

High Temperature, Low Strain Extensometer with Extended Performance Series 7650A up to 1600 °C

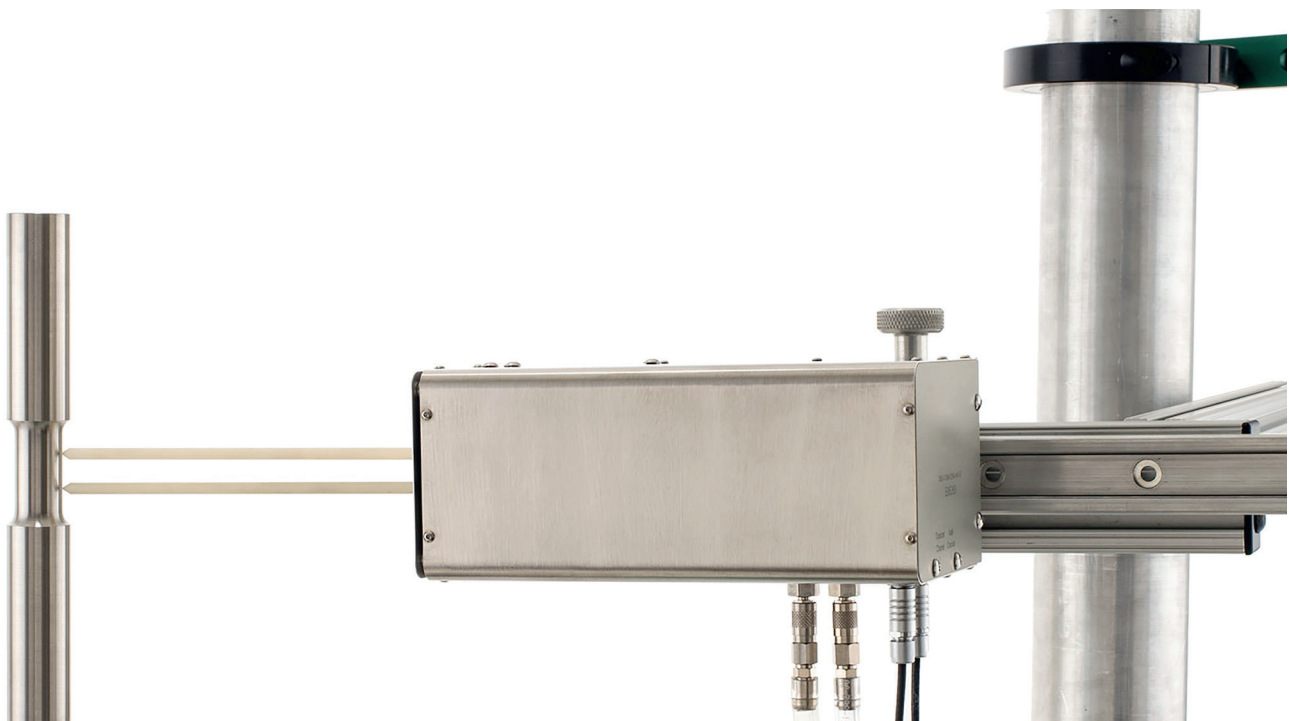
Model 7650A water-cooled extensometers measure and control strains with extremely high precision due to their design features and low strain range.

All models are capable of tension and compression strain measurement and may be used for fatigue testing under fully reversed load and strain conditions at frequencies up to 10 Hz.

These units are compatible with materials testing furnaces or induction heating systems and is available with high purity alumina rods for testing up to 1200°C and silicon carbide rods for temperatures up to 1600°C.

All 7650A models can be mounted rigidly on the load frame and incorporate slide mounting to bring the extensometer into contact with the specimen.

The gauge length is set automatically before mounting on the test specimen, which allows for hot mounting after thermal equilibrium has been reached.



The 7650A series is specifically designed to provide high accuracy, high resolution measurements and perform high temperature fatigue testing at the highest possible frequencies.

They incorporate capacitive sensors for low operating force (Operating Force: <30 grams typical) and include electronics with programmable filtering and multi-point linearization for improved performance and accuracy. The overall design minimizes, and in many cases virtually eliminates, any influence from common lab environment vibrations.

The application range includes:

- Tension
- Compression
- Low Cycle Fatigue
- Thermo Mechanical Fatigue
- Through Zero Fatigue
- Strain-controlled Testing

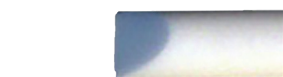
Features

- Meet or exceed the accuracy class B-1 according to ASTM E83 and class 0.5 according to ISO 9513
- Rugged design for testing through specimen failure
- Hot mountable and retractable
- Self-setting gauge length with fine adjustment feature
- All models can measure in both tension and compression and may be used for cyclic testing at test frequencies up to 10 Hz
- Excellent ambient vibration rejection; primary vibration mode >100 Hz typical
- Digital controller and power supply included. Provides high level DC voltage output with low noise Easily interfaced to test controllers, data acquisition boards and chart recorders
- Includes high speed analogue and digital outputs
- Web-based user interface for setup and data acquisition
- Selectable analogue and digital filter options from 2 Hz to 3 kHz
- Built-in calibration reference and auto-zero features
- Multiple extensometer calibration files may be loaded for use with one controller
- Can be used with specimens at elevated temperatures while only requiring room temperature calibration
- Quick-disconnect water cooling fittings and signal cables
- Analog Output: User specified, $\pm 10\text{VDC}$ typical, $\pm 10.8\text{VDC}$ rail
- Digital Output: 24 bit high speed Ethernet output with built-in web interface
- Cyclic Testing: up to 10 Hz, depending on test system and test amplitude
- Linearity: 11 point digital linearization, $\leq 0.1\%$ FS typical linearity
- Hysteresis: $\leq 0.1\%$ FS typical
- Resolution: <75 PPM (0.0075%FS) RMS @ 4 kHz, <6 PPM (0.0006%FS) @ 100 Hz at gauge length
- Filter: Selectable 100 Hz analog and 2 Hz – 3 kHz digital filters
- Sensor Cables: 2 m (6.5 ft) room temperature cables
- Output Cables: Flexible 2.4 m (8 ft) analog output cables
- Operating Force: <30 grams typical
- Contact Force: <560 grams typical
- Environment: Recommended for testing in dry air, inert / non-corrosive gases, or vacuum
- Power: Includes power supply for your country

Supplied Parts

- One set of extension rods. Rod lengths are made to fit furnace as required or inductive heating system
- Slide mounting (mounting arm) with friction lock-on linear slide for loading contact rods into testing position
- Model DT6229 single-channel signal conditioner provides analog and digital outputs
- Includes high quality foam lined case
- Constant temperature recirculating chiller, mounting bracket or column mounting bracket sold separately

Available Rod Tip Styles



STRAIGHT CHISEL
Flat and round specimens



VEE CHISEL
Round specimens



CONICAL TIP
Flat specimens

Straight Chisel: Most versatile, since they can be used with round for flat specimens

Vee chisel: For round specimens

Conical Chisel: For flat specimens

Important Note

Liquid cooling is recommended for all elevated temperature tests to obtain the best measurement accuracy and retain the validity of a room temperature calibration when the specimen temperature is $>540\text{ }^{\circ}\text{C}$ ($1000\text{ }^{\circ}\text{F}$).

Cooling is necessary to prevent extensometer damage for testing in the range of $\sim 800\text{--}1600\text{ }^{\circ}\text{C}$ ($1500\text{--}2900\text{ }^{\circ}\text{F}$).

Specification:

| | |
|--------------------|--|
| Analog Output: | User specified, ± 10 VDC typical, ± 10.8 VDC rail |
| Digital Output: | 24 bit high speed Ethernet output with built-in web interface |
| Cyclic Testing: | up to 10 Hz, depending on test system and test amplitude |
| Accuracy: | Standard configurations meet ASTM E83 class B-1 and ISO 9513 class 0,5 requirements for accuracy. A test certificate is included. Rod lengths >250 mm (10") can affect the final class rating. |
| Linearity: | 11 point digital linearization, $\leq 0.1\%$ FS typical linearity |
| Hysteresis: | $\leq 0.1\%$ FS typical |
| Resolution: | <75 PPM (0.0075%FS) RMS @ 4 kHz, < 6PPM (0.0006%FS) @ 100 Hz at gauge length |
| Filter: | Selectable 100 Hz analog and 2 Hz - 3 kHz digital filters |
| Temperature Range: | Standard (-ST) is to 1200 °C (2200 °F), optional(-HT) 1600 °C (2900 °F) Sensor Cables: 2 m (6.5 ft) room temperature cables |
| Output Cables: | Flexible 2.4 m (8 ft) analog output cables |
| Operating Force: | <30 grams typical |
| Contact Force: | <560 grams typical |
| Environment: | Recommended for testing in dry air, inert / non-corrosive gases, or vacuum |
| Power: | Includes power supply for your country (specify) |

Technical Data

Ceramic rod lengths are made to fit furnaces as required. Provide furnace dimensions and electrical outlet type at time of ordering. Requires external mounting brackets and 110 - 240VAC / 4W electrical power. Water cooling is recommended; required for 1000 °C and above. Other configurations are available with special order; please contact us to discuss your requirements.

| | | | |
|---------------------------|--------------|------------|-----------|
| Model Number 7650A | 0125M | 015 | ST |
| Gage Length | | | |
| Travel | | | |
| Temperature Ranges | | | |

| Gage Length: | |
|--------------|---------|
| -0125M | 12.5 mm |
| -025M | 25.0 mm |

| Measuring Range (Travel) | |
|--------------------------|-------------------|
| -015M | +1.5 mm / -1.5 mm |
| -020M | +2.0 mm / -1.0 mm |
| -025M | +2.5 / -0.5 mm |

| Temperature Ranges: | | |
|---------------------|-----------|--------------------|
| Standard | ST | Ambient to 1200 °C |
| High | HT | Ambient to 1600 °C |

Example: 7650A-025M-020M-ST: 25 mm gauge length, +2.0 / -1.0 mm measuring range, standard temperature range (room temperature to 1200 °C)

Options:

- Constant-temperature recirculating chiller
- Load frame mounting brackets
- Bulkhead adapters for use in vacuum chambers

