

ABB megawatt station

PVS800-MWS – 1 to 2.4 MW



The ABB megawatt station is a compact plug-and-play solution designed for large-scale solar power generation. It houses all the electrical equipment that is needed to rapidly connect a photovoltaic (PV) power plant to a medium voltage (MV) electricity grid. All the components within the ABB megawatt station are from ABB's product portfolio.

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01 ABB megawatt station PVS800-MWS – an optimized plug-and-play solution for large-scale solar power generation

Turnkey-solution for PV power plants

The ABB megawatt station design capitalizes on ABB's long experience in developing and manufacturing secondary substations for utilities and major endusers worldwide in conventional power transmission installations.

A station houses two ABB central inverters, an optimized transformer, MV switchgear, a monitoring system and DC connections from solar array. The ABB megawatt station is used to connect a PV power plant to a MV electricity grid easily and rapidly. To meet the PV power plant's demanded capacity, several ABB megawatt station can be used.

Compact design eases transportation

The housing is based on a standard, insulated, steel-framed 40-foot High Cube shipping container. The small inverter footprint makes

the container compact and easy to lift via a standard crane. The total package weighs only 21 metric tons. The optimized shipping container solution ensures cost-effective and safe transportability to the site. The station's optimized air circulation and filtering system together with thermal insulation enable operation in harsh temperature and humidity environments. The ABB megawatt station is designed for at least 25 years of operation.

Highlights

- Proven technology and reliable components
- Compact and robust design
- High total efficiency
- Modular and serviceable system
- Embedded auxiliary power distribution system
- Extendable manufacturing footprint with fast deliveries
- Global life cycle services and support

PVS800-MWS

Solar inverters

ABB solar inverter, PVS800 is a result of decades of industry experience and the use of proven frequency converter technology. As such the PVS800 solar inverter provides a highly efficient and cost-effective way to convert the direct current, generated by solar modules, into high-quality and CO₂-free alternating current. Two or one ABB central inverters are used in the ABB megawatt station. The inverters provide high conversion efficiency with low auxiliary power consumption.

Transformer

The ABB megawatt station includes an ABB vacuum cast coil dry-type transformer. The transformer is designed to meet the reliability, durability, and efficiency required in PV applications. It is specifically designed and optimized for ABB solar inverters to provide the best performance throughout the lifetime of the plant.

The transformer is environmentally safe, having no volatile liquids that can leak, and it carries no fire risk. It provides excellent mechanical and short-circuit characteristics.

As a major global transformer manufacturer, ABB offers a wide range of dry-type transformers. Alternate power transformers are available to meet customer requirements. All ABB's transformers are manufactured in accordance with the most demanding industry and international standards.

Switchgear

ABB offers a complete range of medium voltage switchgear for secondary distribution, including air-insulated and gas-insulated switchgear.

The ABB megawatt station is equipped, as standard, with the widely proven ABB SafeRing, SF₆-insulated switchgear.

A sealed steel tank with constant atmospheric conditions ensures a high level of reliability as well as personnel safety. The virtually maintenance-free system comes in a compact and flexible design that allows for a versatile switchgear configuration. As an option ABB's gas-insulated SafePlus and air insulated Unisec switchgear are also available.

Technical data and types

Type code	PVS800-MWS-1000kW-C	PVS800-MWS-1750kW-B	PVS800-MWS-2000kW-C
Input (DC)			
DC voltage range, mpp ($U_{DC, mpp}$)	600 to 850 V	525 to 825 V	600 to 850 V
Maximum DC voltage ($U_{DC, max}$) ¹⁾	1100 V	1100 V	1100 V
Maximum DC current ($I_{DC, max}$)	1710 A	2 x 1710 A	2 x 1710 A
Voltage ripple, PV voltage (U_{PV})	< 3%	< 3%	< 3%
Number of protected DC inputs (parallel)	8...10 (+/-)	2 x 8...10 (+/-)	2 x 8...10 (+/-)
Number of mppt trackers	1	2	2
Output (AC)			
Nominal AC output power ($P_{AC, N}$)	1000 kW	1750 kW	2000 kW
Maximum AC output power ($P_{AC, max}$) at 20 °C	1200 kW	2100 kW	2400 kW
Voltage range (U_{AC})	6...36 kV	6...36 kV	6...36 kV
Output frequency	50/60 Hz	50/60 Hz	50/60 Hz
Harmonic distortion, current ²⁾	< 3%	< 3%	< 3%
Power factor compensation (cos φ)	Yes	Yes	Yes
Inverter type	1 x PVS800-57-1000kW-C	2 x PVS800-57-0875kW-B	2 x PVS800-57-1000kW-C
Transformer type ³⁾	ABB Vacuum cast coil dry-type		
Medium voltage switchgear type ⁴⁾	ABB SafeRing / Safeplus		
Efficiency			
Maximum ⁵⁾ (inverter only)	98.6%	98.7%	98.8%
Euro-eta ⁵⁾ (inverter only)	98.2%	98.5%	98.6%

¹⁾ If DC voltage is > 1000 V, the inverter will not be damaged, but will not start

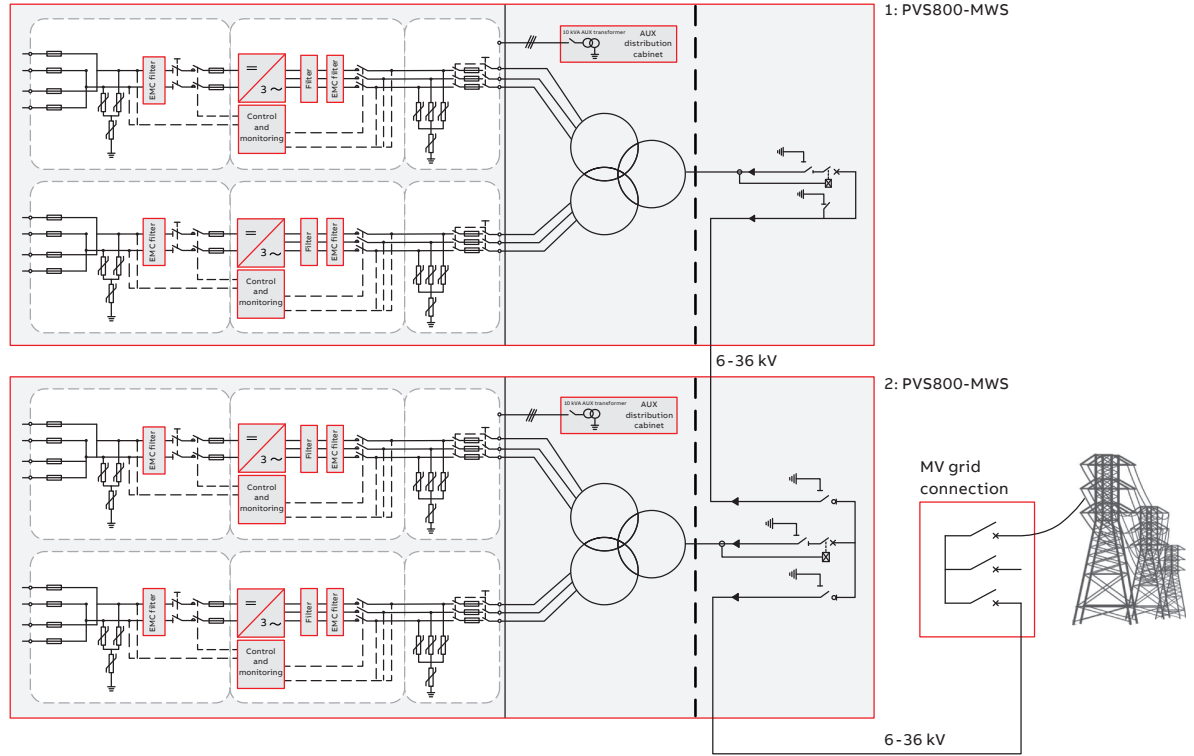
²⁾ At nominal power

³⁾ Other ABB transformer types available as an option

⁴⁾ Other ABB switchgear types available as an option

⁵⁾ Inverter efficiency without auxiliary power consumption, at lowest DC voltage

ABB megawatt station design and grid connection



Type code	PVS800-MWS-1000kW-C	PVS800-MWS-1750kW-B	PVS800-MWS-2000kW-C
Power consumption			
Own consumption in operation ⁶⁾	< 1000 W	< 1300 W	< 1300 W
Standby operation consumption ⁶⁾	< 300 W	< 300 W	< 300 W
External auxiliary voltage	3 ~ 400 V/50 Hz	3 ~ 350 V/50 Hz	3 ~ 400 V/50 Hz
Dimensions and weight			
Width/Height/Depth, mm	40' HC container (12190/2900/2440)	40' HC container (12190/2900/2440)	40' HC container (12190/2900/2440)
Weight approx.	< 19 t	< 21 t	< 21 t
Environmental limits			
Degree of protection	IP43 (IP54 optional)	IP43 (IP54 optional)	IP43 (IP54 optional)
Ambient temperature range (nominal ratings)	-15 to +45 °C	-15 to +45 °C	-15 to +45 °C
Maximum ambient temperature ⁷⁾	+50 °C	+50 °C	+50 °C
Relative humidity, non condensing	15 to 95%	15 to 95%	15 to 95%
Maximum altitude (above sea level) ⁸⁾	2000 m	2000 m	2000 m
User interface and communications			
Local user interface	Inverter's control panel and PC interface through ABB Drive Window		
Fieldbus connectivity	Modbus, PROFIBUS, Ethernet		
Product compliance			
Conformity	IEC 60364, IEC 61936-1, IEC 60502-1		
Grid support	Reactive power compensation, Power reduction, Low voltage ride through		

⁶⁾ Without options and heating

⁷⁾ Power derating after 40 °C / 45 °C

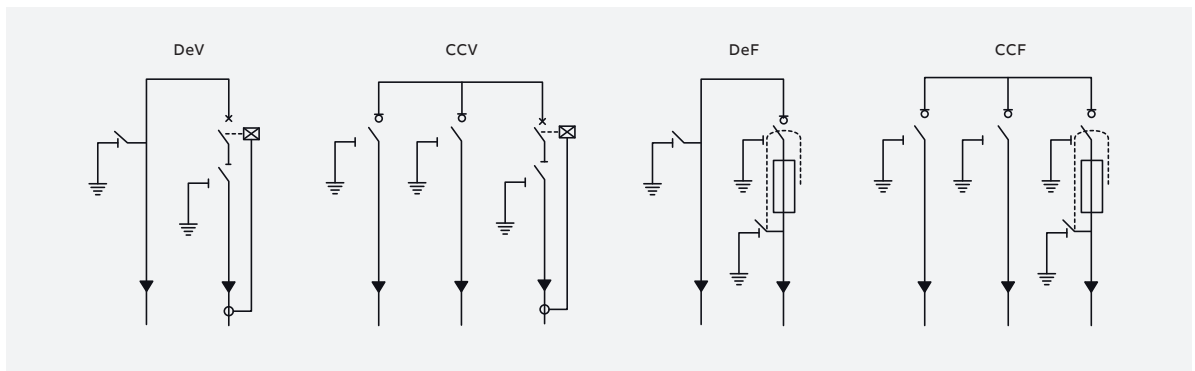
⁸⁾ Power derating above 1000 m. Above 2000 m special requirements.



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02 Inside view of PVS800-MWS with two PVS800 inverters, MV transformer and MV switchgear

MV switchgear standard configurations for ABB megawatt station



Accessories

- Solar array junction boxes with string monitoring
- Remote monitoring solutions
- Warranty extensions
- Solar inverter care contracts

Options

- MV AC output voltages (6 to 36 kV)
- Different MV switchgear configurations
- I/O extensions
- Fieldbus and Ethernet connections
- Auxiliary power supply from main power connections
- Salinity or sand storm filtering units
- C5M enclosure corrosion protection

Support and service

ABB supports its customers with a dedicated service network in more than 60 countries and provides a complete range of life cycle services from installation and commissioning to preventative maintenance, spare parts, repairs and recycling.

For more information please contact your local ABB representative or visit:

www.abb.com/solarinverters
www.abb.com

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