

circuit breaker

Anglais

**MV distribution
factory built assemblies
at your service**

instructions for use

**LF draw-out
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**

as per iso 3864–2

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

**WARNING**

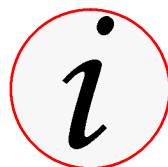
as per iso 3864–2

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

**CAUTION**

as per iso 3864–2

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.

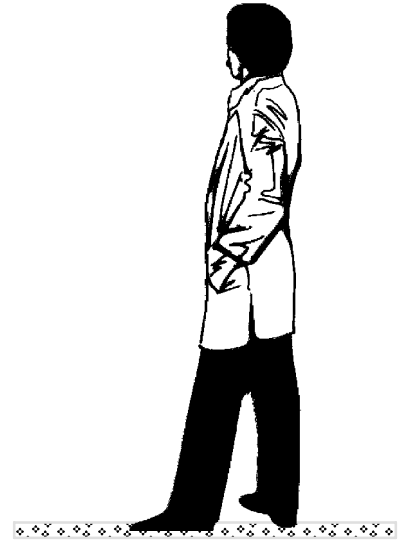
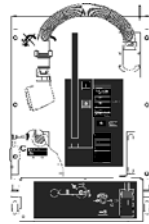


INFORMATION-ADVICE
We draw your attention to this specific point.

contact the Schneider Electric service unit for diagnosis and advice



Call your sales representative who will put you in contact with the closest
SCHNEIDER ELECTRIC
group service centre.
You can log on to:
www.schneider-electric.com



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.

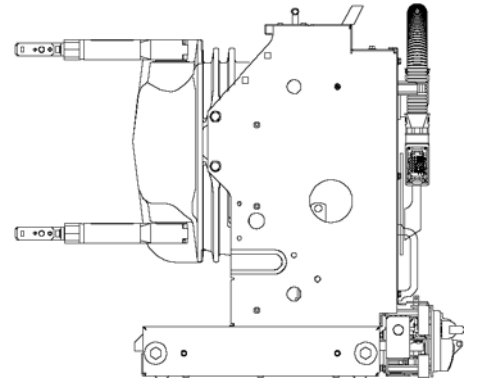
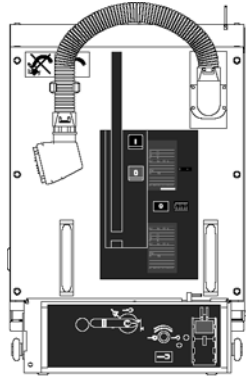


CAUTION

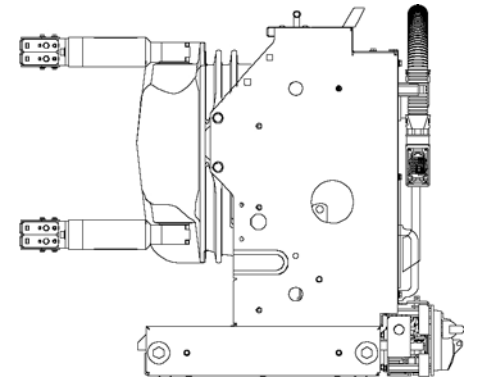
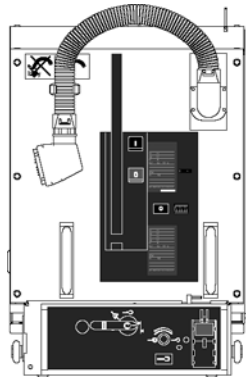
Only undertake the work after having read and understood all the explanations given in this document.

If you have any difficulty complying with these rules, please contact **Schneider Electric**.

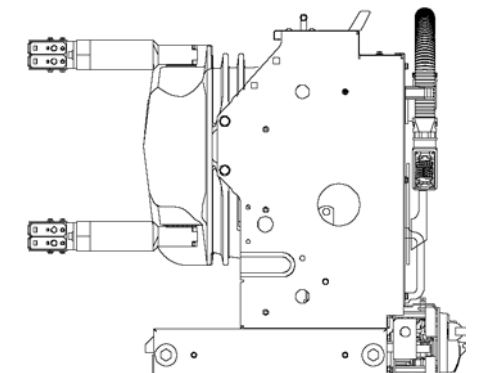
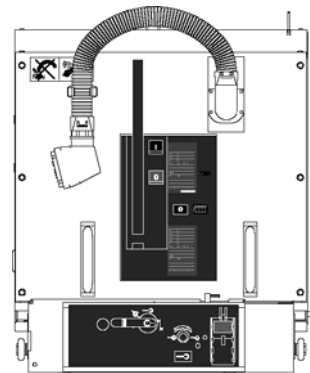
**draw-out
circuit-breakers**
LF1 630A



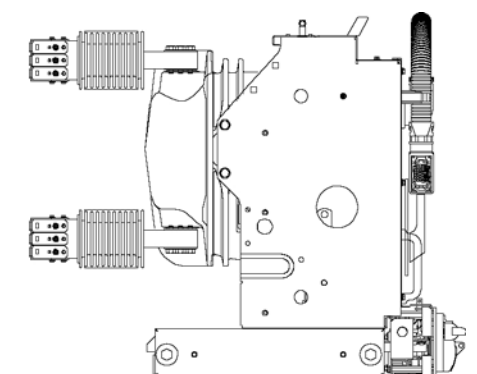
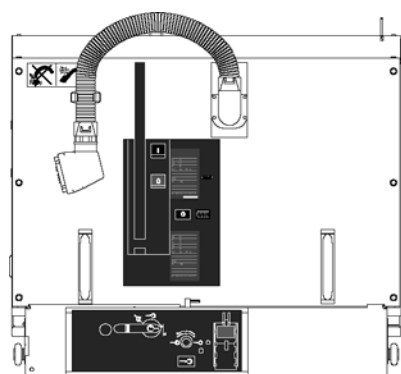
LF1 1250A



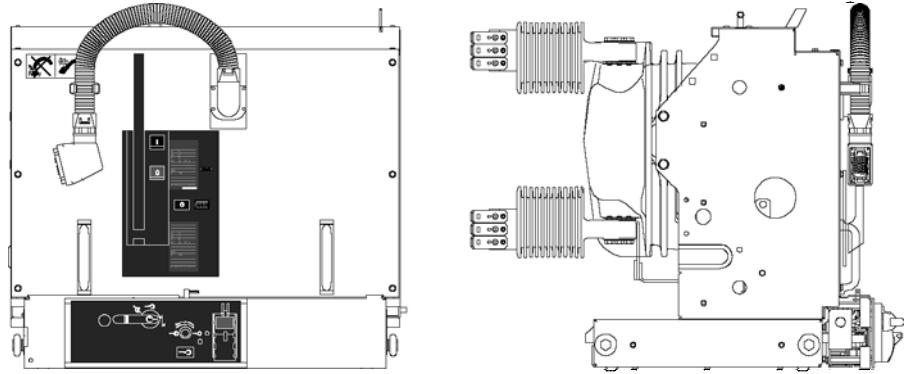
LF2 630A and 1250A



LF3 2500A

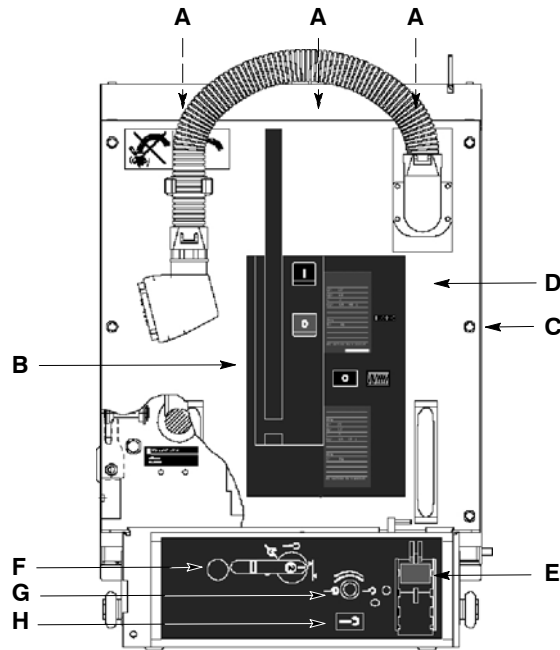


LF3 3150A



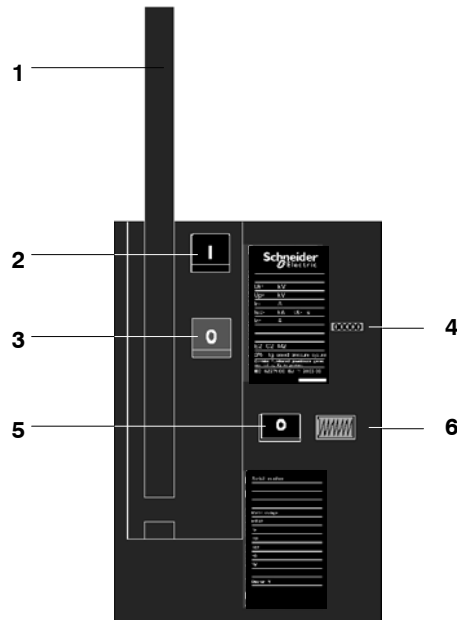
front panel

- A : poles
- B : operating mechanism plate
- C : circuit-breaker frame
- D : front plate
- E : mechanical opening pushbutton
- F : moving part position selector
- G : opening for inserting the operating crank handle of the moving part
- H : moving part position mechanical indicator



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



identification

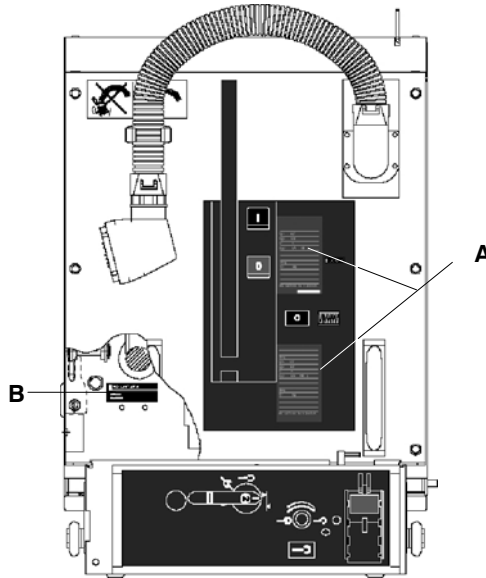
Check:

- 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

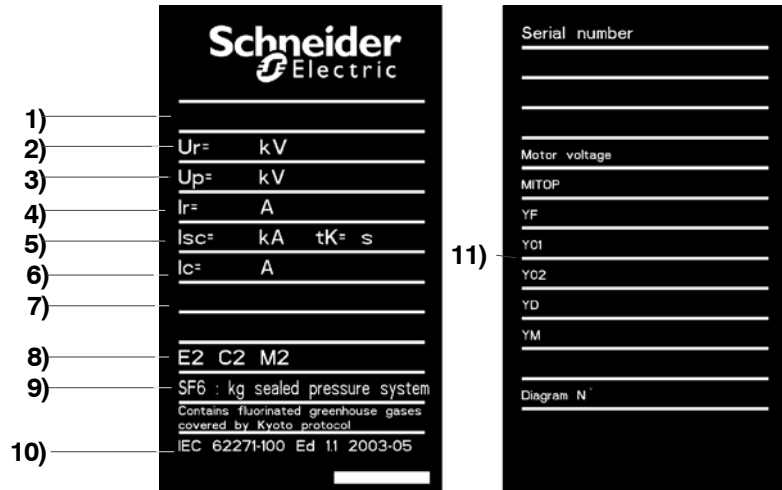
IEC standard

- A : technical data and auxiliaries plate
- B : serial number



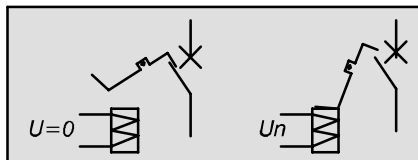
contactor and auxiliaries rating plates

- 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 label

(stuck on the operating mechanism plate)

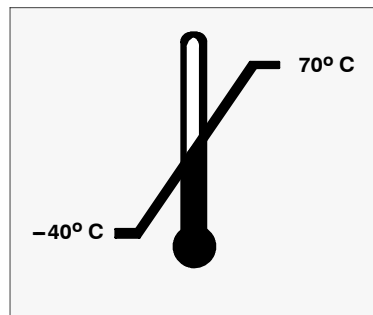
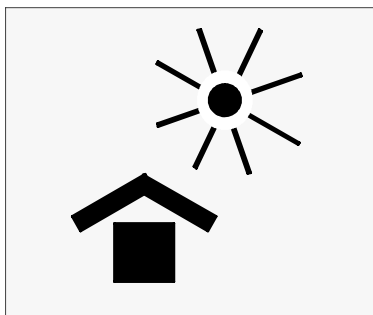
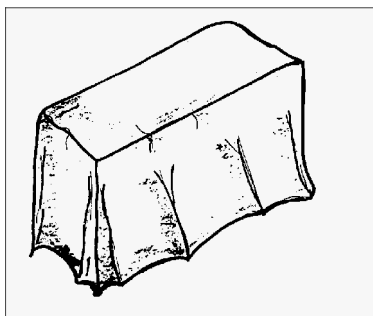


Label indicating the undervoltage trip device option.

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 exceptional case of the circuit-breaker being delivered separately from an MCset FU and in the event 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

In the exceptional case of the circuit-breaker being delivered separately from an MCset FU.

- unpack the equipment on the installation site.
- avoid impacts.

Once the device is unpacked, handle it by lifting or rolling means.

handling by lifting

Sling up the device using the lifting lugs and place it on the OED.

When the device has been taken up by the OED, unhook the slings, remove the handling parts and their screws.

NB: keep the lugs and screws for subsequent handling operations.

handling by rolling

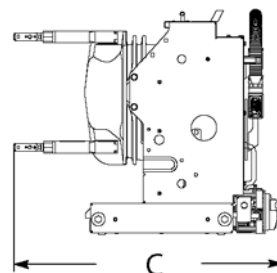
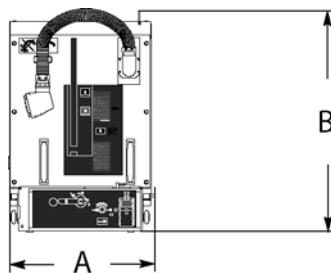
The device is handled by its front face by means of a moving part extraction tool (OED) on an even floor.



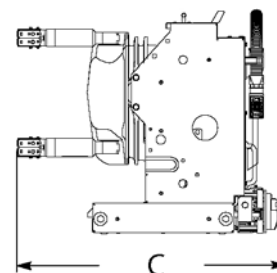
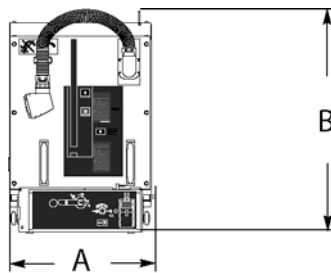
Never pull or push the device by the poles (the poles are pressurised).

overall dimensions

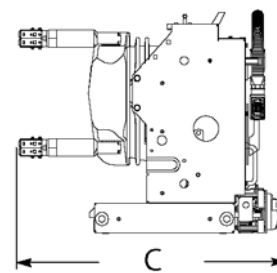
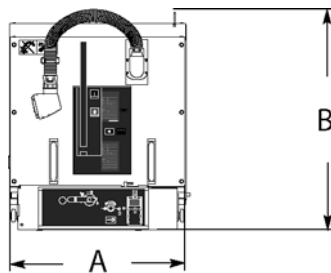
LF1 630 A



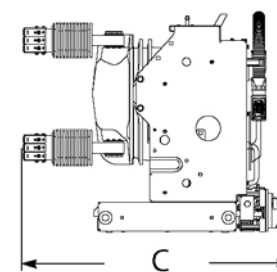
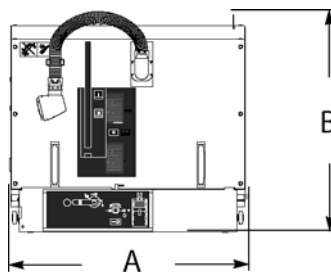
LF1 1250 A



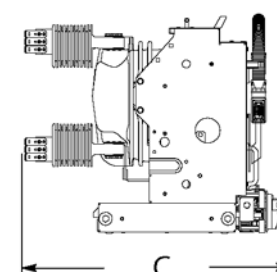
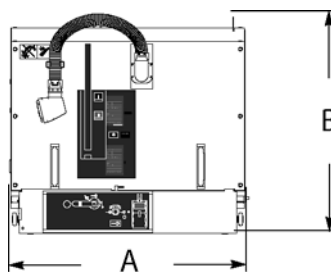
LF2 630 A et 1250 A



LF3 2500 A



LF3 3150 A



devices	phase to phase	dimensions			weight Kg
		A	B	C	
LF1 630 A	145	497	749	897	160
LF1 1250 A	145	497	749	897	170
LF2 630 A et 1250 A	185	627	749	897	190
LF3 2500 A	240	827	749	897	280
LF3 3150 A	240	827	749	897	320

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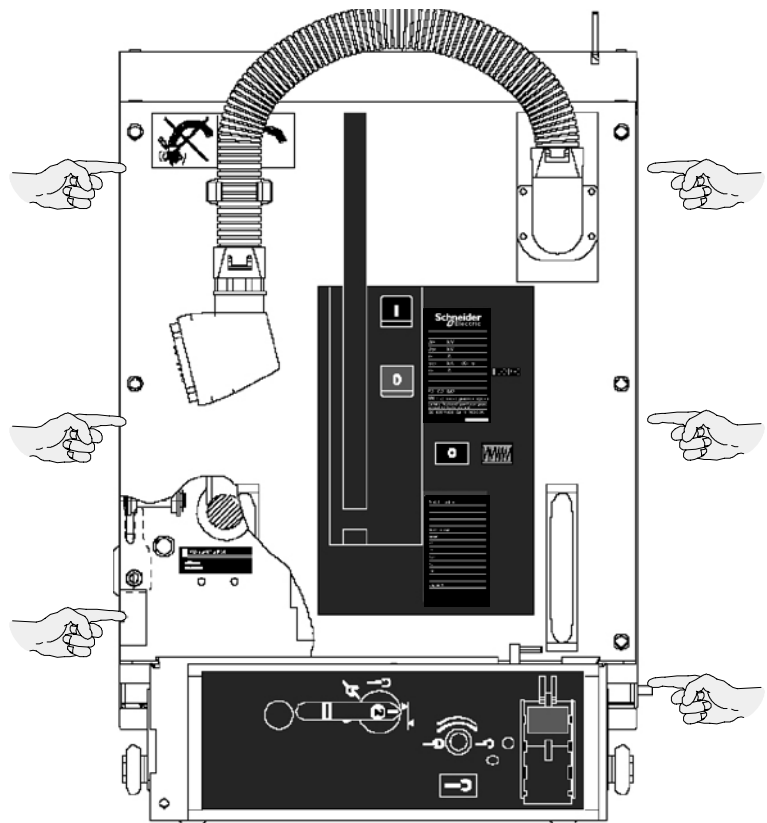
fitting and extracting

To fit or extract a draw-out **LF** on an **MCset** functional unit, refer to the functional unit user manual.

plugging in and out

To plug in or out a draw-out **LF** on an **MCset** functional unit, refer to the functional unit user manual.

removing the front plate

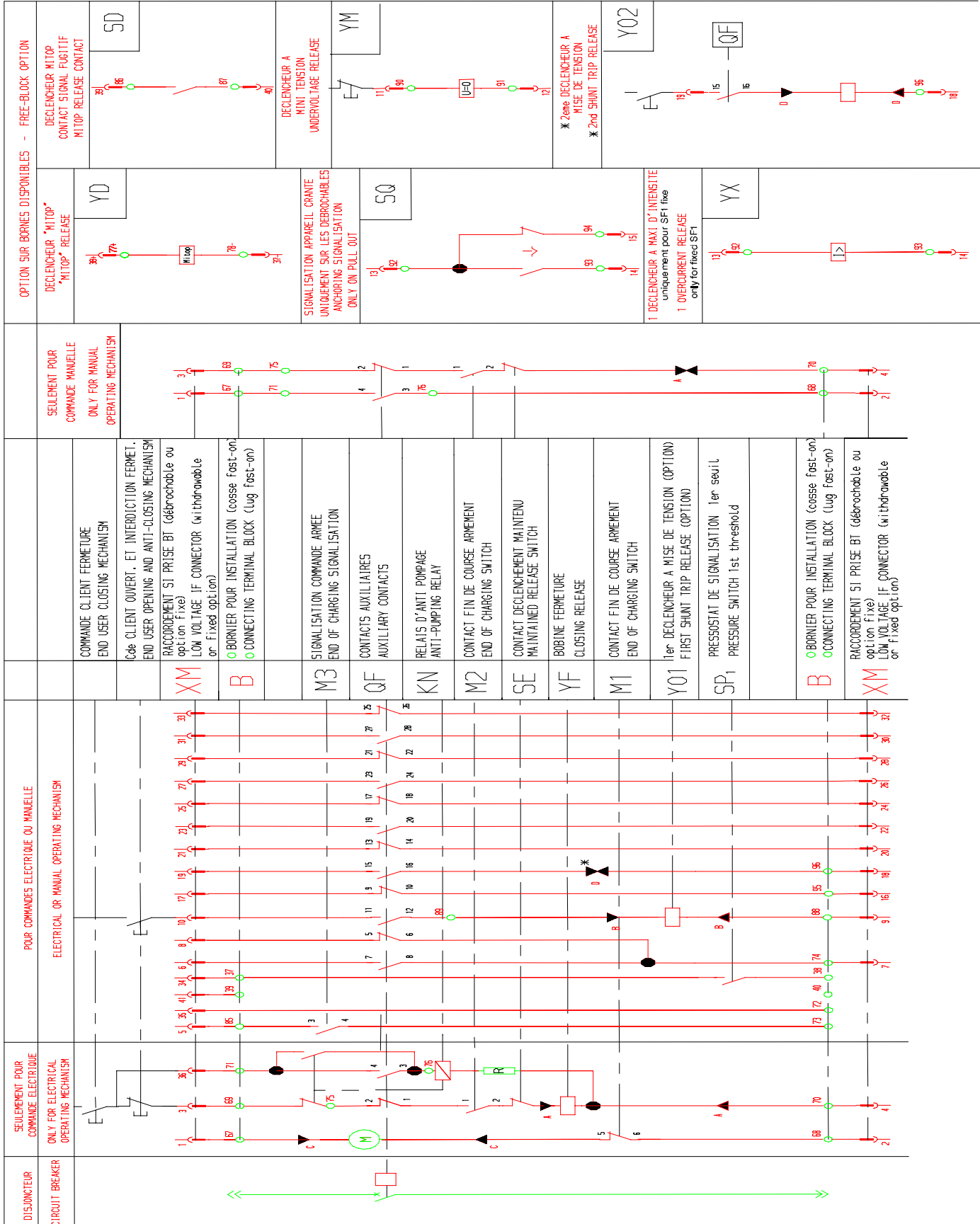


Remove the 6 front plate fixing screws.
Remove the front plate.

Reassemble the covers in reverse order to disassembly.

electrical diagram n° 889461

MV circuit breaker fixed or withdrawable (pressure switch 1 treshold)



- A** : signalisation pression SF6/source d'alimentation commune pour signalisation commande armée et signalisation disj. O disj. F/point commun pour bobine enclenchement et relais anti-pompage
SF6 pressure signalisation/ common source of power supply for end of charging signalisation and opened or closed CB signalisation/common point for releasa interlock and anti-pumping relay
- B** : point commun pour signalisation commande armée / signalisation pression SF6 / signalisation disj.. O – disj.. F surveillance continuité du circuit de déclenchement
common point for end of charging signalisation/SF6 pressure signalisation/ opened or closed CB signalisation supervision of continulty release circuit
- C** : point commun pour : signalisation commande armée / signalisation pression SF6 / signalisation disj.. O – disj.. F
common point for end of charging signalisation/SF6 pressure signalisation/ opened or closed CB signalisation
- D** : point commun pour : signalisation commande armée / signalisation pression SF6 / surveillance continuité du circuit de déclenchement
common point for end of charging signalisation/SF6 pressure signalisatio supervision of continuity release circuit
- E** : point commun pour : signalisation commande armée / signalisation pression SF6
common point for end of charging signalisation/SF6 pressure signalisation
- F** : signalisation commande armée surveillance / continuité du circuit de déclenchement / point commun pour signal, pression SF6 et signal disj.. O – disj.. F
end of charging signal / supervision of continuity release circuit / common point for SF6 pressure and opened or closed CB signalisation
- G** : signalisation commande armée / point commun pour signalisation pression SF6 et signalisation disj. O disj. F
end of charging signalisation / common point for SF6 pressure and opened or closed CB signalisation
- H** : signalisation, pression SF6 / point commun pour signalisation commande armée et signalisation disj.. O – disj.. F surveillance continuité du circuit de déclenchement
SF6 pressure signalisation / common point for end of charging signalisation and opened or closed CB signalisation supervision of continuity release circuit
- J** : signalisation pression SF6 / point commun pour signalisation commande armée et signalisation disj. O disj. F
SF6 pressure signalisation / common point for end of charging signalisation and opened or closed CB signalisation
- P** : signalisation commande armée / surveillance continuité du circuit de déclenchement
end of charging signalisation /supervision of continuity of release circuit

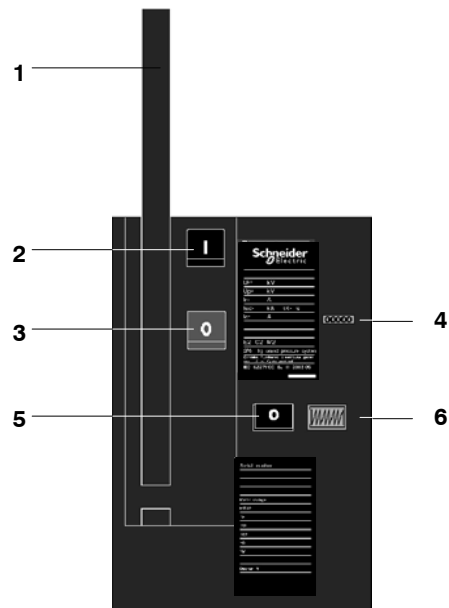
les pontages sont possibles uniquement sur les disjoncteurs avec prises de raccordement
the bridges are only possible on the circuit breaker with low voltage connectors

type de branchement 1 ère lettre du schéma <i>type of connection (1 ch letter of diagram)</i>	A	B	C	D	E	F	G	H	J	P	
présence de pont entre les bornes -- / -- <i>bridge between terminals -- / --</i>	72 / 73	—	×	×	×	×	×	×	—	—	×
	72 / 38	×	×	×	×	×	—	—	×	×	—
H pontage standard et niveau C <i>H bridge standard and level C</i>	73 / 74	×	×	×	—	—	—	—	×	×	—
	89 / 95	—	×	—	×	—	×	—	×	—	×
A pontage à utiliser qu'en cas de retrofit (interchangeabilité). <i>A bridge only to be used in retrofit cases</i>	69 / 71	×	—	—	—	—	—	—	—	—	—
	74 / 38	—	—	—	—	—	×	×	—	—	—
	-- / --	—	—	—	—	—	—	—	—	—	—
	-- / --	—	—	—	—	—	—	—	—	—	—
	-- / --	—	—	—	—	—	—	—	—	—	—

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operating mechanism plate

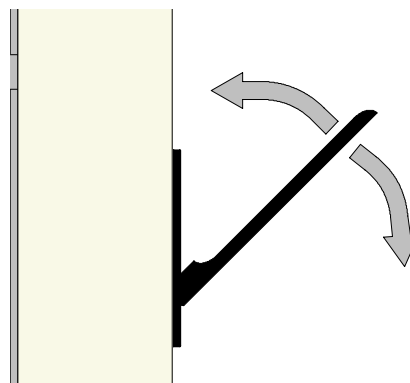
- 1 : operating mechanism charging lever
- 2 : closing pushbutton
- 3 : opening pushbutton
- 4 : operation counter
- 5 : "open or closed" device status mechanical indicator
- 6 : "charged or uncharged" operating mechanism charging status mechanical indicator



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.

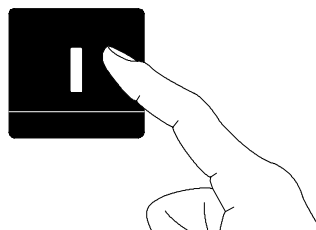


The circuit-breaker position indicator remains on "O" (*device open*). The operating mechanism indicator moves to the **charged** position.

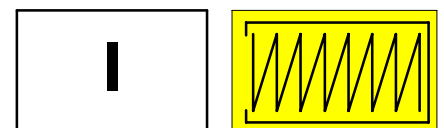
closing



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*).

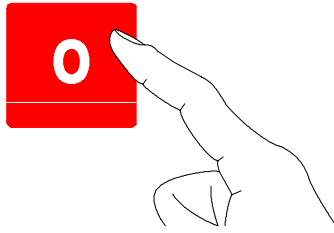


Press the pushbutton to close the circuit-breaker.



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

opening



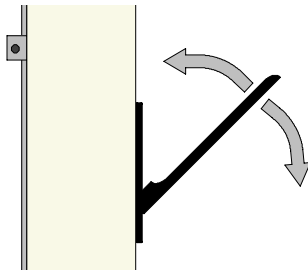
Press the pushbutton to open the circuit-breaker.



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.

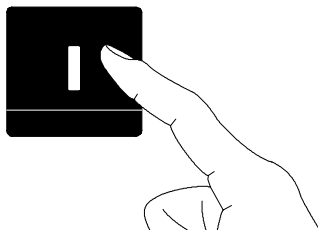


The circuit-breaker position indicator remains on "O" (*device open*). The operating mechanism indicator moves to the **charged** position.

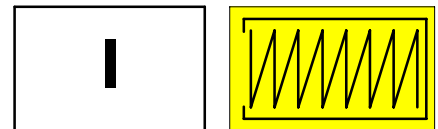
closing



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*).

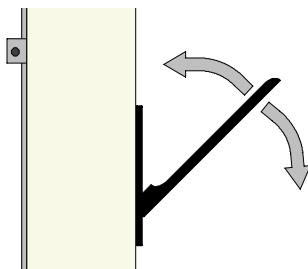


Press the pushbutton to close the circuit-breaker.

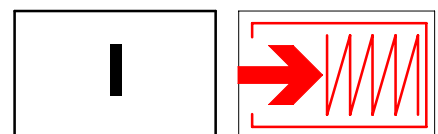


The circuit-breaker position indicator moves to "I" (*device closed*). The operating mechanism indicator moves to the **deactivated** position.

charging the operating mechanism

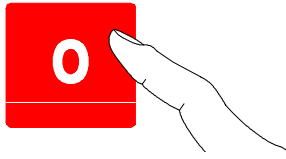


Charge the operating mechanism by an up and down motion until you hear a click.

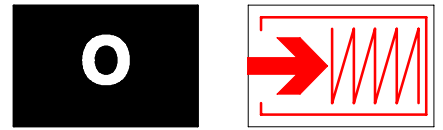


The circuit-breaker position indicator remains on "I" (*device closed*). The operating mechanism indicator moves to the **charged** position.

opening

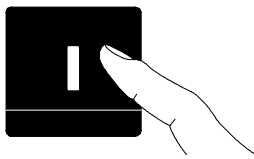


Press the pushbutton to open the circuit-breaker.

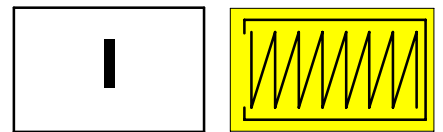


The circuit-breaker position indicator remains on "O" (*device open*).
The operating mechanism indicator moves to the **charged** position.

closing

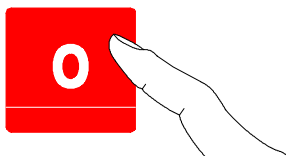


Press the pushbutton to close the circuit-breaker



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.

foreword safety instructions

All the operations described below must be performed in accordance with applicable safety standards **under the supervision of a competent authority.**
We recommend that you extract the circuit-breaker from the MCset cubicle (see functional unit user manual).

To access the various parts:

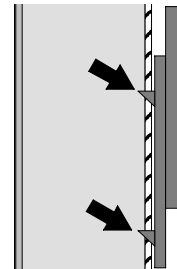
- open the circuit-breaker
- cut the supply to the auxiliary circuits and the main circuit
- close then open the circuit-breaker by means of the push buttons in order to deactivate the operating mechanism
- avoid impacts
(*pressurised enclosure*)

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

description	servicing operations	supplies	tools
pole enclosure	dusting the enclosure		cloth
arcing contact wear degree	measuring degree of wear		lamp, bell
operating mechanism			
spring guide	cleaning with a degreasing agent	unchlorinated solvent degreasing agent	cloth
	greasing, oiling	vacuoline oils 133 oil Isoflex Topas L152 grease	brush, oiler
operating mechanism unit	overall cleaning		cloth
	greasing, oiling	vacuoline oils 133 oil Isoflex Topas L152 grease	brush, oiler
latching mechanism and linkage	cleaning with a degreasing agent	unchlorinated solvent degreasing agent	cloth
	greasing, oiling	vacuoline oils 133 oil Isoflex Topas L152 grease	brush, oiler
gear motor	greasing	Isoflex Topas L152 grease	brush
pole operating mechanism connection mechanism			
	cleaning with a degreasing agent		cloth
	greasing, oiling	vacuoline oils 133 oil Isoflex Topas L152 grease	brush, oiler
propulsion guide			
	cleaning with a degreasing agent	unchlorinated solvent degreasing agent	cloth
	greasing	Isoflex Topas L152 grease	brush
endless screw	cleaning with a degreasing agent	unchlorinated solvent degreasing agent	cloth
	greasing	isoflex Topas L152 grease	brush

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.

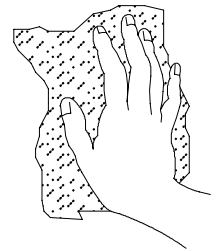
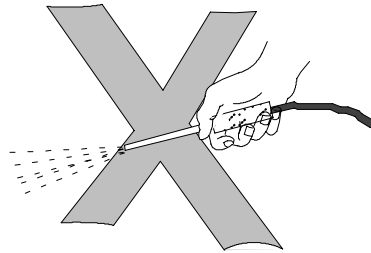
The main drawbacks of such processes are.

- 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

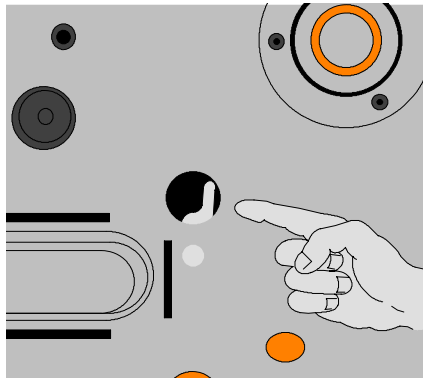
Never use solvents and alcohol.



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.

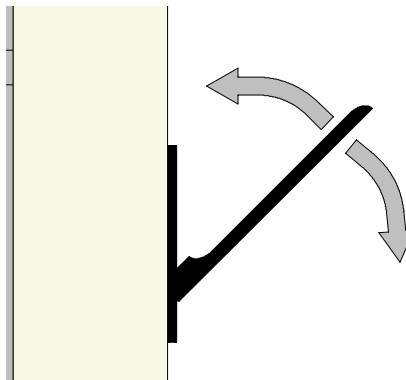


Arcing contact wear is monitored on the operation mechanism/circuit-breaker pole link.

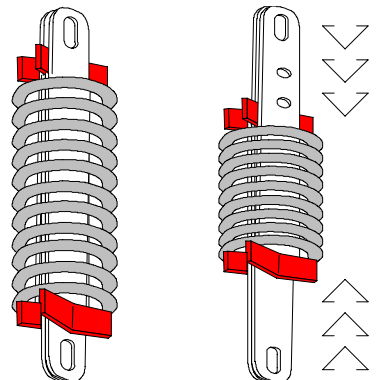


Check that the circuit-breaker is open, with its operating mechanism deactivated.

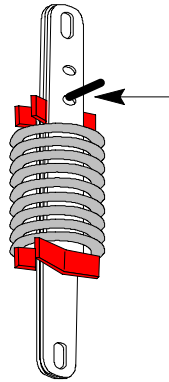
removing the closing springs



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

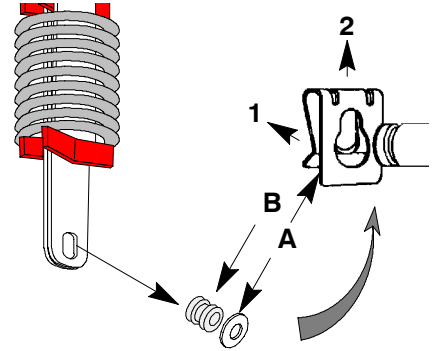


... the springs will be compressed...



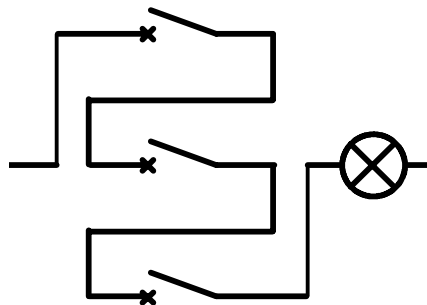
..... as soon as possible insert a 6 dia. 40 mm long min. screw or pin into the hole shown above.
Release the lever.

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*).

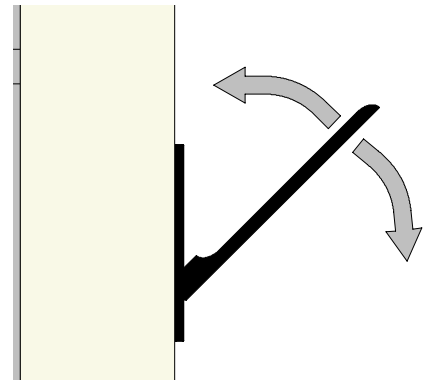


Remove the washer and circlips **A**. Release and withdraw the spring. Remove ring **B** taking care not to damage it (Teflon coating).

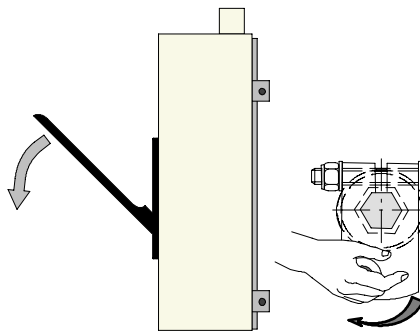
checking



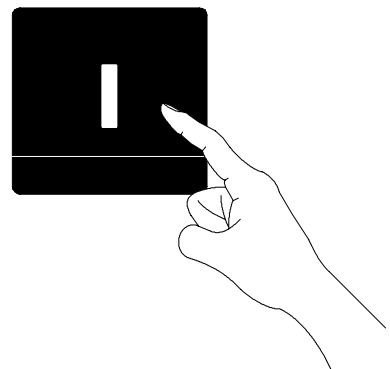
Serial connect the three phases of the device and insert a bell type indicator in the circuit.



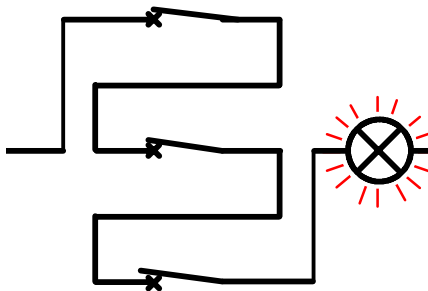
Charge the operating mechanism until you hear a click indicating charging is complete.



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



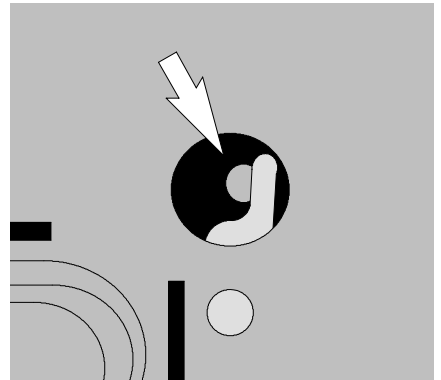
At the same time press the closing "I" pushbutton and the charging lever in order to release the latching mechanism.



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.



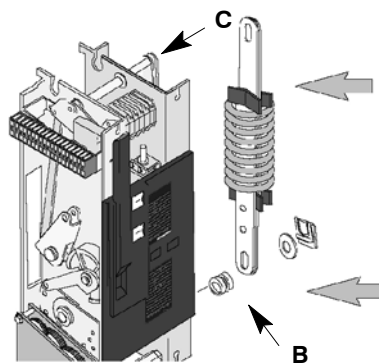
Keep the lever in this position, with the bell activated.
 If the position is overshoot, repeat the operation.



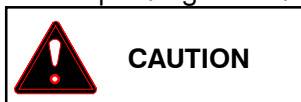
When the lamp is on, a rod with a diameter less **than or equal to 6 mm** can be inserted in the hole shown above.

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

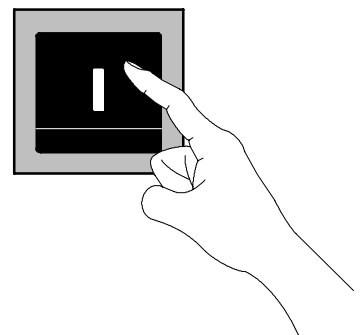
fitting the closing springs



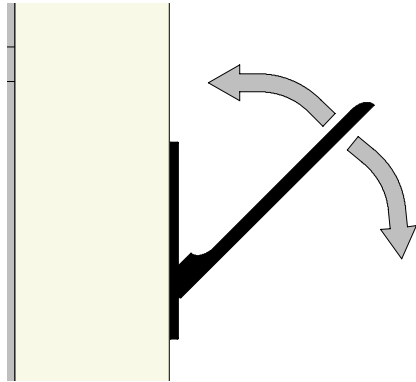
Fit the spring on pin **C** and ring **B** of the operating mechanism.



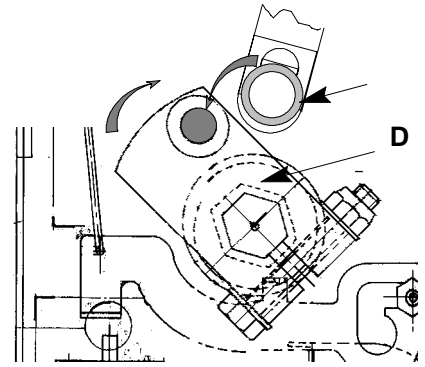
Do not lubricate when mounting and do not scratch the teflonised ring.



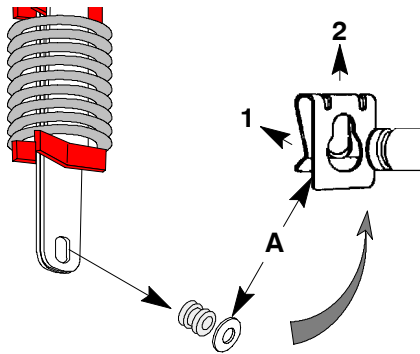
Press the closing button and at the same time....



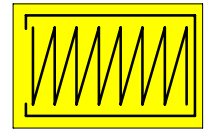
... continue charging....



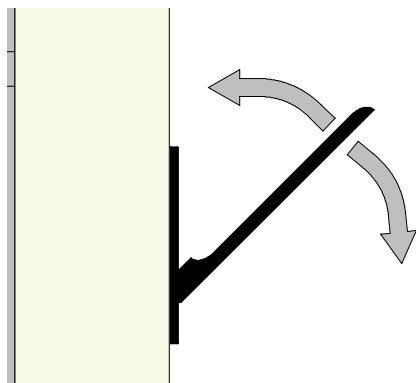
... in order to bring the crank handle **D** into the axis of the lower fixing hole of the spring guide.



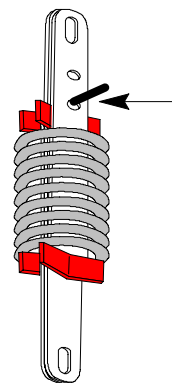
Fit the washer and the circlips **A**.



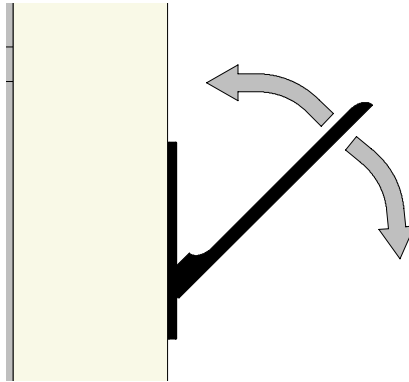
Check that the circuit-breaker is open and that the operating mechanism is deactivated.



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



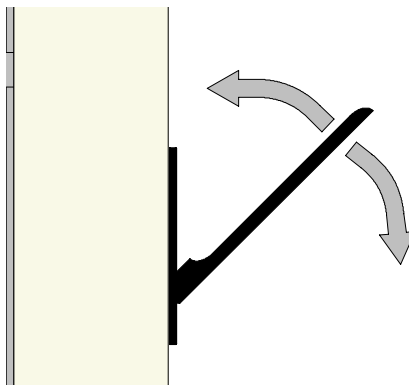
Remove the locking created on the springs with the 6 dia. screw or pin.



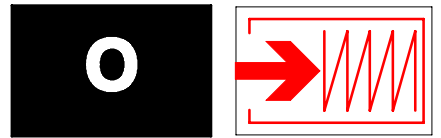
Continue charging until you hear a click.

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

**lubricating
the spring guides
closing spring**

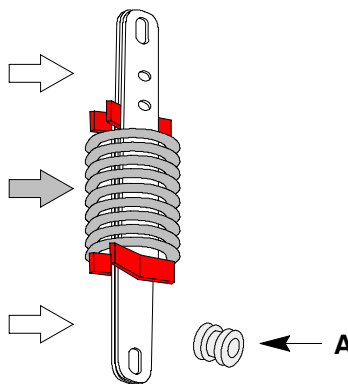


Charge the operating mechanism by an up and down motion until you hear a click.



The circuit-breaker position indicator remains on “O” (*device open*).

The operating mechanism indicator moves to the **charged** position.



The springs will be compressed.

- lubricate the guides
- oil the phosphatised springs



do not lubricate the teflonised ring A.



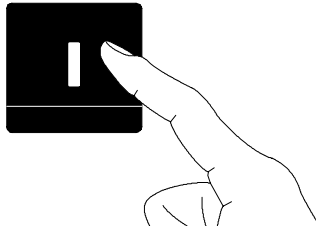
A brush must be used to lubricate. Do not dismantle the spring to perform this operation.

opening spring

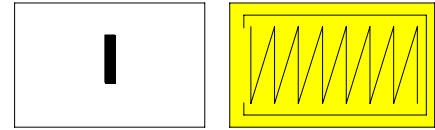
manual closing of the circuit-breaker



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*).

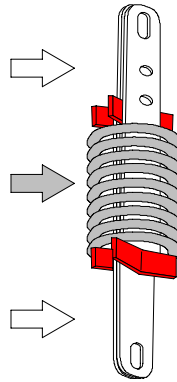


Press the push button “ I ” to close the circuit-breaker.



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

The operating mechanism indicator moves to the **deactivated** position.



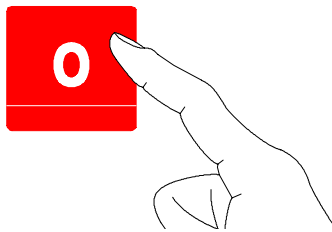
The springs will be compressed:

- lubricate the guides
- oil the phosphatised springs.



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

manual opening of the circuit-breaker



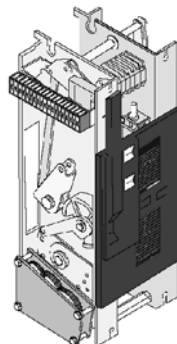
Press the push button “ O ” to open the circuit-breaker.



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

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

operating mechanism unit

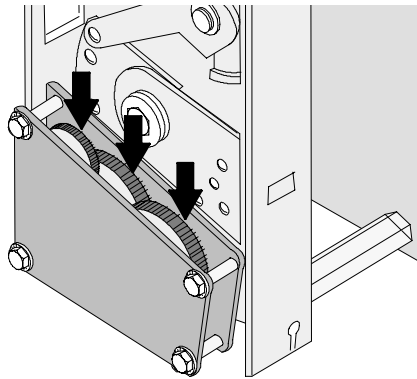


Clean the entire subassembly.
Oil all the phosphatised parts.
Check that the locking eye bolts are fitted.
Lubricate the pins and hinges.



**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



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.**

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.

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



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

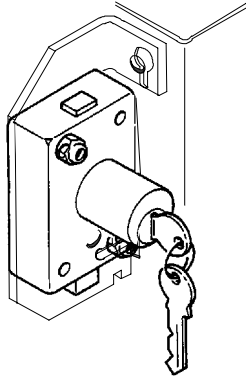
- Nylstop (self-locking nut)
- Contact washer
- Locking eye bolts
- Mechanical pin

summarising table

description	performed by	comments
replacing the enclosure	Schneider Electric	(replacing the device)
replacing the RI operating mechanism	Schneider Electric	
replacing the key-lock	Schneider Electric o Customer	
replacing the closing spring	Schneider Electric o Customer	
replacing the releases		
simple closing releases	Schneider Electric o Customer	
shunt releases or simple overcurrent trip devices	Schneider Electric o Customer	
undervoltage trip devices without lifting system	Schneider Electric o Customer	
undervoltage trip devices without lifting system with a time delay unit	Schneider Electric o Customer	
undervoltage trip devices with lifting system	Schneider Electric	
shunt releases or double overcurrent trip devices	Schneider Electric o Customer	
replacing the MITOP release	Schneider Electric	
replacing the gear motor	Schneider Electric o Customer	every 10 000 operations
replacing the microswitch (SE)	Schneider Electric o Customer	
replacing the M1, M2 and M3 end of charging contacts	Schneider Electric o Customer	
replacing the antipumping relay	Schneider Electric o Customer	
replacing the auxiliary contact unit	Schneider Electric o Customer	
replacing the operation counter	Schneider Electric	every 10 000 operations

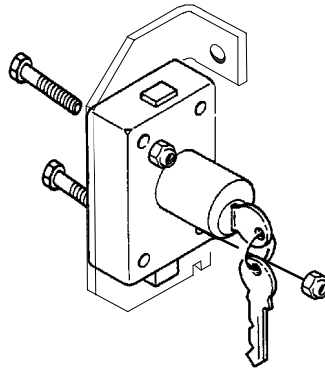
replacing a key-lock removal

This interlocking is optional.
With MCset integration, interlocking is conducted on the functional unit.

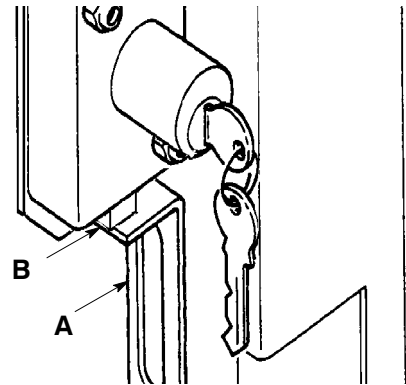


Remove the 2 screws fixing the lock. Separate the lock from its support.

fitting and checking

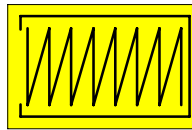


Fit the lock on its support. Fit and tighten the lock fixing screws.



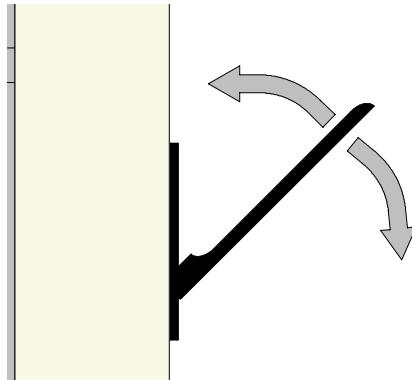
Part **A** must not be flanged by the latch on lock **B**.

replacing the closing springs

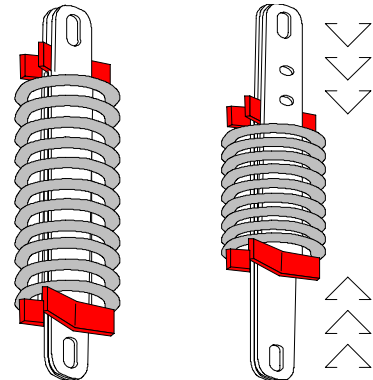


Check that the circuit-breaker is open and that the operating mechanism is deactivated.

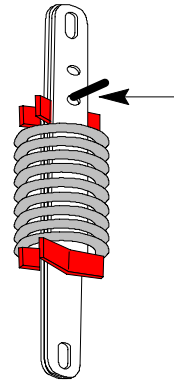
removing the closing springs



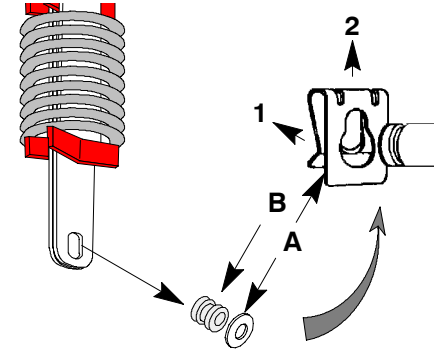
Very slightly charge the operating mechanism using the charging lever...



.... the springs will be compressed...

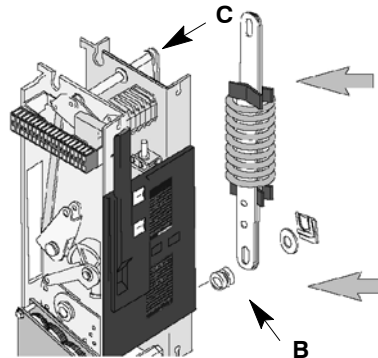


... as soon as possible insert a 6 dia. 40 mm long min. screw or pin into the hole shown above. Release the lever. The springs will exert a force on the pin.
On no account must the pin be free.
(do not exceed the first notch on the operating mechanism, or perform a complete cycle and start again).



Remove the washer and the circlips **A**.
Remove ring **B** taking care not to damage it (Teflon coating).

fitting the closing springs

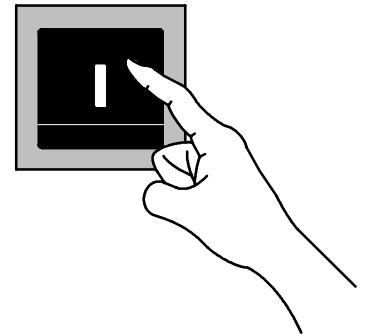


Fit the spring and ring **B** on pin **C** of the operating mechanism.

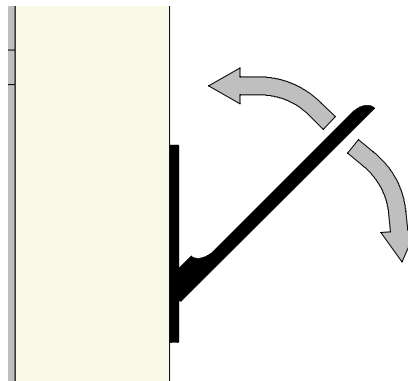


CAUTION

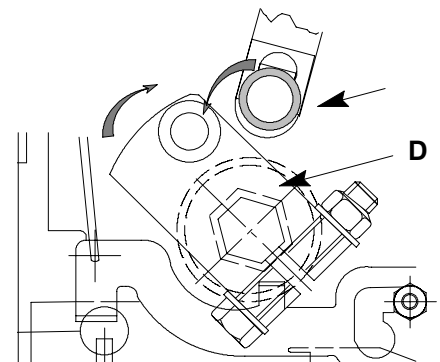
Do not lubricate when mounting and do not scratch the teflonised ring.



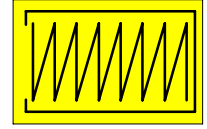
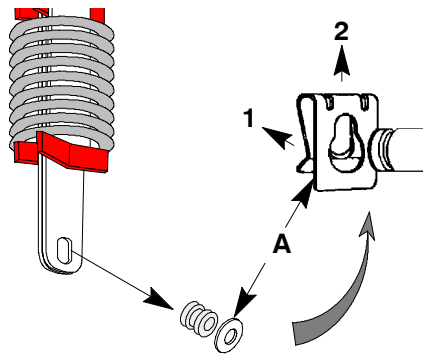
Press the closing button and at the same time....



...continue charging....

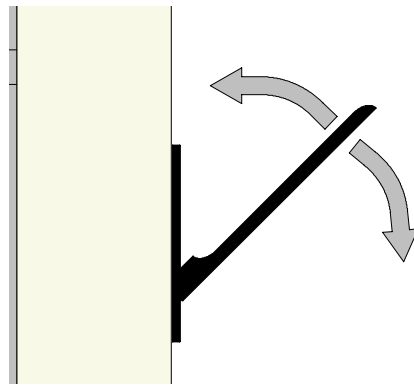


... in order to bring the crank handle **D** into the axis of the lower fixing hole of the spring guide.

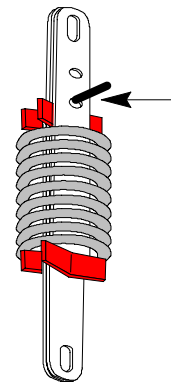


Fit the washer and the circlips **A**.

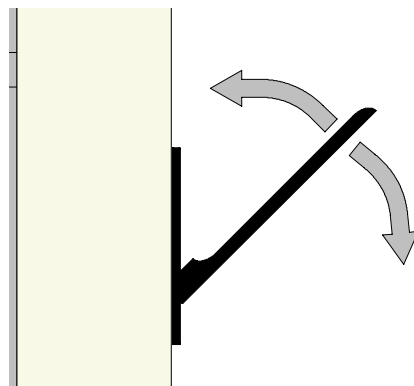
Check that the circuit-breaker is open and that the operating mechanism is deactivated.



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.



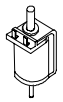

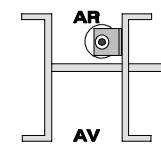
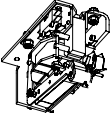

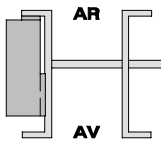
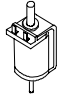


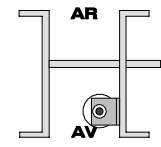
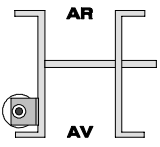
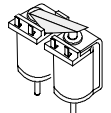


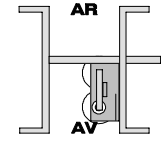
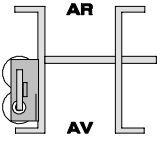
Continue charging until you hear a click.

Check:

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

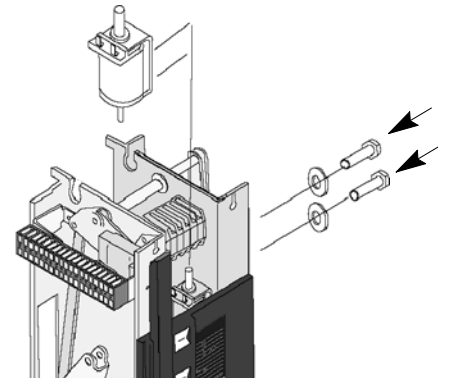
replacing a release

different positions of releases in the operating mechanism

release	undervoltage release	shunt release	overcurrent trip unit	top view of assembly position
single closing release				I 
undervoltage release				II 
single opening release				III  IV 
double opening release				V  VI 

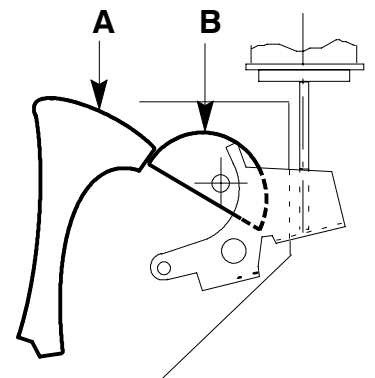
single closing release according to position I removal

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



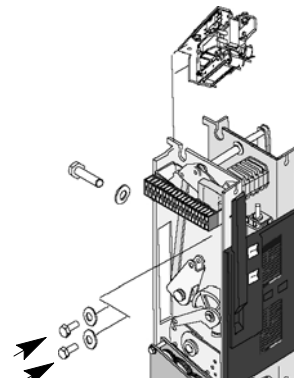
fitting and checking

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**.

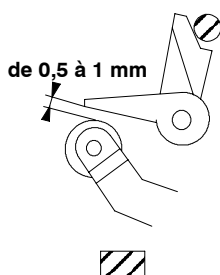


**undervoltage release
according to position II
removal**

Mark and disconnect the wires.
Remove the two M6 fixing screws.
Remove the trip unit.



fitting and checking

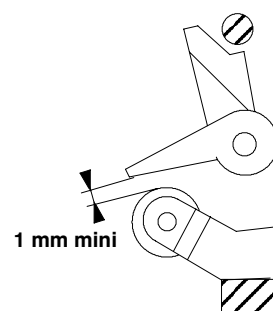


Place the trip unit in the tripped position. Place the crank handle in the limit stop position.

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.

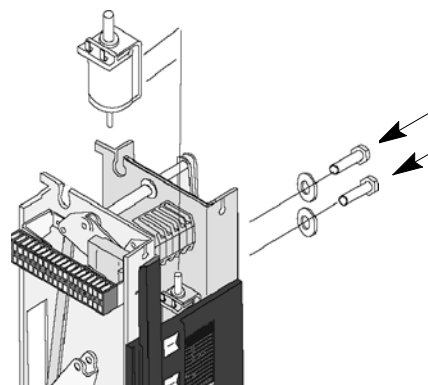
Tightening torque: 13 Nm.



When the magnetic circuit is closed, check that there is at least **1 mm** clearance between the idle crank handle and the trip unit.

**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.



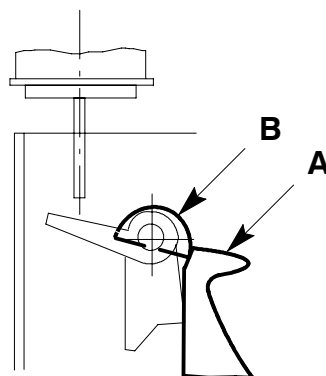
fitting and checking

Fit in reverse order to removal.

Tightening torque: 13 Nm.

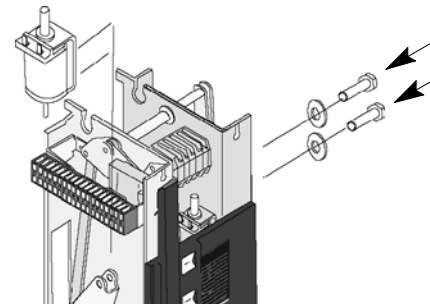
Position the release with its cylindrical rod pointing towards the latching crank handle.

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**.



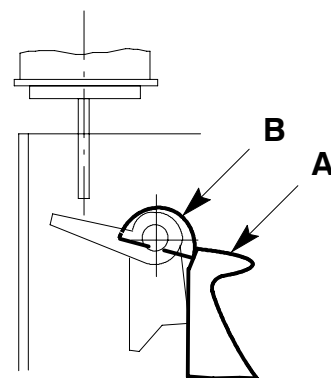
**according to position IV
removal**

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.



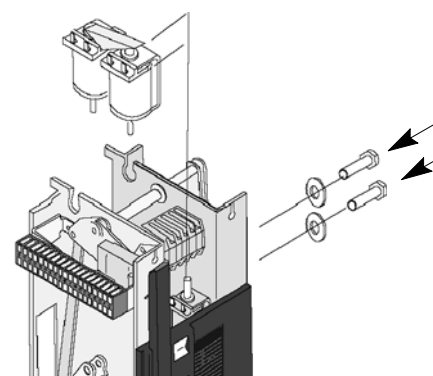
fitting and checking

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**.



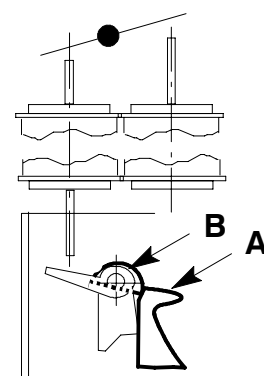
**shunt release or
overcurrent trip unit
(two coils)
according to position V
removal**

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



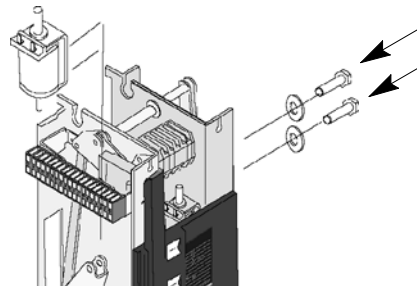
fitting and checking

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**.



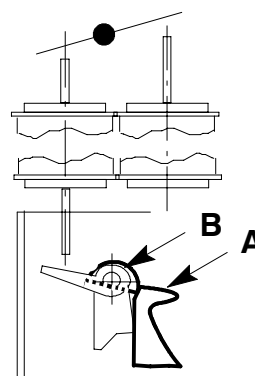
**according to position VI
removal**

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

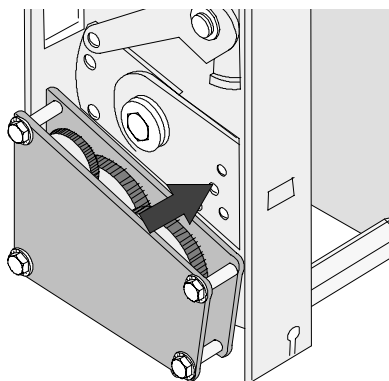


fitting and checking

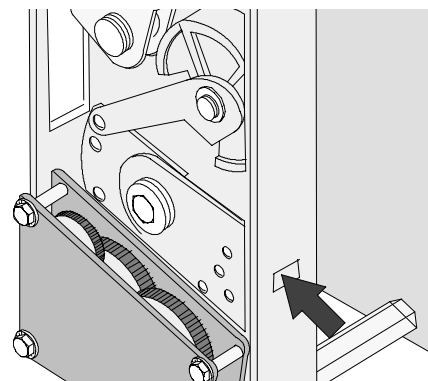
Fit in reverse order to removal.
Tightening torque: 13 Nm.
Position the release with its cylindrical rod pointing towards the latching crank handle.
Check that the coil rod does not flange the crank handle in the tripped position and ensures passage of the closing lock **A** on the eccentric catch **B**.



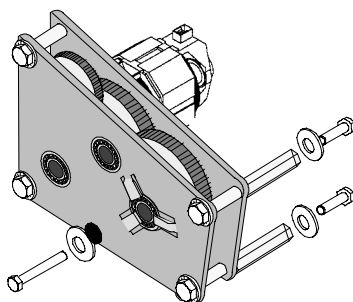
**replacement
gear motor and roller
on the ratchet holder
removing the gear motor**



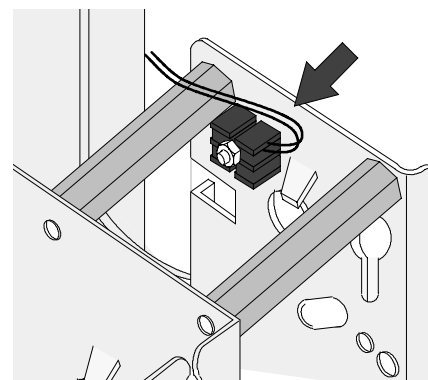
Unhook the ratchet holder return spring and lift the gear latching ratchet by means of a screwdriver.



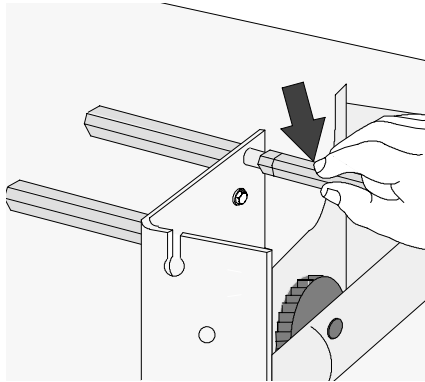
Raise the motor ratchet holder as high as possible and lock it in place with the screwdriver.



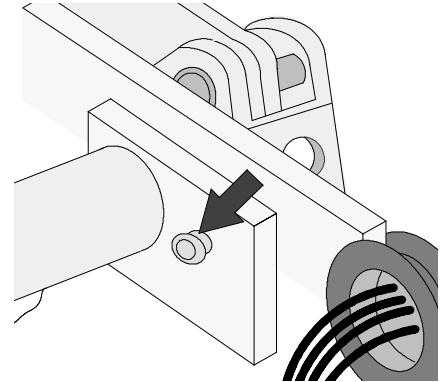
Remove the gear motor (3 screws).



Disconnect the 2 motor supply wires.



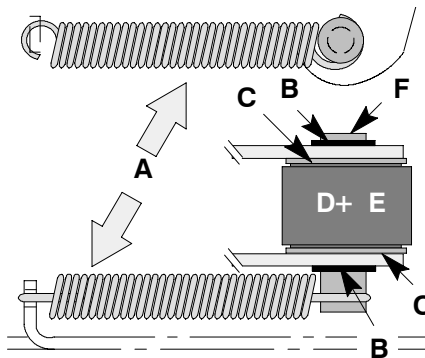
Remove the small column.



Take out this rivet.

Replace it with an M4 screw combined with washers and lock nut.

removing the roller on the ratchet holder

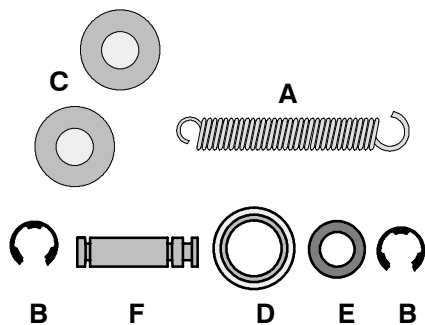


Remove spring **A**.

Remove the roller.

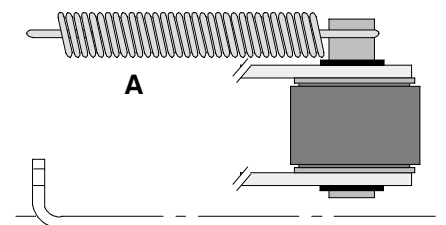
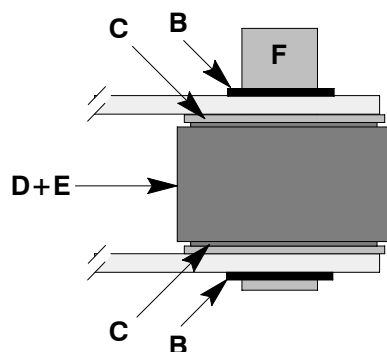
- Truarc **B**.
- washers **C**.
- bearing **D**.
- internal bearing ring **E**.
- pin **F**.

placing the roller on the ratchet holder



Prepare and lubricate the parts:

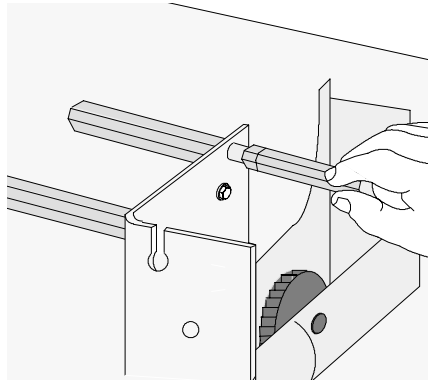
- bearing **D**.
- internal bearing ring **E**.
- pin **F**.
- washers **C**.
- Truarc **B**.
- spring **A**.



Assemble the roller, with the part of the pin used to hook the spring turned towards the gear motor.

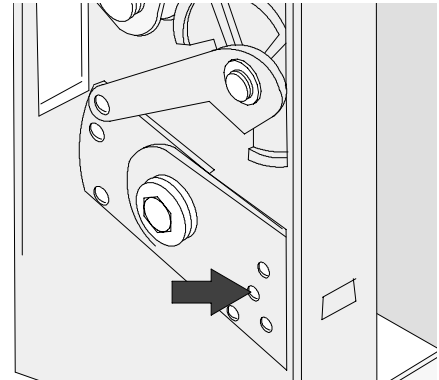
Place the spring on the ratchet holder

fitting the gear motor



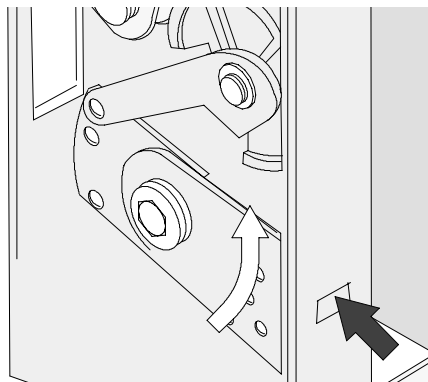
Stick (SR 270 strong loctite) and screw the HM6 length 12, **class 12.9** stud in the yellow column on the tool mark side .

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

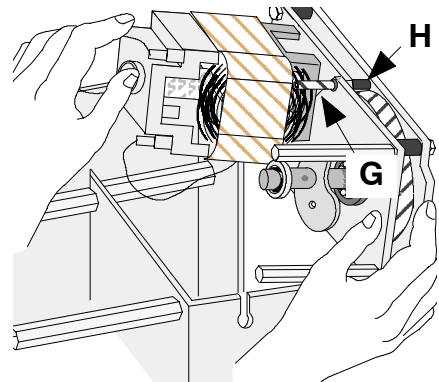


To fit the gear motor, raise the ratchet wheel as far as it will go and lock it using the screwdriver.

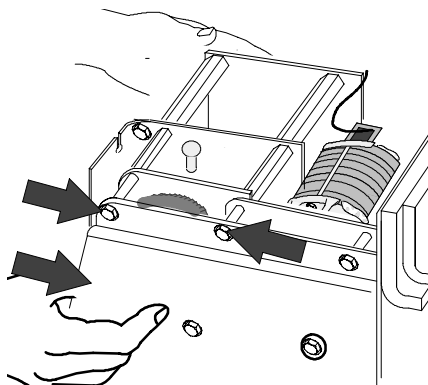
Should a ratchet catch in the ratchet wheel, it will prevent this operation.



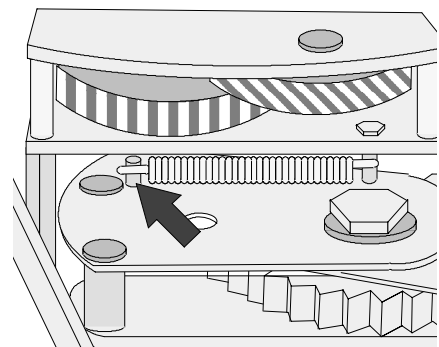
Raise the motor ratchet wheel as far as it will go and lock it using the screwdriver.



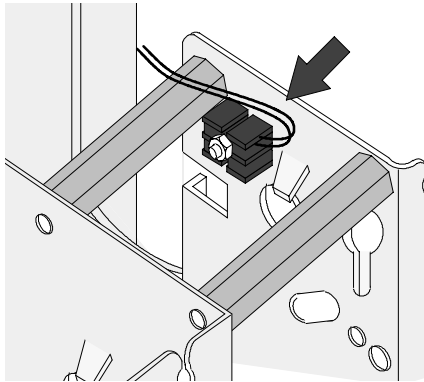
Insert the gear motor, taking care not to remove screw **G** so as not to lose spacer **H** placed between the two flanges.



Fit the screws **class 10.9** (stick using SR 270 strong loctite) and secure the gear motor assembly to a **torque of 13 Nm**.

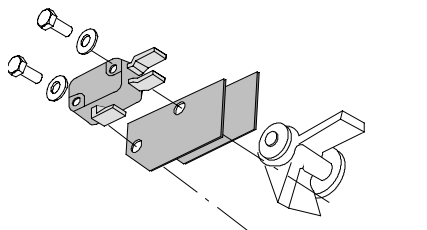


Hook the spring onto the gear motor pin.



- connect the wiring to the terminal block

replacing an SE microswitch removal



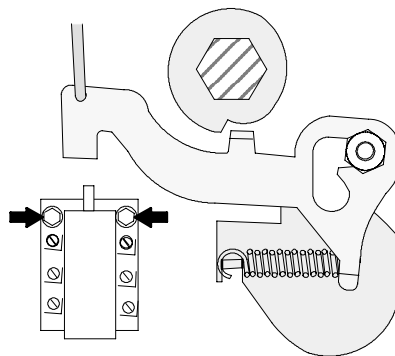
Remove the two fixing screws.
Remove the microswitch without withdrawing the insulating plates.

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.

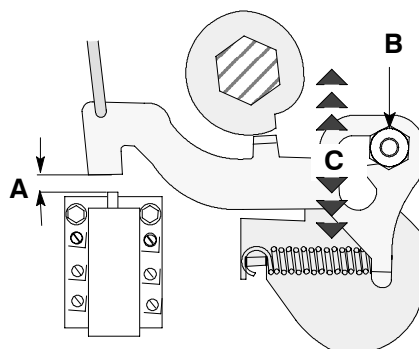
Tightening torque: 0.7 Nm.

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



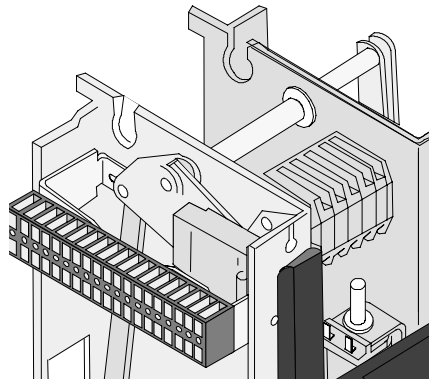
Proceed in reverse order.
Lock the contact fixing screws.

Tightening torque : 0.7 Nm.

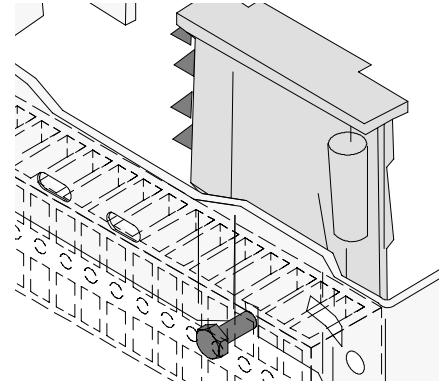
Adjustment:

- do not flange the contact, adjust travel **A** $0,7^{+0,1}_{-0,2}$ mm.
- NB:** to adjust **A**,
- loosen nut **B**
- move the part along **C**

replacing the antipumping relay removal

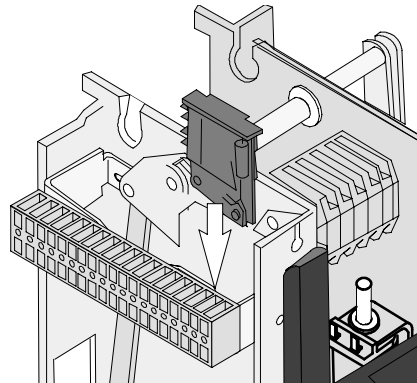


Mark and disconnect the wires.

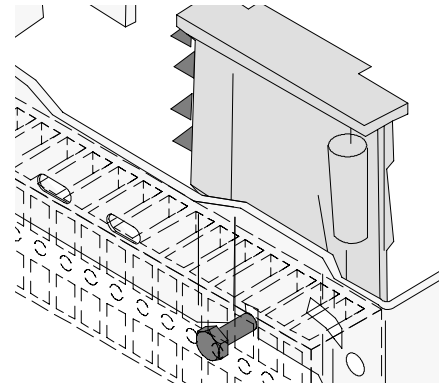


Loosen the fixing screw and slide the relay so that the screw leaves the slot.
Use a 7 wrench.

fitting

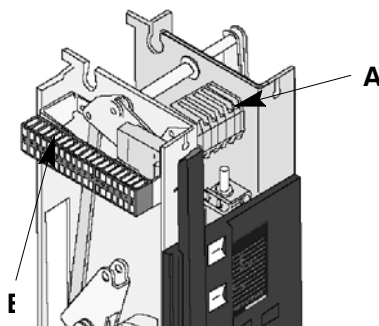


Fit the fixing screw on the relay and position the relay.



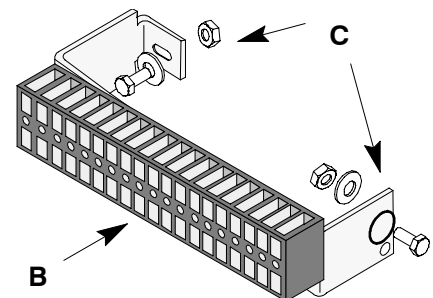
Lock the fixing screw in place.
Tightening torque : 0.7 Nm.
Connect the wires as in the wiring diagram and bind.

replacing the auxiliary contact unit removal



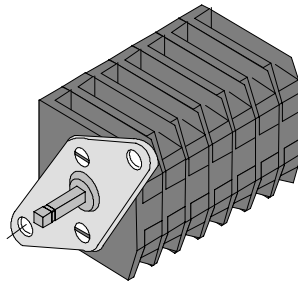
Remove the operating mechanism cover.

- locate the contact unit **A**.
- mark and disconnect the wires.

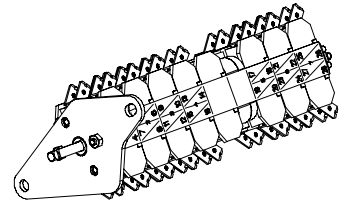


Remove the terminal block assembly **B**, fixed by screws, washers and nuts **C**.

presentation

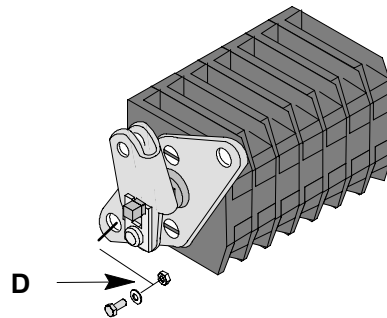


OLD rotary switch **ENTRELEC**.

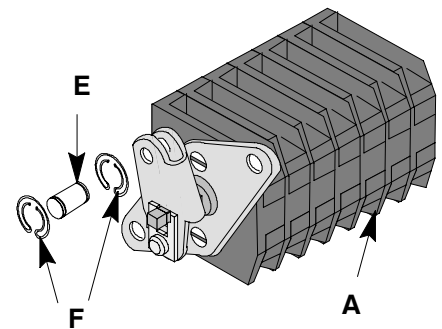


NEW rotary switch **MAFELEC**.

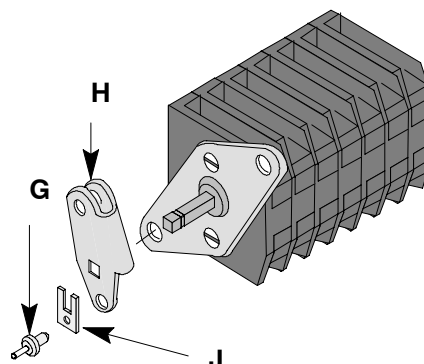
dismantling the OLD rotary switch



Remove the 2 nylstop nuts **D**.

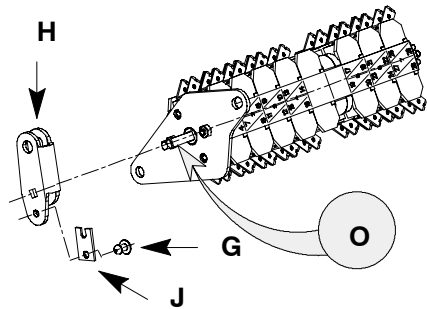


- remove pin **E** and colar **F**
- remove rotary switch **A**



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

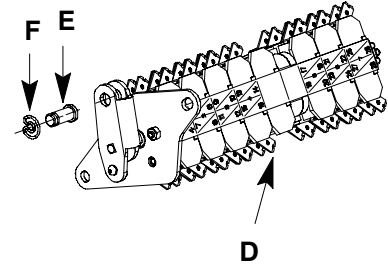
fitting of new rotary switch



Assemble on the new unit, crank **H** according to the assembly direction shown above :

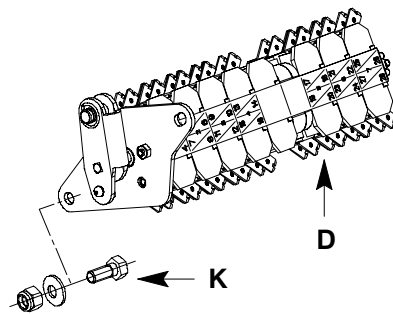
- reference "O" (*engraved on the pin*) in front of the hole of rivet **G**

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



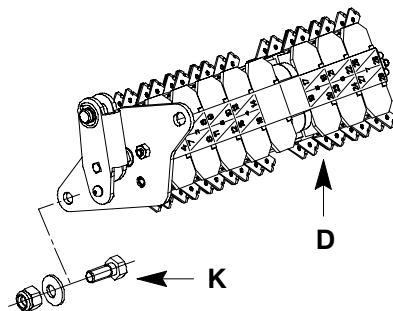
To end the assembly, the operation is the reverse to the dismantling.

- fix rotary switch **D** on the operating mechanism
- fix pin **E** and collar **F**

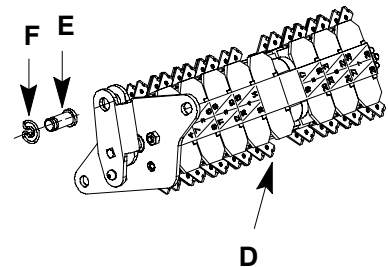


- fix and lock the 2 nylstop nuts **K**
- fix the assembly terminal block **D**, fix by screws, washers, nuts

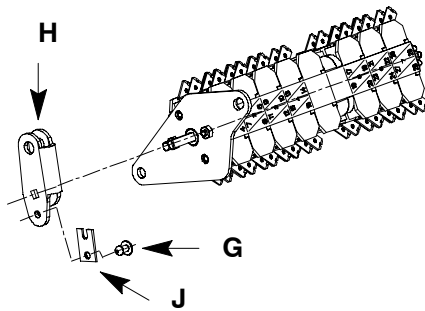
dismantling of the new rotary switch



Remove the 2 nylstop nuts **K**.



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



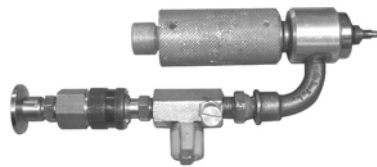
Remove rivet **G** which locks small plate **J**. Remove crank **H** and small plate **J**

SF6 gas recovery conformity rules

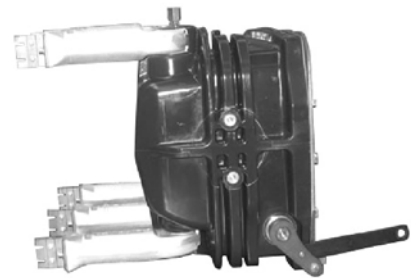
The SF6 must be removed before any dismantling operation can be carried out in compliance with the procedures described in IEC-61634 and according to the following instructions.

The gas must be treated in compliance with IEC-60480.

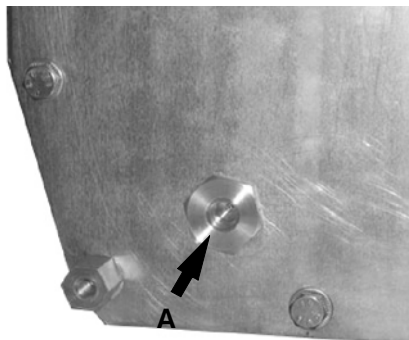
intervention method



Tool necessary for the operation



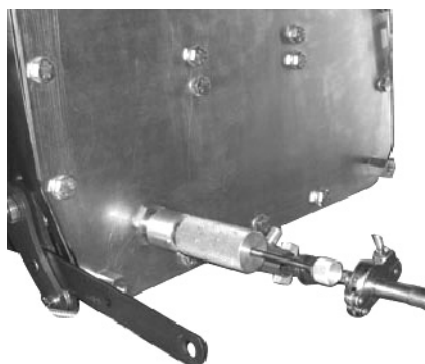
LF



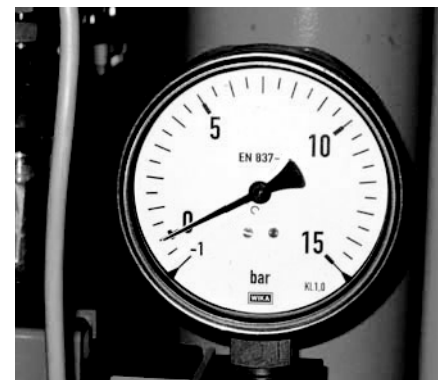
Plug (A).



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**.

symptoms	Faulty devices	Probable causes and solutions
Charging impossible.	Electrical operating mechanism: motor	Insufficient voltage at motor terminals <ul style="list-style-type: none"> ■ restore voltage ■ replace motor if required
	End of charging contact	<ul style="list-style-type: none"> ■ check contact state ■ replace it if required
	Wiring	<ul style="list-style-type: none"> ■ check auxiliary circuit connections
Circuit–breaker closing impossible. the indicator remains green	Undervoltage release	The coil is not energised <ul style="list-style-type: none"> ■ energise the release or keep it artificially in the « closed circuit » position
	Closing release	The release is badly connected <ul style="list-style-type: none"> ■ check the circuit The winding is cut <ul style="list-style-type: none"> ■ replace the release
	Charging device	The operating mechanism is not charged <ul style="list-style-type: none"> ■ charge the operating mechanism
The circuit–breaker closes and opens immediately and remains open although the closing order is maintained.	All opening trip units (<i>direct or indirect</i>)	There is a fault on the main HV circuit, or protection circuits are incorrectly adjusted <ul style="list-style-type: none"> ■ remove the fault ■ adjust the protection circuits
The circuit–breaker opens and closes in turn.	Antipumping relay or direct releases	<ul style="list-style-type: none"> ■ replace the relay ■ readjust
The circuit–breaker does not open manually or remotely. (<i>circuit–breaker without electrical operating mechanism</i>).	Operating mechanism or circuit–breaker (<i>incomplete closing</i>)	Hard spot on the operating mechanism or circuit–breaker <ul style="list-style-type: none"> ■ finish charging the mechanism with the manual charging handle. Warn the Groupe Schneider service centre.
	Trip unit	The trip unit is badly connected <ul style="list-style-type: none"> ■ check the circuit The winding is cut <ul style="list-style-type: none"> ■ replace the trip unit ■ check the protection circuit

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A series of horizontal dotted lines for writing.

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As standards, specifications and designs change from time
to time, please ask for confirmation of the information given
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