

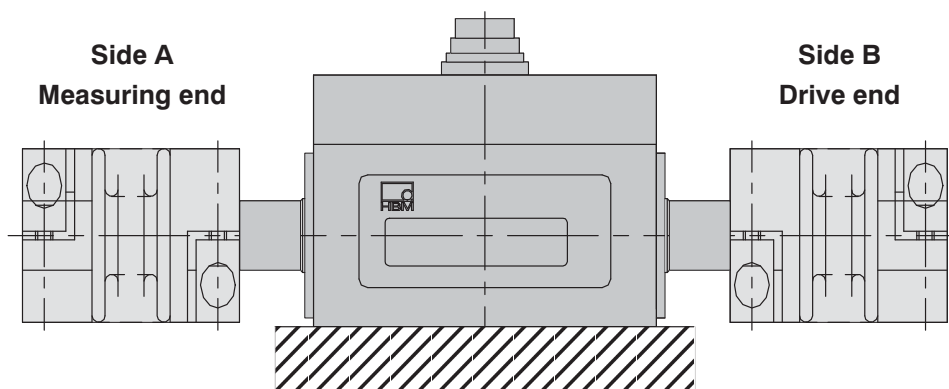
T20WN

Torque Transducers



Special features

- Nominal (rated) torques:
0.1 N·m, 0.2 N·m, 0.5 N·m, 1 N·m,
2 N·m, 5 N·m, 10 N·m, 20 N·m,
50 N·m, 100 N·m, 200 N·m
- Accuracy class: 0.2
- Contactless transmission of the
measurement signal
- Measurement on rotating and
stationary parts
- Cylindrical shaft ends for non-
play friction joints
- Integrated measuring system for
speed and angle of rotation
- Torque output signal: ± 10 V



This example requires two of the couplings offered

Specifications T20WN

Type	T20WN												
Accuracy class	0.2												
Torque measuring system													
Nominal (rated) torque M_{nom} for reference only	N·m	0.1	0.2	0.5	1	2	5	10	20	50	100	200	
	ft·lb	0.075	0.15	0.375	0.75	1.5	3.75	7.5	15	37.5	75	150	
Nominal (rated) sensitivity (nominal (rated) signal range between torque = zero and nominal (rated) torque)	V	10											
Characteristic tolerance (deviation of the actual output quantity at M_{nom} from the nominal (rated) signal range)	%	± 0.2											
Output signal at torque = zero	V	0 ± 0.2											
Nominal (rated) output signal with positive nominal (rated) torque	V	+10											
	V	-10											
Load resistance	MΩ	> 1											
Long-term drift over 48 h	mV	< ± 50											
Cut-off frequency (-3 dB)	Hz	200											
Residual ripple	mV _{PP}	< 80											
Group delay time	ms	< 1,0											
Temperature influence per 10 K in the nominal (rated) temperature range on the output signal, related to the actual value of signal span	%	± 0.1											
	%	± 0.2											
Power supply Nominal (rated) excitation voltage (separated extra-low voltage)	V (DC)	12 (10.8...13.2)											
	V	5...13.2											
	A	< 0.2											
	W	< 2.4											
	mV _{PP}	200											
Characteristic curve deviation related to the nominal (rated) sensitivity	%	< ± 0.1											
Variability, related to the change in output signal	%	< ± 0.05											
Calibration signal	V	+10 ± 0.2%											
Measuring system for speed/angle of rotation													
Measuring system	Optical												
Pulses per revolution	Number	360											
Output signal	V	5 (asymmetrical); two square wave signals 90° phase shifted											
Minimum speed for sufficient pulse stability	rpm	0											
Load resistance	kΩ	> 10											
Group delay time	μs	< 3											
Maximum measurable speed	rpm	3000											
General data													
EMC													
EMI (Immunity) (EN50082-2)	RF enclosure	V/m	10										
	RF common mode	V _{PP}	10										
	Magnetic field	A/m	100										
	Burst	kV	2/1										
	DSE	kV	4/8										

Specifications T20WN

EME (Emission) (EN55011) RFI-Voltage Field strength		Class B Class B										
Degree of protection according to EN 60 529		IP40										
Weight, approx.	kg	0.17					0.34			0.6		
Nominal (rated) torque M_{nom} for reference only	N·m ft·lb	0.1 0.075	0.2 0.15	0.5 0.375	1 0.75	2 1.5	5 3.75	10 7.5	20 15	50 37.5	100 75	200 150
Nominal (rated) temperature range	°C [°F]	+5 [41]...+45 [113]										
Service temperature range	°C [°F]	0 [32]...+60 [140]										
Storage temperature range	°C [°F]	-5 [23]...+70 [158]										
Impact resistance, test severity level to IEC 68; part 2-27; IEC 68-2-27-1987 Number of impacts Duration Acceleration (half-sine)	n ms m/s ²	1000 3 650										
Vibration resistance, test severity level to IEC 68, part 2-6; IEC 68-2-6-1982 Frequency range Duration Acceleration (amplitude)	Hz h m/s ²	5...65 1.5 50										
Nominal (rated) speed	rpm	10 000										
Load limits ¹⁾ Limit torque, related to M_{nom} Breaking torque, related to M_{nom} Axial limit force Lateral limit force Bending limit moment Oscillation bandwidth according to DIN 50100 (peak-to-peak) ³⁾	% % kN N Nm %	200 ²⁾ > 280 0.2 0.2 0.2 0.34 0.5 1.1 1.75 2.75 5.3 7.6 12.5 3.6 3.6 3.6 5.7 8.3 18.2 29 46 88 127 207 0.12 0.12 0.12 0.23 0.4 0.93 1.9 3.7 10 17 36 80										
Mechanical values												
Torsional stiffness C_T	kN·m / rad	0.03	0.03	0.03	0.05	0.07	0.91	1.9	3.25	14	21.9	32.6
Torsion angle at M_{nom}	degree	0.2	0.38	0.96	1.1	1.7	0.32	0.3	0.35	0.2	0.26	0.35
Max. limits for relative shaft vibration (peak-to-peak) ⁴⁾	µm	$s_{max} = \frac{4500}{\sqrt{n}}$										
Rms value for the vibration velocity of the housing according to VDI 2056	mm/s	$v_{eff} = \frac{\sqrt{n}}{3}$										
Mass moment of inertia of the rotor (around the axis of rotation) with speed measuring system ($\times 10^{-3}$)	gm ²	0.06	0.06	0.06	0.063	0.068	6.1	6.13	6.23	53.7	54.6	57.2
Balance quality-level per DIN ISO 1940	-	G 6.3										

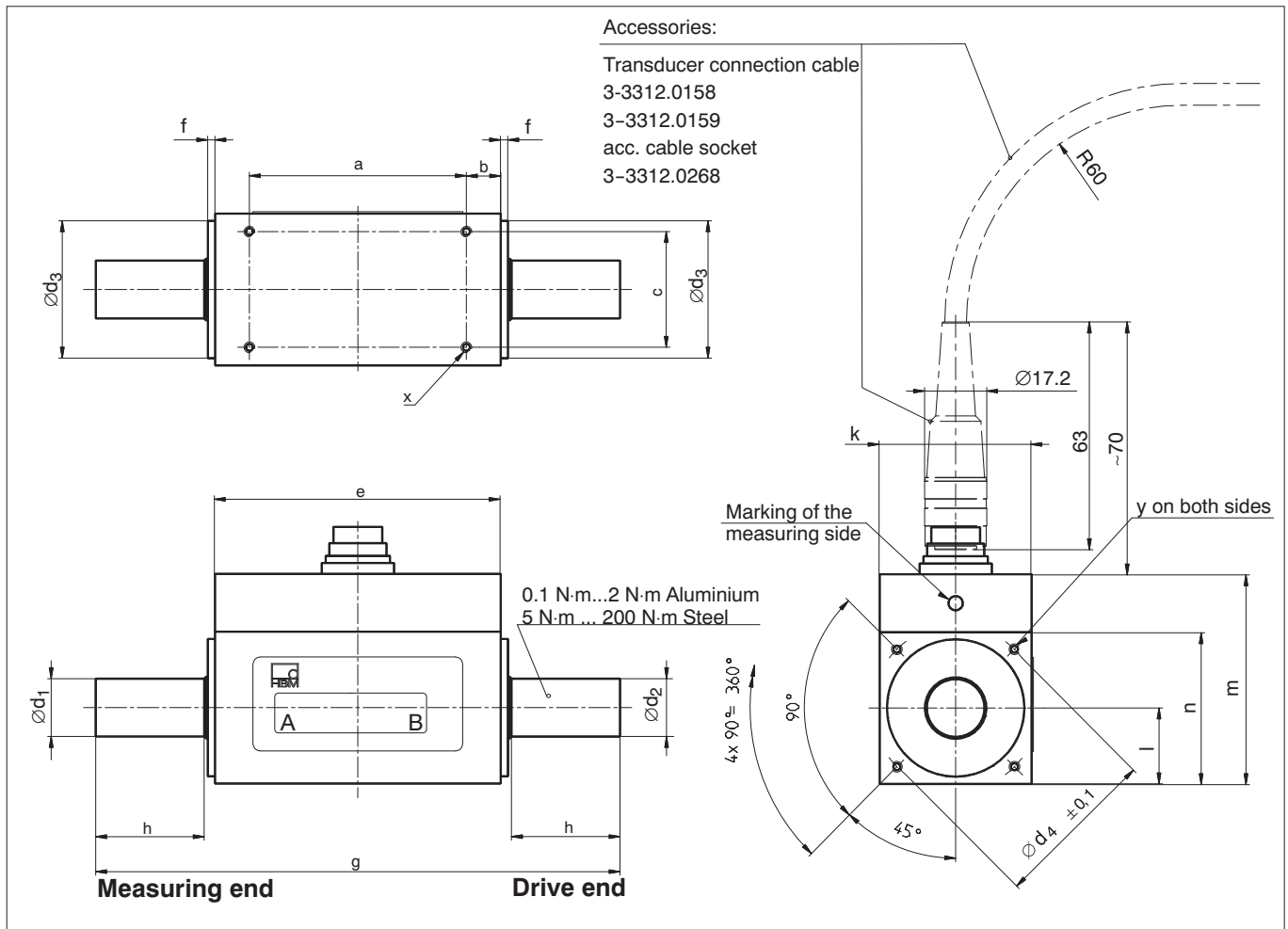
¹⁾ Each type of irregular stress can only be permitted with its given statistic load limit values (bending moment, lateral or axial load, exceeding the nominal (rated) torque) if none of the others can occur. Otherwise the limit values must be reduced. If for instance 30 % of the bending limit moment and also 30 % of the lateral limit force are present, only 40 % of the axial limit force are permitted, provided that the nominal (rated) torque is not exceeded. With the permitted bending moments, axial and lateral limit forces, measuring errors of about 1 % of the nominal (rated) torque can occur.

²⁾ Please observe the coupling's maximum torque (T_{Kmax}).

³⁾ The nominal (rated) torque must not be exceeded.

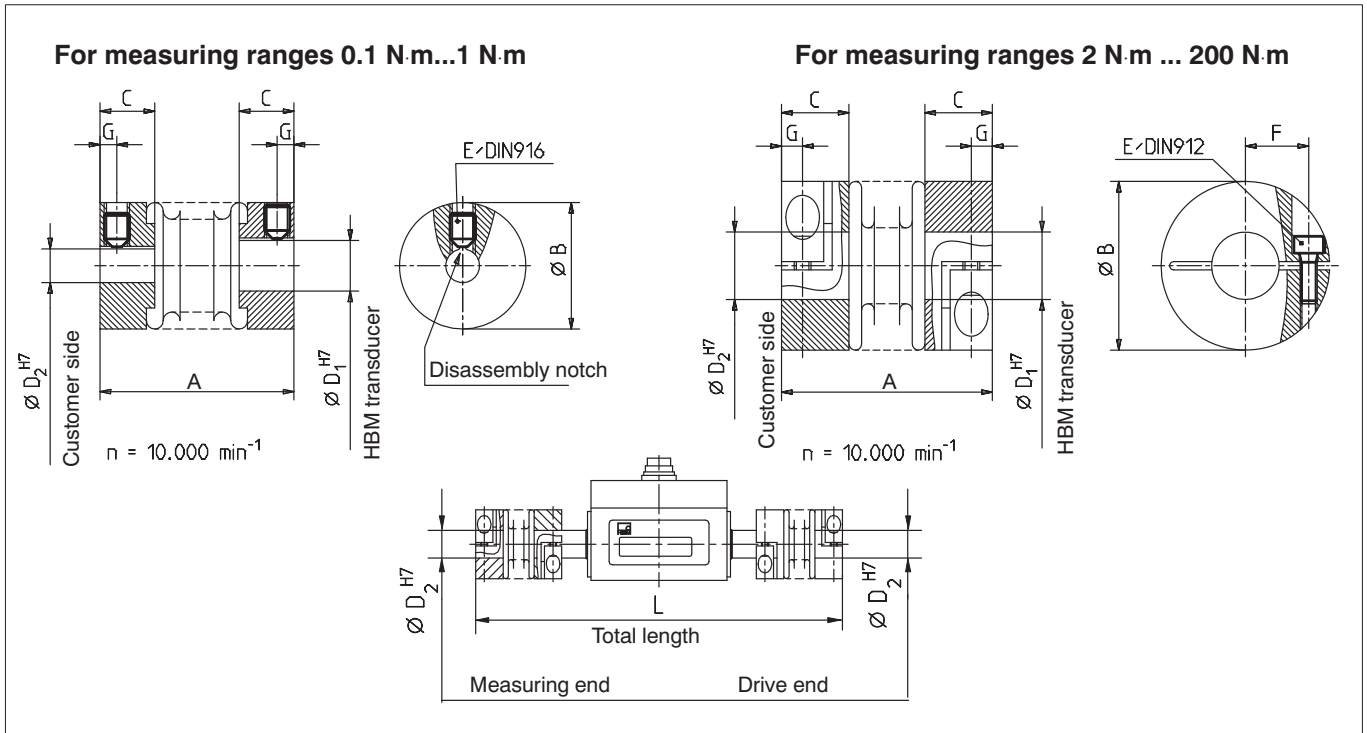
⁴⁾ Relative undulations within the range of the adapter flange in accordance with DIN 45670/VDI 2059.

Dimensions T20WN



Measuring range (N·m)	Dimensions in mm																
	a	b	c	$e_{\pm 1}$	f	g	h	$k_{\pm 1}$	l	$m_{\pm 1}$	n	$\varnothing d_1 \text{ g6}$	$\varnothing d_2 \text{ g6}$	$\varnothing d_3 -0.1$	$\varnothing d_4 \pm 0.1$	y	x
0.1	40	11	22	62	2	95	14	28	14	48.5	30	6	8	27	32	M3/6 depth	M3/5 depth
0.2	40	11	22	62	2	95	14	28	14	48.5	30	6	8	27	32	M3/6 depth	M3/5 depth
0.5	40	11	22	62	2	95	14	28	14	48.5	30	6	8	27	32	M3/6 depth	M3/5 depth
1	40	11	22	62	2	95	14	28	14	48.5	30	6	8	27	32	M3/6 depth	M3/5 depth
2	40	11	22	62	2	95	14	28	14	48.5	30	6	8	27	32	M3/6 depth	M3/5 depth
5	60	9.5	32	79	2	145	30	42	21	58	42	16	16	38	46	M3/6 depth	M3/6 depth
10	60	9.5	32	79	2	145	30	42	21	58	42	16	16	38	46	M3/6 depth	M3/6 depth
20	60	9.5	32	79	2	145	30	42	21	58	42	16	16	38	46	M3/6 depth	M3/6 depth
50	42	15	40	72	3	170	45	56	28	73	56	26	26	54	65	M4/8 depth	M4/8 depth
100	42	15	40	72	3	170	45	56	28	73	56	26	26	54	65	M4/8 depth	M4/8 depth
200	42	15	40	72	3	170	45	56	28	73	56	26	26	54	65	M4/8 depth	M4/8 depth

Bellow couplings



Dimensions

Measuring range [N·m]	Parts-No.	Dimensions in mm									
		A	ØB	C	ØD_1		ØD_2	E	F	G	L
					Measuring end T20WN	Drive end T20WN	variable from - to				
0.1	3-4412.0001	23 ₋₁	15	6.5	6	8	3-9	M3	-	2	128
0.2											
0.5											
1	3-4412.0002	25 ₋₁	15	6.5	6	8	3-9	M3	-	2	132
2	3-4412.0003	40 ₋₁	25	13	6	8	3-12.7	M3	8	4	149
5	3-4412.0004	50 ₋₁	40	16	16	16	5-22	M4	15	5	213
10											
20	3-4412.0005	69 ₋₂	56	21	16	16	10-32	M6	19	7.5	241
50	3-4412.0006	80 ₋₂	66	23.5	26	26	12-32	M8	23	9.5	283
100	3-4412.0007	93 ₋₂	82	28	26	26	19-40	M10	27	11	300
200	3-4412.0008	109 ₋₂	110	35	26	26	24-56	M12	39	13	318

Please specify upon order: D_2 connecting holes as specified by customer within the stated limits; H7 boring tolerance.

By using only **one** bellow coupling, please indicate the construction side of the coupling:

Measuring end = 6 mm / Drive end = 8 mm

Specifications

Measuring range [N·m]	Coupling torque maximum T_{Kmax} [N·m]	Mass moment of inertia [kg·cm ²]	Weight [g]	Torsional stiffness [kNm/rad]	Max. permitted misalignment			Spring stiffness		Material of coupling hub and fastening ring	Tightening torque of clamping screws [N·m]
					axial [mm]	radial [mm]	angular [deg]	axial [N/mm]	radial [N/mm]		
0.1	0.5	0.012	6	0.21	0.5	0.2	1.5	13.4	47.7	Aluminium	0.35
0.2											
0.5											
1	1	0.018	7	0.38	0.5	0.2	1.5	27.4	84.3		0.75
2											
5	10	1.6	120	9.05	1	0.2	1.5	33.3	389		1.5
10											
20											
50	60	2.0	400	72	1.5	0.15	1.5	67	679		35
100											
200	300	40	3800	157	2	0.15	1.5	124	2940	Steel	120

General notes

- Install the shafts in the coupling hubs before fastening the couplings' clamping screws!
- Do not stretch the bellow couplings beyond the specified permissible elasticities.
- The input and output shafts must be free from grease and burrs.
- The shaft diameters should be made with a j6 tolerance to obtain the H7/j6 preference fit.

Mounting position

The T20WN Torque Transducer with bellow couplings can be used in any mounting position (horizontal, vertical or oblique). With vertical or oblique operation, please ensure that additional masses are sufficiently supported.

Equipment as supplied

The couplings and the torque transducer are delivered separately ex-works.

Accessories T20WN, to be ordered separately

Connection cable, 5 m long, order no. 3-3301.0158

Connection cable, 10 m long, order no. 3-3301.0159

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

Terminal box, order no. 1-VK20A

Bellows couplings

Regional Distributor



803, Riqqa Palace Building
Al-Maktum Ave.
P.O.Box 181802 Dubai, UAE
Tel: +9714 - 2270081
Fax: +9714 - 2239962
E-mail: rcsco@eim.ae
www.rcs-co.com

Hottinger Baldwin Messtechnik GmbH

Im Tiefen See 45, D-64293 Darmstadt, Germany
Tel.: +49 6151 8030; Fax: +49 6151 803 9100
E-mail: support@hbm.com www.hbm.com



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