omega.com®
OMEGA®

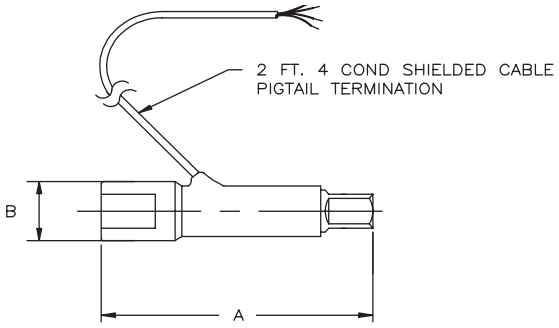
TQ103

SOCKET EXTENSION REACTION TORQUE SENSOR

INSTRUCTION SHEET

M1644-1204

The OMEGA® TQ103 Series socket extension torque sensor is ideal for installation between a socket and drive to measure or verify bolt torque. The sensor can measure torque in both clockwise and counterclockwise directions. Any electronic display or control device which is compatible with strain gage transducers may be used with the sensor. The sensors are available in 1/4", 3/8", 1/2", and 3/4" square drives.



SPECIFICATIONS

RATED OUTPUT:	1 to 3mV/V Nominal
EXCITATION:	10Vdc, 20Vdc max
ACCURACY:	0.37% F.S.
NON-LINEARITY:	0.25% F.S.
HYSTERESIS:	0.25% F.S.
REPEATABILITY:	0.1% F.S.
ZERO BALANCE:	0.1% F.S.
OPERATING TEMP. RANGE:	-65°F TO +250°F
COMPENSATED TEMP. RANGE:	70°F TO 170°F
THERMAL EFFECTS:	
ZERO:	0.002% F.S./F
SPAN:	0.002% RDG/F
MAXIMUM LOAD:	
SAFE:	150% F
ULTIMATE:	300% F.S.
BRIDGE RESISTANCE:	1000 OHMS
ANGULAR DEFLECTION AT F.S.:	3 DEG
CONSTRUCTION:	Black anodized tool steel
ELECTRICAL:	2ft. of 4 conductor shielded cable, pigtail termination

WIRING

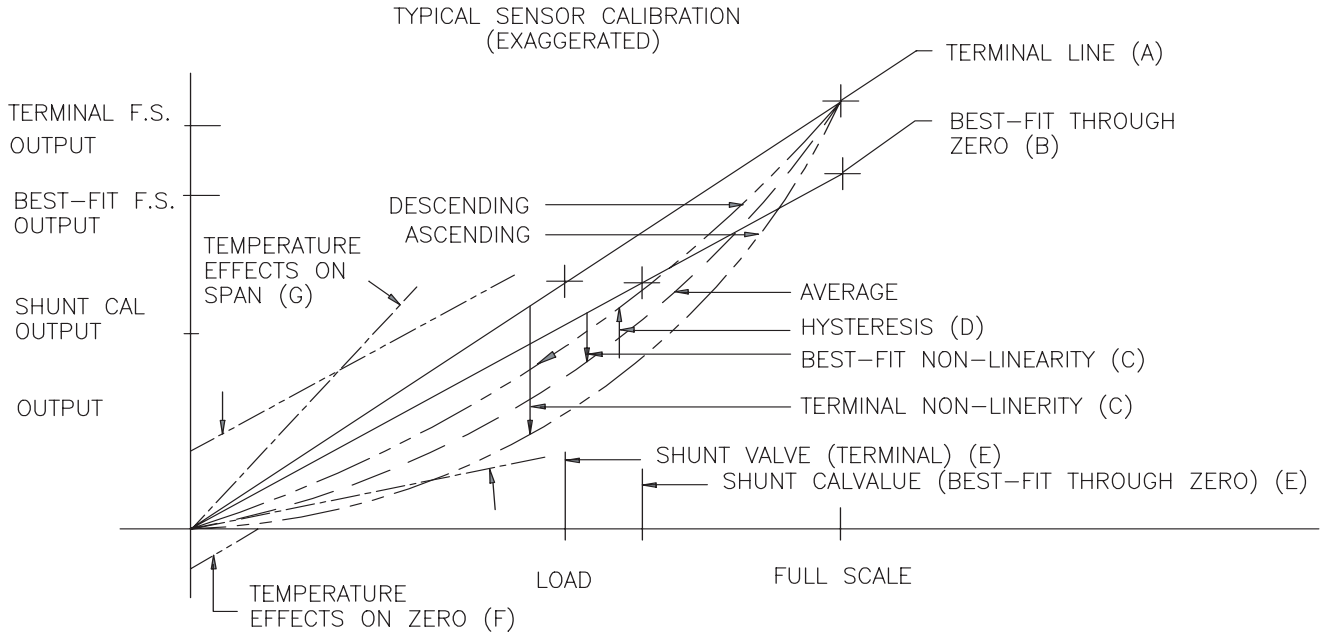
RED	(+) Excitation
BLACK	(-) Excitaion
YELLOW	(+) Signal
WHITE	(-) Signal

DIMENSIONS

MODEL	SQUARE DRIVE SIZE	CAPACITY (in-lbs)	DIM A	DIM B (DIA)
TQ103-25	1/4"	25	3	1/2"
TQ103-50	1/4"	50	3	1/2"
TQ103-125	1/4"	125	3	1/2"
TQ103-200	3/8"	200	3	11/16"
TQ103-600	3/8"	600	3	11/16"
TQ103-1.5K	1/2"	1500	3.5	7/8"
TQ103-2.4K	1/2"	2400	3.5	7/8"
TQ103-6K	3/4"	6000	5	1-1/2"

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 or descending increments. The data recorded is then best fit to second degree equations which describ axcending, descending, and average calibration curves. These equations are incrementally solved to generatre theorectical senosr outputs at various loads. The calibratio sheet supplies you with data points whose meanings are defined in the Sensor Calibration diagram (see reverse side).



Terminal Non-Linearity (N/L): 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 theorectical data.

Best fit through zero Non-linearity (BF/0): computed from deivations of average theorectical data from a straight line through zero with a slope which produces minimum deviations with average theorectical 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 the second order non-linearity, the average outputs and shunt cal output values should be used.

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's 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 OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's 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. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been 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 are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S 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.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

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

1. Purchase Order 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 relative to the product.

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

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

Shop online at omega.com

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gages
- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

M1644/1204