MV product

Earthing switch up to 17.5 kV

Installation guide

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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 separately 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

<table>
<thead>
<tr>
<th>Phase distance (mm)</th>
<th>160</th>
<th>200</th>
<th>240</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (kV rms)</td>
<td>7.2</td>
<td>12</td>
<td>17.5</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td>50/60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power frequency withstand voltage (Ud, kV)</td>
<td>20</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>Lighting impulse withstand voltage (Up, kV peak)</td>
<td>60</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>Short-time withstand current (lkA rms-1 s)</td>
<td>31.5</td>
<td>31.5</td>
<td>40</td>
</tr>
<tr>
<td>Short-time withstand current (lkA peak)</td>
<td>31.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak withstand (lkA peak)</td>
<td></td>
<td>2.5 lk (50 Hz) and 2.6 lk (60 Hz)</td>
<td></td>
</tr>
<tr>
<td>Short-circuit making current (lkA peak)</td>
<td></td>
<td>2.5 lk (50 Hz) and 2.6 lk (60 Hz)</td>
<td></td>
</tr>
</tbody>
</table>

Endurance

- Mechanical endurance (Ur, kV rms): Mo class (1000 cycles)
- Electrical endurance (E1 class)

(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.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>3NO/NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivered as option</td>
<td></td>
</tr>
<tr>
<td>Breaking capacity</td>
<td></td>
</tr>
<tr>
<td>(cos ϕ: 0.3)</td>
<td></td>
</tr>
<tr>
<td>V AC 240</td>
<td>15 A</td>
</tr>
<tr>
<td>V DC 48</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>3 A</td>
</tr>
</tbody>
</table>

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 function 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.
**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 Ø6.7 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 Ø8 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 pallet 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 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

Cassette outline

Reference hole: 7.2 x 9.2 on drawing: 51236371F0-7 in B2

7.2 x 9.2
180
Ø7.2
23
130
Earthing switch accessories

**Draw-in locking by padlock**

**Drawings:**
- 51235989F0 sheet 5/9.

**Installation leaflet:**
- 07897323FR.

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**Earthing switch electrical signalling**

**Drawings:**
- 51235989F0 sheet 5/9.

**Installation leaflet:**
- 07897324FR.

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**Earthing switch electromagnetic locking**

**Drawings:**
- 51235989F0 sheet 6/9.

**Installation leaflet:**
- 07897325FR.
Earthing switch accessories

Electromagnetic locking of the CB draw-in

**Drawings:**
- 51235989F0 sheet 6/9.

**Installation leaflet:**
- 07897326FR.

Open or close position earthing switch locking (1 lock)

**Drawings:**
- 51235989F0 sheet 7/9.

**Installation leaflet:**
- 07897328FR.

Open or close position earthing switch locking (2 locks)

**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

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<tr>
<td>Earthing switch electrical signalling</td>
<td>07897324FR</td>
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<tr>
<td>Earthing switch electromagnetic interlock</td>
<td>07897325FR</td>
</tr>
<tr>
<td>Circuit breaker withdrawable position interlock</td>
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<td>VPIS installation</td>
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## Installation drawings

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

### List of local added value drawings

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