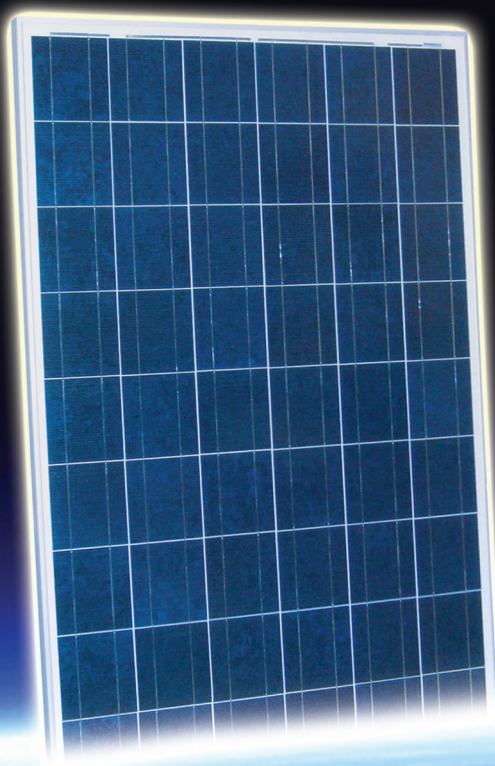




# ENERGY CATALOGUE



[www.fvgenergy.com](http://www.fvgenergy.com)



## FVG ENERGY - PRODUCTION OF PHOTOVOLTAIC MODULES

The sun offers energy at a "real bargain" and also in great abundance.

Even in times of "energy hunger" like the present, the energy that the sun continuously irradiates on the earth is equal to 10,000 times the world energy requirements.

Of all the energy sources available to us, the sun represents the more long-lasting source by far, with a life expectancy of billions of years.

To satisfy the world energy requirement, by using photovoltaics, a surface area of 145,000 km<sup>2</sup> would be sufficient.

This corresponds to a square having 380 Km sides.

## THE COMPANY

FVG Energy was established in 2006, offspring of a ten-year old project of an important company with more than thirty years' experience in the production of electronic equipment for the management of electricity in areas without grid connection, bringing together highly qualified engineers and production personnel. An evolution from battery chargers with converter, modified and pure sinewave inverters, up-to-date switching battery chargers, solar chargers, rectifiers, isolators to photovoltaic panels for stand alone systems. 2007 saw the first IEC61215 and II Class certification for the FVG 36 and 72 cells range and then the certification IEC61215 and EN61730-1 and EN61730-2 for the FVG 60 cells range for grid connect systems, with the production of a series of modules from 10W to 250W mono and polycrystalline.

## ITALIAN PRODUCTION SITE

The first machinery purchased for the soldering and lamination process in 2005 was later backed up by modern infrastructures and September 2008 saw the opening of the new production centre in Shanghai, which allows to satisfy the ever-growing demand for products within a short delivery time. FVG Energy Shanghai in this way backs up the Italian production, pursuing the philosophy of quality, competence and reliability that has always distinguished FVG Energy and enabled it to grow at an incredible rate. The ISO9001 certified production locations, with the use of modern and sophisticated Italian and Swiss production lines, manufacture the FVG Energy module which is sold all over the world from the Shanghai production centre.

## ITALIAN PRODUCTION



**HEADQUARTERS - FVG ENERGY**  
Carlino (UD) - ITALY



**NEW PRODUCTION SITE  
AND R&D CENTRE FVG ENERGY**  
Carlino (UD) - ITALY

## SHANGHAI PRODUCTION



**HEAD OFFICE  
IN P.R.CHINA**  
Bund Centre - SHANGHAI



**FACTORY IN P.R.CHINA**  
SHANGHAI

## GLOBAL COVERAGE







## CERTIFICATIONS

In 2007 the 36 and 72 cells series of monocrystalline silicon photovoltaic modules produced by FVG Energy obtained the first IEC61215 and Safety Class II certifications. In 2008 the study began for the design of the new range of modules with the use of 60 cells 156x156mm both in mono and polycrystalline, with a power range from 190W to 250W and obtaining certification in 2009 from the Eurotest Laboratori in Padua. The present production range, which is evermore in expansion, offers modules with a power range from 10W to 250W using cells with an efficiency that reaches 18%. FVG Energy is presently committed to the research and development of the new technologies in THINFILM and foresees the marketing of this new variety in 2010.



## COMPANY STRATEGY

FVG Energy chooses to produce according to the highest European qualitative standards. The highly efficient modules produced by FVG Energy confirm the commitment of the company towards green energy and technology that has a low environmental impact. The use of high-efficiency solar panels reduces the number of modules required which means:

- lower cost of photovoltaic modules
- lower weight of the modules = reduced transport costs, reduced structural loads
- lower number of mounting/wiring/connecting structures.

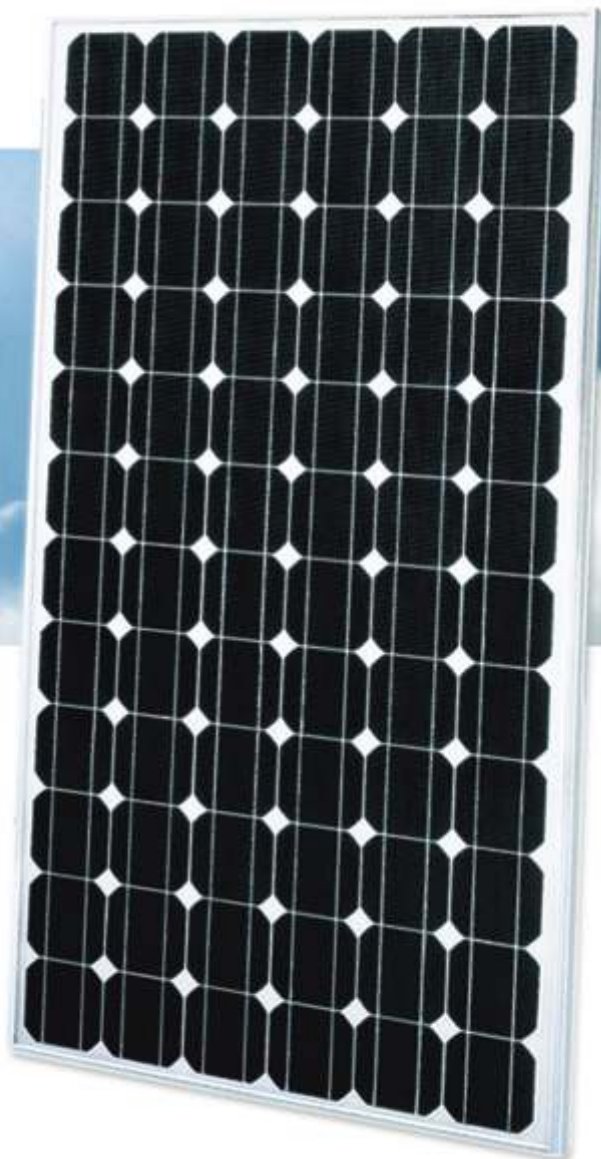
## DISTRIBUTION OF PHOTOVOLTAIC PRODUCTS

FVG Energy has become an important reference point of the major installation companies of photovoltaic systems and distributes, on a national and international scale, its photovoltaic modules, FRONIUS, SMA and MASTERVOLT inverters, steel and aluminum structures, solar cables, MC and TYCO connectors and anything else necessary for the completion of the systems.



## DISTRIBUTED BRANDS





## FVG 72-125

**Monocrystalline Silicon  
Photovoltaic Module  
Power peak 160 to 185W**

UPDATED 08-03-2009

### GENERAL DESCRIPTION

The FVG 72-125 photovoltaic modules are suitable for residential systems, stand-alone and grid-connect systems, office buildings, solar power stations, solar villages, villas, mountain cottages, pumps, traffic signs, radio relay stations, telecommunication systems, telemeter systems, lighting equipment.

The number of the cells is 72 and the max system voltage DC is 700V.

The FVG 72-125 photovoltaic modules are IEC61215 and Safety Class II certified.

### CHARACTERISTICS

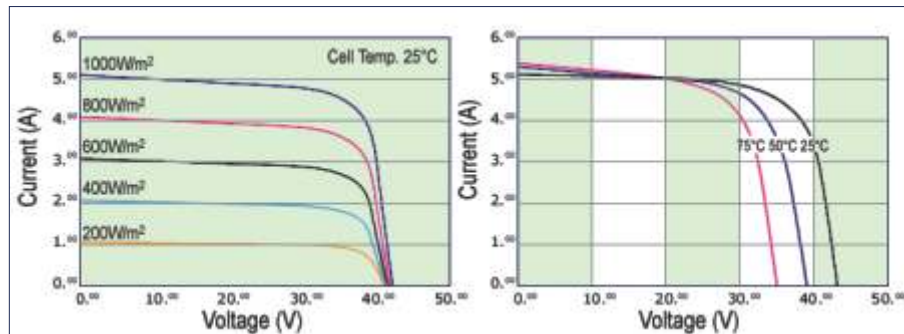
1. The FVG 72-125 photovoltaic modules are manufactured with 72 125x125 mm monocrystalline silicon cells.
2. The cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron 4mm tempered glass.
3. The production process ensures the cells maximum protection against critical and environmental conditions.
4. Modules are extremely resistant thanks to the aluminum frame for extended outdoor use.
5. Our photovoltaic modules are manufactured using specialized personnel and high quality materials.

## ELECTRO-OPTICAL CHARACTERISTICS

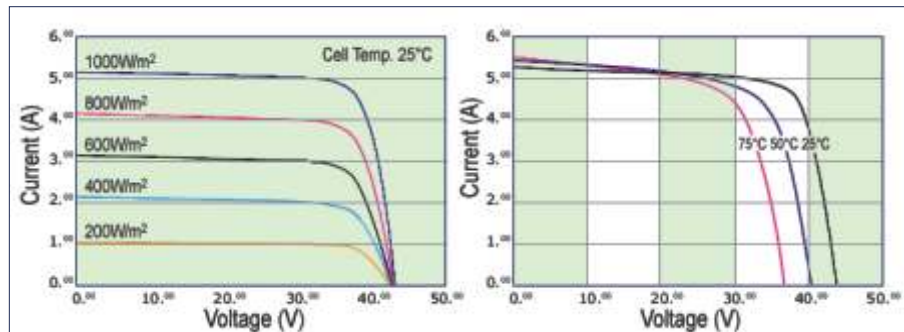
| Code  | Type         | Model         | Module Efficiency | Cell Efficiency | Power Peak (W) | V <sub>m</sub> (V) | I <sub>m</sub> (A) | V <sub>oc</sub> (V) | I <sub>sc</sub> (A) | Power Tolerance |
|-------|--------------|---------------|-------------------|-----------------|----------------|--------------------|--------------------|---------------------|---------------------|-----------------|
| 50181 | FVG 72 - 125 | FVG 160M - MC | 12.60%            | 15.00%          | 160            | 34.90              | 4.60               | 42.80               | 5.15                | +/- 3%          |
| 50183 | FVG 72 - 125 | FVG 165M - MC | 13.00%            | 15.50%          | 165            | 35.60              | 4.65               | 43.20               | 5.20                | +/- 3%          |
| 50184 | FVG 72 - 125 | FVG 170M - MC | 13.40%            | 16.00%          | 170            | 35.80              | 4.76               | 43.60               | 5.25                | +/- 3%          |
| 50185 | FVG 72 - 125 | FVG 175M - MC | 13.80%            | 16.50%          | 175            | 36.20              | 4.85               | 43.90               | 5.30                | +/- 3%          |
| 50186 | FVG 72 - 125 | FVG 180M - MC | 14.20%            | 17.00%          | 180            | 36.80              | 4.90               | 44.20               | 5.35                | +/- 3%          |
| 50187 | FVG 72 - 125 | FVG 185M - MC | 14.60%            | 17.50%          | 185            | 37.50              | 4.95               | 44.50               | 5.40                | +/- 3%          |

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Cell and Connection                         | Mono-crystalline silicon - 72 in series      |
| Max Series Fuse                             | 7A                                           |
| P <sub>m</sub> Temperature Coefficient      | -0.45%/°C                                    |
| V <sub>oc</sub> Temperature Coefficient     | -0.35%/°C                                    |
| I <sub>sc</sub> Temperature Coefficient     | 0.05%/°C                                     |
| Test Condition                              | STC:AM=1.5 1000W/m <sup>2</sup>              |
| NOCT                                        | 47± 2°C                                      |
| Max System Voltage (VDC)                    | 700                                          |
| Operating Temperature / Storage Temperature | -40~+85°C                                    |
| Loading Capacity                            | 600pcs/40ft Container; 300pcs/20ft Container |

### FVG 165M-MC - 72 CELLS - MONOCRYSTALLINE



### FVG 180M-MC - 72 CELLS - MONOCRYSTALLINE



### WARRANTY

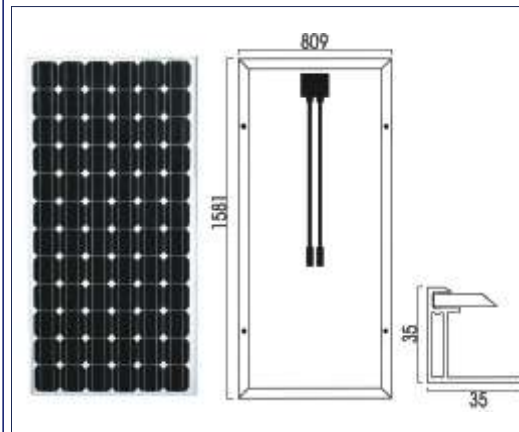
#### 3 YEARS LIMITED ON PV MODULES AND 25 YEARS LTD ON POWER OUTPUT

The power output values shall be those measured under FVG Energy standard measurement conditions as follows:

- light spectrum of AM 1.5;
- irradiation of 1,000W per m<sup>2</sup>;
- a cell temperature of 25°C.

For more information ask your local dealer or FVG Energy directly (www.fvgenergy.com) for the full document of Warranty.

### DIMENSIONS AND PACKING



Module Dimensions: mm 1581 x 809 x 35  
Module Net Weight: kg 16  
Carton Dimensions: about cm 161 x 83 x 9  
Pallet Dimensions: about cm 165 x 85 x h195  
Pallet Net Weight: kg 620  
1 carton = 2 modules  
1 pallet = 19 cartons = 38 modules  
1 maxi pallet of 50 modules = cm 104x164xh190  
Maxi pallet weight of 50 modules = kg 800

### JUNCTION BOX



Junction box with cables and waterproof connectors.  
With 3 bypass diodes.  
Cable length cm 90.  
Line 3 type connectors.





UPDATED 08-03-2009

## FVG 60-156

**Monocrystalline Silicon  
Photovoltaic Module  
Power peak 210 to 250W**

### GENERAL DESCRIPTION

The FVG 60-156 photovoltaic modules are suitable for residential systems, grid-connect systems, office buildings, solar power stations, solar villages, villas, mountain cottages, pumps, traffic signs, radio relay stations, telecommunication systems, telemeter systems, lighting equipment, MW ground plants.

The number of the cells is 60 and the max system voltage DC is 1000V.

The FVG 60-156 photovoltaic modules are IEC61215 and EN61730-2 certified.

### CHARACTERISTICS

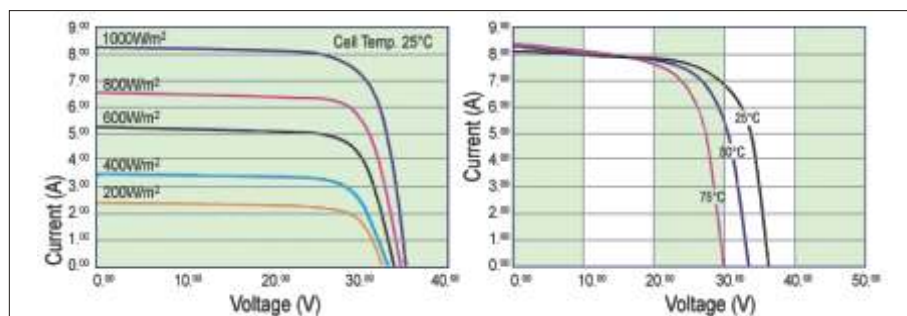
1. The FVG 60-156 photovoltaic modules are manufactured with 60 156x156 mm monocrystalline silicon cells.
2. The cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron 4mm tempered glass.
3. The production process ensures the cells maximum protection against critical and environmental conditions.
4. Modules are extremely resistant thanks to the aluminum frame for extended outdoor use.
5. Our photovoltaic modules are manufactured using specialized personnel and high quality materials.

## ELECTRO-OPTICAL CHARACTERISTICS

| Code  | Type         | Model         | Module Efficiency | Cell Efficiency | Power Peak (W) | V <sub>m</sub> (V) | I <sub>m</sub> (A) | V <sub>oc</sub> (V) | I <sub>sc</sub> (A) | Power Tolerance |
|-------|--------------|---------------|-------------------|-----------------|----------------|--------------------|--------------------|---------------------|---------------------|-----------------|
| 50240 | FVG 60 - 156 | FVG 210M - MC | 12.80%            | 14.80%          | 210            | 29.20              | 7.20               | 36.40               | 7.86                | +/- 3%          |
| 50241 | FVG 60 - 156 | FVG 215M - MC | 13.10%            | 15.15%          | 215            | 29.50              | 7.29               | 36.60               | 7.91                | +/- 3%          |
| 50242 | FVG 60 - 156 | FVG 220M - MC | 13.40%            | 15.50%          | 220            | 29.80              | 7.39               | 36.80               | 8.00                | +/- 3%          |
| 50243 | FVG 60 - 156 | FVG 225M - MC | 13.75%            | 15.85%          | 225            | 29.90              | 7.55               | 36.90               | 8.09                | +/- 3%          |
| 50244 | FVG 60 - 156 | FVG 230M - MC | 14.10%            | 16.20%          | 230            | 30.00              | 7.67               | 37.00               | 8.18                | +/- 3%          |
| 50245 | FVG 60 - 156 | FVG 235M - MC | 14.40%            | 16.55%          | 235            | 30.30              | 7.77               | 37.25               | 8.28                | +/- 3%          |
| 50246 | FVG 60 - 156 | FVG 240M - MC | 14.70%            | 16.90%          | 240            | 30.60              | 7.85               | 37.50               | 8.38                | +/- 3%          |
| 50247 | FVG 60 - 156 | FVG 245M - MC | 15.00%            | 17.20%          | 245            | 30.80              | 7.97               | 37.75               | 8.48                | +/- 3%          |
| 50248 | FVG 60 - 156 | FVG 250M - MC | 15.30%            | 17.50%          | 250            | 30.95              | 8.10               | 37.95               | 8.58                | +/- 3%          |

|                                             |                                                         |
|---------------------------------------------|---------------------------------------------------------|
| Cell and Connection                         | Monocrystalline silicon - 60 in series                  |
| Max Series Fuse                             | 11A                                                     |
| P <sub>m</sub> Temperature Coefficient      | -0.45 % /°C                                             |
| V <sub>oc</sub> Temperature Coefficient     | -0.35 % /°C                                             |
| I <sub>sc</sub> Temperature Coefficient     | 0.05 % /°C                                              |
| Test Condition                              | STC:AM=1.5 1000W/m <sup>2</sup> , Cell Temperature 25°C |
| NOCT                                        | 47± 2°C                                                 |
| Max System Voltage (VDC)                    | 1000                                                    |
| Operating Temperature / Storage Temperature | -40~+85°C                                               |
| Dielectric Insulation Voltage               | 3000 VCD max                                            |

### FVG - 60 CELLS - MONOCRYSTALLINE



### WARRANTY

#### 3 YEARS LIMITED ON PV MODULES AND 25 YEARS LTD ON POWER OUTPUT

The power output values shall be those measured under FVG Energy standard measurement conditions as follows:

- (a) light spectrum of AM 1.5;
- (b) irradiation of 1,000W per m<sup>2</sup>;
- (c) a cell temperature of 25°C.

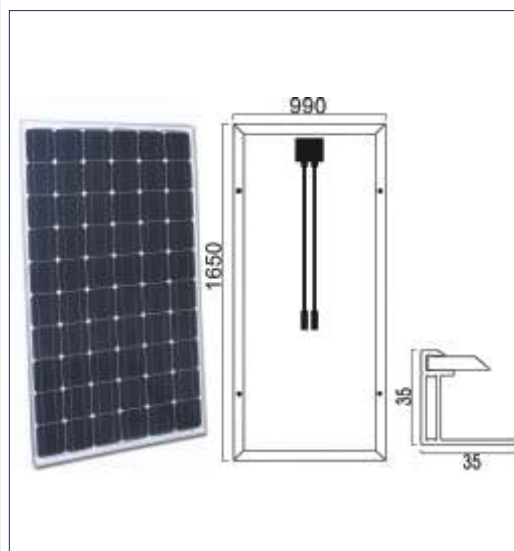
For more information ask your local dealer or FVG Energy directly (www.fvgenergy.com) for the full document of Warranty.

### JUNCTION BOX



Junction box with cables and waterproof connectors.  
With 6 bypass diodes.  
Cable length cm 90.  
Line 3 type connectors.

### DIMENSIONS AND PACKING



Module Dimensions: mm 1650 x 990 x 35  
Module Net Weight: kg 21.50  
Carton Dimensions: about cm 172 x 108 x h8  
Pallet Dimensions: about cm 176 x 109 x h180  
Pallet Net Weight: kg 900  
1 carton = 2 modules  
1 pallet = 20 cartons = 40 modules  
Container Loading Capacity  
20ft: 240 Pcs (6 pallets)  
40ft: 480 Pcs (12 pallets)



## FVG 60-156

**Polycrystalline Silicon  
Photovoltaic Module  
Power peak 200 to 240W**

UPDATED 08-03-2009

### GENERAL DESCRIPTION

The FVG 60-156 photovoltaic modules are suitable for residential systems, grid-connect systems, office buildings, solar power stations, solar villages, villas, mountain cottages, pumps, traffic signs, radio relay stations, telecommunication systems, telemeter systems, lighting equipment, MW ground plants.

The number of the cells is 60 and the max system voltage DC is 1000V.

The FVG 60-156 photovoltaic modules are IEC61215 and EN61730-1 certified.

### CHARACTERISTICS

1. The FVG 60-156 photovoltaic modules are manufactured with 60 156x156 mm polycrystalline silicon cells.
2. The cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron 4mm tempered glass.
3. The production process ensures the cells maximum protection against critical and environmental conditions.
4. Modules are extremely resistant thanks to the aluminum frame for extended outdoor use.
5. Our photovoltaic modules are manufactured using specialized personnel and high quality materials.

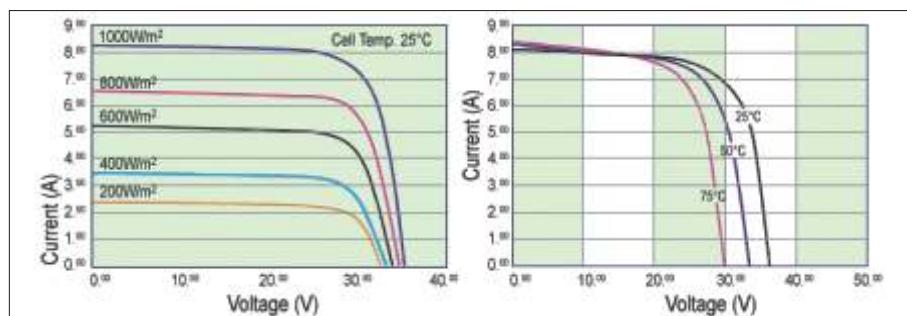


## ELECTRO-OPTICAL CHARACTERISTICS

| Code  | Type         | Model         | Module Efficiency | Cell Efficiency | Power Peak (W) | V <sub>m</sub> (V) | I <sub>m</sub> (A) | V <sub>oc</sub> (V) | I <sub>sc</sub> (A) | Power Tolerance |
|-------|--------------|---------------|-------------------|-----------------|----------------|--------------------|--------------------|---------------------|---------------------|-----------------|
| 50230 | FVG 60 - 156 | FVG 200P - MC | 12.20%            | 13.70%          | 200            | 28.70              | 6.97               | 36.00               | 7.75                | +/- 3%          |
| 50231 | FVG 60 - 156 | FVG 205P - MC | 12.50%            | 14.05%          | 205            | 29.20              | 7.05               | 36.20               | 7.81                | +/- 3%          |
| 50232 | FVG 60 - 156 | FVG 210P - MC | 12.80%            | 14.40%          | 210            | 29.70              | 7.10               | 36.40               | 7.86                | +/- 3%          |
| 50233 | FVG 60 - 156 | FVG 215P - MC | 13.10%            | 14.75%          | 215            | 29.75              | 7.25               | 36.60               | 7.93                | +/- 3%          |
| 50234 | FVG 60 - 156 | FVG 220P - MC | 13.40%            | 15.10%          | 220            | 29.80              | 7.39               | 36.80               | 8.00                | +/- 3%          |
| 50235 | FVG 60 - 156 | FVG 225P - MC | 13.70%            | 15.45%          | 225            | 30.00              | 7.50               | 37.00               | 8.07                | +/- 3%          |
| 50236 | FVG 60 - 156 | FVG 230P - MC | 14.00%            | 15.80%          | 230            | 30.30              | 7.60               | 37.20               | 8.14                | +/- 3%          |
| 50237 | FVG 60 - 156 | FVG 235P - MC | 14.30%            | 16.15%          | 235            | 30.40              | 7.75               | 37.40               | 8.21                | +/- 3%          |
| 50238 | FVG 60 - 156 | FVG 240P - MC | 14.60%            | 16.50%          | 240            | 30.50              | 7.88               | 37.60               | 8.28                | +/- 3%          |

|                                             |                                                         |
|---------------------------------------------|---------------------------------------------------------|
| Cell and Connection                         | Polycrystalline silicon - 60 in series                  |
| Max Series Fuse                             | 11A                                                     |
| P <sub>m</sub> Temperature Coefficient      | -0.45 % /°C                                             |
| V <sub>oc</sub> Temperature Coefficient     | -0.35 % /°C                                             |
| I <sub>sc</sub> Temperature Coefficient     | 0.05 % /°C                                              |
| Test Condition                              | STC:AM=1.5 1000W/m <sup>2</sup> , Cell Temperature 25°C |
| NOCT                                        | 47± 2°C                                                 |
| Max System Voltage (VDC)                    | 1000                                                    |
| Operating Temperature / Storage Temperature | -40~+85°C                                               |
| Dielectric Insulation Voltage               | 3000 VCD max                                            |

### FVG 60 CELLS- POLYCRYSTALLINE



### WARRANTY

#### 3 YEARS LIMITED ON PV MODULES AND 25 YEARS LTD ON POWER OUTPUT

The power output values shall be those measured under FVG Energy standard measurement conditions as follows:

- (a) light spectrum of AM 1.5;
- (b) irradiation of 1,000W per m<sup>2</sup>;
- (c) a cell temperature of 25°C.

For more information ask your local dealer or FVG Energy directly (www.fvgenergy.com) for the full document of Warranty.

### JUNCTION BOX



Junction box with cables and waterproof connectors.  
With 6 bypass diodes.  
Cable length cm 90.  
Line 3 type connectors.

### DIMENSIONS AND PACKING



Module Dimensions: mm 1650 x 990 x 35  
Module Net Weight: kg 21.50  
Carton Dimensions: about cm 172 x 108 x h8  
Pallet Dimensions: about cm 176 x 109 x h180  
Pallet Net Weight: kg 900  
1 carton = 2 modules  
1 pallet = 20 cartons = 40 modules

Container Loading Capacity  
20ft: 240 Pcs (6 pallets)  
40ft: 480 Pcs (12 pallets)



## FVG 36-125

**Monocrystalline Silicon  
Photovoltaic Module  
Peak power 80 - 85 - 90 W**

UPDATED 08-03-2009

### GENERAL DESCRIPTION

The FVG 36-125 photovoltaic modules are suitable for residential systems stand-alone and grid-connect systems, office buildings, solar power stations, solar villages, villas, mountain cottages, pumps, traffic signs, radio relay stations, telecommunication systems, telemeter systems, lighting equipment.

The number of the cells is 36 and the max system voltage DC is 700V.

The FVG 36-125 photovoltaic modules are IEC61215 and Safety Class II certified.

### CHARACTERISTICS

1. The FVG 36-125 photovoltaic modules are manufactured with 36 125x125 mm monocrystalline silicon cells.
2. The cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron 4mm tempered glass.
3. The production process ensures the cells maximum protection against critical and environmental conditions.
4. Modules are extremely resistant thanks to the aluminum frame for extended outdoor use.
5. Our photovoltaic modules are manufactured using specialized personnel and high quality materials.

## ELECTRO-OPTICAL CHARACTERISTICS

| Code  | Type         | Model        | Module Efficiency | Cell Efficiency | Power Peak (W) | Vm (V) | Im (A) | Voc (V) | Isc (A) | Power Tolerance |
|-------|--------------|--------------|-------------------|-----------------|----------------|--------|--------|---------|---------|-----------------|
| 50166 | FVG 36 - 125 | FVG 80M - MC | 12.60%            | 15.00%          | 80             | 18.20  | 4.40   | 22.10   | 4.87    | +/- 5%          |
| 50167 | FVG 36 - 125 | FVG 85M - MC | 13.40%            | 14.00%          | 85             | 18.50  | 4.59   | 22.20   | 5.13    | +/- 5%          |
| 50168 | FVG 36 - 125 | FVG 90M - MC | 14.20%            | 17.00%          | 90             | 18.50  | 4.86   | 22.30   | 5.37    | +/- 5%          |

Electrical specifications at 1000 W/mq, 25°C, AM 1.5.

### WARRANTY

#### A: 3 Years Limited PV Modules Warranty

FVG Energy srl warrants the PV Module(s) to be free from the defects and/or failures specified below for a period not exceeding three (3) years from the date of sale to the original customer - ("Customer"):

- 1) defects and/or failures due to manufacturing;
- 2) defects and/or failures due to materials;
- 3) cracking of the front glass surface due to foreign objects inside the glass;

Note: This limited warranty shall exclude cracking of the front glass surface due to external shock from flying objects or external stress or transportation damages.

- 4) non-conformity to specifications due to faulty manufacturing and/or inspection processes.

If the PV Module(s) fails to conform to this warranty, FVG Energy srl will repair or replace the PV Module(s), at its sole option.

#### B. Limited Power Output Warranty of 25 years (90%- 80%)

FVG Energy srl warrants that if:

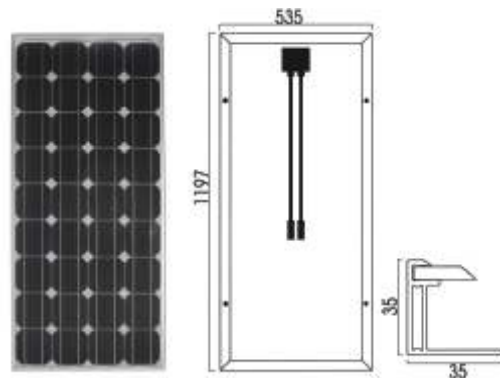
(a) within the first twelve and a half (12.5) years from the date of sale to the Customer, the PV Module(s) exhibits a power output of less than ninety percent (90%) of the original minimum rated power specified at the time of sale (Power peak minus the power tolerance %);

(b) within twenty-five (25) years from the date of sale to the Customer, the PV Module(s) exhibits a power output of less than eighty percent (80%) of the original minimum rated power specified at the time of sale (Power peak minus the power tolerance %)\*, FVG Energy will deliver additional PV Module(s) to replace the missing power output, or repair or replace the PV Module(s), at FVG Energy srl sole option.

\*The power output values shall be those measured under FVG Energy srl standard measurement conditions as follows: (a) light spectrum of AM 1.5; (b) irradiation of 1,000w per m<sup>2</sup>; (c) a cell temperature of 25°C.

For more information ask your local dealer or FVG Energy srl directly (www.fvgenergy.com) for the full document of Warranty.

### DIMENSIONS AND PACKING



### JUNCTION BOX



Junction box with cables and waterproof connectors.

With 2 bypass diodes.  
Cable length cm 90.  
Line 3 type connectors.

Module Dimensions: mm 1197 x 535 x 35

Module Net Weight: kg 9.2

Carton Dimensions: about cm 121.5 x 57 x h8.5

Pallet Dimensions: about cm 80 x 120 x h160

Pallet Net Weight: kg 400

1 carton = 2 modules

1 pallet = 20 cartons = 40 modules

Container Loading Capacity

20ft: 600 Pcs

40ft: 1200 Pcs





## FVG

**Photovoltaic Module**  
**Power peak 10 to 50W**  
**Monocrystalline and**  
**Polycrystalline**

## GENERAL DESCRIPTION

The photovoltaic modules are suitable for residential systems, stand-alone systems, office buildings, solar power stations, solar villages, villas, mountain cottages, pumps, traffic signs, radio relay stations, telecommunication systems, telemeter systems, lighting equipment.

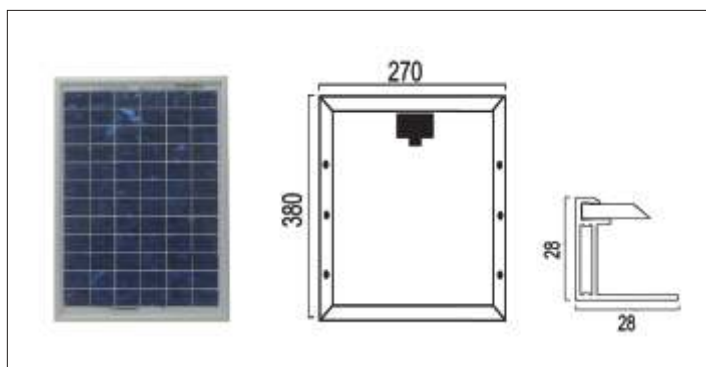
The number of the cells is 36 and the max system voltage DC is 600V.

The FVG photovoltaic modules are manufactured according to the IEC61215 standards.

UPDATED 08-03-2009

## CHARACTERISTICS

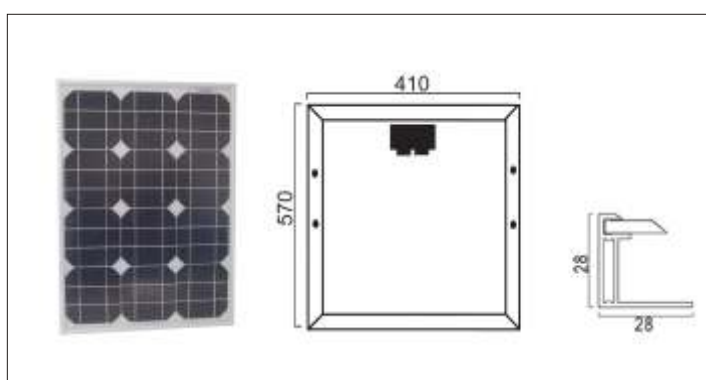
- 1.** The FVG photovoltaic modules are manufactured with 36 silicon cells.
- 2.** The cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron tempered glass.
- 3.** The production process ensures the cells maximum protection against critical and environmental conditions.
- 4.** Modules are extremely resistant thanks to the aluminum frame for extended outdoor use.
- 5.** The photovoltaic modules are manufactured using specialized personnel and high quality materials.



## PHOTOVOLTAIC MODULE - 10W - POLYCRYSTALLINE

| CODE  | MODEL   | POWER PEAK | V <sub>m</sub> (V) | I <sub>m</sub> (A) | V <sub>oc</sub> (V) | I <sub>sc</sub> (A) |
|-------|---------|------------|--------------------|--------------------|---------------------|---------------------|
| 50102 | FVG 10P | 10W        | 17.5               | 0.57               | 21                  | 0.66                |

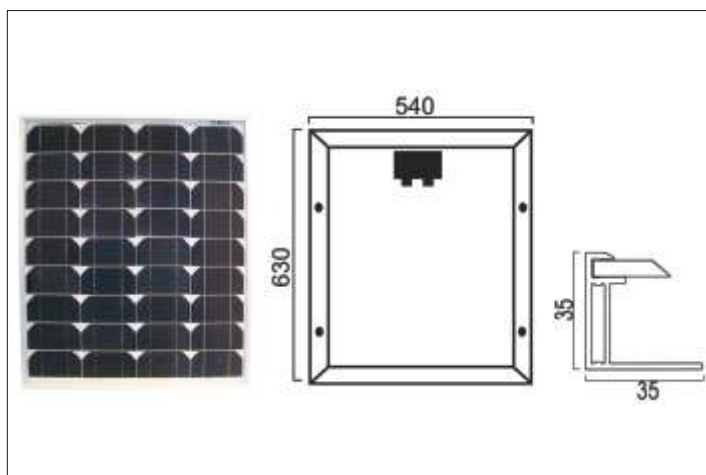
Dimensions: mm 270 x 380 x h28



## PHOTOVOLTAIC MODULE - 25W - MONOCRYSTALLINE

| CODE  | MODEL   | POWER PEAK | V <sub>m</sub> (V) | I <sub>m</sub> (A) | V <sub>oc</sub> (V) | I <sub>sc</sub> (A) |
|-------|---------|------------|--------------------|--------------------|---------------------|---------------------|
| 50107 | FVG 25M | 25W        | 17.1               | 1.46               | 21.8                | 1.76                |

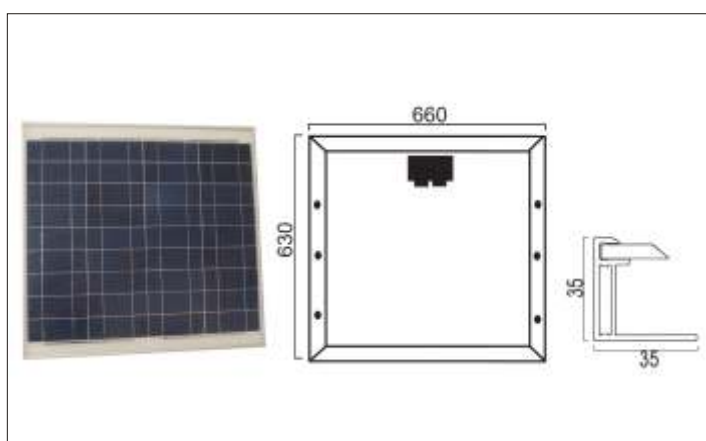
Dimensions: mm 410 x 570 x h28



## PHOTOVOLTAIC MODULE - 40W - MONOCRYSTALLINE

| CODE  | MODEL   | POWER PEAK | V <sub>m</sub> (V) | I <sub>m</sub> (A) | V <sub>oc</sub> (V) | I <sub>sc</sub> (A) |
|-------|---------|------------|--------------------|--------------------|---------------------|---------------------|
| 50110 | FVG 40M | 40W        | 17.3               | 2.32               | 21.9                | 2.56                |

Dimensions: mm 540 x 630 x h35



## PHOTOVOLTAIC MODULE - 50W - POLYCRYSTALLINE

| CODE  | MODEL   | POWER PEAK | V <sub>m</sub> (V) | I <sub>m</sub> (A) | V <sub>oc</sub> (V) | I <sub>sc</sub> (A) |
|-------|---------|------------|--------------------|--------------------|---------------------|---------------------|
| 50116 | FVG 50P | 50W        | 17.5               | 2.90               | 22                  | 3.20                |

Dimensions: mm 660 x 630 x h35



| MODEL                                               | IG15                                                | IG20           | IG30          | IG40                                    | IG60HV        |
|-----------------------------------------------------|-----------------------------------------------------|----------------|---------------|-----------------------------------------|---------------|
| INPUT DATA                                          |                                                     |                |               |                                         |               |
| MPP voltage range                                   | 150 - 400V                                          | 150 - 400V     | 150 - 400V    | 150 - 400V                              | 150 - 400V    |
| Max input voltage (at 1000W/m <sup>2</sup> ; -10°C) | 500V                                                | 500V           | 500V          | 500V                                    | 530V          |
| PV system output                                    | 1300 - 2000 Wp                                      | 1800 - 2700 Wp | 2500 - 3600Wp | 3500 - 5500Wp                           | 4600 - 6700Wp |
| Max input current                                   | 10.8A                                               | 14.3A          | 19A           | 29.4A                                   | 35.8A         |
| OUTPUT DATA                                         |                                                     |                |               |                                         |               |
| Nominal output                                      | 1300W                                               | 1800W          | 2500W         | 3500W                                   | 5000W         |
| Max power output                                    | 1500W                                               | 2000W          | 2650W         | 4100W                                   | 5000W         |
| Max efficiency                                      | 94.2%                                               | 94.3%          | 94.3%         | 94.3%                                   | 94.3%         |
| Euro efficiency                                     | 91.4%                                               | 92.3%          | 93.5%         | 93.5%                                   | 93.5%         |
| Mains voltage/ frequency                            | 230V / 50Hz                                         |                |               |                                         |               |
| Distortion factor                                   | < 3.5%                                              |                |               |                                         |               |
| Power factor                                        | 1                                                   |                |               |                                         |               |
| Power consumption at night                          | 0 W                                                 |                |               |                                         |               |
| GENERAL DATA                                        |                                                     |                |               |                                         |               |
| Size (l x w x h)                                    | 366 x 344 x 220 mm (500 x 435 x 225 mm)             |                |               | 610 x 344 x 220 mm (733 x 435 x 225 mm) |               |
| Weight                                              | 9 kg (12 kg)                                        |                |               | 16 kg (20 kg)                           |               |
| Cooling                                             | controlled forced-air cooling                       |                |               |                                         |               |
| Housing variations                                  | designer internal housing; optional outdoor housing |                |               |                                         |               |
| Ambient temperature range                           | From -20°C to + 50°C                                |                |               |                                         |               |
| Permissible humidity                                | From 0% to 95%                                      |                |               |                                         |               |
| PROTECTIVE DEVICED                                  |                                                     |                |               |                                         |               |
| DC insulation measurement                           | Warning at R <sub>ISO</sub> <500k Ohm               |                |               |                                         |               |
| Polarity reversal protection                        | built-in                                            |                |               |                                         |               |
| Behaviour on DC overload                            | displacement of operating point                     |                |               |                                         |               |
| FVG ENERGY CODE                                     | 50850                                               | 50855          | 50860         | 50865                                   | 50870         |

| MODEL                                                | IG Plus35                                         | IG Plus50  | IG Plus70                    | IG Plus100    | IG Plus150          |
|------------------------------------------------------|---------------------------------------------------|------------|------------------------------|---------------|---------------------|
| INPUT DATA                                           |                                                   |            |                              |               |                     |
| DC nominal capacity                                  | 3700W                                             | 4200W      | 6800W                        | 8400W         | 12600W              |
| MPP voltage range                                    | 230 - 500V                                        | 230 - 500V | 230 - 500V                   | 230 - 500V    | 230 - 500V          |
| Max input voltage (for 1000W/m <sup>2</sup> ; -10°C) | 600V                                              | 600V       | 600V                         | 600V          | 600V                |
| Max input                                            | 16A                                               | 18.3A      | 29.7A                        | 36.6A         | 54.9A               |
| OUTPUT DATA                                          |                                                   |            |                              |               |                     |
| AC nominal capacity                                  | 3500W                                             | 4000W      | 6500W                        | 8000W         | 12000W              |
| Max output                                           | 3500W                                             | 4000W      | 6500W                        | 8000W         | 12000W              |
| Max efficiency                                       | 96.0%                                             | 96.0%      | 96.0%                        | 96.0%         | 96.0%               |
| Euro efficiency                                      | 95.0%                                             | 95.1%      | 95.4%                        | 95.5%         | 95.5%               |
| MPP adaptation efficiency                            | 99.9%                                             |            |                              |               |                     |
| Main voltage / Frequency                             | 230V / 50Hz (60Hz)                                |            |                              |               |                     |
| Power factor                                         | 1-phase                                           |            | 2-phase / 1-phase (optional) |               | 3-phase             |
| Harmonic factor                                      | < 3,5%                                            |            |                              |               |                     |
| Power factor                                         | 1                                                 |            |                              |               |                     |
| Power consumption at night                           | 1 W                                               |            |                              |               |                     |
| GENERAL DATA                                         |                                                   |            |                              |               |                     |
| Size (l x w x h)                                     | 631 x 434 x 244 mm                                |            | 926 x 434 x 244 mm           |               | 1221 x 434 x 244 mm |
| Connection area weight                               | 11 kg                                             |            |                              |               |                     |
| Power module area weight                             | 14 kg                                             |            | 26 kg                        |               | 38 kg               |
| Protection class                                     | IP 44                                             |            |                              |               |                     |
| Inverter concept                                     | HF transformer                                    |            |                              |               |                     |
| Cooling                                              | Regulated cooling                                 |            |                              |               |                     |
| Housing                                              | Metal housing for inside and outside installation |            |                              |               |                     |
| Ambient temperature range                            | From -20°C to + 50°C                              |            |                              |               |                     |
| Permitted humidity                                   | From 0% to 95%                                    |            |                              |               |                     |
| SAFETY EQUIPMENT                                     |                                                   |            |                              |               |                     |
| DC insulation measurement                            | Warning at R <sub>ISO</sub> <500k Ohm             |            |                              |               |                     |
| Overload behaviour                                   | Operating point shift, power limiter              |            |                              |               |                     |
| DC circuit breaker                                   | Integrated                                        |            |                              |               |                     |
| FVG ENERGY CODE                                      | 50835                                             | 50836      | 50837 - 50838                | 50939 - 50840 | 50842               |



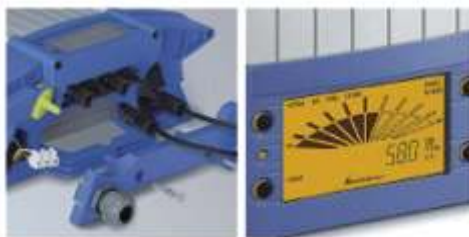


**FVG ENERGY**



| MODEL                            | SB 1100                   | SB1700    | SB2500    | SB3000    | SB3300                    | SB3300TL-HC        | SB 3800          | SB4000TL            | SB5000TL |
|----------------------------------|---------------------------|-----------|-----------|-----------|---------------------------|--------------------|------------------|---------------------|----------|
| INPUT (CC)                       |                           |           |           |           |                           |                    |                  |                     |          |
| Max DC input power               | 1210W                     | 1850W     | 2700W     | 3200W     | 3832W                     | 3440W              | 4040W            | 4300W               | 5300W    |
| Max DC voltage                   | 400V                      | 400V      | 600V      | 600V      | 500V                      | 750V               | 500V             | 550V                | 550V     |
| PV voltage range, MPPT           | 139V-400V                 | 139V-400V | 224V-600V | 268V-600V | 200V-500V                 | 125V-750V          | 200V - 500V      | 125V - 440V         |          |
| Max input current                | 10A                       | 12,6A     | 12A       | 12A       | 20A                       | 11A                | 20A              | 2 x 15A             |          |
| N°of MPP trackers                | 1                         | 1         | 1         | 1         | 1                         | 1                  | 1                | 2                   | 2        |
| Max N°of strings (parallel)      | 2                         | 2         | 3         | 3         | 3                         | 2                  | 3                | 2x2                 | 2x2      |
| OUTPUT (AC)                      |                           |           |           |           |                           |                    |                  |                     |          |
| Nominal AC output power          | 1000W                     | 1550W     | 2300W     | 2750W     | 3300W                     | 3000W              | 3800W            | 4000W               | 4600W    |
| Max AC output power              | 1100W                     | 1700W     | 2500W     | 3000W     | 3600W                     | 3300W              | 3800W            | 4000W               | 5000W    |
| Max output current               | 5.6A                      | 8.6A      | 12.5A     | 15A       | 16.6A                     | 16A                | 16.6A            | 22A                 | 22A      |
| Nominal AC voltage / range       | 220V - 240V / 180V - 262V |           |           |           | 220V - 240V / 180V - 260V |                    |                  | 220V-240V/180V-260V |          |
| AC grid frequency / range        | 50Hz / 60Hz / ±4.5Hz      |           |           |           |                           | 50Hz/45.5Hz-52.5Hz | 50Hz/60Hz/±4.5Hz | 50Hz,60Hz/45Hz-65Hz |          |
| Power factor (cos j )            | 1                         | 1         | 1         | 1         | 1                         | 1                  | 1                | 1                   | 1        |
| AC connection                    | single-phase              |           |           |           |                           |                    |                  |                     |          |
| EFFICIENCY                       |                           |           |           |           |                           |                    |                  |                     |          |
| Max efficiency                   | 93.0%                     | 93.5%     | 94.1%     | 95.0%     | 95.2%                     | 96.0%              | 95.6%            | 97.0%               | 97.0%    |
| Euro ETA                         | 91.6%                     | 91.8%     | 93.2%     | 93.6%     | 94.4%                     | 94.6%              | 94.7%            | 96.2%               | 96.5%    |
| GENERAL DATA                     |                           |           |           |           |                           |                    |                  |                     |          |
| Dimensions (l x w x h) mm        | 434 x 295 x 214           |           |           |           | 450x352x236               | 470x490x225        | 450x352x236      | 470 x 445 x 180     |          |
| Weight                           | 22 kg                     | 25 kg     | 30 kg     | 32 kg     | 41 kg                     | 28 kg              | 41 kg            | 25 kg               | 25 kg    |
| Operating temperature range      | -25°C to +60°C            |           |           |           |                           |                    |                  |                     |          |
| Operat. consump.:standby/night   | <4W/0.1W                  | <5W/0.1W  | <7W/0.25W |           | <7W/0.1W                  | <10W / 0.25W       | <7W/0.1W         | <10W/0.5W           |          |
| Topology                         | NF transformer            |           |           |           |                           | transformerless    | NF transformer   | transformerless     |          |
| Cooling concept                  | Convection                |           |           |           | OptiCool                  | Convection         | OptiCool         |                     |          |
| Mounting location: in/out (IP65) | Standard equipment        |           |           |           |                           |                    |                  |                     |          |
| FVG ENERGY CODE                  | 50900                     | 50901     | 50902     | 50903     | 50904                     | 50905              | 50913            | 50906               | 50907    |

| MODEL                            | SMC5000             | SMC6000 | SMC6000TL       | SMC7000TL | SMC8000TL | SMC7000HV      | SMC9000TL        | SMC10000TL      | SMC11000TL |
|----------------------------------|---------------------|---------|-----------------|-----------|-----------|----------------|------------------|-----------------|------------|
| INPUT (CC)                       |                     |         |                 |           |           |                |                  |                 |            |
| Max DC input power               | 5750W               | 6300W   | 6200W           | 7200W     | 8250W     | 7500W          | 9300W            | 10350W          | 11400W     |
| Max DC voltage                   | 600V                | 600V    | 700V            | 700V      | 700V      | 800V           | 700V             | 700V            | 700V       |
| PV voltage range, MPPT           | 246V - 480V         |         | 333V - 500V     |           |           | 335V - 560V    | 333V-500V        | 333V-500V       | 333V-500V  |
| Max input current                | 26A                 | 26A     | 19A             | 22A       | 25A       | 23A            | 28A              | 31A             | 34A        |
| N°of MPP trackers                | 1                   | 1       | 1               | 1         | 1         | 1              | 1                | 1               | 1          |
| Max N°of strings (parallel)      | 4                   | 4       | 4               | 4         | 4         | 4              | 5                | 5               | 5          |
| OUTPUT (AC)                      |                     |         |                 |           |           |                |                  |                 |            |
| Nominal AC output power          | 5000W               | 6000W   | 6000W           | 7000W     | 8000W     | 6650W          | 9000W            | 10000W          | 11000W     |
| Max AC output power              | 5000W               | 6000W   | 6000W           | 7000W     | 8000W     | 7000W          | 9000W            | 10000W          | 11000W     |
| Max output current               | 26A                 | 26A     | 27A             | 31A       | 25A       | 31A            | 40A              | 44A             | 48A        |
| Nominal CA voltage / range       | 220V-240V/180V-260V |         |                 |           |           |                |                  |                 |            |
| AC grid frequency / range        | 50Hz/60Hz/±4.5Hz    |         | 50Hz / ±4.5Hz   |           |           |                | 50Hz/60Hz/±4.5Hz |                 |            |
| Power factor (cos j )            | 1                   | 1       | 1               | 1         | 1         | 1              | 1                | 1               | 1          |
| AC connection                    | single-phase        |         |                 |           |           |                |                  |                 |            |
| EFFICIENCY                       |                     |         |                 |           |           |                |                  |                 |            |
| Max efficiency                   | 96.1%               | 96.1%   | 98.0%           | 98.0%     | 98.0%     | 96.1%          | 98.0%            | 98.0%           | 98.0%      |
| Euro ETA                         | 95.2%               | 95.2%   | 97.7%           | 97.7%     | 97.7%     | 95.3%          | 97.6%            | 97.5%           | 97.5%      |
| GENERAL DATA                     |                     |         |                 |           |           |                |                  |                 |            |
| Dimensions (l x w x h) mm        | 468 x 613 x 242     |         |                 |           |           |                |                  |                 |            |
| Weight                           | 62kg                | 63kg    | 31kg            | 32kg      | 33kg      | 65kg           | ca. 35kg         |                 |            |
| Operating temperature range      | -25°C to +60°C      |         |                 |           |           |                |                  |                 |            |
| Operat. consump.:standby/night   | <7W / 0.25W         |         | <10W / 0.25W    |           |           | <7W / 0.25W    |                  | <10W / 0.25W    |            |
| Topology                         | NF transformer      |         | transformerless |           |           | NF transformer |                  | transformerless |            |
| Cooling concept                  | OptiCool            |         |                 |           |           |                |                  |                 |            |
| Mounting location: in/out (IP65) | Standard equipment  |         |                 |           |           |                |                  |                 |            |
| FVG ENERGY CODE                  | 50908               | 50909   | 50910           | 50914     | 50912     | 50911          | 50915            | 50916           | 50917      |



| MODEL                           | XS2000                                                                                       | XS3200       | XS4300       | XS6500        |
|---------------------------------|----------------------------------------------------------------------------------------------|--------------|--------------|---------------|
| SOLAR INPUT DC                  |                                                                                              |              |              |               |
| Recommended PV power range      | 1300-2000Wp                                                                                  | 2200-3300Wp  | 2900-4350Wp  | 4000-7000Wp   |
| Nominal input power             | 1590W DC                                                                                     | 2650W DC     | 3490W DC     | 5265W DC      |
| Maximum input power             | 1670W DC                                                                                     | 2780W DC     | 3660W DC     | 5525W DC      |
| Start-up power                  | 5W                                                                                           | 7W           | 7W           | 10W           |
| Operating voltage range         | 62-450V DC                                                                                   | 100-600V DC  | 100-550V DC  | 100-600V DC   |
| MPP voltage range at nom. power | 145-360V DC                                                                                  | 180-480C DC  | 230-440V DC  | 180-480V DC   |
| Maximum voltage                 | 450V DC                                                                                      | 600V DC      | 550V DC      | 600 V DC      |
| Rated current                   | 11A                                                                                          | 15A          | 15A          | 2x15A o 1x30A |
| MPP tracker                     | 1                                                                                            | 1            | 1            | 2             |
| DC connection                   | 2 sets of MultiContact (4mm) connectors                                                      |              |              |               |
| GRID OUTPUT AC                  |                                                                                              |              |              |               |
| Voltage                         | 230V AC (184-276 Italy), single phase                                                        |              |              |               |
| Nominal output power at 45°C    | 1500W                                                                                        | 2500W        | 3300W        | 5000W         |
| Maximum output power            | 1575W                                                                                        | 2625W        | 3465W        | 5250W         |
| Nominal current                 | 8A                                                                                           | 13A          | 17A          | 25A           |
| Frequency                       | 45 - 65Hz (according to country)                                                             |              |              |               |
| Standby power                   | < 0.5 W                                                                                      |              |              |               |
| European efficiency             | 94.4% a 300V                                                                                 | 94.3% a 400V | 94.6% a 370V | 94.5% a 400V  |
| Maximum efficiency              | 95.7%                                                                                        | 95.4%        | 95.6%        | 95.5%         |
| AC connection                   | terminal block 2.5 - 4mm <sup>2</sup>                                                        |              |              |               |
| GENERAL DATA                    |                                                                                              |              |              |               |
| Operating temperature           | from -20° to 60°C, full power up to 45°C ambient air temperature, derating -3%/°C above 45°C |              |              |               |
| Relative humidity               | maximum 95% non-condensing, PCB has anti-moisture coating                                    |              |              |               |
| Protection degree               | IP44                                                                                         |              |              |               |
| Dimensions (h x w x d) mm       | 545x356x145                                                                                  | 545x356x145  | 545x356x145  | 725x356x145   |
| Weight                          | 10kg                                                                                         | 10kg         | 10kg         | 15kg          |
| FVG ENERGY CODE                 | 50820                                                                                        | 50821        | 50822        | 50823         |

| MODEL                              | XL10                                                                                            | XL15                         |
|------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------|
| SOLAR INPUT CC                     |                                                                                                 |                              |
| Recommended PV power range         | from 9 to 13 Kwp                                                                                | from 14 to 20Kwp             |
| Maximum input power                | 11200W DC                                                                                       | 16800W DC                    |
| Continuous power at 40°C           | 10650 W DC                                                                                      | 15975W DC                    |
| Start-up power                     | 3x10W                                                                                           | 3x10W                        |
| Operating voltage                  | 100-550V DC; nominal 400V DC                                                                    | 100-600V DC; nominal 400V DC |
| MPP voltage range at nominal power | 180-480V DC                                                                                     | 180-480V DC                  |
| Maximum voltage                    | 600V DC                                                                                         | 600 V DC                     |
| Rated current                      | 3x15A                                                                                           | 3x30A                        |
| MPP tracker                        | 3 MPP tracker with 99.9% MPP efficiency (Fraunhofer algorithm)                                  |                              |
| DC connectors                      | 6 MultiContact II connectors                                                                    |                              |
| GRID OUTPUT AC                     |                                                                                                 |                              |
| Voltage                            | 3x230V AC three phase                                                                           |                              |
| Nominal power                      | 10000W                                                                                          | 15000W                       |
| Maximum power                      | 10500W                                                                                          | 15750W                       |
| Nominal current                    | 3x15A                                                                                           | 3x22A                        |
| Frequency                          | 50Hzmodels: programmable from 48 to 52Hz                                                        |                              |
| Stand-by power                     | < 0.5 W                                                                                         |                              |
| EU efficiency                      | 95% at Unom                                                                                     |                              |
| Maximum efficiency                 | 96%                                                                                             | 96%                          |
| AC connectors                      | AC and DC glands on detachable plate in bottom of connection compartment.                       |                              |
| GENERAL DATA                       |                                                                                                 |                              |
| Operating temperature              | -20°C to +60°C ambient,full power up to 45°C ambient air temperature, derating 3%/°C above 45°C |                              |
| Relative humidity                  | Protected against humidity and condensing air by PCB coating                                    |                              |
| Protection degree                  | IP55                                                                                            |                              |
| Dimensions (h x w x d) mm          | 1200x580x480 (with legs: 1408x638x480)                                                          |                              |
| Weight                             | 135kg                                                                                           |                              |
| FVG ENERGY CODE                    | 50824                                                                                           | 50825                        |

Unipolar wire with grade 5 tinplated copper flexible conductor. First insulation HEPR type G7 special. Second insulation Elastomer compound Halogen Free Type M2. Specific for Photovoltaic systems with nominal voltage U<sub>0</sub>/U<sub>600</sub>/100V in alternating current and not over 1500V in direct current, flame retardant, halogen free, designed to last at least 25 years.



| FVG ENERGY CODE | CABUR CODE | DESCRIPTION                  |
|-----------------|------------|------------------------------|
| 50290           | ISCS04400  | Black cable 4mm. Spool 400mt |
| 50291           | ISCS04401  | Red cable 4mm. Spool 400mt   |
| 50292           | ISCS06300  | Black cable 6mm. Spool 300mt |
| 50293           | ISCS06301  | Red cable 6mm. Spool 300mt   |

WIRE STRIPPER  
CABUR CODE  
KXCCLSPPE

FVG ENERGY CODE  
50411



**LINE 3:** PIN dimension: Δ 3mm; Maximum voltage 1000V DC; Maximum current: 25A at 70°C - 20A at 85°C; Contact resistance <5m Ohm; Contact material: Cu; Plating: Tin; Insulation: PPO; Protection grade: IP67 (IEC 60529); Temperature range: -40°C +90°C; Flammability level: UL94-V0.



| FVG ENERGY CODE | CABUR CODE | DESCRIPTION                                                                                            | Pcs |
|-----------------|------------|--------------------------------------------------------------------------------------------------------|-----|
| 50400           | IS15240    | Male connector with harness clamp for contacts with sec. from 1.5mm <sup>2</sup> to 4mm <sup>2</sup>   | 100 |
| 50401           | IS25241    | Female connector with harness clamp for contacts with sec. from 1.5mm <sup>2</sup> to 4mm <sup>2</sup> | 100 |
| 50276           | IS15240    | Male connector with harness clamp for contacts with sec. from 1.5mm <sup>2</sup> to 4mm <sup>2</sup>   | 10  |
| 50277           | IS25241    | Female connector with harness clamp for contacts with sec. from 1.5mm <sup>2</sup> to 4mm <sup>2</sup> | 10  |



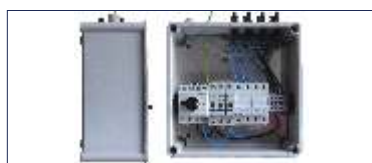
| FVG ENERGY CODE | CABUR CODE | DESCRIPTION                                                                                       | Pcs |
|-----------------|------------|---------------------------------------------------------------------------------------------------|-----|
| 50296           | IS41410    | Y connector male/female-female for contacts with sec. from 1.5mm <sup>2</sup> to 6mm <sup>2</sup> | 10  |
| 50297           | IS41420    | Y connector female/male-male for contacts with sec. from 1.5mm <sup>2</sup> to 6mm <sup>2</sup>   | 10  |

**LINE 4:** PIN dimension: Δ 4mm; Maximum voltage 1000V DC; Maximum current: 30A at 70°C - 25A at 85°C; Contact resistance <5m Ohm; Contact material: Cu; Plating: Tin; Insulation: PPO; Protection grade: IP67 (IEC 60529); Temperature range: -40°C +90°C; Flammability level: UL94-V0.



| FVG ENERGY CODE | CABUR CODE | DESCRIPTION                                                                         | Pcs |
|-----------------|------------|-------------------------------------------------------------------------------------|-----|
| 50398           | IS14240    | Male connector for contacts with sec. from 1.5mm <sup>2</sup> to 6mm <sup>2</sup>   | 100 |
| 50399           | IS24241    | Female connector for contacts with sec. from 1.5mm <sup>2</sup> to 6mm <sup>2</sup> | 100 |
| 50294           | IS14240    | Male connector for contacts with sec. from 1.5mm <sup>2</sup> to 6mm <sup>2</sup>   | 10  |
| 50295           | IS24241    | Female connector for contacts with sec. from 1.5mm <sup>2</sup> to 6mm <sup>2</sup> | 10  |

**DC ELECTRICAL SWITCHBOARD** for protection and parallel connection of 2, 4, 6 and 8 arrays, for connection and protection from overcurrent and overvoltage. Prewired, it is equipped with isolator, fuse-holders, fuses, voltage arresters, Type 4 connectors (diodes optional) - Maximum Voltage 1000V .



| FVG ENERGY CODE | ARRAYS Nr | MAX CURRENT |
|-----------------|-----------|-------------|
| 50300           | 2         | 30A         |
| 50301           | 4         | 40A         |
| 50302           | 6         | 50A         |
| 50303           | 8         | 60A         |

CRIMPING TOOL  
CABUR CODE  
KXR10406

FVG ENERGY CODE  
50410



| FVG ENERGY CODE | CABUR CODE   | DESCRIPTION                                                                                  |
|-----------------|--------------|----------------------------------------------------------------------------------------------|
| 50298           | ISKIT03      | PROFESSIONAL TOOL BOX KIT03 - LINE 3                                                         |
|                 |              | <b>The Kit includes:</b>                                                                     |
|                 | KXMC03MG1540 | Male connector with harness clamp 3mm for contacts with sec. from 1.5 to 4mm <sup>2</sup>    |
|                 | KXMC03FG1540 | Female connector with harness clamp 3mm for contacts with sec. from 1.5 to 4mm <sup>2</sup>  |
|                 | KXMC03MPAN   | Male panel connector diam. 3mm for contacts with sec. from 1.5 to 4mm <sup>2</sup>           |
|                 | KXMC03FPAN   | Female panel connector diam. 3mm for contacts with sec. da 1.5 to 4mm <sup>2</sup>           |
|                 | KXMC03YMFF   | Y connector male/female-female diam. 3mm for contacts with sec. from 1.5 to 4mm <sup>2</sup> |
|                 | KXMC03YMFF   | Y connector female/male-male diam. 3mm for contacts with sec. from 1.5 to 4mm <sup>2</sup>   |
|                 | UMCT         | Crimping tool                                                                                |
|                 | KXMM0406     | Contact Case                                                                                 |



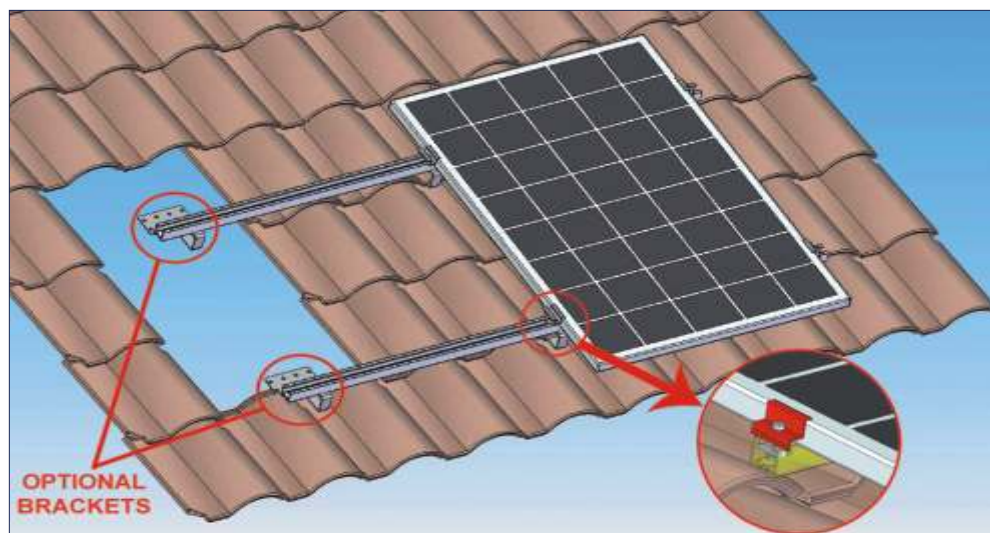
| FVG ENERGY CODE | CABUR CODE  | DESCRIPTION                                                                                  |
|-----------------|-------------|----------------------------------------------------------------------------------------------|
| 50299           | ISKIT04     | PROFESSIONAL TOOL BOX KIT04 - LINE 4                                                         |
|                 |             | <b>The Kit includes:</b>                                                                     |
|                 | KXMC04M1560 | Male connector diam. 4mm for contacts with sec. from 1.5 to 6mm <sup>2</sup>                 |
|                 | KXMC04F1560 | Female connector diam. 4mm for contacts with sec. from 1.5 to 6mm <sup>2</sup>               |
|                 | KXMC04MPAN  | Male panel connector diam. 4mm for contacts with sec. from 1.5 to 6mm <sup>2</sup>           |
|                 | KXMC04FPAN  | Female panel connector diam. 4mm for contacts with sec. from 1.5 to 6mm <sup>2</sup>         |
|                 | KXMC04YMFF  | Y connector male/female-female diam. 4mm for contacts with sec. from 1.5 to 6mm <sup>2</sup> |
|                 | KXMC04YMFF  | Y female/male-male diam. 4mm for contacts with sec. from 1.5 to 6mm <sup>2</sup>             |
|                 | UMCT        | Crimping tool                                                                                |
|                 | KXMM0406    | Contact Case                                                                                 |



# FIXING STRUCTURES FOR PHOTOVOLTAIC MODULES mm 1581 x 809 x 35 ON A SLOPING ROOF



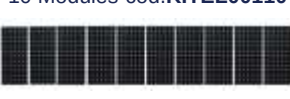
**FVG ENERGY**

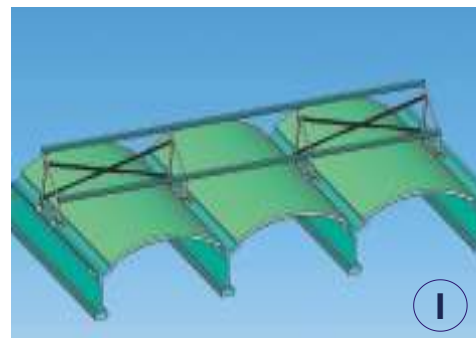
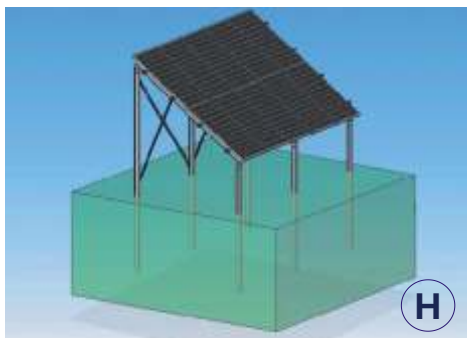
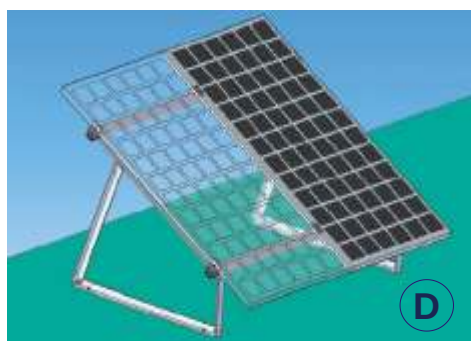
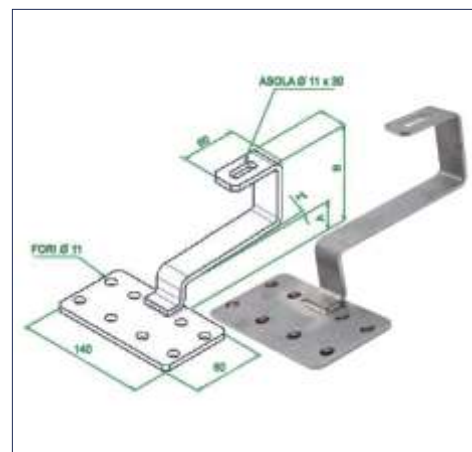
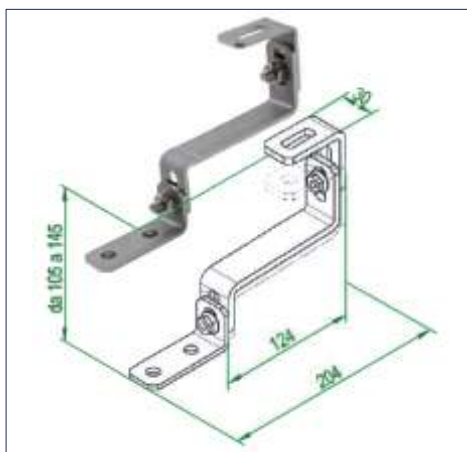


Standard fixing structures for module arrays from 2 to 10 units installed on a sloping roof. Aluminium bars and special stainless steel clamps make a photovoltaic plant assembly quick and easy.

Brackets for fixing modules to roof are optional.

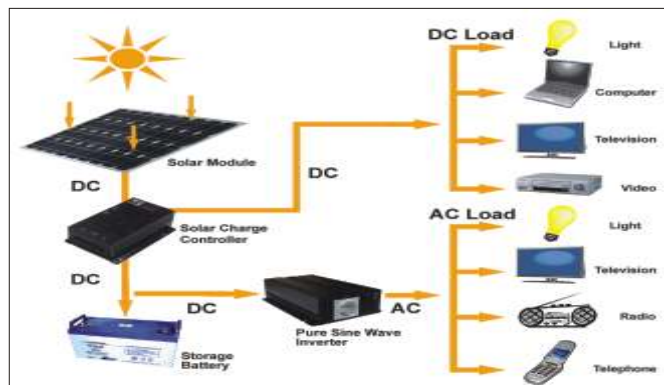
The kit does not include photovoltaic modules.

| KIT COMPONENTS<br>STRUCTURE                                                                                     | JOINING<br>PLATE | ALUMINIUM<br>BAR | TERMINAL | MIDDLE<br>CLAMP | M8 S.S.<br>SCREW | M8 SPRING<br>NUT | M10 S.S.<br>SCREW | N° OF<br>OPTIONAL<br>BRACKETS FOR<br>SEMI-INTEGRAT<br>ED PLANT |
|-----------------------------------------------------------------------------------------------------------------|------------------|------------------|----------|-----------------|------------------|------------------|-------------------|----------------------------------------------------------------|
| 2 Modules-cod.KITEL00102<br>  | 0                | 2                | 4        | 2               | 6                | 6                | 4                 | 4                                                              |
| 3 Modules-cod.KITEL00103<br> | 0                | 2                | 4        | 4               | 8                | 8                | 8                 | 8                                                              |
| 4 Modules-cod.KITEL00104<br> | 2                | 3                | 4        | 6               | 10               | 10               | 10                | 10                                                             |
| 5 Modules-cod.KITEL00105<br> | 2                | 4                | 4        | 8               | 12               | 12               | 12                | 12                                                             |
| 6 Modules-cod.KITEL00106<br>  | 2                | 4                | 4        | 10              | 14               | 14               | 16                | 16                                                             |
| 7 Modules-cod.KITEL00107<br>  | 2                | 4                | 4        | 12              | 16               | 16               | 18                | 18                                                             |
| 8 Modules-cod.KITEL00108<br>  | 6                | 5                | 4        | 14              | 18               | 18               | 20                | 20                                                             |
| 9 Modules-cod.KITEL00109<br>  | 4                | 6                | 4        | 16              | 20               | 20               | 24                | 24                                                             |
| 10 Modules-cod.KITEL00110<br> | 4                | 6                | 4        | 18              | 22               | 22               | 30                | 30                                                             |



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# SOLAR CHARGER



| MODEL                      | SolarCharger                                                                                           |
|----------------------------|--------------------------------------------------------------------------------------------------------|
| VOLTAGE CONFIGURATIONS     | 12 and 24Vdc Auto-Detection                                                                            |
| RATED CHARGING CURRENT     | 40 Amp                                                                                                 |
| RATED LOAD CURRENT         | 15 Amp                                                                                                 |
| MAXIMUM PV OPEN VOLTAGE    | 55Vcd                                                                                                  |
| TYPICAL IDLE POWER         | < 10mA                                                                                                 |
| BULK CHARGE                | 14.6Vcd / 29.2Vcd                                                                                      |
| FLOATING VOLTAGE           | 13.4Vcd / 26.8Vcd                                                                                      |
| EQUALIZATION VOLTAGE       | 14.0Vcd / 28.0Vcd                                                                                      |
| OVER CHARGING PROTECTION   | 14.8Vcd / 29.6Vcd                                                                                      |
| LEAD ACID BATTERY SETTINGS | Adjustable                                                                                             |
| NiCad BATTERY SETTING      | Adjustable                                                                                             |
| LOAD CONTROL MODE          | 1. Low Voltage Reconnect (LVR): Adjustable<br>2. Low Voltage Disconnect (LVD): Automatic disconnection |
| OPERATING TEMPERATURE      | 0-40°C (De-Rating at 40-60°C)                                                                          |
| OPERATING ALTITUDE         | 5000 Metres                                                                                            |
| CHASSIS LEVEL              | IP21                                                                                                   |
| RECOMMENDED WIRE SIZE      | #8 AWG                                                                                                 |
| COOLING                    | Natural Cooling                                                                                        |
| BATTERY TEMPERATURE SENSOR | Optional                                                                                               |
| DIMENSIONS (LxWxH)         | 192 x 140 x 66 mm                                                                                      |
| CODE                       | 50080                                                                                                  |

## SOLAR CHARGER CONTROLLER 12V/24V WITH MPPT

Adopting advanced MPPT technology, Solar Charger photovoltaic charge controller is the key component in off-grid or stand alone solar power generation systems. Solar Charger can track the maximum power point and transfer the energy to various types of batteries. The built-in MPPT microprocessor enables Solar Charger to increase the charging current up to 30% compared to traditional charge controllers. Easy installation and capable of parallel connection, Solar Charger is the perfect solution for home to large solar system applications.

### Technical Features:

- High converting efficiency higher than 97% for minimizing energy loss;
- Built-in MPPT tracker for optimizing power transformation;
- Reversed current protection for preventing equipment damage;
- Automatic battery temperature compensation for long-term reliability;
- Capable of selecting different charging mode for various type of batteries;
- Capable of connecting additional DC load for wider applications;
- Three-stage charge control system (bulk, absorption and float mode) with temperature compensation;
- LED indicators display charge status in real time;
- Pulse Width Modulation (PWM) topology combined with a multi-stage charge control algorithm leads to superior charging and enhanced battery performance.



Cod. 50062-50061



Cod. 50065



Cod. 50075



Cod. 50068

## SOLAR CHARGE CONTROLLER 12V/24V

This new range of multi-voltage (12V/24V) solar charge controllers from 10A to 30A with a 3 or 4 stage charge control system can load up to 2 battery banks simultaneously (code 50075).

They are ideal for stand-alone photovoltaic plants, on boats, campervans, street-lighting, according to the model.

| MODEL                 | LP12/24-10A  | SH12/24-10A             | SH12/24-20A             | SH12/24-30A             | SH12/24-10A-2             |
|-----------------------|--------------|-------------------------|-------------------------|-------------------------|---------------------------|
| Output Volts          | 12/24V       | 12/24V                  | 12/24V                  | 12/24V                  | 12/24V                    |
| Maximum current       | 10A          | 10A                     | 20A                     | 30A                     | 10A                       |
| Max charge voltage    | 14.4/28.8V   | 14.4/28.8V              | 14.4/28.8V              | 14.4/28.8V              | 14.4/28.8V                |
| Load disconnection    | 11.1/22.2V   | 11.1/22.2V              | 11.1/22.2V              | 11.1/22.2V              | 11.1/22.2V                |
| Load reconnection     | 13.1/26.2V   | 13.1/26.2V              | 13.1/26.2V              | 13.1/26.2V              | 13.1/26.2V                |
| Charge mode           | 4 stage      | 4 stage                 | 4 stage                 | 3 stage                 | 3 stage                   |
| N° of output          | 1            | 1                       | 1                       | 1                       | 2                         |
| Operating temperature | -35/+55°C    | -35/+55°C               | -35/+55°C               | -20/+50°C               | -35/+55°C                 |
| Protection degree     | IP22         | IP22                    | IP22                    | //                      |                           |
| Type                  | Street-light | Stand Alone Boat/Camper | Stand Alone Boat/Camper | Stand Alone Boat/Camper | Stand Alone - Boat/Camper |
| LCD Display           | No           | No                      | No                      | Yes                     | No                        |
| FVG ENERGY CODE       | 50062        | 50061                   | 50065                   | 50068                   | 50075                     |





|             |                             |                                                           |       |     |
|-------------|-----------------------------|-----------------------------------------------------------|-------|-----|
| INPUT       | Voltage Range               | 90~280Vac                                                 |       |     |
|             | Frequency Range             | 40~70Hz                                                   |       |     |
|             | Connection                  | Hard Wiring                                               |       |     |
| OUTPUT      | Voltage                     | 12V/24Vdc, Adjustable                                     |       |     |
|             | Charging Voltage            | 14.4±0.1Vdc / 28.8±0.2Vdc                                 |       |     |
|             | Charging Current (Max.)     | Input Voltage 180~280Vac                                  | 12Vdc | 40A |
|             |                             |                                                           | 24Vdc | 20A |
|             |                             | Input Voltage 90~180Vac                                   | 12Vdc | 20A |
|             |                             |                                                           | 24Vdc | 10A |
|             | Selectable Charging Current | 4 Steps: Approach to 25/50/75/100% of Max. Rating Current |       |     |
|             | Selectable Battery Type     | Lead-Acid / Gel / AGM Battery                             |       |     |
|             | Parallel Operation          | Yes                                                       |       |     |
| EFFICIENCY  | Connection                  | Harg Wiring                                               |       |     |
|             | 3-Steps Charging Mode       | Costant Current / Costant Voltage / Floating Voltage      |       |     |
|             |                             | >80% at 230 Vac with various Full Load                    |       |     |
| INDICATOR   | LED                         | Three color LEDs with various combinations                |       |     |
| DIMENSIONS  | Tower Case (LxWxH)          | mm 224 x 255 x 80                                         |       |     |
| WEIGHT      | Tower Case                  | 1.7 Kg                                                    |       |     |
| ENVIRONMENT | EMC                         | EMS: EN55024; EMI: EN55022, Class A                       |       |     |
|             | Operating Environment       | -10°~60°C (Derating from 40~60°C)                         |       |     |
|             | Relative Humidity           | 5-95% (NON-CONDENSING)                                    |       |     |
|             | Cooling                     | Fan Cooling                                               |       |     |
|             | Noise Level                 | <50dB at 1 Metre                                          |       |     |
| CODE        |                             | 20800                                                     |       |     |

## UNIVERSAL CHARGER 40

Up to 40A Charging Capacity with wider input voltages and connected battery type selections. Responding to the demand of the large charging ability to diverse types of batteries in the market, FVG Energy is proud to introduce the new generation Universal Charger which adopts the reliable high frequency structure, compatible with wider selective range of input voltage from 90Vac-280Vac, and has 12Vdc or 24Vdc output selections. It provides maximized flexibility in terms of wider input voltage, optional output voltage, customized output current and selective charging modes for diverse types of batteries that maximize battery lifetime. Universal Charger is suitable for satisfying various demands of large power charging ability and is the best choice for multiple power surroundings.

### Technical Features:

- Three stages variable charging voltage algorithm by timing for maximizing battery lifetime;
- Large charging design (40A for 12Vdc mode, 20A for 24Vdc mode) for shortening charging time;
- Selectable charging currents based on connected capacity for extending battery lifetime with optimized charging types of batteries of Flooded Lead-Acid, Gel, AGM chemistries batteries;
- Wider input voltage range from 90Vac to 280Vac for universal input;
- High AC to DC converting efficiency design (higher than 80%);
- Smart fan control. Built-in control firmware for controlling fan on/off status bases on charger operating mode. When the battery is charged, the fan will stop to reduce the noise and also extend the fan lifetime.



## MAINTENANCE-FREE RECHARGEABLE SEALED LEAD ACID BATTERIES

Sealed lead acid batteries with oxygen recombination technology. Totally sealed batteries, maintenance-free, suitable for photovoltaic systems, and for every application that needs long duration and high performances.

These batteries have an average life of 5 years (if the use is correct). The battery has plates, separators, safety valves and container. Since the electrolyte is held by a glassmat separator and plates, the battery can be used in any direction and position without leakage.

| MODEL            | 12AH         | 44AH        | 65AH          | 100AH-HP   | 150AH       | 200AH       |
|------------------|--------------|-------------|---------------|------------|-------------|-------------|
| Tens. stand-by   | 13.5-13.8V   | 13.5-13.8V  | 13.5-13.6V    | 13.5-13.8V | 13.5-13.6V  | 13.5-13.8V  |
| Tens. deep cycle | 14.1-15.0V   | 14.4-15.0V  | 14.7-15.0V    | 14.4-15.0V | 14.7-15.0V  | 14.4-15.0V  |
| Average life     | 5 years      | 5 years     | 5 years       | 10 years   | 5 years     | 5 years     |
| Size cm          | 10x15.1xh9.8 | 19x16.5xh18 | 35x16.5xh17.5 | 33x17xh22  | 48x17xh24.5 | 53x24xh21.5 |
| Weight           | Kg 5.2       | Kg 13.5     | Kg 30         | Kg 31.7    | Kg 43.8     | Kg 62       |
| CODE             | 50455        | 50460       | 50465         | 50490      | 50475       | 50480       |

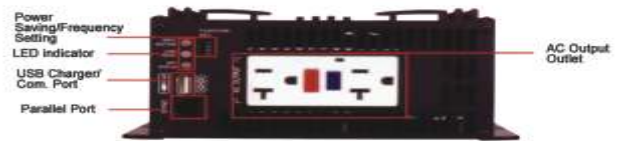
# PURE SINE WAVE INVERTER



## FRONT PANEL CONFIGURATION



## BACK PANEL CONFIGURATION



| MODEL                     | PURE SINE WAVE INVERTER 600                                                           | PURE SINE WAVE INVERTER 1000 | PURE SINE WAVE INVERTER 2000 |
|---------------------------|---------------------------------------------------------------------------------------|------------------------------|------------------------------|
| OUTPUT POWER (CONTINUOUS) | 600W                                                                                  | 1000W                        | 2000W                        |
| SURGE RATING              | 1200W                                                                                 | 2000W                        | 4000W                        |
| NOMINAL INPUT VOLTAGE     | 12Vdc                                                                                 |                              |                              |
| OUTPUT VOLTAGE            | 220Vac                                                                                |                              |                              |
| CREST FACTOR              | 3 : 1                                                                                 |                              |                              |
| OUTPUT FREQUENCY          | 50Hz ± 0.1%                                                                           |                              |                              |
| EFFICIENCY                | > 88%                                                                                 |                              |                              |
| NO LOAD CURRENT DRAW      | < 15W                                                                                 |                              |                              |
| STAND-BY CURRENT DRAW     | < 5W                                                                                  |                              |                              |
| OUTPUT WAVEFORM           | PURE SINE WAVE                                                                        |                              |                              |
| TOTAL HARMONIC DISTORTION | < 3% with Linear Load                                                                 |                              |                              |
| INPUT VOLTAGE REGULATION  | 10.5-15Vcd for 12V series                                                             |                              |                              |
| OUTPUT VOLTAGE REGULATION | 220Vac ± 5%                                                                           |                              |                              |
| PROTECTION                | Overload, Short circuit, reverse polarity, over/under input voltage, over temperature |                              |                              |
| OPERATING TEMPERATURE     | 0 ~ 40°C (de-rating with 2.5% / °C from 40°C up to 60°C)                              |                              |                              |
| DIMENSIONS (LxWxH) mm     | 270 x 160 x 70                                                                        | 350 x 180 x 88               | 400 x 200 x 166              |
| WEIGHT                    | 2.5 Kg                                                                                | 4.0 Kg                       | 8.0 Kg                       |
| EMC                       | FCC Part 15, EN55022 Class B                                                          |                              |                              |
| COMMUNICATION PORT        | RS 232                                                                                |                              |                              |
| CODE                      | 20780                                                                                 | 20782                        | 20786                        |

## PURE SINE WAVE INVERTER 600-1000-1500 - 12V

The new Sine Wave Inverter series inverter adopts superior features and is designed with the highest standards in the industry. The high frequency structure reduces the size of the Pure Sine Wave Inverter and achieves the highest power density in the market. The unique N+X parallel redundancy feature maximizes the flexibility and expansibility of integrating additional inverter units in the features. Designed for diverse applications, this inverter promises to fulfill the demands from home to heavy-duty industrial environment.

### Technical Features:

- High frequency switching technology for compact size and light weight;
- Pure sine wave output (THD < 3%) for wide range of applications and harsh environment;
- High efficient DC-to-AC conversion minimizing energy loss;
- "All master" dynamic mechanism eliminates single point failure to optimize reliability;
- Low power "Power Saving Mode": no-load consumption lower than 15W;
- Input/output isolated design for maximum operation safety;
- Intelligent cooling fan speed control determined by loads;
- LED indicators;
- DSP control;
- Multiple protection: input low voltage / overload / short circuit / low battery alarm / input over voltage / over temperature;
- Wall-mount design for easy placement.

## INVERTER PURE SINE WAVE WITH UPS - INPUT 24+230V - OUTPUT 230V AC



| MODEL                    | 2024                                                      | 3224        |
|--------------------------|-----------------------------------------------------------|-------------|
| Capacity                 | 2000W                                                     | 3200W       |
| Surge Power Capacity     | 6000W                                                     | 9600W       |
| Voltage Range            | 184-253VAC                                                | 184-263VAC  |
| Frequency Range          | 50-60Hz ± 3Hz, Auto Detection                             |             |
| Short Circuit Protection | Circuit Breaker                                           |             |
| Transfer Time            | 20ms                                                      |             |
| Nominal Voltage          | 24VDC                                                     | 24VDC       |
| Rated Charging Voltage   | Float: 27.0Vdc±0.6Vdc; Bulk: 28.4Vdc±0.3Vdc               |             |
| Rated Charging Current   | 35A                                                       | 70A         |
| Charging Mode            | Constant Current Mode/Constant Voltage Mode/Floating Mode |             |
| Dimensions (DxWxH) mm    | 381x217x179                                               | 579x227x179 |
| Net Weight kg            | 20 kg                                                     | 25 kg       |
| Operating Temperature    | 0-40°C, 0-90% relative humidity (no-condensing)           |             |
| Noise Level              | Less than 60dB                                            |             |
| FVG ENERGY CODE          | 20805                                                     | 20807       |

## SWITCHING BATTERY CHARGERS



**FVG ENERGY**



20911  
20912



20909



20913

### SWITCHING BATTERY CHARGERS "SBC" - WALL-MOUNTED

Simultaneously handle up to 3 separate banks of batteries supplying each one with the required current. Fully automatic. 3-stage charging system (normal, boost and floating) for a 100% charge and long battery life. They can be used as an independent power supply unit without the need of backup batteries. Switching mode technology allows minimum weight and dimensions. Possibility of connecting more battery chargers in parallel. They also operate with very low AC mains voltage (180V). Dual voltage power supply (115/230V) that make them suitable for worldwide use. Protection against reverse polarity, short circuit, and overheating. Input and output fuses. Forced ventilation through 2 electronically controlled fans. 3/5 LED controls.

| CODE  | Input Volt  | Input Amp (230V) | Output Volts | Charge voltage floating | Charge voltage Booster | Out DC (Amp) | Dimensions mm | Net Weight Kg | Operating Temperature |
|-------|-------------|------------------|--------------|-------------------------|------------------------|--------------|---------------|---------------|-----------------------|
| 20911 | 110 or 220V | 4A               | 12V          | 13.4-13.8V              | 14.1-14.5V             | 60A          | 340x300x80    | 4 Kg          | -10/+50°C             |
| 20912 | 110 or 220V | 7A               | 24V          | 26.8-27.6V              | 28.2-29V               | 50A          | 340x300x80    | 4 Kg          | -10/+50°C             |
| 20909 | 110 or 220V | 7A               | 24V          | 26.8-27.6V              | 28.2-29V               | 30A          | 310x230x80    | 4 Kg          | -10/+50°C             |
| 20913 | 110 or 220V | 14A              | 24V          | 26.8-27.6V              | 28.2-29V               | 100A         | 340x300x180   | 7 Kg          | -10/+50°C             |



20915  
20916

### REMOTE CONTROL

Remote control panel with 6 mt cable. With ampere out indicator. Dimensions: mm 130 x 65 x 30

Suitable for codes # 20909 - 20911 - 20912:  
**Code 20915**

Suitable for code # 20913:  
**Code 20916**



20889



20890  
20895

### PTSBC - CHARGERS

PTSBC series provides automatic multi-rate charge, with 3 charge stages. They provide short circuit protection, reverse polarity protection and over loaded protection. Electronic cooling system with fan (only in 6A and 10A models). LED light to indicate stage. These battery chargers are suitable for cars, trucks, agricultural machinery, camping and boats. The switching system allows a 100% charge and a battery long life. PTSBC's can always be connected because they are fully automatic.

| MODEL               | PTSBC-212F | PTSBC-1012F | PTSBC-624F |
|---------------------|------------|-------------|------------|
| Input Voltage (VAC) | 90V ~ 240V | 90V ~ 240V  | 90V ~ 240V |
| Frequency           | 50 ~ 60 Hz | 50 ~ 60 Hz  | 50 ~ 60 Hz |
| Output Current      | 2A         | 10A         | 6A         |
| Output Voltage      | 12V        | 12V         | 24V        |
| Equalizer Charge    | 14.6V      | 14.6V       | 29.2V      |
| Floating Charge     | 13.7V      | 13.7V       | 27.4V      |
| Dimensions mm       | 115x62x33  | 162x90x50   | 162x90x50  |
| Net Weight          | 0.50 Kg    | 0.85 Kg     | 0.85 Kg    |
| CODE                | 20889      | 20890       | 20895      |



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