



425 SERIES

# M425 Torque Transducer

PRODUCT OVERVIEW



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## M425 Torque Transducer

The **M425 Torque Transducer** by Datum Electronics is a highly-accurate inline rotary torque sensor, available in a variety of sizes and capable of measuring bidirectional torque from 10 N·m to 30 kN·m.

Utilising strain-gauge technology, the Datum M425 delivers  $\pm 0.1\%$  non-linearity and  $\pm 0.05\%$  repeatability for exceptional precision. Its non-contact signal transmission system enables reliable measurement of static and dynamic torque.

With a compact, robust design, integrated self-supporting bearings, and a choice of digital and analogue outputs, the Datum M425 is built for seamless integration into customer test beds and is employed in a diverse range of global industries. As part of the 425 Series, it is also fully compatible with **Datum Link**, our latest application for iOS, Android, and Windows devices.

For bespoke requirements, including very high RPM, IP ratings, and custom shaft sizes, Datum Electronics also offers the **RS425 Torque Transducer**. Contact our team to discuss your application or learn more.

### Features and Benefits

- Accuracy Class: 0.1
- Torque ranges 0-10 N·m to 0-30,000 N·m
- High data sample rate
- Non-contact data transmission
- Compatible with Datum Link app for iOS, Android, & Windows
- Digital data outputs via RS-485 and Wi-Fi
- Calibrated analogue data for torque speed and power
- High resolution torque sampling
- Static and rotary torque measurement
- Simple to integrate
- Robust construction



## Performance

Non-Linearity	±0.1% FSD		
Repeatability	±0.05% FSD		
Hysteresis	±0.05% FSD		
Noise-free Resolution	20 bit to 13.5 bit (dependent on sample rate)		
Digital Sample Rate	Standard 100 SPS Up to 4000 please enquire		
Analogue Sample Rate	Up to 100 SPS, standard 20 SPS		
Output Baud Rate	3 Mbaud as standard		
<b>RPM Measurement</b>			
Included as	Up to 30 pulses per rev		
<b>Transducer Output Interfaces:</b>			
Serial data via RS-485			
Wi-Fi 2.4 GHz transmission			
<b>Transducer Output Data:</b>			
Torque	Shaft RPM	Shaft Temp.	Diagnostics

## Power Supply

12-24Vdc | via Datum Connect Interface

## Environment

Thermal Stability of Gain per 10°C	0.02%
Thermal Stability of Zero per 10°C	0.02%
Normal Specification Range	10°C to 60°C
Operating Range	-10°C to +70°C
Storage Range	-35°C to +75°C
Environmental Protection	IP54 (see Datum RS425 for IP67/68 options)
Electromagnetic Compatibility	EN61326-1:2006 (IEC61000-4), IEC60945)



## Performance Characteristics

M425 model	Rated load (N·m)	Rated load (lbf·ft)	Standard RPM Range	Pulse per rev	Overall length (mm)	Moment length (mm)
S1-10Nm	10	7.4	1-10,000	30	184	154
S1-20Nm	20	14.8	1-10,000	30	184	154
S1-50Nm	50	36.9	1-10,000	30	184	154
S1-100Nm	100	73.8	1-10,000	30	184	154
S2-250Nm	250	184.4	1-8,000	30	240	175.5
S2-500Nm	500	368.8	1-8,000	30	240	175.5
S3-1kNm	1,000	737.6	1-6,000	30	315	132.75
S3-2kNm	2,000	1,475.1	1-6,000	30	315	132.75
S4-5kNm	5,000	3,687.8	1-5,000	15	425	218.75
S4-10kNm	10,000	7,375.6	1-5,000	15	425	218.75
S5-15kNm	15,000	11,063.4	1-2,000	15	416	191
S5-20kNm	20,000	14,751.2	1-2,000	15	416	191
S5-25kNm	25,000	18,439.1	1-2,000	15	416	191
S5-30kNm	30,000	22,126.9	1-2,000	15	416	191

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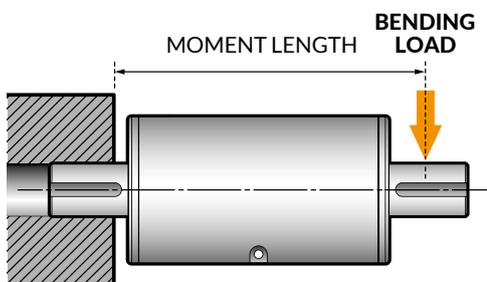


## Tech Specifications

M425 model	Bending load at the moment length (N)	Shaft proof load (N·m)	Shaft ultimate (breaking) load (N·m)	Axial load (N)	Torsional compliance (rad/N·m)	Torsional stiffness (N·m/rad)	Rotor mass (kg)	Total mass (kg)
S1-10Nm	8	18	32	442	2.06E-03	485	0.232	1.132
S1-20Nm	14	31	55	636	1.12E-03	891	0.241	1.141
S1-50Nm	33	74	131	1,131	5.25E-04	1,904	0.263	1.162
S1-100Nm	65	144	257	1,767	3.62E-04	2,761	0.287	1.185
S2-250Nm	153	389	694	3,431	6.09E-05	16,418	1.188	2.806
S2-500Nm	330	838	1,497	5,726	3.74E-05	26,749	1.296	2.913
S3-1kNm	797	1,530	2,732	8,553	1.07E-05	93,458	4.499	7.332
S3-2kNm	1,644	3,155	5,633	13,854	4.99E-06	200,573	4.720	7.552
S4-5kNm	2,364	7,477	13,353	24,630	2.22E-06	450,056	14.068	17.692
S4-10kNm	4,618	14,604	26,079	38,485	1.27E-06	789,591	14.638	18.291
S5-15kNm	8,502	23,477	41,922	52,810	3.82E-07	2,614,430	28.562	33.968
S5-20kNm	11,241	31,040	55,428	63,617	2.95E-07	3,390,520	29.107	34.513
S5-25kNm	14,513	40,075	71,562	75,430	2.39E-07	4,185,528	29.536	34.942
S5-30kNm	17,851	49,290	88,018	86,590	2.06E-07	4,863,152	29.869	35.275

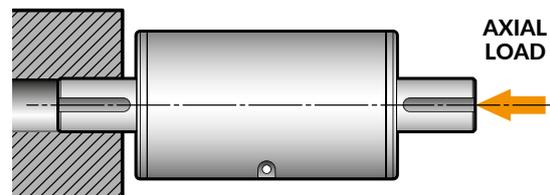
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### Bending loads



Where possible moments at the end on the shaft should be avoided. The table contains values for the moments that can be exerted without damage with the transducer not rotating. These values should be reduced if the shaft is rotating.

### Axial loads



Direct Axial loads will have little effect on performance, however offset Axial loads that apply a cross moment to the shaft will have an effect on the smaller size 1 transducers below 50 N·m and should be avoided.

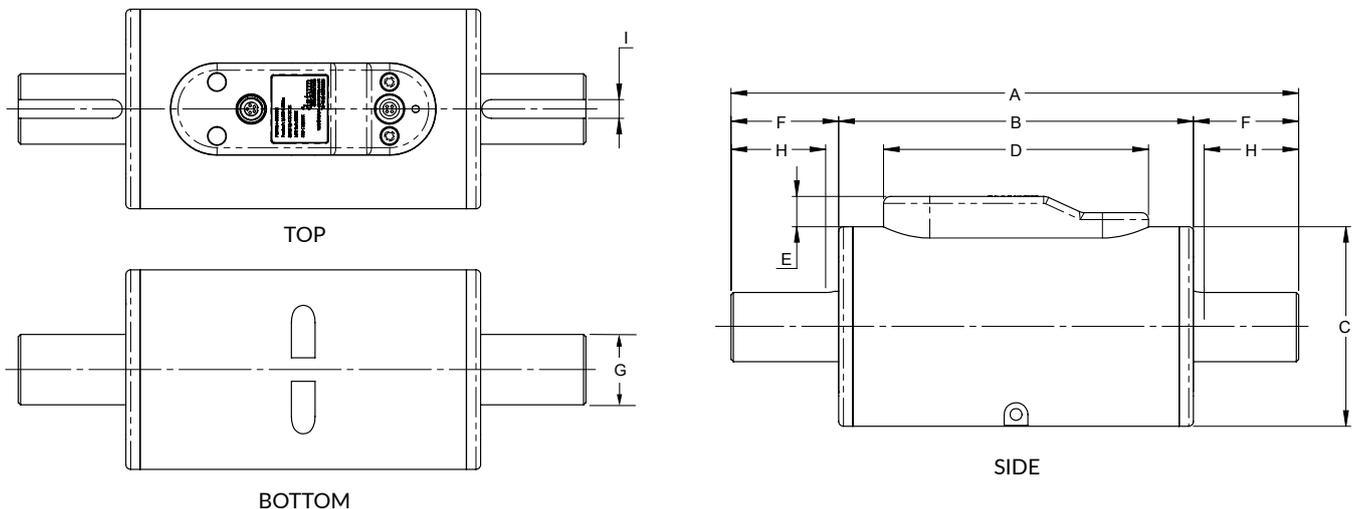
## Dimensions

	A	B	C	D	E	F	G		H	I	J
M425 model	Overall length (mm)	Body length (mm)	Body dia. (mm)	Output module length (mm)	Output module height (mm)	Exposed shaft length (mm)	Shaft dia. (mm)	Number of keyways	Keyway length (BS 4235-1:1972) (mm)	Keyway width (BS 4235-1:1972) (mm)	Keyway depth off centre (mm)
S1-10Nm	184	130	66	112	13.5	27	15	1	22.5	5	4.3
S1-20Nm	184	130	66	112	13.5	27	15	1	22.5	5	4.3
S1-50Nm	184	130	66	112	135	27	15	1	22.5	5	4.3
S1-100Nm	184	130	66	112	13.5	27	15	1	22.5	5	4.3
S2-250Nm	240	150	85	112	13.5	45	30	1	44	8	11
S2-500Nm	240	150	85	112	13.5	45	30	1	44	8	11
S3-1kNm	315	150	112	112	13.5	82.5	50	1	78.5	12*	20
S3-2kNm	315	150	112	112	13.5	82.5	50	1	78.5	12*	20
S4-5kNm	425	150	137	112	13.5	137.5	75	1	78.5	20	30
S4-10kNm	425	150	137	112	13.5	137.5	75	1	78.5	20	30
S5-15kNm	416	168	172	112	13.5	124	110	2	116	32	44
S5-20kNm	416	168	172	112	13.5	124	110	2	116	32	44
S5-25kNm	416	168	172	112	13.5	124	110	2	116	32	44
S5-30kNm	416	168	172	112	13.5	124	110	2	116	32	44

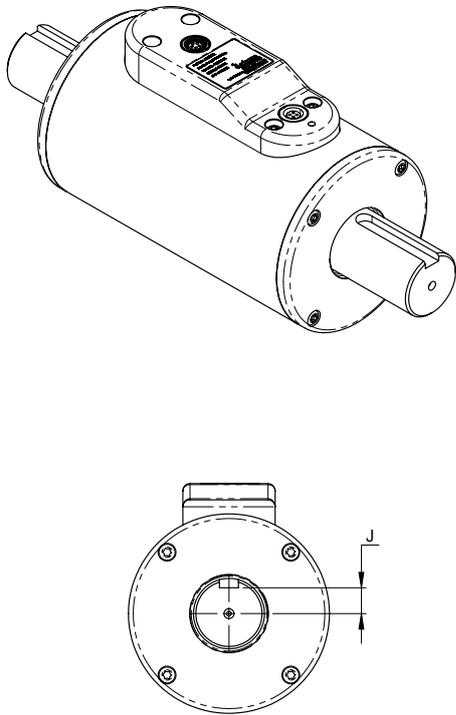
\* Does not comply with BS 4235-1:1972

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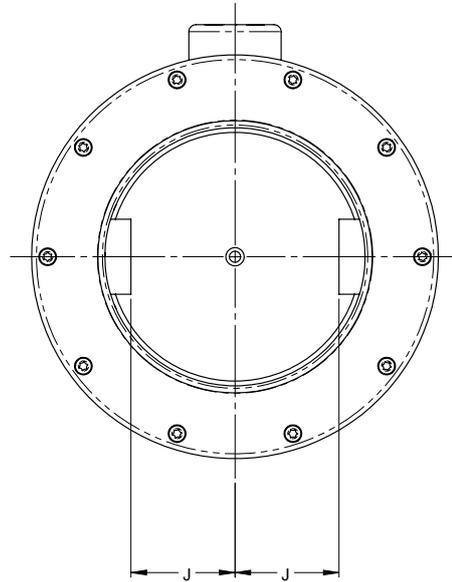
## Alphabet key for M425



Model sizes 1-4



Model size 5





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Contact Us

Rev. D

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