

MECHATRONICS

ELECTRIC GRIPPING SYSTEMS AND SENSORS



Clamps, rotary actuators, tool changers, and sensors to optimize production processes and reduce consumption.

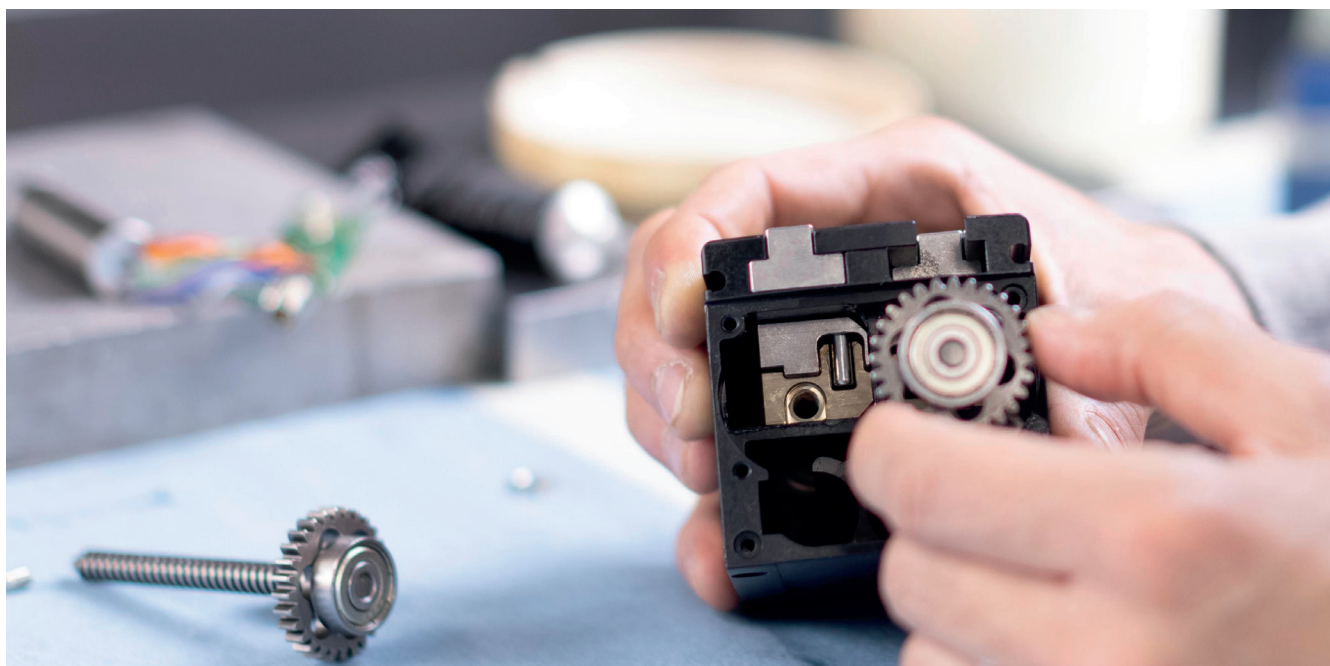


Electrical solutions for your applications

Since 1987, Gimatic has started investing in the electrical sector, to be competitive in the market and offer a wider range of products.

Gimatic electric grippers are available in a wide variety of sizes and configurations. This allows customers to choose the right gripper for their specific application.

Gimatic electric grippers are distinguished by high performance and energy efficiency, ensuring rapid and precise object gripping and release. Thanks to their reliability and reduced maintenance needs, they offer a flexible and versatile solution, ideal for various applications such as assembly, packaging and material handling, and many others.



Main features:

1 Gimatic's various plug & play electric product models ensure the workpiece is held even in the event of a power failure, increasing safety while reducing energy costs and environmental impact.

2 We offer various standard electrical products, but we are open to customizations based on customer needs, such as modifying performance or customizing gripper fingers.

3 Gimatic invests heavily in research and development. This allows Gimatic to stay ahead of the competition and develop new and innovative automation technologies.

Wide range of products

The Mechatronics department is responsible for the development of electric grippers.

The grippers are categorized into Plug&Play and Servo series; they are tested and configured at Gimatic's headquarters to ensure maximum quality and durability. In fact, every gripper is guaranteed for 10 million cycles.

In addition to grippers, the department develops automatic tool changers and accessories, such as: drives, sensors, GMP-rated covers, rotary units, and cobot kits.



Main Industries:



AUTOMOTIVE



FOOD&BEVERAGE



PHARMACEUTICAL AND MEDICAL



COLLABORATIVE ROBOTS



ASSEMBLY MACHINES



AEROSPACE



Plug&Play Electric Grippers



Plug & Play electric grippers stand out for their ease of use and **energy efficiency**: a **simple digital command** is all it takes to open or close the grippers, and the motor consumes energy only during movement. This means that, once the part is gripped, the gripper consumes no energy, ensuring significant savings.

Parallel Grippers:

Parallel grippers can be used in many applications, as it **is possible to create custom fingers** to adapt them to the different shapes of the parts.

Angular Grippers:

Angular grippers are **used to grip an off-center object or to create a wider opening** thanks to their angular stroke.

MPLM



MPPM



MPXM



MPBM



- **No electricity consumption** when the gripper is gripping.
- Guaranteed **position holding in case of blackout**.
- Brushless motor with long electrical life (**Brushless DC**).
- Motor drive incorporated in the gripper.
- **24 Vdc** low voltage power supply.
- **M8x1**, 3-pin standard connection.
- Controllable by PLC like a pneumatic valve.
- **Self-centering mechanism**: adapts to any workpiece size between the jaws.
- Maintenance-free for **10 million cycles**.
- **T-slot jaws** for heavy loads.
- Compatible with rotary actuators.
- Optional magnetic sensors.
- 4-pin versions available for force regulation or peak output.

Rotary Grippers:

COMING SOON

We are developing rotary electric grippers to combine gripping and rotation in a single device. The gripper is digitally controllable for both gripping and rotation actions and integrates feedback signals for precise and reliable monitoring.

MREG



- Gripping and rotation are two **independent movements**.
- Optional: mechanical limit switches for 0-180 degree rotation.
- **I/O control** logic.
- Integrated feedback on both rotation and gripping.
- Integrated absolute encoder for angular position detection.
- No consumption when motors are off (part gripped).
- Error diagnostics.



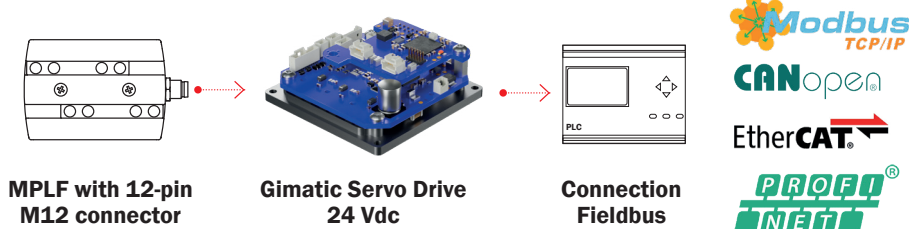
Servo Electric Grippers

Thanks to the use of a drive, these grippers allow for the implementation of position, speed, and force controls, as well as any other customizable control algorithm.

MPLF



- **24 Vdc** brushless motor
- Integrated ABZ incremental encoder
- External drive required: possibility to use the Gimatic drive with position, speed, and force control.
- The fieldbus used depends on the chosen drive



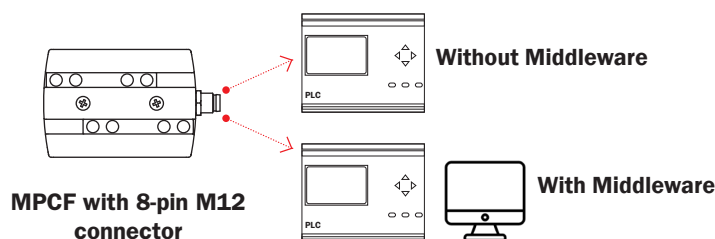
MPLF Operation

The gripper is equipped with a **12-pin M12 male connector** for power supply and connection of feedback signals (HALL sensors and incremental encoder) with external electronics.

MPCF



- **24 Vdc** brushless motor
- Integrated linear absolute encoder on the grippers
- Integrated **CANopen** drive with dual **CANbus** and **RS-485** serial interface
- Two operating modes: as a generic device compliant with the **CANopen DS-402** standard or via **Gimatic middleware** where an external master activates predefined macros stored in the gripper during the setup phase.
- **Smart interface** for Windows PC for setup, testing and recipe parameterization



MPCF Operation

The gripper can be used in two modes:

- **With Gimatic Middleware:** for testing, configuring and using the gripper in a simplified way. The middleware is based on predefined macros that can be easily called by an external master. Possibility of using a Smart interface for Windows PC to configure and store movement recipes.
- **Without Gimatic Middleware:** The gripper is used in real-time as a generic device compliant with the CANopen DS-402 standard for high-performance applications.



COMING SOON

IO-LINK Grippers



Gimatic offers electric grippers compliant with the **IO-Link** standard. They are slave devices ready to be connected directly to a master. These grippers are equipped with integrated sensors and allow the control of fundamental parameters such as gripping **force** and **gripper position**. The monitoring and diagnostics guaranteed by the IO-Link protocol allow to **optimize predictive maintenance**, reducing downtime. Furthermore, the simplicity of installation and configuration ensures less wiring, **greater efficiency** and **a wide adaptability** to any system.

RPPE



- Grippers with **IO-Link** protocol for data exchange
- Parallel grippers, including long-stroke (up to 150 mm)
- Integrated position sensors
- Ability to **adjust gripping force** and control grippers in position
- **No consumption** when the motor is off
- **Error diagnostics**



GMP Gripping Solutions Kit

Gimatic electric grippers **can operate in environments characterized by high standards of cleanliness and hygiene** thanks to the integration of the **KIT-GMP**. An adapter allows the electric gripper to be attached to a robotic interface (not included) and to protect its operation by means of a sterilizable silicone cover.

GMP



- Wacker **Silpuran®** silicone cover, compliant with **FDA 21 CFR 177.2600** and approved by FDA/EHEDG.
- It is compatible with **MPPM/MPXM/MPLM grippers**, which differ in stroke length and gripping force to meet the needs of different customers.
- The GMP kit can also be used with **MPLF/MPCF servo grippers**.
- Thanks to the transparent cover, the LEDs of the internal sensors are easily readable.
- Hygienic design surfaces that **prevent bacterial growth**.
- Easy fixing of gripper fingers with **anti-rotation system**.

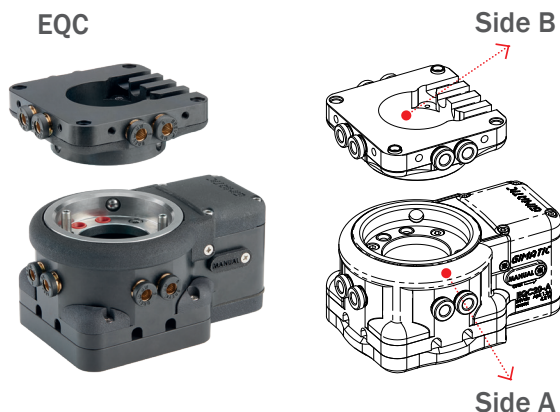
- Compatible with cleaning procedures using hydrogen peroxide (VHP-H2O2) and UV.
- Gimatic GMP kits are certified by the Fraunhofer IPA Institute in Stuttgart.
- IP65 protection rating.
- GMP class A/B





Electric Tool Changer

Quick changers are used to **minimize tool changeover times**. Gimatic offers automatic electric quick changers driven by an **integrated electric motor**. They are **plug-and-play** devices and therefore do not require any drivers. EQC (Electric quick changers) are equipped with integrated air channels and optional modular electrical connectors.



The EQC electric quick changer family is available for applications with automatic tool element change.

The system **consists of an active part (side A) and a passive mechanical plate (side B)**. The active part is usually connected to the robot wrist, while one or more flanges are connected to the interchangeable gripping elements.

Optionals

- RMAQC05/RMBQC05 (8 pins for EQC05)
- RMAQC/RMBQC (32 pins for EQC20 and EQC100)
- RRAQC/RRBQC (RFID identification modules and 16-pin electrical connection module for EQC20 and EQC100)



- Fully **automatic version**.
- Designed for collaborative robot applications.
- **Optional ISO 9409 flange** for direct robot interface.
- Power cable with **8-pin M8x1 connector**, 200 mm length for direct connection to the robot wrist.
- **24 Vdc** low voltage power supply.
- Up to **6 user pneumatic connections**.
- **Optional electrical connectors** to be placed in the through center hole.
- 3 different sizes: EQC05, EQC20, EQC100 **with payload up to 100kg**.

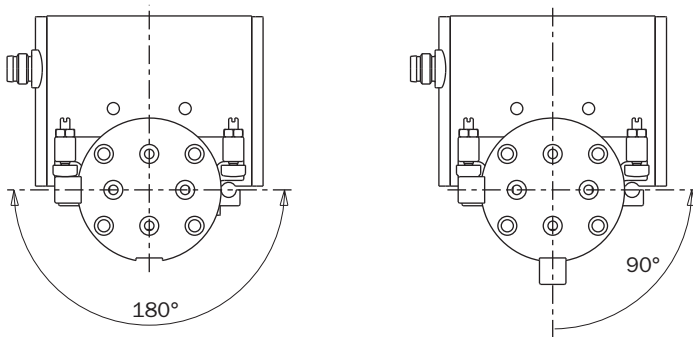
Electric Rotary Units

Rotary units are used to achieve a rotary movement of 90° or 180°. The Gimatic MRE electric rotary unit has the same operating principle as the Plug&Play electric grippers: it can be controlled by a digital command and does not require any drive.

MRE

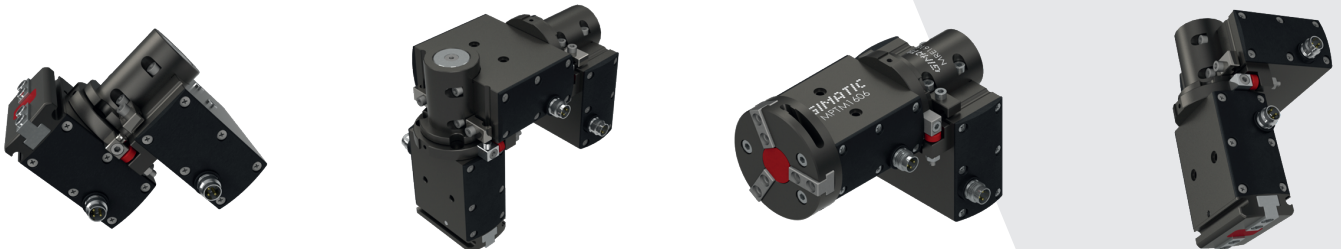


- **No electricity consumption** when the actuator is in position: guaranteed **position holding in case of blackout**.
- Integrated long-life brushless motor (**Brushless DC**).
- **24 Vdc** low voltage power supply. Standard **M8x1, 3-pole** connection. Controllable by PLC like a pneumatic valve.
- **10 million cycles** maintenance-free.
- Compatible with Gimatic electric grippers.
- Optional inductive sensors.



Rotation Angle

- MRE electric rotary actuators are capable of rotating 90° or 180°.





Sensors

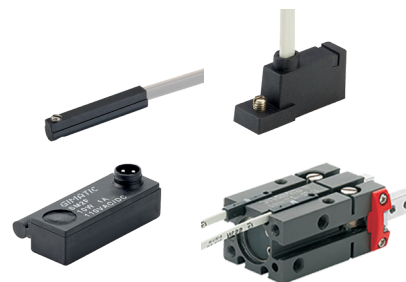
Sensors for EOATs: a world of possibilities.

Our team of experts has developed a wide range of sensors to complete our solutions, offering a variety of functions that allow the robots to adapt to any task **precisely** and **safely**. The sensors allow precise detection of the gripping fingers in relation to the object to be grasped, ensuring an accurate and secure grip.

Magnetic Sensors

Developed for applications on Gimatic components and industrial cylinders.

- REED and GMR technology
- Output PNP/NPN, 2 wires, and analog
- C,T, Dovetail slot and Tie-Rod cylinder suitable
- Full range of brackets and adapters
- Cable, M8 and M12 connector output



Pro Sensors

Developed for Gimatic products where sensor mounting space is limited and multiple monitoring signals are required.

- 3 outputs in a single sensor
- Programmable outputs
- 3 switching points
- PNP or NPN outputs
- NO/NC settable output
- Cable or M8 and M12 connector outputs
- Available in IO-LINK version



Inductive Sensors

Used to maximise reading precision and to operate in the presence of external magnetic fields (which prevent the normal use of magnetic sensors).

- Detect metal component presence on the assembly line
- Determine end position of linear actuators
- Measure the fill level of metal containers
- Diam. 3/ 4 mm available
- 1mm nominal sensing distance
- PNP/NPN output
- PUR cable output



Vacuum Sensors

Used to monitor the achievement of the desired vacuum level when the suction cup is in contact with the object and for diagnosing the vacuum system's operation.

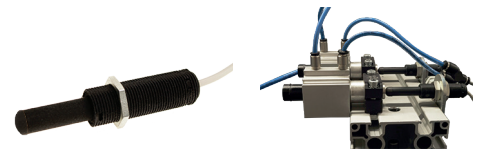
- Monitor and regulate vacuum for automated object handling
- Regulate vacuum during package sealing process
- Monitor vacuum for pneumatic material transport
- Monitor and maintain vacuum in tanks and storage environments



Touch Sensors

Designed to detect touch or pressure in applications requiring monitoring or control of physical contact between two surfaces or objects.

- Detect the presence or position of components or objects on production or assembly lines
- Detect the end position of linear or rotary actuators, ensuring stopping at the desired point
- Monitor the force applied during the fastening of sensitive components, preventing damage due to excessive pressure
- M14x1 mm reed switch
- Soft head to avoid damage to the product
- Detecting stroke range 2.5÷15 mm



Optical Sensors

Optical sensor, designed to detect the presence of objects in industrial environments.

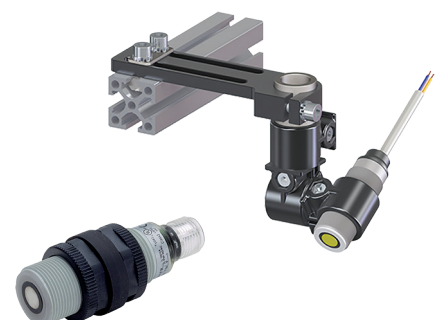
- Detect the presence of objects passing along a production line
- Monitor the position of components during the assembly process
- M18x1 mm photoelectric sensor
- 100 mm sensing distance
- PNP/NPN output



Ultrasonic sensors

Used to identify the piece via ultrasound, enabling measurement of the distance to the piece.

- Measure the fill level of a food-grade tank
- Detect object presence or absence on a production line conveyor
- M18x1 mm ultrasonic sensor
- PNP/NPN NO/NC output
- 40-300 mm sensing distance
- Lightweight technopolymer body
- Easy installation and versatile use





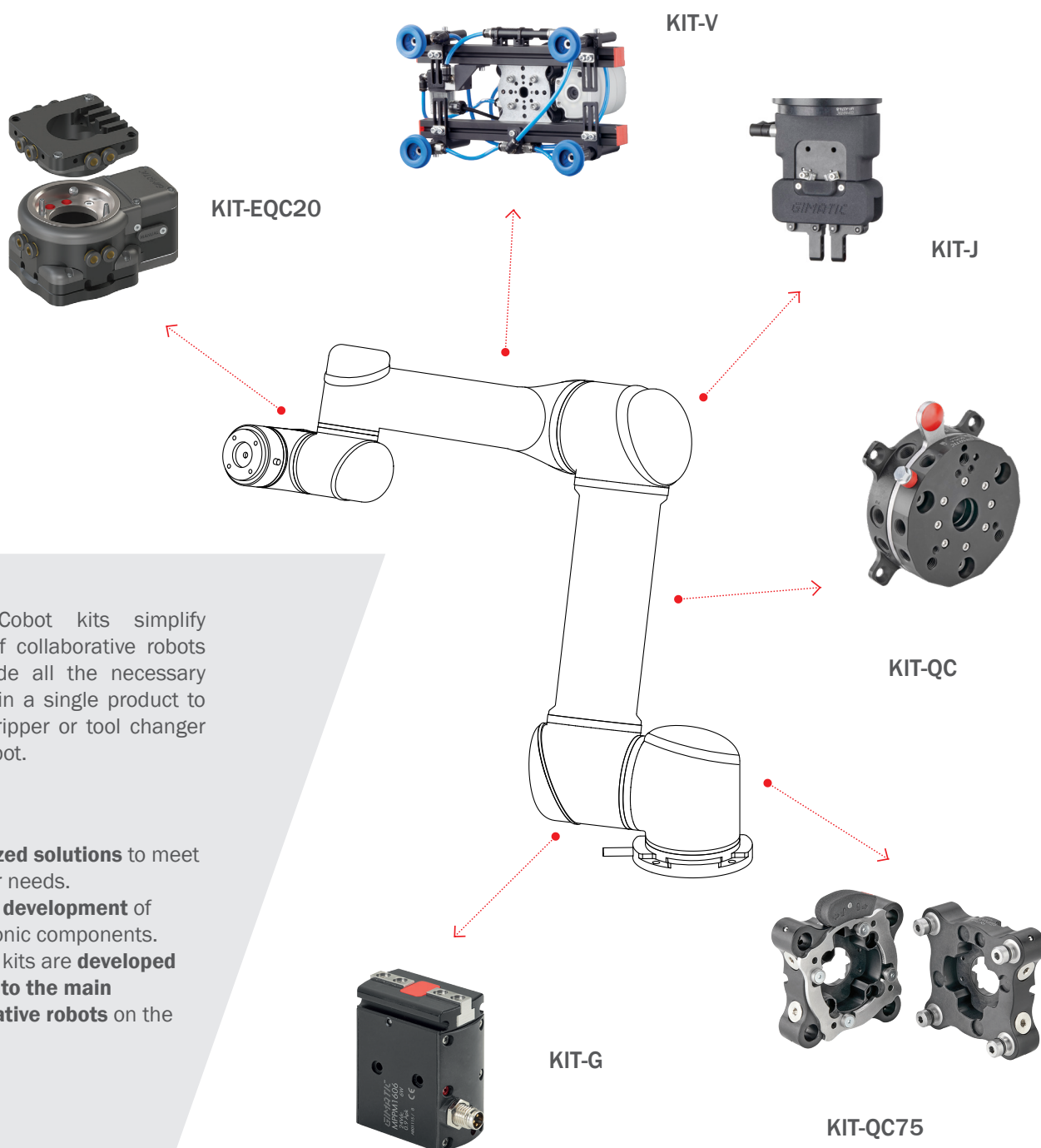
Cobot Kit



Gimatic creates specific solutions for collaborative robots, consisting of **Plug & Play kits**, complete with **plug-in software**. The range includes **collaborative grippers and tool changers**.

All Gimatic Cobot kits have common peculiarities:

- They include all the hardware necessary to instantly connect the kit to the specific cobot.
- They include plug-in software for easy and immediate installation and control of the device.
- Electrical cables along the Cobot arm are eliminated.



Gimatic Cobot kits simplify the use of collaborative robots and provide all the necessary elements in a single product to use the gripper or tool changer on the Cobot.

- **Customized solutions** to meet customer needs.
- **In-house development** of mechatronic components.
- All Cobot kits are **developed to adapt to the main collaborative robots** on the market.

CapBox - Capacitor Box

The Capacitor Box allows the correct operation of Gimatic electric grippers in all cases where the power supply is limited (e.g., some collaborative robots that do not have enough power at the wrist).

CAPBOX



- **2 models available** (one for plug and play grippers size 16 and 25, one for size 32).
- **Compact dimensions.**
- Integrated connection of power supply, command signal and additional I/O.
- Plug & play connection with **standard 8-pin M8 connectors and 3-pin/4-pin M8 angled connectors** (depending on the gripper version chosen).



Connessioni Elettriche

- The Capacitor Box circuit has an input side and an output side. The input side allows to connect the power supply, the command signal and the auxiliary I/O through an M8-8 pin female connector. The output side allows direct connection with 3 or 4 pin Plug & Play gripper models. The default configuration is with both input and output command signals in NPN version.
- The user can customize the configuration by simply changing the electrical connections.



**Engineering Beauty.
Automating the World.**





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