



ELECTRIFICATION – DISTRIBUTION SOLUTIONS DIVISION SERVICE, R6.0 2020

Apparatus retrofit solutions

OneFit

Contents

Sections

Section A:

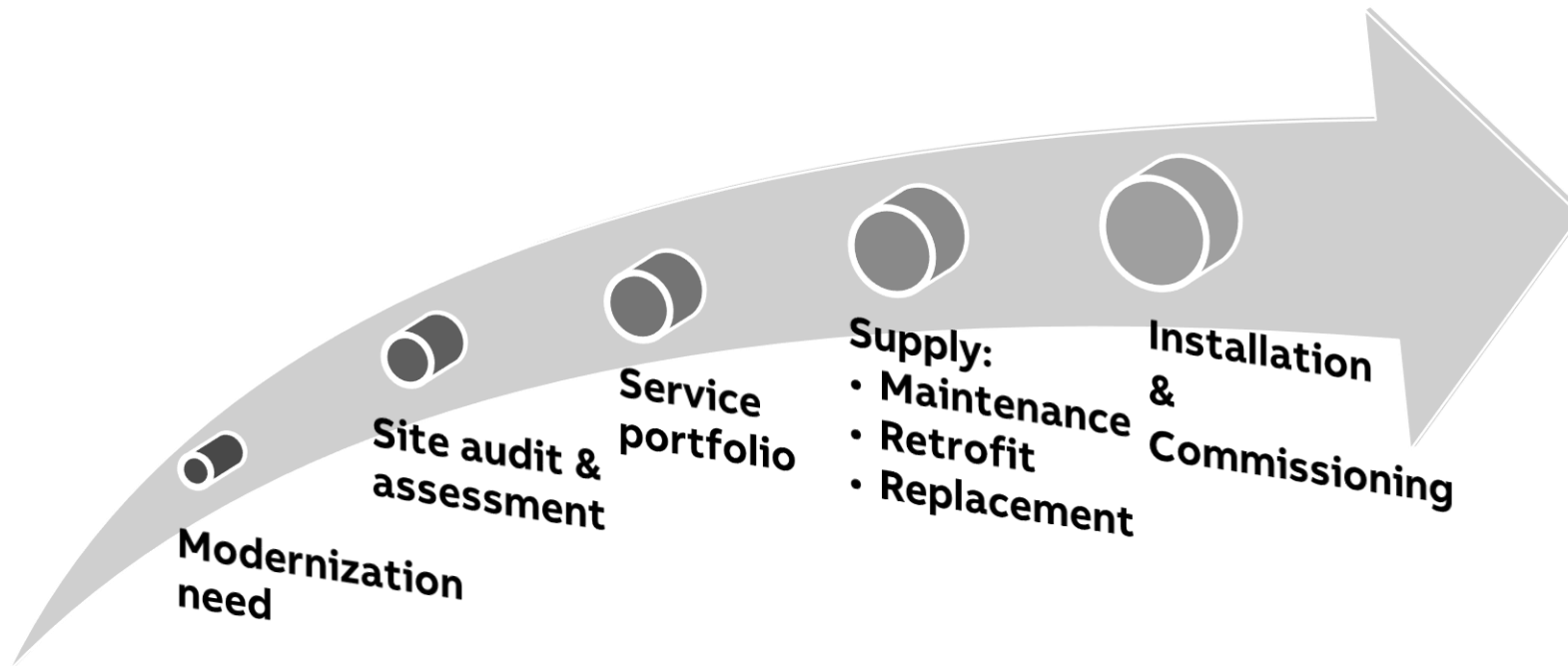
- Asset upgrade
- Retrofit
- Technical solutions

Section B:

- OneFit
- True plug-in technology
- Ready to go
- Packages

Asset upgrade

Full system provider



Retrofit

Overview

Phased-out devices replacement



Mechanical and electrical adaptation design



Current production apparatus

Benefits

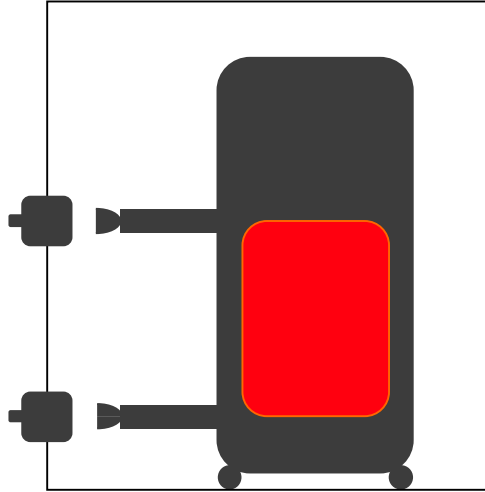
- Asset upgrade
- Retrofit
- Technical solutions



Retrofit

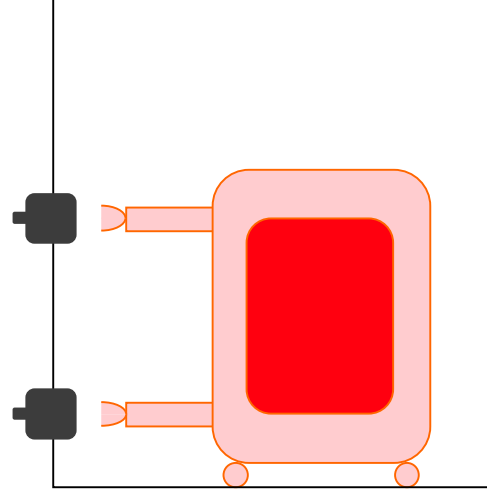
Technical solutions

Conversion



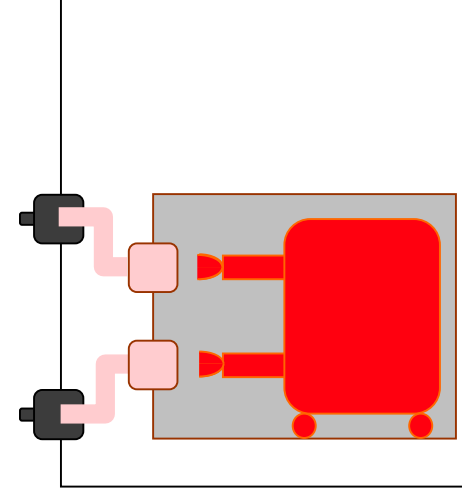
Interchangeable with original apparatus

Roll-in replacement

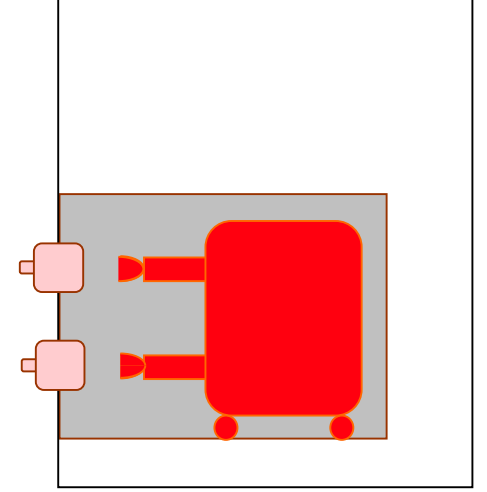


Retrofill

Hard-bus retrofill



Cradle-in cradle



Interchangeable with new equipment

■ Original components

■ New device

■ Adaptation system

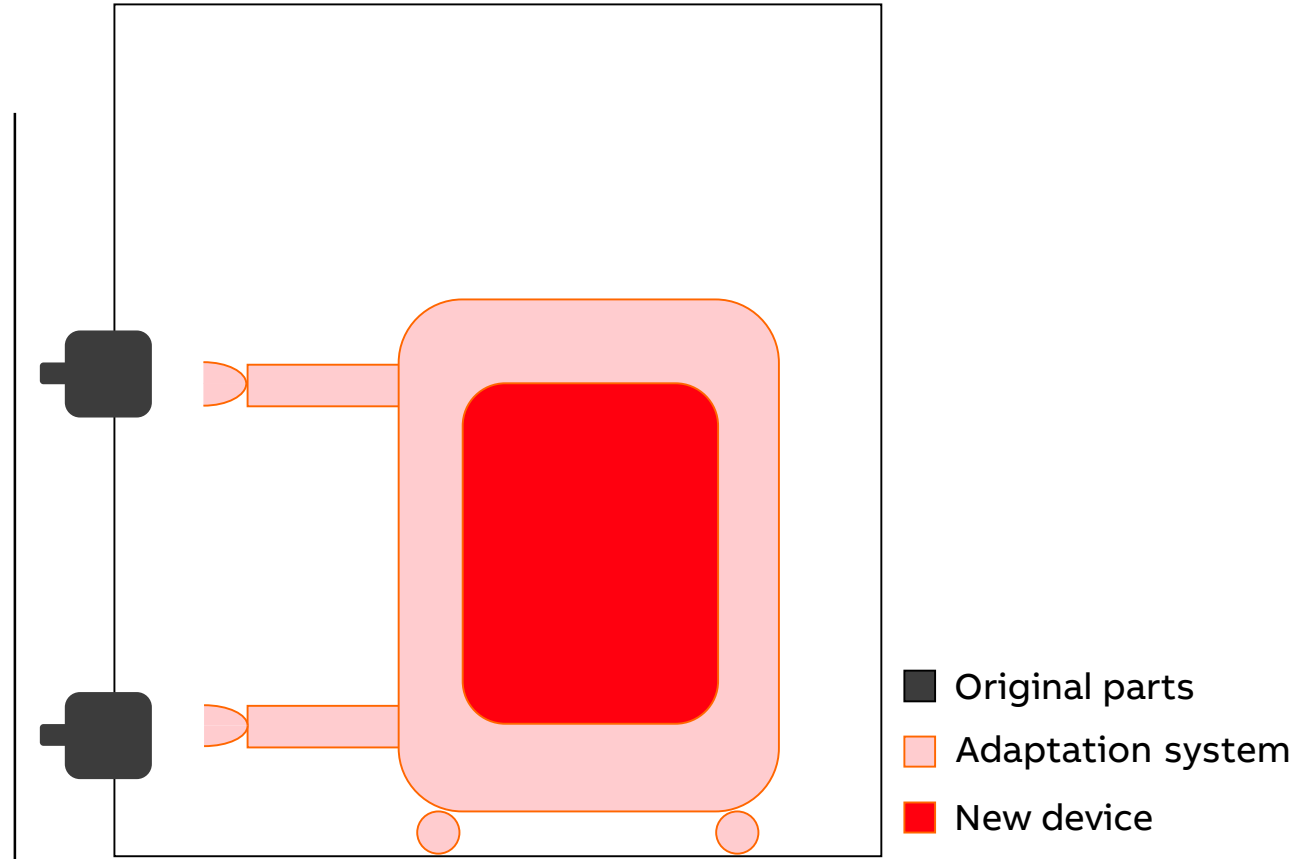
■ New frame/cassette

Technical solutions

Roll-in replacement

Features

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

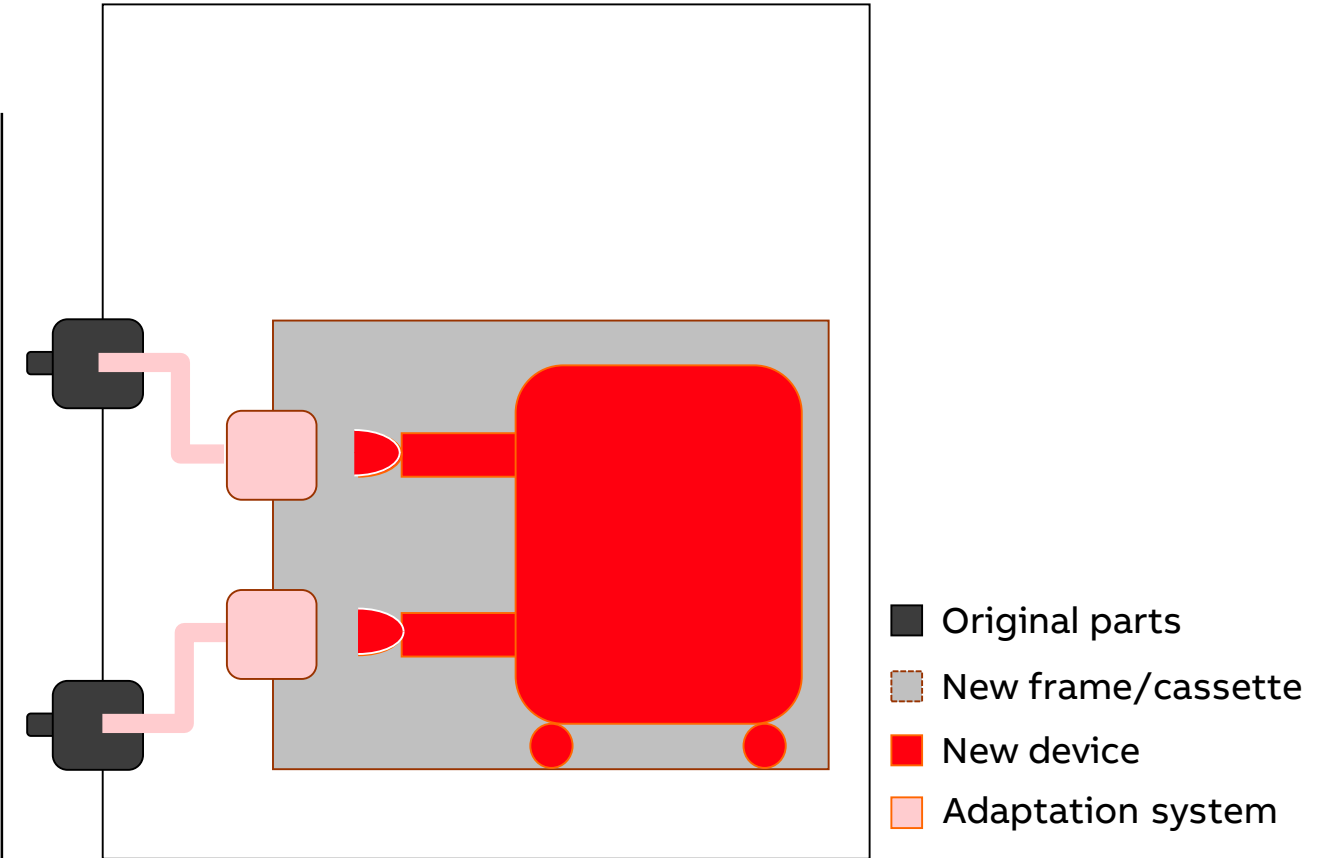


Technical solutions

Retrofill: Hard-bus retrofill

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



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OneFit

The latest ABB hard-bus retrofill

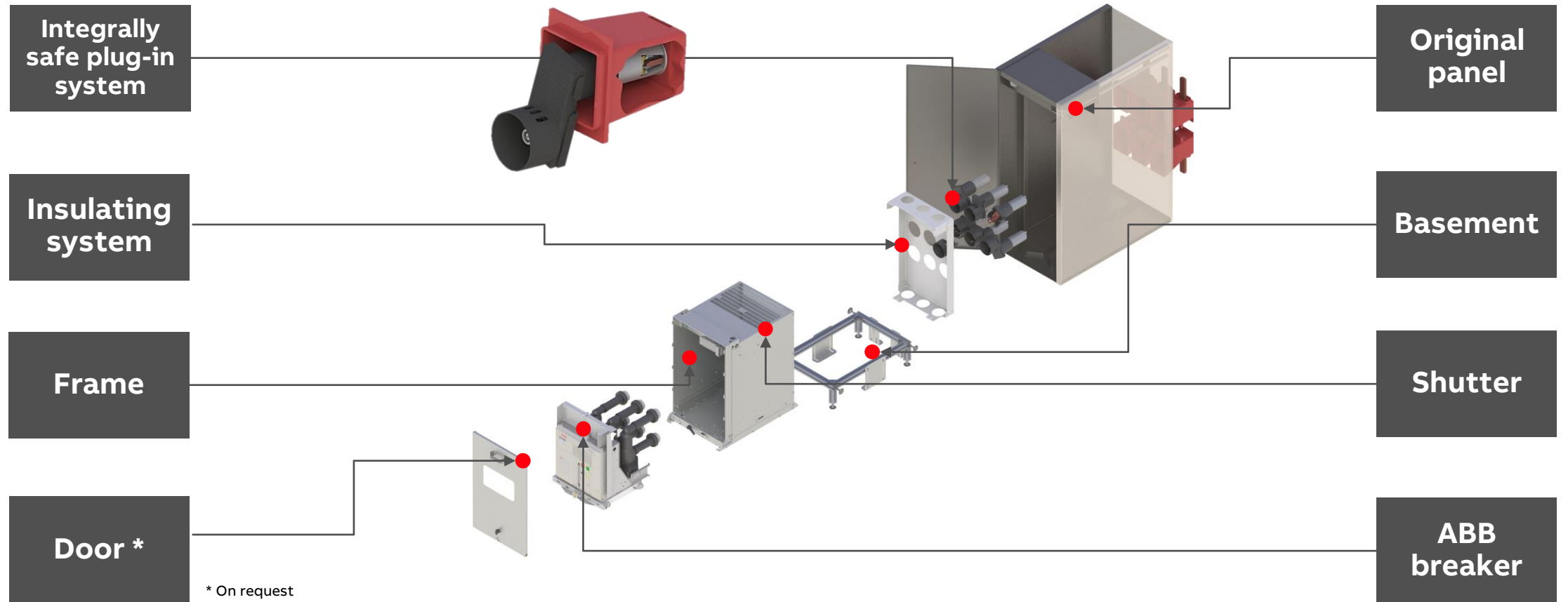
ABB integrally safe plug-in design

ABB technology added value



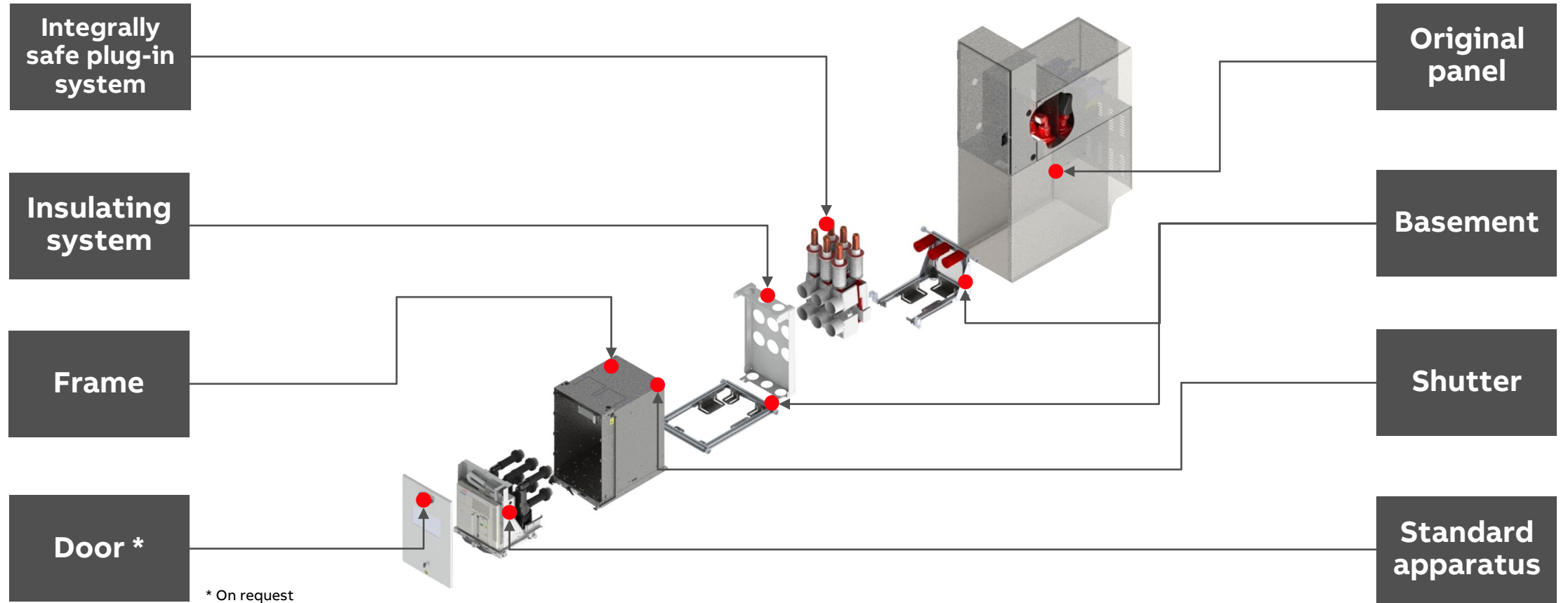
OneFit

Design concept for horizontal drawout breakers



OneFit

Design concept for vertical lift breakers

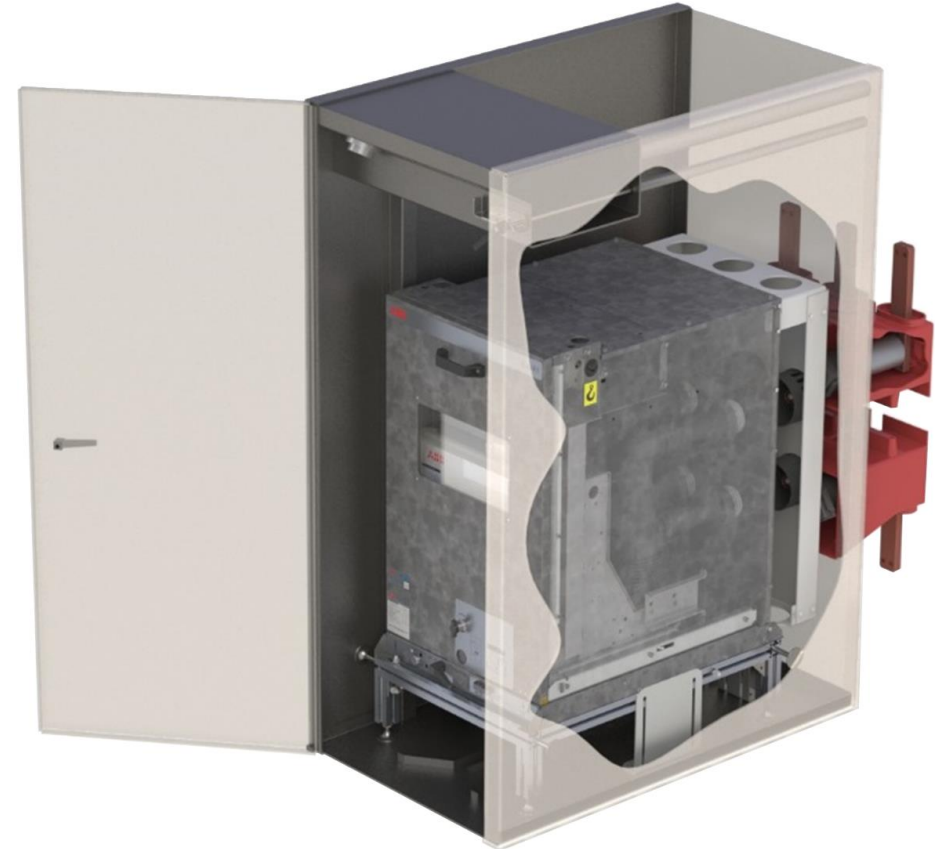


OneFit

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

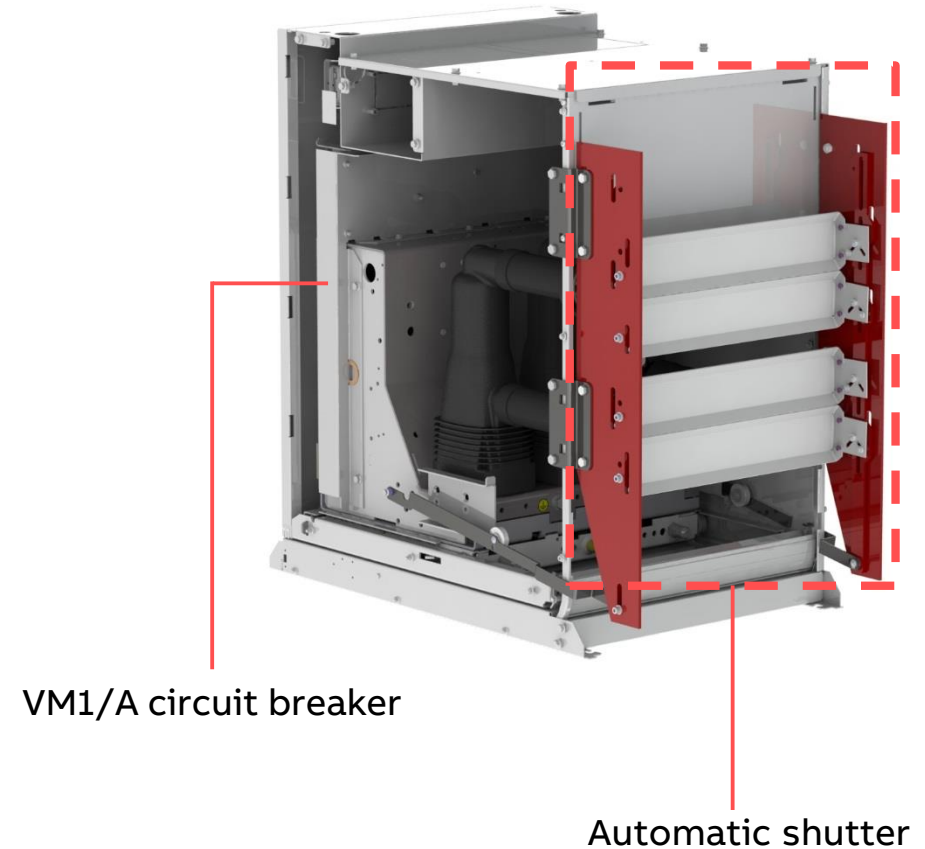


OneFit

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



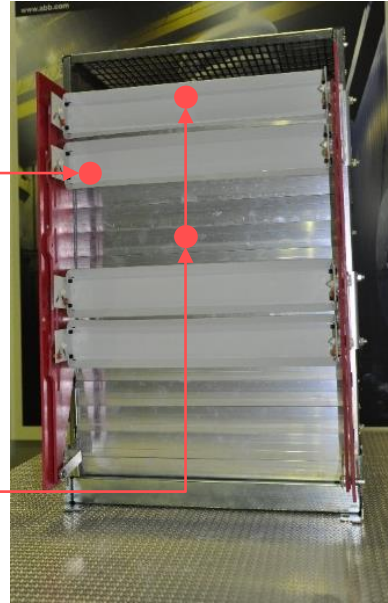
OneFit

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



OneFit
frame

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

OneFit frame [AxBxC]	W600 [535x859x792mm]	W700 [685x859x792mm]	W800 [754x886x792mm]
VD4G version	VD4G/P-25	VD4G/P-40	VD4G/LR-50
Poles distance	150mm	210mm	210mm
Rated voltage U_r	15kV	15kV	15kV
Rated normal current (40° C) I_r	1250A	up to 2000A	2500A 3150A ^(a)
Rated frequency f_r	50/60Hz	50/60Hz	50/60Hz
Symmetrical short-circuit current I_{scg} Class G1	16kA	25kA	50kA
Rated short-time withstand current I_k (3 s)	25kA	40kA	50kA

OneFit

Customer benefits in retrofit solutions

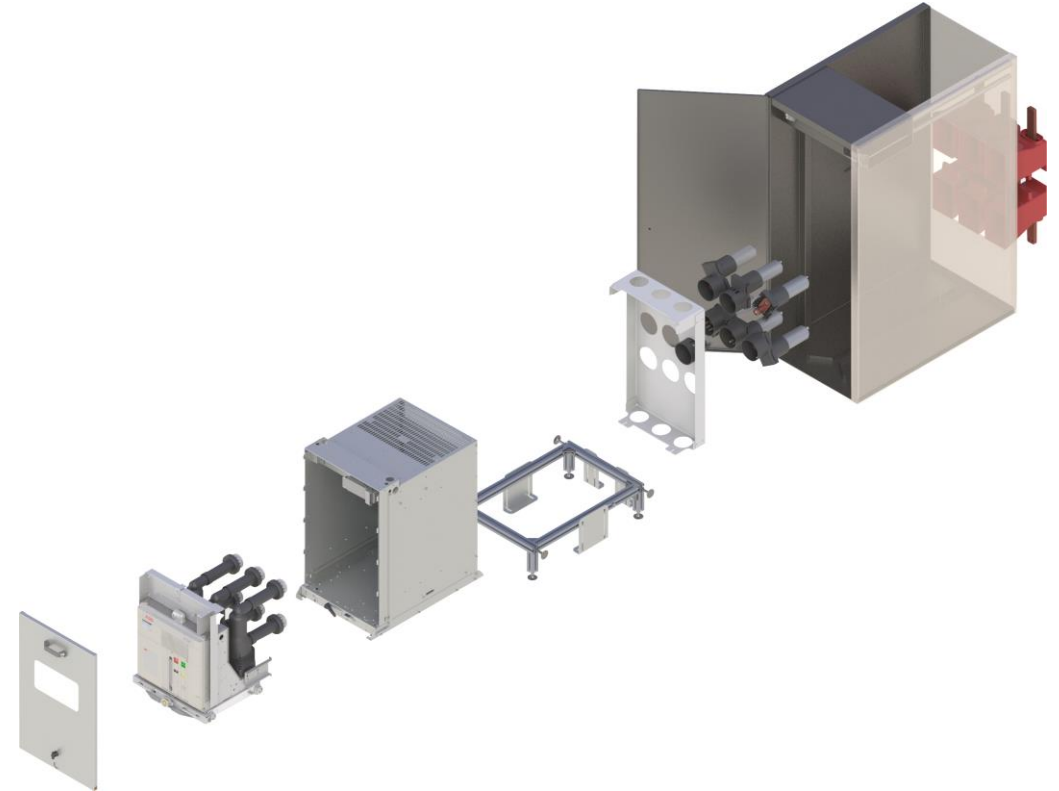
Both ABB and non-ABB installed base applicability targeting full life time extension

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

R6.0 High ratings breaker application

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 (754mmwide)



VD4/LR 17.25-32FA.50

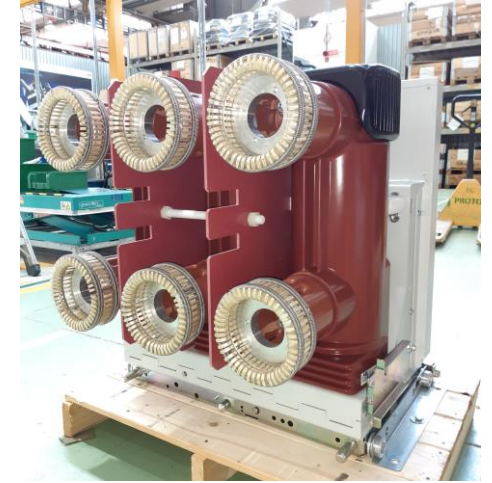
OneFit

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

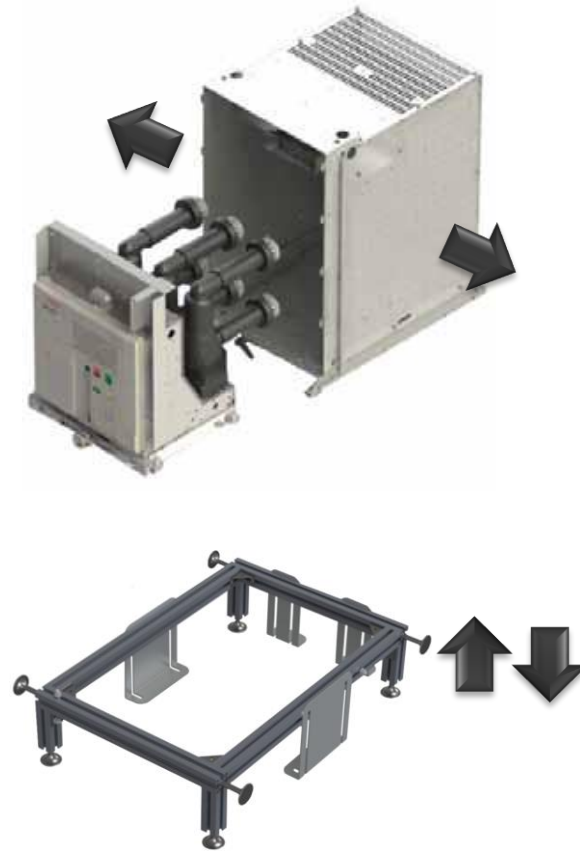


VM1/A/LR 15.30FA.50

True plug-in technology

Adaptable

Original panel dimensions are not constraints anymore



True plug-in technology

Flexible

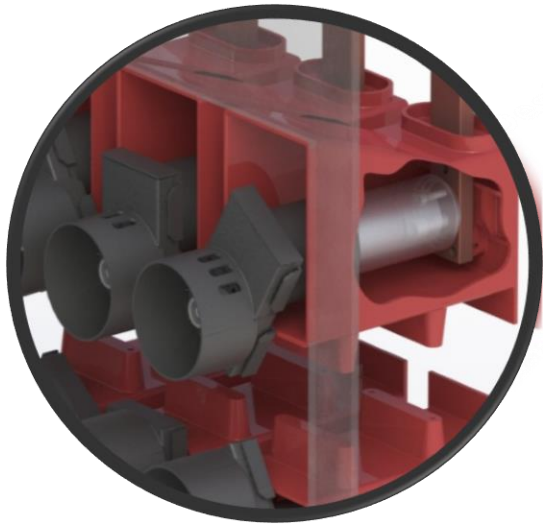
Existing breaker design is over



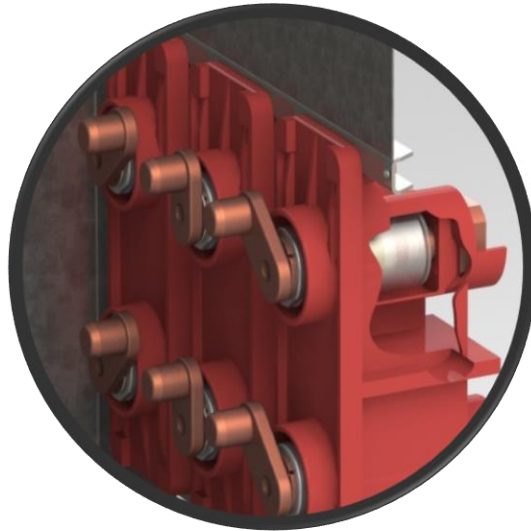
True plug-in technology

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



Ready to go

Extended features

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

Fit for purpose

OneFit Safety



OneFit Safety Plus



OneFit eSafety Plus



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

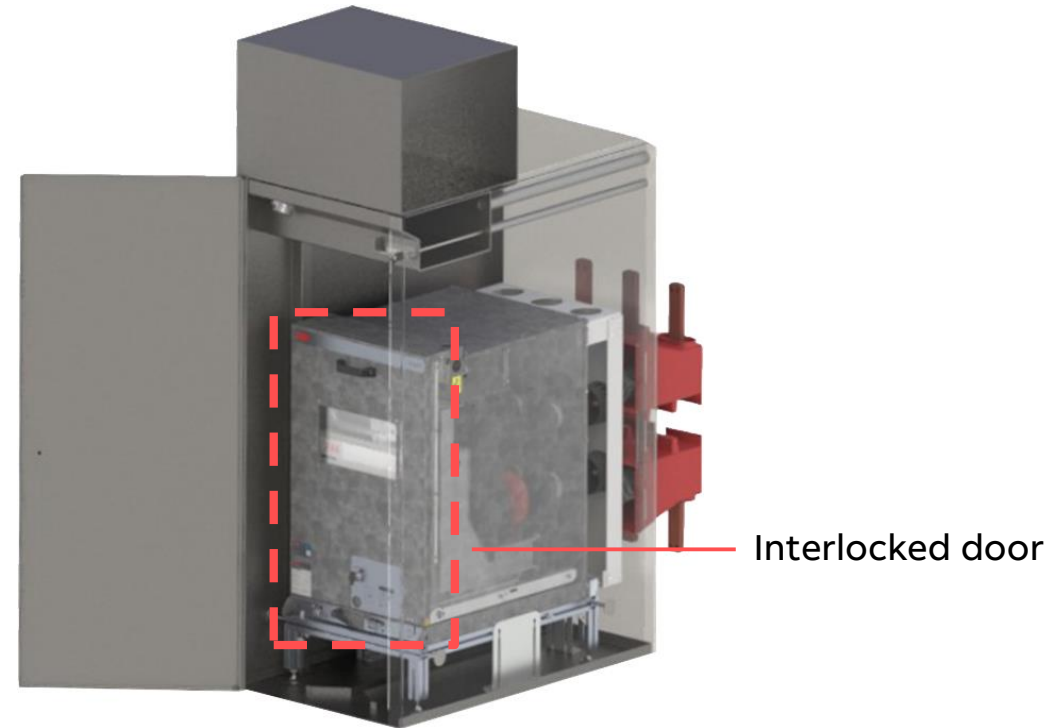
Packages

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



OneFit Safety

OneFit Safety
Plus

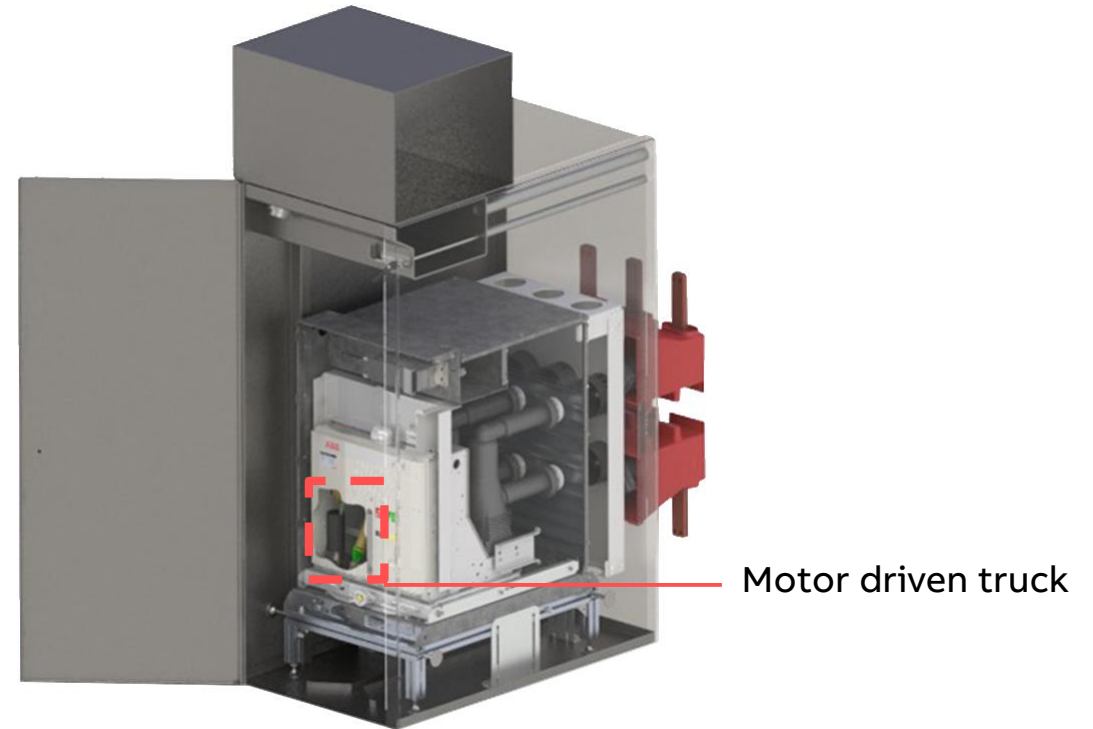
OneFit eSafety
Plus

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



OneFit Safety

OneFit Safety
Plus

OneFit eSafety
Plus

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

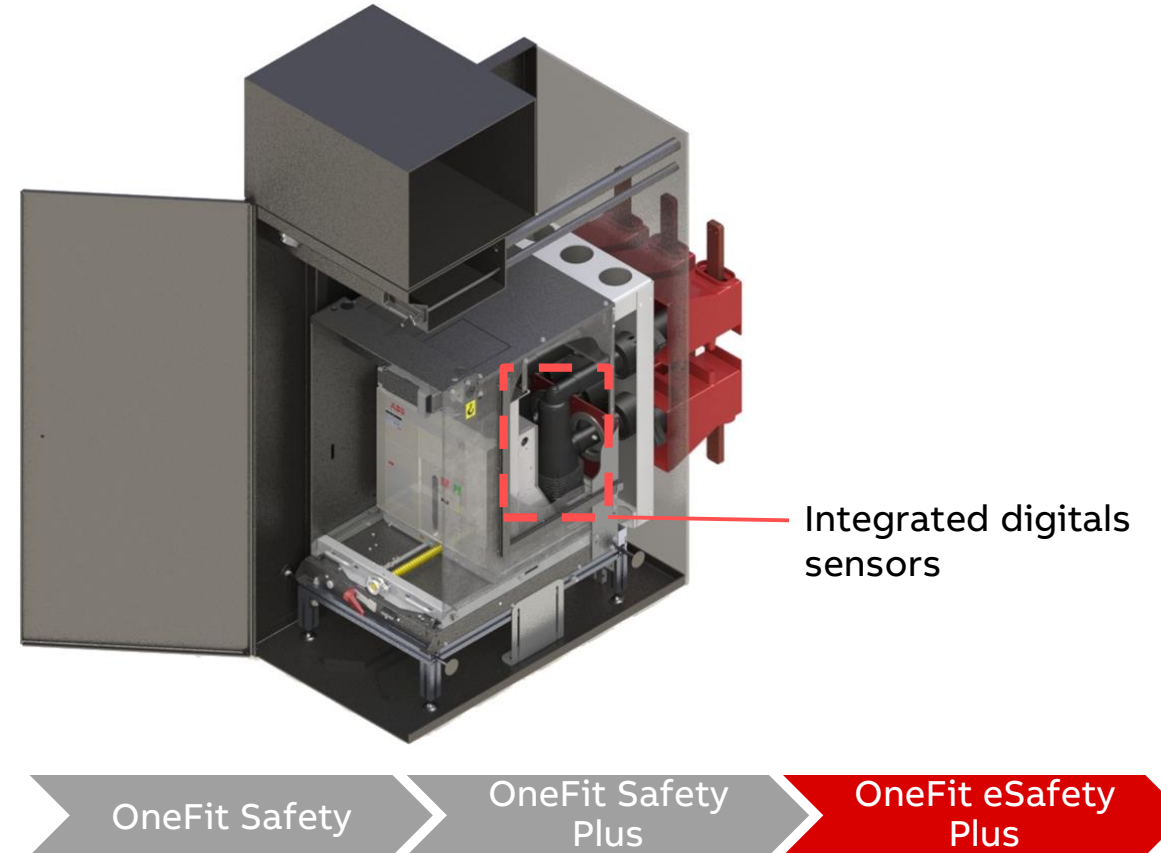
Unique solution for the full switchgear revamping (breakers and relays retrofitting)

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

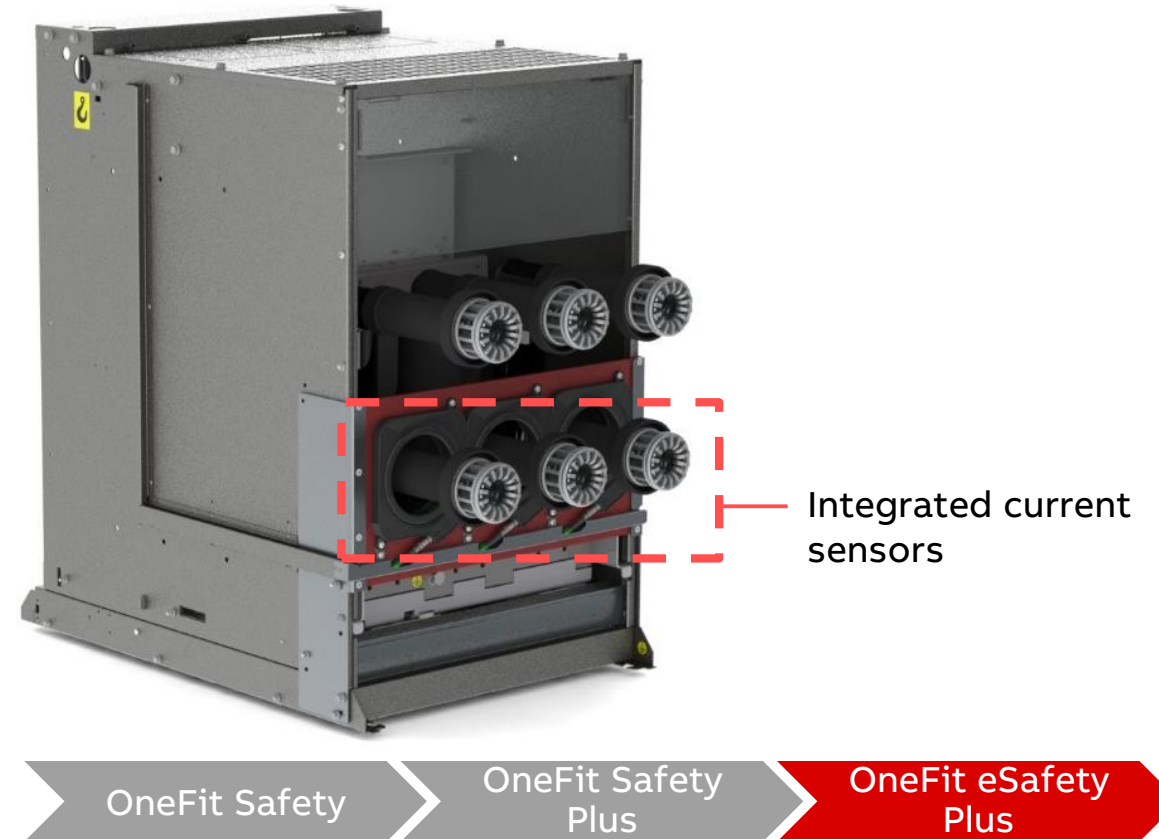


Packages

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



Packages

OneFit eSafety Plus

Integral equipment revamping

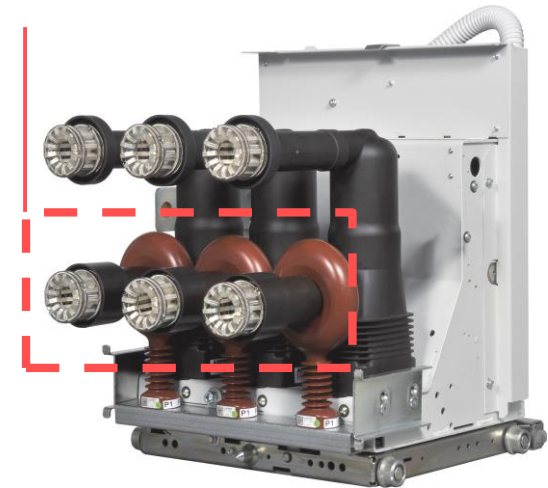
The integration measuring sensors onboard VD4 Digitup gives new life to the switchgear

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



Combisensors onboard VD4 Digitup



OneFit Safety

OneFit Safety
Plus

OneFit eSafety
Plus

OneFit documentation links



[Product Webpage](#)

[Add 20 years to the lifetime
of your switchgear](#)

[Concept movie](#)

[Operation movie](#)

[Product Guide](#)





ABB