

# 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 (ie 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 de-centralized 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 knowhow 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 de-centralized PV systems**

ABB's three-phase PRO-33 string inverter is designed for medium and large de-centralized 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

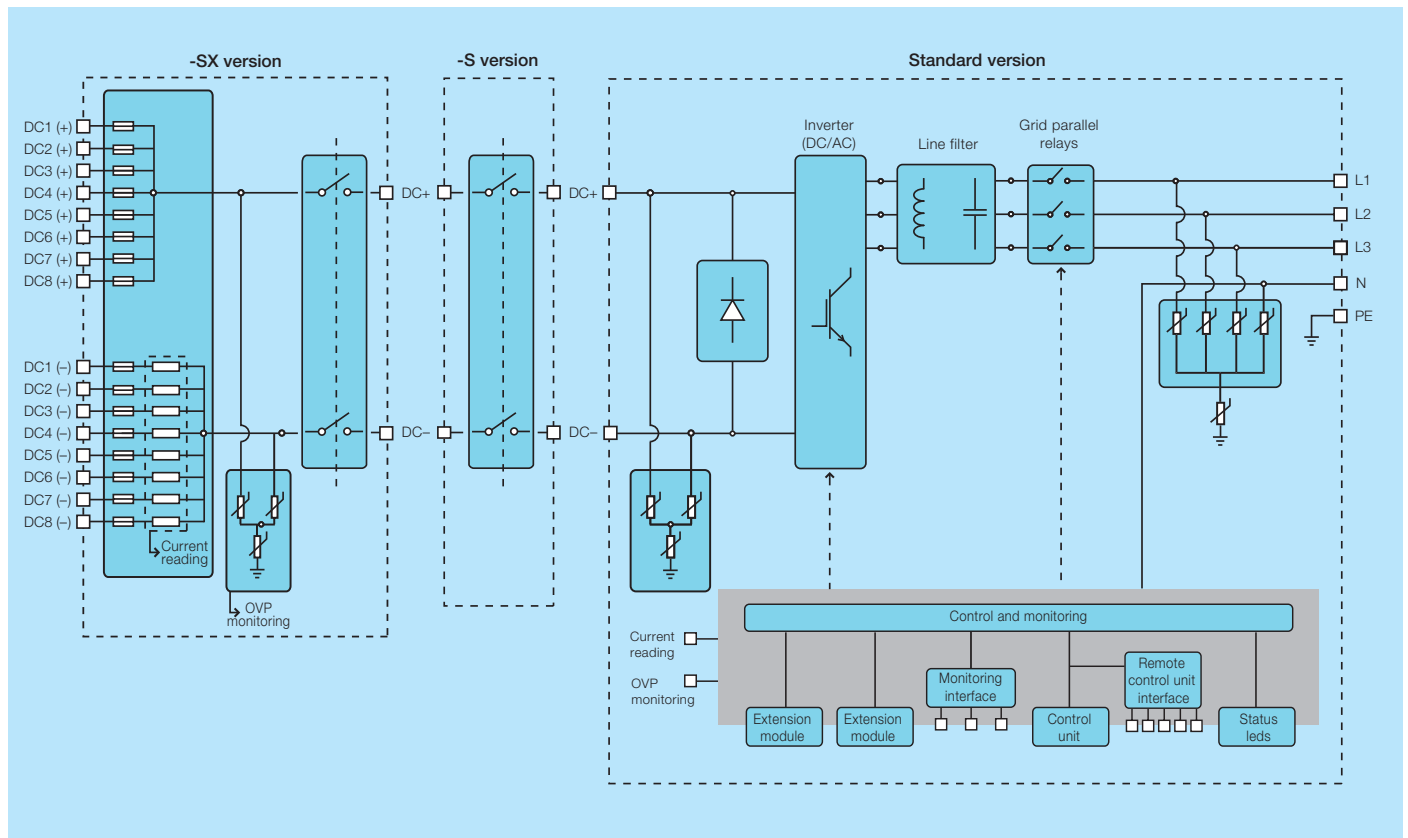
Type designation	33 kW PRO-33.0-TL-OUTD
<b>Input side</b>	
Absolute maximum DC input voltage ( $V_{max,abs}$ )	1100 V <sup>1)</sup>
Startup DC input voltage ( $V_{start}$ )	610 V
Operating DC input voltage range ( $V_{demin}, V_{dcmx}$ )	580 to 950 V
Rated DC input voltage ( $V_{dcr}$ )	580 V
Rated DC input power ( $P_{dcr}$ )	33 700 W
Number of independent MPPT	1
MPPT input DC voltage range ( $V_{MPPTmin}, V_{MPPTmax}$ ) at $P_{dcr}$	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	Tool-less PV connector Phoenix Sunclix on -SX version/screw terminal block on standard and -S version
<b>Input protection</b>	
Reverse polarity protection	Inverter protection only, from limited current source, via short-circuit diode and for fused -SX model when more than 2 strings are connected.
Input over voltage protection for each MPPT - varistor (-/S) version	3
Input over voltage protection - plug in modular surge arrester (-SX version)	3 (Class II)
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 >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>2)</sup>
Maximum AC output current ( $I_{ac,max}$ )	50.3 A
Contributory fault current	50.3 A
Rated output frequency ( $f_r$ )	50 Hz/60 Hz
Output frequency range ( $f_{min}, f_{max}$ )	47 to 53 Hz/57 to 63 Hz <sup>3)</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

<sup>1)</sup> Inverter does not start >1000 V

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

<sup>3)</sup> The frequency range may vary depending on specific country grid standard

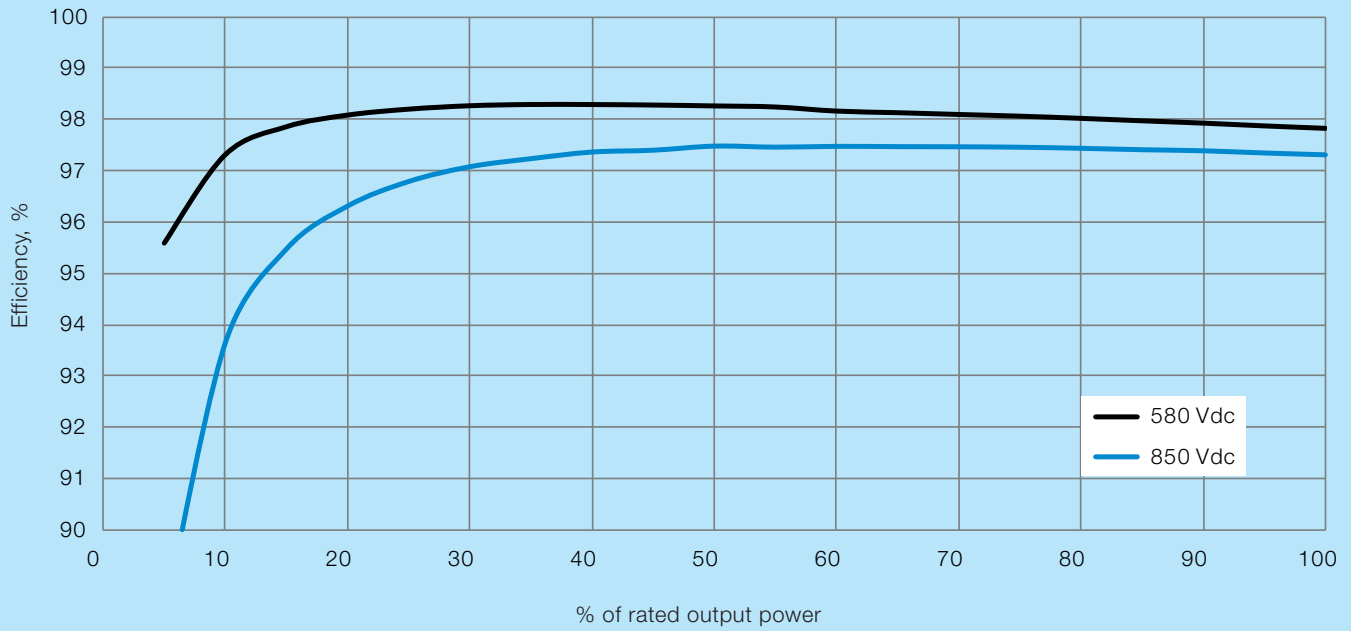
## ABB string inverter design diagram



## 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 AC overcurrent protection	50.3 A
Output overvoltage protection - varistor	5
<b>Operating performance</b>	
Maximum efficiency ( $\eta_{max}$ )	98.3%
Weighted efficiency (EURO/CEC)	98.0%/98.1%
Night time consumption	< 1 W
Stand-by consumption	< 20 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
Noise emission	< 67 dB(A) @ 1 m
Maximum operating altitude without derating	2000 m/6560 ft
<b>Physical</b>	
Environmental protection rating	IP 65 (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 lb (standard version)
Mounting system	Wall bracket
<b>Safety</b>	
Isolation level	Transformerless
Marking	CE, RCM mark
Safety and EMC standard	EN 62109-1, EN 62109-2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
Grid standard (check availability)	CEI 0-21, CEI 0-16, VDE 0126-1-1, VDE-AR-N 4105, G59/3, VDE 0126-1-1/A1 VFR2014, PPC Greece, MEA, PEA, IEC 61727, IEC 62116, EN 50438, AS4777/AS3100, RD1699/RD661 (check from sales for additional grid standards)
<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

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

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VSN700 Data Logger and web user interface