



## Low Profile Tension and Compression Load Cell | DSCRC

High Accuracy, Low Profile, with a High Frequency Response

- **Lead Time:** 8 - 10 weeks



### AT A GLANCE

- Capacities: 0-200N up to 0-2000N
- Output: 2mV/V
- Environmental Protection: IP65
- High Accuracy:  $< \pm 0.1\%/RC$
- Optional Fatigue-Rated Versions

- **Low Profile to Easily Fit Where Space is Limited**
- **Perfect for both Weighing and Force Measuring**
- **Ideal for Dynamic Measurements Thanks to its High Frequency Response**
- **Customisation Available to Suit your Specific Application**
- **Let us do the work for you – We can Supply the DSCRC as a Complete Measuring System**

### DESCRIPTION

Applied Measurements DSCRC low profile tension and compression load cell/pancake load cell is manufactured from stainless steel and is suitable for use in weighing and force measurement applications. They 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 our DSCRC low profile tension and compression load cell also make them ideal for dynamic force and load measurement applications. The high-speed analogue SGA amplifier (<https://appmeas.co.uk/products/instrumentation/load-cell-amplifier-sga/>) is an ideal complement to the DSCRC, offering a conditioned signal output of 4-20mA,  $\pm 5Vdc$  or  $\pm 10Vdc$  with a bandwidth of up to 6kHz.

As with all our load cells, the DSCRC low profile tension and compression load cell design can be modified to suit your exact requirements, with alternative threads, custom dimensions and customer-specific capacities.

If you require a rated capacity greater than 0-2kN, the DSCC low profile load cell (<https://appmeas.co.uk/products/load-cells-force-sensors/low-profile-pancake-load-cell-dscc/>) covers forces from 0-5kN up to 0-1000kN as standard.

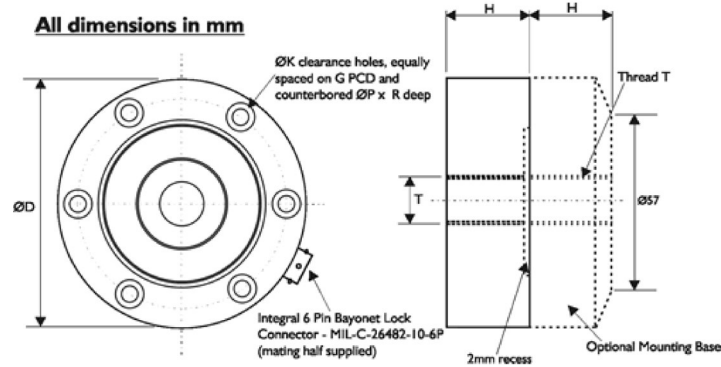
### TECHNICAL SPECIFICATIONS



Rated Capacity (RC)	N	0-200, 0-500, 0-1000, 0-2000
Operating Modes		Tension/Compression / Tension & Compression
Sensitivity (RO)	mV/V	2.0 nominal (1.0 on fatigue-rated versions)
Zero Balance/Offset	±%/Rated Output	<5.0
Output Symmetry (tension vs. compression)	%/Rated Output	<0.5 typical
Non-Linearity	±%/Rated Output (BFSL)	<0.10
Hysteresis	%/Rated Output	<0.08
Repeatability	±%/Applied Load	<0.03
Temperature Effect on Zero	±%/Rated Capacity/ °C	<0.005
Temperature Effect on Sensitivity	±%/Applied Load/ °C	<0.005
Input Resistance	Ohms	375 nominal
Output Resistance	Ohms	350 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 +60
Storage Temperature Range	°C	-20 to +80
Safe Overload	% of Rated Capacity	150
Ultimate Overload	% of Rated Capacity	300
Deflection @ Rated Capacity	mm	<0.4 nominal
Fundamental Resonant Frequency*		See table
IP Rating (Environmental Protection)		IP65 (2000N version) / IP52 (1000N and below)
Weight (excluding cable)	kg	0.75 (1.65 with base)
Fatigue Life		10 <sup>8</sup> cycles typical (10 <sup>9</sup> cycles on fatigue-rated version)
Cable Length (as standard)	metres	3
Cable Type		4 core screened, PUR sheath, Ø5
Electrical Connections		6 Pin Bayonet Lock Connector (MIL-C-26482-10-6P) + mating cable assembly
Construction Material		Stainless 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



Capacity (N)	ØD	H	G	K	T	ØP	R	Natural Frequency (kHz)
200	76	25	60	6 off Ø7	M10 x 1.0	11	7	1.5
500	76	25	60	6 off Ø7	M10 x 1.0	11	7	2.2
1000	76	25	60	6 off Ø7	M10x1.0	11	7	3
2000	76	25	60	6 off Ø7	M10x1.0	11	7	4

All dimensions are in mm

### Wiring Details

Wire	Designation
Red	+ve excitation
Blue	-ve excitation
Green	+ve signal (compression)
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
DSCRC	200N	003	000	DSCRC-200N-003-000
DSCRC	500N	003	000	DSCRC-500N-003-000
DSCRC	1000N	003	000	DSCRC-1000N-003-000
DSCRC	2000N	003	000	DSCRC-2000N-003-000

## 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

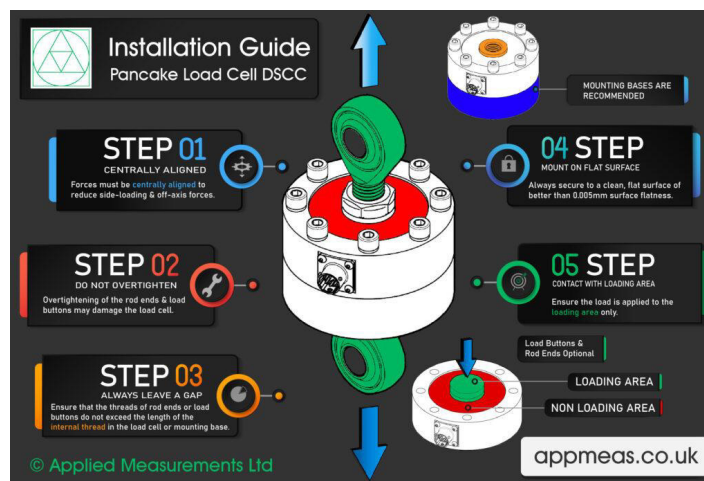
Ensure that the threads of rod ends or load buttons do not exceed the length of the internal thread in the load cell or mounting base. If a gap is not maintained, the sensing section of the load cell will not be able to move freely when tensile or compressive force is applied, leading to erroneous readings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



## MOUNTING AND INSTALLATION ACCESSORIES

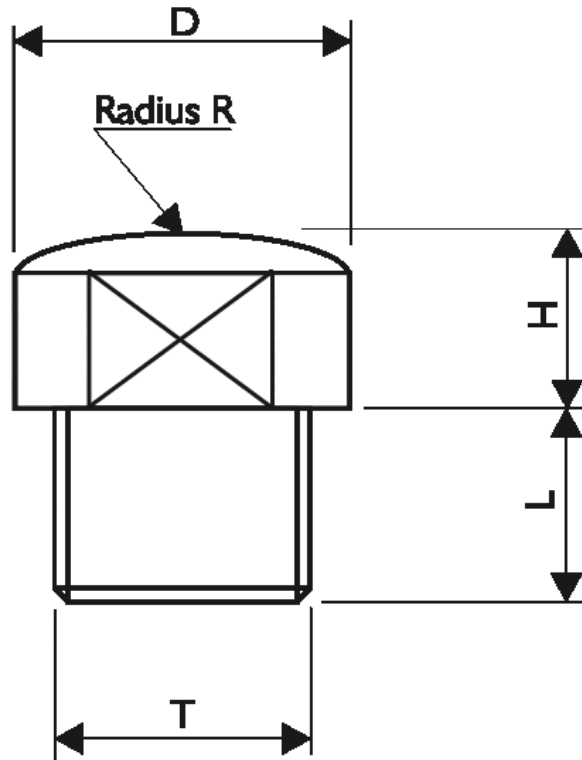
### Load Buttons and Rod End Bearings

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	M10x 1.0
D	16
H	6
L	10
R	150

### 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.

Key Features:

- 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, please consult sales.
- Are maintenance-free.
- Hard chromium/PTFE composite sliding contact surfaces.
- Enables compact adjacent construction thanks to its thin-walled design of the eye housing.

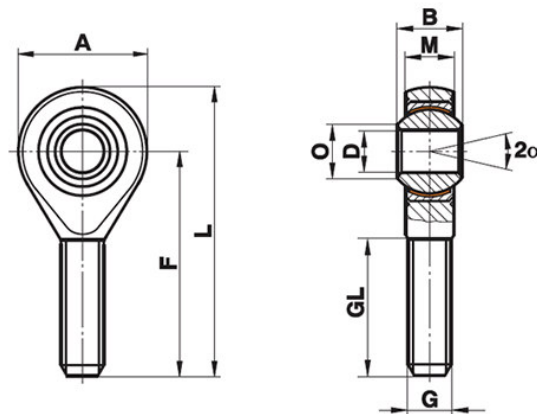
Series GAXSW..MS



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

Preloaded bearing.

	Specifications
Housing	Heat-treated steel to 42CrMo4, Aisi 4140, forged, polished, nickel plated with high polish finish.
Insert	Stainless Steel to 1.4571, Aisi 316Ti with PTFE liner bonded to inner surface.
Ball	Bearing steel to 100Cr6, Aisi 52100, hardened, ground, polished, hard chrome plated on the running surface.
Clearance	Preloaded, zero tolerance.
On Request	With left hand thread, threaded bolt and further sizes are available



Load Cell	Ordering Code	DH7	B	M	A	F	L	O	G	GL	Static radial load C <sub>0</sub> kN	Dynamic radial load C <sub>0</sub> kN	Torque Ndm	α	weight gr
DSCRC 200N to 2000N	GAXSW 10x1 MS	10	14	10.5	28	48	62	12.9	M 10x1	29	31.4	28.1	6-16	13°	56

## PUBLISHED SENSOR APPLICATION ARTICLES

Below is a published sensor application paper that shows you how the DSCRC low profile tension and compression load cell has been used in a specific application. See our published sensor application articles page (<https://appmeas.co.uk/resources/sensor-application-papers/>) for many more.



## Shape Control for Experimental Continuation

<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.120.254101> (<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.120.254101>)

By Robin M. Neville, Rainer M. J. Groh, Alberto Pirrera, and Mark Schenk, *Phys. Rev. Lett.* **120**, 254101 – Published 21 June 2018. Available as open access.

Abstract: An experimental method has been developed to locate unstable equilibria of nonlinear structures quasistatically. The technique involves loading a structure by the application of either a force or a displacement at a main actuation point while simultaneously controlling the overall shape using additional bidirectional probe points.[...]

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<https://appmeas.co.uk/products/load-cells-force-sensors/low-profile-tension-compression-load-cell-dscrc/>