



## DBBSS/TSF Torque and Axial Force Sensor

### **Key Features:**

- Capacities 0-50N/0-1Nm to 0-250kN/0-2500Nm
- Output: 1mV/V Typical (Force & Torque Axes)
- Accuracy:  $<\pm 0.1\%$ /RC
- Environmental Protection: IP65
- Custom Versions Available
- Low Profile, Very Compact
- Low Deflection
- Minimal Crosstalk
- Stainless Steel Robust Construction
- 3 Year Warranty



*Measures Static Torque and Axial Load/Force in Tension and/or Compression*

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The DBBSS/TSF torque and axial force sensors are designed to measure both static torque and axial load in tension and/or compression. The unique design of this compact and accurate dual axis transducer ensures that crosstalk between the axes is minimised (typically between 0.1% and 1%), with accuracy of better than 0.1% of the rated capacity in both torque and force modes.

This dual-axis transducer is widely used in geotechnical and materials testing sectors where it is employed as a central component on pieces of high accuracy analytical test equipment.

Design modifications such as size, capacity and configuration of mounting holes or fixtures, can be made on the DBBSS/TSF sensors to suit your application with little or no effect on the cost, please speak to our sales team.

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### **Options:**

- Custom Versions Available
- Non-Standard Ranges Available
- Dual Bayonet-Lock Connector with 4-Core Screened Cable Assemblies (one per axis)
- Submersible (IP68) Versions
- USB Version (via DSC-USB)
- High Temperature Versions
- Rotary/Rotating Versions
- Fatigue Rated Versions
- Vacuum Applications Versions
- Pressurised Environments
- 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:**

- Geotechnical Testing & Monitoring
- Materials Testing Applications
- Servo Hydraulic Testing Systems
- Fatigue Testing Machines
- Turbine Thrust & Torque Measurement
- Renewable Energy Research & Development Applications

For pricing or any further information, please contact Omni Instruments Ltd.









## Specification:

Rated Capacity (RC)	N/Nm (Fz/Mz) kN/Nm (Fz/Mz)	0-50/0-1; 0-100/0-2; 0-250/0-5; 0-500/0-10; 0-1/0-10; 0-2.5/0-25; 0-5/0-50; 0-10/0-100; 0-25/0-250; 0-25/0-500; 0-50/0-500; 0-100/0-1000; 0-250/0-2500
Operating Modes	Tension/Compression / Tension & Compression	
Sensitivity (RO) (Force & Torque Outputs)	mV/V	1 typical (0.5 typical on 0-50N/0-1Nm and 0-100/0-2Nm versions)
Zero Balance/Offset	±%/Rated Output	1
Output Symmetry	±%/Rated Output	<0.5 typical
Non-Linearity	±%/Rated Output	Axial Force <0.05 / Torque <0.10
Hysteresis	±%/Rated Output	<0.1
Repeatability	±%/Rated Output	Axial Force <0.03 / Torque <0.05
Temperature Effect on Zero	±%/Rated Output/ °C	<0.01
Temperature Effect on Sensitivity	±%/Applied Load/ °C	<0.005
Crosstalk	%	0.1 to 1 typical
Input Resistance	Ohms	400 nominal (Force Axis) 750 nominal (Torque Axis)
Output Resistance	Ohms	350 nominal (Force Axis) 700 nominal (Torque Axis)
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	300
Maximum Safe Side Load	%/Rated Force Capacity	30
Deflection @ Rated Capacity		Consult sales
Fundamental Resonant Frequency*		Consult sales
IP Rating (Environmental Protection)		IP65
Weight (excluding cable)		See dimension table
Fatigue Life		10 <sup>8</sup> cycles typical (10 <sup>9</sup> cycles on fatigue-rated versions)
Cable Length (as standard)	metres	5
Electrical Connection		6-Pin Bayonet Lock Connector + Mating Cable Assembly Fitted with 5 Metres of 6-Core Screened Cable
Construction		Stainless Steel + Aluminium (0-500N/0-10Nm + below) / Stainless Steel (0-1kN/0-10Nm + above)
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.

## Wiring Diagram - 6 Core Cable:

Wire	Designation
 Red	+ve excitation
 Blue	-ve excitation
 Green	+ve signal (Force Axis) (Compression)
 Yellow	-ve signal (Force Axis)
 Black	+ve signal (Torque Axis) (Clockwise)
 White	-ve signal (Torque Axis)

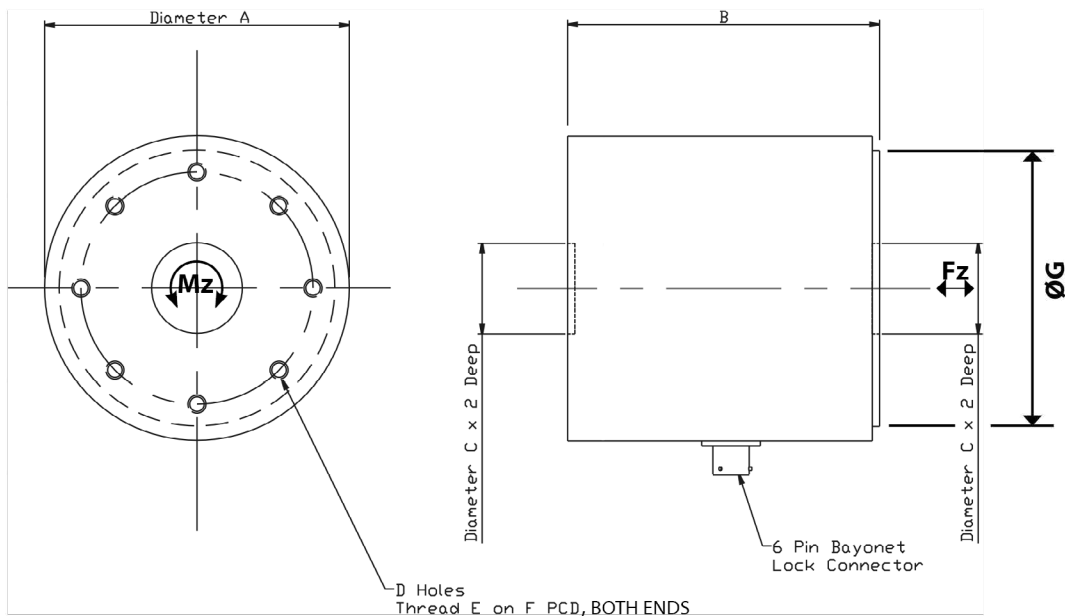
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## Dimensions (mm):

CAPACITY (Fz/Mz)	ØA	B	ØC	D	E	ØF	ØG	WEIGHT (kg)
0-50N/0-1Nm, 0-100N/0-2Nm, 0-250N/0-5Nm, 0-500N/0-10Nm	66	80	20/H7	6	M4 x 6DP	50	60	0.8
0-1kN/0-10Nm, 0-2.5kN/0-25Nm, 0-5kN/0-50Nm	84	86	25/H7	8	M5 x 7DP	64	76	3.5
0-10kN/0-100Nm, 0-25kN/0-250Nm, 0-25kN/0-500Nm	86	120	25/H7	6	M8 x 12DP	60	78	4.5
0-50kN/0-500Nm, 0-100kN/0-1000Nm	135	125	30/H7	12	M10 x 15DP	100	125	11
0-250kN/0-2500Nm	230	200	35/H7	12	M16 x 24DP	190	218	47

NOTE: MANY OTHER FORCE + TORQUE CAPACITY COMBINATIONS ARE POSSIBLE - PLEASE CONTACT OUR TECHNICAL SALES TEAM WITH YOUR REQUIREMENT FOR A FAST QUOTATION



## Ordering Codes:

Core Product	Capacity (inc Engineering Units)	Cable Length (m)	Specials Code	Example Result
DBBSS-TSF	50N/1Nm	005	000	DBBSS-TSF-50N-1Nm-005-000
DBBSS-TSF	100N/2Nm	005	000	DBBSS-TSF-100N-2Nm-005-000
DBBSS-TSF	250N/5Nm	005	000	DBBSS-TSF-250N-5Nm-005-000
DBBSS-TSF	500N/10Nm	005	000	DBBSS-TSF-500N-10Nm-005-000
DBBSS-TSF	1kN-10Nm	005	000	DBBSS-TSF-1kN-10Nm-005-000
DBBSS-TSF	2.5kN-25Nm	005	000	DBBSS-TSF-2.5kN-25Nm-005-000
DBBSS-TSF	5kN-50Nm	005	000	DBBSS-TSF-5kN-50Nm-005-000
DBBSS-TSF	10kN-100Nm	005	000	DBBSS-TSF-10kN-100Nm-005-000
DBBSS-TSF	25kN-250Nm	005	000	DBBSS-TSF-25kN-250Nm-005-000
DBBSS-TSF	25kN-500Nm	005	000	DBBSS-TSF-25kN-500Nm-005-000
DBBSS-TSF	50kN-500Nm	005	000	DBBSS-TSF-50kN-500Nm-005-000
DBBSS-TSF	100kN-1000Nm	005	000	DBBSS-TSF-100kN-1000Nm-005-000
DBBSS-TSF	250kN-2500Nm	005	000	DBBSS-TSF-250kN-2500Nm-005-000

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