

# T22

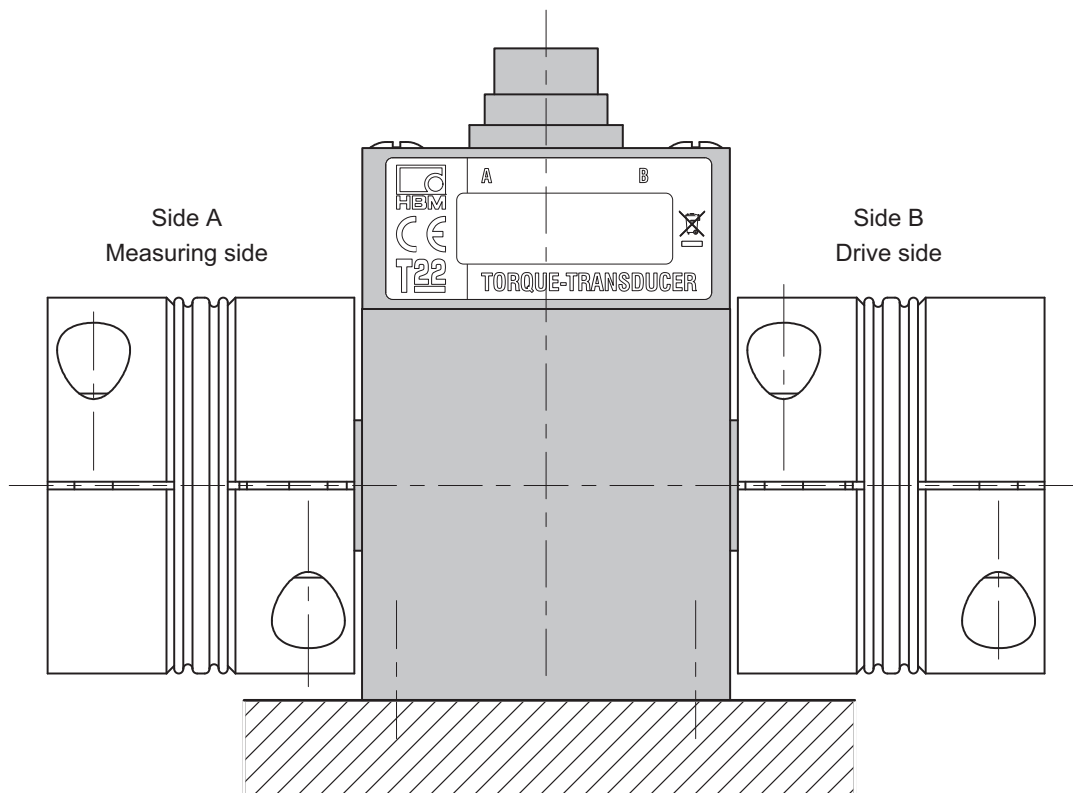
## Torque transducer

### Special features

- Nominal (rated) torques 0.5 Nm, 1 Nm, 2 Nm, 5 Nm, 10 Nm, 20 Nm, 50 Nm, 100 Nm, 200 Nm, 500 Nm and 1 kNm
- Nominal (rated) rotational speed up to 20000 rpm (depending on measuring range)
- Accuracy class: 0.5
- Contactless transmission of measurement signals
- Measurement on rotating or stationary parts
- Cylindrical shaft ends for non-play friction joints
- $\pm 5$  V and  $10 \pm 8$  mA torque output signal



### Installation example with two bellows couplings



## Specifications

<b>Type</b>		T22											
<b>Accuracy class</b>		0.5											
<b>Torque measuring system</b>													
<b>Nominal (rated) torque <math>M_{nom}</math></b>	N·m	0.5	1	2	5	10	20	50	100	200	500		
	kN·m												1
<b>Nominal (rated) sensitivity</b> (span between torque = zero and nominal (rated) torque $M_{nom}$ )													
Voltage output	V	5											
Current output	mA	8											
<b>Sensitivity tolerance</b> (deviation of the actual output quantity at $M_{nom}$ from the nominal (rated) sensitivity)													
Voltage output	%	±0.5											
Current output	%	±0.5											
<b>Output signal at torque = zero</b>													
Voltage output	V	0 ± 0.2											
Current output	mA	10 ± 0.2											
<b>Nominal (rated) output signal</b>													
Voltage output													
at positive nominal (rated) torque	V	+5											
at negative nominal (rated) torque	V	-5											
Current output													
at positive nominal (rated) torque	mA	+18											
at negative nominal (rated) torque	mA	+2											
<b>Load resistance</b> (Voltage output)	MΩ	>1											
<b>Burden</b> (current output)													
with $U_B = 12\text{ V}$	Ω	250											
with $U_B = 24\text{ V}$	Ω	500											
<b>Longterm drift over 48h</b>													
Voltage output	mV	< ± 50											
Current output	μA	< ± 80											
<b>Cut-off frequency (-3 dB)</b> (volt. output / current output)	kHz	1											
<b>Group delay</b> (voltage output / current output)	μs	450											
<b>Residual ripple</b>													
Voltage output	mV <sub>pp</sub>	< 100											
Current output	mA <sub>pp</sub>	< 0.1											
<b>Effect of temperature per 10 K in the nominal (rated) temperature range</b>													
on the <b>output signal</b> , related to the actual value of the signal span	%	≤ ± 0.2											
on the <b>zero signal</b> , relat. to the nominal (rated) sensitivity	%	≤ ± 0.5											
<b>Power supply</b>													
Nominal (rated) supply voltage range	V (DC)	11.5 ... 30											
Current consumption in measuring mode	A	< 0.2											
Nominal (rated) power consumption	W	< 2.4											
Permissible residual ripple of supply voltage	mV <sub>pp</sub>	200											
<b>Linearity error including hysteresis</b> , related to the nominal (rated) sensitivity	%	≤ ± 0.3											
<b>Rel. standard deviation of repeatability</b> per DIN 1319, related to the variation of the output signal	%	≤ ± 0.1											
<b>Max. level control range</b> <sup>1)</sup>													
voltage output / current output	%	≤ 120											

<sup>1)</sup> Output signal range in which there is a repeatable correlation between torque and output signal.

## Specifications (continued)

Nominal (rated) torque $M_{nom}$	N·m	0.5	1	2	5	10	20	50	100	200	500		
	kN·m											1	
<b>General data</b>													
<b>EMC <sup>2)</sup></b>													
<b>Immunity from interference</b> (DIN EN 61326-1 / EN 61000-6)													
Enclosure													
HF line interference	V	10 / A											
150 kHz - 80 MHz (AM)	KV	Air 8 / A											
ESD (electrostatic discharge)	kV	Contact 4 / A											
Enclosure													
Electromagnetic field													
80 MHz - 1000 MHz (AM)	V/m	10 / A											
1400 MHz - 2700 MHz (AM)	V/m	3 / A											
Lines - Connecting cable													
Burst (fast transients)	kV	2 / A											
<b>Emission (EME) (EN 61326-1 / EN 55011)</b>													
RFI voltage (interference voltage at DC mains connection)	-	Class B (150 kHz - 30 MHz)											
RFI field strength (Electromagnetic RFI field strength)	-	Class B (30 MHz - 1000 MHz)											
<b>Degree of protection per EN 60 529</b>													
		IP 40											
<b>Nominal (rated) temperature range</b>													
	°C [°F]	+5...+45 [+41...+113]											
<b>Operating temperature range</b>													
	°C [°F]	0...+60 [+32...+140]											
<b>Storage temperature range</b>													
	°C [°F]	-5...+70 [+23...+158]											
<b>Impact resistance, test severity level per DIN IEC 68; Part 2-27; IEC 68-2-29-1987</b>													
number	n	1000											
duration	ms	3											
acceleration (halfsine)	m/s <sup>2</sup>	650											
<b>Vibration resistance, test severity level per DIN IEC 68, Part 2-6: IEC 68-2-6-1982</b>													
frequency range	Hz	5 ... 65											
duration	h	1.5											
acceleration (amplitude)	m/s <sup>2</sup>	50											
<b>Nominal (rated) rotational speed <math>n_{nom}</math></b>													
	min <sup>-1</sup>	20 000			16 000			12 000			9 000		
<b>Load limits <sup>3)</sup></b>													
<b>Limit torque, related to <math>M_{nom}</math></b>													
	%	200 <sup>5)</sup>											
<b>Breaking torque, related to <math>M_{nom}</math></b>													
	%	> 280											
<b>Longitudinal limit force</b>													
	kN	0.19	0.19	0.19	0.9	0.9	0.9	1.6	1.6	1.6	4	4	
<b>Lateral limit force</b>													
	N	30	30	60	25	45	90	210	420	850	1400	2800	
<b>Bending limit moment</b>													
	N·m	0.3	0.3	0.5	0.5	0.9	1.9	5.5	11	22	54	109	
<b>Oscillation width per DIN 50100 (peak-to-peak)<sup>4)</sup></b>													
	%	80											

<sup>2)</sup> Test severity / criterion: Industrial environment, cable length  $\leq 30$  m. Application not outside buildings.

<sup>3)</sup> Each type of irregular stress (bending moment, lateral or longitudinal force, exceeding nominal (rated) torque) can only be permitted up to its specified static load limit provided none of the others can occur at the same time. If this condition is not met, the limit values must be reduced. If 30% of the bending limit moment and lateral limit force occur at the same time, only 40% of the longitudinal limit force is permissible and the nominal (rated) torque must not be exceeded. The permissible bending moments, longitudinal forces and lateral forces can affect the measurement result by approx. 1 % of the nominal (rated) torque.

<sup>4)</sup> The nominal (rated) torque must not be exceeded.

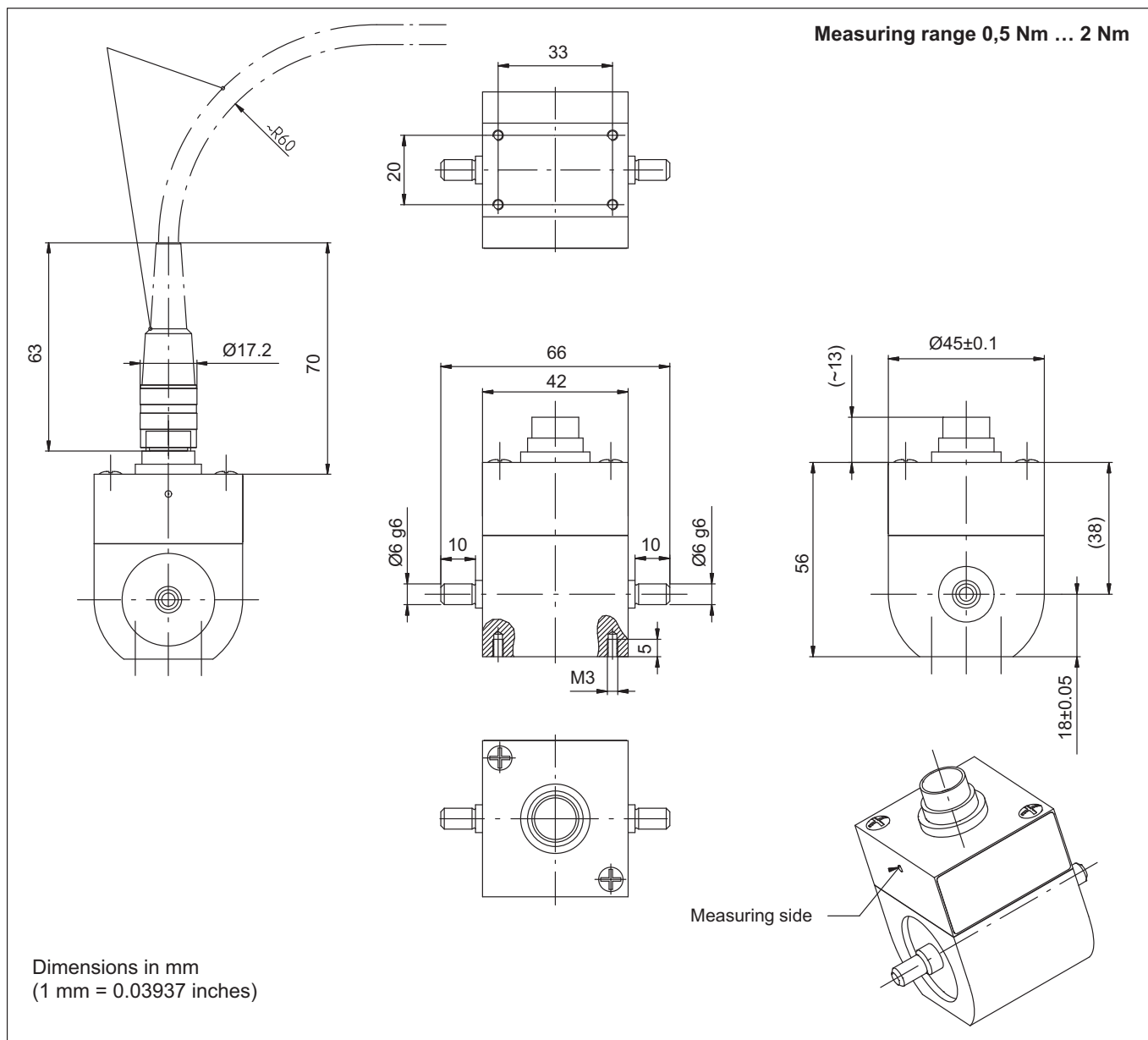
<sup>5)</sup> Please adhere to the maximum torque ( $T_{max}$ ) of the couplings.

## Specifications (continued)

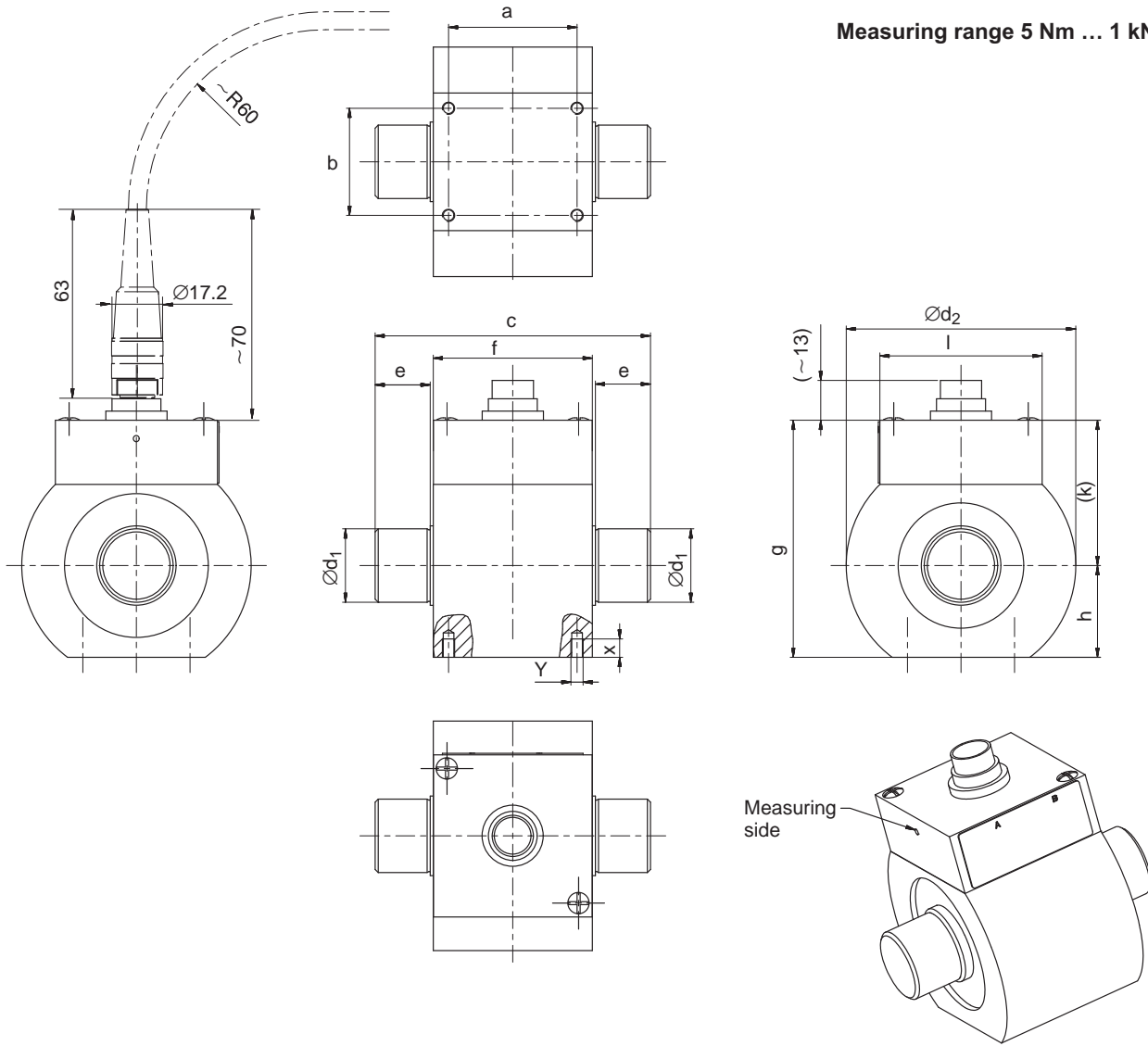
Nominal (rated) torque $M_{nom}$	N·m	0.5	1	2	5	10	20	50	100	200	500	
	kN·m											1
<b>Mechanical values</b>												
Torsional stiffness $c_T$	kN·m/ rad	0.14	0.14	0.29	1.1	2.7	5.4	19.7	35.5	52.4	288. 6	418. 9
Torsion angle at $M_{nom}$	Deg.	0.20	0.39	0.39	0.26	0.21	0.21	0.15	0.16	0.22	0.10	0.14
Balance quality-level per DIN ISO 1940		G 6.3										
Max. limits for relative shaft vibration (peak-to-peak) <sup>6)</sup>	μm	$s_{max} = \frac{4500}{\sqrt{n}}$ (n in rpm)										
Rms value for the vibration velocity of the enclosure designated in VDI 2056	mm/s	$v_{eff} = \frac{\sqrt{n}}{3}$ (n in rpm)										
<b>Mass moment of inertia</b>												
total		1.5	1.5	1.5	13.4	13.5	13.6	39.8	40.5	42.4	335. 0	351. 9
drive side of shaft	$10^{-3}$ g·m <sup>2</sup>	0.145	0.145	0.145	11.6	11.7	11.7	29.2	29.6	30.5	187. 9	196. 3
measuring side of shaft		0.05	0.05	0.05	1.8	1.8	1.9	10.6	10.9	11.9	147. 1	155. 6
<b>Weight</b>	g	230			550			850			2400	

<sup>6)</sup> Relative undulation in the area of the connecting shaft stubs, following DIN 45670/VDI 2059

# Dimensions of the T22



Measuring range 5 Nm ... 1 kNm



Measuring range (N·m)	Dimensions (in mm)												
	a	b	c	e	f	g	h ±0.05	(k)	l	Ød <sub>1 g6</sub>	Ød <sub>2 ±0.1</sub>	Y	X
5	39	31	80	15	48	72	28	44	52.75	15	70	M4	6
10													
20													
50	42	35	90	18	52	77.5	30	47.5	53	24	75	M4	6
100													
200													
500	50	55	120	26	65	97.5	40	57.5	75.5	40	105	M5	10
1k													

**Accessories for the T22, to be ordered separately**

Transducer connection cable, 5 m long, order no. 3-3301.0158

Transducer connection cable, 10 m long, order no. 3-3301.0159

Cable socket, 12-pin (Binder), order no. 3-3312.0268

Bellows couplings

Junction box, order no. 1-VK20A

**Accessories for junction box VK20A, to be ordered separately**

Connection cable, 1.5 m long (D-Sub, 15-pin - free ends), order no. 1-KAB151A-1.5

Connection cable, 1.5 m long (SUBCON5 - free ends), order no. 1-KAB152-1.5

Subject to modifications.  
All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability.

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