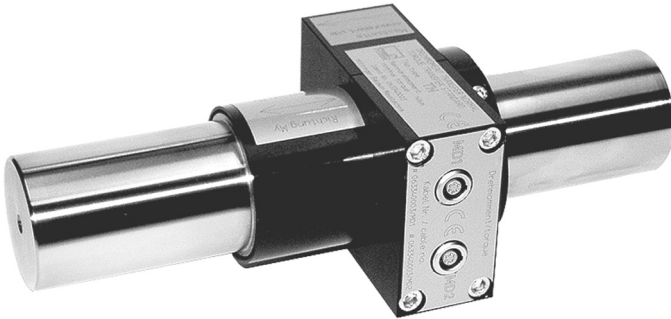


# TN

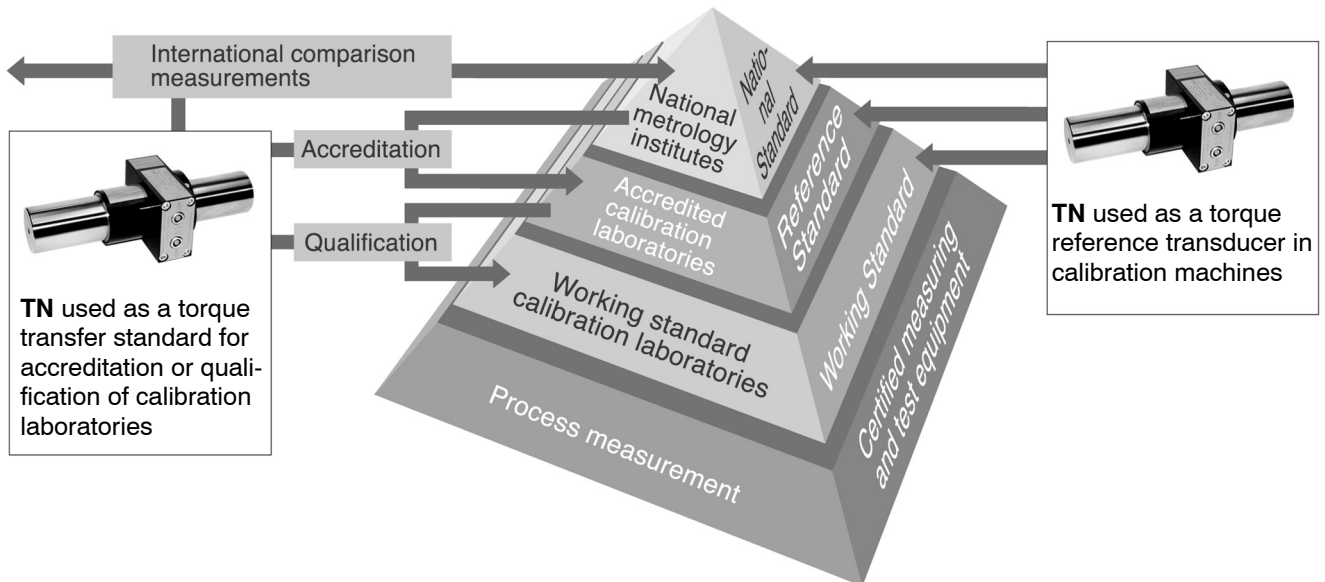
## Torque transfer standard



### Special features

- Nominal (rated) torques from 100 N·m to 20 kN·m
- Cylindrical shaft ends without keys, dimensions acc. to DIN 51309 and EA-10/14
- Class 0.05 acc. to DIN 51309 or EA-10/14 resp. (in conjunction with DKD calibration certificate)
- Options: TOP Transfer standard (enhanced accuracy); second torque measuring bridge; measuring point for bending moments; integrated temperature measurement

### Fields of application



## Specifications

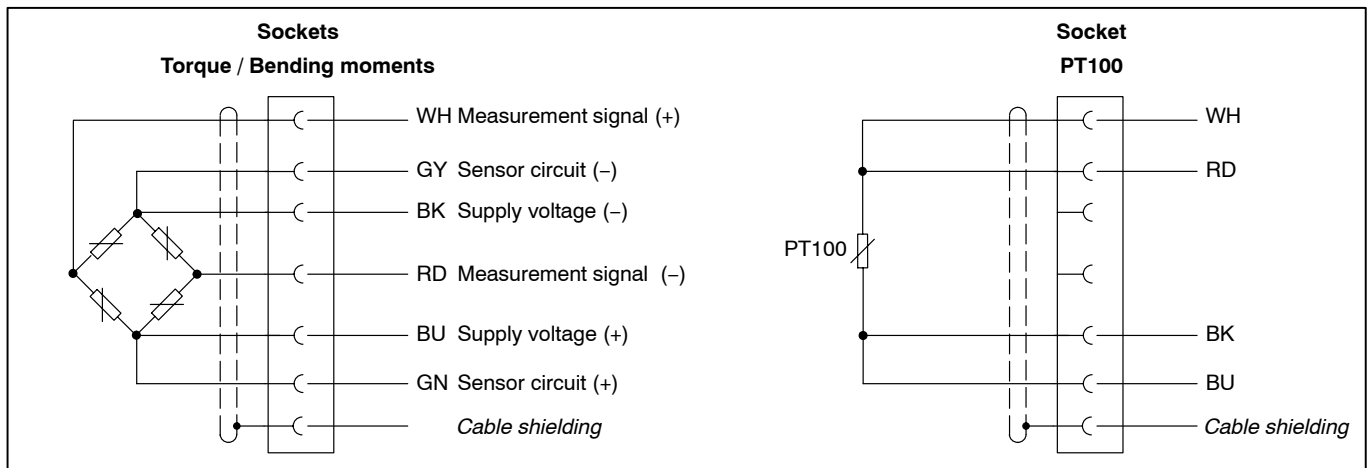
Type		TN								
<b>Accuracy class</b>		0.02								
<b>Nominal (rated) torque <math>M_{nom}</math></b>	N·m	100	200	500						
	kN·m				1	2	5	10	20	
for reference only	ft·lb	75	150	375	750	1,500	3,750	7,500	15,000	
<b>Sensitivity range</b>		mV/V 1.5 to 2.0								
<b>Zero signal tolerance</b>		mV/V $\pm 0.25$								
<b>Temperature effect per 10K in the nominal (rated) temperature range</b>										
on the output signal, related to the actual value	%	$\leq \pm 0.01$								
on the zero signal, related to the nominal (rated) sensitivity	%	$\leq \pm 0.01$								
<b>Linearity deviation including hysteresis</b> , relative to the nominal (rated) sensitivity		% $\leq \pm 0.02$								
<b>Relative standard deviation of repeatability</b> acc. to DIN 1319, related to the variation of the output signal		% $\leq \pm 0.01$								
<b>Input resistance</b> at reference temperature		$\Omega$ approx. 400								
<b>Output resistance</b> at reference temperature		$\Omega$ approx. 350								
<b>Reference excitation voltage</b>		V 5								
<b>Operating range of the excitation voltage</b>		V 2.5 ... 12								
<b>General data</b>										
<b>EMC</b>										
<b>Emission</b> acc. to EN 61326-1, Table 4 RFI field strength		Class B								
<b>Immunity from interference</b> (EN 61326-1, Table A.1)										
Electromagnetic field (AM)	V/m	10								
Magnetic field	A/m	100								
Electrostatic discharge (ESD)										
Contact	kV	4								
Air	kV	8								
Burst (rapid transients)	kV	2								
Surge (impulse voltages)	kV	1								
Line-related interference (AM)	V	10								
<b>Degree of protection according to EN 60 529</b>		- IP20								
<b>Reference temperature</b>		$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ] +22 [+71.6]								
<b>Nominal (rated) temperature range</b>		$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ] +10...+30 [+50 ... +86]								
<b>Operating temperature range</b>		$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ] +10...+40 [+50 ... +104]								
<b>Storage temperature range</b>		$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ] +10...+40 [+50 ... +104]								
<b>Electrical connection</b>		Lemo <sup>®</sup> connector								
<b>Weight, approx.</b>		kg	3.8	3.8	4.0	4.2	8.8	11.5	32.5	36.5
<b>Impact resistance, test severity level to IEC 68, part 2-27; IEC 68-2-27-1987</b>										
Number of impacts	n	1000								
Duration	ms	3								
Acceleration (half-sine)	m/s <sup>2</sup>	650								
<b>Vibration resistance, test severity level to 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>Load limits</b>										
<b>Limit torque</b> , related to $M_{nom}$		% 130								
<b>Breaking torque</b> , related to $M_{nom}$		% >300								
<b>Vibration bandwidth</b> acc. to DIN 50100 (peak-to-peak)		% 200								

## Specifications

Mechanical data									
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
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

Supplementary information according to DIN 51309 or EA-10/14			
Class according to DIN 51309 or EA-10/14		0.05	TOP Transfer standard (for torque measuring bridge 1)
Relative zero error (zero signal return)	%	$\leq 0.0125$	$\leq 0.004$
Relative reproducibility and repeatability error ( $0.2 \cdot M_{nom}$ to $M_{nom}$ )	without rotation	$\leq 0.025$	$\leq 0.005$
	with rotation	$\leq 0.05$	$\leq 0.01$
Relative interpolation error	%	$\leq \pm 0.025$	$\leq \pm 0.025$
Relative reversibility error ( $0.2 \cdot M_{nom}$ to $M_{nom}$ )	%	$\leq 0.063$	$\leq 0.04$

## Cable assignment



## Scope of supply:

TN Torque Transfer Standard

Connection cable, 3m, (Lemo® connector on transducer side, pigtails on amplifier side)

Test report

## Options:

Temperature measurement (PT100)

Second torque measuring bridge

Measuring bridges for bending moment (x and y direction)

Enhanced accuracy (TOP Transfer standard; only in conjunction with a DKD calibration)

## Accessories:

Transport case (for TN with nominal (rated) torques from 100 N·m to 1 kN·m)

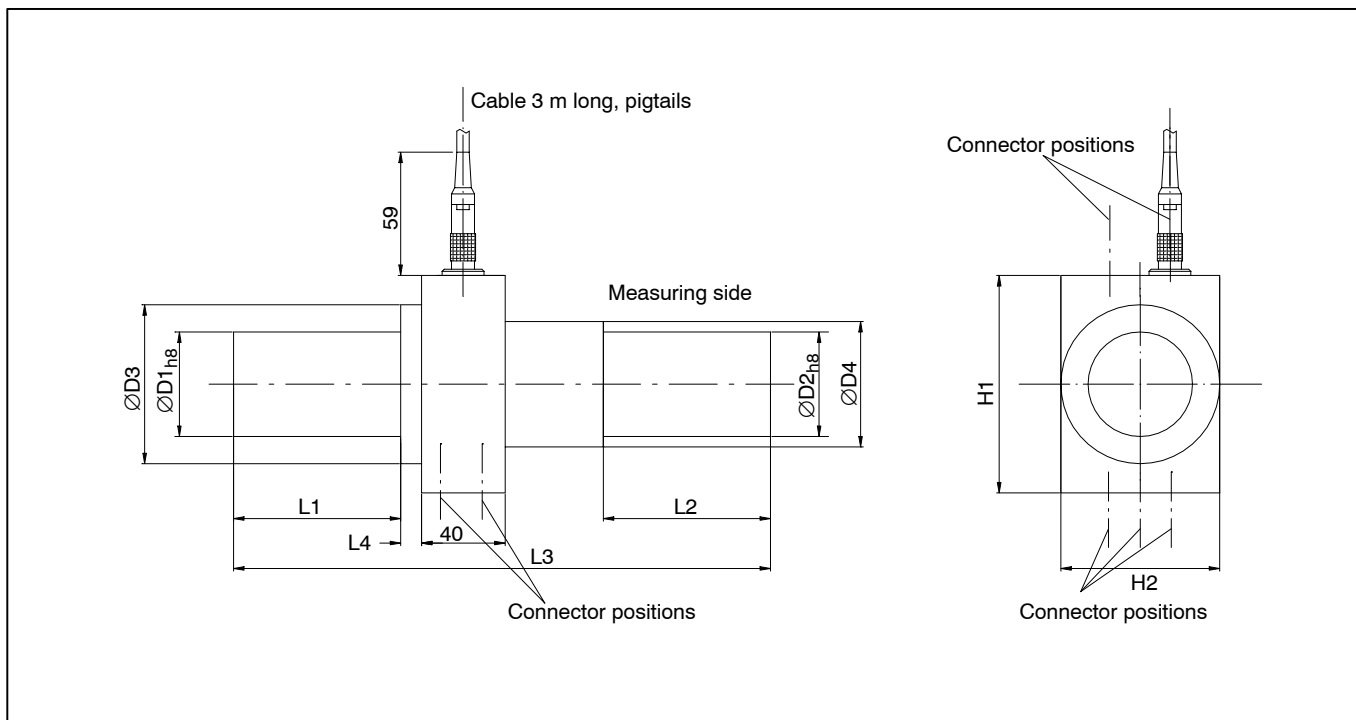
Transport box (for TN with nominal (rated) torques from 2 kN·m to 20 kN·m)

MS 3106PEMV connector, fitted to cable

15-pin D connector, fitted to cable

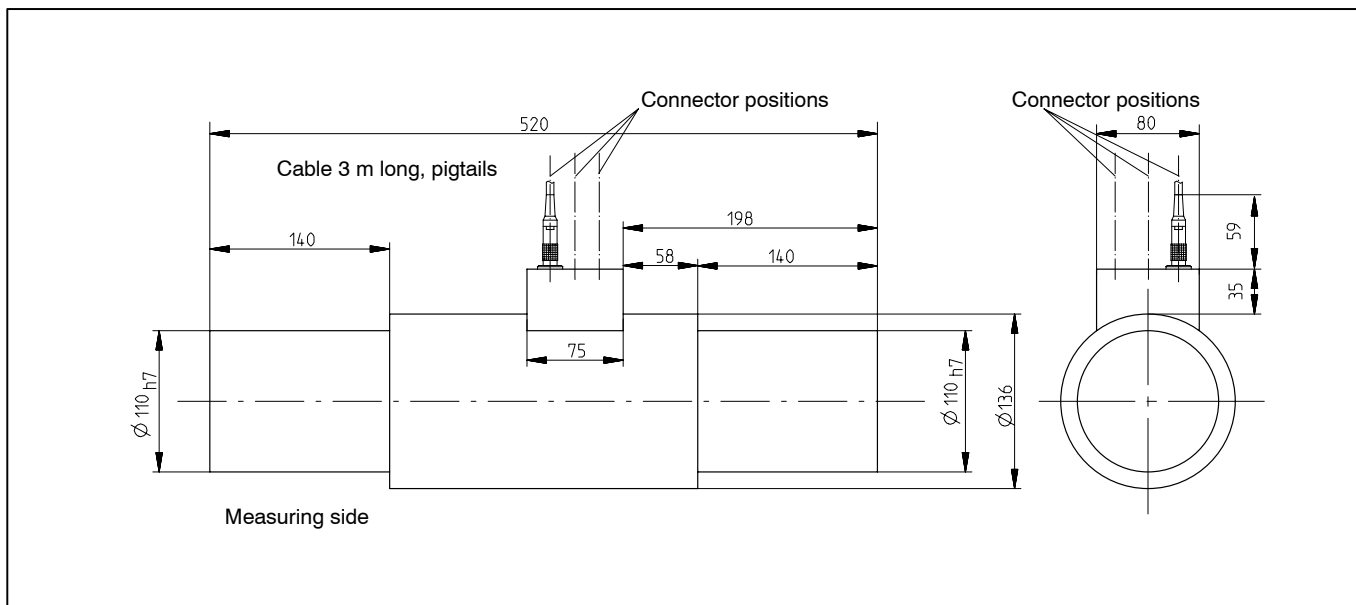
DKD calibration certificate according to DIN 51309 or EA-10/4

**Dimensions in mm (1 mm = 0.03937 inches); nominal (rated) torques 100 N·m ... 5 kN·m**



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
1 kN·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

**Dimensions in mm; nominal (rated) torques 10 kN·m and 20 kN·m**



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