FIMER

Solar inverter
TRIO-TM-50.0-400
TRIO-TM-60.0-480

The TRIO-TM-50.0/60.0 is FIMER's three-phase string solution for cost efficient large decentralized photovoltaic systems for both commercial and utility applications.

From 50.0 to 60.0 kW

This member of the TRIO family, with 3 independent MPPT and power ratings of up to 60 kW (480 V version), has been designed with the objective 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-50.0/60.0 has a modular design to guarantee maximum flexibility, thanks to the different versions available.
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, used also in the previous TRIO products, designed for a simple and fast maintenance, allowing a maximum flexibility of plant design.
The inverter comes with mounting supports for both horizontal and vertical installations, which allow for the best use of space available beneath the solar panels.
Embedded multi communication interfaces (WLAN, Ethernet, RS485) combined with a Sunspec compliant Modbus protocol (RTU/TCP) allow the inverter to be easily integrated with any third party monitoring and control systems.

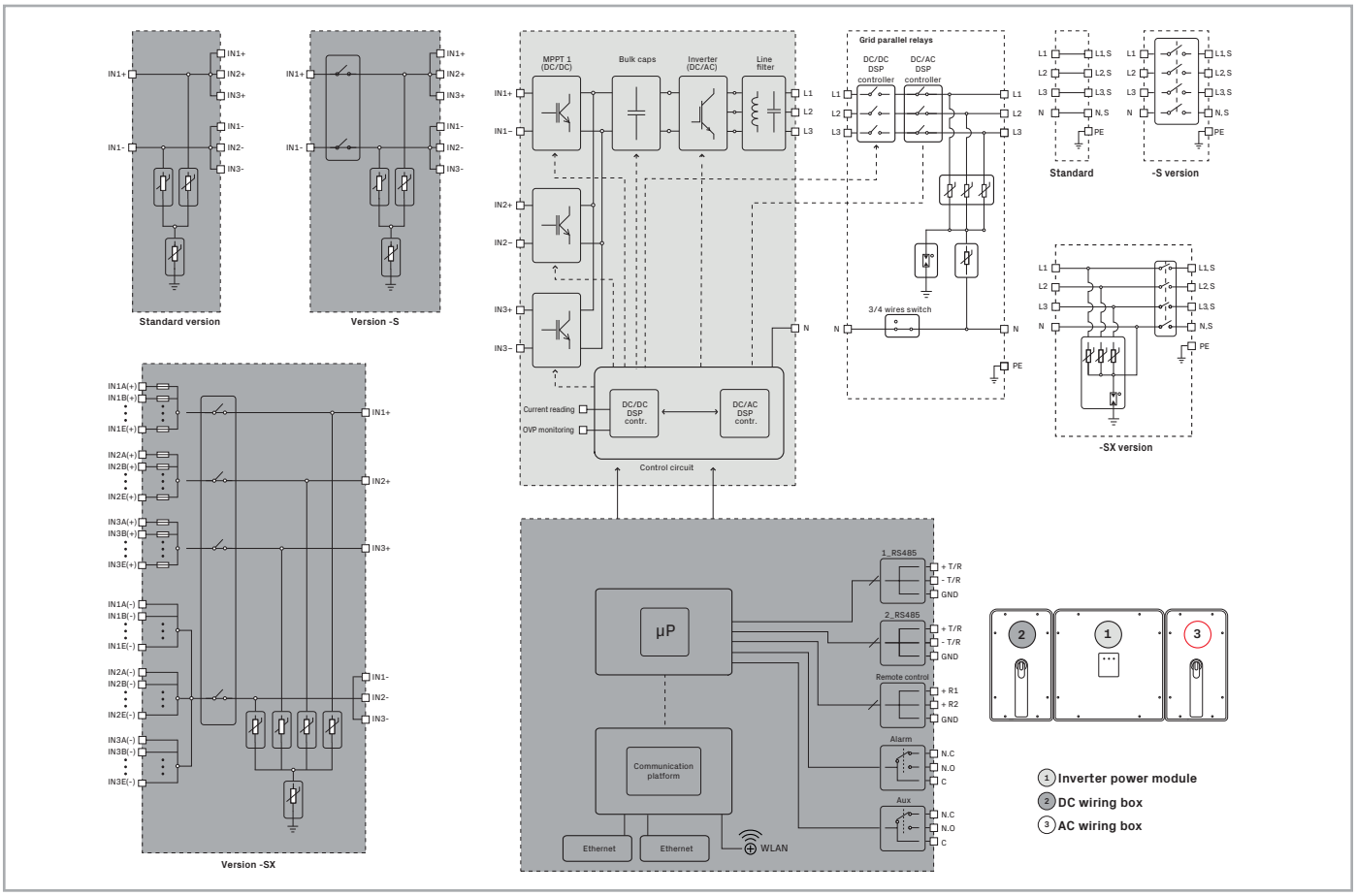
Improved commissioning and maintenance

Thanks to the build-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 any additional external loggers.
Remote firmware update of the inverter system and components 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
- Both vertical and horizontal installation
- 2 available sizes, 50 and 60 kW with 400 and 480 Vac of output voltage, respectively
- Wireless access to embedded user interfaces
- Ethernet daisy chain enabled
- Modbus TPC/RTU Sunspec compliant
- Remote monitoring and firmware update via Aurora Vision (logger free)
- Lifetime free of charge access to Aurora Vision

TRIO-TM-50.0/60.0 string inverter block diagram



Technical data and types

Type code	TRIO-TM-50.0-400	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 420 V)	420...700 V (Default 500 V)
Operating DC input voltage range (V_{dcmin}...V_{dcmax})	0,7xV_{start} ...950 V (min 300 V)	0,7xV_{start} ...950 V (min 360 V)
Rated DC input voltage (V_{dcr})	610 Vdc	720 Vdc
Rated DC input power (P_{dcr})	52000 W	61800 W
Number of independent MPPT	3 (SX and SX2 version) / 1 (standard and S version)	
Number of MPPT in parallel mode	1	
Maximum DC input power for each MPPT ($P_{MPPT,max}$)	17500 W	21000 W
MPPT input DC voltage range ($V_{MPPTmin}$ ... $V_{MPPTmax}$) at P_{acr}	480-800 Vdc	570-800 Vdc
Maximum DC input current (I_{dcmax}) for each MPPT	36 A	
Maximum input short circuit current for each MPPT	55 A (165 A in case of parallel MPPT)	
Number of DC input pairs for each MPPT	5	
DC connection type	Screw terminal block (Standard and -S version) or PV quick fit connector [1] (-SX and SX2 version)	
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 (option) with monitoring	
Photovoltaic array isolation control	According to local 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} @cosφ=1)	50000 W	60000 W
Maximum AC output power (P_{acmax} @cosφ=1)	50000 W	60000 W
Maximum apparent power (S_{max})	50000 VA	60000 VA
Rated AC grid voltage ($V_{ac,r}$)	400 V	480 V
AC voltage range	320...480 V [2]	384...571 V [2]
Maximum AC output current ($I_{ac,max}$)	77 A	
Contributory fault current	92 A	
Rated output frequency (f_r)	50 Hz / 60 Hz	
Output frequency range (f_{min}...f_{max})	47...53 Hz / 57...63 Hz [3]	
Nominal power factor and adjustable range	> 0.995; 0...1 inductive/capacitive with maximum S_{max}	
Total current harmonic distortion	<3%	
AC connection type	Screw terminal block, cable gland	
Output protection		
Anti-islanding protection	According to local standard	
Maximum external AC overcurrent protection	100 A	
Output overvoltage protection - varistor	Yes	
Output overvoltage protection - plug-in modular surge arrester	Type 2 (option) with monitoring	
Operating performance		
Maximum efficiency (η_{max})	98.3%	98.5%
Weighted efficiency (EURO)	98.0% / -	98.0% / -
Communication		
Embedded communication interfaces	2x RS485, 2x Ethernet (RJ45), WLAN (IEEE802.11 b/g/n @ 2,4 GHz)	
Communication protocols	Modbus RTU / TCP (Sunspec compliant); Aurora Protocol	
Remote monitoring services	Standard level access to Aurora Vision monitoring portal	
Advanced features	Integrated Web User Interface; Display (option); 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)	-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	

Technical data and types

Type code	TRIO-TM-50.0-400	TRIO-TM-60.0-480
Physical		
Environmental protection rating	IP65 (IP54 for cooling section)	
Cooling	Forced air	
Dimension (H x W x D)	725 mm x 1491 mm x 315 mm / 28.5" x 58.7" x 12.4"	
Weight	95 kg / 209 lbs overall, 66 kg / 145 lbs electronic compartment, 15 kg / 33 lbs AC wiring box (full optional), 14kg / 31 lbs DC wiring box (full optional)	
Mounting system	Wall bracket, horizontal support	
Safety		
Isolation level	Transformerless	
Marking	CE	
Safety and EMC standard	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12	
Grid standard (check your sales channel for availability)	CEI 0-21, CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G59/3, EN 50438 (not for all national appendices), RD 1699, RD 413, RD 661, P.O. 12.3, AS 4777, BDEW, NRS-097-2-1, MEA, PEA, IEC 61727, IEC 60068, IEC 61683, VFR-2014, IEC 62116	
Available product variants		
Inverter power module	TRIO-TM-50.0-400-POWER MODULE	TRIO-TM-60.0-480-POWER MODULE
DC wiring box options [4]		
Input connections with terminal blocks	DCWB-TRIO-TM-50.0-400	DCWB-TRIO-TM-60.0-480
Input connections with terminal blocks + DC switch	DCWB-S-TRIO-TM-50.0-400	DCWB-S-TRIO-TM-60.0-480
15 quick input connections + fuses (single pole) + DC switch [5]	DCWB-SX-TRIO-TM-50.0-400	DCWB-SX-TRIO-TM-60.0-480
15 quick input connections + fuses (both poles) + DC switch [5]	DCWB-SX2-TRIO-TM-50.0-400	DCWB-SX2-TRIO-TM-60.0-480
AC wiring box options		
AC output connections with terminal blocks	ACWB-TRIO-TM-50.0	ACWB-TRIO-TM-60.0
AC output connections with terminal blocks + AC switch [5]	ACWB-SX-TRIO-TM-50.0	ACWB-SX-TRIO-TM-60.0
Optional available		
TRIO-GROUNDING-KIT	Available	Available
TRIO-AC-WIRING-KIT	Available	Available

1) Please refer to the document "String inverters – Product manual appendix" available at www.fimer.com for information on the quick-fit connector brand and model used in the inverter
2) The AC voltage range may vary depending on specific country grid standards
3) The Frequency range may vary depending on specific country grid standards
4) DCWB with display is available as optional, with dedicated wiring box version
5) Type 2 surge arresters available as optional, with dedicated wiring box version

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

FIMER

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

fimer.com

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. FIMER does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

TRIO-TM-50.0/60.0_EN REV. A 10-03.2020