



APPLIED MEASUREMENTS LTD.
Transducer Specialists...

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www.appmeas.co.uk

DDEN Submersible Miniature In-Line Load Cell

Key Features:

- Capacities 0-250N up to 0-50kN
- Fully Submersible: IP68 to 10m
- Tension and Compression
- Output: 0.75mV/V to 2mV/V
- Accuracy: $<\pm 0.15\%/RC$ (0.05% typical)
- Optional Integral Amplifier
- Low Profile and Very Compact
- Integral Male Threads for In-Line Mounting
- High Natural Frequency
- Low Deflection
- Robust Construction
- 3 Year Warranty



Low Profile Fully Submersible Load Cell for use in Tension and Compression

The DDEN series of submersible in-line load cells are designed for use in both tension and compression. It is sealed to IP68 environmental protection rating with 'O' rings to provide integrity at depths of up to 10 metres as standard. Greater depths and customised version can be provided, please speak to our sales team.

The DDEN fully submersible load cell is designed to be used underwater or in areas subject to high humidity or the risk of flooding. Current applications include wave tank measurement systems and mooring buoy cable tension monitoring. The DDEN's low profile and compact design, enables its use in applications with restricted mounting space, where other in-line load cells such as the s-beam load cells are too large.

The DDEN's low deflection and high natural frequency results lends it to material testing applications and cable tension monitoring applications.

If an internal amplifier is needed we offer a DDENA variant. The DDENA can incorporate any of the ICA series amplifiers to provide a high-level analogue output signal such as 0.1-10Vdc or 4-20mA.

Options:

- Non-Standard Sizes & Ranges Available on Request
- Shunt Calibration Facility
- Spherical Seating Rod End Bearings
- Female Adaptor Available on Request
- Compression Fittings Available
- Integral ICA Series Amplifiers
- Integral DCell RS485 Signal Digitiser
- USB Versions (via DSC-USB)
- TEDS (Transducer Electronic Data Sheet)
- TEDS Allows Plug & Play with TEDS Enabled Instrumentation
- Single or Multi-Channel PC-Based Monitoring & Data Logging System
- Wireless Version (via T24 instrumentation)

Applications:

- Materials Testing
- Cable Tension Monitoring
- Submersible Applications
- Locations with High Humidity
- Locations Susceptible to Flooding
- Marine Testing
- Hydrodynamic Testing



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Specification:

| | | |
|-------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------|
| Rated Capacity (RC) | N | 250, 500, 1000, 2000, 5000, 10000, 20000, 50000 |
| Sensitivity (RO) | mV/V | 2 (0.75 on 250N & 1.5 on 500N) |
| Zero Balance/Offset | ±%/Rated Output | <1.0 |
| Output Symmetry (tension vs. compression) | ±%/Rated Output | <0.25 typical |
| Non-Linearity | ±%/Rated Output | <0.15 (0.05 typical) |
| Hysteresis | %/Rated Output | <0.15 (0.05 typical) |
| Repeatability | ±%/Rated Output | <0.1 |
| Temperature Effect on Zero | ±%/Rated Output/ °C | <0.005 |
| Temperature Effect on Sensitivity | ±%/Applied Load/ °C | <0.005 |
| Input Resistance | Ohms | 700 |
| Output Resistance | Ohms | 700 |
| 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 |
| Deflection @ Rated Capacity | mm | 250N=0.09; 500N=0.06; 1000N=0.04; 2000N=0.03; 5000N=0.02; 10,000N=0.015; 20,000N=0.01; 50,000N=0.03 |
| Fundamental Resonant Frequency* | kHz | 250N=0.72; 500N=1.18; 1000N=2; 2000N=3.1; 5000N=6.1; 10,000N=9.9; 20,000N=18.2; 50,000N=13.3 |
| IP Rating (Environmental Protection) | | IP68 to 10m depth (please consult sales for greater depths) |
| Weight (excluding cable) | kg | 250N to 20kN: 0.3kg / 50kN: 0.45kg |
| Fatigue Life | | 10 ⁸ cycles typical |
| Cable Length (as standard) | metres | 2 |
| Cable Type | | 4-core screened submersible, PUR (weight: 82g/m) sheathed, Ø7.5 |
| Construction Material | | 17-4 PH Stainless Steel |
| Resolution | | 1 part in 250,000 (with appropriate instrumentation) |
| Pressure Effect on Output | | 9N/mH ² O nominal |

Wiring Diagram:

| Wire | Designation |
|--------------------------------------------------------------------------------------------|----------------------|
|  Red | +ve excitation |
|  Blue | -ve excitation |
|  White | +ve signal (tension) |
|  Yellow | -ve signal |



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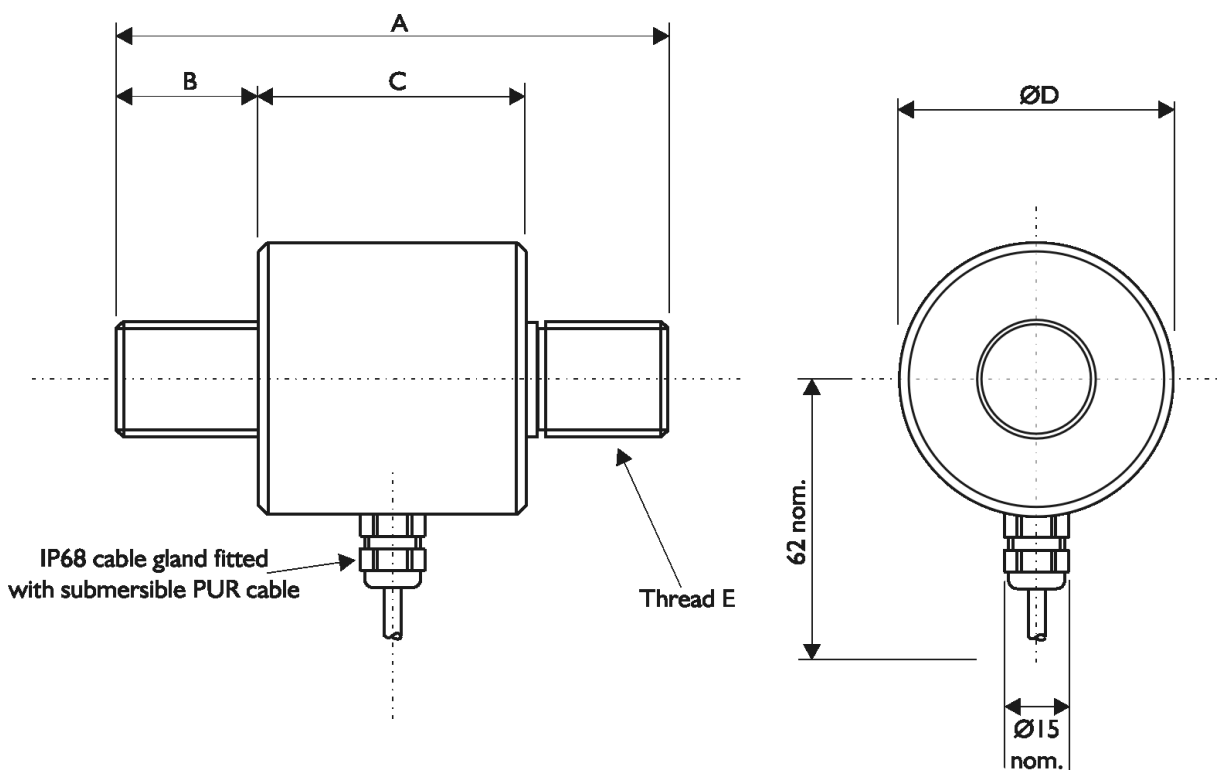
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Dimensions (mm):

| MODEL | CAPACITY (N) | A | B | C | ØD | E |
|-------|------------------------------------------|----|----|----|----|------------|
| DDEN | 250, 500, 1000, 2000, 5000, 10000, 20000 | 67 | 15 | 35 | 44 | M12 x 1.75 |
| DDEN | 50000 | 71 | 18 | 35 | 44 | M16 x 2.0 |
| | | | | | | |
| DDENA | 250, 500, 1000, 2000, 5000, 10000, 20000 | 67 | 15 | 35 | 44 | M12 x 1.75 |
| DDENA | 50000 | 71 | 17 | 37 | 50 | M16 x 2.0 |





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Ordering Codes:

| Core Product | Capacity (inc Engineering Units) | Cable Length (m) | Specials Code | Example Result |
|--------------|----------------------------------|------------------|---------------|----------------------|
| DDEN | 250N | 002 | 000 | DDEN-250N-002-000 |
| DDEN | 500N | 002 | 000 | DDEN-500N-002-000 |
| DDEN | 1000N | 002 | 000 | DDEN-1000N-002-000 |
| DDEN | 2000N | 002 | 000 | DDEN-2000N-002-000 |
| DDEN | 5000N | 002 | 000 | DDEN-5000N-002-000 |
| DDEN | 10,000N | 002 | 000 | DDEN-10,000N-002-000 |
| DDEN | 20,000N | 002 | 000 | DDEN-20,000N-002-000 |
| DDEN | 50,000N | 002 | 000 | DDEN-50,000N-002-000 |

| Core Product | Capacity (inc Engineering Units) | Cable Length (m) | Specials Code | Example Result |
|--------------|----------------------------------|------------------|---------------|-----------------------|
| DDENA | 250N | 002 | 000 | DDENA-250N-002-000 |
| DDENA | 500N | 002 | 000 | DDENA-500N-002-000 |
| DDENA | 1000N | 002 | 000 | DDENA-100N-002-000 |
| DDENA | 2000N | 002 | 000 | DDENA-2000N-002-000 |
| DDENA | 5000N | 002 | 000 | DDENA-5000N-002-000 |
| DDENA | 10,000N | 002 | 000 | DDENA-10,000N-002-000 |
| DDENA | 20,000N | 002 | 000 | DDENA-20,000N-002-000 |
| DDENA | 50,000N | 002 | 000 | DDENA-50,000N-002-000 |

Associated Products:



[TR150 Handheld Indicator](#)



[T24 Wireless Telemetry Range](#)



[Intuitive2-L Panel-Mount Indicator](#)



[DSC-USB USB Signal Digitiser](#)



[ICA Miniature Strain Gauge Amplifier](#)



[SGA Signal Conditioner/Amplifier](#)