



Pancake Load Cell | Low Profile Force Sensor | DSCC

Low Profile, Adaptable and Accurate, with a High Frequency Response

- **Lead Time:** 5kN to 200kN: Stock
250kN: 2 weeks (not DSCC8)
Over 250kN: 10 weeks
- **Buy online:** <https://appmeas.co.uk/shop/load-cells/dsc/>



AT A GLANCE

- Capacities: 0-5kN up to 0-1000kN
- Output: 2mV/V
- High-Frequency Response
- High Accuracy: $<\pm 0.05\%/RC$
- Options:
 - Fatigue-Rated Versions
 - IP67 Rated Versions
 - IP68 Submersible Versions
 - ISO 376 Version available

- Low Profile to Easily Fit Where Space is Limited
- Perfect for both Weighing and Force Measuring
- Ideal for Crash Test Walls
- High-Frequency Response
- Fully Submersible Marine and Underwater Versions Available
- Immersible Versions for Humid or Flood Risk Environments
- Customisation Available to Suit your Specific Application
- ISO 376 option available if you need to calibrate equipment

DESCRIPTION

The DSCC pancake load cell / low profile load cell by Applied Measurements is manufactured in **stainless steel** and is suitable for use in **weighing and force measurement** applications. Our pancake load cells are available to buy online with capacities 0-200kN in stock. Load buttons are also available on request.

The DSCC can operate in **both tension and compression** and are commonly used in materials testing and component fatigue testing applications for axial force measurements where a high accuracy, low-profile device is required.



The **high-frequency response** of the DSCC pancake load cells also makes them **ideal for dynamic force and load measurement applications** such as crash test walls. The high-speed analogue SGA amplifier (<https://appmeas.co.uk/products/instrumentation/load-cell-amplifier-sga/>) is an ideal complement to the DSCC pancake load cell, offering a conditioned signal output of 4-20mA, $\pm 5\text{Vdc}$ or $\pm 10\text{Vdc}$ with a bandwidth of up to 6kHz.

Thanks to the pancake load cell's dual-diaphragm design and central threaded through-hole, it is largely **insensitive to bending, off-axis, bending, side-load/shear loads and torsion.**

As with all Applied Measurements pancake load cell designs, the DSCC low profile load cell **can be modified** to suit your specific requirements, with alternative threads, custom dimensions, counter-bored mounting holes and higher capacities in excess of 3000kN possible.

Plus, for harsh, wet or humid environments we can make gel-filled pancake load cells rated to IP67. IP68 immersion versions are suitable for complete submersion and can also be offered on request. See Applied Measurements IP ratings guide (<https://appmeas.co.uk/resources/ip-ratings-ingress-protection/>) for more details.

If you require a pancake load cell with a rated capacity below 5kN for low-range measurements, the DSCRC low profile load cell (<https://appmeas.co.uk/products/load-cells-force-sensors/low-profile-tension-compression-load-cell-dscrc/>) covers forces from 0-200N up to 0-2kN.

Our pancake load cell can be provided with Load Cell Instrumentation (<https://appmeas.co.uk/products/instrumentation/?cats=load-cells-strain-gauges>) many of which are available to buy in our online shop.

ISO 376 Calibration standard

Our DSCCHA pancake load cell can be supplied with BS EN ISO 376 certification. ISO 376 certification is required if you wish your validated product to calibrate other products in accordance with ISO 7500. ISO 376 certification can be for compression, tensile or a combination of both. Please speak to our sales team for more details.

The ISO 376 compliant DSCCHA can also be supplied with a loading cap, and for tensile applications, Rod End Bearings.

TECHNICAL SPECIFICATIONS

Rated Capacity (RC)	kN	0-5, 0-10, 0-25, 0-50, 0-100, 0-200, 0-250, 0-300, 0-500, 0-750, 0-1000
Operating Modes		Tension/Compression / Tension & Compression
Sensitivity (RO)	mV/V	2.0 (up to 200kN) / 2.7 nominal (250kN upwards)
Zero Balance/Offset	$\pm\%$ /Rated Output	<1.0
Output Symmetry (tension vs. compression)	$\%$ /Rated Load	<0.25 (0.8 typical on $\varnothing 155$ 250kN)
Non-Linearity	$\pm\%$ /Rated Output (BFSL)	<0.05 (<0.03 typical)
Hysteresis	$\pm\%$ /Rated Output	<0.05 (<0.03 typical)
Repeatability	$\pm\%$ /Rated Output	<0.05 (<0.03 typical)
Temperature Effect on Zero	$\pm\%$ /Rated Capacity/ °C	<0.005
Temperature Effect on Sensitivity	$\pm\%$ /Applied Load/ °C	<0.005
Effect of Eccentricity	$\%$ /Applied Load/25mm	< ± 0.25 typical
Effect of Side Load	%	0.25 typical
Bridge Resistance	Ohms	See dimension table
Insulation Resistance	Megohms @ 50 Vdc	>5000
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	>250
Maximum Safe Side Load ** (Fx or Fy)	% of Rated Capacity	40
Maximum Safe Torque/Bending Moment	(Mx, My or Mz) **	See dimensions table



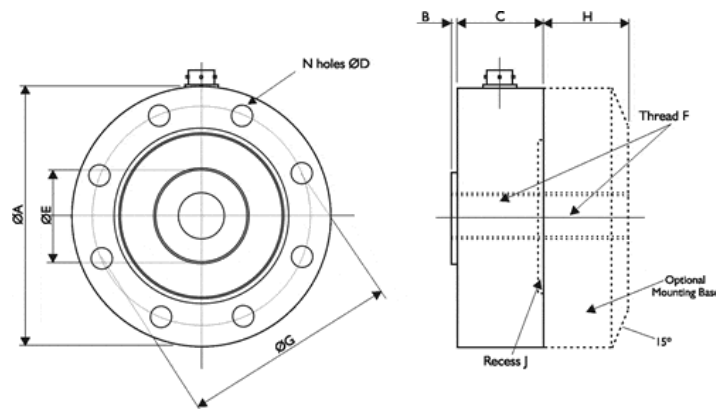
Rated Capacity (RC)	kN	0-5, 0-10, 0-25, 0-50, 0-100, 0-200, 0-250, 0-300, 0-500, 0-750, 0-1000
Deflection @ Rated Capacity	mm (nominal) at Rated Load	0.05 (>50kN) / 0.1 (100-250kN) / 0.13 (300-1000kN)
IP Rating (Environmental Protection)		IP65
Cable Length (as standard)	metres	3
Cable Type	Single Bridge Versions	6-Pin Amphenol Connector (PT02A-10-6P to MIL-DTL-26482 spec) + Mating Cable Assembly (4-core screened cable, PUR sheath, Ø5)
	Dual Bridge Versions	8-Pin M12 x 1 Connector + Mating Cable Assembly, (8-core screened cable, PUR sheath, Ø^)
Construction		Stainless Steel
Resolution		1 part in 250,000 (with appropriate instrumentation)
Fatigue Life	Fully Reversed Cycles	Standard Versions: 30-50 million typical Fatigue-Rated Versions: 500 million Versions rated to 1 billion+ on request

*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.

**Extraneous load ratings (Fx, Fy, Mx, My, Mz) are based on application of only one at any time in addition to force in the primary measurement axis (Fz). Contact our engineering department if multi extraneous loads will occur simultaneously.

CORE PRODUCT REF	CAPACITY (kN)	Bridge Resistance (ohms, nominal)	Deflection at RC (mm, nominal)	Resonant Frequency (kHz)	Extraneous Load Limit (Mx, My or Mz) (Nm)	Weight (kg no base)	Weight (kg with base)
DSCC	0-5, 0-10, 0-25, 0-50	700	0.05	5kN=3.5	30	1.5	3.7
				10kN=4.5	60		
				25kN=6.5	150		
				50kN=7.2	300		
DSCC	0-100, 0-200, 0-250	1050	0.1	100kN=6.5	845	3.9	9.1
				200kN=7.8	1690		
				250kN=8.7	2000		
DSCC8	0-250, 0-300, 0-500	1400	0.1	250kN=9	1500	11	24
				300kN=9.3	1800		
				500kN=10	3000		
DSCC	0-300, 0-500, 0-750, 0-1000	350	0.13	300kN=8.7	2030	25.5	65
				500kN=8.9	3390		
				1000kN=9.0	6780		

Product Dimensions





Core Product Ref	CAPACITY (kN)	ØA (Size)	B	C	ØD	ØE	Thread F	ØG	N holes	H	J
DSCC	0-5, 0-10, 0-25, 0-50	107	2	33	8.5	33	M20 x 2.5	90	8	35	2
DSCC	0-100, 0-200, 0-250	155	3	45	11	60	M36 x 2	130	12	45	2
DSCC8	0-250, 0-300, 0-500	202	2	52	12.2	95.5	M56x4	165	16	50	2
DSCC	0-300, 0-500, 0-750, 0-1000	278	6	78	17	118	M64 x 6*	230	16	84	4

*If you require rod end bearings please request an M64 x 4 thread. Note that the maximum rated safe static load on this size rod end is 689kN.

All dimensions are in mm

Wiring Details (Single Bridge Version)

Wire	Connector Pin	Designation
Red	Pin A	+ve excitation
Blue	Pin B	-ve excitation
Green	Pin C	+ve signal (compression)
Yellow	Pin D	-ve signal
Screen	N/C	To ground - not connected to load cell body

Wiring Details (Dual Bridge Version)

Wire	Connector Pin	Designation
Red	Pin 8	+ve excitation (bridge A)
Blue	Pin 7	-ve excitation (bridge A)
Green	Pin 3	+ve signal (compression) (bridge A)
Yellow	Pin 4	-ve signal (bridge A)
Brown	Pin 2	+ve excitation (bridge B)
White	Pin 1	-ve excitation (bridge B)
Pink	Pin 6	+ve signal (compression) (bridge B)
Grey	Pin 5	-ve signal (compression)
Screen	N/C	To ground - not connected to load cell body

ORDERING CODES & OPTIONS

Core Product	Capacity (inc Engineering Units)	Cable Length (m)	Specials Code	Example Result
DSCC	5kN	003	000	DSCC-5kN-003-000
DSCC	10kN	003	000	DSCC-10kN-003-000
DSCC	25kN	003	000	DSCC-25kN-003-000
DSCC	50kN	003	000	DSCC-50kN-003-000
DSCC	100kN	003	000	DSCC-100kN-003-000
DSCC	200kN	003	000	DSCC-200kN-003-000
DSCC	250kN	003	000	DSCC-250kN-003-000
DSCC	300kN	003	000	DSCC-300kN-003-000



Core Product	Capacity (inc Engineering Units)	Cable Length (m)	Specials Code	Example Result
DSCC	500kN	003	000	DSCC-500kN-003-000
DSCC	750kN	003	000	DSCC-750kN-003-000
DSCC	1000kN	003	000	DSCC-1000kN-003-000
DSCC8	250kN	003	000	DSCC8-250kN-003-000
DSCC8	300kN	003	000	DSCC8-300kN-003-000
DSCC8	500kN	003	000	DSCC8-500kN-003-000
			Other Specials Code	Details
			029	Fatigue rated to 500 million cycles
			033	Mounting base fitted
			061	Fatigue rated to 500 million cycles + mounting base fitted
			088	Dual strain gauge bridges + fatigue rated to 500 million cycles
			126	Dual strain gauge bridges
			127	Dual strain gauge bridges + mounting base fitted
			128	Dual strain gauge bridge + mounting base + fatigue rated to 500 million cycles

HOW TO INSTALL A PANCAKE LOAD CELL GUIDE

Our Applied Measurements experts have put together a 5-step guide to demonstrate how to correctly install a pancake 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 pancake 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 pancake load cell. As this can cause damage to the load cell.

Step 3 – Always Leave a Gap

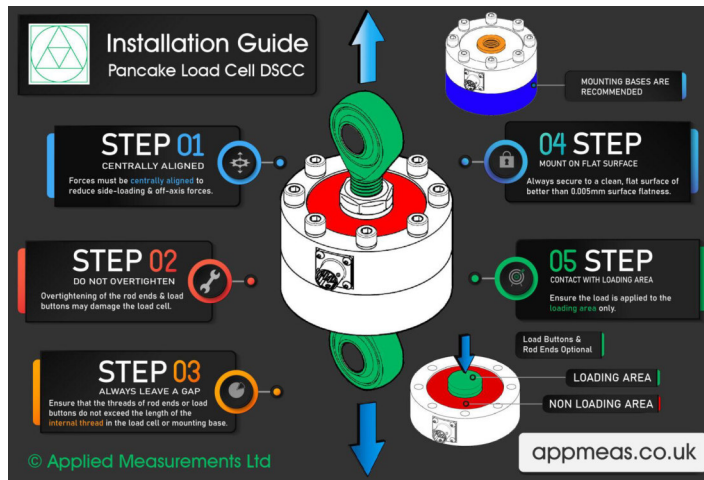
Ensure that the threads of rod ends or load buttons do not exceed the length of the internal thread in the load cell or mounting base. If a gap is not maintained, the sensing section of the load cell will not be able to move freely when tensile or compressive force is applied, leading to erroneous readings and potential damage.

Step 4 – Mount on a Flat Surface

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

Step 5 – Contact with Loading Area Only

When installing the pancake load cell ensure the load is applied to the loading area only.



Graphic by Wendy Jeffery

MOUNTING AND INSTALLATION ACCESSORIES

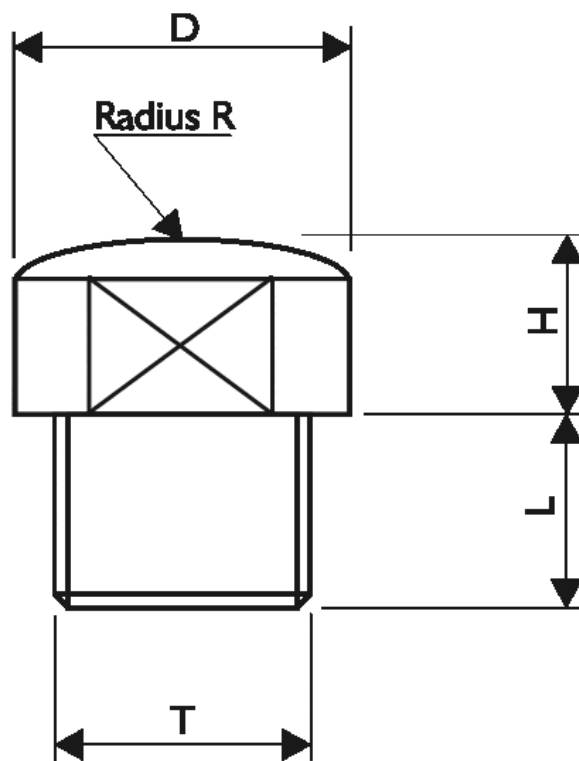
Load Buttons and Rod End Bearings

Designed to align forces through the principal 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

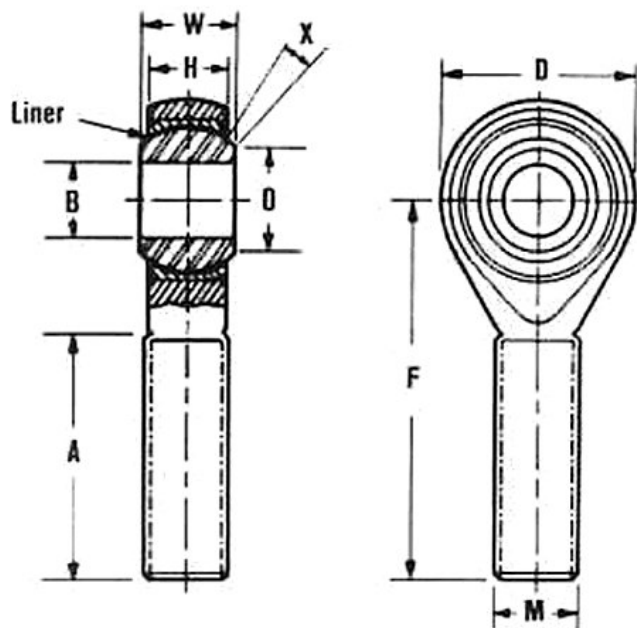




THREAD T	M20 x 2.5	M36 x 2	M56 x 4	M64 x 6
D	33	60	95.5	118
H	14	25	40	50
L	26	40	50	65
R	200	200	300	400

Rod End Bearings for Tension Use

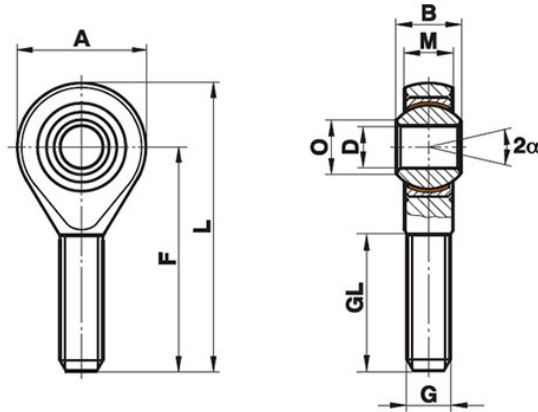
Maintenance-free rod ends are a complete units made up of a housing with both an integral shank (with an internal or external thread) and a maintenance-free spherical plain bearing, located within the housing.



Rod End Series K – Maintenance Free – Series GAXSW – DSCC up to 200kN

For use at high tension loads up to 230kN. Consult sales for rod-end to suit DSCC-250kN.

Rod ends with male thread made from heat-treated steel, zinc plated with PTFE liner, maintenance free.



Rod End Bearing GAXSW

Load Cell	Ordering Code	D	B	M	A	F	L	O	G	GL	Static Load C ₀ kN	Dynamic Load C kN	Limiting Speed rev/min *	Weight g
DSCC-5kN to 50kN	GAXSW20x2.5	20	25	18	50	78	103	24.3	M20x2.5	47	93.5	78	190	348
DSCC-100kN to 200kN	GAXSW35	35	43	28	80	125	165	37.7	M36x2	73	230	205	110	1600
For DSCC-250kN consult sales.														

Materials:	
Housing	Heat-treated steel to 42CrMo4, Aisi 4140, forged.
Insert	Free-cutting steel to 9SMnPb28K, 12L13, with PTFE liner bonded to the inner surface.
Ball	Bearing steel to 100Cr6, Aisi 52100, hardened, ground, polished.

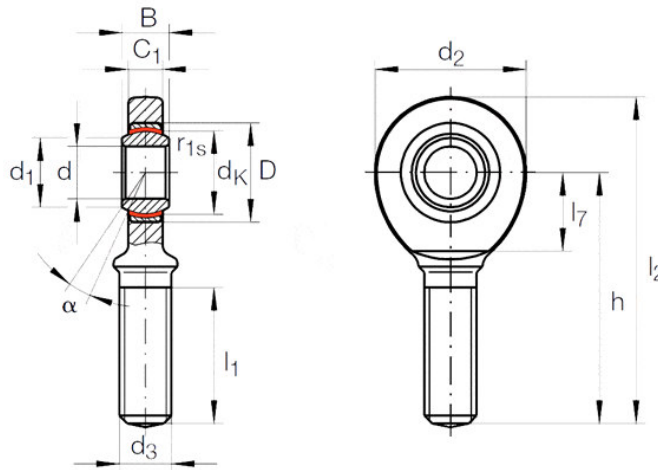
Rod End Series GAR..UK-2RS – DSCC up to 1000kN (689kN max load*)

*Consult sales for rod-ends to suit forces over 689kN.

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

GAR..UK-2RS
 (right hand thread)

- To ISO 12 240-4, dimension series E, type M
- Shank with external thread
- Suffix -2RS: lip seals on both sides, for operating temperatures from -30°C to +130°C

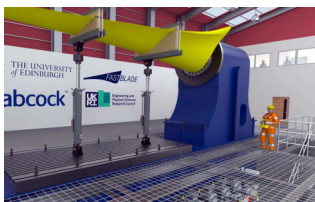


LOAD CELL	SHAFT DIAMETER	DESIGNATION		MASS ≈ kg	DIMENSIONS						
		WITHOUT SEALS	WITH SEALS		d	D	B	dk	d1	d2	d3
DSCC-300kN to 1000kN	80	-	GAR 80 UK-2RS	12	80 ^{-0.015}	120	55 ^{-0.15}	105	89.4	180	M64 x 6
DSCC8 0-250, 0-300, 0-500kN	70	-	GAR70-UK-2RS	8.2	80 ^{-0.015}	105	49 ^{-0.15}	92	77.8	160	M56 x 4

LOAD CELL	Degrees						Chamfer Dimension	Basic Load Ratings ²⁾		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
DSCC-300kN to 1000kN	270	47	6	140	360	100	1	1 125 000	689 000	0 - 0.072	80
DSCC8 0-250, 0-300, 0-500kN	235	42	6	125	315	87	1	885 000	564 000	0 - 0.072	70

CASE STUDIES

Applied Measurements Load Cells in World's First Regenerative Fatigue Test Facility



Developed by the University of Edinburgh, FASTBLADE is designed for high-quality, low-cost fatigue testing of tidal turbine blades, composite bridge sections and carbon fibre aircraft wing boxes and is the world's first test facility that uses regenerative hydraulic technology. Thanks to its cost-effective and accelerated testing, FASTBLADE reduces design risks, delivers rapid evaluation and enables faster certification and deployment of new products to the global market. Applied Measurements DSCC precision pancake load cells are an integral part of FASTBLADE's design. They are low profile, high accuracy and have a high-frequency response. Find out more...



[Read more... \(https://appmeas.co.uk/blog/fatigue-test-facility/\)](https://appmeas.co.uk/blog/fatigue-test-facility/)



Creating 1000 Times More Power with Submersible Load Measuring Pins

The measuring device needed to withstand permanent underwater submersion. "Our load measuring pin's stainless steel construction and ability to be customised to IP68 submersion rating made this the ideal choice for use in Deep Green's control system", explains Ollie Morcom, Applied Measurements' Sales Director.

[Read more... \(https://appmeas.co.uk/blog/creating-1000-times-power-submersible-load-measuring-pins/\)](https://appmeas.co.uk/blog/creating-1000-times-power-submersible-load-measuring-pins/)



Applied Measurements' Submersible Load Cells fitted to the World's Largest All-Terrain Hexapod

Applied Measurements provided the load cells needed to monitor the force on individual legs to stop the Mantis (the world's largest hydraulic hexapod robot) walking into a situation that is hazardous to its overall stability. Assisted by Applied Measurements' compact and submersible DSCC load cells, the Mantis successfully travels over all slopes and uneven surfaces, traversing most types of terrain, even wading through water.

[Read more... \(https://appmeas.co.uk/blog/applied-measurements-submersible-load-cells-worlds-largest-all-terrain-hexapod/\)](https://appmeas.co.uk/blog/applied-measurements-submersible-load-cells-worlds-largest-all-terrain-hexapod/)

Array

View this page in a browser:



<https://appmeas.co.uk/products/load-cells-force-sensors/low-profile-pancake-load-cell-dscc/>