

# T32FNA

## Torque Transducers



### Special features

- Torque measurement without effects from bearings
- Brushless transfer of measured signals
- Measurement of rapidly changing (dynamic) and constant torques
- Measurement with correct polarity of positive and negative torque
- Nominal (rated) speed from 11000 min<sup>-1</sup> up to 20000 min<sup>-1</sup>
- Nominal (rated) torque from 50 N·m up to 25 kN·m
- Can handle power up to 28.8 MW (39000PS)

### Type-Survey

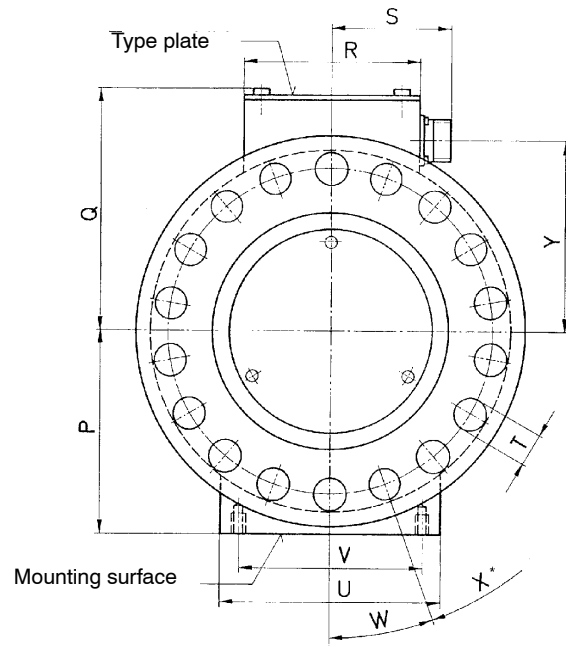
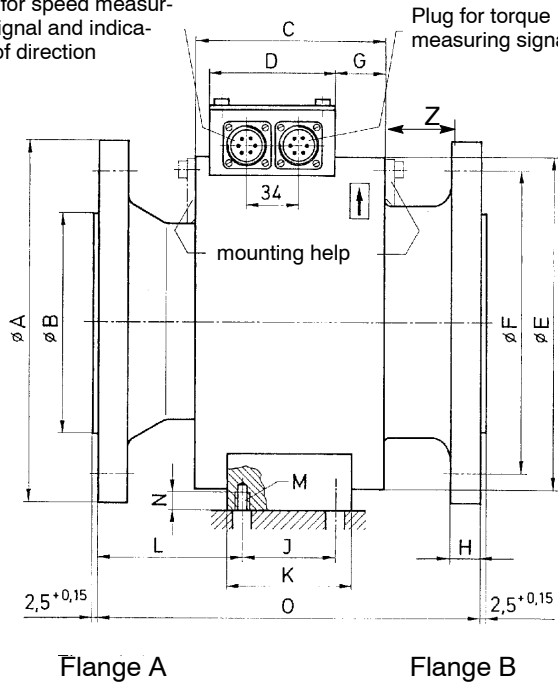
Type (Ordering designation)	Nominal (rated) torque	Nominal (rated) speed
T32FNA/50 N·m	50 N·m	20 000 min <sup>-1</sup>
T32FNA/100 N·m	100 N·m	20 000 min <sup>-1</sup>
T32FNA/200 N·m	200 N·m	20 000 min <sup>-1</sup>
T32FNA/500 N·m	500 N·m	15 000 min <sup>-1</sup>
T32FNA/1 kN·m	1 kN·m	15 000 min <sup>-1</sup>
T32FNA/2 kN·m	2 kN·m	15 000 min <sup>-1</sup>
T32FNA/10 kN·m	10 kN·m	11 000 min <sup>-1</sup>
T32FNA/25 kN·m	25 kN·m	11 000 min <sup>-1</sup>

**Dimensions** (in mm; 1 mm = 0.03937 inches)

**T32FNA / 50 n·m ... 25 kN·m**

Plug for speed measuring signal and indication of direction

Plug for torque measuring signal



\* Permissible deviation of pitch ± 5'

Dimensions without tolerances to DIN 7168-m

**T32FNA 50 N·m ... 200 N·m**

A	B	C	D	E	F	G	H	J	K	L	M	N
90	60 <sub>-0,005</sub>	84	70	107	72 <sub>±0,1</sub>	6	8.5	15	38	76	M5	8
O	P	Q	R	S	T	U	V	W	X	Y	Z	
161.5 <sub>-0,5</sub>	66.5 <sub>-0,2</sub>	87.5	105	69	6.4 <sup>H12</sup>	70	30	45°	8x45°	58.8	28	

**T32FNA 500 N·m ... 2 kN·m**

A	B	C	D	E	F	G	H	J	K	L	M	N
157	100 <sub>-0,005</sub>	102	80	124	130 <sub>±0,1</sub>	17	13	22	38	90.5	M8	12
O	P	Q	R	S	T	U	V	W	X	Y	Z	
171.5 <sub>-0,5</sub>	75 <sub>-0,2</sub>	96	105	69	10.5 <sup>H12</sup>	70	54	24°	15x24°	67	17	

**T32FNA 5 k·Nm ... 25 kN·m**

A	B	C	D	E	F	G	H	J	K	L	M	N
235	140 <sub>-0,005</sub>	122	80	216	196 <sub>±0,1</sub>	33.5	18.5	60	80	90	M8	14
O	P	Q	R	S	T	U	V	W	X	Y	Z	
244.6 <sub>-0,5</sub>	123 <sub>-0,2</sub>	140.8	105	69	17 <sup>H12</sup>	130	110	20°	18x20°	113	42.6	

## Specifications

Type		T32FNA							
Accuracy class		0.3	0.2				0.1		
<b>Torque measuring system</b>									
<b>Nominal (rated) torque <math>M_N</math></b>	N·m	50	100	200	500	1 k	2 k	10 k	25 k
<b>Nominal (rated) sensitivity</b> (nominal (rated) signal range between torque = zero and nominal (rated) torque)	kHz	5							
<b>Sensitivity tolerance</b> (deviation of the actual frequency range from the nominal (rated) signal range at $M_N$ )	%	< ±0.1							
<b>Output frequency</b> at torque = zero	kHz	10							
<b>Nominal (rated) output frequency</b> with positive $M_N$	kHz	15 (12 V peak-to-peak)							
with negative $M_N$	kHz	5 (12 V peak-to-peak)							
<b>Load resistance</b>	kΩ	≥2							
<b>Temperature deviation</b> per 10K at nominal (rated) temperature range of									
<b>output signal</b> (related to the actual value of signal span)	%	< ±0.1							
<b>zero signal</b> (related to the nominal (rated) sensitivity)	%	< ±0.1				< ±0.05			
<b>Excitation voltage</b>									
Square wave voltage (peak-to-peak)	V	54 ± 5 %							
Current consumption	mA	800 ± 5 %							
Release of calibration signal	V	80 ± 5 %							
Current consumption	mA	1000 ± 5 %							
Frequency	kHz	approx. 15							
<b>Excitation voltage for the preamplifier</b>	V	-15/0/+15							
<b>Preamplifier, max. current consumption</b>	mA	-20/0/+20							
<b>Calibration signal</b> , value given on name plate	-	approx. 50 % from $M_N$							
<b>Tolerance of calibration signal</b> , related to $M_N$	%	< ±0.05							
<b>Linearity deviation including hysteresis</b> , related to nominal (rated) sensitivity	%	< ±0.3		< ±0.2		< ±0.1			
<b>Rel. standard deviation of the reproducibility</b> accord. to DIN 1319, rel. to variation of the output signal	%	< ±0.03							
<b>Speed measuring system</b>									
<b>Nominal (rated) speed</b>	min <sup>-1</sup>	20000		15000			11000		
<b>Output signal</b> , pulse voltage (peak-to-peak)	V	25							
<b>Load resistance</b>	kΩ	≥5							
<b>Minimum speed</b> to achieve sufficient pulse quality	min <sup>-1</sup>	2							
<b>General information on the torque transducers</b>									
<b>Protection class</b> , according to EN 60529		IP 54							
<b>Weight</b> , Rotor	kg	2.5		7.1	7.2	7.3	31.6	32	
Stator	kg	2.8		3.0			11.0		
<b>Nominal (rated) temperature range</b>	°C [°F]	+10 ... +60 [+50 ... +140]							
<b>Service temperature range</b>	°C [°F]	-10 ... +60 [-15 ... +140]							
<b>Storage temperature range</b>	°C [°F]	-50 ... +70 [-60 ... +160]							
<b>Additional reliability data</b>									
<b>Mechanical shock</b> , degree of precision to DIN IEC 68, part 2-27; IEC 68-2-27-1987									
Number	n	1000							
Duration	ms	3							
Acceleration	m/s <sup>2</sup>	500							
<b>Vibration stress test</b> , degree of precision to DIN IEC 68 part 2-6; IEC 68-2-6-1982									
Frequency range	Hz	5 ... 65							
Duration	h	1.5							
Acceleration	m/s <sup>2</sup>	50							

## Specifications (continued)

Mechanical values									
<b>Nominal (rated) torque <math>M_N</math></b>	N · m	50	100	200	500	1 k	2 k	10 k	25 k
<b>Torsional stiffness <math>C_T</math></b>	kNm/ rad	10.5	19.5	34.3	142	242	369	2910	6480
<b>Torsion angle at <math>M_N</math></b>	grad	0.27	0.29	0.33	0.20	0.24	0.31	0.19	0.22
<b>Mass moment of inertia</b>	gm <sup>2</sup>		1.85			16		149	154
<b>Balance quality-level to DIN ISO 1940</b>		G 2.5							
<b>Max. limits for relative shaft vibration* (peak-to-peak)</b>	μ m	$s_{max} = \frac{4500}{\sqrt{n}}$							
<b>Max. limits</b>	mm	± 2.5							
<b>Max.</b>	mm	± 3							
<b>Mechanical limit values**</b>									
Limit torque, related to $M_N$	%	150							
Breaking torque, related to $M_N$	%	>300							
Lateral limit force on the rotor	N	50	100	190	410	1.1 k	1.6 k	5.7 k	14 k
Axial limit force on the rotor	kN	1.3	2.5	5	7	14	27	100	200
Bending limit moment on the rotor	N · m	6	12	23	60	115	230	1.15 k	2.8 k
Vibration amplitude to DIN 50 100 (peak-to-peak)	N · m	35	70	140	350	700	1.4 k	7 k	17.5 k

\*  $s_{max}$  in the flange area of T30 FNA is defined in accordance with DIN 45 670 or VDI 2059

\*\* Each type of irregular stress can only be permitted with its given limit value (bending moment, side load or axial load, exceeding the nominal (rated) speed) if none of the others can occur. Otherwise the limit values must be reduced. If for instance 30 % of the bending moment and also 30 % of the side load are present, only 40 % of the axial load are permitted, provided that the nominal (rated) torque is not exceeded. With maximum additional loading, measuring errors of the order of 1 % of the nominal (rated) torque can occur.

## Accessories, to be ordered separately

Connecting cable	Length [m]	Lead connection
Kab 139A-6	6	Binder 423 - free ends (Greenline)
<b>Cable extension</b>		
Kab 0304A-10	10	7-pole socket - 7-pole plug (Greenline)
Kab 8/00-2/2/2	min. 10	Cut to length

## Couplings

HBM offers Renck-curved-tooth couplings® for mounting.

Dimensions and specifications can be found in separate brochure which are available on request.

GLB up to 20 000min<sup>-1</sup> (depends on the nominal (rated) speed)

SBG up to 3 000min<sup>-1</sup>

Also, couplings from Rexnord of Dortmund are matched to HBM torque transducers.

Modifications reserved.  
All details describe our products in general form only. They are not to be understood as express warranty and do not constitute any liability whatsoever.

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