instructions for use

LF and LFP fixed circuit-breakers
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symbols and conventions

Caution:
you will find all the symbols
below throughout the
document, indicating
the hazard levels
depending on the
different types of situation.

DANGER: failure to follow this
instruction will result in death or serious
injury.

WARNING: failure to follow this
instruction may result in death or
serious injury.

CAUTION: failure to follow this
instruction may result in injuries.
This alert signal can also be used to indicate
practices that could damage the SM6 unit.

INFORMATION-ADVICE
We draw your attention to this specific point.
distribution rules

The aim of this publication is to enable the SF6 unit to be installed correctly.

This document is not a commercial document. It is a strictly technical document drawn up by Schneider Electric.

safety rules

CAUTION

All the operations described below must be performed in compliance with applicable safety standards, under the responsibility of a competent authority.

WARNING

The contractor must be certified and authorised to manipulate and perform work on the SF6 unit.

CAUTION

Only undertake the work after having read and understood all the explanations given in this document. If you have any difficulty complying with these rules, please contact Schneider Electric.
LF fixed circuit-breaker

A: enclosure
B: operating mechanism plate
C: RI operating mechanism
D: LV wiring inlet
E: mechanical opening
   trip device
F: energy discharging
   (after opening and elimination
   of voltage on the gear motor)

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<table>
<thead>
<tr>
<th>fixed equipment</th>
<th>IEC standard</th>
<th>ANSI standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF1</td>
<td>630 A et 1250 A</td>
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</tr>
<tr>
<td>LF2</td>
<td>630 A, 1250 A et 2000 A</td>
<td>1200 A et 2000 A</td>
</tr>
<tr>
<td>LF3</td>
<td>1250 A, 2500 A et 3150 A</td>
<td>1200 A, 2000 A et 3000 A</td>
</tr>
<tr>
<td>LFP</td>
<td>5000 A</td>
<td></td>
</tr>
</tbody>
</table>

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operating mechanism
plate

1: operating mechanism
   charging lever
2: closing pushbutton
3: opening pushbutton
4: operation counter
5: "open or closed" device
   status mechanical indicator
6: "charged or uncharged"
   operating mechanism charging
   status mechanical indicator
7: keylock (option)
support frame

P : support frame (kit)
This frame is an option.
It is disassembled on delivery.
The assembly manual is enclosed in the packing.
identification

Check:
- that the technical data marked on the rating plates match the information given on the order form.
- that the connection diagram is enclosed with the device manual.

location of the information plates

IEC standard
A: technical data and auxiliaries plate
B: serial number

ANSI standard
A: technical data plate
C: auxiliaries plate

IEC circuit-breaker, operating mechanism and auxiliaries information plate

1: device type designation
2: rated voltage
3: rated lightning impulse withstand voltage
4: rated continuous operating current
5: rated breaking capacity for CC 3s
6: no-load breaking capacity
7: rated operating sequence
8: class
9: SF6 mass
10: reference standard
11: characteristics information plates

option labels
(stuck on the operating mechanism plate)

Label indicating the undervoltage trip device option.
Label indicating the key—lock option.
storage

The circuit-breakers are dispatched in the open position, with the operating mechanism deactivated.

Store the devices in their original packing.

prolonged storage

In the case of prolonged storage, the device must remain in its original packing.

After prolonged storage, all insulating parts must be thoroughly cleaned prior to use. The enclosure must be dusted using a clean, dry cloth.

unpacking and handling

- Unpack equipment at the installation site.
- Avoid chocks.

WARNING

poles are under pressure.

by lifting

removing the wooden frame

Dismantle the crate to reach the wooden frame.

Hook the eye bolts on the small columns.
Caution: on the LF3 and LFP, the centre of gravity is shifted on the enclosure side.

Dismantle the wooden uprights on each side of the crate as well as the iron parts (yellow), 8 screws. These parts must be discarded.

Lift the assembly, then dismantle the rest of the crate.

To assemble the rolling frame and the LF on the frame, refer to the kit manual found in the frame parcel.

by rolling
overall dimensions
LF1, LF2, LF3 circuit breakers

Dimension D represents the space to be filled between the front and the rear fixing points of LF1, and between the front and rear fixing points of LF2.

- with a rolling frame, use the spacers supplied in the bag of screws and bolts.

<table>
<thead>
<tr>
<th>fixed circuit breakers</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF1</td>
<td>493</td>
<td>261</td>
<td>542</td>
<td>9</td>
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<tr>
<td>LF2</td>
<td>553</td>
<td>304</td>
<td>628</td>
<td>13</td>
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<tr>
<td>LF3</td>
<td>728</td>
<td>378</td>
<td>776</td>
<td>0</td>
</tr>
</tbody>
</table>
LFP circuit breakers

4 M10 fixing screws on each side

2 fix 14x19

1040 38
597 945
533 533
1086 19
7

16

107 555
304 32
330 60
80
270
417
360
135
85
52
229.5
533 533
fitting a circuit-breaker

with a support frame

**CAUTION**

On no account must the support frame be used to convert a fixed circuit-breaker into a draw-out one.

Once the support frame has been fitted, fix it to the ground using the 2 fixing lugs. If necessary, insert washers between the fixing lug and the ground in order to prevent deformation of the lug.

without a support frame

Fit the circuit-breaker and fix it using standard screws and bolts. (8 fixing points)

**CAUTION**

The useful depth of internal screw threads for fitting the screws and bolts is 18 mm. Tightening torque: 45 Nm.

connecting the earth bar
HV connections
busbar connection principle
Tightening torque: 50 Nm.
Use class 8.8 hexagonal head screws as well as contact washers.

busbar and connector connection principle
Tightening torque: 50 Nm.
Use class 8.8 hexagonal head screws as well as contact washers.

busbar and arm connection principle
Tightening torque: 50 Nm.
Use class 8.8 hexagonal head screws as well as contact washers.
dimension of LF1, LF2 and LF3 connections

Internal screw thread useful depth is 26 mm.

<table>
<thead>
<tr>
<th>equipment</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF1</td>
<td>145</td>
<td>145</td>
<td>160</td>
</tr>
<tr>
<td>LF2</td>
<td>165</td>
<td>165</td>
<td>180</td>
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<tr>
<td>LF3</td>
<td>225</td>
<td>225</td>
<td>240</td>
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</tbody>
</table>

dimension of LFP connections

Internal screw thread useful depth is 26 mm.
## Indicative Connection Table

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Type of Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF1 630A 75 kV impulse</td>
<td>2 40x5 mm busbars</td>
</tr>
<tr>
<td>LF1 1250A 75 kV impulse</td>
<td>1 63x12 mm busbar</td>
</tr>
<tr>
<td>LF2 630A 75 kV impulse</td>
<td>2 40x5 mm busbars</td>
</tr>
<tr>
<td>LF2 1250A 95 kV impulse</td>
<td>2 40x5 mm busbars + arm</td>
</tr>
<tr>
<td>LF2 1250A 75 kV impulse</td>
<td>1 63x12 mm busbar</td>
</tr>
<tr>
<td>LF2 1250A 95 kV impulse</td>
<td>1 63x12 mm busbar + arm</td>
</tr>
<tr>
<td>equipment</td>
<td>type of connection</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>LF2 1200A ANSI 60 kV</td>
<td>1 63x12 mm busbar</td>
</tr>
<tr>
<td>impulse</td>
<td></td>
</tr>
<tr>
<td>LF2 1200A ANSI 95 kV</td>
<td>1 63x12 mm busbar + arm</td>
</tr>
<tr>
<td>impulse</td>
<td></td>
</tr>
<tr>
<td>LF2 2000A ANSI 95 kV</td>
<td>2 63x12 mm busbars + arm</td>
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<tr>
<td>impulse</td>
<td></td>
</tr>
<tr>
<td>LF3 630A IEC 75 kV</td>
<td>2 40x5 mm busbars</td>
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<tr>
<td>impulse</td>
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<tr>
<td>LF3 1250A IEC 75 kV</td>
<td>1 63x12 mm busbar</td>
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<tr>
<td>impulse</td>
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<tr>
<td>LF3 1250A IEC 95 kV</td>
<td>1 63x12 mm busbar + arm</td>
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<tr>
<td>impulse</td>
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<tr>
<td>Equipment</td>
<td>Type of Connection</td>
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<tr>
<td>---------------------------------</td>
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</tr>
<tr>
<td>LF3 2500A IEC 95 kV impulse</td>
<td>2 100x8 busbars + connector</td>
</tr>
<tr>
<td>LF3 3150A IEC 95 kV impulse</td>
<td>2 100x10 busbars + connector</td>
</tr>
<tr>
<td>LF3 1200A ANSI 60 kV impulse</td>
<td>1 63x12 mm busbar</td>
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<tr>
<td>or LF3 1200A ANSI 95 kV impulse</td>
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<tr>
<td>LF3 2000A ANSI 95 kV impulse</td>
<td>2 100x8 busbars + connector</td>
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<tr>
<td>LF3 3000A ANSI 95 kV impulse</td>
<td>2 100x10 busbars + connector</td>
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<tr>
<td>equipment</td>
<td>type of connection</td>
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<tr>
<td>LFP</td>
<td>4 100x10 mm busbars</td>
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</tbody>
</table>

**LV connection**

**wiring insertion**

Wiring is inserted through one of the 3 cut-out capsules.

---

**access to the LV connection terminal block**

**LF1, LF2 and LF3 circuit-breakers**

**CAUTION**

Check that the device is open, with the operating mechanism deactivated.

Unscrew and remove the fixing screws on both sides of the cover and under the lower closing plate.

Remove the cover by pulling it upwards.
CAUTION

Check that the device is open, with the operating mechanism deactivated.

Remove the front panel cover by withdrawing the 8 fixing screws.

Remove the top and bottom covers by withdrawing the 4 fixing screws on each cover.

LV connection terminal block

Connection is possible on the connection terminal block or on the auxiliary contact terminal block (refer to the wiring diagram).
A : connection terminal block
B : auxiliary contacts
### Type of Connection (1st Letter of Diagram)

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<th>C</th>
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<th>F</th>
<th>G</th>
<th>H</th>
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<th>P</th>
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<td>H Pontage Standard and Level C</td>
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<td>P End of Charging Signalisation</td>
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**The bridges are only possible on the circuit breaker with low voltage connectors.**
A: SF6 pressure signalisation/common source of power supply for end of charging signalisation and circuit breaker 0 circuit breaker C / common point for release interlock and anti pumping relay SF6 pressure signal

B: common point for end of charging signalisation/SF6 pressure signalisation / circuit breaker 0 circuit breaker C signal continued surveillance of release circuit SF6 pressure signalisation

C: common point for end of charging signalisation /SF6 pressure signalisation / circuit breaker 0 circuit breaker C signal SF6 pressure signalisation

D: common point for end of charging signalisation /SF6 pressure signalisation / continued surveillance of release circuit SF6 pressure signalisation

E: common point for end of charging signalisation / SF6 pressure signalisation SF6 pressure signalisation

F: end of charging signal continued surveillance of release circuit common pt for SF6 press signal and circuit breaker 0 cir.. breaker C signal common pt for SF6 press signal and cir.. breaker 0–circ. breaker C signal

G: end of charging signalisation / common point for SF6 pressure signal and circuit breaker 0 cir.. breaker C signal common pt for SF6 press signal and cir.. breaker 0–circ. breaker C signal

H: SF6 pressure signalisation / common point for end of charging signalisation and circuit breaker 0 circuit breaker C signal continued surveillance of release circuit SF6 pressure signalisation

J: SF6 pressure signalisation / common point for end of charging signalisation and circuit breaker 0 circuit breaker C signal SF6 pressure signalisation

P: end of charging signalisation continued surveillance of release circuit SF6 pressure signalisation

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The bridges are only possible on the circuit breaker with low voltage connectors

<table>
<thead>
<tr>
<th>type of connection (1 th letter of diagram)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tr>
<td>A bridge only to be used in retrofit cases</td>
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</tbody>
</table>
operating instructions

operating mechanism plate
1 : operating mechanism charging lever
2 : closing pushbutton
3 : opening pushbutton
4 : operation counter
5 : "open or closed" device status mechanical indicator
6 : "charged or uncharged" operating mechanism charging status mechanical indicator

operating instructions

circuit—breaker manual operation
carrying out a Closing – Opening cycle
charging the operating mechanism

Charge the operating mechanism by an up and down motion until you hear a click.
The circuit—breaker position indicator remains on "O" (device open). The operating mechanism indicator moves to the charged position.

closing

CAUTION
if the circuit—breaker is equipped with an undervoltage release (optional), the latter must be energised in order to close the circuit—breaker (except in the case of downstream supply).

Press the pushbutton to close the circuit—breaker.
The circuit—breaker position indicator moves to "I" (device closed). The operating mechanism indicator moves to the deactivated position.
opening

Press the pushbutton to open the circuit-breaker.

The circuit-breaker position indicator remains on "O" (device open). The operating mechanism indicator moves to the deactivated position.

carrying out an Opening – Closing – Opening cycle

charging the operating mechanism

Charge the operating mechanism by an up and down motion until you hear a click.

The circuit-breaker position indicator remains on "O" (device open). The operating mechanism indicator moves to the charged position.

closing

if the circuit-breaker is equipped with an undervoltage release (optional), the latter must be energised in order to close the circuit-breaker (except in the case of downstream supply).

Press the pushbutton to close the circuit-breaker.

The circuit-breaker position indicator moves to "I" (device closed). The operating mechanism indicator moves to the deactivated position.

charging the operating mechanism

Charge the operating mechanism by an up and down motion until you hear a click.

The circuit-breaker position indicator remains on "I" (device closed). The operating mechanism indicator moves to the charged position.
opening

Press the pushbutton to open the circuit-breaker.

The circuit-breaker position indicator remains on "O" (device open).
The operating mechanism indicator moves to the charged position.

closing

Press the pushbutton to close the circuit-breaker.

The circuit-breaker position indicator moves to "I" (device closed).
The operating mechanism indicator moves to the deactivated position.

opening

Press the pushbutton to open the circuit-breaker.

The circuit-breaker position indicator moves to "O" (device open).
The operating mechanism indicator moves to the deactivated position.

circuit-breaker remote operation

electrical charging of the operating mechanism
A gear motor unit automatically recharges the operating mechanism after a circuit-breaker closing.

opening and closing
The release opening and closing operations are remote controlled.

circuit-breaker interlocking
(optional)

The circuit-breaker is locked in the open position with the key-lock.

To lock:
- press the opening button
- keep the "O" opening button depressed
- turn and remove the key
foreword

safety instructions

All the operations described below must be performed in accordance with applicable safety standards under the supervision of a competent authority.

To access the various parts:
- open the circuit-breaker
- cut the supply to the auxiliary circuits and the main circuit
- close then open the circuit-breaker by means of the push buttons in order to deactivate the operating mechanism
- avoid impacts (pressurised enclosure)

general rules

Our equipment is designed to guarantee optimum service provided that the maintenance operations described in this document are complied with.

These operations require removal of the protective covers (front plate and operating mechanism plate).

Removal and replacement of the covers is described in the installation instructions section.

The front plate is removed by withdrawing its clips.

cycle and maintenance operations

This device is designed to operate for 10 years or 10 000 operations in normal conditions of use according to the IEC 694 standard.

We recommend:
- an opening/closing operation at least once a year
- a visual inspection at least once every 5 years with the Groupe Schneider service centres.
**summarising table**

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**preventive maintenance and cleaning instructions**

The pressurised SF6 gas inside the pole retains all its dielectric properties after breaking. Electrical durability is limited by contact wear. This wear depends on device use. We draw your attention to the risk of cleaning processes, consisting of spraying solvents at high pressure.

The main drawbacks of such processes are:
- damage due to jet pressure and impossibility of re-lubricating inaccessible fixing points.
- risk of overheating due to solvent presence on contact areas.
- elimination of special protections.

---

**CAUTION**

Never use solvents and alcohol.

If the insulating parts are dusty, it is recommended that you remove the dust using a dry cloth.
monitoring arcing contact wear

This operation requires removal of the springs.

Arcing contact wear is monitored on the operating mechanism/circuit-breaker pole link.

Check that the circuit-breaker is open, with its operating mechanism deactivated.

removing the closing springs

Slightly charge the operating mechanism using the charging lever...

... the springs will be compressed...

..... as soon as possible insert a 6 dia. 40 mm long min. screw or pin into the hole shown above. Release the lever. The springs will exert a force on the pin. On no account must the pin be free. (do not exceed the first notch on the operating mechanism, or perform a complete cycle and start again).

Remove the washer and circlips A. Release and withdraw the spring. Remove ring B taking care not to damage it (Teflon coating).
Checking

Serial connect the three phases of the device and insert a bell type indicator in the circuit.

Charge the operating mechanism until you hear a click indicating charging is complete.

Exert pressure on the lever and at the same time pull the right-hand crank handle towards you until the ratchet wheel is latched.

At the same time press the closing "I" pushbutton and the charging lever in order to release the latching mechanism.

Very slowly close the circuit-breaker using the lever. Stop charging as soon as the lamp comes on: the arcing contacts of the three phases are in contact.

When the lamp is on, a rod with a diameter less than or equal to 6 mm can be inserted in the hole shown above.

For larger diameters, absence of signal means the device must be replaced.

Caution

Keep the lever in this position, with the bell activated.

If the position is overshot, repeat the operation.
fitting the closing springs

Fit the spring on pin C and ring B of the operating mechanism.

**CAUTION**
Do not lubricate when mounting and do not scratch the teflonised ring.

... continue charging....

... in order to bring the crank handle D into the axis of the lower fixing hole of the spring guide.

Fit the washer and the circlips A.

Check that the circuit—breaker is open and that the operating mechanism is deactivated.
Slightly charge the operating mechanism in order to unflange the springs.

Remove the locking created on the springs with the 6 dia. screw or pin.

Continue charging until you hear a click.

Check: Close then open using the "I" and "O" pushbuttons in order to deactivate the operating mechanism.

**lubricating the spring guides**

**closing spring**

Charge the operating mechanism by an up and down motion until you hear a click.

The circuit-breaker position indicator remains on "O" (device open). The operating mechanism indicator moves to the charged position.
The springs will be compressed.

**CAUTION**
Do not lubricate the teflonised ring A.

**WARNING**
A brush must be used to lubricate. Do not dismantle the spring to perform this operation.

### opening spring

**manual closing of the circuit-breaker**

- Lubricate the guides
- Oil the phosphatised springs

**CAUTION**
If the circuit-breaker is equipped with an undervoltage release *(optional)*, the latter must be energised in order to close the circuit-breaker *(except in the case of downstream supply)*.

Press the push button “I” to close the circuit-breaker.

The circuit-breaker position indicator moves to “I” *(device closed)*.

The operating mechanism indicator moves to the deactivated position.

The springs will be compressed:
- Lubricate the guides
- Oil the phosphatised springs

**WARNING**
A brush must be used to lubricate. Do not dismantle the spring to perform this operation.

### manual opening of the circuit-breaker

Press the push button “O” to open the circuit-breaker.

The circuit-breaker position indicator moves to “O” *(device open)*.

The operating mechanism indicator indicates that the mechanism is deactivated.
operating mechanism unit

Clean the entire subassembly.
Oil all the phosphatised parts.
Check that the locking eye bolts are fitted.
Lubricate the pins and hinges.

**WARNING**
A brush must be used to lubricate. Do not dismantle the operating mechanism to perform this operation.

---

gear motor

Clean the entire subassembly.
Lubricate the gears.

**WARNING**
A brush must be used to lubricate. Do not dismantle the gear motor to perform this operation.

---

SEPAM diagnosis

This function supplies the total number of breakings and the cumulated total of broken KA2. The cumulated total of broken amps reflects the degree of wear of the breaking part.

This information is used to manage arcing contact wear and to generate monitoring.
Maximum levels of broken amp cumulated totals:
- LF1, 2 or 3: cumulated 30000 (KA)^2.
SEPAM connection schematic diagram

**Key Symbols:***
- **J**: circuit-breaker
- **KN**: antipumping relay
- **M**: charging motor
- **M1-M2**: end of charging contacts
- **M3**: operating mechanism charged contact
- **QF**: circuit-breaker auxiliary contacts
- **SE**: tripping contact depressed
- **SO1**: SEPAM output: tripping
- **SO2**: SEPAM output: activation
- **SI1**: SEPAM input: monitoring the tripping circuit with device closed
- **SI2**: SEPAM input: monitoring the tripping circuit with device open
- **SI16**: SEPAM input: monitoring pole pressure
- **Sn**: closing disabling contact (external)
- **SP**: pressure switch contact
- **SQ**: device ready to operate contact
- **YF**: closing release
- **Y01**: shunt release

---

 additional notes and descriptions
foreword

Corrective maintenance operations are designed to replace faulty subassemblies.

The operations listed in the summarising table below can be performed either by the customer or by the Groupe Schneider After-Sales representatives.

For any other operations consult your nearest Groupe Schneider representatives.

CAUTION

when replacing equipment, the following accessories must all be replaced by new devices.

– Nylstop (self-locking nut)
– Contact washer
– Locking eye bolts
– Mechanical pin

After each operation carry out the electrical tests in accordance with current standards.

summarising table

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replacing a key–lock

removal

Remove the 2 screws fixing the lock. Separate the lock from its support.

fitting and checking

Fit the lock on its support. Fit and tighten the lock fixing screws.

Part A must not be flanged by the latch on lock B.

Replacing the closing springs

Check that the circuit–breaker is open and that the operating mechanism is deactivated.

removing the closing springs

Very slightly charge the operating mechanism using the charging lever...

.... the springs will be compressed...
as soon as possible insert a 6 dia. 40 mm long min. screw or pin into the hole shown above. Release the lever. The springs will exert a force on the pin. On no account must the pin be free.

(do not exceed the first notch on the operating mechanism, or perform a complete cycle and start again).

Remove the washer and the circlips E.
Remove ring F taking care not to damage it (Teflon coating).

fitting the closing springs

Fit the spring and ring F on pin G of the operating mechanism.

Press the closing button and at the same time....

CAUTION
Do not lubricate when mounting and do not scratch the teflonised ring.
...continue charging...

... in order to bring the crank handle H into the axis of the lower fixing hole of the spring guide.

Fit the washer and the circlips E.

Check that the circuit-breaker is open and that the operating mechanism is deactivated.

Slightly charge the operating mechanism in order to unflange the springs.

Remove the locking created on the springs with the 6 dia. screw or pin.
Continue charging until you hear a click.

Check: Close then open using the “I” and “O” pushbuttons in order to deactivate the operating mechanism.

replacing a release
different positions of releases in the operating mechanism

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single closing release according to position I
removal

Mark and disconnect the wires. Remove the two M6 fixing screws. Remove the release.
fitting and checking

Fit in reverse order to removal.

**Tightening torque: 13 Nm.**

Position the release with its cylindrical rod pointing towards the latching crank handle.

Check that the coil rod does not flange the crank handle in the tripped position and ensures passage of the closing lock A on the eccentric catch B.

---

**undervoltage release according to position II removal**

Mark and disconnect the wires.

Remove the two M6 fixing screws.

Remove the trip unit.

---

fitting and checking

Place the trip unit in the tripped position. Place the crank handle in the limit stop position.

There must be a clearance of 0.5 to 1 mm between the crank handle and the trip unit.

Fit the two M6 fixing screws.

**Tightening torque: 13 Nm.**

---

**shunt release or overcurrent trip unit according to position III removal**

Mark and disconnect the wires.

Remove the two M6 fixing screws.

Remove the release.
fitting and checking

Fit in reverse order to removal.

**Tightening torque: 13 Nm.**

Position the release with its cylindrical rod pointing towards the latching crank handle.

Check that the coil rod does not flange the crank handle in the tripped position and ensures passage of the closing lock A on the eccentric catch B.

accordin to position IV

**NB**: the coil is mounted to the left or right of the operating mechanism according to the protection type.

Mark and disconnect the wires.

Remove the two M6 fixing screws.

This assembly is **compatible** with the presence of an undervoltage release

Remove the release.

fitting and checking

Fit in reverse order to removal.

**Tightening torque: 13 Nm.**

Position the release with its cylindrical rod pointing towards the latching crank handle.

Check that the coil rod does not flange the crank handle in the tripped position and ensures passage of the closing lock A on the eccentric catch B.

shunt release or overcurrent trip unit (two coils)

Mark and disconnect the wires.

Remove the two M6 fixing screws.

Remove the release.
fitting and checking

Fit in reverse order to removal.

**Tightening torque: 13 Nm.**

Position the release with its cylindrical rod pointing towards the latching crank handle.

Check that the coil rod does not flange the crank handle in the tripped position and ensures passage of the closing lock A on the eccentric catch B.

---

according to position VI removal

Mark and disconnect the wires.

Remove the two M6 fixing screws.

Remove the release.

---

fitting and checking

Fit in reverse order to removal.

**Tightening torque: 13 Nm.**

Position the release with its cylindrical rod pointing towards the latching crank handle.

Check that the coil rod does not flange the crank handle in the tripped position and ensures passage of the closing lock A on the eccentric catch B.

---

replacement gear motor and roller on the ratchet holder

removing the gear motor

Unhook the ratchet holder return spring and lift the gear latching ratchet by means of a screwdriver.

Raise the motor ratchet holder as high as possible and lock it in place with the screwdriver.
Remove the gear motor (3 screws).

Disconnect the 2 motor supply wires.

Remove the small column.

Take out this rivet. Replace it with an M4 screw combined with washers and lock nut.

removing the roller on the ratchet holder

Remove spring A.
Remove the roller:
- Truarc B.
- washers C.
- bearing D.
- internal bearing ring E.
- pin F.

placing the roller on the ratchet holder

Prepare and lubricate the parts:
- bearing D.
- internal bearing ring E.
- pin F.
- washers C.
- Truarc B.
- spring A.
Assemble the roller, with the part of the pin used to hook the spring turned towards the gear motor.

flying the gear motor

Place the spring on the ratchet holder.

Stick (SR 270 strong loctite) and screw the HM6 length 12, class 12.9 stud in the yellow column on the tool mark side.

Stick (SR 270 strong loctite) and screw the new column equipped with the stud into the operating mechanism column.

To fit the gear motor, raise the ratchet wheel as far as it will go and lock it using the screwdriver. Should a ratchet catch in the ratchet wheel, it will prevent this operation.

Raise the motor ratchet wheel as far as it will go and lock it using the screwdriver.

Insert the gear motor, taking care not to remove screw G so as not to lose spacer H placed between the two flanges.
Fit the screws **class 10.9** (stick using SR 270 strong loctite) and secure the gear motor assembly to a **torque of 13 Nm**.

Hook the spring onto the gear motor pin.

- **connect the wiring to the terminal block**

---

**replacing an SE microswitch removal**

Remove the two fixing screws. Remove the microswitch without withdrawing the insulating plates.

---

**fitting and checking**

Perform reverse operation to disassembly having first compensated clearance in an anticlockwise direction and pushed the contact in the direction of the auxiliary contacts.

**Tightening torque: 0.7 Nm.**
replacing an end of charging contact (M1/M2/M3) removal

Mark and disconnect the wires. Remove the 6 hexagon socket screws and fixing nuts.

fitting and adjustment

Proceed in reverse order. Lock the contact fixing screws. 
**Tightening torque:** 0.7 Nm. 
**Adjustment:**
- do not flange the contact, 
  adjust travel A 0.7 ± 0.2 mm.  
**NB:** to adjust A,  
- loosen nut B  
- move the part along C

replacing the antipumping relay removal

Mark and disconnect the wires.  
Loosen the fixing screw and slide the relay so that the screw leaves the slot.  
Use a 7 wrench.
fitting

Fit the fixing screw on the relay and position the relay. Lock the fixing screw in place. **Tightening torque: 0.7 Nm.** Connect the wires as in the wiring diagram and bind.

replacing the auxiliary contact unit removal

Remove the operating mechanism cover.
- locate the contact unit A.
- mark and disconnect the wires.

Remove the terminal block assembly B, fixed by screws, washers and nuts C.

presentation

OLD rotary switch ENTRELEC. NEW rotary switch MAFELEC.
dismantling the OLD rotary switch

Remove the 2 nylstop nuts D.

- remove pin E and colar F
- remove rotary switch A

- remove rivet G which locks small plate J
- remove crank H and small plate J

fitting of new rotary switch

Assemble on the new unit, crank H according to the assembly direction shown above:
- reference "O" (engraved on the pin) in front of the hole of rivet G

Fit plate J and fix it by a rivet G (or a diameter 3 screw).

To end the assembly, the operation is the reverse to the dismantling.
- fix rotary switch D on the operating mechanism
- fix pin E and colar F
- fix and lock the 2 nylstop nuts K
- fix the assembly terminal block D, fix by screws, washers, nuts

---

**dismantling of the new rotary switch**

Remove the 2 nylstop nuts K.

Remove pin E and collar F, remove rotary switch D.

Remove rivet G which locks small plate J. Remove crank H and small plate J.
**SF6 gas recovery conformity rules**

The SF6 must be removed before any dismantling operation can be carried out in compliance with the procedures described in IEC-61634 and according to the following instructions. The gas must be treated in compliance with IEC-60480.

**intervention method**

Tool necessary for the operation

Plug (A).

Connect the vacuum/filling device.

Vacuum/filling device connected.

Wait until the pressure gauge shows 0 (15 min to empty the tank) before removing the connection.
problems, probable causes and solutions

The information given below reduces operating downtimes to a minimum. If the solutions proposed are not effective, we suggest you contact the Groupe Schneider service centre.

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• replace motor if required |
| End of charging contact |  |  
• check contact state  
• replace it if required |
| Wiring |  |  
• check auxiliary circuit connections |
| Circuit–breaker closing impossible.  
the indicator remains open | Undervoltage release | The coil is not energised  
• energise the release or keep it artificially in the « closed circuit » position |
| Closing release |  |  
• check the circuit  
• The winding is cut  
• replace the release |
| Charging device |  |  
• The operating mechanism is not charged  
• charge the operating mechanism |
| The circuit–breaker closes and opens immediately and remains open although the closing order is maintained. | All opening trip units (direct or indirect) | There is a fault on the main HV circuit, or protection circuits are incorrectly adjusted  
• remove the fault  
• adjust the protection circuits |
| The circuit–breaker opens and closes in turn. | Antipumping relay or direct releases |  
• replace the relay  
• readjust |
| The circuit–breaker does not open manually or remotely.  
(circuit–breaker without electrical operating mechanism). | Operating mechanism or circuit–breaker (incomplete closing) | Hard spot on the operating mechanism or circuit–breaker  
• finish charging the mechanism with the manual charging handle.  
Warn the Groupe Schneider service centre. |
| Trip unit |  |  
• The trip unit is badly connected  
• check the circuit  
• The winding is cut  
• replace the trip unit  
• check the protection circuit |
group Schneider Electric service centers are there for:

engineering and technical assistance
start-up
training
preventive and corrective maintenance
adaptation work
spare parts

Call your sales representative who will put you in touch with your nearest group Schneider Electric service centers.