

SOLAR INVERTERS

## ABB string inverters

TRIO-50.0-TL-OUTD / TRIO-60.0-TL-OUTD-480

50 to 60 kW



The TRIO-50.0/60.0 inverter is ABB's three-phase string solution for cost efficient large decentralized photovoltaic systems for both commercial and utility applications.

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01 TRIO-50.0/60.0  
outdoor string inverter

The TRIO-50.0/60.0 inverter has been designed with the objective to maximize the ROI in large systems with all the advantages of a decentralized configuration for both rooftop and ground-mounted installations.

### Modular design

TRIO-50.0/60.0 has a landscape modular design to guarantee maximum flexibility.

The separate and configurable AC and DC compartments increase the ease of installation and maintenance with their ability to remain separately wired from the inverter module inside the system.

The TRIO-50.0/60.0 comes with the most complete wiring box configurations available including up to 16 DC inputs with fast connectors, monitored fuses, AC and DC switches and monitored type II AC and DC surge arresters.

### Flexibility of installation

The forced air cooling system, designed for a simple and fast maintenance allows for the maximum flexibility of installation. The inverter comes with mounting supports for both horizontal and vertical positions which allow for the best use of space available beneath the solar panels.

### Design flexibility

The double stage conversion topology offers the advantage of a wide input voltage range for maximum flexibility of the system design.

### Highlights

- Transformerless topology
- Each inverter is set on specific grid codes which can be selected directly in the field
- Separate AC and DC compartments are available in different configurations
- Wide input range
- Both vertical and horizontal installation
- New 60 kW version available (480 Vac)

# ABB string inverters

## TRIO-50.0-TL-OUTD

## TRIO-60.0-TL-OUTD-480

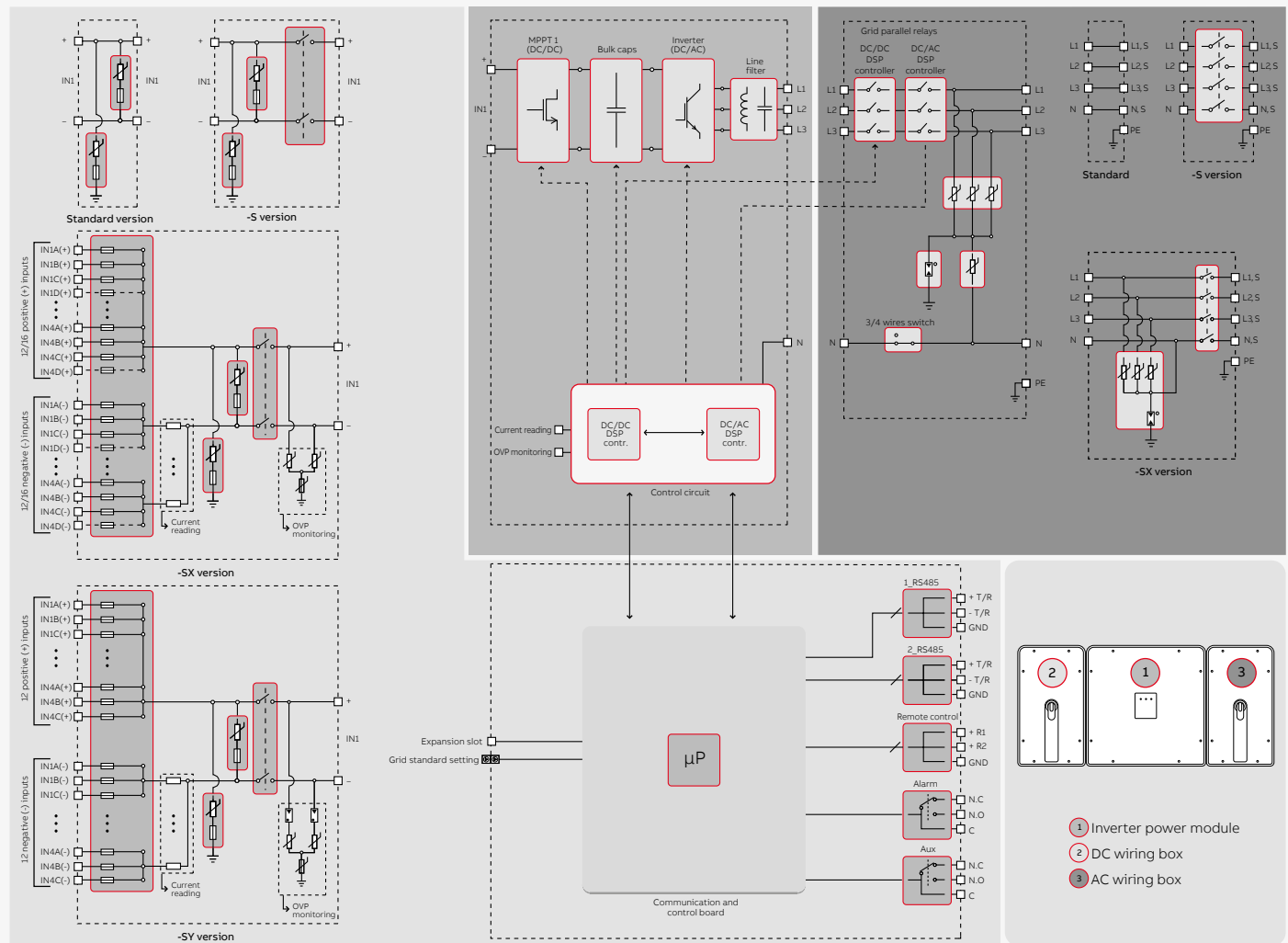
### 50 to 60 kW



**Technical data and types**

Type code	TRIO-50.0-TL-OUTD	TRIO-60.0-TL-OUTD-480
<b>Input side</b>		
Absolute maximum DC input voltage ( $V_{max,abs}$ )	1000 V	
Start-up DC input voltage ( $V_{start}$ )	420...700 V (Default 420 V)	420...700 V (Default 500 V)
Operating DC input voltage range ( $V_{dcmin}...V_{dcmax}$ )	0,7x $V_{start}$ ...950 V (min 300 V)	0,7x $V_{start}$ ...950 V (min 360 V)
Rated DC input voltage ( $V_{dcr}$ )	610 Vdc	720 Vdc
Rated DC input power ( $P_{dcr}$ )	52000 W	61800 W
Number of independent MPPT	1	
MPPT input DC voltage range ( $V_{MPPTmin} ... V_{MPPTmax}$ ) at $P_{acr}$	480-800 Vdc	570-800 Vdc
Maximum DC input current ( $I_{dcmax}$ )	108 A	
Maximum input short circuit current	160 A	
Number of DC input pairs	12 (-SX/-SY), 16 (-SX)	16 (-SX)
DC connection type	PV quick fit connector <sup>3)</sup> on -SX and -SY 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	Yes, 2	
Input over voltage protection for each MPPT - plug In modular surge arrester	Type 2 (-SX version) / Type 1+2 (-SY version)	
Photovoltaic array isolation control	According to local standard	
DC switch rating for each MPPT (version with DC switch)	200 A / 1000 V	
Fuse rating (version with fuses)	15 A / 1000 V	
<b>Output side</b>		
AC grid connection type	Three-phase (3W+PE or 4W+PE)	
Rated AC power ( $P_{acr} @ \cos\phi=1$ )	50000 W	60000 W
Maximum AC output power ( $P_{acmax} @ \cos\phi=1$ )	50000 W	60000 W
Maximum apparent power ( $S_{max}$ )	50000 VA	60000 VA
Rated AC grid voltage ( $V_{acr}$ )	400 V	480 V
AC voltage range	320...480 V <sup>1)</sup>	384...571 V <sup>1)</sup>
Maximum AC output current ( $I_{ac,max}$ )	77 A	
Contributory fault current	92 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; 0...1 inductive/capacitive with maximum $S_{max}$	
Total current harmonic distortion	<3%	
Maximum AC cable section allowed	95 mm <sup>2</sup> copper (with TRIO-ALUMINUM-KIT 150 mm <sup>2</sup> aluminum)	
AC connection type	Screw terminal block, cable gland PG42	
<b>Output protection</b>		
Anti-islanding protection	According to local standard	
Maximum external AC overcurrent protection	100 A	
Output overvoltage protection - varistor	Yes, 4	
Output overvoltage protection - plug in modular surge arrester (-SX version)	4, Type 2	
<b>Operating performance</b>		
Maximum efficiency ( $\eta_{max}$ )	98.3%	98.5%
Weighted efficiency (EURO/CEC)	98.0% / -	98.0% / -
<b>Communication</b>		
Remote monitoring	VSN300 Wifi Logger Card (opt.), VSN700 Data Logger (opt.)	
Wireless local monitoring	VSN300 Wifi Logger Card (opt.)	
User interface	LEDs, Display (option)	
Communication interface	2 (RS485)	
<b>Environmental</b>		
Ambient temperature range	-25...+60°C/ -13...14°F with derating above 50°C / 140°F	-25...+60°C/-13...140°F with derating above 45°C/113°F
Relative humidity	4%... 100% condensing	
Sound pressure level, typical	75 dB(A) @1 m	
Maximum operating altitude without derating	2000 m / 6560 ft	
<b>Physical</b>		
Environmental protection rating	IP65 (IP54 for cooling section)	
Cooling	Forced air	
Dimension (H x W x D)	725 mm x 1491 mm x 315 mm / 28.5" x 58.7" x 12.4"	
Weight	95 kg / 209 lbs overall, 66 kg / 145 lbs electronic compartment, 15 kg / 33 lbs AC wiring box (full optional), 14kg / 31 lbs DC wiring box (full optional)	
Mounting system	Wall bracket, horizontal support	

ABB TRIO-50.0-TL-OUTD/TRIO-60.0-TL-OUTD-480 string inverter block diagram



Technical data and types

Type code	TRIO-50.0-TL-OUTD	TRIO-60.0-TL-OUTD-480
<b>Safety</b>		
Isolation level	Transformerless	
Marking	CE	
Safety and EMC standard	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12	
Grid standard (check your sales channel for availability)	CEI 0-21 <sup>4)</sup> , CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105 <sup>4)</sup> , G59/3, EN 50438 (not for all national appendices) <sup>4)</sup> , RD 1699 <sup>4)</sup> , RD 413 <sup>4)</sup> , RD 661 <sup>4)</sup> , P.O. 12.3 <sup>4)</sup> , AS 4777 <sup>4)</sup> , BDEW, NRS-097-2-1 <sup>4)</sup> , MEA <sup>4)</sup> , PEA <sup>4)</sup> , IEC 61727, IEC 60068, IEC 61683, VFR-2014, IEC 62116	
<b>Available product variants</b>		
<b>Inverter power module</b>	TRIO-50.0-TL-OUTD-POWER MODULE	TRIO-60.0-TL-OUTD-POWER MODULE
<b>DC wiring box options</b>		
Input connections with terminal blocks	DCWB-TRIO-50.0-TL-OUTD <sup>5)</sup>	DCWB-TRIO-60.0-TL-OUTD
Input connections with terminal blocks + DC switch	DCWB-S-TRIO-50.0-TL-OUTD <sup>5)</sup>	DCWB-S-TRIO-60.0-TL-OUTD
12 quick input connections + fuses + DC switch + surge arresters Type 2	DCWB-SX-TRIO-50.0-TL-OUTD/12 INPUTS <sup>5)</sup>	-
16 quick input connections + fuses + DC switch + surge arresters Type 2	DCWB-SX-TRIO-50.0-TL-OUTD/16 INPUTS <sup>5)</sup>	DCWB-SX-TRIO-60.0-TL-OUTD/16 INPUTS
12 quick input connections + fuses + DC switch + surge arresters Type 1+2	DCWB-SY-TRIO-50.0-TL-OUTD <sup>5)</sup>	-
<b>AC wiring box options</b>		
AC output connections with terminal blocks	ACWB-TRIO-50.0-TL-OUTD	ACWB-TRIO-60.0-TL-OUTD
AC output connections with terminal blocks + AC switch	ACWB-S-TRIO-50.0-TL-OUTD	ACWB-S-TRIO-60.0-TL-OUTD
AC output connections with terminal blocks + AC switch + surge arrester Type 2	ACWB-SX-TRIO-50.0-TL-OUTD	ACWB-SX-TRIO-60.0-TL-OUTD

<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

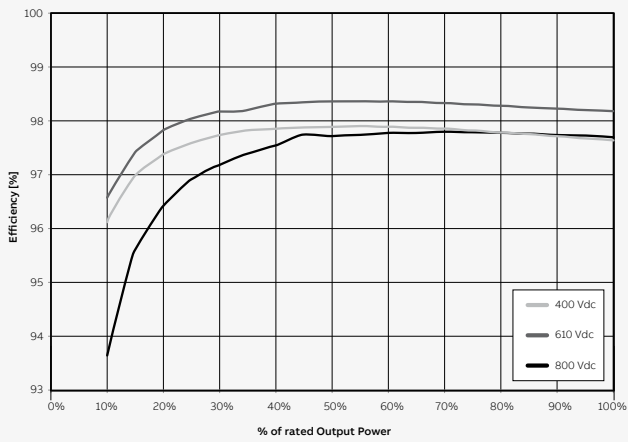
<sup>3)</sup> Please refer to the document "String inverters – Product manual appendix" available at [www.abb.com/solarinverters](http://www.abb.com/solarinverters) for information on the quick-fit connector brand and model used in the inverter

<sup>4)</sup> Valid only for model TRIO-50-TL-OUTD

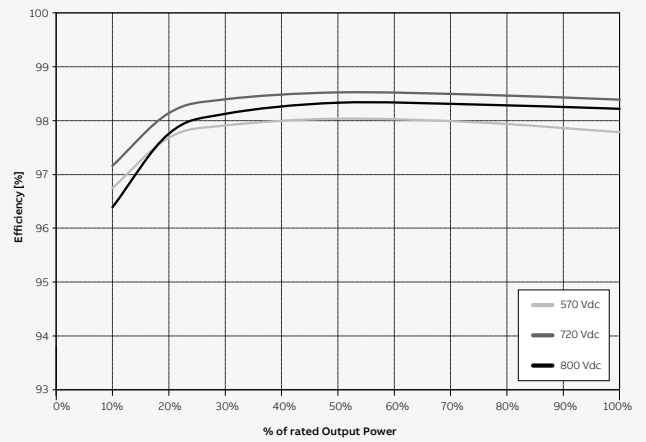
<sup>5)</sup> DCWB with display is available on request

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

Efficiency curves of TRIO-50.0-TL-OUTD



Efficiency curves of TRIO-60.0-TL-OUTD



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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