

# 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.

#### **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

## Additional highlights

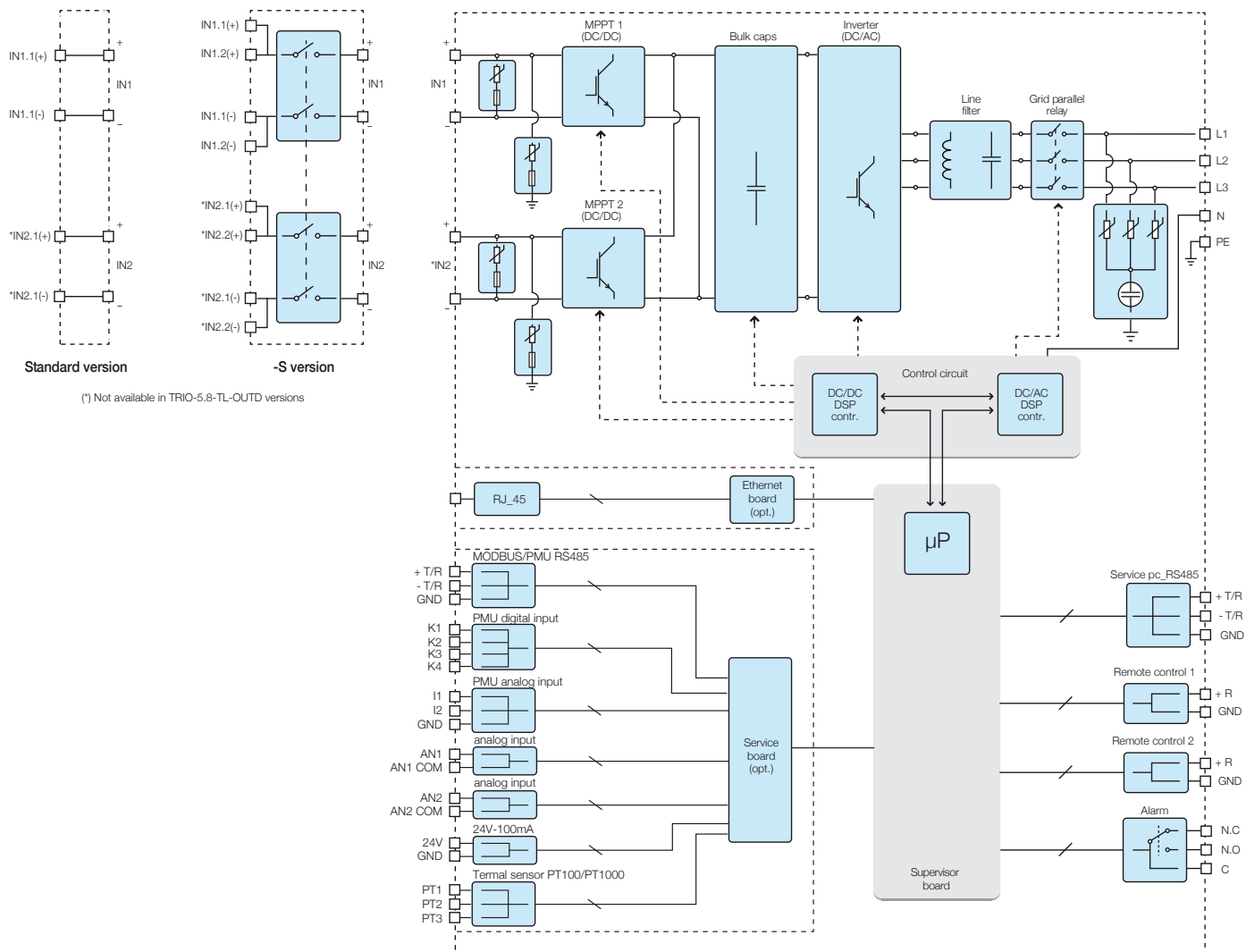
- DC switch version option (-S)
- Natural convection cooling for maximum reliability
- Outdoor enclosure for unrestricted use under any environmental conditions (IP65)
- Sliding cover for the easiest installation and maintenance
- Datalogger and smart grid functionalities integrated on expansion cards:
  - 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)



## Technical data and types

Type code	TRIO-5.8-TL-OUTD	TRIO-7.5-TL-OUTD	TRIO-8.5-TL-OUTD
<b>Input side</b>			
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 ( $V_{dcmin}...V_{dcmax}$ )		$0.7 \times V_{start}...950$ 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)		
<b>Input protection</b>			
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	
<b>Output side</b>			
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 ( $V_{ac,r}$ )		400 V	
AC voltage range		320...480 V <sup>(1)</sup>	
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 <sup>(2)</sup>	
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	
<b>Output protection</b>			
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	
<b>Operating performance</b>			
Maximum efficiency ( $\eta_{max}$ )		98.0%	
Weighted efficiency (EURO/OEC)	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
<b>Communication</b>			
Wired local monitoring	Ethernet card with webserver (opt.), PVI-USB-RS232_485 (opt.)		
Remote monitoring	Ethernet card (opt.), VSN300 Wifi Logger Card <sup>(3)</sup> (opt.), PVI-AEC-EVO (opt.), VSN700 Data Logger (opt.)		
Wireless local monitoring	VSN300 Wifi Logger Card <sup>(3)</sup> (opt.)		
User interface	Graphic display		
<b>Environmental</b>			
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		
<b>Physical</b>			
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		
<b>Safety</b>			
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		
<b>Available products variants</b>			
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

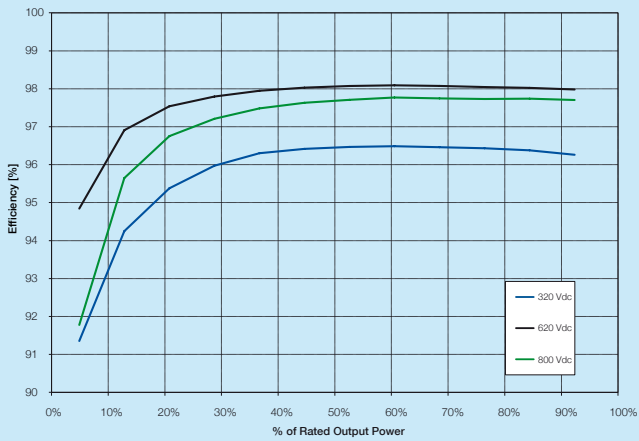
1. The AC voltage range may vary depending on specific country grid standard

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

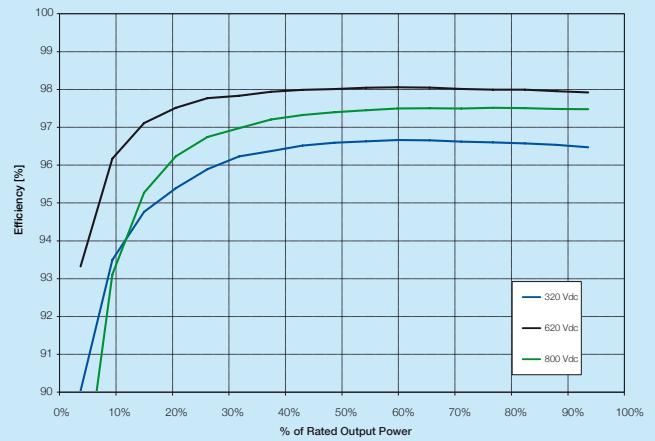
3. Check availability before to order

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

Efficiency curves of TRIO-5.8-TL-OUTD



Efficiency curves of TRIO-8.5-TL-OUTD



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