ENCOPIM Servo-Pneumatics consists on:

- Standards-based pneumatic drives (cylinders and semi-rotary drives) and valves,
- Powered by regular air at standard operating pressures (typically 6 bar),
- Equipped with transducers (position, force, torque, angle, …),
- Servo-controlled in a high frequency closed-loop at real time
- Using adaptative control algorithms specially aimed at non-lineal systems, such as the Servo-Pneumatic ones due to the high compressibility rate of air.
Advantages of ENCOPIM Servo-Pneumatics in comparison with servo-hydraulics

- Cheaper drives (cylinders and rotary drives) and valves,
- Power packs not required: regular air lines are available (for free) at laboratories and factories,
- Cleaner: no oil leaks,
- Easier configuration and operation,
- Very reliable “on the shelf” components world-wide available (no dependence on the supplier).

ENCOPIM Servo-Pneumatics allows:

- Perform static (strength and deflection), fatigue (endurance), and dynamic (impact) tests on materials, components, assemblies and systems.
- Test with the same or better accuracy than using well-known servo-hydraulic systems but,
- At an extremely competitive price.
- Focussed to:
  - Research & Development Labs,
  - Quality Departments,
  - Control at Manufacturing Lines.

⚠️ Quality Labs do not have usually costly servo-hydraulic equipments among their facilities. Therefore, they have now the possibility of performing very accurate tests at low cost thanks to ENCOPIM Servo-Pneumatic technology!
ENCOPIM’s compact digital servo controller (SCDC) is designed for static, fatigue, and dynamic tests, uni or multi-axial, on materials, components, assemblies and systems, and suitable for a variety of actuating technologies: Servo-Pneumatic, servo-hydraulic, servo-electric and electro-mechanic.

The test management (parameter settings, results display and analysis) is run by RTEST, user-friendly software featuring advanced closed-loop control algorithms, installed on an external Laptop or PC linked to the SCDC via Ethernet.

RTEST is multi-platform software for a wide range of applications: from a simple data acquisition to complex multi-axial fatigue tests reproducing inputs taken from real service, from static uni-axial tests to repetitive dynamic tests.

See data-sheet.
**Parameters for Linear Actuators**

- Max. “reasonable” Force: ±20 kN (piston Ø200 mm at 6 bar)
  
  Forces up to ±46 kN with piston Ø320 mm at 6 bar are “possible” but not always “reasonable”.
  Mostly Forces up to ±7 kN (piston Ø125 mm at 6 bar).

- Max. Stroke length: 1100 mm
  Mostly Strokes up to 500 mm.

- Speed range: 5 – 1000 mm/s
  Lower and higher speeds are possible under special configurations.

- Frequency range: mostly up to 10-15 Hz
  Higher frequencies are possible under special configurations.
Parameters for **Semi-Rotary Actuators**

- Max. Torque: ±20 Nm at 6 bar.
- Max. Angle: 270º (mostly 180º).
- Frequency: up to 10 Hz.

Higher values are possible under special configurations.

**Examples of applications on Automotive sector**

- Pedals and pedal boxes static strength and fatigue endurance.
- Handbrake handle fatigue endurance test.
- Steering wheel strength and fatigue endurance.
- Seats fatigue endurance, knee and bottom impact, «Bump and Squirm» tests.
- Seat cushions wear test.
- Linear free motion impact test for passive safety.
- Pendulum head impact test for passive safety.
- Slam of doors, bonnet, tail gate, etc. on vehicle.
- Door components (hinges, retainers, handles, looks, etc.) fatigue endurance.

*ENCOPIM approach to the market is develop customized applications. The above mentioned are just illustrative examples.*
Examples of applications on Automotive sector

Pedals and pedal boxes (12 actuators with climatic chambers)
Examples of applications on Automotive sector

**Seats**

![Seats Image](image1)

Examples of applications on Automotive sector

**Head impact test rig**

![Head Impact Test Rig Image](image2)
Examples of applications on Automotive sector

Slam doors on vehicle

Door components