

Precision Load Cells

The World of Precision Made Force Transducers

With many years of experience in the Precision Load Cells field, Servotest has been working to develop testing equipment that exceeds other manufacturers in the market place.

We offer an unbeatable range of dynamic test equipment that covers a whole spectrum of testing needs required of a modern manufacturing organisation. By offering our equipment in a number of bespoke ranges and complementary accessories, we can offer the variety of testing forces, sizes and orientations needed.

International service is reliably supplied through a series of satellite offices and partner organisations. Spare parts are stored and available locally to avoid long lead times for repairs and upgrades. Turnkey facilities including planning, updating, installation and maintenance are available and can be individually designed to suit specific needs. New technology is continually introduced into the hardware, instrumentation and software to keep your equipment at the forefront of the industry. At the same time the equipment complies with the various International Standards in place, including; MIL, ASTM, IEC, ISO and BS.

A world of experience...

Servotest is a World Class Test and Motion Simulation Company, with experience of operating around the globe, for multi national corporations and smaller specialist companies and Government Departments. Since the 1950's our engineers and equipment has been at the forefront of our industry. Product and Service quality is maintained by a program of continuous training and



development of our people and equipment. We operate in all of the key industry sectors for our market place, including Automotive, Marine, Civil Engineering, Aviation, Defence, Aerospace and Traction. The company holds both ISO14001 and 9001 Quality accreditation marks and is a member of many national and international trade organisations.

Precision Load Cell Equipment

The Servotest LC range of Load Cells are precision-made force transducers for tension and compression through zero measurement. They are available in a wide range of sizes from 2.5KN to 5000KN, and are fully compatible with the standard range of Servotest linear actuators and test machines. All accessories that fit the actuator piston rod will fit the load cell, and the load cell can be attached to an actuator or load frame without using special adapters. Non-standard sizes, even outside this range, can be supplied to special order.

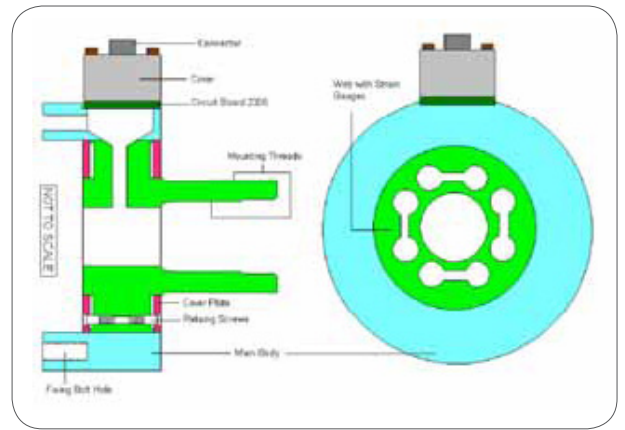
Design

The Servotest LC Load Cell has been very carefully developed to guarantee reliability and repeatability. It is of shear-web design, giving an inherently compact and robust structure, which can withstand a high degree of overloading, bending, torsion, and side loading without sustaining damage or losing accuracy. The specially designed shape ensures perfect symmetry of output in tension and compression and zero hysteresis.

Construction

The Servotest LC Load Cell is precision machined from solid alloy steel and cadmium plated for rust protection. The shear webs are strain gauged by specialists, using matched, high accuracy alloy strain gauges, in a shear bridge configuration incorporating temperature compensation. The gauges are electrically connected to a compact and robust Plessey-style fixed plug attached to the side of the load cell body. The gauges and connecting wires are acrylic coated to protect them from the effects of oil and moisture. End plates are fitted to give additional physical protection and these are vented to equalise the barometric pressure.

The shear bridge configuration comprises a four arm Wheatstone bridge, which gives a high output at low strain level. This output is of equal magnitude but opposite sign in tension and compression.



Rating

The Servotest LC Load cell gauges are operated at low strain level for infinite fatigue life with continuous reversal at full dynamic load. Up to 200% of rated load can be applied for static or very low frequency measurements. Up to 250% short duration overloading can be applied without significant zero shift.

Resistance to Extraneous Forces

Although Servotest machines and test systems are carefully designed to minimise extraneous forces lateral and torsional accelerations are inevitable in many dynamic applications. A shear web load cell is inherently rigid in all planes and in the highly developed Servotest design gives a high resistance to such forces with insignificant cross talk.

Designation

The Servotest LC range of Load Cells are individually designated by the compatible actuator type number and the load cell dynamic rating, viz.

For example LC-080-500

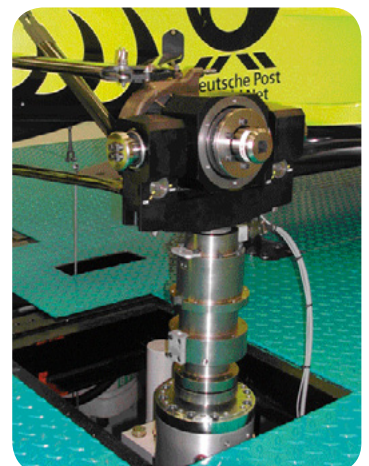
LC = Load Cell

080 = to fit 80mm

Piston Rod Diameter,

500 = 500 KN

Dynamic.

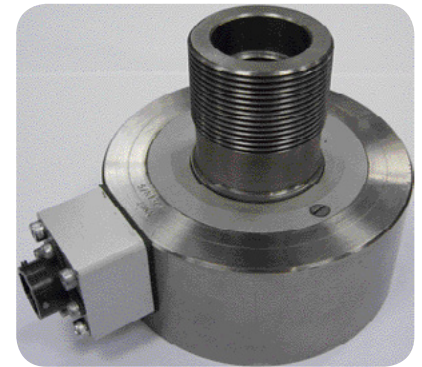


Servotest Load Cells are used by the Spyker F1 team

Technical Specifications

Compact Servo-controller Specification

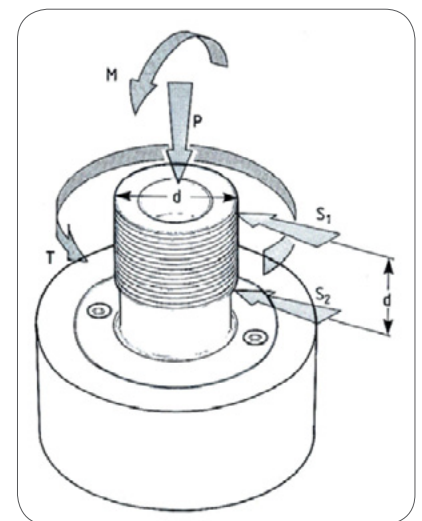
Calibration	BS 1610 Grade A (Al to special order) Linearity $\pm 1\%$ ($\pm 0.5\%$ to special order)
Temperature zero drift	Less than 0.005% per °C
Calibration change with temperature	Less than 0.005% per °C
Compensated temperature range	-10°C to +40°C (greater range to special order)
Hysteresis	Less than 0.03%
Sensitivity	0.8mV/V at rated load
Maximum supply voltage	15V
Bridge resistance	240 ohms
Fatigue life at full load	Infinite
Static overload	200%
Short duration overload	250%
Repeatability	$\pm 0.05\%$



Load cell

Resistance to Extraneous Forces

Type of Load Cell	P 250% Overload Capacity (kN)	T Torsional Moment Capacity (Nm)	M Bending Moment Capacity (Nm)	S ₁ Side Force Capacity (KN)	S ₂ Side Force Capacity (KN)
LC - 032 - 2.5	6.2	98	49	0.8	1.5
LC - 040 - 5	12.5	310	150	2.5	5
LC - 040 - 20	50	1200	720	10	20
LC - 050 - 5	12.5	380	190	2.8	8.5
LC - 050 - 50	125	3800	1900	29	90
LC - 065 - 10	25	1300	680	8.3	26
LC - 065 - 100	250	10000	5100	62	200
LC - 080 - 50	120	5700	2800	32	110
LC - 080 - 200	500	23000	12000	130	500
LC - 100 - 100	250	15000	7900	62	210
LC - 100 - 500	1200	84000	43000	340	1150
LC - 150 - 300	750	69000	35000	180	600
LC - 150 - 1200	3000	270000	140000	740	2300
LC - 200 - 750	1800	170000	870000	290	800
LC - 200 - 2500	6200	560000	290000	990	2600
LC - 250 - 1000	2500	430000	220000	420	920
LC - 250 - 5000	12000	210000	1100000	2100	4600



Extraneous forces exerted on load cells

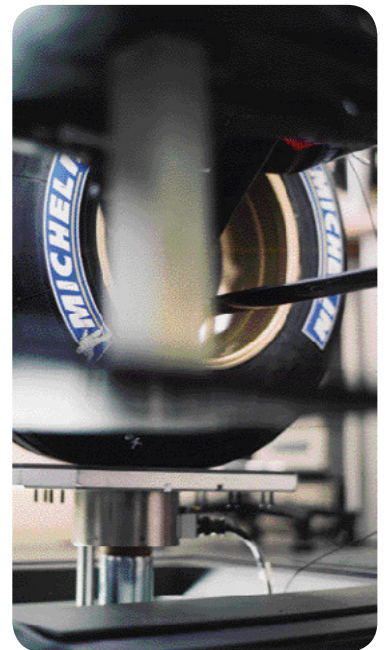
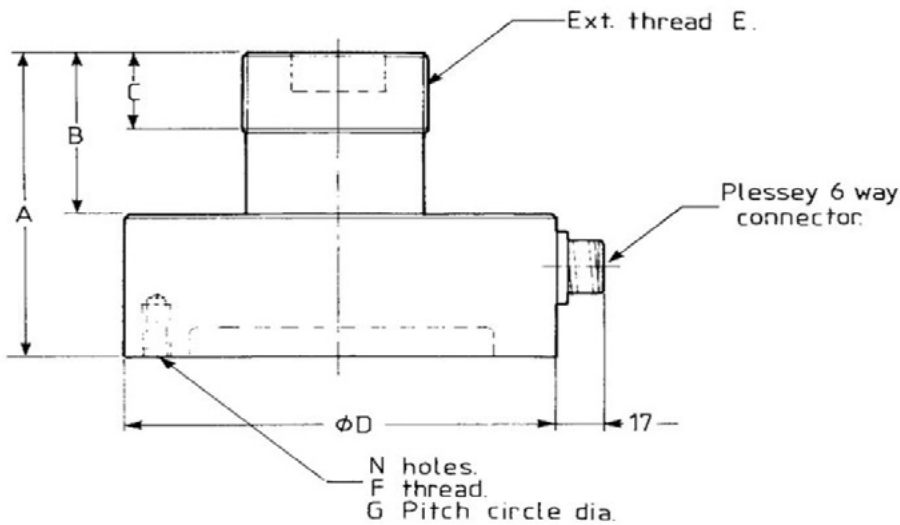
Servotest policy is one of continual improvement and therefore specifications may change without notice.

Option: In high sensitivity applications, where a small load cell is used with a large actuator, a shear plate can be incorporated into the load cell assembly to protect the load cell against accidental damage.

Technical Specifications (cont.)

Load Cell Dimensions

Dimension (mm) Type of Load Cell	A	B	C	D	E	F	G	H	Approx. Load Cell Mass (kg)
LC - 032 - 2.5 to 20	91	45	25	102	M30 X2	M6	81	8	2.5
LC - 040 - 5 to 20	96	50	30	102	M36 X2	M6	81	8	3.0
LC - 050 - 5 to 50	100	50	30	115	M48 X2	M8	98	8	4.2
LC - 065 - 10 to 100	121	60	30	135	M60 X2	M8	118	8	6.8
LC - 080 - 50 to 200	141.5	60	40	160	M72 X2	M12	138	12	13.8
LC - 100 - 100 to 500	200	85	50	250	M90 X2	M16	210	12	45
LC - 150 - 300 to 1200	300	130	75	300	M140 X2	M20	255	16	100
LC - 200 - 750 to 2500	380	210	100	400	M190 X3	026	340	24	195
LC - 250 - 1000 to 5000	660	400	180	700	M280 X4	039	600	24	900



Servotest Supply Load Cells to Spyker and Red Bull F1 Teams

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