Apparatus retrofit solutions
OneFit
Contents

Sections

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• Asset upgrade
• Retrofit
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• True plug-in technology
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Asset upgrade
Full system provider
Retrofit

Overview

- Phased-out devices replacement
- Mechanical and electrical adaptation design
- Current production apparatus

Benefits
- Asset upgrade
- Retrofit
- Technical solutions
Retrofit

Technical solutions

**Conversion**

- Original components
- New device
- Adaptation system

**Roll-in replacement**

- Original components
- New device
- Adaptation system

**Retrofit**

- Hard-bus retrofit
- Cradle-in cradle

- Original components
- New device
- Adaptation system
- New frame/cassette
Technical solutions

Roll-in replacement

Features

- Significant modifications to the switchgear are not required
- Reduced downtime
- Higher performances and additional features

| Original parts | Adaptation system | New device |
Technical solutions

Retrofill: Hard-bus retrofit

Features

- A new frame hosts a standard apparatus
- An additional power circuit makes the connection
- Existing bushings generally remain in place
- Renew of the main functional components of the original switchgear
- Suggested solution when shutters and interlocks are in bad condition
- Significant site work needed
Contents
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OneFit
The latest ABB hard-bus retrofill

ABB integrally safe plug-in design

ABB technology added value
OneFit

Design concept for horizontal drawout breakers

- Integrally safe plug-in system
- Insulating system
- Frame
- Door *

* On request
OneFit

Design concept for vertical lift breakers

- Integrally safe plug-in system
- Insulating system
- Frame
- Door *

* On request
OneFit

Type tests: IEC and GB version

Type tested solution according to:

- Latest IEC Standards:
  - 62271-1 (for the frame)
  - 62271-100 (for the circuit-breaker)
  - 62271-200 when the original panel is provided to perform the tests

- Latest GB Standards:
  - 3906 Alternating current metal-enclosed switchgear
OneFit

Type tests: ANSI version

Type tested solution according to latest IEEE Standards:
• C37.20.2 Standard for Metal Clad Switchgear
• C37.04 Rating structure of high voltage circuit breakers
• C37.59 Requirements for conversion of power switchgear equipment

VM1/A circuit breaker
Automative shutter
OneFit

ANSI version characteristics

Manually operated metallic IEC shutter

PLUS

Automatically operated insulating ANSI shutter

1. Full metallic segregation during breaker insertion to and removal from the frame avoiding accidental electrical-contact injuries.

2. Automatically operated insulating shutter during breaker rack-in and out. Available also motor operated, increasing the distance between the operator and any fault incident.
OneFit

Generator breaker application

OneFit with VD4G targets brown field generator applications

VD4G range fulfills MVA and rating current of each generator breaker replacement:

- VD4G vacuum generator circuit breaker family
- Type tested solution according to the new dual logo IEEE/IEC 62271-37-013-2015 Standards
- Up to 15kV operating voltage, 17.5 kV IEC rated insulation class

VD4G/P-25

VD4G/P-40

VD4G/LR-50
### OneFit

**VD4G onboard OneFit**

<table>
<thead>
<tr>
<th>OneFit frame [AxBxC]</th>
<th>W600 [535x859x792mm]</th>
<th>W700 [685x859x792mm]</th>
<th>W800 [754x886x792mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VD4G version</strong></td>
<td><strong>VD4G/P-25</strong></td>
<td><strong>VD4G/P-40</strong></td>
<td><strong>VD4G/LR-50</strong></td>
</tr>
<tr>
<td>Poles distance</td>
<td>150mm</td>
<td>210mm</td>
<td>210mm</td>
</tr>
<tr>
<td>Rated voltage Ur</td>
<td>15kV</td>
<td>15kV</td>
<td>15kV</td>
</tr>
<tr>
<td>Rated normal current (40°C) Ir</td>
<td>1250A</td>
<td>up to 2000A</td>
<td>2500A</td>
</tr>
<tr>
<td>Rated frequency fr</td>
<td>50/60Hz</td>
<td>50/60Hz</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>Symmetrical short-circuit current Iscg Class G1</td>
<td>16kA</td>
<td>25kA</td>
<td>50kA</td>
</tr>
<tr>
<td>Rated short-time withstand current Ik (3 s)</td>
<td>25kA</td>
<td>40kA</td>
<td>50kA</td>
</tr>
</tbody>
</table>

(a) 3150A rated normal current value may require forced ventilation depending on the original panel design.
OneFit

Customer benefits in retrofit solutions

Both ABB and non-ABB installed base applicability targeting full life time extension

Quick and easy integration of the generator circuit breakers into existing switchgear lineups

Integrated solution with the same operating interface of the distribution retrofit breakers

ABB technical support and analysis of the existing network and the new retrofit breakers

Compliance with latest Standards of the complete retrofit solution
OneFit with VD4 and VM1/A targets brown field high ratings in IEC and IEEE/ANSI applications

New released range fulfills MVA and rating current for distribution breakers replacement:

- Up to 17.5kV 3150A 50kA with VD4 according to IEC62271-100
- Up to 15kV 3000A 50kA with VM1/A according to IEEE C37.04

Onboard W800 OneFit frame (754mm wide)
OneFit

R6.0 High ratings breaker application

Distribution circuit breaker application, when a VD4G is not required, but high rated current are involved

Depending on original switchboard design it requires application of forced ventilation for higher rated current

- 2500A rated with natural air ventilation in W800
- 3000A or 3150A with forced air (FA) ventilation
- ANSI shutter option available

VD4/LR 17.25-32FA.50

VM1/A/LR 15.30FA.50
True plug-in technology

Adaptable

Original panel dimensions are not constraints anymore
True plug-in technology
Flexible

Existing breaker design is over
True plug-in technology

Universal

Screwed

Round

Flat

No limits to interface
Ready to go

Optimized solution

Safety upgrade due to embedded interlocking system with new shutter

Improved dielectric properties due to new integrated insulation design

Design compliance with all circuit breakers type and fused contactors

Application example n. 1
Ready to go

Apparatus range

Benefit of the widest apparatus range

HD4, VD4, VD4 Digitup, VD4G, VM1, VSC
Inducted voltage injuries avoided due to closed door racking

Arc fault operator effects prevented by the remote motor operated racking system

Switchgear revamping with replacement of circuit breaker, measuring sensors and protection relay

Application example n. 2
Ready to go

Modernization

- Earthing switch functionality modernization
- New interlocking functionalities
- Cable testing truck
- Earthing truck also with making capability

ABB ES truck with reliable short circuit making capability

ABB ES truck – without making capability
Ready to go
Link to the future

Interchangeable equipment with new extension panels and additional switchgear
Reusable apparatus in replacement switchgear
Packages

Keep the original standards... increase the safety for personnel ... renew the switchgear
Packages

OneFit Safety

**Increased protection for personnel**

New apparatus racking system, integrated metal isolating shutter and state-of-the-art interlocking system

Added features overcome the existing equipment design constraints providing closed-door operational mode, avoiding accidental electrical-contact injuries
Packages

OneFit Safety Plus

A new level of operational safety

Embedded remote racking provides a safer operating environment for personnel, increasing the distance between the operator and arc-flash-incident energy at the switchgear site.
Safety aspects

Racking-in and out operational procedure

How:
- Circuit breakers racking with open door
- With original or Roll-in-retrofit breakers
- Same operation procedure as the original SWG

When:
- non internal arc (IA) resistant switchgear construction
- missing gas ducts
Packages

OneFit eSafety Plus

**Integral equipment revamping**

Unique solution for the full switchgear revamping (breakers and relays retrofitting)

Integrated current sensors with no heat dissipation

Voltage sensors unaffected by ferroresonance risk

Relay retrofitting with Relion® family

Best choice for retrofitting old breakers with onboard measuring transformers or direct relays
Packages
OneFit eSafety Plus

Integral equipment revamping
Current sensors onboard OneFit frame
Suitable in combination with HD4, VD4 P150 versions and VSC apparatus type
New life to the switchgear integrating relay and voltage sensors

Integrated current sensors
Packages

OneFit eSafety Plus

Integral equipment revamping

The integration measuring sensors onboard VD4 Digitup gives new life to the switchgear

MTTR (Mean Time to Repair) much shorter than conventional solutions

VD4 Digitup is the ideal solution for all installations where a high degree of continuity of service is required
OneFit documentation links

Product Webpage

Add 20 years to the lifetime of your switchgear

Concept movie

Operation movie

Product Guide