

DISTRIBUTION SOLUTIONS

OneFit Product guide

OneFit is the latest ABB hard-bus retrofit design concept for easy connection of new standard apparatus to a wide range of existing panels.

ABB offers a solution to completely modernize existing medium voltage (MV) switchgear regardless of their age, design and brand.

OneFit is a core enabler to increase flexibility, efficiency, safety, productivity and reliability for plant operators and to lower cost of operation.

Table of contents

004 – 005	1. OneFit
006 – 007	2. OneFit for different racking systems and primary contacts
008 – 009	3. Selection guide
010 – 011	4. OneFit Safety kit for IEC-GB Standards
012 – 013	5. OneFit Safety kit for ANSI-IEEE Standards
014 – 015	6. OneFit packages
016 – 017	7. OneFit SafetyPlus components
018 – 019	8. On demand accessories and spares parts
020 – 021	9. Apparatus fitting OneFit frame
022	10. Earthing truck options
023	11. Apparatus removal trucks
024	12. OneFit development process
025 – 026	13. Installation & Commissioning

1. OneFit

Concept

Retrofill is a modernization process including the replacement of the circuit breaker and some of the functional components of the power compartments. It is applicable where the existing switchgear frame is in serviceable condition. This product family includes a range of solutions supporting the switchgear upgrade when additional constraints are in place:

- other parts than the breaker (shutters, interlocks, etc.) need to be replaced;
- the original panel design does not allow to meet today required features and Standards.

OneFit is the latest ABB hard-bus retrofill design concept, embedding an integrally safe plug-in technology to easily connect the new breaker to a wide range of existing panels.

OneFit is composed by a frame hosting the new circuit breaker. It is connected to the existing switchgear bushings by an additional power circuit, that acts also as inner interface with the new breaker. This solution balances the need for a retrofill solution with reasonably limited site works and linked outage.

OneFit solution is in accordance to latest IEC, ANSI and GB Standards.

OneFit is available both for panel with horizontal drawout and for vertical lift breakers.

This guideline gives indication about OneFit versions, ratings and accessories available.



Switchgear renewal with OneFit

Benefits

Operational aspects:

- The new apparatus embeds standard spare parts with all the benefits in terms of availability and delivery terms
- Equipment and spare parts are interchangeable with new ABB extension panels and additional switchgear
- Plant standardization: revamping of different original manufactured panels using same standard ABB apparatus
- Same operational interface and maintenance approach for the equipment installed in OneFit and new ABB panels

Modernization process:

- OneFit balances the need for a retrofill solution with reasonably limited site works and linked outage, thus avoiding any side impact (infrastructure modification and loss of production)
- Short term assets management can be included in the maintenance budget (Opex, Operating Expenditure) by using OneFit while the long term Strategy can focus on the full switchgear replacement (Capex, CAPital EXpenditure)
- Proposed apparatus are standard breakers, so they can be reused without any modification in future ABB replacement switchgear, providing an optimized investment to next substation renewal

Personnel protection increase:

- New metallic partition shutter
- Increased dielectric properties thanks to new insulating arrangement
- Loss of service continuity category in accordance to IEC Standards: upgrade of existing LSC-1 and LSC-2A switchgear to LSC-2B PM (busbar, circuit breaker and cable compartments are physically and electrically segregated with metallic partitions and shutters)
- New apparatus racking system with standard interlocks
- Apparatus racking in and out with closed door
- Motorized apparatus racking in and out for all apparatus as an option

Equipment revamping with integrated sensors and protection relay:

- Remote control and new advanced protection relay
- Integrated current sensors with no heat dissipation
- Voltage sensors unaffected by ferroresonance risk

Earthing switch functionality modernization:

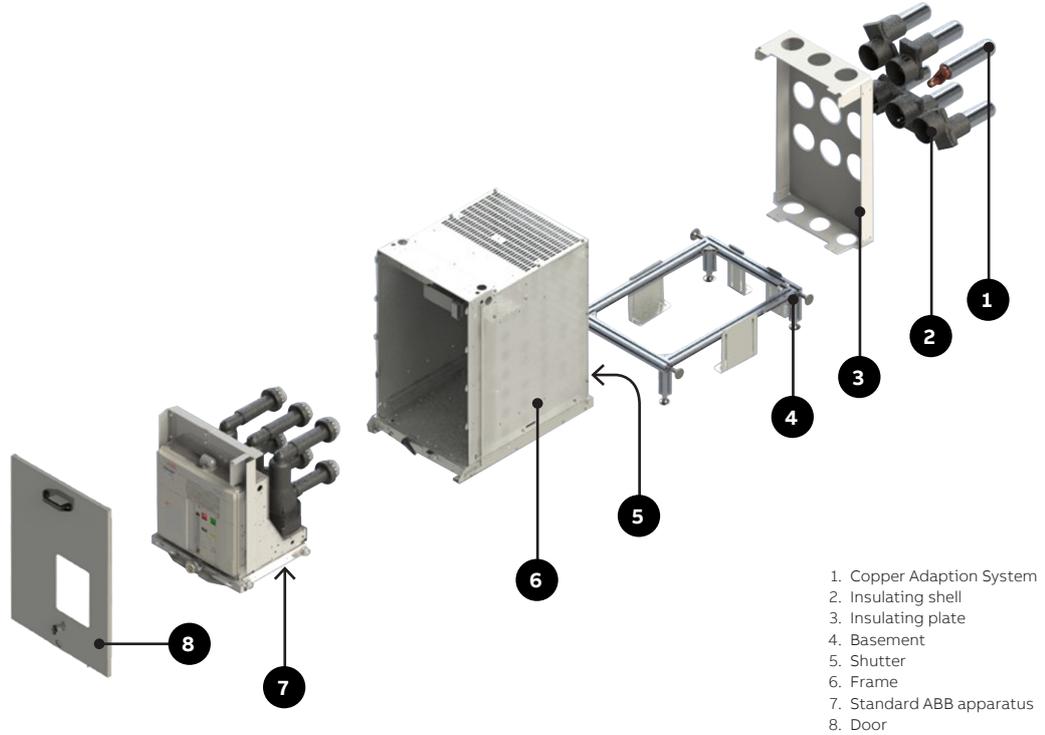
- New interlocking functionalities
- Cable testing truck
- Earthing truck, also with making capability

New internal arc safety level:

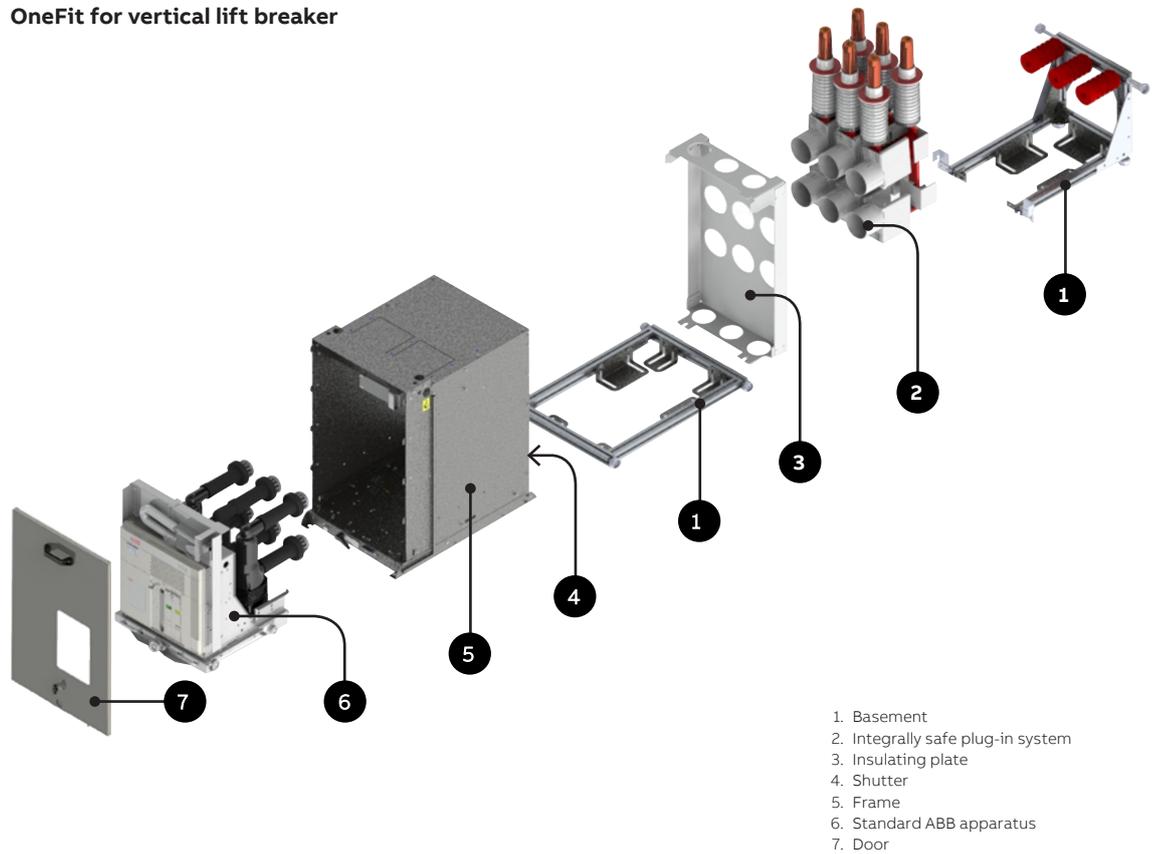
- Relay retrofitting with Relion® family embedding arc detection inputs
- Switchgear upgrade with REA arc flash mitigation relay
- Integration of the arc protection system UFES (Ultra Fast Earthing Switch)

2. OneFit for different racking systems and primary contacts

OneFit for horizontal drawout breaker



OneFit for vertical lift breaker

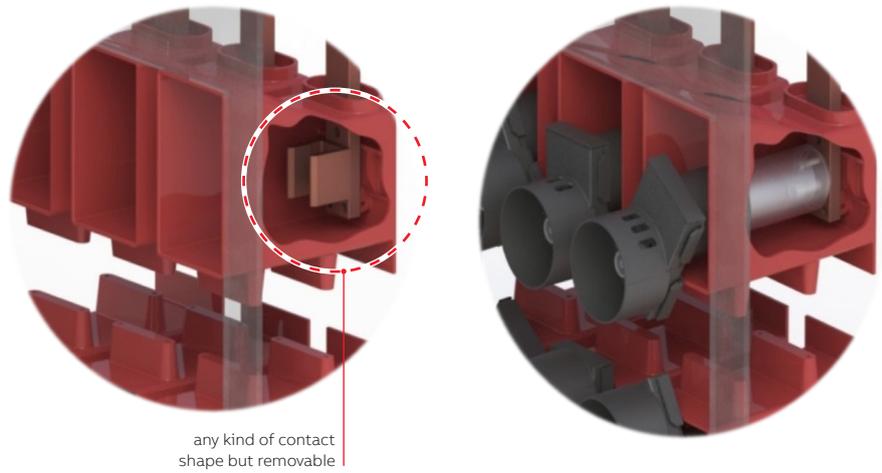


Copper adaptation system versions

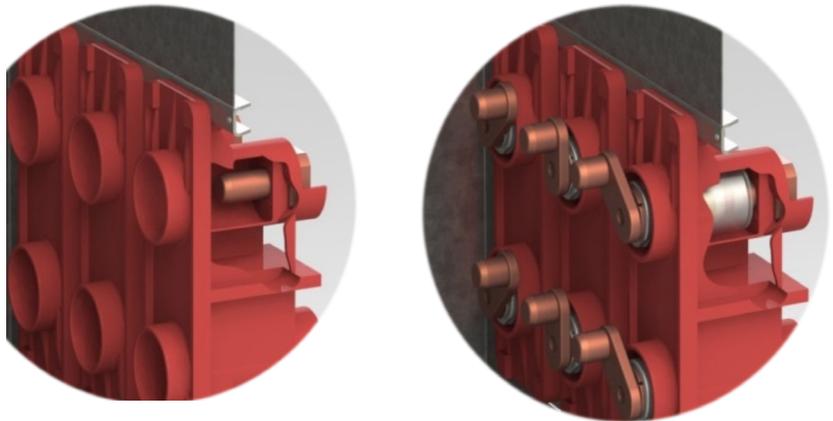
The OneFit solution has been studied for different types of original primary contacts found in the original panels.

Copper adaptation systems have been studied for the following connections:

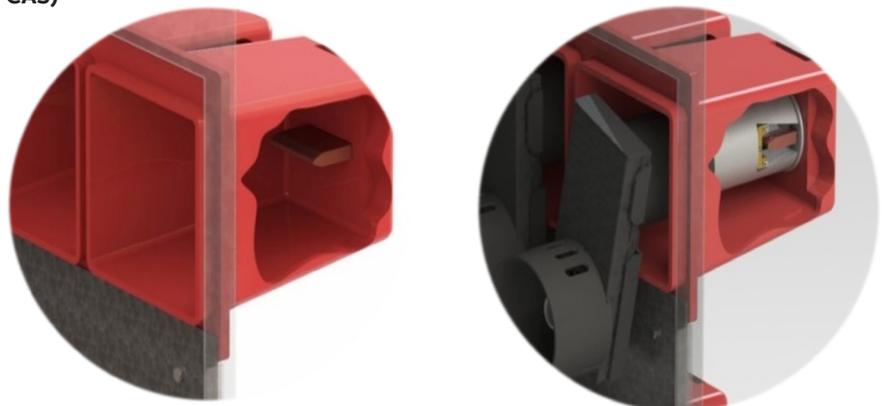
1. Screwed connections (SCAS)



2. Round connections (RCAS)



3. Flat connections (FCAS)



3. Selection guide

In order to select the right OneFit solution for the each application please follow the next steps:

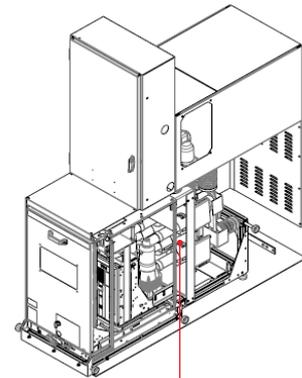
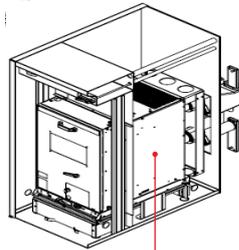
1. Identify:

- type of Standard to be applied:
 - IEC-GB
 - ANSI-IEEE
- apparatus racking movement (see Pag. 6):
 - Horizontal draw-out
 - Vertical lift breaker
- type of power contact (see Pag. 7 for details):
 - Screwed
 - Round
 - Flat
- go to proper page in order to see the available OneFit kit ratings available:

Standard

Horizontal draw-out

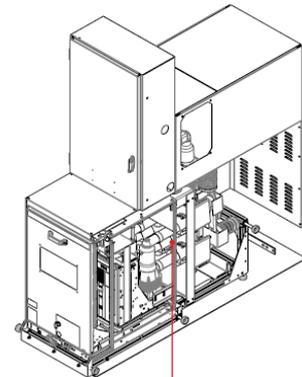
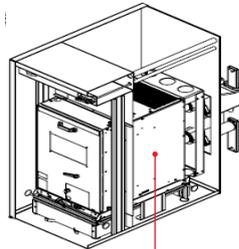
Vertical lift breaker



IEC-GB

Pag. 10

Pag. 11



ANSI-IEEE

Pag. 12

Pag. 13

2. Select OneFit package (see Pag. 14-15) for details:

- Safety (standard package with closed-door operational mode)
- Safety Plus (remote racking in/out motorization), embedded motorization on the circuit breaker: select mandatory and optional components for this package at Pag. 16 and remember to select circuit breaker version with motorized truck option (VD4, VM1 or VSC)
- Alternative solution to Safety Plus package is TruckMaster CS portable driver (Pag. 17) available for each apparatus type (VD4, VM1, VSC, HD4)
- eSafety Plus (integrated measuring sensors in the OneFit frame)

3. Select OneFit accessories and spares parts, see Pag. 18-19**4. Select the new apparatus type onboard OneFit and its electrical characteristics (see Pag. 20-21).**

Please choose and check rated nominal current (Amps) and short withstand current (kAmps) referred to the real plant service value.

5. Evaluate if necessary to have:

- earthing truck, see options at Pag. 23

6. Select apparatus removal truck, if needed, see Pag. 23**7. See details about the custom engineering process at Pag. 24****8. See details about installation and commissioning, check necessary Jigs kit, Pag. 25-26**

4. OneFit Safety kit for IEC-GB Standards

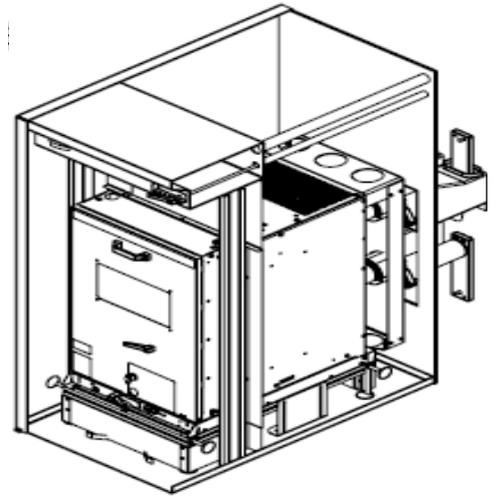
Type tested solution according to:

Latest IEC-GB 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



Horizontal drawout breakers

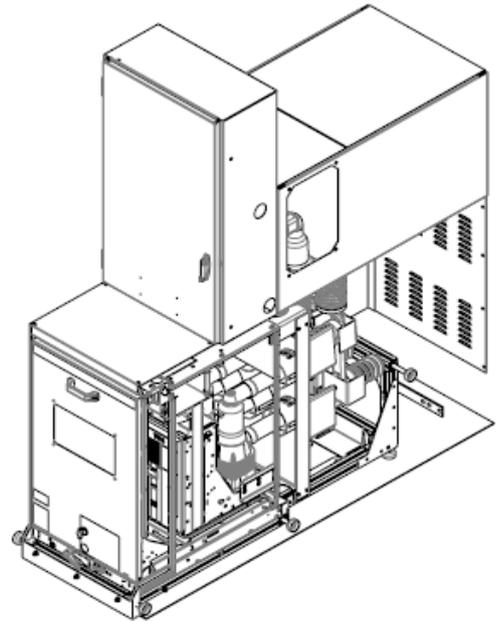
OneFit kit with screwed (SCAS) or round copper adaptation system (RCAS)						
Un [kV] ⁽¹⁾	Isc [kA]	In = 630A	In = 1250A	In = 1600-2000A	In = 2500 A	In = 3150A ⁽²⁾
12 - 17.5	25					
	31.5					
	40 ⁽³⁾					
	50 ⁽⁴⁾					
24	25					
	31.5					
	40 ⁽²⁾					

⁽¹⁾ High ratings up to 2000A and 40kA are available in special circuit breaker execution in P150 for panel width < 700mm with OneFit W600
⁽²⁾ Available only with HD4, a previous analysis is needed, contact the factory
⁽³⁾ Rated current above 2500A requires forced ventilation in W800 OneFit frame
⁽⁴⁾ Special RCAS solution is required for high kA or power contacts with diameter higher than 38mm

OneFit kit with flat copper adaptation system (FCAS) ⁽²⁾					
	In = 630A	In = 1250A	In = 1600-2000A	In = 2500 A	In = 3150A
12 - 17.5 - 24 kV up to 40 kA					

⁽²⁾ Required for Flat contact system of original circuit breaker
 Note: OneFit frame selection depends on ratings and panel dimensions.

 Available solutions
 Contact ABB



Vertical lift breakers

OneFit kit with screwed (SCAS) or round copper adaptation system (RCAS)							
Un [kV]	Isc [kA]	In = 400 A	In = 630 A	In = 800 A	In = 1250 A	In = 1600-2000 A	In > 2000 A
12 - 17.5	25						
	31.5						
	40						
	50 (*)						



OneFit frame version according to IEC-GB Standards (*)

Frame	Rated voltage [kV]	Rated current [A]	Isc Icw [kA]	Overall dim. no.	A [mm]	B [mm]	C [mm]	Weight [Kg]
OneFit W600	7.2 - 17.5 kV	630 - 2000 A	16 - 40 kA	1VCS004646	535	859	752	60
OneFit W700	7.2 - 17.5 kV	630 - 2000 A	16 - 50 kA	1VCS006242	685	859	792	70
OneFit W700	24 kV	630 - 2500 A	16 - 31.5 kA	1VCS008024	685	941	977	80
OneFit W800	7.2 - 17.5 kV	630 - 3150 A	16 - 50 kA	1VCS010160	754	886	792	80

For higher ratings please contact ABB for feasibility

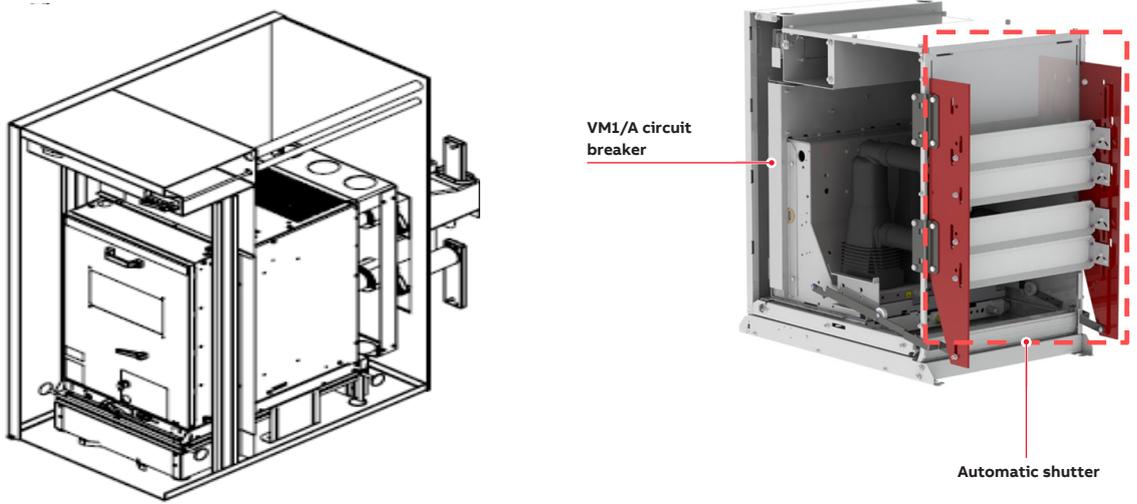
(*) Technical remarks: please consider the above overall dimensions are maximum width, height and depth of the OneFit frame in the different variants. C depth doesn't include the depth for the Copper Adaptation System related to the specific original panel type and voltage level. The feasibility study will evaluate if OneFit installation stays inside the panel or not, based on internal panel dimensions supplied. If the internal depth from the door to the bushings is minor of 1100mm (12-17kV) or minor of 1350mm (24kV), the OneFit frame will be partially placed outside the panel so, it is necessary to take all external dimensions, to design the metal completion.

Available solutions
 Contact ABB

5. OneFit Safety kit for ANSI-IEEE Standards

Type tested solution according to latest ANSI-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



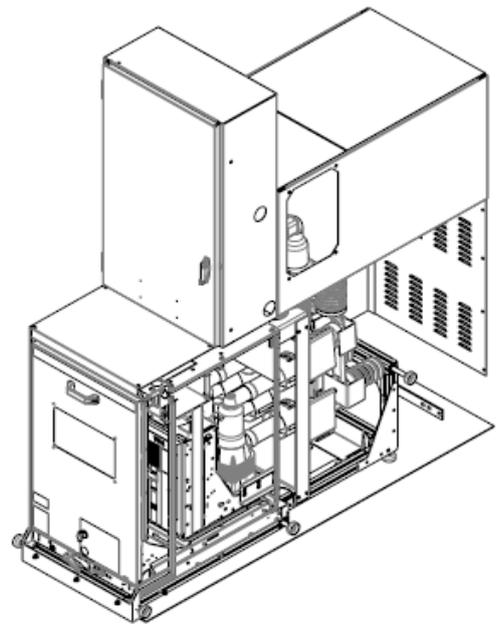
Horizontal drawout breakers

OneFit kit with screwed (SCAS) or round copper adaptation system (RCAS)				
Un [kV] (*)	Isc [kA]	In =1200 A	In = 2000 A	In = 3000 A (*)
5 - 15	25			
	31.5			
	40			
	50 (*)			

(*) High ratings up to 2000A and 40kA are available in special execution in P150 for 21" panel width, contact factory
 (**) Special RCAS solution is required for high kA or power contacts with diameter higher than 1" 1/2
 (***) Rated current above 2500A requires forced ventilation in W800 OneFit frame

OneFit kit with flat copper adaptation system (FCAS) (*)			
	In =1200 A	In = 2000 A	In = 3000 A
5-15 kV up to 40 kA			

(*) Required for Flat contact system of original circuit breaker



Vertical lift breakers

OneFit kit with screwed (SCAS) or round copper adaptation system (RCAS) ⁽¹⁾				
Un [kV]	Isc [kA]	In =1200 A	In = 2000 A	In > 2000 A
5 - 15	25			
	31.5			
	40			

OneFit package addition

Panel width	26"	36"
ANSI automatic shutter ⁽⁴⁾	●	●

⁽⁴⁾ One per OneFit kit

OneFit frame version according to ANSI-IEEE Standards ⁽⁵⁾



Frame	Rated voltage [kV]	Rated current [A]	Isc Icw [kA]	Overall dim. no.	A [in/mm]	B [in/mm]	C [in/mm]	Weight [lbs/Kg]
OneFit W600	5 - 15 kV	1200 - 2000 A	25 - 40 kA	1VCS004646	21.7 / 551	33.8 / 859	35 / 888	143.3 / 65
OneFit W700	5 - 15 kV	1200 - 2000 A	25 - 50 kA	1VCS006242	27.6 / 701	33.8 / 859	35 / 888	165.3 / 75
OneFit W800	5 - 15 kV	up to 3150 A	up to 50 kA	1VCS010160	30.3 / 770	33.8 / 859	35 / 888	187.4 / 85

⁽⁵⁾ Technical remarks: please consider the above overall dimensions are maximum width, height and depth of the OneFit frame in the different variants. C depth doesn't include the depth for the Copper Adaptation System related to the specific original panel type and voltage level. The feasibility study will evaluate if OneFit installation stays inside the panel or not, based on internal panel dimensions supplied. If the internal depth from the door to the bushings is minor of 1100mm (5-15 kV), the OneFit frame will be partially placed outside the panel so, it is necessary to take all external dimensions, to design the metal completion.

- Standard
- On request

- Available solutions
- Contact ABB

6. OneFit packages

OneFit is the true retrofit solution providing new apparatus racking system, integrated metallic isolating shutter and state of the art interlocking system. The OneFit range is composed of different packages. Each package represents an increase in safety for personnel and switchgear renewal.

OneFit Safety package

Added features overcome the existing equipment design constraints, providing closed door operational mode, avoiding accidental electrical contact injuries and increasing personnel protection.

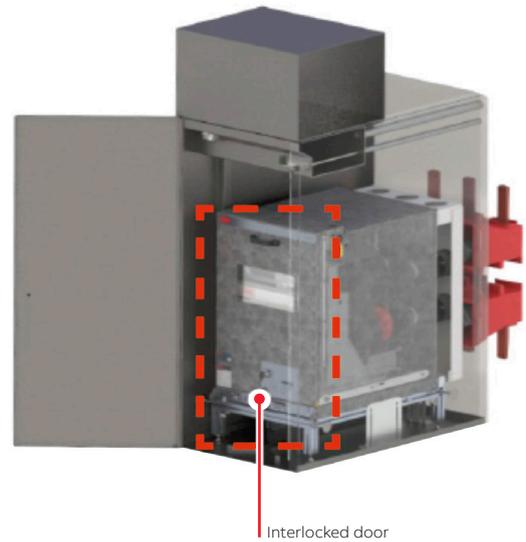


Fig. 1

OneFit Safety Plus package

Remote racking provides a safer operating environment for personnel through the proven method of adding distance between the operator and arc flash incident energy at the switchgear site, bringing operation of power equipment to a new level of safety.

Integrated solution

It is suggested to integrate a motor operated racking system (truck motorization) on each new circuit breakers when frequent operations are required (Fig. 2 and 3).

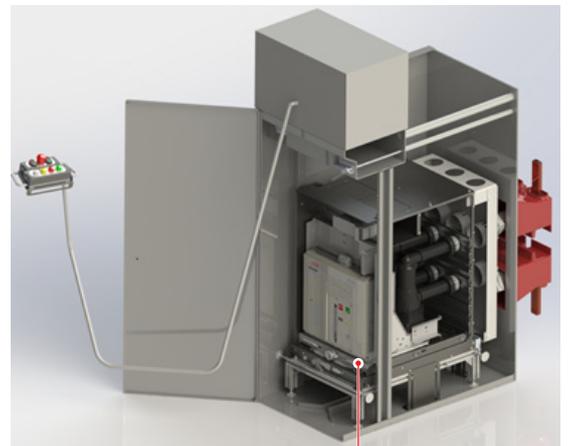


Fig. 2

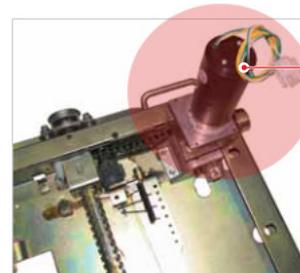


Fig. 3

Other option for motorization applicable to all OneFit packages is TruckMaster CS. This is a portable solution recommended during racking operations controlled by the operator through a remote console when few operations are carried out essentially related to maintenance operations (Fig. 4).



Fig. 4

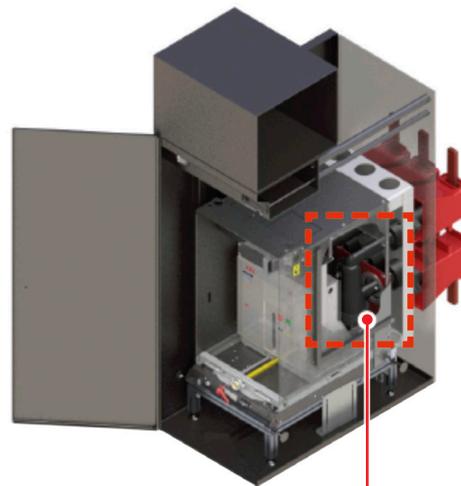
OneFit eSafety Plus package

Integrated measuring sensors in the OneFit frame allows to give a new life to switchgear, combining all the benefits of the previous packages with a complete equipment revamping.

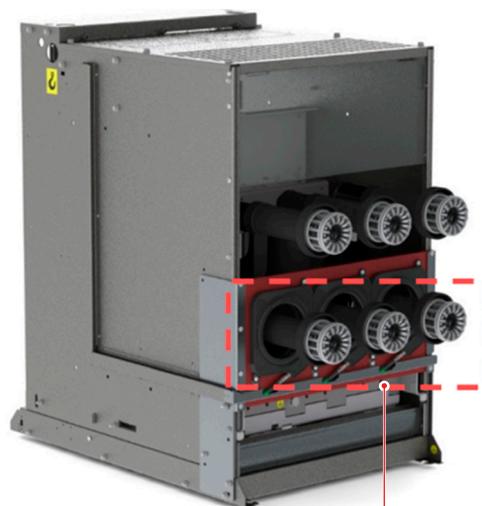
Relion® family relays can support this sensors (for example REF601 or REF615 with RJ-45 ports for analog input).

This feature is available on IEC versions only, both for horizontal drawout and for vertical lift breakers.

Current sensors onboard OneFit frame are suitable in combination with HD4, VD4, VM1 and VSC apparatus type up to 17 kV and 2000 A for horizontal drawout and up to 17 kV and 1250 A for vertical lift. Voltage sensors may be integrated depending on specific original circuit breaker design.



Integral digital sensors



Integral current sensors

7. OneFit SafetyPlus components

Option 1: OneFit Safety Plus integrated solution
 During installation and commissioning and later for customer operational needs and for apparatus maintenance, it will be required to rack in and out between "Test" to "Service" positions the circuit breaker installed in OneFit frames.

Such operation can be performed manually or be motorized selecting in the order phase also the following components. OneFit Safety Plus integrated solution package supports circuit breaker truck motorization providing electrical interlocks to proper shutter position.

Mandatory components for OneFit Safety Plus implementation

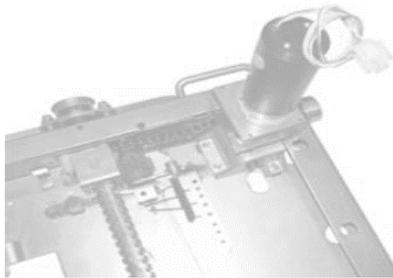
1 (Fig. 1)	Circuit breaker with motorized truck	Order with circuit breaker order form	One for each circuit breaker
2 (Fig. 2)	Safety Plus assembly	●	One for each OneFit kit

Optional components (remote control from a distance within 15m-50ft)

The optional components allows to implement remote control in the switchgear room.

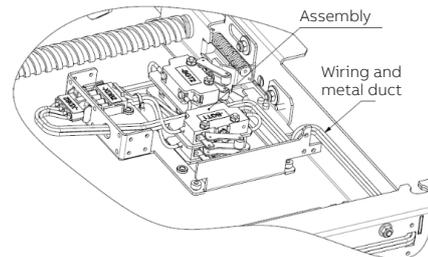
Remote control from other location (i.e. by means of SCADA) can be implemented using only mandatory components.

3 (Fig. 3)	Switchgear signal port	○	One for each OneFit kit
4 (Fig. 4)	Remote console	○	One for switchgear line-up



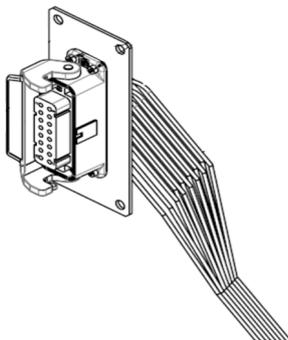
Motor operated truck accessory (- MAT)
 It is required to be ordered together with the additional CLUTCH accessory for motorized truck that enables manual operation of the truck in case of emergency or auxiliary power failure and transmitted contacts -BGT1 -BGT2 of withdrawable circuit breaker.

Fig. 1



Safety Plus assembly provides microswitches for shutter positions and relevant wiring and terminals to support motorization racking or electrical interlock to shutter position. Refer to OneFit wiring diagram for reference.

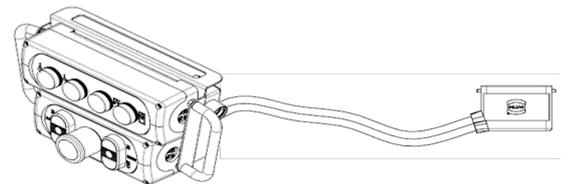
Fig. 2



The motorized truck controls that the breaker connected-service or disconnected-test limit position is reached by reading truck operated contacts integrated in the circuit breaker.

The switchgear signal port enables to connect the remote console, power the unit and signal circuit breaker and truck positions through this interface to the switchgear. One switchgear signal port with 3m - 9ft wiring for connection to low voltage control wiring for each motorized breaker compartment of the switchgear line-up is required.

Fig. 3



Remote console provides the control and position indications to actuate the breaker operation (Open and Close) and racking in-out operation. The 15m-50ft cable length enables the personnel to be at a safe distance from the breaker for all required switching and racking operations. A single remote console for line-up is needed in the switch-room to implement the remote racking operations by connecting it to the signal port of the circuit breaker unit to be operated. One remote console each 5 units is suggested or at least one for each busbar for redundancy.

Fig. 4

- Standard
- On request



NOTE: circuit breaker racking in-out motorization requires the availability of DC voltage supply and proper motor protection by dedicated low voltage circuit breaker. Refer to circuit breaker wiring diagram.

Option 2: OneFit Safety Plus TruckMaster CS portable solution



Fig. 1

TruckMaster CS allows withdrawable circuit breakers with rotary racking systems to be remotely racked in and out from a safe distance. The device can be simply and rapidly applied to the OneFit compartment door.

TruckMaster CS can be purchased via [BOL](#) selecting two codes:

- 1) TruckMaster CS trolley kit code to be chosen in accordance to OneFit frame rating voltage and power supply voltage.

	Un [kV]	
Supply Voltage/	5-17.5kV	24kV
110 V DC	1VCFTMCS110N200000	1VCFTMCS110N300000
220 V DC	1VCFTMCS220N200000	1VCFTMCS220N300000

- 2) Adapter ordering code that is always the same.

Adapter	1VCFTMCSB63D30L475
---------	--------------------

Please visit TruckMaster CS product [webpage](#) for details.

8. On demand accessories and spares parts

Please provide OneFit serial number in order to deliver the proper spare parts.

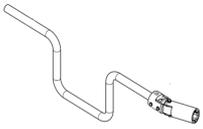
			Code	Minimum Qty	Spare parts
1	(Fig. 1)	Special jointed lever (for racking in/ out and shutter movimentation)	1VCF683000R0041	One per OneFit kit	X
2	(Fig. 2)	Mechanical interlock with the earthing switch key lock	1VCF683000R0081	One per OneFit kit	(¹)
3	(Fig. 3)	Anticondensation heating element 110-125V 100W assembly&wires (²)	1VCF683000R0082	One per OneFit kit	(¹)
3A	(Fig. 3)	Anticondensation heating element 220V 100W assembly&wires (²)	1VCF683000R0053	One per OneFit kit	(¹)
4	(Fig. 4)	Earthing blade assembly up to 17.5kV, up to 32kA (³)	1VCF683000R0052	One per OneFit kit	(¹)
4A	(Fig. 4)	Earthing blade assembly 24kV, up to 32kA (³)	1VCF683000R0051	One per OneFit kit	(¹)
4B	(Fig. 4)	Earthing blade assembly up to 17kV, 40-50kA (³)	1VCF683000R0085	One per OneFit kit	(¹)
4C	(Fig. 4)	Earthing blade assembly 24kV, 40kA (³)	1VCF683000R0086	One per OneFit kit	(¹)
5	(Fig. 5)	Standardized internal metal completion (material supply)	1VCF683000R0045	One per OneFit kit	
6	(Fig. 6)	Non standardized (external) metal completion panel design	1VCF683000R0044	One per OneFit kit type	
7		Non standardized (external) metal completion (material supply)	1VCF683000R0080	One per OneFit kit	
8		TruckMaster CS remote control rack in-out motorization	See "TruckMaster CS" page 17	One per switchgear	
9	(Fig. 7)	ANSI automatic shutter for 26" panel width	1V CF683000R0059	One per OneFit kit	(¹)
9A	(Fig. 7)	ANSI automatic shutter for 36" panel width	1V CF683000R0060	One per OneFit kit	(¹)
10	(Fig. 8)	Optional door with mechanical emergency opening for HD4	1VCF683000R0031	One per OneFit kit	
10A	(Fig. 8)	Optional door with mechanical emergency opening for VD4	1VCF683000R0032	One per OneFit kit	
10B	(Fig. 8)	Optional door with mechanical emergency opening for VM1	1VCF683000R0033	One per OneFit kit	
11	(Fig. 11)	Potential-free contacts of the shutter in the open position (-BGT1)	1VCF683000R0042	One per OneFit kit	X
11A	(Fig. 11)	Potential-free contacts of the shutter in the closed position (-BGT2)	1VCF683000R0043	One per OneFit kit	X
12A	(Fig. 12)	Potential-free contacts of the shutter in the open position and handle position contact (-BGT3)	1VCF683000R0083	One per OneFit kit	X
13	(Fig. 13)	OneFit frame closed shutter key lock	1VCF683000R0098	One per OneFit kit	X
14	(Fig. 14)	Cable test truck door sliding window version	1VCF683000R0071	One per OneFit cable test truck	X
14A	(Fig. 14)	Cable test truck door hinged window version	1VCF683000R0072	One per OneFit cable test truck	X

(1) Spare parts to be replaced by an ABB field service engineer with OneFit L3 certification.

(2) Anticondensation heating element can be mounted on frame side, below basement or provided loose depending on ratings and specific switchgear solution. The application is defined during engineering phase.

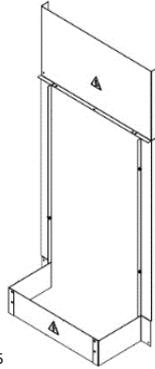
(3) Up to 31.5kA earthing blade application is on one side only, default is left side. If right side is required specify at order.

High kA versions, 40 and 50 kA, require earthing blade application on both sides of OneFit frame and on apparatus truck.



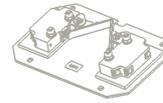
Special Lever used when circuit breaker installation position is very low

Fig. 1



Standardized internal metal completion

Fig. 5



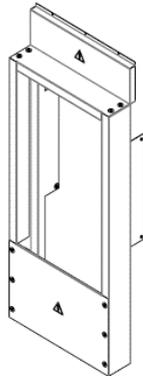
Potential-free contacts of the shutter in the open or closed position

Fig. 9



Mechanical interlock with the earthing switch key lock

Fig. 2



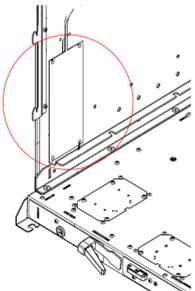
Metal completion panel is required when OneFit kit depth is greater than panel available depth.

Fig. 6



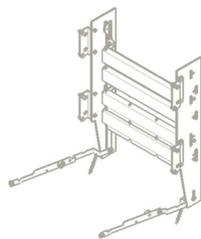
Potential-free contacts of the shutter in the open position and handle position contact (-BGT3)

Fig. 10



Anticondensation heating element when required by environmental condition ; indicative image only.

Fig. 3



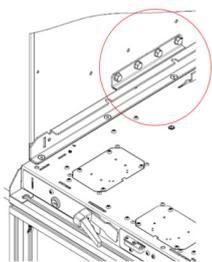
ANSI automatic shutter

Fig. 7



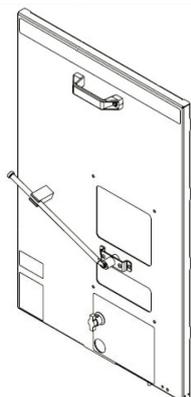
OneFit frame closed shutter key lock. Indicate specific original key lock code when an identical key is required.

Fig. 11



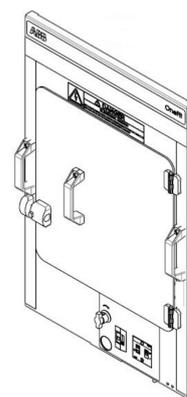
Earthing blade to provide additional earthing circuit during racking in/out movement. Compulsory with earthing truck. **Please attention:** this item requires earthing plier accessory to be ordered with the circuit breaker

Fig. 4



Optional door with mechanical emergency opening

Fig. 8



Cable test truck door

Fig. 12

9. Apparatus fitting OneFit frame

General purpose apparatus:

- VD4: vacuum breaker with mechanical actuator
- VM1: vacuum breaker with magnetic actuator
- HD4: SF6 gas breaker with mechanical actuator
- VSC: fused vacuum contactor

In this way, it is possible to propose the most suitable device. The use of standard apparatus means that all standard accessories (motorization, interlocks, etc.) can be used, and with this come all the benefits in terms of availability and delivery of spare parts.

Circuit breaker and OneFit frame size are selected in order to provide the best solution fitting existing switchgear.

The use of circuit breaker /P version allows the interchangeability in new UniGear switchgear.

9. OneFit with VD4G for generator applications

The OneFit is type tested with the VD4G range in the different frames sizes to support all ratings required and gives a new life to the switchgear with complete equipment revamping. Each generator has specific technical characteristics and therefore an application analysis is always needed.

Apparatus composition remarks:

- Fit for purpose longer umbilical cord for wiring plug support is needed for OneFit W600
- Always use truck mounted auxiliary contacts so to read racked-in/racked-out apparatus position and enable electrical locks with breaker position, if required
- Truck mounted door interlock is not needed because the same function is embedded into OneFit design already.

Special applications apparatus:

- VD4G circuit breaker family designed for generator application complying with dual logo IEC/IEEE 62271-37-013;
- VD4 Digitup with onboard mechanical actuator and measuring sensors in order to retrofit original breakers with instrument transformers on truck or direct protection mounted on top of medium voltage poles.



VD4G versions combined with OneFit frames

OneFit frame	W600	W700	W800
VD4G version	VD4G/P-25	VD4G/P-40	VD4G/LR-50
Poles distance	150 mm	210 mm	210 mm
Rated voltage Ur	15 kV	15 kV	15 kV
Rated normal current (40° C) Ir	1250 A	up to 2000 A	2500 A 3150 A (¹)
Rated frequency fr	50/60 Hz	50/60 Hz	50/60 Hz
Symmetrical short-circuit current Iscg Class G1	16 kA	25 kA	50 kA
Symmetrical short-time withstand current Ik (3 s)	25 kA	40 kA	50 kA

(¹) Rated current above 2500A requires forced ventilation in W800 OneFit frame

VD4 Digitup - Enabling digital switchgear



VD4 Digitup combined with OneFit W600 frame allows to make medium voltage switchgear digital. The integration of measuring sensors onboard VD4 Digitup is available for the following ratings according to IEC Standards in 150mm phase pitch for W600 OneFit frame:

The solutions have the protection relay in the auxiliary compartment. Upgrade of the protection and control functions requiring voltage signals that are not available in the panels, becomes possible. Please visit "[VD4 Digitup](#)" product webpage for details.

OneFit W600 with VD4 Digitup P150			Overall dimensions
Ur	Isc	Ir	
kV	kA	A ⁽¹⁾	
12-17.5	16	630	1VCS012065
	20	630	
	25	630	
	31.5	630	
	16	1250	
	20	1250	
	25	1250	
	31.5	1250	

⁽¹⁾ Rated thermal current (40 °C): 630A-1000A (instead of 1250A), with combisensors.

10. Earthing truck options

Mandatory components for earthing or cable testing truck implementation

1 (Fig. 1)	Earthing blade	See OneFit specific accessories page 18	One for each OneFit frame
------------	----------------	-----------------------------------------	---------------------------

Earthing truck options

2 (Fig. 2)	Earthing truck with making power (with lower or upper bushing)	Contact ABB	One for switchgear line-up
3 (Fig. 3)	Earthing truck without making capability (with lower or upper bushing)	Contact ABB	One for switchgear line-up
4a (Fig. 4 and 5)	Cable testing and earthing truck with lower or upper bushing and sliding window door (*)	Contact ABB	One for switchgear line-up
4b (Fig. 4 and 6)	Cable testing and earthing truck with lower or upper bushing and hinged window door (*)	Contact ABB	One for switchgear line-up

(*) Cable testing truck can be used with temporary earthing device limited to 10kA/1s

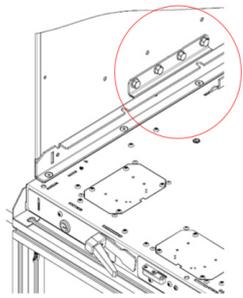


Fig. 1

Earthing blade to provide additional earthing circuit during racking in/out movement, a copper path for direct earthing of the fault.

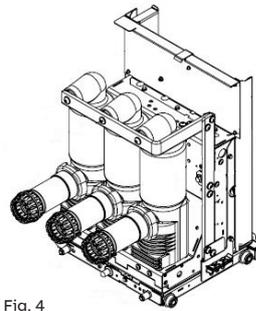


Fig. 4

Earthing truck with making power, lower bushing version

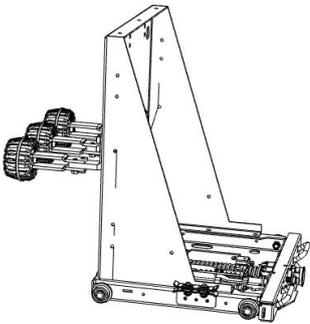


Fig. 2

Earthing truck without making capability, upper bushing version

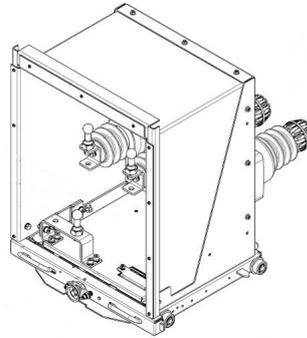


Fig. 5

Cable testing and earthing truck with lower bushing version

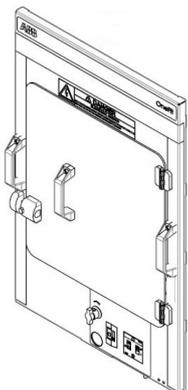


Fig. 3

Hinged window door provided with cable testing and earthing truck

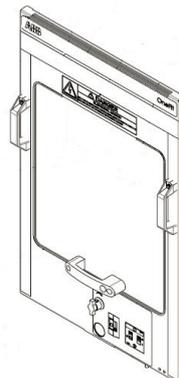


Fig. 6

Door with sliding window provided with cable testing and earthing truck. Option available only when the door is external from the circuit breaker compartment

11. Apparatus removal trucks

OneFit options for site apparatus removal from frame

1 (Fig. 1)	Apparatus carrier fixed truck P150	○	Two per switchgear
1A (Fig. 1)	Apparatus carrier fixed truck P210	○	Two per switchgear
2 (Fig. 2)	Variable height apparatus carrier	○	One per switchgear
3 (Fig. 3)	OneFit connection plate for customer truck	○	One per switchgear

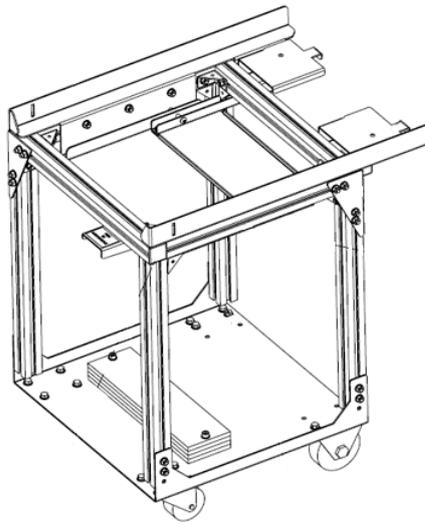


Fig. 1

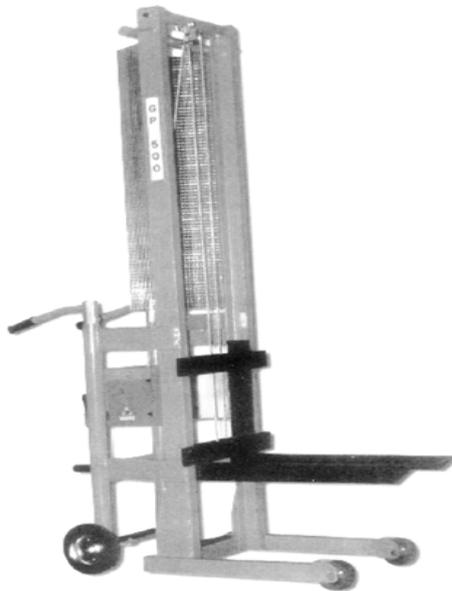


Fig. 2

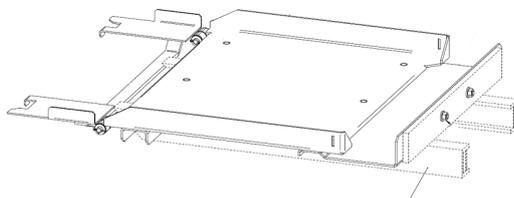


Fig. 3

Technical remarks

During installation and commissioning and later for customer operational needs and for apparatus maintenance it will be required to move circuit breakers in and out of OneFit installed frames. Such operation may be performed with different tools, as listed above.

Number of apparatus carrier trucks needed:

- 1) Apparatus carrier fixed truck (Fig. 1) used for apparatus movement (two for SWG). Fixed height carrier truck is designed to order to match the OneFit frame installation height. At least two trucks are needed to exchange apparatus between frames, additional trucks are needed if spare CBs or earthing truck shall be ready to use at site. Option as four pivoting wheels for tight substation floor application shall be specified at order.
- 2) Variable height apparatus carrier (Fig. 2): it enables to load apparatus in the frame and the height is adjustable (one for SWG): it can be used on any project as a Service crew tool to install the apparatus, direct loading from transport pallets. It is recommended when customer has different OneFit solutions heights. It is recommended when OneFit height is above 800mm or for double floor applications. It is necessary to order also item 3, OneFit connection plate, in order to use properly the variable height apparatus carrier.
- 3) OneFit apparatus connection plate (Fig. 3) to be mounted on customer height adjustable truck (one for SWG): this part enables to use the existing original CB loading truck and to adapt the connection plate that enables to hook to OneFit frame and safely load CBs in the frame. Connection of the plate to original carrier will be responsibility of the local service units installing OneFit solution.

External means are needed to load the CBs from transport pallet on the fixed height trucks, such as a crane.

12. OneFit development process

The following table shows all the steps to be analyzed in order to develop and provide the proper OneFit solution:

Step by step:	
a	Site survey ⁽¹⁾
b	Dimensional data and photos ⁽²⁾
c	Engineering and project management activity ⁽³⁾
d	Customer visits and site execution coordination
e	Electric diagram schematics definition
f	CB order form definition, accessories, etc
g	CB procurement
h	OneFit kit and accessories procurement ⁽⁴⁾
j	External metal design ⁽⁵⁾
k	External metal production ⁽⁶⁾
l	Other parts engineering ⁽⁷⁾
m	Other parts sourcing and production ⁽⁷⁾
n	Items for installations (JIGs) ⁽⁸⁾
o	Installation and Commissioning supervision
p	Installation workforce

⁽¹⁾ ABB field technicians can be provided on demand to support site activities;

⁽²⁾ Please provide technical information related to the existing breakers installed at site;

⁽³⁾ The analysis of the existing circuit diagram and different wiring inside MV cubicle shall be verified during project engineering stage to define the CB order form and define with customer as an example:

- different number of auxiliary contacts;
- different use of the auxiliary contacts in the basic circuit diagram;
- mechanically driven auxiliary contacts (open and closed status) in the LV compartment cannot be replicated and therefore they must be re-arranged using available circuit breaker contacts -BGB1/-BGB2/-BGB3 or auxiliary relays.
- mechanically driven auxiliary contacts in the LV compartment related to circuit breaker test/service position cannot be replicated and therefore they must be re-arranged using available circuit breaker truck contacts -BGT1/-BGT2
- unavailability of some electrical application.

⁽⁴⁾ Whether necessary, any kind of materials, components and/or site activities needed in order to adapt existing panels for OneFit installation are excluded from this process. ABB will provide adaption design whether needed;

⁽⁵⁾ In some configuration it will not be possible to install OneFit within the front door of the panel, a generic example metal completion design to provide IP2x protection will be provided by competence center. Non standardized (external) metal completion panel design specific to the application shall be engineered from the local country service organization. Specific order design can be provided by competence center on demand at fixed rate providing all required dimensional information.

⁽⁶⁾ Production of external metal completion is in charge of local country service organization.

⁽⁷⁾ Other parts engineering, as example are earthing switch interlock design, special solutions for VTs and CTs replacement, low voltage cabinet engineering for Protection & Control replacement and upgrade shall be engineered from the local country service organization. Specific order design can be provided by competence center on demand

⁽⁸⁾ It is possible to rent the required JIGs for order execution.

13. Installation & Commissioning



Technical remarks

The commissioning activities have to be performed by qualified & skilled personnel, with proven experience in the medium voltage field & in observance of the local safety rules. A complete short switchgear shutdown is mandatory in order to perform OneFit commissioning activities in safety conditions. Minor modification on MV panel auxiliary circuit (fixed parts) may be necessary in order to adapt it for OneFit.

Installation and Commissioning procedures are available on demand.

13. Installation & Commissioning

The table below gives indication about OneFit installation and commissioning average time per panel, considering two trained field service engineers (OneFit Level 3 trained). Consider additional time in order to execute all safety procedure, deliver and unpack material at panel site, solve and define working procedure for the specific panel.

A time optimization can be considered for installation and commissioning when more units must be installed in the same period. Additional time shall be considered for secondary wiring depending on extension of low voltage cabinet renovation, from simple circuit breaker auxiliary wiring to replacement of protection and control.

Suggested installation time per OneFit unit, power parts only	1-2 pcs	3-5 pcs	6-10 pcs	> 10 pcs
Hours [hrs] per horizontal drawout breaker, two trained field technicians	14	10	8	6
Hours [hrs] per vertical lift breaker, two trained field technicians	16	12	10	8

Installation JIGs are necessary to properly execute OneFit Kit installation. Depending on circuit breaker pole distance and pole size different JIGs are needed.

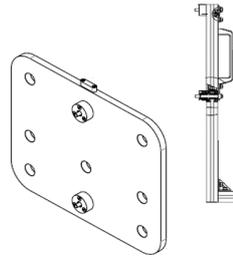


Fig. 1



—
For more information please contact:



—
More product information:

abb.com/mediumvoltage

Your contact center:

abb.com/contactcenters

More service information:

abb.com/service

OneFit webpage:



Data and illustration are not binding. We reserve the right to make changes in the course of technical development.

© Copyright 2020 ABB. All rights reserved.