



Solar inverter

Medium Voltage Modular Compact Skid

PVS-260/300-MVMCS

The new FIMER medium voltage modular compact skid is a plug&play solution designed to seamlessly and efficiently replace monolithic converter solutions on large-scale solar power generation systems based on a centralized architecture.

Combining up to 24 single MPPT power conversion modules in a fully-equipped factory pre-assembled and pretested 40 feet HC MV station, the new platform can compete with multi-MW scale station designs of the latest central inverters, allowing system designers to apply the modular architecture to systems of any kind and any size.

From 6300 to 7200 kW

Centralized System Architecture / Modular Conversion Core

The PVS-260/300-MVMCS is an integrated product specifically engineered for utility-scale PV systems adopting a centralized system architecture.

The PVS-260/300-MVMCS is modular in nature. Indeed, the system includes up to 24 single MPPT independent PVS-260/300 power conversion modules, arranged in a fully-equipped factory pre-assembled and pretested 40 feet HC MV station with a total MVA capacity as high as 7200 kVA.

Designed to seamlessly and efficiently replace monolithic converter solutions on large-scale solar power generation systems, this solution outperforms any conventional central system, allowing PV designers to extend the benefits of modular conversion to systems of any kind and any size.

The benefits of Modular Conversion: lower LCOE

The PVS-260/PVS-300-MVMCS by FIMER makes it possible to align the capital costs of a modular solution with those of a centralized system, while ensuring the following benefits that are typical of a modular conversion solution:

- Higher system availability, above 99.9% compared to 99.5% maximum from central solutions, thanks to the inherent fault tolerance and reduced MTTR guaranteed by modular conversion.
- Lower O&M efforts thanks to the granularity of power conversion accomplished with smaller and swappable power blocks. Depending on site-specific conditions this achieves a remarkable 1.5 to 2.5 percent reduction on the LCOE of a modular conversion architecture compared to a central solution. Moreover, all power electronics is concentrated nearby the other critical AC power assets to simplify the control and routine maintenance.

Fully equipped and engineered by FIMER

The solution's optimized cooling, filtering and high environmental protection degree allow its installation in a wide span of environmental conditions, from harsh desert temperatures to cold and humid environments.

The MVMCS includes an optimized MV oil-immersed transformer, MV gas-insulated switchgear, all necessary LV protections and connections to the (up to) 24 conversion modules and a set of available auxiliary services with independent auxiliary power. Depending on the number of conversion modules, the MVMCS provides up to 24 independent MPPTs and direct connection to the up to 24 individual DC cable pairs coming from the DC recombiner boxes. All components are part of the FIMER portfolio, ensuring the highest standards of quality, performance and durability.

Unmatched flexibility and scalability

Thanks to its inherent granularity, the MVMCS provides an un-matched scalability to adapt to systems of any size, any type. This medium voltage compact skid 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 FIMER compact skids can be used and connected thanks to the versatility of the integrated MV switchgear.

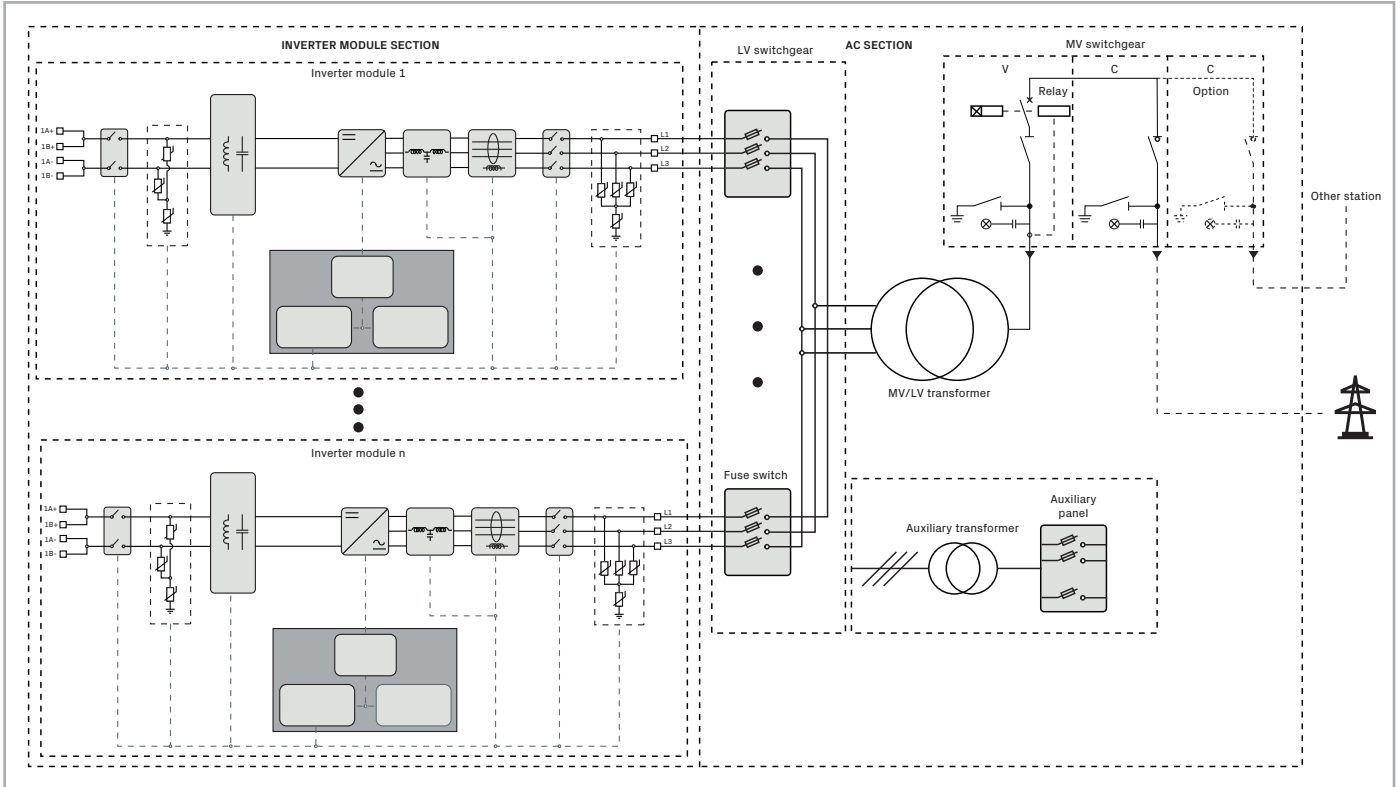
Reduced logistic costs

The compact skid solution is suitable for transportation inside a closed 40 feet high cube shipping container. The standardized shipping dimensions ensure cost-effective and safe transportability to the site, even overseas.

Highlights

- Designed for centralized systems based on up to 24 units of the record-high power capacity (260/300 kVA) and power density 1500 Vdc single-MPPT conversion modules PVS-260/300.
- Integrated low voltage distribution panel for a simplified and cost optimized Balance of System (BoS) without the need for any additional recombiners.
- Quick individual isolation of each conversion module, even on-load, for easy and cost-effective maintenance, ensuring maximum uptime.
- Individually-protected feeders, enabling separate inverters to be serviced without disrupting the rest of the units connected to the same cluster.
- DC connection cabinet for up to 24 individual DC home runs (support 400mm² Al cable).
- Optimized and very compact layout for integration of all components necessary for medium voltage connection.
- Standardized shipping dimensions ensure reduced logistic costs.
- Made in Europe product, compatible with most of the world-wide structural regulations and standards.
- Vertically integrated product manufactured by FIMER, guaranteed by FIMER.

MVCS Compact Skid block diagram



Technical data and types		
Maximum rating in KVA	Up to 6300	Up to 7200
Inverter		
Inverter module	PVS-260-TL	PVS-300-TL
Number of inverter modules		Up to 24
Number of independent MPPT		Up to 24
Absolute maximum DC input voltage ($V_{max,abs}$)		1500 V
Operating DC input voltage range ($V_{dcmin}...V_{dcmax}$)	850...1500 V	978...1500 V
Maximum DC input current for each MPPT ($I_{MPPTmax}$)		325 A
Maximum input short circuit current for each MPPT		700 A
Number of DC inputs pairs for each MPPT		2
DC connection type	Type Terminal block M12 cable lug up to 400mm2	
AC output voltage	600 V	690 V
LV distribution panel		
Number of fused protected feeders		Up to 24
Fuse rating of feeders		350 A
Breakable on load		Yes
Over voltage protection – Type 2 replaceable surge arrester		Yes, with monitoring
Over voltage protection – Type 1+2 replaceable surge arrester		Optional, with monitoring
MV Transformer		
Transformer type	Sealed oil immersed (ONAN)	
Maximum AC power	Up to 6300 kVA	Up to 7200 kVA
Rated Low voltage level	600 V	690 V
Rated Medium voltage level		≤ 36 kV
Rated frequency		50 Hz / 60 Hz
Oil type	Mineral (Vegetable as an option)	
Tap changer		± 2 x 2.5%
Windings material (primary / secondary)		Al / Al
ECO efficiency		Optional
MV switchgear		
Switchgear type	SF6 - Insulated	
Rated current	630 A	
Configuration	Single feeder (CV) or double feeder (CCV)	
Protection (up to 24 kV / up to 36 kV)	Circuit Breaker (16 kA or 20 kA / 20 kA or 25 kA)	
Protection relay	ABB REJ603 or equivalent (others on request)	
Motorization	Optional	
Auxiliary supply		
Auxiliary supply transformer power	10 kVA (higher on request)	
Auxiliary transformer voltage	600 V / 400-230 V	690 V / 400-230 V
Low voltage distribution panel for auxiliary functions	Yes	
Mechanical characteristics		
Dimensions (length x width x height) in mm	11400 x 2150 x 2500	
Environmental		
Operating ambient temperature range	-25...+60° C	
Operating altitude range	≤ 2000 m	
Relative humidity (non -condensing)	≤ 95%	
Environmental protection rating	IP 54 (IP66 for inverters)	
Painting corrosion protection	C4 (C5M optional)	
Product compliance		
Conformity	IEC 60364, IEC 61936-1, IEC 60502-1	



Solar inverter

PVS-260/300-TL

The new PVS-260/300-TL is the innovative single-MPPT converter by FIMER that forms the basic building block of a new generation of modular converter solutions for utility PV systems, offering record-high AC capacity and power-to-weight ratio to enable the integration of utility-scale ground mounted PV systems based on a centralized modular architecture.

From 262,5 to 300 kW

High power density

This new single-MPPT string inverter with a record-high capacity and power-to-weight ratio exceeding 3kW/kg, delivers up to 300 kVA (260 kVA) at 690 Vac (600 Vac). This not only reduces the logistics and installation costs but also the Electrical Balance of System costs for free field utility-scale ground mounted PV installations. MV stations of up to 7200 KVA capacity can be combined with 24 units of PVS-300, increasing the single power block to reach the same capacity of the latest central monolithic solutions within the same physical size, providing all the benefits of a modular conversion at an equivalent initial cost.

Reduced O&M cost

The granularity of the power conversion is accomplished with smaller capacity and swappable power blocks that ensure minimal MTTR and reduced labor cost compared to the on-site repairs of central inverter solutions.

Maximum Energy Yield

With a maximum efficiency exceeding 99% and weighted efficiency above 98.8%, the PVS-260/300-TL is on the leading edge of the power conversion technology applied to PV systems, offering the maximum energy yield to utility-scale systems of any size.

This is combined with the highest availability exceeding 99.9% compared to 99.5% maximum from monolithic MW-scale inverters, thanks to the inherent fault tolerance, reduced MTTR and easy/low labor cost guaranteed by the swappable modular converters which further contributes to preserve the optimal system yield and maximum ROI.

Protect and maximize the efficiency of your assets

Advanced inverter diagnostic and prognostic services can be combined with PID recovery options, ensuring your assets and profitability are secured throughout the entire PV system operating life.

FIMER Digital Platform

Thanks to cloud and edge computing capabilities, big data analytics and AI the FIMER digital platform can help customers

to solve the challenge of the new digital era.

The FIMER Digital Platform consists of ICT technologies and a full set of functionalities and services properly combined at both cloud and edge level able to provide customers with a fully integrated future-proof solution characterized by higher performance, higher reliability, maximized cyber security and always aligned with needs and expectations in terms of minimizing Total Cost of Ownership and facilitating maintenance activities in large scale distributed solar generators.

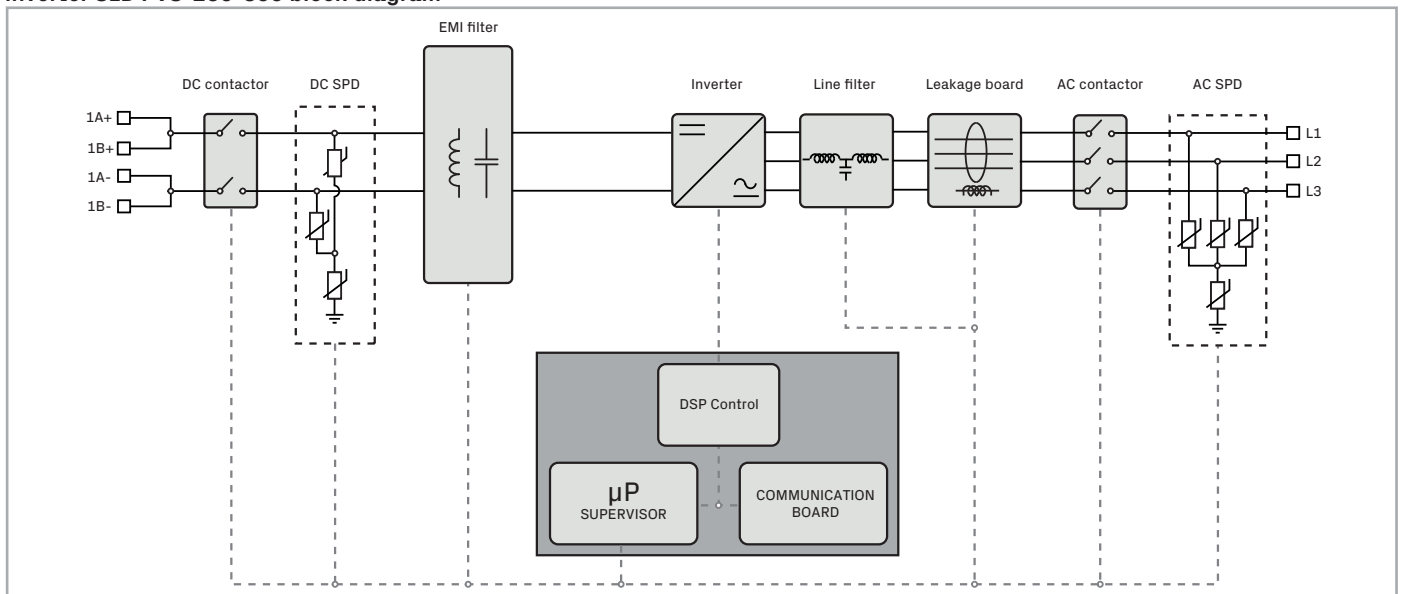
The new FIMER PVS-260/300 inverter integrates the last standard IP-based technology; in addition, through the integration of an advanced smart cluster-level aggregator gateway, many more functionalities and services can be enabled at plant level such as a fully scalable hierarchical plant controlling solution, effective integration with any 3rd party PPC or SCADA system and always according to any modern regulatory norm and grid operator standard (like IEC 61850, IEC 104, etc...).

Additional premium services are also available to exploit the smart functionalities integrated in each unit (including diagnosis, prognostic and predictive maintenance, scheduled FW upgrade and remote parameter's setting and many others), allowing the system to easily meet the most demanding grid support requirements for systems of any size, as well as to enable both owner and aggregator to play the new solar game in the digital era.

Highlights

- The most powerful single-MPPT string inverter in Utility (300 kVA); Power to weight ratio > 3kW/kg
- Optimized for the integration of Utility PV systems based on centralized architecture with modular converters
- Maximum Energy Yield, $\eta_{MAX} > 99\%$
- Remote firmware upgrade and Multi inverter commissioning
- Segregated DC & AC wiring compartment, support both Al and Cu Cable up to 400mm2
- PID recovery function (optional)
- Support Q@night function

Inverter SLD PVS-260-300 block diagram



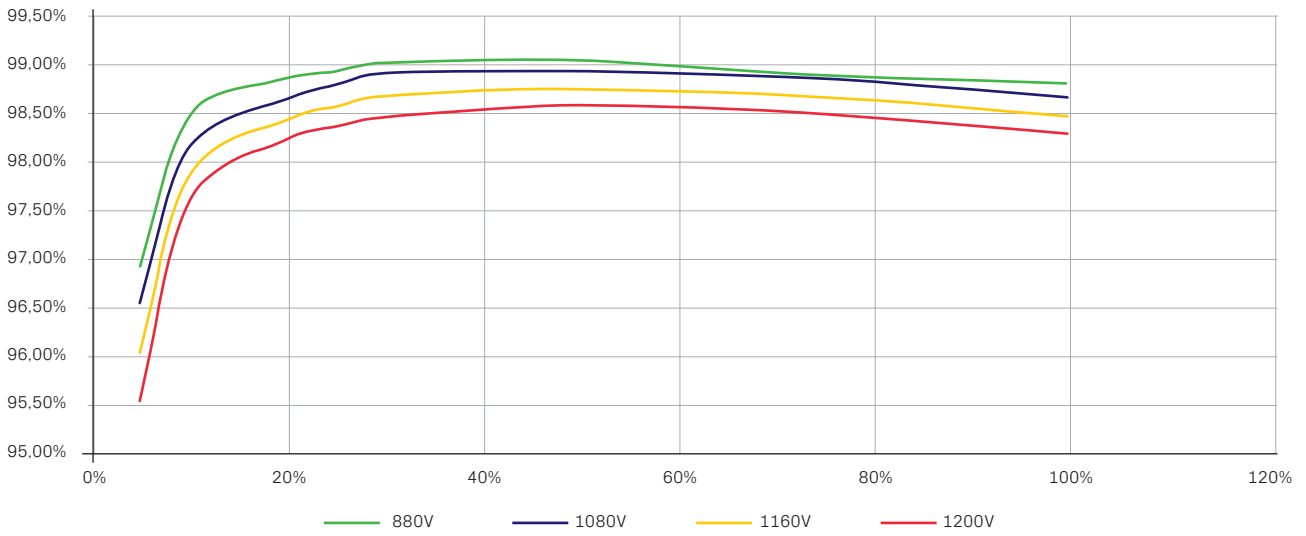
Technical data and types

Type code	PVS-260-TL	PVS-300-TL
Input side		
Absolute maximum DC input voltage ($V_{max,abs}$)		1500 V
Operating DC input voltage range ($V_{dcmin}...V_{dcmax}$)	850...1500 V	978...1500 V
Number of independent MPPT		1
Maximum DC input current ($I_{MPPTmax}$)		325 A
Maximum input short circuit current		700 A
Number of DC inputs pairs		2
DC connection type	Type Terminal block M12 cable lug up to 400mm ²	
Input protection		
Reverse polarity protection	Yes, from limited current source	
Input over voltage protection - Type 2 surge arrester	Yes, with monitoring	
Input over voltage protection - Type 1+2 surge arrester	Optional, with monitoring	
Photovoltaic array isolation control (Insulation Resistance)	Yes, acc. to IEC 62109-2	
Residual Current Monitoring Unit (leakage current protection)	Yes, acc. to IEC 62109-2	
Output side		
AC Grid connection type	Three phase 3W+PE	
Rated AC power ($P_{ac,r}$)	238700 W	273000 W
Maximum AC output power ($P_{ac,max}$ @ $\cos\phi=1$)	262500 W	300000 W
Maximum apparent power (S_{max})	262500 VA	300000 VA
Rated AC grid voltage ($V_{ac,r}$)	600 V	690 V
Rated AC output current ($I_{ac,max}$)	229.7 A	228.5A
Maximum AC output current ($I_{ac,max}$)		253 A
Rated output frequency (f_r)	50 Hz / 60 Hz	
Nominal power factor and adjustable range	> 0.995, 0.8 inductive/capacitive with maximum S_{max}	
Total current harmonic distortion	< 3%	
Max DC Current Injection (% of I_n)	< 0.5%* I_n	
Maximum AC Cable / single core (multi core)	4x1x400mm ² (4x300mm ²)	
AC connection type	Type Terminal block M12 cable lug	
Output protection		
Anti-islanding protection	According to local standard	
Output overvoltage protection - Type 2 surge protection device	Yes, with monitoring	
Operating performance		
Maximum efficiency (η_{max})	≥99.02	
Weighted efficiency (EURO/CEC)	≥98.85	
Communication		
Communication interface	Ethernet, RS-485	
Local user interface	4 LEDs, Web User Interface, Mobile APP	
Communication protocol	Modbus RTU/TCP (Sunspec compliant)	
Commissioning tool	Web User Interface / Mobile APP	
Monitoring	Plant Portfolio Platform	
FW update	locally/remotely	
Parameter upgrade	locally/remotely	
Environmental		
Operating ambient temperature range	-25...+60°C	
Relative humidity	4%...100% condensing	
Maximum operating altitude	4000 m	
Physical		
Environmental protection rating	IP 66	
Cooling	Forced air cooling	
Dimension (H x W x D)	700 x 950 x 450 mm	
Weight	≤100kg	
Safety		
Isolation level	Transformerless	
Marking	CE	
Safety and EMC standard (planned)	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-4, EN55011:2017	
Grid standard (check your sales channel for availability)	TBC	
Option available		
Q@night	Optional	
PID Recovery	Optional	

1) External AC protection is mandatory

Preliminary information. Product information and data are subject to change without notice.

Efficiency Curves



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

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