

Spending too much  
to maintain aging  
switchgear?

Circuit breaker  
solutions from  
Square D Services.



**SQUARE D**

by Schneider Electric

Spending too much time and money  
on equipment maintenance?



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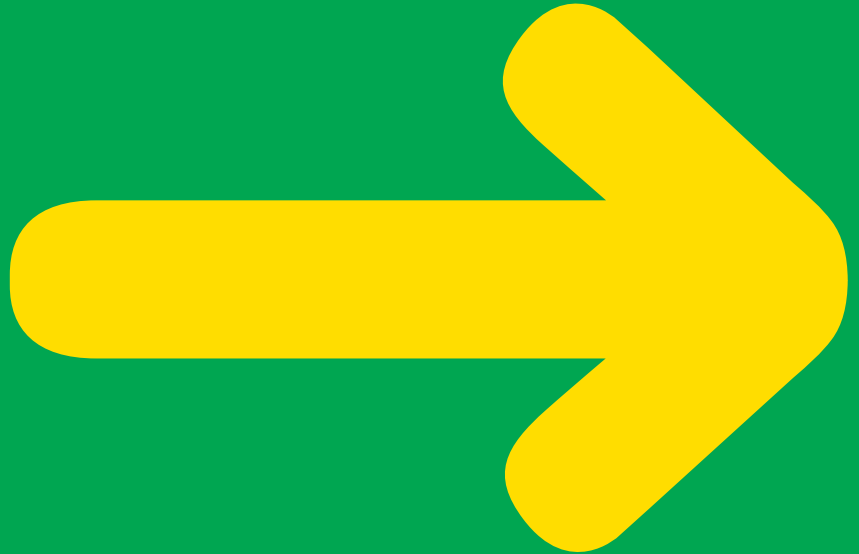


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Square D  
Service Solutions

Increase power system  
reliability and productivity

Lower lifecycle costs  
and equipment downtime



# Square D Services:

## Your source for circuit breaker excellence.

Square D Services brings together exceptional circuit breaker technology, engineering and installation expertise in complete solutions designed to minimize downtime, improve reliability and extend the life of your existing equipment.



### The heart of any industrial facility is its electrical distribution system

In an industrial facility, nothing operates without a reliable flow of electricity. Therefore, it is critical to properly maintain the switchgear that houses overcurrent protective devices, including circuit breakers, fuses or protective relays. However, even with annual maintenance there may be instances where repairs and/or upgrades are necessary. Factors to consider include the operating environment, the availability of spare parts, reliability and the cost of ongoing maintenance. Another consideration may be the need to increase the switchgear's fault or continuous current rating or the desire to upgrade technology.

As a result, facility managers are often faced with the choice of maintaining aging (or obsolete) equipment or replacing it with a new switchgear line-up to take advantage of current technology.

### Upgrade existing equipment

Square D Services offers two additional options that are cost-effective and will expand the capabilities of your electrical system with minimal downtime. Our direct replacement and retrofit solutions utilize the upgraded technology of our Masterpact® NT/NW insulated case circuit breaker for low voltage systems or the Magnum™ circuit breaker for medium voltage systems.

#### Masterpact NT/NW Low Voltage Circuit Breakers

These state-of-the-art circuit breakers provide solid state protection, reduce the potential for an arc flash event and do not require maintenance under normal operating conditions. Designs are available for most manufacturers' low voltage switchboards and switchgear.

#### Magnum Medium Voltage Circuit Breakers

Each Magnum circuit breaker is manufactured using totally new components including state-of-the-art vacuum or SF6 arc interruption technology. Designs are available in 5kV to 15kV for most manufacturers' switchgear.

The benefits of utilizing the existing switchgear structure include:

- An economical alternative to purchasing new equipment
- The footprint of the equipment line-up is not affected
- The downtime is minimized when compared with equipment demolition and replacement
- Cable damage, replacement or splicing is negated
- Upgrades can be performed on an incremental basis to meet budget constraints or outage opportunities

# The right solution for your application.

Two different upgrade solutions with the same end result: improved power system reliability and lower life cycle costs.



## Retrofit

The existing switchgear cell and bus are modified to accept the new circuit breaker.

**Low Voltage** - This solution provides a Masterpact cradle and circuit breaker, along with a new racking mechanism and primary and secondary connections in each switchgear cell. Existing cells are modified to accept the new cradle and circuit breaker, including a custom-engineered connection between the cradle and the switchgear line and load side bus. Custom designs are available for most brands of low voltage switchgear.

**Medium Voltage** - This solution upgrades switchgear by installing a new medium voltage circuit breaker and cell into an existing line-up. Necessary modifications—including an all-new racking mechanism, primary and secondary disconnects and customized connections—are made to the existing cell. Available designs include:

- Air-Magnetic to Vacuum or SF<sub>6</sub>
- Air-Blast to Vacuum or SF<sub>6</sub>
- OCB Switchgear to Vacuum or SF<sub>6</sub> Switchgear
- Convert Stationary Circuit Breaker to Draw-Out or Obsolete Air Circuit Breaker to Vacuum or SF<sub>6</sub>

## Direct Replacement

A new circuit breaker and adapter cradle fit into the existing cubicle with little-to-no cell modification, resulting in minimal downtime.

**Low Voltage** - A standard Masterpact cradle is installed into an adapter cradle to form one assembly, which is then installed into the switchgear cubicle. (This cradle-in-cradle assembly locks into place and will remain in the switchgear cell after the initial installation.) The new Masterpact circuit breaker racks in and out of the adapter cradle. A new door is installed, however cell interlocks, the racking mechanism and the switchgear structure are not modified. Designs are available for most manufacturers' switchgear.

**Medium Voltage** – The Magnum direct replacement circuit breaker will rack into the switchgear line-up and correctly interface with the existing compartment cell. The original racking mechanism, safety interlocks and the primary / secondary disconnects inherent in the original equipment design are maintained and the switchgear structure is not modified. Magnum medium voltage direct replacement circuit breakers are available for most manufacturers' switchgear.

# Why upgrade?



When considering whether to replace or upgrade your existing switchgear, there are a number of factors to consider. One which many people never think about is conduit placement.

Installing new switchgear (which is usually smaller than the older/obsolete equipment it is designed to replace) requires that existing conduit above and below the equipment be moved. This time consuming and expensive process is eliminated by upgrading existing equipment with solutions from Square D Services.

## Improved Reliability

- Dash-pot style or air break interrupting devices on existing circuit breakers may have reliability issues
  - Many do not trip at all
  - Those that trip are not repeatable and may be well outside the time-current coordination parameters
- Aging materials reduce equipment reliability
  - Dielectric breakdown of insulating components
  - Degradation of aging mechanical parts

## Increased Capabilities

- Fault current interruption
  - New circuit breakers are available with higher ratings
  - In most cases the interruption capacity of the entire switchgear can be increased with an engineering study and a circuit breaker upgrade or replacement
- Arc flash limiting circuit breaker availability
- Trip unit accuracy and repeatability
- Power metering, monitoring and communication

## Reduced Maintenance Costs

- Older power circuit breakers require periodic maintenance and overhaul, which is expensive and time consuming
  - Lengthens outages
  - May require outside support
- Many components for existing circuit breakers are no longer supported
  - New parts are no longer available
  - The quantity and quality of used or reconditioned parts is decreasing
  - Prices of used or reconditioned parts are increasing

Masterpact and Magnum replacement breakers for switchgear modernization are installed, tested and commissioned by factory-trained Square D Service technicians and are backed by a one-year warranty.



Magnum Replacement Circuit Breaker



Masterpact Replacement Circuit Breaker

# Masterpact NT/NW Low Voltage Direct Replacement Circuit Breakers

Masterpact NT/NW power circuit breakers are designed to help protect electrical systems from damage caused by overloads, short circuits and equipment ground faults. Providing the latest in breaker technology, Masterpact circuit breakers feature high ampere interrupting and short-time current ratings, Modbus® communication protocol and field-installable devices, including sensor plugs and accessories.

Masterpact circuit breakers do not require maintenance under normal operating conditions. Completely modular in design, all replaceable parts can be installed with hand tools and require no critical adjustments.



Micrologic Trip Units

## Additional features include:

- Drawout breakers with three racking positions and status indicator on cradle
- High ampere interrupting rating (AIR)
- High short-time current rating
- Drawout or fixed mount, 3- or 4-pole construction
- Integral ground-fault protection for equipment
- Protective relaying functions
- Zone-selective interlocking (ZSI), which can reduce damage in the event of a fault
- Field-installable accessories
- Meets the requirements of UL 489, UL 1066, ANSI, IEC 60947-2 and CE Mark standards

## Benefits include:

- Reduced maintenance requirements; no lubrication or adjustments required
- Shutters are provided, potentially reducing PPE required to remove breakers

## MicroLogic® Trip Units: Protection and Communications

For “smarter breakers”, a complete line of Micrologic trip units are available for use with Masterpact circuit breakers. These trip units provide



Standard Masterpact designs are available for most manufacturers' low voltage switchgear for direct replacement or retrofill applications.

- Fused for short-circuit protection
- Choice of Micrologic solid state trip unit devices for overload protection

Micrologic trip units provide three levels of protection combined with three levels of functionality: Current (type A), Power (type P) and Harmonics (type H).

Functions include:

- Load protection
- Power measurement
- Power monitoring
- Maintenance monitoring

TRIP UNIT FEATURES	TRIP UNIT TYPES			
	Basic	A	P	H
Open and close the circuit breaker		■	■	■
Circuit breaker position and status: – Open / Tripped / Closed / Connected / Test / Disconnected		■	■	■
Display all measurements and settings		■	■	■
View current and voltage waveforms				■
Fine settings			■	■
Read all logged data			■	■
Maintenance record				■

# Magnum Medium Voltage Direct Replacement Circuit Breakers

## Reduced Costs for Equipment Upgrades

- New circuit breakers installed in existing switchgear
- Available in 5kV to 15kV versions
- Utilizes new vacuum and SF6 arc interruption
- Upgraded MVA ratings are available
- Installation expense is a fraction of new equipment costs
- Reduced maintenance and operating costs

## Less Down Time for Installation

- Rolls into the existing cell with little-to-no modifications
  - A bus outage may not even be required
- Complete factory testing backed by standard equipment warranty
- Installation overseen by trained technician

## Enhanced Equipment Reliability

- Designed to meet ANSI/IEEE C37.59 standards
- Manufactured with all new components
- High dielectric strength, moisture resistance, primary insulation
- Nuclear certification available



## Available for Most Manufacturer's Equipment

- General Electric
- Allis-Chalmers and Siemens/Allis
- Westinghouse and Cutler-Hammer
- ITE/ABB
- McGraw Edison
- FPE
- Square D



The Magnum operating mechanism is simple to inspect and maintain.





## Why Choose Square D Services?

Square D Services from Schneider Electric, offers a broad range of service solutions to support any manufacturers' electrical distribution equipment. Whether the solution is refurbishment, replacement, maintenance or recommendations to optimize your existing system, our nationwide network of qualified experts offers a complete service package.

For more information call 1-888-SQUARED or visit us online at [www.SquareD-Services.com](http://www.SquareD-Services.com)

## Emergency Services & Disaster Recovery

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24 hours/day • 7 days/week

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