

# PVMaster III EM

## PVM3.57.315.EM

- Central inverter for direct connection to a medium voltage transformer
- MPP voltage range 570 V to 920 V
- Applicable with all common module types
- Maximum efficiency >98.8 % <sup>7)</sup>
- Certification according to the technical BDEW guideline “Generating Plants Connected to the Medium-Voltage Network“



### Technical data

Designation	PVM3.57.315.EM
<b>Generator connection (DC)</b>	
Recommended PV generator output <sup>1)</sup>	310 kWp
Min./max. input voltage ( $V_{dc, min} / V_{dc, max}$ )	570 V / 1000 V
MPP voltage range ( $V_{mpp, min}$ to $V_{mpp, max}$ )	570 V to 920 V
MPP-Tracker	1
Max. input current ( $I_{dc, max}$ )	500 A
Rated input voltage ( $V_{dc, r}$ )	620 V
Start voltage supply ( $V_{dc, start}$ ) <sup>2)</sup>	635 V
Termination technique flat terminal (L+, L-) <sup>3)</sup>	M12 (1 x 300 mm <sup>2</sup> Cu, 2 x 150 mm <sup>2</sup> Cu, 1 x 400 mm <sup>2</sup> Al, 2 x 185 mm <sup>2</sup> Al)
<b>Mains power connection (AC)</b>	
Max. output power ( $S_{ac, r}$ ) at $V_{ac, r}$	315 kVA
Rated power ( $P_{ac, r}$ ) at $\cos \varphi = 0.95$ to $1$ <sup>4)</sup>	283 kW
Rated voltage ( $V_{ac, r}$ ) <sup>5)</sup>	350 V
Min./max. output voltage ( $V_{ac, min} / V_{ac, max}$ )	In accordance with country-specific requirements
Rated frequency ( $f_r$ )	50 Hz / 60 Hz
Frequency range ( $f_{min}$ to $f_{max}$ )	In accordance with country-specific requirements
Max. output current ( $I_{ac, max}$ )	520 A
System form	IT (3~)
Power factor $\cos \varphi$ <sup>6)</sup>	Adjustable 0.8 ind. to 0.8 cap.
Distortion factor (THD) at $P_{ac, r}$	<2.5 %
Termination technique flat terminal (L1, L2, L3)	M10 (1 x 240 mm <sup>2</sup> Cu, 2 x 120 mm <sup>2</sup> Cu, 1 x 300 mm <sup>2</sup> Al, 2 x 185 mm <sup>2</sup> Al)
<b>Efficiency <sup>7)</sup></b>	
Max. efficiency	>98.8 %
European efficiency	>98.6 %
CEC efficiency	>98.6 %
<b>Dimensions</b>	
Height (including 200 mm plinth)	2080 mm
Width	1200 mm
Depth	500 mm
Weight (approx.)	470 kg
<b>General data</b>	
Immediate vicinity	Indoor installation
Ambient temperature <sup>8)</sup>	-10°C to +50°C
Relative humidity <sup>8)</sup>	15 % to 95 %, condensation not permitted
Pollution severity (EN 60664-1)	2
Cooling method	Regulated air/liquid cooling
Fresh air requirement	600 m <sup>3</sup> /h
<b>Liquid cooling</b>	
Max. coolant input temperature	60°C
Min. coolant flow rate	8 l/min
Coolant	Water-glycol mixture

1) At Module-STC (1000 W/m<sup>2</sup>; AM 1.5; 25°C) in accordance with EN 60904-3

Data as per EN 50524

2) The actual DC start voltage is derived from the currently available PV generator output

3) With DC main switch

4) For systems which do fall within the scope of the technical directive issued by the German Association of Energy and Water Industries (BDEW e.V.), “Erzeugungsanlagen am Mittelspannungsnetz“ [Generating plants on the medium-voltage network], the maximum active power will be permanently limited by means of software functions in order to meet the requirements set out in the 4th addendum “Regelungen und Übergangsfristen für bestimmte Anforderungen in Ergänzung zur technischen Richtlinie“ [Procedures and provisional deadlines for certain requirements further to the technical directive]. The active power will be reduced if the grid voltage is less than 95 % of the rated grid voltage  $V_{ac, r}$  and/or if the power factor is below  $\cos \varphi = 0.95$ .

5) Line-to-line voltage; other rated system voltages on request

6) Engineering notes regarding module design at reactive power from 0.9 ind. or 0.9 cap.

7) Data referred to inverter excluding medium voltage transformer

8) Option cabinet heater is required if frosting occurs or humidity higher than 85 %

## Technical data

Designation	PVM3.57.315.EM
<b>Power consumption</b>	
Intrinsic consumption in active mode (approx.)	600 W
Standby power consumption <sup>9)</sup> / night	<100 W / 1.5 W
External auxiliary voltage supply	1 x terminal, three-phase, 400 V, 50/60 Hz
<b>Safety / Protective equipment</b>	
Protection class (IEC 62103)	1
Protection type (IEC 60529)	Dependent on installed exhaust air system, otherwise IP20
Insulation monitoring of PV generator	Yes
AC/DC surge voltage protector	Optional / Yes
Temperature monitoring	Temperature-dependent derating, shutdown at impermissible temperatures
Overload response	Current limitation, operating point shift
PV generator/mains decoupling	Electrical isolation by low frequency transformer
Disconnection option	Yes
<b>Standards</b>	
General	<ul style="list-style-type: none"> <li>- CE conformity</li> <li>- Conforming to EEG 2014</li> <li>- DIN EN 62109: Safety of power converters for use in photovoltaic power systems</li> <li>- DIN EN 61000-6-2 and DIN EN 61000-6-4: Electromagnetic compatibility</li> <li>- BDEW (Bundesverband der Energie- und Wasserwirtschaft e. V. - Federal Energy and Water Management Association) guidelines: Guidelines for connection and parallel operation of generating plants on medium voltage networks, regulations and transition periods for specific requirements supplementary to the technical guidelines, additions and FGW-TR 3/4/8</li> </ul>
Grid monitoring	- In accordance with country-specific requirements
<b>Interfaces / Features / Options</b>	
Interfaces	<ul style="list-style-type: none"> <li>- 1 x Ethernet (RJ45)</li> <li>- 1 x microSD card</li> <li>- 7 x digital outputs as floating contacts (24 V to 230 V, AC/DC, changeover contact)</li> <li>- 7 x digital inputs with extended-range actuation coils (24 V or 230 V, AC/DC)</li> <li>- 2 x S0 pulse inputs or digital inputs with extended-range actuation coils (24 V or 230 V, AC/DC)</li> <li>- 2 x analog inputs (0 V to +10 V / -10 V to +10 V / 0 mA to 20 mA / 4 mA to 20 mA)</li> <li>- 2 x PT100 input</li> <li>- 1 x CAN (e.g. for string monitoring)</li> <li>- 1 x LTI InterCOM (cross-communication between multiple PVMaster III)</li> </ul>
Features	<ul style="list-style-type: none"> <li>- DC surge protector type 2</li> <li>- AC surge protector type 2 (auxiliary supply AC voltage)</li> <li>- DC main switch</li> <li>- AC short-circuit proofing</li> <li>- Insulation monitoring of PV generator</li> <li>- Extensive power factor control functions for static and dynamic grid stabilisation</li> <li>- Web server</li> <li>- Integrated data logger</li> <li>- Support for various online portals</li> </ul>
Options	<ul style="list-style-type: none"> <li>- LTI medium voltage transformer</li> <li>- DC surge protector type 1 + 2</li> <li>- AC surge protector type 1 + 2</li> <li>- PV generator earthing</li> <li>- Heavy-duty transportation and mounting plinth</li> <li>- VPN modem (GSM, DSL) for remote data access and transmission</li> <li>- Control unit with extensive functionality</li> <li>- Online monitoring of operational data</li> <li>- Trouble reports issued by e-mail</li> <li>- Air/liquid heat exchanger with pump</li> <li>- LTI plant control system</li> </ul>

9) Without fan in passive mode