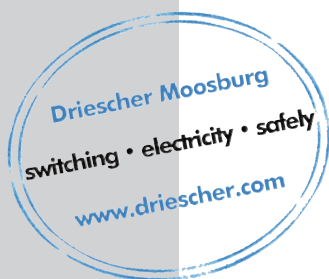


**Instructions for Installation,
Operation and Maintenance
for DRIESCHER -
Air - Insulated Medium - Voltage
Compact Switchgears
for Substations**

- Rated voltage
12 kV and 24 kV
- Rated current
630 A



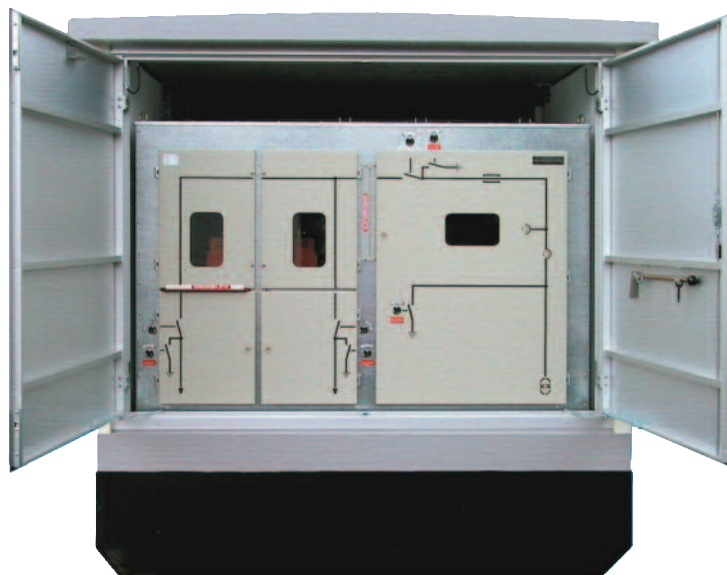
12 kV

**ELEKTROTECHNISCHE WERKE
FRITZ DRIESCHER & SÖHNE GMBH**

D-85366 MOOSBURG • TEL. +49 87 61 6 81-0 • FAX +49 87 61 68 12 30
<http://www.driescher.com> infoservice@driescher.de



• 2	Content
• 3	Operating conditions, Technical description
• 4	Shipping, Transport, Storage and weights
• 5	Installation and bolting Compact switchgears 12 kV
• 6	Installation and bolting Compact switchgears 24 kV
• 7	Earthing, Cable mounting and cable connection
• 8	Operation
• 9	Capacitive voltage test system and short-circuit indicator (optional)
• 10	Capacitive voltage test system
• 11	Inspection, maintenance and commissioning
• 11	Inserting and replacing of h.v.h.b.c., Insulating protective barrier
• 11	Service
• 12	Range of products



Operating conditions

The compact switchgears are installed in closed electrical operating areas which are only to be entered by skilled personnel and appropriately instructed persons.

The equipment can be used at an altitude of up to 1000 m above sea level. For installations above an

altitude of 1000 m the rated insulating level of the switchgear must be corrected accordingly. The compact switchgears are designed for use under normal operating conditions in compliance with the standard EN 62271-1.

Technical conditions

Design

The air-insulated medium-voltage compact switchgears comprise at least one outgoing feeder cable and one transformer feeder.

The compact switchgears frame is made of a screwed, hot-galvanized composite structure.

The entire compact switchgear is metal-encapsulated to guarantee optimal protection to persons and plant.

The compact switchgears are fitted at the front with single-wing sheet steel doors which have inserted compound glass windows for visual inspection of the switch-disconnectors.

Every compact switchgear has a screwed on rear panel of galvanized sheet steel with separate assembly openings.

Connecting cables are conducted from the bottom into the switch panels where they are mounted on adjustable rails.

Equipment

The cable panels are equipped with an in-line switch-disconnector H 27 EK.

A fuse switch-disconnector H 27 SEA or H 27 SuT is installed in the transformer feeder panel.

The compact switchgears can, of course, also be equipped with an earthing switch as well as with current and voltage transformers.

The optimal interlocking of the devices practically rules out any incorrect operation.

Earthing switches or spherical fixed points are available for earthing and short-circuiting.

When work is being carried out insulating protective barriers can be inserted in the open isolating distance of the switching devices in question, with the door closed. All switch panels are designed for central locking with double-bit key.

Pressure relief is in downward direction.

Technical Standards

The design of the air-insulated switchgears corresponds to the specifications of the EN 62271-200. The resistance to accidental arcs of the switch panels has been determined at 16 and 25 kA; 1 s, by an independent testing institute.

The installed switchgear equipment is designed in compliance with the latest standard.

The degree of protection of the switch panels corresponds to IP 3X.

Technical data of the installed switchgear equipment:

- for switch-disconnectors in *Brochure 727*
- for disconnectors and earthing switches in *Brochure 731*

Shipping, Transport and Storage

Delivery condition

The compact switchgears are usually fully preassembled at the manufacturing factory.

Transportation on the site

There are transporting lugs on the top of the switch panels or units. These must be removed again after installation. To transport the panels using lifting tackle please proceed as shown in *Fig. 1*.

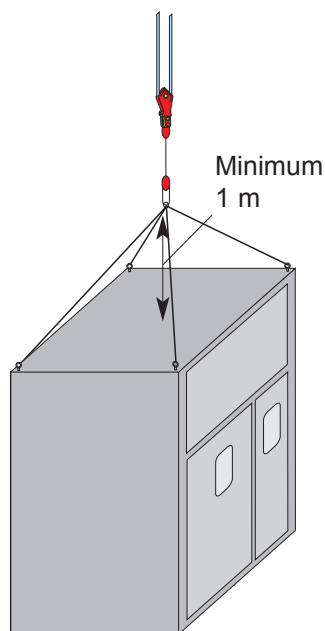
For transportation using a shovel loader it is necessary to insert pallets or square timber beneath, which are then taken up by the lifting arm as shown in *Fig. 2*.

Storage

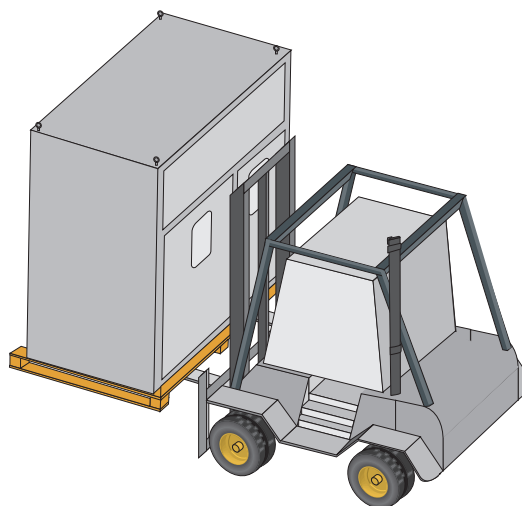
The switch panels must be appropriately stored in a dry, well-vented area and protected against contamination.



All compact switchgears have to be transported as shown in *Fig. 1 and 2*. The minimum distance (1 m) between top of panel and hook of crane (see *picture 1*) is valid for all kind of transportation varieties.



Picture 1: Shipping of a compact switchgear



Picture 2: Loading an shipping unit using shovel loader (lifting arms take up panel end)

Weights

Type	Weight with max. equipment approx. kg	Drawing-no.
D 12 - 127014	590	KS3 - 094808
D 12 - 147014	610	KS3 - 094804
D 24 - 121114	630	KS4 - 092811
D 24 - 171114	700	KS3 - 091489 / KS2 - 106307
D 24 - 211114	980	KS3 - 097157

Installation D 12 - ..7014

Floor properties

A level floor is sufficient.
Compensate any irregularities by metal strips. Make sure to avoid any distortion of the panels and the panel doors!

Securing the panels

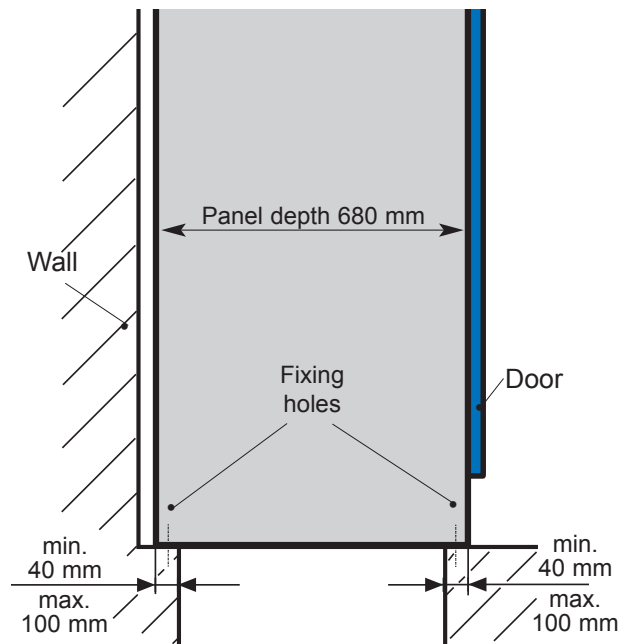
The compact switchgear can be bolted directly to the floor of the building or bolted to an iron frame in the floor.

The panels can also be installed on an elevated floor.

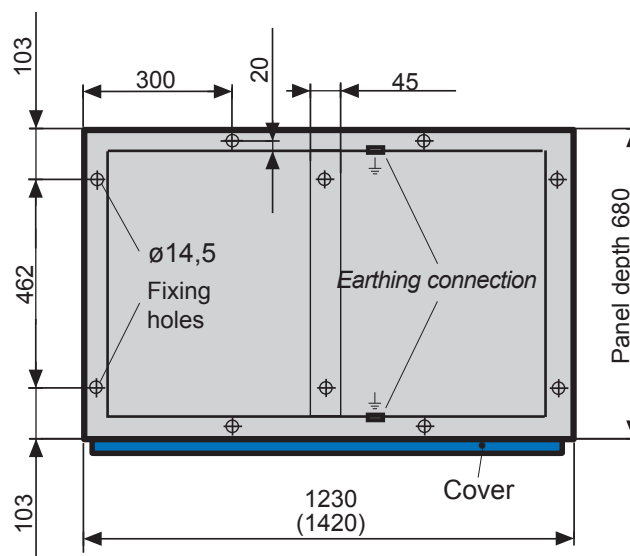
Floor openings

These are shown in *Picture 3 and 4*.

The openings can also be continuous along the length of the switchgear.



Picture 3: Floor plan (Side view)



Picture 4: Floor plan (Top view)

Floor properties

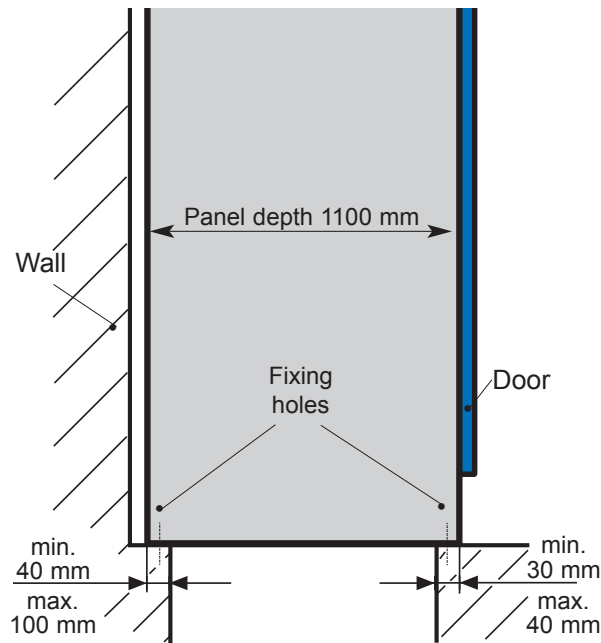
A level floor is sufficient.
 Compensate any irregularities by metal strips. Make sure to avoid any distortion of the panels and the panel doors!

Securing the panels

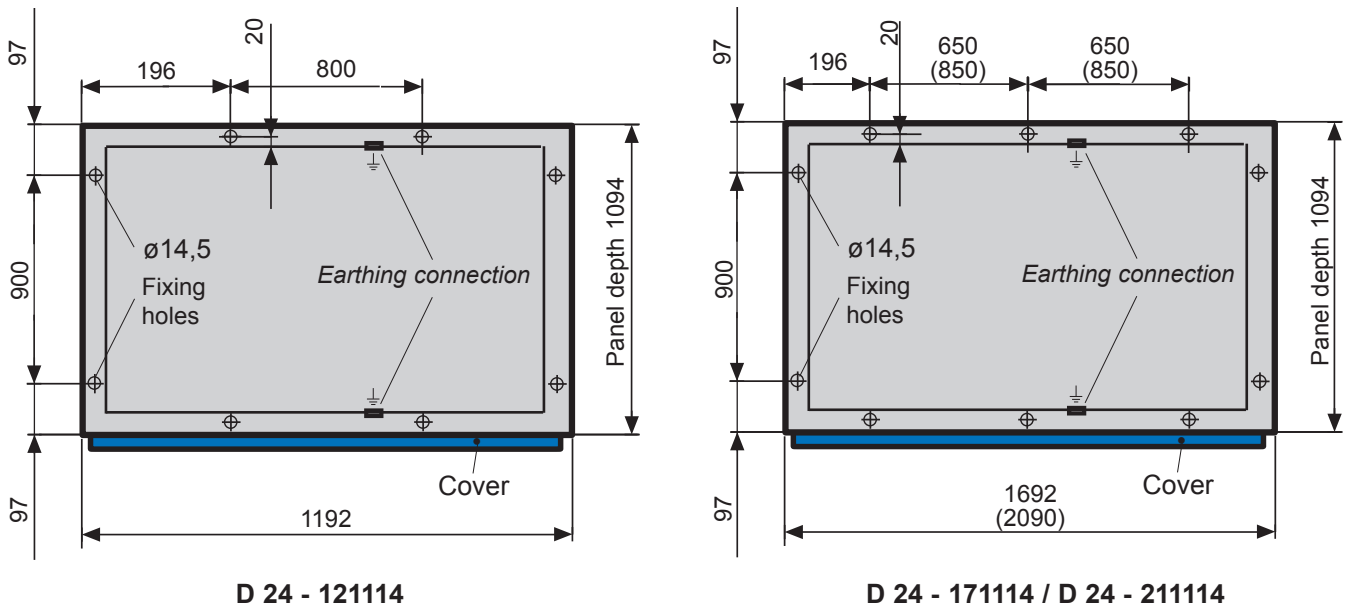
The compact switchgear can be bolted directly to the floor of the building or bolted to an iron frame in the floor.
 The panels can also be installed on an elevated floor.

Floor openings

These are shown in *Picture 5 and 6*.
 The openings can also be continuous along the length of the switchgear.



Picture 5: Floor plan (Top view)



Picture 6: Floor plan (Side view)

Earthing, Cable mounting and cable connection

Connection to the station earth

It is sufficient to connect the station earth once for a switchgear. For this purpose there is a panel earthing connection M12 or M16. Satisfactory earthing of the entire system is provided by using hot-galvanized sheeting and with the bolting of the switchgear.

Earthing the cable

Earthing of the cable jacket is carried out at the galvanized cable mounting arms.

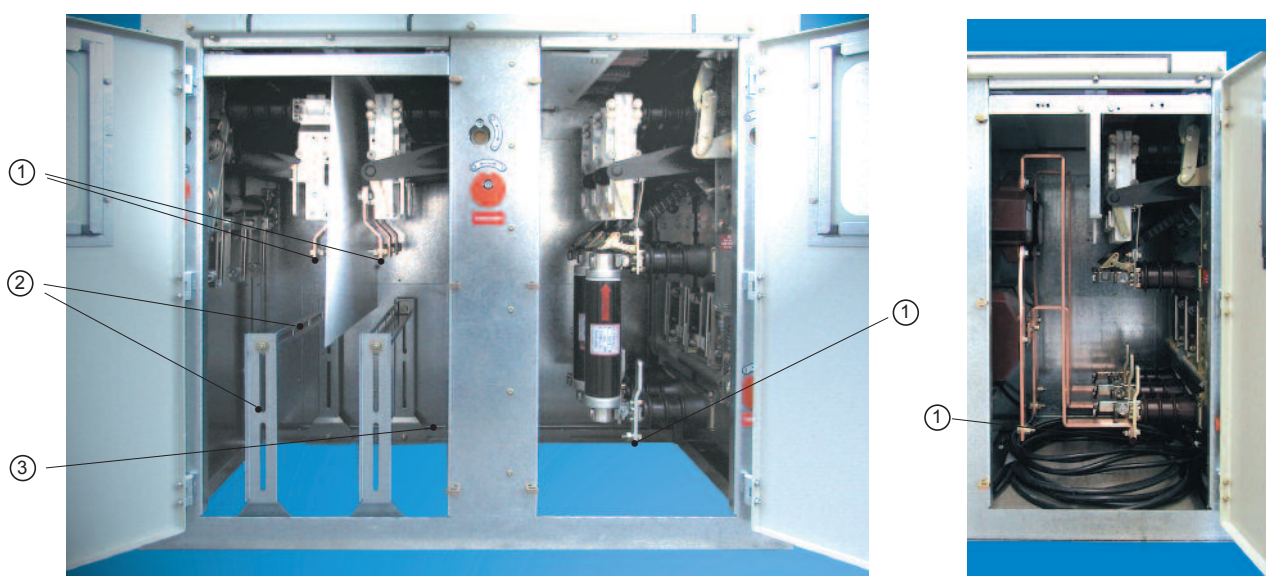
Cable fastening and cable connection

The cable and sealing-end fastening is to be carried out using the height and width-adjustable galvanized sealing-end mounts as shown in *Picture 7 and 8*.

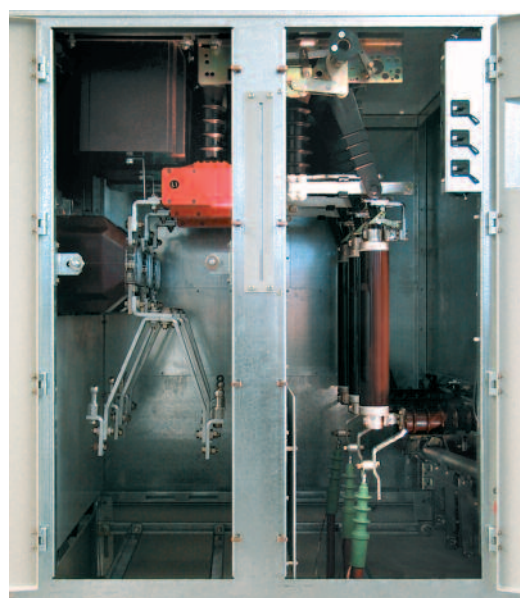
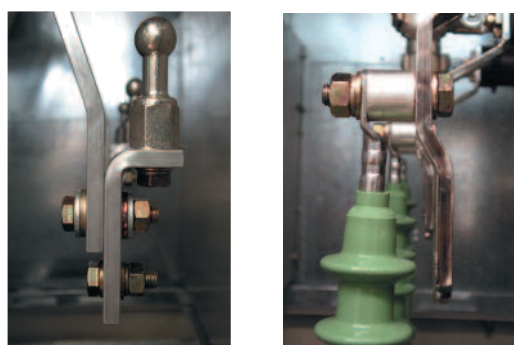
When connecting the cables always make sure to avoid any tension, thrust or torsion at the connecting contacts.

75 Nm tightening torque.

- ① Cable connection
- ② Cable mounting arm
- ③ Earthing connection



Picture 7: Cable mounting and cable connection Type D12 - 127014



Picture 8: Cable mounting and cable connection Type D24 - 121114

General

The switches can be operated acc. to the operating direction noticed in the actuating labelling when the panel door is closed.

Compact switchgear

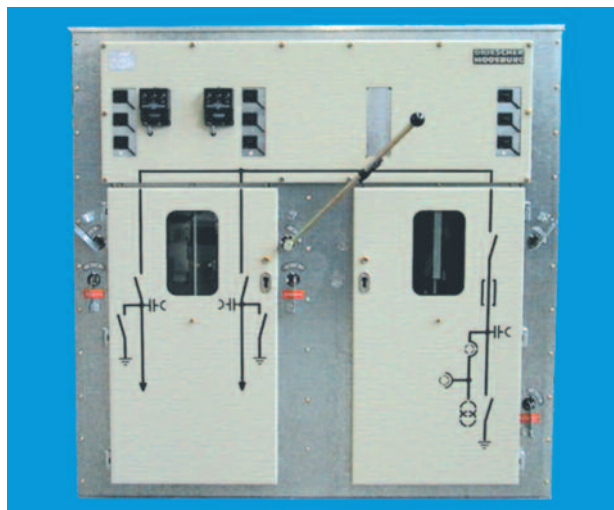
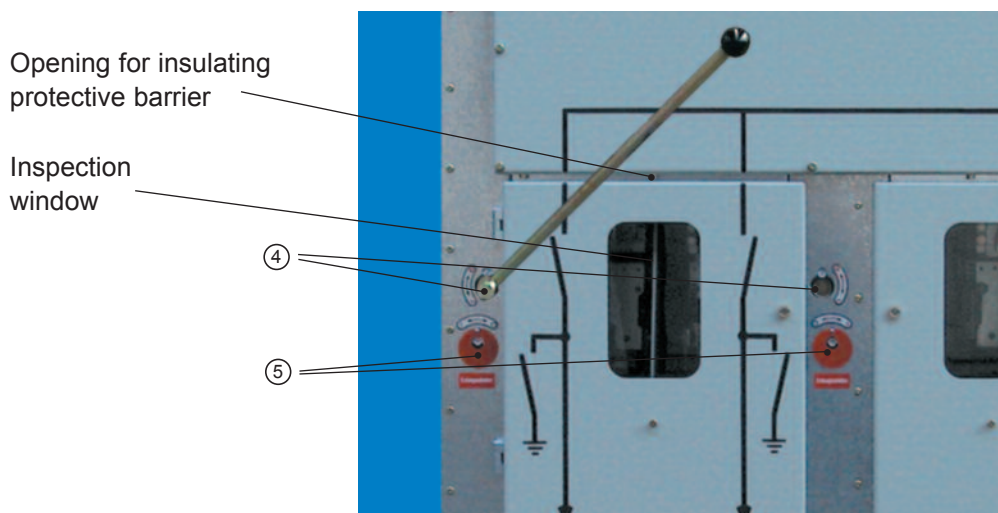
1. The position of the switch disconnecter can be seen through the inspection windows in the door. In addition, there is a mechanical position indicator which is directly connected to the switch shaft and which shows each position of the switch.
2. For operating the switch disconnecter use the operating lever. ④
The direction of rotation and the position indicator of the switch disconnecter is specified at the cover.
3. For operating the earthing switch ⑤, use also the operating lever. The direction of rotation and the position indicator of the earthing switch is also specified at the cover.

Earthing switch and switch disconnector have possibility for interlocking.

During breaking operation of the switch-fuse combination type H 27 SuT inserted in the transformer panel, it has to be taken into consideration that the operating lever is turned 90° to the left to the stop. When the release is not effected manually (fuse or overload release) the switch wave keeps in "ON"-position and must be manually brought into "OFF"-position for reclosing.

Opening and closing panel door

The panel door with central locking can be opened or closed by a double-bit key.

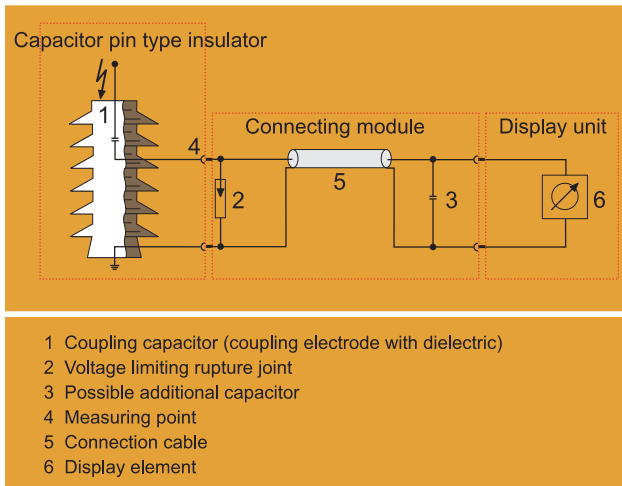


Picture 9: Operation

Capacitive Test system and short-circuit indicator (as an option)

In VDE 0682 Part 415 (IEC 61243-5) the minimum requirements and testing conditions are specified for capacitive voltage testing systems.

Our product program for capacitive voltage testing systems comprises:



Voltage test systems are interconnected single-pole, capacitively to live parts and serve to verify the isolation from supply in 3-phase alternating current switchgears (three-phase system). They also can be used to carry out phase comparisons.

A capacitive indication system consists of a coupling part fixed-mounted in the switchgear and the pluggable indicator locally changeable.

With the components capacitive DRIESCHER divider insulator and line module DEHNcap/M one coupling part can be erected.

The coupling part comprises the individual components coupling capacitor (1), connecting lead (5), voltage restricting rupture joint (2), measuring circuit (3) and measuring point (4).

Normally, one coupling part per phase is mounted in medium voltage switchgears.

HR as well as LRM-line modules can be connected to the capacitive divider insulators.

The ordered components are completely assembled in the company or- if necessary- can also be added later. On page 10 you can see all possible combinations of insulators and connecting modules.



Picture: Capacitive interface and short-circuit indicator

Please also read the instructions of DEHN enclosed in delivery of the switch panel !

For testing voltage free condition

- Check **test apparatus** before use
- Remove cover ⑥ of socket-contact
- Test voltage-free condition on the socket-contacts with voltage indicator.

Do not use shorting plugs, because the protective function of the voltage limiting rupture joint will get ineffective!

For testing In-phase condition

- The phase comparison measuring has to be carried out before the first connection to the system of a live cable.
- Remove cover ⑥ of socket-contact
- Check socket-contacts (L1-L1, L2-L2, L3-L3) of the corresponding outgoing cable unit for in-phase condition with a phase comparison device.

Periodic test

Acc. to BGV A3 the coupling parts for capacitive voltage test systems have to be checked at least all 6 years. The periodic test has to be written down in the field of designation.

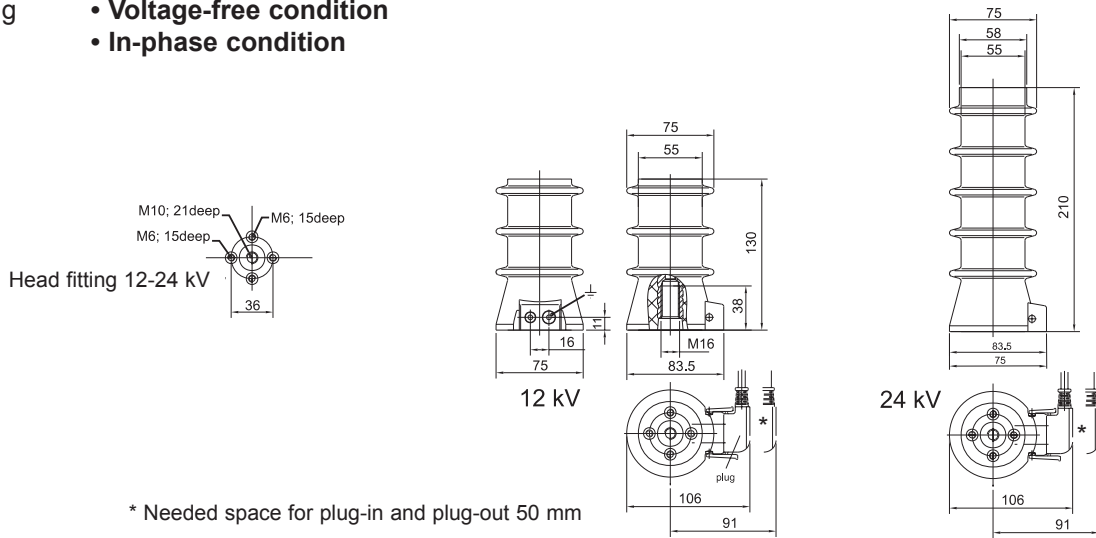
Short-circuit indicator ⑦

- a corresponding instruction for short-circuit indicator is enclosed in delivery.

Capacitive Test System

DRIESCHER-divider insulator with coupling parts DEHNcap for voltage test system acc. to VDE 682 part 415, EN 61243-5

- for testing
- Voltage-free condition
 - In-phase condition



Rated Voltage in kV	Coupling capacity in pF	Creeping distance in mm	Number of screens	Weight in kg	Drawing-no.	Part-no.
12	20	175	3	0,9	SI3-108504	2-45165983
24	15	275	5	1,3	SI3-108505	2-45165984

Coupling parts DEHNcap



Rated voltage in kV	Distance between sockets in mm	Length of connecting cable in mm	Additional capacity in pF	Response threshold in kV	Weight ca. kg	Part-no.
12	19	4000		1,6	0,8	2-33601010
12...24	19	4500	207 420	2,9	0,9	2-33601020

General

Our products have been on the market for many years and thousands of these switchgears are used successfully. We are able to say that the quality of our products is distinguished by a high level of ruggedness and operational safety and reliability. To guarantee that the requirements put to the switchgear are met and to avoid any possible power failures, appropriate maintenance, inspection and possible repair measures are necessary to provide a reliable power supply. The measures employed depend on the age of the switchgear, its operating frequency and the level of the operated currents.

Inspection and maintenance

In addition to an annual visual inspection, these measures should be carried out after approx. 10 years, even if the switches are not operated frequently and only under minimal load. Shorter intervals between inspections may be necessary in the event of negative impact from the environment, such as:

- corrosive atmospheres, air with a high dust content, damp plant facilities etc.
- high operating frequency



Disassembly as well as removal and installation of the switch (parts) are only to be carried out by DRIESCHER personnel or appropriately authorized skilled personnel, this being due in particular to the expertise required for the correct adjustment. Only original DRIESCHER parts and accessory or parts cleared from us may be mounted.

Commissioning

The switchgear should only be commissioned in dry condition.

Each switch instant has already been correctly adjusted prior to delivery.

Each and every switch is adjusted and tested prior to leaving the factory!

Nevertheless, satisfactory operation of the switch should be checked prior to commissioning.

When doing this, please observe the following Instructions:

- B727 for switch disconnectors H27
- B731 for disconnectors and earthing switches

Inserting and replacing of h.v.h.b.c. fuses

- Switch off the switch-disconnector positioned above the h.v.h.b.c. fuse.
- Confirm the absence of voltage
- Close earthing switch

To remove a fuse from the panel, get hold of it using fuse tongs and remove from the fuse mounting contacts.

When inserting, the h.v.h.b.c. fuses are taken with the fuse tongs and inserted into the contact in that way

that the striker pin can operate the release mechanism (observe marking on h.v.h.b.v. fuse)

For a better handling, we recommend an fuse tongs with lateral clamping shoes (Part-no. 77212001, *Brochure 773*).

If a h.v.h.b.c. fuse has operated, the two other fuses should also be replaced due to the possibility of overcurrent ageing.

Insulating protective barrier

The insulating protective barrier prevents any impermissible approach or accidental contact of live parts. It has to be inserted between cable terminal compartment and bus bar compartment with closed panel door and opened switch disconnector, when it has to be worked in the panel and the switchgear

cannot be put completely into the dead status (according to type).

After closing the panel door the plate can be removed through pulling at the pulling hole.

If there is not enough space (aisle < 1000 mm) an inflected isolating plate can be delivered.

Service

Our skilled personnel are always available to assist you in the event of any malfunctions or queries regarding the compatibility, assembly or maintenance - also out of normal office hours.

Please always inform us about the data on the type plate.

Tel. +49 (0) 87 61 6 81-0 Email: service@driescher.de

Our range of products includes:

Medium-voltage systems

- Single-bus and duplicate-bus switchgear
- Non-withdrawable, withdrawable, and truck-type units
- Compact switchgear assemblies
- Customer-specific models
- Industrial systems

Medium-voltage switchgear

- Indoor switches, disconnectors, and earthing switches (single and triple pole)
- Indoor circuit breakers (low oil content and vacuum)
- Outdoor switches (low oil content and vacuum)
- Railway switches for power supply and catenary
- High-voltage high-breaking-capacity fuses
- Customer-specific models

Low-voltage systems

- Open-framework design
- Enclosed break devices (up to 6.300 A)
- Cable and fixed-station distribution cabinets

Low-voltage switchgear

- Switch disconnectors
- Switch and fuse blocks
- Low-voltage high-breaking-capacity fuses

Compact sub-station

- Concrete construction
- Container construction

Driving gear

- Hand-operated and motor-operated mechanisms
- Indoor and outdoor driving gear

Accessories

- For medium and low voltages
- For station equipment
- Insulators (0.5 kV - 38.5 kV)
- Plastic and glass-reinforced plastic screening

Service

- Maintenance and Service of all switches and switchgears
- Training courses and seminars
- Thermography; Live-line working

Dimensions, weights, diagrams and descriptions in this brochure are non-binding. Subject to change without notice.

switching • electricity • safely

Printed on chlorine free bleached paper. For nature's sake.

ELEKTROTECHNISCHE WERKE FRITZ DRIESCHER & SÖHNE GMBH

D-85366 MOOSBURG • TEL. +49 87 61 6 81-0 • FAX +49 87 61 68 12 30
<http://www.driescher.com> infoservice@driescher.de

