Metal Work Mechatronics

50 YEARS 1967•2017

METAL WORK® PNEUMATIC

Metal Work.
A leader in pneumatic automation for 50 years

Metal Work has its roots in traditional mechanical engineering and has grown over time following natural technological development. Today, the Metal Work Group comprises R&D and production units that are equipped with fully-fledged automated systems.

Metal Work Mechatronics is the result of a half-century of experience in the design and manufacture of top quality innovative components, the synthesis of latest-generation technologies and services applied to industrial automation.

The team of the Metal Work Mechatronics consists of engineers and companies belonging to the Metal Work Group that have pooled their expertise to offer the world of automation and automated mechanical engineering a wide range of products and advisory, design and assistance services gauged to meet customer specific requirements.

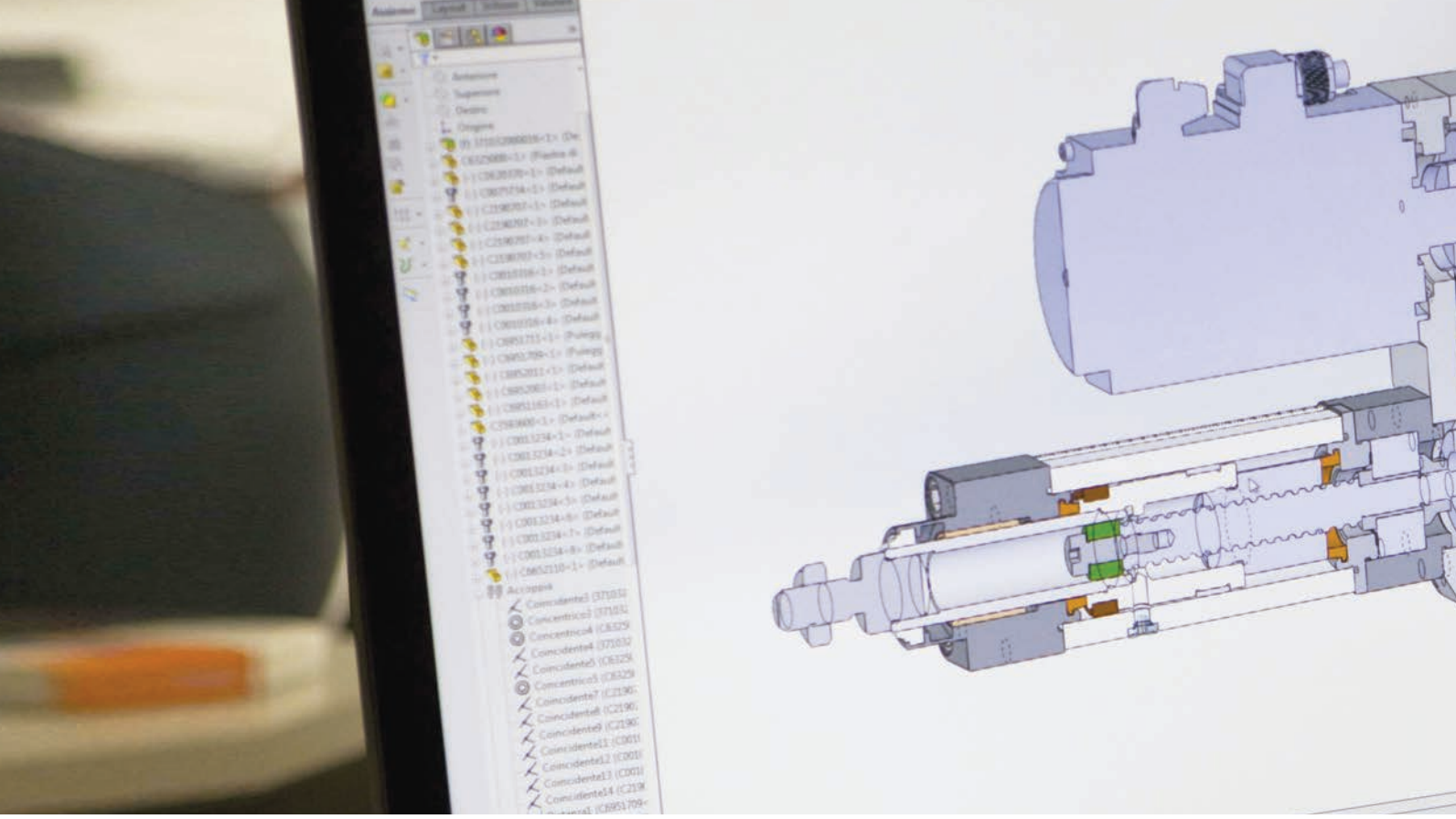
Metal Work has been synonymous with the manufacture of pneumatic components for 50 years.

Air treatment units

Fittings and accessories

Pneumatic, electropneumatic, mechanical valves

Pneumatic and electrical actuators



Metal Work Mechatronics:
know-how and synergy at your service

Metal Work Mechatronics encompasses the expertise and solutions developed by the companies belonging to Metal Work Group.

Alfameccanica

The flagship of the Metal Work Group, Alfameccanica produces component parts for the handling industry, and over the years it has developed its own range of products, including grippers, actuators and guide units for cylinders - all featuring premium quality, top performance and accurate design.

The product range has recently been complemented and extended by V-Lock products, the brainchild of effective cooperation with the Swiss company Montech, a historical brand in the production of component parts for the handling industry.

The range of standard product is completed by the series of special actuators that are designed and developed to meet specific customer requirements, using special superior quality aluminium alloys or stainless steel.

Fluid Force

Fluid Force comes in where pneumatics encounters hydraulics. This dynamic business boasts decades of experience in the design and production of hybrid air-oil component parts. Hydraulic brakes used to regulate the motion of pneumatic, in-line and rotary actuators are a good example.

Over the years, Fluid Force has developed a series of complementary products, such as air-oil pumps or air-oil pressure multipliers.

The top mechanical skills and the high level of precision have made Fluid Force a benchmark in the Metal Work Group for the assembling of electric cylinders equipped either with standard motors or special motors.

SPMC

SPMC is the company in the Group that designs and develops assembly machines that are used by Metal Work to make its own components.

The Group's expertise and the entire range of products are accessible to customers and are continuously tested and assessed directly in the field. Skilled engineers carry out in-process analyses on a regular basis to improve the quality and performance of each component of the machines that are designed and developed in house.

PService and Metal Work

The technical expertise and customer service at Metal Work goes well beyond the production units. The Group's team of mechanical engineers and sales network, consisting of 46 PService branches in Italy and worldwide, have an in-depth knowledge of the product and its applications that is fuelled by in-field data acquired day after day and supported by latest-generation IT tools, such as CRM.
The extensive know-how of the sales network provides active support for the design, development and operation of pneumatic panels and hydraulic control units, as well as the design and installation of electronic control systems (system integrators) directly at customers' premises.

Products / Electric cylinders

Elektro cylinders

Elektro ISO 15552 cylinders are characterised by a connection interface complying with the relevant standard.

The piston rod extension is controlled by a system with a hardened screw and recirculating ball screw nut. The piston has a guide strip calibrated to reduce to a minimum the play and vibration during rotation of the ball screw.

This cylinder can be equipped with a built-in non-rotating system. The piston comes with magnets and the barrel has longitudinal slots for housing sensors. The piston rod has an increased outside diameter and thickness to make it extra rigid and more resistant to radial and peak loads.

A system for greasing the screws is incorporated in the cylinders and numerous standard accessories can be used for their installation, including an intermediate hinge. The motor can be selected from an optimised range, which encompasses both STEPPING and BRUSHLESS motors. Special adaptor flanges, joints and drive systems can be provided if the customer wishes to use a particular brand of motor.

Elektro cylinders are available in sizes 32, 50, 63, 63 HD (heavy duty, for high loads), 80 and 100.

Round DC cylinders

Round DC cylinders are the ideal solution for applications requiring the control of speed, thrust and acceleration. The DC motor is powered 12V DC or 24VDC and is actuated by a simple On-Off control. It is designed for alternate "work-rest", non-continuous operation.

The main differences compared to the Elektro ISO15552 are:

- Reduced size
- Limited load capacity
- DC motor instead of STEPPING or BRUSHLESS
- Non-programmable speed and acceleration

Given the high standard of quality of manufacture and materials, this cylinder is mainly used in industrial applications.

Products / Electric axes

Shak

The Shak belt-driven electric axis features excellent manufacture and a sturdy anodised aluminium extruded profile that ensure optimal rigidity. The slide is moved by means of adjustable castors running along hardened and tempered guides.
The slide is driven by a reinforced belt that is connected to the motor.

The Shak axis can mount either BRUSHLESS or STEPPER motors. The versions with a BRUSHLESS motor can be equipped with a speed gear unit, when you want to make of the most of the available torque.

Nozzles are also mounted on the moving plate for easy lubrication of the guides.

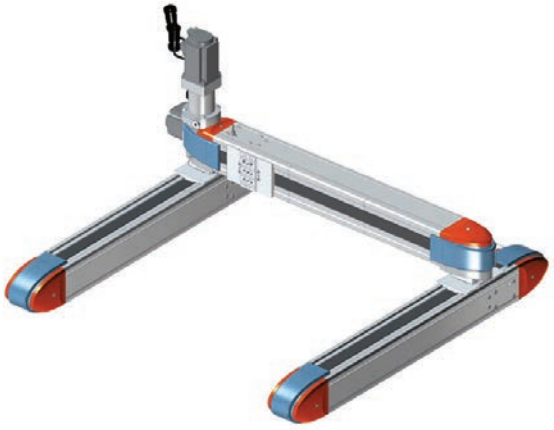
The extruded profile and the moving plate are fitted with a V-Lock interface with a dovetail for the easy fixing of the axis and other components, using QS or K elements.

In addition to standard drives, other brands of motor can be mounted if the customer so wishes. The homing position is identified by an inductive sensor included in the supply.

Two different sizes are available, SHAK 340 and SHAK 470, with pre-set standard strokes. For each size it is possible to choose the side on which to mount the motor (4 positions). A version with a smooth tree-type output, mounted in a pre-set position, is also available.

The cylinder can be mounted both horizontally and vertically. With vertical installation, it is advisable to use motors with a holding brake that only activates in the event of a power failure but not when there is a motor overload. For the correct operation of the brake, it is necessary to meet the limits required by the axial load curves according to the speed.

Among the accessories available there is a cable guiding system with a handy cable channel and bracket.



Shak Gantry

The Shak Gantry system is designed to form a portal made up of two parallel axes (drive X-axis and driven X-axis) surmounted by a transversal axis (Y-axis). Both axes are connected one to the other by means of an anodized aluminium shaft and two flexible couplings that compensate for any minor misalignments.
The shape of both the couplings and the drive shaft is designed to facilitate disassembly.

The carriages of the drive axis and the driven axis (both with a V-Lock interface featuring a typical shape and grooves) move synchronously thanks to the drive shaft.

On the extruded body of both axes, the typical V-Lock dovetail is provided for easy fixing to the support structure, using QS elements.

The motion is the same as with the SHAK single axis and has the same advantages.

A Brushless motor with speed gear has been adopted as it ensures optimal load capacity without sacrificing the dynamics and speed performance typical of this product.

In addition to the standard drives proposed in the catalogue, the cylinder can be customised with the installation of other makes of motor. The homing position is identified by an inductive proximity sensor included in the supply.

Two sizes area available, SHAK GANTRY 340 and SHAK GANTRY 470, with standard pre-set strokes. For each size, it is also possible to choose on which side to mount the motors (RH or LH).

The SHAK GANTRY portal was designed and optimised for horizontal installation. On request, the motors can be supplied with a holding brake, which activates only in the event of a power failure but not when there is a motor overload.

Among the accessories available there is a cable-guiding system with a handy cable channel and bracket (in the version with motors on the left-hand side).

Products / Electric axes

Svak axis

The SVAK can be used as the Z-axis on the Cartesian portal. This belt-driven rodless electric actuator is characterised by the fact that the motor and reducer unit is integral with the carriage, instead of being fitted to one end of the extruded section on which the carriage slides. This solution is known as "cantilever". In the typical application, the carriage is fixed while the extruded section moves.

The SVAK can be used either horizontally or vertically, but the most common use is in vertical applications, which explains why the motor is supplied complete with a brake that causes the axis to remain still even when it is not electrically powered.

The SVAK uses the universal V-Lock modular system for fixing the carriage to external auxiliaries and the various components to one end of the extruded section.

The sides of the extruded section, which is made of anodised aluminium, houses two hardened and ground guides that slide on adjustable wheels that are integral with the carriage. The carriage is moved by a toothed belt, complete with a tensioning system. Guide lubrication nozzles are also provided on the carriage.

The Svak axis uses a Brushless motor with a toothed belt 1:2 gear speed reducer for the pulleys. This design was opted for because it ensures excellent load capacities without sacrificing the typical dynamics and speed of this product.

In addition to the standard drive proposed in the catalogue, it is also possible to customise the cylinder by using other motors. The homing position is detected by an inductive proximity sensor included in the supply.

A cable guiding system with cable-carrying chain and mounting bracket is also available on request as an accessory.

SK axis

The SK is an electric axis without screw-driven piston rod, with V-Lock interface. The cylinder frame is made of extruded solid aluminium, which gives the cylinder optimal torsion and flexural rigidity.

The carriage features an interchangeable fixing interface plate, which is available with V-Lock axial or V-Lock orthogonal ports or in the blank type for custom solutions.

The carriage is driven by two sturdy pre-loaded ball recirculation bearings that ensure great accuracy of movement, which is generated by a system consisting of a hardened and tempered screw and a ball recirculation lead nut. The screw is pre-stressed with an elastic load device by means of cup springs in order to reduce noise level and vibration and extend the useful life of the system.
Threaded holes for the lubrication of the guides and ball recirculation screws are provided on both sides of the carriage.

A series of slots for the fixing of the magnetic sensors are provided on the two sides of the barrel.

BRUSHLESS and STEPPER motors can be mounted on this axis, with optional motor brake or built-in encoder. The cylinder can also be supplied without motor drive or, on request, with modules for interfacing with other motor brands.

The motors can be mounted in line with the barrel or geared using toothed belt transmission gears.

BK axis

The BK is an electric axis without belt-driven piston rod, with V-Lock interface. The cylinder frame is made of extruded aluminium with an optimised shape, which gives the cylinder maximum rigidity and a slim outline.

The typical V-Lock dovetail on one side of the extruded section is provided for easy installation, using QS elements.

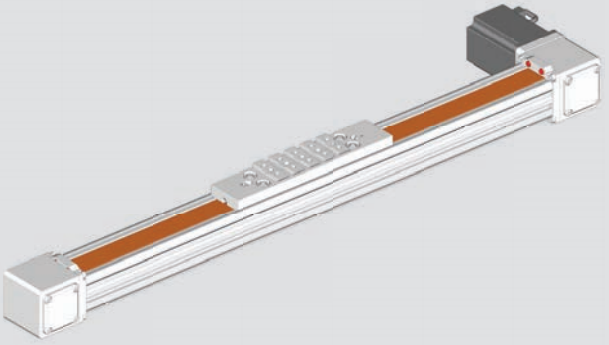
The following carriage guide systems are available, depending on the end user's requirements:

- heavy-duty, the carriage is driven by two sturdy pre-stressed ball recirculation slides that ensure the highest precision of movement;

- lightweight, the carriage is driven by technopolymer castor wheels, fixed onto bearings with an adjustable play.

The carriage is driven by a polyurethane-loaded belt.

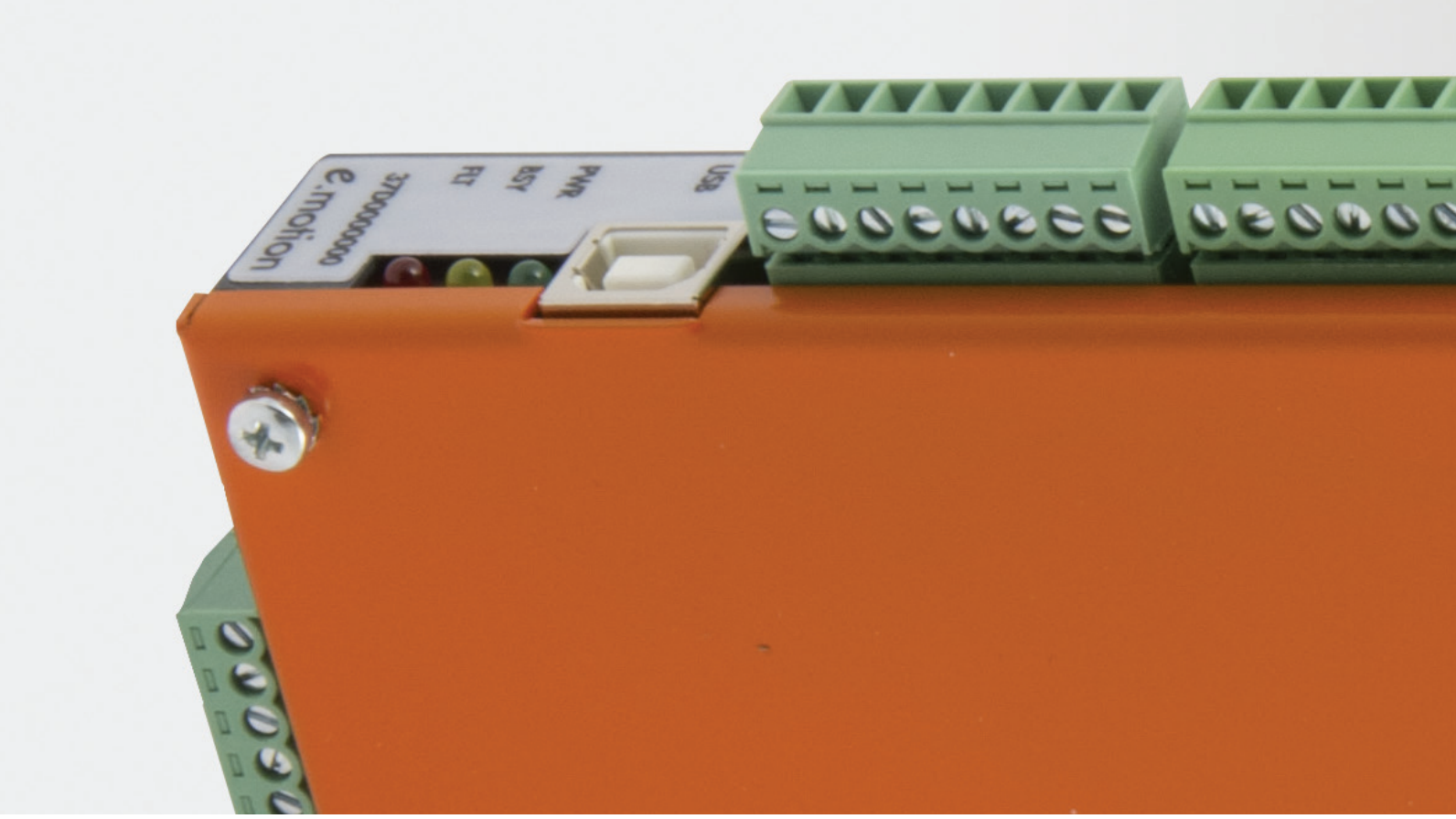
A slot for the fixing of magnetic sensors is provided on the two sides of the barrel.



Various BRUSHLESS and STEPPER motor drives are available, with optional motor brake.

The cylinder can also be supplied without motor drive or, on request, with modules for interfacing with other motor brands.

The main feature of this axis it that it can reach speeds as high as 10 m/s!



Products / Control devices

eMotion

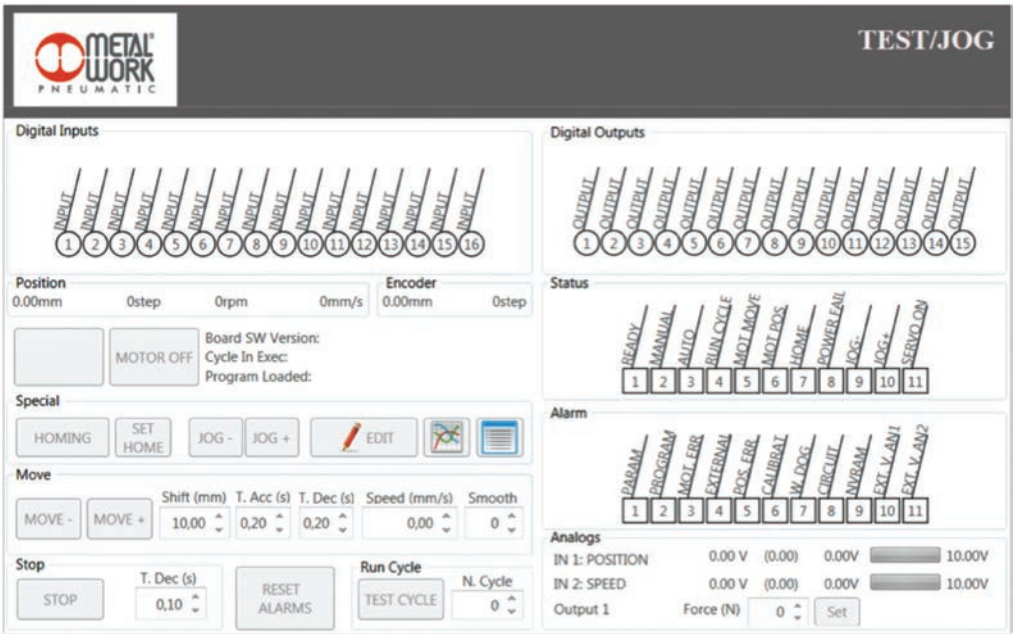
eMotion is an electronic programmable device designed to control electric pulse train motors, for either brushless or stepper motors.

This is the ideal solution for customers who are not familiar with programming or for applications where PLC control is not available.

Using an easy, intuitive user interface and a simple yet comprehensive programming language, with eMotion you can fully control any electric axes, regardless of whether Metal Work motors or other makes are used.

eMotion hardware and software have been entirely developed by Metal Work, which allows full customisation and adaptation to all possible user requirements.

The special sizing software used by our engineers makes it possible to offer the customer personalised advice on choosing the best suitable axes among those offered by Metal Work, as well as full assistance in developing the eMotion software, by providing all the information required to start up the application.


TEST/JOG
Digital Inputs
INPUT 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Digital Outputs
OUTPUT 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Position
0.00mm 0step 0rpm 0mm/s
Encoder
0.00mm 0step
MOTOR OFF
Board SW Version:
Cycle In Exec:
Program Loaded:
Status
READY MANUAL AUTO RUN CYCLE MOT MOVE MOT POS HOME POWER FAIL JOG- JOG+ SERVO ON
1 2 3 4 5 6 7 8 9 10 11
Special
HOMING
SET HOME
JOG -
JOG +
EDIT
Alarm
PARAM PROGRAM MOT FBK EXTERNAL POS FBK CALIBRAT W. DOG CIRCUIT NVRAM EXT V AN1 EXT V AN2
1 2 3 4 5 6 7 8 9 10 11
Move
MOVE -
MOVE +
Shift (mm) 10,00
T. Acc (s) 0,20
T. Dec (s) 0,20
Speed (mm/s) 0,00
Smooth 0
Analogs
IN 1: POSITION 0.00 V (0.00) 0.00V 10.00V
IN 2: SPEED 0.00 V (0.00) 0.00V 10.00V
Output 1 Force (N) 0 Set
Stop
STOP
T. Dec (s) 0,10
RESET ALARMS
Run Cycle
TEST CYCLE
N. Cycle 0

Products / Actuators

In a typical automated mechanical engineering application, our cylinders and electric axes are a perfect complement to our range of grippers, in-line axes and pneumatic rotary actuators.

Metal Work offers a full range of slides, guided in-line actuators, two- or multiple position rotary actuators, two- or three-jaw parallel or angle grippers.

In-line actuators

Among in-line actuators, worthy of mentioning are our compact cylinders on bronze guide, ball recirculation bushes or sleeves, which are available in the version with or without cushioning; the guide units for ISO 15552 cylinders or 6432, with pneumatic, elastic or hydraulic stops.

Flat slides type S10, S11 and S12; precision slides S13 and S14; rodless cylinders with ball recirculation guide and shoe.

CMPGK compact guided cylinder

GD-K V-LOCK guide unit

S13 slide

LEPK Quick & Place

Rotary actuators

Moving on to rotary actuators, our robust, powerful R1s, for torques up to 120 Nm are worth mentioning.

Or again our R3 rotary actuators, with spring stops or shock-absorbers.

Not to mention the DAP-Ks, which offer the possibility of using 4 adjustable stop positions.

R1

R3

DAP-K

Products / Grippers

Metal Work production comprises a wide range of grippers:

- parallel with two parallel jaws: P1, P2, P3
- for long strokes: P4 and GPL-K
- with three parallel jaws: P12
- with two hinged jaws: P7
- toggle type: P9

P1

P2

P3

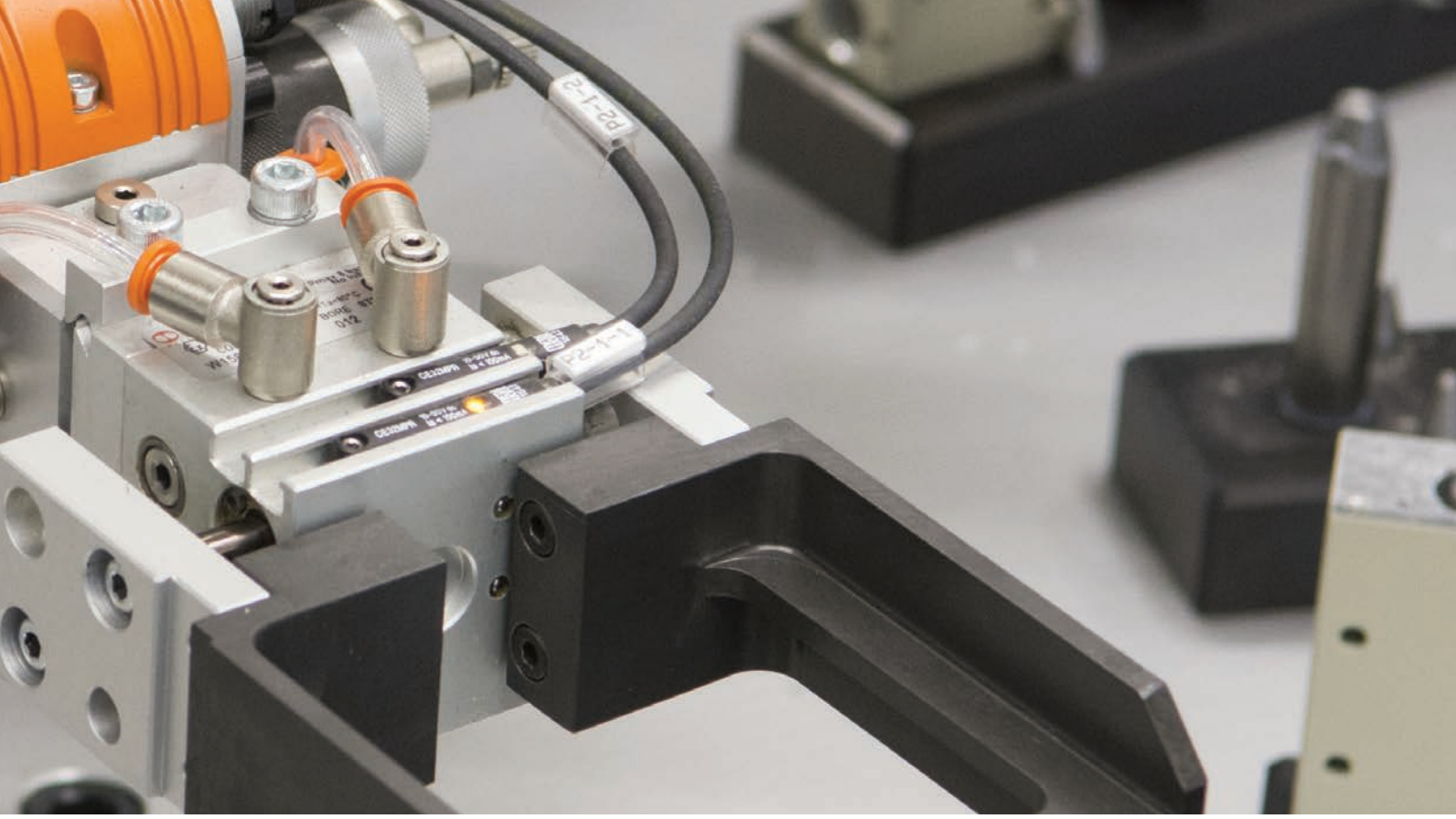
P4

GPL-K

P7

P9

P12



Custom products

Alfameccanica turns out thousands of custom products made of either aluminium, alloy steel or stainless steel, which are studied jointly with the customer according to specific requirements.

Compact guided cylinder

Compact multi-fixing cylinder

Cylinder ⌀ 125 with piston rod 60

Short stroke mini

Compact mini

Stopper

Products / EB 80

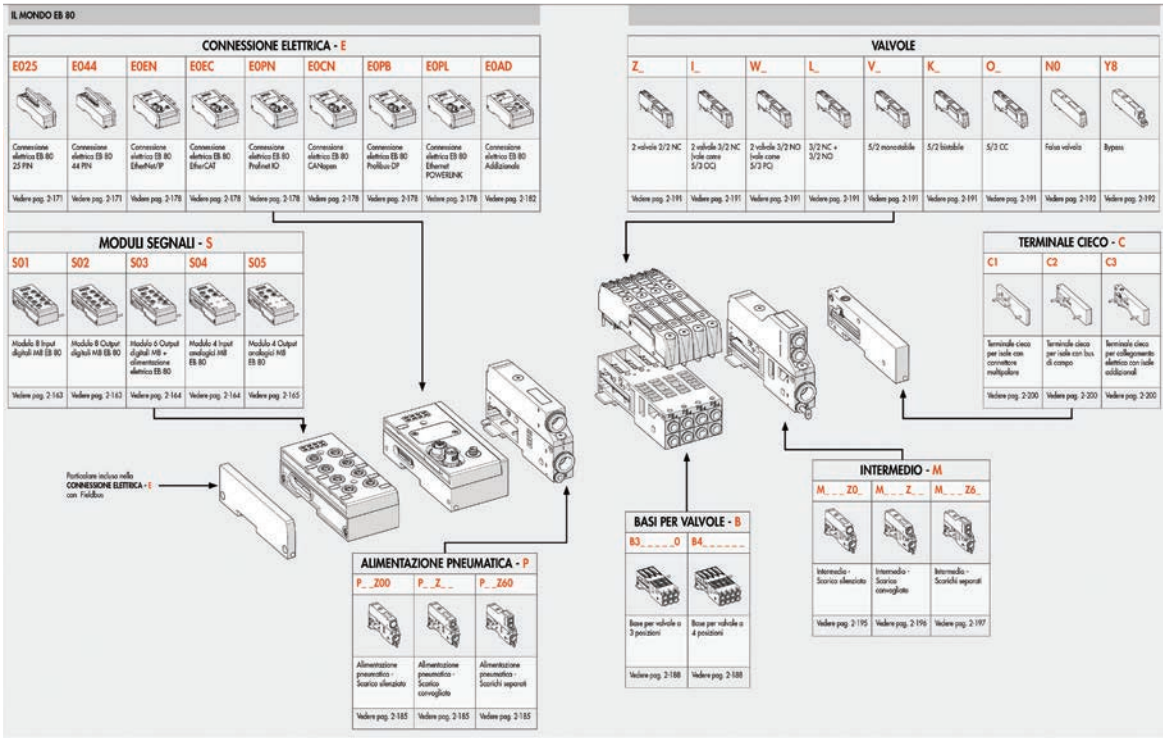
Driven by customers, designed by Metal Work

The EB 80 is the result of lengthy research aimed at understanding customer needs and converting them into solutions. It is an electro-pneumatic system that encompasses solenoid valves, power supply, digital or analogue input or output signal control in a single unit.

The EB 80 can accommodate multi-function pneumatic solenoid valves with connections in the diameter range of 4, 8 and10 mm. Flow rate up to 1200 Nl/min (ø 10). The maximum number of controls for valves is 38 with electric multi-pole connection, and 128 with field bus connection. The signal management modules can handle up to 128 DI+128 DO+16 AI+16 AO. Patents and utility models ensure protection of the most innovative solutions.

The EB 80 stands out for the quality of materials used and accurate manufacture, which results in a highly reliable product. It is very easy to configure, which makes it a highly customisable solution.

- Reliability
- The environment and energy saving
- Customisation
- Warehouse and spare parts management
- Certifications
- Maintenance
- Performance
- User interface and use
- Product range


IL MONDO EB 80
CONNESSIONE ELETTRICA - E
E025
E044
E0EN
E0EC
E0PN
E0CN
E0PB
E0PL
E0AD
MODULI SEGNALI - S
S01
S02
S03
S04
S05
VALVOLE
Z_
I_
W_
L_
V_
K_
O_
N0
Y8
TERMINALE CIECO - C
C1
C2
C3
INTERMEDIO - M
BASI PER VALVOLE - B
ALIMENTAZIONE PNEUMATICA - P
P_ _Z00
P_ _Z_ _
P_ _Z60

Customer service

Extensive know-how and Metal Work Mechatronics's vast range of products combine ideally in providing top-level advice and customer service, both on the telephone and on site.

Our primary objective is to assist our customers in conceiving products and solutions that meet their requirements, whether it be a simple component, a motor or a compound system, such as the EB 80.

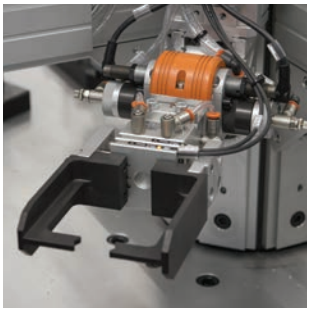
After-sales service is also guaranteed. A team of qualified service engineers, who use modern diagnostic and development tools, assist the customer on site or online during the commissioning of a machine or a system.

Training courses are regularly provided for our staff on various matters, especially on latest-generation products. Metal Work also organises in-house and external training and refresher courses for production plants and schools.

Our test laboratories are accessible to our customers for carrying out specific tests and the simulation of new applications.

Applications

Metal Work Mechatronics is a market player with specific skills in all industrial sectors dealing with automated mechanical engineering.
Some of the numerous applications developed by our customers and co-engineered with our team of experts are shown here by way of example.



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