

5. HIWIN rotary tables TMN

5.1 Characteristics of the TMN rotary tables

The particularly flat and light precision rotary tables of the TMN series are suited to all applications in which high rigidity and accuracy are needed along with the smallest dimensions possible. Typical areas of use include the manufacture of LEDs, solar cells and semiconductors. The zero-maintenance TMN rotary tables use precision bearings and optical encoders to achieve very high positioning and repeat accuracy.

Key features:

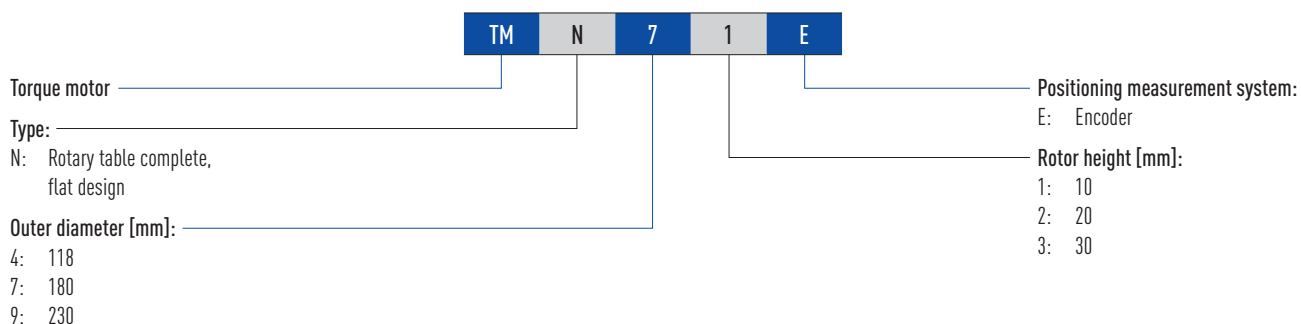
- Backlash-free and extremely dynamic
- Extremely flat design
- Integrated rotary encoder

Typical applications:

- LED manufacture and testing
- Production of solar cells
- Manufacture of semiconductor components



5.2 Order code for TMN rotary tables



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5.3 Technical data for TMN

5.3.1 Technical data for TMN42

Torque-speed curves (DC bus voltage: 320/560 VDC)

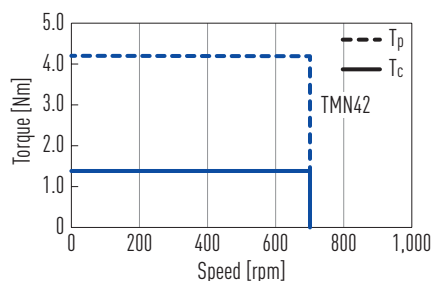


Table 5.1 Technical data for TMN42 HIWIN rotary tables

	Symbol	Unit	TMN42
Technical data of rotary table			
Peak torque (for 1 sec.)	T_p	Nm	4.2
Continuous torque	T_c	Nm	1.4
Stall torque	T_s	Nm	0.98
Inertia of rotating parts	J	kgm ²	0.003
Weight	M_m	kg	2
Max. axial load	F_a	N	600
Max. radial load	F_r	N	600
Max. moment of tilt	M_k	Nm	30
Nominal speed (at 400 VAC)	n	1/min	700
Position accuracy		arc sec	± 45
Repeating accuracy		arc sec	± 2.5
Radial run-out		mm	0.03
Axial run-out		mm	0.03
Height	H	mm	45
Protection class			IP40
Technical data of motor			
Peak current (for 1 sec.)	I_p	A_{eff}	4.5
Continuous current	I_c	A_{eff}	1.5
Motor constant	K_m	Nm/ \sqrt{W}	0.4
Resistance ¹⁾	R_{25}	Ω	4.59
Inductance ¹⁾	L	mH	8.18
Electrical time constant	T_e	ms	1.78
Torque constant	K_t	Nm/ A_{eff}	0.97
Back emf constant	K_u	$V_{eff}/(rad/s)$	0.56
Number of poles	$2p$		16
Thermal resistance	R_{th}	°C/W	4.84
Thermal time constant	T_{th}	s	1,170
Thermal sensor			PTC SNM 100
Max. DC Bus		V	600

All the specifications in the table (except dimensions) are in ± 10 % of tolerance at 25 °C ambient temperature

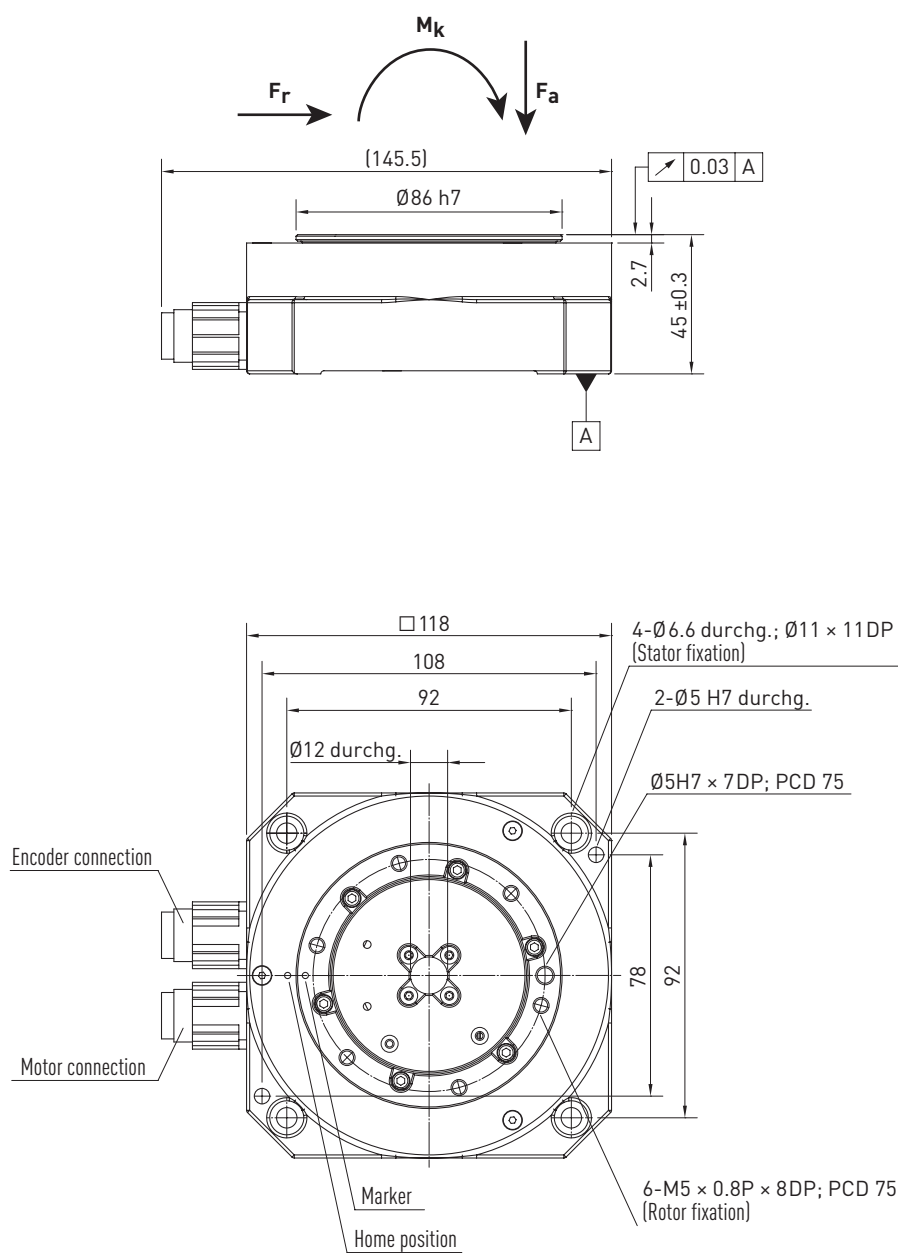
¹⁾ Line-to-line

Encoder specifications (optical, incremental)

- 2,048 lines/cycle
- Index mark
- Signal output sin/cos 1 V_{pp}

Dimensions of the TMN42 HIWIN rotary table

(For values, see [Table 5.1](#))



Rotary Tables

HIWIN rotary tables TMN

5.3.2 Technical data for TMN71

Torque-speed curves (DC bus voltage: 320/560 VDC)

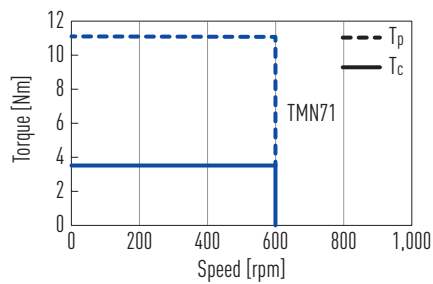


Table 5.2 Technical data for TMN71 HIWIN rotary tables

	Symbol	Unit	TMN71
Technical data of rotary table			
Peak torque (for 1 sec.)	T_p	Nm	11.1
Continuous torque	T_c	Nm	3.7
Stall torque	T_s	Nm	2.59
Inertia of rotating parts	J	kgm ²	0.008
Weight	M_m	kg	3.5
Max. axial load	F_a	N	1,000
Max. radial load	F_r	N	1,000
Max. moment of tilt	M_k	Nm	50
Nominal speed (at 400 VAC)	n	1/min	600
Position accuracy		arc sec	± 45
Repeating accuracy		arc sec	± 2.5
Radial run-out		mm	0.03
Axial run-out		mm	0.03
Height	H	mm	50
Protection class			IP40
Technical data of motor			
Peak current (for 1 sec.)	I_p	A_{eff}	10.2
Continuous current	I_c	A_{eff}	3.4
Motor constant	K_m	Nm/√W	0.6
Resistance ¹⁾	R_{25}	Ω	2.22
Inductance ¹⁾	L	mH	9.02
Electrical time constant	T_e	ms	4.1
Torque constant	K_t	Nm/A _{eff}	1.09
Back emf constant	K_u	V _{eff} /rad/s	0.63
Number of poles	$2p$		16
Thermal resistance	R_{th}	°C/W	1.95
Thermal time constant	T_{th}	s	1,420
Thermal sensor			PTC SNM 100
Max. DC Bus		V	600

All the specifications in the table (except dimensions) are in ± 10 % of tolerance at 25 °C ambient temperature

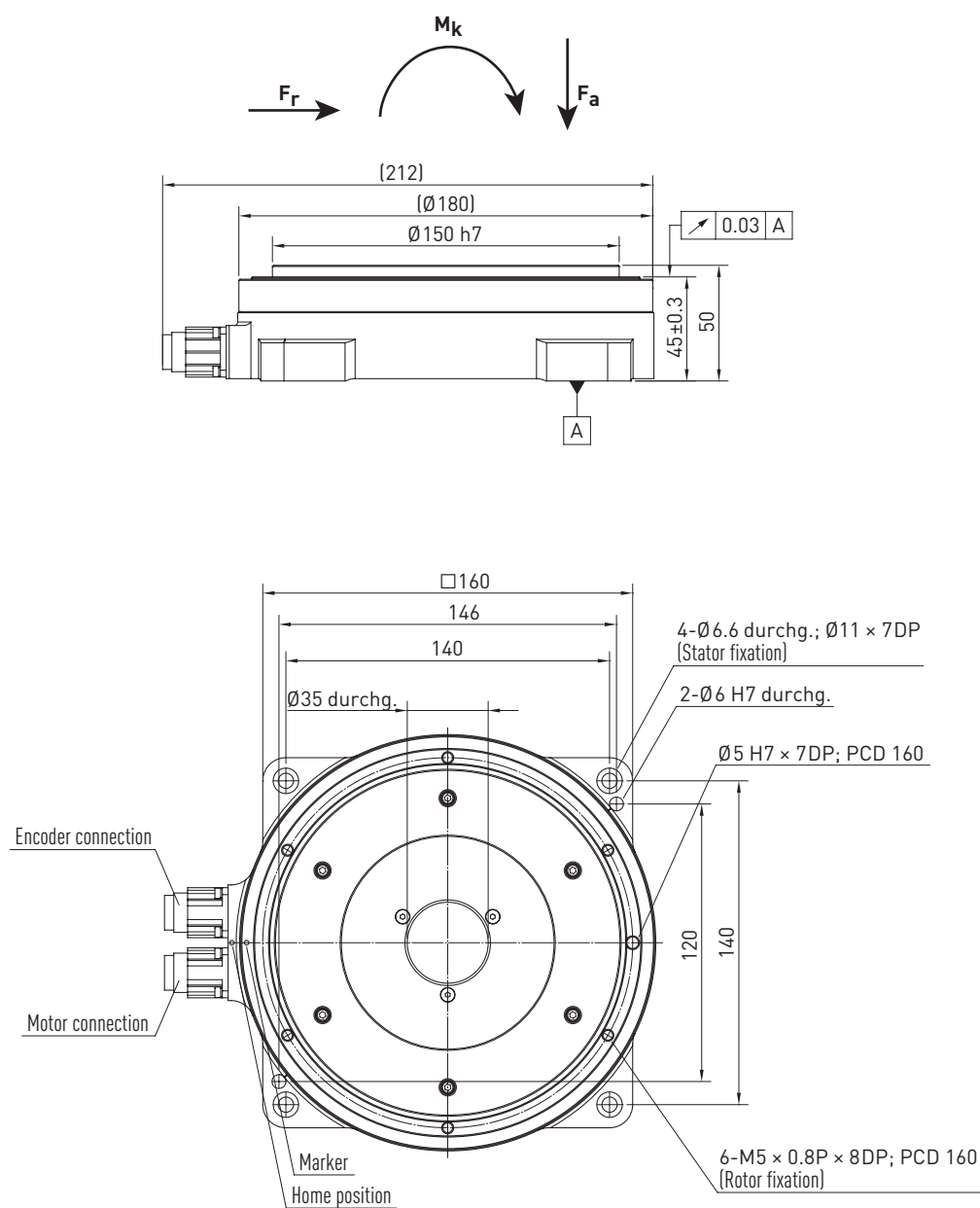
¹⁾ Line-to-line

Encoder specifications (optical, incremental)

- 2,048 lines/cycle
- Index mark
- Signal output sin/cos 1 V_{pp}

Dimensions of the TMN71 HIWIN rotary table

(For values, see [Table 5.2](#))



Rotary Tables

HIWIN rotary tables TMN

5.3.3 Technical data for TMN93

Torque-speed curves (DC bus voltage: 320/560 VDC)

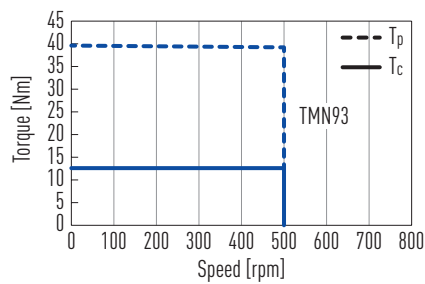


Table 5.3 Technical data for TMN93 HIWIN rotary tables

	Symbol	Unit	TMN93
Technical data of rotary table			
Peak torque (for 1 sec.)	T_p	Nm	39.6
Continuous torque	T_c	Nm	13.2
Stall torque	T_s	Nm	9.24
Inertia of rotating parts	J	kgm ²	0.012
Weight	M_m	kg	7.5
Max. axial load	F_a	N	1,000
Max. radial load	F_r	N	1,000
Max. moment of tilt	M_k	Nm	50
Nominal speed (at 400 VAC)	n	1/min	500
Position accuracy		arc sec	± 45
Repeating accuracy		arc sec	± 2.5
Radial run-out		mm	0.03
Axial run-out		mm	0.03
Height	H	mm	55
Protection class			IP40
Technical data of motor			
Peak current (for 1 sec.)	I_p	A_{eff}	10.2
Continuous current	I_c	A_{eff}	3.4
Motor constant	K_m	Nm/√W	1.5
Resistance ¹⁾	R_{25}	Ω	4.3
Inductance ¹⁾	L	mH	23.2
Electrical time constant	T_e	ms	5.4
Torque constant	K_t	Nm/A _{eff}	3.9
Back emf constant	K_u	V _{eff} /rad/s	2.25
Number of poles	$2p$		22
Thermal resistance	R_{th}	°C/W	1.01
Thermal time constant	T_{th}	s	1,780
Thermal sensor			PTC SNM 100
Max. DC Bus		V	600

All the specifications in the table (except dimensions) are in ± 10 % of tolerance at 25 °C ambient temperature

¹⁾ Line-to-line

Encoder specifications (optical, incremental)

- 3,600 lines/cycle
- Index mark
- Signal output sin/cos 1 V_{pp}

Dimensions of the TMN93 HIWIN rotary table

(For values, see [Table 5.3](#))

