

# T4A, T4WA-S3

## Torque/Screw Torque Transducer



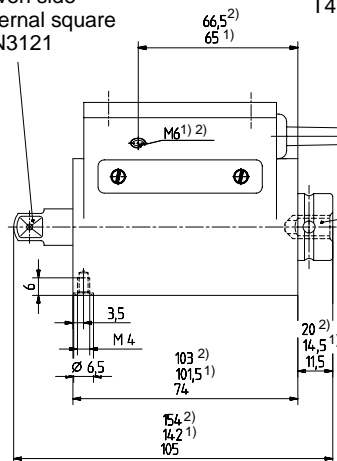
### Special features

- 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 <sup>2</sup>	0.04	0.04	0.04	0.04	0.04	0.04	0.28	0.44	
Maximum permissible rotation speed	min <sup>-1</sup>	4000								
Service life of brushes, approx.	Rev.	3 x 10 <sup>8</sup>						6 x 10 <sup>8</sup>		
Mechanical values (by reference to nominal torque)										
Static limit load	%	150				125			150	
Static ultimate load	%	300				200			300	
Lateral limit force on shaft <sup>1)</sup>	N	5	10	20	50	80	125	235	370	
Axial limit force on shaft <sup>1)</sup>	kN	0.35	0.7	2.0	3.5	5.5	8.8	16.4	25.9	
Bending limit moment on shaft <sup>1)</sup>	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 <sub>N</sub> or -M <sub>N</sub>								
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 <sup>2</sup>	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 <sup>2</sup>	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 <sub>DC</sub>	4.8...5.2								
Maximum current consumption	mA	50								

<sup>1)</sup> 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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