
PORTFOLIO OVERVIEW

String combiners for solar photovoltaic systems



String combiners

Unmatched protection and control

In a photovoltaic system the modules are arranged in strings and fields depending on the type of inverter used, the total power and the technical characteristics of the modules. The connection of modules in series is made on the modules themselves, while the parallel connection of the strings is made inside string boxes that accommodate, along with the interconnection systems, also the overcurrent protection devices, disconnectors and surge protection devices.

The string boxes form subsystems that can be standardized according to the number of strings, voltage and rated current. ABB offers different product ranges, each dedicated to specific installation conditions with typical configurations.

01



02



01 String boxes

The installation of a photovoltaic system often occurs in complex logistic situations, critical from the environmental and time perspective. The availability of tested and certified pre-assembled components allows the installer to avoid unnecessary on site assembly, wiring and certification activities for the string boxes. String boxes enclose functions such as string protection, protection against overvoltage and disconnect, with components suitable for the string's various voltage levels and the number of connected strings.

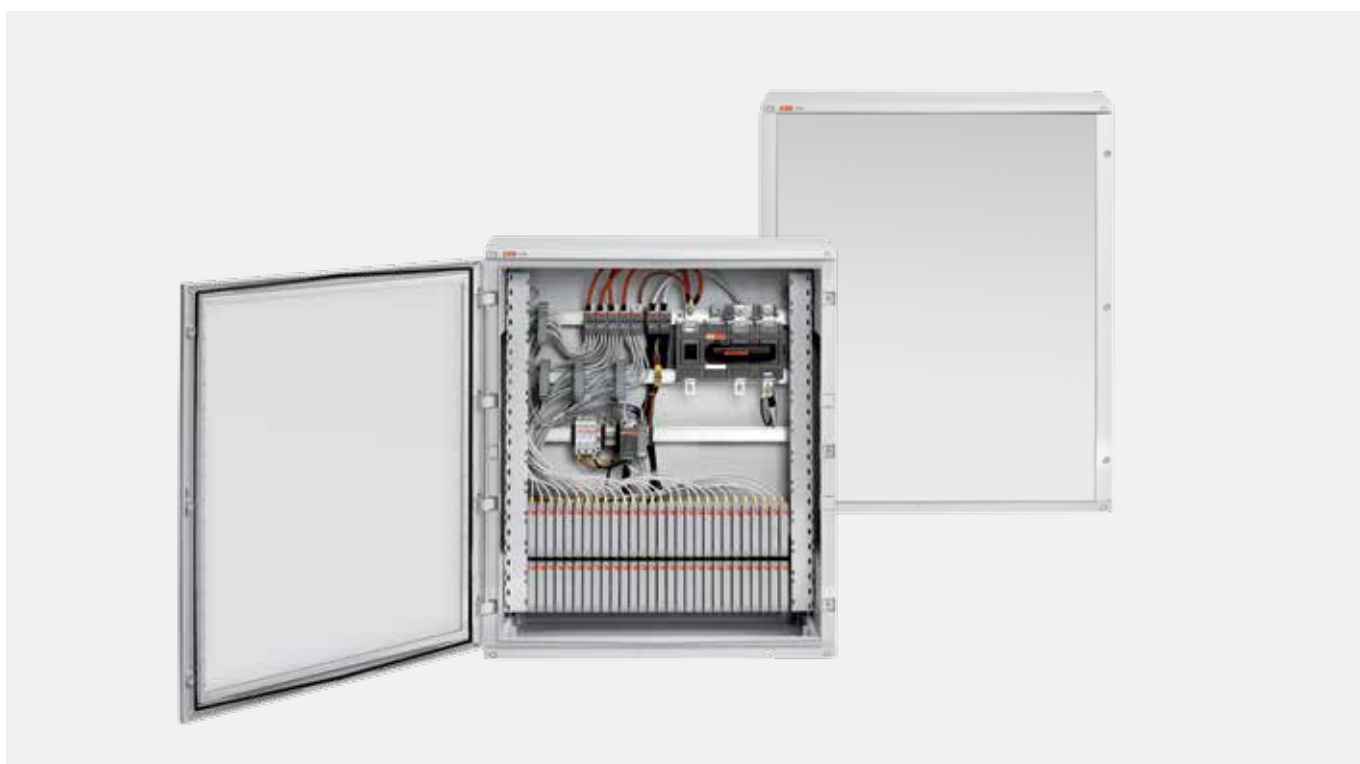
02 Multi-output string boxes

The development and the increasingly frequent adoption of multi-string inverters has made it necessary to reduce the costs and the space occupied by the string boxes, to bring together in a single switchboard the protective devices and disconnectors of multiple strings intended to be connected to a specific inverter input. Multi-string inverters resolve in an easy and cost-effective way system conditions characterized by modules installed in different leaning and exposure positions or minimize the problems related to systematic shading of parts of the system.

03 String boxes for monitoring

The string monitoring is an important function in running medium and large size installations, since it allows to improve the manufacturability and maintenance of the system. ABB offers a series of pre-wired string boxes for all installation conditions: they are equipped both with devices necessary for string protection, surge protection and disconnection, and with useful devices for string monitoring.

03



A complete set of information, a touch away from your fingers

Value added services in combination with products and solutions make ABB offer unique. ABB also provides a wide range of documents and information intended for the renewable energy industry. With services like publications, catalogs, websites, blogs and video tutorials, in digital or printed versions, you can always find a tailor made solution for your requirement and for your applications.

Catalog
Solutions for solar energy. Low- and medium- voltage components and systems.



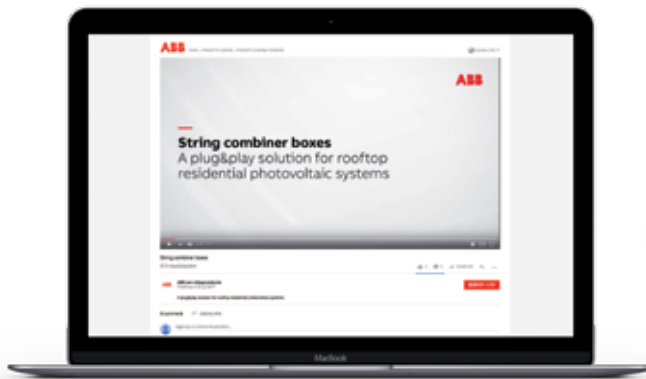
A valuable technical resource accompanying the designer during the engineering stage for implementation of a photovoltaic installation, from initial specifications to commissioning. This publication describes in depth the aspects concerning not only the basic architectures, but also the specific components required for engineering, inspection and management of a photovoltaic system, both on the DC and AC sides.

In addition to schematics and detailed circuit diagrams, the catalog illustrates the complete offer for ABB photovoltaic applications, ranging from safety assemblies to string combiners and recombiners, through switches, disconnecting switches, panels and accessories.



Video

String combiner boxes.



A video that shows how string combiner boxes are the best plug&play solution for photovoltaic systems, ensuring top protection through high quality components, maximum flexibility thanks to a wide range of models and sizes, and fast installation with ready-to-use configurations.

Video tutorials

Garage Nuggets.



GEMINI challenges the sun.



Multipurpose outdoor enclosures.



These video tutorials provide the user with a clear and direct approach to the applications of the solar energy industry, taking advantage of a large impact audiovisual communication. Information on installations, products and regulations are offered in a graphically attractive appearance for a quick learning. In Garage Nugget No. 5 and 6 “Multipurpose outdoor enclosures” and “Gemini challenges the sun” the narrating voice describes the ABB product portfolio for photovoltaic market. Specifically, the videos provide a detailed description of Gemini enclosure features, manufactured with techniques and materials conceived to withstand the environmental conditions and safety of photovoltaic systems, both outdoor and indoor.

A complete set of information, a touch away from your fingers

A website gathering all of the digital resources related to low-voltage products for photovoltaic applications. Product specifications, Application Notes, regulatory studies, case studies, social network groups, newsletters... a contribution towards the culture of renewable energies, capitalizing not only the know-how of the experts of our group, but also the expertise of installers and designers who use ABB products worldwide.

Website

Low-voltage products for solar power.

Blog

Conversations.



An online resource providing the opportunity to navigate through the wide portfolio of products, system and low-voltage solutions by ABB. A valuable tool for an in-depth analysis of the aspects related to the value of photovoltaic chain, with dedicated contents concerning creation, transmission and distribution of energy in both on-grid and off-grid applications.



Join the conversation on the current changes in trends and technologies. In this tagged blog you can subscribe the channel dedicated to renewable energies or any thematic channel to ask questions, share your opinions with other users of the community and download documentation concerning solar and wind-power applications.

Website

Solar power solutions.



ABB provides the widest portfolio of products, solutions and services available in the photovoltaic industry. The “Solar power solutions” website is a portal which provides access to every information resources of the ABB group, giving the opportunity to navigate among case histories, references of projects, catalogs, news, service proposals and much more.

Website

Solar inverters.



A link dedicated to the widest and most complete portfolio of photovoltaic inverters in the industry. From the small string inverters in single-phase to three-phase inverters and up to the multi megawatt for centralized installations. Product specifications, informational resources, but also the ABB technical and the sales support services are just a click away.

Website

Medium-voltage products.



A portal dedicated to medium-voltage photovoltaic applications, specially to systems related to networks and micro-networks. The medium-voltage product range for solar applications includes a complete range of switchgear solutions, energy storage modules, compact secondary substations, outdoor apparatus and components and indoor air-insulated load break switches, specially designed to meet the most stringent specifications of medium-voltage photovoltaic applications.

Website

Turnkey stations.

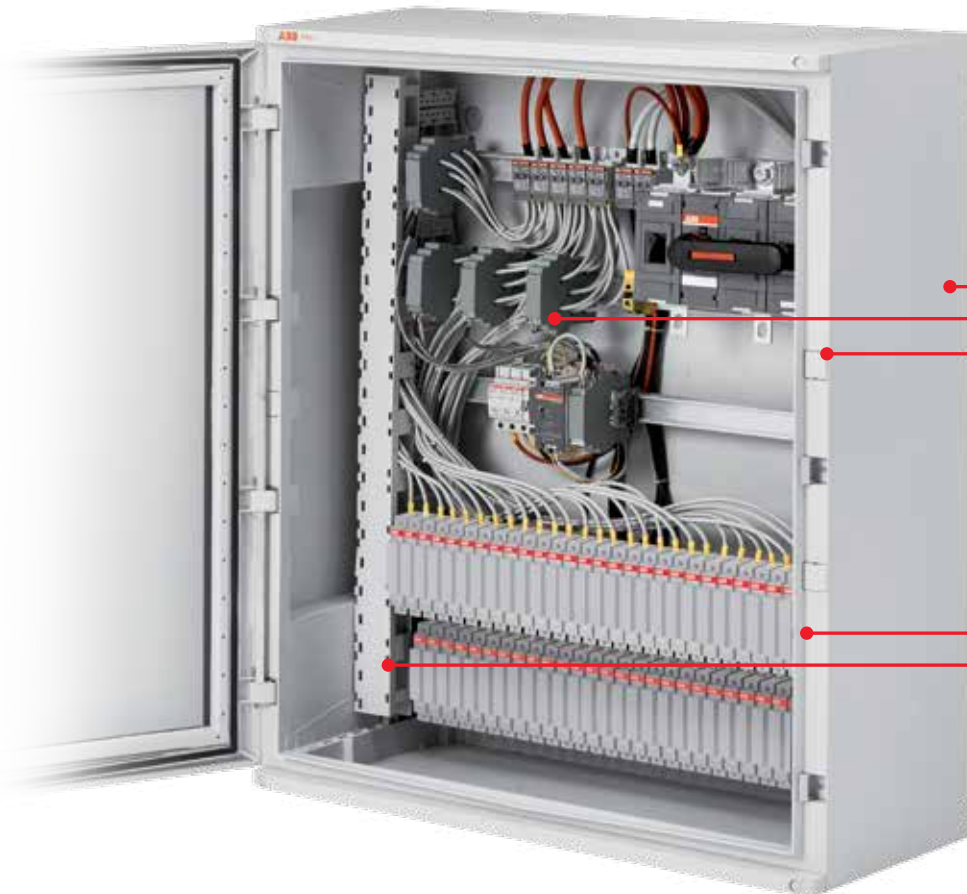


In an increasingly dynamic and challenging context, ABB “turnkey” solutions allow the users to implement plug-and-play photovoltaic stations, already equipped with all of the active and passive components required for one-click commissioning.

This website is specially dedicated to low voltage cabinets, components and inverters for indoor and outdoor applications in the range between 440 kW and 3.1 MW.

String combiner

Range plus



Complete range to address the requirements in residential, commercial and utility scale projects in 1000V DC and 1500V DC applications.



Per le esigenze poste da condizioni climatiche estreme fino a 50 °C.



Thermoplastic manufactured with co-injection technique ensuring highest sturdiness but very lite in total weight as compared to metal enclosures.

Design, production, quality and service

An essential factor in determining the success of a photovoltaic system is the accurate selection of its components, with particular attention to connections, and protections from the modules to the inverters. As the photovoltaic system has to perform for more than 20 years in harsh environments, the products used should be considered of high quality and as a good investment for long lasting performance. The string combiners are particularly important as they are usually installed under the photovoltaic panels and therefore exposed to the most harsh environment.

- ABB combiners host ABB components specifically made for photovoltaic applications, making it easy during maintenance to rely on one single producer and supplier, from components to the whole system.
- Capacity to deliver all over the world at your site.
- Comprehensive documentation for easy assembly at site.
- Service and support through ABB local sales organization worldwide.



— IP66 enclosures for extreme outdoor conditions resistant to atmospheric conditions and dusty environments.



— Components selected for protection are based on best in class photovoltaic products (OTDC Disconnectors, OVR PV SPDs, E 90 PV Fuse Holders, Gemini thermoplastic outdoor enclosures).



— Thermoplastic material, 100% recyclable make it environmentally friendly.



— IP20 protection of components inside the combiner - No live parts are accessible directly inside the combiners ensuring safety of the installers.



— Efficient design enabling to have configurations from 1 to 32 strings in a single enclosure, making it easy for logistics and installation at site.



— Development and assembly process in accordance to the latest IEC Standards.



— 100% quality Inspection before dispatch, ensuring highest level of reliability.



— String combiner box with monitoring options. Available with monitoring of current, voltage, temperature and status of disconnectors and/or surge protection devices. Communication over RS485 ensuring easy integration with the plant / inverter monitoring systems.

String combiner 1000V DC

Technical features

String combiner type	1 st.	2 st.	3 st.	4 st.	6 st.	8 st.	10 st.	12 st.	14 st.	16 st.	18 st.	20 st.	24 st.	28 st.	32 st.	
General Data																
Maximum Voltage	1000VDC															
No of DC Input (+ & -, optional)	1	2	3	4	6	8	10	12	14	16	18	20	24	28	32	
SPD protection	Type 2 Pluggable															
String protection	No			Per each incoming string												
Monitoring	No								Optional							
Monitoring Parameters	No								Current, temperature and SPD signal as standard. Optional to include Voltage and Disconnecter signal							
Communication Protocol	No								Modbus RTU							
Enclosure Type																
Model	Europa					Gemini										
Material Type	Thermoplastic															
Door Type/ Opening	Transparent, Hinged Door					Opaque, Hinged Door openable 180 Deg										
Lock Type	Click on push to lock					Doors supplied with 2 standard double bit locks (3 for sizes 5 and 6)										
Rated Service Voltage	1000VDC															
Degree of resistance to impacts	IK 10															
Degree of protection	IP65					IP66										
Recyclable	100%															
Environmental data																
Operating Temperature °C	-20°C upto +50°C															
Storage temperature °C	-20°C upto +60°C															
Resistance to Abnormal heat and fire	upto 750°C															
Height above Sea level	Up to 2000m															
Humidity	up to 95%															
DC Input																
Input Cable entry	M16 Cable Gland, 2,5 - 16 mm ²															
Input Connection	Terminals			Directly on the Fuse Holder												
Fuse Type	No fuse			Cylindrical 10x38 gPV												
Fuse Size				15A												
DC Output																
Output Cable gland +/-	M16	M16	M16	M16	M25	M25	M25	M32	M32	M32	M32	M40	M40	M40	M40	
Clamping cable diameter (m ²)	2,5-16				25-50			70-120				150-240				
Conductor material	Copper/Alluminium															
Terminal Type	Pipe terminal					Ring Terminal										
Voltage DC	1000VDC															
Maximun current output	10A	20A	30A	40A	60A	80A	100A	120A	140A	160A	180A	200A	240A	280A	320A	

String combiner 1500V DC

Technical features

String combiner type	16 st.	18 st.	20 st.	24 st.	28 st.	32 st.
General Data						
Maximum Voltage (VDC)	1500					
No of DC Input	16	18	20	24	28	32
DC input for + & -	Optional available					-
SPD protection	Type 2 Pluggable					-
Monitoring	Optional					-
Monitoring Parameters	Current, temperature and SPD signal as standard. Optional to include Voltage and Disconnecter signal					-
Communication Protocol	Modbus RTU					-
Enclosure Type						
Model	Gemini					
Material Type	Thermoplastic					
Door Type/ Opening	Opaque, Hinged Door openable 180 Deg					
Lock Type	Doors supplied with 2 standard double bit locks (3 for sizes 5 and 6)					
Rated Service Voltage	1500VDC					
Degree of resistance to impacts	IK10					
Degree of protection	IP66					
Recyclable	100%					
Environmental data						
Operating Temperature °C	-20°C upto +50°C					
Storage temperature °C	-20°C upto +60°C					
Resistance to Abnormal heat and fire	upto 750°C					
Height above Sea level	Up to 2000m					
Humidity	up to 95%					
DC Input						
Input Cable entry	M16 Cable Gland, 2,5 - 16 mm ²					
Input Connection	Directly on the Fuse Holder					
Fuse Type	Cylindrical 10x85 gPV					
Fuse Size (A)	15					
DC Output						
Output Cable gland	M32	M32	M40	M40	M40	M40
Clamping area	70-120		150-240			
Conductor material	Copper/Alluminium					
Terminal Type	Ring Terminal					
Voltage DC	1500					
Maximum Current Output (A)	160A	180A	200A	240A	280A	320A



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Main catalog:
String combiners for solar photovoltaic systems.
A plug & play solution for photovoltaic solar installations

Cod. 1SLC009000D0201

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