

Medium Voltage distribution

# **Evolis circuit breakers** **12-24 kV**

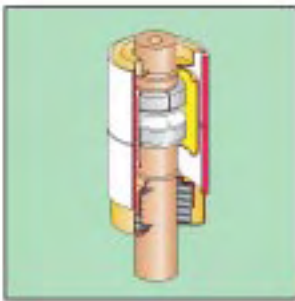
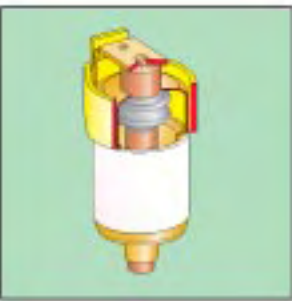
vacuum breaking

fixed and withdrawable versions

Catalogue

# 2008

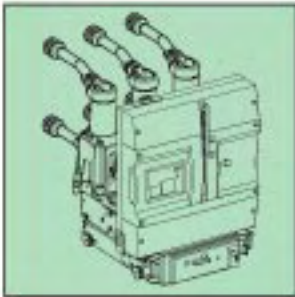
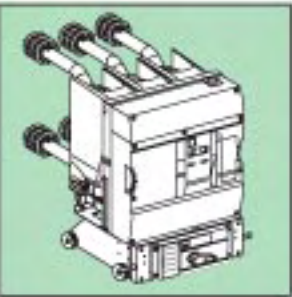




**Presentation**

Evolis circuit breakers  
The very best of vacuum technology  
Extended products offer

2-3  
4-6  
7



**Circuit breaker**

Performance tables 12-17.5KV  
Function descriptions  
Dimensions  
Performance tables 24KV  
Function descriptions  
Dimensions  
Order form

8-9  
10-17  
18-19  
20-21  
22-29  
30-31  
32-35



**Option**

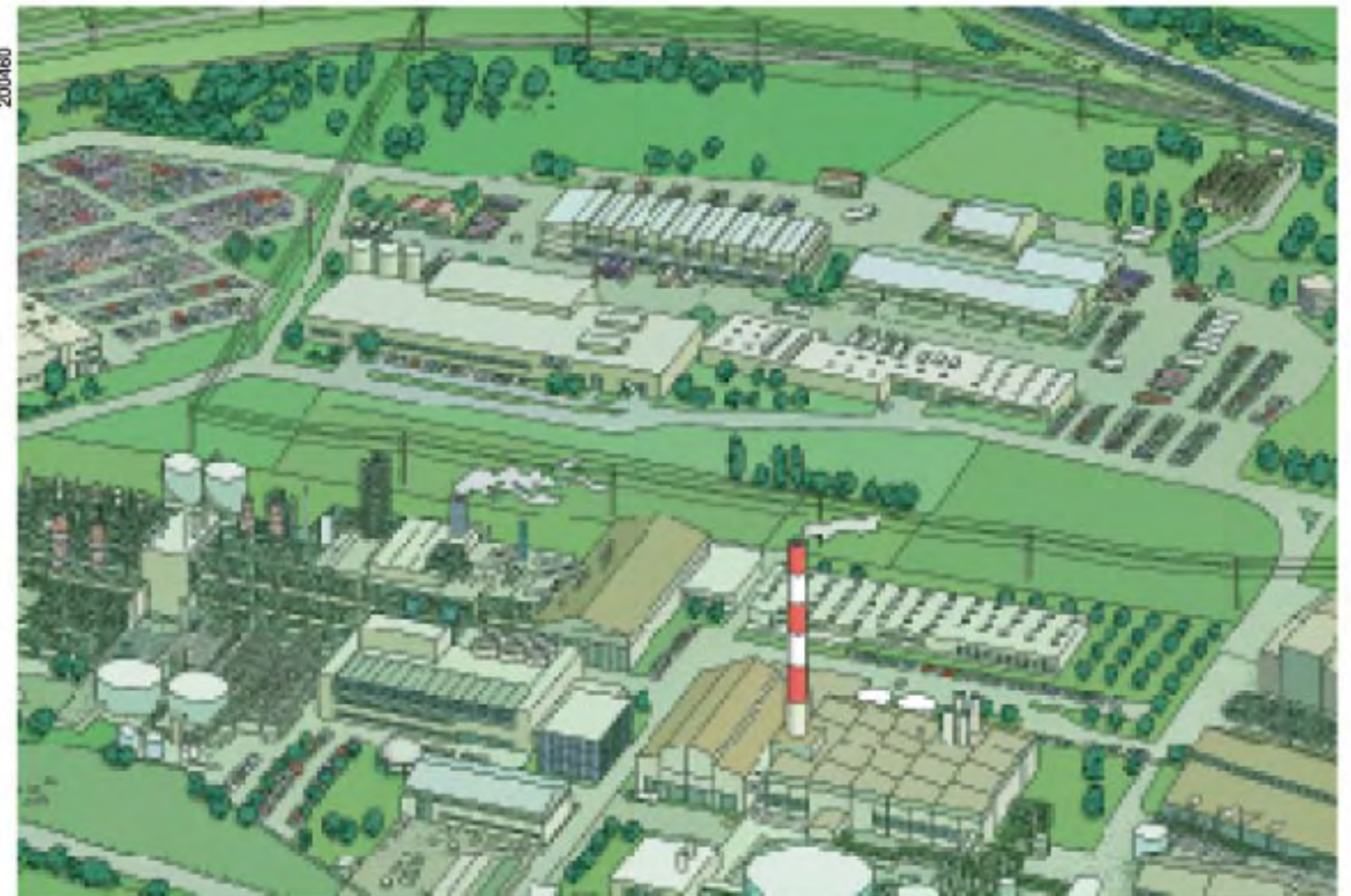
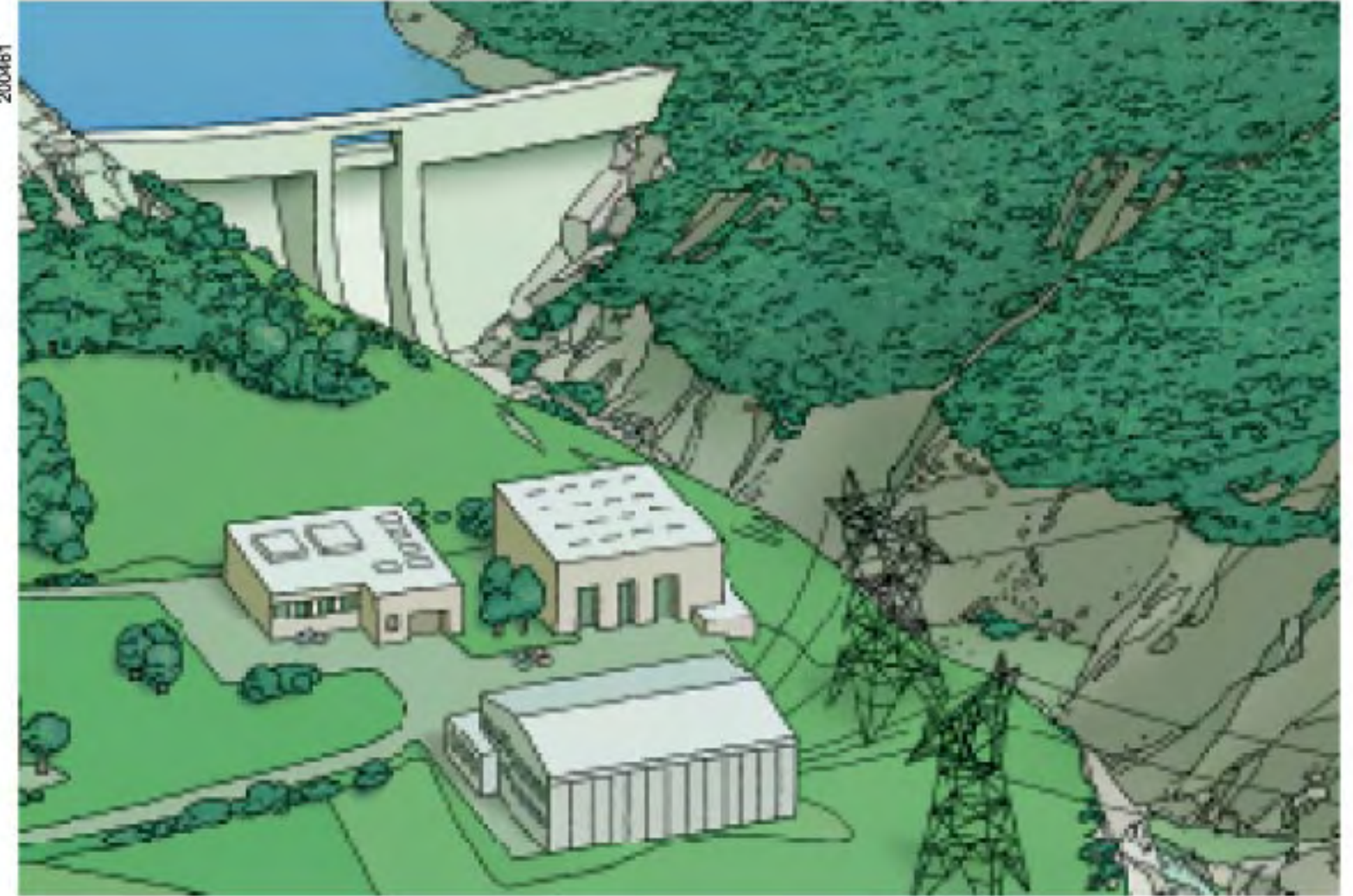
LPCT sensors  
Earthing switch

36  
37-41

**Evolis** circuit breakers are used to protect and control public or industrial medium voltage electrical distribution networks.

**Evolis** is indoor switchgear that is particularly suited to the production and renovation of HV/MV, MV/MV and MV/LV substations.

It is suitable for the protection of all types of applications:  
cables, lines, motors, capacitors, transformers, bus sectioning of sources, etc.



*A safe, easy to integrate  
and comprehensive range  
for demanding installations.*

■ Evolis is a vacuum circuit-breaker that meets current and future standards in terms of electrical installation dependability, in compliance with standards and environmental protection.

It is the quintessential expression of Merlin Gerin's know-how.

■ Evolis is intended for all network applications, either new or renovation installations, for utilities companies, infrastructures, process industry and tertiary building.



*Evolis 12 kV withdrawable*



*Evolis 24 kV withdrawable*

*As a specialist in breaking technologies, Merlin Gerin took naturally an interest in vacuum breaking techniques. A major R&D investment was made to develop and engineer Evolis, providing customers with the very best of vacuum technology.*

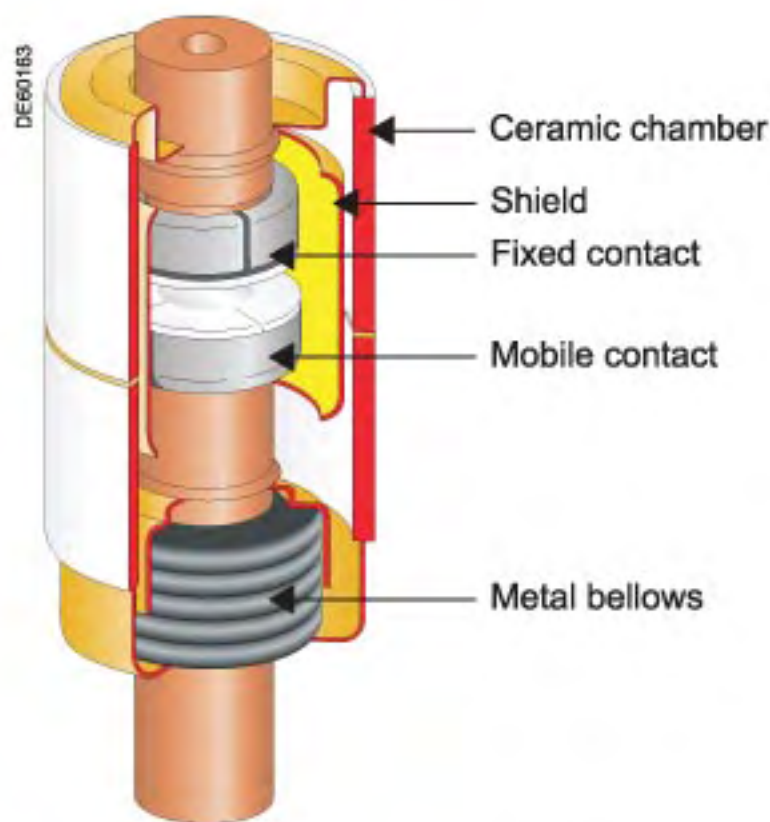


Fig. 1: vacuum interrupter components

## Make-up of a vacuum interrupter

■ Vacuum interrupters basically have two electrical contacts, one fixed and the other mobile, and a sealed enclosure. The latter enables a high level of vacuum to be maintained inside the interrupter (less than  $10^{-7}$  bar) to provide insulation between the open contacts.

■ The dielectric strength of the vacuum allows the contact-to-contact distance to be reduced. This short distance together with the low opening speed allow the use of a low energy control mechanism. A metal bellows provides the link between the mobile contact and the enclosure.

■ In order to keep the vacuum level required for the correct operation of the interrupter for 30 years, the enclosure must be perfectly sealed, and the various components have to be fully degased. This is achieved by:

- choosing materials that are specifically selected for this application (metals and ceramics),
- choosing an appropriate assembly process (vacuum, high temperature brazing),
- the use of a "getter" material to absorb the residual gas.

## Current breaking in a vacuum interrupter

■ In vacuum breaking, the electrical arc generated on separation of the contacts is made up of a plasma of metal vapors produced by the vaporization of the contact material.

■ At low values of current, these vapors very quickly condense on the shield and contacts when the arc disappears, thus allowing:

- the vacuum to be re-established,
- a contact-to-contact dielectric strength to be restored that is greater than the recovery voltage: breaking is then complete.

■ At high currents, the electrical arc in the vacuum switches to a concentrated mode which causes high, localized temperature rises on the contacts. The existence of these hot spots is detrimental to the quick restoring of the dielectric strength. Two techniques can be used in order to avoid this stagnation of the static concentrated arc:

- the so called RMF (Radial Magnetic Field) technique, involves rotating the arc thanks to an electromagnetic effect generated by a radial magnetic field; this therefore limits contact erosion.
- a more recent technique called AMF (Axial Magnetic Field) involves applying an axial magnetic field parallel to the axis of the two contacts (fig. 2) which allows a diffuse arc to be maintained (fig. 3) even at high current values. The arc energy is spread over the whole contact surface area, therefore causing very low levels of erosion.
- Merlin Gerin has chosen this last technique for the Evolis range.

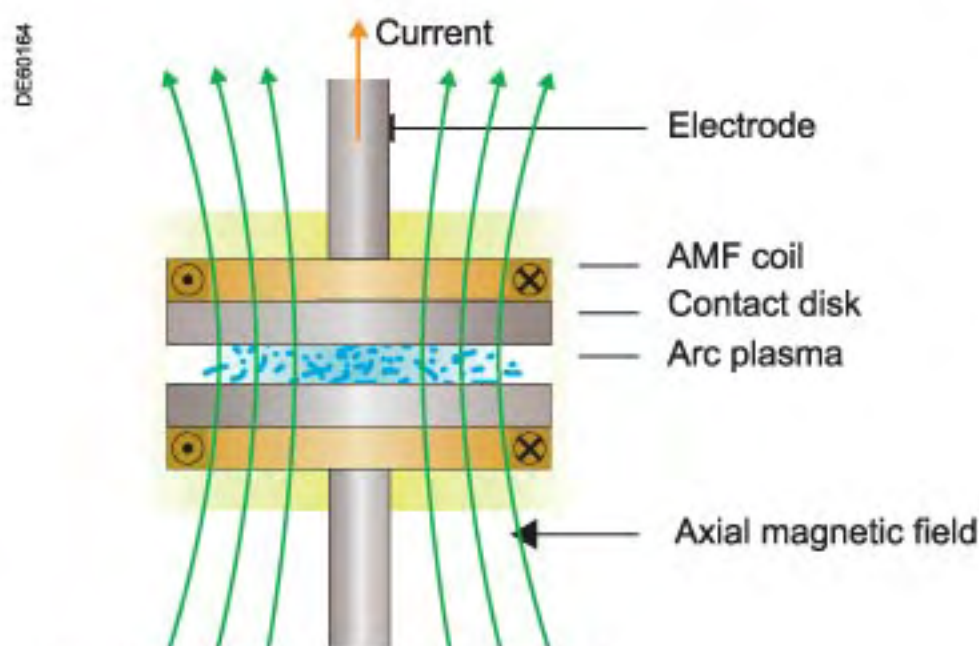


Fig. 2: cross-section of AMF contact

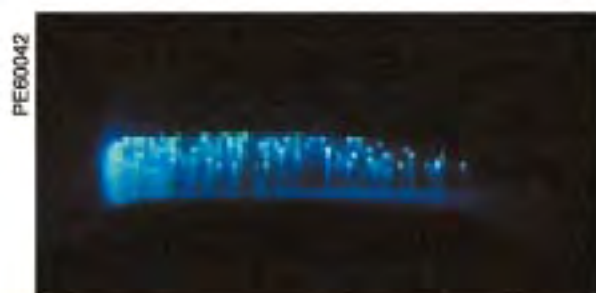


Fig. 3: diffuse vacuum arc AMF technology

*Merlin Gerin's choices for Evolis combined with its industrial expertise provides customer with a highly reliable range of circuit-breakers. These products are suitable for the most demanding conditions with the guarantee of full compliance with international standards.*

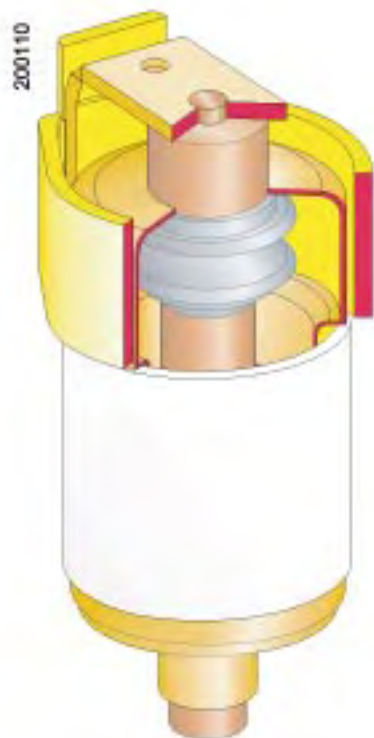


Fig 4: 17.5 kV external coil type interrupter

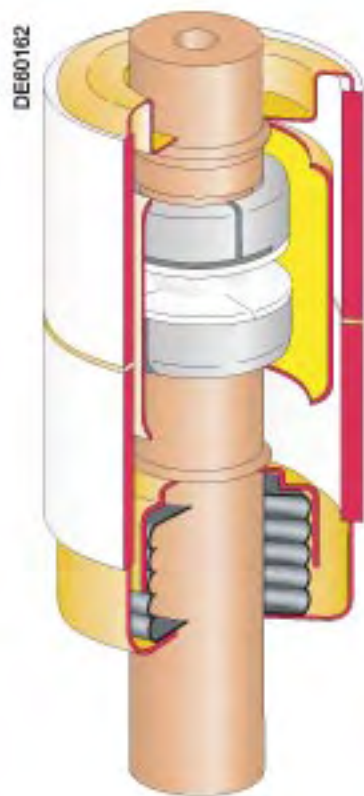


Fig 5: 24 kV internal coil type interrupter

## AMF technology

- Evolis circuit-breakers use AMF type vacuum interrupters. According to technical and economic optimization considerations, the axial magnetic field is generated:
  - either by a coil outside of the interrupter (fig. 4), for rated voltages up to 17.5 kV,
  - or by a coil integrated in the interrupter contact structure (fig. 5), for the 24 kV voltage level.
- In both cases the AMF vacuum interrupters feature low arc voltages ( $U_{arc}$  of around 50 V) and maximum usage of the contact surface for very low contact erosion.

## The advantages provided

- The above choices provide customers with the following advantages in MV circuit-breaker applications:
  - simple and compact vacuum interrupters,
  - CuCr materials as main contacts in the interrupter for lower chopping current and low surge during breaking,
  - high electrical endurance meaning that there is no need for contact wear inspection in normal network protection applications including highly disturbed overhead line feeders.



Vacuum interrupter



Industrial process expertise

## Systematic advanced control

The main components of the circuit-breaker, such as vacuum interrupter and operating mechanism, are produced by Schneider Electric. The vacuum interrupters are manufactured in an ultra-modern production unit in France. During manufacture, each circuit-breaker is subjected to systematic advanced testing.

### Vacuum interrupter testing

- The level of vacuum in each interrupter is tested using the "magnetron discharge method".
- Using this sophisticated procedure, measurement is very precise and does not require access to the inside of the interrupter, thus not affecting the airtight seal.

### Circuit-breaker testing

- A rigorous set of tests and measurements is carried out on each circuit-breaker.
- The results are reported and signed off by the quality control department on each device's test certificate to ensure product traceability.

## Compliance with standards

- Evolis complies with IEC 62271-100.
- Design and production are certified to ISO 9000 (version 2000).
- Production sites are certified to ISO 14001 (environmental standard).

## Certification

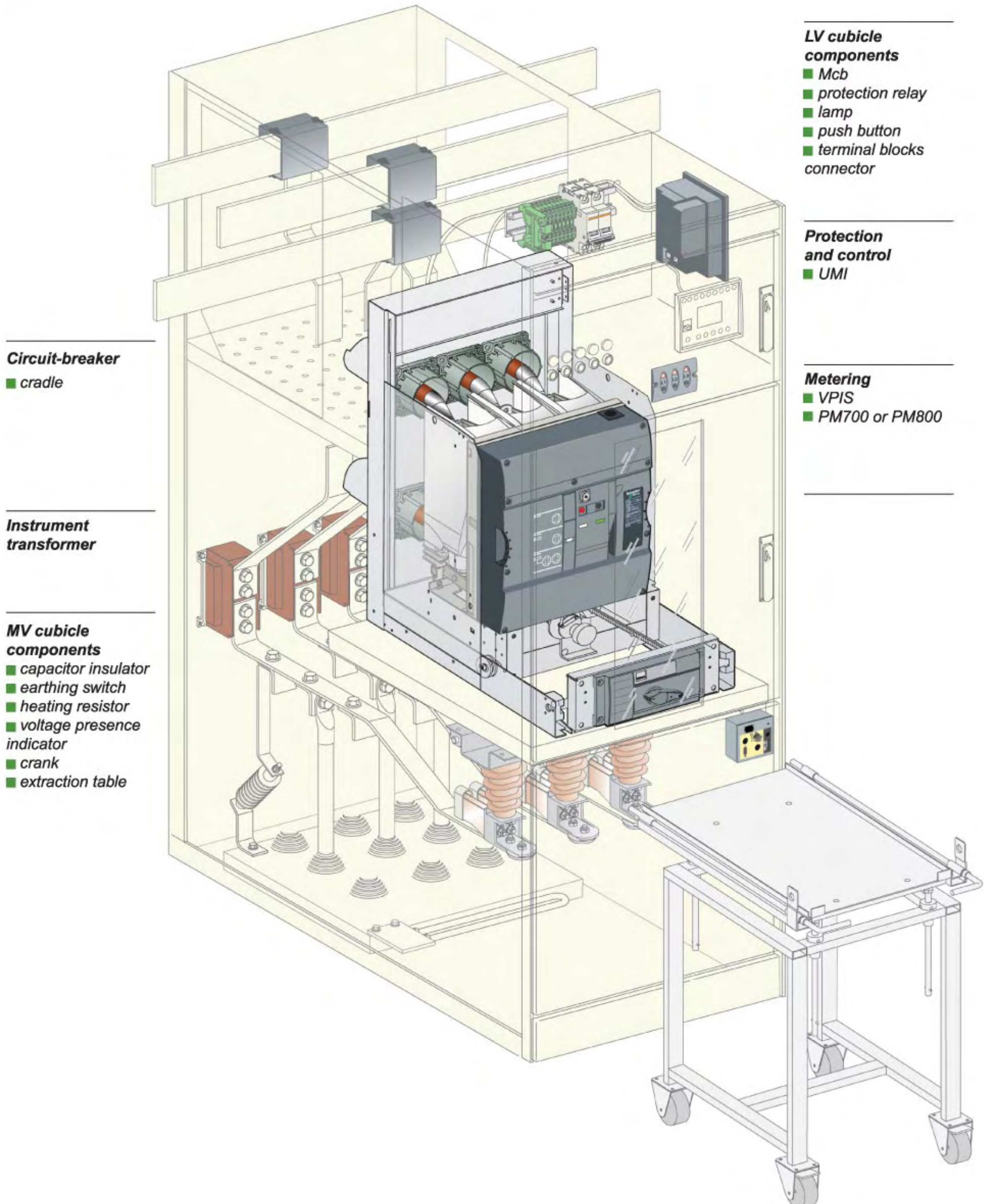
- The certificate of conformity provides guarantees that the circuit-breaker:
  - has been subject to type tests according to EN 45001 standards procedures in accredited laboratories by independent organizations,
  - is in conformity with recognized international standards
- Evolis is currently being certified by external EN 45011 accredited organizations, members of the STL (Short circuit Testing Liaison)
  - EN 45001: general requirements for the competence of testing and calibration laboratories,
  - EN 45011: general requirements for bodies of operating product certification systems.

## Environmental care

- Product design takes account of the environmental constraints described in a "Product Environment Profile" dossier (PEP).
- An end-of-service-life manual details procedures for dismantling and processing components.

# Extended products offer

DE60129



# Performance tables

## 12KV-17.5KV

### Common characteristics according to IEC 62271-100

|                                    |                        |           |                                                                                       |
|------------------------------------|------------------------|-----------|---------------------------------------------------------------------------------------|
| rated frequency                    | <b>fr</b>              | (Hz)      | 50 & 60                                                                               |
| short-time withstand current       | <b>Ik</b> for tk = 3 s | (kA) rms  | Ik = Isc                                                                              |
| rated peak withstand current       | <b>Ip</b>              | peak (kA) | Ip = 2.5 & 2.6 Ik                                                                     |
| rated short circuit making current |                        | peak (kA) | = 2.5 & 2.6 Isc                                                                       |
| operating sequence                 |                        |           | O - 3 mn - CO - 3 mn - CO<br>O - 0.3 s - CO - 3 mn - CO<br>O - 0.3 s - CO - 15 s - CO |
| operating times                    | opening                | ms        | < 50                                                                                  |
|                                    | breaking               | ms        | < 60                                                                                  |
|                                    | closing                | ms        | < 65                                                                                  |
| mechanical endurance               | class                  |           | M2                                                                                    |
|                                    | number of operations   |           | 10000 (30000 upon request)                                                            |
| electrical endurance               | class                  |           | E2                                                                                    |
|                                    | number of operations   | 25 kA     | 100                                                                                   |
|                                    |                        | 31.5 kA   | 100                                                                                   |
|                                    |                        | 40 kA     | 100                                                                                   |
| capacitive current breaking        |                        |           | class C1-C2 (for some applications)                                                   |
| Humidity:                          |                        |           |                                                                                       |
| average relative humidity          | 24-hours period        |           | < 95%                                                                                 |
|                                    | 1 month                |           | < 90%                                                                                 |

### Electrical characteristics according to IEC 62271-100

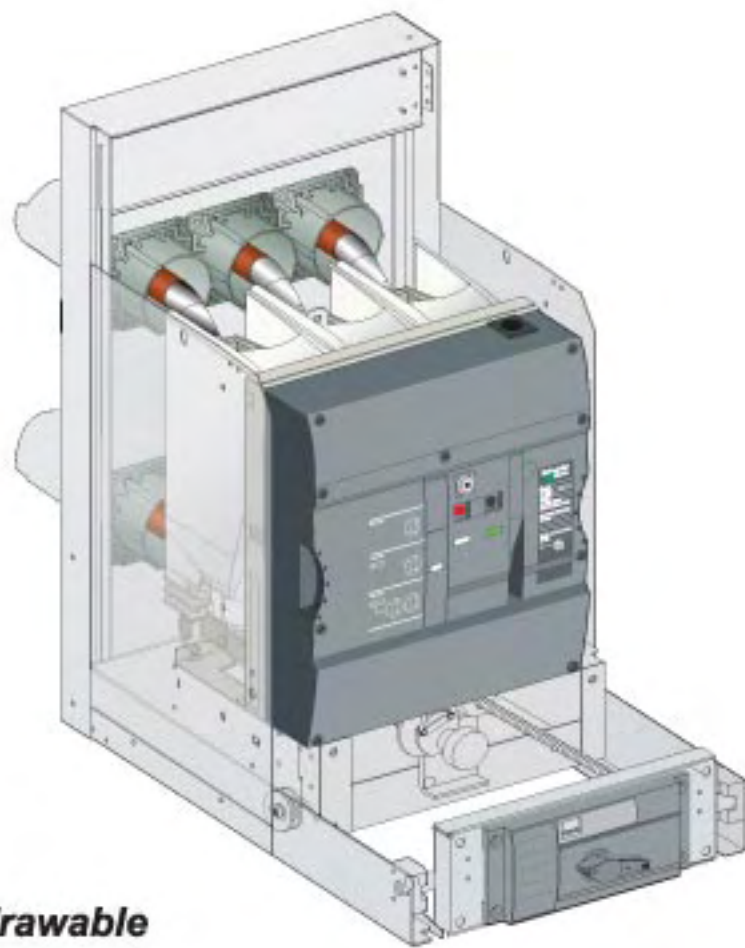
|                                      |                     |             |             |             |             |             |             |             |             |             |  |
|--------------------------------------|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| circuit breaker                      |                     | <b>12P1</b> | <b>12P1</b> | <b>12P1</b> | <b>12P3</b> | <b>12P3</b> | <b>12P3</b> | <b>17P2</b> | <b>17P2</b> | <b>17P2</b> |  |
| Withdrawable type                    |                     | <b>630</b>  | <b>1250</b> | <b>2500</b> | <b>630</b>  | <b>1250</b> | <b>2500</b> | <b>630</b>  | <b>1250</b> | <b>2500</b> |  |
| rated voltage                        | <b>Ur</b> (kV) rms  | 12          | 12          | 12          | 12          | 12          | 12          | 17.5        | 17.5        | 17.5        |  |
| rated insulation voltage             | <b>Ud</b> (kV) rms  | 28          | 28          | 28          | 28          | 28          | 28          | 38          | 38          | 38          |  |
| rated insulation voltage             | <b>Up</b> (kV) peak | 75          | 75          | 75          | 75          | 75          | 75          | 95          | 95          | 95          |  |
| rated short-circuit breaking current | <b>Isc</b> (kA) rms | 25          | 25          | 25          | 40          | 40          | 40          | 31.5        | 31.5        | 31.5        |  |
| rated normal current (-25° +40°C)    | <b>Ir</b> (A) rms   | 630         | 1250        | 2500        | 630         | 1250        | 2500        | 630         | 1250        | 2500        |  |
| climatic version                     | -25° +40°C          | ■           | ■           | ■           | ■           | ■           | ■           | ■           | ■           | ■           |  |

### Installation and connections

|                                 |            |      |      |      |      |      |      |      |      |      |  |
|---------------------------------|------------|------|------|------|------|------|------|------|------|------|--|
| phase distance:                 |            |      |      |      |      |      |      |      |      |      |  |
| between poles (mm)              |            | 145  | 145  | 240  | 240  | 240  | 240  | 185  | 185  | 240  |  |
| dimensions C.B. and cradle (mm) | width (W)  | 576  | 576  | 866  | 866  | 866  | 866  | 686  | 686  | 866  |  |
|                                 | depth (D)  | 1140 | 1140 | 1140 | 1140 | 1140 | 1140 | 1140 | 1140 | 1140 |  |
|                                 | height (H) | 965  | 965  | 965  | 965  | 965  | 965  | 965  | 965  | 965  |  |
| mass C.B. and cradle            | (kg)       | 165  | 165  | 272  | 272  | 272  | 272  | 174  | 174  | 272  |  |

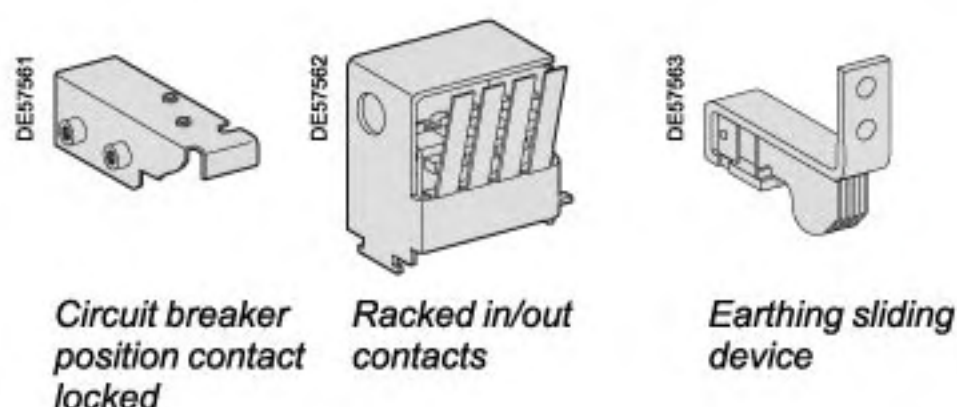
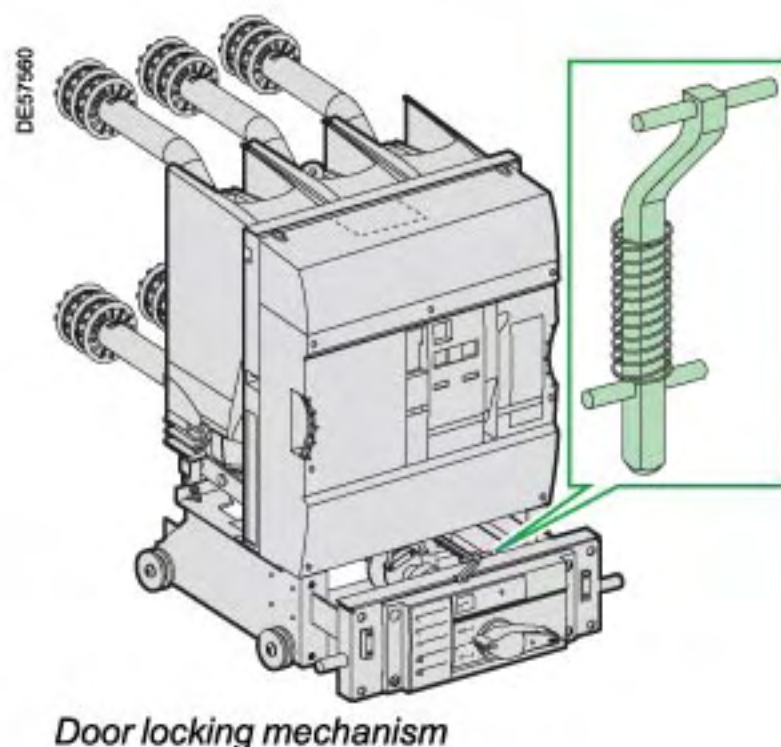
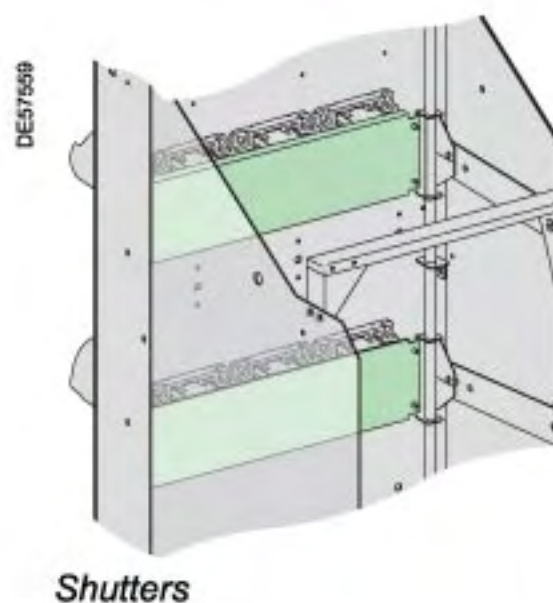
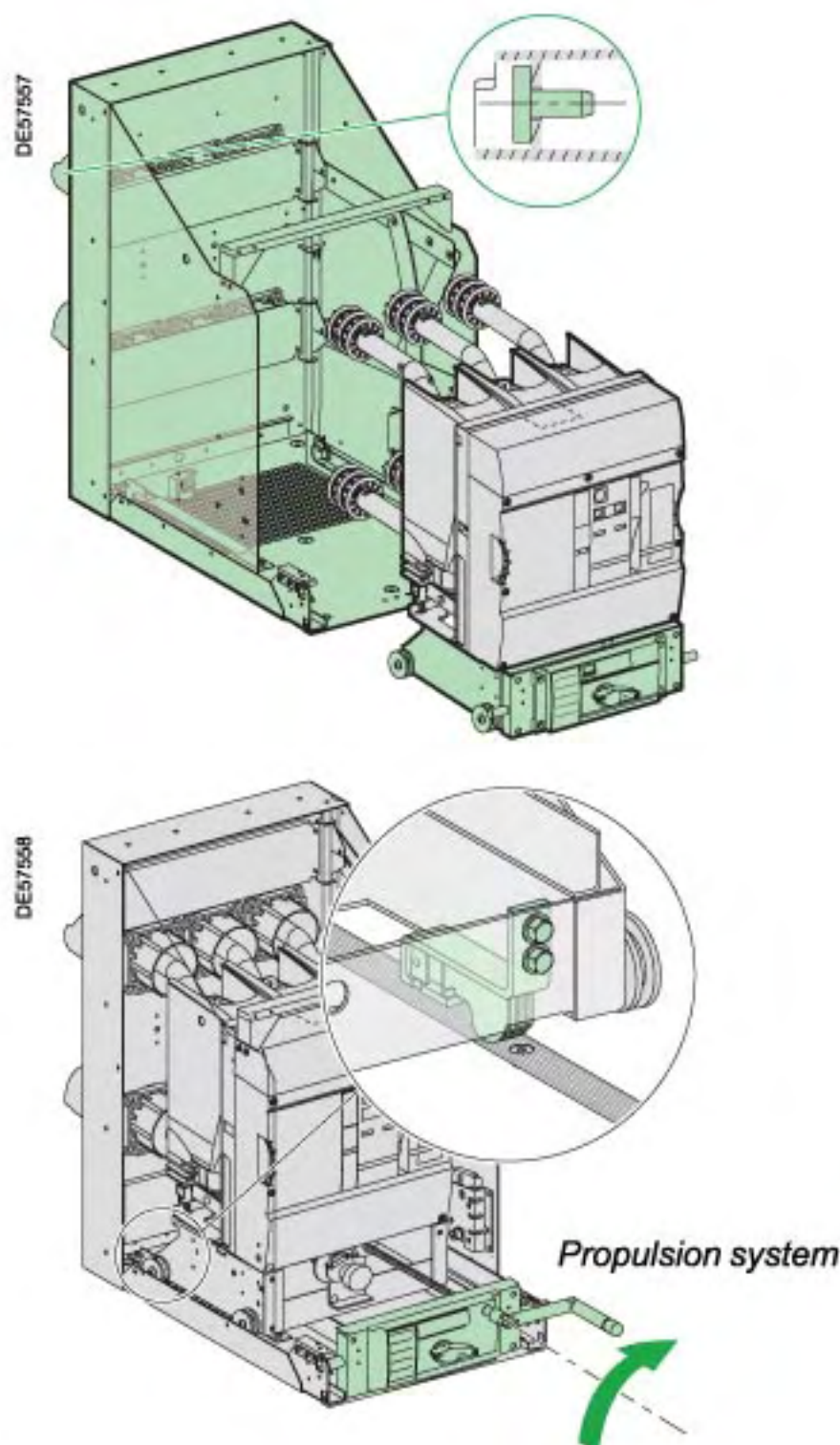


Fixed



Withdrawable

| Fixed type | 12P1 | 12P1 | 12P1 | 12P3 | 12P3 | 12P3 | 17P2 | 17P2 | 17P2 |  |  |
|------------|------|------|------|------|------|------|------|------|------|--|--|
|            | 630  | 1250 | 2500 | 630  | 1250 | 2500 | 630  | 1250 | 2500 |  |  |
|            | 12   | 12   | 12   | 12   | 12   | 12   | 17.5 | 17.5 | 17.5 |  |  |
|            | 28   | 28   | 28   | 28   | 28   | 28   | 38   | 38   | 38   |  |  |
|            | 75   | 75   | 75   | 75   | 75   | 75   | 95   | 95   | 95   |  |  |
|            | 25   | 25   | 25   | 40   | 40   | 40   | 31.5 | 31.5 | 31.5 |  |  |
|            | 630  | 1250 | 2500 | 630  | 1250 | 2500 | 630  | 1250 | 2500 |  |  |
|            | ■    | ■    | ■    | ■    | ■    | ■    | ■    | ■    | ■    |  |  |
|            |      |      |      |      |      |      |      |      |      |  |  |
|            | 145  | 145  | 240  | 240  | 240  | 240  | 185  | 185  | 240  |  |  |
|            | 470  | 470  | 660  | 660  | 660  | 660  | 550  | 550  | 660  |  |  |
|            | 429  | 429  | 429  | 429  | 429  | 429  | 429  | 429  | 429  |  |  |
|            | 535  | 535  | 535  | 535  | 535  | 535  | 535  | 535  | 535  |  |  |
|            | 51   | 51   | 79   | 79   | 79   | 79   | 55   | 55   | 79   |  |  |



## Composition

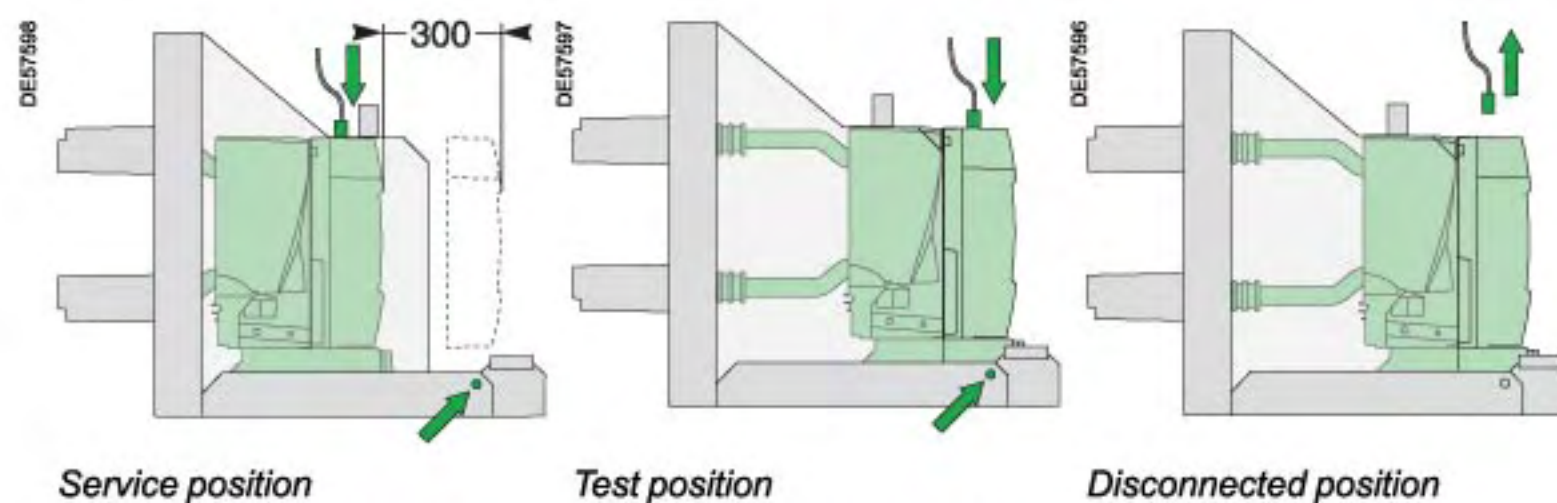
The "racking in" function is carried out by:

- the racking truck supporting the circuit breaker (mobile part)
- the cradle with bushings (fixed part)
- LV plug.

## Operation

The circuit breaker can be placed in 3 stable positions:

- **service position:** circuit breaker racked in and locked in position; LV plugs connected
- **test position:** circuit breaker racked out and locked in position; LV plug connected
- **disconnected position:** circuit breaker racked out and locked in position; LV plug disconnected. The circuit breaker can be unlocked and extracted from the cradle.



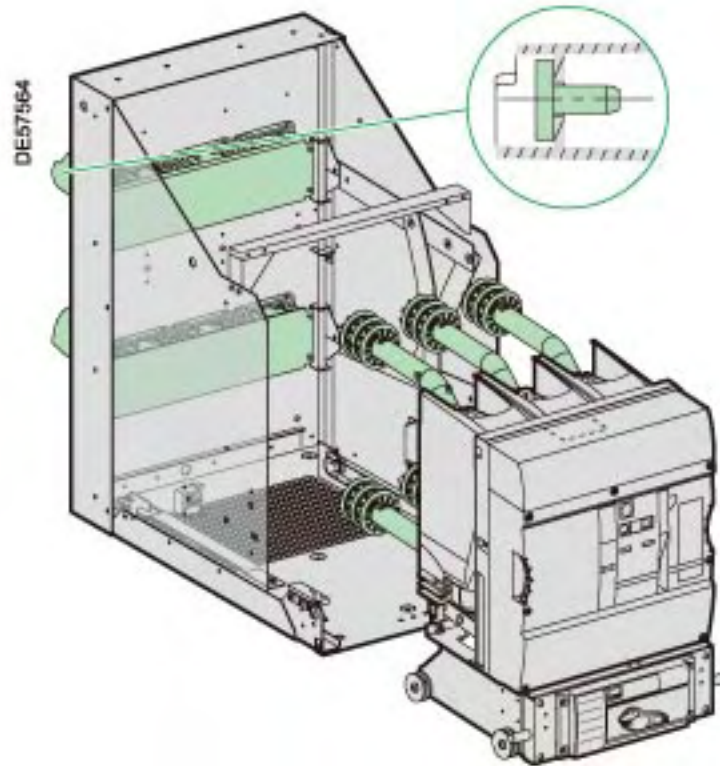
**Note:** the arrows show the "locked positions" for the circuit breaker and the LV plug.

## Functions

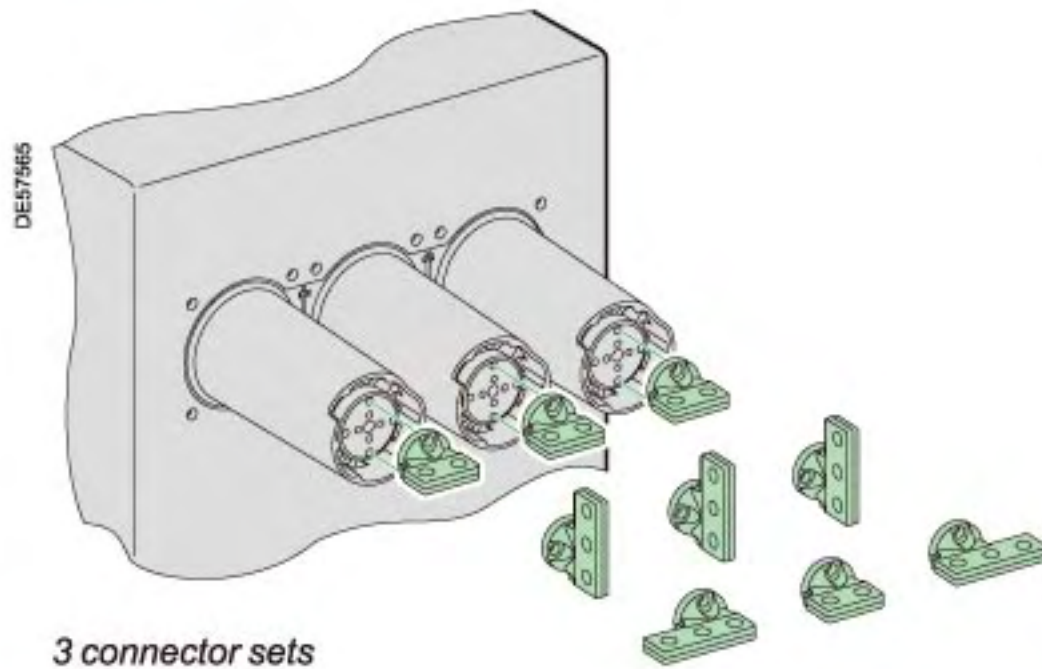
- A drive system combined with a threaded shaft gives easier racking in and out. The racking in mechanism can be operated with the door closed.
- An interlock stops the user from inserting the lever as long as the racking truck has not been put in the "racked in/out" position.
- An interlock between the circuit breaker status and the truck gives secure operation: racking in or out is only possible if the circuit breaker is open.
- An interlock also exists between the LV connector and the truck. It is only possible to rack in if the LV connector is connected.
- The cradle floor has all the fixing holes needed to correctly position the earthing switch control mechanism and power circuit. This makes earthing switch operation reliable and gives interlocking between the circuit breaker and the earthing switch.
- Earthing is automatic when the truck is fully racked in.
- Protective shutters stop fingers from touching the racking clusters when the device is extracted (protection index: IP2X).
- For maintenance operations, it is possible to:
  - ☐ padlock the shutters in the closed position
  - ☐ unlock the shutter mechanism to access the racking clusters.
- A foolproof device enables correct matching of the cradle and circuit breaker rating. This system is mounted on the cradle base. Part of the system must be assembled by the panel builder on the cubicle floor.

## Accessories

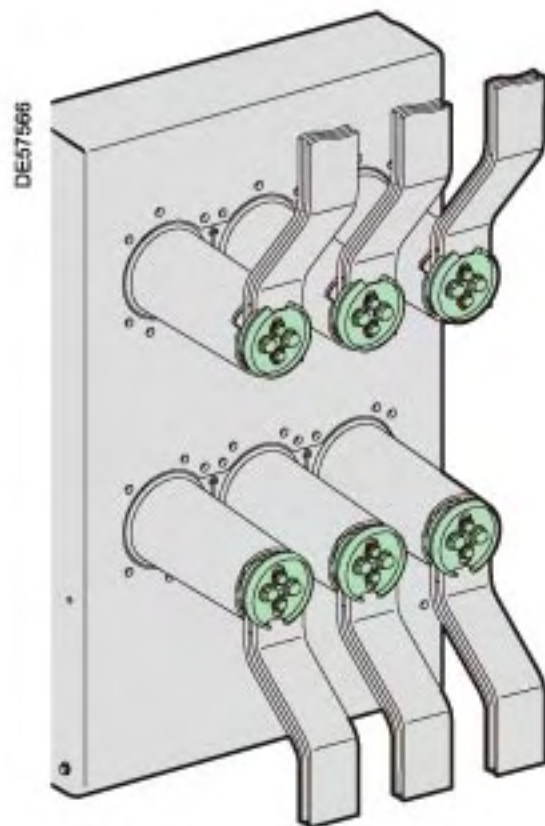
- One set of auxiliary contacts:
  - ☐ 4 circuit breaker racked in/out position contacts
  - ☐ 1 contact showing that the circuit breaker is locked in place on the cradle.
- Cradle earthing is provided by a sliding copper contact.
- A key locking system (Ronis or Profalux) for the circuit breaker in the racked out position enables increased safety downstream of it during work. This system is associated with an earthing switch.
- Locking of the circuit breaker compartment door. This device enables the circuit breaker, full version, to only be operated when the door is closed.



Power circuit



3 connector sets



Field deflectors

## Composition

The power circuit comprises:

- mobile contacts with disconnectable clusters and arms mounted on the circuit breaker
- fingers attached to the cradle and insulated by bushings and metal shutters.

This assembly provides perfect control of the dielectric strength, mechanic, the short time withstand current and the temperature rise.

All of these characteristics have been validated in tests.

## Connection

Connection is easily done from outside the cradle:

- on vertical copper terminals integrated in the bushing
- by a connector set, also used on the base circuit breaker.

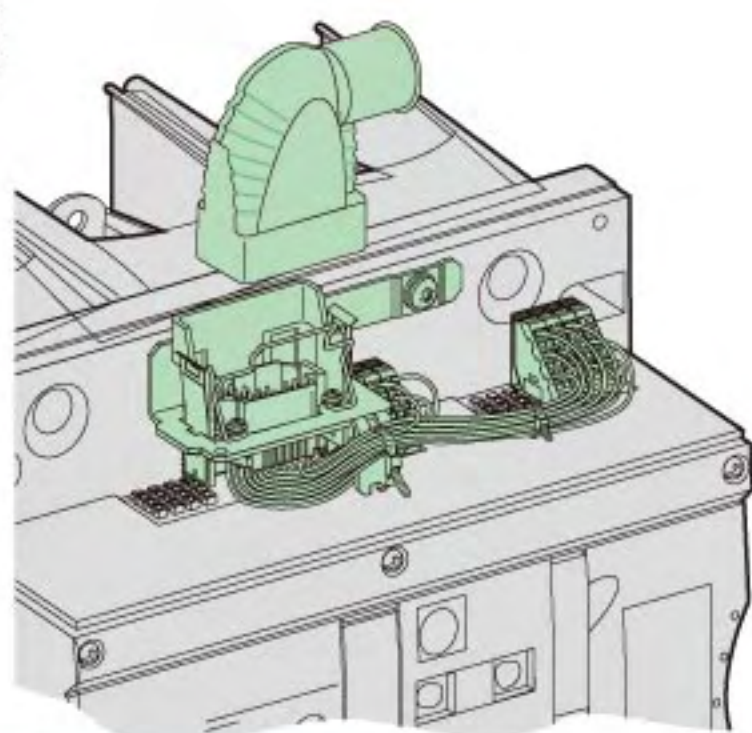
### Note:

The dielectric strength values given in the performance table, do not take these connectors into account.

The panel builder must check the whole cubicle connection configuration.

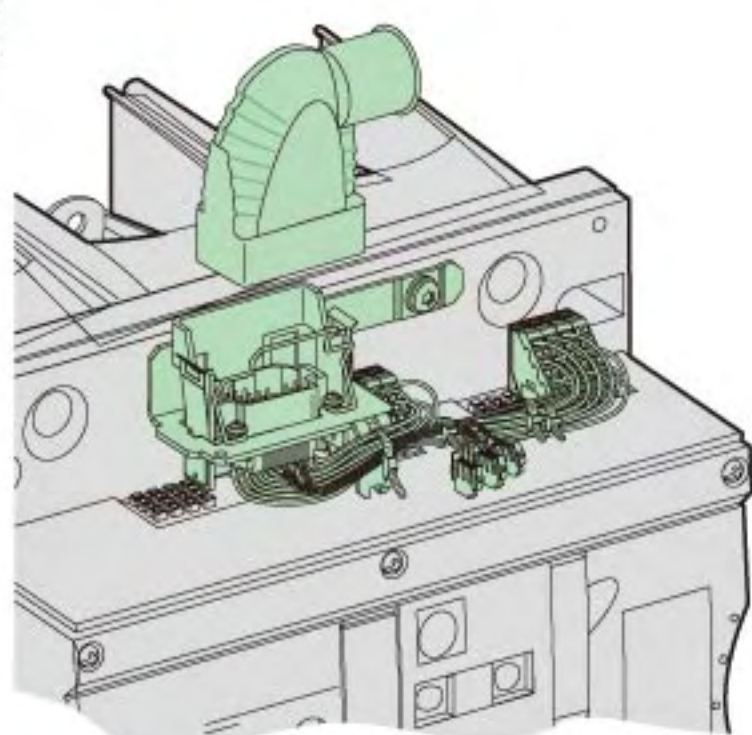
For circuit breakers with a rated voltage of  $U_r = 17.5$  kV with a phase to phase distance of 185 mm, field deflectors are used to increase the dielectric strength by 75 kV to 95 kV.

DES7523



18-pin version LV plug

DES7524



42-pin version LV plug

### Main functions

With the base circuit breaker, the LV wiring uses a LV plug which comprises:

- the fixed part (male) mounted on the circuit breaker and fully connected to the control mechanism
- the mobile part (female) compatible with the male part.

### Two versions of the LV plug are available

#### An 18-pin version, enabling connection of:

- a shunt opening release MX1
- a remote control mechanism (electrical motor, shunt closing release XF)
- a "ready to close" contact PF
- a maximum number of auxiliary contacts: 1 NC - 1 NO - 2 changeover contacts. (see "indication" page, "Open/closed position auxiliary contacts" chapter).

#### An 42-pin version, enabling connection of:

- a shunt opening release MX1
- a second opening release (shunt type MX2 or undervoltage type MN)
- a low energy release (Mitop)
- a fault trip indicator contact SDE
- a remote contact reset system SDE
- a remote control mechanism (electrical motor, shunt closing release XF)
- a "ready to close" contact PF
- a maximum number of auxiliary contacts: 4 NC - 5 NO - 2 changeover contacts. (see "indication" page, "Open/closed position auxiliary contacts" chapter).

**Note:** see the table of the releases' combinations "Order form" page.

#### Interlocking function:

In conformity with IEC standard 62271-200, an interlocking function prohibits:

- racking in when the LV plug is not connected
- disconnection of the LV plug if the circuit breaker is in the racked-in position.

### LV wiring kit

A wiring kit with 42 wires (2 meters long) equipped with pins that can be adapted to the LV plug can be supplied for connected in to the cubicle's LV compartment.

### Flexible ducting

This 525 mm long duct with a hinged LV plug, enables protection of the LV wiring that connects the circuit breaker to the cubicle's LV compartment.



#### Operation of the P2 stored energy operating mechanism

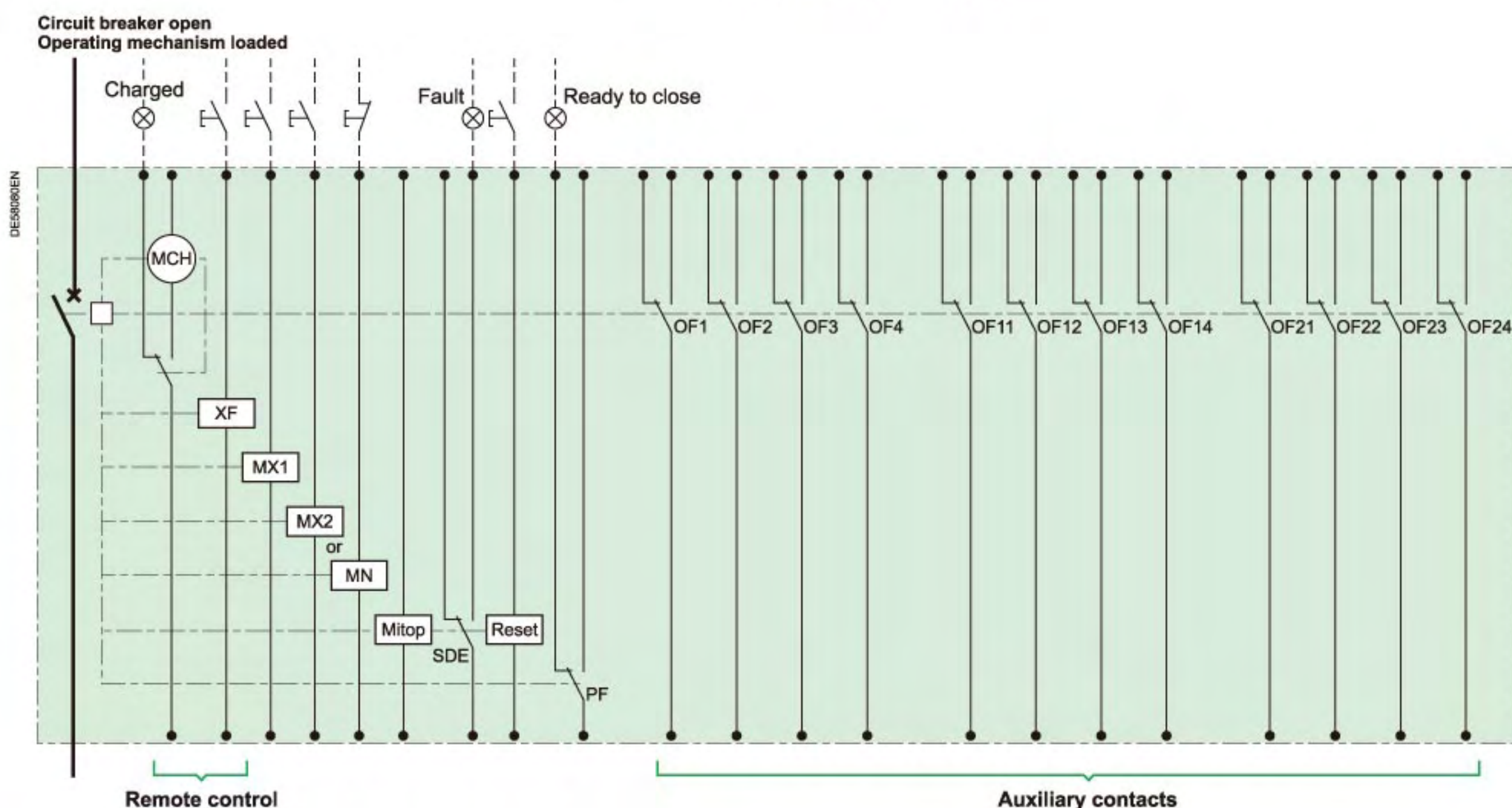
This gives the device an opening and closing speed that is independent of the operator whether the order is electrical or manual.

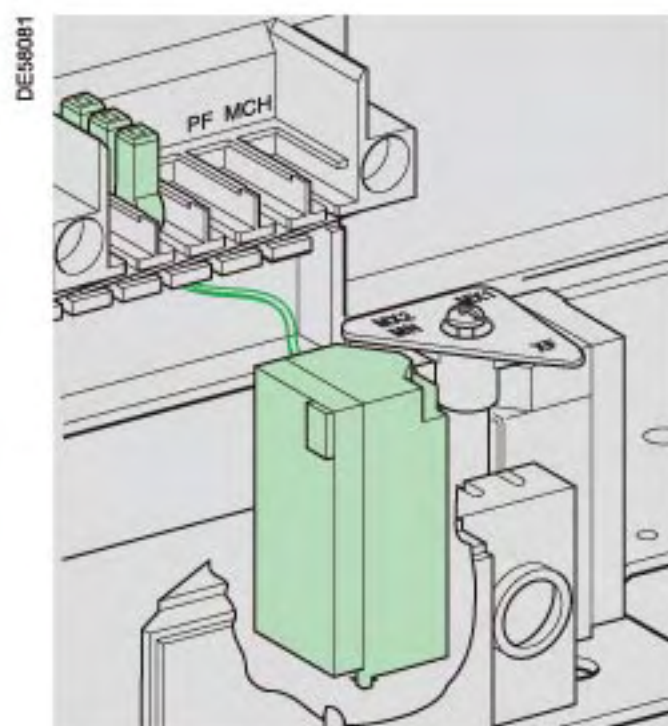
The electrical control mechanism carries out reclosing cycles and is automatically recharged by a geared motor each time after closing.

#### It consists of:

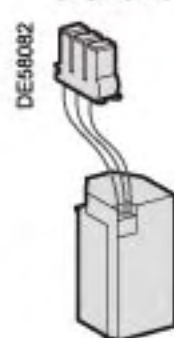
- the stored energy operating mechanism which stores in springs the energy required to open and close the device
- a gear motor electrical charging device with manual charging by lever (useful on loss of auxiliary supply)
- manual order devices by push buttons on the front panel of the device
- an electrical remote closing device containing a release with an antipumping relay
- an electrical opening device containing one or more releases, for example:
  - ☐ shunt opening
  - ☐ undervoltage
  - ☐ Mitop, a low consumption release, used only with the Sepam 100 LA protection relay.
- an operation counter
- a position indication device by mechanical indicator and 3 modules of 4 auxiliary contacts whose availability varies according to the diagram used
- a device for indicating "charged" operating mechanism status by mechanical indicator and electrical contact.

#### Wiring diagram (principle)

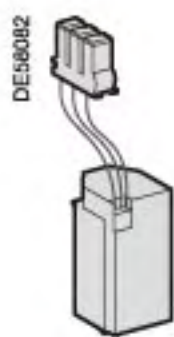




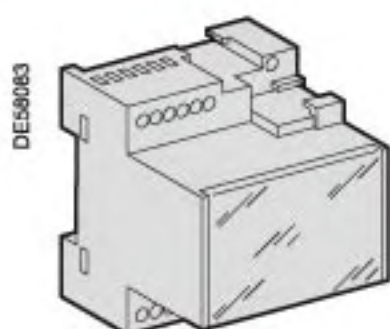
Circuit breaker equipped with a shunt opening release MX



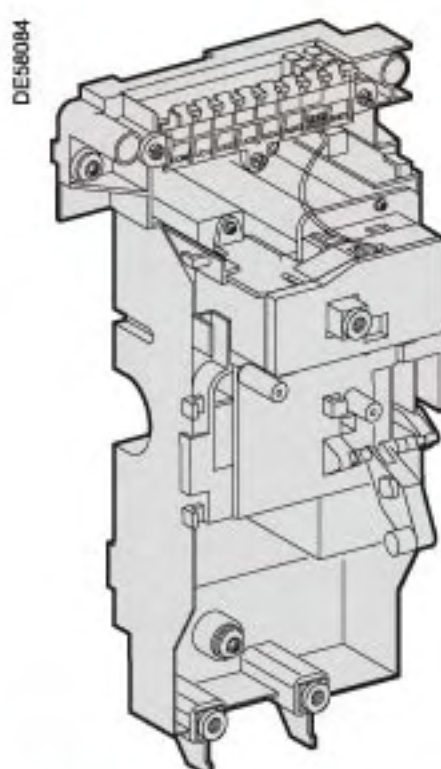
Shunt opening release (MX1 and MX2)



Undervoltage release (MN)



Time delay for undervoltage release (MN)



Low energy release (Mitop)

### Composition

The opening circuit is produced using the following components:

- a shunt opening release (MX1)
  - a second shunt opening release (MX2)
  - undervoltage release (MN)
  - time delayed undervoltage release (MNR: MN + time delay).
- The time delay, placed outside the circuit breaker, can be disabled by an emergency stop button to give instant circuit breaker opening.

- low energy release (Mitop).

**Note:** see the table of the releases' combinations on the following page.

### Shunt opening release (MX1 and MX2)

Energizing this release causes instant opening of the circuit breaker.

Permanent power supply to the MX unit locks the circuit breaker in the "open" position.

#### Characteristics

|                       |                       |                  |
|-----------------------|-----------------------|------------------|
| Power supply          | See "Order form" page |                  |
| Threshold             | 0.7 to 1.1 Ur         |                  |
| Consumption (VA or W) | Triggering            | 200 (for 200 ms) |
|                       | Latched               | 4.5              |

### Undervoltage release (MN)

This release unit causes the systematic opening of the circuit breaker when its supply voltage drops below a value less than 35% of the rated voltage, even if this drop is slow and gradual. It can open the circuit breaker between 35% and 70% of its rated voltage. If the release unit is not supplied power, manual or electrical closing of the circuit breaker is impossible. Closing of the circuit breaker is possible when the supply voltage of the release unit reaches 85% of its rated voltage.

#### Characteristics

|                       |                       |                  |
|-----------------------|-----------------------|------------------|
| Power supply          | See "Order form" page |                  |
| Threshold             | Opening               | 0.35 to 0.7 Ur   |
|                       | Closing               | 0.85 Ur          |
| Consumption (VA or W) | Triggering            | 200 (for 200 ms) |
|                       | Latched               | 4.5              |

### Time delay for MN

To eliminate spurious tripping of the circuit breaker when there are brief voltage drops, the MN action is controlled with a time delay.

This function is achieved by adding a time delay unit outside of the undervoltage release (MN) circuit (adjustable time delay).

This unit is placed outside the circuit breaker and can be inhibited by an emergency stop button to obtain instant circuit breaker opening.

#### Characteristics

|                       |                             |                  |
|-----------------------|-----------------------------|------------------|
| Power supply          | See "Order form" page       |                  |
| Threshold             | Opening                     | 0.35 to 0.7 Ur   |
|                       | Closing                     | 0.85 Ur          |
| Consumption (VA or W) | Triggering                  | 200 (for 200 ms) |
|                       | Latched                     | 4.5              |
| Time delay            | 0.5 s - 0.9 s - 1.5 s - 3 s |                  |

### Low energy release (Mitop)

This release includes a low consumption unit and is specifically used with the Sepam 100LA self-powered unit ("REFLEX MODULE"), or the VIP relay.

#### Characteristics

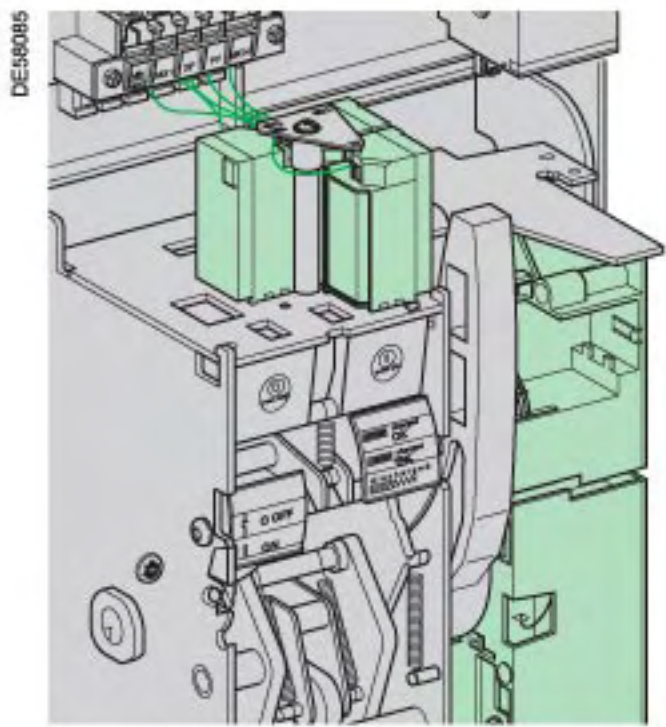
|              |                 |
|--------------|-----------------|
| Power supply | Direct current  |
| Threshold    | 0.6 A < I < 3 A |

Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact, provided with the Mitop.

This release also includes a coil (reset) enabling remote SDE contact reset.

#### Comment:

Use of the Mitop low energy release requires adjustment of the protection relay time delay in order to ensure that the circuit breaker trips between 45-50 ms.



Circuit breaker equipped with remote control

Function

Remote control enables the remote opening and closing of the circuit breaker.

The opening order always takes priority over the closing order.

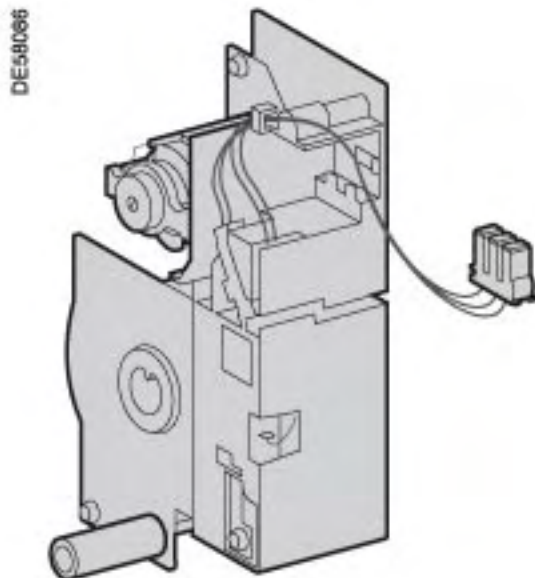
In the event of simultaneous opening and closing orders, the mechanism discharges under no load, without moving the main contacts. The circuit breaker remains in the "open" position.

In the event of latched opening and closing orders, the mechanism carries out anti-pumping function as standard, by blocking the circuit breaker in the "open" position.

Anti-pumping function: after opening on a fault or deliberate opening via the manual or electrical mechanism, the closing order must be interrupted then reactivated to enable reclosing of the circuit breaker.

Composition

- The remote control comprises:
- an electrical motor (MCH) equipped with a "spring armed" CH limit switch
  - a shunt closing release (XF).



Electrical motor MCH

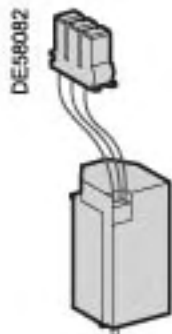
Electrical motor (MCH)

The electrical motor carries out the automatic rearming of the storage energy springs as soon as the circuit breaker closes. This allows instant reclosing of the device after opening. The arming lever is only used as a backup control in the case of the absence of the auxiliary power supply.

An electrical motor (MCH) equipped with a "spring armed" CH limit switch. This contact indicates the "armed" position of the mechanism (springs armed).

Characteristics

|                       |                             |
|-----------------------|-----------------------------|
| Power supply          | See "Order form" page       |
| Threshold             | 0.85 to 1.1 Ur              |
| Consumption (VA or W) | 180                         |
| Motor overcurrent     | 2 to 3 In for 0.1 s         |
| Arming time           | 6 s maximum                 |
| Operating rate        | 3 cycles maximum per minute |
| CH contact            | 10 A/240 V                  |



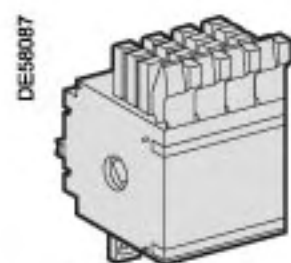
Shunt closing release XF

Shunt closing release (XF)

This release allows remote closing of the circuit breaker when the control mechanism is armed. It can be permanently or briefly supplied power.

Characteristics XF

|                       |                       |                  |
|-----------------------|-----------------------|------------------|
| Power supply          | See "Order form" page |                  |
| Threshold             | XF                    | 0.85 to 1.1 Ur   |
| Consumption (VA or W) | Triggering            | 200 (for 200 ms) |
|                       | Latched               | 4.5              |



Rotary type contacts (OC)

### “Open/closed” auxiliary position contacts (OC)

These auxiliary contacts indicate the “open” or “closed” position of the circuit breaker.

■ Rotary type changeover contacts directly controlled by the circuit breaker mechanism.

■ Indicator contacts are proposed:

□ for standard relaying applications

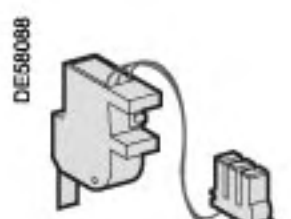
□ for low level control applications with plc's or electronic circuits.

This version is compatible with Sepam series 20-40-80 units.

#### Characteristics

|                       |           |                         |        |
|-----------------------|-----------|-------------------------|--------|
| Standard delivery     | 4         |                         |        |
| Maximum quantity      | 12        |                         |        |
| Breaking capacity (A) | Standard  | Min. load: 100 mA/24 V  |        |
| Cos $\phi$ : 0.3      | V AC      | 240/380                 | 10/6 * |
| CA12/DC12             |           | 480                     | 10/6 * |
|                       |           | 690                     | 6      |
|                       | V DC      | 24/48                   | 10/6 * |
|                       |           | 125                     | 10/6 * |
|                       |           | 250                     | 3      |
|                       | Low level | Min. load: 2 mA/15 V DC |        |
|                       | V AC      | 24/48                   | 6      |
|                       |           | 240                     | 6      |
|                       |           | 380                     | 3      |
|                       | V DC      | 24/48                   | 6      |
|                       |           | 125                     | 6      |
|                       |           | 250                     | 3      |

\* Standard contacts: 10 A; optional contacts: 6 A (temperature derating)



“Ready to close” PF contact

### “Ready to close” PF contact

The circuit breaker is “ready to close” when shown by a mechanical indicator and a PF changeover contact.

This information simultaneously indicates that:

■ the circuit breaker is open

■ the storage energy springs are armed

■ there is no permanent closing order

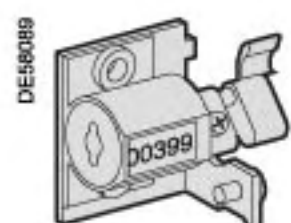
■ there is no permanent opening order caused by:

□ a safety opening order (2nd MX or MN)

□ keylocking of the device in the open position.

#### Characteristics

|                       |           |                         |      |
|-----------------------|-----------|-------------------------|------|
| Standard delivery     | 0         |                         |      |
| Maximum quantity      | 1         |                         |      |
| Breaking capacity (A) | Standard  | Min. load: 100 mA/24 V  |      |
| Cos $\phi$ : 0.3      | V AC      | 240/380                 | 5    |
| CA12/DC12             |           | 480                     | 5    |
|                       |           | 690                     | 3    |
|                       | V DC      | 24/48                   | 3    |
|                       |           | 125                     | 0.3  |
|                       |           | 250                     | 0.15 |
|                       | Low level | Min. load: 2 mA/15 V DC |      |
|                       | V AC      | 24/48                   | 3    |
|                       |           | 240                     | 3    |
|                       |           | 380                     | 3    |
|                       | V DC      | 24/48                   | 3    |
|                       |           | 125                     | 0.3  |
|                       |           | 250                     | 0.15 |

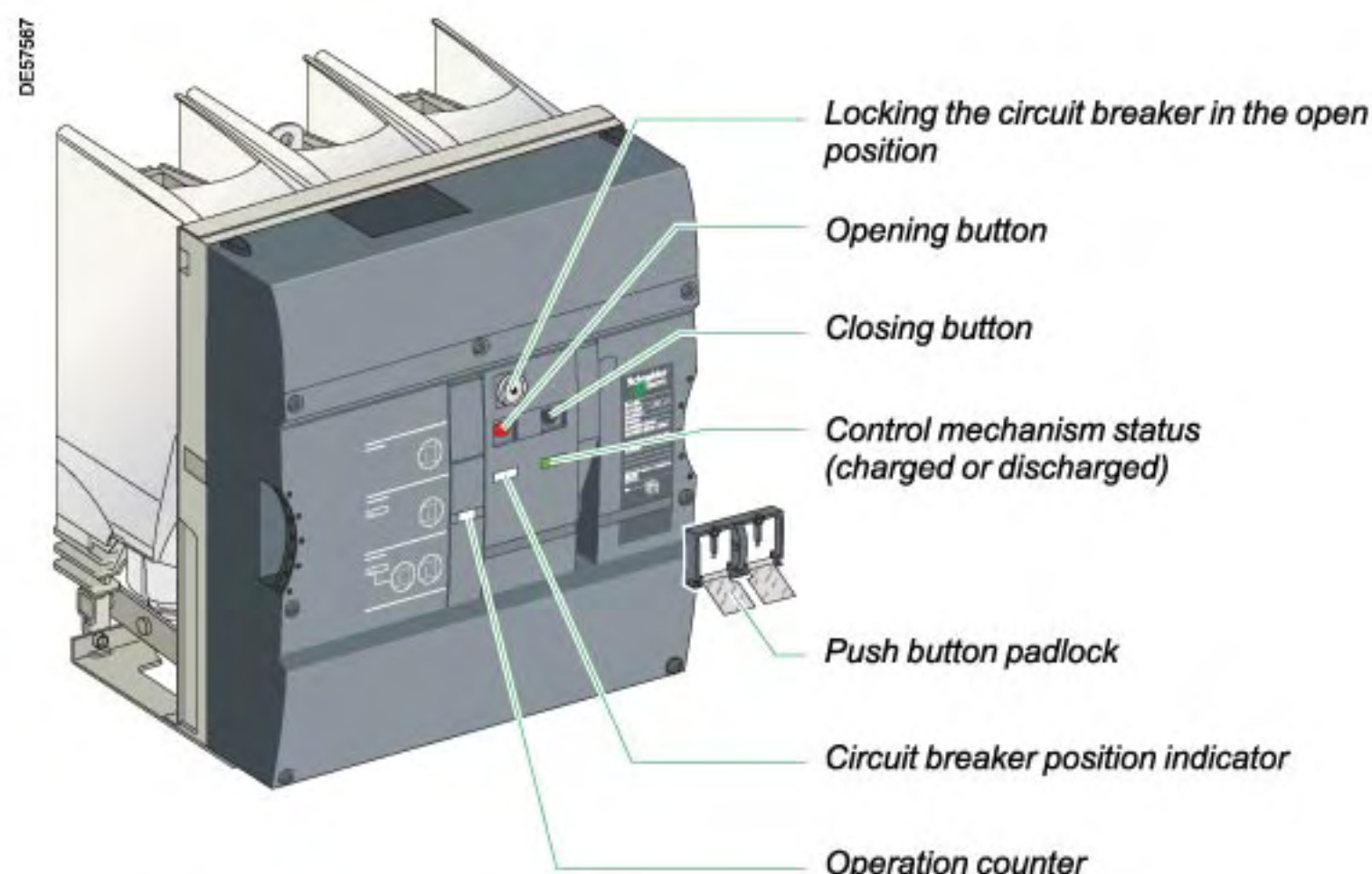


Operation counter (CDM)

### Operation counter (CDM)

The operation counter is visible on the front panel.

It totalizes the number of switching cycles (CO) that the device has carried out.



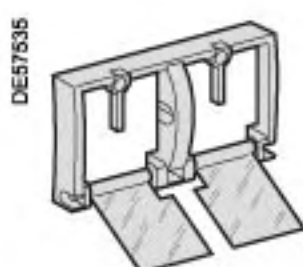
### Push button padlock

This transparent screen blocks access to the opening and closing push-buttons on the circuit breaker.

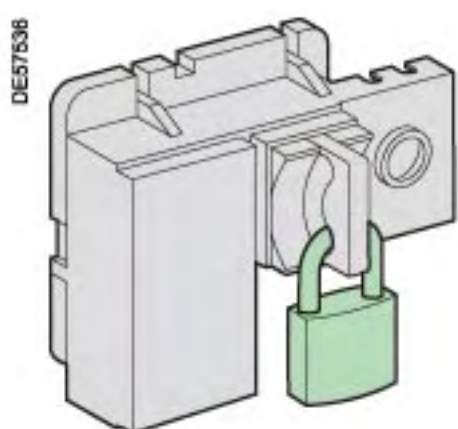
The device enables the opening or closing push button to be locked independently. It is often associated with an electrical motor (MCH).

Locking is achieved either:

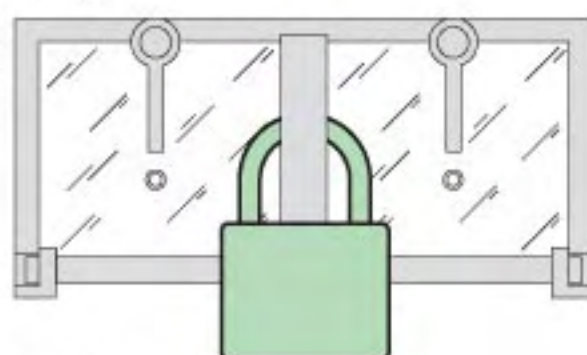
- b by 2 screws
- b by 3 padlocks, not supplied
- b by a lead seal.



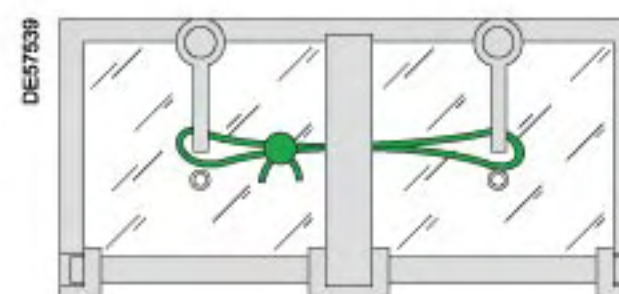
Push button padlock



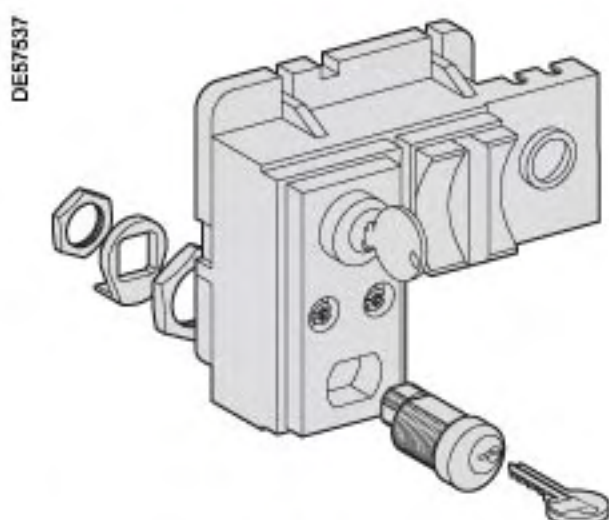
Padlocking of the circuit breaker in the "open" position



Padlocking



Lead sealing



Keylocking of the circuit breaker in the "open" position

### Locking of the circuit breaker in the "open" position

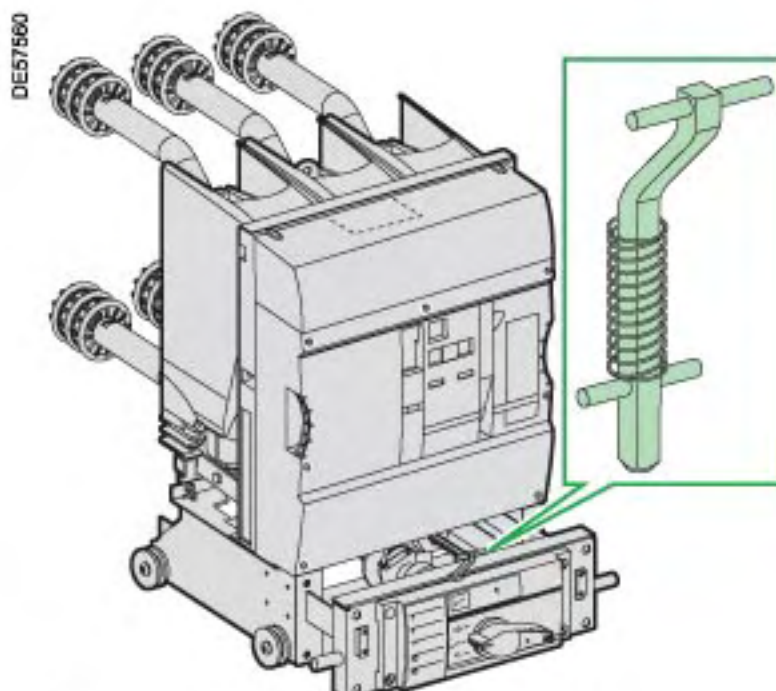
The circuit breaker is locked in the "open" position by blocking the opening push button in the engaged position:

- b by a padlock 1 to 3 padlocks, not supplied
- b by a keylocks 1 or 2 different keylocks, not supplied

The keylocks are of captive key type, with the key free after locking, either Profalux or Ronis (right turn), and are proposed according to the options either with:

- b 1 single keylock
- b 1 single keylock mounted on the circuit breaker + 1 identical delivered separately for interlocking with another device
- b 2 different keylocks for double locking.

Profalux and Ronis keylocks are inter-compatible.



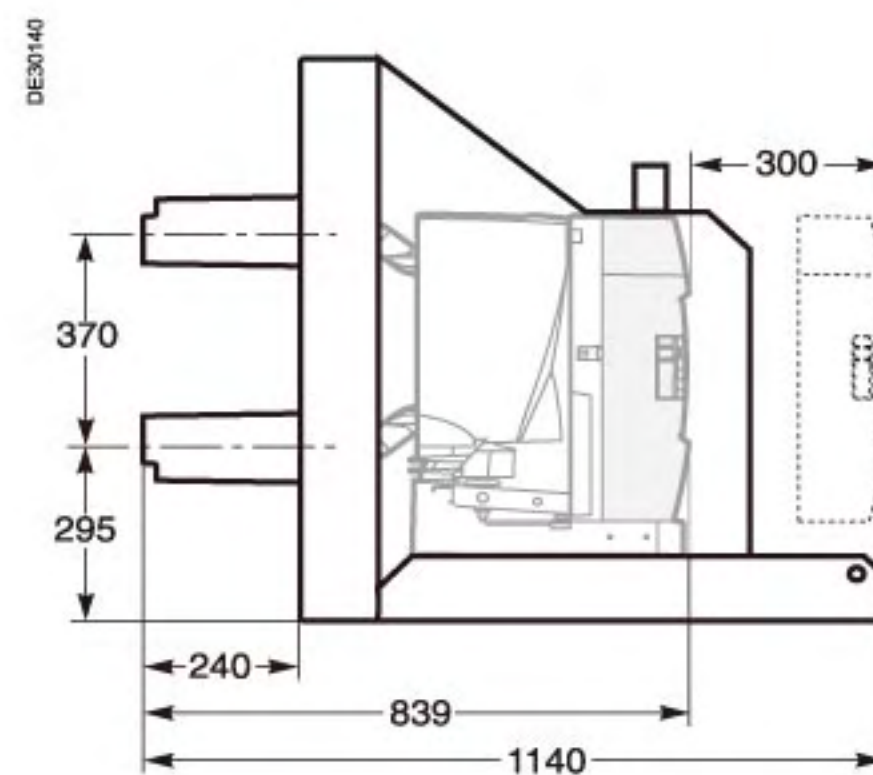
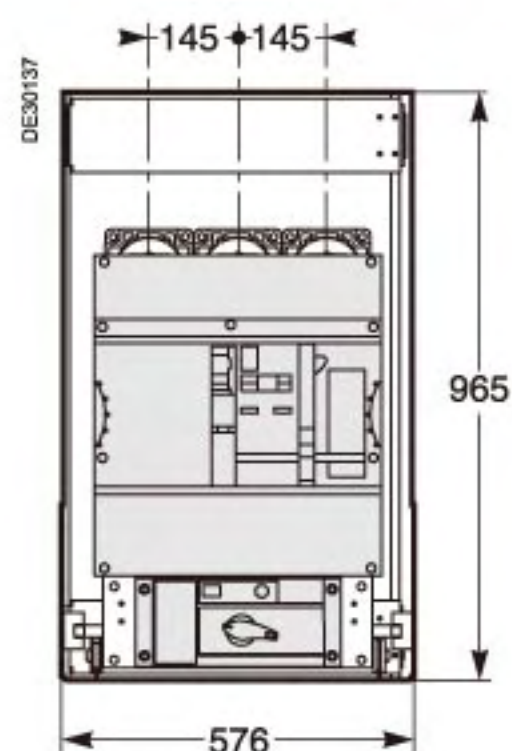
Cubicle door interlocking mechanism

### Cubicle door interlocking mechanism

This device enables the circuit breaker to only be operated when the door is closed, for the withdrawable version with a cradle.

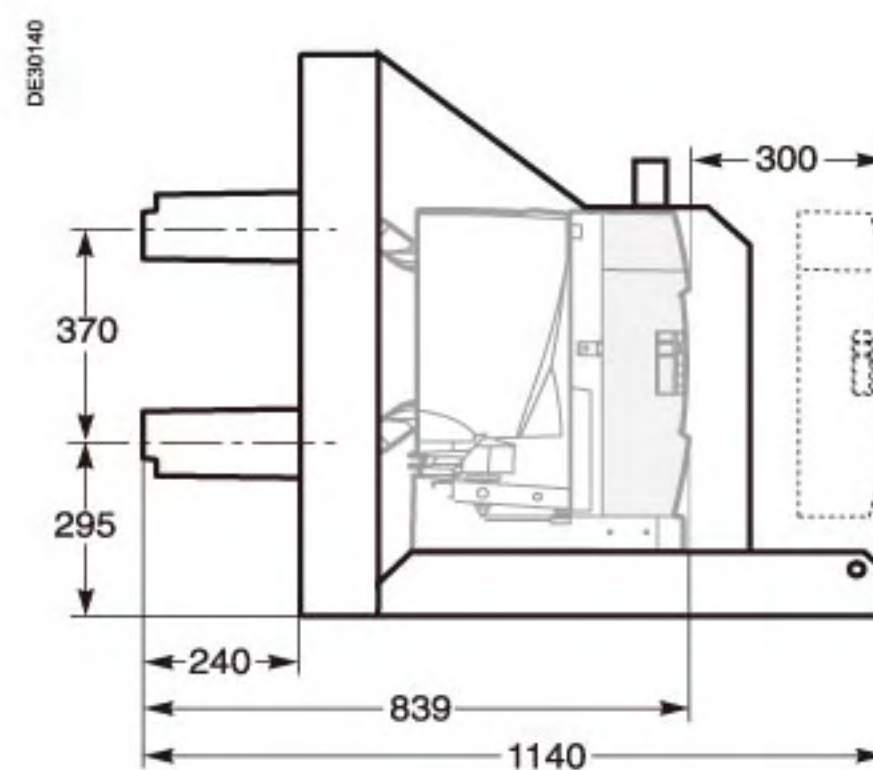
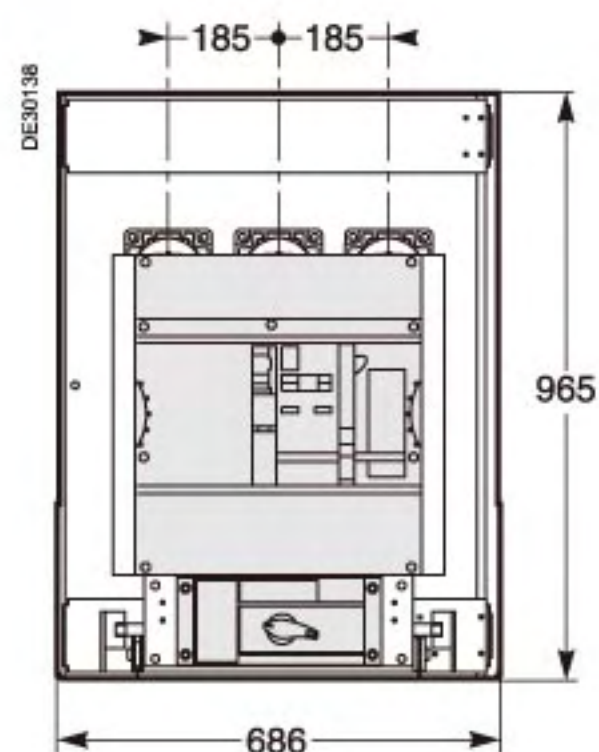
### Phase distance between poles 145 mm circuit breakers

12P1-630  
12P1-1250



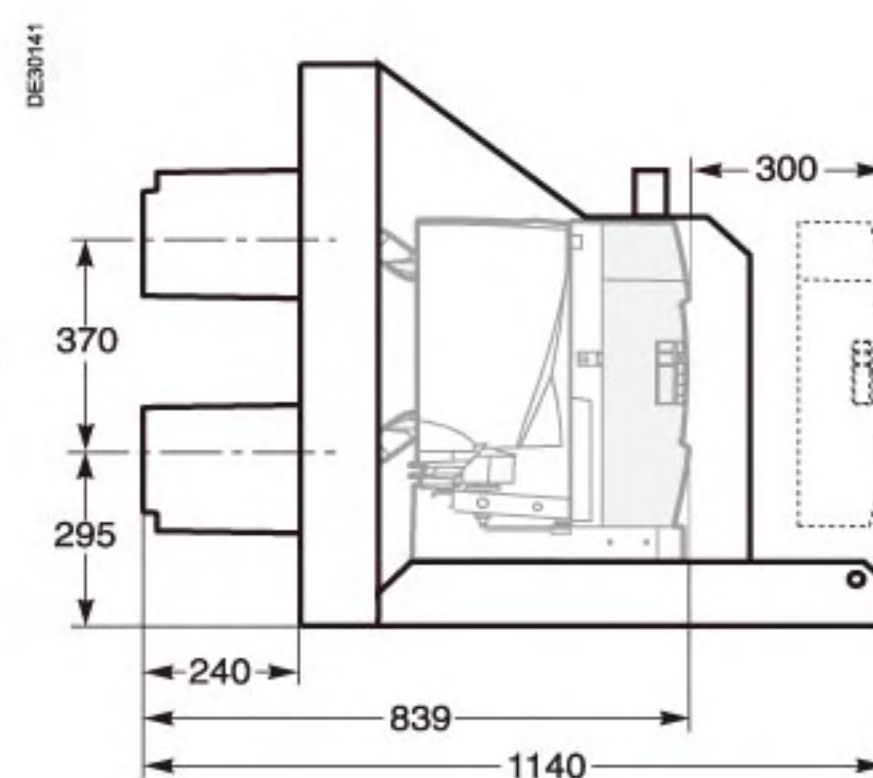
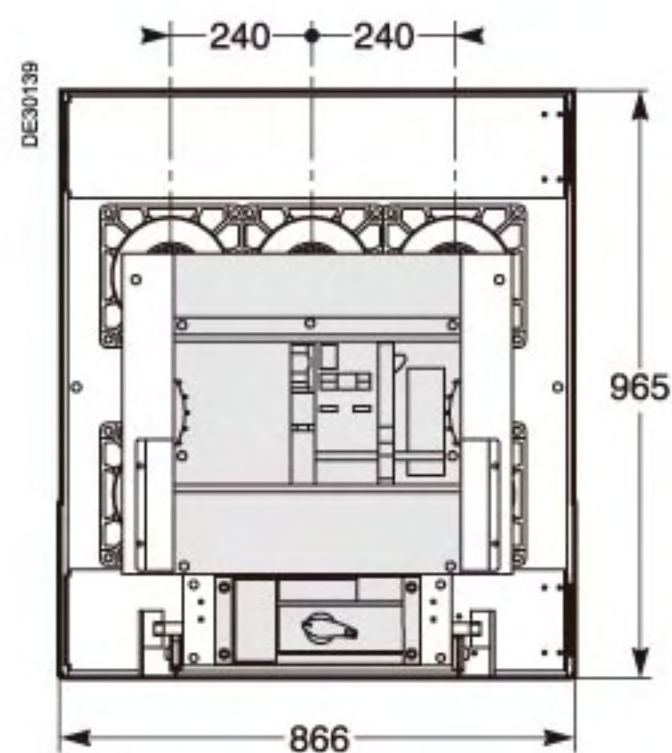
### Phase distance between poles 185 mm circuit breakers

17P2-630  
17P2-1250



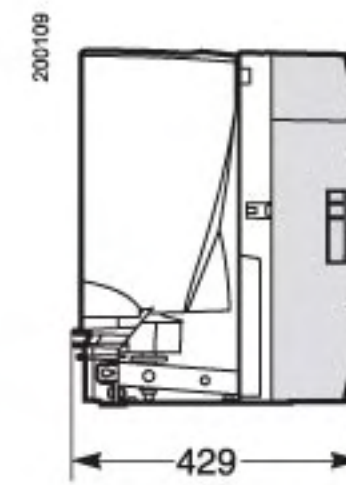
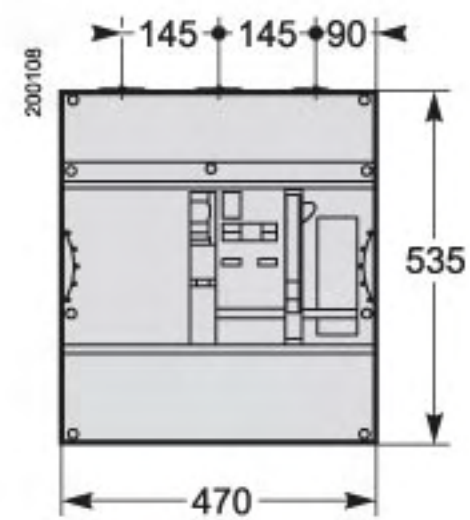
### Phase distance between poles 240 mm circuit breakers

12P1-2500  
12P3-630  
12P3-1250  
12P3-2500  
17P2-2500

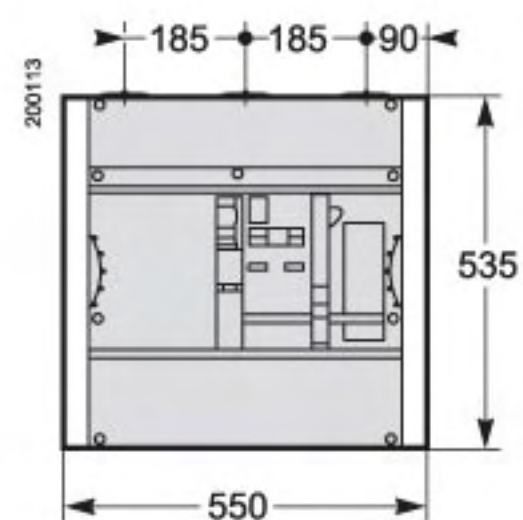


**Phase distance between poles 145 mm  
circuit breakers**

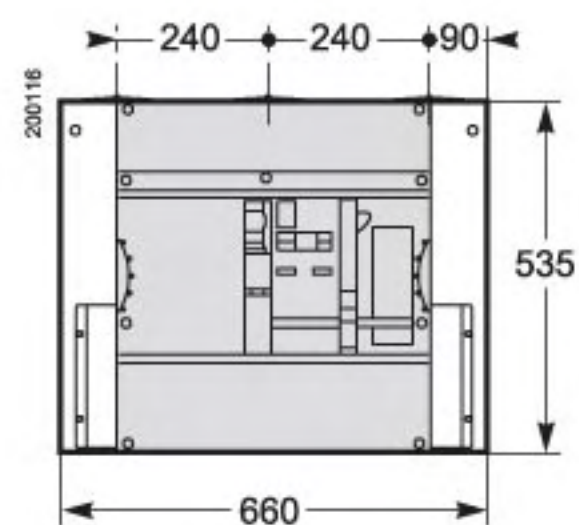
12P1-630  
12P1-1250


**Phase distance between poles 185 mm  
circuit breakers**

17P2-630  
17P2-1250


**Phase distance between poles 240 mm  
circuit breakers**

12P1-2500  
12P3-630  
12P3-1250  
12P3-2500  
17P2-2500



## Common characteristics according to IEC 62271-100

|                                    |                        |            |                                                                                       |
|------------------------------------|------------------------|------------|---------------------------------------------------------------------------------------|
| rated frequency                    | <b>fr</b>              | (Hz)       | 50 & 60                                                                               |
| short-time withstand current       | <b>Ik</b> for tk = 3 s | (kA) rms   | Ik = I <sub>sc</sub>                                                                  |
| rated peak withstand current       | <b>Ip</b>              | peak (kA)  | Ip = 2.5 & 2.6 Ik                                                                     |
| rated short circuit making current |                        | peak (kA)  | = 2.5 & 2.6 I <sub>sc</sub>                                                           |
| operating sequence                 |                        |            | O - 3 mn - CO - 3 mn - CO<br>O - 0.3 s - CO - 3 mn - CO<br>O - 0.3 s - CO - 15 s - CO |
| operating times                    | opening                | ms         | < 50                                                                                  |
|                                    | breaking               | ms         | < 65                                                                                  |
|                                    | closing                | ms         | < 70                                                                                  |
| mechanical endurance               | class                  |            | M2                                                                                    |
|                                    | number of operations   |            | 10000 (30000 upon request)                                                            |
| electrical endurance               | class                  |            | E2                                                                                    |
|                                    | number of operations   | 12.5&16 kA | 100                                                                                   |
|                                    |                        | 25 kA      | 100                                                                                   |
|                                    |                        | 31.5 kA    | 100                                                                                   |
| capacitive current breaking        |                        |            | class C1-C2 (for some applications)                                                   |
| Humidity:                          |                        |            |                                                                                       |
| average relative humidity          | 24-hours period        |            | < 95%                                                                                 |
|                                    | 1 month                |            | < 90%                                                                                 |

## Electrical characteristics according to IEC 62271-100

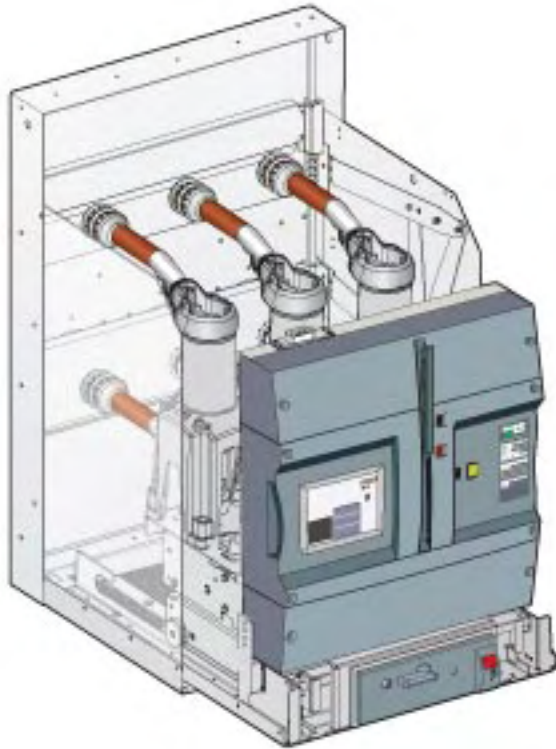
|                                      |                     |      |      |      |     |      |      |     |      |      |      |      |      |
|--------------------------------------|---------------------|------|------|------|-----|------|------|-----|------|------|------|------|------|
| circuit breaker                      |                     |      |      |      |     |      |      |     |      |      |      |      |      |
| Withdrawable type                    |                     |      |      |      |     |      |      |     |      |      |      |      |      |
| rated voltage                        | <b>Ur</b> (kV) rms  | 24   | 24   | 24   | 24  | 24   | 24   | 24  | 24   | 24   | 24   | 24   | 24   |
| rated insulation voltage             | <b>Ud</b> (kV) rms  | 50   | 50   | 50   | 50  | 50   | 50   | 50  | 50   | 50   | 50   | 50   | 50   |
| rated insulation voltage             | <b>Up</b> (kV) peak | 125  | 125  | 125  | 125 | 125  | 125  | 125 | 125  | 125  | 125  | 125  | 125  |
| rated short-circuit breaking current | <b>Isc</b> (kA) rms | 12.5 | 12.5 | 12.5 | 16  | 16   | 16   | 25  | 25   | 25   | 31.5 | 31.5 | 31.5 |
| rated normal current (-25° +40°C)    | <b>Ir</b> (A) rms   | 630  | 1250 | 2500 | 630 | 1250 | 2500 | 630 | 1250 | 2500 | 630  | 1250 | 2500 |
| climatic version                     | -25° +40°C          | ■    | ■    | ■    | ■   | ■    | ■    | ■   | ■    | ■    | ■    | ■    | ■    |

## Installation and connections

|                                 |            |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------------------|------------|------|------|------|------|------|------|------|------|------|------|------|------|
| phase distance:                 |            |      |      |      |      |      |      |      |      |      |      |      |      |
| between poles (mm)              |            | 230  | 230  | 250  | 230  | 230  | 250  | 230  | 230  | 250  | 250  | 250  | 250  |
| dimensions C.B. and cradle (mm) | width (W)  | 786  | 786  | 886  | 786  | 786  | 886  | 786  | 786  | 886  | 886  | 886  | 886  |
|                                 | depth (D)  | 1309 | 1309 | 1309 | 1309 | 1309 | 1309 | 1309 | 1309 | 1309 | 1309 | 1309 | 1309 |
|                                 | height (H) | 1188 | 1188 | 1188 | 1188 | 1188 | 1188 | 1188 | 1188 | 1188 | 1188 | 1188 | 1188 |
| mass C.B. and cradle            | (kg)       | 270  | 270  | 354  | 270  | 270  | 354  | 270  | 270  | 354  | 354  | 354  | 354  |



Fixed

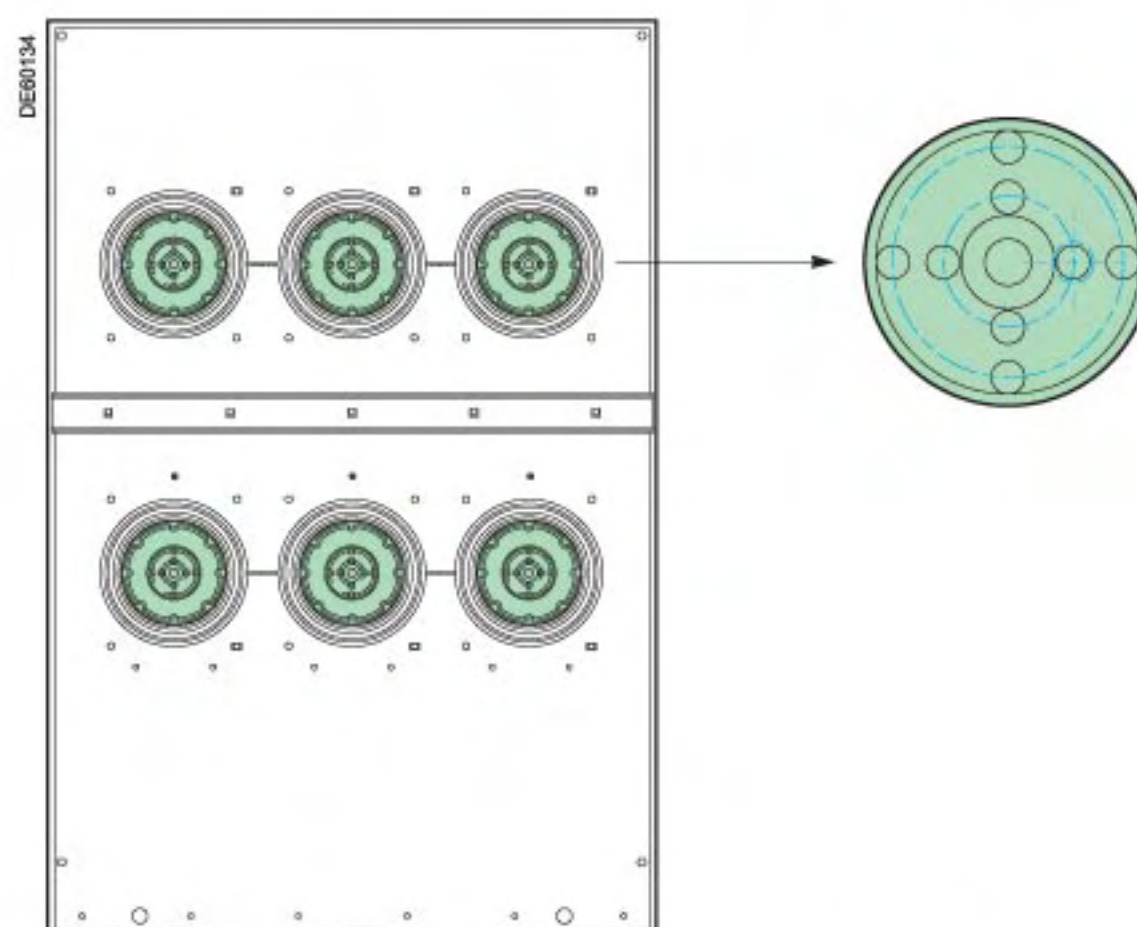


Withdrawable

| Fixed type |         |       |         |         |       |         |         |       |       |       |       |     |  |
|------------|---------|-------|---------|---------|-------|---------|---------|-------|-------|-------|-------|-----|--|
| 24         | 24      | 24    | 24      | 24      | 24    | 24      | 24      | 24    | 24    | 24    | 24    | 24  |  |
| 50         | 50      | 50    | 50      | 50      | 50    | 50      | 50      | 50    | 50    | 50    | 50    | 50  |  |
| 125        | 125     | 125   | 125     | 125     | 125   | 125     | 125     | 125   | 125   | 125   | 125   | 125 |  |
| 12.5       | 12.5    | 12.5  | 16      | 16      | 16    | 25      | 25      | 25    | 31.5  | 31.5  | 31.5  |     |  |
| 630        | 1250    | 2500  | 630     | 1250    | 2500  | 630     | 1250    | 2500  | 630   | 1250  | 2500  |     |  |
| ■          | ■       | ■     | ■       | ■       | ■     | ■       | ■       | ■     | ■     | ■     | ■     |     |  |
|            |         |       |         |         |       |         |         |       |       |       |       |     |  |
| 230/250    | 230/250 | 250   | 230/250 | 230/250 | 250   | 230/250 | 230/250 | 250   | 250   | 250   | 250   | 250 |  |
| 655/734    | 655/734 | 745   | 655/734 | 655/734 | 745   | 655/734 | 655/734 | 745   | 745   | 745   | 745   |     |  |
| 712.5      | 712.5   | 712.5 | 712.5   | 712.5   | 712.5 | 712.5   | 712.5   | 712.5 | 712.5 | 712.5 | 712.5 |     |  |
| 593        | 593     | 593   | 593     | 593     | 593   | 593     | 593     | 593   | 593   | 593   | 593   |     |  |
| 97         | 97      | 135   | 97      | 97      | 135   | 97      | 97      | 135   | 135   | 135   | 135   |     |  |

### Connection

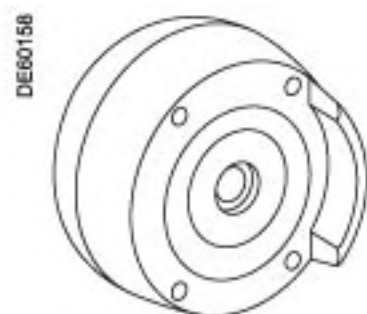
- Customer connection is easily achieved outside the cradle:
- on vertical copper terminals integrated in the bushing.

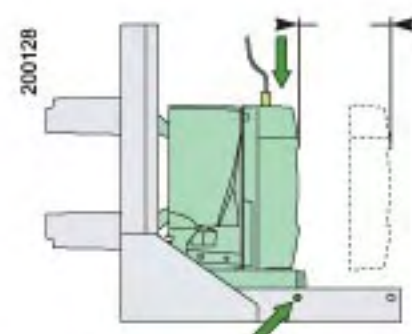


Type tested connection configuration are shown in the Installation Guide.

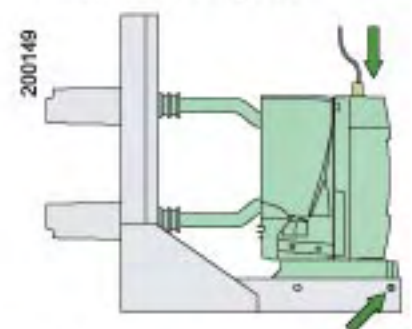
### Field deflectors

The field deflectors are to be fitted at the end of the bushings. They are necessary in case of installation of the cradle within a compartmented cubicle. For other applications, tested configurations are described in the Installation Guide.

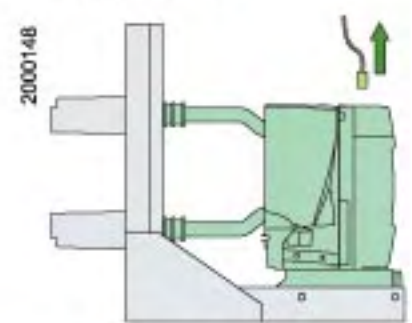




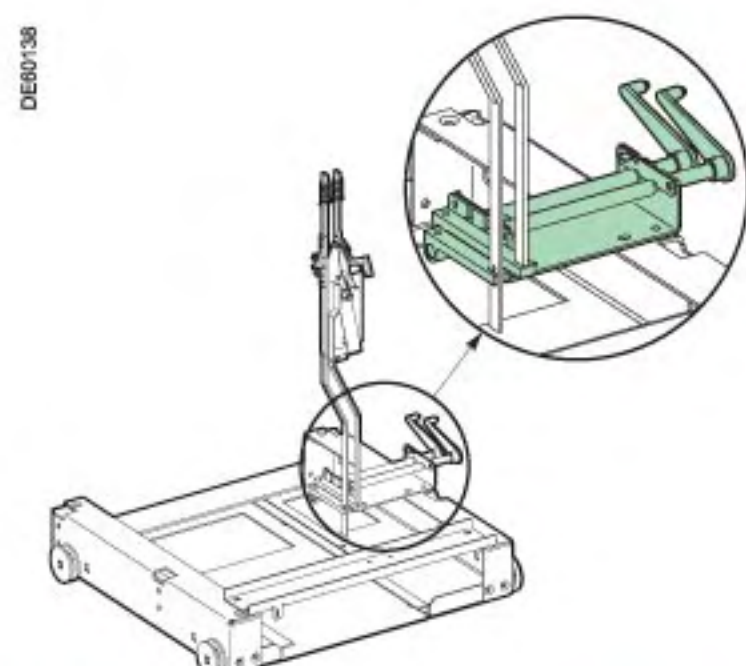
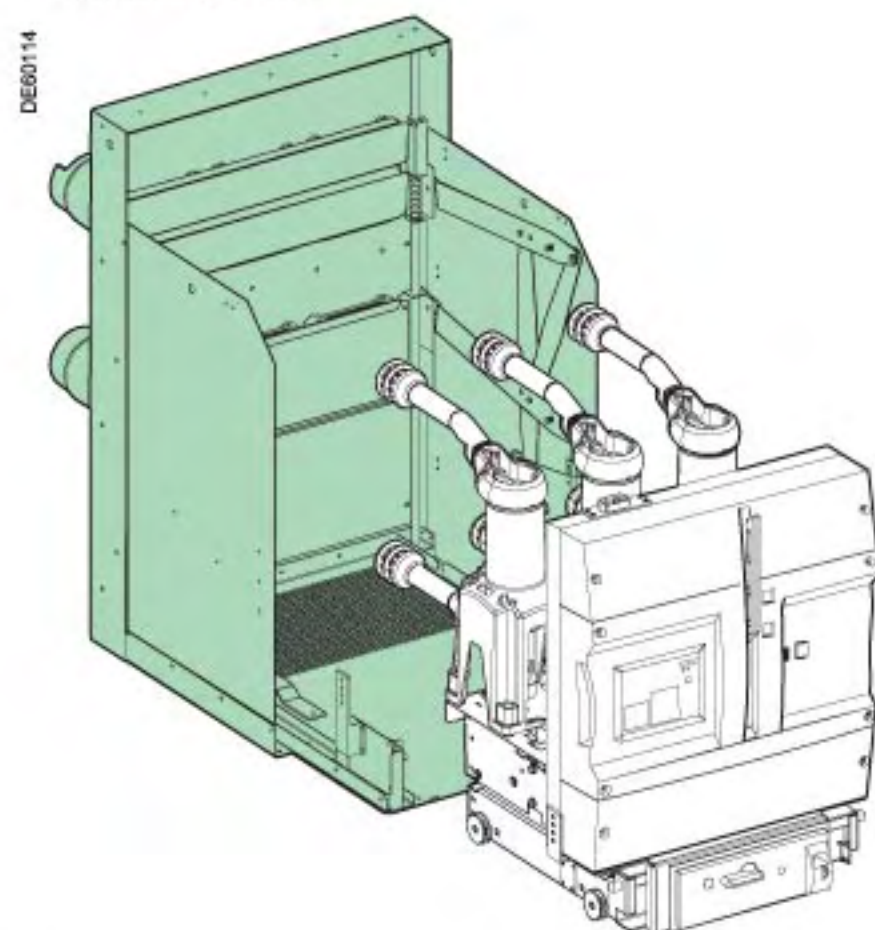
Service position



Test position



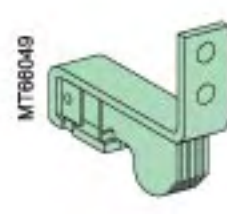
Extracted position



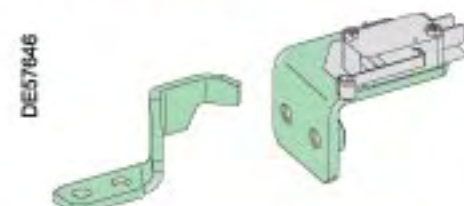
Auto-discharge function



Racked in/out position



Earthing sliding device



Test position contact

## Composition

■ The "racking in" function is provided by:

- the racking truck supporting the circuit-breaker (mobile part),
- the cradle including the bushings (fixed part),
- the LV plug.

## Operating procedure

■ The circuit-breaker moves through 3 stable positions:

- service position:  
circuit-breaker racked in and locked in place; low voltage plug connected,
- test position:  
circuit-breaker racked out and locked in place; low voltage plug connected,
- extracted position:  
the circuit-breaker can be unlocked and extracted from the cubicle, with no interlocking.

## Safety functions

A propulsive system combined with a screw-shaft makes racking in and racking out easier.

### ■ Interlocking

In accordance with IEC standards 62271-100 and 62271-200, the following interlockings are provided:

- racking in or out are impossible unless the circuit-breaker is in the open position,
- racking in the circuit-breaker is impossible unless the LV plug is connected,
- disconnecting the LV plug is impossible unless the circuit-breaker is racked out.

In addition the truck is equipped with a device that allows circuit-breaker racking in to be interlocked with the cubicle door (which must be specially designed):

- It is only possible to rack in the circuit-breaker if the door is closed,
- the door can only be opened with the circuit-breaker racked out.

■ **Earthing** is achieved throughout the whole racking in operation by the mean of the wheels of the racking truck. Additional earthing device can be supplied as an option.

■ **Protective shutters** on the cradle prevent access to the racking fingers when the device is extracted (protection index: IP2X).

■ For maintenance or test purposes, it is possible to:

- padlock the shutters in the closed position,
- unlock the shutters mechanism to access the fixed contacts, and insert a screen to prevent the lived set of fixed contacts being exposed.

■ **A fool-proof protection** enables cradle and circuit-breaker to be matched up. This system is mounted on the circuit-breaker. Part of it has to be assembled by the panel builder on the cradle side.

### ■ Earthing switch

It can be fixed on the cradle, allowing proper interlocking between the circuit-breaker and the earthing switch, (see detailed description in "Earthing switch and cubicle components" catalogue).

### ■ Anti-drop function

This function ensures the safety of the operator during the extraction of the circuit-breaker.

## Accessories

■ 4 racked in/racked out position contacts.

■ Additional earthing device (copper brush).

■ Core sensors LPCT type, directly fitted on the bushings of the cradle.

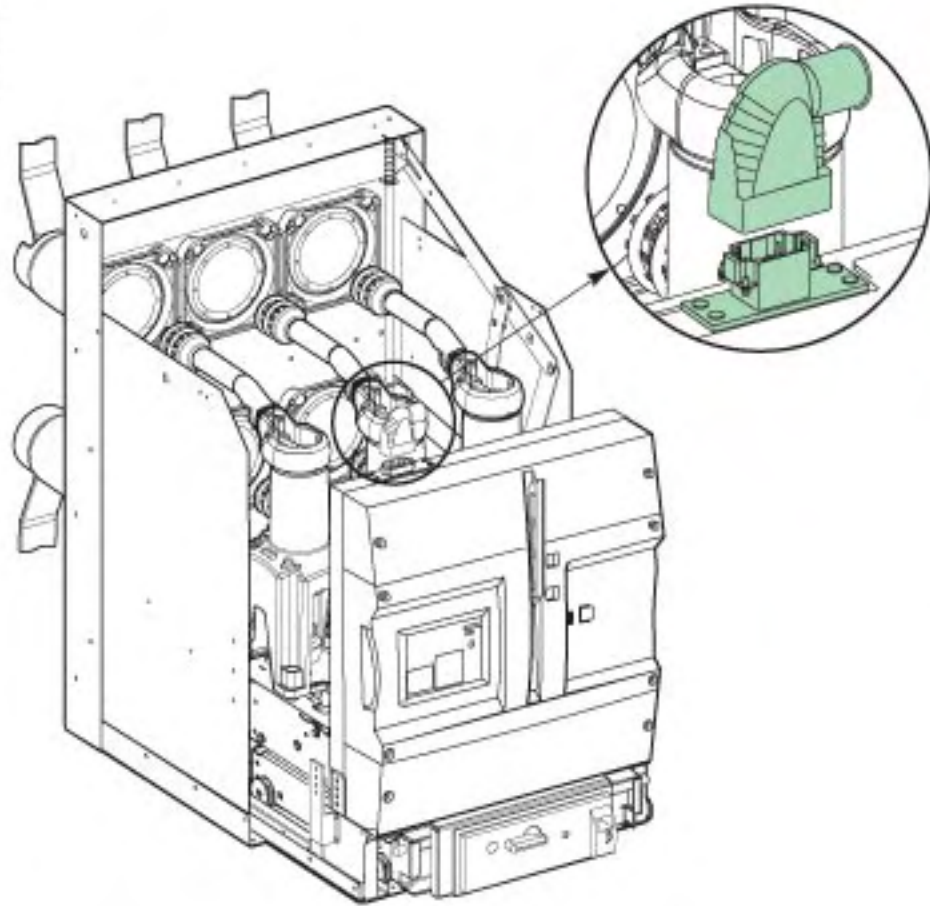
■ Auto-discharge function:

the spring of the circuit-breaker operating mechanism is automatically discharged when the circuit-breaker is extracted from the cubicle. This feature avoids unexpected closing of the circuit-breaker.

■ Test position contact.

This contact is activated when the circuit breaker is in the "test" or "service" position.

DE60155



### Main functions

- With the basic withdrawable circuit-breaker, LV wiring is produced via an LV plug.
- The LV plug includes:
  - ☐ the fixed part (male) fitted on the circuit-breaker and fully wired to the terminal block of the operating mechanism,
  - ☐ the mobile part (female) compatible with the male part.

### Two versions of LV plug are available

- **A 21-pin LV plug, allowing to connection of**
  - ☐ a shunt opening release YO1,
  - ☐ a remote control mechanism (electrical motor, shunt closing release YF, antipumping relay),
  - ☐ the Pilot monitoring device,
  - ☐ maximum number of auxiliary contacts: 3 NC - 3 NO - 1 CHG  
(see details in chapter "Open/closed auxiliary contacts").
- **A 42-pin LV plug, allowing to connect**
  - ☐ an opening release (shunt opening release or under-voltage release),
  - ☐ a second opening release (shunt opening release YO2, under-voltage release YN or low energy release MITOP),
  - ☐ a remote control mechanism (electrical motor, shunt closing release, antipumping relay)
  - ☐ the Pilot monitoring device,
  - ☐ maximum number of auxiliary contacts: 5 NC - 6 NO - 1 CHG  
(see details in chapter "Open/closed auxiliary contacts").
- **Interlocking function**

In order to comply with IEC standard 62271-200, an interlocking feature prevents:

  - ☐ racking in when the LV plug is not connected.
  - ☐ disconnection of the LV plug when the circuit-breaker is in racking in position.

### LV wiring kit

- A kit including 21 wires (2 meters long) fitted with pin suitable for the plug can be supplied for connection to the LV compartment of the cubicle.

This arrangement provides an auxiliary supply connection with a high level of electrical safety.



### Operation of the RI stored energy operating mechanism

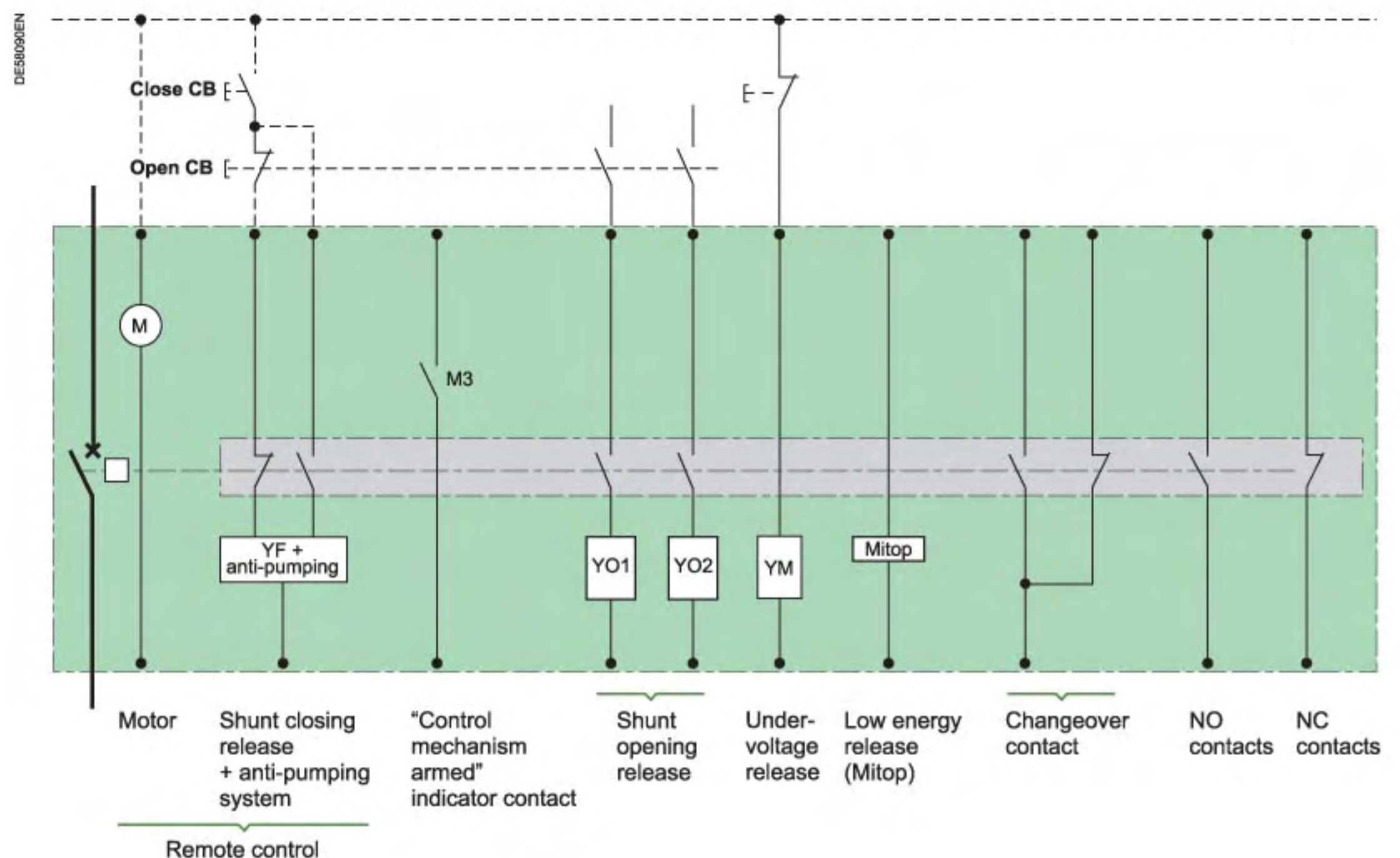
This gives the device an opening and closing speed that is independent of the operator whether the order is electrical or manual.

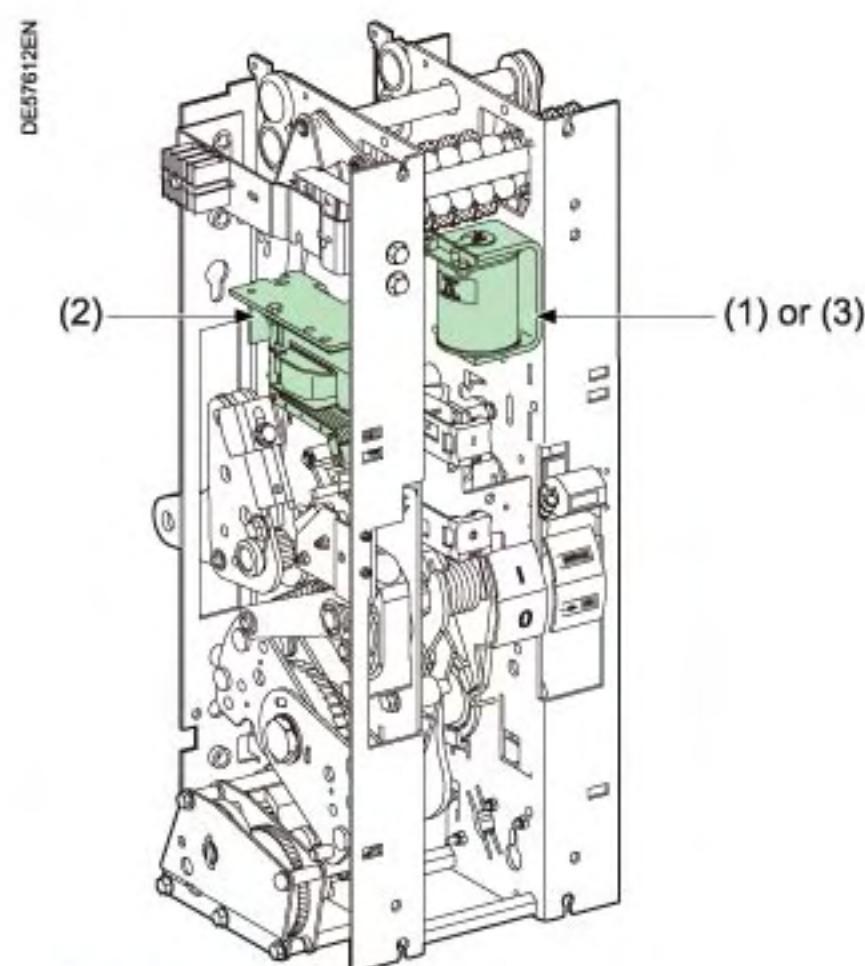
The electrical control mechanism carries out reclosing cycles and is automatically recharged by a geared motor each time after closing.

#### It consists of:

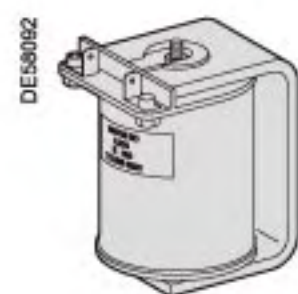
- the stored energy operating mechanism which stores in springs the energy required to open and close the device
- a manual lever-operated spring arming device
- a geared electrical arming device which automatically re-arms the control mechanism as soon as the circuit breaker is closed (optional)
- manual order devices by push buttons on the front panel of the device
- an electrical remote closing device containing a release with an antipumping relay
- an electrical opening order device comprising one or several release units which can be of the following type:
  - ☐ shunt opening
  - ☐ undervoltage
  - ☐ Mitop, a low consumption release, used only with the Sepam 100 LA protection relay.
- an operation counter
- an "open/closed" position indicator device with a mechanical indicator
- a device for indicating "charged" operating mechanism status by mechanical indicator and electrical contact (optional)
- a module of 14 auxiliary contacts whose availability varies according to the diagram used.

### Wiring diagram (principle)

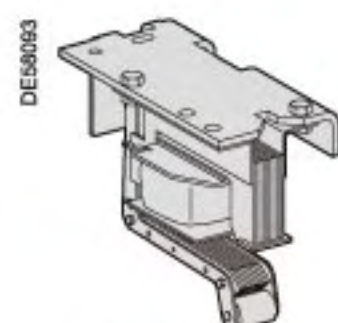




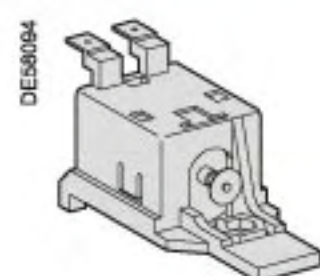
Operating mechanism



Shunt opening release (1)



Undervoltage release (2)



Low energy release (3)

### Composition

The opening circuit can be produced using the following components:

- Shunt opening release (on energizing) (YO1)
- second shunt opening release (on energizing) (YO2)
- undervoltage release (YM)
- low energy release (Mitop).

**Note:** see the table of the releases' combinations on the "Order form" page.

### Shunt opening release (YO1 and YO2)

Energizing this release causes instant opening of the circuit breaker.

#### Characteristics

|              |                       |                |
|--------------|-----------------------|----------------|
| Power supply | See "Order form" page |                |
| Threshold    | V AC                  | 0.85 to 1.1 Ur |
|              | V DC                  | 0.7 to 1.1 Ur  |
| Consumption  | V AC                  | 160 VA         |
|              | V DC                  | 50 W           |

### Undervoltage release (YM)

This release unit causes the systematic opening of the circuit breaker when its supply voltage drops below a value less than 35% of the rated voltage, even if this drop is slow and gradual. It can open the circuit breaker between 35% and 70% of its rated voltage. If the release unit is not supplied power, manual or electrical closing of the circuit breaker is impossible. Closing of the circuit breaker is possible when the supply voltage of the release unit reaches 85% of its rated voltage.

#### Characteristics

| Characteristics |            |                       |                |
|-----------------|------------|-----------------------|----------------|
| Power supply    |            | See "Order form" page |                |
| Threshold       |            | Opening               | 0.35 to 0.7 Ur |
|                 |            | Closing               | 0.85 Ur        |
| Consumption     | Triggering | V AC                  | 400 VA         |
|                 |            | V DC                  | 100 W          |
|                 | Latched    | V AC                  | 100 VA         |
|                 |            | V DC                  | 10 W           |

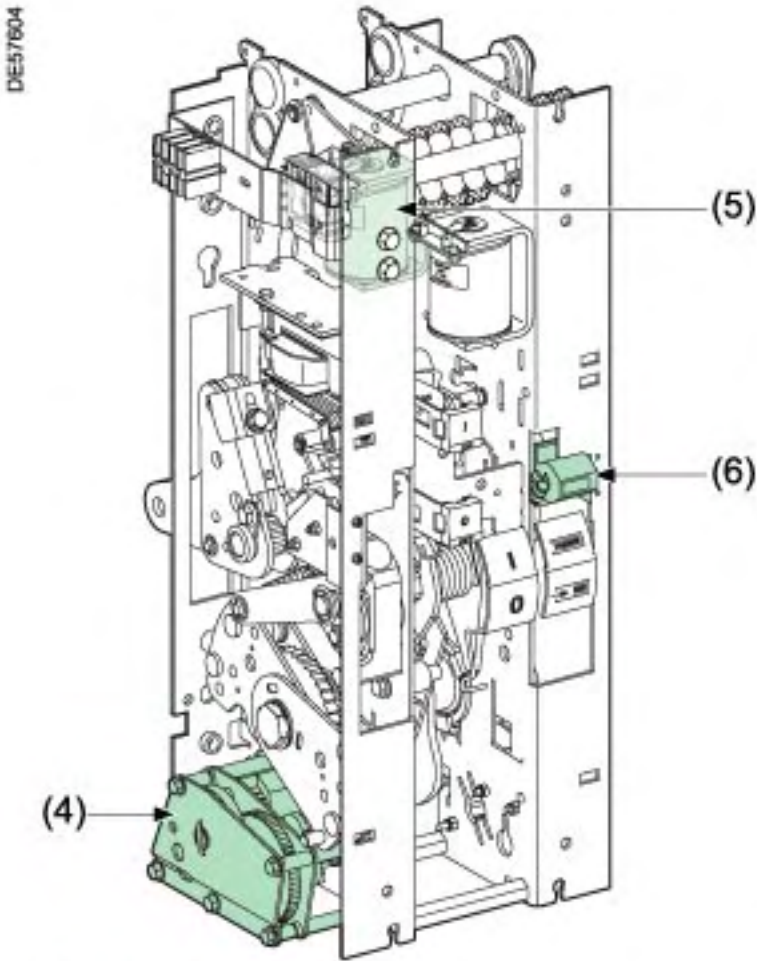
### Low energy release (Mitop)

This release includes a low consumption unit and is specifically used with the Sepam 100LA self-powered relay ("REFLEX MODULE"), or the VIP relay.

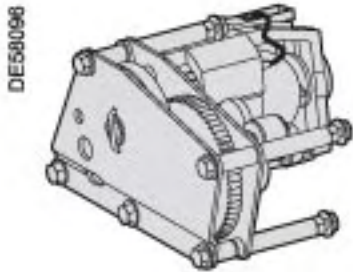
#### Characteristics

|              |                 |
|--------------|-----------------|
| Power supply | Direct current  |
| Threshold    | 0.6 A < I < 3 A |

Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact (option).



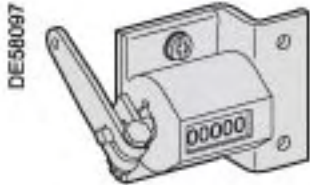
Operating mechanism



Electrical motor and gearing (4)



Shunt closing release (5)



Operation counter (6)

Function

Remote control enables the remote opening and closing of the circuit breaker.

Composition

The remote control mechanism comprises:

- an electrical motor with gearing
- a shunt closing release (YF) combined with an anti-pumping device
- an operation counter.

Electrical motor with gearing (M)

The electrical motor carries out the automatic rearming of the stored energy unit as soon as the circuit breaker is closed. This allows the instant reclosing of the device after opening. The arming lever is only used as a backup operating mechanism in the case of the absence of the auxiliary power supply. The M3 contact indicates the end of arming operations.

Characteristics

|              |                       |                |
|--------------|-----------------------|----------------|
| Power supply | See "Order form" page |                |
| Threshold    | V AC/V DC             | 0.85 to 1.1 Ur |
| Consumption  | V AC                  | 380 VA         |
|              | V DC                  | 380 W          |

Shunt closing release (YF)

This release allows the remote closing of the circuit breaker when the operating mechanism is armed.

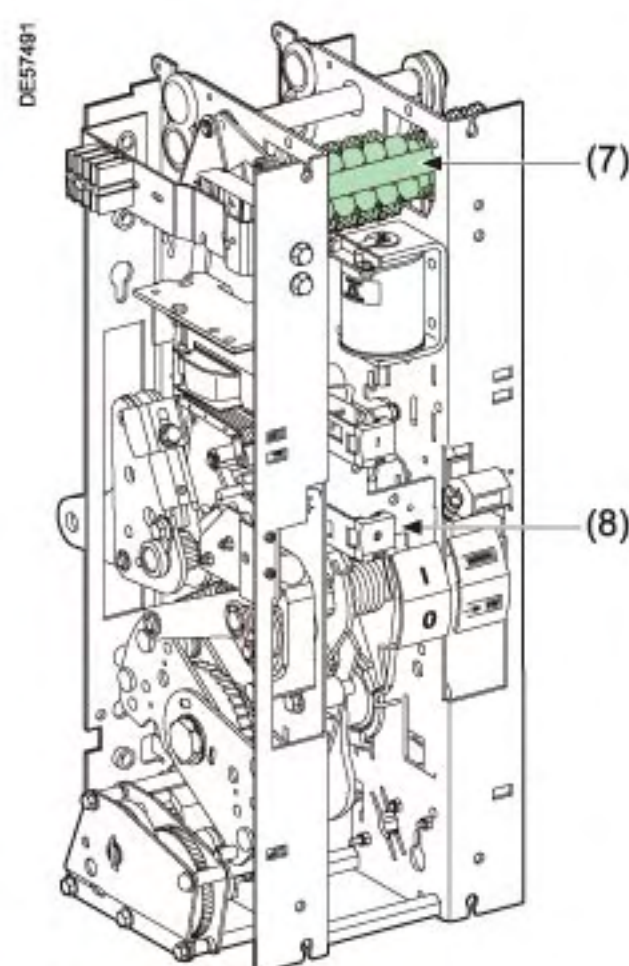
Characteristics

|              |                       |                |
|--------------|-----------------------|----------------|
| Power supply | See "Order form" page |                |
| Threshold    | V AC                  | 0.85 to 1.1 Ur |
|              | V DC                  | 0.85 to 1.1 Ur |
| Consumption  | V AC                  | 160 VA         |
|              | V DC                  | 50 W           |

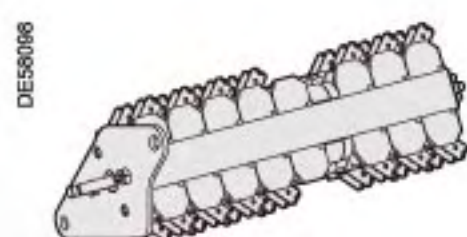
The shunt closing release is combined with an anti-pumping relay that enables priority to be given to opening in the case of a permanent closing order. This thus avoids the device being caught in an uncontrolled opening-closing cycle.

Operation counter

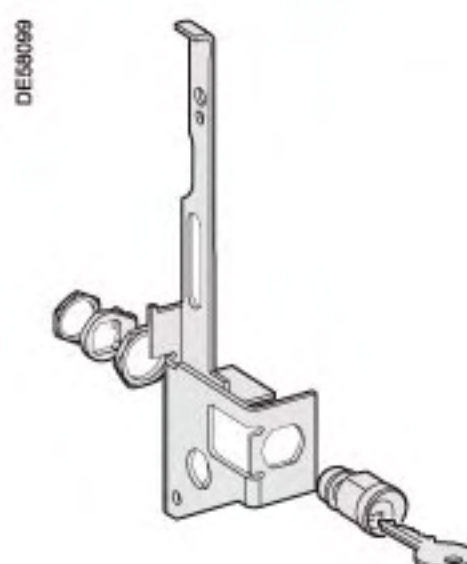
The operation counter is visible on the front panel. It displays the number of switching cycles (CO) that the device has carried out.



Operating mechanism



Auxiliary contacts (7)



Keylocking kit (8)

**“Open/closed” auxiliary contacts**

The number of contacts available depends on the options chosen on the operating mechanism.

■ In the basic configuration, the circuit breaker operating mechanism comprises a total of:

- ☐ 5 normally closed contacts (NC)
- ☐ 6 normally open contacts (NO)
- ☐ 1 changeover contact (CHG).

The usage mode for auxiliary contacts is given in the following table:

| Options                          | NC contact | NO contact |
|----------------------------------|------------|------------|
| Remote control                   | 1          | 1          |
| Shunt opening release (each one) | 0          | 1          |
| Undervoltage release             | 0          | 0          |
| Low energy release Mitop         | 0          | 0          |

To know the final number of available contacts, you must deduct the total number of contacts included in the circuit breaker (5 NC + 6 NO + 1 CHG) from the number of contacts used indicated in the table below.

**E.g.:** a circuit breaker equipped with a remote control and a shunt release has the following contacts available:

4 NC + 4 NO + 1 CHG.

With an undervoltage release instead of a shunt release, this circuit breaker would have the following available contacts:

4 NC + 5 NO + 1 CHG.

b Using a 21-pin LV plug (for withdrawable applications) the maximum number of available contacts is:

3 NC + 3 NO + 1 CHG.

(Instead of 5 NC-6 NO-1 CHG with a 42-pin socket).

| Contact characteristics |    |                                   |       |
|-------------------------|----|-----------------------------------|-------|
| Rated current           |    |                                   | 10 A  |
| Breaking capacity       | AC | 220 V ( $\cos \varphi \geq 0.3$ ) | 1 A   |
|                         | DC | 110/220 V ( $L/R \leq 0.02$ s)    | 0.3 A |

**Operating mechanism with electrical motor**

| Shunt opening release combination |                           |                         |                  |
|-----------------------------------|---------------------------|-------------------------|------------------|
| 1st release                       | Shunt opening release YO1 | Undervoltage release YM | Mitop            |
| 2nd release                       |                           |                         |                  |
| Without                           | 4NF + 4NO + 1CHG          | 4NF + 5NO + 1CHG        | 4NF + 5NO + 1CHG |
| Shunt opening release YO2         | 4NF + 3NO + 1CHG          |                         |                  |
| Undervoltage release YM           | 4NF + 4NO + 1CHG          |                         | 4NF + 5NO + 1CHG |
| Mitop                             | 4NF + 4NO + 1CHG          | 4NF + 5NO + 1CHG        |                  |

**Locking of the circuit breaker in the “open” position**

This locking system enables the fitting of a Profalux or Ronis captive key type keylock (right turn type keylock).

The keylock is not part of the kit but can be supplied as an option.

# Function description

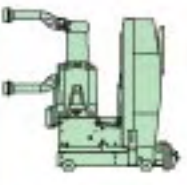
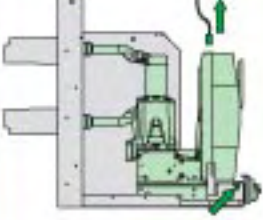
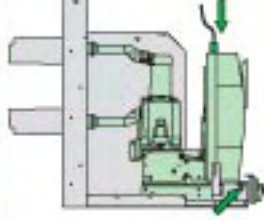
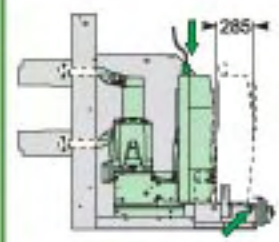
## Safety functions

This table describes the safety functions available on the withdrawable version of the Evolis 24 kV circuit breaker.

### How to use the table

Each of the boxes describes the functional status of each circuit breaker position and the associated parts:

-  Possible status
-  Possible status, impossible operation
-  Impossible status

| Parts                |              | Circuit breaker positions                                                          |                                                                                                                                                                                                     |                                                                                      |                                                                                      |                                                                                                                                                                                                         |                                                                                      |
|----------------------|--------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                      |              |  | Insertion<br><br>Extraction<br> |  |  | Racking-in<br><br>Racking-out<br> |  |
|                      |              | Removed                                                                            |                                                                                                                                                                                                     | Disconnected                                                                         | Test position                                                                        |                                                                                                                                                                                                         | Service                                                                              |
| 1 - Cradle           |              |                                                                                    | Fault-proof protection (1)<br>Anti-drop (2)                                                                                                                                                         |                                                                                      |                                                                                      |                                                                                                                                                                                                         |                                                                                      |
|                      |              | No opening shutters                                                                |                                                                                                                                                                                                     |                                                                                      |                                                                                      |                                                                                                                                                                                                         |                                                                                      |
|                      |              | Shutters padlocking possible                                                       |                                                                                                                                                                                                     |                                                                                      |                                                                                      |                                                                                                                                                                                                         |                                                                                      |
| 2 - LV plug          | Disconnected |                                                                                    |                                                                                                                                                                                                     | No racking-in                                                                        |                                                                                      |                                                                                                                                                                                                         |                                                                                      |
|                      | Connected    |                                                                                    |                                                                                                                                                                                                     |                                                                                      | No unplugging                                                                        |                                                                                                                                                                                                         |                                                                                      |
| 3 - Circuit breaker  | Closed       |                                                                                    |                                                                                                                                                                                                     |                                                                                      | No racking-in                                                                        |                                                                                                                                                                                                         | No racking-out                                                                       |
|                      | Open         |                                                                                    |                                                                                                                                                                                                     |                                                                                      |                                                                                      | No closing                                                                                                                                                                                              |                                                                                      |
|                      |              | Open position circuit breaker locking available (3)                                |                                                                                                                                                                                                     |                                                                                      |                                                                                      |                                                                                                                                                                                                         |                                                                                      |
| 4 - Switchboard door | Open         |                                                                                    |                                                                                                                                                                                                     |                                                                                      | No racking-in                                                                        |                                                                                                                                                                                                         |                                                                                      |
|                      | Closed       |                                                                                    |                                                                                                                                                                                                     |                                                                                      | No door opening (4)                                                                  |                                                                                                                                                                                                         |                                                                                      |
| 5 - Earthing switch  | Open         |                                                                                    |                                                                                                                                                                                                     |                                                                                      |                                                                                      | No earthing switch closing                                                                                                                                                                              |                                                                                      |
|                      | Closed       |                                                                                    |                                                                                                                                                                                                     |                                                                                      | No racking-in                                                                        |                                                                                                                                                                                                         |                                                                                      |

(1) This protection mechanism ensures that the performance levels of the circuit breaker correspond with those of the cradle.

(2) Device that prevents the circuit breaker from dropping when extracted from the cradle.

The device can be either unlocked manually or when the extraction rig is put in position.

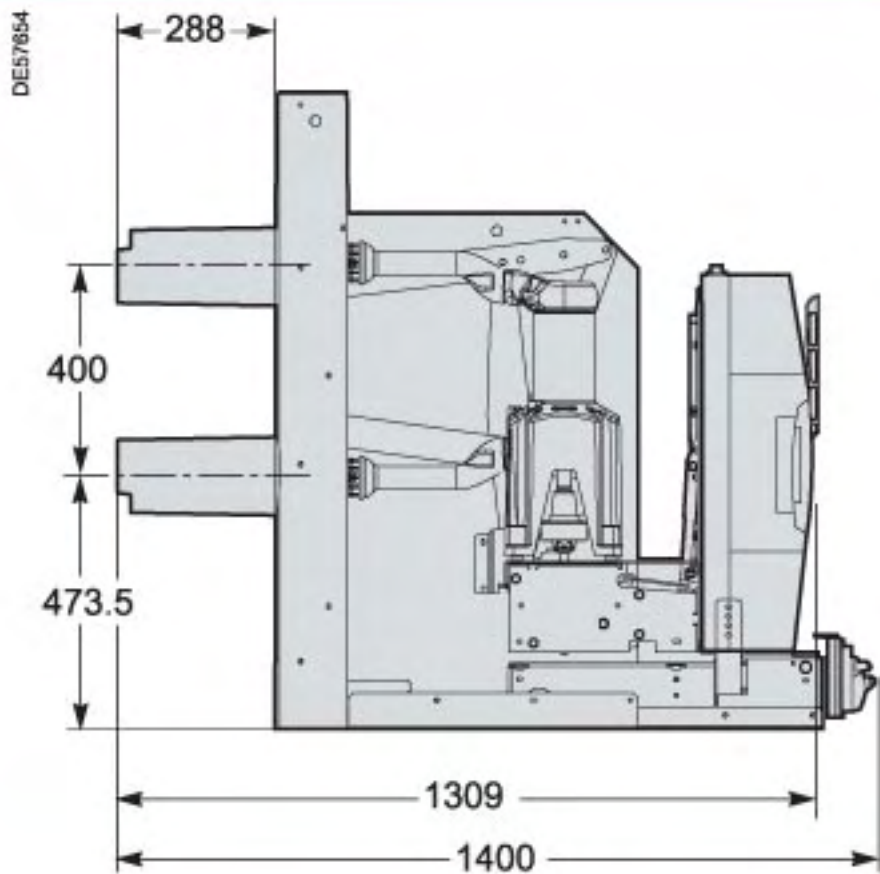
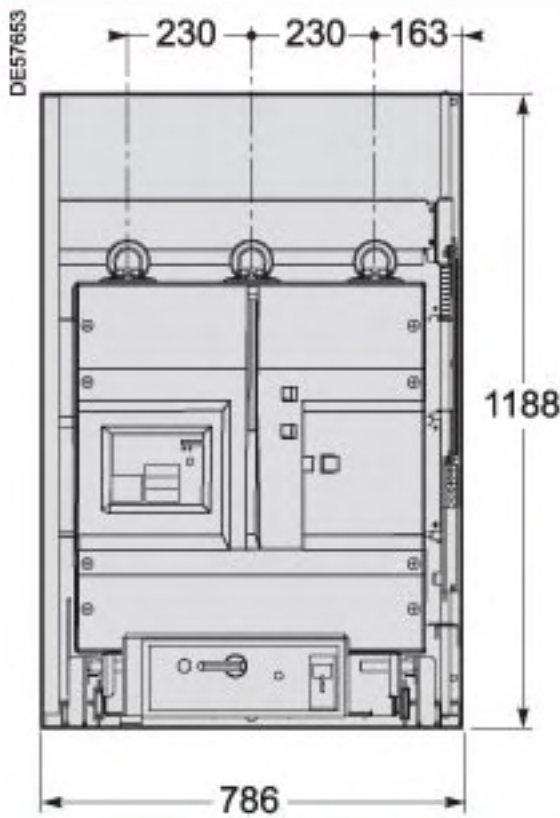
(3) Option.

(4) Interlocking device to be fitted to the cubicle door. If there is no interlocking, the circuit breaker device should be inhibited.

Device

Phase to phase distance 230 mm

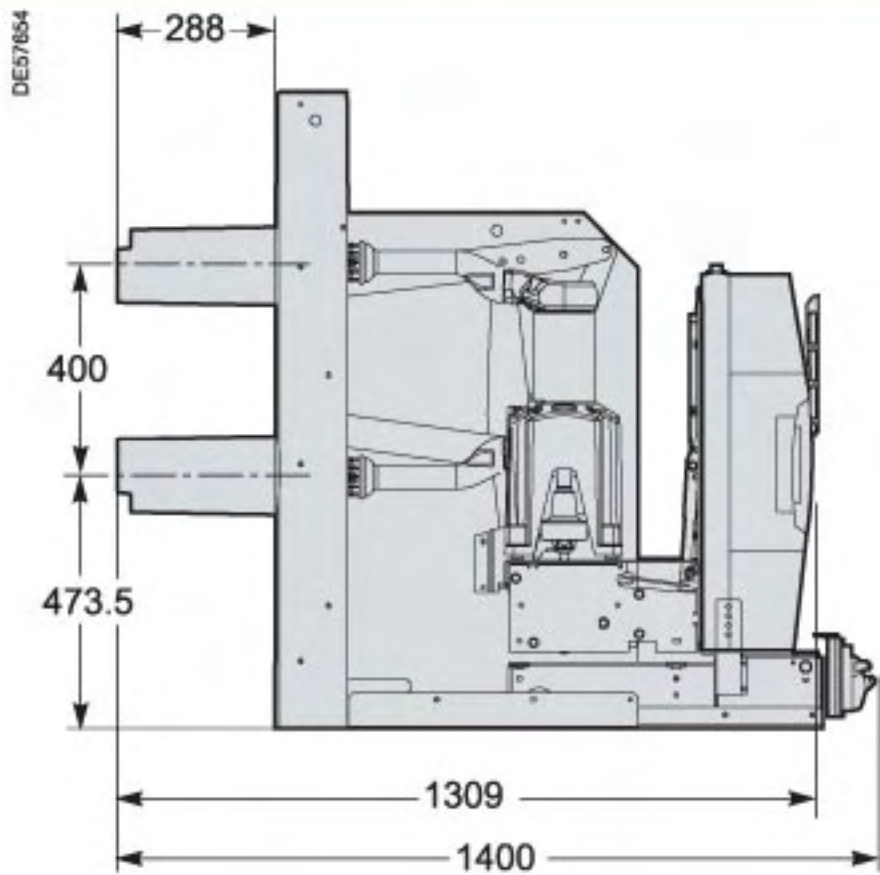
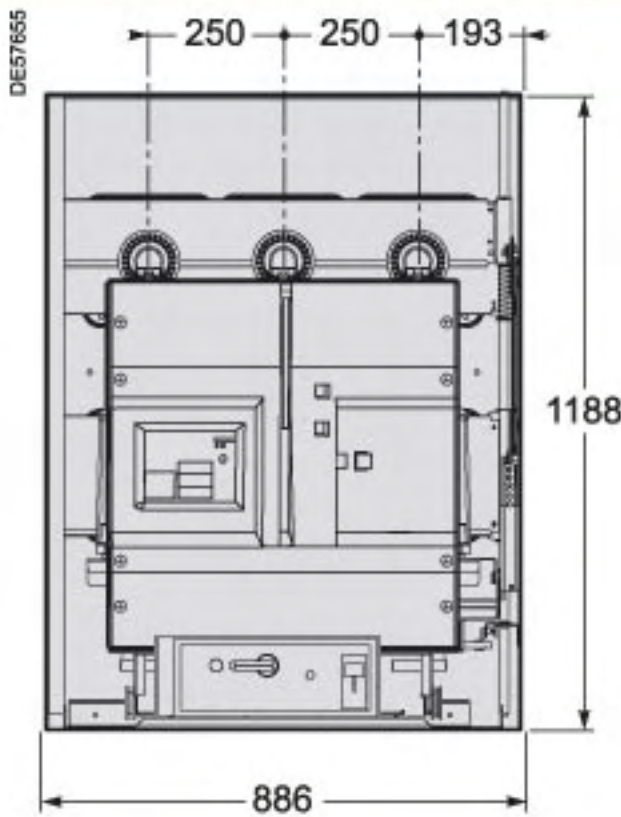
| Ur    | Isc   | Ir     | Weight *     |
|-------|-------|--------|--------------|
| 24 kV | 16 kA | 630 A  | 145 + 125 kg |
|       |       | 1250 A |              |
|       | 25 kA | 630 A  |              |
|       |       | 1250 A |              |



Phase to phase distance 250 mm

| Ur    | Isc     | Ir     | Weight *     |
|-------|---------|--------|--------------|
| 24 kV | 16 kA   | 1250 A | 206 + 148 kg |
|       |         | 2500 A |              |
|       | 25 kA   | 1250 A |              |
|       |         | 2500 A |              |
|       | 31.5 kA | 630 A  |              |
|       |         | 1250 A |              |
|       |         | 2000 A |              |
|       |         | 2500 A |              |

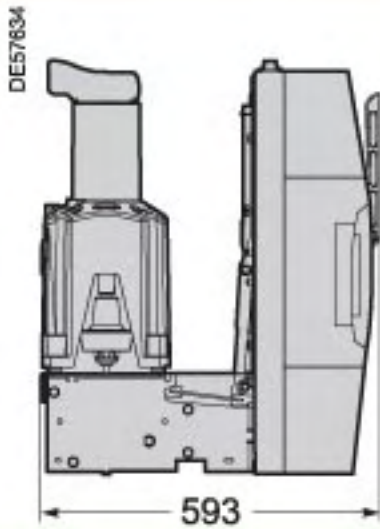
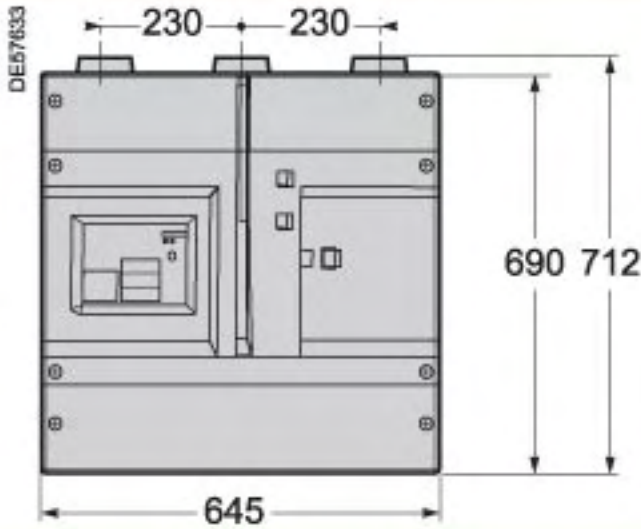
(\*) Circuit breaker + cradle



**Important**  
Detailed installation instructions are given in the "Evolis Installation Guide". Please consult us.

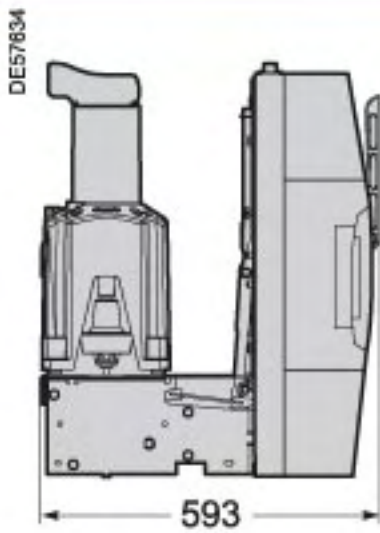
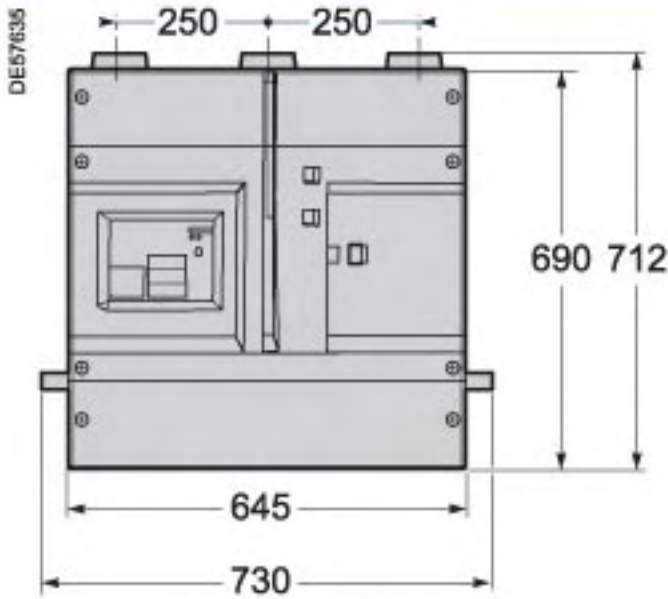
Device  
Phase to phase distance 230 mm

| Ur    | Isc   | Ir     | Weight |
|-------|-------|--------|--------|
| 24 kV | 16 kA | 630 A  | 97 kg  |
|       |       | 1250 A |        |
|       | 25 kA | 630 A  |        |
|       |       | 1250 A |        |

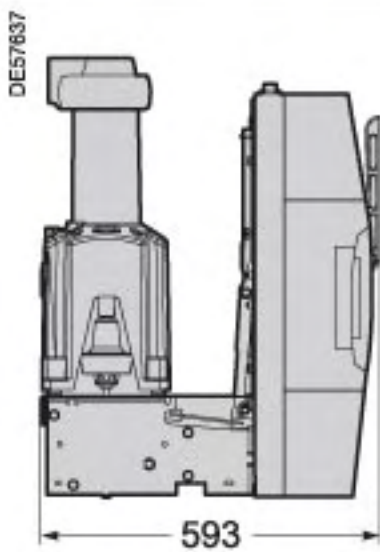
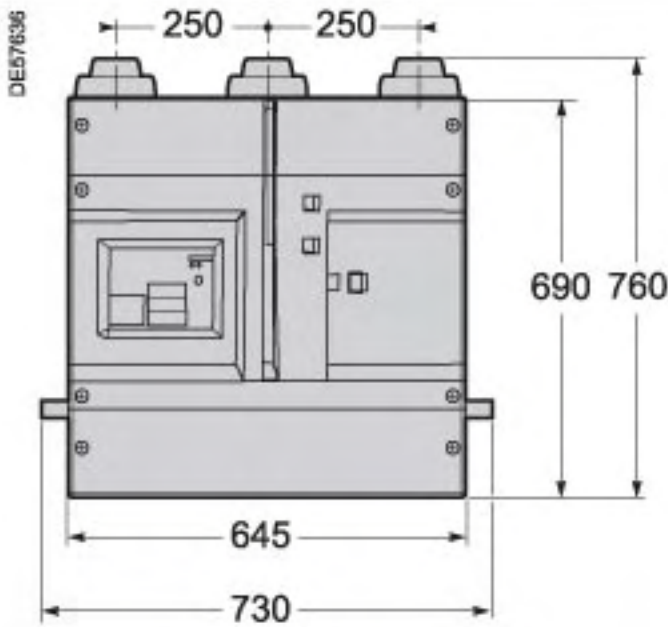


Phase to phase distance 250 mm

| Ur    | Isc   | Ir     | Weight |
|-------|-------|--------|--------|
| 24 kV | 16 kA | 630 A  | 97 kg  |
|       |       | 1250 A |        |
|       | 25 kA | 630 A  |        |
|       |       | 1250 A |        |



| Ur    | Isc     | Ir     | Weight |
|-------|---------|--------|--------|
| 24 kV | 16 kA   | 2000 A | 135 kg |
|       |         | 2500 A |        |
|       | 25 kA   | 2000 A |        |
|       |         | 2500 A |        |
|       | 31.5 kA | 630 A  |        |
|       |         | 1250 A |        |
|       |         | 2000 A |        |
|       |         | 2500 A |        |



**Important**  
Detailed installation instructions are given in the “Evolis Installation Guide”. Please consult us.

Only one of the boxes (ticked ☒ or filled ☐ by the needed value) have to be considered between each horizontal line.

Green box ☒ corresponds to none priced functions.

Releases combinations table

|       |   |   |   |   |   |   |
|-------|---|---|---|---|---|---|
| MX1   | 1 | 1 | 1 | 1 | 1 | 1 |
| MX2   |   | 1 |   |   | 1 |   |
| MN    |   |   | 1 |   |   | 1 |
| Mitop |   |   |   | 1 | 1 | 1 |

## Basic withdrawable circuit breaker

Quantity

Rated voltage  $U_r$  (kV)

Short-circuit current  $I_{sc}$  (kA)

Rated current  $I_r$  (A)

Phase to phase distance (mm) 145 ☐ 185 ☐ 240 ☐

### Colour for push buttons and indicators

Push buttons open/closed: Red/black ☒  
 Indicator open/closed: Black/white ☒ Green/red ☒  
 Operating mechanism charged/discharged: Yellow/white ☒

## Circuit breaker options

### Opening release (see possible choices in combination table)

#### Shunt opening release MX1

24 Vac ☒ 24...30 Vdc ☒ 100...130 Vdc/ac ☒  
 48 Vac ☒ 48...60 Vdc ☒ 200...250 Vdc/ac ☒

#### Shunt opening release MX2

24 Vac ☐ 24...30 Vdc ☐ 100...130 Vdc/ac ☐  
 48 Vac ☐ 48...60 Vdc ☐ 200...250 Vdc/ac ☐

#### Undervoltage release MN

24 Vac ☐ 24...30 Vdc ☐ 100...130 Vdc/ac ☐  
 48 Vac ☐ 48...60 Vdc ☐ 200...250 Vdc/ac ☐

#### Time delay for MN

48...60 Vac ☐ 100...130 Vdc/ac ☐ 200...250 Vdc/ac ☐

Low energy release Mitop ☐

## Remote control

#### Electrical motor MCH

24...30 Vdc ☐ 100...125 Vdc ☐ 200...250 Vdc ☐  
 48...60 Vdc/ac ☐ 100...130 Vac ☐ 200...240 Vac ☐

#### Shunt closing release XF

24 Vac ☒ 24...30 Vdc ☒ 100...130 Vdc/ac ☒  
 48 Vac ☒ 48...60 Vdc ☒ 200...250 Vdc/ac ☒

Module of 4 additional auxiliary contacts O/C 1 ☐ 2 ☐

Ready to close contact PF ☐

LV plug with interlocking 42-pin LV plug (instead of 18) ☐

Operating shaft Quantity (one mini per switchboard)

### Locking of the circuit breaker in the open position

By padlock ☐  
 or by locks and keys Profalux ☒ Ronis ☒  
 If locks 1 lock ☐ 2 identical locks ☐ 2 different locks ☐

Push buttons padlock of O/C circuit breaker ☐

## Cradle

Quantity

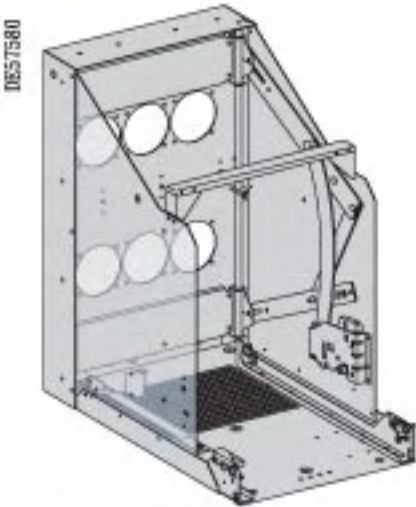
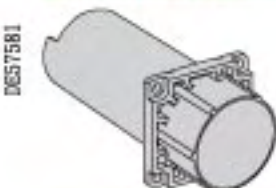
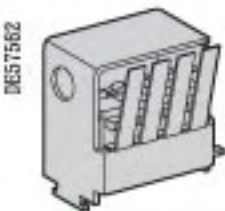
Phase to phase distance (mm) 145 ☐ 185 ☐ 240 ☐

## Cradle accessories

Block of four position indication contacts:  
 CB racked in/racked out ☐

One "CB ready to operate" indication contact ☐

Field deflectors for bushings ☐

| Cradle                                                                              |                                                                     | Ref.  |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------|
| Cradle without bushings                                                             |                                                                     |       |
|    | Phase to phase distance 145 mm                                      | 59316 |
|                                                                                     | Phase to phase distance 185 mm                                      | 59317 |
|                                                                                     | Phase to phase distance 240 mm                                      | 59318 |
|                                                                                     |                                                                     |       |
| Bushings                                                                            |                                                                     |       |
|   | 1 full bushing 630-1250 A                                           | 59382 |
|                                                                                     | 1 full bushing 630-2500 A                                           | 59383 |
|                                                                                     | (you need at least 6 bushings per cradle)                           |       |
| Field deflectors for bushings                                                       |                                                                     |       |
|  | 6 deflectors used to increase dielectric withstand from 75 to 95 kV | 59283 |
|                                                                                     |                                                                     |       |
| Indication of the "CB racked in/racked out" position                                |                                                                     |       |
|  | Module of 4 contacts                                                | 59173 |
|                                                                                     |                                                                     |       |
| Indication of "CB ready to operate"                                                 |                                                                     |       |
|  | C.B. "ready to be operated" PAF (1 AC)                              | 59174 |
|                                                                                     | (indicates that the C.B. is locked in place in the cradle)          |       |

Only one of the boxes (ticked ☒ or filled ☐ by the needed value) have to be considered between each horizontal line.

Green box ☒ corresponds to none priced functions.

Releases combinations table

|       | No LV plug or 42-pin LV plug |   |   |   |   |  | 21-pin LV plug |
|-------|------------------------------|---|---|---|---|--|----------------|
| YO1   | 1                            |   | 1 | 1 | 1 |  | 1              |
| YO2   |                              | 1 |   | 1 |   |  |                |
| YM    |                              |   | 1 |   | 1 |  |                |
| Mitop |                              |   |   | 1 | 1 |  |                |

## Basic withdrawable, frontal circuit breaker

Quantity

|                                         |                                       |                                             |
|-----------------------------------------|---------------------------------------|---------------------------------------------|
| Rated voltage Ur                        | (kV)                                  | <input type="text" value="24"/>             |
| Short circuit current Isc               | (kA)                                  | <input type="text"/>                        |
| Rated current Ir                        | (A)                                   | <input type="text"/>                        |
| Phase to phase distance (mm)            | 230 <input type="checkbox"/>          | 250 <input type="checkbox"/>                |
| Frequency                               | 50 Hz <input type="checkbox"/>        | 60 Hz <input type="checkbox"/>              |
| Colour for push buttons and indicators  |                                       |                                             |
| Push buttons open/closed:               |                                       | Red/black <input type="checkbox"/>          |
| Indicator open/closed:                  | Black/white <input type="checkbox"/>  | Green/red <input type="checkbox"/>          |
| Operating mechanism charged/discharged: | White/yellow <input type="checkbox"/> | Charged/discharged <input type="checkbox"/> |

## Circuit breaker options

Opening release (see possible choices in combination table)

Shunt opening release YO1

|                                 |                                  |                                          |                                          |
|---------------------------------|----------------------------------|------------------------------------------|------------------------------------------|
| 24 Vdc <input type="checkbox"/> | 110 Vdc <input type="checkbox"/> | 220 Vdc <input type="checkbox"/>         | 110 Vac (50 Hz) <input type="checkbox"/> |
| 48 Vdc <input type="checkbox"/> | 125 Vdc <input type="checkbox"/> | 220 Vac (50 Hz) <input type="checkbox"/> | 120 Vac (60 Hz) <input type="checkbox"/> |

Shunt opening release YO2

|                                 |                                  |                                          |                                          |
|---------------------------------|----------------------------------|------------------------------------------|------------------------------------------|
| 24 Vdc <input type="checkbox"/> | 110 Vdc <input type="checkbox"/> | 220 Vdc <input type="checkbox"/>         | 110 Vac (50 Hz) <input type="checkbox"/> |
| 48 Vdc <input type="checkbox"/> | 125 Vdc <input type="checkbox"/> | 220 Vac (50 Hz) <input type="checkbox"/> | 120 Vac (60 Hz) <input type="checkbox"/> |

Undervoltage release YM

|                                 |                                  |                                          |                                          |
|---------------------------------|----------------------------------|------------------------------------------|------------------------------------------|
| 24 Vdc <input type="checkbox"/> | 110 Vdc <input type="checkbox"/> | 220 Vdc <input type="checkbox"/>         | 110 Vac (50 Hz) <input type="checkbox"/> |
| 48 Vdc <input type="checkbox"/> | 125 Vdc <input type="checkbox"/> | 220 Vac (50 Hz) <input type="checkbox"/> | 120 Vac (60 Hz) <input type="checkbox"/> |

Low energy release Mitop Without contact ☐ With contact ☐

Remote control (operation counter already included)

|                    |                                         |                                           |
|--------------------|-----------------------------------------|-------------------------------------------|
| Electrical motor M | 24...32 Vdc <input type="checkbox"/>    | 110...127 Vdc/ac <input type="checkbox"/> |
|                    | 48...60 Vdc/ac <input type="checkbox"/> | 220...250 Vdc/ac <input type="checkbox"/> |

Shunt closing release YF

|                                 |                                  |                                          |                                          |
|---------------------------------|----------------------------------|------------------------------------------|------------------------------------------|
| 24 Vdc <input type="checkbox"/> | 110 Vdc <input type="checkbox"/> | 220 Vdc <input type="checkbox"/>         | 110 Vac (50 Hz) <input type="checkbox"/> |
| 48 Vdc <input type="checkbox"/> | 125 Vdc <input type="checkbox"/> | 220 Vac (50 Hz) <input type="checkbox"/> | 120 Vac (60 Hz) <input type="checkbox"/> |

|                                                                 |                                                                  |
|-----------------------------------------------------------------|------------------------------------------------------------------|
| Operation counter (already included if remote control supplied) | <input type="checkbox"/>                                         |
| LV plug                                                         | 42 pins (instead of 21) <input type="checkbox"/>                 |
| Operating shaft                                                 | <input type="checkbox"/>                                         |
| Open position CB locking device (without lock)                  | <input type="checkbox"/>                                         |
| Locking of the circuit breaker in the open position             |                                                                  |
| Locks and keys                                                  | Profalux <input type="checkbox"/> Ronis <input type="checkbox"/> |
| Discharge of the circuit breaker control mechanism springs      | <input type="checkbox"/>                                         |
| Earthing sliding contact                                        | <input type="checkbox"/>                                         |

## Cradle

Rated current Up to 1250 A and 25 kA ☐ Above 1250 A or 25 kA ☐

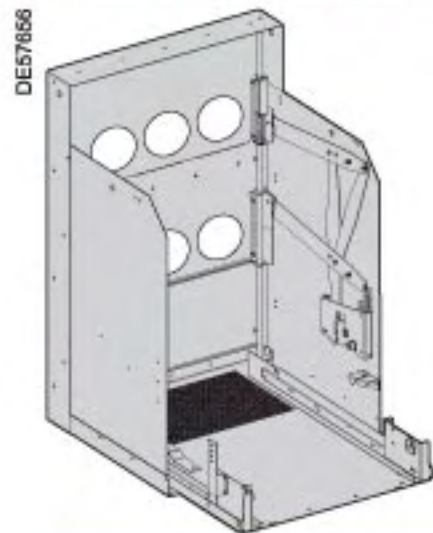
## Cradle accessories

|                                                                                           |                                                                                                |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Rack in/rack out position contact (4 AC)                                                  | <input type="checkbox"/>                                                                       |
| LPCT-TLP                                                                                  | Up to 1250 A and 25 kA <input type="checkbox"/> Above 1250 A or 25 kA <input type="checkbox"/> |
| Test position contact                                                                     | <input type="checkbox"/>                                                                       |
| This contact is activated when the circuit breaker is in the "test" or "service" position |                                                                                                |
| 6 field deflectors                                                                        | 630-2500 A <input type="checkbox"/> 2500 A <input type="checkbox"/>                            |

## Cradle

Ref.

### Cradle without bushings



|                                   |           |
|-----------------------------------|-----------|
| Cradle with 230 mm phase distance | AAA10 015 |
| Cradle with 250 mm phase distance | AAA10 017 |

### Cradle accessories

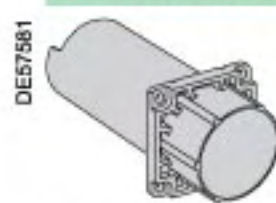


Fig. 1



Fig. 2



Fig. 3

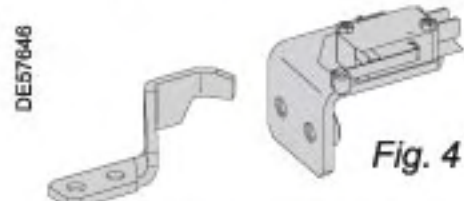
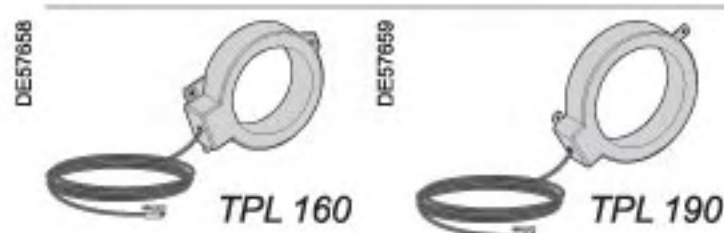


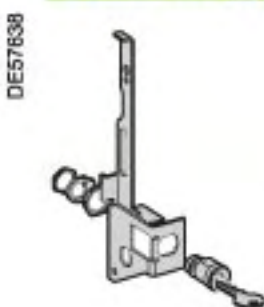
Fig. 4



|                                                                                                                             |                        |           |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------|-----------|
| Bushing kit for cradle (fig.1)                                                                                              | 630-1250 A             | AAA10 016 |
|                                                                                                                             | 2500 A                 | AAA10 018 |
| 6 field deflectors<br>for cradle bushings (fig.2)                                                                           | 630-1250 A             | AAA10 020 |
|                                                                                                                             | 2500 A                 | AAA10 021 |
| 4 racked in/out position contacts (fig.3)<br>(to be installed in the cradle)                                                |                        | 59173     |
| Test position contact. This contact is activated when<br>the circuit breaker is in the "test" or "service" position (fig.4) |                        | AAA10 024 |
| LPCT toroidal sensor                                                                                                        | TLP 160 (up to 1250 A) | AAA10 094 |
|                                                                                                                             | TLP 190 (above)        | AAA10 095 |

## Locking/interlocking

Ref.



|                                                |           |
|------------------------------------------------|-----------|
| Open position CB locking device (without lock) | AAA10 092 |
| Ronis lock                                     | AAA10 058 |
| Profalux lock                                  | AAA10 059 |

**The LPCT's are the best way to increase the effectiveness of the protection chain and simplify the selection.**



### Function

- These Low Power Current Transducers (LPCT) provide accurate current measurement to the protection function when an Evolis circuit-breaker is associated with the Sepam relay range.
- They comply with IEC 60044-8 standard.

### Composition

- Two types of LPCT are available:
  - LPCT for bushings,
  - LPCT for cubicles.
- The sensor is delivered with 5m of cable and connector that allows direct connection to the Sepam unit.

### Mechanical characteristics (LPCT for bushings)

- Mounted directly on the Evolis withdrawable circuit-breaker cradle. The sensors are simply located on the bushings and fixed using three screws. Each sensor covers the full operating range of the corresponding circuit-breaker.
- Connection to the Sepam is achieved using an shielded cable which is attached to each sensor.

### Electrical characteristics

- In compliance with IEC 60044-8 standard, defining Low Power current Transducer with voltage output.
- Usable for nominal currents of 25 A to 2500 A.
- Class 0.5 throughout the range.
- Current sensors deliver a voltage output at a ratio of 100 A/22.5 mV.

#### Common features

|                                  |                          |
|----------------------------------|--------------------------|
| Rated primary current            | 100 A                    |
| Rated secondary output (at 100A) | 22.5 mV                  |
| Accuracy class for measuring     | 0.5                      |
| Accuracy class for protection    | 5P                       |
| Burden                           | $\geq 2 \text{ k}\Omega$ |
| Frequency                        | 50 / 60 Hz               |

#### Specific features

##### Assembly

##### CLP2

In the cubicle



##### CLP3

In the cubicle



##### TLP160

On the bushings



##### TLP190

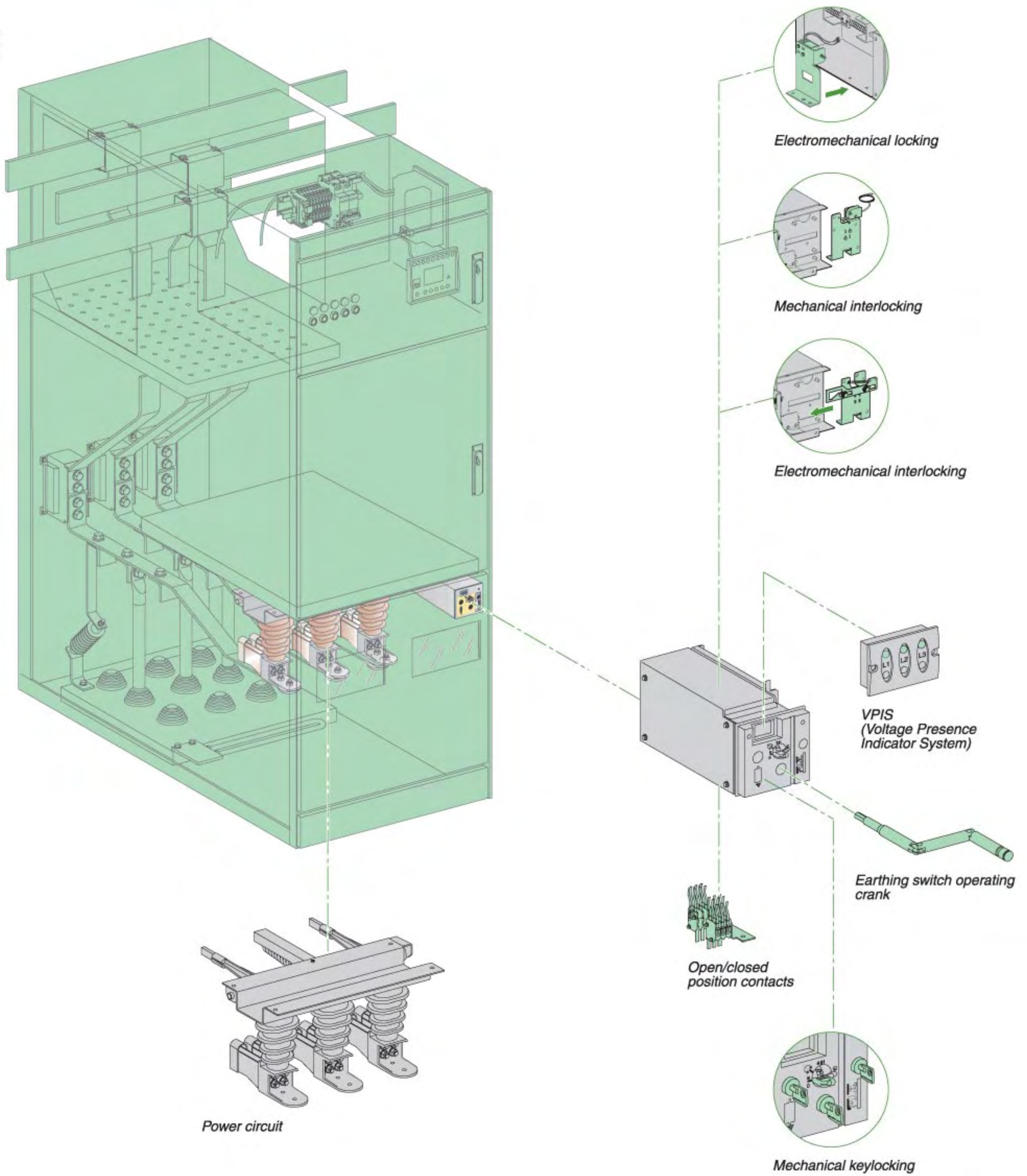
On the bushings

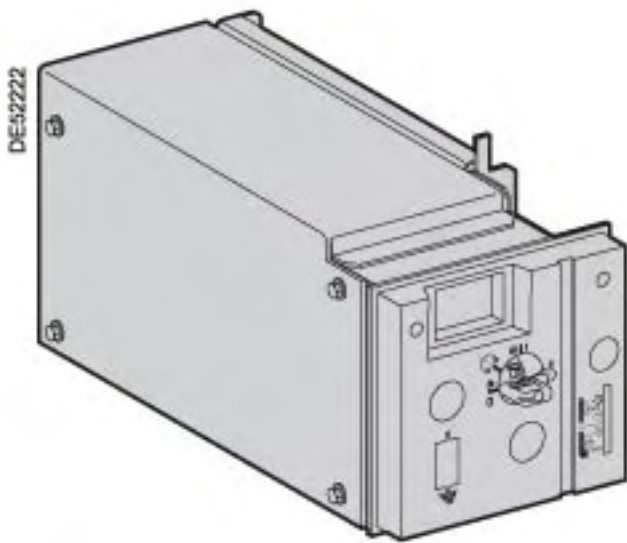


|                                           |           |             |                      |                      |
|-------------------------------------------|-----------|-------------|----------------------|----------------------|
| Rated extended primary current            | 1250 A    | 2500 A      | 1250 A               | 2500 A               |
| Accuracy limit factor                     | 250       | 315         | 250                  | 315                  |
| Rated short time thermal current          | 25 kA/3 s | 31.5 kA/3 s | 25 kA/3 s            | 31.5 kA/3 s          |
| Rated voltage                             | 24 kV     | 24 kV       | 24 kV <sup>(1)</sup> | 24 kV <sup>(1)</sup> |
| Rated power frequency withstand voltage   | 50 kV     | 50 kV       | 50 kV                | 50 kV                |
| Rated lightning impulse withstand voltage | 125 kV    | 125 kV      | 125 kV               | 125 kV               |
| Internal diameter                         |           |             | 160 mm               | 190 mm               |

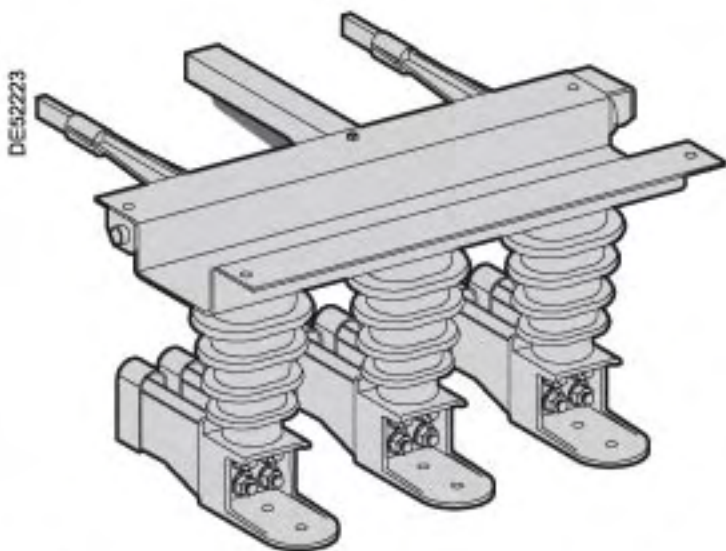
(1) Voltage applied to the cradle equipped with sensors.

DE52554

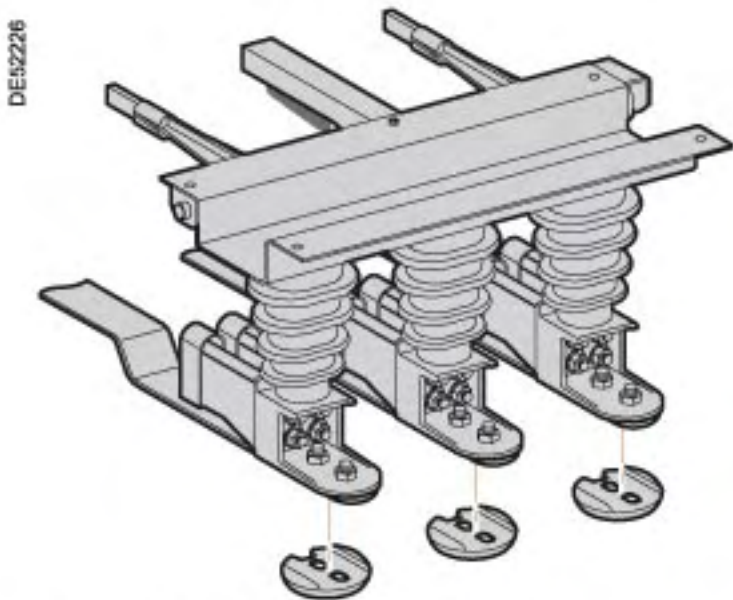




Operating mechanism.



Power circuit.



Power circuit with field deflectors.

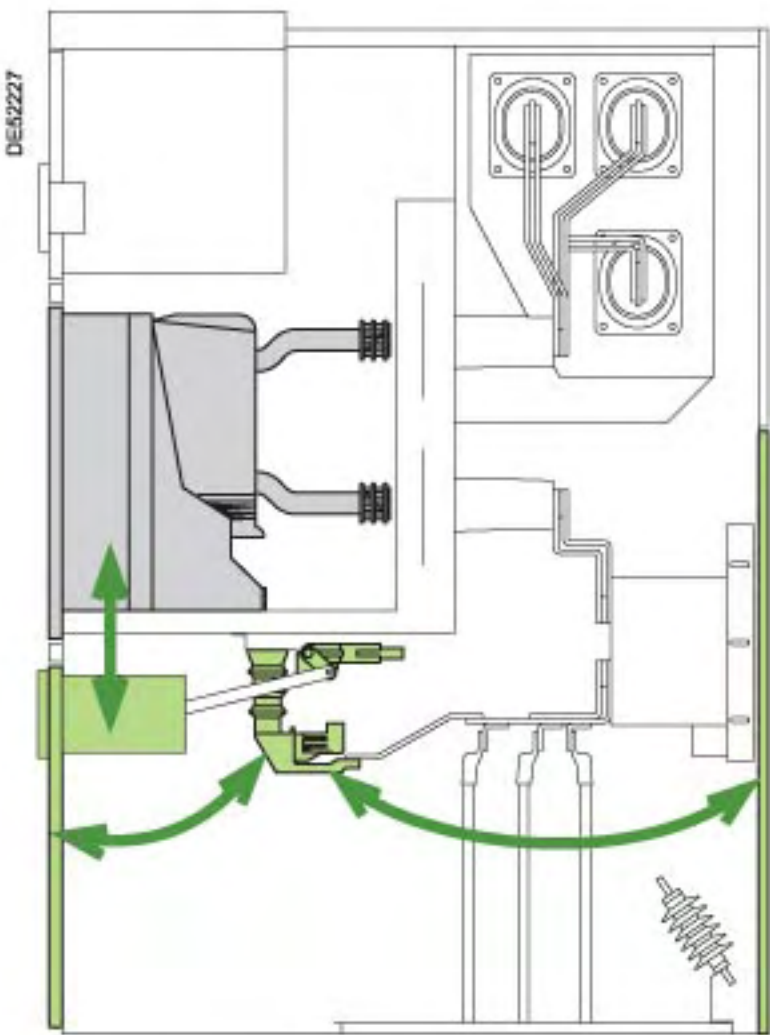
Function

This device is used to short circuit and earth the cable ends before carrying out work in the cable connection compartment in an MV cubicle.

Composition

- b the earthing switch includes :
  - v an operating mechanism to be mounted on the front face of the cubicle
  - v a power circuit unit with fast acting closing mechanism independent of the operator
- b the link between the operating mechanism and the power circuit depends on the length of the cubicle:
  - v for applications with an Evolis cradle y 17.5 kV a drawing defines the installation conditions which allow the panel builder to design the rod between these 2 components (see the installation guide)
  - v for applications with a 24 kV Evolis cradle, there is a kit available to link these 2 components (see order form).

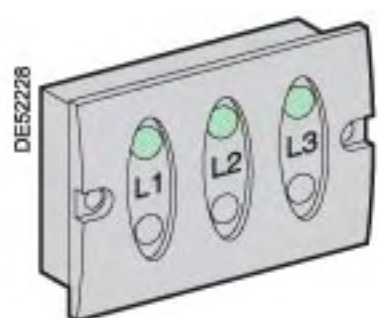
Note: If a 95 kV impulse withstand voltage is required for the 200 mm earthing switch phase distance, it is necessary to add field deflectors on the connections. These should be ordered separately.



- b a mechanical interlock with the circuit breaker is compulsory in order to prevent:
  - v racking in the circuit-breaker with the earthing switch closed
  - v closing the earthing switch with the circuit-breaker not racked out.
- b an installation guide drawing shows the mechanical link to be executed and installed by the panel builder.

Note: if a mechanical interlock with the front or rear access panel of the cable connection compartment is necessary to prevent access to cables, the panel builder is responsible for its design.

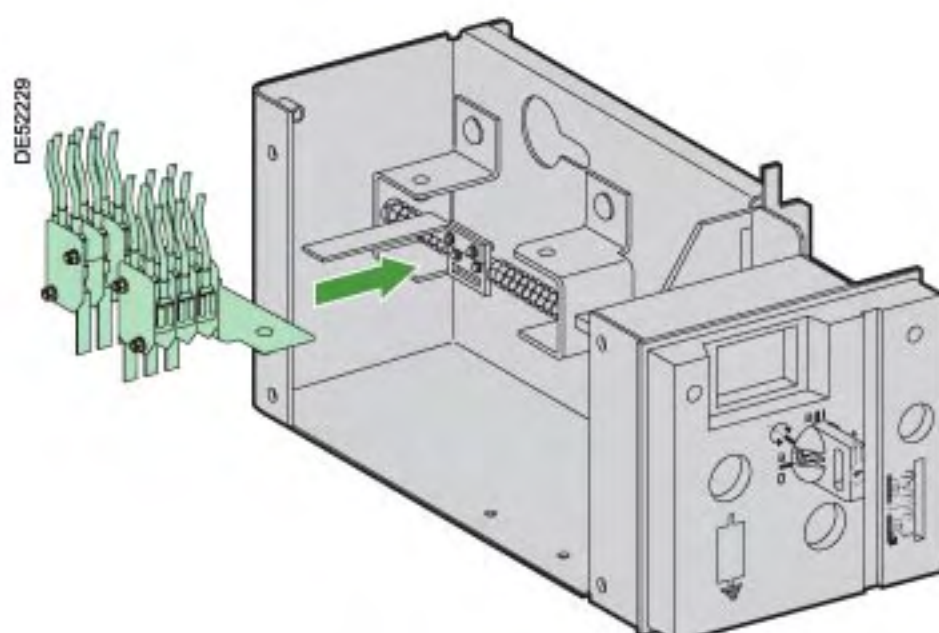
| Electrical characteristics according to IEC 62271-102 |         |       |        |      |        |    |      |        |    |
|-------------------------------------------------------|---------|-------|--------|------|--------|----|------|--------|----|
| Phase distances                                       | mm      | 160   |        |      | 200    |    |      | 240    |    |
| Voltage                                               | (kV)    | 7.2   | 12     | 17.5 | 7.2    | 12 | 17.5 | 7.2    | 12 |
| Short-time withstand current 1 s                      | Ik (kA) | 31.5  | 50     | 40   | 31.5   | 50 | 40   | 31.5   | 50 |
| Short-time withstand current 3 s-4 s                  | Ik (kA) | 31.5  |        |      | 31.5   |    |      | 31.5   |    |
| Peak withstand current                                | Ip (kA) | 50 Hz | 2.5 Ik |      | 2.5 Ik |    |      | 2.5 Ik |    |
|                                                       |         | 60 Hz | 2.6 Ik |      | 2.6 Ik |    |      | 2.6 Ik |    |



VPIS (Voltage Presence Indicator System).

## Voltage present indicator system (VPIS)

- this system, combined with the capacitive divider insulators fitted as standard in the earthing switch, provides indication of the voltage presence on each phase of the main circuit via lights
- it is installed on the front of the earthing switch operating mechanism
- it is available for two voltage ranges, in conformity with standard IEC 61958:
  - 3.2 to 7.2 kV
  - 10 to 24 kV.

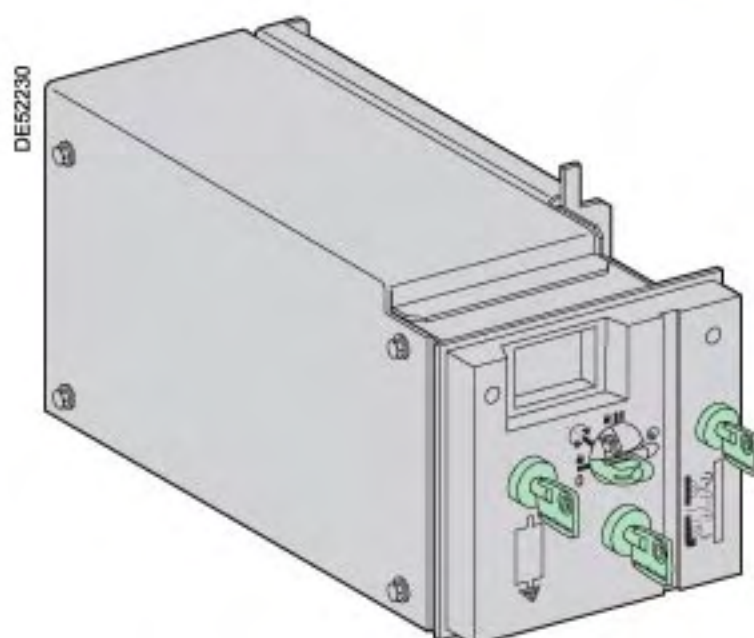


## Open/closed position contacts

A series of 6 auxiliary contacts (3 NO - 3 NC) indicates the open/closed position of the earthing switch. This unit is delivered as an option.

### Characteristics

|                                         |      |     |      |
|-----------------------------------------|------|-----|------|
| Breaking capacity (cos $\varphi$ : 0.3) | V AC | 240 | 15 A |
|                                         | V DC | 48  |      |
|                                         |      | 125 |      |
|                                         |      | 250 | 3 A  |



Locking.

## Earthing switch mechanical interlocking

This function enables the earthing switch to be locked in its open or closed position by adding 1 or 2 key locks.

- several configurations are possible:
  - locked closed by 1 key lock + locked open by 1 key lock
  - locked closed by 2 key locks
  - locked open by 2 key locks.

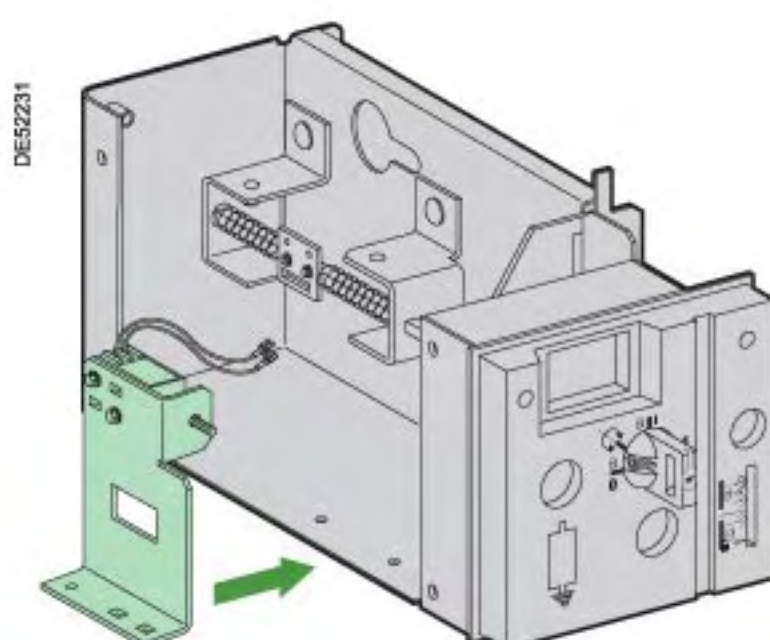
A mechanical adaptation kit is supplied enabling the fitting of the various Profalux key locks.

## Electromechanical locking of the earthing switch

This function is achieved using a coil which blocks switching operation when not energised.

When energised it allows operation of the earthing switch.

This system is available in several versions according to the supply voltage:  
24 V DC - 48 V DC - 110 V DC - 220 V DC.



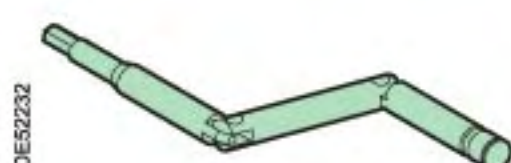
Electromechanical interlocking.

## Mechanical and electromechanical interlocking with the Evolis circuit-breaker

These functions are achieved using padlocks, keylocks or electrical coil, (please see the Installation Guide).

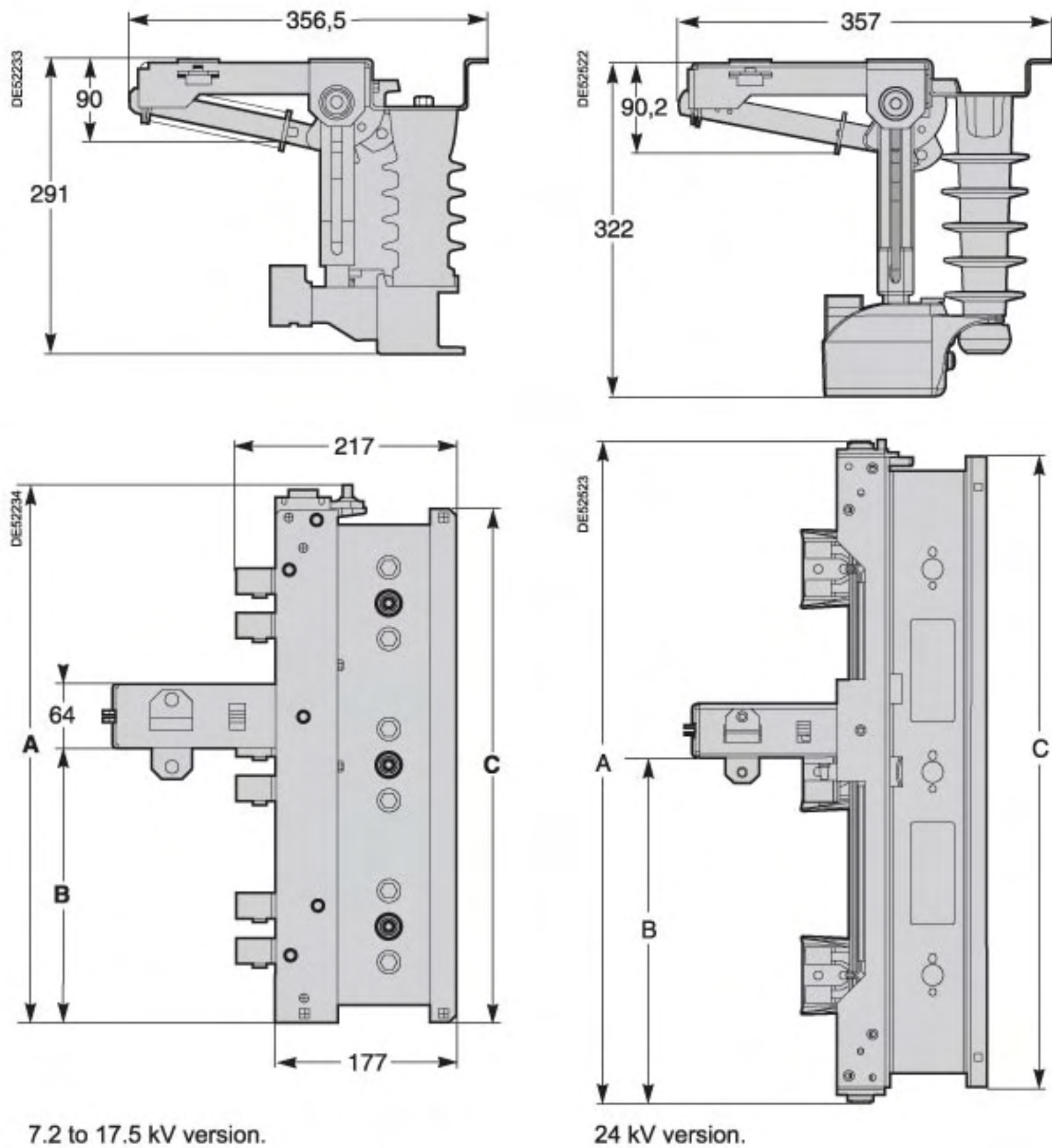
## Earthing switch operating crank

This is identical to the one supplied for the circuit-breaker racking truck. It allows the earthing switch to be operated.



Operating crank.

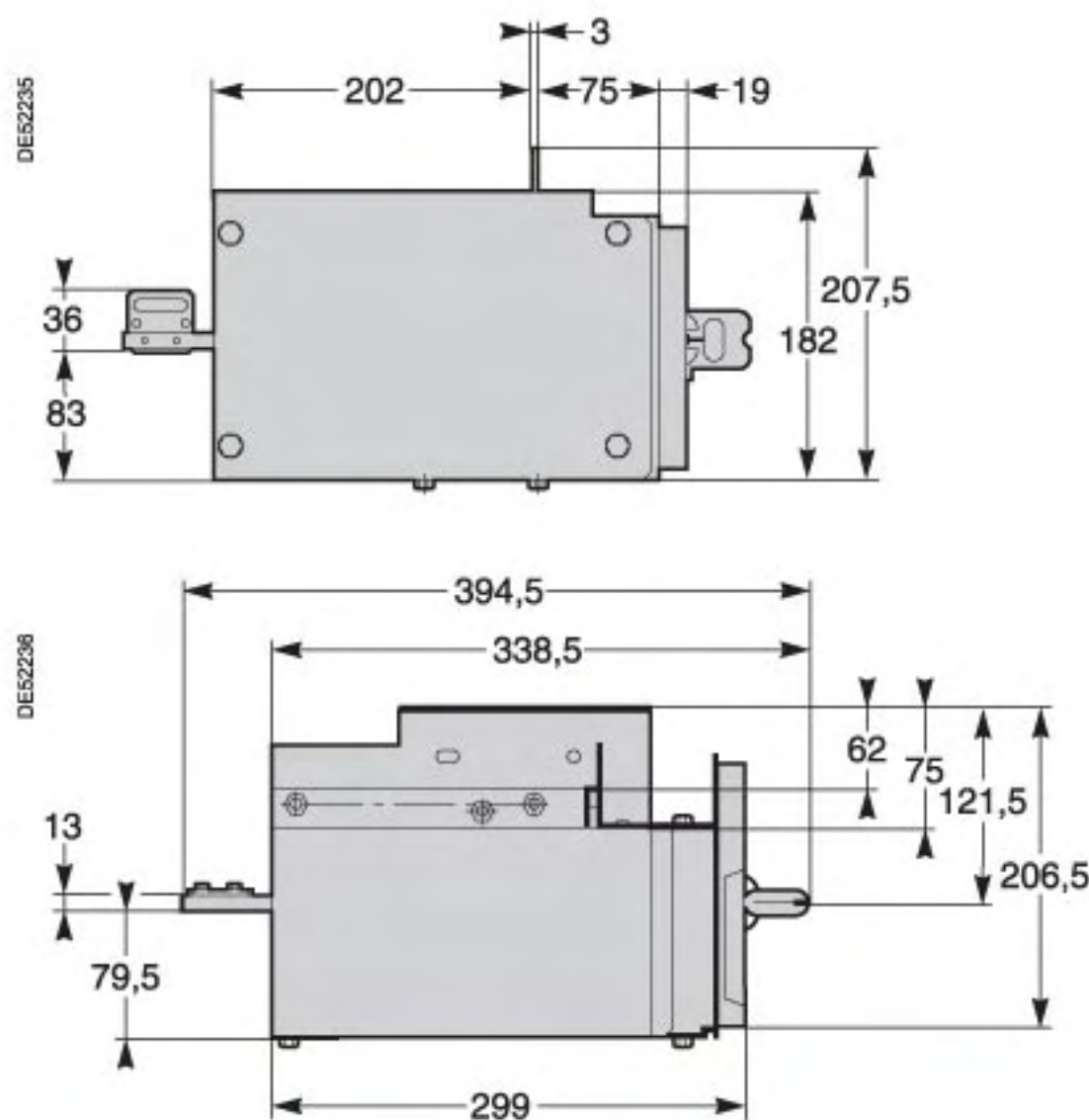
Power circuit



7.2 to 17.5 kV version.

24 kV version.

Operating mechanism



| Phase distance     | 160 | 200  | 240  | 240 |
|--------------------|-----|------|------|-----|
| Rated voltage (kV) | 12  | 17.5 | 17.5 | 24  |
| Dimensions (mm)    |     |      |      |     |
| A                  | 530 | 660  | 860  | 783 |
| B                  | 270 | 335  | 435  | 407 |
| C                  | 506 | 636  | 836  | 744 |

Only one of the boxes (ticked ☒ or filled ☐ by the needed value) have to be considered between each horizontal line.

## Basic units, connectors and application

Quantity 

| Phase distance                                                        | Ur             | Ith           | Reference |                          |
|-----------------------------------------------------------------------|----------------|---------------|-----------|--------------------------|
| 160 mm                                                                | 12 kV          | 31.5 kA . 3 s | 59490     | <input type="checkbox"/> |
| 200 mm                                                                | 7.2 kV         | 50 kA . 1 s   | 59491     | <input type="checkbox"/> |
|                                                                       | ou 12 kV       | 40 kA . 1 s   |           | <input type="checkbox"/> |
|                                                                       | ou 17.5 kV (1) | 31.5 kA . 3 s |           | <input type="checkbox"/> |
| 240 mm                                                                | 12 kV          | 50 kA . 1 s   | 59492     | <input type="checkbox"/> |
|                                                                       | ou 17.5 kV     | 31.5 kA . 3 s |           | <input type="checkbox"/> |
|                                                                       | ou 17.5 kV     | 40 kA . 1 s   |           | <input type="checkbox"/> |
|                                                                       | 24 kV          | 40 kA . 1 s   | AAA10071  | <input type="checkbox"/> |
| (1) 3 field defelectors<br>to be mounted on the insulator connections |                |               | 59281     | <input type="checkbox"/> |

**Compulsory** if Ur = 17.5 kV - 95 kV peak for an earthing switch with 200 mm between phases

## Operating mechanism

|                                                |       |                          |
|------------------------------------------------|-------|--------------------------|
| Mechanism                                      | 59496 | <input type="checkbox"/> |
| Operating crank (minimum one per switchboard)  | 59449 | <input type="checkbox"/> |
| <b>Compulsory</b> with the operating mechanism |       |                          |

## Voltage present indicator system (VPIS)

|                            |                 |       |                          |
|----------------------------|-----------------|-------|--------------------------|
| Voltage presence indicator | 3.2 kV - 7.2 kV | 59498 | <input type="checkbox"/> |
|                            | 10 kV - 24 kV   | 59499 | <input type="checkbox"/> |

## Options

## Indication

|                               |             |       |                          |
|-------------------------------|-------------|-------|--------------------------|
| Open/closed position contacts | 3 NO - 3 NC | 59502 | <input type="checkbox"/> |
|-------------------------------|-------------|-------|--------------------------|

## Earthing switch locking

|                                  |                           |       |                          |
|----------------------------------|---------------------------|-------|--------------------------|
| Keylock mechanism                | 1 keylock O + 1 keylock C | 59506 | <input type="checkbox"/> |
|                                  | 2 keylocks O              | 59508 | <input type="checkbox"/> |
|                                  | 2 keylocks C              | 59509 | <input type="checkbox"/> |
| Electromagnetic<br>(open/closed) | 24 Vdc                    | 59513 | <input type="checkbox"/> |
|                                  | 48 Vdc                    | 59514 | <input type="checkbox"/> |
|                                  | 110 Vdc                   | 59515 | <input type="checkbox"/> |
|                                  | 220 Vdc                   | 59516 | <input type="checkbox"/> |

## Interlocking with the Evolis circuit breaker position

|                                                                                   |         |       |                          |
|-----------------------------------------------------------------------------------|---------|-------|--------------------------|
| Mechanical interlocking of the circuit breaker in the racked out position         |         | 59521 | <input type="checkbox"/> |
| Interlocking by Profalux keylock (keylock not supplied)                           |         | 59523 | <input type="checkbox"/> |
| Electromagnetic interlocking of the circuit breaker<br>in the racked out position | 24 Vdc  | 59526 | <input type="checkbox"/> |
|                                                                                   | 48 Vdc  | 59527 | <input type="checkbox"/> |
|                                                                                   | 110 Vdc | 59528 | <input type="checkbox"/> |
|                                                                                   | 220 Vdc | 59529 | <input type="checkbox"/> |

## Link to power circuit operating mechanism

|                                        |          |                          |
|----------------------------------------|----------|--------------------------|
| Adaptation kit for Evolis 24 kV cradle | AAA10073 | <input type="checkbox"/> |
|----------------------------------------|----------|--------------------------|