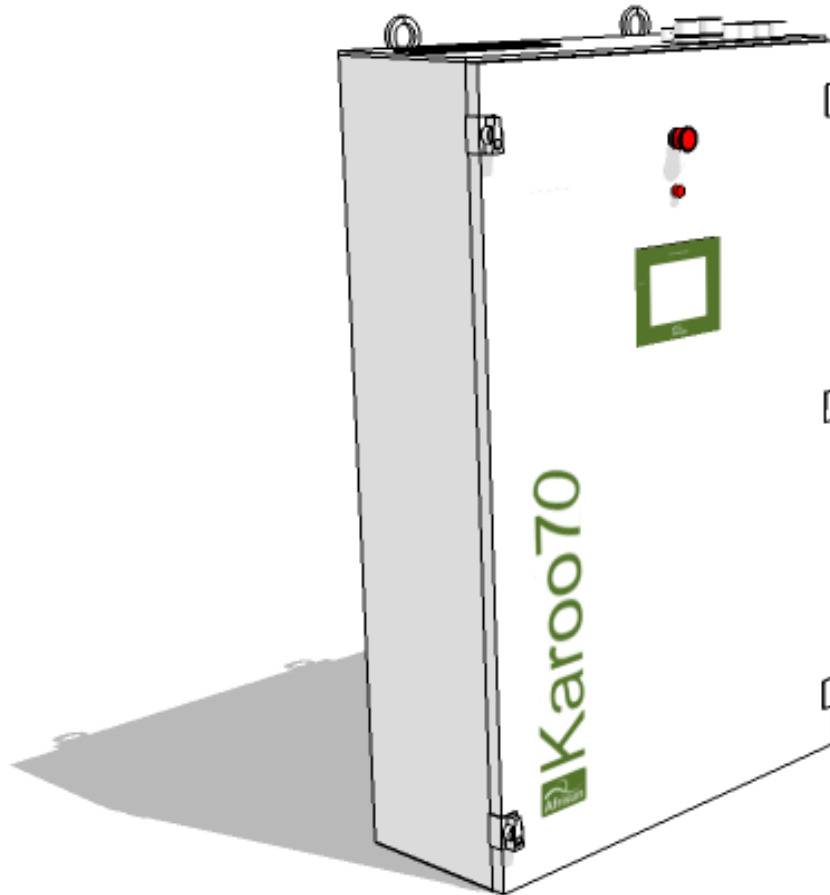


Afrisun Karoo 70

Photovoltaic Grid-tied Inverter



Technical Specifications



Powerful

Most compact system available

Efficient

High efficiency up to 97.5%

Robust

High tolerance to surges and high temperatures

The Afrisun Karoo 70KVA is a three-phase PV inverter for large grid tied or off grid PV power plants. The Karoo 70 is a reliable and affordable system that can be used with polycrystalline and monocrystalline photovoltaic solar panels.

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 configurations can be connected as the system has a wide input voltage operating range. A comprehensive monitoring system allows account of every watt harvested so that an accurate return on investment can be presented.

Specifications

Output side (AC)	Unit	Parameter
Rated voltage	V	3AC 400
Voltage input range	%	+7%
Rated frequency	Hz	50
Frequency range	Hz	49.5 ... 50.5
Rated output power	KVA	70
Maximum output current	A	110
Displacement power factor	PF	-0.5 ... 0.5 (Adjustable)
THD I (at rated power)	%	< 2.5
Surge Protection		Yes
Short circuit protection		Yes

Input side (Photovoltaic [PV])	Unit	Parameter
MPP voltage range	V	450 ...750
Start-up input voltage	V	600
Maximum input current	A	2 x 90
Rated power	KW	70 (2 x 35)
Maximum input voltage	V	900
Number of DC PV inputs		2
Number of MPPTs		2
Surge Protection		Yes
Short Circuit Protection		Yes
DC polarity swap protection		Yes
Ground Fault Detection		Yes

System	Unit	Parameter
Efficiency (peak)	%	97.5
Efficiency (100% loading)	%	96.8
Tare Losses in Standby (Night)	W	<20

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)		2 x Positive Terminal, 2 x Negative Terminal. Cable terminals are for 8 x 35mm ² lug
Output AC		3 x Cable terminals for 6 x 35mm ² lug
Voltage Free Relays (10)	Generator Control	Terminals 1mm ²
Communications		RS488 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	Access to event logs, data logs and control over system from a remote connection either GSM or GPRS. (Remote system control has password protection)

The Karoo 70 from Afrisun is a compact PV or battery backup inverter. The inverter is tailored for grid-tied or off-grid mini-grid integration.

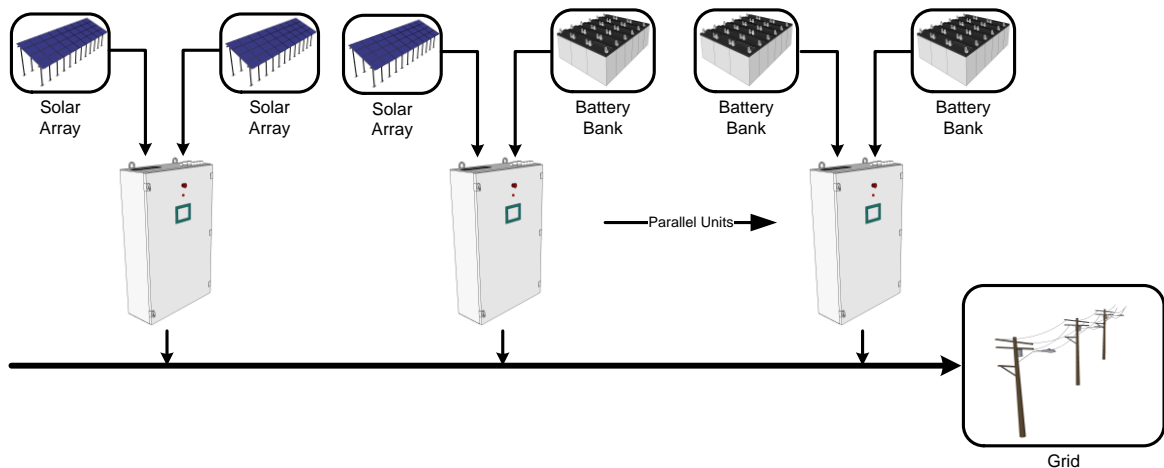
The system maximizes the use of the sun by adjusting the input DC voltage and current for optimal power output from the PV array. Exported power to the grid or mini-grid is maximized by exporting steady balanced and clean power. The Karoo 70 can be adjusted to export power at unity power factor, or if 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 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.

Transformerless systems such as the Karoo 70 offer higher efficiency than transformer based systems. These powerful highly efficient units would thus truly maximize the power harvested from the sun.

Protection of the Karoo 70 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.

The Karoo 70 can be used as part of a modular option for higher output power ratings. This means that multiple Karoo 70 inverters can be connected onto a single three-phase supply to provide much higher photovoltaic export power exported to the grid.

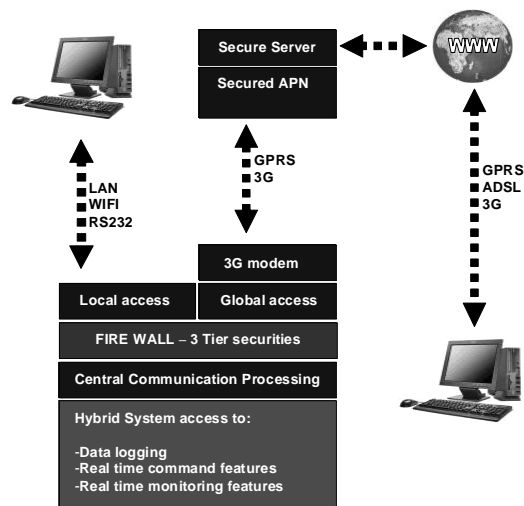


RMCI – Remote Monitoring and Control Interface

The Karoo 70 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).

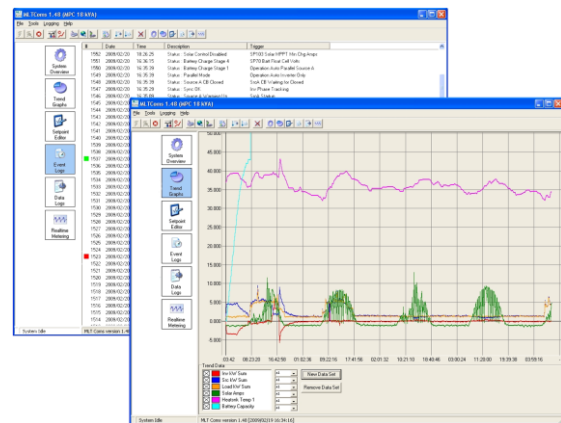
Local access is via RS232/RS488. Global access is via GSM and GPRS. All functionality locally is available globally through a secure network. Authorised personnel can be given levels of access ensuring all critical processes are tamper proof without appropriate clearance.

All access to hybrid system is managed by a local firewall that will manage the security level access. Firewall ensures no “backdoor access” locally or globally.

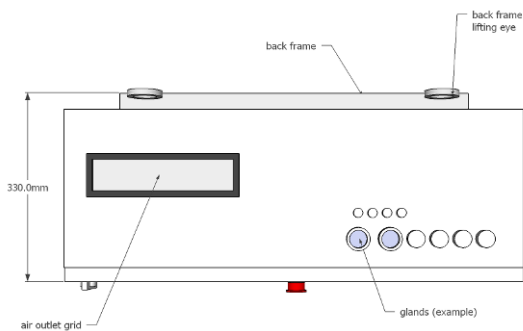
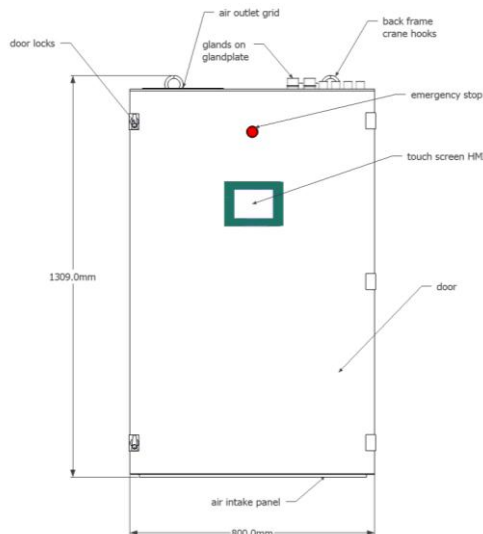


All events and faults minor and critical are logged. Real-time alarms via cellular SMS and email are immediately sent to appropriate parties on a particular event or fault. These features are essential for safety, security and maintenance.

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.



Karoo 70 Dimensions



Transport and Installation

The Karoo 70 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.

