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ELECTRIFICATION DISTRIBUTION SOLUTION

# ABB Service Center

## Breaker Refurbishment Services



ABB service center has all the capabilities necessary to help your company maintain the reliability and performance of distribution systems at the lowest possible cost.

# ABB Canada

## Breaker Refurbishment Program

ABB offers an exclusive refurbishment program for ABB and non-ABB circuit breakers. ABB will provide a full inspection of your breaker and supply a comprehensive report on the best solution to refurbish the unit.

### Refurbishment Process

Once a circuit breaker is received for refurbishment, an "as received" inspection is performed where all the major assemblies are inspected, and tested. The circuit breaker is then completely disassembled down to the last movable part for cleaning\*. All non-current parts are cleaned by methods which remove all foreign material, but do not adversely affect the materials dielectric or structural properties.

All current carrying components are cleaned by a method which does not deteriorate the original plating. After cleaning, all parts are inspected for cracks and deterioration utilizing approved acceptance criteria. Parts are replaced, and/or re-plated as required to extend the life of the breaker.

If the main contact surface is damaged, worn, or cracked, the main contact will be replaced. All old lubricants are removed. Then the mechanism and all non-current carrying pivot points are re-lubricated.

Once the circuit breaker is reassembled, it is "final" tested in accordance with standards. A label is attached to each refurbished circuit breaker to ensure traceability of the refurbishment work. A test report is supplied for each circuit breaker that includes results obtained from "as received" and "final" testing along with the list of replaced parts.

\* Some exceptions apply.



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# ABB Customer Service Solutions

Factory approved refurbishment with warranty, partial or complete overhaul and reconditioning of nuclear, commercial circuit breakers, and protection.

Refurbishments are for circuit breakers with readily available parts. ABB's factory trained technicians provide refurbishment services for both nuclear and non-nuclear low and medium voltage circuit breakers. ABB refurbishes circuit breakers to a "like new operating condition" and provides a full one year warranty that covers parts and labor. In addition to providing excellent circuit breaker refurbishments, ABB works with customers to create refurbishment programs to meet specific needs and timeframes. Examples of customer service solutions include:

- Spare breakers for refurbishment rotation and minimized down time
- On-site refurbishments including maintenance and repairs
- Reusable shipping crates to protect breakers during transit

## Why ABB?



Turnkey refurbishments free customer resources for other assignments.



Combination of service-oriented personnel and factory capabilities assures the most cost effective and timely breaker refurbishments.



Work performed by professional technicians in a controlled environment, supported by design and product engineers.



Nuclear safety related refurbishments comply with 10 CFR 50 Appendix B, 10 CFR Part 21 and NQA1 requirements.



Refurbishments validated by full production testing to original specifications and industry standards



Factory warranty provided on refurbished circuit breakers.

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# Our Services

ABB provides customers with the maximum long-term value for their low and medium voltage circuit breakers and accessories. An experienced staff of engineers and technicians are familiar with all aspects of circuit breaker operations for various industrial environments and applications, ranging from nuclear utilities to commercial installations.

## Refurbishments

Refurbishments are for circuit breakers that have a high duty cycle and/or are near the end of the lubrication lifecycle and where renewal parts are readily available. ABB provides refurbishment services for both nuclear and non-nuclear low and medium voltage circuit breakers with factory trained technicians. ABB refurbishes circuit breakers to a "like new operating condition" and provides a full one-year warranty that covers parts and labor.

## Repairs

Trained technicians evaluate a circuit breaker's condition through diagnostic testing and inspection. Various options are available from immediate repair through full refurbishment.

## Retrofits

Retrofits are conversions or upgrades of breakers to the latest technologies, usually including new trip units for low voltage breakers, or new vacuum interrupters and operating mechanisms for medium voltage breakers.

## On-Site Field Support

Resources are available to perform maintenance, repairs, and refurbishments on-site to reduce cycle times and meet emergency needs.

## Training

ABB provides end user training for customers to perform their own maintenance and custom training programs tailored to meet specific customer needs.

## Parts and Components

The Breaker Service Center maintains an extensive inventory of new and remanufactured parts for many types and vintages of power circuit breakers. Parts are manufactured to the original drawings, specifications, and on-going design improvements, assuring that any part purchased from ABB is interchangeable and of the highest quality and reliability. Parts kits are available for field rebuilds of components and sub-assemblies. Life extension and upgrade kits are also available for field installation.

## Testing

ABB can perform routine and type tests on refurbished LV and medium voltage circuit breakers. Routine tests include electrical and mechanical functional tests; timing test, speed test on some breakers, contact resistance, dielectric tests, partial discharge measurement, and primary injection on LV breakers with protection devices. On roll in replacement, ABB can perform type tests such as Basic Impulse Level (BIL) and Temperature rise test of up to 4000A continuous current.



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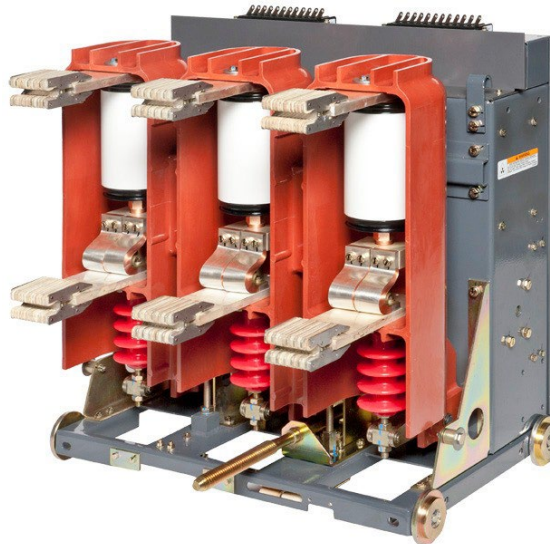
# Non-ABB Circuit Breakers

ABB has expertise to refurbish other manufacturers' circuit breakers to "like new operating conditions." The refurbishment process is the same as with ABB circuit breakers. Base prices quoted cover typical refurbishment components and labor from experienced technicians. Other parts and repairs are performed based on additional quotations and customer approval.

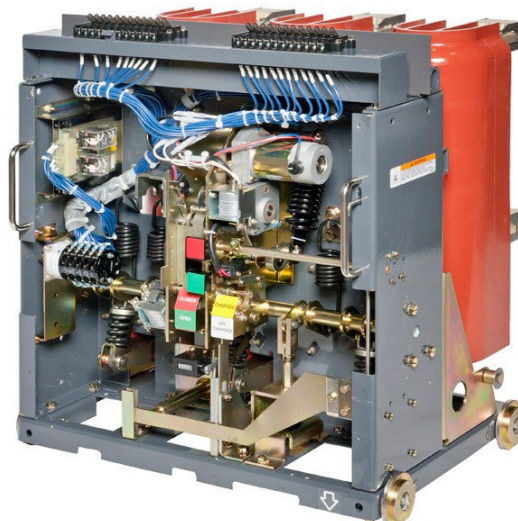
Factory approved maintenance with warranty, partial or complete overhaul and reconditioning of circuit breakers from Schneider Electric, Siemens/Allis Chalmers, Federal Pacific, McGraw Edison, Westinghouse, General Electric, Federal Pioneer, Powell, Toshiba, UNELEC and others.

## Toshiba V16S-MLDA Breaker Refurbishment

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# ABB SACE EMAX BREAKERS

Air circuit breaker series launched in 1996, was available in different versions and is now obsolete.

SACE Emax circuit breaker series consisted in five sizes (E1, E2, E3, E4, E6) available in fixed and withdrawable version with rated uninterrupted currents from 800 to 6300A and breaking capacities ICU up to 150kA at 440V AC, 100kA at 690V AC and 65kA at 1000V AC.



From an architecture point of view, the design was developed using the concepts of modularity. Electronics played a crucial role thanks to the PR111/PR112/PR113 series of electronic trip units with liquid crystal displays that also permitted a harmonic analysis of the currents.

To complete the offer a new series of selective circuit breakers (L range) current limiting was introduced. Emax was the first series of ABB SACE air circuit breakers with the UL mark.

## Service Solutions

- ✓ **Retrofit kits**
  - Direct Replacement E1...E6 with New Emax with PR121/PR122/PR123
  - Hard Bus Retrofill E1...E6 with Emax 2 (IEC/UL)
  - Direct Replacement E1...E6 with Emax 2 (IEC)
- ✓ **Inspections**
- ✓ **Spare parts**
  - **Maintenance and repairs**
    - Preventive maintenance
    - Corrective maintenance
  - **Factory reconditioning**
    - Limitation on available spare parts
  - **Troubleshooting**

\* Some spare parts are available for inventory.

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# Service Locations

## Winnipeg

205 Henlow Bay, Winnipeg MB, R3Y 1G4

## Sudbury

170 Fielding Rd, Sudbury ON, P3Y 1L5

## Quebec City

170-2600 Rue Jean Perrin, Quebec QC, G2C 2C6

## Montreal

TechnoParc Montreal

800 Bd Hymus, Saint-Laurent QC, H4S 2G1

## Brampton

201 Westcreek Blvd, Brampton ON, L6T 5S6

## Edmonton

4836 Eleniak Rd. N Edmonton, AB T6B 2S1

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