SYNTAX 100 - UNIVERSAL TESTING MACHINE

Tensile & Compression Testing Frame

OVERVIEW

The SYNTAX 100 is a high-stiffness universal testing machine designed to offer an optimal balance between performance, accuracy, robustness, and budget. Its compact two-column frame architecture allows full integration into laboratory and industrial environments while maintaining excellent mechanical rigidity and measurement precision.

Model	SYNTAX 100
Capacity (kN)	100
Frame stiffness (kN/mm)	150
Screw type	Preloaded ball screws
Number of guidance column	0
Number of ball screws	2
Transmission type	Gearbox with reinforced belt
Bearing type	Precharged and waterproff, full life greased
Accuracy (Class) Load Cell Mesurement	Class 1 (≥0.1% FS) / Class 0.5 (≥0.2% FS) – ISO 7500-1
Crosshead position resolution (µm)	0,043
Maximum speed, max load (mm/min)	793
Minimum speed (µm/min)	1,76
Crosshead travel (mm) Without load cell and interface	1300
Test width (mm)	450
Working area height (mm)	296
Dimensions (W × D × H) mm	865 × 470 × 1805
Weight (kg)	350
Power supply	230 V Single Phase
Power consumption (W)	3000

MECHANICAL FRAME

Nominal capacity: 100 kN
Frame stiffness: 150 kN/mm
Structure: Lateral metallic frame
Drive system:

- Oversized preloaded ball screws
- Gearbox with reinforced belt transmission
- Machine-tool grade high-capacity bearings

Design: High rigidity structure optimized for tensile, compression, and special test configurations

PROTECTION & DESIGN

Aluminium side panels with transparent polycarbonate shielding
2 mm thick sheet-metal enclosure
Polyurethane-coated protective covers for ball screws (standard)
Front access design for easy handling, including when mounted on pedestal

ERGONOMICS & WORKSPACE

Working height: 296 mm (1026 with pedestal)
Usable test width: 450 mm
Vertical daylight / stroke: 1300 mm

Dimensions (W × D × H) :

- 865 × 470 × 1805 mm (machine only)
- +730 mm with pedestal

Weight :

- 350 kg (depending on tooling, without pedestal)

Tooling compatibility :

- More than 1300 available tooling references
- Compatible with thermal chambers and furnaces

CONTROL ELECTRONICS

CONTROLLER ARCHITECTURE

Remote BlackBox controller
Compact footprint, positioned next to the machine
Integrated cooling fan with dust filter

CONTROLLER VERSION

2.5 kHz control loop

CLOSED-LOOP CONTROL MODES

Force rate (kN/s)
Stress rate (MPa/s)
Crosshead speed (mm/s)
Extensometer speed (mm/s) – multi-extensometer support
Strain (%Lc / %Le per second)

Control mode switching possible during the same test.

MEASUREMENT CHANNELS & RESOLUTION

Force channel resolution : 10,000,000 steps
Resolution : 0.00001% of full scale
Accuracy class :

- Class 1 from 0.1% FS

- Class 0.5 from 0.2% FS

According to ISO 7500-1

Crosshead position :

- Resolution: 0.043 µm
- Accuracy: Class 0.2 (ISO 9513)

Additional channels :

- 3 or 7 configurable measurement channels (depending on controller model)
- Automatic sensor recognition (ISP – Intelligent Sensor Plug)

Supported Sensors :

- Analog extensometers (±10 V, 4–20 mA)
- LVDT
- Encoders / incremental signals
- SSI rulers
- Optical sensors
- Magnetostrictive rulers

SYSTEM EXPANDABILITY

Direct connection and control of :

- Hydraulic grip units
- Automatic arm extensometers
- Mono or bi-camera video extensometers
- External DAQ modules (strain gauges, LVDT, laser sensors, thermocouples)
- Multi-zone furnaces and thermal enclosures
- Video monitoring and screen recording

SAFETY DOORS / SHIELDS (OPTIONAL)

Machine can be supplied with or without safety enclosure, subject to :

- Formal risk assessment by the user
- Compliance with Machinery Directive 2006/42/EC
- Written acknowledgment releasing manufacturer liability

Any change in test method requires a new risk assessment

PEDESTAL / BASE (OPTIONAL)

Ergonomic working height like laboratory benches
Integrated storage shelves for tools and accessories
Mechanically welded steel structure
Weight: 120 kg
Pallet-truck handling capability
Dimensions:

- Height: 730 mm
- Width: 895 mm
- Depth: 600 mm

LOAD CELLS

Available in S-type or compact high-definition HBM technology with:

- Mechanical decoupling
- Internal electronic compensation
- High axial stiffness
- Reduced shock at specimen break

Accuracy up to Class 0.5, error < 0.1%
Automatic load cell identification (EEPROM)
Electronic overload protection
Fixed or pin-mounted configurations to maximize daylight