

Appendix C

Motor Specifications

Motor Specifications

Speed/torque curves, motor specifications, and dimensions are shown on the following pages.

Motor Brakes

Motor brakes are mounted directly behind the motor and are pre-assembled at the factory. When ordering the brake option, specify the motor type.

Brake Characteristics	APEX604	APEX605/606/610	APEX620/630/635	APEX640	Units
Supply voltage	24	24	24	24	VDC
Supply current	0.57	0.57	0.93	1.27	A
Static braking torque	326 (2.3)	850 (6.0)	1130 (8.0)	6800 (48)	oz-in (Nm)

APEX6xx Motor Brake Characteristics

Motor Data

The data sheets show motor characteristics. Torque specifications are with rated and peak current for the *motor*. Rated and peak current for the *drive* may be lower—thus, torque may be lower. Consult the data sheets for *motor* capabilities. Consult the speed/torque curves for APEX615n *system* capabilities.

Positional Repeatability

Repeatability: ± 0.088 degrees, unloaded

Positional Accuracy

Resolver Accuracy: ± 10 arc minutes

Resolver-to-Digital Converter Accuracy: ± 10 arc minutes

Resolver-to-Digital Converter Resolution: 4096 counts/rev

Selecting Controller/Drive/Motor Combinations

We recommend selecting motors for use with the APEX615n Controller/Drives as follows:

APEX6151: SM-231A, SM232A, SM-232B, APEX602, APEX603

APEX6152: APEX604, APEX605, APEX606

APEX6154: APEX610, APEX620, APEX630, APEX635, APEX640

Speed/Torque Curves

The following speed/torque curves represent the available shaft torque at different operating speeds, under the following conditions. Actual motor torque may vary $\pm 10\%$ due to motor manufacturing variances.

SM Motors:

25°C (77°F) ambient temperature

Nominal torque constant K_t

Motor mounted to heatsink:

10" x 10" x 0.25" aluminum

Apex Motors:

40°C (104°F) ambient temperature

Nominal torque constant K_t

Motor mounted to aluminum heatsink:

8" x 12" x 0.25" for APEX602 - APEX630

11.5" x 12" x 0.75" for APEX635, APEX640

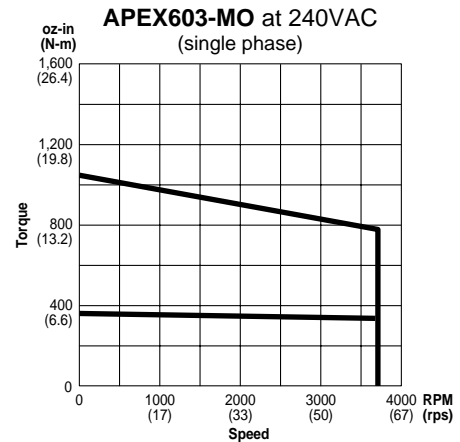
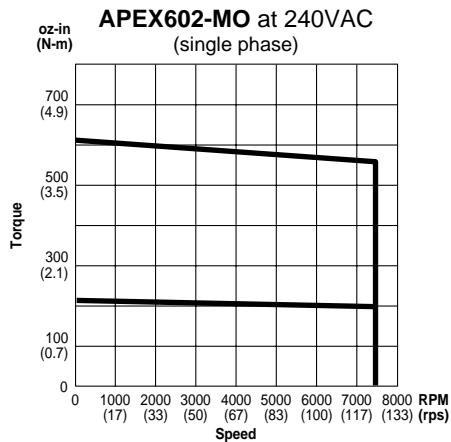
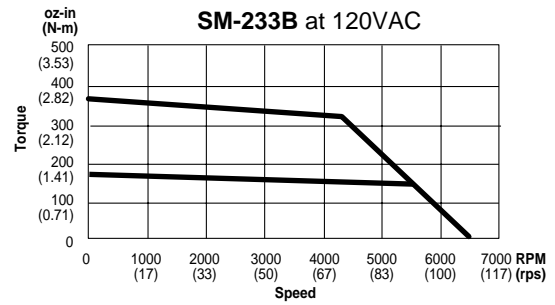
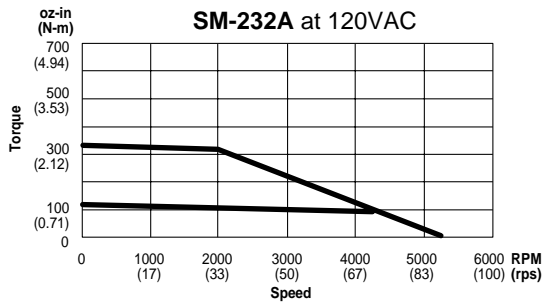
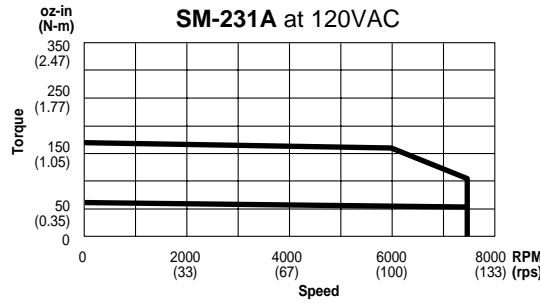
Actual motor torque may vary $\pm 10\%$ due to motor manufacturing variances.

Continuous Duty means steady state operation for drive ambient temperatures of 0°C to 50°C. **Intermittent Duty** means operation for shorter periods of time.

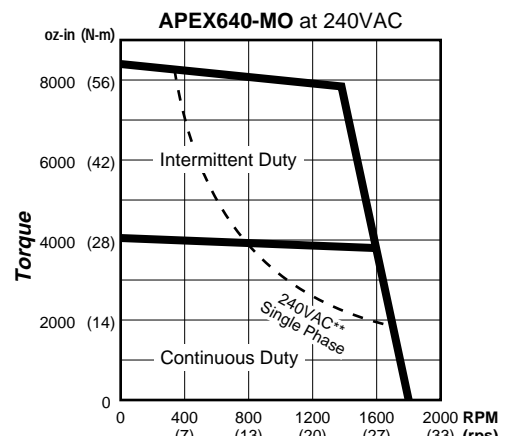
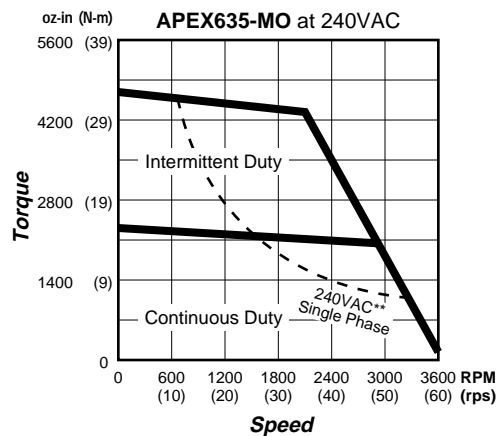
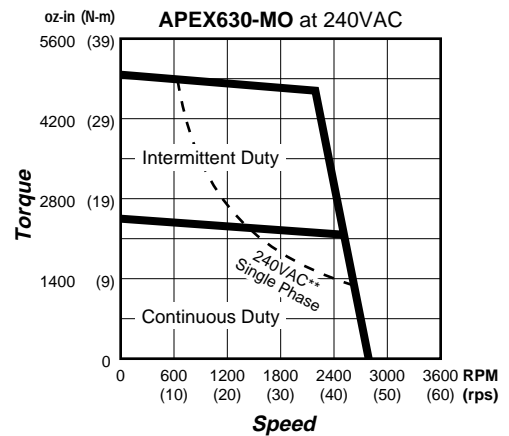
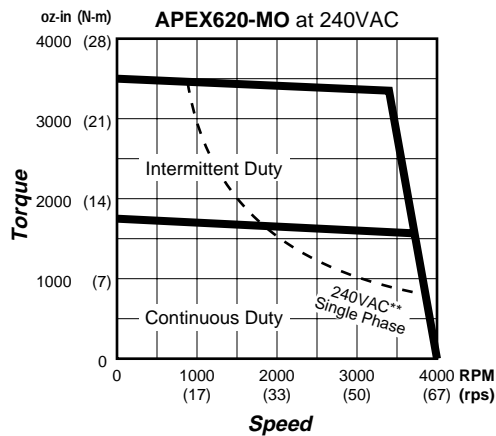
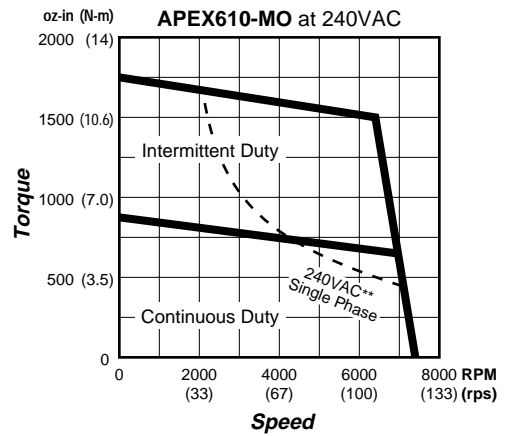
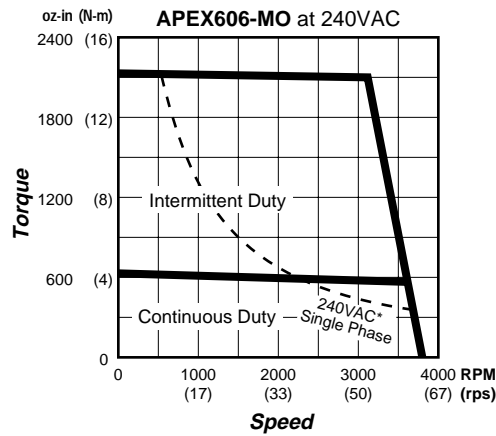
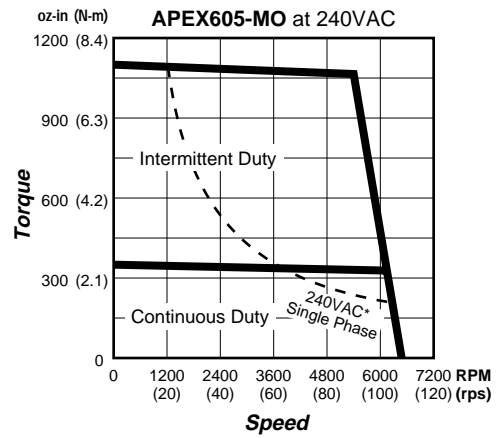
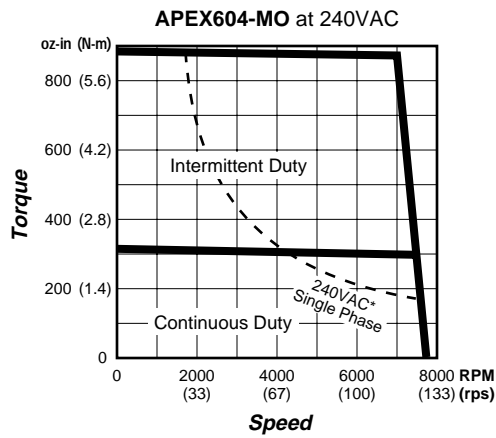
240VAC SINGLE PHASE OPERATION: You must limit single phase operations to current levels that do not blow the AC input fuse. Dotted lines on the speed torque curves show maximum single phase current (8A rms for APEX604, 605, 606 motors; 20A rms for APEX610, 620, 630, 635, 640 motors). If you use single phase power, you must operate your motor in the region below the dotted line.

CAUTION

SM Series Servo Motors are optimized for operation with APEX615n controller/drives at 120VAC. Do not power the controller drive with 240VAC if you use an SM Motor.



Speed/Torque Curves



*240VAC single phase, 8A rms line current
 **240VAC single phase, 20A rms line current

Speed/Torque Curves (at nominal value for torque constant)

SM Motor Specifications

Parameter	Symbol	Units	SM231AR	SM232AR	SM233BR
Stall Torque Continuous ¹	T _{cs}	lb.in. oz. in. Nm	3.5 56 0.40	6.7 107 0.76	10.2 163 1.15
Stall Current Continuous ¹	I _{cs}	amperes - rms	2.0	2.0	3.9
Rated Speed	w _r	rpm rps	7500 125	4250 71	6000 100
Peak Torque ^{1,6}	T _{pk}	lb.in. oz. in. Nm	17.5 280 1.98	33.4 535 3.78	50.9 815 5.76
Peak Current, rms ¹	I _{pk}	amperes	10	10	19.5
Torque @ Rated Speed ¹	T _c	lb.in. oz. in. Nm	2.8 46 0.32	6.0 96 0.68	9.0 145 1.02
Rated Power -- Output Shaft ¹	P _o	watts hp	250 0.34	302 0.40	643 0.86
Voltage Constant ^{3,4}	K _b	volts/radian/sec	0.161	0.310	0.242
Voltage Constant ^{3,4}	K _e	volts/KRPM	16.86	32.45	25.33
Torque Constant ^{3,4,7}	K _t	oz. in./ amp rms Nm/amp rms	27.82 0.20	53.54 0.38	41.76 0.29
Resistance ^{1,3}	R	ohms	5.22	7.5	2.58
Inductance ⁵	L	millihenries	1.64	2.9	1.06
Thermal Resistance ¹	R _{th}	°C/watt	2.23	1.58	1.26
Motor Constant	K _m	oz.in./+watt Nm/+watt	9.58 0.07	15.99 0.11	21.25 0.15
Viscous Damping	B	oz. in./Krpm Nm/Krpm	1.24 8.76 x 10 ⁻³	2.07 14.76 x 10 ⁻³	2.86 20.20 x 10 ⁻³
Torque - Static Friction	T _f	oz. in. Nm	1.2 8.47 x 10 ⁻³	2.0 14.10 x 10 ⁻³	2.25 15.90 x 10 ⁻³
Thermal Time Constant	t _{th}	minutes	30	35	40
Electrical Time Constant	t _e	milliseconds	0.31	0.39	0.41
Mechanical Time Constant	t _m	milliseconds	13.7	8.6	7.0
Rotor Inertia	J	lb.in.sec ² kgm ² * 1E-6	0.00048 54.23	0.00084 94.91	0.00119 134.50
Weight	#	pounds kg	2.6 1.18	3.5 1.59	4.4 2.00
Winding Class			H	H	H

¹ @ 25°C ambient w/ 10x10x0.25 inch mounting plate, 150°C winding temperature
For 40°C ambient operation, reduce values by 12%.

³ ± 10%, line-to-line

⁴ peak value

⁵ ± 30%, line-to-line, inductance bridge measurement method @ 1kHz

⁶ Peak current for 1 sec with initial winding temperature of 60°C or less.

⁷ Effective torque constant when applied with a sinusoidal amplifier.

All specifications are subject to engineering change

APEX and SM Resolver Specifications

Parameter	Value
Input voltage @ 7000 Hz	4.25 volts
Input current, max.	55 ma
Input power, nominal	0.12 watts
Impedance ZSO (@90°)	58 +j145 ohms
Impedance ZRO	53 +j72 ohms
Impedance ZRS	42 +j55 ohms
Transformation ratio	0.470 ±5%
Output voltage	2.0 ±5% volts
D.C. rotor resistance	23 ±10% ohms
D.C. stator resistance	19 ±10% ohms
Sensitivity	35 mV/Degree
Max. Error from EZ	±10 minutes
Phase shift, open circuit	5° leading ±3°
Null voltage (total)	20 mV rms
Impedance ZSS	50 +j128 ohms
Inertia	included in motor specification

	Motor Size:	APEX602		Value	Units	Tolerance
1	Constant (s):	Torque		52.6 (0.37)	oz-in/A rms (Nm/A rms)	± 10%
2		Voltage (Sinusoidal)		22.5	V rms/Krpm	± 10%
3		Electrical Time		5.3	milliseconds	nominal
4		Mechanical Time		1.40	milliseconds	nominal
5		Thermal		11.0	minutes	nominal
6	Torque (s):	Continuous, Stall		236 (1.67)	oz-in (Nm)	min. [1]
7	(NOTE: Values are with	Continuous, Stall		223 (1.57)	oz-in (Nm)	min. [2]
8	rated and peak current,	Continuous, Rated		202 (1.43)	oz-in (Nm)	min. [2]
9	lines 15 & 16 below.	Peak, Max w/o Saturation		630 (4.45)	oz-in (Nm)	min. [1]
10	Drive current, and thus	Static Friction		7.68 (0.05)	oz-in (Nm)	max.
11	torque, may be lower.)	Ripple (of Rated Torque)		5	percent	max. [3]
12	Speed:	Rated		7500 (125)	rpm (rps)	reference
13		Maximum		7500 (125)	rpm (rps)	reference
14	Frequency	Rated		250	Hz	max.
15	Current:	Rated		4.2	A rms	max. [1]
16		Peak		12.6	A rms	nominal
17	Voltage:	Rated		240	V rms	reference
18		Max		250	V rms	maximum
19	Output Power	Rated		1.12 (1.5)	kWatts (hp)	min. [1]
20	Inductance	Terminal (line-line)		14.4	mH	± 30%
21	D.C. Resistance	Terminal (line-line)		2.72	ohms	± 10 % [1]
22	Acceleration at Rated Torque			96500	rads/sec ²	Theoretical
23	Rotor Inertia			2.52 (46.1)	oz-in ² (kgm ² * 1E-6)	nominal
24	Damping			0.384 (0.0027)	oz-in/krpm (Nm/krpm)	nominal
25	Weight			7.0 (3.17)	lbs. (kg)	max.
26	Winding Temperature			170°C (338°F) [4]	°C (°F)	max.
27	Winding Temperature Rise (Above Ambient) [1]			145°C (293°F)	°C (°F)	reference
28	Insulation Class			H	—	reference
29	Thermostat TRIP Temperature			170°C (338°F)	°C (°F)	± 5° C
30	Thermostat RESET Temperature			135°C (275°F)	°C (°F)	± 10° C
31	Dielectric Strength, (Winding-to-Frame)			1750	VAC	min.
32	Winding Capacitance-to-Frame			0.000898	µF	max.
33	IP Classification			65 [8]	rated	standard
34	Shaft:	Radial-Play	At End	12E-6 (68E-9)	in/lb (m/N)	reference
			At Faceplate	7.0E-6 (40E-9)	in/lb (m/N)	reference
35		Material [5]		RC-#30	—	reference
36		Magnet Type		NdFeB	—	—
37		Loading [6]	1000 rpm (17 rps)	81 (360)	lbs. (N)	max. [7]
			2000 rpm (33 rps)	65 (289)	lbs. (N)	max. [7]
			3000 rpm (50 rps)	56 (249)	lbs. (N)	max. [7]
			4000 rpm (67 rps)	51 (227)	lbs. (N)	max. [7]
			5000 rpm (83 rps)	48 (213)	lbs. (N)	max. [7]
38	Motor Vibration			N	ISO 2373	Standard
39	Bearing Class, Internal/External			1/Class 3	ABEC/AFBMA	reference
40	Bearing Grease			SRI #2	Manufacturer	reference
41	Shaft Seal Pressure			3 (0.21)	psi (kg/cm ²)	max.
42	Basic Motor Design			3 phase wye connected 2(P/2)		
43	Stator Phase Sequence			A-C-B (viewed from front face plate)		
44	Vendor/Supplier			Industrial Drives B-104-B		
45	Resolver Type/Accuracy			Single-Speed; Rotor-Excited; ± 10 arc min.; Resolution is 4096 counts/rev post-quadrature		
46	Resolver Manufacturer/Model #			Fasco # 21-BRCX-335-J39		
47	Standard Resolver Cable Part Number			71-011777-xx		
48	Standard Motor Cable Part Number			71-011774-xx		
49	Options:	Brake—24VDC (0.57A)—326 oz-in (2.3 Nm) Holding Torque			(requires resolver cable 71-014082-xx)	
		IP67 Classification	No Keyway			
		Incremental Encoder	Shaft Modifications			
		Tachometer	IP65 Shaft Seal			
[1]	25°C (77°F) Ambient			[5] Rotor steel is rated as <i>fatigue proof</i>		
[2]	40°C (104°F) Ambient			[6] Loads centered 1 inch from mounting flange		
[3]	Measured at 60 rpm (1 rps) in Velocity Mode			[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.		
[4]	Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)			[8] Motor shaft is IP30 rated.		

	Motor Size:	APEX603	Value	Units	Tolerance	
1	Constant (s):	Torque	114.6 (0.81)	oz-in/A rms (Nm/A rms)	± 10%	
2		Voltage (Sinusoidal)	49.0	V rms/Krpm	± 10%	
3		Electrical Time	9.7	milliseconds	nominal	
4		Mechanical Time	-----	milliseconds	nominal	
5		Thermal	18	minutes	nominal	
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall	367 (2.59)	oz-in (Nm)	min. [1]	
7		Continuous, Stall	346 (2.44)	oz-in (Nm)	min. [2]	
8		Continuous, Rated	356 (2.51)	oz-in (Nm)	min. [2]	
9		Peak, Max w/o Saturation	1046 (7.38)	oz-in (Nm)	min. [1]	
10		Static Friction	12.0 (0.08)	oz-in (Nm)	max.	
11	Ripple (of Rated Torque)	5	percent	max. [3]		
12	Speed:	Rated	3800 (63)	rpm (rps)	reference	
13		Maximum	3800 (63)	rpm (rps)	reference	
14	Frequency	Rated	126.7	Hz	max.	
15	Current:	Rated	3.0	A rms	max. [1]	
16		Peak	9.6	A rms	nominal	
17	Voltage:	Rated	240	V rms	reference	
18		Max	250	V rms	maximum	
19	Output Power	Rated	1.0 (1.3)	kWatts (hp)	min. [1]	
20	Inductance	Terminal (line-line)	68	mH	± 30%	
21	D.C. Resistance	Terminal (line-line)	7.0	ohms	± 10 % [1]	
22	Acceleration at Rated Torque		74150	rads/sec ²	Theoretical	
23	Rotor Inertia		5.45 (99.6)	oz-in ² (kgm ² * 1E-6)	nominal	
24	Damping		0.960 (0.0068)	oz-in/krpm (Nm/krpm)	nominal	
25	Weight		9.0 (4.08)	lbs. (kg)	max.	
26	Winding Temperature		170°C (338°F) [4]	°C (°F)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145°C (293°F)	°C (°F)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170°C (338°F)	°C (°F)	± 5° C	
30	Thermostat RESET Temperature		135°C (275°F)	°C (°F)	± 10° C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance-to-Frame		0.00122	µF	max.	
33	IP Classification		65 [8]	rated	standard	
34	Shaft:	Radial-Play	At End	14E-6 (80E-9)	in/lb (m/N)	reference
			At Faceplate	8.0E-6 (45E-9)	in/lb (m/N)	reference
35		Material [5]	RC-#30	—	reference	
36		Magnet Type	NdFeB	—	—	
37	Loading [6]	1000 rpm (17 rps)	85.4 (380)	lbs. (N)	max. [7]	
		2000 rpm (33 rps)	67.8 (302)	lbs. (N)	max. [7]	
		3000 rpm (50 rps)	59.1 (263)	lbs. (N)	max. [7]	
		4000 rpm (67 rps)	53.8 (239)	lbs. (N)	max. [7]	
		5000 rpm (83 rps)	50 (222)	lbs. (N)	max. [7]	
38	Motor Vibration		N	ISO 2373	Standard	
39	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
40	Bearing Grease		SRI #2	Manufacturer	reference	
41	Shaft Seal Pressure		3 (0.21)	psi (kg/cm ²)	max.	
42	Basic Motor Design		3 phase wye connected 2(P/2)			
43	Stator Phase Sequence		A-C-B (viewed from front face plate)			
44	Vendor/Supplier		Industrial Drives B-202-B			
45	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 10 arc min.; Resolution is 4096 counts/rev post-quadrature			
46	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
47	Standard Resolver Cable Part Number		71-011777-xx			
48	Standard Motor Cable Part Number		71-011774-xx			
49	Options:	Brake—24VDC (0.57A)—845 oz-in (5.97 Nm) Holding Torque		(requires resolver cable 71-014082-xx)		
		IP67 Classification	No Keyway			
		Incremental Encoder	Shaft Modifications			
		Tachometer	IP65 Shaft Seal			
[1]	25°C (77°F) Ambient		[5] Rotor steel is rated as <i>fatigue proof</i>			
[2]	40°C (104°F) Ambient		[6] Loads centered 1 inch from mounting flange			
[3]	Measured at 60 rpm (1 rps) in Velocity Mode		[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.			
[4]	Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)		[8] Motor shaft is IP30 rated.			

APEX603 Motor Specifications

	Motor Size:	APEX604		Value	Units	Tolerance
1	Constant (s):	Torque		52.6 (0.37)	oz-in/A rms (Nm/A rms)	± 10%
2		Voltage (Sinusoidal)		22.5	V rms/Krpm	± 10%
3		Electrical Time		58.7	milliseconds	nominal
4		Mechanical Time		1.30	milliseconds	nominal
5		Thermal		12	minutes	nominal
6	(NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall		334 (2.36)	oz-in (Nm)	min. [1]
7		Continuous, Stall		315 (2.22)	oz-in (Nm)	min. [2]
8		Continuous, Rated		269 (1.90)	oz-in (Nm)	min. [2]
9		Peak, Max w/o Saturation		899 (6.35)	oz-in (Nm)	min. [1]
10		Static Friction		9.6 (0.07)	oz-in (Nm)	max.
11		Ripple (of Rated Torque)		5	percent	max. [3]
12	Speed:	Rated		7500 (125)	rpm (rps)	reference
13		Maximum		7500 (125)	rpm (rps)	reference
14	Frequency	Rated		250	Hz	max.
15	Current:	Rated		6.0	A rms	max. [1]
16		Peak		18.8	A rms	nominal
17	Voltage:	Rated		240	V rms	reference
18		Max		250	V rms	maximum
19	Output Power	Rated		1.5 (2.0)	kWatts (hp)	min. [1]
20	Inductance	Terminal (line-line)		9.4	mH	± 30%
21	D.C. Resistance	Terminal (line-line)		1.6	ohms	± 10 % [1]
22	Acceleration at Rated Torque			82980	rads/sec ²	Theoretical
23	Rotor Inertia			4.18 (76.5)	oz-in ² (kgm ² * 1E-6)	nominal
24	Damping			0.580 (0.0041)	oz-in/krpm (Nm/krpm)	nominal
25	Weight			8.5 (3.86)	lbs. (kg)	max.
26	Winding Temperature			170°C (338°F) [4]	°C (°F)	max.
27	Winding Temperature Rise (Above Ambient) [1]			145°C (293°F)	°C (°F)	reference
28	Insulation Class			H	—	reference
29	Thermostat TRIP Temperature			170°C (338°F)	°C (°F)	± 5° C
30	Thermostat RESET Temperature			135°C (275°F)	°C (°F)	± 10° C
31	Dielectric Strength, (Winding-to-Frame)			1750	VAC	min.
32	Winding Capacitance-to-Frame			0.00122	µF	max.
33	IP Classification			65 [8]	rated	standard
34	Shaft:	Radial-Play	At End	12E-6 (68E-9)	in/lb (m/N)	reference
			At Faceplate	5.6E-6 (32E-9)	in/lb (m/N)	reference
35		Material [5]		RC-#30	—	—
36		Magnet Type		NdFeB	—	—
37	Loading [6]	1000 rpm (17 rps)		84 (374)	lbs. (N)	max. [7]
		2000 rpm (33 rps)		67 (298)	lbs. (N)	max. [7]
		3000 rpm (50 rps)		58 (258)	lbs. (N)	max. [7]
		4000 rpm (67 rps)		53 (236)	lbs. (N)	max. [7]
		5000 rpm (83 rps)		49 (218)	lbs. (N)	max. [7]
38	Bearing Class, Internal/External			1/Class 3	ABEC/AFBMA	reference
39	Bearing Grease			SRI #2	Manufacturer	reference
40	Shaft Seal Pressure			3 (0.21)	psi (kg/cm ²)	max.
41	Basic Motor Design			3 phase <i>wye</i> connected 2(P/2)		
42	Stator Phase Sequence			A-C-B (viewed from front face plate)		
43	Vendor/Supplier			Industrial Drives B-106-B		
44	Resolver Type/Accuracy			Single-Speed; Rotor-Excited; ± 10 arc min.		
45	Resolver Manufacturer/Model #			Fasco # 21-BRCX-335-J39		
46	Standard Resolver Cable Part Number			71-013862-xx		
47	Standard Motor Cable Part Number			71-013863-xx		
48	Options:	Brake—24VDC (0.57A)—326 oz-in (2.3 Nm) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25°C (77°F) Ambient				[5] Rotor steel is rated as <i>fatigue proof</i>		
[2] 40°C (104°F) Ambient				[6] Loads centered 1 inch from mounting flange		
[3] Measured at 60 rpm (1 rps) in Velocity Mode				[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.		
[4] Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)				[8] Motor shaft is IP30 rated.		

	Motor Size:	APEX605		Value	Units	Tolerance
1	Constant (s):	Torque		68.7 (0.49)	oz-in/A rms (Nm/A rms)	± 10%
2		Voltage (Sinusoidal)		29.4	V rms/Krpm	± 10%
3		Electrical Time		10.68	milliseconds	nominal
4		Mechanical Time		1.46	milliseconds	nominal
5		Thermal		18	minutes	nominal
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall		367 (2.59)	oz-in (Nm)	min. [1]
7		Continuous, Stall		346 (2.44)	oz-in (Nm)	min. [2]
8		Continuous, Rated		321 (2.27)	oz-in (Nm)	min. [2]
9		Peak, Max w/o Saturation		1085 (7.66)	oz-in (Nm)	min. [1]
10		Static Friction		0.96 (0.007)	oz-in (Nm)	max.
11		Ripple (of Rated Torque)		5	percent	max. [3]
12	Speed:	Rated		6200 (103)	rpm (rps)	reference
13		Maximum		6200 (103)	rpm (rps)	reference
14	Frequency	Rated		207	Hz	max.
15	Current:	Rated		5	A rms	max. [1]
16		Peak		16.6	A rms	nominal
17	Voltage:	Rated		240	V rms	reference
18		Max		250	V rms	maximum
19	Output Power	Rated		1.5 (2.0)	kWatts (hp)	min. [1]
20	Inductance	Terminal (line-line)		25	mH	± 30%
21	D.C. Resistance	Terminal (line-line)		2.3	ohms	± 10 % [1]
22	Acceleration at Rated Torque			76870	rads/sec ²	Theoretical
23	Rotor Inertia			5.43 (99.6)	oz-in ² (kgm ² * 1E-6)	nominal
24	Damping			0.96 (0.0068)	oz-in/krpm (Nm/krpm)	nominal
25	Weight			10 (4.5)	lbs. (kg)	max.
26	Winding Temperature			170°C (338°F) [4]	°C (°F)	max.
27	Winding Temperature Rise (Above Ambient) [1]			145°C (293°F)	°C (°F)	reference
28	Insulation Class			H	—	reference
29	Thermostat TRIP Temperature			170°C (338°F)	°C (°F)	± 5° C
30	Thermostat RESET Temperature			135°C (275°F)	°C (°F)	± 10° C
31	Dielectric Strength, (Winding-to-Frame)			1750	VAC	min.
32	Winding Capacitance-to-Frame			0.00122	µF	max.
33	IP Classification			65 [8]	rated	standard
34	Shaft:	Radial-Play	At End	14E-6 (80E-9)	in/lb (m/N)	reference
			At Faceplate	8E-6 (45E-9)	in/lb (m/N)	reference
35	Material [5]			RC-#30	—	—
36	Magnet Type			NdFeB	—	—
37	Loading [6]	1000 rpm (17 rps)		85.4 (380)	lbs. (N)	max. [7]
		2000 rpm (33 rps)		67.8 (301)	lbs. (N)	max. [7]
		3000 rpm (50 rps)		59.1 (263)	lbs. (N)	max. [7]
		4000 rpm (67 rps)		53.8 (239)	lbs. (N)	max. [7]
		5000 rpm (83 rps)		50 (222)	lbs. (N)	max. [7]
38	Bearing Class, Internal/External			1/Class 3	ABEC/AFBMA	reference
39	Bearing Grease			SRI #2	Manufacturer	reference
40	Shaft Seal Pressure			3 (0.21)	psi (kg/cm ²)	max.
41	Basic Motor Design			3 phase wye connected 2(P/2)		
42	Stator Phase Sequence			A-C-B (viewed from front face plate)		
43	Vendor/Supplier			Industrial Drives B-202-C		
44	Resolver Type/Accuracy			Single-Speed; Rotor-Excited; ± 10 arc min.		
45	Resolver Manufacturer/Model #			Fasco # 21-BRCX-335-J39		
46	Standard Resolver Cable Part Number			71-013862-xx		
47	Standard Motor Cable Part Number			71-013863-xx		
48	Options:	Brake—24VDC (0.57A)—850 oz-in (6.0 Nm) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1]	25°C (77°F) Ambient			[5] Rotor steel is rated as <i>fatigue proof</i>		
[2]	40°C (104°F) Ambient			[6] Loads centered 1 inch from mounting flange		
[3]	Measured at 60 rpm (1 rps) in Velocity Mode			[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.		
[4]	Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)			[8] Motor shaft is IP30 rated.		

APEX605 Motor Specifications

	Motor Size:	APEX606		Value	Units	Tolerance
1	Constant (s):	Torque		120 (0.85)	oz-in/A rms (Nm/A rms)	± 10%
2		Voltage (Sinusoidal)		51.2	V rms/Krpm	± 10%
3		Electrical Time		15.32	milliseconds	nominal
4		Mechanical Time		0.896	milliseconds	nominal
5		Thermal		20	minutes	nominal
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall		672 (4.75)	oz-in (Nm)	min. [1]
7		Continuous, Stall		634 (4.48)	oz-in (Nm)	min. [2]
8		Continuous, Rated		576 (4.07)	oz-in (Nm)	min. [2]
9		Peak, Max w/o Saturation		1957 (13.82)	oz-in (Nm)	min. [1]
10		Static Friction		0.96 (0.007)	oz-in (Nm)	max
11	Ripple (of Rated Torque)		5	percent	max. [3]	
12	Speed:	Rated		3600 (60)	rpm (rps)	reference
13		Maximum		3600 (60)	rpm (rps)	reference
14	Frequency	Rated		120	Hz	max.
15	Current:	Rated		5.3	A rms	max. [1]
16		Peak		17.2	A rms	nominal
17	Voltage:	Rated		240	V rms	reference
18		Max		250	V rms	maximum
19	Output Power:	Rated		1.6 (2.1)	kWatts (hp)	min. [1]
20	Inductance:	Terminal (line-line)		38	mH	± 30%
21	D.C. Resistance	Terminal (line-line)		2.48	ohms	± 10 % [1]
22	Acceleration at Rated Torque			80000	rads/sec ²	Theoretical
23	Rotor Inertia			9.44 (172.9)	oz-in ² (kgm ² * 1E-6)	nominal
24	Damping			1.344 (0.0095)	oz-in/krpm (Nm/krpm)	nominal
25	Weight			13.4 (6.1)	lbs. (kg)	max.
26	Winding Temperature			170°C (338°F) [4]	°C (°F)	max.
27	Winding Temperature Rise (Above Ambient) [1]			145°C (293°F)	°C (°F)	reference
28	Insulation Class			H	—	reference
29	Thermostat TRIP Temperature			170°C (338°F)	°C (°F)	± 5 °C
30	Thermostat RESET Temperature			135°C (275°F)	°C (°F)	± 10 °C
31	Dielectric Strength, (Winding-to-Frame)			1750	VAC	min.
32	Winding Capacitance to Frame			0.00201	µF	max.
33	IP Classification			65 [8]	rated	standard
34	Shaft:	Radial-Play	At End	14E-6 (80E-9)	in/lb (m/N)	reference
			At Faceplate		8E-6 (45E-9)	ln/lb (m/N)
35		Material [5]		RC-#30	—	—
36		Magnet Type		NdFeB	—	—
37	Loading [6]	1000 rpm (17 rps)		90.1 (401)	lbs. (N)	max. [7]
		2000 rpm (33 rps)		71.6 (318)	lbs. (N)	max. [7]
		3000 rpm (50 rps)		62.4 (278)	lbs. (N)	max. [7]
		4000 rpm (67 rps)		N/A	lbs. (N)	max. [7]
		5000 rpm (83 rps)		N/A	lbs. (N)	max. [7]
38	Bearing Class, Internal/External			1/Class 3	ABEC/AFBMA	reference
39	Bearing Grease			SRI #2	Manufacturer	reference
40	Shaft Seal Pressure			3 (0.21)	psi (kg/cm ²)	max.
41	Basic Motor Design			3 phase wye connected 2(P/2)		
42	Stator Phase Sequence			A-C-B (viewed from front face plate)		
43	Vendor/Supplier			Industrial Drives B-204-B		
44	Resolver Type/Accuracy			Single-Speed; Rotor-Excited; ± 10 arc min.		
45	Resolver Manufacturer/Model #			Fasco # 21-BRCX-335-J39		
46	Standard Resolver Cable Part Number			71-013862-xx		
47	Standard Motor Cable Part Number			71-013863-xx		
48	Options:	Brake—24VDC (0.57A)—850 oz-in (6.0 NM) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25°C (77°F) Ambient				[5] Rotor steel is rated as <i>fatigue proof</i>		
[2] 40°C (104°F) Ambient				[6] Loads centered 1 inch from mounting flange		
[3] Measured at 60 rpm (1 rps) in Velocity Mode				[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.		
[4] Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)				[8] Motor shaft is IP30 rated.		

	Motor Size:	APEX610		Value	Units	Tolerance
1	Constant (s):	Torque		61.4 (0.43)	oz-in/A rms (Nm/A rms)	± 10%
2		Voltage (Sinusoidal)		26.2	V rms/Krpm	±10%
3		Electrical Time		13.16	milliseconds	nominal
4		Mechanical Time		0.762	milliseconds	nominal
5		Thermal		21	minutes	nominal
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall		977 (6.90)	oz-in (Nm)	min. [1]
7		Continuous, Stall		921.6 (6.51)	oz-in (Nm)	min. [2]
8		Continuous, Rated		653 (4.61)	oz-in (Nm)	min. [2]
9		Peak, Max w/o Saturation		2630 (18.57)	oz-in (Nm)	min. [1]
10		Static Friction		0.96 (0.007)	oz-in (Nm)	max
11	Ripple (of Rated Torque)		5	percent	min. [3]	
12	Speed:	Rated		7000 (117)	rpm (rps)	reference
13		Maximum		7000 (117)	rpm (rps)	reference
14	Frequency	Rated		233	Hz	max.
15	Current:	Rated		15	A rms	max. [1]
16		Peak		45	A rms	nominal
17	Voltage:	Rated		230	V rms	reference
18		Max		250	V rms	maximum
19	Output Power:	Rated		3.3 (4.5)	kWatts (hp)	min. [1]
20	Inductance:	Terminal (line-line)		5	mH	± 30%
21	D.C. Resistance	Terminal (line-line)		0.38	ohms	± 10 % [1]
22	Acceleration at Rated Torque			73934	rads/sec ²	Theoretical
23	Rotor Inertia			13.72 (251.2)	oz-in ² (kgm ² * 1E-6)	nominal
24	Damping			1.728 (0.0122)	oz-in/krpm (Nm/krpm)	nominal
25	Weight			16.35 (7.43)	lbs. (kg)	max.
26	Winding Temperature			170°C (338°F) [4]	°C (°F)	max.
27	Winding Temperature Rise (Above Ambient) [1]			145°C (293°F)	°C (°F)	reference
28	Insulation Class			H	—	reference
29	Thermostat TRIP Temperature			170°C (338°F)	°C (°F)	± 5 °C
30	Thermostat RESET Temperature			135°C (275°F)	°C (°F)	± 10 °C
31	Dielectric Strength, (Winding-to-Frame)			1750	VAC	min.
32	Winding Capacitance-to-Frame			0.00205	µF	max.
33	IP Classification			65 [8]	rated	standard
34	Shaft:	Radial-Play	At End	14E-6 (80E-9)	in/lb (m/N)	reference
				At Faceplate	8E-6 (45E-9)	in/lb (m/N)
35		Material [5]		RC-#30		
36		Magnet Type		NdFeB		
37		Loading [6]	1000 rpm (17 rps)	93.5 (416)	lbs. (N)	max. [7]
			2000 rpm (33 rps)	74.2 (330)	lbs. (N)	max. [7]
			3000 rpm (50 rps)	64.8 (288)	lbs. (N)	max. [7]
			4000 rpm (67 rps)	59 (262)	lbs. (N)	max. [7]
			5000 rpm (83 rps)	54.7 (243)	lbs. (N)	max. [7]
38	Bearing Class, Internal/External			1/Class 3	ABEC/AFBMA	reference
39	Bearing Grease			SRI #2	Manufacturer	reference
40	Shaft Seal Pressure			3 (0.21)	psi (kg/cm ²)	max.
41	Basic Motor Design			3 phase wye connected 2(P/2)		
42	Stator Phase Sequence			A-C-B (viewed from front face plate)		
43	Vendor/Supplier			Industrial Drives B-206-D		
44	Resolver Type/Accuracy			Single-Speed; Rotor-Excited; ± 10 arc min.		
45	Resolver Manufacturer/Model #			Fasco # 21-BRCX-335-J39		
46	Standard Resolver Cable Part Number			71-013862-xx		
47	Standard Motor Cable Part Number			71-013864-xx		
48	Options:	Brake—24VDC (0.57A)—850 oz-in (6.0 Nm) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1]	25°C (77°F) Ambient			[5] Rotor steel is rated as <i>fatigue proof</i>		
[2]	40°C (104°F) Ambient			[6] Loads centered 1 inch from mounting flange		
[3]	Measured at 60 rpm (1 rps) in Velocity Mode			[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.		
[4]	Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)			[8] Motor shaft is IP30 rated.		

APEX610 Motor Specifications

	Motor Size:	APEX620	Value	Units	Tolerance	
1	Constant (s):	Torque	124.2 (0.877)	oz-in/A rms (Nm/A rms)	± 10%	
2		Voltage (Sinusoidal)	53	V rms/Krpm	± 10%	
3		Electrical Time	23.4	milliseconds	nominal	
4		Mechanical Time	0.82	milliseconds	nominal	
5		Thermal	22	minutes	nominal	
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall	1974 (13.94)	oz-in (Nm)	min. [1]	
7		Continuous, Stall	1862 (13.15)	oz-in (Nm)	min. [2]	
8		Continuous, Rated	1632 (11.52)	oz-in (Nm)	min. [2]	
9		Peak, Max w/o Saturation	5299 (37.42)	oz-in (Nm)	min. [1]	
10		Static Friction	25 (0.176)	oz-in (Nm)	max. [1]	
11	Ripple (of Rated Torque)	4.5	percent	min. [3]		
12	Speed:	Rated	3700 (62)	rpm (rps)	reference	
13		Maximum	3700 (62)	rpm (rps)	reference	
14	Frequency	Rated	123	Hz	max.	
15	Current:	Rated	15	A rms	max. [1]	
16		Peak	45	A rms	nominal	
17	Voltage:	Rated	230	V rms	reference	
18		Max	250	V rms	maximum	
19	Output Power:	Rated	4.5 (6)	kWatts (hp)	min. [1]	
20	Inductance:	Terminal (line-line)	15	mH	± 30%	
21	D.C. Resistance	Terminal (line-line)	0.64	Ohms	± 10 % [1]	
22	Acceleration at Rated Torque		57025	rads/sec ²	Theoretical	
23	Rotor Inertia		35.8 (656)	oz-in ² (kgm ² * 1E-6)	nominal	
24	Damping		2.496 (0.0176)	oz-in/krpm (Nm/krpm)	nominal	
25	Weight		29 (13.2)	lbs. (kg)	max.	
26	Winding Temperature		170°C (338°F) [4]	°C (°F)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145°C (293°F)	°C (°F)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170°C (338°F)	°C (°F)	± 5 °C	
30	Thermostat RESET Temperature		135°C (275°F)	°C (°F)	± 10 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance-to-Frame		0.0034	µF	max.	
33	IP Classification		65 [8]	rated	standard	
34	Shaft:	Radial-Play	At End At Faceplate	20E-6 (114E-9) 7E-6 (40E-9)	in/lb (m/N) in/lb (m/N)	reference reference
35		Material [5]		RC-#30	—	—
36	Magnet Type		NdFeB	—	—	
37	Loading [6]	1000 rpm (17 rps)	154.7 (688)	lbs. (N)	max. [7]	
		2000 rpm (33 rps)	122.8 (546)	lbs. (N)	max. [7]	
		3000 rpm (50 rps)	107.2 (477)	lbs. (N)	max. [7]	
		4000 rpm (67 rps)	N/A	lbs. (N)	max. [7]	
		5000 rpm (83 rps)	N/A	lbs. (N)	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		3 (0.21)	psi (kg/cm ²)	max.	
41	Basic Motor Design		3 phase wye connected 2(P/2)			
42	Stator Phase Sequence		A-C-B (viewed from front face plate)			
43	Vendor/Supplier		Industrial Drives B-404-D			
44	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 10 arc min.			
45	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
46	Standard Resolver Cable Part Number		71-013862-xx			
47	Standard Motor Cable Part Number		71-013864-xx			
48	Options:	Brake—24VDC (0.93A)—1130 oz-in (8.0 Nm) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25°C (77°F) Ambient			[5] Rotor steel is rated as <i>fatigue proof</i>			
[2] 40°C (104°F) Ambient			[6] Loads centered 1 inch from mounting flange			
[3] Measured at 60 rpm (1 rps) in Velocity Mode			[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.			
[4] Rated for 20,000 Hours or 40,000 Hours @ 155°C (311°F)			[8] Motor shaft is IP30 rated.			

	Motor Size:	APEX630	Value	Units	Tolerance	
1	Constant (s):	Torque	175.3 (1.24)	oz-in/A rms (Nm/A rms)	± 10%	
2		Voltage (Sinusoidal)	74.9	V rms/Krpm	± 10%	
3		Electrical Time	26.7	milliseconds	nominal	
4		Mechanical Time	0.68	milliseconds	nominal	
5		Thermal	28	minutes	nominal	
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall	2788 (19.69)	oz-in (Nm)	min. [1]	
7		Continuous, Stall	2630 (18.57)	oz-in (Nm)	min. [2]	
8		Continuous, Rated	2304 (16.27)	oz-in (Nm)	min. [2]	
9		Peak, Max w/o Saturation	7488 (52.88)	oz-in (Nm)	min. [1]	
10		Static Friction	40.7 (0.287)	oz-in (Nm)	max.	
11	Ripple (of Rated Torque)	4.5	percent	min. [3]		
12	Speed:	Rated	2500 (42)	rpm (rps)	reference	
13		Maximum	2500 (42)	rpm (rps)	reference	
14	Frequency	Rated	83	Hz	max.	
15	Current:	Rated	15	A rms	max. [1]	
16		Peak	45	A rms	nominal	
17	Voltage:	Rated	230	V rms	reference	
18		Max	250	V rms	maximum	
19	Output Power:	Rated	4.3 (5.7)	kWatts (hp)	min. [1]	
20	Inductance:	Terminal (line-line)	20	mH	± 30%	
21	D.C. Resistance	Terminal (line-line)	0.75	Ohms	± 10 % [1]	
22	Acceleration at Rated Torque		56934	rads/sec ²	Theoretical	
23	Rotor Inertia		50.7 (929)	oz-in ² (kgm ² * 1E-6)	nominal	
24	Damping		2.88 (0.020)	oz-in/krpm (Nm/krpm)	nominal	
25	Weight		32 (14.5)	lbs. (kg)	max.	
26	Winding Temperature		170°C (338°F) [4]	°C (°F)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145°C (293°F)	°C (°F)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170°C (338°F)	°C (°F)	± 5 °C	
30	Thermostat RESET Temperature		135°C (275°F)	°C (°F)	± 5 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance to Frame		0.0038	µF	max.	
33	IP Classification		65 [8]	rated	standard	
34	Shaft:	Radial-Play	At End	20E-6 (114E-9)	in/lb (m/N)	reference
			At Faceplate	7E-6 (40E-9)	in/lb (m/N)	reference
35		Material [5]	RC-#30	—	—	
36		Magnet Type	NdFeB	—	—	
37	Loading [6]	1000 rpm (17 rps)	160 (712)	lbs. (N)	max. [7]	
		2000 rpm (33 rps)	127.1 (565)	lbs. (N)	max. [7]	
		3000 rpm (50 rps)	N/A	lbs. (N)	max. [7]	
		4000 rpm (67 rps)	N/A	lbs. (N)	max. [7]	
		5000 rpm (83 rps)	N/A	lbs. (N)	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		3 (0.21)	psi (kg/cm ²)	max.	
41	Basic Motor Design		3 phase wye connected 2(P/2)			
42	Stator Phase Sequence—CW rotor rotation		A-C-B (viewed from front face plate)			
43	Vendor/Supplier		Industrial Drives B-406-D			
44	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 10 arc min.			
45	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
46	Standard Resolver Cable Part Number		71-013862-xx			
47	Standard Motor Cable Part Number		71-013864-xx			
48	Options:	Brake—24VDC (0.93A)—1130 oz-in (8.0 Nm) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1]	25°C (77°F) Ambient		[5] Rotor steel is rated as <i>fatigue proof</i>			
[2]	40°C (104°F) Ambient		[6] Loads centered 1 inch from mounting flange			
[3]	Measured at 60 rpm (1 rps) in Velocity Mode		[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.			
[4]	Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)		[8] Motor shaft is IP30 rated.			

APEX630 Motor Specifications

	Motor Size:	APEX635		Value	Units	Tolerance	
1	Constant (s):	Torque		164.0 (1.158)	oz-in/A rms (Nm/A rms)	± 10%	
2		Voltage (Sinusoidal)		70	V rms/Krpm	± 10%	
3		Electrical Time		0.77	milliseconds	nominal	
4		Mechanical Time		20.8	milliseconds	nominal	
5		Thermal		28	minutes	nominal	
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall		2605 (18.39)	oz-in (Nm)	min. [1]	
7		Continuous, Stall		2458 (17.36)	oz-in (Nm)	min. [2]	
8		Continuous, Rated		2054 (14.50)	oz-in (Nm)	min. [2]	
9		Peak, Max w/o Saturation		7008 (49.49)	oz-in (Nm)	min. [1]	
10		Static Friction		69 (0.49)	oz-in (Nm)	max.	
11		Ripple (of Rated Torque)		4.5	percent	min. [3]	
12	Speed:	Rated		3000 (50)	rpm (rps)	reference	
13		Maximum		3000 (50)	rpm (rps)	reference	
14	Frequency	Rated		150	Hz	max.	
15	Current:	Rated		15	A rms	max. [1]	
16		Peak		45	A rms	nominal	
17	Voltage:	Rated		230	V rms	reference	
18		Max		250	V rms	maximum	
19	Output Power:	Rated		4.5 (6.1)	kWatts (hp)	min. [1]	
20	Inductance:	Terminal (line-line)		14	mH	± 30%	
21	D.C. Resistance	Terminal (line-line)		0.647	Ohms	± 10 % [1]	
22	Acceleration at Rated Torque			48945	rads/sec ²	Theoretical	
23	Rotor Inertia			56.1 (1028)	oz-in ² (kgm ² * 1E-6)	nominal	
24	Damping			2.88 (0.020)	oz-in/krpm (Nm/krpm)	nominal	
25	Weight			37 (16.8)	lbs. (kg)	max.	
26	Winding Temperature			170°C (338°F) [4]	°C (°F)	max.	
27	Winding Temperature Rise (Above Ambient) [1]			145°C (293°F)	°C (°F)	reference	
28	Insulation Class			H	—	reference	
29	Thermostat TRIP Temperature			170°C (338°F)	°C (°F)	± 5 °C	
30	Thermostat RESET Temperature			135°C (275°F)	°C (°F)	± 5 °C	
31	Dielectric Strength, (Winding-to-Frame)			1750	VAC	min.	
32	Winding Capacitance to Frame			0.0038	µF	max.	
33	IP Classification			65	rated	standard	
34	Shaft:	Radial-Play	At End	20E-6 (114E-9)	in/lb (m/N)	reference	
				At Faceplate	7E-6 (40E-9)	in/lb (m/N)	reference
35		Material [5]		RC-#30			
36		Magnet Type		NdFeB			
37	Loading [6]	1000 rpm (17 rps)		243.5 (1,083)	lbs. (N)	max. [7]	
		2000 rpm (33 rps)		193.3 (860)	lbs. (N)	max. [7]	
		3000 rpm (50 rps)		168.8 (751)	lbs. (N)	max. [7]	
		4000 rpm (67 rps)		N/A	lbs. (N)	max. [7]	
		5000 rpm (83 rps)		N/A	lbs. (N)	max. [7]	
38	Bearing Class, Internal/External			1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease			SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure			3 (0.21)	psi (kg/cm ²)	max.	
41	Basic Motor Design			3 phase wye connected 2(P/2)			
42	Stator Phase Sequence—CW rotor rotation			A-C-B (viewed from front face plate)			
43	Vendor/Supplier			Industrial Drives B-602-C			
44	Resolver Type/Accuracy			Single-Speed; Rotor-Excited; ± 10 arc min.			
45	Resolver Manufacturer/Model #			Fasco # 21-BRCX-335-J39			
46	Standard Resolver Cable Part Number			71-013862-xx			
47	Standard Motor Cable Part Number			71-013865-xx			
48	Options:	Brake—24VDC (0.93A)— 1130 oz-in(8.0 Nm) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway					
[1] 25°C (77°F) Ambient [2] 40°C (104°F) Ambient [3] Measured at 60 rpm (1 rps) in Velocity Mode [4] Rated for 20,000 Hours or 40,000 Hours @ 155°C (311°F)				[5] Rotor steel is rated as <i>fatigue proof</i> [6] Loads centered 1 inch from mounting flange [7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure. [8] Motor shaft is IP30 rated.			

	Motor Size:	APEX640	Value	Units	Tolerance	
1	Constant (s):	Torque	291.5 (2.06)	oz-in/A rms (Nm/A rms)	± 10%	
2		Voltage (Sinusoidal)	124.5	V rms/Krpm	± 10%	
3		Electrical Time	26.2	milliseconds	nominal	
4		Mechanical Time	0.55	milliseconds	nominal	
5		Thermal	33	minutes	nominal	
6	Torque (s): (NOTE: Values are with rated and peak current, lines 15 & 16 below. Drive current, and thus torque, may be lower.)	Continuous, Stall	4640 (32.76)	oz-in (Nm)	min. [1]	
7		Continuous, Stall	4378 (30.92)	oz-in (Nm)	min. [2]	
8		Continuous, Rated	3955 (27.93)	oz-in (Nm)	min. [2]	
9		Peak, Max w/o Saturation	12461 (87.99)	oz-in (Nm)	min. [1]	
10		Static Friction	73 (0.52)	oz-in (Nm)	max.	
11	Ripple (of Rated Torque)	4.5	percent	max. [3]		
12	Speed:	Rated	1600 (27)	rpm (rps)	reference	
13		Maximum	1600 (27)	rpm (rps)	reference	
14	Frequency	Rated	80	Hz	max.	
15	Current:	Rated	15	A rms	max. [1]	
16		Peak	45	A rms	nominal	
17	Voltage:	Rated	230	V rms	reference	
18		Max	250	V rms	maximum	
19	Output Power:	Rated	4.7 (6.3)	kWatts (hp)	min. [1]	
20	Inductance:	Terminal (line-line)	20	mH	± 30%	
21	D.C. Resistance	Terminal (line-line)	0.763	Ohms	± 10 % [1]	
22	Acceleration at Rated Torque		43667	rads/sec ²	Theoretical	
23	Rotor Inertia		111.0 (2034)	oz-in ² (kgm ² * 1E-6)	nominal	
24	Damping		15.36 (0.1085)	oz-in/krpm (Nm/krpm)	nominal	
25	Weight		51 (23.2)	lbs. (kg)	max.	
26	Winding Temperature		170°C (338°F) [4]	°C (°F)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145°C (293°F)	°C (°F)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170°C (338°F)	°C (°F)	± 5 °C	
30	Thermostat RESET Temperature		135°C (275°F)	°C (°F)	± 10 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance to Frame		0.0082	µF	max.	
33	IP Classification		65 [8]	rated	standard	
34	Shaft:	Radial-Play	At End	10E-6 (57E-9)	in/lb (m/N)	reference
			At Faceplate	4E-6 (23E-9)	in/lb (m/N)	reference
35		Material [5]	RC-#30	—	—	
36		Magnet Type	NdFeB	—	—	
37	Loading [6]	1000 rpm (17 rps)	255.6 (1,130)	lbs. (N)	max. [7]	
		2000 rpm (33 rps)	N/A	lbs. (N)	max. [7]	
		3000 rpm (50 rps)	N/A	lbs. (N)	max. [7]	
		4000 rpm (67 rps)	N/A	lbs. (N)	max. [7]	
		5000 rpm (83 rps)	N/A	lbs. (N)	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		3 (0.21)	psi (kg/cm ²)	max.	
41	Basic Motor Design		3 phase wye connected 3(P/2)			
42	Stator Phase Sequence—CW rotor rotation		A-C-B (viewed from front face plate)			
43	Vendor/Supplier		Industrial Drives B-604-D			
44	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 10 arc min.			
45	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
46	Standard Resolver Cable Part Number		71-013862-xx			
47	Standard Motor Cable Part Number		71-013865-xx			
48	Options:	Brake—24VDC (1.27A)—6800 oz-in (48 Nm) Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25°C (77°F) Ambient			[5] Rotor steel is rated as <i>fatigue proof</i>			
[2] 40°C (104°F) Ambient			[6] Loads centered 1 inch from mounting flange			
[3] Measured at 60 rpm (1 rps) in Velocity Mode			[7] Loads may be radial and axial such that the sum of the radial and two times the axial does not exceed this figure.			
[4] Rated for 20,000 Hours or 40,000 Hours @ 155° C (311°F)			[8] Motor shaft is IP30 rated.			

APEX640 Motor Specifications