INSTRON®



Servohydraulic | Fatigue Testing Systems

“Brilliant ideas deserve the right tools to bring them to life. When you have the confidence that your materials and designs will perform under pressure, you can create products that change the world.”

Tim Palmer
Group President, Instron

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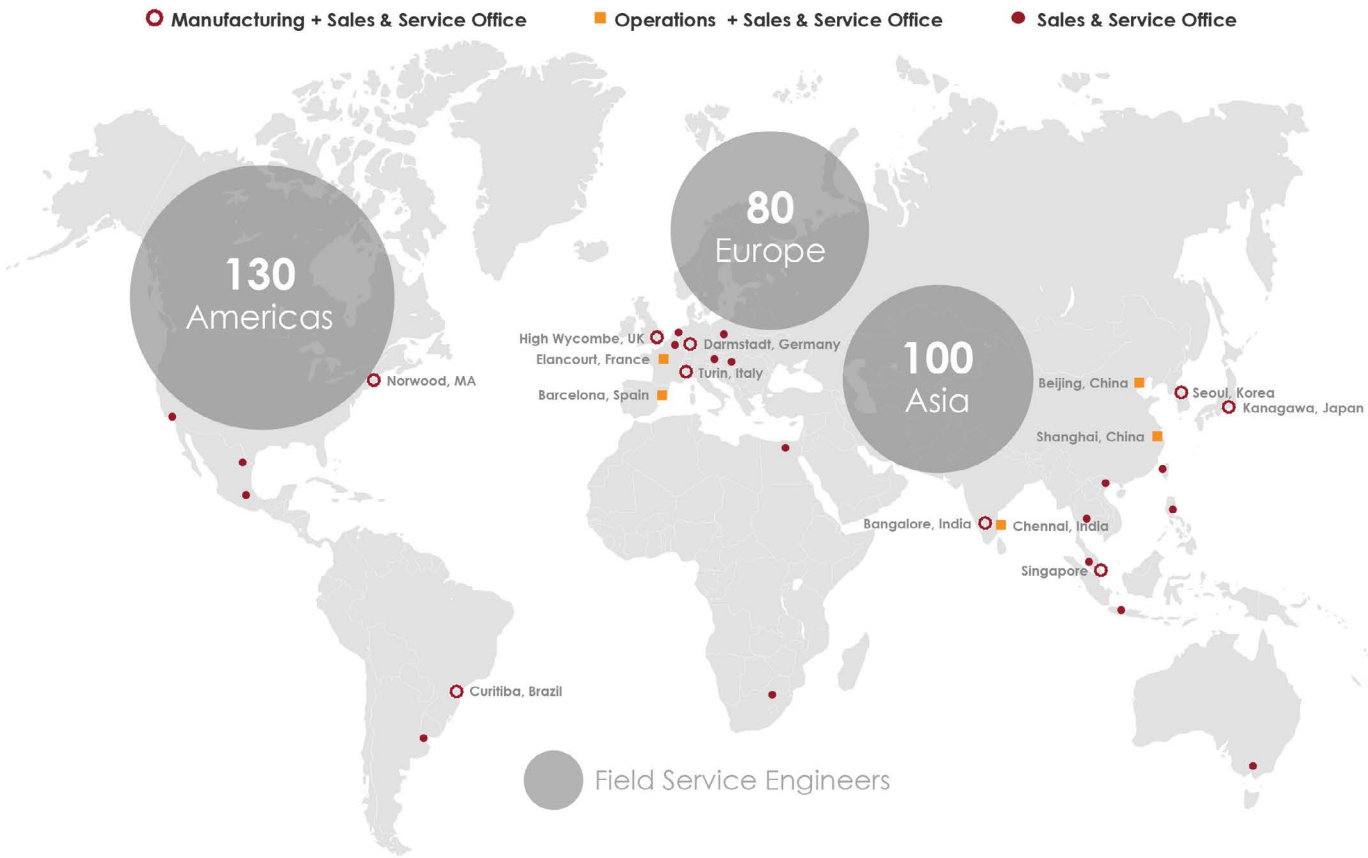
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About Instron®



1500+ Employees Globally

120 Sales in Countries

40+ Languages Spoken

80 YEARS Materials Testing Experience

300+ Field Service Engineers








A world leading supplier of mechanical testing equipment

Instron® is a supplier of a wide variety of mechanical testing equipment in almost every aspect of industry and academia. From quality control through to high-end research and development, we support customers in their pursuit of high quality, long-lasting products. As well as a full range of fatigue testing equipment, you can ask your Instron representative for more information about almost any testing application:

- Dynamic & Fatigue testing
- High temperature testing
- High rate or high speed testing
- Electromechanical static testing
- High force static hydraulic testing
- Impact testing and drop towers
- Rheology and melt flow testing
- Structural testing

A Commitment to Innovation

The Instron brand is synonymous with market-leading, quality products. Over the years, our investment in research and development has produced a number of materials testing innovations from the first strain gauge load cell to all-electric dynamic systems. Innovation is at the heart of our long term commitment to solve our customer's materials testing challenges, big or small.

Service and Support

It is our objective at Instron to provide our customers the best ownership experience by delivering the highest quality products, expert support and world-class service. As well as having companywide ISO 9001 accreditation, Instron is committed to providing customers with a wealth of applications support and a lifecycle management policy to support customers in achieving long-term business continuity.




Servohydraulic Fatigue Products

25 kN - 500 kN Dynamic Load Frames

8872 Servohydraulic Fatigue Testing System
25 kN

The Instron® 8872 is a compact tabletop servohydraulic testing system that meets the challenging demands of various static and dynamic testing requirements. With the actuator in the upper crosshead and a lower t-slot table, the 8872 makes an ideal platform for a variety of medical devices, biomaterials, advanced materials, and other component testing.

Features

- Double-acting servohydraulic actuator with force capacity up to ±25 kN (±5620 lbf)
- High-stiffness, precision-aligned load frame with twin columns and actuator in upper crosshead
- 100 mm (4 in) of usable stroke
- Designed for both dynamic and static testing on a variety of materials and components
- Choice of hydraulic configuration and dynamic performance to suit application
- Adjustable upper crosshead with hydraulic lifts and manual locks fitted as standard for easy adjustment of daylight
- Patented$_1$ Dynacell™ load cell technology for faster testing and reduction of inertial errors
- Compact tabletop servohydraulic fatigue testing system – frame requires less than 0.4 m² (4.3 ft²) of space
- Designed to be used with the 3621 Series of Hydraulic Power Units
- Compatible with a large range of grips, fixtures, chambers, extensometers, protective shields, and other accessories
- Patented stiffness based tuning algorithm that enables users to tune a variety of specimens in seconds



Controller and Software

The Instron 8872 is supplied with a digital 8800MT controller that provides full system control including features such as stiffness based tuning, amplitude control, specimen protect, up to 24-bit resolution across the full range of transducers, and adaptive control technology. It also allows access to WaveMatrix™3 Dynamic Testing Software, Bluehill® Software for static tests and other application specific software, such as Bluehill Fracture.

FRAME SPECIFICATIONS

Daylight Opening (Maximum Between Load Cell and base at Mid-stroke)	mm in	1067 42
Dynamic Load Capacity	kN lbf	±25 ±5620
Actuator Stroke (Total)	mm in	100 4
Configuration		Twin-Column High-Stiffness Load Frame with Actuator in Upper Crosshead and T-Slot Base
Lifts and Locks		Hydraulically-Powered Lifts and Manual Locks
Load Cell		Patented[1] Dynacell™ Fatigue-Rated Load Cell with Capacity to Suit Actuator
Load Weighing Accuracy		±0.5% of Indicated Load or ±0.005% of Load Cell Capacity (1-100%), Whichever is Greater
Hydraulic Pressure Supply (Required)	bar psi	207 3000
Electrical Supply		Single-Phase Mains 90-132 or 180-264 VAC 45/65 Hz Power Consumption: 800 VA Max
Operating Environment		+10 to +38 °C (+50 to +100 °F) with 10 to 90% Humidity Non-Condensing
Frame Stiffness	kN/mm	260 (at 600 mm crosshead height)
Frame Weight	kg lb	287 633

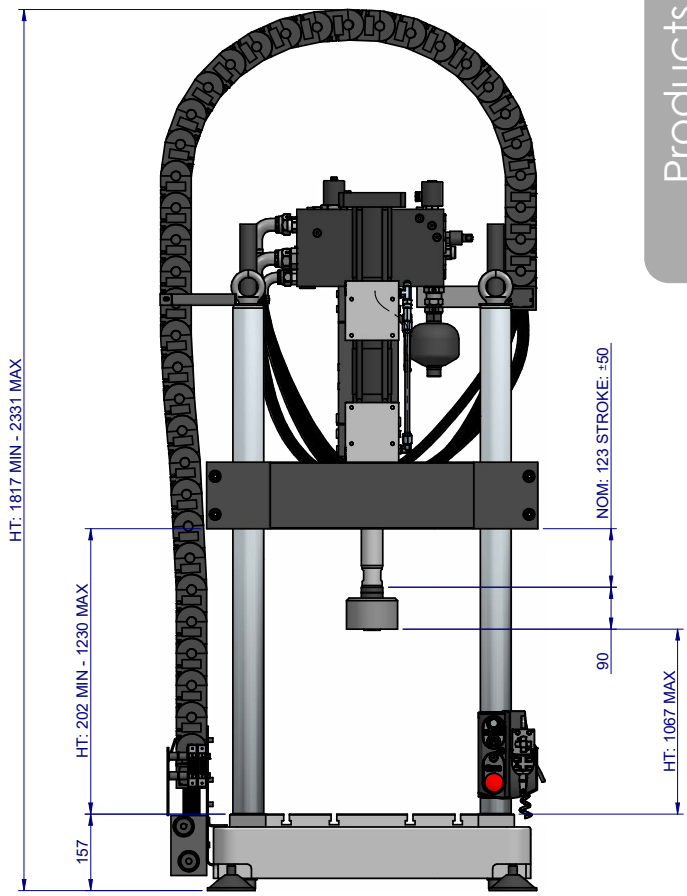
MECHANICAL INTERFACES

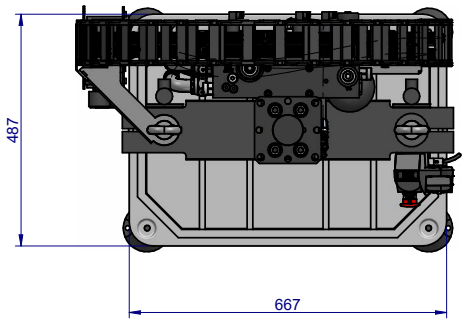
Load Cell	M20 × 1.5 Right Hand Central Thread
Actuator	M20 × 1.5 Right Hand Central Thread
Table and Crosshead	4 × M10 Holes on a 280 mm × 90 mm for Accessory Mounting 6 × M10 on 100 mm PCD (Table) with 40 mm Location Diameter 4 × M10 T-Slots Running Front and Back, Spaced 80 and 100 mm From Center Line

ACCESSORIES

2742-301	±30 kN Fatigue-Rated Hydraulic Wedge Grips
2780-118	Fracture Mechanics Grips for 12.5 mm Wide Compact Tension Specimen (±20kN static, ±10kN dynamic)
2810-181	3-Point Fatigue-Rated Bend Fixture (±100kN Dynamic)
2810-184	4-Point Conversion Kit for 2810-181
2840-119	150 mm (6 in) Diameter Compression Platens (500kN)

1) US Patent Number 6508132





Instron® 8872 Dimensions (All Dimensions in mm)

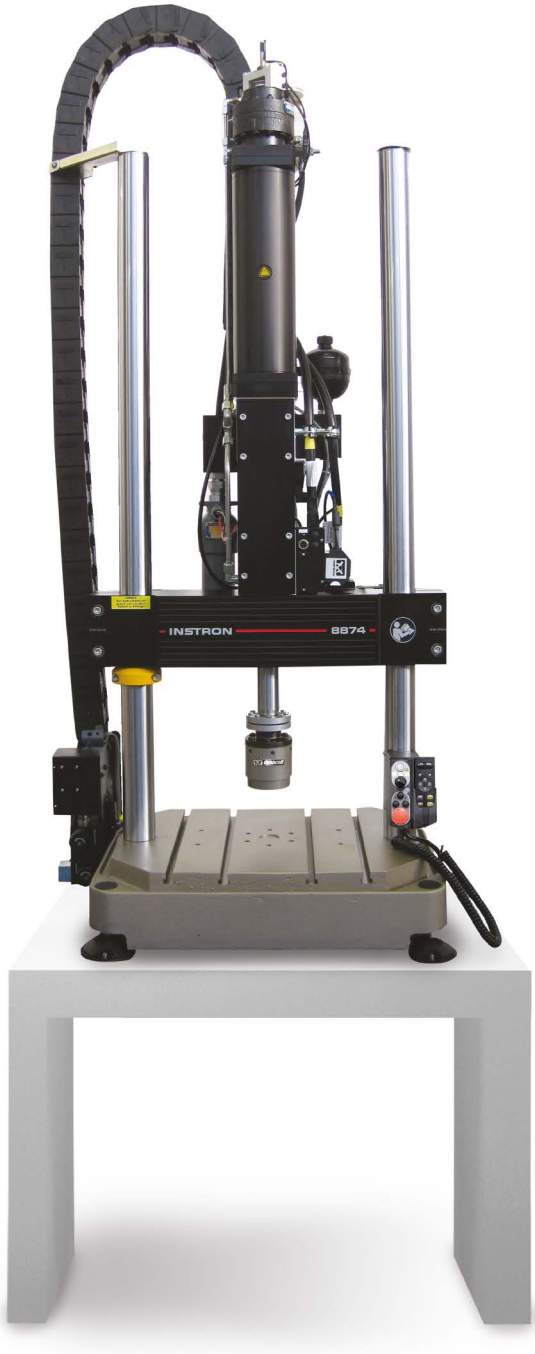
Drawings not to scale, for reference use only

8874 Biaxial Servohydraulic Fatigue Testing System
25 kN/100 Nm

The Instron® 8874 is a compact tabletop biaxial servohydraulic testing system that meets the challenging demands of various static and dynamic tests. The system carries out axial, torsion, or combined axial-torsion tests. With the actuator in the upper crosshead and a lower t-slot table, the 8874 makes an ideal platform for testing a variety of medical devices, biomaterials, advanced materials, and other components testing.

Features

- Double-acting servohydraulic actuator with force capacity up to ±25 kN (±5620 lbf) and torque capacity of ±100 Nm (880 in-lb)
- High-stiffness, precision-aligned load frame with twin columns and actuator in upper crosshead
- 100 mm (4 in) of usable axial stroke and ±130° of rotation
- Designed for both dynamic and static testing on a variety of materials and components
- Adjustable upper crosshead with hydraulic lifts and manual locks fitted as standard for easy adjustment of daylight
- Patented$_1$ Dynacell™ load cell technology for faster testing and reduction of inertial errors
- Compact tabletop servohydraulic fatigue testing system – frame requires less than 0.4 m² (4.3 ft²) of space
- Designed to be used with the 3621 Series of Hydraulic Power Units
- Compatible with a large range of grips, fixtures, chambers, extensometers, protective shields, and other accessories
- Patented stiffness based tuning algorithm that enables users to tune a variety of specimens in seconds



Controller and Software

The 8874 is supplied with a two-axis digital 8800MT controller that provides full system control, including features such as stiffness based tuning, amplitude control, specimen protect, up to 24-bit resolution across the full range of transducers, and adaptive control technology. It also allows access to WaveMatrix™3 Dynamic Testing Software, Bluehill® Software for axial static tests, and other application specific software, such as Bluehill Fracture.

FRAME SPECIFICATIONS

Daylight Opening (Maximum Between Load Cell and base with Actuator at Mid-stroke)	mm in	1033 40.1
Dynamic Load Capacity	kN lbf	±25 ±5620
Torque Capacity	Nm inlb	100 880
Actuator Stroke (Total)	mm in	100 4
Actuator Rotation		±130°
Configuration		Twin-Column High-Stiffness Load Frame with Actuator in Upper Crosshead and T-Slot Base
Lifts and Locks		Hydraulically-Powered Lifts and Manual Locks
Load Cell		Patented[1] Biaxial Dynacell™: Fatigue-Rated Load Cell with Capacity to Suit Actuators
Load Weighing Accuracy		±0.5% of Indicated Load or ±0.005% of Load Cell Capacity (1-100%), Whichever is Greater
Hydraulic Pressure Supply (Required)	bar psi	207 3000
Electrical Supply		Single-Phase Mains 90-132 or 180-264 VAC 45/65 Hz Power Consumption: 800 VA Max
Operating Environment		+10 to +38 °C (+50 to +100 °F) with 10 to 90% Humidity Non-Condensing
Frame Stiffness	kN/mm	260 (at 600 mm crosshead height)
Torsional Stiffness	kNm/deg	870
Frame Weight	kg lb	327 721

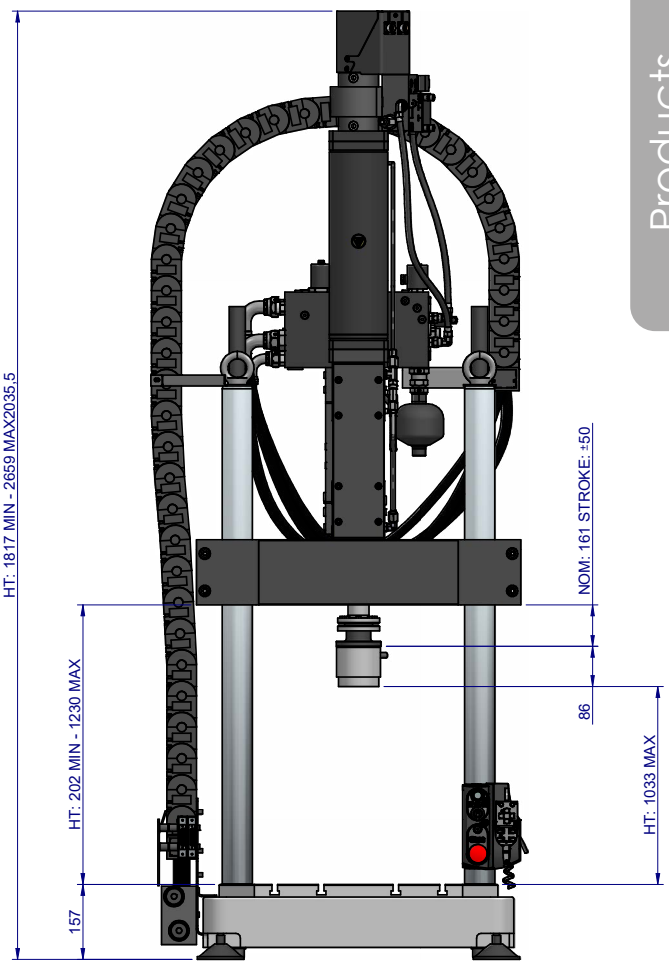
MECHANICAL INTERFACES

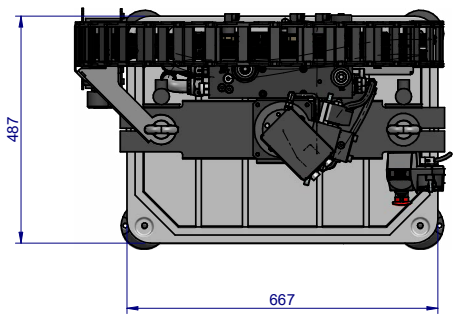
Load Cell	6 × M8 on 75 PCD
Actuator	6 × M8 on 75 mm PCD 6 × 9 mm Diameter Through Holes on 75 mm PCD
Table	4 × M10 Holes on a 280 mm × 90 mm for Accessory Mounting 6 × M10 on 100 mm PCD (Table) with 40 mm Location Diameter 4 × M10 T-Slots Running Front to Back, Spaced 80 and 100 mm from Centerline
Crosshead	4 × M10 Holes on a 280 mm × 90 mm for Accessory Mounting 6 × M10 on 100 mm PCD (Table) with 40 mm Location Diameter

ACCESSORIES

8260C	**±25 kN / ±100 Nm Fatigue Rated Hydraulic Wedge Grips**

1) US Patent Number 6508132





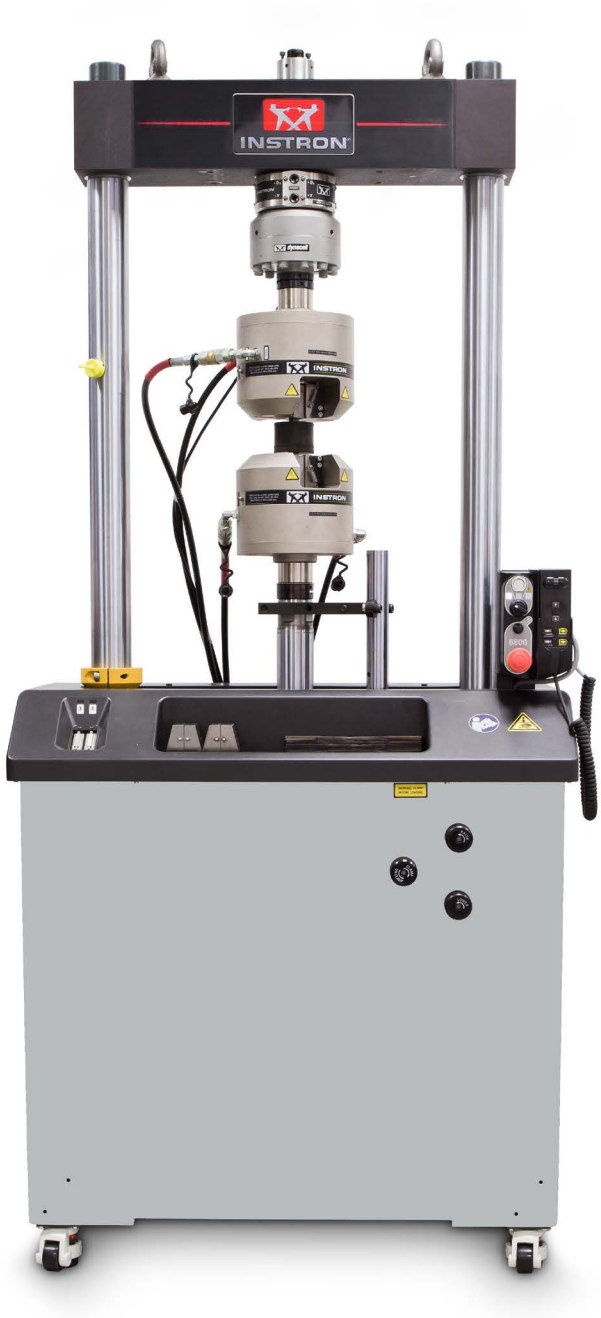
Instron® 8874 Dimensions (All Dimensions in mm)
Drawings not to scale, for reference use only

8801 Servohydraulic Fatigue Testing System
Up to 100 kN

The Instron® 8801 is a compact servohydraulic fatigue testing system that meets the challenging demands of various static and dynamic testing requirements. 8801 systems provide complete testing solutions to satisfy the needs of advanced materials and component testing, and are ideally suited for fatigue testing and fracture mechanics. The compact design of the 8801 frame makes it ideal for installation within any laboratory environment, generally without the need for strengthened floors or raised ceiling heights.

Features

- Double-acting servohydraulic actuator with force capacity up to ±100 kN (±22 kip)
- High-stiffness, precision-aligned load frame with twin columns and actuator in lower base
- 150 mm (6 in) of usable stroke
- Designed for both dynamic and static testing on a variety of materials and components
- Choice of hydraulic configuration and dynamic performance to suit application
- Extra-height for testing with longer load strings
- Adjustable upper crosshead with hydraulic lifts and locks fitted as standard for easy adjustment of daylight
- Patented$_1$ Dynacell™ advanced load cell technology for faster testing and reduction of inertial errors
- Compact servohydraulic fatigue test system – frame requires less than 0.5 m² (5.4 ft²) of floor space
- Hydrostatic bearing actuators for higher side-load resistance or material critical applications, such as low cycle fatigue (LCF)
- Designed to be used with the 3621 Series of Hydraulic Power Units
- Compatible with a large range of grips, fixtures, chambers, extensometers, protective shields, and other accessories
- Patented stiffness based tuning algorithm that enables users to tune a variety of specimens in seconds



Controller and Software

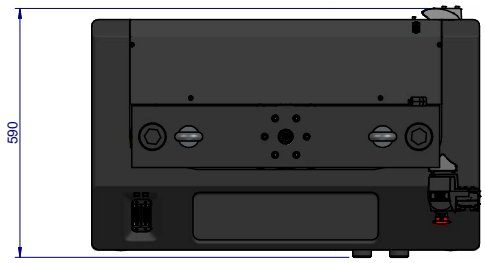
The Instron 8801 is supplied with a digital 8800MT controller that provides full system control, including features such as stiffness based tuning, amplitude control, specimen protect, up to 24-bit resolution across the full range of transducers, and adaptive control technology. It also allows access to WaveMatrix™3 Dynamic Testing Software, Bluehill Universal® Software for axial static tests, and other application specific software, such as Bluehill Fracture.

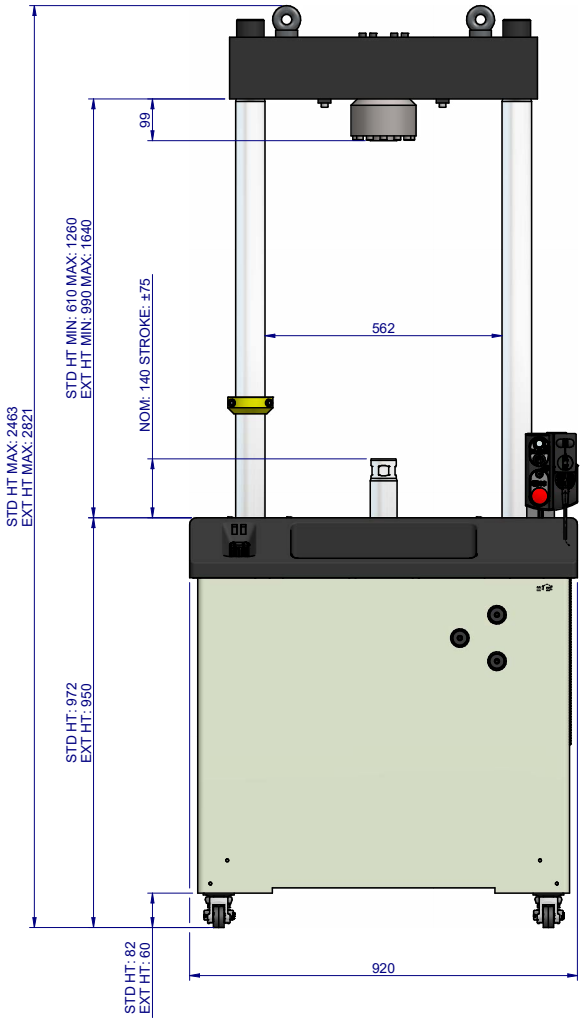
FRAME SPECIFICATIONS		Standard Height	Extra Height
Daylight Opening (Maximum Between Load Cell and Actuator at Mid-stroke)	mm	1021	1401
	in	40.2	55.2
Dynamic Load Capacity	kN	±50	±100
	Kip	±11	±22
Actuator Stroke (Total)	mm	150	
	in	5.9	
Configuration		Twin-Column High-Stiffness Load Frame with Actuator in Lower Table	
Lifts and Locks		Hydraulically-Powered Lifts and Locks	
Load Cell		Patented[1] Dynacell™ Fatigue-Rated Load Cell Mounted to Upper Crosshead with Capacity to Suit Actuator	
Load Weighing Accuracy		±0.5% of Indicated Load or ±0.005% of Load Cell Capacity (1-100%), Whichever is greater	
Hydraulic Pressure Supply (Required)	bar	207	
	psi	3000	
Electrical Supply		Single-Phase Mains 90-132 or 180-264 VAC 45/65 Hz Power Consumption: 800 VA max	
Operating Environment		+10 to +38 °C (+50 to +100 °F) with 30 to 95% Humidity Non-Condensing	
Frame Stiffness	kN/mm	390 (at 1000 mm crosshead height)	
Frame Weight	kg	680	
	lb	1500	

MECHANICAL INTERFACES	
Load Cell	M30 × 2 Right Hand Central Thread
Actuator	M30 × 2 Right Hand Central Thread
Table and Crosshead	4 × M10 Holes on a 280 mm × 90 mm for Accessory Mounting

ACCESSORIES	
2743-401	±100 kN Fatigued-Rated Hydraulic Wedge Grips
2743-402	±100 kN Fatigued-Rated Mechanical Wedge Grips
2780-119	Fracture Mechanics Grips for 25 mm Wide Compact Tension Specimen (±50kN dynamic)
2810-181	100 kN Fatigue-Rated 3-Point Bend Fixture
2810-184	4-Point Conversion Kit for 2810-181
2840-119	150 mm (6 in) Diameter (±500kN dynamic)

1) US Patent Number 6508132





Instron® 8801 Dimensions (All Dimensions are in mm)

Drawings not to scale, for reference use only

8862 Low Cycle Fatigue Testing System
100 kN Servo-Electric Actuator

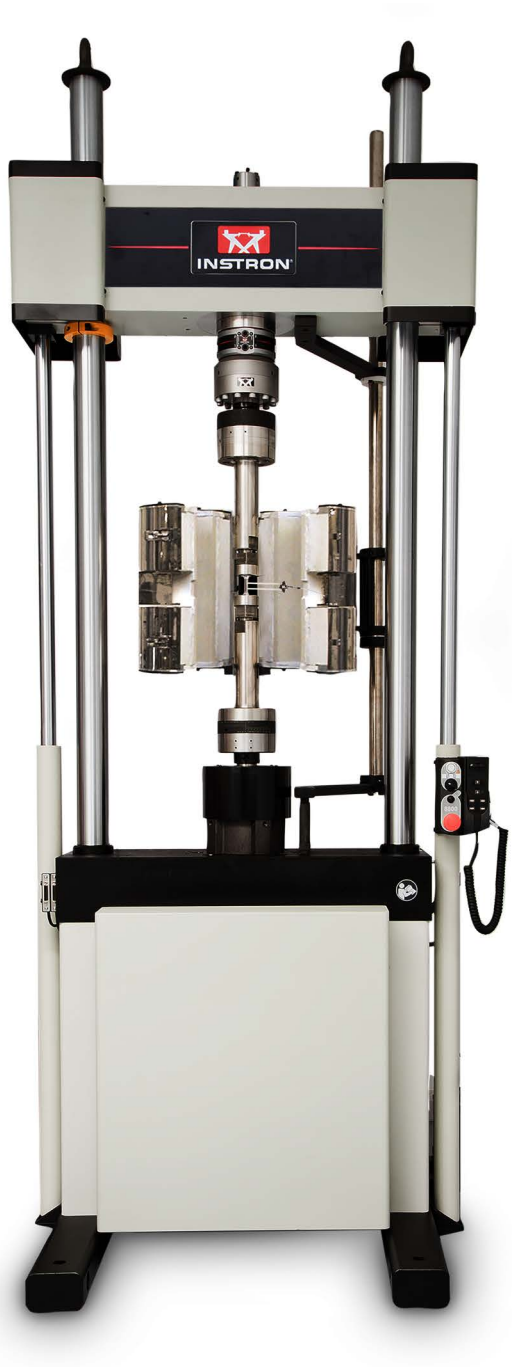
8862 systems have been the industry choice for Low Cycle Fatigue (LCF) testing for decades and are now fully integrated with our latest controller platform. Instron® has developed this system specifically to address the challenges of reverse-stress Low Cycle Fatigue and Thermomechanical Fatigue (TMF) testing. The unique actuator technology utilizes an all-electric, backlash free, ball-screw drive, eliminating the need for hydraulic infrastructure to support the machine.

An ideal platform for Low Cycle Fatigue

- High capacity loading frame that maximizes lateral and axial stiffness during reverse stress testing
- Precision control achieved by our unique backlash free actuator design delivering actuator velocities down to just 1 µm/hour
- Easy installation into any lab space with minimal infrastructure requirements
- Virtually silent operation creating an ideal working environment for your operators
- Low power consumption reducing your annual cost of running tests
- Minimal maintenance required compared with a fully hydraulic system
- Integration with Uninterruptable Power Supply to protect your specimen from overloading in the event of power loss
- Patented stiffness based tuning algorithm that enables users to tune a variety of specimens in seconds

Instron® expertise across your entire application

- Dedicated LCF and TMF software packages make it easy to carry out complex tests and get the results you need first time, every time
- Complete alignment solutions are included on all high temperature systems. This means that you can measure and adjust loadstring alignment with the AlignPro package. The guided software will tell you exactly which adjustments are required to achieve perfect alignment
- Instron's core transducer technology is designed and manufactured by Instron in our UK centre of excellence and verified in our own on-site accredited facility
- Years of experience and expertise in the changing demands of international high temperature standards and the technical challenges of testing up to and beyond 1000 °C
- World-class control delivered by the 8800MT which is the latest in the prestigious 8800 family of dynamic digital controllers



FRAME SPECIFICATIONS

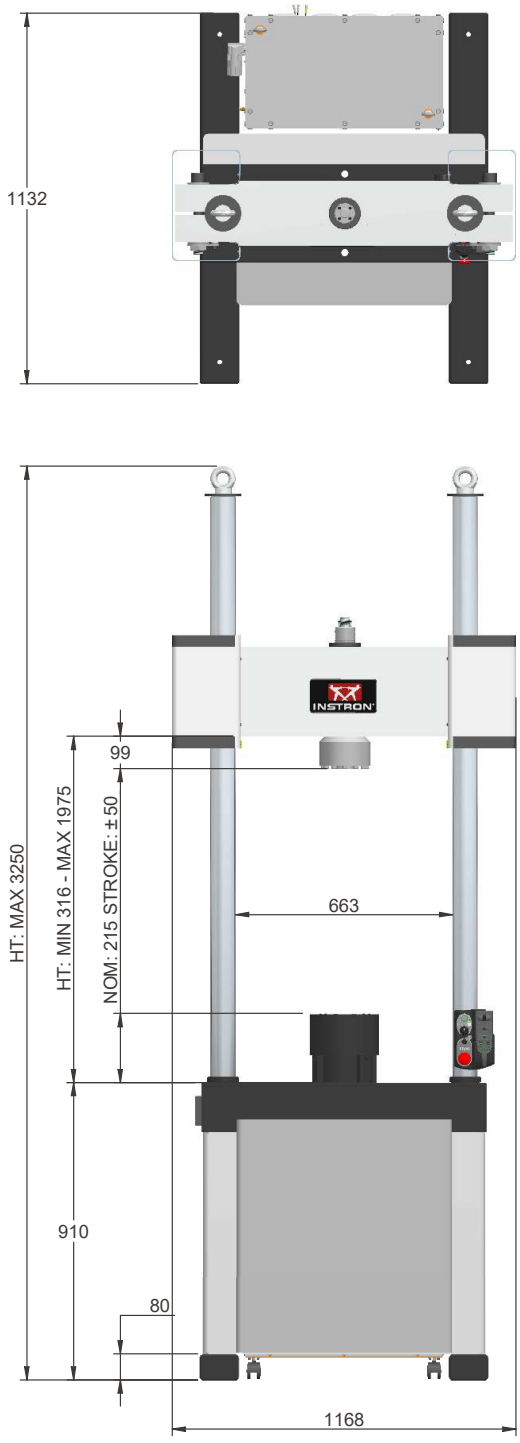
Daylight Opening (Maximum Between Load Cell and Actuator at Mid-stroke)	mm	1660
	in	65.3
Dynamic Load Capacity	kN	Up to 100
	kip	Up to 22
Actuator Stroke (Total)	mm	100
	in	4
Configuration		Twin-Column High-Stiffness Load Frame with Actuator in Lower Table
Lift and Locks		Hydraulically-Powered Lifts and Locks
Load Cell		Patented[1] Dynacell™ Fatigue-Rated Load Cell with Capacity to Suit Actuator
Load Weighing Accuracy		±0.5% of Indicated Load or ±0.005% of Load Cell Capacity (1-100%), Whichever is Greater
Max Actuator Speed	mm/min	300
Min Actuator Speed	µ/hr	1 requires suitable transducer
Electrical Supply		Single-Phase Mains 90-132 or 180-264 V 45/65 Hz with Power Consumption 800 VA Max
Operating Environment		+10 to +38°C (+50 to +100°F) with 10 to 90% Humidity Non-Condensing
Frame Stiffness	kN/mm	595 (at 1000 mm crosshead height)
Maximum Frame Weight (Dependent on Final Configuration)	kg	1460
	lb	3219

MECHANICAL INTERFACES

Load Cell	M30 × 2 Right Hand Female Central Thread
Actuator	M30 × 2 Right Hand Female Central Thread

ACCESSORIES

Heating	1000°C Furnace or Induction Coil
Gripping	Reverse stress pull-rods or water cooled Grips
Software	WaveMatrix3 or Thermomechanical fatigue
Alignment	Mechanical alignment fixture and Alignment software
Extensometry	High temperature extensometers (12.5 mm and 25 mm GL)



Instron® 8862 Dimensions (All Dimensions are in mm)

Drawings not to scale, for reference use only

8802 Servohydraulic Fatigue Testing System
Up to 250 kN

The Instron® 8802 is a compact servohydraulic fatigue testing system that meets the challenging demands of various static and dynamic testing requirements. 8802 systems provide complete testing solutions to satisfy the needs of advanced materials and component testing, and are ideally suited for fatigue testing and fracture mechanics. The compact design of the 8802 frame makes it ideal for installation within any laboratory environment, generally without the need for strengthened floors or raised ceiling heights.

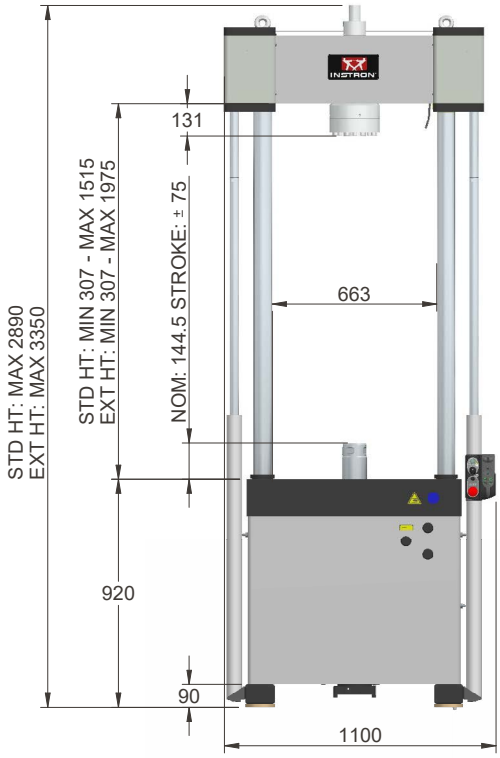
Features

- Double acting Servohydraulic actuator force capacity up to ±250 kN (±56 Kip)
- High-stiffness, precision-aligned load frame with twin columns and actuator in lower base or upper crosshead
- 150 mm (5,9 in) of usable stroke
- Designed for both dynamic and static testing on a variety of materials and components
- Choice of hydraulic configuration and dynamic performance to suit application
- Extra-height frame options for testing longer load strings
- Adjustable upper crosshead with hydraulic lifts and locks fitted as standard for easy adjustment of daylight
- Patented[1], Dynacell™ advanced load cell technology for faster testing and reduction of inertial errors
- Floor-standing servohydraulic fatigue testing system – frame requires less than 1.2 m^2 (12.9 ft^2) of floor space
- Hydrostatic bearing actuators for higher side-load resistance or material critical applications, such as low-cycle fatigue (LCF)
- Designed to be used with the 3621 Series of Hydraulic Power Units
- Compatible with a large range of grips, fixtures, chambers, extensometers, protective shields, and other accessories
- Patented stiffness based tuning algorithm that enables users to tune a variety of specimens in seconds

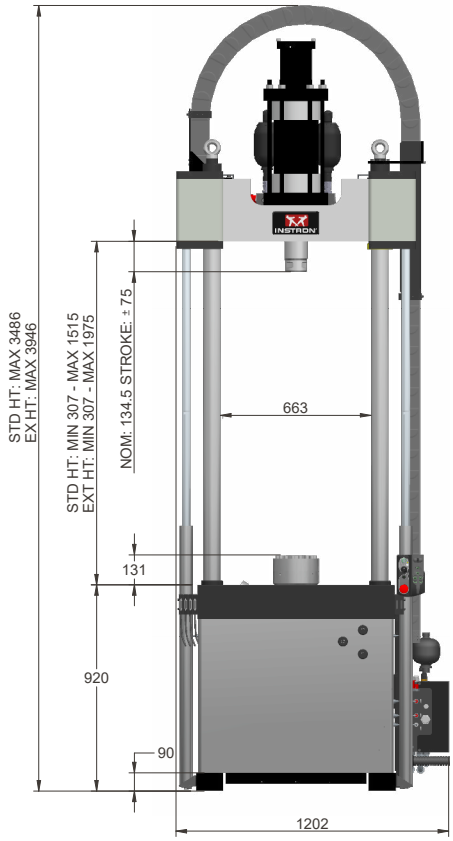


Controller and Software

The Instron 8802 is supplied with a digital 8800MT controller that provides full system control, including features such as stiffness based tuning, amplitude control, specimen protect, up to 24-bit resolution across the full range of transducers, and adaptive control technology. It also allows access to WaveMatrix™3 Dynamic Testing Software, Bluehill Universal Software for axial static tests, and other application specific software, such as Bluehill Fracture.



Total frame footprint 1.2 m²
Instron® 8802 Actuator in Base Dimensions



Total frame footprint may vary
Instron 8802 Actuator in Crosshead Dimensions

FRAME SPECIFICATIONS		Standard Height Frame
Daylight Opening (Maximum Between Load Cell and Actuator at Mid-stroke, with Largest Capacity Actuator)	mm in	1240 48.8
Dynamic Load Capacity	kN kip	Up to 250 Up to 56
Actuator Stroke (Total)	mm in	Standard offering 150* 5.9
Actuator Force Rating	kN	Standard offering 100/250*
Configuration		Twin-Column High-Stiffness Load Frame with Actuator in Lower Table or Upper Crosshead
Lift and Locks		Hydraulically-Powered Lifts and Locks
Load Cell		Patented[1] Dynacell™ Fatigue-Rated Load Cell with Capacity to Suit Actuator
Load Weighing Accuracy		±0.5% of Indicated Load or ±0.005% of Load Cell Capacity (1-100%) Whichever is Greater
Manifold Options		Single Valve or Dual Valve
Hydraulic Pressure Supply (Required)	bar psi	207 3000
Frame Stiffness	kN/mm	585 (at 1000 mm crosshead height)
Maximum Frame Weight (Dependent on Final Configuration)	kg lb	1366 3012

MECHANICAL INTERFACES	
Load Cell	M30/M48 × 2 Right Hand Female Central Thread
Actuator	M30/M48 × 2 Right Hand Female Central Thread
Table and Crosshead	4 × M10 Holes on a 280 mm × 90 mm for Accessory Mounting

* Consult factory for alternative available configurations
1) US Patent Number 6508132

8803 Servohydraulic Fatigue Testing System
Up to 500 kN

The Instron® 8803 is a versatile servohydraulic fatigue testing system that performs static and dynamic tests on materials and components up to 500 kN. 8803 systems provide complete testing solutions to satisfy the needs of advanced materials and component testing, and are ideally suited for fatigue testing and fracture mechanics. This features a large number of configurations and options, including lower t-slot tables, the 8803 makes an ideal platform for any laboratory.

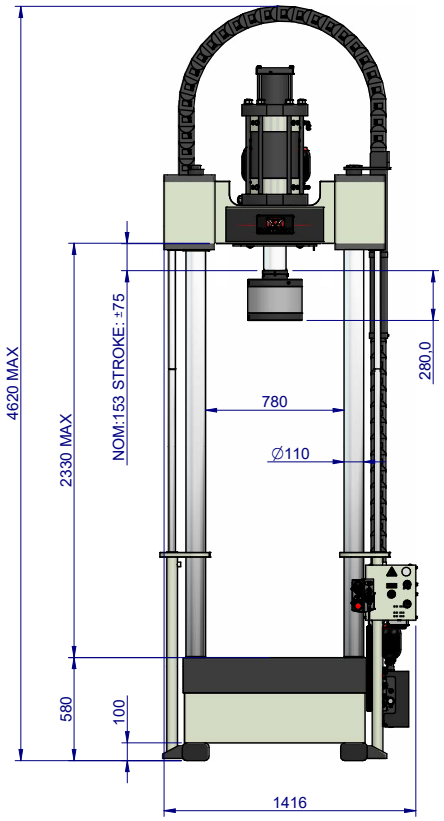
Features

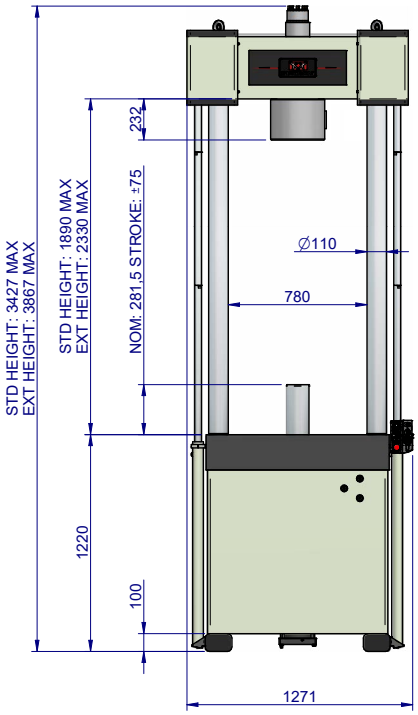
- Double-acting servohydraulic actuator with force capacity up to ±500 kN (±112 kip)
- High-stiffness, precision-aligned load frame with twin columns and actuator in lower base or upper crosshead
- Designed for both dynamic and static testing on a variety of materials and components
- Choice of hydraulic configuration and dynamic performance to suit application
- Extra-height and Extra-extra height frame options for testing longer load strings
- Adjustable upper crosshead with hydraulic lifts and lock fitted as standard for easy adjustment of daylight
- Up to 250 mm (9.8 in) of usable stroke
- Patented$_1$ Dynacell™ advanced load cell technology for faster testing and reduction of inertial errors
- Floor-standing servohydraulic fatigue testing system frame requires less than 1.6 m² (16.6 ft²) of floor space
- Hydrostatic bearing actuators for high side-load resistance and better alignment during testing
- Designed to be used with the 3621 Series of Hydraulic Power Units
- Compatible with a large range of grips, fixtures, chambers, extensometers, protective shields, and other accessories
- Patented stiffness based tuning algorithm that enables users to tune a variety of specimens in seconds



Controller and Software

The Instron 8803 is supplied with a digital 8800MT controller that provides full system control including features such as stiffness based tuning, amplitude control, specimen protect, up to 24-bit resolution across the full range of transducers, and adaptive control technology. It also allows access to WaveMatrix™3 Dynamic Testing Software, Bluehill® Software for static tests, and other application specific software, such as Bluehill Fracture.





Drawings not to scale, for reference use only

FRAME SPECIFICATIONS		Standard Height Frame
Daylight Opening (Maximum Between Load Cell and Actuator at Mid-stroke)	mm in	1816.5 71.5
Dynamic Load Capacity	kN kip	500 112
Actuator Stroke (Total)	mm in	up to 250 5.9
Actuator Force Rating	kN	500*
Configuration		Twin-Column High-Stiffness Load Frame with Actuator in Lower Table or Upper Crosshead
Lift and Locks		Hydraulically-Powered Lifts and Locks
Load Cell		Patented$_1$ Dynacell™ Fatigue-Rated Load Cell with Capacity to Suit Actuator
Load Weighing Accuracy		±0.5% of Indicated Load or ±0.005% of Load Cell Capacity (1-100%), Whichever is Greater
Manifold Options		Single Valve, Dual Valve,
Hydraulic Pressure Supply (Required)	bar psi	207 3000
Electrical Supply		Single-Phase Mains 90-132 or 180-264 V 45/65 Hz with Power Consumption 400 VA Max
Operating Environment		+10 to +38°C (+50 to +100°F) with 10 to 90% Humidity Non-Condensing
Frame Stiffness	kN/mm	1066
Maximum Frame Weight (Dependent on Final Configuration)	kg lb	2580 5688

MECHANICAL INTERFACES	
Load Cell	M72 × 3 Right Hand Female Central Thread
Actuator	M72 × 3 Right Hand Female Central Thread
Table and Crosshead	4 × M10 Holes on a 280 mm x 90 mm for Accessory Mounting

ACCESSORIES	
2742-601	±500 kN Fatigue-Rated Hydraulic Wedge Grips
2750-120	Fracture Mechanics Grips for 50 mm Wide Compact (±250kN dynamic)
2810-250	500 kN Fatigue-Rated 3-Point Bend Fixture
2840-119	150 mm (6 in) Diameter (±500kN)

*Note: Dimensions and specifications relate to a 500kN system with a ±75mm (±2.95in) stroke actuator. Other capacity actuators may change certain specifications. Overall heights for actuator in crosshead configurations are stated with a ±125mm (±4.9in) stroke actuators. Check with your local Instron office for further details. 1) US Patent Number 6508132

8800 MiniTower Control Electronics

The 8800MT controller is a class-leading, fully digital dynamic controller that utilizes Instron® core technologies and is capable of running static and high-frequency dynamic tests. Found at the heart of Instron's servohydraulic testing systems, the 8800MT controller provides full system control, machine safety, transducer conditioning, and data acquisition, as well as acts as the foundation for the user interface to the testing machine.

Features

- Dedicated materials testing hardware and firmware-based controller developed through decades of research, development, and continuous use
- Continuous synchronous data acquisition and loop closure rates of 10 kHz
- Up to 24-bit data resolution across the entire span of each transducer provides maximum data quality
- Automatic identification and calibration of all compatible transducers prevents configuration errors and simplifies setup
- Specimen Protect function helps to avoid damage of specimen and fixtures during test setup and end of test
- Continuous update of PID control terms with Adaptive Control - optimizes the control parameters throughout a test to suit the changing stiffness characteristics of the specimen
- Expandable architecture; extensive analog and digital channel capabilities
- Patented stiffness based tuning algorithm that enables users to tune a variety of specimens in seconds





Handset and Frame

The handset, frame controls, and emergency stop button make up the hardware interface that is rigidly mounted to the testing machine. Their functionality includes switching the machine into low power or high power mode; offering fast or fine positioning of the actuator; and where fitted, opening and closing of hydraulic grips. Uniquely, the 8800MT offers additional protection by locking out the actuator and grip controls when a waveform is running, or when in load or strain control.



Console Software

Console Software is the main user interface to the 8800MT controller. Running on a PC, it allows all controller functions to be viewed and configured including control-loop optimization, setting of operational limits, and running of simple cyclic tests. Console provides the foundation for running more demanding tests in application software such as WaveMatrix™3, Bluehill® Software, or specific software, such as Bluehill Fracture.

Specifications
8800 MT

CONFIGURATIONS

Axes of control	1-2
Sensor conditioning channels	Up to 8
Channels as Standard	Position and Load
Spare Channel Slot for	Strain 1 and Strain 2 or any other compatible sensors
Control Loop Type	Type PID (Proportional, Integral, Derivative), Lag, Feed Forward (2 Term), Notch (4 Term) and External Compensation Input (e.g. Acceleration or Pressure Feedback)
Control Loop Update Rate	10 kHz
Auto Loop Shaping	Position, Load, and Strain
Adaptive Loop Shaping	Continually Updated PID Terms at 1 kHz
Low Power "Specimen Loading Mode" Feature	Maximum Actuator Velocity Limited by Control System

EXTERNAL INPUTS AND OUTPUTS

Analogue Input	1 off Per Axis, +/-10V Scalable
Analogue Outputs	4 off Per Axis, +/-10V with 20% Over-Range, Zero Suppressed and Scalable. Selectable from Feedback Signals, Demand Error, etc
Digital Inputs	4 off, Programmable, Low Level Opto Isolated Optional: 4 off 24V Inputs
Digital Outputs	4 off, Programmable, Low Level Opto Isolated for High-Speed Switching Optional: 4 off 24V, 1A Outputs for High Power Switching

WAVEFORM GENERATION

Frequency Range	0.00001 to 1,000 Hz
Resolution	64-bit
Waveforms	Sine, Triangle, Square, Haversine, Havertriangle, Havesquare, Ramp, Dual Ramp, Trapezoidal, and Random

SIGNAL CONDITIONING

Compatible Transducer Types	Resistive Bridges (e.g. Strain Gauged Load Cells and Extensometers), AC Devices (e.g. LVDT) and DC (e.g. Pre-Conditioned Devices)
Transducer Recognition / Calibration	Automatic with Instron® Devices, Manual with Others
Data Acquisition Rate	10 kHz
Resolution	19-bit (1k Hz Bandwidth) 24-bit (1 Hz Bandwidth via a Digital Readout)

SYSTEM MEASUREMENT ACCURACIES (WITH INSTRON TRANSDUCERS)

Position	±0.2% of Transducer Full Travel Under Normal Operating Conditions
Load	±0.002% of Load Cell Capacity or 0.5% of Indicated Load, Whichever is Greater - Meets or Surpasses ISO7500-1 Class 0.5, ASTM E 4, EN10002-2 Class 0.5, JIS (B7721, B7733) Down to 1/250th of Full Scale.
Strain	±0.005% of Transducer Capacity or ±0.25% of Reading ±Transducer Accuracy, Whichever is Greater. Meets or Surpasses ISO9513 Class 0.5, 1, 2, ASTM E 83 Class B1, B2, C, D, EN 10002-4 Class 0.5, 1, 2 and JIS7741 Grade 0.5, 12 Depending on the Extensometer Used.

GENERAL SPECIFICATIONS

Weight (Fully Populated)	kg lb	up to 22.4 50
Height	mm in	450 17.7
Width	mm in	198 7.8
Depth	mm in	475 18.7
Electrical Supply		90-132 VAC or 180-264 VAC 45-65 Hz Single Phase (Auto Switching)
Power Consumption		600 VA Maximum
Environmental Conditions	°C °F	10 to 38, Humidity 10 to 90% Non-Condensing 50 to 100, Humidity 10 to 90% Non-Condensing



3D View (All Measurements in mm)

Hydraulic Power Unit (HPU)
3621 Series

Instron HPU's can be configured to support an extensive collection of fully integrated Servohydraulic Dynamic and Fatigue material testing systems; ranging from 25kN up to 5000kN.

The 3621 series delivers consistent flow rates ranging from 37.9 L/min to 681 L/min at nominal operating pressures of 207 Bar (3000 psi) as standard and will deliver market leading levels of performance, quality and safety for a range of tests including but not limited to:

- High-Cycle, Low-Cycle and Thermo-Mechanical Fatigue
- Fracture Toughness and Crack Growth Studies
- Axial-Torsion & Multi-Axial
- High Strain Rate, Quasi-Static, Creep Fatigue and more



Standard Operation

With a broad range of applications and tests suitable for Servohydraulic testing systems, determining products which meet both the current and future needs of your lab can be complex. The powerful 3621 series integrates an array of essential features as standard which minimizes the options available and reduces the possible quantity of configurations: simplifying the selection process.

Features and Benefits

Safety

From protecting your brand to ensuring the safety of operators in your laboratory, without compromise, Instron systems are designed to minimize risks inherent in mechanical testing:

- Low Noise Operation as Standard
- Insulated Low-Temperature Touch Chassis
- Automatic Overtemp. & Hi/Lo Flow Protection
- User Friendly Control Interface

Reliability

When seeking to optimize lab productivity, accuracy and efficiency, dependable products that deliver consistent results are essential in maximizing testing uptime:

- Outlet Ripple Dampening Technology
- Rapid Response Displacement Pump
- Anti-Corrosion Stainless Steel Heat Exchanger
- Ultra-Fine Oil Cleansing Pressure & Return Filters

Adaptability

Balancing immediate requirements and ensuring future flexibility when designing a test lab can be a challenge, however, it is possible to minimize compromise via practical innovation:

- Compact & Lightweight Chassis Design
- Wide Operational Pressure/Flow Envelope
- Pipe-Run Extending Adjustable Pressure Valve
- Built-In Maneuverability Kit

Sustainability

Long-standing commitments, rooted in Instron's core values are fundamental to how we develop products that make a difference to the environment, our people and communities:

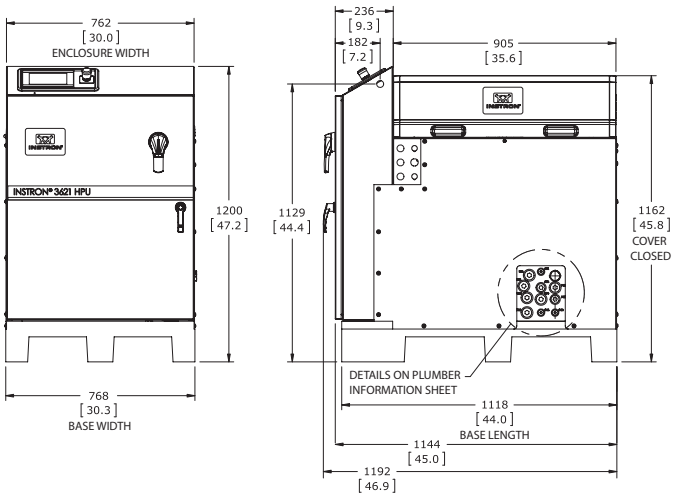
- Energy Efficient Variable Displacement Pump
- Low Maintenance Component Architecture
- Minimal Operational Cooling Demand
- Low Operational Oil Volume

Specifications
HPU

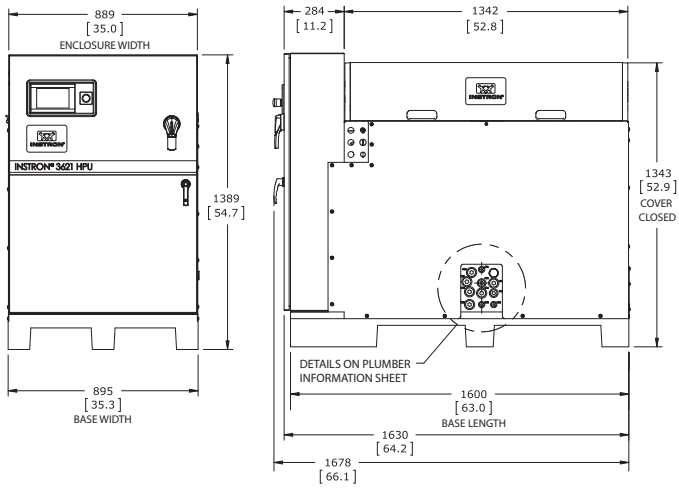
			3621-002		3621-003		3621-004	
Motor Capacity		kW	18.5		30.0		45.0	
Operating Pressure		Bar	207					
		PSI	3000					
Electrical Supply Data	Freq.	Hz	50	60	50	60	50	60
	Phase	Φ	3					
Supply Voltage	200V - 208V			✔		✔		✔
	220V - 230V		✔		✔		✔	
	220V - 240V			✔		✔		✔
	380V - 400V			✔		✔		✔
	380V - 415V		✔		✔		✔	
	415V - 440V		✔		✔		✔	
	440V - 480V			✔		✔		✔
	575V			✔		✔		✔
Nominal Flow Rate		LPM	37.9	41.6	60.6	75.7	100.7	113.6
		GPM*	10.0	11.0	16.5	20.0	26.6	30.0
Noise Level[1]		dB(A)	60		63			
Dimensions	Length	m	1.15		1.68			
	Width	m	0.77		0.90			
	Height	m	1.20		1.39			
	Footprint	m^2	0.88		1.50			
	Volume	m^3	1.10		2.09			
Weight	Gross[2]	kg	603		984		1021	
	Dry[3]	kg	404		676		712	
	Oil	kg	199		308		309	
Oil Reservoir Capacity		L (gal.*)	223 (58.9)		352 (93.0)			
Cooling Type (Source)		Water	✔		✔		✔	
Accumulator		-			✔		✔	
Transportation Kit		-	✔		✔		✔	

Note: For individual higher capacity systems, please consult your local sales office for further guidance and information.
LPM = Liters per minute | GPM = US Gallons per minute | 1 Measured at a distance of 1m in free field conditions | 2 Weight including max. oil charge | 3 Weight excluding max. oil charge | * US measurements.

3621-002



3621-003 & 3621-004



Note: Min. recommended clearance space (L x W x H): 3621-002 = 2313 mm x 1778mm x 1604mm | 3621-003 & 3621-004 = 2799mm x 1905mm x 1856mm.

Servohydraulic Applications

Individual Application Pages

General Fatigue



Page 26

Composites Fatigue



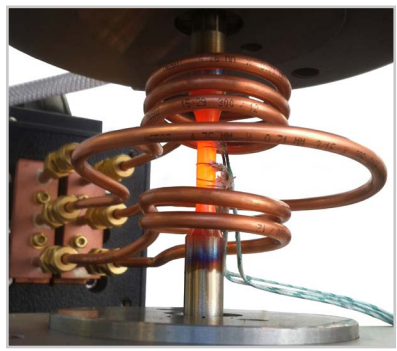
Page 28

Low Cycle Fatigue



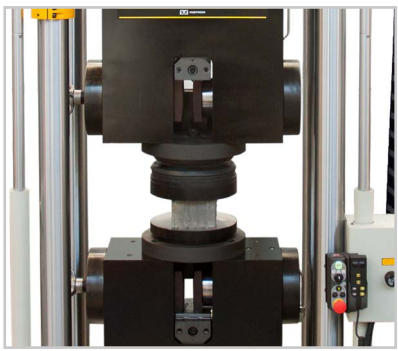
Page 30

Thermomechanical Fatigue



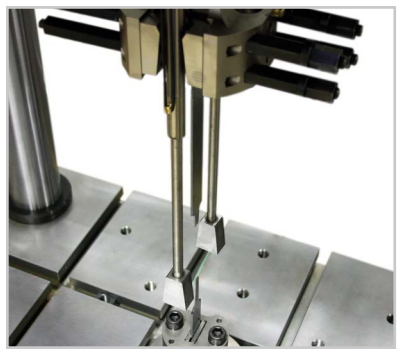
Page 32

High Capacity



Page 34

High Strain Rate

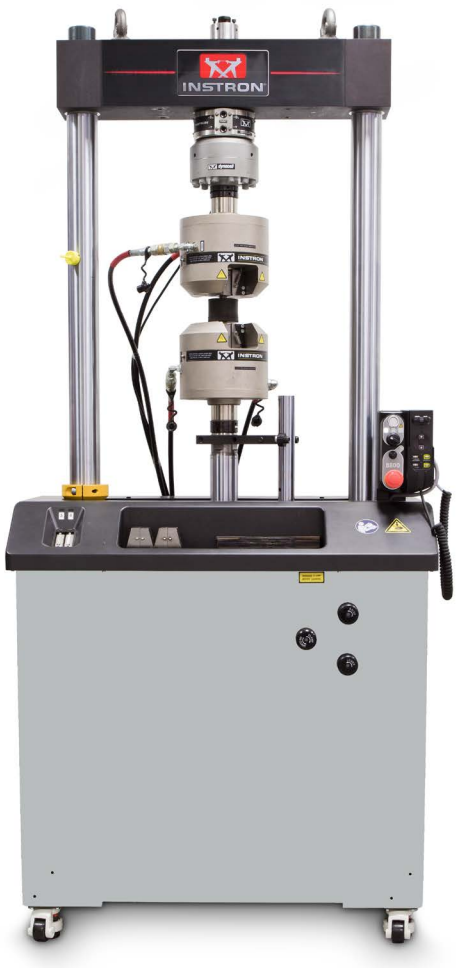


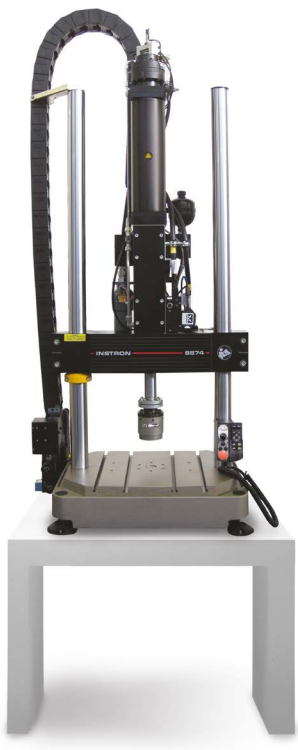
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General Purpose Fatigue
Machines for a variety of research and testing

In many research and educational institutes, machines are required to meet a variety of changing testing needs over time. Instron® provides a range of general purpose fatigue testing systems that can be used with different software packages and testing accessories to meet all of your fatigue and static testing requirements.







Things to consider when buying a fatigue machine

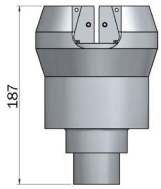
1. Specimen Geometry & Material Properties
This helps our application engineers to understand required test loads, suitable gripping techniques and frame size.

2. Dynamic Performance
It is important to consider what frequency you need to run tests at. While increasing test frequency reduces time to market for new products, it requires high flow oil supplies and increases the system price and the running costs; we can help find the right machine for you.

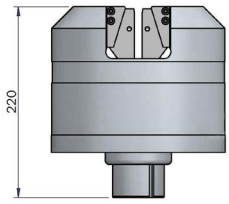
3. Installation and Infrastructure
Hydraulic machines offer a compact way to reach high dynamic forces and rapidly cycle specimens to failure. However, the requirement for oil and the physical size of fatigue machines does mean you should give careful consideration to the installation site and infrastructure requirements they need.

Hydraulic Wedge Grips

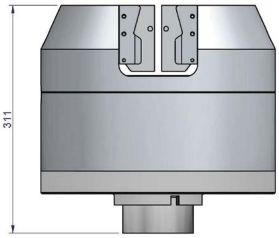
Instron® hydraulic wedge action grips may be used in static or dynamic testing applications, in both tension and compression. Interchangeable wedge-shaped grip faces accommodate different sizes of flat and round specimens.



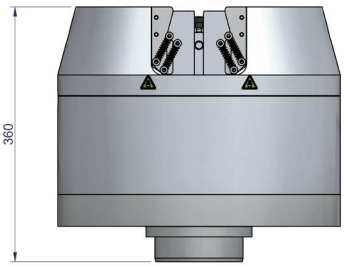
30 kN



100 kN



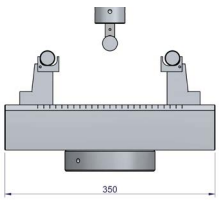
250 kN



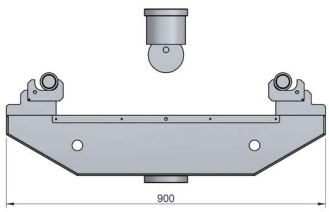
500 kN

3-Point Bend Fixtures

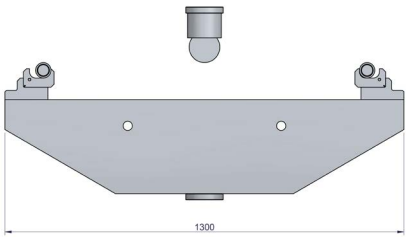
The flexure fixture allows a variety of flexural and fracture toughness bend tests to be performed, including determination of flexural modulus, flexural strength and flexural yield strength. Easy to install, the 3-point bend fixture can be modified with an optional standard kit to provide a 4-point bending conversion.



100 kN



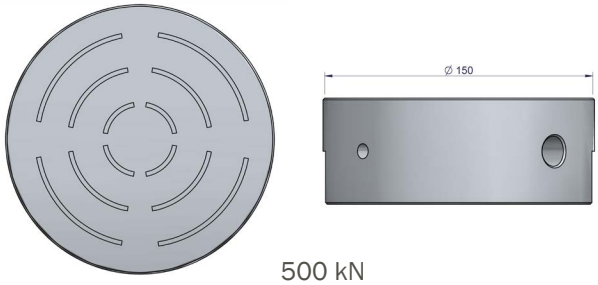
250 kN



500 kN

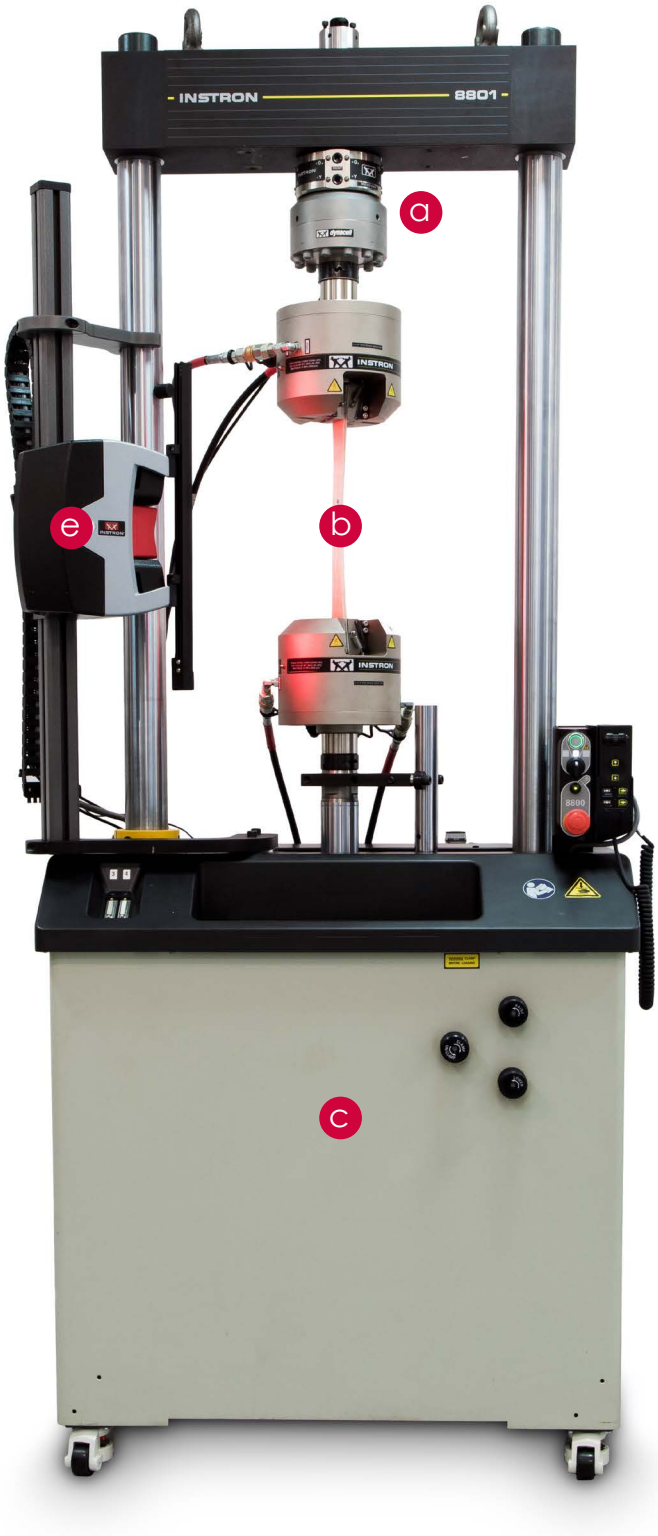
Compression Platens

Designed to be centered on the loading axis of an electromechanical or hydraulic universal test machine load frame, compression platens provide a hardened surface for compression tests in which uniform stress distribution is critical. Instron compression platens are available in a selection of diameters and force ranges.



500 kN

Composite Fatigue
Systems for Static and Fatigue Testing



Composite testing machines need to be configured to suit the specific challenges of the materials they test. Composite materials are stiffer, but are more susceptible to misalignment than typical metal High Cycle Fatigue (HCF) specimens. Instron® can configure a test frame which offers superior frame stiffness with a range of actuator capacities. The 150 mm stroke of our hydraulic frames is ideal for both static and fatigue testing of composite specimens.

Instron also offers alignment solutions for measuring and adjusting load string alignment, guided by our intelligent AlignPro software. The most exciting developments in the field of composites fatigue include our frequency control module Specimen Self-Heating Control (SSHC) for controlling specimen temperature during composite fatigue and the Instron AVE 2 Non-Contacting Video extensometer, which offers dynamic strain control up to 20 Hz without needing to attach physical transducers.

a. Mechanical alignment fixture
b. General purpose hydraulic grip
c. Hydraulic actuator (100 kN - 500 kN)
d. WaveMatrix Specimen Self-Heating Control Software (SSHC)
e. Dynamic AVE 2, Non-Contacting Video extensometer



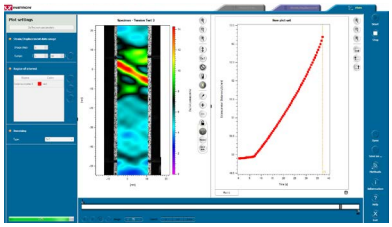
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AVE 2 Dynamic Strain Measurement and Control

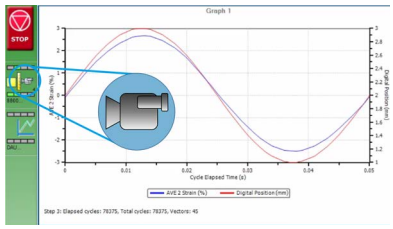
Instron's next generation video extensometer offers a solution for carrying out full field strain mapping during static testing and non-contacting strain control during cyclic fatigue. This powerful solution is not sensitive to high energy specimen failures which can damage traditional clip on extensometers.



Available with all systems using 8800MT dynamic control electronics



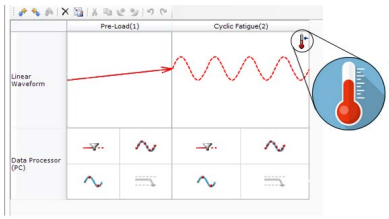
Optional DIC full field strain mapping for static testing with Bluehill



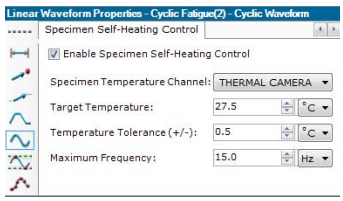
Use with WaveMatrix for cyclic strain control up to frequencies of 20 Hz

WaveMatrix Specimen Self-Heating Control (SSHC)

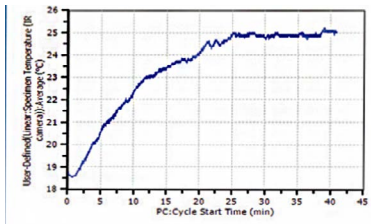
The SSHC WaveMatrix module can automatically adjust cyclic test frequency to maintain constant specimen temperature during composites fatigue. This increases the consistency of test results, but can also reduce your test times without compromising test fidelity.



Add SSHC Temperature Control to any Cyclic Waveform



Easily configure temperature parameters with no prior specimen knowledge



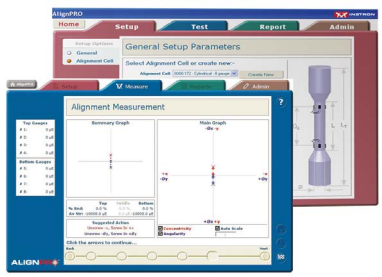
Modulate test frequency to ensure consistent specimen temperature

AlignPro System

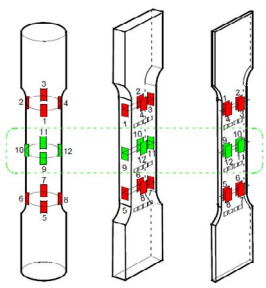
For alignment critical applications, Instron provides a complete package of alignment tools to measure, adjust and ensure the alignment of your loading string. Precision alignment is easily achieved with the use of our prompted software which will guide you through the process of making mechanical adjustments and the data can help you with NADCAP accreditation.



Mechanical alignment fixtures available for 100-600 kN systems

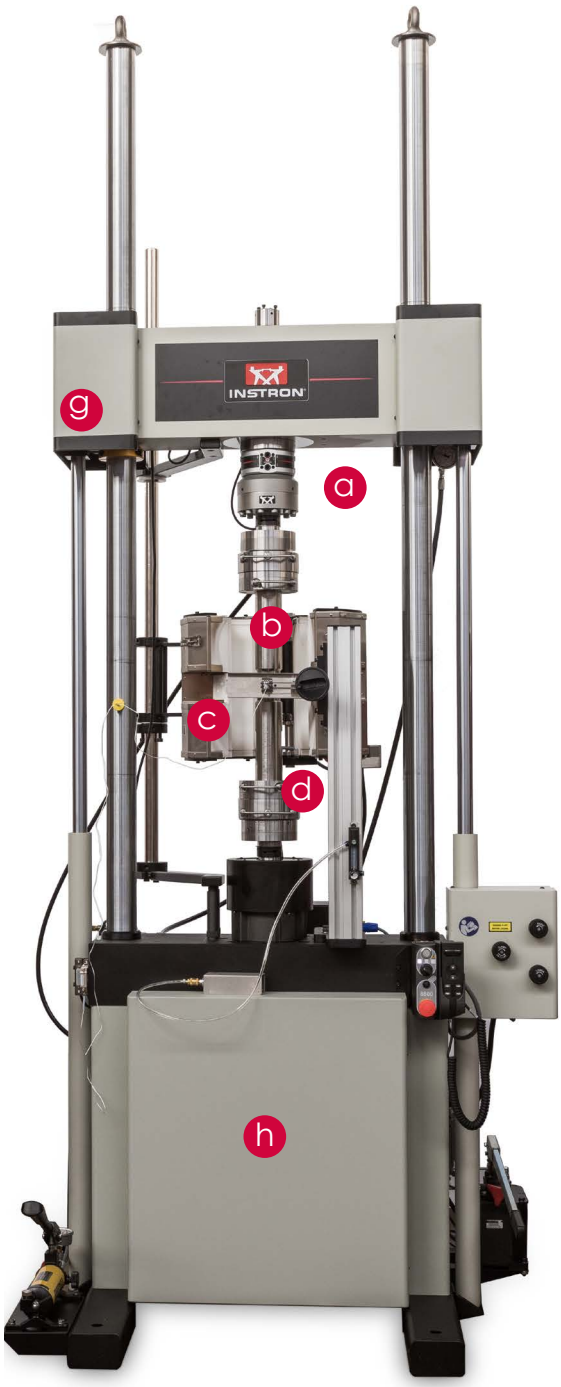


Prompted software for measuring and adjusting system alignment



A range of strain gauged specimens available to suit your application

Low Cycle Fatigue
Systems for Isothermal high temperature metals testing



The international standards for Low Cycle Fatigue (LCF) testing give clear guidance to the key requirements of an LCF test, although some customers needs are even greater. Test requirements are very challenging, usually requiring direct control of strain from an extensometer. Introducing significant amounts of plastic strain into the specimen with each angle means that good tuning and excellent machine control are vital in order to meet the peak strain tolerances.

In addition to machine control, the standard specifies extremely tight alignment specifications and challenging temperature uniformity requirements. All of this combined means that achieving world class LCF tests demands an integrated system with dedicated load strings and test.

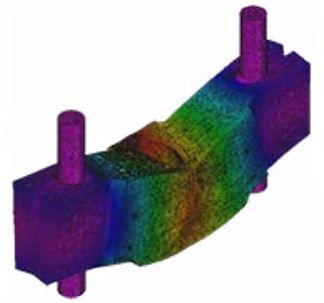
a. Mechanical Alignment Fixture
b. Hydraulic High Temperature Pull Rods - Meeting Class 5 Alignment Specification
c. High Temperature Extensometer
d. 1000 (degrees C) Three - Zone Furnace
e. Application Specific LCF Software
f. Patented Stiffness Based Tuning
g. 250 kN High Stiffness Load Frame
h. Servoelectric or Servohydraulic actuator technology available



*Set up for illustration purposes only

Class 5 Alignment & Maximized Frame Stiffness

ASTM E606 and ISO 12106 have recently doubled the requirement for load string alignment in order to minimize the effect of the specimen buckling. Instron® achieves this demanding requirement while maintaining the usability of your system. AlignPro fixture and prompted alignment software combined with 'one-touch' high temperature hydraulic grips ensure repeatable alignment during every test.



Using modern design tools to optimize frame and load string stiffness



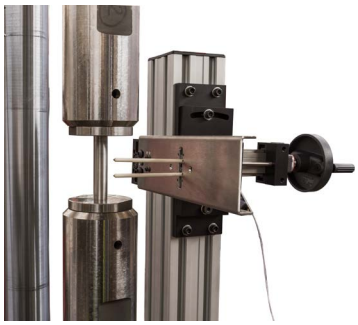
Hydraulically pre-loaded high temperature pull rods to meet class 5 alignment



Mechanical load string alignment using guided alignment software

Strain Control & Stiffness Based Tuning

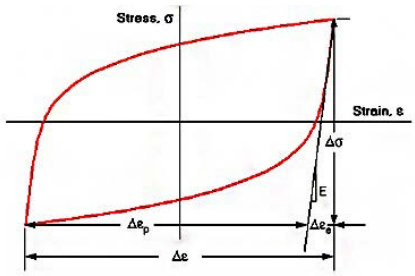
Achieving the demanding first cycle peak strain tolerances during an LCF test requires the combined integration of many aspects of test control. Good high temperature extensometry, combined with Instron's patented Stiffness Based Tuning deliver the ideal turning point control; even during extensive plastic strain.



Instron designed and manufactured high temperature extensometry



Patented Stiffness Based Tuning is ideal for high temperature extensometry

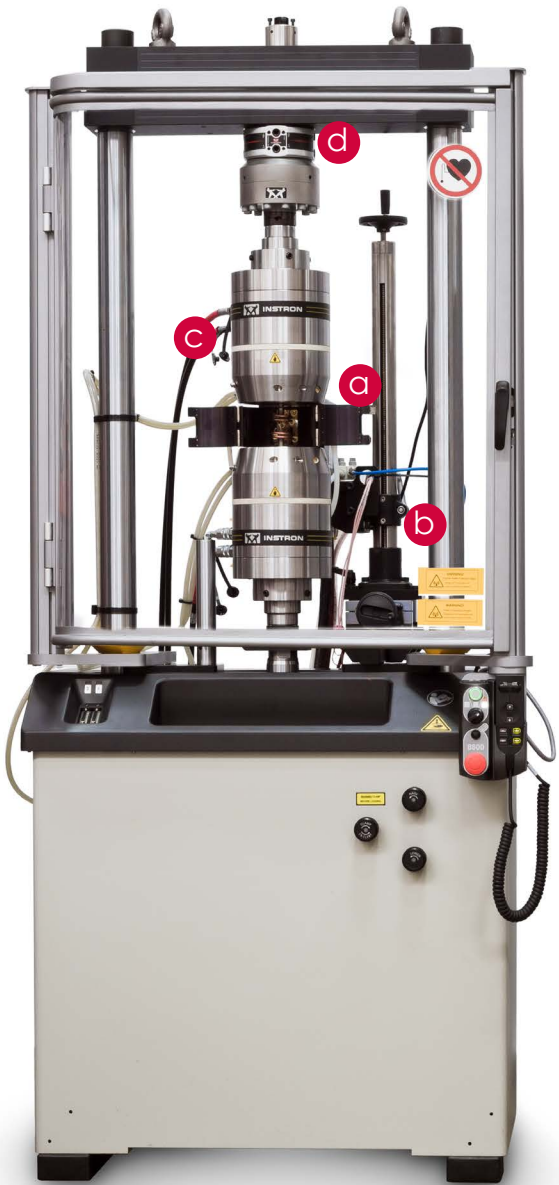


Perfect combination of tuning and advanced machine control are needed to deliver ideal hysteresis loops in LCF testing

Thermomechanical Fatigue
Combined Thermal and mechanical cycling

Instron® Thermomechanical Fatigue (TMF) testing systems provide a fully integrated, turnkey solution for analysis of combined thermal and mechnical loading cycles on high performance materials. Typical applications are component materials for gas turbines and jet engines, which are subjected to fluctuating temperatures and cyclic loads. Expert integration of proven products has resulted in a complete, user-friendly system, perfect for simulating these conditions and measuring material performance.

a. External cooling collar, multi-coil induction and integrated extensometery
b. Precision coil adjustment and mounting
c. Collet head grip for improved alignment and tubular specimen cooling
d. Mechanical alignment fixture
e. Dedicated and highly automated TMF Software Package
f. Full-system integration with Instron electronics





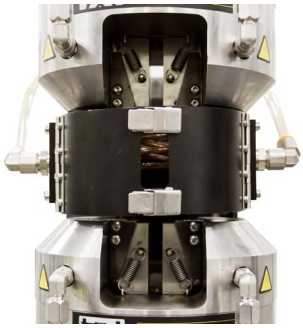
*Set up for illustration purposes only

Functionality and Capability

Instron® TMF systems are designed to guarantee machine performance and test accuracy, ensuring that you can trust your data is of the highest quality. Collaboration with industry and continuous improvements have helped us to continuously develop and refine new features, creating a truly optimized package for TMF testing.



Multi-coil Induction head allows for easy optimization of temperature gradient



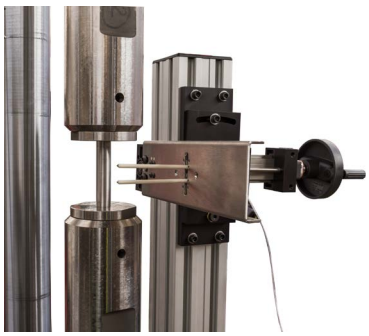
External cooling collar to maximize specimen for cooling uniformity over gauge length



Collet grip available as standard to support internal cooling of tubular specimens

Usability and Repeatability

Test reproducibility and ease-of-use are key factors to consider when comparing TMF systems, and integrated Instron systems are designed to guarantee both. Below is a selection of key features that will help to ensure your system is easy to use and produces the most repeatable data.



High temperature extensometer with low contact force and high positioning repeatability mounting bracket with forced cooling



Backlash free servo-electric actuator option for low strain rate specifically designed testing



Precision work head mount with axial and radial adjustment of induction coil

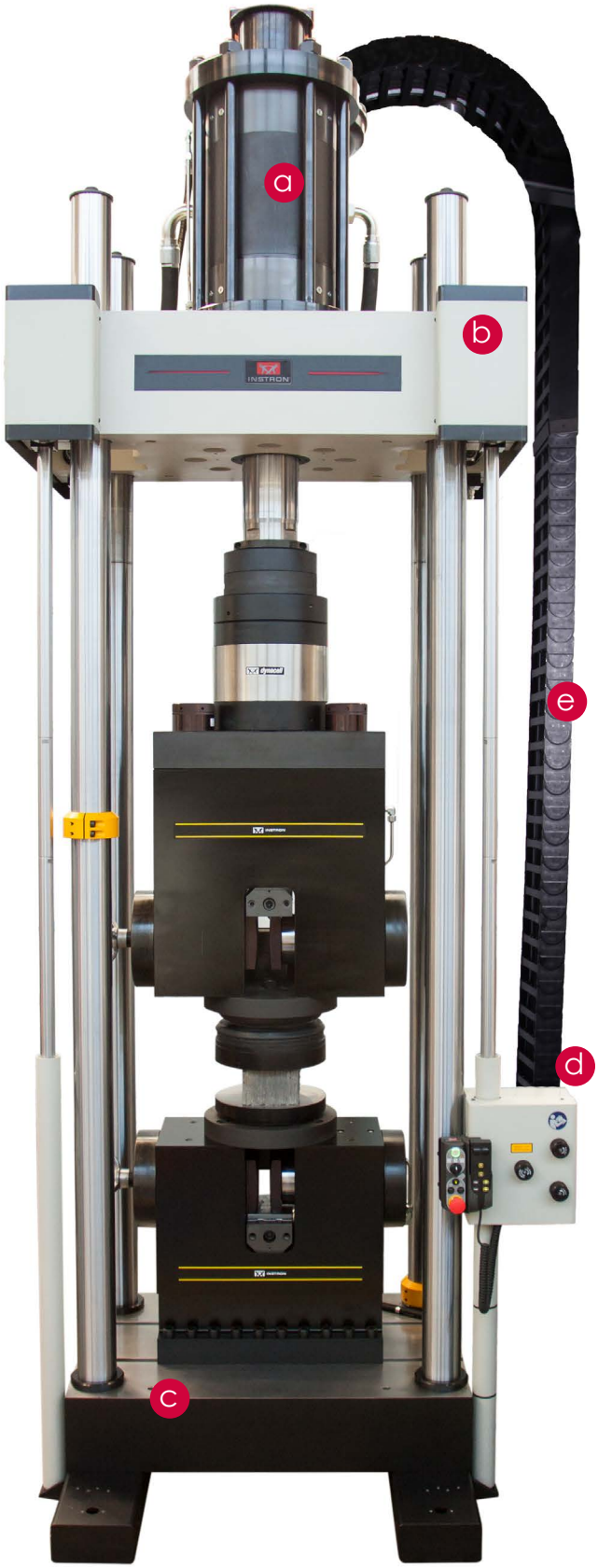
Dedicated TMF Software

Our purpose-designed TMF software makes it quick and easy for you to conduct tests in accordance with international standards, including ASTM E2368 and ISO 12111. After setting up the test method, an automated process can execute four stages of the test: Stabilization, Thermal Strain Measurement, Verification, and Test, with no need for manual calculations or use of third-party software. Carrying out the full test within one piece of dedicated software saves time and reduces the chance of human error.

Automated process with interactive graphs and live data views during all stages

Stabilization	Thermal Strain Measurement	Verification	Test
Specimen is subjected to thermal pre-cycling under no-load conditions	Measures thermal expansion of the specimen during temperature cycling	Thermal strain compensation is verified by checking stress remains withing limits during thermal cycle	Predefined mechanical and thermal loading is applied to the specimen simultaneously

High Capacity
Systems for dynamic testing at 1000 kN +



For testing at forces of 1000 kN and above, Instron® can provide a range of machines up to 5000 kN. These machines use the same software, electronics and interfaces as all of our hydraulic fatigue machines, which ensures continuity in your laboratory.

The challenges involved with purchasing and installing a machine of this size are very different to those of a more common lower capacity fatigue machine. Our expert group of high capacity engineers will be able to help you through the process and support you from the initial specification of your machine right through to the final installation and acceptance testing.

If you are interested in high-frequency performance, Instron also offers a range of high-performance, seal-less actuators for high-capacity testing.

a. 280 bar & 210 bar actuator technology
b. Hydraulic crosshead lifts and clamps
c. T-slot table for component tests
d. Same controls and software as lower capacity machines
e. IGUS hose management



No Special Training Needed

While our high-capacity machines are significantly larger than most hydraulic test frames, they use all of the same electronics, software and user interfaces as any of our hydraulic machines. If your users are familiar with our user-friendly software packages, they will find it very easy to use these larger machines confidently and competently.



Easy access to frame and grip controls from workstation



WaveMatrix™3 Software for Cyclic fatigue testing



Bluehill for static tensile and compression testing

Instron® Engineered Systems Service

Instron has a range of options available on high-capacity frames to meet the needs of your test. We can provide standard (210 bar) or high performance seal-less actuator technology (280 bar). The frame itself can be configured with a T-Slot table to suit larger component testing or with a loadstring to suit your test specimens. All of our high-capacity frames include an IGUS chain hose management system to ensure ease of crosshead adjustment while maintaining a test space free of overhanging hoses.



Seal-less actuators for high-performance and high lateral stiffness



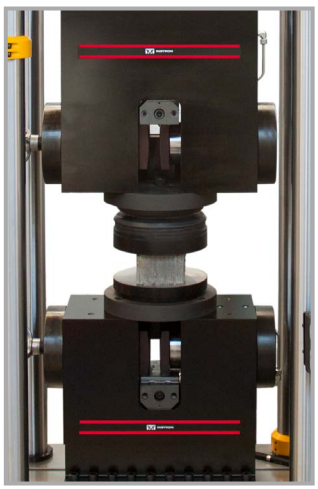
T-Slot base for versatility and component testing



Igus chain hose management

High Capacity Load Strings for your Application

As well as providing a comprehensive support throughout the specification, design and installation of your high capacity machine, Instron will be able to provide a range of high-capacity accessories to support your testing application.



High Capacity Compression Platens



1 MN R-Curve 16” Panel Grips

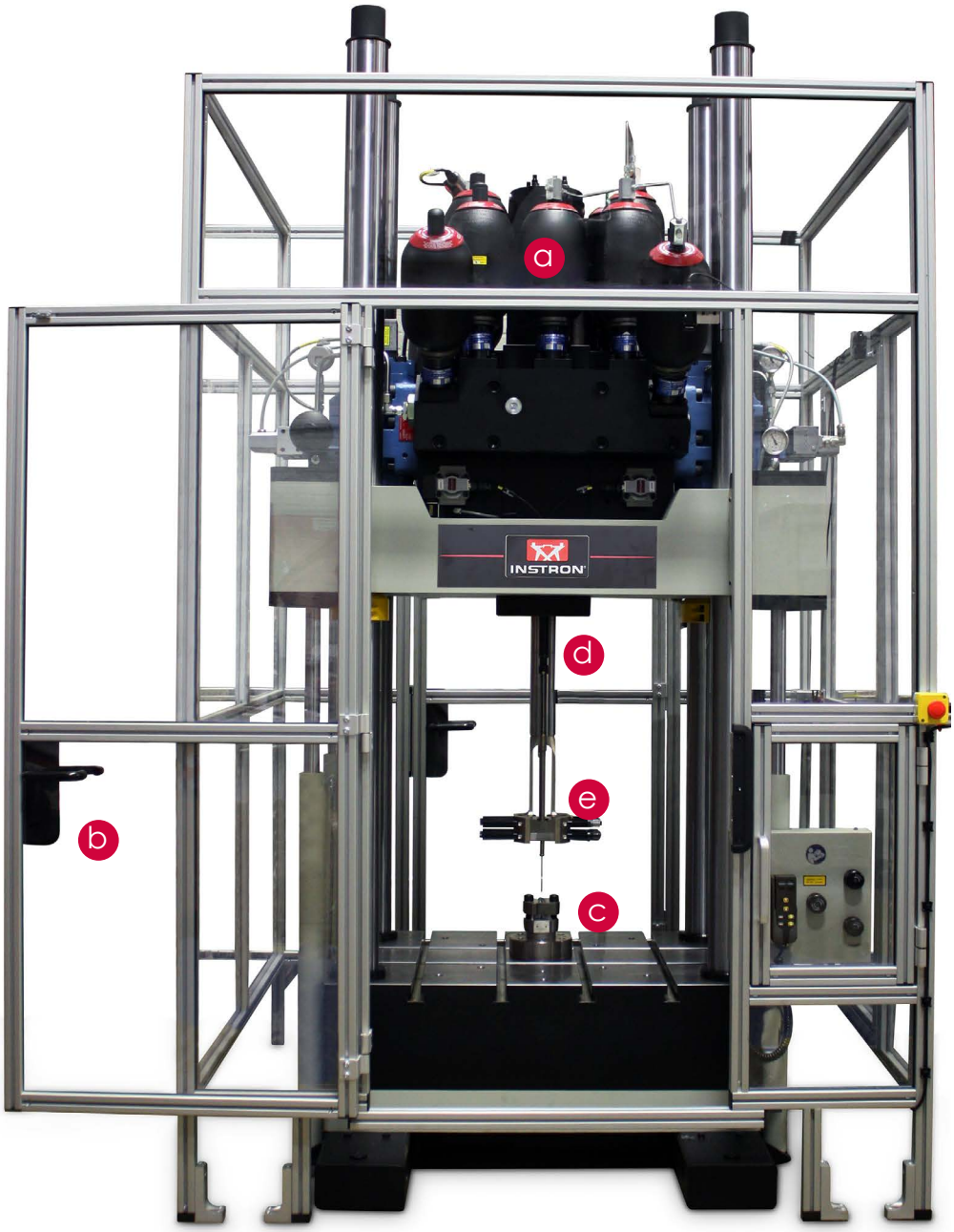


2.5 MN Side-Action Hydraulic Grips

High Strain Rate VHS Testing Systems
System for high speed testing up to 25m/s

Material properties vary significantly with strain rate, therefore the use of properties determined by quasi-static testing in the analysis and design of structures which undergo high speed loading may lead to very conservative, overweight designs, or to designs which fail prematurely and unexpectedly. High strain rates are often seen by structures as part of normal service conditions such as the landing gear on aircraft, the crash impact of a road vehicle or even the cord strain when a parachute is opened.

For over 20 years, Instron® has lead the way in the study of high strain rate testing of metals, plastics and composites, continuously innovating its dedicated range of testing equipment, to ensure the accuracy of those material properties, critical in the modelling of a structure behaviour in real life conditions. Capable of speeds up to 25 m/sec, the Instron VHS is designed for impact, puncture and tensile testing in a wide variety of applications, in particular where a constant or complex velocity profile is required.



a. Over 20 years experience in high speed actuator design
b. Interlocked Safety Guard
c. 4 column design with versatile, configurable test space with T-Slot table
d. Up to 600 mm stroke with maximum test speed of up to 25m/s
e. Instron Fast Jaw tensile gripping technique

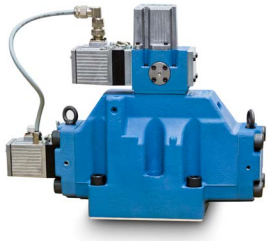


Safety First

Instron® VHS machines are capable of moving at up to 25 m/s and release up to 1300 l/min of high pressure hydraulic oil in a test which lasts as little as 10 ms. With this in mind, we make operator safety our absolute priority in the design of these systems.



Interlocked Safety Enclosure which restricts access to the test area during test



Dual Hydraulic Circuitry on all safety critical components

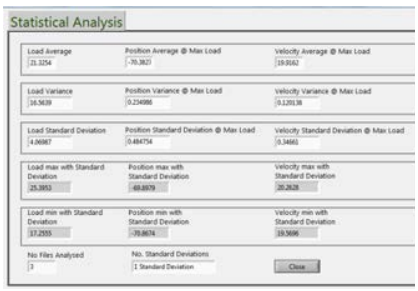
Full System CE Certification

Data Processing, Software and Camera Integration

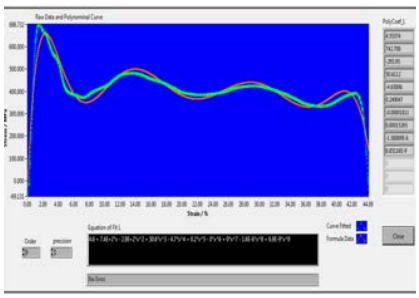
With data aquisition, even a short test duration produces a large amount of test data. Instron software has a range of powerful tools to make the processing of high speed test data and its use in modelling packages straightforward, which in turn simplifies your workflows and procedures.



High Speed DIC Camera Data Integration & Post Processing



Rapid Statistical Analysis of Multiple Results Files Reducing Post Processing Time



Polynomial Curve Fitting to facilitate theoretical modelling and simulation

Research a Variety of Material Properties

Once you have configured your system and chosen a force range and a velocity, you can then select a variety of accessories to support different test types and service conditions. We can also include additional equipment for testing at elevated sub-ambient temperatures.



Patented Fast Jaw Tensile Gripping to Reduce Impact Rebound

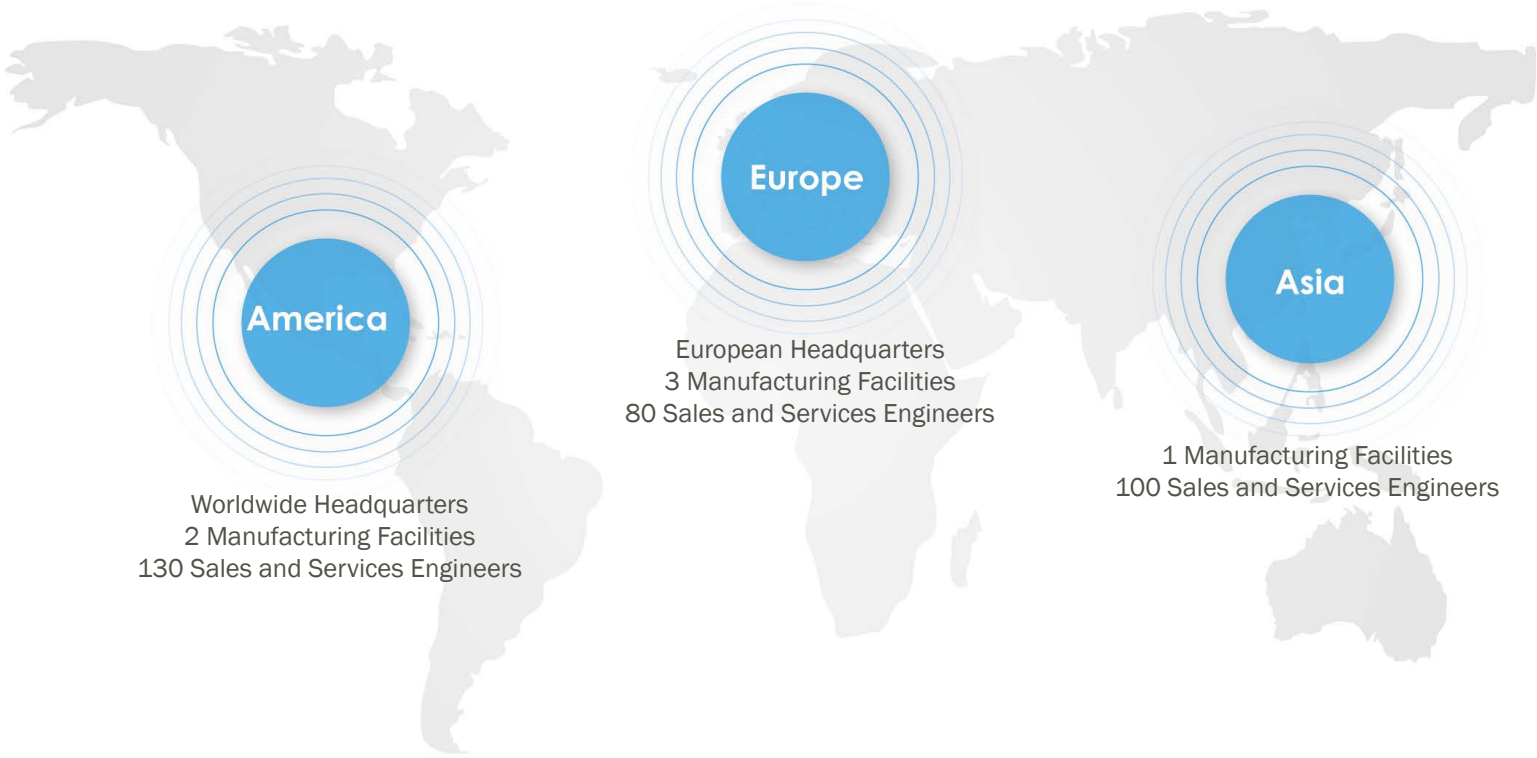


Guided Compression with ‘Load Fuse’ to Protect System



Puncture Probes and Instrumented Heads

Notes



Worldwide Headquarters
2 Manufacturing Facilities
130 Sales and Services Engineers

European Headquarters
3 Manufacturing Facilities
80 Sales and Services Engineers

1 Manufacturing Facilities
100 Sales and Services Engineers

Global Support that is Local to You

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