

Eco<sup>2</sup>truxure™  
Innovation At Every Level

PacT Series

# EvoPacT LF

Medium Voltage Distribution

Catalog 2025

SF<sub>6</sub> Circuit Breaker up to 17.5 kV



[se.com](http://se.com)

Life Is On

**Schneider**  
Electric



# Same technology, same offer, simpler names

We're making it easier for you to navigate across the wide range of our world-class digital products and select the offers that are right for you and your needs with confidence.

## EcoStruxure Architecture

To enable brand consistency, relevance and impact, we are reinforcing our EcoStruxure™ architecture and digital customer lifecycle tools to help ensure a seamless experience from the CAPEX to OPEX phases of each project, bridging our entire ecosystem of partners, services providers and end users.

EcoStruxure is our IoT-enabled open and interoperable system architecture and platform. EcoStruxure delivers enhanced values around safety, reliability, efficiency, sustainability and connectivity for our customers. EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity technologies to deliver Innovation At Every Level from Connected Products, Edge Control, Apps, and Analytics and Services: our IoT technology Levels.

Old names	New names
Ecodial	EcoStruxure Power Design
Ecoreal	EcoStruxure Power Build
Ecoreach	EcoStruxure Power Commission
MasterPact MTZ mobile App/Easergy mobile App	EcoStruxure Power Device App

## PacT and SeT Series

Featuring outstanding medium-voltage (MV) and low-voltage (LV) switchboards, motor control centers and power distribution solutions for high-performance power applications, Schneider Electric's PacT and SeT Series provides optimized solutions based on high levels of safety and an optimized footprint. Built on a modular architecture and incorporating smart connected devices for increase safety, reliability, performance and energy efficiency, the SeT Series is delivered to customers directly from our Schneider Electric plants or via a global network of licensed partner panel builders, who are trained and audited to provide quality equipment and support.

Old names	New names
HVX	EvoPacT HVX
LF	EvoPacT LF
SF	EvoPacT SF
Premset	PremSeT
Compact	ComPacT
Masterpact	MasterPacT
Transferpact	TransferPacT
Fupact	FuPacT

# Your Concerns



## Continuity of Service

- Low level of SF<sub>6</sub> pressure
- A safety membrane which, in very rare cases of an internal arc, will open in order to let the gas flow to the back of the circuit breaker
- Keeping at 0 bar of SF<sub>6</sub>:
  - The nominal performance
  - The capacity to break once at least 80% of the full breaking capacity
  - The capacity to withstand at least 80% of the insulating level
- Breaking all types of current without overvoltages



## Proven Technology

- Long experience of Schneider Electric in manufacturing MV circuit breakers in SF<sub>6</sub> technology
- 100,000 EvoPacT LF Circuit Breakers installed with over 20 years of experience



## Ease of Installation

- Compact dimensions
- Cassette version: retrofit and new panels integration





# GENERAL CONTENT

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Our purpose is to

empower all to make the most of our energy and resources



Find more information [here](#) 

All pictures of the catalogue illustrate the product in an environment close to reality. They were taken off-line. For live operation the P.P.E. (personal protective equipment) must be used in accordance with the regulations of the place of installation.



# General Presentation



# Content

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# The Advantages of Proven Technology

## General Presentation

Schneider Electric has developed a wide range of high performance and reliable devices operating faultlessly on all 5 continents.

Continuously increasing its performance, the company maintains a very high level of innovation in its offer.

### Key Benefits

- Compact and simple design
- No overvoltage during breaking
- Comprehensive range
- Soft breaking without chopping currents
- Continuous monitoring of the gas pressure inside poles

### Enhanced Safety

The breaking medium is sulfur hexafluoride (SF<sub>6</sub>) used at low pressure. The insulating enclosure containing the circuit breaker pole(s) is equipped with a safety membrane. In addition, the rated characteristics, breaking the rated current under the rated voltage, are generally maintained at zero relative bars of SF<sub>6</sub>.

### Enhanced Reliability

The motor-charged spring stored energy operating mechanism is a key factor of device reliability: Schneider Electric cumulates 45 years experience with this type of mechanism, 1,200,000 of which are already in operation. Schneider Electric's mastery of design and the testing of sealed systems guarantees sustained device performance for at least 30 years.

### Increased endurance

The mechanical and electrical endurance of Schneider Electric SF<sub>6</sub> breaking devices are in conformity with the most demanding specifications recommended by the IEC. These devices therefore meet requirements for even the most exposed of networks.

### Sustainable

Schneider Electric devices have been designed to ensure protection of the environment:

- The materials used, both insulating and conductive, are identified and easy to separate and recycle.
- The SF<sub>6</sub> gas is under control from production through to the circuit breakers end of life. In particular it can be recovered at the end of the circuit breakers life and re-used after treatment in line with the new European directive.
- An end of life manual for the product details procedures for dismantling and recycling components.

### Quality Assurance

During production, each circuit breaker undergoes systematic routine tests in order to check quality and conformity:

- Pole sealing check.
- Checking the correct mechanical operation of the device, plus its associated locking mechanisms.
- Checking simultaneous closing of contacts.
- Checking power frequency insulation level.
- Checking main circuit resistance.
- Checking auxiliary circuit insulation.
- Checking switching speeds.
- Checking the switching cycle.
- Measuring the switching times.

The results are recorded on the test certificate for each device which is initiated by the quality control department.

### Certification



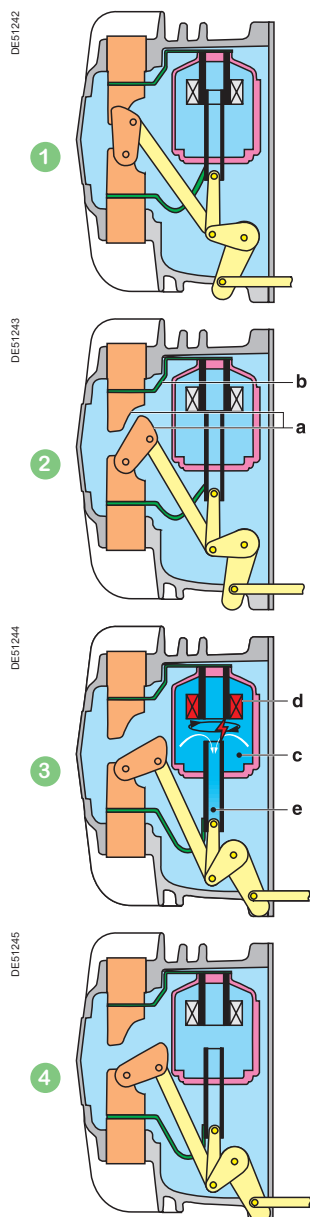
The quality system for the design and production of EvoPacT LF range is certified in conformity with ISO 9001: 2008 quality assurance standard requirements.

The environmental management system adopted by Schneider Electric production sites for the production of EvoPacT LF range has been assessed and judged to be in conformity with requirements in standard ISO 14001.



# Breaking Principle

## General Presentation



### Breaking Principle: Self Expansion

EvoPacT LF circuit breakers use the SF<sub>6</sub> gas self expansion technique.

This technique is the result of many years experience in SF<sub>6</sub> technology and major research work.

It combines the effect of thermal expansion with a rotating arc to create arc blowing and quenching conditions.

The result is reduced control energy requirements and arcing contact erosion; this increases mechanical and electrical endurance.

The operating sequence of a self-expansion breaking chamber, whose moving part is driven by the mechanical operating mechanism, is as follows:

1

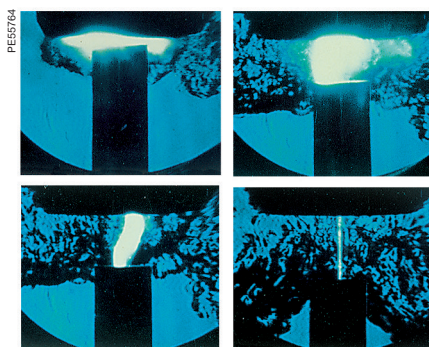
The circuit breaker is closed.

2

On opening of the main contacts (a) the current is shunted into the breaking circuit (b).

3

On separation of the arcing contacts, an electrical arc appears in the expansion volume (c).



Electrical arc in a self-expansion breaking chamber

The arc rotates under the effect of the magnetic field created by the coil (d) through which flows the current to be broken:

- the overpressure created by the temperature build-up of the gas in the expansion volume (c) causes a gaseous flow blowing the arc inside the tubular arcing contact (e).
- resulting in arc quenching when the current passes through the zero point.

4

The circuit breaker is open.



# Scope of Application and Some References

Our EvoPacT LF circuit breaker adapts to all electrical power distribution requirements up to 17.5 kV.

## Applications

EvoPacT LF circuit breakers are three-pole indoor MV circuit breakers.

They are mainly used for operation and protection of public, industrial and tertiary distribution networks from 7.2 to 17.5 kV.

Through their anti-seismic qualification, they are particularly well suited to nuclear or thermal power production installations and applications in heavy industries such as the petrochemical industry.

Through their compact dimensions and harmonized range, EvoPacT LF circuit breakers are positioned very favorably on the retrofit market.

EvoPacT LF Circuit breaker is a component integrated in MV switchgear used in power distribution to protect and control cables, transformer and MV substations, motors, capacitors banks, and so on.

SF<sub>6</sub> Self expansion breaking technique use in EvoPacT LF circuit breaker makes all current types, capacitive and inductive, without generating operating overvoltage that could damage the installation.

Therefore, it is greatly appropriate for the retrofit and upgrading of old installations.

A two thresholds pressure switch in standard to monitor the gas pressure (0.1 MPa, 0.05 MPa/ 1 bar, 0.5 bar).

An EvoPacT SF<sub>6</sub> circuit breaker is an essential component of an indoor metal-enclosed device intended for the MV section of HV/MV substations and high power MV/MV substations.

- EvoPacT SF<sub>6</sub> circuit breaker offers you:
  - Pre-engineered and adaptable solutions tailored to your specific requirements.
  - Significantly reduced maintenance.
  - Local support centres throughout the world.
- EvoPacT LF circuit breaker gives you the advantages of:
  - Continuity of service for your networks.
  - Enhanced safety for your staff and operations.
  - Optimised investment throughout the life of your installation.
  - The possibility of integrating your medium voltage switchboard in a monitoring and control system.

EvoPacT LF circuit breaker is present in all power distribution markets

## Energy

- Electric power stations (thermal, nuclear)
- Auxiliary substations
- Source substations

## Industry

- Oil and gas
- Chemical industry
- Paper mills
- Metallurgy
- Car industry
- Mining
- Cement plants

## Infrastructure

- Airports
- Ports
- Hospitals
- Water treatment

## Marine and Navy applications

- Cruisers
- Container ships
- Tankers
- Offshore platforms, fixed and mobile
- LNG (Liquid Natural Gas)
- Navy



## General Presentation

Scope of Application  
and Some References**Marine**

Jan de Nul	Belgium (MCSeT)
Zhen Hua Port Machinery	China (MCSeT)
FREMM	France (MCSeT)
Conti Rederei	Germany (MCSeT)
MSC	Italy (MCSeT)
M.O.L.	Japan (MCSeT)
STX Shipyard	Korea (MCSeT)
CPOC	Malaya (MCSeT)
Subsea	Norway (MCSeT)
Sovcomflot	Russia (MCSeT)
TMT	Taiwan (MCSeT)
British Gas	United Kingdom (MCSeT)
Norwegian Cruise Lines	USA (MCSeT)

**Industry**

Algérienne des eaux	Algeria (MCSeT)
Water treatment, Degremont	Argentina (MCSeT)
Alcoa Aluminium	Australia (MCSeT)
Croesus Mining	Australia (MCSeT)
Rolleston Coal Pty LTD	Australia (MCSeT)
Ciment Karadag	Azerbaijan (MCSeT)
Volvo	Belgium (MCSeT)
Cement Lafarge	Equator - Turkey (MCSeT)
Cement Lafarge	France (MCSeT)
Ford	Germany (MCSeT)
Irak Traitement des eaux	Irak
Arab Union Contracting Company	Libya (MCSeT)
Arcelor	Luxemburg (MCSeT)
Opel	Russia (MCSeT)
Ciment Bastas	Turkey (MCSeT)

**Power generation**

Sonelgaz	Algeria (MCSeT)
Moranbah Generation Facility	Australia (MCSeT)
China Nuclear Power programmes	China (MCSeT)
CEA Cadarache	France (MCSeT)
Enertherm	France (MCSeT)
Wind Turbines	France (MCSeT)
La Termica	Italy (MCSeT)
Al Fanar Electrical System	KSA (MCSeT)
Skagerak Nett AS	Norway (MCSeT)
EVN thermal power station	Vietnam (MCSeT)

**Oil and Gas**

Girassol Mpg-Elf	Angola (MCSeT)
ONAL	Gabon (MCSeT)
Alya Co	Kazakhstan (MCSeT)
Tengiz Chevroil JV	Kazakhstan (MCSeT)
Occidental Mukhaizna LLC	Oman (MCSeT)
Qatar Petroleum	Qatar (MCSeT)
Repsol, Santander	Spain (MCSeT)
Syrian Gas Company	Syria (MCSeT)
Turkmengaz	Turkmenistan (MCSeT)
Abu Dhabi Oil Refining Company	United Arab Emirates (MCSeT)
Yemen LNG Company	Yemen (MCSeT)
Yemgas - Technip	Yemen (MCSeT)

**Infrastructure**

Italian Railways	Italy (MCSeT)
Alicante airport	Spain (MCSeT)
Port of Laem Chabang	Thailand (MCSeT)



# Operating Conditions and Standards

PES0251



## Operating Conditions

Normal operating conditions, according to the IEC International Standards listed below, for indoor switchgear.

### Ambient Air Temperature

- Less than or equal to 40 °C.
- Less than or equal to 35 °C on average over 24 hours.
- Greater than or equal to -25 °C.

### Altitude

- Less than or equal to 1000 m.
- Above 1000 m, a derating coefficient is applied (contact Schneider Electric).

### Atmosphere

- No dust, smoke, or corrosive or inflammable gas and vapor, or salt.

### Humidity

- Average relative humidity over a 24 hour period  $\leq 95\%$ .
- Average relative humidity over a 1 month period  $\leq 90\%$ .
- Average vapor pressure over a 24 hour period  $\leq 2.2$  kPa.
- Average vapor pressure over a 1 month period  $\leq 1.8$  kPa.

## Storage conditions

In order to retain all of the functional units qualities when stored for prolonged periods, we recommend that the equipment is stored in its original packaging, in dry conditions, and sheltered from the sun and rain at a temperature ranging from -40 °C up to +70 °C.

## Standards

The EvoPacT LF range meets the following international standards:

- IEC 62271-100: High-voltage switchgear and controlgear - Alternating current circuit breakers.
- IEC 62271-1: High-voltage switchgear and controlgear: common specifications.
- GOST conformity: R52565 - 2006.

PM104595





# EvoPacT LF Circuit Breakers Panorama

## General Presentation

One range of comprehensive and proven three-pole circuit breaker units for indoor installation using SF<sub>6</sub> technology.

Both compact and dependable, it is ideally suited to the most demanding applications.

PM109886



EvoPacT LF circuit breakers fixed version  
7.2–17.5 kV

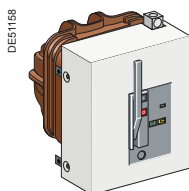
PM109889



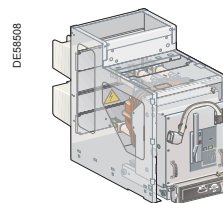
EvoPacT LF circuit breakers withdrawable version  
7.2–17.5 kV

### EvoPacT LF Range Circuit Breakers

#### LF1-LF2-LF3

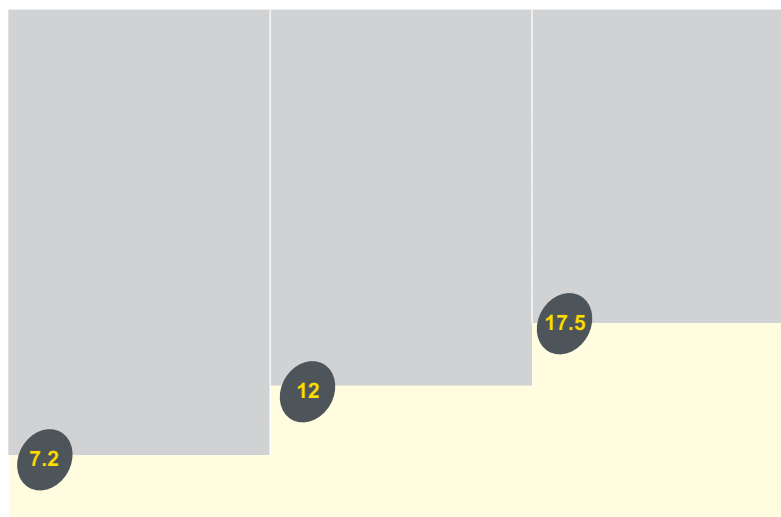


Fixed



Withdrawable

Rated voltage Ur (kV, 50/60 Hz)



Rated short-circuit breaking current (Isc)

25–50 kA	25–40 kA
----------	----------

Rated current (Ir)

630–3150 A
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# EvoPacT LF Circuit Breakers Fixed Version

# Contents

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# EvoPacT LF SF<sub>6</sub> Circuit Breaker

## Presentation

### Fixed Version

PM109588



EvoPacT LF1 - LF2 - LF3 circuit breakers

PM109891



EvoPacT LF1 - LF2 - LF3 circuit breakers installed on a support frame

## Description of the Device

The EvoPacT LF circuit breaker comprises a basic fixed version:

- 3 poles integrated in a sealed pressure system type insulating enclosure. The sealed assembly is filled with SF<sub>6</sub> gas at low relative pressure (0.15 MPa/1.5 bars and equipped with a pressure switch.
- A RI stored energy electrical operating mechanism. This gives the device an opening and closing speed that is independent of the operator, for both electrical and manual orders. It enables reclosing cycles to be carried out.
- A front panel housing the manual operating mechanism and status indicators.
- Upstream and downstream terminals for the power circuit connection.
- A terminal block for connection of external auxiliary circuits.

Each device can also be fitted with the following options:

- A seismic version is available, allowing to withstand the specific parameters of earthquakes and marine applications.
- A supporting frame equipped with rollers and ground fixing brackets for fixed installation.
- Circuit breaker locking in the open position by a keylock installed on the front plate of the operating mechanism.
- A 42-pin Harting type LV connector.

# EvoPacT LF SF<sub>6</sub> Circuit Breaker

## Fixed Version

# General Characteristics

Electrical characteristics according to IEC 62271-100				EvoPacT LF1				EvoPacT LF2			
Rated voltage	Ur	kV 50/60 Hz		7.2		12		7.2		12	17.5
Insulation voltage											
- Power frequency withstand	Ud	kV 50 Hz 1min*		20		28		20		28	38
- Lightning impulse withstand	Up	kV peak		60		75		60		75	95
Rated current	Ir	A	630	■	■	■	■	■	■	■	■
			1250	■	■	■	■	■	■	■	■
			2000	–	–	–	–	■	■	■	■
Short circuit current	Isc	kA		25	31.5	25	31.5	40	50	40	25
Short time withstand current	I <sub>k</sub> /t <sub>k</sub>	kA/3 s		25	31.5	25	31.5	40	50	40	25
Short-circuit making current	I <sub>p</sub>	kA peak	50 Hz	63	79	63	79	100	125	100	63
			60 Hz	65	82	65	82	104	130	104	65
Rated switching sequence		O-3 min-CO-3 min-CO		■	■	■	■	■	■	■	■
		O-0.3 s-CO-3 min-CO		■	■	■	■	■	■	■	■
		O-0.3 s-CO-15 s-CO		■	■	■	■	■	■	■	■
Operating times		Opening ms		< 54				< 54			
		Breaking ms		< 70				< 70			
		Closing ms		< 72				< 72			
Service temperature	T	°C		-25 to +40				-25 to +40			
Mechanical endurance		Class		M2				M2			
		Number of switching operations		10,000				10,000			
Electrical endurance		Class		E2				E2			
Capacitive current breaking capacity		Class		C2				C2			

\* Ud 42 kV 50 Hz, 1 min available in standard.

■ Available

– Not available

Electrical characteristics according to IEC 62271-100				EvoPacT LF3											
Rated voltage	Ur	kV 50/60 Hz		7.2				12				17.5			
Insulation voltage															
- Power frequency withstand	Ud	kV 50 Hz 1min*		20				28				38			
- Lightning impulse withstand	Up	kV peak		60				75				95			
Rated current	Ir	A	630	–	–	–	–	–	–	–	–	–	–	–	–
			1250	–	–	–	–	–	–	–	■	–	–	■	
			2000	–	–	–	–	–	–	–	–	–	–	–	
			2500	■	■	■	■	■	■	■	■	■	■	■	
			3150	■	■	■	■	■	■	■	■	■	■	■	
Short circuit current	Isc	kA		25	31.5	40	50	25	31.5	40	50	25	31.5	40	
Short time withstand current	Ik/tk	kA/3 s		25	31.5	40	50	25	31.5	40	50	25	31.5	40	
Short-circuit making current	Ip	kA peak	50 Hz	63	79	100	125	63	79	100	125	63	79	100	
			60 Hz	65	82	104	130	65	82	104	130	65	82	104	
Rated switching sequence	O-3 min-CO-3 min-CO			■	■	■	■	■	■	■	■	■	■	■	
	O-0.3 s-CO-3 min-CO			■	■	■	■	■	■	■	■	■	■	–	
	O-0.3 s-CO-15 s-CO			■	■	■	■	■	■	■	■	■	■	–	
Operating times	Opening ms			< 54											
	Breaking ms			< 70											
	Closing ms			< 72											
Service temperature	T	°C		-25 to +40											
Mechanical endurance	Class			M2											
	Number of switching operations			10,000											
Electrical endurance	Class			E2											
Capacitive current breaking capacity	Class			C2											

\* Ud 42 kV 50 Hz, 1 min available in standard.

■ Available

– Not available

## Specific applications

### Protection of generators and power station auxiliaries

All circuit breakers in the EvoPacT LF range break short circuit currents with an asymmetry of at least 30%.

In cases where the network constant L/R is greater than 45 ms, the asymmetry to be broken is higher; this is often the case of circuit breakers protecting nuclear or thermal power station auxiliaries or circuit breakers that are close to generator sets or large transformers.

Specific tests have been carried out:

Circuit breakers	kV	kA	Asymmetry
EvoPacT LF2	7.2	43.5	50%
EvoPacT LF3	7.2	43.5	50%
	12	40	50%
	17.5	25	100%

### Switching and protection of capacitor banks

EvoPacT LF range circuit breakers are particularly well suited to switching and protection of capacitor banks; they are classed C2 according to standard IEC 62271-100.

Tests carried out according to the standard for breaking at 400 A with making and breaking cycles in case of a capacitor bank with a making current of 20 kA.



# EvoPacT LF SF<sub>6</sub> Circuit Breaker Fixed Version

## Description of Functions RI Stored Energy Operating Mechanism Wiring diagram

PM109995



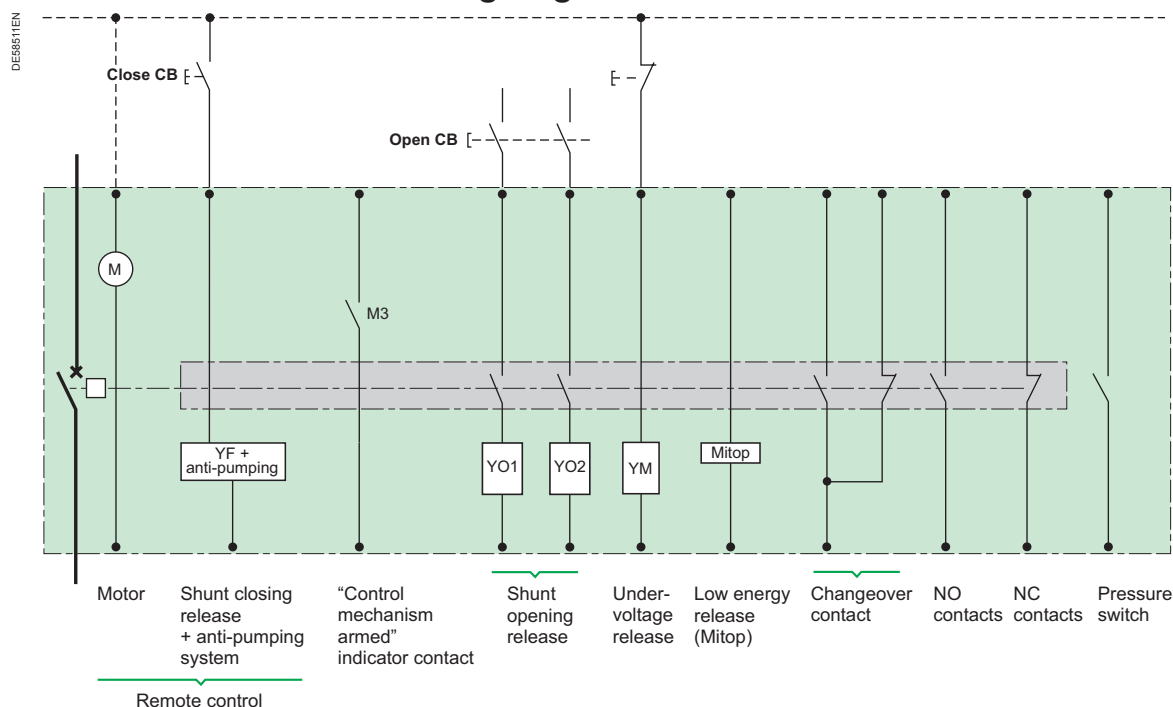
### Operation of the RI Stored Energy Operating Mechanism

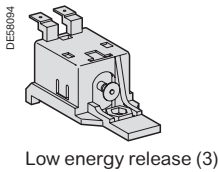
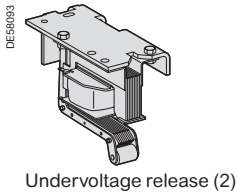
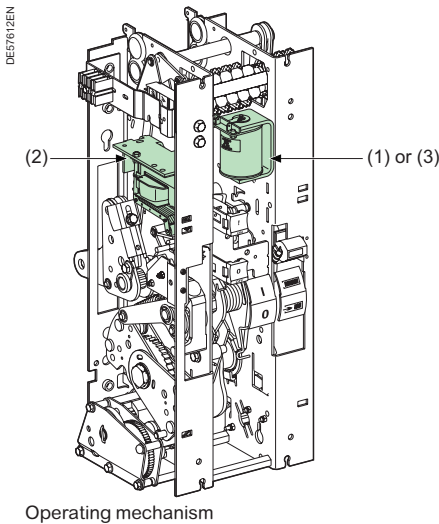
This mechanism guarantees the device an opening and closing speed unaffected by the operator, for both electric and manual orders. It carries out the O and CO cycles and is automatically recharged by a gear motor after closing.

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 (red and black).
- An electrical remote closing device containing a release with an antipumping relay.
- An electrical opening device containing one or more releases, for example:
  - Shunt trip devices.
  - Mitop, a low consumption release, used only with the self protection relay.
- An operation counter.
- A position indication device by mechanical indicator (black and white) and a module of 14 auxiliary contacts whose availability varies according to the diagram used.
- A device for indicating charged operating mechanism status by mechanical indicator and electrical contact.
- A two thresholds pressure switch allows to monitor the gas pressure (0.1 MPa, 0.05 MPa/1 bar, 0.5 bar, relative pressure).

### Wiring diagram





## 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 Order Forms page.

### Shunt Opening Release (YO1 and YO2)

Energizing this unit causes instant opening of the circuit breaker.

Characteristics		
Power supply	See Order Forms page	
Threshold	Vac	0.85 to 1.1 Ur
	Vdc	0.7 to 1.1 Ur
Consumption	Vac	160 VA
	Vdc	50 W

As an option, the tripping circuit monitoring (supervision) enables to ensure that the circuit breaker is ready to open.

### 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 compulsory when the supply voltage of the release unit reaches 85% of its rated voltage.

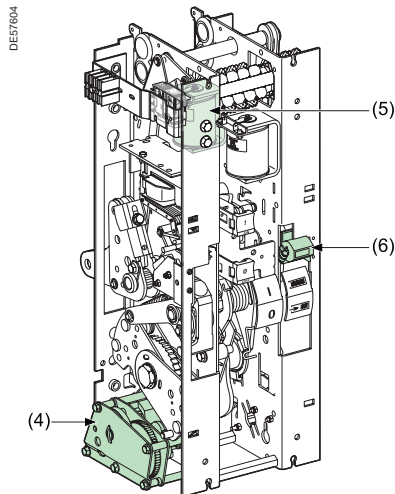
Characteristics			
Power supply		See Order Forms page	
Threshold		Opening	0.35 to 0.7 Ur
		Closing	0.85 Ur
Consumption	Triggering	Vac	400 VA
		Vdc	100 W
	Latched	Vac	100 VA
		Vdc	10 W

### Low Energy Release (Mitop)

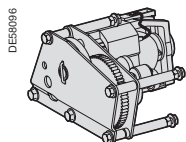
This specific release unit comprises a low consumption unit and is specifically used with self-powered relays. The circuit-breakers opening time must be adjusted with the relay to a minimum value of 45 ms.

Characteristics	
Power supply	Direct current
Threshold	0.6 A < I < 3 A

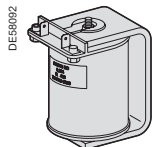
Any tripping due to the Mitop release unit is momentarily indicated by an SDE type changeover contact.



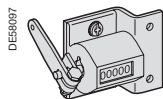
Operating mechanism



Electrical motor with 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 arms and re-arms the stored energy unit as soon as the circuit breaker is closed. This allows the instant closing of the device after opening.  
The arming lever is only used as a back-up operating mechanism in the case of any auxiliary power supply.  
The M3 contact indicates the end of arming operations.

Characteristics		
Power supply	See Order Forms page	
Threshold	Vac/Vdc	0.85 to 1.1 Ur
Consumption	Vac	380 VA
	Vdc	380 W

#### Shunt Closing Release (YF)

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

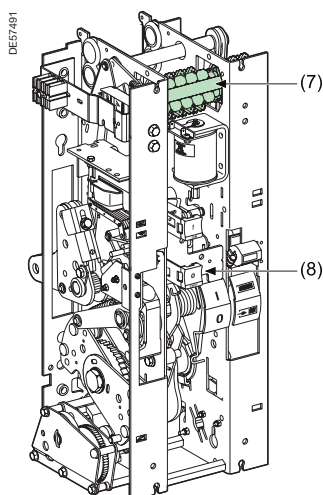
Characteristics		
Power supply	See Order Forms page	
Threshold	Vac	0.85 to 1.1 Ur
	Vdc	0.85 to 1.1 Ur
Consumption	Vac	160 VA
	Vdc	50 W

The anti-pumping relay enables the guaranteeing of opening priority in the case of a permanent closing order. This therefore avoids the device being caught in a uncontrolled opening-closing loop.

#### 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.

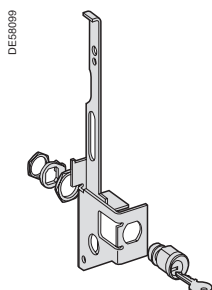




Operating mechanism



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 breakers operating mechanism comprises a total of:

- 7 normally closed contacts (NC).
- 7 normally open contacts (NO).
- 1 changeover contact (CHG).

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

Options	NC contact	NO contact
Remote control	1	1
Shunt opening release (each one) YO1/YO2	0	1
Undervoltage release YM	0	0
Low energy release (Mitop)	0	0

In order to know the final number of available contacts, you must deduct the total number of contacts included in the circuit breaker (7 NC + 7 NO + 1 CHG), the number of contacts used given in the table above.

For example: a circuit breaker equipped with a remote control and a shunt trip unit has the following available contacts:  
6 NC + 5 NO + 1 CHG.

With a undervoltage release instead of the shunt trip, this circuit breaker would have the following available contacts:  
6 NC + 6 NO + 1 CHG.

Shunt opening release combination			
1st release	Shunt opening release YO1	Undervoltage release YM	Mitop
2nd release			
Without	6NC+5NO+1CHG	6NC+6NO+1CHG	6NC+6NO+1CHG
Shunt opening release YO2	6NC+4NO+1CHG		
Undervoltage release YM	6NC+5NO+1CHG		
Mitop	6NC+5NO+1CHG	6NC+6NO+1CHG	

## Locking the Circuit Breaker in the Open Position

This key-operated device allows the circuit breaker to be locked in the open position.

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

Locking is achieved using a Profalux or Ronis captive key type keylock.

# EvoPacT LF SF<sub>6</sub> Circuit Breaker

## Fixed Version

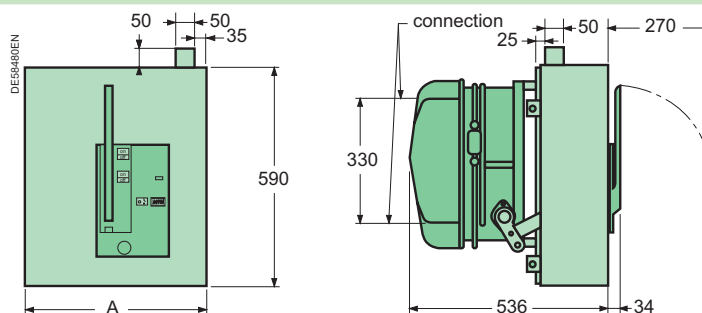
## Dimensions

### EvoPacT LF1, LF2, LF3 Circuit Breakers

#### Device

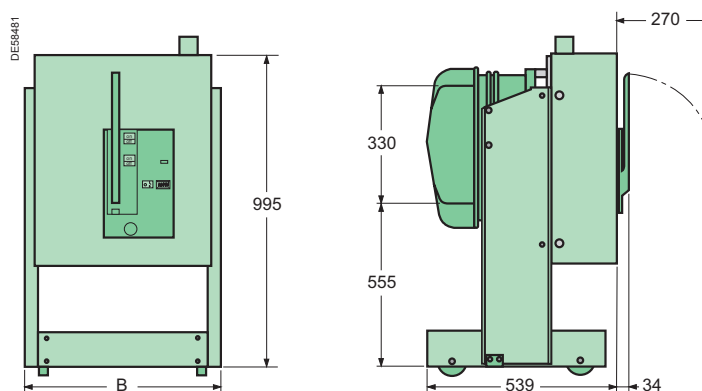
##### Fixed version

EvoPacT	LF1	LF2	LF3
A	493	554	728
Weight (Kg)*	115	134	197



##### Fixed version with support frame (to be ordered separately)

EvoPacT	LF1	LF2	LF3
B	542	602	776
Weight (Kg)*	135	154	217

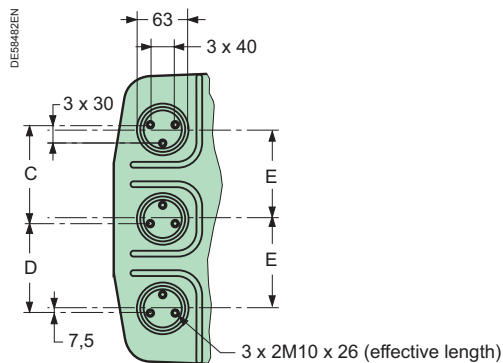


\* Maximum values, depending on ratings and options.

#### Connections

##### Direct to the device

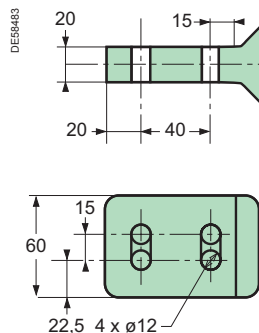
- EvoPacT LF1
- EvoPacT LF2 < 2000 A < 95 kV impulse
- EvoPacT LF3 < 2500 A and < 95 kV impulse



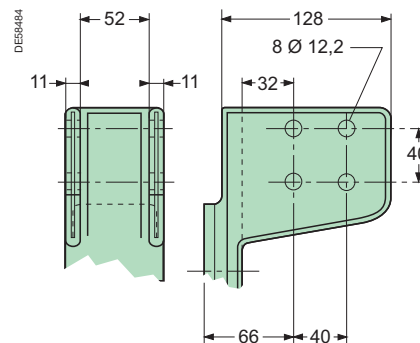
EvoPacT	LF1	LF2	LF3
C	160	180	240
D	145	165	225
E	145	165	225

##### Connection on pads

- EvoPacT LF2:
  - 2000 A
  - 1250 A/95 kV impulse
  - 630 A/95 kV impulse
- EvoPacT LF3:
  - 1250 A/95 kV impulse



- EvoPacT LF3:
  - 2500 A/95 kV impulse
  - 3150 A/95 kV impulse



##### Note:

- Recommended connection screw M10 class 8.8.
- Tightening torque: 50 N•m with contact washer.
- Connectors delivered mounted on the device.
- For more details refer to the dimensional drawings.



# EvoPacT LF Circuit Breakers Withdrawable Version





# Contents

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# EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

## Presentation

PM109589



EvoPacT LF withdrawable circuit breaker  
and MC cassette

## Description of the Device

**The basic withdrawable version of the EvoPacT LF circuit breaker comprises:**

- The circuit breaker unit with its operating mechanism:
  - 3 poles integrated in a sealed pressure system type insulating enclosure. The sealed assembly is filled with SF<sub>6</sub> gas at low relative pressure (0.15 MPa/1.5 bars) and equipped with a pressure switch.
  - An RI stored energy electrical operating mechanism. This gives the device an opening and closing speed that is independent of the operator, for both electrical and manual orders. It enables reclosing cycles to be carried out.
  - A front panel housing the manual operating mechanism and status indicators.
- The components enabling it to be withdrawable:
  - The circuit breaker is equipped with racking arms and contact fingers and mounted on a racking-in/racking-out drive device with a threaded shaft activated by a handle, including all of the safety interlock systems.
  - A Harting type male LV connector allows connection of the external auxiliary circuits.

**Each device can optionally be fitted with:**

- Locking of the circuit breaker in the following positions:
    - Racked-out, by a key lock installed on the drive device for disconnecting truck.
  - The basic MC cassette, comprising:
    - A metal structure and two guide rails.
    - Fixed connection fingers insulated by bushings.
    - Metal shutters to insulate from the HV part.
    - Safety interlocking systems.
    - A female Harting type LV connector.
  - MC cassette options:
    - Circuit breaker racked-in or out position indicator contacts.
    - A circuit breaker operating mechanism spring discharge system.
    - A circuit breaker racked-in blocking mechanism.
    - An extraction tool.
    - An equipped door.
    - A foolproof device for the circuit breaker rating.
    - An earthing switch operating mechanism.
- Refer to *MV Switchboards Components, Catalog* (AMTED305019EN).

# General Characteristics

## EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

Electrical characteristics according to IEC 62271-100				Circuit breaker LF1/Cassette MC1			
Rated voltage	Ur	kV 50/60 Hz		7.2		12	
Insulation voltage							
- Power frequency withstand	Ud	kV 50 Hz 1min*		20		28	
- Lightning impulse withstand	Up	kV peak		60		75	
Rated current	Ir	A	630	■	■	■	■
			1250	■	■	■	■
Short circuit current	Isc	kA		25	31.5	25	31.5
Short time withstand current	Ik/tk	kA/3 s, kA/1 s		25	31.5	25	31.5
Short-circuit making current	Ip	kA peak	50 Hz	63	79	63	79
			60 Hz	65	82	65	82
Rated switching sequence		O-3 min-CO-3 min-CO		■	■	■	■
		O-0.3 s-CO-3 min-CO		■	■	■	■
		O-0.3 s-CO-15 s-CO		■	■	■	■
Operating times		Opening ms		< 54			
		Breaking ms		< 70			
		Closing ms		< 72			
Service temperature	T	°C		-25 to +40			
Mechanical endurance		Class		M2			
		Number of switching operations		10,000			
Electrical endurance		Class		E2			
Capacitive current breaking capacity		Class		C2			

\* Ud 42 kV 50 Hz, 1 min available in standard.

■ Available

### Specific applications

#### Protection of generators and power station auxiliaries

All circuit breakers in the EvoPacT LF range break short circuit currents with an asymmetry of at least 30%.

In cases where the network constant L/R is greater than 45 ms, the asymmetry to be broken is higher; this is often the case of circuit breakers protecting nuclear or thermal power station auxiliaries or circuit breakers that are close to generator sets or large transformers.

Specific tests have been carried out:

Circuit breakers	kV	kA	Asymmetry
EvoPacT LF2	7.2	43.5	50%
EvoPacT LF3	7.2	43.5	50%
	12	40	50%
	17.5	25	100%

#### Switching and protection of capacitor banks

EvoPacT LF range circuit breakers are particularly well suited to switching and protection of capacitor banks; they are classed C2 according to standard IEC 62271-100.

Tests carried out according to the standard for breaking at 400 A with making and breaking cycles in case of a capacitor bank with a making current of 20 kA.



# General Characteristics

EvoPacT LF SF<sub>6</sub> Circuit Breaker

Withdrawable Version

Electrical characteristics according to IEC 62271-100				Circuit breaker LF2/Cassette MC2								
Rated voltage	Ur	kV 50/60 Hz		7.2				12			17.5	
Insulation voltage												
- Power frequency withstand	Ud	kV 50 Hz 1min*		20				28			38	
- Lightning impulse withstand	Up	kV peak		60				75			95	
Rated current	Ir	A	630	–	–	■	■**	–	–	■	■	■
			1250	■	■	■	■**	–	–	■	■	■
			1600	■	■	■	■**	■	■	■	■	■
Short circuit current	Isc	kA		25	31.5	40	50	25	31.5	40	25	31.5
Short time withstand current	Ik/tk	kA/3 s, kA/1 s		25	31.5	40	50**	25	31.5	40	25	31.5
Short-circuit making current	Ip	kA peak	50 Hz	63	79	100	125	63	79	100	63	79
			60 Hz	65	82	104	130	65	82	104	65	82
Rated switching sequence	O-3 min-CO-3 min-CO			■	■	■	■	■	■	■	■	■
	O-0.3 s-CO-3 min-CO			■	■	■	■	■	■	■	■	■
	O-0.3 s-CO-15 s-CO			■	■	■	■	■	■	■	■	■
Operating times	Opening ms			< 54								
	Breaking ms			< 70								
	Closing ms			< 72								
Service temperature	T	°C		-25 to +40								
Mechanical endurance	Class			M2								
	Number of switching operations			10,000								
Electrical endurance	Class			E2								
Capacitive current breaking capacity	Class			C2								

\* Ud 42 kV 50 Hz, 1 min available in standard.

\*\* Rated short-circuit breaking duration (t<sub>k</sub>): 1 s.

■ Available

– Not available

Electrical characteristics according to IEC 62271-100				Circuit breaker LF3/Cassette MC3											
Rated voltage		Ur	kV 50/60 Hz	7.2				12				17.5			
Insulation voltage															
- power frequency withstand		Ud	kV 50 Hz 1min*	20				28				38			
- lightning impulse withstand		Up	kV peak	60				75				95			
Rated current	Ir	A	630	–	–	–	–	–	–	–	–	–	–	–	–
			1250	–	–	–	–	–	–	–	■**	–	–	■	
			1600	–	–	–	–	–	–	–	–	–	–	–	
			2500	■	■	■	■	■	■	■	■	■	■	■	
			3150	■	■	■	■	■	■	■	■	■	■	■	
Short circuit current		Isc	kA	25	31.5	40	50	25	31.5	40	50	25	31.5	40	
Short time withstand current		I <sub>k</sub> /t <sub>k</sub>	kA/3 s, kA/1 s	25	31.5	40	50	25	31.5	40	50	25	31.5	40	
Short-circuit making current		Ip	kA peak	50 Hz	63	79	100	125	63	79	100	125	63	79	100
			60 Hz	65	82	104	130	65	82	104	130	65	82	104	
Rated switching sequence		O-3 min-CO-3 min-CO		■	■	■	■	■	■	■	■	■	■	■	■
		O-0.3 s-CO-3 min-CO		■	■	■	■	■	■	■	■	■	■	■	–
		O-0.3 s-CO-15 s-CO		■	■	■	■	■	■	■	■	■	■	■	–
Operating times		Opening ms		< 54											
		Breaking ms		< 70											
		Closing ms		< 72											
Service temperature		T	°C	–25 to +40											
Mechanical endurance		Class		M2											
		Number of switching operations		10 000											
Electrical endurance		Class		E2											
Capacitive current breaking capacity		Class		C2											

\* Ud 42 kV 50 Hz, 1 min available in standard.

\*\* Rated short-circuit breaking duration (t<sub>k</sub>): 1 s.

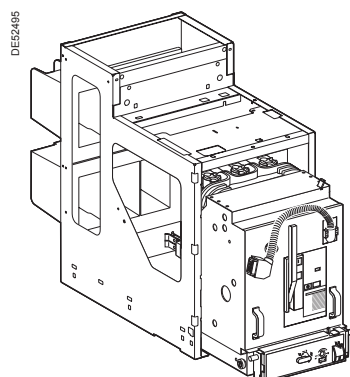
■ Available

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# EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

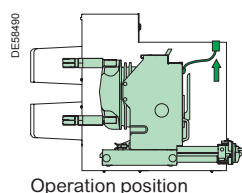
## Description of Functions Racking-in



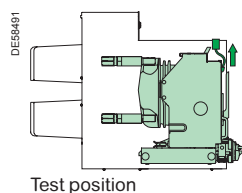
### Assembly Components

The racking-in/racking-out function is achieved by:

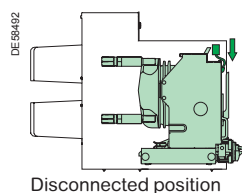
- the withdrawable circuit breaker with its LV connector (mobile part).
- the cassette with its bushings (fixed part).



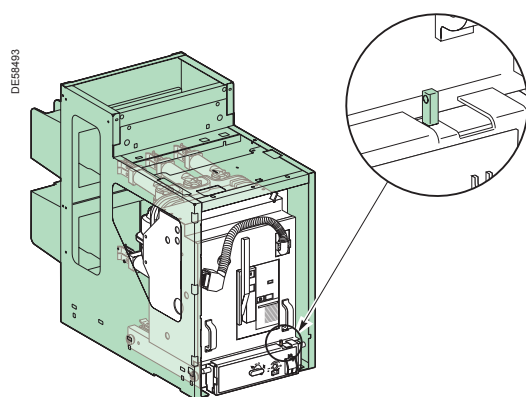
Operation position



Test position



Disconnected position



Interlocking door-cubicle

### Circuit Breaker Operation

The withdrawable 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 extracted and locked in this position, LV plug disconnected.

### Circuit Breaker Safety Functions

A racking system with a threaded shaft makes it easier to rack-in and rack-out.

#### Test position contact

This is activated when the circuit breaker is in the test or service positions. Earthing is achieved throughout the operation through the racking carriage wheels. An addition earthing system can be supplied as an option.

#### Interlocking mechanisms

In conformity with IEC standards 62271-100 and 62271-200, the following interlocks are available:

- Prohibiting racking-in or racking-out if the circuit breaker is not in the open position.
- Prohibiting racking-in of the circuit breaker if the LV connector is not connected.
- Prohibiting disconnecting of the LV connector if the circuit breaker is not racked-out.

#### Cubicle door interlocking mechanism (MC cassette door only)

The racking base is equipped with a device that allows interlocking between racking-out of the circuit breaker and the cubicle door.

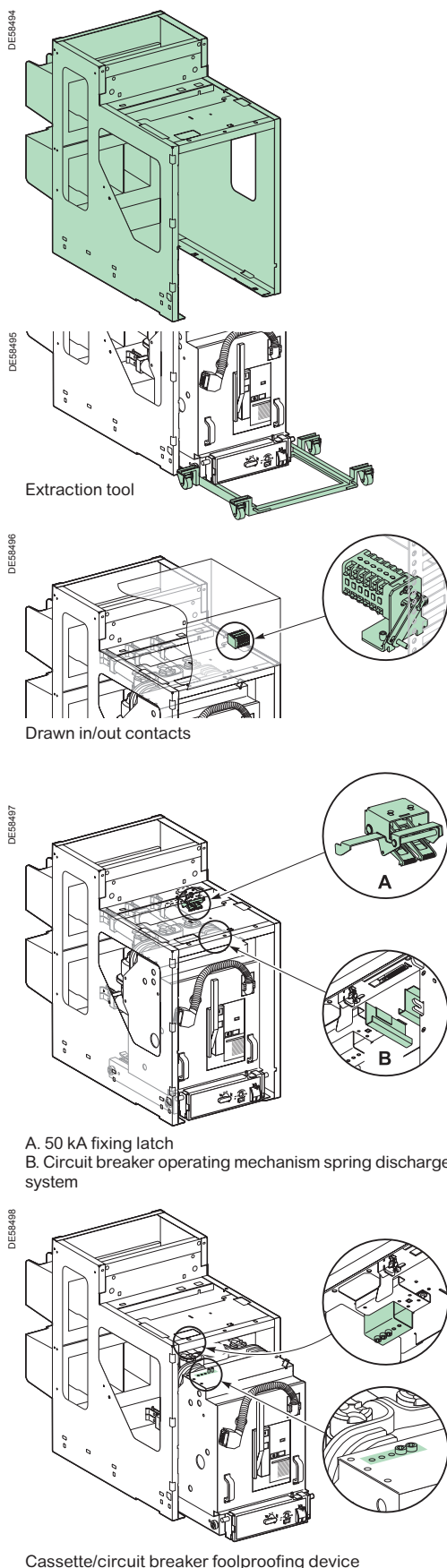
- Only possible to rack-in the circuit breaker only if the door is closed.
- Only possible to open the door only if the circuit breaker is racked-out.

This device must be disabled if the interlocking function is not present.



## EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

# Description of Functions Racking-in



## MC Cassette Safety Functions

The MC cassette is designed to receive the EvoPacT LF circuit breaker and comprises the following components ensuring safety when racking-in (see details in the Installation Guide ref. 07897536EN).

### Metal structure with two guide rails

The rails guide the EvoPacT LF circuit breaker during racking-in/out operations.

### Fixed connection fingers insulated by bushings

The three ends of the circuit breaker, fitted with racking clusters, provide the contact with these three fingers.

### Metal shutters to insulate from the MV part

Three shutters mounted on the structure stop access to the racking fingers when the circuit breaker is extracted (protection index: IP2X).

### Safety interlocking systems

When carrying out maintenance operations, it is possible to:

- Padlock the shutters in the closed position
- Unlock the access mechanism to the fixed contacts.

### Anti-drop function

This function ensures operator safety during circuit breaker extraction.

## Compulsory MC Cassette Accessories

### Female Harting low voltage connector

A connector with a cable can either be delivered with the circuit breaker or separately.

### Panel with circuit breaker operation pictograms

A self-adhesive panel shows racking-in and racking-out operations for the circuit breaker. This is systematically delivered when the circuit breaker is ordered either with the cassette or as a separate order.

### Racking handle

The handle is used for circuit breaker racking-in/racking-out operations and for earthing switch opening and closing operations.

### Extraction tool

A standard tool allows the breaking device to be extracted from each cassette version, whatever the installation height, up to 800 mm from the ground.

- A simplified extraction tool can be manufactured locally according to the installation height.

### 50 kA fixing latch

This upper lock enabling the circuit breaker to be held in the cassette in the case of a fault, is compulsory for EvoPacT LF2/EvoPacT LF3 circuit breakers with 40 and 50 kA withstand.

## MC Cassette Options

### Circuit breaker racked-in or racked-out position indicator contacts

12 contacts (6 NO + 6 NC)

### Circuit breaker operating mechanism spring discharge system

Circuit breaker operating mechanism springs are automatically discharged when it is extracted from the cubicle. This function avoids any risk of unwanted circuit breaker closing.

### Mechanical circuit breaker racked-in lock

This option is included when the earthing switch is installed. However, it can be delivered separately if the earthing circuit breaker is not required: it takes the space and volume of the earthing switch operating mechanism.

### Equipped MV access door

Possibility of delivering a fully equipped, available with or without the manual circuit breaker closing mechanism.

### Foolproofing device

This enables foolproofing of the circuit breaker rating relative to the cassette rating. This system is mounted on the cassette side. The corresponding combining of the right circuit breaker rating must be carried out by the panel builder.

### Earthing switch operating mechanism

This can be mounted under the cassette, for suitable interlocking between the circuit breaker and the earthing switch.

Refer to *Installation guide* (07897490EN).

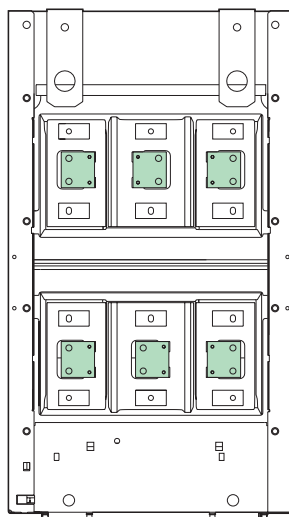
## EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

# Description of Functions Connection

## MV Connection

The customer connection is easily made at the rear of the cassette on the connection terminals integrated in the bushings.  
(see drilling details in the Installation Guide ref. 07897536EN).

DE56499



## LV Connection

With the withdrawable circuit breaker, the LV cabling has an LV connector with:

- A mobile part (male Harting connector) at the end of a flexible cable, fully connected to the operating mechanism terminal by a sleeve.
- A fixed part (female Harting connector) compatible with the male part mounted at the top, inside the cassette.

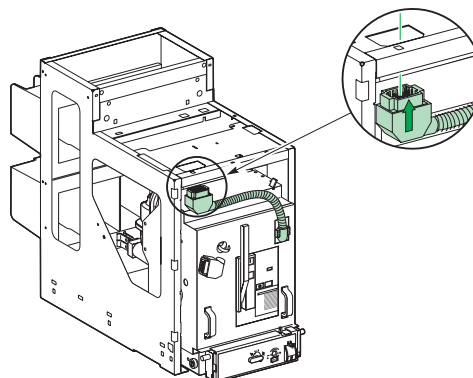
## Interlocking Function

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 plug connection

DE58500





## EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

# Description of Functions

## RI Stored Energy Operating Mechanism Wiring diagram

PM109995



### Operation of the RI Stored Energy Operating Mechanism

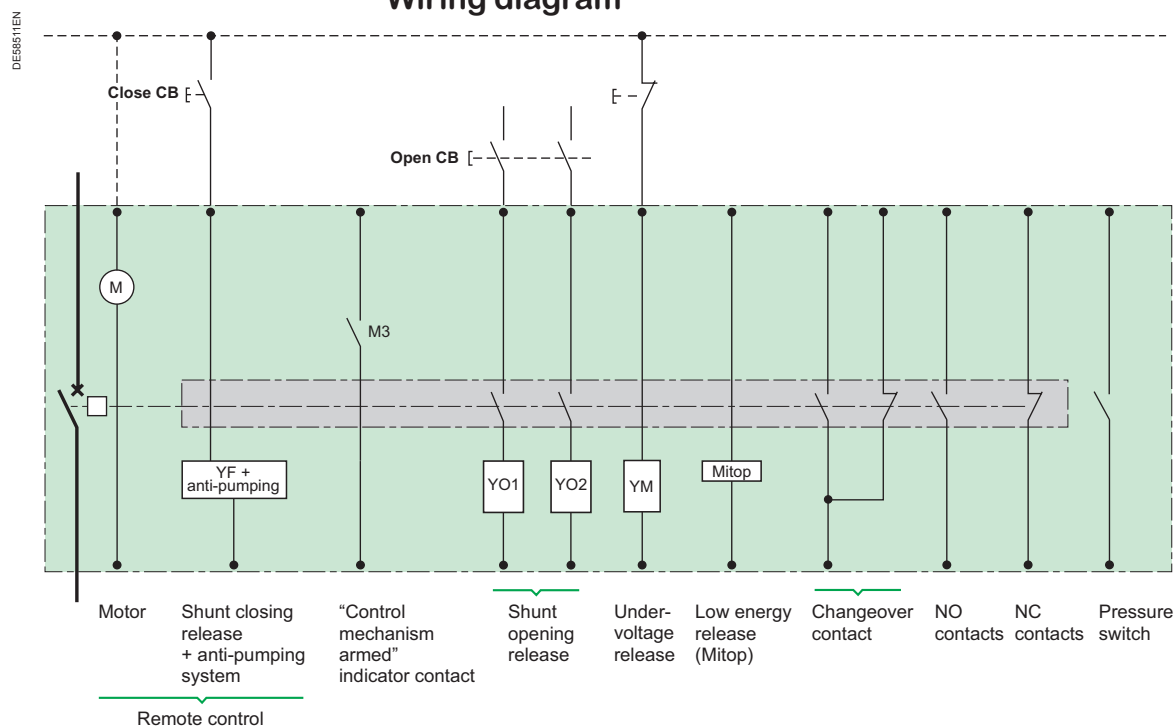
This mechanism guarantees the device an opening and closing speed unaffected by the operator, for both electric and manual orders.

It carries out the O and CO cycles and is automatically recharged by a gear motor 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 (red and black).
- 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 trip devices.
  - Mitop, a low consumption release, used with self protection relay.
- An operation counter.
- A position indication device by mechanical indicator (black and white) and a module of 14 auxiliary contacts whose availability varies according to the diagram used.
- A device for indicating charged operating mechanism status by mechanical indicator and electrical contact.
- A two thresholds pressure switch allows to monitor the gas pressure (0.1 MPa, 0.05 MPa/1 bar, 0.5 bar, relative pressure).

### Wiring diagram

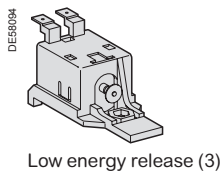
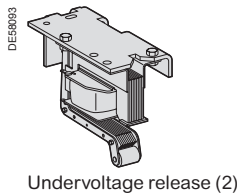
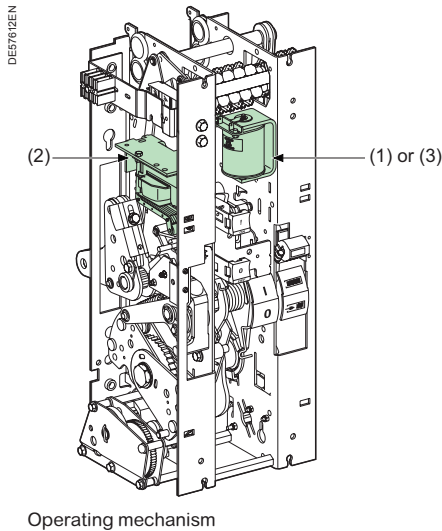


# EvoPacT LF SF<sub>6</sub> Circuit Breaker

## Withdrawable Version

# Description of Functions

## Opening Circuit



## 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, Order Forms page.

### Shunt Opening Release (YO1 and YO2)

Energizing this unit causes instant opening of the circuit breaker.

Characteristics		
Power supply	See Order Forms page	
Threshold	Vac	0.85 to 1.1 Ur
	Vdc	0.7 to 1.1 Ur
Consumption	Vac	160 VA
	Vdc	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			
Power supply		See Order Forms page	
Threshold		Opening	0.35 to 0.7 Ur
		Closing	0.85 Ur
Consumption	Triggering	Vac	400 VA
		Vdc	100 W
	Latched	Vac	100 VA
		Vdc	10 W

### Low Energy Release (Mitop)

This specific release unit comprises a low consumption unit and is specifically used for Sepam 100LA self-powered relays. The circuit-breakers opening time must be adjusted with the relay to a minimum value of 45 ms.

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 (optional).

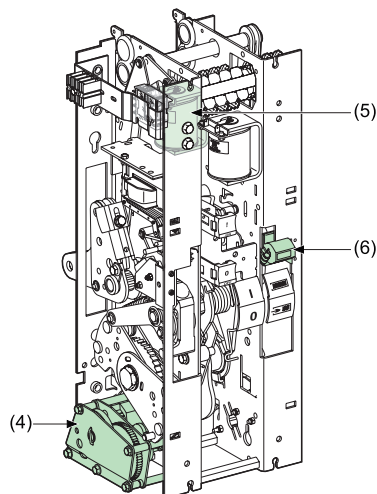




## EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

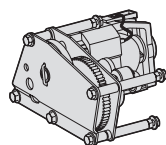
# Description of Functions Remote Control

DE57604



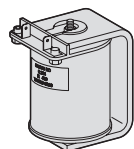
Operating mechanism

DE56096



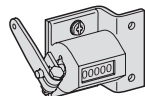
Electrical motor with gearing (4)

DE56002



Shunt closing release (5)

DE56097



Operation counter (6)

### Function

In its basic version, the circuit breaker comprises a remote control mechanism for remote circuit breaker opening and closing.

### 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 Forms page	
Threshold	Vac/Vdc	0.85 to 1.1 Ur
Consumption	Vac	380 VA
	Vdc	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 Forms page	
Threshold	Vac	0.85 to 1.1 Ur
	Vdc	0.85 to 1.1 Ur
Consumption	Vac	160 VA
	Vdc	50 W

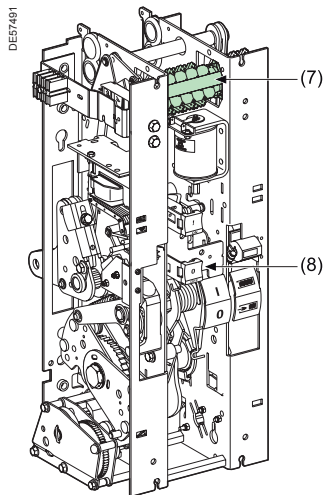
The shunt closing release is combined with an anti-pumping relay that enables priority to be given to opening in the case of a permanent closing order. This therefore avoids the device being caught in an uncontrolled opening-closing cycle.

#### 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.

# EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

## Description of Functions Indication and Locking/Interlocking



Operating mechanism



Auxiliary contacts (7)

### Open/Closed Auxiliary Contacts

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

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

- 7 normally closed contacts (NC).
- 7 normally open contacts (NO).
- 1 changeover contact (CHG).

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

Options		
	NC contact	NO contact
Remote control	1	1
Shunt opening release (each one) YO1/YO2	0	1
Undervoltage release YM	0	0
Low energy release (Mitop)	0	0

In order to know the final number of available contacts, you must deduct the total number of contacts included in the circuit breaker (7 NC + 7 NO + 1 CHG), the number of contacts used given in the table above.

For example: a circuit breaker equipped with a remote control and a shunt trip unit has the following available contacts:

6 NC + 5 NO + 1 CHG.

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

6 NC + 6 NO + 1 CHG.

Shunt opening release combination			
1st release	Shunt opening release YO1	Undervoltage release YM	Mitop
2nd release			
Without	6NC+5NO+1CHG	6NC+6NO+1CHG	6NC+6NO+1CHG
Shunt opening release YO2	6NC+4NO+1CHG		
Undervoltage release YM	6NC+5NO+1CHG		
Mitop	6NC+5NO+1CHG	6NC+6NO+1CHG	

Contacts characteristics			
Rated current			10 A
Breaking capacity	AC	220 V (cos φ ≥ 0.3)	1 A
	DC	110/220 V (L/R ≤ 0.02 s)	0.3 A



# EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version


## Description of Functions Safety Functions

This table describes the safety functions available on the withdrawable version of the EvoPacT LF circuit breaker.

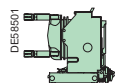
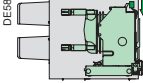
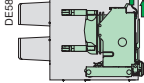
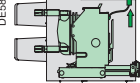
### How to use the table

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					
							
		Removed	Disconnected	Test position			Service
1 - Cradle			Fool-proof protection <sup>(1)</sup>				
			Anti-drop <sup>(2)</sup>				
		No opening shutters					
		Shutters padlocking possible					
2 - LV plug	Disconnected			Door closing impossible			
	Connected				No unplugging <sup>(5)</sup>		
3 - Circuit breaker	Closed		Auto-discharge function <sup>(3)</sup>		No racking-in		No racking-out
	Open				No closing		
		Open position circuit breaker locking available <sup>(3)</sup>					
4 - Switchboard door	Open				No racking-in		
	Closed				No door opening <sup>(4)</sup>		
5 - Earthing switch	Open				No earthing switch closing		
	Closed				No racking-in		

<sup>(1)</sup> This protection mechanism ensures that the performance levels of the circuit breaker correspond with those of the cassette.

<sup>(2)</sup> Device that prevents the circuit breaker from dropping when extracted from the cassette.  
The device can be either unlocked manually or when the extraction jig is put in position.

<sup>(3)</sup> Optional.

<sup>(4)</sup> Interlocking device to be fitted to the cubicle door.

<sup>(5)</sup> Because the door is closed.

# EvoPacT LF SF<sub>6</sub> Circuit Breaker Withdrawable Version

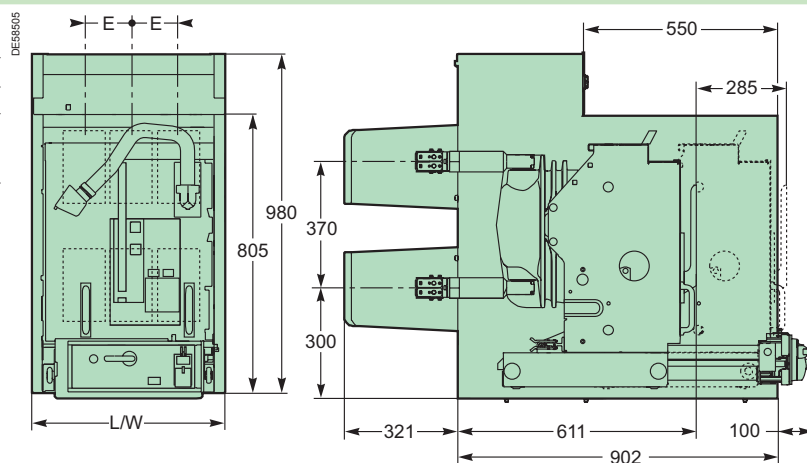
## Dimensions EvoPacT LF1, LF2, LF3 Circuit Breakers

### Device

#### Basic withdrawable

C.B./Cassette	LF1/MC1	LF2/MC2	LF3/MC3
L/W	556	686	886
E (phase to phase)	145	185	240
Weight (Kg)*	248	297	344 (1250A) 363 (2500A) 445 (3150A)

\* Maximum values, depending on ratings and options.





# Order Forms





# Contents

EvoPacT LF Fixed Version	40
EvoPacT LF Withdrawable Version	41

# EvoPacT LF1, LF2, LF3

## Fixed

### Order Forms

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.

Basic fixed circuit breaker

Quantity

Rated voltage  $U_r$

(kV)

Impulse voltage  $U_p$

(kVbil)

Short-circuit current  $I_{sc}$

(kA)

Rated current  $I_r$

(A)

Frequency

50 Hz

60 Hz

Colour for push buttons and indicators

IEC standard

ANSI standard

Push buttons open/close:

Red/black

Red/green

Green/red

Red/black

Indicator open/close:

Green/white

Green/red

Operating mechanism charged/discharged:

White/yellow

Charged/Discharged

Circuit breaker options

1st opening release (see possible choices in combination table below)

Shunt opening release YO1

24 Vdc

110 Vdc

48 Vac (50 Hz)

120 Vac (60 Hz)

30 Vdc

125 Vdc

110 Vac (50 Hz)

240 Vac (60 Hz)

48 Vdc

220 Vdc

220 Vac (50 Hz)

2nd opening release (see possible choices in combination table below)

Shunt opening release YO2

24 Vdc

110 Vdc

48 Vac (50 Hz)

120 Vac (60 Hz)

30 Vdc

125 Vdc

110 Vac (50 Hz)

240 Vac (60 Hz)

48 Vdc

220 Vdc

220 Vac (50 Hz)

Undervoltage release YM

24 Vdc

110 Vdc

48 Vac (50 Hz)

120 Vac (60 Hz)

30 Vdc

125 Vdc

110 Vac (50 Hz)

240 Vac (60 Hz)

48 Vdc

220 Vdc

220 Vac (50 Hz)

Mitop (not available with seismic version)

Without contact

With contact

Remote control

Electrical motor M

24–32 Vdc

110–127 Vdc/ac

48–60 Vdc/ac

220–250 Vdc/ac

Shunt closing release YF

24 Vdc

60 Vdc

220 Vdc

220 Vac (50 Hz)

30 Vdc

110 Vdc

48 Vac (50 Hz)

120 Vac (60 Hz)

48 Vdc

125 Vdc

110 Vac (50 Hz)

240 Vac (60 Hz)

Low voltage wiring connection

Male plug (1.2 m)

Female socket (2 m)

Locking C.B. in open position

Flat

Tubular

Seismic version (consult us)

Support frame

Leaflets language

French

English

Different releases combinations									
Shunt opening releases YO1/YO2	1			2	1	1			
Undervoltage release YM		1			1			1	
Mitop			1			1		1	

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AMTED397052EN-01

## Order Forms

# EvoPacT LF1, LF2, LF3

## Withdrawable

### Order Forms

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.

#### Basic withdrawable circuit breaker

Quantity 

Rated voltage $U_r$	(kV)	<input type="text"/>
Impulse voltage $U_p$	(kVbil)	<input type="text"/>
Short-circuit current $I_{sc}$	(kA)	<input type="text"/>
Rated current $I_r$	(A)	<input type="text"/>
Frequency	50 Hz <input type="checkbox"/>	60 Hz <input type="checkbox"/>
Colour for push buttons and indicators	IEC standard	ANSI standard
Push buttons open/close:	Red/black <input type="checkbox"/> Red/green <input type="checkbox"/> Green/red <input type="checkbox"/>	Red/black <input type="checkbox"/>
Indicator open/close:	Green/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

##### 1st opening release (see possible choices in combination table below)

###### Shunt opening release YO1

24 Vdc <input type="checkbox"/>	110 Vdc <input type="checkbox"/>	48 Vac (50 Hz) <input type="checkbox"/>	120 Vac (60 Hz) <input type="checkbox"/>
30 Vdc <input type="checkbox"/>	125 Vdc <input type="checkbox"/>	110 Vac (50 Hz) <input type="checkbox"/>	240 Vac (60 Hz) <input type="checkbox"/>
48 Vdc <input type="checkbox"/>	220 Vdc <input type="checkbox"/>	220 Vac (50 Hz) <input type="checkbox"/>	

##### 2nd opening release (see possible choices in combination table below)

###### Shunt opening release YO2

24 Vdc <input type="checkbox"/>	110 Vdc <input type="checkbox"/>	48 Vac (50 Hz) <input type="checkbox"/>	120 Vac (60 Hz) <input type="checkbox"/>
30 Vdc <input type="checkbox"/>	125 Vdc <input type="checkbox"/>	110 Vac (50 Hz) <input type="checkbox"/>	240 Vac (60 Hz) <input type="checkbox"/>
48 Vdc <input type="checkbox"/>	220 Vdc <input type="checkbox"/>	220 Vac (50 Hz) <input type="checkbox"/>	

###### Undervoltage release YM

24 Vdc <input type="checkbox"/>	110 Vdc <input type="checkbox"/>	48 Vac (50 Hz) <input type="checkbox"/>	120 Vac (60 Hz) <input type="checkbox"/>
30 Vdc <input type="checkbox"/>	125 Vdc <input type="checkbox"/>	110 Vac (50 Hz) <input type="checkbox"/>	240 Vac (60 Hz) <input type="checkbox"/>
48 Vdc <input type="checkbox"/>	220 Vdc <input type="checkbox"/>	220 Vac (50 Hz) <input type="checkbox"/>	

Mitop (not available with seismic version)

Without contact ☐ With contact ☐

#### Remote control

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"/>	60 Vdc <input type="checkbox"/>	220 Vdc <input type="checkbox"/>	220 Vac (50 Hz) <input type="checkbox"/>
30 Vdc <input type="checkbox"/>	110 Vdc <input type="checkbox"/>	48 Vac (50 Hz) <input type="checkbox"/>	120 Vac (60 Hz) <input type="checkbox"/>
48 Vdc <input type="checkbox"/>	125 Vdc <input type="checkbox"/>	110 Vac (50 Hz) <input type="checkbox"/>	240 Vac (60 Hz) <input type="checkbox"/>

Seismic version (consult us)

Leaflets language French ☐ English ☐

#### MC cassette

MC cassette type	MC1 <input type="checkbox"/>	MC2 <input type="checkbox"/>	MC3 <input type="checkbox"/>
Rated short circuit current $I_{sc}$		$\leq 40$ kA <input type="checkbox"/>	50 kA <input type="checkbox"/>
Rated current $I_r$	1250 A <input type="checkbox"/>	2500 A <input type="checkbox"/>	3150 A <input type="checkbox"/>

#### MC cassette accessories

Racked in/out position contact		6 NO, 6 NC <input type="checkbox"/>	
Pictogram	of the circuit breaker <input type="checkbox"/>	of the earthing switch <input type="checkbox"/>	
Circuit breaker spring mechanism discharge		<input type="checkbox"/>	
Extraction table		Quantity <input type="text"/>	
Extra handle		Quantity <input type="text"/>	
Door with hinge, windows and pictogram	MC1 <input type="checkbox"/>	MC2 <input type="checkbox"/>	MC3 <input type="checkbox"/>

#### Different releases combinations

Shunt opening releases YO1/YO2	1	2	1	1	
Undervoltage release YM		1		1	1
Mitop				1	1



# Services



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Services

# Schneider Electric Services

Peace of Mind throughout your installation  
life cycle

## Understanding and managing the complexities of your operations

### Service Lifecycle Management

Connected switchgear is a foundational element of EcoStruxure, Schneider Electric, open, and interoperable system architecture.

Connectivity offers customers greater visibility of their facilities and more control over operational health.

#### How to improve site safety

 Electrical Safety Training



- Detect any knowledge gaps and attend appropriate e-learning, practical and hands-on electrical safety training courses.

 Electrical Distribution  
Consulting Services



- Our consulting services portfolio offers asset health analysis for your site and recommends preventive actions.

#### How to improve protection your new installation

 Service Plans



- Knowing your installation with the right service plan.

 Maintenance Services



- A complete solution to maintain your equipment. Helping ensure service continuity and peace of mind at every step.

#### How to modernize aging infrastructure

 Digitized Modernization



- Modernize your electrical distribution switchgear with pre-engineered retrofit service solutions.

 SF<sub>6</sub> Recovery Services



- Peace-of-mind for your transition to SF<sub>6</sub>-free medium voltage switchgear.

 Spare Parts Management



- Spare part availability and reduced downtime.

All pictures of the catalogue illustrate the product in an environment close to reality. They were taken off-line. For live operation the PPE (Personal Protective Equipment) must be used in accordance with the regulations of the place of installation.

Find more information [here](#)

# ProDiag Breaker

## Diagnosis of MV and LV Circuit Breakers



### What is ProDiag Breaker?

ProDiag Breaker is a Schneider Electric diagnosis tool. ProDiag Breaker compares the mechanical and electrical parameters measured during the full operation of circuit breakers with the data collected from our production facilities. This allows detecting possible failure in advance. It measures, records and displays on a screen the key electrical parameters in MV and LV circuit breakers, relating to opening, closing and springloading operations.

All this data is automatically compared with the criteria for the circuit breaker designated in the software, which indicates which values are within the acceptable range, which are on the limit and which are outside it. Two tests are always performed on each circuit breakers, one at minimum voltage and one at nominal voltage. A written report is generated and provided by Schneider Electric so that the customer can use it as a tool to define the necessary corrective action (maintenance, repair or replacement).

ProDiag Breaker is part of ProDiag preventive maintenance plan. Evaluation of circuit breakers using ProDiag Breaker includes:

- Evaluation of the operating mechanism.
- Measurement and comparison of the actual contact resistance with that specified by the manufacturer.
- Measurement and comparison of the insulation resistance.
- Evaluation of the general circuit breaker conditions based on the captured data.

Moreover, analysis of the ProDiag Breaker time/travel curve combined with the current curve of the coil and phase contact detects possible faults, such as:

- Worn out latches and operating mechanisms.
- Faulty coils.
- Mechanical wear and tear and hardening of lubricating grease.
- Defective shock absorbers.
- Defective simultaneous contact operation (opening/closing).

Some maintenance programmes involve dismantling the circuit breaker mechanism to check its condition. ProDiag Breaker using signals captured from the circuit breaker operation, reduces maintenance costs compared with programs which check the circuit breakers manually.

### ProDiag Breaker Objectives

Your priority is to enhance the reliability of your installation:

- to ensure its continuity of service.
- to minimize the time for maintenance and repair.
- to perform maintenance.
- Only on the equipment requiring it and only when necessary (conditional preventive maintenance).

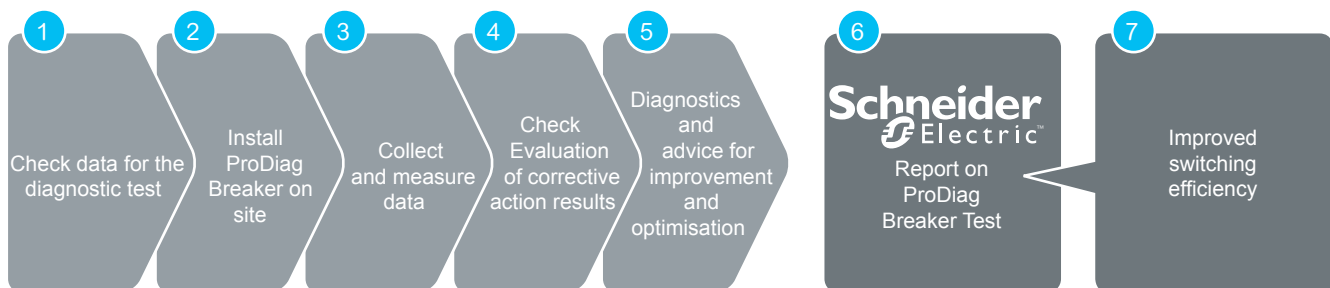
### Results

ProDiag Breaker provides a report of the complete nature of the circuit breaker, detailing: closing /opening time, contact simultaneity, bounce and resistance, mechanical closing and opening forces.

This report enables any required maintenance to be targeted and time in order to optimize the customer's maintenance plan.

### Where can ProDiag Breaker reduce costs?

- ProDiag Breaker significantly reduces the time taken to identify potential faults in a circuit breaker, using operational analysis rather than inspection and mechanical re-sets.
- The software analyses the captured data and identifies the specific problem area.
- A device normal operating life is increased by timely diagnostics of when and what repairs are necessary.
- The tool comprises both hardware and software, resulting in a highly efficient predictive maintenance program.





# Separated Components

## Services

The following components can be ordered separately and can be adapted or replaced by the customer.

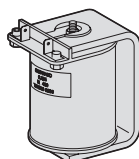
### Auxiliaries

Shunt opening release			YO1 or YO2	
24 Vdc			889705BL	
30 Vdc			889705BL	
48 Vdc			889705BJ	
60 Vdc			889705BG	
110 Vdc			889705BE	
125 Vdc			889705BD	
220 Vdc			889705BB	
48 Vac	50 Hz		SPK0041SF1	
110 Vac	50 Hz		889705BL	
220 Vac	50 Hz		889705BH	
120 Vac	60 Hz		889705BK	
240 Vac	60 Hz		889705BH	

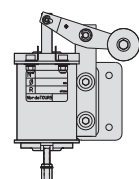
Shunt opening release - Seismic version			YO1	YO2
24 Vdc			SPK0003SF	SPK0011SF
30 Vdc			SPK0008SF	SPK0016SF
48 Vdc			SPK0004SF	SPK0012SF
60 Vdc			SPK0021SF	SPK0022SF
110 Vdc			00891486FE	00891487FE
125 Vdc			SPK0005SF	SPK0013SF
220 Vdc			SPK0006SF	SPK0014SF
48 Vac	50 Hz		SPK0007SF	SPK0015SF
110 Vac	50 Hz		SPK0008SF	SPK0016SF
220 Vac	50 Hz		SPK0009SF	SPK0017SF
120 Vac	60 Hz		SPK0010SF	SPK0018SF
240 Vac	60 Hz		SPK0009SF	SPK0017SF

Shunt closing release YF			Anti pumping Relay	Closing Release
24 Vdc			MV261207	889705AL
30 Vdc			MV261208	889705AK
48 Vdc			MV261209	889705AH
60 Vdc			MV261210	889705AG
110 Vdc			MV261211	889705AD
125 Vdc			MV261212	889705AD
220 Vdc			MV261213	889705AA
48 Vac	50 Hz		MV261215	889705AP
110 Vac	50 Hz		MV261216	889705AL
220 Vac	50 Hz		MV261218	889705AH
120 Vac	60 Hz		MV261216	889705AL
240 Vac	60 Hz		MV261218	889705AH
Zelio (RXM) relay adaptation kit for RI*			MV261246	

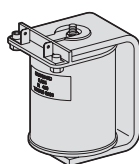
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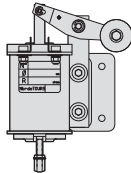
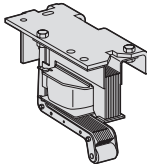
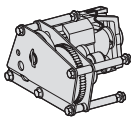
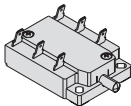
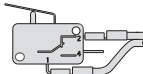
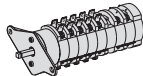
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# Separated Components

## Services

### Auxiliaries

Shunt closing release YF Seismic version			Anti pumping Relay	Closing Release
	24 Vdc		MV261207	00891485FL
	30 Vdc		MV261208	SPK0019SF
	48 Vdc		MV261209	00891485FH
	60 Vdc		MV261210	SPK0020SF
	110 Vdc		MV261211	SPK0001SF
	125 Vdc		MV261212	SPK0001SF
	220 Vdc		MV261213	00891485FB
	48 Vac	50 Hz	MV261215	SPK0002SF
	110 Vac	50 Hz	MV261216	00891485FL
	220 Vac	50 Hz	MV261218	00891485FH
	120 Vac	60 Hz	MV261216	00891485FL
	240 Vac	60 Hz	MV261218	00891485FH
Zelio (RXM) relay adaptation kit for RI*			MV261246	
Undervoltage release YM				
	24 Vdc		889772AB	
	30 Vdc		889772AC	
	48 Vdc		889772AE	
	60 Vdc		889772AF	
	110 Vdc		889772AH	
	125 Vdc		889772AJ	
	220 Vdc		889772AM	
	48 Vac	50 Hz	889773AQ	
	110 Vac	50 Hz	889773AU	
	220 Vac	50 Hz	889773AX	
	120 Vac	60 Hz	889773AU	
	240 Vac	60 Hz	889773AX	
Electrical motor and Gear reducer (Ametek) (after 12/1999)				
	24–32 Vdc		51072122A1	
	48–60 Vac/dc		51072122B1	
	110–127 Vac/dc		51072122C1	
	220–250 Vac/dc		51072122D1	
End of charging				
	contact M1, M2, M3		AAV85908	
	Micro switch SE and SQ			
	contact SE and SQ		730734A	
	Auxiliary contacts			
	8NO + 8NC (after 2012)		MV261239	

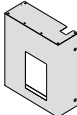
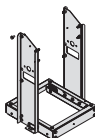
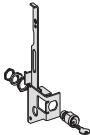
\* To be ordered in case of POK or APE relay type replacement.



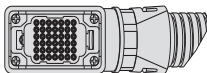

# Separated Components

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## Accessories (fixed version)

Cover			
	EvoPacT LF1		00889520FA
	EvoPacT LF2		00889520FB
	EvoPacT LF3		00889520FC
CB support frame			
	EvoPacT LF1		00889810FA
	EvoPacT LF2		00889810FB
	EvoPacT LF3		00889810FC
Locking, interlocking			
	Open position circuit-breaker locking (without lock)		888516A
	Flat lock		AAV86887
	Tubular lock		AAV86892

## LV connection (fixed version)

Male plug and lead			
	EvoPacT LF1/EvoPacT LF2	L=1,2M	MV261070
	EvoPacT LF3	L=1,2M	MV261074
Female plug and lead			
	All types	L=2M	MV261071

## Accessories (withdrawable version)

Front cover + red push button kits for w/o truck			
	All types		MV261241



[se.com](http://se.com)

Notes

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# Register to mySchneider and simplify your life at all steps of your business

## Connect mySchneider



Register to [mySchneider](#) portal and discover your personalized experience giving you access to tools and resources helping you being more efficient, productive, develop your skills and collaborate.

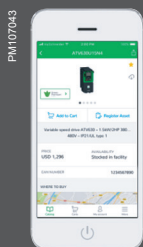
You'll get:

- Productivity tools
- Personalized resources
- Collaborative sales support
- Trainings

### Get Support anytime



- Access 24/7 self-service, mobile catalog and access to expert help
- Offline and online catalog
- Get trainings, Advanced support



PM107043

### Collaborate, find solution and make business

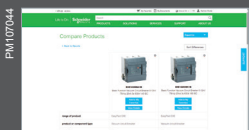


- Get to Schneider Electric Exchange find solution develop business
- Schneider Electric Exchange is an online community where individuals can do business
- Whether you're seeking find Solutions or have products, services, and advice to share
- We'll help you connect with peers, technology partners, and experts to gain a competitive edge

### Select and Design

#### Advanced WEB functionalities that help to:

- Select and compare components
- Build easily your technical documentation with ready to use tools (CAD, export files...)



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### Manage your installed base



**Digital Logbook, where you can find all of the documents you'll need during your circuit breakers' manufacturing, installation, operation, and maintenance from anywhere, in a single, well secured paperless environment.**

- User manuals
- Design drawings
- Single-line drawings
- Factory and site acceptance tests
- Spare parts lists
- Maintenance records, schedules, and more

### Configure and Quote

#### Simplified and validated configuration

- Always updated technical content
- Ready to use data and documentation for your projects
- Last minute changes
- Manage and track your orders



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Notes

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Life Is On | **Schneider**  
Electric

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07-2025  
AMTED397052EN-01

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