

AfriSun70 – Multi Purpose Inverter

Technical Data

MLT DRIVES



Powerful
Most compact system available

Efficient
High efficiency up to 97.5%

Robust
High tolerance to surges and high temperatures

This 70 kVA inverter from MLT DRIVES is a 3-phase AC-DC inverter for large grid-tied or off-grid PV/battery storage power plants. The AfriSun70 is a reliable and affordable system that can be used with thinfilm, polycrystalline or monocrystalline photovoltaic solar panels **or** batteries. To maximize power harvested from the PV array the inverter has intelligent features that allow reliable and balanced export power at all times. Easy integration is possible through versatility: Various types of PV or battery configurations can be connected as the system has a wide input operating voltage range. Comprehensive monitoring system accounts of every Watt harvested or stored, so that an accurate return on investment can be presented.

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Specifications

Output side (AC)	Unit	PV Inverter	Battery Backup
Rated voltage	V	3AC 400	3AC 400
Voltage range	%	+7%	+2% (Island Mode)
Rated frequency	Hz	50	50
Frequency range	Hz	47.5 ... 52.5	45.0 ... 55.0
Rated output power	kVA	70	70
Overload	%	n/a	125% for 10m 150% for 15s
Maximum output current	A	110	110
Displacement power factor	PF	-0.5 ... 0.5 (Adjustable)	-0.1 to 0.1
THD I (at rated power)	%	< 5	n/a
THD V (at rated power)	%	n/a	< 2
Surge Protection		Yes	Yes
Short circuit protection		Yes	Yes

Input side (AC)	Unit	PV Inverter	Battery Backup
Rated voltage	V	n/a	3 AC 400
Voltage range	%	n/a	+7%
Rated frequency	Hz	n/a	45 ... 55
Rated Power	KVA	n/a	40 ... 500 ¹
Surge Protection		n/a	Yes
Maximum Current	A	n/a	750 ¹

Input side (Photovoltaic [PV])	Unit	PV Inverter	Battery Backup
MPP voltage range	V	450 ...750	n/a
Start-up input voltage	V	600	n/a
Maximum input current	A	190	n/a
Rated power	kW	72	n/a
Maximum input voltage	V	900	n/a
Number of DC inputs		1	n/a
Surge Protection		Yes	n/a
Short Circuit Protection		Yes	n/a
DC polarity swap protection		Yes	n/a
Ground Fault Detection		Yes	n/a

Input side (Battery)	Unit	PV Inverter	Battery Backup
Nominal battery voltage	V	n/a	480..600
Maximum battery voltage	VPC	n/a	2.65
	V	n/a	800
Minimum battery voltage	VPC	n/a	1.75
	V	n/a	420
Rated power	KW	n/a	70
Maximum input current	A	n/a	150
Number of DC inputs		n/a	1
Surge Protection		n/a	Yes
Ground Fault Protection		n/a	Yes

System	Unit	PV Inverter	Battery Backup
Efficiency	%	Up to 97.5	Up to 97.5
Efficiency (100% loading)	%	Up to 96.8	Up to 96.8
Tare losses no load	W	<20 (at night)	300

¹ The rated input AC power is limited by an external contactor that is not supplied with the AfriSun70. The limitation on the specification results from the minimum and maximum measureable sensing input range.



Dimensions and weight		Unit
Width	mm	860
Height	mm	1309
Depth	mm	358
Weight	kg	310

General technical specifications		Unit
Noise Level	dB(A)	<80
Installation		Suitable for indoor installation only
Mounting method		Wall mounting
Cooling method		Forced air ventilation Air intake at bottom (leave 750mm from floor) Air discharge through the cabinet roof
Cooling air requirement	m ³ /h	2000
Enclosure		IP42 (Prevents entry of insects)
Colour		RAL 7035

Climatic conditions		Unit
Ambient temperature	°C	-5 ... 45
Ambient temperature for transport	°C	-25 ... 70
Maximum ambient for rated power	°C	40
Relative humidity	%	5 ... 85
Maximum altitude above sea level for rated power at rated temperature	m	1900

Connectors		
Input DC (Photovoltaic)		Cable terminal for 50mm ² wire
Output AC		Cable terminal for 35mm ² wire
Voltage Free Relays (5)	Generator Control	Terminals 1mm ²
Communications		RS232/RS422 Modbus Slave
Antenna		Sub Miniature version A

Operator panel	
Display Type	Touch screen LCD Power export, KWH summations, energy exported pervious day, trending graphs
Remote control	Secure remote control of system, and access to event and data logs, is available using either GSM or GPRS

The AfriSun70 from MLT DRIVES is a compact PV or battery backup inverter. The inverter is tailored for grid-tied or off-grid mini-grid integration.

If configured as a PV inverter, the system maximizes the use of the sun by adjusting the input DC voltage and current for optimal power output from the PV array. Exported power to the grid or mini-grid is maximized by exporting steady balanced and clean power. The AfriSun70 can be adjusted to export power at unity power factor, or if power factor adjustments need to be done the export power factor is adjustable.

Even though the system will export balanced currents into the three phase supply it may be that the one phase voltage is raised substantially because it is loaded. In this event, the system will reduce export on that phase in order to stabilize the supply voltage. The inverter meets over-voltage protection according to IEC60364.

If configured as a battery backup inverter, the battery charge characteristics are adjustable on this four stage battery charger. Temperature compensation and programmable periodic equalize charge cycles can be set up.

As backup inverter the AfriSun70 draws balanced power from the generator at unity power factor,

even if the load is skew (load is only connected on one or two phases). Voltage free relays can be configured to control the starting and stopping of a generator. An output relay must then be used to close a external contactor that connects the generator to the AC bus (load).

Transformerless systems such as the AfriSun70 offer higher efficiency than transformer based systems. These powerful highly efficient units would thus truly maximize the power harvested from the sun or stored in batteries.

Protection of the AfriSun70 is comprehensive and includes islanding detection, electronic overload, short circuit, over- temperature, frequency out of range, under and over voltage protection. The inverter will reduce its throughput power if the temperatures are getting too high to avoid shut-down of the unit. A warning or fault message can be sent via SMS to the operator(s). The inverter meets the IEC61727 “Photovoltaic systems – Characteristics of utility interface” in terms of total harmonic distortion, flicker and current injection.

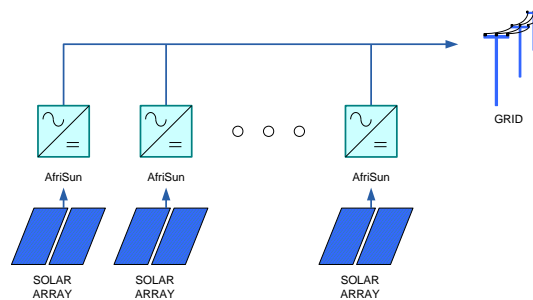


Figure 1 - AfriSun70 configured as PV Inverter

The AfriSun70 can be used as part of a modular option for higher output power ratings. This means that many AfriSun70 inverters can be connected

onto a single three phase supply to provide much higher photovoltaic export power exported to the grid or backup battery power.

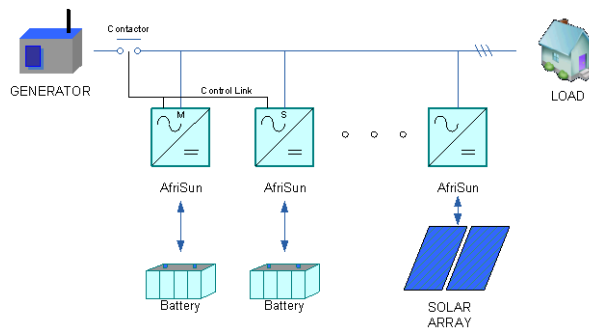
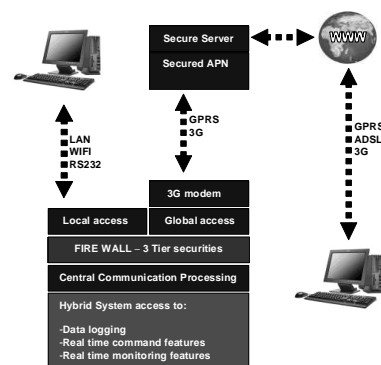


Figure 2 - AfriSun70 configured as a Battery Backup Inverter operating with a PV Inverter

RMCI – Remote Monitoring and Control Interface

The AfriSun inverter can optionally be configured with a RMCI. The RMCI gives versatile access to the entire power system for monitoring and control purposes. Access is local (on site) or global (from any PC in the world).

Local access is via RS232/RS422. Secure remote control of system, and access to event and data logs, is available using either GSM or GPRS. Authorised personnel can be given levels of access ensuring all critical processes are tamper proof without appropriate clearance.

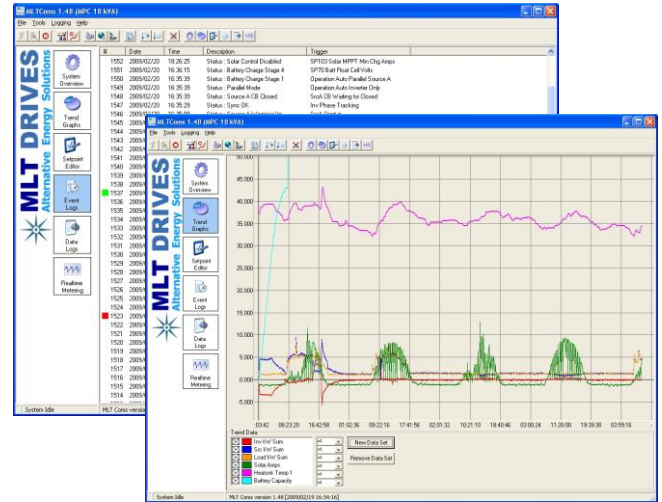


All access to hybrid system is managed by a local firewall that will manage the security level access. Firewall ensures that no “backdoor access” is available either locally or globally. Visual SCADA interfaces offer a real-time overview of system. Data delay is minimal.

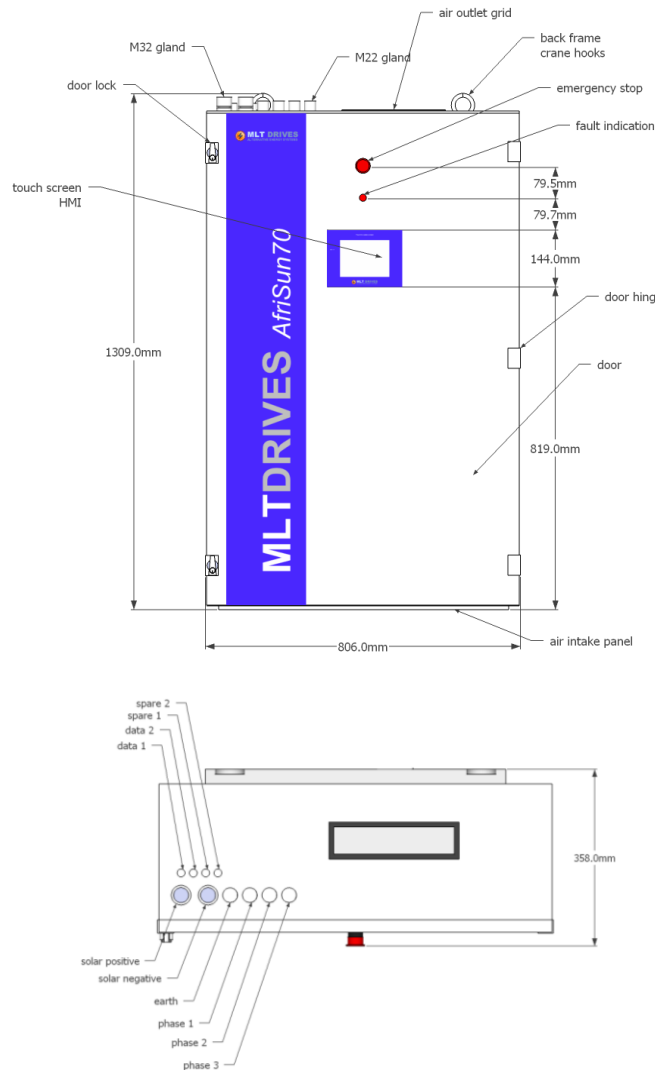
All events and faults minor and critical are logged. Real-time alarms via cellular SMS and email are immediately sent to appropriate parties on a particular event or fault. These features are essential for safety, security and maintenance.

All voltage, current and power channels are periodically logged and available for advanced analysis using a variety of graphing and data mapping tools. Data can be exported to .csv file for

refined analysis in MS Excel or alternative spreadsheet software.



AfriSun70 Dimensions



Transport and Installation

The AfriSun70 is designed to be compact so that it is easy to transport. Two crane hooks are supplied on the top of the unit. A rugged mounting frame is attached at the back of the unit that can be used to rest the unit on during transportation. This frame

has six mounting keyholes that must be used to wall-mount the units. A 750mm gap must be left from the floor upwards to allow sufficient air intake at the bottom of the unit. A 500mm gap must be left at the top for exhaust air.

