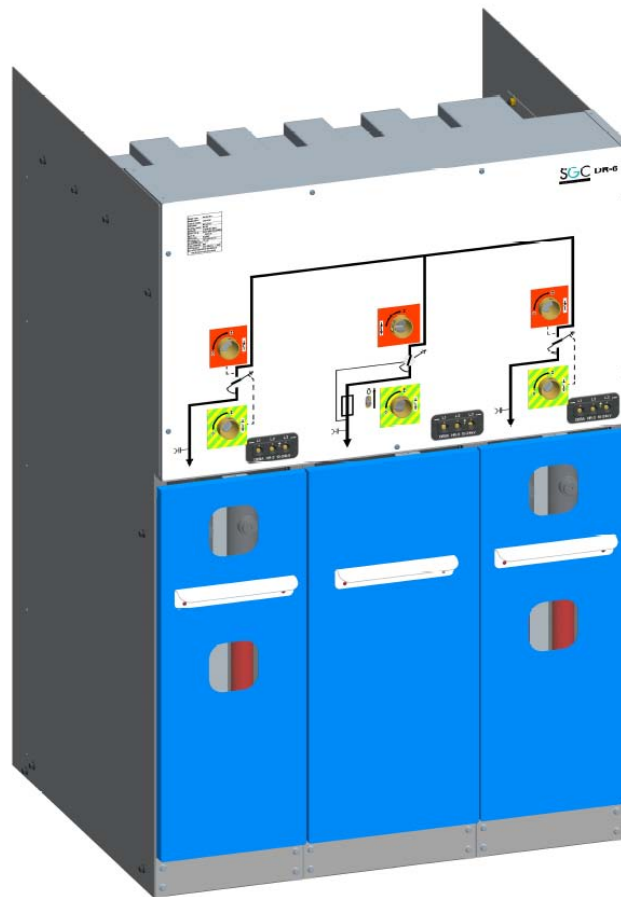


# DR-6C

## MEDIUM VOLTAGE SWITCHGEAR COMPACT RING MAIN UNIT



### User Manual: DR-6C / DR-6+ C



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## PREFACE

### About this manual

This document is intended as a reference for qualified and trained operators to operate the medium voltage switchgear in a safe and economical way.

This document uses the term “medium voltage switchgear” to denote a random, but in actual practice, existing combination of DR6 cubicles that, mutually coupled and connected, constitute a client-specific transformation or distribution station. See: “General description”.

The chapters and sections are numbered. The page numbers (consisting of the chapter number and the page number) and the document code can be found at the bottom of every page.

In the documentation the words “left”, “right”, “front” and “behind” are used to indicate a specific part of the medium voltage switchgear. The starting point is always the position of the operator, standing in front of the medium voltage switchgear, facing the switchgear.

### Pictograms and safety symbols in and on the medium voltage switchgear

Depending on the version, the following pictograms are used on the medium voltage switchgear:



**WARNING**

High Voltage Danger

Access to this cubicle is only allowed after this cubicle and both the directly adjacent cubicles (previous and next one) are voltage-free.



**WARNING**

Drilling prohibited.

Drilling is strictly prohibited on surfaces bearing this pictogram.

## Pictograms used in this manual

The following pictograms apply to the medium voltage switchgear user documents:



### CAUTION!

A procedure that can, if not carried out with the proper care, result in damage to the medium voltage switchgear, the surrounding area or the environment.



### WARNING

High Voltage Danger



### CAUTION!

Clamping danger



Notes, suggestions and advice.



Render this cubicle, the next one and the previous cubicle, voltage-free, before carrying out the work described.



Open the load break switch and the earthing switch before carrying out the work described in the manual.



Consult the indicated information sources first.



Protect the medium voltage switchgear from water and damp.

## Related documentation

The following technical documentation for medium voltage switchgear is available:

- Transport manual DR-6C
- User manual DR-6C

## Service and technical assistance

For information concerning specific settings, maintenance or repair work that is not mentioned here, please contact SGC - SwitchGear Company nv.

- When contacting SGC - SwitchGear Company nv, always provide the following information:
  - Cubicle type and voltage
  - Serial number of the cubicles

## General safety directions and instructions

SGC - SwitchGear Company nv does not accept any liability for damage or injury caused by not (strictly) following the safety directions and instructions, or by negligence during the installation, the use, the maintenance, or the repair of the medium voltage switchgear and its (possibly) additional options.

Depending on any specific user circumstances, or depending on any additional, fitted options, extra safety instructions may be required. Please contact SGC - SwitchGear Company nv immediately if you encounter a potential danger during the operation of the medium voltage switchgear.

**The owner/operator of the medium voltage switchgear is fully responsible at all times for observing the locally applicable safety instructions and guidelines.**

### User manual

- Anyone who uses or operates the medium voltage switchgear, must be familiar with the contents of the user manual, and follow the directions contained within very closely. The owner/operator must educate the users in accordance with the user manual and he or she must obey all directions and instructions.
- Never change the order of the required actions.
- Always keep the user manual close to the medium voltage switchgear.

### Pictograms and safety symbols

The pictograms, symbols and instructions applied to the medium voltage switchgear are a part of the safety equipment. They may therefore not be covered or removed, and must be present and clearly readable throughout the entire life cycle of the medium voltage switchgear.

- Replace or repair unreadable or damaged pictograms, symbols and instruction immediately. Contact SGC - SwitchGear Company nv for replacements.

### Operators

The execution of the work detailed herein (transport, installation, use and maintenance) is strictly reserved for trained and qualified operators, who are familiar with the dangers that may arise from operating the material. Temporary employees and personnel in training cannot operate the medium voltage switchgear under any circumstances.

### Technical specifications

- Technical specifications must not be changed.
- Modification of the medium voltage switchgear (or parts thereof) is not permitted.



## Transport, storage, installation, operation and maintenance

- See corresponding documents:
  - “Safety guidelines – transport”
  - “Safety guidelines – storage”
  - “Safety guidelines – installation”
  - “Safety guidelines – operation”
  - “Safety guidelines – maintenance”

## Intended use

The medium voltage switchgear is designed exclusively for use as transformation and distribution stations, according to the guidelines and conditions provided by SGC - SwitchGear Company nv. Every other different or extended use, does comply with the intended use.<sup>1</sup>

SGC - SwitchGear Company nv does not accept any liability for damage(s) or injuries resulting from deviation(s) of the intended use.

The medium voltage switchgear complies with the current norms and guidelines. See: Technical Brochure

- Operate the medium voltage switchgear strictly in a technically perfect condition, in accordance with the intended use outlined above.



Leave the sealed connections entirely intact, at all times. Breaking the sealed connections irrevocably voids any guarantee claims.

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<sup>1</sup> The “Intended use” as defined in EN 292-1 “is the use for which the technical product is suited as specified by the manufacturer including his directions in the sales brochure.” In case of doubt, it is the use that can be deduced from the construction, the model and the function of the technical product that is considered normal use. Operating the product within the limits of its intended use also involves observing the instructions in the user manual.



# 1 GENERAL INSTALLATION & SAFETY GUIDELINES

## 1.1.1 General



Installation of the medium voltage switchgear is reserved strictly for trained and authorized operators, who respect the locally applicable safety prescriptions & guidelines.

The actual connection and first start-up is to be performed by trained and authorized personnel in service of the power supply company.

- See also: "General safety prescriptions and instructions".
- Never leave tools or equipment behind in, or on, the medium voltage switchgear.
- Install the medium voltage switchgear exclusively in spaces that fully comply with the following recommendations (according to IEC 60298):

## 1.1.2 Recommendations – installation room

Recommendations regarding the installation room parameters are subdivided in recommendations concerning:

- floor surface
- environmental conditions
- air circulation
- free height of the installation area
- dimensions of the access doors to the installation area
- free space in front of the cubicles
- internal arc resistance

### 1.1.2.1 Floor surface

The surface fit for the medium voltage switchgear placement, needs to be sufficiently strong and perfectly flat. The maximum allowed difference in level is **2 mm/m**.

### 1.1.2.2 Environmental conditions

DR-6C cubicles have been designed for **indoor** installation, provided that the following environmental conditions are met:

description	values
environmental temperature	min. -15 °C - max. +45 °C
relative air humidity (%)	min. 10% - max. 70% (without condensation)
installation altitude (m.a.s.l.)	max. 1.000 m above sea level

Table 1: Environmental conditions

Consequently:

- Avoid storage in dusty areas.
- Avoid storage in areas with a high level of relative air humidity.
- Avoid storage in areas sensible to lightning.
- Avoid storage in areas where cubicles may be exposed to corrosive gases or fluids.



Contact SGC - SwitchGear Company nv if the cubicles need to be stored or installed in places where the required environmental conditions cannot be guaranteed.

### 1.1.2.3 Air circulation

- Ensure proper air circulation in the installation area.
- Secure the air circulation openings to prevent small animals or rodents from gaining access to the installation area.

Particularly when the medium voltage switchgear contains one or more transformer cubicles, special attention needs to be placed on air circulation. Consult the table below to calculate the corresponding values. The table displays capacity losses with regard to the capacity of the cast resin transformers.

Transformer Capacity (KVA)	P (W)
100	1.605
160	2.175
250	2.850
315	3.412
400	4.012
500	4.837
630	5.745
800	6.787
1.000	7.875
1.250	10.350
1.600	12.450
2.000	16.125

Table 2: Overview of capacity losses in cast resin transformers

#### 1.1.2.4 Free height of the installation area

The free height of the installation room has to be **at least 2.000 mm**. Depending on the distribution network manager however, a larger minimum free height may be required. An ideal free height, universally accepted by all distribution network managers, is 2.500 mm.



Dry transformers with a capacity of  $\geq 1250$  KVA require a minimal height of at least **2.500 mm**.

#### 1.1.2.5 Dimensions of the access doors to the installation area

The provided height and width measurements apply to all doors that offer access to the installation room. These minimum requirements also apply if the installation room is not directly accessible from the outside.

description	value
Height of the access door	min. 2.200 mm
Width of the access door	min. 100 mm + width of the widest cubicle

**Table 3: Dimensions of the access doors**



If the medium voltage switchgear does not contain any transformer cubicle(s), a minimal door height of **2.000 mm** suffices. If a transformer cubicle has been included, the dimensions of the transformer always need to be taken into account. For the correct dimensions of the different cubicles, please see: "Dimensions & weights".

If the medium voltage switchgear is to be installed in basements or cellars, an access hatch is required, with a length and width of at least 400 mm larger than the dimensions of the largest cubicle or transformer.

#### 1.1.2.6 Free space in front of the cubicles

The free space in front of the cubicles depends on the assembly of the medium voltage switchgear.

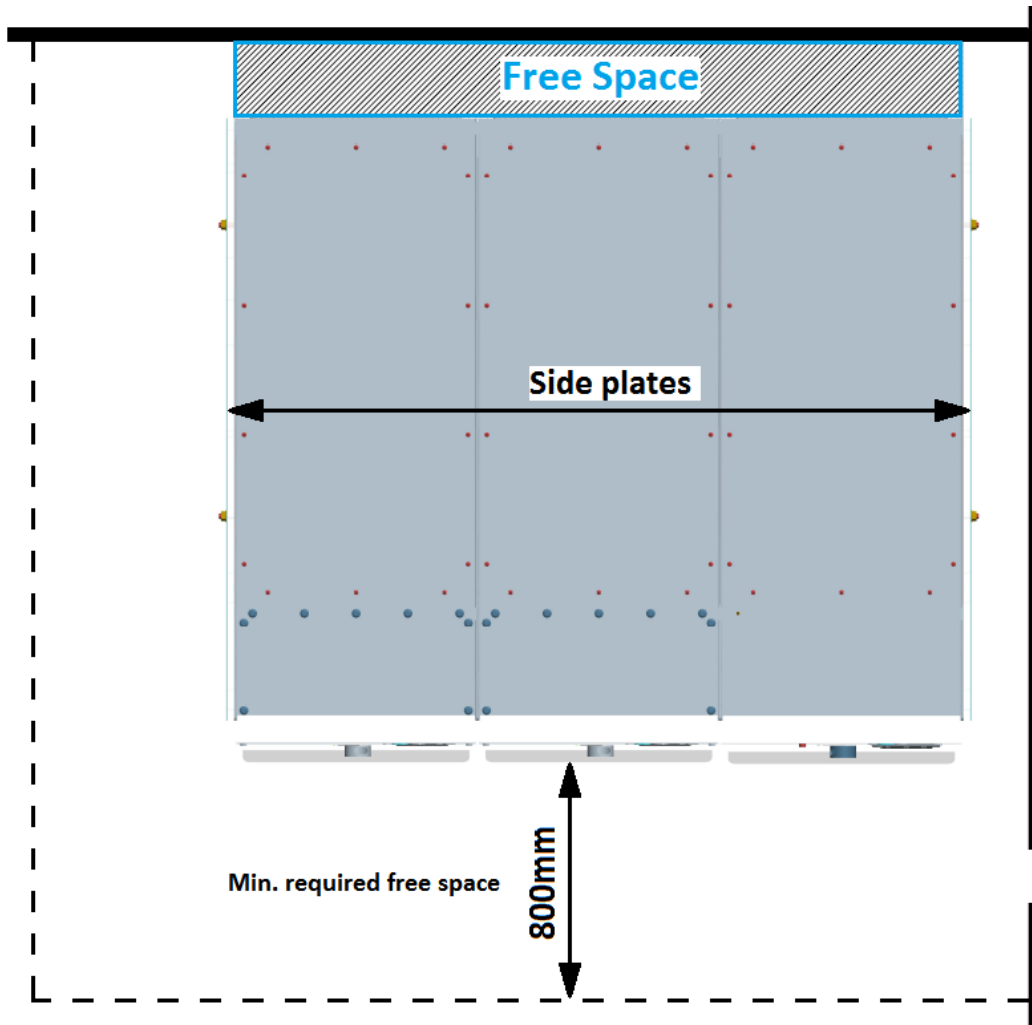


If the medium voltage switchgear does not contain any transformer cubicle(s), the minimum free passage is **800 mm**. Medium voltage switchgear with a transformer cubicle with a capacity of  $\geq 1.000$  KVA requires a free passage of at least **2.000 mm**.

### 1.1.2.7 Internal arc resistance

To prevent major material damage, serious physical injury or electrocution in the (unlikely) event of an internal arc, the following installation guidelines apply:

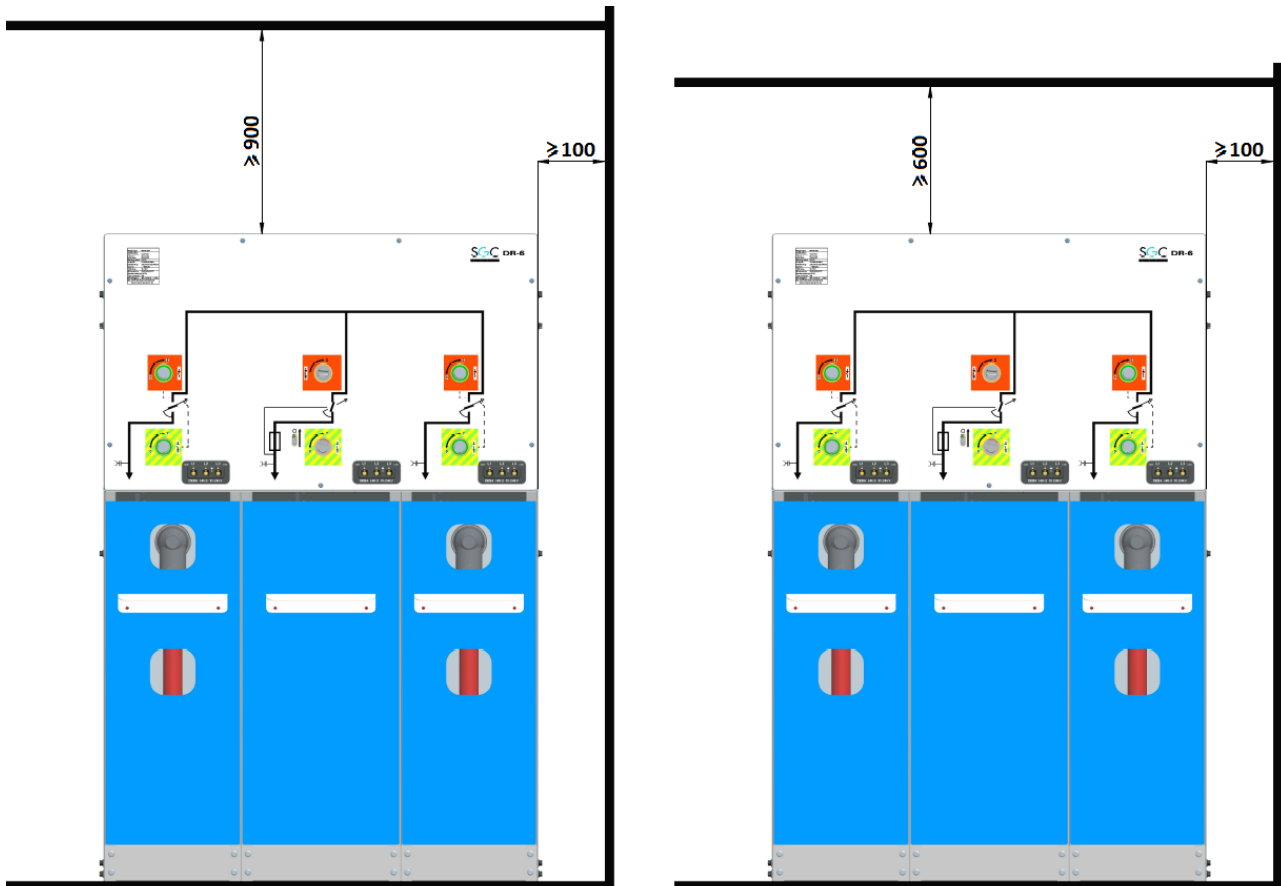
- Between the rear side of the cubicles and the wall of the installation room, ample free space needs to be provided, as displayed in Figure 1. This layout corresponds with an assembly where the side plates of the cubicles reach the rear side of the installation room. As a result, the free space behind the cubicles is entirely closed off. Consequently, a possible internal arc will trigger the overpressure system of the rear plates.



**Figure 1: Top view of installed cubicles**



A transformer cubicle can always be placed with its rear side against the wall.



**Figure 2: Minimal free height  $\geq 900$  for DR-6C installation (Left),  
Minimal free height  $\geq 600$  for DR-6C+ installation (Right)**



Anchor each cubicle of the medium voltage switchgear to the floor as described in the Installation Manual DW646112.

Medium voltage cubicles installed according to the aforementioned guidelines always restrict an internal arc to its compartment of origin.





## 2 USE

### 2.1 Safety guidelines – use

- See also "General safety guidelines and – instructions".
- Operating the medium-voltage switchgear is restricted to qualified and trained operators, taking into consideration the locally applicable safety prescriptions and guidelines.
- Make sure that during operation the door is always correctly closed and locked with a sturdy padlock. Switching with an open door is impossible.

### 2.2 Identification of the cubicles

Every DR-6C medium-voltage cubicle is equipped with a type plate and a stamped serial number.

#### 2.2.1 Type plate

The synoptic diagram is equipped with a type plate, in the top-left corner.

The type plate registers the following data:

- A: Cubicle type
- B: Serial number and production year of the medium-voltage switchgear
- C: Voltage
- D: Other technical specifications

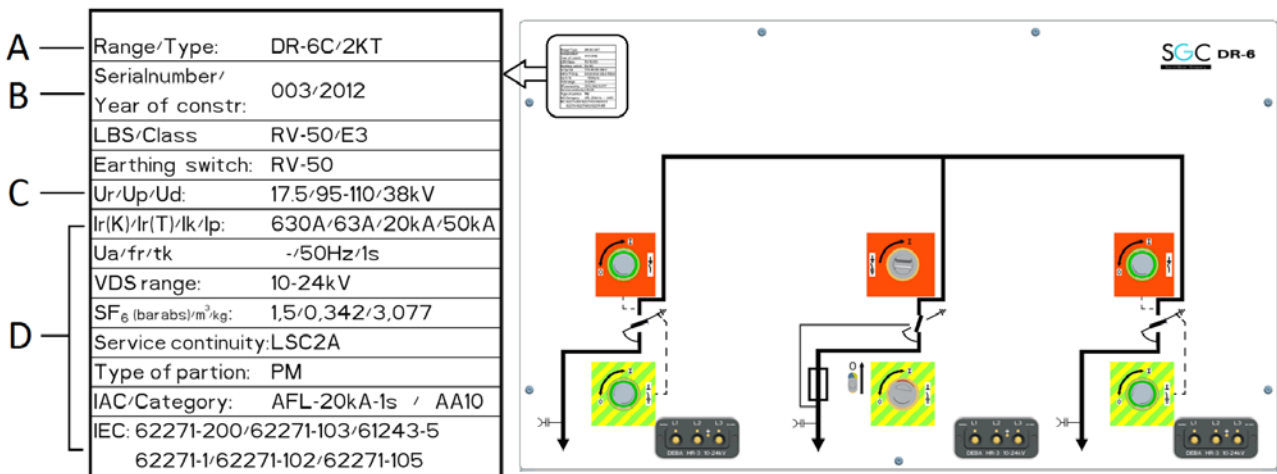
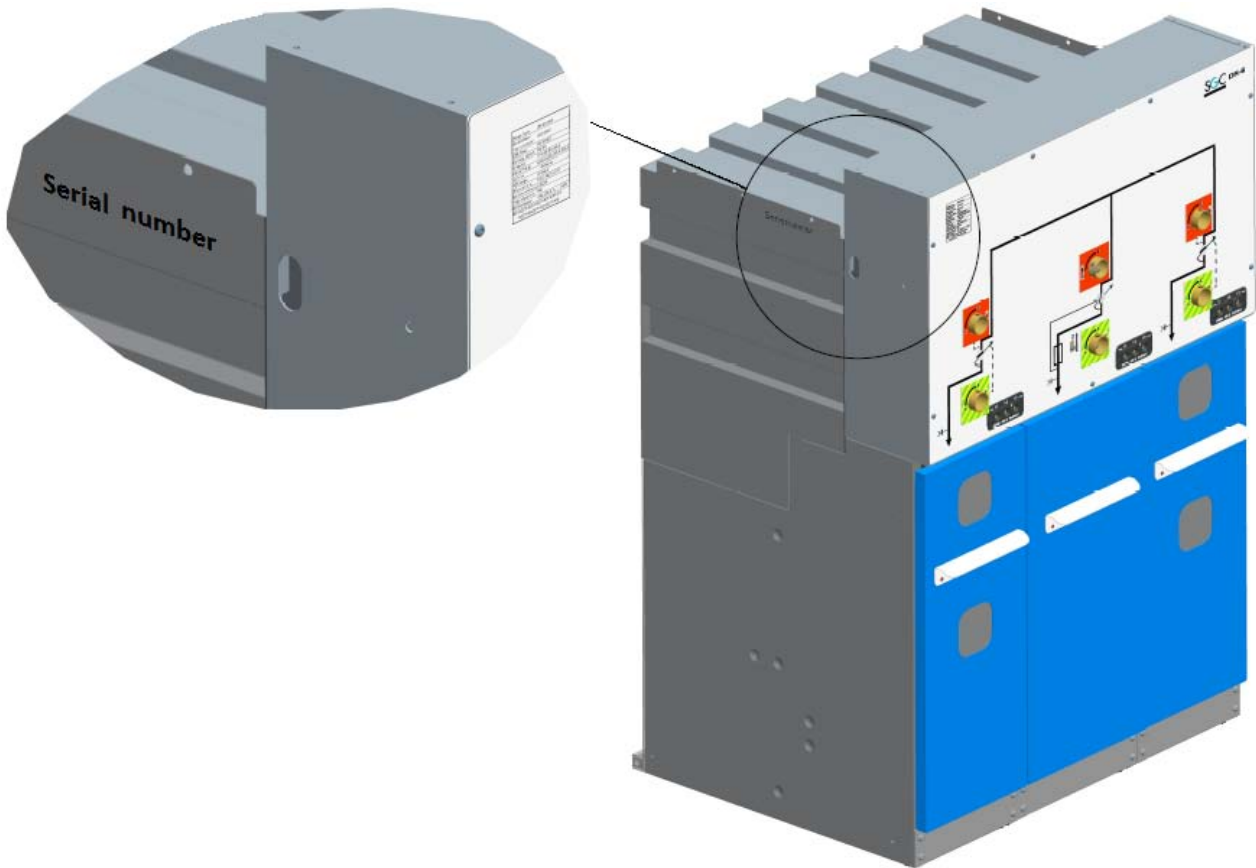


Figure 3: Type plate on the synoptic diagram

### 2.2.2 Serial number

The stamped serial number can be found on the left lateral side of the medium-voltage cubicle. The serial number is visible after disassembling the end panel.



**Figure 4: Serial number stamped in the medium-voltage cubicle**

## 2.3 Operation

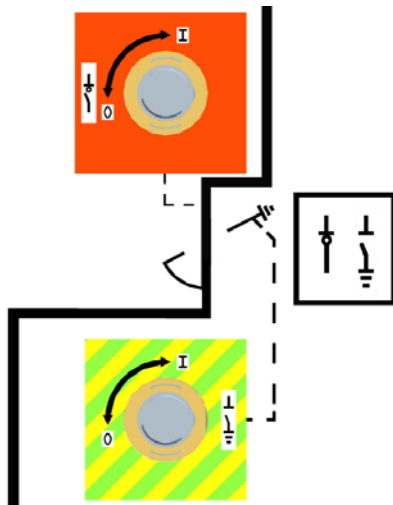
Depending on the version, the medium-voltage switchgear is equipped with (a number of) the following controls and indicators:

- synoptic diagram (see "Synoptic diagram")
- operational lever
- load break switch
- earthing switch
- capacitive voltage indicators
- low-voltage switch



The function of these controls and indicators, as well as their operation, is described by their actual operation.

### 2.3.1 Operating the combination load break switch – earthing switch



During normal operation, the position is as follows:

- load break switch CLOSED
- earthing switch OPEN

The indicator on the synoptic diagram is placed vertically, see Figure 5.

In this position the earthing switch is automatically locked. It is impossible to close the earthing switch.

Figure 5: Load break switch closed earthing switch open

#### 2.3.1.1 Opening the load break switch and closing the earthing switch

- Place the operational lever on the operational axis of the load break switch.
- Turn the operational axis **counterclockwise** (1) until the load break switch audibly opens. The indicator on the synoptic diagram is no longer in the vertical position, the earthing switch is automatically unlocked (2).
- Place the operational lever on the operational axis of the earthing switch.
- Turn the operational axis **clockwise** (3) until the earthing switch audibly closes. The indicator on the synoptic diagram is now in the earthing position (4).  
If necessary, the door can now be opened.

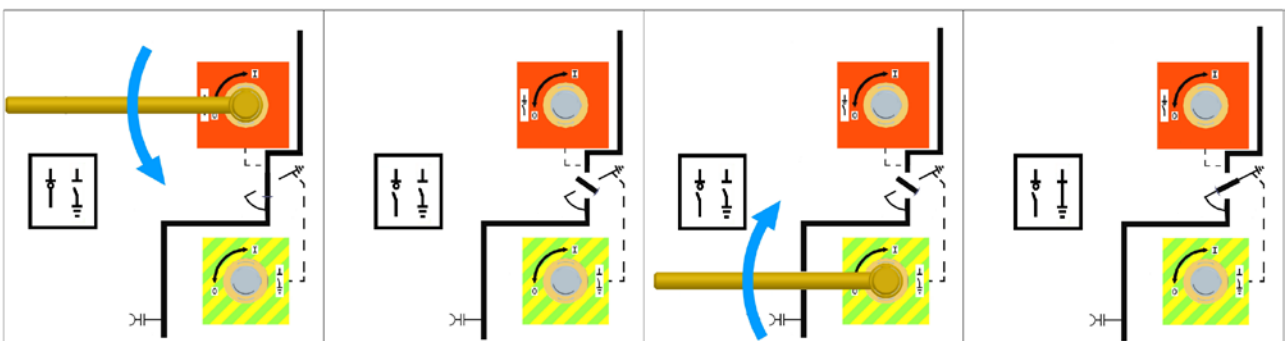


Figure 6: Opening the load break switch, closing the earthing switch



Turning counterclockwise = opening switch  
Turning clockwise = closing switch

### 2.3.1.2 Opening the earthing switch and closing the load break switch

- Ensure that the door to the cable compartment is closed. See: “Placing the door back”.
- Place the operational lever on the operational axis of the earthing switch.
- Turn the operational axis **counterclockwise** (1) until the earthing switch audibly opens. The indicator on the synoptic diagram is in the neutral position (2).
- Place the operational lever on the operational axis of the load break switch.
- Turn the operational axis **clockwise** (3) until the load break switch audibly closes. The indicator on the synoptic diagram will move to a vertical position (4). The cubicle is now ready to be put into service.

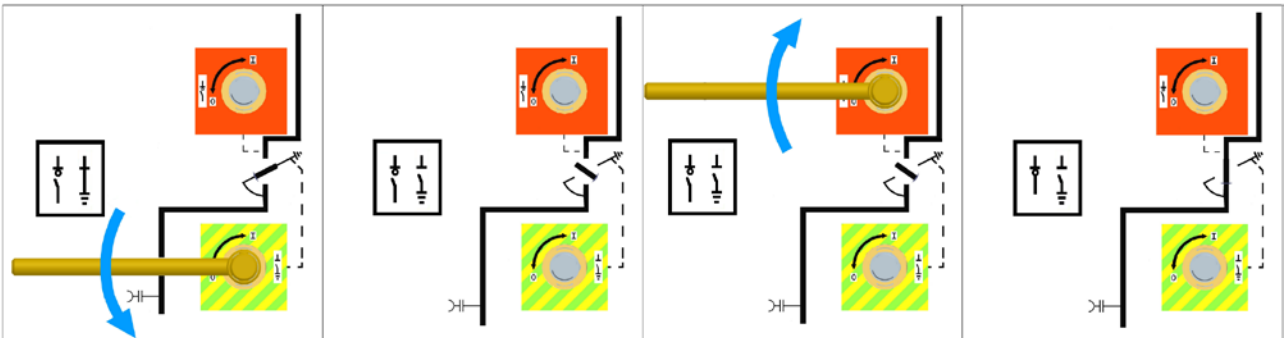


Figure 7: Opening the earthing switch, closing the load break switch



Turning counterclockwise = opening switch  
Turning clockwise = closing switch

### 2.3.2 Reading the capacitive voltage indicators

The capacitive voltage indicators (A) offer the possibility to measure the phase sequence during the first operation. See: “Measuring the phase sequence”.

The voltage indicators also offer the possibility to monitor (in DF-P cubicles) whether fuse protectors have been used and if (with the load break switch in the OPEN position) there is still voltage on the cables.

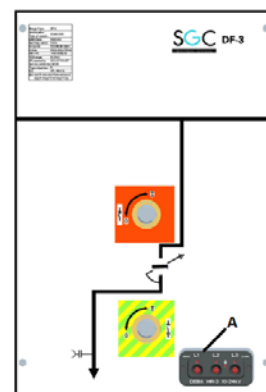
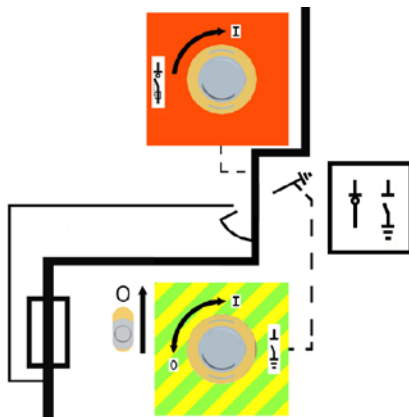


Figure 8: Reading capacitive voltage indicators

### 2.3.3 Operating the combination load break switch – fuse protection



**Figure 9: Combination load break switch – fuse protection closed earthing switch open**

During normal operation, the position is as follows:

- load break switch is CLOSED
- earthing switch is OPEN

The indicator on the synoptic diagram is placed vertically, see Figure 5.

In this position the earthing switch is automatically locked. It is impossible to close the earthing switch.

#### 2.3.3.1 Opening the load break switch and closing the earthing switch

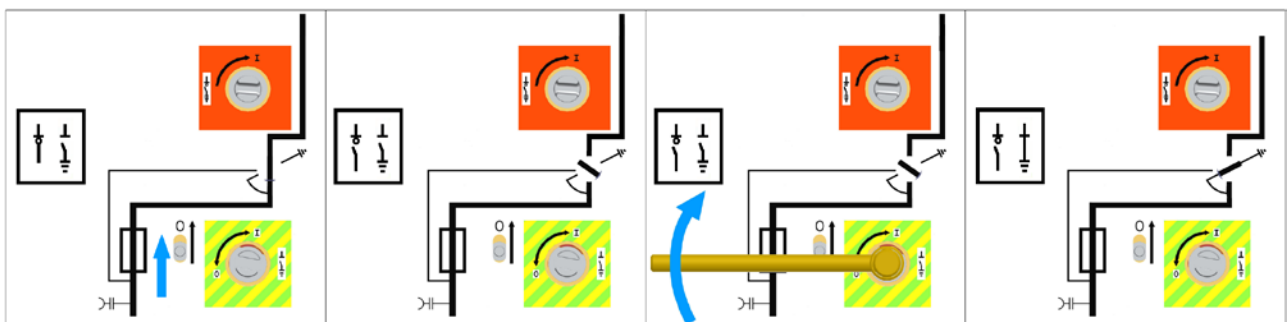
- Make an upward movement with the operational button (1) until the load break switch audibly opens. The indicator on the synoptic diagram is no longer in the vertical position, the earthing switch is automatically unlocked (2).



Check using the capacitive voltage indicators whether (with the load break switch in the OPEN position) there is still voltage on the cables. The capacitive voltage indicators have to be OFF.

If necessary, the door can now be opened.

- Place the operational lever on the operational axis of the earthing switch.
- Turn the operational axis **clockwise** (3) until the earthing switch audibly closes. The indicator on the synoptic diagram is in the earthing position (4).  
If necessary, the door can now be opened.



**Figure 10: Opening combination load break switch-fuse protection, closing earthing switch**



Turning counterclockwise = opening switch  
Turning clockwise = closing switch

### 2.3.3.2 Opening the earthing switch and closing the load break switch

- Ensure that the door to the cable compartment is closed. See: “Placing the door back”.
- Place the operational lever on the operational axis of the earthing switch.
- Turn the operational axis **counterclockwise** (1) until the earthing switch audibly opens. The indicator on the synoptic diagram is in the neutral position (2).
- Place the operational lever on the operational axis of the load break switch.
- Turn the operational axis **clockwise** (3) until the load break switch audibly closes. The indicator on the synoptic diagram will move to a vertical position (4). The cubicle is now ready to be put into use.

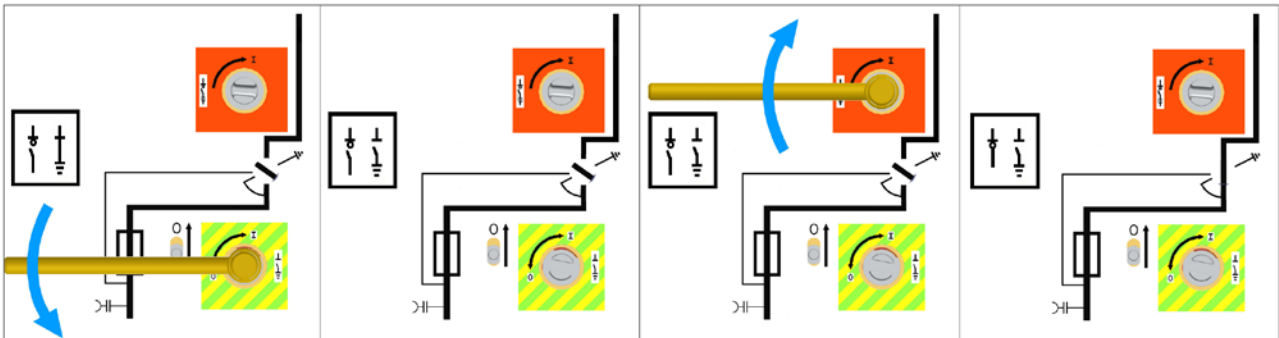


Figure 11: Opening earthing switch, closing combination load break switch-fuse protection



Turning counterclockwise = opening switch  
Turning clockwise = closing switch

### 2.3.4 Automatic recloser for cubicle type DF-P

The automatic recloser consists of the following main elements:

- Under voltage release 220 VAC
- Motor operation of load break switch
- Voltage detection
- Battery-operated control



Important notice: during manual operation or during work on the medium-voltage switchgear, the operator (BA4/BA5) always needs to move the switch manual-automatic in the “manual” position, and needs to remove the key to lock the operation procedure in the “manual” position. This is necessary to prevent unwanted switching.

#### 2.3.4.1 Working procedure

If the voltage drops off the grid, the load break switch will drop down by acting on the under voltage release. When the voltage returns from the grid, the load break switch will reengage, after a specific time, set in advance. The time can be set using time relay KO2 and KO3. KO2 sets the reengagement time and KO3 prevents pumping (anti-pumping). A possible error (protection on the transformer) will result in disconnecting. Every error (melting of the HRC fuses, protection of the transformer) is locked, which prevents reconnection. Reconnection is possible only after a local intervention by an operator (BA4/BA5) who can track the error, remedy it, and afterwards push the reset button to allow for automatic reconnection after placing the “manual-automatic” switch back into the “AUT” position (see important notice earlier).

## 2.4 Locks

The locks below are provided by default on products in the DR-6C line-up. If any other specifications are required, the possibilities can be easily examined on simple demand.

### 2.4.1 Locks between load break switch and earthing switch



Load break switch closed

The earthing switch is automatically closed in this position. It is impossible to close the earthing switch.

Load break switch open, earthing switch open

In the neutral position, it is possible to switch either the earthing switch or the load break switch.

Earthing switch closed

In this position, the load break switch is locked automatically. It is not possible to lock the load break switch.

### 2.4.2 Door lock

#### 2.4.2.1 Removing the door



Access to the cable compartment is only possible if the load break switch is in the OPEN position and the earthing switch is in the CLOSED position.

#### 2.4.2.2 Placing the door back



Before placing the door back, the load break switch must be in the OPEN position and the earthing switch in the CLOSED position.

- Carefully check whether there are still tools or fixing materials in the cable compartment and remove them if necessary.
- Check all connections.
- Attach the door (B) to the cable compartment:
  - Take hold of the door with both hands using the grip (D).
  - Carefully place the door onto the support points.
  - Press the door down.
- Lock the door using a sturdy padlock (C) on the locking clip (A).

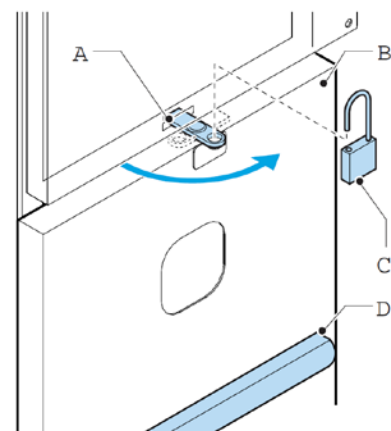


Figure 12: Placing the door back



The keys can only be stored by specially designated, authorized operators.



## 2.5 Measuring the phase sequence



The phase sequence is frequently measured between K fields.

Using the voltage indicators (A) on the front panel, the phase sequence can be measured easily.

- Measure using a voltage meter/phase sequence indicator (B) between the **corresponding** phases. A phase sequence indicator (RM086000) is optionally available.



If no voltage can be measured, the phase sequence is correct. To double check, the voltage between **different** phases can be measured. Obviously voltage does need to be measured in this case.

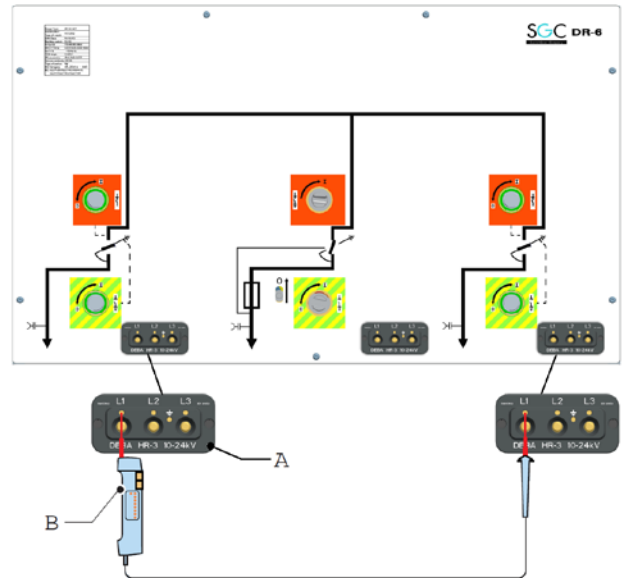


Figure 13: Measuring phase sequence

## 2.6 Disassembly of the front panel

Disassemble the front panel (C) by:

- Unscrewing the seven hexagonal tap bolts (A).
- Removing the spring washers (B)
- Removing the front panel (C).

The control and low-voltage compartment are now accessible.

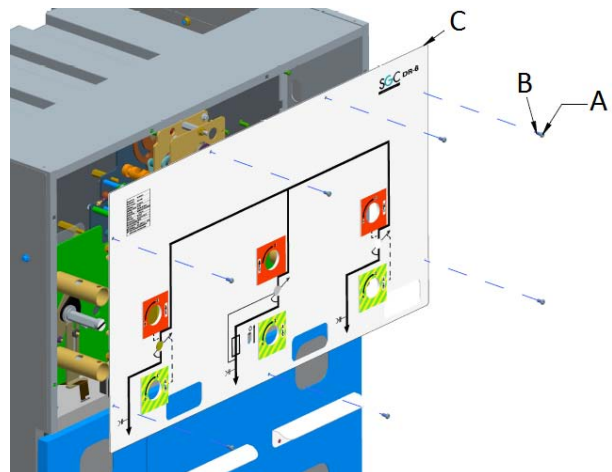


Figure 14: Disassembly front panel DR-6



### 3 MAINTENANCE

#### 3.1 Safety guidelines - maintenance

- See also "General safety guidelines en –instructions".
- The detailed maintenance guidelines are restricted to authorized and trained operators, respecting the locally applicable safety prescriptions and guidelines.
- All other maintenance tasks, not mentioned here, are restricted to trained and authorized service personnel (in service of the distribution company).
- Ensure that the medium-voltage switchgear is voltage-free before executing any of the described maintenance operations.
- Only put the medium-voltage switchgear back into operation after the front panels and doors (if applicable) have been reattached and the maintenance steps have been carefully verified.
- Never leave any tools or fixing materials behind inside or on the medium-voltage switchgear.

#### 3.2 Maintenance – general

DR-6C cubicles have been designed to operate flawlessly for an extend period of time, with minimum maintenance. To ensure perfect operation, a few simple maintenance and cleaning operations are required. If proper caution is exercised, and if the prescribed operations are performed accurately, possible errors will be discovered and frequently be corrected before any failure occurs. Since service intervals depend on specific work and company circumstances, and as a result, vary strongly, no intervals are provided.

The following tasks are nevertheless required:

Interval	Task
Every two years	Switching the switch(es) in DR-6C cubicles with switching function <ul style="list-style-type: none"> <li>• See "§2.3 Operation".</li> </ul>
Every two years	Render the entire medium-voltage switchgear voltage-free <ul style="list-style-type: none"> <li>• See " Safety guidelines – maintenance ".</li> </ul>
Every ten years	Replacing the fuse protectors in T fields <ul style="list-style-type: none"> <li>• See "§3.2.3 Replacing fuse protectors (T-fields)".</li> </ul>



## **Important notice concerning DR-6C medium-voltage switchgear.**

DR-6C medium-voltage switchgear requires minimum maintenance. It is of the “sealed for life type” and does not require an intervention when it comes to sealing, during the entire life cycle of the switchgear.

The integrated RV-50 load break switches are developed according to IEC 62271-102 standards and have a mechanical life cycle of 1000 operations. The maintenance intervals can vary depending on the use of the load break switch. Nevertheless, a number of scheduled maintenance tasks are still required, as described in the previous table.

### **3.2.1 General control operations**

- Regularly perform a thorough, general visual inspection.
- Check whether the cables are still connected properly.

#### **3.2.1.1 Cleaning DR-6C cubicles**

Contamination of the DR-6C cubicles can initially be limited by respecting the recommendations regarding the installation area. See: “Recommendations – installation area”.

#### **3.2.1.2 Cleaning the exterior**

- First read the safety guidelines. See: “Safety guidelines – maintenance”.
- Clean the exterior with a lint-free cloth and a non-corrosive cleaning product.
- Ensure that the cleaned surfaces are completely dry.

#### **3.2.1.3 Condensation**

SGC - SwitchGear Company nv’s equipment is tested according to IEC 60932, procedure A, level 2. These tests serve to verify the proper functioning of the equipment in the presence of condensation.

To avoid condensation, it is recommended to:

- Properly air the room
- Properly heat the room
- Ensure a proper degree of humidity

If despite these measures, condensation does still appear, SGC - SwitchGear Company nv can optionally install heating resistors (30 W) in each cubicle.

### 3.2.1.4 *Cleaning the interior*

The entire interior of the DR-6C cubicles needs to be kept free from dust, moisture, and other contaminations. This applies in particular to the cable compartment.



A clean and dust-free interior facilitates dielectric characteristics and reduces creepage current to a minimum.

- Render the entire medium-voltage switchgear voltage-free. See "§3.1 Safety guidelines – maintenance"
- Disassemble the front panel. See "§2.6 Disassembly of the front panel"
- Remove the door. See "§2.4.2.1 Removing the door".
- Clean the interior (including the cables) with a lint-free cloth and a non-corrosive cleaning product.
- Rub the cleaned surfaces thoroughly dry to prevent surface oxidation, copper oxidation and corrosion of the fixing materials.
- Check all bolt-nut connections.
- Assemble the front panel.
- Place the door back.

### 3.2.2 **Switching the switches**

Switches that are used rarely or never, need to be switched **at least every two years** to check the functioning of the mechanical components. See "§2.3 Operation".

### 3.2.3 Replacing the fuse protectors (T-fields)

Fuse protectors in DR-6C T-fields need to be replaced **at least every 10 operational years**, or sooner if necessary as part of a repair (e.g. after one of the fuse protectors has been used.)



Always replace **all three** HRC-protection fuses simultaneously, even though only one of them is broken.

- Render the entire medium-voltage switchgear voltage-free. See "§3.1 Safety guidelines – maintenance".
- Remove the door. See "§2.4.2.1 Removing the door".
- Unlock the fuse canister by:
  - Upward movement of the fuse handle until it is in a vertical position (Figure 15-2 and Figure 15-3).
  - Let the fuse handle return to a horizontal position (Figure 15-4).
  - The fuse canister (Figure 15-4) can now be removed from the fuse container.

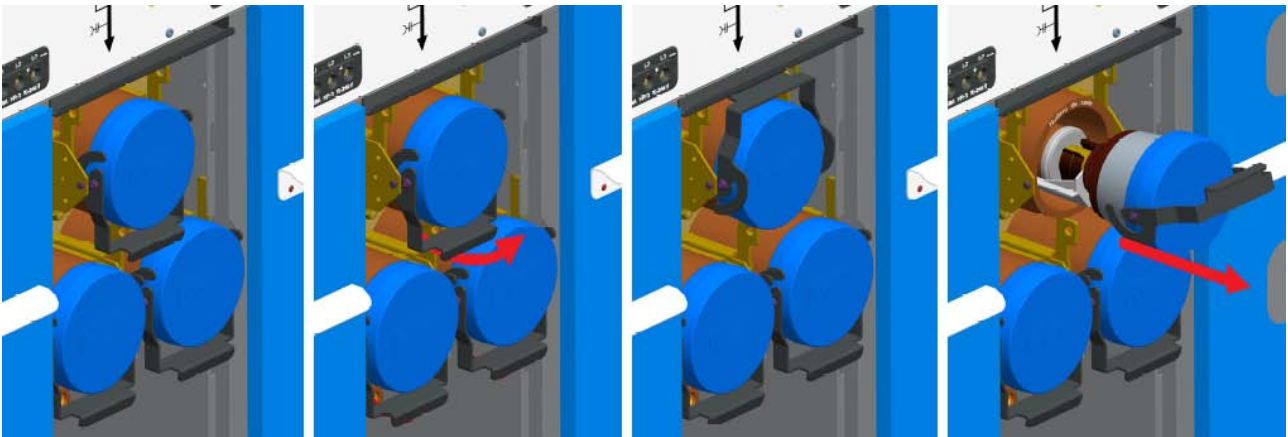


Figure 15: Opening fuse canister

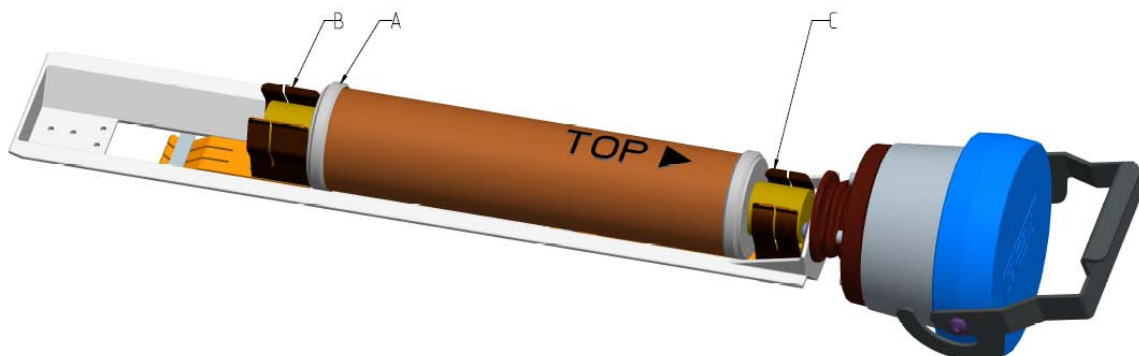


Figure 16: Fuse canister DR-6C

- Remove the three fuse protectors (A) from the fuse canister:
  - Lift the fuse protector (A) from the rear spring clamp (B).
  - Remove the fuse protector with a twisting motion from the front spring clamp (C).

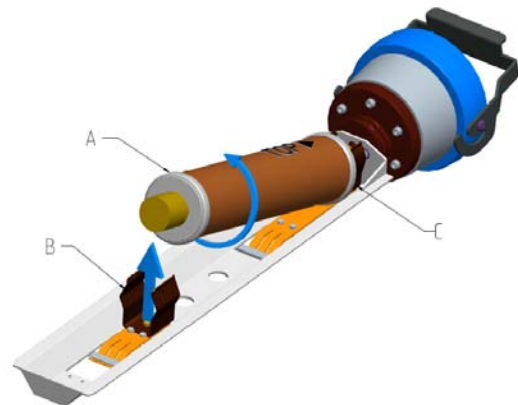



Figure 17: Replacing fuse protectors

- 
 Support the fuse canister during assembling & disassembling of the fuse protectors to prevent damage.

- Manually check the trip mechanism: the levers (D+E) cannot get stuck or show any defects.
- Install the new fuse protectors.

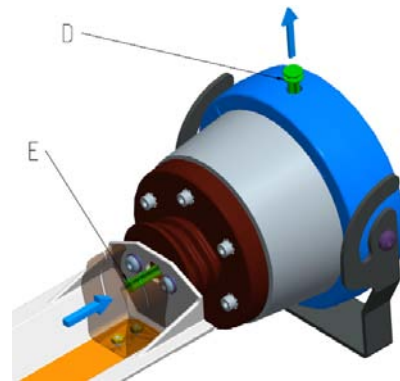



Figure 18: Checking tripping mechanism

- 
 Ensure that the strikers are on top. The arrow (F) should point upwards.

- Place the fuse protector in the rear spring clamp (B).
- Push the fuse protector with a twisting motion in the front spring clamp (C). Avoid any damage and distortion to the spring clamp. And support the fuse canister during assembly of the new fuse protectors to avoid damage.

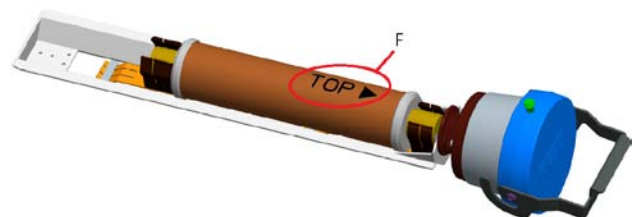


Figure 19: New fuse protectors with striker pointing towards the handle

- Place the door to the cable compartment back. See "§2.4.2.2 Placing the door back".
- Lock the door with a sturdy padlock.
- Put the medium-voltage switchgear back into operation.

### 3.3 Unpacking

The DR-6C cubicles are by default wrapped in protective foil and secured to a euro pallet. The most appropriate place to unpack the cubicles is of course the final installation area.

- Cut the tie down strips used to fasten the cubicle onto the pallet.
- Carefully remove the protective foil.
- Examine the delivery note to ensure that the cubicle is complete.
- Check the cubicle for possible (transport) damage.
- Carefully lift the cubicle off the pallet.



If any parts are missing or damaged, contact the transporter or SGC - SwitchGear Company nv. Heavily damaged cubicles always need to be returned to SGC - SwitchGear Company nv.



By request, cubicles come equipped with lifting lugs. If you use these, use strictly appropriate lifting & hoisting tools, in perfect condition and with sufficient power. Respect the applicable safety measures. Fastening the load and giving instructions to the person operating the lifting & hoisting is strictly reserved to experienced personnel, within visual and shouting distance of the operator using the hoist or lift tool.

- Remove the pallet.
- Remove the door.
  - Turn the part designated for the padlock open (middle, top of the door).
  - Grab the handle to the cable compartment door with both hands.
  - Carefully take the door and move it upwards.



DR-6C cubicles are equipped with a load break switch and an earthing switch and by default they are delivered in these positions: “load break switch open – earthing switch closed”. In these positions, the door is always removable.

- Place the removed door in a place where there is no risk of damage.
- Repeat the steps above for each separate functional unit.

After the wrapping materials are disposed of in regulation with the applicable legislation, the positioning of the cubicles can begin.



## 4 DR-6C CUBICLES AND THE ENVIRONMENT

### 4.1 Packing materials

Packing materials consist mainly of:



- (unprocessed) wood
- synthetic tie down strips
- synthetic foil

Ask your local sanitation services for possible recycling options or environmentally-friendly disposal of packing materials. Deliver the packing materials in the prescribed manner (sorted).



In Belgium, Euro-pallets need to be returned to SGC - SwitchGear Company nv after the installation of the cubicles.

### 4.2 Disposal of the cubicles

With regards to reusing electrical components, SF<sub>6</sub>-gas (sulphur hexafluoride) filled switchgear material can be returned to SGC - SwitchGear Company nv at the end of its life cycle and after being damaged.

After consultation, entire DR-6C cubicles can also be returned. If this proves to be impossible, the cubicles are to be processed in an environmentally friendly way. Ask your local sanitation services for possible recycling options or environmentally-friendly disposal of packing materials. Deliver the packing materials in the prescribed manner (sorted).

### 4.3 Recuperation of SF<sub>6</sub> gas

The recuperation of SF<sub>6</sub>-gas in medium-voltage cubicles of the DR-6C type, concerns the gas-filled tank with integrated load break switches of the RV-50 type. The stainless steel casing contains a gaseous volume of 0,342m<sup>3</sup> with a pressure of 1.5 bar absolute at 20°C. Taking into account the dimensions and the volume of the gas, users are advised to have the recycling and destruction of gas-filled components done, at the end of the life-cycle, by a specialized company.

In this case, the user will take into account the local regulations with regards to transport. Insofar as possible, the user will denote the predictable state of decomposition of the gas, in order to be able to provide adequate treatment.

At the end of the life cycle (usually 30 years) the decomposition degree of the gas, in the case of switches, will be considered as minor (see Table 1 – section 6 IEC 61634). At the end of the life cycle of DR-6C medium-voltage cubicles, the user can also turn to SGC - SwitchGear Company nv in order to recycle, to recuperate and destroy the SF<sub>6</sub> gas.



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