

Low Voltage Equipment Life Extension and Modernization

Power Circuit Breaker Low Voltage Retrofill



Power Circuit Breaker Retrofill

Eaton's retrofill conversion includes replacement of the original circuit breaker and circuit breaker compartment components within an existing vertical section. Aging cell components are replaced with a new Eaton Magnum DS cassette and secondary terminal blocks. Old, high maintenance circuit breakers are replaced with a new Eaton Magnum DS power circuit breaker. Eaton's retrofill solution offers an advantage over switchgear replacement in cases where the original equipment is inaccessible, too costly to remove, or extended downtime is not an option.

Increased Safety

Eaton's retrofill solution can increase the original equipment safety by offering Arc Flash protection features and replacing worn-out and unreliable components within an existing compartment. Utilizing modern circuit breaker technology which has been tested to the latest IEEE/ANSI standards will give our customers a cost effective solution to bring their switchgear into the 21st century.

Maximize Life Extension

All replacement circuit breakers are factory new and are electrically and mechanically equivalent or superior to the circuit breakers they replace. These are not "Retrofits" and no parts are reused from the original circuit breakers. Eaton's Magnum DS Circuit Breaker technology reduces up to 50% of maintenance procedures commonly associated with vintage power circuit breakers. The arc chutes, contacts, mechanism and control components can be easily inspected. Minor maintenance (such as lubricating the mechanism) can also be easily accomplished. Arc chutes can be removed with two bolts and visually inspected or replaced. Once the arc chutes are removed, viewing the main contacts along with their contact wear indicator results in a quick and simple decision to replace if necessary.

Increase Interruption Rating

Changes resulting from the addition of new larger transformers, bus ties, parallel generation, and new sources of incoming power can drastically increase the level of available short circuit current in the power distribution systems. The bus system's momentary capability can be analyzed by Eaton's factory qualified engineers and braced to new higher levels. Magnum DS circuit breakers are available to increase interrupting capabilities while still maintaining the original circuit breaker cell dimensions, providing thousands of dollars in savings over the cost of replacing the switchgear. Cell-to-breaker coding systems (rejection plates) are maintained or corrected to comply with IEEE/ANSI standards.

Increase Continuous Current Rating

Changes to industrial and commercial facilities, such as increased manufacturing operations, will typically increase the demand for electrical power. Often, an increase in electrical demand can cause the load on a circuit to exceed the circuit breaker's continuous current rating. Eaton's factory qualified service engineers can inspect existing LV metal-enclosed switchgear, including the existing breaker cubicles, line and load primary stabs, load cables, and bus system to verify the application for a circuit breaker ampacity upgrade. Magnum DS circuit breakers are available with increased continuous current to satisfy most of these requirements.

Low Voltage Retrofill Benefits

- Aging cell components are replaced with a new Magnum DS cassette and secondary terminal blocks
- Old, high maintenance breakers are replaced with new Magnum DS circuit breakers.
- Spare parts and support are readily available
- Existing cabling and main bus structures are left undisturbed
- Down time and installation costs are drastically reduced compared to new switchgear.

Low Voltage Retrofill Offerings

- SPB circuit breakers
- Typical Metal frame 600V circuit breakers
- Pringle Switches / Bolted Pressure Switches

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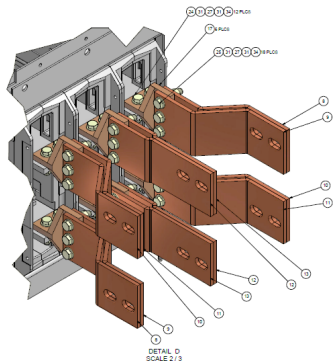
Initial Data Collection

A typical circuit breaker retrofill solution involves two site visits. The first visit is required to make a detailed drawing of the existing switchgear and to collect dimensional data to provide a fully engineered solution. This visit requires a bus outage on the gear being measured to create an electrically safe working environment. The final installation package will include the new circuit breaker and cassette, replacement bus, bus bracing, Magnum cassette mounting components, replacement doors, filler panels, and installation documentation. A typical outage for gathering information can range from 2-4 hours depending on the size and complexity of the retrofill.



Custom Design to fit Customer Switchgear

All retrofills are custom designed for the customer's switchgear and application. Eaton uses 3D software to engineer all components to ensure a precision fit for each specific switchgear lineup and minimize adjustments during installation.

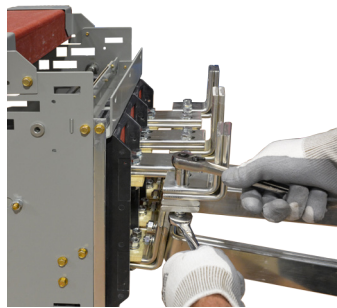


Design Evaluation & Certification to IEEE Standards

Design validation tests are performed on representative Retrofills for all frame sizes. This is done to confirm the capability and validate electrical performance of a particular frame size of a device to meet its prescribed ratings and to operate under service conditions as stated in the IEEE standards.

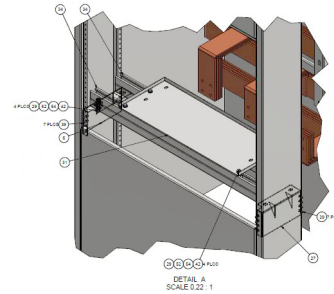
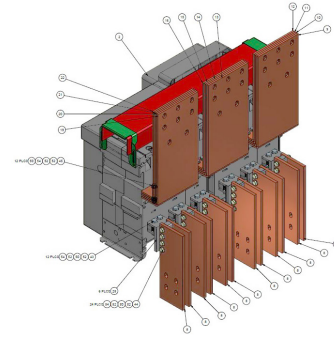
Production and Installation Preparation

The engineered solution is manufactured and delivered to the facility where the retrofills are being assembled. An Eaton representative conducts an inspection of all components to validate all parts have been made correctly to assemble and install the retrofill. Where possible, pre-assembly of portions of the design will be performed to expedite the final installation process.



Comprehensive Installation Plans and Design Package

All retrofill orders have a complete comprehensive installation plan and design package that is included with the order. This will aid in the installation of the equipment and give the customer a new set of prints for the device that has been installed.



Site Installation and Commissioning

The second visit is required to perform the installation of the new solution. This involves the removal of the existing device and primary/secondary cell disconnects. A new cassette is then bolted into the existing cubical. New bus and supports are provided to connect from the first bolted joint of the vertical risers in the rear of the switchgear to the cassette. Existing secondary wiring is then routed to the new terminal blocks. Finally, a new door is installed and the new circuit breaker is inserted into the cassette.

Arcflash Reduction Maintenance System

An optional 520MC Digitrip Unit can be added to the DS Magnum circuit breaker to modify trip level settings (determined and selected by a person who is experienced in power system analysis), reducing the effective level of arc flash for downstream devices.



Rotary Racking System

Rotary racking allows insertion and removal with the RPR-2 Remote Power Racking System.



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Printed in USA
Publication No. PA019008EN
October 2017