
ELECTRIFICATION SERVICE - GERMANY

Medium Voltage Retrofit Solutions



ABB Electrification Service portfolio provides the right combination to keep your equipment at peak performance.

Retrofitting is a key element.

From roll-in replacement to hard-bus retrofill, our Service organization can help you to replace your old ABB and non-ABB circuit breakers updating your installed base to the latest technology.

This means additional safety, reliability and reduced environmental impact.

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1. Abbreviations and definitions

/CS	Retrofit screw type with insertion and extraction through a rotative handle
CB	Circuit Breaker
ELSE	Electrification Service
LCM	Life Cycle Management
M&D	Monitor and Diagnostics
In	Nominal current according to IEC 62271-200
Isc	Short circuit current according to IEC 62271-200
RiR	Roll-in Retrofit
Pitch distance	Distance between two phases (central to lateral) in the circuit breaker
Vn	Nominal Voltage according to IEC 62271-200



2. Our service portfolio



ABB's Electrification Services portfolio provides a range of offerings far beyond standard product support: from onsite services for risk reducing installation and startup, to availability services to help you proactively reduce downtime and meet your service level commitments.



Start-up and maintenance services

- Installation and commissioning
- Training
- Spares and consumables
- Maintenance (preventive, condition-based and predictive)
 - SWAPs maintenance program
- Extended Warranty



Lifecycle services

- Engineering and consulting
- Extensions, upgrades and retrofit
 - Roll-in Retrofit
 - Onefit/ hard-bus retrofit
- Relay Retrofit Program
- Circuit breaker remote racking systems
 - TruckMaster
 - Motorized circuit breaker truck
- Arc flash protection upgrades
- End of life services
- Replacement



Advanced services

- ABB Ability™ Condition Monitoring for switchgear – SWICOM
- ABB Ability™ Condition Monitoring for electrical systems – CMES
- ABB Ability™ Energy and Asset Manager
- ABB Ability™ Life cycle assessment for electrical systems – MySiteCondition
- ABB Ability™ Backup Management for electrical systems – Data Care



Technical support and repairs

- Remote Assistance for electrical systems
 - RAISE
- Collaborative Operations for electrical systems
 - CLOSER
- Onsite and factory repair and maintenance



Support agreements

- ABB Power Care

3. Life cycle management

Life cycle management (LCM) is the process that enables ABB to innovate and manage products and related services throughout the entire business life cycle — effectively and efficiently. It is ABB’s goal to protect our customers’ investment beyond the life cycle of the underlying platform products.

The ABB life cycle management process originates from: IEC 62402, the IEC Application Guide about Obsolescence Management, which stresses the importance of managing obsolescence as an integral part of the design, development, production, and in-service support of a product. The extensive, lengthy experience of ABB for the management of products and their life cycle.

Four stages define the life cycle policy for ABB electrification distribution solutions:

1. **Active**
2. **Classic**
3. **Limited**
4. **Obsolete**

Open communication with our customers is continuous, with notifications provided for each status change several months in advance, as well as a minimum of 10 years of support granted from the Classic phase to the beginning of the Obsolete phase.

Please contact ABB Service team to have an assessment on the Life Cycle Status of your installed base and define the best actions to keep your system running.

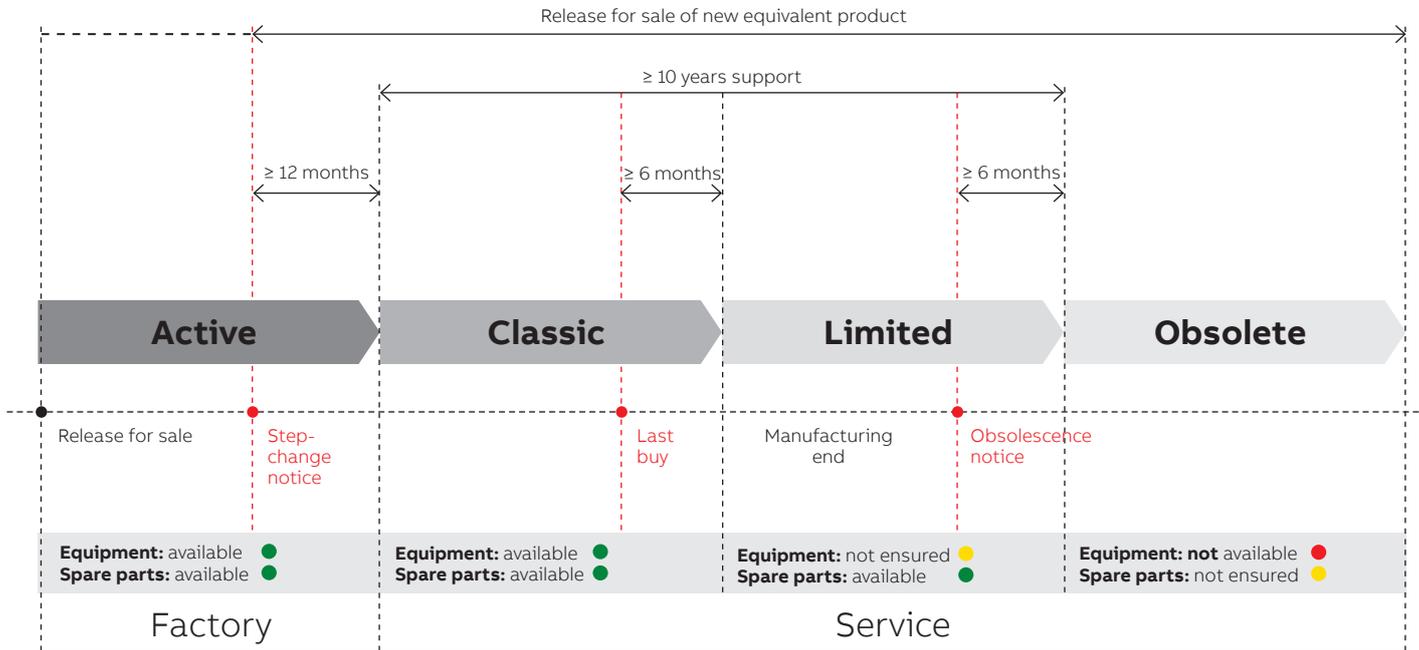


ABB services are at your disposal for making the best use of ABB assets at every life cycle stage.

Active

- Long-term support thanks to Power Care customer support agreements
- Extended warranty application
- Worldwide Service competence, ready for prompt actuation
- Certified ABB spare parts ready in stock to guarantee their availability throughout the product lifetime

Classic

- Last Buy opportunity of complete equipment
- Spare parts availability as per active product conditions
- Time to keep equipment healthy via Power Care customer support agreements
- Call for training with wide coverage thanks to worldwide footprint still available.

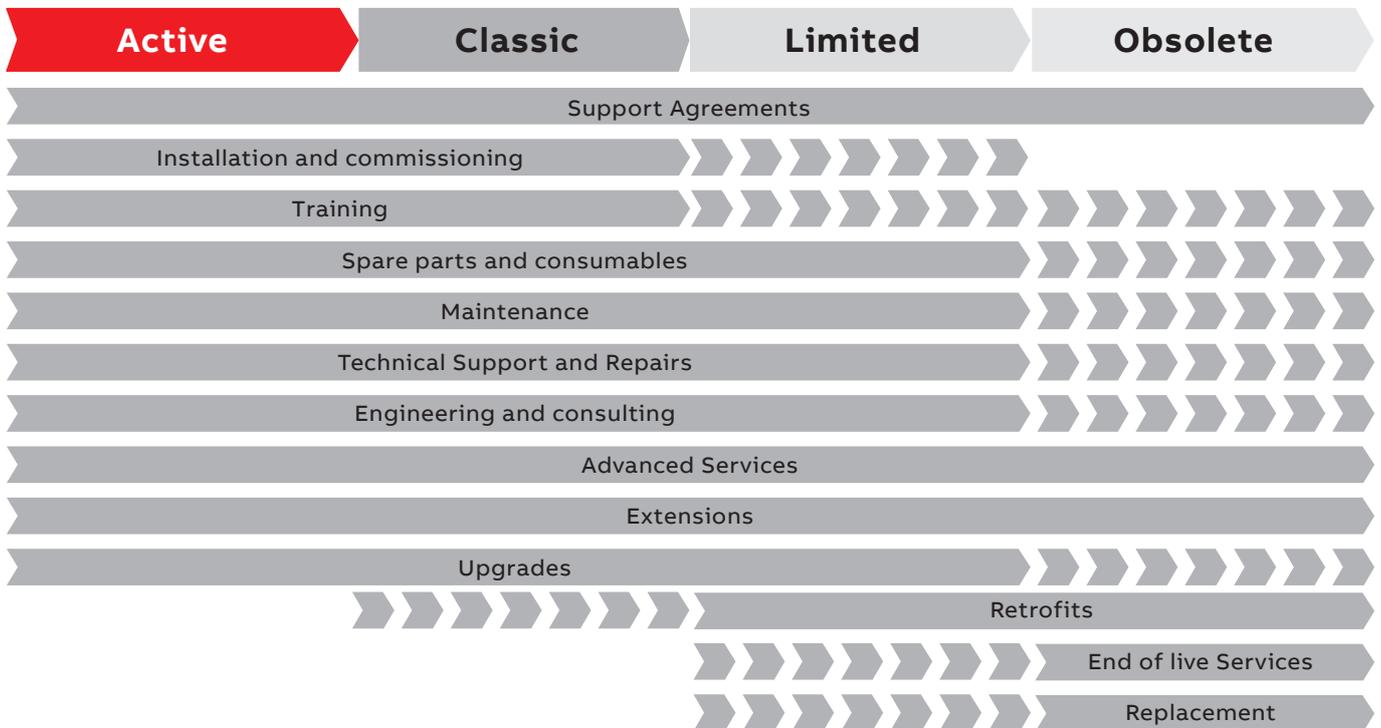
Limited

- Spare parts fully available
- Retrofit solutions can already be applied
- Power Care customer support agreements designed to keep the service experience as per active products

Obsolete

- Spare parts could be still accessible on request.
- Retrofit solutions are usually available. The use of active products allows a new life to be given to the plants.

Our consultancy services are always available for supporting cost-effective and optimized investments. Special care is given to obtain a soft shift to new applications and solutions.



4. The retrofit concept

Whenever a device is no longer available on the market and/or maintenance is no longer efficient, ABB service team can offer a valid and cost saving solution compared to the full switchgear replacement. Obsolete and limited equipment can be replaced using roll-in retrofit or retrofit kits, which are specifically designed by ABB ELSE team in GERMANY to minimize downtime and replace only the noble parts, keeping the original switchgear components that are not worn by time. ABB Service experts conduct site audits on existing installations to assess the condition of equipment, recommend the proper solution, and support the right investment decision. Even if IEC does not cover retrofit solutions with a dedicated Standard prescribing type testing, ABB applies the highest safety and reliability requirements to ensure products' quality and safety. In fact, ABB design policy adopts the fundamental philosophy of IEEE C37.591 Standard: [...] a converted (*) product is a new design and shall be design verified to substantiate that it meets its nameplate ratings as well as applicable standards [...]

Circuit breaker retrofits are a cost-effective switchgear modernization solution. The result is an improvement in safety, reliability, maintenance, sustainability and performance.

(*) To be considered as Retrofit

ABB is a full-system provider which includes: Site data collection, Design, Manufacturing, Testing, Installation and commissioning. With our expertise, both ABB and non-ABB equipment can be retrofitted.

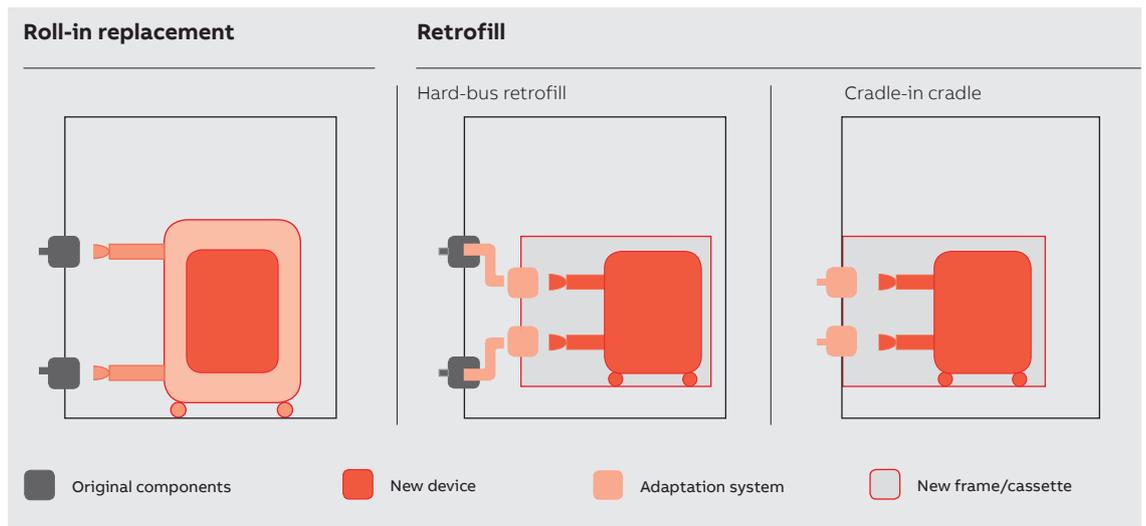
Characteristics of the different technical solutions for retrofit

Roll-in Replacement:

- Only new components used
- The new truck carries a standard basic circuit breaker
- High performance and additional features
- Reduced downtime
- Fully type tested
- Plug and play solution

Hard bus Retrofit - Onefit:

- Only new components used
- The new frame hosts a standard circuit breaker
- An additional power circuit makes the connection
- Existing bushings generally remain in place
- Fully type tested



5. Enhance the performance and reliability of your installed base

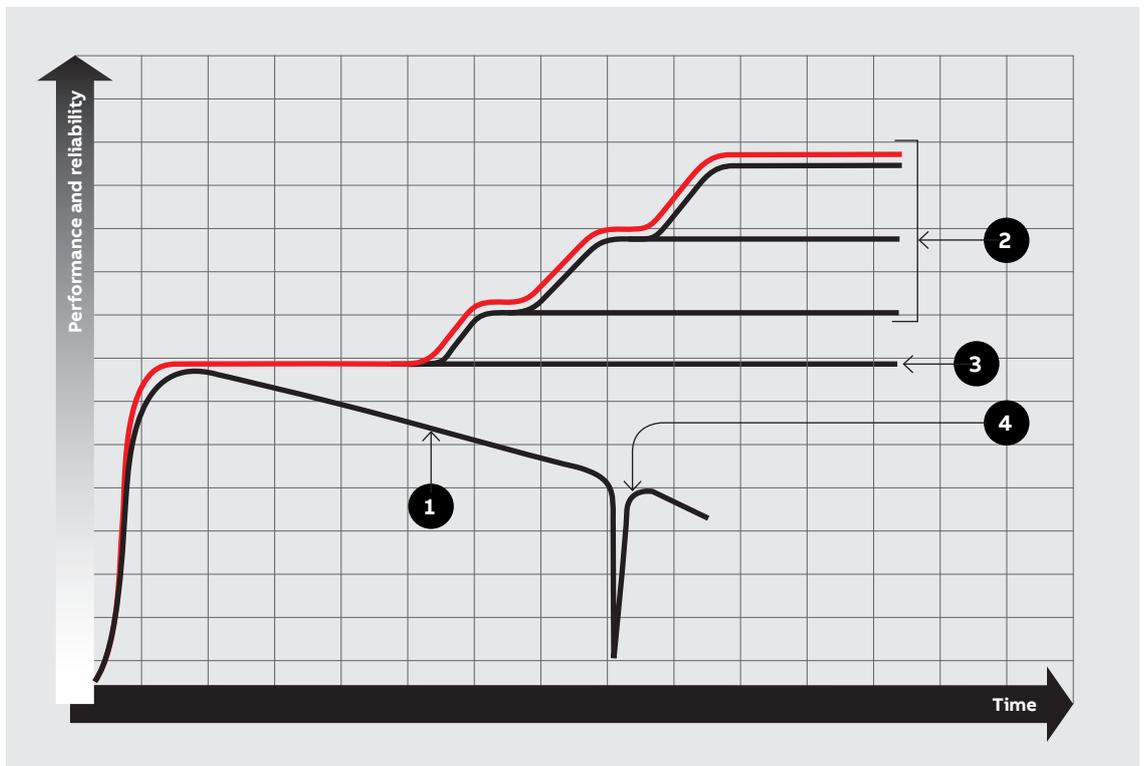
ABB is offering a full range of solutions to keep your installed base up and running during its entire life cycle.

The SWAPs maintenance program supports you to optimize the maintenance plan for the complete line-up.

SWAPs is a maintenance program based on 5 levels of maintenance (See, Watch, Act, Perform, Secure), where intervals are defined according to the assessment of the equipment environmental and operational conditions, age, previous maintenance performed, and presence of monitoring and

diagnostic solutions. The schedule continues till the equipment reaches its end of life, also recommending the right time for relay and circuit breaker retrofit.

When electrical components become obsolete, or a new technology is available, something more than a maintenance program might be required to keep a high efficiency of the installed base. In these cases, upgrade and retrofit solutions enhance the performance and reliability of the full system.



- 1 No maintenance
- 2 Upgrade or retrofit solutions
- 3 Risk and condition-based maintenance
- 4 Repair

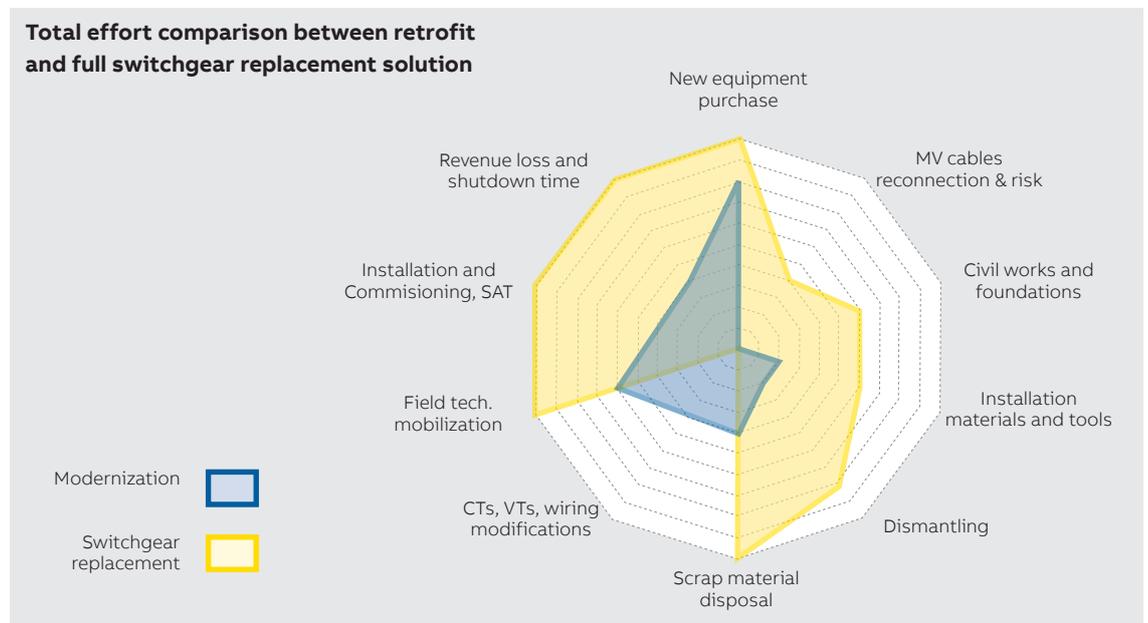
6. Retrofit value proposition

Based on long-time experience and know-how, ABB developed roll-in retrofit and Retrofill solutions specifically tailored to most limited and obsolete medium voltage circuit breakers that were produced by ABB and other manufacturers. This provides the opportunity to eliminate outdated technology like air magnetic or minimum oil, using the latest interrupting technology. The result is a significant improvement in reliability, safety, maintenance, and performance. Roll-in Retrofit and Retrofill have different benefits for customer. Some of them are common for both solution, some are specific.

Benefits of Roll-in Retrofit and Retrofill (Onefit)

- Last state-of-the-art switching technologies using ABB vacuum or gas SF6 apparatus
- Solution based on type tests according to the latest IEC Standards
- Increase of safety thanks to the available optional features like motorization of the insertion and extraction of the breaker
- Reduction of maintenance cost during the lifetime thanks to the new circuit breaker technology
- Easy implementation of digitalization solution to give access to Asset Manager on cloud solution
- Interchangeability and fast replacement with the existing old circuit breaker
- Safety replacement of the existing interlocks and shutters
- Up to 80% of downtime reduction to install the solution compared to full replacement
- Reduction of totals economic effort (See below picture) compared to the full replacement up to 50%.

ABB service team can support to define the best solution based on technical requirements, available budget and safety improvement required. Please refer to chapter 7 for more details on how to choose the best solution to renew your installed base.



7. Choose the best solution to renew your old installed base

With our expertise, we can support customer to define the best solution based on the real needs. When the installed base is at the end of life it is possible to choose one of the following options to keep the system up and running:

- Roll-in retrofit
- Retrofill - Onefit
- Full switchgear replacement

The evaluation of the best solution must consider

different aspects, as each one has different advantages compared to the others. We can divide the benefits in the following areas: safety, technical, environmental and economic ones.

Below tables can help to highlight the different benefits of each solution. It's recommended to contact ABB Service team to perform a tailor-made assessment and define the best investment for the specific case.

Safety benefits

	Risk of internal arc	Internal arc protection	Racking in and out operation	Open and close operations	Interlocks and shutter system
Existing Obsolete CBs	~80% of all electrical accidents are caused by arc flash due to wrong operations, interlock failures, degradation of the insulation materials. In old equipment the risk is very high	Old switchgears generally are not tested to withstand an internal arc.	In old CBs the rack-in / out operations are generally performed with open door, exposing the technician to high risk	In old system Switchgear the open and close operations are generally performed in front of the switchgear	It's common in old switchgear that interlocks and shutter system fails
Roll-in Retrofit (RiR)	Possible failure due to CBs is reduced. The upgrade of the switchgear (shutters, interlocks..) is not in the scope of work of the RiR, it's recommend during installation and commissioning to check the interlocks and shutter system in order to reduce the risk of failure	The upgrade of the switchgear is not in the scope of work so it maintains the original Internal arc protection ABB can propose different solution to reduce the effect and duration of an internal arc (e.g UFES solution)	RiR includes the option to motorize the rackin/out (motor on truck or TruckMaster®), to operate the CBs from safety distance and in some application to change the racking in/out system (e.g with rotative handle)	The reliability of the opening and closing operation in new mechanism of RiR is very high, it's also possible to operate remotely the opening and closing system using ArcSwitch®	The upgrade of the switchgear (shutters, interlocks..) is not in the scope of work of the RiR, it's recommend during installation and commissioning to check the interlocks and shutter system in order to reduce the risk of failure
Onefit Retrofill	The interlocks and shutter system will be replaced, the new ones are according to last international standard reducing the risk of internal arc	Onefit is not changing the original Internal arc protection classification of the switchgear, adding the Onefit door provide a protection against internal arc ABB can propose different solution to reduce the effect and duration of an internal arc (e.g UFES solution)	Racking in/out operations are performed with a closed door, the existing system is replaced using rotative handle insertion. Onefit solution includes the option to motorize the rack-in/out (motor on truck or TruckMaster®)	The reliability of the opening and closing operation in new mechanism of RiR is very high, it's also possible to operate remotely the opening and closing system using ArcSwitch®	The interlocks and shutter system will be replaced, the new ones are according to last international standard
Switchgear full replacement	The risk of internal arc in new equipment is lower than old one. It's recommended to perform a training on how to operate the switchgear to avoid wrong actions that can cause internal arc. ABB can propose solution to monitor the partial discharge that could cause and Internal arc (Swicom and PD-Com solution)	New switchgear is generally tested against internal arc. ABB can propose different solution to reduce the effect and duration of an internal arc (e.g UFES solution)	Racking in/out operations are performed with a closed door, the existing system is replaced using rotative handle insertion. Onefit solution includes the option to motorize the rackin/out (motor on truck or TruckMaster®)	The reliability of the opening and closing operation in new mechanism of RiR is very high, it's also possible to operate remotely the opening and closing system using ArcSwitch®	The interlocks and shutter system will be replaced, the new ones are according to last international standard



7. Choose the best solution to renew your old installed base

Economic benefits

	OPEX	CAPEX	Unforeseen costs during installation & commissioning	Unforeseen costs during operation	Installation and commissioning time
Existing Obsolete product	High opex cost to perform maintenance of the equipment and high cost of spare parts - if available	high risk on unforeseen CAPEX in emergency condition (No budget allocation) due to failures	-	High risks of lost of product and switchgear due to equipment failures (e.g. Internal arc, missing opening/closing operation, broken interlocks etc.)	-
Roll-in Retrofit (RiR)	Significant reduction of OPEX costs thanks to new type of CBs. Spare parts prices and availabilities are relative to active equipment, price reduction of the spares are around 50% less than obsolete CBs's spares. Spares lead time is short, it's not required to keep an high spare parts stock.	Limit investment - less than 60% compared to switchgear replacement - considering the full scope of work. It's possible to do partial replacement for only critical feeders based on available budget. The replacement can plan according to planned shutdown and not in emergency situation	RiR is a direct replacement solution so very low risk. Maintenance of the switchgear is suggested to ensure the shutters and interlocks functionality	New CBs failure rates is very limited with proper maintenance plan in place. It's possible to implement digital monitoring solutions with up to 40% of maintenance cost reduction (Refer to SWICOM and Asset Manager) lowering the failure rates.	Fast installation and commissioning, less than 1h per unit with only half busbar out of service.
Onefit Retrofit	Significant reduction of OPEX costs thanks to new type of CBs. Spare parts prices and availabilities are relative to active equipment, price reduction of the spares are around 50% less than obsolete CBs's spares. Spares lead time is short, it's not required to keep an high spare parts stock.	Limit investment - less than 50% compared to switchgear replacement - considering the full scope of work. It's possible to do partial replacement for only critical feeders based on available budget. The replacement can plan according to planned shutdown and not in emergency situation	Onefit is designed to fit in the original panel so the risks are limited. The switchgear frame and copper system must be in good condition while interlocks and shutter will be fully replaced	New CBs failure rates is very limited with proper maintenance plan in place. It's possible to implement digital monitoring solutions with up to 40% of maintenance cost reduction (Refer to SWICOM and Asset Manager) lowering the failure rates. The replacement of the interlocks and shutter reduce the possible failure rates of the full switchgear	Average installation & commissioning time 6-8h per unit with only half-busbar out of service.
Switchgear full replacement	Significant reduction of OPEX costs thanks to new type of CBs. Spare parts prices and availabilities are relative to active equipment, price reduction of the spares are around 50% less than obsolete CBs's spares. Spares lead time is short, it's not required to keep an high spare parts stock.	High investment required.	High risks due to extra civil works and possible damages of existing MV cables during the replacement	New CBs failure rates is very limited with proper maintenance plan in place. It's possible to implement digital monitoring solutions with up to 40% of maintenance cost reduction (Refer to SWICOM and Asset Manager) lowering the failure rates.	Installation & commissioning time not easily valued due to unexped issues during the activity. The I&C time will be much higher than 8h per unit considering also the existing switchgear disposal and civil works required.



Environmental benefits

	Equipment disposal / Circular economy	Materials disposal during normal operation	Dangerous materials	Failure risks with environmental impact	Risk of Fire
Existing Obsolete product	The complete unit will be disposed also in case of small failure due to unavailability/limitation of spare parts. The risk of failure is higher in obsolete products compared to active ones.	Disposal of exhausted dielectric material in the maintenance activities (e.g. oil in oil CBs) or leakage due to end of life of the CBS (e.g. SF6 in SF6 CBs)	Presence of dangerous materials, like asbestos or Oil. SF6 gas could be danger in case is deteriorated.	High risk of failure that can create a environmental impact (e.g SF6 or oil leakage, toxic smokes creation)	High risks of fire in case of oil breaker, or due to partial discharge for deteriorated insulataion materilas, or due to wrong operations with consequence of an internal arc
Roll-in Retrofit (RiR)	No materials disposal, only the existing CBs if no longer usable. The switchgear frame will remain with a reduction of waste in the average of 60% to 70% compered to a SWG replacement (based on old SACE switchgear)	New CBs are sealed for life, it's not required any replacement of the dielectric materials. It is possible to use Vaccum CBs	New CBs are sealed for life with no leakage during standard operation and very low risk of leakage in case of failure. It is possible to use Vaccum CBs	Reduced risk of failure compared to old CBs. It's possible to implement digital monitoring to reduce the risk of failure including internal arc (SWICOM, PDCOM for partial dicharge, temperature monitoring and Asset manager solutions)	Very low risk for the new CBs
Onefit Retrofit	Some materials disposal, including the existing CBs if no longer usable in other units. The switchgear frame will remain with a reduction of waste in the average of 50% to 60% compered to a SWG replacement (based on old SACE switchgear)	New CBs are sealed for life, it's not required any replacement of the dielectric materials. It is possible to use Vaccum CBs	New CBs are sealed for life with no leakage during standard operation and very low risk of leakage in case of failure. It is possible to use Vaccum CBs	Reduced risk of failure compared to old CBs and old shutter/interlocks system, It's possible to implement digital monitoring to reduce the risk of failure including internal arc (SWICOM; PDCOM for partial dicharge, temperature monitoring and Asset manager solutions)	Very low risk for the new CBs and CBs's enclosure
Full replacement	The complete existing switchgear will be disposed (around 1000kg of waste for each unit)	New CBs are sealed for life, it's not required any replacement of the dielectric materials. It is possible to use Vaccum CBs	New CBs are sealed for life with no leakage during standard operation and very low risk of leakage in case of failure. It is possible to use Vaccum CBs	Reduced risk of failure compared to old switchgear. It's possible to implement digital monitoring to reduce the risk of failure including internal arc (SWICOM, PDCOM for partial dicharge, temperature monitoring and Asset manager solutions)	Very low risk for the new Switchgear



7. Choose the best solution to renew your old installed base

Technical benefits

	International Standard	Standardization of the installed base	Operating sequence	Digitalization and new functionalities	Availability of spare parts
Existing Obsolete product	According to old standard	Typically different types and brands of CBs are installed, with different operations sequences, different spares and technologies	Operation sequence available generally with slow cycle	Difficult to digitalize an old obsolete system	For Obsolete products the spare parts are not guaranteed
Roll-in Retrofit (RiR)	The retrofit CBs is tested according to the latest IEC (or ANSI) standard : IEC 62271-100, IEC 62271-200 The switchgear will remain tested according to the original standard	The RiR will be 100% interchangeable with existing products. Installing RiR in all the installed base the spare parts related to the mechanisms and the basic CBs will be in common.	It's possible to implement fast cycle and reclosure according to last international standard	The digitalization of the switchgear can be done during the commissioning of the retrofit. With RiR is easy to implement new functionalities. Revamping of the relays can be offered as optional	Fully availability of the spare parts for the CBs
Onefit Retrofit	The retrofit CBs and the enclosure (onefit) is tested according to the latest IEC (or ANSI) standard : IEC 62271-100, IEC 62271-200 The switchgear will remain tested according to the original standard	The CBs for Onefit is standard used also in ABB switchgear. Installing Onefit to all the installed base will allow to have the all the spare parts in common, one type of CBs interchangeable with the same CBs with the same rating.	It's possible to implement fast cycle and reclosure according to last international standard	The digitalization of the switchgear can be done during the commissioning of the Onefit. There is the option to offer digital CBs VD4-Digitup in order to renew also the relays and CTs	Fully availability of the spare parts for the CBs and enclosure (Onefit)
Switchgear full replacement	The full switchgear is tested according to the latest IEC (or ANSI) standard: IEC 62271-200.	The CBs used in new SWG is a standard CBs produced in the assembling line, the same used in Onefit	It's possible to implement fast cycle and reclosure according to last international standard	Digital switchgear is an available option, new switchgear can be produced according to the functionalities required	Fully availability of the spare parts for the switchgear



8. Available roll-in retrofit solutions

8.1 ASEA HKK in VHD/VHE panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-1	HKK	12	800	12	210	VHD-12	VD4	VD4 fixed	12.08.16	GCER007760R0101
DE-2	HKK	12	1250	12	210	VHD-12	VD4	VD4 fixed	12.12.16	GCER007760R0101
DE-3	HKK	12	1250	12	210	VHD-12	VD4	VD4 fixed	12.12.25	GCER007760R0105
DE-4	HKK	12	1250	12	210	VHD-12	VD4	VD4 fixed	12.12.40	GCER007760R0109
DE-5	HKK	12	1600	12	210	VHD-12	VD4	VD4 fixed	12.16.40	GCER007760R0109
DE-6	HKK	12	1250	12	210	VHE-12	VD4	VD4 fixed	12.12.40	GCER007760R0102
DE-7	HKK	12	1600	12	210	VHE-12	VD4	VD4 fixed	12.16.40	GCER007760R0102
DE-8	HKK	12	1250	12	210	VHE-12	VD4	VD4 fixed	12.12.25	GCER007760R0106
DE-9	HKK	12	800	12	210	VHE-12	VD4	VD4 fixed	12.08.16	GCER007760R0107
DE-10	HKK	12	3150	12	210	VHE-12	VD4	VD4 fixed	12.31.40	GCER007760R0110
DE-11	HKK	12	2500	12	210	VHE-12	VD4	VD4 fixed	12.25.40	GCER007760R0111
DE-12	HKK	12	3150	12	210	VHE-12	VD4	VD4 fixed	12.31.40	GCER007760R0121
DE-13	HKK	24	1250	24	275	VHD-24	VD4	VD4 fixed	24.12.25	GCER007760R0103
DE-14	HKK	24	800	24	275	VHD-24	VD4	VD4 fixed	24.08.16	GCER007760R0104
DE-15	HKK	24	1250	24	275	VHD-24	VD4	VD4 fixed	24.12.16	GCER007760R0104
DE-16	HKK	24	2500	24	275	VHD-24	VD4	VD4 fixed	24.25.25	GCER007760R0112
DE-17	HKK	24	1250	24	275	VHD-24	VD4	VD4 fixed	24.12.25	GCER007760R0123
DE-18	HKK	24	1250	24	275	VHD-24	VM1	VM1 fixed	24.12.25	GCER007760R0143
DE-19	HKK	24	2500	24	275	VHD-24	VD4	VD4 fixed	24.25.25	GCER007760R0118
DE-20	HKK	24	1250	24	275	VHD-24	VD4	VD4 fixed	24.12.25	GCER007760R0119
DE-21	HKK	24	3150	24	275	VHD-24	VD4	VD4 fixed	24.31.25	GCER007760R0120
DE-22	HKK	24	1250	24	210	VHD-24	VD4	VD4 fixed	24.12.31	GCER007760R0108



8.2 ASEA HKK in DELTA panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-23	HKK	12	1250	12	155	Delta	VD4	VD4 fixed	12.12.25	GCE80022000R0101
DE-24	HKK	12	2500	12	160/185	Delta	VD4	VD4 fixed	12.31.25	GCE80022000R0102
DE-25	HKK	12	1250	12	180	Delta	VD4	VD4 fixed	12.12.25	GCE80022000R0103
DE-26	HKK	12	630	12	150	Delta	HD4	HD4 fixed	12.06.25	GCE80022000R0104



8.3 Calor Emag OD3/OD4 panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-27	OD3 / OD4	12	630	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-28	OD3 / OD4	12	630	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-29	OD3 / OD4	12	630	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-30	OD3 / OD4	12	630	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-31	OD3 / OD4	12	1250	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-32	OD3 / OD4	12	1250	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-33	OD3 / OD4	12	1250	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-34	OD3 / OD4	12	1250	12	150	ZE4	VD4	VD4 fixed		GCE8000715M0101
DE-35	OD3 / OD4	12	630	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-36	OD3 / OD4	12	630	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-37	OD3 / OD4	12	630	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-38	OD3 / OD4	12	630	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-39	OD3 / OD4	12	1250	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-40	OD3 / OD4	12	1250	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-41	OD3 / OD4	12	1250	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-42	OD3 / OD4	12	1250	12	150	ZP2	VD4	VD4 fixed		GCE8000715M0101
DE-43	OD3 / OD4	12	630	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-44	OD3 / OD4	12	630	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-45	OD3 / OD4	12	630	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-46	OD3 / OD4	12	630	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-47	OD3 / OD4	12	1250	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-48	OD3 / OD4	12	1250	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-49	OD3 / OD4	12	1250	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-50	OD3 / OD4	12	1250	12	150	ZW4	VD4	VD4 fixed		GCE8000715M0101
DE-51	OD3 / OD4	12	630	12	210	ZE4.3	VD4	VD4 fixed		GCE8000796R0101
DE-52	OD3 / OD4	12	1250	12	210	ZE4.3	VD4	VD4 fixed		GCE8000796R0101
DE-53	OD3 / OD4	24	630	24	210	ZE7	VD4	VD4 fixed		GCE8001576M0101

8. Available roll-in retrofit solutions

8.3 Calor Emag OD3/OD4 panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-54	OD3 / OD4	24	630	24	210	ZE7	VD4	VD4 fixed		GCE8001576M0101
DE-55	OD3 / OD4	24	630	24	210	ZE7	VD4	VD4 fixed		GCE8001576M0101
DE-56	OD3 / OD4	24	1250	24	210	ZE7	VD4	VD4 fixed		GCE8001576M0101
DE-57	OD3 / OD4	24	1250	24	210	ZE7	VD4	VD4 fixed		GCE8001576M0101
DE-58	OD3 / OD4	24	1250	24	210	ZE7	VD4	VD4 fixed		GCE8001576M0101
DE-59	OD3 / OD4	24	630	24	210	ZE8	VD4	VD4 fixed		GCE8001576R0102
DE-60	OD3 / OD4	24	630	24	210	ZE8	VD4	VD4 fixed		GCE8001576R0102
DE-61	OD3 / OD4	24	630	24	210	ZE8	VD4	VD4 fixed		GCE8001576R0102
DE-62	OD3 / OD4	24	1250	24	210	ZE8	VD4	VD4 fixed		GCE8001576R0102
DE-63	OD3 / OD4	24	1250	24	210	ZE8	VD4	VD4 fixed		GCE8001576R0102
DE-64	OD3 / OD4	24	1250	24	210	ZE8	VD4	VD4 fixed		GCE8001576R0102
DE-65	OD3 / OD4	24	630	24	210	ZE3	VD4	VD4 fixed		GCE8001576R0102
DE-66	OD3 / OD4	24	630	24	210	ZE3	VD4	VD4 fixed		GCE8001576R0102
DE-67	OD3 / OD4	24	630	24	210	ZE3	VD4	VD4 fixed		GCE8001576R0102
DE-68	OD3 / OD4	24	1250	24	210	ZE3	VD4	VD4 fixed		GCE8001576R0102
DE-69	OD3 / OD4	24	1250	24	210	ZE3	VD4	VD4 fixed		GCE8001576R0102
DE-70	OD3 / OD4	24	1250	24	210	ZE3	VD4	VD4 fixed		GCE8001576R0102
DE-71	OD3 / OD4	24	630	24	210	ZE4	VD4	VD4 fixed		GCE8001576R0102
DE-72	OD3 / OD4	24	630	24	210	ZE4	VD4	VD4 fixed		GCE8001576R0102
DE-73	OD3 / OD4	24	630	24	210	ZE4	VD4	VD4 fixed		GCE8001576R0102
DE-74	OD3 / OD4	24	1250	24	210	ZE4	VD4	VD4 fixed		GCE8001576R0102
DE-75	OD3 / OD4	24	1250	24	210	ZE4	VD4	VD4 fixed		GCE8001576R0102
DE-76	OD3 / OD4	24	1250	24	210	ZE4	VD4	VD4 fixed		GCE8001576R0102
DE-77	OD3 / OD4	24	630	24	210	ZP2	VD4	VD4 fixed		GCE8001576R0102
DE-78	OD3 / OD4	24	630	24	210	ZP2	VD4	VD4 fixed		GCE8001576R0102
DE-79	OD3 / OD4	24	630	24	210	ZP2	VD4	VD4 fixed		GCE8001576R0102
DE-80	OD3 / OD4	24	1250	24	210	ZP2	VD4	VD4 fixed		GCE8001576R0102
DE-81	OD3 / OD4	24	1250	24	210	ZP2	VD4	VD4 fixed		GCE8001576R0102
DE-82	OD3 / OD4	24	1250	24	210	ZP2	VD4	VD4 fixed		GCE8001576R0102
DE-83	OD3 / OD4	17	630	17	150	ZE3	VD4	VD4 fixed		GCE8001731M0101
DE-84	OD3 / OD4	17	630	17	150	ZE3	VD4	VD4 fixed		GCE8001731M0101
DE-85	OD3 / OD4	17	630	17	150	ZE3	VD4	VD4 fixed		GCE8001731M0101
DE-86	OD3 / OD4	17	1250	17	150	ZE3	VD4	VD4 fixed		GCE8001731M0101
DE-87	OD3 / OD4	17	1250	17	150	ZE3	VD4	VD4 fixed		GCE8001731M0101
DE-88	OD3 / OD4	17	1250	17	150	ZE3	VD4	VD4 fixed		GCE8001731M0101
DE-89	OD3 / OD4	17	630	17	150	ZE4	VD4	VD4 fixed		GCE8001731M0101
DE-90	OD3 / OD4	17	630	17	150	ZE4	VD4	VD4 fixed		GCE8001731M0101
DE-91	OD3 / OD4	17	630	17	150	ZE4	VD4	VD4 fixed		GCE8001731M0101
DE-92	OD3 / OD4	17	1250	17	150	ZE4	VD4	VD4 fixed		GCE8001731M0101
DE-93	OD3 / OD4	17	1250	17	150	ZE4	VD4	VD4 fixed		GCE8001731M0101
DE-94	OD3 / OD4	17	1250	17	150	ZE4	VD4	VD4 fixed		GCE8001731M0101
DE-95	OD3 / OD4	12	1600	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-96	OD3 / OD4	12	1600	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-97	OD3 / OD4	12	1600	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-98	OD3 / OD4	12	2000	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-99	OD3 / OD4	12	2000	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-100	OD3 / OD4	12	2000	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-101	OD3 / OD4	12	2500	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-102	OD3 / OD4	12	2500	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-103	OD3 / OD4	12	2500	12	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-104	OD3 / OD4	17	1600	17	210	ZE3	VD4	VD4 fixed		GCE8001897M0101

8.3 Calor Emag OD3/OD4 panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-105	OD3 / OD4	17	1600	17	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-106	OD3 / OD4	17	2000	17	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-107	OD3 / OD4	17	2000	17	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-108	OD3 / OD4	17	2500	17	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-109	OD3 / OD4	17	2500	17	210	ZE3	VD4	VD4 fixed		GCE8001897M0101
DE-110	OD3 / OD4	12	1600	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-111	OD3 / OD4	12	1600	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-112	OD3 / OD4	12	1600	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-113	OD3 / OD4	12	1600	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-114	OD3 / OD4	12	2000	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-115	OD3 / OD4	12	2000	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-116	OD3 / OD4	12	2000	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-117	OD3 / OD4	12	2500	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-118	OD3 / OD4	12	2500	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-119	OD3 / OD4	12	2500	12	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-120	OD3 / OD4	17	1600	17	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-121	OD3 / OD4	17	1600	17	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-122	OD3 / OD4	17	2000	17	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-123	OD3 / OD4	17	2000	17	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-124	OD3 / OD4	17	2500	17	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-125	OD3 / OD4	17	2500	17	210	ZE4	VD4	VD4 fixed		GCE8001897M0101
DE-126	OD3 / OD4	12	1600	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-127	OD3 / OD4	12	1600	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-128	OD3 / OD4	12	1600	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-129	OD3 / OD4	12	2000	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-130	OD3 / OD4	12	2000	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-131	OD3 / OD4	12	2000	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-132	OD3 / OD4	12	2500	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-133	OD3 / OD4	12	2500	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-134	OD3 / OD4	12	2500	12	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-135	OD3 / OD4	17	1600	17	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-136	OD3 / OD4	17	1600	17	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-137	OD3 / OD4	17	2000	17	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-138	OD3 / OD4	17	2000	17	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-139	OD3 / OD4	17	2500	17	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-140	OD3 / OD4	17	2500	17	210	ZP1	VD4	VD4 fixed		GCE8001897M0101
DE-141	OD3 / OD4	12	1600	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-142	OD3 / OD4	12	1600	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-143	OD3 / OD4	12	1600	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-144	OD3 / OD4	12	2000	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-145	OD3 / OD4	12	2000	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-146	OD3 / OD4	12	2000	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-147	OD3 / OD4	12	2500	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-148	OD3 / OD4	12	2500	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-149	OD3 / OD4	12	2500	12	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-150	OD3 / OD4	17	1600	17	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-151	OD3 / OD4	17	1600	17	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-152	OD3 / OD4	17	2000	17	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-153	OD3 / OD4	17	2000	17	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-154	OD3 / OD4	17	2500	17	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-155	OD3 / OD4	17	2500	17	210	ZP2	VD4	VD4 fixed		GCE8001897M0101
DE-156	OD3 / OD4	12	630	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101

8. Available roll-in retrofit solutions

8.3 Calor Emag OD3/OD4 panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-157	OD3 / OD4	12	630	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101
DE-158	OD3 / OD4	12	630	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101
DE-159	OD3 / OD4	12	630	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101
DE-160	OD3 / OD4	12	1250	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101
DE-161	OD3 / OD4	12	1250	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101
DE-162	OD3 / OD4	12	1250	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101
DE-163	OD3 / OD4	12	1250	12	150	ZE4.3	VD4	VD4 fixed		GCE8001961M0101
DE-164	OD3 / OD4	12	630	12	150	ZR2	VD4	VD4 fixed		GCE8002621M0101
DE-165	OD3 / OD4	12	630	12	150	ZR2	VD4	VD4 fixed		GCE8002621M0101
DE-166	OD3 / OD4	12	630	12	150	ZR2	VD4	VD4 fixed		GCE8002621M0101
DE-167	OD3 / OD4	12	1250	12	150	ZR2	VD4	VD4 fixed		GCE8002621M0101
DE-168	OD3 / OD4	12	1250	12	150	ZR2	VD4	VD4 fixed		GCE8002621M0101
DE-169	OD3 / OD4	12	1250	12	150	ZR2	VD4	VD4 fixed		GCE8002621M0101
DE-170	OD3 / OD4	12	630	12	150	ZR3	VD4	VD4 fixed		GCE8002621M0101
DE-171	OD3 / OD4	12	630	12	150	ZR3	VD4	VD4 fixed		GCE8002621M0101
DE-172	OD3 / OD4	12	630	12	150	ZR3	VD4	VD4 fixed		GCE8002621M0101
DE-173	OD3 / OD4	12	1250	12	150	ZR3	VD4	VD4 fixed		GCE8002621M0101
DE-174	OD3 / OD4	12	1250	12	150	ZR3	VD4	VD4 fixed		GCE8002621M0101
DE-175	OD3 / OD4	12	1250	12	150	ZR3	VD4	VD4 fixed		GCE8002621M0101
DE-176	OD3 / OD4	36	1250	36	360	ZE4	VD4	VD4 fixed		GCER010120R0101
DE-177	OD3 / OD4	36	1250	36	360	ZE4	VD4	VD4 fixed		GCER010120R0101
DE-178	OD3 / OD4	36	1600	36	360	ZE4	VD4	VD4 fixed		GCER010120R0102
DE-179	OD3 / OD4	36	1600	36	360	ZE4	VD4	VD4 fixed		GCER010120R0102
DE-180	OD3 / OD4	36	2000	36	360	ZE4	VD4	VD4 fixed		GCER010120R0103
DE-181	OD3 / OD4	36	2000	36	360	ZE4	VD4	VD4 fixed		GCER010120R0103
DE-182	OD3 / OD4	36	2500	36	360	ZE4	VD4	VD4 fixed		GCER010120R0103
DE-183	OD3 / OD4	36	2500	36	360	ZE4	VD4	VD4 fixed		GCER010120R0103
DE-184	OD3 / OD4	36	1250	36	360	ZW4	VD4	VD4 fixed		GCER010120R0104
DE-185	OD3 / OD4	36	1250	36	360	ZW4	VD4	VD4 fixed		GCER010120R0104
DE-186	OD3 / OD4	36	1600	36	360	ZW4	VD4	VD4 fixed		GCER010120R0105
DE-187	OD3 / OD4	36	1600	36	360	ZW4	VD4	VD4 fixed		GCER010120R0105
DE-188	OD3 / OD4	36	2000	36	360	ZW4	VD4	VD4 fixed		GCER010120R0106
DE-189	OD3 / OD4	36	2000	36	360	ZW4	VD4	VD4 fixed		GCER010120R0106
DE-190	OD3 / OD4	36	2500	36	360	ZW4	VD4	VD4 fixed		GCER010120R0106
DE-191	OD3 / OD4	36	2500	36	360	ZW4	VD4	VD4 fixed		GCER010120R0106
DE-192	OD3 / OD4	36	1250	36	360	ZE8	VD4	VD4 fixed		GCER010120R0107
DE-193	OD3 / OD4	36	1600	36	360	ZE8	VD4	VD4 fixed		GCER010120R0108
DE-194	OD3 / OD4	36	2000	36	360	ZE8	VD4	VD4 fixed		GCER010120R0109
DE-195	OD3 / OD4	36	1250	36	360	ZE10.2	VD4	VD4 fixed		GCER010120R0110
DE-196	OD3 / OD4	36	16000	36	360	ZE10.2	VD4	VD4 fixed		GCER010120R0111
DE-197	OD3 / OD4	36	2000	36	360	ZE10.2	VD4	VD4 fixed		GCER010120R0112
DE-198	OD3 / OD4	17	630	17	150	ZP1	VD4	VD4 fixed		GCE8001731M0101
DE-199	OD3 / OD4	17	630	17	150	ZP1	VD4	VD4 fixed		GCE8001731M0101
DE-200	OD3 / OD4	17	630	17	150	ZP1	VD4	VD4 fixed		GCE8001731M0101
DE-201	OD3 / OD4	17	1250	17	150	ZP1	VD4	VD4 fixed		GCE8001731M0101
DE-202	OD3 / OD4	17	1250	17	150	ZP1	VD4	VD4 fixed		GCE8001731M0101
DE-203	OD3 / OD4	17	1250	17	150	ZP1	VD4	VD4 fixed		GCE8001731M0101
DE-204	OD3 / OD4	17	630	17	150	ZP2	VD4	VD4 fixed		GCE8001731M0101
DE-205	OD3 / OD4	17	630	17	150	ZP2	VD4	VD4 fixed		GCE8001731M0101
DE-206	OD3 / OD4	17	630	17	150	ZP2	VD4	VD4 fixed		GCE8001731M0101
DE-207	OD3 / OD4	17	1250	17	150	ZP2	VD4	VD4 fixed		GCE8001731M0101
DE-208	OD3 / OD4	17	1250	17	150	ZP2	VD4	VD4 fixed		GCE8001731M0101

8.3 Calor Emag OD3/OD4 panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-209	OD3 / OD4	17	1250	17	150	ZP2	VD4	VD4 fixed		GCE8001731M0101
DE-210	OD3 / OD4	17	630	17	150	ZW3	VD4	VD4 fixed		GCE8001731M0101
DE-211	OD3 / OD4	17	630	17	150	ZW3	VD4	VD4 fixed		GCE8001731M0101
DE-212	OD3 / OD4	17	630	17	150	ZW3	VD4	VD4 fixed		GCE8001731M0101
DE-213	OD3 / OD4	17	1250	17	150	ZW3	VD4	VD4 fixed		GCE8001731M0101
DE-214	OD3 / OD4	17	1250	17	150	ZW3	VD4	VD4 fixed		GCE8001731M0101
DE-215	OD3 / OD4	17	1250	17	150	ZW3	VD4	VD4 fixed		GCE8001731M0101
DE-216	OD3 / OD4	17	630	17	150	ZW4	VD4	VD4 fixed		GCE8001731M0101
DE-217	OD3 / OD4	17	630	17	150	ZW4	VD4	VD4 fixed		GCE8001731M0101
DE-218	OD3 / OD4	17	630	17	150	ZW4	VD4	VD4 fixed		GCE8001731M0101
DE-219	OD3 / OD4	17	1250	17	150	ZW4	VD4	VD4 fixed		GCE8001731M0101
DE-220	OD3 / OD4	17	1250	17	150	ZW4	VD4	VD4 fixed		GCE8001731M0101
DE-221	OD3 / OD4	17	1250	17	150	ZW4	VD4	VD4 fixed		GCE8001731M0101



8.5 BBC SBKJ in BA1/2 pan

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-222	SBKJ	12	630	12	150	BA1/2	VD4 EL	VD4 EL fixed	12.06.16	GCER020200R0101
DE-223	SBKJ	12	1250	12		BA1/2	VD4 EL	VD4 EL fixed	12.12.31	GCER020200R0102
DE-224	SBKJ	12	2000	12		BA1/2	VD4 EL	VD4 EL fixed	12.20.31	GCER020200R0103
DE-225	SBKJ	12	4000	12	275	BA1/2	VD4 EL	VD4 EL fixed	12.40.25	GCER020200R0104
DE-226	SBKJ	12	1600	12	210	BA1/2	VD4 EL	VD4 EL fixed	12.16.31	GCER020200R0105
DE-227	SBKJ	12	1600	12		BA1/2	VD4 EL	VD4 EL fixed	12.16.40	GCER020200R0106
DE-228	SBKJ	12	1250	12	P150	BA1/2	VD4 EL	VD4 EL fixed	12.12.40	GCER026100R0101



8. Available roll-in retrofit solutions

8.6 BBC HB/HC/OD/BA/BD in BAX panels

Id	Exting CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-229	HB	17	1250	17	210	BAL	VD4 EL	VD4 EL fixed	17.12.25	GCER026293R0101
DE-230	HC	17	2500	17	275	BAL	VD4 EL	VD4 EL fixed	17.25.25	GCER026293R0102
DE-231	HB	17	1250	17	230	BA2D	VD4 EL	VD4 EL fixed	17.12.25	GCER026332R0101
DE-232	HB	17	2500	17	230	BA2D	VD4 EL	VD4 EL fixed	17.25.25	GCER026332R0102
DE-233	HB	17	1250	17	230	BA2D	VD4 EL	VD4 EL fixed	17.12.25	GCER026332R0103
DE-234	HB/HC/OD	12	1250	12	200	BA1	VD4 EL	VD4 EL fixed	12.12.31	GCER02000R1105
DE-235	HB/HC/OD	12	1250	12	200	BA1	VD4 EL	VD4 EL fixed	12.12.31	GCER02000R1106
DE-236	HB/HC/OD	12	2500	12	275	BA1	VD4 EL	VD4 EL fixed	12.25.31	GCER02000R1108
DE-237	HB/HC/OD	12	3150	12	275	BA1	VD4 EL	VD4 EL fixed	12.31.40	GCER02000R1102
DE-238	HB/HC/OD	12	1600	12	275	BA1	VD4 EL	VD4 EL fixed	12.16.32	GCER02000R1109
DE-239	BA-BD	12	1250	12	200	BA/BD	VD4 EL	VD4 EL fixed	12.12.32	GCER007500R0103
DE-240	HB/HC/OD	17	1250	17	210	BAX	VD4 EL	VD4 EL fixed	17.12.25	GCER007150R0111
DE-241	HB/HC/OD	17	2500	17	275	BAX	VD4 EL	VD4 EL fixed	17.25.25	GCER007150R0112
DE-242	HB/HC/OD	17	3100	17	275	BAX	VD4 EL	VD4 EL fixed	17.31.25	GCER007150R0114
DE-243	HB/HC/OD	12	630	12	150	BAL	VD4 EL	VD4 EL fixed	12.06.25	GCER021000R0101
DE-244	HB/HC/OD	12	1250	12	150	BAL	VD4 EL	VD4 EL fixed	12.12.25	GCER021000R0103
DE-245	HB/HC/OD	12	1600	12	210	BAL	VD4 EL	VD4 EL fixed	12.16.26	GCER021000R0104
DE-246	HB/HC/OD	24	630	24	210	BAL	VD4 EL	VD4 EL fixed	24.06.25	GCER021000R0106
DE-247	HB/HC/OD	12	1250	12	150	BADR	VD4 EL	VD4 EL fixed	12.12.32	GCER026331R0101
DE-248	HB/HC/OD	17	1250	17	230	BA2D	VD4 EL	VD4 EL fixed	17.12.25	GCER026332R0101
DE-249	HB/HC/OD	17	2500	17	230	BA2D	VD4 EL	VD4 EL fixed	17.25.25	GCER026332R0102
DE-250	Univer-II	12	630	12	150	BA	VD4	VD4 fixed	12.06.20	GCER026294R0101
DE-251	Univer G	12	630	12	150	BA	VD4	VD4 fixed	12.06.25	GCER026333R0101
DE-252	DBH10	12	1250	12	P180	DB	VD4 EL (aufgespreizt)	VD4 EL (aufgespreizt) fixed	12.12.32	GCER029000R0101



8.7 VEM SCI in CSI-CSIM panel

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-253	SCI	24	630	24	275	CSI-CSIM	VD4	VD4 fixed	24.06.16	
DE-254	SCI	12	630	12	210	CSI	VD4	VD4 fixed	12.06.20	
DE-255	SCI	24	1250	24	275	CSI-CSIM	VD4	VD4 fixed	24.12.25	



8.8 VZ1 in Ritter GT1 panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-267	VZ1	12	630	12	P150	Ritter GT1	VD4	VD4 fixed	12.06.20	GCER026849R0101



8.9 AEG MC 506/12-2 in RMB 6/12 panels

Id	Extng CBs Type	Vn [kV]	In [A]	Isc [kA]	Pitch [mm]	Panel application	RiR family	RiR CBs type	Rating code Vn In Isc	RiR dimensional drawing
DE-271	MC 506/12-2	12	630	12	210	RMB 6/12	VD4	VD4 fixed	12.06.25	GCER026006R0101





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