

# 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 0 ...  $\pm 10$  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	<0,5
Output signal	VDC	$\pm 10$
at $M_{nom}$ (rated)	VDC	$\pm 10$
Load resistance	k $\Omega$	>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-pole connector
Supply voltage	VDC	18 ... 26
Power consumption	W	<2

4520A\_000-765e-09\_09

**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**

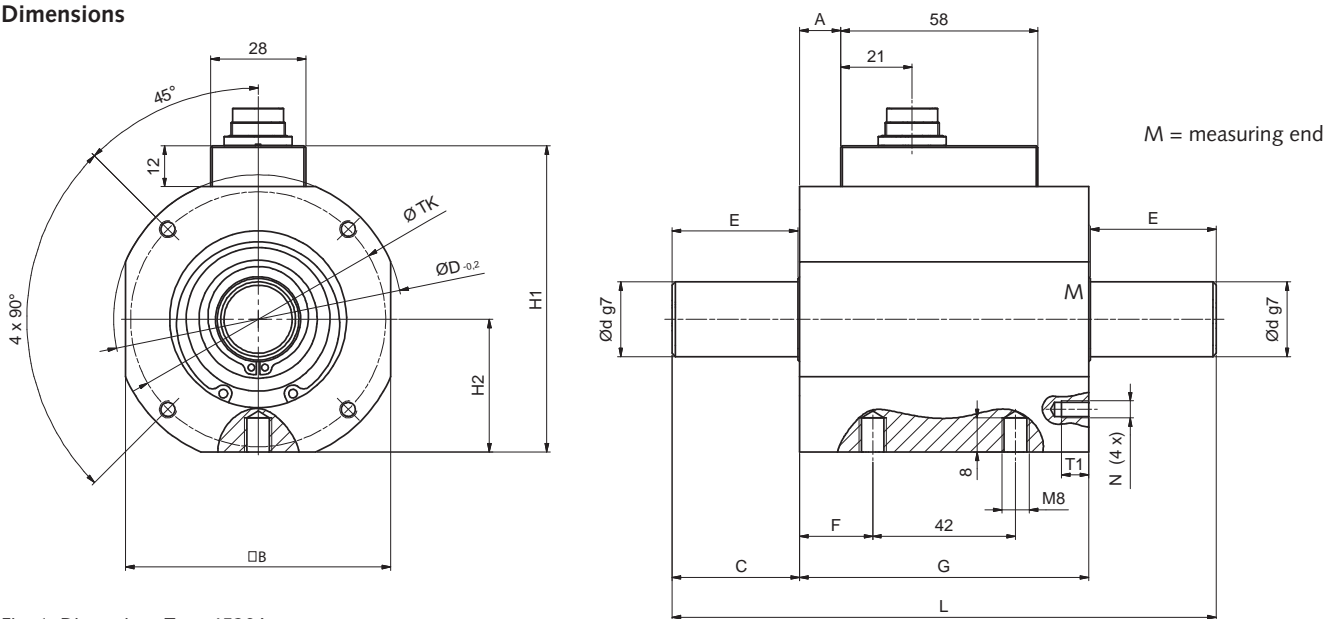


Fig. 1: Dimensions Type 4520A...

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

4520A\_000-765e-09\_09

## Electrical Connections

### Pin Allocation of Built-in 12-pole Connector

Function	PIN	Description
Supply	F	+U <sub>B</sub>
	E	GND
Shield	M	In sensor; connected to case
Torque output	C	U <sub>A</sub> ±10 VDC at M <sub>nom</sub> at >2 kΩ 10 VDC at control signal resolution R <sub>i,C</sub> = 10 Ω, output with short-circuit protection connection to AGND
	D	AGND Reference for U <sub>A</sub>
Speed sensor	B	Track A
Supply		Open collector output
Speed pulses		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-pole  | Type/Art No.<br>KSM000703 |
| • Connecting cable, length 5 m, 12-pole – flying leads  | KSM124970-5               |
| • Connecting cable, length 2,5 m, 12-pole – CoMo Torque   | KSM185380-2,5             |
| • CoMo Torque ControlMonitor evaluation instrument for torque sensors (see data sheet 4503A_000-595e) | 4700A                     |
| • Connecting cable, length 5 m 12-pole neg. – 12-pole pos.  | KSM07203-5                |

### Ordering Key

Type 4520A 

#### 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

### Ordering Example

Type 4520A10

Torque sensor:  
Rated torque 10 N·m