CATALOGUE 2020

SAS Inc.
Spring Analysis Systems
WWW.SASTESTERS.COM
SINCE 2001

INDEX

ABOUT SAS

Spring Analysis Systems (SAS Inc) was established in 2001 to provide cutting edge non-destructive testing solutions to industry and specifically to the spring and wire forming industries. SAS Inc develops technologically advanced inspection equipment and testing solutions to support industries continual quest for manufacturing better product at a lower cost. SAS Inc competes in the global economy and has established an international service and sales network to support its inspection equipment on every continent.

Testing requirements served:
- Hi Speed Compression, Tension and Torsion load testing.
- Vision Inspection (geometrical inspection) for 2D and 3D general and wire formed parts.
- Fatigue Testing and Life Cycle Analysis for tension, compression, torsion springs and their assemblies.
- Automated Compression and torsion testing systems for both load/torque and geometric features.
- Real-time in-process 2D and 3D Wire Forming inspection and sorting.

Industries Served:
Spring and Wire Forming, Automotive, Aerospace, Railroad, Medical, Military, Plastics.

History:
Spring Analysis Systems (SAS Inc) was founded in 2001 by Larry Sheiman and Martin Somers, both of whom are Aeronautical Engineers with a very strong background in the Hi-Tech and aerospace industries.
SAS Inc introduced the world's first spring tester (CT Series) that was entirely controlled by a pocket PC in 2002. In 2004 SAS Inc introduced the world's first (CTV1600 Series) optical multi-framed compression spring measurement system.
Since then our product families include a wide range of models of industry beating high speed compression, tension and torsion testers, life cycle and fatigue testers and the latest line of vision inspection equipment for both axi-symmetrical parts and for 2 and 3D wire forms.
Although SAS Inc initially developed its products to serve the Wire and Spring Industry, other industries have successfully embraced these product families for a multitude of testing applications.
SAS Inc's creativity in its in-house software development has enabled its equipment to serve a large spectrum of industries from the aero-space industry through to the automotive and medical industries.

CT Series

C-Frame small footprint-Programmable Tension and Compression Spring Testers

HS and Standard Models

Model	Load Capacity		Load Resolution		Load Accuracy at 0.5% of Range		Standard Stroke		HS Model Stroke		Platten Diameter	
	Lbf	N	Lbf	N	+-Lbf	+-N	in	mm	in	mm	in	mm
CT-10	2.24	10	0.000045	0.0002	0.000056	0.00025	8	200	20	500	2.2	55
CT-50	11.21	50	0.000224	0.001	0.00028	0.00125	8	200	20	500	2.2	55
CT-100	22.43	100	0.000449	0.002	0.000561	0.0025	8	200	20	500	2.2	55
CT-200	44.85	200	0.000897	0.004	0.001121	0.005	8	200	20	500	2.2	55
CT-500	112.13	500	0.002243	0.01	0.002803	0.0125	8	200	20	500	2.2	55
CT-2000	560.65	2500	0.011213	0.05	0.014016	0.0625	20	500	20	500	3.15	80
CT-5000	1121.3	5000	0.022426	0.1	0.028033	0.125	20	500	20	500	4	100
CT-10000SP	2242.61	10000	0.089704	0.4	0.056065	0.25	N/A	N/A	20	500	8	200
CT-20000SP	4485.22	20000	0.179409	0.8	0.11213	0.5	N/A	N/A	20	500	8	200

CT SERIES MEET AND EXCEED THE FOLLOWING STANDARDS: ISO 7500/1 CLASS 0.5, ASTM E4

Model	Standard Stroke Resolution		Standard Stroke Accuracy		HS Model Stroke Resolution		HS Model Stroke Accuracy		Standard Model Top Speed		HS Model Top Speed	
	in	mm	+- in	+- mm	in	mm	+- in	+- mm	in/sec	mm/sec	in/sec	mm/sec
CT-10	0.00012	0.003	0.00079	0.02	0.0000098	0.00025	0.00039	0.01	0.51	13	4.92	125
CT-50	0.00012	0.003	0.00079	0.02	0.0000098	0.00025	0.00039	0.01	0.51	13	4.92	125
CT-100	0.00012	0.003	0.00079	0.02	0.0000098	0.00025	0.00039	0.01	0.51	13	4.92	125
CT-200	0.00012	0.003	0.00079	0.02	0.0000098	0.00025	0.00039	0.01	0.51	13	4.92	125
CT-500	0.00012	0.003	0.00079	0.02	0.0000098	0.00025	0.00039	0.01	0.51	13	4.92	125
CT-2000	0.00031	0.008	0.00157	0.04	0.0000098	0.00025	0.00039	0.01	0.51	13	4.92	125
CT-5000	0.00031	0.008	0.00157	0.04	0.0000197	0.0005	0.00039	0.01	0.63	16	6.3	160
CT-10000SP	N/A	N/A	N/A	N/A	0.0000197	0.0005	0.00039	0.01	N/A	N/A	1.97	50
CT-20000SP	N/A	N/A	N/A	N/A	0.0000039	0.0001	0.00039	0.01	N/A	N/A	0.98	25

The LVA Optional module is available in the CT500, CT2000, CT5000, CT10000SP and CT-20000SP Models LVA Module measures and displays the resultant force magnitude and its vector direction including in-plane loading and its vector pierce point position

HS Models are 10X faster and 3X more accurate (stroke) than the standard models.
Electric Conductive Freelength measurement available as an optional module in all HS Models

CT Series

H-Frame Dual and Quad ballscrew design-High Capacity-Programmable Tension and Compression Testers

Includes new HS Technology. (High Speed/high resolution)

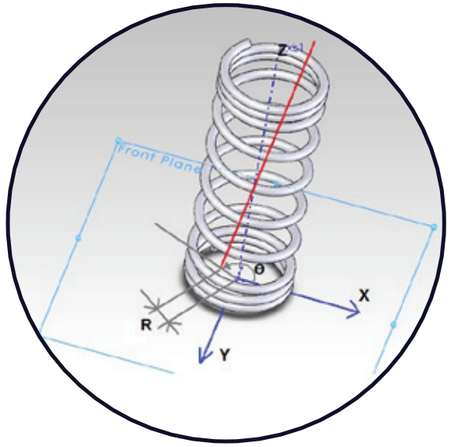
Model	Load Capacity		Load Resolution		Load Accuracy at 0.5% of Range		Standard Stroke		Stroke Resolution		Platen Diameter		Speed		# Ball Scews
	Lbf	N	Lbf	N	±lbf	±N	in	mm	in	mm	in	mm	in/ sec	mm/sec	
CT-10000	2243	10000	0.04	0.2	0.06	0.25	40	1000	0.0000039	0.0001	8	200	1.969	50	Dual
CT-20000	4485	20000	0.09	0.4	0.11	0.5	40	1000	0.0000039	0.0001	8	200	1.969	50	Dual
CT-30000	6728	30000	0.13	0.6	0.17	0.75	40	1000	0.0000039	0.0001	8	200	1.969	50	Dual
CT-50000	11213	50000	0.22	1	0.28	1.25	40	1000	0.000002	0.00005	16	400	1.969	50	Quad
CT-50000SP	11213	50000	0.22	1	0.28	1.25	40	1000	0.000002	0.00005	8	200	1.969	50	Dual
CT-100000	22426	100000	0.45	2	0.56	2.5	40	1000	0.000001	0.000025	16	400	0.984	25	Quad
CT-200000	44852	200000	0.9	4	1.12	5	40	1000	0.0000006	0.000015	16	400	0.591	15	Quad

CT SERIES MEET AND EXCEED THE FOLLOWING STANDARDS: ISO 7500/1 CLASS 0.5, ASTM E4

- Three Loadcell extreme Offset Capability is standard in CT-50000, CT-100000 and CT-200000 Testers, Optional for the others
- Optional Increased Stroke to 1500mm on all models
- Optional LVA Module Available

Optional Electric Conductivity Freelength Module Available on all models

The LVA Module (LOAD VECTOR ANALYSES) is an optional feature for all CT Series H Frame models



CT - 50000

CT - 100000

CT - 200000

LVA Module measures and displays the resultant force magnitude and its vector direction including in-plane loading and its vector pierce point position

CT-PC Series

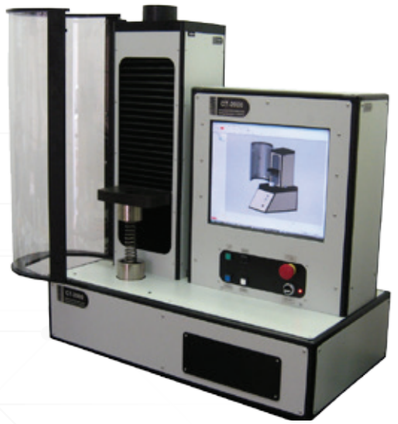
C-Frame with HS Testers Features, including built in PC and Touch Screen

Including HS Technology

Model	Load Capacity		Load Resolution		Load Accuracy at 0.5% of Range		Platen Diameter	
	Lbf	N	Lbf	N	±lbf	±N	in	mm
CTPC-10	2.24	10	0.000045	0.0002	0.000056	0.00025	3.15	80
CTPC-50	11.21	50	0.000224	0.001	0.00028	0.00125	3.15	80
CTPC-100	22.43	100	0.000449	0.002	0.000561	0.0025	3.15	80
CTPC-200	44.85	200	0.000897	0.004	0.001121	0.005	3.15	80
CTPC-500	112.13	500	0.002243	0.01	0.002803	0.0125	3.15	80
CTPC-2000	560.65	2500	0.011213	0.05	0.014016	0.0625	3.15	80
CTPC-5000	1121.3	5000	0.022426	0.1	0.028033	0.125	4	100
CTPC-10000	2242.61	10000	0.089704	0.4	0.056065	0.25	8	200

CT SERIES MEET AND EXCEED THE FOLLOWING STANDARDS: ISO 7500/1 CLASS 0.5, ASTM E4

- 500mm (20”) Stroke
- Top Speed 125mm/sec (4.9”/sec) for all models up to CTPC-2000, speed for CTPC-5000 is 160mm/sec (6.3”/sec), speed for CTPC-10000 is 50mm/sec (1.97”/sec)
- LVA module is optional for CTPC-500 and larger models
- Dual Loadcells available for all models
- Optional CTV1600 Combined with CTPC model



CT Dual Series

C-Frame - Programmable Tension and Compression Spring Testers with dual loadcells and HS tester features

Primary Loadcell and Stroke Paramaters- as displayed in the CT Series C-Frame Models pages 4 and 5

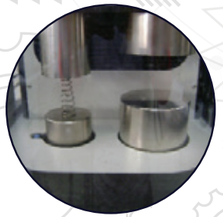
AVAILABLE Secondary LOADCELLS

	Loadcell Capacity Newtons (N)					Loadcell Capacity Newtons (Lbf)				
CT-100Dual	10	50	100			2.24	11.21	22.4		
CT-200Dual	10	50	100	200		2.24	11.21	22.4	44.85	
CT-500Dual	10	50	100	200	500	2.24	11.21	22.4	44.85	112.13
CT-2000Dual	10	50	100	200	500	2.24	11.21	22.4	44.85	112.13
CT-5000Dual	10	50	100	200	500	2.24	11.21	22.4	44.85	112.13
CT-10000Dual	10	50	100	200	500	2.24	11.21	22.4	44.85	112.13

Secondary Loadcell Specifications

LoadCell Capacity		Load Resolution		Load Accuracy at 0.5% of Range	
N	Lbf	N	Lbf	±N	±Lbf
10	2.24	0.0002	0.000045	0.00025	0.000056
50	2.24	0.001	0.000224	0.00125	0.00028
100	2.24	0.002	0.000449	0.0025	0.000561
200	2.24	0.004	0.000897	0.005	0.001121
500	2.24	0.01	0.002243	0.0125	0.002803

- Secondary loadcells meet and exceed the following standards: Iso 7500/1 class 0.5, ASTM E4
- Active loadcell electronically identified
- Optional secondary loadcells can be configured with either CT-Series or CT-PC Series models

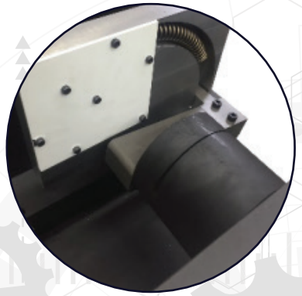


T Series

Programmable Torsion Spring Testers

HS and Standard Models

Model	Torque Capacity		Torque Resolution		Torque Accuracy at 1% of Range		Rotation Range	Standard Model Rotation Resolution	HS Model Rotational Resolution	Rotation Accuracy	Standard Model Rotation Speed	HS Model Rotation Speed
	Lbf.in	N.M	Lbf.in	N.M	±Lbf.in	±NM	degrees	degrees	degrees	±degrees	RPM	RPM
T-0.01	0.09	0.01	0.000002	0.0000002	0.00001	0.000001	50000	0.036	0.036	0.1	6	3000
T-0.1	0.89	0.1	0.000018	0.000002	0.00009	0.00001	50000	0.036	0.036	0.1	6	3000
T-2	17.7	2	0.000354	0.00004	0.00177	0.0002	50000	0.036	0.004	0.1	6	300
T-20	177	20	0.00354	0.0004	0.0177	0.002	50000	0.036	0.004	0.1	6	300
T-50	442.5	50	0.00885	0.001	0.04425	0.005	50000	0.036	0.004	0.1	30	300
T-100	885	100	0.0177	0.002	0.0885	0.01	50000	N/A	0.004	0.1	N/A	200
T-200	1770	200	0.0354	0.004	0.177	0.02	50000	N/A	0.002	0.1	N/A	100
T-500	4425	500	0.0885	0.01	0.4425	0.05	50000	N/A	0.002	0.1	N/A	75
T-2000	17700	2,000	0.354	0.04	1.77	0.2	50000	N/A	0.0005	0.1	N/A	20



Combined Compression and Torsion Spring Tester

- High Speed Model includes a combination of high speed motion and high resolution for accurate positioning.
- Fatigue testing ability is available with the HS models.
- Interchangeable torquecells are available
- Standard fixturing includes a 3 jaw juck

CTMS Series

Manual Tension and Compression Testers, 2 Models Available.

Standard Models, Fitted fitted with stand alone digital displays.

Pc Models: Including Full Programmable Features for automated testing with full reporting and SPC Functionality.

Model	Load Capacity		Standard Model Load Resolution		Standard Model Load Accuracy at 1% of Range		PC Model Load Resolution		PC Model Load Accuracy at 1% of Range	
	Lbf	N	Lbf	N	±lbf	±N	Lbf	N	±lbf	±N
CTMS-10	2.24	10	0.001097	0.0049	0.002243	0.01	0.000045	0.0002	0.000112	0.0005
CTMS-50	11.21	50	0.005485	0.0244	0.011213	0.05	0.000224	0.001	0.000561	0.0025
CTMS-100	22.43	100	0.01097	0.0488	0.022426	0.1	0.000449	0.002	0.001121	0.005
CTMS-200	44.85	200	0.02194	0.0977	0.044852	0.2	0.000897	0.004	0.002243	0.01
CTMS-500	112.13	500	0.054851	0.2441	0.11213	0.5	0.002243	0.01	0.005607	0.025

CTMS SERIES MEET AND EXCEED THE FOLLOWING STANDARDS: ISO 7500/1 CLASS 1, ASTM E4

Stroke:	200mm	8"
Standard Stroke Resolution:	0.01mm	0.00039"
Standard Stroke Accuracy: ±	0.03mm	0.00118"

PC Model Stroke Resolution:	0.003mm
PC Model Stroke Accuracy:	0.000118"

TMS Series

Manual Torsion Spring Testers

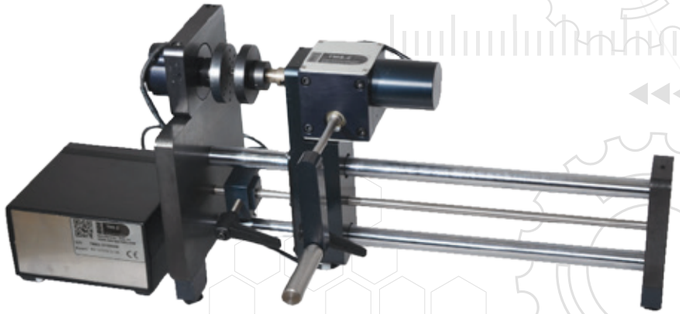
2 Models Available

- Standard Models. Supplied with a stand alone digital display
- PC models. Include full programmable features for automated testing
- It includes the full reporting and SPC functionality
- Interchangeable torquecells are available.

Model	Torque Capacity		Standard Torque Resolution		Standard Torque Accuracy at 1% of Range		PC Model Torque Resolution		PC Model Torque Accuracy at 1% of Range	
	Lbf.in	N.M	Lbf.in	N.M	±lbf.in	±NM	Lbf.in	N.M	±lbf.in	±NM
TMS-0.01	0.09	0.01	0.000043	0.0000049	0.00009	0.00001	0.000003	0.00000031	0.00004	0.000005
TMS-0.1	0.89	0.1	0.000432	0.0000488	0.00089	0.0001	0.000027	0.00000305	0.00044	0.00005
TMS-2	17.7	2	0.008643	0.0009766	0.0177	0.002	0.00054	0.00006104	0.00885	0.001

Rotational Range (degrees)	50000
Standard Torque Resolution (degrees)	0.018
Standard Torque Accuracy (±degrees)	0.5

PC Model Rotational Resolution (Degrees)	0.0055
PC Model Rotational Accuracy ±degrees	0.1



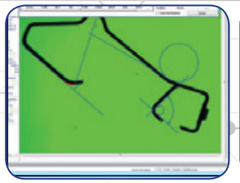
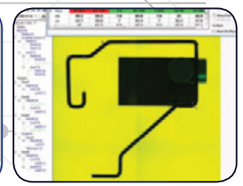
CTV2000 Series

Programmable Vision measurement of 2D and 3D part

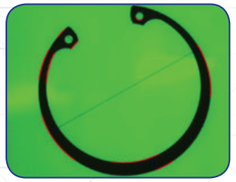
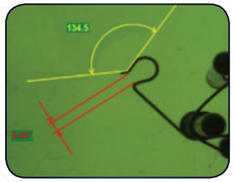
Model	Minimum Part size		Maximum Part size X x Y or Y x X				Vision Space Resolution		Vision Space Accuracy	
	in	mm	X in	Y in	X mm	Y mm	in	mm	±in	±mm
CTV2KM-16	0.005	0.12	0.554	0.416	14.07	10.56	0.00023	0.006	0.000114	0.003
CTV2KM-42	0.013	0.33	1.591	1.195	40.41	30.34	0.00065	0.017	0.000327	0.008
CTV2KM-64	0.018	0.45	2.132	1.601	54.15	40.66	0.00088	0.022	0.000438	0.011
CTV2KM-70	0.022	0.56	2.665	2.001	67.69	50.83	0.0011	0.028	0.000548	0.014
CTV2KM-107	0.034	0.86	4.099	3.078	104.12	78.19	0.00169	0.043	0.000843	0.021
CTV2000XYZHR	0.013	0.332	180	160	160	180	0.000654	0.017	0.000327	0.008

Camera Type for all models:	5Mpixel CMos
	Telecentric

CTV2000XYZHR Includes:	Motorized Z Axis
	XY Servo Axis
	Z axis Resolution: 0.05mm
	XY Axis Resolution: 0.003mm (0.0001”)
	XY Axis Accuracy: ±0.02mm (±0.0008”)

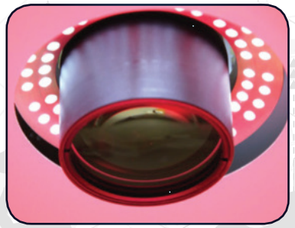






FEATURES

- Automatic and manual part recognition
- Multiple part inspection for measurement of 2D and 3D parts
- Programmable from DXF CAD Files



CTV1600 Series

Programmable Vision Measurement for perpendicularity (E1), parallelism (E2) Free length (Lo), OD, Concentricity and Pitch of coiled springs. All Models include W Axis: Position accuracy 0.1 degrees

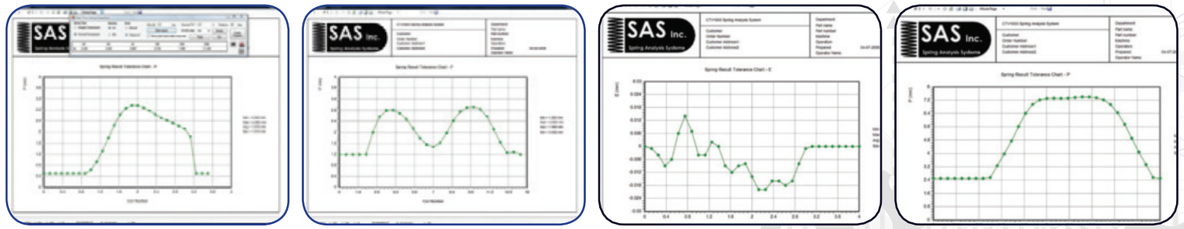
FEATURES

- **All models include motorized W axis with position accuracy of 0.1 degrees**
- **Excellent R&R Performance**
- **SPC Control Charts, Analysis and Reports**
- **3 Mpixel, 5 Mpixel or 10 Mpixel Cmos Telecentric camera and lens on all models**

Motorized Z axis models available for part lengths up to 700 mm allowing for measurement of tall springs.

Camera Type: 3 Mpixel Cmos, Lens Type: Telecentric										
Model	Minimum Part size (OD and Lo)		Maximum Part size				Vision Space Resolution		Vision Space Accuracy	
	in	mm	OD in	Lo in	OD mm	Lo mm	in	mm	±in	±mm
CTV1600-16	0.006	0.16	0.622	0.466	15.79	11.85	0.00032	0.008	0.00016	0.004
CTV1600-42	0.018	0.47	1.786	1.34	45.37	34.03	0.00092	0.023	0.000459	0.012
CTV1600-64	0.025	0.63	2.394	1.795	60.8	45.6	0.00123	0.031	0.000615	0.016
CTV1600-70	0.031	0.78	2.992	2.244	76	57	0.00154	0.039	0.000769	0.02
CTV1600-107	0.047	1.2	4.6	3.441	116.85	87.4	0.00236	0.06	0.001182	0.03

Camera Type: 10 Mpixel Cmos, Lens Type: Telecentric										
Model	Minimum Part size (OD and Lo)		Maximum Part size ODxLo or LoxOD				Vision Space Resolution		Vision Space Accuracy	
	in	mm	OD in	Lo in	OD mm	Lo mm	in	mm	±in	±mm
CTV1600-16	0.003	0.09	0.622	0.466	15.79	11.85	0.00017	0.004	0.000085	0.002
CTV1600-42	0.01	0.25	1.786	1.34	45.37	34.03	0.00049	0.012	0.000245	0.006
CTV1600-64	0.013	0.33	2.394	1.795	60.8	45.6	0.00066	0.017	0.000328	0.008
CTV1600-70	0.016	0.42	2.992	2.244	76	57	0.00082	0.021	0.00041	0.01
CTV1600-107	0.025	0.64	4.6	3.441	116.85	87.4	0.00126	0.032	0.000631	0.016

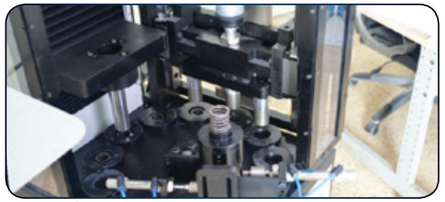


ALT Series

Fully Automated loading, Setting, Testing, Sorting and Packing Systems

Model	Load Capacity		Load Resolution		Load Accuracy at 0.5% of Range		Platen Diameter	
	Lbf	N	Lbf	N	±lbf	±N	in	mm
ALT-10	2.24	10	0.000045	0.0002	0.000056	0.00025	3.15	80
ALT-50	11.21	50	0.000224	0.001	0.00028	0.00125	3.15	80
ALT-100	22.43	100	0.000449	0.002	0.000561	0.0025	3.15	80
ALT-200	44.85	200	0.000897	0.004	0.001121	0.005	3.15	80
ALT-500	112.13	500	0.002243	0.01	0.002803	0.0125	3.15	80
ALT-2000	560.65	2500	0.011213	0.05	0.014016	0.0625	3.15	80
ALT-5000	1121.3	5000	0.022426	0.1	0.028033	0.125	5.9	150

- Fully programmable
- Servo Driven force testing station-Multiple force measurement at multiple heights
- Programmable setting station
- 3 way, 5 way and analogue sorter available
- Part loading mechanism available for integration into bowl feeding or automatic loading systems
- Maximum throughput 3000 parts per hour; (depending on system configuration)

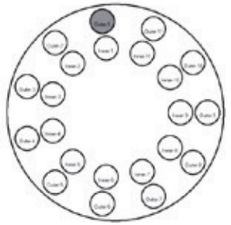


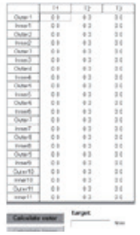
BATT Series

Fully Automated loading, Setting, Testing, Sorting and Packing Systems for torsion Springs

FULLY PROGRAMMABLE

- Servo Driven torsion heads testing station-Multiple torque measurements at multiple angles
- 3 way sorter available
- Test throughput in excess of 2000 parts per hour (depending on system configuration)

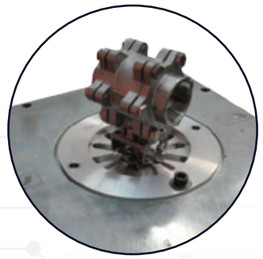


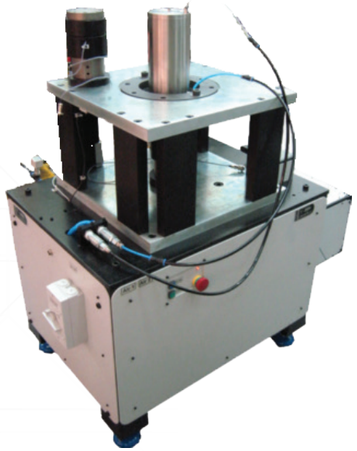


Valve Testers

TESTS PNEUMATIC DOUBLE ACTING AND SINGLE ACTING VALVE ACTUATORS.

- Fully maps the torque/angle opening and closing characteristics.
- Multiple load cell capability up to 2000Nm torque.





ALS Series

Fully Automated high throughput Setting Systems for Compression Springs

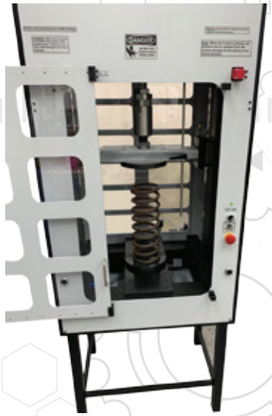
FULLY PROGRAMMABLE SETTING SYSTEM.

- Pneumatic setting station-Multiple sets available
- 2000N and 5000N setting forces available
- Part loading mechanism available for integration into bowl feeding or automatic loading systems
- Maximum throughput 5000 parts per hour (depending on system configuration)

LS Series

LARGE COMPRESSION SPRING PNEUMATIC SETTING SYSTEMS

- Setting Forces up to 20000N (4485lbf)
- Strokes up to 500mm (20”)
- Full Safety Features Included



LST Series

Programmable PC Driven compression/Extension Life Cycle (Fatigue) Testers

Model	Number of Stations	Maximum Total Load		Maximum Load per channel		Max Rotational Speed	Maximum Stroke		Maximumm Adjustabl Freelength	
		lbf	N	lbf	N	Hz	in	mm	in	mm
LST1200-6	6	269	1200	67	300	25	2.36	60	7.87	200
LST1200-12	12	538	2400	67	300	25	2.36	60	7.87	200
LST5000-6	6	1121	5000	179	800	25	2.36	60	7.87	200
LST5000-12	12	2243	10000	179	800	25	2.36	60	7.87	200
LST10000-6	6	2243	10000	359	1600	25	2.36	60	7.87	200
LST10000-12	12	4485	20000	359	1600	25	2.36	60	7.87	200

*** SPEED-STROKE-FORCE DERATING APPLIES

Mechanical/ NON-PC Models available too

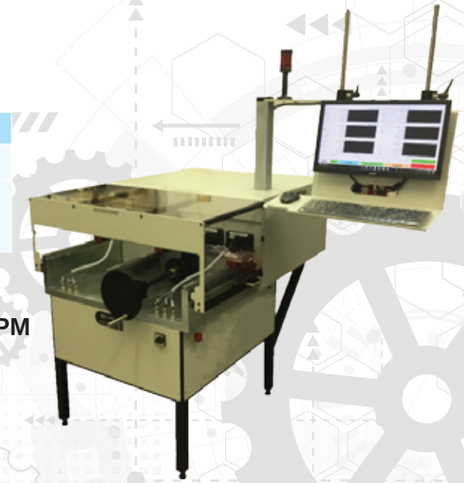
PC MODELS INCLUDE

- 6 or 12 channel simultaneous load
- Unattended programmable fatigue testing solution
- Assisted setup with height gauges
- Reporting module
- Optional Temperature Control Units with air heated temperatures up to 250 degrees C

TFT Series

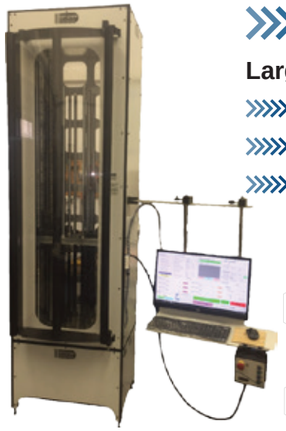
Programmable PC Driven Torsion Cycle (Fatigue) Testers

Model	Number of Stations	Maximum Total Torque		Maximum Load per channel		Max Rotational Speed
		lbf.in	N.M	lbf.in	N.M	RPM
TFT-2	6	106.2	12	17.7	2	300
TFT-5	6	265.5	30	44.25	5	300
TFT-20	6	1062	120	177	20	200



FEATURES

- Endless Angular Rotation available with speeds up to 300RPM
- Up to 6 channels per tester including Torque-cells for continuous torque measurement and reporting
- Optional Temperature Control Units with air heated temperatures up to 250 degrees C.



CFT Series

Large Stroke Compression/Extension Life Cycle / Fatigue Testers

- Up to 1500mm (60") stroke
- Up to 133mm/sec linear velocity
- PC controlled with loadcells at every station for load monitoring and reporting.

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