



# Aftermarket Solutions Products and Services

Providing the best Aftermarket Customer Solutions for existing electrical distribution systems, utilizing ABB technology and safety advancements.





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# Aftermarket Solutions

## ABB Electrification Industrial Solutions

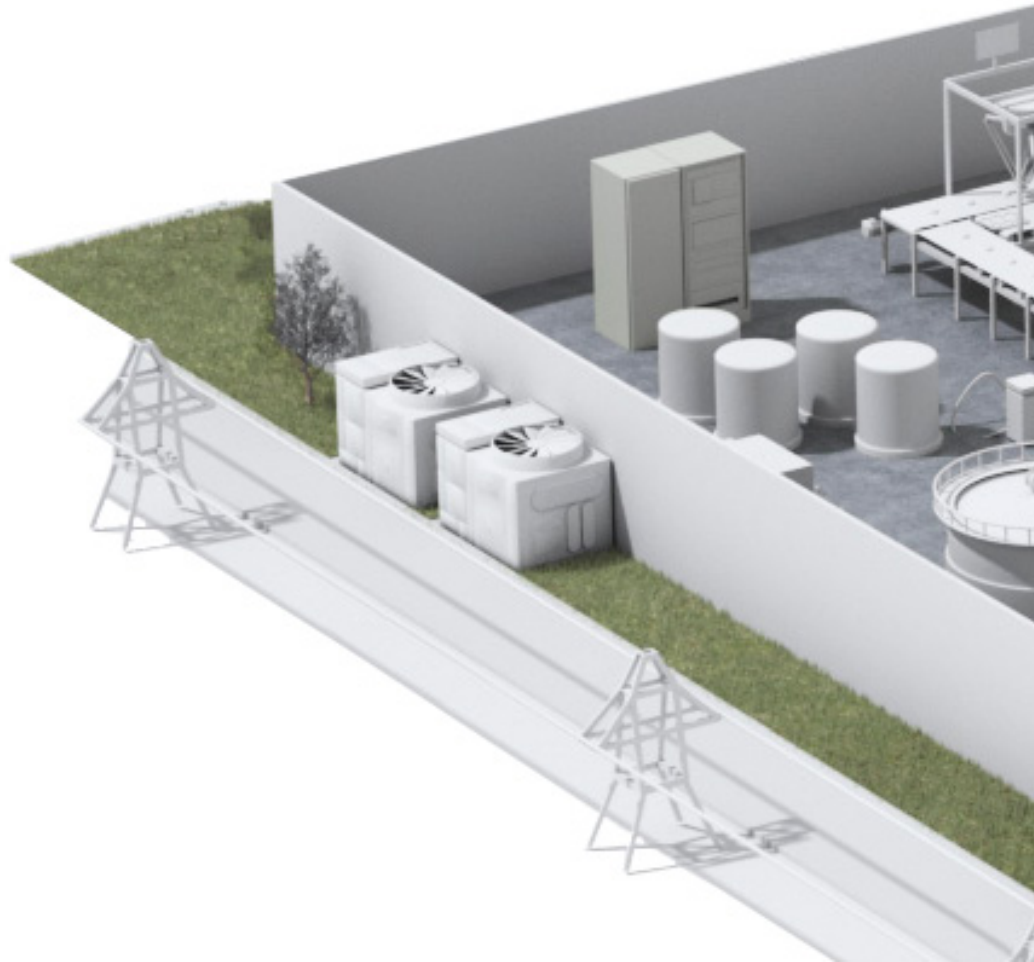
Our North American Aftermarket Team is dedicated to supporting customers through the latest innovations and services, while relying on our extensive GE legacy product knowledge. Our experienced team manages your projects to make sure commitments are met and plant uptime is maximized.

We work with you to extend the life and usefulness of your equipment, and to preserve your equipment investment.

Our support team is backed by complete web based product literature, product and services training, and Extended Warranty Programs and Long Term Service Agreements.

We strive to offer the best solutions for existing electrical distribution systems. That's why our Aftermarket Solutions are the first choice by customers based on the quality of our products and services.

We deliver Aftermarket Solutions that employ the latest technology, while keeping safety as the central concern. Whether you need product upgrades and modifications, safety enhancements, or obsolete equipment re-engineering, we have solutions for your switchgear, switchboards, motor control centers, busway, panelboards, breakers, and more.

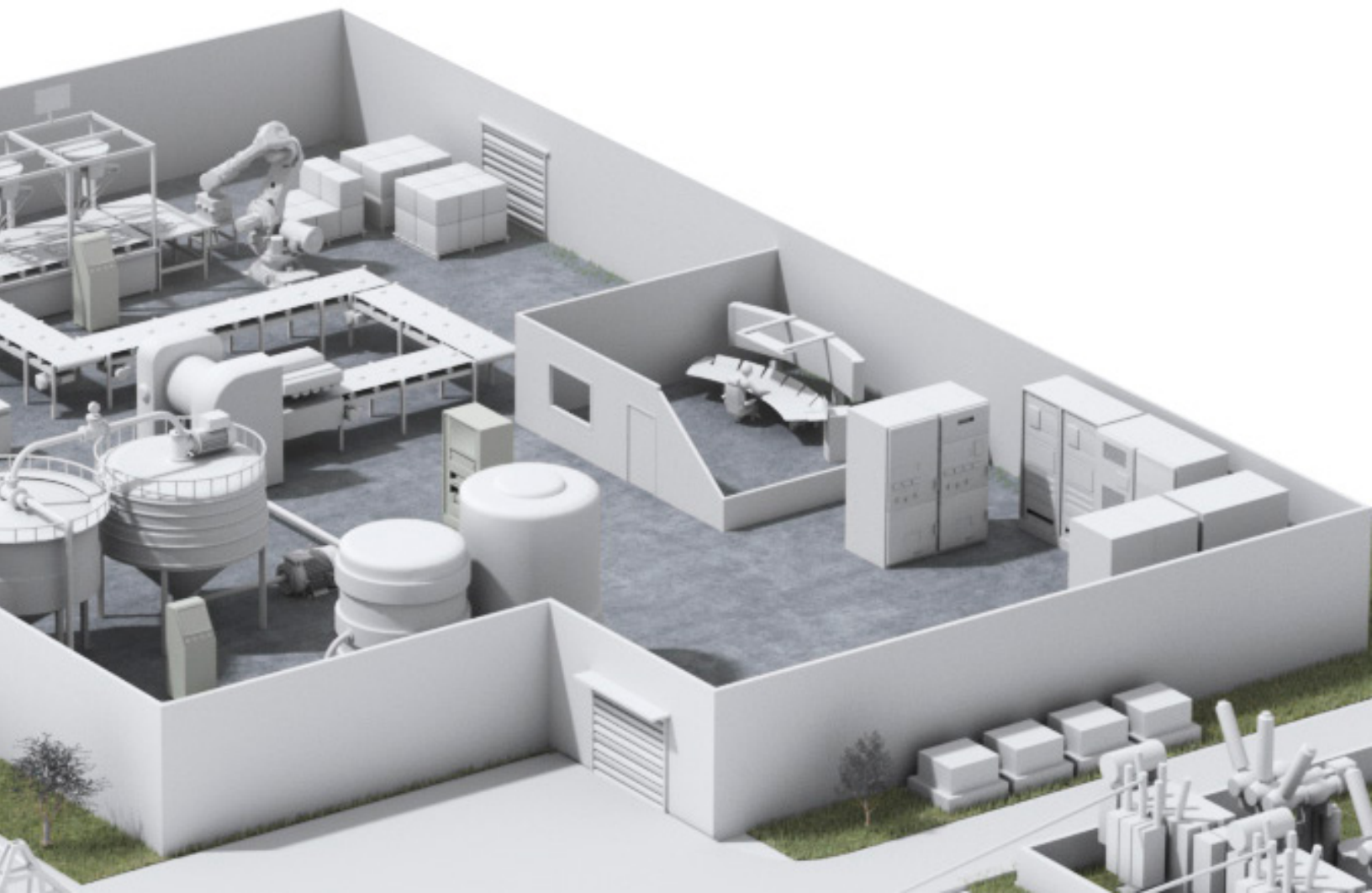


## Experts in a wide array of equipment

Today, our applications for this energy resource are nearly endless. Our deep portfolio of electrical components, systems, and services speaks to the lasting necessity of the industry we helped to invent.

ABB remains at the forefront of innovation to safety and power system optimization. Our trusted services and expertise can help keep your plant and people safe and productive.

Any weakness in the electrical distribution system can quickly cause injuries, damaged gear, or disrupt your business. ABB technicians will be on-site to ensure optimal design, code compliance, and risk reduction throughout the facility.



# Product Portfolio

Life cycle services for extended life-time and improved performance



## Installation and commissioning

A great investment in long-term trouble-free equipment operation.



## Training & Safety

The best way to ensure user staff has the needed skills.



## Spares and consumables

All original and genuine spare parts, upgrade kits and service boxes.



## Maintenance

Preventive, risk-based and predictive maintenance services to keep running the production.



## Repairs

Workshop and on site repairs by our service engineers to get equipment ready to restart as soon as possible.



## Engineering and Consulting

Product application recommendations, customized switchgear solutions, health and environmental best practices.

## Extensions, Upgrades and Retrofits

Safety upgrades

- Achieve maximum safety integrating arc fault protection systems (TVCO2) and remote breakers racking solutions (RRD).

Breaker retrofits

- Replacement of any old circuit breaker with modern equipment (in Direct Replacement, Cradle in Cradle and Hard Bus Retrofill solutions).

Relay upgrades

- Integration of advanced protection and communications capabilities with full functions compatibility (Ekip UP)



## End of life services

In line with satisfy environmental requirements, ABB takes care of the proper disposal and recycling of installed or returned parts.



## Replacements

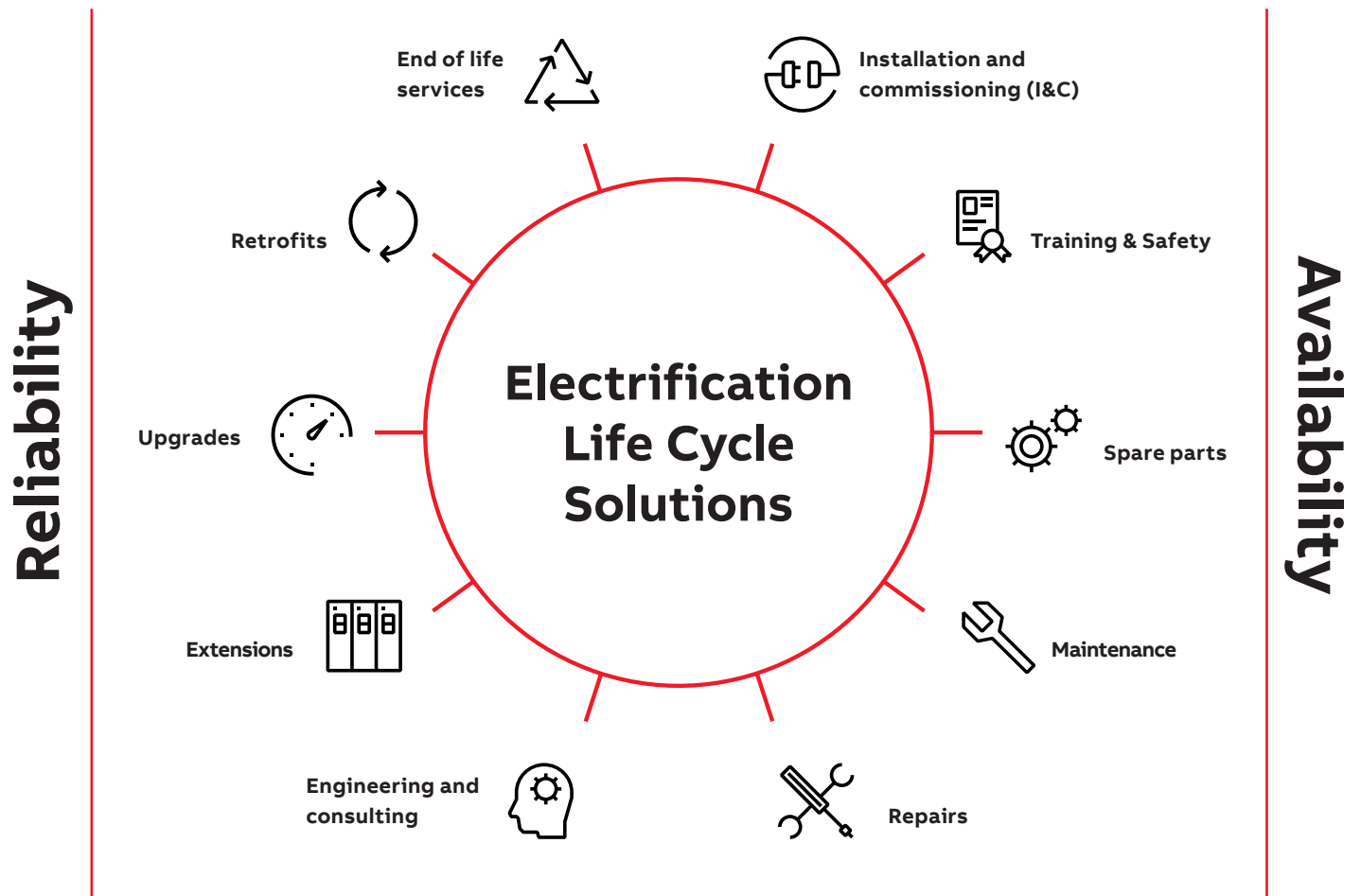
Replacing older equipment can dramatically increase performance and reduce costs.

# Services for Electrification

Service offerings to support the entire asset lifecycle

We offer full support and life cycle services from start to finish of Low voltage and Medium voltage switchgears, motor control centers and relays.

## Safety





# Life Cycle Services

ABB's products are designed for continuous evolution. It is ABB's goal to protect our customers' investment beyond the life cycles of the underlying platform products.

## 1. 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 life time (Active, Classic and Limited stages)

## 2. Classic

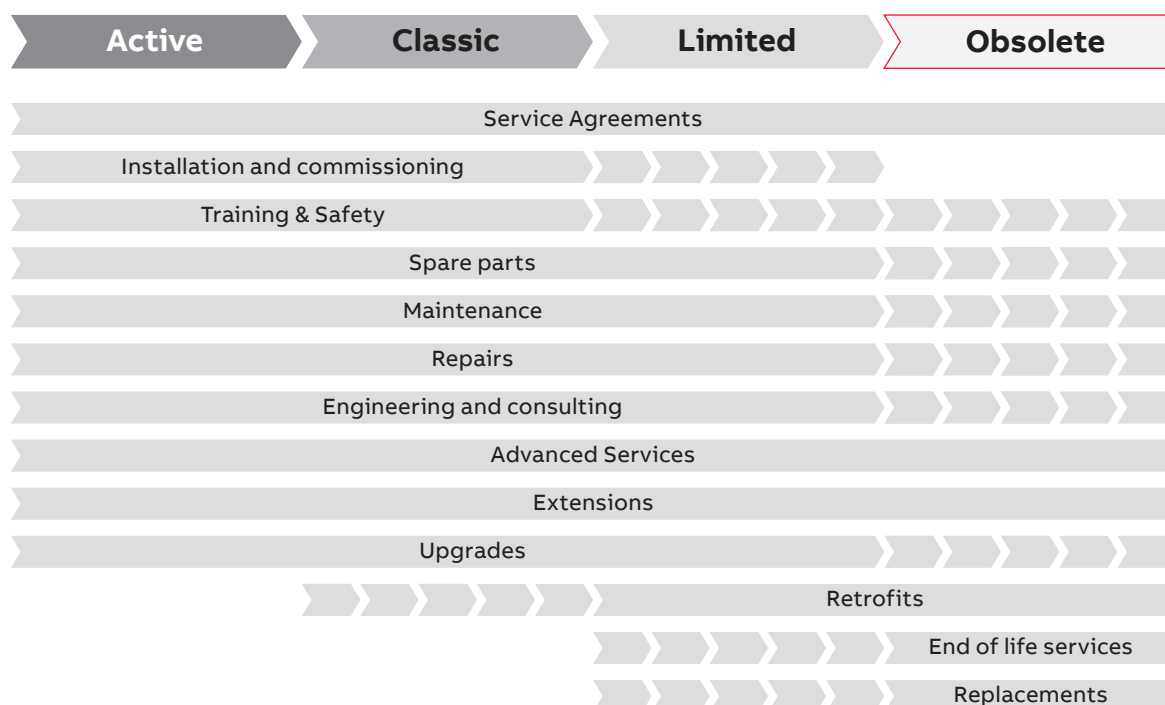
- "Last Buy" opportunity of complete equipment
- Good chance to obtain spare parts as per active products conditions
- Best time to keep equipment healthy via Power Care customer support agreements
- Call for training with wide coverage thanks to worldwide footprint still available.

## 3. 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

## 4. 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.





# Arc Flash Solutions

Leverage our unique domain expertise to evaluate and provide custom solutions

## Overview

Getting a new or updated arc flash study is just the first step in taking a system- wide approach to making sure your maintenance personnel stay safe while minimizing potential equipment damage and down time should an arc incident occur. ABB offers multiple solutions designed to fit your facility's specific needs and within your budget.

An ABB study and resulting report provides customers with remediation recommendations needed to upgrade and maintain their power delivery infrastructure with the results focused on reducing operating costs, improving efficiency, increasing reliability and improving system maintainability.

## Features

- Trained and certified Power Systems Engineers to evaluate your system
- Engineers specifically trained to incorporate the latest NFPA70E & IEEE 1584 Standards
- Data collection and one-line development support
- Standardized reports in your preferred software (EasyPower, SKM, ETAP) to show areas of high incident energy exposure
- Custom recommendations that help prioritize incident energy lowering solutions that fit your outage windows and budgets
- Site specific training to help your electrical workers understand how to interpret and apply study results

## Benefits

- Improves employee safety against electrical arcs
- Calculates IEEE incident energy values and arc-flash boundaries
- Addresses arc-flash issues within NFPA 70E
- Provides required field marking through detailed warning labels to communicate
  - IEEE incident energy
  - IEEE arc flash boundary
- ABB employs only proven data collection methods, detailed calculations and thorough software-based analysis to identify the calculated incident energy and arc-flash boundary for each potential hazard.

## Other System Studies Capabilities

- Short Circuit Study
- Load Flow and Power Factor Study
- Protective Device Coordination Study
- Harmonic Analysis
- Conceptual Design Study
- Motor Starting Study
- Impact Load Study
- Power System Automation Study
- Diagnostic Study



# Repair Services

ABB Service Centers feature on-site and in-shop service for motor, switchgear and mechanical repairs offering a total repair solution.

## Motor Services

- All manufacturers—all sizes
- DC and AC motors
- On-site and in-shop capabilities
- Electrical and mechanical testing
- Basic overhaul—clean and inspect
- Complete rewinds and insulation system upgrades
- Analysis - failure, vibration, and infrared
- Laser alignment
- VPI (Vacuum pressure impregnation)
- Digital diagnostic management solutions
- Replacement parts
- Load testing
- Star punched rotor rewinds
- Equipment management programs
- Motor health monitoring

## Switchgear Services

- All manufacturers
- On-site and in-shop capabilities
- All voltage classes
- DOBLE power factor testing
- Loaner circuit breakers
- Phase loss protection installations
- Low Voltage Micro Versa Trip Plus\*
- Solid state conversions
- Limitamp\* motor starter maintenance and vacuum conversions
- Power management system retrofits
- Diagnostic testing and evaluation
- Total substation maintenance
- Trip curve certification
- Ground fault testing and certification

## Mechanical Services

- On-site machine capabilities
- Refiners for paper mills
- Compressors
- Centrifuges
  - Centrifugal and vertical
- Pumps
  - Vertical, centrifugal, and boiler feed
- Crushers and excavators
- Blowers
- Screwpresses, feeders, and fans
- Gears and gearboxes
- Babbitt bearings
- Low-speed balancing
- Optical alignment
- Welding and machining
- Nondestructive testing
- Process machine rebuilding
- Component re-manufacturing and upgrade



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# Transformer Field Services

Experienced and highly skilled transformer repair personnel committed to delivering a suite of technologies that pinpoint problems with the highest degree of timeliness and accuracy to ensure that service is restored with minimal disruption to our customers.

## Fluid

- Transformer Dielectric Fluid Sampling and Diagnostic Analysis Services
- Transformer Vacuum Filling Services
- Retrofills
- Fluid Processing, including Dehydration, Degasification and Full Reclamation including Fullers Earth or Clay Reactivation
  - Mineral Oil
  - Special Fluids including Silicone, FR3, Alpha, Beta
  - Energized Processing on Qualified Transformers

## Repair Services

- LTC Inspection, Repairs and Upgrades
- Minor or Major Leak Repair
- Component Replacement – Bushings Coolers, Radiators, Gauges, Pumps, Fans, Air Cells
- Internal Inspections
- Regasketing
- Full Service Turnkey Installations. Relocation, Transportation, and Rigging
- Installation of Gas Monitoring and Intelligent Devices – Kelman, Hydran, 509, TMI

## Electrical Testing Service

- Full Electrical Testing
  - Acceptance/Routine Electrical Testing
  - Diagnostic Electrical Testing
  - SFRA Testing/Leakage Reactance/DFR
  - Portable Loss/Heat Run Testing
  - Portable Induced Testing
  - Portable Impulse Testing



## Support Services

- Fluid and Electrical Test Report Analysis with Recommendations
- Engineering Consultation and Analysis Diagnostic
- Packaged Substation Services - Crew and processing equipment under your direction for 30, 60, or 90-day periods
- On-site Project Management

# Retrofitting Kit Solutions

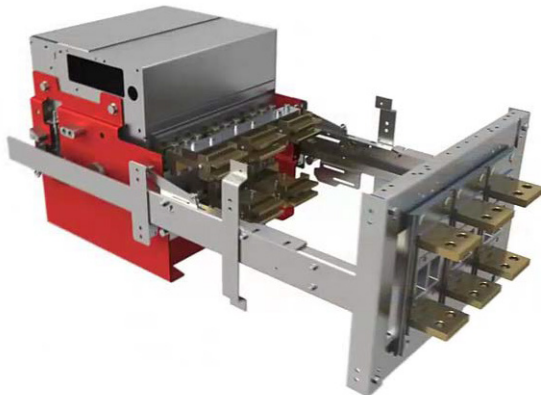
ABB knows how to upgrade your installations



## Hard Bus Retrofill (HBRF)

The simplest solution where the existing fixed part is removed from the switchboard and the new one is installed using a pre-designed bus bar connection and protection shields.

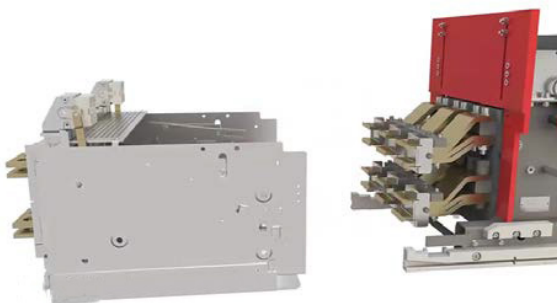
Other OEMs — GE, AEG, Schneider, Siemens, Terasaki, Mitsubishi



## Direct Replacement (DR)

The moving part of the new circuit breaker has to be modified to simulate the moving part of the old circuit breaker. It requires a very short shutdown.

Other OEMs — Schneider, MastepactM (under development)



## Cradle in Cradle (CiC)

The fixed part of the new circuit breaker is modified to be inserted in the old fixed part.

Other OEMs — GE, Federal Pacific, Allis Chalmers



# Low Voltage Retrofit Solutions

ABB offers several solutions to modernize and extend the life of your Low Voltage switchgear. We have solutions to update low voltage circuit breakers and trip units for several manufacturers.

ENTELIGUARD  
TRIP UNITTRIP UNIT  
TOOLKIT

EMAX 2

EKIP UP

POWER BREAK\*I  
(PBI) TO  
POWER BREAK II  
(PBII) RETROFILLSNEW HIGH PRESSURE  
CONTACT  
FUSIBLE SWITCH

# EntelliGuard\* R Retrofills

EntelliGuard R Retrofill provides a streamlined solution to update your legacy circuit breakers with a new EntelliGuard G style breaker, to give your existing switchgear a new lease on life.

01 EntelliGuard R Retrofill

## Overview

The EntelliGuard R offers a means to increase reliability and enhance the protection of your existing electrical system. In addition to providing a host of new features, the EntelliGuard R Retrofill solution includes the EntelliGuard TU Trip Unit for both arc flash protection and selectivity at the same time.

## Features

- Remote racking using the standard EntelliGuard G racking device
- Trip unit and all indicators visible through the door
- Through-the-door racking
- Single finger cluster design
- Easy field wiring of Retrofill with ABB provided AS-IS drawings
- Pre-punched doors available with or without holes for pilot lights and RELT switch for all stack widths
- AK Retrofills utilize the EntelliGuard G lifting bar
- Increases short circuit rating on AK25 and
- AKR30S while maintaining UL approval

## Benefits

The EntelliGuard R Retrofill can provide savings right from the start because it makes the most of your existing equipment. Since it is 100% interchangeable with ABB breakers it provides:

- Minimized exposure to arc flash or electrical shock
- Less heat generation and a solid, reliable connection when compared to designs with finger clusters on both the cassette and breaker
- Lower maintenance breaker due to high quality modern mechanism
- Lessened exposure to electrical shock or arc flash
- Minimized shut down time during replacement because of little to no cubicle modifications
- Interfacing with the original cubicle secondary disconnects, position switches, and neutral disconnects
- Compatibility with shutters in existing breaker cubicles
- Secondary disconnect wiring connection with no modifications to your switchgear

Available for ABB and non-ABB equipment

Visit the following link for additional options for your low voltage breaker replacements and upgrades or use the QR code below:

<https://new.abb.com/low-voltage/service/service-breakers-switches/extension-upgrades-and-retrofits/selector>



# EntelliGuard Trip Unit

The EntelliGuard TU trip unit provides the industry's most advanced instantaneous protection without compromising system selectivity.

—  
01 EntelliGuard  
TU trip unit

## Overview

EntelliGuard TU Trip Unit has been designed to be plug and play compatible with previous generation trip units, MicroVersaTrip, MicroVersaTrip RMS-9, EPIC, MicroVersaTrip Plus, MicroVersaTrip PM, Power+ and ProTrip.

The EntelliGuard TU Trip Unit is an electronic device that interfaces with a circuit breaker. It monitors current and/or voltage and trips the breaker in the event of an over-current or voltage related condition. It also provides protective relay functions, advanced metering, diagnostic features, and communications. A User Interface is provided on the front panel to allow adjustment of the Trip Unit's parameters. In addition to trip unit upgrades, conversion kits are offered to upgrade ANSI type legacy breakers.

Electronic trip units are normally supplied factory fitted. However spares are available that plug into the breaker, automatically read the main breaker data and adjust themselves automatically to the breaker type.



This option can be used to allow field replacement or upgrades of existing trip units OR can allow the user to acquire breakers in kit form and customize them locally.

## Reliable and Safe

- Circuit breakers maintain UL listing after conversion
- Mechanical rejection and per-frame settings limits guarantee failsafe protection
- Positive maintenance status indication/test and ZSI testing capability

## Selectivity

- ArcWatch = Safety and Selectivity at the same time
- Instantaneous and Threshold ZSI allows for full selectivity and arc flash protection simultaneously
- Multiple LT curve shapes, broad setting and delay range, flexibility for every protection need

## Installation

- Replacing just the trip unit allows for a significant reduction in installation time
- Windows®-based software allows for quick setting, troubleshooting and testing
- Integral RELT can be activated either by using a 24V signal or Modbus communication
- Mechanism timing is provided standard on all models

## Simplicity - Our Plug & Play Universal Trip Unit

- Just 1-3 catalog numbers can cover an entire switchgear line-up or replace ANY AKR or WavePro in a facility
- 10 catalog numbers can cover all GE trip units launched since 1981!
- Shipping in one day from factory



# Trip Unit Toolkit

Instantaneous – Zone Selective Interlocking (I-ZSI) EntelliGuard trip units allow multiple layers of large circuit breakers to operate as a system.

## Overview

Trip Unit Toolkit is a powerful software package that enables users to manage, monitor and test parameters present in the ABB range of EntelliGuard, PremEon and microEntelliGuard trip units. It supports the full ABB Industrial Circuit Breaker Portfolio: EntelliGuard and Power Break II, GuardEon, Record Plus, Spectra.

Trip Unit Toolkit is a free PC application which is capable to view metering, breaker status, event log, waveform capture, to update trip unit settings, digitally test and many more useful features.

Trip Unit Manager Gateway enables users to monitor their breaker line-up in a safe and effective way up to 10 breakers. It is compatible with GTU types: GACB, GTU-C and GTU-D.

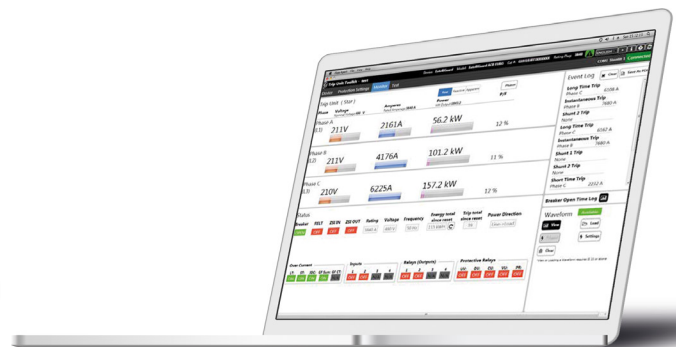
## Features

- Manage, monitor, test in one software
- Available both on PC and mobile device platform
- Plug & play connection with the equipment
- Compatible with the full portfolio of ABB Low Voltage Circuit Breakers

## Benefits

Keeping in mind, making the process easier and more convenient when it comes to configuration and daily operation of your breaker line-up, ABB has developed Trip Unit Toolkit, the powerful software package which:

- Enables you to use one simple application for everything
- Eases the way of making general settings even offline
- Supports predictive maintenance thanks to tracking and providing critical predictive analytics
- Enhances safety as the software is capable of creating a sequence to let your operators run multiple tests remotely
- Free Download



# SACE Emax 2

The power needed, when needed.

## Overview

Emax 2 all-in-one is the first circuit breaker that matches new grid requirements. It enables a direct communication to the new energy management cloud-computing platform ABB Ability™ Electrical Distribution Control System. Smart and plug and play architecture makes Emax 2 all-in-one easy to use. Leveraging also unmatched electrical performances, Emax 2 sets a new circuit-breaker benchmark for the needs of today and tomorrow.

## Efficiency and control

Managing loads in any condition is now possible thanks to Advanced Functionalities such as Adaptive load shedding, Predictive load shedding, Power Controller, Embedded ATS, Synchro-reclosing, Adaptive protection, Interface protection system and Interface Device.

## Connectivity

Complete integration into smart grids, buildings and industrial plants is possible. Up to 30% time savings for wiring connections.

## Performance

Four sizes are available. Compact dimensions and high performance. Up to a 25% cost savings in both footprint and copper.

## Ease of use and safety

Productivity is increased while all stages, from design to daily operations, are simplified. Up to 15% time savings for terminal connection installation. Unique alarm tracking and network analyzer for the best continuity of service.



Frame	E1.2	E2.2	E4.2	E6.2
<b>Max Amp Rating</b>	1200A	2000A	3600A*	6000A**
<b>Max kA @ 508VAC</b>	65kA		100kA	
<b>Max Icw @ 508VAC</b>	50kA	85kA		100kA

\* 3600A is available in fixed version only

\*\* Availability Q1 2019

# Ekip UP Trip Unit

Ekip UP is the new digital unit, part of ABB Ability™ portfolio, which upgrades low voltage systems transforming them into the next-generation electrical distribution plants.

01 Ekip UP

## Overview

Ekip UP is the low-voltage digital unit able to monitor, protect and control the next generation of plants. Thanks to the built-in software-based function, Ekip UP is the unit that digitalizes the plant performance. Sharing all the electronics solutions of “all-in-one” platform, Ekip UP completes the ecosystem to fit all the market opportunities.

The result is a unit suitable for all the different applications including all the needed functionalities without the need of additional external devices.

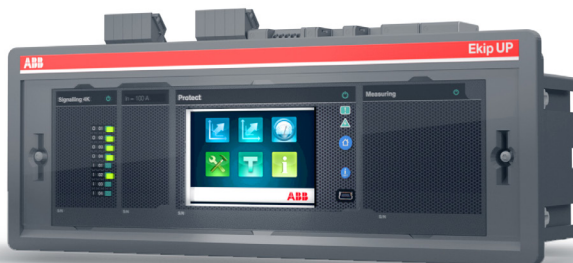
## Features

- Monitor
  - Measurement capability of main energy parameters
  - Network analyzer to evaluate the power quality.
  - Datalogger based on event triggers for fast fault diagnosis.
  - Connectivity for system integration up to 8 field-bus protocols, plus a property bus for power automation applications that require advanced cyber-security.

- Embedded gateway that ensures power understanding by cloud-based energy management system.
- Protect
  - Distribution protection based on current and voltage measurement
  - Generator protection and interface protection systems
  - Adaptive threshold according to grid topology
  - Digital selectivity for resource coordination
  - Load shedding algorithms to prevent blackouts.
  - Programmable logics to manage transferswitching operations and maximize service continuity
  - Synchronization function of different power sources inside.
- Control
  - Power management systems to optimize plant resources and enable Demand Response applications.

## Benefits

- UP-date old facility with the latest innovation in the fastest way
- UP-grade plant and get more functionalities in order to cover all the opportunities
- UP-load measures and enable true energy management function
- Maximize UP-time thanks to easy commissioning without impact on switchboard design.



# Power Break\* I (PBI) to Power Break II (PBII) Retrofills

Instantaneous – Zone Selective Interlocking (I-ZSI) EntelliGuard trip units allow multiple layers of large circuit breakers to operate as a system.

—  
01 Power Break II  
(PBII) Retrofills  
—  
02 Power Break\* I (PBI)

## Overview

In response to customer requests, ABB introduced PBII engineered solutions for the complete retrofit of both draw-out and fixed-mounted PBI circuit breakers that is effective and minimizes related customer downtime. Our offering includes application and design engineering services, state-of-the-art equipment with UL and cUL certification, and field engineering support of the installation work.

To learn more about Trip Unit Toolkit, the powerful software package available for Power Break Trip Units, please check Digital services chapter.

## Features

- Compact, lightweight design
- Optional mechanical counter
- Padlock device standard
- Easy-to-reach ON/OFF buttons
- Padlockable door for added security

- Drop-in shunt trip, undervoltage release, and bell alarm (with and without manual lockout) modules
- Flush-mounted pump handle
- Choice of trip units, field upgradeable to EntelliGuard Trip Unit
- UL and CSA Listed
- IEC 947-2 Certified

## Benefits

This offering enables customers to retrofit their existing PBI circuit breakers with ABB's next generation of circuit breakers, PBII models, that have upgraded features and functions, ABB's solution provides:

- OEM knowledge and familiarity with Power Break products
- Minimal downtime for retrofit work to be completed



# New High Pressure Contact Fusible Switch

Based on the Power Break II platform, ABB's new High Pressure Contact Fusible Switch provides a more reliable and user-friendly operation up to 4000 Amps.

—  
01 Current HPC  
—  
02 New HPC

## Overview

With the electronic control unit equipped in the new HPC an extended range of options are available like Instantaneous and Zone-Selective Interlocking, Ground fault alarm, Metering, Communication or RELT. These features allow facilities to instantly increase personnel safety. To ensure convenient usage new HPC is also developed to have an improved interface. All of the Power Break II accessories are available for HPC as well like motor operation, bell alarm, remote closing system etc.

To learn more about Trip Unit Toolkit, the powerful software package available for HPC control units, please check Digital services chapter.

## Features

- Equipped with an electronic control unit
- GF via EntelliGuard control unit with phase CT's Electrical and mechanical operation
- Standard Padlock (same as PBII), Standard interlock
- Kirk Key Interlock
- Hidden "ON", Pushbutton Covers
- Modernized look and feel

## Benefits

As a result of a conscious user-centered development, ABB's new HPC switch provides a state-of-the-art solution for today's latest requirements:

- Simplifies operation thanks to the electronic control unit with its broad options of communication, metering, relays etc.
- Eases maintenance as it has the same foot print and bus connections as current HPC
- Provides a more extensive solution for customization thanks to its extended range of accessories (fully compatible with PBII)
- Brings the feeling of using a cutting-edge technology thanks to its modernized look and improved interface.



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01



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02

# Medium Voltage Retrofit Solutions

ABB has a reliable medium-voltage portfolio that helps protect and control electrical equipment in commercial, industrial and utility applications worldwide. From original equipment manufacturing to retrofits and new infrastructure builds, our MV portfolio delivers solutions.

LIS (LOAD  
INTERRUPTER  
SWITCH) RETROFITS

LIMITAMP  
CONVERSION KIT

RELAY UPGRADES

UFES - SWITCHGEAR  
UPGRADES FOR  
RAPID ARC FAULT  
EXTINGUISHING





# Roll-in Replacement for Medium Voltage Breakers

ABB incorporates proven technologies for medium voltage roll-in replacement circuit breakers, such as vacuum interrupters and operating mechanisms.

## Overview

Based on long-time experience and know-how, ABB developed roll-in replacement retrofit solutions specially tailored to most existing limited and obsolete, floor rolling, medium voltage circuit breakers that were produced by ABB and other manufacturers. As a result, ABB can offer the opportunity to eliminate outdated air magnetic technology through the use of the latest vacuum interrupting technology. The result is a significant improvement in reliability, safety, maintenance and performance.

## Features

ABB roll-in replacement solutions for technical outdated switching technologies are equipped with the state-of-the-art ABB vacuum circuit breaker, valued for outstanding quality and reliability.

- Equipped with embedded poles that guarantee process stability and quality
- Embedded poles provide optimum protection for the vacuum interrupter from moisture, dust and external damage
- Low maintenance magnetic operating mechanism or modular spring stored energy operating mechanism available

## Enhanced Safety and Reliability

- Designed, built and tested according to latest applicable ANSI standards
- Circuit breakers are type tested and each breaker undergoes full production testing
- Tested in a switchgear cell to ensure integrity and fit

## Customization

All ABB roll-in replacement solutions are customized. This guarantees that the bushings and truck of the retrofit solution match the existing panel on the customer site and that only a short downtime for the exchange will be required.

- Built with all new parts
- Modification of the existing circuit breaker switchgear compartment is not typically necessary
- Switchgear interlocking safeguards



Visit the following link for additional options for your medium voltage breaker replacements and upgrades or use the QR code on the left:

<https://new.abb.com/medium-voltage/service/extension-upgrades-and-retrofits>



# Medium Voltage LIS (Load Interrupter Switch) Retrofits

ABB's Medium Voltage LIS Retrofit solution provides reduced Arc Flash incident energy levels for customers on their existing MV equipment.

—  
01 Medium Voltage  
LIS (Load Interrupter  
Switch) Retrofits

## Overview

This new solution retrofits a fixed mounted vacuum circuit breaker (VCB) into the fused compartment of LIS. Operating in three cycles, the fast-acting VCB is superior to fuses and offers a new Arc Flash mitigating solution designed in response to Arc Flash Safety Standards. The circuit breaker is a three-phase AC breaker with 17.5kV rated voltage, especially suited for conditions that require frequent operation. In addition, the MV LIS Retrofit can use customer specified relays.

This solution can be purchase as a new unit or as a field retrofit for GE Load Interrupter Switches. With pre-outage measurements and verification, ABB can also provide retrofits to other manufacturer's Load Interrupter Switches.

## Features

- Relay options for upstream and/or downstream communications
- Retrofitting into your existing LIS enclosure  
Separate low voltage door

## Benefits

The Medium Voltage LIS Retrofit solution delivers the safety and flexibility for your existing equipment, offering

- Reduced Arc Flash levels from the transformer down to the LV system
- Transformer protection via the latest relay technology (bus and transformer differential protection)
- Added transformer protection via an optional snubber application
- Minimal downtime for installation and commissioning (approx. 8-12 hours)
- Added reliability and quality of an IEEE-rated, fast-acting, 3-cycle Vacuum Circuit Breaker with embedded pole technology
- Access to breaker operation without the need to open the high voltage compartment



# Limitamp Conversion Kit

Limitamp Vacuum Contactors are designed to provide long, trouble-free service with only a minimal amount of maintenance. At the same time, this new generation of contactors makes the system dramatically safer for workers, reducing arc flash energy

—  
01 Limitamp  
Control Section  
—  
02 Vacuum Limitamp  
Contactor replacement

## Overview

Upgrades from original air break main contactors to vacuum interrupters are available either as complete roll-out/roll-in replacements, or as conversions completed by factory authorized service organizations.

## Features

- Fully interchangeable with air break contactors
- No replaceable arc vanes and arcing horns to maintain
- Uses same clip and bolted fuses as air break contactors

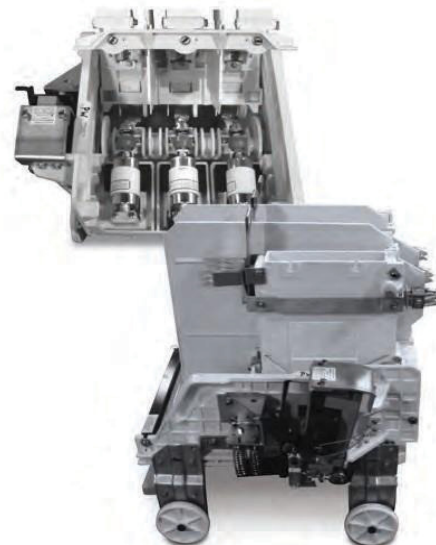
- Interrupters use low chopping current materials
- Latch contactors available from factory (no field conversion)
- Designed and tested to meet UL374 & NEMA
- ICS-3 Part 2
- CSA certified

## Benefits

- Quiet operation due to use of DC coils
- Long life with minimal maintenance
- Contained arc during interruption, even when interrupter fail to interrupt
- Fast and simple inspection of vacuum interrupter tip wear



—  
01



—  
02

# Relay Upgrades & Replacements

Relay upgrades are a cost-effective beginning to plant modernization, network communications and integration of new communication protocols like IEC 61850.

—  
01 Original electro-mechanical relays  
—  
02 New consolidated Digital relay upgrade

## Overview

Our service team has experience in relay and panel conversions using ABB Relion®, GE Multilin™ and other relay brands. A migration from older electromechanical and early digital relays to current technology digital relays can give your maintenance and reliability teams improved visibility and control of your plant equipment.

## ABB Relion® Features

- DNP 3.0, Modbus, & IEC 61850
- Large matrix display & 11 user-programmable LEDs as a standard
- Digital inputs with programmable thresholds
- Six setting groups – store multiple protection settings
- Type tested to global standards – includes ANSI, IEC and UL
- Front Ethernet port for relay configuration
- User programmable CT inputs for 1A or 5A – no variants
- Up to 3-winding transformer protection with RET620
- Configurable single-line diagram – view protection on-screen
- Circuit break monitoring – increase circuit breaker lifetime
- Relion's native language is GOOSE (<10 ms delivery)
- No more proprietary cables, ABB uses off-the-shelf Ethernet

## Benefits

- Enhanced Communication and Diagnostics
  - Expanded Communications options with multiple protocols including native IEC 61850
  - Metering and control functions, multiple I/O options programmable pushbuttons and status LEDs, and communication interfaces
  - Enhanced Metering and diagnostic information
- Improved Safety and Protection
  - Arc flash detection
  - Reduced installation space requirements through compact design - convergence of protection,
- Cost reduction
  - Modular construction simplifying and reducing the stock of spare parts

## Available Digital Relays

- Generator protection and control
- Feeder protection and control
- Transformer protection and control
- Line distance protection
- Line differential protection and control
- Motor protection and control
- Voltage protection and control
- Bus Protection
- Phasor measurement
- Power system automation



01



02

# UFES - Switchgear Upgrades for Rapid Arc Fault Extinguishing

Innovative arc flash mitigation in less than 4 ms: the highest possible level of arc flash protection for personnel and equipment, maintenance of secure power supply and the reduction of production stoppages.

— 01 UFES primary switching elements

— 02 Service Box application side mounted

— 03 UFES truck application in switchgear

## Overview

The occurrence of an arc fault, the most serious fault within a switchgear system, is mostly associated with extremely high thermal and mechanical stresses in the area concerned. The Ultra-Fast Earthing Switch (UFES) immediately mitigate the effects of internal arc faults and raise safety standards to a whole new level. The UFES does not only act as an active protection for personnel, but also saves the equipment from heavy damages minimizing the necessary repair work and downtime. This latest arc fault mitigation technology now effectively helps to avoid these negative effects if a fault should occur.

## Features

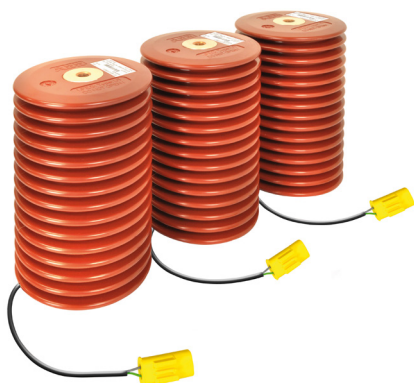
- Vacuum interrupter and operating system in one compact unit
- Fast and reliable micro gas generator operating mechanism
- Fast switching time of ~ 1.5 ms
- Easy handling
- Low-maintenance
- Flexible installation

## Service retrofit solutions

- Service box application
- Installation in cable compartment

## Available ratings

- Maximum rated voltage:  $U_r = 40.5 \text{ kV}$
- Maximum rated short-time withstand current for MV: for  $U_r = 17.5 \text{ kV}$   $I_k = 50 \text{ kA (3s)}$ ,  $63 \text{ kA (1s)}$
- Maximum rated short-time withstand current for LV: for  $U_r = 1.4 \text{ kV}$   $I_k = 100 \text{ kA (0.5s)}$



— 01



— 02



— 03

# Digital Solutions

EKIP UP

ABB ENVISAGE

ABB ABILITY™  
ELECTRICAL  
DISTRIBUTION  
CONTROL SYSTEM

ABB EMPOWER

A

B

C

D





# Ekip UP

Ekip UP is the new digital unit, part of ABB Ability™ portfolio, which upgrades low voltage systems transforming them into the next-generation electrical distribution plants.

- 01 Ekip UP product family is CE marked, conform to the IEC 60255 standard, and cULus listed in compliance with UL508 and CSA C22.2 No 14-13
- 02 Flexible current sensor type C available for use in existing switchgear
- Up to 6300 A (Kit -3p/4p)  
100mm-120mm-290mm  
Current class 1  
Voltages class 0,5  
Power class 2

**Overview**

Ekip UP is the low-voltage digital unit able to monitor, protect and control the next generation of plants. Thanks to the built-in software-based function, Ekip UP is the unit that digitalizes the plant performance. Sharing all the electronics solutions of “all-in-one” platform, Ekip UP completes the ecosystem to fit all the market opportunities.

The result is a unit suitable for all the different applications including all the needed functionalities without the need of additional external devices.

**Features**

- Benefits**
- Save 10% operational costs on electrical distribution through actions based on energy management and power quality analysis
  - Save 10% operational costs on electrical distribution through actions based on asset management while increasing plant reliability and safety protections in 1 hour
  - Save 20% operational costs on electrical distribution through power management

Operating voltage, Ue [V]	Up to 1150
Operating current, In [A]	From 100 to 6300
Operating frequency [Hz]	50-60
Operating temperature [°C]	From -25 to +60
Protection degree	IP40

- + Standard functions
- + Advanced functions

	Ekip UP Monitor	Ekip UP Protect	Ekip UP Protect+	Ekip UP Control	Ekip UP Control+
Control				+	+
Protection		+	+		+
Metering	+	+	+	+	+

—  
01



—  
02



# ABB envisage

## Power Management & Control System

### Overview

To manage rising energy costs and the constant demand to keep mission-critical systems operating efficiently, ABB Electrification Industrial Solutions re-imagined the traditional energy management system (EMS). ABB envisage offers the most comprehensive, customizable software solution with the most responsive and experienced services resource team anywhere.

The integrated EMS provides an accurate and easy-to-understand graphical representation of the facility to help you make informed, timely decisions. It monitors energy consumption, analyzes collected data, receives automatic warnings of device events, performs advanced harmonics analysis, allocates energy costs, and even manages loads. This intelligent system is at the ready 24/7 to give owners, managers, and engineers a secure and complete check of the quality and reliability of the power source, with email and text message alerts if needed.

### Features

- Monitoring, Power analytics, Energy tracking,
- Control and Automation
- Manages unlimited number of ABB and non-ABB devices (including meters, trip units, generators, transformers, drives switches).
- Supports over 100 protocols including the latest industry protocols and legacy, third-party protocols as well
- Web access & mobile app availability

### Benefits

envisage is ideal for anyone concerned with advancing efficiency and minimizing the downtime caused by power transients.

- Data centers - envisage offers root cause analyses required by stakeholders who seek assurances about the reliability and quality of the facility's electricity supply
- Hospitals - envisage can help lower energy costs, electrical outages, and regulatory compliance - custom JCAHO reporting saves labor and provides required records
- Industrial - Large power-intensive industries such as oil and gas, mining, and food and beverage seeking to control energy costs
- Commercial - Buildings designed to comply with LEED certification





# ABB Ability™ Electrical Distribution Control System

ABB Ability™ Electrical Distribution Control System is the innovative cloud-computing platform designed to monitor, optimize, predict and control the electrical system.

## Overview

ABB Ability™ Electrical Distribution Control System is built on a state-of-the-art cloud architecture for data collection, processing and storage. This cloud architecture has been developed together with Microsoft in order to enhance performance and guarantee the highest reliability and security

## Benefits

- **Monitor:** Discover plant performance, supervise the electrical system and allocate costs
- **Optimize:** Schedule and analyze the relevant information, improve the use of your assets and take the right business decision
- **Predict:** Supervise the system health conditions and predict next maintenance actions
- **Control:** Remotely implement an effective power management strategy to simply achieve energy savings

## Features

- **Dashboard**
  - Single or multi-site info is processed to display energy consumption and power generation trends
  - Intuitive interface and immediate availability of data allow users to check on the most relevant info at their facilities
- **Assets**
  - Possibility to create a sketch or overview of the assets and link it to its “digital twin”
  - Upload custom diagrams, photos, technical drawings of switchboards and plant synoptic panels
- **Power Controller**
  - Makes load management simple, accurate and remote by combining ABB Ability™ EDCS and Emax 2 Power Manager
- **Analytics**
  - Enables collection and export of data and historical trends, via on-demand query or automatic report scheduling
  - Simplifies and enhances the analyses of power factor compensation, energy management and cost allocation.



# ABB empower

A brand new digital gateway to do more

## Overview

Begin a new relationship with ABB and with your customers.

empower is your new gateway to instant answers, time savers, ideas and experts. It is designed to help you deliver better service, improve productivity and get answers from any location with any digital device. It's your one stop for day-to-day productivity and important news. You are in charge of a powerful new tool for getting things done.

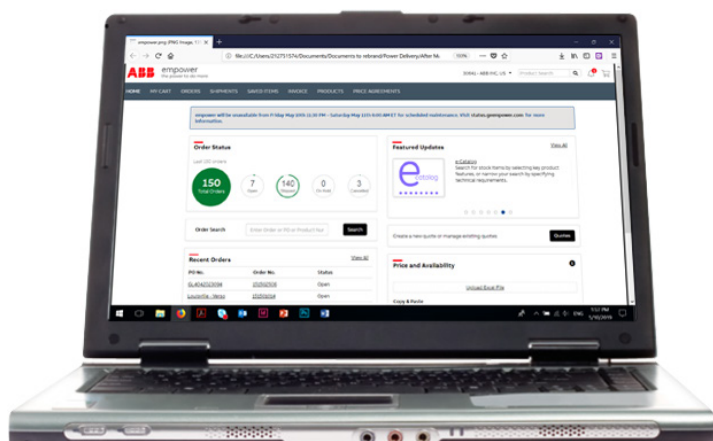
## Features

- Product Information
- Pricing
- Product Availability
- Quoting
- Custom-Branded Proposal Writing
- Product Configuration
- Ordering
- Order Tracking
- Post-Sales Support

## Benefits

ABB's new empower software technology brings a powerful but simple solution for providing all necessary and useful information our customers might need in the purchasing process. It

- Makes easy to access all required information as everything is in a single tool
- Keeps you up-to-date thanks to complete visibility, real-time answers, proactive notifications
- Saves time with broad options for customization (customizable dashboards, templates, product configurations etc.) and smart behavior as it remembers common actions to ease the usage
- Provides a forceful analyzing opportunity as a result of the comprehensive reporting function
- Reduces the chance for errors
- Gives an information advantage by providing direct line to ABB experts





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