

iKUBE 

F150

Technical Sheet



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F150

● **iKube**

- Introduction
- Electric Diagram
- Opening & Closing System
- Dimensions
- Productivity/Authonomy
- Technical Characteristics
- Contacts

Free Mobile Green Energy

F150: Introduction

Free
Mobile
Green
ENERGY

iKube is a ready to use mobile solar generator able to guarantee up to 4 kW power supply.

Designed to provide electricity in all areas of the globe not covered by a distribution grid and for all uses that require to be able to move their energy source. **iKube** can work even in the absence of sunshine offering the advantage of compactness, low noise, no fumes and fuel costs.

The batteries contained in the base of only 1 m³ are recharged by the photovoltaic generator which, with its surface of 9 m², develops a power of 1,4 kW.

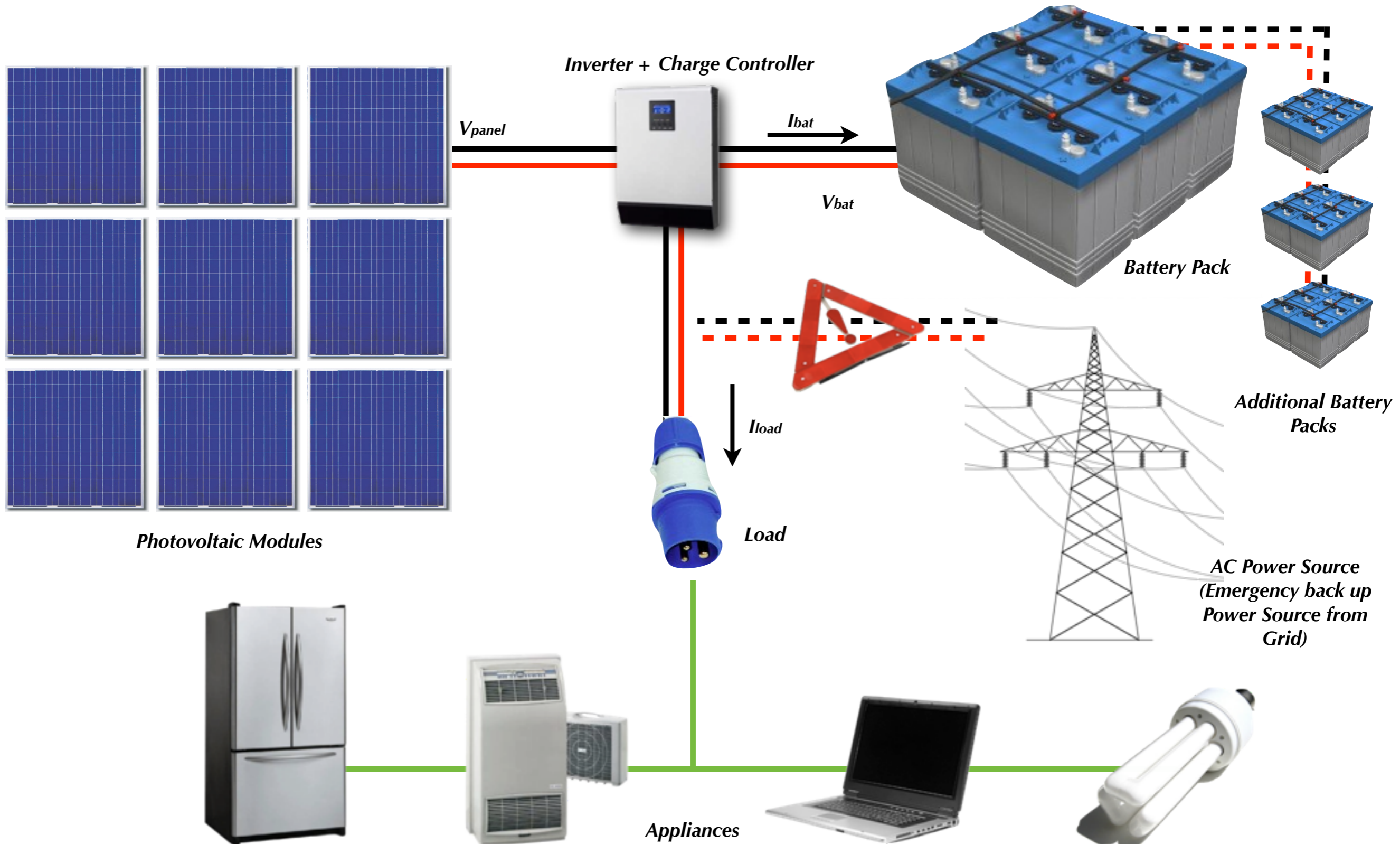
iKube key features:

- **Cost Effective** - no fuel needed, low maintenance costs.
- **Easy to Transport** - optimized Power vs Volume ratio, “folded” mode for transportation.
- **Sustainable** - no fumes, no pollution, no noise.

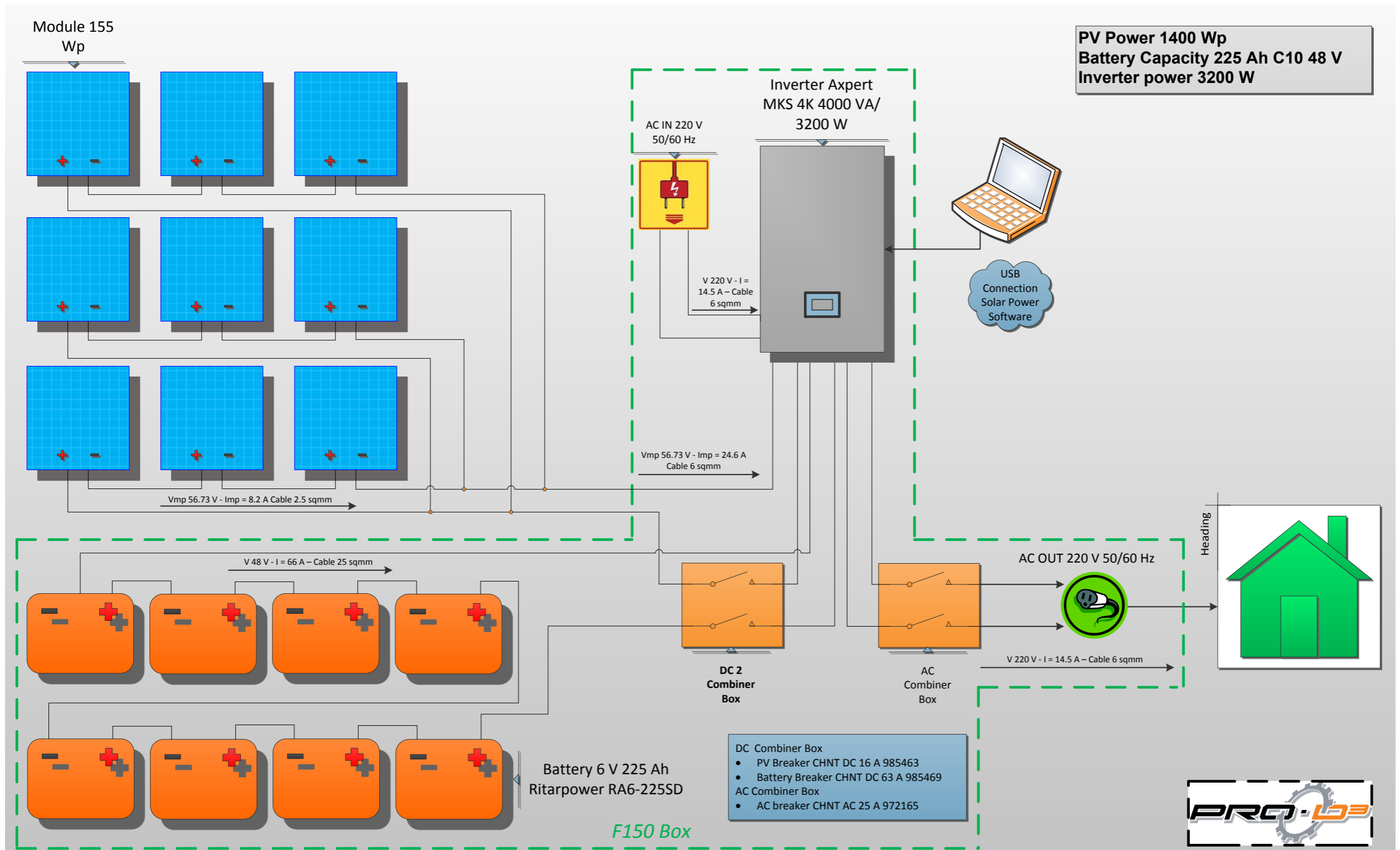
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generatore fotovoltaico mobile

F150: Electric Diagram



F150: Electric Diagram



F150: Opening/Closing

1



2



5



4



3



F150: Opening/Closing

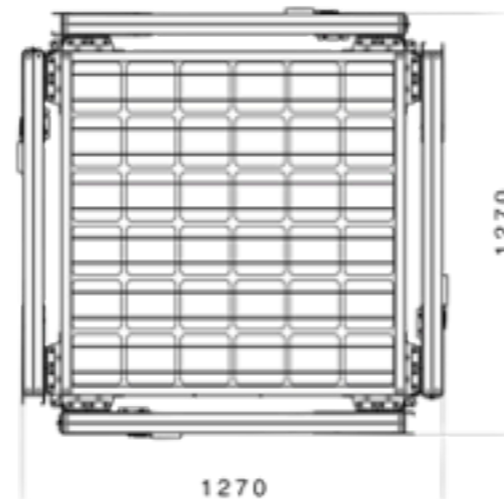
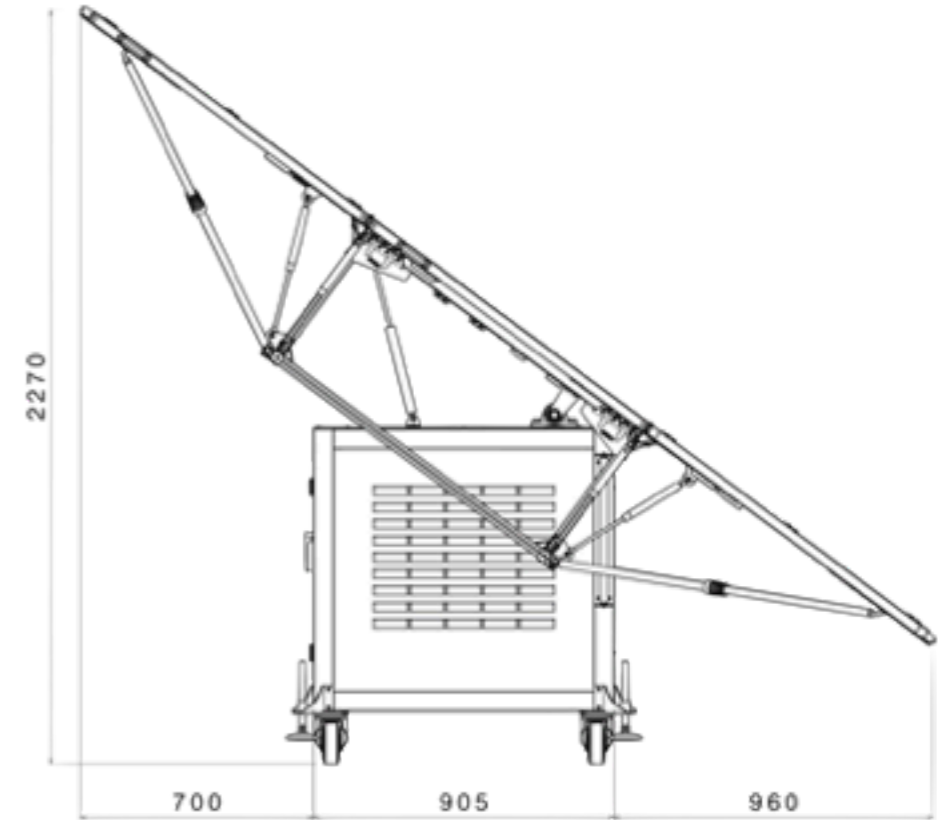
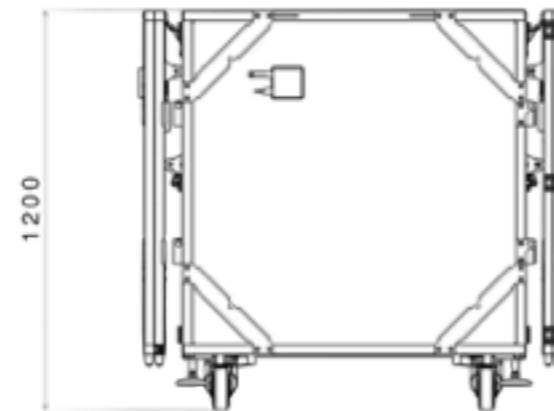
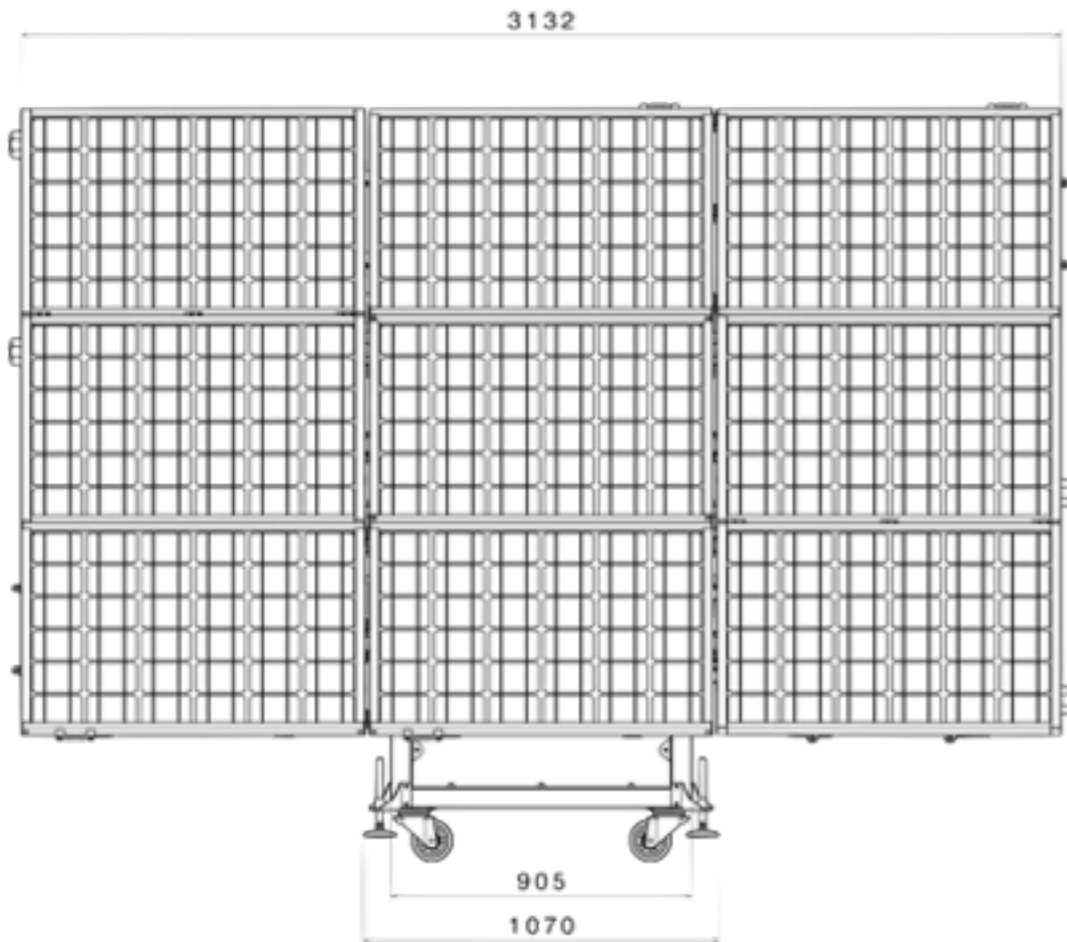


Opened



Closed

F150: Dimensions



F150: Productivity/Autonomy



Irradiation values calculated considering the average monthly rainfall

MONTH	ROMA		CASABLANCA	
	Monthly Production (kWh)	Daily Average (kWh)	Monthly Production (kWh)	Daily Average (kWh)
January	90	2,9	153	4,9
February	108	3,9	156	5,6
March	141	4,5	208	6,7
April	176	5,9	201	6,7
May	201	6,5	214	6,9
June	199	6,4	210	7,0
July	219	7,1	215	6,9
August	213	6,9	215	6,9
September	180	6,0	198	6,6
October	151	5,0	178	5,9
November	103	3,3	155	5,0
December	84	2,7	139	4,5
Yearly Production (kWh)	1865		2242	

Irradiation values calculated considering the presence of total sun

MONTH	ROMA		CASABLANCA	
	Monthly Production (kWh)	Daily Average (kWh)	Monthly Production (kWh)	Daily Average (kWh)
January	172	5,5	216	7,0
February	193	6,9	224	8,0
March	257	8,3	277	8,9
April	274	9,1	285	9,5
May	294	9,5	298	9,9
June	288	9,6	295	9,8
July	294	9,5	305	9,8
August	280	9,0	290	9,4
September	258	8,6	263	8,8
October	220	7,3	250	8,1
November	177	5,7	220	7,3
December	155	5,0	203	6,5
Yearly Production (kWh)	2862		3126	

These results were obtained assuming an inclination angle of 30 degrees and an azimuth angle of 0 °

F150: Productivity/Autonomy

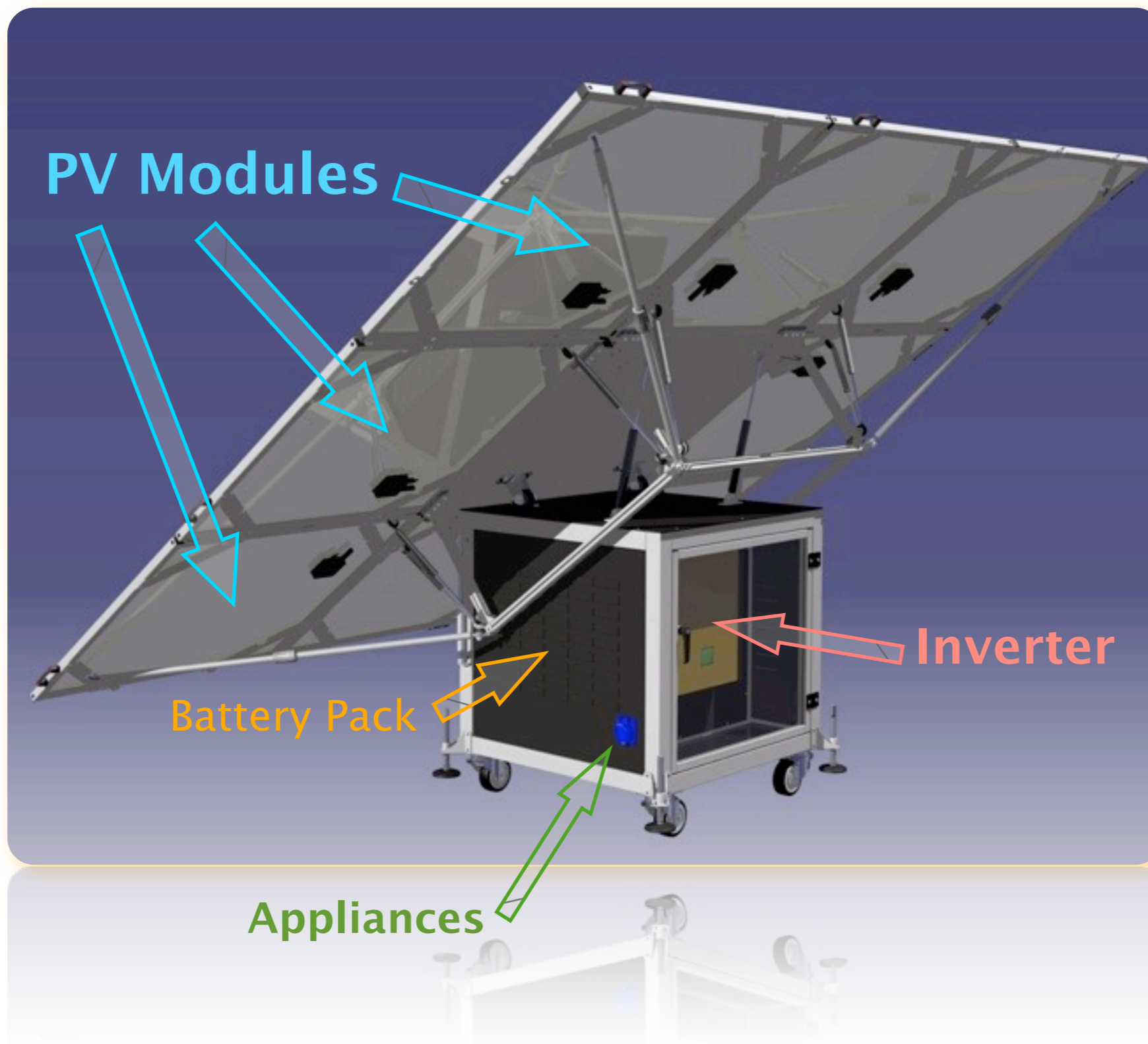
Here below are described two load configurations of a typical home environment:

Lighting	n. Hours	Q.ty	Wh/day
Lamp 15 W	4	6	460
Lamp 40 W	1	1	
Lamp 60 W	1	1	
Fridge	n. Hours	Q. ty	Wh/ day
Fridge 40 L	8	1	640
Television	n. Hours	Q. ty	Wh/ day
Television 22 inch	6	1	720
Computer	n. Hours	Q. ty	Wh/ day
Monitor 17 inch	4	1	680
Microwave	n. minutes	Q. ty	Wh/ day
Microwave 500 W	25	1	208
Washing Machine	n. minutes	Q. ty	Wh/ day
Small Washing Machine	25	1	500
Tot Wh/day			3208
kWh/day		kWh/month	kWh/year
3.208		96.24	1170.92

Lighting	n. Hours	Q.ty	Wh/day
Lamp 15 W	6	6	780
Lamp 40 W	6	1	
Lamp 60 W	6	0	
Fridge	n. Hours	Q. ty	Wh/ day
Fridge 80 L	8	1	800
Television	n. Hours	Q. ty	Wh/ day
Television 31 inch	6	1	900
Computer	n. Hours	Q. ty	Wh/ day
Monitor 19 inch	4	1	720
Microwave	n. minutes	Q. ty	Wh/ day
Microwave 800 W	25	1	333
Washing Machine	n. minutes	Q. ty	Wh/ day
Small Washing Machine	25	1	500
Tot Wh/day			4033
kWh/day		kWh/month	kWh/year
4.03		121.00	1472.04

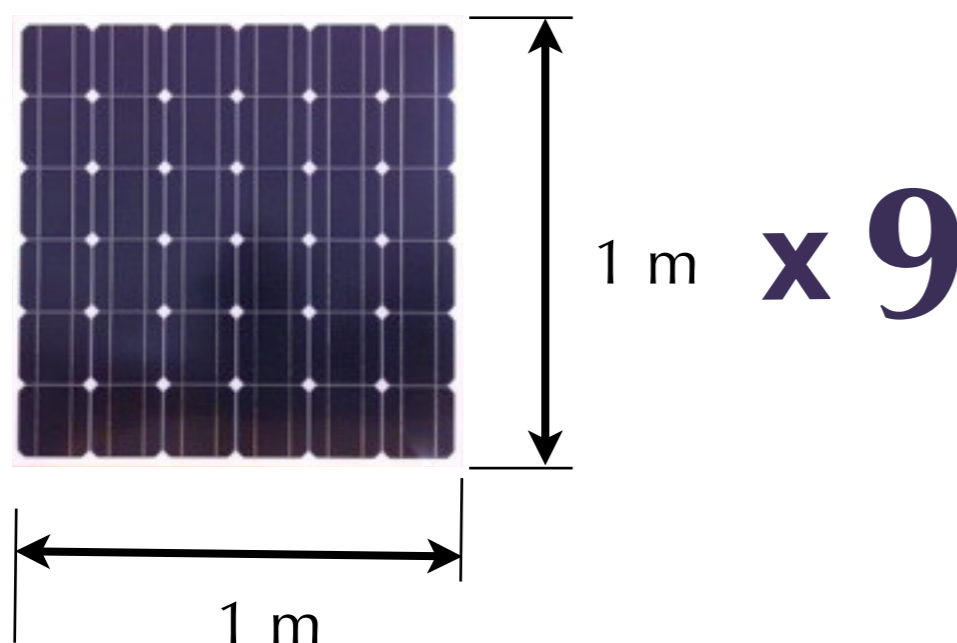
Comparing the average kWh/day consumption with the daily Productivity, the iKube is able to satisfy the energy needs of a house.

F150: Technical Characteristics



F150: Technical Characteristics

PV Modules



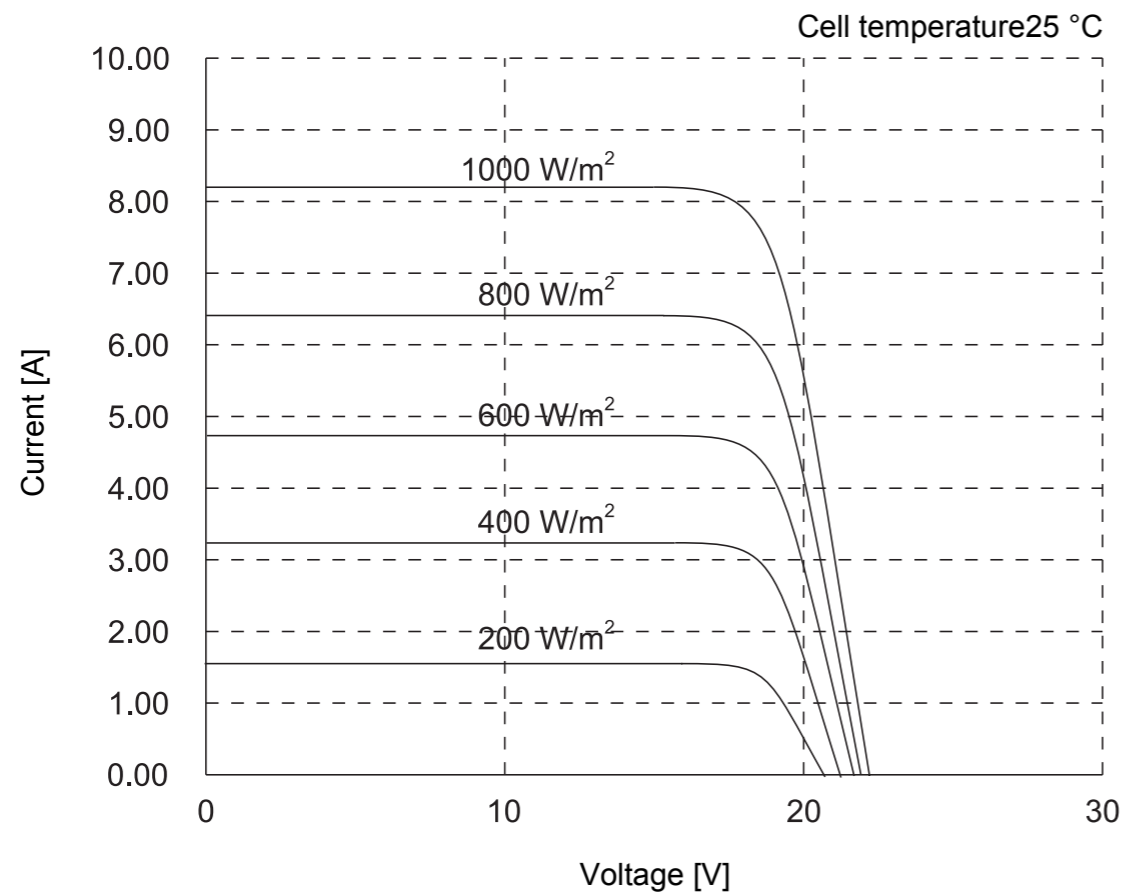
Frameless POLI/MONO Crystalline silicon PV Modules are assembled on the iKube structure.

Technical data	
Max power Pmax (W)	155
Max power voltage Vmp (V)	16,54
Max power current Imp (A)	9,37
Open circuit voltage Voc (V)	21,6
Short circuit current Isc (A)	9,98
Min warranted power Pmin (W)	150
Working tolerance (%)	+/- 3%
Max system voltage (V)	1000
Cell efficiency (%)	16,60
Module efficiency (%)	14,00
NOCT (°C)	41,32
Pmax temperature coefficient (%/°C)	-0,43
Voc temperature coefficient (%/°C)	-0,34
Isc temperature coefficient (%/°C)	0,03
Weight (kg)	12
Note 1: Standard conditions. Air mass 1.5, irradiance 1000 W/m ² , cell temperature 25 °C. Note 2: Values indicated are nominal.	

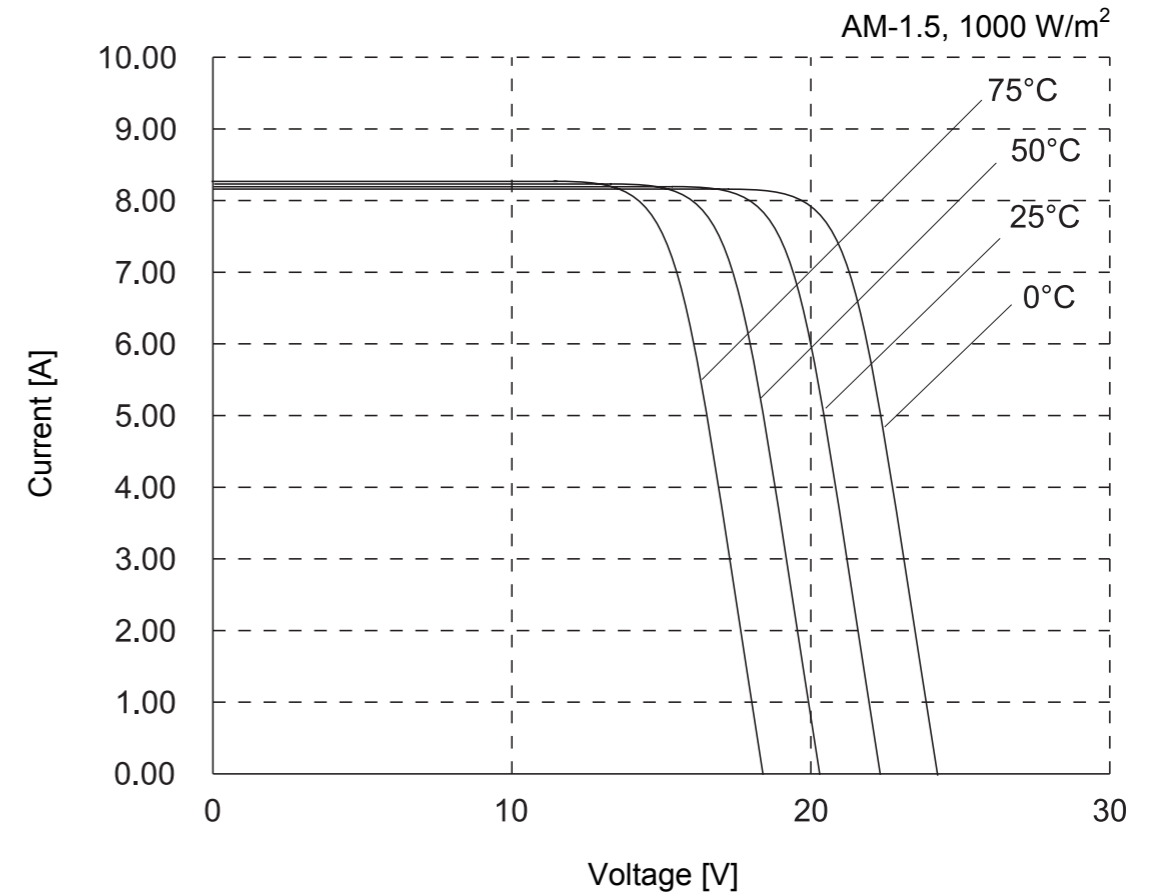
F150: Technical Characteristics

PV Modules

Irradiance dependence



Temperature dependence



Guarantees

Product warranty: 12 years (90% of nominal output power)
 25 years (80% of nominal output power)

Performance guarantee: 5 years (as per contractual terms)



IEC 61215 and
 IEC 61730
 Certified



EN ISO 9001:2000
 Certified Company

F150: Technical Characteristics

Inverter

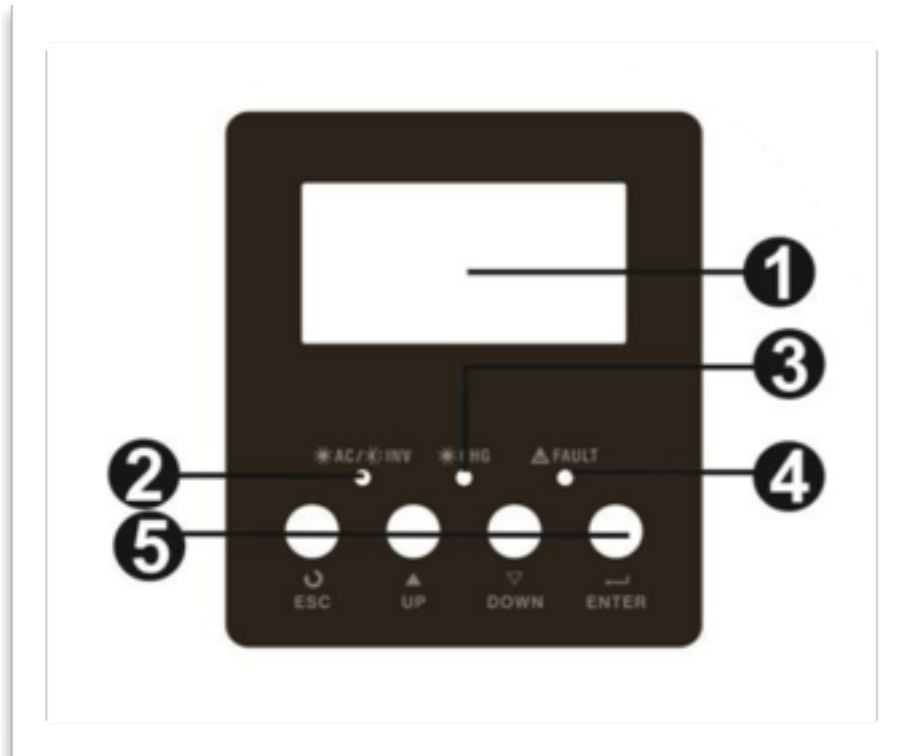


- Pure sine wave inverter
- Built-in MPPT solar charge controller
- Selectable input voltage range for home appliances and personal computers
- Selectable charging current based on applications
- Configurable AC/Solar input priority via LCD setting
- Compatible to mains voltage or generator power
- Parallel operation with up to 4 units
- Auto restart while AC is recovering
- Overload and short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function

RATED POWER	4000VA/3200W
INPUT	
Voltage	230 VAC
Selectable Voltage Range	170-280 VAC (For Personal Computers) ; 90-280 VAC (For Home Appliances)
Frequency Range	50 Hz/60 Hz (Auto sensing)
OUTPUT	
AC Voltage Regulation (Batt. Mode)	230VAC ± 5 %
Surge Power	8000VA
Efficiency (Peak)	1
Transfer Time	10 ms (For Personal Computers); 20 ms (For Home Appliances)
Waveform	Pure sine wave
BATTERY & AC CHARGER	
Battery Voltage	48 VDC
Floating Charge Voltage	54 VDC
Overcharge Protection	54 VDC
Maximum Charge Current	20 A or 30 A
SOLAR CHARGER	
Maximum PV Array Power	3000 W
MPPT Range @ Operating Voltage	60VDC ~115VDC
Maximum PV Array Open Circuit V	145VDC
Maximum Charging Current	60A
Maximum Efficiency	1
Standby Power Consumption	2 W
PHYSICAL	
Dimension, D x W x H (mm)	140 x 295 x 540
Net Weight (kgs)	13.3
OPERATING ENVIRONMENT	
Humidity	5% to 95% Relative Humidity(Non-condensing)
Operating Temperature	0°C - 55°C
Storage Temperature	-15°C - 60°C

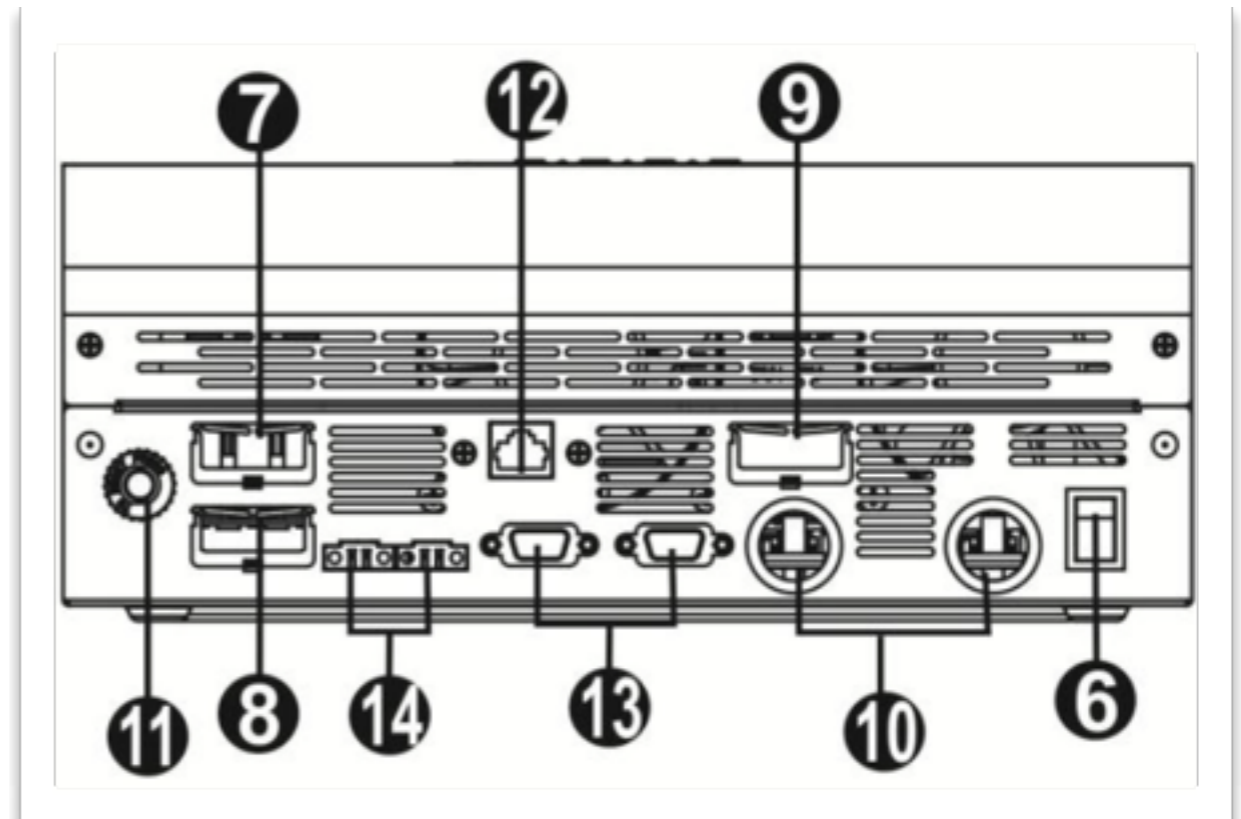
F150: Technical Characteristics

Overview



- 1. LCD display
- 2. Status indicator
- 3. Charging indicator
- 4. Fault indicator
- 5. Function buttons
- 6. Power on/off switch
- 7. AC input

Inverter



- 8. AC output
- 9. PV input
- 10. Battery input
- 11. Circuit breaker
- 12. RS232 communication port
- 13. Parallel communication cable (only for parallel model)
- 14. Current sharing cable (only for parallel model)

F150: Technical Characteristics

Battery Pack

DC 225 Ah C10 6V



x 8

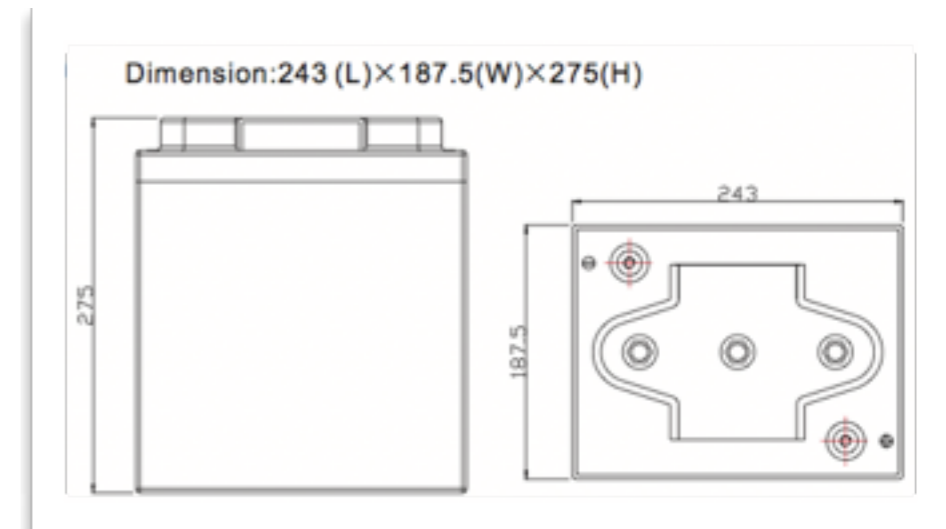
AGM Technology

A key feature of AGM batteries is the phenomenon of internal gas recombination.

As a charging lead-acid battery nears full state of charge, hydrogen and oxygen gasses are produced by the reactions at the negative and positive plates, respectively.

In a flooded battery, these gasses escape from the battery through the vents, thus requiring periodic water additions.

In an AGM battery the excellent ion transport properties of the liquid electrolyte held suspended in the glass mats, the oxygen molecules can migrate from the positive plate and recombine with the slowly evolving hydrogen at the negative plate and form water again. Under conditions of controlled charging, the pressure relief vents in AGM batteries are designed to remain closed, preventing the release of any gasses and water loss.

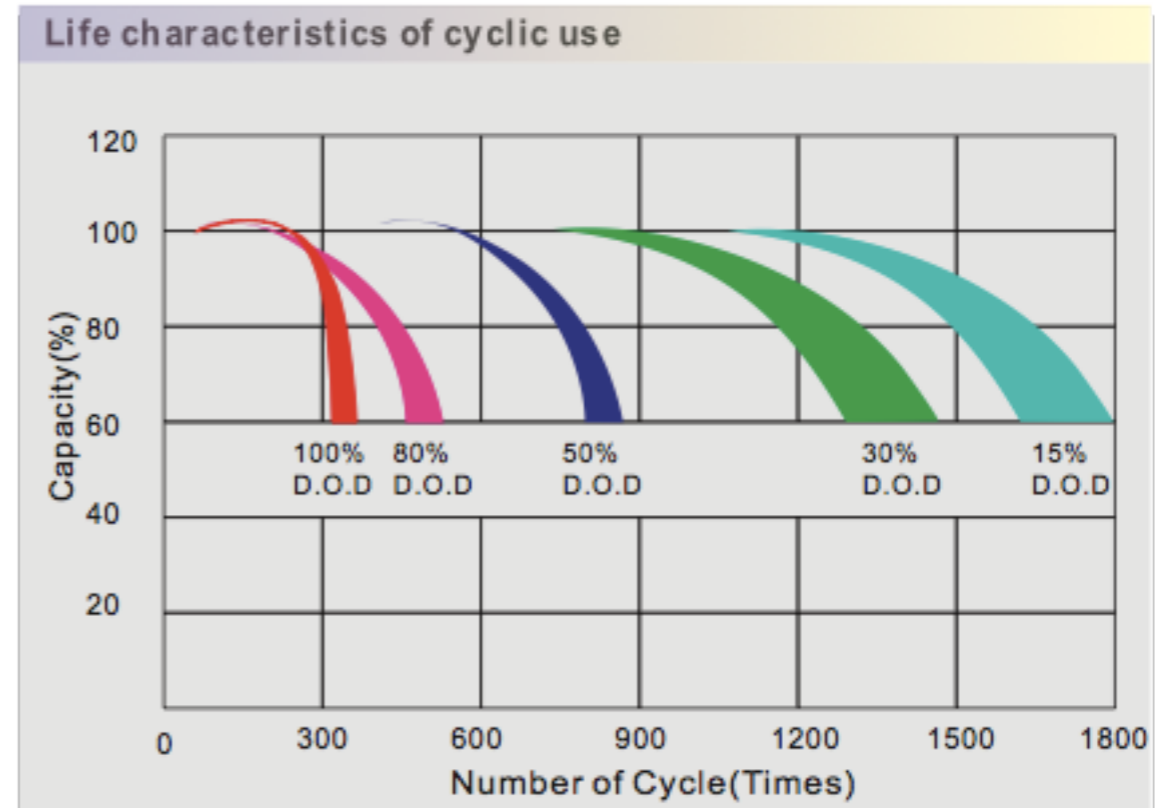
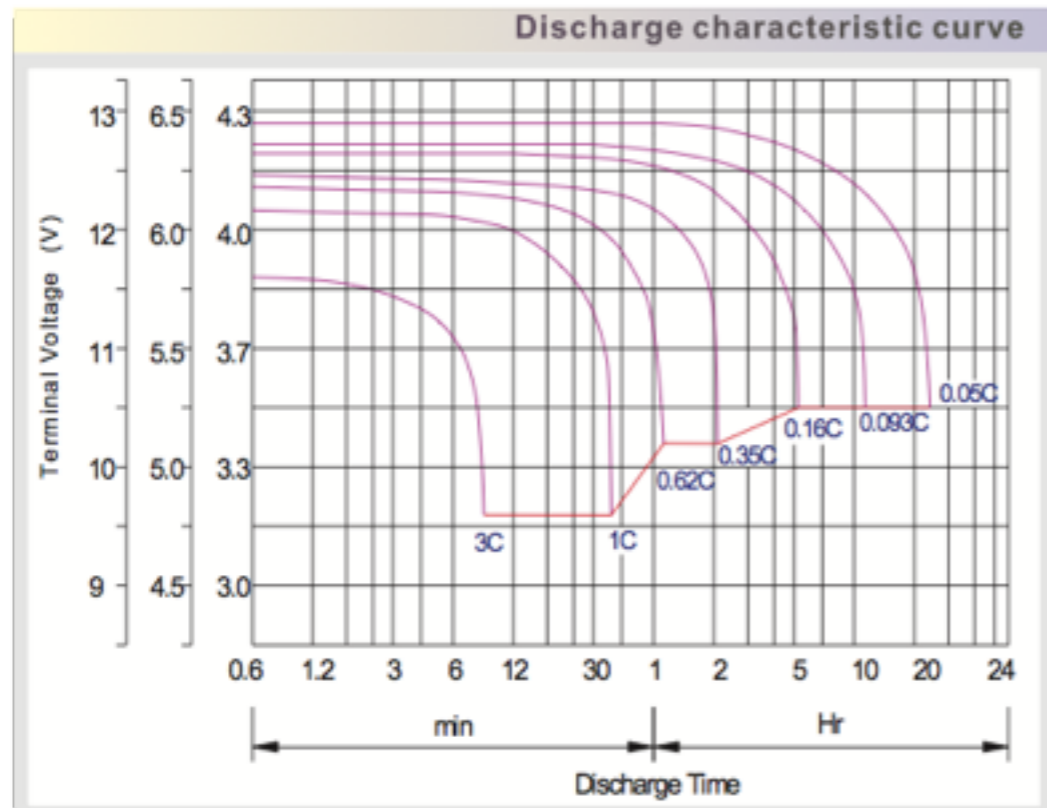


Cells Per Unit	3
Voltage Per Unit	6
Capacity	225Ah@10hr-rate to 1.80V per cell @25°C
Weight	Approx. 32.0 Kg
Max. Discharge Current	2250 A (5 sec)
Internal Resistance	Approx. 4.0 mΩ
Operating Temperature Range	Discharge: -20°C~60°C Charge: 0°C~50°C Storage: -20°C~60°C
Normal Operating Temperature Range	25°C±5°C
Float Charging Voltage	6.8 to 6.9 VDC/unit Average at 25°C
Recommended Maximum Charging Current Limit	67.5A
Equalization and Cycle Service	7.3 to 7.4 VDC/unit Average at 25°C
Self Discharge	RITAR Valve Regulated Lead Acid (VRLA) batteries can be stored for more than 6 months at 25°C. Self-discharge ratio less than 3% per month at 25°C. Please charge batteries before using.
Terminal	Terminal F14
Container Material	A.B.S. (UL94-HB) , Flammability resistance of UL94-V1 can be available upon request.

F150: Technical Characteristics

Battery Pack

Discharge & Duration



Capacity Factors With Different Temperature

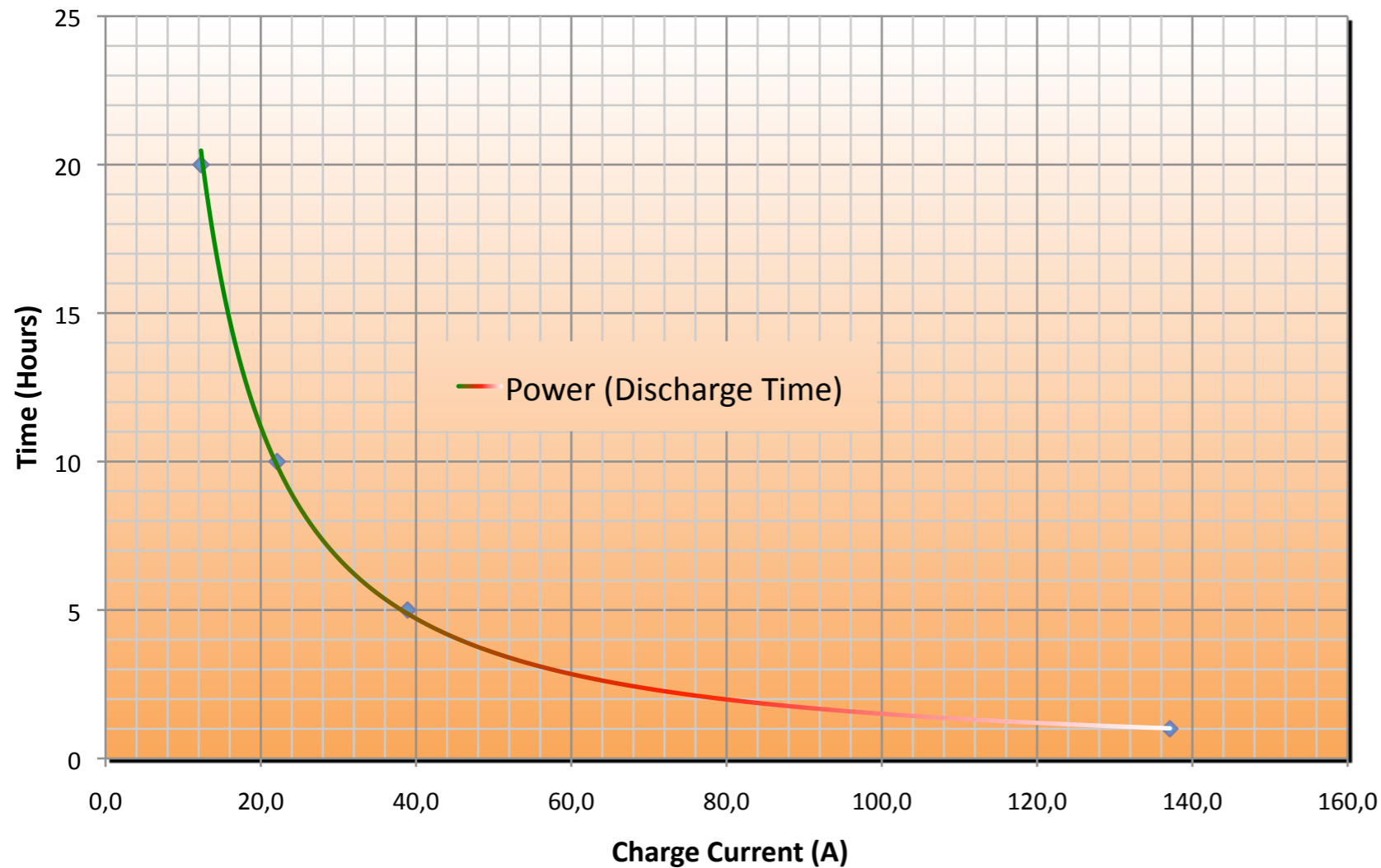
Battery Type		-20°C	-10°C	0°C	5°C	10°C	20°C	25°C	30°C	40°C	45°C
GEL Battery	6V&12V	50%	70%	83%	85%	90%	98%	100%	102%	104%	105%
	2V	60%	75%	85%	88%	92%	99%	100%	103%	105%	106%
AGM Battery	6V&12V	46%	66%	76%	83%	90%	98%	100%	103%	107%	109%
	2V	55%	70%	80%	85%	92%	99%	100%	104%	108%	110%

F150: Technical Characteristics

Battery Pack

The Autonomy of the iKube in total absence of sunlight is calculated as follows:

Discharge characteristics of battery DC 225 Ah C10 6V (from data sheet)



This Curve, approximately:

$$\text{Hours} = 466,64 * \text{Ampere}^{-1.246}$$

expresses how many hours a battery DC 225 Ah lasts, if its working with that level of current expressed in amperes.

F150: Technical Characteristics

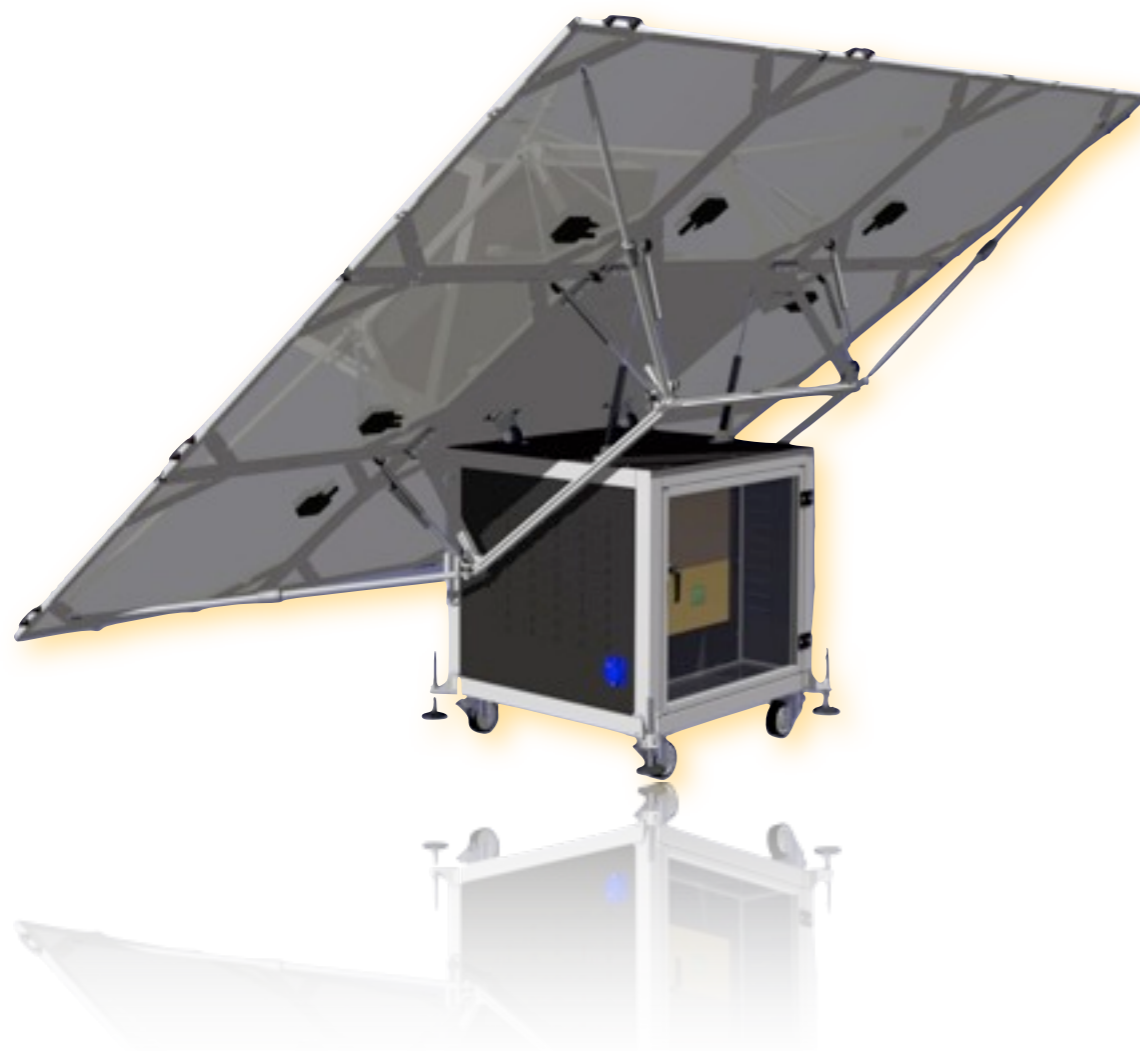
Battery Pack

<i>Power (W)</i>	<i>Remaining Hours</i>
100	170,0
500	24,0
800	13,2
1000	10,0
1500	6,1
2000	4,3
3000	2,6

**The above Datas are referred to the standard battery pack contained in the iKube.
Additional external battery packs can be added to multiply the autonomy.**

F150: Technical Characteristics

iKube F150



Inverter Power	4.000 VA / 3.200 W
Dimensions	1,27x1,27x1,20 m
Weight	550 Kg
Autonomy (1 KW load)	10 h
Battery Pack	48V 225 Ah
Generator Power	1,4 KWp
Photovoltaic surface	9 m ²

CONTACTS

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