

Solar inverters

ABB turnkey stations PLUS-STATION 530 to 1200 kW



Turnkey solutions using 67 kW modular inverters. These solutions are for managing large solar installations directly connected to the medium voltage grid, with nominal outputs up to 1.2 MW.

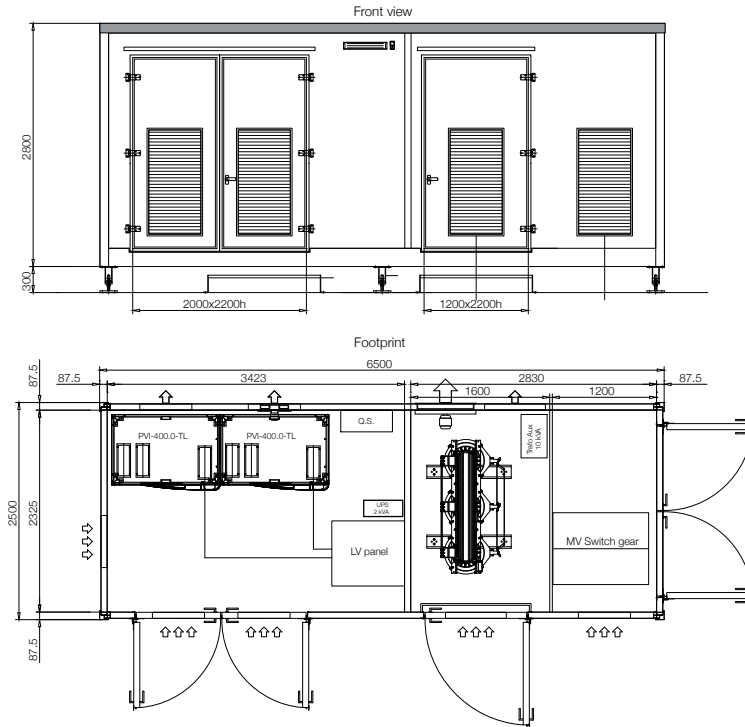
These compact and reliable products are not only highly scalable, but also have a high power density, thanks to the series of central inverters. Furthermore, the use of LV/MV low-loss transformers ensures maximum levels of efficiency and return on investment.

The ease of maintenance of the complete solution is ensured by the optimum layout of the components, making them easily accessible for repairs, as well as by the modular structure of the central inverters.

Highlights

- Turnkey solution for managing large solar installations
- Nominal output up to 1.2 MW
- Extremely compact design, thanks to the use of the series of 67 kW inverters
- Maximized energy collection, thanks to the modular structure of the inverters and the use of low-loss medium-tension transformers
- Modular inverters giving maximum flexibility

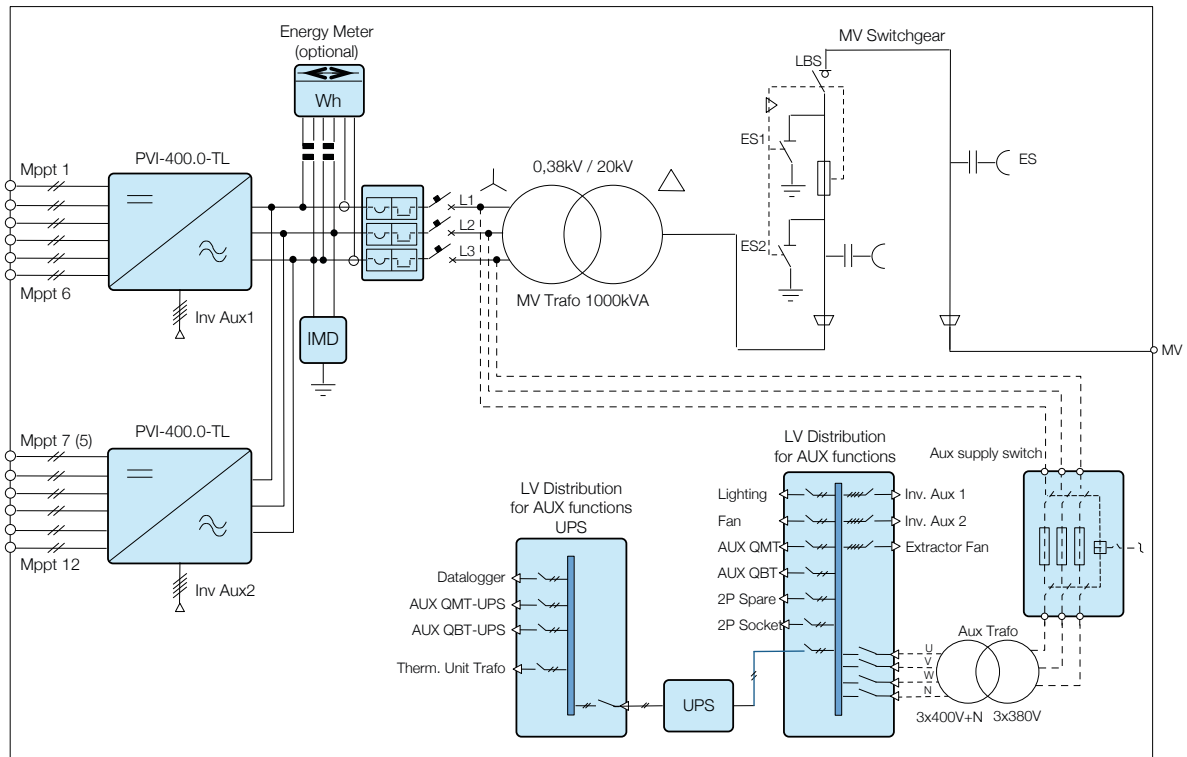
Footprint PLUS-STATION-800.0



Technical data and types

Type code	PLUS-STATION-530.0	PLUS-STATION-665.0	PLUS-STATION-800.0
Inverter ⁽¹⁾	PVI-267.0-TL PVI-267.0-TL	PVI-400.0-TL PVI-267.0-TL	PVI-400.0-TL PVI-400.0-TL
Input parameters (DC)			
Absolute maximum input voltage ($V_{dc,max}$)	1000 V	1000 V	1000 V
MPPT input voltage range ($V_{MPPTmin}, \dots, V_{MPPTmax}$)	570 - 850 V	570 - 850 V	570 - 850 V
MPPT input voltage range at full power ($V_{MPPTmin,f}, \dots, V_{MPPTmax,f}$)	570 - 800 V	570 - 800 V	570 - 800 V
Number of independent MPPT in multi-master configuration ⁽²⁾	8	10	12
Number of independent MPPT in multi-master/slave configuration ⁽²⁾	4	6	6
Number of independent MPPT in master/slave configuration ⁽³⁾	2	2	2
Total maximum input current ($I_{dc,max}$)	984 A	1230 A	1476 A
Number of DC input pairs	8	10	12
Max. DC input wire section (each polarity) ⁽⁴⁾	4x185mm ² + 4x300mm ² (M10) or 16x 120mm ² (M10)	5x185mm ² + 5x300mm ² (M10) or 20x 120mm ² (M10)	6x185mm ² + 6x300mm ² (M10) or 24x 120mm ² (M10)
Standard equipment-input			
Reverse polarity and backfeed current protection (each input)		Yes, with series diode	
Input fuse overcurrent protection (each input/both polarities) ⁽⁵⁾	125A/1000V	125A/1000V	125A/1000V
Load-breaking DC switch (each input) ⁽⁵⁾	200A/1000V	200A/1000V	200A/1000V
Input overvoltage protection - varistors	1 for each MPPT channel Type II		
Output parameters (AC) at medium voltage			
Rated output power ($P_{ac,r}$)	528 kW	660 kW	792 kW
Rated output current ($I_{ac,r}$)	15,2 A	19,0 A	22,8 A
Rated output voltage ($V_{ac,r}$) ⁽⁶⁾	20 kV	20 kV	20kV
Rated output frequency (f)	50 Hz	50 Hz	50Hz
Rated power factor (cos ϕ)	>0,995 (adj. $\pm 0,90$)	>0,995 (adj. $\pm 0,90$)	>0,995 (adj. $\pm 0,90$)
Tap changer ⁽⁴⁾	$\pm 2 \times 2,5\% / 380V$	$\pm 2 \times 2,5\% / 380V$	$\pm 2 \times 2,5\% / 380V$
Current harmonic distortion (THD%) ⁽⁷⁾	< 3% (@ $P_{ac,r}$)	< 3% (@ $P_{ac,r}$)	< 3% (@ $P_{ac,r}$)
Inverter Performance			
Peak efficiency (η_{max}) ⁽⁸⁾	98,0%	98,0%	98,0%
Euro efficiency (η_{euro}) ⁽⁸⁾	97,7%	97,7%	97,7%
Inverter switching frequency	18 kHz	18 kHz	18 kHz
Night time losses ⁽¹⁰⁾	<66 W	<80 W	<94 W
LV distribution panel			
AC output circuit breaker	Yes		
Device for insulation permanent control	Yes, with alarm		
Energy meters (optional) ⁽¹³⁾	Four quadrant, MID certified with MODBUS/RS485 communication port		
Auxiliary supply			
Auxiliary supply voltage	3x400Vac + N, 50Hz		
Maximum consumption in operation ⁽⁹⁾	<0.18% of $P_{ac,r}$	<0.18% of $P_{ac,r}$	<0.18% of $P_{ac,r}$
Low voltage distribution for auxiliary functions	Yes (includes dedicated and protected supply lines for: inverter, datalogger, lighting, AC socket, spare).		
Cooling			
Cooling type	Forced air cooling by thermally-controlled fan (integrated in the inverter)		
Required air cooling volume (inverter compartment)	8000 m	10600 m	11200 m
Air filter	Integrated in the inverter		
Environmental parameters			
Full power operating temperature range	-10°C ... +40°C		
Relative humidity (non-condensing)	$\leq 95\%$		
Maximum operating altitude without derating ⁽¹¹⁾	1000		
Communication/user interface and system monitoring			
Communication port (PC / Datalogger)	1 x RS485 (RS485_USR)		
Communication to String Combiner boxes (PVI-STRINGCOMB)	1 x RS485 (RS485_2)		
Remote communication (optional)	PVI-AEC-EVO (Ethernet, GSM/GPRS, Wireless)		
User interface	2-lines display (on each inverter module)		

Electrical diagram of PLUS-STATION-800.0



Technical data and types

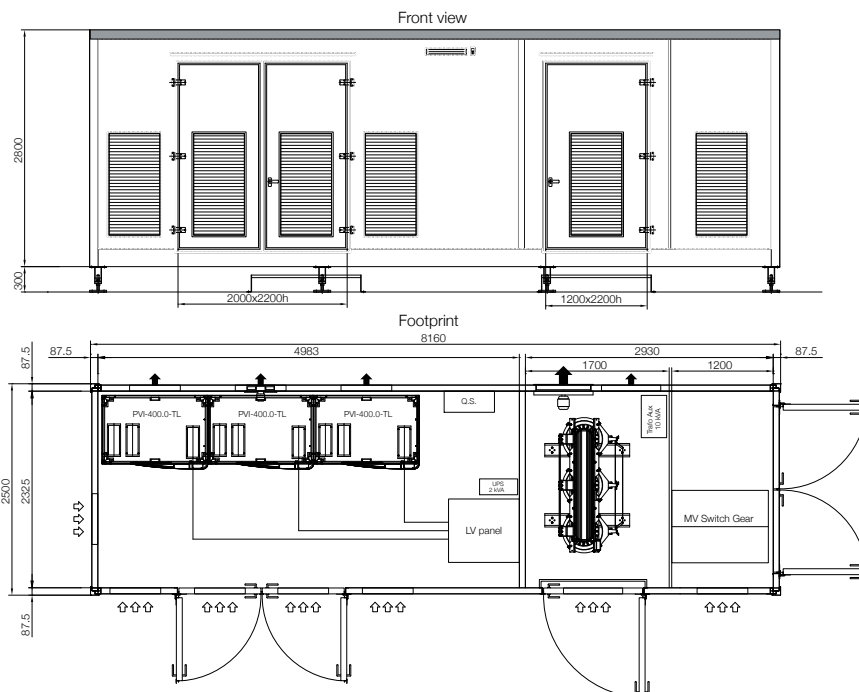
Type code	PLUS-STATION-530.0	PLUS-STATION-665.0	PLUS-STATION-800.0
Inverter ⁽¹⁾	PVI-267.0-TL	PVI-400.0-TL	PVI-400.0-TL
	PVI-267.0-TL	PVI-267.0-TL	PVI-400.0-TL
Medium-voltage transformer			
Construction	Oil/dry		
Rated power oil/dry	630kVA / 800 kVA	800kVA / 800 kVA	1000kVA / 1000kVA
Number of secondary windings	1 (2 for GND version)		
Cooling	ONAN (oil type) / air (dry type)		
Vector group	Dyn11		
Short circuit voltage	6%		
Losses class (according EN 50541-1) (Oil/Dry)	BoBk/AoBk with no positive tolerance		
MV switchgear			
Configuration	Single feeder (double feeder optional)		
Trafo protection ⁽¹²⁾	Fuses and disconnecter 24kV, 16kA (1s) / 630A		
Auxiliary supply transformer for inverters and ancillary components			
Construction	Dry		
Rated power (voltage)	10kVA (320/400V)		
Cooling	Air		
Vector group	Dyn11		
On load losses	400W		
Disconnect switch for AUX transformer	Yes		
UPS			
Integrated AUX supply UPS for protection and monitoring system	2kVA		
Mechanical characteristics (floating and grounded version)			
Dimensions (WxHxD)	6500 x 2800(*) x 2500 mm		
(*) Overall height pier mounted	3100 mm		
Body material	Sandwich technology		
Oil collecting tank	Yes		
Environmental protection rate	IP43 (IP54 optional)		
Approvals			
Certifications	CE		
EMC end safety	EN 61000-6-2, EN 61000-6-4; EN 61000-3-11; EN 61000-3-12; EN58178		
Grid connection	CEI 0-16, BDEW, RD1663		

- For further details please refer to the specific datasheet for the individual components
- Not available in grounded configuration
- For this configuration an external DC protection is suggested (not provided)
- Cable crimped with reduced size terminal ring:
 - For cable up to 185mmq: use terminal ring for M10 screw and max width 30mm
 - For cable up to 300mmq: use terminal ring for M10 screw and max width 40mm
- In case of master/slave configuration, an external panel with fuses is suggested (not provided)
- Other medium voltage levels available on request

- AC voltage distortion <2%
 - Conversion efficiency, not including auxiliary supply consumption
 - Not including the auxiliary transformer losses
 - Not including the medium-voltage transformer losses
 - Contact ABB for application at higher altitudes
 - MV Switchgear is included in the station
 - Energy meter is included in the LV compartment
- In case of grounded version a meter for each inverter will be installed

Optional	PLUS-STATION
Energy meter	○
LV distribution panels for auxiliary functions	●
10KVA auxiliary transformer (incl. switch)	●
Insulation monitoring system	●
Double feeder switchgear with line and ground disconnect in each feeder	○
Monitoring system PVI-AEC-EVO	○
UPS 2kVA for monitoring and protection system	●

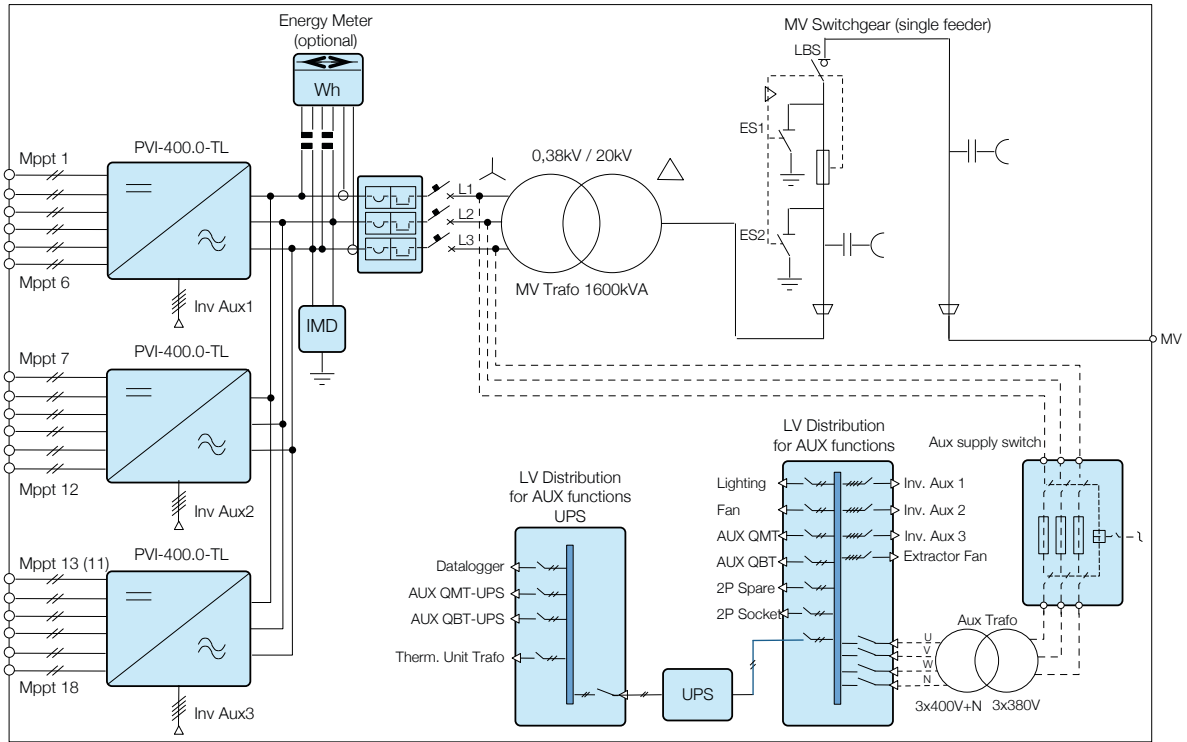
Footprint PLUS-STATION-1200.0



Technical data and types

Type code	PLUS-STATION-930.0	PLUS-STATION-1065.0	PLUS-STATION-1200.0
Inverter ⁽¹⁾	1xPVI-400.0-TL 2xPVI-267.0-TL	2xPVI-400.0-TL 1xPVI-267.0-TL	3xPVI-400.0-TL
Input parameters (DC)			
Absolute maximum input voltage ($V_{dc,max}$)	1000 V	1000 V	1000 V
MPPT input voltage range ($V_{MPPTmin}, \dots, V_{MPPTmax}$)	570 - 850 V	570 - 850 V	570 - 850 V
MPPT input voltage range at full power ($V_{MPPTmin,f}, \dots, V_{MPPTmax,f}$)	570 - 800 V	570 - 800 V	570 - 800 V
Number of independent MPPT in multi-master configuration ⁽²⁾	14	16	18
Number of independent MPPT in multi-master/slave configuration ⁽²⁾	7	8	6
Number of independent MPPT in master/slave configuration ⁽³⁾	3	3	3
Total maximum input current ($I_{dc,max}$)	1722 A	1968 A	2214 A
Number of DC input pairs	14	16	18
Max. DC input wire section (each polarity) ⁽⁴⁾	7x185mm ² + 7x300mm ² (M10)	8x185mm ² + 8x300mm ² (M10)	9x185mm ² + 9x300mm ² (M10)
Standard equipment-input			
Reverse polarity and backfeed current protection (each input)		Yes, with series diode	
Input fuse overcurrent protection (each input/both polarities) ⁽⁵⁾	125A/1000V	125A/1000V	125A/1000V
Load-breaking DC switch (each input) ⁽⁵⁾	200A/1000V	200A/1000V	200A/1000V
Input overvoltage protection - varistors		1 for each MPPT channel Type II	
Output parameters (AC) at medium voltage			
Rated output power ($P_{ac,r}$)	924 kW	1056 kW	1118 kW
Rated output current ($I_{ac,r}$)	26.7 A	30.4 A	32.2 A
Rated output voltage ($V_{ac,r}$) ⁽⁶⁾	20kV	20kV	20kV
Rated output frequency (f)	50Hz	50Hz	50Hz
Rated power factor (cos ϕ)	>0,995 (adj. $\pm 0,90$)	>0,995 (adj. $\pm 0,90$)	>0,995 (adj. $\pm 0,90$)
Tap changer ⁽⁴⁾	$\pm 2 \times 2,5\% / 380V$	$\pm 2 \times 2,5\% / 380V$	$\pm 2 \times 2,5\% / 380V$
Current harmonic distortion (THD%) ⁽⁷⁾	< 3% (@ $P_{ac,r}$)	< 3% (@ $P_{ac,r}$)	< 3% (@ $P_{ac,r}$)
Inverter performance			
Peak efficiency (η_{max}) ⁽⁸⁾	98,0%	98,0%	98,0%
Euro efficiency (η_{euro}) ⁽⁸⁾	97,7%	97,7%	97,7%
Inverter switching frequency	18 kHz	18 kHz	18 kHz
Night time losses ⁽¹⁰⁾	<113 W	<127 W	<141 W
LV distribution panel			
AC output circuit breaker		Yes	
Device for insulation permanent control		Yes, with alarm	
Energy meters (optional) ⁽¹³⁾	Four Quadrant, MID certified with MODBUS/RS485 communication port		
Auxiliary supply			
Auxiliary supply voltage		3x400Vac + N, 50Hz	
Maximum consumption in operation ⁽⁹⁾	<0,18% of $P_{ac,r}$	<0,18% of $P_{ac,r}$	<0,18% of $P_{ac,r}$
Low voltage distribution for auxiliary functions	Yes (includes dedicated and protected supply lines for: inverter, datalogger, lighting, AC socket, spare).		
Cooling			
Cooling type	Forced air cooling by thermally-controlled fan (integrated in the inverter)		
Required air cooling volume (inverter compartment)	13600 m	15200 m	16800 m
Air filter	Integrated in the inverter		
Environmental parameters			
Full power operating temperature range		-10°C ... +40°C	
Relative humidity (non-condensing)		$\leq 95\%$	
Maximum operating altitude without derating ⁽¹¹⁾		1000	
Communication/user interface and system monitoring			
Communication port (PC / Datalogger)		1 x RS485 (RS485_USR)	
Communication to String Combiner boxes (PVI-STRINGCOMB)		1 x RS485 (RS485_2)	
Remote communication (optional)	PVI-AEC-EVO (Ethernet, GSM/GPRS, Wireless)		
User interface	2-lines Display (on each inverter module)		

Electrical diagram of PLUS-STATION-1200.0



Technical data and types

Type code	PLUS-STATION-930.0	PLUS-STATION-1065.0	PLUS-STATION-1200.0
Inverter ⁽¹⁾	1xPVI-400.0-TL 2xPVI-267.0-TL	2xPVI-400.0-TL 1xPVI-267.0-TL	3xPVI-400.0-TL
Medium-voltage transformer			
Construction	Oil/dry		
Rated power oil/dry	1250kVA / 1250 KVA	1250kVA / 1600 KVA	1600kVA / 1600 kVA
Number of secondary windings	1 (3 for GND version)		
Cooling	ONAN (oil type) / air (dry type)		
Vector group	Dyn11		
Short circuit voltage	6%		
Losses class (according EN 50541-1) (Oil/Dry)	BoBk/AoBk with no positive tolerance		
MV switchgear			
Configuration	Single feeder (double feeder optional)		
Trafo protection ⁽¹²⁾	Fuses and disconnecter 24kV, 16kA (1s) / 630A		
Auxiliary supply transformer for inverters and ancillary components			
Construction	Dry		
Rated power (voltage)	10kVA (320/400V)		
Cooling	Air		
Vector group	Dyn11		
On load losses	400W		
Disconnect switch for AUX transformer	Yes		
UPS			
Integrated AUX supply UPS for protection and monitoring system	2kVA		
Mechanical characteristics (floating and grounded version)			
Dimensions (WxHxD)	8160 x 2800(*) x 2500 mm		
(*) Overall height pier mounted	3100 mm		
Body material	Sandwich technology		
Oil collecting tank	Yes		
Environmental protection rate	IP43 (IP54 optional)		
Approvals			
Certifications	CE		
EMC end safety	EN 61000-6-2, EN 61000-6-4 EN 61000-3-11; EN 61000-3-12; EN58178		
Grid connection	CEI 0-16, BDEW, RD1663		

- For further details please refer to the specific datasheet for the individual components
- Not available in grounded configuration
- For this configuration an external DC protection is suggested (not provided)
- Cable crimped with reduced size terminal ring:
 - For cable up to 185mmq: use terminal ring for M10 screw and max width 30mm
 - For cable up to 300mmq: use terminal ring for M10 screw and max width 40mm
- In case of master/slave configuration, an external panel with fuses is suggested (not provided)
- Other medium voltage levels available on request

- AC voltage distortion <2%
- Conversion efficiency, not including auxiliary supply consumption
- Not including the auxiliary transformer losses
- Not including the medium-voltage transformer losses
- Contact ABB for application at higher altitudes
- MV Switchgear is included in the station
- Energy meter is included in the LV compartment
In case of grounded version a meter for each inverter will be installed

Optional

Optional	PLUS-STATION
Energy meter	○
LV distribution panels for auxiliary functions	●
10KVA auxiliary transformer (incl. switch)	●
Insulation monitoring system	●
Double feeder switchgear with line and ground disconnect in each feeder	○
Monitoring system PVI-AEC-EVO	○
UPS 2kVA for monitoring and protection system	●

Support and service

ABB supports its customers with dedicated, global service organization in more than 60 countries and strong regional and national technical partner networks providing complete range of life cycle services.

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

www.abb.com/solarinverters

www.abb.com

© Copyright 2014 ABB. All rights reserved.
Specifications subject to change without notice.

