

3. HIWIN rotary tables DMS

3.1 Characteristics of the DMS rotary tables

DMS rotary tables are directly driven rotary tables and do not therefore have a gearbox. The extremely rigid connection between the motor and load, coupled with a high-quality servo drive controller, ensures outstanding acceleration capabilities and movement with good uniformity. Due to the hollow shaft design, DMS rotary tables are especially well suited to automation tasks. Media, cable systems or mechanisms can pass through with ease.

Key features:

- Backlash-free and extremely dynamic
- Brush-less and high-torque
- Various rotary encoder options
- Optionally with functional safety encoder
- Cleanroom compatible (ISO class 2)

Typical applications:

- Automation technology
- Pick&Place



FUNCTIONAL
SAFETY

IPA

CLEAN
ROOM
ISO 2

3.2 Order code for DMS rotary tables

DMS	14	Z	0	S	P	0	0	S	0	0	L	S	0	0	(KCI120)
Type: Rotary table															Encoder type
Rotor height:															Empty
Encoder type:															Clamp:
X: Incremental															0: Without (standard)
Z: Absolute															Hollow shaft:
Hall sensor:															S, X: see tables "Technical data encoder"
0: Without hall sensor															Connector type:
Winding code:															E: Incremental encoder (RIK4)
S: Standard (DMS0x, DMS1x)															L: EnDat, BiSS-C single-turn encoder (KCI120, ECN125, Resolute)
L: For high rotational speed (DMS0x, DM13x)															M: EnDat encoder with incremental track (ECN113)
G: Standard (DMS3x, DMS7x)															Wire:
H: For high rotational speed (DMS3x, DMS7x)															0: M17, straight outlet
Temperature sensor:															Error Mapping:
P: PTC sensor															0: Without (standard)
Protection class:															1: ±10 arcsec
0: IP40															2: ±5 arcsec
Empty															Axial/Radial Runout:
															S: 30 µm/ 30 µm (standard)
															P: 5 µm/ 30 µm
															A: 5 µm/ 15 µm

Example order code:

DMS14-Z0SP00-S0-0LS-0-0 (KCI120)

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Here you can select your variant of the rotary table



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3.3 Technical data for DMS

3.3.1 Technical data for DMS0

Torque-speed curve (DC bus voltage: 600 VDC)

DMS03 – Standard (S)

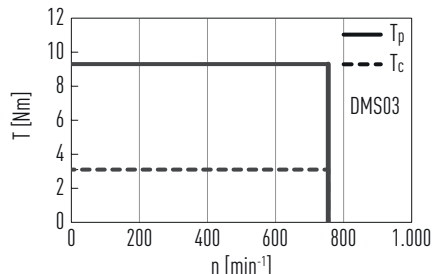


Table 3.1 Technical data for DMS0

	Symbol	Unit	DMS03
Technical data of rotary table			
Winding variant			Standard (S)
Peak torque (for 1 sec.)	T_p	Nm	9.3
Continuous torque	T_c	Nm	3.1
Stall torque	T_s	Nm	2.17
Inertia of rotating parts	J	kgm ²	0.003
Weight	M_m	kg	4
Max. axial load	F_a	N	3,700
Max. radial load	F_r	N	820
Max. moment of tilt	M_k	Nm	40
Max. speed (600 VDC)	n	min ⁻¹	750
Max. speed (325 VDC)	n	min ⁻¹	700
Radial run-out		mm	0,03/ 0,015 ²⁾
Axial run-out		mm	0,03/ 0,005 ²⁾
Protection class			IP40
Technical data of motor			
Peak current (for 1 sec.)	I_p	A_{eff}	6.0
Continuous current	I_c	A_{eff}	2.0
Motor constant	K_m	Nm/ $\sqrt{W}$	0.5
Resistance ¹⁾	R_{25}	Ω	7.1
Inductance ¹⁾	L	mH	15.2
Electrical time constant	T_e	ms	2.1
Torque constant	K_t	Nm/ A_{eff}	1.55
Back emf constant	K_u	$V_{eff}/(rad/s)$	0.82
Number of poles	2p		10
Thermal resistance	R_{th}	°C/W	1.76
Thermal time constant	T_{th}	s	1,930
Thermal sensor			PTC SNM 100
Max. DC Bus		V	600

All values $\pm 10\%$ at 25 °C ambient temperature

¹⁾ Line-to-line

²⁾ Optional

Table 3.2 Technical data encoder DMS0

	Symbol	Unit	RIK4	KCI120	KBI136	Resolute
Encoder type			Incremental	Absolute, single-turn	Absolute, multi-turn	Absolute, single-turn
Functional principle			Optical	Inductive	Inductive	Optical
Resolution			2,048 strokes/ rotation	20 bit	20 bit (position)/ 16 bit (rotations)	26 bit
Interface			sin/cos 1 V _{pp}	EnDat 2.2	EnDat 2.2	BiSS-C
Functional safety				FUNCTIONAL SAFETY	FUNCTIONAL SAFETY	
Accuracy ¹⁾		arcsec	±45	±45	±45	±45
Repeatability		arcsec	±3	±3	±3	±3
Hollow shaft diameter	D _i	mm	24	24	24	24
Product key hollow shaft			S	S	S	X
Product key pin assignment			E	L	N	L

¹⁾ Optionally with error compensation ±10 arcsec or ±5 arcsec

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(For values, see Table 3.1)



3.3.2 Technical data for DMS1

Torque-speed curves (DC bus voltage: 600 VDC)

DMS14, DMS18 – Standard (S)

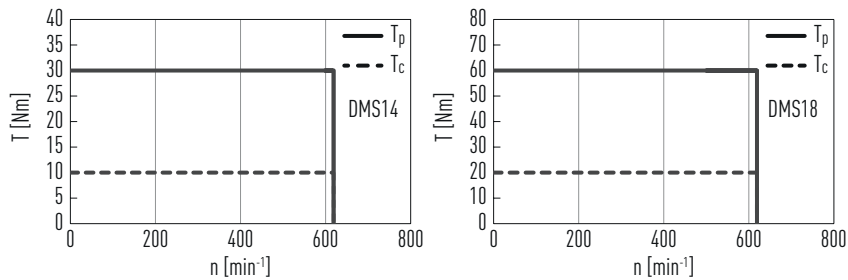


Table 3.3 Technical data for DMS1

	Symbol	Unit	DMS14	DMS18
Technical data of rotary table				
Winding variant			Standard (S)	
Peak torque (for 1 sec.)	T _p	Nm	30	60
Continuous torque	T _c	Nm	10	20
Stall torque	T _s	Nm	7	14
Inertia of rotating parts	J	kgm ²	0.0065	0.0075
Weight	M _m	kg	7.0	9.5
Max. axial load	F _a	N	3,700	
Max. radial load	F _r	N	1,700	
Max. moment of tilt	M _k	Nm	60	
Max. speed (600 VDC)	n	min ⁻¹	630	630
Max. speed (325 VDC)	n	min ⁻¹	600	500
Radial run-out		mm	0.03/ 0.015 ²⁾	
Axial run-out		mm	0.03/ 0.015 ²⁾	
Height	H	mm	120	160
Protection class			IP40	
Technical data of motor				
Peak current (for 1 sec.)	I _p	A _{eff}	12	
Continuous current	I _c	A _{eff}	4	
Motor constant	K _m	Nm/√W	1.0	1.6
Resistance ¹⁾	R ₂₅	Ω	3.9	6.5
Inductance ¹⁾	L	mH	14.0	26.0
Electrical time constant	T _e	ms	3.6	4.0
Torque constant	K _t	Nm/A _{eff}	2.50	5.00
Back emf constant	K _u	V _{eff} /(rad/s)	1.2	2.4
Number of poles	2p		22	
Thermal resistance	R _{th}	°C/W	0.80	0.48
Thermal time constant	T _{th}	s	2,290	2,520
Thermal sensor			PTC SNM 100	
Max. DC Bus		V	600	

All values $\pm 10\%$ at 25 °C ambient temperature

¹⁾ Line-to-line

²⁾ Optional

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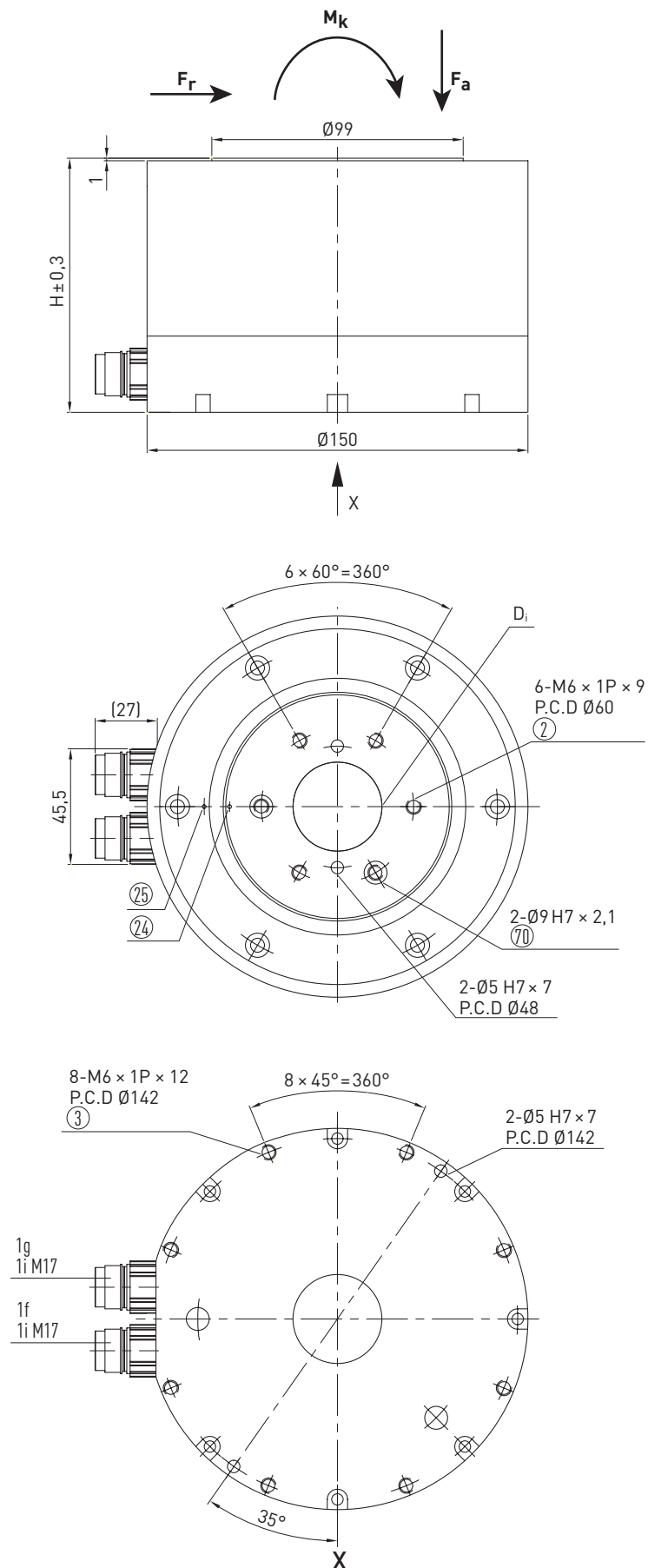
Table 3.4 Technical data encoder DMS1

	Symbol	Unit	RIK4	KCI120	ECN113	ECN125	Resolute
Encoder type			Incremental	Absolute, single-turn	Absolute, single-turn	Absolute, single-turn	Absolute, single-turn
Functional principle			Optical	Inductive	Optical	Optical	Optical
Resolution			3,600 strokes/rotation	20 bit	13 bit absolute with incremental track 2,048 strokes	25 bit	26 bit
Interface			sin/cos 1 V _{pp}	EnDat 2.2	EnDat 2.2 + sin/cos 1 V _{pp}	EnDat 2.2	BiSS-C
Functional safety							
Accuracy ¹⁾		arcsec	±45	±45	±45	±45	±45
Repeatability		arcsec	±3	±3	±3	±3	±3
Hollow shaft diameter	D _i	mm	35	35	35	35	35
Product key hollow shaft			S	S	X	X	S
Product key pin assignment			E	L	M	L	L

¹⁾ Optionally with error compensation ±10 arcsec or ±5 arcsec

Dimensions of the DMS1

(For values, see Table 3.3)



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3.3.3 Technical data for DMS3

Torque-speed curves (DC bus voltage: 600 VDC)

DMS34, DMS38, DMS3C – Standard (G)

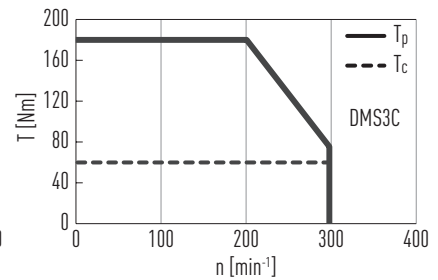
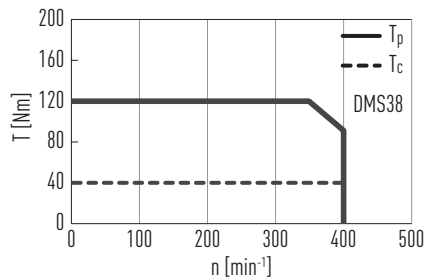
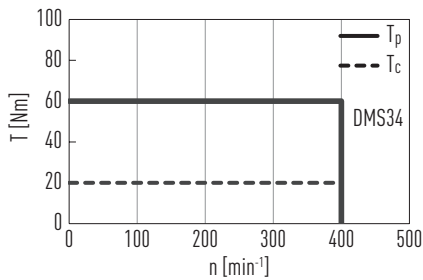


Table 3.5 Technical data for DMS3

	Symbol	Unit	DMS34	DMS38	DMS3C
Technical data of rotary table					
Winding variant			Standard (G)		
Peak torque (for 1 sec.)	T _p	Nm	60	120	180
Continuous torque	T _c	Nm	20	40	60
Stall torque	T _s	Nm	14	28	42
Inertia of rotating parts	J	kgm ²	0.020	0.026	0.035
Weight	M _m	kg	17.0	22.5	28.5
Max. axial load	F _a	N	8,000		
Max. radial load	F _r	N	6,500		
Max. moment of tilt	M _k	Nm	240		
Max. speed (600 VDC)	n	min ⁻¹	400	400	300
Max. speed (325 VDC)	n	min ⁻¹	400	200	120
Radial run-out		mm	0.03/ 0.015 ²⁾		
Axial run-out		mm	0.03/ 0.005 ²⁾		
Height	H	mm	150	190	230
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	1.8	2.8	3.6
Resistance ¹⁾	R ₂₅	Ω	7.5	12.0	17.1
Inductance ¹⁾	L	mH	32.0	53.6	81.0
Electrical time constant	T _e	ms	4.6	4.5	4.9
Torque constant	K _t	Nm/A _{eff}	6	12	18
Back emf constant	K _u	V _{eff} /(rad/s)	3	6	9
Number of poles	2p		22		
Thermal resistance	R _{th}	°C/W	0.73	0.46	0.32
Thermal time constant	T _{th}	s	2,020	2,130	2,170
Thermal sensor			PTC SNM 120		
Max. DC Bus		V	600		

All values ±10 % at 25 °C ambient temperature

¹⁾ Line-to-line

²⁾ Optional

Table 3.6 Technical data encoder DMS3

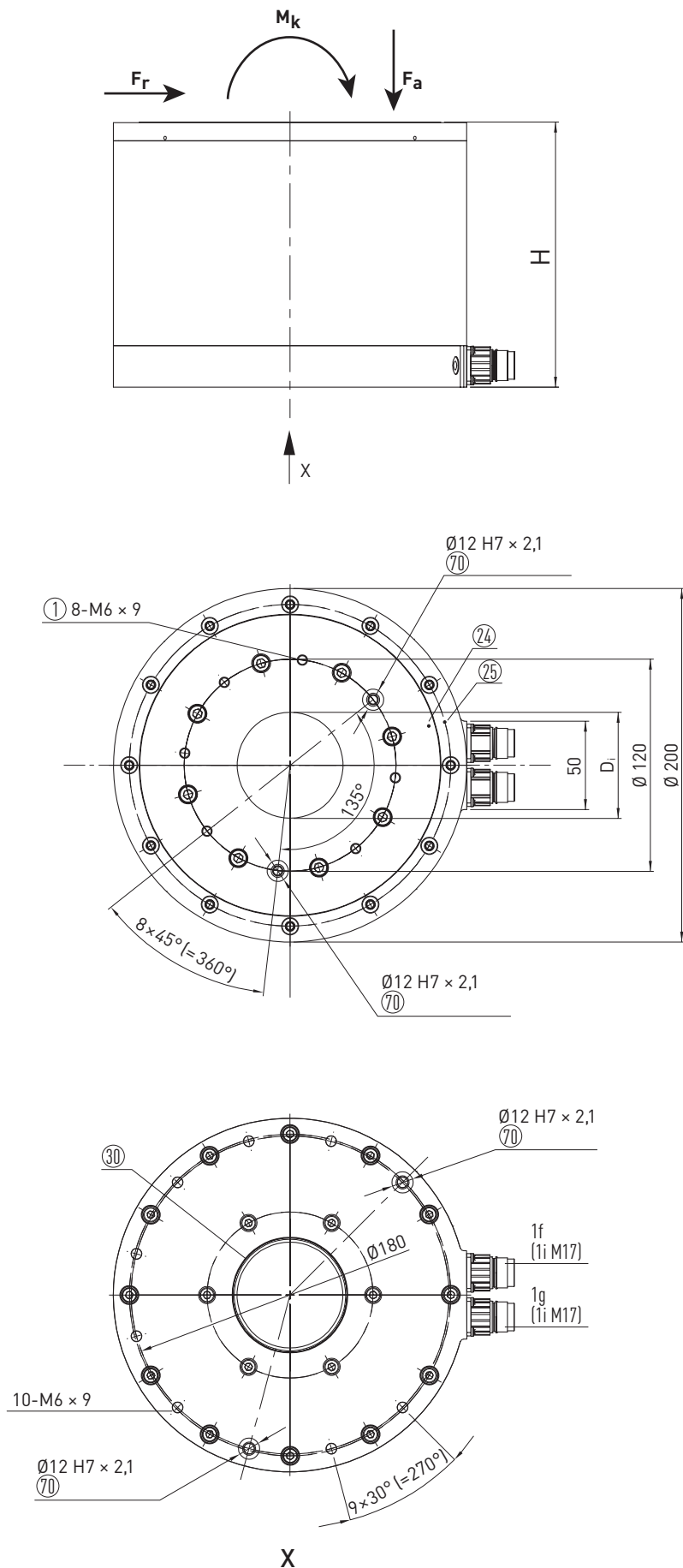
	Symbol	Unit	RIK4	KCI120	ECN113	ECN125	Resolute
Encoder type			Incremental	Absolute, single-turn	Absolute, single-turn	Absolute, single-turn	Absolute, single-turn
Functional principle			Optical	Inductive	Optical	Optical	Optical
Resolution			3,600 strokes/rotation	20 bit	13 bit absolute with incremental track 2,048 strokes	25 bit	26 bit
Interface			sin/cos 1 V _{pp}	EnDat 2.2	EnDat 2.2 + sin/cos 1 V _{pp}	EnDat 2.2	BiSS-C
Functional safety							
Accuracy ¹⁾		arcsec	±25	±45	±25	±25	±25
Repeatability		arcsec	±2,5	±3	±2,5	±2,5	±2,5
Hollow shaft diameter	D _i	mm	60	35	40	40	60
Product key hollow shaft			S	X	X	X	S
Product key pin assignment			E	L	M	L	L

¹⁾ Optionally with error compensation ±10 arcsec or ±5 arcsec

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Dimensions of the DMS3
(For values, see Table 3.5)



3.3.4 Technical data for DMS7

Torque-speed curves (DC bus voltage: 600 VDC)

DMS74 – Standard (G), DMS76 – for high speed (H), DMS7C – Standard (G)

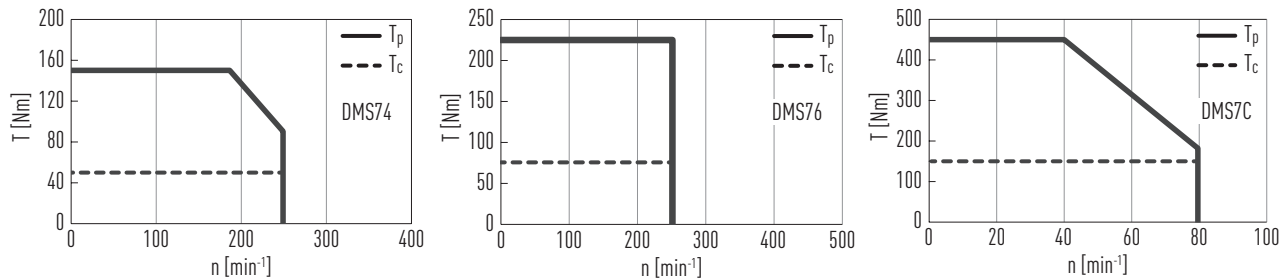


Table 3.7 Technical data for DMS7

	Symbol	Unit	DMS74	DMS76	DMS7C
Technical data of rotary table					
Winding variant			Standard (G)	For high speed (H)	Standard (G)
Peak torque (for 1 sec.)	T _p	Nm	150	225	450
Continuous torque	T _c	Nm	50	75	150
Stall torque	T _s	Nm	35.0	52.5	105.0
Inertia of rotating parts	J	kgm ²	0.152	0.174	0.241
Weight	M _m	kg	36	41	57
Max. axial load	F _a	N	8,000		
Max. radial load	F _r	N	6,500		
Max. moment of tilt	M _k	Nm	360		
Max. speed (600 VDC)	n	min ⁻¹	250	250	80
Max. speed (325 VDC)	n	min ⁻¹	120	170	30
Radial run-out		mm	0.03/ 0.015 ²⁾		
Axial run-out		mm	0.03/ 0.005 ²⁾		
Height	H	mm	160	180	240
Protection class			IP40		
Technical data of motor					
Peak current (for 1 sec.)	I _p	A _{eff}	10.2	20.4	10.2
Continuous current	I _c	A _{eff}	3.4	6.8	3.4
Motor constant	K _m	Nm/√W	3.9	5.0	7.7
Resistance ¹⁾	R ₂₅	Ω	12.9	4.3	29.0
Inductance ¹⁾	L	mH	55	19	145
Electrical time constant	T _e	ms	4.3	4.4	5.0
Torque constant	K _t	Nm/A _{eff}	17.0	12.8	51.1
Back emf constant	K _u	V _{eff} /rad/s)	9.8	7.4	29.5
Number of poles	2p		44		
Thermal resistance	R _{th}	°C/W	0.42	0.32	0.19
Thermal time constant	T _{th}	s	2,230	2,330	2,350
Thermal sensor			PTC SNM 120		
Max. DC Bus		V	600		

All values ±10 % at 25 °C ambient temperature

¹⁾ Line-to-line

²⁾ Optional

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Table 3.8 Technical data encoder DMS7							
	Symbol	Unit	RIK4	KCI120	ECN113	ECN125	Resolute
Encoder type			Incremental	Absolute, single-turn	Absolute, single-turn	Absolute, single-turn	Absolut, single-turn
Functional principle			Optical	Inductive	Optical	Optical	Optical
Resolution			5n400 strokes/rotation	20 bit	13 bit absolute with incremental track 2,048 Striche	25 bit	26 bit
Interface			sin/cos 1 V _{pp}	EnDat 2.2	EnDat 2.2 + sin/cos 1 V _{pp}	EnDat 2.2	BiSS-C
Functional safety							
Accuracy ¹⁾		arcsec	±25	±45	±25	±25	±25
Repeatability		arcsec	±2,5	±3	±2,5	±2,5	±2,5
Hollow shaft diameter	D _i	mm	104	35	40	40	104
Product key hollow shaft			S	X	X	X	S
Product key pin assignment			E	L	M	L	L

¹⁾ Optionally with error compensation ±10 arcsec or ±5 arcsec

Dimensions of the DMS7

(For values, see Table 3.7)

