

Solar inverters

ABB string inverters TRIO-50.0-TL-OUTD 50 kW



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

The most powerful ABB string inverter available today, this new addition to the TRIO family 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 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 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

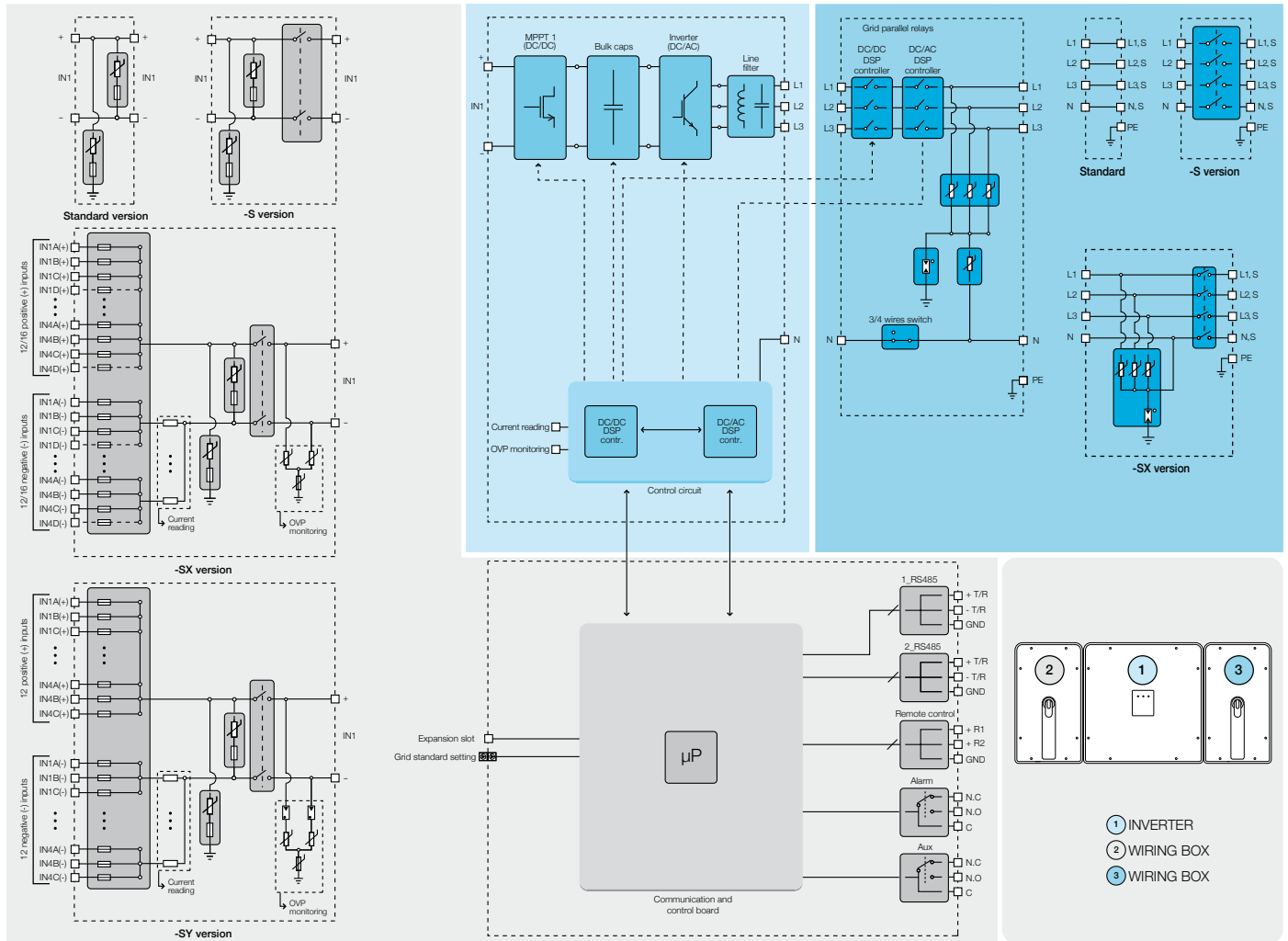
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected directly in the field
- Separate AC and DC compartments are available in different configurations
- Wide input range
- Both vertical and horizontal installation



Technical data and types

Type code	TRIO-50.0-TL-OUTD
Input side	
Absolute maximum DC input voltage ($V_{max,abs}$)	1000 V
Start-up DC input voltage (V_{start})	360...500 V (Default 420 V)
Operating DC input voltage range ($V_{dcmín...}V_{dcmax}$)	0,7x V_{start} ...950 V (min 300 V)
Rated DC input voltage (V_{dcr})	610 Vdc
Rated DC input power (P_{dcr})	51200 W
Number of independent MPPT	1
MPPT input DC voltage range ($V_{MPPTmin} \dots V_{MPPTmax}$) at P_{dcr}	480-800 Vdc
Maximum DC input current ($I_{dcmáx}$)	110 A
Maximum input short circuit current	160 A
Number of DC inputs pairs	12 or 16 (-SX version) / 12 (-SY version)
DC connection type	PV quick fit connector ³⁾ on -SX and -SY version / Screw terminal block on Standard and -S version
Input protection	
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	-SX: Type 2; -SY: Type 1+2
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
Output side	
AC grid connection type	Three-phase (3W+PE or 4W+PE)
Rated AC power ($P_{acr} @\cos\phi=1$)	50000 W
Maximum AC output power ($P_{acmax} @\cos\phi=1$)	50000 W
Maximum apparent power (S_{max})	50000 VA
Rated AC grid voltage ($V_{acr,r}$)	400 V
AC voltage range	320...480 V ¹⁾
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 ²⁾
Nominal power factor and adjustable range	> 0.995; 0...1 inductive/capacitive with maximum S_{max}
Total current harmonic distortion	<3%
AC connection type	Screw terminal block, cable gland PG42
Output protection	
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
Operating performance	
Maximum efficiency (η_{max})	98.30%
Weighted efficiency (EURO/CEC)	98.0% / -
Communication	
Remote monitoring	VSN300 Wifi Logger Card (opt.), VSN700 Data Logger (opt.)
Wireless local monitoring	VSN300 Wifi Logger Card (opt.)
User interface	LEDs
Communication interface	2 (RS485)

Block diagram of TRIO-50.0-TL-OUTD



Technical data and types

Type code	TRIO-50.0-TL-OUTD
Environmental	
Ambient temperature range	-25...+60°C / -13...140 °F with derating above 50 °C / 122 °F
Relative humidity	4%... 100% condensing
Sound pressure level, typical	75 dB(A) @ 1 m
Maximum operating altitude without derating	2000 m / 6560 ft
Physical	
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
Safety	
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, CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G59/3, EN 50438 (not for all national appendices), RD 1699, RD 413, RD 661, P.O. 12.3, AS 4777, BDEW, NRS-097-2-1, MEA, PEA, IEC 61727, IEC 60068, IEC 61683, VFR-2014, IEC 62116
Available product variants	
Inverter power module	TRIO-50.0-TL-OUTD-POWER MODULE
DC wiring box options	
Input connections with terminal blocks	DCWB-TRIO-50.0-TL-OUTD
Input connections with terminal blocks + DC switch	DCWB-S-TRIO-50.0-TL-OUTD
12 quick Input connections + fuses + DC switch + surge arresters Type 2	DCWB-SX-TRIO-50.0-TL-OUTD/12 INPUTS
16 quick Input connections + fuses + DC switch + surge arresters Type 2	DCWB-SX-TRIO-50.0-TL-OUTD/16 INPUTS
12 quick Input connections + fuses + DC switch + surge arresters Type 1 + 2	DCWB-SY-TRIO-50.0-TL-OUTD
AC wiring box options	
AC output connections with terminal blocks	ACWB-TRIO-50.0-TL-OUTD
AC output connections with terminal blocks + AC switch	ACWB-S-TRIO-50.0-TL-OUTD
AC output connections with terminal blocks + AC switch + surge arrester Type 2	ACWB-SX-TRIO-50.0-TL-OUTD

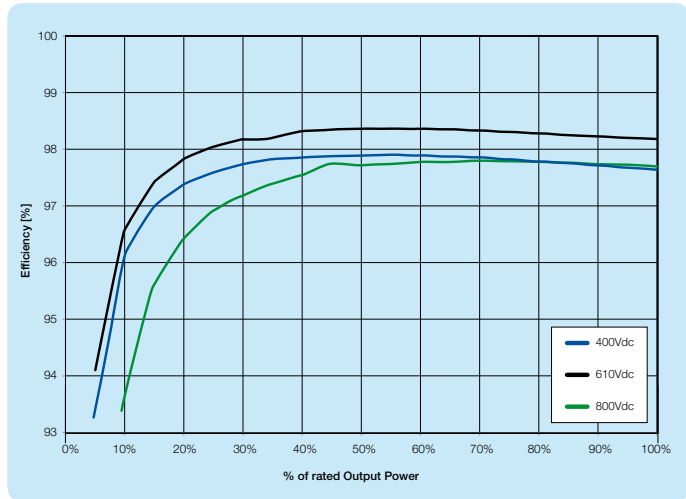
¹⁾ The AC voltage range may vary depending on specific country grid standard

²⁾ The Frequency range may vary depending on specific country grid standard

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

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

Efficiency curves of TRIO-50.0-TL-OUTD



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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.

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