

Torque Sensor

Rotating, non-contact transfer

Model 8645 with round shaft

Model 8646 with square ends

| | |
|-----------|-----------|
| Code: | 8645 EN |
| Delivery: | ex stock |
| Warranty: | 24 months |

CAD data 2D/3D for this sensor:
 Download directly at www.traceparts.com
 Info: refer to data sheet 80-CAD-EN



Very low price

- Measuring range 0 ... 2.5 Nm to 0 ... 500 Nm
- Very low price
- New, patented measuring technology
- Speed up to 5000 1/min
- Maintenance-free due to non-contact transfer
- Integrated amplifier

8645 EN

Application

With its new EMD technology this sensor can measure static and dynamic torque from non-rotation up to permanent high speed.

The reliability and, above all, the very low price opens up new possibilities next to the present applications for torque measurement sensors.

Examples:

- ▶ Automotive (steering, gearing, motors)
- ▶ Drilling systems
- ▶ Screwing and bolting tools
- ▶ Textile machines
- ▶ Test rigs
- ▶ Pumps
- ▶ Fitness and workout gears
- ▶ Mechanical conveying technology
- ▶ Household appliances

A-Tech Instruments Ltd.

Description

A new, patented technology (EMD technology) is used to create the electrical voltage from the applied torque.

The nickeliferous steel shaft is impregnated with a permanent magnetic pattern. Torque changes this pattern as well as the magnetic field. As a result, the sensor delivers a torque-dependent measurement signal for the evaluation by EMD electronic of the stator.

The function derives only from a magnetization of the shaft (no strain gauges, no wiring).

An ASIC for signal extension gives the user a torque-proportional electrical voltage.

Technical Data
Model 8645, round ends

Dim. tolerance acc. ISO 2768-f

| Order Code | Measuring Range | Dimensions [mm] | | | | | | | | | | | | | | Moment of Inertia [g cm ²] | Weight [g] |
|-------------|-----------------|-----------------|----|------|-------------------|-------------------|---|------|---|---|----|------|----|----|-----|--|------------|
| | | A | B | C | ∅ D _{k6} | E ^{+0,3} | F | G | H | K | L | M | N | P | S | | |
| 8645-5002.5 | 0 ... ± 2.5 Nm | 125 | 70 | 27.5 | 9 | 40 | - | 8 | 5 | - | 23 | 43.9 | 15 | 37 | 1.5 | 4.86 | 400 |
| 8645-5005 | 0 ... ± 5 Nm | 125 | 70 | 27.5 | 9 | 40 | - | 8 | 5 | - | 23 | 43.9 | 15 | 37 | 1.5 | 5.12 | 400 |
| 8645-5007.5 | 0 ... ± 7.5 Nm | 125 | 70 | 27.5 | 9 | 40 | - | 8 | 5 | - | 23 | 43.9 | 15 | 37 | 1.5 | 5.53 | 400 |
| 8645-5017.5 | 0 ... ± 17.5 Nm | 125 | 70 | 27.5 | 9 | 40 | - | 8 | 5 | - | 23 | 43.9 | 15 | 37 | 1.5 | 8.15 | 450 |
| 8645-5075 | 0 ... ± 75 Nm | 139 | 70 | 34.5 | 14 | 50 | - | 8 | 5 | - | 30 | 43.9 | 18 | 47 | 1.5 | 46.4 | 700 |
| 8645-5175 | 0 ... ± 175 Nm | 179 | 70 | 54.5 | 19 | 50 | - | 8 | 5 | - | 50 | 43.9 | 18 | 47 | 1.5 | 180 | 900 |
| 8645-5250 | 0 ... ± 250 Nm | 179 | 70 | 54.5 | 19 | 50 | - | 8 | 5 | - | 50 | 43.9 | 18 | 47 | 1.5 | 188 | 1000 |
| 8645-5500 | 0 ... ± 500 Nm | 220 | 87 | 66.6 | 25 | 60 | - | 10.5 | 2 | - | - | 61.4 | 19 | 57 | 1.5 | 984 | 1700 |

Model 8646, square end

| Order Code | Measuring Range | Dimensions [mm] | | | | | | | | | | | | | | Moment of Inertia [g cm ²] | Weight [g] |
|-------------|-----------------|-----------------|----|------|--------|----|------|------|---|------|---|------|----|----|-----|--|------------|
| | | A | B | C | Square | E | F | G | H | K | L | M | N | P | S | | |
| 8646-5002.5 | 0 ... ± 2.5 Nm | 95.5 | 70 | 9.5 | 1/4" | 40 | 16 | 8 | 5 | 12 | - | 43.9 | 15 | 37 | 1.5 | 2.53 | 400 |
| 8646-5005 | 0 ... ± 5 Nm | 95.5 | 70 | 9.5 | 1/4" | 40 | 16 | 8 | 5 | 12 | - | 43.9 | 15 | 37 | 1.5 | 2.79 | 400 |
| 8646-5007.5 | 0 ... ± 7.5 Nm | 95.5 | 70 | 9.5 | 1/4" | 40 | 16 | 8 | 5 | 12 | - | 43.9 | 15 | 37 | 1.5 | 3.20 | 400 |
| 8646-5017.5 | 0 ... ± 17.5 Nm | 95.5 | 70 | 9.5 | 1/4" | 40 | 16 | 8 | 5 | 12 | - | 43.9 | 15 | 37 | 1.5 | 5.82 | 450 |
| 8646-5075 | 0 ... ± 75 Nm | 107 | 70 | 13 | 3/8" | 50 | 24 | 8 | 5 | 18 | - | 43.9 | 18 | 47 | 1.5 | 30.2 | 700 |
| 8646-5175 | 0 ... ± 175 Nm | 123.5 | 70 | 18.5 | 1/2" | 50 | 35 | 8 | 5 | 24 | - | 43.9 | 18 | 47 | 1.5 | 100 | 800 |
| 8646-5250 | 0 ... ± 250 Nm | 123.5 | 70 | 18.5 | 1/2" | 50 | 35 | 8 | 5 | 24 | - | 43.9 | 18 | 47 | 1.5 | 102 | 800 |
| 8646-5500 | 0 ... ± 500 Nm | 146 | 87 | 29.6 | 3/4" | 60 | 29.6 | 10.5 | 2 | 33.5 | - | 61.4 | 19 | 57 | 1.5 | 563 | 1500 |

Electrical values

Excitation voltage: 9 ... 12 V DC
 Excitation current (60 mA for a period of 10 ms at the start): < 10 mA
 Analog output signal ± measuring range: 2.5 V ± 2 V nominal
 Signal output at 0 Nm (adjustable): 2.5 VDC
 Output resistance: 50 Ω
 Cut-off frequency (-3 db): 1 kHz

Environmental conditions

Temperature operating: 0 ... 70 °C
 Temperature effect zero: < ± 0.1 % F.S./K
 Do not apply torque sensor within dynamic magnetic fields, e.g. near high running motors.

Resistance to magnetic fields:
 max. 300 kA/m at distance of 70 mm (4000 Oe)

Mechanical values

Linearity and hysteresis failure and signal variation during rotation:
 measuring ranges up to 250 Nm < ± 1 % F.S.
 measuring range 500 Nm < ± 2 % F.S.
 Repeatability: < ± 0.1 % F.S.
 Resolution: 0.1 % F.S.
 Rotary speed:
 model 8645 (permanent ≤ 3000) max. 5000 min⁻¹
 model 8646 max. 1000 min⁻¹

Protection class: acc. EN 60529 IP50
 Max. torque of usage: 150 % of nominal torque
 Fracture torque: 300 % of nominal torque
 Maximum axial load (all ranges) between shaft and housing:
 influence < 1 % F.S. 40 N
 Maximum radial load (all ranges) influence < 1 % F.S. 50 N
 Shaft material housing: Ni Cr Ni 14
 Electrical connection: 5 pin connector,
 mating connector mounted on cable,
 length 1,5 m, included in delivery

Mechanical connection:

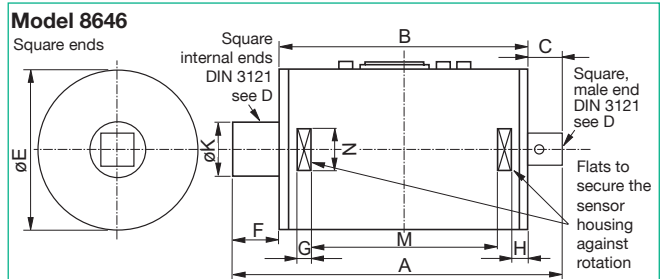
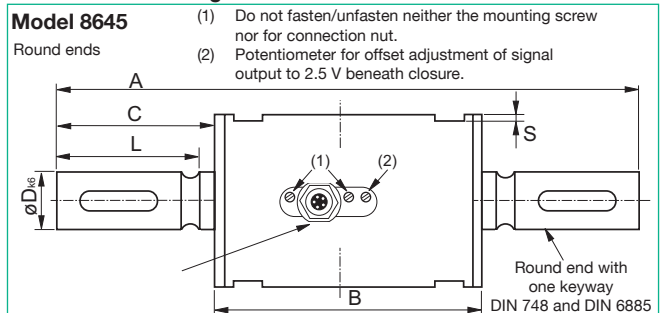
Model 8645 both shaft ends with keyway acc.
 measuring range up to 250 Nm 1 keyway acc. DIN 6885-1A
 measuring range 500 Nm 2 keyways acc. DIN 6885-1A
 Model 8646 Square, male and female, acc. DIN 3121

| Wiring Code Cable | Wiring Code | Connection at Sensor |
|-----------------------|-------------------------------|----------------------|
| excitation | + white | 1 |
| signal output | + brown | 2 |
| excitation/signal GND | - black | 3 |
| free | | 4 |
| reference voltage | V _{ref} (2.5 V) grey | 5 |

Upon delivery without mounted connector please use a connector with shielding. Generally the shielding should escort the signal as far as possible. The use of another cable than the one included in delivery can affect the proper function of the sensor system.

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Dimensional drawings


The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.

Download via www.burster.com or directly at www.traceparts.com. For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

Mounting Instructions

For mounting the sensor it should be respected that the shafts are arranged exactly in line to the connecting shafts. There should not exit any axial and radial load. To avoid that please use flexible shaft couplings, torsionally stiff. The four flats on the housing should be only used to secure the sensor against rotation. Refer to clamps and accessories. Avoid any axial or radial load between housing and shaft during the installation.

Order Information

Torque sensor, round ends, measuring range 0 ... ± 5 Nm, (cable 1.5 m included) **Model 8645-5005**

Accessories

Connector for connecting the sensor to burster desktop devices **Model 9941**
 Installation of a connector to the sensor cable **Order Code 99004**
 Connecting cable length 1.5 m, one end free (included in delivery) **Model 8645-Z001**
 Connecting cable length 3 m, one end free **Model 8645-Z002**
 Clamp for 8645 and 8646 for ranges up to 17.5 Nm **Model 8645-Z003**
 for ranges from 75 Nm **Model 8645-Z004**
 Amplifier, process indicators like e.g. digital displays 9163, 9180 **see section 9 of the catalog.**