



ELECTRIC ACTUATORS DIVISION

**D**UPLOMATIC  
ELECTRIC ACTUATORS



For decades now, Duplomatic has been an established player in the motion control market. Besides the wide range of hydraulic products and the complex customized design solutions, today Duplomatic offers its new line of Electric Actuators.



**Duplomatic Electric Actuators** is a division of Duplomatic Oleodinamica S.p.A. and part of an international corporation that employs more than 260 people, made up of 6 Companies and 7 production plants (5 in Italy, 1 in USA and 1 in China). We are able to serve over 800 customers all over the world, with a turnover of more than 60 million.

# THE VALUE OF OUR HISTORY

During the 70s, thanks to the expertise acquired since 1952 as a worldwide leading company in copying servo-systems, Duplomatic developed an innovative range of electro-hydraulic servo-actuators. These products took advantage of the copying valve precision of adjustment in order to control the actuator speed and position. By means of a kinematic system with a high coupling precision performance, the copying valve was controlled by a “stepper motor” and was provided with feedback through a ball screw nut, strictly fastened to the actuator rod. The advantage of avoiding the use of any transducer allowed a fast spread of these systems into many different fields: machine-tool (axes control), shipyards (propeller pitch and stabilizer control), iron and steel industry (continuous casting control), and so on. The flagship of this type of actuators has been the application designed for Aleph and Delphi projects, at the CERN in Geneva: a series of servo-actuators provided with stepper motor were used for the positioning of big magnets with high precision of parallelism.

# THE ADDED VALUE OF OUR ELECTRIC CYLINDER

## Power saving

An electric cylinder consumes one tenth of the electric power absorbed by a pneumatic one. The break-even point can be easily reached in 6-12 months, thus making electric actuators far more convenient than pneumatics.

## Productivity increase

Working times and production downtimes reduction.

## Smart control and versatility

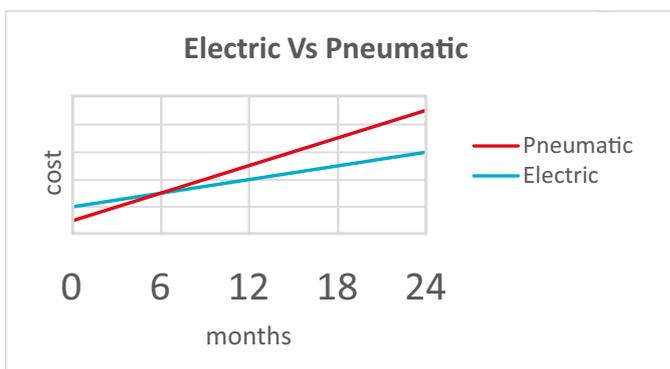
Multiple positioning, programming with multiple recipe possibility.

## Hygiene and cleanliness

In those environments where lubricated air and oil are discouraged, like cleanrooms and food and beverage machines.

## System simplification

Replacement of air pipes with single electric cables, removal of manifolds, air filtering stations, etc.





“All the details to express the full potential of your projects”

It's not the electric cylinder that will set limits to your applications; it is rather your application characteristics that will determine the most suitable cylinder for your projects.

Thanks to a complete range of possible combinations of sizes, accessories, type of screws, motors and drives, Duplomatic will play its part in ensuring your projects reach their full potential.



# PRODUCTION

## Top quality in the production of our electric cylinder

- Anti-rotation system with double sliding blocks
- Full thread holes on barrel for front cap screws tightening, not as on pneumatic cylinders
- Front caps are machined from solid material blocks
- Barrels, with a Duplomatic-customized design, are made with “structural” alloy
- All machined aluminum parts (high mechanical strength alloy) are sand-blasted and anodized
- Cylinder rod guide in metallic material

## Top Flexibility

- Customizable solutions even for one single piece
- Possibility to mount customer's motor on our cylinder
- Wide range of available motors
- Three types of trust bearing stacks depending on the application
- Different types of screws for motion transmission
- All the cylinders can be equipped with in line or parallel motor

## Top competitiveness

- Compact dimensions if compared to competitors, with the same axial force

# BASIC - ECL2

- Max axial force: 2,000 N
- Max speed: 160 mm/s
- Max stroke: 400 mm
- Lead screw
- DC motor
- ISO 6432 type
- Sizes: 25-32
- Available round-shaped with in line or parallel motor



## BASIC PLUS - ECS2



- Max axial force: 4,000 N
- Max speed: 635 mm/s
- Max stroke: 600 mm
- Lead screw and roller screw
- Stepper motor
- ISO 6432 type
- Sizes: 25-32-50
- Available round-shaped with in line or parallel motor

## STANDARD - ECL3



- Max axial force: 10,000 N
- Max speed: 1,300 mm/s
- Max stroke: 800 mm
- Lead screw and roller screw
- Stepper and Brushless motor
- ISO 15552 compatible
- Sizes: 32-50-63
- Available square-shaped with in line or parallel motor

## STANDARD PLUS - ECS3

- Max axial force: 20,000 N
- Max speed: 1,300 mm/s
- Max stroke: 1,400 mm
- Roller screw
- Stepper and Brushless motor
- ISO 15552 compatible
- Sizes: 32-50-80
- Available square-shaped with in line or parallel motor



## POWER - ECS4

- ISO 6020
- Max axial force: 50,000 N
- Max speed: 800 mm/s
- Max stroke: 1,400 mm
- Roller screw and planetary roller screw
- Brushless motor
- Size: 80
- Available square-shaped with in line or parallel motor



# SERVO MOTORS - MBM

Diplomatic electric actuators can be equipped with both brushless and stepper motors and controlled by servo-drives depending on the design specifications defined together with you. If you already have a specific motor or if such motor is specifically required by the planned solution, we will be able to integrate it with our cylinder. Otherwise, we can offer a full range of servo-motors in order to provide a complete solution that can guarantee the best in terms of performances, reliability and efficiency. The MBM motors are sinusoidal three-phase brushless servo motors, with rare-earth permanent magnets. The possibility to make strong customizations, such as changing the mechanical flange design, the supply voltage or the choice of the feedback sensor, makes them suitable for several applications and able to connect with most of the controllers available on the market.

Here following are the main characteristics of Diplomatic Servo Motors:

Flanges	60-80-115-145 mm
Supply voltage	from 160 to 560 Vdc
Torque values	from 0.8 to 24 Nm
Poles number	6 for 60 and 80 sizes 8 for 115 and 145 sizes
Speed range	from 0 to 8000 rpm
Cooling	natural convection
Protection degree	up to IP 65
Operating temperature	from -20 to +40 °C



# SERVO DRIVES - SCJ

Duplomatic offers a complete range of drives that can be combined with brushless or stepper motors, as suitable complementary items to reach the best results without caring about further technical details.

## Here following the main characteristics of Duplomatic Servo Drives:

- Compact servo amplifiers for the complete motor range
- Torque, speed, and positioning control
- Uniform control interface over the complete product range
- In compliance with CANopen® DS301/DS402 standards
- UL approval (upon request)
- Programmable digital inputs and outputs
- 2 encoder interfaces (RS422, SINCOS, BISS®, HIPERFACE®)
- Digital set point input
- Automatic driving of holding brake
- Separated logic and power supply
- Fieldbus: RS232, RS485, CANopen®, EtherCAT®, ProfiBus, ProfiNet

	Single axis	Double axes
Max output power	from 1.4 to 10 kW	from 0.45 to 10 kW
Supply voltage	up to 400 Vac	
	up to 560 Vac	
Interfaces	RS232, RS485, CANopen®, EtherCAT®, ProfiBus, ProfiNet	



# TESTING

Quality is essential: all our products are carefully tested and controlled according to a detailed check-list. Our testing bench is at your disposal for tests and demos of a large variety of application solutions.

The bench has been internally developed thanks to the designing and control skills of the Electric Actuator Division. Its load capability is higher than 5 tons and is used to test Duplomatic electric cylinders for strength, endurance and maximum force validation. Its controlling software ensures duty cycle monitoring and supplies data for a complete analysis of the cylinder behaviour during the test.

This testing configuration (see picture) represents an example of the complete mechatronics range offered by the Electric Actuators Division: an electric cylinder with brushless motor, drive and position controller.

Duplomatic is the perfect choice for all equipment manufacturers and automation system developers in search for a partner technically capable of ensuring cooperation for the development, improvement and quality of their projects.

Testing bench equipped with POWER ECS4

- Axial force over 5 ton
- Planetary roller screw
- Brushless motor flange 145
- Servo drive 10 KW



# APPLICATIONS

Typical applications of electric actuators:

- harsh environments
- automotive
- sliding doors
- food & beverage
- railway maintenance
- wood processing
- packaging
- dosing machines
- pharmaceutical
- blow moulding
- wind turbines



# GROWING TOGETHER



**DIPLOMATIC**  
ELECTRIC ACTUATORS

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