PRODUCT PORTFOLIO

BATTERY ENERGY STORAGE SOLUTIONS

For the equipment manufacturer

ENGINEERED
TO OUTRUN

By 2030, battery energy storage installed capacity is estimated to be 93,000 MW in the United States (1). The significant growth of this technology will play a major role in the future of electrification.

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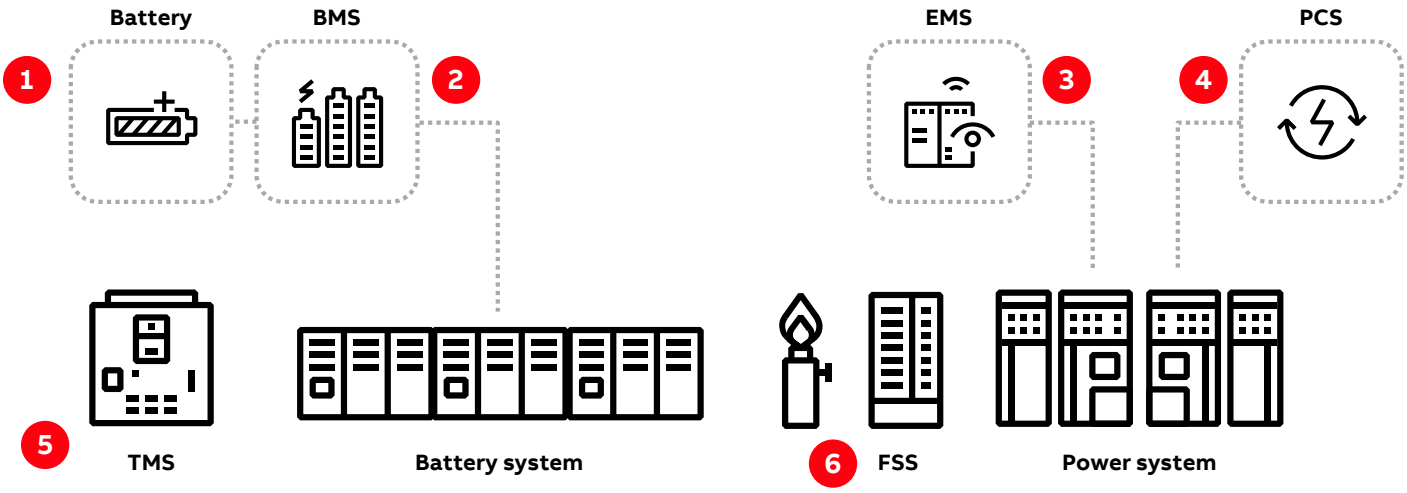
APPLICATION OVERVIEW

The main configuration of ESS

Container type ESS (Example)



1. Battery
- Fundamental component of the BESS that stores electrical energy until dispatch

2. Battery management system (BMS)
- Monitors internal battery performance, system parameters, and potential hazards
- Internally collects data to maintain optimal charge levels, preventing overcharging

3. Energy management system (EMS)
- Operating system for BESS, controlling dispatch activity and managing charge/discharge cycles
- Optimizes performance using real-time data from the PCS
- Enables remote monitoring of the BESS

4. Power conversion/conditioning system (PCS)
- Converts direct current produced by the batteries into alternating current that can be used for power consumption on the grid
- During off-peak times, absorbs energy from the grid for storage in the BESS

5. Thermal management system (TMS)
- Regulates the internal system temperature of the BESS

6. Fire suppression system (FSS)
- Releases a fire suppression agent in the event of thermal runaway

APPLICATION OVERVIEW

BESS

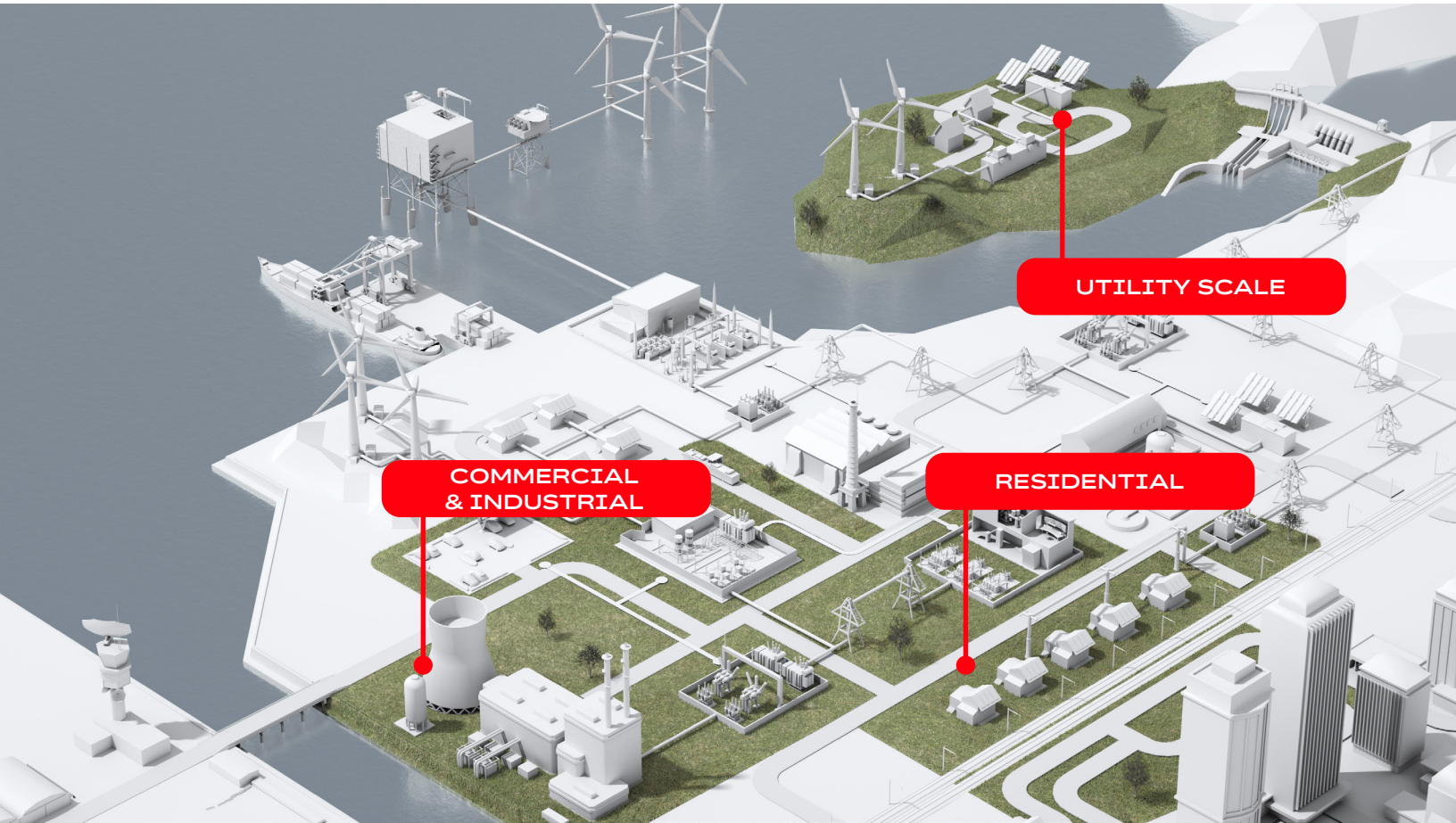
Front of the meter (FTM)
FTM BESS are systems that are either directly connected to the utility grid or are owned and operated by electric utility companies. These systems are typically integrated with generation facilities, distribution networks, or transmission systems. Their primary roles are to provide direct benefits to the electric utility companies which include:

- Arbitrage
- Support of conventional generation
- Capacity firming
- Limitation of upstream disturbances
- Frequency control
- Voltage support
- Black start
- Distribution power quality

Behind the meter (BTM)
BTM BESS are installed on the consumer's side of the utility service meter. These systems are common in commercial, industrial, and residential settings. The main goal of BTM BESS is to manage energy consumption for the consumer and reduce electricity bills. Their primary roles are:

Commercial and industrial (C&I)
- Integration of renewable energy
- Peak shaving and demand charge management
- Uninterrupted power supply
- Power quality management
- Time-of-use energy cost management
- EV fast charging infrastructure

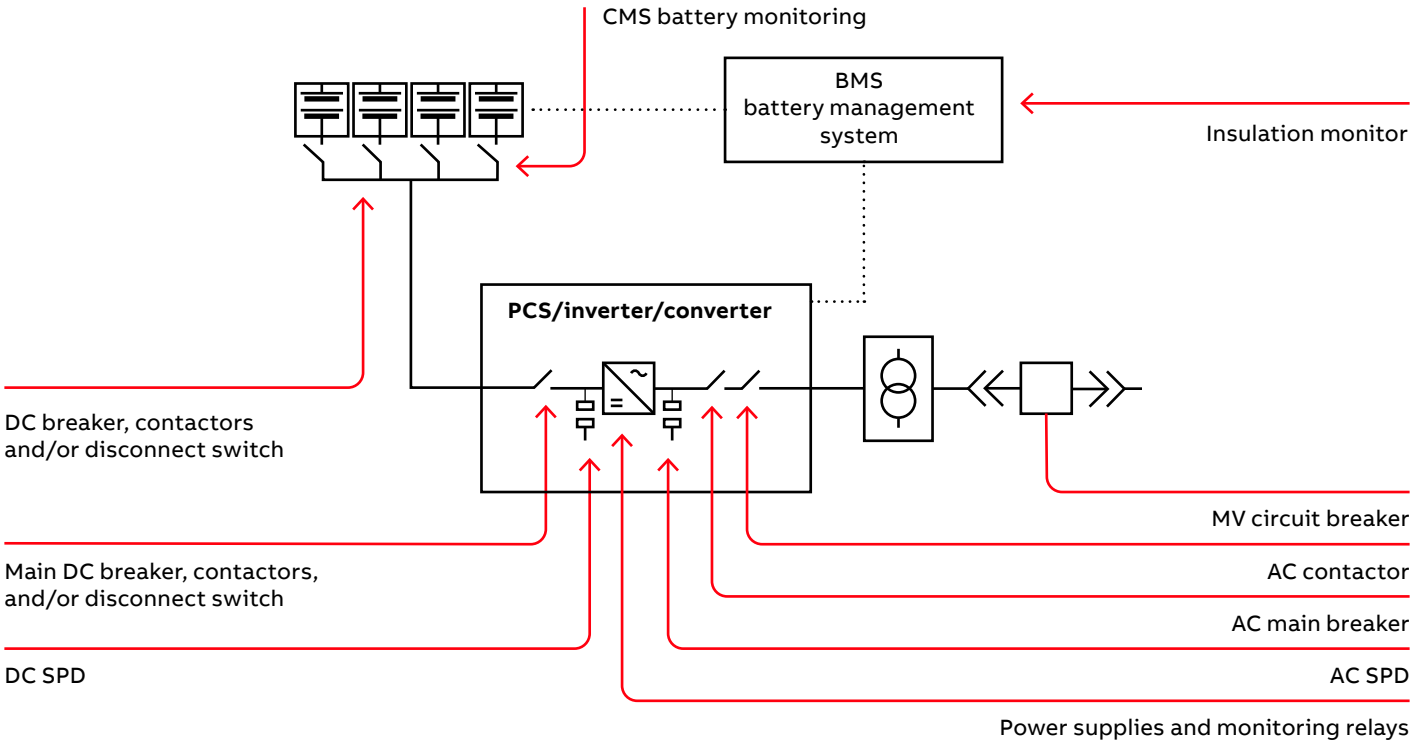
Residential
- Integration of renewable energy
- Time-of-use energy cost management
- EV charging infrastructure



APPLICATION OVERVIEW

BESS

As a world leader in innovative solutions, ABB offers specialty products engineered specifically for the demanding requirements of the energy storage market offering higher-voltage components up to 1500 V DC.



KEY VALUES

01

Safety

Reduce the chances of a fire and loss of valuable assets with a complete range of surge protection devices (SPDs); protect your entire electrical system from lightning and surges.

02

Smarter protection

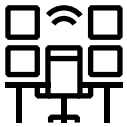
Help to increase power in your installation and reduce capital expenditure by using ABB's full range of 1500 V DC low voltage components.

03

Speed up your projects

Optimize system's performance with ABB's range of compact products, durable in various temperatures and humidity ratings.

04



Smarter metering and monitoring

Help maximize power yield and cash generation by correctly measuring your BESS parameters using ABB Ability™ Energy and Asset Manager; along with Ekip Touch trip measuring units combined with Modbus TCP communications.

FEATURED PRODUCTS

SACE® EMAX 2 MS/DC-E SWITCH DISCONNECTORS

Compliance and reliability
The switch-disconnector covers 1500 V DC installations in compliance with UL 489B and UL 489F, with rated short-time current up to 100 kA.
Flexible installation
Guarantee great flexibility for any installation; it is possible to insulate one polarity or both, and manage current flow in both directions.
Design innovation
Available in fixed and drawable version, and terminals can be setup vertically or horizontally.

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SACE® TMAX® PV MOLDED CASE CIRCUIT BREAKERS

Product range
Circuit breakers and molded case switch disconnectors rated up to 1500 V DC (UL 489 B or F) and 800 V AC (UL 489) with various frame sizes up to 1200 A.
Installation
Complete portfolio of mechanical and electrical accessories, including the connection jumpers that are mandatory for UL versions.
Energy efficiency
Tmax PV technology enhances efficiency by utilizing higher voltage for both AC and DC systems where, configurations support voltages up to 1500 V DC and 800 V AC, reducing power losses.

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INSULATION MONITORING RELAYS (IMDs)

Continuous operation
Early fault detection with monitoring of voltage-free networks and reduced downtime with early pre-warnings.
Safety and protection
Fast, reliable earth fault detection supports fire prevention.
Easy installation
Clear visualization of device status via LEDs, easy adjustments with rotary wheels push-in terminals.

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OVR PV TYPE 2 SURGE PROTECTIVE DEVICES

Extended lifetime
Safety reserve system with two varistors per line to extend protection lifetime.
Faster wiring
Uses the same terminal as Pro M compact devices to offer complete coordination and time-saving in wiring operation.
Easy replacement
Pluggable cartridge for easy replacement during maintenance.

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OTDC DISCONNECT SWITCHES - ESS

Product range
Offering reliable switching for a wide range of ESS applications up to 1500 V DC, they provide high kA ratings up to 40 kA in a 2-pole and 4-pole 1500 V DC.
Compliance and reliability
Tested according to IEC60947-3 and UL 98B, ratings according to utilization category DC-PV2 and mechanical endurance 10,000 operating cycles.
Design flexibility
Grounded and ungrounded types available and symmetrical pole design enables independent polarity.

CATALOG WEBSITE

OT NON-FUSIBLE DISCONNECT SWITCHES 800/1000 V AC

Easy to install
Enables 3- and 4-pole installation with different positions of the switching mechanism. The mechanism and poles can be located according to the customer's specific installation requirements and the length of the shaft is adjustable, saving installation time.
Safety and protection
Interlocking fuse covers prevent opening while the switch is in the ON position. The fuse links are fully isolated from both ends when the switch is in OFF position.
Reliability
Designed and tested for reliability in extreme conditions.

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DC SWITCHING CONTACTORS (GF)

Product range
Rated up to 210 A, 1500 V DC for PV solar power application, up to 2050 A, 1000 VDC, and wide control voltage range.
Technology
Designed based on the well-proven AF technology that ensures controlled, distinct, and energy efficient operation of the contactor.
Durability
Has built-in surge suppression.

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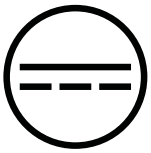
COMPLEMENTARY PRODUCTS

DC and AC side components



DC side components

Used in:
- Battery management systems (BMS)
- DC side of inverter/converter
- DC side of power conditioning system (PCS)
- DC side of energy management systems (EMS)

AC side components

Used in:
- AC side of inverter/converter
- AC side of power conditioning system (PCS)
- AC side of energy management systems (EMS)

COMPLEMENTARY PRODUCTS

SACE® EMAX 2 AIR CIRCUIT BREAKERS (ACBs)

Product range
It comes in different ranges, up to 6000 A and up to 100 kA, for short circuit protection, which enables the construction of switchgear with compact dimensions and high ratings.
Efficiency and control
Its embedded features of all-in-one innovation can be used for advanced functions such as Load Shedding, Power Controller, Embedded ATS, Synchrocheck logics, Interface Protection, and Adaptive Protection/Dual Settings.
Connectivity
Simplified integration into automation and energy management systems due to the eight communication protocols supported.

CATALOG WEBSITE

AC SIDE

SACE® TMAX® XT MOLDED CASE CIRCUIT BREAKERS (MCCBs)

Product range
This circuit breaker portfolio helps ensure extreme performance and protection features up to 1200 A.
Performance and protection
It sets the standards when extreme breaking capacity is needed, sharing the same logic, interfaces, and features regardless of operating voltage or environmental conditions.
Data and connectivity
Provide advanced metering features and access, monitor, and control information remotely, improving efficiency and saving energy.

CATALOG WEBSITE

DC SIDE AC SIDE

AF CONTACTORS

Product range
UL 508 and UL 60947-4-1 contactors certified for up to 900 hp - 480 V and 2850 A - general use.
Installation
Comes in screw, push-in spring and ring tongue connection types. The push-in spring terminals offer only one push for extremely fast wiring.
Energy efficient
A reduction of the coil's energy consumption lets customers save energy.

CATALOG WEBSITE

DC SIDE AC SIDE

TRUONE™ AUTOMATIC TRANSFER SWITCHES

Innovation
The world's first true purpose-built automatic transfer switch, engineered to incorporate switch and controller in one seamless unit.
Installation
All-in-one concept that brings easy and fast installation with a single wire using standard enclosures.
Safety and protection
TruONE enables emergency manual operation, even under load, without opening the panel door when the HMI is mounted to the ATS frame.

CATALOG WEBSITE AC SIDE

EPD24 SELECTIVE PROTECTION OF 24V DC LOAD CIRCUITS

Continuous operation
This product offers selective overcurrent protection for the loads connected and reacts to short circuits or overloads more rapidly than the supplying switch mode power supply.
Product range
UL 508 and UL 2367 approved and variable rated currents can be set on advanced from 0.5 A to 12 A or on entry from 1 A to 10 A. Expansion up to 32 channels (8 devices) via jumpers.
Energy efficiency
The 4-channel devices feature very high efficiency and significantly reduced power loss.

CATALOG WEBSITE AC SIDE

ULTRACAPACITOR-BASED BUFFERING UNITS, CP-B POWER SUPPLIES

Continuous operation
Buffering 24 V DC supply of up to 572 s with its maintenance-free and latest ultra- capacitor technology.
Efficiency
Efficiency is higher than 95%.
Product range
Rated currents 3 A DC, 10 A DC, 20 A DC.

CATALOG WEBSITE DC SIDE AC SIDE

COMPLEMENTARY PRODUCTS

22 MM PILOT DEVICES

Product range
Modular plastic and metal ranges include flexible and adjustable products to meet your exact needs.
Reliability
Designed with a protection degree of up to 4X, guaranteeing reliability in extreme environments.
Installation
The compact range reduces installation space and saves time, and the modular range enables tool-free installation that is quick and simple.

CATALOG WEBSITE

AC SIDE

NEMA 30 MM HEAVY-DUTY OIL-TIGHT PILOT DEVICES

Product range
NEMA types 1, 3, 3R, 4, 4X, 12 and 13 to meet a wide range of applications.
Durability
Due to the octagonal locking nut design, greater torque can be applied during assembly and installation to provide a water- and oil-tight fit.
Installation
Ease of assembly with one-screw contact block mounting and easy wiring with 45° angled wire terminals.

CATALOG WEBSITE

AC SIDE

POWER SUPPLIES

Product range
Wide range of AC or DC supply voltages with output voltage of up to 48 V DC, output current of up to 20 A and output power of up to 480 W.
Durability
Coated (PCBA) and ATEX certification available for hazardous locations. It has overload protection, active power factor correction and a broad certified AC and DC input range.
Efficiency
These power supplies have a 150% integrated power reserve and operate at an efficiency of up to 94%.

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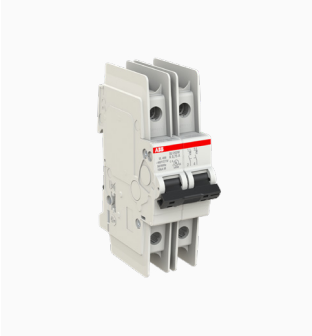
DC SIDE AC SIDE



MINIATURE CIRCUIT BREAKERS (MCBs)

Product range
Largest selection of current-limiting, compact, DIN-rail mounted MCBs for applications with ratings of 0.2 to 100 A, up to 600 V AC/DC and 50 kA short circuit protection.
Safety
Thermal and magnetic trips are provided to cover both overcurrent and short-circuit faults.
Compliance
UL 489 and UL 1077 approved.

CATALOG WEBSITE DC SIDE AC SIDE

RESIDUAL CURRENT DEVICES (RCDs)

Product range
This product trips when the system leaks a significant current to ground and it is rated up to 125 A, 120–277 V AC (2-pole) and 120–480Y V AC (4-pole).
Innovation
The contact position indicator (CPI) always indicates the status of the contacts (red = closed contacts; green = open contacts) independent of the toggle position.
Compliance
The ground-fault sensing and relaying equipment components are UL 1053 approved.

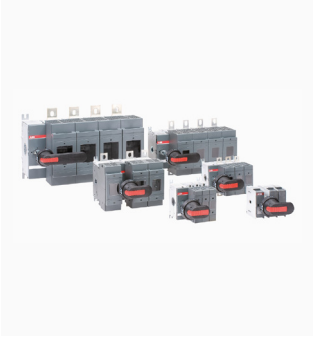
CATALOG WEBSITE AC SIDE

MEASURING AND MONITORING RELAYS

Design
Wide range of products from single- and three-phase monitors to temperature monitoring relays.
Technology
Easy Connect Technology with push-in terminals allows the product to be wired much more quickly and easily – without the need for tools.
Product range
Comes in value devices (CM-E range) and advanced solutions (CM-S and CM-N range) to meet customer's needs.

CATALOG WEBSITE AC SIDE

COMPLEMENTARY PRODUCTS



OS FUSIBLE DISCONNECT SWITCHES

Safety and protection
Designed for personal safety as well as for reliable process protection.
Reliability and performance
The knife contact design, in combination with the fuse link, enables rapid fault clearance and maintains a protection level even after a fault occurs.
Installation
Its accessories create considerable savings in terms of installation time and costs. For example, the shaft can be adjusted to various installation depths, which eliminates the need for special cutting tools.

CATALOG WEBSITE

AC SIDE

OT NON-FUSIBLE DISCONNECT SWITCHES

Product range
UL 508 and UL 98 approved portfolio of switches with ratings between 16 and 2000 A for AC.
Installation
Their modular design and smaller dimensions enable installation into even the smallest enclosures, saving space and significantly reducing material, handling and installation costs.
Reliability
Designed to be virtually maintenance free across their entire extended lifespan.

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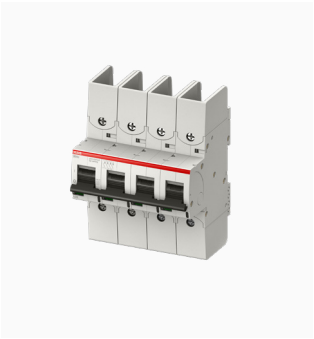
DC SIDE AC SIDE



S804U-PVS5 HIGH-PERFORMANCE MCB

Technology
Has thermal tripping mechanism for overload protection and electromechanics tripping mechanism for short circuit protection.
Product range
UL 489B approved and device is developed to meet the requirements as GFDI (Ground Fault Detection Interrupter) in photovoltaic systems.
Continuous operation
In case of a ground fault, the breaker will trip, and the PV generator will not be damaged.

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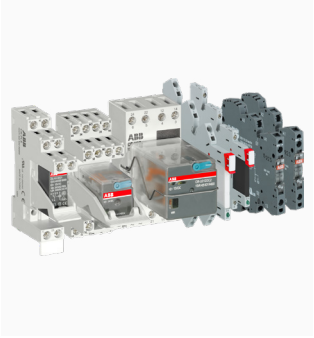
DC SIDE



INTERFACE RELAYS AND OPTOCOUPLERS

Continuous operation
Optocouplers allow for continuous operation without any mechanical wear-and-tear.
Installation
The interface relay includes both pluggable and non-pluggable relays. The pluggable relays allow for the easy and seamless exchange of relay modules.
Product rating
The wide variety of pluggable interface relays have coil voltages from 5 V DC to 230 V AC and are accompanied by standard or logic sockets that may be used for switching AC or DC loads.

CATALOG WEBSITE

DC SIDE AC SIDE

CONTROL POWER AND MACHINE TOOL TRANSFORMERS

Installation
Type IP transformers are lightweight, small, and designed for minimum mounting dimensions.
Safety
Finger-safe terminals offer added protection and safety.
Reliability
Pressure-plate terminals ensure secure connections.

CATALOG WEBSITE

AC SIDE

SURGE PROTECTIVE DEVICES (SPDs)

Product range
UL 1449 and has options for voltages up to 600 V AC and 1500 V DC.
Durability
Safety reserve system with two varistors per line extends protection lifetime.
Installation
Pluggable and replaceable cartridges for easy replacement during maintenance.

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DC SIDE AC SIDE

COMPLEMENTARY PRODUCTS

MANUAL MOTOR STARTERS

Protection and control
Protection and control in almost every situation, including hazardous areas, protecting installations from short-circuits, overloads and phase failures while also controlling the current flow through a simple ON / OFF switch.
Speed up your projects
The main range of accessories is shared across multiple starters (both with screw and push-in spring terminals available), making logistics and planning simpler.
Continuous operation
Fuseless motor protection reduces maintenance costs and downtimes by avoiding fuse replacement after faults.

CATALOG WEBSITE AC SIDE

OVERLOAD RELAYS

Product range
Thermal overload relays cover a current range from 0.1 A to 200 A, while electronic overload relays cover an even larger current range from 0.1 A to 1250 A.
Energy-efficient
Electronic overload relays combine high accuracy with an energy-efficient design that does not need an extra external supply.
Continuous operation
The selectable automatic reset mode allows for reduced downtimes and traveling costs for installation in dispersed locations.

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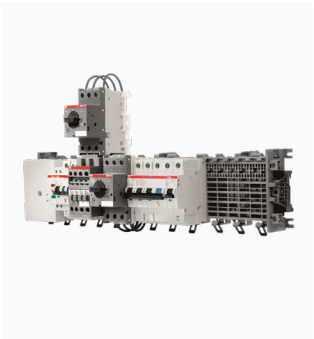

SMISSLINE TP POWER BAR SYSTEMS

Installation
Quick maintenance of the switchboard as the wiring is already integrated into the plug-in socket system.
Flexibility
Rapid replacement, easy expansion and mixed-pole layout possible and directly pluggable devices such as MCBs, RCDs, RCBOs, motor starters, and switch disconnectors.
Safety
Allows for load-free plugging in and unplugging under voltage without additional personal safety equipment for protection against electrical hazards.

CATALOG WEBSITE DC SIDE AC SIDE

CIRCUIT MONITORING SYSTEM (CMS)

Reliability
Clear visibility of energy consumption is made possible at branch level and measurement of any kind of current-direct, alternating or mixed; up to 160 A.
Installation
Everything needed for effective measurement is available in ultra-compact sensors and the system can be extended or modified at any time due to its flexibility and modularity.
Energy efficiency
Identification of optimal load distribution and energy consumptions to reduce inefficiencies.

CATALOG WEBSITE

DC SIDE

FUSE HOLDERS

Durability and reliability
They offer venting grooves and cooling chambers to improve heat dissipation.
Product range
UL approved IP20 fuse holders with ratings up to 30 A at 1500 V DC for PV fuse holders.
Installation
Ergonomic flip hinge makes fuse replacement easier in small spaces, even while wearing gloves.

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DC SIDE AC SIDE

MV BREAKERS

Product range
ABB offers the following ANSI indoor vacuum circuit breakers: ADVAC, AMVAC, VD4-IEEE, VM1-IEEE, and VD4-CS with voltage range from 5 kV to 40.5 kV.
Technology
Designed for easy integration into metal-clad switchgear applications, increasing benefits in a compact footprint and optimizing maintenance.
Performance
Up to 5 times higher performance than the market standard with 10,000 maintenance, inrush, and restrike-free operations.

CATALOG WEBSITE

AC SIDE

References

(1) “US energy storage monitor: Q1 2024,” Wood Mackenzie. [Online]. Available: https://power-and-renewables.woodmac.com/reportaction/150215089/Toc [Accessed: May 12, 2026].

LEARN MORE

To learn more about ABB engineered products for battery energy storage systems, visit our website

CONTACT US

Do you have a similar project and are you searching for the right application configuration?
Contact us and talk to our experts!

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ABB Inc.
305 Gregson Dr.
Cary, NC 27511
United States

electrification.us.abb.com

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