



Renewable energy - Photovoltaic industry



MecVel
actuators for
solar trackers

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THE GREEN AND ECO-FRIENDLY SIDE OF MECVEL

MecVel is in the linear automation industry since 1987, developing and producing technologies targeted to the renewable energies field and automations required by these applications.

Specifically, the linear actuator is an electromechanical cylinder powered by an electric motor connected to a gearbox, which moves a series of gears and a push rod to transform the rotatory motion of the motor into a linear movement, with a load capacity up to 20 tons.

Moreover, the customization service of the company allows to configure any product in order to meet the technical specifications of the application for which it is intended, giving shape to a performing solution, tailored for each customer. Electric linear actuator performances, in fact, are as better as dedicated to a specific function, and that's why MecVel, giving a great attention to the industry 4.0 concepts of energy efficiency and sustainable production, has focused on solar tracking systems.



FOCUS ON SUNTRACKERS

Solar trackers can be with single and dual axis, and these tracking systems offer the highest efficiency: single axis solar trackers allow for an increase in terms of energy conversion up to 40% more than a fixed photovoltaic plant, while the highest increase (up to +50%) is provided by a dual axis system.

In a single axis solar tracker the photovoltaic panel rotation is on one axis: on the vertical one, there is the so called "roll movement", and this allows the continuous photovoltaic panel orientation and the slow but constant "chasing" of the sun during the day, while on the horizontal one, there is the so called "tilt movement" and the efficiency is influenced by seasons, that's why this solution is well suited for countries with low latitudes.

Dual axis solar trackers have the two rotation axis perpendicular to each other, providing both kinds of movement: an electric linear actuator is applied to each rotation axis, so that the photovoltaic panel is always oriented towards the sun, keeping a 90° angle between its surface and beams, in order to maximize the tracking process.

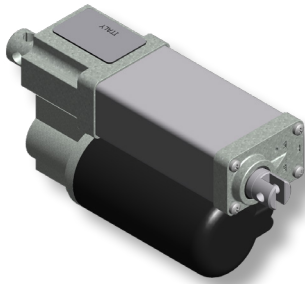


MECVEL'S ACTUATORS ADVANTAGES

Choosing a solar tracking system with electric linear actuators instead of a fixed photovoltaic plant leads to a series of benefits:

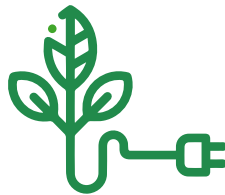
- The electric system of the linear actuator has reduced dimensions, minimal connections, low consumptions, the possibility to regulate with accuracy the power supplied and keep the position in static conditions
- Specific setups allow to resist to harsh climatic conditions as humidity, air salinity, wind, thanks to a static load higher than the dynamic one
- The speed can be lowered up to 1 mm/s through gearboxes able to provide a reduced input torque, increasing the time needed to complete the stroke and complying with the photovoltaic industry standards
- Devices as limit switches, potentiometer, encoder allow to have a constant feedback on the position reached and keep an optimal inclination
- Bellow boots, cover tubes and stainless steel elements offer a higher resistance to corrosion by external agents
- The installation of the electric linear actuator is simple and "clean", also thanks to dedicated ends and fixing points, and it requires a little maintenance, made easier from the great accessibility of the product, mounted externally to the main structure
- No environmental impact: the shading is minimal and this leads to a lower use of the ground, as there are no permanently shaded areas, thanks to the continuous rotation of the photovoltaic panel, so that rain and sun can reach, at different times, all the land below



ALI1-P

linear actuator with parallel motor, for a further reduction of the overall dimension, with a "tie-rod" function, connected to a simple lever in order to amplify the handling of small photovoltaic panels or solar concentrator connected in line each other.

- Max load: 2.500 N
- Max speed: 2,8 mm/s
- DC motor

**ALI3 E ALI3-S**

linear actuators applied directly to the structure of the module, for the handling of a single photovoltaic panel or solar concentrator.

- Dynamic/static load: 6.500/8.000 N
- Max speed: 5 mm/s
- DC motor

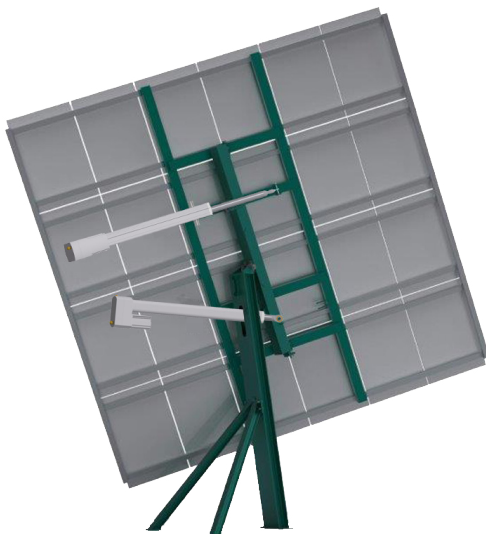
**ALI4-P**

linear actuators applied directly to the structure of the module, for the handling of a single photovoltaic panel or solar concentrator. The version with parallel motor allows a further reduction of the overall dimension.

- Dynamic/static load: 10.000/20.000 N
- Max speed: 1,25 mm/s
- DC motor

HP5

- **A static axial force up to 45000 N**, HP5 is able to keep the load of the whole photovoltaic panel if the solar tracker is in "rest" or safety position
- **A dynamic force up to 15000 N** even with long strokes (> 500 mm), maintaining extremely low both speed and consumption (2 mm/s and 6 A)
- **Max speed:** 20 mm/s
- **The steel cross gearbox** allows to directly transfer the motion from the motor to the push rod, without any loss in terms of efficiency
- **Parallel motor** to the electric linear actuator body for a further reduction of the overall dimensions
- Fixing system with **adjustable pins** placed on the cover tube make HP5 versatile and easy to match with any structure



The HP5 is an electric linear actuator developed by MecVel for the photovoltaic industry. This product is able to keep a very high static load also in case of long strokes (> 500 mm), maintaining extremely low both speed and consumption (15000 N with 2 mm/s and 6 A).



Every MecVel product can be customized to perfectly adapt to the application it is designed for, ensuring the actuator reliability and duration.

