



Low voltage air circuit breaker retrofitting  
kits  
ABB solutions, skills, advantages

# Low Voltage Air Circuit Breaker Retrofitting Kits

## ABB Solutions, skills, advantages

### ABB Solutions

As production advances and improves over the years, it is normal to see systems change, loads increased, and harsh environments deteriorate vital equipment. Because of these dynamics, it's important to recognize that air circuit breakers put into service many years ago might not meet the requirements of reliability and safety demanded today. Assurance that people, equipment and processes are properly protected is a growing concern.

A proactive approach to system protection includes routine maintenance, however, as aging breakers become obsolete, this may be insufficient to satisfy customer needs such as improving the electrical and mechanical performances, extending the life of the system or complying with safety regulations.

ABB Low Voltage Service offers a unique way to upgrade to the next generation of hardware and software from ABB to exchange wear parts or outdated equipment components while maintaining original plant and equipment configuration.

### ABB's response

- Converge to more versatile products that minimize production cost while adapting to market needs
- Offer efficient products that boost the installation's value. (reliability, quality, additional features, etc.)
- ABB has developed retrofit and upgrade strategies for existing installed equipment to offer life extension opportunities

### ABB Retrofitting

The need to upgrade or replace existing air circuit breakers is becoming increasingly important as aging circuit breakers become less reliable and replacement parts become obsolete. ABB's Low Voltage Air Circuit Breaker(ACB) Retrofit is a cost effective upgrade solution for installed, aging switchgear. With advanced technology and safety features, ABB offers products, solutions and services that will ensure customer confidence in safe, reliable, and coordinated systems.

As production or process requirements change and as safety codes and standards become more stringent, it is important to ensure coordination and protection within the system. Switchgear is not susceptible to the same mechanical wear therefore it is not necessary to replace the original switchgear which makes a retrofit solution an ideal way to introduce modern components into the system.

No matter the brand of existing switchgear, customers have the option of updating their gear through retrofit solutions, utilizing new generation ABB Emax air circuit breakers which are modified to fit into the existing switchgear by cradle in cradle, roll in replacement or hard bus retrofit designs. ABB has designs available for most manufacturers' equipment in the US market.

The ABB Emax series ensures mechanical and electrical reliability with great flexibility, thanks to modern-technology microprocessor-based electronic protections that introduce capabilities, such as advanced protection and selectivity, power metering, monitoring and communication.



## ABB Advanced Technology

ABB's low voltage retrofit designs are developed by breaker experts who ensure operational requirements are met by custom engineering solutions to guarantee the proper fit and function within the existing gear.

All kits are designed on 3D models, engineered and produced according to ABB procedures. The quality system is certified by local and international certification bodies (complying with ISO Standards).



ABB retrofit kits are routine and type tested following test and verification plans defined by the relevant standards and by internal procedures specifically designed for retrofit. The entire range of ABB retrofit circuit-breakers are tested in ABB and third party ISO17025 laboratories. All breakers used within these kits comply with ANSI and UL certifications.



The following is a list of tests performed on ABB retrofitting kits:

- Operational performance capability test with and without current: The electrical parameters of the new breakers should meet or exceed the requirements of the old breaker
- Mechanical operation test of racking in and out of the moving part
- The protection locks and signaling devices
- Protection degree
- The short time current withstand capability
- The dielectric withstand capability
- The current carrying capability of the primary connections.

## ABB Solution Advantages

Obsolete breakers can be replaced using equipment specifically designed by ABB Low Voltage Service to preserve the existing framework and to minimize downtime and costs.

The use of the retrofitting kits provides several advantages:

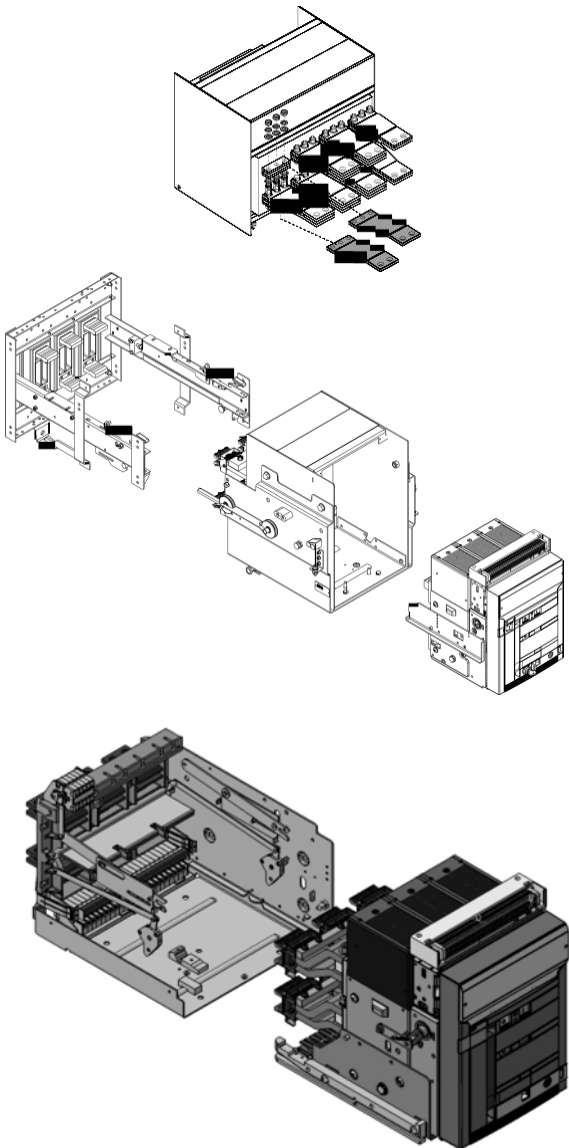
- Increase total life cycle of the switchgear;
- maintain the original configuration of the switchgear equipment and installation;
- improve safety and reliability
- ease of maintenance and functionality of the system;
- low investment costs compared to those required for the installation of a new switchgear;
- planned scheduling and implementation with minimal downtime;
- cost reduction of maintenance and repairs;
- service continuity guaranteed with protection of investments;
- full interconnectivity with the existing distribution systems;
- easy and safe replacement;
- no structural changes;
- adaptations to auxiliary circuits;
- greater control of plants with new electronic protections;
- upgrading of the switchboard with new technology (as power management and energy saving) implies economic benefits;
- customized solutions based on specific customer needs.



## Retrofitting Kit Solutions

ABB can offer a turnkey solution from the proposal and design, through the manufacturing and testing, up to the installation and commissioning.

In order to address the wide range of designs in the marketplace, ABB has options for retrofits which include:



**Hard Bus Retrofill (HBR):** The obsolete circuit-breaker is totally removed and substituted with the Emax circuit-breaker. The kit contains custom designed and preconfigured busbars and covers to adapt the new circuit-breaker to the existing busbars.

**Benefit:** The time and effort of emptying the compartment and arranging it to fit the new cassette is offset by providing a modern, reliable and interchangeable solution.

**Cradle in Cradle (CiC):** the fixed part of the new circuit-breaker is suitably adapted and tested in ABB. This solution allows the new fixed part to be fitted inside the existing fixed part of the old circuit breaker.

**Benefit:** This solution balances the need for a retrofill solution with reasonably limited site works and linked outage. Emax modules can be purchased and stocked as spares.

**Direct Roll in Replacement (DRR):** It is the faster solution for the customer. The moving part of the old circuit-breaker is removed and the moving part of the new circuit-breaker is suitably modified and tested in ABB to be inserted into the existing fixed part. This implies a very short plant shutdown for the installation.

**Benefit:** Latest standards compliance is one of the key elements when designing and testing replacement breakers. This methodology allows to exchange the original device without the extended downtime required for the switchgear replacement. Higher performances and additional features can also be targeted.



## Contact us

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