

SOLAR INVERTERS

ABB string inverters

TRIO-5.8/7.5/8.5-TL-OUTD

5.8 to 8.5 kW



The all-in-one residential three-phase TRIO-5.8, 7.5 and 8.5 kW inverters deliver performance, ease of use and installation, monitoring and control.

With their 98% peak efficiency and wide input voltage range, the residential TRIO inverter means flexible installations and powerful output.

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TRIO-5.8/7.5/8.5-
TL-OUTD outdoor
string inverter

Commercial grade engineering at residential scale

The topology of the larger, commercial TRIO inverters has been redesigned to ensure that the TRIO-5.8/7.5/8.5 models also enjoy high conversion efficiency across a wide range of input voltages. Optional integrated dataloggers and smart grid functionality, remote firmware updating and elegantly simple sliding front covers make these all-in-one devices easy to install and maintain. In short, they are commercial grade engineering at residential scale.

Inverters packed with powerful features

The double maximum power point tracker (MPPT) gives maximum installation flexibility for an optimal energy production (TRIO-7.5/8.5 models). This line of inverters can integrate power control, monitoring functionalities and environmental sensor inputs, without requiring external components.

A compact Ethernet expansion card provides data logging functionality for monitoring the main parameters of the plant as well as advanced O&M operations both locally (with the integrated webserver) and remotely (with the AV Plant Portfolio Manager portal), via a LAN connection.

The outer cover with its natural cooling mechanism qualifies at IP65 environmental protection level for external use. It provides maximum reliability and ease of installation, with a sliding front panel giving access to the connection and configuration area without requiring the complete removal of the cover.

Highlights

- Three-phase bridge topology for DC/ AC output converter
- Transformerless topology
- Two independent MPPT channels for TRIO-7.5/8.5 allow optimal energy harvesting from two sub-arrays oriented in different directions (one MPPT channel for TRIO-5.8)
- Flat efficiency curves ensure high efficiency at all output levels enabling consistent and stable performance across the entire input voltage and output power range
- Wide input voltage range
- Remote inverter upgrade
- Reactive power management
- DC switch version available (-S)
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions (IP65)
- Sliding cover for the easiest installation and maintenance
- Data logger and smart grid functionalities integrated on expansion cards:
 - PMU expansion card option, with external sensor inputs for monitoring environmental conditions and additional RS-485 for Modbus protocol
 - Ethernet expansion card option with integrated web server and remote monitoring capability via web portal (Modbus/TCP supported)
- Availability of auxiliary DC output voltage (24 V, 100 mA)

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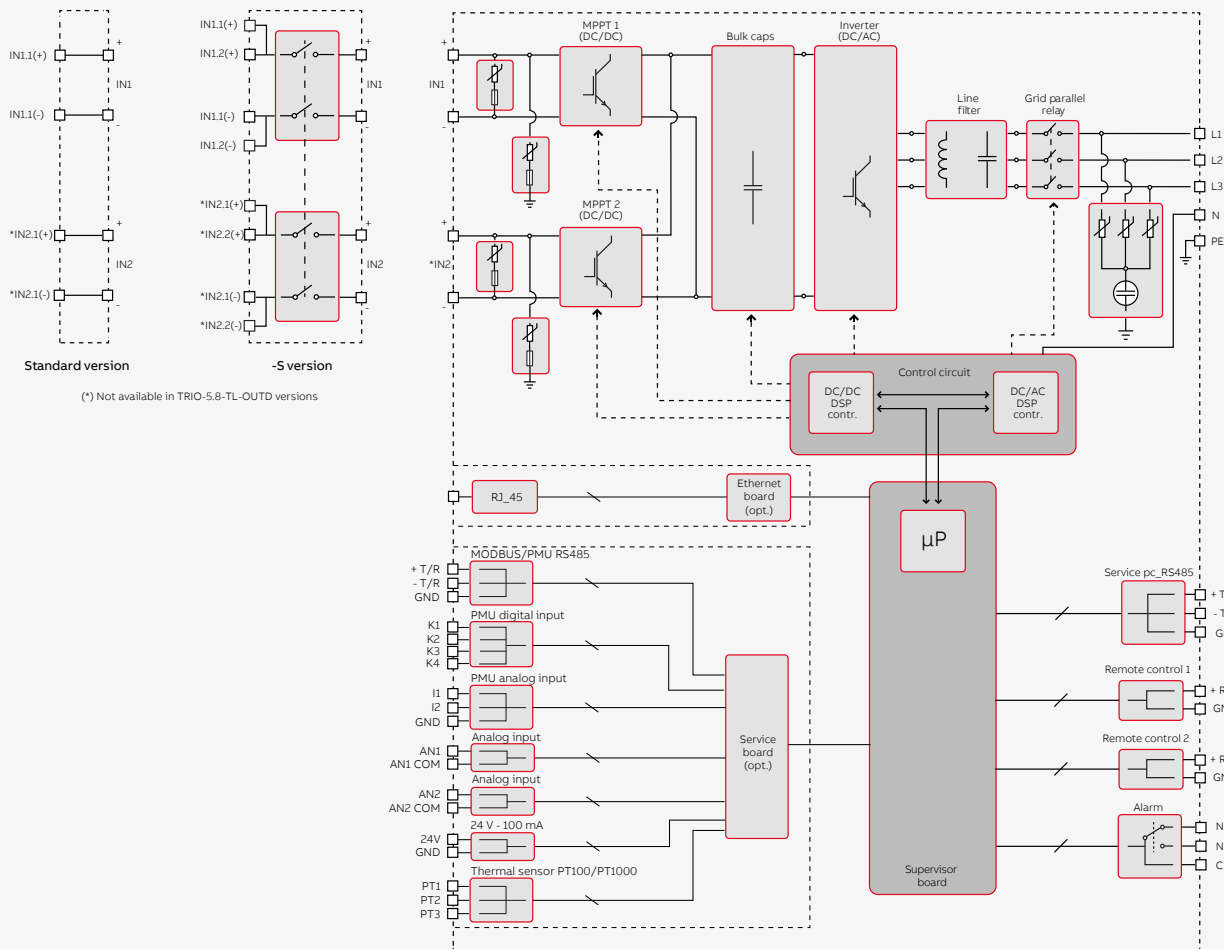
5.8 to 8.5 kW



Technical data and types

| Type code | TRIO-5.8-TL-OUTD | TRIO-7.5-TL-OUTD | TRIO-8.5-TL-OUTD |
|---|--|--|--|
| Input side | | | |
| Absolute maximum DC input voltage ($V_{max,abs}$) | 1000 V | | |
| Start-up DC input voltage (V_{start}) | 350 V (adj. 200...500 V) | | |
| Operating DC input voltage range ($V_{dcmin}...V_{dcmax}$) | 0.7 x $V_{start}...950$ V (min 200 V) | | |
| Rated DC input voltage (V_{dcr}) | 620 V | | |
| Rated DC input power (P_{dcr}) | 5950 W | 7650 W | 8700 W |
| Number of independent MPPT | 1 | 2 | 2 |
| Maximum DC input power for each MPPT ($P_{MPPTmax}$) | Linear derating from max to null [800 V ≤ V_{MPPT} ≤ 950 V] | | |
| MPPT input DC voltage range ($V_{MPPTmin} ... V_{MPPTmax}$) at P_{acr} | 320...800 V | - | - |
| DC input voltage range with parallel configuration of MPPT at P_{acr} | - | 320...800 V | 320...800 V |
| DC power limitation with parallel configuration of MPPT | - | Linear derating from max to null [800 V ≤ V_{MPPT} ≤ 950 V] | |
| DC power limitation for each MPPT with independent configuration of MPPT at P_{acr} , max unbalance example | - | 4800 W [320 V ≤ V_{MPPT} ≤ 800 V] the other channel: P_{dcr} -4800 W [215 V ≤ V_{MPPT} ≤ 800 V] | 4800 W [320 V ≤ V_{MPPT} ≤ 800 V] the other channel: P_{dcr} -4800 W [290 V ≤ V_{MPPT} ≤ 800 V] |
| Maximum DC input current (I_{dcmax}) / for each MPPT ($I_{MPPTmax}$) | 18.9 A | 30.0 A / 15.0 A | 30.0 A / 15.0 A |
| Maximum input short circuit current for each MPPT | 24.0 A | 20.0 A | 20.0 A |
| Number of DC input pairs for each MPPT | 2 (-S version) | | |
| DC connection type | PV quick fit connector ³⁾ on -S version / Screw terminal block on standard version | | |
| Input protection | | | |
| Reverse polarity protection | Yes, from limited current source | | |
| Input over voltage protection for each MPPT - varistor | Yes, 4 | | |
| Photovoltaic array isolation control | According to local standard | | |
| DC switch rating for each MPPT (version with DC switch) | 16 A / 1000 V, 25 A / 800 V | | |
| Output side | | | |
| AC grid connection type | Three-phase 3W+PE or 4W+PE | | |
| Rated AC power ($P_{acr}@cos\phi=1$) | 5800 W | 7500 W | 8500 W |
| Maximum apparent power (S_{max}) | 5800 VA | 7500 VA | 8500 VA |
| Rated AC grid voltage ($V_{acr,r}$) | 400 V | | |
| AC voltage range | 320...480 V ¹⁾ | | |
| Maximum AC output current ($I_{ac,max}$) | 10.0 A | 12.5 A | 14.5 A |
| Contributory fault current | 12.0 A | 14.5 A | 16.5 A |
| Rated output frequency (f) | 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, adj. ± 0.9 with P_{acr} = 5.22 kW, ± 0.8 with max 5.8 kVA | > 0.995, adj. ± 0.9 with P_{acr} = 6.75 kW, ± 0.8 with max 7.5 kVA | > 0.995, adj. ± 0.9 with P_{acr} = 7.65 kW, ± 0.8 with max 8.5 kVA |
| Total current harmonic distortion | < 2% | | |
| AC connection type | Screw terminal block, cable gland M32 | | |
| Output protection | | | |
| Anti-islanding protection | According to local standard | | |
| Maximum external AC overcurrent protection | 16.0 A | 16.0 A | 20.0 A |
| Output overvoltage protection - varistor | 4 plus gas arrester | | |
| Operating performance | | | |
| Maximum efficiency (η_{max}) | 98.0% | | |
| Weighted efficiency (EURO/CEC) | 97.4% / - | 97.5% / - | 97.5% / - |
| Feed in power threshold | 32 W | 36 W | 36 W |
| Night consumption | < 3 W | | |

ABB TRIO-5.8/7.5/8.5-TL-OUTD string inverter block diagram



Technical data and types

| Type code | TRIO-5.8-TL-OUTD | TRIO-7.5-TL-OUTD | TRIO-8.5-TL-OUTD |
|---|--|------------------------|------------------------|
| Communication | Ethernet card with webserver (opt.), PVI-USB-RS232_485 (opt.) | | |
| Wired local monitoring | Ethernet card (opt.), VSN300 Wifi Logger Card (opt.), VSN700 Data Logger (opt.) | | |
| Remote monitoring | VSN300 Wifi Logger Card (opt.) | | |
| Wireless local monitoring | Graphic display | | |
| User interface | Graphic display | | |
| Environmental | -25...+60°C /-13...140°F with derating above 50°C/122°F | | |
| Ambient temperature range | 0...100% condensing | | |
| Relative humidity | 50 dBA @ 1 m | | |
| Sound pressure level, typical | 2000 m / 6560 ft | | |
| Maximum operating altitude without derating | IP65 | | |
| Physical | Natural | | |
| Environmental protection rating | 641mm x 429 mm x 220 mm/ 25.2" x 16.9" x 8.7" | | |
| Cooling | (855 mm x 429 mm x 237 mm/ 33.7" x 16.9" x 9.3" with open front cover) | | |
| Dimension (H x W x D) | 25.0 kg / 55.1 lbs | 28.0 kg / 61.7 lbs | 28.0 kg / 61.7 lbs |
| Weight | Wall bracket | | |
| Mounting system | Transformerless | | |
| Safety | CE (50 Hz only), RCM | | |
| Isolation level | EN 62109-1, EN 62109-2, AS/NZS3100, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3 | | |
| Marking | CEI 0-21, CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G83/2, G59/3, RD 1699, RD 413, NRS-097-2-1, AS 4777, IEC 61727, IEC 62116, VFR 2014 | | |
| Safety and EMC standard | Grid standard (check your sales channel for availability) | | |
| Grid standard (check your sales channel for availability) | Available products variants | | |
| Standard | TRIO-5.8-TL-OUTD-400 | TRIO-7.5-TL-OUTD-400 | TRIO-8.5-TL-OUTD-400 |
| With DC switch | TRIO-5.8-TL-OUTD-S-400 | TRIO-7.5-TL-OUTD-S-400 | TRIO-8.5-TL-OUTD-S-400 |

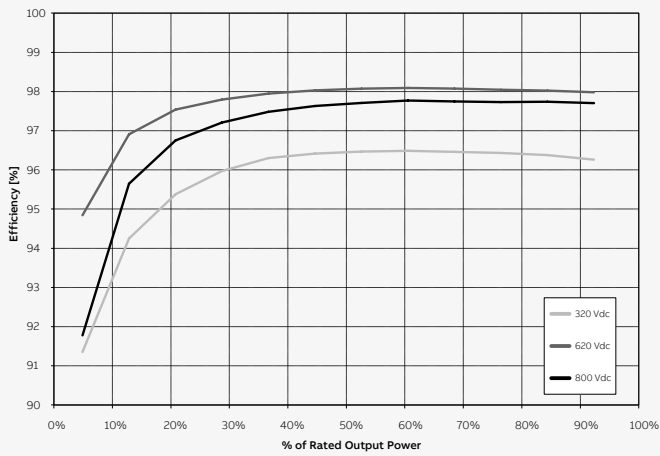
¹⁾ The AC voltage range may vary depending on specific country grid standard

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

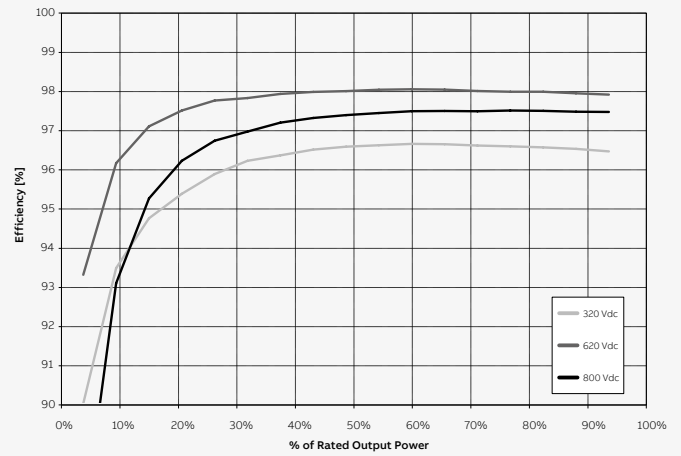
³⁾ Please refer to the document "String inverters – Product manual appendix" available at www.abb.com/solarinverters for information on the quick-fit connector brand and model used in the inverter

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

Efficiency curves of TRIO-5.8-TL-OUTD



Efficiency curves of TRIO-8.5-TL-OUTD



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

www.abb.com/solarinverters
www.abb.com

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