

ABB megawatt station

PVS980-MWS – 3.6 to 4.6 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, PVS980-MWS, with two PVS980 central inverters, MV transformer and MV switchgear

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 outdoor 1500 V_{DC} ABB central inverters, an optimized ABB dry type- or oil immersed 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 station has standard, 40-foot High Cube shipping container dimensions. The small inverter footprint makes the station compact and easy to lift via a standard crane. The total package weighs less than 30 metric tons. The standardized shipping dimensions ensures cost-effective and

safe transportability to the site even overseas. The station's optimized air circulation and filtering system together with thermal insulation for dry type transformer or open air design for oil immersed transformer enable installations to various ambient conditions, from harsh desert temperatures to cold and humid environments. The ABB megawatt station is designed for at least 25 years of operation.

Highlights

- Proven technology and reliable components
- Compact and robust design
- Outstanding endurance for outdoor use
- High DC input voltage up to 1500 V_{DC}
- High total efficiency
- Extensive DC and AC side protection
- Self-contained cooling system for inverters
- Modular and serviceable system
- Embedded auxiliary power distribution system
- Extendable manufacturing footprint with fast deliveries
- Global life cycle services and support

PVS980-MWS

Solar inverters

Like other ABB central inverters, the PVS980 has been developed on the basis of decades of experience in the industry and proven technology platform. Unrivalled expertise from the world's market and technology leader in frequency converters is the hallmark of this solar inverter series. The PVS980 inverter is one of the most efficient and cost-effective ways of converting the direct current (DC) generated by solar modules into high quality and CO₂-free alternating current (AC) that can be fed into the power distribution network. Two ABB central inverters are used in the ABB megawatt station. The inverters provide high conversion efficiency with low auxiliary power consumption with very low maintenance need.

Transformer

The ABB megawatt station includes an ABB vacuum cast coil dry-type- or alternatively ABB oil immersed 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.

As a major global transformer manufacturer, ABB offers a wide range of 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.

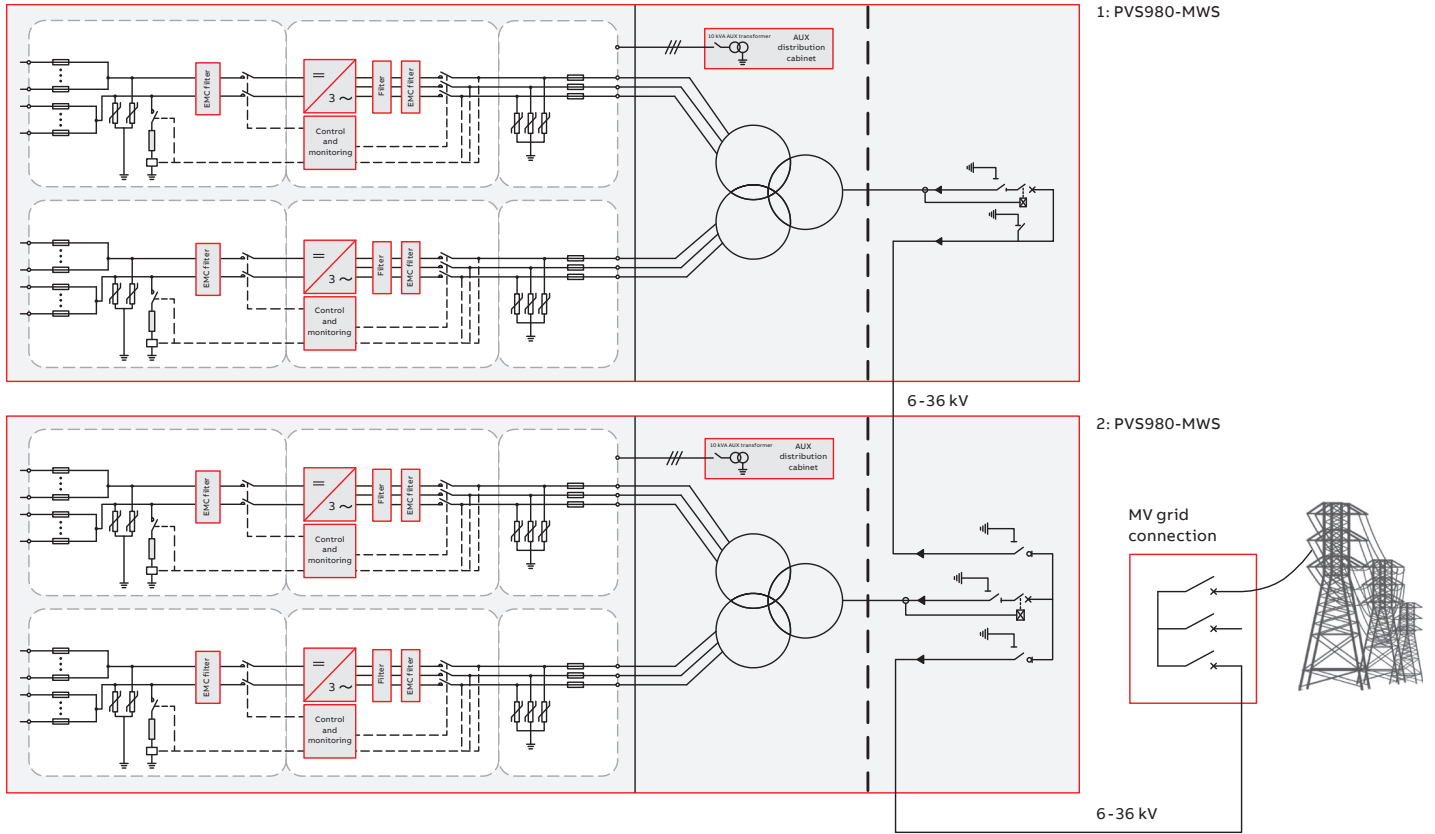
Technical data and types

Type designation ¹⁾	-3636kVA-I-xx-zzz	-3818kVA-J-xx-zzz	-4000kVA-K-xx-zzz	-4182kVA-L-xx-zzz
Maximum rating	4000 kVA	4200 kVA	4400 kVA	4600 kVA
Input (DC)				
Maximum input power ($P_{PV,max}$)	2x2909 kWp	2x3056 kWp	2x3200 kWp	2x3346
DC voltage range, mpp ($U_{DC,mpp}$) @ 35 °C (122°F)	850...1500 V	893...1500 V	935...1500 V	978...1500 V
(@ S_{nom}) @ 50 °C (122°F)	850...1100 V	893...1100 V	935...1100 V	978...1100 V
Maximum operational DC voltage ($U_{DC,max}$)	1500 V			
Number of protected DC inputs (parallel)	2x8 (up to 24 as option)			
Number of mppt trackers	2			
Output (AC)				
Inverter type (2x ABB central inverter)	PVS980-58-1818kVA-I	PVS980-58-1909kVA-J	PVS980-58-2000kVA-K	PVS980-58-2091kVA-L
Nominal AC output power ($S_{N(AC)}$) @ 50 °C (122°F)	3636 kVA	3818 kVA	4000 kVA	4182 kVA
Maximum AC output power ($S_{MAX(AC)}$) @ 35 °C (122°F)	4000 kVA	4200 kVA	4400 kVA	4600 kVA
Medium voltage range ($U_{N(AC)}$)	12 kV to 36 kV ²⁾			
Output frequency	50/60 Hz			
Harmonic distortion, current ³⁾	< 3%			
Power factor compensation (cosφ)	Yes			
Transformer type	ABB Vacuum cast coil dry type (AF), or ABB Oil immersed type (ONAN)			
Medium voltage switchgear type ⁴⁾	ABB SafeRing, SF ₆ -insulated, DeV, CV or CCV			
Enclosure	Painted steel outdoor enclosure, IP54, C4 corrosion protection			
Efficiency				
Maximum (inverter only)	98.8%			
Euro-eta (inverter only)	98.6%			

¹⁾ Where xx-medium voltage level, zzz-transformer type, oil or dry
²⁾ Nominal voltage 12 kV to 36 kV, from 6 kV on as option

³⁾ At nominal power
⁴⁾ Other ABB switchgear types available as an option

ABB megawatt station design and grid connection



Technical data and types

Type designation ¹⁾	-3636kVA-I-xx-zzz	-3818kVA-J-xx-zzz	-4000kVA-K-xx-zzz	-4182kVA-L-xx-zzz
Maximum rating	4000 kVA	4200 kVA	4400 kVA	4600 kVA
Power consumption				
Own consumption in operation	≤ 5500 W / ≤ 7700 W ⁵⁾			
Standby operation consumption	≤ 800 W			
Auxiliary voltage for customer use	3 ~ 400 V/50 Hz, up to 40 kVA			
Dimensions and weight				
Width/Height/Depth, mm	12190 mm/2900 mm/2440 mm (40' HC container dimensions)			
Weight approx.	< 30 t			
Environmental limits				
Degree of protection	Inverter IP56/IP66, UL Type 3R. IP44/54 RMU and dry type transformer housing			
Ambient temperature range (nominal ratings) ⁶⁾	-20 °C to +50 °C			
Maximum altitude (above sea level) ⁷⁾	1000 m			
Relative humidity, non condensing	5% to 95%			
User interface and communications				
Local user interface	Inverter's control panel and PC interface through ABB Drive Studio			
Fieldbus connectivity	Modbus RTU, -TCP, Ethernet IP, Profinet			
Product compliance				
Conformity	IEC 60364, IEC 61936-1, IEC 60502-1			
Grid support	Reactive power compensation ⁸⁾ , Power reduction, LVRT, HVRT, FqRT			

⁵⁾ ≤ 5500 W with oil type transformer, ≤ 7700 W with dry type transformer
⁶⁾ Extended range upon request

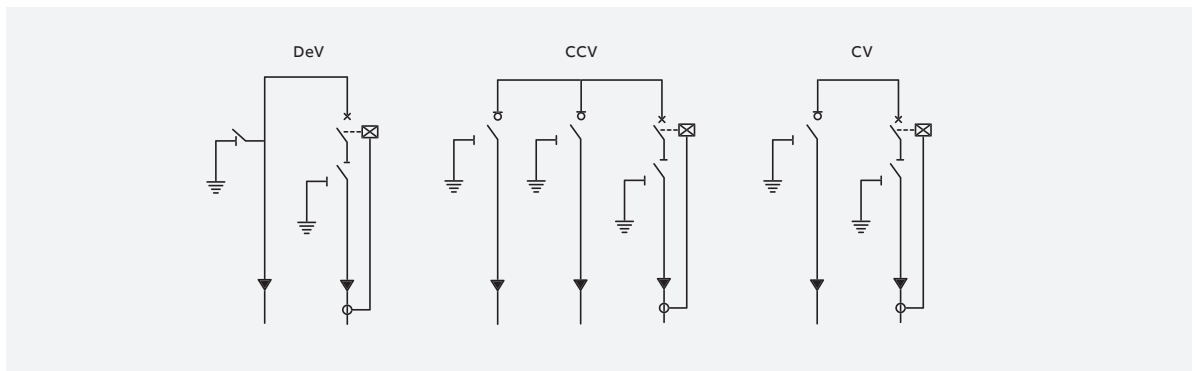
⁷⁾ Higher altitude upon request
⁸⁾ Also during the night



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02 ABB megawatt station, PVS980-MWS - a compact plug-and-play solution for utility-scale PV plants

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
- DC grounding, positive
- Floating DC
- Fieldbus and Ethernet connections
- Auxiliary power supply from main power connections
- 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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