



Nano | Up to 25 kN

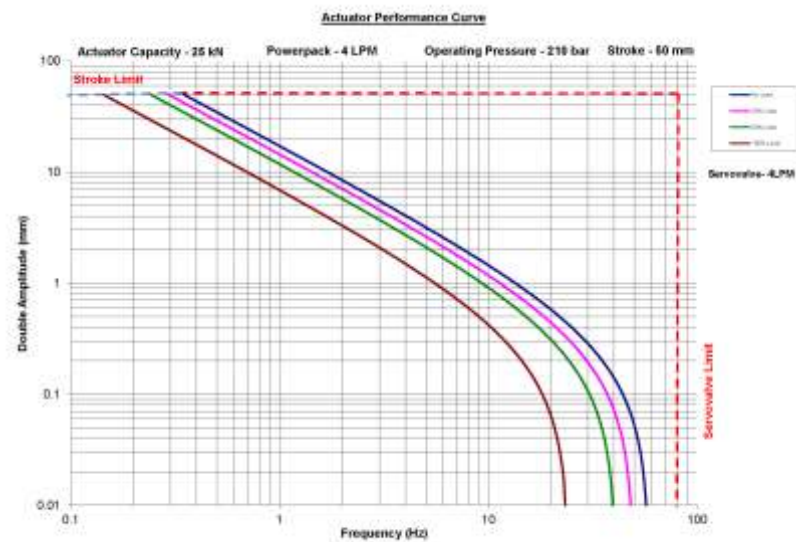


Technical Features

- Single footprint system
- Up to 25 kN load capacity
- 0-65 Hz on standard systems; 0-100 Hz available as option
- Virtually noiseless
- High precision servo-control

The Nano is a servo-hydraulic solution for comprehensive mechanical testing of materials.

These fully-automated systems are ideal for academic institutions to teach strength of materials, fatigue life, fracture mechanics besides basic research applications.



Note: The plots above represent are mathematical prediction of system performance. Possession of this information is not a guarantee that the system will perform as predicted. Interpretation of the data is the sole responsibility of the user.

Unique Features

Universal Grips: A pair of grips is used for the entire range of static and dynamic tests.

No site preparation: Runs on single phase supply and requires no special flooring.

Dedicated application software: Single window to run static and dynamic tests. Step-by-step prompting makes it easy for all users.

Quiet, energy efficient, air cooled: Virtually noiseless operation and is self-cooled.

Easy to relocate: Caster wheels attached on the base of the machine allow easy movement. In addition, the wheels are lockable to ensure stability during operation.



Universal Grips for Multiple Applications

One set of grips are combined with a series of light weight, easy-to-handle attachments to cater to a variety of specimens and tests:

Attachment	Specimens	Tests
Wedge Grips	Flat	<ul style="list-style-type: none"> Tension Stress Controlled High Cycle Fatigue Standards: ASTM E8, E466
Three Point Bend Fixtures	Flat Round Single Edge Bend	<ul style="list-style-type: none"> Bending Inter-laminar Shear Strength Fracture Toughness Fatigue Crack Growth Standards: ASTM E399, ASTM E1820
Compression Platens	Flat Round Components	<ul style="list-style-type: none"> Compression Compression Fatigue Standards: ASTM E9
Clevis Grips	Compact Tension	<ul style="list-style-type: none"> Tear Tests Fatigue Crack Growth Fracture Toughness Standards: ASTM E399, ASTM E1820
Threaded Fixtures	Round, threaded (M10 or M12)	<ul style="list-style-type: none"> Tension Strain Controlled Low Cycle Fatigue Standards: ASTM E606, E8





- A** Wedge Grips
- B** Three Point Bend Fixtures
- C** Compression Platens
- D** Clevis Grips
- E** Threaded Fixtures
- F** Extensometer
- G** Crack Opening Displacement Gage

Static and Dynamic Testing

Tensile and Tensile Fatigue:

- Flat specimens from 0.5 to 5 mm thick
- Extensometer with gage length of 12.5 mm and travel of +6.25/-3.1 mm
- Software for automated generation of
 - stress vs. strain data
 - number of cycles to failure
 - failure elongation
 - modulus

Standards: ASTM E8, E466



Compression and Compression Fatigue:

- Flat and round (diameter up to 60 mm)
- Software for automated generation of
 - load vs. displacement data
 - number of cycles to failure
 - failure compression
 - modulus

Standards: : ASTM E9

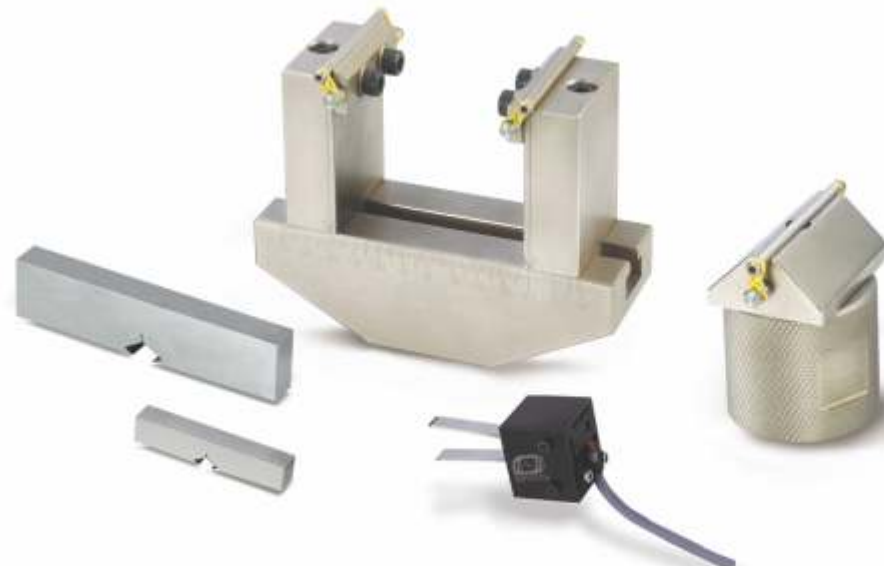
Flexure, Fatigue Crack Propagation and Fracture Toughness



Three Point Bend

- Adjustable span width of 35 (without COD) to 100 mm for flat and single edge bend specimens
- Rollers of diameter 5mm
- COD gage with gage length of 5 mm and travel of +3/-1 mm
- Software for automated generation of
 - load vs. displacement data
 - da/dN vs. ΔK data
 - bending strength
 - rate of crack growth
 - fracture toughness

Standards: ASTM E399, ASTM E1820



Tear, Fatigue Crack Propagation and Fracture Toughness

Clevis Grips

- Compact Tension specimens with a thickness of 6.35 mm and pin diameter of 6.35 mm
- COD gage with gage length of 5 mm and travel of +3/-1 mm travel
- Software for automated generation of
 - load vs. displacement data
 - da/dN vs. ΔK data
 - rate of crack growth
 - fracture toughness

Standards: ASTM E399, ASTM E1820



Strain Controlled Dynamic Testing



Low Cycle Fatigue

- M10 and M12 threaded specimens
- Extensometer with gage length of 12.5 mm and travel of ± 1 mm
- Software for automated generation of
 - SN data
 - stress vs. strain hysteresis loops
 - loading and unloading modulus
 - number of cycles to failure

Standards: ASTM E606, E8



Application Software

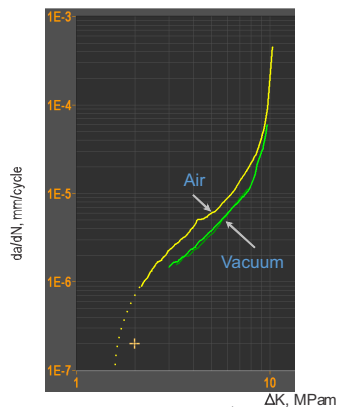
- Dedicated software for separate applications
 - tensile, compression, high cycle fatigue
 - low cycle fatigue
 - fatigue crack propagation
 - K_{IC} and J_{IC}
- User-friendly interface with step-by-step prompting
- Conduct of test in stroke, load or strain control modes
- Automatic or user-specified data acquisition rates
- Online display of load, displacement and strain
- Live update of graphical information
- Report generation in Microsoft Excel

Test-By-WiFi/Wire/Wireless

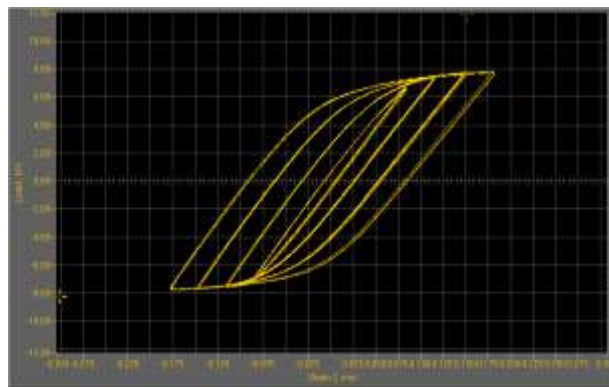
Test-By-Wire technology transforms the testing experience. It renders test equipment operation as easy and as intuitive as using your smartphone!

What it means to the user: Absolutely all operator controls concentrated onto a single device with context sensitive touchscreen display.

Conventional test systems have their controls scattered all over the system, requiring intimate knowledge of individual system components, distracting physical movement away from 'point of action'. For example, pump controls may be located separate from actuator controls and all of these may not be together with the E-Stop, not to mention the operator console itself. With all these integrated into a single 'cockpit' style panel, it is intuitive and easy-to-use for even a less experienced operator.



da/dN vs ΔK (MPa \sqrt{m}) for Fatigue Crack Growth Studies



Cyclic Stress (MPa) vs. Strain loading to determine Low Cycle Fatigue Properties



Touch Screen Interface

Specifications

Model	Nano 25
Model No.	UT-01-0025
Force Rating	± 25 kN
Load Cell	Shear web/pan cake configuration Resolution: 5 N, Accuracy: 0.3% of full scale
Actuator	Fatigue rated and dynamic design Stroke: ±25 mm, Resolution: 0.1 µm
*Cyclic Frequency	0-65 Hz on standard systems; 0-100 Hz available as option
Controller	Single station controller high performance DSP with 24 bit data acquisition and digital signal conditioning for load, stroke and extensometer. Up to 32kHz loop update Configuration: 1 encoder, 3 strain and 4 high level channels
Wedge Grips	Two sets of wedges for specimens between 0.5 to 5 mm thick
Compression Platens	A set of compression platens of 60 mm diameter. Spherical seating on one platen Etched concentric rings for to ensure centering of specimen
Three Point Bend Fixtures	Span widths adjustable from 35 (without COD) to 100 mm Roller diameters of 5 and 10 mm
Clevis Grips	Specimen thickness of 6.35 mm and pin diameter of 6.35 mm
Threaded Fixtures	Round specimens with threading of M10 or M12
Tensile Extensometer	Gage length: 12.5 mm, Travel:+6.25/-3.1 mm Resolution: 1 µm, Accuracy: 0.5% of gage length
LCF Extensometer	Gage length: 12.5 mm, Travel:±1 mm Resolution: 0.5 µm, Accuracy: 0.5% of gage length
COD gage	Gage length: 5 mm, Travel:+3/-1 mm Resolution: 1 µm, Accuracy: 0.5% of gage length
Other accessories	M27 x 2 threaded adapters, pre-loading spanners, and spiral washers
Application Software	Test Builder (ASTM E8, E466, D695, ISO 13003 etc.) Low Cycle Fatigue (ASTM E606) Fatigue Crack Propagation (ASTM E647) Fracture Toughness (ASTM E399, E1820)
Total System Weight	<200 kg
Power Requirements	200-240 V, 15 A single phase supply

*Please refer Actuator Performance Graph (page1)



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