

SOLAR INVERTERS

ABB string inverters

TRIO-TM-60.0-US-480



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01 TRIO-TM-60.0 outdoor string inverter

The new addition to the TRIO family, now with three independent MPPT and a total power rating of 60 kW, has been designed to maximize the ROI in large systems with all the advantages of a decentralized configuration for both rooftop and ground-mounted installations.

Modular design

The TRIO-TM-60.0 has a modular design to guarantee maximum flexibility, in configuring the inverter into the available versions. 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 15 DC inputs with fast connectors, string protection fuses, AC and DC switches and type II AC and DC surge arresters.

Design flexibility

The double-stage conversion topology offers the advantage of a wide input voltage range for maximum flexibility of system design. The TRIO-TM comes with a forced air cooling system, designed for simple and fast maintenance, allowing a maximum flexibility of plant design. The inverter can be mounted at any angle in between horizontal and vertical. Embedded multi communication interfaces (WLAN, Ethernet, RS485) combined with a Sunspec compliant Modbus

The TRIO-TM-60.0 is ABB's latest three-phase string solution for cost efficient large decentralized photovoltaic systems for both commercial and utility applications.

protocol (RTU/TCP) allows the inverter to be easily integrated with any third-party monitoring and control systems.

Thanks to the built-in Web User Interface (WUI) the installer can commission the inverter wirelessly and change advanced parameters by using any standard WLAN enabled device (smartphone, tablet or PC). Integrated logging capability allows remote monitoring of the plant without the need of an additional external. Remote firmware updates of the inverter system and components available via Aurora Vision.

Highlights

- 3 Independent MPPT
- Transformerless inverter
- Double-stage topology for a wide input range
- Large set of specific grid codes available which can be selected directly in the field
- Separate AC and DC compartments are available in different configurations
- Vertical and horizontal installations and any angle in between
- 60 kW with 480 Vac of output voltage
- Wireless Access to embedded user interfaces
- Ethernet daisy chain enabled
- Modbus TPC/RTU Sunspec compliant
- Remote monitoring and firmware updates via Aurora Vision (Logger free)

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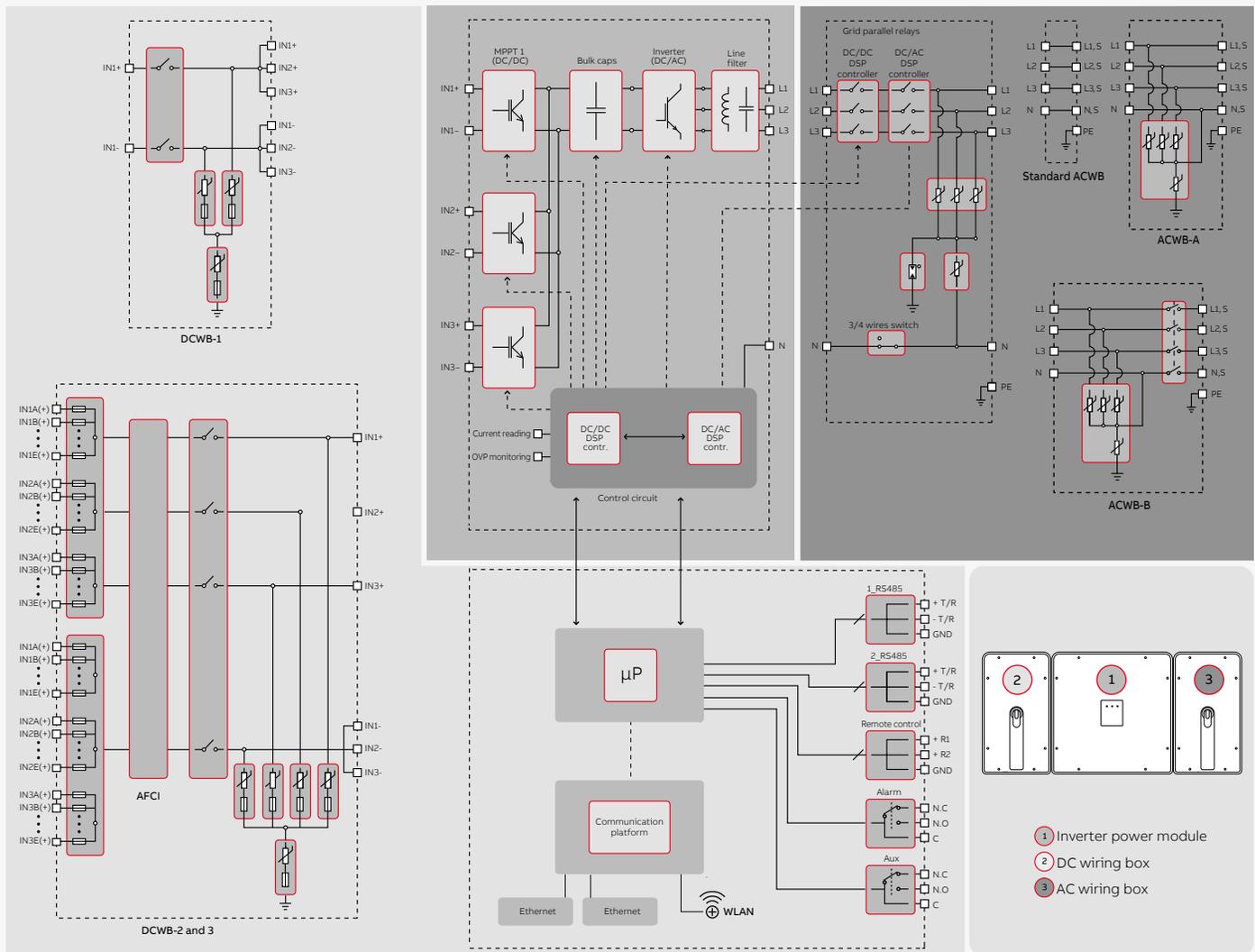
TRIO-TM-60.0-US-480



Technical data and types

Type code	TRIO-TM-60.0-480
Input side	
Absolute maximum DC input voltage ($V_{max,abs}$)	1000 V
Start-up DC input voltage (V_{start})	420...700 V (Default 500 V)
Operating DC input voltage range ($V_{dmin}...V_{dmax}$)	$0.7 \times V_{start} ... 950$ V (min 360 V)
Rated DC input voltage (V_{dcr})	720 Vdc
Rated DC input power (P_{dcr})	61800 W
Number of independent MPPT	3
Maximum DC input power for each MPPT ($P_{MPPT,max}$)	21000
MPPT input DC voltage range ($V_{MPPTmin} ... V_{MPPTmax}$) at P_{acr}	570-800 Vdc
Maximum DC input current ($I_{dcr,max}$) for each MPPT	36 A
Maximum input short circuit current for each MPPT	55 A (165 A with of parallel MPPT)
Number of DC inputs pairs for each MPPT	5
DC connection type	Input lugs (DCWB-1), Conduit entry (DCWB-2) and PV quick fit connector ³⁾ (DCWB-3)
Input protection	
Reverse polarity protection	Yes, from limited current source
Input over voltage protection for each MPPT - varistor	Yes, 1 for each MPPT
Input over voltage protection for each MPPT - plug In modular surge arrester	Type 2 (on DCWB-2 or 3 only)
Photovoltaic array isolation control	List the US standard
DC switch rating for each MPPT (version with DC switch)	60 A / 1000 V for each MPPT (180 A in case of parallel MPPT)
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 ($P_{acr} @ \cos\phi=1$)	60000 W
Maximum AC output power ($P_{ac,max} @ \cos\phi=1$)	60000 W
Maximum apparent power (S_{max})	60000 VA
Rated AC grid voltage (V_{acr})	480 V
AC voltage range	422...528 V ¹⁾
Maximum AC output current ($I_{ac,max}$)	77 A
Contributory fault current	92 A
Rated output frequency (f_r)	60 Hz
Output frequency range ($f_{min}...f_{max}$)	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%
Maximum AC cable	AWG 3/0 without AC Switch, AWG 1/0 with AC Switch (ACWB-B)
AC connection type	Screw terminal block, cable gland PG42
Output protection	
Anti-islanding protection	IEEE 1547
Maximum external AC overcurrent protection	100 A
Output overvoltage protection - varistor	Yes
Output overvoltage protection - plug In modular surge arrester	Type 2 (ACWB-A and ACWB-B)
Operating performance	
Maximum efficiency (η_{max})	98.5%
Weighted efficiency (CEC)	98.0%
Communication	
Embedded communication interfaces	2 x RS485, 2 x Ethernet (RJ45), WLAN (IEEE802.11 b/g/n@2.4Ghz)
Communication protocol	Modbus RTU/TCP (Sunspec compliant); Aurora protocol
Remote monitoring services	Standard level access to Aurora Vision monitoring Cloud
Advanced features	Integrated Web User Interfaces; Embedded logging and direct transferring of data to cloud
Environmental	
Ambient temperature range	-25...+60°C (-13...140 °F) with derating above 45 °C (113 °F)
Relative humidity	4%... 100% condensing
Sound pressure level, typical	75 dB(A) @1 m
Maximum operating altitude	2000m / 6561ft

ABB TRIO-TM-60.0-US-480 string inverter block diagram



Technical data and types

Type code	TRIO-TM-60.0-480
Physical	
Environmental protection rating	Type 4X
Cooling	Forced air
Dimension (H x W x D)	28.5 x 58.7 x 12.4 in (725 x 1491 x 315 mm)
Weight	95 kg / 209 lbs overall, 66 kg / 145 lbs electronic compartment, 15 kg / 33 lbs AC wiring box (full option), 14kg / 31 lbs DC wiring box (full optional)
Mounting system	Vertical or horizontal support
Safety	
Isolation level	Transformerless
Marking	TUV
Safety and EMC standard	UL 1741, Rule 21, HECO tester per UL 1741 SA, UL 1699B, UL 62109-1:2014, UL 50E (Type 4x), IEEEl547, IEEEl547.1, CSA C22.2 107.1-01-2001, CSA TIL M-07, FCC Part 15 Sub-part B Class B Limited
Available product variants	
Inverter power module	TRIO-TM-60.0-US-480-POWER MODULE
DC wiring box options	
Touch-safe fuse holder 15 strings, DC Switch, AFCl, SPD type II, conduit entry	DCWB-2-TRIO-TM-60.0-US-480
15 quick Input connections, fuses, DC switch, AFCl, SPD type II	DCWB-3-TRIO-TM-60.0-US-480
AC wiring box options	
AC terminal block, Switch, SPD type II, conduit entry	ACWB-B-TRIO-TM-60.0-US-480

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
⁴⁾ Maximum number of opening 5 under overloading
 Remark. Features not specifically listed in the present data sheet are not included in the product

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

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

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