

TRIO-20.0-TL TRIO-27.6-TL

GENERAL SPECIFICATIONS OUTDOOR MODELS

The latest in Power-One's Aurora Trio range, this new-look three-phase inverter fills a specific niche in the commercial solar market. This new three-phase inverter benefits from the three-phase inverter technology perfected in the PVI-10.0 and 12.5, probably the world's most commonly used three-phase inverter which has led the way in best-in-class efficiency.

Controlling more PV panels than its smaller predecessor, the Trio-27.6 and Trio-20.0 will offer more flexibility and control to installers who have large installations with varying aspects or orientations. This device has two independent MPPTs and efficiency ratings of up to 98.2%. The very wide input voltage range makes the inverter suitable to installations with reduced string size.

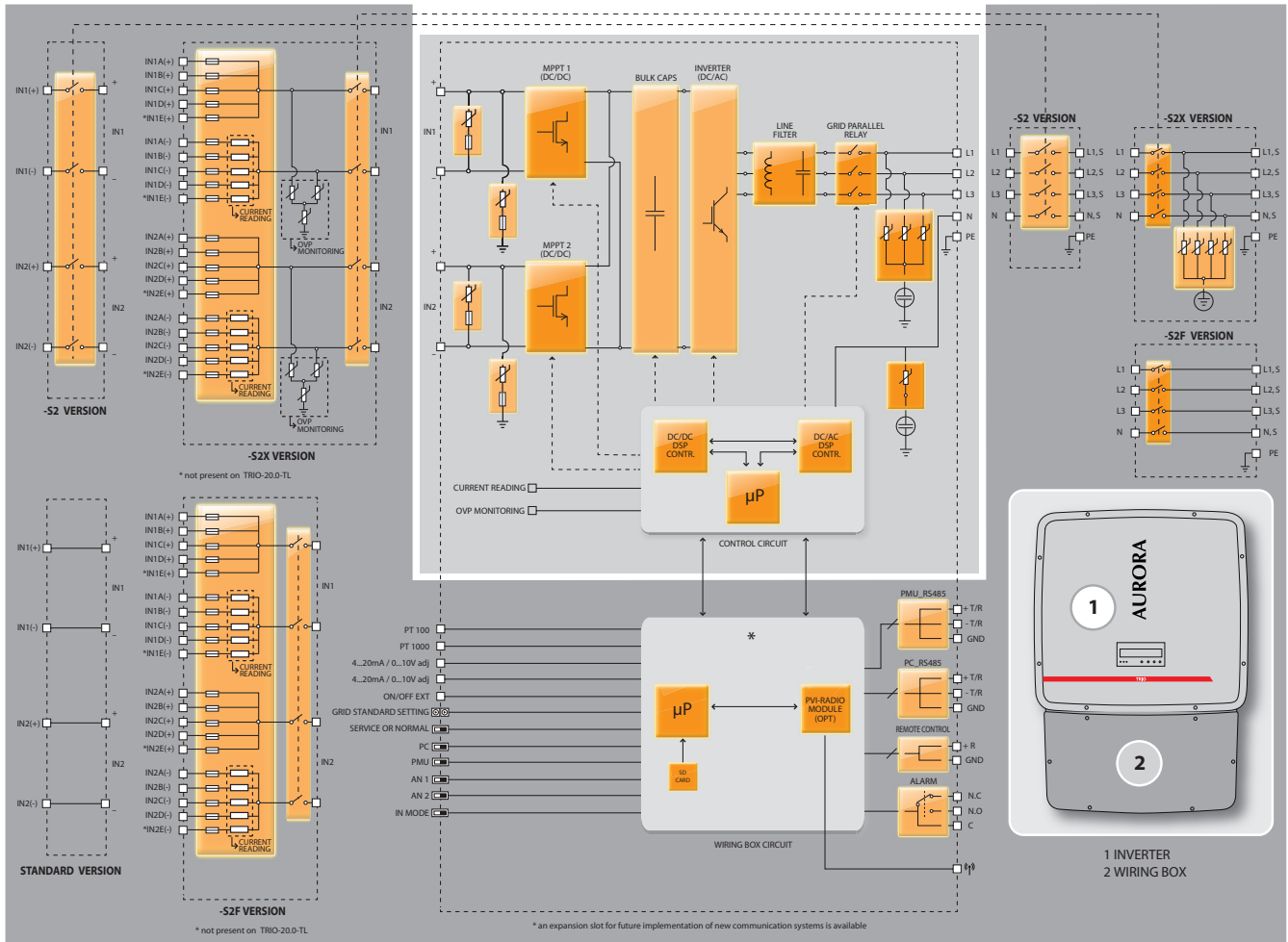
The new look inverter has new features including a special built-in heat sink compartment and front panel display system. The unit is free of electrolytic capacitors, leading to a longer product lifetime.



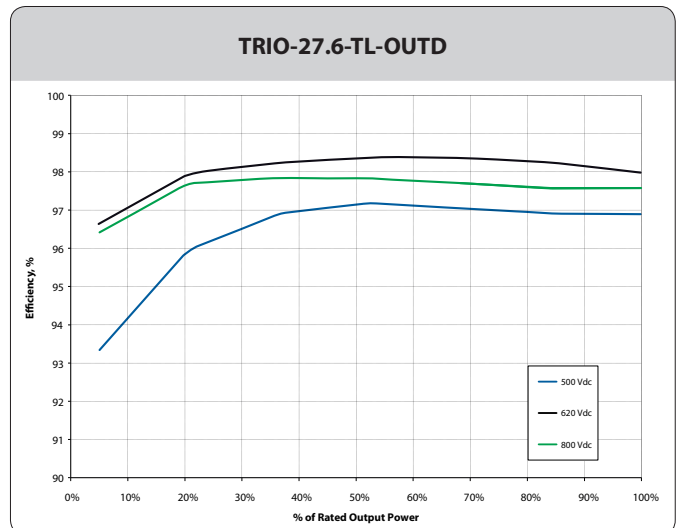
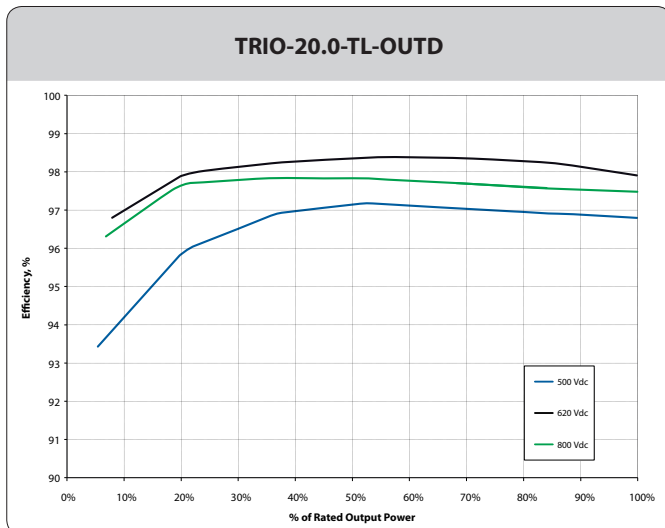
Features

- 'Electrolyte-free' power converter to further increase the life expectancy and long term reliability
- Quiet Rail
- True three-phase bridge topology for DC/AC output converter
- Each inverter is set on specific grid codes which can be selected in the field
- Dual input sections with independent MPP tracking, allows optimal energy harvesting from two sub-arrays oriented in different directions
- Wide input range
- Detachable wiring box to allow an easy installation
- Integrated string combiner with different options of configuration which include DC and AC disconnect switch in compliance with international Standards (-S2, -S2F and -S2X versions)
- High speed and precise MPPT algorithm for real time power tracking and improved energy harvesting
- Flat efficiency curves ensure high efficiency at all output levels ensuring consistent and stable performance across the entire input voltage and output power range
- Outdoor enclosure for unrestricted use under any environmental conditions
- Capability to select via display the Active Power reduction and the Reactive Power regulation (fixed $\cos(\phi)$, standard $\cos(\phi)=f(P)$ curve, Fixed Q (Q/Pn))
- Capability to connect external sensors for monitoring environmental conditions
- Availability of auxiliary DC output voltage (24V, 300mA)

BLOCK DIAGRAM OF TRIO-27.6-TL- OUTD



Block Diagram and Efficiency Curves



PARAMETER	TRIO-20.0-TL-OUTD	TRIO-27.6-TL-OUTD
Input Side		
Absolute Maximum DC Input Voltage ($V_{max,abs}$)	1000 V	1000 V
Start-up DC Input Voltage (V_{start})	360 V (adj. 250...500 V)	360 V (adj. 250...500 V)
Operating DC Input Voltage Range ($V_{dcmin}...V_{dcmax}$)	0.7 x $V_{start}...950$ V	0.7 x $V_{start}...950$ V
Rated DC Input Power (P_{dcr})	20750 W	28600 W
Number of Independent MPPT	2	2
Maximum DC Input Power for each MPPT ($P_{MPPTmax}$)	12000 W	16000 W
DC Input Voltage Range with Parallel Configuration of MPPT at P_{acr}	440...800 V	500...800 V
DC Power Limitation with Parallel Configuration of MPPT	Linear Derating From MAX to Null [800V $\leq V_{MPPT} \leq 950$ V]	Linear Derating From MAX to Null [800V $\leq V_{MPPT} \leq 950$ V]
DC Power Limitation for each MPPT with Independent Configuration of MPPT at P_{acr} , max unbalance example	12000 W [480V $\leq V_{MPPT} \leq 800$ V] the other channel: P_{dcr} -12000W [350V $\leq V_{MPPT} \leq 800$ V]	16000 W [500V $\leq V_{MPPT} \leq 800$ V] the other channel: P_{dcr} -16000W [400V $\leq V_{MPPT} \leq 800$ V]
Maximum DC Input Current (I_{dcmax}) / for each MPPT ($I_{MPPTmax}$)	50.0 A / 25.0 A	64.0 A / 32.0 A
Maximum Input Short Circuit Current for each MPPT	30.0 A	40.0 A
Number of DC Inputs Pairs for each MPPT	1 (4 in -S2X and -S2F Versions)	1 (5 in -S2X and -S2F Versions)
DC Connection Type	Tool Free PV Connector WM / MC4 (Screw Terminal Block on Standard and -S2 versions)	Tool Free PV Connector WM / MC4 (Screw Terminal Block on Standard and -S2 versions)
Input Protection		
Reverse Polarity protection	Yes, from limited current source	Yes, from limited current source
Input Over Voltage Protection for each MPPT - Varistor	2	2
Input Over Voltage Protection for each MPPT - Plug In Modular Surge Arrester (-S2X Version)	3 (Class II)	3 (Class II)
Photovoltaic Array Isolation Control	According to local standard	According to local standard
DC Switch Rating for each MPPT (Version with DC switch)	40 A / 1000 V	40 A / 1000 V
Fuse Rating (Versions with fuses)	12 A / 1000 V	12 A / 1000 V
Output Side		
AC Grid Connection Type	Three phase 3W or 4W+PE	Three phase 3W or 4W+PE
Rated AC Power (P_{acr})	20000 W	27600 W
Maximum AC Output Power (P_{acmax})	22000 W ⁽³⁾	30000 W ⁽⁴⁾
Rated AC Grid Voltage (V_{acr})	400 V	400 V
AC Voltage Range	320...480 V ⁽¹⁾	320...480 V ⁽¹⁾
Maximum AC Output Current ($I_{ac,max}$)	33.0 A	45.0 A
Rated Output Frequency (f.)	50 Hz	50 Hz
Output Frequency Range ($f_{min}...f_{max}$)	47...53 Hz ⁽²⁾	47...53 Hz ⁽²⁾
Nominal Power Factor (Cos $\phi_{i_{acr}}$)	> 0.995 (adj. ± 0.9 , or fixed by display down to ± 0.8 with max 22 kVA)	> 0.995 (adj. ± 0.9 , or fixed by display down to ± 0.8 with max 30 kVA)
Total Current Harmonic Distortion	< 3%	< 3%
AC Connection Type	Screw terminal block	Screw terminal block
Output Protection		
Anti-Islanding Protection	According to local standard	According to local standard
Maximum AC Overcurrent Protection	34.0 A	46.0 A
Output Overvoltage Protection - Varistor	4	4
Output Over Voltage Protection - Plug In Modular Surge Arrester (-S2X Version)	4 (Class II)	4 (Class II)
Operating Performance		
Maximum Efficiency (η_{max})	98.2%	98.2%
Weighted Efficiency (EURO/CEC)	98.0% / 98.0%	98.0% / 98.0%
Feed In Power Threshold	40 W	40 W
Stand-by Consumption	< 8W	< 8W
Communication		
Wired Local Monitoring	PVI-USB-RS232_485 (opt.), PVI-DESKTOP (opt.)	PVI-USB-RS232_485 (opt.), PVI-DESKTOP (opt.)
Remote Monitoring	PVI-AEC-EVO (opt.), AURORA-UNIVERSAL (opt.)	PVI-AEC-EVO (opt.), AURORA-UNIVERSAL (opt.)
Wireless Local Monitoring	PVI-DESKTOP (opt.) with PVI-RADIOMODULE (opt.)	PVI-DESKTOP (opt.) with PVI-RADIOMODULE (opt.)
User Interface	Graphic display	Graphic display
Environmental		
Ambient Temperature Range	-25...+60°C / -13...140°F with derating above 45°C/113°F	-25...+60°C / -13...140°F with derating above 45°C/113°F
Relative Humidity	0...100% condensing	0...100% condensing
Noise Emission	< 50 dB(A) @ 1 m	< 50 dB(A) @ 1 m
Maximum Operating Altitude without Derating	2000 m / 6560 ft	2000 m / 6560 ft
Physical		
Environmental Protection Rating	IP 65	IP 65
Cooling	Natural	Natural
Dimension (H x W x D)	1061 mm x 702 mm x 292 mm/ 41.7" x 27.6" x 11.5"	1061 mm x 702 mm x 292 mm/ 41.7" x 27.6" x 11.5"
Weight	< 70.0 kg / 154.3 lb (Standard Version)	< 75.0 kg / 165.4 lb (Standard Version)
Mounting System	Wall bracket	Wall bracket
Safety		
Isolation Level	Transformerless	Transformerless
Marking	CE	CE
Safety and EMC Standard	EN 50178, AS/NZS3100, AS/NZS 60950, EN61000-6-1, EN61000-6-3, EN61000-3-11, EN61000-3-12	EN 50178, AS/NZS3100, AS/NZS 60950, EN61000-6-1, EN61000-6-3, EN61000-3-11, EN61000-3-12
Grid Standard	Enel Guideline (CEI 0-21 + Attachment A70 Terna, CEI 0-16) ⁽⁵⁾ , VDE 0126-1-1, VDE-AR-N 4105, G59/2, EN 50438, RD1663, AS 4777, BDEW	Enel Guideline (CEI 0-21 + Attachment A70 Terna, CEI 0-16) ⁽⁵⁾ , VDE 0126-1-1, VDE-AR-N 4105, G59/2, EN 50438, RD1663, AS 4777, BDEW
Available Products Variants		
Standard	TRIO-20.0-TL-OUTD-400	TRIO-27.6-TL-OUTD-400
With DC+AC Switch	TRIO-20.0-TL-OUTD-S2-400	TRIO-27.6-TL-OUTD-S2-400
With DC+AC Switch and Fuse	TRIO-20.0-TL-OUTD-S2F-400	TRIO-27.6-TL-OUTD-S2F-400
With DC+AC Switch, Fuse and Surge Arrester	TRIO-20.0-TL-OUTD-S2X-400	TRIO-27.6-TL-OUTD-S2X-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. Limited to 20000 W for Germany

4. Limited to 27600 W for Germany

5. Since their applicability dates

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



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