



General Description

The E200 ORT (Optical Rotary Torque) Transducer provides an ideal means for precise dynamic measurement of rotary and static torque of less than 50mNm and for bandwidths up to 50KHz.



Technology

An extensively developed measurement principle is used, in which the intensity of light beams is measured by means of photovoltaic detectors, and the electrical output is used to provide precise indication of the applied 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 30,000 RPM standard. Further increases in RPM are available as an option depending upon shaft size. The torque shaft is of low compliance – $\frac{1}{2}^\circ$ maximum torsion deflection on the smaller transducers, and $\frac{1}{4}^\circ$ maximum on the larger transducers, at full-scale deflection. The lamps providing the light source are selected to ensure long life and high stability with the light intensity automatically controlled within the transducer body by a monitor cell.

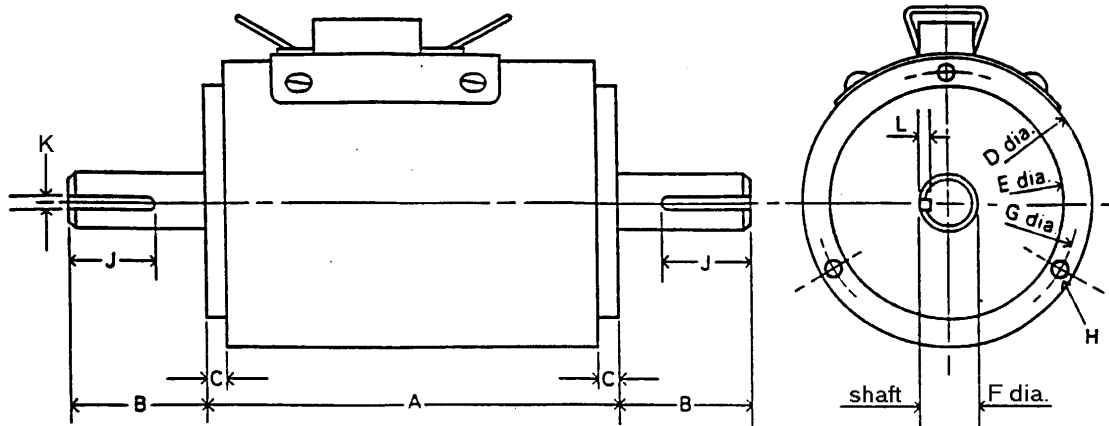
E200 ORT Transducers can be modified to be compatible with the D Series Instrumentation.

Standard Specifications

Model	Full Scale Deflection (Calibration in any of the units below is possible)						Max Speed (RPM)
	S.I		F.P.S		M.K.S		
E200ORT-1S	0-10	mNm	0-1	ozf.in	0-100	gf.cm	30,000
E200ORT-2S	0-20	mNm	0-2	ozf.in	0-200	gf.cm	30,000
E200ORT-1	0-50	mNm	0-5	ozf.in	0-500	gf.cm	30,000
E200ORT-2	0-100	mNm	0-10	ozf.in	0-1	kgf.cm	30,000
E200ORT-3	0-200	mNm	0-20	ozf.in	0-2	kgf.cm	30,000
E200ORT-4	0-500	mNm	0-50	ozf.in	0-5	kgf.cm	30,000
E200ORT-5			0-100	ozf.in			30,000
E200ORT-6	0-1	Nm	0-10	lbf.in	0-10	kgf.cm	30,000
E200ORT-7	0-2	Nm	0-20	lbf.in	0-20	kgf.cm	20,000
E200ORT-8	0-5	Nm	0-50	lbf.in	0-50	kgf.cm	20,000
E200ORT-9	0-10	Nm	0-100	lbf.in	0-100	kgf.cm	20,000
E200ORT-10	0-20	Nm	0-200	lbf.in	0-200	kgf.cm	20,000
E200ORT-11	0-50	Nm	0-500	lbf.in	0-500	kgf.cm	15,000
E200ORT-12	0-100	Nm	0-1000	lbf.in	0-10	kgf.m	15,000
E200ORT-13	0-200	Nm	0-100	lbf.ft	0-20	kgf.m	12,000
E200ORT-14	0-500	Nm	0-200	lbf.ft	0-50	kgf.m	12,000

Standard

Cable length	2 metres - see options 3&4	Interface readout	E201/2
Outputs	From E201/2 module ($\pm 5V$)	Safe mechanical overload	200% of rating
Power supply	From E200 interface	Memory	Embedded non-volatile memory chip
Accuracy	1% FSD; 0.5% to order	Hysteresis	Better than 0.1%
Bandwidth	50 KHz	Bearings	Deep grooved shielded bearings with oil lubrication-see options 5&6
Temperature range	-10°C to + 50°C	Temperature coefficient	Less than 0.05% per °C



Mechanical Parameters

Model	Dimensions (mm)											
	A	B	C	D	E	F	G	H	depth	J	K	L
E200ORT-1s- E200ORT-6	75	25.4	1.5	62	50	6.35	56	M3	5	19.05	Flat	0.183
E200ORT-7- E200ORT-10	105	38	1.5	62	50	12.7	56	M3	6.35	30	3.96	1.98
E200ORT-11- E200ORT-12	130	60	1.5	62	50	20	56	M3	11	53	6	3.5
E200ORT-13- E200ORT-14	135	60	4	88	70	30	80	M4	12.7	54	10	5

Options

Option	Description	Information/remarks
1	Optical RPM Pickoff	External dimensions are not affected
2	Transducer Sealing to IP65	Some external dimensions change. Maximum running speeds will be considerably reduced, and drag torque will increase - Consult factory
3	Extension Cable	Between 2 metres and 10 metres a standard or heavy-duty extension cable may be used. Please specify required length
4	Cable Driver	Between 10 metres and 120 metres, a cable driver is fitted close to the transducer together with an extension lead. Please specify required length
5	High Speed Bearings	At very high speeds, for better balance, we recommend plain or splined shafts – Consult factory See chart below for max speeds
6	Sealed Bearings	See chart below for max speeds

Max speed (Note: quoted in RPM with no radial or side loads)

Option	E200 ORT-1S E200 ORT-6	E200 ORT-7 E200 ORT-10	E200 ORT-11 E200 ORT-12	E200 ORT-13 E200 ORT-14
5	Consult factory	30,000	25,000	20,000
6	15,000	12,000	9,000	7,000
Standard	30,000	20,000	15,000	12,000