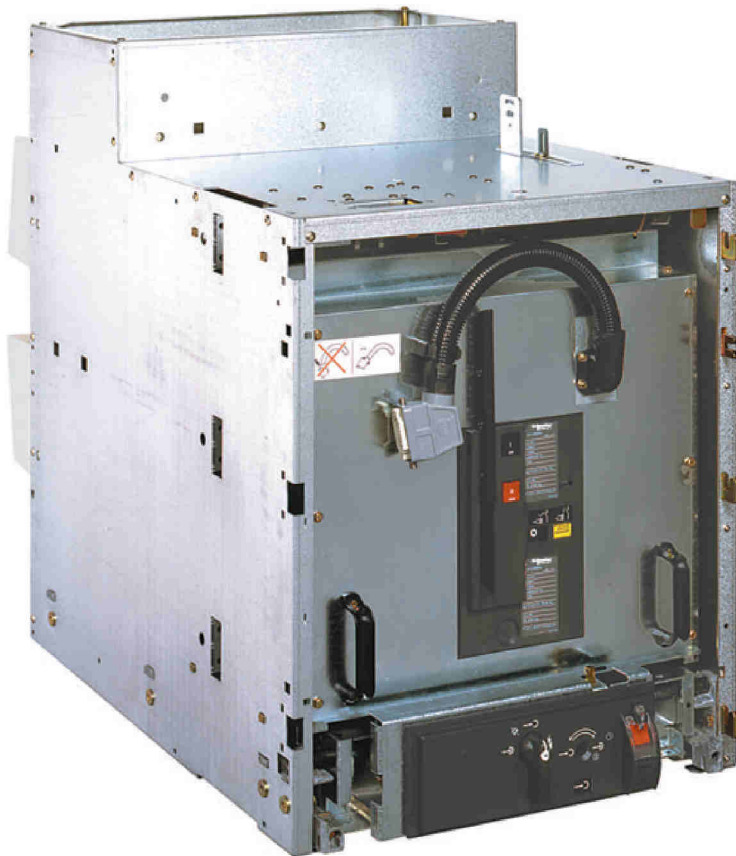


instructions for use

LF draw-out circuit-breakers



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Important informations notice

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout

this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.



WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.



INFORMATION-ADVICE

We draw your attention on this particular point.

important remarks

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

diffusion rules

CAUTION

The total or partial reproduction of this manual is prohibited and only the Schneider Electric agents have an exclusive right to use.

safety rules



DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- Beware of potential hazards, and carefully inspect the work area for tools and objects that may have been left inside the equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

cleaning instructions



SOLVENTS AND ALCOHOL FORBIDDEN



HIGH-PRESSURE CLEANER FORBIDDEN

disposal of the equipment at end-of-life



WARNING

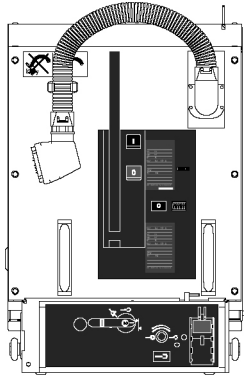
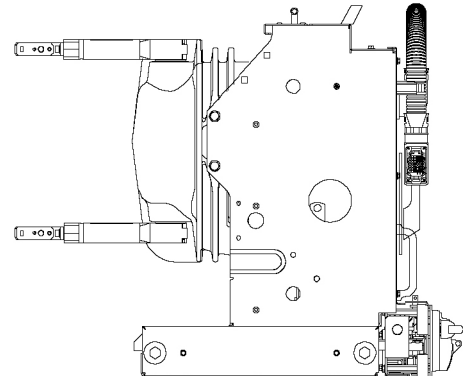
This equipment contains SF6 gas. SF6 is a powerful greenhouse gas and is harmful for the environment. Prior to disposal of the equipment at end-of-life, the SF6 gas must be recovered in order for it to be recycled, reclaimed or destroyed.

- **DO NOT carry out any dismantling operations unless authorized.**
- **DO NOT handle SF6 gas unless certified.**
- **DO NOT release SF6 gas to the atmosphere.**

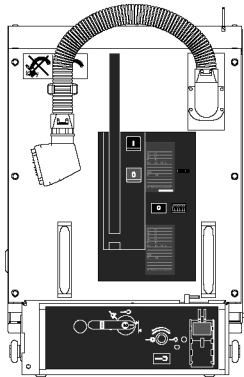
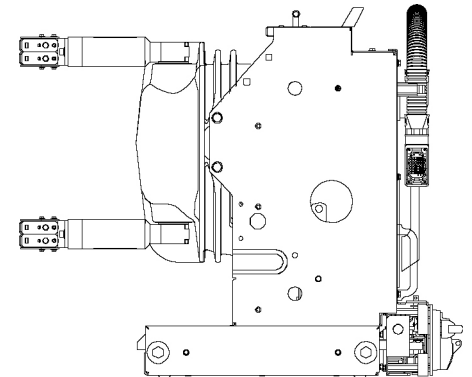
Penalties may apply according to local regulations and rules (Regulation (EU) N° 517/2014 for all European countries).

Schneider Electric offers a complete service to dismantle and recycle Medium Voltage equipment and SF6 gas at end-of-life. This service is compliant with IEC 62271-4 and conforms to local regulations. Please contact Schneider Electric for details.

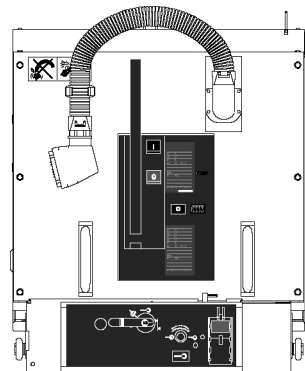
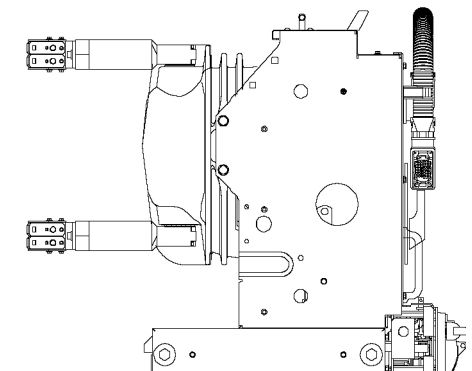
draw-out circuit-breakers LF1 630A



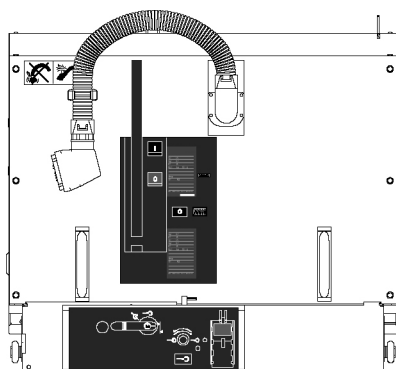
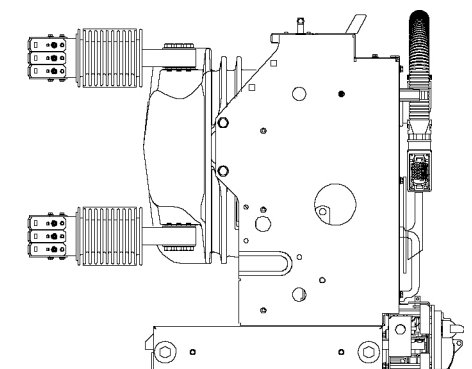
LF1 1250A



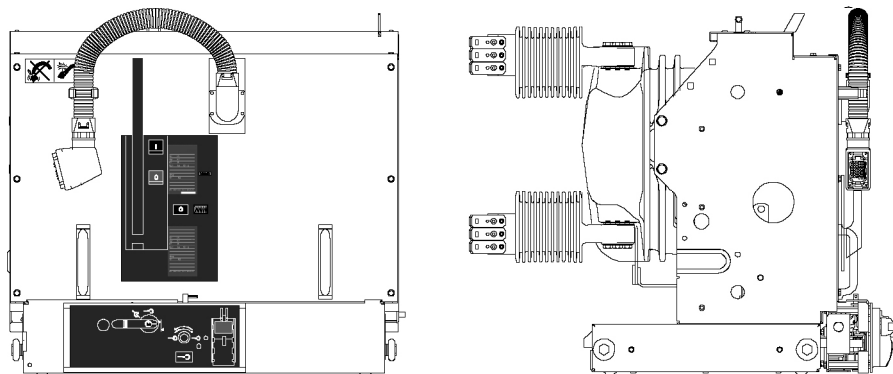
LF2 630A and 1250A



LF3 2500A

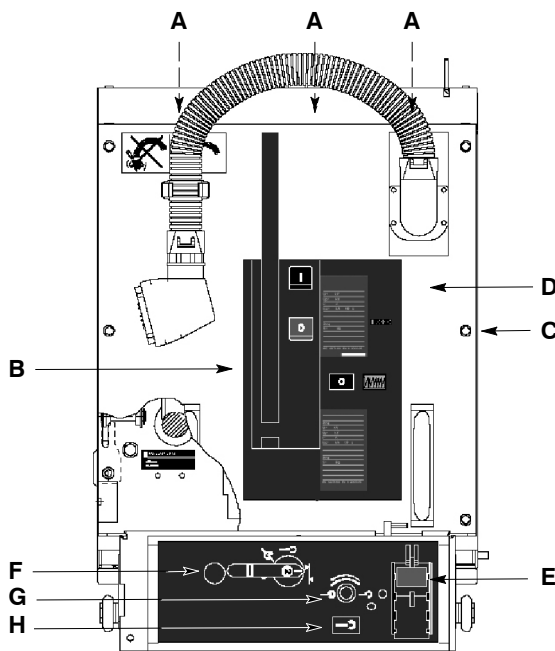


LF3 3150A



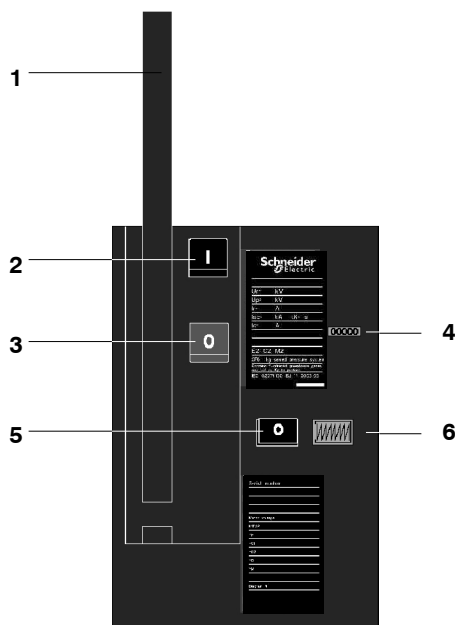
front panel

- 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:

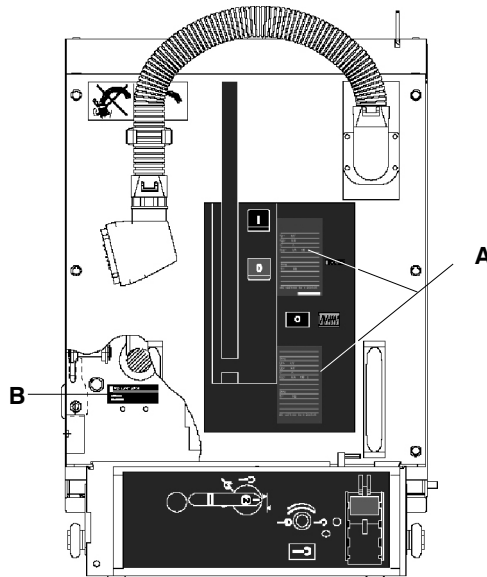
■ that the technical data marked on the rating plates match the information given on the order form.

■ that the connection diagram is enclosed with the device manual.

location of the information plates

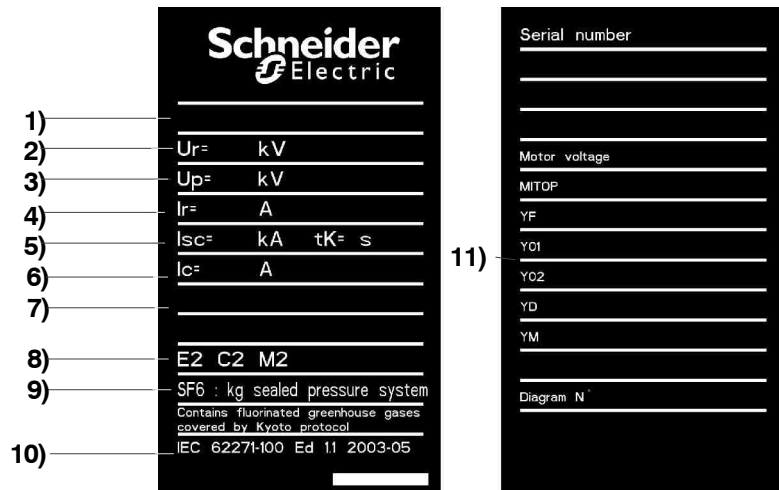
IEC standard

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



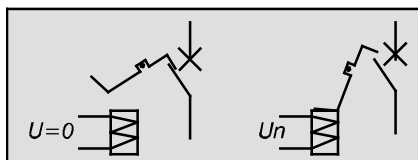
contactor and auxiliaries rating plates

- 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)

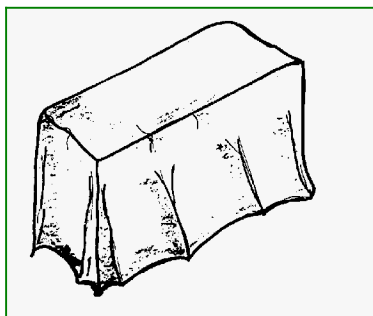
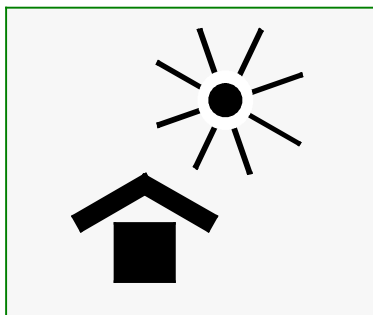
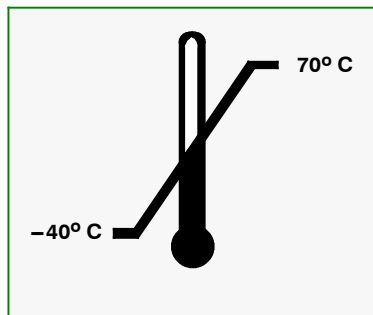


Label indicating the undervoltage trip device option.

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

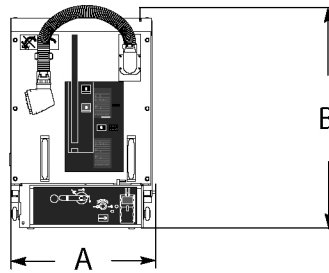
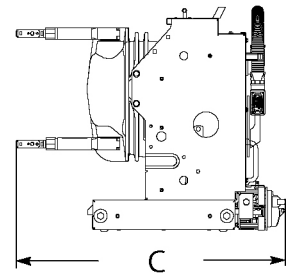
The device is handled by its front face by means of a moving part extraction tool (OED) on an even floor.



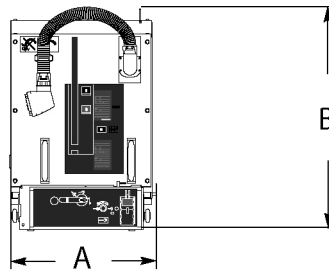
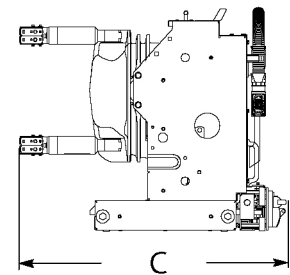
Never pull or push the device by the poles (the poles are pressurised).

overall dimensions

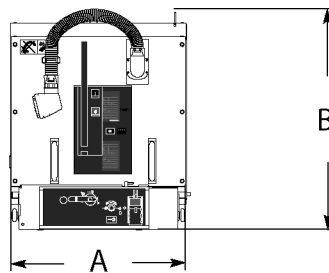
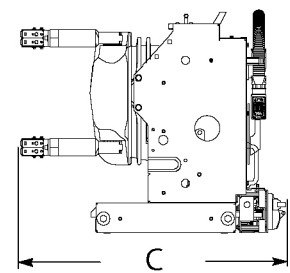
LF1 630 A



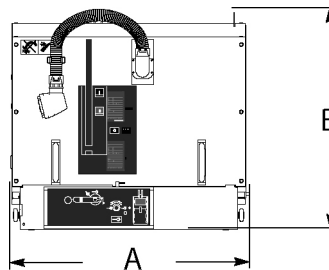
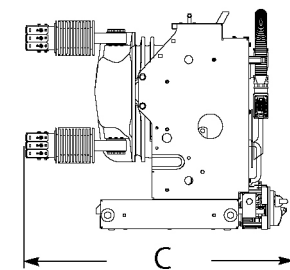
LF1 1250 A



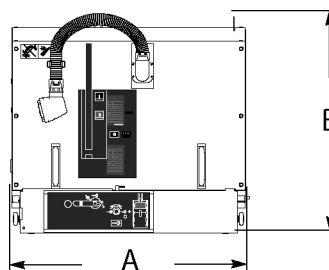
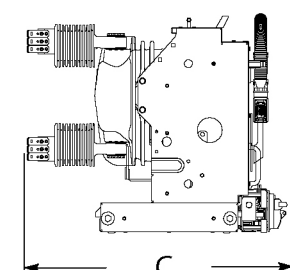
LF2 630 A et 1250 A



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

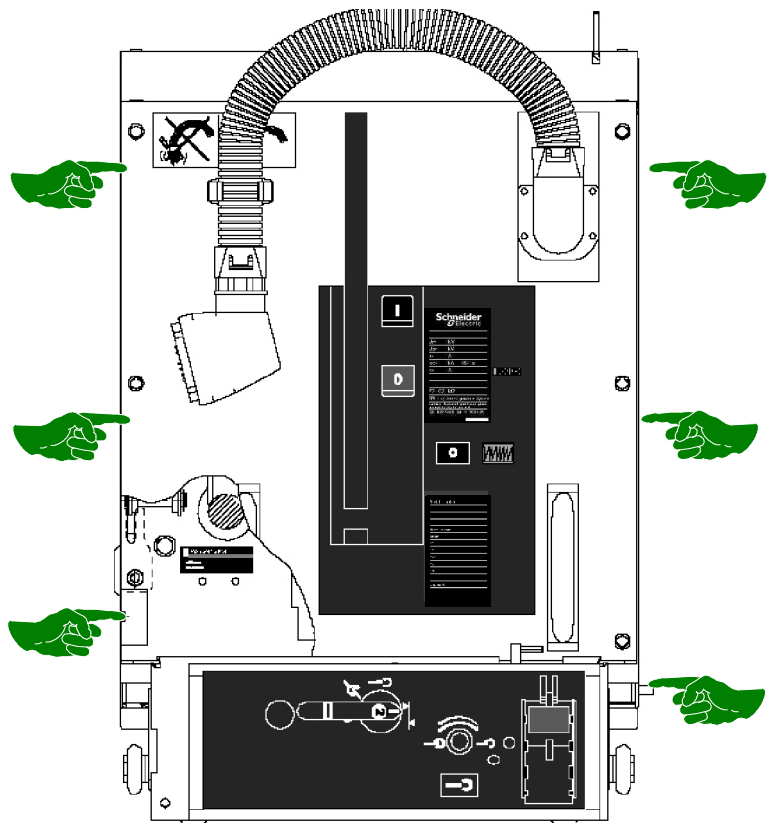
fitting and extracting

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.

<p>Diagram of a fixed circuit breaker with withdrawable sections. The top section is labeled 'WITHDRAWABLE' and shows a switch mechanism. The middle section is labeled 'FIXED' and shows a switch mechanism. The bottom section is labeled 'WITHDRAWABLE' and shows a switch mechanism.</p>	<p>Circuit breaker</p>
<p>Diagram of a circuit breaker with manual operating mechanism. The diagram shows the internal components, including the main switch, auxiliary switch, and manual operating mechanism. The main switch is labeled 'M' and the auxiliary switch is labeled 'A'. The manual operating mechanism is labeled 'B'.</p>	<p>only for manual operating mechanism</p>
<p>Diagram of a circuit breaker with electrical operating mechanism. The diagram shows the internal components, including the main switch, auxiliary switch, and electrical operating mechanism. The main switch is labeled 'M' and the auxiliary switch is labeled 'A'. The electrical operating mechanism is labeled 'E'.</p>	<p>only for electrical operating mechanism</p>
<p>Diagram of a circuit breaker with electrical or manual operating mechanism. The diagram shows the internal components, including the main switch, auxiliary switch, and electrical or manual operating mechanism. The main switch is labeled 'M' and the auxiliary switch is labeled 'A'. The electrical or manual operating mechanism is labeled 'E'.</p>	<p>electrical or manual operating mechanism</p>
<p>Diagram of auxiliary contacts for customer. The diagram shows the internal components, including the main switch, auxiliary switch, and auxiliary contacts. The main switch is labeled 'M' and the auxiliary switch is labeled 'A'. The auxiliary contacts are labeled 'C'.</p>	<p>auxiliary contacts for customer</p>

legend

XM	Low voltage plug connections (withdrawable or fixed position)
B	Connecting terminal block (lug fast–on)
M1	End of charging switch
M2	End of charging switch
M3	End of charging switch
QF	Auxiliary contacts
SE	Maintained release switch
YF	Closing release
Y01	First shunt trip release
Y02	2nd shunt trip release
YM	Undervoltage release
YD	MITOP release
SD	MITOP release contact
SQ	Latch signalisation only on rack out
KN	Anti–pumping relay
SP1	Pressure switch 1st threshold
SP2	Pressure switch 2nd threshold

The bridges are only possible on the circuit breaker with low voltage connectors	
BRIDGE 02 (supervision)	BRIDGE 01 (standard)
B73/B74: End of charging signalisation and CB position signalisation	B73/B74: End of charging signalisation and CB position signalisation
B38/B72 : SF6 pressure switch signalisation 1 st threshold	B38/B72 : SF6 pressure switch signalisation 1 st threshold
B40/B72 : SF6 pressure switch signalisation 2 nd threshold	B40/B72 : SF6 pressure switch signalisation 2 nd threshold
B89/B95 : Y01 supervision	B89/B95: Y01 supervision
QF14/QF16 : Y02 supervision	
B75/B20 : YF supervision	
Note : equivalent bridge 01 with YF and Y02 supervision	Note : equivalent bridge H

recommendations and precautions

Warning : opening coil supervision

	Voltage (V)	Maximun current allowable permanently (mA)
Direct Current	24	105
	48	55
	110	24
	125	13
	220	12
Alternative Current	48	200
	110	100
	120	78
	220	45
	240	45

Warning : closing coil supervision

	Voltage (V)	Maximun current allowable permanently (mA)
Direct Current	24	100
	48	45
	110	13
	125	13
	220	10
Alternative Current	48	200
	110	85
	125	85
	220	45
	240	45

Anti-pumping relay installation recommendations

In case of a length of wire greater than 6 meters, between power supply and anti-pumping relay, we request you to order the following commercial references of RC circuit or diode for compensation.

AC	24–60 V	RXM041BN7
	110–240 V	RXM041FU7
DC	6–250 V	RXM040W



circuit RC



diode

Undervoltage release installation recommendations

During come back to initial position of undervoltage release, the inrush currents are important and can lead to the destruction of the coil.

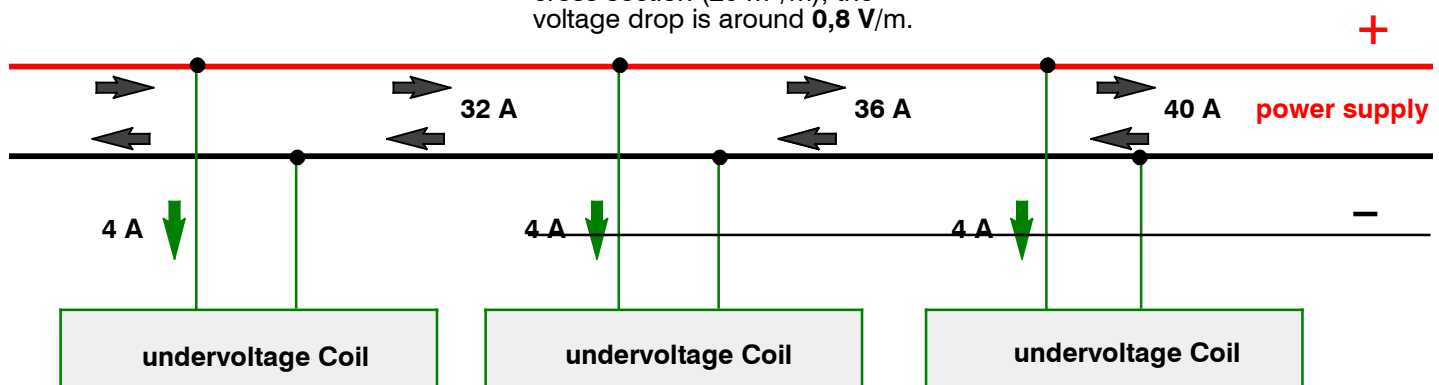
Therefore, during the installation check the following to avoid this problem:

- wire cross section
- wire length
- power supply voltage drop

information

Consider a network with 10 coils in series with the distance 1 m between them. For **24 VDC** power supply, the consumption is **4 A** per coil. Therefore **40 A** if there are 10 release in series. With 1 mm² wire cross section (20 m²/m), the voltage drop is around **0,8 V/m**.

Hence the voltage becomes 16 V instead of 24 V seen by the 10th coil at 10 meters length. In this case, the voltage at the terminal of the coils is **16 V** instead of **24**: so below **85%**.

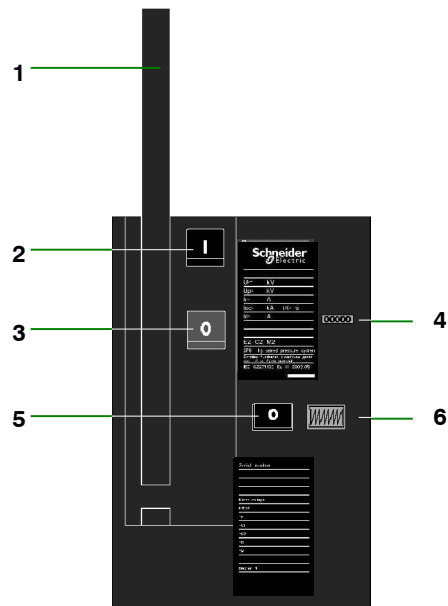


Warning pressure switch

Pressure switch is a safety device. It must be connected to an adapted alarm system.

operating mechanism plate

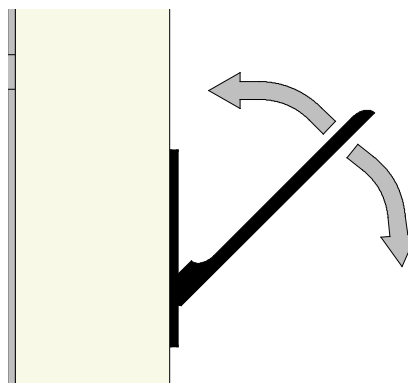
- 1 : operating mechanism charging lever
- 2 : closing pushbutton
- 3 : opening pushbutton
- 4 : operation counter
- 5 : "open or closed" device status mechanical indicator
- 6 : "charged or uncharged" operating mechanism charging status mechanical indicator



circuit-breaker manual operation

carrying out a Closing – Opening cycle

charging the operating mechanism

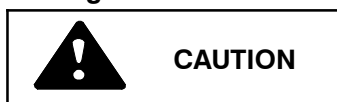


Charge the operating mechanism by an up and down motion until you hear a click.

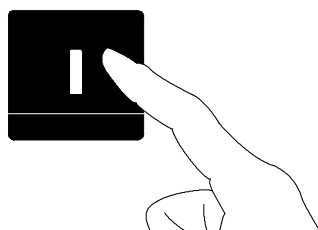


The circuit-breaker position indicator remains on "O" (device **open**). The operating mechanism indicator moves to the **charged** position.

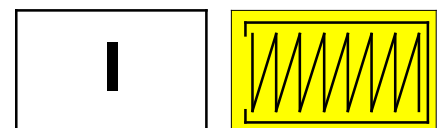
closing



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*).

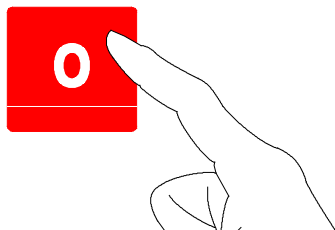


Press the pushbutton to close the circuit-breaker.

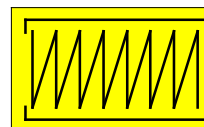


The circuit-breaker position indicator moves to "I" (device **closed**). The operating mechanism indicator moves to the **deactivated** position.

opening



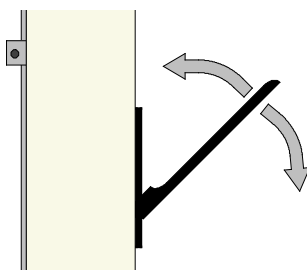
Press the pushbutton to open the circuit-breaker.



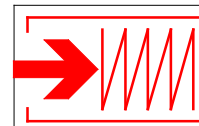
The circuit-breaker position indicator remains on “O” (*device open*).
The operating mechanism indicator moves to the **deactivated** position.

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.

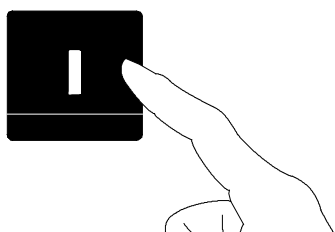


The circuit-breaker position indicator remains on “O” (*device open*).
The operating mechanism indicator moves to the **charged** position.

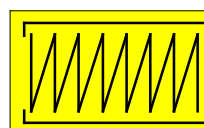
closing



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*).

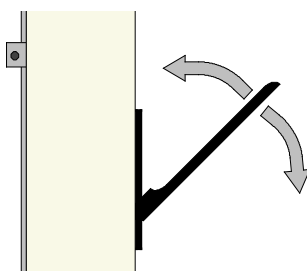


Press the pushbutton to close the circuit-breaker.

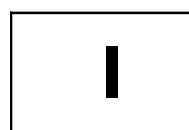
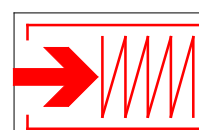


The circuit-breaker position indicator moves to “I” (*device closed*).
The operating mechanism indicator moves to the **deactivated** position.

charging the operating mechanism

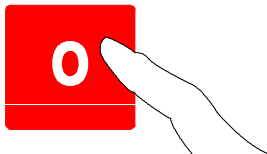


Charge the operating mechanism by an up and down motion until you hear a click.

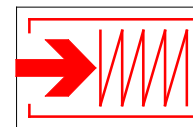


The circuit-breaker position indicator remains on “I” (*device closed*).
The operating mechanism indicator moves to the **charged** position.

opening

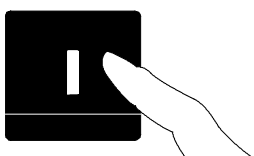


Press the pushbutton to open the circuit-breaker.

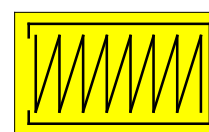


The circuit-breaker position indicator remains on “O” (*device **open***).
The operating mechanism indicator moves to the **charged** position.

closing

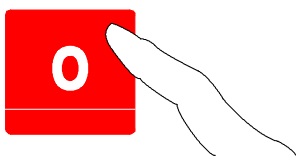


Press the pushbutton to close the circuit-breaker

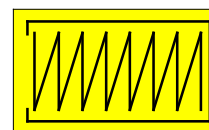


The circuit-breaker position indicator moves to “I” (*device **closed***).
The operating mechanism indicator moves to the **deactivated** position.

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

Description	Levels
Operations recommended in the instructions manual "installation – operation – maintenance", carried out by suitably qualified personnel having received training allowing them to intervene whilst respecting the safety rules	1
Complex operations, requiring specific expertise and the implementation of support equipment in accordance with Schneider–Electric's procedures. These are carried out by Schneider–Electric or by a specialised technician, trained by Schneider–Electric (see § 1.2) in the implementation of procedures, and who is equipped with specific equipment.	2
All preventive and corrective maintenance, all renovation and reconstruction work is carried out by Schneider Electric.	3

foreword safety instructions

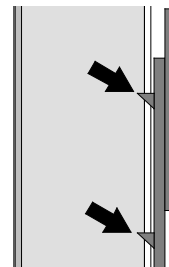
All the operations described below must be performed in accordance with applicable safety standards **under the supervision of a competent authority.**
We recommend that you extract the circuit–breaker from the MCset cubicle (see functional unit user manual).

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 30 years or 10 000 cycles in normal conditions of use according to the **IEC 62271 – 100** standard.

The following are recommended:

- an O/I cycle at least once a year
- a maintenance at least once every 2 years to be determined with the **Schneider Electric service centres.**

For any other maintenance operations (not listed below), please contact your nearest group Schneider Electric service centre.

summarising table

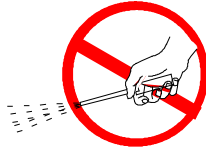
Description of maintenance operations	Frequency	Levels		
Recommended operations	5 years	1	2	3
Verification of the presence and condition of accessories (levers, etc.)	■	■	■	■
Visual inspection of the exterior (cleanliness, absence of oxidation, etc.)	■	■	■	■
Cleaning of external elements, with a clean, dry cloth.	■	■	■	■
Checking the tightening torque (covers, wiring ducts, connections, etc.)	■	■	■	■
Checking the mechanical controls by carrying out a number of operations	■	■	■	■
Checking the positioning of the status indicators (armed, open and closed)	■	■	■	■
Control of the status and functioning of locking by key locks	■	■	■	■
Dusting and cleaning the internal mechanical elements and poles (without solvent)	■		■	■
Inspection of the tightening of the threaded fasteners and presence of internal stop elements	■			■
Checking arcing contact wear	■			■
General cleaning of the control block				
Lubrication and greasing of the control block (vacuoline oil 133; grease Isoflex Topas L152)	■			■
Cleaning the spring guides (with unchlorinated grease remover)				
Lubrication and greasing of spring guides (vacuoline oil 133; grease Isoflex Topas L152)	■			■
Greasing of motor gear (grease Isoflex Topas L152)	■			■
Cleaning the control mechanism of the pole (with unchlorinated grease remover)				
Lubrication and greasing of control mechanism of the pole (vacuoline oil 133; grease Isoflex Topas L152)	■			■
Cleaning the motor gear	10000 cycles		■	■
Replacing the operation counter	10000 cycles			■

Corrective Maintenance (on fault)	Levels	
	2	3
Recommended operations		
Replacing the keylocking	■	■
Replacing the closing springs	■	■
Replacing the enclosure		■
Replacing the RI operating mechanism		■
Replacing the single closing release coil	■	■
Replacing the shunt release coil or simple overcurrent trip devices	■	■
Replacing the release coil undervoltage trip devices without lifting system	■	■
Replacing the release coil undervoltage trip devices without lifting system with a time delay unit	■	■
Replacing the release coil undervoltage trip devices with lifting system	■	■
Replacing the release coil shunt releases or double overcurrent trip devices	■	■
Replacing the motor gear box	■	■
Replacing the micro-contact (SE)	■	■
Replacing the end of charging contact	■	■
Replacing the anti-pumping relay	■	■
Replacing the auxiliary contact unit	■	■
Replacing the MITOP release mechanism		■
Replacing the operation counter		■
Procedure in case of pressure switch alarm		■

foreword



CHEMICAL SOLVENT AND ALCOHOL **FORBIDDEN**



HIGH PRESSURE CLEANING PROCESS **FORBIDDEN**

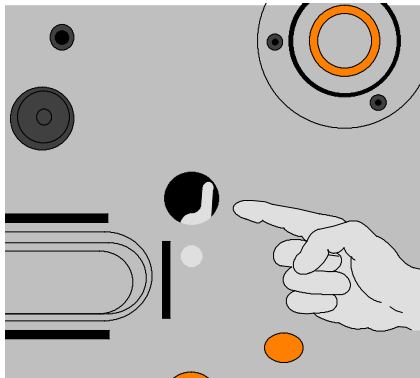
The main drawbacks of such processes are.

- 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.

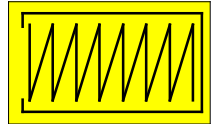
If the insulating parts are dusty, it is recommended that **you remove the dust using a dry cloth lintless.**

monitoring arcing contact wear

This operation requires removal of the springs.

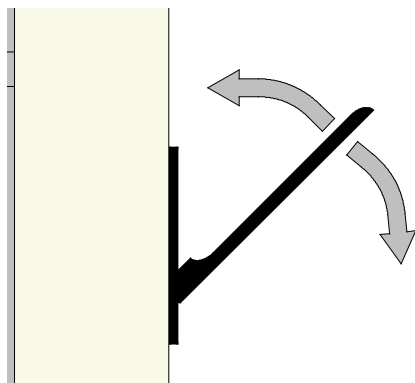


Arcing contact wear is monitored on the operation mechanism/circuit-breaker pole link.

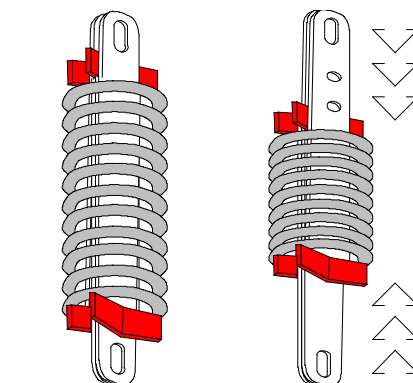


Check that the circuit-breaker is open, with its operating mechanism deactivated.

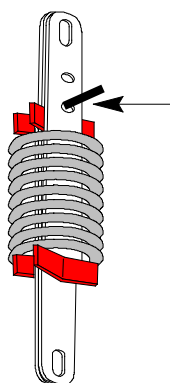
removing the closing springs



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



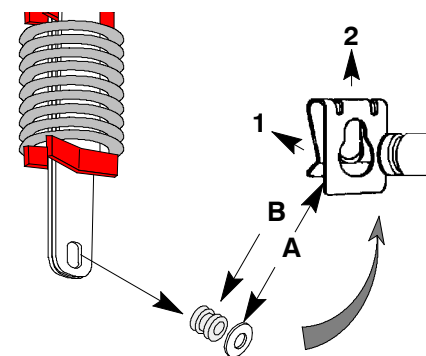
... the springs will be compressed...



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

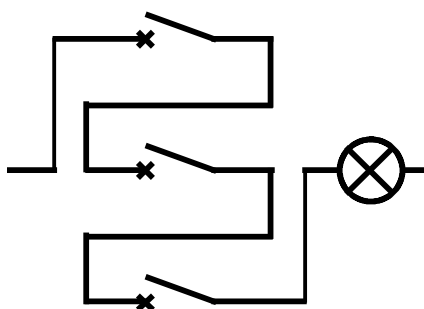
Release the lever.

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).*

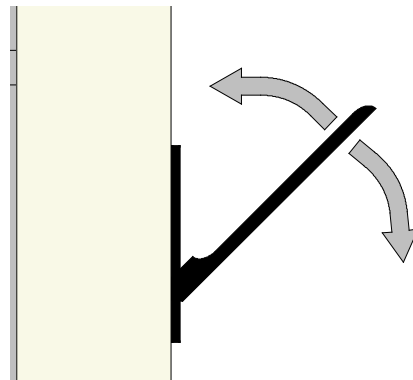


Remove the washer and circlips **A**. Release and withdraw the spring. Remove ring **B** taking care not to damage it (Teflon coating).

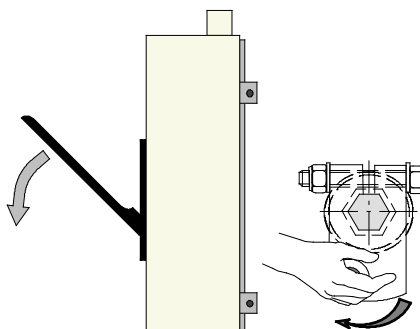
checking



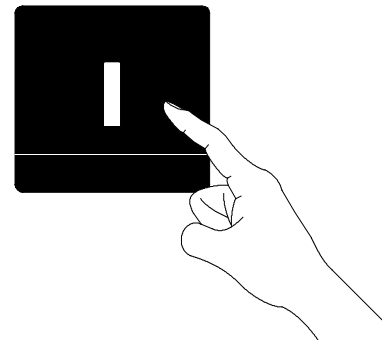
Serial connect the three phases of the device and insert a bell type indicator in the circuit.



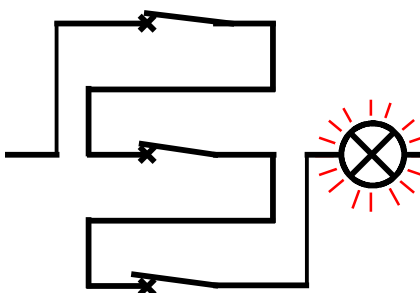
Charge the operating mechanism until you hear a click indicating charging is complete.



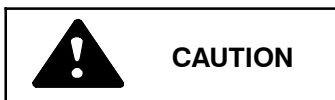
Exert pressure on the lever and at the same time pull the right-hand crank handle towards you until the ratchet wheel is latched.



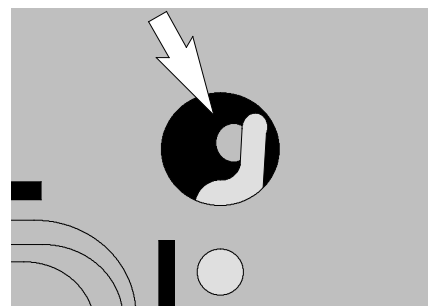
At the same time press the closing “I” pushbutton and the charging lever in order to release the latching mechanism.



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.



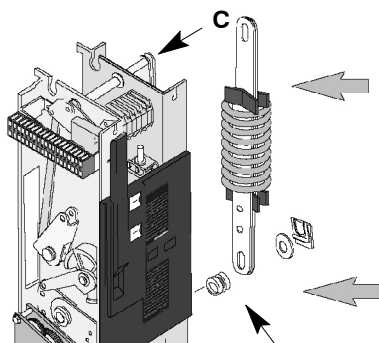
Keep the lever in this position, with the bell activated.
If the position is overshoot, repeat the operation.



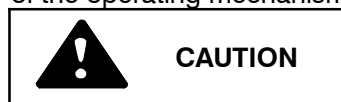
When the lamp is on, a rod with a diameter less **than or equal to 6 mm** can be inserted in the hole shown above.

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

fitting the closing springs

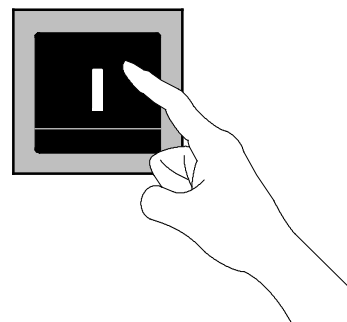


Fit the spring on pin **C** and ring **B** of the operating mechanism.

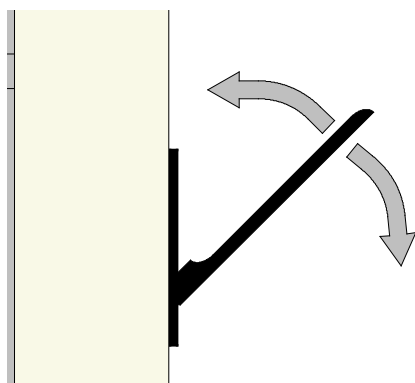


CAUTION

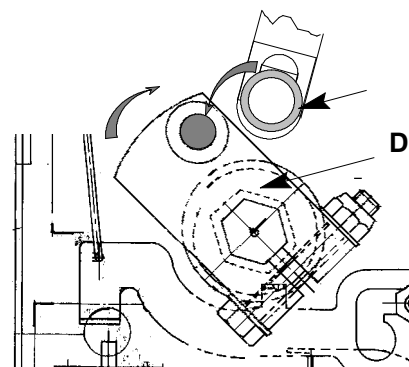
Do not lubricate when mounting and do not scratch the teflonised ring.



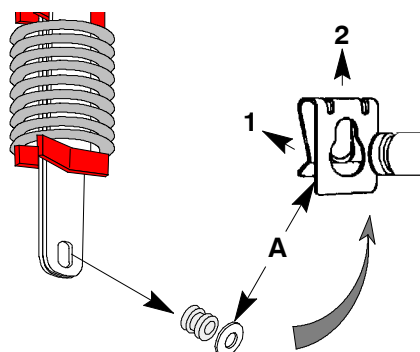
Press the closing button and at the same time....



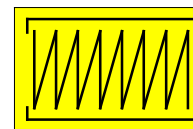
... continue charging....



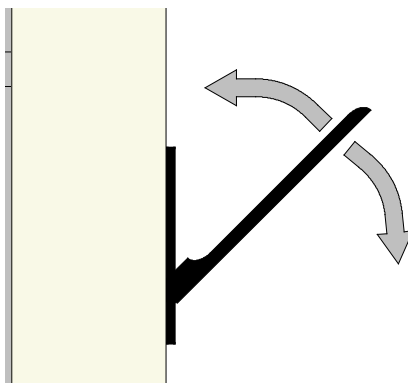
... in order to bring the crank handle **D** into the axis of the lower fixing hole of the spring guide.



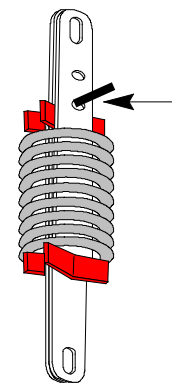
Fit the washer and the circlips **A**.



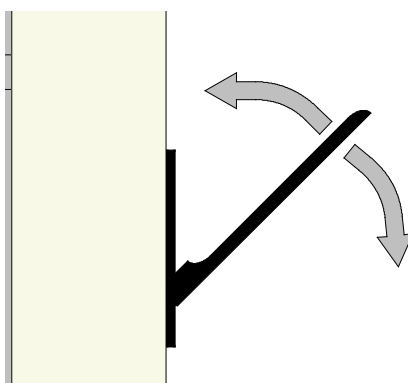
Check that the circuit-breaker is open and that the operating mechanism is deactivated.



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



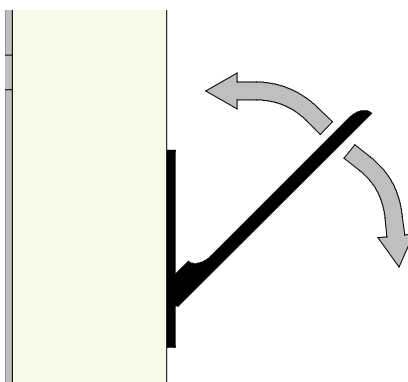
Remove the locking created on the springs with the 6 dia. screw or pin.



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

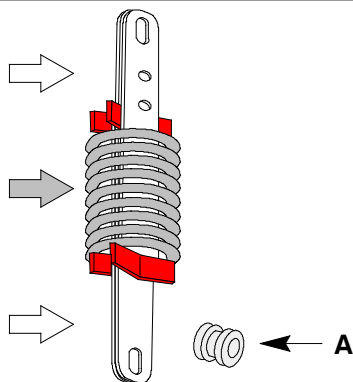


Charge the operating mechanism by an up and down motion until you hear a click.



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



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.

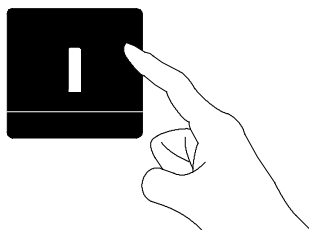
opening spring

manual closing of the circuit-breaker

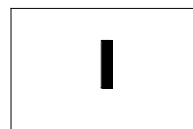
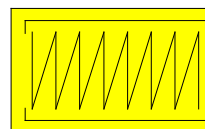


CAUTION

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*).

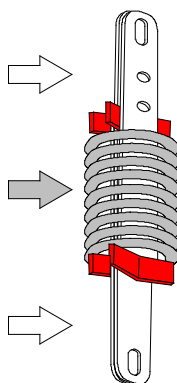


Press the push button “ I ” to close the circuit-breaker.



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

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



The springs will be compressed:

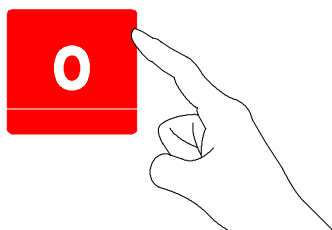
- lubricate the guides
- oil the phosphatised springs.



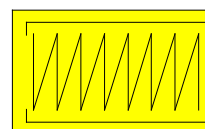
WARNING

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

manual opening of the circuit-breaker



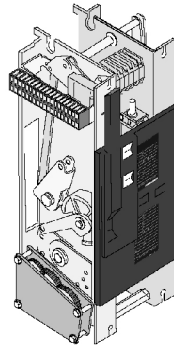
Press the push button “ O ” to open the circuit-breaker.



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

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

operating mechanism unit



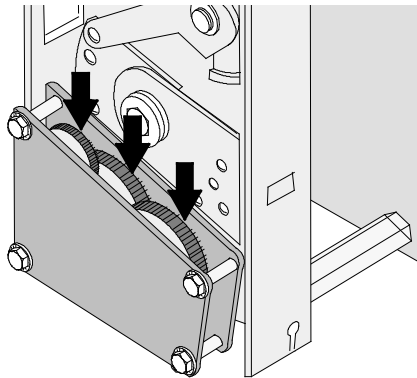
Clean the entire subassembly.
Oil all the phosphatised parts.
Check that the locking eye bolts
are fitted.
Lubricate the pins and hinges.



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 30 000 (kA)².**

foreword

Corrective maintenance operations are designed to replace faulty subassemblies.

For any other operations consult your nearest Schneider Electric representatives.

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



CAUTION

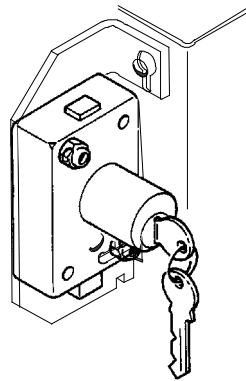
when replacing equipment, the following accessories must all be replaced by new devices.

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

replacing a key-lock removal

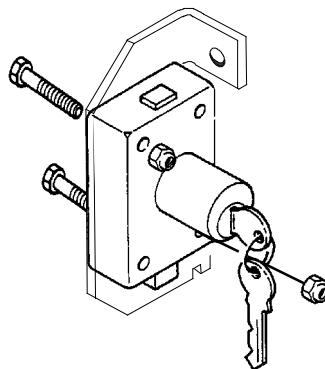
This interlocking is optional.

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

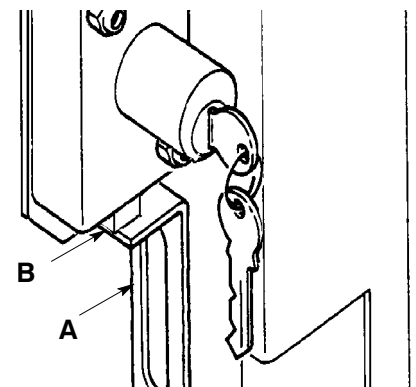


Remove the 2 screws fixing the lock. Separate the lock from its support.

fitting and checking



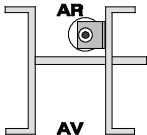
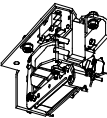
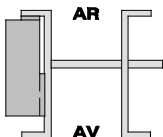
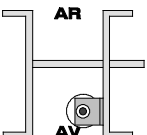
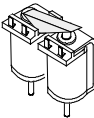
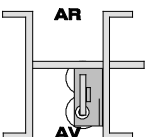
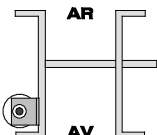
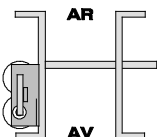
Fit the lock on its support. Fit and tighten the lock fixing screws.



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

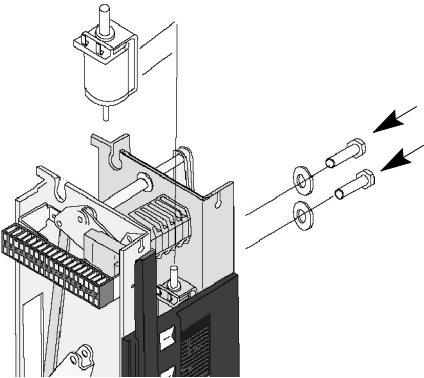
replacing a release

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	
double opening release					V	
					IV	
					VI	

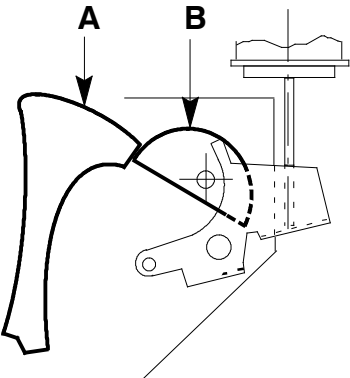
single closing release according to position I removal

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



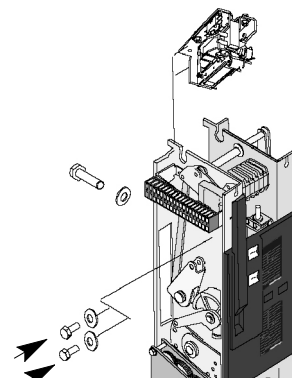
fitting and checking

Fit in reverse order to removal.
Tightening torque: 13 N.m.
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**.

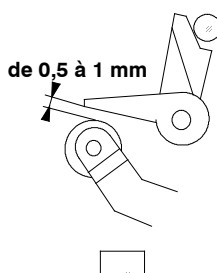


undervoltage release according to position II removal

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



fitting and checking

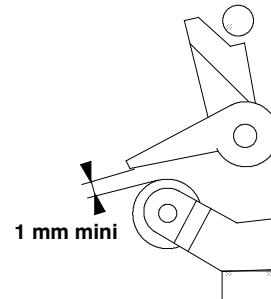


Place the trip unit in the tripped position. Place the crank handle in the limit stop position.

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.

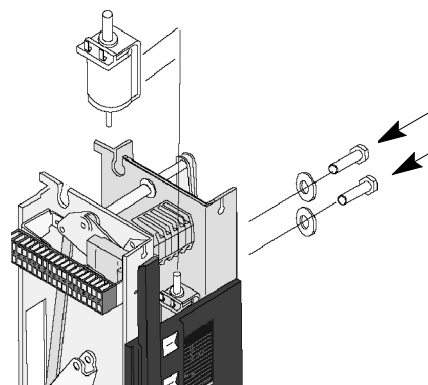
Tightening torque: 13 N.m.



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.



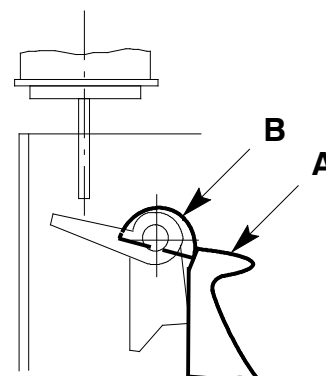
fitting and checking

Fit in reverse order to removal.

Tightening torque: 13 N.m.

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

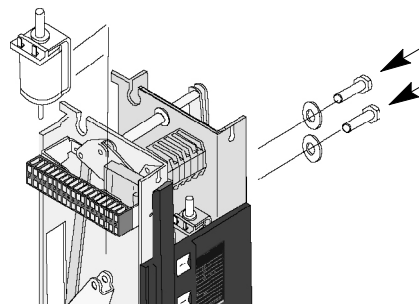
NB: the coil is mounted to the left or right of the operating mechanism according to the protection type.

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.



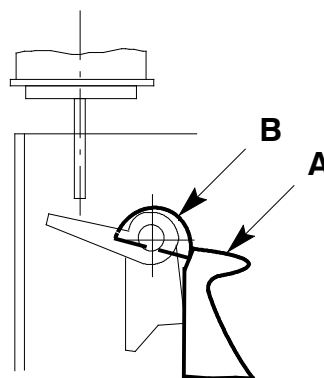
fitting and checking

Fit in reverse order to removal.

Tightening torque: 13 N.m.

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**.



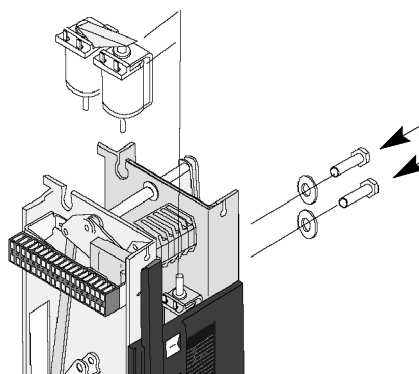
shunt release or overcurrent trip unit (two coils)

according to position V removal

Mark and disconnect the wires.

Remove the two M6 fixing screws.

Remove the release.



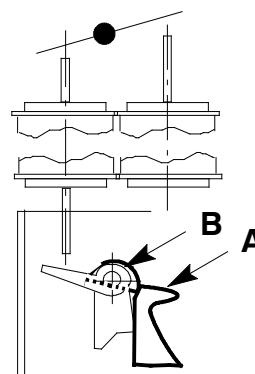
fitting and checking

Fit in reverse order to removal.

Tightening torque: 13 N.m.

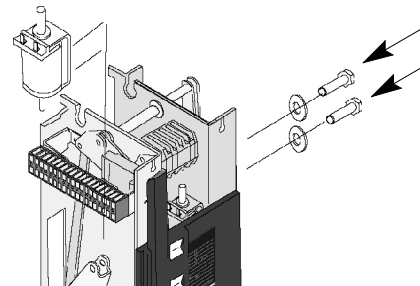
Position the release with its cylindrical rod pointing towards the latching crank handle.

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**.



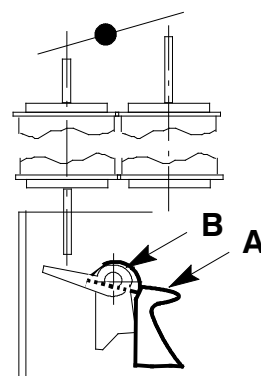
**according to position VI
removal**

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

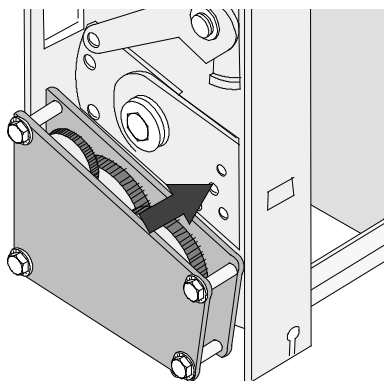


fitting and checking

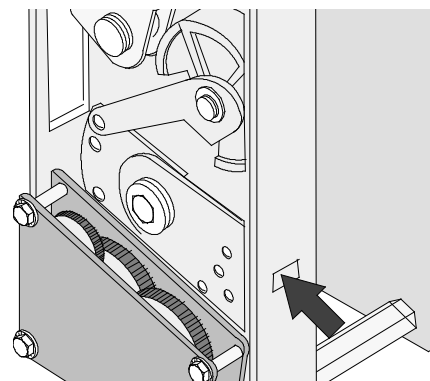
Fit in reverse order to removal.
Tightening torque: 13 N.m.
Position the release with its
cylindrical rod pointing towards the
latching crank handle.
Check that the coil rod does not
flange the crank handle in the
tripped position and ensures
passage of the closing lock **A**
on the eccentric catch **B**.



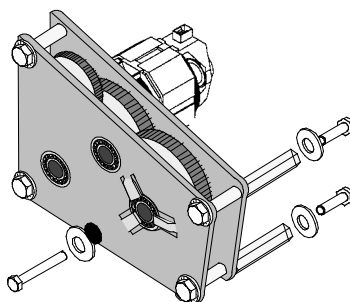
**replacement
gear motor and roller
on the ratchet holder
removing the gear motor**



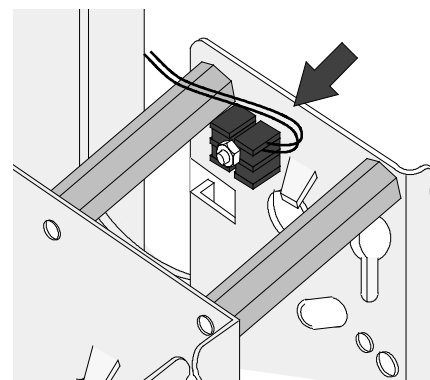
Unhook the ratchet holder return
spring and lift the gear latching rat-
chet by means of a screwdriver.



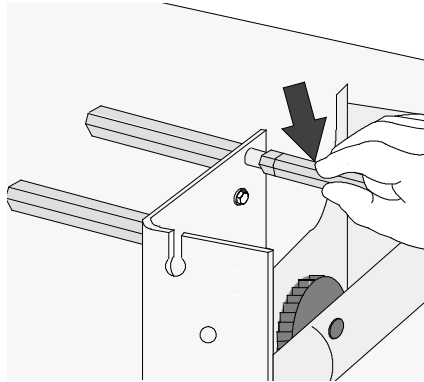
Raise the motor ratchet holder as
high as possible and lock it in
place with the screwdriver.



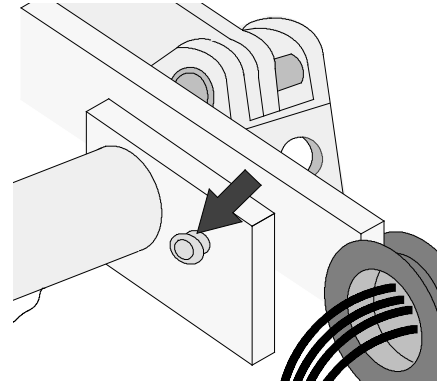
Remove the gear motor (3 screws).



Disconnect the 2 motor supply
wires.



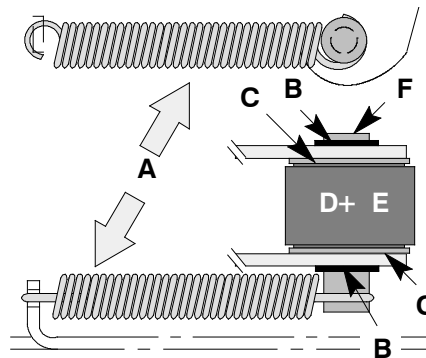
Remove the small column.



Take out this rivet.

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

removing the roller on the ratchet holder

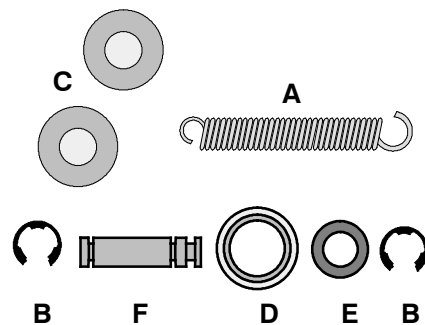


Remove spring A.

Remove the roller.

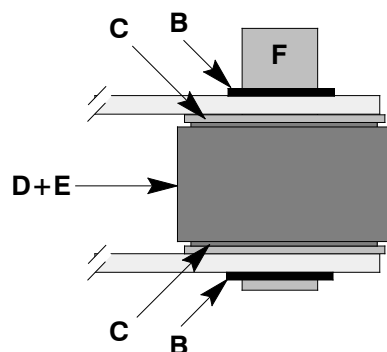
- Truarc B.
- washers C.
- bearing D.
- internal bearing ring E.
- pin F.

placing the roller on the ratchet holder

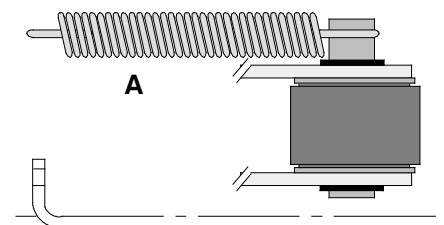


Prepare and lubricate the parts:

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

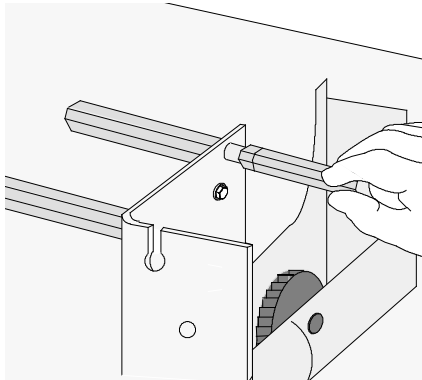


Assemble the roller, with the part of the pin used to hook the spring turned towards the gear motor.



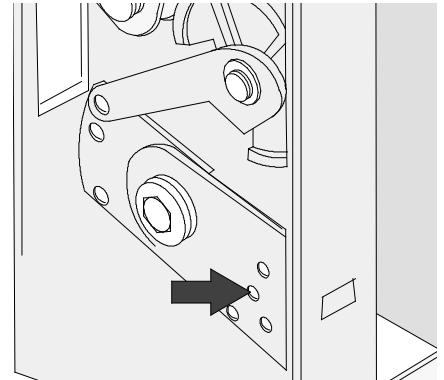
Place the spring on the ratchet holder

fitting the gear motor



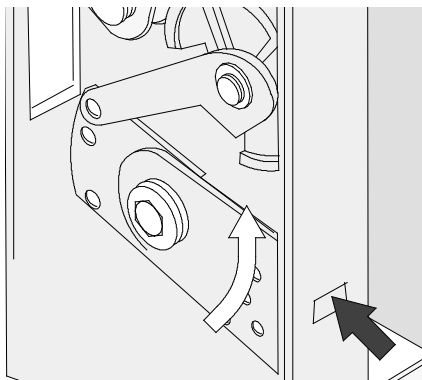
Stick (SR 270 strong loctite) and screw the HM6 length 12, **class 12.9** stud in the yellow column on the tool mark side .

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

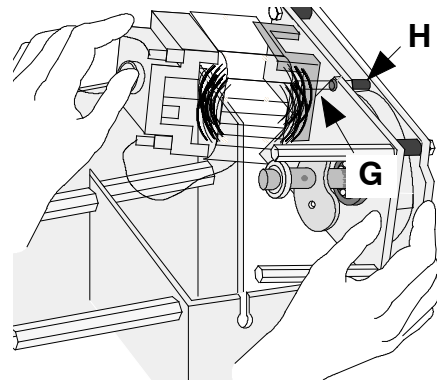


To fit the gear motor, raise the ratchet wheel as far as it will go and lock it using the screwdriver.

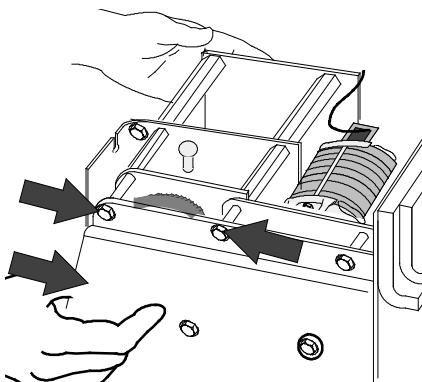
Should a ratchet catch in the ratchet wheel, it will prevent this operation.



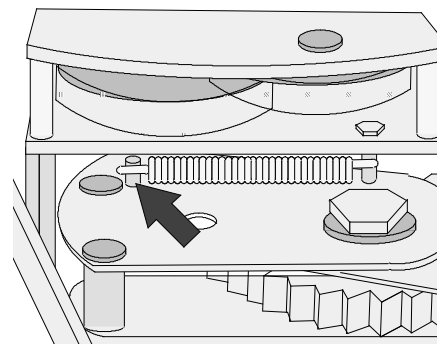
Raise the motor ratchet wheel as far as it will go and lock it using the screwdriver.



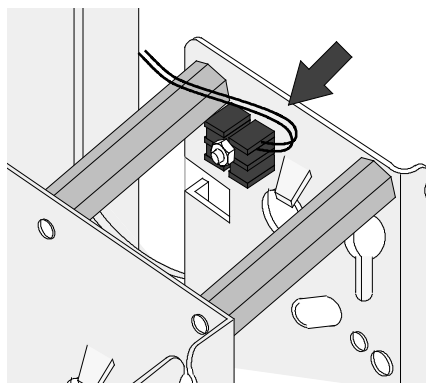
Insert the gear motor, taking care not to remove screw **G** so as not to lose spacer **H** placed between the two flanges.



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

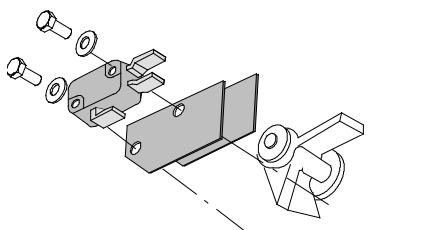


Hook the spring onto the gear motor pin.



- connect the wiring to the terminal block

replacing an SE microswitch removal



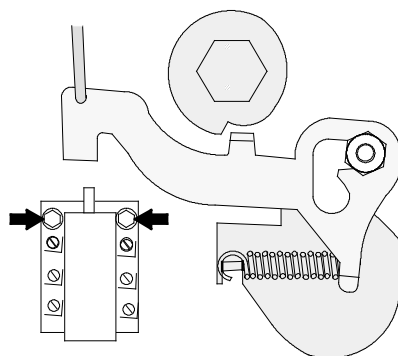
Remove the two fixing screws.
Remove the microswitch without
withdrawing the insulating plates.

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.

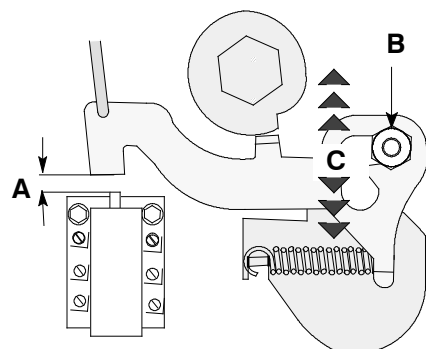
Tightening torque: 0.7 N.m.

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 N.m.

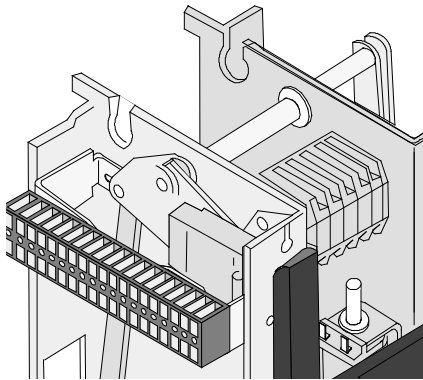
Adjustment:

- do not flange the contact,
adjust travel **A** $0,7^{+0,1}_{-0,2}$ mm.

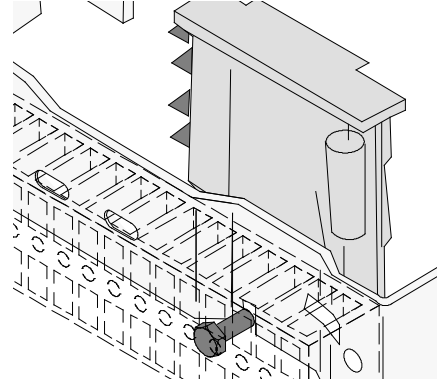
NB: to adjust **A**,

- loosen nut **B**
- move the part along **C**

replacing the antipumping relay removal

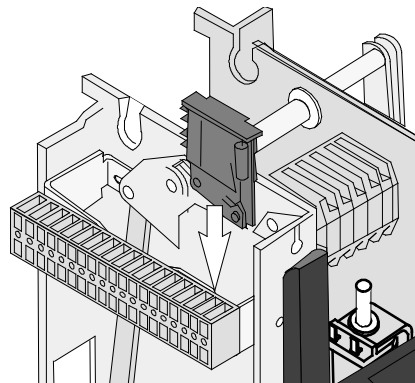


Mark and disconnect the wires.

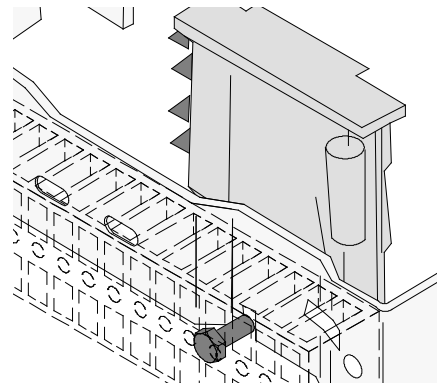


Loosen the fixing screw and slide the relay so that the screw leaves the slot.
Use a 7 wrench.

fitting

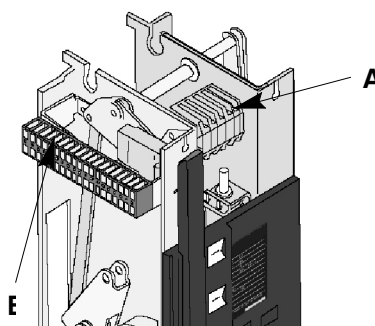


Fit the fixing screw on the relay and position the relay.



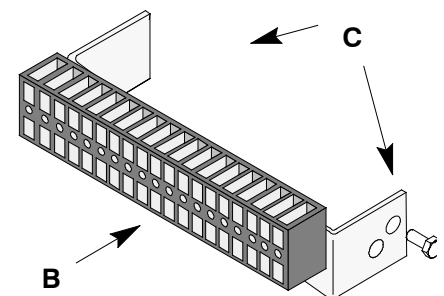
Lock the fixing screw in place.
Tightening torque : 0.7 N.m.
Connect the wires as in the wiring diagram and bind.

replacing the auxiliary contact unit removal



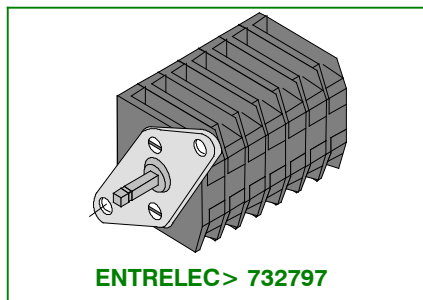
Remove the operating mechanism cover.

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



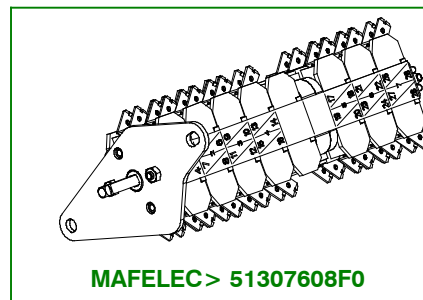
Remove the terminal block assembly **B**, fixed by screws, washers and nuts **C**.

replacement of the rotating contacts



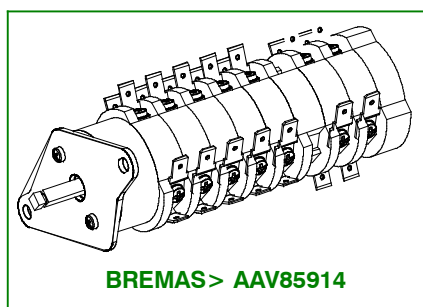
ENTRELEC > 732797

OLD rotating contacts ENTRELEC until 2005/14/12



MAFELEC > 51307608F0

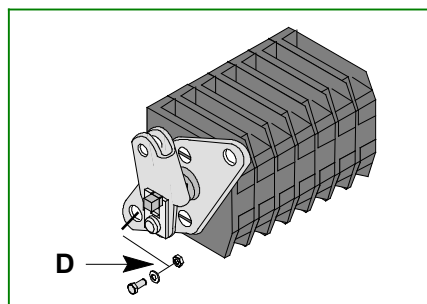
OLD rotating contacts MAFELEC until 2010/23/02



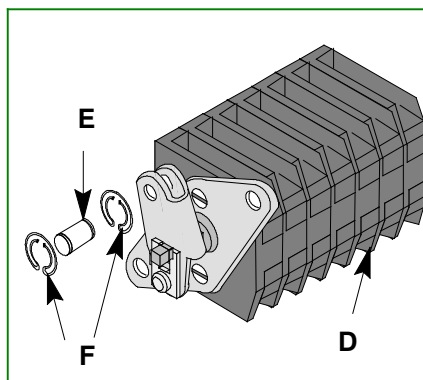
BREMAS > AAV85914

New rotating contacts BREMAS from 2010/23/02

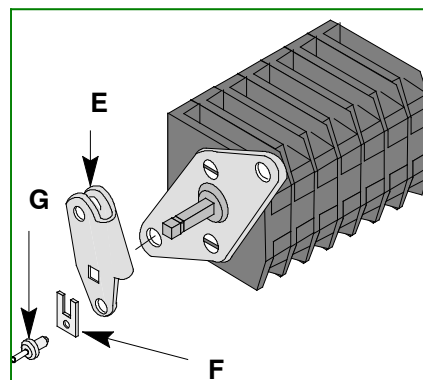
dismantling the OLD rotating contacts ENTRELEC



Remove the 2 nylstop nuts **D**.



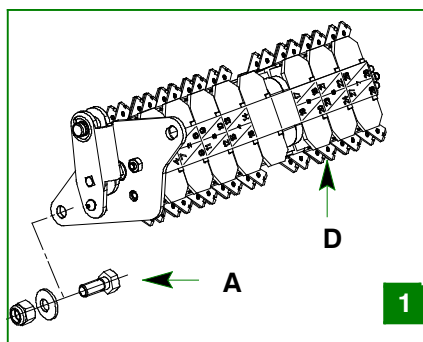
- remove pin **E** and colar **F**
- remove rotating contacts **D**



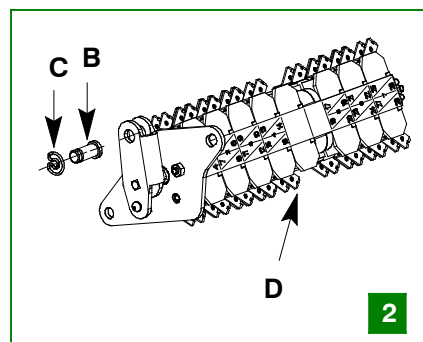
- remove rivet **G** which locks small plate **F**
- remove crank **E** and small plate **F**

dismantling the OLD rotating contacts MAFELEC

D : rotating contacts



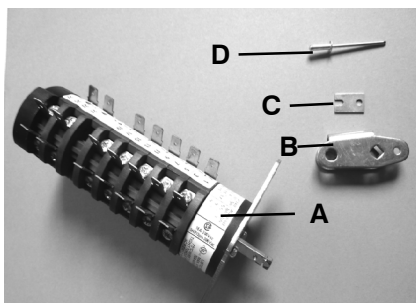
Remove the 2 nylstop nuts (**A**).



Remove pin **B** and colar **C**, remove rotating contacts **D**

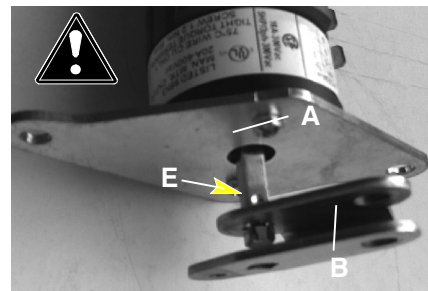
NEW

installation of rotating contacts BREMAS



Kit reference : **MV261239**

- **A** : rotating contacts
- **B** :crank
- **C** :plate
- **D** :rivet



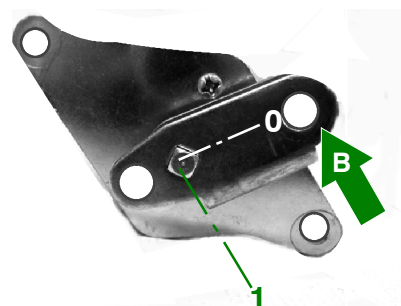
Correctly position the crank (B) on the pin of the contact (A), using the punch (E) as a position mark.

correct configuration before to continue intervention

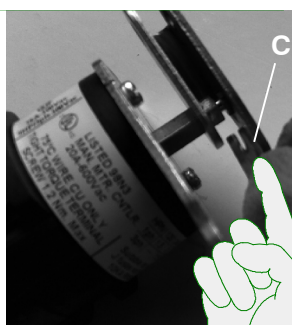


Correct assembly.

You can continue the intervention.



The crank **B** must move freely from the position **0** to **1**



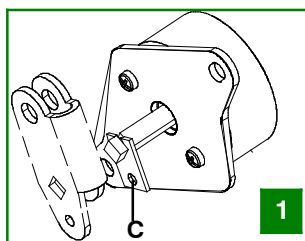
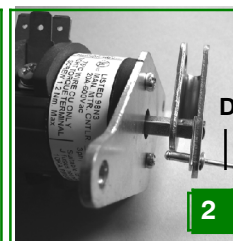
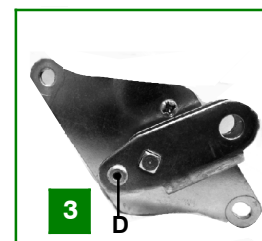
Install the plate **C**.

1 :The notch of the plate (**C**) must be positioned in the axis of the contact

2 : put in place the rivet (**D**)

3 : rivet all

the new rotating contacts can be installed in the circuit breaker



dismantling the new rotating contacts BREMAS

■ refer to the removal of old rotating contacts.

SF6 gas recovery conformity rules (reminder)



WARNING

This equipment contains SF6 gas. SF6 is a powerful greenhouse gas and is harmful for the environment. Prior to disposal of the equipment at end-of-life, the SF6 gas must be recovered in order for it to be recycled, reclaimed or destroyed.

- **DO NOT carry out any dismantling operations unless authorized.**
- **DO NOT handle SF6 gas unless certified.**
- **DO NOT release SF6 gas to the atmosphere.**

Penalties may apply according to local regulations and rules (Regulation (EU) N° 517/2014 for all European countries).

Schneider Electric offers a complete service to dismantle and recycle Medium Voltage equipment and SF6 gas at end-of-life. This service is compliant with IEC 62271-4 and conforms to local regulations. Please contact Schneider Electric for details.

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 **Schneider Electric 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 Schneider Electric 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

**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
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Electric service centers.**

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

Conception, rédaction: Service Documentation
Technique T&D

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