



**GREY  
LINE**

**Electric  
linear  
actuators and  
industry 4.0:  
automation and  
robotics meet  
MecVel  
applications**



Robotics is one of the pillars of the industry 4.0 trend, due to its transversal use in several applications.

MecVel has decided to focus on the role of electric linear actuators in these fields, gaining in-depth experience through the development of specific projects.

## **ELECTRIC LINEAR ACTUATORS AND ROBOTICS: HOW DO THEY INTEGRATE?**

One of the main purposes of industrial automation is to make the processes “smarter”, which in terms of production means increase efficiency and productivity through integration and optimization of different technologies, that must communicate and collaborate in the most effective way.

The electric linear actuator, in particular, is the perfect solution for those applications requiring a positioning accuracy with relatively high load capacity and speed (15000 N and 150 mm/s max.), and these conditions can be easily found in AGVs, or Automated Guided Vehicles.

The result is the ideal match between mobile robots with several features and usages and electric linear actuators, thanks to their ease of installation, simplicity of control and reliability.

The main benefits that electric linear actuators provide to AGVs can be summarized in:

- They use an electric system, which is perfectly matchable with AGVs that, due to “limited” dimensions, can’t have on board components required by hydraulic or pneumatic systems
- They can handle intermediate positions, offer a good repeatability of motion and have a higher precision, if compared to hydraulic or pneumatic systems
- They can be combined with any kind of servo motor thanks to tailored flanges, for a significant increase in terms of performance
- They are relatively compact in terms of overall dimensions, if compared to the force they can provide
- They do not need particular maintenance

### **AGVs and logistics**

AGVs are widely used in logistics, to automate and make faster storage and picking processes of goods from the warehouse.

It is fundamental that mobile robots mount electric linear actuators to control some movements required by these operations, as the AGV steering and the lifting of the loading platform.

### **AGVs and agriculture**

Looking to an agriculture more and more sustainable, the use of AGVs in farming and zootechnics allows for a reduction of waste and an optimization of resources.

MecVel is specialized in different handlings involved in the feeding process, supporting the breeding industry, but electric linear actuators can be perfectly located also in greenhouses, vineyards and agriculture in general.

### **AGVs and industry**

The highest expression of robotics is in cobots, or collaborative robots, that can be placed along large assembly lines, with the purpose to facilitate and automate some mounting processes, as the easiest and most repetitive ones.

Electric linear actuators can be used from the handling of motorized arms to AGVs, with a focus on industrial fields as automotive, beverage and plastics processing.

## ELECTRIC LINEAR ACTUATORS AND AUTOMATION: MECVEL APPLICATIONS

A fundamental ability of the company is to know how to constantly innovate itself, anticipating the main market trends and shaping its range of products in order to make it always up-to-date and able to meet the new needs of linear motion in industrial automation.

This must be added to the use of a "green" technology, as the electric system has no environmental impact in terms of pollution, in compliance with the industry 4.0 concepts of energy efficiency and sustainable production.

### Electric linear actuators and intralogistics

Moving goods inside a factory, especially if with large dimensions, requires effective solutions.

One of the most important online marketplaces has chosen to use AGVs for intralogistics in its warehouses, as they are automatic, safe and fast systems for storing, moving and picking products.

Electric linear actuators developed for this application must answer to specific needs: regulate the height of the AGV loading platform according to kind and quantity of packages to be transported and placed in the warehouse.

This requires great flexibility, to optimize the operator activities and the warehouse, which assumes a more "dynamic" role.

The product chosen for this project is ALI2 DC: this model can be placed in small spaces, being able at the same time to provide a load capacity of 2000/2500 N at 20/30 mm/s, while the encoder on board gives a constant feedback on the position reached by the stroke.

### Electric linear actuators and zootechnics

MecVel manufactures electric linear actuators for zootechnics, dedicated in particular to AGVS used for feeding systems and the distribution of forage.

In this case, electric linear actuators handle the AGV direction through the steering, allow the opening of the upper hatch for loading the forage, regulate the press that compacts and pushes the forage through the exit points, control the diverter which moves the forage sideways, in order to keep clean the AGV passage.

ALI1-PF and ALI3-F are the most suitable models for these linear movements: specifically, ALI1-PF mounts the DC motor parallel to its body, in order to reduce the overall dimensions, and it is chosen when the load is not so relevant, as well as the speed (2500 N at 5,6 mm/s max.).

ALI3-F is installed when it is required a higher force, as it can provide up to 6000 N at 12 mm/s. In both cases, limit switches on board the electric linear actuator ensure a precise and reliable stroke control.

### Electric linear actuators and industrial production

In terms of production processes and automation of production lines, electric linear actuators are involved in several areas, in addition to the control of AGV steering and direction: MecVel has developed solutions regarding the positioning of sensors in dosing systems for the food industry, rather than injection/blowing devices for the plastics processing.

In these fields, the AM series is the most suitable, together with the smallest sizes of the EC series, as developed to orient itself towards servo actuation: this means fast, repetitive, precise movements, with medium-heavy loads (up to 15000 N).

These products can be interchangeable with pneumatic cylinders, while ball screws and servo motors complete the configuration, ensuring high performances and long life.

In terms of AGVs used in automotive, the control of AGV steering and direction can be performed by a special version of ALI2 DC with double screw, able to provide up to 2000 N at 10 mm/s.

This shows the versatility of MecVel, that since 1987 manufactures electric linear actuators supported by an important customization service, that allows to configure each product in order to satisfy the technical requirements of the application to which it is intended, to get exactly the linear motion desired.



## INTRALOGISTICS

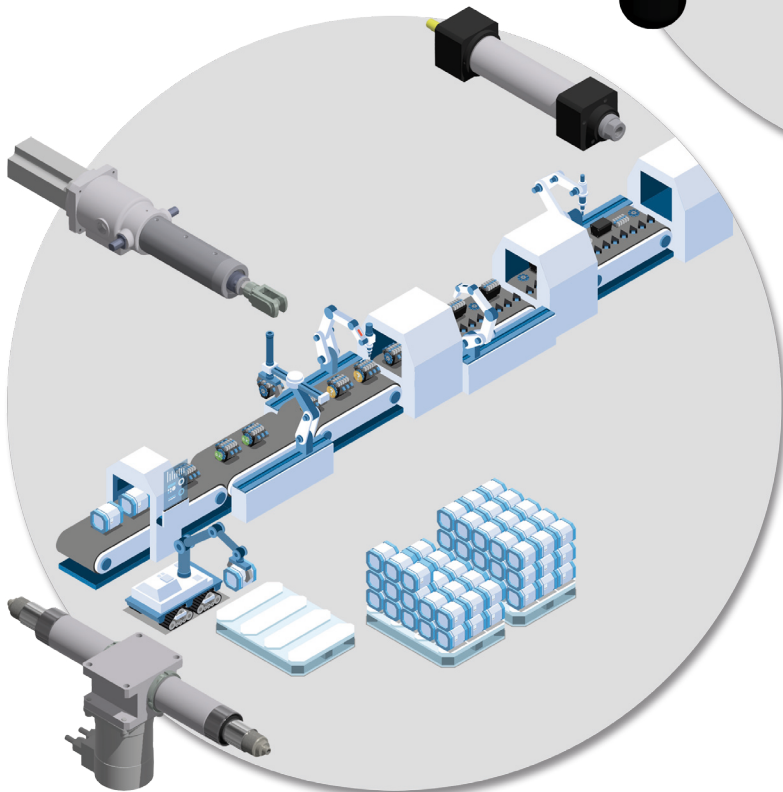
ALI2 and ALI2-DS (with double screw) DC electric linear actuators handle the lifting of the AGV loading platform, together with its direction through the steering control

## ZOOTECHNICS

ALI3-F and ALI1-PF (version with the motor parallel to the push rod) DC electric linear actuators allow at least 4 movements on board of AGVs used in the breeding industry: steering control, opening of the upper hatch, pushing and distribution of the forage

## INDUSTRIAL PRODUCTION

Among the several applications, AM and EC series are chosen in particular for the positioning of motorized arms, sensors, injection/blowing devices in dosing systems, plastics processing or along assembly lines, also thanks to the use of high-efficiency servo motors



For further information or to setup your product  
contact us at:  
MecVel Srl - Via Due Portoni 23, Bologna, Italy  
051 4143711 - [www.mecvel.com](http://www.mecvel.com)  
[info@mecvel.com](mailto:info@mecvel.com) - [marketing@mecvel.com](mailto:marketing@mecvel.com)