

Basic Line Torque Sensor

Type 4520A...

Rotating with Contactfree Signal Transmission

Torque sensors Type 4520A... operate on the strain gage principle and supply an analog output signal of $\pm 0 \dots 10$ VDC that is transmitted without contact.

- Measuring ranges from 1 ... 1 000 N·m
- Speed up to 10 000 1/min
- High frequency response
- Maintenance-free thanks to contactfree signal transmission
- Shaft end
- Integral speed measurement
- Great value for money

Description

The robust Type 4520A... for measuring torque on rotating shafts offers particularly good value for money and is recommended primarily as an entry-level solution for torque measurement. Frequency modulation is used to transmit the torque signal from the rotating shaft without contact and convert it into an analog signal. The speed signal at 60 pulses/rev. is available as TTL signal level. An external electrical control input is provided as standard.

Applications

Type 4520A... is suitable for static and dynamic measurement of torques in assembly and for quality control in production and the laboratory.

Technical Data

Basic Mechanical Data

| | | |
|------------------------|-------------|-----------------|
| Measuring range | N·m | 1 ... 1 000 |
| Rated torque M_{nom} | N·m | 1 ... 1 000 |
| Overload capacity | | |
| Alternating torque | | 1 x M_{nom} |
| Maximum | | 1,5 x M_{nom} |
| Speed measurement | pulses/rev. | 60 |
| Rated speed | | |
| 1 ... 10 N·m | 1/min | 10 000 |
| 20 ... 200 N·m | 1/min | 8 000 |
| 500 ... 1 000 N·m | 1/min | 7 000 |
| Case material | | anodized Al |
| Degree of protection | | IP40 |



General Electrical Data

| | | |
|-------------------------------------|-------------|---------------------------------|
| Cut-off frequency -3 dB | kHz | 1,5 |
| Accuracy class | | 0,5 |
| Linearity error | | |
| including hysteresis | % FSO | < $\pm 0,5$ |
| Output signal | VDC | $\pm 0 \dots 10$ |
| at M_{nom} (rated) | VDC | 10 |
| Load resistance | k Ω | >10 |
| Thermal zero drift | % FSO/10 °C | < $\pm 0,3$ |
| Thermal sensitivity shift | % FSO/10 °C | < $\pm 0,3$ |
| Control signal | % | 100 $\pm 0,5$ |
| 100 % control input | VDC | "On" 5 ... 30 "Off" 0 ... 2 |
| Operating temperature range (rated) | °C | 10 ... 60 |
| Service temperature range | °C | 0 ... 70 |
| Storage temperature range | °C | -25 ... 80 |
| Electrical connection | | built-in 12 pin connector |
| Supply voltage | VDC | 18 ... 26 |
| Power consumption | W | <2 |

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Torsional Rigidity and Inertia

| Measuring range N·m | Torsional rigidity N·m/rad | Angle of twist at M_{nom} | Inertia $kgcm^3$ | | Weight kg |
|------------------------|-------------------------------|--------------------------------|---------------------|-----------|--------------|
| | | | Measuring end | Drive end | |
| 1 | 330 | 0,17 | 0,0152 | 0,0145 | 0,5 |
| 2 | 330 | 0,34 | 0,0152 | 0,0145 | 0,5 |
| 5 | 715 | 0,4 | 0,0157 | 0,0148 | 0,52 |
| 10 | 715 | 0,8 | 0,0157 | 0,0148 | 0,52 |
| 20 | 8 690 | 0,13 | 0,44 | 0,47 | 1,35 |
| 50 | 8 690 | 0,33 | 0,44 | 0,47 | 1,35 |
| 100 | 19 800 | 0,29 | 0,493 | 0,527 | 1,5 |
| 200 | 19 800 | 0,58 | 0,493 | 0,527 | 1,5 |
| 500 | 165 560 | 0,17 | 3,56 | 3,09 | 3,3 |
| 1 000 | 165 560 | 0,35 | 3,56 | 3,09 | 3,3 |

Dimensions

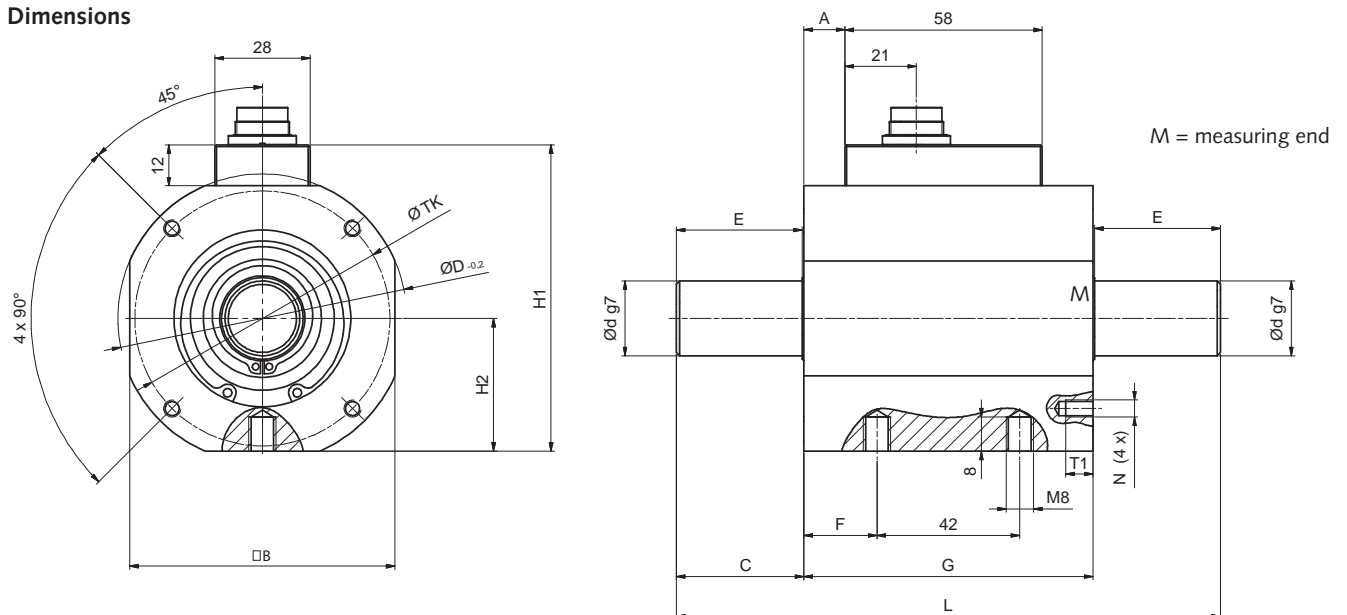


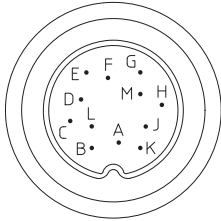
Fig. 1: Dimensions Type 4520A...

| Size | 1 | 2 | 2 | 3 |
|------------------|----------|-----------|-------------|---------------|
| Rated torque N·m | 1 ... 10 | 20 ... 50 | 100 ... 200 | 500 ... 1 000 |
| A | 0 | 12 | 12 | 11 |
| □B | 58 | 78 | 78 | 91 |
| C | 16 | 27,5 | 37,5 | 59 |
| øD | 65 | 85 | 85 | 98 |
| ød g7 | 10 | 18 | 22 | 42 |
| E | 15 | 27 | 37 | 58 |
| F | 8 | 21,5 | 21,5 | 19 |
| G | 58 | 85 | 85 | 80 |
| H1 | 70 | 90 | 90 | 103 |
| H2 | 29 | 39 | 39 | 45,5 |
| L | 90 | 140 | 160 | 198 |
| N | M4 | M5 | M5 | M6 |
| T1 | 7 | 8 | 8 | 10 |
| øTK | 48 | 75 | 75 | 85 |

Electrical Connections

Pin Allocation of Built-in 12 pin Connector

| Function | PIN | Description |
|---------------------|-----|---|
| Supply | F | +U _B |
| | E | GND |
| Shield | M | In sensor; connected to case |
| Torque output | C | U _A ±10 VDC at M _{nom} at >2 kΩ 10 VDC at control signal resolution R _{i,C} = 10 Ω, output with short-circuit protection connection to AGND |
| | D | AGND Reference for U _A |
| Speed sensor | B | Track A Open collector output Internal 1 kΩ resistance to 5 VDC (pull up), TTL-level |
| 100 % control input | K | Control Off: 0 ... 2 VDC On: 5 ... 30 VDC |
| | A | KGND Reference for control |
| | G | Reserved |
| | H | Reserved |
| | J | Reserved |
| | L | Reserved |



Included Accessories

- None

Optional Accessories

- | | |
|---|----------------------------|
| • Female cable connector with solder lug 12 pin | Type/Art. No. KSM000703 |
| • Connecting cable, length 5 m, 12 pin – flying leads | KSM124970-5 |
| • Connecting cable, length 2,5 m, 12 pin – CoMo Torque | KSM185380-2,5 |
| • Control Monitor CoMo Torque evaluation instrument for torque sensors (see data sheet 4503A_000-595) | 4700A |
| • Connecting cable, length 5 m 12 pin neg. – 12 pin pos. | KSM07203-5 |

Ordering Key

Measuring Range in N·m

| | |
|-------|-------|
| 1 | 1 |
| 2 | 2 |
| 5 | 5 |
| 10 | 10 |
| 20 | 20 |
| 50 | 50 |
| 100 | 100 |
| 200 | 200 |
| 500 | 500 |
| 1 000 | 1 000 |

Type 4520A



Ordering Example

Type 4520A10

Torque sensor: Rated torque 10 N·m