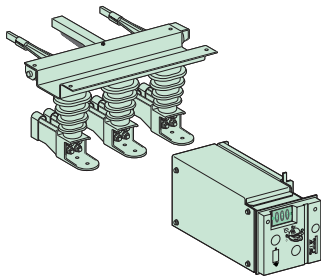


MV product

Earthing switch up to 17.5 kV

Installation guide

2008



Earthing switch

Schneider
Electric

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Information given in this guide is to give the panel builder a good understanding of all technical assembling condition.

Quality and performances of final assembly is under the panel builder responsibility.

Schneider Electric is responsible for quality and performances of each component.

General description

Earthing switch 17.5 kV may be used by panel builders to make all type of installation requiring earth and short circuit the cable ends before work is performed in the cable compartment.

- the earthing switch includes:
 - an operating mechanism to be mounted on the front face of the cubicle
 - a power circuit unit with a fast acting closing mechanism independent of the operator
- the link between the 2 devices will have a length depending of the depth of the cubicle. A drawing defines the installation conditions which allow the panel builder to design the rods according the distance
- a kit permits to install the earthing switch in case of adaptation with an Evolis cradle
- a kit permits to install the earthing switch in case of adaptation with an MCset cartridge
- mechanical interlocking with the circuit breaker is mandatory and prevents:
 - racking in the circuit breaker if the earthing switch is closed
 - closing the earthing switch if the circuit breaker is not opened and racked out
 - a drawing of the installation guide, shows the mechanical link to be manufactured and installed by the panel builder
- a mechanical blocking up of the circuit breaker racking in can be delivered separatly if the earthing switch is not required: it takes up the place and the volume of the earthing switch driving mechanism.

Electrical characteristics according to IEC 62271-102

Phase distance	mm	160		200		240			
Rated values									
Voltage	kV rms	7.2	12	7.2	12	17.5	7.2	12	17.5
Frequency	fr Hz	50/60							
Power frequency withstand voltage ⁽¹⁾	Ud kV rms	20	28	20	28	38	20	28	38
Lighting impulse withstand voltage	Up kV peak	60	75	60	75	95 ⁽²⁾	60	75	95
Short-time withstand current 1 s	Ik kA rms-1 s	31.5	31.5	50	40	31.5	50	50	40
Short-time withstand current	kA rms	31.5 - 4 s							
Peak withstand	Ip kA peak	2.5 Ik (50 Hz) and 2.6 Ik (60 Hz)							
Short-circuit making current		2.5 Ik (50 Hz) and 2.6 Ik (60 Hz)							
Endurance									
Mechanical endurance	Ur kV rms	Mo class (1000 cycles)							
Electrical endurance		E1 class ⁽³⁾							

(1) 42 kV withstand for power circuit unit up to 17.5 kV.

(2) If the 95 kV impulse withstand voltage is required for 200 mm earthing switch phase distance, it is necessary to add field deflectors on the connections.

(3) Other performances on request.

Overall size dimensions:

- drawing 51235989F0 sheet 1/9.

General description

Accessories

Field deflectors:

■ if 95 kV dielectric withstand is required for 200 mm earthing switch phase distance, it is necessary to add field deflectors on the connections.

Voltage presence indicator system

- this system, combined with the capacitive divider insulator integrated as standard in the earthing system, provides an indication of the voltage in each phase of the main circuit
- it is mounted on the front of the earthing operating mechanism
- it is available for two voltage ranges, in conformity with standard IEC 61958:
 - 3.2 to 7.2 kV
 - 10 to 17.5 kV.

Open / closed position contacts

A block of 6 auxiliary contacts indicates the open/closed position of the earthing switch.

Characteristics

Delivered as option		3NO/NC	
Breaking capacity (cos φ : 0.3)	V AC	240	15 A
	V DC	48	
		125	
		250	3 A

Mechanical earthing switch locking

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 available:
 - 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 delivered to fit the various key locks Profalux which are not supplied.

Electromechanical interlocking of the earthing switch

This functions is achieved using a coil which blocks switching operation. When energised it releases the earthing switch which can then be closed. The system is available in several versions according to the supply voltage:

24 V DC - 48 V DC - 110 V DC - 220 V DC.

Mechanical and electromechanical interlockings with the Evolis circuit breaker racked in/out position

These functions are achieved using lock(s) and key(s) and/or an electrical coil (please see the installation guide).

Earthing switch operating lever

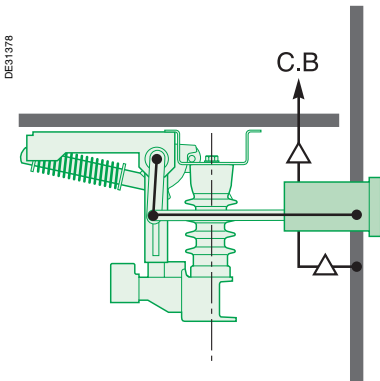
This is identical to the one supplied for the circuit breaker racking truck MCset and Nex. It is used to operate the earthing switch.

Earthing switch installation 17.5 kV

Important

If no VPIS mounted on the mechanism box, the capacitive insulators must be earthed.

Earthing switch in general case of use (except in Nex and MCset)



Mechanical fixing

■ to see drawing 51235989F0 sheet 2/9

- the power device must be fixed in 4 points
- the 3 square apertures are designed to receive M6 cage nuts and the $\text{Ø}6.7$ hole a standard M6 bolt. Screwing torque is 1.3 mdaN with contact washers.

The driving box must be fixed by the top by 2 or 3 holes for nut crimping.

- it is compulsory to fix the box laterally to strengthen the system when operating.

Interfaces for signalling

■ to see drawing 51235989F0 sheet 3/9:

- interlocking with circuit breaker:

- on the top of the mechanism box a palett is available to interlock the circuit breaker when the earthing switch is closed.

Dimensions 12 x 3 mm. Travel 12 mm.

- interlocking with cable compartment:

- under the box a $\text{Ø}8$ mm axle is available to lock the cable compartment door if the earthing switch is open

- fuse rod:

- a fuse rod is delivered with the earthing switch mechanism box, used for MCset configuration wich can be used for any application or redesigned based on the drawing 03408980F0.

Signalling and driving rods

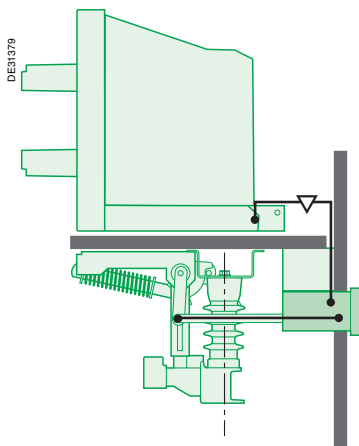
■ the signalling and driving rods must be calculated following drawing 51235989F0 sheet 9/9 and similar to the MCset rods drawings:

- 034089853F0 for signalling rod
- 03408982F0 for driving rod

■ the driving rod must be stopped in translation by a square designed following drawing 51235989F0 sheet 8/9.

Earthing switch installation 17.5 kV

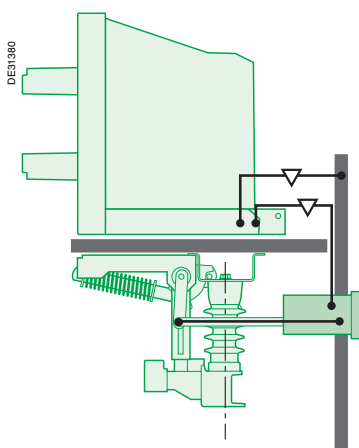
Earthing switch with cradle Evolis (Nex cubicle configuration)



Mechanical fixing and interlocking with the circuit breaker:

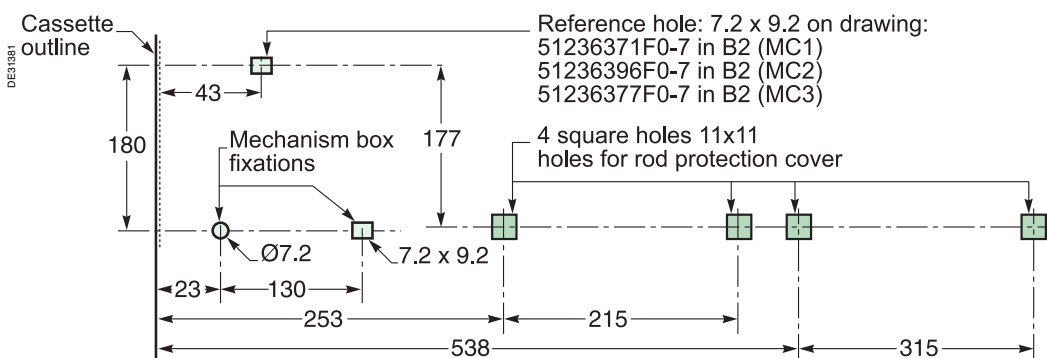
- to see drawing 51223542F0:
 - parts to manufacture locally:
 - to see 51223542FA for 160 mm (cradle 145 mm)
 - to see 51223542FB for 200 mm (cradle 185 mm)
 - to see 51223542FC for 240 mm (cradle 240 mm).
 - power device:
 - it is compulsory to fix the power device with spacers 51223307F0 and 51223317F0 for circuit breaker ventilation (included in drawings)
 - interfaces for signalling:
 - with the parts included in 51223542FA, FB, FC, the fixation of the mechanism box is ensured, same as the interlocking with the circuit breaker and the rods for signalling and driving.

Earthing switch with cassette MCset



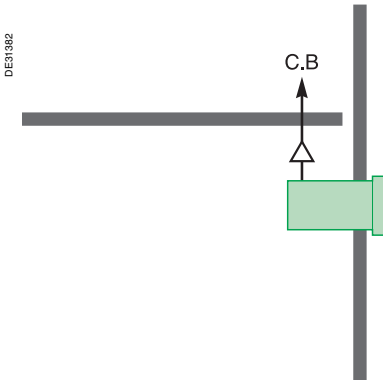
Mechanical fixing and interlocking with the circuit breaker:

- installation according to drawing:
 - 51236371F0 sheet 2/8 for type 1 (phase distance 160 mm)
 - 51236396F0 sheet 2/8 for type 2 (phase distance 200 mm)
 - 51236397F0 sheet 2/8 for type 3 (phase distance 240 mm)
- assembly according to drawing:
 - 51235989F0 sheet 2/9.
- assembly of the protection covers for the rods:
 - 51235240F0 sheet 3/3.
- necessary hardware
 - to fix the earthing switch on the cassette:
 - 4p HM6 x 16 screws
 - 8p Ø6 contact washers
 - 4p HM6 nuts.
 - to fix the control box on the cassette:
 - 2p HM6 x 16 screws
 - 2p Ø6 contact washers
 - to fix the mechanism box on the right fixing phase:
 - 2 Ø6.5 rivets
 - fixing holes to add on the right fixing plate of the cubicle for mechanism box and rod protection cover fixations.



Earthing switch installation 17.5 kV

Mechanical blocking up of the switching device racking-in



Installation in general case of use (except in MCset and Nex)

■ mechanical fixing according to drawing:

□ 51235989F0 sheet 2/9.

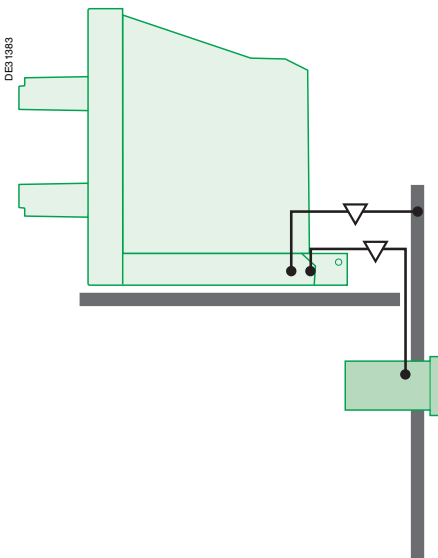
The box must be fixed by the top by 2 or 3 holes for nut crimping.

■ interlockings according to drawing:

□ 51235989F0 sheet 3/9.

On the top of the box a palett is available to lock the circuit breaker.

Dimensions 12 x 3 mm. Travel 12 mm.



Installation with cradle Evolis (Nex cubicle configuration)

■ mechanical fixing according to drawing:

□ 51223542F0.

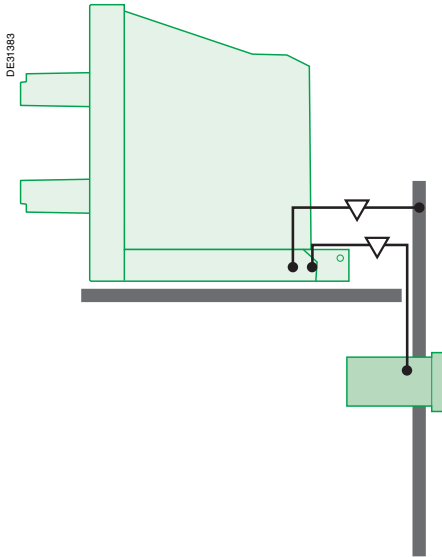
A set of drawing allows to adapt the box under the cradle:

□ 51223542FD.

Available for the all types of cradle Evolis 17.5 kV.

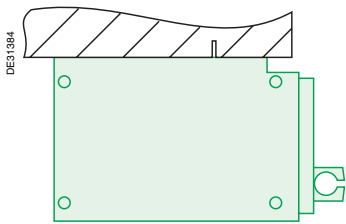
Earthing switch installation 17.5 kV

Mechanical blocking up of the switching device racking-in

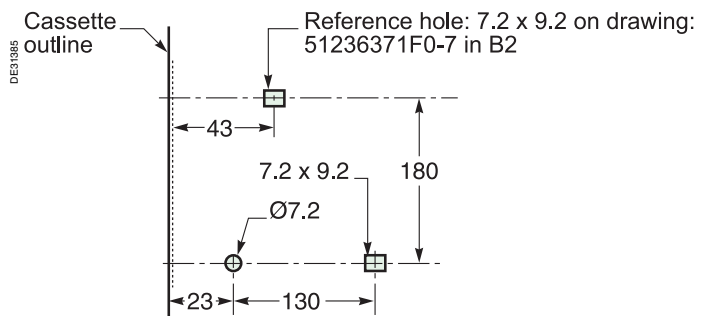


Installation in cassette MCset

- assembling according to drawing:
 - 51235989F0 sheet 2/9.
- necessary hardware:
 - to fix the control box on the cassette:
 - 2p HM6 x 16 screws
 - 2p Ø6 contact washer.
 - to fix the control box on the right fixing plate:
 - 2p Ø6.5 rivet.



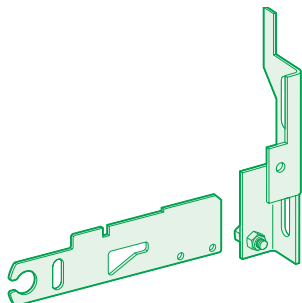
Fixing holes to add in the right fixing plate



Earthing switch accessories

Draw-in locking by padlock

201105



Drawings:

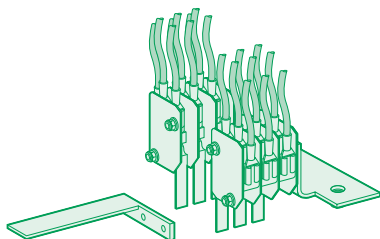
■ 51235989F0 sheet 5/9.

Installation leaflet:

■ 07897323FR.

Earthing switch electrical signalling

201106



Drawings:

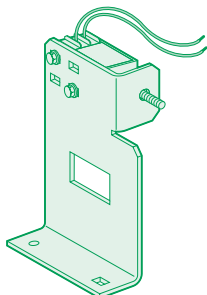
■ 51235989F0 sheet 5/9.

Installation leaflet:

■ 07897324FR.

Earthing switch electromagnetic locking

201107



Drawings:

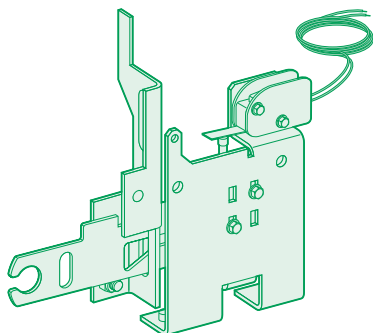
■ 51235989F0 sheet 6/9.

Installation leaflet:

■ 07897325FR.

Electromagnetic locking of the CB draw-in

201108



Drawings:

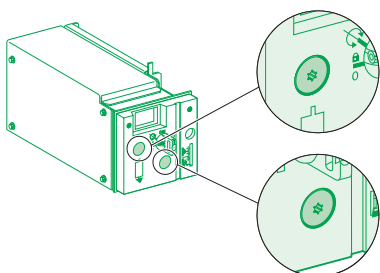
■ 51235989F0 sheet 6/9.

Installation leaflet:

■ 07897326FR.

Open or close position earthing switch locking (1 lock)

201110



Drawings:

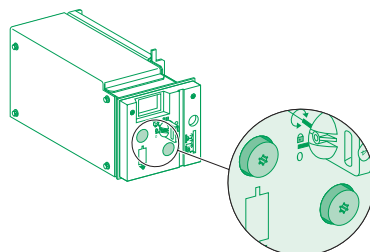
■ 51235989F0 sheet 7/9.

Installation leaflet:

■ 07897328FR.

Open or close position earthing switch locking (2 locks)

201111



Drawings:

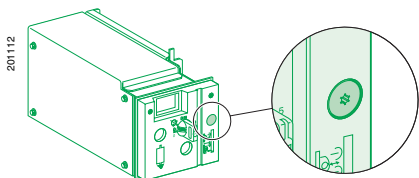
■ 51235989F0 sheet 7/9.

Installation leaflet:

■ 07897329FR.

Earthing switch accessories

Locking by lock of the draw-in forbidding



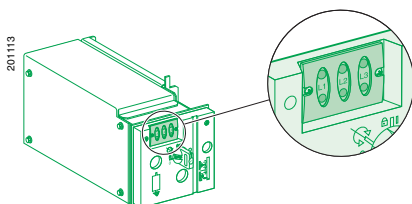
Drawings:

■ 51235651F0.

Installation leaflet:

■ 07897330FR.

VPIS installation



Drawings:

■ 51235989F0 sheet 4/9.

Installation leaflet:

■ 07897331FR.

Appendices

Installation leaflets

Draw-in locking	07897323FR
Earthing switch electrical signalling	07897324FR
Earthing switch electromagnetic interlock	07897325FR
Circuit breaker withdrawable position interlock	07897326FR
Locking device for draw-in locking	07897330FR
VPIS installation	07897331FR

Installation drawings

Fuse rod	03408980F0
Driving rod for MCset	03408982F0
Signalling rod for MCset	03408983F0
Earthing switch assembling for cradle Evolis	51223542F0
Parts for earthing switch phase distance 160 mm	51223542FA
Parts for earthing switch phase distance 200 mm	51223542FB
Parts for earthing switch phase distance 240 mm	51223542FC
Parts for blocking up the circuit breaker racking-in	51223542FD
Earthing switch rod cover protection assembling	51235240F0
Earthing switch assembling	51235989F0
Earthing switch installation in MC1	51236371F0
Earthing switch installation in MC2	51236396F0
Earthing switch installation in MC3	51236397F0

Appendices

List of local added value drawings

Spring	03402321F0
Earth braid	03406305F0
Mecho box	51223306F0
M6 spacer	51223307F0
Drive offset plate	51223308F0
Spacer plate for drive linkage	51223309F0
Shaft mounting bracket	51223313F0
Interlock drive shaft	51223314F0
Mechanism insulator	51223316F0
Earthing switch spacer tapped	51223317F0
Drive linkage for phase distance 200 mm	51223318F0
Indicator drive for phase distance 200 mm	51223319F0
Indicator drive for phase distance 240 mm	51223320F0
Drive linkage for phase distance 240 mm	51223321F0
Drive linkage for phase dit 160 mm	51223322F0
Indicator drive for phase dit 160 mm	51223323F0
Drive offset plate for phase distance 200-240 mm	51223405F0
Trigger	51223600F0
Support square	51223604F0
Earth bar support spacer	51306730F0



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