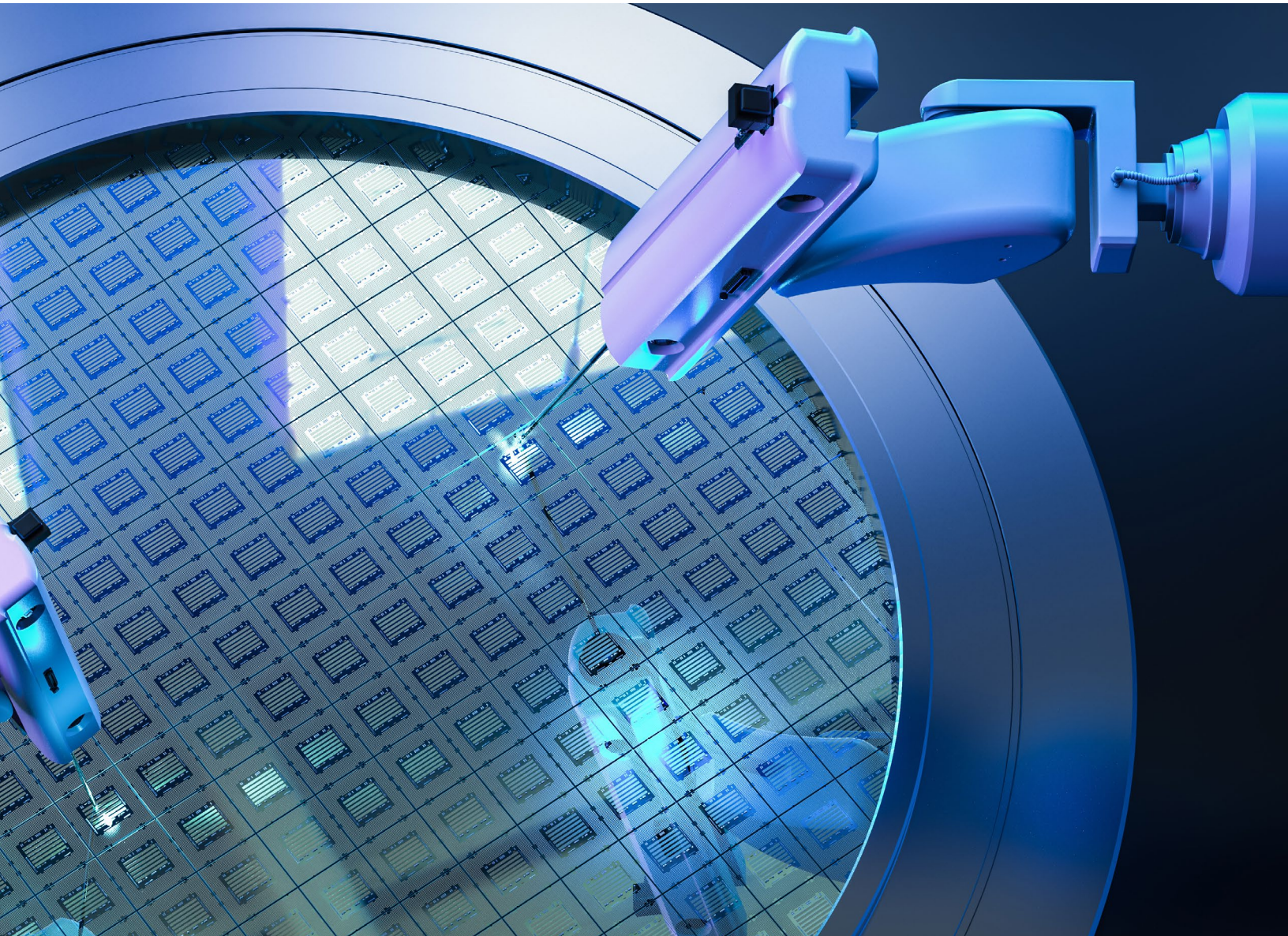
PRODUCT PORTFOLIO

SEMICONDUCTOR FABRICATION MACHINERY SOLUTIONS

For equipment manufacturers

ENGINEERED TO OUTRUN



The semiconductor industry and processes are regularly evolving, increasing the need for new technology and reliability.

Discover how ABB products can provide reliable, efficient, and robust electrical solutions for the semiconductor industry.

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APPLICATION OVERVIEW

Semiconductor fabrication

Semiconductor fabrication consists of four general process categories:

Deposition is any process (oxide layer formation/thermal oxidation) that grows, coats or otherwise transfers a material onto the wafer, including:
- Physical vapor deposition (PVD)
- Chemical vapor deposition (CVD)
- Electrochemical deposition (ECD)
- Molecular beam epitaxy (MBE)
- Atomic layer deposition (ALD)

Patterning is the shaping or altering of deposited materials, generally referred to as photolithography. In conventional photolithography, the wafer is coated with a chemical called a photoresist.

Removal is any process that removes material from the wafer, including:
- Etching processes (either wet or dry)
- Strip processes
- Chemical-mechanical planarization (CMP)

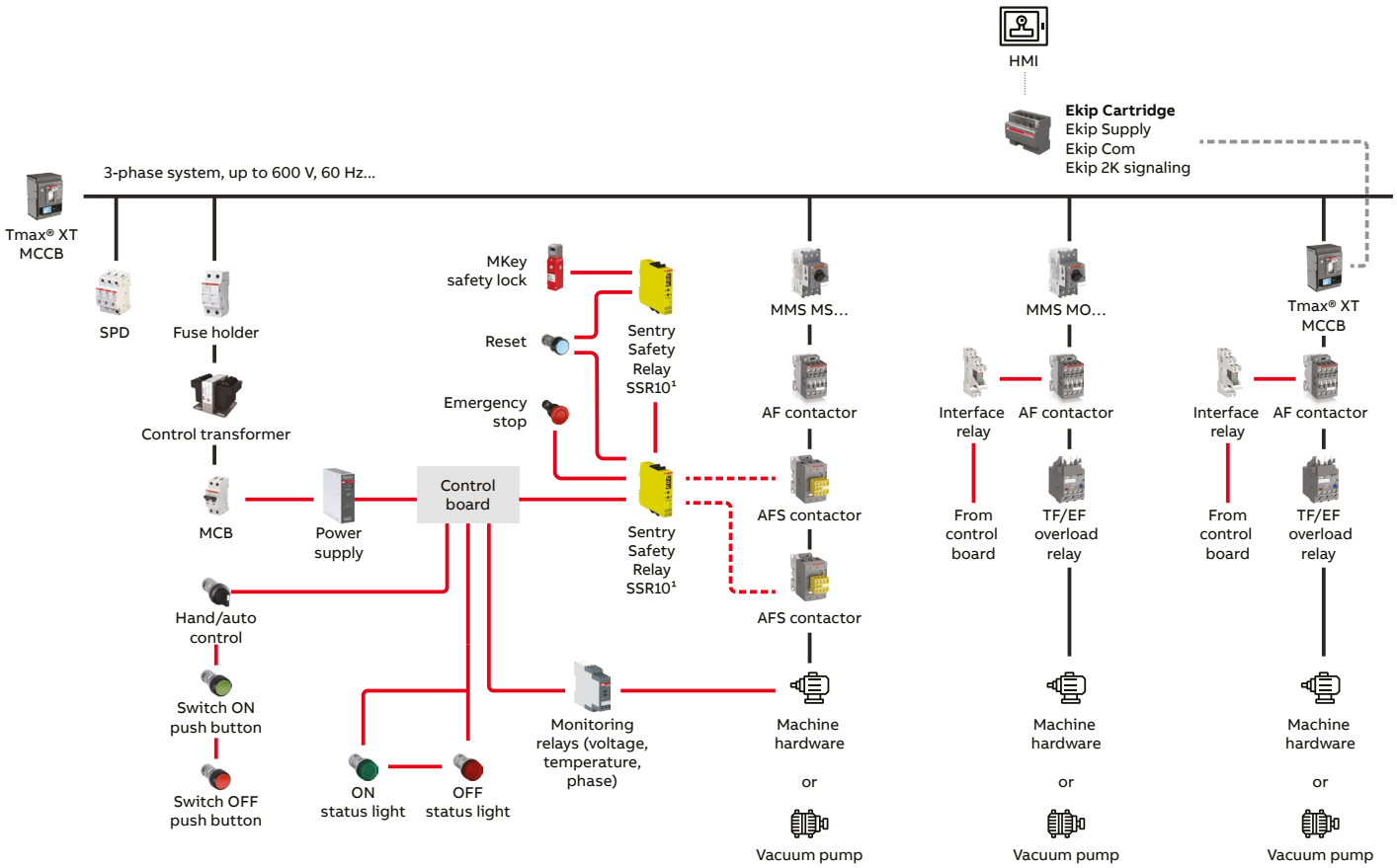
Modification of electrical properties is doping a semiconductor to modulate its electrical, optical and structural properties. Modification is achieved by oxidation, which can be carried out to create semiconductor-insulator junctions to fabricate metal oxide transistors. Two common types of doping are:
- Ion implantation
- Diffusion

In addition to the processes above, fabrication also includes testing, assembly and packaging. All functional electrical testing is completed at both wafer fabrication and packaging levels to ensure quality.

APPLICATION OVERVIEW

Semiconductor fabrication

Whether you are looking to reduce size, increase efficiency, increase reliability or decrease process interruption, ABB has the component options you need to optimize the power and control circuit to best fit your applications.



Power circuit
Control circuit
Communication circuit
Safety contactor control and feedback

MMS – Manual motor starter
MO – Magnetic protection
MS – Magnetic and thermal protection

Note: This configuration is for a generic system and is not representative of existing manufacturers.
¹ The safety circuit can be used to stop multiple motors in a machine. For advanced safety protection, a Pluto PLC can be used instead of the Sentry Safety Relays.

KEY VALUES

01

Safety and protection

Avoid the risk of downtime and damage to sensitive electrical equipment using a complete range of surge protective devices (SPDs) to protect from lightning and transient overvoltages related to poor power quality and switching.

02

Smarter protection

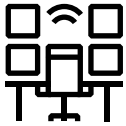
Boost your system's performance and confidence in your investment with our advanced switching and protection components.

03

Compact and easy to install

Save space in the control panel, due to narrower designs in our AF contactors. Additionally, our starter connection kits allow you to make compact and safe connections utilizing close-coupling components.

04



Smarter metering and monitoring

Maximize process yield and system uptime with ABB's full line of control, measurement and monitoring devices for both power and control circuits.

FEATURED PRODUCTS

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 & protection
It sets the standards when extreme breaking capacity is needed, sharing the same logic, interfaces, and featuresregardless of operating voltage or environmental conditions.
Data & connectivity
Improve efficiency and save energy with advanced metering features that allow users to access, monitor, and control information remotely.

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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.

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MINIATURE CIRCUIT BREAKERS (MCBs)

Product range
Largest selection of current-limiting, compact, DIN-rail mounted MCBs for AC and DC 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.

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DIN-RAIL SURGE PROTECTIVE DEVICES (SPDs)

Product range
UL 1449 5th edition and has options for voltages up to 600 V AC.
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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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 overheat protection, activepower 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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FUSE HOLDERS

Product range
UL approved IP20 fuse holders with ratings up to 60 A at 600 V AC/DC.
Durability and reliability
They offer venting grooves and cooling chambers to improve heat dissipation.
Installation
Ergonomic flip hinge makes fuse replacement easier in small spaces, even while wearing gloves.

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MEASURING AND MONITORING RELAYS

Product range
Comes in value devices (CM-E range) and advanced solutions (CM-S and CM-N range) to meet customer's needs.
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.

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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, helping provide 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.

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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.

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OVERLOAD RELAYS

Product range
Thermal overload relays cover a current range from 0.1 A to 200 A, while electronic overload relays cover aneven 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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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.

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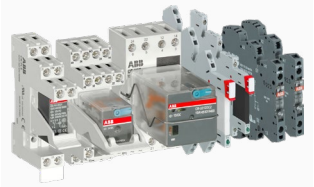

INTERFACE RELAYS AND OPTOCOUPLERS

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.

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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.

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JOKAB SAFETY PRODUCTS

Safety & protection
ABB offers an extensive range of innovative products and solutions for machine safety systems to help protect single machines or entire production lines.
Product range
Jokab includes a large portfolio of safety products such as safety relays, safety controllers, emergency stops, light curtains, safety locks, sensors, and more.
Ease of use
Easily integrated into existing systems with flexible mounting and plug-and-play connectivity to simplify installation and help ensure compliance with safety regulations.

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COMPLEMENTARY PRODUCTS

E150 THERMAL-MAGNETIC MOLDED CASE CIRCUIT BREAKERS

Product range
Range of breakers from 10 to 150 A with multiple short circuit tiers, in 1, 2, or 3 poles, and rated up to 600 VAC or 500 VDC.
High performance
Reliable operation and protection enabling seamless management of power distribution networks with efficiency and minimized downtime.
Installation
Non-interchangeable trip breakers can be accessorized with various signaling and controlling functions as well as add on UL listed current limiters.

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TEY CIRCUIT BREAKERS

Product range
Range of breakers from 15 to 125 A with multiple short circuit tiers (TEY 14 kA, TEYF 18 kA, TEYD 25 kA, TEYH 35 kA and TEYL 65 kA at 480/277 V) allow the most cost-effective ratings for the application.
High performance
Dependable and effective thermal-magnetic trip units with time-current curves designed for easy coordination with upstream main devices.
Installation
Flexible installation with a mounting base for unit mount/lug-lug type installations and 1 inch per pole spacing.

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SACE® FORMULA CIRCUIT BREAKERS

Product range
Range consists of two frames, A1 and A2, which reach up to 100 A and 250 A, respectively, are rated up to 240 VAC or 125 VDC, and are 1, 2, or 3 poles.
Ready to use
Protection trip unit has fixed thermal and magnetic threshold values to put the circuit breaker into service more rapidly.
Installation
Compact dimensions and coordinated depths mean standardized dimensions and savings in panel design.

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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.

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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.

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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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ELECTRONIC PROTECTION DEVICES (EPD24)

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.
Reliability and performance
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.
Energy efficiency
The 4-channel devices feature very high efficiency and significantly reduced power loss.

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M MINI CONTACTORS

Product range
Contactors certified for up to 3 hp 240 V AC and 20 A (600 V AC) – general use.
Installation
Comes in two terminal types available: screw and screw for ring tongue ferrules. Complete range of accessories including front or side mounting auxiliary contact blocks, surge suppressors and electronic timers.
Operation
Standard DC versions with extended operating limits coils.

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B SERIES MINI CONTACTORS

Product range
Contactors certified for up to 5 hp at 480 V and 16 A – general use.
Installation
Connection types available: screw, soldering pins and flat pin. Available in mini-reversing contactor with built-in mechanical interlock.
Energy efficient
Energy and cost savings with special version of 1.4 W coil consumption for direct connection to PLC.

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DEFINITE PURPOSE CONTACTORS

Product range
Define purpose contactors certified for wide current range from 20 A up to 75 A up to 600 V AC.
Size flexibility
Comes in various flexible sizes, compact 1 and 2 pole contactors and full size 2, 3, and 4 pole devices.
Easy installation
Industry standard mounting plate provides easily accessible mounting holes.

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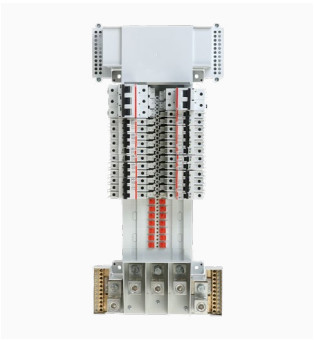

PROLINE PANELBOARDS

Technology
Advanced MCB technology to quickly mitigate short circuit faults.
Safety and protection
Certified IP 20 touch-safe design to prevent electrical shocks.
Increased uptime
Selective coordination between the main breaker and branch breakers helps reduce unplanned downtime.

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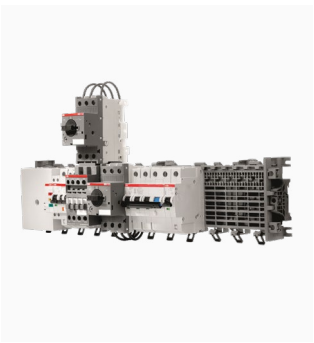

SMISSLINE TP POWER BAR SYSTEMS

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.

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LIMIT SWITCHES

Reliable in extreme conditions
Plastic or metal casing limit switches are designed to operate in the most difficult environments.
Continuous operation
High mechanical durability can handle up to 30 million operations with contacts that are mechanically linked to actuators.
Easy to install
Satisfy design specifications with the flexibility of three different types of electrical connections and cable lengths.

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SOFTSTARTERS

Secure motor reliability
Help increase your motor's lifetime by protecting it from electrical stress and optimizing your load, application, and motor size.
Improve installation efficiency
Reduce your installation time and panel size by having all the features you need built into your softstarter, such as a built-in bypass or overload protection.
Increase application productivity
Reduce the mechanical stress on your motor application, which will increase your uptime, by using torque control, pump cleaning, motor brake, and many other features.

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ELECTRONIC COMPACT STARTERS

Saving space
With a narrow width of 22.5 mm, this starter saves cabinet space, especially with group mounting, and yet still provides motor starting functionalities with motor protection and safety embedded.
Safety and protection
Protect your people with an emergency stop version that complies with SIL 3, PLe safety standards.
Easy to install
Wiring time during installation is cut to a minimum with motor protection, reversing function and emergency stop already integrated into the product.

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LEARN MORE

To learn more about ABB engineered products for semiconductor fabrication equipment, 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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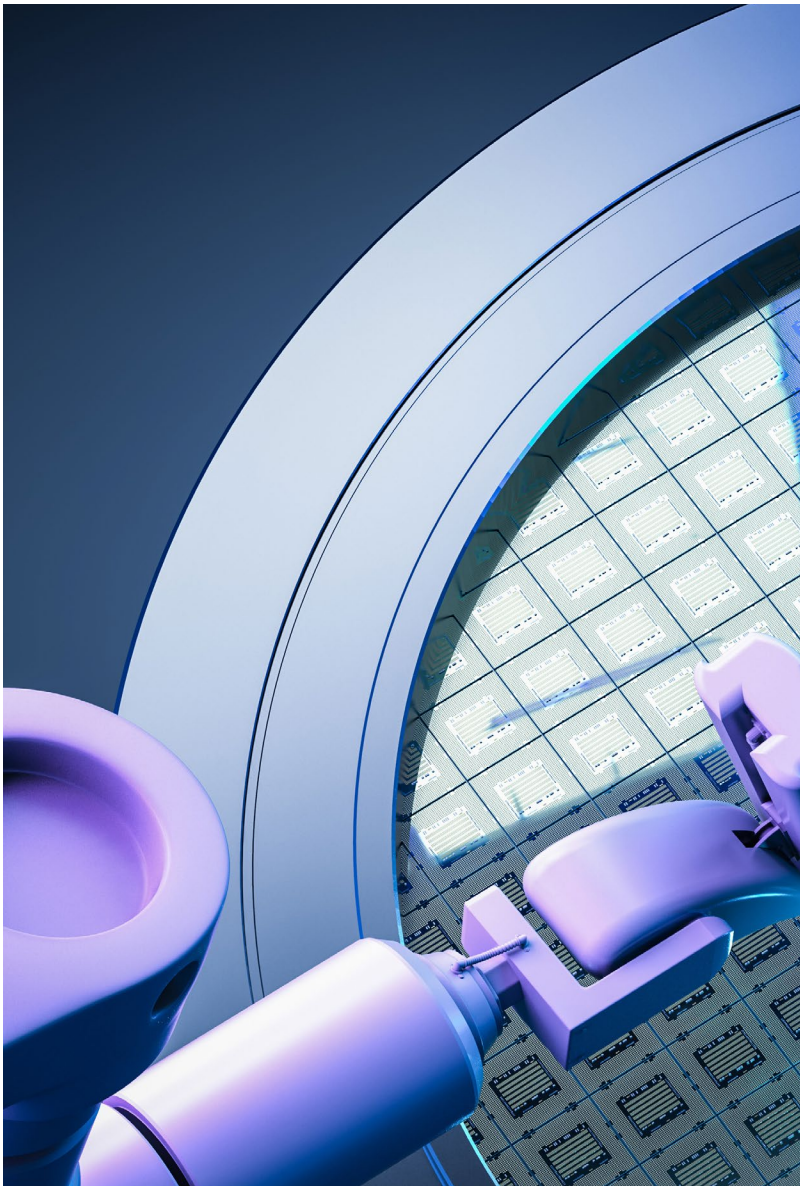

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