Components for Medium Voltage cubicles
The widest range of components to meet your requirements
2013
True peace of mind
Schneider Electric commitments

High quality components
Based on our expertise in building Medium Voltage cubicles, all the proposed components are designed to be fully consistent with the others. This gives an assurance of complete interoperability, which has been tested in our own Medium Voltage cubicles equipped with these components. Moreover, our industrialised processes and quality controls guarantee the highest level of component quality to meet your most demanding expectations.

Easy to integrate
Benefit from our tools and training package to increase your product knowledge and ensure easy integration, allowing you to be more efficient in your business. All necessary information on mounting and assembly is supplied with each component.

Fully type-tested products

Compliant with the latest international and local standards

Tools for your business performance:
- Drawings
- Configurators
- Technical manuals (user guides, installation manuals...)
- Products catalogues
- Maintenance guides and End of life manuals

Easy to source, continuous and worldwide availability
Due to Schneider Electric’s presence in more than 100 countries, you can be sure of finding the range of products and devices to meet your needs and comply with local standards.

Compatible with Smart Grid application
Given the demand for an increasing number of energy production sources and the increasingly significant obligations of network adaptability, operators have to know, understand and act correctly:
- Know the switchboard’s status at all times
- Act with full knowledge of the facts

Medium-voltage switchboards demand more and more remote measurement and control capabilities. You will therefore find a whole range of latest-generation monitoring and control devices which fully complement our Medium Voltage switching devices.
Schneider Electric
a brand you can trust
Benefit from Schneider Electric’s expertise

Schneider Electric’s policy has always been to provide its customers with support in their daily activities to enable them to achieve operational excellence. In this overview, Schneider Electric presents to you all the components that you may need to build your Medium Voltage cubicle, from Medium Voltage to Low Voltage.

The experience of a world leader in Medium Voltage

Schneider Electric has been manufacturing MV cubicles for more than 50 years and its installed base amounts to millions of products and devices. The Schneider Electric brand is known worldwide and recognised by the most demanding customers.

A long history of innovation for a global offer

Based on its experience as a world leader, Schneider Electric has developed a large and comprehensive range of innovative Medium Voltage devices employing vacuum, air and SF6 technology. With the first multi-functional digital protection relay created in 1982, you have the benefit of a global leader’s experience and know-how in electric distribution, automation and power and control. All the devices included in this overview have been designed and manufactured to incorporate the benefits of this extensive experience.

Quality certification:

ISO 9001 and ISO 14001

In each of its units, Schneider Electric has an operating organisation whose main role is to verify quality and ensure compliance with standards. This procedure is:

• uniform for all departments
• recognised by numerous customers and official organisations

The quality system for design and manufacturing is certified in compliance with the requirements of the ISO 9001 Quality Assurance model.

Our common values:

• Quality
• Safety
• Professionalism

5% of sales devoted to R and D

Local support all over the world.

There are always Schneider Electric people close to you:

1 500000+ people in more than 100 countries!
The widest range of components to meet your requirements
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Medium Voltage
Components panorama

Medium Voltage
switching devices

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### Benefits

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<tr>
<th>Feature</th>
<th>HVX - Embedded pole</th>
<th>Evolis</th>
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</thead>
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<tr>
<td>Embedded pole for better dielectric and environmental pollution withstand</td>
<td>Embedded pole for better dielectric and environmental pollution withstand</td>
<td>Compact dimensions&lt;br&gt;Reliable spring mechanism for open pole technology</td>
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</table>

### HVX - Embedded pole

<table>
<thead>
<tr>
<th>Protection and operation of network</th>
<th>HVX - Embedded pole</th>
<th>Evolis</th>
</tr>
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<tbody>
<tr>
<td>Voltage (kV)</td>
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<td>17.5</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>40.5</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>10000</td>
<td>10000</td>
</tr>
<tr>
<td></td>
<td>3p</td>
<td>3p</td>
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### Standards

<table>
<thead>
<tr>
<th>Standards</th>
<th>HVX - Embedded pole</th>
<th>Evolis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC, GB (chinese), GOST standards</td>
<td>IEC, GB (chinese), GOST standards</td>
<td>IEC standards</td>
</tr>
</tbody>
</table>
# SF6 Circuit Breakers

| Functions | Protection and operation of network | Rated voltage |
|-----------|-------------------------------------|--|--|
| Protection and operation of network | | |
| Rated voltage | | |
| Rated voltage | 12kV | 17.5kV | 24kV | 36kV | 36kV | 40.5kV |
| Max. rated short-circuit current | 50kA | 40kA | 25kA | 25kA | 25kA | 40kA | 31.5kA |
| Max. rated current | 3150A | 3150A | 1250A | 1250A | 1250A | 3150A | 2500A |
| Versions | • Fixed | • Fixed | • Fixed |
| Versions | • Withdrawable | • Withdrawable |
| Number of poles | 3p | 3p | 3p |
| Mechanical switching cycles (ON/OFF) | 10000 | 10000 | 10000 |
| Mounting | • Front | • Front | • Front |
| Mounting | • Side |
| Mechanism | Conventional spring | Conventional spring | Conventional spring |
| IEC standards | IEC standards | IEC standards |

## Benefits
- Suited for nuclear powerplant
- Marine solutions certified
- Integrated VIP trip unit (without auxiliary power supply) in SFset up to 24 kV (for side mounted)
- Suited for capacitor bank application
- High energy mechanism (230 J) to open at high voltage ratings
## Medium Voltage switching devices

### Contactors

#### Vacuum contactors

<table>
<thead>
<tr>
<th>CPX</th>
<th>CLX</th>
<th>CBX</th>
<th>CVX</th>
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<td><img src="PE90236" alt="Image" /></td>
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</table>

#### Functions

**Protection and control of network**

**Rated voltage**

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<thead>
<tr>
<th> </th>
<th>7.2 kV</th>
<th>7.2 kV</th>
<th>7.2 kV</th>
<th>12 kV</th>
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<tr>
<td>3.6 kV</td>
<td></td>
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</table>

**Max. rated short-circuit current**

<table>
<thead>
<tr>
<th> </th>
<th>4 kA</th>
<th>6 kA</th>
<th>6 kA</th>
<th>4 kA*</th>
<th>6 kA*</th>
<th>4 kA*</th>
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</thead>
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<tr>
<td>3.6 kV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Max. rated current**

<table>
<thead>
<tr>
<th> </th>
<th>400 A (AC4)</th>
<th>400 A (AC4)</th>
<th>400 A (AC4)</th>
<th>315 A (AC4)</th>
<th>400 A (AC4)</th>
<th>315 A (AC4)</th>
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<tbody>
<tr>
<td>3.6 kV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Versions

- **Fixed**
- **Withdrawable**
  - CBX version equipped with DIN or BS fuses
  - Optional on board auxiliary voltage transformer
  - Withdrawable CBX version equipped with DIN or BS fuses

#### Number of poles

<table>
<thead>
<tr>
<th>3p</th>
<th>3p</th>
<th>1p - 3p</th>
<th>3p</th>
<th>3p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Mechanical switching cycles (ON/OFF)

<table>
<thead>
<tr>
<th>250 000 (mechanical latch) and 1 000 000 (magnetically held)</th>
<th>250 000 (mechanical latch) and 1 000 000 (magnetically held)</th>
<th>250 000 (mechanical latch) and 3 000 000 (magnetically held)</th>
<th>250 000 (mechanical latch) and 1 000 000 (magnetically held)</th>
<th>250 000 (mechanical latch) and 1 000 000 (magnetically held)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 000 (mechanical latch) and 1 000 000 (magnetically held)</td>
<td>250 000 (mechanical latch) and 1 000 000 (magnetically held)</td>
<td>250 000 (mechanical latch) and 3 000 000 (magnetically held)</td>
<td>250 000 (mechanical latch) and 1 000 000 (magnetically held)</td>
<td>250 000 (mechanical latch) and 1 000 000 (magnetically held)</td>
</tr>
</tbody>
</table>

#### Mechanism

- Magnetic or mechanical latch
  - Magnetic or mechanical latch
  - Magnetic or mechanical latch
  - Magnetic or mechanical latch
  - Magnetic or mechanical latch

#### IEC standards

<table>
<thead>
<tr>
<th>IEC standards</th>
<th>IEC standards</th>
<th>IEC, GB (chinese) standards</th>
<th>IEC, GB standards</th>
<th>IEC, GB standards</th>
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</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Benefits

- Special version available for capacitor banks
- Front access to terminals
- Special version available for capacitor banks
- High short circuit breaking capacity in combination with fuses
- LV supply thanks to optional on board VT
- High short circuit breaking capacity in combination with fuses

* 50 kA in conjunction with fuses
## SF6 Contactor

### Rollarc

<table>
<thead>
<tr>
<th>Functions</th>
<th>Protection and control of network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td></td>
</tr>
<tr>
<td>12 kV</td>
<td></td>
</tr>
<tr>
<td>7.2 kV</td>
<td></td>
</tr>
<tr>
<td>Max. rated short-circuit current</td>
<td></td>
</tr>
<tr>
<td>10 kA</td>
<td>8 kA</td>
</tr>
<tr>
<td>Max. rated current</td>
<td></td>
</tr>
<tr>
<td>400 A (AC4)</td>
<td>400 A (AC4)</td>
</tr>
</tbody>
</table>

### Versions

- Fixed
- Withdrawable

<table>
<thead>
<tr>
<th>Number of poles</th>
<th>3p</th>
</tr>
</thead>
</table>

| Mechanical switching cycles (ON/OFF) | 100 000 (mechanical latch) and 300 000 (magnetically held) |

| Mechanism | Magnetic or mechanical latch |

| IEC standards | IEC standards, GB standards |

### Benefits

- Special version available for capacitor banks
- Front access to terminals
- High short circuit breaking capacity in combination with fuses
- LV supply thanks to optional on board VT

Reference product in SF6 contactor market, Nuclear powerplant application, Capacitor bank application
## Medium Voltage Switching Devices

### Switches and Disconnectors

<table>
<thead>
<tr>
<th>SF6 Switch and Disconnector</th>
<th>Air Switch and Disconnector</th>
<th>Withdrawable Earthing and Disconnector Trucks</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBSkit</td>
<td>L-TRIS</td>
<td>Earthing Truck</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disconnector Truck</td>
</tr>
</tbody>
</table>

#### Functions
- **Indoor load break switch, disconnector and accessories**
- **Indoor load break switch, disconnector**
- **The earthing truck is a safety feature which allows the cubicle busbar to be earthed. It is installed instead of the circuit breaker and has the same interlock possibilities.**
- **The disconnector truck enables the upper and lower part of the cubicle to be short-circuited. It is installed instead of the circuit breaker and has the same interlock possibilities.**

#### Rated Voltage
- **Refer to respective Circuit Breaker range and ratings**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>SF6 (kV)</th>
<th>Air (kV)</th>
<th>Earthing Truck (kV)</th>
<th>Disconnector Truck (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 kV</td>
<td>36 kV</td>
<td>36 kV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Max. Rated Short-Circuit Current
- **25 kA**
- **20 kA**
- **20 kA**

#### Max. Rated Current
- **630 A**
- **1250 A**
- **630 A**
- **1600 A**
- **2500 A**

#### IEC Standards
- **DE56784**
- **PE90386**
- **DE56785**
- **PE90384**

#### Benefits
- Unaffected to environment
- Reduced maintenance
- Air technology
- Interchangeability ensured with equivalent circuit-breaker rating
- Interchangeability ensured with equivalent circuit-breaker rating
# Fuses

## Current limiting fuses

<table>
<thead>
<tr>
<th></th>
<th>Fusarc CF</th>
<th>Solefuse</th>
<th>Tepefuse</th>
<th>MGK</th>
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<tbody>
<tr>
<td><img src="image.png" alt="Image" /></td>
<td><img src="image.png" alt="Image" /></td>
<td><img src="image.png" alt="Image" /></td>
<td><img src="image.png" alt="Image" /></td>
<td><img src="image.png" alt="Image" /></td>
</tr>
</tbody>
</table>

### Functions

Protection to Medium Voltage distribution devices (from 3.6 to 36 kV) from both the dynamic and thermal effects of short-circuit currents

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>3.6 kV</th>
<th>7.2 kV</th>
<th>12 kV</th>
<th>17.5 kV</th>
<th>24 kV</th>
<th>36 kV</th>
<th>7.2 kV</th>
<th>12 kV</th>
<th>24 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. rated current</td>
<td>Up to 200 A</td>
<td>Up to 125 A</td>
<td>Up to 0.3 A</td>
<td>Up to 250 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. rated short-circuit current</td>
<td>Up to 63 kA</td>
<td>Up to 50 kA</td>
<td>Up to 40 kA</td>
<td>Up to 50 kA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Applications

- Motors
- Power Transformers
- Capacitors
- Voltage Transformers
- Power Transformers
- Capacitors
- Voltage Transformers
- Motors

### IEC Standards

- IEC 60282-1, DIN 43625, VDE 0670-402
- IEC 60282-1, UTE C64200, C64210
- IEC 60282-1, UTE C64200, C64210
- IEC 60282-1, UTE standards

### Benefits

- High breaking capacity
- High current limitation
- Low I2t values
- Low breaking overvoltage
- Low dissipated power
- Indoor and outdoor applications
- With a thermal striker
Protection, Metering and Remote control

- Protection relays
- Arc fault detectors
- Medium Voltage instrument transformers
- Energy management and control
- Low Voltage protection
- Direct Current power supply
- Low Voltage relays
- Low Voltage control and signalling
- Substation remote control and monitoring and fault indicators
- Substation power supply
## Protection relays

### Functions

Provides protection of network for each applications: Substations (incomer or feeder type) / Transformers / Motors / Generators / Busbars / Capacitors (capacitor protection relay page C-3). Each relays serie offers all the functions required for:

- effective protection of life and property
- accurate measurements and detailed diagnosis
- integral equipment control
- local or remote indications and operation

### Self power / Auxiliary supply

<table>
<thead>
<tr>
<th>Protection relays</th>
<th>Sepam series 10</th>
<th>MiCOM Px10</th>
<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auxiliary supply</td>
<td>• Auxiliary supply</td>
<td>• Self or Dual supply</td>
<td>Auxiliary supply</td>
<td>Auxiliary supply</td>
<td>Auxiliary supply</td>
<td>Auxiliary supply</td>
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### Protection

<table>
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<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Current (1 or 5A)</td>
<td>• Current (1 or 5A)</td>
<td>• Current (1 or 5A)</td>
<td>• Current (1 or 5A)</td>
<td>• Current (1 or 5A)</td>
<td>• Current (1 or 5A)</td>
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<tr>
<td>Phase and Earth basic</td>
<td>Phase and Earth basic</td>
<td>• Phase and Earth basic</td>
<td>• Phase and Earth basic</td>
<td>• Phase and Earth basic</td>
<td>• Phase and Earth basic</td>
<td>• Phase and Earth basic</td>
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### Display

<table>
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<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
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</thead>
<tbody>
<tr>
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<td>Standard UMI</td>
<td>• Standard UMI</td>
<td>• Standard UMI</td>
<td>• Standard UMI</td>
<td>Standard UMI</td>
<td>Standard UMI</td>
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</tbody>
</table>

### Other characteristics

Withdrawable hardware

### Input / Output (up to)

<table>
<thead>
<tr>
<th>Protection relays</th>
<th>Sepam series 10</th>
<th>MiCOM Px10</th>
<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 / 7</td>
<td>6 / 6</td>
<td>10 / 8</td>
<td>10 / 8</td>
<td>7 / 5</td>
<td>7 / 8</td>
<td></td>
</tr>
</tbody>
</table>

### I/O terminals

<table>
<thead>
<tr>
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<th>MiCOM Px10</th>
<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
</tr>
</thead>
<tbody>
<tr>
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<td>• Screw type</td>
<td>• Screw type</td>
<td>• Screw type</td>
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<td>Ring lug</td>
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<td>Ring lug</td>
<td>Ring lug</td>
<td>Ring lug</td>
<td>Ring lug</td>
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</tbody>
</table>

### Temperature sensor (up to)

<table>
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<th>MiCOM Px10</th>
<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
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</thead>
<tbody>
<tr>
<td>8</td>
<td>8 to 16</td>
<td>External RTD input module</td>
<td>10 (motor)</td>
<td></td>
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</table>

### Communication protocol

<table>
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<th>MiCOM Px10</th>
<th>Sepam series 20</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>• Modbus RTU</td>
<td>• Modbus RTU</td>
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<td>• IEC 60870-5-103</td>
<td>• IEC 60870-5-103</td>
<td>• IEC 60870-5-103</td>
<td>• IEC 60870-5-103</td>
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<td>• DNP3</td>
<td>• DNP3</td>
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<tr>
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<td>• Modbus TCP / RTU</td>
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<td>• Profibus DP</td>
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<tr>
<td>• IEC 60870-5-101</td>
<td>• IEC 60870-5-101</td>
<td>• IEC 60870-5-101</td>
<td>• IEC 60870-5-101</td>
<td>• IEC 60870-5-101</td>
<td>• IEC 60870-5-101</td>
<td>• IEC 60870-5-101</td>
</tr>
<tr>
<td>• IEC 61850 with GOOSE</td>
<td>• IEC 61850 with GOOSE</td>
<td>• IEC 61850 with GOOSE</td>
<td>• IEC 61850 with GOOSE</td>
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<tr>
<td>• DNP3</td>
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<tr>
<td>• SPA-bus communication</td>
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<tr>
<td>• DeviceNet</td>
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<tr>
<td>• RSTP*</td>
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<tr>
<td>• Ethernet high availability communication</td>
<td>• Ethernet high availability communication</td>
<td>• Ethernet high availability communication</td>
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<td>• Ethernet high availability communication</td>
<td>• Ethernet high availability communication</td>
</tr>
</tbody>
</table>

### Logic equations

<table>
<thead>
<tr>
<th>Protection relays</th>
<th>Sepam series 10</th>
<th>MiCOM Px10</th>
<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive logic equations</td>
<td>Comprehensive logic equations</td>
<td>Comprehensive logic equations</td>
<td>Comprehensive logic equations</td>
<td>Comprehensive logic equations</td>
<td>Comprehensive logic equations</td>
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<td>Basic logic equations</td>
<td>Basic logic equations</td>
</tr>
</tbody>
</table>

### Safety characteristics

<table>
<thead>
<tr>
<th>Protection relays</th>
<th>Sepam series 10</th>
<th>MiCOM Px10</th>
<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arc flash protection</td>
<td>Arc flash protection</td>
<td>Arc flash protection</td>
<td>Arc flash protection</td>
<td>Arc flash protection</td>
<td>Arc flash protection</td>
<td>Arc flash protection</td>
</tr>
</tbody>
</table>

### IEC and specific country standards (UL, CSA, GOST...)

<table>
<thead>
<tr>
<th>Protection relays</th>
<th>Sepam series 10</th>
<th>MiCOM Px10</th>
<th>Sepam series 20</th>
<th>Sepam series 40</th>
<th>Vamp 50 series</th>
<th>MiCOM Px20</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC and specific country standards (UL, CSA, GOST...)</td>
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<td>IEC and specific country standards (UL, CSA, GOST...)</td>
<td>IEC and specific country standards (UL, CSA, GOST...)</td>
</tr>
</tbody>
</table>

* Ethernet high availability communication
<table>
<thead>
<tr>
<th>Sepam series 60</th>
<th>Sepam series 80</th>
<th>MiCOM Px30</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Sepam series 60" /></td>
<td><img src="image2" alt="Sepam series 80" /></td>
<td><img src="image3" alt="MiCOM Px30" /></td>
</tr>
</tbody>
</table>

### Functions

#### Self power / Auxiliary supply

<table>
<thead>
<tr>
<th>Sepam series 60</th>
<th>Sepam series 80</th>
<th>MiCOM Px30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auxiliary supply</td>
<td>Auxiliary supply</td>
<td>Auxiliary supply</td>
</tr>
</tbody>
</table>

#### Protection

- **Current (1 or 5A or LPCT)**
- **Voltage**
- **Phase and Earth basic**
- **Directional**
- **Synchro-check**

- **Current (1 or 5A or LPCT)**
- **Voltage**
- **Phase and Earth basic**
- **Directional**
- **Synchro-check**
- **Differential**

- **Current (1 or 5A)**
- **Voltage**
- **Phase and Earth basic**
- **Differential**

#### Display

- **Standard UMI**
- **Remote UM**
- **Mimic based UMI**

- **Standard UMI**
- **Remote UM**
- **Mimic based UMI**

- **Standard UMI**
- **Remote UM**
- **Mimic based UMI**

#### Other characteristics

<table>
<thead>
<tr>
<th>Sepam series 60</th>
<th>Sepam series 80</th>
<th>MiCOM Px30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removable S/W cartridge</td>
<td>Removable S/W cartridge</td>
<td>Removable S/W cartridge</td>
</tr>
</tbody>
</table>

#### Input / Output (up to)

<table>
<thead>
<tr>
<th>Sepam series 60</th>
<th>Sepam series 80</th>
<th>MiCOM Px30</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 / 16</td>
<td>42 / 23</td>
<td>50 / 26</td>
</tr>
</tbody>
</table>

#### I/O terminals

- **Screw type**
- **Ring lug**

- **Screw type**
- **Ring lug**

- **Screw type**
- **Ring lug**

#### Temperature sensor (up to)

<table>
<thead>
<tr>
<th>Sepam series 60</th>
<th>Sepam series 80</th>
<th>MiCOM Px30</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 to 16</td>
<td>8 to 16</td>
<td>1 / 9 / 10</td>
</tr>
</tbody>
</table>

### Communication protocol

- **Modbus RTU**
- **IEC 60870-5-103**
- **DNP3**
- **Modbus TCP/IP**
- **IEC 61850 Standard GOOSE**
- **RSTP**

- **Modbus RTU**
- **IEC 60870-5-103**
- **DNP3**
- **Modbus TCP/IP**
- **IEC 61850 Customised GOOSE**
- **RSTP**

- **Modbus RTU**
- **IEC 60870-5-103**
- **DNP3**
- **IEC 61850 with GOOSE**
- **RSTP / SHP / DHP**

### Logic equations

- **Comprehensive logic equations**
- **Control logic by ladder diagram**
- **Comprehensive logic equations**

### Safety characteristics

<table>
<thead>
<tr>
<th>Sepam series 60</th>
<th>Sepam series 80</th>
<th>MiCOM Px30</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 61508 - SIL2</td>
<td>IEC 61508-SIL2</td>
<td>IEC and specific country standards (GOST...)</td>
</tr>
</tbody>
</table>

#### Benefits

- **Sepam**
  - Hardware modularity and common Hardware modules
  - Large range of auxiliary power
  - Full range ROHS and conformal coated

- **MiCOM**
  - Complete and Comprehensive product offer
  - Full IEC 61850 solution with goose
  - All in the box solution

- **Vamp 50**
  - Powerful CPU supporting native IEC 61850
  - Improved safety with economical and fast arc flash protection
**Arc fault detectors**

**Protection, Metering and Remote control**

### Arc fault detector

<table>
<thead>
<tr>
<th>Vamp 120</th>
<th>Vamp 121</th>
<th>Vamp 221 (+I/0 units)*</th>
<th>Vamp 321 (+I/0 units)*</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
</tbody>
</table>

**Functions**

The arc protection unit detects an arc flash in an installation and trips the feeding breaker. An arc flash protection maximises personnel safety and minimises material damage caused by arc faults.

**System features**

- Typical operation on light only principle
- Input for current criteria for I> and L> operation
- Integrated 19 - 256 V AC/DC aux. supply
- Optimised for wind power and other small applications
- Up to 4 arc or smoke sensors
- Selective trip for 2 zones and possibility for generator set emergency trip (separate contact)
- Operation time 7 ms (including the output relay)
- Non-volatile trip status
- NO and NC trip outputs (Zone 1)
- Self-supervision
- Straight-forward installation
- Cost efficient solution

- Current and light tripping criteria (possibility of tripping by light only)
- Operating time 7 ms or less (electromechanical contact)
- Accurate location of arc fault utilising point sensors
- Four selective protection zones per central unit
- Self-supervision of the entire system
- Easy interconnect using VX001 cables
- Phase current measuring
- Earth fault current measuring
- Personal protector option
- Panel or rail mount I/0 units
- Circuit breaker fail protection (CBFP)
- Three phase current, zero sequence voltage and current
- Event logs, disturbance recording and real time clock
- Operation on simultaneous current and light or light only
- Informative display LCD (single line diagram)
- Up to ten trip contacts
- One normally open and one change over alarm contact
- Less than 7 ms operation time (including the output relay)
- Optionally 1 ms operation time when semi-conductor outputs are used
- Programmable operation zones
- Continuous system self supervision
- PC configurable
- Communication ports supporting a wide range of communication protocols which are intended for a SCADA interface

**Sensors**

- Point sensor - surface
  - Arc detection from two compartments simultaneously
  - Self-monitored
  - Cable length adjustable from 6m to 20m down
- Point sensor - pipe
  - Self-monitored
  - Cable length adjustable from 6 to 20m down
- Portable sensor
  - Snap-in connection to I/0 unit
  - Enhanced work safety

- Point sensor - surface
  - Arc detection from two compartments simultaneously
  - Self-monitored
  - Cable length adjustable from 6m to 20m down
- Point sensor - pipe
  - Self-monitored
  - Cable length adjustable from 6 to 20m down
- Portable sensor
  - Snap-in connection to I/0 unit
  - Enhanced work safety

- Loop sensor (fibre)
  - Monitors various compartments
  - Small bending radius for easy installation

**IEC standards**

- IEC standards
- IEC standards
- IEC standards
- IEC standards

---

* I/0 units: 4 ref. available (VAM 3L, VAM 10L/LD, VAM 12L/LD, VAM 4C/CD). The choice is to be made according to the needs of type and number of sensors. Please contact us.

**Benefits**

- Personnel safety
- Reduces production losses
- Extended switchgear life cycle
- Reduced insurance costs
- Low investment costs and fast installation
- Reliable operation
# Medium Voltage instrument transformers

## Current Transformers*  
**CT**  
![Image of CT]

## Voltage Transformers*  
**VT**  
![Image of VT]

## Low Power Current Transformers  
**LPCT**  
![Image of LPCT]

### Functions

- **For protection or metering purpose**
- Allows protection and metering in the same product. Both are achieved in the same winding.

### Rated voltage

<table>
<thead>
<tr>
<th>CT</th>
<th>VT</th>
<th>LPCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.5 kV</td>
<td>40.5 kV</td>
<td>24 kV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. rated short-circuit current</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 kA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. rated current</th>
<th>Max. rated voltage</th>
<th>Max. rated current</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000 A</td>
<td>2500 A</td>
<td>2500 A</td>
</tr>
</tbody>
</table>

### Technology

- **MV insulation technology for MV applications**
- **LV insulation tech. for LV applications**

### Main characteristics

- PX accuracy class can be respected in accordance to the relay formula.
- CT types available with primary winding (wounded or bar type) or without primary winding (toroid or window type).
- Ratio change (tapping) on primary or secondary side according to CT types.
- Available types for connection between phases or between phase and earth.
- Voltage factor 1.9Um x 8h (phase-earth) or 1.2 Um continuously (phase-phase).
- Rated primary voltage up to 35√3 kV (phase-earth) or 35 kV (phase-phase).
- Suitable for applications in earthed or insulated neutral systems.
- Available types with metal screened surface according to application.

<table>
<thead>
<tr>
<th>IEC and specific country standards (IEEE, NBR, NFC, GOST...).</th>
<th>IEC 60044-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 60044-8</td>
<td></td>
</tr>
</tbody>
</table>

*Outdoor offer is also available. Please contact us.*

### Benefits

- Wide range also available following DIN standard
- Lack of emissions of any harmful substances in case of fire
- Operating safety: no danger in the event of any accidental opening of the secondary circuit
- Can be installed in 24 kV, 36 kV or 40.5 kV networks without any specific MV insulation.
### Energy management and control

#### Energy metering
- **AMP - ammeter**: Measures the current flowing through an electrical circuit. **VLT - voltmeter**: Measures the potential difference (voltage) of an electrical circuit.

#### Power and Energy monitoring
- **PM3255**, **PM710**, **PM750**: Offers the basic measurement capabilities required to monitor an electrical installation.

### Functions
- **Measures in amps**
  - Current, per Phase and Neutral
  - Frequency
  - Power factor: Total, Active, reactive, partial active energy
- **Measures in volts**
  - Voltage: Total, Phase-to-Neutral and Phase-to-Phase
  - Power factor: Total
  - Active, reactive, partial active energy
- **Offers the basic measurement capabilities required to monitor an electrical installation**
  - 5-module case (18 mm modules)
  - Energy accuracy: IEC 62053-21 class 1

### Instantaneous rms values
- Current, per Phase and Neutral
- Voltage: Total, Phase-to-Neutral and Phase-to-Phase
- Frequency
- Power factor: Total, Active, reactive, partial active energy
- Multi-tariff management

### Power quality measurements
- THD Current, voltage
- Total harmonic distortion: Current, voltage, per phase

### Data recording
- Min/Max/Demand values
- Alarms
- Data logging
- Min/Max of instantaneous values
- Alarms

### Communication
- Modbus RS485 protocol
- 2 digital inputs
- 1 digital output
- Modbus RS485 protocol
- 2 digital inputs
- 1 digital output

### Display
- Backlit LCD
- Multi-language HMI
- LCD (features large 11 mm high characters and powerful backlighting for easy reading even in extreme lighting conditions viewing angles)

### IEC certifications
- **IEC 60051-1, IEC 61013-1, IEC 61000-4**
- **IEC 61557-12 PMD/S-/K55/1**
- **IEC 62053-21 class 1 PMD/S/K55/1**
- **IEC 62053-22 class 0.5S PMD/S/K55/0.5**

### Benefits
- **Local measurements**
  - Panel instrumentation
  - Sub-billing / cost allocation
  - Remote monitoring of an electrical installation
- **Remote monitoring of an electrical installation**
  - Panel instrumentation
  - Sub-billing / cost allocation
  - Remote monitoring of an electrical installation
  - Harmonic monitoring (THD)
**Power and Energy monitoring**

<table>
<thead>
<tr>
<th>PM820</th>
<th>PM850</th>
<th>PM870</th>
<th>Advanced energy metering</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ION7550</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ION7650</td>
</tr>
</tbody>
</table>

**Functions**

- Offers high-performance capabilities needed to meter and monitor an electrical installation
- Comprehensive Power Quality Analysis
- 96 x 96 mm DIN or Panel mount. RTU, integrated or remote display
- Built in digital input and output. Additional I/Os optional
- Energy Accuracy - ANSI 12.20 Class 0.2 and IEC 62053-23 Class 0.5S

**Instantaneous rms and energy values**

- Active, reactive, apparent energy
- Configurable accumulation mode

**Power quality measurements**

- Individual harmonics (harmonic resolution up to the 63rd) - Current and Voltage
  - Waveform capture (PM870: configurable)
  - EN50160 - ITI/CBEMA/SEMI F-47
  - Power Quality compliance evaluation

- Interharmonics up to the 50th (ION7650 only)

- Voltage disturbances with disturbance direction detection

**Data recording**

- Min/max values with data and event logs
- GPS synchronisation
- Alarms with e-mail notification

- Trending / forecasting

- Memory up to 10 MB

**Communication**

- Built in Modbus RS485
- Optional RS232 and second RS485 ports
- Optional Ethernet port with gateway functionality and web server

- Extensive communications options and protocols. Serial RS232/485, Optical, Modem and/or Ethernet (gateway and web server) ports, Modbus RTU, DNP 3.0, Modbus TCP/IP, IEC 61850 or ION

**Display**

- White backlit LCD display. Intuitive navigation with self-guided, language-selectable menus

- Programmable display. Integral LCD or remote color

**ANSI 12.20 Class 0.2, IEC 61557-12, ANSI C37.90.1 Surge Withstand Capability (SWC) and IEC 61000-4-12 Surge Immunity standards**

**IEEE 519, IEEE 1159 and CBEMA/ITIC**

**Benefits**

- For infrastructure, industrial and buildings
- Highly accurate
- Modular
- Energy cost allocation and savings
- Energy availability and reliability

- For infrastructure, industrial, buildings and utilities
- Revenue metering
- Flexible architecture and programmability
- Energy savings
- Leverage existing infrastructure
- Energy availability and reliability
Protection, Metering and Remote control

Energy management and control

Communication

<table>
<thead>
<tr>
<th>EGX100</th>
<th>EGX300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet Modbus TCP/IP</td>
<td>Ethernet Modbus TCP/IP</td>
</tr>
<tr>
<td>Modbus RS485 serial link</td>
<td>Modbus RS485 serial link</td>
</tr>
<tr>
<td>ION6200</td>
<td>PM800</td>
</tr>
<tr>
<td>Micrologic</td>
<td>Sepam</td>
</tr>
</tbody>
</table>

Functions

Ethernet gateway
- Serves as an Ethernet coupler for PowerLogic system devices and other communicating devices using the Modbus protocol
- Offers complete access to status and measurement information provided by connected devices via PowerLogic PC-based software

Web-enabled integrated gateway-server
- Simplifies power utility monitoring: historical use patterns, which come from real-time electrical system loading data and trend plots, help optimise energy usage and existing electrical infrastructure
- Monitors energy usage patterns, reveals opportunities, and helps verify results of efficiency improvements
- Remotely monitors real-time conditions and profile energy use on your power distribution system

Characteristics

Web interface allows for configuration, diagnostics and maintenance
- Secure user interface via user name and password
- User interface available in English, French, German and Spanish
- Supports serial master to ModbusTCP/IP routing
- Advanced security through ModbusTCP/IP filtering with configurable access levels (read-only or full access)
- Receives control power through Power over Ethernet (PoE) or 24 Vdc power source
- Includes one 10/100Base-Tx Ethernet port
- RS485 2-wire and 4-wire compatibility
- IP30-rated DIN rail mounted enclosure
- Rated for use in industrial environments (-25 to 70°C)

Communication

- RS232 or RS485 (2-wire or 4-wire), depending on settings with Modbus RTU/ASCII, PowerLogic (SY/MAX), Jbus and PowerLogic protocols to support a wide range of devices.
- 10/100 Base TX Ethernet port with HTTP, Modbus TCP/IP, FTP, SNMP (MIB II) and BootP (EGX300 only) protocols
- Web interface for configuration, diagnostics and maintenance

EN 610000, IEC 60950, UL508/UL60950, CSA C22.2, EN 60950, AS/NZS25 60950, EN55022/EN55011/FCC class A standards

Benefits

- Simplifies installation by receiving control power through the Ethernet cable
- Set up via an Ethernet network or a serial connection.
- TCP/IP filtering security allows you to specify the level of access each master has to connected serial devices
- Serial Master Support allows a serial Modbus master device connected to the gateway’s serial port to access devices across a TCP/IP network
- Compact DIN-rail mounted product

- Simplifies installation by receiving control power through the Ethernet cable
- Automatically detects networked devices for easy set-up
- Allows creation of custom web pages; use web pages to view the real-time and logged data for an at-a-glance view of your energy consumption
- Dashboards display energy consumption information aggregated over time
- System Access Point shows networked Schneider Electric devices
## Low Voltage protection

<table>
<thead>
<tr>
<th></th>
<th>C60N</th>
<th>C60HDC</th>
<th>C60 Electrical auxiliaries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN rail miniature circuit-breakers. Circuit-Breaker used in auxiliary power supply circuits providing overload and short circuit protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 to 240 VAC (Ph/N)</td>
<td>250 VDC/pole</td>
<td>• 24...415 VAC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 24...130 VDC</td>
</tr>
<tr>
<td><strong>Number of poles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1, 2, 3, 4</td>
<td>1 or 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Breaking capacity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10kA at 240 VAC</td>
<td>6 kA at 250 VDC</td>
<td>Maximum operating current</td>
<td></td>
</tr>
<tr>
<td><strong>Nominal current</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5 to 63 A</td>
<td></td>
<td></td>
<td>• 6 A at U ≤ 240 VAC and 3 A at U ≤ 415 VAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 6 A at U = 24 VDC, 2 A at U ≤ 48 VDC,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 A at U ≤ 130 VDC</td>
</tr>
<tr>
<td><strong>Type of loads/ Tripping curve</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B, C, D</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IEC 947-2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Tripping Curve                  * Type of loads
C (I(n)=d=10n)                  Standard
D (10n=I(n)<14n)                Inrush current
B (3n=I(n)<5n)                  Electronics or high cable length

## Benefits

The Multi9 circuit-breaker is recognised in over 100 countries for its quality and the breadth of its range, making it an indispensable component for your Low Voltage cabinet with complete peace of mind.
# Direct Current Power Supply

## Direct Current Power Supply

### Functions

The electronic switch mode power supply is designed to provide the direct current voltage necessary for automation system equipment control units.

<table>
<thead>
<tr>
<th>Rated input voltage</th>
<th>Input type</th>
<th>Output voltage and current</th>
<th>Power output</th>
<th>IEC standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 to 240 VAC</td>
<td>1 phase</td>
<td>24 VDC / 3.5 A, 5 A, 10 A, 20 A</td>
<td>72 to 144 W</td>
<td>IEC standards</td>
</tr>
<tr>
<td>400 to 500 VAC</td>
<td>1 or 2 phases</td>
<td>24 VDC / 20 A, 30 A, 40 A</td>
<td>85 to 960 W</td>
<td>IEC standards</td>
</tr>
<tr>
<td>100 to 500 VAC</td>
<td>3 phases</td>
<td>24 VDC / 3 A, 5 A, 10 A, 20 A</td>
<td>72 to 960 W</td>
<td>IEC standards</td>
</tr>
<tr>
<td>400 to 500 VAC</td>
<td>3 phases</td>
<td>24 VDC / 20 A, 40 A</td>
<td>72 to 960 W</td>
<td>IEC standards</td>
</tr>
</tbody>
</table>

### Benefits

- **Compact size**
  - • Removable terminals
  - • Diagnosis relay

- **Compact size**
  - • Removable terminals
  - • Diagnosis relay

- **Wide input voltage**
  - (100 - 500 VAC)
  - • Power boost
  - • Manual or automatic reset mode
  - • Advanced diagnostic

- **Power boost**
  - • Manual or automatic reset mode
  - • Advanced diagnostic

*ABL4 and ABL8 only available in some countries*
# Low Voltage relays

## Electromechanical plug-in relays

<table>
<thead>
<tr>
<th>Zelio relays</th>
<th>Miniature relays RXM</th>
<th>Universal relays RUM</th>
</tr>
</thead>
</table>

### Functions

- Designed for the adaptation, amplification, multiplication and processing of information in automated system

### Switching voltage

- 12/250 VAC/DC

### Number of contacts

<table>
<thead>
<tr>
<th>2, 3 or 4 CO</th>
<th>2 or 3 CO</th>
</tr>
</thead>
</table>

### Current

<table>
<thead>
<tr>
<th>6 - 10 - 12 A</th>
<th>10 A</th>
</tr>
</thead>
</table>

### Mounting

- Plugs into socket (DIN rail)
- IEC 61984-1

### Benefits

- Wide choice of number of contacts (up to 4)
- Simplicity of installation and maintenance
- Standardisation of relay pin arrangement on its socket.
- TEST button for checking the relay functions, even in a remote enclosure
- Clear indication: contact status mechanical indicator and RELAY ON @LED indicator
- Suitable input/output currents and switching voltages
# Low Voltage
## Control and Signalling

### Pushbuttons and Switches

<table>
<thead>
<tr>
<th>Functions</th>
<th>Enables operation of the Low Voltage circuits of the Medium Voltage cubicle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ZB6/XB6</strong></td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>XB7</strong></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>ZB5/XB5</strong></td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>ZB4/XB4</strong></td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>K1/K2</strong></td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mounting hole (mm)</strong></th>
<th>16</th>
<th>22</th>
<th>16/22</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material</strong></td>
<td>Plastic</td>
<td>Metallic</td>
<td>Plastic or metallic</td>
</tr>
<tr>
<td><strong>Head shape</strong></td>
<td><img src="image11.png" alt="Image" /></td>
<td><img src="image12.png" alt="Image" /></td>
<td><img src="image13.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>Composition type</strong></td>
<td>Modular</td>
<td>Unibody</td>
<td>Modular</td>
</tr>
<tr>
<td><strong>Panel fixing with</strong></td>
<td>Plastic nut</td>
<td>3 points metal</td>
<td>Plastic nut or 4 screws</td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>IP 65</td>
<td>IP 65</td>
<td>IP 66</td>
</tr>
<tr>
<td><strong>Rated insulation voltage</strong></td>
<td>250 V</td>
<td>250 V</td>
<td>600 V</td>
</tr>
<tr>
<td><strong>UL/CSA, IEC</strong></td>
<td>UL/CSA, IEC</td>
<td>UL/CSA, IEC, CCC, GOST</td>
<td>UL/CSA, IEC, CCC, GOST</td>
</tr>
</tbody>
</table>

### Benefits
- Easy to select and to install
- A wide choice of functions
- Robustness and mechanical durability
- High protection degree
- Excellent aesthetics and ergonomics
**Illuminated Pushbuttons, Pilot lights and Switches**

<table>
<thead>
<tr>
<th></th>
<th>XVL</th>
<th>ZB6/XB6</th>
<th>XB7</th>
<th>ZB5/XB5</th>
<th>ZB4/XB4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provides status information and enable control of Low Voltage circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mounting hole (mm)</strong></td>
<td>8/10/12</td>
<td>16</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Plastic</td>
<td>Metallic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Head shape</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Composition type</strong></td>
<td>Unibody</td>
<td>Modular</td>
<td>Unibody</td>
<td>Modular</td>
<td></td>
</tr>
<tr>
<td><strong>Panel fixing with</strong></td>
<td>Plastic nut</td>
<td>3 points metal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>IP 40 / IP 65</td>
<td>IP 65</td>
<td>IP 65</td>
<td>IP 66</td>
<td>IP 66</td>
</tr>
<tr>
<td><strong>Rated insulation voltage</strong></td>
<td>50V</td>
<td>250V</td>
<td>250V</td>
<td>600V max</td>
<td>600V max</td>
</tr>
<tr>
<td>UL/CSA, IEC</td>
<td>UL/CSA, IEC</td>
<td>UL/CSA, IEC, CCC, GOST</td>
<td>UL/CSA, IEC, CCC, GOST</td>
<td>UL/CSA, IEC, CCC, GOST</td>
<td></td>
</tr>
</tbody>
</table>

**Benefits**

- Long life resistance (LED technology)
- True colours and excellent brightness
- A wide choice of voltages
- High protection degree
- Easy mounting
Low Voltage
Control and Signalling

### Selector switches

<table>
<thead>
<tr>
<th></th>
<th>CMA</th>
<th>CMV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Functions</strong></td>
<td><strong>Functions</strong></td>
</tr>
<tr>
<td>CMA</td>
<td>uses a single ammeter (by means of Current Transformers) for successive measurement of the currents of a three-phase circuit</td>
<td>uses a single voltmeter for successive measurement of voltages (phase-to-phase and phase-to-neutral) of a three-phase circuit</td>
</tr>
<tr>
<td></td>
<td>48 x 48 Flush mounted</td>
<td>48 x 48 Flush mounted</td>
</tr>
<tr>
<td></td>
<td><strong>Mechanical switching cycles</strong></td>
<td><strong>Electrical switching cycles</strong></td>
</tr>
<tr>
<td></td>
<td>2 000 000</td>
<td>100 000</td>
</tr>
<tr>
<td></td>
<td><strong>Max. rated voltage</strong></td>
<td><strong>Max. rated current</strong></td>
</tr>
<tr>
<td></td>
<td>230 V</td>
<td>20 A</td>
</tr>
<tr>
<td></td>
<td><strong>IEC 60947-3</strong></td>
<td></td>
</tr>
</tbody>
</table>

- AgNi contact ensuring mechanical durability
- IP65 on front face
**Protection, Metering and Remote control**

**Low Voltage Control and Signalling**

<table>
<thead>
<tr>
<th>New Linergy TR - Terminal Blocks*</th>
<th>Cable Ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSY TRV</td>
<td>NSY TRR</td>
</tr>
</tbody>
</table>

**Functions**

- Ensures connection of Low Voltage cables or wires
- Facilitates the insertion of wires into the terminals and assures the insulation between adjacent connection
- Allows the identification of the wires

**Technology**

- Screw clamp technology
- Spring clamp technology
- Push-in technology
- Insulated cable ends

**Connection functions**

<table>
<thead>
<tr>
<th></th>
<th>Screw clamp technology</th>
<th>Spring clamp technology</th>
<th>Push-in technology</th>
<th>Insulated cable ends</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Passthrough (2.5 - 250 mm²)</td>
<td>Passthrough (2.5 - 16 mm²)</td>
<td>Passthrough (1 - 2.5 mm²)</td>
<td>Three available versions:</td>
</tr>
<tr>
<td></td>
<td>Protective earth</td>
<td>Protective earth</td>
<td>Protective earth</td>
<td>Single conductor cable ends</td>
</tr>
<tr>
<td></td>
<td>Disconnect type (blade or fuse)</td>
<td>Disconnect type (blade or fuse)</td>
<td>Disconnect type (blade or fuse)</td>
<td>Single conductor markable cable ends</td>
</tr>
<tr>
<td></td>
<td>Double deck, multi-pole</td>
<td>Double deck, multi-pole</td>
<td>Double deck, multi-pole</td>
<td>Twin conductor cable ends</td>
</tr>
<tr>
<td></td>
<td>Multifunction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neutral disconnect</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Conductor nominal c.s.a. (cross section area)**

| 2.5 mm² to 240 mm² | 2.5 mm² to 16 mm² | 2.5 mm² and 4 mm² | 0.25 mm² to 50 mm² |

**Number of poles**

| 1 - 1 x 1 / 1 - 2 x 2 | 1 - 1 x 1 / 1 - 1 x 2 / 1 - 2 x 2 | 1 - 1 x 1 / 1 - 1 x 2 / 1 - 2 x 2 | 1 - 1 x 1 / 1 - 1 x 2 / 1 - 2 x 2 / 2 - 1 x 1 / 2 - 1 x 2 / 3 - 1 x 1 |
| 2 - 1 x 1 / 3 - 1 x 1 | 2 - 1 x 1 / 2 - 1 x 2 / 3 - 1 x 1 | 2 - 1 x 1 / 2 - 1 x 2 / 3 - 1 x 1 | 2 - 1 x 1 / 2 - 1 x 2 / 3 - 1 x 1 |

**Clip-on mounting on rail type**

| 2 5 | 2 5 | 2 5 |
| UL, CSA, VDE, ATEX | UL, CSA, VDE, ATEX | UL, CSA, ATEX |
| UL, CSA |

* available from January 2013

**Benefits**

- Rugged and reliable
  - This technology not only provides quality, safety and availability of equipment but optimises installation setup and operation with their simple integrated functions
- Cost effective (quick and reliable)
  - Spring technology is a maintenance-free connection method assuring separation of mechanical and electrical functions. It also eliminates the need for regular retightening
- Quick and innovative
  - Solid conductors or conductors with cable-ends can be directly inserted into the terminal block without tools. The actuation lever can be operated with any tool for loosening conductors
- Fast and reliable wiring
  - Don’t forget the AZ5 and DZ5 ranges of cable ends to simplify wiring and provide optimum electrical continuity between wire and terminal block.
## Substation remote control and monitoring units

<table>
<thead>
<tr>
<th>Easergy</th>
<th>Flair 200C</th>
<th>Flair 21D-22D-23D-23DM*</th>
<th>Flair 219-279</th>
</tr>
</thead>
</table>

### Functions

- Provides switch remote monitoring and control
- Option for Automatic Transfer System (ATS) using Voltage Presence Information from VD23 (see D-2)
- Capacity: 1-16 switches
- Battery autonomy: 16 h
- Fault indicator: phase and earth fault
- Uninterruptible power supply: 24 or 48 Vcc
- Option for IEC 61131 programming languages to develop automation functions

### Protocols

- IEC 870-5-101 and 104, DNP3/DNP3 IP, Modbus/Modbus TCP and various customer owned protocols

### Transmission systems

- Ethernet, RS232/485, radio, PSTN, GSM, GPRS
- Periodic call management
- Concentration of Modbus slave devices
- Embedded web server
- Local and remote configuration

### Earthing system

- Direct, impedant, compensated, isolated

### Supply

- Self powered by current sensor (+ Li battery on Flair 22D)
  - Flair 279: 230V AC + Li battery
  - Flair 219: Li battery

### Measurement

- Ammeter
- Maxmeter

### Communication

- Dry output contact (Flair 21D-22D-23D)
  - Modbus RS485 (23DM)

### IEC standards

- * available from April 2013

## Fault Passage Indicators (FPI)

<table>
<thead>
<tr>
<th>Easergy</th>
<th>Flair 21D-22D-23D-23DM*</th>
<th>Flair 219-279</th>
</tr>
</thead>
</table>

### Functions

- Provides remote access to fault detection and data monitoring of the substation
- One or two Fault Indicators: phase and earth fault for all types of neutral arrangement
- Integrated functions of measurement and monitoring of the substation and data transmission
- Option for IEC 61131 programming languages to develop automation functions

### Detection

- Phase and earth fault

### Setting

- By dip switches
- By menu on LCD display

### Installation

- Embedded in the switchgear
- Wall mounted

### Communication

- Dry output contact
  - Flair 21D-22D-23D
  - Modbus RS485 (23DM)

### IEC standards

- * available from April 2013

### All-In-One device

- Reliability
- Single configuration and diagnostic tool
- Opens the door to the most advanced Smart grid monitoring needs

### Easy commissioning

- Highly configurable
- Long life time
- Measurement functions included
- Advanced fault detection features

### Configurable fault detection settings

- Ten years life time battery
## Substation power supply

### Easergy

#### PS100

### Functions

The PS100 associated with a back-up battery ensures the uninterrupted power supply up to 48 hours in the event of micro-outage and power interruptions for:
- MV switchgear electrical mechanism (motors and coils)
- Transmission equipment (e.g. radio)
- Protection relays, Fault Passage indicators or others IEDS
- And all others devices in MV/LV substations (Low Voltage breakers, PLC concentrator,)

### Power supply outputs

- 12 VDC - 100 W/20 s (for modem, radio, RTU, etc) and 18 W permanent
- 48 VDC or 24 VDC - 300 W/1 minute (for switchgear operating mechanism motors) and 90 W permanent (for protection relays, electronic devices, etc)

### Protocols

- Modbus
- IEC 60255-5 (10 kV level) standard

### Additional Features

- Transmission equipment such as radios
- Control units such as Remote Terminal Units (RTU) or Automatic Transfer Systems (ATS)
- Protection relays, Fault Passage Indicators and other Intelligent Electronic Devices (IED)
- Robustness to the environment of a substation (10 kV insulation, -40°C + 70°C operating temperature)
- Additional ENERGY BACK-UP to restart the installation after a prolonged network cut
- Modbus communication port forwards monitoring data to allow optimised maintenance operations
- Limitation, dedicated to radio units, to avoid the battery discharge
Energy efficiency with Power Factor Correction

Most utilities have specific policies for billing reactive energy. Price penalties are applied if the active power / apparent power ratio is not within the guidelines.

Power Factor Correction solutions modify and control the reactive power to avoid utility penalties and reduce overall kVA demand. These solutions result in lowering utility power bills by 5 to 10%.
### Capacitors and Power Factor controller

<table>
<thead>
<tr>
<th>Capacitors</th>
<th>Power Factor controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propivar NG</td>
<td>Varlogic NR6 - NR12 - NRC12</td>
</tr>
</tbody>
</table>

#### Functions

- Propivar capacitors are used to build capacitor banks for power factor correction on medium voltage networks.
- Measures the reactive power of the installation and control connection and disconnection of capacitor steps in order to obtain the required power factor.

#### Maximum Voltage Um (kV)

<table>
<thead>
<tr>
<th></th>
<th>NR6</th>
<th>NR12</th>
<th>NRC12</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.2 kV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 kV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.5 kV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 kV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36 kV</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Basic Impulse Level (BIL) (kV peak)

<table>
<thead>
<tr>
<th>BIL (kV peak)</th>
<th>60</th>
<th>75</th>
<th>95</th>
<th>125</th>
<th>170</th>
</tr>
</thead>
</table>

#### Technical specifications

- They allow by their different assembly combination to cover many power ratings depending on the insulation voltage, frequency and harmonic pollution level of the network.
- Single capacitor
- 3 phase capacitor
- Surge protection
- Double capacitor unit
- Panel mounting on 35 mm DIN rail (EN 50022).
- Insensitive to phase rotation polarity.
- Direct display of network and capacitor bank step characteristics
- Automatic programming and commissioning
- Communication option Modbus RS485 network

#### Maximum nominal reactive power

<table>
<thead>
<tr>
<th>Reactive Power</th>
<th>900 kvar (1p)</th>
<th>600 kvar (3p)</th>
<th>800 kvar (double capacitor unit)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Standards</th>
<th>IEC 60871-1, 2 and 4, NEMA CP1. Other standards on request</th>
<th>IEC 61326 (CEM), IEC 61010-1/EN 61010-1 standards</th>
</tr>
</thead>
</table>

#### Benefits

- Safety: all Propivar NG capacitors are type tested
- Reliability: 30 years design life
- Green: no PCB full compliance with ROHS directive
- Simplification of the installation, supervision and maintenance of reactive power compensation equipment
- Intuitive man/machine dialogue
Switching devices adapted to capacitor applications

Circuit - Breakers
- SF1 and SF2
- HVX

Contactors
- Rollarc
- CBX (specific version)
- CPX (specific version up to 3.6 kV)

Protection relays
Sepam series C86

Protection relay dedicated to capacitor application

Self power / Auxiliary supply
Auxiliary supply
Protection
- Current (1 or 5 A or LPCT)
- Voltage
- Phase and Earth basic
- Directional
- Synchro-check
- Differential

Display
- Standard UMI
- Remote UMI
- Mimic based UMI

Other characteristics
Removable S/W cartridge
Input / Output (up to)
42 / 23
I/O terminals
- Screw type
- Ring lug
Temperature sensor (up to)
8 to 16
Communication protocol
- Modbus RTU
- IEC 60870-5-103
- DNP3
- Modbus TCP/IP
- IEC 61850
- Customised GOOSE
- RSTP*

Logic equations
Control logic
by ladder diagram
Safety characteristics
IEC 61508 - SIL2

IEC standards
- Ethernet high availability communication

Benefits
- Compliance with RoHS European directive
- Low Energy consumption
Medium Voltage
Components panorama

Accessories

**Accessories**

<table>
<thead>
<tr>
<th>Sepam 100MI</th>
<th>VPIS V2 and phase concordance unit</th>
<th>VD23</th>
<th>Insulating holder w or w/o capacitive divider</th>
</tr>
</thead>
</table>

**Functions**

- **Module with animated mimic diagram and selector switch/ pushbutton for local or remote control, showing the cubicle single line diagram with devices symbolised**
- **Self-powered Voltage Presence Indicating System**
  - Including voltage output version (VPIS-VO) for connection to a VD23 Voltage presence relay
  - Needs Phase Concordance Unit for Phase concordance checking
- **Indicates presence or absence of voltage through 1 or 2 relays**
- **For MV networks from 3 kV to 36 kV**
- **Associated with VPIS-VO**
  - Without capacitive divider: provides mechanical support and insulation through their rigid fin arrangement; used to support busbars and cable ends
  - With capacitive divider: provides mechanical support and insulation. The embedded capacitors in this insulating holder provide voltage output to indicate the voltage presence, up to 24 kV

**Technical specifications**

- Available in 14 standards types
- 21-pin connector on the back for the connection of
  - Supply voltage
  - Device position indication output
  - Circuit breaker control (open/ close and disconnect) outputs.
- Power supply: 24 to 127V AC/DC
- Connectors on the front panel allowing to use a Phase Concordance Unit
- Light indication using LEDs
- Made in 2 parts: surge protection part, always connected and Voltage presence indication part, replaceable for maintenance
- Self-adapted to network Voltage
- Displays the voltage in % of nominal
- Output contacts behaviour configurable according to various combinations of phase and unbalance voltage status
- DIN format
- Allows to address various applications:
  - Automatic transfer systems
  - Alarms on voltage loss
  - Automation on voltage loss
  - Earth locking on voltage presence
  - Alarms on voltage presence
- Height: 175 mm
- Capacitive divider: ISO 35 pf

**Reference numbers**

- Each module is suited to a particular indication and local control application chosen according to:
  - Cubicle single-line diagram
  - Devices whose positions are to be indicated
  - Required local control functions
- 4 versions according to voltage ranges:
  - VP624x3 (2 kV-4 kV)
  - VP624x4 (3 kV-6.3 kV)
  - VP624x7 (9 kV-17 kV)
  - VP624x8 (13 kV-25 kV)
  - With 2 ref. for each version:
    - x=0 for VPIS
    - x=1 for VPIS-VO
  - Phase concordance unit: VP62421
- Voltage presence relay (VD23):
  - ref. EMS58421
  - Combined voltage presence relay + Fault Passage Indicator (Flair 23DV): ref. EMS58353
- 3 isolateurs standards:
  - 17.5 kV ref. 59431
  - 24 kV ref. AAA10075
- 3 isolateurs avec diviseurs capacitifs:
  - 17.5 kV ref. 59430
  - 24 kV ref. AAA10074

**Benefits**

- Includes all the animated mimic elements for viewing, breaking and disconnection devices status
- Compact size and easy installation
- Reduced cabling
- Stand-alone or with Sepam
- High reliability thanks to:
  - Harsh environment design
  - LED indication: extended life time
- Fits all MV network neutral systems
- Compact (DIN format)
- Output contact behaviour highly configurable according to configuration needs
- Dielectric withstand
- Mechanical robustness
### Accessories

<table>
<thead>
<tr>
<th>Anti-condensation Heating element</th>
<th>Insulation busbar cover</th>
<th>High resistance plastic window</th>
<th>Cubicle compartment handle</th>
<th>Extraction table</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
</tbody>
</table>

### Functions

<table>
<thead>
<tr>
<th>Heating the inside of the cubicle when the ambient temperature is too low</th>
<th>Set of 3 insulating covers which enables improved dielectric withstand at the busbars connections in the cubicle</th>
<th>Located on the panel or the door, allows you to see inside a cubicle</th>
<th>Enables the front panel door of the cubicle to be closed.</th>
<th>Enables the circuit-breaker to be taken out of the cubicle and handled during maintenance operations or cubicle manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image6.png" alt="Image" /></td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
<td><img src="image9.png" alt="Image" /></td>
<td><img src="image10.png" alt="Image" /></td>
</tr>
</tbody>
</table>

### Technical specifications

- 220 V AC
- 150 W
- Length: 432 mm
- Supplied with its support without thermostat

For 1 to 4 busbars (100 m x 800 mm each)

- 3 mm thick transparent Polycarbonate window
- Dimensions: 198 mm x 85 mm
- Material: Zamak
- A version with key is available
- Height adjustment up to 250 mm
- A latching device is provided between the extraction table and the cradle

### Reference numbers

<table>
<thead>
<tr>
<th>59280</th>
<th>59420</th>
<th>59105</th>
<th>59270 (handle)</th>
<th>59271 (handle with key)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Available for respective circuit-breakers ranges.</td>
<td>For Evolis: - 59130 (full extraction table) - 59129 (top tray of the table + full device drawings for local manufacturing) - For other circuit-breakers, please contact us</td>
</tr>
</tbody>
</table>

### Avoid condensation in the cubicle

<table>
<thead>
<tr>
<th>Can be adjusted according to number of busbars</th>
<th>Internal arc withstand up to 31.5 kA</th>
<th>Robustness</th>
<th>Possibility to manufacture locally the table support frame</th>
</tr>
</thead>
</table>
UK contact details -

0870 608 8 608
Fax 0870 608 8 606

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Fax 01 601 2201

As the global specialist in energy management with operations in more than 100 countries, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in energy and infrastructure, industrial processes, building automation and data centres/networks, as well as a broad presence in residential applications.

Schneider Electric is dedicated to making individuals’ and organisations’ energy safe, reliable, efficient, productive and green from Power Plant to Plug™.

We are changing our brand names and becoming one Schneider Electric. You’ll get the same great quality products, but from one name you can remember and trust. This provides you and your customers with the reassurance associated with Schneider Electric.

Some of our market leading brands have already become Schneider Electric including Merlin Gerin, Telemecanique, Square D, GET, Mita, Sarel, Himel, Thorsman, Tower and TAC.

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