responsibility is an integral part of our corporate culture.

Our sustainability strategy, in which we have defined areas of action and formulated ambitious goals, ensures a planned approach.

You can find out what we have already achieved and how we intend to advance this issue online on our sustainability page.

Read more here:

Sustainability |DEHN

https://de.hn/crSCb



Services

Shortcut to the right service:
https://www.dehn-international.com/en/products/services

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Live working up to 36 kV	Page 19
Insulating protective shutters – Customised to your installation	Page 19



Ensuring everyday safety

DEHN offers practical all-round services for **the organisation** of everyday electrical engineering tasks.
Buying high-quality and tested products for the implementation of electrical safety rules is only the first step towards safety. By law and by standard, you must regularly check your safety devices (voltage detectors, EaS devices, insulating sticks). We can do this for you!

You can also leave the professional cleaning of your medium- and low-voltage switchgear installations to us. Another important point:
What is the situation when it comes to assessing the risk of arc faults in your installations? When was the last risk assessment? Here, too, we can offer you assistance with the DEHNarX service. You will find your contact person on the next few pages:



One of its kind worldwide: Digitalised high-voltage test laboratory

Thousands of periodic inspections are carried out annually in the DEHN high-voltage test facility. In 2021, significant investments were made in the test facility, which has been in use since 1993. Alongside hardware modifications, such as a new frequency converter, the interactive voice assistant, a globally unique feature, was implemented on the software front. These extensive modifications make the DEHN test facility with voice assistant a unique innovation. The updated emergency shut-off and the safety circuit control system also put the test facility on a high level as far as occupational and plant safety are concerned.

If you have any questions about our range of services, please contact service@dehn.de.

Automated product testing – advantages for you

- **Quicker periodic inspection**
  The processing times for periodic inspections are shorter. Thanks to the optimised, digitalised processes in our high-voltage test field, your safety devices are available again sooner.
- **The test spectrum is widening**
  With the new frequency converter, installed for the first time worldwide, it is possible to generate voltages of up to 250 kV in a frequency range of 16.7 to 200 Hz. The voltage quality remains consistently high over the entire voltage range.
- **Process-reliable periodic inspections**
  Existing processes are set-up-automated and the entire plant is raised to a new technical level. DEHN employees can initiate the respective test steps via voice assistant. The automation sets the appropriate voltage and the travel of the test setup. The settings and measured values can be monitored on the screens in the test facility.
- **New benchmarks for occupational and plant safety**
  The modernisations achieve the highest safety level (Performance Level E) currently achievable for a plant of this type.
- **Customised high-voltage testing**
  Contact us for your individual high-voltage tests.

DEHNsense EFD: Instruction and parameterisation

DEHNsense EFD provides timely warnings of electrical voltage hazards – directly upon entering the danger or vicinity zone. In combination with the DEHNwork app, profiles for electrical installations can be preset so that the voltage alarm is quickly ready for use and correctly configured in accordance with DIN VDE 0105-100.

Well briefed, optimally configured

To ensure that you can create profiles and use the device easily and without errors, we offer comprehensive training in DEHNsense EFD and the DEHNwork app.

Services at a glance:

- Joint installation of the DEHNwork app, registration of a company profile via the DEHN platform
- Comprehensive instruction in setting up and using the DEHNsense EFD and the DEHNwork app
- Creating profiles in the DEHNwork app for the various electrical systems on which the hazard warning device is used
- Testing the system profiles created in situations that may arise in day-to-day work on the electrical systems
- Optional extra: Labelling of your systems with QR code for the respective system profile

Requirements for the service

In order to perform the service, the systems to be parameterised must be accessible. In addition, we require information on the necessary personal protective equipment, system specifications and other customer-specific data.

Request instruction and parameterisation now at: efd@dehn.de

Learn more about DEHNsense EFD

For more information on our voltage alarm and the options offered by the DEHNwork app, please see page 25 or visit our website.

More information online:





Regularly check voltage detectors



Periodic inspection of protective and auxiliary equipment

DGUV Regulation 3 "Electrical installations and equipment" is the central German accident prevention regulation for electrical engineering. It applies to electrical installations and equipment such as voltage detectors, phase comparators and voltage detecting systems. It is also recommended for non-electrical work in the vicinity of electrical installations and equipment. The inspection intervals for protective and auxiliary equipment are specified in §5 Inspections. As the operator, you are responsible for maintenance, keeping deadlines and conducting the inspection! The DGUV recommends a periodic inspection every six years.

Only tested devices will save your life

- Regular maintenance tests ensure that your devices are in a proper and safe condition. The test is documented on the device and in a separate test report.
- Periodic inspection of voltage detectors, phase comparators, earthing and short-circuiting devices, etc. at the DEHN Service Centre.
- Periodic inspection at your location Earthing and short-circuiting devices

It's simple! Send operating devices such as voltage detectors to DEHN without any prior notification.

You can find all information here:

Easily configure earthing and short-circuiting devices online

The 4th safety rule when working on electrical installations is "earthing and short-circuiting". This secures the de-energised state of the system for the duration of the work against interference voltages, atmospheric surges, unforeseen feedback and erroneous re-connection.

Only an EaS device that has been adapted to your system will ensure that you are safe when working on electrical systems. So, use the EaS configurator with its intuitive navigation to choose the right EaS device.

Customised for you:

- Select place of use, basic structure of the device: 1-pole, 2-pole, 3-pole, material type, cable cross-section, length, connection elements, clamp and earthing stick
- With a variant number you can order a finished product again and again.
  A permanent plausibility check takes place in the background.

You can find the new EaS configurator and a demo version here:

Technical testing of earthing and short-circuiting devices with the LoRe measuring device

Make sure you keep the regular inspection intervals for earthing and short-circuiting devices.

You have two ways of technically assessing the overall condition of your EuK devices with a measurement procedure:

1. Have your EuK devices checked by DEHN

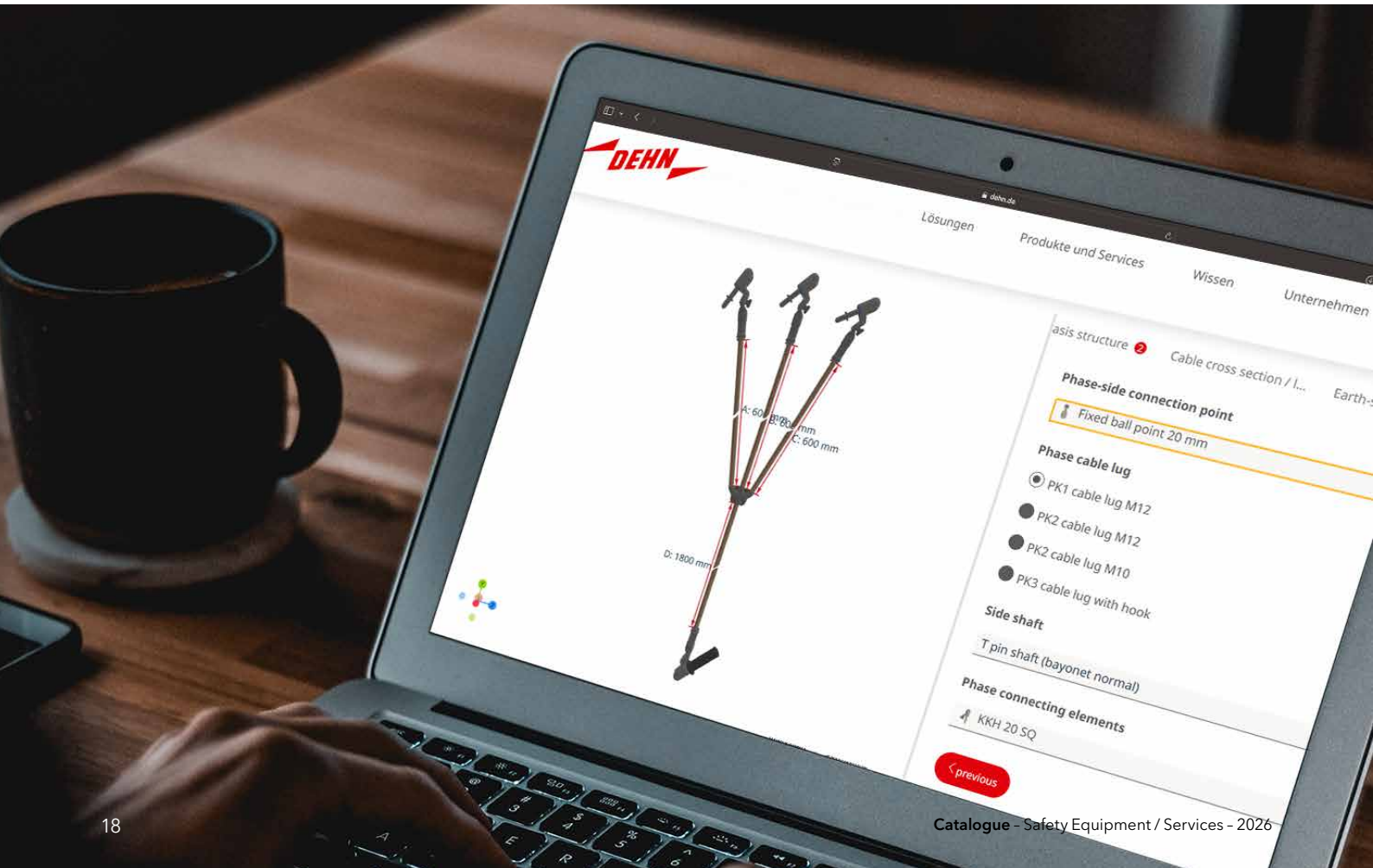
- Send us your EaS and we will check your portable safety devices to ensure that they are in perfect working order.
- Alternatively, we can inspect your EaS at your location.

Shipping information can be found here:

2. Test your EaS device yourself

- With the Lore measuring device, you can detect hidden damage that cannot be revealed by a visual inspection alone. Whereas previously the strands had to be cut open for testing, the EaS devices are now tested non-destructively.
- Measured values confirm that your EaS is in perfect working order.

Buy a mikroΩmeter LoRe EaS:





Cleaning live electrical installations up to 36 kV

You have neither the time, the trained personnel nor the equipment. But you still want to enjoy the benefits of cleaning your plant while it is live in order to increase its availability?
Then you have come to the right place.

This work is carried out by electrically skilled persons with special training employed by DEHN:

- Cleaning of low and medium-voltage system up to 36 kV
- Measuring up insulating protective shutters up to 36 kV

Insulating protective shutters – Made to measure

Insulating protective shutters protect against direct contact with live parts when working on switchgear installations.
No two installations are the same! That is why insulating protective shutters are always made to measure.

DEHN helps you with the procurement of protective shutters for your installation by measuring under live conditions, cutting to size and manufacturing.

How to reach us:

Your query about safety equipment:
+49 9181 906 1510
technik.support@dehn.de




DEHN
DEHNsense EFD
Anlagenbetreiber:
HZB Helmholtz Zentrum Berlin
Anlagenbezeichnung:
Station 1 - Übergabe
Anlagenprofil:

DEHNarX – Arc-fault risk assessment

Quickly find the right service product:
https://www.dehn-international.com/en/products/services#maintenance

DEHNarX – Detecting and evaluating the risk of an arc fault	Page 22
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Detecting and evaluating the risk of an arc fault.

Meet the requirements of work safety legislation

The specific task of an "arc fault risk assessment" is not properly clarified in many companies. According to §5 of the German Occupational Health and Safety Act, every employer must carry out an assessment of the electrical hazards for their employees in order to deduce adequate work protection measures.
With our DEHNarX service, you can have the protective measures already in place at your company reviewed and optimised, and we will recommend additional measures based on the latest technology. Comprehensive documentation right through to safety-increasing system marking can be booked individually. Get in touch with us so that we can provide you with a personalised quote for our DEHNarX risk assessment.

What methods do you use to carry out risk assessments?

DGUV-I 203-077 is the German Social Accident Insurance's recommendation for dealing with thermal hazards caused by arc faults.

What exactly are the dangers of an arc fault?

An arc fault is an unintended electric gas discharge between two electrodes. This can reach temperatures of up to 10,000°C and cause serious damage such as material combustion and explosions. Toxic vapours endanger the lungs; radiation endangers the eyes. In addition, air expansion causes a dangerous bang of up to 140 dB.

Possible causes:

- Human error (e.g. failure to observe safety rules)
- Technical defects (e.g. insulation faults, soiling)
- Animals in the system (e.g. rodents, snails)



Arc fault accidents can be avoided.

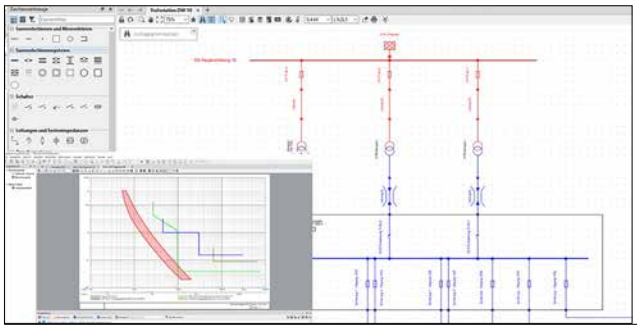
Modular solutions that can be booked individually



Data record

Part No. 799 930

Gathering of all relevant data and documents relating to the electrical systems and workplaces to be examined on site. Coordination of the DEHN checklist in order to develop a holistic concept.



Network analysis

Part No. 799 932

Digital simulation of the electrical network using professional software. In addition to calculating the required short-circuit currents in accordance with IEC 60909, the relevant overcurrent protective devices are also evaluated with regard to tripping times.



Arc fault protection concept

Part No. 799 934

Definition of the protection goals with the customer
Determination and calculation of all necessary factors and working distances for the workstations under consideration.
Calculation of the expected arc fault energies / incident energies as per DGUV-I 203-077 and IEEE 1584.



Equipment labels

Part No. 799 936

Creation of customer-specific equipment labels to inform employees directly at the electrical systems about the hazards and protective measures to be implemented.



Training

Part No. 799 938

Training at the end of the project to inform staff working on electrical installations about the findings and protective measures of the risk assessment and to train them accordingly.

Benefits of DEHNarX Risk Assessment

- **Legitimate.** According to §5 of the German Occupational Health and Safety Act (ArbSchG), every employer must carry out an assessment of the electrical hazards for their employees in order to implement effective work protection measures.
- **Standard-compliant.** The risk assessment is performed according to DGUV-I 203-077 or the American procedure NFPA 70E / IEEE 1584
- **Modular.** The services of the risk assessment can be customised to requirements.
- **Authoritative.** Based on the assessment, suitable protection measures can be defined as per the TOP principle.
- **Activating.** The results of the risk assessment help the people in charge and fitters reduce the probability of an arc fault occurring.

Those responsible for occupational safety and installations ensure a transparent arc fault protection concept

Create transparency about your arc fault protection concept for all those concerned working on electrical workstations. According to the TOP principle, and in descending order or priority, this includes technical, organisational and personal arc fault protection measures.

Discover DEHNarX online:

Learn more about the DEHNarX service. You can find further information on our website, as well as our practical dialogue guideline, which helps electrical safety specialists determine protective measures.

https://vde.hn/6qPUC



DEHNsense EFD – Hazard Warning Device

Discover our products:
https://de.hn/6MUHZ

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DEHNsense EFD
Your additional warning – can be adjusted to your specific system!

Whether due to the routine of everyday work or a lack of experience, equipment mix-ups occur more often than one might think – and repeatedly lead to fatal accidents.

Detects voltage before it becomes dangerous
The DEHNsense EFD (Electric Field Detector) warns fitters if they accidentally approach a switchgear cell or overhead line that is still live – visually, acoustically and through vibration. The three senses are stimulated independently of each other for optimal recognition of the alarm.

Easy to configure via app
In conjunction with the DEHNwork app, you can create specific system profiles and flexibly adjust the response thresholds of your EFD.

Complements the 5 safety rules
As an additional measure to the 5 safety rules, the DEHNsense EFD significantly increases safety when working on electrical systems. The device is a substitute neither for compliance with the 5 safety rules (5SR) of DIN VDE 0105-100 nor verifying a dead condition (3rd rule).

Smart connection to the DEHNwork app



DEHNsense EFD
Contactless transmission of the individual response values to the EFD

DEHNwork APP
Display of device data, measurement data, system profiles, setting of response thresholds and warning functions

DEHNwork administration
Web application (backend) for creating and managing system profiles

Explanatory videos, FAQs and support relating to DEHNsense EFD and the DEHNwork app can be found here:
https://de.hn/4hELD

DEHNsense EFD



Adjusting the display sensitivity of the DEHNsense EFD via the DEHNwork app before starting work.

Nominal voltage 6 – 420 kV / 16.7 – 60 Hz



- **Always at the right installation.** If the technician accidentally approaches the wrong live switchgear cell or overhead contact line, a clear alarm is given.
- **Optimum response value.** The response sensitivity of the EFD can be adapted to the specific installation in order to avoid false alarms.
- **Triple alarm.** Visual, acoustic and haptic signals warn against ingress into the danger zone.
- **Smart work.** The EFD can connect to the DEHNwork app, display device information, and make application-specific settings on the device.
- **At the ready.** Create specific system profiles in the DEHNwork app and corresponding QR codes to attach to the system – for contactless transmission of the individual response values to your EFD.
- **Long operating times.** The high rechargeable battery capacity and optimised, low energy consumption ensure a long battery life. Replaceable battery charging is contactless.
- **MUTE function.** Mute function using the 1-button operating concept, can be operated with gloves (e.g. conversations regarding switching operations).

If the previously defined voltage zone is approached, a three-fold warning is given.

Visual – Visible from all sides – by red flashing lights

Acoustic – By an alternating warning tone

Haptic – By device vibration

Make use of our services

- Free online seminar from the DEHNacademy: **Danger of a routine** – Voltage alarm protects against system mix-ups (approx. 30 min)
- Instruction and parameterisation
- Maintenance test with rechargeable battery replacement after 6 years

To the video:
Worn on the wrist

https://de.hn/aXYEX



General Information:	
Temperature range	-20°C to +55°C
For use in wet weather conditions	
Point of use	Indoor and outdoor installations
Degree of protection	IP 65
Material	**Plastic**

Kit includes:	
No.	**Description**
1	Plastic case
2	DEHNsense EFD including adapter
3	Flexible wrist strap
4	Instructions for use
****)**	Flexible helmet strap not included



Type	**EFD BU 6 420 C**
Part No.	**740 200** NEW
Nominal voltage (U_N)	6 – 420 kV
Frequency	16.7 – 60 Hz
Battery capacity	750 mAh, replaceable
Charging	Contactless, inductive charging (Qi standard) *)
Degree of protection	IP 65
Self-test function	Yes
Handling	1-button operating concept
Operation	Standby mode (continuous operation)
Transmission type	Bluetooth LE
CE declaration in accordance with	Radio Equipment Directive (RED) 2014/53/EU and RoHS Directive 2011/65/EU
Frequency range	2,400 to 2,483.5 MHz
Transmission power	max. +5 dBm
Dimensions	50 x 70 x 30 mm

*) Note: Required charger with Qi standard not included.

Accessories for DEHNsense EFD

Flexible helmet strap for DEHNsense EFD



Type	**EFD F HB**
Part No.	**740 290** NEW
Suitable for	DEHNsense EFD (Part No. 740 200)
Material	**Rubber**

The EFD is fixed using the flexible helmet strap.



To the video:
Worn on a helmet

https://de.hn/4pGmx



DEHNwork APP

Smart control via your DEHNsense EFD

A clear overview together with quick and simple operation are essential for safe working. With the DEHNwork app, you can keep an eye on all the important parameters and set your DEHNsense EFD to the correct system specifications and response values in no time at all – conveniently on your smartphone or tablet.

At the ready. Safely and correctly configured.

- View all the key device data for your EFD directly in the app and adjust settings.
- Create different system profiles that you can activate, modify and readjust whenever you like.
- Generate system-specific QR codes that allow you to transfer individual response values to your EFD without contact.

Download now free of charge

The DEHNwork app is available for iOS and Android operating systems. Simply scan the appropriate code or enter 'DEHNwork' in the app search.

iOS

Available on the App Store

https://de.hn/bmC7C

Android

ANDROID APP ON Google play

https://de.hn/6m9aG

How the DEHNwork app works



1.

The home screen shows at a glance whether the app is connected to the DEHNsense EFD, its battery level and the active system profile. You also have access to all functions from here, such as setting response thresholds and the QR scanner.



2.

Response thresholds can be adopted and activated from the app using existing system profiles (company-wide).



3.

Within the vicinity zone, you can adjust response thresholds using the slider.



4.

Once you have created a QR code for your system with the preconfigured response thresholds, you can scan it using your smartphone or tablet and the parameters will be transferred directly to your DEHNsense EFD.

DEHNproX – Safe working on electrical installations

Find the right product quickly and easily: **EaS Configurator**

Work according to the five safety rules	Page 30
1. Disconnect	Page 31
2. Secure against re-connection	Page 39
3. Verify that the installation is dead	Page 42
4. Earthing and short-circuiting	Page 71
5. Provide protection against adjacent live parts	Page 105
Live working	Page 115



Safe working on electric systems

Good to know: We have a product family name for our protective and operating equipment for working on electrical installations: **DEHNproX**. This made-up word is a combination of DEHN + protect + X.
You are already familiar with the company slogan DEHNprotects. It describes DEHN's basic philosophy of providing protection against hazards. The "X" in the DEHNproX product family name stands for all the hazards averted by high-quality protective equipment (X = crossing out danger). In the area of electrical occupational safety, these are electric shocks and arc faults.
In the DEHNproX product family, you will find all operating and protective equipment for safe working on electrical installations. Listed are products for the implementation of the five safety rules and products for live working.

DEHNproX – 1. Disconnect completely – Operating sticks

Application	Nominal voltage U_N / Frequency f_N	Product	Page
IS insulating sticks ▪ For use in indoor and outdoor installations ▪ Screw-on switching stick head allows for use as switching stick ▪ Supporting head for hexagon shaft or T pin shaft ▪ For use as earthing stick ▪ For use as operating stick for insulating protective shutters	up to 123 kV / 50 Hz		32
Wireless inspection camera ▪ Periodic visual inspection and documentation of electrical installations and equipment (also without special training) ▪ Wireless WiFi camera operation via smartphon/tablet ▪ No downtimes due to disconnection of the installation	up to 150 kV / 15 ... 60 Hz		34
SCS switching sticks ▪ For use in indoor and outdoor installations ▪ Fully insulated, massive switching stick head ▪ Allows a deep and safe reach into the installation ▪ For use as operating stick for insulating protective shutters	up to 123 kV / 50 Hz		36
RST rescue rods ▪ For use in indoor and outdoor installations ▪ Fully insulated and fixed rescue hook ▪ For rescuing persons from the live working zone in the event of an electrical accident	up to 72.5 kV / 50 Hz		36
SZ fuse tongs ▪ Operating head with two adjustable jaws ▪ Straight or 20° angled operating head ▪ Secure clamping ▪ Wide clamping range from Ø30 to 90 mm	up to 36 kV / 50 Hz		37
Insulating stick with crank handle ▪ For emergency operating of engine drives ▪ For use in indoor and outdoor installations	up to 36 kV		38
German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations (BGV A3)) Operating sticks must be checked according to the DGUV regulation 3 (previously BGV A3) for compliance with the limit values as specified in the electrotechnical rules. This test is carried out in the highvoltage test laboratory at DEHN and includes, among other things: ▪ Testing the discharge current ▪ Testing the protection against bridging ▪ Testing by visual inspection, manual test and measuring The maintenance test is documented in a test report and on the device itself. Prior to each use, a visual inspection for outwardly visible damage and defects must be carried out.			10

IS Insulating Sticks



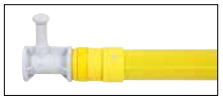
Switching a disconnector by means of an IS SK insulating stick fitted with switching stick head.

Nominal voltages up to 123 kV / 50 Hz
Easy and safe working

- Cost-effective since the application of different supporting heads allows universal use
- Easy handling

General Information:	
Standard (switching stick head)	DIN VDE V 0681-2
Standard (insulating stick)	DIN VDE V 0681-1
Standard (operating stick)	DIN VDE 0682-552
Not for use in wet weather conditions	✹
For use in wet weather conditions	☁
For	Indoor and outdoor installations
Material	**Glass-fibre reinforced polyester tube**

IS SK insulating stick fitted with SSK M12 switching stick head.



IS SQ insulating stick fitted with SSK SQ switching stick head. Black knurled nut for additional locking on the insulating stick.



Insulating Stick, Hexagon Shaft

Operating head with spring locking mechanism and M12 threaded bushing



- Can be used as switching and operating stick by attaching a SSK M12 switching stick head
- Can be used as earthing stick
- Handle closed with end cap



Ø30 mm

Type	IS 36 SK 1000	IS 36 SK 1500
Part No.	**766 001**	**766 002**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 36 kV
Total length (l_G)	1000 mm	1500 mm
Insertion depth (l_O)	175 mm	475 mm
For use at	✹	✹

Insulating Stick, Hexagon Shaft, Plug-in Coupling

Operating head with spring locking mechanism and M12 threaded bushing



- Can be used as switching and operating stick by attaching a SSK M12 switching stick head
- Can be used as earthing stick
- Handle closed with plastic plug-in coupling for extending the handle



Ø30 mm

Type	IS 36 SK STK 1000	IS 123 SK STK 2000
Part No.	**766 100**	**766 122**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 123 kV
Total length (l_G)	1000 mm	2000 mm
Insertion depth (l_O)	175 mm	200 mm
For use at	✹	✹

Type	ISN 36 SK STK 1000
Part No.	**766 111**
Nominal voltage (U_N)	1 ... 36 kV
Total length (l_G)	1000 mm
Insertion depth (l_O)	175 mm
For use at	☁

Accessories for IS Insulating Sticks

Screw-on switching stick head for IS SK insulating sticks

With M12 thread.
In accordance with DIN VDE V 0681-2.



Type	SSK M12
Part No.	**765 005**
Material	**Steel, plastic-sheathed**

Insulating Stick, T Pin Shaft

Operating head with spring-loaded bayonet coupling



- Can be used as switching and operating stick by attaching a SSK SQ switching stick head
- Can be used as operating stick for inserting insulating protective shutters
- Can be used as earthing stick
- Handle closed with end cap



Ø30 mm

General technical data:	
For use at	✹

Type	IS 36 SQ 1000	IS 36 SQ 1500
Part No.	**766 311**	**766 315**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 36 kV
Total length (l_G)	1025 mm	1525 mm
Insertion depth (l_O)	150 mm	500 mm

Type	IS 72.5 SQ SN7743
Part No.	**766 312**
Nominal voltage (U_N)	1 ... 72.5 kV
Total length (l_G)	1300 mm
Insertion depth (l_O)	90 mm

Insulating Stick, T Pin Shaft, Plug-in Coupling



Operating head with spring-loaded bayonet coupling

- Can be used as switching and operating stick by attaching a SSK SQ switching stick head
- Can be used as operating stick for inserting insulating protective shutters
- Can be used as earthing stick
- Handle closed with plastic plug-in coupling for extending the handle



Ø30 mm

Type	IS 36 SQ STK 1000	IS 123 SQ STK 2000
Part No.	**766 301**	**766 322**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 123 kV
Total length (l_G)	1025 mm	2000 mm
Insertion depth (l_O)	150 mm	200 mm
For use at	✹	✹

Type	ISN 36 SQ STK 1000
Part No.	**766 310**
Nominal voltage (U_N)	1 ... 36 kV
Total length (l_G)	1025 mm
Insertion depth (l_O)	150 mm
For use at	☁

Insulating Stick, detachable, T Pin Shaft, Plug-in Coupling



Operating head with bayonet coupling with spring locking mechanism

- Can be used as switching stick and operating stick by attaching the switching stick head SSK SQ
- Can be used as operating stick for inserting insulating protective shutters
- Can be used as earthing stick
- Can be used as handle termination with end cap



Ø30 mm Ø43 mm

Type	ISN 123 SQ STK 2500
Part No.	**766 332**
Nominal voltage (U_N)	110 ... 123 kV
Total length (l_G)	2495 mm
Insertion depth (l_O)	290 mm
For use at	☁

Accessories for IS Insulating Sticks

Switching stick head for IS SQ insulating sticks



With T pin shaft (bayonet locking mechanism).
In accordance with DIN VDE V 0681-2.
T pin shaft in accordance with DIN 48087.
Switching stick head is fixed on the insulating stick via the knurled nut.

Type	SSK SQ
Part No.	**765 009**
Material	**Polyamide**

Insulating Stick, Plug-in Coupling at both ends

Plug-in coupling at both ends for attaching extension elements, operating heads or adapters.



Ø30 mm

General technical data:		
Nominal voltage (U_N)		1 ... 36 kV

Type	IS 36 STK 30 1280	ISN 36 STK 30 1280
Part No.	**766 363**	**766 367**
Total length (l_G)	1280 mm	1280 mm
For use at	✹	☁

Type	ISN 36 STK 930SN7688
Part No.	**766 362**
Total length (l_G)	930 mm
For use at	☁

Accessories for IS Insulating Sticks

STK switching stick head



Ø30 mm

Type	SSK 36 STK 560
Part No.	**766 164**
Total length (l_G)	560 mm

STK operating head / hexagon shaft



Ø30 mm

Operating head with tension spring locking and M12 threaded bushing for indoor use.

Type	AK 36 SK STK 330
Part No.	**766 364**
Total length (l_G)	330 mm

STK operating head / T pin shaft



Ø30 mm

Operating head with spring-loaded bayonet coupling for indoor use.

Type	AK 36 SQ STK 360
Part No.	**766 365**
Total length (l_G)	360 mm

Adapter with flat lock bushing



Ø30 mm

and plug-in coupling for attaching WOLF gardening tools

Type	AD FB18 7 STK SN7007
Part No.	**766 321**
Total length	300 mm
Dimension (bushing)	18 x 7 mm

Note: WOLF gardening tools with adapter are not protected against bridging (electrical safety)!

Wireless Inspection Camera



System monitoring with wireless inspection camera and live display on a smartphone.

Nominal voltages up to 150 kV / 15 ... 60 Hz

- Wireless inspection camera for periodic visual inspection and for documenting the state of electrical installations and equipment (also without special training)
- Brings the invisible to light
- Facilitates work, increases safety, saves time

General Information:	
Standard	Based on EN 50508 (DIN VDE 0682-213)
Temperature range (T_U)	0 °C ... +40 °C
Not for use in wet weather conditions	✷
Material (enclosure)	**PUR**
Material (camera)	**Aluminium**

AC2 digital camera set



Kit includes:		
No.	**Description**	**Type**
1	Plastic case	KKL DIGIK AC2
2	Digital camera enclosure	G DIGIK AC2
3	Camera and battery module incl. magn. protective cover	DIGIK AC2
4	Magnetic adapter holder with ¼" thread	MAH DIGIK AC2
5	Rigid adapter gear coupling	ADS ZK 185

Type	**SET DIGIK AC2**
Part No.	**766 480**
Nominal voltage (U_N)	up to 150 kV
Frequency	15-60 Hz
Resolution	12 megapixels
Objective	Ultra-wide angle (155° field of view)
Digital zoom	4x
sensor	1/1.7" 4K CMOS sensor
Image stabiliser	Electronic
Formats	JPEG/RAW and MP4
Internal memory	22 GB
Ext. SD card	microSD (max. 256 GB) *)
Equipment	Remote control via app
Voice command	Yes
Interfaces	USB type-C
Dimensions (case)	395 x 290 x 105 mm
DB drawing No.	3 Ebgw 03.61-2

*) Handle, insulating sticks and micro SD card are not included.

Accessories for Wireless Inspection Camera

Macro lens

For close-ups



Type	**MO DIGIK AC2**
Part No.	**766 483**
DB drawing No.	3 Ebgw 03.61-2
Dimensions	40 x 40 x 10 mm

Handle with gear coupling



Type	**HG ZK 230**
Part No.	**766 393**
Nominal AC voltage (U_N)	up to 1000 V / 15 ... 60 Hz
Nominal voltage DC (U_N)	up to 1500 V
Total length (l_G)	230 mm

Insulating stick with handle and plug-in coupling

Consisting of one element.



Type	**IS 36 ZK STK 1300**
Part No.	**785 325**
Nominal voltage (U_N)	up to 36 kV
Total length (l_G)	1300 mm
Length (handle) (l_H)	560 mm

Insulating stick with handle and plug-in coupling

Modular. For use as operating stick with handle, hand guard, insulating element, red ring and extension, extendible handle.



Type	**IS T 36 ZK STK 1300**
Part No.	**785 315**
Nominal voltage (U_N)	up to 36 kV
Total length	1300 mm
Length (handle) (l_H)	560 mm

Adapter with gear coupling

With plug-in coupling.



Type	**AD ZK STK 30 360**
Part No.	**766 359**
Total length (l_G)	360 mm

IS STK insulating stick with plug-in coupling

Plug-in coupling at both ends for attaching extension elements, operating heads or adapters.



Type	**IS 36 STK 30 1280**
Part No.	**766 363**
Nominal voltage (U_N)	Up to 36 kV
Total length (l_G)	1280 mm
Length (handle) (l_H)	560 mm

Operating stick set

Set for animal guard adapter and wireless inspection camera.



Type	ASSN 36 STK ZK
Part No.	**766 380**
Nominal voltage (U_N)	1 ... 36 kV
Max. total length ($l_{G\,max}$)	6780 mm
DB drawing No.	3 Ebgw 03.61-2

Insulating stick (T pin shaft)

Operating head with spring loaded bayonet coupling.



Ø30 mm

Type	IS 36 SQ 1000	IS 36 SQ 1500
Part No.	**766 311**	**766 315**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 36 kV
Total length (l_G)	1025 mm	1525 mm
Length (handle) (l_H)	350 mm	500 mm

Adapter (T pin shaft / gear coupling)



For insulating sticks with cone coupling for T pin shafts (bayonet locking mechanism).
The lock nut allows to fix the adapter on the insulating stick.

Type	AD SQ ZK 165
Part No.	**766 396**
Length	182 mm

Rigid adapter with gear coupling

With ¼" thread for housing wireless inspection camera.



Ø20 mm

Type	ADS ZK 185
Part No.	**766 389**
Total length (l_G)	185 mm
Thread	1/4" BS
Colour	yellow

Flexible adapter with gear coupling

With ¼" thread for housing wireless inspection camera.



Ø28 mm

Type	AD ZK 185
Part No.	**766 392**
Total length	185 mm
Colour	yellow

Extension

with gear coupling



Type	ISV 220 ZK MS	ISV 320 ZK MS
Part No.	**785 316**	**785 317**
Total length (l_G)	220 mm	320 mm

Type	ISV 420 ZK MS	ISV 820 ZK MS
Part No.	**785 318**	**785 319**
Total length (l_G)	420 mm	820 mm

ISV 36 STK insulating stick extension

Plug-in coupling at both ends for extending the insertion depth or the handle.



Ø30 mm

Type	ISV 36 STK 30 910	ISV 36 STK 30 1280
Part No.	**766 356**	**766 366**
Total length (l_G)	910 mm	1280 mm

HV STK extension handle

Plug-in coupling at both ends for extending the handle.



Type	HV STK 30 710	HV STK 43 910
Part No.	**766 335**	**766 456**
Total length	710 mm	910 mm
Diameter	30 mm	43 mm

Type		HV STK 43 1280
Part No.		**766 466**
Total length		1280 mm
Diameter		43 mm

Insulating stick (T pin shaft / plug-in coupling)

Operating head with spring loaded bayonet coupling.



Ø30 mm

Type	IS 36 SQ STK 1000	IS 123 SQ STK 2000
Part No.	**766 301**	**766 322**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 123 kV
Total length (l_G)	1025 mm	2000 mm
Length (handle) (l_H)	350 mm	500 mm

Insulating stick extensions

With gear coupling



Ø20 mm

Type	ISV 220 ZK 123 SN7739	ISV 320 ZK 123 SN7740
Part No.	**785 311**	**785 312**
Total length (l_G)	220 mm	320 mm

Type	ISV 420 ZK 123 SN7741	ISV 820 ZK 123 SN7742
Part No.	**785 313**	**785 314**
Total length (l_G)	420 mm	820 mm

SCS Switching Sticks



Switching a disconnector by means of an SCS switching stick.

Nominal voltages up to 72.5 kV / 50 Hz
Easy and safe working

- Cost-effective
- User-friendly

General Information:	
Standard (switching stick head)	DIN VDE V 0681-2
Standard (switching stick)	DIN VDE V 0681-1 and -2
Standard (insulating stick)	DIN VDE V 0681-1
Standard (operating stick)	DIN VDE 0682-552
Not for use in wet weather conditions	✹
For use in wet weather conditions	☁
For	For indoor and outdoor installations
Design	Fully insulated, solid switching stick head
Material (insulating tube)	**Glass-fibre reinforced polyester tube**
Material (switching pin)	**Steel, plastic-sheathed**

Nominal Voltages up to 72.5 kV

With end cap.



General technical data:		
For use at	✹	

Type	SCS 36 1000	SCS 36 1500
Part No.	**763 610**	**763 611**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 36 kV
Total length (l_G)	1030 mm	1500 mm
Insertion depth (l_O)	135 mm	415 mm

Type	SCS 36 2000	SCS 72 1500
Part No.	**763 612**	**763 615**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 72.5 kV
Total length (l_G)	2000 mm	1500 mm
Insertion depth (l_O)	765 mm	290 mm

Type	SCS 72 2000	SCS 72 3000
Part No.	**763 620**	**763 630**
Nominal voltage (U_N)	1 ... 72.5 kV	1 ... 72.5 kV
Total length (l_G)	2000 mm	3000 mm
Insertion depth (l_O)	690 mm	1500 mm

Nominal Voltages up to 36 kV

Handle sealed with plastic plug-in coupling for extending the handle.



Type	SCS 36 STK 1000	SCSN 36 STK 1000
Part No.	**763 100**	**763 111**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 36 kV
Total length (l_G)	1000 mm	1000 mm
Insertion depth (l_O)	135 mm	135 mm
For use at	✹	☁

RST Rescue Rods



Insulated RST rescue rod used to rescue a victim of electrical shock from the live working zone.

Nominal voltages up to 72.5 kV / 50 Hz

- For use in indoor and outdoor installations
- Fixed rescue hook (protected against bridging)
- For rescuing persons weighing up to approximately 100 kg from the live working zone in the event of an electrical accident

General Information:	
Standard	based on DIN VDE V 0681-1
Not for use in wet weather conditions	✹
Material (hook)	**PVC-HI solid rod**
Material (insulating tube)	**Glass-fibre reinforced polyester tube**
End fitting	Non-slip plastic cap

Rescue Rod up to 36 kV



Type RST ...	36 1000	36 1500
Part No.	**766 040**	**766 041**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 36 kV
Total length (l_G)	1235 mm	1695 mm
Insertion depth (l_O)	410 mm	620 mm

Type RST ...	36 2000	72.5 1500
Part No.	**766 042**	**766 043**
Nominal voltage (U_N)	1 ... 36 kV	1 ... 72.5 kV
Total length (l_G)	2195 mm	1525 mm
Insertion depth (l_O)	970 mm	325 mm

SZ Fuse Tongs



SZ fuse tongs for inserting and removing HH fuses.

Nominal voltages up to 36 kV / 50 Hz
Easy and safe working
- User-friendly

The reducing insert delivered with the SZ fuse tong allows low clamping ranges from Ø30 to 50 mm.
Without reducing insert, HV HBC fuses from Ø50 to 90 mm can be actuated.



In practice, the 20° angled operating head allows safe and easy actuation of HH fuses that are not easily accessible.



General Information:	
Standard	DIN VDE V 0681-3
Not for use in wet weather conditions	✷
Design	Straight and 20° angled clamping head
Clamping range	Wide clamping range from Ø30 to 90 mm
Material (insulating stick)	**Glass-fibre reinforced polyester tube**
Material (operating head)	**Glass-fibre reinforced polyamide**
Material (adjustable handle)	**Polyamide**
Material (reducing insert)	**Polyamide**
Colour	Grey ●

Straight version



Ø43 mm

General Information:		
Nominal voltage (U_N)	1 ... 36 kV	
Clamping range	30 ... 50*) / 50 ... 90 mm	
Insertion depth (l_O)	185 mm	
Type SZ HH ...	**1060**	**1250**
Part No.	**765 040**	**765 041**
Total length (l_G)	1060 mm	1250 mm

Type SZ HH ...	**1500**
Part No.	**765 042**
Total length (l_G)	1500 mm

*) Only if used with reducing insert

20° angled version



Ø43 mm

General Information:	
Nominal voltage (U_N)	1 ... 36 kV
Clamping range	30 ... 50*) / 50 ... 90 mm
Insertion depth (l_O)	195 mm

Type SZ HH ...	W20 1070	W20 1250
Part No.	**765 050**	**765 051**
Total length (l_G)	1070 mm	1250 mm

Type SZ HH ...	**W20 1500**
Part No.	**765 052**
Total length (l_G)	1500 mm

*) Only if used with reducing insert

Accessories for SZ Fuse Tongs

Storage device for HH fuses
Wall-mounted.



Type	HV 3HH ET
Part No.	**700 005**
For	HH fuses

Note: Two storage devices are required!

Storage device for HH fuses and fuse tong
Wall-mounted.



Type	HV 3HH SZ ET
Part No.	**700 004**
For	HH fuses and fuse tong

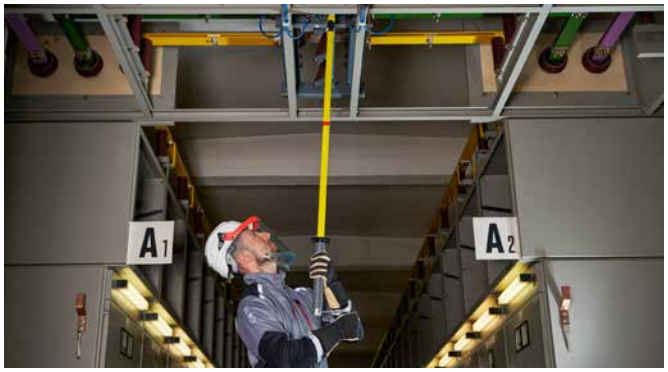
Note: Two storage devices are required!

Storage device kit for HH fuses or HH fuses and fuse tong
Wall-mounted.



Type	HV 3HH	HV 3HH SZ
Part No.	**700 015**	**700 014**
Consisting of	2x HV 3HH ET	1x HV 3HH ET and 1x HV 3HH ZS ET

Insulating Stick with Crank Handle



Insulating stick with crank handle for emergency operation of motor-driven disconnectors.

Nominal voltages up to 36 kV / 15 ... 60 Hz

- For emergency operation of engine drives
- For indoor and outdoor installations

General Information:	
Standard	DIN VDE V 0681-1
Not for use in wet weather conditions	✹
Material (operating head)	**Plastic**
Material (extension)	**Glass-fibre reinforced polyester tube**
Material (test unit)	**Glass-fibre reinforced polyester tube**

Operating Head

With hexagon shaft 24 mm and hexagon coupling 12 mm.


Ø30 mm

Type	AK SK24 SK12
Part No.	**763 712**
Total length (l_G)	120 mm
For use at	✹

Insulating Stick with Crank Handle

With hexagon coupling 12 mm and button.



Type	IS SK12 HK 1720
Part No.	**763 710**
Nominal voltage (U_N)	1 ... 36 kV
Total length (l_G)	1720 mm
Insertion depth (l_O)	540 mm
For use at	✹

Insulating Stick Extension

With hexagon coupling 12 mm and button.



Type	ISV SK12 1060
Part No.	**763 711**
Nominal voltage (U_N)	1 ... 36 kV
Total length (l_G)	1060 mm
For use at	✹

Lock-Out Systems



Lock-out system for three modular widths.

Nominal voltages up to 1000 V

- Protection against re-connection
- Symbol „Nicht schalten" [Do not close the circuit] acc. to German regulation (ASR A13)



General technical data:	
Only for indoor installations	
For	Indoor installations
PU	10 pc(s)

Insulating Plug

For screw inserts.



Type SE ...	E14	E18	E27 E33
Part No.	785 639	785 650	785 640
Size	E14	E18	E27 and E33
Diameter	20 mm	25 mm	45 mm
Dimensions	Ø20 x 40 mm	Ø25 x 40 mm	Ø45 x 55 mm

Insulating Blade

For NH fuse holders and distribution blocks.



Type SE ...	NH00	NH0
Part No.	785 641	785 642
Size	00	0
Blade	13 x 5 mm	38 x 5 mm
Dimensions	80 mm	125 mm

Type SE ...	NH1	NH2 3
Part No.	785 643	785 644
Size	1	2 and 3
Blade	38 x 5 mm	38 x 5 mm
Dimensions	135 mm	150 mm

Lock-Out System

For single-pole and multipole circuit breakers with a clamping range of 45 mm.



Type SE ...	REG 1TE	REG 2TE	REG 3TE
Part No.	785 638	785 652	785 637
Size	1 modular width	2 modular widths	3 modular widths
Dimensions	52 x 17 mm	52 x 34 mm	52 x 51 mm

E-mobility warning signs



Clearly visible warning signs on the e-vehicle.

Warning cross: "Attention – Voltage! Unauthorised access prohibited"

With suction cups for secure placement and fixing.



Type WHS AS ...	ZFUV
Part No.	700 060
Dimensions (L x W x H)	280 x 280 x 150 mm
Material	Free foam, weather-resistant

Warning sign: "Attention – Voltage! Unauthorised access and contact prohibited"

Including attachment contour for plastic posts.



Type WHS AS ...	BSZFUV
Part No.	700 059
Dimensions (W x H)	200 x 280 mm
Material	Free foam, weather-resistant

Warning sign: "Attention – Voltage! Switching prohibited"

Including drill hole.



Type WHS AS ...	SV
Part No.	700 058
Dimensions (W x H)	54 x 86 mm
Material	Plastic

Barrier and Accessories



Barrier in a transformer station.

- Barrier and accessories for providing protection for installation parts.

Red-white barrier

Robust design, suitable for indoor and outdoor installations.



General technical data:		
Material		**Glass-fibre reinforced polyester**
Dimensions (W x H)		32 x 46 mm
Material thickness		**6 mm**
Colour		Red ● / white ○

Type	**AB 32 46 RW K L1000**	**AB 32 46 RW K L1500**
Part No.	**700 080**	**700 081**
Length	1000 mm	1500 mm

Type	**AB 32 46 RW K L2000**	**AB 32 46 RW K L2500**
Part No.	**700 082**	**700 083**
Length	2000 mm	2500 mm

Type	**AB 32 46 RW K L3000**	**AB 32 46 RW K L3500**
Part No.	**700 084**	**700 085**
Length	3000 mm	3500 mm

Type	**AB 32 46 RW K L4000**	**AB 32 46 RW K L4500**
Part No.	**700 086**	**700 087**
Length	4000 mm	4500 mm

Type	**AB 32 46 RW K L5000**	**AB 32 46 RW K L5500**
Part No.	**700 088**	**700 089**
Length	5000 mm	5500 mm

Type	**AB 32 46 RW K L6000**
Part No.	**700 090**
Length	6000 mm

Barrier Holder

1 pack = 2 pieces.



Type	**H AB 32 46 K**
Part No.	**700 098**
Material	**Plastic**
Material thickness	6 mm
Colour	Red ●

Chain post set



For sealing off the workplace (6 posts, 10-m chain, 10 links, 10 hooks).

- Zum Absperren der Arbeitsstätte (6 Pfosten, 10 m Kette, 10 Glieder, 10 Haken).

Chain post set Secur



Type KTST SET 6ZFS ...	**RTWS 10M KT**	**GBSW 10M KT**
Part No.	**700 110**	**700 111**
Colour	Red ● / white ○	yellow ● / black ●
Chain length	10 m	10 m
Post material	**Plastic**	**Plastic**
Base material	**Cement**	**Cement**

Accessories for Chain post set

Barrier chain Secur

Colour change after 13 links.



Type	**ASKT RTWS 10 M KST**	**ASKT GBSW 10 M KST**
Part No.	**700 112**	**700 113**
Colour	rot ● / white ○	yellow ● / black ●
Link thickness	6 mm	6 mm
Chain length	10 m	10 m
Material	**Plastic**	**Plastic**



DEHNproX

find out more online

Safe when it matters most

Comprehensive arc fault protection concept

Every company is obliged under the Occupational Health and Safety Act to protect its employees from possible accidents according to the **„hierarchy of risk control".**

Step-by-step to your protection concept
Analyse the work situations for your electrical installations.

Use
- the arc fault risk check list,
- the "Let's check!" online seminar,
- and the dialogue guideline

to assess and optimise arc fault protection measures.

Go to comprehensive arc fault protection

DEHNproX – 3. Verify that the installation is dead – Voltage detectors

Description / Type	Nominal voltage U_N / Frequency f_N	Product	Page
HVD voltage detector ▪ 360° optical display for reliable indicator recognition ▪ Self-test of all active components, including the test probe ▪ Integrated frequency detection prevents misuse ▪ DEHNwork app-ready: in the future, it will support the connection to the DEHNwork app	up to 36 kV / 50 Hz		44
PHE4 voltage detector ▪ For use in wet weather conditions ▪ For indoor and outdoor installations ▪ Visual and acoustic indication ▪ Self-test of all live parts (up to 36 kV) ▪ Large nominal voltage range	up to 30 kV / 50 or 60 Hz up to 30 ... 420 kV / 50 Hz up to 33 kV / 50 Hz (British Influenced Voltage Level)		46
PHE III voltage detector / PHE III ZK indicator with test prod / PHE III set ▪ For use in wet weather conditions ▪ For indoor and outdoor installations ▪ With self-testing element ▪ Visual and acoustic indication ▪ Quick battery replacement, without tools	up to 30 kV / 50 Hz up to 30 kV / 50 Hz (with standby function) 20 and 60 ... 110 kV / 50 Hz		49 50 52
PHG II voltage detector ▪ Use in indoor installations only ▪ Visual indication via three LEDs offset by 120° ▪ Passive voltage detector without batteries	6 / 10 / 20 kV / 50 Hz		51
ASP /HSA distance voltage detector ▪ For use in wet weather conditions ▪ Distance voltage detector ▪ For overhead lines and outdoor switching stations ▪ With self-testing element ▪ Visual and acoustic indication	110 ... 420 kV / 50 Hz or 16,7 Hz 1 ... 420 kV / 50 Hz, 60 Hz or 16.7 Hz		53 54
PHE/G DC voltage detector ▪ For use in wet weather conditions ▪ For indoor and outdoor installations ▪ With self-testing element ▪ Visual indicator ▪ Two-pole (one-/two-stick)	up to 24 kV / DC voltage		56
SPN voltage detector for power supply ▪ For use in wet weather conditions ▪ No battery required ▪ For use in overhead line networks by attaching extension prods	50 ... 500 V 50 ... 1000 V		57
SPN voltage detector for the electrical trade and industry ▪ Analogue and digital version ▪ No batteries required for analog device	12 ... 1000 V AC/DC 1.0 ... 1000 V AC / 1200 V DC		58
Accessories, storage and transport cases ▪ Electrodes, probes, adapters, end fittings, storage devices ▪ Cases, bags			65 67
Discharge devices ▪ For discharging static charges ▪ Different contact electrodes			69

German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations (BGV A3))

Voltage detectors must be checked according to the DGUV regulation 3 (previously BGV A3) for compliance with the limit values as specified in the electrotechnical rules. This test is carried out in the high-voltage test laboratory at DEHN and includes, among other things:

- Testing the discharge current
- Testing for clear indication
- Testing the protection against bridging
- Testing by visual inspection, manual test and measuring

The maintenance test is documented in a test report and on the device itself.

The intervals for maintenance tests of voltage detectors depend on their conditions of use, e.g. frequency of use, stress due to environmental conditions and transport, etc, however, according to DGUV regulation 3, **at least** every **6 years**.



10

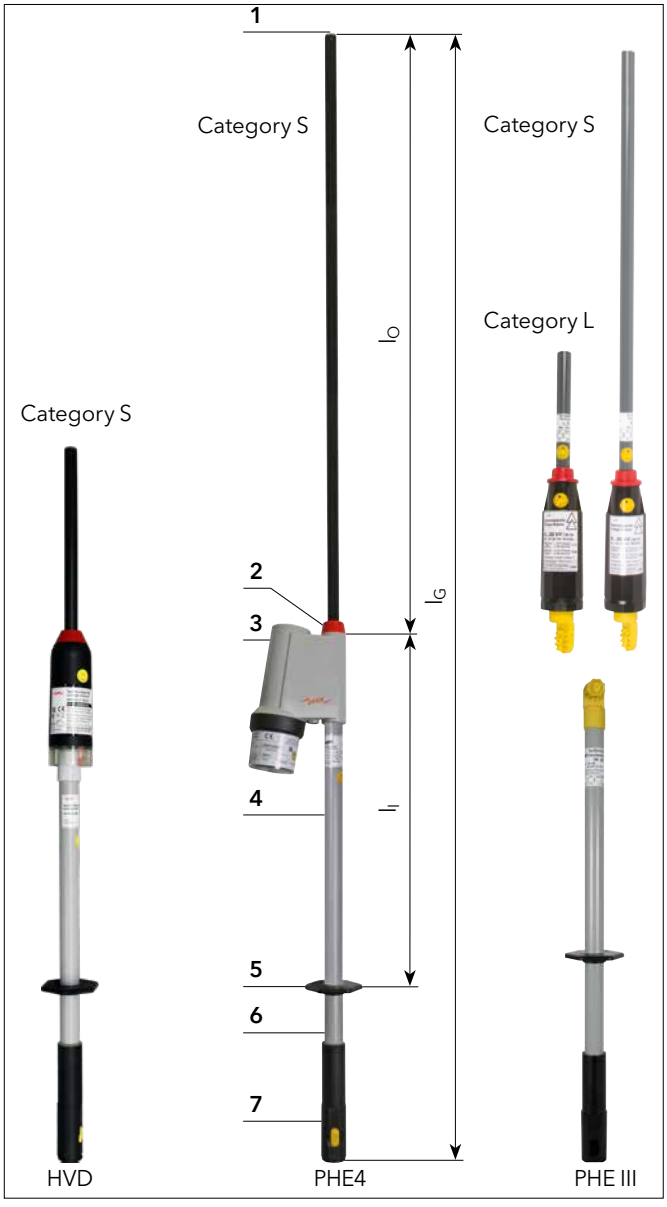
Structure of the voltage detector

Voltage detectors according to IEC/EN 61243-1 (DIN VDE 0682-411) are designed to verify on all poles at the work location that the installation is dead according to EN 50110-1 (DIN VDE 0105-100). Only electrotechnically skilled or instructed persons are allowed to verify on all poles at the work location or as close as possible to the work location that the installation is dead.
Voltage detectors must be tested for correct operation immediately before and after use. Correct operation of voltage detectors without self-testing element must be verified by contacting a part of the installation connected to operating voltage.
Verifying that the installation is dead using a voltage detector is considered live working.
Voltage detectors may only be used for the nominal voltages / nominal voltage ranges as indicated on the rating plate. The user may be at risk if the voltage detector is used for voltages other than indicated on the rating plate (incorrect indication, electric shock, arcing).
Voltage detectors labelled with "For indoor use only" may only be used in indoor installations.
Voltage detectors labelled with "For use in wet weather conditions" may be used in all weather conditions (rain, snow, fog and dew).
Voltage detectors according to IEC/EN 61243-1 (DIN VDE 0682-411) are only suitable to a limited extent for use in **factory assembled (type-tested) installations**. If space in installations is confined, flashover may occur when inserting the test prod into the installation. The user of the voltage detector or the operator of the switchgear installation must contact the manufacturer of the type-tested installation to find out whether the voltage detector may be used in the installation (please refer to the table on the next page: Application of voltage detectors in type-tested, factory assembled switchgear installations).

Design of voltage detectors
Voltage detectors according to IEC/EN 61243-1 (DIN VDE 0682-411) are **single-pole** devices designed to make contact with the part of the installation to be tested.
There are **two mechanically different designs** of voltage detectors: Complete and separate voltage detectors.
Complete voltage detectors (HVD, PHE4, PHE III, PHE and PHG II) consist of an insulating stick, indicator and test prod and are tested as a complete unit.
Separate voltage detectors (PHE III indicator with test prod) must be attached to a suitably rated insulating stick.
Single-pole **voltage detectors** typically consist of a **handle**, **insulating element**, **indicator** and **test prod** with **contact electrode**.

The **insulating element** is the section of a voltage detector between the hand guard and the red ring. It ensures that the user maintains an adequate safety distance for safe operation.
The **test prod** (contact electrode extension) with a contact electrode **above the red ring** allows to reach remote parts of the installation and to **eliminate** the influence of **interference fields**.
Voltage detectors are classified into two categories based on their behaviour in case of interference fields or their field of application.
Voltage detectors of **category "L"** (line) with a short test prod (without contact electrode extension) are designed for use on overhead lines.

Voltage detector of **category "S"** (switchgear) with a long test prod (with contact electrode extension) are resistant to interference fields and are therefore used in switchgear installations. They are also suitable for overhead lines.
The **hand guard** provides a visible barrier between the handle and the insulating element and prevents the user from making contact with the insulating element.
The **red ring** indicates the end of the insulating element in the direction of the test electrode. This provides the user with a visible limit for contact with live parts in the installation. The insulating **element** between the red ring and the hand guard must not contact live parts, however, it may contact earthed parts.
The **test electrode** is the part of the voltage detector that is used to make contact with the part of the installation to be tested.



1 Test electrode
2 Red ring
3 Operating head / Indicator
4 Insulating element
5 Hand guard
6 Handle
7 Plug-in coupling for extending the handle

l_G Total length of the voltage detector
l_O Length of the top section
l_I Length of the insulating element



DEHNproX HVD voltage detector: Configurable online. Smart networking.

Digital networking enables the next technological step on the path to Vision ZERO – the path to zero accidents when working on electrical systems. The DEHNproX High Voltage Detector (HVD) takes this step.
This voltage tester offers the first integrated, intelligent system for verifying the absence of voltage on medium- or high-voltage systems.

Your digital safety advantage:

- Configure your HVD online to perfectly match your electrical system.
- Use the connection to the free DEHNwork app and conveniently adjust settings via your smartphone.

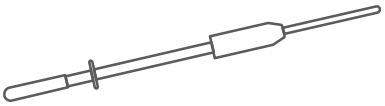
DEHN connected safety

The HVD is part of a digital ecosystem that offers you a new level of convenience, flexibility and security.



Web application
HVD configurator

- Define device options and parameterisation individually and country-specifically online
- Obtain a unique variant number for each configuration
- Order-related production of the variants



Smart high-voltage detector
DEHNproX HVD

- Saves the last 30 events in the device
- Frequency detection prevents misuse
- Contactless firmware updates via the app
- Fully functional even without an app connection



Free iOS-App
DEHNwork App

- Set the duration of readiness for operation, the volume, LED brightness, and more
- Check battery capacity, device data and other status indicators
- Active reminder of the next maintenance test

HVD Voltage Detector



Smart HVD voltage detector with 360°, all-round, visual and acoustic indication.

- 360°, all-round, visual display for guaranteed notification recognition
- Self-test of all live parts including test prod
- Integrated frequency detection prevents misuse
- DEHNwork app-ready: will support connection to the DEHNwork app in the future



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +55 °C, climatic category N (with lithium batteries –40 °C ... +70 °C, additionally climatic categories C and W)
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Display	360°, all-round, visual display and acoustic
Self-testing element	Yes
Material (test electrode)	StSt
Material (test prod)	PP
Material (indicator)	Plastic, fully insulated
Material (insulating stick)	Glass-fibre reinforced polyester tube

Nominal Voltage up to 36 kV / 50 Hz, M12 Thread, Standard versions available from stock

Category "S" for switchgear installations and overhead lines.



Type HVD ...	10 S	20 S	30 S
Part No.	793 010 NEW	793 020 NEW	793 030 NEW
Nominal voltage (U_N)	10 kV	20 kV	30 kV
Total length (l_G)	1100 mm	1270 mm	1440 mm
Insertion depth (l_O)	300 mm	470 mm	640 mm

Type HVD ...	3 10 S	6 20 S
Part No.	793 231 NEW	793 235 NEW
Nominal voltage (U_N)	3 ... 10 kV	6 ... 20 kV
Total length (l_G)	1440 mm	1610 mm
Insertion depth (l_O)	640 mm	810 mm

Type HVD ...	10 20 S	10 30 S
Part No.	793 240 NEW	793 250 NEW
Nominal voltage (U_N)	10 ... 20 kV	10 ... 30 kV
Total length (l_G)	1440 mm	1730 mm
Insertion depth (l_O)	640 mm	930 mm

Type HVD ...	U 3 30 S	U 6 36 S
Part No.	793 530 NEW	793 536 NEW
Nominal voltage (U_N)	3 ... 10 / 10 ... 30 kV	6 ... 20 / 20 ... 36 kV
Total length (l_G)	1730 mm	1610 mm
Insertion depth (l_O)	930 mm	810 mm

DEHNwork App

Voltage testing with smart support

Use the free DEHNwork app with your HVD for optimal overview, user-friendly device management, and maximum safety during voltage testing.

All important device data at a glance. Individually configurable.

- Flexibly adjust the audible or visual indicators, standby time, and other settings of your HVD to meet the specific requirements of your application.
- Stay informed at all times – thanks to displays showing battery capacity, self-test results, nominal data and frequency, connection status, and other device data.

Download now for free

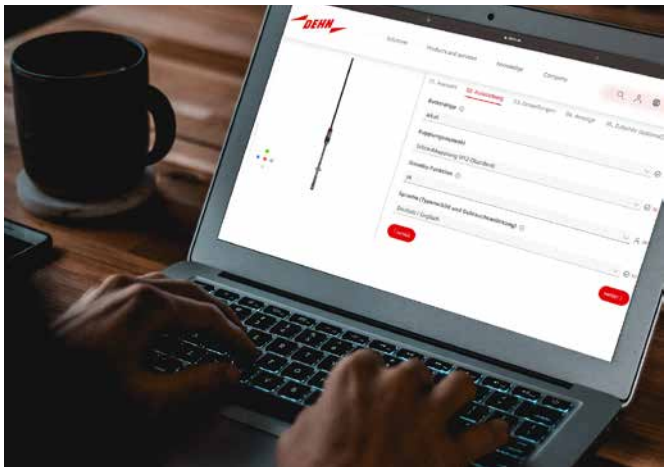
The DEHNwork app is available for iOS operating systems. Simply scan the code or enter "DEHNwork" in the app search.

iOS

Available on the App Store

https://de.hn/bmC7C

HVD voltage detector configurator: Voltage testing with smart supportv



Access the **HVD configurator** at:

https://de.hn/7p3Rj

PHE4 Voltage Detector Medium Voltage



PHE4 voltage detector with visual and acoustic indication.

- Self-test of all live parts including test prod
- Unique plug-in coupling system
- Integrated visual and acoustic indication
- Also for use in wet weather conditions



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +70 °C, climatic category N and W
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Cu alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal Voltages up to 30 kV / 50 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	3 S	6 S
Part No.	**783 003**	**783 006**
Nominal voltage (U_N)	3 kV	6 kV
Total length (l_G)	1030 mm	1030 mm
Insertion depth (l_O)	230 mm	230 mm

Type PHE4 ...	10 S	20 S
Part No.	**783 010**	**783 020**
Nominal voltage (U_N)	10 kV	20 kV
Total length (l_G)	1030 mm	1200 mm
Insertion depth (l_O)	230 mm	400 mm

Type PHE4 ...	30 S
Part No.	**783 030**
Nominal voltage (U_N)	30 kV
Total length (l_G)	1720 mm
Insertion depth (l_O)	920 mm

Nominal Voltages up to 36 kV / 50 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	1 3 S	3 10 S
Part No.	**783 013**	**783 231**
Nominal voltage (U_N)	1 ... 3 kV	3 ... 10 kV
Total length (l_G)	1410 mm	1410 mm
Insertion depth (l_O)	610 mm	610 mm

Type PHE4 ...	6 20 S	10 20 S
Part No.	**783 235**	**783 240**
Nominal voltage (U_N)	6 ... 20 kV	10 ... 20 kV
Total length (l_G)	1600 mm	1410 mm
Insertion depth (l_O)	800 mm	610 mm

Type PHE4 ...	10 30 S	20 36 S
Part No.	**783 250**	**783 245**
Nominal voltage (U_N)	10 ... 30 kV	20 ... 36 kV
Total length (l_G)	1720 mm	1720 mm
Insertion depth (l_O)	920 mm	920 mm

Nominal Voltages up to 36 kV / 50 Hz, switchable, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	U 2 20 S	U 3 30 S
Part No.	**783 520**	**783 530**
Nominal voltage (U_N)	2 ... 6 / 6 ... 20 kV	3 ... 10 / 10 ... 30 kV
Total length (l_G)	1600 mm	1720 mm
Insertion depth (l_O)	800 mm	920 mm

Type PHE4 ...	U 6 36 S
Part No.	**783 536**
Nominal voltage (U_N)	6 ... 15 / 15 ... 36 kV
Total length (l_G)	1720 mm
Insertion depth (l_O)	920 mm

Nominal Voltages up to 30 kV / 50 Hz, Gear Coupling

Category "S" for switchgear installations and overhead lines.





Type PHE4 ...	3 S ZK	6 S ZK
Part No.	**783 103**	**783 106**
Nominal voltage (U_N)	3 kV	6 kV
Total length (l_G)	1070 mm	1070 mm
Insertion depth (l_O)	230 mm	230 mm

Type PHE4 ...	10 S ZK	20 S ZK
Part No.	**783 110**	**783 120**
Nominal voltage (U_N)	10 kV	20 kV
Total length (l_G)	1070 mm	1240 mm
Insertion depth (l_O)	230 mm	400 mm

Type PHE4 ...	30 S ZK
Part No.	**783 130**
Nominal voltage (U_N)	30 kV
Total length (l_G)	1760 mm
Insertion depth (l_O)	920 mm

Nominal Voltages up to 30 kV / 50 Hz, Gear Coupling

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	3 10 S ZK	6 20 S ZK
Part No.	**783 141**	**783 151**
Nominal voltage (U_N)	3 ... 10 kV	6 ... 20 kV
Total length (l_G)	1450 mm	1640 mm
Insertion depth (l_O)	610 mm	800 mm

Type PHE4 ...	10 30 S ZK
Part No.	**783 161**
Nominal voltage (U_N)	10 ... 30 kV
Total length (l_G)	1760 mm
Insertion depth (l_O)	920 mm

Nominal Voltages up to 36 kV / 60 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



General technical data:	
Frequency	60 Hz

Type PHE4 ...	3 10 S 60	6 20 S 60
Part No.	**783 332**	**783 335**
Nominal voltage (U_N)	3 ... 10 kV	6 ... 20 kV
Total length (l_G)	1410 mm	1600 mm
Insertion depth (l_O)	610 mm	800 mm

Type PHE4 ...	10 30 S 60	20 36 S 60
Part No.	**783 345**	**783 342**
Nominal voltage (U_N)	10 ... 30 kV	20 ... 36 kV
Total length (l_G)	1720 mm	1720 mm
Insertion depth (l_O)	920 mm	920 mm

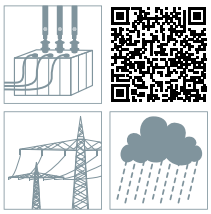
Type PHE4 ...	U 3 36 S 60
Part No.	**783 395**
Nominal voltage (U_N)	3 ... 10 / 12 ... 36 kV
Total length (l_G)	1720 mm
Insertion depth (l_O)	920 mm

PHE4 Voltage Detector High Voltage



PHE4 voltage detector applied in a 110 kV outdoor switching station.

- High nominal voltage range
- Unique plug-in coupling system
- Integrated visual and acoustic indication
- Also for use in wet weather conditions



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	-25 °C ... +70 °C, climatic category N and W
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Cu-alloy/gal Sn**
Material (test prod)	**PP**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal voltage ranges 30 ... 132 kV / 50 Hz, M12 thread

Category "S" for switchgear installations and overhead lines.



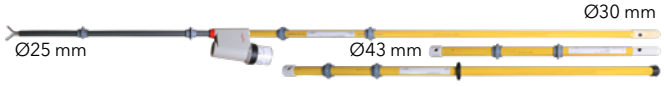
General technical data:	
Insertion depth (l_O)	910 mm

Type PHE4 ...	30 60 S	60 110 S
Part No.	**783 270**	**783 275**
Nominal voltage (U_N)	30 ... 60 kV	60 ... 110 kV
Total length (l_G)	2560 mm	3010 mm

Type PHE4 ...	60 132 S
Part No.	**783 280**
Nominal voltage (U_N)	60 ... 132 kV
Total length (l_G)	3420 mm

Nominal Voltage Ranges 110 ... 420 kV / 50 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



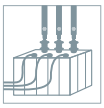
Type PHE4 ...	110 220 S	220 420 S
Part No.	**783 285**	**783 290**
Nominal voltage (U_N)	110 ... 220 kV	220 ... 420 kV
Total length (l_G)	4420 mm	5750 mm
Insertion depth (l_O)	910 mm	910 mm

PHE4 Voltage Detector (British Influenced Voltage Level)



PHE4 voltage detector with visual and acoustic indication.

- Self-test of all live parts (including test prod category „S")
- Unique plug-in coupling system
- Integrated visual and acoustic indication
- Also for use in wet weather conditions






General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +70 °C, climatic category N and W
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Copper alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal Voltages up to 33 kV / 50 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	3.3 S	6.6 S
Part No.	**783 033**	**783 066**
Nominal voltage (U_N)	3.3 kV	6.6 kV
Total length (l_G)	1030 mm	1030 mm
Insertion depth (l_O)	230 mm	230 mm

Type PHE4 ...	11 S	22 S
Part No.	**783 011**	**783 022**
Nominal voltage (U_N)	11 kV	22 kV
Total length (l_G)	1030 mm	1200 mm
Insertion depth (l_O)	230 mm	400 mm

Type PHE4 ...	33 S
Part No.	**783 045**
Nominal voltage (U_N)	33 kV
Total length (l_G)	1720 mm
Insertion depth (l_O)	920 mm

Nominal Voltage Ranges up to 33 kV / 50 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	3.3 11 S	6.6 22 S
Part No.	**783 233**	**783 243**
Nominal voltage (U_N)	3.3 ... 11 kV	6.6 ... 22 kV
Total length (l_G)	1410 mm	1600 mm
Insertion depth (l_O)	610 mm	800 mm

Type PHE4 ...	11 33 S
Part No.	**783 255**
Nominal voltage (U_N)	11 ... 33 kV
Total length (l_G)	1720 mm
Insertion depth (l_O)	920 mm

Nominal Voltage Ranges up to 33 kV / 50 Hz, switchable, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	U 6.6 11 S	U 3.3 33 S
Part No.	**783 511**	**783 533**
Nominal voltage (U_N)	6.6 / 11 kV	3.3 ... 11 / 11 ... 33 kV
Total length (l_G)	1030 mm	1720 mm
Insertion depth (l_O)	230 mm	920 mm

PHE III Voltage Detector



PHE III voltage detector with visual and acoustic indicator used for an indoor switchgear installation.

Nominal voltages up to 30 kV / 50 Hz
Safe verification of isolation from supply voltage

- Reliable indication
- Easy to use
- Cost-effective / space-saving transport



General technical data:	
Standard	DIN VDE 0682-411 (EN/IEC 61243-1) and DIN VDE V 0682-421
Temperature range	–25 °C ... +55 °C, climatic category N
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Copper alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal Voltages up to 30 kV / 50 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE3 ...	3 S	6 S
Part No.	**767 703**	**767 706**
Nominal voltage (U_N)	3 kV	6 kV
Total length (l_G)	1080 mm	1080 mm
Insertion depth (l_O)	285 mm	285 mm

Type PHE3 ...	10 S	20 S
Part No.	**767 710**	**767 720**
Nominal voltage (U_N)	10 kV	20 kV
Total length (l_G)	1080 mm	1230 mm
Insertion depth (l_O)	285 mm	435 mm

Type PHE3 ...	30 S
Part No.	**767 730**
Nominal voltage (U_N)	30 kV
Total length (l_G)	1415 mm
Insertion depth (l_O)	620 mm

Nominal Voltage Ranges up to 30 kV / 50 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



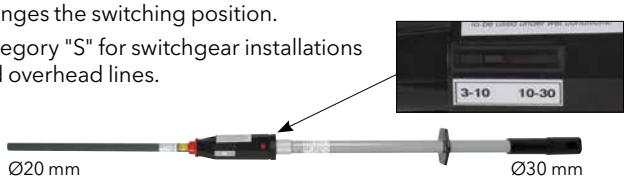
Type PHE3 ...	3 10 S	6 20 S
Part No.	**767 711**	**767 721**
Nominal voltage (U_N)	3 ... 10 kV	6 ... 20 kV
Total length (l_G)	1415 mm	1575 mm
Insertion depth (l_O)	620 mm	780 mm

Type PHE3 ...	10 30 S
Part No.	**767 731**
Nominal voltage (U_N)	10 ... 30 kV
Total length (l_G)	1675 mm
Insertion depth (l_O)	880 mm

Nominal Voltage Ranges up to 30 kV / 50 Hz, M12 Thread, switchable

The nominal voltage selector switch allows to switch between two nominal voltage ranges. For safety reasons, the voltage detector can only be switched on if the selector switch is switched to the most sensitive range of 3 kV to 10 kV. The switch snaps into the relevant position, thus providing protection against inadvertent switching. A magnetically operated, wear-resistant reed switch changes the switching position.

Category "S" for switchgear installations and overhead lines.



Type PHE3 ...	U 3 30 S
Part No.	**767 733**
Nominal voltage (U_N)	3 ... 10 / 10 ... 30 kV
Total length (l_G)	1675 mm
Insertion depth (l_O)	880 mm

Nominal Voltage Ranges up to 30 kV / 50 Hz, Test Kit, Thread M12

With two test prods of Category "S" for switchgear installations and overhead lines and of Category "L" for overhead lines.



Type PHE3 ...	6 20 SL	10 30 SL
Part No.	**767 740**	**767 750**
Nominal voltage (U_N)	6 ... 20 kV	10 ... 30 kV
Total length (l_G)	1575 / 980 mm	1675 / 980 mm
Insertion depth (l_O)	780 / 185 mm	880 / 185 mm

Nominal Voltage Ranges up to 30 kV / 50 Hz, Test Kit, Gear Coupling

With two test prods of Category "S" for switchgear installations and overhead lines and of Category "L" for overhead lines.



Type PHE3 ...	6 20 SL ZK	10 30 SL ZK
Part No.	**767 940**	**767 950**
Nominal voltage (U_N)	6 ... 20 kV	10 ... 30 kV
Total length (l_G)	1650 / 1050 mm	1750 / 1050 mm
Insertion depth (l_O)	780 / 185 mm	880 / 185 mm

Nominal Voltages up to 30 kV / 50 Hz, Gear Coupling

Category "S" for switchgear installations and overhead lines.



Type PHE3 ...	3 S ZK	6 S ZK
Part No.	**767 903**	**767 906**
Nominal voltage (U_N)	3 kV	6 kV
Total length (l_G)	1150 mm	1150 mm
Insertion depth (l_O)	285 mm	285 mm

Type PHE3 ...	10 S ZK	20 S ZK
Part No.	**767 910**	**767 920**
Nominal voltage (U_N)	10 kV	20 kV
Total length (l_G)	1150 mm	1300 mm
Insertion depth (l_O)	285 mm	435 mm

Type PHE3 ...		30 S ZK
Part No.		**767 930**
Nominal voltage (U_N)		30 kV
Total length (l_G)		1485 mm
Insertion depth (l_O)		620 mm

Nominal Voltage Ranges up to 30 kV / 50 Hz, Gear Coupling

Category "S" for switchgear installations and overhead lines.



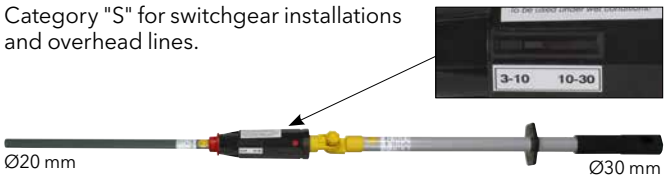
Type PHE3 ...	3 10 S ZK	6 20 S ZK
Part No.	**767 941**	**767 951**
Nominal voltage (U_N)	3 ... 10 kV	6 ... 20 kV
Total length (l_G)	1485 mm	1645 mm
Insertion depth (l_O)	620 mm	780 mm

Type PHE3 ...		10 30 S ZK
Part No.		**767 961**
Nominal voltage (U_N)		10 ... 30 kV
Total length (l_G)		1745 mm
Insertion depth (l_O)		880 mm

Nominal Voltage Ranges up to 36 kV / 50 Hz, Gear Coupling, switchable

The nominal voltage selector switch allows to switch between two nominal voltage ranges. For safety reasons, the voltage detector can only be switched on if the selector switch is switched to the most sensitive range of (3 kV to 10 kV or 6 kV to 20 kV). The switch snaps into the relevant position, thus providing protection against inadvertent switching. A magnetically operated, wear-resistant reed switch changes the switching position.

Category "S" for switchgear installations and overhead lines.



Type PHE3 ...	U 3 30 S ZK	U 6 36 S SN7728
Part No.	**767 960**	**767 944**
Nominal voltage (U_N)	3 ... 10 / 10 ... 30 kV	6 ... 20 / 20 ... 36 kV
Total length (l_G)	1745 mm	1745 mm
Insertion depth (l_O)	880 mm	880 mm

PHE III ZK Indicator with Test Prod



Prüfkopf PHE III mit Universalzahnkupplung und Isolierstange.

Nominal voltages up to 30 kV / 50 Hz
Safe verification of isolation from supply voltage

- Reliable indication with standby function
- Easy to use
- Cost-effective / space-saving transport



General technical data:	
Standard (indicator with test prod)	EN/IEC 61243-1 (DIN VDE 0682-411)
Standard (universal gear coupling)	EN/IEC 60832 (DIN VDE 0682-211)
Temperature range	–25 °C ... +55 °C, climatic category N
Design	Separate
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Copper alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**

Standby function

The PHE III indicator with test prod has a standby function meaning that the device is automatically activated as soon as contact with energised equipment is made (without previous self-test) and visually and acoustically indicates "voltage present". When making contact with de-energised equipment, the indicator is not activated.

Attention

The PHE III indicator with test prod may only be used in combination with a suitably rated insulating stick.

Nominal Voltage Ranges up to 30 kV / 50 Hz, Category "S"

Category "S" for switchgear installations and overhead lines.



Type PHE3 ...	PK6 20 S SB ZK	PK10 30 S SB ZK
Part No.	**767 921**	**767 931**
Nominal voltage (U_N)	6 ... 20 kV	10 ... 30 kV
Total length (l_G)	1010 mm	1110 mm
Insertion depth (l_O)	780 mm	880 mm

Nominal Voltage Ranges up to 30 kV / 50 Hz, Category "L"

Category "L" for overhead lines.



Type PHE3 ...	PK6 20 L SB ZK	PK10 30 L SB ZK
Part No.	**767 922**	**767 932**
Nominal voltage (U_N)	6 ... 20 kV	10 ... 30 kV
Total length (l_G)	415 mm	415 mm
Insertion depth (l_O)	185 mm	185 mm

Accessories for PHE III ZK Indicator with Test Prod

Insulating stick for PHE4 and PHE III with universal gear coupling

Handle end fitting with plastic plug-in coupling as extension handle.



Type	IS ZK STK 670
Part No.	**766 368**
Total length (l_G)	670 mm
Length (handle) (l_H)	265 mm
Diameter	30 mm
Material	**Glass-fibre reinforced polyester tube**

Telescopic insulating stick, with universal gear coupling

With scale for measuring the ground clearance, mounted support included.



Type	ISMTC N 36 ZK 10600
Part No.	**766 037**
Nominal voltage (U_N)	Up to 36 kV
Total length ($l_{G\,max}$ / $l_{G\,min}$)	10,600 / 1750 mm
Length (handle) ($l_{H\,min}$)	1680 mm
Material	**Glass-fibre reinforced epoxy resin tube**

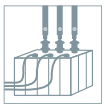
PHG II Voltage Detector



PHG II voltage detector used in a type-tested switchgear installation.

Nominal voltages up to 20 kV / 50 Hz
Easy and safe testing

- Cost-effective
- Reliable indication







General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	-25 °C ... +55 °C, climatic category N
Design	**Complete**
Only for indoor installations	✶
For	Indoor installations
Indication	Visual, 3 LEDs
Function	Passive voltage detector without batteries
Material (test electrode)	**Cu/gal Sn**
Material (test prod)	**Glass-fibre reinforced polyester tube**
Material (indicator)	**Plastic**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Test for correct operation:

The EN 50110-1 (DIN VDE 0105-100) standard requires that voltage detectors be tested for correct operation directly before and after they are used. Voltage detectors without self-testing element must be tested for correct operation by contacting parts of the installation connected to operating voltage.

On the test prod of the voltage detector there is a fork-shaped electrode.

Nominal Voltages up to 20 kV / 50 Hz

Category "S" for indoor switchgear installations.



General technical data:	
Total length (l_G)	1425 mm
Insertion depth (l_O)	720 mm

Type PHG2 ...	6	10
Part No.	**766 706**	**766 710**
Nominal voltage (U_N)	6 kV	10 kV

Type PHG2 ...	20
Part No.	**766 720**
Nominal voltage (U_N)	20 kV

PHE III Voltage Detector Kit



PHE III voltage detector used on a 110 kV outdoor station.

Nominal voltage 20 and 60 ... 110 kV / 50 Hz
Safe verification of isolation from supply voltage

- Reliable indication
- Easy to use
- Multi-purpose kit
- Cost-effective / space-saving transport



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	-25 °C ... +55 °C, climatic category N
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Copper alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Parts list:

No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
1	766 927	**6**	769 701	**11**	766 335	**16**	766 077
2	766 924	**7**	767 722	**12**	766 115	**17**	766 889
3	766 960	**8**	767 734	**13**	766 116	**18**	767 996
4	767 763	**9**	769 713	**14**	766 117	**19**	766 998
5	767 771	**10**	766 368	**15**	766 120		

For more detailed information on these products, see * www. dehn-international.com.

Nominal Voltage 20 kV / 50 Hz

Category "S" for switchgear installations and overhead lines.

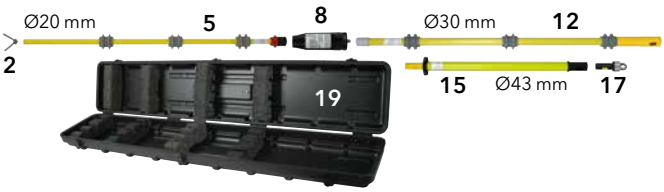
Possible lengths:		
Length l_G	**Insertion depth l_O**	**Pos. No.**
3080 mm	1580 mm	1+3+4+7+10+11
2290 mm	800 mm	1+4+7+10+11
1660 mm	800 mm	1+4+7+10



Type	PHE3S 20 S ZK
Part No.	**767 724**
Nominal voltage (U_N)	20 kV
Total length ($l_{G\,max}$)	3080 mm
Insertion depth ($l_{O\,max}$)	1580 mm

Nominal Voltage Range 60 ... 110 kV / 50 Hz

Category "S" for switchgear installations and overhead lines.

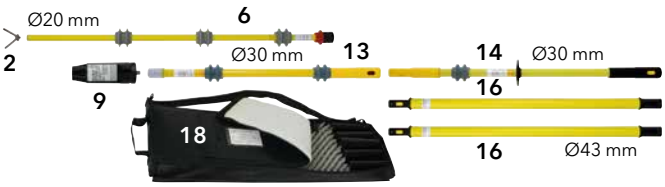


Type	PHE3S2 60 110 S
Part No.	**767 980**
Nominal voltage (U_N)	60 ... 110 kV
Total length (l_G)	2980 mm
Insertion depth (l_O)	880 mm

Nominal Voltage Range 60 ... 110 kV / 50 Hz CODED

Special test prod and indicator are mutually coded, i.e. no other test prod fits mechanically for the used indicator. Thus confusion of test prods is avoided.

Category "S" for switchgear installations and overhead lines as coded type.



Type	PHE3S60 110S CSN7774
Part No.	**769 712**
Nominal voltage (U_N)	60 ... 110 kV
Total length ($l_{G\,max}$ / $l_{G\,min}$)	4470 / 2840 mm
Insertion depth (l_O)	880 mm

ASP Non-Contact Voltage Detector Kit



Use of an ASP distance voltage detector in an outdoor switching station.

Nominal voltage range
110 ... 420 kV / 16.7 and 50 Hz
Easy and safe testing

- Easy to use due to compact design
- Cost-effective / space-saving transport

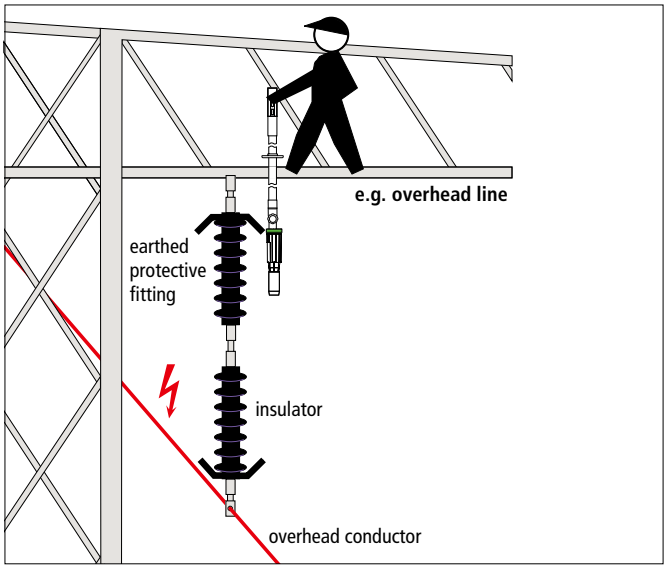




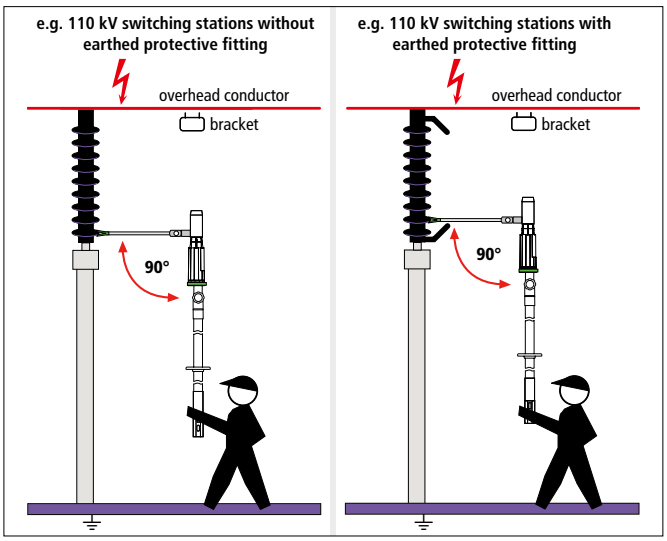


General technical data:	
Temperature range	–25 °C ... +55 °C
For use in wet weather conditions	
For	Overhead lines and outdoor switching stations
Indication	Acoustic and visual
Self-testing element	Yes
Material (indicator)	**Plastic, fully insulated, black**
Material (electric field sensor)	**Plastic, black**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Category „S" and „L"
Devices of category „S" may only be used in outdoor switching stations, devices of category „L" for overhead lines only. Devices of category „S" / „L" may be used both for outdoor switching stations and overhead lines.



Use for overhead lines
The green ring on the ASP distance voltage detector with category „L" electric field sensor is used to make contact with the last earthed protective fitting in such a way that the electric field sensor points in the direction of the overhead conductor fixed at the other end of the insulator.



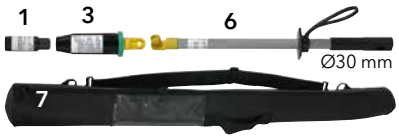
Use in outdoor switching stations
The green ring on the arm of the ASP distance voltage detector with category „S" electric field sensor is used to make contact with the lowest insulator plate at a right angle. If an earthed protective fitting is available, contact is made at the next possible insulator plate above the protective fitting.

Parts list:							
No.	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**
1	767 576	**3**	767 591	**5**	767 593	**7**	767 574
2	767 577	**4**	767 592	**6**	766 369	**8**	767 996

For more detailed information on these products, see * www. dehn-international.com.

Category "L", 50 Hz

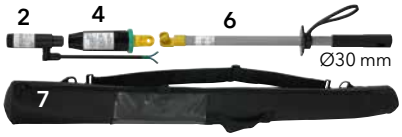
Category "L" for overhead lines in accordance with the DIN VDE V 0682-417/10.2013 preliminary standard.



Type ASPS 110 ...	**420 L**
Part No.	**767 571**
Nominal voltage (U_N)	110 ... 420 kV
Frequency	50 Hz
Total length (l_G)	960 mm

Category "S", 50 Hz

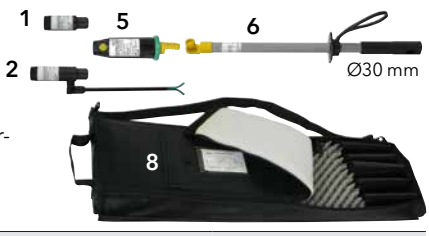
Category "S" for outdoor switching stations.



Type ASPS 110 ...	**420 S**
Part No.	**767 572**
Nominal voltage (U_N)	110 ... 420 kV
Frequency	50 Hz
Total length (l_G)	1000 mm

Category "S / L", 50 Hz

Category "S / L" for overhead lines and outdoor switching stations.



Type ASPS 110 ...	**420 S L**
Part No.	**767 573**
Nominal voltage (U_N)	110 ... 420 kV
Frequency	50 Hz
Total length (l_G)	1000 mm

HSA 194 High-Voltage Indicator



High-voltage indicator used on a 110 kV overhead line.

Nominal voltage range
110 ... 420 kV / 16.7 and 50 Hz

Easy and safe testing

- For contactlessly verifying that switchgear and high-voltage overhead lines or centre-earthed monophase traction power lines are dead
- Cost-effective / space-saving transport



Special instructions for the use of HSA 194 110 420 SN7737 (Part No. 767539)
The device can be switched between the "climbing check" mode (switch position when climbing the tower) and the "110 ... 420 kV" mode for verifying that the overhead conductor is dead.

Switch position "climbing check"
When climbing the lattice tower, the switch position "climbing check" allows to check from the corner leg whether the next overhead conductor (or conductor bundle) is still energised when approaching it. During this check, the high-voltage indicator is moved closer towards the next overhead conductor and moved within 0.5 m (see **Fig. 1**). If the conductor is energised, there is a visual (red flashing light) and acoustic signal. The **minimum distance A (min)** (according to the nominal voltage in **Table 2**) between the operating head of the high-voltage indicator and the overhead conductor must be observed. The customer must determine the maximum distance A (max) (safe tripping of the high-voltage indicator when approaching the overhead conductor) depending on the nominal voltage and document it in the operating instructions.
Using the high-voltage indicator when climbing lattice towers does not replace verifying absence of voltage from the cross arm.

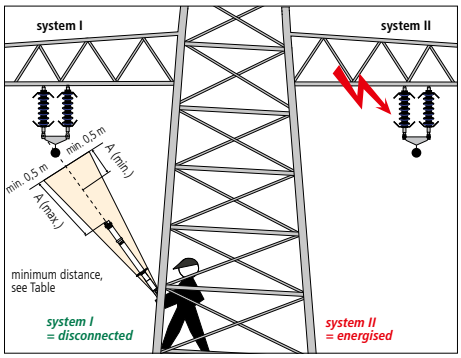


Figure 1: Example of application on the corner leg of a lattice tower with switch position "climbing check" (only HSA 194 110 420 SN7737)

Nominal voltage	Min safety distance A (min.)
110 kV	2000 mm
220 kV	3000 mm
380 kV	4000 mm
420 kV	4400 mm

Table

General technical data:	
Temperature range	– 25 °C ... + 55 °C, climatic category N
For use in wet weather conditions	
Indication	Acoustic and visual
Self-testing element	Yes
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

General application notes for the HSA 194
Switch position voltage range „110 ... 420 kV"
To verify absence of voltage from the tower cross arm, place the green ring of the high-voltage indicator on the last earthed protective fitting (or earthed insulator cap) of the insulator so that the operating head of the high-voltage indicator (see **Fig. 2**) points towards the overhead conductor to be tested, which is attached to the other insulator end (longitudinal axis of the device in parallel to the longitudinal axis of the insulator). If the conductor is energised, there is a visual (red flashing light) and acoustic signal.

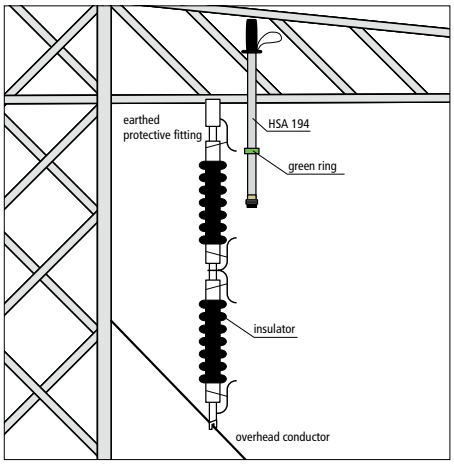


Figure 2: Example of application on the tower cross arm with switch position "110 ... 420 kV"

Nominal Voltage Range 110 ... 420 kV

With plug-in coupling as end fitting for extending the handle.
Storage bag included in delivery.



Type	HSA194 110 420 STK
Part No.	**767 541**
Nominal voltage range (U_N)	110 ... 420 kV
Frequency	50 Hz
Total length (l_G)	940 mm
Insulating clearance (l_I)	540 mm
Verification while climbing the tower	No

Nominal Voltage Range 110 ... 420 kV, with verification while climbing the tower

With plug-in coupling as end fitting for extending the handle.
Storage bag included in delivery.

Type	HSA 194 110 420 SN7737
Part No.	**767 539**
Nominal voltage range (U_N)	110 ... 420 kV
Frequency	50 Hz
Total length (l_G)	940 mm
Insulating clearance (l_I)	540 mm
Verification while climbing the tower	Yes

HSA 205 High-Voltage Indicator



HSA 205 high-voltage indicator with insulating cap used on a switchgear installation.

Nominal voltage range
1 ... 420 kV / 50 or 60 Hz

- For contactlessly verifying that switchgear installations and high-voltage overhead lines are dead
- Wide nominal voltage range



General technical data:	
Temperature range	–25 °C ... +55 °C, climatic category N
For use in wet weather conditions	
Indication	Visual and acoustic
Self-testing element	Yes
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Application notes
The operating head of HSA 205 high-voltage indicator is fitted with a yellow switching ring, which is used to set the required nominal voltage range, either 1 to 30 kV, 30 to 220 kV or 110 to 420 kV. The transparent insulating cap must be used in the voltage range from 1 to 30 kV. Provided that the insulating tube and cap of the high-voltage indicator are in a dry and clean condition, the minimum distance A can be reduced for nominal voltages up to 30 kV.
If these conditions cannot be ensured, the minimum distance A must be maintained!

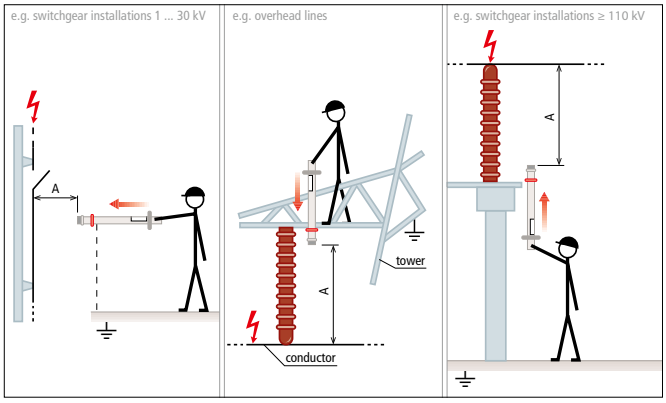
Minimum distances A according to nominal voltage:		
Selected voltage range	**Nominal voltage acc. to DIN VDE 0105 Part 1**	**Min. safety distance A DIN VDE 0105 Part 1**
Red 1 ... 30 kV	over 1 up to 6 kV	90 mm indoor installations
	over 6 up to 10 kV	120 mm indoor installations
	over 1 up to 10 kV	150 mm outdoor installations
	over 10 up to 20 kV	220 mm indoor and outdoor installations
	over 20 up to 30 kV	320 mm indoor and outdoor installations
White 30 ... 220 kV	over 30 up to 45 kV	480 mm indoor and outdoor installations
	over 45 up to 60 kV	630 mm indoor and outdoor installations
	over 60 up to 110 kV	1100 mm indoor and outdoor installations
	over 110 up to 220 kV	2100 mm indoor and outdoor installations
Yellow 110 ... 420 kV	over 110 up to 220 kV	2100 mm indoor and outdoor installations
	over 220 up to 420 kV	2900/3400 mm indoor and outdoor installations

Nominal Voltage Ranges up to 420 kV, switchable

With insulating cap and plug-in coupling as end fitting for extending the handle.
Storage bag included in delivery.



Type HSA205 U 1 ...	420 STK	420SN7608
Part No.	**767 552**	**767 547**
Nominal voltage range (U_N)	1 ... 30 / 30 ... 220 / 110 ... 420 kV	1 ... 30 / 30 ... 220 / 110 ... 420 kV
Frequency	50 Hz	**60 Hz**
Total length (l_G)	950 mm	950 mm
Insulating clearance (l_I)	540 mm	540 mm



PHE/G d.c. Voltage Detector



PHE/G II d.c. voltage detector for d.c. links (ICE power car).

Nominal voltages up to 24 kV d.c.
Safe verification of isolation from supply voltage

- For use in direct voltage systems (electrified rail networks, d.c. links)
- Reliable indication
- Easy to use due to compact design
- User-friendly



The test prod of d.c. voltage detectors is colour-coded according to the polarity of the test prod:

positive pole – red;

negative pole – blue.

General technical data:	
Standard	Based on EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +55 °C, climatic category N
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Visual
Self-testing element	Yes
Material (test prod)	**Glass-fibre reinforced polyester tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**
Material (earthing / connecting cable)	**Copper cable, highly flexible**

PHE/G I for Switchgear Installations, positive pole on indicator with test prod

One stick

- For direct voltage systems with earthed negative pole
- Positive pole: indicator with test prod
- Negative pole: earth clamp with magnet



Type	PHEG1.S P SN7401
Part No.	**767 666**
Threshold voltage (U_t)	120 V
Nominal voltage (U_N)	1 ... 24 kV
Length (earthing cable)	2000 mm
Total length (l_G)	1260 mm
Insertion depth (l_O)	535 mm

PHE/G I for Switchgear Installations, positive pole on indicator with test prod, angled

One stick

- For direct voltage systems with earthed negative pole
- Positive pole: Indicator with test prod
- Negative pole: Earth clamp



Type	PHEG1 S P SN7240
Part No.	**767 636**
Threshold voltage (U_t)	60 V
Nominal voltage (U_N)	3.8 kV
Length (earthing cable)	4000 mm
Total length (l_G)	1100 mm

PHE/G II for Switchgear Installations

Two sticks

- For unearthed direct voltage installations
- For d.c. links
- Positive pole: Indicator with test prod
- Negative pole: Insulating stick

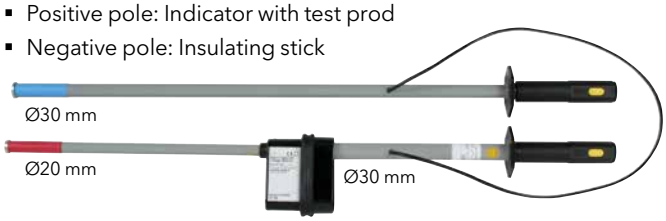


Type	PHEG2.P SN7517	PHEG2.P SN7629
Part No.	**767 671**	**767 681**
Threshold voltage (U_t)	90 V	120 V
Nominal voltage (U_N)	1 ... 24 kV	1 ... 24 kV
Length (connecting cable)	1200 mm	2000 mm
Total length (l_G)	1260 mm	1260 mm
Insertion depth (l_O)	545 mm	545 mm

PHE/G II for Switchgear Installations and DC Links

Two sticks

- For unearthed direct voltage installations
- For d.c. links (e.g. electric locomotives; Part No. 767 647)
- Positive pole: Indicator with test prod
- Negative pole: Insulating stick



General technical data:	
Length (connecting cable)	1200 mm

Type	PHEG2 P SN7552	PHEG2 P SN7259
Part No.	**767 647**	**767 645**
Threshold voltage (U_t)	90 V	120 V
Nominal voltage (U_N)	1 ... 4.2 kV	1 ... 12 kV
Total length (l_G)	600 mm	1085 mm

Type	PHEG2 P SN7407	PHEG2 P SN7194
Part No.	**767 640**	**767 637**
Threshold voltage (U_t)	350 V	750 V
Nominal voltage (U_N)	600 ... 750 V	1.5 kV
Total length (l_G)	1085 mm	1085 mm

PHE/G II for DC voltage systems with coupled AC voltages

Two sticks

- For unearthed DC voltage systems
- Positive pole: indicator with test prod
- Minus pole: Insulating stick



Type	PHEG2 P SN7759
Part No.	**767 661**
Threshold voltage (U_t)	120 V
Special function	with AC suppression*)
Nominal voltage (U_N)	1 ... 12 kV
Length (connecting cable)	1200 mm
Total length (l_G)	1085 mm

*) PHE/G II with AC suppression for clear indication in DC voltage systems with coupled AC voltages.

Two-pole SPN voltage detector for power supply



Two-pole SPN voltage detector used with extension prods for overhead lines.

Nominal voltages up to 1000 V

- Extremely shock-resistant, waterproof and dust-proof enclosure
- Test ball with additional phase, rotation field and continuity test
- Two versions with different measuring ranges
- For use in overhead line networks by attaching extension prods
- No battery required

General technical data:	
Standard	EN/IEC 61243-3 (DIN VDE 0682-401)
Temperature range	-15 °C ... +45 °C
Degree of protection	IP 65
For use in wet weather conditions	
Material (indicator)	**Safety enclosure made of solid rubber**
Indication	Direct-reading instrument, LCD and LED
Connecting cable	PUR-sheathed cable, highly flexible, 1000 mm
Overvoltage category	SPN 500B: CAT IV 500 V; SPN 1000B: CAT IV 1000 V

Nominal Voltage Range up to 1000 V

Basic devices.



Type SPN ...	500B	1000B
Part No.	**766 660**	**766 665**
Nominal voltage range (U_N)	50 ... 500 V	50 ... 1000 V
Frequency range	15 ... 500 Hz and DC	15 ... 500 Hz and DC
Dimensions (indicator)	274 x 75 x 47 mm	274 x 75 x 47 mm

Accessories for Two-pole SPN voltage detector for power supply

Extension prod

For use in overhead line networks, to be screwed onto the basic device.

Type	VS 500 SPN II
Part No.	**766 542**
Length	500 mm

Artificial leather bag, empty



For SPN voltage detectors (basic device with extension prods).

Type	AT SPN II
Part No.	**766 543**
Dimensions	535 x 160 mm
Colour	Black ●

Two-pole SPN voltage detector for the electrical trade and industry



Testing the high DC voltage of a HV electric vehicle.

Nominal voltages up to 1000 V

- Direct display system with low stress on the test point
- Switchable vibration motor
- Ideal for voltage testing on photovoltaic and wind power plants; on hybrid vehicles; on high system voltages in industry; in service and in trades

General technical data:	
Standard	EN 61243-3 (VDE 0682-401)
Degree of protection	IP 65
Overvoltage category	CAT IV 600 V

Nominal voltage range 12 to 1,000 V AC/DC, analogue



Type SPN ...	1000 A
Part No.	700 100
Indicator	Plunger coil (illuminated)/LED
Voltage range	12 V – 1000 V AC/DC
Rotating field test	LCD (R icon)
Single-pole line conductor test (phase)	LCD (R icon)
Polarity test	LED (+/-)
Load switching via pushbutton	I_S = 550 mA (1000 V) 30 mA RCD trip
Vibration alarm	yes

Nominal voltage range 1 to 1000 V AC / 1200 DC, digital



Type SPN ...	1200 D
Part No.	700 102
Indicator	LED/LCD (lights up)
Voltage range	1.0 V – 1000 V AC / 1200 V DC
Frequency measurement range	1 – 1000 Hz
Acoustic and visual continuity test	Buzzer + yellow LED 0 – 100 kΩ
Diode test	0.3 – 2.0 V
Resistance measuring range	0.1 kΩ – 300 kΩ
Rotating field test	Green LEDs (right/left)
Single-pole line conductor test (phase)	Red "flash" LED
Polarity test	LCD (+/-)
Cable break detector	Yellow LED (flashing)
Load switching via pushbutton	I_S = 550 mA (1000 V) 30 mA RCD trip
Vibration alarm	yes
Measuring point lighting	White LED

Structure of phase comparators

Phase comparators in accordance with EN/IEC 61481-1 (DIN VDE 0682-431-1) are designed for testing for in-phase condition of three-phase systems.
Only electrically skilled or instructed persons are allowed to test for in-phase condition. Phase comparators have to be tested for correct operation immediately before and after use.
Phase comparators without self-testing element have to be tested for correct operation by making contact with a part of the installation connected to operating voltage. Testing for in-phase condition by means of a phase comparator is considered live working.
Phase comparators may only be used for the nominal voltages / nominal voltage ranges as indicated on the rating plate. The user may be at risk if the voltage detector is used for voltages other than indicated on the rating plate (incorrect indication, electric shock, arcing).
Phase comparators labelled "For indoor and outdoor installations" must not be used in wet weather conditions.
Phase comparators labelled "Also suitable for use in wet weather conditions" may be used in all weather conditions such as rain, snow, fog and dew. Phase comparators in accordance with IEC/EN 61481-1 (DIN VDE 0682-431-1) are only suitable to a limited extent for use in factory assembled (type-tested) installations.
When inserting the test prod, flashovers may occur due to the restricted space in these installations. The user of the phase comparator or the operator of the switchgear must ask the manufacturer of the type-tested equipment whether the existing phase comparator may be used.

Structure of phase comparators

Phase comparators can be designed as a two-pole device (resistive phase comparator) in accordance with IEC/EN 61481-2 (DIN VDE 0682-431-2) or as a single-pole device (capacitive phase comparator) in accordance with IEC/EN 61481-1 (DIN VDE 0682-431-1).
The structure of the PHV I single-pole phase comparator is similar to that of a capacitive voltage detector. The functional principle of single-pole phase comparator is based on a microprocessor controlled electronic storage system.
Single-pole phase comparators consist of a handle with hand guard, insulating element, indicator and test prod with contact electrode.
The **insulating element** is the section of a phase comparator between the hand guard and the red ring. It ensures that the user maintains an adequate safety distance for safe operation.
The **test prod** with a contact electrode above the red ring makes it possible to reach remote parts of the installation and to eliminate the influence of interference fields.

German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations (BGV A3))

Phase comparators must be checked according to the DGUV regulation 3 (previously BGV A3) for compliance with the limit values as specified in the electrotechnical rules. This test is carried out in the high-voltage test laboratory at DEHN and includes, among other things:



- Testing the discharge current
- Testing for clear indication
- Testing the protection against bridging
- Testing by visual inspection, manual test and measuring

The maintenance test is documented in a test report and on the device itself.

The intervals for maintenance tests of phase comparators depend on their conditions of use, e.g. frequency of use, stress due to environmental conditions and transport, etc, however, according to DGUV regulation 3, **at least** every **6 years**.

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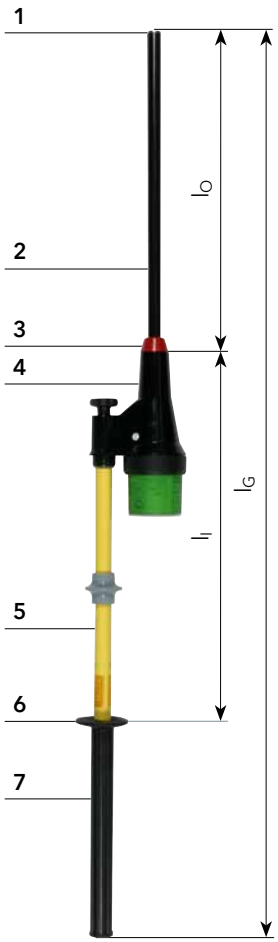
The **hand guard** is a clearly visible and tangible barrier between the handle and the insulating element. It prevents the user's hand from slipping off the handle and making accidental contact with the insulating element.
The **red ring** marks the end of the insulating element towards the test electrode. It provides the user with a visible limitation for contact with live parts of the installation. The insulating clearance between the red ring and hand guard must not contact live parts, but contact with earthed parts is allowed.
The **test electrode** is part of the phase comparator which is used to make contact with the uninsulated part of the installation to be tested.

Single-pole PHV I phase comparator



1 Test electrode
2 Test prod
3 Red ring
4 Indicator
5 Insulating element
6 Hand guard
7 Handle

l_G Total length of the phase comparator
l_O Length of the top section
l_I Length of the insulating element

Storage bags and transport cases

- Cases: Plastic
- Bags: Artificial leather or canvas



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Single-pole PHV I Phase Comparator



Single-pole PHV I phase comparator used in a switchgear installation.

Nominal voltages up to 36 kV / 50 Hz
Safe testingn
- Reliable indication

General technical data:	
Standard	EN/IEC 61481-1 (DIN VDE 0682-431-1)
Temperature range	-25 °C ... +55 °C, climatic category N
For use in wet weather conditions	
For	Indoor and outdoor installations
Self-testing element	Yes
Material (test prod)	**Plastic**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal Voltage Ranges up to 36 kV / 50 Hz



Type PHV1P ...	6 12	10 20
Part No.	759 706	759 712
Nominal voltage (U_N)	6 ... 12 kV	10 ... 20 kV
Total length (l_G)	1270 mm	1270 mm
Insertion depth (l_O)	450 mm	450 mm

Type PHV1P ...	20 36
Part No.	759 736
Nominal voltage (U_N)	20 ... 36 kV
Total length (l_G)	1730 mm
Insertion depth (l_O)	910 mm

Nominal Voltage Ranges up to 36 kV / 50 Hz, switchable



Type PHV1P ...	U 5 36
Part No.	759 716
Nominal voltage (U_N)	5 ... 10 / 20 ... 36 kV
Total length (l_G)	1730 mm
Insertion depth (l_O)	910 mm

DEHNproX – 3. Verify that the installation is dead – DEHNcap voltage detecting system

Application, indication	Nominal voltage U_N / Frequency f_N	Product	Page
DEHNcap/P voltage indicator / DEHNcap/P test unit			
▪ Passive indicator without batteries ▪ LED display ▪ Also suitable for use as permanent voltage indicator	up to 45 kV / 50 Hz		61
▪ For simple functional test ▪ Simple operation on a 230 V socket outlet ▪ For HR and LRM indicators	230 V / 50 Hz		
DEHNcap/A voltage indicator			
▪ Active voltage indicator ▪ Indication via two separate LEDs ▪ With self-testing element and battery monitoring device ▪ Automatic deactivation after use	up to 45 kV / 50 Hz		62
DEHNcap/IT interface test unit			
▪ Active indicator for maintenance tests ▪ Indication via two separate LEDs ▪ With self-testing element and battery monitoring device ▪ Automatic deactivation after use	up to 45 kV / 50 Hz		62
DEHNcap/PC phase comparator			
▪ Active indicator for testing in-phase conditions ▪ Indication via three separate LEDs ▪ Can be used at HR test sockets with two HR-LRM test adapters ▪ Comparator detects zero crossings of the systems to be compared ▪ With battery monitoring function	up to 45 kV / 50 Hz		63
DEHNcap HR-LRM test set			
▪ Complete test set	up to 45 kV / 50 Hz		64
DEHNcap test adapter			
▪ HR-LRM test adapter ▪ LR-LRM test adapter			64

German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations (BGV A3))

Capacitive voltage detecting systems must be checked according to the DGUV regulation 3 (previously BGV A3) for compliance with the limit values as specified in the electrotechnical rules. This test is carried out in the high-voltage test laboratory at DEHN.

The maintenance test is documented in a test report and on the device itself.

The intervals for maintenance tests of capacitive voltage detecting systems depend on their conditions of use, e.g. frequency of use, stress due to environmental conditions and transport, etc, however, according to DGUV regulation 3, **at least** every **6 years**.



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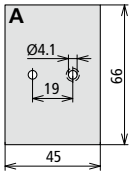
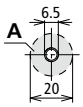
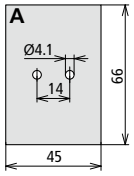
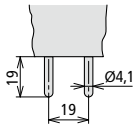
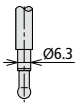
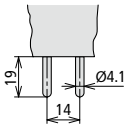
Electrical and mechanical interface requirements for pluggable HR, LR and LRM voltage detecting systems

System description		HR high resistance	LR low resistance	LRM low resistance, modified
Input impedance of the indicator	X_C	36 MΩ	2 MΩ	2 MΩ
Electrical response conditions of the interface	I	2.5 µA	2.5 µA	2.5 µA
Electrical response conditions of the interface	U	90 V	5 V	5 V
Socket arrangement and minimum spare area A for indicator or plug				
Plug arrangement				

DEHNcap/P Voltage Indicator



DEHNcap/P passive voltage indicator used in an encapsulated switchgear installation.

Nominal voltages up to 45 kV / 50 Hz
Easy verification of isolation from supply voltage

- Cost-effective

General technical data:	
Standard	EN/IEC 61243-5 (DIN VDE 0682-415)
Temperature range	–25 °C ... +55 °C
Degree of protection	IP 66
Type of device	Voltage indicator
Use	Can also be used as permanent voltage indicator

Test for correct operation

EN 50110-1 (DIN VDE 0105-100) requires that voltage indicators be tested for correct operation shortly before and after use. Passive indicators without self-testing element must be tested for correct operation by plugging them into test sockets connected to operating voltage or into a test unit (DEHNcap/P test unit).

DEHNcap/P-HR



Type SAG DCA P ...	HR GA
Part No.	**767 101**
Dimensions	40 x 48 x 35 mm
Plug spacing	19 mm
Indication threshold (HR system)	90 V
Input impedance (HR system)	36 MOhms

Accessories for DEHNcap/P Voltage Indicator

Test unit for DEHNcap/P



Type	TG DCA
Part No.	**767 110**
Nominal voltage (U_N)	230 V
Frequency	50 Hz
Nominal capacity	500 mW
Max. short-circuit current at the test socket	Approx. 20 µA
Dimensions	43 x 75 x 35 mm

DEHNcap/P-LRM



Type SAG DCA P ...	LRM GA
Part No.	**767 102**
Dimensions	40 x 48 x 35 mm
Plug spacing	14 mm
Indication threshold (LRM system)	5 V
Input impedance (LRM system)	2 MOhms

DEHNcap/A Voltage Indicator



Self-test of a DEHNcap/A voltage indicator.

Nominal voltages up to 45 kV / 50 Hz
Safe verification of isolation from supply voltage

- User-friendly
- Easy application

General technical data:	
Standard	EN/IEC 61243-5 (DIN VDE 0682-415)
Temperature range	– 25 °C ... + 55 °C
Field of application	Active voltage indicator for testing
Self-testing element	Yes

Self-testing element

DEHNcap/A electronic voltage indicators have an integrated self-testing element. By simply pressing the test button, the electronic circuit is tested for correct operation. The self-test is automatically performed as soon as the indicator is switched on. The voltage indicator is only operational if the test button is pressed, i.e. the function test was performed successfully.

DEHNcap/A-LRM



Type	SAG DCA A LRM
Part No.	**767 112**
Dimensions	120 x 60 x 25 mm
Plug spacing	14 mm
Type of plug	2 multilam plugs (Ø4 mm)
Indication threshold (LRM system)	5 V
Input impedance (LRM system)	2 MOhms

DEHNcap/IT Interface Test Unit



DEHNcap/IT interface test unit allows to carry out maintenance tests on coupling systems of switchgear installations according to IEC/EN 61243-5 (DIN VDE 0682-415).

Nominal voltages up to 45 kV / 50 Hz
Easy and safe testing

- User-friendly
- Easy handling

General technical data:	
Standard	EN/IEC 61243-5 (DIN VDE 0682-415)
Temperature range	– 25 °C ... + 55 °C
Field of application	Active indicator for maintenance tests on coupling systems
Self-testing element	Yes

Self-testing element

The DEHNcap/IT interface test unit has an integrated self-testing element. By simply pressing the test button, the electronic circuit is tested for correct operation. The self-test is automatically performed as soon as the indicator is switched on. The interface test unit is only operational if the test button is pressed i.e. the function test was performed successfully.

DEHNcap/IT-LRM



Type	SPG DCA IT LRM
Part No.	**767 122**
Dimensions	120 x 60 x 25 mm
Plug spacing	14 mm
Type of plug	2 multilam plugs (Ø4 mm)
Input impedance (LRM system)	2 MOhms
Test threshold	3.2 µA

DEHNcap/PC-LRM Phase Comparator



DEHNcap/PC-LRM phase comparator with two HR-LRM test adapters used in an HR switchgear installation.

Nominal voltages up to 45 kV / 50 Hz
Easy and safe testing

- User-friendly
- Easy handling

General technical data:	
Standard	EN/IEC 61243-5 (DIN VDE 0682-415)
Temperature range	–25 °C ... +55 °C
Design	Active indicator for testing for in-phase conditions on LRM test sockets
Field of application	For HR test sockets with two HR-LRM test adapters
Self-testing element	Yes

By attaching two optional HR-LRM adapters (Part No. 767 133), the DEHNcap/PC-LRM phase comparator can also be used for phase comparison in HR systems. DEHNcap/PC-LRM is designed as a universal phase comparator in accordance with EN/IEC 61243-5 (DIN VDE 0682-415) and detects zero crossings, but no voltage values.

DEHNcap/PC-LRM



Type PV DCA PC ...	LRM
Part No.	**767 132**
Dimensions	145 x 85 x 32 mm
Measuring cables	3 measuring cables with multilam plug (Ø4 mm)
Length (measuring cable)	2000 mm
Indication threshold (LRM system)	5 V
Input impedance (LRM system)	2 MOhms

DEHNcap/PC-LRM Phase Comparator Kit

Phase comparator in an artificial leather bag (KLT 23 164).



Type PV DCA PC ...	LRM T
Part No.	**767 139**
Dimensions	145 x 85 x 32 mm
Measuring cables	3 measuring cables with multilam plug (Ø4 mm)
Length (measuring cable)	2000 mm
Indication threshold (LRM system)	5 V
Input impedance (LRM system)	2 MOhms

Accessories for DEHNcap/PC-LRM Phase Comparator

Artificial leather bag, empty

With carrying strap.



Type	KLT 23 16 4
Part No.	**767 500**
Suitable for	DCA PC
Dimensions	235 x 160 x 40 mm
Colour	Black ●

DEHNcap HR-LRM Test Kit



Kit in a plastic case for verifying that the installation is dead and testing the interface as well as for in-phase conditions in HR and LRM systems.

Nominal voltages up to 45 kV / 50 Hz
Easy and safe testing

- Complete test kit for universal use
- Easy operation

General technical data:	
Standard	EN/IEC 61243-5 (DIN VDE 0682-415)
Temperature range	-25 °C ... +55 °C

DEHNcap HR-LRM Test Kit



Kit includes:			
No.	**Part No.**	**No.**	**Part No.**
1	767 112 (1x)	**4**	767 133 (2x)
2	767 122 (1x)	**5**	767 107 (1x)
3	767 132 (1x)		

For more detailed information on these products, see www.dehn-international.com.

Type	PS DCA HR LRM
Part No.	**767 150**
Dimensions	395 x 295 x 105 mm

DEHNcap Test Adapter



The HR-LRM test adapter for plugging an LRM indicator into a HR test socket.

Easy and safe testing

- Easy mechanical and electrical adaptation to HR, LR test sockets
- Measuring impedance for maintenance tests on coupling systems with suitable µA meter
- 4 mm safety plugs or sockets
- Energised HR plug, insulated

General technical data:	
Standard	EN/IEC 61243-5 (DIN VDE 0682-415)
Temperature range	- 25 °C ... + 55 °C

HR-LRM Test Adapter



For electrical and mechanical adaptation of HR (HO) to LRM systems.
Used as a measuring impedance with X_C = 36 MOhms for maintenance tests on HR coupling systems (with suitable µA meter).

Type MA DCA ...	HR LRM
Part No.	**767 133**
Dimensions	90 x 50 x 30 mm
Plug spacing	19 mm
Socket spacing	14 mm
Type of plug	2 multilam plugs (Ø4 mm)
Type of test socket	2 sockets (Ø4 mm)

LR-LRM Test Adapter



For mechanical adaptation of LR (NO) to LRM systems.

Type MA DCA ...	LR LRM
Part No.	**767 136**
Dimensions	100 x 50 x 30 mm
Plug spacing	jack, 6.3 mm
Socket spacing	14 mm
Type of plug	1 jack
Type of test socket	2 sockets (Ø4 mm)

Electrodes

- Safe contact with the part of an installation to be tested
- With M8 thread, to be screwed on the test prods of HVD, PHE4, PHE III, PHE voltage detectors as well as PHV I phase comparators

Onion-shaped Electrode
For contacting varnished busbars.



Type EL M8 ...	SZ PHE PHV
Part No.	**766 913**
Nominal voltage (U_N)	From 1 kV
Material	**Brass/gal CuSn**

Pin-shaped Electrode
For contacting varnished busbars.



Type EL M8 ...	S PHE PHV
Part No.	**766 925**
Nominal voltage (U_N)	From 1 kV
Material	StSt

V-shaped Electrode
For contacting round conductors.



Type EL M8 ...	V PHE PHV
Part No.	**766 927**
Nominal voltage (U_N)	From 1 kV
Material	**Cu/gal Sn**

Hook-shaped Electrode
For contacting overhead line conductors.



Type EL M8 ...	H PHE
Part No.	**766 923**
Application	For overhead lines only
Material	**St/gal Zn**

Fork-shaped Electrode
For contacting overhead line conductors.



Type EL M8 ...	G PHE
Part No.	**766 924**
Application	For overhead lines only
Material	StSt

Eaton Holec Magnefix Electrode
For Eaton Holec Magnefix switchgear installations of type MA, MD4, MF, MG, MY.

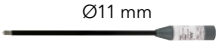


Type EL M8 ...	MAG PHE PHV
Part No.	**766 915**
Nominal voltage (U_N)	3 ... 15 kV
Material	**Brass/gal CuSn, PVC**

Test Probes

- Safe contact with the part of an installation to be tested
- With M8 thread, to be screwed on test electrodes of HVD, PHE4, PHE III and PHE voltage detectors
- For switchgear installations with limited access
- Available in different lengths and angles

Test Probe, straight
For switchgear installations with limited access (e.g. Calor Emag/Isopond and Krone/KES)



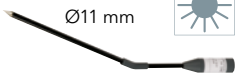
Type PSO M8 ...	PHE
Part No.	**766 916**
Nominal voltage (U_N)	1 ... 24 kV
Total length (l_G)	420 mm
Length (l_1)	300 mm
Suitable for	HVD, PHE4, PHE III, PHE

Test Probe, straight, 800 mm
For transformer stations and switchgear installations that require a greater insertion depth.



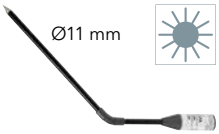
Type PSO M8 ...	PHE L800
Part No.	**766 960**
Nominal voltage (U_N)	1 ... 24 kV
Total length (l_G)	890 mm
Suitable for	HVD, PHE4, PHE III, PHE

Test Probe, 25° angled
For switchgear installations with limited access.



Type PSO M8 ...	W25 PHE
Part No.	**766 940**
Nominal voltage (U_N)	1 ... 24 kV
Total length (l_G)	450 mm
Length (l_1)	280 mm
Suitable for	HVD, PHE4, PHE III, PHE

Test Probe, 45° angled
For switchgear installations with limited access.



Type PSO M8 ...	W45 PHE
Part No.	**766 941**
Nominal voltage (U_N)	1 ... 24 kV
Total length (l_G)	395 mm
Length (l_1)	280 mm
Suitable for	HVD, PHE4, PHE III, PHE

Test Probe, 90° angled
For switchgear installations with a limited tulip-shaped access from bottom to top.



Type PSO M8 ...	W90 PHE
Part No.	**766 950**
Nominal voltage (U_N)	1 ... 24 kV
Total length (l_G)	200 mm
Length (l_1)	370 mm
Suitable for	HVD, PHE4, PHE III, PHE

Adapters and End Fittings

Adapter (Plug-In Coupling / T Pin Shaft)

For extending the handle of IS ... STK insulating sticks by an ES SQ or ES SQL earthing stick.



Type	AD HV STK SQ
Part No.	**766 313**
Total length (l_G)	275 mm

End Fitting STK (Plug-in Coupling)

For use as termination and protection



Type	A STK
Part No.	**766 888**
Total length (l_G)	85 mm
Diameter	30 / 43 mm

End Fitting STK with Eye

For use as protection and transport eye when working on overhead lines.



Type	AR STK
Part No.	**766 889**
Total length (l_G)	150 mm
Diameter	30 / 43 mm

Storage Devices

- Wall-mounted
- Easy and safe storage of earthing and short-circuiting devices, voltage detectors and operating sticks (Ø30 or 43 mm)

For a Voltage Detector and an Earthing Stick

For a voltage detector and an earthing stick of any length

Hole spacing: 290/390 mm,
holes: Ø7 mm



Type HV ...	P ST D24	P ST D30
Part No.	**700 006**	**700 007**
Dimensions	530 x 30 x 136 mm	430 x 30 x 136 mm
For stick diameters	24 mm	30 mm
DB material No.	–	828 077

Type HV ...	P ST D40 45
Part No.	**700 008**
Dimensions	530 x 30 x 149 mm
For stick diameters	40 ... 45 mm
DB material No.	–

For an Earthing and Short-Circuiting Device and an Earthing Stick

For an earthing and short-circuiting device and an earthing stick of any length

Hole spacing: 424 mm,
holes: Ø7 mm



Type HV ...	EKV ES30	EKV ES40
Part No.	**700 000**	**700 002**
Dimensions	525 x 175 x 214 mm	525 x 175 x 214 mm
For stick diameters	30 mm	43 mm
DB drawing No.	3 Ebgw 01.70	–
DB material No.	742 395	–

For an Earthing and Short-Circuiting Device and an Earthing Stick up to 1.5 m

For an earthing and short-circuiting device and an earthing stick with a length up to 1.5 m

Hole spacing: 104 mm,
holes: Ø7 mm



Type HV ...	EKV ES30 1500
Part No.	**700 003**
Dimensions	214 x 150 mm
For stick diameters	30 / 43 mm

Storage Bags and Transport Cases / Easy Choice

Note: All storage bags and transport cases are delivered without content.

Safety Equipment \ Storage Bags and Transport Cases	Sheet Steel Case	Plastic Caser				Plastic Bag	Artificial Leather Bag						Storage Bag
	767 701	766 036	766 993	766 994	767 107	766 602	767 996	766 996	767 574	767 500	766 614	766 543	766 601	766 704
HVD up to l_G 1450 mm / * up to l_G 1760 mm			*	■		■	■	*					*	
PHE4 up to l_G 1450 mm				■			■						■	
PHE4 up to l_G 3010 mm / * up to l_G 1760 mm			■					■					*	
PHE4 from l_G 4420 mm (l_G 5750 mm)						■								
PHE III up to l_G 1675 mm	■		■	■			■							
PHE III ZK Indicator with **Test Prod**		■					■							
PHE III Kit			■					■						
ASP * from Part No. 767 573							*		■					
HSA									■					
PHE/G											■			■
Voltage detectors for **LV Installations**												■		
PHV I up to l_G 1270 mm				■			■							
PHV I up to l_G 1730 mm			■					■						
DEHNcap					■					■				

Sheet Steel Case

Sheet Steel Case for PHE III
Hammer-tone finished with foam padding.



Type	**SKL 95 21 10**
Part No.	**767 701**
Dimensions	950 x 210 x 115 mm
Colour	Blue ●

Canvas Bag

Canvas Bag for PHE and PHE/G I
With carrier handle.



Type STT ...	**120 30 15**
Part No.	**766 704**
Dimensions	1220 x 390 x 150 mm
Colour	Olive ●

Plastic Case

Universal Plastic Case for HVD, PHE4, PHE III and PHV I

With foam padding.



Type	KKL 92 28 12	KKL 132 36 14
Part No.	**766 994**	**766 993**
Dimensions	920 x 280 x 126 mm	1320 x 365 x 140 mm
Colour	Black ●	Black ●

Plastic Case for PHE III Indicator with Test Prod

With foam padding



Type	KKL PK PHE3 L
Part No.	**766 036**
Dimensions	390 x 280 x 80 mm
Colour	Grey ●

Plastic Case for DEHNcap

With foam padding



Type	KKL DCA
Part No.	**767 107**
Dimensions	390 x 280 x 84 mm
Colour	Grey ●

Plastic Bag

Plastic Bag for HVD and PHE4

With carrier handle



Type	KST 2470 740
Part No.	**766 602** NEW
Dimensions	2470 x 740 mm
Colour	Dark grey ●
DB drawing No.	3 Ebgw 02.51

Artificial Leather Bag

Artificial Leather Bag for HVD, PHE4, PHE III, ASP, PHV I and IS STK

With zip, carrier handle and shoulder strap.



Type KLT ...	101 30 10	133 34 10
Part No.	**767 996**	**766 996**
Dimensions	1010 x 300 x 100 mm	1300 x 345 x 100 mm
Colour	Black ●	Black ●

Artificial Leather Bag for HVD, PHE4, PHE and PHV I

With carrier handle



Type KLT ...	121 25 16
Part No.	**766 601**
Dimensions	1200 x 250 x 160 mm
Colour	Black ●

Artificial Leather Bag for ASP and HSA

With zip and carrier handle.



Type KLT ...	104 9
Part No.	**767 574**
Dimensions	Ø90 x 1040 mm
Colour	Black ●

Artificial Leather Bag for PHE/G

With carrier handle



Type KLT ...	160 17
Part No.	**766 614**
Dimensions	Ø170 x 1600 mm
Colour	Black ●

Discharge and Equipotential Bonding Devices

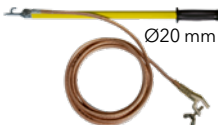


Single-pole device for discharging static charges.

- For discharging static charges
- Different contact electrodes
- Coupling electrode, especially for round conductors (Ø12 ... 26.5 mm) of electrostatic precipitator systems
- Waterproof, plastic-sheathed cable entries, with additional anti-kink protection

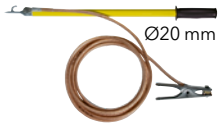
General technical data:	
Not for use in wet weather conditions	✷
Material (contact electrode)	Cu alloy/gal Sn
Material (contact and coupling electrode)	Zamak
Material (coupling electrode)	Bronze/gal Sn
Material (insulating tube)	Glass-fibre reinforced polyester tube
Material (earthing cable)	Cu, highly flexible

Discharge Device with Handle and Earth Clamp with Wing Bolt



Type	EV TES 465 EK
Part No.	758 020
Cable length	3500 mm
Cable cross-section	16 mm²
Cable sheath	Transparent
Total length (l_G)	550 mm
Clamping range	Up to 20 mm

Discharge Device with Handle and Spring-loaded Earth Pliers



Type	EV TES 465 EZ
Part No.	758 021
Cable length	3500 mm
Cable cross-section	16 mm²
Cable sheath	Transparent
Total length (l_G)	550 mm
Clamping range Rd / Fl	up to Ø16 mm / to 13 mm

Discharge Device with Handle and Cable Lug at the Earth Cable End

Hole (Ø8.4 mm) and silicone cable



Type	EV TES 465 KS10
Part No.	758 022
Cable length	3500 mm
Cable cross-section	10 mm²
Cable sheath	Red silicone cable
Total length (l_G)	550 mm

Discharge Device with Earth Clamp with Wing Bolt



Type	EV TS 2000 EK
Part No.	758 001
Cable length	3500 mm
Cable cross-section	16 mm²
Cable sheath	Transparent
Total length (l_G)	2050 mm
Clamping range	Up to 20 mm

Discharge Device with Spring-loaded Earth Pliers



Type	EV TS 2000 EZ
Part No.	758 003
Cable length	3500 mm
Cable cross-section	16 mm²
Cable sheath	Transparent
Total length (l_G)	2050 mm
Clamping range Rd / Fl	up to Ø16 mm / to 13 mm

Earthing Device with Earth Clamp with Tommy Bar

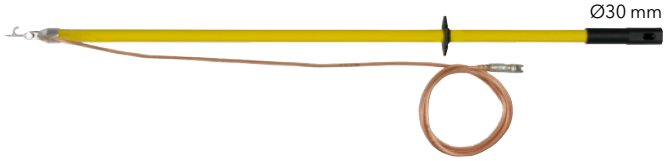
For round conductors (Ø12 ... 26.5 mm) of electrostatic precipitator systems



Type	EV EH 1725 EK
Part No.	758 015
Cable length	3500 mm
Cable cross-section	25 mm²
Cable sheath	Transparent
Total length (l_G)	1725 mm
Clamping range	Up to 30 mm

Discharge Device with Contact and Coupling Electrode and Cable Lug at the Earth Cable End

PK1 anti-rotation crimped cable lug (hole Ø12.5 mm).



Type	EV TES STK 1500 KS
Part No.	758 025
Cable length	3500 mm
Cable cross-section	16 mm²
Cable sheath	Transparent
Total length (l_G)	1500 mm

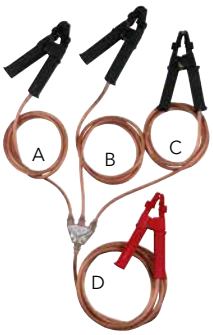
Discharge Device with Clamp and Cable Lug at the Earth Cable End

PK1 anti-rotation crimped cable lug (hole Ø12.5 mm).



Type	EV EHB 1600 SN7114
Part No.	**758 028**
Cable length	3500 mm
Cable cross-section	16 mm²
Cable sheath	Transparent
Total length (l_G)	1600 mm

Equipotential Bonding Device with Insulated Earth Clamps



Type	PAV 3+1 16 ZAK
Part No.	**758 099**
Cable length (A / B / C)	1750 mm
Cable length (D)	3200 mm
Cable cross-section	16 mm²
Cable sheath	transparent
Clamping range	5-25 mm

Discharge Device with Handle, without Earth Cable



Type	EV TES 465 SN7215
Part No.	**758 036**
Total length (l_G)	550 mm
Screw	M8 x 20 mm

Discharge Device with Contact Electrode without Earth Cable



Type	EV TS STK 1470
Part No.	**758 075**
Total length (l_G)	1470 mm
Screw	M8 x 20 mm

Discharge Device with Contact and Coupling Electrode without Earth Cable



Type	EV TES STK 1500
Part No.	**758 085**
Total length (l_G)	1500 mm
Screw	M8 x 20 mm

Discharge Device with Hook without Earth Cable



Type	EV EHB STK 1600
Part No.	**758 095**
Total length (l_G)	1600 mm
Screw	M8 x 20 mm

Accessories for Discharge and Equipotential Bonding Devices

Earth cable with crimped cable lug

Earthing cable combinable with discharge device.
PK1 crimped cable lug for connection with earth connecting elements.

General technical data:		
Material		Cu
Type of crimped cable lug		PK1 (Ø12.5 mm) and PK2 (Ø8.5 mm)
Cable length		To be specified on order (500-25000 mm)

Type	EL 16CU KS12.5 8.5	EL 25CU KS12.5 8.5
Part No.	**758 116**	**758 125**
Cable cross-section	16 mm²	25 mm²

Type	EL 35CU KS12.5 8.5
Part No.	**758 135**
Cable cross-section	35 mm²

Earthing cable length to be specified when ordering (in steps of 500 mm).

Earth cable with earth pliers

Earth cable combinable with discharge device.



Type	EL 16CU EZ KS8.5
Part No.	**758 216**
Material (cable)	Cu
Type of crimped cable lug	PK2 (Ø8.5 mm)
Material of pliers	StSt
Clamping range Rd / Fl	Up to Ø16 mm / up to 13 mm
Cable cross-section	16 mm²
Cable length	To be specified on order (500-25000 mm)

Earthing cable length to be specified when ordering (in steps of 500 mm).

DEHNproX – 4. Earthing and short circuiting – EaS devices

Type / Application	Product	Page
Fixed phase and earthing points		75
EaS cables, unequipped ▪ Single to five-pole		79
Phase connection elements ▪ For switchgear installations ▪ For overhead lines		82
Earth-side connection elements ▪ Earthing kit/spike ▪ For switchgear installations and overhead lines		86
Earthing sticks ▪ For switchgear installations, single and two-part ▪ For overhead lines, telescopic and multi-part		89
EaS devices, short-circuiting bars	 	91

Maintenance test acccording to German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations (BGV A3))

According to DGUV regulation 3 (formerly BGV A3), §5 paragraph 1, operating equipment, which also includes EaS devices, must be checked to ensure it is in good condition and at specific intervals.

The intervals shall be selected in such a way that defects which are to be anticipated are detected in good time. This test is carried out at DEHN or on the customer's premises according to a new measuring method*) and includes

- Visual inspection to detect visible defects.
- Measurement of the total resistance at the stationary EaS device (static test)
- Measurement of the relative change in resistance in the cable and at the connection points of the moving EaS device (dynamic test).

The maintenance test is documented in a test report and on the device itself.

*) This measuring procedure was developed on behalf of BG ETEM (German trade association for energy, textiles, electrical goods and media products) at the University of Applied Sciences Dresden (HTW Dresden).



10

Earthing and Short-Circuiting Devices

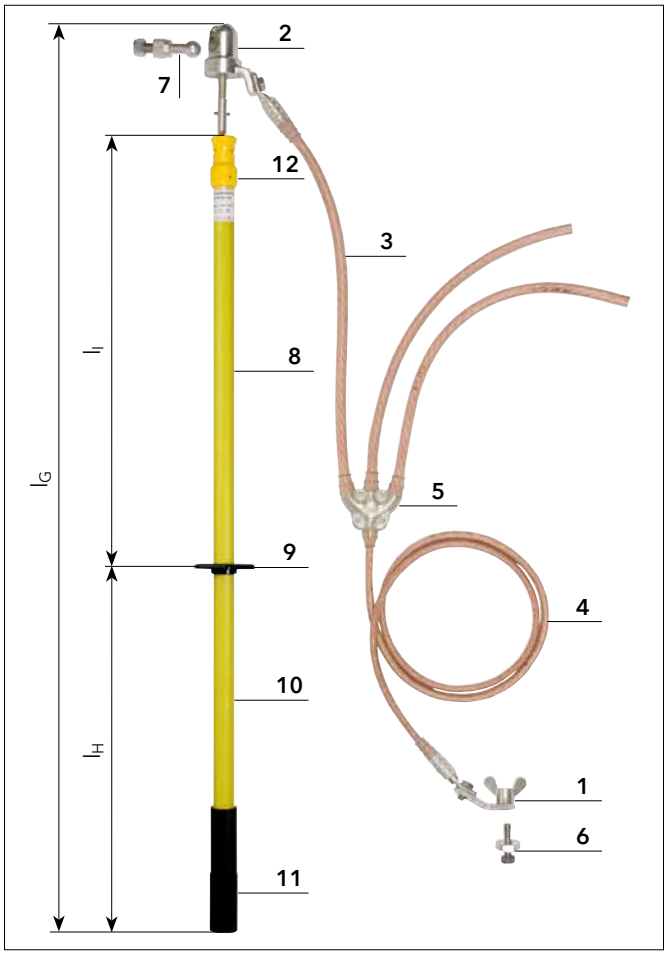
The key point of the five safety rules for dead working is earthing and short-circuiting at the work location. This measure ensures the de-energised state for the duration of the work, also with regard to interference voltages, atmospheric surges or erroneous reconnection.
Portable devices for earthing and short-circuiting may only be used if the absence of voltage has been verified immediately beforehand at the place of installation.
When connecting the earthing and short-circuiting device, the earthing cable must always be connected to the earthing system first, so that any residual or interference voltages present are discharged.

Portable devices for earthing or earthing and short-circuiting according to DIN VDE 0683-100 (EN/IEC 61230) are devices to be used manually which are brought up to and connected with the fixed connection points of parts of electrical installations for the purpose of earthing and short-circuiting (according to DIN VDE 0105-100 or EN 50110-1, section 6.2.4) without forced guidance (e.g. slots, sockets, guide rails). They consist of earthing and short-circuiting devices (EaS devices) and earthing sticks.
The **earthing and short-circuiting device** is a device with which electrical conductors can be both earthed and short-circuited. It consists of an earthing device and a short-circuiting device. The earthing device is a device for connecting the earth-termination system to a short-circuiting device or to the equipment to be earthed. It consists of a connection component (**1**) and earthing cable (**4**).
The short-circuiting device is a device for connecting the line conductors to be short-circuited. It consists of connection components (**1+2**), short-circuiting cables or bars (**3**) and, where necessary, connecting clusters (**5**).
The **short-circuiting bar** is a rigid short-circuiting device.
Connecting clusters connect the short-circuiting cables to each other and to the earthing cable or the short-circuiting bar to the earthing cable.
Connection components connect the earthing and short-circuiting cables or busbars directly or via intermediate links, e.g. via cable lugs, to the earthing system and the system parts, where necessary via fixed connection points. Fixed connection points are those points on system parts to which the earthing and short-circuiting devices are connected, e.g. cables, bars, fixed ball points, cylinder bolts, stirrups. The connection of the fixed ball point and the ball head cap of the earthing and short-circuiting device ensures the highest degree of short-circuit strength.
Fixed connection points are parts of the installation to which earthing and short-circuiting devices are connected (e.g. conductors, bars, fixed ball points, cylinder bolts, clamps etc.). Maximum short-circuit strength can be achieved by connecting the fixed ball point with the ball head cap of the earthing and short-circuiting device.
Earthing sticks are hand-held insulating sticks for bringing the connection components of earthing and short-circuiting devices up to parts of power installations for the purpose of earthing and short-circuiting. They consist of an insulating element, black ring, handle and coupling for holding a connection component. Earthing sticks must be selected according to the weight of the earthing and short-circuiting device to be installed (see specification: "maximum permissible load on the operating head in kg").
The **insulating element** is the part of the earthing stick between the black ring and the end of the earthing stick in the direction of the connection component. It ensures that the user maintains the required safety distance, and it provides sufficient insulation. In installations exceeding 1 kV, the insulating element must have a minimum length l_I of 500 mm.

A complete device for earthing and short-circuiting according to DIN VDE 0683-100 (EN/IEC 61230) consists of, e.g.:
- Fixed point/fixed ball point
- One or three-pole earthing and short-circuiting device or short-circuiting bar
- Fixed earthing terminal
- Earthing stick

Earthed and short-circuiting devices as well as fixed ball and earthing points must be rated for the **short-circuit current** possible at the point of use. The required cable cross-sections depend on the max. short-circuit current I_k in A and the short-circuit duration T_k in s.

Note:
In the event of a short-circuit, the short-circuit current flows via short-circuiting devices, which is what the devices are rated for – but this is not the case with earthing devices. These do not carry short-circuit current and can therefore have a weaker design.



1 Connection component to earth-termination system
2 Connection component to line
3 Short-circuiting cable
4 Earthing cable
5 Connecting cluster
6 Earth connection point
7 Line connection point
8 Insulating element with length l_I
9 Hand guard
10 Handle with length l_H
11 End fitting with plug-in coupling
12 Coupling

Portable devices for earthing or earthing and short-circuiting

Cable cross-section:
In the case of three-pole earthing and short-circuiting devices, the cross-section of the earthing cable can always be reduced according to the following table for short-circuiting cables of 50 mm² and larger.
These earthing and short-circuiting devices with reduced earthing cable cross-section can be used in all networks without direct neutral earthing (e.g. compensated system with impedance neutral earthing).
For networks with direct (rigid) neutral earthing, the short-circuiting and earthing cables must have the same cross-section.

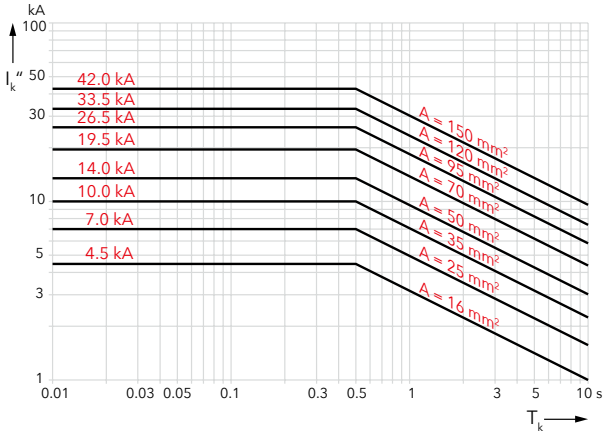
The current carrying capacity of the short-circuiting cable and the short-circuiting bar depends on the material, cross-section (A) and short-circuit duration (T_k).
The calculations were based on the worst case of the off-generator short-circuit ($\mu = 1$) and the highest DC component ($\chi = 1.8$) with I_k" as the maximum initial short-circuit alternating current, which according to DIN VDE 0102 is equal to the sustained short-circuit current I_k and equal to the breaking current I_a:

$I_k" = I_k = I_a$

The required cable or bar cross-sections of the short-circuiting device can be determined from the diagrams or the table according to the short-circuit current and the short-circuit duration for an installation.

Cable Cross-Section	
Short-circuiting cable	**Earthing cable**
16 mm²	16 mm²
25 mm²	25 mm²
35 mm²	35 mm²
50 mm²	25 mm²
70 mm²	35 mm²
95 mm²	35 mm²
120 mm²	50 mm²
150 mm²	50 mm²

Current carrying capacity of copper short-circuiting cables for use in three-phase systems

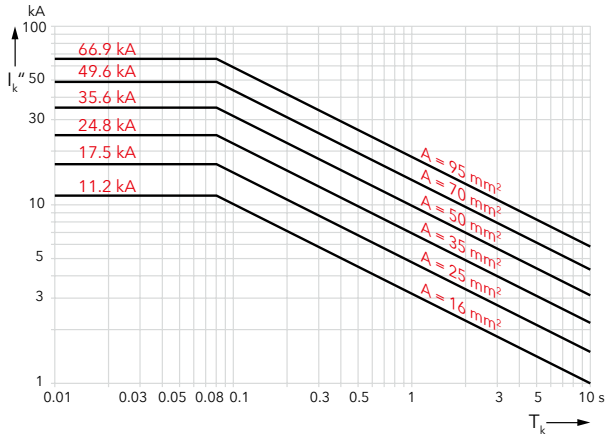


Initial cable temperature 20 °C
Final cable temperature 250 °C

$A = 5.07\ I_k" \sqrt{T_k}$ for $T_k \geq 0.5$ s

Meaning here:
A Cable cross-section in mm²
I_k" maximum initial symmetrical short-circuit current in kA as per DIN VDE 0102
T_k short-circuit duration in s

Current carrying capability of copper short-circuiting cables for use in DC installations

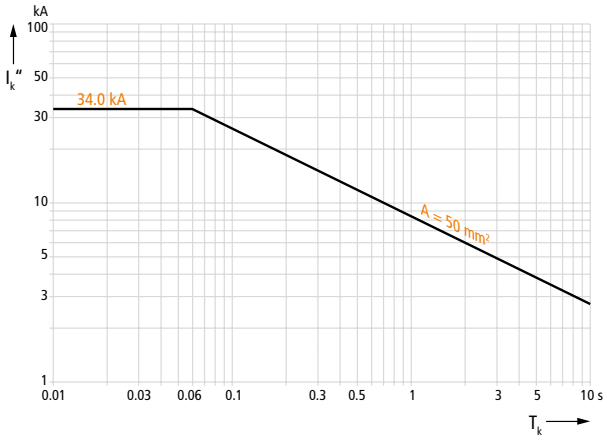


Initial cable temperature 20 °C
Final cable temperature 250 °C

$A = 5.07\ I_k" \sqrt{T_k}$ for $T_k \geq 0.08$ s

Meaning here:
A Cable cross-section in mm²
I_k" maximum initial symmetrical short-circuit current in kA as per DIN VDE 0102
T_k short-circuit duration in s

Current carrying capability of copper short-circuiting cables for use on the overhead contact lines of electric railways



Initial cable temperature 20 °C
Final cable temperature 250 °C

$A = 6.0\ I_k" \sqrt{T_k}$ for $T_k \geq 0.06$ s

Meaning here:
A Cable cross-section in mm²
I_k" maximum initial symmetrical short-circuit current in kA as per DIN VDE 0102
T_k short-circuit duration in s

Calculation example:

Specified: mains breaking capacity S_a
short-circuit duration T_k

Sought: required cable or bar cross-section A.

The off-generator short-circuit is used as a basis.

Three-phase current $I_k'' = I_k = I_a = \frac{S_a}{\sqrt{3} \bullet U_N}$

Single-phase alternating current $I_k'' = I_k = I_a = \frac{S_a}{U_N}$

With "I_k" the required cable or bar cross-section can now be calculated from the above equations or taken from the diagrams. The permissible current-time load capacity of an earthing and short-circuiting device is indicated by the cross-section specification on the short-circuiting cables or bars.

Note:

- Earthing and short-circuiting devices are only rated for a one-off exposure to the permissible current-time load!
- Short-circuiting cables of multipole earthing and short-circuiting devices must have the same cross-sections.
- The cable lengths of the earthing and short-circuiting devices should be at least 1.2 times the distance between two fixed connection points. Furthermore, the cable lengths selected should be as short as possible, as the cables will move violently in the event of a short-circuit.
- If earthing and short-circuiting devices are connected in parallel with cables to reach certain total cable cross-sections, the following conditions are to be observed:

1. same cable lengths and cross-sections,
2. same connection components and points,
3. installation of the devices close together with parallel arrangement of the cables,
4. for each cable, the permissible load capacity must be reduced to 75% of that of the corresponding the cable cross-section.

Note:
If it is ensured that earthing and short-circuiting devices connected in parallel are only loaded once with the full short-circuit current (no automatic reclosing or short interruption), the devices may be fully loaded.

Table:
Cable cross-section of the earthing and short-circuiting device depending on the maximum short-circuit current Ik and the maximum short-circuit duration T_k

- for copper (Cu)

Cross-section of the copper cable	Maximum permissible short-circuit current I_k for a duration of				
	10 s	5 s	2 s	1 s *)	≤ 0.5 s *)
16 mm²	1 000 A	1 400 A	2 200 A	3 200 A	4 500 A
25 mm²	1 600 A	2 200 A	3 500 A	4 900 A	7 000 A
35 mm²	2 200 A	3 100 A	4 900 A	6 900 A	10 000 A
50 mm²	3 100 A	4 400 A	7 000 A	9 900 A	14 000 A
70 mm²	4 400 A	6 200 A	9 800 A	13 800 A	19 500 A
95 mm²	5 900 A	8 400 A	13 200 A	18 700 A	26 500 A
120 mm²	7 500 A	10 600 A	16 700 A	23 700 A	33 500 A
150 mm²	9 400 A	13 200 A	20 900 A	29 600 A	42 000 A

*) catalogue data

- for aluminium (Al)

Cross-section of the aluminium cable	Maximum permissible short-circuit current I_k for a duration of				
	10 s	5 s	2 s	1 s *)	≤ 0.5 s *)
35 mm²	1 400 A	2 000 A	3 200 A	4 600 A	6 500 A
50 mm²	2 100 A	2 900 A	4 600 A	6 600 A	9 300 A

*) catalogue data

Fixed Ball Points



Straight fixed ball point mounted on a busbar.

Ø20 or 25 mm

- Suitable for fixing busbar connections according to DIN 43673-1
- Self-locking nut
- M12 or M16 non-cutting formed female thread
- M12 or M16 threaded pin

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100) and based on DIN 48088-1
Material (fixed ball point)	E-Cu/gal Sn
Material (threaded pin)	StSt A2-70
Hexagon nut	DIN 985-M12-8 / gal Zn; DIN 985-M16-8 / gal Zn
Tightening torque	M10: 30-40 Nm; M12: 50-65 Nm; M16: 100-110 Nm

Angled with Terminal Lug



Type KFP ...	20 S AL 12	25 S AL 12
Part No.	706 300	756 300
Fixed ball point Ø	20 mm	25 mm
Bore Ø	12.5 mm	12.5 mm
Dimensions	45 x 30 x 9 mm	50 x 30 x 9 mm
Max. cable cross-section Cu	50 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	14.0 kA	26.5 kA
Max. short-circuit current I_k 1 s	9.9 kA	18.7 kA

Straight with Round Conductor Half Shell for Round Copper Conductors



General technical data:	
Fixed ball point Ø	25 mm
Max. cable cross-section Cu	95 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA
Max. short-circuit current I_k 1 s	18.7 kA

Type KFP ...	25 RL 10	25 RL 12
Part No.	725 010	725 012
For round conductor Ød	10 mm	12 mm

Type KFP ...	25 RL 14	25 RL 16
Part No.	725 014	725 016
For round conductor Ød	14 mm	16 mm

Type KFP ...	25 RL 18	25 RL 20
Part No.	725 018	725 020
For round conductor Ød	18 mm	20 mm

Straight with Threaded Pin and Self-locking Nut



Type KFP ...	20 M12 35 SSM	20 M12 45 SN7078
Part No.	754 235	754 238
Fixed ball point Ø	20 mm	20 mm
Dimensions	M12 x 35 mm	M12 x 45 mm
Wrench size	24 mm	24 mm
Max. cable cross-section Cu	120 mm²	120 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

Type KFP ...	20 M16 45 SSM	25 M12 25 SSM
Part No.	754 645	755 225
Fixed ball point Ø	20 mm	25 mm
Dimensions	M16 x 45 mm	M12 x 25 mm
Wrench size	24 mm	27 mm
Max. cable cross-section Cu	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Type KFP ...	25 M12 45 SSM	25 M16 45 SSM
Part No.	755 245	755 645
Fixed ball point Ø	25 mm	25 mm
Dimensions	M12 x 45 mm	M16 x 45 mm
Wrench size	27 mm	27 mm
Max. cable cross-section Cu	150 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	42.0 kA	42.0 kA
Max. short-circuit current I_k 1 s	29.6 kA	29.6 kA

Straight with Female Thread



Type KFP ...	20 M10	20 M12
Part No.	754 205	754 200
Fixed ball point Ø	20 mm	20 mm
Dimensions	M10	M12
Wrench size	24 mm	24 mm
Max. cable cross-section Cu	120 mm²	120 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

Type KFP ...	20 M16	25 M12
Part No.	754 600	755 200
Fixed ball point Ø	20 mm	25 mm
Dimensions	M16	M12
Wrench size	24 mm	27 mm
Max. cable cross-section Cu	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Type KFP ...		25 M16
Part No.		755 600
Fixed ball point Ø		25 mm
Dimensions		M16
Wrench size		27 mm
Max. cable cross-section Cu		150 mm²
Max. short-circuit current I_k 0.5 s		42.0 kA
Max. short-circuit current I_k 1 s		29.6 kA

45° angled with Threaded Pin and Self-locking Nut



Type KFP ...	20 W45M12 SN7024	20 W45 M12 35SSM
Part No.	706 239	706 235
Fixed ball point Ø	20 mm	20 mm
Dimensions	M12 x 30 mm	M12 x 35 mm
Wrench size	24 mm	24 mm
Max. cable cross-section Cu	70 mm²	70 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	19.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	13.8 kA

Type KFP ...	20 W45 M16 45SSM	25 W45 M12 45SSM
Part No.	706 645	756 245
Fixed ball point Ø	20 mm	25 mm
Dimensions	M16 x 45 mm	M12 x 45 mm
Wrench size	24 mm	27 mm
Max. cable cross-section Cu	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type KFP ...	25 W45 M16 45SSM
Part No.	756 645
Fixed ball point Ø	25 mm
Dimensions	M16 x 45 mm
Wrench size	27 mm
Max. cable cross-section Cu	95 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA
Max. short-circuit current I_k 1 s	18.7 kA

45° angled with Female Thread



Type KFP ...	20 W45 M12	20 W45 M16
Part No.	706 200	706 600
Fixed ball point Ø	20 mm	20 mm
Dimensions	M12	M16
Wrench size	24 mm	24 mm
Max. cable cross-section Cu	70 mm²	70 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	19.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	13.8 kA

Type KFP ...	25 W45 M12	25 W45 M16
Part No.	756 200	756 600
Fixed ball point Ø	25 mm	25 mm
Dimensions	M12	M16
Wrench size	27 mm	27 mm
Max. cable cross-section Cu	95 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	18.7 kA	18.7 kA

90° angled with Threaded Pin and Self-locking Nut



Type KFP ...	20 W90 M12 35SSM	20 W90 M16 45SSM
Part No.	707 235	707 645
Fixed ball point Ø	20 mm	20 mm
Dimensions	M12 x 35 mm	M16 x 45 mm
Wrench size	24 mm	24 mm
Max. cable cross-section Cu	70 mm²	70 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	19.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	13.8 kA

Type KFP ...	25 W90 M12 45SSM	25 W90 M16 45SSM
Part No.	757 245	757 645
Fixed ball point Ø	25 mm	25 mm
Dimensions	M12 x 45 mm	M16 x 45 mm
Wrench size	27 mm	27 mm
Max. cable cross-section Cu	95 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	18.7 kA	18.7 kA

90° angled with Female Thread



Type KFP ...	20 W90 M12	20 W90 M16
Part No.	707 200	707 600
Fixed ball point Ø	20 mm	20 mm
Dimensions	M12	M16
Wrench size	24 mm	24 mm
Max. cable cross-section Cu	70 mm²	70 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	19.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	13.8 kA

Type KFP ...	25 W90 M12	25 W90 M16
Part No.	757 200	757 600
Fixed ball point Ø	25 mm	25 mm
Dimensions	M12	M16
Wrench size	27 mm	27 mm
Max. cable cross-section Cu	95 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	18.7 kA	18.7 kA

Fixed Earthing Points



Erdungsfestpunkt mit Ringnut und Erdanschlussbuchse.

Ring groove and connecting elements

- For connecting earth bushings or earth connecting plates in accordance with DIN 48088-2
- Welding-type or bolted-type connector for connecting earth connectors with wing nut or wing bolt on the earth cable end
- Connectors with M12 or M16 threaded pin
- M12 or M16 female thread

Ring Groove Fixed Point with Threaded Pin and Nut



Type	EFP 16 RN M12 35 SSM	EFP 16 RN M16 45 SSM
Part No.	**790 251**	**790 261**
Dimensions	M12 x 35 mm	M16 x 45 mm
Diameter	16 mm	16 mm
Wrench size	22 mm	22 mm
Max. cable cross-section Cu	150 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	42.0*) kA	42.0*) kA
Max. short-circuit current I_k 1 s	29.6*) kA	29.6*) kA
Material	Brass (CuNi2Si) / gal Sn	Brass (CuNi2Si) / gal Sn
Material (threaded pin)	StSt A2-70	StSt A2-70
Material (nut)	DIN 985-M12-8 / gal Zn	DIN 985-M16-8 / gal Zn

*) For earthing and short-circuiting devices with cable lengths > 4000 mm: 26.5 kA / 0.5 s (18.7 kA / 1 s)

Ring Groove Fixed Point with Female Thread



Type	EFP 16 RN M12	EFP 16 RN M16
Part No.	**790 250**	**790 260**
Dimensions	M12	M16
Diameter	16 mm	16 mm
Wrench size	22 mm	22 mm
Max. cable cross-section Cu	150 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	42.0*) kA	42.0*) kA
Max. short-circuit current I_k 1 s	29.6*) kA	29.6*) kA
Material	Brass (CuNi2Si) / gal Sn	Brass (CuNi2Si) / gal Sn

*) For earthing and short-circuiting devices with cable lengths > 4000 mm: 26.5 kA / 0.5 s (18.7 kA / 1 s)

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100) and DIN 48088-2 and -5
Tightening torque	M12: 50 ... 65 Nm; M16: 100 ... 110 Nm

Weld-on Connector with Threaded Pin



Type	AS SCHW M12 25	AS SCHW M16 30
Part No.	**705 501**	**755 501**
Dimensions	M12 x 25 mm	M16 x 30 mm
Material	**St/gal Zn**	**St/gal Zn**

Weld-on Connector with Female Thread



Type	AS SCHW M12	AS SCHW M16
Part No.	**336 020**	**336 025**
Dimensions	M12	M16
Material	**St/gal Zn**	**St/gal Zn**

Bolted-type Connector with Female Thread



Type	AS SCHR M12 M12 40
Part No.	**705 504**
Dimensions	M12 / M12 x 40 mm
Wrench size	27 mm
Material	Copper alloy/gal Sn

Bolted-type Connector with Threaded Pin and Separate Hexagon Nut



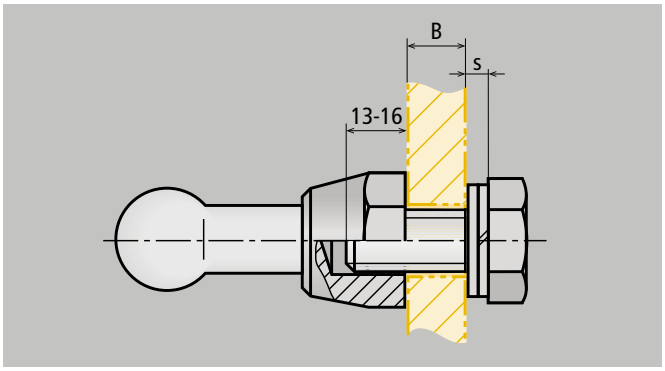
Type	AS SCHR M12 55	AS SCHR M16 65
Part No.	**705 500**	**750 500**
Dimensions	M12 x 55 mm	M16 x 65 mm
Wrench size	32 mm	41 mm
Material (threaded pin)	StSt	StSt
Material (nut)	Copper alloy/gal Sn / HDG steel	Copper alloy/gal Sn / HDG steel

Bolted-type Connector for Converting from M12 to M16 Threaded Pin



Type	AS SCHR M16 55 M12
Part No.	**705 510**
Dimensions	M12 x 20 mm / M16 x 55 mm
Wrench size	41 mm
Material (threaded pin)	StSt
Material (nut)	Copper alloy/gal Sn

Fastening Material



Determination of the required bolt length.

For fixed ball and earthing points

- Hexagon bolt for fixing busbar connections according to DIN 43673-1
- Resilient pressure plate for installing M12 or M16 fixed points on aluminium busbars

General technical data:	
Standard (hexagon bolts)	In accordance with DIN 933 and DIN 43673-1
Standard (spring washers)	In accordance with DIN 128
Standard (washers)	In accordance with DIN 125

Determination of the bolt length l
l (mm) = B + s + 13 ... 16

l = Bolt length
B = Thickness of the busbar
s = Thickness of the spring washer and washer

Resilient Square Pressure Plate



For reliable contact and permanent installation of fixed ball points on aluminium busbars.
Pressure plates must be shimmed on both sides of the busbar.

Type	DP 40 40 B13 AL	DP 50 50 B17 AL
Part No.	**525 001**	**525 002**
Dimensions	M12, 40 x 40 x 6 mm	M16, 50 x 50 x 8 mm
Material	**Highly resistant Al alloy**	**Highly resistant Al alloy**

Hexagon Bolts



General technical data:	
Material	**StSt A2-70**

Type	SKS M10X30 V2A	SKS M12X25 V2A
Part No.	**561 924**	**561 925**
Dimensions	M10 x 30 mm	M12 x 25 mm

Type	SKS M12X30 V2A	SKS M12X35 V2A
Part No.	**561 930**	**561 935**
Dimensions	M12 x 30 mm	M12 x 35 mm

Type	SKS M16X30 V4A
Part No.	**561 931**
Dimensions	M16 x 30 mm

Spring Washers



General technical data:	
Material	**StSt A2-70**

Type	FR A10 V2A	FR A12 V2A
Part No.	**524 910**	**524 912**
Dimensions	A10 (s = 2.2) mm	A12 (s = 2.4) mm

Type	FR A16 V2A
Part No.	**524 913**
Dimensions	A16 (s = 2.8) mm

Washers



Type	SCH A10.5 V4A	SCH A13 V4A
Part No.	**525 910**	**525 912**
Dimensions	A10.5 (s = 2.0) mm	A13 (s = 2.4) mm
Material	**StSt A4-70**	**StSt A4-70**

Type	SCH A17 V2A
Part No.	**525 916**
Dimensions	A17 (s = 3.0) mm
Material	**StSt A2-70**

Earth Connecting Plates



Earth connecting plate with fixed ball points and ball head cap with plastic handle.

- Connecting plate with high short-circuit current carrying capacity
- Single-pole connection of the phase arms
- For connecting single-pole earthing and short-circuiting devices to transformers of overhead line masts or to fuse holders
- For fixed ball points (Ø20 mm, Ø25 mm) or ring groove pins (Ø16 mm)

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100) and fixed points in accordance with DIN 48088-1
Material (plate)	**Aluminium**
Material (terminal lug)	4 mm: **Cu / gal Sn**; 6 mm: **HDG steel**
Material (fixed point)	**E-Cu / brass (CuNi2Si) / gal Sn**

With three Fixed Ball Points and Ball Head Cap



Type EAPA 3 ...	KFP 20 KKH	KFP 25 KKH
Part No.	**728 620**	**728 625**
Fixed point Ø	20 mm	25 mm
Max. cable cross-section Cu	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

With three Fixed Ball Points

For mounting on earth connecting clamps with PK1 anti-rotation protection.



Type EAPA 3 ...	KFP 20 B13	KFP 25 B13
Part No.	**728 522**	**728 526**
Fixed point Ø	20 mm	25 mm
Max. cable cross-section Cu	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

With three Ring Groove Fixed Points and Earth Bushing



Type EAPA 3 ...	RN 16 EAB
Part No.	**728 516**
Fixed point Ø	16 mm
Max. cable cross-section Cu	95 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA
Max. short-circuit current I_k 1 s	18.7 kA

Earthing and Short-Circuiting Cables, unequipped



Equipped three-pole earthing and short-circuiting device in a switchgear installation.

- To be equipped with connecting components
- Transparent sheath
- Waterproof and plastic-sheathed cable entries and node unit, additional anti-kink protection
- Standard anti-rotation crimped cable lugs (type PK1)
- Other cable lengths and crimped cable lugs can be selected online via the earthing and short-circuiting configurator
- Earthing and short-circuiting devices can be configured online via the earthing and short-circuiting configurator

General technical data:	
Standard	EN/IEC 61138 (DIN VDE 0283-3) and EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	– 25 °C ... +55 °C
Material (cable)	**Al, flexible; E-Cu, extra finely stranded and highly flexible**
Material (sheath)	**Thermoplastic polymer (flexible PVC compound YM2)**
Hole (cable lug)	Ø12.5 mm



Crimped cable lugs, type **PK1**:

Standard anti-rotation cable lug with cut-out.



Crimped cable lugs, type **PK2**:

Cable lugs without cut-out for connecting parts from other manufacturers are available on request.



Crimped cable lugs, type **PK3**:

Hook-type cable lugs up to cable cross-sections of 35 mm² are available on request.

Earthing Cable Cu in accordance with IEC 61138



The cable is delivered without crimped cable lugs and can be ordered by the metre.

General technical data:	
Minimum order quantity *)	1 m

Type	ES YM2 16	ES YM2 25
Part No.	716 001	725 001
Cable cross-section	16 mm²	25 mm²

Type	ES YM2 35	ES YM2 50
Part No.	735 001	750 001
Cable cross-section	35 mm²	50 mm²

Type	ES YM2 70	ES YM2 95
Part No.	770 001	795 001
Cable cross-section	70 mm²	95 mm²

Type	ES YM2 120	ES YM2 150
Part No.	712 001	715 001
Cable cross-section	120 mm²	150 mm²

*) Length of earthing cable to be specified when ordering (in whole metres).

Single-pole Earthing and Short-circuiting Cables, aluminium version



Type EKV1+0 ...	35 VGHVBP5	50 VKVBG8W
Part No.	VGHVBP5	VKVBG8W
Cable cross-section	35 mm²	50 mm²
Material	Al	Al
Max. short-circuit current I_k 0.5 s	6.5 kA	9.3 kA
Max. short-circuit current I_k 1 s	4.6 kA	6.6 kA
Crimped cable lug	PK1	PK1

Attention: Please state the relevant Variant No. when ordering.

Single-pole Earthing and Short-Circuiting Cables, copper version



General technical data:	
Material	Cu
Crimped cable lug	PK1

Type EKV1+0 ...	16 V4YPRGE	25 VSY71K4
Part No.	V4YPRGE	VSY71K4
Cable cross-section	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit current I_k 1 s	3.2 kA	4.9 kA

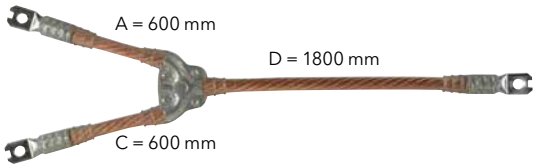
Type EKV1+0 ...	35 V9JF26K	50 VRJG23Y
Part No.	V9JF26K	VRJG23Y
Cable cross-section	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	9.9 kA

Type EKV1+0 ...	70 VPZBBSL	95 VZC3FST
Part No.	VPZBBSL	VZC3FST
Cable cross-section	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type EKV1+0 ...	120 V797FE6	150 VB53TC9
Part No.	V797FE6	VB53TC9
Cable cross-section	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Attention: Please state the relevant Variant No. when ordering.

Two-pole Earthing and Short-Circuiting Cables, copper version



General technical data:	
Material	Cu
Crimped cable lug	PK1

Type EKV2+0 ...	16 G V7265NS	25 G VZL6TGH
Part No.	V7265NS	VZL6TGH
Cable cross-section	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit current I_k 1 s	3.2 kA	4.9 kA

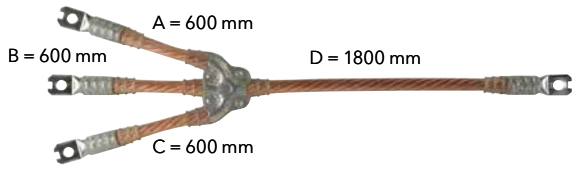
Type EKV2+0 ...	35 G VPHPZV2	50 G VJ13VWW
Part No.	VPHPZV2	VJ13VWW
Cable cross-section	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	9.9 kA

Type EKV2+0 ...	70 G VTJKEZU	95 G VAM7M6H
Part No.	VTJKEZU	VAM7M6H
Cable cross-section	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type EKV2+0 ...	120 G VFV1Z7K	150 G VLL6JWS
Part No.	VFV1Z7K	VLL6JWS
Cable cross-section	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Attention: Please state the relevant Variant No. when ordering.

Three-pole Earthing and Short-Circuiting Cables, copper version, same cable cross-section



General technical data:		
Material		Cu
Crimped cable lug		PK1

Type EKV3+0 ...	16 G VE5MT89	25 G VNC1S9W
Part No.	VE5MT89	VNC1S9W
Cable cross-section	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit current I_k 1 s	3.2 kA	4.9 kA

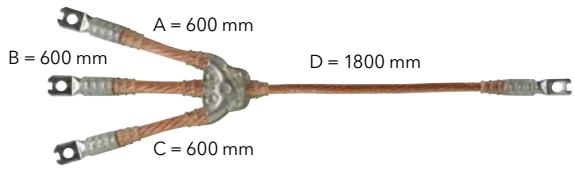
Type EKV3+0 ...	35 G V18JQHQ	50 G VJ7VGZD
Part No.	V18JQHQ	VJ7VGZD
Cable cross-section	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	9.9 kA

Type EKV3+0 ...	70 G VH95BZZ	95 G VM2J7S3
Part No.	VH95BZZ	VM2J7S3
Cable cross-section	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type EKV3+0 ...	120 G V8D4AQ2	150 G VG3V6T2
Part No.	V8D4AQ2	VG3V6T2
Cable cross-section	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Attention: Please state the relevant Variant No. when ordering.

Three-pole Earthing and Short-Circuiting Cables, copper version, reduced cable cross-section



General technical data:		
Material		Cu
Crimped cable lug		PK1

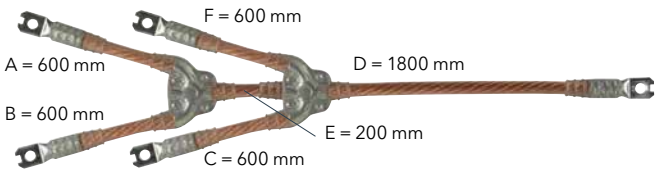
Type EKV3+0 ...	50 R VN35H5D	70 R VTCS2XV
Part No.	VN35H5D	VTCS2XV
Cable cross-section	50/25 mm²	70/35 mm²
Max. short-circuit current I_k 0.5 s	14.0 kA	19.5 kA
Max. short-circuit current I_k 1 s	9.9 kA	13.8 kA

Type EKV3+0 ...	95 R VLB2F3G	120 R V8115WA
Part No.	VLB2F3G	V8115WA
Cable cross-section	95/35 mm²	120/50 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	18.7 kA	23.7 kA

Type EKV3+0 ...	150 R V11E77B
Part No.	V11E77B
Cable cross-section	150/50 mm²
Max. short-circuit current I_k 0.5 s	42.0 kA
Max. short-circuit current I_k 1 s	29.6 kA

Attention: Please state the relevant Variant No. when ordering.

Four-pole Earthing and Short-Circuiting Cables, copper version



General technical data:		
Material		Cu
Crimped cable lug		PK1

Type EKV4u0 ...	16 G VGUVRRG	25 G VGM214B
Part No.	VGUVRRG	VGM214B
Cable cross-section	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit current I_k 1 s	3.2 kA	4.9 kA

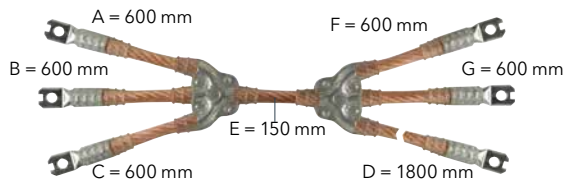
Type EKV4u0 ...	35 G V93UVAP	50 G V3NCSHX
Part No.	V93UVAP	V3NCSHX
Cable cross-section	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	9.9 kA

Type EKV4u0 ...	70 G V7GN8WU	95 G VABRSSE
Part No.	V7GN8WU	VABRSSE
Cable cross-section	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type EKV4u0 ...	120 G V27E2GP	150 G V291ZZT
Part No.	V27E2GP	V291ZZT
Cable cross-section	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Attention: Please state the relevant Variant No. when ordering.

Five-pole Earthing and Short-Circuiting Cables, copper version



General technical data:	
Material	Cu
Crimped cable lug	PK1

Type EKV5+0 ...	16 G VQ7PF5A	25 G VZKQZB5
Part No.	VQ7PF5A	VZKQZB5
Cable cross-section	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit current I_k 1 s	3.2 kA	4.9 kA

Type EKV5+0 ...	35 G V76D5TH	50 G V6VE249
Part No.	V76D5TH	V6VE249
Cable cross-section	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	9.9 kA

Type EKV5+0 ...	70 G VDXTBGF	95 G VGCMAA5
Part No.	VDXTBGF	VGCMAA5
Cable cross-section	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type EKV5+0 ...	120 G VVL7AKP	150 G VHV1NKR
Part No.	VVL7AKP	VHV1NKR
Cable cross-section	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Attention: Please state the relevant Variant No. when ordering.

Earthing rods for switchgear/overhead lines Selection guide – Quick overview

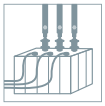
Terminal screw spindle	Rod holder
Hexagon shaft **SK**	
T pin shaft (also suitable for SQL) **SQ**	
Long T pin shaft **SQL**	

Phase Connecting Elements for Switchgear Installations



Connecting the phase cable end with universal clamp to a fixed ball point.

- To be fitted to the phase cable end of single-pole to five-pole earthing and short-circuiting devices
- Type PK1 anti-rotation protection
- Other earthing and short-circuiting devices can be configured online via the earthing and short-circuiting configurator



General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100), threaded T pin shaft DIN 48087
Temperature range	-25 °C ... +55 °C
Material (clamp body)	Cu alloy/gal Sn
Material (terminal lug)	Cu alloy/gal Sn
Material (shaft)	Cu alloy/gal Sn
Material (pressure plate)	Cu alloy/gal Sn / St/Zn

Two types of ball head caps are available:

- Rigid ball head cap
- Adjustable ball head cap (4x 90°)

The adjustable ball head cap allows the user to connect the earthing and short-circuiting device to fixed ball points that are installed in unfavourable positions. Thus, in the vast majority of cases, angled fixed ball points no longer have to be used.



Rigid ball head cap.



Adjustable ball head cap (4x 90°).

*) **Clamping range and maximum cable cross-section of universal clamps used for:**

Fixed ball point Ø	T Pin Collar width	Rd / Fl Clamping range	Max. cable cross-section Cu
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	16 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	25 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	35 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	50 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	70 mm²
20 / 25 / 30 mm	15 / 18 mm	–	95 mm²
– / 25 / 30 mm	–	–	120 mm²
–	–	–	150 mm²




SK: Hexagon Shaft




SQ: T Pin Shaft

Rigid Ball Head Cap, Hexagon Shaft



Type	KKH 20 SK	KKH 25 SK
Part No.	**772 310**	**772 320**
For fixed ball point Ø	20 mm	25 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Rigid Ball Head Cap, T Pin Shaft



Type	KKH 20 SQ	KKH 25 SQ
Part No.	**772 311**	**772 321**
For fixed ball point Ø	20 mm	25 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Adjustable Ball Head Cap (4x 90°), Hexagon Shaft



Type	KKH 20 D SK	KKH 25 D SK
Part No.	**772 330**	**772 340**
For fixed ball point Ø	20 mm	25 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Adjustable Ball Head Cap (4x 90°), T Pin Shaft



Type	KKH 20 D SQ	KKH 25 D SQ
Part No.	**772 331**	**772 341**
For fixed ball point Ø	20 mm	25 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Universal Clamp, Hexagon Shaft



Type	UK 25 SK	UK 30 SK
Part No.	**773 034**	**773 130**
For fixed ball point Ø	20 / 25 mm	25 / 30 mm
For T pins with a collar width of	15 mm	18 mm
Rd / Fl clamping range	20 mm	30 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120*) mm²	16 ... 120*) mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

*) See table for „Clamping range and maximum cable cross-section of universal clamps used for"

Universal Clamp, T Pin Shaft



Type	UK 25 SQ	UK 30 SQ
Part No.	**773 234**	**773 330**
For fixed ball point Ø	20 / 25 mm	25 / 30 mm
For T pins with a collar width of	15 mm	18 mm
Rd / Fl clamping range	20 mm	30 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120*) mm²	16 ... 120*) mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

*) See table for „Clamping range and maximum cable cross-section of universal clamps used for"

Round Pin Clamp, T Pin Shaft

For round pins in switchgear installations.



General technical data:	
Anti-rotation protection	PK1
For cable cross-section Cu	16 … 150 mm²
Max. short-circuit current I_k 0.5 s	**42.0 kA**
Max. short-circuit current I_k 1 s	29.6 kA

Type	RBK 25 SQ SN7151	RBK 26 SQ SN7255
Part No.	**715 314**	**715 315**
For round pins Ø	25 mm	26 mm

Type	RBK 30 SQ SN7642	RBK 35 SQ
Part No.	**715 313**	**715 312**
For round pins Ø	30 mm	35 mm

Phase Connecting Element, T Pin Shaft

With M16 threaded pin for installation in switchgear installations.



Type	PAS EK SQ 16
Part No.	**771 316**
Dimensions	M16
Anti-rotation protection	PK1
For cable cross-section Cu	16 … 150 mm²
Max. short-circuit current I_k 0.5 s	42.0 kA
Max. short-circuit current I_k 1 s	29.6 kA

The clamps must have the same maximum short-circuit current as the earthing and short-circuiting cables!

Phase Connecting Elements for Overhead Lines



Attaching a phase screw clamp to an overhead line.

- For connecting the phase cables of single-pole and three-pole earthing and short-circuiting devices to overhead lines
- With coupling aid for safe attachment on conductor cables
- Easy coupling due to spring-loaded clamp
- Anti-rotation protection type PK1 or PK2 and long threaded T pin shaft
- Earthing and short-circuiting devices can be configured online via the earthing and short-circuiting configurator

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100), threaded T pin shaft DIN 48087
Temperature range	–25 °C … +55 °C
Material (pressure plate)	**Aluminium alloy**
Material (clamp body)	**Aluminium alloy**
Material (shaft)	**Copper alloy/gal Sn** or **StSt**
Material (coupling aid)	**St/gal Zn**



Spring-loaded phase screw clamp.



Phase screw clamp fitted with fixed coupling aid allows safe coupling.



Clamp with long shaft and earthing stick with aluminium cone coupling.



Crimped cable lug, type **PK1**:
Standard anti-rotation cable lug with cut-out.



Crimped cable lug, type **PK2**:
Cable lugs without cut-out for connecting parts from other manufacturers are available on request.

Standard Phase Screw Clamp

Short-circuit-proof, even if the conductor cables are corroded due to weathering.



Type	PSK 4 30 SQL	PSK 10 65 SQL
Part No.	**784 201**	**784 301**
Clamping range Ø	4 ... 30 mm	10 ... 65 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 70 mm²	16 ... 120 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	23.7 kA

Phase Screw Clamp with Coupling Aid

Short-circuit-proof, even if the conductor cables are corroded due to weathering.



Type	PSK 4 30 SQL EH	PSK 10 65 SQL EH
Part No.	**784 401**	**784 501**
Clamping range Ø	4 ... 30 mm	10 ... 65 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 70 mm²	16 ... 120 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	23.7 kA

Spring-loaded Phase Screw Clamp

Easy coupling due to spring-loaded clamp.



Type	PSK FV 4 30 SQL
Part No.	**784 480**
Clamping range Ø	4 ... 30 mm
Anti-rotation protection	PK1
For cable cross-section Cu	16 ... 70 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA
Max. short-circuit current I_k 1 s	13.8 kA

Phase Screw Clamp with Wide Clamping Range

Ideally suited for use with Al and Al/St conductor cables, pipes and fixed phase points.



Type	PSK 10 85 SQL
Part No.	**784 085**
Clamping range Ø	10 ... 85 mm
Anti-rotation protection	PK2
For cable cross-section Cu	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	29.6 kA
Max. short-circuit current I_k 1 s	29.6 kA

Phase Screw Clamp with Wide Clamping Range and Telescopic Earthing Stick

Ideally suited for use with Al and Al/St conductor cables, pipes and fixed phase points.



Type	ESTC PSK 5000 SN7249
Part No.	**769 511**
Clamping range Ø	10 ... 85 mm
Anti-rotation protection	PK2
For cable cross-section Cu	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	29.6 kA
Max. short-circuit current I_k 1 s	29.6 kA
Total length ($I_{G\,max}$ / $I_{G\,min}$)	5200 / 2875 mm
Length (handle)	1900 mm

Phase Screw Clamp

Ideally suited for use in inclined positions.



Type	PSK 10 32 SQL
Part No.	**784 032**
Clamping range Ø	10 ... 32 mm
Anti-rotation protection	PK2
For cable cross-section Cu	16 ... 95 mm²
Max. short-circuit current I_k 0.5 s	18.7 kA
Max. short-circuit current I_k 1 s	18.7 kA

Phase Screw Clamp with Safety Bow

Ideally suited for use in inclined positions.



Type	PSK 10 32 SQL SB
Part No.	**784 038**
Clamping range Ø	10 ... 32 mm
Anti-rotation protection	PK2
For cable cross-section Cu	16 ... 95 mm²
Max. short-circuit current I_k 0.5 s	18.7 kA
Max. short-circuit current I_k 1 s	18.7 kA

Rigid Ball Head Cap



Type	KKH 20 SQL	KKH 25 SQL
Part No.	**772 314**	**772 324**
For fixed ball point Ø	20 mm	25 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Universal Clamp



Type	UK 25 SQL	UK 30 SQL
Part No.	**773 236**	**773 331**
For fixed ball point Ø	20 / 25 mm	25 / 30 mm
For T pins with a collar width of	15 mm	18 mm
Rd / Fl clamping range	20 mm	30 mm
Anti-rotation protection	PK1	PK1
For cable cross-section Cu	16 ... 120*) mm²	16 ... 120*) mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

*) See table for „Clamping range and maximum cable cross-section of universal clamps used for"

The clamps must be designed for the same maximum short-circuit current as the earthing and short-circuiting cables!

Accessories for Phase Connecting Elements for Overhead Lines

Two-pole phase connecting plate

Allows to connect two phase screw clamps with PK1 anti-rotation element.



Type	PAP 2 M12 SSM B13
Part No.	**728 312**
Anti-rotation cable lug	PK1
Borehole	Ø12.5 mm
Max. short-circuit current I_k 0.5 s	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA

Three-pole phase connecting plate with round pin

Phase connecting plate for phase clamps.



Type	PAP 3 M12 SSM B13 RB
Part No.	**728 313**
Anti-rotation cable lug	PK1
Borehole	Ø12.5 mm
Max. short-circuit current I_k 0.5 s	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA

***) Clamping range and maximum cable cross-section of universal clamps used for:**

Fixed ball point Ø	T Pin Collar width	Rd / Fl Clamping range	Max. cable cross-section Cu
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	16 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	25 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	35 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	50 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	70 mm²
20 / 25 / 30 mm	15 / 18 mm	–	95 mm²
– / 25 / 30 mm	–	–	120 mm²
–	–	–	150 mm²

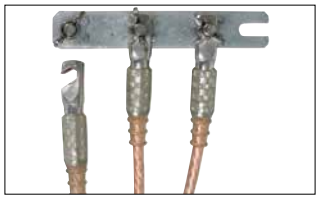
Earthing Kit



Earthing busbar and earthing cables mounted on a tubular earth electrode.

- For overhead line systems
- For driving the tubular earth electrode into the ground

General technical data:	
Material (tubular earth electrode)	**HDG steel**
Material (bolt)	**StSt (V2A)**
Material (handle)	**Wood**
Material (earthing busbar)	**HDG steel**

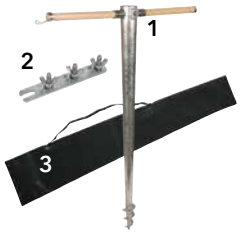


Crimped cable lugs, type **PK3:**

Anti-rotation hook-type cable lug mounted on a three-pole earthing busbar.

Earthing Kit

For three-pole earthing devices.



Kit includes:			
No.	**Part No.**	**No.**	**Part No.**
1	644 000	**3**	766 601
2	799 019		

For more information about the articles, see www.dehn-international.com

Type	ES 3P FL ER
Part No.	**799 009**
Total length (l_G)	1000 mm
Bolt	M10 x 35 mm

Accessories for Earthing Kit

Tubular earth electrode with drill



Type ERO BSP ASSM10 1000 ...	STTZN
Part No.	**644 000**
Length (drill)	1000 mm
Stock No.	5975-12-120-0006

Three-pole earthing busbar

With slot for mounting the earthing busbar on the tubular earth electrode, for hook-type cable lugs of type PK3.



Type	ESS 3P M10 FM
Part No.	**799 019**
Dimensions	180 x 30 x 5 mm
Bolt	3x M10 x 35 mm

Earthing Spike



Earthing spike with coiled earthing cable.

- To be driven into the soil
- Two half-shells for earthing or extension cables
- Hot-dip galvanised version

General technical data:	
Material	**HDG steel**
Material (bolt)	**St/St**

Earthing Spike



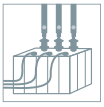
Type	ESP HVS 1500
Part No.	**799 006**
Total length (l_G)	1500 mm
Bolt	M12 x 25 mm

Earth Connecting Elements for Switchgear Installations and Overhead Lines



Earth bushing with tommy bar on a fixed earthing point with ring groove.

- For connecting the earth cable end to fixed ball points, T pins, round and flat conductors, connecting elements and flat profiles
- For wide clamping ranges up to 40 mm
- Anti-rotation protection of type PK1 or PK2
- Earthing and short-circuiting devices can be configured online by means of the earthing and short-circuiting configurator





General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	–25 °C ... +55 °C
Material (clamp body)	**Cu alloy/gal Sn / MCI/gal Zn**
Material (shaft)	**Cu alloy/gal Sn / brass/gal Zn**
Material (pressure plate)	**Cu alloy/gal Sn / St/gal Zn**
Material (terminal lug)	**E-Cu/gal Sn**
Material (wing nut)	**Cu alloy/gal Sn**
Material (milling plate)	**Hardened/nikel-plated steel**
Material (spring)	**Spring steel**

Universal Clamp with Wing Bolt



Type	UEK 25 FS	UEK 30 FS
Part No.	**774 034**	**774 130**
For fixed ball point Ø	20 / 25 mm	25 / 30 mm
For T pins with a collar width of	15 mm	18 mm
Rd / Fl clamping range	20 mm	30 mm
Anti-rotation cable lug	PK1	PK1
For cable cross-section Cu	16 ... 120*) mm²	16 ... 120*) mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

*) See table for „Clamping range and maximum cable cross-section of universal clamps used for"

Universal Clamp with Handle



Type	UEK 25 HG	UEK 30 HG
Part No.	**774 234**	**774 330**
For fixed ball point Ø	20 / 25 mm	25 / 30 mm
For T pins with a collar width of	15 mm	18 mm
Rd / Fl clamping range	20 mm	30 mm
Anti-rotation cable lug	PK1	PK1
For cable cross-section Cu	16 ... 120*) mm²	16 ... 120*) mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

*) See table for „Clamping range and maximum cable cross-section of universal clamps used for"

Universal Clamp with Tommy Bar



Type	UEK 25 SKN	UEK 30 SKN
Part No.	**774 434**	**774 530**
For fixed ball point Ø	20 / 25 mm	30 mm
For T pins with a collar width of	15 mm	18 mm
Rd / Fl clamping range	20 mm	30 mm
Anti-rotation cable lug	PK1	PK1
For cable cross-section Cu	16 ... 120*) mm²	16 ... 120*) mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA	23.7 kA

*) See table for „Clamping range and maximum cable cross-section of universal clamps used for"

Rigid Ball Head Cap with Wing Bolt



Type	KKH 20 FS	KKH 25 FS
Part No.	**772 312**	**772 322**
For fixed ball point Ø	20 mm	25 mm
Anti-rotation cable lug	PK1	PK1
For cable cross-section Cu	16 ... 120 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Rigid Ball Head Cap with Handle



Type	KKH 20 HG	KKH 25 HG
Part No.	**772 313**	**772 323**
For fixed ball point Ø	20 mm	25 mm
Anti-rotation cable lug	PK1	PK1
For cable cross-section Cu	16 ... 120 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Earth Connecting Element with Wing Nut



Type	EAS EK FM 12	EAS EK FM 16
Part No.	**775 621**	**775 631**
Dimensions	M12	M16
Anti-rotation cable lug	PK1	PK1
For cable cross-section Cu	16 ... 150 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	42.0 kA	42.0 kA
Max. short-circuit current I_k 1 s	29.6 kA	29.6 kA

Earth Connecting Element with Wing Bolt



Type	EAS EK FS 12	EAS EK FS 16
Part No.	**775 626**	**775 636**
Dimensions	M12 x 15 mm	M16 x 15 mm
Anti-rotation cable lug	PK1	PK1
For cable cross-section Cu	16 ... 150 mm²	16 ... 150 mm²
Max. short-circuit current I_k 0.5 s	42.0 kA	42.0 kA
Max. short-circuit current I_k 1 s	29.6 kA	29.6 kA

Earth Bushing with Wing Bolt

For fixed earthing points with ring groove



Type	EAB RN 16 FS
Part No.	**790 150**
Dimensions	Ø16 mm
Anti-rotation cable lug	PK1
For cable cross-section Cu	16 ... 150*) mm²
Max. short-circuit current I_k 0.5 s	42.0 kA
Max. short-circuit current I_k 1 s	29.6 kA

*) For cable lengths > 4000 mm: max. up to 95 mm² (26.5 kA / 0.5 s).

Earth Bushing with Tommy Bar

For fixed earthing points with ring groove



Type	EAB RN 16 SKN
Part No.	**790 160**
Dimensions	Ø16 mm
Anti-rotation cable lug	PK2
For cable cross-section Cu	16 ... 150**) mm²
Max. short-circuit current I_k 0.5 s	29.6 kA
Max. short-circuit current I_k 1 s	29.6 kA

**) Max. short-circuit current of 29.6 kA even in case of a disconnection time I_k of 1 s.

Earth Milling Clamp with Tommy Bar and Disc Springs

Milling plate, disc springs and long tommy bar for reliable contact



Type	EFK FL40 SKN
Part No.	**792 190**
Clamping range	up to 40 mm
Anti-rotation cable lug	PK1
For cable cross-section Cu	16 ... 95 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA
Max. short-circuit current I_k 1 s	18.7 kA

Earth Milling Clamp with Tommy Bar

Milling plate and long tommy bar for reliable contact



Type	EFK FL30 SKN
Part No.	**792 030**
Clamping range	Up to 30 mm
Anti-rotation cable lug	PK1
For cable cross-section Cu	16 ... 50 mm²
Max. short-circuit current I_k 0.5 s	14.0 kA
Max. short-circuit current I_k 1 s	9.9 kA

The clamps must have the same maximum short-circuit current as the earthing and short-circuiting cables!

***) Clamping range and maximum cable cross-section of universal clamps used for:**

Fixed ball point ∅	T Pin Collar width	Rd / Fl Clamping range	Max. cable cross-section Cu
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	16 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	25 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	35 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	50 mm²
20 / 25 / 30 mm	15 / 18 mm	20 / 30 mm	70 mm²
20 / 25 / 30 mm	15 / 18 mm	–	95 mm²
– / 25 / 30 mm	–	–	120 mm²
–	–	–	150 mm²

Earthing Sticks for Switchgear Installations



Earthing stick used for attaching an earthing and short-circuiting device to an installation.

- For attaching earthing and short-circuiting devices
- Available in different lengths
- Modular for easy transport
- Light-weight construction
- Hexagon shaft (WS 19 mm) or T pin shaft



General technical data:	
Standard	T pin shaft DIN 48087
Temperature range	–25 °C ... +55 °C
Material (insulating tube)	**Glass-fibre reinforced polyester tube**
End fitting	Non-slip plastic cap or plug-in coupling for extending the handle



Earthing sticks with bayonet locking mechanism (T pin shaft) can also be used for clamps with hexagon shaft by attaching an AES SQ SK adapter.



The plug-in coupling allows for easy handle extension of ES STK earthing sticks.

Earthing sticks are hand-held insulating sticks for approaching clamps of earthing and short-circuiting devices to parts of electrical installations for earthing and short-circuiting purposes.
They consist of an insulating element, black ring, handle and coupling for attaching clamps. Earthing sticks have to be selected according to the **weight** of the earthing and short-circuiting device.
The **insulating element** is the part of the earthing stick between the black ring and the end of the earthing stick in the direction of the clamp. It ensures that the user maintains the required safety distance and provides sufficient insulation. In installations exceeding 1 kV, the insulating element must have a minimum length of 500 mm.

With hexagon shaft

Handle termination with end cap (spring locking mechanism)





Ø30 mm

Type	ES SK 1000	ES SK 1500
Part No.	**761 010**	**761 015**
Total length (l_G)	1000 mm	1500 mm
Length (handle) (l_H)	430 mm	930 mm

With T pin shaft

Handle termination with end cap (bayonet locking mechanism)





Ø30 mm

Type	ES SQ 1000	ES SQ 1500
Part No.	**761 011**	**761 016**
Total length (l_G)	1000 mm	1500 mm
Length (handle) (l_H)	430 mm	930 mm

With hexagon shaft, plug-in coupling

Handle termination with plastic plug-in coupling for extending the handle (spring locking mechanism)





Ø30 mm

Type	ES SK STK 1000	ES SK STK 2000
Part No.	**761 001**	**761 003**
Total length (l_G)	1000 mm	2000 mm
Length (handle) (l_H)	430 mm	1430 mm

With T pin shaft, plug-in coupling

Handle termination with plastic plug-in coupling for extending the handle (bayonet locking mechanism)





Ø30 mm

Type	ES SQ STK 1000	ES SQ STK 2000
Part No.	**761 002**	**761 004**
Total length (l_G)	1000 mm	2000 mm
Length (handle) (l_H)	430 mm	1430 mm

Telescopic with T pin shaft and plug-in coupling





Ø43 mm

Type	ESTC SQ STK SN7562
Part No.	**769 304**
Total length ($l_{G\,max}$ / $l_{G\,min}$)	3040 / 1790 mm
Length (handle) (l_H)	900 mm

Two-part, with hexagon shaft

Handle termination with plastic plug-in coupling for extending the handle (spring locking mechanism)





Ø30 mm Ø43 mm

Type	EST SK STK 920
Part No.	**761 070**
Total length (l_G)	920 mm
Length (handle) (l_H)	415 mm

Two-part, with T pin shaft

Handle termination with plastic plug-in coupling for extending the handle (bayonet locking mechanism)





Ø30 mm Ø43 mm

Type	EST SQ STK 920
Part No.	**761 075**
Total length (l_G)	920 mm
Length (handle) (l_H)	415 mm

Accessories for Earthing Sticks for Switchgear Installations

Adapter (T pin shaft / hexagon shaft)

Suitable for putting on earthing sticks with coupling for T pin shaft (bayonet locking mechanism). The lock nut enables the adapter to be fixed to the earthing stick.



Type	AD ES SQ SK
Part No.	**765 001**
Length	130 mm

Earthing Sticks for Overhead Lines

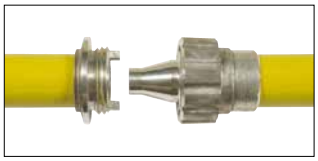


Telescopic earthing stick with aluminium cone coupling and phase screw clamp.

- For outdoor use
- Robust aluminium cone coupling
- Total lengths up to 6000 mm
- Telescopic stick, length continuously adjustable by star knob
- For phase screw clamps and clamps with long T pin shaft



General technical data:	
Temperature range	-25 °C ... +55 °C
Material (insulating tube)	**Glass-fibre reinforced polyester tube**
Material (threaded coupling, star knob)	**Aluminium alloy**
End fitting	Aluminium/rubber eye / Plug-in coupling for extending the handle



Robust aluminium threaded coupling allows positive and non-positive connection due to the screw connection and gearing.



End fitting with eye (Al/rubber) or plug-in coupling with eye (Al/rubber) for extending the handle.

A square tube (26 mm) can be pulled out of the round insulating tube and can be fixed in any position between Imin and l_{max} using the star knob.

Lockable adjusting ring

- The adjusting ring on the cone has the following functions:
- Position "AUF" (= OPEN): Stick can be removed after the clamp has been attached
- Position "ZU" (= CLOSED): Stick and clamp remain coupled even after the earthing and short-circuiting device has been attached



Telescopic, with T pin shaft



Type	ESTC SQL 4000	ESTC SQL 5000
Part No.	**769 400**	**769 500**
Total length ($l_{G\,max}$ / $l_{G\,min}$)	4015 / 2180 mm	5015 / 2680 mm
Length (handle) (l_H)	1400 mm	1900 mm

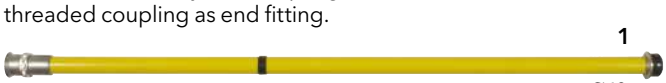
Telescopic, with T pin shaft, plug-in coupling



Type	ESTC SQL STK 3000
Part No.	**769 300**
Total length ($l_{G\,max}$ / $l_{G\,min}$)	3015 / 1760 mm
Length (handle) (l_H)	900 mm

Multi-part, top section

With aluminium bayonet coupling and aluminium threaded coupling as end fitting.



Type	EST KS SQL 1500
Part No.	**769 503**
Total length (l_G)	1600 mm

Multi-part, intermediate section

With aluminium threaded coupling, connector with nut and bushing.



Type	EST ZS 1500
Part No.	**769 504**
Total length (l_G)	1580 mm

Multi-part, end fitting

With connector and nut of the aluminium threaded coupling and end fitting with ring eye.



Type	EST ES 1500
Part No.	**769 505**
Total length (l_G)	1590 mm

Permissible loads for the earthing sticks:		
Length l_G	**No.**	**Max. load on the operating head**
6000 mm	**1+2+2+3**	3.5 kg
4500 mm	**1+2+3**	10 kg
3000 mm	**1+3**	10 kg
1500 mm	**1**	20 kg

Accessories for Earthing Sticks for Overhead Lines

Adapter (T pin shaft / long T pin shaft)

Suitable for insertion into earthing sticks with aluminium cone coupling for T pin shafts (bayonet locking mechanism) to accept clamps with T pin shaft.
The lock nut allows to fix the adapter on the earthing stick.



Type	AD ES SQ SQL
Part No.	**765 006**
Length	185 mm

EaS Configurator: Easy online configuration

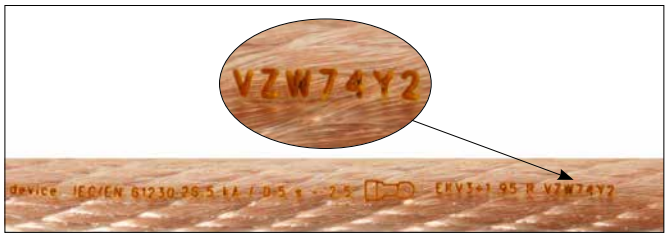


You will find the EaS configurator at http://de.hn/9F1XX

- Easy online selection of the suitable EaS device
- Unique laser marking of the EaS device
- Individual configuration
- Permanent plausibility check in the background
- User-friendly interface
- To start the configuration, simply enter the Variant No., Part No. or Product configuration

General technical data:	
Standard	EN/IEC 61138 (DIN VDE 0283-3) and EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	-25 °C ... +55 °C
Material (cable)	**Al, flexible; E-Cu, extra finely stranded and highly flexible**
Material (sheath)	**Thermoplastic (soft PVC compound YM2)**
Hole (terminal lug)	Ø12.5 mm

Earthing and short-circuiting devices (EaS) for switchgear installations and overhead line application can be individually configured online on the DEHN homepage.
The configurator provides you with two options to start the configuration (product or system view).
The product view is ideally suited for users who know exactly what they need and already have a concrete idea of, for example, the cable cross-section and clamps to be used.
As an alternative, the system view can be selected. For this extended version of the product view, information on the installation must be provided.
The application location of the EaS device determines which clamps are ultimately available for selection. A distinction is made here between switchgear installations and overhead line systems.
A permanent plausibility check ensures reliable selection of the right device. Further accessories such as earthing sticks are optionally displayed for the configured EaS devices.
At the end of the configuration the result is shown graphically and in a detailed description. In addition, a unique Variant No. is assigned to the application-specific earthing and short-circuiting device, which is lasered on the device later.

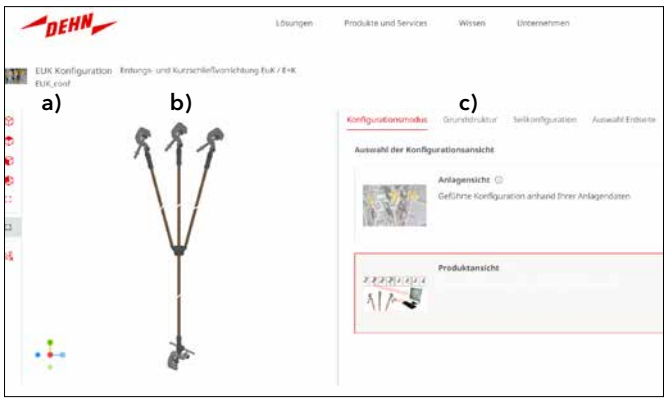


The EaS configurator is graphically divided into three parts:

a) On the left, the modular features are displayed in a tree structure. The selection history is shown, and you can jump back to it at any time and change properties that have already been selected. The tree structure allows a clearly structured configuration.

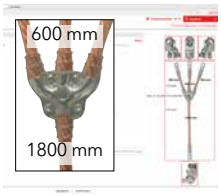
b) In the centre you can select or change the required information via the keyboard or mouse. This usually happens "step by step", i.e. only after a property has been evaluated is the next characteristic "visible" and selectable.

c) On the right, the current status is graphically displayed in an active visualisation in order to support and simplify the right selection. Here too, data can be entered in the relevant fields.



Three-pole, same Cable Cross-Section with Ball Head Caps

... easy configuration ...



General technical data:	
Earth cable end	EAS EK FM 12

Type EKV3+1 ...	16 G VGJD2QX	25 G VRDSN66
Part No.	VGJD2QX	VRDSN66
Phase cable end	KKH 20 SK	KKH 20 SK
For fixed ball point Ø	20 mm	20 mm
Cable cross-section Cu	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit current I_k 1 s	3.2 kA	4.9 kA

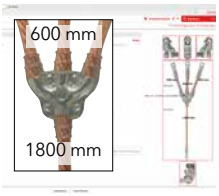
Type EKV3+1 ...	35 G V3WJMYY	50 G VU8P6LE
Part No.	V3WJMYY	VU8P6LE
Phase cable end	KKH 20 SK	KKH 20 SK
For fixed ball point Ø	20 mm	20 mm
Cable cross-section Cu	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	9.9 kA

Type EKV3+1 ...	70 G VCEY1U6	95 G VA3926U
Part No.	VCEY1U6	VA3926U
Phase cable end	KKH 20 SK	KKH 20 SK
For fixed ball point Ø	20 mm	20 mm
Cable cross-section Cu	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type EKV3+1 ...	120 G VAB3PJV	150 G V1KPXFR
Part No.	VAB3PJV	V1KPXFR
Phase cable end	KKH 20 SK	KKH 25 SK
For fixed ball point Ø	20 mm	25 mm
Cable cross-section Cu	120 mm²	150 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA	42.0 kA
Max. short-circuit current I_k 1 s	23.7 kA	29.6 kA

Three-pole, reduced Cable Cross-Section with Ball Head Caps

... easy configuration ...



General technical data:	
Earth cable end	EAS EK FM 12

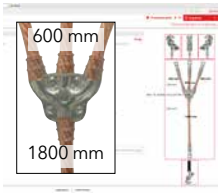
Type EKV3+1 ...	50 R VD28FAD	70 R VQYP8B2
Part No.	VD28FAD	VQYP8B2
Phase cable end	KKH 20 SK	KKH 20 SK
For fixed ball point Ø	20 mm	20 mm
Cable cross-section Cu	50/25 mm²	70/35 mm²
Max. short-circuit current I_k 0.5 s	14.0 kA	19.5 kA
Max. short-circuit current I_k 1 s	9.9 kA	13.8 kA

Type EKV3+1 ...	95 R V5SVXPH	120 R VTSY9XH
Part No.	V5SVXPH	VTSY9XH
Phase cable end	KKH 20 SK	KKH 20 SK
For fixed ball point Ø	20 mm	20 mm
Cable cross-section Cu	95/35 mm²	120/50 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	18.7 kA	23.7 kA

Type EKV3+1 ...	150 R VHBWUNH
Part No.	VHBWUNH
Phase cable end	KKH 25 SK
For fixed ball point Ø	25 mm
Cable cross-section Cu	150/50 mm²
Max. short-circuit current I_k 0.5 s	42.0 kA
Max. short-circuit current I_k 1 s	29.6 kA

Three-pole, same Cable Cross-Section with Universal Clamp

... easy configuration ...



General technical data:	
Phase cable end	UK 25 SQ
Earth cable end	UEK 25 HG
For fixed ball point Ø	**20 / 25 mm**
For T pins with a collar width of	15 mm
Rd / Fl clamping range	20 mm

Type EKV3+1 ...	16 G V8MCNWM	25 G V8VF7CP
Part No.	**V8MCNWM**	**V8VF7CP**
Cable cross-section Cu	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit current I_k 1 s	3.2 kA	4.9 kA

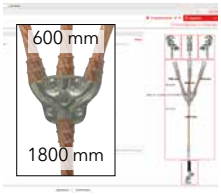
Type EKV3+1 ...	35 G V5VN56Z	50 G VPH98CT
Part No.	**V5VN56Z**	**VPH98CT**
Cable cross-section Cu	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	9.9 kA

Type EKV3+1 ...	70 G VMLM2BZ	95 G VE9HQHJ
Part No.	**VMLM2BZ**	**VE9HQHJ**
Cable cross-section Cu	70 mm²	95 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA
Max. short-circuit current I_k 1 s	13.8 kA	18.7 kA

Type EKV3+1 ...	120 G VKZLVU3
Part No.	**VKZLVU3**
Cable cross-section Cu	120 mm²
Max. short-circuit current I_k 0.5 s	33.5 kA
Max. short-circuit current I_k 1 s	23.7 kA

Three-pole, reduced Cable Cross-Section with Universal Clamp

... easy configuration ...



General technical data:	
Phase cable end	UK 25 SQ
Earth cable end	UEK 25 HG
For fixed ball point Ø	**20 / 25 mm**
For T pins with a collar width of	15 mm
Rd / Fl clamping range	20 mm

Type EKV3+1 ...	50 R VMBDCM1	70 R V4RJ7A2
Part No.	**VMBDCM1**	**V4RJ7A2**
Cable cross-section Cu	50/25 mm²	70/35 mm²
Max. short-circuit current I_k 0.5 s	14.0 kA	19.5 kA
Max. short-circuit current I_k 1 s	9.9 kA	13.8 kA

Type EKV3+1 ...	95 R VRAB9WB	120 R VACNLP8
Part No.	**VRAB9WB**	**VACNLP8**
Cable cross-section Cu	95/35 mm²	120/50 mm²
Max. short-circuit current I_k 0.5 s	26.5 kA	33.5 kA
Max. short-circuit current I_k 1 s	18.7 kA	23.7 kA

Single-pole with Phase Screw Clamp

... easy configuration ...



Type EKV1+1	16 VE5E8FZ	25 VF33XR2
Part No.	**VE5E8FZ**	**VF33XR2**
Phase cable end	PSK 4 30 SQL	PSK 4 30 SQL
Earth cable end	EFK FL40 SKN	EFK FL40 SKN
Clamping range Ø	4 ... 30 mm	4 ... 30 mm
Cable cross-section Cu	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit curr. I_k 1 s	3.2 kA	4.9 kA

Type EKV1+1	35 V43FCV8	50 V2KWXUL
Part No.	**V43FCV8**	**V2KWXUL**
Phase cable end	PSK 4 30 SQL	PSK 4 30 SQL
Earth cable end	EFK FL40 SKN	EFK FL40 SKN
Clamping range Ø	4 ... 30 mm	4 ... 30 mm
Cable cross-section Cu	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit curr.I_k 1 s	6.9 kA	9.9 kA

Type EKV1+1	70 VRP32FL	95 V2WPYVF	120 VG4GXHQ
Part No.	**VRP32FL**	**V2WPYVF**	**VG4GXHQ**
Phase cable end	PSK 4 30 SQL	PSK 10 65 SQL	PSK 10 65 SQL
Earth cable end	EFK FL40 SKN	UEK 30 HG	UEK 30 HG
Clamping range Ø	4 ... 30 mm	10 ... 65 mm	10 ... 65 mm
Cable cross-section Cu	70 mm²	95 mm²	120 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA	33.5 kA
Max. short-circuit curr. I_k 1 s	13.8 kA	18.7 kA	23.7 kA

Single-pole with Universal Clamp

... easy configuration ...



General technical data:	
Phase cable end	UK 25 SQ
Earth cable end	UEK 30 HG
For fixed ball point Ø	**20 / 25 mm**
For T pins with a collar width of	15 mm
Rd / Fl clamping range	20 mm

Type EKV1+1 ...	16 VMZDL8N	25 VB1DETL
Part No.	**VMZDL8N**	**VB1DETL**
Cable cross-section Cu	16 mm²	25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit curr. I_k 1 s	3.2 kA	4.9 kA

Type EKV1+1 ...	35 V8PPJEF	50 VQY44GL
Part No.	**V8PPJEF**	**VQY44GL**
Cable cross-section Cu	35 mm²	50 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	14.0 kA
Max. short-circuit curr. I_k 1 s	6.9 kA	9.9 kA

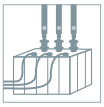
Type EKV1+1 ...	70 VFZ17TJ	95 VWBDMPS	120 V3CM9FR
Part No.	**VFZ17TJ**	**VWBDMPS**	**V3CM9FR**
Cable cross-section Cu	70 mm²	95 mm²	120 mm²
Max. short-circuit current I_k 0.5 s	19.5 kA	26.5 kA	33.5 kA
Max. short-circuit curr. I_k 1 s	13.8 kA	18.7 kA	23.7 kA

Short-Circuiting Bar

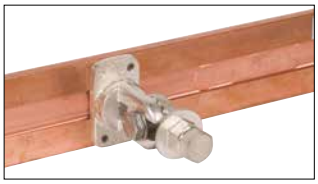


Short-circuiting bar with earthing cable on a switchgear installation.

- Simply compile the right short circuit bar online
- Individual configuration
- Permanent plausibility check in the background
- With longitudinal slot for reliable contact
- High short-circuit current strength up to max. 130 kA / 0.5 s for low-voltage systems (LV) and 80 kA / 0.5 s for medium-voltage systems (MV)
- For use with earthing sticks for hexagon or T pin shafts
- Short-circuiting bar and earthing cable lengths can be selected online via the earthing and short-circuiting configurator

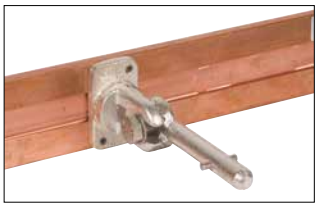


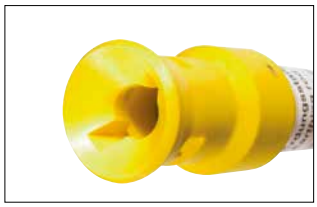
In order to connect the earthing cable to the earthing system, it is fitted with a rigid ball head cap with a wing bolt for fixed ball points (Ø20 mm) (Part No. 772 312 (type KKH 20 FS)). Other equipment or cable lengths can be selected online via the earthing and short-circuiting configurator.
Short-circuiting bars are available with two different coupling mechanisms for earthing sticks:



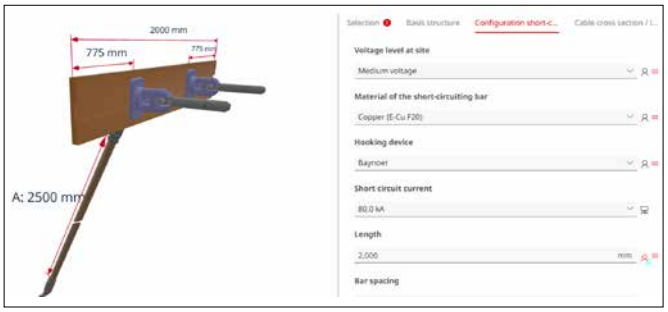


SK: Hexagon shaft.



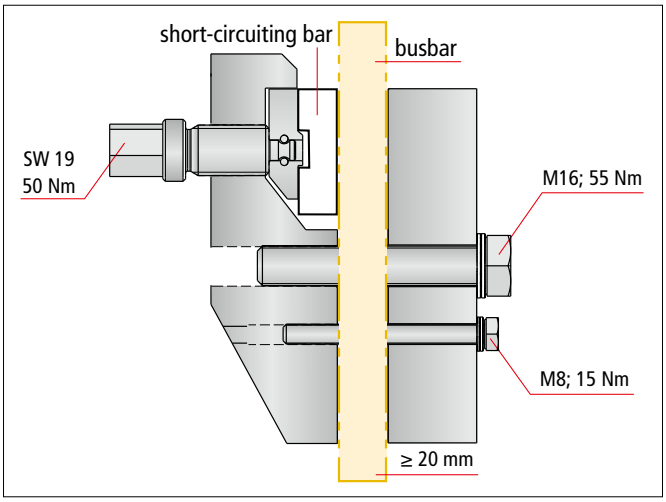


SQ: T pin shaft (bayonet locking mechanism).



You will find the EaS configurator at http://de.hn/9F1XX

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	–25 °C ... +55 °C
Profile dimensions	60 x 12 mm
Material (earthing cable)	**Highly flexible copper**
Cable cross-section	50 mm²



Fixed clamping point mounted on busbar and inserted short-circuiting bar

Short-Circuiting Bar made of Copper

Rigid ball head cap (KKH 20 FS) on the earth cable end.

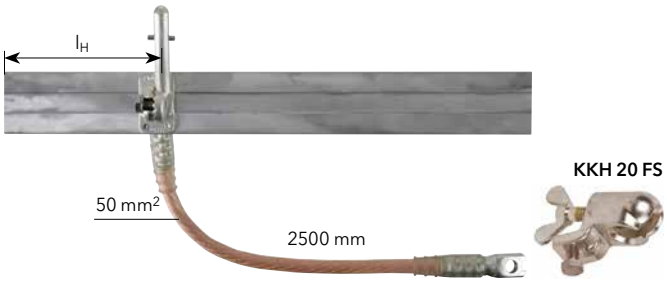


Type	KS SQ C NS VL2FG28	KS SK C NS VHNEFQE
Part No.	VL2FG28	VHNEFQE
Application	LV	LV
Coupling mechanism	SQ	SK
Position of the coupling mechanism (l_H)	175 mm	175 mm
Total length (l_G)	500 mm	500 mm
Bar spacing (S_A)	150 mm	150 mm
Max. short-circuit current I_k 0.5 s	130 kA	130 kA
Max. short-circuit current I_k 1 s	90 kA	90 kA

Type KSX ...	SQ C MS VV7M6CQ	SK C MS V5DHK24
Part No.	VV7M6CQ	V5DHK24
Application	MV	MV
Coupling mechanism	SQ	SK
Position of the coupling mechanism (l_H)	525 mm	525 mm
Total length (l_G)	1500 mm	1500 mm
Bar spacing (S_A)	450 mm	450 mm
Max. short-circuit current I_k 0.5 s	80 kA	80 kA
Max. short-circuit current I_k 1 s	80 kA	80 kA

Short-Circuiting Bar made of Aluminium

Rigid ball head cap (KKH 20 FS) on the earth cable end.



Type	KS SQ A NS VNRLBXU	KS SK A NS VP33XYL
Part No.	**VNRLBXU**	**VP33XYL**
Application	LV	LV
Coupling mechanism	SQ	SK
Position of the coupling mechanism (l_H)	175 mm	175 mm
Total length (l_G)	500 mm	500 mm
Bar spacing (S_A)	150 mm	150 mm
Max. short-circuit current I_k 0.5 s	90 kA	90 kA
Max. short-circuit current I_k 1 s	64 kA	64 kA

Type	KSX SQ A MS VSJ3Y6N	KSX SK A MS VANH53Y
Part No.	**VSJ3Y6N**	**VANH53Y**
Application	MV	MV
Coupling mechanism	SQ	SK
Position of the coupling mechanism (l_H)	675 mm	675 mm
Total length (l_G)	1500 mm	1500 mm
Bar spacing (S_A)	450 mm	450 mm
Max. short-circuit current I_k 0.5 s	60 kA	60 kA
Max. short-circuit current I_k 1 s	60 kA	60 kA

Two coupling mechanisms are required for a total length > 1000 mm.
Note: When ordering, please specify the Variant No. generated online via the earthing and short-circuiting configurator.

Accessories for Short-Circuiting Bar

Clamping point for busbars

Fixed clamping point with fixing elements for a busbar thickness up to 25 mm for short-circuiting bars with longitudinal slot.

*) Note: max values see product data sheet for short-circuiting bar



Type	KLFP M16 KSS
Part No.	**795 020**
Type	with hexagon shaft wrench size 19
Material	Al / **St**
Max. short-circuit current I_k 0.5 s	130 kA *)
Max. short-circuit current I_k 1 s	90 kA *)

SQ screw-type adapter

Screw-type adapter with Cardan joint spanner for fitting onto earthing sticks, T pin shaft (bayonet mechanism), for fixed clamping points.



Type	SA KLFP SQ SK
Part No.	**795 212**
Hexagon socket	wrench size 19 mm

Adapter (T pin shaft / hexagon shaft)

Suitable for putting on earthing sticks with coupling for T pin shaft (bayonet locking mechanism). The lock nut enables the adapter to be fixed to the earthing stick.



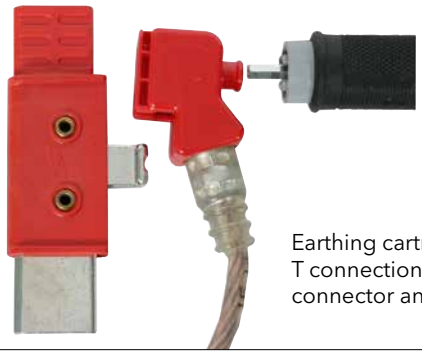
Type	AD ES SQ SK
Part No.	**765 001**
Length	130 mm

EaS Devices (fully insulated) for Low-Voltage Cable Distribution Cabinets



Attaching a fully insulated earthing and short-circuiting device using an earthing handle of type VI.

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	–25 °C ... +55 °C



Earthing cartridge with T connection, fully insulated connector and earthing handle.

Kit for low-voltage installations, fully insulated type VI

- Fully insulated, shock-proof version
- Complete kit for cable distribution cabinets (CDCs)
- Safe operation with insulated earthing handle of type VI (with dual function), suitable for both inserting and removing earthing cartridges with T connection as well as for attaching earthing and short-circuiting devices (EaS devices)
- Waterproof, plastic-sheathed cable guide and node unit, with additional anti-kink protection
- Other cable lengths can be selected online via the earthing and short-circuiting configurator

Kit in Plastic Case



Kit includes:			
No.	**Part No.**	**No.**	**Part No.**
1	745 902	**5**	745 910 (6x)
3	V162LDM (2x)	**6**	745 922 (1x)
4	745 905 (3x)		

For more detailed information on these products, see Single Parts.

Type EKS VI 2F KVS ...	KK
Part No.	**745 903**
Variant No. of EaS device	V162LDM
Dimensions	450 x 350 x 110 mm

Attention: Please state the relevant Variant No. when ordering.

Kit in Sheet Steel Case



Kit includes:			
No.	**Part No.**	**No.**	**Part No.**
2	745 900	**5**	745 910 (6x)
3	V162LDM (2x)	**6**	745 922 (1x)
4	745 905 (3x)		

For more detailed information on these products, see Single Parts.

Type EKS VI 2F KVS ...	SBK
Part No.	**745 901**
Variant No. of EaS device	V162LDM
Dimensions	440 x 330 x 100 mm

Attention: Please state the relevant Variant No. when ordering.

Accessories for EaS Devices (fully insulated) for Low-Voltage Cable Distribution Cabinets

Plastic case, empty

With foam padding.



Type	KKL EKS VI KVS
Part No.	**745 902**
Dimensions	450 x 350 x 110 mm

Sheet steel case, empty

With foam padding.



Type	SBKL EKS VI KVS
Part No.	**745 900**
Dimensions	440 x 330 x 100 mm

Plastic case, empty

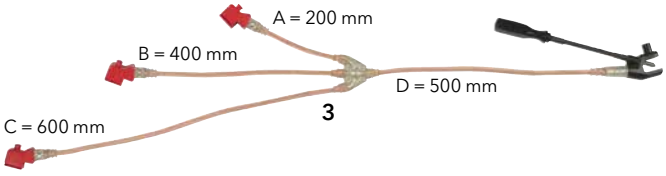
With foam padding and hook-and-loop fastener.



Type	KK 56 41 17 EK VI TI
Part No.	**745 952**
Dimensions	565 x 410 x 170 mm

Earthing and short-circuiting device VI, earth clamp with flexible adjustable handle

Adjustable handle with two positions, clamping range up to 20 mm. For cable distribution cabinets.

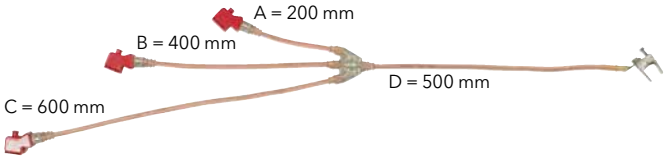


Type EKV3 ...	25VI DG V162LDM	35VI DG VE5K3HM
Part No.	**V162LDM**	**VE5K3HM**
Cable cross-section Cu	25/25 mm²	35/35 mm²
Max. short-circuit current I_k 0.5 s	7.0 kA	10.0 kA
Max. short-circuit curr. I_k 1 s	4.9 kA	6.9 kA

Note: When ordering, please specify a clear Variant No.

Earthing and short-circuiting device VI, spring-loaded earth clamp

Clamping range up to 24 mm, installation via adjustable handle DGF EKV VI.
For cable distribution cabinets.

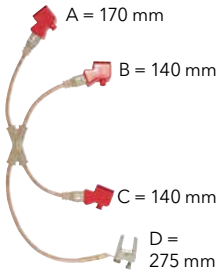


Type EKV3 ...	25VI EK VMRSJWD	35VI EK VEH4JQY
Part No.	**VMRSJWD**	**VEH4JQY**
Cable cross-section Cu	25/25 mm²	35/35 mm²
Max. short-circuit current I_k 0.5 s	7.0 kA	10.0 kA
Max. short-circuit curr.I_k 1 s	4.9 kA	6.9 kA

Note: Please state the relevant Variant No. when ordering.

Earthing and short-circuiting device VI, spring-loaded earth clamp

Clamping range up to 24 mm, attachment via adjustable handle DGF EKV VI.
For service entrance boxes.



Type EKV3 ...	16VI EK VZPW9LG
Part No.	**VZPW9LG**
Cable cross-section Cu	16/16 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA
Max. short-circuit current I_k 1 s	3.2 kA

Note: When ordering, please specify a clear Variant No.

Spring-loaded compact clamp

With T connection and hexagon locking screw (WS 10) for use with earthing handle VI and fixing via adjustable handle with flexible shaft.



Type	KK TA 0 24 SK10
Part No.	**745 503**
Clamping range	Up to 24 mm
Max. short-circuit current I_k 0.5 s	10.0 kA
Max. short-circuit current I_k 1 s	6.9 kA

Earthing adapter clamp for blade contacts

The earthing adapter clamp is particularly suitable for short-circuiting the LV blade contacts in NH fuse strips having a blade width of 33 or 44 mm and a blade depth of 6 and 8 mm.
With T connection and hexagon locking screw WS10.
To be inserted by means of an earthing handle VI and to be fixed by means of an adjustable handle with flexible shaft.



Type	EK SN7089
Part No.	**745 510**
for blade contact	33 / 44 mm
Max. short-circuit current I_k 0.5 s	10.0 kA
Max. short-circuit current I_k 1 s	6.9 kA

NH 00 earthing cartridges

With T connection for installation into NH fuse holders and blocks of size NH 00 using a VI earthing handle.



Type	EP NH00 VI TA
Part No.	**745 905**
Size	00
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	4.9 kA
Max. short-circuit current I_k 1 s	4.9 kA

NH 1 ... 3 earthing cartridges

With T connection for installation into NH fuse holders and blocks of size NH 1 ... 3 using a VI earthing handle.



Type	EP NH1 3 VI TA
Part No.	**745 910**
Size	1 ... 3
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	9.6 kA
Max. short-circuit current I_k 1 s	6.9 kA

NH 4a earthing cartridges



Type	EP NH4A VI TA
Part No.	**745 915**
Size	4a
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA
Max. short-circuit current I_k 1 s	6.9 kA

VI earthing handle

With dual function

- For installing earthing cartridges with T connection into NH fuse holders
- For connecting VI earthing and short-circuiting devices to earthing cartridges



Type	EG 00 4A VI
Part No.	**745 922**
Length	285 mm

Rotary handle with flexible shaft

With magnetic socket wrench insert.
For connecting spring-loaded earth clamps.



Type	DGF EKV VI
Part No.	**745 921**
Length	290 mm

EaS Devices (partly insulated) for Low-Voltage Cable Distribution Cabinets



Attaching a partly insulated earthing and short-circuiting device using an earthing handle of type TI.

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	–25 °C ... +55 °C

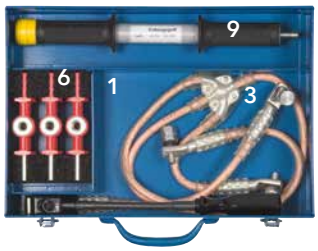


Earthing cartridge with M10 connection, partly insulated connector and earthing handle.

Kit for low-voltage installations, partly insulated type TI

- Complete kit for cable distribution cabinets (CDCs)
- Safe operation with insulated earthing handle of type TI (with dual function), suitable both for installing and removing earthing cartridges with M10 connection as well as for attaching earthing and short-circuiting devices (EaS devices)
- Waterproof, plastic-sheathed cable guide and node unit, with additional anti-kink protection
- Other cable lengths can be selected online via the earthing and short-circuiting configurator

Kit I in Sheet Steel Case



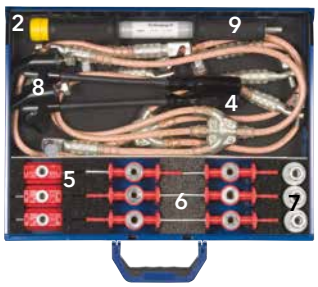
Kit includes:			
No.	**Part No.**	**No.**	**Part No.**
1	766 300	**6**	745 018 (3x)
3	VSUN6NV (1x)	**9**	745 400 (1x)

For more detailed information on these products, see Single Parts.

Type EKS TI ...	KVS SBK
Part No.	**766 302**
Variant No. of EaS device	VSUN6NV
Dimensions	380 x 260 x 80 mm

Attention: Please state the relevant Variant No. when ordering.

Kit II in Sheet Steel Case



Kit includes:			
No.	**Part No.**	**No.**	**Part No.**
2	766 298	**7**	745 202 (3x)
4	VUKMT58 (2x)	**8**	745 602 (2x)
5	745 302 (3x)	**9**	745 400 (1x)
6	745 018 (6x)		

For more detailed information on these products, see Single Parts.

Type EKS TI ...	2F KVS SBK
Part No.	**745 500**
Variant No. of EaS device	VUKMT58
Dimensions	440 x 330 x 66 mm

Attention: Please state the relevant Variant No. when ordering.

Accessories for EaS Devices (partly insulated) for Low-Voltage Cable Distribution Cabinets

Sheet steel case, empty



Type	SBKL EKS TI KVS
Part No.	**766 300**
Dimensions	380 x 260 x 80 mm

Sheet steel case, empty

With foam padding.



Type	SBKL EKS TI KVS 2F
Part No.	**766 298**
Dimensions	440 x 330 x 66 mm

Plastic case, empty

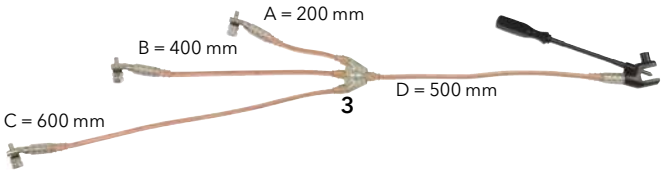
With foam padding and hook-and-loop fastener.



Type	KK 56 41 17 EK VI TI
Part No.	**745 952**
Dimensions	565 x 410 x 170 mm

Earthing and short-circuiting device TI, earth clamp with flexible adjustable handle

Adjustable handle with two positions, clamping range up to 20 mm. For cable distribution cabinets.

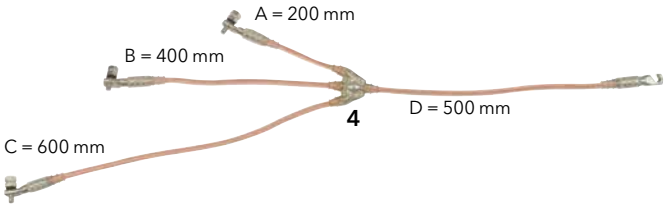


Type EKV3 ...	25TI DG VSUN6NV	35TI DG VSHDQZB
Part No.	**VSUN6NV**	**VSHDQZB**
Cable cross-section Cu	25/25 mm²	35/35 mm²
Max. short-circuit current I_k 0.5 s	7.0 kA	10.0 kA
Max. short-circuit curr. I_k 1 s	4.9 kA	6.9 kA

Note: When ordering, please specify a clear Variant No.

EaS device TI, with hook-shaped cable lug on the earth cable end

For installation of earth clamps EK I FL20 DGF or EK FL20 FS.
For cable distribution cabinets.



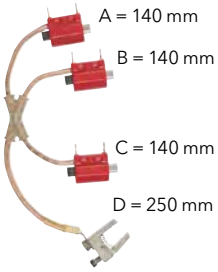
Type EKV3 ...	16TI HK V3RQASE	25TI HK VUKMT58
Part No.	V3RQASE	VUKMT58
Cable cross-section Cu	16/16 mm²	25/25 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA	7.0 kA
Max. short-circuit curr. I_k 1 s	3.2 kA	4.9 kA

Type EKV3 ...	35TI HK VDZ2VDX
Part No.	VDZ2VDX
Cable cross-section Cu	35/35 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA
Max. short-circuit current I_k 1 s	6.9 kA

Note: When ordering, please specify a clear Variant No.

Earthing and short-circuiting device TI, spring-loaded earth clamp

Clamping range up to 24 mm and fixing via adjustable handle DGF EKV VI.
Earthing cartridges of size 00 fixed on the phase cable end.
For service entrance boxes.

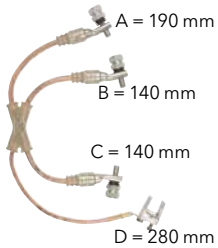


Type	EKV3 NH00 TI V1RC3P2
Part No.	V1RC3P2
Cable cross-section Cu	16/16 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA
Max. short-circuit current I_k 1 s	3.2 kA

Note: When ordering, please specify a clear Variant No.

Earthing and short-circuiting device TI, spring-loaded earth clamp

Clamping range up to 24 mm and fixing via adjustable handle DGF EKV VI.
Screw-on cable lugs with M10 hexagon pin on the phase cable end.
To be screwed onto earthing cartridges with M10 connection of service entrance boxes.



Type	EKV3 16TI EK VSB29AH
Part No.	VSB29AH
Cable cross-section Cu	16/16 mm²
Max. short-circuit current I_k 0.5 s	4.5 kA
Max. short-circuit current I_k 1 s	3.2 kA

Note: When ordering, please specify a clear Variant No.

NH 00 earthing cartridges

With M10 connection for insertion into NH fuse holders and blocks of size NH 00 using a TI earthing handle.


5

Type	EP NH00 TI M10
Part No.	745 302
Size	00
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	4.9 kA
Max. short-circuit current I_k 1 s	4.9 kA

Earthing cartridge NH 00 with grip lugs

With M10 connection for use with earthing handle type TI or NH fuse puller with sleeve NHS AG 00 3 NS.



Type	EP NH00 TI SN7379
Part No.	745 307
Size	00
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	4.9 kA
Max. short-circuit current I_k 1 s	4.9 kA

NH 1 ... 3 earthing cartridges

With M10 connection for insertion into NH fuse holders and blocks of size NH 1 ... 3 using a TI earthing handle.


6

Type	EP NH1 3 TI M10
Part No.	745 018
Size	1 ... 3
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	9.6 kA
Max. short-circuit current I_k 1 s	6.9 kA

NH 1 ... 3 earthing cartridges with grip lugs

With M10 connection for use with TI earthing handle or NH fuse handle with sleeve NHS AG 00 3 NS.



Type	EP NH1 3 TI GL M10
Part No.	745 017
Size	1 ... 3
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	9.6 kA
Max. short-circuit current I_k 1 s	6.9 kA

NH 4a earthing cartridges

With M10 connection for insertion into NH fuse holders and blocks of size NH 4a.



Type	EP NH4A TI M10
Part No.	745 016
Size	4a
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA
Max. short-circuit current I_k 1 s	6.9 kA

Adapter

Adapter for earthing cartridges NH 1…3, partly insulated, with M10 connection.
For screwing in by means of earthing handle TI through opening (D_{min} = 11 mm) in the window of NH fuse switch disconnectors.



Type	AD EP TI M10
Part No.	745 022
Material	Ms/gal CuSn
Thread size	M10
Diameter (bolt)	11 mm
Max. short-circuit current I_k 0.5 s	9.6 kA
Max. short-circuit current I_k 1 s	6.9 kA

Contact blade

With M10 connection for insertion by means of earthing handle type TI.



Type	KM AB M10 SN7280
Part No.	745 021
Size	1 ... 3
Max. cable cross-section Cu	35 mm²
Max. short-circuit current I_k 0.5 s	9.6 kA
Max. short-circuit current I_k 1 s	6.9 kA

Touch protection for earthing cartridges NH 1...3



Type	BS EP NH1 3 TI
Part No.	745 506
Size	1 ... 3
Material	Thermoplastic

Screw-in earthing insert with M10 connection, insulated

Insulated thread.
To be screwed into E27 and E33 threaded fuse holders using a TI earthing handle


7

Type	ESE E27 TI M10	ESE E33 TI M10
Part No.	745 201	745 202
Size	E27	E33
Conctact pin	Brass/gal CuSn	Brass/gal CuSn
Thread	Plastic	Plastic
Max. short-circuit current I_k 0.05 s	4.5 kA	7.0 kA

Screw-in earthing insert with M10 connection

Conductive thread.
To be screwed into E27 and E33 threaded fuse holders using a TI earthing handle.



Type	ESE E27 KBI M10	ESE E33 KBI M10
Part No.	745 203	745 204
Size	E27	E33
Contact pin	Plastic	Plastic
Thread	Brass/gal CuSn	Brass/gal CuSn
Max. short-circuit current I_k 0.05 s	4.5 kA	7.0 kA

Earth clamp with flexible adjustable handle and two setting positions

To be connected to the earth cable end of earthing and short-circuiting devices for cable distribution cabinets, with M8 pin with anti-rotation protection and nut.


8

Type	EK I FL20 DGF
Part No.	745 602
Clamping range	Up to 20 mm

Bare earth clamp with wing bolt

To be connected to the earth cable end of earthing and short-circuiting devices for cable distribution cabinets, with M8 pin with anti-rotation protection and nut.



Type	EK FL20 FS
Part No.	745 502
Clamping range	Up to 20 mm

Spring-loaded compact clamp

With threaded bolt M8 x 12 mm and hexagon locking screw (wrench size 10).
Fixed by means of adjustable handle with flexible shaft.



Type	KK M8 0 24 SK 10
Part No.	745 508
Clamping range	Up to 24 mm
Max. short-circuit current I_k 0.5 s	10.0 kA
Max. short-circuit current I_k 1 s	6.9 kA

TI earthing handle

With dual function.

- For installing earthing cartridges or screw-in earthing inserts with M10 connection
- For connecting TI earthing and short-circuiting devices to earthing cartridges (wrench size 19)


9

Type	EG TI EKV
Part No.	745 400
Length	355 mm

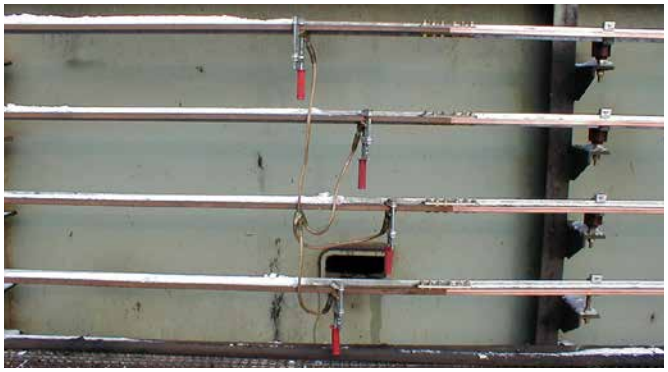
Rotary handle with flexible shaft

With magnetic socket wrench insert.
For connecting spring-loaded earth clamps.



Type	DGF EKV VI
Part No.	745 921
Length	290 mm

Earthing and Short-Circuiting Devices for Crane Conductor Bars



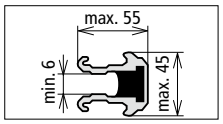
Three-pole earthing and short-circuiting device with screw clamps.

With screw clamps

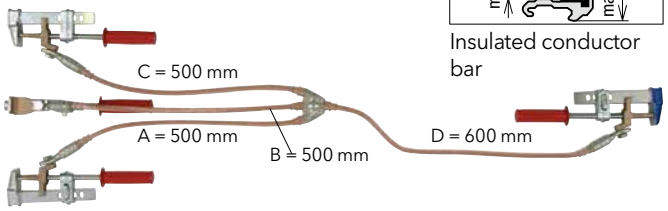
- For insulated or bare conductor bars of cranes and lifting equipment
- Allows to lock the clamping range of the clamps in several positions
- Waterproof, plastic-sheathed cable entries and node unit, with additional ant-kink protection
- Other cable lengths can be selected online via the earthing and short-circuiting configurator

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	–25 °C ... +55 °C
Material (clamp body)	**MCI/gal Zn**
Material (pressure plates)	**Cu alloy**
Material (short-circuiting cables)	**Cu, highly flexible**

With Screw Clamps for insulated Conductor Bars



Insulated conductor bar



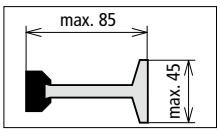
General technical data:	
Clamping range	55 mm

Type EKV3 ...	25IS ZK VH8QTCZ	35IS ZK VKB2Q6J
Part No.	**VH8QTCZ**	**VKB2Q6J**
Cable cross-section Cu	25/25 mm²	35/35 mm²
Max. short-circuit current I_k 0.5 s	7.0 kA	10.0 kA
Max. short-circuit current I_k 1 s	4.9 kA	6.9 kA

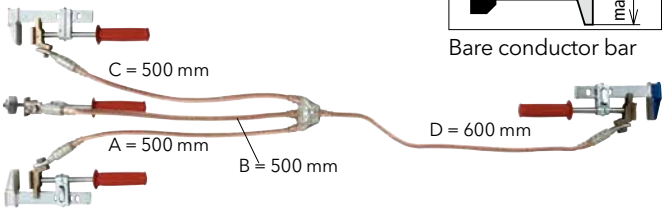
Type EKV3 ...	50IS ZK VP6YV4T
Part No.	**VP6YV4T**
Cable cross-section Cu	50/50 mm²
Max. short-circuit current I_k 0.5 s	14.0 kA
Max. short-circuit current I_k 1 s	9.9 kA

Attention: Please state the relevant Variant No. when ordering.

With Screw Clamps for bare Conductor Bars



Bare conductor bar



Type EKV3 ...	25BS ZK VQKTK4T	35BS ZK VN63A91
Part No.	**VQKTK4T**	**VN63A91**
Clamping range	85 mm	85 mm
Cable cross-section Cu	25/25 mm²	35/35 mm²
Max. short-circuit current I_k 0.5 s	7.0 kA	10.0 kA
Max. short-circuit current I_k 1 s	4.9 kA	6.9 kA

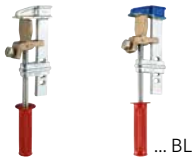
Attention: Please state the relevant Variant No. when ordering.

The clamp for the PEN conductor is marked in blue.

Accessories for Earthing and Short-Circuiting Devices for Crane Conductor Bars

Screw clamps for insulated conductor bars

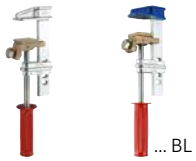
With M12 bolt.



Type	ZK55 IS	ZK55 IS BL
Part No.	**771 230**	**771 231**
Clamping range	55 mm	55 mm
Anti-rotation protection	PK2	PK2
For cable cross-section Cu	25 ... 50 mm²	25 ... 50 mm²
Max. short-circuit current I_k 0.5 s	14.0 kA	14.0 kA
Max. short-circuit current I_k 1 s	9.9 kA	9.9 kA

Screw clamps for bare conductor bars

With M12 bolt.



Type	ZK85 BS	ZK85 BS BL
Part No.	**771 232**	**771 233**
Clamping range	85 mm	85 mm
Anti-rotation protection	PK2	PK2
For cable cross-section Cu	25 ... 35 mm²	25 ... 35 mm²
Max. short-circuit current I_k 0.5 s	10.0 kA	10.0 kA
Max. short-circuit current I_k 1 s	6.9 kA	6.9 kA

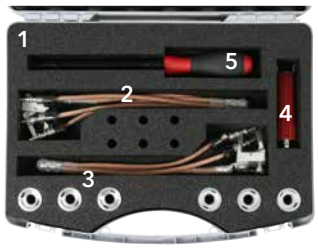
Earthing and Short-Circuiting Device for Street Lighting Systems



Earthing and short-circuiting device installed at a junction and fuse box of a street lighting mast.

- For junction and fuse boxes of street lighting systems
- For E14 fuse links
- E27 to E14 thread aluminium adapter
- Max. 125 A backup fuse, operating class: gL/gG

Kit in Plastic Case



Kit includes:			
No.	**Part No.**	**No.**	**Part No.**
1	745 106	**4**	745 109 (1x)
2	745 107 (2x)	**5**	745 921 (1x)
3	745 108 (6x)		

For more detailed information on these products, see Single Parts.

Type	**EKV ÜGK MB S**
Part No.	**745 105**
Dimensions	395 x 295 x 105 mm

Accessories for Earthing and Short-Circuiting Device for Street Lighting Systems

Plastic case, empty

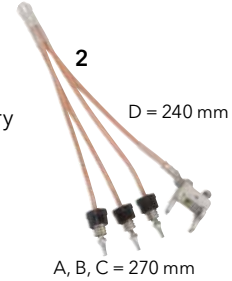
With foam padding.



Type	**KKL EKV ÜGK MB**
Part No.	**745 106**
Dimensions	395 x 280 x 110 mm
Colour	Grey

Earthing and short-circuiting device for street lighting systems

With three fixed E14 screw-in earthing inserts and spring-loaded earth clamp, clamping range up to 24 mm (fixed via rotary handle DGF EKV VI).



Type	**EKV ÜGK MB**
Part No.	**745 107**
Cable cross-section	6 mm²

Earthing and short-circuiting device for street lighting systems

With two permanently mounted E14 screw-in earthing inserts and two spring-loaded earth clamp, clamping range up to 24 mm (fixing via adjustable handle DGF EKV VI).



Type	**EKV ÜGK MB SN7724**
Part No.	**745 121**
Cable cross-section (phase side)	6 mm²

Earthing and short-circuiting device for street lighting systems

With three permanently mounted E14 screw-in earthing inserts and spring-loaded earth clamp, clamping range up to 24 mm (fixing via adjustable handle DGF EKV VI).
Type Süwag



Type	**EKV ÜGK MB SN7354**
Part No.	**745 115**
Cable cross-section	6 mm²
Type	with ratchet screw 4x10 mm

Compact clamp for street lighting

With M8 x 12 mm threaded screw and hexagon locking screw WS10.
To be fixed by means of turning handle with flexible shaft.



Type	**KKS M8 0 24 SK10**
Part No.	**745 509**
Clamping range	up to 24 mm

E27 / E14 adapter

Reducing insert for converting from E27 to E14 threads.
Allows to use earthing and short-circuiting devices with E14 screw-in earthing inserts even for E27 threads.



Type	**RED E27 E14 ÜGK MB**
Part No.	**745 108**
Dimensions	Ø30 x 25 mm
Material	Al

Installation adapter

For installing E27 / E14 adapters and gauge rings for D-fuses DII and DIII.



Type	**PSS DII**
Part No.	**745 109**
Dimensions	Ø30 x 110 mm
Material	**Plastic**

Rotary handle with flexible shaft

With magnetic socket wrench insert.
For connecting spring-loaded earth clamps.



Type	**DGF EKV VI**
Part No.	**745 921**
Length	290 mm

Earthing Handle for Low-Voltage Installations



Attaching an earthing and short-circuiting device in a low-voltage switchgear installation using an earthing handle.

For low-voltage installations

- For attaching earthing and short-circuiting devices in low-voltage installations
- End fitting with plug-in coupling for extending the handle
- Light-weight construction
- Hexagon shaft (WS19) or T pin shaft

General technical data:	
Standard	T pin shaft DIN 48087
Temperature range	–25 °C ... +55 °C
Material (insulating tube)	**Glass-fibre reinforced polyester tube**
Material (coupling)	**Plastic**
Material (end fitting)	Plug-in coupling for extending the handle

Earthing Handle for Hexagon Shafts, Plug-in Coupling

Handle termination with plastic plug-in coupling for extending the handle (spring locking mechanism)



Type EG ...	SK STK 400
Part No.	**745 415**
Total length (l_G)	400 mm
Length (handle) (l_H)	185 mm

Earthing Handle for T Pin Shafts, Plug-in Coupling

Handle termination with plastic plug-in coupling for extending the handle (bayonet locking mechanism)



Type EG ...	SQ STK 400
Part No.	**745 414**
Total length (l_G)	400 mm
Length (handle) (l_H)	185 mm

Storage Devices

- Wall-mounted
- Easy and safe storage of earthing and short-circuiting devices, voltage detectors and operating sticks (Ø30 or 43 mm)

For a Voltage Detector and an Earthing Stick

For a voltage detector and an earthing stick of any length
Hole spacing: 290/390 mm, holes: Ø7 mm



Type HV ...	P ST D24	P ST D30
Part No.	**700 006**	**700 007**
Dimensions	530 x 30 x 136 mm	430 x 30 x 136 mm
For stick diameters	24 mm	30 mm
DB material No.	–	828 077

Type HV ...	P ST D40 45
Part No.	**700 008**
Dimensions	530 x 30 x 149 mm
For stick diameters	40 ... 45 mm
DB material No.	–

For an Earthing and Short-Circuiting Device and an Earthing Stick

For an earthing and short-circuiting device and an earthing stick of any length
Hole spacing: 424 mm, holes: Ø7 mm



Type HV ...	EKV ES30	EKV ES40
Part No.	**700 000**	**700 002**
Dimensions	525 x 175 x 214 mm	525 x 175 x 214 mm
For stick diameters	30 mm	43 mm
DB drawing No.	3 Ebgw 01.70	–
DB material No.	742 395	–

For an Earthing and Short-Circuiting Device and an Earthing Stick up to 1.5 m

For an earthing and short-circuiting device and an earthing stick with a length up to 1.5 m
Hole spacing: 104 mm, holes: Ø7 mm



Type HV ...	EKV ES30 1500
Part No.	**700 003**
Dimensions	214 x 150 mm
For stick diameters	30 / 43 mm

Sheet Steel Case

Sheet Steel Case for Earthing and Short-Circuiting Device VI/TI

Optionally available with foam padding



General technical data:	
Colour	Blue ●

Type	SBKL EKS VI KVS	SBKL EKS TI KVS 2F
Part No.	**745 900**	**766 298**
Dimensions	440 x 330 x 100 mm	440 x 330 x 66 mm
Design	With foam padding	With foam padding

Type	SBKL EKS TI KVS
Part No.	**766 300**
Dimensions	380 x 260 x 80 mm
Design	–

Plastic Case

Plastic Case for Earthing and Short-Circuiting Device VI/TI

With foam padding and hook-and-loop fastener.



Type	KK 56 41 17 EK VI TI	KKL EKS VI KVS
Part No.	**745 952**	**745 902**
Dimensions	565 x 410 x 170 mm	450 x 350 x 110 mm
Colour	Black●	Black ●

Plastic Case for Earthing and Short-Circuiting Devices

With retaining springs for two-part earthing stick.



Type	KK 56 41 17 EK HK
Part No.	**745 953**
Dimensions	565 x 410 x 170 mm
Colour	Black ●

Canvas Bag

Canvas Bag for Earthing and Short-Circuiting Device

With two separate internal pockets and carrier handle.



Type STT ...	55 27 30
Part No.	**785 111**
Dimensions	550 x 255 x 300 mm
Colour	Olive ●
DB drawing No.	3 Ebgw 01.67

MicroΩmeter LoRe EaS



MikroΩmeter

- Mobile measuring system for performing technical tests on portable earthing and short-circuiting devices (EaS) at regular intervals
- For determining minimum ohmic resistances of earthing and short-circuiting devices and the quality of electrical connections e.g. conductor rails or switch contacts
- Electronic transfer of measured values to the evaluation software via USB interface
- Software-aided procedure and automatic documentation of results
- Acoustic signal as soon as the limit values are exceeded
- Calibrated when delivered
- Software update via USB interface

MikroΩmeter LoRe EaS

Double rail system included in delivery.



Type	MOMS LORE EUK
Part No.	**799 100**
Measuring range	0.01 µΩ … 500 mΩ
Min. resolution	1 nΩ
Measuring accuracy	100 nΩ
Type of measurement	Four-conductor measurement
Measuring current	Approx. 30 A … 70 A
Interface	USB 2.0 connection
Case dimensions (h x w x d)	190 x 500 x 450 mm
Weight (with accessories)	Approx. 9 kg
Temperature range	-10 °C ... +40 °C

Insulating protective shutters up to 36 kV



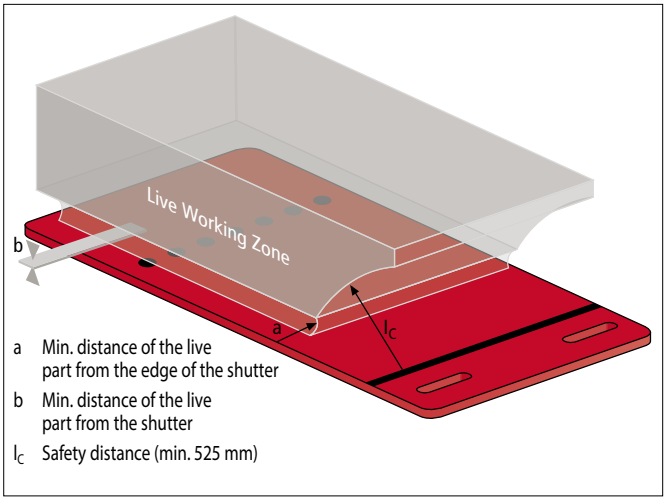
Inserting a protective shutter of type A4 into a closed system.

Rated voltages from 1 kV to 36 kV

- Protection against accidental contact with live parts of installations with rated voltages from 1 kV to 36 kV
- Four different designs for use in almost all types of switchgear installations

General technical data:	
Standard	DIN VDE 0682-552
For	Use in indoor installations only

According to the five safety rules, adjacent parts are parts situated in the vicinity zone. If parts of an installation near the work location cannot be disconnected, additional safety measures must be taken before starting work as is the case with work in the vicinity of live parts.
Insulating protective shutters according to DIN VDE 0682-522 are used to provide protection against accidental contact with live parts of an installation. They are portable and inserted under live conditions by hand or by using an operating stick.
Insulating protective shutters are designed for short-term use in indoor electrical installations according to DIN VDE 0101 with voltages from 1 to 36 kV a.c. at nominal frequencies below 100 Hz to provide protection against direct contact according to DIN VDE 0105-100 when working in the vicinity of live parts.
When used in medium-voltage installations, insulating protective shutters might have to be adapted, for example if it is not possible to insert shutters in the live working zone without risk due to unfavourably located drives, switch components or isolating plates. In such cases, a standard-compliant solution can be found by cutting out parts of the insulating protective shutter or cutting it to size. For that purpose, technical details must be provided. We have developed a special template for insulating protective shutters which can be used, for example, to mark the exact location of cut-outs.
For enquiries and orders, please fill in the template on our website www.dehn-international.com.



Example of a live working zone in case of an insulating protective shutter of type A1.

Rated voltage	Minimum distance of the live part	
U_r	from shutter edge a	from shutter bv
3.6 kV	60 mm	0 mm
7.2 kV	90 mm	0 mm
12.0 kV	120 mm	20 mm
24.0 kV	220 mm	60 mm
36.0 kV	320 mm	100 mm

Note
Insulating protective shutters do not protect against re-connection. The protected area is the area which is separated from the area containing live parts by the insulating protective shutter. The minimum distances shown in the above table between shutters / shutter edges and live parts must be observed.
The protective part (with length IS and, if required, height hS) of insulating protective shutters is the part that provides protection against accidental contact with live parts. It is fitted with either a handle or a coupling for attaching an operating stick.
Outside the live working zone, the following gaps are permissible between shutter edge and cell wall:

- Up to 10 mm without restriction
- Up to 40 mm, if the distance between the shutter edge and the live working zone is at least 100 mm
- Up to 100 mm near a switch subconstruction

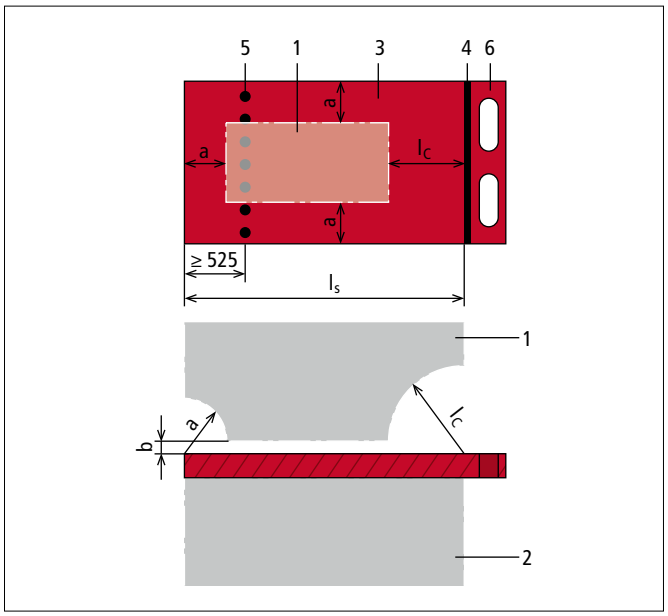
Due to the various designs of switchgear installations, DIN VDE 0682-552 defines four different basic types of protective shutters:

A1, safety distance provides protection during inserting and removing insulating protective shutters.

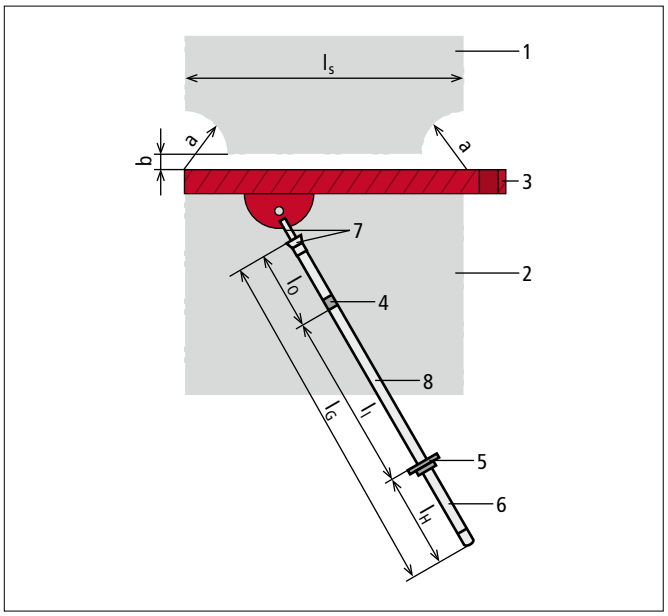
A2, protective section provides protection during inserting and removing insulating protective shutters.

A3, operating stick provides protection during inserting and removing insulating protective shutters.

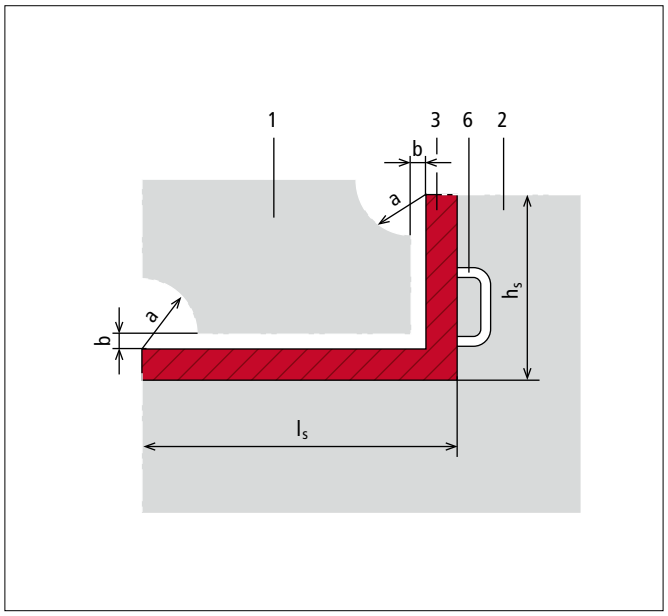
A4, protective device installed in the installation provides protection during inserting and removing insulating protective shutters.



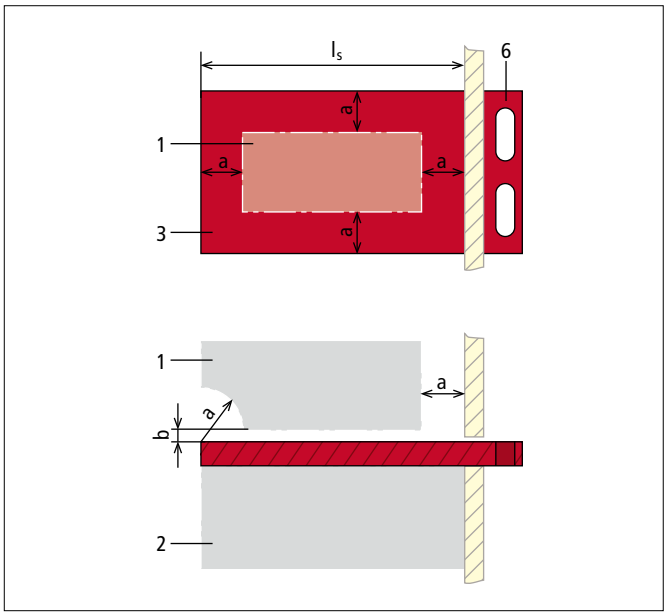
Protective shutter of type **A1** – Operation by hand.



Protective shutter of type **A3** – Operation by means of an operating stick.



Protective shutter of type **A2** – Operation by hand.



Protective shutter of type **A4** – Operation by hand.

1 Live working zone
2 Protected area
3 Protective section with length l_S (and height h_S)
4 Limit mark or red ring
5 Guide mark / hand guard
6 Handle
7 Coupling
8 Insulating element of the operating stick with length l_I

l_G Total length of the operating stick
l_O Length of the top section of the operating stick
l_H Length of the handle of the operating stick
l_I Length of the insulating element of the operating stick
l_S Length of the protective section
l_C Safety distance

a Minimum distance of live parts from the edge of the insulating protective shutter

b Minimum distance of live parts from the insulating protective shutter

Type A1

With finger holes, guide and limit mark for inserting and removing insulating protective shutters into / from guide rails by hand.

The guide mark is a dotted line with a minimum distance of 525 mm from the rear shutter edge. The section beyond this mark must not be contacted when inserting the insulating protective shutter.
The limit mark is a continuous line and separates the handle from the protective section. The section beyond this mark must not be contacted when inserting the insulating protective shutter and must be at least 525 mm away from live parts when the shutter has been inserted.



Type ISP 36 PVC ...	A1...
Part No.	**763 211**
Rated voltage (U_r)	Up to 36 kV
Material	**Rigid PVC**

Type A2

With 90° angled handle and hand grips for inserting or removing insulating protective shutters into / from guide rails by hand. Other angled handles (70° to 270°) are available on request.

The height of the handle has to be selected in such a way that live parts of the installation above the shutter are completely covered.



Type ISP 36 PVC ...	A2...
Part No.	**763 221**
Rated voltage (U_r)	Up to 36 kV
Material	**Rigid PVC**

Führungsschienen und sonstiges Zubehör sind im Erfassungsbogen (DEHN-Formblatt-Nr. 2090) aufgeführt.

Type A3

With storage device with bayonet pin for inserting and removing insulating protective shutters into / from guide rails using an operating stick.

This shutter type is also available with a longitudinal slot and a storage device (rotable shutter). In this case, the shutter is operated using an operating stick with switching stick head.
Two persons are required to insert / remove shutter sizes exceeding 1 m^2. For this purpose, two retaining devices for attaching operating sticks are required.
Moreover, insulating protective shutters are also available with rolls.



Type ISP 36 PVC ...	A3...
Part No.	**763 231**
Rated voltage (U_r)	Up to 36 kV
Material	**Rigid PVC**

Type A4

With finger holes (without additional marks) for use in factory assembled switchgear panels. Instead of finger holes, the shutters are also available with a grip (minimum height: 35 mm).

The shutter is inserted through a slot into the closed installation.
The protective device of the installation must ensure full protection when inserting and removing the shutter. In type-tested switchgear installations in accordance with DIN VDE 0670-6 and 7 or EN/IEC 62271-200 (DIN VDE 0671-200), insulating protective shutters may only be used in consultation with the manufacturer of the switchgear installation.



Type ISP 36 PVC ...	A4...
Part No.	**763 241**
Rated voltage (U_r)	Up to 36 kV
Material	**Rigid PVC**

Insulating mats up to 1,000 V



Insulating mat laid out for work on high-voltage systems.

- For site isolation when working on live equipment up to 1,000 V or near live installations
- Different lengths

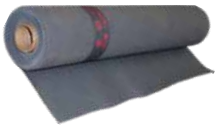
Insulating mats up to 36 kV



Switch room with insulating mat fitted.

- For site isolation when working on live equipment up to 36 kV or near live installations
- Different lengthsn

Insulating mat up to 1,000 V



General technical data:	
Class	0
Standard	EN/IEC 61111
Nominal voltage up to (U_N)	1000 V
Temperature resistance	-40°C to +65°C
Width	1000 mm
Thickness	2 mm
Colour	Grey

Type ES0FI G - 1 X ...	10	1
Part No.	**787 457**	**787 461**
Length	10 m	1 m

Type ES0FI G - 1 X ...	2	3
Part No.	**787 462**	**787 463**
Length	2 m	3 m

Type ES0FI G - 1 X ...	4	5
Part No.	**787 464**	**787 465**
Length	4 m	5 m

Type ES0FI G - 1 X ...	6	7
Part No.	**787 466**	**787 467**
Length	6 m	7 m

Type ES0FI G - 1 X ...	8	9
Part No.	**787 468**	**787 469**
Length	8 m	9 m

Insulating mat up to 36 kV



General technical data:	
Class	4
Standard	EN/IEC 61111
Nominal voltage up to (U_N)	36 kV
Temperature resistance	-40°C to +65°C
Width	1000 mm
Thickness	5.2 mm
Colour	Grey

Type ES4FI G - 1 X ...	10	1
Part No.	**787 459**	**787 471**
Length	10 m	1 m

Type ES4FI G - 1 X ...	2	3
Part No.	**787 472**	**787 473**
Length	2 m	3 m

Type ES4FI G - 1 X ...	4	5
Part No.	**787 474**	**787 475**
Length	4 m	5 m

Type ES4FI G - 1 X ...	6	7
Part No.	**787 476**	**787 477**
Length	6 m	7 m

Type ES4FI G - 1 X ...	8	9
Part No.	**787 478**	**787 479**
Length	8 m	9 m

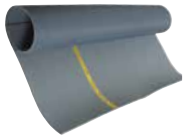
Insulating mats with dielectric strength 50 kV



Switch room with insulating mat fitted.

- For use in electrical switch and test rooms
- Not permitted as standing surface insulation for live working!
- Different lengthsn

Insulating mat with a dielectric strength of 50 kV



General technical data:	
Standard	VDE 0303-21
Nominal voltage up to (U_N)	50 kV
Temperature resistance	-55 °C ... +70 °C
Material	**Polymer NR/SBR**
Width	1000 mm
Thickness	4.5 mm
Colour	Grey

Type IMG SAN 1M ...	10M	1M
Part No.	**785 459**	**785 201** NEW
Length	10 m	1 m

Type IMG SAN 1M ...	2M	3M
Part No.	**785 202** NEW	**785 203** NEW
Length	2 m	3 m

Type IMG SAN 1M ...	4M	5M
Part No.	**785 204** NEW	**785 205** NEW
Length	4 m	5 m

Type IMG SAN 1M ...	6M	7M
Part No.	**785 206** NEW	**785 207** NEW
Length	6 m	7 m

Type IMG SAN 1M ...	8M	9M
Part No.	**785 208** NEW	**785 209** NEW
Length	8 m	9 m

Insulating blankets up to 1,000 V



Covering live parts.

- For protection against accidental and direct contact with live parts
- For covering adjacent live parts
- Different lengths, widths and thicknesses

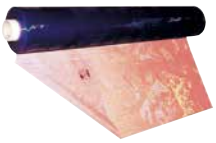
General technical data:	
Standard	DIN VDE 0682-511 (EN/IEC 61112)

Plastic insulating blanket, rolled goods



Type	ATK 135 50M NS	ATK 120 25M NS
Part No.	**785 465**	**785 467**
Class	0	0
Nominal voltage up to (U_N)	1000 V	1000 V
Length	50 m	25 m
Width	1350 mm	1200 mm
Thickness	0.5 mm	1.0 mm
Colour	Crystal clear	Transparent

Plastic insulating blanket, cut to size



Type	ATK 135 ..M NS	ATK 120 ..M NS
Part No.	**785 466**	**785 468**
Class	0	0
Nominal voltage up to (U_N)	1000 V	1000 V
Length	Any up to 50 m *)	Any up to 25 m *)
Width	1350 mm	1200 mm
Thickness	0.5 mm	1.0 mm
Colour	Crystal clear	Transparent
Minimum order length	1,000 mm	1,000 mm

*) Length to be specified when ordering!
Note: Can only be supplied in 1,000 mm increments.

EPDM elastomer wrapping tape, rolled goods

For covering insulators



Type	WBN 200 2,5M NS
Part No.	**785 646**
Class	0
Nominal voltage up to (U_N)	1000 V
Length	2.5 m
Width	200 mm
Thickness	1.0 mm
Colour	Red

EPDM elastomer insulating blanket, rolled goods

With VDE / GS label, flexible at low temperatures.



Type	ATN 140 10M NS
Part No.	785 471
Class	0
Nominal voltage up to (U_N)	1000 V
Length	10 m
Width	1400 mm
Thickness	1.0 mm
Colour	Red ●

Insulating blanket from EPDM elastomer, cut to size



Type	ATN 140 ..M NS
Part No.	785 472
Class	0
Nominal voltage up to (U_N)	1000 V
Length	Any up to 10 m *)
Width	1400 mm
Thickness	1.0 mm
Colour	Red ●
Minimum order length	1,000 mm

*) Length to be specified when ordering!
Note: Can only be supplied in 1,000 mm increments.

Accessories for Insulating blankets up to 1,000 V

Clip

With insulated steel spring.



Type	KK 35 NS
Part No.	785 647
Max. clamping range	35 mm
Dimensions	170 / 110 mm
Material	Plastic

Hook



Type	HK 8 NS
Part No.	785 648
Dimensions	Ø8, 126 / 72 mm
Material	Plastic

Eye

Two-piece



Type	OEK 12 NS
Part No.	785 649
Dimensions	Ø12 / 26 mm
Material	Plastic

Insulating caps up to 1,000 V



For insulating bare ends of electrical cables.

- For insulating bare ends of electrical conductors.

Insulating cap with collar



General technical data:		
Nominal voltage (U_N)		1000 V
Opening (Ø)		10 mm
Material		Plastic

Type ISK MS QS ...	6 35 L100	10 50 L100
Part No.	700 120	700 121
Suitable for	6-35 mm²	10-50 mm²
Length	100 mm	100 mm

Type ISK MS QS ...	35 95 L110
Part No.	700 122
Suitable for	35-95 mm²
Length	110 mm

Spare Parts

Electric Bulb



Type	GL 3.5V 0.2A E10
Part No.	**766 605**
Description	Small electric bulb 3.5 V / 0.2 A
Suitable for	PHE

Mignon Battery

Dangerous goods transport regulations only allow delivery of Part No. 766 611 within Germany.



Type	MZ 1.5V L91 FR6 LI 4	MZ 1.5 IEC LR6 AL
Part No.	**766 611**	**766 618**
Description	Mignon battery 1.5 V, lithium	Mignon battery 1.5 V, alkaline manganese
PU	4 pieces	1 piece

Block Battery

Dangerous goods transport regulations only allow delivery of Part No. 767 712 within Germany.



Type	EB 9V LI	EB 9V AL
Part No.	**767 712**	**767 713**
Description	9 V E block battery, lithium	9 V E block battery, alkaline manganese
PU	1 piece	1 piece

Protective Rubber for PHE



Type	FSG PHE
Part No.	**767 776**
Suitable for	PHE

Protective Rubber for PHG II



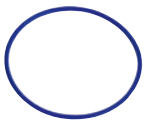
Type	FSG PHG2 PHV
Part No.	**767 777**
Suitable for	PHG II and PHV

Sealing Ring for PHE III



Type	DR PS PHE3
Part No.	**767 779**
Suitable for	PHE III test prod and ASP electric field sensor

Sealing Ring for PHE4 and PHV I



Type	DR PAG
Part No.	**759 798**
Suitable for	PHE4 and PHV I

Threaded ring for PHE4 and PHV I



Type	GR PAG
Part No.	**759 799**
Suitable for	PHE4 and PHV I

Test Prods



Test prod with integrated test electrode allows safe contact with the part of an installation to be tested.

General technical data:	
Colour	Grey ● or yellow ●
Diameter	20 mm
Material (test electrode)	Cu alloy / gal Sn
Material (test prod)	Glass-fibre reinforced epoxy resin tube

For PHE III up to 30 kV / Category "S"


Ø20 mm

Type	S60 PS PHE 285	S61 PS PHE 435
Part No.	767 760	767 761
Total length (l_G)	320 mm	470 mm
Insertion depth (l_O)	285 mm	435 mm

Type	S62 PS PHE 620	S63 PS PHE 780
Part No.	767 762	767 763
Total length (l_G)	655 mm	815 mm
Insertion depth (l_O)	620 mm	780 mm

Type	S64 PS PHE 880
Part No.	767 764
Total length (l_G)	915 mm
Insertion depth (l_O)	880 mm

For PHE III above 30 kV / Category "S"


Ø20 mm

Type	S66 PS PHE 880
Part No.	767 771
Total length (l_G)	915 mm
Insertion depth (l_O)	880 mm

For PHE III above 30 kV / Category "S", CODED


Ø20 mm

Type S66PS ...	PHE880 C SN7771
Part No.	769 701
Total length (l_G)	915 mm
Insertion depth (l_O)	880 mm
Type	Coded

For PHE III up to 30 kV / Category "L"


Ø20 mm

Type	L71 PS PHE 185
Part No.	767 766
Total length (l_G)	220 mm
Insertion depth (l_O)	185 mm

Other versions are available on request.

Operating Heads

STK switching stick head


Ø30 mm

Type	SSK 36 STK 560	SSK 36 STK 930SN7689
Part No.	766 164	766 169
Total length (l_G)	560 mm	930 mm

Screw-on switching stick head for IS SK insulating sticks

With M12 thread.
In accordance with DIN VDE V 0681-2.



Type	SSK M12
Part No.	765 005
Material	Steel, plastic-sheathed

Switching stick head for IS SQ insulating sticks

With T pin shaft (bayonet locking mechanism).
In accordance with DIN VDE V 0681-2.
T pin shaft in accordance with DIN 48087.
Switching stick head is fixed on the insulating stick via the knurled nut.



Type	SSK SQ
Part No.	765 009
Material	Polyamide

STK operating head / T pin shaft

Operating head with spring-loaded bayonet coupling for indoor use.


Ø30 mm

Type	AK 36 SQ STK 360
Part No.	766 365
Total length (l_G)	360 mm

STK operating head / hexagon shaft

Operating head with tension spring locking and M12 threaded bushing for indoor use.


Ø30 mm

Type	AK 36 SK STK 330
Part No.	766 364
Total length (l_G)	330 mm

Insulating Sticks

Insulating stick for PHE4 with M12 threaded bushing



General technical data:	
Material	**Glass-fibre reinforced polyester tube**

Type	IS PHE4 STK 700	IS PHE4 STK 770
Part No.	**783 900**	**783 905**
Total length (l_G)	700 mm	770 mm
Length (handle) (l_H)	250 mm	220 mm

Type	IS PHE4 STK 1110
Part No.	**783 906**
Total length (l_G)	1110 mm
Length (handle) (l_H)	520 mm

Insulating stick for PHE III with M12 threaded bushing

With plug-in coupling for extending the handle



Type	IS M12 STK 640
Part No.	**766 331**
Total length (l_G)	640 mm
Length (handle) (l_H)	270 mm
Material	**Glass-fibre reinforced polyester tube**

Insulating stick for PHE III with M12 threaded bushing

With end cap.



Type	IS M12 AK 635
Part No.	**766 328**
Total length (l_G)	635 mm
Handle length (l_H)	270 mm
Material	**Glass-fibre reinforced polyester tube**

Insulating stick for PHE4 and PHE III with universal gear coupling

Handle end fitting with plastic plug-in coupling as extension handle.



Type	IS ZK STK 670
Part No.	**766 368**
Total length (l_G)	670 mm
Length (handle) (l_H)	265 mm
Material	**Glass-fibre reinforced polyester tube**

Insulating stick for ASP with universal gear coupling

Plug-in coupling for extending the handle.



Type	IS ZK STK HS 670
Part No.	**766 369**
Total length (l_G)	670 mm
Length (handle) (l_H)	270 mm
Material	**Glass-fibre reinforced polyester tube**

IS STK insulating stick with plug-in coupling

Plug-in coupling at both ends for attaching extension elements, operating heads or adapters.



Type	IS 36 STK 30 1280
Part No.	**766 363**
Nominal voltage (U_N)	Up to 36 kV
Total length (l_G)	1280 mm
Length (handle) (l_H)	560 mm

ISN 36 STK insulating stick with silicon insulator

Plug-in coupling at both ends for attaching extension elements, operating heads or adapters.



Type	ISN 36 STK 30 1280	ISN 36 STK 930SN7688
Part No.	**766 367**	**766 362**
Nominal voltage (U_N)	Up to 36 kV	Up to 36 kV
Total length (l_G)	1280 mm	930 mm
Length (handle) (l_H)	560 mm	190 mm
Material	**Glass-fibre reinforced polyester tube**	**Glass-fibre reinforced polyester tube**

Telescopic insulating stick, with universal gear coupling

With scale for measuring the ground clearance, mounted support included.



Type	ISMTC N 36 ZK 10600
Part No.	**766 037**
Nominal voltage (U_N)	Up to 36 kV
Total length ($l_{G\,max}$ / $l_{G\,min}$)	10,600 / 1750 mm
Length (handle) ($l_{H\,min}$)	1680 mm
Material	**Glass-fibre reinforced epoxy resin tube**

Accessories for Insulating Sticks

Contacting aid

For telescopic insulating sticks.



Type	AK AH ZK ISMTC
Part No.	**766 049**
Total length (l_G)	340 mm

Support



Type	AH ISMTC
Part No.	**766 038**
Suitable for	Telescopic insulating stick

Plastic bolt with star knob



Type	KS SG BLS 8
Part No.	**766 105**
Suitable for	Universal gear coupling

Canvas bag, empty – With carrier handle

Max. capacity:

- 1 Telescopic insulating stick
- 1 Contacting aid
- 1 Test prod



Type	STT 180 20
Part No.	**766 039**

Insulating Elements

Insulating element with M12 threaded bushing
With plug-in coupling for the handle.


Ø30 mm

Type	IT M12 STK 30 1150	ISO M12 STK 30SN7563
Part No.	**766 115**	**766 116**
Nominal voltage (U_N)	up to 110 kV	up to 110 kV
Total length (l_G)	1150 mm	780 mm
Diameter	30 mm	30 mm
Type	–	coded

Insulating element with hand guard


Ø30 mm

Type	ISU STK STK 30SN7564
Part No.	**766 117**
Nominal voltage (U_N)	up to 110 kV
Total length (l_G)	935 mm
Diameter	30 mm
Type	coded

Insulating element with gear coupling
With plug-in coupling.
Setting angle of the gear coupling: – 30° / 0° / + 30°.


Ø30 mm

Type	IT ZK30 STK 30 360
Part No.	**766 358**
Total length (l_G)	360 mm

Insulating element for PHE4


Ø30 mm

Type	IT PHE4 STK 760	IT PHE4 STK 1210
Part No.	**783 920**	**783 925**
Total length (l_G)	760 mm	1210 mm

Adapter

Adapter with M12 threaded bushing
With plug-in coupling.


Ø30 mm

Type	AD M12 STK 30 350	AD PHE4 STK 410
Part No.	**766 352**	**783 930**
Total length (l_G)	350 mm	410 mm

Adapter with gear coupling
With plug-in coupling.


Ø30 mm

Type	AD ZK STK 30 360
Part No.	**766 359**
Total length (l_G)	360 mm

Adapter with cone-shaped support
With gear coupling and cone-shaped support, accommodates cleaning sponges (Part No. 766 056).


Ø25mm

Type	AD ZK 25 200
Part No.	**766 055**
Total length (l_G)	200 mm

Handle / Extensions

Handle
With hand guard and end fitting and plug-in coupling for extending the handle.


Ø43 mm

Type	H STK 43 800
Part No.	**766 120**
Total length (l_G)	830 mm

Handle
With hand guard and end fitting with plug-in coupling for extending the handle.


Ø43 mm

Type	H STK 43 500
Part No.	**766 520**
Total length (l_G)	500 mm

Insulating Stick Extension for PHE4
For nominal voltage range 110 ... 220 kV and 220 ... 420 kV.


Ø43 mm

Type	ISV PHE4 43 1100
Part No.	**783 945**
Total length (l_G)	1100 mm

ISV 36 STK insulating stick extension
Plug-in coupling at both ends for extending the insertion depth or the handle.


Ø30 mm

Type	ISV 36 STK 30 910	ISV 36 STK 30 1280
Part No.	**766 356**	**766 366**
Total length (l_G)	910 mm	1280 mm

HV STK extension handle
Plug-in coupling at both ends for extending the handle.


Ø30/43 mm


Ø43 mm

Type	HV STK 30 710	HV STK 43 910
Part No.	**766 335**	**766 456**
Total length	710 mm	910 mm
Diameter	30 mm	43 mm
Colour	Grey	Grey

Type	HV STK 43 1280	HV STK 43 975
Part No.	**766 466**	**766 077**
Gesamtlänge (l_G)	1280 mm	975 mm
Diameter	43 mm	43 mm
Colour	Grey	Yellow
DB Zeichnungs-Nr.	3 Ebgw 02.53	3 Ebgw 02.53

Type	HV STK 43 975	HV STK 43 1045
Part No.	**766 077**	**766 076**
Total length (l_G)	975 mm	1045 mm
Diameter	43 mm	43 mm
Colour	Yellow	Yellow
DB drawing No.	3 Ebgw 02.53	3 Ebgw 02.53

DEHNproX – Live working

Type / Application	Nominal voltage U_N / Frequency f_N	Product	Page

TRS NS dry cleaning kit

- Suction cleaning under live conditions
- Specially adapted operating heads for intensive cleaning
- Plug-in coupling system for quick exchange of operating heads

up to 1,000 V / 15 ... 60 Hz



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FRS ZK MS damp cleaning kit

- Damp cleaning equipment for use under live conditions with special cleaning liquid
- Universal gear coupling for replacing and adjusting the angle of operating heads
- Plug-in operating heads allow fast and easy replacement of the sponges

up to 36 kV / 15 ... 60 Hz



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TRS MS / TRS MS V1 dry cleaning kits

- Suction cleaning under live conditions
- Transparent intake tubes for enhanced safety
- Specially adapted operating heads for intensive cleaning
- Plug-in coupling system for quick exchange of operating heads

up to 36 kV / 15 ... 60 Hz



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TFRS MS combined cleaning kit

- Combined dry and damp cleaning
- Transparent intake tubes for enhanced safety
- Specially adapted operating heads for intensive cleaning
- Universal gear coupling for replacing and adjusting the angle of operating heads
- Plug-in operating heads allow fast and easy replacement of the sponges

up to 36 kV / 15 ... 60 Hz



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Hand oiler for switchgear installations

- For lubricating movable parts in switchgear installations.
- Transparent insulating hand oiler ensures increased safety
- Easy to use thanks to flexible tip
- If required, the insertion depth of the hand oiler can be increased by means of optional extensions

up to 36 kV / 50 Hz



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Maintenance test accc. to German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations BGV A3)

Operating sticks also have to be subjected to electrotechnical tests. Therefore we recommend testing according to German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations BGV A3). This entails testing for compliance with the limit values specified in the electrotechnical rules. The test includes:

- Testing the discharge current
- Testing the protection against bridging
- Visual inspection

The maintenance test is documented in a test report and on the device itself.

The intervals for maintenance tests depend on the conditions of use, e.g. frequency of use, stress due to environmental conditions and transport, etc, however, according to DGUV regulation 3, **at least** every **6 years**.



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Permanent availability of electricity has become a decisive factor in international competition.
At the same time, increasing cost pressure in the energy supply sector means that less and less redundancy is being made available in the power supply. First of all, this requires increased operational reliability of existing plants, and secondly, it is not always possible to disconnect entire plant sections for the necessary maintenance and servicing work. Live working offers an alternative. DEHN has experience in this method of working and has developed products that can be found in the DELTEC product range.

Disconnecting installations for maintenance work
Electrical equipment and low, medium and high-voltage systems such as overhead lines, transformer substations, switchgear installations, distribution boards, transformer cells or cable distribution cabinets cannot be disconnected or can only be disconnected with great effort due to undesired downtimes or cost intensive work on Sundays and public holidays.

Live cleaning

Clean installations increase system reliability
In case of adverse weather conditions (moisture), arc exposure may occur as a result of soiled installations, dust layers and residue from lubricants on insulators and cable sealing ends in medium-voltage installations, cobwebs and weeds in cable distribution boards as well as dust and lubricant layers in low-voltage installations, resulting in power failure, damage to the equipment and even injury or death.

Regular cleaning intervals
Surveys have shown that, depending on the type and degree of soiling, cleaning work on open indoor systems and cable distribution cabinets is required at regular intervals of between roughly six months and two years.

Dry cleaning by suction combined with damp cleaning
Dry cleaning work is performed by suction with operating heads or by brushing soiled parts of the installation while simultaneously sucking the dirt away. Loose dust layers and cobwebs are quickly and easily vacuumed away. In the case of oily and stubborn deposits, wet cleaning with sponges moistened with special insulating cleaning fluid has the desired cleaning effect. The work is carried out according to the live working procedure "hot stick working".

Dry suction cleaning equipment
Suction cleaning equipment consists of a cleaning head (operating heads, brushes), intake tube with handle, extension, intake hose and suction device.
All individual parts are made of plastic and are fully insulated.
The shape of the brushes and operating heads is largely adapted to the parts of installations to be cleaned.
The special plug-in coupling system of the dry cleaning equipment prevents accidental use of accessories not intended for this application (e.g. industrial vacuum cleaner accessories).

Requirements on the suction device
The suction device used must meet the following requirements:

- The industrial suction cleaner must have a minimum air velocity of 20 m/s and a visual indication of the intake capacity.
- The intake hose must have a continuous inner diameter ≥ 30 mm and be free of metal parts.

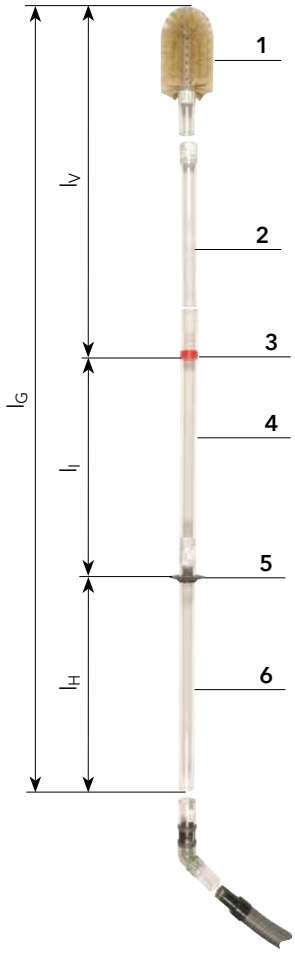
Damp cleaning equipment
Damp cleaning equipment consists of special cleaning heads (sponge holders), an insulating stick with handle and extension elements. All individual parts are fully insulated. The plug-in system of operating heads and sponges allows easy and fast replacement of dirty sponges. Only approved sponges may be used for this purpose.

Requirements on installers

Selection of electrically skilled persons for live working
Maintenance and repair work may only be carried out by electrically skilled persons with several years of experience in operating or maintaining electrical installations who have also successfully completed a special training course for such work.
During this training, both basic theoretical knowledge and practical skills (training of individual work processes) are taught.

Training as live worker
The training as a specialised live worker is based on detailed target descriptions as required by the German trade association BG ETEM "Live working on electrical installations and equipment", DGUV regulation 103-011 (previously BGR A3). It includes theoretical and practical training for the electrically skilled person and ends after a performance test with the presentation of a "live working" certificate.

"Live working" procedure
During hot stick working, the worker keeps a predefined distance from live parts of the installation and uses insulating sticks/operating sticks.



1 Operating head
2 Extension
3 Red ring
4 Insulating element
5 Hand guard
6 Handle

Dimensions:
l_H Length of the handle
l_I Length of the insulating element
l_V Length of the extension
l_G Total length

Schematic diagram

TRS NS Dry Cleaning Kit



Live cleaning of a low-voltage switchgear installation using the TRS NS dry cleaning kit.

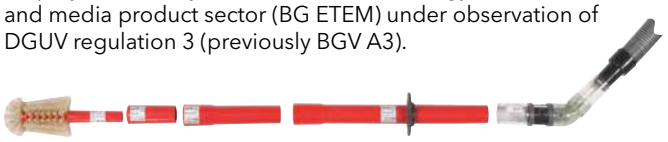
Nominal voltages up to 1000 V / 15 ... 60 Hz

- For indoor and outdoor installations
- Equipment for suction cleaning under live conditions
- For dry cleaning of cable distribution cabinets, open indoor installations and control cabinets
- Specially adapted operating heads for intensive cleaning
- Plug-in coupling system allows fast replacement of operating heads
- Regulation of intake air in the handle area

General technical data:	
Standard	Based on DIN VDE 0682-621
Not for use in wet weather conditions	✷

Requirements

Cleaning work up to 1000 V generally is allowed to be done under supervision of a qualified electrician according to EN 50110-1 "Operation of electrical installations" and is allowed to be done in accordance with the national accident prevention regulations (UVV) "Elektrische Anlagen und Betriebsmittel" [Electrical installations and equipment] stipulated by the German Employer's Liability Association for the energy, textile, electrical and media product sector (BG ETEM) under observation of DGUV regulation 3 (previously BGV A3).



TRS NS Dry Cleaning Kit
Fully equipped plastic case.



Kit includes:

No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
1	785 506	**7**	785 540	**13**	785 543	**19**	785 595
2	785 520	**8**	785 541	**14**	785 570	**20**	785 596
3	785 521	**9**	785 542	**15**	785 550	**21**	785 580
4	785 522	**10**	785 590	**16**	785 555	**22**	785 585
5	785 523	**11**	785 591	**17**	785 515		
6	785 530	**12**	785 560	**18**	785 200		

For more detailed information on these products, see www.dehn-international.com.

Type	TRS NS
Part No.	**785 502**
Dimensions	560 x 410 x 170 mm
Total length ($l_{G\,max}$ / $l_{G\,min}$)	1350 / 560 mm

FRS ZK MS Damp Cleaning Kit



Damp cleaning of a transformer using the FRS ZK MS damp cleaning kit.

Nominal voltages up to 36 kV / 15 ... 60 Hz

- For indoor and outdoor installations
- Damp cleaning equipment for use under live conditions with special cleaning liquid
- Universal gear coupling for replacing and adjusting the angle of operating heads
- Rigid and flexible plug-in operating heads allow fast and easy replacement of the sponges

General technical data:	
Standard	Based on DIN VDE 0681-1 and DIN VDE 0682-621
Standard (universal gear coupling)	EN/IEC 60832 (DIN VDE 0682-211)
Not for use in wet weather conditions	✷

Application

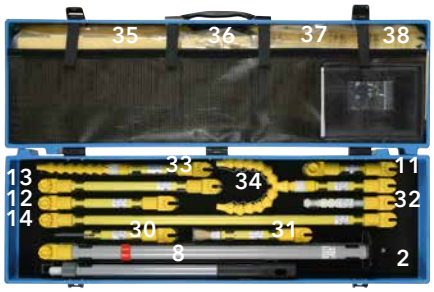
Damp sponges allow to remove tough pollution layers and to clean oily transformer surfaces. Special insulating cleaning liquids (e.g. Rivolta SLX 500; SLX TOP or SLX Super from Bremer & Leguil, Duisburg/Germany, and Florin 2000 from Flore, Koblenz/Germany) must be selected according to the rated voltage of the installation and the environmental conditions.

Requirements

Cleaning work from 1 to 36 kV must be carried out under supervision of a qualified electrician according to EN 50110-1 "Operation of electrical installations – Minimum Requirements", observing clauses 6.3.1 to 6.3.12. In Germany FRS ZK MS damp cleaning kits are subject to DGUV Vorschrift 3 (former BGV A3) and DGUV Regel 103-011 (former BGR A3) of the national accident prevention regulations (UVV) "Elektrische Anlagen und Betriebsmittel" [Electrical installations and equipment] stipulated by the German Employer's Liability Association for the energy, textile, electrical and media product sector (BG ETEM).



FRS ZK MS Damp Cleaning Kit
Fully equipped GRP case.



Kit includes:

No.	Part No.	No.	Part No.
2	785 229	**32**	785 324
8	785 315	**33**	785 322
11	785 316	**34**	785 323
12	785 317	**35**	785 274
13	785 318	**36**	785 275
14	785 319	**37**	785 279
30	785 320	**38**	785 280
31	785 321		

see www.dehn-international.com

Type	FRS ZK MS
Part No.	**785 940**
Dimensions	945 x 285 x 170 mm
Total length ($l_{G\,max}$ / $l_{G\,min}$)	3250 / 1450 mm
Extension ($l_{G\,max}$ / $l_{G\,min}$)	2100 / 350 mm

TRS MS Dry Cleaning Kit



Live cleaning of a transformer using the TRS MS dry cleaning kit.

General technical data:	
Standard	DIN VDE 0682-621
Not for use in wet weather conditions	✷

Requirements

Cleaning work from 1 to 36 kV must be carried out under supervision of a qualified electrician according to EN 50110-1 "Operation of electrical installations – Minimum Requirements", observing clauses 6.3.1 to 6.3.12. In Germany TRS MS dry cleaning kits are subject to DGUV Vorschrift 3 (previously BGV A3) and DGUV Regel 103-011 (previously BGR A3) of the national accident prevention regulations (UVV) "Elektrische Anlagen und Betriebsmittel" [Electrical installations and equipment] stipulated by the German Employer's Liability Association for the Energy, Textiles, Electric and Media Industry (BG ETEM).

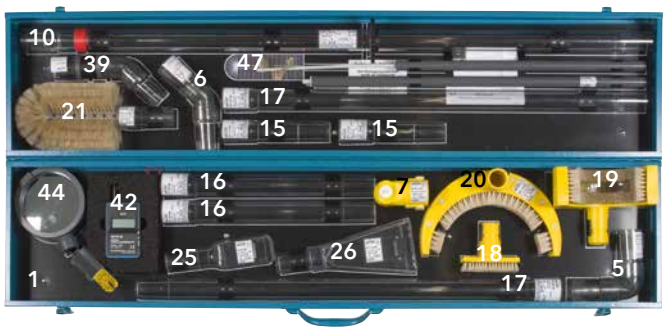
Nominal voltages up to 36 kV / 15 ... 60 Hz

- For indoor and outdoor installations
- Equipment for live cleaning by means of suction
- For dry cleaning of transformers and switchgear installations
- Transparent intake tubes ensure enhanced safety
- Specially adapted operating heads for intensive cleaning
- Plug-in coupling system allows fast replacement of operating heads



TRS MS Dry Cleaning Kit

Fully equipped GRP case.



Kit includes:

No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
1	785 301	**15**	785 121*)	**20**	785 150	**42**	785 180
5	785 131	**16**	785 122*)	**21**	785 170	**44**	785 190
6	785 132	**17**	785 123*)	**25**	785 220	**47**	785 210
7	785 130	**18**	785 160	**26**	785 221		
10	785 120	**19**	785 140	**39**	785 200		

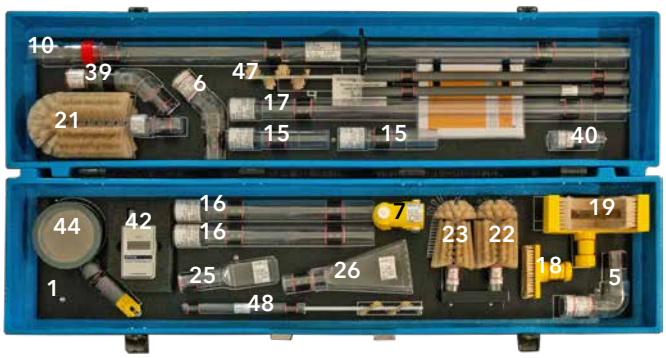
For more detailed information on these products, see www.dehn-international.com.

*) 2 pieces in a set

Type TRS ...	MS
Part No.	**785 100**
Dimensions	1260 x 305 x 205 mm
Total length ($l_{G\,max}$ / $l_{G\,min}$)	3580 / 1180 mm
Extension ($l_{G\,max}$ / $l_{G\,min}$)	2515 / 115 mm

TRS MS V1 Dry Cleaning Kit

Fully equipped GRP case.



Kit includes:

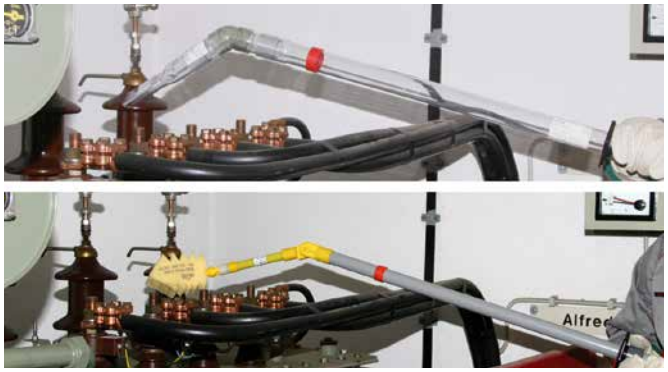
No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
1	785 301	**16**	785 122*)	**23**	785 172	**44**	785 190
5	785 131	**17**	785 123	**25**	785 220	**47**	785 210
6	785 132	**18**	785 160	**26**	785 221	**48**	785 585
7	785 130	**19**	785 140	**39**	785 200		
10	785 120	**21**	785 170	**40**	785 212		
15	785 121*)	**22**	785 171	**42**	785 180		

For more detailed information on these products, see www.dehn-international.com.

*) 2 pieces in a set

Type TRS ...	MS V1
Part No.	**785 112**
Dimensions	1260 x 305 x 205 mm
Total length ($l_{G\,max}$ / $l_{G\,min}$)	3580 / 1180 mm
Extension ($l_{G\,max}$ / $l_{G\,min}$)	2515 / 115 mm

TFRS MS Combined Cleaning Kit



TFRS MS combined cleaning kit used for dry and damp cleaning of a transformer under live conditions.

Nominal voltages up to 36 kV / 15 ... 60 Hz

- For indoor and outdoor installations
- Combined dry and damp cleaning kit for cleaning under live conditions
- Transparent intake tubes ensure enhanced safety
- Specially adapted operating heads for intensive cleaning
- Universal gear coupling for replacing and adjusting the angle of operating heads
- Rigid and flexible plug-in operating heads allow fast and easy replacement of the sponges

General technical data:	
Standard	Based on DIN VDE 0681-1 and DIN VDE 0682-621
Standard (universal gear coupling)	EN/IEC 60832 (DIN VDE 0682-211)
Not for use in wet weather conditions	✷

Application

Dry cleaning work is performed by suction cleaning with operating heads or brushing soiled parts of the installation while simultaneously sucking the dirt away. Loose dust layers and cobwebs are easily removed with little effort. Damp cleaning eliminates oily and tough contaminants with the help of sponges soaked with special insulating cleaning liquids.

Requirements

Cleaning work from 1 to 36 kV must be carried out under supervision of a qualified electrician according to EN 50110-1 "Operation of electrical installations – Minimum Requirements", observing clauses 6.3.1 to 6.3.12. In Germany TFRS MS combined cleaning kit are subject to DGUV Vorschrift 3 and DGUV Regel 103-011 (previously BGV A3 and BGR A3) of the national accident prevention regulations (UVV) "Elektrische Anlagen und Betriebsmittel" [Electrical installations and equipment] stipulated by the German Employer's Liability Association for the Energy, Textiles, Electric and Media Industry (BG ETEM).

TFRS MS Combined Cleaning Kit

Fully equipped GRP case and leather bag.



Kit includes: – Case:

No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
3	785 951	**17**	785 123*)	**27**	785 223	**37**	785 279
5	785 131	**18**	785 160	**28**	785 551	**38**	785 280
6	785 132	**19**	785 140	**29**	785 552	**39**	785 200
7	785 130	**20**	785 150	**30**	785 320	**40**	785 212
11	785 316	**21**	785 170	**31**	785 321	**41**	785 259
12	785 317	**22**	785 171	**32**	785 324	**43**	785 181
13	785 318	**23**	785 172	**33**	785 322	**44**	785 190
14	785 319*)	**24**	785 151	**34**	785 323	**45**	785 953
15	785 121	**25**	785 220	**35**	785 274	**46**	785 224
16	785 122	**26**	785 221	**36**	785 275		

For more detailed information on these products, see www.dehn-international.com.

*) 2 pieces in a set

Kit includes: – Bag:

No.	Part No.	No.	Part No.	No.	Part No.
4	785 952	**10**	785 120	**48**	785 585
9	785 325	**47**	785 210	**49**	785 109

For more detailed information on these products, see www.dehn-international.com.

Type	TFRS MS
Part No.	**785 950**
Dimensions (bag)	1400 x 280 mm
Dimensions (case)	900 x 415 x 430 mm



Accessory for NS and MS Cleaning Kits

Industrial vacuum cleaner

For dry and combined cleaning kits.



Equipment:
25 l special plastic container, 2 large wheels, 2 locking brakes, handle and cable holder, socl matic switch-on mechanism, electromagnetic automatic vibration function, speed control, v acceleration rate controller,electronic running feature, moisture identification with sensor-controlled disconnection, 2 new polyester filter cassettes, FKP 4300, filter area 2x 4300 cm² = 8600 cm², dust collection capacity 99,99 %, class L in accordance with DIN EN 60335-2-69 Annex AA, cord length 8 m.

Technical data:
Intake hose with straight connecting adapter Ø35 mm, 5 m long

Type	HISC 1600
Part No.	**785 310**
Max. capacity	1600 W
Nominal voltage (U_N)	230 V
Dimensions	450 x 390 x 490 mm

Application:



Reducing inserts

For connection between SSA W D intake hose adapter and intake hoses from other manufacturers with different diameters and straight connecting adapter.



General technical data:	
Total length (l_G)	105 mm

Type	RSI 32	RSI 34
Part No.	**785 213**	**785 214**
Diameter	35 / 32 mm	35 / 34 mm

Type	RSI 35	RSI 38
Part No.	**785 215**	**785 216**
Diameter	35 / 35 mm	35 / 38 mm

Type	RSI 45	RSI 51
Part No.	**785 217**	**785 218**
Diameter	35 / 45 mm	35 / 51 mm

Type	RSI 58
Part No.	**785 219**
Diameter	35 / 58 mm

Tubular brush 80 mm

Cylindrical bristles.



Type	STB 80 ZK MS
Part No.	**785 159**
Total length (l_G)	250 mm
Diameter	80 mm

Rectangular brush



Type	REB 25055 ZK MS
Part No.	**785 169**
Dimensions	250 x 55 x 155

Scraper



Type	S 100 ZK MS
Part No.	**785 329**
Total length (l_G)	310 mm
Diameter	100 mm

Cleaning head 55 with scraper

For TRS MS and TFRS MS.
Including 3 spare scrapers.



Type	FD 60 MS SN7271
Part No.	**785 225**
Total length (l_G)	190 mm
Diameter	40 mm

90° angled flat cleaning head with detachable brush

For TRS NS dry cleaning kits.



Type	FWD 35 P NS
Part No.	**785 592**
Total length (l_G)	200 mm
Diameter	25 mm

Intake tube with handle

For TRS MS and TFRS MS cleaning kits.



Type	SRH 1180 IS 650 MS
Part No.	**785 119**
Total length (l_G)	1180 mm, insulating element 650 mm

Canvas bag, empty

With two separate internal pockets and carrier handle.



Type	STT 55 27 30
Part No.	**785 111**
Dimensions	550 x 270 x 300 mm
Colour	Olive ●

Hand Oiler for Switchgear Installations



Nominal Voltages up to 36 kV

- For lubricating movable parts in switchgear installations with a nominal voltage up to 36 kV / 50 Hz
- Transparent insulating hand oiler ensures increased safety
- Easy to use thanks to flexible tip
- If required, the insertion depth of the hand oiler can be increased by means of optional extensions

General technical data:	
Standard	Based on DIN VDE 0681-1 and DIN VDE 0682-621
Temperature range	+5 °C ... +50 °C
Not for use in wet weather conditions	✷



Hand Oiler

Type	HOEL 36 20 1100
Part No.	**785 399**
Nominal voltage (U_N)	Up to 36 kV
Total length (l_G)	1160 mm
Volume (oil container)	200 ml

Accessories for Hand Oiler for Switchgear Installations

Extension for hand oiler

Ø20 mm



Type	VL HOEL 20 500
Part No.	**785 398**
Nominal voltage (U_N)	Up to 36 kV
Total length (l_G)	500 mm



configurable

Arc fault protection at your fingertips

Electrician set for protection against arc faults

Protect your workers from the thermal effects of an arc fault. With our electrician set, you have everything you need for working on electrical systems at your fingertips. Now also available as a configurable set.

- 1x DEHNcare ArcFit protective clothing Indoor or Outdoor
- 1 pair of protective gloves
- 1x ESH safety helmet for electricians with APS T AS face shield
- 1x microfibre bag
  1x storage bag

Configure the electrician set now.

More information here:

DEHNcare – Personal protective equipment

ArcFit Indoor Protective Clothing – Professional Protection for Everyday Use *)	Page 126
ArcFit Outdoor Protective Clothing – High Visibility in Everyday Life	Page 130
Protective clothing UnderWear – Increase protection level	Page 138
ArcFit HLP 63 Protective Clothing – Demanding, even in extreme situations	Page 139
ArcClassic Protective Clothing – Noticeably Protected	Page 140
Protective Gloves – Hands Need Extra Protection	Page 142
Safety Shoes – Protection for Electricians up to 1000 V	Page 148
Eye and Face Protection	Page 149
Electrician's Kit – Everything You Need in One Grab	Page 152
Storage and transport bags	Page 153
Size charts	Page 154



In touch with people: personal protective equipment

Arc faults are a serious hazard when working on electrical equipment. High-quality personal protective equipment (PPE) is essential to protect electricians. In this chapter, you will discover protective clothing of various protection classes specifically designed to protect against the effects of an arc fault. Find out more about our personal protective equipment designed to offer electricians working in electrical hazard areas protection and comfort.

More information and images about personal protective equipment against the thermal effects of electric fault arcs can be found here:

DEHNcare – Personal protective equipment

Type / Application	Product	Page
ArcFit Indoor Protective Clothing – Professional Protection for Everyday Use *) Arc-fault-tested protective clothing ▪ Protective jacket and trousers and bib overall for men and women ▪ Protection from the thermal effects of an arc fault when working on electrical installations ▪ Arc flash protection class APC 2 or PPE 2 ▪ Multinorm clothing		126
ArcFit Outdoor Protective Clothing – High Visibility in Everyday Life *) Arc-fault-tested protective clothing ▪ Protective jacket and trousers and bib overall for men and women ▪ Protection from the thermal effects of an arc fault when working on electrical installations ▪ Arc flash protection class APC 2 or PPE 2 ▪ Multi-standard clothing with high-visibility and chemical protection, among other features		130 134
Protective clothing UnderWear – Increase protection level Accessories for arc-fault-tested protective clothing ▪ An elevated level of protection is provided when combined with DEHNcare ArcFit ▪ Undershirt and pants ▪ Polo shirt		138
ArcFit HLP 63 Protective Clothing – Demanding, even in extreme situations Arc-fault-tested protective clothing ▪ Protective jacket and trousers (pull-on bib overall) and Coat ▪ Protection from the thermal effects of an arc fault when working on electrical installations ▪ Arc flash protection class APC 2 or PPE 4 ▪ Multinorm clothing		139
ArcClassic Protective Clothing – Noticeably Protected *) Arc-fault-tested protective clothing ▪ Protective coat, jacket and trousers ▪ Protection from the thermal effects of an arc fault when working on electrical installations ▪ Arc flash protection class APC 2 or PPE 3		140
Protective Gloves – Hands Need Extra Protection *) **DEHNcare APG XT** **DEHNcare APG** **Insulating gloves up to 500 / 1000 V** **Insulating gloves up to 36 kV**		143 144 145 147
Safety Shoes – Protection for Electricians up to 1000 V **Safety shoes with insulating soles up to 1000 V**		148
Eye and Face Protection **DEHNcare APS with active protection** **Balaclava** **DEHNcare APS with headgear** **DEHNcare APS with lever arms** **ESH U S safety helmet for electricians**		149 150 150 151 151
Electrician's Kit – Everything You Need in One Grab Appropriate starter set for electricians for outdoor and indoor use		152

Protective clothing ArcFit Indoor



Arc-fault-tested protective clothing for everyday use.

The multinorm all-rounder: the all-round single-layer material ensures great mobility for all activities, a perfect fit for every figure and a comfortable feeling all day long.

- Environmentally friendly – washable up to 60°
- Custom designs possible
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	IEC 61482-2, EN ISO 11612, EN 1149-5, EN ISO 13688, EN ISO 11611, EN 17353
Material	**Cotton (52%), modacrylic (22%), viscose (19%), para-aramid (6%), static inhibitors (1%)**
Material (sewing thread)	**Kevlar (100%)**



Flame-resistant red zippers



Elastic cuff

Arc-fault-tested protective jacket, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APJ ID 42	APJ ID 44
Part No.	785 600	785 601
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APJ ID 46	APJ ID 48
Part No.	785 330	785 331
Size (international)	46 (XS)	48 (S)

Type	APJ ID 50	APJ ID 52
Part No.	785 332	785 333
Size (international)	50 (M)	52 (M/L)

Type	APJ ID 54	APJ ID 56
Part No.	785 334	785 335
Size (international)	54 (L)	56 (XL)

Type	APJ ID 58	APJ ID 60
Part No.	785 336	785 337
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APJ ID 62	APJ ID 64
Part No.	785 338	787 602
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APJ ID 66	APJ ID 68
Part No.	787 603	787 604
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested protective trousers, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APT ID 42	APT ID 44
Part No.	787 650	787 651
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APT ID 46	APT ID 48
Part No.	785 340	785 341
Size (international)	46 (XS)	48 (S)

Type	APT ID 50	APT ID 52
Part No.	785 342	785 343
Size (international)	50 (M)	52 (M/L)

Type	APT ID 54	APT ID 56
Part No.	785 344	785 345
Size (international)	54 (L)	56 (XL)

Type	APT ID 58	APT ID 60
Part No.	785 346	785 347
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APT ID 62	APT ID 64
Part No.	785 348	787 652
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APT ID 66	APT ID 68
Part No.	787 653	787 654
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested bib overall, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APD ID 42	APD ID 44
Part No.	787 900 NEW	787 901 NEW
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APD ID 46	APD ID 48
Part No.	787 902 NEW	787 903 NEW
Size (international)	46 (XS)	48 (S)

Type	APD ID 50	APD ID 52
Part No.	787 904 NEW	787 905 NEW
Size (international)	50 (M)	52 (M/L)

Type	APD ID 54	APD ID 56
Part No.	787 906 NEW	787 907 NEW
Size (international)	54 (L)	56 (XL)

Type	APD ID 58	APD ID 60
Part No.	787 908 NEW	787 909 NEW
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APD ID 62	APD ID 64
Part No.	787 910 NEW	787 911 NEW
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APD ID 66	APD ID 68
Part No.	787 912 NEW	787 913 NEW
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested protective jacket, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APJ ID 22	APJ ID 23
Part No.	787 610	787 611
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APJ ID 24	APJ ID 25
Part No.	787 612	787 613
Size (international)	24 (S-K)	25 (M-K)

Type	APJ ID 26	APJ ID 27
Part No.	787 614	787 615
Size (international)	26 (M/L-K)	27 (L-K)

Type	APJ ID 28	APJ ID 29
Part No.	787 616	787 617
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APJ ID 30
Part No.	787 618
Size (international)	30 (2XL-K)

Arc-fault-tested protective trousers, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APT ID 22	APT ID 23
Part No.	787 660	787 661
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APT ID 24	APT ID 25
Part No.	787 662	787 663
Size (international)	24 (S-K)	25 (M-K)

Type	APT ID 26	APT ID 27
Part No.	787 664	787 665
Size (international)	26 (M/L-K)	27 (L-K)

Type	APT ID 28	APT ID 29
Part No.	787 666	787 667
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APT ID 30
Part No.	787 668
Size (international)	30 (2XL-K)

Arc-fault-tested bib overall, men's short sizes

*) Outer fabric after preparation



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APD ID 22	APD ID 23
Part No.	787 914 NEW	787 915 NEW
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APD ID 24	APD ID 25
Part No.	787 916 NEW	787 917 NEW
Size (international)	24 (S-K)	25 (M-K)

Type	APD ID 26	APD ID 27
Part No.	787 918 NEW	787 919 NEW
Size (international)	26 (M/L-K)	27 (L-K)

Type	APD ID 28	APD ID 29
Part No.	787 920 NEW	787 921 NEW
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APD ID 30
Part No.	787 922 NEW
Size (international)	30 (2XL-K)

Arc-fault-tested protective jacket, men's long sizes

*) Outer fabric after preparation



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APJ ID 90	APJ ID 94
Part No.	787 620	787 621
Size (international)	90 (XS-L)	94 (S-L)

Type	APJ ID 98	APJ ID 102
Part No.	787 622	787 623
Size (international)	98 (M-L)	102 (M/L-L)

Type	APJ ID 106	APJ ID 110
Part No.	787 624	787 625
Size (international)	106 (L-L)	110 (XL-L)

Type	APJ ID 114	APJ ID 118
Part No.	787 626	787 627
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested protective trousers, men's long sizes

*) Outer fabric after preparation



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APT ID 90	APT ID 94
Part No.	787 670	787 671
Size (international)	90 (XS-L)	94 (S-L)

Type	APT ID 98	APT ID 102
Part No.	787 672	787 673
Size (international)	98 (M-L)	102 (M/L-L)

Type	APT ID 106	APT ID 110
Part No.	787 674	787 675
Size (international)	106 (L-L)	110 (XL-L)

Type	APT ID 114	APT ID 118
Part No.	787 676	787 677
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested bib overall, men's long sizes

*) Outer fabric after preparation



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APD ID 90	APD ID 94
Part No.	787 923 NEW	787 924 NEW
Size (international)	90 (XS-L)	94 (S-L)

Type	APD ID 98	APD ID 102
Part No.	787 925 NEW	787 926 NEW
Size (international)	98 (M-L)	102 (M/L-L)

Type	APD ID 106	APD ID 110
Part No.	787 927 NEW	787 928 NEW
Size (international)	106 (L-L)	110 (XL-L)

Type	APD ID 114	APD ID 118
Part No.	787 929 NEW	787 930 NEW
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested protective jacket, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APJ ID F 34	APJ ID F 36
Part No.	787 630	787 631
Size (international)	34 (XS)	36 (S)

Type	APJ ID F 38	APJ ID F 40
Part No.	787 632	787 633
Size (international)	38 (M)	40 (M/L)

Type	APJ ID F 42	APJ ID F 44
Part No.	787 634	787 635
Size (international)	42 (L)	44 (XL)

Type	APJ ID F 46	APJ ID F 48
Part No.	787 636	787 637
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APJ ID F 50	APJ ID F 52
Part No.	787 638	787 639
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APJ ID F 54	APJ ID F 56
Part No.	787 640	787 641
Size (international)	54 (3XL/4XL)	56 (4XL)

Arc-fault-tested protective trousers, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APT ID F 34	APT ID F 36
Part No.	787 680	787 681
Size (international)	34 (XS)	36 (S)

Type	APT ID F 38	APT ID F 40
Part No.	787 682	787 683
Size (international)	38 (M)	40 (M/L)

Type	APT ID F 42	APT ID F 44
Part No.	787 684	787 685
Size (international)	42 (L)	44 (XL)

Type	APT ID F 46	APT ID F 48
Part No.	787 686	787 687
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APT ID F 50	APT ID F 52
Part No.	787 688	787 689
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APT ID F 54	APT ID F 56
Part No.	787 690	787 691
Size (international)	54 (3XL/4XL)	56 (4XL)

Arc-fault-tested bib overall, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc Rating – ATPV (Open Arc)	18 cal / cm² *)
Arc Rating – ELIM (Open Arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	450 g/m²
Primary colour	grey
Secondary colour	black
Zipper	red

Type	APD ID F 34	APD ID F 36
Part No.	788 005 NEW	788 006 NEW
Size (international)	34 (XS)	36 (S)

Type	APD ID F 38	APD ID F 40
Part No.	788 007 NEW	788 008 NEW
Size (international)	38 (M)	40 (M/L)

Type	APD ID F 42	APD ID F 44
Part No.	788 009 NEW	788 010 NEW
Size (international)	42 (L)	44 (XL)

Type	APD ID F 46	APD ID F 48
Part No.	788 011 NEW	788 012 NEW
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APD ID F 50	APD ID F 52
Part No.	788 013 NEW	788 014 NEW
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APD ID F 54	APD ID F 56
Part No.	788 015 NEW	788 016 NEW
Size (international)	54 (3XL/4XL)	56 (4XL)

Protective clothing ArcFit Outdoor



Arc-fault-tested protective clothing with special properties for outdoor areas.

Best visibility to protect against accidents in any outdoor situation: this multinorm all-rounder fits every employee thanks to the variety of sizes and its modern cut. This clothing is comfortable all day due to its single layer material.

- Dirt-repellent and water-repellent
- Environmentally friendly – washable up to 60°
- Custom designs possible
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	IEC 61482-2, EN ISO 11612, EN 1149-5, EN ISO 20471, EN 13034, EN ISO 13688, EN ISO 11611
Material	**Modacrylic (40%), viscose (59%), static inhibitors (1%), PU membrane: meta-armid knitting (100%)**
Material (sewing thread)	**Kevlar (100%)**



Safety at a glance!
Flame-resistant red zippers



Fully concealed zippers prevent the penetration of liquids

Arc-fault-tested protective jacket – fluorescent yellow, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APJ OD YE 42	APJ OD YE 44
Part No.	**787 700**	**787 701**
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APJ OD YE 46	APJ OD YE 48
Part No.	**785 350**	**785 351**
Size (international)	46 (XS)	48 (S)

Type	APJ OD YE 50	APJ OD YE 52
Part No.	**785 352**	**785 353**
Size (international)	50 (M)	52 (M/L)

Type	APJ OD YE 54	APJ OD YE 56
Part No.	**785 354**	**785 355**
Size (international)	54 (L)	56 (XL)

Type	APJ OD YE 58	APJ OD YE 60
Part No.	**785 356**	**785 357**
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APJ OD YE 62	APJ OD YE 64
Part No.	**785 358**	**787 702**
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APJ OD YE 66	APJ OD YE 68
Part No.	**787 703**	**787 704**
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested protective trousers – fluorescent yellow, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APT OD YE 42	APT OD YE 44
Part No.	**787 750**	**787 751**
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APT OD YE 46	APT OD YE 48
Part No.	**785 360**	**785 361**
Size (international)	46 (XS)	48 (S)

Type	APT OD YE 50	APT OD YE 52
Part No.	785 362	785 363
Size (international)	50 (M)	52 (M/L)

Type	APT OD YE 54	APT OD YE 56
Part No.	785 364	785 365
Size (international)	54 (L)	56 (XL)

Type	APT OD YE 58	APT OD YE 60
Part No.	785 366	785 367
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APT OD YE 62	APT OD YE 64
Part No.	785 368	787 752
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APT OD YE 66	APT OD YE 68
Part No.	787 753	787 754
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested bib overall – fluorescent yellow, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APD OD YE 42	APD OD YE 44
Part No.	787 931 NEW	787 932 NEW
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APD OD YE 46	APD OD YE 48
Part No.	787 933 NEW	787 934 NEW
Size (international)	46 (XS)	48 (S)

Type	APD OD YE 50	APD OD YE 52
Part No.	787 935 NEW	787 936 NEW
Size (international)	50 (M)	52 (M/L)

Type	APD OD YE 54	APD OD YE 56
Part No.	787 937 NEW	787 938 NEW
Size (international)	54 (L)	56 (XL)

Type	APD OD YE 58	APD OD YE 60
Part No.	787 939 NEW	787 940 NEW
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APD OD YE 62	APD OD YE 64
Part No.	787 941 NEW	787 942 NEW
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APD OD YE 66	APD OD YE 68
Part No.	787 943 NEW	787 944 NEW
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested protective jacket – fluorescent yellow, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APJ OD YE 22	APJ OD YE 23
Part No.	787 710	787 711
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APJ OD YE 24	APJ OD YE 25
Part No.	787 712	787 713
Size (international)	24 (S-K)	25 (M-K)

Type	APJ OD YE 26	APJ OD YE 27
Part No.	787 714	787 715
Size (international)	26 (M/L-K)	27 (L-K)

Type	APJ OD YE 28	APJ OD YE 29
Part No.	787 716	787 717
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APJ OD YE 30
Part No.	787 718
Size (international)	30 (2XL-K)

Arc-fault-tested protective trousers – fluorescent yellow, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APT OD YE 22	APT OD YE 23
Part No.	787 760	787 761
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APT OD YE 24	APT OD YE 25
Part No.	787 762	787 763
Size (international)	24 (S-K)	25 (M-K)

Type	APT OD YE 26	APT OD YE 27
Part No.	787 764	787 765
Size (international)	26 (M/L-K)	27 (L-K)

Type	APT OD YE 28	APT OD YE 29
Part No.	787 766	787 767
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APT OD YE 30
Part No.	787 768

Arc-fault-tested bib overall – fluorescent yellow, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APD OD YE 22	APD OD YE 23
Part No.	787 945 NEW	787 946 NEW
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APD OD YE 24	APD OD YE 25
Part No.	787 947 NEW	787 948 NEW
Size (international)	24 (S-K)	25 (M-K)

Type	APD OD YE 26	APD OD YE 27
Part No.	787 949 NEW	787 950 NEW
Size (international)	26 (M/L-K)	27 (L-K)

Type	APD OD YE 28	APD OD YE 29
Part No.	787 951 NEW	787 952 NEW
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APD OD YE 30
Part No.	787 953 NEW
Size (international)	30 (2XL-K)

Arc-fault-tested protective jacket – fluorescent yellow, men's long sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APJ OD YE 90	APJ OD YE 94
Part No.	787 720	787 721
Size (international)	90 (XS-L)	94 (S-L)

Type	APJ OD YE 98	APJ OD YE 102
Part No.	787 722	787 723
Size (international)	98 (M-L)	102 (M/L-L)

Type	APJ OD YE 106	APJ OD YE 110
Part No.	787 724	787 725
Size (international)	106 (L-L)	110 (XL-L)

Type	APJ OD YE 114	APJ OD YE 118
Part No.	787 726	787 727
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested protective trousers – fluorescent yellow, men's long sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APT OD YE 90	APT OD YE 94
Part No.	787 770	787 771
Size (international)	90 (XS-L)	94 (S-L)

Type	APT OD YE 98	APT OD YE 102
Part No.	787 772	787 773
Size (international)	98 (M-L)	102 (M/L-L)

Type	APT OD YE 106	APT OD YE 110
Part No.	787 774	787 775
Size (international)	106 (L-L)	110 (XL-L)

Type	APT OD YE 114	APT OD YE 118
Part No.	787 776	787 777
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested bib overall – fluorescent yellow, men's long sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APD OD YE 90	APD OD YE 94
Part No.	787 954 NEW	787 955 NEW
Size (international)	90 (XS-L)	94 (S-L)

Type	APD OD YE 98	APD OD YE 102
Part No.	787 956 NEW	787 957 NEW
Size (international)	98 (M-L)	102 (M/L-L)

Type	APD OD YE 106	APD OD YE 110
Part No.	787 958 NEW	787 959 NEW
Size (international)	106 (L-L)	110 (XL-L)

Type	APD OD YE 114	APD OD YE 118
Part No.	787 960 NEW	787 961 NEW
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested protective jacket – fluorescent yellow, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APJ OD YE F 34	APJ OD YE F 36
Part No.	787 730	787 731
Size (international)	34 (XS)	36 (S)

Type	APJ OD YE F 38	APJ OD YE F 40
Part No.	787 732	787 733
Size (international)	38 (M)	40 (M/L)

Type	APJ OD YE F 42	APJ OD YE F 44
Part No.	787 734	787 735
Size (international)	42 (L)	44 (XL)

Type	APJ OD YE F 46	APJ OD YE F 48
Part No.	787 736	787 737
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APJ OD YE F 50	APJ OD YE F 52
Part No.	787 738	787 739
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APJ OD YE F 54	APJ OD YE F 56
Part No.	787 740	787 741
Size (international)	54 (3XL/4XL)	56 (4XL)

Arc-fault-tested protective trousers – fluorescent yellow, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APT OD YE F 34	APT OD YE F 36
Part No.	787 780	787 781
Size (international)	34 (XS)	36 (S)

Type	APT OD YE F 38	APT OD YE F 40
Part No.	787 782	787 783
Size (international)	38 (M)	40 (M/L)

Type	APT OD YE F 42	APT OD YE F 44
Part No.	787 784	787 785
Size (international)	42 (L)	44 (XL)

Type	APT OD YE F 46	APT OD YE F 48
Part No.	787 786	787 787
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APT OD YE F 50	APT OD YE F 52
Part No.	787 788	787 789
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APT OD YE F 54	APT OD YE F 56
Part No.	787 790	787 791
Size (international)	54 (3XL/4XL)	56 (4XL)

Arc-fault-tested bib overall – fluorescent yellow, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	300 g/m²
Primary colour	fluorescent yellow
Secondary colour	grey
Zipper	red

Type	APD OD YE F 34	APD OD YE F 36
Part No.	788 017 NEW	788 018 NEW
Size (international)	34 (XS)	36 (S)

Type	APD OD YE F 38	APD OD YE F 40
Part No.	788 019 NEW	788 020 NEW
Size (international)	38 (M)	40 (M/L)

Type	APD OD YE F 42	APD OD YE F 44
Part No.	788 021 NEW	788 022 NEW
Size (international)	42 (L)	44 (XL)

Type	APD OD YE F 46	APD OD YE F 48
Part No.	788 023 NEW	788 024 NEW
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APD OD YE F 50	APD OD YE F 52
Part No.	788 025 NEW	788 026 NEW
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APD OD YE F 54	APD OD YE F 56
Part No.	788 027 NEW	788 028 NEW
Size (international)	54 (3XL/4XL)	56 (4XL)

Arc-fault-tested protective jacket – fluorescent orange, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APJ OD OG 42	APJ OD OG 44
Part No.	787 800	787 801
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APJ OD OG 46	APJ OD OG 48
Part No.	787 350	787 351
Size (international)	46 (XS)	48 (S)

Type	APJ OD OG 50	APJ OD OG 52
Part No.	787 352	787 353
Size (international)	50 (M)	52 (M/L)

Type	APJ OD OG 54	APJ OD OG 56
Part No.	787 354	787 355
Size (international)	54 (L)	56 (XL)

Type	APJ OD OG 58	APJ OD OG 60
Part No.	787 356	787 357
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APJ OD OG 62	APJ OD OG 64
Part No.	787 358	787 802
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APJ OD OG 66	APJ OD OG 68
Part No.	787 803	787 804
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested protective trousers – fluorescent orange, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APT OD OG 42	APT OD OG 44
Part No.	787 850	787 851
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APT OD OG 48	APT OD OG 50
Part No.	787 361	787 362
Size (international)	48 (S)	50 (M)

Type	APT OD OG 52	APT OD OG 54
Part No.	787 363	787 364
Size (international)	52 (M/L)	54 (L)

Type	APT OD OG 56	APT OD OG 58
Part No.	787 365	787 366
Size (international)	56 (XL)	58 (XL/2XL)

Type	APT OD OG 60	APT OD OG 62
Part No.	787 367	787 368
Size (international)	60 (2XL)	62 (3XL)

Type	APT OD OG 64	APT OD OG 66
Part No.	787 852	787 853
Size (international)	64 (3XL/4XL)	66 (4XL)

Type		APT OD OG 68
Part No.		787 854
Size (international)		68 (4XL/5XL)

Arc-fault-tested bib overall – fluorescent orange, standard men's sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APD OD OG 42	APD OD OG 44
Part No.	787 962 NEW	787 963 NEW
Size (international)	42 (2XS)	44 (2XS/XS)

Type	APD OD OG 46	APD OD OG 48
Part No.	787 964 NEW	787 965 NEW
Size (international)	46 (XS)	48 (S)

Type	APD OD OG 50	APD OD OG 52
Part No.	787 966 NEW	787 967 NEW
Size (international)	50 (M)	52 (M/L)

Type	APD OD OG 54	APD OD OG 56
Part No.	787 968 NEW	787 969 NEW
Size (international)	54 (L)	56 (XL)

Type	APD OD OG 58	APD OD OG 60
Part No.	787 970 NEW	787 971 NEW
Size (international)	58 (XL/2XL)	60 (2XL)

Type	APD OD OG 62	APD OD OG 64
Part No.	787 972 NEW	787 973 NEW
Size (international)	62 (3XL)	64 (3XL/4XL)

Type	APD OD OG 66	APD OD OG 68
Part No.	787 974 NEW	787 975 NEW
Size (international)	66 (4XL)	68 (4XL/5XL)

Arc-fault-tested protective jacket – fluorescent orange, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APJ OD OG 22	APJ OD OG 23
Part No.	787 810	787 811
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APJ OD OG 24	APJ OD OG 25
Part No.	787 812	787 813
Size (international)	24 (S-K)	25 (M-K)

Type	APJ OD OG 26	APJ OD OG 27
Part No.	787 814	787 815
Size (international)	26 (M/L-K)	27 (L-K)

Type	APJ OD OG 28	APJ OD OG 29
Part No.	787 816	787 817
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APJ OD OG 30
Part No.	787 818
Size (international)	30 (2XL-K)

Arc-fault-tested protective trousers – fluorescent orange, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APT OD OG 22	APT OD OG 23
Part No.	787 860	787 861
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APT OD OG 24	APT OD OG 25
Part No.	787 862	787 863
Size (international)	24 (S-K)	25 (M-K)

Type	APT OD OG 26	APT OD OG 27
Part No.	787 864	787 865
Size (international)	26 (M/L-K)	27 (L-K)

Type	APT OD OG 28	APT OD OG 29
Part No.	787 866	787 867
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APT OD OG 30
Part No.	787 868
Size (international)	30 (2XL-K)

Arc-fault-tested bib overall – fluorescent orange, men's short sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APD OD OG 22	APD OD OG 23
Part No.	787 976 NEW	787 977 NEW
Size (international)	22 (2XS/XS-K)	23 (XS-K)

Type	APD OD OG 24	APD OD OG 25
Part No.	787 978 NEW	787 979 NEW
Size (international)	24 (S-K)	25 (M-K)

Type	APD OD OG 26	APD OD OG 27
Part No.	787 980 NEW	787 981 NEW
Size (international)	26 (M/L-K)	27 (L-K)

Type	APD OD OG 28	APD OD OG 29
Part No.	787 982 NEW	787 983 NEW
Size (international)	28 (XL-K)	29 (XL/2XL-K)

Type	APD OD OG 30
Part No.	787 984 NEW
Size (international)	30 (2XL-K)

Arc-fault-tested protective jacket – fluorescent orange, men's long sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APJ OD OG 90	APJ OD OG 94
Part No.	787 820	787 821
Size (international)	90 (XS-L)	94 (S-L)

Type	APJ OD OG 98	APJ OD OG 102
Part No.	787 822	787 823
Size (international)	98 (M-L)	102 (M/L-L)

Type	APJ OD OG 106	APJ OD OG 110
Part No.	787 824	787 825
Size (international)	106 (L-L)	110 (XL-L)

Type	APJ OD OG 114	APJ OD OG 118
Part No.	787 826	787 827
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested protective trousers – fluorescent orange, men's long sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APT OD OG 90	APT OD OG 94
Part No.	787 870	787 871
Size (international)	90 (XS-L)	94 (S-L)

Type	APT OD OG 98	APT OD OG 102
Part No.	787 872	787 873
Size (international)	98 (M-L)	102 (M/L-L)

Type	APT OD OG 106	APT OD OG 110
Part No.	787 874	787 875
Size (international)	106 (L-L)	110 (XL-L)

Type	APT OD OG 114	APT OD OG 118
Part No.	787 876	787 877
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested bib overall – fluorescent orange, men's long sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APD OD OG 90	APD OD OG 94
Part No.	787 985 NEW	787 986 NEW
Size (international)	90 (XS-L)	94 (S-L)

Type	APD OD OG 98	APD OD OG 102
Part No.	787 987 NEW	787 988 NEW
Size (international)	98 (M-L)	102 (M/L-L)

Type	APD OD OG 106	APD OD OG 110
Part No.	787 989 NEW	787 990 NEW
Size (international)	106 (L-L)	110 (XL-L)

Type	APD OD OG 114	APD OD OG 118
Part No.	787 991 NEW	787 992 NEW
Size (international)	114 (XL/2XL-L)	118 (2XL-L)

Arc-fault-tested protective jacket – fluorescent orange, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APJ OD OG F 34	APJ OD OG F 36
Part No.	787 830	787 831
Size (international)	34 (XS)	36 (S)

Type	APJ OD OG F 38	APJ OD OG F 40
Part No.	787 832	787 833
Size (international)	38 (M)	40 (M/L)

Type	APJ OD OG F 42	APJ OD OG F 44
Part No.	787 834	787 835
Size (international)	42 (L)	44 (XL)

Type	APJ OD OG F 46	APJ OD OG F 48
Part No.	787 836	787 837
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APJ OD OG F 50	APJ OD OG F 52
Part No.	787 838	787 839
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APJ OD OG F 54	APJ OD OG F 56
Part No.	787 840	787 841
Size (international)	54 (3XL/4XL)	56 (4XL)

Arc-fault-tested protective trousers – fluorescent orange, standard ladies' sizes



*) Outer fabric after preparation

General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APT OD OG F 34	APT OD OG F 36
Part No.	787 880	787 881
Size (international)	34 (XS)	36 (S)

Type	APT OD OG F 38	APT OD OG F 40
Part No.	787 882	787 883
Size (international)	38 (M)	40 (M/L)

Type	APT OD OG F 42	APT OD OG F 44
Part No.	787 884	787 885
Size (international)	42 (L)	44 (XL)

Type	APT OD OG F 46	APT OD OG F 48
Part No.	787 886	787 887
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APT OD OG F 50	APT OD OG F 52
Part No.	**787 888**	**787 889**
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APT OD OG F 54	APT OD OG F 56
Part No.	**787 890**	**787 891**
Size (international)	54 (3XL/4XL)	56 (4XL)

Arc-fault-tested bib overall – fluorescent orange, standard ladies' sizes

*) Outer fabric after preparation



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test) in combination with UnderWear	630 kJ
Arc rating – ATPV (open arc)	16 cal / cm² *)
Arc rating – ELIM (open arc)	13 cal / cm²
PPE category (NFPA 70E)	PPE 2
Weight per unit area	330 g/m²
Primary colour	fluorescent orange
Secondary colour	grey
Zipper	red

Type	APD OD OG F 34	APD OD OG F 36
Part No.	**787 993** NEW	**787 994** NEW
Size (international)	34 (XS)	36 (S)

Type	APD OD OG F 38	APD OD OG F 40
Part No.	**787 995** NEW	**787 996** NEW
Size (international)	38 (M)	40 (M/L)

Type	APD OD OG F 42	APD OD OG F 44
Part No.	**787 997** NEW	**787 998** NEW
Size (international)	42 (L)	44 (XL)

Type	APD OD OG F 46	APD OD OG F 48
Part No.	**787 999** NEW	**788 000** NEW
Size (international)	46 (XL/2XL)	48 (2XL)

Type	APD OD OG F 50	APD OD OG F 52
Part No.	**788 001** NEW	**788 002** NEW
Size (international)	50 (2XL/3XL)	52 (3XL)

Type	APD OD OG F 54	APD OD OG F 56
Part No.	**788 003** NEW	**788 004** NEW
Size (international)	54 (3XL/4XL)	56 (4XL)

Accessories for Protective clothing ArcFit Indoor

Belt, Flame-retardant

- Elastic



General technical data:	
Colour	black
Suitable for	APT ID/OD

Type	APA B 80	APA B 90
Part No.	**785 377**	**785 370**
Length	80 cm	90 cm
- Men's standard sizes	42	44 + 46
- Men's short sizes	–	22 + 23
- Men's long sizes	–	90
- Ladies' standard sizes	34 + 36	38 + 40

Type	APA B 100	APA B 110
Part No.	**785 371**	**785 372**
Length	100 cm	110 cm
- Men's standard sizes	48 + 50	52 + 54
- Men's short sizes	24 + 25	26 + 27
- Men's long sizes	94 + 98	102 + 106
- Ladies' standard sizes	42 + 44	46 + 48

Type	APA B 120	APA B 130
Part No.	**785 373**	**785 374**
Length	120 cm	130 cm
- Men's standard sizes	56 + 58	60 +62
- Men's short sizes	28 + 29	30
- Men's long sizes	110 + 114	118
- Ladies' standard sizes	50 + 52	54 + 56

Type	APA B 140	APA B 150
Part No.	**785 375**	**785 376**
Length	140 cm	150 cm
- Men's standard sizes	64 + 66	68
- Men's short sizes	–	–
- Men's long sizes	–	–
- Ladies' standard sizes	–	–



Protective clothing UnderWear



Increase the protection level of your PPE against arc faults with the new UnderWear.

A layered clothing principle increases the level of protection in conjunction with DEHNcare ArcFit.

- Bicolour polo shirt, arc fault protection class APC 1; high-visibility clothing class 1
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	IEC 61482-2, EN ISO 11612, EN 1149-5, EN ISO 20471

Arc-fault-tested undershirt, long-sleeved



General technical data:	
Arc fault protection class (box test 4 kA / 0.5 s – single-pole)	APC 1
Arc power (W_{arc} or W_{LBP})	168 kJ
Arc Rating – ATPV (Open Arc Test)	4.1 cal / cm²
In combination with DEHNcare ArcFit Indoor	31 cal / cm²
In combination with DEHNcare ArcFit Outdoor	37 cal / cm²
Arc Rating – ELIM (in combination with DEHNcare ArcFit Indoor)	28 cal / cm²
Arc Rating – ELIM (in combination with DEHNcare ArcFit Outdoor)	34 cal / cm²
Material	Cotton (50%), modacrylic (39%), viscose (10%), static inhibitors (1%)
Weight per unit area	160 g/m²
Colour	blue

Type	APUS XS	APUS S
Part No.	**787 011**	**787 012**
Size (international)	XS	S

Type	APUS M	APUS L
Part No.	**787 013**	**787 014**
Size (international)	M	L

Type	APUS XL	APUS 2XL
Part No.	**787 015**	**787 016**
Size (international)	XL	2XL

Type	APUS 3XL	APUS 4XL
Part No.	**787 017**	**787 018**
Size (international)	3XL	4XL

Arc-fault-tested underpants



General technical data:	
Arc fault protection class (box test 4 kA / 0.5 s – single-pole)	APC 1
Arc power (W_{arc} or W_{LBP})	168 kJ
Arc Rating – ATPV (Open Arc Test)	4.1 cal / cm²
In combination with DEHNcare ArcFit Indoor	31 cal / cm²
In combination with DEHNcare ArcFit Outdoor	37 cal / cm²
Arc Rating – ELIM (in combination with DEHNcare ArcFit Indoor)	28 cal / cm²
Arc Rating – ELIM (in combination with DEHNcare ArcFit Outdoor)	34 cal / cm²
Material	Cotton (50%), modacrylic (39%), viscose (10%), static inhibitors (1%)
Weight per unit area	160 g/m²
Colour	blue

Type	APUP XS	APUP S
Part No.	**787 021**	**787 022**
Size (international)	XS	S

Type	APUP M	APUP L
Part No.	**787 023**	**787 024**
Size (international)	M	L

Type	APUP XL	APUP 2XL
Part No.	**787 025**	**787 026**
Size (international)	XL	2XL

Type	APUP 3XL	APUP 4XL
Part No.	**787 027**	**787 028**
Size (international)	3XL	4XL

Arc-fault-tested polo shirt, long-sleeved



General technical data:	
Arc fault protection class (box test 4 kA / 0.5 s – single-pole)	APC 1
Arc power (W_{arc} or W_{LBP})	168 kJ
Arc Rating – ATPV (Open Arc Test)	5.4 cal / cm²
Material	Cotton (50%), modacrylic (39%), viscose (10%), static inhibitors (1%)
Weight per unit area	160 g/m²
Colour	fluorescent yellow/blue
High-visibility clothing class	1

Type	APPS BC XS	APPS BC S
Part No.	**787 001**	**787 002**
Size (international)	XS	S

Type	APPS BC M	APPS BC L
Part No.	**787 003**	**787 004**
Size (international)	M	L

Type	APPS BC XL	APPS BC 2XL
Part No.	**787 005**	**787 006**
Size (international)	XL	2XL

Type	APPS BC 3XL	APPS BC 4XL
Part No.	**787 007**	**787 008**
Size (international)	3XL	4XL

Protective clothing ArcFit HLP 63



Personal protectiveclothing for work on electrical installations with higher energies.

- All-round protection with arc flash protection class APC 2 – PPE 4 as per NFPA 70E
- Even more safety for demanding work – APC 2 also with increased arc energy of 630 kJ (W_{arc} or W_{LBP})
- Environmentally friendly – washable up to 60°
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	IEC 61482-2, EN ISO 11612, EN 1149-5, EN ISO 13688, EN ISO 11611, EN 17353, ASTM F1959
Material – outer fabric	**Modacrylic (46%), HT viscose (22%), FR viscose (18%), para-aramid (12%), static inhibitors (2%)**
Material – lining / non-woven material	**Lining: Aramid (34%), FR viscose (34%), Reg. viscose (32%) / non-woven material: FR viscose (85%), para-aramid (15%)**
Material (sewing thread)	**Kevlar (100%)**

Arc-fault-tested protective jacket



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)	630 kJ
Arc Rating – ATPV (Open Arc)	63 cal / cm²
Arc Rating – ELIM (Open Arc)	58 cal / cm²
PPE category (NFPA 70E)	PPE 4
Outer fabric weight per unit area	225 g / m²
Lining / non-woven material weight per unit area	430 g / m²
Colour	navy blue
Zipper	red

Type	APJ 63C S	APJ 63C M
Part No.	**787 370**	**787 371**
Size (international)	48 (S)	50/52 (M)

Type	APJ 63C L	APJ 63C XL
Part No.	**787 372**	**787 373**
Size (international)	52/54 (L)	56/58 (XL)

Type	APJ 63C 2XL	APJ 63C 3XL
Part No.	**787 374**	**787 375**
Size (international)	58/60 (2XL)	62/64 (3XL)

Type	APJ 63C 4XL
Part No.	**787 376**
Size (international)	64/66 (4XL)

Arc-fault-tested protective trousers (bib overall as over-trousers)



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)	630 kJ
Arc Rating – ATPV (Open Arc)	63 cal / cm²
Arc Rating – ELIM (Open Arc)	58 cal / cm²
PPE category (NFPA 70E)	PPE 4
Outer fabric weight per unit area	225 g / m²
Lining / non-woven material weight per unit area	430 g / m²
Colour	navy blue
Zipper	red

Type	APD 63C S	APD 63C M
Part No.	**787 380**	**787 381**
Size (international)	48 (S)	50/52 (M)

Type	APD 63C L	APD 63C XL
Part No.	**787 382**	**787 383**
Size (international)	52/54 (L)	56/58 (XL)

Type	APD 63C 2XL	APD 63C 3XL
Part No.	**787 384**	**787 385**
Size (international)	58/60 (2XL)	62/64 (3XL)

Type	APD 63C 4XL
Part No.	**787 386**
Size (international)	64/66 (4XL)

Arc-fault-tested protective coat



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)	630 kJ
Arc Rating – ATPV (Open Arc)	63 cal / cm²
Arc Rating – ELIM (Open Arc)	58 cal / cm²
PPE category (NFPA 70E)	PPE 4
Outer fabric weight per unit area	225 g / m²
Lining / non-woven material weight per unit area	430 g / m²
Colour	navy blue
Zipper	red

Type	APC 63C S	APC 63C M
Part No.	**785 880** NEW	**785 881** NEW
Size (international)	48 (S)	50/52 (M)

Type	APC 63C L	APC 63C XL
Part No.	**785 882** NEW	**785 883** NEW
Size (international)	52/54 (L)	56/58 (XL)

Type	APC 63C 2XL	APC 63C 3XL
Part No.	**785 884** NEW	**785 885** NEW
Size (international)	58/60 (2XL)	62/64 (3XL)

Type	APC 63C 4XL
Part No.	**785 886** NEW
Size (international)	64/66 (4XL)

Protective clothing ArcClassic



The ArcClassic is ideal as protective equipment in transformer stations and switchgear installations for non-routine switching operations.

- Comfortable to wear due to the use of breathable leather and neoprene
- Flame-retardant zippers and hook-and-loop fasteners
- Reflective strips
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	IEC 61482-2, EN ISO 14116
Outer material	**Siliconised calf grain leather, 100% Kevlar® interlock knit**
Inner material	**100% cotton**
Material (sewing thread)	**100% Kevlar®**

Arc-fault-tested Protective Coat

- Reinforced stand-up collar
- Useful side arm pockets
- Zip and hook-and-loop fasteners



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)	630 kJ
EuroTest PIP001 (10 kA / 1 s – three-pole)	Yes
Arc Rating – ATPV (Open Arc Test)	33.1 cal / cm²
PPE category (NFPA 70E)	PPE 3

Type	APC 48 50	APC 52 54
Part No.	**785 755**	**785 756**
Size (international)	48 / 50 (M)	52 / 54 (L)

Type	APC 56 58	APC 60 62
Part No.	**785 757**	**785 758**
Size (international)	56 / 58 (XL)	60 / 62 (XXL)

Type	APC 64 66
Part No.	**785 759**
Size (international)	64 / 66 (3XL)

In case of very heavy soiling, there is the option of special leather dry cleaning. Further information can be found at www.dehn.online-impraegnierung.de.



Jacket with reinforced stand-up collar and useful side arm pockets.



Trousers with adjustable belt and useful leg pockets.

Arc-fault-tested Protective Jacket

- Reinforced stand-up collar
- Useful side arm pockets
- Zip and hook-and-loop fastener



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)	630 kJ
EuroTest PIP001 (10 kA / 1 s – three-pole)	Yes
Arc Rating – ATPV (Open Arc Test)	33.1 cal / cm²
PPE category (NFPA 70E)	PPE 3

Type	APJ 46	APJ 48
Part No.	**785 769**	**785 770**
Size (international)	46 (XS)	48 (S)

Type	APJ 50	APJ 52
Part No.	**785 771**	**785 772**
Size (international)	50 (M)	52 (L)

Type	APJ 54	APJ 56
Part No.	**785 773**	**785 774**
Size (international)	54 (XL)	56 (XXL)

Type	APJ 58
Part No.	**785 775**
Size (international)	58 (3XL)

Arc-fault-tested Protective Trousers

- Knee pads and pair of braces included
- Pockets for knee pads
- Adjustable belt



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)	630 kJ
Arc Rating – ATPV (Open Arc Test)	29.2 cal / cm²
PPE category (NFPA 70E)	PPE 3

Type	APT 46	APT 48
Part No.	**785 779**	**785 780**
Size (international)	46 (XS)	48 (S)

Type	APT 50	APT 52
Part No.	**785 781**	**785 782**
Size (international)	50 (M)	52 (L)

Type	APT 54	APT 56
Part No.	**785 783**	**785 784**
Size (international)	54 (XL)	56 (XXL)

Type	APT 58
Part No.	**785 785**
Size (international)	58 (3XL)

Arc-fault-tested Protective Hood

Note: Safety helmet for electricians ESH U S is not included in delivery!



Type	APHO AS
Part No.	**785 750**
Material	**plastic, neoprene, leather**
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc Rating – ATPV (Open Arc Test)	37.2 cal / cm^2
PPE Category (NFPA 70E)	PPE 3
Visible light transmittance (VLT)	29.1 ... 43.2 %

Accessories for Protective clothing ArcClassic

Pair of braces

For arc-fault-tested protective trousers with four hook-and-loop fasteners.



Type	APA B
Part No.	**785 788**
Colour	Black ●

Knee pads

For arc-fault-tested protective trousers, to be inserted into the lining of the trouser legs (slit pockets).



Type	APA KP
Part No.	**785 789**
Material	**Foam**



Closest to the danger: The hands need special protection

They are our most important tools when working on electrical systems – and of all body parts, they are closest to the arc fault hazard.
In the event of an arc fault, the hands are exposed to the highest energy density.
With its test principle GS-ET-42-2, the DGUV has set new guidelines and recommends higher protection classes than for other personal protective equipment against the thermal effects of an electric fault arc.
A risk assessment (see page 21) must be carried out to determine the appropriate protection class, and the dynamic component must be assessed when working.

Simply browse and order directly:
DEHNcare protective gloves online:

A good feeling when working with electricity: DEHNcare protective gloves

Our gloves are available in different levels of protection and offer the following advantages:

- excellent fit
- optimum mobility,
- quality workmanship,
- tested safety, certified according to PPE regulation (EU) 2016/425.

The right protection for every application: our range at a glance

DEHNcare APG XT
Protection class APC 2 150

DEHNcare APG
Protection class APC 2 for working distances up to at least 300 mm

Protective gloves APG XT



Arc-fault-tested protective gloves of protection class APC2 150 (special class for hand protection according to the DGUV) for working on electrical systems.

- First gloves on the German market which have obtained protection class APC 2 at 150 mm in accordance with the GS-ET 42-2 test principle.
- Specially designed to provide the necessary protection even at the smallest distance from the source of risk
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	GS-ET 42-2, ASTM F2675, EN 388, EN 407
Material (glove palm)	**Siliconised calf grain leather**
Material (glove back)	**100% Kevlar interlock knit**
Material (sewing thread)	**Kevlar**

Arc-fault-tested protective gloves XT



General technical data:		
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)		APC 2 150
Arc energy (APC 2 150) (W_{arc} or W_{LBP})		320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)		630 kJ
Arc Rating – ATPV (Open Arc Test)		40 cal / cm²
PPE category (NFPA 70E)		PPE 4
Gauntlet length		140 mm
Type APG XT ...	**7**	**8**
Part No.	**785 830**	**785 831**
Total length	330 mm	335 mm
Size (international)	7 (S)	8 (M)
Type APG XT ...	**9**	**10**
Part No.	**785 832**	**785 833**
Total length	340 mm	350 mm
Size (international)	9 (L)	10 (XL)
Type APG XT ...	**11**	**12**
Part No.	**785 834**	**785 835**
Total length	355 mm	360 mm
Size (international)	11 (2XL)	12 (3XL)
Type APG XT ...		**13**
Part No.		**785 836**
Total length		365 mm
Size (international)		13 (4XL)

Arc-fault-tested protective gloves with long gauntlet XT



General technical data:		
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)		APC 2 150
Arc energy (APC 2 150) (W_{arc} or W_{LBP})		320 kJ
Extended electric arc energy (W_{arc} or W_{LBP}) (based on box test)		630 kJ
Arc Rating – ATPV (Open Arc Test)		40 cal / cm²
PPE category (NFPA 70E)		PPE 4
Gauntlet length		230 mm
Type APG XT ...	**7 L**	**8 L**
Part No.	**785 840**	**785 841**
Total length	410 mm	420 mm
Size (international)	7 (S)	8 (M)
Type APG XT ...	**9 L**	**10 L**
Part No.	**785 842**	**785 843**
Total length	430 mm	435 mm
Size (international)	9 (L)	10 (XL)
Type APG XT ...	**11 L**	**12 L**
Part No.	**785 844**	**785 845**
Total length	440 mm	445 mm
Size (international)	11 (2XL)	12 (3XL)
Type APG XT ...		**13 L**
Part No.		**785 846**
Total length		450 mm
Size (international)		13 (4XL)

Protective gloves APG



Arc-fault-tested protective gloves for working on electrical installations.

- For protection against thermal and mechanical risks
- Excellent fit due to special glove cut
- Good touch sensitivity due to soft leather inner surface of the gloves
- Very comfortable to wear due to the use of breathable materials
- **Now also in grey**
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	GS-ET 42-2, ASTM F2675, EN 388, EN 407
Material (glove palm)	**Siliconised calf grain leather**
Material (glove back)	**100% Kevlar® interlock knit**
Material (sewing thread)	**Kevlar®**

Arc-fault-tested protective gloves, grey



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (APC 2) (W_{arc} or W_{LBP})	320 kJ
Arc energy (APC 1 150) (W_{arc} or W_{LBP})	168 kJ
Arc Rating – ATPV (Open Arc Test)	35 cal / cm²
PPE category (NFPA 70E)	PPE 3
Gauntlet length	140 mm

Type APG ...	GREY 7	GREY 8
Part No.	**785 850**	**785 851**
Total length	330 mm	335 mm
Size (international)	7 (S)	8 (M)

Type APG ...	GREY 9	GREY 10
Part No.	**785 852**	**785 853**
Total length	340 mm	350 mm
Size (international)	9 (L)	10 (XL)

Type APG ...	GREY 11	GREY 12
Part No.	**785 854**	**785 855**
Total length	355 mm	360 mm
Size (international)	11 (2XL)	12 (3XL)

Type APG ...	GREY 13
Part No.	**785 856**
Total length	365 mm
Size (international)	13 (4XL)

Arc-fault-tested protective gloves with long gauntlet, grey



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (APC 2) (W_{arc} or W_{LBP})	320 kJ
Arc energy (APC 1 150) (W_{arc} or W_{LBP})	168 kJ
Arc Rating – ATPV (Open Arc Test)	35 cal / cm²
PPE category (NFPA 70E)	PPE 3
Gauntlet length	230 mm

Type APG ...	GREY 7 L	GREY 8 L
Part No.	**785 860**	**785 861**
Total length	410 mm	420 mm
Size (international)	7 (S)	8 (M)

Type APG ...	GREY 9 L	GREY 10 L
Part No.	**785 862**	**785 863**
Total length	430 mm	435 mm
Size (international)	9 (L)	10 (XL)

Type APG ...	GREY 11 L	GREY 12 L
Part No.	**785 864**	**785 865**
Total length	440 mm	445 mm
Size (international)	11 (2XL)	12 (3XL)

Type APG ...	GREY 13 L
Part No.	**785 866**
Total length	450 mm
Size (international)	13 (4XL)

Arc-fault-tested protective gloves, beige



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc Rating – ATPV (Open Arc Test)	32.8 cal / cm²
PPE category (NFPA 70E)	PPE 3
Gauntlet length	115 mm

Type APG ...	8	9
Part No.	**785 796**	**785 797**
Total length	310 mm	315 mm
Size (international)	8 (M)	9 (L)

Type APG ...	10	11
Part No.	**785 798**	**785 799**
Total length	325 mm	330 mm
Size (international)	10 (XL)	11 (2XL)

Type APG ...	12
Part No.	**785 800**
Total length	335 mm
Size (international)	12 (3XL)

Arc-fault-tested protective gloves with long gauntlet, beige



General technical data:	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc Rating – ATPV (Open Arc Test)	32.8 cal / cm²
PPE category (NFPA 70E)	PPE 3
Gauntlet length	250 mm

Type APG ...	8 L	9 L
Part No.	**785 808**	**785 809**
Total length	440 mm	450 mm
Size (international)	8 (M)	9 (L)

Type APG ...	10 L	11 L
Part No.	**785 810**	**785 811**
Total length	455 mm	460 mm
Size (international)	10 (XL)	11 (2XL)

Type APG ...	12 L
Part No.	**785 812**
Total length	465 mm
Size (international)	12 (3XL)

Insulating gloves up to 500 V



Work on an electric vehicle with insulating gloves.

- For working on live parts
- The gloves provide an excellent fit and high elasticity with maximum insulating capacity
- Different designs available to suit your needs
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	EN 60903, IEC 61482-1-2

Insulating gloves, 500 V, category AZC

Acid, ozone and cold-resistant



General technical data:	
Category	AZC
Class	00
Max. operating voltage	500 V AC (750 V DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Colour	red
Thickness	0.5 mm
Total length	360 mm
Material	**Natural rubber**

Type	KL-A-8-36-S	KL-A-9-36-S
Part No.	**787 480**	**787 481**
Size	8	9

Type	KL-A-10-36-S	KL-A-11-36-S
Part No.	**787 482**	**787 483**
Size	10	11

Insulating gloves, 500 V, category RC, two-colour

Resistant against acids, ozone and oil, as well as extremely low temperatures



General technical data:	
Category	RC
Class	00
Max. operating voltage	500 V AC (750 V DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc rating in accordance with ASTM F2675	14 cal / cm²
Colour	black
Thickness	1.8 mm
Total length	360 mm
Material	**Natural rubber**

Type	KC-AI-8-36-S	KC-AI-9-36-S
Part No.	**787 490**	**787 491**
Size	8	9

Type	KC-AI-10-36-S	KC-AI-11-36-S
Part No.	**787 492**	**787 493**
Size	10	11

Insulating gloves up to 1000 V



Work on an electric vehicle with insulating gloves.

- For working on live parts
- The gloves provide an excellent fit and high elasticity with maximum insulating capacity
- Different designs available to suit your needs
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	EN 60903, IEC 61482-1-2, ASTM F2675/ F2675M-22e1

Insulating gloves, 1,000 V, category RC

Resistant against acids, ozone and oil, as well as extremely low temperatures



General technical data:	
Category	RC
Class	0
Max. operating voltage	1,000 V AC (1,500 V DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Colour	red
Thickness	1.0 mm
Total length	360 mm
Material	**Natural rubber**

Type	KL-B-8-36-S	KL-B-9-36-S
Part No.	**787 484**	**787 485**
Size	8	9

Type	KL-B-10-36-S	KL-B-11-36-S
Part No.	**787 486**	**787 487**
Size	10	11

Insulating gloves, 1,000 V, category RC, two-colour

Resistant against acids, ozone and oil, as well as extremely low temperatures

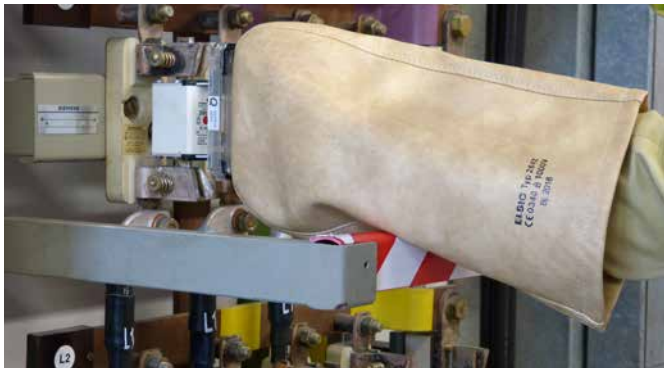


General technical data:	
Category	RC
Class	0
Max. operating voltage	1,000 V AC (1,500 V DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc rating in accordance with ASTM F2675	25 cal / cm²
Colour	black
Thickness	2.3 mm
Total length	360 mm
Material	**Natural rubber**

Type	KC-BI-8-36-S	KC-BI-9-36-S
Part No.	**787 494**	**787 495**
Size	8	9

Type	KC-BI-10-36-S	KC-BI-11-36-S
Part No.	**787 496**	**787 497**
Size	10	11

NH fuse puller up to 1,000 V



Operating an NH fuse with an NH fuse puller with sleeve.

- Zum Arbeiten an unter Spannung stehenden Teilen
- Mit festangesetzter Stulpe
- Zertifiziert gemäß PSA-Verordnung (EU) 2016/425

General technical data:	
Standard	VDE 0680-4; GS-ET-38

NH fuse puller with sleeve



Type	NHS AG 00 3 NS
Part No.	**785 645**
Nominal voltage up to (U_N)	1,000 V AC
Colour	Beige
Material	**Coated cotton fabric**

Insulating gloves up to 36 kV



Work on live parts with insulating gloves.

- Zum Arbeiten an unter Spannung stehenden Teilen bis 36 kV AC
- Kategorie RC = Beständigkeit gegen Säuren, Ozon und Öl sowie gegen extrem niedrige Temperaturen
- Zertifiziert gemäß PSA-Verordnung (EU) 2016/425

General technical data:	
Standard	EN 60903, IEC 61482-1-2, ASTM F2675/ F2675M-22e1

Insulating gloves – class 1

Resistant against acids, ozone and oil, as well as extremely low temperatures



General technical data:	
Category	RC
Max. operating voltage	7.5 kV AC (11.25 kV DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
ATPV	7.2 cal / cm²
Total length	410 mm
Wall thickness	1.5 mm
Packaging colour	white

Type	KL-C-ARC-8-41-S	KL-C-ARC-9-41-S
Part No.	787 100	787 101
Size	8	9

Type	KL-C-ARC-10-41-S	KL-C-ARC-11-41-S
Part No.	787 102	787 103
Size	10	11

Insulating gloves – class 2

Resistant against acids, ozone and oil, as well as extremely low temperatures



General technical data:	
Category	RC
Max. operating voltage	17 kV AC (25.5 kV DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
ATPV	16 cal / cm²
Total length	410 mm
Wall thickness	2.3 mm
Packaging colour	white / yellow

Type	KL-D-ARC-8-41-S	KL-D-ARC-9-41-S
Part No.	787 104	787 105
Size	8	9

Type	KL-D-ARC-10-41-S	KL-D-ARC-11-41-S
Part No.	787 106	787 107
Size	10	11

Insulating gloves – class 3

Resistant against acids, ozone and oil, as well as extremely low temperatures



General technical data:	
Category	RC
Max. operating voltage	26.5 kV AC (39.75 kV DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
ATPV	26.6 cal / cm²
Total length	410 mm
Wall thickness	2.9 mm
Packaging colour	white / green

Type	KL-E-ARC-8-41-S	KL-E-ARC-9-41-S
Part No.	787 108	787 109
Size	8	9

Type	KL-E-ARC-10-41-S	KL-E-ARC-11-41-S
Part No.	787 110	787 111
Size	10	11

Insulating gloves – class 4

Resistant against acids, ozone and oil, as well as extremely low temperatures



General technical data:	
Category	RC
Max. operating voltage	36 kV AC (54 kV DC)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
ATPV	39 cal / cm²
Total length	410 mm
Wall thickness	3.5 mm
Packaging colour	white / orange

Type	KL-F-ARC-9-41-S	KL-F-ARC-10-41-S
Part No.	787 112	787 113
Size	9	10

Type	KL-F-ARC-11-41-S
Part No.	787 114
Size	11

Accessories for Insulating gloves up to 36 kV

Pneumatic glove tester

Suitable for the periodic inspection pursuant to EN 60903.



Type	VPG90
Part No.	787 000
Colour	Grey

Storage bag, empty

With hook-and-loop fastener and hook.



Type	AT IHS NS
Part No.	785 490
Dimensions	400 x 180 x 50 mm
Colour	Brown

Safety shoes with insulating soles up to 1000 V



Safety shoes are an important part of personal protective equipment.

- Safety shoes and boots for electricians
- Insulating outsole for up to 1,000 V
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	EN ISO 20345:2011
Material	Leather
Lining	**Textile**
Classification as per EN ISO 20345:2011	Class I
Protection class as per EN ISO 20345:2011	SB

Low shoe, type FLOW



Type	FLOW SB FO E P CI WRU SRC 36	FLOW SB FO E P CI WRU SRC 37
Part No.	**787 200**	**787 201**
Size	36	37

Type	FLOW SB FO E P CI WRU SRC 38	FLOW SB FO E P CI WRU SRC 39
Part No.	**787 202**	**787 203**
Size	38	39

Type	FLOW SB FO E P CI WRU SRC 40	FLOW SB FO E P CI WRU SRC 41
Part No.	**787 204**	**787 205**
Size	40	41

Type	FLOW SB FO E P CI WRU SRC 42	FLOW SB FO E P CI WRU SRC 43
Part No.	**787 206**	**787 207**
Size	42	43

Type	FLOW SB FO E P CI WRU SRC 44	FLOW SB FO E P CI WRU SRC 45
Part No.	**787 208**	**787 209**
Size	44	45

Type	FLOW SB FO E P CI WRU SRC 46	FLOW SB FO E P CI WRU SRC 47
Part No.	**787 210**	**787 211**
Size	46	47

Laced boots, type LIGHT



Type	LIGHT SB FO E P CI WRU SRC 36	LIGHT SB FO E P CI WRU SRC 37
Part No.	**787 220**	**787 221**
Size	36	37

Type	LIGHT SB FO E P CI WRU SRC 38	LIGHT SB FO E P CI WRU SRC 39
Part No.	**787 222**	**787 223**
Size	38	39

Type	LIGHT SB FO E P CI WRU SRC 40	LIGHT SB FO E P CI WRU SRC 41
Part No.	**787 224**	**787 225**
Size	40	41

Type	LIGHT SB FO E P CI WRU SRC 42	LIGHT SB FO E P CI WRU SRC 43
Part No.	**787 226**	**787 227**
Size	42	43

Type	LIGHT SB FO E P CI WRU SRC 44	LIGHT SB FO E P CI WRU SRC 45
Part No.	**787 228**	**787 229**
Size	44	45

Type	LIGHT SB FO E P CI WRU SRC 46	LIGHT SB FO E P CI WRU SRC 47
Part No.	**787 230**	**787 231**
Size	46	47

DEHNcare APS face shield with active protection



Arc-fault-tested face shield with additional illumination.

- Active protection (darkening) in case of an arc fault
- Best visual perception due to ergonomic chin protection
- Anti-mist coating
- Full protection even with scratches
- Service life of 10 years
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	GS-ET-29, EN 166, EN 170

Arc-fault-tested face shield with clip

- Fits the slot in the ESH U S safety helmet for electricians
- With slot on both sides for LED face shield light



General technical data:	
Material	**Polycarbonate**
Thickness	1.5 mm
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	318 kJ

Type APS T AS ...	CL2 SC	14C SC
Part No.	**785 821**	**785 822**
Colour	Transparent	Light grey
Arc Rating – ATPV (Open Arc Test)	–	14 cal / cm²
Visible light transmittance (VLT)	74.4 ... 100 %	43.2 ... 58.1 %
Light transmittance class	0	2

Type APS T AS ...	25C SC
Part No.	**785 823**
Colour	Grey
Arc Rating – ATPV (Open Arc Test)	25 cal / cm²
Visible light transmittance (VLT)	43.2 ... 58.1 %
Light transmittance class	2

Accessories for DEHNcare APS face shield with active protection

LED face shield lamp

Suitablefor slots on DEHNcare APS T AS face shields ...
Note: Battery not included!



Type	LED APS T AS
Part No.	**785 829**
Degree of protection	IPX4
Max. luminous flux	60 lumen

Arc-fault-tested face shield with tensioning strap

- Suitable for all standard safety helmets for electricians
- With slot on both sides for LED face shield light



General technical data:	
Material	**Polycarbonate**
Thickness	1.5 mm
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	318 kJ

Type APS T AS ...	CL2 FS	14C FS
Part No.	**785 824**	**785 825**
Colour	Transparent	Light grey
Arc Rating – ATPV (Open Arc Test)	–	14 cal / cm²
Visible light transmittance (VLT)	74.4 ... 100 %	43.2 ... 58.1 %
Light transmittance class	0	2

Type APS T AS ...	25C FS
Part No.	**785 826**
Colour	Grey
Arc Rating – ATPV (Open Arc Test)	25 cal / cm²
Visible light transmittance (VLT)	43.2 ... 58.1 %
Light transmittance class	2

Accessories for DEHNcare APS face shield with active protection

Visor holder with clip

For arc-fault-tested face shields with clip; APS T AS CL2 SC / APS T AS 14C SC / APS T AS 25C SC.



Type	VH SC APS T AS
Part No.	**785 820**
Material	**Nylon**
Colour	Red

Visor holder with strap

For arc-fault-tested face shields with strap; APS T AS CL2 FS / APS T AS 14C FS / APS T AS 25C FS.



Type	VH FS APS T AS
Part No.	**785 827**
Material	**Nylon**
Colour	Red

Microfibre bag

For cleaning and storing the DEHNcare APS face shields.



Type	MFB APS
Part No.	**785 724**
Suitable for	DEHNcare APS
Dimension	450 x 400 mm
Colour	black ●

Spare parts for visor holder with clip

Spare part for visor holders with clips consisting of two clips (left and right), including fixing bolts.



Type	R KIT APS ... SC
Part No.	**785 828**
Material	**Plastic**

Balaclava



The protection level is increased by wearing a balaclava.

- Increases the protective effect in combination with the face shield DEHNcare APS T AS …
- Large face opening
- Large collar protects the neck
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	EN ISO 13688, EN ISO 11612, EN 61482-1-2

Arc-fault-tested balaclava



*) Outer fabric after preparation

Type	APB APC2 29C
Part No.	**785 790**
Material	**Modacrylic (55%), cotton (45%)**
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2 *)
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc Rating – ATPV (Open Arc Test)	29 cal / cm^2
PPE category (NFPA 70E)	PPE 3
Colour	navy blue
Size (international)	One size

DEHNcare APS face shield with headgear



Face shield can be worn without additional helmet.

- Face shield with headgear for protection against the mechanical and thermal hazards of an electric arc during live working or when in close proximity to live parts.
- Arcing class APC 1
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	GS-ET 29, EN 166

Arc-fault-tested face shield with headgear



Type	APS ARC E1 SK7
Part No.	**785 870**
Nominal voltage up to (U_N)	1000 V
Colour	Transparent
Material	**Polycarbonate**
Wall thickness	approx. 2 mm
Arc fault protection class (box test 4 kA / 0.5 s – single-pole)	APC 1
Arc energy (W_{arc} or W_{LBP})	168 kJ

Accessories for DEHNcare APS face shield with headgear

Microfibre bag

For cleaning and storing the DEHNcare APS face shields.



Type	MFB APS
Part No.	**785 724**
Suitable for	DEHNcare APS
Dimension	450 x 400 mm
Colour	black ●

DEHNcare APS face shield with lever arms



Fitter wearing protective equipment for charging post maintenance.

- Fog-free on the inside
- Extremely scratch-resistant
- Chemical-resistant on the outside
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	GS-ET-29, EN 166, EN 170

Arc-fault-tested Face Shield with mechanical Lever



Type APS ...	CL1 MEHA
Part No.	**785 721**
Nominal voltage up to (U_N)	1000 V
Colour	Transparent
Material	**Polycarbonate**
Wall thickness	approx. 2 mm
Arc fault protection class (box test 4 kA / 0.5 s - single-pole)	APC 1
Arc energy (W_{arc} or W_{LBP})	158 kJ
Visible light transmittance (VLT)	≥ 75 %

Arc-fault-tested Face Shield with magnetic Lever



Type APS ...	CL2 MAHA
Part No.	**785 722**
Nominal voltage up to (U_N)	1000 V
Colour	blue
Material	**polycarbonate**
Wall thickness	approx. 2 mm
Arc fault protection class (box test 7 kA / 0.5 s - single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	318 kJ
Visible light transmittance (VLT)	≥ 74.4 %

Accessories f. DEHNcare APS face shield with lever arms

Microfibre bag

For cleaning and storing the DEHNcare APS face shields.



Type	MFB APS
Part No.	**785 724**
Suitable for	DEHNcare APS
Dimension	450 x 400 mm
Colour	black ●

DEHNcare ESH U S safety helmet f. electricians



Safety helmet for electricians is part of the personal protective equipment.

- With slot for APS ... SC face shield
- Adjustable to head sizes from 52 to 61 cm via push / rotary knob
- Six-point suspension with sweatband
- Certified according to PPE regulation (EU) 2016/425

General technical data:	
Standard	EN 50365, EN 397

ESH U S

Saftey helmet with short peak



General technical data:	
Nominal voltage up to (U_N)	1000 V AC
Material	**HDPE plastics**

Type ESH U 1000 S ...	SY	SW
Part No.	**785 705**	**785 706**
Colour	Yellow ●	white ○

Type ESH U 1000 S ...	SO	SB
Part No.	**785 707**	**785 708**
Colour	Orange ●	Blue ●

Type ESH U 1000 S ...	SR
Part No.	**785 709**
Colour	Red ●

Accessories for DEHNcare ESH U S safety helmet

Chin strap

For safety helmets for electricians ESH U S 1000, adjustable.



Type	KR ESH U 1000
Part No.	**785 738**
Colour	Black ●

Sweat band

For replacement on the ESH U S safety helmet for electricians



Type	SB ESH U 1000
Part No.	**785 739**
Material	**Hydro-flock (S31F) PVC (S31P)**
PU	10 pc(s).

LED head torch



- Fits the slot of the ESH US safety helmet for electricians, in connection with face shield APS CL1 MEHA and APS CL2 MAHA
- With two separate reflectors for distance and area lighting, with 4 switching steps
- Two charging options: micro USB or charging cradle. Charging unit with with charging cradle included in delivery

Type	LED HL ESH
Part No.	**785 723**
Degree of protection	IP 67
Light current max.	115 lumens

Indoor and outdoor electrician sets



To have everything you need for working on electrical systems, simply grab your bag.

- Various sets for indoor and outdoor use
- Available in different sizes
- Components comply with arc fault protection class 2 (APC 2)
- Protective equipment is certified according to PPE regulation (EU) 2016/425

Indoor



For the indoor electrician set, the DEHNcare ArcFit is only available in the standard colours grey/black.

General technical data:	
Protective jacket/trousers	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Protective Gloves	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc rating – ATPV (open arc test)	32.8 cal / cm²
PPE category (NFPA 70E)	PPE 3
Face shield	transparent
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	318 kJ
Visible light transmittance (VLT)	74.4 ... 100 %
Light transmittance class	0
Safety helmet for electricians	yellow
Nominal voltage up to (U_N)	1000 V
Microfibre bag	450 x 400 mm
Storage bag	Ø300, 500 mm

Type PSA ESET ...	S ID	M ID
Part No.	**785 906**	**785 900**
Protective jacket/trousers	48 (S)	50 (M)
Protective gloves	9 (L)	10 (XL)
Belt	100 cm	110 cm

Type PSA ESET ...	L ID	XL ID	2XL ID
Part No.	**785 901**	**785 902**	**785 907**
Protective jacket/trousers	54 (L)	56 (XL)	60 (2XL)
Protective gloves	10 (XL)	10 (XL)	11 (XXL)
Belt	110 cm	120 cm	130 cm

Indoor – configurable



For the configurable indoor electrician set, the DEHNcare ArcFit is only available in the standard colours grey/black.
The helmet colour and sizes are freely selectable.

Type PSA ESET ...	KONFI ID
Part No.	**785 960**
Protective jacket/trousers Men's standard sizes: 42 (2XS) – 68 (4XL/5XL), Men's short sizes: 22 (2XS/XS-K) – 30 (2XL-K), Men's long sizes: 90 (XS-L) – 118 (2XL-L), Ladies' standard sizes: 34 (XS) – 56 (4XL)	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Protective gloves	7 (S) / 8 (M) / 9 (L) / 10 (XL) / 11 (2XL) / 12 (3XL) / 13 (4XL)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc rating – ATPV (open arc test)	40 cal / cm²
PPE category (NFPA 70E)	4
Face shield	transparent
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	318 kJ
Visible light transmittance (VLT)	74.4 to 100%
Light transmittance class	0
Safety helmet for electricians	yellow / white / orange / blue / red
Nominal voltage up to (U_N)	1000 V
Belt	80 / 90 / 100 / 110 / 120 / 130 / 140 / 150 cm
Microfibre bag	450 x 400 mm
Storage rucksack	650 x 400 mm

Outdoor

For the outdoor electrician set, the DEHNcare ArcFit is only available in the standard colours yellow/grey.



General technical data:	
Protective jacket/trousers	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Protective Gloves	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc rating – ATPV (open arc test)	32.8 cal / cm²
PPE category (NFPA 70E)	PPE 3
Face shield	transparent
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	318 kJ
Visible light transmittance (VLT)	74.4 ... 100 %
Light transmittance class	0
Safety helmet for electricians	yellow
Nominal voltage up to (U_N)	1000 V
Microfibre bag	450 x 400 mm
Storage bag	Ø300, 500 mm

Type PSA ESET ...	S OD	M OD
Part No.	**785 908**	**785 903**
Protective jacket/trousers	48 (S)	50 (M)
Protective gloves	9 (L)	10 (XL)
Belt	100 cm	110 cm

Type PSA ESET ...	L OD	XL OD
Part No.	**785 904**	**785 905**
Protective jacket/trousers	54 (L)	56 (XL)
Protective gloves	10 (XL)	10 (XL)
Belt	110 cm	120 cm

Outdoor – configurable

For the configurable outdoor electrician set, the DEHNcare ArcFit is only available in the standard colours yellow/grey.
The helmet colour and sizes are freely selectable.



Type PSA ESET ...	KONFI OD YE
Part No.	**785 961**
Protective jacket/trousers Men's standard sizes: 42 (2XS) – 68 (4XL/5XL), Men's short sizes: 22 (2XS/XS-K) – 30 (2XL-K), Men's long sizes: 90 (XS-L) – 118 (2XL-L), Ladies' standard sizes: 34 (XS) – 56 (4XL)	
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Protective gloves	7 (S) / 8 (M) / 9 (L) / 10 (XL) / 11 (2XL) / 12 (3XL) / 13 (4XL)
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	320 kJ
Arc rating – ATPV (open arc test)	40 cal / cm²
PPE category (NFPA 70E)	4
Face shield	transparent
Arc fault protection class (box test 7 kA / 0.5 s – single-pole)	APC 2
Arc energy (W_{arc} or W_{LBP})	318 kJ
Visible light transmittance (VLT)	74.4 to 100%
Light transmittance class	0
Safety helmet for electricians	yellow / white / orange / blue / red
Nominal voltage up to (U_N)	1000 V
Belt	80 / 90 / 100 / 110 / 120 / 130 / 140 / 150 cm
Microfibre bag	450 x 400 mm
Storage rucksack	650 x 400 mm

Plastic Bag / Rucksack

For DEHNcare protective equipment.

Storage Bag

With side handle, carrying strap and string.



Type	AT 50 30
Part No.	**785 442**
Suitable for	ESH U + DEHNcare APS and APG
Dimensions	Ø300, 500 mm
Colour	Red ●

Rucksack

With carrying straps and side net pocket with string.



Type	ARS 65 40
Part No.	**785 443**
Suitable for	DEHNcare protective equipment
Dimensions	650 x 400 mm
Colour	Red ●

Storage bag

With large internal pocket and long shoulder strap.



Type	AT 50 32 28
Part No.	**785 444** NEW
Suitable for	DEHNcare protective clothing HLP 63
Dimensions	500 x 320 x 280 mm
Colour	black ●

Microfibre Bag

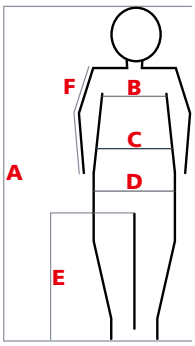
For cleaning and keeping of face shields DEHNcare APS.



Type	MFB APS
Part No.	**785 724**
Suitable for	DEHNcare APS
Dimensions	450 x 400 mm
Colour	Black ●

Find the right size to get the perfect fit with your DEHNcare personal protective equipment.

Protective clothing – How to take your measurements (cm):



A	**Body size:**	without shoes, from the top of your head to the soles of your feet
B	**Chest measurement:**	measure under your arms round the widest part of your chest
C	**Waistband:**	measure around your waist with the tape measure snug but not digging in
D	**Hip size:**	measure with the tape measure around the widest part of the hips
E	**Inside leg length:**	measure from the crotch to the hemline
F	**Sleeve length:**	measure from the top of the shoulder over the elbow to the wrist bone

Protective Clothing DEHNcare ArcFit Indoor / Outdoor

[1] Body measurements (measured on the body)
[2] Finished measurements (measured on clothing)

Standard men's sizes (cm)

Ordering size	42	44	46	48	50	52	54	56	58	60	62	64	66	68
	2XS	2XS/XS	XS	S	M	M/L	L	XL	XL/2XL	2XL	3XL	3XL/4XL	4XL	4XL/5XL
Body size [1]	159-171	162-174	165-177	168-180	171-183	174-186	176-188	178-190	180-192	182-194	184-196	186-198	188-200	190-202
Chest measurement [1]	81-87	85-91	89-95	93-99	97-103	101-107	105-111	109-115	113-119	117-123	121-127	125-131	129-135	133-139
Waistband [1]	69-77	73-81	77-85	81-89	85-93	89-97	93-101	99-107	105-113	111-119	117-127	122-132	127-137	132-142
Hip size [2] (trousers)	91	95	99	103	107	111	115	119	123	127	131	135	139	143
Hip size [2] (bib overall)	97	101	105	109	113	117	121	125	129	133	137	141	145	149
Inside leg length [2]	77.5/78.5	78.5/79.5	79.5/80.5	80.5/81.5	81.5/82.5	82.5/83.5	83.5/84.5	84.5/85.5	85/86	85.5/86.5	86/87	86.5/87.5	87/88	87.5/88.5
Sleeve length [2]	63/63.5	64/64.5	65/65.5	66/66.5	67/67.5	68/68.5	69/69.5	70/70.5	70.5/71	71/71.5	71.5/72	72/72.5	72.5/73	73/73.5

Men's short sizes (cm)

Ordering size	22	23	24	25	26	27	28	29	30
	2XS/XS-K	XS-K	S-K	M-K	M/L-K	L-K	XL-K	XL/2XL-K	2XL-K
Body size [1]	157-166	160-169	163-172	166-175	169-178	171-180	173-182	175-184	177-186
Chest measurement [1]	85-91	89-95	93-99	97-103	101-107	105-111	109-115	113-119	117-123
Waistband [1]	75-83	79-87	83-91	87-95	92-100	97-105	102-110	107-115	113-121
Hip size (trousers) [2]	95	99	103	107	111	115	119	123	127
Hip size (bib overall) [2]	101	105	109	113	117	121	125	129	133
Inside leg length [2]	74.5/ 75.5	75.5/ 76.5	76.5/ 77.5	77.5/ 78.5	78.5/ 79.5	79.5/ 80.5	80.5/81.5	81/82	81.5/82.5
Sleeve length [2]	61/61.5	62/62.5	63/63.5	64/64.5	65/65.5	66/66.5	67/67.5	67.5/68	68/68.5

Men's long sizes (cm)

Ordering size	90	94	98	102	106	110	114	118
	XS-L	S-L	M-L	M/L-L	L-L	XL-L	XL/2XL-L	2XL-L
Body size [1]	173-182	176-185	179-188	182-191	184-193	186-195	188-197	190-199
Chest measurement [1]	89-95	93-99	97-103	101-107	105-111	109-115	113-119	117-123
Waistband [1]	75-83	79-87	83-91	87-95	91-99	97-105	103-111	109-117
Hip size (trousers) [2]	99	103	107	111	115	119	123	127
Hip size (bib overall) [2]	104	108	112	116	120	124	128	132
Inside leg length [2]	83.5/ 84.5	84.5/ 85.5	85.5/ 86.5	86.5/ 87.5	87.5/88.5	88.5/89.5	89/90	89.5/90.5
Sleeve length [2]	68/68.5	69/69.5	70/70.5	71/71.5	72/72.5	73/73.5	73.5/74	74/74.5

Standard ladies' sizes (cm)

Ordering size	34	36	38	40	42	44	46	48	50	52	54	56
	XS	S	M	M/L	L	XL	XL/2XL	2XL	2XL/3XL	3XL	3XL/4XL	4XL
Body size [1]	163-175	163-175	163-175	163-175	163-175	163-175	163-175	163-175	163-175	163-175	163-175	163-175
Chest measurement [1]	78-85	82-89	86-93	90-97	94-102	99-108	104-113	111-120	117-126	124-133	131-140	138-147
Waistband [1]	70-78	74-82	78-86	82-90	86-94	90-98	95-103	100-108	105-113	110-118	115-123	120-128
Hip size [2] (trousers)	94	98	102	106	110	114	118	122	126	130	134	138
Hip size [2] (bib overall)	100	104	108	112	116	120	125	129	134	138	143	147
Inside leg length [2]	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5
Sleeve length [2]	59	59.5	60	60.5	61	61.5	62	62.5	62.5	62.5	62.5	62.5

Protective Clothing ArcFit HLP 63

[1] Body measurements (measured on the body)
[2] Finished measurements (measured on clothing)

Standard men's sizes (cm)

Ordering size	48	50/52	52/54	56/58	58/60	62/64	64/66
	S	M	L	XL	2XL	3XL	4XL
Body size [1]	166-178	170-182	174-188	178-190	182-194	184-196	188-200
Chest measurement [1]	92-102	98-108	104-114	110-120	116-126	122-132	128-138
Waistband [1]	80-90	86-96	92-102	98-108	104-114	110-120	116-126
Hip size (bib overall) [2]	116	123	131	138	146	152	160
Inside leg length [2]	81.5	83.5	85.5	87.5	88.5	89.5	90.5
Sleeve length [2]	63.5	65	66.5	68	69.5	71	72.5

Protective Clothing ArcClassic jacket and trousers

Protective Clothing ArcClassic coat

Standard men's sizes (cm)

Ordering size	46	48	50	52	54	56	58	48/50	52/54	56/58	60/62	64/66
	XS	S	M	L	XL	2XL	3XL	M	L	XL	2XL	3XL
Body size [1]	165-177	168-180	171-183	174-186	176-188	178-190	180-192	172-180	178-185	182-189	186-191	190-197
Chest measurement [1]	92-95	96-100	101-103	104-107	108-111	112-115	116-119	96-103	104-111	112-119	120-127	128-135
Waistband [1]	79-82	83-86	87-90	91-94	95-98	99-102	103-107	–	–	–	–	–
Hip size [2]	104	108	112	116	120	124	128	–	–	–	–	–
Inside leg length [2]	83.5	84.5	85.5	86	86.5	87	87.5	–	–	–	–	–
Sleeve length [2]	69.6	70.2	70.8	71.4	72	72.6	73.2	71	73	75	77	79

Protective gloves – How to find the right size (mm):



Please use a tape measure to measure the circumference of your hand at the knuckles (without the thumb). Your hand should be open with the fingers together.

Protective Gloves APG XT – normal gauntlet (mm)

... APG XT – long gauntlet (mm)

Ordering size	7	8	9	10	11	12	13	7	8	9	10	11	12	13
	S	M	L	XL	2XL	3XL	4XL	S	M	L	XL	2XL	3XL	4XL
Total length	330	335	340	350	355	360	365	410	420	430	435	440	445	450
Gauntlet length	140	140	140	140	140	140	140	230	230	230	230	230	230	230
Hand circumference	205	220	240	250	265	270	280	205	220	240	250	265	270	280

Protective Gloves APG grey – normal gauntlet (mm)

... APG grey – long gauntlet (mm)

Ordering size	7	8	9	10	11	12	13	7	8	9	10	11	12	13
	S	M	L	XL	2XL	3XL	4XL	S	M	L	XL	2XL	3XL	4XL
Total length	330	335	340	350	355	360	365	410	420	430	435	440	445	450
Gauntlet length	140	140	140	140	140	140	140	230	230	230	230	230	230	230
Hand circumference	205	220	240	250	265	270	280	205	220	240	250	265	270	280

Protective Gloves APG beige – normal gauntlet (mm)

... APG beige – long gauntlet (mm)

Ordering size	8	9	10	11	12	8	9	10	11	12
	M	L	XL	2XL	3XL	M	L	XL	2XL	3XL
Total length	310	315	325	330	335	440	450	455	460	465
Gauntlet length	115	115	115	115	115	250	250	250	250	250
Hand circumference	220	240	250	265	270	220	240	250	265	270



EFD provides visual, acoustic, and vibration warnings.

DEHNcare

test the DEHNsense EFD

Your additional warning – Adjustable to specific systems

DEHNsense EFD | Elektrischer Feld Detektor

Clear advantages for safe working

Always at the right installation
If the technician accidentally approaches the wrong live switchgear cell or overhead contact line, a clear alarm is given.

Recognise danger in good time
Visual and acoustic signals warn against entering danger zones. DEHNsense EFD also alerts the user by vibrating.

Use exact response values
You can adapt the response sensitivity of the EFD to your specific installation in order to avoid false alarms.
System profiles can be created in the DEHNwork app, then read and activated on the system via QR codes on a smartphone.

Work digitally interconnected and smart
Manage your individual system profiles easily and clearly with the DEHNwork app.
Use this app to display device information and adjust the DEHNsense EFD settings to the specific application.

Discover now how DEHNsense EFD protects lives.

More information here:

DEHNshort – Arc fault protection system

Further information on arc fault protection:

DEHNshort active arc fault protection system	Page 158
Introduction	Page 159
System description	Page 159
Components	Page 160
Light sensors and accessories	Page 160
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Safe when it matters most

The importance of arc fault protection is highly relevant for switchgear manufacturers and operators because arc faults in low-voltage switchgear assemblies pose an existential threat to people and equipment. As the operator of electrical installations, you are obliged to take suitable **technical protection measures** to protect employees in accordance with occupational health and safety legislation.

In addition to occupational safety, availability requirements, and thus system protection, must be evaluated when planning an electrical power distribution system.
Active arc fault protection systems in low-voltage switchgear assemblies are increasingly becoming established in all relevant regulations and have long since been regarded as state of the art. Your will receive comprehensive support during the planning process. Feel free to contact us.

DEHNshort – Active Arc Fault Protection System



Active arc fault protection system DEHNshort in a switchgear cabinet.

- Protection of people and systems as per DIN EN 61439-2, Suppl. 1 (IEC/TR 61641 ed. 3, 2014)
- Use in low-voltage switchgear and controlgear assemblies according to DIN EN 61439-2 after integration tests according to DIN VDE 0660-600-2-1, 2021 (IEC TS 63107: 2020)
- Maximum system availability
- Modular system structure
- System status is indicated at the front of the installation

General technical data:	
Rated operating voltage (U_e)	400 – 690 V AC / 50 Hz
Rated short-time withstand current of the quenching devices (I_{cw})	110 kA, 300 ms
Lower response threshold (I_{parc})	5 kA
Max. admissible ambient temperature of the point sensors (during operation)	–20 °C ... +85 °C
Max. admissible ambient temperature of the fibre-optic sensors (during operation)	–5 °C ... +85 °C
Max. admissible ambient temperature of the quenching devices (during operation)	–5 °C ... +70 °C
Typical arc fault extinction times (t_{mtA})	< 3-4 ms bei 100 kA
Typical arc fault energies (E_{arc})	40–60



Built-in protective current transformers



Built-in light sensors



Detection devices integrated in the door



Built-in quenching devices

DEHNshort offers optimum protection for persons and switchgear installations against the effects of an arc fault. To ensure this, particularly short response times are required in energy-intensive switchgear installations. A few milliseconds decide the extent of the effects of an arc fault. DEHNshort is a system that detects the arc fault immediately after ignition, evaluates the recorded sensor signals and quenches the arc fault by generating a three-phase bolted short-circuit.

Functional principle:

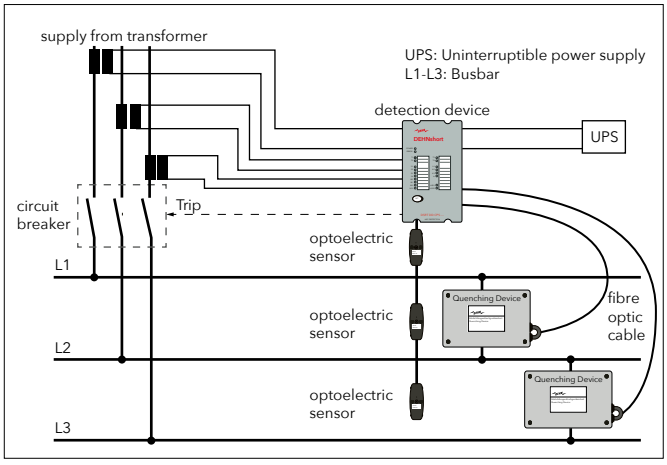
Detect
In all feeders, protective current transformers positioned upstream of the feeding circuit breakers detect the overcurrent associated with the arc fault. As a second detection variable, special light sensors detect the extremely bright light of the arc fault. Depending on system requirements, the light sensors are available as a point sensor or fibre-optic sensor.

Evaluate
Electronic detection devices link the sensor signals and activate the quenching devices of the relevant busbar as well as the shunt releases of all feeder circuit breakers in the event of both detection variables appearing.

Quench
By activating the quenching devices, a bolted short-circuit is created in parallel to the arc fault in a very short time. Due to this low-resistance bypass, the voltage collapses and the arc fault is immediately quenched. The thyristors that short-circuit the three phases of the busbar immediately after activation of the quenching devices should be explicitly mentioned in this context. Subsequently, a contact device driven by a spring takes over the channelling of the short-circuit current until it is disconnected by the feeding circuit breakers.

Disconnect completely
To ensure that the switchgear installation is not loaded with the short-circuit current for longer than necessary – and to ensure additional safety – all feeder circuit breakers receive a disconnection command via floating contacts on the respective shunt releases. This disconnects the arcing busbar section from the mains.

Restoration of service
After rectifying the original fault, replacing the quenching devices and carrying out an insulation test, the system can be put back into operation within a very short time. The arc fault protection realised in this way is considerably higher than the requirements of test criteria 1–7 from DIN EN 61439-2, Suppl. 1 (IEC TR 61641 ed3 of 2014). DEHNshort is used wherever there is a high demand for the protection of people and availability of the electrical power supply.



Basic circuit diagram

Detection Device (Current + Light)

Detection unit DSRT DD CPS .... for current and light detection (DSRT PS point sensors), including output for connecting two DSRT QD II quenching devices.



Type DSRT ...	DD CPS BACA	DD CPS AACA
Part No.	**782 030**	**782 031**
Min. / max. voltage (U_N)	18-72 V d.c.	92-265 V AC / DC
Degree of protection (front side)	IP 50	IP 50
Degree of protection (rear side)	IP 20	IP 20
Dimensions of the front plate (H x W)	177 x 102 mm	177 x 102 mm
Mounting dimensions (H x W x D)	157 x 82 x 164 mm	157 x 82 x 164 mm
Sensor inputs	S1, S2, S3, S4 (3 sensors (DSRT PS) can be connected per channel)	S1, S2, S3, S4 (3 sensors (DSRT PS) can be connected per channel)
Current inputs	1 A / 5 A (IL1, IL2, IL3, Io)	1 A / 5 A (IL1, IL2, IL3, Io)
Binary inputs	24 V d.c., 3 mA (BI1, BI2)	24 V d.c., 3 mA (BI1, BI2)
Tripping relay	Up to 250 V a.c./d.c. 5 A (T1, T2, T3, T4)	Up to 250 V a.c./d.c. 5 A (T1, T2, T3, T4)
High-speed outputs	Up to 250 V a.c./d.c. 2 A (HS01, HS02)	Up to 250 V a.c./d.c. 2 A (HS01, HS02)
Quenching device outputs	Optical fibre cable (at least 43 mA) (2x TX)	Optical fibre cable (at least 43 mA) (2x TX)
Binary output	24 V d.c 20 mA (B01)	24 V d.c. 20 mA (B01)
Operating temperature (T_U)	-35 °C ... +70 °C	-35 °C ... +70 °C
Tripping time of the relay	7 ms	7 ms
Tripping time HSO	< 2 ms	< 2 ms
Tripping time TX	< 2 ms	< 2 ms
Arc fault quenching time (t_{mtA})	< 3-4 ms with DSRT QD II	< 3-4 ms with DSRT QD II
Approvals	VdS	VdS

Detection Device (Point Sensor)

DSRT DD PS detection device .... for light detection (DSRT PS point sensors), including output for connecting two DSRT QD II quenching devices.



Type DSRT ...	DD PS BACA	DD PS AACA
Part No.	**782 040**	**782 041**
Min. / max. voltage (U_N)	18-72 V d.c.	92-265 V AC / DC
Degree of protection (front side)	IP 50	IP 50
Degree of protection (rear side)	IP 20	IP 20
Dimensions of the front plate (H x W)	177 x 52 mm	177 x 52 mm
Mounting dimensions (H x W x D)	157 x 45 x 164 mm	157 x 45 x 164 mm
Sensor inputs	S1, S2, S3, S4 (3 sensors (DSRT PS) can be connected per channel)	S1, S2, S3, S4 (3 sensors (DSRT PS) can be connected per channel)
Binary inputs	24 V d.c., 3 mA (BI1, BI2)	24 V d.c., 3 mA (BI1, BI2)
Tripping relay	Up to 250 V a.c./d.c. 5 A (T1, T2, T3, T4)	Up to 250 V a.c./d.c. 5 A (T1, T2, T3, T4)
Quenching device outputs	Optical fibre cable (at least 43 mA) (2x TX)	Optical fibre cable (at least 43 mA) (2x TX)
Binary output	24 V d.c. 20 mA (B01)	24 V d.c. 20 mA (B01)
Operating temperature (T_U)	-35 °C ... +70 °C	-35 °C ... +70 °C
Tripping time of the relay	7 ms	7 ms
Tripping time TX	< 2 ms	< 2 ms
Arc fault quenching time (t_{mtA})	< 3-4 ms with DSRT QD II	< 3-4 ms with DSRT QD II
Approvals	VdS	VdS

Detection Device (Fibre Optic Sensor)

DSRT DD FS .... detection device for light detection (DSRT FS fibre optic sensor).



Type DSRT ...	DD FS BAAA	DD FS AAAA
Part No.	**782 050**	**782 051**
Min. / max. voltage (U_N)	18-72 V d.c.	92-265 V AC / DC
Degree of protection (front side)	IP 50	IP 50
Degree of protection (rear side)	IP 20	IP 20
Dimensions of the front plate (H x W)	177 x 52 mm	177 x 52 mm
Mounting dimensions (H x W x D)	157 x 45 x 164 mm	157 x 45 x 164 mm
Sensor inputs	S1, S2, S3 (one fibre optic sensor (DSRT FS) can be connected per channel)	S1, S2, S3 (fibre optic sensor (DSRT FS) can be connected per channel)
Binary inputs	24 V d.c., 3 mA (BI1, BI2)	24 V d.c., 3 mA (BI1, BI2)
Tripping relay	Up to 250 V a.c./d.c. 5 A (T1, T2, T3, T4)	Up to 250 V a.c./d.c. 5 A (T1, T2, T3, T4)
Binary output	24 V d.c. 20 mA (B01)	24 V d.c. 20 mA (B01)
Operating temperature (T_U)	-35 °C ... +70 °C	-35 °C ... +70 °C
Tripping time of the relay	7 ms	7 ms
Arc fault quenching time (t_{mtA})	< 3-4 ms with DSRT QD II	< 3-4 ms with DSRT QD II
Approvals	VdS	VdS

Point Sensor

DSRT PS point sensor for arc detection. Serial connection of max. 3 sensors at each sensor input of DSRT DD CPS and DSRT DD PS devices.



Type DSRT ...	PS
Part No.	**782 060**
Dimensions (L x W x H)	90 x 32.8 x 19.5 mm
Fixing holes	2x 3.2 mm
Lower response threshold (I_{parc})	5 kA
Detection radius	90° (180°)
Max. distance to the arc fault	2 m (0.5 m)
Sensor wiring	Two cores and shielding
Sensor cable specification	Twisted pair max. 0,5 mm², shielded
Max. sensor cable length per sensor cable	100 m
Degree of protection	IP 60
Operating temperature (T_U)	-20 °C ... +85 °C
Approvals	VdS

Accessories for DEHNshort – Active Arc Fault Protection System

Fixing clip for point sensors

Fixing clip for securing the DSRT PS point sensor in the switchgear cabinet.



Type	SPBCLPS
Part No.	**782 097**
Hole pitch	25 mm
Hole Ø	5 mm
PU	5 pc(s)

Fibre Optic Sensor

DSRT FS fibre optic sensor for arc detection. Connection of one sensor at each sensor input of DSRT DD FS devices.



General technical data:	
Diameter	1.2 mm
Bending radius	50 mm
Lower response threshold (I_{parc})	5 kA
Detection radius	360°
Max. distance to the arc fault	max. 10 cm
Operating temperature (T_U)	–5 °C ... +85 °C
Approvals	VdS

Type DSRT ...	FS 8 1.5	FS 10 1.5
Part No.	**782 077**	**782 081**
Sensor length	8 m	10 m
Active sensor length	5 m	7 m

Type DSRT ...	FS 12 1.5	FS 15 1.5
Part No.	**782 085**	**782 091**
Sensor length	12 m	15 m
Active sensor length	9 m	12 m

Type DSRT ...	FS 17 1.5
Part No.	**782 092**
Sensor length	17 m
Active sensor length	14 m

Accessories for DEHNshort – Active Arc Fault Protection System

Foam rubber

For fibre optic sensors DSRT FS.



Type	DSRT SR D8 L20
Part No.	**782 098**
Length	20 mm
Diameter	8 mm
PU	50 pc(s)

Fixing clip

For fibre optic sensors DSRT FS.



Type	DSRT FC D8
Part No.	**782 099**
Diameter	8 mm
Mounting bore	Ø6.5 mm
PU	50 pc(s)

Quenching Device QD II

Quenching device for connection to DSRT DD CPS and DSRT DD PS detection devices.



Type DSRT ...	QD II
Part No.	**782 002**
Rated operating voltage (U_e)	400 – 690 V AC, 50 Hz
Rated short-time withstand current (I_{cw})	110 kA, 300 ms
Rated peak withstand current (I_{pk})	242 kA
Standard	IEC 60947-9-1:2019
Dimensions (H x W x D)	177 x 120 x 180 mm
System configurations	TN, TT, IT
Degree of protection	IP 00
Approvals	VdS

Fibre Optic Cable

Prewired fibre optic cables for connecting DSRT DD CPS, DSRT DD PS detection devices and DSRT QD II quenching device units.
1 set = 2 pieces



General technical data:	
Diameter	2.2 mm
Approvals	VdS

Type DSRT ...	LWL 0.75	LWL 2.00
Part No.	**782 020**	**782 022**
Length	0.75 m	2 m

Type DSRT ...	LWL 4.00	LWL 8.00
Part No.	**782 024**	**782 028**
Length	4 m	8 m

DEHNshort – Arc fault protection system

These manufacturers of low-voltage switchgear assemblies have integrated the DEHNshort active arc fault protection system into their switchgear systems in accordance with IEC TS 63107:

CUBIC

FEAG

FEAG ENERGOLINE

HENSEL

Husemann
Stark in Strom und Technik

Leukhardt
Schaltanlagen

ME
TECHNIK FÜR DIE ZUKUNFT

NATUS
INDUSTRIAL SOLUTION SYSTEMS

RITTAL

Rolf Janssen GmbH
Elektrotechnische Werke

SAB GmbH
Steuerungs- und Anlagenbau

SEDOTEC

SENTEG
Schaltanlagen für Energietechnik GmbH

SIEMENS

Further information can be found here:

Safe working on electric railways

You can find more information on our protection solutions for the railway environment at: **https://www.dehn-international. com/en/safelyworking-on-electrified-tracks**

Safety equipment for railway workers, technical emergency services and emergency management

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Wireless inspection camera	Page 166
Insulating stick kit for cleaning windscreens	Page 167
Voltage detector	Page 168
Earthing and short-circuiting	Page 176
Voltage-limiting devices SDS	Page 182



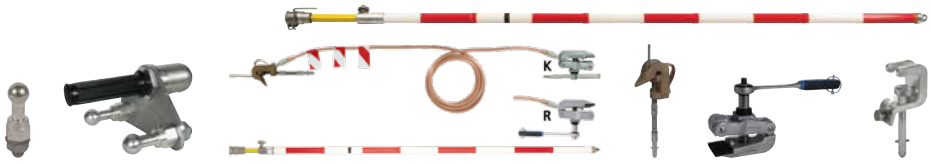
Protective clothing against arc faults can be found in the DEHNcare chapter starting on page 123.

Safe working on electric railways

In modern rail technology, safety is of paramount importance. The DEHN safety equipment portfolio offers you tools and equipment, including protective and auxiliary equipment, for working in accordance with the five safety rules in the areas of electrified track systems and electrical supply systems. In this chapter you will find our solutions for safe working on overhead contact lines, substations, switchgear installations, for frequencies of 50 or 16.7 Hz or for DC systems.

Be it a wireless inspection camera or voltage detector, or telescopic earthing sticks and earthing and short-circuiting devices for railway earthing.
All DEHN products have been tried and tested over many years and are as a rule approved by Deutsche Bahn with material and drawing numbers.

Safe working on electric railways

Application	Nominal voltage U_N / Frequency f_N	Product	Page
Ice removal rod ▪ For removing icicles in the vicinity of live parts ▪ Solid ice removal hammer ▪ Telescopic handle	up to 15 kV / 16.5 Hz and 25 kV / 50 Hz		166
Wireless inspection camera ▪ Periodic visual inspection and documentation of the state of electrical installations and equipment (also without special training) ▪ Wireless Wi-Fi operation of the camera via smartphone / tablet ▪ No downtimes due to disconnection of the installations	up to 150 kV / 15 ... 60 Hz		166
Insulating stick kit for cleaning windscreens ▪ Insulating stick kit for cleaning the windscreens of electric locomotives	up to 7.5 kV / DC and 25 kV / AC		167
Voltage detector for overhead contact line systems ▪ Suitable for use in wet weather conditions ▪ Cost-effective / space-saving transport	up to 15 kV / 16.7 Hz up to 25 kV / 50 Hz		168
Voltage detectors for switchgear installations ▪ Suitable for use in wet weather conditions ▪ Easy handling	20 kV / 50 Hz or 16.7 Hz switchable		169
Voltage detectors for traction power lines ▪ Suitable for use in wet weather conditions ▪ Easy handling	up to 15 kV / 16.7 Hz		170
Voltage detectors for outdoor switching stations ▪ Suitable for use in wet weather conditions ▪ Kit for universal use ▪ Cost-effective / space-saving transport	110 ... 132 kV / 50 and 16.7 Hz 66 kV / 16.7 Hz 110 ... 420 kV / 16.7 Hz		171
Voltage detector for direct current systems ▪ Suitable for use in wet weather conditions, for indoor and outdoor installations ▪ Two-pole (one-/two-stick)	up to 24 kV / DC voltage		174
Earthing and short-circuiting			176
Voltage-limiting devices SDS			182

German Social Accident Insurance (DGUV) Regulation 3 (formerly accident prevention regulations (BGV A3))

Operating sticks, voltage detectors and EaS devices must be checked according to the DGUV regulation 3 (previously BGV A3) to ensure that they are in good condition and comply with the limit values as specified in the electrotechnical rules. This test is carried out in the high-voltage test laboratory at DEHN and includes, among other things:

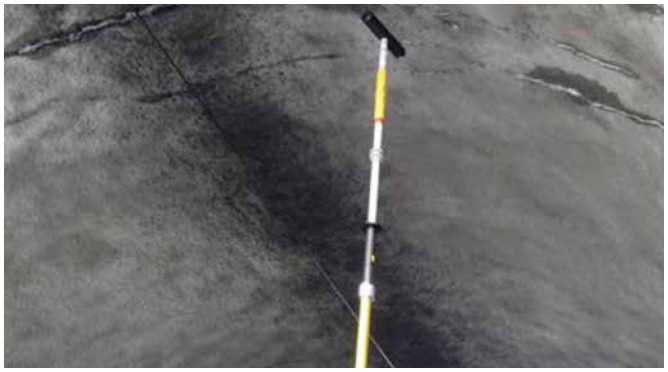
- Testing the discharge current
- Testing the protection against bridging
- Testing by visual inspection, manual test and measuring
- Measurement of the total resistance on EaS devices
- Measurement of the relative change in resistance on EaS devices

The maintenance test is documented in a test report and on the device itself.
The intervals for maintenance tests of depend on the conditions of use, e.g. frequency of use, stress due to environmental conditions and transport, etc, however, according to DGUV regulation 3, **at least** every **6 years**.



10

Ice Removal Rod



Removing icicles on a tunnel entrance.

Nominal voltages up to 25 kV

- For removing ice in the vicinity of live parts e.g. outdoor overhead contact lines or tunnel systems
- Solid ice removal hammer made of insulating material
- Insulating stick for 15 kV / 16.7 Hz and 25 kV / 50 Hz systems
- With telescopic handle up to a total length of 3420 mm to 5270 mm

General technical data:	
Standard (operating head)	Based on DIN VDE 0682-411 and DIN VDE V 0681-1
Standard (insulating stick)	Based on DIN VDE 0682-411 and DIN VDE V 0681-1
For use in wet weather conditions	
Material (insulating stick)	**Glass-fibre reinforced polyester tube**
Material (handle)	**Glass-fibre reinforced polyester tube**

Operating Head (Hammer)

With plug-in coupling.



Type	AK 25 ESH STK SN7361
Part No.	**766 372**
Nominal voltage (U_N)	1 ... 25 kV
Total length (l_G)	400 mm
Dimensions (operating head)	300 x 56 mm
For use at	

Insulating Stick

With plug-in coupling for operating head (hammer).



Type	ISN 25 STK 900SN7360
Part No.	**766 371**
Nominal voltage (U_N)	1 ... 25 kV
Total length (l_G)	920 mm
For use at	

Telescopic Extension Handle

With plug-in coupling for the insulating stick and end fitting with eye.



Type	HVTC STK 4100 SN7359
Part No.	**766 469**
Total length ($l_{G\,max}$ / $l_{G\,min}$)	4120 / 2290 mm
For use at	

Wireless Inspection Camera



System monitoring with wireless inspection camera and live display on a smartphone.

Nominal voltage up to 150 kV / 15 ... 60 Hz

- Wireless inspection camera for periodic visual inspection and for documenting the state of electrical installations and equipment (also without special training)
- Brings the invisible to light
- Facilitates work, increases safety, saves time

General technical data:	
Standard	Based on EN 50508 (DIN VDE 0682-213)
Temperature range (T_U)	0 °C ... +40 °C
Not for use in wet weather conditions	
Material (enclosure)	**PUR**
Material (camera)	**Aluminium**

AC2 digital camera set



Kit includes:		
No.	**Description**	**Type**
1	Plastic case	KKL DIGIK AC2
2	Digital camera enclosure	G DIGIK AC2
3	Camera and battery module incl. magn. protective cover	DIGIK AC2
4	Magnetic adapter holder with ¼" thread	MAH DIGIK AC2
5	Rigid adapter gear coupling	ADS ZK 185

Type	SET DIGIK AC2
Part No.	**766 480**
Nominal voltage (U_N)	up to 150 kV
Frequency	15-60 Hz
Resolution	12 megapixels
Objective	Ultra-wide angle (155° field of view)
Digital zoom	4x
Sensor	1/1.7" 4K CMOS sensor
Image stabiliser	Electronic
Formats	JPEG/RAW and MP4
Internal memory	22 GB
Ext. SD card	microSD (max. 256 GB) *)
Equipment	Remote control via app
Voice command	Yes
Interfaces	USB type-C
Dimensions (case)	395 x 290 x 105 mm
DB drawing No.	3 Ebgw 03.61-2

*) Handle, insulating sticks and micro SD card are not included.

Macro lens

For close-ups



Type	MO DIGIK AC2
Part No.	**766 483**
DB drawing No.	3 Ebgw 03.61-2
Dimensions	40 x 40 x 10 mm

Accessories for Wireless Inspection Camera

Operating stick set
Set for animal guard adapter and wireless inspection camera.



Type	ASSN 36 STK ZK
Part No.	766 380
Nominal voltage (U_N)	1 ... 36 kV
Max. total length ($l_{G\,max}$)	6780 mm
DB drawing No.	3 Ebgw 03.61-2

Insulating Stick Kit for Cleaning the Windscreens of Electric Locomotives



Insultating stick kit used for cleaning the windscreen of an electric locomotive.

Nominal voltages up to 7.5 kV / DC and 25 kV / AC

- For cleaning the windscreens of electric locomotives
- Protection against accidental contact with live parts (e.g. overhead contact lines)
- Adjustable inclination angle of the operating head

General technical data:	
Standard	Wet test in accordance with EN/IEC 61243-1 (DIN VDE 0682-411)
For use in wet weather conditions	
Material (insulating tube)	**Glass-fibre reinforced polyester tube**
End fitting	Non-slip plastic cap



Insulating Stick Kit for Cleaning Windscreens

Parts list:							
No.	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**
1	766 048	**2**	766 055	**3**	766 056	**4**	766 057

For more detailed information on these products, see www. dehn-international.com.

Type	IS 25 ZK RK 3160
Part No.	766 340
Nominal AC voltage (U_N)	Up to 25 kV
Nominal voltage DC (U_N)	Up to 7.5 kV
Total length (l_G)	3160 mm
Insertion depth (l_O)	1630 mm

Accessories for Operating sticks



Installation of the "animal guard" with the help of an adapter to protect birds and small animals.

Adapter for animal guard
Adapter with gear coupling for mounting the 3M Animal Guard.



Type	AD ZK 3M 170
Part No.	766 059
Total length (l_G)	170 mm
DB drawing No.	Ebgw 04.71

Adapter with gear coupling
With plug-in coupling.



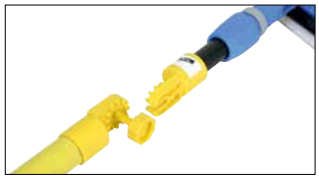
Type	AD ZK STK 30 360
Part No.	766 359
Total length (l_G)	360 mm



Adapter with gear coupling for attaching the cleaning head.



The hook-and-loop fastener allows fast replacement of the cleaning pad.



The universal gear coupling can be adjusted from 0° to 90° in 30° increments.

Note:
In accordance with EN/IEC 61243-1 (DIN VDE 0682-411), IS 25 ZK 2885 insulating sticks and AD ZK 25 200 adapters can also be used in wet weather conditions for nominal voltages up to 7.5 kV d.c. and 25 kV a.c. The cleaning agent must not exceed the maximum conductivity of 1000 µS / cm.
Due to the risk of bridging, water and cleaning agents must not be used to clean live parts of installations.

Spare Parts for Insulating Stick Kit

Cleaning head
Flexibly adjustable, for attaching cleaning pads.



Type	RK 230 100 AS25
Part No.	766 056
Dimensions	230 x 100 mm
Diameter	25 mm

Rectangular cleaning pad



Type	RP 250 115 20
Part No.	766 057
Dimensions	250 x 115 x 20 mm
PU	10 pc(s)

Voltage detectors for overhead contact line systems

PHE Voltage Detector Kit



PHE voltage detector with visual indicator used on an overhead contact line of German Railways (DB).

Nominal voltage 15 kV / 16.7 Hz
Easy and safe testing

- For overhead contact lines of electric railways
- Cost-effective / space-saving transport
- Easy to use due to simple plug-in system



General technical data:	
Standard	DIN VDE 0681-6
For use in wet weather conditions	
Indication	Visual
Self-testing element	Yes
Material (test electrode)	**St/gal Zn**
Material (test prod)	**Glass-fibre reinforced polyester tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Parts list:

No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
1	766 619	**4**	766 072	**7**	766 076	**10**	766 602
2	766 678*	**5**	766 075	**8**	766 077	**11**	766 704
3	766 677*	**6**	766 073	**9**	766 889		

For more detailed information on these products, see chapter Accessories or www.dehn-international.com.

Nominal Voltage 15 kV / 16.7 Hz

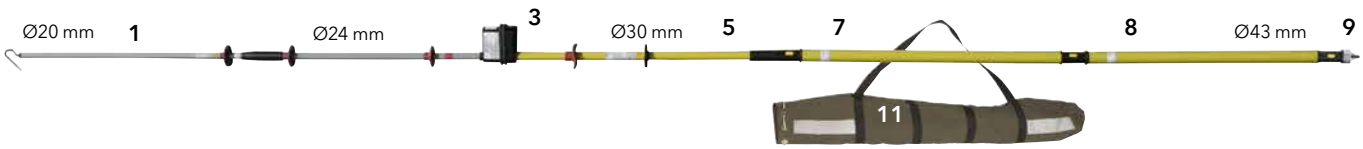
Detachable (four elements).



Type PHE 15 16.7 ...	4T TA
Part No.	**766 616**
Nominal voltage (U_N)	15 kV
Frequency	16.7 Hz
Total length (l_G)	4890 mm
Insertion depth (l_O)	1675 mm
DB drawing No.	3 Ebgw 02.51
DB material No.	237 129

Nominal Voltage 15 kV / 16.7 Hz (for Transport in Motor Vehicles)

Detachable (six elements).



Type PHE 15 16.7 ...	6T TA
Part No.	**766 617**
Nominal voltage (U_N)	15 kV
Frequency	16.7 Hz
Total length (l_G)	4900 mm
Insertion depth (l_O)	1675 mm
DB drawing No.	3 Ebgw 02.53
DB material No.	652 975



Two-part test prod with robust threaded coupling (six-part kit for transport in motor vehicles).

Volt. detec. f. overhead contact line systems

PHE III Voltage Detector

Nominal voltages up to 25 kV / 50 Hz
Safe verification of isolation from supply voltage

- Reliable indication
- Easy to use
- Cost-effective / space-saving transport



General technical data:	
Standard	DIN VDE 0682-411 (EN/IEC 61243-1) and DIN VDE V 0682-421
Temperature range	–25 °C ... +55 °C, climatic category N
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Copper alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal Voltages up to 25 kV / 50 Hz

For the overhead contact lines of electric railways.
Category "S" for single-ended monophase systems.



Type PHE3 ...	25 S 50 1P
Part No.	**767 125**
Nominal voltage (U_N)	25 kV
Total length (l_G)	1680 mm
Insertion depth (l_O)	880 mm

Voltage detectors for switching stations

PHE4 Voltage Detector Medium Voltage

- Self-test of all live parts including test prod
- Unique plug-in coupling system
- Integrated visual and acoustic indication
- Also for use in wet weather conditions



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +70 °C, climatic category N and W
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element *)	Yes
Material (test electrode)	**Cu alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal Voltage up to 20 kV / 50 Hz or 16.7 Hz, switchable

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	U 6 20 S 16.7 50
Part No.	**783 430**
Nominal voltage (U_N)	6 ... 20 kV
Frequency	50 / 16.7 Hz
Total length (l_G)	1600 mm
Insertion depth (l_O)	800 mm

*) all circuits including test prod

Nominal Voltage up to 20 kV / 16.7 Hz, M12 Thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	6 20 S 16.7
Part No.	**783 420**
Nominal voltage (U_N)	6 ... 20 kV
Frequency	16.7 Hz
Total length (l_G)	1600 mm
Insertion depth (l_O)	800 mm

*) all circuits including test prod

Voltage detectors for switching stations

PHE Voltage Detector



PHE voltage detector with visual indication.

Nominal voltages up to 20 kV / 50 Hz or 16.7 Hz
Easy and safe testing

- Reliable indication
- Easy to use



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411) and DIN VDE V 0682-421
Temperature range	–25 °C ... +55 °C, climatic category N
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Visual
Self-testing element	Yes
Material (test electrode)	**Copper alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal Voltage Ranges up to 20 kV / 16.7 Hz

For single-ended monophase switchgear installations and point heating systems.



Type PHE ...	6 20 S 16.7 1P
Part No.	**767 415**
Nominal voltage (U_N)	6 ... 20 kV
Frequency	16.7 Hz
Total length (l_G)	1560 mm
Insertion depth (l_O)	770 mm
DB drawing No.	3 Ebgw 02.52
DB material No.	738 302

Nominal Voltage Ranges 20 kV / 50 Hz or 16.7 Hz, switchable

For three-phase systems and single-ended monophase switchgear installations.

Special features of the switchable voltage detector:
The selector switch can be moved into three positions for the relevant voltage and frequency ranges:
3 ... 10 kV / 50 Hz – three-phase systems
6 ... 20 kV / 50 Hz – three-phase systems
6 ... 20 kV / 16.7 Hz – single-ended monophase systems
For safety reasons, the detector can only be switched on if the selector switch is switched to the most sensitive range of 3 kV to 10 kV / 50 Hz. The switch snaps into the relevant position and provides protection against accidental switching. A magnetically operated, wear-resistant reed switch changes the switching position.



Type PHE ...	3 20 S FU 1P
Part No.	**767 416**
Nominal voltage (U_N)	3 ... 20 kV
Frequency	16.7 and 50 Hz
Total length (l_G)	1560 mm
Insertion depth (l_O)	770 mm
DB drawing No.	3 Ebgw 02.54
DB material No.	743 361

Voltage detectors for traction power lines

Nominal Voltage 15 kV / 16.7 Hz

For traction power lines.
Hook-shaped electrode and end fitting with plug-in coupling and non-slip eye included.

Use for traction power lines
Voltage detectors for traction power lines have a shorter extension than voltage detectors for overhead contact lines. To ensure reliable indication, the PHE 15 16.7 BEL STK voltage detector may only be used for traction power lines and not for other components of overhead contact lines. Moreover, it must not be used from ladder trolleys for overhead contact lines. Traction power lines are supply lines, line feeders, bypass lines, connecting lines, feeder lines, 15 kV cables, cable sealing ends, switch lines and transverse switch lines.



Type PHE ...	15 16.7 BEL STK
Part No.	**767 413**
Nominal voltage (U_N)	15 kV
Frequency	16.7 Hz
Total length (l_G)	1645 mm
Insertion depth (l_O)	765 mm
DB drawing No.	3 Ebgw 02.55
DB material No.	964 851

Voltage detectors for outdoor switching stations

PHE III Voltage Detector Kit



PHE III voltage detector used on a 110 kV outdoor station.

Nominal voltages 110 ... 132 kV / 50 and 16.7 Hz and 66 kV / 16.7 Hz
Safe verification of isolation from supply voltage

- Reliable indication
- Easy to use
- Multi-purpose kit
- Cost-effective / space-saving transport



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +55 °C, climatic category N
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element	Yes
Material (test electrode)	**Copper alloy/gal Sn**
Material (test prod)	**Glass-fibre reinforced epoxy resin tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Parts list:

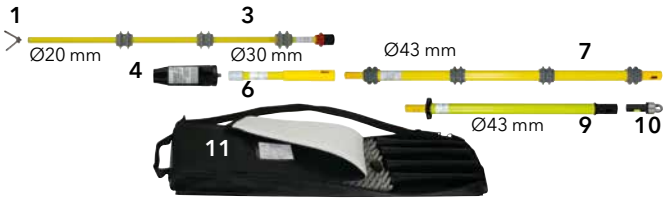
No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
1	766 924	**4**	767 129	**7**	767 128	**10**	766 889
2	766 923	**5**	769 715	**8**	766 115	**11**	767 996
3	767 771	**6**	766 352	**9**	766 120		

For more detailed information on these products, see www.dehn-international.com.

Nominal Voltage Range 110 ... 132 kV / 50 and 16.7 Hz

For 50 Hz three-phase systems and 16.7 Hz centre-earthed monophase traction power lines.
Range does not have to be switched.

Category "S"



Type	PHE3S 110 132 S
Part No.	**767 131**
Nominal voltage (U_N)	110 ... 132 kV
Total length (l_G)	3440 mm
Insertion depth (l_O)	880 mm
DB drawing No.	3 Eku 710 001
DB material No.	01 101 358

Nominal Voltage 66 kV / 16.7 Hz

Category "S" for single-ended monophase systems



Type	PHE3 66 16.7S SN7705
Part No.	**769 714**
Nominal voltage (U_N)	66 kV
Total length (l_G)	2980 mm
Insertion depth (l_O)	880 mm

Voltage detectors for outdoor switching stations

PHE4 Voltage Detector High Voltage



PHE4 voltage detector applied in a 110 kV outdoor switching station.

- High nominal voltage range
- Unique plug-in coupling system
- Integrated visual and acoustic indication
- Also for use in wet weather conditions



General technical data:	
Standard	EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +70 °C, climatic category N and W
Design	Complete
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Acoustic and visual
Self-testing element *)	Yes
Material (test electrode)	**Cu-alloy/gal Sn**
Material (test prod)	**PP**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Nominal voltage range 110 ... 132 kV / 50 and 16.7 Hz, M12 thread

Category "S" for switchgear installations and overhead lines.



Type PHE4 ...	110 132 S 16.7 50
Part No.	**783 460**
Nominal voltage (U_N)	110 ... 132 kV
Frequency	50 and 16.7 Hz
Total length (l_G)	3420 mm
Insertion depth (l_O)	910 mm

*) all circuits without test prod

ASP Non-Contact Voltage Detector Kit



Use of an ASP distance voltage detector in an outdoor switching station.

Nominal voltage range 110 ... 420 kV / 16.7 and 50 Hz
Easy and safe testing

- Easy to use due to compact design
- Cost-effective / space-saving transport



General technical data:	
Temperature range	–25 °C ... +55 °C
For use in wet weather conditions	
For	Overhead lines and outdoor switching stations
Indication	Acoustic and visual
Self-testing element	Yes
Material (indicator)	**Plastic, fully insulated, black**
Material (electric field sensor)	**Plastic, black**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

Parts list:							
No.	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**
1	767 576	**2**	767 564	**3**	766 369	**4**	767 574

For more detailed information on these products, see www.dehn-international.com.

Category "L", 16.7 Hz

Category "L" for centre-earthed monophase traction power lines.



Type ASPS 110 ...	132 16.7 L
Part No.	**767 565**
Nominal voltage (U_N)	110 ... 132 kV
Frequency	16.7 Hz
Total length (l_G)	960 mm
DB drawing no.	3 Eku 710 002

Voltage detectors for outdoor switching stations

HSA 194 High-Voltage Indicator



High-voltage indicator used on a 110 kV overhead line.

Nominal voltage range 110 ... 420 kV / 16.7 and 50 Hz

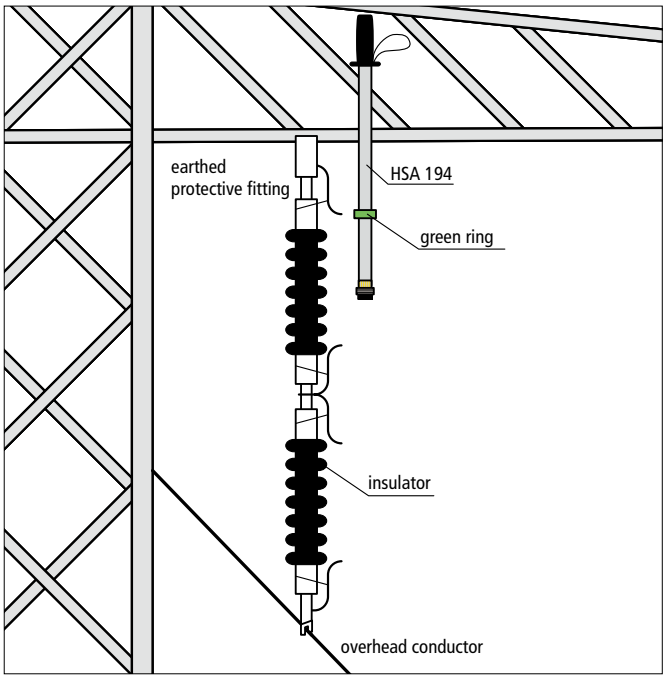
Easy and safe testing

- For contactlessly verifying that switchgear and high-voltage overhead lines or centre-earthed monophase traction power lines are dead
- Cost-effective / space-saving transport



General technical data:	
Temperature range	– 25 °C ... + 55 °C, climatic category N
For use in wet weather conditions	
Indication	Acoustic and visual
Self-testing element	Yes
Material (insulating stick)	**Glass-fibre reinforced polyester tube**

To verify absence of voltage from the tower cross arm, place the green ring of the high-voltage indicator on the last earthed protective fitting (or earthed insulator cap) of the insulator so that the operating head of the high-voltage indicator (see Fig. 2) points towards the overhead conductor to be tested, which is attached to the other insulator end (longitudinal axis of the device in parallel to the longitudinal axis of the insulator). If the conductor is energised, there is a visual (red flashing light) and acoustic signal.



Nominal Voltage Range 110 ... 420 kV

With plug-in coupling as end fitting for extending the handle.
Storage bag included in delivery.



Type	HSA194 110 420 16.7
Part No.	**767 542**
Nominal voltage range (U_N)	110 ... 420 kV
Frequency	16.7 Hz
Total length (l_G)	940 mm
Insulating clearance (l_I)	540 mm
DB drawing No.	3 Ekgw 02.54
Verification while climbing the tower	No

Voltage detectors for DC voltage systems

PHE/G d.c. Voltage Detector



PHE/G II d.c. voltage detector for d.c. links (ICE power car).

Nominal voltages up to 24 kV d.c.
Safe verification of isolation from supply voltage

- For use in direct voltage systems (electrified rail networks, d.c. links)
- Reliable indication
- Easy to use due to compact design
- User-friendly



The test prod of d.c. voltage detectors is colour-coded according to the polarity of the test prod:
positive pole – red;
negative pole – blue.

General technical data:	
Standard	Based on EN/IEC 61243-1 (DIN VDE 0682-411)
Temperature range	–25 °C ... +55 °C, climatic category N
For use in wet weather conditions	
For	Indoor and outdoor installations
Indication	Visual
Self-testing element	Yes
Material (test prod)	**Glass-fibre reinforced polyester tube**
Material (indicator)	**Plastic, fully insulated**
Material (insulating stick)	**Glass-fibre reinforced polyester tube**
Material (earthing / connecting cable)	**Copper cable, highly flexible**

PHE/G I for Switchgear Installations, positive pole on indicator with test prod

One stick

- For direct voltage systems with earthed negative pole
- Positive pole: indicator with test prod
- Negative pole: earth clamp with magnet



Type	PHEG1.S P SN7401
Part No.	**767 666**
Threshold voltage (U_t)	120 V
Nominal voltage (U_N)	1 ... 24 kV
Length (earthing cable)	2000 mm
Total length (l_G)	1260 mm
Insertion depth (l_O)	535 mm

PHE/G I for Switchgear Installations, positive pole on indicator with test prod, angled

One stick

- For direct voltage systems with earthed negative pole
- Positive pole: Indicator with test prod
- Negative pole: Earth clamp



Type	PHEG1 S P SN7240
Part No.	**767 636**
Threshold voltage (U_t)	60 V
Nominal voltage (U_N)	3.8 kV
Length (earthing cable)	4000 mm
Total length (l_G)	1100 mm

PHE/G I for Overhead Contact Lines, positive pole on indicator with test prod



One stick (three elements)

- For direct voltage systems with earthed negative pole
- Positive pole: Indicator with test prod
- Negative pole: Earth clamp

PHE/G I for Overhead Contact Lines, nagative pole on indicator with test prod



One stick (four elements)

- For d.c. voltage systems with earthed positive pole
- Negative pole: Indicator with test prod
- Positive pole: Earth clamp



Type	PHEG1 FD P 3
Part No.	**767 610**
Threshold voltage (U_t)	1.1 kV
Nominal voltage (U_N)	3.0 kV
Length (earthing cable)	6000 mm
Total length (l_G)	4125 mm

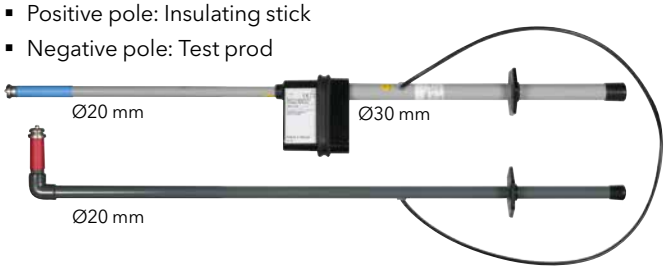
Type	PHEG1 FD M SN7223
Part No.	**767 614**
Threshold voltage (U_t)	0.825 kV
Nominal voltage (U_N)	1.65 kV
Length (earthing cable)	8000 mm
Total length (l_G)	4060 mm

Voltage detectors for DC voltage systems

PHE/G II, angled positive pole

Two sticks

- For unearthed direct voltage installations
- For d.c. links
- Positive pole: Insulating stick
- Negative pole: Test prod



Type	PHEG2 P SN7346
Part No.	**767 639**
Threshold voltage (U_t)	150 V
Nominal voltage (U_N)	750 V
Length (connecting cable)	1200 mm
Total length (l_G)	1100 mm

PHE/G II for Switchgear Installations

Two sticks

- For unearthed direct voltage installations
- For d.c. links
- Positive pole: Indicator with test prod
- Negative pole: Insulating stick

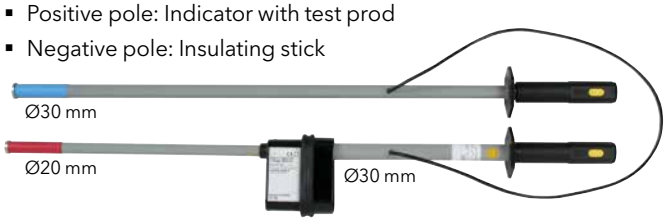


Type	PHEG2.P SN7517	PHEG2.P SN7629
Part No.	**767 671**	**767 681** NEW
Threshold voltage (U_t)	90 V	120 V
Nominal voltage (U_N)	1 ... 24 kV	1 ... 24 kV
Length (connecting cable)	1200 mm	2000 mm
Total length (l_G)	1260 mm	1260 mm
Insertion depth (l_O)	545 mm	545 mm

PHE/G II for Switchgear Installations and DC Links

Two sticks

- For unearthed direct voltage installations
- For d.c. links (e.g. electric locomotives; Part No. 767 647)
- Positive pole: Indicator with test prod
- Negative pole: Insulating stick



General technical data:	
Length (connecting cable)	1200 mm

Type	PHEG2 P SN7552	PHEG2 P SN7259
Part No.	**767 647**	**767 645**
Threshold voltage (U_t)	90 V	120 V
Nominal voltage (U_N)	1 ... 4.2 kV	1 ... 12 kV
Total length (l_G)	600 mm	1085 mm

Type	PHEG2 P SN7407	PHEG2 P SN7194
Part No.	**767 640**	**767 637**
Threshold voltage (U_t)	350 V	750 V
Nominal voltage (U_N)	600 ... 750 V	1.5 kV
Total length (l_G)	1085 mm	1085 mm

PHE/G II for DC voltage systems with coupled AC voltages

Two sticks

- For unearthed DC voltage systems
- Positive pole: indicator with test prod
- Minus pole: Insulating stick



Type	PHEG2 P SN7759
Part No.	**767 661**
Threshold voltage (U_t)	120 V
Special function	with AC suppression*)
Nominal voltage (U_N)	1 ... 12 kV
Length (connecting cable)	1200 mm
Total length (l_G)	1085 mm

*) PHE/G II with AC suppression for clear indication in DC voltage systems with coupled AC voltages.

Accessories

Plastic Bag

Plastic Bag for HVD and PHE4

With carrier handle



Type	KST 2470 740
Part No.	**766 602** NEW
Dimensions	2470 x 740 mm
Colour	Dark grey ●
DB drawing No.	3 Ebgw 02.51

Artificial Leather Bag

Artificial Leather Bag for PHE/G

With carrier handle



Type KLT ...	160 17
Part No.	**766 614**
Dimensions	Ø170 x 1600 mm
Colour	Black ●

Canvas Bag

Canvas Bag for PHE and PHE/G I

With carrier handle.



Type STT ...	120 30 15
Part No.	**766 704**
Dimensions	1220 x 390 x 150 mm
Colour	Olive ●

Fixed Ball Points



Straight fixed ball point mounted on a busbar.

- Suitable for fixing busbar connections according to DIN 43673-1
- Self-locking nut
- M12 or M16 non-cutting formed female thread
- M12 or M16 threaded pin

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100) and based on DIN 48088-1
Material (fixed ball point)	**E-Cu/gal Sn**
Material (threaded pin)	**StSt A2-70**
Hexagon nut	DIN 985-M12-8 / gal Zn; DIN 985-M16-8 / gal Zn
Tightening torque	M10: 30-40 Nm; M12: 50-65 Nm; M16: 100-110 Nm

Straight with Threaded Pin, Nut and Washer



General technical data:		
Fixed ball point Ø		25 mm
Max. short-circuit current I_k 0.06 s		34.0 kA
DB drawing No.		3 Ebgw 01.63

Type KFP ...	**25 M16 25 SKM**	**25 M12 35 SKM**
Part No.	**755 626**	**755 627**
Dimensions	M16 x 25 mm	M12 x 35 mm
DB material No.	157 541	622 014

Type KFP ...	**25 M16 45 SKM**
Part No.	**755 646**
Dimensions	M16 x 45 mm
DB material No.	157 542

Straight with Threaded Pin



Type KFP ...	**25 M16 25**
Part No.	**755 636**
Fixed ball point Ø	25 mm
Dimensions	M16 x 25 mm
Max. short-circuit current I_k 0.06 s	34.0 kA
DB drawing No.	3 Ebgw 01.63
DB material No.	609 426

Earth Connecting Plates



Earth connecting plate with fixed ball points and ball head cap with plastic handle.

- Connecting plate with high short-circuit current carrying capacity
- Single-pole connection of the phase arms
- For connecting single-pole earthing and short-circuiting devices to transformers of overhead line masts or to fuse holders
- For fixed ball points (Ø25 mm)

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100) and fixed points in accordance with DIN 48088-1
Material (plate)	**Aluminium**
Material (terminal lug)	4 mm: **Cu/gal Sn**; 6 mm: **HDG steel**
Material (fixed point)	**E-Cu** or **Brass (CuNi2Si)/gal Sn**

With two Fixed Ball Points and Ball Head Cap

With adjustable ball head cap (Ø25 mm) and plastic handle.
For connecting two single-pole earthing and short-circuiting devices to one fixed ball point (Ø25 mm).



Type	**EAP 2 25 KKH HG**
Part No.	**728 501**
Fixed point Ø	25 mm
DB drawing No.	3 Ebgw 01.66
DB material No.	157 540

Terminal Lug with one Fixed Ball Point

For connection to a fuse holder.



Type	**EAP 25 SIT US OL**
Part No.	**728 503**
Fixed point Ø	25 mm
DB drawing No.	4 Ebgw 01.60
DB material No.	157 545

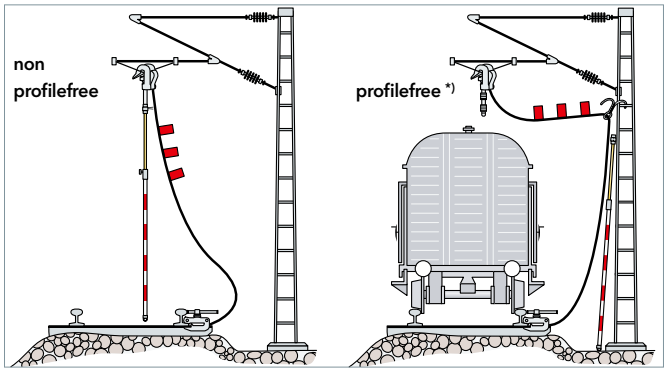
Terminal Lug with two Fixed Ball Points

For connection to the mast.



Type	**EAP 2 25 MA US OL**
Part No.	**728 502**
Fixed point Ø	25 mm
DB drawing No.	3 Ebgw 01.61
DB material No.	157 548

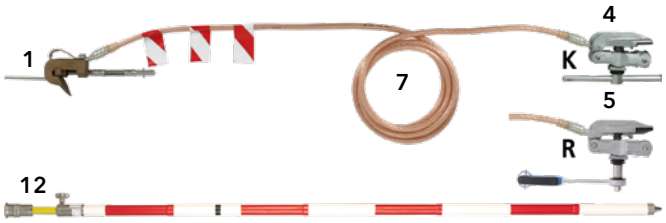
Kits for Railway Applications



General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	–25 °C ... +55 °C

Kit for Overhead Contact Lines (non-profile-free)

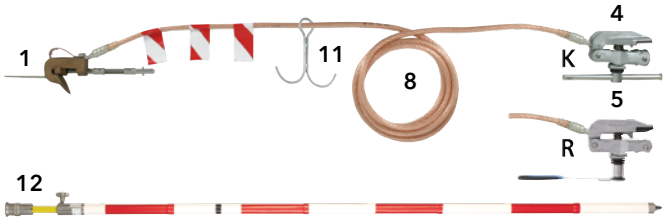
Telescopic earthing stick with adjusting ring (max. 5 m long)



Type BEV ...	OL NPF K	OL NPF R
Part No.	**750 210**	**750 218**
Design	Tommy bar	Ratchet
Cable cross-section	50 mm²	50 mm²
Cable length	8500 mm	8500 mm
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.51	3 Ebgw 01.51
DB material No.	237 117	–

Kit for Overhead Contact Lines (profile-free *))

Telescopic earthing stick with adjusting ring (max. 5 m long).



Type BEV ...	OL PF K	OL PF R
Part No.	**750 211**	**750 219**
Design	Tommy bar	Ratchet
Cable cross-section	50 mm²	50 mm²
Cable length	12000 mm	12000 mm
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.51	3 Ebgw 01.51
DB material No.	237 118	–

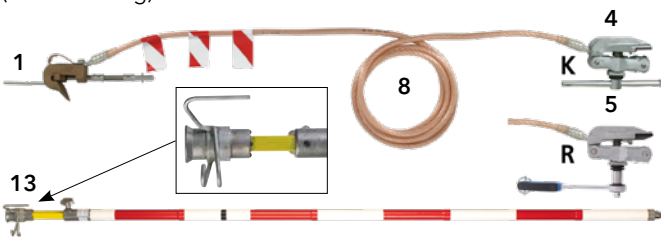
*) Profile-free earthing means that the earthing cable can be suspended on the tower thus allowing for limited diesel locomotive operation.

Parts list:							
No.	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**	**No.**	**Part No.**
1	784 755	**6**	774 251	**11**	767 128	**15**	769 352
2	773 251	**7**	751 085	**12**	766 115	**16**	761 015
3	784 352	**8**	751 120	**13**	769 508	**17**	785 111
4	792 450	**9**	751 040	**14**	769 515	**18**	700 000
5	792 455	**10**	751 150				

For more detailed information on these products, see www.dehn-international.com.

Kit for Overhead Contact Lines (profile-free *))

Telescopic earthing stick with cable guide and hook (max. 5 m long).



Type BEV ...	OL PF V2 K	OL PF V2 R
Part No.	**750 214**	**750 221**
Design	Tommy bar	Ratchet
Cable cross-section	50 mm²	50 mm²
Cable length	12000 mm	12000 mm
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.51	3 Ebgw 01.51
DB material No.	237 115	–

*) Profile-free earthing means that the earthing cable can be suspended on the tower thus allowing for limited diesel locomotive operation.

Kit for Overhead Contact Lines for Transport in Motor Vehicles (non-profile-free)

For technical emergency service and emergency management

Telescopic earthing stick kit consisting of six elements, pluggable (max. 5 m long).



Type BEV ...	OL NPF PKW K	OL NPF PKW R
Part No.	**750 196**	**750 216**
Design	Tommy bar	Ratchet
Cable cross-section	50 mm²	50 mm²
Cable length	8500 mm	8500 mm
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.67	3 Ebgw 01.67
DB material No.	237 125	–

Kit for Overhead Contact Lines for Transport in Motor Vehicles (profile-free *))

For technical emergency service and emergency management

Telescopic earthing stick kit consisting of six elements, pluggable (max. 5 m long).



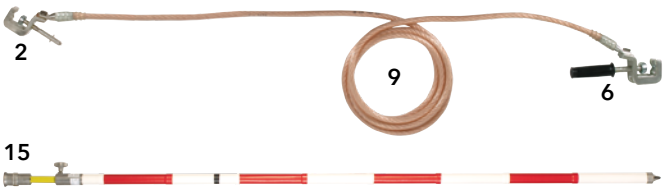
Type BEV ...	OL PF PKW K	OL PF PKW R
Part No.	**750 200**	**750 217**
Design	Tommy bar	Ratchet
Cable cross-section	50 mm²	50 mm²
Cable length	12000 mm	12000 mm
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.67	3 Ebgw 01.67

*) Profile-free earthing means that the earthing cable can be suspended on the tower thus allowing for limited diesel locomotive operation.

Kit for Transformers at Overhead Line Towers

For earthing on fuse carriers

Telescopic earthing stick with adjusting ring (max. 3.5 m long).



Type BEV ...	US OL ST
Part No.	**750 212**
Cable cross-section	50 mm²
Cable length	4000 mm
Max. short-circuit current I_k 0.06 s	34.0 kA
DB drawing No.	3 Ebgw 01.57
DB material No.	237 121

Kit for Supply Lines, Line Feeders, Bypass Lines and other Types of Lines

For earthing the supply line and traction current lines

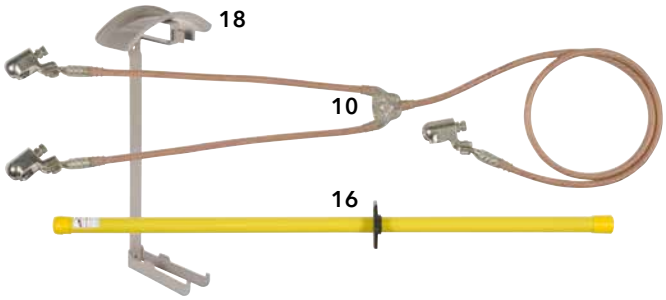
Telescopic earthing stick with adjusting ring (max. 3.5 m long).



Type BEV ...	SVUL
Part No.	**750 213**
Cable cross-section	50 mm²
Cable length	4000 mm
Max. short-circuit current I_k 0.06 s	34.0 kA
DB drawing No.	3 Ebgw 01.57
DB material No.	237 119

Kit for Electric Point and Train Pre-Heating Systems

For the initial equipment of a transformer of electric point and train pre-heating systems.



Type BEV ...	WHA ZVA
Part No.	**750 215**
Cable cross-section	50 mm²
Cable length	600 / 1800 mm
Max. short-circuit current I_k 0.06 s	34.0 kA
DB drawing No.	3 Ebgw 01.70
DB material No.	742 402

For voltage detectors for electric point heating systems, please refer to the PHE voltage detector chapter.

Accessories for Kits for Railway Applications

Canvas bag, empty

With two separate internal pockets and carrier handle.



Type	STT 55 27 30
Part No.	**785 111**
Dimensions	550 x 270 x 300 mm
Colour	Olive ●

Canvas bag for six-part earthing stick

With carrier handle



Type	STT 110 15
Part No.	**769 509**
Suitable for	EST
Dimensions	Ø150 x 1100 mm
Colour	Olive ●
DB drawing No.	3 Ebgw 01.67

Earthing Sticks for Railway Applications



Attaching a railway earthing device.

For threaded T pin shafts (bayonet locking mechanism)

- For outdoor use
- Robust aluminium cone coupling
- Telescopic stick, length continuously adjustable by star knob
- Only suitable for phase screw clamps and clamps with long T pin shaft

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100)
Temperature range	-25 °C ... +55 °C

Telescopic, with T pin shaft

For threaded T pin shaft (bayonet locking mechanism).



Type	ESTC SQL RW 3500	ESTC SQL RW 5000
Part No.	**769 352**	**769 502**
Total length ($l_{G\,max}$ / $l_{G\,min}$)	3515 / 1935 mm	5015 / 2685 mm
DB drawing No.	3 Ebgw 01.58	3 Ebgw 01.52
DB material No.	157 534	157 533

Telescopic with T pin shaft and cable guide

For threaded T pin shaft (bayonet locking mechanism).
The coupling is additionally fitted with a cable entry and a hook for securing the earthing cable and earthing stick at the tower (without adjusting ring).



Type	ESTC SQL H RW 5000
Part No.	**769 508**
Total length ($l_{G\,max}$ / $l_{G\,min}$)	5015 / 2685 mm
DB drawing No.	3 Ebgw 01.55
DB material No.	612 142

Six-part, with T pin shaft and aluminium coupling

For threaded T pin shafts (bayonet locking mechanism)



Type	EST SQL RW 4855 TA
Part No.	**769 515**
Total length ($l_{G\,max}$ / $l_{G\,min}$)	4855 / 1035 mm
DB drawing No.	3 Ebgw 01.68-1

Phase Connecting Elements for Railway Applications



Coupling the earth clamp to the overhead contact line.

- Safe positive-locking earth clamps for railway applications

Earth Clamp for Overhead Contact Lines

With contact electrode and flexible threaded T pin shaft according to DIN 48087.
For AC 80 to AC 120 overhead contact lines.



Type	FEK 4 15 TS FSQL	FEK4 15 TS FSQL AB29
Part No.	**784 755**	**784 756**
Clamping range Ø	4 ... 15 mm	4 ... 15 mm
Anti-rotation cable lug	PK2 (Ø10.5 mm)	PK2 (Ø10.5 mm)
For cable material	Cu	Al
For cable cross-section	50 mm²	70 mm²
Max. short-circuit current I_k 0.06 s	34.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.54	Ebgw 01.85
DB material No.	157 536	–

Line Clamp

With contact electrode and threaded T pin shaft according to DIN 48087.
For supply and traction power lines.



Type	LK 4 40 TS SQL
Part No.	**784 352**
Clamping range Ø	4 ... 40 mm
Anti-rotation cable lug	PK2 (Ø10.5 mm)
DB drawing No.	3 Ebgw 01.65
DB material No.	157 539

Earth Connecting Elements for Railway Applications



Clamp for railway tracks mounted on the track profile.

- Safe earth connection elements for railway applications

Clamp for Railway Tracks with Tommy Bar

With detachable tommy bar (locking spring).
For profile-free earthing of track profiles S49, S54, S64 and UIC60.



Type	SAK PFE KN	SAK PFE KN AB29
Part No.	**792 450**	**792 451**
Anti-rotation cable lug	PK2 (Ø10.5 mm)	PK2 (Ø10.5 mm)
Cable material	Cu	Al
For cable cross-section	50 mm²	70 mm²
Max. short-circuit current I_k 0.06 s	34.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.53 Bl. 1	Ebgw 01.82
DB material No.	157 535	–

Clamp for Railway Tracks with Ratchet

With detachable ratchet.
For profile-free earthing of track profiles S49, S54, S64 and UIC60.



Type	SAK PFE ARA	SAK PFE ARA AB29
Part No.	**792 455**	**792 456**
Anti-rotation cable lug	PK2 (Ø10.5 mm)	PK2 (Ø10.5 mm)
Cable material	Cu	Al
For cable cross-section	50 mm²	70 mm²
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.53 Bl. 2	3 Ebgw 01.83-1

Universal Clamp, T Pin Shaft

T pin according to DIN 48087.



Universal Clamp with Handle



Type	UK K25 FL30 SQL	UK K25 FL30 HG
Part No.	**773 251**	**774 251**
For fixed ball point Ø	25 / 30 mm	25 / 30 mm
Anti-rotation cable lug	PK2 (Ø10.5 mm)	PK2 (Ø10.5 mm)
For cable cross section Cu	50 mm²	50 mm²
Max. short-circuit current I_k 0.06 s	34.0 kA	34.0 kA
DB drawing No.	4 Ebgw 01.59	4 Ebgw 01.64
DB material No.	157 538	157 537

Earthing and Short-Circuiting Devices for Railway Applications

Earthing and short-circuiting devices in accordance with EN/IEC 61230 (DIN VDE 0683-100) for earthing and short-circuiting electrical installations at the work location in accordance with EN 50110 (DIN VDE 0105-100).

General technical data:	
Standard	EN/IEC 61230 (DIN VDE 0683-100) and IEC 61138
Temperature range	– 25 °C ... + 55 °C

Parts list:

No.	Part No.	No.	Part No.	No.	Part No.	No.	Part No.
1 Cu	784 755	**4** Cu	792 450	**7** Cu	751 085	**9** Cu	751 040
1 Al	784 756	**4** Al	792 451	**7** Al	752 085	**9** Al	752 040
2	773 251	**5** Cu	792 455	**8** Cu	751 120	**10**	750 202
3	784 352	**5** Al	792 456	**8** Al	752 120	**11**	740 124
		6	774 251				

For more detailed information on these products, see www.dehn-international.com.

With Universal Clamp (T Pin Shaft) and Universal Clamp (Handle)



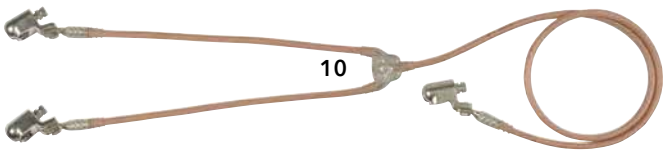
Type	EKV UK 50 4000	EKV UKQ UKH70 4000AL
Part No.	**750 041**	**752 041**
Material (cable)	Cu	Al
Cable cross-section	50 mm²	70 mm²
Cable length	4000 mm	4000 mm
Max. short-circuit current I_k 0.06 s	34.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.57	Ebgw 01.73

With Conductor Clamp and Universal Clamp (Handle)



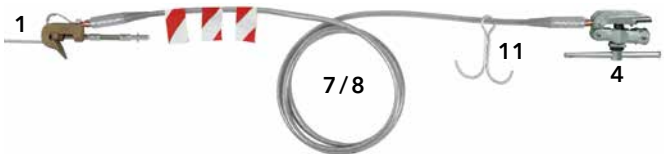
Type	EKV LK 50 4000	EKV LK UKH 70 4000AL
Part No.	**750 042**	**752 042**
Material (cable)	Cu	Al
Cable cross-section	50 mm²	70 mm²
Cable length	4000 mm	4000 mm
Max. short-circuit current I_k 0.06 s	34.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.57	Ebgw 01.77

With Ball Head Caps (Ø25 mm)



Type	EKV2 50 KKH 600 1800
Part No.	**751 150**
Material (cable)	Cu
Cable cross-section	50 mm²
Cable length	600 / 1800 mm
Max. short-circuit current I_k 0.06 s	34.0 kA
DB drawing No.	3 Ebgw 01.70
DB material No.	742 400

With Earth Clamp for Overhead Contact Lines and Clamp for Railway Tracks with Tommy

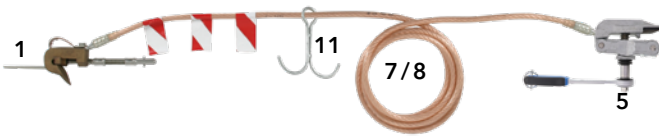


Type	EKV K 50 8500	EKV K 50 12000
Part No.	**751 086**	**751 126**
Material (cable)	Cu	Cu
Cable cross-section	50 mm²	50 mm²
Cable length	8500 mm	12000 mm
Hook	–	–
Max. short-circuit current I_k 0.06 s	34.0 kA	34.0 kA
DB drawing No.	3 Ebgw 01.51/67	3 Ebgw 01.51/67

Type	EKV K H 50 12000	EKV FD K 70 8500AL
Part No.	**751 121**	**752 086**
Material (cable)	Cu	Al
Cable cross-section	50 mm²	70 mm²
Cable length	12000 mm	8500 mm
Hook	✔	–
Max. short-circuit current I_k 0.06 s	34.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.51/67	Ebgw 01.74

Type	EKV FD K 70 12000AL	EKV FD K H70 12000AL
Part No.	**752 126**	**752 121**
Material (cable)	Al	Al
Cable cross-section	70 mm²	70 mm²
Cable length	12000 mm	12000 mm
Hook	–	✔
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	Ebgw 01.74	Ebgw 01.79

With Earth Clamp for Overhead Contact Lines and Clamp for Railway Tracks with Ratchet

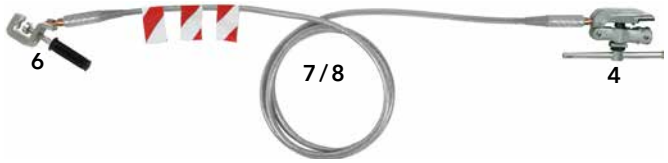


Type	EKV R 50 8500	EKV R 50 12000
Part No.	**751 087**	**751 127**
Material (cable)	Cu	Cu
Cable cross-section	50 mm²	50 mm²
Cable length	8500 mm	12000 mm
Hook	–	–
Max. short-circuit current I_k 0.06 s	34.0 kA	34.0 kA
DB drawing No.	3 Ebgw 01.51/67	3 Ebgw 01.51/67

Type	EKV R H 50 12000	EKV FD R 70 8500AL
Part No.	**751 122**	**752 087**
Material (cable)	Cu	Al
Cable cross-section	50 mm²	70 mm²
Cable length	12000 mm	8500 mm
Hook	✔	–
Max. short-circuit current I_k 0.06 s	34.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.51/67	Ebgw 01.78

Type	EKV FD R 70 12000AL	EKV FD R H70 12000AL
Part No.	**752 127**	**752 122**
Material (cable)	Al	Al
Cable cross-section	70 mm²	70 mm²
Cable length	12000 mm	12000 mm
Hook	–	✔
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	Ebgw 01.78	Ebgw 01.80

With Universal Clamp (Handle) and Clamp for Railway Tracks with Tommy



Type	BEV MF SE K	BEV BM HZ BDW K
Part No.	**751 191**	**751 193**
Material (cable)	Cu	Cu
Cable cross-section	50 mm²	50 mm²
Cable length	8500 mm	12000 mm
Max. short-circuit current I_k 0.06 s	34.0 kA	34.0 kA
DB drawing No.	3 Ebgw 01.56	3 Ebgw 01.56

Type	BEV UKH K 70 8500AL	BEV UKH K 70 12000AL
Part No.	**752 191**	**752 193**
Material (cable)	Al	Al
Cable cross-section	70 mm²	70 mm²
Cable length	8500 mm	12000 mm
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	Ebgw 01.75	Ebgw 01.75

With Universal Clamp (Handle) and Clamp for Railway Tracks with Ratchet



Type	BEV MF SE R	BEV BM HZ BDW R
Part No.	**751 196**	**751 197**
Material (cable)	Cu	Cu
Cable cross-section	50 mm²	50 mm²
Cable length	8500 mm	12000 mm
Max. short-circuit current I_k 0.06 s	34.0 kA	34.0 kA
DB drawing No.	3 Ebgw 01.56	3 Ebgw 01.56

Type	BEV UKH R 70 8500AL	BEV UKH R 70 12000AL
Part No.	**752 196**	**752 197**
Material (cable)	Al	Al
Cable cross-section	70 mm²	70 mm²
Cable length	8500 mm	12000 mm
Max. short-circuit current I_k 0.06 s	32.0 kA	32.0 kA
DB drawing No.	Ebgw 01.76	Ebgw 01.76

With Universal Clamps (Handle) on both sides



Type	BEV MF LTE	BEV 2XUKH 70 8500AL
Part No.	**751 192**	**752 192**
Material (cable)	Cu	Al
Cable cross-section	50 mm²	70 mm²
Cable length	8500 mm	8500 mm
Max. short-circuit current I_k 0.06 s	34.0 kA	32.0 kA
DB drawing No.	3 Ebgw 01.56	Ebgw 01.72

Accessories for Earthing and Short-Circuiting Devices for Railway Applications

Single-pole EaS cable, copper, unequipped

With red and white marking and cable lug with borehole Ø10.5 mm.



General technical data:	
Material	Cu
Crimped cable lug	PK2 (Ø10.5 mm)
Cable cross-section	50 mm²

Type	EKS 50 BEV 4M	EKS 50 BEV 8.5M
Part No.	**751 040**	**751 085**
Cable length	4000 mm	8500 mm
DB material No.	157 511	157 512

Type	EKS 50 BEV 12M	EKS 50 BEV 13M
Part No.	**751 120**	**751 130**
Cable length	12000 mm	13000 mm
DB material No.	157 513	–

Type	EKS 50 BEV 14M
Part No.	**751 140**
Cable length	14000 mm
DB material No.	–

Single-pole EaS cable, aluminium, unequipped

With small red/white marking flags and cable lug with drill hole Ø10.5 mm.



General technical data:	
Material	Al
Crimped cable lug design	PK2 (Ø10.5 mm)
Cable cross-section	70 mm²

Type	EKS B10.5 70 4000AL	EKS B10.5 70 8500AL
Part No.	**752 040**	**752 085**
Cable length	4000 mm	8500 mm

Type	EKS B10.5 70 12000AL
Part No.	**752 120**
Cable length	12000 mm

Suspension hook

For (profile-free) suspension of earthing cables on towers.



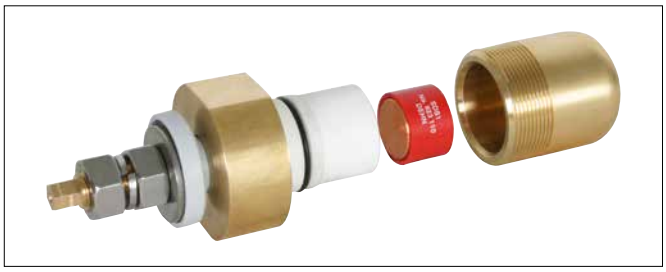
Type	EHH BEV OL
Part No.	**740 124**
DB material No.	778 794

Voltage Limiting Devices





- Electrical isolation of insulated track sections and earthed parts of installations
- Safe equipotential bonding in case of a short-circuit or earth fault at the overhead contact line due to high-current-resistant welding of the electrodes
- Discharge of lightning overvoltages without short-circuit formation due to lightning-resistant SDS ... voltage limiting device
- Short-circuit withstand capability up to 25 kA_{rms} / 100 ms; 36 kA_{rms} / 75 ms



EN 50122-1 describes the use of voltage limiting devices for d.c. and a.c. traction systems for so-called „open traction system earthing" of conductive components of the overhead contact line and pantograph zone.
Voltage limiting devices (SDS ...) are used to prevent the occurrence of hazardous surges between the insulated tracks or track sections of electric railways and earthed parts of the installation.
Their function is to permanently connect parts of the installation in the overhead contact line and pantograph zone to the return circuit as soon as the threshold voltage is exceeded.
In case of atmospheric overvoltages, the lightning-resistant SDS ... voltage limiting device is capable of returning to its initial state after discharging the impulse current. Only when the specified lightning current load is exceeded, does a permanent short circuit occur due to high-current-resistant welding of the electrodes, making it necessary to to replace the fuse link.
The SDS voltage limiting device consists of a spark gap unit and the respective connecting kit and can be directly connected to the rail or overhead contact line tower.
The spark gap unit of type SDS 1 (Part No. 923 110) developed by DEHN has also been approved by the German Federal Railway Authority (EBA).

SDS 1

Voltage limiting device for a power-frequency sparkover voltage ≤ 940 V.



Type SDS ...	1
Part No.	**923 110**
VLD type (EN 50122-1)	VLD-F
Power frequency sparkover voltage (U_{aw})	≤ 940 V
DC sparkover voltage (U_{ag})	700 V -14 % ... +28 %
Impulse sparkover voltage	≤ 1400 V (1 kV/µs)
Self-extinguishing capability	300 A / 65 V
Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x	5 kA
Lightning current withstand capability (10/350 µs)	100 kA
Safe short-circuit due to welding of the electrodes in case of alternating currents	≥ 2.5 kA / 1000 V / 30 ms, ≥ 1.5 kA / 1000 V / 100 ms
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 750 A / 250 ms
Short-circuit withstand capability	25 kA_{rms} / 100 ms; 36 kA_{rms} / 75 ms
Long-term current	1 kA_{rms} for t ≤ 120 s
Leakage current (I_{lc})	< 1 µA for 100 V dc
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx	
Approvals	EBA
DB drawing No.	4 Ebs 15.13.20 Sheet 2

SDS 2

Voltage limiting device for a d.c. sparkover voltage of 350 V.



Type SDS ...	2
Part No.	**923 117**
VLD type (EN 50122-1)	VLD-F
DC sparkover voltage (U_{ag})	350 V +/- 20 %
Impulse sparkover voltage	≤ 900 V (1 kV/µs)
Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x	2 kA
Lightning current withstand capability (10/350 µs)	25 kA
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 600 A / 250 ms
Short-circuit withstand capability	25 kA_{rms} / 100 ms; 36 kA_{rms} / 75 ms
Long-term current	1 kA_{rms} for t ≤ 120 s
Leakage current (I_{lc})	< 1 µA for 100 V dc
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx	

SDS 3

Voltage limiting device for a d.c. sparkover voltage of 550 V.



Type SDS ...	3
Part No.	**923 116**
VLD type (EN 50122-1)	VLD-F
DC sparkover voltage (U_{ag})	550 V +/- 20 %
Impulse sparkover voltage	≤ 1000 V (1 kV/µs)
Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x	2.5 kA
Lightning current withstand capability (10/350 µs)	25 kA
Short-circuit withstand capability	25 kA_{rms} / 100 ms
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx	

SDS 4

Voltage limiting device for a d.c. sparkover voltage of 230 V.



Type SDS ...	4
Part No.	**923 118**
VLD type (EN 50122-1)	VLD-F
DC sparkover voltage (U_{ag})	230 V +/- 20 %
Impulse sparkover voltage	≤ 650 V (1 kV/µs)
Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x	2.5 kA
Lightning current withstand capability (10/350 µs)	25 kA
Impulse current discharge capacity (8/20 µs) 0.1x / 0.5x / 1x	20 kA
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 600 A / 250 ms
Short-circuit withstand capability	25 kA_{rms} / 100 ms; 36 kA_{rms} / 75 ms
Long-term current	1 kA_{rms} for t ≤ 120 s
Leakage current (I_{lc})	< 1 µA for 100 V dc
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx	

SDS 5

Voltage limiting device for a d.c. sparkover voltage of 120 V.



Type SDS ...	5
Part No.	**923 119**
VLD type (EN 50122-1)	VLD-F
DC sparkover voltage (U_{ag})	120 V +/- 20 %
Impulse sparkover voltage	≤ 600 V (1 kV/µs)
Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x	2 kA
Lightning current withstand capability (10/350 µs)	25 kA
Impulse current discharge capacity (8/20 µs) 0.1x / 0.5x / 1x	20 kA
Safe short-circuit due to welding of the electrodes in case of direct currents	≥ 600 A / 250 ms
Short-circuit withstand capability	25 kA_{rms} / 100 ms; 36 kA_{rms} / 75 ms
Long-term current	1 kA_{rms} for t ≤ 120 s
Leakage current (I_{lc})	< 1 µA for 100 V dc
Operating temperature range (T_U)	-40 °C ... +80 °C
To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx	

Accessories for Voltage Limiting Devices

Mast adapter for SDS voltage-limiting devices

For mounting on the mast support profile of a contact wire mast with Fl 8–12 mm.



Type	MA SDS M12
Part No.	**723 199**
Lightning current carrying capability (10/350 µs)	25 kA
Short-circuit withstand capability	21 kA_{rms} / 30 ms
Long-term current	1 kA_{rms} at t ≤ 120 s
Leakage current (I_{lc})	< 1 µA at 100 V d.c.
Dimensions of the threaded pin	M12
Material	**Brass**
Degree of protection of the inner enclosure	IP 67



test the camera

Brings the invisible to light

DEHNproX Inspection Camera

Inspection camera approved by **DB InfraGO AG** facilitates the regular visual inspection and documentation of the condition of the overhead line system of live electric railways.

- **Brings the invisible to light:** Discover hidden contamination and damage live.
- **Increases safety:** The electrician can stay outside the danger zone by attaching the camera to an insulating stick.
- **Documents system condition:** Easy creation and archiving of photos and films as documentation.
- **Saves time:** No disconnection of the system during inspection is necessary.

Discover now how the DEHNproX inspection camera increases safety and saves time.



More information here:

Directories

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Part No.	GTIN*	PG	Weight	PU	SU	Page
336 020	003941	05 00 04 01	118 g	1	pc(s)	77
336 025	003958	05 00 04 01	252 g	1	pc(s)	77
524 910	039339	01 50 50 01	2 g	1	pc(s)	78
524 912	039360	01 06 01 01	4 g	1	pc(s)	78
524 913	053250	01 06 01 01	8 g	1	pc(s)	78
525 001	004986	05 00 04 50	19 g	10	pc(s)	78
525 002	004993	05 00 04 50	37 g	10	pc(s)	78
525 910	390911	01 50 50 01	3 g	1	pc(s)	78
525 912	053267	01 50 50 01	5 g	1	pc(s)	78
525 916	053274	01 06 01 01	10 g	1	pc(s)	78
561 924	047280	01 50 50 01	26 g	1	pc(s)	78
561 925	056244	01 06 01 01	35 g	1	pc(s)	78
561 930	053298	01 06 01 01	39 g	1	pc(s)	78
561 931	053311	01 06 01 01	77 g	1	pc(s)	78
561 935	056053	01 06 01 01	42 g	1	pc(s)	78
644 000	030268	03 07 01 01	4.45 kg	1	pc(s)	86
700 000	004122	05 05 01 06	1.16 kg	1	pc(s)	66/103
700 002	004139	05 05 01 06	1.15 kg	1	pc(s)	66/103
700 003	004146	05 05 01 06	700 g	1	pc(s)	66/103
700 004	004153	05 05 01 06	1.00 kg	1	pc(s)	37
700 005	004160	05 05 01 06	707 g	1	pc(s)	37
700 006	004177	05 05 01 06	780 g	1	pc(s)	66/103
700 007	004184	05 05 01 06	780 g	1	pc(s)	66/103
700 008	004191	05 05 01 06	803 g	1	pc(s)	66/103
700 014	007208	05 05 01 06	1.71 kg	1	pc(s)	37
700 015	007192	05 05 01 06	1.41 kg	1	pc(s)	37
700 058	511682	05 00 02 02	5 g	10	pc(s)	39
700 059	511699	05 00 02 02	167 g	1	pc(s)	39
700 060	511705	05 00 02 02	363 g	1	pc(s)	39
700 080	539075	05 00 02 03	750 g	1	pc(s)	40
700 081	539129	05 00 02 03	1.13 kg	1	pc(s)	40
700 082	539327	05 00 02 03	1.50 kg	1	pc(s)	40
700 083	539334	05 00 02 03	1.88 kg	1	pc(s)	40
700 084	539518	05 00 02 03	2.25 kg	1	pc(s)	40
700 085	539549	05 00 02 03	2.63 kg	1	pc(s)	40
700 086	539556	05 00 02 03	3.00 kg	1	pc(s)	40
700 087	539617	05 00 02 03	3.38 kg	1	pc(s)	40
700 088	539631	05 00 02 03	3.75 kg	1	pc(s)	40
700 089	539648	05 00 02 03	4.13 kg	1	pc(s)	40
700 090	539655	05 00 02 03	4.50 kg	1	pc(s)	40
700 098	157422	05 00 02 03	180 g/PAK	1	PAK	40
700 100	500280	05 00 03 09	318 g	1	pc(s)	58
700 102	500297	05 00 03 09	345 g	1	pc(s)	58
700 110	501546	05 00 02 03	18.74 kg	1	pc(s)	40
700 111	502055	05 00 02 03	19.93 kg	1	pc(s)	40
700 112	502062	05 00 02 03	660 g	1	pc(s)	40
700 113	502079	05 00 02 03	680 g	1	pc(s)	40
700 120	501560	05 01 01 05	15 g	1	pc(s)	110
700 121	501577	05 01 01 05	20 g	1	pc(s)	110
700 122	501584	05 01 01 05	29 g	1	pc(s)	110
705 500	000025	05 00 04 50	122 g	1	pc(s)	77
705 501	003927	05 00 04 01	152 g	1	pc(s)	77
705 504	008021	05 00 04 50	183 g	5	pc(s)	77
705 510	089587	05 00 04 50	240 g	1	pc(s)	77
706 200	004276	05 00 04 01	172 g	1	pc(s)	76
706 235	004290	05 00 04 01	219 g	1	pc(s)	76
706 239	155145	05 00 04 01	227 g	1	pc(s)	76
706 300	003675	05 00 04 01	129 g	1	pc(s)	75
706 600	004283	05 00 04 01	158 g	1	pc(s)	76
706 645	004306	05 00 04 01	274 g	1	pc(s)	76
707 200	004368	05 00 04 01	204 g	1	pc(s)	76
707 235	004382	05 00 04 01	259 g	1	pc(s)	76
707 600	004375	05 00 04 01	191 g	1	pc(s)	76
707 645	004399	05 00 04 01	299 g	1	pc(s)	76
712 001	011823	05 00 04 02	1.23 kg/m	1	m	80
715 001	011830	05 00 04 02	1.52 kg/m	1	m	80
715 312	150386	05 00 04 08	1.50 kg	1	pc(s)	84
715 313	154971	05 00 04 08	1.55 kg	1	pc(s)	84
715 314	132474	05 00 04 08	1.61 kg	1	pc(s)	84
715 315	135338	05 00 04 08	1.60 kg	1	pc(s)	84
716 001	010406	05 00 04 02	1.00 m/Stk	1	pc(s)	80
723 199	151703	05 03 01 01	750 g	1	pc(s)	183
725 001	011793	05 00 04 02	207 g/m	1	m	80
725 010	003750	05 00 04 01	410 g	1	pc(s)	75
725 012	003767	05 00 04 01	400 g	1	pc(s)	75
725 014	003774	05 00 04 01	385 g	1	pc(s)	75
725 016	003781	05 00 04 01	365 g	1	pc(s)	75
725 018	078048	05 00 04 01	345 g	1	pc(s)	75
725 020	003804	05 00 04 01	320 g	1	pc(s)	75
728 312	128712	05 00 04 08	270 g	1	pc(s)	86
728 313	157132	05 00 04 08	612 g	1	pc(s)	86
728 501	079618	05 00 04 07	900 g	1	pc(s)	176
728 502	079571	05 00 04 07	708 g	1	pc(s)	176
728 503	079564	05 00 04 07	453 g	1	pc(s)	176
728 516	147898	05 00 04 09	1.44 kg	1	pc(s)	79
728 522	147874	05 00 04 09	676 g	1	pc(s)	79
728 526	147881	05 00 04 09	934 g	1	pc(s)	79
728 620	147843	05 00 04 09	985 g	1	pc(s)	79
728 625	147867	05 00 04 09	984 g	1	pc(s)	79
735 001	011847	05 00 04 02	366 g/m	1	m	80
740 124	051072	05 00 04 06	255 g	1	pc(s)	182
740 200	522558	05 06 01 01	368 g	1	pc(s)	27
740 290	526174	05 06 01 01	48 g	1	pc(s)	27
745 016	052000	05 00 04 13	467 g	1	pc(s)	99
745 017	052017	05 00 04 13	277 g	1	pc(s)	99
745 018	052048	05 00 04 13	271 g	1	pc(s)	99
745 021	155336	05 00 04 13	289 g	1	pc(s)	100
745 022	353138	05 00 04 13	114 g	3	pc(s)	99
745 105	104457	05 00 04 15	1.83 kg	1	pc(s)	102
745 106	104495	05 05 01 02	890 g	1	pc(s)	102
745 107	104501	05 00 04 15	286 g	1	pc(s)	102
745 108	104518	05 00 04 15	20 g	1	pc(s)	102
745 109	104525	05 00 04 15	18 g	1	pc(s)	102
745 115	155299	05 00 04 15	296 g	1	pc(s)	102
745 121	268418	05 00 04 15	415 g	1	pc(s)	102
745 201	008007	05 00 04 15	65 g	1	pc(s)	100
745 202	007871	05 00 04 15	90 g	1	pc(s)	100
745 203	008014	05 00 04 15	102 g	1	pc(s)	100
745 204	018655	05 00 04 15	145 g	1	pc(s)	100
745 302	052024	05 00 04 15	110 g	1	pc(s)	99
745 307	155404	05 00 04 15	116 g	1	pc(s)	99
745 400	006959	05 00 04 13	250 g	1	pc(s)	100
745 414	116085	05 00 04 11	285 g	1	pc(s)	103
745 415	116092	05 00 04 11	275 g	1	pc(s)	103
745 500	007888	05 00 04 13	7.57 kg	1	pc(s)	98
745 502	072213	05 00 04 13	360 g	1	pc(s)	100
745 503	133570	05 00 04 12	154 g	1	pc(s)	97
745 506	307667	05 00 04 13	114 g	1	pc(s)	100
745 508	149366	05 00 04 13	137 g	1	pc(s)	100
745 509	149915	05 00 04 13	127 g	1	pc(s)	102
745 510	155671	05 00 04 13	225 g	1	pc(s)	97
745 602	072220	05 00 04 13	406 g	1	pc(s)	100
745 900	082731	05 05 01 01	3.71 kg	1	pc(s)	96/104
745 901	083530	05 00 04 12	6.89 kg	1	pc(s)	96
745 902	093591	05 05 01 02	1.62 kg	1	pc(s)	96
745 902	093591	05 05 01 02	1.62 kg	1	pc(s)	104
745 903	093577	05 00 04 12	7.00 kg	1	pc(s)	96
745 905	082021	05 00 04 12	75 g	1	pc(s)	97
745 910	082038	05 00 04 12	190 g	1	pc(s)	97
745 915	082045	05 00 04 12	420 g	1	pc(s)	97
745 921	082069	05 00 04 12	216 g	1	pc(s)	97/100/102
745 922	082434	05 00 04 12	220 g	1	pc(s)	97

*) and 1) see page 197

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Part No.	GTIN*	PG	Weight	PU	SU	Page
745 952	137066	05 05 01 02	4.90 kg	1	pc(s)	96/98/104
745 953	137073	05 05 01 02	4.95 kg	1	pc(s)	104
750 001	011809	05 00 04 02	535 g/m	1	m	80
750 041	126688	05 00 04 06	4.22 kg	1	pc(s)	180
750 042	126695	05 00 04 06	3.89 kg	1	pc(s)	180
750 196	123823	05 00 04 06	26.58 kg	1	pc(s)	177
750 200	123830	05 00 04 06	16.95 kg	1	pc(s)	178
750 210	123793	05 00 04 06	13.44 kg	1	pc(s)	177
750 211	123809	05 00 04 06	15.55 kg	1	pc(s)	177
750 212	123847	05 00 04 06	13.00 kg	1	pc(s)	178
750 213	123861	05 00 04 06	8.76 kg	1	pc(s)	178
750 214	123816	05 00 04 06	15.60 kg	1	pc(s)	177
750 215	123878	05 00 04 06	7.30 kg	1	pc(s)	178
750 216	157255	05 00 04 06	26.58 kg	1	pc(s)	177
750 217	157262	05 00 04 06	17.08 kg	1	pc(s)	178
750 218	157224	05 00 04 06	14.73 kg	1	pc(s)	177
750 219	157231	05 00 04 06	16.87 kg	1	pc(s)	177
750 221	157248	05 00 04 06	15.51 kg	1	pc(s)	177
750 500	000032	05 00 04 50	250 g	1	pc(s)	77
751 040	006041	05 00 04 02	2.60 kg	1	pc(s)	182
751 085	006058	05 00 04 02	4.98 kg	1	pc(s)	182
751 086	126626	05 00 04 06	8.99 kg	1	pc(s)	181
751 087	126633	05 00 04 06	9.13 kg	1	pc(s)	181
751 120	006065	05 00 04 02	6.86 kg	1	pc(s)	182
751 121	126640	05 00 04 06	11.14 kg	1	pc(s)	181
751 122	126657	05 00 04 06	11.41 kg	1	pc(s)	181
751 126	126664	05 00 04 06	10.88 kg	1	pc(s)	181
751 127	126671	05 00 04 06	11.01 kg	1	pc(s)	181
751 130	041776	05 00 04 02	7.39 kg	1	pc(s)	182
751 140	018570	05 00 04 02	7.93 kg	1	pc(s)	182
751 150	084520	05 00 04 06	4.53 kg	1	pc(s)	180
751 191	126602	05 00 04 06	8.82 kg	1	pc(s)	181
751 192	123885	05 00 04 06	6.68 kg	1	pc(s)	182
751 193	123892	05 00 04 06	10.28 kg	1	pc(s)	181
751 196	157767	05 00 04 06	8.53 kg	1	pc(s)	181
751 197	157774	05 00 04 06	14.41 kg	1	pc(s)	181
752 040	230187	05 00 04 03	1.09 kg	1	pc(s)	182
752 041	230569	05 00 04 05	3.18 kg	1	pc(s)	180
752 042	230576	05 00 04 05	3.57 kg	1	pc(s)	180
752 085	230637	05 00 04 03	2.32 kg	1	pc(s)	182
752 086	230217	05 00 04 07	7.02 kg	1	pc(s)	181
752 087	230422	05 00 04 07	7.33 kg	1	pc(s)	181
752 120	230644	05 00 04 03	3.28 kg	1	pc(s)	182
752 121	230316	05 00 04 07	8.32 kg	1	pc(s)	181
752 122	230453	05 00 04 07	8.48 kg	1	pc(s)	181
752 126	230262	05 00 04 07	8.05 kg	1	pc(s)	181
752 127	230439	05 00 04 07	8.21 kg	1	pc(s)	181
752 191	230330	05 00 04 07	6.34 kg	1	pc(s)	181
752 192	230590	05 00 04 07	4.66 kg	1	pc(s)	182
752 193	230538	05 00 04 07	7.38 kg	1	pc(s)	181
752 196	230545	05 00 04 07	6.52 kg	1	pc(s)	181
752 197	230552	05 00 04 07	7.55 kg	1	pc(s)	181
754 200	004207	05 00 04 01	131 g	1	pc(s)	75
754 205	097865	05 00 04 01	137 g	1	pc(s)	75
754 235	004221	05 00 04 01	184 g	1	pc(s)	75
754 238	131309	05 00 04 01	180 g	1	pc(s)	75
754 600	004214	05 00 04 01	116 g	1	pc(s)	75
754 645	004238	05 00 04 01	287 g	1	pc(s)	75
755 200	000087	05 00 04 01	220 g	1	pc(s)	75
755 225	004498	05 00 04 01	265 g	1	pc(s)	75
755 245	000070	05 00 04 01	278 g	1	pc(s)	75
755 501	003934	05 00 04 01	298 g	1	pc(s)	77
755 600	000094	05 00 04 01	204 g	1	pc(s)	75
755 626	079625	05 00 04 01	301 g	1	pc(s)	176
755 627	077768	05 00 04 01	311 g	1	pc(s)	176
755 636	079670	05 00 04 01	310 g	1	pc(s)	176
755 645	000100	05 00 04 01	319 g	1	pc(s)	75
755 646	079632	05 00 04 01	330 g	1	pc(s)	176

Part No.	GTIN*	PG	Weight	PU	SU	Page
756 200	004313	05 00 04 01	357 g	1	pc(s)	76
756 245	004337	05 00 04 01	434 g	1	pc(s)	76
756 300	003682	05 00 04 01	212 g	1	pc(s)	75
756 600	004320	05 00 04 01	356 g	1	pc(s)	76
756 645	004344	05 00 04 01	470 g	1	pc(s)	76
757 200	004405	05 00 04 01	395 g	1	pc(s)	76
757 245	004429	05 00 04 01	454 g	1	pc(s)	76
757 600	004412	05 00 04 01	370 g	1	pc(s)	76
757 645	004436	05 00 04 01	491 g	1	pc(s)	76
758 001	004030	05 00 04 16	2.21 kg	1	pc(s)	69
758 003	004047	05 00 04 16	1.95 kg	1	pc(s)	69
758 015	041608	05 00 04 16	2.62 kg	1	pc(s)	69
758 020	098992	05 00 04 16	1.34 kg	1	pc(s)	69
758 021	099005	05 00 04 16	1.10 kg	1	pc(s)	69
758 022	099012	05 00 04 16	650 g	1	pc(s)	69
758 025	127838	05 00 04 16	1.49 kg	1	pc(s)	69
758 028	132450	05 00 04 16	4.16 kg	1	pc(s)	70
758 036	133884	05 00 04 16	203 g	1	pc(s)	70
758 075	247789	05 00 04 16	1.08 kg	1	pc(s)	70
758 085	247819	05 00 04 16	750 g	1	pc(s)	70
758 095	247826	05 00 04 16	1.32 kg	1	pc(s)	70
758 099	287587	05 00 04 16	3.06 kg	1	pc(s)	70
758 116	247918	05 00 04 16	220 g	1	pc(s)	70
758 125	247925	05 00 04 16	260 g	1	pc(s)	70
758 135	247932	05 00 04 16	301 g	1	pc(s)	70
758 216	247949	05 00 04 16	282 g	1	pc(s)	70
759 706	259232	05 00 03 11	1.24 kg	1	pc(s)	59
759 712	259256	05 00 03 11	1.24 kg	1	pc(s)	59
759 736	259263	05 00 03 11	1.46 kg	1	pc(s)	59
759 716	259270	05 00 03 11	1.52 kg	1	pc(s)	59
759 798	259317	05 00 03 50	2 g	1	pc(s)	111
759 799	259294	05 00 03 50	32 g	1	pc(s)	111
761 001	125179	05 00 04 11	525 g	1	pc(s)	89
761 002	125186	05 00 04 11	400 g	1	pc(s)	90
761 003	134348	05 00 04 11	830 g	1	pc(s)	89
761 004	134355	05 00 04 11	853 g	1	pc(s)	90
761 010	000155	05 00 04 11	980 g	1	pc(s)	89
761 011	000230	05 00 04 11	1.05 kg	1	pc(s)	89
761 015	000162	05 00 04 11	1.35 kg	1	pc(s)	89
761 016	000247	05 00 04 11	1.36 kg	1	pc(s)	89
761 031	008519	05 00 04 11	1.73 kg	1	pc(s)	89
761 070	136212	05 00 04 11	800 g	1	pc(s)	90
761 075	136229	05 00 04 11	800 g	1	pc(s)	90
763 100	125155	05 00 01 02	600 g	1	pc(s)	36
763 111	137226	05 00 01 02	580 g	1	pc(s)	36
763 211	081567	05 00 05 01	8.00 kg	1	pc(s)	107
763 221	081574	05 00 05 01	8.00 kg	1	pc(s)	107
763 231	081581	05 00 05 01	8.00 kg	1	pc(s)	107
763 241	081598	05 00 05 01	8.00 kg	1	pc(s)	107
763 610	003286	05 00 01 02	962 g	1	pc(s)	36
763 611	076921	05 00 01 02	610 g	1	pc(s)	36
763 612	078635	05 00 01 02	800 g	1	pc(s)	36
763 615	003309	05 00 01 02	1.42 kg	1	pc(s)	36
763 620	003316	05 00 01 02	800 g	1	pc(s)	36
763 630	003330	05 00 01 02	1.35 kg	1	pc(s)	36
763 710	098558	05 00 01 01	1.20 kg	1	pc(s)	38
763 711	098565	05 00 01 01	442 g	1	pc(s)	38
763 712	098572	05 00 01 01	49 g	1	pc(s)	38
765 001	051805	05 00 04 11	190 g	1	pc(s)	90/95
765 005	051775	05 00 01 02	117 g	1	pc(s)	32/112
765 006	156104	05 00 04 11	315 g	1	pc(s)	91
765 009	051782	05 00 01 02	145 g	1	pc(s)	33/112
765 040	093751	05 00 01 03	2.13 kg	1	pc(s)	37
765 041	093768	05 00 01 03	2.28 kg	1	pc(s)	37
765 042	093775	05 00 01 03	2.59 kg	1	pc(s)	37
765 050	093782	05 00 01 03	2.15 kg	1	pc(s)	37
765 051	093799	05 00 01 03	2.29 kg	1	pc(s)	37
765 052	093805	05 00 01 03	2.59 kg	1	pc(s)	37

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Part No.	GTIN*	PG	Weight	PU	SU	Page
766 001	017825	05 00 01 01	416 g	1	pc(s)	32
766 002	017832	05 00 01 01	810 g	1	pc(s)	32
766 036	105584	05 05 01 02	968 g	1	pc(s)	68
766 037	125940	05 00 01 01	6.56 kg	1	pc(s)	51/113
766 038	105355	05 00 01 01	275 g	1	pc(s)	113
766 039	105362	05 05 01 04	712 g	1	pc(s)	113
766 040	113046	05 00 01 04	820 g	1	pc(s)	36
766 041	113053	05 00 01 04	1.02 kg	1	pc(s)	36
766 042	113060	05 00 01 04	1.12 kg	1	pc(s)	36
766 043	510142	05 00 01 04	1.00 kg	1	pc(s)	36
766 049	108059	05 00 01 01	165 g	1	pc(s)	113
766 055	125063	05 00 01 01	120 g	1	pc(s)	114
766 056	125070	05 00 01 01	204 g	1	pc(s)	167
766 057	125087	05 00 01 50	287 g/PAK	1	PAK	167
766 059	378681	05 00 01 01	110 g	1	pc(s)	167
766 073	126121	05 00 03 50	1.60 kg	1	pc(s)	114
766 076	120464	05 00 04 11	770 g	1	pc(s)	114
766 077	120457	05 00 04 11	730 g	1	pc(s)	114
766 100	125117	05 00 01 01	400 g	1	pc(s)	32
766 105	125988	05 00 03 50	10 g	1	pc(s)	113
766 111	137295	05 00 01 01	560 g	1	pc(s)	32
766 115	136038	05 00 01 50	725 g	1	pc(s)	114
766 116	153073	05 00 01 01	1.05 kg	1	pc(s)	114
766 117	153080	05 00 01 01	645 g	1	pc(s)	114
766 120	136052	05 00 01 50	690 g	1	pc(s)	114
766 122	134249	05 00 01 01	800 g	1	pc(s)	32
766 164	121751	05 00 01 02	400 g	1	pc(s)	33/112
766 169	230675	05 00 01 02	550 g	1	pc(s)	112
766 298	007864	05 05 01 01	3.70 kg	1	pc(s)	98
766 298	007864	05 05 01 01	3.70 kg	1	pc(s)	104
766 300	007628	05 05 01 01	1.20 kg	1	pc(s)	98/104
766 301	125124	05 00 01 01	400 g	1	pc(s)	33/35
766 302	051317	05 00 04 13	4.38 kg	1	pc(s)	98
766 310	137318	05 00 01 01	560 g	1	pc(s)	33
766 311	017856	05 00 01 01	419 g	1	pc(s)	32/35
766 312	311985	05 00 01 01	540 g	1	pc(s)	32
766 313	115040	05 00 01 50	413 g	1	pc(s)	66
766 315	008281	05 00 01 01	820 g	1	pc(s)	32/35
766 321	129528	05 00 01 50	227 g	1	pc(s)	33
766 322	134256	05 00 01 01	800 g	1	pc(s)	33/35
766 328	135765	05 00 01 01	283 g	1	pc(s)	113
766 331	115002	05 00 01 01	375 g	1	pc(s)	113
766 332	137325	05 00 01 01	2.38 kg	1	pc(s)	33
766 335	115033	05 00 01 50	420 g	1	pc(s)	35/114
766 340	125056	05 00 01 01	3.00 kg	1	pc(s)	167
766 352	136069	05 00 01 50	250 g	1	pc(s)	114
766 356	121799	05 00 01 50	400 g	1	pc(s)	35/114
766 358	136137	05 00 01 50	200 g	1	pc(s)	114
766 359	134379	05 00 01 50	200 g	1	pc(s)	34/114/167
766 362	230705	05 00 01 01	635 g	1	pc(s)	33/113
766 363	121737	05 00 01 01	600 g	1	pc(s)	33/34
766 363	121737	05 00 01 01	600 g	1	pc(s)	113
766 364	128262	05 00 01 01	240 g	1	pc(s)	33/112
766 365	121768	05 00 01 01	200 g	1	pc(s)	33/112
766 366	121782	05 00 01 50	600 g	1	pc(s)	35/114
766 367	137042	05 00 01 01	600 g	1	pc(s)	33/113
766 368	115026	05 00 01 01	340 g	1	pc(s)	51/113
766 369	125025	05 00 01 01	388 g	1	pc(s)	113
766 371	139909	05 00 01 01	560 g	1	pc(s)	166
766 372	139916	05 00 01 01	1.24 kg	1	pc(s)	166
766 380	400863	05 00 01 01	6.67 kg	1	pc(s)	35/167
766 389	411838	05 00 01 05	82 g	1	pc(s)	35
766 392	282902	05 00 01 05	78 g	1	pc(s)	35
766 393	282926	05 00 01 05	153 g	1	pc(s)	34
766 396	307056	05 00 01 05	123 g	1	pc(s)	35
766 456	121812	05 00 01 50	690 g	1	pc(s)	35/114
766 466	121805	05 00 01 50	900 g	1	pc(s)	35/114
766 469	139893	05 00 01 01	3.42 kg	1	pc(s)	166
766 480	511835	05 00 01 05	1.55 kg	1	pc(s)	34/164
766 483	513921	05 00 01 05	17 g	1	pc(s)	34/164
766 520	136243	05 00 04 11	306 g	1	pc(s)	114
766 542	051706	05 00 03 09	71 g	1	pc(s)	57
766 543	051683	05 05 01 03	148 g	1	pc(s)	57
766 601	056596	05 05 01 03	319 g	1	pc(s)	68
766 602	056626	05 05 01 03	1.31 kg	1	pc(s)	68/175
766 605	054370	05 50 50 01	2 g	1	pc(s)	111
766 611	146549	05 00 03 50	94 g/PAK	1	PAK	111
766 614	056916	05 05 01 03	600 g	1	pc(s)	68/175
766 616	126091	05 00 03 02	5.09 kg	1	pc(s)	168
766 617	101760	05 00 03 02	4.95 kg	1	pc(s)	168
766 618	148277	05 00 03 50	24 g	1	pc(s)	111
766 660	302464	05 00 03 09	460 g	1	pc(s)	57
766 665	302488	05 00 03 09	460 g	1	pc(s)	57
766 704	069749	05 05 01 04	720 g	1	pc(s)	67/175
766 706	094307	05 00 03 07	800 g	1	pc(s)	51
766 710	094314	05 00 03 07	1.70 kg	1	pc(s)	51
766 720	094321	05 00 03 07	1.70 kg	1	pc(s)	51
766 888	125209	05 00 03 50	63 g	1	pc(s)	66
766 889	125193	05 00 03 50	172 g	1	pc(s)	66
766 913	051836	05 00 03 50	42 g	1	pc(s)	65
766 915	088207	05 00 03 50	220 g	1	pc(s)	65
766 916	106840	05 00 03 50	125 g	1	pc(s)	65
766 923	074590	05 00 03 50	71 g	1	pc(s)	65
766 924	094840	05 00 03 50	46 g	1	pc(s)	65
766 925	091672	05 00 03 50	10 g	1	pc(s)	65
766 927	097452	05 00 03 50	12 g	1	pc(s)	65
766 940	080485	05 00 03 50	145 g	1	pc(s)	65
766 941	080478	05 00 03 50	150 g	1	pc(s)	65
766 950	090668	05 00 03 50	339 g	1	pc(s)	65
766 960	109629	05 00 03 50	310 g	1	pc(s)	65
766 993	534223	05 05 01 02	0 g	1	pc(s)	68
766 994	247062	05 05 01 02	3.31 kg	1	pc(s)	68
766 996	128170	05 05 01 03	4.00 kg	1	pc(s)	68
767 101	069541	05 00 03 12	60 g	1	pc(s)	61
767 102	074064	05 00 03 12	62 g	1	pc(s)	61
767 107	105577	05 05 01 02	880 g	1	pc(s)	68
767 110	070905	05 00 03 12	119 g	1	pc(s)	61
767 112	074361	05 00 03 12	150 g	1	pc(s)	62
767 122	074385	05 00 03 12	185 g	1	pc(s)	62
767 125	130319	05 00 03 01	1.26 kg	1	pc(s)	169
767 131	139411	05 00 03 01	6.20 kg	1	pc(s)	171
767 132	073005	05 00 03 12	640 g	1	pc(s)	63
767 133	073494	05 00 03 12	85 g	1	pc(s)	64
767 136	081109	05 00 03 12	65 g	1	pc(s)	64
767 139	136953	05 00 03 12	820 g	1	pc(s)	63
767 150	139473	05 00 03 12	1.94 kg	1	pc(s)	64
767 413	128750	05 00 03 02	1.77 kg	1	pc(s)	170
767 415	081116	05 00 03 02	1.52 kg	1	pc(s)	170
767 416	084247	05 00 03 02	2.62 kg	1	pc(s)	170
767 500	105676	05 05 01 03	280 g	1	pc(s)	63
767 539	306769	05 00 03 06	1.40 kg	1	pc(s)	54
767 541	115712	05 00 03 06	1.20 kg	1	pc(s)	54/173
767 542	086616	05 00 03 06	5.35 kg	1	pc(s)	54/173
767 547	158276	05 00 03 06	2.00 kg	1	pc(s)	55
767 552	115736	05 00 03 06	2.00 kg	1	pc(s)	55
767 565	143760	05 00 03 06	2.03 kg	1	pc(s)	172
767 571	124967	05 00 03 06	1.99 kg	1	pc(s)	53
767 572	124974	05 00 03 06	2.01 kg	1	pc(s)	53
767 573	134270	05 00 03 06	3.57 kg	1	pc(s)	53
767 574	125971	05 05 01 03	500 g	1	pc(s)	68
767 610	135208	05 00 03 08	4.40 kg	1	pc(s)	174
767 614	135307	05 00 03 08	6.00 kg	1	pc(s)	174
767 636	155886	05 00 03 08	2.31 kg	1	pc(s)	56
767 636	155886	05 00 03 08	2.31 kg	1	pc(s)	174
767 637	155879	05 00 03 08	2.10 kg	1	pc(s)	54/173
767 639	155817	05 00 03 08	2.40 kg	1	pc(s)	175
767 640	155978	05 00 03 08	2.10 kg	1	pc(s)	54/173
767 645	156067	05 00 03 08	2.60 kg	1	pc(s)	54/173
767 647	156081	05 00 03 08	2.10 kg	1	pc(s)	54/173
767 661	535558	05 00 03 08	3.50 kg	1	pc(s)	57/175
767 666	157071	05 00 03 08	2.20 kg	1	pc(s)	56
767 666	157071	05 00 03 08	2.20 kg	1	pc(s)	174
767 671	156807	05 00 03 08	2.60 kg	1	pc(s)	56/175
767 681	153165	05 00 03 08	2.60 kg	1	pc(s)	56/175
767 701	071292	05 05 01 01	5.70 kg	1	pc(s)	67
767 703	070899	05 00 03 01	1.01 kg	1	pc(s)	49
767 706	070837	05 00 03 01	1.01 kg	1	pc(s)	49

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767 710	070851	05 00 03 01	1.01 kg	1	pc(s)	49
767 711	070820	05 00 03 01	1.16 kg	1	pc(s)	49
767 712	074699	05 50 50 01	37 g	1	pc(s)	111
767 713	094925	05 50 50 01	45 g	1	pc(s)	111
767 720	070844	05 00 03 01	1.89 kg	1	pc(s)	49
767 721	070868	05 00 03 01	1.23 kg	1	pc(s)	49
767 724	125902	05 00 03 01	4.22 kg	1	pc(s)	52
767 730	070813	05 00 03 01	1.13 kg	1	pc(s)	49
767 731	070875	05 00 03 01	1.29 kg	1	pc(s)	49
767 733	070882	05 00 03 01	1.29 kg	1	pc(s)	49
767 740	071063	05 00 03 01	1.45 kg	1	pc(s)	49
767 750	071070	05 00 03 01	1.51 kg	1	pc(s)	49
767 760	072947	05 00 03 01	177 g	1	pc(s)	112
767 761	072954	05 00 03 01	282 g	1	pc(s)	112
767 762	072961	05 00 03 01	353 g	1	pc(s)	112
767 763	072978	05 00 03 01	529 g	1	pc(s)	112
767 764	072114	05 00 03 01	506 g	1	pc(s)	112
767 766	091696	05 00 03 01	129 g	1	pc(s)	112
767 771	115118	05 00 03 01	600 g	1	pc(s)	112
767 776	096486	05 50 50 01	58 g	1	pc(s)	111
767 777	096493	05 50 50 01	46 g	1	pc(s)	111
767 779	093942	05 00 03 50	3 g	1	pc(s)	111
767 903	134737	05 00 03 01	992 g	1	pc(s)	50
767 906	134744	05 00 03 01	992 g	1	pc(s)	50
767 910	134751	05 00 03 01	992 g	1	pc(s)	50
767 920	134768	05 00 03 01	1.10 kg	1	pc(s)	50
767 921	097360	05 00 03 01	1.65 kg	1	pc(s)	51
767 922	097384	05 00 03 01	1.07 kg	1	pc(s)	51
767 930	134775	05 00 03 01	1.17 kg	1	pc(s)	50
767 931	097377	05 00 03 01	1.08 kg	1	pc(s)	51
767 932	097391	05 00 03 01	1.07 kg	1	pc(s)	51
767 940	134829	05 00 03 01	1.39 kg	1	pc(s)	49
767 941	134782	05 00 03 01	1.17 kg	1	pc(s)	50
767 944	277731	05 00 03 01	1.38 kg	1	pc(s)	50
767 950	134836	05 00 03 01	1.44 kg	1	pc(s)	49
767 951	134799	05 00 03 01	1.26 kg	1	pc(s)	50
767 960	134812	05 00 03 01	1.32 kg	1	pc(s)	50
767 961	134805	05 00 03 01	1.32 kg	1	pc(s)	50
767 980	125926	05 00 03 01	5.98 kg	1	pc(s)	52
767 996	120181	05 05 01 03	2.30 kg	1	pc(s)	68
769 300	080867	05 00 04 11	2.80 kg	1	pc(s)	91
769 304	149144	05 00 04 11	2.00 kg	1	pc(s)	90
769 352	007345	05 00 04 11	3.70 kg	1	pc(s)	179
769 400	080881	05 00 04 11	3.37 kg	1	pc(s)	91
769 500	080904	05 00 04 11	3.92 kg	1	pc(s)	91
769 502	004542	05 00 04 11	4.54 kg	1	pc(s)	179
769 503	003996	05 00 04 11	1.65 kg	1	pc(s)	91
769 504	004559	05 00 04 11	1.66 kg	1	pc(s)	91
769 505	004566	05 00 04 11	1.46 kg	1	pc(s)	91
769 508	052383	05 00 04 11	4.50 kg	1	pc(s)	179
769 509	068230	05 05 01 04	358 g	1	pc(s)	178
769 511	135055	05 00 04 11	4.41 kg	1	pc(s)	85
769 515	157361	05 00 04 11	6.01 kg	1	pc(s)	179
769 701	242470	05 00 03 01	750 g	1	pc(s)	112
769 712	242517	05 00 03 01	5.23 kg	1	pc(s)	52
769 714	246768	05 00 03 01	2.80 kg	1	pc(s)	171
770 001	011762	05 00 04 02	753 g/m	1	m	80
771 230	144392	05 00 04 14	1.05 kg	1	pc(s)	101
771 231	144408	05 00 04 14	1.05 kg	1	pc(s)	101
771 232	144415	05 00 04 14	1.05 kg	1	pc(s)	101
771 233	144422	05 00 04 14	1.05 kg	1	pc(s)	101
771 316	150393	05 00 04 08	418 g	1	pc(s)	84
772 310	057593	05 00 04 08	469 g	1	pc(s)	83
772 311	057586	05 00 04 08	482 g	1	pc(s)	83
772 312	054431	05 00 04 08	480 g	1	pc(s)	88
772 313	054448	05 00 04 09	400 g	1	pc(s)	88
772 314	080171	05 00 04 08	446 g	1	pc(s)	85
772 320	057432	05 00 04 08	785 g	1	pc(s)	83
772 321	057449	05 00 04 08	756 g	1	pc(s)	83
772 322	054455	05 00 04 09	747 g	1	pc(s)	88
772 323	054462	05 00 04 09	876 g	1	pc(s)	88
772 324	080188	05 00 04 08	719 g	1	pc(s)	85
772 330	069220	05 00 04 08	560 g	1	pc(s)	83
772 331	066304	05 00 04 08	566 g	1	pc(s)	83
772 340	057456	05 00 04 08	878 g	1	pc(s)	83
772 341	057425	05 00 04 08	902 g	1	pc(s)	83
773 034	114562	05 00 04 08	634 g	1	pc(s)	83
773 130	057722	05 00 04 08	801 g	1	pc(s)	83
773 234	114555	05 00 04 08	661 g	1	pc(s)	83
773 236	114579	05 00 04 08	714 g	1	pc(s)	86
773 251	005990	05 00 04 08	901 g	1	pc(s)	180
773 330	057760	05 00 04 08	830 g	1	pc(s)	83
773 331	069244	05 00 04 08	793 g	1	pc(s)	86
774 034	114586	05 00 04 09	662 g	1	pc(s)	87
774 130	057739	05 00 04 09	780 g	1	pc(s)	87
774 234	114593	05 00 04 09	772 g	1	pc(s)	88
774 251	006003	05 00 04 09	955 g	1	pc(s)	180
774 330	057715	05 00 04 09	941 g	1	pc(s)	88
774 434	114609	05 00 04 09	712 g	1	pc(s)	88
774 530	057746	05 00 04 09	700 g	1	pc(s)	88
775 621	102545	05 00 04 09	311 g	1	pc(s)	88
775 626	102569	05 00 04 09	343 g	1	pc(s)	88
775 631	102552	05 00 04 09	290 g	1	pc(s)	88
775 636	102576	05 00 04 09	350 g	1	pc(s)	88
782 002	312562	05 20 10 02	5.23 kg	1	pc(s)	161
782 020	236509	05 20 10 02	10 g/PAK	1	PAK	161
782 022	236516	05 20 10 02	20 g/PAK	1	PAK	161
782 024	237193	05 20 10 02	36 g/PAK	1	PAK	161
782 028	237223	05 20 10 02	66 g/PAK	1	PAK	161
782 030	245792	05 20 10 02	1.19 kg	1	pc(s)	160
782 031	245815	05 20 10 02	1.19 kg	1	pc(s)	160
782 040	245822	05 20 10 02	784 g	1	pc(s)	160
782 041	245839	05 20 10 02	784 g	1	pc(s)	160
782 050	245846	05 20 10 02	851 g	1	pc(s)	160
782 051	245853	05 20 10 02	851 g	1	pc(s)	160
782 060	245860	05 20 10 02	27 g	1	pc(s)	160
782 077	273375	05 20 10 02	44 g	1	pc(s)	161
782 081	273344	05 20 10 02	49 g	1	pc(s)	161
782 085	273443	05 20 10 02	70 g	1	pc(s)	161
782 091	273474	05 20 10 02	77 g	1	pc(s)	161
782 092	468092	05 20 10 02	70 g	1	pc(s)	161
782 097	445970	05 20 10 02	16 g/PAK	1	PAK	160
782 098	274013	05 20 10 02	30 g/PAK	1	PAK	161
782 099	274006	05 20 10 02	45 g/PAK	1	PAK	161
783 003	310179	05 00 03 03	1.24 kg	1	pc(s)	46
783 006	310155	05 00 03 03	1.27 kg	1	pc(s)	46
783 010	297869	05 00 03 03	1.23 kg	1	pc(s)	46
783 011	310131	05 00 03 03	1.25 kg	1	pc(s)	48
783 013	310186	05 00 03 03	1.47 kg	1	pc(s)	46
783 020	310124	05 00 03 03	1.35 kg	1	pc(s)	46
783 022	310117	05 00 03 03	1.35 kg	1	pc(s)	48
783 030	310100	05 00 03 03	1.62 kg	1	pc(s)	46
783 033	310162	05 00 03 03	1.28 kg	1	pc(s)	48
783 045	310094	05 00 03 03	1.35 kg	1	pc(s)	48
783 066	310148	05 00 03 03	1.27 kg	1	pc(s)	48
783 103	317277	05 00 03 03	1.27 kg	1	pc(s)	46
783 106	317260	05 00 03 03	1.27 kg	1	pc(s)	46
783 110	317253	05 00 03 03	1.27 kg	1	pc(s)	46
783 120	317246	05 00 03 03	1.35 kg	1	pc(s)	46
783 130	317239	05 00 03 03	1.61 kg	1	pc(s)	46
783 141	317222	05 00 03 03	1.46 kg	1	pc(s)	47
783 151	317215	05 00 03 03	1.55 kg	1	pc(s)	47
783 161	317208	05 00 03 03	1.61 kg	1	pc(s)	47
783 231	310087	05 00 03 03	1.46 kg	1	pc(s)	46
783 233	310063	05 00 03 03	1.46 kg	1	pc(s)	48
783 235	310049	05 00 03 03	1.55 kg	1	pc(s)	46
783 240	310056	05 00 03 03	1.46 kg	1	pc(s)	46
783 243	310018	05 00 03 03	1.55 kg	1	pc(s)	48
783 245	310032	05 00 03 03	1.61 kg	1	pc(s)	46

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783 250	309999	05 00 03 03	1.61 kg	1	pc(s)	46
783 255	309982	05 00 03 03	1.61 kg	1	pc(s)	48
783 270	309852	05 00 03 03	2.48 kg	1	pc(s)	47
783 275	309845	05 00 03 03	2.91 kg	1	pc(s)	47
783 280	317284	05 00 03 03	3.31 kg	1	pc(s)	47
783 285	316898	05 00 03 03	3.80 kg	1	pc(s)	47
783 290	316904	05 00 03 03	5.56 kg	1	pc(s)	47
783 332	310070	05 00 03 03	1.46 kg	1	pc(s)	47
783 335	310001	05 00 03 03	1.55 kg	1	pc(s)	47
783 342	310025	05 00 03 03	1.61 kg	1	pc(s)	47
783 345	309975	05 00 03 03	1.61 kg	1	pc(s)	47
783 395	309951	05 00 03 03	1.61 kg	1	pc(s)	47
783 420	309890	05 00 03 03	1.55 kg	1	pc(s)	169
783 430	309906	05 00 03 03	1.55 kg	1	pc(s)	169
783 460	309869	05 00 03 03	3.31 kg	1	pc(s)	172
783 511	309937	05 00 03 03	1.27 kg	1	pc(s)	48
783 520	309913	05 00 03 03	1.55 kg	1	pc(s)	46
783 530	309968	05 00 03 03	1.61 kg	1	pc(s)	46
783 533	309920	05 00 03 03	1.61 kg	1	pc(s)	48
783 536	309944	05 00 03 03	1.61 kg	1	pc(s)	46
783 900	292505	05 00 01 01	443 g	1	pc(s)	113
783 905	292499	05 00 01 01	488 g	1	pc(s)	113
783 906	292482	05 00 01 01	702 g	1	pc(s)	113
783 920	292437	05 00 01 50	520 g	1	pc(s)	114
783 925	292444	05 00 01 50	745 g	1	pc(s)	114
783 930	292451	05 00 03 03	265 g	1	pc(s)	114
783 945	436466	05 00 03 03	1.16 kg	1	pc(s)	114
784 032	018679	05 00 04 08	969 g	1	pc(s)	85
784 038	138452	05 00 04 08	1.01 kg	1	pc(s)	85
784 085	018686	05 00 04 08	872 g	1	pc(s)	85
784 201	006591	05 00 04 08	880 g	1	pc(s)	85
784 301	006553	05 00 04 08	1.70 kg	1	pc(s)	85
784 352	006072	05 00 04 08	806 g	1	pc(s)	179
784 401	006614	05 00 04 08	1.30 kg	1	pc(s)	85
784 480	054479	05 00 04 08	600 g	1	pc(s)	85
784 501	006560	05 00 04 08	1.95 kg	1	pc(s)	85
784 755	054202	05 00 04 08	1.54 kg	1	pc(s)	179
784 756	230118	05 00 04 08	1.60 kg	1	pc(s)	179
785 100	087606	05 01 01 01	18.00 kg	1	pc(s)	118
785 111	070257	05 05 01 04	612 g	1	pc(s)	104/120/178
785 112	106550	05 01 01 01	17.80 kg	1	pc(s)	118
785 119	098213	05 01 01 01	510 g	1	pc(s)	120
785 159	284517	05 01 01 01	120 g	1	pc(s)	120
785 169	284753	05 01 01 01	312 g	1	pc(s)	120
785 213	090279	05 01 01 01	320 g	1	pc(s)	120
785 214	090286	05 01 01 01	320 g	1	pc(s)	120
785 215	090293	05 01 01 01	320 g	1	pc(s)	120
785 216	090309	05 01 01 01	320 g	1	pc(s)	120
785 217	090316	05 01 01 01	320 g	1	pc(s)	120
785 218	090323	05 01 01 01	320 g	1	pc(s)	120
785 219	090330	05 01 01 01	78 g	1	pc(s)	120
785 225	136434	05 01 01 01	140 g	1	pc(s)	120
785 310	092013	05 01 01 01	12.70 kg	1	pc(s)	120
785 311	307551	05 00 01 05	110 g	1	pc(s)	35
785 312	307568	05 00 01 05	130 g	1	pc(s)	35
785 313	307582	05 00 01 05	150 g	1	pc(s)	35
785 314	307575	05 00 01 05	250 g	1	pc(s)	35
785 315	106277	05 01 01 01	632 g	1	pc(s)	34
785 316	106284	05 01 01 01	95 g	1	pc(s)	35
785 317	106291	05 01 01 01	130 g	1	pc(s)	35
785 318	106307	05 01 01 01	152 g	1	pc(s)	35
785 319	106314	05 01 01 01	247 g	1	pc(s)	35
785 325	106581	05 01 01 01	600 g	1	pc(s)	34
785 329	284760	05 01 01 01	135 g	1	pc(s)	120
785 330	451872	05 02 03 01	923 g	1	pc(s)	126
785 331	451889	05 02 03 01	1.06 kg	1	pc(s)	126
785 332	451896	05 02 03 01	1.09 kg	1	pc(s)	126
785 333	451902	05 02 03 01	1.10 kg	1	pc(s)	126
785 334	451919	05 02 03 01	1.15 kg	1	pc(s)	126
785 335	451926	05 02 03 01	1.06 kg	1	pc(s)	126
785 336	451933	05 02 03 01	1.09 kg	1	pc(s)	126
785 337	451940	05 02 03 01	1.10 kg	1	pc(s)	126
785 338	451957	05 02 03 01	1.27 kg	1	pc(s)	126
785 340	451964	05 02 03 02	970 g	1	pc(s)	126
785 341	451988	05 02 03 02	1.00 kg	1	pc(s)	126
785 342	451995	05 02 03 02	1.03 kg	1	pc(s)	126
785 343	452015	05 02 03 02	1.06 kg	1	pc(s)	126
785 344	452022	05 02 03 02	1.09 kg	1	pc(s)	126
785 345	452039	05 02 03 02	1.12 kg	1	pc(s)	126
785 346	452046	05 02 03 02	1.15 kg	1	pc(s)	126
785 347	452053	05 02 03 02	1.18 kg	1	pc(s)	126
785 348	452060	05 02 03 02	1.30 kg	1	pc(s)	126
785 350	452077	05 02 03 03	777 g	1	pc(s)	130
785 351	452084	05 02 03 03	896 g	1	pc(s)	130
785 352	452091	05 02 03 03	926 g	1	pc(s)	130
785 353	452107	05 02 03 03	956 g	1	pc(s)	130
785 354	452114	05 02 03 03	986 g	1	pc(s)	130
785 355	452121	05 02 03 03	1.02 kg	1	pc(s)	130
785 356	452138	05 02 03 03	1.05 kg	1	pc(s)	130
785 357	452145	05 02 03 03	1.08 kg	1	pc(s)	130
785 358	452152	05 02 03 03	1.11 kg	1	pc(s)	130
785 360	452169	05 02 03 04	747 g	1	pc(s)	130
785 361	452176	05 02 03 04	777 g	1	pc(s)	130
785 362	452183	05 02 03 04	807 g	1	pc(s)	130
785 362	452183	05 02 03 04	807 g	1	pc(s)	131
785 363	452190	05 02 03 04	837 g	1	pc(s)	130
785 363	452190	05 02 03 04	837 g	1	pc(s)	131
785 364	452206	05 02 03 04	867 g	1	pc(s)	130/131
785 365	452213	05 02 03 04	897 g	1	pc(s)	130/131
785 366	452220	05 02 03 04	927 g	1	pc(s)	130/131
785 367	452237	05 02 03 04	957 g	1	pc(s)	130/131
785 368	452244	05 02 03 04	987 g	1	pc(s)	130/131
785 370	456006	05 02 03 50	76 g	1	pc(s)	137
785 371	456037	05 02 03 50	80 g	1	pc(s)	137
785 372	456051	05 02 03 50	87 g	1	pc(s)	137
785 373	456075	05 02 03 50	92 g	1	pc(s)	137
785 374	456082	05 02 03 50	95 g	1	pc(s)	137
785 375	500242	05 02 03 50	102 g	1	pc(s)	137
785 376	500259	05 02 03 50	107 g	1	pc(s)	137
785 377	501034	05 02 03 50	70 g	1	pc(s)	137
785 398	146532	05 01 01 02	156 g	1	pc(s)	121
785 399	146525	05 01 01 02	757 g	1	pc(s)	121
785 442	152847	05 05 01 05	280 g	1	pc(s)	153
785 443	152854	05 05 01 05	550 g	1	pc(s)	153
785 444	556539	05 05 01 05	781 g	1	pc(s)	153
785 458	115064	05 01 01 05	5.80 g/mm	500	mm	109
785 459	115057	05 01 01 05	56.00 kg	1	pc(s)	109
785 465	088733	05 01 01 05	41.50 kg	1	pc(s)	109
785 466	088030	05 01 01 05	0.83 g/mm	500	mm	109
785 467	088740	05 01 01 05	38.00 kg	1	pc(s)	109
785 468	088757	05 01 01 05	1.64 g/mm	500	mm	109
785 471	088764	05 01 01 05	20.00 kg	1	pc(s)	110
785 472	087057	05 01 01 05	1.95 g/mm	500	mm	110
785 490	086890	05 01 01 03	240 g	1	pc(s)	147
785 502	087347	05 01 01 01	7.20 kg	1	pc(s)	117
785 592	087552	05 01 01 01	50 g	1	pc(s)	120
785 637	100701	05 00 02 01	14 g	10	pc(s)	39
785 638	086920	05 00 02 01	6 g	10	pc(s)	39
785 639	087019	05 00 02 01	15 g	10	pc(s)	39
785 640	087026	05 00 02 01	55 g	10	pc(s)	39
785 641	087897	05 00 02 01	55 g	10	pc(s)	39
785 642	087903	05 00 02 01	75 g	10	pc(s)	39
785 643	087910	05 00 02 01	80 g	10	pc(s)	39
785 644	087927	05 00 02 01	80 g	10	pc(s)	39
785 645	086869	05 01 01 03	420 g	1	pc(s)	146
785 646	089174	05 01 01 05	760 g	1	pc(s)	109
785 647	087040	05 01 01 05	73 g	1	pc(s)	110
785 648	088047	05 01 01 05	19 g	1	pc(s)	110
785 649	088054	05 01 01 05	2 g	1	pc(s)	110
785 650	106536	05 00 02 01	22 g	10	pc(s)	39
785 652	111479	05 00 02 01	8 g	10	pc(s)	39
785 705	341449	05 02 04 01	400 g	1	pc(s)	151
785 706	341456	05 02 04 01	400 g	1	pc(s)	151
785 707	341487	05 02 04 01	400 g	1	pc(s)	151
785 708	341463	05 02 04 01	400 g	1	pc(s)	151
785 709	341470	05 02 04 01	400 g	1	pc(s)	151

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785 721	360198	05 02 05 03	182 g	1	pc(s)	151
785 722	360242	05 02 05 03	294 g	1	pc(s)	151
785 723	360266	05 02 04 50	148 g	1	pc(s)	152
785 724	360310	05 02 05 50	52 g	1	pc(s)	149/150
785 724	360310	05 02 05 50	52 g	1	pc(s)	151/153
785 738	274716	05 02 04 50	39 g	1	pc(s)	151
785 739	274723	05 02 04 50	5 g	10	pc(s)	151
785 750	529694	05 02 02 04	800 g	1	pc(s)	141
785 755	152861	05 02 02 03	2.62 kg	1	pc(s)	140
785 756	152878	05 02 02 03	2.73 kg	1	pc(s)	140
785 757	152885	05 02 02 03	2.83 kg	1	pc(s)	140
785 758	245150	05 02 02 03	3.21 kg	1	pc(s)	140
785 759	329362	05 02 02 03	3.28 kg	1	pc(s)	140
785 769	152007	05 02 02 01	1.86 kg	1	pc(s)	140
785 770	149458	05 02 02 01	1.86 kg	1	pc(s)	140
785 771	149465	05 02 02 01	1.73 kg	1	pc(s)	140
785 772	149472	05 02 02 01	1.85 kg	1	pc(s)	140
785 773	149489	05 02 02 01	1.90 kg	1	pc(s)	140
785 774	149502	05 02 02 01	2.16 kg	1	pc(s)	140
785 775	149519	05 02 02 01	2.01 kg	1	pc(s)	140
785 779	151994	05 02 02 02	1.40 kg	1	pc(s)	140
785 780	149526	05 02 02 02	1.46 kg	1	pc(s)	140
785 781	149533	05 02 02 02	1.53 kg	1	pc(s)	140
785 782	149540	05 02 02 02	1.53 kg	1	pc(s)	140
785 783	149557	05 02 02 02	1.65 kg	1	pc(s)	140
785 784	149564	05 02 02 02	1.73 kg	1	pc(s)	140
785 785	149571	05 02 02 02	1.83 kg	1	pc(s)	140
785 788	149588	05 02 02 02	112 g	1	pc(s)	141
785 789	149595	05 02 02 02	75 g/Pa	1	Pa	141
785 790	489776	05 02 05 50	167 g	1	pc(s)	150
785 796	124912	05 02 01 01	310 g	1	Pa	144
785 797	124936	05 02 01 01	330 g	1	Pa	144
785 798	124943	05 02 01 01	317 g	1	Pa	144
785 799	124950	05 02 01 01	337 g	1	Pa	144
785 800	131019	05 02 01 01	340 g	1	Pa	144
785 808	242265	05 02 01 02	250 g	1	Pa	145
785 809	242296	05 02 01 02	270 g	1	Pa	145
785 810	242302	05 02 01 02	451 g	1	Pa	145
785 811	242319	05 02 01 02	452 g	1	Pa	145
785 812	242326	05 02 01 02	463 g	1	Pa	145
785 820	433182	05 02 05 50	83 g	1	pc(s)	149
785 821	426979	05 02 05 04	325 g	1	pc(s)	149
785 822	426993	05 02 05 04	327 g	1	pc(s)	149
785 823	427013	05 02 05 04	329 g	1	pc(s)	149
785 824	426986	05 02 05 04	350 g	1	pc(s)	149
785 825	427006	05 02 05 04	348 g	1	pc(s)	149
785 826	427020	05 02 05 04	352 g	1	pc(s)	149
785 827	433199	05 02 05 50	103 g	1	pc(s)	149
785 828	459953	05 02 05 50	23 g	1	PAK	149
785 829	459113	05 02 05 50	41 g	1	pc(s)	149
785 830	486157	05 02 01 07	207 g	1	Pa	143
785 831	486164	05 02 01 07	210 g	1	Pa	143
785 832	486171	05 02 01 07	244 g	1	Pa	143
785 833	486188	05 02 01 07	266 g	1	Pa	143
785 834	486195	05 02 01 07	272 g	1	Pa	143
785 835	486201	05 02 01 07	290 g	1	Pa	143
785 836	486218	05 02 01 07	305 g	1	Pa	143
785 840	486232	05 02 01 08	300 g	1	Pa	143
785 841	486249	05 02 01 08	305 g	1	Pa	143
785 842	486256	05 02 01 08	326 g	1	Pa	143
785 843	486263	05 02 01 08	369 g	1	Pa	143
785 844	486270	05 02 01 08	369 g	1	Pa	143
785 845	486287	05 02 01 08	392 g	1	Pa	143
785 846	486294	05 02 01 08	405 g	1	Pa	143
785 850	486300	05 02 01 05	297 g	1	Pa	144
785 851	486317	05 02 01 05	310 g	1	Pa	144
785 852	486324	05 02 01 05	320 g	1	Pa	144
785 853	486331	05 02 01 05	330 g	1	Pa	144
785 854	486348	05 02 01 05	343 g	1	Pa	144
785 855	486355	05 02 01 05	363 g	1	Pa	144
785 856	486362	05 02 01 05	367 g	1	Pa	144
785 860	486379	05 02 01 06	380 g	1	Pa	144
785 861	486386	05 02 01 06	383 g	1	Pa	144
785 862	486393	05 02 01 06	390 g	1	Pa	144
785 863	486430	05 02 01 06	390 g	1	Pa	144
785 864	486409	05 02 01 06	420 g	1	Pa	144
785 865	486416	05 02 01 06	427 g	1	Pa	144
785 866	486423	05 02 01 06	447 g	1	Pa	144
785 870	497504	05 02 05 05	410 g	1	pc(s)	150
785 880	539778	05 02 06 03	–	1	pc(s)	139
785 881	539822	05 02 06 03	–	1	pc(s)	139
785 882	539785	05 02 06 03	–	1	pc(s)	139
785 883	539792	05 02 06 03	–	1	pc(s)	139
785 884	539808	05 02 06 03	–	1	pc(s)	139
785 885	539815	05 02 06 03	–	1	pc(s)	139
785 886	545021	05 02 06 03	–	1	pc(s)	139
785 900	469556	05 02 03 50	2.43 kg	1	pc(s)	152
785 901	469563	05 02 03 50	2.43 kg	1	pc(s)	152
785 902	469570	05 02 03 50	2.55 kg	1	pc(s)	152
785 903	469587	05 02 03 50	3.08 kg	1	pc(s)	153
785 904	469594	05 02 03 50	3.18 kg	1	pc(s)	153
785 905	469600	05 02 03 50	3.27 kg	1	pc(s)	153
785 906	476516	05 02 03 50	2.43 kg	1	pc(s)	152
785 907	476523	05 02 03 50	2.55 kg	1	pc(s)	152
785 908	476530	05 02 03 50	3.08 kg	1	pc(s)	153
785 909	476547	05 02 03 50	3.27 kg	1	pc(s)	153
785 940	106253	05 01 01 01	10.85 kg	1	pc(s)	117
785 950	106383	05 01 01 01	27.30 kg	1	pc(s)	119
785 960	502796	05 99 00 00	4.34 kg	1	pc(s)	152
785 961	502789	05 99 00 00	3.28 kg	1	pc(s)	153
787 000	483088	05 01 01 03	500 g	1	pc(s)	147
787 001	482296	05 02 03 15	453 g	1	pc(s)	138
787 002	482302	05 02 03 15	477 g	1	pc(s)	138
787 003	482319	05 02 03 15	497 g	1	pc(s)	138
787 004	482425	05 02 03 15	487 g	1	pc(s)	138
787 005	482654	05 02 03 15	517 g	1	pc(s)	138
787 006	482661	05 02 03 15	530 g	1	pc(s)	138
787 007	482722	05 02 03 15	547 g	1	pc(s)	138
787 008	482715	05 02 03 15	570 g	1	pc(s)	138
787 011	482739	05 02 03 15	277 g	1	pc(s)	138
787 012	482746	05 02 03 15	293 g	1	pc(s)	138
787 013	482753	05 02 03 15	307 g	1	pc(s)	138
787 014	482760	05 02 03 15	323 g	1	pc(s)	138
787 015	482777	05 02 03 15	353 g	1	pc(s)	138
787 016	482784	05 02 03 15	367 g	1	pc(s)	138
787 017	482791	05 02 03 15	390 g	1	pc(s)	138
787 018	482807	05 02 03 15	407 g	1	pc(s)	138
787 021	482814	05 02 03 15	237 g	1	pc(s)	138
787 022	482821	05 02 03 15	227 g	1	pc(s)	138
787 023	482432	05 02 03 15	250 g	1	pc(s)	138
787 024	482449	05 02 03 15	247 g	1	pc(s)	138
787 025	482456	05 02 03 15	260 g	1	pc(s)	138
787 026	482463	05 02 03 15	277 g	1	pc(s)	138
787 027	482470	05 02 03 15	287 g	1	pc(s)	138
787 028	482487	05 02 03 15	293 g	1	pc(s)	138
787 100	483118	05 01 01 03	430 g	1	Pa	147
787 101	483125	05 01 01 03	430 g	1	Pa	147
787 102	483132	05 01 01 03	430 g	1	Pa	147
787 103	483149	05 01 01 03	650 g	1	Pa	147
787 104	483156	05 01 01 03	650 g	1	Pa	147
787 105	483163	05 01 01 03	650 g	1	Pa	147
787 106	483170	05 01 01 03	650 g	1	Pa	147
787 107	483187	05 01 01 03	830 g	1	Pa	147
787 108	483194	05 01 01 03	830 g	1	Pa	147
787 109	483224	05 01 01 03	830 g	1	Pa	147
787 110	483231	05 01 01 03	830 g	1	Pa	147
787 111	483248	05 01 01 03	960 g	1	Pa	147
787 112	483255	05 01 01 03	960 g	1	Pa	147
787 113	483262	05 01 01 03	960 g	1	Pa	147
787 114	483279	05 01 01 03	960 g	1	Pa	147
787 200	507876	05 01 01 03	600 g	1	Pa	148
787 201	507920	05 01 01 03	600 g	1	Pa	148
787 202	507937	05 01 01 03	600 g	1	Pa	148
787 203	507944	05 01 01 03	600 g	1	Pa	148
787 204	507951	05 01 01 03	600 g	1	Pa	148
787 205	507968	05 01 01 03	600 g	1	Pa	148
787 206	507975	05 01 01 03	600 g	1	Pa	148

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787 207	507982	05 01 01 03	600 g	1	Pa	148
787 208	507999	05 01 01 03	600 g	1	Pa	148
787 209	508002	05 01 01 03	600 g	1	Pa	148
787 210	508019	05 01 01 03	600 g	1	Pa	148
787 211	508026	05 01 01 03	600 g	1	Pa	148
787 220	508033	05 01 01 03	650 g	1	Pa	148
787 221	508040	05 01 01 03	650 g	1	Pa	148
787 222	508057	05 01 01 03	650 g	1	Pa	148
787 223	508064	05 01 01 03	650 g	1	Pa	148
787 224	508088	05 01 01 03	650 g	1	Pa	148
787 225	508095	05 01 01 03	650 g	1	Pa	148
787 226	508101	05 01 01 03	650 g	1	Pa	148
787 227	508118	05 01 01 03	650 g	1	Pa	148
787 228	508125	05 01 01 03	650 g	1	Pa	148
787 229	508132	05 01 01 03	650 g	1	Pa	148
787 230	508149	05 01 01 03	650 g	1	Pa	148
787 231	508156	05 01 01 03	650 g	1	Pa	148
787 350	478169	05 02 03 03	777 g	1	pc(s)	134
787 351	478176	05 02 03 03	811 g	1	pc(s)	134
787 352	478183	05 02 03 03	830 g	1	pc(s)	134
787 353	478190	05 02 03 03	815 g	1	pc(s)	134
787 354	478206	05 02 03 03	833 g	1	pc(s)	134
787 355	478213	05 02 03 03	880 g	1	pc(s)	134
787 356	478220	05 02 03 03	912 g	1	pc(s)	134
787 357	478237	05 02 03 03	932 g	1	pc(s)	134
787 358	478244	05 02 03 03	936 g	1	pc(s)	134
787 360	478251	05 02 03 04	747 g	1	pc(s)	134
787 361	478268	05 02 03 04	777 g	1	pc(s)	134
787 362	478275	05 02 03 04	807 g	1	pc(s)	134
787 363	478282	05 02 03 04	837 g	1	pc(s)	134
787 364	478299	05 02 03 04	867 g	1	pc(s)	134
787 365	478305	05 02 03 04	927 g	1	pc(s)	134
787 366	478312	05 02 03 04	957 g	1	pc(s)	134
787 367	478329	05 02 03 04	987 g	1	pc(s)	134
787 368	478336	05 02 03 04	866 g	1	pc(s)	134
787 370	512467	05 02 06 01	890 g	1	pc(s)	139
787 371	512337	05 02 06 01	960 g	1	pc(s)	139
787 372	512344	05 02 06 01	1.03 kg	1	pc(s)	139
787 373	512351	05 02 06 01	1.10 kg	1	pc(s)	139
787 374	512368	05 02 06 01	1.17 kg	1	pc(s)	139
787 375	512375	05 02 06 01	1.24 kg	1	pc(s)	139
787 376	512382	05 02 06 01	1.31 kg	1	pc(s)	139
787 380	512399	05 02 06 02	1.10 kg	1	pc(s)	139
787 381	512405	05 02 06 02	1.16 kg	1	pc(s)	139
787 382	512412	05 02 06 02	1.21 kg	1	pc(s)	139
787 383	512429	05 02 06 02	1.26 kg	1	pc(s)	139
787 384	512436	05 02 06 02	1.32 kg	1	pc(s)	139
787 385	512443	05 02 06 02	1.38 kg	1	pc(s)	139
787 386	512450	05 02 06 02	1.43 kg	1	pc(s)	139
787 457	480070	05 01 01 05	33.10 kg	1	pc(s)	108
787 459	480087	05 01 01 05	83.20 kg	1	pc(s)	108
787 461	513884	05 01 01 05	3.31 kg	1	pc(s)	108
787 462	513839	05 01 01 05	6.62 kg	1	pc(s)	108
787 463	513891	05 01 01 05	9.93 kg	1	pc(s)	108
787 464	513907	05 01 01 05	13.24 kg	1	pc(s)	108
787 465	513914	05 01 01 05	16.55 kg	1	pc(s)	108
787 466	513846	05 01 01 05	19.86 kg	1	pc(s)	108
787 467	513853	05 01 01 05	23.17 kg	1	pc(s)	108
787 468	513860	05 01 01 05	26.48 kg	1	pc(s)	108
787 469	513938	05 01 01 05	29.79 kg	1	pc(s)	108
787 471	513747	05 01 01 05	8.32 kg	1	pc(s)	108
787 472	513754	05 01 01 05	16.64 kg	1	pc(s)	108
787 473	513761	05 01 01 05	24.96 kg	1	pc(s)	108
787 474	513778	05 01 01 05	33.28 kg	1	pc(s)	108
787 475	513785	05 01 01 05	41.60 kg	1	pc(s)	108
787 476	513792	05 01 01 05	49.92 kg	1	pc(s)	108
787 477	513808	05 01 01 05	58.24 kg	1	pc(s)	108
787 478	513815	05 01 01 05	66.56 kg	1	pc(s)	108
787 479	513822	05 01 01 05	74.88 kg	1	pc(s)	108
787 480	479821	05 01 01 03	95 g	1	Pa	145
787 481	479838	05 01 01 03	115 g	1	Pa	145
787 482	479845	05 01 01 03	123 g	1	Pa	145
787 483	479852	05 01 01 03	146 g	1	Pa	145
787 484	479814	05 01 01 03	183 g	1	Pa	146
787 485	479920	05 01 01 03	197 g	1	Pa	146
787 486	479937	05 01 01 03	200 g	1	Pa	146
787 487	479944	05 01 01 03	226 g	1	Pa	146
787 490	479951	05 01 01 03	303 g	1	Pa	145
787 491	479968	05 01 01 03	347 g	1	Pa	145
787 492	479975	05 01 01 03	363 g	1	Pa	145
787 493	479982	05 01 01 03	353 g	1	Pa	145
787 494	479999	05 01 01 03	427 g	1	Pa	146
787 495	480001	05 01 01 03	433 g	1	Pa	146
787 496	480018	05 01 01 03	483 g	1	Pa	146
787 497	480025	05 01 01 03	487 g	1	Pa	146
787 600	490130	05 02 03 01	960 g	1	pc(s)	126
787 601	490147	05 02 03 01	960 g	1	pc(s)	126
787 602	490154	05 02 03 01	1.33 kg	1	pc(s)	126
787 603	490161	05 02 03 01	960 g	1	pc(s)	126
787 604	492165	05 02 03 01	960 g	1	pc(s)	126
787 610	490178	05 02 03 01	960 g	1	pc(s)	127
787 611	490185	05 02 03 01	960 g	1	pc(s)	127
787 612	490192	05 02 03 01	960 g	1	pc(s)	127
787 613	490208	05 02 03 01	960 g	1	pc(s)	127
787 614	490215	05 02 03 01	960 g	1	pc(s)	127
787 615	490222	05 02 03 01	960 g	1	pc(s)	127
787 616	490239	05 02 03 01	960 g	1	pc(s)	127
787 617	490246	05 02 03 01	960 g	1	pc(s)	127
787 618	490253	05 02 03 01	960 g	1	pc(s)	127
787 620	490260	05 02 03 01	1.11 kg	1	pc(s)	128
787 621	490277	05 02 03 01	1.11 kg	1	pc(s)	128
787 622	490284	05 02 03 01	1.11 kg	1	pc(s)	128
787 623	490291	05 02 03 01	1.11 kg	1	pc(s)	128
787 624	490307	05 02 03 01	1.11 kg	1	pc(s)	128
787 625	490314	05 02 03 01	1.11 kg	1	pc(s)	128
787 626	490321	05 02 03 01	1.11 kg	1	pc(s)	128
787 627	490338	05 02 03 01	1.11 kg	1	pc(s)	128
787 630	490345	05 02 03 01	960 g	1	pc(s)	129
787 631	490352	05 02 03 01	960 g	1	pc(s)	129
787 632	490369	05 02 03 01	960 g	1	pc(s)	129
787 633	490376	05 02 03 01	960 g	1	pc(s)	129
787 634	490383	05 02 03 01	960 g	1	pc(s)	129
787 635	490390	05 02 03 01	960 g	1	pc(s)	129
787 636	490406	05 02 03 01	960 g	1	pc(s)	129
787 637	490413	05 02 03 01	960 g	1	pc(s)	129
787 638	490420	05 02 03 01	960 g	1	pc(s)	129
787 639	490437	05 02 03 01	960 g	1	pc(s)	129
787 640	490444	05 02 03 01	960 g	1	pc(s)	129
787 641	490451	05 02 03 01	960 g	1	pc(s)	129
787 650	490468	05 02 03 02	1.02 kg	1	pc(s)	126
787 651	490475	05 02 03 02	1.02 kg	1	pc(s)	126
787 652	490482	05 02 03 02	1.02 kg	1	pc(s)	126
787 653	490499	05 02 03 02	1.02 kg	1	pc(s)	126
787 654	490505	05 02 03 02	1.02 kg	1	pc(s)	126
787 660	490512	05 02 03 02	1.02 kg	1	pc(s)	127
787 661	490529	05 02 03 02	1.02 kg	1	pc(s)	127
787 662	490536	05 02 03 02	1.02 kg	1	pc(s)	127
787 663	490543	05 02 03 02	1.02 kg	1	pc(s)	127
787 664	490550	05 02 03 02	1.02 kg	1	pc(s)	127
787 665	490567	05 02 03 02	1.02 kg	1	pc(s)	127
787 666	490574	05 02 03 02	1.02 kg	1	pc(s)	127
787 667	490581	05 02 03 02	1.02 kg	1	pc(s)	127
787 668	490598	05 02 03 02	1.02 kg	1	pc(s)	127
787 670	490604	05 02 03 02	1.08 kg	1	pc(s)	128
787 671	490611	05 02 03 02	1.08 kg	1	pc(s)	128
787 672	490628	05 02 03 02	1.08 kg	1	pc(s)	128
787 673	490635	05 02 03 02	1.08 kg	1	pc(s)	128
787 674	490642	05 02 03 02	1.08 kg	1	pc(s)	128
787 675	490659	05 02 03 02	1.08 kg	1	pc(s)	128
787 676	490666	05 02 03 02	1.08 kg	1	pc(s)	128
787 677	490673	05 02 03 02	1.08 kg	1	pc(s)	128
787 680	490680	05 02 03 02	878 g	1	pc(s)	129
787 681	490697	05 02 03 02	878 g	1	pc(s)	129
787 682	490703	05 02 03 02	878 g	1	pc(s)	129
787 683	490710	05 02 03 02	878 g	1	pc(s)	129
787 684	490727	05 02 03 02	878 g	1	pc(s)	129
787 685	490734	05 02 03 02	878 g	1	pc(s)	129
787 686	490741	05 02 03 02	878 g	1	pc(s)	129

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787 687	490758	05 02 03 02	878 g	1	pc(s)	129
787 688	490765	05 02 03 02	878 g	1	pc(s)	129
787 689	490772	05 02 03 02	878 g	1	pc(s)	129
787 690	490789	05 02 03 02	878 g	1	pc(s)	129
787 691	496194	05 02 03 02	878 g	1	pc(s)	129
787 700	490796	05 02 03 03	980 g	1	pc(s)	130
787 701	490802	05 02 03 03	980 g	1	pc(s)	130
787 702	490819	05 02 03 03	980 g	1	pc(s)	130
787 703	490826	05 02 03 03	980 g	1	pc(s)	130
787 704	490833	05 02 03 03	980 g	1	pc(s)	130
787 710	490840	05 02 03 03	980 g	1	pc(s)	131
787 711	490857	05 02 03 03	980 g	1	pc(s)	131
787 712	490864	05 02 03 03	980 g	1	pc(s)	131
787 713	490871	05 02 03 03	980 g	1	pc(s)	131
787 714	490888	05 02 03 03	980 g	1	pc(s)	131
787 715	490895	05 02 03 03	980 g	1	pc(s)	131
787 716	490901	05 02 03 03	980 g	1	pc(s)	131
787 717	490918	05 02 03 03	980 g	1	pc(s)	131
787 718	490925	05 02 03 03	980 g	1	pc(s)	131
787 720	490932	05 02 03 03	1.02 kg	1	pc(s)	132
787 721	490949	05 02 03 03	1.02 kg	1	pc(s)	132
787 722	490956	05 02 03 03	1.02 kg	1	pc(s)	132
787 723	490963	05 02 03 03	1.02 kg	1	pc(s)	132
787 724	490970	05 02 03 03	1.02 kg	1	pc(s)	132
787 725	490987	05 02 03 03	1.02 kg	1	pc(s)	132
787 726	490994	05 02 03 03	1.02 kg	1	pc(s)	132
787 727	491007	05 02 03 03	1.02 kg	1	pc(s)	132
787 730	491014	05 02 03 03	880 g	1	pc(s)	133
787 731	491021	05 02 03 03	880 g	1	pc(s)	133
787 732	491038	05 02 03 03	880 g	1	pc(s)	133
787 733	491045	05 02 03 03	880 g	1	pc(s)	133
787 734	491052	05 02 03 03	880 g	1	pc(s)	133
787 735	491069	05 02 03 03	880 g	1	pc(s)	133
787 736	491076	05 02 03 03	880 g	1	pc(s)	133
787 737	491083	05 02 03 03	880 g	1	pc(s)	133
787 738	491090	05 02 03 03	880 g	1	pc(s)	133
787 739	491106	05 02 03 03	880 g	1	pc(s)	133
787 740	491113	05 02 03 03	880 g	1	pc(s)	133
787 741	491120	05 02 03 03	880 g	1	pc(s)	133
787 750	491137	05 02 03 04	770 g	1	pc(s)	130
787 751	491144	05 02 03 04	770 g	1	pc(s)	130
787 752	491151	05 02 03 04	770 g	1	pc(s)	130/131
787 753	491168	05 02 03 04	770 g	1	pc(s)	130/131
787 754	491175	05 02 03 04	770 g	1	pc(s)	130/131
787 760	491182	05 02 03 04	770 g	1	pc(s)	131
787 761	491199	05 02 03 04	770 g	1	pc(s)	131
787 762	491205	05 02 03 04	770 g	1	pc(s)	131
787 763	491212	05 02 03 04	770 g	1	pc(s)	131
787 764	491229	05 02 03 04	770 g	1	pc(s)	131
787 765	491236	05 02 03 04	770 g	1	pc(s)	131
787 766	491243	05 02 03 04	770 g	1	pc(s)	131
787 767	491250	05 02 03 04	770 g	1	pc(s)	131
787 768	491267	05 02 03 04	770 g	1	pc(s)	131
787 770	491274	05 02 03 04	840 g	1	pc(s)	132
787 771	491281	05 02 03 04	840 g	1	pc(s)	132
787 772	491298	05 02 03 04	840 g	1	pc(s)	132
787 773	491304	05 02 03 04	840 g	1	pc(s)	132
787 774	491311	05 02 03 04	840 g	1	pc(s)	132
787 775	491328	05 02 03 04	840 g	1	pc(s)	132
787 776	491335	05 02 03 04	840 g	1	pc(s)	132
787 777	491342	05 02 03 04	840 g	1	pc(s)	132
787 780	491359	05 02 03 04	930 g	1	pc(s)	133
787 781	491366	05 02 03 04	930 g	1	pc(s)	133
787 782	491373	05 02 03 04	930 g	1	pc(s)	133
787 783	491380	05 02 03 04	930 g	1	pc(s)	133
787 784	491397	05 02 03 04	930 g	1	pc(s)	133
787 785	491403	05 02 03 04	930 g	1	pc(s)	133
787 786	491410	05 02 03 04	930 g	1	pc(s)	133
787 787	491427	05 02 03 04	930 g	1	pc(s)	133
787 788	491434	05 02 03 04	930 g	1	pc(s)	133
787 789	491441	05 02 03 04	930 g	1	pc(s)	133
787 790	491458	05 02 03 04	678 g	1	pc(s)	133
787 791	491465	05 02 03 04	678 g	1	pc(s)	133
787 800	491472	05 02 03 03	980 g	1	pc(s)	134
787 801	491489	05 02 03 03	980 g	1	pc(s)	134
787 802	491496	05 02 03 03	980 g	1	pc(s)	134
787 803	491502	05 02 03 03	980 g	1	pc(s)	134
787 804	491519	05 02 03 03	980 g	1	pc(s)	134
787 810	491526	05 02 03 03	950 g	1	pc(s)	135
787 811	491533	05 02 03 03	950 g	1	pc(s)	135
787 812	491540	05 02 03 03	950 g	1	pc(s)	135
787 813	491557	05 02 03 03	950 g	1	pc(s)	135
787 814	491564	05 02 03 03	950 g	1	pc(s)	135
787 815	491571	05 02 03 03	950 g	1	pc(s)	135
787 816	491588	05 02 03 03	950 g	1	pc(s)	135
787 817	491595	05 02 03 03	950 g	1	pc(s)	135
787 818	491601	05 02 03 03	950 g	1	pc(s)	135
787 820	491618	05 02 03 03	1.06 kg	1	pc(s)	135
787 821	491625	05 02 03 03	1.06 kg	1	pc(s)	135
787 822	491632	05 02 03 03	1.06 kg	1	pc(s)	135
787 823	491649	05 02 03 03	1.06 kg	1	pc(s)	135
787 824	491656	05 02 03 03	1.06 kg	1	pc(s)	135
787 825	491663	05 02 03 03	1.06 kg	1	pc(s)	135
787 826	491670	05 02 03 03	1.06 kg	1	pc(s)	135
787 827	491687	05 02 03 03	1.06 kg	1	pc(s)	135
787 830	491694	05 02 03 03	880 g	1	pc(s)	136
787 831	491700	05 02 03 03	880 g	1	pc(s)	136
787 832	491724	05 02 03 03	880 g	1	pc(s)	136
787 833	491731	05 02 03 03	880 g	1	pc(s)	136
787 834	491748	05 02 03 03	880 g	1	pc(s)	136
787 835	491755	05 02 03 03	880 g	1	pc(s)	136
787 836	491762	05 02 03 03	880 g	1	pc(s)	136
787 837	491779	05 02 03 03	880 g	1	pc(s)	136
787 838	491786	05 02 03 03	880 g	1	pc(s)	136
787 839	491793	05 02 03 03	880 g	1	pc(s)	136
787 840	491809	05 02 03 03	880 g	1	pc(s)	136
787 841	491816	05 02 03 03	880 g	1	pc(s)	136
787 850	491823	05 02 03 04	880 g	1	pc(s)	134
787 851	491830	05 02 03 04	880 g	1	pc(s)	134
787 852	491847	05 02 03 04	880 g	1	pc(s)	134
787 853	491854	05 02 03 04	880 g	1	pc(s)	134
787 854	491861	05 02 03 04	880 g	1	pc(s)	134
787 860	491878	05 02 03 04	850 g	1	pc(s)	135
787 861	491885	05 02 03 04	850 g	1	pc(s)	135
787 862	491892	05 02 03 04	850 g	1	pc(s)	135
787 863	491908	05 02 03 04	850 g	1	pc(s)	135
787 864	491915	05 02 03 04	850 g	1	pc(s)	135
787 865	491922	05 02 03 04	850 g	1	pc(s)	135
787 866	491939	05 02 03 04	850 g	1	pc(s)	135
787 867	491946	05 02 03 04	850 g	1	pc(s)	135
787 868	491953	05 02 03 04	850 g	1	pc(s)	135
787 870	491960	05 02 03 04	930 g	1	pc(s)	136
787 871	491977	05 02 03 04	930 g	1	pc(s)	136
787 872	491984	05 02 03 04	930 g	1	pc(s)	136
787 873	491991	05 02 03 04	930 g	1	pc(s)	136
787 874	492004	05 02 03 04	930 g	1	pc(s)	136
787 875	492011	05 02 03 04	930 g	1	pc(s)	136
787 876	492028	05 02 03 04	930 g	1	pc(s)	136
787 877	492035	05 02 03 04	930 g	1	pc(s)	136
787 880	492042	05 02 03 04	748 g	1	pc(s)	136
787 881	492059	05 02 03 04	748 g	1	pc(s)	136
787 882	492066	05 02 03 04	748 g	1	pc(s)	136
787 883	492073	05 02 03 04	748 g	1	pc(s)	136
787 884	492080	05 02 03 04	748 g	1	pc(s)	136
787 885	492097	05 02 03 04	748 g	1	pc(s)	136
787 886	492103	05 02 03 04	748 g	1	pc(s)	136
787 887	492110	05 02 03 04	748 g	1	pc(s)	136
787 888	492127	05 02 03 04	748 g	1	pc(s)	137
787 889	492134	05 02 03 04	748 g	1	pc(s)	137
787 890	492141	05 02 03 04	748 g	1	pc(s)	137
787 891	492158	05 02 03 04	748 g	1	pc(s)	137
787 900	515048	05 02 03 02	1.03 kg	1	pc(s)	127
787 901	515055	05 02 03 02	1.06 kg	1	pc(s)	127
787 902	515062	05 02 03 02	1.08 kg	1	pc(s)	127
787 903	515079	05 02 03 02	1.14 kg	1	pc(s)	127
787 904	515086	05 02 03 02	1.18 kg	1	pc(s)	127
787 905	516120	05 02 03 02	1.23 kg	1	pc(s)	127
787 906	516175	05 02 03 02	1.26 kg	1	pc(s)	127

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Part No.	GTIN*	PG	Weight	PU	SU	Page
787 907	516182	05 02 03 02	1.31 kg	1	pc(s)	127
787 908	516199	05 02 03 02	1.37 kg	1	pc(s)	127
787 909	516205	05 02 03 02	1.41 kg	1	pc(s)	127
787 910	516212	05 02 03 02	1.44 kg	1	pc(s)	127
787 911	516229	05 02 03 02	1.48 kg	1	pc(s)	127
787 912	516236	05 02 03 02	1.51 kg	1	pc(s)	127
787 913	516243	05 02 03 02	1.55 kg	1	pc(s)	127
787 914	516250	05 02 03 02	1.71 kg	1	pc(s)	128
787 915	516267	05 02 03 02	1.75 kg	1	pc(s)	128
787 916	516274	05 02 03 02	1.79 kg	1	pc(s)	128
787 917	516281	05 02 03 02	1.83 kg	1	pc(s)	128
787 918	516298	05 02 03 02	1.86 kg	1	pc(s)	128
787 919	516304	05 02 03 02	1.90 kg	1	pc(s)	128
787 920	516311	05 02 03 02	1.95 kg	1	pc(s)	128
787 921	516328	05 02 03 02	1.98 kg	1	pc(s)	128
787 922	516335	05 02 03 02	2.03 kg	1	pc(s)	128
787 923	516342	05 02 03 02	1.79 kg	1	pc(s)	128
787 924	516359	05 02 03 02	1.80 kg	1	pc(s)	128
787 925	516366	05 02 03 02	1.87 kg	1	pc(s)	128
787 926	516373	05 02 03 02	1.91 kg	1	pc(s)	128
787 927	516380	05 02 03 02	1.95 kg	1	pc(s)	128
787 928	516397	05 02 03 02	1.95 kg	1	pc(s)	128
787 929	516403	05 02 03 02	2.04 kg	1	pc(s)	128
787 930	516410	05 02 03 02	2.10 kg	1	pc(s)	128
787 931	516427	05 02 03 04	1.46 kg	1	pc(s)	131
787 932	516434	05 02 03 04	1.49 kg	1	pc(s)	131
787 933	516441	05 02 03 04	1.51 kg	1	pc(s)	131
787 934	516458	05 02 03 04	1.60 kg	1	pc(s)	131
787 935	516465	05 02 03 04	1.65 kg	1	pc(s)	131
787 936	516472	05 02 03 04	1.63 kg	1	pc(s)	131
787 937	516489	05 02 03 04	1.65 kg	1	pc(s)	131
787 938	516496	05 02 03 04	1.76 kg	1	pc(s)	131
787 939	516502	05 02 03 04	1.72 kg	1	pc(s)	131
787 940	516519	05 02 03 04	1.81 kg	1	pc(s)	131
787 941	516526	05 02 03 04	1.77 kg	1	pc(s)	131
787 942	516533	05 02 03 04	1.87 kg	1	pc(s)	131
787 943	516540	05 02 03 04	1.90 kg	1	pc(s)	131
787 944	516557	05 02 03 04	1.93 kg	1	pc(s)	131
787 945	516564	05 02 03 04	1.00 kg	1	pc(s)	132
787 946	516571	05 02 03 04	1.00 kg	1	pc(s)	132
787 947	516588	05 02 03 04	1.00 kg	1	pc(s)	132
787 948	516595	05 02 03 04	1.00 kg	1	pc(s)	132
787 949	516601	05 02 03 04	1.00 kg	1	pc(s)	132
787 950	516618	05 02 03 04	1.00 kg	1	pc(s)	132
787 951	516625	05 02 03 04	1.00 kg	1	pc(s)	132
787 952	516632	05 02 03 04	1.00 kg	1	pc(s)	132
787 953	516649	05 02 03 04	1.00 kg	1	pc(s)	132
787 954	516656	05 02 03 04	1.14 kg	1	pc(s)	132
787 955	516663	05 02 03 04	1.14 kg	1	pc(s)	132
787 956	516670	05 02 03 04	1.14 kg	1	pc(s)	132
787 957	516687	05 02 03 04	1.14 kg	1	pc(s)	132
787 958	516694	05 02 03 04	1.14 kg	1	pc(s)	132
787 959	516700	05 02 03 04	1.14 kg	1	pc(s)	132
787 960	516717	05 02 03 04	1.14 kg	1	pc(s)	132
787 961	516724	05 02 03 04	1.14 kg	1	pc(s)	132
787 962	516755	05 02 03 04	890 g	1	pc(s)	134
787 963	516762	05 02 03 04	920 g	1	pc(s)	134
787 964	516830	05 02 03 04	950 g	1	pc(s)	134
787 965	516847	05 02 03 04	980 g	1	pc(s)	134
787 966	516854	05 02 03 04	1.01 kg	1	pc(s)	134
787 967	516861	05 02 03 04	1.04 kg	1	pc(s)	134
787 968	516878	05 02 03 04	1.07 kg	1	pc(s)	134
787 969	516885	05 02 03 04	1.10 kg	1	pc(s)	134
787 970	516892	05 02 03 04	1.13 kg	1	pc(s)	134
787 971	516908	05 02 03 04	1.16 kg	1	pc(s)	134
787 972	516922	05 02 03 04	1.19 kg	1	pc(s)	134
787 973	516939	05 02 03 04	1.22 kg	1	pc(s)	134
787 974	516946	05 02 03 04	1.25 kg	1	pc(s)	134
787 975	516953	05 02 03 04	1.28 kg	1	pc(s)	134
787 976	516960	05 02 03 04	880 g	1	pc(s)	135
787 977	516977	05 02 03 04	920 g	1	pc(s)	135
787 978	516984	05 02 03 04	960 g	1	pc(s)	135
787 979	516991	05 02 03 04	1.00 kg	1	pc(s)	135
787 980	517004	05 02 03 04	1.02 kg	1	pc(s)	135
787 981	517011	05 02 03 04	1.06 kg	1	pc(s)	135
787 982	517028	05 02 03 04	1.10 kg	1	pc(s)	135
787 983	517035	05 02 03 04	1.14 kg	1	pc(s)	135
787 984	517042	05 02 03 04	1.18 kg	1	pc(s)	135
787 985	517059	05 02 03 04	970 g	1	pc(s)	136
787 986	517066	05 02 03 04	1.00 kg	1	pc(s)	136
787 987	517073	05 02 03 04	1.03 kg	1	pc(s)	136
787 988	517080	05 02 03 04	1.05 kg	1	pc(s)	136
787 989	517097	05 02 03 04	1.10 kg	1	pc(s)	136
787 990	517103	05 02 03 04	1.14 kg	1	pc(s)	136
787 991	517110	05 02 03 04	1.18 kg	1	pc(s)	136
787 992	517127	05 02 03 04	1.22 kg	1	pc(s)	136

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787 993	517134	05 02 03 04	830 g	1	pc(s)	137
787 994	517141	05 02 03 04	860 g	1	pc(s)	137
787 995	517158	05 02 03 04	890 g	1	pc(s)	137
787 996	517172	05 02 03 04	920 g	1	pc(s)	137
787 997	517189	05 02 03 04	950 g	1	pc(s)	137
787 998	517196	05 02 03 04	980 g	1	pc(s)	137
787 999	517202	05 02 03 04	1.01 kg	1	pc(s)	137
788 000	517219	05 02 03 04	1.04 kg	1	pc(s)	137
788 001	517233	05 02 03 04	1.07 kg	1	pc(s)	137
788 002	517240	05 02 03 04	1.10 kg	1	pc(s)	137
788 003	517257	05 02 03 04	1.13 kg	1	pc(s)	137
788 004	517264	05 02 03 04	1.16 kg	1	pc(s)	137
788 005	517271	05 02 03 02	1.23 kg	1	pc(s)	129
788 006	517288	05 02 03 02	1.26 kg	1	pc(s)	129
788 007	517295	05 02 03 02	1.29 kg	1	pc(s)	129
788 008	517301	05 02 03 02	1.32 kg	1	pc(s)	129
788 009	517318	05 02 03 02	1.35 kg	1	pc(s)	129
788 010	517349	05 02 03 02	1.35 kg	1	pc(s)	129
788 011	517356	05 02 03 02	1.38 kg	1	pc(s)	129
788 012	517363	05 02 03 02	1.41 kg	1	pc(s)	129
788 013	517370	05 02 03 02	1.44 kg	1	pc(s)	129
788 014	517387	05 02 03 02	1.47 kg	1	pc(s)	129
788 015	517394	05 02 03 02	1.50 kg	1	pc(s)	129
788 016	517400	05 02 03 02	2.04 kg	1	pc(s)	129
788 017	517424	05 02 03 04	1.36 kg	1	pc(s)	133
788 018	517431	05 02 03 04	1.39 kg	1	pc(s)	133
788 019	517448	05 02 03 04	1.42 kg	1	pc(s)	133
788 020	517455	05 02 03 04	1.45 kg	1	pc(s)	133
788 021	517462	05 02 03 04	1.48 kg	1	pc(s)	133
788 022	517479	05 02 03 04	1.51 kg	1	pc(s)	133
788 023	517486	05 02 03 04	1.54 kg	1	pc(s)	133
788 024	517493	05 02 03 04	1.57 kg	1	pc(s)	133
788 025	517509	05 02 03 04	1.60 kg	1	pc(s)	133
788 026	517516	05 02 03 04	1.63 kg	1	pc(s)	133
788 027	517523	05 02 03 04	1.66 kg	1	pc(s)	133
788 028	517530	05 02 03 04	1.20 kg	1	pc(s)	133
790 150	005365	05 00 04 09	450 g	1	pc(s)	88
790 160	018693	05 00 04 09	737 g	1	pc(s)	88
790 250	089495	05 00 04 01	193 g	1	pc(s)	77
790 251	089501	05 00 04 01	248 g	1	pc(s)	77
790 260	089518	05 00 04 01	180 g	1	pc(s)	77
790 261	089525	05 00 04 01	277 g	1	pc(s)	77
792 030	005853	05 00 04 09	610 g	1	pc(s)	89
792 190	068315	05 00 04 09	1.22 kg	1	pc(s)	88
792 450	051744	05 00 04 09	2.60 kg	1	pc(s)	180
792 451	230170	05 00 04 09	2.60 kg	1	pc(s)	180
792 455	376724	05 00 04 09	2.89 kg	1	pc(s)	180
792 456	446625	05 00 04 09	2.94 kg	1	pc(s)	180
793 010	556805	05 00 03 04	–	1	Stk.	45
793 020	556812	05 00 03 04	–	1	Stk.	45
793 030	556829	05 00 03 04	–	1	Stk.	45
793 231	556836	05 00 03 04	–	1	Stk.	45
793 235	556850	05 00 03 04	–	1	Stk.	45
793 240	556843	05 00 03 04	–	1	Stk.	45
793 250	556867	05 00 03 04	–	1	Stk.	45
793 530	556874	05 00 03 04	–	1	Stk.	45
793 536	556881	05 00 03 04	–	1	Stk.	45
795 001	011816	05 00 04 02	1.00 kg/m	1	m	80
795 020	424296	05 00 04 10	2.87 kg	1	pc(s)	95
795 212	423237	05 00 04 10	331 g	1	pc(s)	95
799 006	157347	05 00 04 09	4.00 kg	1	pc(s)	87
799 009	123298	05 00 04 09	5.10 kg	1	pc(s)	86
799 019	123304	05 00 04 09	328 g	1	pc(s)	86
799 100	237094	05 04 01 01	12.20 kg	1	pc(s)	104
799 930	-	10 70 50 00	-	1	pc(s)	23
799 932	-	10 70 50 00	-	1	pc(s)	23
799 934	-	10 70 50 00	-	1	pc(s)	23
799 936	-	10 70 50 00	-	1	pc(s)	23
799 938	-	10 70 50 00	-	1	pc(s)	23
923 110	092426	05 03 01 01	46 g	10	pc(s)	183
923 116	085978	05 03 01 01	42 g	10	pc(s)	183
923 117	093478	05 03 01 01	42 g	10	pc(s)	183
923 118	104969	05 03 01 01	38 g	10	pc(s)	183
923 119	104976	05 03 01 01	38 g	10	pc(s)	183

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V1KPXFR	165427	05 00 04 04	9.85 kg	1	pc(s)	92
V1RC3P2	163737	05 00 04 13	587 g	1	pc(s)	99
V2KWXUL	165588	05 00 04 04	4.99 kg	1	pc(s)	93
V2WPYVF	165601	05 00 04 04	8.06 kg	1	pc(s)	93
V3CM9FR	165687	05 00 04 04	8.31 kg	1	pc(s)	93
V3NCSHX	164031	05 00 04 02	3.44 kg	1	pc(s)	81
V3RQASE	163744	05 00 04 13	1.09 kg	1	pc(s)	99
V3WJMYY	163676	05 00 04 04	3.65 kg	1	pc(s)	92
V4RJ7A2	165526	05 00 04 04	5.76 kg	1	pc(s)	93
V4YPRGE	165243	05 00 04 02	1.14 kg	1	pc(s)	80
V5DHK24	461970	05 00 04 10	10.00 kg	1	pc(s)	94
V5SVXPH	164727	05 00 04 04	6.33 kg	1	pc(s)	92
V5VN56Z	165465	05 00 04 04	4.81 kg	1	pc(s)	93
V6VE249	164185	05 00 04 02	10.00 kg	1	pc(s)	82
V7GN8WU	162389	05 00 04 02	4.62 kg	1	pc(s)	81
V8D4AQ2	163485	05 00 04 02	6.04 kg	1	pc(s)	81
V8MCNWM	165441	05 00 04 04	4.14 kg	1	pc(s)	93
V8PPJEF	165649	05 00 04 04	3.67 kg	1	pc(s)	93
V8VF7CP	165458	05 00 04 04	4.66 kg	1	pc(s)	93
V9JF26K	163294	05 00 04 02	2.09 kg	1	pc(s)	80
V11E77B	163515	05 00 04 02	5.52 kg	1	pc(s)	81
V18JQHQ	163546	05 00 04 02	1.91 kg	1	pc(s)	81
V27E2GP	163980	05 00 04 02	7.89 kg	1	pc(s)	81
V43FCV8	165571	05 00 04 04	4.11 kg	1	pc(s)	93
V76D5TH	164178	05 00 04 02	10.00 kg	1	pc(s)	82
V93UVAP	164024	05 00 04 02	2.42 kg	1	pc(s)	81
V162LDM	162655	05 00 04 12	1.38 kg	1	pc(s)	96
V291ZZT	163997	05 00 04 02	9.39 kg	1	pc(s)	81
V797FE6	163188	05 00 04 02	6.65 kg	1	pc(s)	80
V7265NS	163355	05 00 04 02	1.04 kg	1	pc(s)	80
V8115WA	163508	05 00 04 02	4.60 kg	1	pc(s)	81
VA3926U	165403	05 00 04 04	6.81 kg	1	pc(s)	92
VAB3PJV	165410	05 00 04 04	7.80 kg	1	pc(s)	92
VABRSSE	164048	05 00 04 02	6.65 kg	1	pc(s)	81
VACNLP8	165540	05 00 04 04	7.51 kg	1	pc(s)	93
VAM7M6H	165267	05 00 04 02	4.25 kg	1	pc(s)	80
VANH53Y	461987	05 00 04 10	10.00 kg	1	pc(s)	95
VB1DETL	165632	05 00 04 04	1.53 kg	1	pc(s)	93
VB53TC9	163270	05 00 04 02	8.23 kg	1	pc(s)	80
VCEY1U6	165397	05 00 04 04	5.33 kg	1	pc(s)	92
VD28FAD	165434	05 00 04 04	3.94 kg	1	pc(s)	92
VDXTBGF	164192	05 00 04 02	10.00 kg	1	pc(s)	82
VDZ2VDX	163843	05 00 04 13	1.38 kg	1	pc(s)	99
VE5E8FZ	165557	05 00 04 04	3.20 kg	1	pc(s)	93
VE5K3HM	162679	05 00 04 12	1.53 kg	1	pc(s)	96
VE5MT89	163522	05 00 04 02	1.24 kg	1	pc(s)	81
VE9HQHJ	165496	05 00 04 04	7.91 kg	1	pc(s)	93
VEH4JQY	163850	05 00 04 12	1.25 kg	1	pc(s)	97
VF33XR2	165564	05 00 04 04	10.00 kg	1	pc(s)	93
VFV1Z7K	163331	05 00 04 02	5.07 kg	1	pc(s)	80
VFZ17TJ	165663	05 00 04 04	5.68 kg	1	pc(s)	93
VG3V6T2	165298	05 00 04 02	7.32 kg	1	pc(s)	81
VG4GXHQ	165618	05 00 04 04	9.31 kg	1	pc(s)	93
VGCMAA5	162518	05 00 04 02	10.00 kg	1	pc(s)	82
VGHVBP5	360389	05 00 04 05	1.12 kg	1	pc(s)	80
VGJD2QX	165373	05 00 04 04	3.00 kg	1	pc(s)	92
VGM214B	164017	05 00 04 02	2.01 kg	1	pc(s)	81
VGUVRRG	164000	05 00 04 02	1.67 kg	1	pc(s)	81
VH8QTCZ	163775	05 00 04 14	5.43 kg	1	pc(s)	101
VH95BZZ	165274	05 00 04 02	3.54 kg	1	pc(s)	81
VHBWUNH	163645	05 00 04 04	7.86 kg	1	pc(s)	92
VHNEFQE	450837	05 00 04 10	5.64 kg	1	pc(s)	94
VHV1NKR	164147	05 00 04 02	10.00 kg	1	pc(s)	82
VJ7VGZD	163553	05 00 04 02	2.67 kg	1	pc(s)	81
VJ13VWW	162136	05 00 04 02	2.27 kg	1	pc(s)	80
VKB2Q6J	163829	05 00 04 14	5.58 kg	1	pc(s)	101
VKVBG8W	360136	05 00 04 05	1.51 kg	1	pc(s)	80
VKZLVU3	165502	05 00 04 04	7.90 kg	1	pc(s)	93
VL2FG28	450820	05 00 04 10	5.68 kg	1	pc(s)	94
VLB2F3G	163607	05 00 04 02	3.83 kg	1	pc(s)	81
VLL6JWS	163348	05 00 04 02	6.08 kg	1	pc(s)	80
VM2J7S3	165281	05 00 04 02	5.05 kg	1	pc(s)	81
VMBDCM1	165519	05 00 04 04	5.09 kg	1	pc(s)	93
VMLM2BZ	165489	05 00 04 04	6.44 kg	1	pc(s)	93
VMRSJWD	163805	05 00 04 12	1.10 kg	1	pc(s)	97
VMZDL8N	165625	05 00 04 04	2.75 kg	1	pc(s)	93
VN35H5D	163560	05 00 04 02	2.19 kg	1	pc(s)	81
VN63A91	163812	05 00 04 14	5.40 kg	1	pc(s)	101
VNC1S9W	163539	05 00 04 02	1.56 kg	1	pc(s)	81
VNRLBXU	450868	05 00 04 10	10.00 kg	1	pc(s)	95
VP6YV4T	162686	05 00 04 14	6.13 kg	1	pc(s)	101
VP33XYL	450875	05 00 04 10	10.00 kg	1	pc(s)	95
VPH98CT	165472	05 00 04 04	5.75 kg	1	pc(s)	93
VPHPZV2	163379	05 00 04 02	1.55 kg	1	pc(s)	80
VPZBBSL	163317	05 00 04 02	4.03 kg	1	pc(s)	80
VQ7PF5A	164154	05 00 04 02	1.86 kg	1	pc(s)	82
VQKTK4T	163768	05 00 04 14	5.23 kg	1	pc(s)	101
VQY44GL	165656	05 00 04 04	4.51 kg	1	pc(s)	93
VQYP8B2	163195	05 00 04 04	7.15 kg	1	pc(s)	92
VRAB9WB	165533	05 00 04 04	6.72 kg	1	pc(s)	93
VRDSN66	163669	05 00 04 04	3.29 kg	1	pc(s)	92
VRJG23Y	163300	05 00 04 02	2.93 kg	1	pc(s)	80
VRP32FL	165595	05 00 04 04	6.12 kg	1	pc(s)	93
VSB29AH	162662	05 00 04 13	805 g	1	pc(s)	99
VSHDQZB	163836	05 00 04 13	1.71 kg	1	pc(s)	98
VSJ3Y6N	461994	05 00 04 10	10.00 kg	1	pc(s)	95
VSUN6NV	163782	05 00 04 13	1.56 kg	1	pc(s)	98
VSY71K4	163287	05 00 04 02	982 g	1	pc(s)	80
VTCS2XV	163584	05 00 04 02	2.83 kg	1	pc(s)	81
VTJKEZU	165250	05 00 04 02	2.99 kg	1	pc(s)	80
VTSY9XH	163621	05 00 04 04	6.40 kg	1	pc(s)	92
VU8P6LE	165380	05 00 04 04	4.38 kg	1	pc(s)	92
VUKMT58	163799	05 00 04 13	1.25 kg	1	pc(s)	99
VV7M6CQ	461963	05 00 04 10	10.00 kg	1	pc(s)	94
VVL7AKP	164130	05 00 04 02	10.00 kg	1	pc(s)	82
VWBDMPS	165670	05 00 04 04	7.12 kg	1	pc(s)	93
VZC3FST	163324	05 00 04 02	5.47 kg	1	pc(s)	80
VZKQZB5	164161	05 00 04 02	2.28 kg	1	pc(s)	82
VZL6TGH	163362	05 00 04 02	1.31 kg	1	pc(s)	80
VZPW9LG	163751	05 00 04 12	675 g	1	pc(s)	95

Notes

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* GTIN (EAN-Code)
No. For reasons of clarity, only the individual GTIN part is specified. The country and DEHN code (40 13364) must be put in front of this number.
[1)] The country and DEHN code (69 42299) must be put in front of this number.

Abbrevations:

PG	Product-Group
PU	Packing Unit
SU	Sales Unit (piece, meter, millimeter, kilogram, grams, liter, kit or pair)
pc(s)	Piece
m	Meter
mm	Millimeter
kg	Kilogram
g	Grams
Ltr	Liter
Pa	Pair
Pak	Kit
Weight	Weight per sales unit

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AB 32 46 RW K L4000	700 086	40
AB 32 46 RW K L4500	700 087	40
AB 32 46 RW K L5000	700 088	40
AB 32 46 RW K L5500	700 089	40
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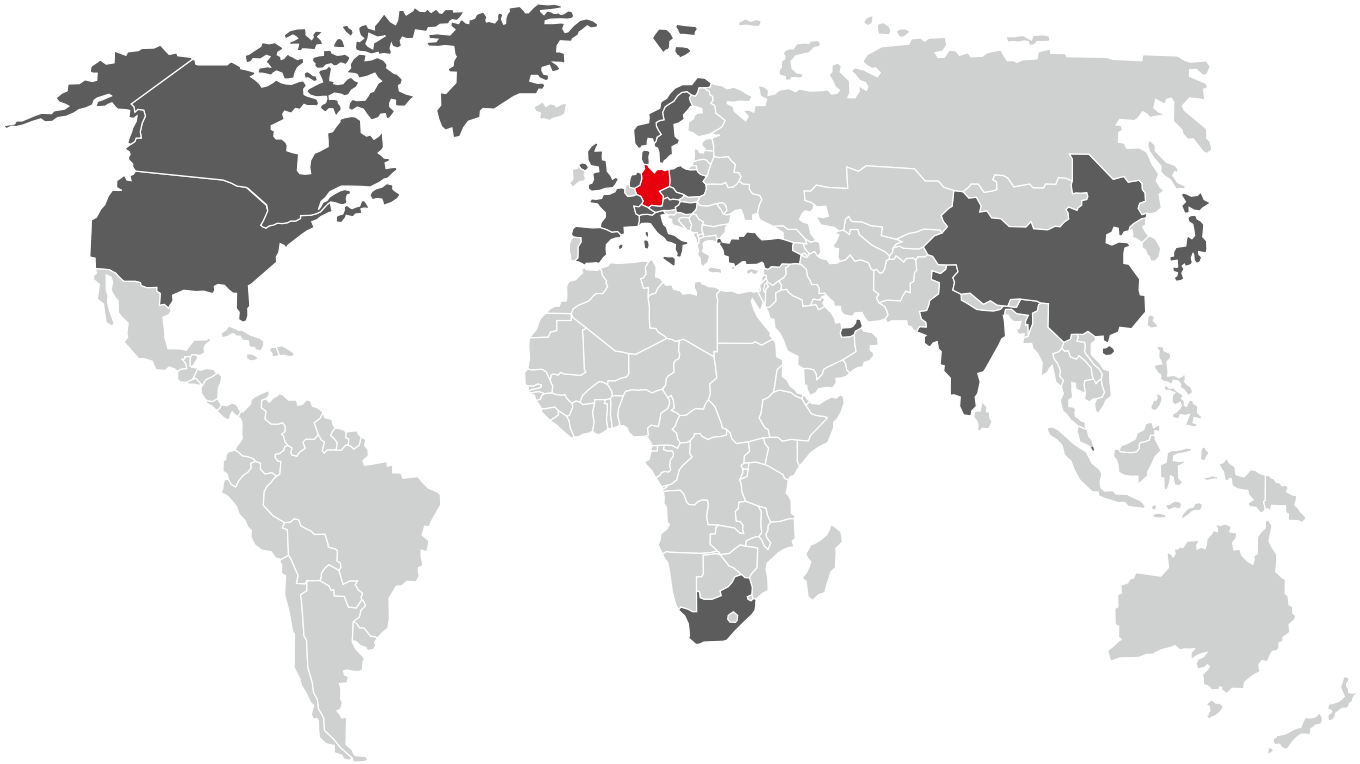

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