

ABB string inverters

PVI-5000/6000-TL-OUTD

5 to 6 kW



Designed for residential and small commercial photovoltaic installations, this inverter fills a specific niche in the product line to cater for those installations producing between 5kW and 20kW.

This inverter has a dual input section to process two strings with independent Maximum Power Point Tracking (MPPT), high speed and precise MPPT algorithm for real-time power tracking and energy harvesting, as well as transformerless operation for high performance efficiencies of up to 97.0%.

Suitable for low power installations with reduced string size

The wide input voltage range makes the inverter suitable for low power installations with reduced string size. Flat efficiency curves ensure high efficiency at all output levels ensuring consistent and stable performance across the entire input voltage and output power range.

This outdoor inverter has been designed as a completely sealed unit to withstand the harshest environmental conditions.

Highlights

- Single-phase output
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected in the field
- Dual input section with independent MPPT, allows optimal energy harvesting from two sub-arrays oriented in different directions

Additional highlights

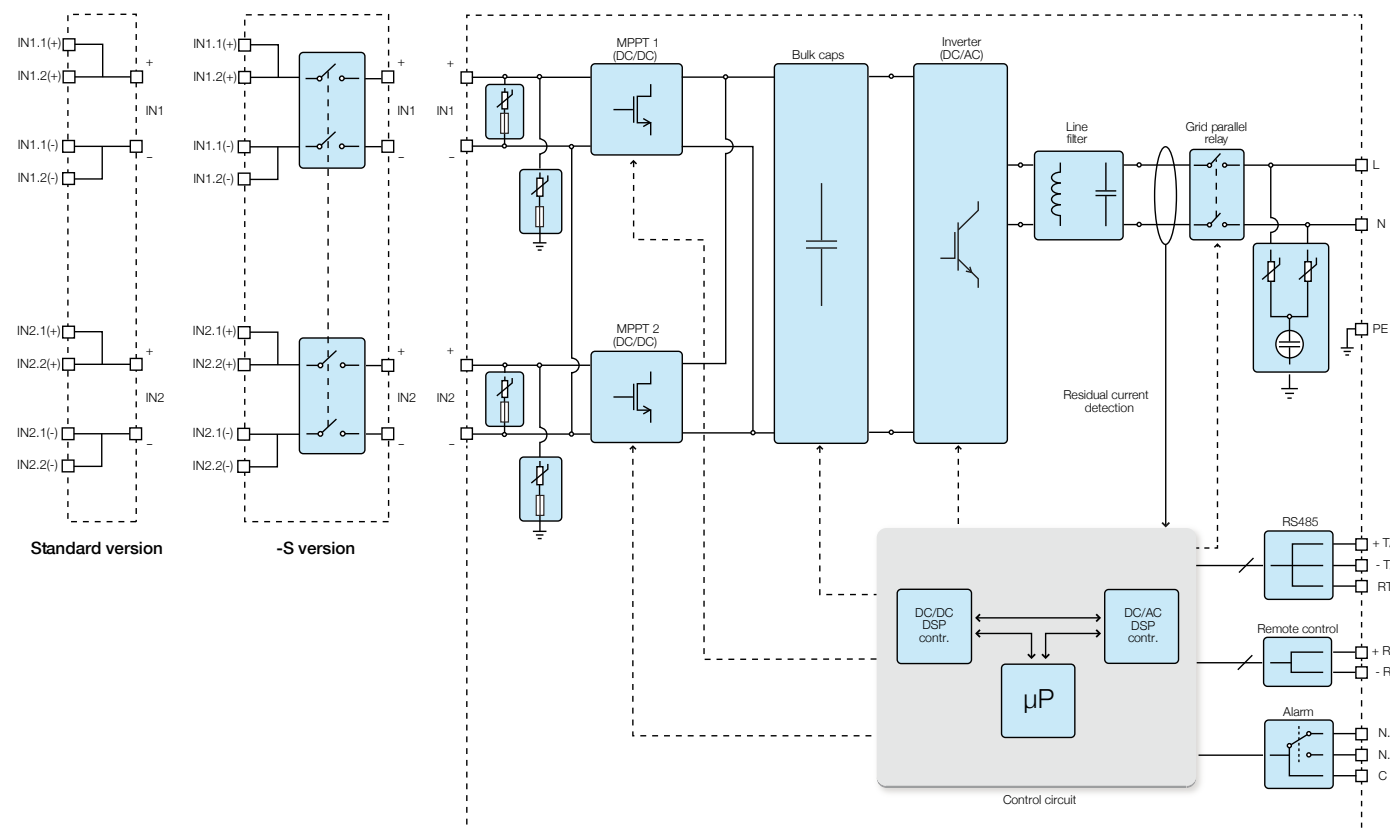
- Wide input voltage range
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions
- RS-485 communication interface (for connection to laptop or datalogger)



Technical data and types

Type code	PVI-5000-TL-OUTD	PVI-6000-TL-OUTD
Input side		
Absolute maximum DC input voltage ($V_{max,abs}$)	600 V	
Start-up DC input voltage (V_{start})	200 V (adj. 120...350 V)	
Operating DC input voltage range ($V_{dmin}...V_{dmax}$)	0.7 x $V_{start}...580$ V (min 90 V)	
Rated DC input voltage (V_{dcr})	360 V	
Rated DC input power (P_{dcr})	5150 W	6200 W
Number of independent MPPT	2	
Maximum DC input power for each MPPT ($P_{MPPTmax}$)	4000 W	
DC input voltage range with parallel configuration of MPPT at P_{dcr}	150...530 V	180...530 V
DC power limitation with parallel configuration of MPPT	Linear derating from max to null [$530\text{ V}\leq V_{MPPT}\leq 580\text{ V}$]	
DC power limitation for each MPPT with independent configuration of MPPT at P_{dcr} , max unbalance example	4000 W [$220\text{ V}\leq V_{MPPT}\leq 530\text{ V}$] the other channel: $P_{dcr}=4000\text{ W}$ [$90\text{ V}\leq V_{MPPT}\leq 530\text{ V}$]	4000 W [$220\text{ V}\leq V_{MPPT}\leq 530\text{ V}$] the other channel: $P_{dcr}=4000\text{ W}$ [$120\text{ V}\leq V_{MPPT}\leq 530\text{ V}$]
Maximum DC input current (I_{dcmax}) / for each MPPT ($I_{MPPTmax}$)	36.0 A / 18.0 A	
Maximum input short circuit current for each MPPT	22.0 A	
Number of DC inputs pairs for each MPPT	2	
DC connection type	PV quick fit connector ³⁾	
Input protection		
Reverse polarity protection	Yes, from limited current source	
Input over voltage protection for each MPPT - varistor	Yes	
Photovoltaic array isolation control	According to local standard	
DC switch rating for each MPPT (version with DC switch)	25 A / 600 V	
Output side		
AC grid connection type	Single-phase	
Rated AC power (P_{acr} @ $\cos\phi=1$)	5000 W ⁴⁾	6000 W
Rated AC power (P_{acr} @ $\cos\phi=\pm 0.9$)	5000 W ⁴⁾	6000 W
Maximum AC output power (P_{acmax} @ $\cos\phi=1$)	5000 W ⁴⁾	6000 W
Maximum apparent power (S_{max})	5560 VA	6670 VA
Rated AC grid voltage (V_{acr})	230 V	
AC voltage range	180...264 V ¹⁾	
Maximum AC output current ($I_{ac,max}$)	25.0 A	30.0 A
Contributory fault current	32.0 A	40.0 A
Rated output frequency (f_i)	50 Hz / 60 Hz	
Output frequency range ($f_{min}...f_{max}$)	47...53 Hz / 57...63 Hz ²⁾	
Nominal power factor and adjustable range	> 0.995, adj. 0.8 inductive to 0.8 capacitive	
Total current harmonic distortion	< 3.5%	
AC connection type	Terminal block, cable gland M32	

Block diagram of PVI-5000/6000-TL-OUTD



Technical data and types

Type code	PVI-5000-TL-OUTD		PVI-6000-TL-OUTD
Output protection			
Anti-islanding protection	According to local standard		
Maximum external AC overcurrent protection	32.0 A		40.0 A
Output overvoltage protection - varistor	2 (L - N / L - PE)		
Operating performance			
Maximum efficiency (η_{max})	97.0%		
Weighted efficiency (EURO/CEC)	96.4% / -		
Feed in power threshold	10.0 W		
Night consumption	< 0.4 W		
Communication			
Wired local monitoring	PVI-USB-RS232_485 (opt.)		
Remote monitoring	VSN300 Wifi Logger Card (opt.), VSN700 Data Logger (opt.)		
Wireless local monitoring	VSN300 Wifi Logger Card (opt.)		
User interface	16 characters x 2 lines LCD display		
Environmental			
Ambient temperature range	-25...+60°C (-13...+ 140°F)	-25...+60°C (-13...+ 140°F) with derating above 50°C (122°F)	
Relative humidity	0...100% condensing		
Sound pressure level, typical	50 dBA @ 1 m		
Maximum operating altitude without derating	2000 m / 6560 ft		
Physical			
Environmental protection rating	IP65		
Cooling	Natural		
Dimension (H x W x D)	810 mm x 325 mm x 222 mm / 31.9" x 12.8" x 8.7"		
Weight	< 26.0 kg / 57.3 lbs		
Mounting system	Wall bracket		
Safety			
Isolation level	Transformerless		
Marking	CE (50 Hz only), RCM		
Safety and EMC standard	EN 50178, IEC/EN 62109-1, IEC/EN 62109-2, AS/NZS 3100, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12		
Grid standard (check your sales channel for availability)	CEI 0-21, DIN V VDE V 0126-1-1, G59/3, EN 50438 (not for all national appendices), RD 1699, RD 413, ITC-BT-40, AS 4777, C10/11, IEC 61727, IEC 62116		
Available products variants			
Standard	PVI-5000-TL-OUTD	PVI-6000-TL-OUTD	
With DC switch	PVI-5000-TL-OUTD-S	PVI-6000-TL-OUTD-S	

¹⁾ The AC voltage range may vary depending on specific country grid standard

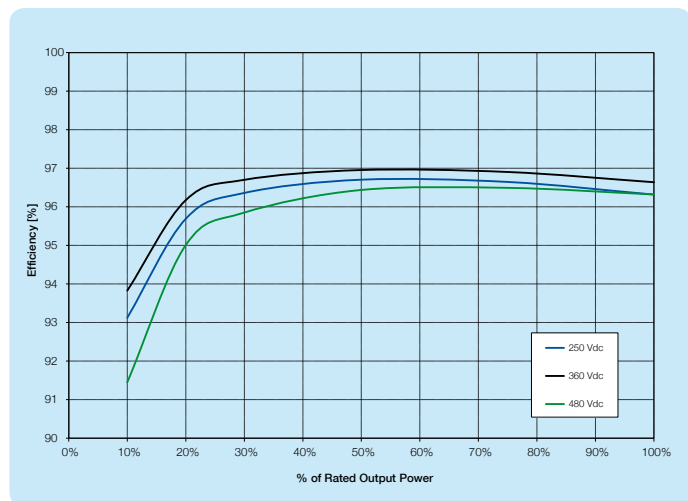
²⁾ The Frequency range may vary depending on specific country grid standard

³⁾ Please refer to the document "String inverters – Product manual appendix" available at www.abb.com/solarinverters for information on the quick-fit connector brand and model used in the inverter

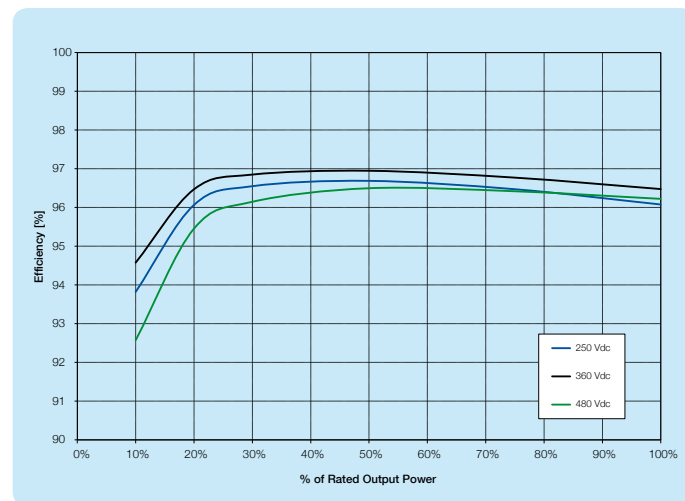
⁴⁾ 4600 W for Australia

Remark. Features not specifically listed in the present data sheet are not included in the product

Efficiency curves of PVI-5000-TL-OUTD



Efficiency curves of PVI-6000-TL-OUTD



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