



# Focus on Solar Tracking

# Improving energy efficiency

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Global warming and the drive to minimise greenhouse gas emissions has put the focus on how to make the most of natural energy sources.

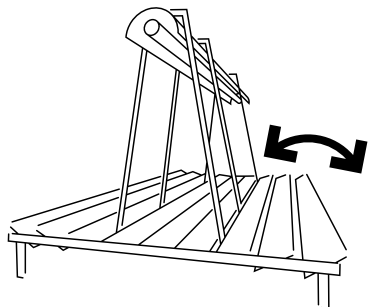
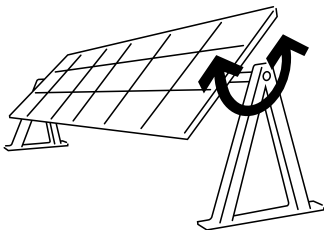
Solar tracking is an obvious way to improve the efficiency of solar power plants. As the sun moves across the sky, an electric actuator system makes sure that the solar panels follow automatically and maintain the optimum angle to make the most of the sunbeams.

In recent years, the TECHLINE® team of engineers and consultants have given solar tracking their special attention. The well-proven reliability and long maintenance-free lifetime of LINAK actuators even under extremely rough conditions make TECHLINE electric actuator solutions particularly well suited for this kind of application.

Flexibility is a keyword. You get excellent stepless positioning and feedback to your control system - both digital and analogue. When the main power is not available, LINAK actuators can run on battery backup and manual override is also available.

Creating value for our customers – by cooperating with LINAK® you get:

- Dedicated worldwide sales and service teams in more than 30 countries.
- Quality actuator solutions developed to meet the harsh environments to which solar parks are exposed.
- Complete and simple solutions from one supplier. As an option our actuators come with embedded Modbus technology for ease of communication and less component complexity.



# IC movement for solar tracking

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IC is the range of integrated control options for TECHLINE® actuators that present you with almost unlimited possibilities for superior control and monitoring, to enhance the value and performance of your application.

For solar tracking, actuators with IC provide cost-effective performance and innovative technology:

- Simple installation with built-in electronics.
- Easy overview and precise control of the actuator movement.
- The actuator can be customised on site to fit multiple solutions in a single application.
- Easy monitoring of the actuator's condition which ensures a minimum of downtime.
- All IC options are based on the same well-tested interface, which is covered by the actuator's IP degree.

*If you are looking for a movement solution that will help you stay competitive in the future, then go for LINAK actuators with integrated controller, and **Move for the Future**.*



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## Integrated Controller:

- Customisable feedbacks
- Parallel movement
- BUS communication



For more information on IC, please go to [LINAK.COM/SEGMENTS/TECHLINE/TECH-TRENDS/INTEGRATED-CONTROL/](https://www.linak.com/segments/techline/tech-trends/integrated-control/)

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# Actuators with embedded Modbus communication

Modbus is part of our IC™ programme and is a well-known communication technology that has been on the market for years. Modbus simplifies the communication, meaning you can connect several solar trackers in serial and thereby eliminate the need for lots of signal cables and still control the whole park from a central point.

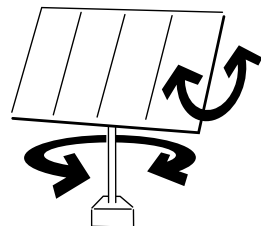
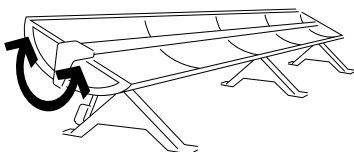
Besides from improving your return on investment, Modbus has many other advantages:

## Lower investment

- Less complex system
- Less cables due to BUS topology
- Less need for I/O boxes
- Less programming time due to standard communication language
- Less installation time as the number of components are reduced and the control of the solution is embedded
- Everything programmable and controllable from a central controller
- One scalable solution for different sizes of installations

## Longer lifetime

- Electronic overload protection protects the actuator. The current can be adjusted in both directions.
- Lowering of speed and soft-start and stop reduce the wear on mechanical parts
- Temperature surveillance and alarm



# Imagine...

...if LINAK could reduce your maintenance costs by 50%?

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## Lower maintenance and operational costs

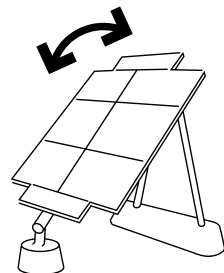
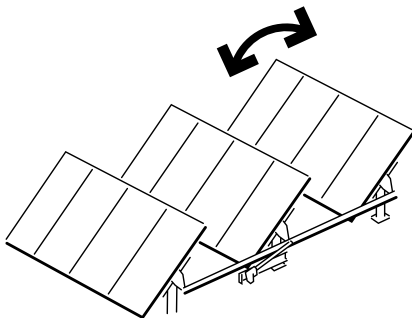
- Less components
- Maintenance-free mechanics
- Easy integration with SCADA systems through BUS interface
- Integrated diagnostics enable preventive maintenance. E.g. log of current, cycles and temperature
- Remote monitoring of installation by use of an Ethernet-BUS gateway

## Improved yield of PV installations

- Accurate positioning of solar panels or mirrors improve return of investment
- Enhancement of solar algorithm from a central point

## What is Modbus

Modbus Protocol is a messaging structure developed by Modicon in 1979. It is used to establish master-slave communication between intelligent devices. It is a de facto standard, truly open and the most widely used network protocol in the industrial manufacturing environment. It has been implemented in different devices to provide reliable data transport between devices.



# Actuators for solar tracking

## Actuator LA37 - robust and dependable

Tough applications require equally tough actuator solutions. The LA37 was specifically developed for solar applications, where there is a need for more lifting capacity and holding force. This is done without compromising the well-known LINAK quality, so you can expect a minimum of maintenance and a long lifetime of up to 20 years - that is why we grant 5 years warranty.



### LA37 features:

- Force 7.5 kN (7,000 cycles) - 15 kN (700 cycles), Modbus 10 kN
- Static holding force up to 45 kN\* in push and pull
- Dynamic wind stress forces 15 kN push/pull, 100,000 times
- Speed 3.5 mm/sec.
- 24 V DC motor
- Stroke length 500, 750 and 1000 mm
- Heavy-duty aluminium housing for harsh conditions
- IP66
- Integrated brake, high self-locking ability
- Hand crank for manual operation
- Embedded electronics and feedback, e.g. HALL pulses or Modbus RTU
- Ball rod eye
- Salt and chemical tested
- 5 years warranty\*\*
- **Available with IC™**



\* depending on stroke length \*\* special conditions

## Actuator LA36 - reliable and tough

The actuator LA36 is one of the most solid and powerful LINAK actuators, designed to operate under extreme conditions. The LA36 is a maintenance-free product with a long lifetime and a high IP degree. This high-quality actuator offers a very strong alternative to hydraulic solutions.



### LA36 features:

- Max thrust up to 10,000 N
- Standard stroke 100-999 mm
- Heavy-duty aluminum housing for harsh conditions
- Protection class IP66 / IP69K
- Integrated brake, high self-locking ability
- Voltage 12, 24 or 36 V DC
- Hall sensors or potentiometer for relative or absolute feedback, regardless of the stroke length
- Solid metal construction
- Hand crank for manual operation
- Salt and chemical tested
- High-pressure cleaning resistant
- **Available with IC™**

# Actuators for solar tracking

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## Actuator LA35 - flexible and powerful

The actuator LA35 is a powerful actuator with a low noise level. It is designed for a variety of both indoor and outdoor applications and provides a practical, cost-effective solution with low power consumption.



### LA35 features:

- Max thrust up to 6,000 N in push and up to 4,000 N in pull
- Heavy-duty aluminium housing for harsh conditions
- Protection class IP66 dynamic, IP69K static
- Stroke up to 600 mm
- Easy to use interface – with integrated power electronics for direct connection to control system
- Potential free limit switches as an option
- Hall sensors or potentiometer for relative or absolute feedback, regardless of the stroke length
- Built-in limit switches and brake
- Voltage 12 or 24 V DC
- **Available with Basic IC™**



## Actuator LA37 - solid and powerful

Tough applications require equally tough actuator solutions. The actuator LA37 is specifically developed for heavy-duty applications in harsh environments, where there is a need for high lifting capacity and holding force. The LA37 offers the well-known LINAK quality, guaranteeing you a maintenance-free product with a long lifetime.



### LA37 features:

- Max thrust up to 15,000 N
- Max speed up to 3.5 mm/sec
- Standard stroke 100-600 mm
- Protection class IP66 / IP69K
- Voltage 12 or 24V DC
- Heavy-duty aluminum housing for harsh conditions
- Integrated brake, high self-locking ability
- Hall sensors or potentiometer for relative or absolute feedback, regardless of the stroke length
- Built-in endstop
- Solid metal construction
- Hand crank for manual operation
- Salt spray and chemical tested
- High-pressure cleaning resistant
- **Available with IC™**

# 100% function tests

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In each application, the actuator is just one component of many, but at TECHLINE® we fully appreciate that it is of utmost importance to you and your customers. Not a single actuator leaves LINAK® until it has undergone a 100% function test.

Depending on the actuator type, various tests have been carried through. Please consult your local LINAK office or take a look at the actuator data sheet in question to get a thorough test overview.

This is your guarantee that a solution based on LINAK TECHLINE electric actuator systems is a solution that will work reliably for years and years.

## Electrical tests:

All electrical parts are tested i.e. power supply, power and signals cables, control signals etc. Electrical immunity is tested according to industrial standards i.e. for radio noise, electrical discharge and burst.\*

(\* ) These tests do not apply to third party products!

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## Climatic tests:

In the climatic test the actuators are tested to operate in extreme temperatures as well as to endure rapid changes in temperature. In some tests, the actuator has to withstand going from a +100°C environment to -30°C repeatedly and still maintain full functionality.

## Mechanical tests:

**Vibration:** The actuator must withstand continuous vibration in three directions.

**Shock:** The shock test puts the actuator through 3 shocks of up to 100 G in each of 6 directions.

**Bump:** The actuator receives bumps of up to 40 G in each of six directions several hundred times.

- EN/IEC 61000-6-4** - Generic standard emission industry
  - EN/IEC 60204** - Electrical equipment of machinery
  - EN 50121-3-2** - Railway applications - Rolling stock apparatus
  - 94/25/EC** - Recreational crafts directive
  - EN/ISO 13766** - Earth moving machinery
  - EN/IEC 61000-6-2** - Generic standard immunity industry
  - 2004/104/EC** - Automotive Directive
  - EN/ISO 14982** - Agricultural and forestry machines
  - EN/ISO 13309** - Construction machinery
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- EN600068-2-1 (Ab)** - Cold test
  - EN60068-2-2 (Bb)** - Dry heat:
  - EN60068-2-14** - Change of temperature
  - EN60068-2-30** - Damp heat
  - EN60068-2-52** - Salt spray
  - EN60529-IP66** - Degrees of protection
  - BS7691/96 hours** - Chemicals
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- EN60068-2-36 (Fdb)** - Vibration
- EN60068-2-29 (Eb)** - Bump
- EN60068-2-27 (Ea)** - Shock





## Global presence

LINAK has a well-developed sales and service organisation in Europe, the Americas, Asia and Australia. Therefore, we can assist you and your customers locally, under the global sales concept idea: Be global, act local



For further information, please visit our websites:

**SOLAR-TRACKING.COM**

**LINAK.COM/BUSINESS-AREAS/ENERGY/SOLAR-TRACKING/**

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### TERMS OF USE

The user is responsible for determining the suitability of LINAK products for a specific application. LINAK takes great care in providing accurate and up-to-date information on its products. However, due to continuous development in order to improve its products, LINAK products are subject to frequent modifications and changes without prior notice. Therefore, LINAK cannot guarantee the correct and actual status of said information on its products. While LINAK uses its best efforts to fulfil orders, LINAK cannot, for the same reasons as mentioned above, guarantee the availability of any particular product. Therefore, LINAK reserves the right to discontinue the sale of any product displayed on its website or listed in its catalogues or other written material drawn up by LINAK.

All sales are subject to the Standard Terms of Sale and Delivery for LINAK. For a copy hereof, please contact LINAK.

LINAK has a world-class sales and service organisation.

Today we are present in 35 countries all over the world.

For further information, please visit our website: **LINAK.COM**

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WE IMPROVE YOUR LIFE