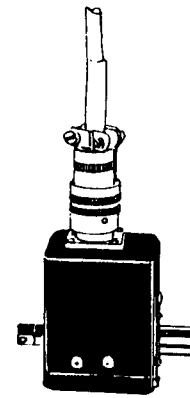




# MODEL TQ502 Socket Extension Rotary Torque Sensor

Operator's Manual M1582/0193



## GENERAL DESCRIPTION

The OMEGA TQ502 series Rotary Socket Torque Sensor is a convenient and low cost means of measuring dynamic torque. These sensors are typically used to measure output torque in production fastening applications using stall and clutch type nutrunners. The sensor has a built-in coined silver slip ring for rotary/stationary signal conversion. This sensor is compatible with all strain gage condition instruments, and is available in 1/4, 3/8, 1/2, and 3/4" square drive versions with capacities from 0-125 in-lb to 0-6000 in-lb.

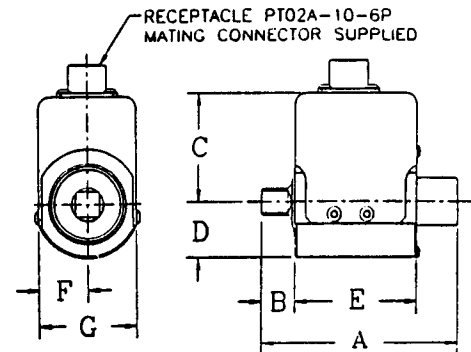
## SPECIFICATIONS

<b>RATED OUTPUT:</b>	1 to 3 mV/V nominal (see chart below)	<b>OPERATING TEMP. RANGE:</b>	-65°F to 250°F
<b>EXCITATION:</b>	10 Vdc, 20 Vdc maximum	<b>COMPENSATED TEMP. RANGE:</b>	32°F to 170°F
<b>ACCURACY:</b>	0.37% F.S.	<b>BRIDGE RESISTANCE:</b>	1000 ohms
<b>NON-LINEARITY:</b>	0.25% F.S.	<b>MAX. RPM:</b>	3000
<b>HYSTERESIS:</b>	0.25% F.S.	<b>BRUSH LIFE (HOURS):</b>	4.6 x 10 <sup>6</sup> /RPM
<b>REPEATABILITY:</b>	0.1% F.S.	<b>CONSTRUCTION:</b>	Black anodized steel
<b>ZERO BALANCE:</b>	1.0% F.S.	<b>ELECTRICAL:</b>	Mating connector included
<b>THERMAL EFFECTS</b>		<b>WEIGHT:</b>	8 oz.

<b>Zero:</b>	0.002% F.S./°F
<b>Span:</b>	0.002% Rdg./°F
<b>MAX. LOAD</b>	
<b>Safe:</b>	115% F.S. (TQ502-600, TQ502-2.4K) 150% F.S. (All other models)
<b>Ultimate:</b>	150% F.S. (TQ502-600, TQ502-2.4K) 200% F.S. (TQ502-1.5K, TQ502-6K) 300% F.S. (All other models)

## WIRING

- PIN**
- A: (+) EXCITATION
  - B: (-) EXCITATION
  - C: (+) SIGNAL
  - D: (-) SIGNAL

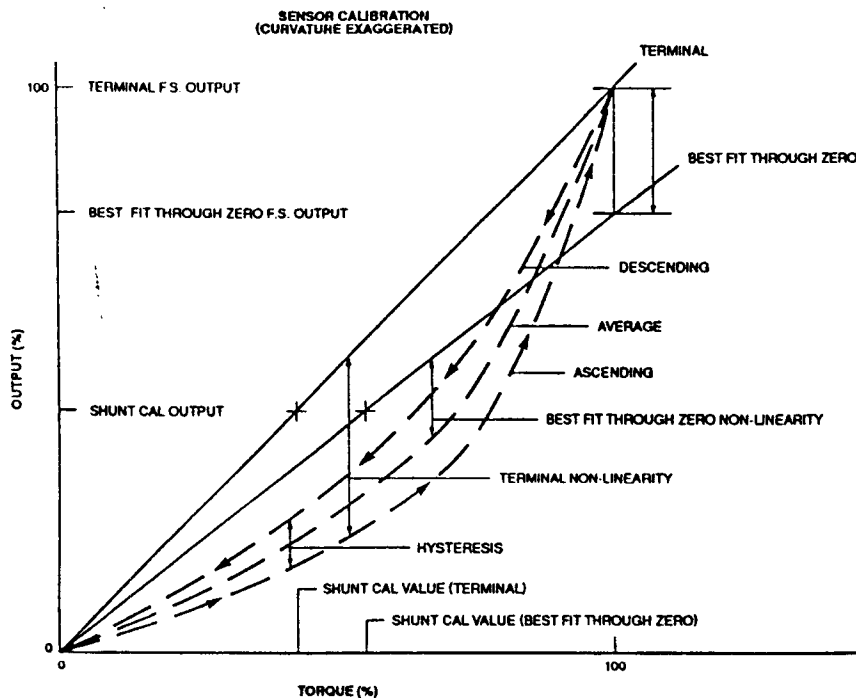


## DIMENSIONS (INCHES)

MODEL	DRIVE	RANGE (IN-LB)	OUTPUT (mV/V)	A	B	C	D	E	F	G
TQ502-25	1/4" HEX	0 - 25	1.0	3.75	1.08	1.62	.81	1.86	.75	1.50
TQ502-50	1/4" HEX	0 - 50	2.0	3.75	1.08	1.62	.81	1.86	.75	1.50
TQ502-125	1/4" SQ.	0 - 125	2.0	3.00	.50	1.62	.81	1.86	.75	1.50
TQ502-200	3/8" SQ.	0 - 200	1.5	3.00	.50	1.62	.81	1.86	.75	1.50
TQ502-600	3/8" SQ.	0 - 600	3.0	3.00	.50	1.62	.81	1.86	.75	1.50
TQ502-1.5K	1/2" SQ.	0 - 1,500	3.0	3.50	.64	1.62	.81	1.86	.75	1.50
TQ502-2.4K	1/2" SQ.	0 - 2,400	3.0	3.50	.64	1.62	.81	1.86	.75	1.50
TQ502-6K	3/4" SQ.	0 - 6,000	3.0	5.10	0.96	1.80	1.12	2.50	1.00	2.00

## GENERAL CALIBRATION PROCEDURE

To create the calibration curve furnished to you, the sensor is cycled through the operating range to develop a stable hysteresis loop. Known loads are then applied to the sensor by means of dead weights or a reference load cell in ascending and descending increments. The data recorded is then best fit to second degree equations which describe ascending, descending, and average calibration curves. These equations are incrementally solved to generate theoretical sensor outputs at various loads. The calibration sheet supplies you with these data points whose meanings are defined in the Sensor Calibration diagram.



**Terminal Non-linearity (NL):** computed from deviations of ascending theoretical data from a straight line connecting the zero and full scale points.

**Terminal hysteresis (HYS):** computed from the differences between descending and ascending theoretical data.

**Best fit through zero Non-linearity (BF/0):** computed from deviations of average theoretical data from a straight line through zero with a slope which produces minimum deviations with average theoretical data.

Best fit through zero outputs and best fit through zero shunt cal values should be used when the sensor is assumed to be linear. If the instrumentation is capable of correcting second order non-linearity, the average outputs and shunt cal output values should be used.

## WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that our customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. Our Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

We are glad to offer suggestions on the use of our various products. Nevertheless OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.

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## RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to OMEGA's Customer Service Department. Call toll free in the USA and Canada: 1-800-622-2378, FAX: 203-359-7811; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems you are having with the product.

FOR NON-WARRANTY REPAIRS OR CALIBRATION, consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

1. Your P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of the product,
3. Repair instructions and/or specific problems you are having with the product.