

# T STANDALONE AXIS

ASME-RTMBi1400503R#S0000

Data sheet

Version 2.0





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- 1) RTMBi140-050 with connectors and AccurET Modular 300VDC
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- 3) RTMBi140-050-3RBS with free leads and AccurET Modular 400/600VDC or third party controller 300/600VDC



### PRECISION INDEXING ROTARY TABLE



ANG REGIONATION				
AXIS DESIGNATION				
Number of controlled axes		1	_	
Axes name Thrust transmitter: DD (direct drive) or ID (indirect drive)		Theta DD		
Thrust transmitter. DD (direct drive) or ID (indirect drive	<u>')                                    </u>	DE		
TESTING CONDITIONS	UNIT			
Position controller	_	AccurET Modula	ar 300 07/15A	
Motion controller	-	non		
Rated payload	kg	2.3	l .	
Rated inertia	kg.m <sup>2</sup>	0.02	25	
Tool point position	mm	centered on the table. 18.4 r	nm above rotor's interface	
Ambient temperature	°C	22±	1	
DIMENSIONAL DATA	UNIT			
Outside diameter	mm	166		
Inside diameter	mm	25		
Height Total stroke	mm °	115 Unlim		
Total stroke Total mass (without payload)	kg	Uniim 10.:		
Rotor inertia (without payload)	kg.m <sup>2</sup>	2.07E		
	Ng.111			
TORQUE CAPABILITIES (1) (2)	UNIT	RTMBi140-050-3RAS	RTMBi140-050-3RBS	
Peak torque	Nm	59.6	37.3	
Continuous torque (3)	Nm	14.4	14.4	
Standstill torque	Nm	10.8	10.8	
Max. detent torque (average to peak)	Nm	0.48	0.48	
Static friction (maximal value)	Nm	0.45	0.45	
Dynamic friction (maximal value)	Nm/(rad/s)	0.012	0.012	
LOAD CAPACITIES	UNIT			
Maximum moment load (4)	Nm	12		
Maximum axial load	N	120		
Maximum axial load in upside down configuration	N	120		
DYNAMIC PERFORMANCE	LINIT			
	UNIT	405	0	
Maximum speed (5)	rad/s	125		
Maximum acceleration	rad/s <sup>2</sup>	1000		
Typical position stability at 2kHz (6)	arcsec	±1.	0	
STAGE ACCURACY				
	UNIT			
	UNIT	+21	)	
Positioning accuracy (without mapping)	arcsec	±2l		
		±20 ±6 ±20		
Positioning accuracy (without mapping) Positioning accuracy (with mapping)	arcsec arcsec	±6		
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability	arcsec arcsec arcsec	±6 ±2		
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability	arcsec arcsec arcsec arcsec	±6 ±2 ±3		
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius	arcsec arcsec arcsec arcsec µm µm	±6 ±2 ±3 20		
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS	arcsec arcsec arcsec arcsec  µm µm	±6 ±2 ±3 20 20		
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS Encoder and signal type	arcsec arcsec arcsec arcsec µm µm	±6 ±2 ±3 20 20 Optical - Inc	premental	
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS Encoder and signal type Output signal	arcsec arcsec arcsec arcsec  µm µm  UNIT	±6 ±2 ±3 20 20 Optical - Inc	eremental	
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS Encoder and signal type Output signal Line count	arcsec arcsec arcsec arcsec  µm µm	#6 #2 #2 #3 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2	eremental	
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS Encoder and signal type Output signal Line count Reference mark	arcsec arcsec arcsec arcsec  µm µm  UNIT	#6 #2 #2 #3 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2	cremental pp	
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS Encoder and signal type Output signal Line count Reference mark Power supply	arcsec arcsec arcsec  µm µm  UNIT  - period/turn -	#6 #2 #2 #3 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2	cremental	
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS Encoder and signal type Output signal Line count Reference mark Power supply  WORKING ENVIRONMENT	arcsec arcsec arcsec  µm µm  UNIT  - period/turn -	#6 #2 #2 #3 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2	cremental pp	
Positioning accuracy (without mapping) Positioning accuracy (with mapping) Unidirectional repeatability Bidirectional repeatability Radial runout Total axial error at 41 [mm] radius  ENCODER CHARACTERISTICS  Encoder and signal type Output signal Line count Reference mark Power supply	arcsec arcsec arcsec  µm µm  UNIT  - period/turn -	#6 #2 #2 #3 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2 #2	eremental PP 0 %	

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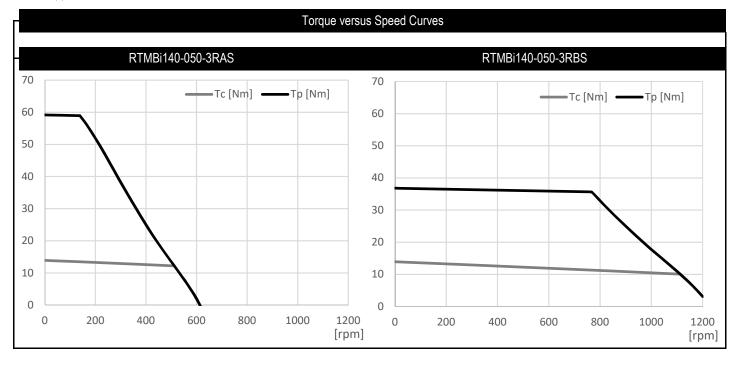
	ELECTRICAL SPECIFICATIONS (1) (2)	UNIT		
	Motor type	-	Ironcore	Ironcore
	Motor model	-	TMB0140-050-3RAS	TMB0140-050-3RBS
	Number of phases	-	3	3
Kt	Force constant	Nm/Arms	6.01	3.00
Ku	Back EMF constant (7)	Vrms/(rad/s)	3.47	1.74
Km	Motor constant	Nm/√W	1.55	1.55
R20	Electrical resistance at 20°C (7)	Ohm	10.0	2.50
Ld/Lo	Flectrical inductance (7)	mH	50.5 / 55.8	12.6 / 14.0
lp	Peak current	Arms	15.0	15.0
lc	Continuous current (3)	Arms	2.64	5.28
ls	Standstill current	Arms	2.00	4.00
ns	Standstill speed	rad/s	0.0020	0.0020
Udc	Nominal input voltage	VDC	326	326
Pc	Max. cont. power dissipation (3)	W	137	137
2p	Number of poles	-	22	22

GUIDING ELEMENTS		
GOIDING LLLINLINTS		
Туре	Ball bearing	
	_	-
MATERIAL AND FINISH		
Baseplate	Stainless steel	
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) Tolerances on electrical parameters are available on request
- (2) Considering a PWM frequency at 10kHz
- (3) Coils at 100°C with additional surface of 0.070m² fixed on the base and 0.015m² on the rotor made of black anodized aluminum
- (4) At the fastening holes of the rotor
- (5) See torque vs speed curve to check if the specification can be reached based on selected winding
- (6) Specification given at encoder level without any additional load fixed to the customer interface. This specification is reduced when an additional mass is fixed to the customer interface
- (7) Terminal to terminal





## PRECISION INDEXING ROTARY TABLE



AXIS DESIGNATION  Number of controlled axes		1		
Axes name		Theta		
Thrust transmitter: DD (direct drive) or ID (indirect drive)	e)	DD		
	-,			
TESTING CONDITIONS	UNIT			
Position controller	-	AccurET Modular 400 AccurET Modular 600 Third party 300 VDC Third party 600 VDC 15/40A 15/40A no current limit no current limit		
Motion controller	-	none		
Rated payload	kg	2.3		
Rated inertia	kg.m <sup>2</sup>	0.025		
Tool point position	mm	centered on the table. 18.4 mm above rotor's interface		
Ambient temperature	°C	22±1		
DIMENSIONAL DATA	UNIT			
Outside diameter	mm	166		
Inside diameter	mm	25		
Height	mm	115		
Total stroke	0	Unlimited		
Total mass (without payload)	kg	10.5		
Rotor inertia (without payload)	kg.m <sup>2</sup>	2.07E-03		
TODOLLE CARARU THE (1)				
TORQUE CAPABILITIES (1)	UNIT			
Peak torque	Nm	65.6		
Continuous torque (2)	Nm	14.4		
Standstill torque  Max. detent torque (average to peak)	Nm	10.8		
Static friction (maximal value)	Nm Nm	0.48 0.45		
Dynamic friction (maximal value)	Nm/(rad/s)	0.43		
	.(,			
LOAD CAPACITIES	UNIT			
Maximum moment load (3)	Nm	12		
Maximum axial load	N	120		
Maximum axial load in upside down configuration	N	120		
DYNAMIC PERFORMANCE	UNIT			
Maximum speed (4)	rad/s	115.2		
Maximum acceleration	rad/s <sup>2</sup>	10000		
Typical position stability at 2kHz (5)	arcsec	±1.5		
	1			
STAGE ACCURACY	UNIT			
Positioning accuracy (without mapping)	arcsec	±20		
Positioning accuracy (with mapping)	arcsec	±6		
Unidirectional repeatability Bidirectional repeatability	arcsec	±2 ±3		
Radial runout	arcsec	20		
Total axial error at 41 [mm] radius	μm	20		
Total axial citor at 41 [mm] radius	μIII			
ENCODER CHARACTERISTICS	UNIT	T		
Encoder and signal type	-	Optical - Incremental		
Output signal	-	1 Vpp		
Line count	period/turn	5000		
Reference mark	-	1		
Power supply	V	5±10%		
WORKING ENVIRONMENT				
		IP40		
IP protection grade		IP40		

	ELECTRICAL SPECIFICATIONS (1)	UNIT	AccurET Modular 400 15/40A	AccurET Modular 600 15/40A	Third party 300 VDC no current limit	Third party 600 VDC no current limit
	Motor type	-	Ironcore			
	Motor model	-		TMB0140	-050-3RAS	
	Number of phases	-			3	
Kt	Force constant	Nm/Arms	6.01	6.01	6.01	6.01
Ku	Back EMF constant (6)	Vrms/(rad/s)	3.47	3.47	3.47	3.47
Km	Motor constant	Nm/√W	1.55	1.55	1.55	1.55
R20	Electrical resistance at 20°C (6)	Ohm	10.0	10.0	10.0	10.0
Ld/Lo	Electrical inductance (6)	mH	50.5 / 55.8	50.5 / 55.8	50.5 / 55.8	50.5 / 55.8
lp	Peak current	Arms	17.9	17.9	17.9	17.9
lc	Continuous current (2)	Arms	2.64	2.64	2.64	2.64
ls	Standstill current	Arms	2.00	2.00	2.00	2.00
ns	Standstill speed	rad/s	0.0020	0.0020	0.0020	0.0020
Udc	Nominal input voltage	VDC	395	565	300	600
Pc	Max. cont. power dissipation (2)	W	137	137	137	137
2p	Number of poles	-		2	22	

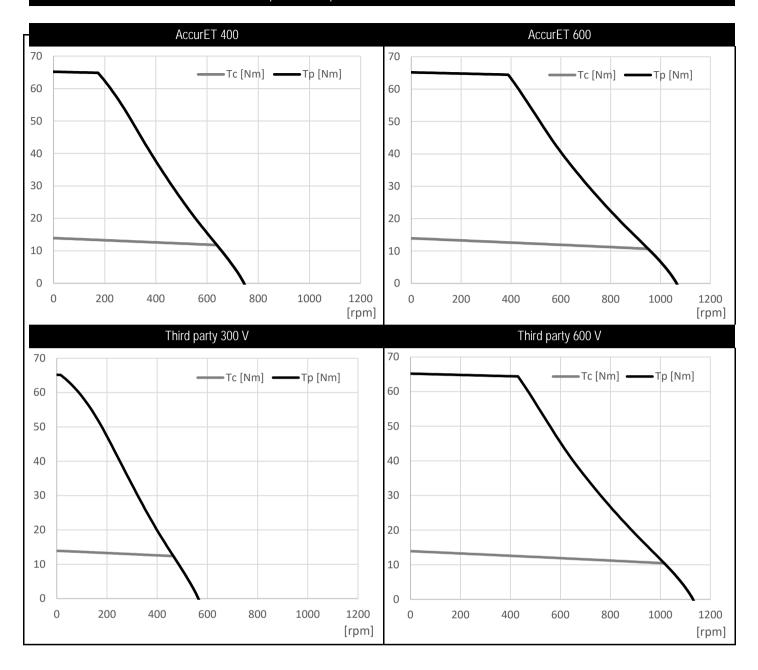
GUIDING ELEMENTS	
Туре	Ball bearing
MATERIAL AND FINISH	
	Stainless steel
Baseplate Shaft	Stainless steel

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) Tolerances on electrical parameters are available on request.
- (2) Coils at 100°C with additional surface of 0.070m<sup>2</sup> fixed on the base and 0.015m<sup>2</sup> on the rotor made of black anodized aluminum.
- (3) At the fastening holes of the rotor.
- (4) See torque vs speed curve to check if the specification can be reached based on selected DC bus voltage limitation.
- (5) Specification given at encoder level without any additional load fixed to the customer interface. This specification is reduced when an additional mass is fixed to the customer interface.
- (6) Terminal to terminal.

#### Torque versus Speed Curves for RTMBi140-050-3RAS





## PRECISION INDEXING ROTARY TABLE



AXIS DESIGNATION					
Number of controlled axes					
Axes name			The	eta	
Thrust transmitter: DD (direct drive) or ID (indirect drive		D	D		
TESTING CONDITIONS	UNIT	T			
Position controller		AccurET Modular 400	AccurET Modular 600	Third party 300 VDC	Third party 600 VDC
	-	15/40A	15/40A	no current limit	no current limit
Motion controller Rated payload	kg				
Rated inertia	kg.m <sup>2</sup>		0.0		
Tool point position	mm	С	entered on the table. 18.4	mm above rotor's interfac	e
Ambient temperature	°C		22:	±1	
DIMENSIONAL DATA	UNIT	1			
Outside diameter	mm		16		
Inside diameter	mm		2 11		
Height Total stroke	mm °		Unlin		
Total mass (without payload)	kg		10		
Rotor inertia (without payload)	kg.m <sup>2</sup>		2.07	E-03	
TORQUE CAPABILITIES (1)	UNIT	1			
Peak torque	Nm		65	.6	
Continuous torque (2)	Nm		14		
Standstill torque	Nm	10.8			
Max. detent torque (average to peak) Static friction (maximal value)	Nm Nm	0.48 0.45			
Dynamic friction (maximal value)	Nm/(rad/s)	0.012			
LOAD CAPACITIES	UNIT				
Maximum moment load (3)	Nm	12			
Maximum axial load	N		12		
Maximum axial load in upside down configuration	N		12	20	
DYNAMIC PERFORMANCE	UNIT	1			
Maximum speed (4)	rad/s		125	5.6	
Maximum acceleration	rad/s <sup>2</sup>	10000			
Typical position stability at 2kHz (5)	arcsec	±1.5			
STAGE ACCURACY	UNIT				
Positioning accuracy (without mapping)	arcsec		±2	20	
Positioning accuracy (with mapping)	arcsec		±		
Unidirectional repeatability	arcsec	±2			
Bidirectional repeatability  Radial runout	arcsec µm	±3 20			
Total axial error at 41 [mm] radius	μm	20			
ENCODED CHADACTERISTICS	LINIT				
ENCODER CHARACTERISTICS  Encoder and signal type	UNIT -		Ontical In	cremental	
Output signal	-	Optical - Incremental  1 Vpp			
Line count	period/turn	5000			
Reference mark	- V		1 5±1	0%	
Power supply	V		5±1	U /0	
WORKING ENVIRONMENT					
IP protection grade			IP.		
Standard compliance			SEMI	S22	

	ELECTRICAL SPECIFICATIONS (1)	UNIT	AccurET Modular 400 15/40A	AccurET Modular 600 15/40A	Third party 300 VDC no current limit	Third party 600 VDC no current limit
	Motor type	-		Iron	core	
	Motor model	-		TMB0140	-050-3RBS	
	Number of phases	-			3	
Kt	Force constant	Nm/Arms	3.00	3.00	3.00	3.00
Ku	Back EMF constant (6)	Vrms/(rad/s)	1.74	1.74	1.74	1.74
Km	Motor constant	Nm/√W	1.55	1.55	1.55	1.55
R20	Electrical resistance at 20°C (6)	Ohm	2.50	2.50	2.50	2.50
Ld/Lo	Electrical inductance (6)	mH	12.6 / 14.0	12.6 / 14.0	12.6 / 14.0	12.6 / 14.0
lp	Peak current	Arms	35.8	35.8	35.8	35.8
lc	Continuous current (2)	Arms	5.28	5.28	5.28	5.28
ls	Standstill current	Arms	4.00	4.00	4.00	4.00
ns	Standstill speed	rad/s	0.0020	0.0020	0.0020	0.0020
Udc	Nominal input voltage	VDC	395	565	300	600
Pc	Max. cont. power dissipation (2)	W	137	137	137	137
2p	Number of poles	-			22	·

GUIDING ELEMENTS	
Туре	Ball bearing
MATERIAL AND FINISH	
Baseplate	Stainless steel
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.

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- (2) Coils at 100°C with additional surface of 0.070m<sup>2</sup> fixed on the base and 0.015m<sup>2</sup> on the rotor made of black anodized aluminum.
- (3) At the fastening holes of the rotor.
- (4) See torque vs speed curve to check if the specification can be reached based on selected DC bus voltage limitation.
- (5) Specification given at encoder level without any additional load fixed to the customer interface. This specification is reduced when an additional mass is fixed to the customer interface.
- (6) Terminal to terminal.

#### Torque versus Speed Curves for RTMBi140-050-3RBS

