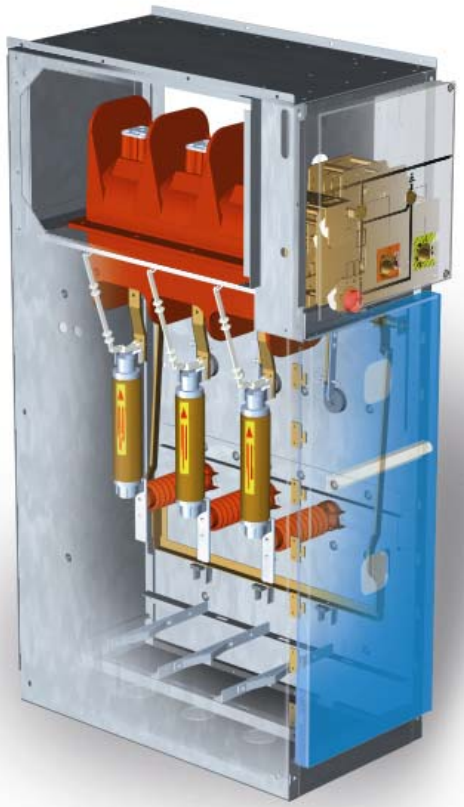
DF-2

MEDIUM VOLTAGE SWITCHGEAR

THE MODULAR CONCEPT



Extract installation manual:
Gland plates and cable connections

SGC
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PREFACE

This document

This document is intended as a reference for qualified and trained operators to transport, install, use and maintain the medium voltage switchgear in a safe and economic way.

In this document the definition “medium voltage switchgear” is used to indicate a random – but in actual practice existing – combination of DF-2 cubicles that, connected, form a customer-specific transformation or distribution switchgear. For details, see “General description”.

The chapters and sections are numbered. The page numbering (Form of the chapter number and the page number) and the document code can be found at the bottom of each 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 side of the switchgear.

Pictograms and safety symbols in and on the medium voltage switchgear

Depending on the version, the following pictogram is used on the medium voltage switchgear:

WARNING
High Voltage Danger
Access to the particular cubicle is only allowed after the cubicle itself, the next and the previous cubicle are voltage-free.

Pictograms in the documentation

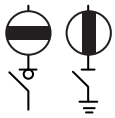
In the user’s manual of the medium voltage switchgear, the following pictograms are used:

CAUTION
Procedures that can – when not carried out with the necessary care - result in damage to the medium voltage switchgear, the surrounding area or the environment.

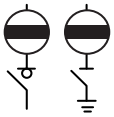
WARNING
High Voltage Danger

CAUTION
Clamping danger

Notes, suggestions and advices



Make the cubicle in question, the next one and the previous cubicle voltage-free, before carrying out the work described.



Open the load break switch as well as the earthing switch before carrying out the work described.

Consult the indicated information sources first.

Protect the medium voltage switchgear from water or damp.

Related documentation

The following technical documentation is available for the medium voltage switchgear:

- Spare-parts list (AG608301)
- Technical Brochure (AG601301)
- Transport Manual
- Maintenance Manual

1 ASSEMBLY OF THE FLOOR PANS – CABLE CONNECTION

Considering the fact that when installing the cubicles, the assembly of the floor pans and the connection of the cables happens almost simultaneously, the descriptions of these actions are combined.
The following applies in all circumstances:

A standard connection is possible up to 400 mm² for a single core cable per phase.
Upon request, single core cables up to 630 mm² or 2 parallel cables up to 630mm² per phase can be connected to the DF-2 switchgear.

Connection of the cables is restricted to trained, qualified and authorised personnel in accordance with the guideline mentioned in the installation manual and using exclusively the materials supplied by SGC nv.

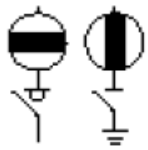
The floor pans and cable grommets should be installed in accordance with the below mentioned guidelines and in accordance with the state of art closing off all openings, prior to placing the switchgear into service.

The cable clamps should be installed in accordance with the below mentioned guidelines and in accordance with the state of art to fulfil its function as strain relief, prior to placing the switchgear into service.

Trifurcation of 3-core cable should be done outside the switchgear and cables must never cross inside the cubicle. For the connection of the cables, a torque of **60Nm** needs to be respected at all times.

1.1 Assembly instructions for connecting single phase cables

1.1.1 Preparations



Ensure that the switchgear in question is entirely voltage-free and earthed.

1.1.2 DF-A / DF-P

- Mount the first floor pan at the rear of the switchgear (Figure 1A) on both sides to the frame, using the flange bolt (Figure 1B), the serrated spring washer (Figure 1C), and the bolt (Figure 1D).

- Disassemble the cable bracket (Figure 2 B).

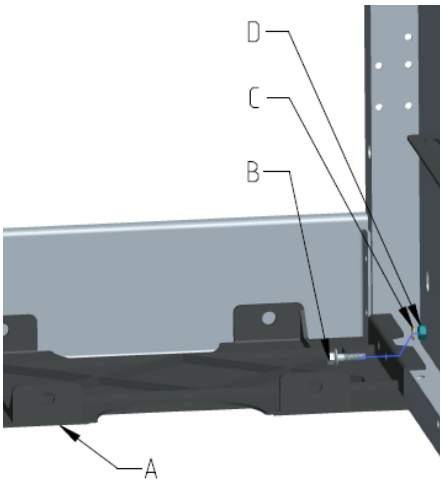


Figure 1

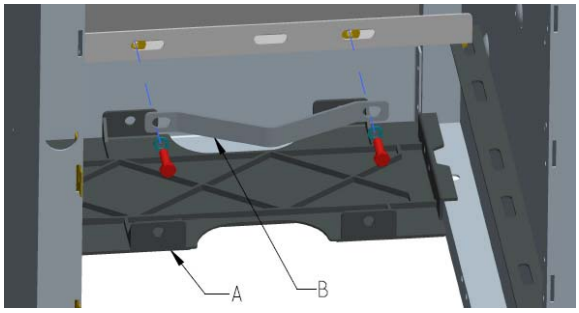


Figure 2

- Make a circular incisions in the grommet in accordance with the cable section to be connected (Figure 3A). Slide the grommet over the cable at the right height.

- Install the cable over the M12 bolt against the connection terminal. Place the washer (Figure 3B), disc spring (Figure 3C) and nut (Figure 3D).

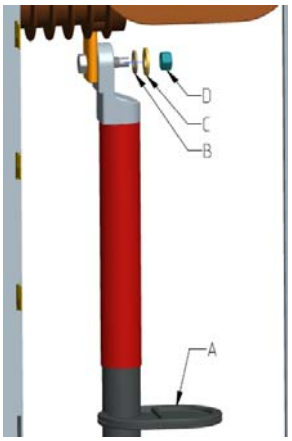


Figure 3

- Connect the earthing cable (Figure 4B) to the earthing strip (Figure 4D) using the bolt (Figure 4C).

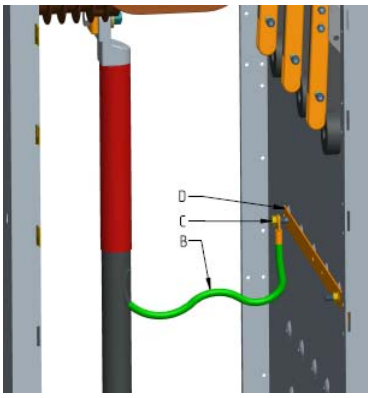


Figure 4

- Assemble the cable clamp (Figure 5A) on the cable support and fix it into place using hexagonal tap bolts (Figure 5C), the spring washers (Figure 5B) and the nut (Figure 5D).
- Place the second bottom plate (Figure 6A) in the cubicle to cause the grommet to be fixed into place by both bottom plates.
- Secure the bottom plate on both sides to the frame using a flange bolt (Figure 6B), a serrated spring washer (Figure 6C) and a nut (Figure 6D).

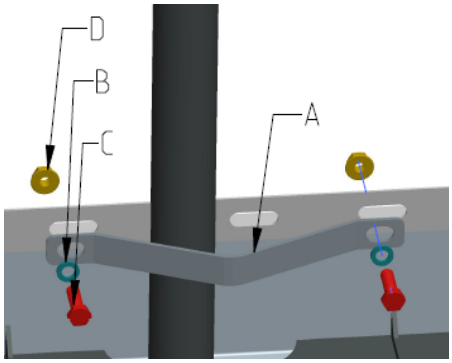


Figure 5

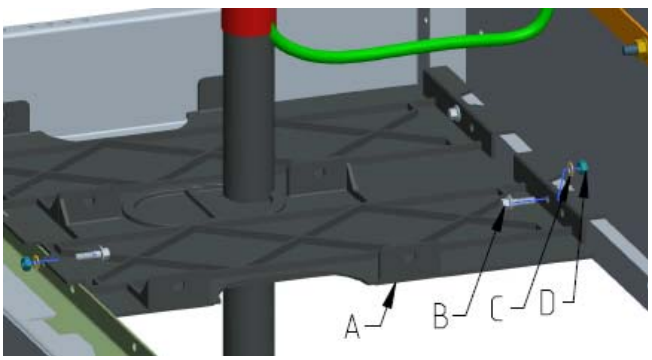


Figure 6

- Connect the cable securely with a torque of **60Nm** and pay special attention to:
  - Connection between cable lug and contact
  - Strain relief of the (capacitive) isolator
  - Accurate cable clamping using cable clamps
- Fix the cable clamps using a torque of **25 Nm**.
- Continue according to these instructions, working towards the door opening in a systematic sequence.
-

Since the assembly of the cables and bottom plates occurs in an analogous fashion for DF-P cubicles, no further details are provided here. By request, a more exhaustive description can be obtained.

1.1.3 DF-D and DF-D/EDN

The circuit breaker can be withdrawn to allow an easy and comfortable cable assembly.

- Disassemble the first three floor pans, leaving the last one assembled (Figure 7A)
- Make a circular incisions in the grommet in accordance with the cable section to be connected (Figure 8A)
- Slide the grommet over the cable (Figure 8A)

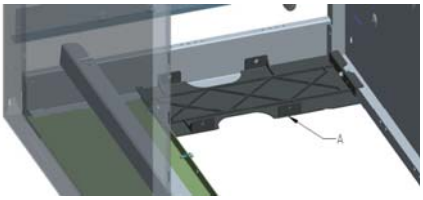


Figure 7

- Mount the cable over the M12 bolt, onto the contact terminal. Place the washer (Figure 8B), the disc spring (Figure 8C) and the nut (Figure 8D)
- Move the grommet (Figure 9A) to the correct height
- Connect the earthing cable (Figure 9B) onto the earthing strip (Figure 9D) by means of the nut (Figure 9C).

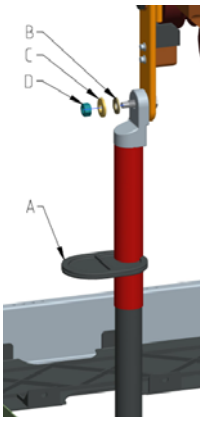


Figure 8

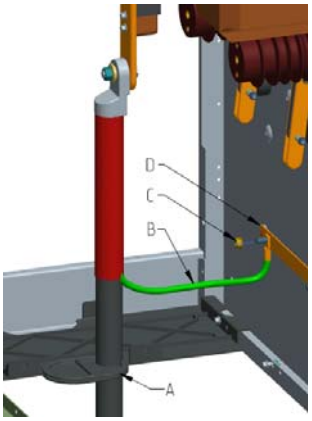


Figure 9

- Place the second bottom plate (Figure 10A) inside the cubicle, in order for the grommet to be fixed into place between the two bottom plates.
- Secure the bottom plates on both sides to the frame using a flange bolt (Figure 10B), a serrated spring washer (Figure 10C) and a nut (Figure 10D).

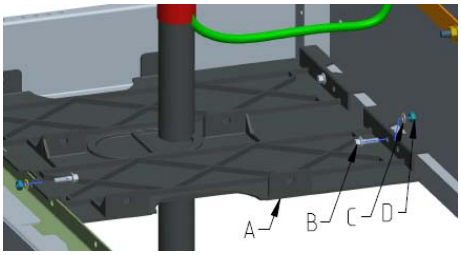


Figure 10

- Mount the cable clamps (Figure 11A) onto the bottom plate and secure them using hexagonal tap bolts (Figure 11C), spring washers (Figure 11B) and flange nut (Figure 11D).
- Fasten the cable securely with a torque of **60 Nm**. Pay special attention to:
  - Connection between cable lug and contact
  - Strain relief of the (capacitive) isolator
  - Accurate cable clamping using cable clamps
- Secure the cable brackets with a torque of **25 Nm**.
- Continue according to these instructions, working towards the door opening in a systematic sequence.
- The circuit breaker can now be placed back into the cubicle, the flexible coppers can be connected to the busbar copper, with a torque of **35 Nm.**

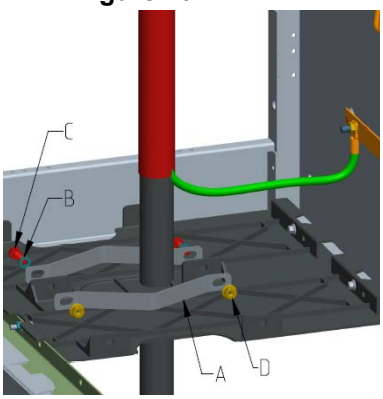


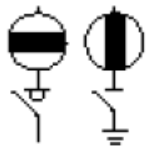
Figure 11

1.2 Assembly instructions for connecting parallel cables

Since the assembly of the bottom plates and the connection of the cables usually occurs hand in hand, the instructions are described here simultaneously.

These instruction allow for an assembly of 2 parallel cables with a section of 400 mm² per cable per phase. By request, provisions for a connection with 2 parallel cables with a section of up to 630 mm² are possible.

1.2.1 Preparations



Ensure that the switchgear in question is entirely voltage-free and earthed.

1.2.2 DF-D and DF-D/EDN type 800A/1250A

The circuit breaker can be withdrawn to allow for an easy and comfortable cable assembly.

- Disassemble the first three floor pans, leaving the last one assembled (Figure 12A).
- Make a circular incisions in the grommet in accordance with the cable section to be connected (Figure 13A).
- Slide the grommet over the cable plug (Figure 14A).

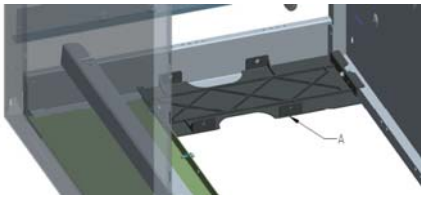


Figure 12

- Mount the cable over the M12 bolt, onto the contact terminal. Place the washer (Figure 13B), the disc spring (Figure 13C) and the nut (Figure 13D).

- Repeat these steps for the connection of the second cable on the contact
- Slide the grommet (Figure 14A) over the cables at the correct height.

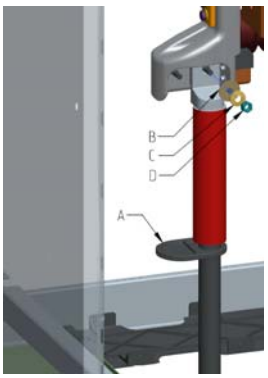


Figure 13

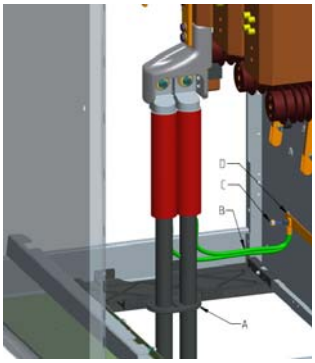


Figure 14

- Connect the earthing cable (Figure 14B) onto the earthing strip (Figure 14D) by means of the nut (Figure 14C).

- Place the second bottom plate (Figure 15A) inside the cubicle, in order for the grommet to be fixed into place between the two bottom plates.
- Secure the bottom plate on both sides to the frame using a flange bolt (Figure 15B), a serrated spring washer (Figure 15C) and a bolt (Figure 15D).

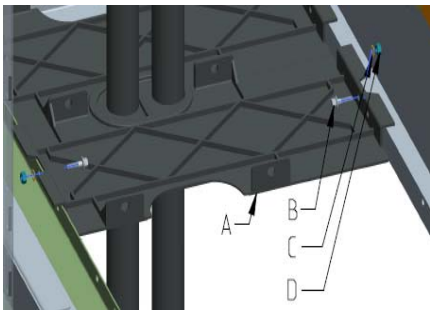


Figure 15

- Mount the cable clamps (Figure 16A) onto the bottom plate and secure them using hexagonal tap bolts (Figure 16B), spring washers (Figure 16C) and flange bolt (Figure 16D).

- Fasten the cable securely with a torque of **60 Nm**. Pay special attention to:
    - Connection between cable lug and contact
    - Strain relief of the (capacitive) isolator
    - Accurate cable clamping using cable clamps

- Secure the cable clamps with a torque of **25 Nm**.

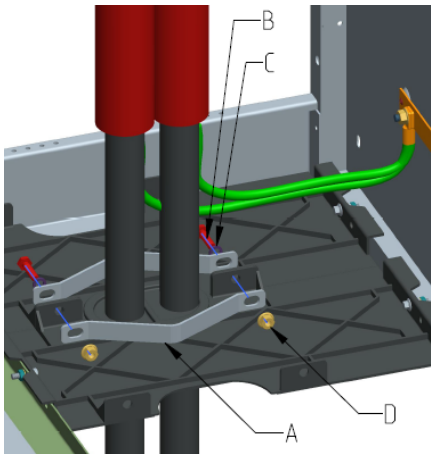


Figure 16

- Continue according to these instructions, working towards the door opening in a systematic sequence.

- The circuit breaker can now be placed back into the cubicle, the flexible tresses can be connected to the earthing copper, with a torque of **35Nm**.

After connecting the all floor pans, grommets and connecting the cables, the door can be placed back onto the cubicle.

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