

# ABB megawatt station PVS800-MWS 1 to 1.25 MW



The ABB megawatt station is a turnkey 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 megawatt station are from ABB's product portfolio.

#### 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 end-users 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 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 stations can be combined.

#### Compact design eases transportation

The steel-framed insulated container comes complete with a concrete foundation. A thermally insulated inverter compartment enables operation in harsh temperature and humidity environments and is designed for at least 25 years of operation.

The hollow concrete foundation has a double floor within the inverter compartment. This provides easy access for cabling. Additionally the small inverter footprint makes the container compact and easy to lift via a standard crane, thereby simplifying transportation.

The complete ABB megawatt station weighs only 20 tons. At 50 m<sup>3</sup>, the container's volume is some 15 percent smaller than equivalent solutions.

#### Highlights

- Proven technology and reliable components
- Compact and robust design
- High total efficiency
- Modular and serviceable system
- Double-stage air pre-filtering for reduced maintenance
- Global life cycle services and support

# ABB megawatt station

## Solar inverters

ABB solar inverters are the result of decades of industry experience and the use of proven frequency converter technology. As such the solar inverters provide a highly efficient and cost-effective way to convert the direct current, generated by solar modules, into high-quality and CO<sub>2</sub>-free alternating current. Two ABB central inverters are used in the ABB megawatt station. The inverters provide high efficiency conversion with low auxiliary power consumption.

## Transformer

The ABB megawatt station features 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 or explosion risk. It provides excellent mechanical and short-circuit characteristics.

As a major global transformer manufacturer, ABB offers a wide range of liquid-filled and 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-20	PVS800-MWS-1250kW-20
	1 MW	1.25 MW
<b>Input (DC)</b>		
Maximum input power ( $P_{PV,max}$ )	2 × 600 kW	2 × 760 kW
DC voltage range, mpp ( $U_{DC, mpp}$ )	450 to 825 V	525 to 825 V
Maximum DC voltage ( $U_{DC, max}$ ) <sup>1)</sup>	1000 V	1000 V
Maximum DC current ( $I_{DC, max}$ )	2 × 1145 A	
Voltage ripple, PV voltage ( $U_{PV}$ )	< 3%	< 3%
Number of protected DC inputs (parallel)	2 × 8 (+/-)	2 × 8 (+/-)
Number of mppt trackers	2	2
<b>Output (AC)</b>		
Nominal AC output power ( $P_{AC, N}$ )	1000 kW	1250 kW
Nominal AC current ( $I_{AC, N}$ )	28.9 A	36.1 A
Nominal output voltage ( $U_{AC, N}$ ) <sup>2)</sup>	20 kV	20 kV
Output frequency	50/60 Hz	50/60 Hz
Harmonic distortion, current <sup>3)</sup>	< 3%	< 3%
Power factor compensation (cosφ)	Yes	Yes
Inverter type (2 x ABB central inverters)	PVS800-57-0500kW-A	PVS800-57-0630kW-B
Transformer type <sup>4)</sup>	ABB Vacuum cast coil dry-type	
Medium voltage switchgear type <sup>5)</sup>	ABB SafeRing type DeV with REJ603 protection relay (self-powered)	
<b>Efficiency</b>		
Maximum <sup>6)</sup> (including transformer)	97.8%	97.8%
Euro-eta <sup>6)</sup> (including transformer)	97.1%	97.3%

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

<sup>2)</sup> Voltages between 6 and 24 kV available as an option

<sup>3)</sup> At nominal power

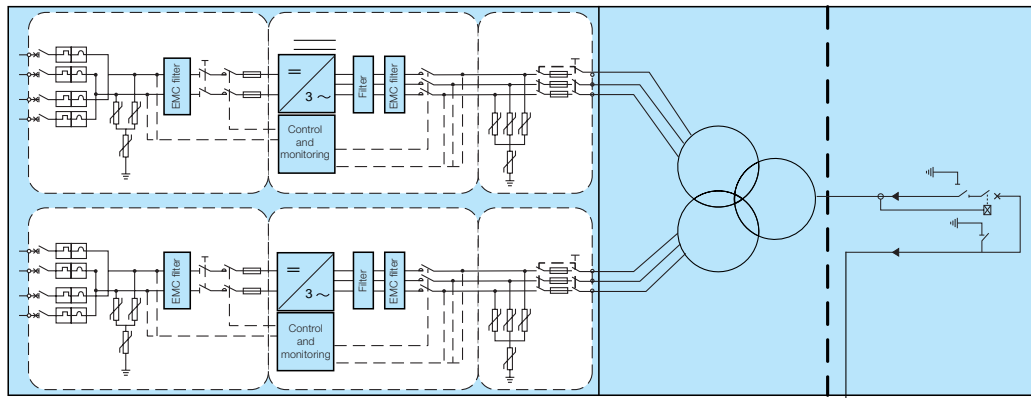
<sup>4)</sup> Other ABB transformer types available as an option

<sup>5)</sup> Other ABB switchgear types available as an option

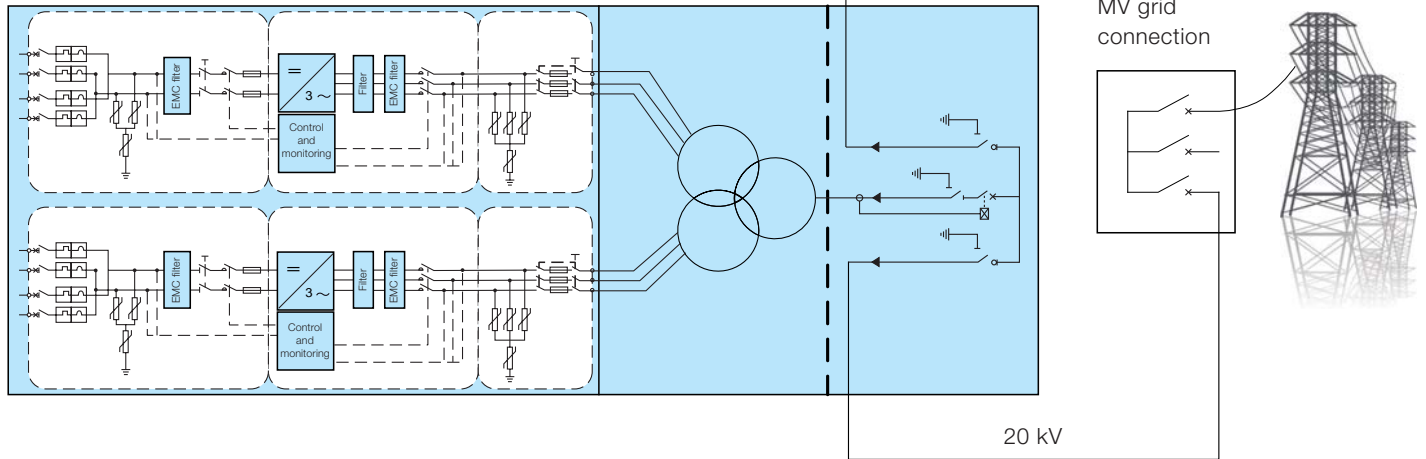
<sup>6)</sup> Efficiency without auxiliary power consumption, at lowest DC voltage

# ABB megawatt station design and grid connection

## 1: PVS800-MWS



## 2: PVS800-MWS



Type code	PVS800-MWS-1000kW-20	PVS800-MWS-1250kW-20
	1 MW	1.25 MW
<b>Power consumption</b>		
Own consumption in operation <sup>7)</sup>	< 1200 W	< 1200 W
Standby operation consumption <sup>7)</sup>	< 140 W	< 140 W
External auxiliary voltage	3 ~ 400 V/50 Hz	3 ~ 400 V/50 Hz
<b>Dimensions and weight</b>		
Width/Height/Depth, mm	W 6930/H 3070/D 2430	W 6930/H 3070/D 2430
Weight approx.	20 t	21 t
<b>Environmental limits</b>		
Degree of protection	IP54 (inverter section)/IP23d (transformer and switchgear section)	IP54 (inverter section)/IP23d (transformer and switchgear section)
Ambient temperature range (nominal ratings)	-20 to +40 °C	-20 to +40 °C
Maximum ambient temperature <sup>8)</sup>	+50 °C	+50 °C
Relative humidity, non condensing	15 to 95%	15 to 95%
Maximum altitude (above sea level) <sup>9)</sup>	2000 m	2000 m
Maximum cooling air flow	6720 m <sup>3</sup> /h	6720 m <sup>3</sup> /h
<b>User interface and communications</b>		
Local user interface	Inverter's control panel and PC interface through ABB Drive Window	
Fieldbus connectivity	Modbus, PROFIBUS, Ethernet	
<b>Product compliance</b>		
Conformity	IEC 62271-202 High-voltage/low-voltage prefabricated substation	
Certifications and approvals	BDEW	
Grid support	Reactive power compensation, Power reduction, Low voltage ride through	

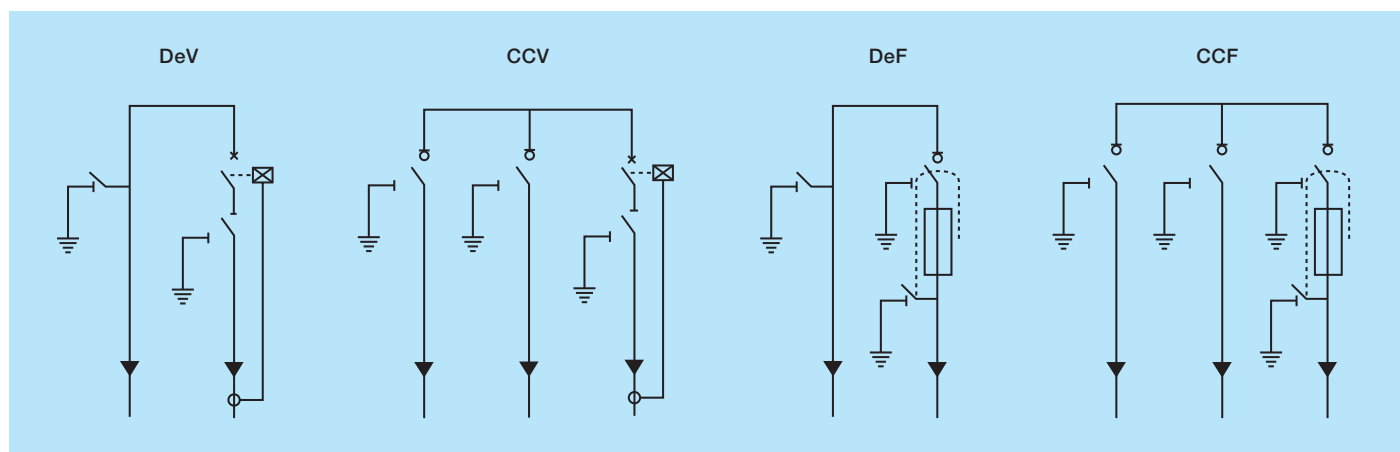
<sup>7)</sup> Without options and heating

<sup>8)</sup> Power derating after 40 °C

<sup>9)</sup> Power derating above 1000 m. Above 2000 m special requirements.



### 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 24 kV)
- Different MV switchgear configurations
- Air-insulated MV switchgear
- Optional liquid-filled and dry-type transformers
- I/O extensions
- DC grounding (negative and positive)
- Fieldbus and Ethernet connections
- Auxiliary power supply from main power connections

#### 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](http://www.abb.com/solarinverters)  
[www.abb.com](http://www.abb.com)

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