

Live Working

Permanent availability of electricity has become a decisive factor in international competition. At the same time, power interruptions must be reduced as a result of the increasing cost pressure. This makes it difficult to ensure reliability of existing installations and to perform maintenance work as entire parts of the installation cannot be isolated and the only alternative is live working. DEHN + SÖHNE has long-standing experience in the field of live working and has developed products which can be found in the DELTEC product range.

Isolating installations for maintenance work

Electrical equipment and low-voltage, medium-voltage and high-voltage systems such as overhead lines, transformer substations, switchgear installations, distribution boards, transformer cells or cable distribution cabinets cannot be isolated or can only be isolated with great effort due to undesired downtimes and costly work on Sundays and public holidays.

Live cleaning

Clean installations increase system reliability

Soiled electrical installations and adverse weather conditions (moisture) may cause power failure, damage to the equipment and even personal injuries as a result of an electrical arc. In medium-voltage installations, dust layers and residues from lubricants on insulators and cable sealing ends may cause failure. In cable distribution boards and low-voltage installations, cobwebs, weeds and dust are likely to occur.

Regular cleaning intervals

Surveys revealed that open indoor installations and cable distribution cabinets have to be cleaned at regular intervals between 6 months and 2 years depending on the type and degree of pollution.

Dry suction cleaning combined with damp cleaning

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 layers of dust and cobwebs are easily cleaned with little effort. Damp cleaning eliminates oily and tough pollutant layers with the help of sponges soaked with special insulating cleaning liquid. This type of work is performed according to "hot stick working" procedure.

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 single 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. accessories of industrial vacuum cleaners).

Requirements on the vacuum cleaner

The vacuum cleaner used must meet the following requirements:

- The industrial vacuum 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 $\geq \varnothing 30$ mm and must not contain any metal parts.

Damp cleaning equipment

Damp cleaning equipment consists of special cleaning heads (sponge holders), an insulating stick with handle and extension elements. All single 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.

Refilling cable sealing ends

Refilling insulating oil into cable sealing ends

The refilling device considerably reduces the refilling procedure, making it safer and easier. The insulating oil is heated according to the manufacturers' specifications and filled into the cable sealing end by simply pushing a button on the refilling lance. The compact device with rolls has a max. capacity of 5 litres of insulating oil. The screw plug at the cable sealing end is loosened with an insulated screw driver (insulating operating stick with interchangeable operating head). This type of work is performed according to "hot stick working" procedure.

Equipment for refilling insulating oil into cable sealing ends

Refilling equipment consists of a pumping unit with a reservoir, regulated heating, pump, refilling lance and an insulated screw driver system consisting of an insulating stick with a manually operated mechanism (adjustable handle) and interchangeable operating heads (straight and angled) with a safety plug-in system accepting different bits and screw plugs. The refilling lance and the pumping unit are connected via a hose and a control line (pump ON/OFF). The refilling lance and the screw driver are fully insulated. Special plastic screw plugs are available for different cable sealing ends which are attached to the insulated screw driver.

Requirements on installers

Selection of electrically skilled persons for live working

Only electrically skilled persons with experience of several years in the operation and maintenance of electrical installations are allowed to perform maintenance and repair work. Electrically skilled persons must be theoretically and practically trained for this type of work.

Training as live worker

The training for specialised live workers is based on detailed target descriptions as required by the German professional association for precision and electrical engineering. It includes theoretical and practical training and a "live working" certificate upon completion of the training.

Live Working Product Range

Live Working

Live Working

"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.

Design of operating sticks

Operating sticks according to DIN VDE 0681/0682 are hand-held devices for operating, testing and shielding live equipment. They consist of one or several insulating sticks rated for the nominal voltage of the equipment and of an operating head designed for the intended application. **Operating sticks**, are for example **intake tubes**, **insulating sticks**, **locking sticks**, **refilling lances** or **insulated screw drivers**. They are marked with a **triangle symbol**  on the rating plate.

An operating stick consists of a **handle**, an **insulating element** and an **operating head**.

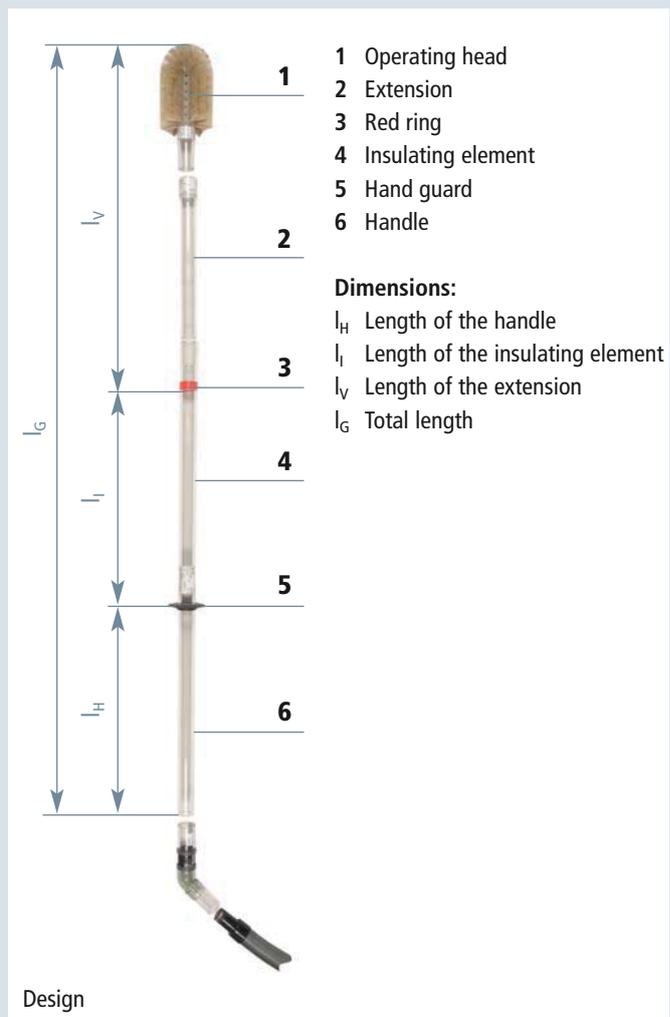
The **operating head** is the part of the operating stick containing the operating element, for example cleaning heads and brushes of a dry cleaning kit or the sponge holders of a damp cleaning kit.

The **insulating element** is the part of the operating stick between the hand guard and red ring. It provides the user with a safety distance and sufficient isolation for safe operation.

The **extension** is the part of the operating stick between the insulating and operating element of the operating head. It allows the user to reach remote parts of the installation and to pass the operating head next to live parts.

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.

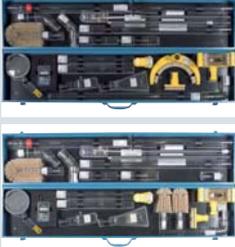
The **red ring** indicates the end of the insulating element in the direction of the operating head. It provides a visible barrier and prevents the user from making contact with live parts of the installation. The insulating element between the red ring and hand guard must not contact live parts, however, contact with earthed parts is allowed.



Live Working

Selection Guide

Live Working Product Range

Devices	Nominal voltage U_N / Frequency f_N	Application	Page	
TRS NS Dry Cleaning Kit	up to 1000 V / 15 ... 60 Hz	Live cleaning by suction Specially adapted operating heads for intensive cleaning Plug-in coupling system allows fast replacement of operating heads	132	
TRS MS TRS MS V1 Dry Cleaning Kit	up to 36 kV / 15 ... 60 Hz	Live cleaning by suction Transparent intake tubes for enhanced safety Specially adapted operating heads for intensive cleaning Plug-in coupling system allows fast replacement of operating heads	135	
FRS ZK MS Damp Cleaning Kit	up to 36 kV / 15 ... 60 Hz	Damp cleaning element 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 allows fast and easy replacement of sponges	137	
TFRS MS Combined Cleaning Kit	up to 36 kV / 15 ... 60 Hz	Combined equipment for 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 allows fast and easy replacement of sponges	138	
NFG MS Refilling Device	up to 36 kV / 15 ... 60 Hz	Refilling of insulating oil under live conditions Safe, fast and easy refilling procedure	144	
MS Insulated Screw Driver	up to 36 kV / 15 ... 60 Hz	For loosening and tightening the screw plugs of cable sealing ends under live conditions With interchangeable operating heads	146	

Maintenance tests

According to German regulations (BGV A3), operating sticks have to be tested for compliance with the prescribed limits as stated in the Electrical Safety Rules. This test includes:

- measurement of the leakage current,
- test for protection against bridging,
- visual inspection

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

The test intervals depend on the operating conditions of the operating stick e.g. frequency of use, environmental conditions and transport. According to German regulations, however, it is advisable to carry out a maintenance test **at least every 6 years**.



TRS NS Dry Cleaning Kit

Live Working

Nominal voltages up to 1000 V / 15 ... 60 Hz

Cleaning Equipment



Live cleaning of a low-voltage switchgear installation using the TRS NS dry cleaning kit

- 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 Information:

Standard	Based on DIN VDE 0680 Part 3
Use	Not suitable for use in wet weather conditions

Requirements

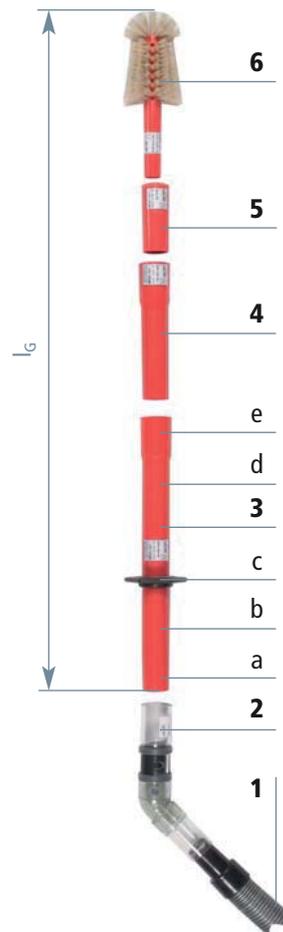
Cleaning work up to 1000 V must be carried out under supervision of a qualified electrician according to EN 50110-1 "Operation of electrical installations – Minimum Requirements". In Germany TRS NS dry cleaning kits are subject to BGV A3 of the national accident prevention regulations (UVV) "Elektrische Anlagen und Betriebsmittel" [Electrical installations and equipment] stipulated by the German Employer's Liability Association for the energy, textile, electrical and media product sector (BGEM).



Chamfered flat cleaning head in use



Tubular brush in use



- 1 Intake hose
- 2 Intake hose adapter
- 3 Intake tube with
 - a Lower connecting part
 - b Handle
 - c Hand guard
 - d Insulating element
 - e Top connecting part
- 4 Extension tube
- 5 Intake tube adapter
- 6 Cleaning head

Dimensions:

$l_{G \min} = 560 \text{ mm}$
 $l_{G \max} = 1350 \text{ mm}$

Design

Live Working

TRS NS Dry Cleaning Kit

Cleaning Equipment

Fully equipped plastic case



Type	TRS NS
Part No.	785 502
Dimensions	530 x 390 x 170 mm

Single Parts for TRS NS Dry Cleaning Kit

Plastic Case, empty

With retaining clips

Type	KKL TRS NS
Part No.	785 506
Colour	Black
Dimensions	530 x 390 x 170 mm



Extension

Insulating tube, with top and lower connecting part

Type	SRV 200 NS	SRV 300 NS	SRV 400 NS
Part No.	785 521	785 522	785 523
Diameter	40 mm	40 mm	40 mm
Dimensions	200 mm	300 mm	400 mm



Single Parts for TRS NS Dry Cleaning Kit

Intake Tube with Handle

For use as operating tube with handle and hand guard, with top and lower connecting part

Type	SRH 400 NS
Part No.	785 520
Dimensions	380 mm



Adjustable Angle

Lockable, adjustable due to 15° gearing, with top and lower connecting part

Type	SRW V NS
Part No.	785 530
Diameter	40 mm
Dimensions	300 mm



Flat Cleaning Head 55

Width: 55 mm

Type	FD 55 NS
Part No.	785 540
Diameter	40 mm
Dimensions	200 mm



Flat Cleaning Head 35

Width: 35 mm

Type	FD 35 NS
Part No.	785 541
Diameter	25 mm
Dimensions	200 mm



Flat Cleaning Head 35

Width: 35 mm, 60° outlet, chamfered

Type	FD 35 S NS
Part No.	785 542
Diameter	25 mm
Dimensions	200 mm



Flat Cleaning Head 35

Width: 35 mm, straight, with detachable brush

Type	FD 35 P NS
Part No.	785 590
Diameter	25 mm
Dimensions	230 mm



Flat Cleaning Head 35

Width: 35 mm, 30° angled, with detachable brush

Type	FD 35 W P NS
Part No.	785 591
Diameter	25 mm
Dimensions	240 mm



Round Cleaning Head

With scraper (50 mm)

Type	RD 25 S NS
Part No.	785 560
Diameter	25 mm
Dimensions	240 mm



TRS NS Dry Cleaning Kit

Live Working

Single Parts

Cleaning Equipment



Cross Cleaning Head 35

Width: 35 mm, 30° angled

Type	QD 35 W NS
Part No.	785 543
Diameter	25 mm
Dimensions	200 mm



Round Cleaning Head

With brush

Type	RD 25 P NS
Part No.	785 570
Diameter	25 mm
Dimensions	230 mm



Tubular Brush 85 mm

Cylindrical bristles

Type	STB 85 Z NS
Part No.	785 550
Diameter	25 mm
Dimensions	240 mm



Tubular Brush 85 mm

Conical bristles

Type	STB 85 K NS
Part No.	785 555
Diameter	25 mm
Dimensions	240 mm



Intake Tube Adapter

For brushes and cleaning heads (Ø25 mm)

Type	SRA NS
Part No.	785 515
Diameter	40 / 25 mm
Dimensions	100 mm



Intake Hose Adapter

Adjustable, 120° angled, regulation of intake air, for use with intake hose system (Ø35 mm)

Type	SSA W D
Part No.	785 200
Diameter	35 / 40 mm



Spare Brush

Short bristles, for flat cleaning heads with detachable brush

Type	EP 25 K NS
Part No.	785 595
Dimensions	25 mm
PU	3 pieces



Spare Brush

Long bristles, for flat cleaning heads, with detachable brush

Type	EP 25 L NS
Part No.	785 596
Dimensions	40 mm
PU	3 pieces



Cleaning Brush

For individual kit parts (Ø40 mm)

Type	RB 40 NS
Part No.	785 580
Diameter	45 mm
Dimensions	410 mm



Cleaning Brush

For individual kit parts (Ø25 mm)

Type	RB 20 NS
Part No.	785 585
Diameter	30 mm
Dimensions	330 mm

Live Working

Cleaning Equipment

- For indoor and outdoor installations
- Equipment for live cleaning by means of suction
- For dry cleaning of transformers and switch-gear 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

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



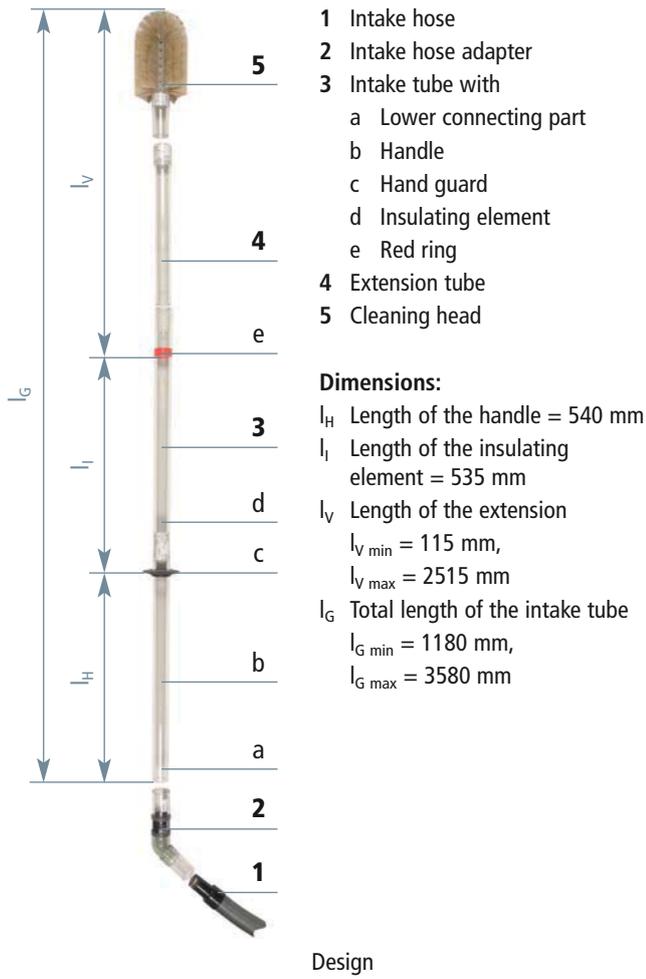
Live cleaning of a transformer using the TRS MS dry cleaning kit

General Information:

Standard	DIN VDE 0682 Part 621
Use	Not suitable 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 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, textile, electrical and media product sector (BGETEM).



Cleaning an insulator with a flat cleaning head and 135° angled intake tube



Cleaning an insulator with a tubular brush

TRS MS Dry Cleaning Kit

Live Working

TRS MS Dry Cleaning Kit

Cleaning Equipment



Fully equipped GRP case

Type	TRS MS
Part No.	785 100
Dimensions	1200 x 270 x 165 mm

TRS MS V1 Dry Cleaning Kit



Fully equipped GRP case

Type	TRS MS V1
Part No.	785 112
Dimensions	1200 x 270 x 165 mm

Live Working

Cleaning Equipment

- 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



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 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, textile, electrical and media product sector (BGEM).

FRS ZK MS Damp Cleaning Kit

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



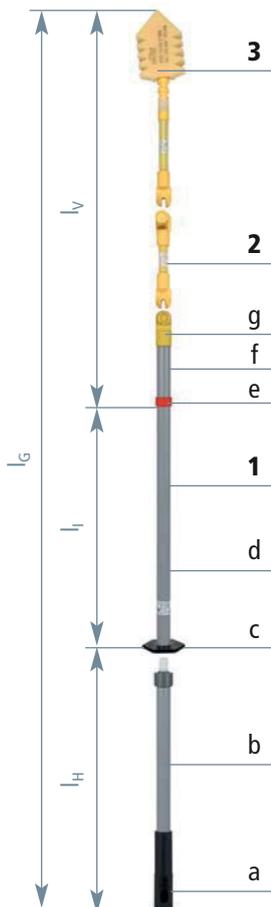
Damp cleaning of a transformer using the FRS ZK MS damp cleaning kit

General Information:

Standard	Based on DIN VDE 0681 Part 1 and DIN VDE 0682 Part 621
Standard (universal gear coupling)	EN/IEC 60832 (DIN VDE 0682 Part 211)
Use	Not suitable for use in wet weather conditions



The universal gear coupling permits fast replacement of operating heads and extensions



- 1 Insulating stick with
 - a End fitting with plug-in coupling
 - b Handle
 - c Hand guard
 - d Insulating element
 - e Red ring
 - f Extension
 - g Top connecting part
- 2 Extension tube
- 3 Operating head with sponge

Dimensions:

- l_H Length of the handle = 510 mm
 l_I Length of the insulating element = 525 mm
 l_V Length of the extension
 $l_{V \min}$ = 350 mm,
 $l_{V \max}$ = 2100 mm
 l_G Total length
 $l_{G \min}$ = 1450 mm,
 $l_{G \max}$ = 3250 mm

Design



Fully equipped GRP case

Type	FRS ZK MS
Part No.	785 940
Dimensions	850 x 300 x 200 mm

TFRS MS Combined Cleaning Kit

Live Working

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

Cleaning Equipment



TFRS MS combined cleaning kit used for dry and damp cleaning of a transformer under live conditions

General Information:

Standard	Based on DIN VDE 0681 Part 1 and DIN VDE 0682 Part 621
Standard (universal gear coupling)	EN/IEC 60832 (DIN VDE 0682 Part 211)
Use	Not suitable for use in wet weather conditions



Fully equipped GRP case and leather bag

Type	TFRS MS
Part No.	785 950
Dimensions (bag)	1400 x 280 mm
Dimensions (case)	850 x 410 x 400 mm

Customised kits are available on request.

- 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



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 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, textile, electrical and media product sector (BGEMEM).



Live Working

Single Parts for MS Cleaning Kit

Cleaning Equipment

GRP Case, empty

With retaining clips and printed top and bottom insert

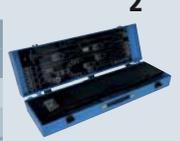
Type	KKL TRS MS
Part No.	785 301
Colour	Blue
Dimensions	1200 x 270 x 165 mm



GRP Case, empty

With retaining clips and printed bottom insert

Type	KKL FRS ZK MS
Part No.	785 229
Colour	Blue
Dimensions	850 x 300 x 200 mm



GRP Case, empty

With retaining clips and printed top and bottom insert

Type	KKL TFRS MS
Part No.	785 951
Colour	Blue
Dimensions	850 x 410 x 400 mm



Artificial Leather Bag, empty

With zip and shoulder strap

Type	KLT 140 28
Part No.	785 952
Colour	Black
Dimensions	1400 x 280 mm



90° angled Intake Tube

Type	SRW 90 MS
Part No.	785 131
Diameter	40 mm
Dimensions	120 mm



135° angled Intake Tube

Type	SRW 135 MS
Part No.	785 132
Diameter	40 mm
Dimensions	100 mm



Angled Intake Tube

Lockable, adjustable due to 15° gearing, for positioning the cleaning heads

Type	SRW V MS
Part No.	785 130
Diameter	40 mm
Dimensions	160 mm



Insulating Stick with Handle and plug-in Coupling

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

Type	ISH T 1300 ZK MS
Part No.	785 315
Diameter	30 mm
Dimensions	1300 mm



Intake Tube with Handle

For use as operating tube with handle, hand guard, insulating element, red ring and extension

Type	SRH 1180 MS
Part No.	785 120
Diameter	40 mm
Dimensions	1180, insulating element 525 mm



Insulating Stick with Handle and plug-in Coupling

Consisting of one element

Type	ISH 1300 ZK MS
Part No.	785 325
Diameter	30 mm
Dimensions	1300 mm



Extension

Type	ISV 220 ZK MS	ISV 320 ZK MS
Part No.	785 316	785 317
Diameter	20 mm	20 mm
Dimensions	220 mm	320 mm

Type	ISV 420 ZK MS	ISV 820 ZK MS
Part No.	785 318	785 319
Diameter	20 mm	20 mm
Dimensions	420 mm	820 mm



Extension

Type	SRV 200 MS	SRV 400 MS	SRV 800 MS
Part No.	785 121	785 122	785 123
Diameter	40 mm	40 mm	40 mm
Dimensions	200 mm	400 mm	800 mm



Single Parts for MS Cleaning Kit

Live Working
Cleaning Equipment

18



Rectangular Brush

Type	REB 1095 MS
Part No.	785 160
Diameter	40 mm
Dimensions	105 x 90 x 50 mm

19-20



Half-round Brush

For cleaning insulators as well as horizontal and vertical openings. The brush can be attached to SRW V MS angled intake tubes that can be adjusted to lead the brush around the complete insulator.

Type	HRB 120 MS	HRB 190 MS
Part No.	785 140	785 150
Diameter	40 / 120 mm	40 / 190 mm

21



Tubular Brush 120 mm

Cylindrical bristles

Type	STB 120 MS
Part No.	785 170
Diameter	40 mm
Dimensions	250 mm

22



Tubular Brush 85 mm

Cylindrical bristles

Type	STB 80 MS
Part No.	785 171
Diameter	25 mm
Dimensions	240 mm

23



Tubular Brush 85 mm

Conical bristles

Type	STB 80 K MS
Part No.	785 172
Diameter	25 mm
Dimensions	240 mm

24



Round Head Brush

Type	BB 245 MS
Part No.	785 151
Diameter	40 mm
Dimensions	390 mm

25



Cleaning Head 60

Width: 60 mm

Type	FD 60 MS
Part No.	785 220
Diameter	40 mm
Dimensions	190 mm

26



Cleaning Head 110

Width: 110 mm

Type	FD 110 MS
Part No.	785 221
Diameter	40 mm
Dimensions	260 mm

27



Cleaning Head 210

Width: 210 mm

Type	FD 210 MS
Part No.	785 223
Diameter	40 mm
Dimensions	255 mm

28



Flat Cleaning Head 35

Type	FD 35 S MS
Part No.	785 551
Diameter	40 mm
Dimensions	35 mm

29



Flat Cleaning Head

Width: 35 mm, 30° angled, with detachable brush

Type	FD 35 W P MS
Part No.	785 552
Diameter	40 mm
Dimensions	35 mm

30



Scraper

Type	S 30 ZK MS
Part No.	785 320
Diameter	20 mm
Dimensions	280 mm

31



Round Brush

Type	RP 15 ZK MS
Part No.	785 321
Diameter	20 mm
Dimensions	270 mm

Live Working

Single Parts for MS Cleaning Kit

Cleaning Equipment

Rigid Operating Head

For attaching cleaning sponges

Type	AK RS S ZK MS
Part No.	785 324
Diameter	20 mm
Dimensions	200 mm



32

Single Operating Head

Flexible, for attaching cleaning sponges

Type	AK RS ZK MS
Part No.	785 322
Diameter	20 mm
Dimensions	400 mm



33

Dual Operating Head

Flexible, for attaching cleaning sponges

Type	AK RS 2 ZK MS
Part No.	785 323
Diameter	20 mm
Dimensions	415 mm



34

Rectangular Cleaning Sponge

Type	RS 1544 MS
Part No.	785 274
Dimensions	150 x 40 x 40 mm
PU	5 pieces



35

Rectangular Cleaning Sponge

Type	RS 1574 MS
Part No.	785 275
Dimensions	150 x 70 x 40 mm
PU	5 pieces



36

Rectangular Cleaning Sponge, serrated

Type	RS 15104 Z MS
Part No.	785 279
Dimensions	150 x 100 x 40 mm
PU	5 pieces



37

Rectangular Cleaning Sponge, serrated

Type	RSD 15104 Z MS
Part No.	785 280
Dimensions	150 x 100 x 40 mm
PU	5 pieces



38

Intake Hose Adapter

Adjustable, 120° angled, regulation of intake air, for use with intake hose system (Ø35 mm)

Type	SSA W D
Part No.	785 200
Diameter	35 / 40 mm



39

Intake Tube Adapter

For brushes and cleaning heads (Ø25 mm)

Type	SRA MS
Part No.	785 212
Diameter	40 / 25 mm
Dimensions	100 mm



40

Operating Head Adapter

Universal gear coupling / transparent tube (Ø25 mm)

Type	AKA TF ZK MS
Part No.	785 259
Diameter	40 mm
Dimensions	125 mm



41

Single Parts for MS Cleaning Kit

Live Working

Cleaning Equipment

Digital Hygrometer/Thermometer

For verifying the climatic conditions that must be adhered to.

Measuring range: - 20 °C ... + 70 °C (temperature), 10 ... 95 % (relative air humidity)



Type	DHTM
Part No.	785 180
Dimensions	140 x 65 mm

Digital Hygrometer/Thermometer

For verifying the climatic conditions that must be adhered to.

Measuring range: 0 °C ... + 50 °C (temperature), 5 ... 95 % (relative air humidity)



Type	DHTM T 615
Part No.	785 181
Dimensions	57 x 190 x 42 mm



Insulating Mirror

For visual inspection of hidden electrical components

Type	ISP 135 MS
Part No.	785 190
Diameter	40 / 135 mm



Spray Bottle

For cleaning liquids

Type	SF FRF MS
Part No.	785 953
Capacity	500 ml

Spare Brush

For FD 39 WP MS flat cleaning heads



Type	EP 25 L MS
Part No.	785 224
Dimensions	40 mm
PU	3 pieces



Cleaning Brush

For individual kit parts (Ø40 mm), modular

Type	RB 50 MS
Part No.	785 210
Diameter	45 mm
Dimensions	1430 mm



Cleaning Brush

For individual kit parts (Ø25 mm)

Type	RB 20 NS
Part No.	785 585
Diameter	30 mm
Dimensions	330 mm



Barrier Rod

Modular, for use as visible working limit

Type	AS MS
Part No.	785 109
Dimensions	2200 mm

Live Working

Accessory for NS and MS Cleaning Kits

Cleaning Equipment

Industrial Vacuum Cleaner

For dry and combined cleaning kits

Equipment:

The industrial vacuum cleaner consists of a 25 l plastic container, 2 large wheels, 2 guide wheels with locking brakes, handle and cable holder, socket outlet with automatic switch-on mechanism, electromagnetic pulse filter cleaning, automatic vibration function, speed control, volume flow control, acceleration rate controller, electronic running feature, moisture identification with sensor-controlled disconnection, 2 new polyester filter cassettes, FKP 4300, filter area $2 \times 4300 \text{ cm}^2 = 8600 \text{ cm}^2$, dust collection capacity in accordance with BIA, class C, cord length: 8 m

Technical data:

- Intake hose with straight connecting adapter ($\varnothing 35 \text{ mm}$), 5 m long

Type	HIS 1400 TRS
Part No.	785 310
Nominal capacity	1400 W
Nominal voltage	230 V
Max. air flow	61 l/s
Max. low air pressure	248 mbars
Capacity (container)	25 l gross volume, 20 l for dust, 15 l for water
Dimensions	400 x 400 x 560 mm



Reducing Inserts

For connection between SSA W D intake hose adapter and intake hoses from other manufacturers with different diameters and straight connecting adapter.

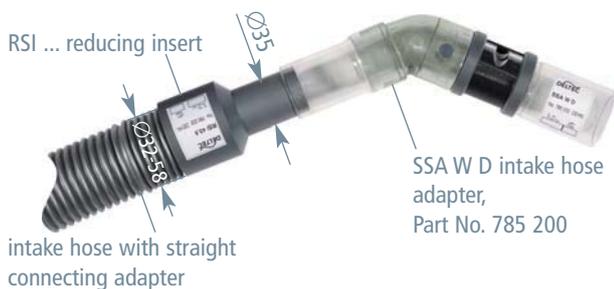
Type	RSI 32	RSI 34	RSI 35
Part No.	785 213	785 214	785 215
Diameter	35 / 32 mm	35 / 34 mm	35 / 35 mm
Dimensions	105 mm	105 mm	105 mm

Type	RSI 38	RSI 45
Part No.	785 216	785 217
Diameter	35 / 38 mm	35 / 45 mm
Dimensions	105 mm	105 mm

Type	RSI 51	RSI 58
Part No.	785 218	785 219
Diameter	35 / 51 mm	35 / 58 mm
Dimensions	105 mm	105 mm



Application:



90° angled flat Cleaning Head with detachable Brush

For TRS NS dry cleaning kits

Type	FWD 35 P NS
Part No.	785 592
Diameter	25 mm
Dimensions	200 mm



Intake Tube with Handle

For TRS MS and TFRS MS cleaning kits

Type	SRH 1180 IS 650 MS
Part No.	785 119
Diameter	40 mm
Dimensions	1180 mm, insulating element 650 mm



HV STK Extension Handle

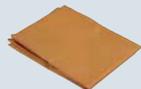
Plug-in coupling at both ends for extending the handle

Type	HV STK 710
Part No.	766 335
Diameter	30 mm
Total length (l _G)	710 mm
Material	Glass-fibre reinforced polyester tube
Colour	Grey



Cover

Type	AP 152 G
Part No.	785 110
Colour	Yellow
Dimensions	1500 x 2000 mm



Canvas Bag, empty

With two separate internal pockets and shoulder strap
For intake hose, cover, safety helmet with face shield, working gloves

Type	STT 55 27 30
Part No.	785 111
Colour	Olive
Dimensions	550 x 270 x 300 mm



NFG MS Refilling Device

Live Working

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

Refilling Equipment



Refilling of hot HT mass under live conditions

- For indoor and outdoor installations
- Equipment for refilling hot HT mass into paper-insulated mass-impregnated cables under live conditions
- Safe, fast and easy refilling procedure
- Transparent insulating refilling lance ensures enhanced safety



General Information:

Standard	Based on DIN VDE 0681 Part 1 and DIN VDE 0682 Part 621
Design	Not suitable for use in wet weather conditions

Design

The refilling device consists of a pumping unit with a reservoir, regulated heating and pump as well as an insulating refilling lance. The oil reservoir can be removed for easy transport and can be sealed with a cover. The pump and the insulating refilling lance are connected by means of a temperature-resistant, removable and highly flexible refilling hose and a pump control cable (Ein [On]/Aus [Off] circuit). All components are arranged on a transport vehicle (with additional support brackets), suitable for mounting.

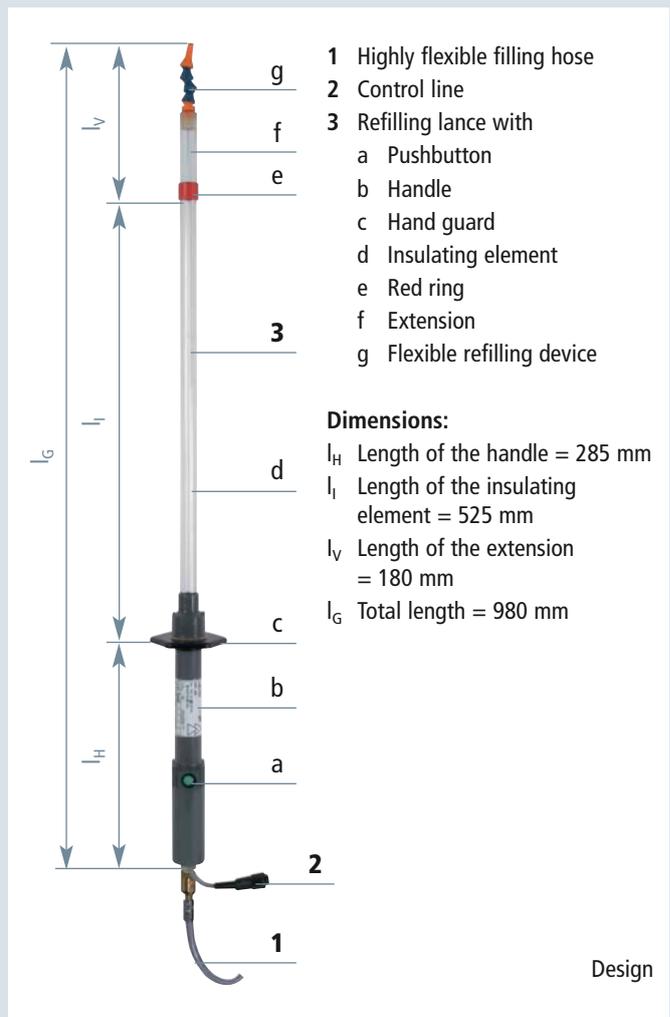
When working under live conditions, the screw plugs of cable sealing ends are removed and replaced with an insulated screw driver. Special plastic screw plugs can be used for sealing the cable ends.

Requirements

The refilling device is to be used 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 NFG MS refilling devices are subject to 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, textile, electrical and media product sectors (BGEMEM).



After lifting the conveying pump out of the HT mass, the oil reservoir can be removed from the NFG MS for refilling.



Design

Live Working

NFG MS Refilling Device

Refilling Equipment

MS Refilling Device

Fully equipped with insulating refilling lance and reservoir

Type	NFG MS
Part No.	785 260
Nominal capacity	1200 W
Supply voltage	230 V
Frequency	50 Hz
Reservoir size	5 litres
Heating control range	0 °C ... + 120 °C
Thermometer indication range	0 °C ... + 120 °C
Dimensions	632 x 329 x 1490 mm



Accessory for NFG MS Refilling Device

Insulating Refilling Lance

Operating stick with detachable, highly flexible filling hose (1350 mm), handle, hand guard, insulating element, red ring, extension and flexible lance tip

Type	INFL MS
Part No.	785 261
Diameter	30 / 20 mm
Dimensions	980 mm



Other lengths of insulating refilling lances are available on request.

Reservoir

Made of stainless steel, with cover and adjustable ventilation

Type	OEB NFG MS	RFB NFG MS
Part No.	785 264	785 295
Capacity (heating element)	950 W	No heating element
Dimensions	320 x 165 x 164 mm	320 x 165 x 164 mm



GRP Case, empty

Max. capacity:

3 NFG MS reservoirs

Type	KKL B NFG MS
Part No.	785 299
Colour	Blue
Dimensions	600 x 380 x 220 mm



MS Screw Driver Set

Live Working

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

Refilling Equipment



Loosening the locking screw using the MS insulated screw driver

- For indoor and outdoor installations
- For loosening and tightening the screw plugs of cable sealing ends under live conditions
- With interchangeable operating heads (straight and angled)



General Information:

Standard	Based on DIN VDE 0681 Part 1
Use	Not suitable for use in wet weather conditions

Application

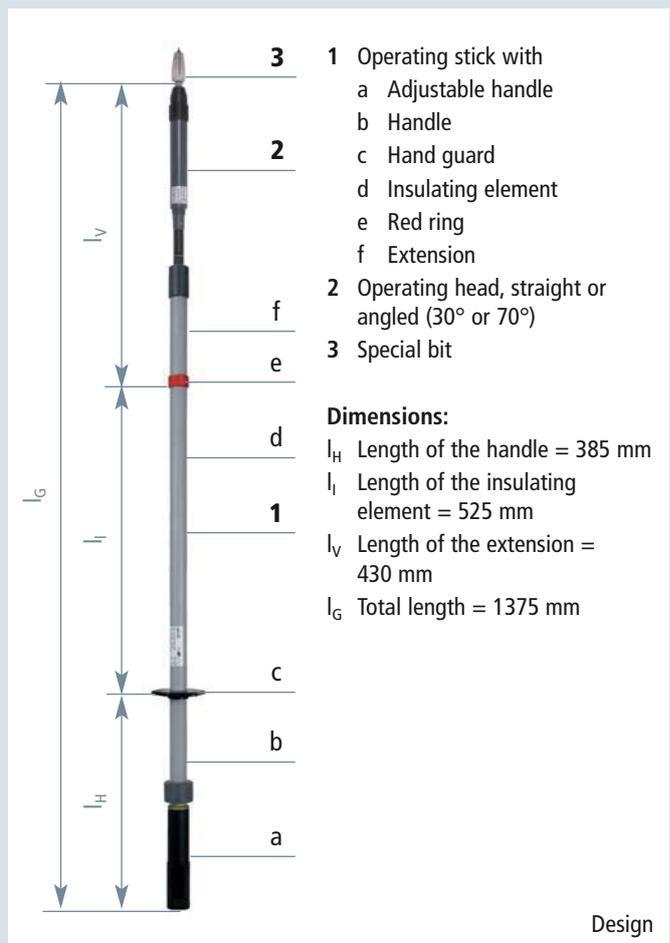
The insulated screw driver with interchangeable operating heads (straight and angled) for attaching special bits and screw plugs allows to loosen or tighten the screw plugs of cable sealing ends under live conditions. Only tested bits (screw plug blade inserts) and special screw plugs may be used.

Requirements

Maintenance 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 MS screw drivers are subject to 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, textile, electrical and media product sectors (BGETEM).



Apart from the insulated screw driver kit, the plastic case allows transport of the insulating refilling lance including filling hose and special screw plugs. These elements, however, are not included in delivery.



Live Working

MS Screw Driver Set

Refilling Equipment



Fully equipped plastic case

Type	SDS KEV MS
Part No.	785 265
Dimensions	1270 x 215 x 140 mm
Material (operating head)	PVC
Material (handle)	Plastic
Material (insulating stick)	Glass-fibre reinforced polyester tube

Further insulating element extensions, operating heads and special bits are available on request.

Single Parts for MS Screw Driver Set

Plastic Case, empty

With foam padding

Type	KKL SDS KEV MS
Part No.	785 298
Colour	Black
Dimensions	1270 x 215 x 140 mm



Single Parts for MS Screw Driver Set

Operating Stick with adjustable Handle

With plug-in coupling for extending the handle, hand guard, insulating element, red ring and extension

Type	BS SD KEV MS 1120
Part No.	785 266
Diameter	30 mm
Dimensions	1135 mm



Extension

For operating sticks

Type	VL 350 SD KEV MS
Part No.	785 273
Diameter	30 mm
Dimensions	350 mm



Straight Operating Head

With hexagon socket for attaching special bits and special screw plugs

Type	AK SD KEV MS
Part No.	785 267
Diameter	30 mm
Dimensions	310 mm



30° angled Operating Head

With hexagon socket for attaching special bits and special screw plugs

Type	AK SD W30 KEV MS
Part No.	785 268
Diameter	30 mm
Dimensions	270 mm



70° angled Operating Head

With hexagon socket for attaching special bits and special screw plugs

Type	AK SD W70 KEV MS
Part No.	785 269
Diameter	30 mm
Dimensions	300 mm



Special Bit 13 mm

With safety plug-in system suitable for AK SD ... operating heads

Type	BIT 13 SD KEV MS
Part No.	785 271
Diameter	25 mm
Dimensions	50 mm



Special Bit 8 mm

With safety plug-in system suitable for AK SD ... operating heads

Type	BIT 8 SD KEV MS
Part No.	785 272
Diameter	25 mm
Dimensions	50 mm



Special Screw Plugs

Live Working

Nominal voltages up to 36 kV

Refilling Equipment



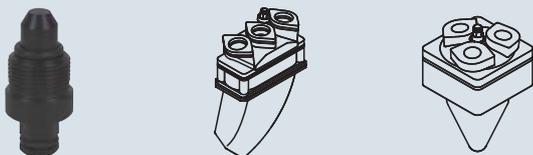
Screwing a special screw plug into a cable sealing end using an angled operating head

- For indoor and outdoor installations
- For sealing cable sealing ends
- For use with operating heads of type AK SD ...
- With safety plug-in system
- UV-resistant

General Information:

Use Not suitable for use in wet weather conditions

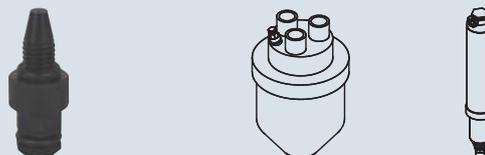
Special Screw Plug (F & G)



For cable sealing ends

Type	VS F&G M22 F
Part No.	785 281
Dimensions	M22 x 55 mm
PU	12 pc(s)

Special Screw Plug (Köttgen)



For cable sealing ends

Type	VS KOET M10
Part No.	785 282
Dimensions	M10 x 45 mm
PU	12 pc(s)

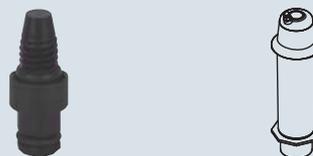
Special Screw Plug (Raychem)



For cable sealing ends

Type	VS RAY M14
Part No.	785 283
Dimensions	M14 x 45 mm
PU	12 pc(s)

Special Screw Plug (GOW)



For cable sealing ends

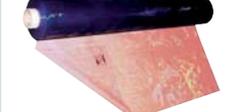
Type	VS GOW M12
Part No.	785 284
Dimensions	M12 x 45 mm
PU	12 pc(s)

Special screw plugs for cable sealing ends from other manufacturers are available on request.

Live Working

Selection Guide

Protective and Auxiliary Equipment

Device	Nominal voltage U_N	Application	Page	
DEHNcare APS	up to 1000 V	Arc-fault-tested face shield suitable for all standard safety helmets for electricians	150	
DEHNcare ESH		Insulating safety helmet for electricians (EN 50365) six-point suspension with sweatband		
DEHNcare APG		Arc-fault-tested protective gloves	152	
PPE – Personal Protective Equipment	up to 1000 V	Safety helmet NH fuse puller with sleeve Insulating gloves	154	
Covering Material	up to 1000 V	Insulated platform	156	
		Covering material Insulated mats for insulating the operating location	158	
	up to 50 kV		159	
Lock-out Systems	up to 1000 V	Insulating plugs Insulating blades Lock-out systems	160	

DEHNcare APS and ESH

Live Working

Nominal voltages up to 1000 V

Protective and Auxiliary Equipment



Attaching an earthing and short-circuiting device using the required personal protective equipment

Prevent injuries – Stay healthy

- High wearing comfort
- High degree of protection and low wear due to energy-absorbing nanoparticles
- Excellent visibility due to anti-mist coating and high light transmittance
- Face shield with clip for easy insertion into the helmet
- Certified according to the requirements of directive 89/686/EEC on personal protective equipment

General Information:

Standard	EN 50365 (safety helmet for electricians), EN 166 and EN 177 (face shield), box test in accordance with IEC 61482-1-2, ATPV test in accordance with IEC 61482-1-1
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Use of the protective equipment



By pressing the rotary knob the head strap is loosened. If the rotary knob is turned, the head strap is adjusted to the head size of the user.

Live Working

DEHNcare APS and ESH

Protective and Auxiliary Equipment

Arc-fault-tested Face Shield with Clip and Chin Protector



Fits the slot in the ESH safety helmet for electricians

Type	APS CL2 SC	APS 12C SC
Part No.	785 746	785 747
Nominal voltage up to (U_N)	1000 V	1000 V
Material	Plastic	Plastic
Wall thickness	1.5 mm	1.5 mm
Incident energy after box test	(class 2) 423 kJ / m ²	(class 2) 423 kJ / m ²
ATPV (Arc Thermal Performance Value)	—	12 cal / cm ²
Visible Light Transmittance (VLT)	> 75 %	65 % ... 75 %

Arc-fault-tested Safety Helmet with Strap and Chin Protector



Suitable for all standard safety helmets for electricians

Type	APS CL2 FS	APS 12C FS
Part No.	785 748	785 749
Nominal voltage up to (U_N)	1000 V	1000 V
Material	Plastic	Plastic
Wall thickness	1.5 mm	1.5 mm
Incident energy after box test	(class 2) 423 kJ / m ²	(class 2) 423 kJ / m ²
ATPV (Arc Thermal Performance Value)	—	12 cal / cm ²
Visible Light Transmittance (VLT)	> 75 %	65 % ... 75 %

Safety Helmet for Electricians

- Electrically isolating safety helmet for electricians (EN 50365)
- For nominal voltages up to 1000 V
- With slot for APS ... SC face shield
- Adjustable to head sizes from 51 to 63 cm via push/rotary knob
- Six-point suspension with sweatband
- ABS shell



Type	ESH 1000 S Y	ESH 1000 S W	ESH 1000 S O	ESH 1000 S B	ESH 1000 S R
Part No.	785 740	785 741	785 742	785 743	785 744
Nominal voltage up to (U_N)	1000 V				
Colour	Yellow	White	Orange	Blue	Red
Material	ABS plastic				



Actuation of an NH fuse puller using protective gloves

Prevent injuries – Stay healthy

- 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
- Breathable materials maximise wearing comfort
- Certified according to the requirements of directive 89/686/EEC on personal protective equipment

General Information:

Standard	Box test in accordance with IEC 61482-1-2, ATPV test in accordance with IEC 61482-1-1, DIN EN 388, DIN EN 407
Material (glove palm)	Siliconised calf grain leather
Material (glove back)	100% Kevlar® interlock knit
Material (sewing thread)	Kevlar®

Notes

Article 5 of the German Labour Protection Law requires employers to perform a hazard analysis. This hazard analysis also involves arc fault protection. Employers must select and provide approved protective clothing including helmets, face shields and gloves to protect personnel against the hazards of arc faults. They must also ensure that each employee who is exposed to the hazards of arc faults wears protective clothing. Protective gloves of type APG are no insulating gloves in accordance with EN/IEC 60903 (DIN VDE 0682 Part 311) for live working.

Live Working

DEHNcare APG

Protective and Auxiliary Equipment

Arc-Fault-Tested protective Gloves

Glove size

Measure the circumference around your knuckles to determine your correct glove size.

Order example

Glove size 10 is recommended for a circumference around your knuckles of 24 cm.

Glove size:	
Circumference around the knuckles	Glove size
20.3 cm	8
22.9 cm	9
25.4 cm	10
27.9 cm	11
30.5 cm	12



Type	APG 8	APG 9	APG 10	APG 11	APG 12
Part No.	785 796	785 797	785 798	785 799	785 800
Incident energy	(class 2) 423 kJ / m ²				
ATPV (Arc Thermal Performance Value)	32.8 cal / cm ²				
Total length	310 mm	320 mm	330 mm	340 mm	350 mm
Gauntlet length	100 mm				
Size	8	9	10	11	12

PPE – Personal Protective Equipment

Live Working

Nominal voltages up to 1000 V

Protective and Auxiliary Equipment



Live working with insulating gloves up to 1000 V

- For working on live parts
- Insulating gloves combine excellent fit and high elasticity with maximum insulation resistance
- Two different models to suit your needs

General Information:

Standard (gloves)	EN 60903 (DIN VDE 0682 Part 311)
Standard (face shield)	DIN EN 166 and additional GS-ET-29 requirements of the trade association
Standard (NH fuse puller)	DIN VDE 0680 Part 4

Maintenance test

The pneumatic glove tester allows to perform maintenance tests in compliance with the relevant standard and even detects minimal damage to the insulating gloves. Gloves should be inspected before each use, therefore the glove tester is an indispensable and very practical safety tool.



Face Shield with Strap



- Arc-fault-tested in accordance with GS-ET-29 test principle
- High Visible Light Transmittance (VLT)
- Coating on both sides prevents misting up, polished edges, 1.5 mm thick
- The face shield can be locked into the use and non-use position
- Suitable for all common safety helmets for electricians

Type	SSC ASH NS
Part No.	785 427
Nominal voltage up to (U_N)	1000 V
Wall thickness	1.5 mm
Size	Universal
Material	Plastic
Incident energy after box test	(class 1) 135 kJ / m ²
Visible Light Transmittance (VLT)	> 75 %

NH Fuse Puller with Sleeve



- NH fuse puller in accordance with DIN VDE 0680 Part 4 with sleeve made of coated cotton fabric
- For actuating fuses of sizes NH00, 1, 2 and 3

Type	NHS AG 00 3 NS
Part No.	785 645
Nominal voltage up to (U_N)	1000 V
Colour	Brown
Material	Coated cotton fabric

Live Working

PPE – Personal Protective Equipment

Protective and Auxiliary Equipment

Insulating Gloves, Category M



For high mechanical stress

Type	IHS 00 M 9 NS	IHS 00 M 10 NS	IHS 0 M 9 NS	IHS 0 M 10 NS
Part No.	785 491	785 492	785 493	785 494
Class	00	00	0	0
Nominal voltage up to (U_N)	500 V	500 V	1000 V	1000 V
Colour	Beige	Beige	Beige	Beige
Wall thickness	0.5 mm	0.5 mm	1.0 mm	1.0 mm
Size	9	10	9	10

Insulating Gloves, Category RC



Resistant to acid, oil, ozone, high mechanical stress and extremely low temperatures

With inner coating and textured gripping surface

Type	IHS 00 RC 9 NS	IHS 00 RC 10 NS
Part No.	785 495	785 496
Class	00	00
Nominal voltage up to (U_N)	500 V	500 V
Colour	Orange	Orange
Wall thickness	0.9 mm	0.9 mm
Size	9	10

Sizes 8 and 11 are available on request.

Accessory for insulating Gloves

Storage Bag, empty

With hook-and-loop fastener and coupling hook

Type	AT IHS NS
Part No.	785 490
Colour	Brown
Dimensions	400 x 180 x 50 mm



Accessory for insulating Gloves

Pneumatic Glove Tester

For performing tests required by the standard

Type	PHSP NS
Part No.	785 497
Colour	Grey



Insulating Equipment for Airport Lighting Systems

Live Working

Nominal voltages up to 17.5 kV / 15 ... 60 Hz

Protective and Auxiliary Equipment



Replacement of a faulty illuminant (airport lighting system) at a runway

- Equipment for live maintenance and repair work on airport lighting systems
- Insulated platform for insulating the operating location
- Circumferential, fluorescent marker tape indicates the maximum permissible height for plants in green spaces and can be used as reflector at night
- Two removable kneeling cushions for comfortable working
- Replaceable skids for easy positioning and transport



General Information:

Standard	Based on DIN VDE 0681 Part 1
Relative air humidity	≤ 90%
Temperature range	– 25 °C ... + 55 °C
Use	Not suitable for use in wet weather conditions
Material (insulated platform)	Glass-fibre reinforced plastic
Material (extension)	Glass-fibre reinforced rod

Application

The insulated platform and the insulating extension are used for e.g. replacing illuminants at airport lighting systems under live conditions. The insulated platform insulates the operating location during live working. The insulating extension is used as insulating intermediate section between the ratchet (with 13 mm square) and operating head (e.g. 17 mm bushing).



The insulating extension is used as insulating intermediate section when attaching the illuminant.

Application:

Insulating extension with operating head and ratchet with torque adjustment.



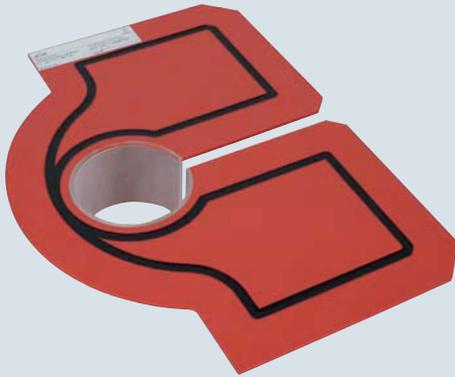
Insulating extension
IV VK13 SW17 1000
Part No. 785 445

Live Working

Insulating Equipment for Airport Lighting Systems

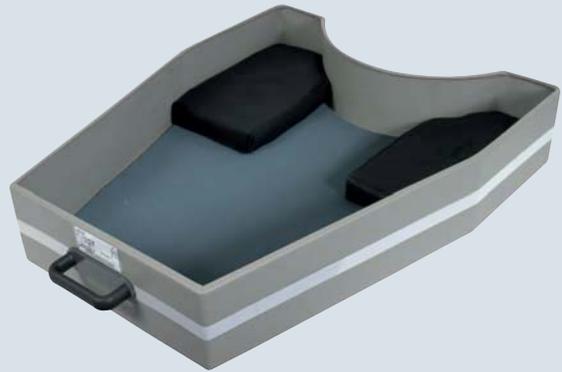
Protective and Auxiliary Equipment

Insulating Insert for buried Beacons



Type	IE UF LF 150	IE UF LF 200
Part No.	785 440	785 441
Nominal voltage up to (U_N)	1000 V / a.c.; 1500 V / d.c.	1000 V / a.c.; 1500 V / d.c.
Diameter	150 mm	200 mm
Dimensions	600 x 440 mm	600 x 460 mm

IW insulated Platform



For beacons up to a maximum diameter of 225 mm

Type	IW 17.5 890 650 180
Part No.	785 408
Nominal voltage up to (U_N)	17.5 kV
Dimensions	890 x 650 x 180 mm

Insulating Extension



With 13 mm square and width across flats 17 for torque limiter

Type	IV VK13 SW17 1000
Part No.	785 445
Nominal voltage up to (U_N)	1000 V / a.c.; 1500 V / d.c.
Length	1000 mm

Covering Material and insulated Mats

Live Working

Protective and Auxiliary Equipment



Covering live parts

- Protection against accidental and direct contact with live parts
- For covering adjacent live parts
- Available in different lengths, widths, thicknesses and colours
- Insulated rubber mats for insulating the operating location

General Information:

Standard DIN VDE 0680 Part 1

Insulated Covering Material (Crystal Clear)



Type	ATK 135 50M NS	ATK 135 ..M NS
Part No.	785 465	785 466
Nominal voltage up to (U _N)	1000 V	1000 V
Length	50 m	Any up to 50 m *)
Width	1350 mm	1350 mm
Thickness	0.5 mm	0.5 mm
Colour	Crystal clear	Crystal clear

Insulated Covering Material (Transparent)



Type	ATK 120 25M NS	ATK 120 ..M NS
Part No.	785 467	785 468
Nominal voltage up to (U _N)	1000 V	1000 V
Length	25 m	Any up to 25 m *)
Width	1200 mm	1200 mm
Thickness	1.0 mm	1.0 mm
Colour	Transparent	Transparent

*) Required length to be specified at order!

Live Working

Covering Material and insulated Mats

Protective and Auxiliary Equipment

Insulated Covering Material (Chloroprene Rubber)



For covering insulators

Type	WBN 200 2,5M NS
Part No.	785 646
Nominal voltage up to (U_N)	1000 V
Length	2.5 m
Width	200 mm
Thickness	1.0 mm
Colour	Red

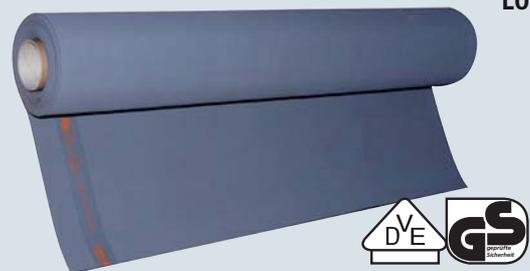
Insulated Covering Material (Chloroprene Rubber)



Flexible at low temperatures

Type	ATN 140 10M NS	ATN 140 ..M NS
Part No.	785 471	785 472
Nominal voltage up to (U_N)	1000 V	1000 V
Length	10 m	Any up to 10 m *)
Width	1400 mm	1400 mm
Thickness	1.0 mm	1.0 mm
Colour	Red	Red

Insulated Rubber Mats for Insulating the Operating Location



Type	IMG SI 1M NS	IMG SI 10M NS	IMG SI ..M NS
Part No.	785 455	785 457	785 456
Nominal voltage up to (U_N)	1000 V	1000 V	1000 V
Length	1 m	10 m	Any up to 10 m *)
Width	1000 mm	1000 mm	1000 mm
Thickness	3.0 mm	3.0 mm	3.0 mm
Colour	Grey	Grey	Grey

Accessory for Covering Material and insulated Mats

Clip

With insulated steel spring

With VDE/GS sign

Type	KK 35 NS
Part No.	785 647
Max. clamping range	35 mm
Dimensions	170 / 110 mm
Material	Plastic



Eye

Consists of two elements

Type	OEK 12 NS
Part No.	785 649
Dimensions	Ø12 / 26 mm
Material	Plastic

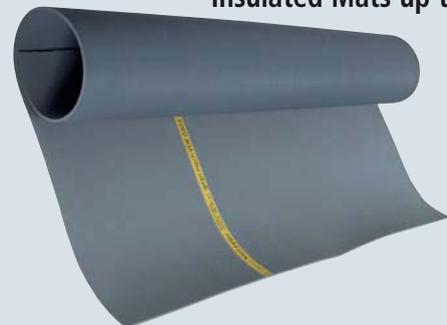


Hook

Type	HK 8 NS
Part No.	785 648
Dimensions	Ø8, 130 / 72 mm
Material	Plastic



Insulated Mats up to 50 kV



For use in electrical control and test rooms, dielectric strength of 50 kV, tested to DIN VDE 0303 Part 21

Type	IMG SAN 1M 10M	IMG SAN 1M ..M
Part No.	785 459	785 458
Nominal voltage up to (U_N)	50 kV	50 kV
Length	10 m	Any up to 10 m *)
Width	1000 mm	1000 mm
Thickness	4.5 mm	4.5 mm
Colour	Grey	Grey

*) Required length to be specified at order!

Lock-out Systems

Live Working

Nominal voltages up to 1000 V

Protective and Auxiliary Equipment



Lock-out system with 3 modules

- Protection against reconnection
- Symbol "Nicht schalten" [Do not close the circuit] acc. to German regulations (VGB 125)
- Insulating plug for screw inserts
- Insulating blade for NH fuse holders
- Lock-out systems for circuit breakers



General Information:

Standard	VGB 125 and DIN 40008
For	Indoor installations

Insulating Plug



For screw inserts

Type	SE E14	SE E18	SE E27 E33
Part No.	785 639	785 650	785 640
Size	E14	E18	E27 and 33
Diameter	20 mm	25 mm	45 mm
Dimensions	∅20 x 40 mm	∅25 x 40 mm	∅45 x 55 mm

Insulating Blade



For NH fuse holders and distribution blocks

Type	SE NH00	SE NH0	SE NH1	SE NH2 3
Part No.	785 641	785 642	785 643	785 644
Size	00	0	1	2 and 3
Blade	38 x 5	38 x 5	38 x 5	38 x 5
Dimensions	80 mm	125 mm	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	SE REG 2TE	SE REG 3TE
Part No.	785 638	785 652	785 637
Size	1 module	2 modules	3 modules
Dimensions	52 x 17 mm	52 x 34 mm	52 x 51 mm