

# ABB string inverters PRO-33.0-TL-OUTD 33 kW



ABB string inverters cost-efficiently convert the direct current (DC) generated by solar modules into high quality three-phase alternating current (AC) that can be fed into the power distribution network (i.e. grid). Designed to meet the needs of the entire supply chain – from system integrators and installers to end users – these transformerless, three-phase inverters are designed for decentralized photovoltaic (PV) systems installed in commercial and industrial systems up to megawatt (MW) sizes.

#### A new inverter from the world's leading power technology company

ABB, a global leader in power and automation technologies, brings decades of experience, technology leadership and application know-how from renewable energies to this new string inverter. Such experience and technology ensures high quality, safe and reliable solar inverters are delivered every time.

#### High power package for decentralized PV systems

ABB's three-phase PRO-33 string inverter is designed for medium and large decentralized PV systems either on large-scale commercial and industrial rooftops or ground-mounted PV plants. The inverter offers cost-efficiency in a high power, wall-mountable package with very high conversion efficiency. The all-in-one design with built-in and monitored PV plant protection devices reduces the need of costly external devices.

The single maximum power point tracker (MPPT) and optimized MPPT window are suitable for uniform-shaped PV plants with long strings connected to the inverter. The high maximum DC input voltage of up to 1100 V gives PV plant designers extra flexibility and allows more PV modules to be connected in series to reduce cabling costs.

#### Highlights

- Compact, high power wall-mountable package
- High maximum DC input voltage of up to 1100 V
- Configurable all-in-one design
- Advanced grid support functions
- Safe and intuitive user interface
- Robust enclosure, with IP65 rating suitable for outdoor installation

# ABB string inverters

## Configurable all-in-one design

The ABB PRO-33.0 string inverter comes in three product variants. The standard model with or without DC switch is designed for use with an external string combiner box. The all-in-one model with built-in string combiner box includes a DC switch, string current monitoring with alarm, PV fuses, monitored surge protection devices and tool-less solar quick connectors. The inverter's all-in-one design, with built-in and monitored PV plant protection devices, reduces the need of costly external devices.

## High total efficiency maximizes return on investment

The PRO-33.0 inverter offers a high conversion and MPP tracking efficiency in all conditions. A flat efficiency curve provides high revenues in low and high radiation conditions.

## Fast and easy commissioning

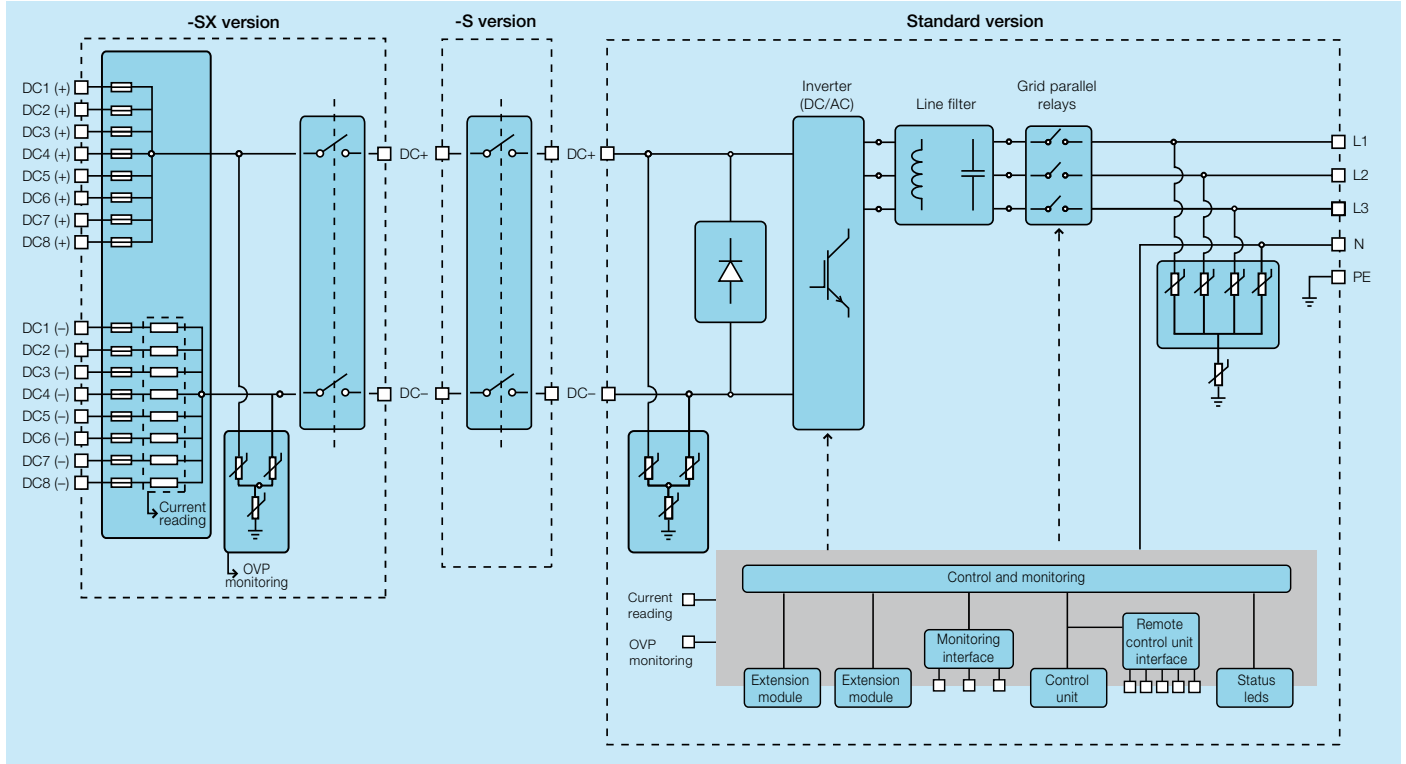
Fast PV plant commissioning is enabled via pre-programmed country grid code settings that are easily selectable. Extensive certification ensures wide grid code compatibility. Plug and Play DC and AC connectors enable fast and safe cabling. A touch protected installation area provides additional safety and comfort for inverter installation and maintenance.



## Technical data and type

Type designation	33 kW PRO-33.0-TL-OUTD
<b>Input side</b>	
Absolute maximum DC input voltage ( $V_{max,abs}$ )	1100 V <sup>4)</sup>
Startup DC input voltage ( $V_{start}$ )	610 V
Operating DC input voltage range ( $V_{demin}...V_{dcmx}$ )	580 to 950 V
Rated DC input voltage ( $V_{dcr}$ )	580 V
Rated DC input power ( $P_{dcr}$ )	33 700 W
Number of independent MPPT	1
MPPT input DC voltage range ( $V_{MPPTmin}...V_{MPPTmax}$ ) at $P_{acr}$	580 to 850 V
Maximum DC input current ( $I_{dcmx}$ )/for each MPPT ( $I_{MPPTmax}$ )	58 A
Maximum input short circuit current for each MPPT	80 A
Number of DC inputs pairs for each MPPT	1 in Standard and -S version/8 in -SX version
DC connection type	PV quick fit connector <sup>3)</sup> on -SX version / Screw terminal block on Standard and -S version
<b>Input protection</b>	
Reverse polarity protection	Yes, from limited current source
Input over voltage protection for each MPPT - varistor (-/S) version	Yes
Input over voltage protection - plug in modular surge arrester (-SX version)	Type 2
Photovoltaic array isolation control	According to local standard
DC switch rating for each MPPT (version with DC switch)	58 A / 1000 V, 50 A / 1200 V
Fuse rating (versions with fuses)	15 A / 1100 V
<b>Output side</b>	
AC grid connection type	Three-phase 3W+PE or 4W+PE
Rated AC power ( $P_{acr}$ , @ $\cos\phi>0.99$ )	33 000 W
Maximum apparent power ( $S_{max}$ )	33 000 VA
Rated AC grid voltage ( $V_{acr}$ )	400 V
AC voltage range	320 to 480 V <sup>1)</sup>
Maximum AC output current ( $I_{ac,max}$ )	50.3 A
Contributory fault current	50.3 A
Rated output frequency ( $f_i$ )	50 Hz/60 Hz
Output frequency range ( $f_{min}...f_{max}$ )	47 to 53 Hz/57 to 63 Hz <sup>2)</sup>
Nominal power factor and adjustable range	> 0.995, with $P_{acr} = 33.0$ kW, adj. $\pm 0.9$ with $P_{acr} = 29.7$ kW, adj. $\pm 0$ to 1 with $S = 33.0$ kVA
Total current harmonic distortion	< 3%
AC connection type	Fixed plug type connector

## ABB string inverter design diagram



## Technical data and type

Type designation	<b>33 kW</b> <b>PRO-33.0-TL-OUTD</b>
<b>Output protection</b>	
Anti-islanding protection	According to local standard
Maximum external AC overcurrent protection	80 A
Output overvoltage protection - varistor	5
<b>Operating performance</b>	
Maximum efficiency ( $\eta_{max}$ )	98.3%
Weighted efficiency (EURO/CEC)	98.0% / 98.1%
Feed in power threshold	20 W
Night consumption	< 1 W
<b>Communication</b>	
Remote monitoring	VSN700 Data Logger (opt.)
User interface	Detachable graphical display
<b>Environmental</b>	
Ambient temperature range	-25 to +60°C / -13 to 140°F with derating above 45°C/113°F
Relative humidity	0 to 100% condensing
Sound pressure level, typical	67 dBA @ 1 m
Maximum operating altitude without derating	3000 m / 9840 ft
<b>Physical</b>	
Environmental protection rating	IP65 (IP54 fans)
Cooling	Forced
Dimension (H x W x D) mm/inch	740 x 520 x 300 mm / 29.1" x 20.5" x 11.8"
Weight kg / lb	< 66.0 kg / 146 lbs (standard version)
Mounting system	Wall bracket
<b>Safety</b>	
Isolation level	Transformerless
Marking	CE, RCM
Safety and EMC standard	IEC/EN 62109-1, IEC/EN 62109-2, EN61000-6-2, AS/NZS 3200, EN61000-6-3, EN61000-3-11, EN61000-3-12
Grid standard (check availability)	CEI 0-21, CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G59/3, C10/11, EN 50438 (not for all national appendices), PPC Greece, RD 1699, RD 413, RD 661, P.O. 12.3, UNE206007-1, AS 4777, BDEW, NRS-097-2-1, SAGC, MEA, PEA, IEC 61727, IEC 62116, ABNT NBR16149/16150, VFR-2014
<b>Available product variants</b>	
Standard	PRO-33.0-TL-OUTD-400
With DC switch	PRO-33.0-TL-OUTD-S-400
With DC switch, fuses and DC surge arresters	PRO-33.0-TL-OUTD-SX-400

<sup>1)</sup> The AC voltage range may vary depending on specific country grid standard

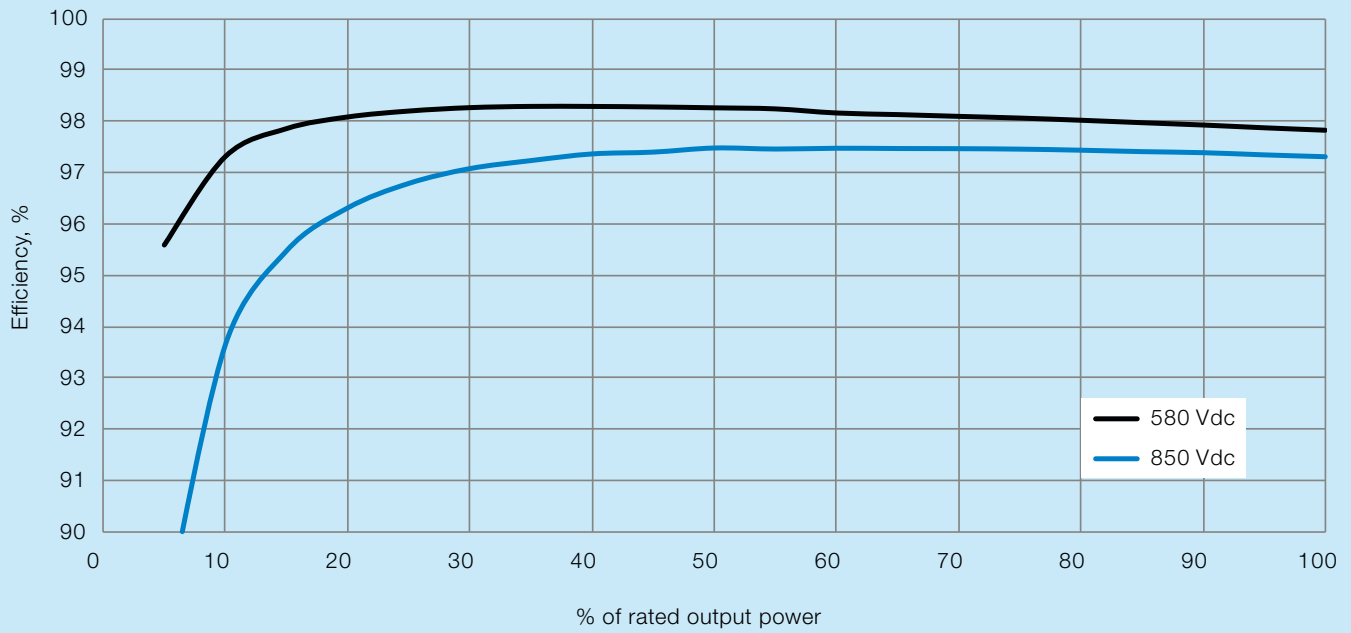
<sup>2)</sup> The frequency range may vary depending on specific country grid standard

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

<sup>4)</sup> Inverter does not start >1000 V

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

## Efficiency curves of PRO-33.0-TL-OUTD



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### Accessories

- User friendly data logger with web interface for commissioning and monitoring portal for viewing the assets performance
- IO module for programmable relay output
- Warranty extensions

### Support and service

ABB supports its customers within dedicated, global service organizations in more than 60 countries and strong regional and national technical partner networks providing a complete range of life cycle services.

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

[www.abb.com/solarinverters](http://www.abb.com/solarinverters)

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VSN700 Data Logger and web user interface