T STANDALONE AXIS

ASME-RTMBi1400303R#S0000

Data sheet

Version 2.0

ETEL

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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 300 07/15A
Motion controller	-	none
Rated payload	kg	2.3
Rated inertia	$kg.m^2$	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
Total mass (without payload)	kg	8.5
Rotor inertia (without payload)	$kg.m^2$	1.53E-03

TORQUE CAPABILITIES (1) (2)	UNIT	RTMBi140-030-3RAS	RTMBi140-030-3RBS
Peak torque	Nm	33.6	21.4
Continuous torque (3)	Nm	9.39	9.39
Standstill torque	Nm	7.08	7.08
Max. detent torque (average to peak)	Nm	0.29	0.29
Static friction (maximal value)	Nm	0.30	0.30
Dynamic friction (maximal value)	Nm/(rad/s)	0.012	0.012

LOAD CAPACITIES	UNIT	
Maximum moment load (4)	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^2	10000
Typical position stability at 2kHz (6)	arcsec	±1.5

STAGE ACCURACY	UNIT	
Positioning accuracy (without mapping)	arcsec	±20
Positioning accuracy (with mapping)	arcsec	±6
Unidirectional repeatability	arcsec	±2
Bidirectional repeatability	arcsec	±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	-	1
Power supply	V	5±10%

WORKING ENVIRONMENT	
IP protection grade	IP40
Standard compliance	SEMI S22

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/Lq	Electrical inductance (7)	mH	30.3 / 33.4	7.58 / 8.35
Ip	Peak current	Arms	15.0	15.0
Ic	Continuous current (3)	Arms	2.88	5.76
Is	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	
Type	Ball bearing

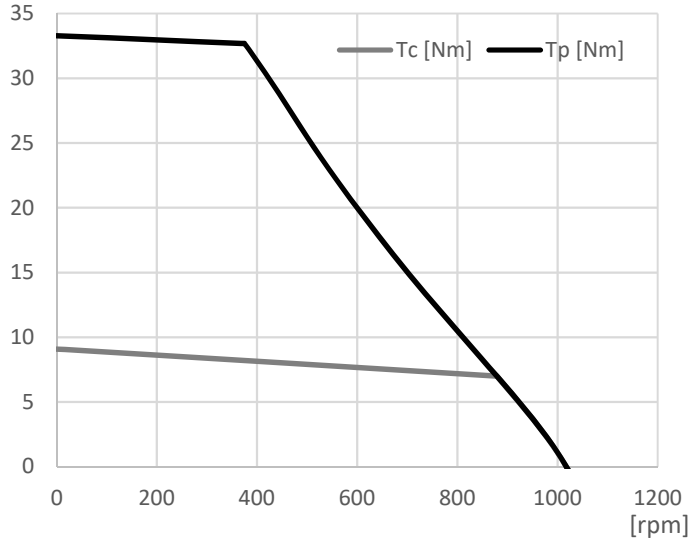
MATERIAL AND FINISH	
Baseplate	Stainless steel
Shaft	Stainless steel

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.

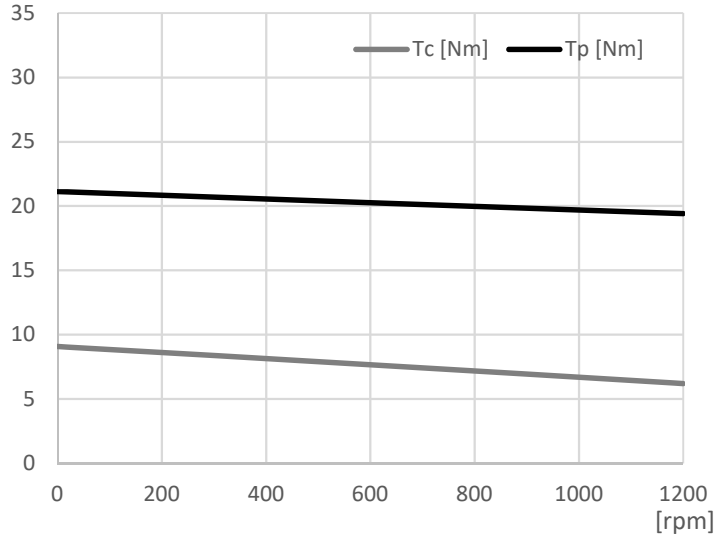
Notes: The specifications given may be mutually exclusive. Unless stated otherwise, all measurements are made within the testing conditions.
(1) Tolerances on electrical parameters are available on request.
(2) Considering a PWM frequency at 10 kHz
(3) Coils at 100°C with additional surface of 0.070m^2 fixed on the base and 0.012m^2 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.

Torque versus Speed Curves

RTMBi140-030-3RAS



RTMBi140-030-3RBS



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 15/40A	AccurET Modular 600 15/40A	Third party 300 VDC no current limit	Third party 600 VDC no current limit
Motion controller	-	none			
Rated payload	kg	2.3			
Rated inertia	$kg.m^2$	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
Total mass (without payload)	kg	8.5
Rotor inertia (without payload)	$kg.m^2$	1.53E-03

TORQUE CAPABILITIES (1)	UNIT	
Peak torque	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)	Nm	0.30
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^2	10000
Typical position stability at 2kHz (5)	arcsec	±1.5

STAGE ACCURACY	UNIT	
Positioning accuracy (without mapping)	arcsec	±20
Positioning accuracy (with mapping)	arcsec	±6
Unidirectional repeatability	arcsec	±2
Bidirectional repeatability	arcsec	±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	-	1
Power supply	V	5±10%

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/Lq	Electrical inductance (6)	mH	30.3 / 33.4	30.3 / 33.4	30.3 / 33.4	30.3 / 33.4
Ip	Peak current	Arms	20.6	20.6	20.6	20.6
Ic	Continuous current (2)	Arms	2.88	2.88	2.88	2.88
Is	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	-	22			

GUIDING ELEMENTS	
Type	Ball bearing

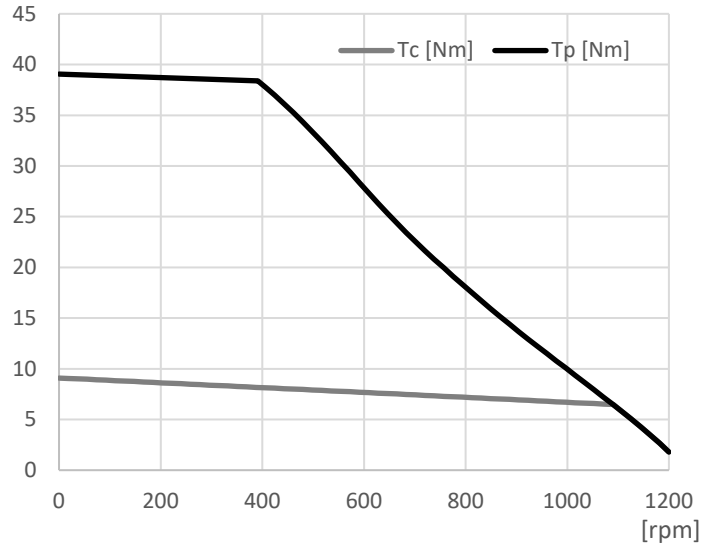
MATERIAL AND FINISH	
Baseplate	Stainless steel
Shaft	Stainless steel

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.

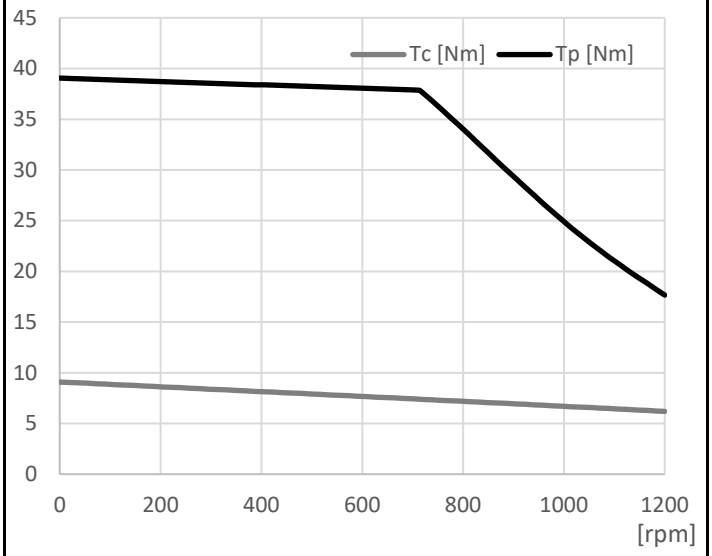
Notes: The specifications given may be mutually exclusive. Unless stated otherwise, all measurements are made within the testing conditions.
(1) Tolerances on electrical parameters are available on request.
(2) Coils at 100°C with additional surface of 0.070m^2 fixed on the base and 0.012m^2 on the rotor 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

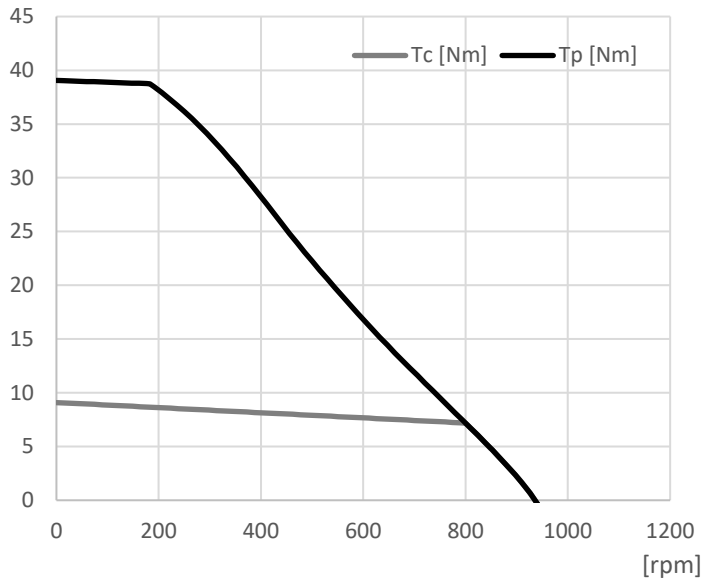
AccurET 400



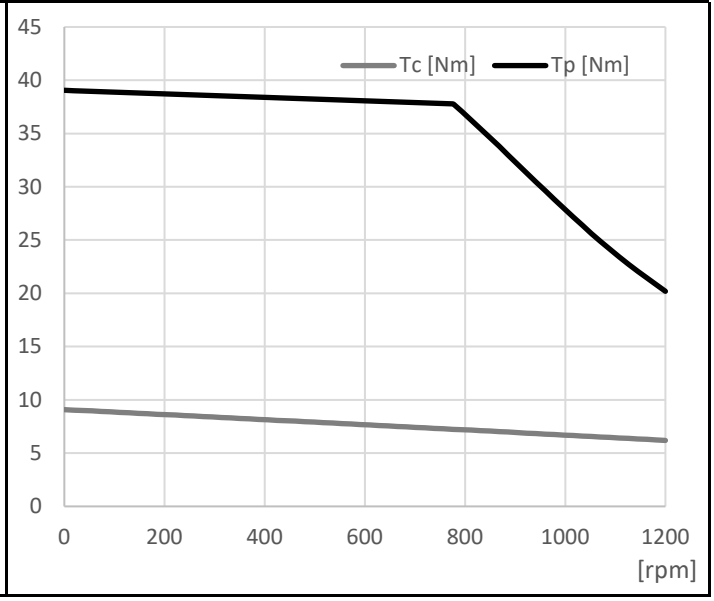
AccurET 600



Third party 300 V



Third party 600 V



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 15/40A	AccurET Modular 600 15/40A	Third party 300 VDC no current limit	Third party 600 VDC no current limit
Motion controller	-	none			
Rated payload	kg	2.3			
Rated inertia	$kg.m^2$	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
Total mass (without payload)	kg	8.5
Rotor inertia (without payload)	$kg.m^2$	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	Nm	7.08			
Max. detent torque (average to peak)	Nm	0.29			
Static friction (maximal value)	Nm	0.30			
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^2	10000
Typical position stability at 2kHz (5)	arcsec	±1.5

STAGE ACCURACY	UNIT	
Positioning accuracy (without mapping)	arcsec	±20
Positioning accuracy (with mapping)	arcsec	±6
Unidirectional repeatability	arcsec	±2
Bidirectional repeatability	arcsec	±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	-	1
Power supply	V	5±10%

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	-	TMB0140-030-3RBS			
	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/Lq	Electrical inductance (6)	mH	7.58 / 8.35	7.58 / 8.35	7.58 / 8.35	7.58 / 8.35
Ip	Peak current	Arms	40	40	41.1	41.1
Ic	Continuous current (2)	Arms	5.76	5.76	5.76	5.76
Is	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	-	22			

GUIDING ELEMENTS	
Type	Ball bearing

MATERIAL AND FINISH	
Baseplate	Stainless steel
Shaft	Stainless steel

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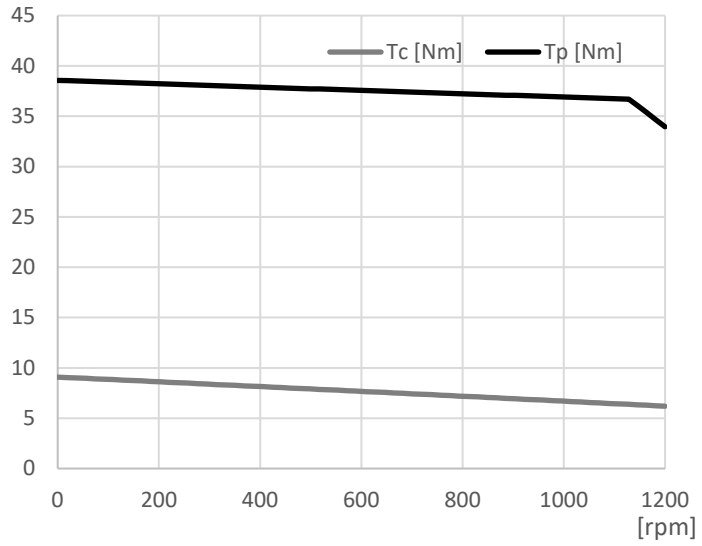
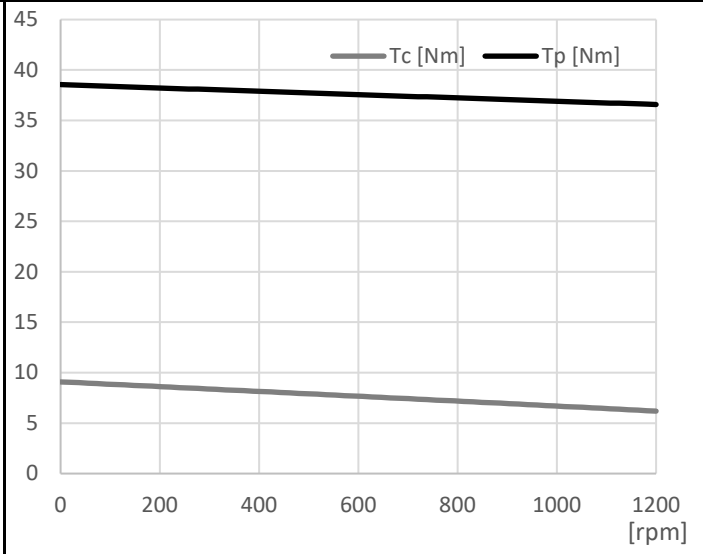
Notes: The specifications given may be mutually exclusive. Unless stated otherwise, all measurements are made within the testing conditions.
(1) Tolerances on electrical parameters are available on request.
(2) Coils at 100°C with additional surface of 0.070m^2 fixed on the base and 0.012m^2 on the rotor 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

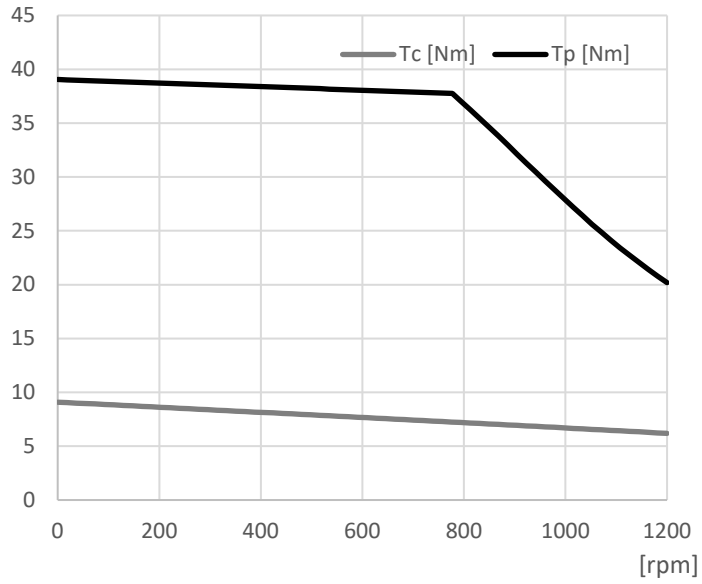
AccurET 400



AccurET 600



Third party 300 V



Third party 600 V