DF-2

MEDIUM VOLTAGE SWITCHGEAR

THE MODULAR CONCEPT

Installation manual busbar coupler
DF-LKB (+)

READ THIS DOCUMENT CAREFULLY BEFORE ANY OPERATION

SwitchGear Company

THE SPECIALIST IN MEDIUM VOLTAGE SWITCHGEAR

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PREFACE

Introduction

This document is intended as a reference for qualified and trained operators to install 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 DF-2 functions that, mutually coupled and connected, constitute a client-specific transformation or distribution station.

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
Danger of high voltage
Access to this cubicle is only allowed after this cubicle and both the directly adjacent cubicles (previous and next one) are de-energized.

WARNING
Drilling prohibited.
Drilling is strictly prohibited on surfaces equipped with this pictogram.

Pictograms in the documentation

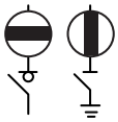
The following pictograms apply to the medium voltage switchgear user documents:

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.

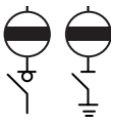
WARNING
High Voltage Danger

CAUTION!
Clamping danger

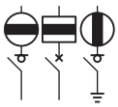
Notes, suggestions and advice.



Make 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.



Make this cubicle, the next one and the previous cubicle, voltage-free, before carrying out the work described. Open the load-break switch and the circuit breaker. Close the earthing switch

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:

- Installation manual DF-2
- User manual DF-2

Service and technical support

For information concerning specific settings, maintenance or repair work which is not covered in the manual, please contact SGC - SwitchGear Company nv.

When contacting SGC – Switchgear Company nv, always provide the following information:

- Cubicle designation and characteristics
- Serial number of the cubicle(s)

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, use, maintenance, or the repair of the medium voltage switchgear and its accompanying options.
Depending on specific user circumstances, or installed 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 following the locally applicable safety directions 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 obey all directions and instructions.
- Never change the order of the required actions.
- Always keep the user manual in the vicinity of 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 lifespan of the medium voltage switchgear.

- Replace or repair unreadable or damaged pictograms, symbols and instruction immediately. Therefore, contact SGC – SwitchGear Company nv.

Operators

The execution of the work described (transport, installation, use and maintenance) is strictly reserved for trained and qualified operators, who are familiar with the dangers that can occur when operating medium voltage switchgear. Temporary staff and personnel in training may not operate the medium voltage switchgear under any circumstances.

Technical specifications

- Technical specifications may 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”

Cubicles that fell over or have otherwise been damaged always HAVE TO BE RETURNED to SGC - SwitchGear Company for a checkup

Intended use

The medium voltage switchgear is designed exclusively for use as transformation or distribution stations, in accordance to the specifications and conditions provided by SGC – SwitchGear Company nv. Any other or further use is not in accordance with the intended use.[1]

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

- Only use the medium voltage switchgear in technically perfect condition, in accordance with the intended use described above.

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

[1] 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.

BUS BAR COUPLER DF-LKB

1 GENERAL INSTALLATION REQUIREMENTS

1.1 Safety guidelines – installation

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" in the DF-2 manual.
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 62271-200).

1.1.2 Recommendations – installation room parameters

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

DF-2 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 nv - SwitchGear Company 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 2200 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 2500 mm.

Dry transformers with a capacity of ≥ 1250 KVA require a minimal height of at least **2500 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. 2200 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 **2000 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” in the DF-2 manual.

If the medium voltage switchgear is to be installed in basements, 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 composition of the medium voltage switchgear.

If the medium voltage switchgear does not contain transformer cubicle(s), the minimum free passage is **1,500 mm** (preferably 2,500 mm). With medium voltage switchgears with a transformer cubicle with a capacity of ≥ 1.000 KVA the free passage must have a minimum of **2,000 mm**.

1.1.2.7 Internal arc resistance

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

- Leave at least 150 mm free between the rear wall of the cubicles and the wall of the installation area. In this way the back plate over pressure system can operate if (unlikely) an internal arc occurs.
- Anchor each bus coupler on top of the medium voltage switchgear using the material supplied.
- Connect the cubicles together using the attachment material supplied.
- Ensure proper fitment of the end panels.

In medium voltage switchgears installed in accordance with the above-described installation procedure, the (unlikely) internal arc will always be limited to the compartment in which it has occurred.

2 UNPACKING

The DF-2 cubicles are packed as standard in protective foil and mounted on a euro pallet. The most suitable place for unpacking the cubicles is of course the definitive installation area.

- Clip or cut the straps securing the cubicle to the pallet.
- Carefully remove the protection foil.
- Check against the delivery receipt that the cubicle is complete.
- Check the cubicle for any (transportation) damage.
- Additionally, a “Shockwatch” is attached to the cubicle. If the “Shockwatch” indicator is red upon delivery, it must be returned to SGC nv - SwitchGear Company for inspection.

If parts are missing or damaged, contact the conveyor or SGC nv - SwitchGear Company. Seriously damaged cubicles must always be returned to SGC nv - SwitchGear Company.

- Carefully lift the cubicle off the pallet.

CAUTION

The cubicles are fitted with lifting eyes if requested. If you use these lifting devices, use suitable hoisting and lifting machinery in perfect condition and with sufficient hoisting capacity only. Observe the applicable safety precautions. The handling and operating of hoisting or lifting machinery is restricted to experienced staff within the visible and shouting range of the operator of the hoisting or lifting machinery.

- Remove the pallet.
- Remove the access panels.
- Place the loose access panels where there is no risk of it being damaged.
- Repeat the above steps for each individual cubicle.
- If necessary, disassemble the end panels that have been fitted to one of the cubicles.

After the packaging material is disposed in accordance with the applicable directives, the installation of the cubicles can be started.

3 INSTALLATION GUIDELINES

3.1 Switchgear arrangement

3.1.1 Busbar coupler mounted on top of two DF-A(+) cubicles

When a busbar coupler DF-LKB is mounted on top of two incoming/cable cubicles type DF-A(+), the busbar coupler will have a width of 1.000mm. The busbar coupler will occupy the entire roof area of the two cubicles.

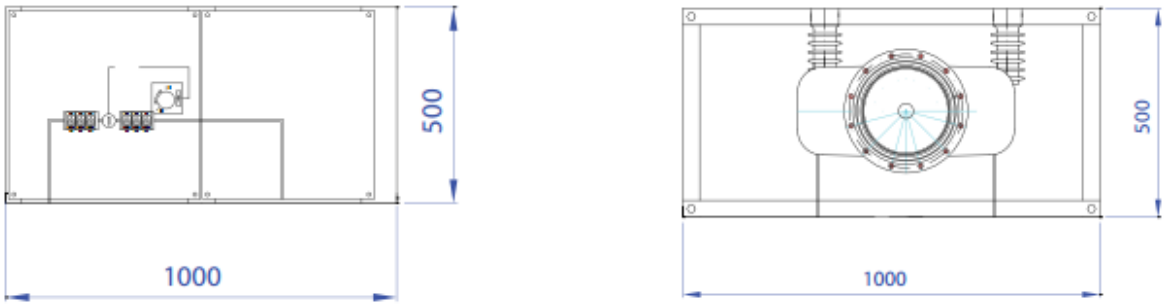


Figure 1: DF-LKB(+) on top of two DF-A(+)

3.1.2 Busbar coupler mounted on top of a DF-A(+) and DF-D(+) cubicle

When a busbar coupler DF-LKB(+) is mounted on top of one incoming/cable cubicle type DF-A(+) and one protection cubicle with vacuum circuit breaker type DF-D(+), the busbar coupler will have a width of 1.250mm. The busbar coupler will occupy the entire roof area of the two cubicles.

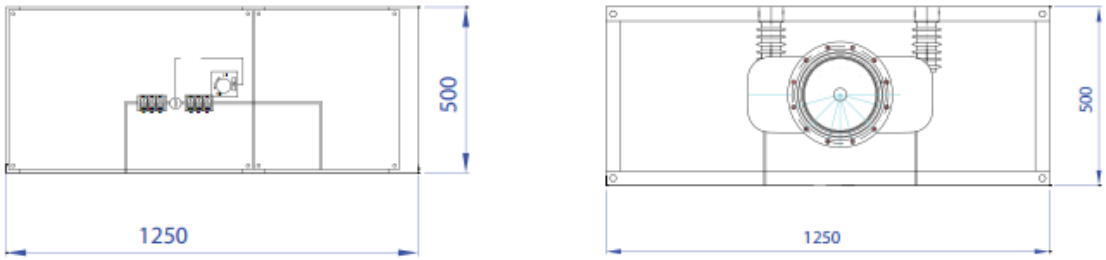


Figure 2: DF-LKB(+) on top of DF-A(+) and DF-D(+)

3.1.3 Busbar coupler mounted on top of two DF-D(+) cubicles

When a busbar coupler DF-LKB(+) is mounted on top two protection cubicle with vacuum circuit breaker type DF-D(+), the busbar coupler will have a width of 1.250mm. The busbar coupler will not occupy the entire roof area of the two cubicles, an additional roof having a width of 250mm for the left hand cubicle will be supplied.

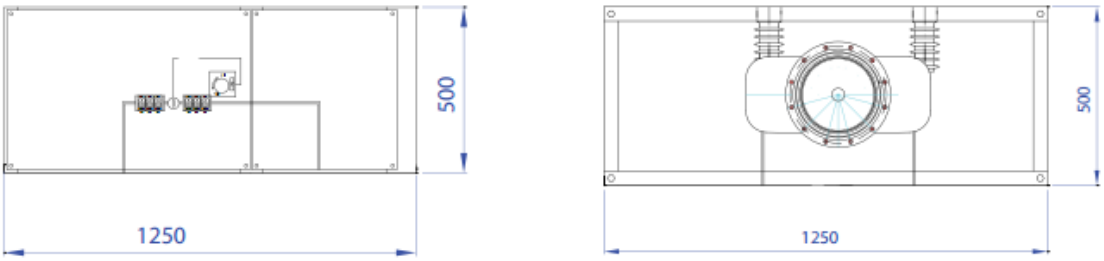


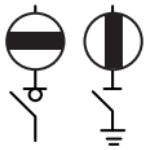
Figure 3: DF-LKB(+) on top of two DF-D(+)

3.2 Cubicle assembly

3.2.1 Busbar coupler mounted on top of two DF-A(+) cubicles

3.2.1.1 Preparation

The following preparations must be made before starting to assemble the cubicle.



- Ensure that the cubicle, the next one, and the previous one are de-energized and earthed
- Ensure that the bus bar is de-energized.

3.2.1.2 Positioning on the busbar coupler

The DF-A(+) medium-voltage switchgears should be installed perfectly level and need to be anchored, as described in the DF-2 manual prior to positioning the busbar coupler DF-LKB.

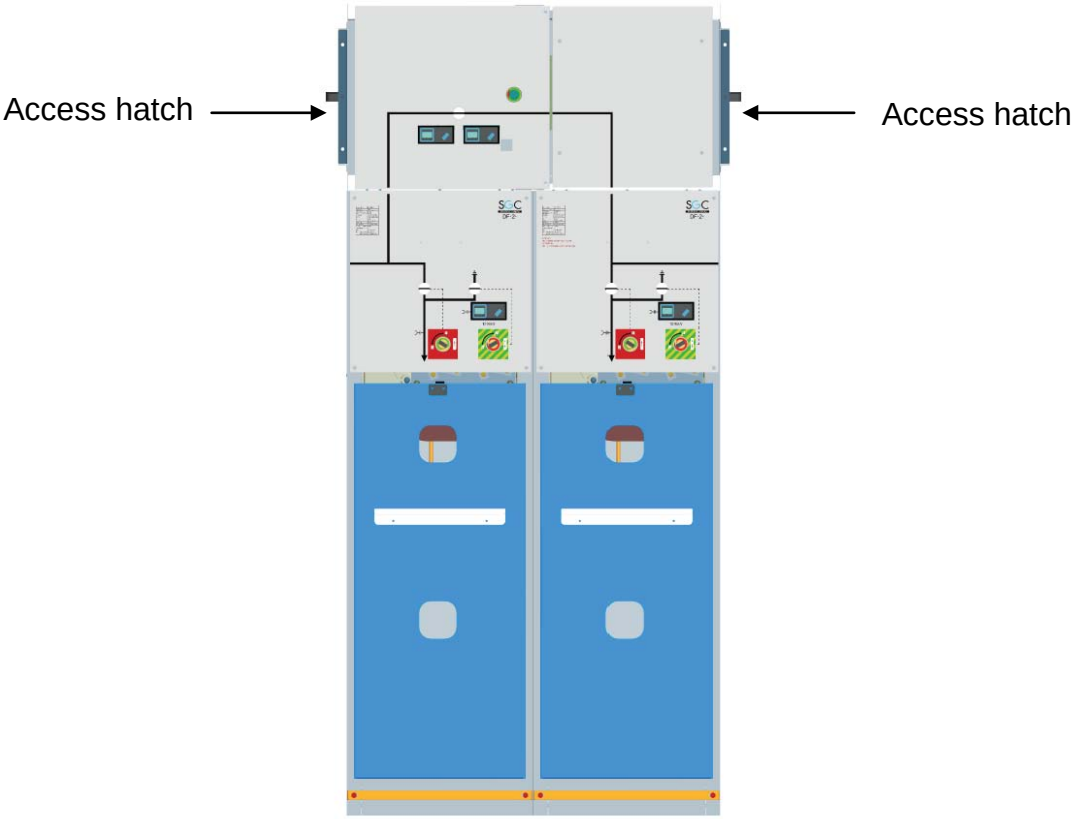


Figure 4: Positioning of the bus bar coupler DF-LKB on top of two DF-A(+) cubicles

3.2.1.3 Disassembly of the access hatches

In order to have access to the bus bar and the fixation points of the cubicle, the access hatches on both sides should be disconnected. Therefore, the self-securing hexagon flange bolts (A) and self-securing flange nuts (B) should be loosened (Figure 5). The access hatch can now be removed (Figure 6).

Figure 5: Disassembly of the access hatch

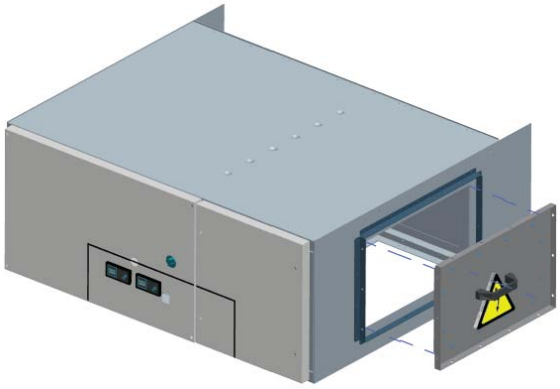


Figure 6: Remove access hatch

3.2.1.4 Anchoring busbar coupler DF-LKB

The fasteners for anchoring the busbar coupler DF-LKB are supplied with the corresponding cubicle.

The busbar coupler DF-LKB must be anchored, on top of the right DF-A(+) cubicle, by means of 5 self-drilling hexagon head screw (A) along the right side panel and by means of 3 self-drilling hexagon head screw (A) along the rear side of the cubicle. Repeat the above steps for the left hand side, on top of the left DF-A(+) cubicle.

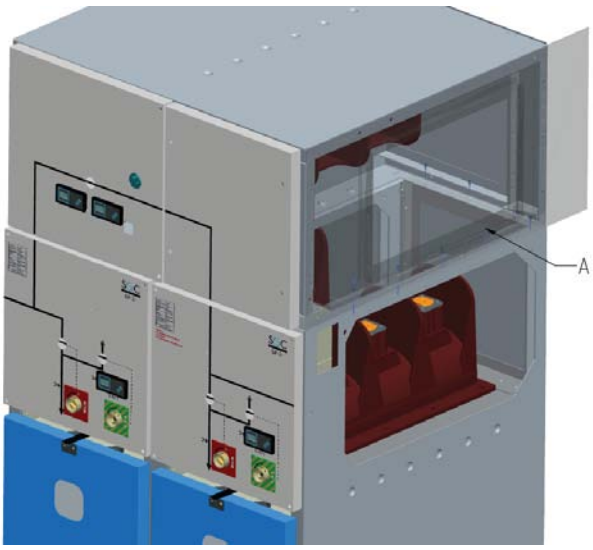


Figure 7: Anchoring DF-LKB (right hand side)

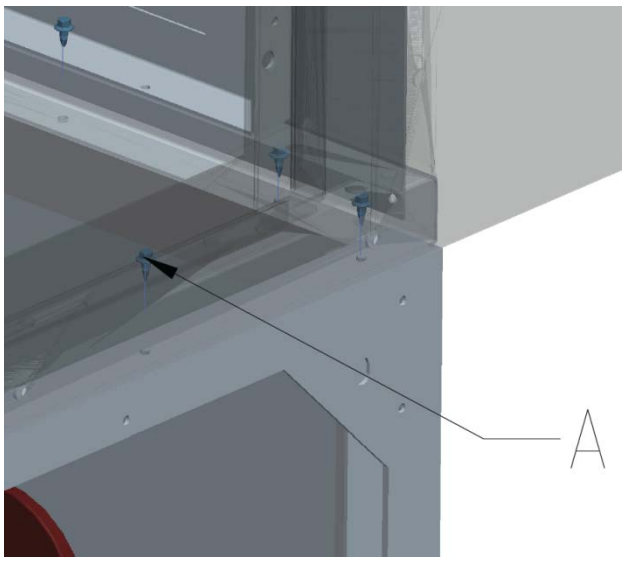


Figure 8: Detail anchoring DF-LKB

3.2.1.5 Installation of the busbars

3.2.1.5.1 Installation of the busbar on the right hand side

To be able to install the busbar of the bus coupler DF-LKB, one should first place the busbar between the adjacent cubicles (Figure 9-A) and if required a CU-spacer.

- Place the busbars (Figure 9-B) against the copper contacts of the load break switch.
- Attach the busbars using the fitting material supplied:
  - Hexagon tap bolts M12x35 (Figure 9-E)
  - Lock washers Ø M12 (Figure 9-D)
  - Flat washers Ø M12 (Figure 9-C)
- Set the hexagon tap bolts to a torque of 35 Nm.
- Repeat the above steps for the remaining two phases.
- The fixation of the busbar onto the DF-A(+) cubicle should be performed like described in the DF-2 manual.

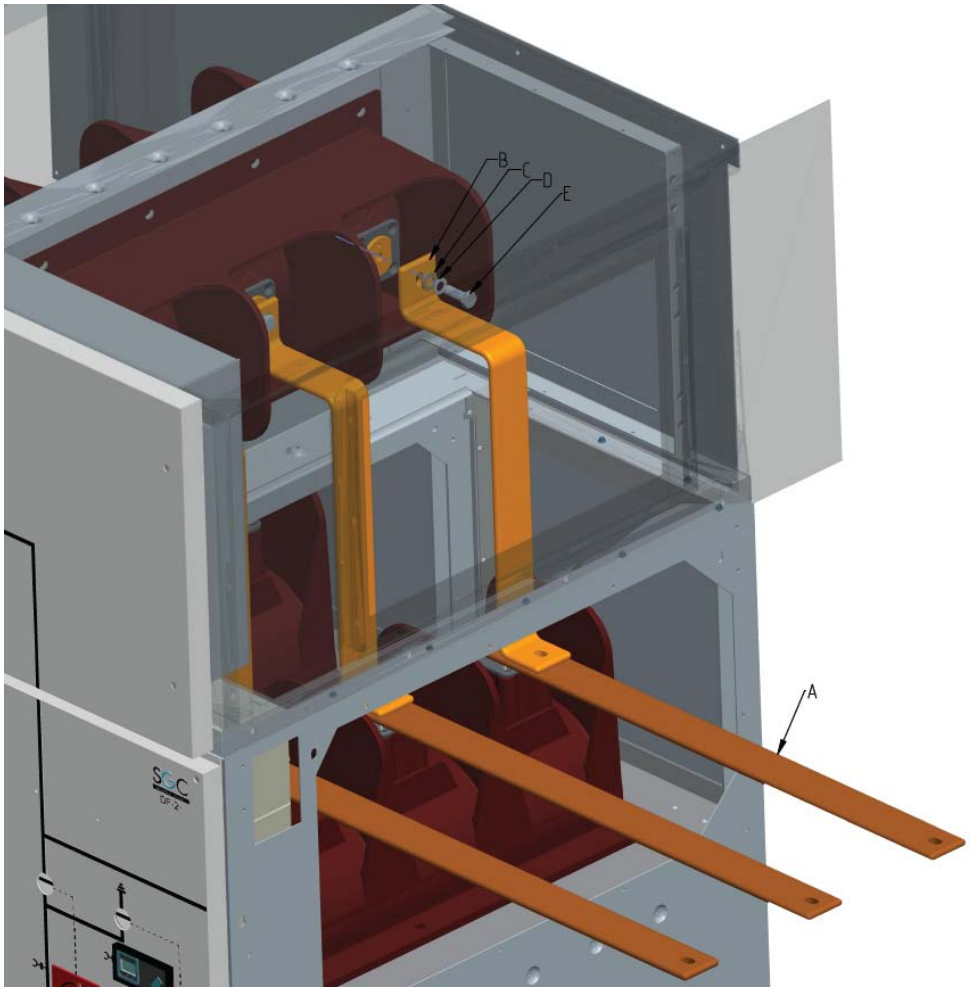


Figure 9: Installation of bus bar (right hand side)

3.2.1.5.2 Installation of the busbar on the left hand side

To be able to install the busbar of the bus coupler DF-LKB, one should first place the busbar between the adjacent cubicles (Figure 10-A) and if required a CU-spacer.

- Place the busbars (Figure 10-B) against the copper contacts of the load break switch.
- Attach the busbars using the fitting material supplied:
  - Hexagon tap bolts M12x35 (Figure 10-E)
  - Lock washers Ø M12 (Figure 10-D)
  - Flat washers Ø M12 (Figure 10-C)
- Set the hexagon tap bolts to a torque of 35 Nm.
- Repeat the above steps for the remaining two phases.
- The fixation of the busbar onto the DF-A(+) cubicle should be performed like described in the DF-2 manual.

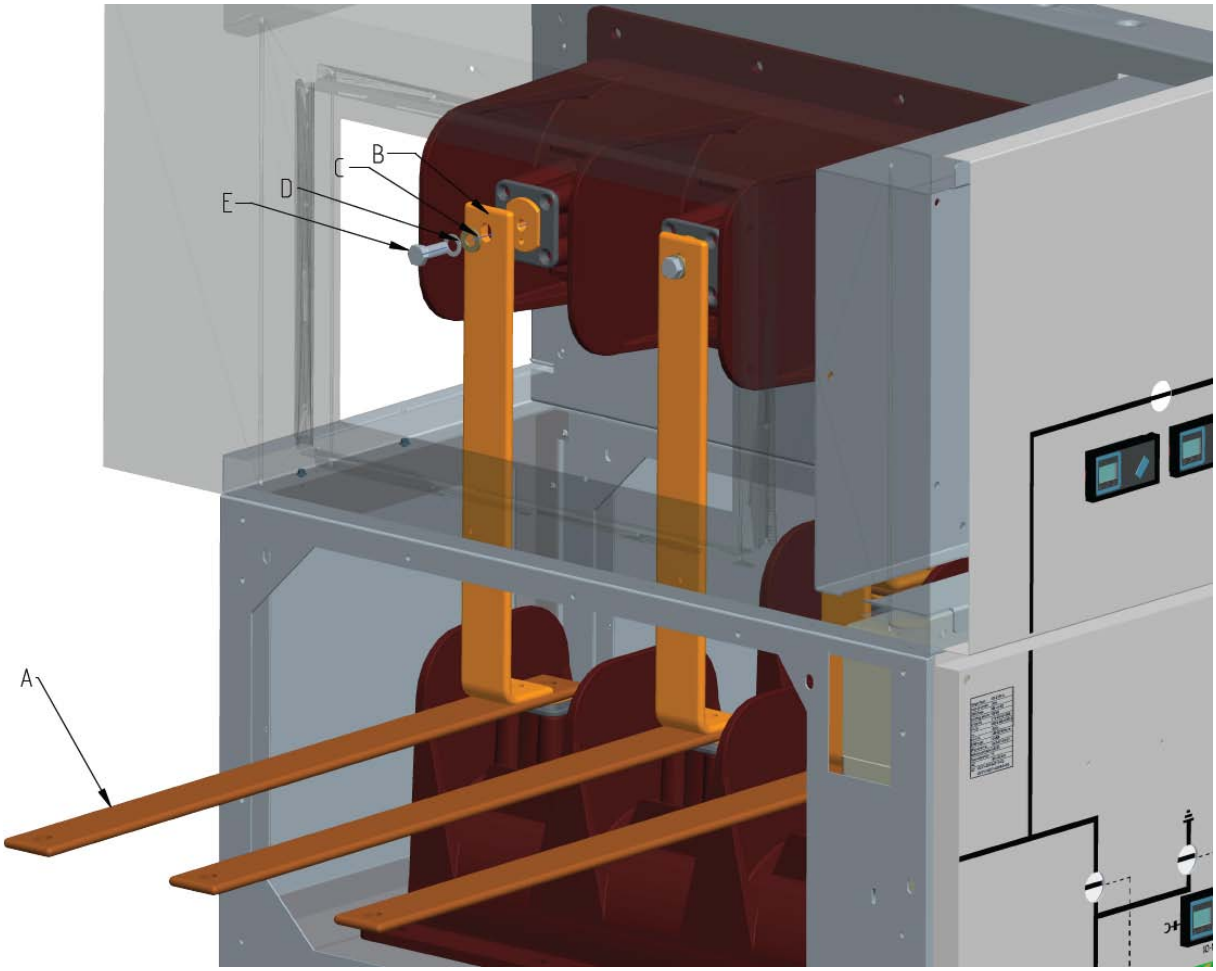


Figure 10: Installation of bus bar (left hand side)

3.2.1.6 Assembly of the earthing connection

An earthing cable is attached to the bottom right of the busbar coupler DF-LKB. This earthing cable should be guided through the opening in the LV-compartment and transferred to the cubicle below (Figure 11).

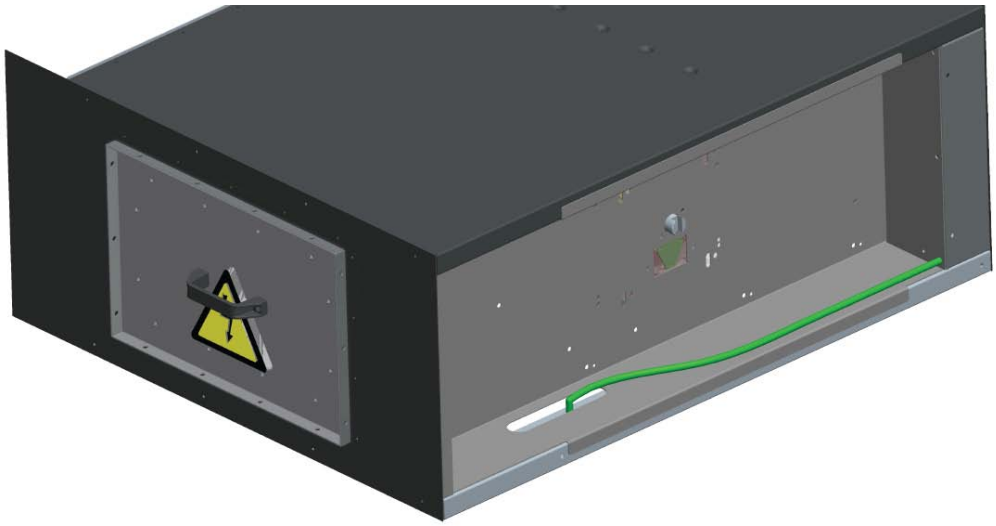


Figure 11: Earthing cable guide through opening in LV-compartment

When the busbar coupler is mounted onto two DF-A(+) cubicles, the earthing cable should be attached to the copper earthing bar on the left side panel of the left DF-A (+) cubicle (Figure 12).

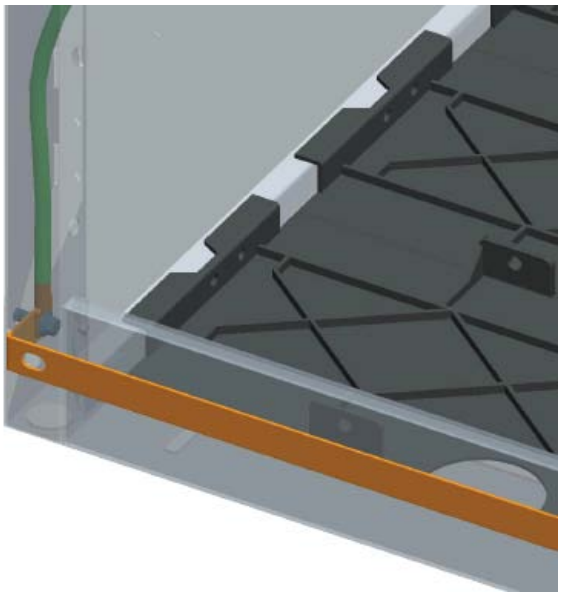


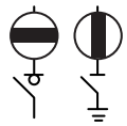
Figure 12: Fixation of the earthing cable in the below cubicle

3.2.2 Busbar coupler mounted on top of a DF-A(+) and DF-D(+) cubicle

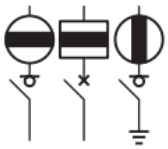
3.2.2.1 Preparation

The following preparations must be made before starting to assemble the cubicle.

Make that the entire medium voltage switchgear and the circuit breaker is de-energized and grounded.



- Ensure that the cubicle, the next one, and the previous one are de-energized and earthed
- Ensure that the bus bar is de-energized.



- Open both the load-break switch and the circuit breaker.
- The HV cable connection should be de-energized as well.
- Close the earthing switch on the particular unit.
- Ensure that the bus bar is de-energized.

3.2.2.2 Positioning on the busbar coupler

The DF-A(+) and DF-D(+) medium-voltage switchgears should be installed perfectly level and need to be anchored, as described in the DF-2 manual prior to positioning the busbar coupler DF-LKB.

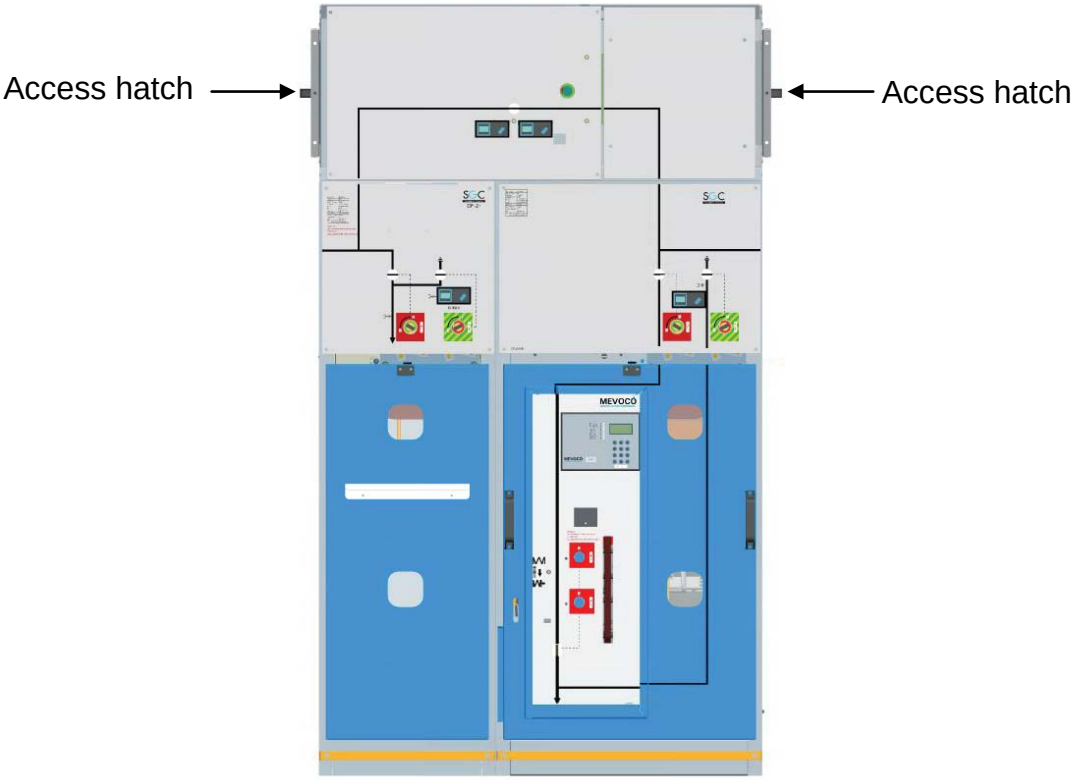


Figure 13: Positioning of the bus bar coupler DF-LKB on top of a DF-A(+) and DF-D (+) cubicle

3.2.2.3 Disassembly of the access hatches

In order to have access to the bus bar and the fixation points of the cubicle, the access hatches on both sides should be disconnected. Therefore, the self-securing hexagon flange bolts (A) and self-securing flange nuts (B) should be loosened (Figure 14). The access hatch can now be removed (Figure 15).

Figure 14: Disassembly of the access hatch

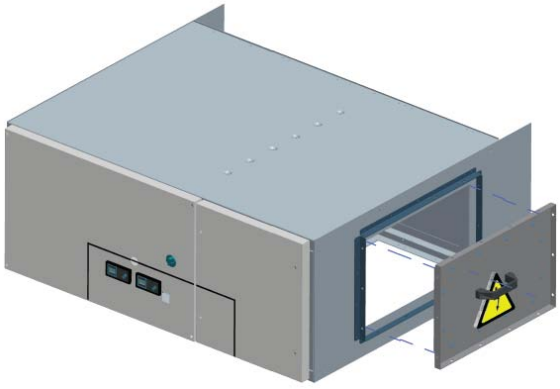


Figure 15: Remove access hatch

3.2.2.4 Anchoring busbar coupler DF-LKB

The fasteners for anchoring the busbar coupler DF-LKB are supplied with the corresponding cubicle.

The busbar coupler DF-LKB must be anchored, on top of the DF-D(+) cubicle, by means of 5 self-drilling hexagon head screw (A) along the right side panel and by means of 3 self-drilling hexagon head screw (A) along the rear side of the cubicle. Repeat the above steps for the left hand side, on top of the DF-A(+) cubicle.

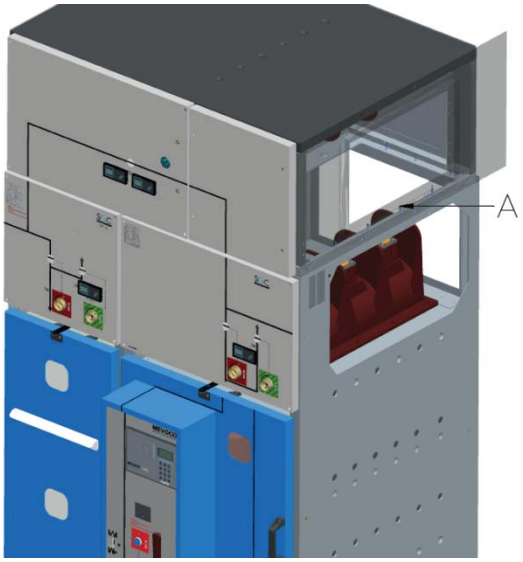


Figure 16: Anchoring DF-LKB (right hand side)

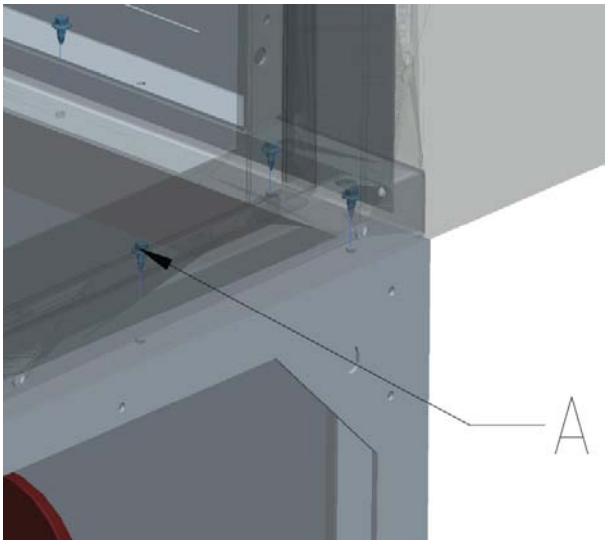


Figure 17: Detail anchoring DF-LKB

3.2.2.5 Installation of the busbars

3.2.2.5.1 Installation of the busbar on the right hand side

To be able to install the busbar of the bus coupler DF-LKB, one should first place the busbar between the adjacent cubicles (Figure 18-A) and if required a CU-spacer.

- Place the busbars (Figure 18-B) against the copper contacts of the load break switch.
- Attach the busbars using the fitting material supplied:
  - Hexagon tap bolts M12x35 (Figure 18-E)
  - Lock washers Ø M12 (Figure 18-D)
  - Flat washers Ø M12 (Figure 18-C)
- Set the hexagon tap bolts to a torque of 35 Nm.
- Repeat the above steps for the remaining two phases.
- The fixation of the busbar onto the DF-D(+) cubicle should be performed like described in the DF-2 manual.

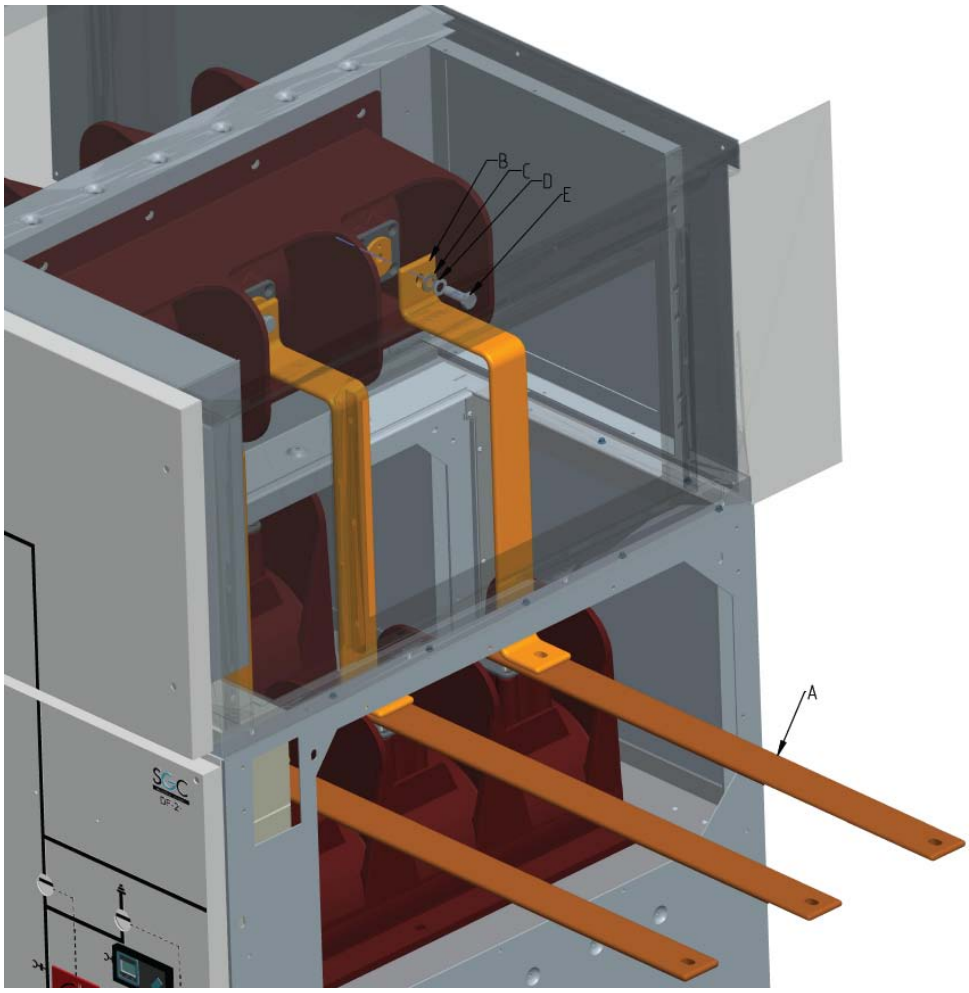


Figure 18: Installation of bus bar (right hand side)

3.2.2.5.2 Installation of the busbar on the left hand side

To be able to install the busbar of the bus coupler DF-LKB, one should first place the busbar between the adjacent cubicles (Figure 19-A) and if required a CU-spacer.

- Place the busbars (Figure 19-B) against the copper contacts of the load break switch.
- Attach the busbars using the fitting material supplied:
  - Hexagon tap bolts M12x35 (Figure 19-E)
  - Lock washers Ø M12 (Figure 19-D)
  - Flat washers Ø M12 (Figure 19-C)
- Set the hexagon tap bolts to a torque of 35 Nm.
- Repeat the above steps for the remaining two phases.
- The fixation of the busbar onto the DF-A(+) cubicle should be performed like described in the DF-2 manual.

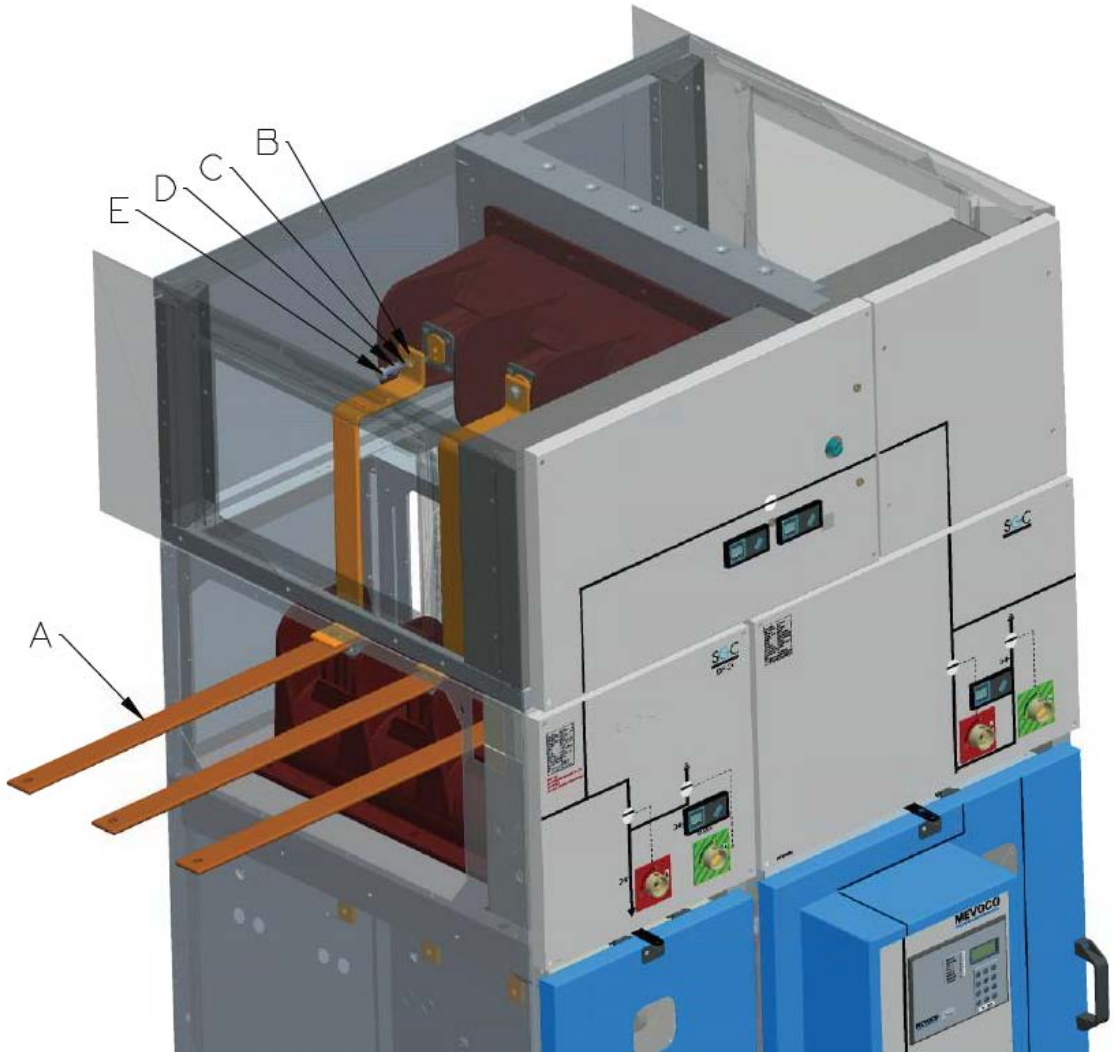


Figure 19: Installation of bus bar (left hand side)

3.2.2.6 Assembly of the earthing connection

An earthing cable is attached to the bottom right of the busbar coupler DF-LKB. This earthing cable should be guided through the opening in the LV-compartment and transferred to the cubicle below (Figure 20).

Figure 20: Earthing cable guide through opening in LV-compartment

When the busbar coupler is mounted onto a DF-A(+) and a DF-D(+) cubicle, the earthing cable should be attached to the copper earthing bar on the right side panel of the left DF-A (+) cubicle (Figure 21).

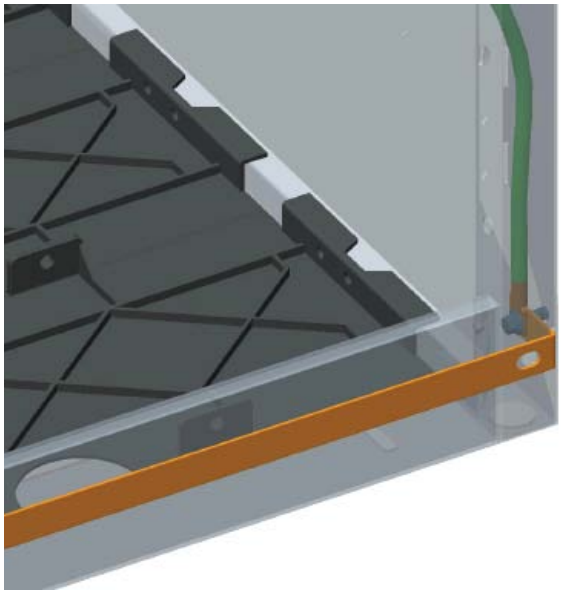


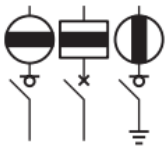
Figure 21: Fixation of the earthing cable in the below cubicle

3.2.3 Busbar coupler mounted on top of two DF-D(+) cubicles

3.2.3.1 Preparation

The following preparations must be made before starting to assemble the cubicle.

Make that the entire medium voltage switchgear and the circuit breaker is de-energized and grounded.



- Open both the load-break switch and the circuit breaker.
- The HV cable connection should be de-energized as well.
- Close the earthing switch on the particular unit.
- Ensure that the bus bar is de-energized.

3.2.3.2 Positioning on the busbar coupler

The DF-D(+) medium-voltage switchgears should be installed perfectly level and need to be anchored, as described in the DF-2 manual prior to positioning the busbar coupler DF-LKB.

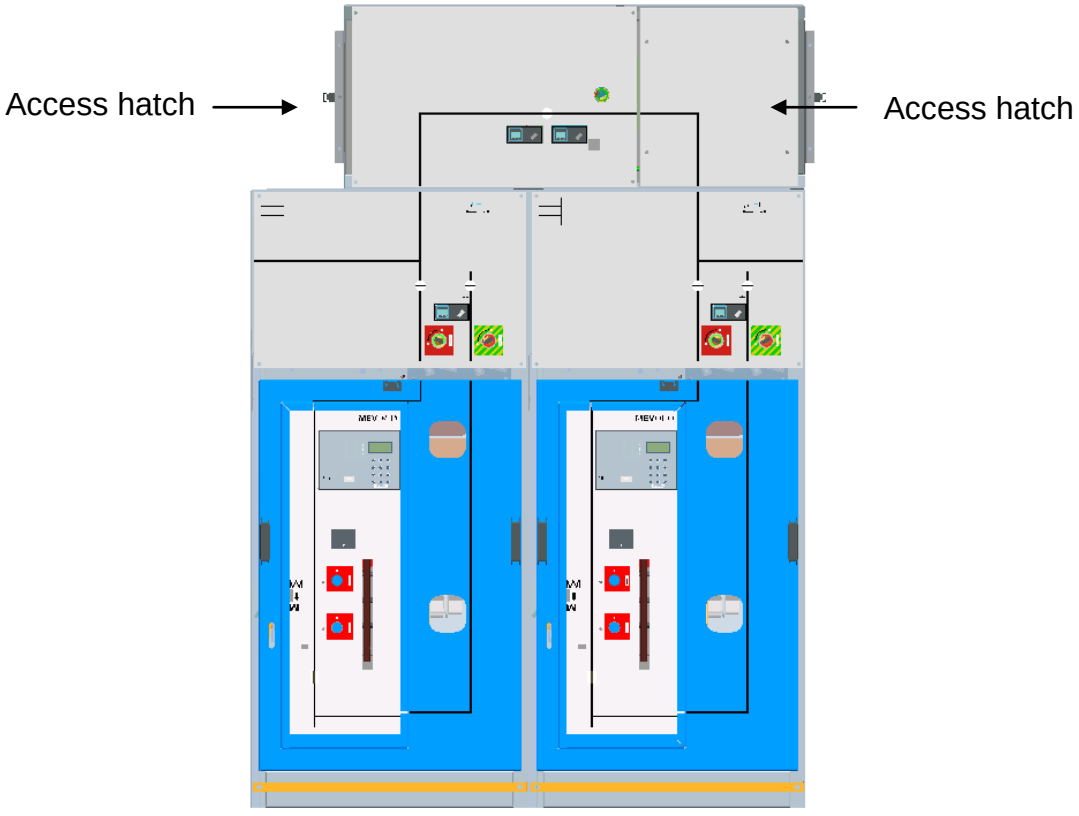


Figure 22: Positioning of the bus bar coupler DF-LKB on top of two DF-D (+) cubicle

3.2.3.3 Disassembly of the access hatches

In order to have access to the bus bar and the fixation points of the cubicle, the access hatches on both sides should be disconnected. Therefore, the self-securing hexagon flange bolts (A) and self-securing flange nuts (B) should be loosened (Figure 23). The access hatch can now be removed (Figure 24).

Figure 23: Disassembly of the access hatch

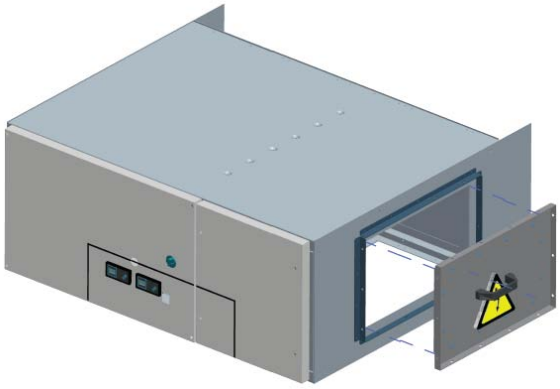


Figure 24: Remove access hatch

3.2.3.4 Anchoring busbar coupler DF-LKB

The fasteners for anchoring the busbar coupler DF-LKB are supplied with the corresponding cubicle.

The busbar coupler DF-LKB must be anchored, on top of the DF-D(+) cubicle, by means of 5 self-drilling hexagon head screw (A) along the right side panel and by means of 3 self-drilling hexagon head screw (A) along the rear side of the cubicle. Along the left side of the busbar coupler DF-LKB should be anchored by means of 2 self-drilling hexagon head screw (A) along the rear side of the cubicle

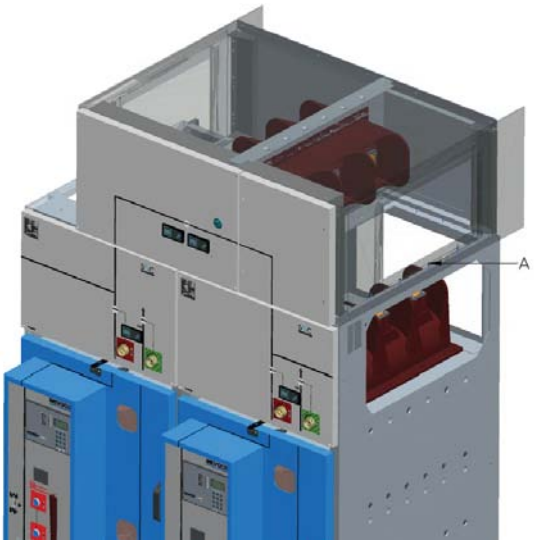


Figure 25: Anchoring DF-LKB (right hand side)

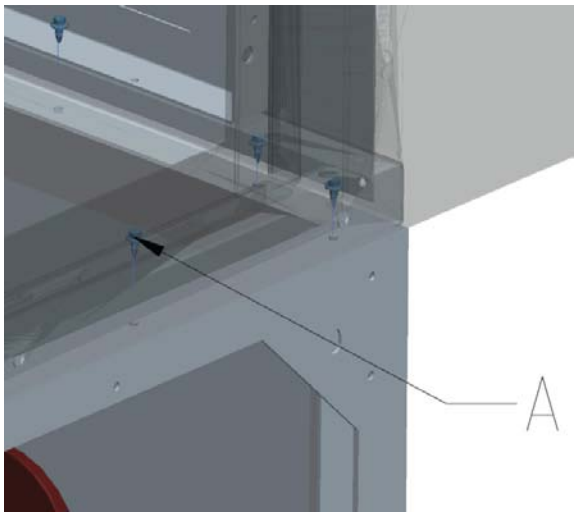


Figure 26: Detail anchoring DF-LKB

3.2.3.5 Installation of the busbars

3.2.3.5.1 Installation of the busbar on the right hand side

To be able to install the busbar of the bus coupler DF-LKB, one should first place the busbar between the adjacent cubicles (Figure 27-A) and if required a CU-spacer.

- Place the busbars (Figure 27-B) against the copper contacts of the load break switch.
- Attach the busbars using the fitting material supplied:
  - Hexagon tap bolts M12x35 (Figure 27-E)
  - Lock washers Ø M12 (Figure 27-D)
  - Flat washers Ø M12 (Figure 27-C)
- Set the hexagon tap bolts to a torque of 35 Nm.
- Repeat the above steps for the remaining two phases.
- The fixation of the busbar onto the DF-D(+) cubicle should be performed like described in the DF-2 manual.

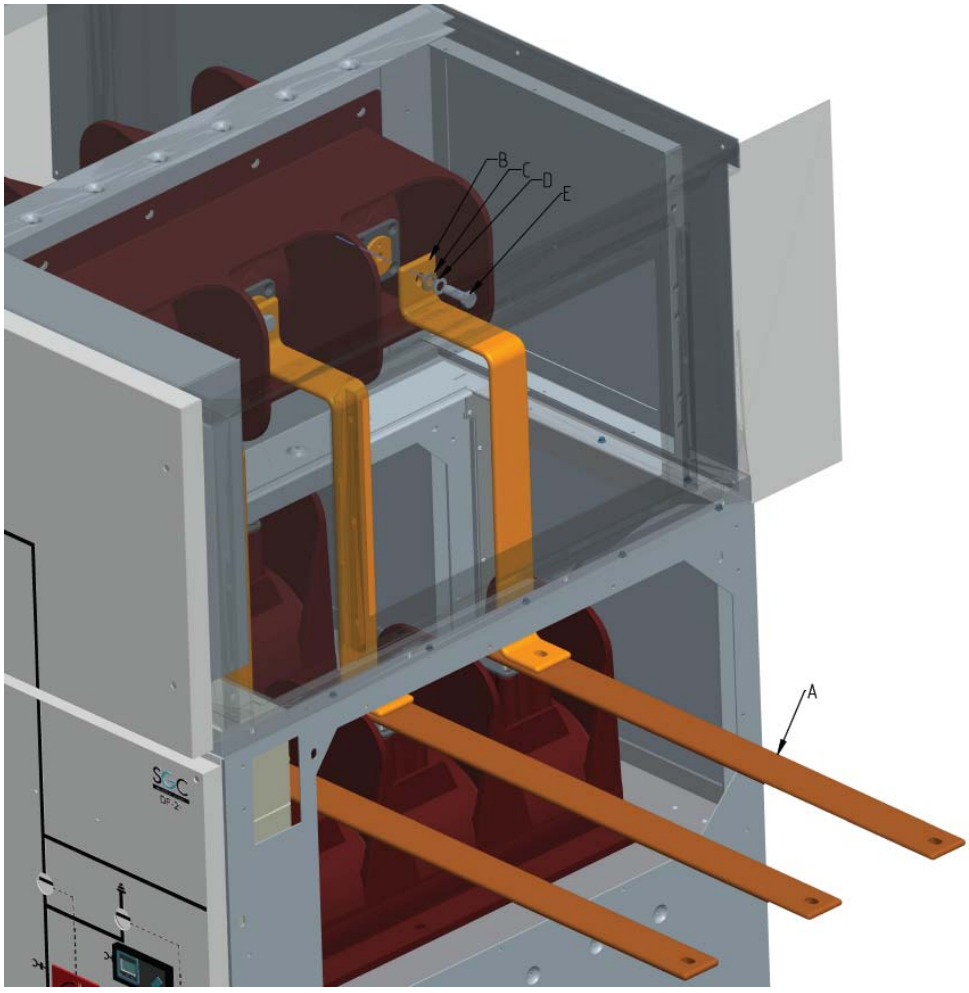


Figure 27: Installation of bus bar (right hand side)

3.2.3.5.2 Installation of the busbar on the left hand side

To be able to install the busbar of the bus coupler DF-LKB, one should first place the busbar between the adjacent cubicles (Figure 28-A) and if required a CU-spacer.

- Place the busbars (Figure 28-B) against the copper contacts of the load break switch.
- Attach the busbars using the fitting material supplied:
  - Hexagon tap bolts M12x35 (Figure 28-E)
  - Lock washers Ø M12 (Figure 28-D)
  - Flat washers Ø M12 (Figure 28-C)
- Set the hexagon tap bolts to a torque of 35 Nm.
- Repeat the above steps for the remaining two phases.
- The fixation of the busbar onto the DF-D(+) cubicle should be performed like described in the DF-2 manual.

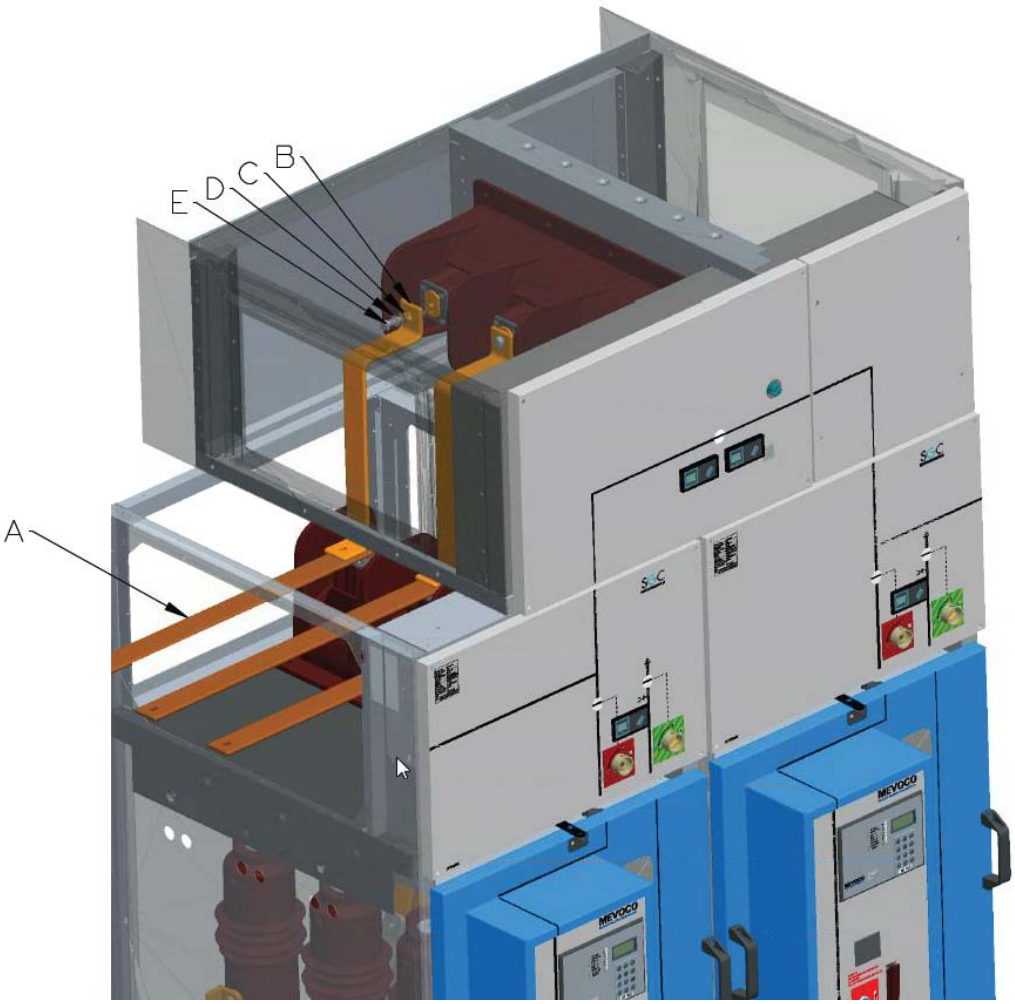


Figure 28: Installation of bus bar (left hand side)

3.2.3.6 Installation of the additional roof panel

The fasteners for anchoring the roof panel on top of the DF-D(+) are supplied with the corresponding cubicle.

The roof panel on top of the left DF-D(+) cubicle (Figure 29-A) must be anchored by means of 6 self-drilling hexagon head screw (Figure 29-B) along the left side panel and by means of 1 self-drilling hexagon head screw (Figure 29-B) along the rear side of the cubicle.
The front side of the roof panel should be fixed by using the M8 RIPP self-locking hexagonal flange bolt (Figure 29-C) and the M8 RIPP hexagonal flange nut (Figure 29-D).

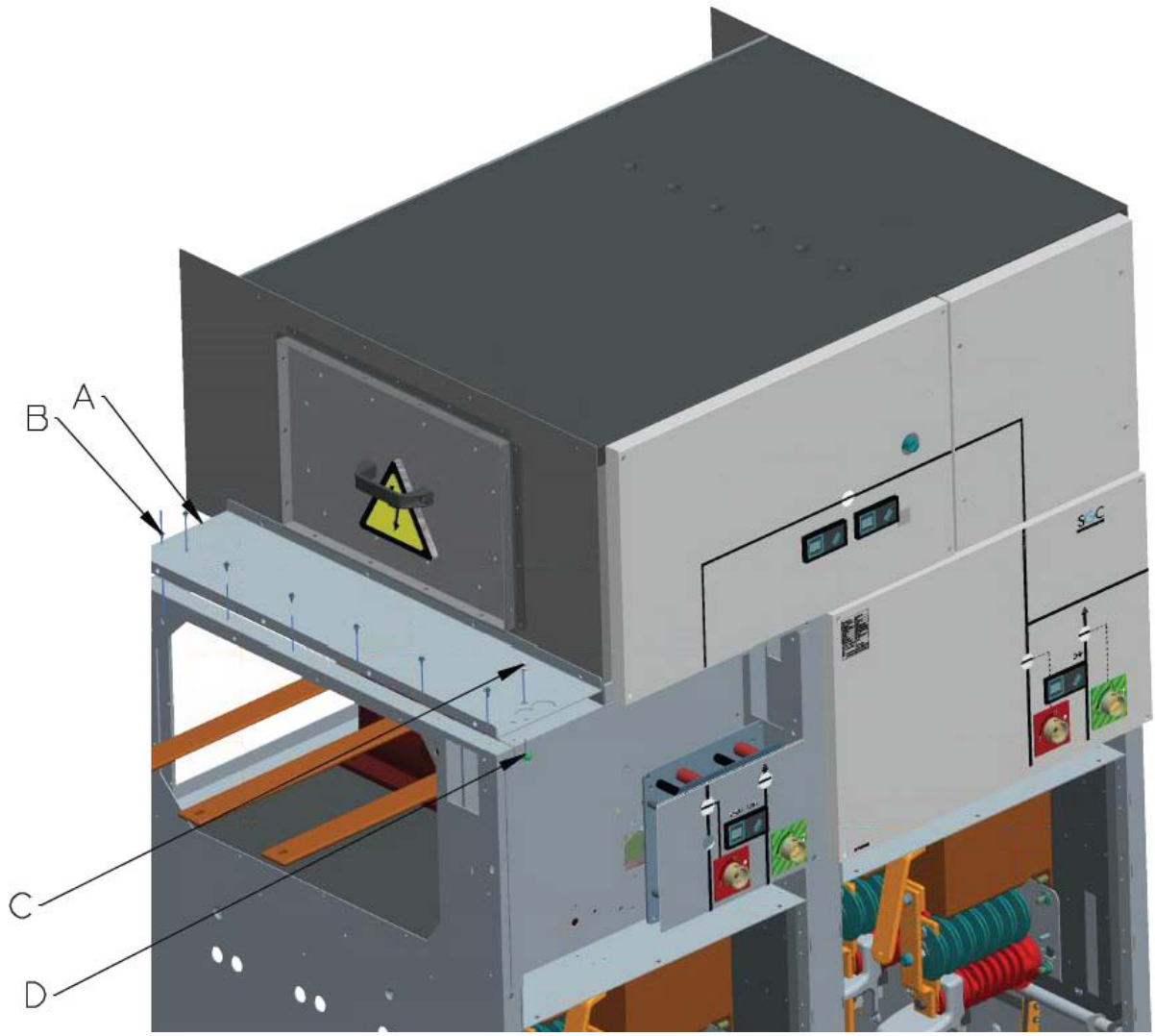


Figure 29: Mounting roof

3.2.3.7 Assembly of the earthing connection

An earthing cable is attached to the bottom right of the busbar coupler DF-LKB. This earthing cable should be guided through the opening in the LV-compartment and transferred to the cubicle below (Figure 30).

Figure 30: Earthing cable guide through opening in LV-compartment

When the busbar coupler is mounted onto two DF-D(+) cubicles, the earthing cable should be attached to the copper earthing bar on the left side panel of the right DF-D (+) cubicle (Figure 31).

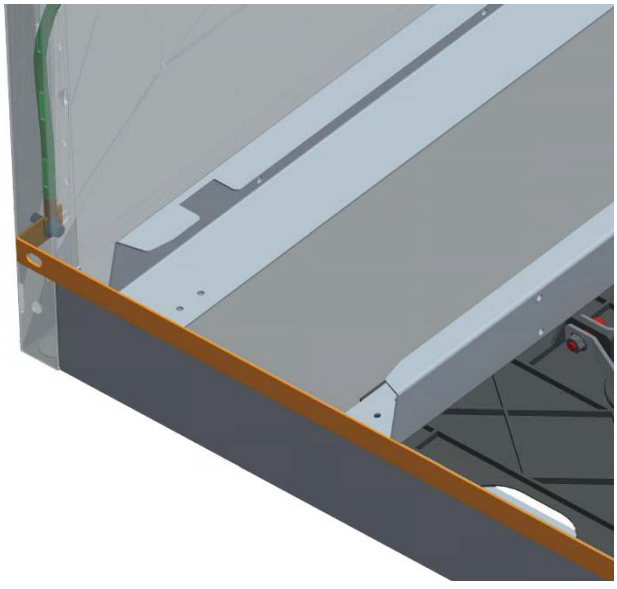


Figure 31: Fixation of the earthing cable in the below cubicle

4 INITIAL COMMISSIONING

The actual connection to the MV grid and the initial commissioning of the medium voltage switchgear can be done by qualified and trained staff employed by the power supply company only, observing the locally applicable safety regulations.

Notes: