



# **T STANDALONE AXIS**

## **ASME-RTMB+2100703##S-##N**

Data sheet

Version 1.0

***ETEL***

AXIS DESIGNATION	
Number of controlled axes	1
Axes name	Theta
Thrust transmitter: DD (direct drive) or ID (indirect drive)	DD

TESTING CONDITIONS	UNIT	
Position controller (1)	-	AccurET Modular 400 15/40A (third party 600 VDC controller, no current limit)
Rated payload	kg	22.3
Rated inertia (added to system)	kg.m <sup>2</sup>	0.195
Rated input voltage	VDC	400
Tool point position	mm	116 mm between rotor interface and tool point plane
Ambient temperature	°C	22 ± 1.0
Isolation system	-	none

DIMENSIONAL DATA	UNIT	FREE AIR		WATER COOLING	
Outside diameter (2)	mm	240	245.2 max	240	245.2 max
Inside diameter	mm	50			
Height	mm	140			
Total angular travel	°	Infinite			
Total mass (without payload)	kg	24.5	29.1	24.5	29.1
Rotor inertia (without payload)	kg.m <sup>2</sup>	35E-03			

TORQUE CAPABILITIES (3)	UNIT	RTMB+210-070-3TAS		RTMB+210-070-3TBS	
		FREE AIR	WATER COOLING	FREE AIR	WATER COOLING
Peak torque	Nm	194 (194)	317 (317)	194 (194)	202 (317)
Continuous torque (4)(5)	Nm	45.4 (45.4)	152 (152)	45.4 (45.4)	126 (147)
Standstill torque (5)	Nm	34 (34)	116 (116)	34 (34)	117 (116)
Max. detent torque (average to peak)	Nm	1.4			
Static friction (maximal value)	Nm	3.5			
Dynamic friction (maximal value)	Nm/(rad/s)	0.1			

LOAD CAPACITIES	UNIT	
Maximum moment load (6)	Nm	200
Maximum axial load	N	4000
Maximum axial load in upside down configuration	N	4000
Maximum radial load	N	1000
Maximum payload	kg	400

DYNAMIC PERFORMANCE	UNIT	RTMB+210-070-3TAS		RTMB+210-070-3TBS	
		FREE AIR	WATER COOLING	FREE AIR	WATER COOLING
Maximum speed	rad/s	27.4 (41.6) 262 rpm (397 rpm)		51.6 (51.6) 493 rpm (493 rpm)	
Maximum acceleration (without added inertia)	rad/s <sup>2</sup>	5500 (5500)	9000 (9000)	5500 (5500)	5700 (9000)
Typical position stability at 2 kHz (7)	arcsec	± 1.2			

ACCURACY	UNIT	
Positioning accuracy (without mapping)	arcsec	± 40
Positioning accuracy (with mapping)	arcsec	± 6
Unidirectional repeatability	arcsec	± 3
Bidirectional repeatability	arcsec	± 4
Radial runout	µm	40
Total axial error at 80 mm radius	µm	20

WORKING ENVIRONMENT		
IP protection grade	-	IP 40

ELECTRICAL SPECIFICATIONS (3)	UNIT	RTMB+210-070-3TAS		RTMB+210-070-3TBS	
		FREE AIR	WATER COOLING	FREE AIR	WATER COOLING
Motor type	-	Ironcore			
Motor model	-	TMB+210-070-3TAS		TMB+210-070-3TBS	
Number of phases	-	3		3	
<b>Kt</b> Force constant	Nm/Arms	17.5		8.75	
<b>Ku</b> Back EMF constant (8)	Vrms/(rad/s)	10		5.01	
<b>Km</b> Motor constant	Nm/√W	4.95			
<b>R20</b> Electrical resistance at 20 °C (8)	Ohm	8.34		2.09	
<b>Ld/Lq</b> Electrical inductance (8)	mH	41.7 / 42.3	41.7 / 38.7	10.4 / 10.6	10.4 / 10.1
<b>Ip</b> Peak current	Arms	12.5 (12.5)	23.8 (23.8)	24.9 (24.9)	25.3 (47.6)
<b>Ic</b> Continuous current (4)(5)	Arms	2.79 (2.79)	9.25 (9.25)	5.57 (5.57)	15.0 (17.8)
<b>Is</b> Standstill current (5)	Arms	2.11 (2.21)	7.01 (7.01)	4.22 (4.43)	14.0 (14.0)
<b>ns</b> Standstill speed	rad/s	0.001	0.077	0.001	0.077
<b>Um</b> Max. input voltage	VDC	400 (600)	400 (600)	400 (600)	400 (600)
<b>Pc</b> Max. cont. power dissipation (4)(5)	W	120	1310	120	803 (1190)
<b>2p</b> Number of poles	-	44			

ENCODER CHARACTERISTICS	UNIT				
Encoder and signal type	-	Optical - Incremental			
Output signal	-	1 Vpp			
Line count	period/turn	18'000			
Reference mark	-	1			
Power supply	V	5 ± 10 %			

WATER COOLING CHARACTERISTICS	UNIT				
<b>Δθw</b> Water temperature difference for Pc	K	-	5	-	5
<b>qw</b> Minimum water flow for Δθw	l/min	-	4.1	-	2.5 (3.7)
<b>Δpw</b> Max. pressure drop at qw	bar	-	0.1	-	0.1
<b>θw</b> Inlet water temperature	°C	-	20	-	20

TYPICAL MOVE AND SETTLE TIMES (7)	UNIT				
Move 1: 9° within ± 3 arcsec with rated inertia	ms	70			

GUIDING ELEMENTS					
Type	-	Cross roller bearing			

MATERIAL AND FINISH					
Baseplate	-	Aluminium			
Shaft	-	Stainless steel			

According to the Machinery Directive 2006/42/EC, the system presently described falls into the "partly completed machinery" category and fully complies with it as long as the system is operated according to the working conditions described in the corresponding manual. Customer is responsible for setting safeties/limitations that will keep the motor in its safe operating area. ETEL cannot be held responsible if the system is used in an improper way.

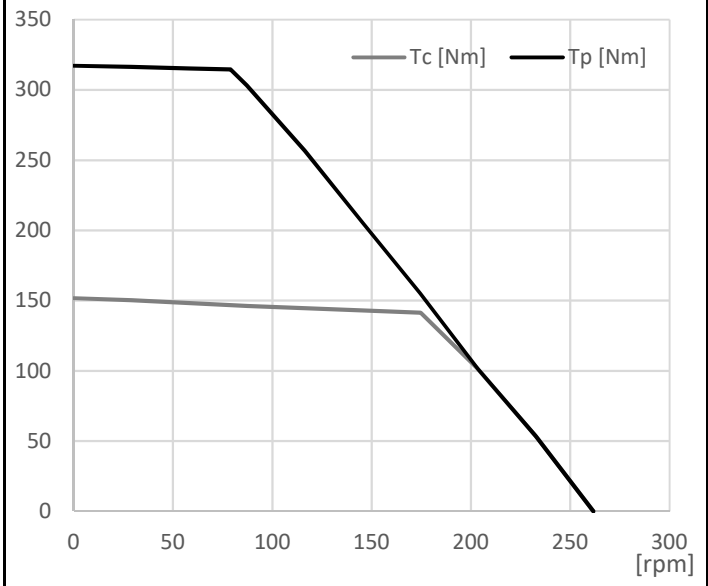
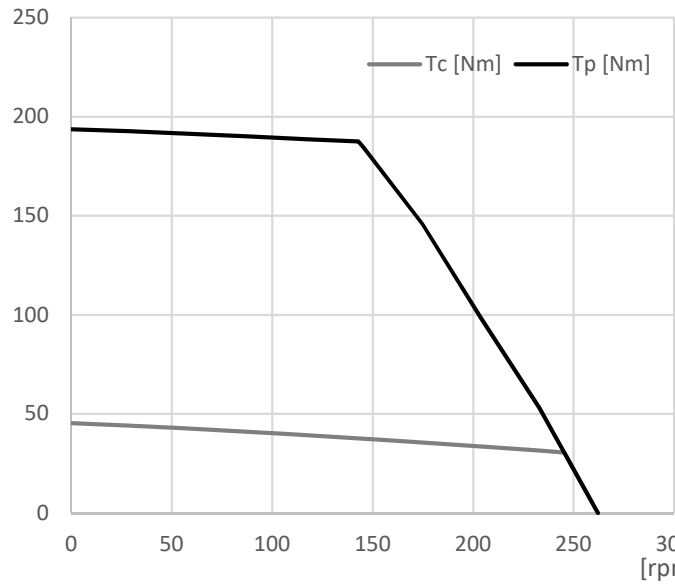
**Notes:** The specifications given may be mutually exclusive. Unless stated otherwise, all measurements are made within the testing conditions.

- (1) The values under brackets correspond to the values with a 600 V controller.
- (2) Without hydraulic fittings bloc for water cooled version.
- (3) Tolerances on electrical parameters are available on request.
- (4) Coils at 80 °C with additional surface of 0.18 m<sup>2</sup> fixed on the base and 0.074 m<sup>2</sup> on the rotor.
- (5) With a sampling frequency limited to 10000 Hz for AccurET 400 controller and a 3TBS coil.
- (6) At the fastening holes of the rotor.
- (7) Specification given at encoder level.
- (8) Terminal to terminal.

"Torque versus Speed" curves for RTMB+210-070-3TAS (with AccurET 400)

FREE AIR

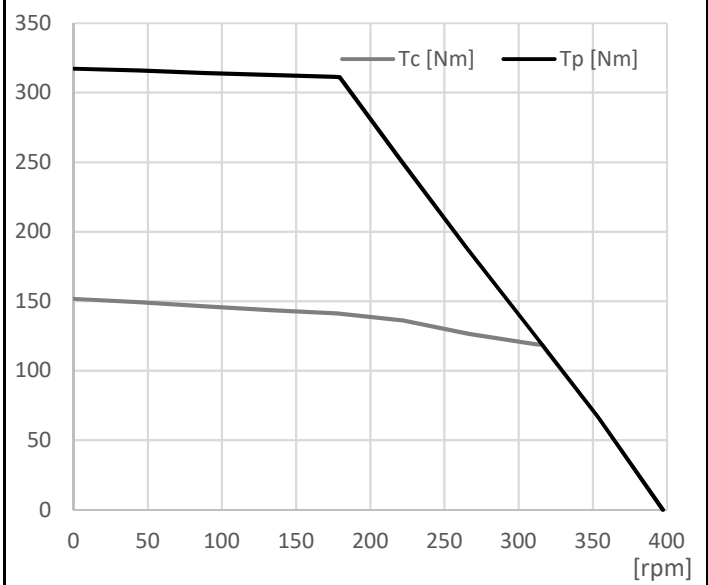
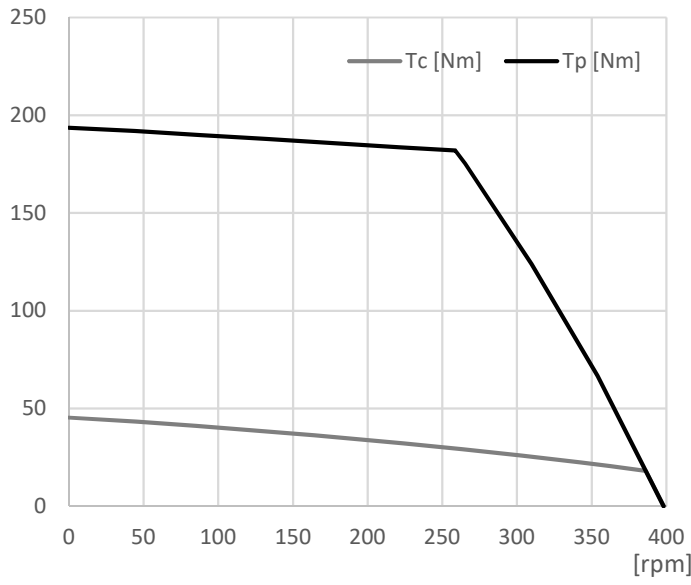
WATER COOLING



"Torque versus Speed" curves for RTMB+210-070-3TAS (with third party 600 VDC controller, no current limitation)

FREE AIR

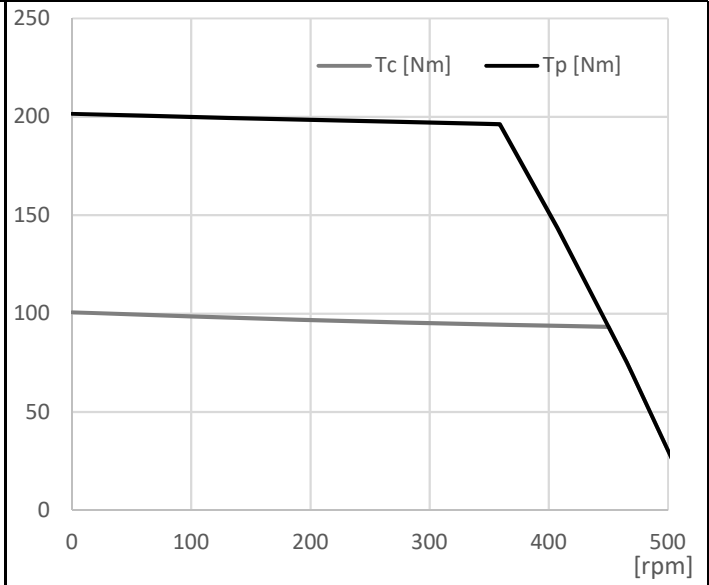
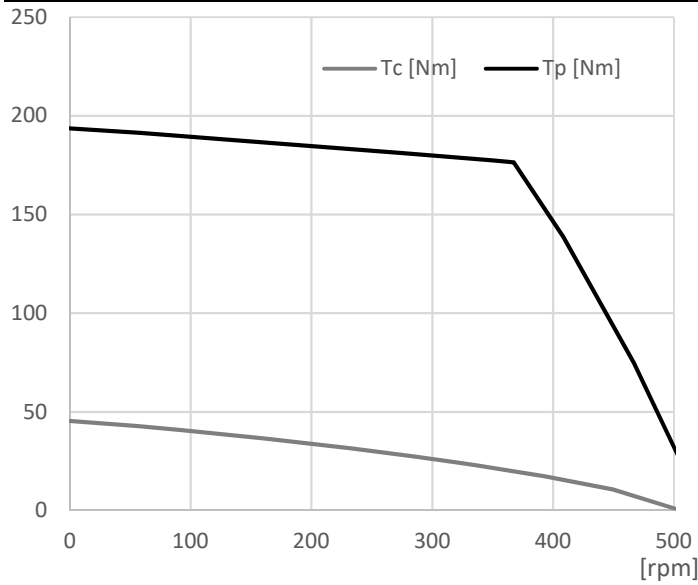
WATER COOLING



"Torque versus Speed" curves for RTMB+210-070-3TBS (with AccurET 400)

FREE AIR

WATER COOLING



"Torque versus Speed" curves for RTMB+210-070-3TBS (with third party 600 VDC controller, no current limitation)

FREE AIR

WATER COOLING

