

# ABB string inverters PVI-3.8/4.6-I-OUTD 3.8 to 4.6 kW



**This isolated inverter is optimized for use in residential applications requiring PV array grounding, such as some thin-film modules. This inverter has also been designed to serve all countries and regions with specific field-configurable set-ups available for all major country grid codes and display languages.**

The 3.8 and 4.6kW isolated inverters have all the usual ABB benefits including dual input section to process two strings with independent MPPT, high speed and precise MPPT algorithm for real-time power tracking and

energy harvesting, as well as regular high performance efficiencies of up to 96.8%. The wide input voltage range makes the inverter suitable to low power installations with reduced string size.

Its high frequency isolated topology allows this unit to be lightweight and compact in size to help with transportation and installation. This rugged outdoor inverter has been designed as a completely sealed unit to withstand the harshest environmental conditions.

### Highlights

- Single phase output
- Each inverter is set on specific grid codes which can be selected in the field
- Night Wake up button to access energy harvesting data and error log
- Dual input sections with independent MPPT tracking, allows optimal energy harvesting from two sub-arrays oriented in different directions
- Wide input range
- High speed and precise MPPT algorithm for real time power tracking and improved energy harvesting

## Additional highlights

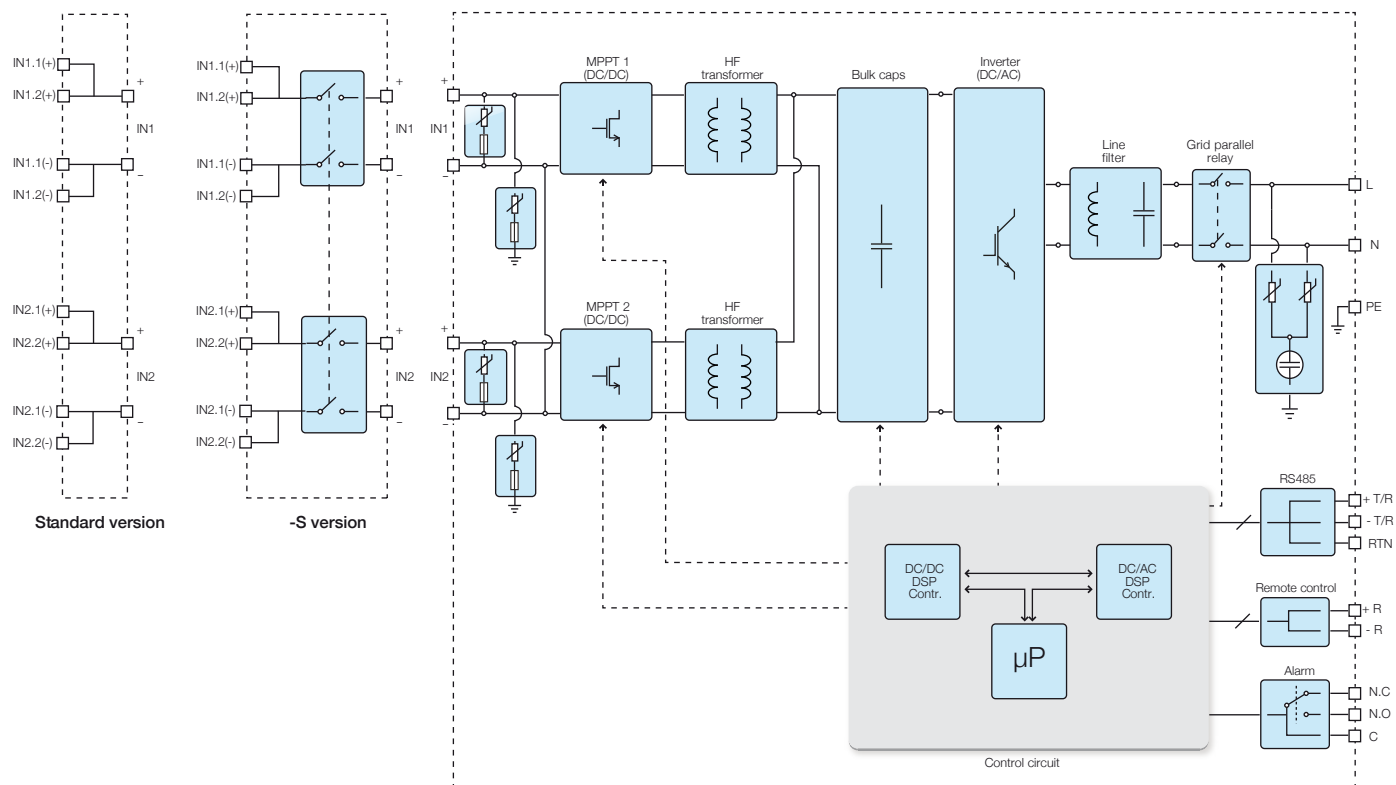
- Flat efficiency curves ensure high efficiency at all output levels ensuring consistent and stable performance across the entire input voltage and output power range
- Outdoor enclosure for unrestricted use under any environmental conditions
- RS-485 communication interface (for connection to laptop or datalogger)
- Compatible with PVI-RADIOMODULE for wireless communication with PVI-DESKTOP



## Technical data and types

Type code	PVI-3.8-I-OUTD	PVI-4.6-I-OUTD
<b>Input side</b>		
Absolute maximum DC input voltage ( $V_{max,abs}$ )	520 V	
Start-up DC input voltage ( $V_{start}$ )	200 V (adj. 120...350 V)	
Operating DC input voltage range ( $V_{dcmin}...V_{dcmax}$ )	0.7 x $V_{start}...520$ V	
Rated DC input voltage ( $V_{dcr}$ )	345 V	
Rated DC input power ( $P_{dcr}$ )	4000 W	4800 W
Number of independent MPPT	2 <sup>(4)</sup>	
Maximum DC input power for each MPPT ( $P_{MPPTmax}$ )	3000 W	
DC input voltage range with parallel configuration of MPPT at $P_{acr}$	160...470 V	180...470 V
DC power limitation with parallel configuration of MPPT	Linear Derating From MAX to Null [470V≤ $V_{MPPT}$ ≤520V]	
DC power limitation for each MPPT with independent configuration of MPPT at $P_{acr}$ , max unbalance example	3000 W [210V≤ $V_{MPPT}$ ≤470V] the other channel: $P_{dcr}$ -3000W [90V≤ $V_{MPPT}$ ≤470V]	3000 W [210V≤ $V_{MPPT}$ ≤470V] the other channel: $P_{dcr}$ -3000W [130V≤ $V_{MPPT}$ ≤470V]
Maximum DC input current ( $I_{dcrmax}$ ) / for each MPPT ( $I_{MPPTmax}$ )	25.0 A / 12.5 A	28.0 A / 14.0 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	
<b>Input protection</b>		
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	
<b>Output side</b>		
AC Grid connection type	Single phase	
Rated AC power ( $P_{acr}$ @ $\cos\phi=1$ )	3800 W	4600 W
Maximum AC output power ( $P_{acmax}$ @ $\cos\phi=1$ )	4200 W <sup>(5)</sup>	5000 W <sup>(6)</sup>
Maximum apparent power ( $S_{max}$ )	4220 VA	5110 VA
Rated AC grid voltage ( $V_{ac,r}$ )	230 V	
AC voltage range	180...264 V <sup>(1)</sup>	
Maximum AC output current ( $I_{ac,max}$ )	18.2 A <sup>(2)</sup>	22.5 A
Contributory fault current	25.0 A	32.0 A
Rated output frequency ( $f_r$ )	50 Hz / 60 Hz	
Output frequency range ( $f_{min}...f_{max}$ )	47...53 Hz / 57...63 Hz <sup>(3)</sup>	
Nominal power factor and adjustable range	> 0.995, adj. ± 0.9 with $P_{acr}$ =3.8 kW	> 0.995, adj. ± 0.9 with $P_{acr}$ =4.6 kW
Total current harmonic distortion	< 2%	
AC connection type	Screw terminal block, cable gland M32	

## Block diagram of PVI-3.8/4.6-I-OUTD



## Technical data and types

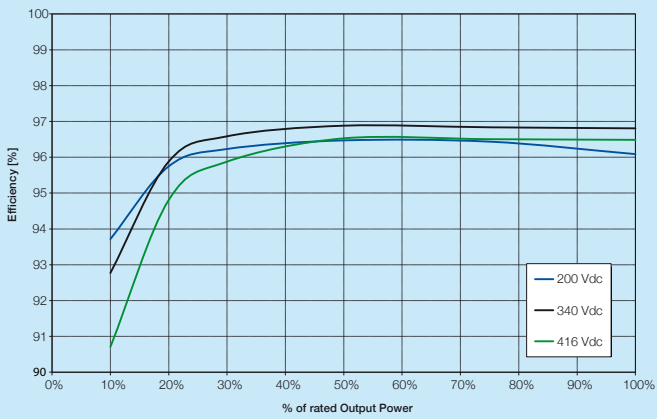
Type code	PVI-3.8-I-OUTD	PVI-4.6-I-OUTD
<b>Output protection</b>		
Anti-islanding protection	According to local standard	
Maximum AC overcurrent protection	20.0 A	25.0 A
Output overvoltage protection - varistor	2 (L - N / L - PE)	
<b>Operating performance</b>		
Maximum efficiency ( $\eta_{max}$ )	96.8%	
Weighted efficiency (EURO/CEC)	96.5% / -	
Feed in power threshold	24.0 W	
Stand-by consumption	< 8.0 W	
<b>Communication</b>		
Wired local monitoring	PVI-USB-RS232_485 (opt.)	
Remote monitoring	Wifi Logger Card <sup>(7)</sup> (opt.), PVI-AEC-EVO (opt.), VSN700 Data Logger (opt.)	
Wireless local monitoring	Wifi Logger Card <sup>(7)</sup> (opt.)	
User interface	16 characters x 2 lines LCD display	
<b>Environmental</b>		
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	
<b>Physical</b>		
Environmental protection rating	IP 65	
Cooling	Natural	
Dimension (H x W x D)	712mm x 325mm x 222mm / 28.0" x 12.8" x 8.7"	
Weight	< 24.0 kg / 53.0 lb	
Mounting system	Wall bracket	
<b>Safety</b>		
Isolation level	HF Transformer	
Marking	CE (50 Hz only)	
Safety and EMC standard	EN 50178, EN62109-1, EN62109-2, AS/NZS3100, AS/NZS 60950, EN61000-6-2, EN61000-6-3, EN61000-3-2, EN61000-3-6	EN 50178, EN62109-1, EN62109-2, AS/NZS3100, AS/NZS 60950, EN61000-6-2, EN61000-6-3, EN61000-3-11, EN61000-3-15
Grid standard	CEI 0-21, VDE 0126-1-1, VDE-AR-N 4105, G83/2, G59/3, EN 50438 (not for all national appendices), RD1699, AS 4777, C10/11, IEC 61727, ABNT NBR 16149, CLC/FprTS 50549	CEI 0-21, VDE 0126-1-1, VDE-AR-N 4105, G59/3, EN 50438 (not for all national appendices), RD1699, AS 4777, C10/11, IEC 61727, ABNT NBR 16149, CLC/FprTS 50549
<b>Available products variants</b>		
Standard	PVI-3.8-I-OUTD	PVI-4.6-I-OUTD
With DC switch	PVI-3.8-I-OUTD-S	PVI-4.6-I-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.
3. The Frequency range may vary depending on specific country grid standard
4. Independent MPPT just with negative ground

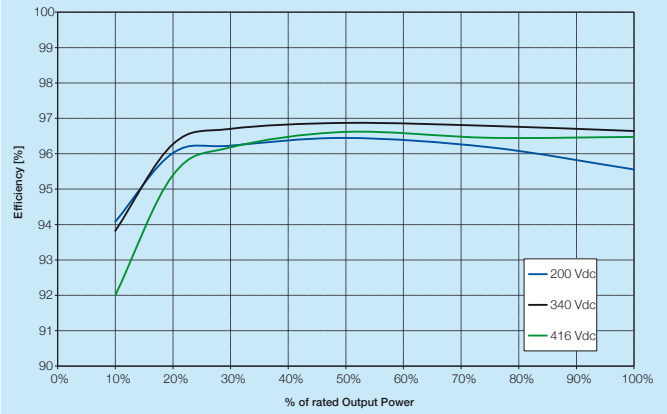
5. Limited to 3800 W for Germany
6. Limited to 4600 W for Germany
7. Check availability before to order

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

Efficiency curves of PVI-3.8-I-OUTD



Efficiency curves of PVI-4.6-I-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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# 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

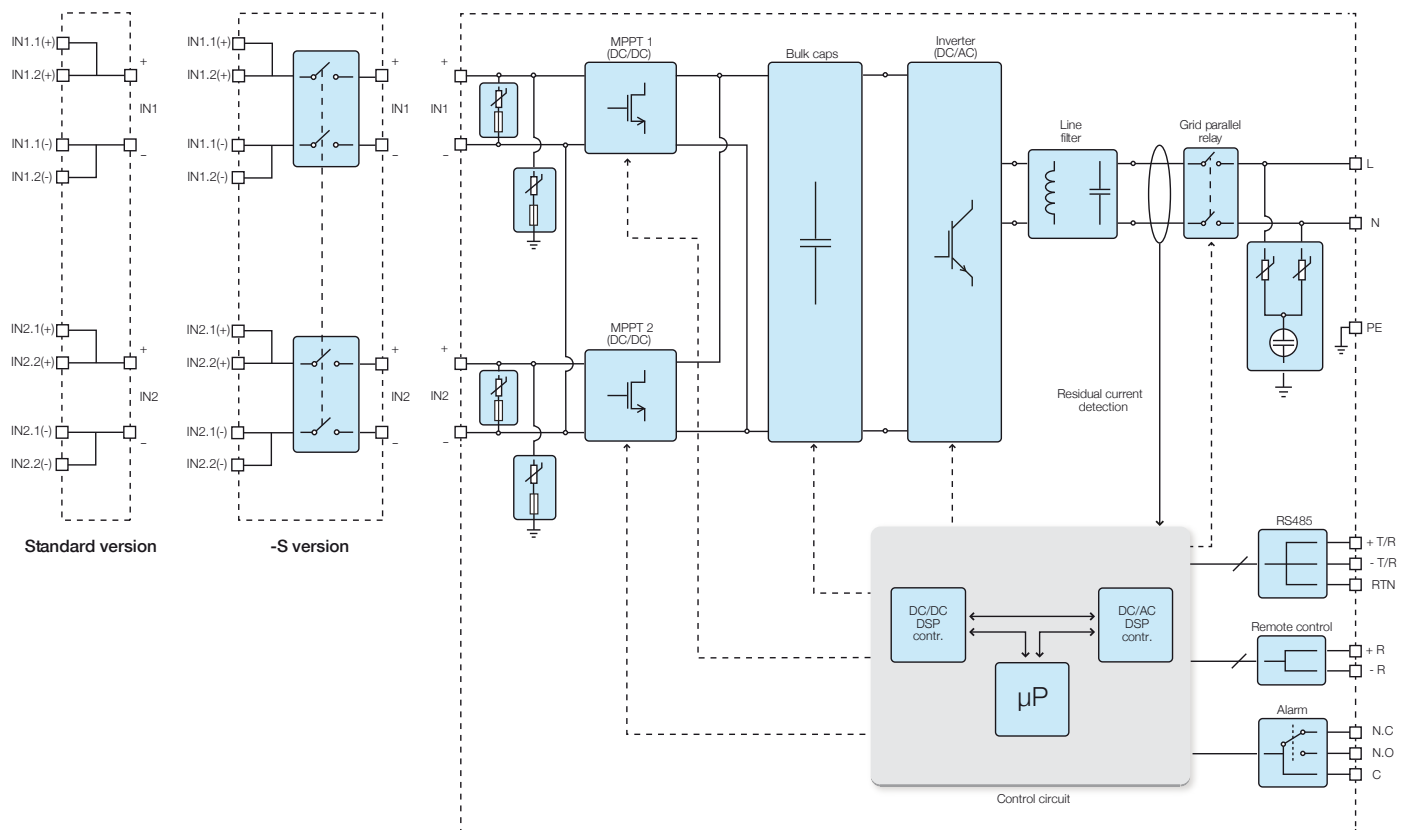
- Wide input range
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions
- RS-485 communication interface (for connection to laptop or datalogger)



## Technical data and types

Type code	PVI-5000-TL-OUTD	PVI-6000-TL-OUTD
<b>Input side</b>		
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	
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 $P_{acr}$	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 ( $I_{dmax}$ ) / 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	Tool Free PV connector WM / MC4	
<b>Input protection</b>		
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	
<b>Output side</b>		
AC grid connection type	Single phase	
Rated AC power ( $P_{acr} @ \cos\phi=1$ )	5000 W	6000 W
Maximum AC output power ( $P_{acmax} @ \cos\phi=1$ )	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 <sup>(1)</sup>	
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 <sup>(2)</sup>	
Nominal power factor and adjustable range	> 0.995, adj. $\pm 0.9$ with $P_{acr}=5.0$ kW	> 0.995, adj. $\pm 0.9$ 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

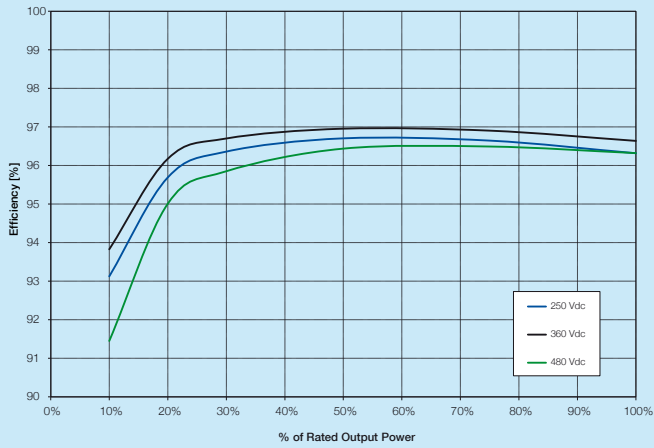
Type code	PVI-5000-TL-OUTD	PVI-6000-TL-OUTD
<b>Output protection</b>		
Anti-islanding protection	According to local standard	
Maximum AC overcurrent protection	32.0 A	40.0 A
Output overvoltage protection - varistor	2 (L - N / L - PE)	
<b>Operating performance</b>		
Maximum efficiency ( $\eta_{max}$ )	97.0%	
Weighted efficiency (EURO/CEC)	96.4% / -	
Feed in power threshold	10.0 W	
Stand-by consumption	< 8.0 W	< 8.0 W
<b>Communication</b>		
Wired local monitoring	PVI-USB-RS232_485 (opt.)	
Remote monitoring	VSN300 Wifi Logger Card <sup>®</sup> (opt.), PVI-AEC-EVO (opt.), VSN700 Data Logger (opt.)	
Wireless local monitoring	VSN300 Wifi Logger Card <sup>®</sup> (opt.)	
User interface	16 characters x 2 lines LCD display	
<b>Environmental</b>		
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	
<b>Physical</b>		
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	
<b>Safety</b>		
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
<b>Available products variants</b>		
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

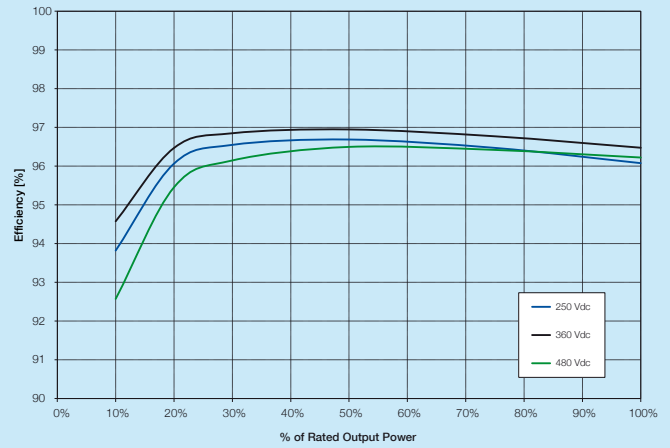
3. Check availability before to order

**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**

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