

T4A, T4WA-S3

Torque/Screw Torque Transducer



Special features

- Torque measurement in any direction
- T4WA-S3: Also provides angle of rotation and rotation speed measurement complete with detection of direction of rotation
- Nominal torques: 5 N·m, 10 N·m, 20 N·m, 50 N·m, 100 N·m, 200 N·m, 500 N·m and 1 kN·m
- Simple mounting with the aid of square connections
- Compact and easy to handle

Dimensions (in mm; 1 mm= 0.03937 inches)

Type	Driven side	Drive
T4A and T4WA-S3 5-50 N·m	3/8" External square DIN 3121-F10	3/8" Internal square DIN 3121-G10
T4A and T4WA-S3 100 N·m	1/2" External square DIN 3121-F12,5	1/2" Internal square DIN 3121-G12,5
T4A and T4WA-S3 200 N·m	3/4" External square DIN 3121-F20	3/4" Internal square DIN 3121-H20
T4A and T4WA-S3 1 kN·m	1" External square DIN 3121-F25	1" Internal square DIN 3121-H25

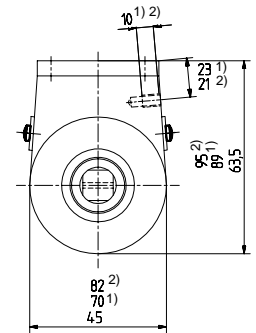
Driven side
external square
DIN3121



Torque:

T4A: 4-wire shielded cable, 3 m long, unterminated
T4WA-S3: 6-wire shielded cable, 3 m long, unterminated

Drive
internal square
DIN3121



Angle of rotation / rotation speed

(T4WA-S3 only) 4-wire shielded cable, 3 m long, unterminated

- 1) for T4../500 N·m
- 2) for T4../1 kN·m

Specifications

Type	T4A/T4WA-S3										
Accuracy class	0.2		0.1								
Torque measuring system											
Nominal torque	N·m	5	10	20	50	100	200	500	1000		
Nominal sensitivity (nom. output signal at nominal torque)	mV/V	2									
Characteristic tolerance	%	< ± 0.2									
Effect of temperature per 10 K in nominal temp. range											
on the output signal (by reference to actual value)	%	< ± 0.1									
on the zero signal (by reference to nominal sensitivity)	%	< ± 0.1									
Linearity deviation including hysteresis (by reference to nominal sensitivity)	%	0.2	0.1								
Relative standard deviation of reproducibility to DIN 1319 (by reference to variation of the output signal)	%	< ± 0.05									
Input resistance at reference temperature (T4A)	Ohm	350 ± 1.8									
Torque measuring system of T4WA-S3	Ohm	420 ± 40									
Output resistance at reference temperature	Ohm	350 ± 1.5									
Maximum permissible excitation voltage	V	20									
Nominal range of the excitation voltage	V	0.5 ... 12									
Reference temperature	°C	+23									
Nominal temperature range	°C	+10...+60									
Operating temperature range	°C	-10...+60									
Storage temperature range	°C	-50...+70									
Torsional stiffness approx.	kNm/rad	0.29	0.61	1.08	2.42	5.57	7.53	27.3	65		
Torsion angle at nominal torque, approx.	Deg.	1	0.9	1.1	1.1	1.0	1.5	1.0	0.9		
Mass moment of inertia	gm ²	0.04	0.04	0.04	0.04	0.04	0.04	0.28	0.44		
Maximum permissible rotation speed	min ⁻¹	4000									
Service life of brushes, approx.	Rev.	3 × 10 ⁸						6 × 10 ⁸			
Mechanical values (by reference to nominal torque)											
Static limit load	%	150					125		150		
Static ultimate load	%	300					200		300		
Lateral limit force on shaft ¹⁾	N	5	10	20	50	80	125	235	370		
Axial limit force on shaft ¹⁾	kN	0.35	0.7	2.0	3.5	5.5	8.8	16.4	25.9		
Bending limit moment on shaft ¹⁾	Nm	0.75	1.5	3	6	11	23	57	114		
Oscillation bandwidth to DIN 50100 (by ref. to nom. torque)	%	70 (peak-to-peak)									
Upper and lower limits		+M _N or -M _N									
Impact resistance, test severity level to DIN IEC68, Part 2-27; IEC 68-2-27-1987											
number of		1000									
Duration	ms	3									
Acceleration (half-sine)	m/s ²	500									
Vibration resistance, test severity level to DIN IEC 68, Part 2-6; IEC 68-2-27-1987											
Frequency range	Hz	5...65									
Duration	h	1.5									
Acceleration (amplitude)	m/s ²	50									
Weight, approx.	kg	0.4						1.8		2.4	
Degree of protection to DIN IEC 60529		IP50									
Rotation speed/angle of rotation measurement system											
Angle of rotation transducer with two output signals		90 pulses per revolution each offset by 1/4 period									
Tolerance of the slot width	mm	± 0.05									
Average optical diameter											
T4WA-S3/5 N m ... 200 N m	mm	approx. 31									
T4WA-S3/500 N m and 1 kN m	mm	approx. 53									
Output voltage (square wave)	V	5, TTL level									
Supply voltage	V _{DC}	4.8...5.2									
Maximum current consumption	mA	50									

¹⁾ Any irregular stress is only permissible up to the specified limits provided none of the other stresses occurring at the time can also reach that value. 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 axial limit force is permissible and nominal torque must not be exceeded. The permissible bending moments, axial forces and lateral forces can affect the measurement result by approx. 1 % of nominal torque.

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