

ABB string inverters

PVI-3.0/3.6/4.2-TL-OUTD

3 to 4.2 kW



ABB's UNO family of single-phase string inverters complements the typical number of rooftop solar panels, allowing home owners to get the most efficient energy harvesting for the size of the property.

The dual input section processes two strings with independent Maximum Power Point Tracking (MPPT). This is particularly useful for rooftop installations with two different orientations (e.g. East and West). The high speed MPPT offers real-time power tracking and improved energy harvesting.

Efficiency of up to 96.8%

The transformerless (TL) operation gives the highest efficiency of up to 96.8%. The wide input voltage range makes the inverter suitable for low power installations with reduced string size.

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

Our most common residential inverter is the ideal size for an average-sized family home.

Highlights

- Single-phase output
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected in the field
- Wide input voltage range
- High speed and precise MPPT algorithm for real time power tracking and improved energy harvesting
- Dual input section with independent MPP tracking, allows optimal energy harvesting from two sub-arrays oriented in different directions

Additional highlights

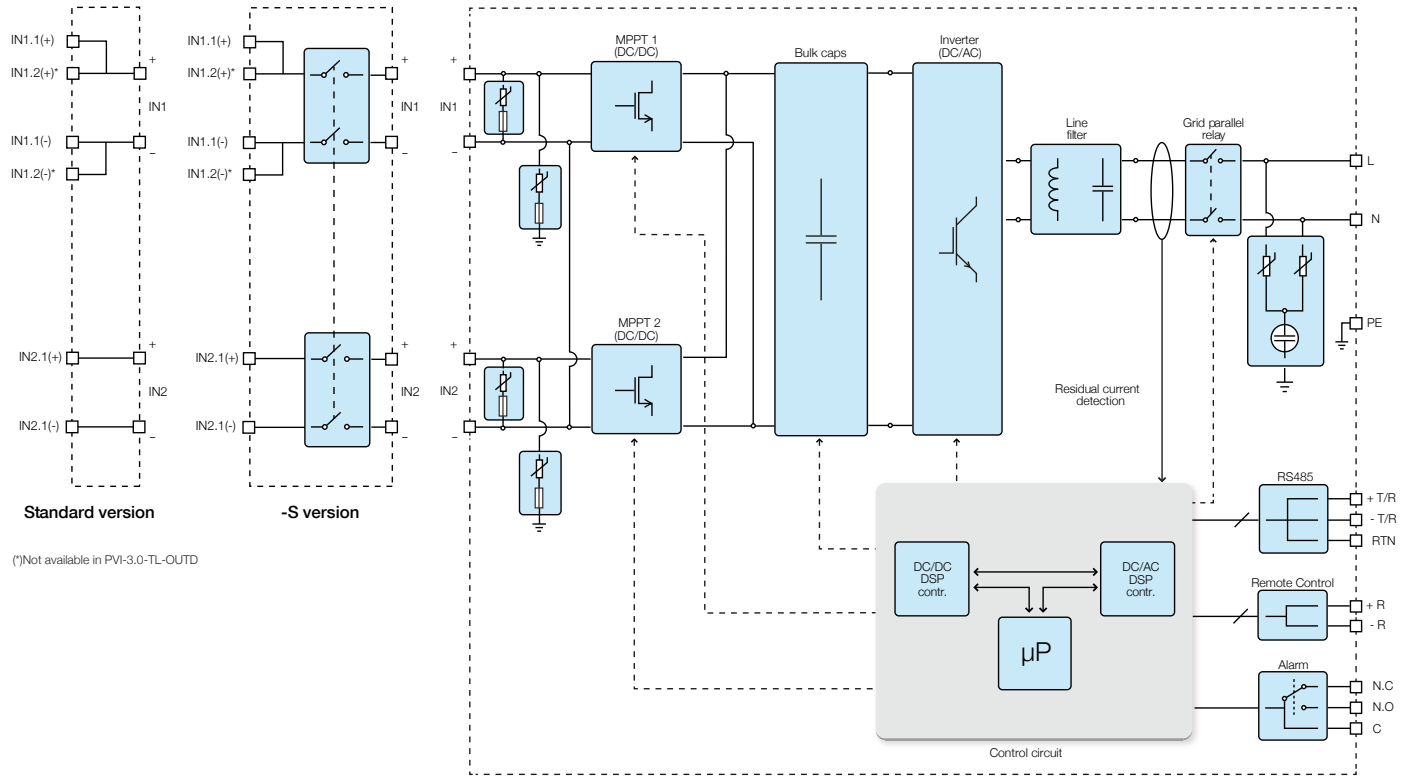
- Flat efficiency curves ensure high efficiency at all output levels ensuring consistent and stable performance across the entire input voltage and output power range
- Integrated DC disconnect switch in compliance with international standards (-S version)
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions
- RS-485 communication interface (for connection to laptop or data logger)



Technical data and types

Type code	PVI-3.0-TL-OUTD	PVI-3.6-TL-OUTD	PVI-4.2-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 ($V_{dmin}...V_{dmax}$)		$0.7 \times V_{start}...580$ V (min 90 V)	
Rated DC input voltage (V_{dcr})		360 V	
Rated DC input power (P_{dcr})	3120 W	3750 W	4375 W
Number of independent MPPT		2	
Maximum DC input power for each MPPT ($P_{MPPTmax}$)	2000 W	3000 W	3000 W
DC input voltage range with parallel configuration of MPPT at P_{dcr}	160...530 V	120...530 V	140...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	2000 W [$200 \text{ V} \leq V_{MPPT} \leq 530 \text{ V}$] the other channel: $P_{dcr} = 2000$ W [$112 \text{ V} \leq V_{MPPT} \leq 530 \text{ V}$]	3000 W [$190 \text{ V} \leq V_{MPPT} \leq 530 \text{ V}$] the other channel: $P_{dcr} = 3000$ W [$90 \text{ V} \leq V_{MPPT} \leq 530 \text{ V}$]	
Maximum DC input current (I_{dmax}) / for each MPPT ($I_{MPPTmax}$)	20.0 A / 10.0 A		32.0 A / 16.0 A
Maximum input short circuit current for each MPPT	12.5 A		20.0 A
Number of DC inputs pairs for each MPPT	1	1	2 for MPPT1 and 1 for MPPT2
DC connection type	Tool Free PV connector WM / MC4		
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 ($P_{acr} @ \cos\phi=1$)	3000 W	3600 W	4200 W
Maximum AC output power ($P_{acmax} @ \cos\phi=1$)	3300 W ⁴⁾	4000 W ⁵⁾	4600 W ⁶⁾
Maximum apparent power (S_{max})	3330 VA	4000 VA	4670 VA
Rated AC grid voltage ($V_{ac,r}$)		230 V	
AC voltage range		180...264 V ¹⁾	
Maximum AC output current ($I_{ac,max}$)	14.5 A	17.2 A ²⁾	20.0 A
Contributory fault current	16.0 A	19.0 A	22.0 A
Rated output frequency (f_i)	50 Hz / 60 Hz		
Output frequency range ($f_{min}...f_{max}$)	47...53 Hz / 57...63 Hz ³⁾		
Nominal power factor and adjustable range	> 0.995, adj. ± 0.9 with $P_{acr} = 3.0$ kW	> 0.995, adj. ± 0.9 with $P_{acr} = 3.6$ kW	> 0.995, adj. ± 0.9 with $P_{acr} = 4.2$ kW
Total current harmonic distortion	< 3.5%		
AC connection type	Screw terminal block, cable gland M25		
Output protection			
Anti-islanding protection	According to local standard		
Maximum external AC overcurrent protection	20.0 A	25.0 A	25.0 A
Output overvoltage protection - varistor	2 (L - N / L - PE)		

Block diagram of PVI-3.0/3.6/4.2-TL-OUTD



Technical data and types

Type code	PVI-3.0-TL-OUTD	PVI-3.6-TL-OUTD	PVI-4.2-TL-OUTD
Operating performance			
Maximum efficiency (η_{max})		96.8%	
Weighted efficiency (EURO/CEC)		96.0% / -	
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.), PVI-AEC-EVO (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 with derating above 50°C/122°F	-25...+60°C /-13...140°F with derating above 55°C/131°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	IP 65		
Cooling	Natural		
Dimension (H x W x D)	618 mm x 325 mm x 222 mm / 24.3" x 12.8" x 8.7"		
Weight	17.5 kg / 38.5 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 61000-3-2, EN 61000-3-3	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	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, VDE-AR-N 4105, G83/2, G59/3, EN 50438 (not for all national appendices), RD 1699, RD 413, ITC-BT-40, AS 4777.2, AS 4777.3, IEC 61727, IEC 62116	CEI 0-21, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G83/2, G59/3, EN 50438 (not for all national appendices), RD 1699, RD 413, ITC-BT-40, AS 4777.2, AS 4777.3, IEC 61727, IEC 62116	CEI 0-21, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G59/3, EN 50438 (not for all national appendices), RD 1699, RD 413, ITC-BT-40, AS 4777.2, AS 4777.3, IEC 61727, IEC 62116
Available products variants			
Standard	PVI-3.0-TL-OUTD	PVI-3.6-TL-OUTD	PVI-4.2-TL-OUTD
With DC switch	PVI-3.0-TL-OUTD-S	PVI-3.6-TL-OUTD-S	PVI-4.2-TL-OUTD-S

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

²⁾ For UK G83/2 setting, maximum output current limited to 16A up to a maximum output power of 3.68 kW

³⁾ The Frequency range may vary depending on specific country grid standard

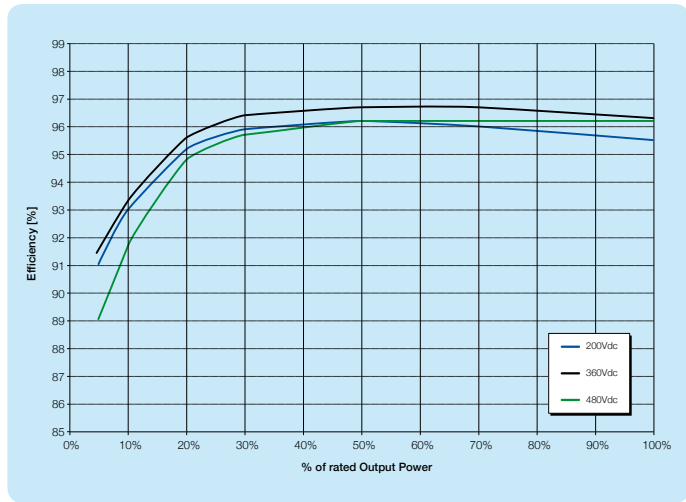
Remark. Features not specifically listed in the present data sheet are not included in the product

⁴⁾ Limited to 3000 W for Germany

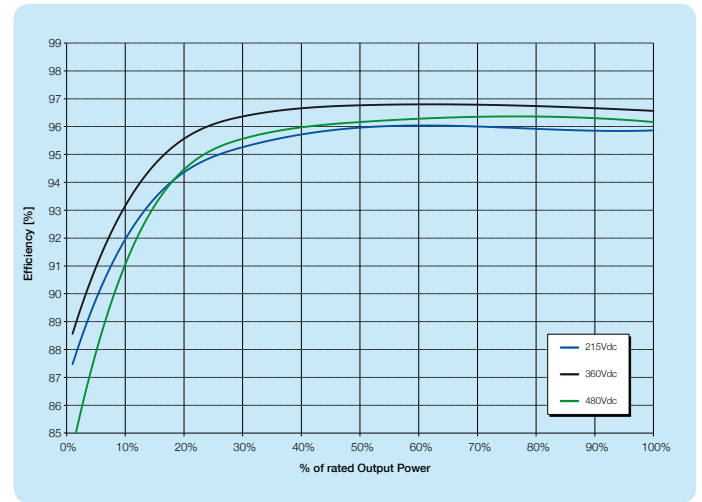
⁵⁾ Limited to 3600 W for Germany

⁶⁾ Limited to 4200 W for Germany

Efficiency curves of PVI-3.0-TL-OUTD



Efficiency curves of PVI-4.2-TL-OUTD



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
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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 tracking, allows optimal energy harvesting from two sub-arrays oriented in different directions

Additional highlights

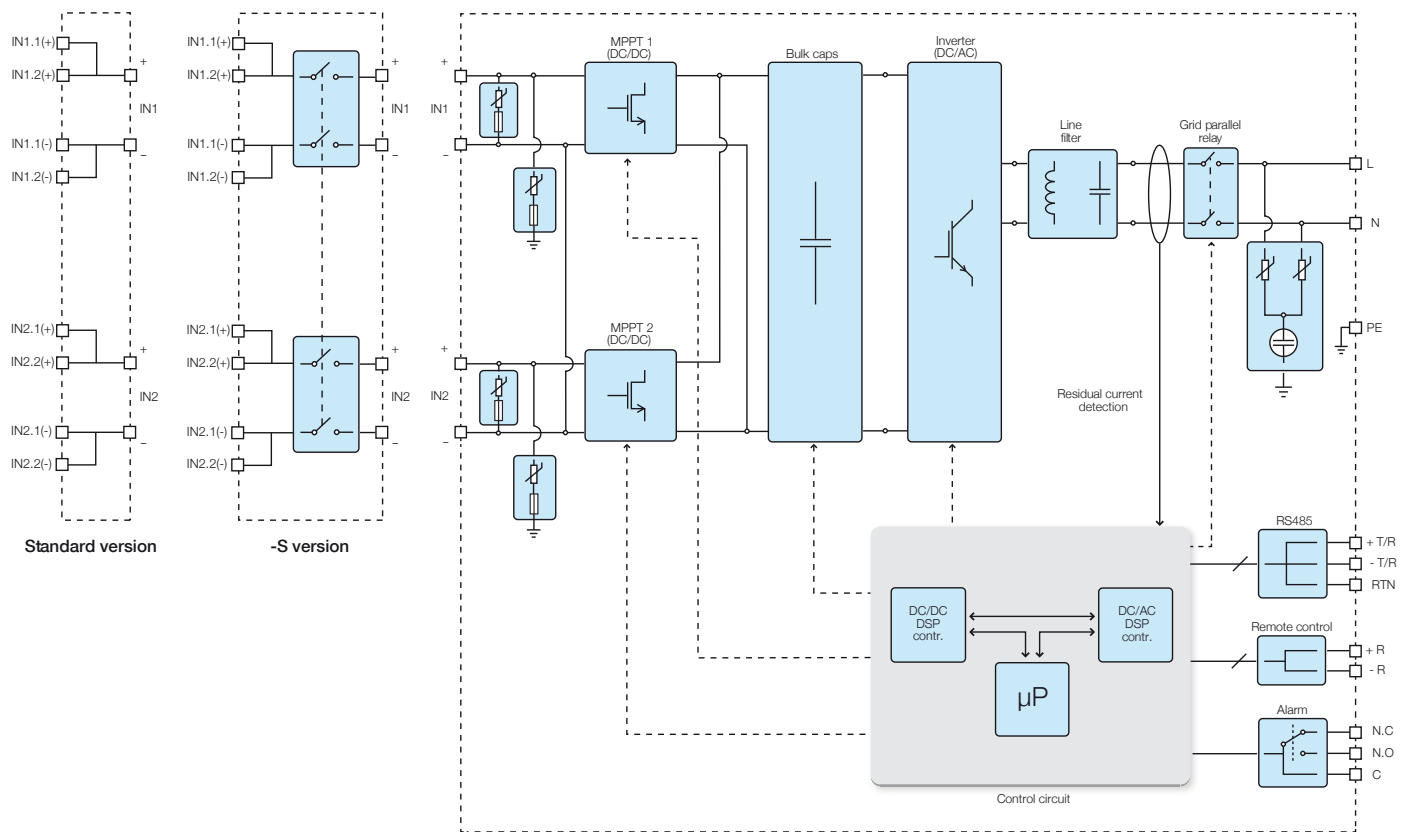
- Wide input range
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions
- RS-485 communication interface (for connection to laptop or datalogger)



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 ($V_{dcr,min}...V_{dcr,max}$)	0.7 x $V_{start}...580$ 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 ($P_{MPPT,max}$)	4000 W	
DC input voltage range with parallel configuration of MPPT at P_{acr}	150...530 V	180...530 V
DC power limitation with parallel configuration of MPPT	Linear derating from max to null [$530V \leq V_{MPPT} \leq 580V$]	
DC power limitation for each MPPT with independent configuration of MPPT at P_{acr} , max unbalance example	4000 W [$220V \leq V_{MPPT} \leq 530V$] the other channel: $P_{dcr}=4000W$ [$90V \leq V_{MPPT} \leq 530V$]	4000 W [$220V \leq V_{MPPT} \leq 530V$] the other channel: $P_{dcr}=4000W$ [$120V \leq V_{MPPT} \leq 530V$]
Maximum DC input current ($I_{dcr,max}$) / for each MPPT ($I_{MPPT,max}$)	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	Tool Free PV connector WM / MC4	
Input protection		
Reverse polarity protection	Yes, from limited current source	
Input over voltage protection for each MPPT - varistor	2	
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	6000 W
Maximum AC output power ($P_{ac,max} @ \cos\phi=1$)	5000 W	6000 W
Maximum apparent power (S_{max})	5560 VA	6670 VA
Rated AC grid voltage ($V_{ac,r}$)	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_r)	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. ± 0.9 with $P_{acr}=5.0$ kW	> 0.995, adj. ± 0.9 with $P_{acr}=6.0$ kW
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

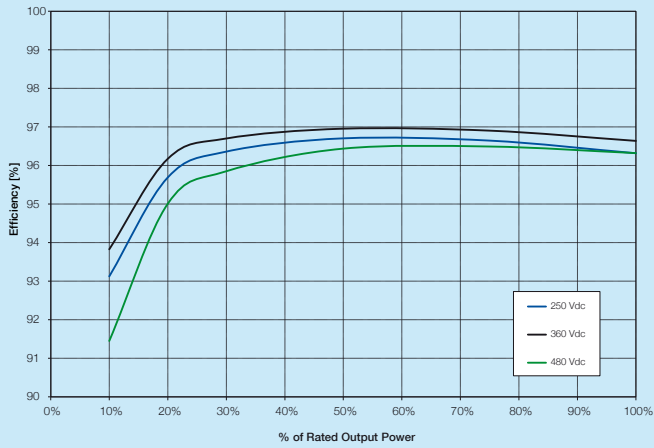
Type code	PVI-5000-TL-OUTD	PVI-6000-TL-OUTD
Output protection		
Anti-islanding protection	According to local standard	
Maximum AC overcurrent protection	32.0 A	40.0 A
Output overvoltage protection - varistor	2 (L - N / L - PE)	
Operating performance		
Maximum efficiency (η_{max})	97.0%	
Weighted efficiency (EURO/CEC)	96.4% / -	
Feed in power threshold	10.0 W	
Stand-by consumption	< 8.0 W	< 8.0 W
Communication		
Wired local monitoring	PVI-USB-RS232_485 (opt.)	
Remote monitoring	VSN300 Wifi Logger Card [®] (opt.), PVI-AEC-EVO (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	
Noise emission	<50 dB(A) @ 1 m	
Maximum operating altitude without derating	2000 m / 6560 ft	
Physical		
Environmental protection rating	IP 65	
Cooling	Natural	
Dimension (H x W x D)	810mm x 325mm x 222mm / 31.9" x 12.8" x 8.7"	
Weight	< 26.0 kg / 57.3 lb	
Mounting system	Wall bracket	
Safety		
Isolation level	Transformerless	
Marking	CE (50 Hz only)	
Safety and EMC standard	EN62109-1, EN62109-2, AS/NZS3100, AS/NZS 60950, EN61000-6-1, EN61000-6-3, EN61000-3-11, EN61000-3-12	
Grid standard (check your sales channel for availability)	CEI 0-21, VDE 0126-1-1, G59/3, EN 50438 (not for all national appendices), RD1699, AS 4777, C10/11, IEC 61727, ABNT NBR 16149, CLC/FprTS 50549, PEA, MEA	CEI 0-21, VDE 0126-1-1, G59/3, EN 50438 (not for all national appendices), RD1699, AS 4777, C10/11, IEC 61727, ABNT NBR 16149, CLC/FprTS 50549
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

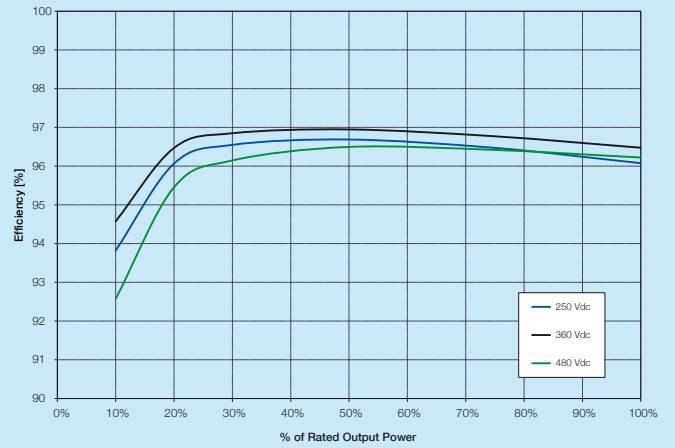
3. Check availability before to order

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



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:

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