

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, these new residential TRIO inverters mean flexible installations and powerful output.

Commercial grade engineering at residential scale

These new additions to the TRIO family are small, light and built smart. 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). The new generation inverters can integrate power control, monitoring functionalities, and environmental sensor inputs, all 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 for 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.

Micro inverters

String inverters

Central inverters

Turnkey stations

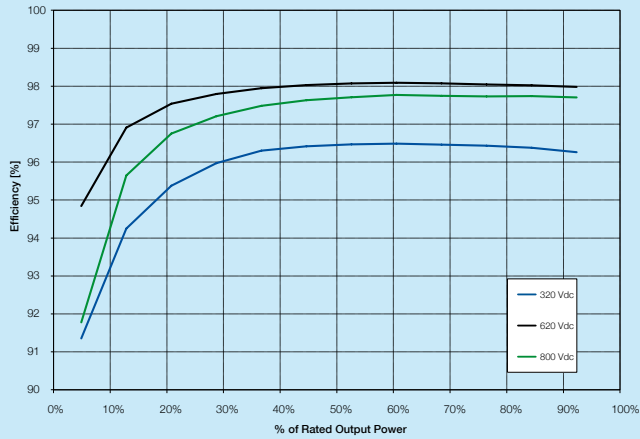
PV + Storage



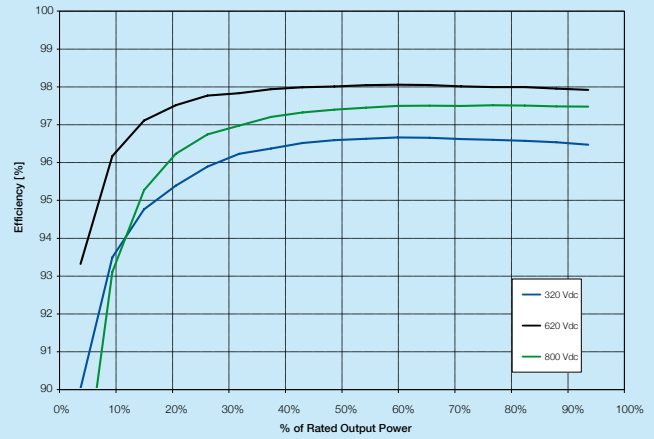
Highlights

- True three-phase bridge topology for DC/AC output converter
- Transformerless topology
- Two independent MPPT channels for TRIO-7.5/8.5 allows 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 ensuring 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 option (-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
- Datalogger 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 (24V, 100mA)

Efficiency curves of TRIO-5.8-TL-OUTD



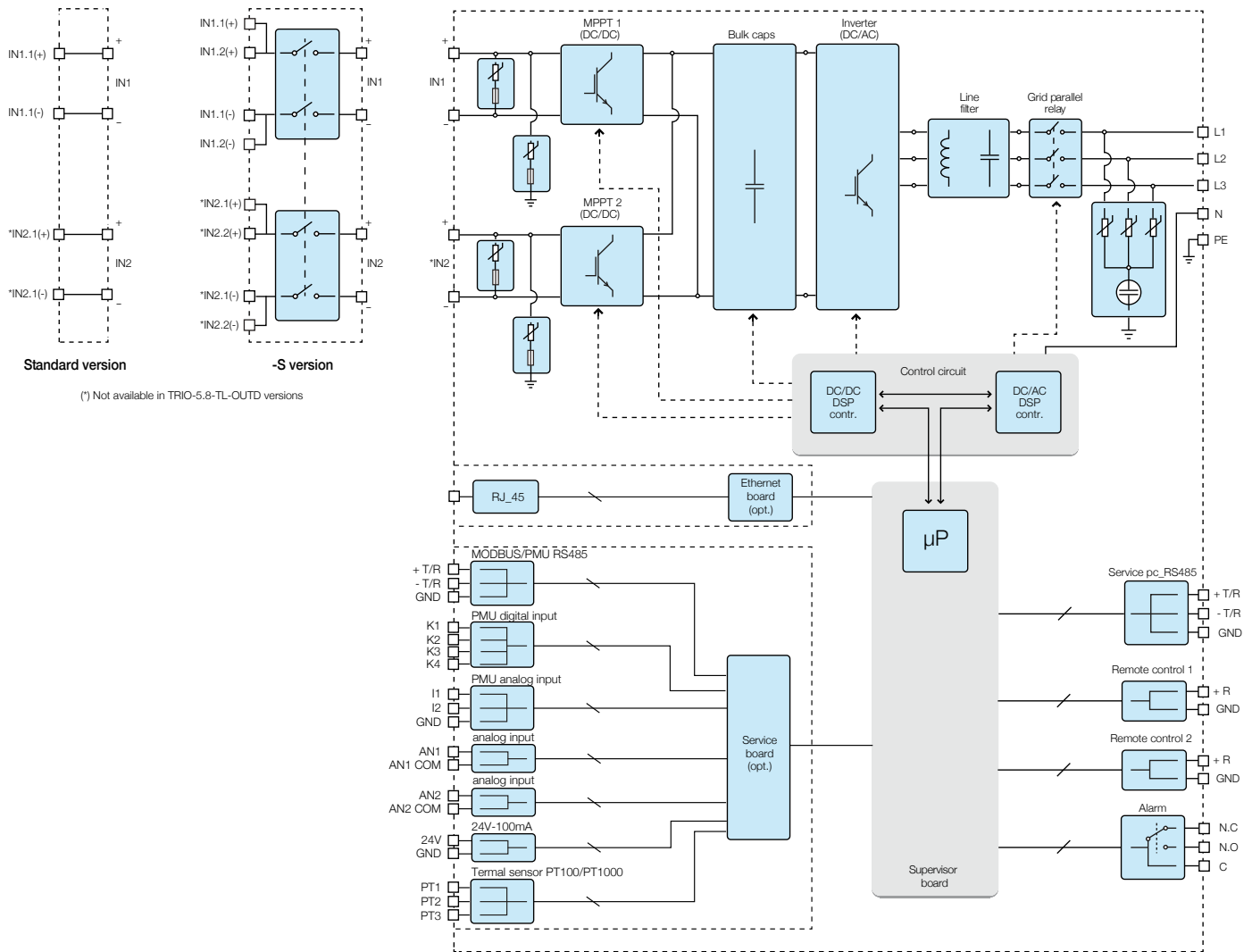
Efficiency curves of TRIO-8.5-TL-OUTD



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 | |
| Rated DC input voltage ($V_{dc,r}$) | | 620 V | |
| Rated DC input power ($P_{dc,r}$) | 5950 W | 7650 W | 8700 W |
| Number of independent MPPT | 1 | 2 | 2 |
| Maximum DC input power for each MPPT ($P_{MPPT,max}$) | 6050 W Linear derating from max to null [$800V \leq V_{MPPT} \leq 950V$] | 4800 W | 4800 W |
| MPPT input DC voltage range ($V_{MPPT,min} ... V_{MPPT,max}$) 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 [$800V \leq V_{MPPT} \leq 950V$] | |
| DC power limitation for each MPPT with independent configuration of MPPT at P_{acr} , max unbalance example | - | 4800 W [$320V \leq V_{MPPT} \leq 800V$] the other channel: $P_{dc,r} = 4800W$ [$215V \leq V_{MPPT} \leq 800V$] | 4800 W [$320V \leq V_{MPPT} \leq 800V$] the other channel: $P_{dc,r} = 4800W$ [$290V \leq V_{MPPT} \leq 800V$] |
| Maximum DC input current ($I_{dc,max}$) / for each MPPT ($I_{MPPT,max}$) | 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 inputs pairs for each MPPT | | 2 (-S version) | |
| DC connection type | Tool Free PV connector WM / MC4 (Screw terminal block on standard version) | | |
| Input protection | | | |
| Reverse polarity protection | | Yes, from limited current source | |
| Input over voltage protection for each MPPT - varistor | | 2 | |
| 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 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. \pm 0.9 with $P_{acr} = 5.22$ kW, \pm 0.8 with max 5.8 kVA | > 0.995, adj. \pm 0.9 with $P_{acr} = 6.75$ kW, \pm 0.8 with max 7.5 kVA | > 0.995, adj. \pm 0.9 with $P_{acr} = 7.65$ kW, \pm 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 AC overcurrent protection | 10.5 A | 13.0 A | 15.0 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 |
| Stand-by consumption | < 15W | < 15W | < 15W |

Block diagram of TRIO-5.8/7.5/8.5-TL-OUTD



Technical data and types

| Type code | TRIO-5.8-TL-OUTD | TRIO-7.5-TL-OUTD | TRIO-8.5-TL-OUTD |
|---|---|------------------------|------------------------|
| Communication | | | |
| Wired local monitoring | Ethernet card with webserver (opt.), PVI-USB-RS232_485 (opt.) | | |
| Remote monitoring | Ethernet card (opt.), VSN300 Wifi Logger Card ⁽³⁾ (opt.), PVI-AEC-EVO (opt.), VSN700 Data Logger (opt.) | | |
| Wireless local monitoring | VSN300 Wifi Logger Card ⁽³⁾ (opt.) | | |
| User interface | Graphic display | | |
| Environmental | | | |
| Ambient temperature range | -25...+60°C / -13...140°F with derating above 50°C/122°F | | |
| Relative humidity | 0...100% condensing | | |
| Noise emission | < 45 dB(A) @ 1 m | | |
| Maximum operating altitude without derating | 2000 m / 6560 ft | | |
| Physical | | | |
| Environmental protection rating | IP 65 | | |
| Cooling | Natural | | |
| Dimension (H x W x D) | 641mm x 429mm x 220mm/ 25.2" x 16.9" x 8.7" (855mm x 429mm x 237mm/ 33.7" x 16.9" x 9.3" with open front cover) | | |
| Weight | 25.0 kg / 55.1 lb | 28.0 kg / 61.7 lb | 28.0 kg / 61.7 lb |
| Mounting system | Wall bracket | | |
| Safety | | | |
| Isolation level | Transformerless | | |
| Marking | CE (50 Hz only) | | |
| Safety and EMC standard | EN62109-1, EN62109-2, AS/NZS3100, AS/NZS 60950, EN61000-6-2, EN61000-6-3, EN61000-3-2, EN61000-3-3 | | |
| Grid standard (check your sales channel for availability) | CEI 0-21, CEI 0-16, VDE 0126-1-1, VDE-AR-N 4105, G83/2, C10/11, EN 50438 (not for all national appendices), RD1699, RD 1565, ABNT NBR 16149, NRS-097-2-1, CLC/FprTS 50549 | | |
| 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. Check availability before to order

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