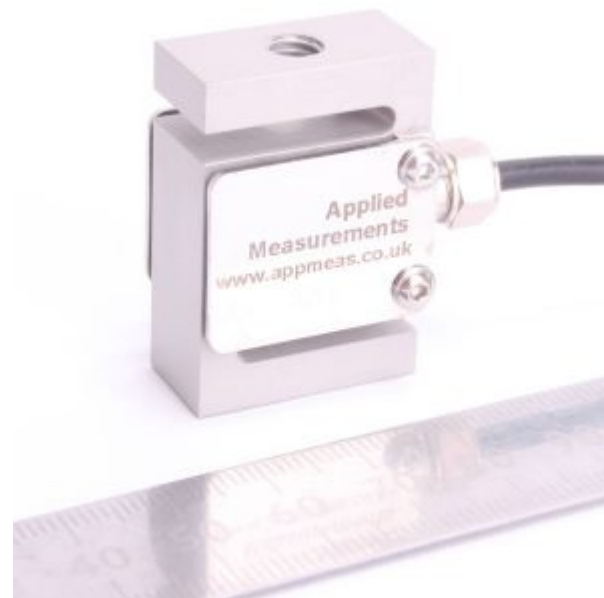




Miniature S-Beam Load Cell | Z-Beam Force Sensor | DBBSMM

Tiny, Accurate and Easily Adaptable, Only 35mm High

- **Lead Time:** 1 week
- **Buy online:** <https://appmeas.co.uk/shop/load-cells/dbbsmm/>



AT A GLANCE

- Capacities: 0-1kg up to 0-50kg
- Output: 2mV/V nominal
- Accuracy: $< \pm 0.03\%$ /RC
- Only 35mm High
- IP51 Environment Protection
- Custom Versions Available

- **Miniature and Compact** – Easily fits in your application.
- **Guaranteed High Performance** – Dual bending beam design.
- **Optional IP67 Gel-Filling** – Ideal for wave tank monitoring.
- **Fast and Simple Installation** – With standard or customised mounting bases and fixtures.
- **Improved Accuracy** -With our specially designed rod end bearings.
- **Submersible Versions Available** – For marine and underwater applications.
- **Customisation Available to Suit Your Specific Application**

DESCRIPTION

Applied Measurements DBBSMM miniature S-Beam load cell (or Z-Beam load cell) is suitable for use in tension and compression and lends itself to both force and load measurement applications where the space to mount a standard size load cell is not available.

All of our miniature S-Beam load cells offer high accuracy of better than $\pm 0.03\%$ of their rated capacity and can be optionally gel-filled to provide a waterproof device suitable for applications such as wave tank monitoring.



Rod end bearings and load buttons are available (see gallery images) to provide optimum loading conditions.

If you require a miniature S-Beam load cell with a capacity greater than 50kg, Applied Measurements can manufacture special versions of the DBBSMM with measuring ranges of 100kg, 150kg, 200kg and upwards on request. Please contact your Applied Measurements expert sales team using the form in the sidebar to discuss your miniature s-beam load cell requirement in detail.

If you are not space-restricted, our DBBSM series of load cells (<https://appmeas.co.uk/products/load-cells-force-sensors/s-beam-universal-load-cell-dbbasm/>) covers load ranges up to 0-30,000kg (300kN).

Our s-beam load cells can be supplied with our Load Cell Instrumentation (<https://appmeas.co.uk/products/instrumentation/?cats=load-cells-strain-gauges>).

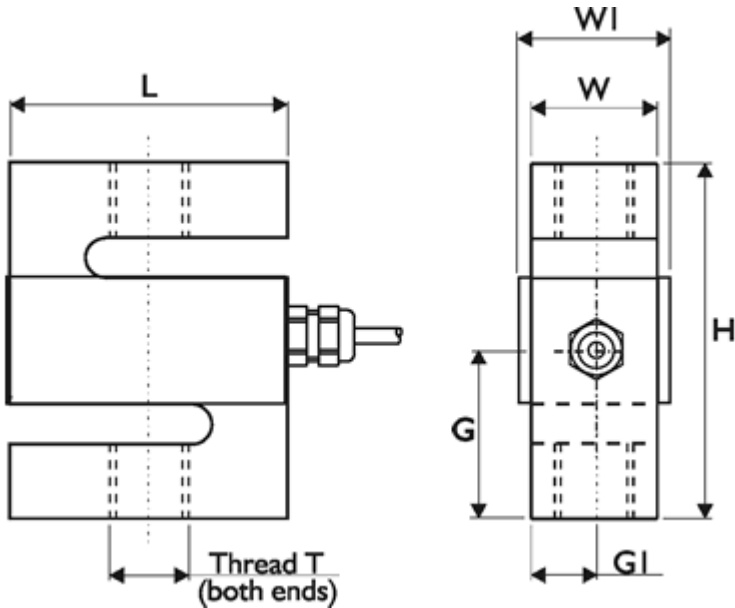
TECHNICAL SPECIFICATIONS

Rated Capacity (RC)	kgf	0-1, 0-2, 0-5, 0-10, 0-25, 0-50
Operating Modes	Tension/Compression / Tension & Compression	
Sensitivity (RO)	mV/V	2.0 nominal
Zero Balance/Offset	±%/Rated Output	<1.0
Zero Return after 30 mins	±%/Applied Load	<0.03
Output Symmetry (tension vs. compression)	±%/Rated Output	<0.10
Non-Linearity	±%/Rated Output (BFSL)	<0.03
Hysteresis	% / Rated Output	<0.02
Output Symmetry	±%/Rated Output	<0.10
Repeatability	±%/Rated Output	<0.02
Temperature Effect on Zero	±%/Rated Output/°C	<0.005
Temperature Effect on Sensitivity	±%/Applied Load/°C	<0.005
Input Resistance	Ohms	375-420 nominal
Output Resistance	Ohms	340-360 nominal
Insulation Resistance	Megohms	>5000 @ 50Vdc
Excitation Voltage	Volts AC or DC	10 recommended (2-15 acceptable)
Operating Temperature Range	°C	-20 to +80
Compensated Temperature Range	°C	0 to +70
Storage Temperature Range	°C	-20 to +80
Safe Overload	% of Rated Capacity	150
Ultimate Overload	% of Rated Capacity	200
Maximum Safe Side Load	% of Rated Capacity	30
Deflection @ Rated Capacity	mm (nominal)	1kg = 0.50, 2kg = 0.30, 5kg = 0.26, 10kg = 0.19, 25kg = 0.12, 50kg = 0.08
Fundamental Resonant Frequency*	Hz	1kg = 200, 2kg = 300, 5kg = 600, 10kg = 950, 25kg = 1900, 50kg = 3000
IP Rating (Environmental Protection)		IP51 (IP67 optional)
Weight (excluding cable)	grams	25
Fatigue Life		Consult Sales
Cable Length (as standard)	metres	2
Cable Type		4-core screened, PVC sheath, Ø3.5
Construction Material		Aluminium Alloy
Resolution		1 part in 250,000 (with appropriate instrumentation)



Rated Capacity (RC)	kgf	0-1, 0-2, 0-5, 0-10, 0-25, 0-50
*The resonant frequency is calculated with the body of the load cell attached to a large plate, ensuring that only the sensing element oscillates: This is vital to achieve the highest natural frequency and subsequent frequency response.		

Product Dimensions (mm)



CAPACITY (kgf)	H	L	W	W1	G	G1	Threads T
1, 2, 5, 10, 25, 50	35	24	12	16	17.5	6	M6x1

Wiring Details

Wire	Designation
Red	+ve excitation
Blue	-ve excitation
Green	+ve signal (tension)
Yellow	-ve signal
Screen	To ground - not connected to load cell body

ORDERING CODES & OPTIONS

Core Product	Capacity (inc Engineering Units)	Cable Length (m)	Specials Code	Example Result
DBBSMM	1kg	002	000	DBBSMM-1kg-002-000
DBBSMM	2kg	002	000	DBBSMM-2kg-002-000
DBBSMM	5kg	002	000	DBBSMM-5kg-002-000
DBBSMM	10kg	002	000	DBBSMM-10kg-002-000
DBBSMM	25kg	002	000	DBBSMM-25kg-002-000
DBBSMM	50kg	002	000	DBBSMM-50kg-002-000

HOW TO INSTALL AN S-BEAM LOAD CELL

Our Applied Measurements experts have put together a 5-step guide to demonstrate how to correctly install an S-beam load cell.

Step 1 – Keep the Forces Centrally Aligned



To reduce any off-axis loading, forces must be centrally aligned through the centre of the load cell. We can supply optional load buttons and rod ends which work to reduce any side loading.

Step 2 – Do Not Overtighten the Rod Ends and Load Buttons

When using rod ends and load buttons be sure not to overtighten them when attaching them to the S-beam load cell. As this can cause damage to the load cell.

Step 3 – Always Leave a Gap

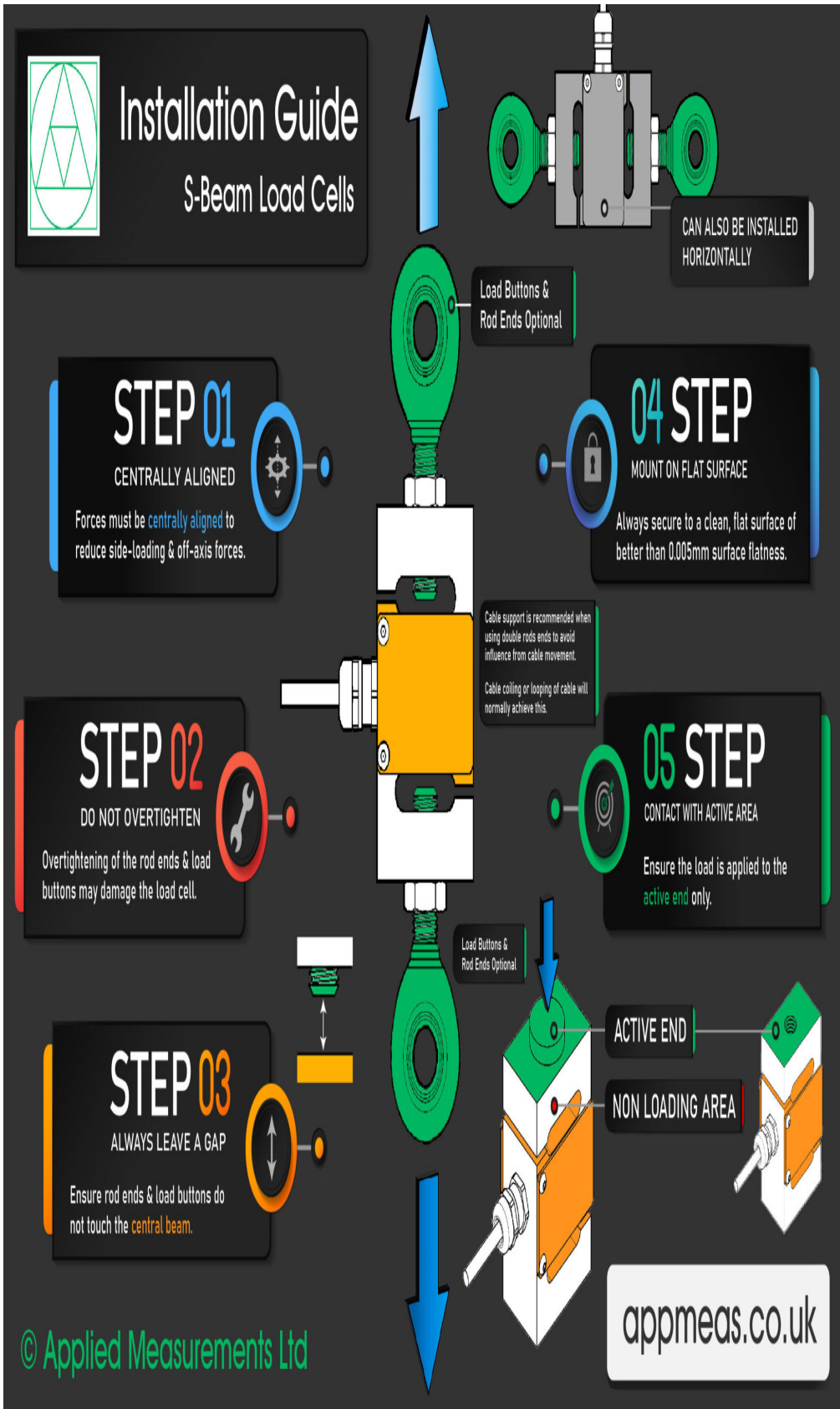
Ensure that the rod ends and load buttons do not touch the central beam. If a gap is not maintained, the central beam will not be able to move freely when tension or compressive force is applied.

Step 4 – Mount on a Flat Surface

Always secure the S-beam load cell to a clean, flat surface of better than 0.005mm surface flatness.

Step 5 – Contact with Active Area Only

When installing the S-beam load cell ensure the load is applied to the active end area only.



Graphic by Wendy Jeffery



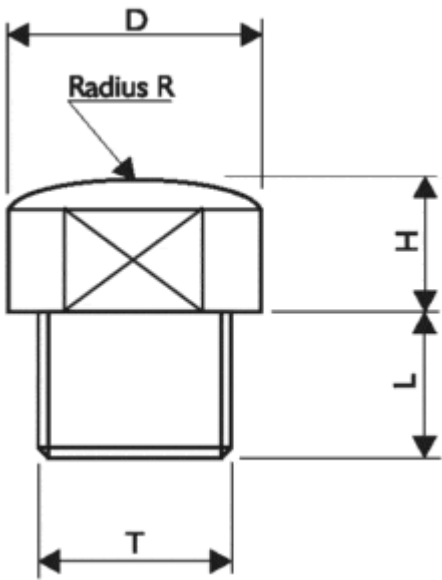
MOUNTING AND INSTALLATION ACCESSORIES

Load Buttons and Rod End Bearings

Designed to align forces through the principle axis of the load cell thus reducing the effects of extraneous forces, hence offering improved performance from the cell.

Load buttons are used where compressive forces are applied.
Rod End Bearings are used where tensile forces are being applied.

Load Buttons for Compressive Use



THREAD T	M6 x 1
D	12.5
H	6
L	9
R	200

Rod End Bearings for Tension Use

Maintenance-free rod ends are a complete units made up of a housing with both an integral shank (with an internal or external thread) and a maintenance-free spherical plain bearing, located within the housing.

- Supports radial loads in a tensile or compressive direction.
- Suitable for unilateral loads – can support alternating loads and alternating loads in combination with bearing GE..UK-2RS, consult sales.
- Zinc plated for corrosion resistance.
- Are maintenance-free.
- Fitted with radial spherical plain bearings GE..UK
- Hard chromium/PTFE composite sliding contact surfaces.
- Enables compact adjacent construction thanks to its thin walled design of the eye housing.

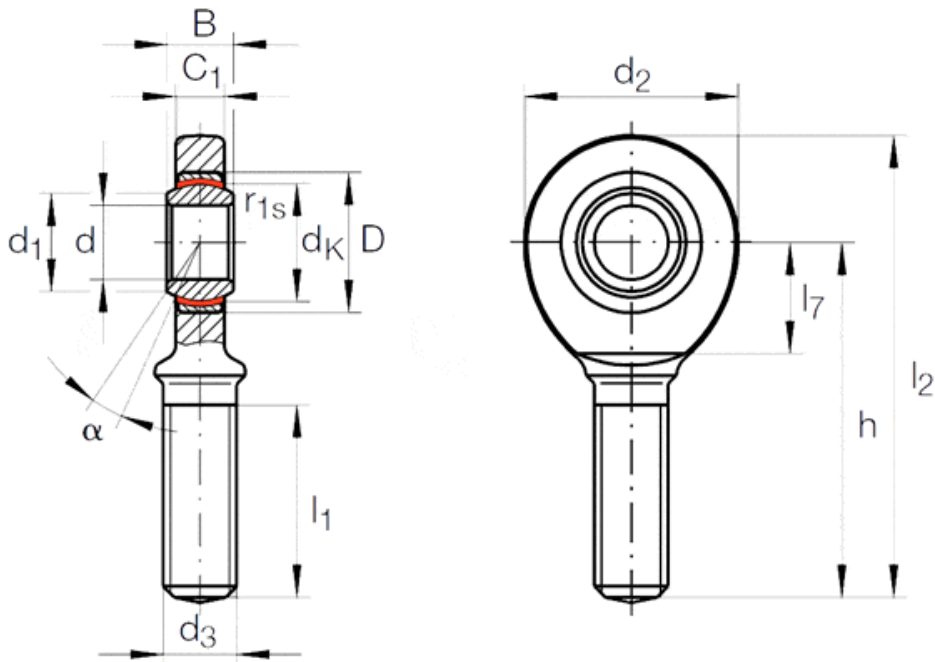


GAR..UK
(right hand thread)

To ISO 12 240-4, dimension series E, type M
Shank with external thread

Maintenance-free
ISO 12 240-4, dimension series E, type M
Sliding contact surface: hard chromium/PTFE

Series GAR..UK
Sliding material: PTFE composite



LOAD CELL	SHAFT DIAMETER	ORDERING CODE		MASS	DIMENSIONS						
	d	WITHOUT SEALS	WITH SEALS	≈ kg	d	D	B	dk	d1	d2	d3
DBBSMM	6	GAR 6 UK	-	0.017	6-0.008	14	6-0.12	10	8	21	M6

LOAD CELL	Degrees						Chamfer Dimension	Basic Load Ratings		Radial Internal Clearance	Shaft Diameter
	h	C1	α	l1	l2	l7	r1s min.	dyn. Cr N	stat. C0r N		d
DBBSMM	36	4.4	13	18	46.5	12	0.3	3 600	6 920	0 - 0.032	6



PUBLISHED SENSOR APPLICATION ARTICLES

Below is a selection of published sensor application papers and journals that show you how the DBBSMM miniature s-beam load cell could be used in specific applications. See our published sensor application articles page (<https://appmeas.co.uk/resources/sensor-application-papers/>) for many more.

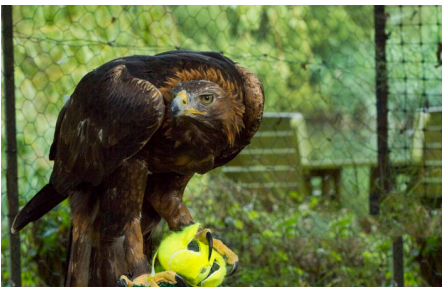
The importance of abductor pollicis longus in wrist motions: A physiological wrist simulator study
(<https://www.sciencedirect.com/science/article/pii/S0021929018305177?via%3Dihub>)

Darshan S.Shah, Claire Middleton, Sabahat Gurdezi, Maxim D.Horwitz, Angela E.Kedgley, Department of Bioengineering, Imperial College London, London, United Kingdom, Department of Hand Surgery, Chelsea and Westminster Hospital, London, United Kingdom. *Journal of Biomechanics* Volume 77, 22 August 2018, Pages 218-222. Available under a Creative Commons Attribution 4.0 International (<https://creativecommons.org/licenses/by/4.0/>) license.

Bovine and degenerated human annulus fibrosus: a microstructural and micromechanical comparison (<https://link.springer.com/article/10.1007/s10237-017-0900-z>)

Claudio Vergari, Daniel Chan, Andrew Clarke, Jessica C. Mansfield, Judith R. Meakin, Peter C. Winlove. *Biomechanics and Modeling in Mechanobiology*. August 2017, Volume 16, Issue 4, pp 1475–1484. Available under a Creative Commons Attribution 4.0 International (<https://creativecommons.org/licenses/by/4.0/>) license.

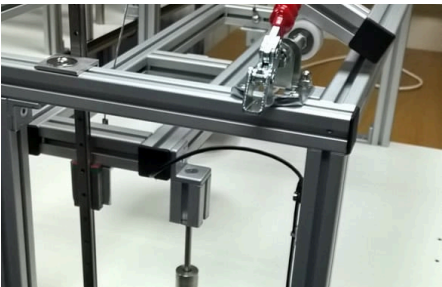
CASE STUDIES



How to measure grip strength of an eagle for BBC Natural World

Last year, we were asked to design a sensor to measure the grip strength of a golden eagle named Tilly, for the award-winning BBC documentary series, Natural World. Challenge - to find a load cell that could withstand the estimated grip strength of an eagle. As Tilly had been trained to catch and grip a tennis ball, the load cell needed to be small enough to fit inside a similar-sized measuring device yet withstand Tilly's tremendous grip strength. Thanks to their unique design, our DBBSMM miniature s-beam load cells were ideal for the job. Not only are they very compact but their s-shaped design offers superior side-load rejection and high accuracy.

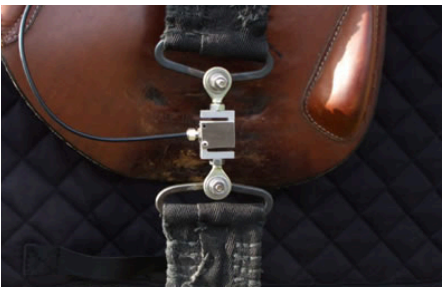
Read more... (<https://appmeas.co.uk/blog/grip-strength-eagle/>)



Universal Fabric Tension Tester for All Fabrics and Styles

The Challenge - Accurately Measure Fabric Tension on Any Style of Furniture. Fabric strength testing guarantees the fabric being used on furniture meets the high quality needed for durability, comfort and support. Choosing the wrong type of fabric can lead to fabric tearing, loss of customer satisfaction and a decrease in sales and profit. Find out how our miniature s-beam load cell, intuitive4-L digital indicator and industrial LVDT displacement sensors were used to determine fabric strength.

Read more... (<https://appmeas.co.uk/blog/fabric-tension-tester/>)



Force Measurement Determines The Effect of Girth Tension on Horse Gait

Using electrical systems for the measurement of mechanical forces is by no means limited to machines and laboratory based applications. In her recently completed research thesis 'Girth Tensions and their Effects on Equine Stride Characteristics', Sue Wright of Moulton College Northampton used load cells, motion sensors and GPS amongst other technologies to measure and record the tension within the girth strap used to hold the saddle in place.

Read more... (<https://appmeas.co.uk/blog/force-measurement-determines-girth-tension/>)

RELATED PRODUCTS

Buy Online



Load Cell Digital Indicator | High Accuracy
| Intuitive4-L
Highly configurable, modular construction

Buy Online



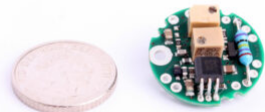
Load Cell Amplifier | Load Cell Signal
Conditioner | SGA
Inputs from 0.06mV/V

Buy Online






USB Load Cell Interface | DSCUSB
100 Readings/Second max.

Buy Online



Miniature Load Cell Amplifier | In-Cell
Amplifier | ICA



From £364	From £211	From £302	From £85
<div>Buy Online</div> <div></div> <div>Handheld Load Cell Indicator Digital Display TR150</div> <div>From £308</div>	<div></div> <div>Large Digit Load Cell Display</div> <div>From £503</div>	<div></div> <div>T24 Wireless Telemetry</div>	

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https://appmeas.co.uk/products/load-cells-force-sensors/miniature-s-beam-load-cell-dbbsmm/