



DUAL-AXIS



# High Tech Solar Trackers

MS-2 TRACKER 10 • MS-2 TRACKER 10 +





## Products and Services

**mecasolar** is a company dedicated to the **design, manufacture and distribution of state-of-the-art dual-axis solar tracking systems**, seasonal single-axis azimuth trackers and fixed structures, making it possible to increase photovoltaic solar energy production, offering a **10 year GUARANTEE on parts and workmanship**. World-leading **mecasolar** trackers and fixed structures are the securest, sturdiest, most efficient and profitable on the market.

### MS-2 TRACKER 10

- V-shaped metal structure and grill for up to 12 kWp panels
- PLC tracking, in a fully equipped independent electric panel
- Three phase motors on both axes
- Hook-up/connection cabinet for storing protectors



The client can include as many inverters as they wish

### MS-2 TRACKER 10 +

- V-shaped metal structure and grill for up to 12 kWp panels
- PLC tracking, in a fully equipped independent electric panel
- Three phase motors on both axes
- Hook-up/connection cabinet for storing protectors (magnetothermic (PIA), differential, power surge protection), fully wired
- 3 SMA Sunny Boy inverters installed with 3.3 kW power rating for outdoors, IP 65



Other SMA inverter models can be fitted

**PLUG & GO**

**mecasolar** makes a clear **commitment to its customers**. With the aim of satisfying the various and diverse needs of our clients, we offer a series of **complementary services** for all tracking systems:

- **Management and support** for everything related to **construction project execution, low voltage, medium voltage and module and inverter configuration**, with our entire Engineering Department at your disposal.
- Adapting to project management needs as required by the customer. **We schedule tracker system deliveries** to our customers in a timely manner and **fully manage and coordinate the logistics**.
- **Adjusting the tracker system to fit customer power requirements for photovoltaic panels and inverters**. Additionally, we can install **the inverter** at the clients' request
- We provide electromechanical **corrective and preventative maintenance** yearly on the tracker systems based on the schedule and frequency defined by the client.



## Production Capacity

**mecasolar** is one of the worldwide industry leaders with the greatest capacity in the market to manufacture solar trackers. Currently, in 2008, we have the **capacity to manufacture 1,272 solar trackers per month**, the equivalent to producing 14 MWp/month.

14,000 trackers/year

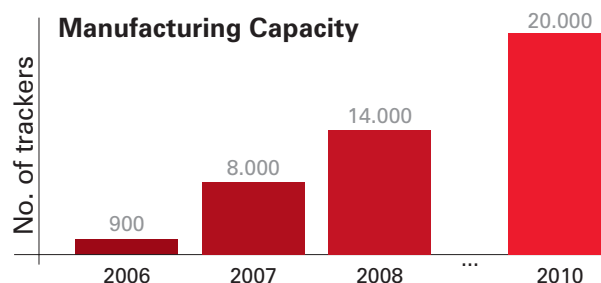
**140 MW/year**

**mecasolar** holds at present the CE, ISO 9001:2000 and ISO 14000 certifications, which makes it possible for it to achieve consistent, excellent fabrication quality with the best guarantees for our clients. Environmentally friendly and consistent with sustainable economic and social development. We also provide fast and flexible service. All components have been tested before being shipped to the client's construction site.



At present we have factories at the following sites:

- Fustiñana - Sede Central - Navarra - SPAIN
- Ribaforada - Navarra - SPAIN
- Tudela - Navarra - SPAIN
- Talavera la Real - Badajoz - SPAIN
- Tesalonica - GREECE
- ITALY
- USA

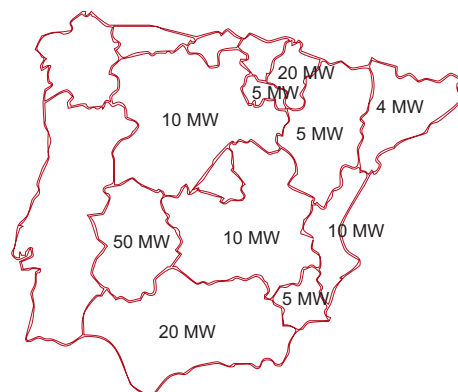


## Experience

Some relevant projects:

- Almaraz-CACERES 20 MW
- Talayuela-CACERES 10 MW
- Aliwin-CACERES 20 MW
- Castejón-NAVARRA 5 MW
- Fustiñana-NAVARRA 5 MW
- Las Gabias-GRANADA 13 MW
- Aznalcollar-SEVILLA 2 MW
- La Roda -ALBACETE 2 MW
- La Gineta -ALBACETE 2 MW

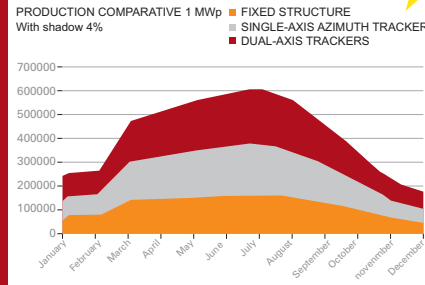
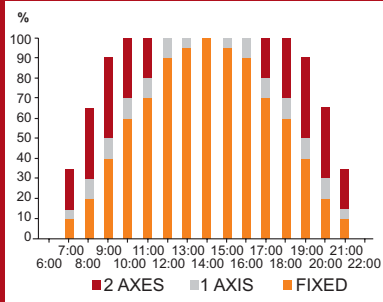
**180 MW installed**



Engineering and/or supply services in the 2004-2008 portfolio

## Advantages that make the difference

10 years  
GUARANTEE ON PARTS AND WORKMANSHIP



### 10-YEAR GUARANTEE ON PARTS AND WORKMANSHIP

mecasolar has designed a product that has been the subject of many years of research, that has been submitted to the strictest resistance and efficiency tests, obtaining as a result, the **UNIQUE** solar tracker with the best **GUARANTEES** on the market.

### MULTI-POWER and MULTIPLE MANUFACTURER FLEXIBILITY

The design of the omega panel support structure provides the mecasolar tracker with incredible **FLEXIBILITY** when it comes to installing different panels made by various manufacturers. The system can handle a maximum power of 12 kWp.

### OVER 35% INCREASE IN PRODUCTIVITY

The mecasolar tracking system is capable of increasing photovoltaic solar energy production by more than 35%, when compared to a fixed installation. This maximizes profits by reducing the investment in solar panels.

### FOUNDATION

Foundation on surface footing - 7.5 m<sup>3</sup> - that does not require any excavation. It is only necessary to clean off the terrain, removing the top layer of vegetation and levelling the ground.

### OUTPUT / THREE PHASE CONNECTION

Each of the three phases is connected to each one of the 3 inverters. This feature reduces losses due to wiring and provides a more balanced power output. Upon any damage in any of the 3 phases, 2/3 of the installation is still productive.

### ADAPTABLE TO CHANGING WEATHER CONDITIONS

The mecasolar tracking system is connected to a meteorology station and works with a PLC controller. The solar tracking device uses this technology to orient the panels under a variety of climate conditions. The PLC programming permits the tracker to operate in snow, electrical storms, fog, darkness and windy conditions. It can withstand winds of up to 140 km/h, and is programmed to adjust the tracker to a horizontal position when wind speeds are in excess of 80 km/h.

### INDEPENDENT CONTROL

Each mecasolar solar tracker comes equipped with an independent PLC controller, which works to monitor solar movements, to handle the prevailing weather conditions and to perform remote operations.

### STURDY, EASY TO INSTALL, REDUCED MAINTENANCE, AND LOW POWER USAGE

The mecasolar tracker motors consume less energy per year (100 kWh/year), resulting in reduced maintenance. Likewise, the robustness of their design and fabrication guarantees the investment over the long term. Furthermore, the easy installation reduces labour costs and time spent on the construction project.



## Simple and Fast Installation with Less Maintenance



### 1 Transport. 10 partially assembled trackers on 3 trucks.

The **mecasolar** trackers are partially assembled before being shipped. 10 fully assembled V-shaped structures are shipped on two trucks, and 10 grills are shipped on a third truck. It is not necessary to contract any special transportation.



### 2 Surface Footing.

**No excavation is necessary.**

Foundation on surface footing that does not require any excavation. It is only necessary to clean off the terrain, removing the top layer of vegetation and levelling the ground. We provide our clients with the necessary mould.



### 3 Quick and simple tracker installation on the foundation footer:

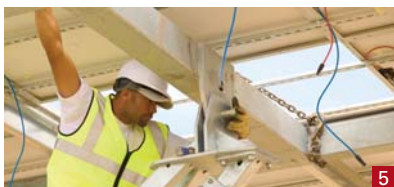
With the same machine used to clean off the terrain, we install the V-shaped structure on the foundation footer. Then, the structure is aligned over the foundation bolts using a double nut system.



### 4 Flexible Installation of Modules

**Any module with any power rating.**

The grill, the structure on which the modules are assembled, gives the **mecasolar** tracker great flexibility in that it permits mounting modules with different power ratings, made by different manufacturers. At this time, the **mecasolar** tracker is the market's most open option, which permits working with any type of module.



### 5 Quick Assembly on the Structure.

Given that one installation crew is able to work on the foundation and on mounting the V-shaped structure on the foundation on one side, while another crew is able to install the modules on the grills; the installation crew can be flexible and versatile and is able to meet reduced installation times.



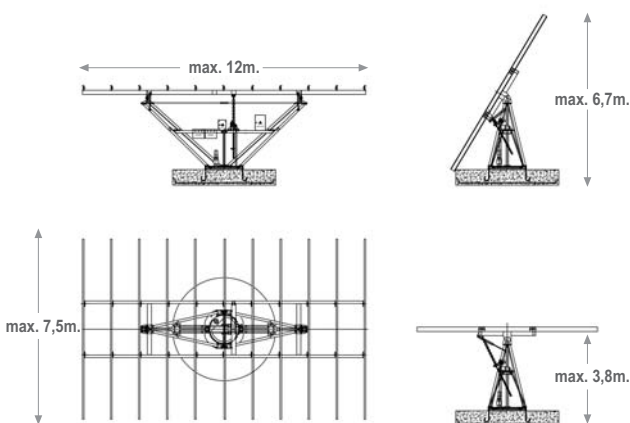
### 6 Quick and Simple Tune-up

Our clients can count on the support of the **mecasolar** technical department at all times to guide them through all phases of their project including: project engineering; civil engineering, construction and installation; as well as in tune-ups and maintenance.

Tracker axis	DUAL AXIS: Horizontal and Vertical
Maximum surface of modules	90 m <sup>2</sup>
Maximum Photovoltaic Power	12 kWp (depending on the efficiency of the modules)
Azimuth drive	By gearmotor and cogged crown wheel
Azimuth rotation angles	Vertical axis: -120 ° to +120 °
Tilt drive	Electrically driven mechanical jack
Motorized Tilt	Adjustable from 0 ° to 60 °
Tracker height at 60 °	6700 mm (from ground to top modules)
Motor consumption	100 kWh / year
Motor operating voltage	400 V Three Phase
Structure	Hot dipped galvanized steel structure
Structure design	"V" Structure on cogged crown wheel
Weight without modules, and without foundation	3000 kg
Electrical cabinets and PLC protection	Metal, weatherproof, fully wired, IP66 Includes PLC fully wired to motor with protection

Electrical supply cabinet	Metal, weather-tight, fully wired, IP66, includes AC surge protection and magnetothermic (PIA) differential (only for MS TRACKER +)
Tracking technology	independent Astronomical programming of PLC
Monitoring	On-site, Ethernet, Internet (OPTIONAL)
Inverters	3 SB SMA inverters 3.3 KW rating, IP65 (only for MS TRACKER +) Possibility of other inverters
Modules to be installed	Any type of PV modules. Optional module holder profile
Module maximum weight	1250 Kg
Wind protection system	Programmable. Horizontal positioning at speeds over 70 km / h (by gearmotor slipping)
Foundation	Surface circular foundation, 7.5 m <sup>3</sup> wire mesh concrete. Optional anchor bolts, direct bolt anchoring
Complies with	UNE-ENV 1991 Eurocode DIN 1055-4 (8.86), DIN 1056 (10.84)
Maximum wind speed	140 Km/h
Maintenance	Annual revision of electrical and mechanical parts to keep the guarantee in force
Guarantee	Up to 10 years on Parts and labour.

## Structure diagram



ISO 9001:2000



ISO 14001:2004



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