

## Assembly, Operating and Maintenance Instructions for DRIESCHER - Air-Insulated Medium-Voltage Switchgears

- Type W 24 - 901121
- Rated voltage 24 kV
- Rated current up to 1250 A



# W 24

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](mailto:infoservice@driescher.de)



• 2	<b>Technical description</b>
• 3	<b>Operating conditions, Shipping, Transport, Storage and weights</b>
• 4	<b>Installation, Bolting switch panels</b>
• 5	<b>Installation and connection of busbars, Terminating element</b>
• 6	<b>Earthing, Cable mounting and cable connection</b>
• 7	<b>Operation</b>
• 8	<b>Inspection, Maintenance, Commissioning</b>
• 8	<b>Inserting and replacing HV-HBC fuses, Insulating protective barrier, service</b>



## Warning

During the operation of these electrical switchpanels certain parts are inevitably exposed to dangerous voltage and mechanical parts may move very quickly, also via remote control. There is a risk of serious injury to the body or to property if the warning instructions are not correctly observed.

Only appropriately trained personnel are to work on this equipment or in the vicinity thereof.

These persons are to be completely familiar with all warnings as well as repair and maintenance measures as specified in these operating instructions. Correct transport and appropriate storage, mounting and assembly as well as the correct operation and maintenance are prerequisites for the satisfactory and safe operation of this equipment.

## Technical description

### Switch panel design

The switch panel framework is of a bolted composite design. The front side of the switch panels is fitted with a folded, reinforced solid sheet door. The compound glass window fitted in the door permits operating personnel to inspect the installed components without involving hazards. The cover in front of the busbars is bolted to prevent any unintentional opening. A plate of insulating material can be inserted in switched-off condition to cover the active components of the busbar area. The insulating plate can be inserted when the panel door is closed. The panel door can be opened when the insulating plate is in place.

### Encapsulating and partitioning

The side walls of the switch panels are of 2 mm thick steel plate. The switch panels are sealed at the back and can also be covered at the bottom, if requested. Pressure relief plates cover the panels at the top. The covering of the switch panels on the operator side is provided by means a metal door with compound glass window.

### Technical data

The design and electrical insulating property of the air-insulated switch panels are in compliance with the DIN VDE 0671 Part 200 and EN 62271-200.

The resistance to accidental arcs of the switch panels has been successfully determined at 20 kA; 1 s by an independent testing institute.

The function and electrical insulating property of the installed equipment is in compliance with EN 62271-1.

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

For technical data on the installed switches please refer to the respective brochures:

- for switch panels see 782
- for circuit breakers see 747
- for switch-disconnectors see 722 and 727
- for disconnecting and earthing switches see 731

## Operating Conditions

The switch panels of Type W 12 are designed for installation in electrical operating areas to which only skilled and appropriately instructed personnel have access. The switch panels are designed for normal operation under normal ambient conditions up to an altitude of 1000 m above sea level.

At altitudes over 1000 m above mean sea level, the figures for rated insulation level must be adjusted. The switch panels are suitable for surrounding conditions in compliance with climate class 12: temperature class of the ambient air:  $-5^{\circ}$  to  $+40^{\circ}$  C, corresponding to normal operating conditions in compliance with DIN EN 62271-1.

## Shipping, Transport and Storage

### Delivery condition

The individual panels or units are usually fully pre-assembled 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 W 12 panels must be transported as shown in Fig. 1 and Fig. 2. The minimum distance of 1m between panel upper edge and lifting hook (see Fig. 1) must be observed with all panel types.

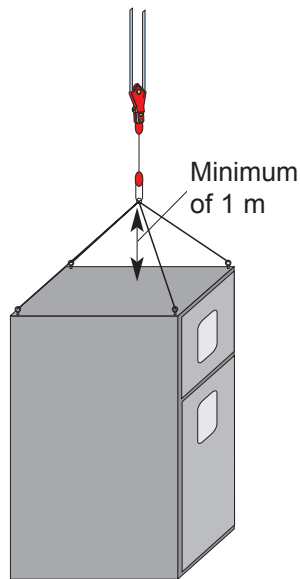


Fig. 1: Transportation of an individual panel

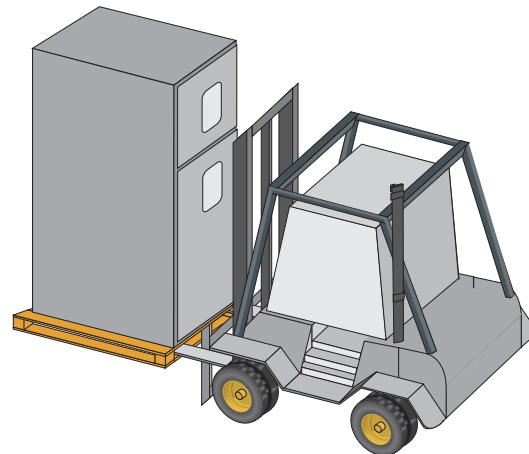


Fig. 2: Loading an individual panel using shovel loader (lifting arms take up panel end)

## Weights

Type	Description	Weight approx. kg	Drawing-no.
WK 24-901121-22	Cable panel	350	HA 1 - 071556
WT 24-901121-22	Transformer feeder panel	350	HA 1 - 071556
WÜ 24-901121-22	Bus sectionalizer panel	350	HA 1 - 071556
WM 24-901121	Measuring panel	480	HA 1 - 071556
WL 24-901121-V625	Circuit-breaker panel	650	HA 1 - 071556

**Floor properties**

A level floor is sufficient. Compensate any irregularities. Make sure to avoid any distortion of the panels!

For this purpose there are two mounting bores arranged centrally to the panel width (Fig. 3). The panels can also be installed on an elevated floor.

**Securing the panels**

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

**Floor openings**

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

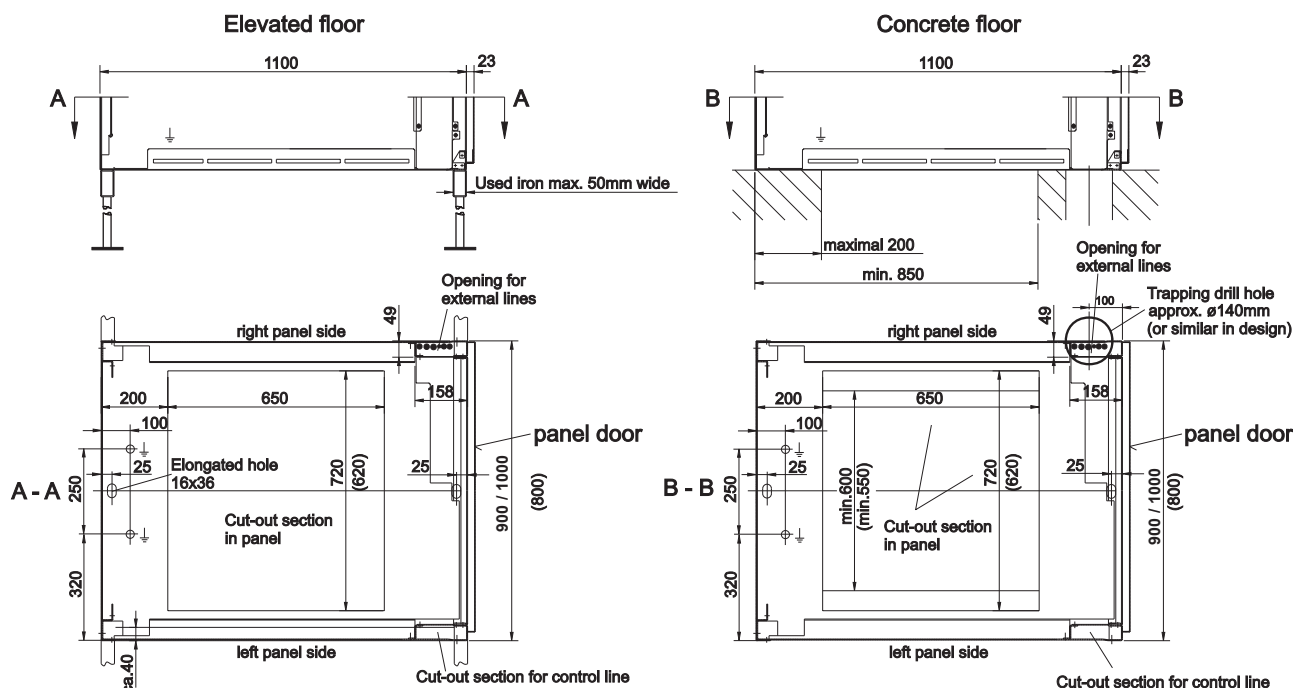


Fig. 3: Installation

**Bolting switch panels together**

**Bolting of the panels**

The housings are bolted 10x at the front and rear using M8 x 20 threaded bolts and nuts DIN 933/934 (Fig. 4). The corresponding screws, nuts and washers are provided as accessories.

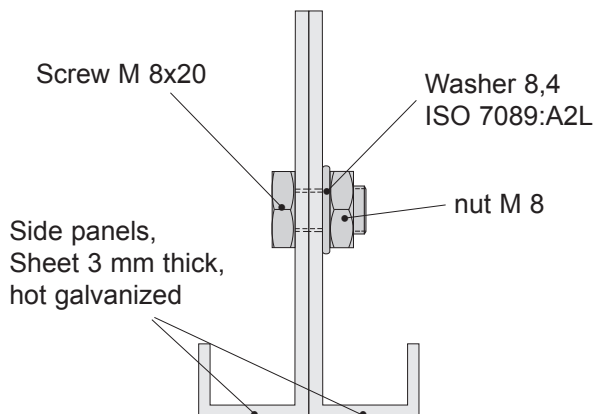


Fig. 4: Bolting of the panels

Installation and Connection of Busbars • Terminating Element

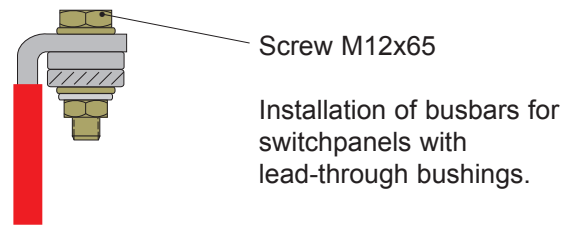
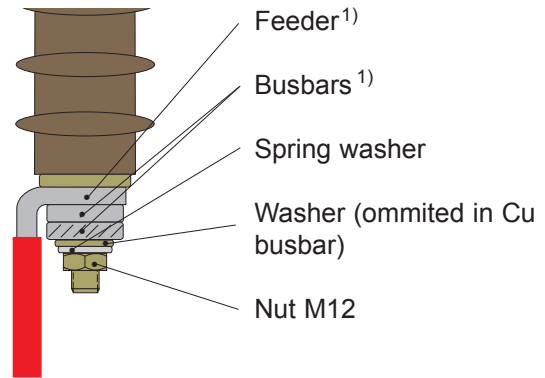
**Installation of busbars**

The installation of the busbars and feeders starts at the right or left end panel of the switchgear, wherein attention must be paid to the same phase sequence within the panels respectively.

The end panel is where the straight end of the busbar pieces comes to rest, the downward arched end is in the neighboring panel.

In systems with busbar partitions the leadthroughs must be mounted on the busbars prior to inserting them. The busbars are then inserted in the holes of the partition board and the screwed union rings mounted between the panels.

There are always 3 three rail pieces screwed together for each phase. In the last end panel an appropriate busbar backing piece must therefore be placed underneath the passed through end of the busbar (between feeder at the top and busbar underneath).



**Connecting the busbars**

In compliance with Fig. 5 the busbars are strapped from panel to panel and bolted directly at the upper connection of the switch pole. The arcing chambers are not to be distorted as otherwise the central striking of the contact blades in the arcing chambers is no longer guaranteed.

The connecting bolts are to be held in place with a second wrench during tightening (75 Nm tightening torque) of the nuts.

**Note:** Prior to installation of the busbars clean the respective contact surfaces of foreign matter using a steel brush and then grease (white Vaseline). Then bolt the bars immediately so that they make contact.

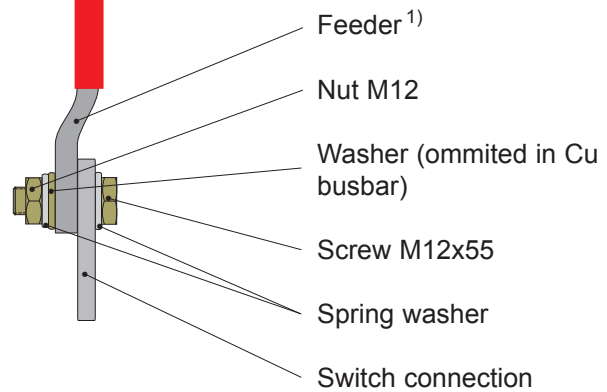


Fig. 5: Connection of busbars

**Terminating element**

For the terminating element of a switchgear the end panels lateral are bolted to a sheet steel end cassette.

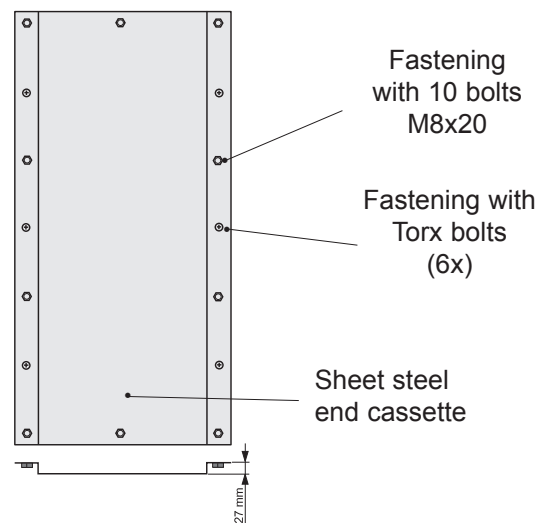


Fig. 6: Assembly terminating element

1) Busbars and discharge rails are optionally provided in copper or aluminium.

**Connection to the station earth**

It is sufficient to connect the station earth once for each switchgear. With switchgear lengths of over 10 m, connect at least twice at places as far away from each other as possible (DIN VDE 0141).

For this purpose there is a marked earthing connector bracket for M12 bolts in each panel.

Satisfactory earthing of the entire system is provided by using hot-galvanized sheeting and with the bolting of the individual panels.

There is an additional earthing connection provided at the lateral elongated holes.

**Earthing the cable**

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

**Earthing with earthing and short-circuit accessories**

For this purpose there is an appropriate earthing bolt on the housing of the switch panel.

The spherical terminal studs are at the cable connection points or on the busbars.

**Cable fastening and cable connection**

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

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

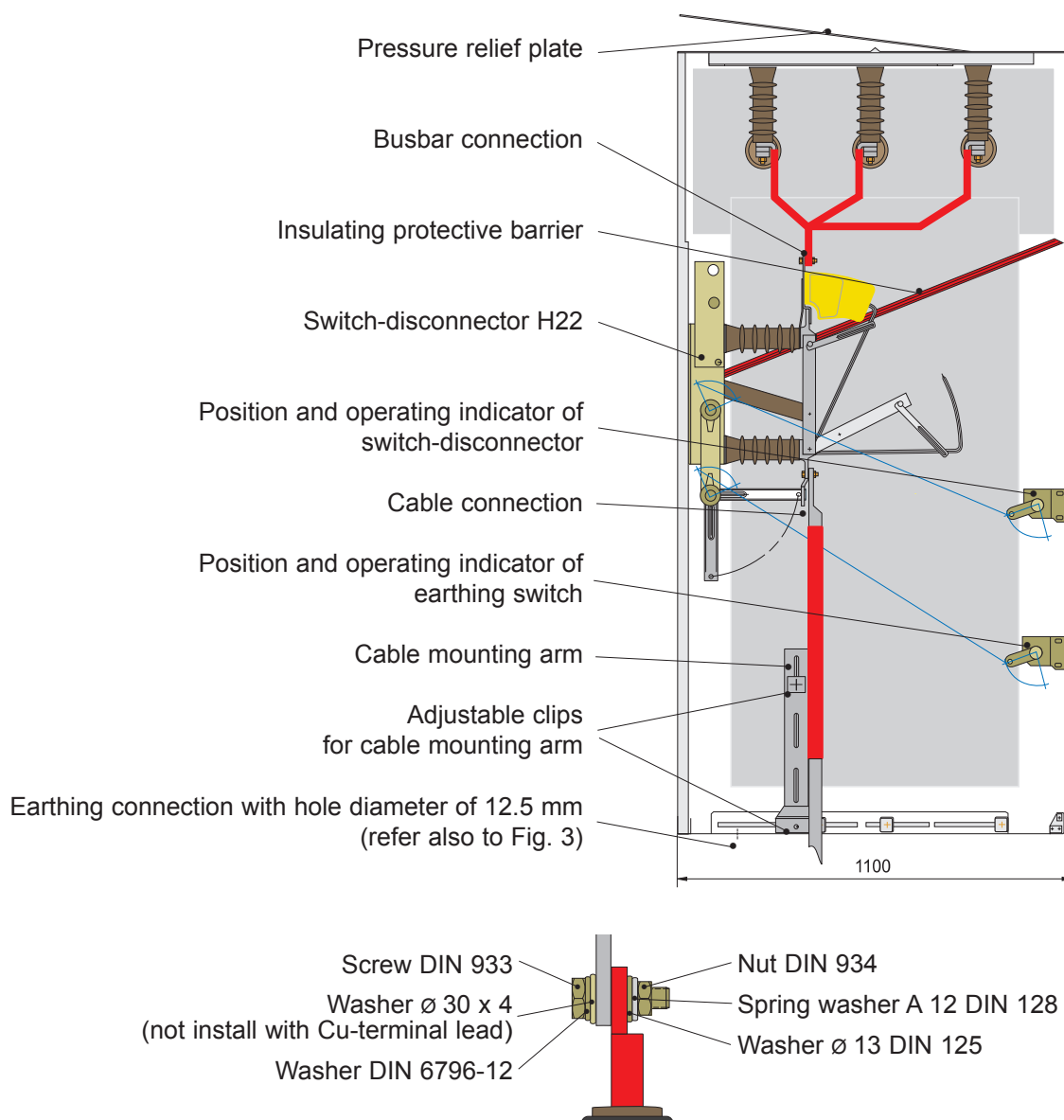


Fig. 7: Cable connection

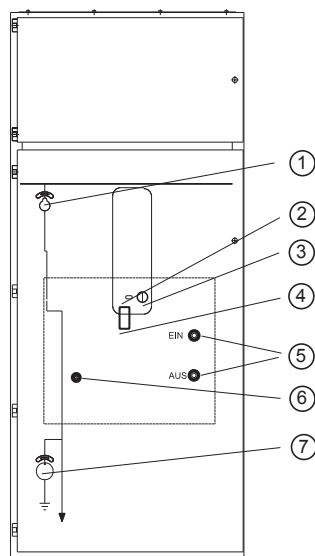
## Operation

### General

The switchgear equipment can be operated with closed panel door by the specified operating mechanism.

#### W24 Circuit-breaker panel

1. The disconnecter (1) is interlocked with the circuit-breaker.
2. To switch the circuit breaker on or off manually, move the release lever (5) up or down.
3. Read of the position of the circuit breaker at the position indicator (3) (0=Off, 1=On)
4. The stored energy mechanism position (4) indicates whether the breaker is in a charged state. In this case, the last operation is always an opening operation in order to be able to switch the circuit-breaker off in the event of control voltage failure.
5. The stored energy mechanism can be recharged using a crank if the supply voltage should fail (6).
6. The total number of switching operations of the circuit-breaker can be read from counter (2).
7. Switch-disconnector (1) and earthing switch (7) can be switched off using the rotary handle.



*Circuit-breaker panel*

#### W24 Transformer feeder panel or cable panel

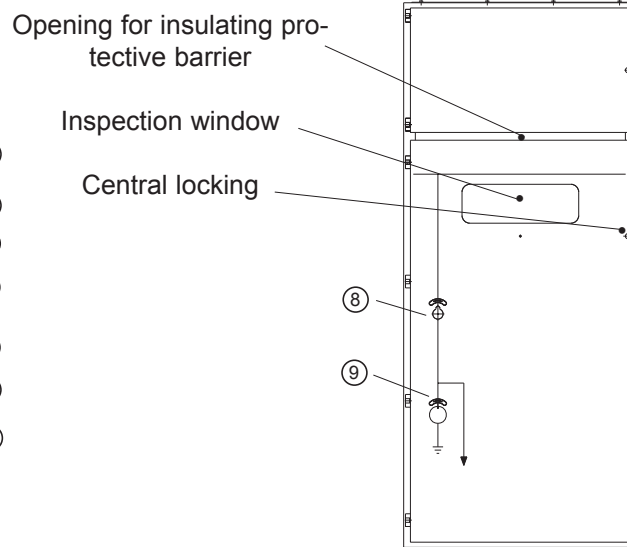
1. The switch-disconnector position can be seen through the window in the door.
2. The switch-disconnector (8), as well as earthing switches (9), can be switched on and off using the plug-on lever operating mechanism. The switching direction and the switch-disconnector and earthing switch positions are indicated.

#### Earthing switch and switch-disconnector can be interlocked upon request.

When switching off the switch-disconnector inserted in the transformer feeder panel always make sure to switch through 90° with the mounted lever, left to the stop. In non-manual release (fuse or shunt release) the operating mechanism remains in "ON" position and must first be manually moved into basic position "OFF" before switching on again.

#### Opening and closing the panel door

The door with central locking for the pressure-containing locks is opened and closed with a double-bearing key.



*Transformer feeder panel or cable panel*

*Fig. 8: Operation*

After correct installation and connection of all cables and lines the switchgear is ready for operation. The individual functions, as required by the customer, are given in the project-specific documentation (specification, circuit diagrams).

Please observe that the supply voltage (auxiliary voltages) must be available for correct operation.

## 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.**

## Commissioning

Commissioning of the plant is only to be carried out in dry condition.

Every switch is adjusted and tested before it leaves the factory. Nevertheless, each switch should be tested for satisfactory operation by carrying out several switching operations in de-energised condition. Please also observe the following operating instructions:

- B747 for circuit-breakers
- B722 and B727 for switch-disconnectors
- B731 for disconnecting switch and earthing switch

## Inserting and Replacing HV-HBC Fuses

Switch off the switch-disconnector positioned above the HV-HBC fuse. Grasp the HV-HBC fuses with fuse tongs and insert in the fuse mounting contacts in such a way that the impact pin can actuate the release mechanism (observe marking on HV-HBC fuse).

To remove a fuse from the panel, get hold of it using fuse tongs and remove from the fuse mounting contacts. If a HV-HBC 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. Insert the barrier with closed panel door if work is to be carried out on the panel and the

system cannot be completely de-energised. After closing the panel door the barrier can be pulled out again by pulling at the hole grip.

## 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](mailto:service@driescher.de)

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](mailto:infoservice@driescher.de)

