

E-series Optical Rotary Torque Transducer

The E-series Optical Rotary Torque Transducer provides an ideal means for precise dynamic measurement of rotary and static torque. Standard ranges cover 0-10mN.m to 0-10,000N.m in six frame sizes. Comparable ranges in metric and imperial calibration are standard (see table). An extensively developed measurement principle is used, in which the intensity of light beams is modulated by the applied torque. Light intensity is measured by means of photovoltaic detectors, and the electrical output is used to provide precise indication of the torque transmitted by the shaft.

The use of this technique results in a transducer having fast mechanical and electrical response, low inertia, and complete freedom from brushes or complex electronics. The absence of brush gear allows high speed operation with a continuous rating of up to 20,000 RPM standard, and 35,000 RPM high speed on the smaller sizes (see table). Sealed bearings are also available. The torque shaft is of low compliance – torsion deflection being approximately $\frac{1}{2}^\circ$ on the smaller sizes, and approximately $\frac{1}{4}^\circ$ on the larger units, at full-scale deflection. The lamps providing the light source are substantially under-rated to ensure long life and high stability, the light intensity being automatically controlled by a monitor cell within the transducer body.

This transducer is fully compatible with a series of interface modules which enables either stand alone operation or/and display and storage of data on a standard PC under Windows 3.11 or 95. See data sheets on E201 and E202 for further information. The Transducers are also backwards compatible with the D Series Instrumentation.

Each transducer in the family contains an embedded non-volatile memory chip storing data on parameters, calibration etc., which is passed to the E201 or E202 and then as an option to a host PC running TorqView® software under Windows®

Option 1 – Optical RPM Pickoff

An optical RPM pick-off is optional on all transducers in the range. External dimensions of the transducers are not affected.

Option 2 – Transducer Sealing to IP65

All Transducers can be supplied sealed to IP65. Some external dimensions change. Maximum running speeds will be considerably reduced, and drag torque will increase - Consult Factory.

Option 3 – Extension Cable

The transducer are supplied with a standard 2-metre transducer lead. However, some applications require longer lead lengths. For up to 10 metres, a standard or heavy-duty extension lead of the required length may be used. Specify required length.

Option 4 – Amplifier

Between 10 metres and a maximum of 120 metres, a cable amplifier which is fitted close to the transducer is required together with an extension lead. Specify required length.

Maximum Speeds

Bearing Type	Standard	Option 5 High Speed*	Option 6 Sealed
E200 ORT 1s-6	30,000	50,000	15,000
E200 ORT 7-10	20,000	35,000	12,000
E200 ORT 11-12	15,000	25,000	9,000
E200 ORT 13-14	12,000	20,000	7,000
E200 ORT 15-16	9,000	14,000	4,500
E200 ORT 17-19	5,000	8,000	2,500

Bearings

Deep grooved shielded bearings with oil lubrication are fitted as standard.

* At very high speeds, for better balance, we recommend plain or splined shafts – Consult Factory

All maximum speeds are quoted with no radial or side loads.

Accuracy: $\pm 1\%$ of FSD; $\pm 0.5\%$ to order.

Operating Temperature Range: 0 to 50°C standard.

Input power: Supplied by the E201/2 unit.

Resolution: See data sheet for E201/2.

Polarity of output signal changes in accordance with direction of applied torque

Linearity: Within 0.5% of span.

Hysteresis: $< 0.1\%$ of FSD.

Transducer Bandwidth: 10 kHz; 50 kHz to special order.

'Zero' Temperature coefficient: Better than 0.1% per °C.

'Span' Temperature coefficient: 0.03% per °C.



Product complies with EMC Regulation BS EN 55011 (1991)

WENtechnology

8411 Garvey Drive / Suite 117
Raleigh, North Carolina 27616
(919) 954-1004 / Fax (919) 954-1009

www.wentec.com

Manufactured for WEN Technology by
Sensor Technology Ltd., Banbury, U.K.

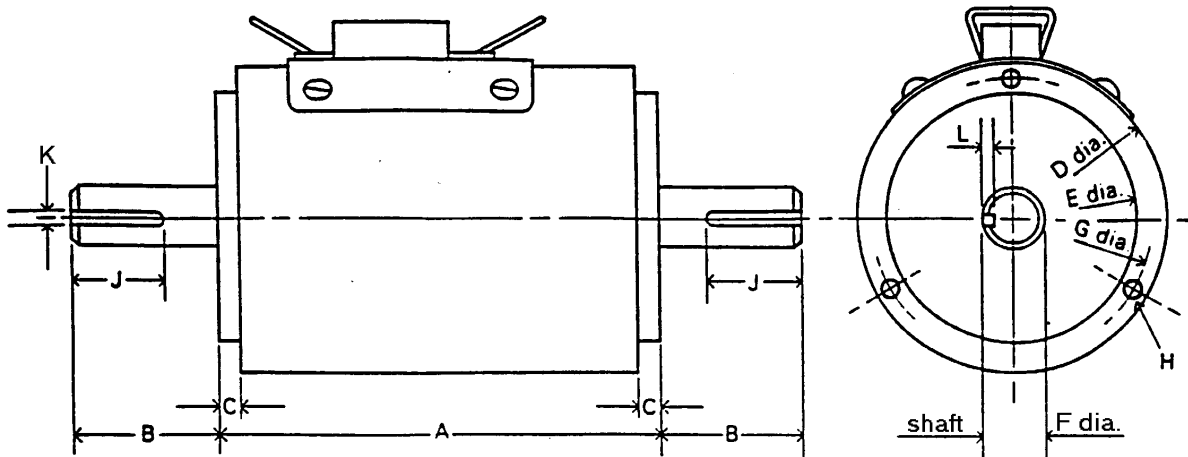
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Mechanical parameters

Standard Ranges: (Larger sizes and non-standard ranges to order)

E200ORT/	S.I. units		F.P.S units		M.K.S. units	
1S	0-10	mN.m	0-1	ozf.in	0-100	gf.cm
2S	0-20	mN.m	0-2	ozf.in	0-200	gf.cm
1	0-50	mN.m	0-5	ozf.in	0-500	gf.cm
2	0-100	mN.m	0-10	ozf.in	0-1	kgf.cm
3	0-200	mN.m	0-20	ozf.in	0-2	kgf.cm
4	0-500	mN.m	0-50	ozf.in	0-5	kgf.cm
5			0-100	ozf.in		
6	0-1	N.m	0-10	lbf.in	0-10	kgf.cm
7	0-2	N.m	0-20	lbf.in	0-20	kgf.cm
8	0-5	N.m	0-50	lbf.in	0-50	kgf.cm
9	0-10	N.m	0-100	lbf.in	0-100	kgf.cm
10	0-20	N.m	0-200	lbf.in	0-200	kgf.cm
11	0-50	N.m	0-500	lbf.in	0-500	kgf.cm
12	0-100	N.m	0-1000	lbf.in	0-10	kgf.m
13	0-200	N.m	0-100	lbf.ft	0-20	kgf.m
14	0-500	N.m	0-200	lbf.ft	0-50	kgf.m
15			0-500	lbf.ft		
16	0-1000	N.m	0-1000	lbf.ft	0-100	kgf.m
17	0-2000	N.m	0-2000	lbf.ft	0-200	kgf.m
18	0-5000	N.m	0-5000	lbf.ft	0-500	kgf.m
19	0-10000	N.m				



Nominal dimensions (mm)

Dimension→	A	B	C	D	E	F	G	H	depth	J	K	L
1-6	75	25.4	1.52	62	50	6.35	56	M3	5	19.05	Flat	0.183
7-10	105	38	1.52	62	50	12.7	56	M3	6.35	30	3.96	1.98
11,12	130.2	60	1.52	62	50	20	56	M3	11	53	6	3.5
13,14	135	60	4	88	70	30	80	M4	12.7	54	10	5
15,16	165	90	4	100	82	45	91	M4	21	75	14	5.5
17,18	265	62.5	10	150	130	75	139	M5	25.4	Spline on shaft		

Shaft ends: Spline, keyway or flat available to order – Consult Factory