



CATALOG

## **Solutions for solar energy**

Low- and medium-voltage  
components, systems and services

# Providing sustainable solutions for renewables



ABB is a world leading supplier of innovative technologies for renewables with a comprehensive range of solutions for solar, wind, Energy Storage Systems and EV charging

As renewables and digitalization enable fundamental changes in how we generate, distribute and consume energy, the only certainty is that new technologies are going to challenge our conceptions of what's possible. ABB is a pioneering leader in that technological innovation and we also actively innovate energy solutions that deliver value to customers in this dynamic environment.

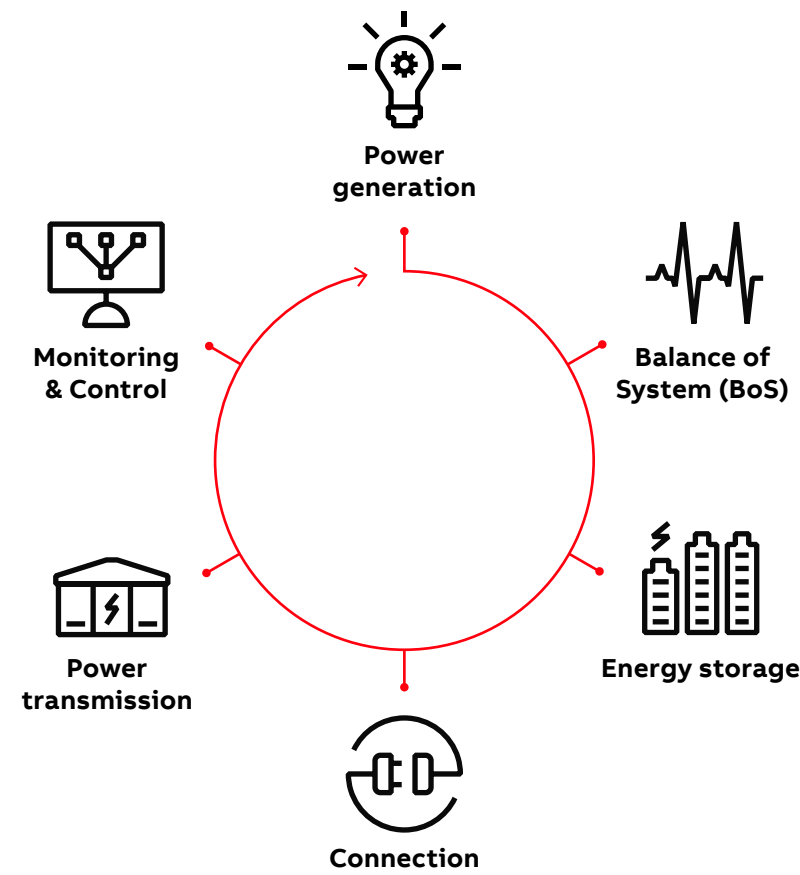




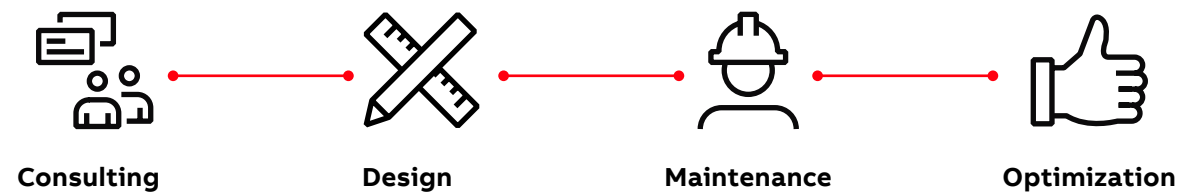
# Delivering sustainable renewables

The challenge of using renewables in the energy mix is to balance supply and demand.

Balancing renewables power supply and end-user’s demand has always been a challenge, but as the renewables share of total generation in many countries is growing, this challenge is increasing. In response to this, ABB supports its customers along the complete renewables power value chain, from consulting, generation, balance of system, storage and connection up to transmission, monitoring and control, as well as maintenance and optimization.



We understand the complexity of implementing solutions that are both sustainable and future-proof.

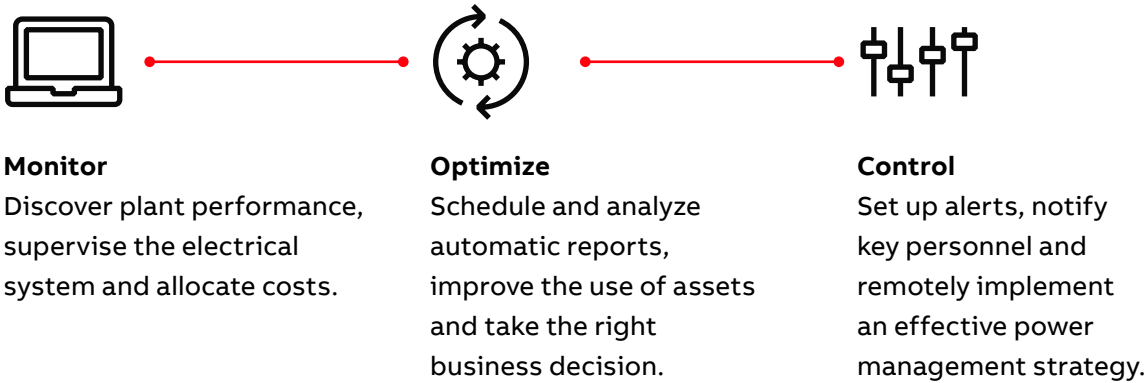


# Digitalization for renewables through ABB Ability™



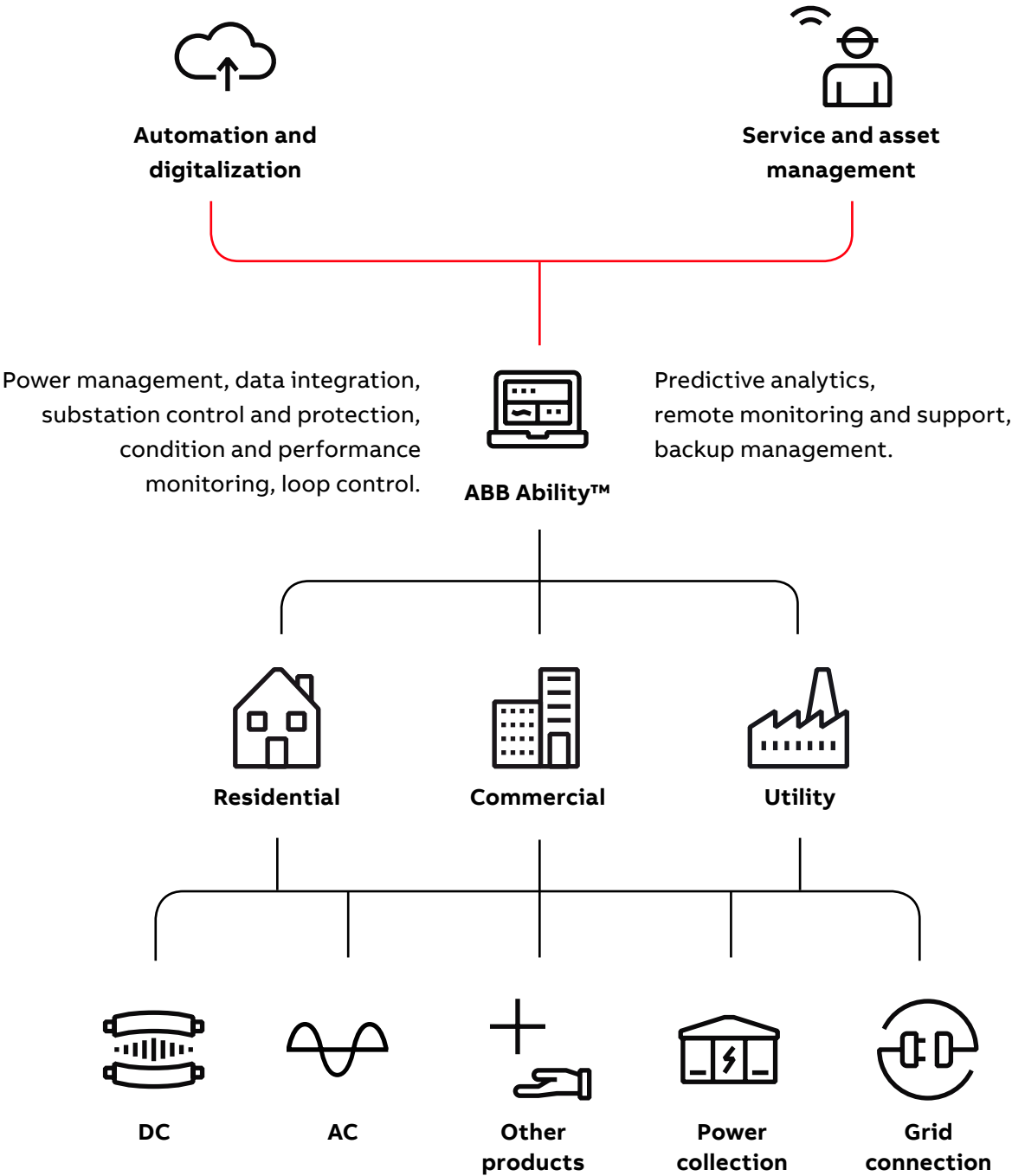
ABB Ability™ is our unified, cross-industry digital solution, giving you the ability to know more, do more, do better, together.

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



Our leading integrated and collaborative digital solutions build on our knowledge and expertise in renewables, which contributes to:

- Maximized service continuity through smart algorithms, even in an emergency
  - Savings of up to 30% on operational costs through energy management system
- Reduction of more than 60% of installed components for the same function
  - Switchgear footprint reduction of up to 50% by embedding logics



# Benefits and advantages for photovoltaic

ABB

Systems, products and solutions answering customers needs and market trends. ABB portfolio for photovoltaic applications focus on delivering continuous operation, higher reliability and return on investments, enabling customers to take full advantage of savings by adopting 1500V DC and 800V AC technologies.



## Reduced costs and resources

*Challenge/trend* Hidden costs are typically neglected, but they significantly impact any business.

*ABB answer* Simplified bidding and negotiation costs with one single supplier thanks to ABB’s complete sun-to-socket offering can save up to 50% in time.



## Energy efficiency

*Challenge/trend* The demand for lower solar energy cost and higher efficiency have pushed higher voltages and more energy efficient equipment:

**800V AC:**

- 14% savings in transformer copper windings

**1500V DC:**

- 35% savings on arrays in parallel
- 33% savings on array components.

*ABB answer* ABB’s complete offering helps increase the “Electrical Balance of System” efficiency related to power losses by up to 35%, allowing more power to be delivered to the consumer.



## Reliable in extreme conditions

*Challenge/trend* Solar plants are commonly located in high temperature environments or at high altitudes, requiring equipment that can work properly under harsh conditions: up to 70°C or 5000 m altitude.

*ABB answer* ABB’s offering is designed taking into account the specific application requirements to deliver the most reliable solution with high performance without deratings of the main characteristics: up to 55°C or 4000 m altitude.



## Continuous operation

*Challenge/trend* Keeping priority loads running during an utility outage is crucial for business continuity.

*ABB answer* ABB’s power manager capabilities allow continuous operation of critical loads when an outage happens in the utility side and renewables are present.



## Global availability

*Challenge/trend* Having the ability to streamline operations and serve multiple markets are survival factors in such a competitive market.

*ABB answer* ABB’s multi-listed (eg.: IEC/UL/CCC and more) products and systems allow customers to export one single design virtually anywhere in the world.



## Speed up your projects

*Challenge/trend* An optimized manufacturing operation can provide that extra advantage needed to secure projects.

*ABB answer* ABB’s factory accessorized products and easy-to-install accessories save up to 15% in installation and commissioning time.




# Solar power

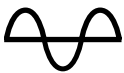
ABB has been a leading player in the solar power industry since the early 1990s

Since then, we have been involved at a pioneering stage in just about every type of photovoltaic (PV) and concentrating solar power (CSP) technology developed, be it in Europe, North America, Australia, North Africa or the Middle East. This gave us a unique expertise in how best to harness, control and store solar energy and efficiently convert it into a reliable power source, ready for transfer into the local grid. ABB's portfolio of products, systems and solutions for the solar power industry is extensive. It ranges from complete power and automation solutions for utilities to commercial, industrial and residential rooftop photovoltaic installations.


- 1




DC
- 2



AC
- 3



Power collection
- 4



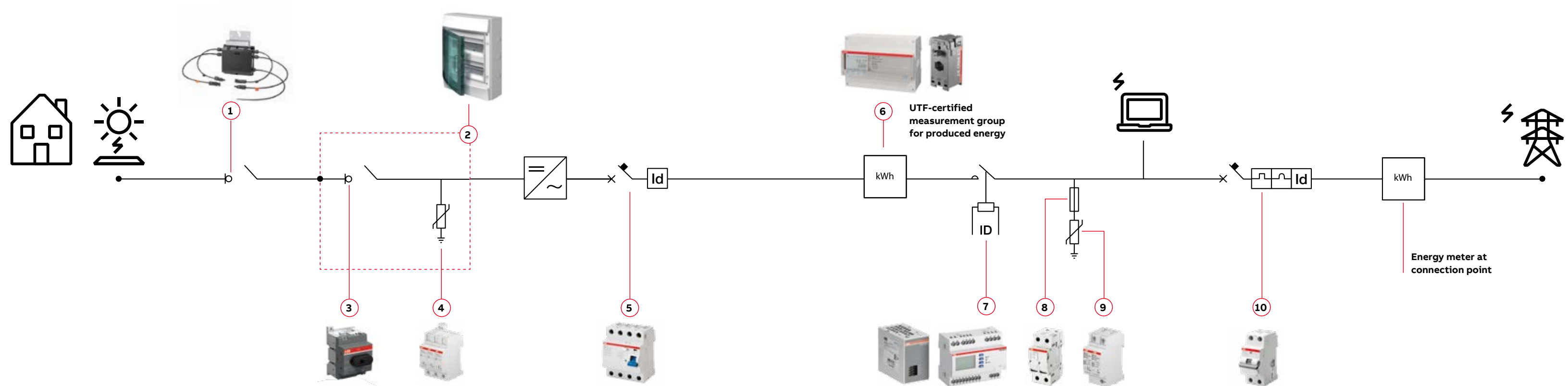
Grid connection





# Application overview

Residential system  $\leq 20\text{kW}$  LV



## Low-voltage products:

1. Rapid Shutdown 2.0
2. String boxes  
Switchboards: Gemini  
Consumer units: MISTRAL65H  
Circuit breakers: S200 M UC Z, S800 PV-SP  
Fuse disconnectors: E 90 PV  
Fuses: E 9F PV  
Spring and screw terminal blocks: SNK PI
3. Switch-disconnectors: OTDC, S800 PV-SD
4. Surge protection devices: OVR PV QS
5. Residual current devices: F202B, F204B
6. Energy meters: EQmeters and current transformers
7. Contactors: AF Series  
Grid-feeding monitoring relays: CM-UFD.MxxM  
Power supplies: CP-x
8. Fuse disconnectors: E 90
9. Surge protective devices: OVR T1 / T1-T2 / T2 QS
10. Residual current circuit breakers: DS202C



DC

## Protection and safety



### MISTRAL65H

Strong, resistant and with a modern look, MISTRAL65H is the most innovative series of IP65 rated consumer units, designed to reduce cabling times as well as allow total integration between modular DIN-rail and front panel devices. Thanks to the elegant design, MISTRAL65H can be installed in residential environments where high level of IP protection is required.



### E90 PV Fuse Holders and fuses

The E90 PV fuse holders have been specifically designed for photovoltaic applications. Thanks to their rated voltage up to 1500V DC, they are perfect for protection of strings in PV applications. Their compact size is perfect for installation in a string combiner box or in an inverter. E90 PV can be used in combination with E9F PV cylindrical fuses for 1000 or 1500V DC.



### OVR PV

Surge Protective Devices are now well integrated in the solar system to protect DC and AC sides with the aim to provide continuity of service and reduce risk of fire, protecting from overvoltages due to lightning strikes or network disturbances. We designed the OVR PV to improve performance and protect any photovoltaic system according to IEC 61643-31 Standard.



### High-performance string protection MCB S800PV-SP

The High-Performance MCB S800PV-SP, specially developed for photovoltaic systems, offers reliable protection for PV modules and lines against reverse currents from defective strings and AC regenerative feedback due to defective inverters. The high demands of PV systems have been considered a priority in the development of the S800PV-SP.





DC

## Switch and disconnection



### High-performance switch-disconnector MCB S800PV-SD

With highly compact design for installation on the DIN rail, the S800PV-SD switch-disconnector offers relevant safety isolation properties. As master switch for PV systems, the whole DC side can thus be safely isolated, locally or from remote.



### High-performance polarized disconnecter MCB S800PV-M-H

This disconnecter might be small, but it's a giant when it comes to performance. With a nominal current range up to 100A, it covers a large range of applications. At the same time, the compact S802PV-M-H is only 54 mm wide. As a result, space requirement is minimal.



### OTDC switches from 16 to 32 Amperes

High performance and energy efficiency: OTDC has very low power losses and is suitable for applications in high ambient temperatures.

The rated currents need no derating even beyond 60°C (140 °F).

Save installation space, time and cost: OTDC switches offer various DC voltage ratings up to 1000 V DC and a control of up to three circuits within the same footprint area.

Three mounting options are available: door, base and DIN rail.



DC

## Metering, monitoring and installation



**CMS-660 - Solar string monitoring**  
How can you detect impairments such as leaves and dirt or even broken cables without great effort? CMS-660 is a solar monitoring system that remotely checks the DC current produced by each string, allowing to compare it not only with its previous performance but also with the performance of other strings. CMS allows detection of over-voltages, breaker trips or high temperatures.



**Insulation monitoring relays**  
The insulation monitoring relays of the CM-IWx range guarantee a continuous insulation monitoring of an IT system. The devices recognize insulation faults as they develop and trip immediately if the value falls below the minimum set threshold. This ensures a reliable operation of the system and prevents operational interruption caused by a second, more severe, insulation fault which may lead to a short-circuit trip of the main circuit-breaker.



**Conduit & fittings**  
An electrical system is as reliable as its conductors and conduit systems & fittings, which provide unsurpassed protection for wires and cables in any demanding applications: power generation and solar panels.



**Metal framing & support systems**  
ABB saves time and labor with its comprehensive lines of metal framing and cable tray, including the industry's only 100% plated products, our 1 1/2" modular system and hundreds of accessories to complete any job.





AC

## Protection and safety



### Residual current devices - RCDs

Residual current devices protect people from life-threatening indirect contacts according to IEC/EN 61008 or IEC/EN 61009 Standards. ABB offers a comprehensive range of devices like RCCBs, RCBOs, RCD-blocks, Earth Leakage Relays DIN-Rail and front panels in order to cope with all the applications in residential, commercial and industrial segments.



### OVR QuickSafe®

QuickSafe is our new generation of Surge Protective Devices (SPD) with improved performance. Thanks to innovative technology this new range of SPDs covers residential and industrial applications with an extremely good protection level, simple installation and preventive maintenance. All according to IEC/EN 61643-11 Standard.



### E90 50A/125A

#### Fuse switch-disconnectors

The E 90 50A/125A fuse switch disconnectors range for cylindrical fuses 14x51mm and 22x58mm, is specifically designed to provide protection against short-circuits and overloads. It is available in a complete range from 1 to 4 poles and provides disconnection properties according to IEC 60947-3 Standard.



AC

## Protection and safety



### Miniature circuit-breakers - MCBs

Miniature circuit-breakers ensure electrical safety in multiple applications. They have two different tripping mechanisms, the delayed thermal tripping mechanism for overload protection and the magnetic tripping mechanism for short-circuit protection.



### Molded case circuit-breakers Tmax XT

The SACE Tmax XT series of Molded Case Circuit-Breakers (MCCBs) are designed to maximize ease of use, integration and connectivity while reliably delivering safety and quality. Rather than just offering standalone protection, they are seen as key elements of the system that give you complete flexibility, extreme breaking capabilities and reliable performance under pressure.





AC

## Switch and disconnection



### Switch-disconnectors SD 200

SD 200 switch-disconnectors can be used as the main switch of the AC side of the inverters. The devices are mounted on a DIN rail or on the rear panel of a switchboard (depending on the rated current) and include a wide range of accessories, facilitating their use in various applications.



### Tmax XT switch-disconnectors

Tmax XT switch-disconnectors are devices created from the corresponding circuit-breakers and feature the same overall dimensions and versions, and can be fitted with the same accessories.



### EasyLine - XLP fuse switch-disconnectors

EasyLine range of fuse switch-disconnectors ensures high protection and reliable operation in critical power applications, distribution boards, switchboards, capacitor banks.



AC

## Switch and disconnection



### Manual operated switch fuses

Our OS range includes manual operated switch fuses from 20 to 1250A, available for all types of fuses: DIN, BS, NFC, CC, JJ and L types.



### Switch-disconnectors

#### 16 to 4000A

Reliable in extreme conditions, ABB switch-disconnectors are designed, built and tested for the best possible performance. They are designed to be virtually maintenance-free across their entire extended lifespan and offer reliable performance in any circumstances. Durability has been ensured by testing switches against the IEC60947- 3, UL508, UL98 and CSA Standards.





AC

## Metering, monitoring and installation



### Energy Meters

Energy consumption awareness is key to reduce energy costs and improve energy efficiency on your machines and electrical assets. Energy meters allow to identify areas for improvement and to generate benefits for owners, facility managers and users. They enable to run smarter buildings in a more energy and cost efficient way.



### Circuit Measurement Systems

With the rise of digitalization and the Internet of Things (IoT), data collection from the entire network for analysis becomes easier, enabling optimization of energy usage and assets. From monitoring energy consumption to control of operations and costs, connectivity-based solutions can improve energy efficiency while reducing costs.



### Grid feeding monitoring relays CM-UFD

ABB's CM-UFD range are multi-functional grid feeding monitoring relays, installed between the renewable energy system and the public grid. They detect unusual events in the public power grid and automatically disconnect and reconnect the renewable power plant.



### System pro E comfort MISTRAL

ABB's series of consumer units combine versatility and performance with an elegant design, reducing installation time while integrating several kinds of devices for DIN-rail and devices to be installed on mounting plate or on blind front panels. With the wide range of sizes and versions, ABB's consumer units are one of the most complete ranges on the market, providing a smarter space for all your installation ideas.



## OTHER PRODUCTS



### MC4-Evo2 photovoltaic connectors

MC4-Evo2 PV connectors are the latest generation of MC4 PV connectors. ABB proposes a complete range of connectors including plug connectors, panel receptacles and branch connectors.



### Ty-Rap high performance cable ties

Innovative design and engineered materials make Ty-Rap® cable ties the perfect fastening solution where performance really matters. Often imitated but never equaled, Ty-Rap® cable ties provide superior performance in any application.



### Wire termination & connectors

ABB is a recognized leader in providing electrical connectors suitable for the majority of all electrical applications.



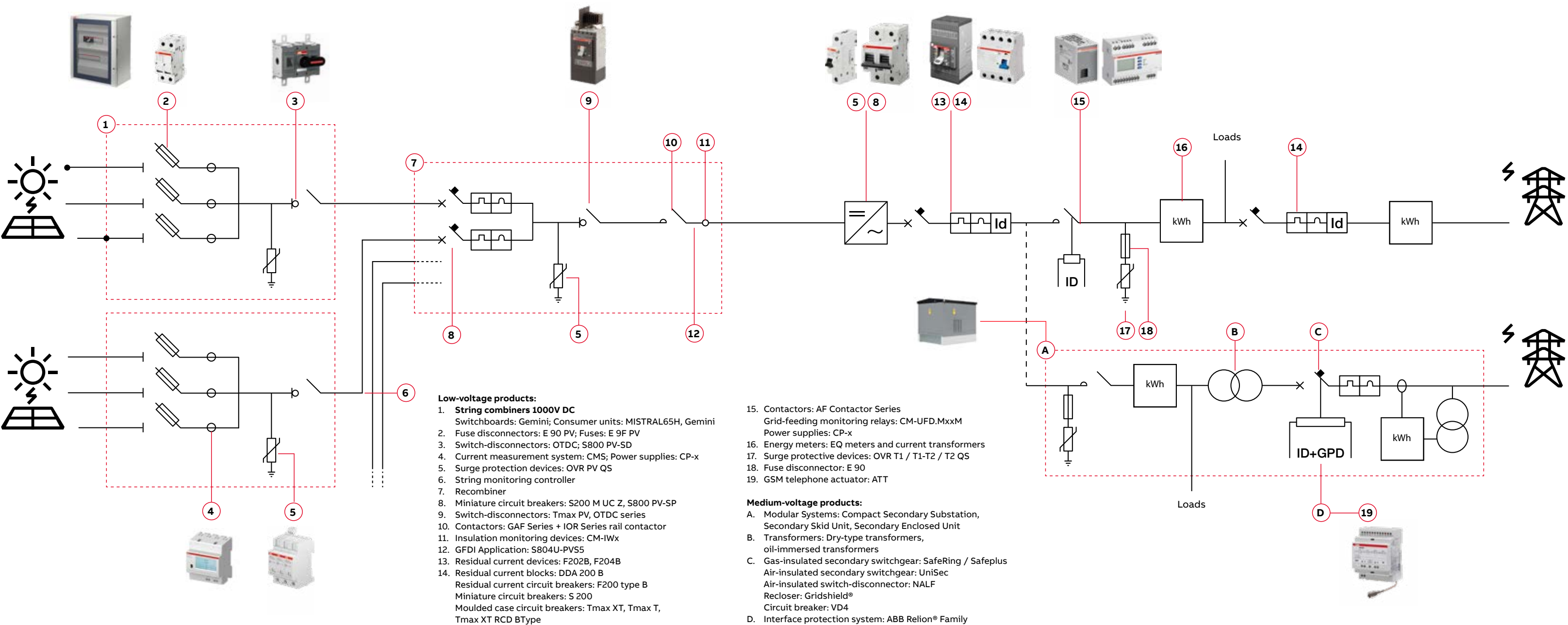
### External Lightning Protection - OPR

To provide effective protection, the Solar system must be protected against direct lightning strikes and have a proper grounding system in addition to protection against overvoltage on both sides of the inverter. OPR, ESE lightning rod is an active system that protects against direct lightning.



# Application overview

## Commercial system 20-1000 kW LV/MV





DC

## Protection and safety



### String combiner boxes GEMINI

In a photovoltaic system, the modules are arranged in strings and arrays depending on the type of inverter used, the total power and the technical characteristics of the modules. ABB offers a complete range of all-in-one combiner boxes hosting string protection devices, disconnectors and surge protective devices (SPDs). It is possible to add also monitoring devices.



### E90 PV Fuse Holders and fuses

The E90 PV fuse holders have been specifically designed for photovoltaic applications. Thanks to their rated voltage up to 1500V DC, they are perfect for protection of strings in PV applications. Their compact size is optimal for installation in a string combiner box or in an inverter. E90 PV can be used in combination with E9F PV cylindrical fuses for 1000 or 1500V DC.



### OVR PV

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DC

## Protection and safety



### Rapid Shutdown 2.0

The second generation of ABB rapid shutdown solution for 600V systems is easy to install. Behind the PV modules, this product provides a fail-safe solution for emergency responders to eliminate voltage in the PV array in compliance with NEC 2014 Rapid Shutdown code requirements. The ABB Rapid Shutdown system requires no extra conduit; minimizing additional material cost and associated labor.



### High-performance string protection MCB S800PV-SP

The High-Performance MCB S800PV-SP, specially developed for photovoltaic systems, offers reliable protection for PV modules and lines against reverse currents from defective strings and AC regenerative feedback due to defective inverters. The high demands of PV systems have been considered a priority in the development of the S800PV-SP.





DC

## Switch and disconnection



**SACE Tmax T - PV**  
The SACE Tmax PV range of molded-case circuit-breakers and switch-disconnectors for IEC and UL applications on both the DC and AC sides of a photovoltaic plant, expands the widely appreciated ability of the SACE Tmax T range to provide the most adaptable and versatile solution for every type of application. The aim is to enhance energy efficiency and limit the rated currents involved, thereby reducing switchgear size, installation time and costs.



**DC switch-disconnectors 16...1600 A**  
The OTDC range of switch-disconnectors from 16 to 1600A is specially designed for DC applications. Thanks to compact design, efficiency and reliability, they bring PV installations to the next level. The versatile OTDC portfolio includes solutions for installations with the most special requirements: 1500 V DC voltages, multi-circuit switching and combined load outputs up to 1600 A.



**High-performance switch-disconnector MCB S800PV-SD**  
With highly compact design for installation on the DIN rail, the S800PV-SD switch-disconnector offers relevant safety isolation properties. As master switch for PV systems, the whole DC side can thus be safely isolated, locally from remote.





DC

# Metering, monitoring and installation



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**Conduit & fittings**  
An electrical system is as reliable as its conductors and conduit systems & fittings, which provide unsurpassed protection for wires and cables in any demanding applications: power generation and solar panels.



**Metal framing & support systems**  
ABB saves time and labor with its comprehensive lines of metal framing and cable tray, including the industry's only 100% plated products, our 1 1/2" modular system and hundreds of accessories to complete any job.





AC

## Protection and safety



### **OVR QuickSafe®**

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### **E90 50A/125A**

#### **Fuse switch-disconnectors**

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AC

## Protection and safety



### Molded case circuit-breakers Tmax XT

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### SACE Emax 2

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.





AC

## Switch and disconnection



### Switches

The switch family consists of a complete range of switch-disconnectors, switch fuses, change-over switches, automatic transfer switches, bypass switches, cam switches and fuses.

ABB's switches are designed for flexibility and reliable performance in a wide variety of applications: power distribution for residential and industrial buildings, HVAC, water pumping stations, data centers and photovoltaic installations.



### InLine II - Fuse switch-disconnectors

InLine II is a technically reliable and proven solution for demanding conditions. A selection of devices with 800V AC ratings are available to support the higher voltage architectures in solar power plants. With a wide range of accessories and cable terminal connections, InLine II guarantees the highest amount of safety and stability.





AC

## Metering, monitoring and installation



### Energy Meters

Energy consumption awareness is key to reduce energy costs and improve energy efficiency on your machines and electrical assets. Energy meters allow to identify areas for improvement and to generate benefits for owners, facility managers and users. They enable to run smarter buildings in a more energy and cost efficient way.



### Circuit Monitoring Systems

With the rise of digitalization and the Internet of Things (IoT), data collection from the entire network for analysis becomes easier, enabling optimization of energy usage and assets. From monitoring energy consumption to control of operations and costs, connectivity-based solutions can improve energy efficiency while reducing costs.



### Grid feeding monitoring relays CM-UFD

ABB's CM-UFD range are multi-functional grid feeding monitoring relays, installed between the renewable energy system and the public grid. They detect unusual events in the public power grid and automatically disconnect and reconnect the renewable power plant.



### Gemini multipurpose enclosures

Gemini switchboards are made through co-injection technology and ABB is the first manufacturer to use it as a molding technique. This process obtains a compact external hard covering and an expanded internal soft core, guaranteeing the highest level of mechanical protection against impacts (IK10). Gemini keeps its mechanical characteristics in the long term.





**POWER COLLECTION / GRID CONNECTION**



- Unipack CSS**  
Safe working:
- Internal arc fault and type tested (IEC 62271-202)
  - Connected to SCADA
  - ABB Ability™ enabled for maintenance and remote management
- Optimized life cycle and maintenance cost:
- Corrosion resistant enclosure of Glass Reinforced Polyester
- Fast installation, commissioning and relocation:
- Lightweight and factory assembled
  - Flexible with wide range of ratings



- EcoFlex eHouse**  
Modular, factory assembled and tested, with ISO dimensions:
- Combinable modules
  - Seismic rated
  - C5M Coating
- Risk mitigation, improved lead time and reduced overall cost:
- Minimal site works
  - Factory production
- Transportable, configurable and standardized:
- Configurable: electrical equipment, floor/wall material, module combinations
  - Reduced engineering
  - Standard shipping



- Secondary Skid Unit**
- Pre-configured design solutions
  - Factory assembled and routine tested
  - One piece delivery for minimizing site works
  - Efficient cooling based an open air design with no additional HVAC required
  - No exposed live parts
  - ABB Ability™ digitally enabled solution providing predictive maintenance and remote management



- Transformers**
- Complete range of distribution transformers designed to grant reliability, durability, and efficiency
  - Liquid-filled and dry-type transformers
  - Services for complete life-cycle support and replacements
  - A complete portfolio that maximizes the return on transformer assets, granting a high reliability, reducing life cycle costs and ensuring optimized performance





## POWER COLLECTION / GRID CONNECTION



### **Air-insulated secondary switchgear UniSec**

UniSec is suitable for up to 24 kV, 1250A, 25kA. It offers a broad portfolio of functional units and technical features. It's suitable for a wide range of applications including solar, industry, substations, data centers and smart grids. Also available as ABB Ability™ UniSec Digital.



### **Gas-insulated secondary switchgear SafeRing/SafePlus**

Compact metal enclosed switchgear for up to 40.5 kV. Unique flexibility thanks to extendibility and the combination of fully modular and semi-modular configurations. High level of reliability, safety and a virtually maintenance-free system. Also available with AirPlus™ or Dry Air insulation gases.





OTHER PRODUCTS



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**Cable protection and insulation**  
ABB offers a wide range of products to guide, protect and insulate your wires and cables in your control panels and equipment. Our range includes braided sleeving, extruded grommets, heatshrink and spiral wrap.

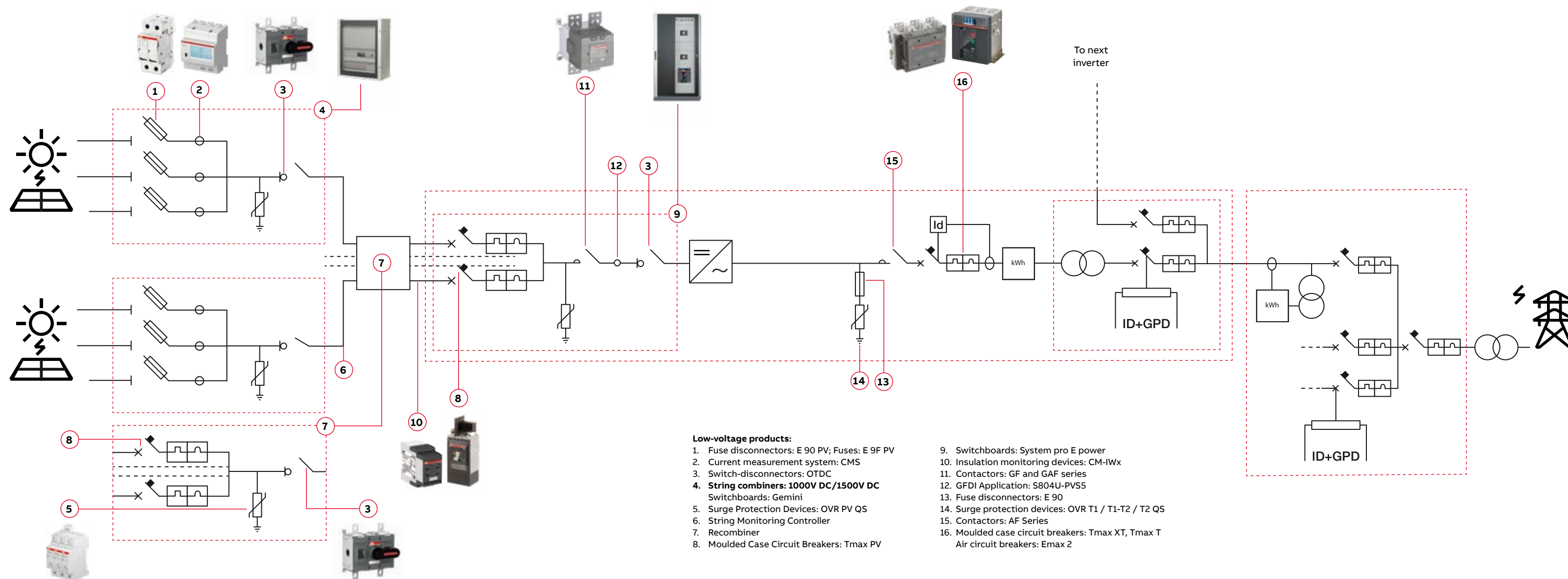


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# Application overview

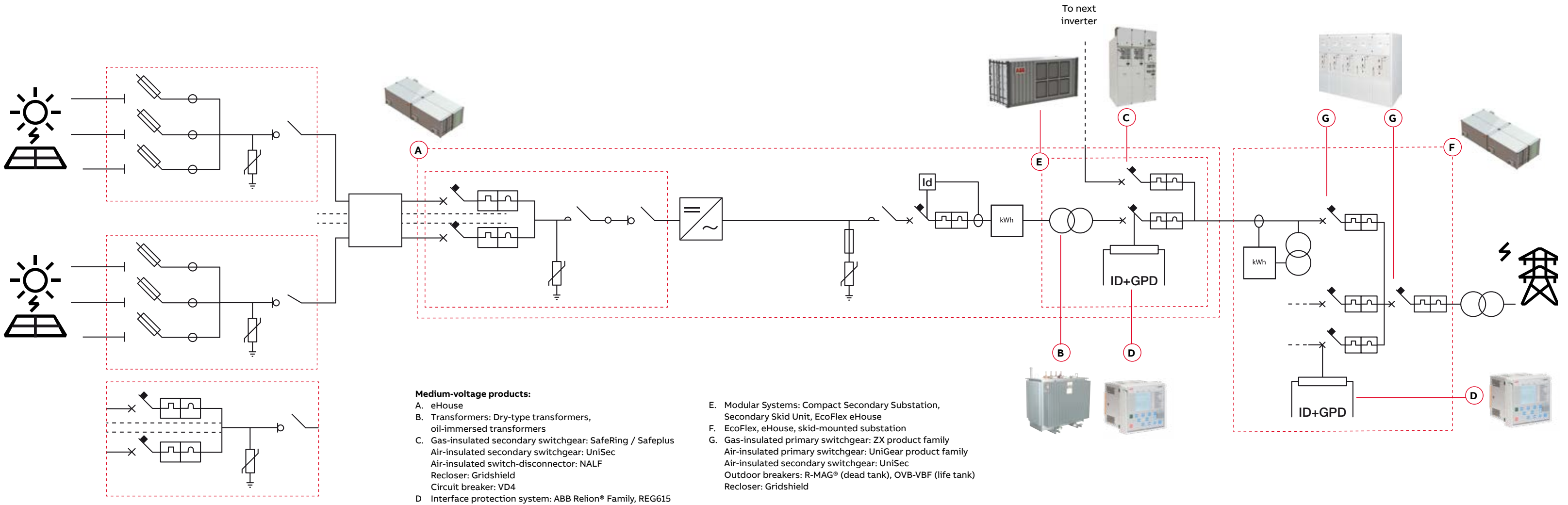
## Utility scale system 1000 kW MV/HV - CENTRAL INVERTERS - Low-voltage products





# Application overview

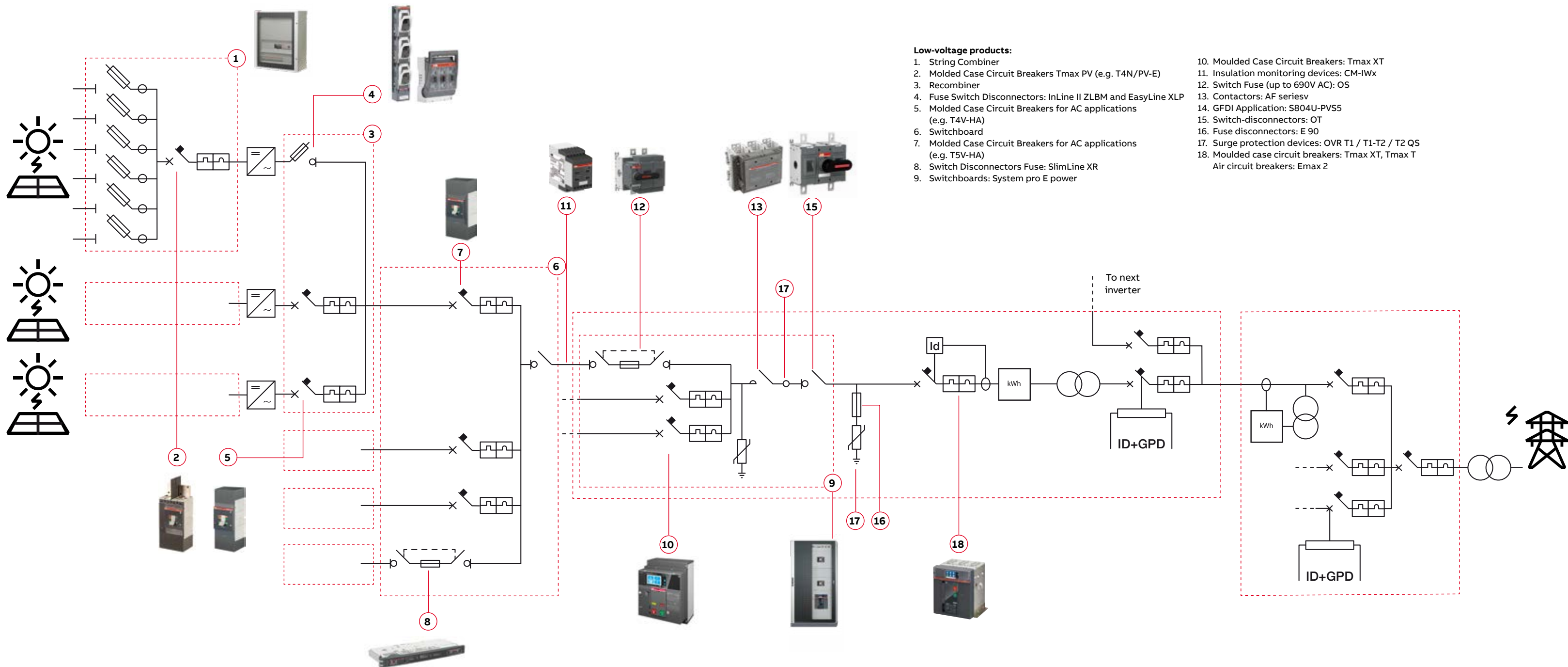
Utility scale system 1000 kW MV/HV - CENTRAL INVERTERS - Medium-voltage products





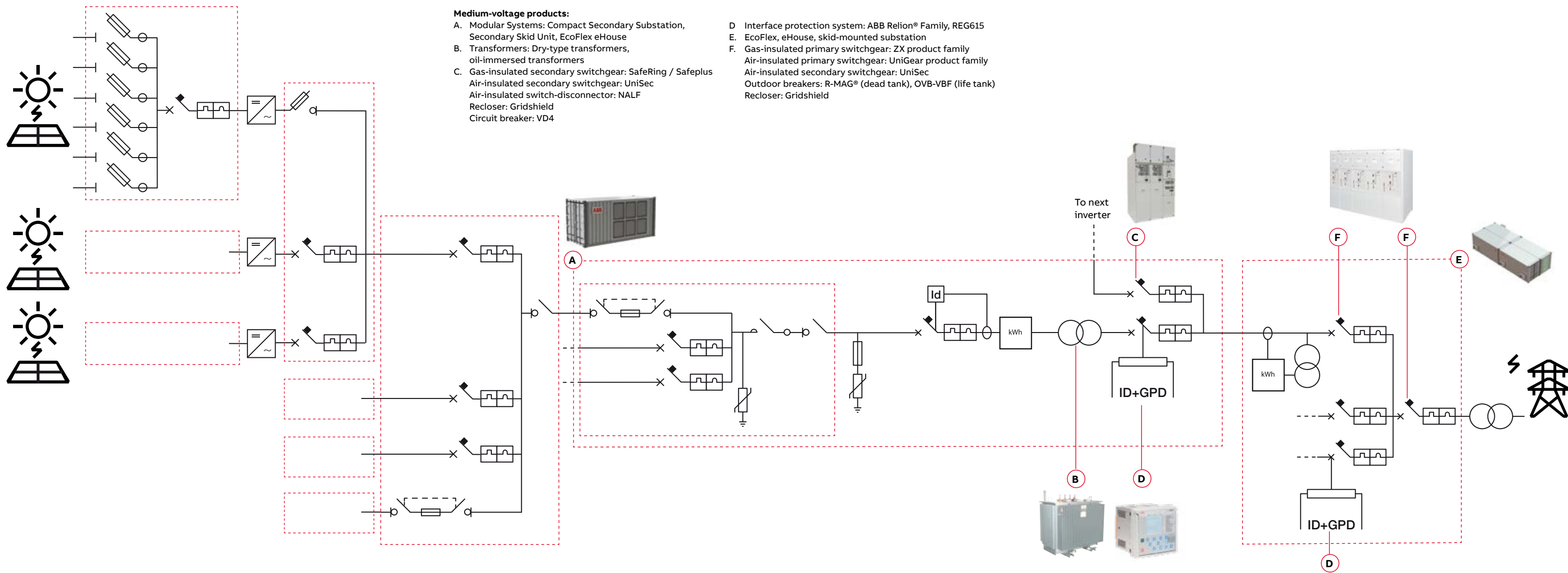
# Application overview

## Utility scale system 1000 kW MV/HV - STRING INVERTERS - Low-voltage products

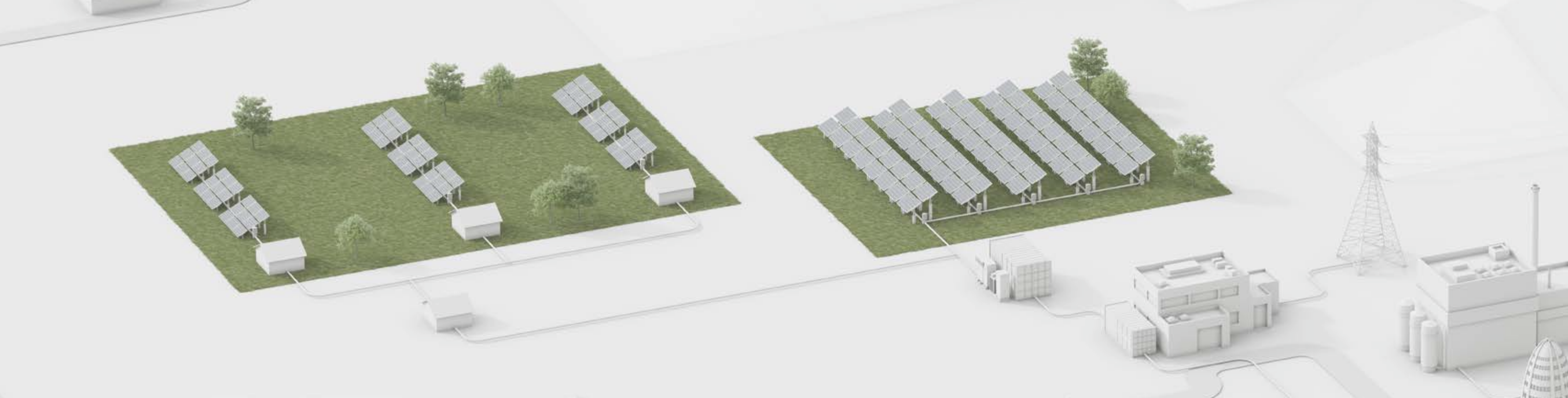


# Application overview

## Utility scale system 1000 kW MV/HV - STRING INVERTERS - Medium-voltage products







DC

## Protection and safety



### String combiner boxes GEMINI

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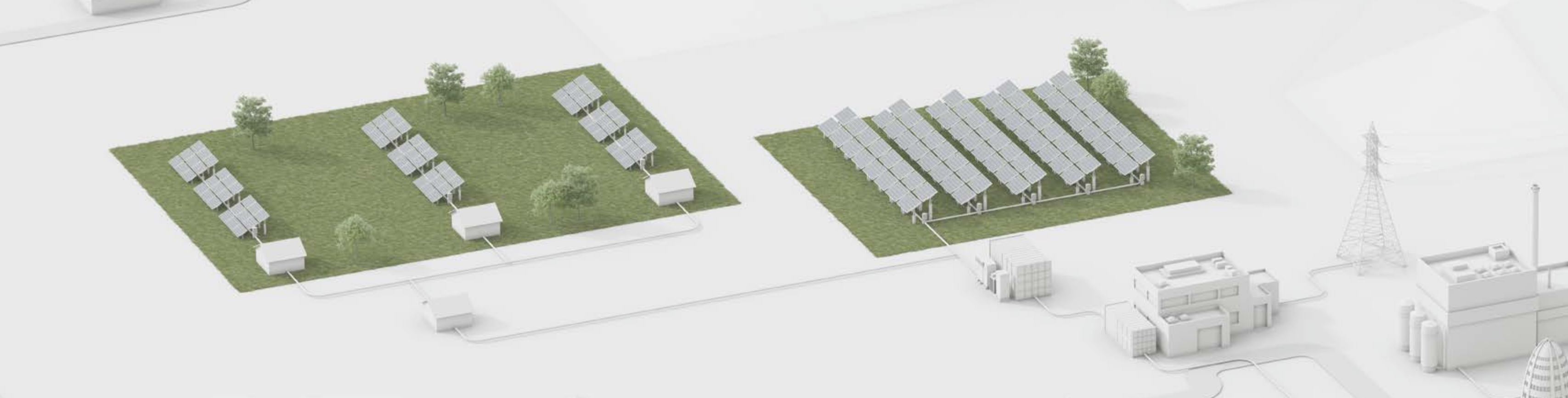
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### S800PV Ground Fault Detector Interrupter

S800PV is used for GFDI application (Ground-Fault Detector Interrupter) in photovoltaic systems. The S804PV-SP5, S804U-PVS5 and S804U-PVSP5 provide ground fault protection according to IEC60947-2 for 1500 VDC, UL489B for 1000 VDC and UL489B (recognized) for 1500 VDC. In case of a ground fault, the breaker will trip, so that the PV generator will not be damaged.



DC

## Switch and disconnection



### DC switch-disconnectors 16...1600 A

The OTDC range of switch-disconnectors from 16 to 1600A is specially designed for DC applications. Thanks to compact design, efficiency and reliability, they bring PV installations to the next level. The versatile OTDC portfolio includes solutions for installations with the most special requirements: 1500 V DC voltages, multi-circuit switching and combined load outputs up to 1600 A.



### SACE Tmax T - PV

The SACE Tmax PV range of molded-case circuit-breakers and switch-disconnectors for IEC and UL applications on both the DC and AC sides of a photovoltaic plant, expands the widely appreciated ability of the SACE Tmax T range to provide the most adaptable and versatile solution for every type of application. The aim is to enhance energy efficiency and limit the rated currents involved, thereby reducing switchgear size, installation time and costs.



### GF contactor

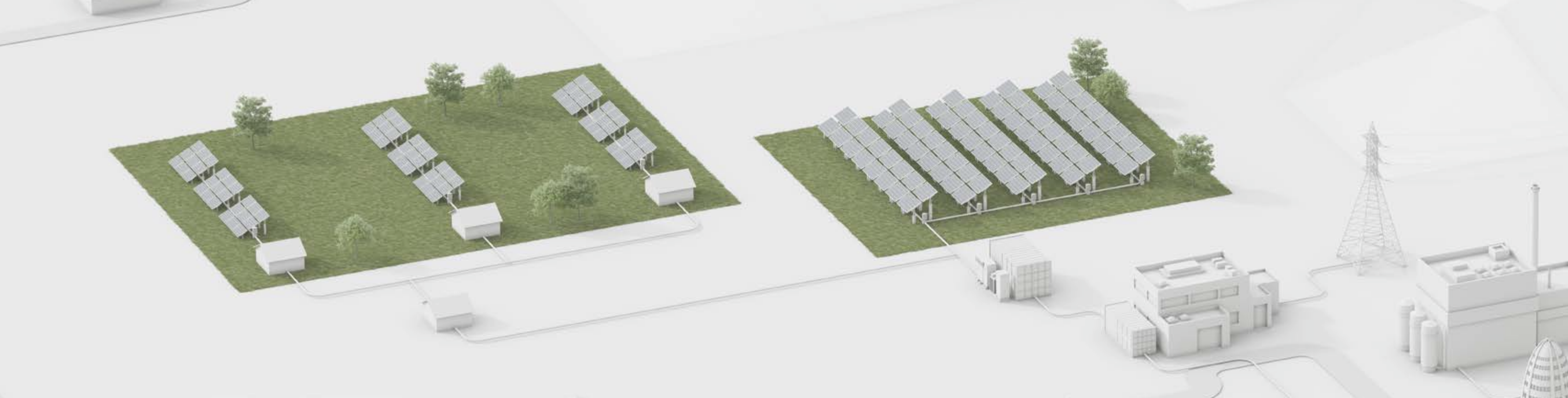
Dedicated contactor for PV solar applications. First ever contactor for new IEC utilization category DC-PV3. Gf contactors range enables automatic, remote and efficient DC switching for 1500V DC solar applications. Bringing energy efficiency, continuous operation and reduced project time to central PV inverter manufacturers.

Standards: IEC/UL

Rated operational voltage  $U_e$  max: 1500V DC

Rated current 1500V DC-PV3: 875...1050 A





DC

## Metering, monitoring and installation



### CMS-660 - Solar string monitoring

How can you detect impairments such as leaves and dirt or even broken cables without great effort?

CMS-660 is a solar monitoring system that remotely checks the DC current produced by each string, allowing to compare it not only with its previous performance but also with the performance of other strings. CMS allows detection of over-voltages, breaker trips or high temperatures.



### Insulation monitoring relays

The insulation monitoring relays of the CM-IWx range guarantee a continuous insulation monitoring of an IT system. The devices recognize insulation faults as they develop and trip immediately if the value falls below the minimum set threshold. This ensures a reliable operation of the system and prevents operational interruption caused by a second, more severe, insulation fault which may lead to a short-circuit trip of the main circuit-breaker.



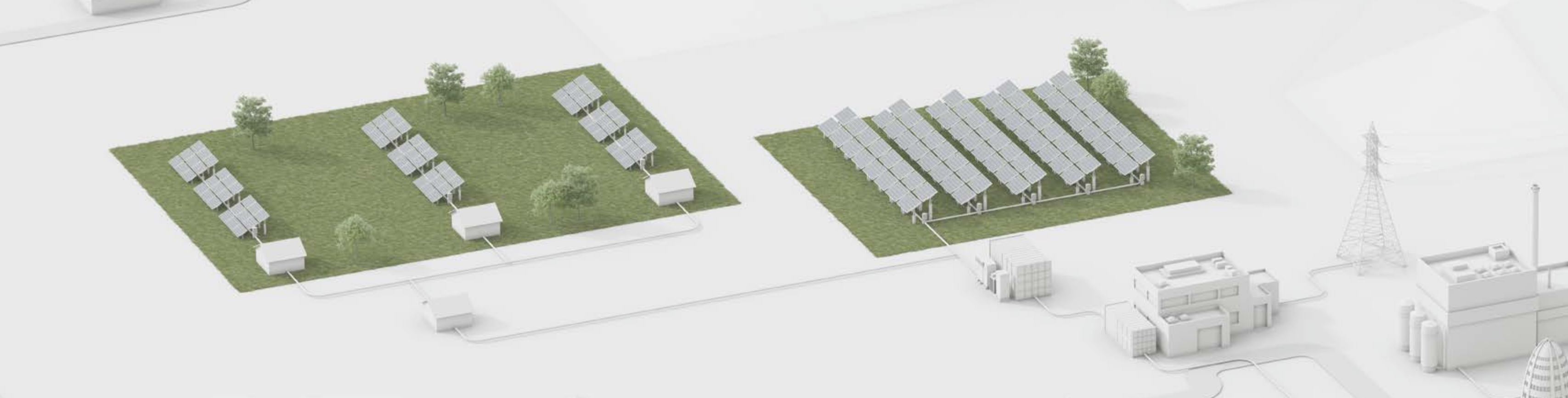
### Conduit & fittings

An electrical system is as reliable as its conductors and conduit systems & fittings, which provide unsurpassed protection for wires and cables in any demanding applications: power generation and solar panels.



### Metal framing & support systems

ABB saves time and labor with its comprehensive lines of metal framing and cable tray, including the industry's only 100% plated products, our 1 1/2" modular system and hundreds of accessories to complete any job.



AC

## Protection and safety



### Residual current devices - RCDs

Residual current devices protect people from life-threatening indirect contacts according to IEC/EN 61008 or IEC/EN 61009 Standards.

ABB offers a comprehensive range of devices like RCCBs, RCBOs, RCD-blocks, Earth Leakage Relays DIN-Rail and front panels in order to cope with all the applications in residential, commercial and industrial segments.



### OVR QuickSafe®

QuickSafe is our new generation of Surge Protective Devices (SPD) with improved performance. Thanks to innovative technology this new range of SPDs covers residential and industrial applications with an extremely good protection level, simple installation and preventive maintenance. All according to IEC/EN 61643-11 Standard.



### SACE Emax 2/E9

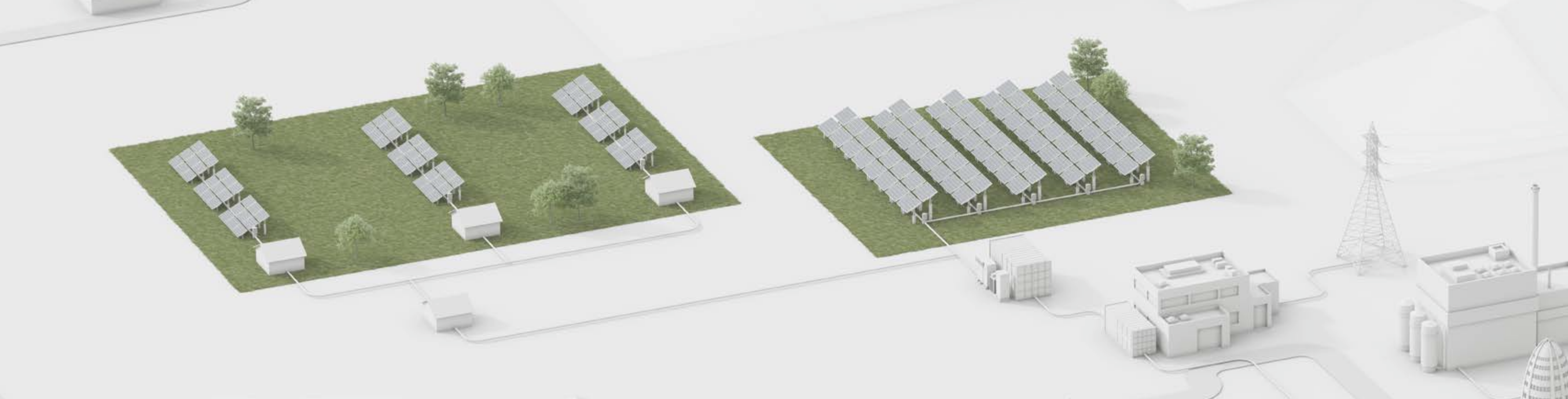
- Smart, plug-and-play architecture, easy to use
- The best performance up to 900V of any device on the market
- The first smart circuit-breaker that enables direct communication with ABB Ability™ EDCS
- Emax 2/E9 all-in-one is the most compact circuit-breaker on the market



### Tmax T4V-HA, T5V-HA and T5X-HA

Tmax PV can be used in plants with voltage up to 800V AC and do not require derating in voltages and breaking capacity up to 4000m. SACE Tmax PV T4V-HA, T5X-HA and T5V-HA circuit-breakers for AC applications are available in UL, IEC 60947-2 and GB14048.2 versions. The T4V-HA bearing the three UL, IEC and CCC marks and T5V-HA bearing both the IEC and UL marks, while T5X-HA fulfils the UL 489 requirements





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AC

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## Switch and disconnection



### Switches

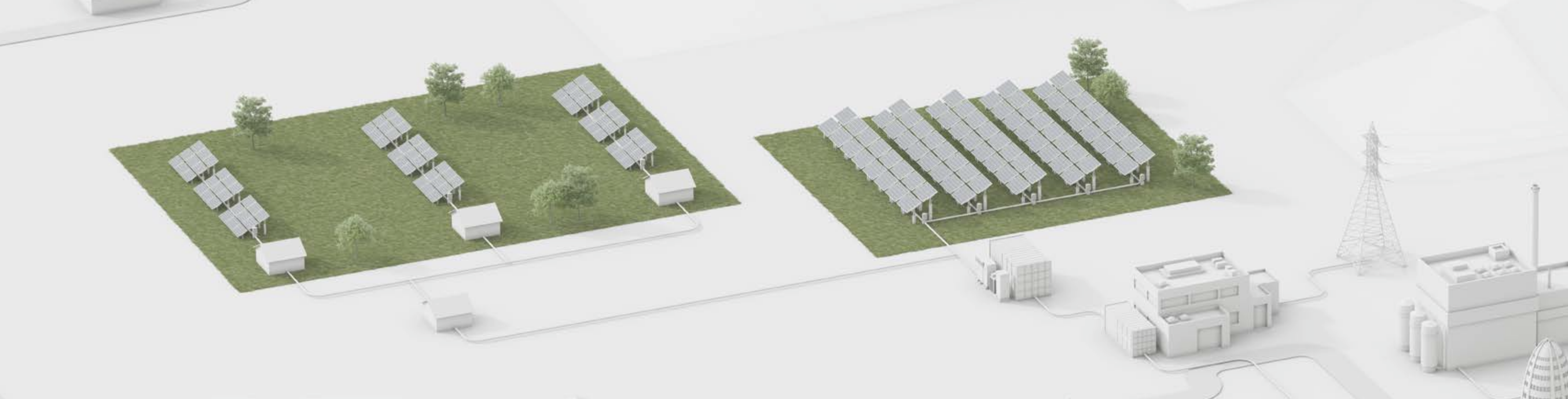
The switch family consists of a complete range of switch-disconnectors, switch fuses, change-over switches, automatic transfer switches, bypass switches, cam switches and fuses.

ABB's switches are designed for flexibility and reliable performance in a wide variety of applications: power distribution for residential and industrial buildings, HVAC, water pumping stations, data centers and photovoltaic installations.



### Fusegear

The 800V AC ratings for InLine II, EasyLine XLP and SlimLine XR ranges are the latest technological update, boosting our Fusegear portfolio performance and making the range a leading-edge solution that anticipates market trends.



AC

# Metering, monitoring and installation



**Energy Meters**  
Energy consumption awareness is key to reduce energy costs and improve energy efficiency on your machines and electrical assets. Energy meters allow to identify areas for improvement and to generate benefits for owners, facility managers and users. They enable to run smarter buildings in a more energy and cost efficient way.



**Circuit Monitoring Systems**  
With the rise of digitalization and the Internet of Things (IoT), data collection from the entire network for analysis becomes easier, enabling optimization of energy usage and assets. From monitoring energy consumption to control of operations and costs, connectivity-based solutions can improve energy efficiency while reducing costs.

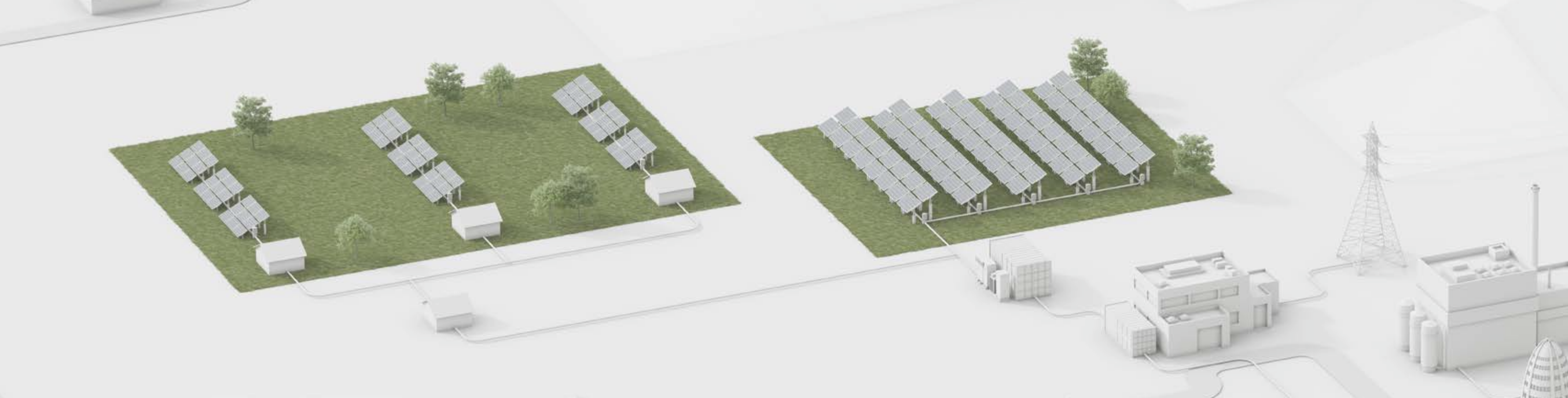


**Grid feeding monitoring relays CM-UFD**  
ABB's CM-UFD range are multi-functional grid feeding monitoring relays, installed between the renewable energy system and the public grid. They detect unusual events in the public power grid and automatically disconnect and reconnect the renewable power plant.



**Power supplies**  
The CP range offers the newest technology in a compact construction of power supplies. Modern power supply units are a vital component in most areas of energy management and automation technology. ABB pays the utmost attention to the resulting requirements. Innovation is the key to a substantial enlargement of our power supply product program.





## POWER COLLECTION



### Unipack CSS

Safe working:

- Internal arc fault and type tested (IEC 62271-202)
- Connected to SCADA
- ABB Ability™ enabled for maintenance and remote management

Optimized life cycle and maintenance cost:

- Corrosion resistant enclosure of Glass Reinforced Polyester
- Fast installation, commissioning and relocation:
- Lightweight and factory assembled
- Flexible with wide range of ratings



### EcoFlex eHouse

Modular, factory assembled and tested, with ISO dimensions:

- Combinable modules
- Seismic rated
- C5M Coating

Risk mitigation, improved lead time and reduced overall cost:

- Minimal site works
- Factory production
- Transportable, configurable and standardized:
- Configurable: electrical equipment, floor/wall material, module combinations
- Reduced engineering
- Standard shipping



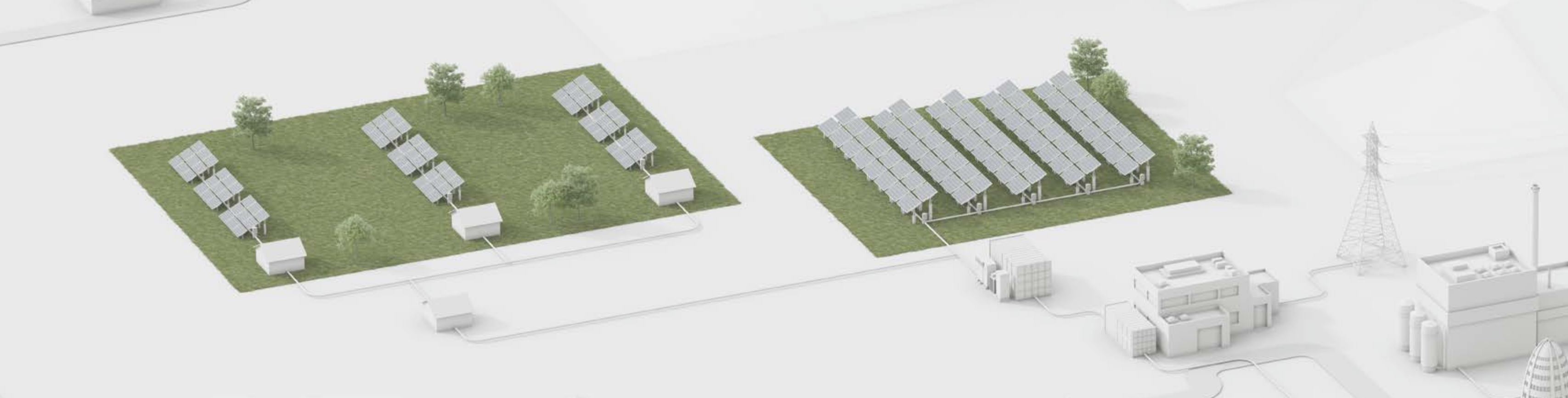
### Secondary Skid Unit

- Pre-configured design solutions
- Factory assembled and routine tested
- One piece delivery for minimizing site works
- Efficient cooling based an open air design with no additional HVAC required
- No exposed live parts
- ABB Ability™ digitally enabled solution providing predictive maintenance and remote management



### Transformers

- Complete range of distribution transformers designed to grant reliability, durability, and efficiency
- Liquid-filled and dry-type transformers
- Services for complete life-cycle support and replacements
- A complete portfolio that maximizes the return on transformer assets, granting a high reliability, reducing life cycle costs and ensuring optimized performance



## GRID CONNECTION



### EcoFlex eHouse

Modular, factory assembled and tested, with ISO dimensions:

- Combinable modules
- Seismic rated
- C5M Coating

Risk mitigation, improved lead time and reduced overall cost:

- Minimal site works
- Factory production

Transportable, configurable and standardized:

- Configurable: electrical equipment, floor/wall material, module combinations
- Reduced engineering
- Standard shipping



### eHouse

- Pre-fabricated transportable switch room for electrical switching and distribution
- Total solution responsibility, risk and design interface by ABB
- Predictable delivery and cost schedule with majority of works performed offsite
- Full factory testing improves energization time
- Simplified project management and single commercial agreement



### Air-insulated switchgear UniGear family

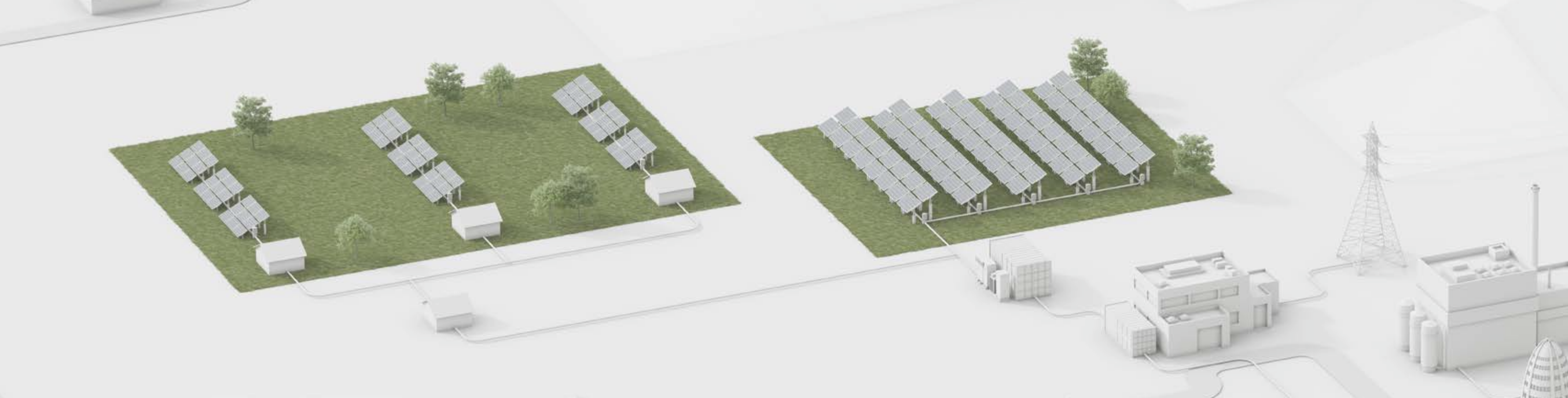
Switchgear for primary distribution up to 40.5 kV. ABB Ability™ UniGear Digital offers flexibility for any application. The digital solution takes advantage of well-proven components: current & voltage sensors, protection relays with IEC 61850 communication to ensure a reliable electrical network.



### Gas-insulated switchgear ZX family

Switchgear for primary distribution up to 40.5 kV. Flexible combination, reliability, availability and economy. Together with complete conventional solutions, the use of digital protection and control technology, sensor systems and plug-in connections make ZX systems fit for the future.





## OTHER PRODUCTS



### Main distribution enclosures

System pro E power is the innovative ABB's main distribution switchboard solution with rated current up to 6300A and short-circuit current up to 120kA. Designed to easily fulfill all electrical installation requirements in terms of protection degree, segregation form and electrical characteristics, according to the latest international Standards and in perfect synergy with all ABB low-voltage equipment.



### Low voltage switchgear

At the core of ABB low-voltage solutions is the MNS solution platform which, in the age of Industry 4.0, has integrated capabilities to sense, collect and analyze the current and upcoming condition of the electrical assembly through ABB Ability™



### External Lightning Protection - OPR

To provide effective protection, the Solar system must be protected against direct lightning strikes and have a proper grounding system in addition to protection against overvoltage on both sides of the inverter. OPR, ESE lightning rod is an active system that protects against direct lightning.



### Scalable Electrical Monitoring and Control Systems

This solution leverages and maximizes ABB portfolio across medium- and low-voltage segments. The deployed products are diverse in nature and include EkipUp units, ABB Ability™ EDCS, COM600, ABB zenon Energy Edition, AC500, AC800M together with ABB Relion/legacy relays, 3rd party devices, MV, LV switchgear and associated systems, using communication protocols and Standards such as IEC 61850, Modbus, IEC 60870-5, Profibus and OPC.



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