



**iKUBE**

**F150**

**Technical Sheet**

**iKUBE**  
**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 (2 inverter power options: 3.200W, 4.000W).

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 m<sup>3</sup> are recharged by the photovoltaic generator which, with its surface of 9 m<sup>2</sup>, develops a power of 1,4 kW.

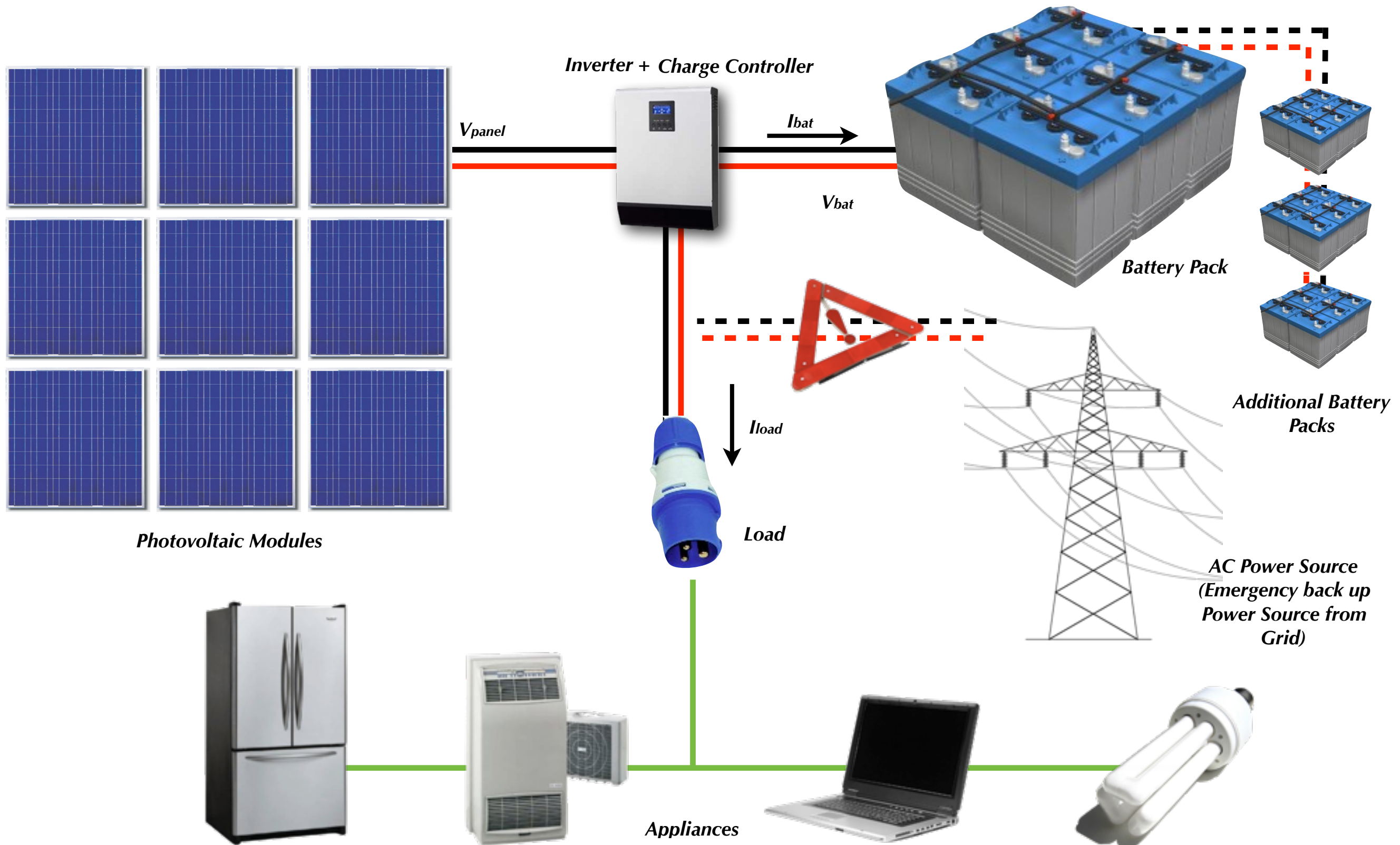
### **iKube key features:**

- **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.

**iKUBE**

generatore fotovoltaico mobile

# F150: Electric Diagram





## ***F150: Opening/Closing***

1



2



5



4



3





## ***F150: Opening/Closing***

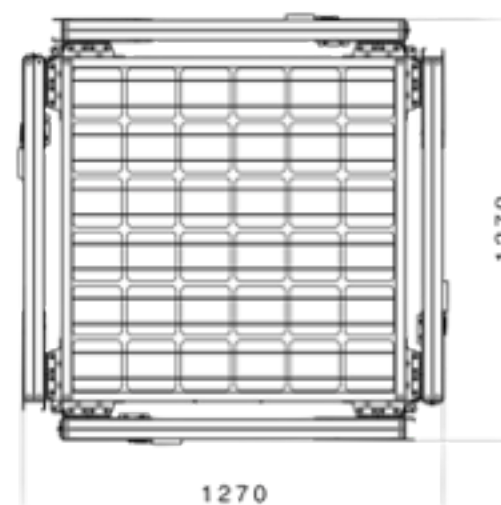
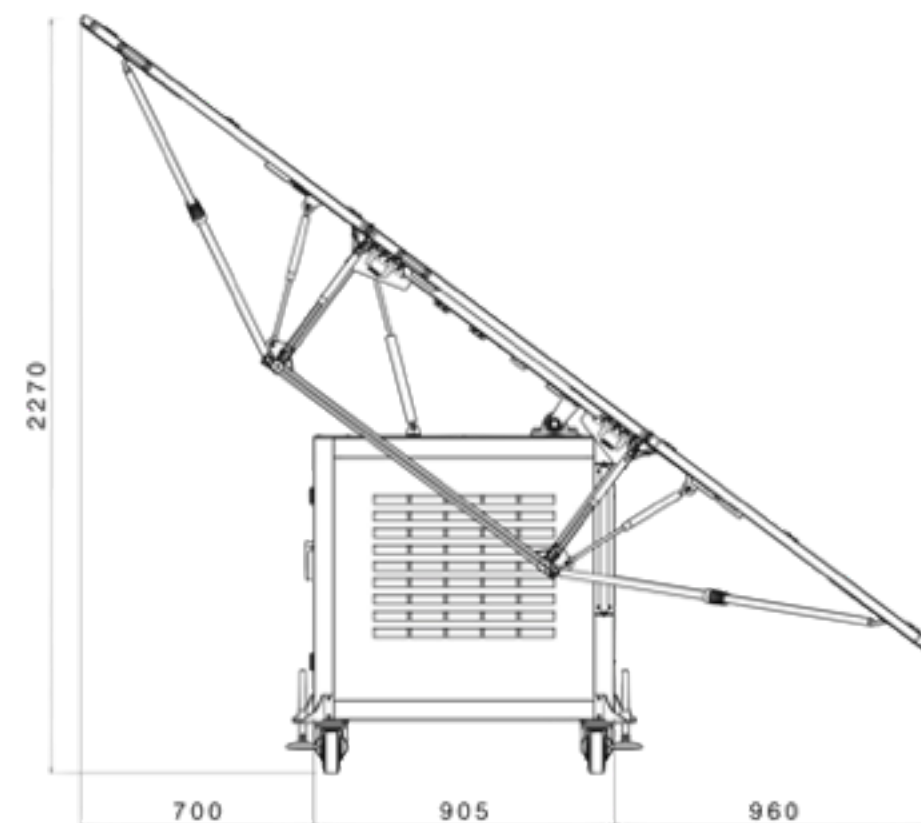
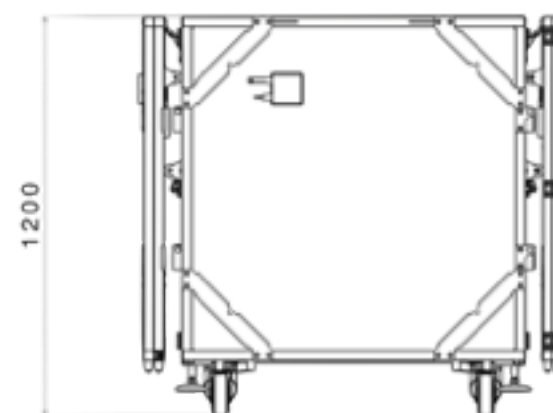
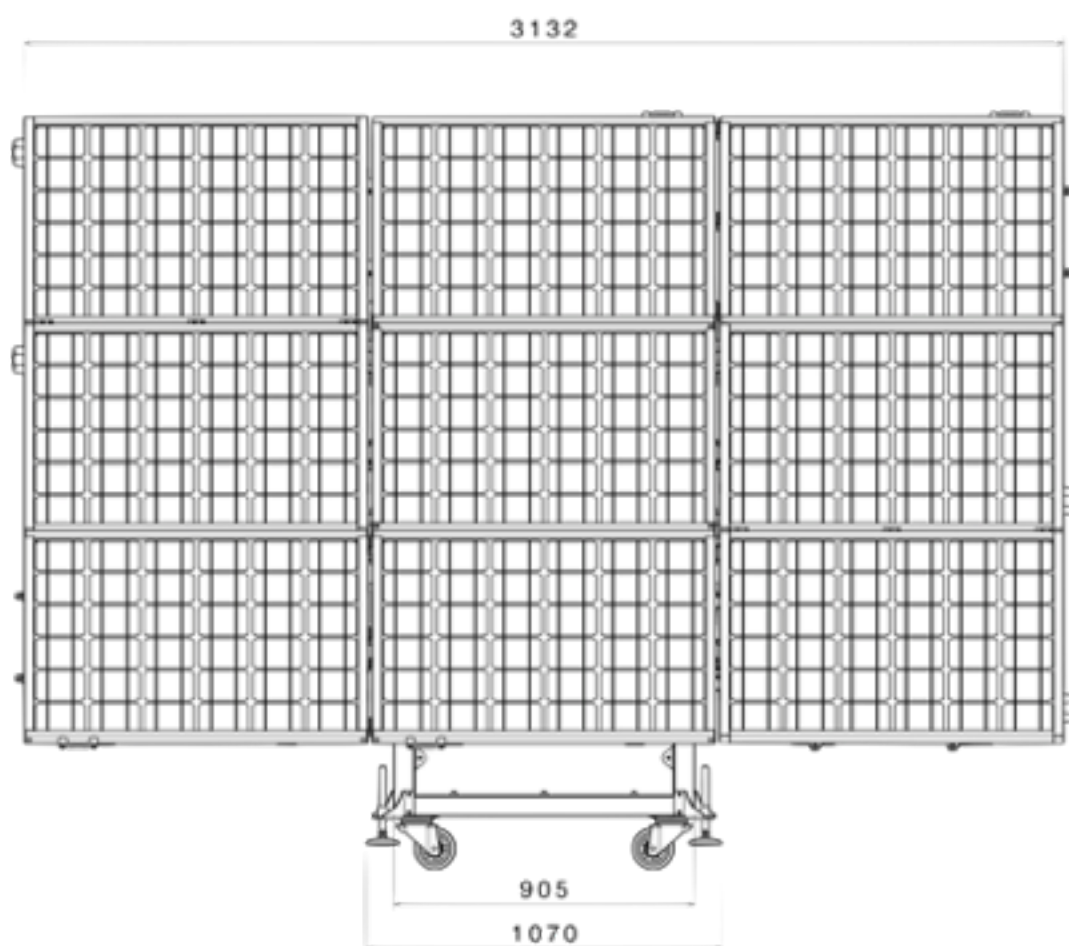


***Opened***



***Closed***

## ***F150: Dimensions***



# F150: Productivity/Autonomy



*Irradiation values calculated considering the average monthly rainfall*

	ROMA		CASABLANCA	
MONTH	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
July	219	7,1	215	6,9
August	213	6,9	215	6,9
September	180	6	198	6,6
October	151	5	178	5,9
November	103	3,3	155	5
December	84	2,7	139	4,5
<b>Yearly Production (kWh)</b>	<b>1865</b>		<b>2242</b>	

*Irradiation values calculated considering the presence of total sun*

	ROMA		CASABLANCA	
MONTH	Monthly Production (kWh)	Daily Average (kWh)	Monthly Production (kWh)	Daily Average (kWh)
January	172	5,5	216	7
February	193	6,9	224	8
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	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	203	6,5
<b>Yearly Production (kWh)</b>	<b>2862</b>		<b>3126</b>	

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



## F150: Productivity/Autonomy

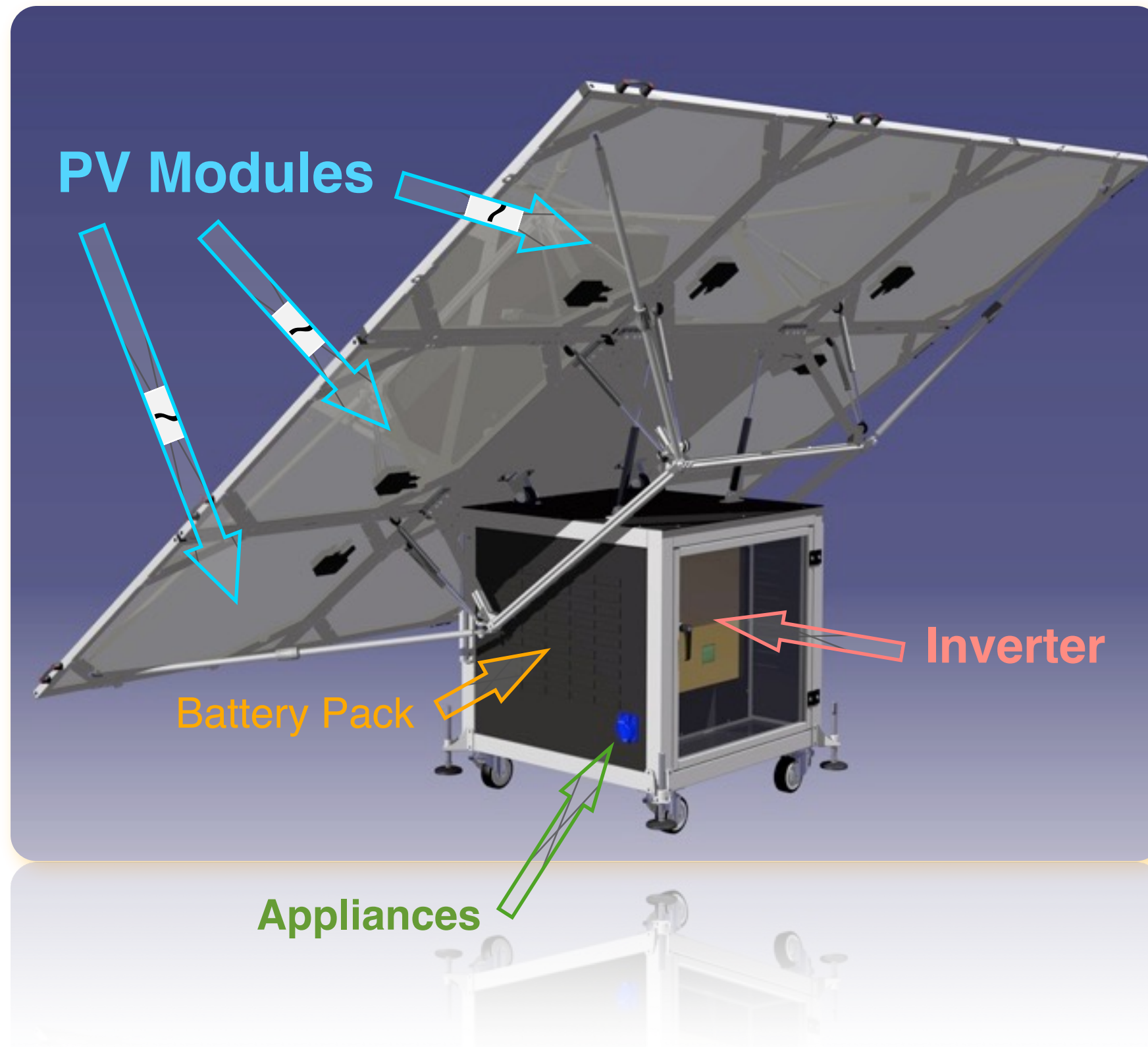
Here below are described two load configurations of a typical home environment:

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
<b>Tot Wh/day</b>			<b>3208</b>
<b>kWh/day</b>	<b>kWh/month</b>		<b>kWh/year</b>
<b>3.208</b>	<b>96.24</b>		<b>1170.92</b>

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
<b>Tot Wh/day</b>			<b>4033</b>
<b>kWh/day</b>	<b>kWh/month</b>		<b>kWh/year</b>
<b>4.03</b>	<b>121.00</b>		<b>1472.04</b>

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

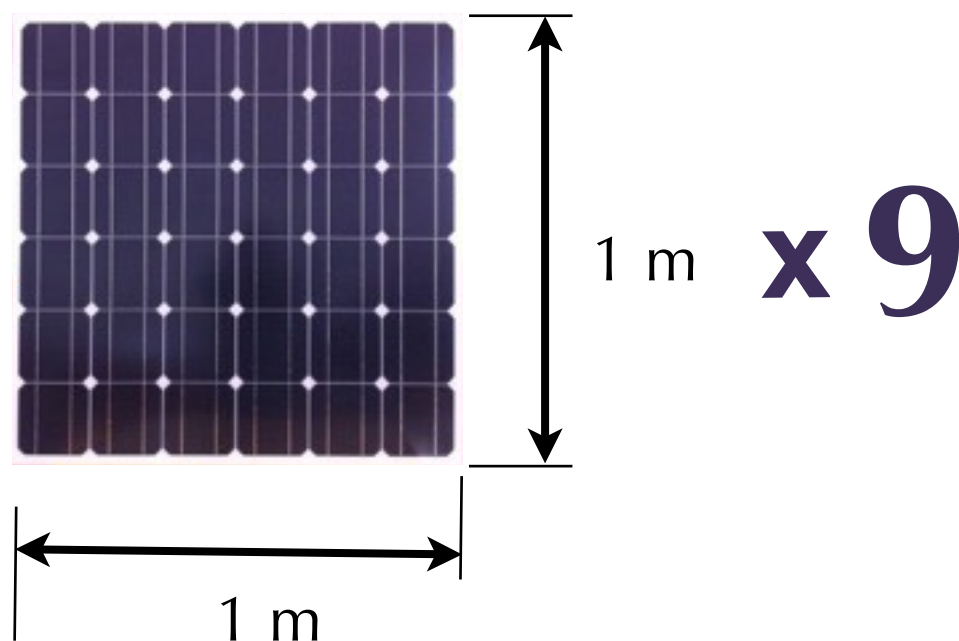
## ***F150: Technical Characteristics***





# ***F150: Technical Characteristics***

## **PV Modules**



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

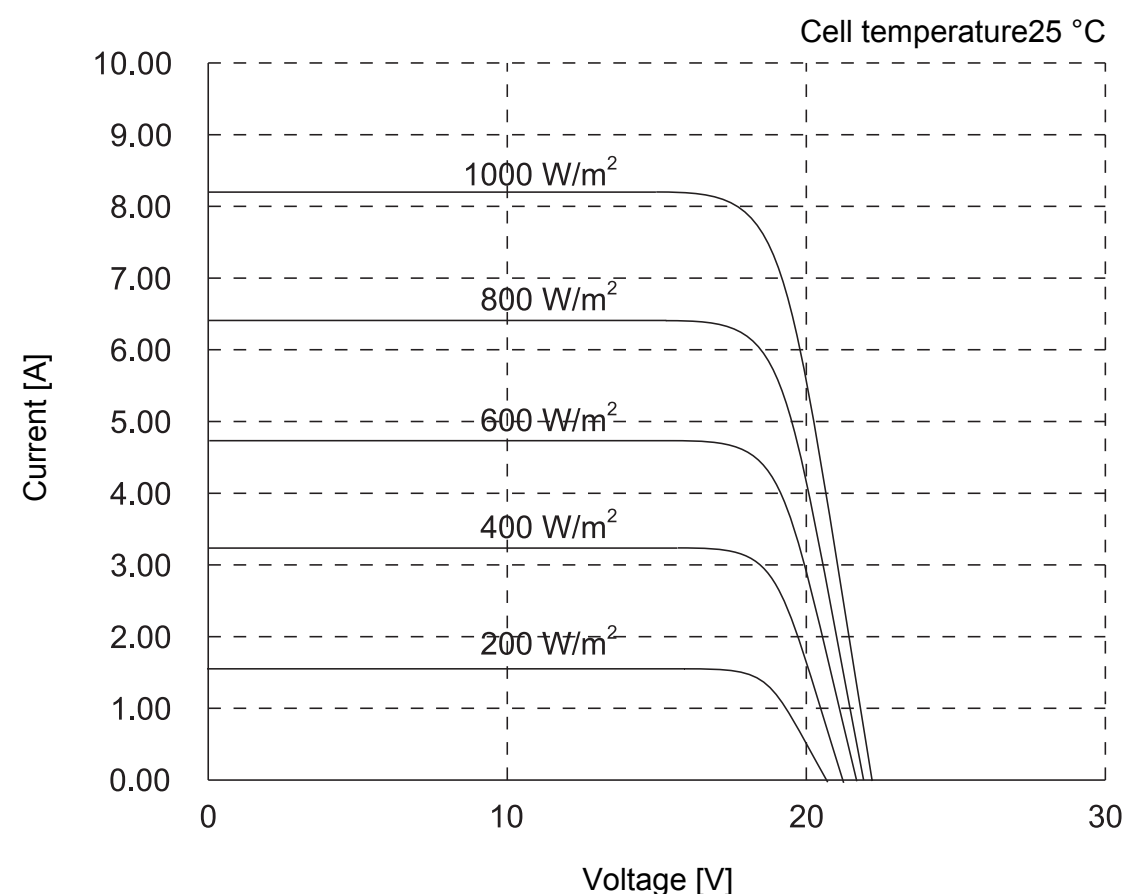
### **Technical data**

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 <sup>2</sup> , cell temperature 25 °C.	
Note 2: Values indicated are nominal.	

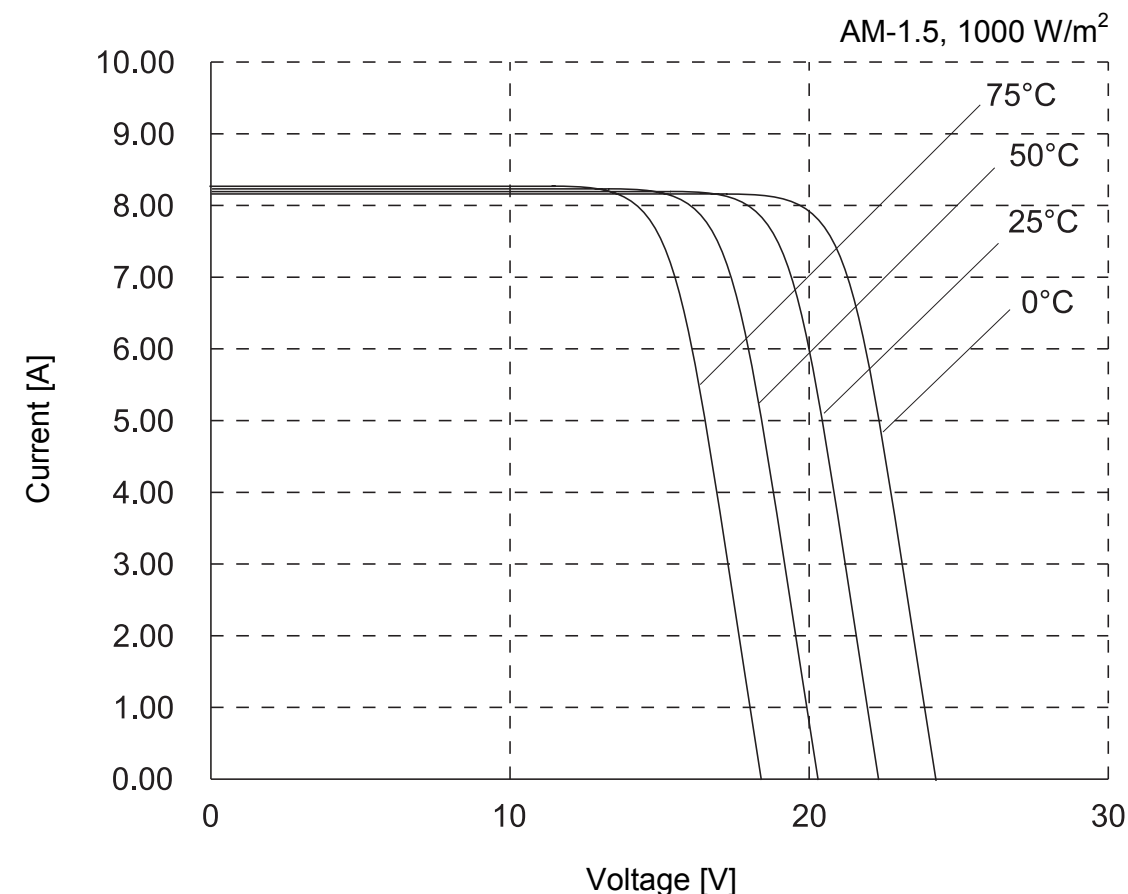
# ***F150: Technical Characteristics***

## **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



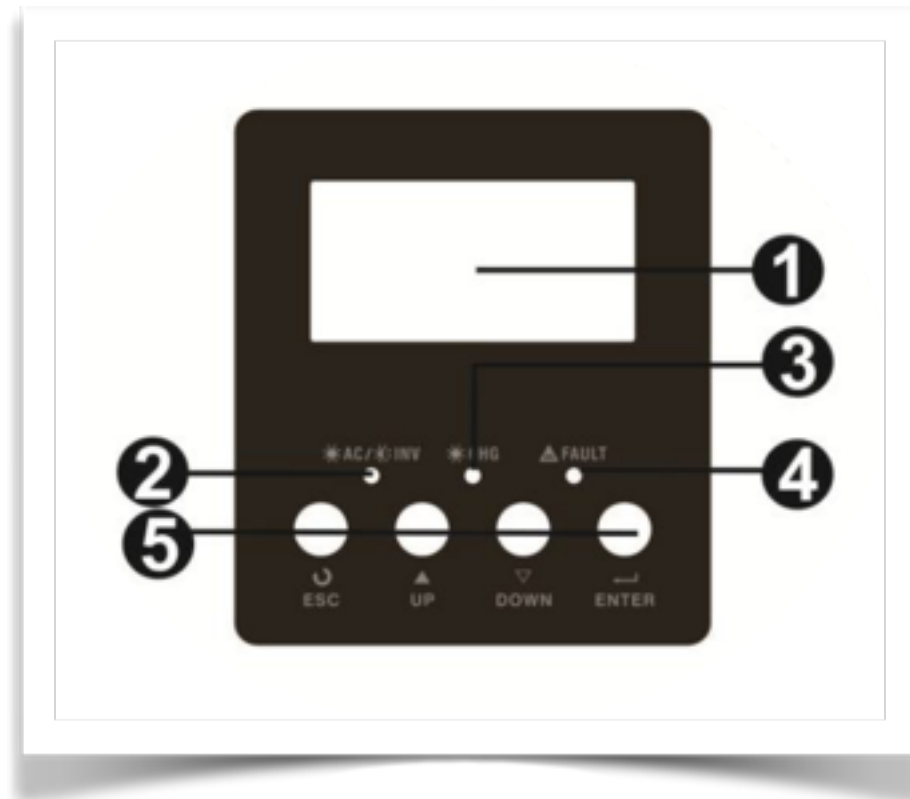
- Pure sine wave inverter
- Built-in MPPT solar charge controller
- Selectable input voltage range for home appliances and personal computers
- Selectable charging current based on applications
- Configurable AC/Solar input priority via LCD setting
- Compatible to mains voltage or generator power
- Parallel 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

<b>RATED POWER</b>	<b>4000VA/3200W</b>
<b>INPUT</b>	
<b>Voltage</b>	230 VAC
<b>Selectable Voltage Range</b>	170-280 VAC (For Personal Computers) ; 90-280 VAC (For Home Appliances)
<b>Frequency Range</b>	50 Hz/60 Hz (Auto sensing)
<b>OUTPUT</b>	
<b>AC Voltage Regulation (Batt. Mode)</b>	230VAC $\pm$ 5 %
<b>Surge Power</b>	8000VA
<b>Efficiency (Peak)</b>	0,93
<b>Transfer Time</b>	10 ms (For Personal Computers); 20 ms (For Home Appliances)
<b>Waveform</b>	Pure sine wave
<b>BATTERY &amp; AC CHARGER</b>	
<b>Battery Voltage</b>	48 VDC
<b>Floating Charge Voltage</b>	54 VDC
<b>Overcharge Protection</b>	54 VDC
<b>Maximum Charge Current</b>	20 A or 30 A
<b>SOLAR CHARGER</b>	
<b>Maximum PV Array Power</b>	3000 W
<b>MPPT Range @ Operating Voltage</b>	60VDC ~115VDC
<b>Maximum PV Array Open Circuit V</b>	145VDC
<b>Maximum Charging Current</b>	60A
<b>Maximum Efficiency</b>	0,98
<b>Standby Power Consumption</b>	2 W
<b>PHYSICAL</b>	
<b>Dimension, D x W x H (mm)</b>	140 x 295 x 540
<b>Net Weight (kgs)</b>	13.3
<b>OPERATING ENVIRONMENT</b>	
<b>Humidity</b>	5% to 95% Relative Humidity(Non-condensing)
<b>Operating Temperature</b>	0°C - 55°C
<b>Storage Temperature</b>	-15°C - 60°C

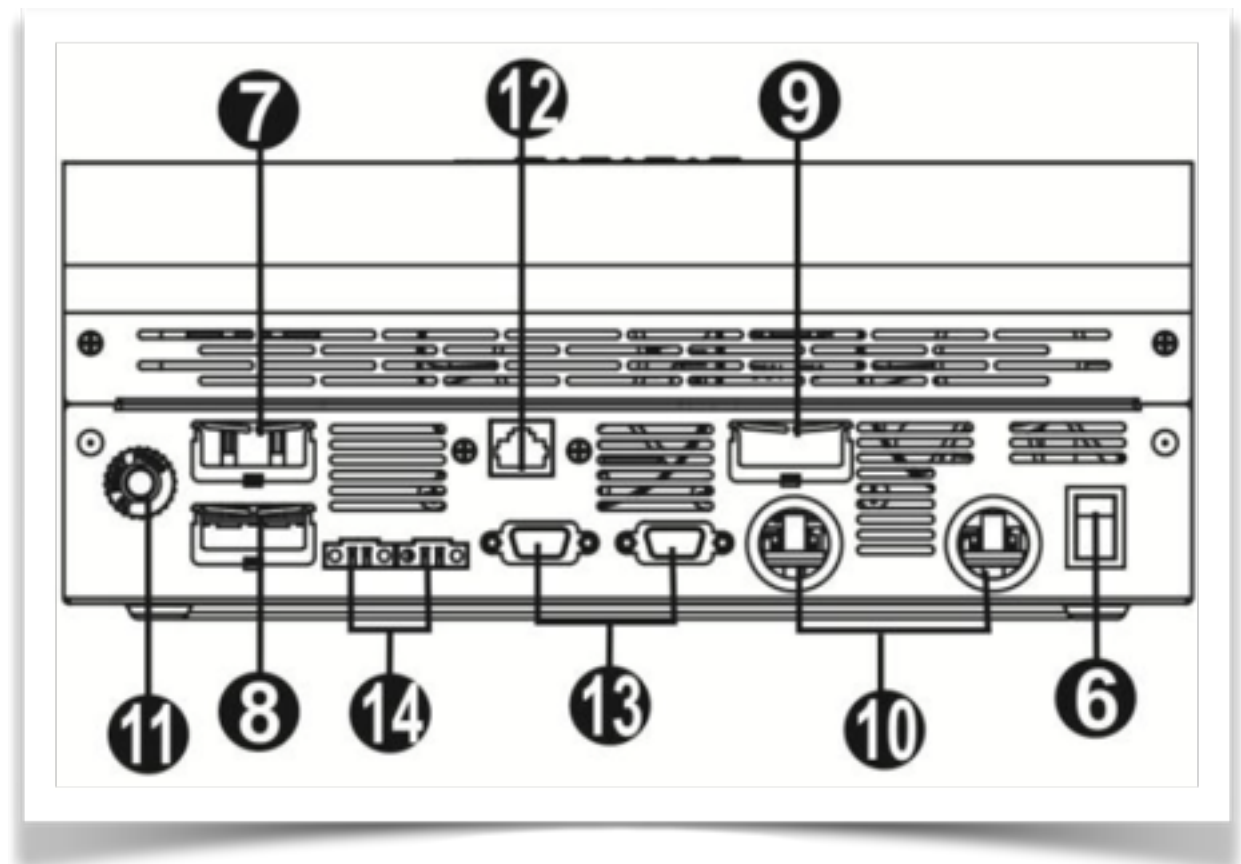
# F150: Technical Characteristics

## Inverter

### Overview



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



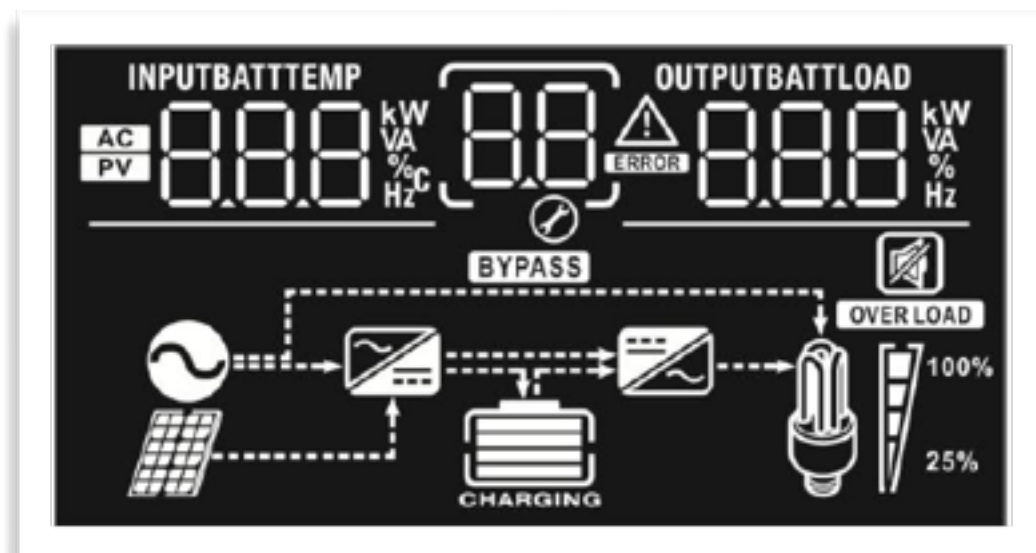
8. AC output
9. PV input
10. Battery input
11. Circuit breaker
12. RS232 communication port
13. Parallel communication cable (only for parallel model)
14. Current sharing cable (only for parallel model)
























# F150: Technical Characteristics

## Inverter

### LCD Information



Load Information				
		Indicates overload.		
	Indicates the load level by 0-24%, 25-50%, 50-74% and 75-100%.			
	0%~25%	25%~50%	50%~75%	75%~100%
				
Mode Operation Information				
		Indicates unit connects to the mains.		
		Indicates unit connects to the PV panel.		
		Indicates load is supplied by utility power.		
		Indicates the utility charger circuit is working.		
		Indicates the DC/AC inverter circuit is working.		
Mute Operation				
		Indicates unit alarm is disabled.		

Icon	Function description	
Input Source Information		
	Indicates the AC input.	
	Indicates the PV input	
	Indicate input voltage, input frequency, PV voltage, battery voltage and charger current.	
Configuration Program and Fault Information		
	Indicates the setting programs.	
	Indicates the warning and fault codes.  Warning:  flashing with warning code.  Fault:  lighting with fault code	
Output Information		
	Indicate output voltage, output frequency, load percent, load in VA and load in Watt.	
Battery Information		
	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.	
In AC mode, it will present battery charging status.		
Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	<2V/cell	4 bars will flash in turns.
	2 ~ 2.083V/cell	Bottom bar will be on and the other three bars will flash in turns.
	2.083 ~ 2.167V/cell	Bottom two bars will be on and the other two bars will flash in turns.
	> 2.167 V/cell	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.

# F150: Technical Characteristics

## Battery Pack

DC 225 Ah C10 6V



x 8

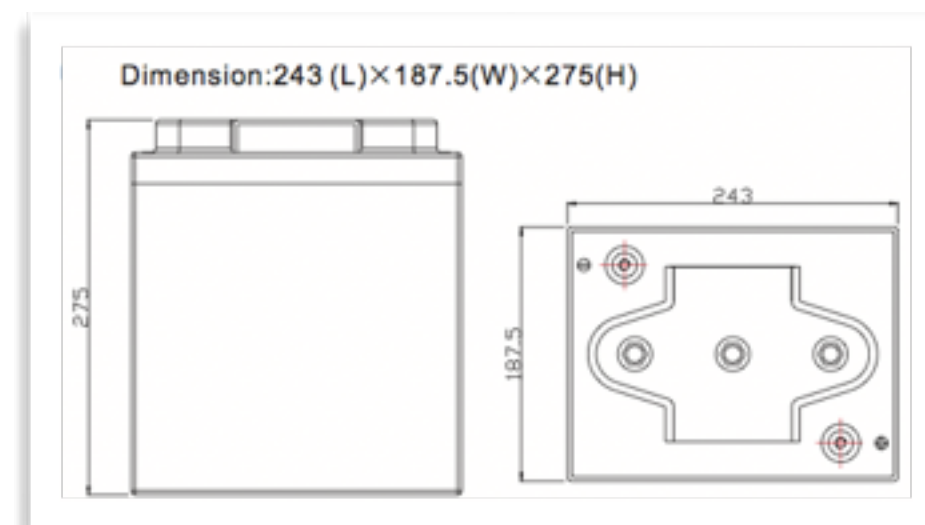
### AGM Technology

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.

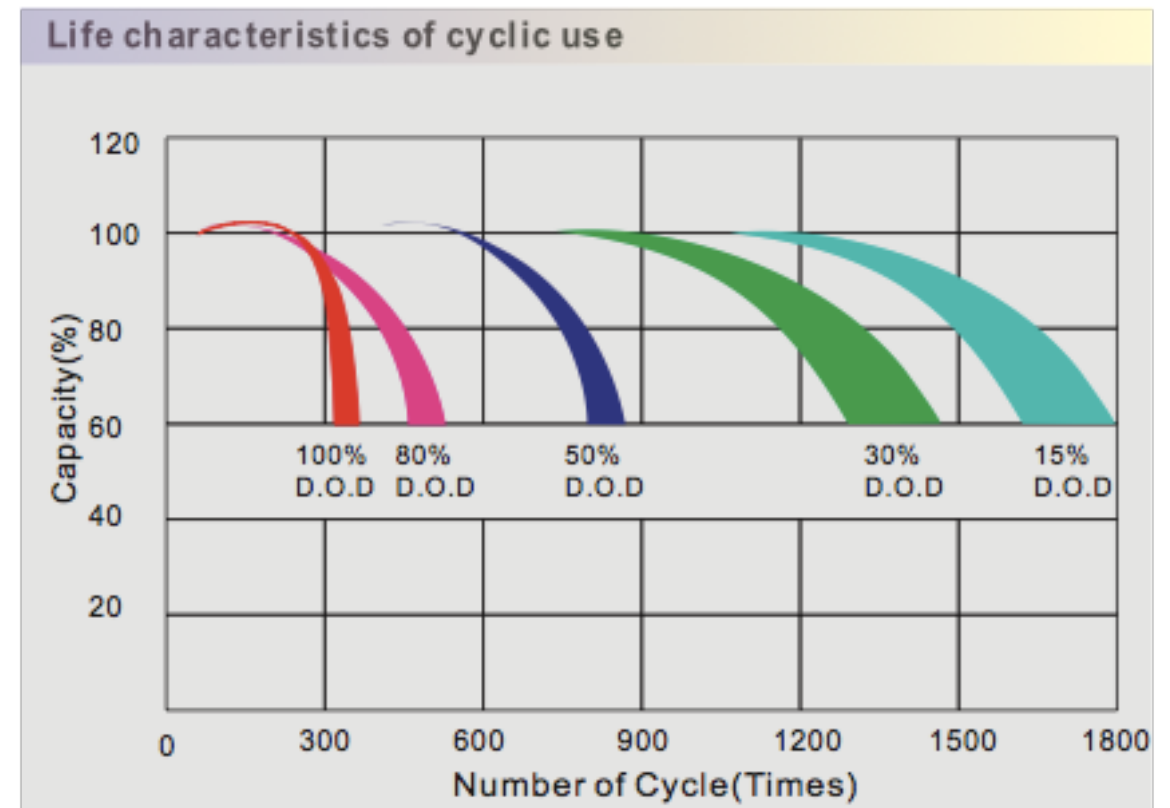
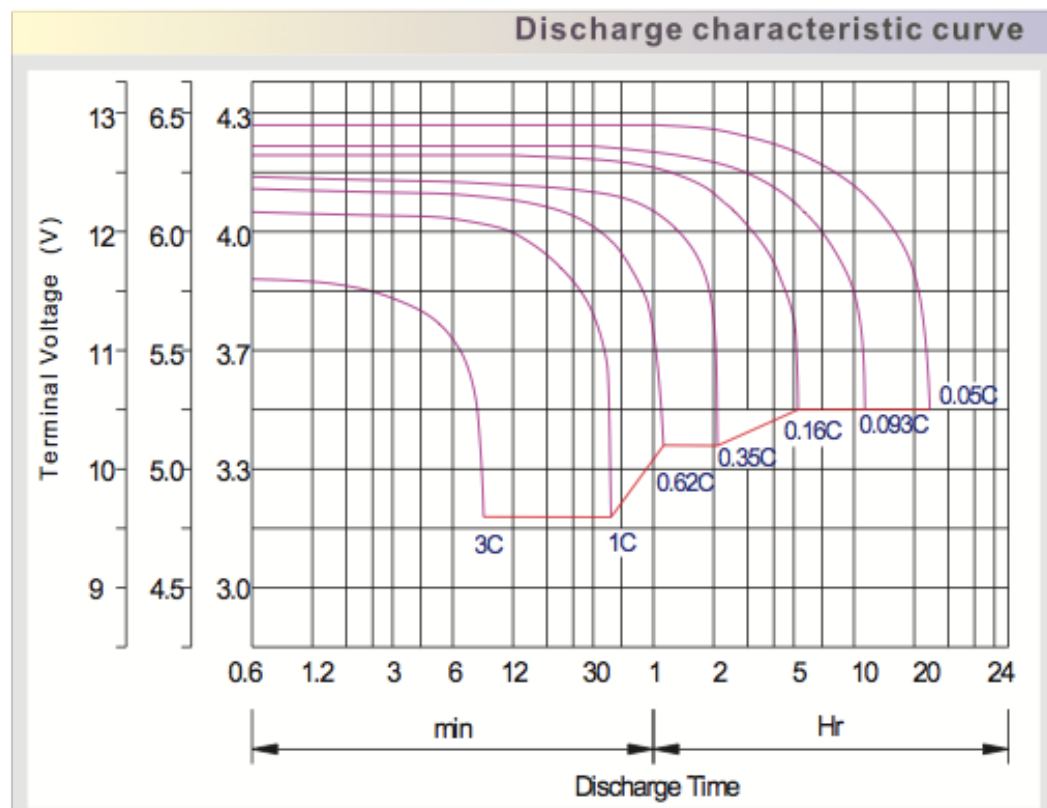


<b>Cells Per Unit</b>	3
<b>Voltage Per Unit</b>	6
<b>Capacity</b>	225Ah@10hr-rate to 1.80V per cell @25°C
<b>Weight</b>	Approx. 32.0 Kg
<b>Max. Discharge Current</b>	2250 A (5 sec)
<b>Internal Resistance</b>	Approx. 4.0 mΩ
<b>Operating Temperature Range</b>	Discharge: -20°C~60°C Charge: 0°C~50°C Storage: -20°C~60°C
<b>Normal Operating Temperature Range</b>	25°C±5°C
<b>Float Charging Voltage</b>	6.8 to 6.9 VDC/unit Average at 25°C
<b>Recommended Maximum Charging Current Limit</b>	67.5A
<b>Equalization and Cycle Service</b>	7.3 to 7.4 VDC/unit Average at 25°C
<b>Self Discharge</b>	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.
<b>Terminal</b>	Terminal F14
<b>Container Material</b>	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℃	-10℃	0℃	5℃	10℃	20℃	25℃	30℃	40℃	45℃
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%

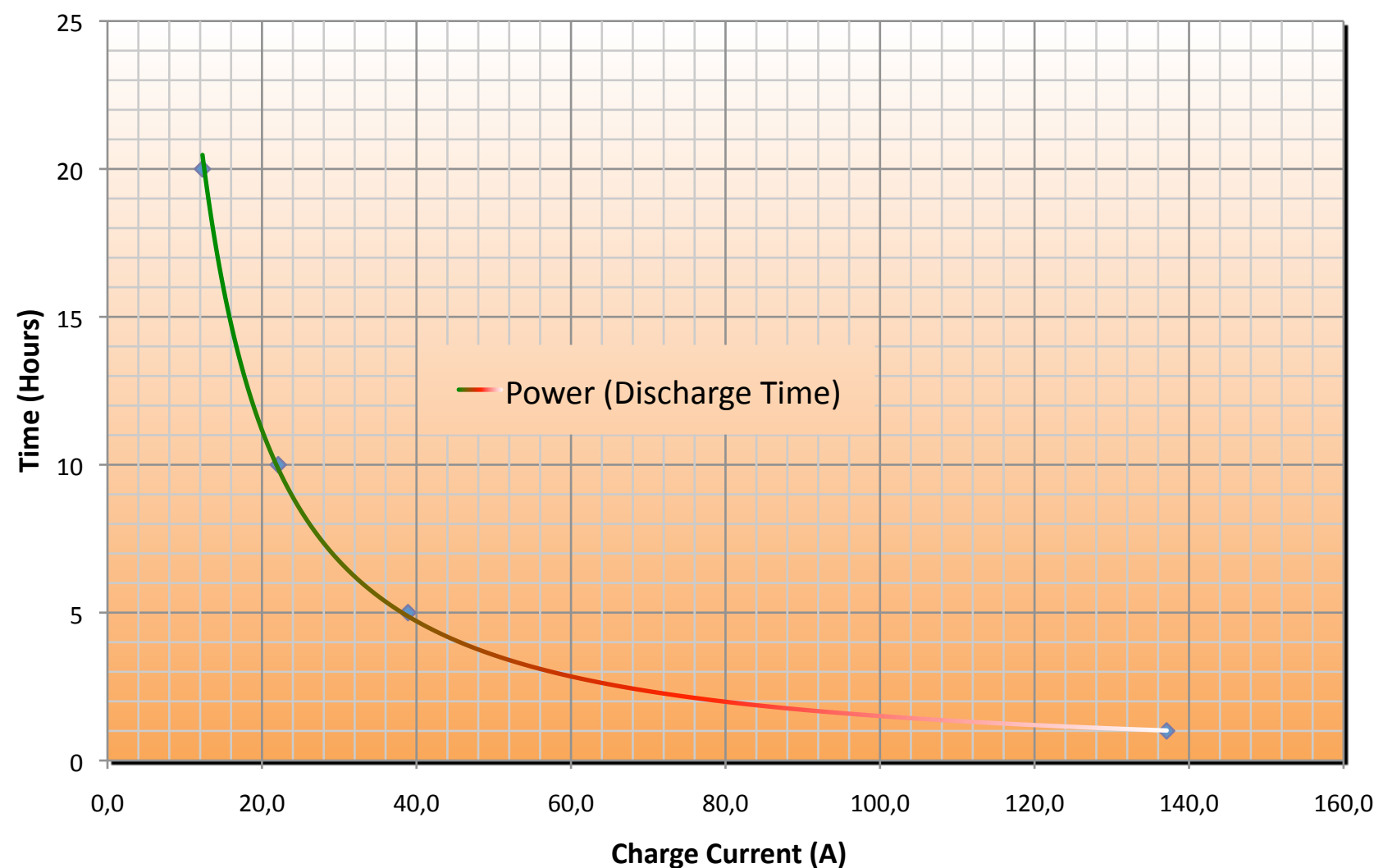


# **F150: Technical Characteristics**

## **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***

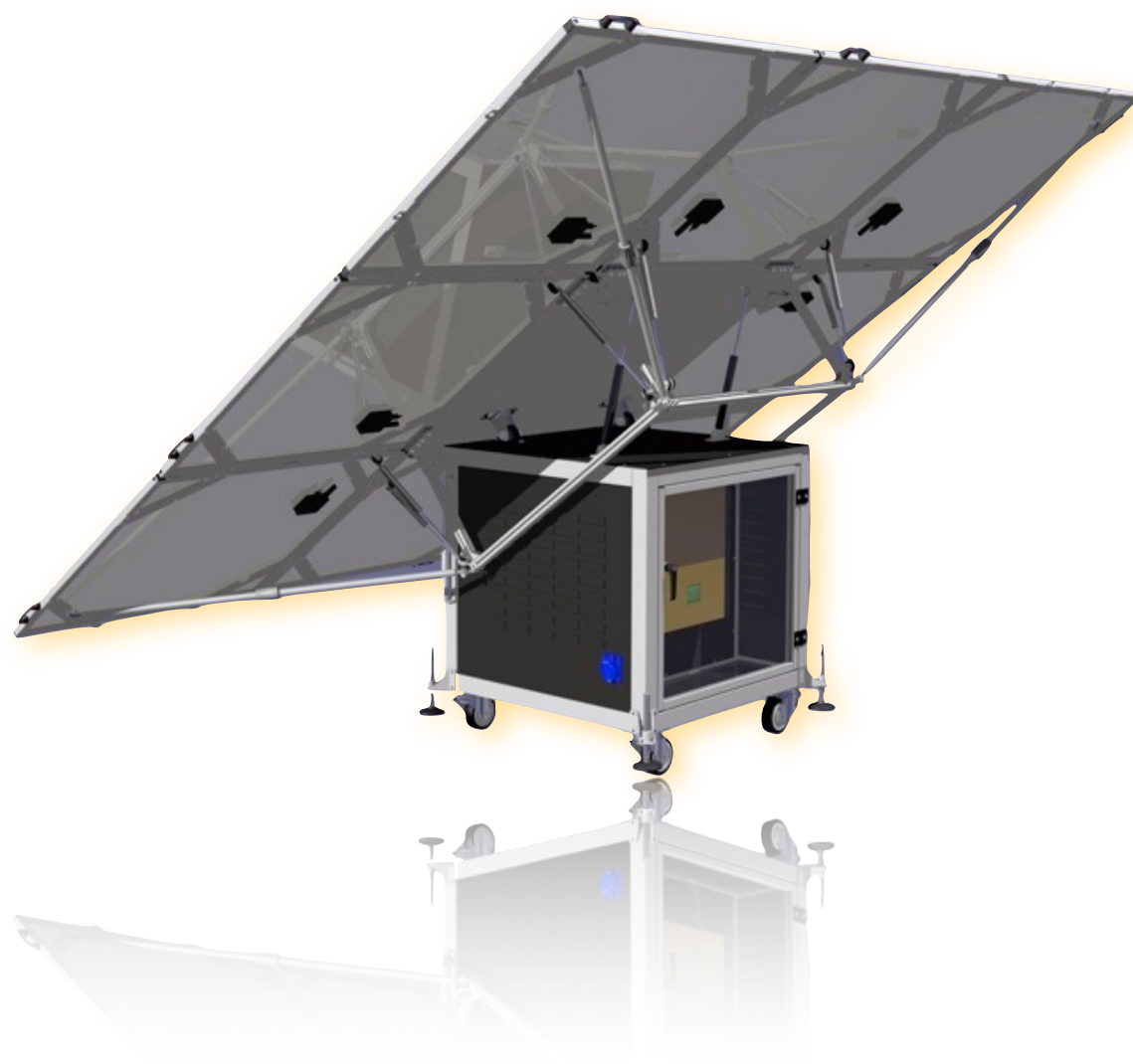
## **Battery Pack**

<b><i>Power (W)</i></b>	<b><i>Remaining Hours</i></b>
100	165
500	22,5
800	12,6
1000	9,5
1500	5,8
2000	4,0
3000	2,4

**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 <sup>2</sup>

Product specifications are subject to change without further notice.



# CONTACTS

Company: **PRO D3 Srl**  
Address: **Via Ho Chi Min 12 – 60022 Castelfidardo  
(Ancona) - Italy**  
Email: **info@ikube.it**  
Web: **www.ikube.it**

## Business Partner



ANCONA

ITALIA

IT 