

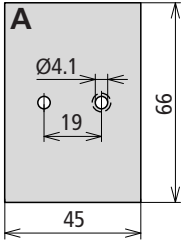
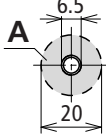
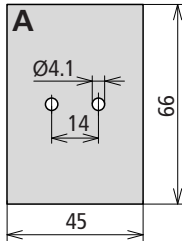
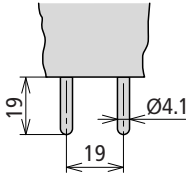
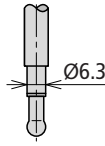
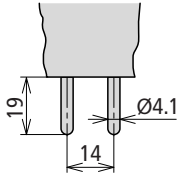
3. Verify that the Installation is dead – DEHNcap Voltage Detecting System

Metal-encapsulated switchgear installations, typically SF6 gas-insulated, have become widely accepted in the field of switchgear construction. In this type of installation, conventional voltage detectors can often not be used for verifying safe isolation from supply voltage in accordance with EN/IEC 61243-1 (DIN VDE 0682-411).

For this reason, capacitive voltage detecting systems in accordance with IEC/EN 61243-5 (DIN VDE 0682-415) have been developed for verifying safe isolation from supply voltage on all poles at the work location in accordance with EN 50110-1 (DIN VDE 0105-100).

Only electrically skilled or instructed persons are allowed to verify safe isolation from supply voltage.

Electrical and mechanical interface requirements for separable 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 M Ω	2 M Ω	2 M Ω
Electrical response conditions of the interface	I	2.5 μ A	2.5 μ A	2.5 μ A
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				

Product	Type	Nominal voltage U_N / Frequency f_N	Application, Indication	Page
DEHNcap/P Voltage Indicator				
	DEHNcap/P	up to 45 kV / 50 Hz	Passive indicator without batteries LED indication Can also be used as permanent voltage indicator	58
	DEHNcap/P Test Unit	230 V / 50 Hz	For testing for correct operation Plugs into 230 V socket outlets For HR and LRM indicators	
DEHNcap/A Voltage Indicator				
	DEHNcap/A	up to 45 kV / 50 Hz	Active voltage indicator Indication by two separate LEDs With self-testing element and battery monitoring device Automatic deactivation after use	59
DEHNcap/IT Interface Test Unit				
	DEHNcap/IT	up to 45 kV / 50 Hz	Active indicator for maintenance tests Indication by two separate LEDs With self-testing element and battery monitoring system Automatic deactivation after use	60
DEHNcap/PC Phase Comparator				
	DEHNcap/ PC-LRM	up to 45 kV / 50 Hz	Active indicator for testing in-phase conditions Indication by three separate LEDs Can be used for HR test sockets with two HR-LRM test adapters Comparator detects zero crossings of the systems to be compared With battery monitoring device	61
DEHNcap HR – LRM Test Set				
	DEHNcap HR – LRM Test Set	up to 45 kV / 50 Hz	Fully equipped test set	62
DEHNcap Test Adapter / Measuring Impedance				
	Test Adapter Measuring Impedance			63
Storage Bags and Transport Cases				
		Sheet metal or plastic case Artificial leather or canvas bag		185
Maintenance Tests				
		According to German regulations (BGV A3), capacitive voltage detecting systems have to be tested for compliance with the prescribed limits as stated in the Electrical Safety Rules. This test is performed in the high-voltage test laboratory of DEHN + SÖHNE. This maintenance test is documented in a test report and on the device. The test intervals depend on the operating conditions of the voltage detecting systems, 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.		

DEHNcap/P Voltage Indicator

Work according to the 5 Safety Rules

Nominal Voltages up to 45 kV / 50 Hz

3. Verify that the Installation is dead – DEHNcap Voltage Detecting System



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

Easy verification of isolation from supply voltage

- Cost-effective



General Information:

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

DEHNcap/P – HR



Type	SAG DCA P HR
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

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 – LRM



Type	SAG DCA P LRM
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

Accessory for DEHNcap/P Voltage Indicator

Test Unit for DEHNcap/P

Test unit for testing DEHNcap/P voltage indicators or other HR (HO) or LRM indicators for correct operation. Both HR and LRM devices can be tested.

The test unit is plugged into the mains socket outlet and generates both test voltages for HR and LRM systems.

Type	TG DCA
Part No.	767 110
Nominal voltage (U _N)	Up to 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



Work according to the 5 Safety Rules

DEHNcap/A Voltage Indicator

3. Verify that the Installation is dead – DEHNcap Voltage Detecting System

Nominal Voltages up to 45 kV / 50 Hz

Safe verification of isolation from supply voltage

- User-friendly
- Easy to use



Self-test of a DEHNcap/A voltage indicator

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.

General Information:

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

DEHNcap/A – HR

Type	SAG DCA A HR
Part No.	767 111
Dimensions	120 x 60 x 25 mm
Plug spacing	19 mm
Type of plug	2x multilam plugs Ø4 mm
Indication threshold (HR system)	90 V
Input impedance (HR system)	36 Mohms

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	2x multilam plugs Ø4 mm
Indication threshold (LRM system)	5 V
Input impedance (LRM system)	2 Mohms

DEHNcap/IT Interface Test Unit

Work according to the 5 Safety Rules

Nominal Voltages up to 45 kV / 50 Hz

3. Verify that the Installation is dead – DEHNcap Voltage Detecting System



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).

General Information:

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

Easy and safe testing



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 – HR



Type	SPG DCA IT HR
Part No.	767 121
Dimensions	120 x 60 x 25 mm
Plug spacing	19 mm
Type of plug	2 multilam plugs Ø4 mm
Input impedance (HR system)	36 Mohms
Test threshold	3.2 µA

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

Work according to the 5 Safety Rules

DEHNcap/PC-LRM Phase Comparator

3. Verify that the Installation is dead – DEHNcap Voltage Detecting System

Nominal Voltages up to 45 kV / 50 Hz

Easy and safe testing

- User-friendly
- Easy to use



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

General Information:

Standard	EN/IEC 61243-5 (DIN VDE 0682-415)
Temperature range	- 25 °C ... + 55 °C
Design	Active indicator for verifying 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.

Accessory for DEHNcap/PC-LRM Phase Comparator**Artificial Leather Bag, empty**

With shoulder strap

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

**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 plugs Ø4 mm
Length (measuring cable)	2000 mm
Indication threshold (LRM system)	5 V
Input impedance (LRM system)	2 Mohms

DEHNcap/PC – LRM Phase Comparator Set

Phase comparator in an artificial leather bag, Part No. 767 500



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

Accessories, spare parts and kit parts from page 193

DEHNcap HR – LRM Test Set

Work according to the 5 Safety Rules

Nominal Voltages up to 45 kV / 50 Hz

3. Verify that the Installation is dead – DEHNcap Voltage Detecting System

**Easy and safe testing**

- Complete test set for universal use
- Easy to use



Set in a plastic case for verifying safe isolation from supply voltage and testing the interface as well as in-phase conditions in HR and LRM systems

General Information:

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

DEHNcap HR – LRM Test Set**Kit includes:**

Pos. No.	Part No.	Pos. No.	Part No.
1	1x 767 112	4	2x 767 133
2	1x 767 122	5	1x 767 107
3	1x 767 132		

For more detailed information on these products, see Accessories chapter

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

Work according to the 5 Safety Rules

DEHNcap Test Adapter / Measuring Impedance**3. Verify that the Installation is dead – DEHNcap Voltage Detecting System****Easy and safe testing**

- Easy mechanical and electrical adaptation to HR, LR or XC 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 Information:

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



The HR-LRM test adapter allows to plug an LRM indicator into a HR test socket

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 \varnothing 4 mm

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 \varnothing 4 mm
Type of test socket	2 sockets \varnothing 4 mm

LRM-XC Measuring Impedance

Used as a measuring impedance with $X_C = 2$ Mohms for maintenance tests on LRM coupling systems (with suitable μA meter).

Type	MA DCA XC LRM
Part No.	767 135
Dimensions	90 x 50 x 30 mm
Plug spacing	14 mm
Socket spacing	16 mm
Type of plug	2 multilam plugs \varnothing 4 mm
Type of test socket	2 sockets \varnothing 4 mm

Further Equipment

Plastic Case

Storage Bags and Transport Cases

Plastic Case for PHE III



With foam padding

Type	KKL PHE3	KKL PHE3 L
Part No.	767 997	767 999
Dimensions	940 x 235 x 140 mm	1290 x 235 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 PHE III Kit



With foam padding

Type	KKL PHE3 60 110
Part No.	766 998
Dimensions	1290 x 235 x 140 mm
Colour	Black

Plastic Case for PHE



With foam padding

Type	KKL PHE	KKL PHE L
Part No.	766 997	766 999
Dimensions	940 x 235 x 140 mm	1290 x 235 x 140 mm
Colour	Black	Black

Plastic Case for PHV and PHV I



With foam padding

Type	KKL PHV	KKL PHV1
Part No.	759 999	759 998
Dimensions	940 x 235 x 140 mm	1290 x 235 x 140 mm
Colour	Black	Black

Plastic Case for DEHNcap



With foam padding

Type	KKL DCA	KKL 26 22 5
Part No.	767 107	767 106
Dimensions	390 x 280 x 84 mm	265 x 215 x 50 mm
Colour	Grey	Black