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Z-Beam Load Cell | S-Beam Load Cell | High Accuracy |. DBB

Tension and Compression with IP67 Immersion Protection to 1m

- **Lead Time:** 3 - 5 days

AT A GLANCE

- Capacities: 0-50kg up to 0-6,000kg
- Output: 2mV/V
- Environmental Protection: IP67
- Accuracy: <±0.03%/RC
- Simple To Install

- **Guaranteed High Performance** – With dual bending beam and shear web designs.
- **IP67 Immersion Protection as Standard to 1m**
- **Fully Submersible Versions Available** – Ideal for permanent marine and offshore applications.
- **Improved Accuracy** – Specially designed rod end bearings which reduce extraneous forces.
- **Fast and Simple Installation** – With standard or customised mounting bases and design fixtures.

DESCRIPTION

Applied Measurements DBB Z-beam load cell / S-beam load cell is suitable for use in tension or compression with IP67 immersion protection to 1m. The design lends itself to both force and load measurement applications such as those found on tensile testing machines, suspended hoppers and geotechnical test equipment, as well as a wide range of other general-purpose applications.

The sensing principle employed on our Z-Beam load cell varies, with a dual bending beam design on the DBBE model which covers capacities from 50kg up to 1000kg and a shear web design on the DBBWAS model which cover ranges from 0-1500kg to 0-6000kg. Both sensing principles offer inherently high accuracy and enable us to guarantee performance of better than ±0.03% of rated capacity.

All our DBB models are constructed from nickel-plated alloy steel.

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

If you require a Z-Beam load cell with capacities of less than 50kg or greater than 6,000kg, Applied Measurements DBBSM series of S-Beam load cells (https://appmeas.co.uk/products/load-cells-force-sensors/s-beam-universal-load-cell-dbbsm/) covers load ranges from 0-1kg (10N) up to 0-30,000kg (300kN). Meanwhile, if you need to fit into a restricted space, our DBBSMM range of miniature S-Beam load cells (https://appmeas.co.uk/products/load-cells-force-sensors/miniature-s-beam-load-cell-dbbsmm/) will fit the bill.

TECHNICAL SPECIFICATIONS

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	DBBE	DBBWAS	Units
Rated Capacity (RC)	0-50, 0-100, 0-150, 0-200, 0-300, 0-500, 0-1000	0-1500, 0-2000, 0-3000, 0-5000, 0-6000	kg
Operating Modes	Tension/Compression/Tension & Compression		
Sensitivity (RO)	2.0 ±0.1%		mV/V
Zero Balance/Offset	<2		±%/Rated Output
Total Error	<0.03		±%/Rated Output
Zero Return after 30 mins	<0.03		±%/Applied Load
Output Symmetry (tension vs. compression)	<0.2 typical		±%/Rated Output
Temperature Effect on Zero	<0.003		±%/Rated Load/˚C
Temperature Effect on Sensitivity	<0.0015		±%/Applied Load/˚C
Input Resistance	400 ±20		Ohms
Output Resistance	350 ±3		Ohms
Insulation Resistance	>2000		Megohms @ 50Vdc
Excitation Voltage	10 recommended (2-15 acceptable)		Volts AC or DC
Operating Temperature Range	-30 to +70		˚C
Compensated Temperature Range	-10 to +45		˚C
Storage Temperature Range	-30 to +70		˚C
Safe Overload	150		% of Rated Capacity
Ultimate Overload	300		% of Rated Capacity
Deflection @ Rated Capacity	<0.4		mm
Fundamental Resonant Frequency*	200 to 1000 typical depending on capacity		Hz
IP Rating (Environmental Protection)	IP67		
Weight (excluding cable)	0.7		kg
Fatigue Life	Consult Sales		
Cable Length (as standard)	6		metres
Cable Type	6-core screened, PUR sheath, Ø6.3		
Construction	Nickel Plated Alloy Steel		
Resolution:	1 part in 250,000 (with appropriate instrumentation)		

*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

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Transducer Specialists...

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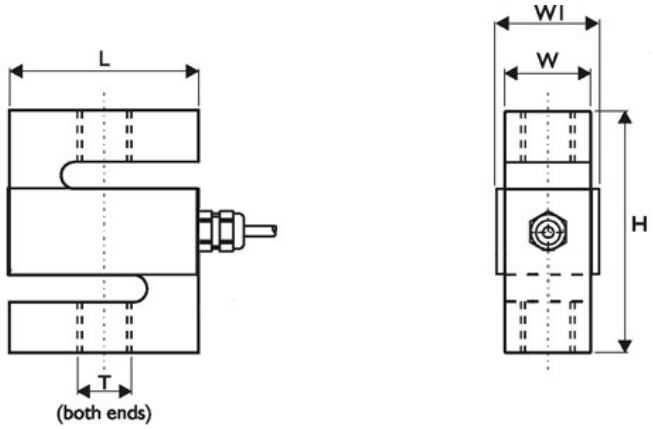

Model	Capacity (kgf)	H	L	W	W1 (nom)	H1	Threads T
DBBE	0-50 to 0-1000	80	62.1	18	22	15	M12 x 1.75
DBBWAS	0-1500, 0-2000	90	70	32	36	19	M16 x 2.0
DBBWAS	0-3000, 0-5000, 0-6000	120	100	45	45	26	M24 x 2.0

All dimensions are in mm

Wiring Details

Wire	Designation
Red	+ve excitation
Black	+ve sense
Blue	-ve excitation
White	-ve sense
Green	+ve signal (tension)
Yellow	-ve signal

ORDERING CODES & OPTIONS

Core Product	Capacity (inc Engineering Units)	Cable Length (m)	Specials Code	Example Result
DBBE	50kg	006	000	DBBE-50kg-006-000
DBBE	100kg	006	000	DBBE-100kg-006-000
DBBE	150kg	006	000	DBBE-150kg-006-000
DBBE	200kg	006	000	DBBE-200kg-006-000
DBBE	300kg	006	000	DBBE-300kg-006-000
DBBE	500kg	006	000	DBBE-500kg-006-000
DBBE	750kg	006	000	DBBE-750kg-006-000
DBBE	1000kg	006	000	DBBE-1000kg-006-000
DBBWAS	1500kg	006	000	DBBWAS-1500kg-006-000
DBBWAS	2000kg	006	000	DBBWAS-2000kg-006-000
DBBWAS	3000kg	006	000	DBBWAS-3000kg-006-000

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Core Product	Capacity (inc Engineering Units)	Cable Length (m)	Specials Code	Example Result
DBBWAS	5000kg	006	000	DBBWAS-5000kg-006-000
DBBWAS	6000kg	006	000	DBBWAS-6000kg-006-000

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

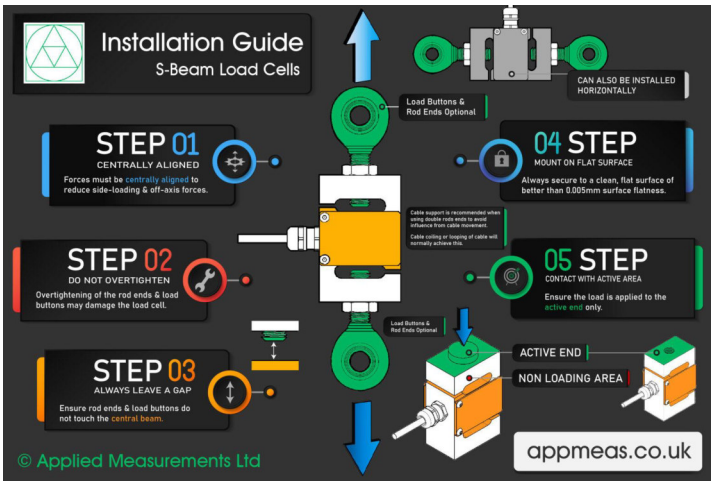
Ensure that the rod ends and load buttons do not touch the central beam. If a gap is not maintained, the central beam will not be able to move freely when tension or compressive force is applied.

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.

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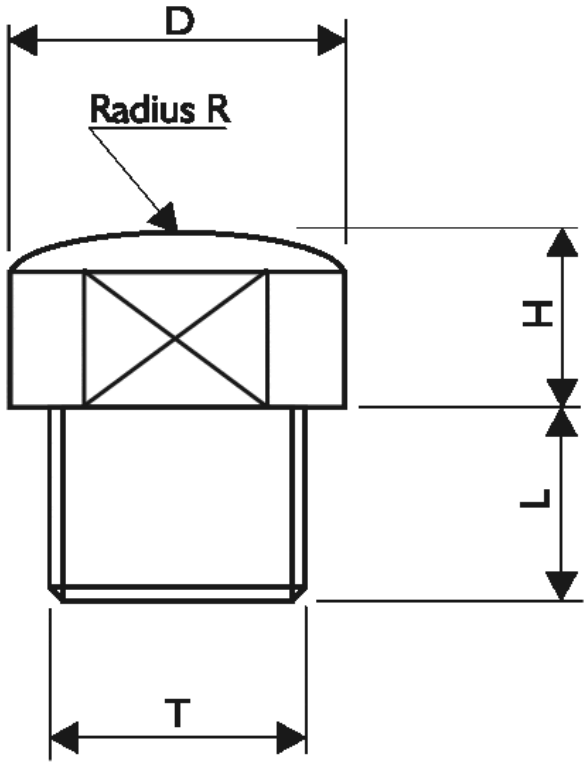
Load Buttons for Compression Use



THREAD T	M12 x 1.75	M16 x 2	M24 x 2
D	22	32	26
H	6	10	14
L	12	16	26
R	150	180	200

Rod End Bearings for Tension Use

- Supports radial loads in a tensile or compressive direction.
- Transmit slow movements with small or moderate swivel angles.
- Suitable for unilateral loads – can support alternating loads and alternating loads in combination with bearing GE..UK-2RS.
- Zinc plated for corrosion resistance.
- Are maintenance-free.
- Sealed maintenance-free rod ends use lip seals to protect against contaminants and water spray.
- Fitted with radial spherical plain bearings GE..UK
- Hard chromium/PTFE composite sliding contact surfaces.
- Right hand or left hand internal or external thread.
- Enables compact adjacent construction thanks to its thin walled design of the eye housing.

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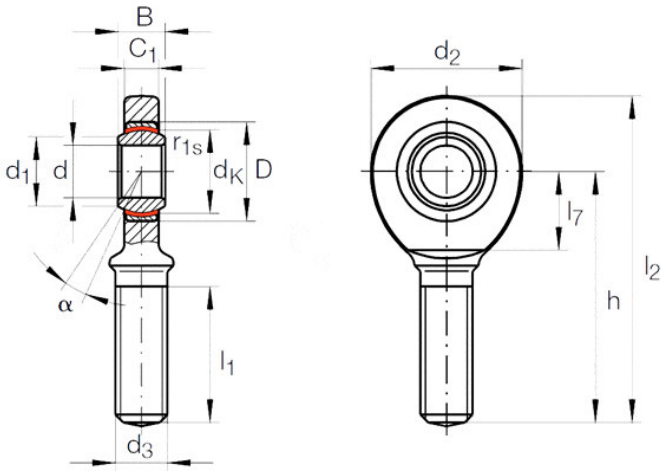
GAR..UK
(right hand thread)

GAL..UK
(left hand thread)

To ISO 12 240-4, dimension series E, type M
Shank with external thread
For shaft diameters from 6mm to 30mm

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

Series GAR..UK
Sliding material: PTFE composite



TYPE	SHAFT DIAMETER	DESIGNATION 1)		MASS	DIMENSIONS						
	d	WITHOUT SEALS	WITH SEALS	≈ kg	d	D	B	d_K	d_1	d_2	d_3
DBBE-50-1000kg	12	GAR 12 UK	-	0.086	$12_{-0.008}$	22	$10_{-0.12}$	18	14.9	34	M12
DBBWAS-1500-2000kg	17	GAR 17 UK	-	0.19	$17_{-0.008}$	30	$14_{-0.12}$	25	20.7	46	M16
DBBWAS-3000-6000kg	25	GAR 25 UK	-	0.56	$25_{-0.01}$	42	$20_{-0.12}$	35.5	29.3	64	M24 x 2

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TYPE	Degrees						Chamfer Dimension	Basic Load Ratings		Radial Internal Clearance	Shaft Diameter
	h	C_1	α	l_1	l_2	l_7	r1s min.	dyn. Cr N	stat. C_{0r} N		d
DBBE-50-500kg	54	8	11	28	71	18	0.3	11 400	30 100	0 - 0.032	12
DBBW-1500-2000kg	69	11	10	36	92	23	0.3	22 400	56 500	0 - 0.04	17
DBBW-3000-6000kg	94	17	7	53	126	32	0.6	51 000	104 000	0 - 0.05	25
1) For a left hand thread, the R is replaced by an L (example: GAL..).											

CASE STUDIES

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/)

Array

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