

# T STANDALONE AXIS

ASME-RTMBi1400303R#S0000

Data sheet

Version 2.0





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- 2) RTMBi140-030-3RAS with free leads and AccurET Modular 400/600VDC or third party controller 300/600VDC
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### PRECISION INDEXING ROTARY TABLE



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	-	AccurET Modular 3	300 07/15A	
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	86		
Total stroke	•	Unlimited	I	
Total mass (without payload)	kg	8.5		
Rotor inertia (without payload)	kg.m <sup>2</sup>	1.53E-03	3	
TOPOLIF CAPADILITIES (A) (O)	LINUT	DTMD:440.000.0DA0	DTMD://40.000.000.0	
TORQUE CAPABILITIES (1) (2)	UNIT	RTMBi140-030-3RAS	RTMBi140-030-3RBS	
Peak torque	Nm	33.6	21.4	
Continuous torque (3) Standstill torque	Nm	9.39	9.39	
Max. detent torque (average to peak)	Nm Nm	7.08 0.29	7.08 0.29	
Static friction (maximal value)	Nm	0.29	0.30	
Dynamic friction (maximal value)	Nm/(rad/s)	0.012	0.012	
	(.22.2)	575.12		
LOAD CAPACITIES	UNIT			
Maximum moment load (4)	Nm	9		
Maximum axial load	N	120		
Maximum axial load in upside down configuration	N II	120		
	L UNIT			
DYNAMIC PERFORMANCE	UNIT rad/s	125.6		
DYNAMIC PERFORMANCE Maximum speed (4)	rad/s	125.6 10000		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration	rad/s rad/s <sup>2</sup>	10000		
DYNAMIC PERFORMANCE Maximum speed (4)	rad/s			
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration	rad/s rad/s <sup>2</sup>	10000		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)	rad/s rad/s² arcsec	10000		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)	rad/s rad/s² arcsec  UNIT	10000 ±1.5 ±20 ±6		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)  Unidirectional repeatability	rad/s rad/s² arcsec  UNIT arcsec	10000 ±1.5 ±20 ±6 ±2		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)  Unidirectional repeatability  Bidirectional repeatability	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec arcsec	10000 ±1.5 ±20 ±6 ±2 ±3		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)  Unidirectional repeatability  Bidirectional repeatability  Radial runout	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec arcsec µm	10000 ±1.5 ±20 ±6 ±2 ±3 20		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)  Unidirectional repeatability  Bidirectional repeatability	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec arcsec	10000 ±1.5 ±20 ±6 ±2 ±3		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)  Unidirectional repeatability  Bidirectional repeatability  Radial runout  Total axial error at 41 [mm] radius	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec arcsec µm	10000 ±1.5 ±20 ±6 ±2 ±3 20		
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)  Unidirectional repeatability  Bidirectional repeatability  Radial runout  Total axial error at 41 [mm] radius	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec  µm µm	10000 ±1.5 ±20 ±6 ±2 ±3 20 20	mental	
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration Typical position stability at 2kHz (6)  STAGE ACCURACY  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	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec  µm µm	10000 ±1.5  ±20 ±6 ±2 ±3 20 20 Optical - Increa	mental	
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration  Typical position stability at 2kHz (6)  STAGE ACCURACY  Positioning accuracy (without mapping)  Positioning accuracy (with mapping)  Unidirectional repeatability  Bidirectional repeatability  Radial runout  Total axial error at 41 [mm] radius	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec  µm µm	10000 ±1.5 ±20 ±6 ±2 ±3 20 20	mental	
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration Typical position stability at 2kHz (6)  STAGE ACCURACY  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	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec  µm µm  UNIT	10000 ±1.5  ±20 ±6 ±2 ±3 20 20 Optical - Increa	mental	
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration Typical position stability at 2kHz (6)  STAGE ACCURACY  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	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec  µm µm  UNIT	10000 ±1.5 ±20 ±6 ±2 ±3 20 20 20 Optical - Increi	mental	
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DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration Typical position stability at 2kHz (6)  STAGE ACCURACY  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	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec µm µm  UNIT - period/turn -	10000 ±1.5 ±20 ±6 ±2 ±3 20 20 20 Optical - Increi 1 Vpp 5000 1 5000	mental	
DYNAMIC PERFORMANCE  Maximum speed (4)  Maximum acceleration Typical position stability at 2kHz (6)  STAGE ACCURACY  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	rad/s rad/s² arcsec  UNIT arcsec arcsec arcsec arcsec µm µm  UNIT - period/turn -	10000 ±1.5 ±20 ±6 ±2 ±3 20 20 20 Optical - Incree 1 Vpp 5000 1		

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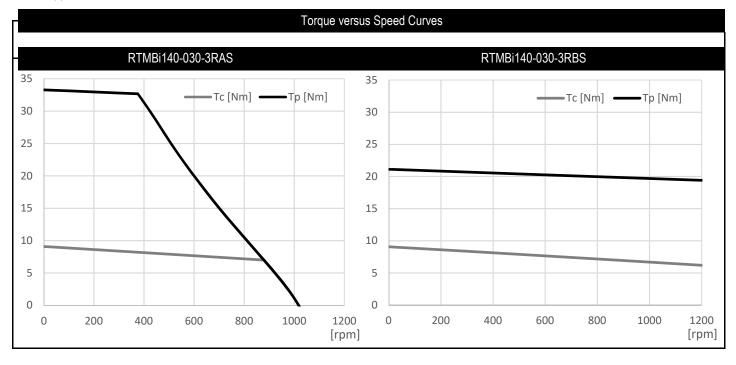
	ELECTRICAL SPECIFICATIONS (1) (2)	UNIT		
	Motor type	-	Ironcore	Ironcore
	Motor model	-	TMB0140-030-3RAS	TMB0140-030-3RBS
	Number of phases	-	3	3
Kt	Force constant	Nm/Arms	3.59	1.79
Ku	Back EMF constant (7)	Vrms/(rad/s)	2.08	1.04
Km	Motor constant	Nm/√W	1.10	1.10
R20	Electrical resistance at 20°C (7)	Ohm	7.08	1.77
Ld/Lo	Flectrical inductance (7)	mH	30.3 / 33.4	7.58 / 8.35
lp	Peak current	Arms	15.0	15.0
lc	Continuous current (3)	Arms	2.88	5.76
ls	Standstill current	Arms	2.18	4.36
ns	Standstill speed	rad/s	0.0023	0.0023
Udc	Nominal input voltage	VDC	326	326
Pc	Max. cont. power dissipation (3)	W	115	115
2p	Number of poles	-	22	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.

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 10 kHz
- (3) Coils at 100°C with additional surface of 0.070m² fixed on the base and 0.012m² 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)	)	DD			
TESTING CONDITIONS	UNIT				
Position controller	-	AccurET Modular 400 AccurET Modular 600 Third party 300 VDC Third party 600 VDC			
Motion controller	_	15/40A 15/40A no current limit no current limit			
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 Total stroke	mm °	86 Unlimited			
Total mass (without payload)	kg	8.5			
Rotor inertia (without payload)	kg.m <sup>2</sup>	1.53E-03			
TODOLLE CADADULTIES (1)	LINIT				
TORQUE CAPABILITIES (1)  Peak torque	UNIT Nm	39.4			
Continuous torque (2)	Nm	9.39			
Standstill torque	Nm	7.08			
Max. detent torque (average to peak)	Nm	0.29			
Static friction (maximal value)  Dynamic friction (maximal value)	Nm Nm/(rad/s)	0.30			
	TVIII/(Tdd/3)	0.012			
LOAD CAPACITIES	UNIT				
Maximum moment load (3)  Maximum axial load	Nm	9 120			
Maximum axial load in upside down configuration	N N	120			
DYNAMIC PERFORMANCE	UNIT				
Maximum speed (4)	rad/s	125.6			
Maximum acceleration  Typical position stability at 2kHz (5)	rad/s <sup>2</sup> arcsec	10000 ±1.5			
Typical position stability at 21(12 (6)	dicacc	11.0			
STAGE ACCURACY	UNIT				
Positioning accuracy (without mapping)	arcsec	±20			
Positioning accuracy (with mapping) Unidirectional repeatability	arcsec	±6			
Bidirectional repeatability	arcsec arcsec	±2 ±3			
Radial runout	μm	20			
Total axial error at 41 [mm] radius	μm	20			
ENCODER CHARACTERISTICS	UNIT				
Encoder and signal type	-	Optical - Incremental			
Output signal	-	1 Vpp			
Line count	period/turn	5000			
Reference mark Power supply	- V	1 5±10%			
т омет эширгу	V	J±1U/0			
WORKING ENVIRONMENT					
IP protection grade		IP40			
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	-	Ironcore				
	Motor model	-		TMB0140	-030-3RAS		
	Number of phases	-			3		
Kt	Force constant	Nm/Arms	3.59	3.59	3.59	3.59	
Ku	Back EMF constant (6)	Vrms/(rad/s)	2.08	2.08	2.08	2.08	
Km	Motor constant	Nm/√W	1.10	1.10	1.10	1.10	
R20	Electrical resistance at 20°C (6)	Ohm	7.08	7.08	7.08	7.08	
Ld/Ld	Electrical inductance (6)	mH	30.3 / 33.4	30.3 / 33.4	30.3 / 33.4	30.3 / 33.4	
lp	Peak current	Arms	20.6	20.6	20.6	20.6	
Ic	Continuous current (2)	Arms	2.88	2.88	2.88	2.88	
ls	Standstill current	Arms	2.18	2.18	2.18	2.18	
ns	Standstill speed	rad/s	0.0023	0.0023	0.0023	0.0023	
Udc	Nominal input voltage	VDC	395	565	300	600	
Pc	Max. cont. power dissipation (2)	W	115	115	115	115	
2p	Number of poles	-		2	2		

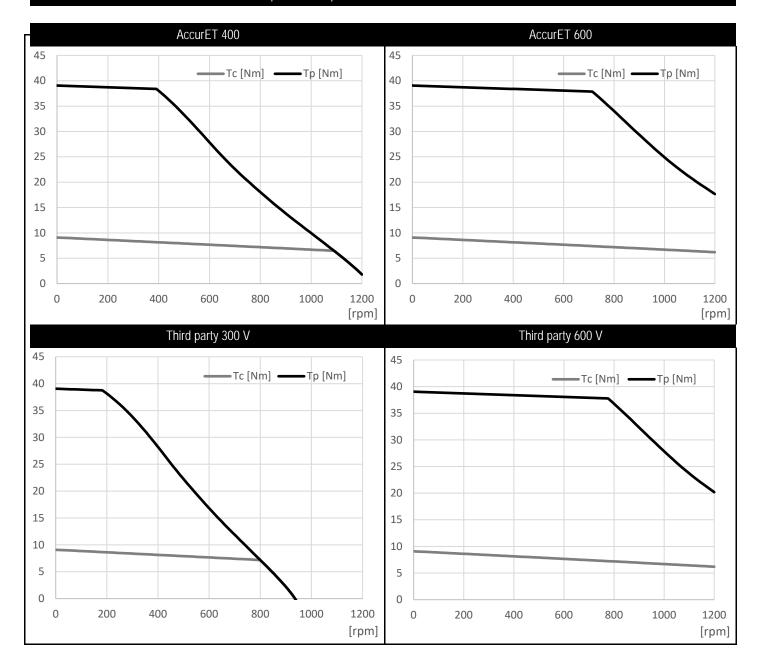
GUIDING ELEMENTS	
Туре	Ball bearing
MATERIAL AND FINISH	
Baseplate	Stainless steel
Shaft	Stainless steel

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.

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 0.012m<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 RTMBi140-030-3RAS





## PRECISION INDEXING ROTARY TABLE



AXIS DESIGNATION					
Number of controlled axes		1			
Axes name  Thrust transmitter, DD (direct drive) or ID (indirect drive)		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  centered on the table. 18.4 mm above rotor's interface			
Tool point position Ambient temperature	mm °C	centered on the table. 18.4 min above rotor's interface  22±1			
		1			
DIMENSIONAL DATA	UNIT				
Outside diameter Inside diameter	mm	166 25			
Height	mm mm	86			
Total stroke	0	Unlimited			
Total mass (without payload)	kg	8.5			
Rotor inertia (without payload)	kg.m <sup>2</sup>	1.53E-03			
TORQUE CAPABILITIES (1)	UNIT				
Peak torque	Nm	38.9 38.9 39.4 39.4			
Continuous torque (2)	Nm	9.39			
Standstill torque Max. detent torque (average to peak)	Nm Nm	7.08			
Static friction (maximal value)	Nm	0.29			
Dynamic friction (maximal value)	Nm/(rad/s)	0.012			
LOAD CAPACITIES	UNIT				
Maximum moment load (3)	Nm	9			
Maximum axial load	N	120			
Maximum axial load in upside down configuration	N	120			
DYNAMIC PERFORMANCE	UNIT				
Maximum speed (4)	rad/s	125.6			
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	±20			
Positioning accuracy (with mapping) Unidirectional repeatability	arcsec	±6 ±2			
Bidirectional repeatability	arcsec arcsec	±2 ±3			
Radial runout	μm	20			
Total axial error at 41 [mm] radius	μm	20			
ENCODER CHARACTERISTICS	UNIT				
Encoder and signal type	-	Optical - Incremental			
Output signal	-	1 Vpp			
Line count	period/turn	5000			
Reference mark Power supply	- V	1 5±10%			
	v V	.1 52.10%			
WORKING ENVIRONMENT					
IP protection grade		IP40 SEMI S22			
Standard compliance		SEIVII SZZ			

	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	-030-3RBS	
	Number of phases	-			3	
Kt	Force constant	Nm/Arms	1.79	1.79	1.79	1.79
Ku	Back EMF constant (6)	Vrms/(rad/s)	1.04	1.04	1.04	1.04
Km	Motor constant	Nm/√W	1.10	1.10	1.10	1.10
R20	Electrical resistance at 20°C (6)	Ohm	1.77	1.77	1.77	1.77
Ld/Lc	Electrical inductance (6)	mH	7.58 / 8.35	7.58 / 8.35	7.58 / 8.35	7.58 / 8.35
lp	Peak current	Arms	40	40	41.1	41.1
Ic	Continuous current (2)	Arms	5.76	5.76	5.76	5.76
ls	Standstill current	Arms	4.36	4.36	4.36	4.36
ns	Standstill speed	rad/s	0.0023	0.0023	0.0023	0.0023
Udc	Nominal input voltage	VDC	395	565	300	600
Pc	Max. cont. power dissipation (2)	W	115	115	115	115
2p	Number of poles	-		2	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.

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 0.012m<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 RTMBi140-030-3RBS

