

HIGH PERFORMANCE IN HYDRAULIC ACTUATION





OUR PASSION FEEDS YOUR TRUST



Cabol is located in the center of the world's most famous Motor Valley, Modena. For 40 years we have been designing and manufacturing electro-hydraulic drives, precisely controlling movements, from the slowest to the fastest. Each component is built with precision, each project follows a precise path. We believe that reliability and reduced maintenance costs increase the competitiveness of our products

QUALITY

Precision



WHAT WE DO

We check:

Quality and roughness of surfaces

Tolerance, concentricity, rectilinearity and coupling of components

The thickness of the chrome plating

Hardness of materials

Absence of impurities

Each action aims to ensure products with high performance and reliability.

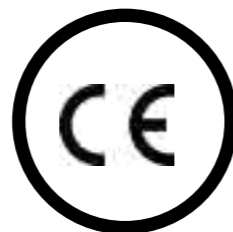
HOW WE ACT

We work with highly skilled young staff, using certified innovative tools



THE WAY WE DO IT

Each Cabol product follows a precise path.
Traceability of the materials is guaranteed.
Company procedures and the organization system are certified as per ISO norm 9001 : 2015



WE DESIRE

To minimize attrition without leakage

To use new composite materials to reduce weight

To increase electronic and hydraulic integration

DESIGN

Integration with costumers



1. Our design interacts in a proactive way with the technical departments of our clients
2. We employ advanced software and hardware support on which we develop FEM structural analyses
3. We cooperate with university research centres aiming to achieve maximum performance for our products



FOR OUR PROJECTS WE USE THE FOLLOWING MATERIALS:

- E355J2, C45, 42 NiCrMo3, 39NiCrMo4
- AISI 304, AISI 420, AISI 316, AISI 360, SAF 2205
- Bronze alloys, Aluminium alloys (ERGAL, AL7075 T6)
- Titanium, Composite materials in carbon fibre

SURFACE TREATMENTS

- Nitriding
- Ceramic coating
- Chroming and nickeling
- Geomet
- Surtec

RANGE

Sizes of our cylinders

- Bore: 20-600 mm
- Stroke: 5.000 mm
- Pressure: 1000 bar
- Speed: up to 20 m/s
- Frequency: up to 200 Hz



OPTION AVAILBLE FOR SERVOCYLINDERS



Cylinder with load cell



Cylinder with rod locking device



Cylinder with valve block



Cylinder with linear sensor



Zero clearance joint



Cylinder with inductive limit switches

PRODUCTION

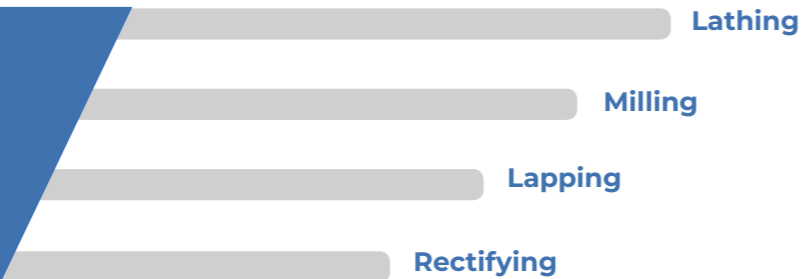
Built with care



We transform the raw material by means of our technologies.
Simple but careful working, with latest generation machines as per 4.0 industry

The components follow a precise path

checked at every point in the production process



PRODUCT

Soft power control



Servocylinders are at the apex of our technology. They are used where the need is for low attrition movements, very high and very low speeds, high frequencies, high precision and repeatability of positioning.

The internal piston and the rod are made in one single piece; after careful machining they are chromed and rectified to comply with the narrowest geometric tolerances required. In the SCHZ and SCHZI series, the components that may be subject to accidental contact during movement undergo specific treatments to increase smoothness, by reducing the value of the coefficient of attrition and resistance to wear.

The servocylinders can be produced in aluminium alloy with very high mechanical features and surface treatment by anodization. As with the actuators in steel, specific treatments have been perfected to increase smooth running and resistance to wear.



INDUSTRIAL SERVOCYLINDERS SCI SERIES

The servocylinders can be equipped with:

- Position transducers
- Manifolds with proportional valves-servo valves.
- Filters and accumulators.
- Proximity switch.
- Load cells
- Electronic control card, to control position, speed and force.



Servocylinder SCI serie in tensile strength test

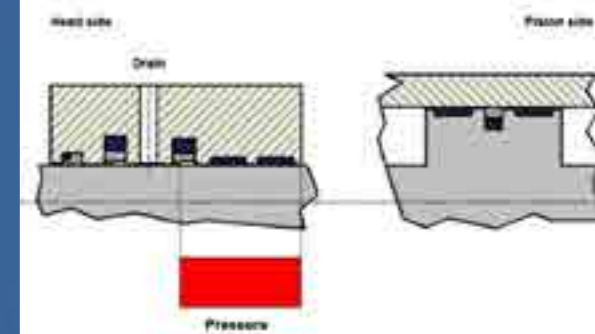


LOW FRICTION SERVOCYLINDERS SC SERIES

Main characteristics:

- WORKING PRESSURE: up to 280 bar
- PISTON SEALING SYSTEM: low friction seals
- ROD SEALING SYSTEM: low friction seals
- GUIDING SYSTEM: low friction guiding bands
- EMERGENCY BRAKING: hydraulic
- MAXIMUM FREQUENCY: 30 Hz
- MAXIMUM SPEED: 15m/s
- POSITION TRANSDUCER: Magnetostrictive or LVDT

SC series cylinders

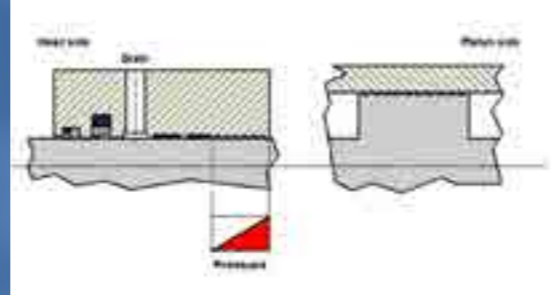


HYDRODINAMIC SERVOCYLINDERS SCHZ SERIES

Main characteristics:

- WORKING PRESSURE: up to 280 bar
- PISTON SEALING SYSTEM: Hydrodynamic abatement
- ROD SEALING SYSTEM: Hydrodynamic abatement
- GUIDING SYSTEM: low friction guiding bands
- EMERGENCY BRAKING: hydraulic
- MAXIMUM FREQUENCY: 30 Hz
- MAXIMUM SPEED: 20 m/s
- POSITION TRANSDUCER: Magnetostrictive or LVDT

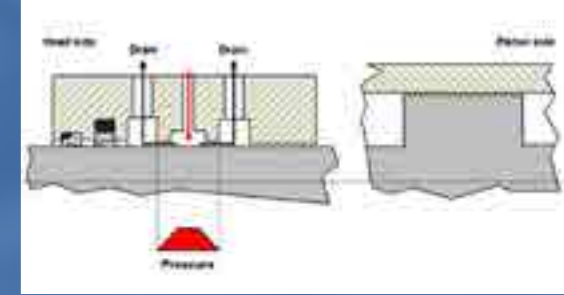
SCHZ series cylinders



HYDROSTATIC SERVOCYLINDERS SCHZI SERIES

Main characteristics:

- WORKING PRESSURE: up to 280 bar
- PISTON SEALING SYSTEM: hydrodynamic abatement
- ROD SEALING SYSTEM: hydrodynamic abatement
- GUIDING SYSTEM: hydrostatic bearing
- EMERGENCY BRAKING: hydraulic
- MAXIMUM FREQUENCY: at the limit of the electronic control system
- MAXIMUM SPEED: 20 m/s
- POSITION TRANSDUCER: Magnetostrictive or LVDT



SGN JOINT WITH ZERO CLEARANCE

The zero clearance joints have compact structure and are personalized according to each client's requirements thanks to which, they can be used on all types of servoactuators at any frequency preset in the design stage. They can be produced to be connected directly to the rod and, by means of an appropriate flange, to the fixed ends of the servoactuators themselves.

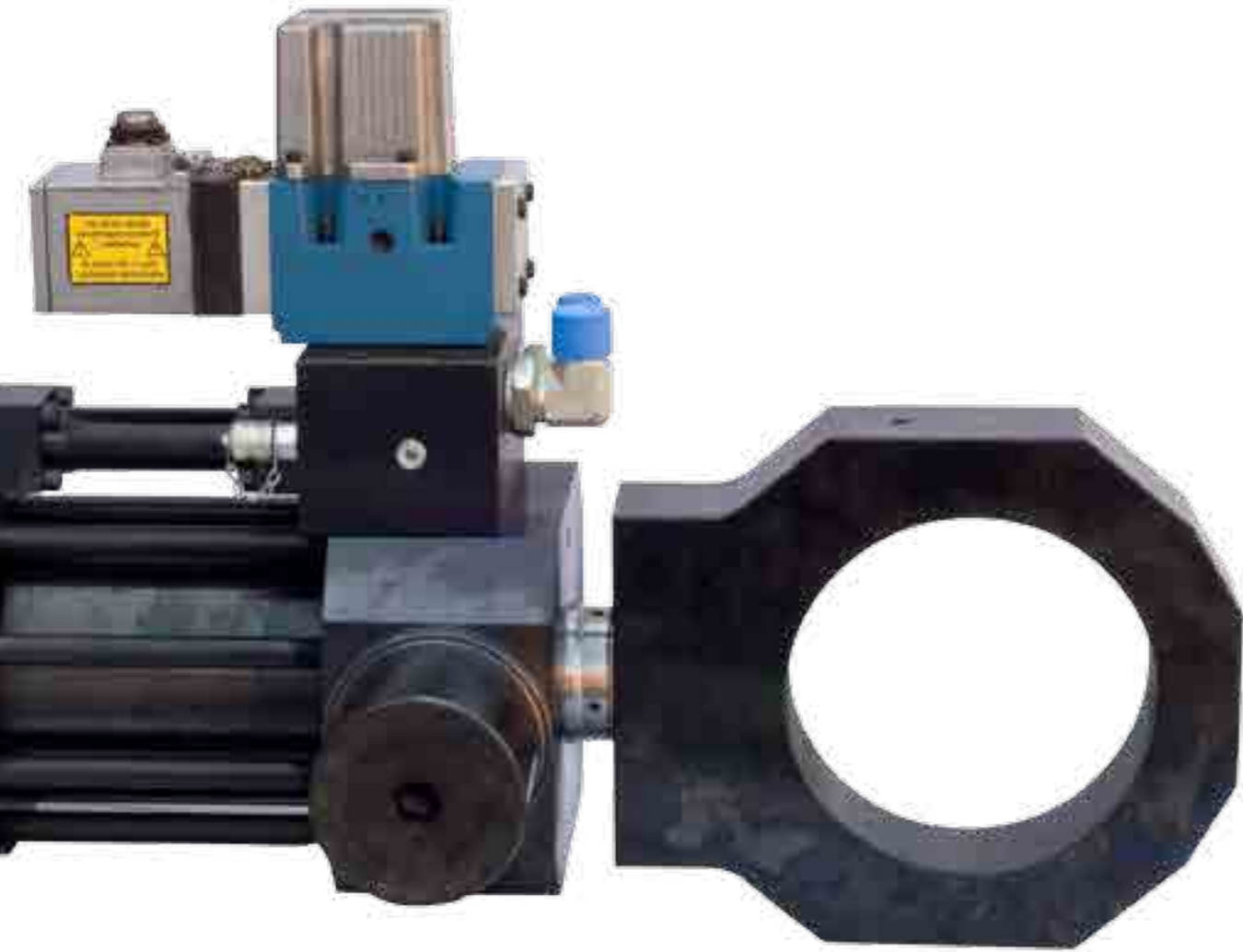
SGN joint with zero clearance fitted on an actuator of 3000 kN, used for seismic frequency tests.



PRODUCT

Cylinders with customized performance

Cabol performs personalized solutions in order to obtain the maximum from every application. Together with the hydraulic cylinder we construct complex mechanical parts that are integrated in the machines.



Hydraulic cylinder for open/close control
Moulds for plastic blow machine



Plastic blow moulding sector

Hydrological cylinders for expulsion tiles,
arranged inside the molds



Ceramic sector

Hydraulic cylinder complete with shift
group for plastic injection machine



Plastic injection sector

Hydraulic microcylinders for metal sample traction. Suitable for working in extreme environments (temperatures from -70°C to $+160^{\circ}\text{C}$).



Testing sector

Hydraulic cylinder for clamping vices



Offshore sector

Hydraulic cylinder for press brake. Made in single piece with valve block control



Sheet metal working sector

Hydraulic cylinder in stainless steel



Naval sector

High pressure hydraulic cylinder for control of rolling rolls



Steel sector (700 bar)

Hydraulic microcylinder in titanium

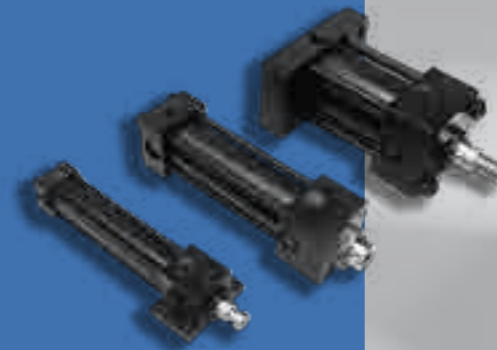


Biomedical sector (spinal tensioner)

PRODUCT

Cylinders as per ISO standards and Special Cylinders deriving from ISO Standards

We produce cylinders as per ISO standards 6020-2, 6020-1, 6022. Construction is performed with the same care and accuracy used in that of special cylinders. Finishing of the sliding surfaces and chrome plating are optimized, the seals are low friction and of highest quality. We like to equip high performance machines with reduced plant shutdowns for maintenance, with the added advantage of an interchangeable product as per the ISO standard.



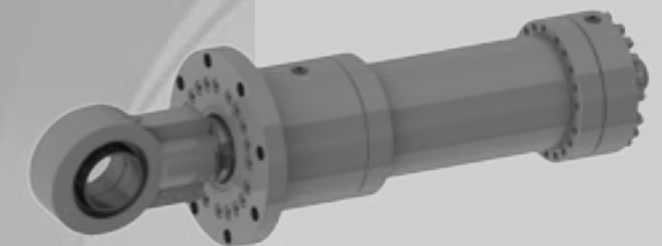
Cylinder with square head and tie rods as per ISO 6020-2



Cylinder with square head and rods as per ISO 6020-2 with integrated chek



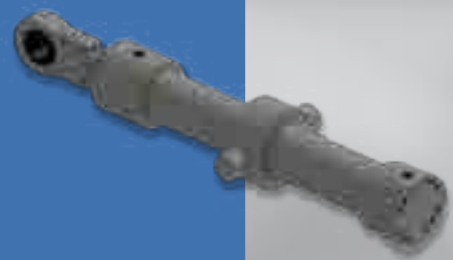
Cylinder derived from ISO 6020-2 for control of mould carriage stroke on blow moulding plastic machine



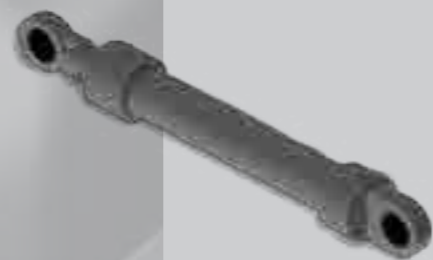
Cylinder ISO 6022 with MF3 attachment



Cylinder derived from ISO 6022 with special MT4 attachment (sheet metal working)



Cylinder ISO 6020-1 MT4 attachment



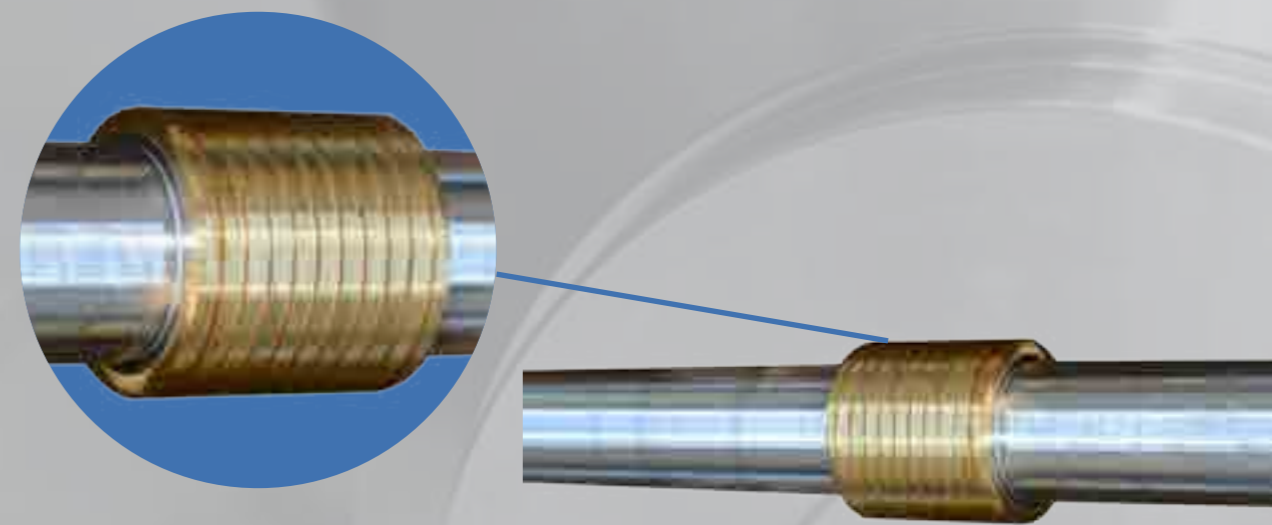
Cylinder ISO 6020-1 MP5 attachment



Example of external nitriding treatment on junction head



Example of microregulation of stroke on rear head bushing installed on cylinder 6020-2



Internal detail of piston rod in single piece with surface bronzing of piston. Rod material in 42 Ni Cr Mo3 with tripled crossed chroming of thickness 60 μ

PRODUCT

Rotary Actuators

From our experience in making linear actuators, we have developed rotary actuators that partly use the same components. Our rotary actuators can achieve torques from 10daNm to 3500 daNm.

They can install:

- Stroke end braking
- Stroke end sensors
- Absolute position encoders



Rotary actuators with torque 3400 daNm

360° rotation – foundry sector



Rotary actuator with torque 1000daNm

200° rotation



Rotary actuator with 300 daNm

270° rotation – Amusement park sector



Rotary actuator with torque 500 daNm

360° rotation – Machine tool sector



Rotary actuator with adjustable angle

For automatic food machine

PRODUCT

Manifolds and Hydraulic Power Packs

For requests for a complete package, Cabol has designed and built a vast range of special manifold and hydraulic power packs. The design starts from the hydraulic scheme defined with the client, after which we perform the 3D design of the manifold and the plant, in consultation with the client on the sizes and interfaces with the machine. The hydraulic power pack can be supplied with electric control panel and can have tanks up to 2000 litres. We can also supply rigid or flexible hydraulic connection as needed for attachment to the final actuators.



Hydraulic control for metal parts test bench



Hydraulic control for special machine tool for mechanical working



Control stage of internal duct manifold ERGALL 7075. Absence of possible detachment of working residues is guaranteed. A servovalve will be installed after the hydraulic flushing.



Cast-iron manifold with NG 10 electrovalves and monitored cartridge valves for control of sheet metal presses.

For sheet metal press control



Steel manifold for installation of logic elements



Trolley, hydraulic unit with battery to generate pressure



Electrohydraulic system for internal pressure control of ceramic moulds

For ceramic sector



Electrohydraulic system for control of lift and descent of the simple effect TUSE telescopic cylinders

This ensures the cylinders are parallel and can be combined with the Trolley Group filling and flushing .

Group for filling and flushing for maintenance and starting new plant



For maintenance and start-up of new plants

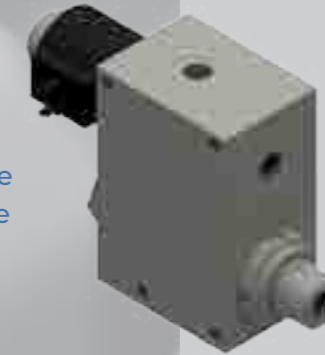
PRODUCT

Cylinder with pressure intensifier

Cabol has developed a technology able to increase the thrust of the hydraulic cylinders. This technology is based on increasing the pressure by reports multiplies up to 4 times the incoming pressure. The system can be integrated within the cylinder (in case of limited space to house the cylinder) or externally, with a hydraulic block by which to control the cylinder. These intensifiers can generate outgoing pressures up to 700 bar with flow up to 200 Lt/min.



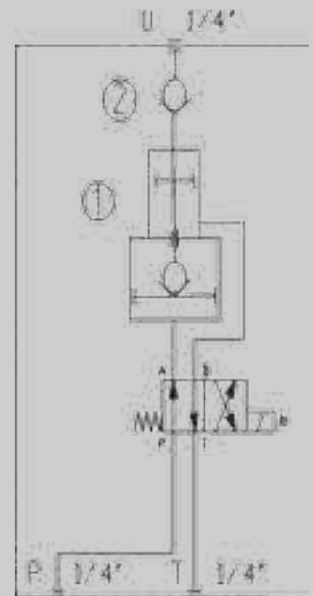
Cylinder with internal pressure intensifier



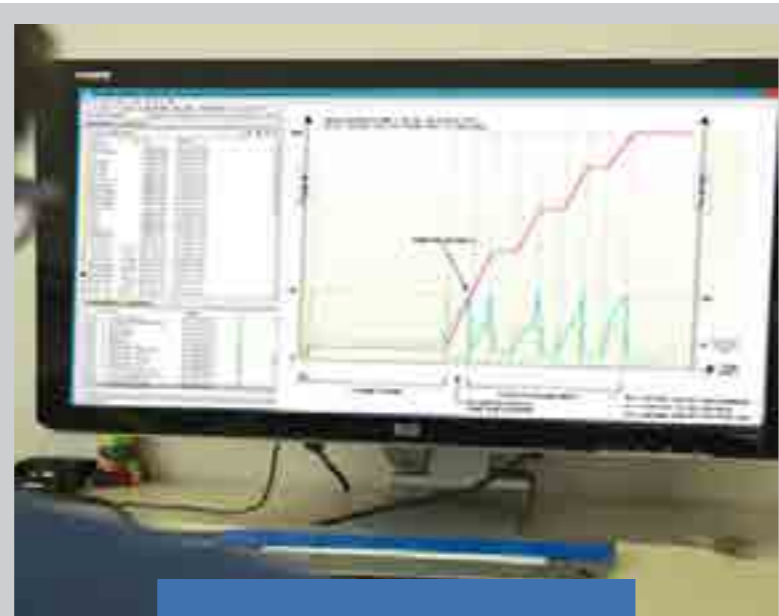
Electrohydraulic pressure intensifier made in single piece with control valve blockage

Built in a single part with control valve block

- BS10.18.00 is an electro-hydraulics intensifier with 1/4" gas threaded port.
- The hydraulic oil passes through the intensifier 1 when the solenoid b is deenergized, the oil reaches the port U actuating the connected actuator.
- When the pressure on port P reaches the maximum pressure of the hydraulics system (for example 250 bar), it is possible to activate the electronic driver of the coil b that generates a square wave at frequency of 2 Hz. The pressure increases progressively reaching the value corresponding to the pressure on the port P multiplied by the geometric ratio of the intensifier.
- If there is no leakage on the actuator connected on the port U, the pressure remains stable at the value reached due to the presence of the check valve 2.
- If there is oil leakage from the actuator connected on the port U, the intensifier continues to increase the pressure to reach the geometric ratio (in reference to the port P), compatibly with the capacity of the hydraulic pump connected on the port P to generate enough flow rate.



Test bench for cylinders and servocylinders with pressure intensifier. Contamination class as per ISO4406 ($\beta_{5\leq 75} \leq 75$, 5 μm absolute)



Testing and verifying internal cylinder pressure with pressure intensifier



Cylinder for closure of the moulds of the plastic blow machine with external electrohydraulic intensifier

External electro-hydraulic intensifier

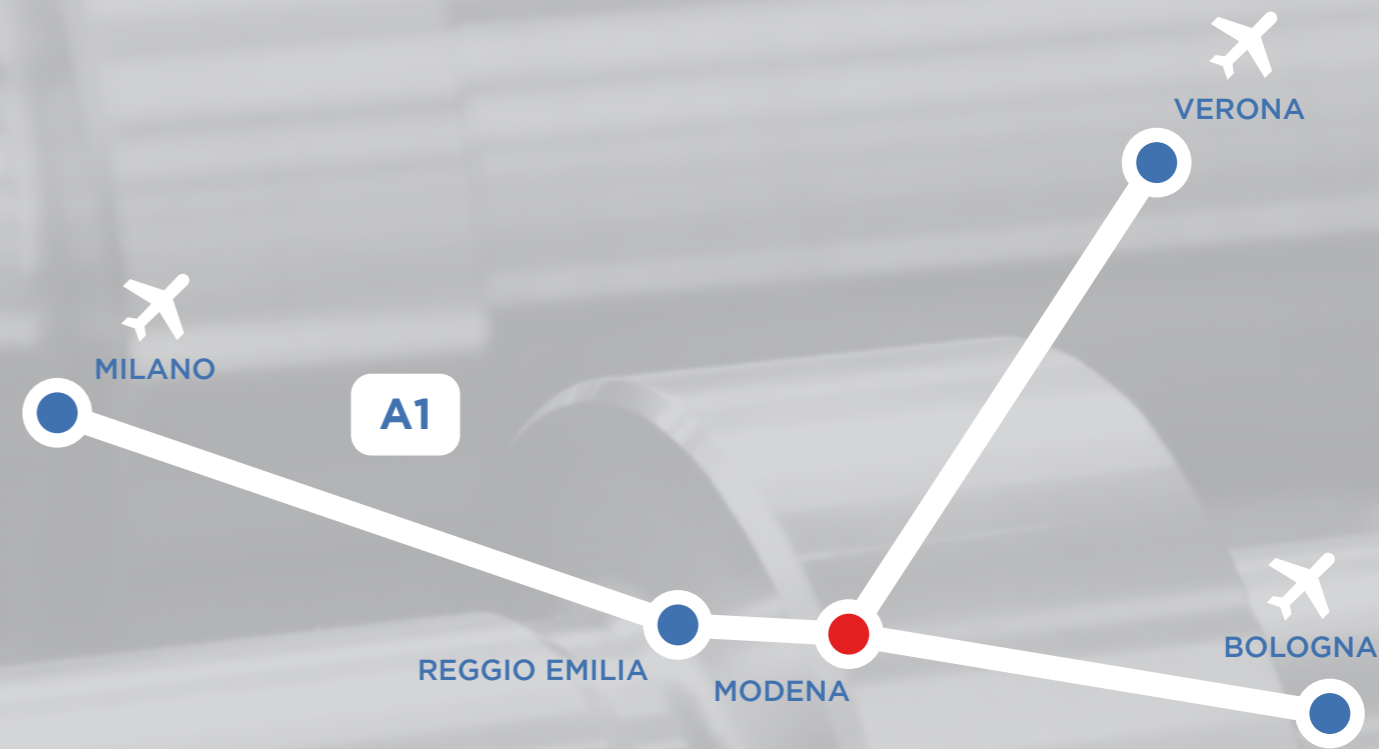
PRODUCT

Hydraulic Telescopic Cylinders for the industrial market

The need for working in confined spaces has led us to develop compact telescopic cylinders able to work up to 1000 bar. These can be integrated in the structures of the machines. The possibility to employ various materials ensures functionality in problematic environments with high temperatures and special fluids.



Cylinders for mould raising





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