

Compact Secondary Substation (CSS) Solar Power Collection application

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CSS is a Compact Secondary Substation solution designed for large scale solar power generation.

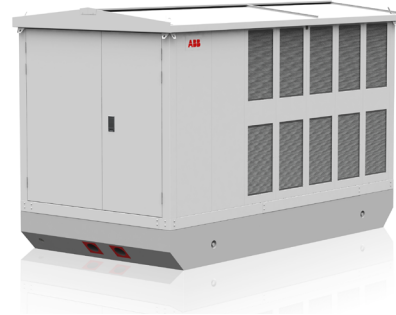
The CSS consists of a type-tested assembly of MV switchgear and a transformer in an enclosure, usually installed as close to the solar strings as possible, enabling the solar collection unit to be easily and rapidly connected to the electricity grid.

Features

- Simple and quick installation – pre-test units at the factory, drop in place and connect cables
- Pre-engineered products to reduce time to quote and supply, while reducing risks
- Engineered for efficient cooling to extend life of equipment
- All ABB designs are green to support the environment
- No exposed live parts, more safe for operator and personnel
- SCADA ready
- All equipment contained in the solar modules are type tested according to their relevant standards
- High level of reliability and safety for equipment and personnel (internal arc tested IAC-AB)
- Type tested according to IEC/AS/GB standards for prefabricated substations, IEC 62271-202 or applicable
- Fully enclosed solutions
- Most enclosure materials available in industry
- All doors are lockable to prevent unauthorized entry
- Concrete enclosure with increased corrosion resistance
- Glass Reinforced Polyester (GRP) housings to meet demanding environmental conditions
- Enclosures are compartmented and electrically segregated for safety
- CSS designs include an oil collection pit for environmental protection in case of oil leakage
- Walk in option for ease of service
- Separate access entries to MV and transformer

Transformer

The CSS is capable to accept either oil immersed or dry type transformers. The transformer characteristics are specifically designed to be fully compatible with the requirements of inverter application. The transformer can be provided with alarm and trip contacts for temperature and gas pressure.



Medium voltage

The CSS can be provided with different options of medium voltage switchgear from ABB's SF6 or air insulated switchgear portfolio. The MV switchgear can be provided with SF6 gas alarm, switch position contacts, plug-in MV surge arresters or auto reclosing functions.

Low voltage

The low voltage protection is included in the inverter equipment. LV cables are directly connected to the transformer LV bushing.

Housing

The housing is a product of ABB's long experience in producing CSS globally. The transformer and switchgear are in their own compartments. Each compartment is optimized to provide air circulation to the transformer and switchgear respectively.

The ABB CSS portfolio has options for different enclosure materials. Glass fiber Reinforced Polyester (GRP) is the optimal design for solar applications due to the following features: light, robust, and patented double layer non-corrosive material making it suitable for harsh and demanding environments.

Smart Grid

- Smart grid ready for easy connection to any SCADA system through any standard communication protocols
- Remote Terminal Unit (RTU) to monitor the SSU and store data for operation, maintenance and fault analysis
- Local and remote monitoring commands available
- Smart grid compatibility provides supervision and operation of substations from a central office by utilizing end user communication and infrastructure and ABB Station automation device

Pre-engineered solution technical data

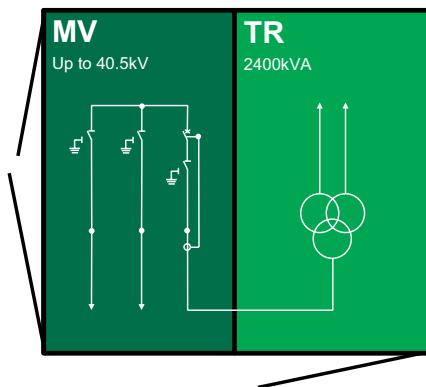
Pre-designed solutions are available for optimized designs and quicker delivery. Power ratings are aligned with the most common inverter power ratings. The solutions are equipped with medium voltage switchgear SafeRing CCV configuration

(cable loop with breaker and relay protection). The transformer includes standard integrated protection for pressure and gas (RIS). Product datasheets are available with an overview of other options available. Pre-designed solutions for Power Collection are shown below:

| Style number | CSS-S-1510-0CCV-4000 | CSS-S-2410-0CCV-3000 | CSS-G-1510-0CCV-4000 | CSS-G-2410-0CCV-2000 |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|
| Enclosure type | Steel | Steel | GRP | GRP |
| Overall parameters | | | | |
| Length x Width x Height, mm | 3950 x 2200 x 2700 | 3950 x 2200 x 2700 | 4500 x 2470 x 2810 | 4500 x 2470 x 2810 |
| Approximate weight (metric tons) | 11.5 | 13.0 | 12.0 | 12.0 |
| MV switchgear | | | | |
| Switchgear type | SafeRing CCV | SafeRing CCV | SafeRing CCV | SafeRing CCV |
| Protection Relay | REJ603 | REJ603 | REJ603 | REJ603 |
| Transformer | | | | |
| Transformer type | oil immersed | oil immersed | oil immersed | oil immersed |
| Power rating, kVA | 1500 | 2400 | 1500 | 2400 |
| LV Voltage level, V | 300 to 400 | 300 to 400 | 300 to 400 | 300 to 400 |
| MV Voltage level, kV max | 13.8 | 40.5 | 13.8 | 24 |
| Standard protection | RIS | RIS | RIS | RIS |

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Single line diagram/layout (without inverter)



For more information please contact:

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General technical data

| | |
|---|------------------|
| Nominal output voltage range | 6 kV to 40.5 kV |
| Ambient temperature range | -25 °C to +40 °C |
| Relative humidity, non-condensing | 95% |
| Max altitude above sea level w/out derating | 1000m |
| Corrosion class (ISO 12944-2) | C4M |
| IP rating, MV compartment/transformer | IP44/IP23D |

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