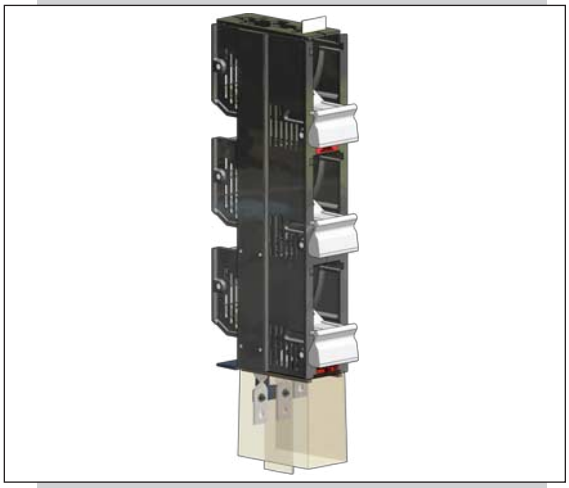
B843

Mounting and operating instructions for

DRIESCHER Low voltage - fused- switch disconnector system 403

Rated current 400 up to 1445 A



ELEKTROTECHNISCHE WERKE
FRITZ DRIESCHER & SÖHNE GMBH
D-85366 MOOSBURG • PHONE +49 87 61 6 81-0 • FAX +49 87 61 68 11 37
http://www.driescher.de infoservice@driescher.de

Table of Contents

Table of contents

CE

CE marking
The DRIESCHER low-voltage products are subject to the CE marking requirement in connection with the Low Voltage Directive 2006/95/EC.
The CE mark is applied to the individual packaging units.
In doing so, DRIESCHER confirms that the products comply with the applicable regulations.
The corresponding declarations of conformity are stored with DRIESCHER.

1 Introduction

Thank you for choosing one of our products. We hope it gives you many hours of successful and problem-free operation.

The low-voltage-fused switch disconnector system 403 has been specially designed and manufactured to meet your requirements.

Do you have any questions you would like to ask us? We look forward to hearing from you.

1.1 Notes on this manual

1.1.1 General note

This operating and maintenance manual contains all information and descriptions required to operate the Earthing switch. This document was created with the utmost care. Any suggestions or comments would be gratefully received.
To make the instructions in this manual easier to follow, the descriptions are accompanied by figures and schematic diagrams of the switching device or its assemblies.

1.1.2 Use of symbols / legend

The following symbols are used in this manual in addition to the warning notices outlined in the chapter Safety:

WARNING: Warns of danger to people. Failure to comply with the warning indicated by this symbol will result in severe injuries.

Warns against damage to property and personal injury caused by mechanical com ponents. Failure to comply with the indications marked with this symbol will result in serious injuries.

Warns against damage to property and personal injury caused by electrical voltage or arc. Failure to comply with the indications marked with this symbol will result in serious injuries.

Caution: Failure to comply with the warning indicated by this symbol could result in injuries.

Attention: Warns of possible material damageor malfunctions. Technical information requiring particular attention.

1.2 Product description

1.2.1 General

The low voltage-fused-switch disconnector system 403 has been specially designed and manufactured to meet the requirements of our customers. They have been in trouble-free use for years.
The correct choice of busbars and components is the responsibility of the operator and operator of the new standard IEC or DIN EN 61439 describes as a successor standard to DIN EN 60439 the design and inspection specifications for low-voltage switchgear combinations, where planning, construction requirements and the required type-approvals are prescribed. In order to safely eliminate hazards for people and goods when handling electrical energy, the expert handling of the equipment and compliance with the applicable regulations is generally required.
Installation and maintenance work, modifications and retrofitting may only be carried out by qualified personnel in compliance with the general installation and safety regulations for work on power plants (including 5 safety rules). The state of the technology and the impairments of the components among themselves must be taken into account. In general, it is important to ensure that all touchable components are switched off without voltage during maintenance measures.
In addition, it is necessary to ensure that the screw connections are made with the prescribed tightening torques, that the respective fittings are used and that the elements for contact protection are fully available
The low voltage-fused-switch disconnector system shall be used and operated according to the intended use.
We would like to point out that the technical description in the product brochure as well as the assembly instructions must always be observed and stored for maintenance work, modifications and retrofits.
Modifications for further development and technical progress are reserved.

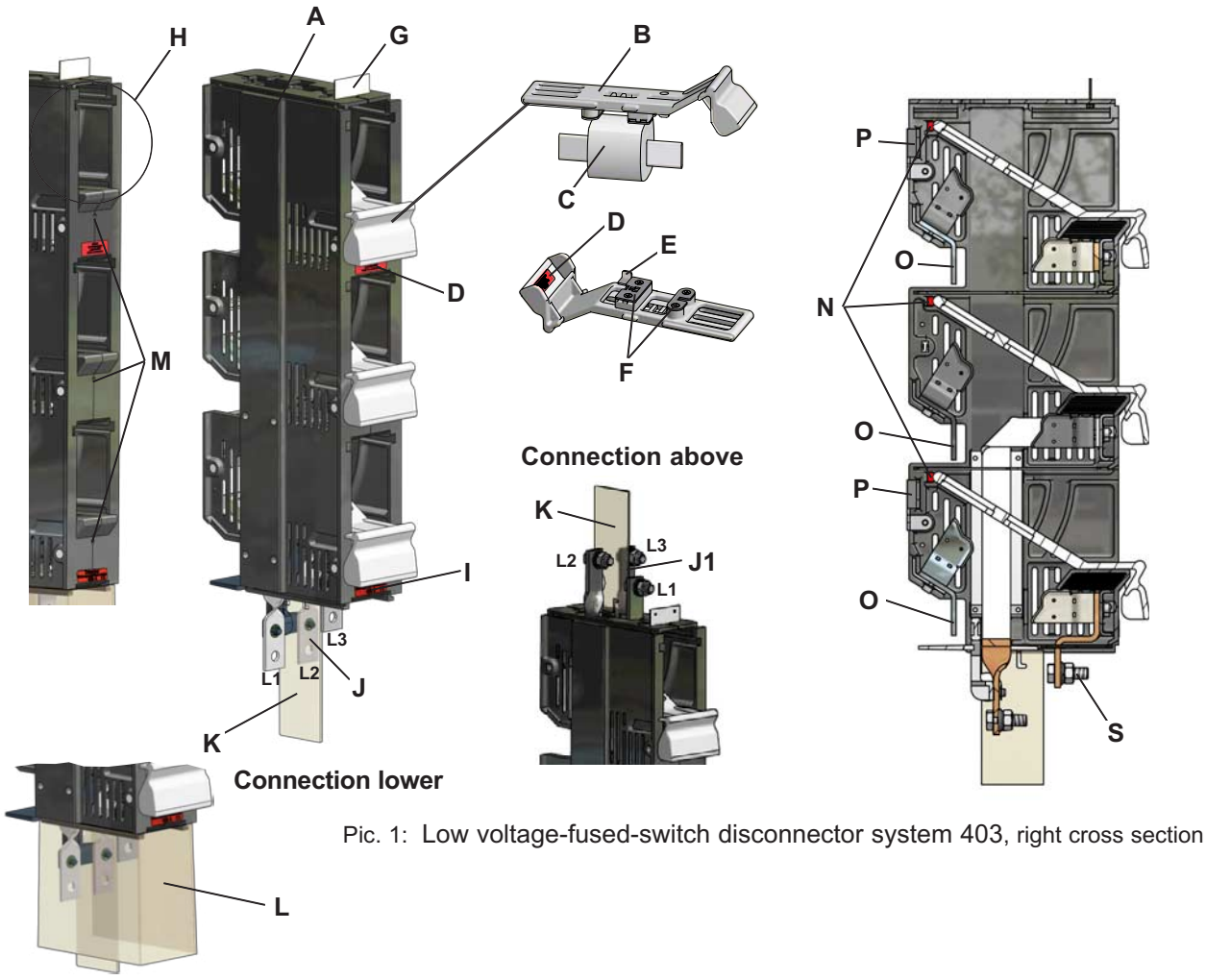
1.2.2 Operating conditions

The information is valid for the described installation situation (vertical installation on horizontal busbar system) and for the ambient conditions "interior" according to the standards IEC/EN 61439-1/2/3/5.

1.2.3 Scope of delievery

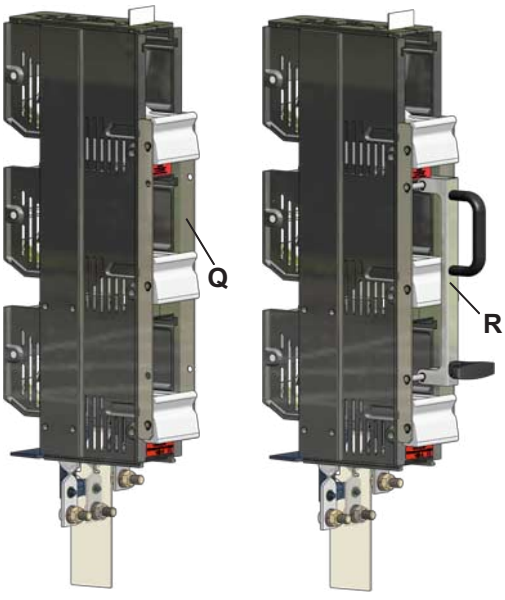
Low voltage-fused-switch disconnector system with sliders
cable insulating cover (L) (optional)

1.2.4 Assemblies and functional elements 403



Pic. 1: Low voltage-fused-switch disconnector system 403, right cross section

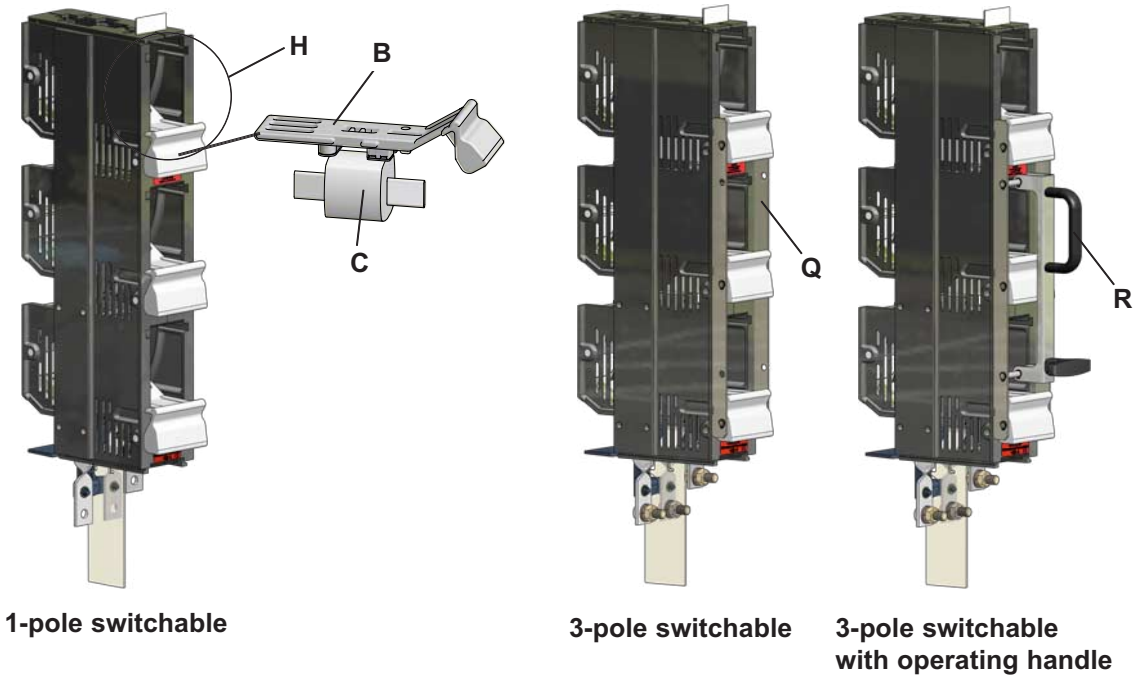
A Low voltage-fused-switch disconnector system 403
B Slider 1-pole
C Low-voltage high-rupturing-capacity fuse DIN 43620
D Indicator plate HRC fuse dimension
E Latching lever for the supports
F The supports HRC fuse
G Marking plate
H Switchroom with guide for slider
I Type plate
J Cable connection bar bottom L1, L2, L3
J1 Cable connection bar top L1, L2, L3
K Insulating baffle plate
L Cable insulating cover
M Inspection holes
N Flat spring
O Busbar contact
P Mounting brackets for frame mounting
Q Slider 3-pole
R Slider 3-pole with operating handle
S Terminal screw M12, caulked



Pic. 2: Low voltage-fused-switch disconnector system 403 , left 3-pole, right 3-pole with operating handle switchable

1.2.5 Operating elements

Low voltage-fused-switch disconnector system 403 - 1-pole, 3-pole and 3-pole with operating handle switchable. Slider (B) with recessed grip above and down with inserted low-voltage high-rupturing-capacity fuse (C).



Pic. 3: Operating elements

B Slider 1-pole
C Low-voltage high-rupturing-capacity fuse DIN 43620
H Switchroom with guide for slider
Q Slider 3-pole
R Slider 3-pole with operating handle

2 Safety

2.1 Intended use / guarantee

The low voltage fused disconnector sysytem is intended for use under the conditions outlined in the section Technical data, on Page 16.

Any use other than those outlined in this section is classed as an unintended use.

Any of the following carried out without express written approval from the manufacturer

- alterations or extensions
- using non-genuine spare parts
- repairs carried out by companies or persons not authorised by the manufacturer

could result in the guarantee becoming null and void.

2.2 Personnel selection and necessary qualifications

Persons working with the switching device must

- be at least 18 years of age.
- have received sufficient training for the relevant tasks.
- be familiar and comply with the current valid rules and safety regulations.

The owner must ensure that only authorised personnel work on the switching device.

Personnel learning to use or being introduced to the device, or operating the device as part of training may only work on the switching device when supervised by an experienced member of staff!

All work on the switching device may only be carried out by trained specialist personnel (DIN VDE 0105-100) and in compliance with all valid regulations specified in the accident prevention regulations (UVVen).

2.3 Organisational safety

The owner must ensure that this operating and maintenance manual is always in the immediate vicinity of the persons responsible for assembling, operating and carrying out maintenance work on the switching device

2.4 Dangers caused by the switching device

The possible danger sources of the switching device are outlined below. Thorough introductory sessions and training for operators help minimise the danger to both people and equipment.
Carrying out regular checks on the knowledge levels and compliance with safety regulations contributes significantly to accident-free operation over the long term.

2.4.1 Danger due to moving parts

WARNING: The switching device has moving components, some of which can be moved remotely (electrically and/or mechanically) with significant force. Touching these parts poses a risk of personal injury or material damage.

Before starting work, it is important to ensure that there is no danger from moving parts.

2.4.2 Danger due to electrical current / arc

WARNING: When operating electrical switching devices, components in the immediate vicinity are supplied with dangerous current. Touching these parts poses a risk of personal injury or material damage.

In the case of a fault arc, extreme hazards arise (high thermal energy, pressure wave, electromagnetic radiation, toxic / hot gases and particles).

The danger zone of the switching device may only be accessed by persons who are aware of the electrical dangers thanks to specialist training, knowledge and experience and can implement the necessary occupational health and safety measures.
Other people may only enter the danger zone when accompanied by the persons listed above.

2.5 Safety installations

For the protection of both personnel and the product, safety installations help prevent accidents or material damage caused by moving parts and assemblies.
Safety installations are Insulating baffle plate (K), Cable insulating cover (L) and Flat spring (N).

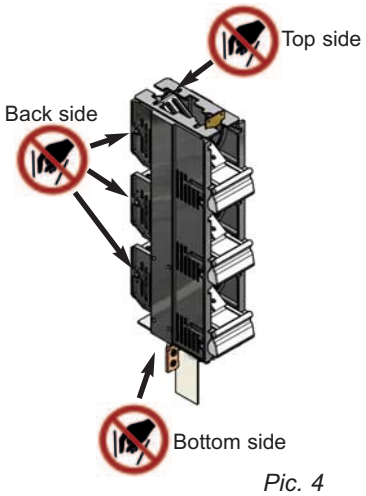
The operator must ensure that trained personnel

- check all safety installations regularly.
- remove any problems on the safety installations immediately.
- secure the switching device against being switched on if not all safety installations are present and working.

3 Assembly

3.1 Transport and storage of the low voltage-fused-switch disconnector system 403

For transport and assembly, only mount the low voltage-fused-switch disconector system 403 from the outside, do not grip it into the system from the back, bottom or top.
Protect the low voltage-fused-switch disconnector system from damage, moisture and contamination until it is installed.



Pic. 4

3.2 General

The low voltage-fused-switch disconnector system 403 must be installed in a suitable housing and must be protected against contamination. The installation position is vertical. The installation of the low voltage-fused-switch disconnector system 403 on under-voltage busbars is carried out with a insulating socket wrench tested in accordance with EN 60900 (DIN VDE 0682 Part 201) or EN 61477 (DIN VDE 0682 Part 130).

For live-line working, the provisions of DIN VDE 0105 Part 1 must be complied with. Live-line working may only be carried out by specially trained specialists.
Please refer to the Safety Tools instructions for use (Order No. 3-81301043).

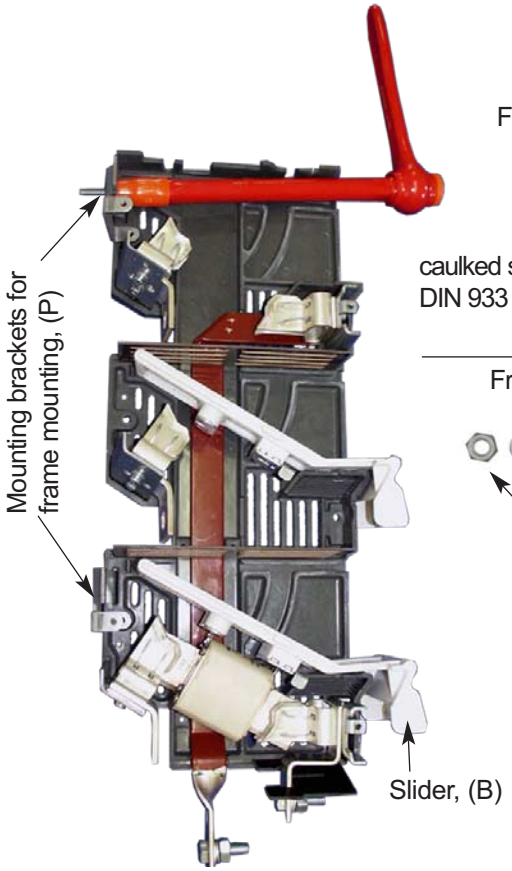
Insulating socket wrench scope of delievery:

Pos.	Part-No.	Length / Socket wrench	Description
1a	2-840 31005	300 mm, Set Pos. 2 - 5	Ratchet wrench, fully insulated according to VDE, scoop-proof up to 1000 V according to 097429 for nut, detent edged ring and washer
1b	2-840 31006	300 mm, Set Pos. 2 - 4, 6	Ratchet wrench, fully insulated according to VDE, scoop-proof up to 1000 V according to 097429-002 for nut and tension washer
2	2-319 00013	1/2 “	Ratchet wrench for right and left batter, according to DIN 7449 1/2 “, isolated, **Observe the instruction manual ratchet!** Order-no.:3-81301043
3	2-611 37790	250 mm, 1/2 “	Extension DIN 7449 1/2 “, isolated,
4	2-319 0023	SW 13, 1/2 “	Socket wrench SW 13 (M8) 1/2 “, isolated, for assembly on the frame
5	2-840 31001	SW 19, 1/2 “	universal joint SW 19 (M12) 1/2 “, isolated, for busbar mounting with the supports for nut, detent edged ring and washer M12
6	2-840 31002	SW 19, 1/2 “	universal joint SW 19 (M12) 1/2 “, isolated, for busbar mounting with the supports for nut und tension washer M12

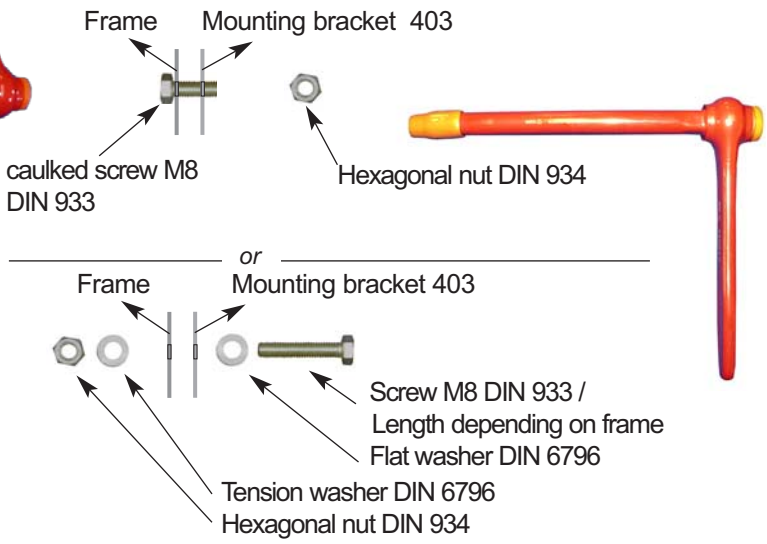
3.3 Assembly on the frame

Low voltage - fused-switch disconnector system type 403 / 400 A - 1445 A are mounted with 2 screws M8 on the frame. The busbars are supported by system 403.
Working cycle:

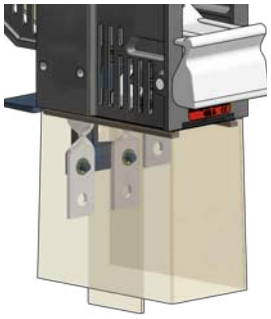
1. Remove the slides for LV-fuses on system 403 (Pic. 7).
2. Putting the 403 system on the frame.
3. Fixing the system 403 *(Pic. 5 and 6)*. **Tightening torque 30 Nm.**
4. Connect the cable. *(see chapter 3.3.2 page 13)*
5. Integrate the cable insulating cover (L) *(Pic. 7)* at the cable feeder.



Pic. 5: 403 system mounting situationon a frame



Pic. 6: Insulating plug-in-lever with socket spanner insert SW 13



Pic. 7: Cable insulating cover (L)

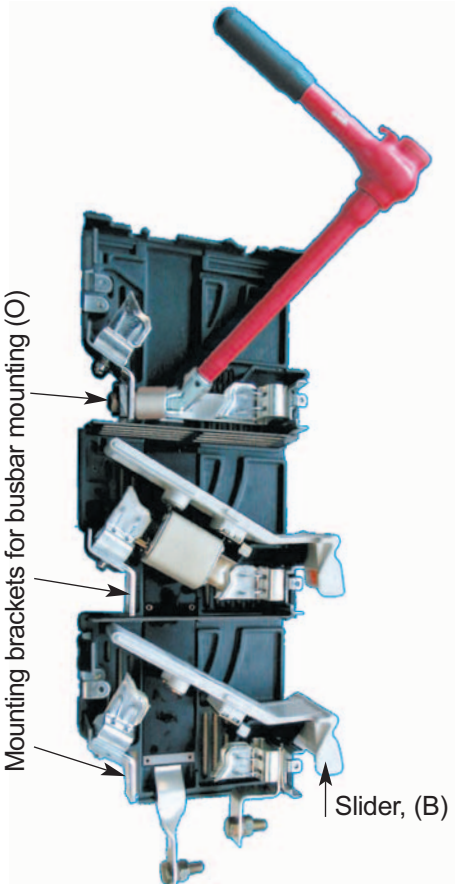
3.4 Assembly on a busbar (de-energized)

For mounting necessary hexagonal nut, tension washer (Pic. 11) and detent edged ring must be attached on the connecting element fixed on the cardan-joint insert (see pic. 10), so that it can be accurately led while fixing on the connecting screw (M12).

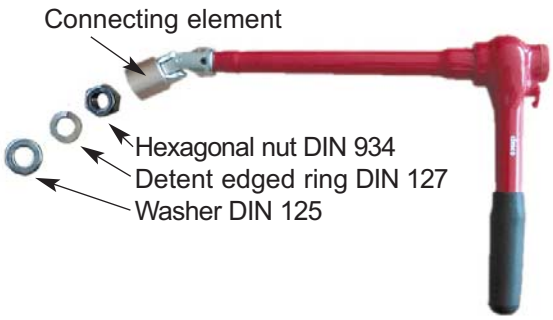
The not isolated cardan-joint insert is addtional fixed with a setscrew on the socket wrench, that the insert can not be removed unintentionally.
As shown in Pic. 9, the insulating socket wrench is led on the caulked-connecting screw of the busbar contact and the screwed connections are properly assambled.
Working cycle:

1. Remove busbar insulating cover. *(Pic. 8)*
2. Remove the slides (B) for LV-fuses on system 403. *(Pic. 9)*
3. Ingerate the cable insulating cover (L) *(Pic. 7)* on system 403 to prevent unintentional contact.
4. Put system 403 on the frame.
5. Fix system 403 *(Pic 9, 10 or 11)*.
   Tightening torque 75 Nm.
6. Remove cable insulating cover (L) *(Pic. 7)* at the cable feeder.
7. Connect the cable. *(see chapter 3.3.2 page 13)*
8. Integrate the cable insulating cover (L) *(Pic. 7)* at the cable feeder.

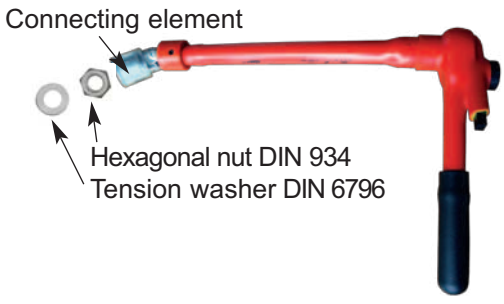
Pic. 8: Busbar insulating cover



Pic. 9: 403 System mounting situation on the busbar



Pic. 10: Insulating socket wrench with socket SW 19 with nut, detent edged ring and washer



Pic. 11: Insulating socket wrench with socket SW 19 with nut and tension washer

B843

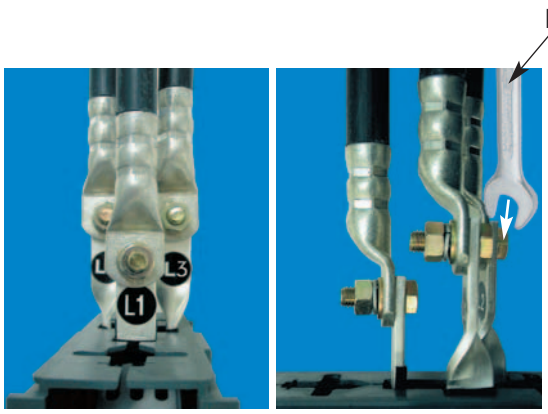
3.5 Connecting the switch cables

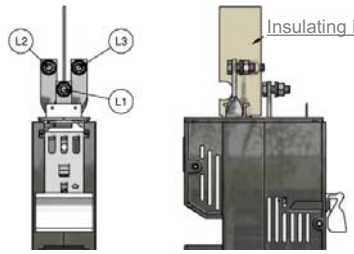
Insert insulating baffle plate (K) into the appropriate fasteners *(Pic. 14)*.
The cables shall be laid over cable lugs or terminal in such a way that there is no mechanical stress(twisting, thrust, pressure, etc.) on the connecting bars (J). The connection screws (S) M12 are caulked in the copper busbar.

➡ When tightening (max. tightening torque 65 Nm) and when loosening connected cables, the screw head must be counter-held with a ring spanner or spanner SW19 *(Pic. 12 and 13)*.

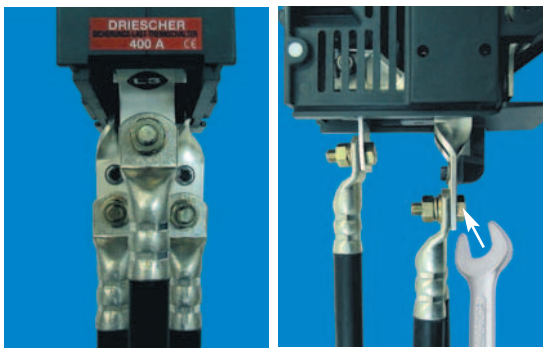
➡ **The connecting bars (J) must not be twisted or bent under any circumstances. The caulked connection screws (S) must not be removed.**
Furthermore, a connection with V-direct connection terminals or flat direct connection terminals is possible, for this the manufacturer's specifications must be observed!

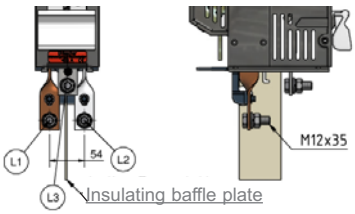
⚠ **After this the cable insulating cover (L, Pic.7) can be mounted.**





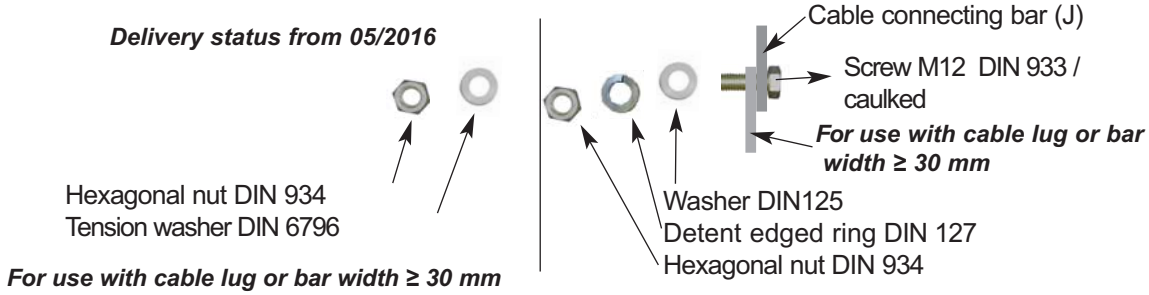
Pic. 12: Cable connection above





Pic. 13: Cable connection below

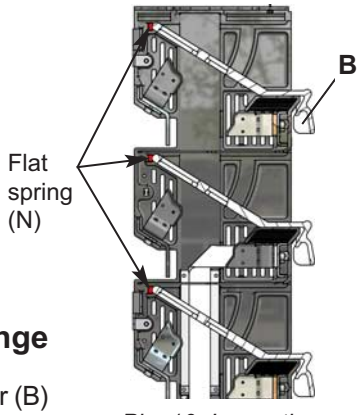
Pic. 14: Insulating baffle plate (K)



Pic.15: Screw connection for cable connection

3.6 Functional check

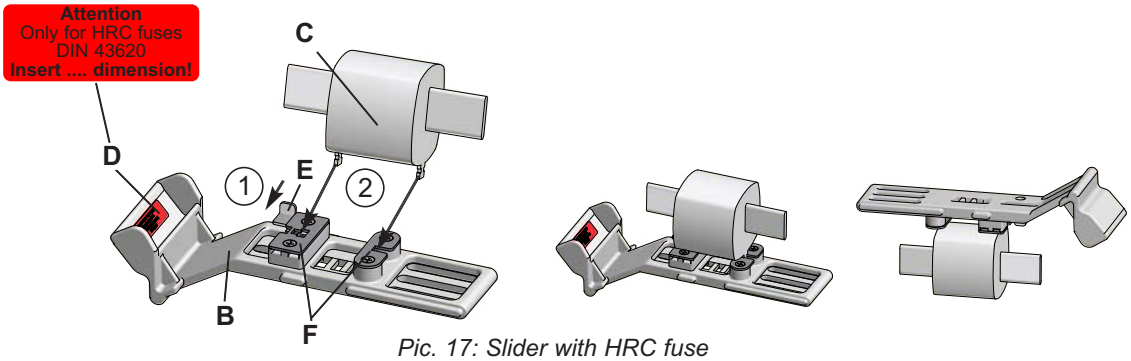
After the Low voltage-fused-switch disconnector system 403 is installed, the cables are connected and the insulating baffle plate (K) (see Pic. 14) is inserted, the flawless mechanical function must be checked with a slider (B) without HRC fuse.
In addition, the correct fit of the flat spring (N) must be checked (see Pic. 16). Then apply the cable insulating cover (L) (Pic. 7).



Pic. 16: Inspection flat spring (N)

3.7 Insert low-voltage high-rupturing-capacity fuse - change

Select appropriate HRC fuse (C). Push the latching lever (E) at the slider (B) in the direction of the arrow. ① *(see Pic. 17)*
Insert fuse with the retaining bracket into the supports (F) ②,
then realease the latching lever(E). The HRC fuse inserts can be used for which slider, see the HRC fuse dimension(D) sign on the low voltage-fused-switch disconnector system.



Pic. 17: Slider with HRC fuse

3.8 Disassembly / Removal low voltage-fused-switch disconnector system 403

For the disassembly of the low voltage-fused-switch disconnector system 403, the steps mentioned on page 11 and 12 assembly must be carried out in reverse order.

Here, too, observe the safety regulations for live-line working if the existing reserve places are equipped in low voltage systems.

4 Operation

4.1 Work station

The owner must ensure that the work station complies with all valid regulations and has sufficient lighting.

4.2 Visual check

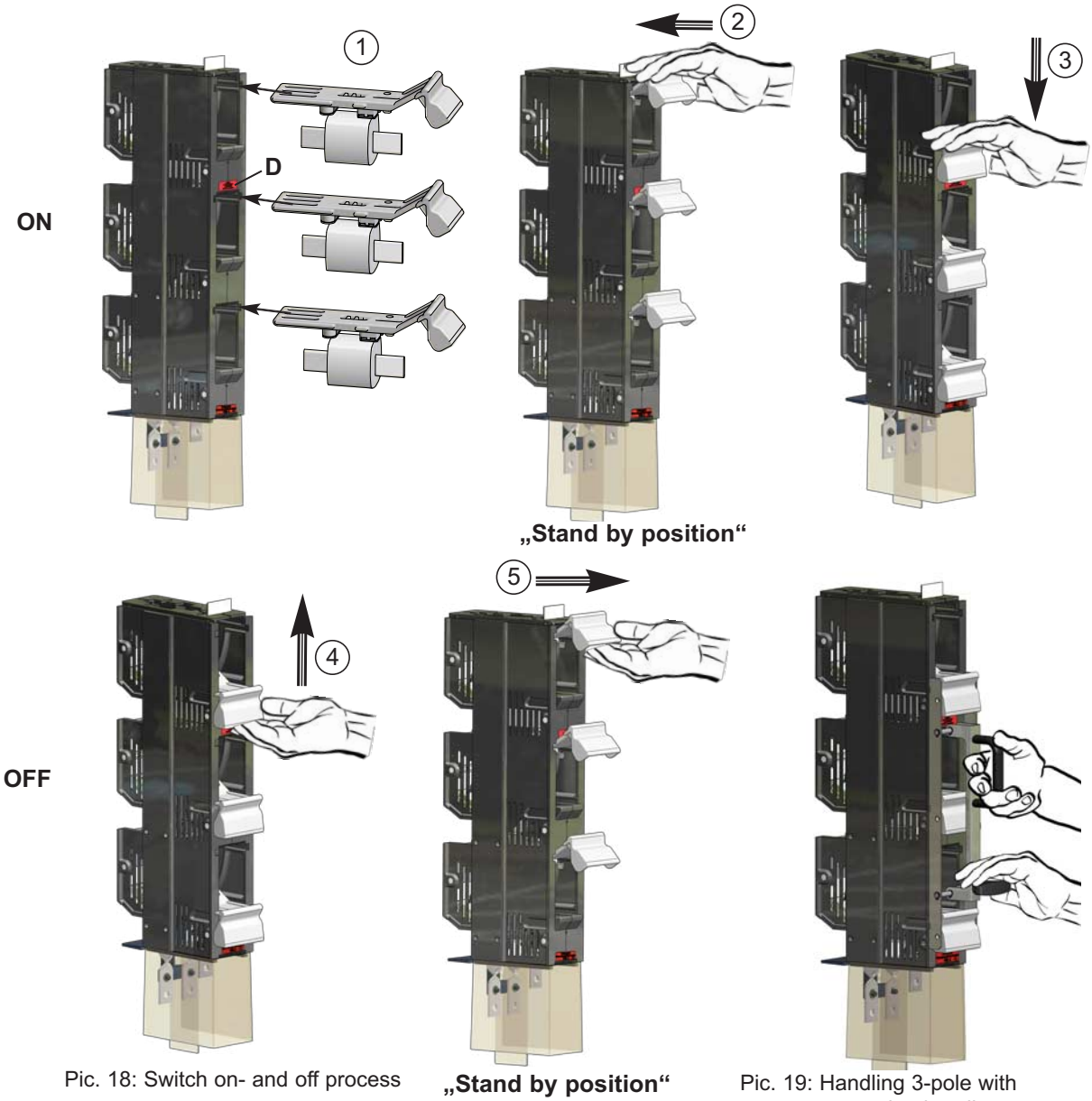
WARNING: Missing or loose components could result in personal injury or material damage.
Check that all mechanical components are complete and secured in place. If faulty or loose mounting parts are detected on the switching device, it may only be commissioned again after it has been repaired by an expert.
A check must be carried out to ensure that the safety installations are complete and functional *(see chapter 2.5*) prior to commissioning.

4.2.1 Commissioning

Once the entire assembly and successful functional check are complete, the switching device is ready for use.

4.2.2 Operation

Insert slider (B) with fuse (C) into the switchroom (H) ①. Slider is now in „Stand by position“. Press the slider into the low voltage-fused-switch disconnector system via the spring pressure②, then press quickly to limited stop③. During the switch-off process, actuate quickly upwards④, the slider is now back in „Stand by position”⑤. When actuating, use the recessed grip at the top and bottom of the slider. For slider 3-pole with actuating handle, use both hands (Pic.19).



Pic. 18: Switch on- and off process

Pic. 19: Handling 3-pole with operating handle

4.2.3 Temporary decommissioning

In order to temporarily decommission the switching function of the low voltage-fused-switch disconnector system, the sliders (B) must be placed in "stand by position".

4.2.4 Decommissioning

The low voltage-fused-switch disconnector system can be shut down by removing the sliders.

B843

5 Technical Data

Switch type	**Low voltage-fused-switch disconnector system 403** audited according to VDE 0660/107 - IEC/EN 60947-1/-3)		
Rated operational current I_e	**400 A**	**630 A**	**910 A**
Rated operational voltage U_e	400/500/690 V AC	400/500/690 V AC	400 V AC
Rated frequency	50 Hz	50 Hz	50 Hz
Rated insulation voltage U_i	1 kV	1 kV	1 kV
Rated impulse withstand voltaget U_{Imp}	12 kV	12 kV	12 kV
Rated conditional short-cirquit current	100 kA	100 kA	50 kA
Rated conditional short-cirquit current	Dimension 1 - 2	Dimension 2 - 3	Dimension 3
Permissible ambient temperature	-25° C up to + 55° C	-25° C up to+ 55° C	-25° C up to + 55° C
Degree of protection	IP 2X	IP 2X	IP 2X
Discharge current- bedewed actation	0,2 mA	0,2 mA	0,2 mA
Mechanical switching cycles	5.000	5.000	5.000
Elektrical switching cycles	500	500	500
Utilisation category according to EN 60947-3	AC-22B	AC-22B	AC-22B
Degree of pollution	3	3	3
Rated reduction factor (RDF)	1,0	1,0	1,0

Operating ambient conditions according to EN 62271-1

Temperature range	-25° up to +55° C
Site altitude	max. 2000 m over NHN
Relative humidity, maximum daily average	95 %
Relative humidity, maximum monthly average	90 %
Water vapour pressure, maximum daily average	2,2 kPa
Water vapour pressure, maximum monthly average	1,8 kPa

Storage conditions

Storage conditions	dry and dust-free -40°up to +60°Celsius

5.1 Service address

Our specialist personnel can be contacted by telephone in the event of faults or to answer any questions you may have with regard to the compatibility, assembly or maintenance, including outside business hours.

Please always provide the information on the identification plates.

Phone +49 (0) 87 61 6 81-0 E-Mail service@driescher.de

6 Disposal

The switching device must be dismantled by qualified personnel.
It must be disposed of in an environmentally-friendly manner. Electrical components must not be disposed of as household waste. 2002/96/EC(WEEE)