MCset with EasyPact EXE

Air insulated switchboard
with Medium Voltage switchgear vacuum technology

Instruction for Use and Maintenance

MFR 6119301-01
10/2019
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1. Safety Information

1.1 Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

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

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

<table>
<thead>
<tr>
<th>⚠️ DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>⚠️ WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>⚠️ CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.</td>
</tr>
</tbody>
</table>

1.2 Please Note

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

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

- This technical manual cannot be used to define or check the equipment’s compatibility with every single user’s application, nor its reliability within it. It is the duty of every user or panel builder to perform a complete risk analysis, evaluation and testing of the products in specific applications in accordance with applicable standards.
- In order to ensure the right functioning of the device installed in the equipment, refer to your equipment manufacturer documentation.
- When the products are used in applications with specific technical and safety rules, you must follow the integration and protection rules for the specific application.

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH</strong></td>
</tr>
<tr>
<td>- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See standards or local equivalent.</td>
</tr>
<tr>
<td>- This circuit breaker and the MCset equipment must only be installed and serviced by qualified electrical personnel.</td>
</tr>
<tr>
<td>- Perform work only after reading and understanding all of the instructions contained in this guide.</td>
</tr>
<tr>
<td>- Turn off all power supplying this circuit breaker before working on or inside the circuit breaker. Turn off or trip the circuit breaker and discharge the mechanism.</td>
</tr>
<tr>
<td>- Always use a properly rated voltage sensing device to confirm power is off.</td>
</tr>
<tr>
<td>- Use only genuine Schneider Electric specific tools (operating crank, extraction table, ...).</td>
</tr>
<tr>
<td>- Check all devices, covers and doors are in correct position before turning on power to this circuit breaker and MCset equipment.</td>
</tr>
<tr>
<td>- Beware of potential hazards and carefully inspect the work area for tools and objects that may have been left inside the circuit breaker and the MCset equipment.</td>
</tr>
<tr>
<td>- Do not modify the mechanical or electrical parts.</td>
</tr>
<tr>
<td>- Do not operate the system with interlocks and protective barriers removed.</td>
</tr>
</tbody>
</table>

Failure to follow these instructions will result in death or serious injury.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HAZARD OF DEGRADED EQUIPMENT PERFORMANCE</strong></td>
</tr>
<tr>
<td>- Respect the handling rules and avoid any shocks to the device.</td>
</tr>
<tr>
<td>- Perform the maintenance and servicing operations described in the maintenance section of this guide.</td>
</tr>
<tr>
<td>- Observe the normal service conditions described in this manual.</td>
</tr>
<tr>
<td>- If the circuit breaker, or the MCset equipment in which the circuit breaker is mounted, is stored before its final installation, observe the storage conditions.</td>
</tr>
</tbody>
</table>

Failure to follow these instructions can result in equipment damage.
1.4 Safety provisions

Before performing work on the cubicle, it is essential that you comply with the following instructions:

⚠️ DANGER

RISK OF FATALITIES DUE TO ELECTRICAL VOLTAGE
- Before removing covers and before performing assembly or maintenance work, make sure that you isolate the system from the high voltage and the supply voltage and that you ground it.
- Comply with the five safety rules:
  1. isolate from the power supply,
  2. make sure that unintentional restart (reclosing) is prevented,
  3. verify zero voltage,
  4. earth and short-circuit,
  5. cover or cordon off adjacent live components.

Failure to follow these instructions will result in death or serious injury.

⚠️ WARNING

RISK OF INJURY DUE TO MOVABLE PARTS IN MECHANICAL DRIVES
Before performing mounting and maintenance work:
- isolate the system from the supply voltage,
- release the circuit-breaker’s energy storing device by OFF-ON-OFF operation,
- switch make-proof earthing switches ON.
- Do not remove the mechanisms during maintenance work.

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

⚠️ WARNING

RISK OF INJURY DUE TO SHARP-EDGED SHEET METAL AND METAL PARTS
During installation and maintenance work:
- Always wear the approved protective clothing in accordance with the valid accident prevention and work regulations.
- Always cover sharp edges.

Failure to follow these instructions can result in serious injuries.

⚠️ CAUTION

HAZARD OF DEGRADED EQUIPMENT PERFORMANCE
- Respect the handling rules and avoid any shocks to the device.
- Perform the maintenance and servicing operations described in the maintenance section of this guide.
- Observe the normal service conditions described in this manual.
- If the disconnecting device, or the MCset equipment in which the disconnecting device is mounted, is stored before its final installation, observe the storage conditions.

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

Applicable standards and regulations:
- Metal-enclosed AC switchgear for rated voltages > 1 kV up to including 52 kV: IEC 62271-200.
- The locally applicable accident prevention, operating and work instructions must be complied with.
- Assembly and maintenance: IEC 61936-1/EN 50522[1].
- Operation of electrical equipment: EN 50110-1[1].

[1] The national standards applicable in the country where the equipment is to be installed must be complied with.

Behaviour in case of incidents or accidents
For the case of an internal fault, the cubicle MCset with EasyPact EXE is equipped with pressure relief ports which prevent the cubicles from bursting.

This Technical Manual does not include information regarding the safety of buildings in case of internal faults (pressure load of the switchboard room and necessary pressure relief ports).

Pressure calculations for switchboard rooms incl. recommendations regarding pressure relief ports can be provided on request against a fee. For further details, please contact the manufacturer.

In case of fire or of internal faults, toxic and caustic decomposition products may be produced.

Comply with the locally applicable accident and safety provisions.

Make sure that first-aid measures are taken in case of injury to persons.
2. General

2.1 General notes

This Technical Manual describes operation and maintenance of the air-insulated medium-voltage switchboards of the MCset with EasyPact EXE. It is exclusively intended for use by the manufacturer’s staff or by persons certified for the MCset with EasyPact EXE series (training certificate).

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it.

This Technical Manual is an integral part of the product and must be stored so that it is readily accessible at all times for and can be used by persons who are to work on the switchboard. If the switchboard is relocated to another site, this Technical Manual must be passed on to the new operators along with the unit.

As our products are subject to continuous development; we reserve the right to make changes regarding the standards, illustrations and technical data described in this Technical Manual. ThisTechnical Manual cannot describe every imaginable individual case or every customer-specific version of the product. For information which is not included in this manual, please contact the manufacturer.

All dimensional data in this manual are in millimeters.

2.2 Reference documents

Where applicable the following additional documents must be complied with:

- Purchase agreement with the stipulations regarding the switchboard-specific equipment and the legal details
- the appropriate switchboard-specific circuit diagrams / documentation
- the Operating Manuals of the low-voltage devices installed in the switchboard (e.g. voltage presence detecting systems, devices in low-voltage cabinet)
- the assembly drawings supplied with the equipment
- the Assembly Instructions of the manufacturer of the cable connection systems to be connected to the switchboard.
- the User Guide of MV devices being used:
  - Vacuum Circuit Breaker EasyPact EXE (No. PHA8537901)
  - Disconnecting Device EasyPact EXE (No. PHA8538401)
  - Earthing Switch (No. PHA8539001)

2.3 Any questions or suggestions?

Do you have any questions or suggestions regarding this manual, or do you require further information?

We always strive to provide you with the best-possible information for optimum, safe use of our products. Thus, do not hesitate to contact us if you have any recommendations, amendments or proposals for improvement.
2.4 Earthing switch control symbols:

- **Operation position**
- **Open position**
- **Closed Position**
- **Motorized operation**
- **Motorized operation is not permitted**
- **Manual operation (possible by using a crank)**
- **Position selector lockable with padlocking**

The rack-in prevention locking is retracted and the withdrawable device can be racked-in or racked-out.

The rack-in prevention locking is pulled out and can be padlocked. The withdrawable device is in Test/disconnected position and cannot be racked-in.

2.5 Equipment marking

<table>
<thead>
<tr>
<th>DANGER</th>
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<tbody>
<tr>
<td><strong>HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH</strong></td>
</tr>
<tr>
<td>It is strictly forbidden to walk on the parts with this label.</td>
</tr>
<tr>
<td>Failure to follow these instructions will result in death or serious injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH</strong></td>
</tr>
<tr>
<td>It is strictly forbidden to remove the parts with this label when the equipment is energised.</td>
</tr>
<tr>
<td>Failure to follow these instructions will result in death or serious injury.</td>
</tr>
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</table>
2.6 Abbreviations used

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AD</td>
<td>Incoming / feeder cubicle</td>
</tr>
<tr>
<td>CL-GL</td>
<td>Withdrawable line coupling cubicle</td>
</tr>
<tr>
<td>E/S</td>
<td>Earthing Switch</td>
</tr>
<tr>
<td>FC</td>
<td>Frequency converter</td>
</tr>
<tr>
<td>FU</td>
<td>Functional Unit (cubicle + withdrawable part)</td>
</tr>
<tr>
<td>I&lt;sub&gt;r&lt;/sub&gt;</td>
<td>Rated current</td>
</tr>
<tr>
<td>LV</td>
<td>Low voltage</td>
</tr>
<tr>
<td>MTP</td>
<td>Connection enclosure between an MCset with EasyPact EXE cubicle and a MOTORPACT cubicle</td>
</tr>
<tr>
<td>MV</td>
<td>Voltage class, including levels 7.2 - 12 and 17.5 kV</td>
</tr>
<tr>
<td>CT</td>
<td>Current transformer or current sensor</td>
</tr>
<tr>
<td>U&lt;sub&gt;r&lt;/sub&gt;</td>
<td>Rated voltage</td>
</tr>
<tr>
<td>VPIS</td>
<td>Voltage Presence Indicator System</td>
</tr>
<tr>
<td>VT</td>
<td>Voltage transformer</td>
</tr>
<tr>
<td>VT fuses</td>
<td>Voltage transformer with withdrawable primary fuses</td>
</tr>
<tr>
<td>DD</td>
<td>Disconnecting Device</td>
</tr>
<tr>
<td>E/S</td>
<td>Earthing Switch</td>
</tr>
<tr>
<td>VCB</td>
<td>Vacuum Circuit Breaker</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Withdrawable part (also named mobile part in other documents)</th>
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</thead>
<tbody>
<tr>
<td>Extraction table</td>
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<td></td>
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General
3. Design and description

3.1 Cubicle design

3.1.1 Incoming / Feeder cubicle (AD)

- AD1 630 / 1250 A
- AD2 630 / 1250 A
- AD3 2500 A

Fig. 1
Schematic diagram of the AD cubicles.

A. Low-voltage compartment
B. Withdrawable part compartment
C. Position inspection windows of the withdrawable part
D. Label of racking device manual operating instruction
E. Voltage detecting system
F. Operator interface of the Earthing Switch
G. Access panel to connection compartment of MV cables or VT fuses
H. Visualisation windows of cables or of VT fuses position
I. Operation and padlocking plate of VT fuses
3.1.2 Circuit-breaker coupling cubicle and bus riser cubicle (CL-GL)

Fig 2. Schematic diagram of CL and GL cubicles.

A. Low-voltage compartment
B. Withdrawable part compartment
C. Position inspection windows of the withdrawable part
D. Operation and locking plate of the withdrawable part
E. Voltage detecting system
F. Earthing Switch operator interface
G. Access panel to withdrawable voltage transformer fuses and to the lower busbar compartments
H. Visualisation windows of cables or of VT fuses position
I. Fixed busbar bridge compartment
J. Operation and padlocking plate of VT fuses
3.1.3 Voltage transformer cubicle (TT1 / TT2)

Fig 3.
Schematic diagram of the TT cubicles.

A. Low-voltage compartment
B. Fixed busbar bridge compartment
C. Visualisation windows
D. Voltage detecting system
E. Operator interface of the Earthing Switch
F. Operation and padlocking plate of VT fuses
G. Access panel to connection compartment of MV cables or VT fuses
H. Visualisation windows of cables or of VT fuses position
3.2 Identification

Fig. 4
Example shows AD cubicle.

A. Name of the cubicle (defined by the customer)
B. Nameplate

3.3 Nameplate

The type designation of the cubicles on the nameplate (Fig. 5) specifies the essential technical data. To access this information, flash the QR code with your Smartphone or your connected tablet; you will be directed to the website containing the data relating to your device. When submitting enquiries to the manufacturer or ordering spare parts, the following information is required:

- Type designation
- Serial number

Fig. 5
Example shows nameplate on the front side of the GL3 cubicle.

A. Type designation
B. Serial number
C. Technical data
D. QR-code with product information
3.4  Labels and indicators on the front cubicle

![Diagram of front cubicle with labels and indicators](image1)

Fig. 6  
Example shows the front side of AD cubicle.

- A. Single line diagram
- B. Label of racking device manual operating instruction
- C. Racking device position indicator
- D. Label and symbols of Earthing Switch manual operating instructions
- E. Earthing Switch status indicator
- F. Label of withdrawable voltage transformer manual operating instructions

3.4.1 Label and indicator of racking device

![Diagram of racking device position indicator](image2)

Fig. 7  
Label and indicator of racking device.

Racking device position indicator:

![Examples of racking device positions](image3)

Fig. 8  
Racking device position indicator.

- Service position
- Intermediate position
- Disconnected/test position
3.4.2 Label and indicator of Earthing Switch

![Image of Earthing Switch with labels and indicator]

**Fig. 9**
Label of Earthing Switch manual operating instructions.

**Earthing Switch status indicator**

- **Open position**
- **Closed position**

![Indicator of Earthing Switch]

**Fig. 10**
Indicator of Earthing Switch.

3.4.3 Label of withdrawable voltage transformer

![Image of withdrawable voltage transformer with labels]

**Fig. 11**
Label of withdrawable voltage transformer.
3.5 Medium Voltage devices

3.5.1 Vacuum Circuit Breaker (VCB)

For further information please refer to EasyPact EXE Vacuum Circuit Breaker User Guide (No. PHA8537901).

Fig. 12
Front view of the vacuum circuit breaker.

A. Power connections  H. Operation counter
B. Removable top cover  I. Operating instructions
C. Auxiliary connection plug  J. Shutter ramp
D. Main front cover  K. Door Interlock
E. Nameplate  L. Earth connection interlock
F. Pushbuttons and indicators  M. Locking handles
   F1 Opening pushbutton  N. Racking position indicator
   F2 Closing pushbutton  O. Hole for crank insertion
   F3 Spring charged and ready-to-close indicator  P. Opening pushbutton
   F4 Main contact position indicator  Q. Locking tabs
G. Operating mechanism charging handle  R. Racking device motor (option)
S. Keylock location (option)
3.5.2 Disconnecting Device (DD)

A Disconnecting Device, as any disconnector, is designed to operate a circuit with no current. For further information please refer to EasyPact EXE Disconnecting Device User Guide (No. PHA8538401).

![Disconnecting Device Diagram]

---

**Fig. 13**
Front view of the disconnecting device.

A. Power connections  
B. Removable top cover  
C. Auxiliary connection plug  
D. Main front cover  
E. Nameplate  
F. Shutter ramp  
G. Door Interlock  
H. Earth connection interlock  
I. Locking handles  
J. Racking position indicator  
K. Hole for crank insertion  
L. Opening pushbutton  
M. Locking tabs  
N. Racking device motor (option)  
O. Keylock location (option)
3.5.3 Earthing Switch (E/S)

For further information please refer to Earthing Switch User Guide PHA8539001.

Fig. 14
Front view of the operating mechanism box (manual version).

Fig. 15
Front view of the operating mechanism box (motorized version).

A. Voltage Presence Indicator System (VPIS)
B. Opening for the insertion of the Earthing Switch operating crank
C. Location for rack-in prevention keylock
D. Earthing Switch position selector
E. Rack-in prevention padlocking
F. Manual operation slider
G. Location for Earthing Switch locks
H. Mechanical indicator of Earthing Switch status
I. Locking system for the door of the MV cable compartment
3.5.4 Voltage Transformer with withdrawable primary fuses (VT fuses)

![Diagram of Voltage Transformer](DM106712.ai)

Fig. 16
Front view of the withdrawable voltage transformer.

A. Opening for the insertion of the voltage transformer withdrawable fuse operating handle
B. Position selector switch for voltage transformer withdrawable fuses.

3.6 Intended use

Air-insulated medium-voltage switchboards of the MCset with EasyPact EXE series are designed exclusively for switching and distributing electrical power. They may only be used in the scope of the specified standards and the switchboard-specific technical data.

Disclaimer of liability

The manufacturer shall not be held responsible for damage which occurs if:
- instructions in this Technical Manual are not complied with,
- the switchgear is not operated according to its intended use (see above),
- the switchgear is assembled, connected or operated improperly,
- accessories or spare parts are used which have not been approved by the manufacturer,
- the switchgear is modified without the manufacturer's approval, or if inadmissible parts are added.

No liability is accepted for parts provided by customers, for example current transformers.

3.7 Applicable standards

MCset with EasyPact EXE series:
- metal-enclosed; loss of service continuity category according to IEC 62271-200: LSC 2B-PM
- type-tested
- tested for internal faults (qualification IAC AFLR)
- dimensioned for indoor installation.

MCset with EasyPact EXE meet the following standards and regulations:

<table>
<thead>
<tr>
<th>Designation</th>
<th>IEC Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switchgear</td>
<td>IEC 62271-200</td>
</tr>
<tr>
<td></td>
<td>IEC 62271-1</td>
</tr>
<tr>
<td>Internal arc classification (IAC)</td>
<td>IEC 62271-200</td>
</tr>
<tr>
<td>Circuit-breaker</td>
<td>IEC 62271-100</td>
</tr>
<tr>
<td>Earthing Switch</td>
<td>IEC 62271-102</td>
</tr>
<tr>
<td>Disconnector truck</td>
<td>IEC 62271-102</td>
</tr>
<tr>
<td>Current transformer</td>
<td>IEC 61869-2</td>
</tr>
<tr>
<td>Voltage transformer</td>
<td>IEC 61869-3</td>
</tr>
<tr>
<td>Voltage detecting systems</td>
<td>IEC 61243-5</td>
</tr>
<tr>
<td>Protection against accidental contact,</td>
<td>IEC 62271-200</td>
</tr>
<tr>
<td>foreign bodies and water</td>
<td>IEC 60529</td>
</tr>
<tr>
<td>High-voltage fuse link</td>
<td>IEC 60644</td>
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<tr>
<td></td>
<td>IEC 60282</td>
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</table>
Degrees of protection against accidental contact and foreign objects

<table>
<thead>
<tr>
<th>Degrees of protection against accidental contact and foreign objects according to IEC 62271-200 and IEC 60529</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of protection of the accessible claddings in the cubicle</td>
</tr>
<tr>
<td>IP3X</td>
</tr>
<tr>
<td>Degree of protection of the switchgear enclosure</td>
</tr>
<tr>
<td>IP4X (^\text{[1]})</td>
</tr>
<tr>
<td>Additional roof</td>
</tr>
<tr>
<td>IPX2</td>
</tr>
</tbody>
</table>

\(^{[1]}\) Other values available on request.

3.8 Ambient and operating conditions

MCset with EasyPact EXE is an indoor switchgear and may only be operated under normal conditions in accordance with IEC 62271-1. Operation under conditions deviating from these is only admissible upon consultation with and with the written approval of the manufacturer.

<table>
<thead>
<tr>
<th>Ambient conditions in accordance with IEC 62271-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature class</td>
</tr>
<tr>
<td>°C</td>
</tr>
<tr>
<td>Ambient temperature min./max. in accordance with IEC <strong>°C</strong> (-5 / +40)<strong>[2]</strong></td>
</tr>
<tr>
<td>Average value over 24 hours</td>
</tr>
<tr>
<td>°C</td>
</tr>
<tr>
<td>Mean relative air humidity: 24 hours / 1 month</td>
</tr>
<tr>
<td>%</td>
</tr>
<tr>
<td>Installation altitude above sea level</td>
</tr>
<tr>
<td>m</td>
</tr>
</tbody>
</table>

\(^{[1]}\) Other values available on request.

3.9 Ratings of the MCset with EasyPact EXE series

<table>
<thead>
<tr>
<th>Rated voltage (U_r) [kV]</th>
<th>12</th>
<th>17.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated insulation level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated power frequency withstand voltage (U_{p,50} 50 \text{ Hz} - 1 \text{ min} ) [rms kV]</td>
<td>28</td>
<td>38</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage (U_{p,1.2/50} \mu s ) [kV peak]</td>
<td>75</td>
<td>95</td>
</tr>
<tr>
<td>Nominal Current and maximum short time withstand current (^{[2]})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional unit with circuit-breaker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated short time withstand current (I_{k, \text{max}}) [kA /3s]</td>
<td>31.5 (^{[2]})</td>
<td>31.5 (^{[2]})</td>
</tr>
<tr>
<td>Rated normal current (I_{V CB}) [A]</td>
<td>1250</td>
<td>1250</td>
</tr>
<tr>
<td>Internal arc withstand (maximum value) AFLR [kA /1s]</td>
<td>31.5 (^{[2]})</td>
<td>31.5 (^{[2]})</td>
</tr>
</tbody>
</table>

\(^{[1]}\) For functional units equipped with circuit-breakers or fuse-contactors, the breaking capacity is equal to the short time withstand current.

In all cases, the device peak making capacity is equal to 2.5 times the short time withstand current.

\(^{[2]}\) For other performance, please contact Schneider Electric.
4. Operation Instructions

For each MV device (VCB, DD and E/S) you have at your disposal a User Guide. It describes the operation, use and maintenance of the corresponding MV device, as well as its storage conditions. The table below gives the main chapters of each document.

<table>
<thead>
<tr>
<th>PHA8537901</th>
<th>PHA85389401</th>
<th>PHA8539001</th>
</tr>
</thead>
<tbody>
<tr>
<td>EasyPact EXE</td>
<td>EasyPact EXE</td>
<td>Medium Voltage Earthing Switch (E/S)</td>
</tr>
<tr>
<td>Medium Voltage Vacuum Circuit Breaker (VCB)</td>
<td>Medium Voltage Disconnecting Device (DD)</td>
<td>Up to 17.5 kV</td>
</tr>
<tr>
<td>Up to 17.5 kV - 630 to 2500 A</td>
<td>Up to 17.5 kV - 630 to 2500 A</td>
<td>For MCset switchboard</td>
</tr>
</tbody>
</table>

- Safety Information
- Overall information
- Introduction to EasyPact EXE
- Before energizing for the first time
- Using EasyPact EXE
- Discovering the electrical auxiliaries
- Maintaining the performance of the EasyPact EXE
- Circuit breaker operation in a nutshell
- Safety Information
- Overall information
- Introduction to EasyPact EXE
- Before energizing for the first time
- Using EasyPact EXE
- Discovering the electrical auxiliaries
- Maintaining the performance of the EasyPact EXE
- Disconnecting Device operation in a nutshell
- Safety Information
- Overall information
- Introduction to EasyPact EXE
- Before energizing for the first time
- Using Earthing Switch
- Maintaining the performance of the Earthing Switch
- Earthing Switch operation in a nutshell

Operation accessories

<table>
<thead>
<tr>
<th>Designation</th>
<th>Reference</th>
<th>View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lever use for:</td>
<td>59449</td>
<td>DM106646.ai</td>
</tr>
<tr>
<td>Earthing Switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Racking operation of withdrawable devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Racking operation of withdrawable VT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple locking padlock</td>
<td>ALP-06</td>
<td>DM106647.ai</td>
</tr>
<tr>
<td>(Supplier CATU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraction table (adjustable for 3 distances)</td>
<td>METACCTRY</td>
<td>DM106648.ai</td>
</tr>
</tbody>
</table>

22
4.1 Interlocks with padlock (not included in the scope of delivery)

Used padlocks Ø 6 to 8 mm.

**Number of possible padlocks per cubicle type:**
- 1 padlock on the opening pushbutton of the withdrawable part
- 1 to 3 padlocks on the E/S operating mechanism to prevent withdrawable part racking-in
- 1 to 3 padlocks on the E/S selector in the open or closed position
- 1 to 3 padlocks on the position selector switch of the VT fuses
- 2 padlocks on the shutter operating mechanism (1 padlock on each shutter)

4.1.1 Withdrawable part padlocking

To lock the racking device opening pushbutton, please refer to VCB User guide (No. PHA 8537901) or to DD User Guide (No. PHA8538401).

![Fig. 17](DM106721.ai)
*Padlocking of racking device open pushbutton.*

4.1.2 Preventing the racking-in of withdrawable part

Pull out the rack-in prevention padlocking and place in the rectangular opening 1 to 3 padlocks (Ø 6 to 8 mm).

![Fig. 18](DM106756.ai)
*Padlocking to avoid the rack-in of a withdrawable device.*
4.1.3 Preventing the Earthing Switch operation

To prevent the Earthing Switch operation (opening or closing) it is possible to place 1 to 3 padlocks (Ø 6 to 8 mm) into the hole of the Earthing Switch position selector.

![Earthing Switch padlocking in open and closed position.](image)

4.1.4 Preventing the VT fuses operation

Plugged-in fuses

Place 1 to 3 padlocks on selector switch to prevent drawout. This also prevents removal of the front panel.

![VT fuses padlocking in closed position.](image)

Withdrawn fuses

Place 1 to 3 padlocks on selector switch to prevent plug-in.

![VT fuses padlocking in open position.](image)
4.1.5 Preventing the opening of the shutters (option)

The shutter operating mechanism is located inside the compartment, on the right side.

![Shutter operating mechanism](Fig. 22)

*Shutter operating mechanism.*

**Important note for \( \geq 31 \, \text{kA/1s internal arc switchgears} \):** to access the shutter operating mechanism, remove the right side sheet metal (2 screws).

![Sheet metal positioned in front of the shutter operating mechanism for \( u \, 31 \, \text{kA/1s internal arc switchboard} \)](Fig. 23)

*Sheet metal positioned in front of the shutter operating mechanism for \( u \, 31 \, \text{kA/1s internal arc switchboard} \).*

---

**NOTICE**

**HAZARD OF DEVICE MALFUNCTIONING**

The metal sheet must be installed before to insert the circuit-breaker.

Failure to follow these instructions can result in equipment damage.

To forbid the opening of shutters the compartment can be equipped with the locking part \( A \).

1. Press the locking part guide.
2. Place the 2 sliders into the slots of the operating mechanism.
3. Insert the padlocks in the holes.

![Padlocking of the shutters](Fig. 24)

*Padlocking of the shutters.*
4.2 Interlocking using locks (option)

4.2.1 Withdrawable part keylocking

Depending on the function of the MV device, the racking device can be keylocked:
- in “Disconnected/test” position for the Vacuum Circuit Breaker (please refer to VCB User guide No. PHA 8537901)
- in “Service” position for the Disconnecting Device (please refer to DD User guide No. PHA8538401).

Fig. 25
Example of racking device keylocking.

4.2.2 Earthing Switch keylocking

The Earthing Switch selector can be keylocked in open or closed position.
Another keylock can be placed on the Earthing Switch operating box to prevent the withdrawable part racking-in.
For detail, please refer to E/S User guide (No. PHA8539001).

Fig. 26
Example of Earthing Switch selector keylocking in open position.

Fig. 27
Keylocking that prevent withdrawable device racking-in.
4.3 Locking using an electromagnet (option)

4.3.1 Electromagnetical locking of the racking device

This function is achieved using a coil which blocks racking-in operation. When the electromagnet is energized, the red pushbutton can be activated and the racking device can be racked in (either manually or by motorization). When the electromagnet is not energized or the power supply is lost, the red pushbutton can’t be activated and the racking device can’t be racked in manually.

The consignment and locking procedures must be defined by operating company.

Lock
When the coil is not energized, the red pushbutton is blocked and cannot be pushed.

Unlock
When the coil is energized, the red pushbutton is unlocked and can be pushed.

Fig. 28
Operation of the electromagnet for locking the racking device pushbutton.

4.3.2 Locking the Earthing Switch

The locking of Earthing Switch can be made with an electromagnet located inside the operating mechanism box, which blocks manual switching operation.

- for Earthing Switch manual version: when the electromagnet is energized, it locks the Earthing Switch position selector in “closed” position.
- for Earthing Switch motorized version: when the electromagnet is energized, it locks the Earthing Switch in motorized mode and thus forbid manual operations.

Fig. 29
Operation of the electromagnet for locking the Earthing Switch.
4.4 Voltage transformers with primary fuses

4.4.1 Plugging in voltage transformer fuses

Initial situation:
- Assembled lower panel
- Selector switch to  

The label on the front plate is a reminder of the operations.

Fig. 30
State of VT fuses at the beginning of plugging in operation.

Operation:

1. Change the position of selector switch to  
   by pulling it and turning it towards the right.

2. Insert the crank into the hole, and turn it clockwise until it is plugged in. Plug-in is completed when resistance can be felt (stop).

3. Remove the crank.

4. Change the position of selector switch to  
   by pulling it and turning it towards the right.
4.4.2 Withdrawing out VT fuses

**Initial situation:**
- Assembled lower panel
- Selector switch to 

The label on the front plate is a reminder of the operations.

**Fig. 31**
*State of VT fuses at the beginning of withdrawing out operation.*

**Operation:**
1. Change the position of selector switch to 
   by pulling it and turning it towards the left.
2. Insert the operating crank into the hole and turn it anti-clockwise until withdrew-out.
3. Remove the crank.
4. Change the position of selector switch to 
   by pulling it and turning it towards the left.
5. Access to the main circuit compartments

5.1 Overview

![Diagram of access points]

**Fig. 32**
Access to the main circuit compartments of a feeder AD cubicle.

A. Access to the lower compartment (connection of MV cables) via the maintenance space or duct (access to CT's also)
B. Access rear (dismantling is optional and is not secured by interlocks)
C. Access Facilitates access to cables (AD cubicle), through the front (access to CT's also)
D. Access to the busbars (not possible for TT cubicle)
D. & E. Access to the rear inter cubicle fastening screws. This sheet must be reassembled before installation of busbars
F. Access to the lower compartment through the front (access to CT's and VT's also)
G. Access to the withdrawable part
H. Access to the low voltage cabinet

5.2 Access to the cable compartment

**DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH
- Move the racking device in "Disconnected/test" position before opening the front door.
- In case upstream VT, presence of voltage in the cables compartment even if the circuit-breaker of the cubicle is racked-out.

Failure to follow these instructions will result in death and serious injury.

The cubicles can be equipped with additional cylinder locks to lock the cable compartment cover and the front door.
5.2.1 Removing and mounting front protection cover panels

**Cubicle without VT or with fixed VT**

*Removing:*
1. Close Earthing Switch (please refer to document PHA8539001).
   It is recommended to padlock it in this position (Fig. 33).
2. In the case of a cubicle equipped with a fixed VT: open the protection switch of the VT secondaries which is located in the regrouping sleeve or in the low-voltage cabinet (Fig. 34).
3. Dismantle the panel by removing screws (Fig. 35).

**Fig. 33**
Earthing Switch closed and padlocked.

**Fig. 34**
Open the protection switch of the VT secondaries.

**Fig. 35**
Cable compartment cover removal (10 screws).

**Mounting:**
To place back into operation, carry out operations in the reverse order of removal (closed Earthing Switch).
Cubicle equipped with a voltage transformer with withdrawal primary fuses

Removing:
1. Withdraw VT fuses (please refer to chapter 4.4.2).
2. Close Earthing Switch (please refer to Earthing Switch User Guide PHA8539001). It is recommended to padlock it in this position (Fig. 33).
3. Open the protection switch of the VT secondaries which is located in the regrouping sleeve or in the low voltage cabinet (Fig. 34).
4. Remove the access panel to the VT fuse (Fig. 36).
5. Remove the bracket at the front of the cubicle (Fig. 37).
6. Remove the access panel to the connection compartment of MV cables (Fig. 38).

Mounting:
To place back into operation, carry out operations in the reverse order of removal (closed Earthing Switch).
5.2.2 Removing and mounting the MV compartment separation sheet

Removing:
1. Remove the withdrawable part (please refer to EasyPact EXE User Guide PHA8537901 or PHA8538401).
2. Remove screws and remove the separation sheet from the MV compartment.

Mounting:
To place back into operation, carry out operations in the reverse order of the removal.

5.2.3 Removing and mounting the manhole sheet

Removing:
Access to the connection compartment of MV cables is possible via the maintenance space at the cubicle manhole level. Likewise, it is possible to access the maintenance space or duct through the inside of the cubicle.

1. Remove Voltage Transformers if the cubicle is equipped with.
2. Remove the screws and remove manhole sheet (Fig. 40).

Mounting
To place back into operation, carry out operations in the reverse order of removal.
5.2.4 Removing and inserting fixed or withdrawable VTs

Preliminary operation for fixed VTs

On each VT:
1. Disconnect the connection bar, by unscrewing the screw.
2. Lift the connection bar.

Fixed VTs / Withdrawable VTs

The removal of VT box from the cubicle is similar operation whatever type of VT.
1. Remove the bracket at the front of the cubicle (Fig. 41).
2. Disconnect the VT low voltage connector (Fig. 42).
3. Remove the VT box using the handle (Fig. 43 & 44).
Closing the MV connection compartment

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HAZARD OF DEGRADED EQUIPMENT PERFORMANCE</strong></td>
</tr>
<tr>
<td>During the first VT insertion, cut and remove the wire ties on the connector of new VT.</td>
</tr>
<tr>
<td>Failure to follow these instructions can result in injury or equipment damage.</td>
</tr>
</tbody>
</table>

**Fig. 45**

*During the first VT insertion, cut and remove the wire ties on the connector.*

To put back into operation, carry out operations in the reverse order of removal. For fixed VTs the tightening torque on connection bar is 30 Nm.

### 5.2.5 Removing the stop arc sheet in the cable compartment

1. Remove the 6 fixation screws in order to take off the sheet.

   ![Diagram](image)

   This sheet need to be reassembled before the cubicle is re-energized.

### 5.2.6 Accessing busbars

**Upper**

For access to busbars, please refer to chapter "Access to the main circuit compartments" p. 30.

**Lower**

Access to lower busbars is possible through the maintenance space by removing the cubicle manhole sheet.

Please refer to chapter "Access to the main circuit compartments" p. 30.
5.2.7 Accessing the main contacts

Lower shutters

Opening lower shutters
1. Using a screwdriver, raise the flat spring to release the lock.
2. Push the ball into the link axis.
3. The shutters will fall and will lock in the down position.

Closing lower shutters
1. Using a screwdriver, raise the flat spring to release the lock.
2. Push the ball into the link axis.
3. Pull the shutters up until they lock.
4. Check that the shutters are back in locked position.

Upper shutters

Opening upper shutters
1. Using a screwdriver, raise the flat spring to release the lock.
2. Push the ball into the link axis.
3. Pull the shutters up until they lock.

Closing upper shutters
1. Using a screwdriver, raise the flat spring to release the lock.
2. Push the ball into the link axis.
3. The shutters will fall and will lock in the down position.
4. Check that the shutters are back in locked position.

**NOTICE**

HAZARD DUE TO MOVING PARTS
Before racking-in the withdrawable part, ensure that the shutters mechanisms have been put back into their initial position (locked closed).
Failure to follow these instructions can result in equipment damage.
6. Electrical diagram for the cubicle

Refer to your equipment’s user guide to find out the proper electrical diagrams corresponding to your MV device without motorization.

The following diagram shows an optional motorized option of MV devices.

| [1] | Rectifier Vishay KBPC806P BF (delivered) |
| [2] | LV plug pin number |
| [3] | 2 pin connectors for motor |

KD  Relay activated when racking-out order
KE  Relay activated when racking-in order
KC  Relay activated when E/S opening order
KO  Relay activated when E/S closing order
KCC Relay activated when all racking conditions are satisfied
KSC Relay activated when all E/S operating conditions are satisfied
QB1 Motorized option of racking device (please refer to VCB or DD User Guide)
QC1 Motorized option of E/S (please refer to E/S User Guide)
M11 DC Motor

Motor 110 V DC has to be protected by an automatic circuit breaker C1A
Motor 220 V DC has to be protected by an automatic circuit breaker C0.5A.
7. Maintenance

MCset with EasyPact EXE Maintenance and Services guide is available. It gives practical information on:

- maintaining the equipment in good operating order,
- ensuring that the equipment is safe during all installation, repair and servicing operations.

DEAI03EN/ART833121
DEAI03FR/ART833120.

7.1 Safety provisions

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Maintenance work may only be performed by trained electricians with proven experience with the MCset with EasyPact EXE series and the valid safety requirements.
- Before removing covers and before performing assembly or maintenance work, make sure that you isolate the system from the high voltage and the supply voltage and that you ground it.
- Comply with the five safety rules:
  1. isolate from the power supply,
  2. make sure that unintentional restart (reclosing) is prevented,
  3. verify zero voltage,
  4. earth and short-circuit,
  5. cover or cordon off adjacent live components.

Failure to follow these instructions will result in death and serious injury.

⚠️ WARNING

HAZARD OF INJURY DUE TO MOVABLE PARTS IN MECHANICAL DRIVES

Before performing mounting and maintenance work:

- isolate the system from the supply voltage;
- release the circuit-breaker’s energy storing device by OFF-ON-OFF operation;
- switch make-proof Earthing Switches ON.
- Do not remove the mechanisms during maintenance work.

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

⚠️ WARNING

HAZARD OF INJURY DUE TO SHARP-EDGED SHEET METAL AND METAL PARTS

During installation and maintenance work

- Always wear the approved protective clothing in accordance with the valid accident prevention and work regulations.
- Always cover sharp edges.

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

7.2 Maintenance and maintenance specifications

MCset with EasyPact EXE series indoor switchgear units have been designed for normal operating conditions in accordance with IEC 62271-1.

Outside normal conditions of use (between -5 °C and 40 °C, absence of dust, corrosive gas, etc.), it is recommended to examine, with our Schneider Electric services centre, the steps to be taken, in order to ensure correct functioning of the installation.

After 6 to 12 months operations, we recommend you to check the busbars and MV cable connection tightening. It should be done with a calibrated torque spanner, adjust to lower torque compare to values indicated in following table:

<table>
<thead>
<tr>
<th>Screw</th>
<th>Torque in Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 6</td>
<td>13</td>
</tr>
<tr>
<td>Ø 8</td>
<td>28</td>
</tr>
<tr>
<td>Ø 10</td>
<td>50</td>
</tr>
<tr>
<td>Ø 12</td>
<td>75</td>
</tr>
<tr>
<td>Ø 14</td>
<td>120</td>
</tr>
</tbody>
</table>
The elastic washers placed on the external sides of the connections and busbars ensure better
distribution of stress induced by the screw torque.

If no problems are detected and if the busbars and cable connections haven’t been modified, it will
not necessary to do again this check.
In case of dismantling, the elastic washers must be change and replace by new ones supplied by
Schneider Electric.

Our service centre is at your disposal at any time:
• to undergo an installation diagnostic,
• to offer you, if need be, suitable maintenance operations,
• to offer you maintenance contracts,
• to offer you adaptations.
For the other MV device maintenance, please refer to the device’s User Guide.

Inspection

**NOTICE**

HAZARD OF DEVICE DAMAGE
In case of frequent condensation or air pollution (dust, smoke or corrosive gases), the
maintenance intervals must be adapted to the actual conditions.
Failure to follow these instructions can result in equipment damage.

It is recommended to check the cubicles visually at regular intervals depending on the strain they
are subject to during operation and in accordance with the national regulations.

A visual inspection includes a complete check of the cubicles by certified staff for contamination,
condensation and damage.

Maintenance
If there are signs of contamination or condensation, the cubicles must be cleaned in expert fashion
(see "7.3 Cleaning" p. 40 and "7.4 Avoid condensation" p. 40) and subsequently the drives,
interlocks and position indicators checked for proper functioning.

Repair
If damage is detected on the cubicles, these must be repaired or components be replaced
immediately ("8. Replacement of components and cubicles" p. 45).

In case of ambiguities or irregularities, please contact the manufacturer’s Service Center
immediately.

<table>
<thead>
<tr>
<th>Maintenance interval</th>
<th>Work to be carried out</th>
<th>Qualification / Work performed by</th>
</tr>
</thead>
</table>
| 1 year               | • Clean and grease drives and movable main current contacts (see "7.6 Lubrication instructions" p. 40  
                        • Check releases and blocking coils for proper function |
|                      |                        | Staff who have been certified for this work |
| After 1,000 actuations of the truck or the Earthing Switch | Revision of the switching device in question | Service Center of the manufacturer |
| Racking device | Refer to the applicable instruction manual for the racking device concerned. PHA8537901 | |
| Circuit-breaker EasyPact EXE | | |
7.3 Cleaning

To ensure the specified insulating level, the insulating components must be clean. On principle, cleanliness deserves utmost attention.

When deposited dirt is detected, the cubicles must be cleaned in an expert manner. When cleaning, make sure that the lubrication in the drive mechanisms is not removed. If the drive mechanisms are no longer sufficiently lubricated, new lubrication must be applied.

**Use a dry cleaning cloth to remove slight soiling:**
Clean using a dry, lint-free cloth. Depending on the degree of soiling, replace cloth as often as necessary.

**Use cleaning agents for severe soiling:**
Use only cleaning agent specified by Schneider Electric (ref. no. S008152. The use of other cleaning agents is not admissible.
- Wear protective gloves.
- Use cleaning agent according to manufacturer's instructions.
- Soak the cloth thoroughly and wipe the insulating components. Keep duration of exposure as short as possible.
- Expose the cleaned surface to the air for at least two hours.

<table>
<thead>
<tr>
<th>Auxiliary products</th>
<th>Ref. no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning agent</td>
<td>S008152</td>
</tr>
</tbody>
</table>

7.4 Avoid condensation

To ensure the specified insulating level, the switchboards – especially their insulating components – must not be exposed to condensation.

**Measures to take in case of condensation:**
If condensation is detected in or on the cubicles, clean the cubicles.
1. Installation or inspection of cubicle heating. It must provide a sufficient heating performance to prevent condensation on the cubicles.
2. Condensation can also be prevented by ensuring suitable ventilation and heating of the station or by using de-humidification devices.

7.5 Corrosion protection

Drive mechanisms and covers have a long-term protection against corrosion. Any damage to the paint, scratches and other damage must be repaired immediately to avoid corrosion.

7.6 Lubrication instructions

**NOTICE**

**HAZARD OF DEVICE DAMAGE**

- The bearings and joints must not be washed out by the cleaning agent.
- The following elements must not be lubricated:
  - Motor
  - Ball bearings
  - Auxiliary releases
  - Push switches
  - Blocking coils
  - Auxiliary switches.
- Only approved lubricants may be used.

Failure to follow these instructions can result in equipment damage.
The lubricants are available from the manufacturer. The use of alternative auxiliary products is not permissible.

<table>
<thead>
<tr>
<th>Lubrication points (Fig. 48)</th>
<th>Lubricants</th>
<th>Lubrication procedure</th>
<th>Markers on the view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sliding electrical contact surfaces</td>
<td>AMBLYGON TA 15/2 “KLUBER” (white)</td>
<td>Apply a thin and uniform film of lubricant</td>
<td>A, B</td>
</tr>
<tr>
<td>All accessible friction points and mechanical sliding surfaces</td>
<td>MOBILITH aSHC 100 (red)</td>
<td>Clean lubrication points with lint-free cotton cloth; apply a thin film of lubricant (using e.g. a paintbrush).</td>
<td>C</td>
</tr>
<tr>
<td>All accessible friction points and mechanical sliding surfaces</td>
<td>ISOFLEX TOPAS L152 “KLUBER” (white)</td>
<td>Clean lubrication points with lint-free cotton cloth; apply a thin film of lubricant (using e.g. a paintbrush).</td>
<td>D, E</td>
</tr>
</tbody>
</table>

Once maintenance work is complete
1. Remove all the tools and auxiliary equipment used.
2. Re-insert withdrawable part into the compartment.
3. Reposition covers, close doors and check switching functions (see Assembly Instructions AGS 531 5010-01, Chapter "Commissioning").
7.7 Corrective maintenance

7.7.1 Replacement of VT box fuses

Start
Racked-out fuses and VT’s LV plug unplugged.
Remove the front panel (refer to chapter “Access to the main circuit compartments”).

Removing

1. Lift holder A.
2. Disconnect the small vertical rod B.
3. Pivot the striker pads C into a horizontal position.
4. Carefully remove the pin from the striker pads D.
5. Push the plug E and turn towards the left and release. The fuse is unlocked.
6. Remove the plug and the fuse.

Installing

1. Place the spring on the plug and check that it is flush against the bottom of the plug and placed between the two clips indicated by the arrows.
2. Insert the fuses, with the strikers facing the front. Place the plugs on the fuses (spring towards the bottom).
3. Push the plug E.
4. Turn it towards the right and release. The fuse is locked, check that the plug is well locked.

5. Carefully insert the pin on the striker pin C.
6. Snap the link A and lift it to place the striker pads C in a vertical position.

7. Connect the small vertical rod B and ensure free operation of the link A.
8. Replacement of components and cubicles

Drive mechanisms, current transformers, voltage transformers, testing and monitoring systems and complete switchgear cubicles can be replaced as required.

Should you have any queries regarding "Replacement of components or cubicles", please contact the manufacturer’s Service Center.

For correct processing of your enquiry, the following data of the nameplate of the cubicle in question are required (see "3.3 Nameplate" p. 14):

- Type designation
- Serial number
- Year of construction.