Rex de Bruyn
PTMV New Zealand

SafeLink
The Ultimate RMU
The Safe Range of Ring Main Switchgear

SafeLink: 12kV Compact Fuse Technology

SafeRing: 12 - 24kV Fuse & Circuit Breaker Technology

SafePlus: 12 - 24kV with Modular Extensibility

A complete range of RMU for all applications

A Life Time Partner for M.V. Switchgear Solutions
12kV Ring Main Switchgear

In our experience...
The last thing you gamble on,
is Network Security and Personal Safety
SafeLink Compact RMU

Applications

• Compact substation
• Outdoor enclosure option
• Compact transformer mounting solution
• Retrofit solution for Epoxy switchgear
SafeLink Compact RMU

Standards

• Designed and tested to IEC 60265, IEC60129, IEC60420 and IEC60694

• Type tested at TCA International laboratory

• Test reports and certificates certified by NATA and ASTA authorities

• Manufacturing and design quality accreditation to ISO9001

• Environmental accreditation to ISO4001
## Switchgear Ratings

<table>
<thead>
<tr>
<th></th>
<th>Cable Ring Switch Disconnector</th>
<th>Transformer T-Off</th>
<th>Cable Ring Earthing Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Voltage</strong></td>
<td>kV</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>Insulated Level : Power frequency</strong></td>
<td>kV</td>
<td>28 *</td>
<td>28 *</td>
</tr>
<tr>
<td><strong>Impulse Withstand Voltage</strong></td>
<td>kV</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td><strong>Rated Current</strong></td>
<td>A</td>
<td>630</td>
<td>See Note 1</td>
</tr>
<tr>
<td><strong>Breaking Capacities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed loop</td>
<td>A</td>
<td>630</td>
<td></td>
</tr>
<tr>
<td>Off load cable charging</td>
<td>kA</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Short Circuit Breaking Current</td>
<td>kA</td>
<td>See Note 2</td>
<td></td>
</tr>
<tr>
<td>Making capacity</td>
<td>kA</td>
<td>50</td>
<td>See Note 2</td>
</tr>
<tr>
<td>Short Time Current : 3 sec</td>
<td>kA</td>
<td>16 or 20</td>
<td>16 or 20</td>
</tr>
</tbody>
</table>

1. Dependent on the current rating of the fuse.
2. Limited by high voltage fuse links
3. * 48 kV on request
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Main Components
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Main Compartments

- Sealed SF₆ tank
- Fuse compartment
- Mechanism compartment
- Cable box
- Venting duct

Total Height: 1350mm
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**Construction**

- Stainless steel tank 3mm
- Mechanism housing IP65
- Hermetically welded tank: IP65 sealed
- Mechanism compartment: IP2X (Accessible)
- Hot dip galvanised, angle iron support frame
- Aluzink 2mm sheet steel cable boxes
- Stainless steel exterior fittings
- Top lifting points
SafeLink Compact RMU

Fuse Compartment

- Horizontal sealed epoxy fuse canisters (IP65).
- Standard DIN fuselinks
- Fuse tripping mechanism in door.
- Fuse caps interlocked with door.
- Interlocked fuse access door.
- SF$_6$ Pressure Gauge
- Terminals and accessory mounting.
Safelink Compact Dimensions

2 & 3 - Way
720 mm

- CFC & CCF
- CCC
- DFD & DCD
- DF & DC

4A - Way
915 mm

- CFCC
- CFCD
- CCCC

4B - Way
1150 mm

- CFFC
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CCF and CFC configurations: Size 2+1

- Both have 2 switched cable connections and 1 transformer connection
- Width 720mm
CCC Configuration: Size 3+0

- Type CCC: 3 Switched cable connections
- Width 720mm
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Single Switching Configuration

Type DFD or DF: 1 Transformer connection and 1 or 2 direct cable connections
Type DCD or DC: 1 Switched cable connection and 1 or 2 direct cable connection

- Width 720mm
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CFFC Configurations : Size 2+2

Type CFCF : 2 Switched cable connection and 2 transformer connections

- Width 1150mm
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CFCC Configurations : 3 + 1

Type CFCC: 3 Switched cable connections and 1 transformer connection.
Or: CFCD: 2 + 1 with direct cable connection for cable extensibility.

- Width 915 mm
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Fuses to Din 43625

ABB type CEF, 12kV, 50 kA

100 amp maximum for transformer protection to 1000 KVA

Dimensions 292mm long
**SafeLink Compact RMU**

**Safety Features**

- Designed for high level of personal safety
- Simple operator interface
- Operation and access fully interlocked
- Active mimic panel
- SF₆ pressure gauge standard
- Voltage indication
- Pressure relief system
- Fault make earth switches
- Earthing both sides of fuses
Cable Compartments

- Segregated, metal enclosed cable boxes
- Heavy duty for arc fault design
- Removable end panels for cable termination
- Removable inner panels for improved access
- Interlocked cable box cover with circuit earth switch
- Cable box cover fixing points (No bolts needed)
- Galvanised angle iron support frame
SafeLink Compact RMU

Cable Compartment features

• Angle iron support frame fixing to floor
• Gland plate or cover plate (optional)
• Cable support rail (optional)
• Earth bar connection
**SafeLink Compact RMU**

**Cable Bushings**

- Front to rear cable configuration
- 100 mm phase centres
- Designed for “slip on” cold shrink insulating boots
- Cable test connection on cable bushing stem
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Cable Bushing Options

Bushing Profile: Series 400 to DIN 47636

- In-line bolted connection stem: 630 Amps
- Adapted pin connection: 630 Amps
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Cable Terminations

- Three Core, 300mm square XLPE cables
- Access with side panel removed
  (Kabledon type KAP 300 insulating boots)

- Single core, 500mm square XLPE cables
- A variety of commonly available “push on”
cold shrink barrier boots can be used i.e.
  (Raychem, type RCAB insulating boots)
SafeLink Compact RMU

Cable Terminations

KAP 300U Insulated Cable Connection

- For indoor cable terminations
- Inline bolted cable connection
- XLPE - cable 15kV, maximum 300mm²
- Paper - insulated cables, maximum 240mm²
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Front Panel

• Front access and operation
• Simple operator interface
• Active mimic panel
• Switch status indication
• Selector handle operation
• Voltage test points standard
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**Transformer Tee-Off Operation**

- Blown fuse indication
- Mechanism reset indication
- Earthing both sides of fuses
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**Ring Switch Operation**

- Padlockable selector handle (also on Tee off)
- Voltage indication socket
- Voltage indicator (Plug in)
Optional Features

- Outdoor enclosure
- Automation
- Remote tripping for fuse switch
- Auxiliary contacts
- Short circuit and earth fault indicators
- Key interlocking
- Operation counter
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Short Circuit Indicator type Alpha E

- Optional on switched cable connections
- Indicating unit and 3 CT’s
- Adjustable trip current 600A, 800A, 1000A
- Optical 3 phase indication
- Remote and manual reset
- Remote indication

- CT’s mounted on cable bushings
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Earth Fault Indicator

• Type EKA - 3 Indicating unit
• Combination earth fault and short circuit options
• Earth fault sensitivity 40A, 80A or 160A
• Earth fault CT’s on each cable core
• Short circuit CT on all 3 cores
• Indicating LED’s for 3 phases
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Voltage Indication and Phase Balance Test

- Capacitive sockets standards
- Electronic tester with LED indication
- Test that cables are connected to correct bushing phase

- Voltage Indicator: Plug in 3 phase
- Self test on Balance tester
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**Tank Arc Fault Venting**

- Very unlikely due to sealed environment
- Service pressure 1.2 bar abs
- Vent release pressure >2.3 bar abs
- Designed to maximise operator safety
- Venting into rear “chimney” section
- Hot gases directed downward behind stand
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SafeLink Fabrication

- Modern ABB robotic welding technology.
- Stainless steel fabrication.
- Automated work stations.
- 24 hour production capability.
- Quality focus.
SafeLink Production

- RMU product factory concept.
- Modern production facility.
- Short delivery focus.
- Quality accreditation ISO9001.
- Environmental accreditation ISO14001.
- Clean environment for SF₆ technology.
SafeLink Compact RMU

SafeLink Testing

• Type tested product.
• Routine factory testing to IEC standards.
• Modern technology for Gas leakage detection.
• Quality tracking with Bar Code system.
• Automated test database for statistical analysis.