



# Miniature In-Line Load Cell | Tension and Compression | DDE

Compact, Low Deflection and Comes with Integral Mounting Threads

- **Lead Time:** 2 - 3 weeks
- **Buy online:** <https://appmeas.co.uk/shop/load-cells/dde-miniature-in-line-load-cell/>



## AT A GLANCE

- Capacities: 0-100N up to 0-50kN
- Output: 2mV/V
- Environmental Protection: IP65
- Accuracy:  $<\pm 0.30\%/RC$
- Low Profile Design

- **Low Profile & Integral Mounting Threads**  
Make it Ideal to use in Small Spaces
- **Designed for Both Tension and Compression**  
Monitoring
- **Customisation Available to Suit Your**  
Application
- **Excellent at Monitoring Fast Changes Thanks**  
to its Low Deflection

## DESCRIPTION

Applied Measurements DDE miniature in-line load cell is suitable for use in both tension and compression and offers a very low profile body coupled with integral mounting threads to allow use in applications with restricted mounting space where other in-line load cell designs such as S-Beam load cells (<https://appmeas.co.uk/products/load-cells-force-sensors/z-beam-s-beam-load-cells/>) are too large.

The DDE's small size means that weight is kept to a minimum, this, in conjunction with its low deflection, results in a high stiffness assembly and makes the load cell suited to the measurement of fast changes in load and high-frequency transients.

The DDE miniature in-line load cell is currently being used in many applications including automotive production, cable tension monitoring and suspension force monitoring. Customised versions with different thread sizes, specific dimensions and interim capacity can also be provided if required.

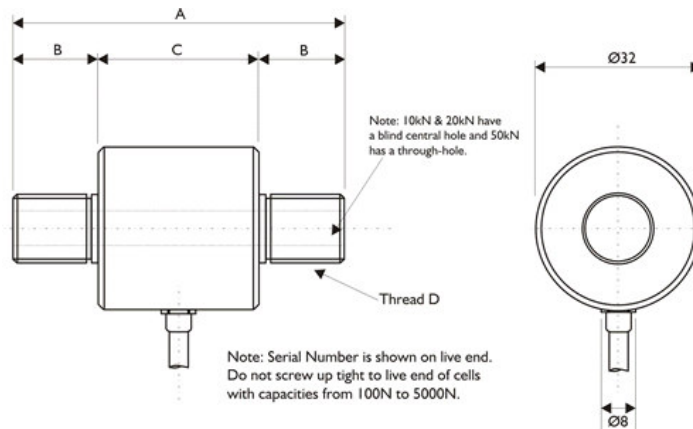
For a submersible in-line load cell please see Applied Measurements DDEN fully submersible load cell (<https://appmeas.co.uk/products/load-cells-force-sensors/in-line-submersible-load-cell-dden/>) which has a protection rating of IP68 suitable for long-term immersion.

## TECHNICAL SPECIFICATIONS



Rated Capacity (RC)	N	0-100, 0-250, 0-500, 0-1000, 0-2500, 0-5000, 0-10000, 0-20000, 0-50000
Operating Modes	Tension/Compression / Tension & Compression	
Sensitivity (RO)	mV/V	2.0 nominal (1.2 approx on 100N)
Zero Balance/Offset	±%/Rated Output	<1.0
Output Symmetry (tension vs. compression)	±%/Rated Output	<1
Non-Linearity	±%/Rated Output (BFSL)	<0.3
Hysteresis	±%/Rated Output	<0.3
Repeatability	±%/Rated Output	<0.2
Temperature Effect on Zero	±%/Rated Output/ °C	<0.005
Temperature Effect on Sensitivity	±%/Applied Load/ °C	<0.005
Input Resistance	Ohms	750 nominal
Output Resistance	Ohms	700 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 Allowable Sideload	% of Rated Capacity	<5
Deflection @ Rated Capacity	mm	See dimensions table
Fundamental Resonant Frequency*	kHz	See dimensions table
IP Rating (Environmental Protection)		IP65
Weight (excluding cable)	grams	150 nominal
Fatigue Life	10 <sup>8</sup> cycles typical (10 <sup>9</sup> cycles on fatigue-rated version)	
Cable Length (as standard)	metres	2
Cable Type	4-core + screen, PVC sheath, Ø3.5 typical	
Construction	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 (mm)



CAPACITY (N)	A	B	C	D	Deflection mm	Resonant Frequency kHz
100	50	15	20	M12	0.10	0.53
250	50	15	20	M12	0.10	0.84
500	50	15	20	M12	0.07	1.42
1000	50	15	20	M12	0.05	2.37
2500	50	15	20	M12	0.03	4.84
5000	50	15	20	M12	0.02	8.39
10000	50	12.5	25	M12	0.04	13
20000	50	12.5	25	M12	0.04	18
50000	56	18	20	M16	0.03	25

### 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
DDE	100N	002	000	DDE-100N-002-000
DDE	250N	002	000	DDE-250N-002-000
DDE	500N	002	000	DDE-500N-002-000
DDE	1000N	002	000	DDE-1000N-002-000
DDE	2500N	002	000	DDE-2500N-002-000
DDE	5000N	002	000	DDE-5000N-002-000
DDE	10,000N	002	000	DDE-10kN-002-000



Core Product	Capacity (inc Engineering Units)	Cable Length (m)	Specials Code	Example Result
DDE	20,000N	002	000	DDE-20kN-002-000
DDE	50,000N	002	000	DDE-50kN-002-000

## MOUNTING AND INSTALLATION ACCESSORIES

### Rod End Bearings for Tension Use

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.

Rod End Bearings are used where tensile forces are being applied.

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.
- 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.



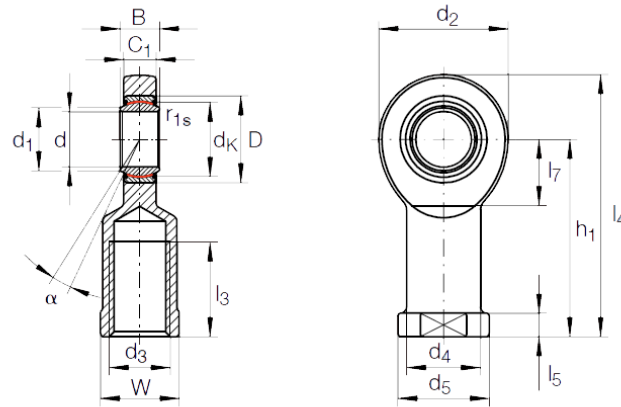
#### **GIR..UK** (right hand thread)

To ISO 12 240-4, dimension series E, type F  
Shank with internal thread

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



Series GIR..UK  
 Sliding material: PTFE composite



LOAD CELL	SHAFT DIAMETER	ORDERING CODE		MASS	DIMENSIONS								
		WITHOUT SEALS	WITH SEALS		≈ kg	d	D	B	dk	d1	d2	d3	d4
DDE-100N to 20kN	12	GIR 12 UK	-	0.096	12 <sup>-0.008</sup>	22	10 <sup>-0.12</sup>	18	14.9	34	M12	17.5	50
DDE-50kN	17	GIR 17 UK	-	0.22	17 <sup>-0.008</sup>	30	14 <sup>-0.12</sup>	25	20.7	46	M16	24	67

LOAD CELL	Degrees								Chamfer Dimension	Basic Load Ratings		Radial Internal Clearance	Shaft Diameter
	C1	α	l3	l4	l5	l7	d5	W		r1s min.	dyn. Cr N		
DDE-100N to 20kN	8	11	23	67	6.5	18	22	19	0.3	11 400	30 400	0 - 0.032	12
DDE-50kN	11	10	34	90	10	23	30	27	0.3	22 400	56 500	0 - 0.04	17

## PUBLISHED SENSOR APPLICATION ARTICLES

Below is a published sensor application paper that shows you how the DDE miniature in-line 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.

Design and implementation of a supervisory system for the automation of drained and non-drained experiments of the triaxial chamber of the faculty of civil engineering ([https://ciencia.lasalle.edu.co/ing\\_automatizacion/75/](https://ciencia.lasalle.edu.co/ing_automatizacion/75/))

By Ramírez García, María Fernánda, Romero Cañón, Diego Andrés. 2009. *Universidad De La Salle*.

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