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Solar inverter PVS-166/175-TL-US

The PVS-166/175-TL-US is FIMER's innovative three-phase string inverter, delivering a solution to enhance and optimize solar power generation for ground mounted utility scale applications.

From 166 to 175 kW

Highest power in class
This new high-power string inverter, within the 1500 Vdc segment, delivers up to 185 kVA at 800 Vac.
This not only maximizes the ROI for ground mounted utility-scale applications but also reduces Balance of System costs (i.e. AC side cabling) for small to large scale, free field ground mounted PV installations.

Design flexibility
The inverter comes equipped with 24 inputs and 12 MPPT, the highest available in the market, enabling maximum PV plant design flexibility and increasing yields also in case of complex installations.

Installer friendly design
Quick and easy installation, thanks to plug and play connectors, as the existing PV module's mounting systems can be used to install the inverters, thus saving time and cost on site preparation.
The fuse and combiner free design eliminates the need for external components, such as separate DC combiner boxes, thanks to the integrated DC disconnect and AC wiring compartment.
The Advanced Cooling Concept preserves the lifetime of the system and minimizes O&M costs thanks to internal heavy-duty cooling fans. These can be easily removed during scheduled maintenance cycles whilst the power module can be easily replaced without removing the wiring box.

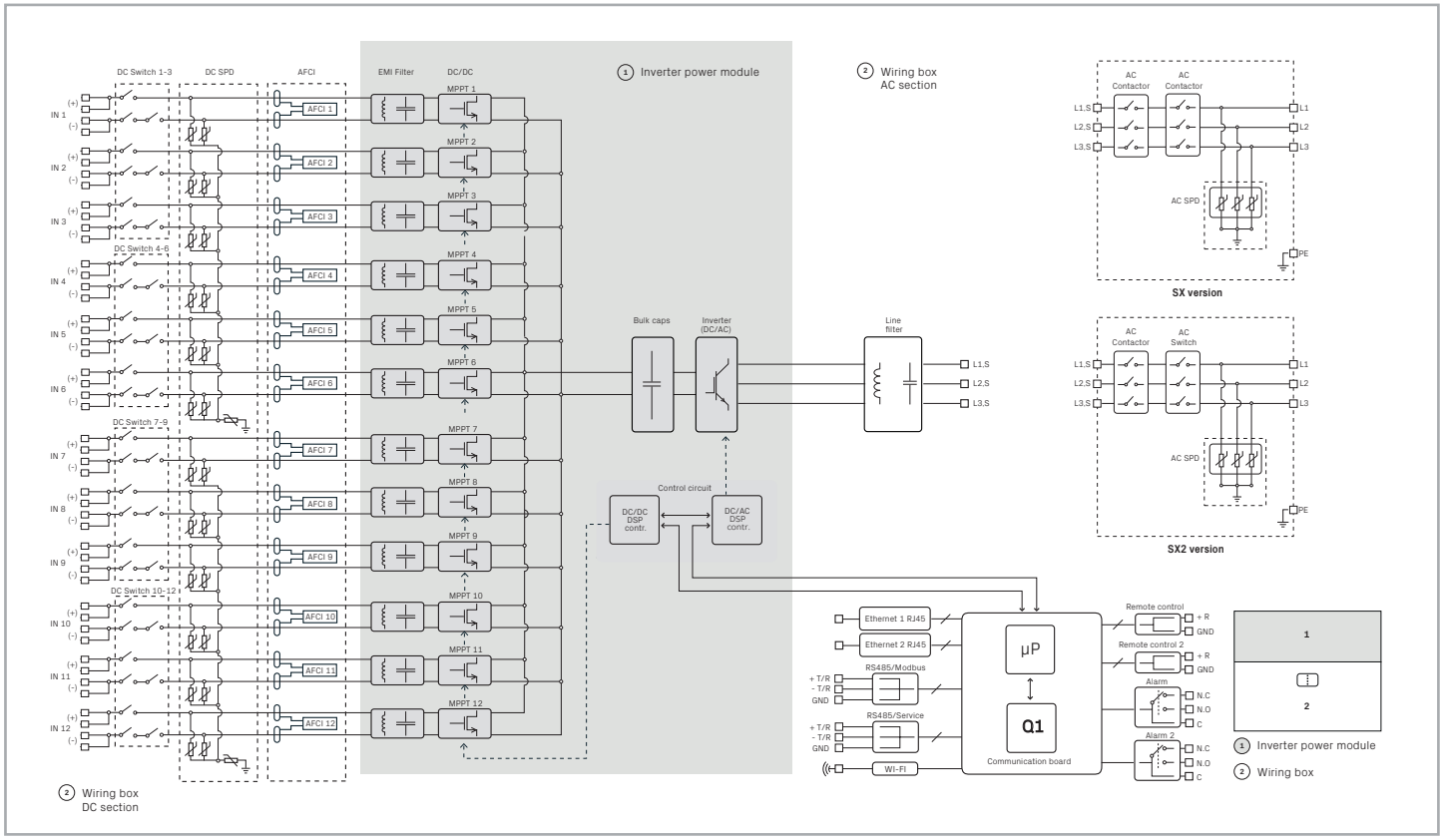
Advanced communication for O&M
Standard wireless access from any mobile device makes the configuration of inverter and plant easier and faster. An improved user experience thanks to a built-in User Interface (UI) enables access to advanced inverter configuration settings.
The Installer for Solar Inverters mobile app and configuration wizard enable a quick multi-inverter installation and commissioning reducing the time spent on site.

Fast system integration
Industry standard Modbus (RTU/TCP)/SUNSPEC protocol enables fast system integration.
Two Ethernet ports enable fast and future-proof communication for PV plants.

Protect your assets
Monitoring your assets is made easy, as every inverter is capable to connect to Aurora Vision cloud platform and thanks to the state-of-the-art cybersecurity and Arc Fault Detection option, your assets and profitability are secure in the long term.

Highlights
- Up to 185 kW power rating, highest in class
- All-in-one combiner and fuse free design
- Separate power module and wiring compartment for fast swap and replacement
- 12 MPPT and wide input voltage range for maximum energy yield
- WLAN interface for commissioning and configuration
- Remote monitoring and firmware upgrade via Aurora Vision cloud platform (logger free)
- Free of charge standard access to Aurora Vision cloud

PVS-166/175-TL-US string inverter block diagram



Technical data and types

Type code	PVS-166-TL US	PVS-175-TL US
Input side		
Absolute maximum DC input voltage ($V_{max,abs}$)	1500 V	
Start-up DC input voltage (V_{start})	750 V (650...1000 V)	
Operating DC input voltage range (V_{dcmin}...V_{dcmax})	0.7 x V_{start}...1500 V (min 600 V)	
Rated DC input voltage (V_{dcr})	1100 V	
Rated DC input power (P_{dcr})	169 000 W @ 40°C	188 000 W @ 30°C (177 kW @ 40°C)
Number of independent MPPT	12	
MPPT input DC voltage range ($V_{MPPTmin}$...$V_{MPPTmax}$) at P_{acr}	850..1350 V	
Maximum DC input current for each MPPT ($I_{MPPTmax}$)	22 A	
Maximum input short circuit current for each MPPT (I_{SCmax})	30 A	
Number of DC input pairs for each MPPT	2 DC inputs per MPPT	
DC connection type	PV quick fit connector [1]	
Input protection		
DC Series Arc Fault Circuit Interrupter	Type I acc. to UL 1699B with single-MPPT sensing capability	
Reverse polarity protection	Yes, from limited current source	
Input over voltage protection for each MPPT	Type 2 with monitoring	
Photovoltaic array isolation control (Insulation Resistance, R-iso)	Yes (pre start-up R-iso measurement)	
Residual Current Monitoring Unit (leakage current protection)	Yes (dynamic GFDI)	
DC Load Breaking Disconnect Switch (rating for each MPPT)	30A/1500V; 50A/1000V	
Fuse rating	N/A, No fuses required	
String current monitoring	MPPT-level current sense	
Output side		
AC Grid connection type	Three phase 3W+PE	
Rated AC power (P_{acr} @cosφ=1)	166 500 W @ 40°C	175 000 W @ 40°C
Maximum AC output power (P_{acmax} @cosφ=1)	166 500 W @ 40°C	185 000 W @≤ 30°C
Maximum apparent power (S_{max})	166 500 VA	185 000 VA
Rated AC grid voltage ($V_{ac,r}$)	800 V	
AC voltage range	680...960 [2]	
Maximum AC output current ($I_{ac,max}$)	134 A	
Rated output frequency (f_r)	50 Hz / 60 Hz	
Output frequency range (f_{min}...f_{max})	45...55 Hz / 55...65 Hz [2]	
Nominal power factor / adjustable range at Smax	>0.995 / 0.75 Lead ... 0.75 Lag	>0.995 / 0.8 Lead ... 0.8 Lag
Total current harmonic distortion	< 3%	
Max DC current injection (% of In)	< 0.5%*In	
AC wire range	4x1x2/0 AWG to 4x1x400 kcmil, Cu/Al [3]	
AC plate	Opening for Trade size 3 conduit	
AC connection type	Copper Busbar for ring terminal lug connections with M10 stud type terminal block (bolts included)	
Output protection		
Anti-islanding protection	Meets UL1741 / IEEE1547 requirements	
Output overvoltage protection - replaceable surge protection device	Type 2 with monitoring	
Operating performance		
Maximum efficiency (η_{max})	98.6 %	
Weighted CEC efficiency (η_{CEC})	98.4 %	
Communication		
Embedded communication interfaces	Dual port Ethernet, WLAN [4], RS-485	
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 Manager, Plant Viewer	
FW update	Remote inverter FW upgrade via Ethernet/WLAN interface locally/remotely	
Parameter upgrade	Remote inverter parameter upgrade via Ethernet/WLAN according to SunSpec Modbus protocol	

Technical data and types

Type code	PVS-166-TL US	PVS-175-TL US
Environmental		
Operating ambient temperature range	-13...+140°F (-25...+60°C) with derating above 104°F (40°C)	
Relative humidity	0...100% condensing	
Sound pressure level, typical	<65 dB(A)@ 1m	
Maximum operating altitude without derating	2000 m / 6560 ft	
Physical		
Environmental protection rating	Cert. to UL 50E Type 4X – meets or exceeds NEMA 4X	
Cooling	Forced air cooling with variable speed cooling fan	
Dimension (H x W x D)	34.2x42.7x16.5 in (867 x 1086 x 419 mm) / -SX model 34.2x42.7x18 in (867 x 1086 x 458 mm) / -SX2 model	
Weight	~76.5kg / 168 lbs for power module ~76.8kg / 169 lbs for wiring box Overall max 153 kg / 338 lbs	
Mounting system	Bracket (included, vertical mounting only)	
Safety		
Isolation level	Transformer-less (floating array)	
Marking	$_{C}$TUV$_{US}$	
Safety and EMC standard	UL1741, IEEE1547, IEEE1547.1, CSA-C22.2 No. 107.1-01, UL1998, UL 1699B, FCC 47 CFR Part 15B Class A Limits	
Grid standard	UL 1741 SA, IEEE1547, IEEE 1547a, Rule 21, Rule 14 (HI)	
Available products variants		
Inverter power module	PVS-166-TL-POWER MODULE	PVS-175-TL-POWER MODULE
24 quick fit connector pairs (2 each MPPT) + DC switches + SPD Type 2	WB-SX-PVS-166-TL-US	WB-SX-PVS-175-TL-US
24 quick fit connector pairs (2 each MPPT) + DC switches + AC disconnection switch + SPD Type 2	WB-SX2-PVS-166-TL-US	WB-SX2-PVS-175-TL-US
Optional available		
DC link recharge circuit	Night time operation with restart capability	
Anti-PID [5]	Based on night time polarization of the array	

1) Multicontact MC4-Evo2. Cable couplers may accept up to 10mm^2 (AWG8)
2) The AC voltage and frequency range may vary depending on specific country grid standard
3) Aluminum cable requires bi-metallic compression lug or bi-metallic adapter
4) As per IEEE 802.11 b/g/n standard, 2.4 GHz
5) Cannot operate simultaneously when installed in conjunction with the DC link recharge circuit

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