TN

Torque Transfer Standard

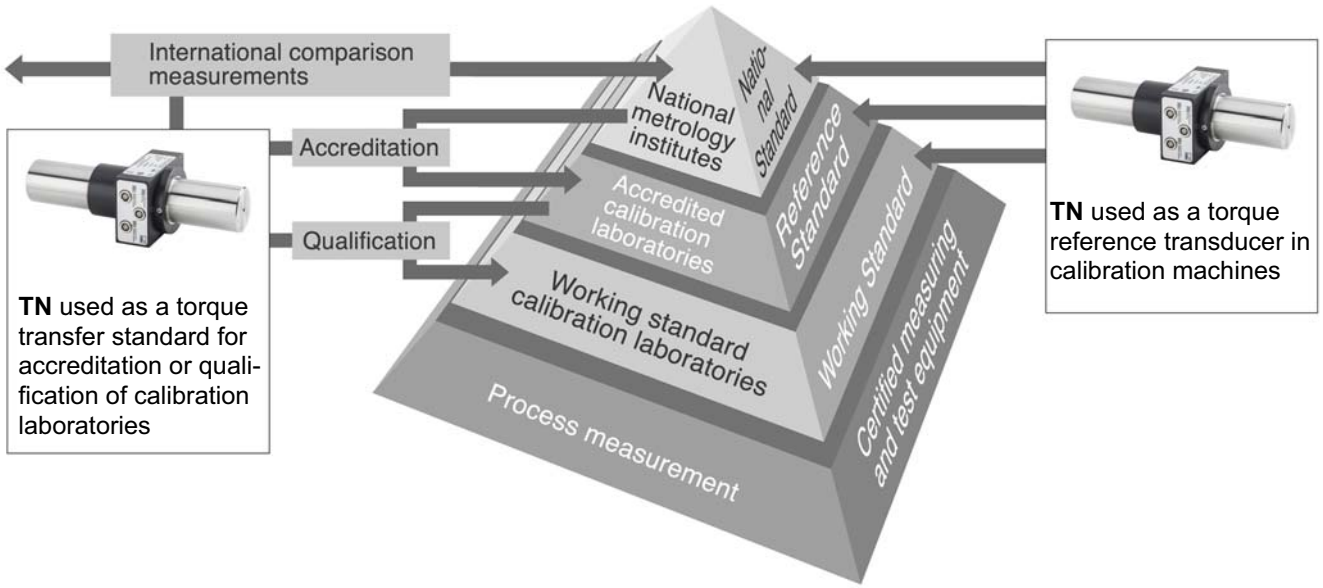
Data sheet

Special features

- **Nominal (rated) torques from 100 N·m to 20 kN·m**
- **Cylindrical shaft ends without keys, dimensions acc. to DIN 51309**
- **Class 0.05 acc. to DIN 51309 resp. (in conjunction with DakkS/DKD calibration certificate)**
- **Standard: Bending moment of auxiliary bridge Mbx and Mby [1)]**
- **Standard: Shipping case with sealing lip**

1) The Mbx and Mby bending moment measurement is designed to check the application of force. Can be used to check the mounting conditions and effective bending moments. See chapter 6.2 of the TN mounting instructions.

Fields of application



Specifications

Type		**TN**							
Accuracy class		0.02							
Nominal (rated) torque M_{nom}	N·m	**100**	**200**	**500**					
	kN·m				**1**	**2**	**5**	**10**	**20**
for reference only	ft-lb	**75**	**150**	**375**	**750**	**1,500**	**3,750**	**7,500**	**15,000**
Rated output (nominal)									
Bridge Md (spread between torque=zero and nominal (rated) torque)	mV/V	1.5 to 2.0							
Zero signal tolerance									
Bridge Md	mV/V	± 0.25							
Temperature effect per 10K in the nominal (rated) temperature range									
on the output signal, related to the actual value	%	≤ ± 0.02							
on the zero signal, related to the nominal (rated) sensitivity	%	≤ ± 0.01							
Linearity deviation including hysteresis, relative to the nominal (rated) sensitivity	%	≤ ± 0.02							
Relative standard deviation of repeatability acc. to DIN 1319, related to the variation of the output signal	%	≤ ± 0.01							
Input resistance at reference temperature	Ω	approx. 400							
Output resistance at reference temperature	Ω	approx. 350							
Reference excitation voltage	V	5							
Operating range of the excitation voltage	V	2.5 ... 12							
General data									
Immunity from interference (EN 61326-1:2013, Table 3)									
Electromagnetic field (AM)	V/m	1							
Electrostatic discharge (ESD)									
Contact	kV	4							
Air	kV	8							
Burst (rapid transients)	kV	0.5							
Line-related interference (AM)	V	1							
Degree of protection according to EN 60 529	-	IP20							
Reference temperature	°C [°F]	+23 [+73.4]							
Nominal (rated) temperature range	°C [°F]	+10...+30 [+50 ... +86]							
Operating temperature range	°C [°F]	+10...+40 [+50 ... +104]							
Storage temperature range	°C [°F]	+10...+40 [+50 ... +104]							
Electrical connection		Lemo® connector							
Weight (without cable), approx.	kg	3.8	3.8	4.0	4.2	8.8	11.5	32.5	36.5
Mechanical shock **test severity level as per DIN EN 60068-2-27:2010**									
Number of impacts	n	1000							
Duration	ms	3							
Acceleration (half-sine)	m/s^2	650							
Vibrational stress **test severity level as per DIN EN 60068-2-6:2008**									
Frequency range	Hz	5 - 65							
Duration	h	1.5							
Acceleration (amplitude)	m/s^2	50							
Load limits[2)]									
Limit torque, related to M_{nom}	%	130							
Breaking torque, related to M_{nom}	%	>300							
Axial limit force	kN	5	10	16	19	39	80	120	200
Lateral limit force	kN	1	2	4	5	9	12	18	26

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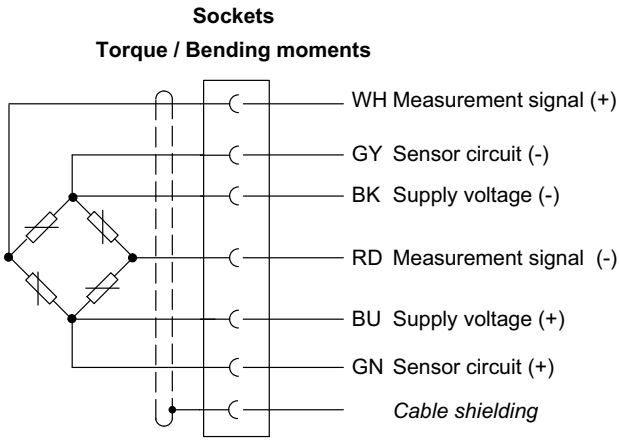
	kN·m				**1**	**2**	**5**	**10**	**20**
for reference only	ft-lb	**75**	**150**	**375**	**750**	**1,500**	**3,750**	**7,500**	**15,000**
Bending moment limit	N·m	50	100	200	220	560	800	1200	1800
Vibration bandwidth acc. to DIN 50100 (peak-to-peak)	%	200							
Mechanical data									
Torsional stiffness	kN·m/ rad	8	11	27	66	100	320	720	1640
Torsion angle at M_{nom}	degree	0.7	1.0	1.1	0.9	1.1	0.9	0.8	0.7

2) Each type of irregular stress (bending moment, lateral or axial force, exceeding the nominal torque) can only be permitted up to its specified 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 moment limit and the lateral limit force occur at the same time, only 40% of the axial limit force is permissible and the nominal (rated) torque must not be exceeded. The effects of 10% of the permissible bending moments, axial and lateral forces on the measurement result are ±0.02% of the nominal torque.

Classification as per DIN 51309 or EURAMET/cg-14			
Class as per DIN 51309	%	0.05	HBM TOP class
Relative zero error (zero signal return)	%	0.0125	0.004
Relative reversibility error vs. actual value	%	0.063 (0.4 M_{nom}–M_{nom})	0.04 (0.2 M_{nom}–M_{nom}) [0.06 (0.1 M_{nom}–M_{nom})]
Relative repeatability (reproducibility and repeatability errors in same installation positions)	%	0.025	0.005
Relative reproducibility (reproducibility and repeatability errors in different installation positions)	%	0.05	0.01
Relative deviation from the display/fitting curve	%	0.025	
Lower limit of measurement range	%	>4000 r	
Relative extended measurement uncertainty	%	0.01	

Cable assignment



Scope of supply

- 1x torque transfer standard TN including bending moment measuring bridges
- 1x mounting instructions
- 3x connection cables, 6 m, (LemoR connector on transducer side, with D-Sub-15-pole on amplifier side)
- 1x DAkkS (national accreditation body for the Federal Republic of Germany) calibration certificate as per DIN 51309
- 1x shipping case with sealing lip

Options

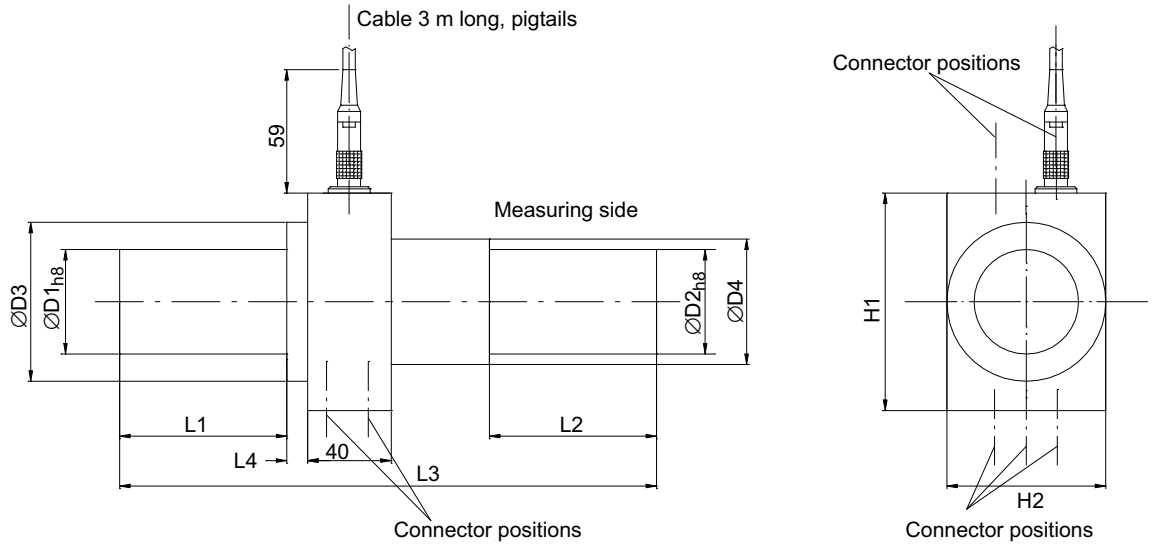
None

Accessories

MS 3106PEMV connector, fitted to cable
15-pin D connector, fitted to cable

Nominal (rated) torques 100 N·m ... 5 kN·m

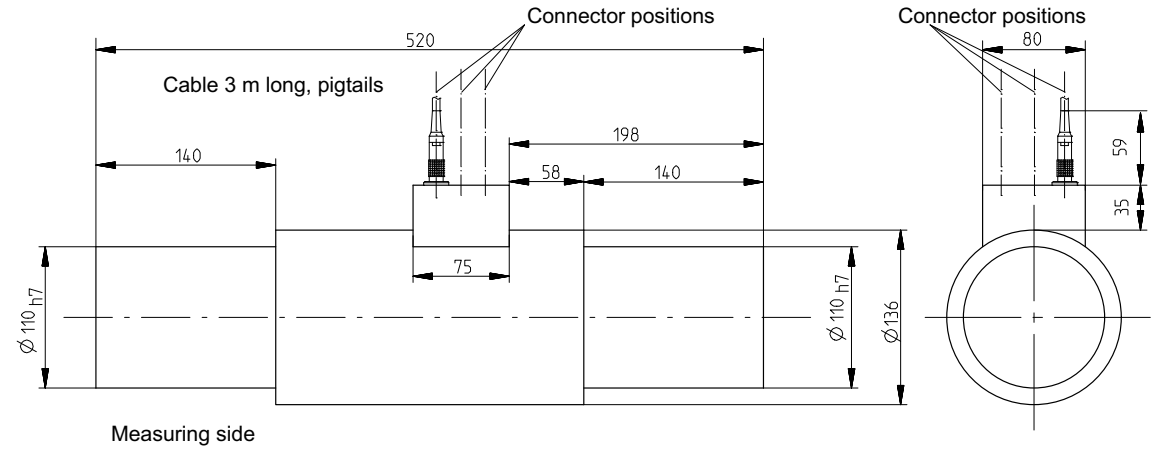
Dimensions in mm (1 mm = 0.03937 inches)



Nominal (rated) torque	D1	D2	D3	D4	L1	L2	L3	L4	H1	H2
100/ 200/ 500 N·m	50	50	76	60	80	80	257	10	104	76
1kN·m	50	50	76	60	80	80	257	10	104	76
2 kN·m	70	70	96	80	115	115	350	15	124	96
5 kN·m	70	70	96	80	115	115	396	15	124	96

Nominal (rated) torques 10 kN·m and 20 kN·m

Dimensions in mm (1 mm = 0.03937 inches)



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