
Hardware Reference

The information in this chapter will enable you to:

- Use this chapter as a quick-reference for system performance specifications

ZX600 Electrical Specifications

Electrical specifications for the ZX Drive's input and output power are provided in this section.

Input Power

Voltage (Nominal)	120VAC (1 or 3-phase) or 120VAC (1 or 3-phase)
Voltage (Range)	92-130VAC (1 or 3-phase) or 205-252VAC (1 or 3-phase)
Frequency (Range)	47-66 Hz
Current (Max. cont.)	15A (rms) 3-phase or 26A (rms) 1-phase
Power (Max. cont.)	6.2 KVA
Fuses	20A slow blow—Not user accessible
Isolation transformer	Not required

The actual input power and current is a function of the motor's operating point (speed and torque) and the duty cycle. You can de-rate the fuses and isolation transformer by scaling the above numbers by your actual requirements. The numbers above reflect the servo motor and drive operating at rated speed and rated torque at 100% duty.

Output Power

Voltage	405 VDC (maximum)
Frequency	0 - 400Hz fundamental (7 kHz PWM)
Current	20A continuous per phase sinusoidal (14.14Arms) 40A peak per phase sinusoidal (28.3Arms)
Regen/power dump	Optional accessory

ZX600 Motor/Drive Configuration

The ZX600's hardware is pre-configured to control Z600 motors. The ZX600 series drives only Z600 motors, the ZX800 series drives only Z800 motors, and the ZX900 series drives only Z900 motors. *Be sure that your drive type matches your motor type (Z600, Z800, or Z900).* If you have questions about the ZX motor/drive configuration, call your local Automation Technology Center (ATC) or distributor.

Technical Data ZX600 Series

	Units	ZX-605	ZX-606	ZX-610	ZX-620	ZX-630	ZX-635	ZX-640
Continuous Stall Torque*	oz-in	346	633	867	1743	2475	2458	4114
	lb-in	22	40	54	109	155	154	257
	lb-ft	1.8	3.3	4.5	9.1	12.9	12.8	21.4
	Nm	2.4	4.5	6.1	12.3	17.5	17.4	29.1
Peak Torque (±10%)	oz-in	1083	1954	1733	3486	4951	7008	8228
	lb-in	68	122	108	218	309	438	514
	lb-ft	5.6	10.2	9.0	18.2	25.8	36.5	42.9
	Nm	7.7	13.8	12.2	24.6	35.0	49.5	58.1
Rated Torque (±10%)	oz-in	321	576	616	1538	2172	2054	3729
	lb-in	20	36	39	96	136	128	233
	lb-ft	1.7	3.0	3.2	8.0	11.3	10.7	19.4
	Nm	2.3	4.1	4.4	10.9	15.3	14.5	26.3
Rated Power	hp	2.0	2.1	4.3	5.6	5.4	6.1	5.9
	kWatts	1.5	1.5	3.2	4.2	4.0	4.5	4.4
Rated Speed	rpm	6200	3600	7000	3700	2500	3000	1600
	rps	103	60	117	62	42	50	27
Rated Current (line)	A (rms)	5.0	5.3	14.1	14.1	14.1	14.1	14.1
Peak Current (3.3 seconds max)	A (rms)	16.6	17.2	28.2	28.2	28.2	28.2	28.2
Max. Cont. AC Input Current (3 phase 240VAC)	A (rms)	6	6	15	15	15	15	15
Rotor Inertia	oz-in ² (mass)	5.45	9.45	13.73	35.87	50.79	56.21	111.21
	oz-in-sec ²	0.01	0.02	0.04	0.09	0.13	0.146	0.29
	Kg-m ² x 1E-6	99.6	172.9	251.2	656.0	929.0	1028.0	2034.0
Motor Weight	lbs	10	13	16	29	32	37	51
	kg(f)	5	6	7	13	15	16	23
Shipping Weight	lbs	51	55	58	70	73	78	92
	kg(f)	23	25	26	32	33	35	42

ZX600 Series Indexer/Drive Performance Specifications

Positional Repeatability

Repeatability: ±0.088 degrees, unloaded

Positional Accuracy

Resolver Accuracy: ±7 arc minutes

Resolver-to-Digital Converter Accuracy: ±8 arc minutes (For finer accuracies, contact Compumotor—800-722-2282.)

Motor/Drive Compatibility

Different motors can take different amounts of current and require different tuning parameters for typical loads. The **CMTR** (Configure Motor Type) command sets up a drive for a particular motor. By issuing **CMTR**, motor current levels and default parameters are recalled from memory. Do not exceed the current level specified for the motor, excessive current levels will damage the motor.

The following information is provided in case you must modify the motor/drive configuration. This command sequence will set up a drive for a particular motor size and perform the commutation (refer to the *ZX Indexer/Drive Software Reference Guide* for more on these commands).

WARNING

This commutation procedure causes violent motor motion. All loads should be removed from the motor shaft before you begin this procedure.

Command	Description
> 1OFF	Turns drive off
> 1CMTRxxx	Sets drive for the motor; xxx = 605, 606, 610, 620, 630, 635, or 640
> 10N	Enables the drive

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	ZX605/606/610	ZX620/630	ZX640	Units
Supply voltage	24	24	24	VDC
Supply current	0.57	0.93	1.27	A
Static braking torque	960	1152	6720	oz-in

Z600 Motor Brake Characteristics

Motor Data

The following pages provide data on each of the motor frame sizes of ZX600 series systems (ZX605, ZX606, ZX610, ZX620, ZX630, ZX635, ZX640). The data reflecting motor torque does not assume operation from a ZX600 drive. The torque specifications reflect the motor's capabilities. In most cases, the motor windings match the drive's output power with an additional safety margin.

	Motor Size: Z605	Value	Units	Tolerance	
1	Constant (s): Torque Voltage (Sinusoidal) Electrical Time Mechanical Time Thermal	68.7	oz-in/A rms	± 10%	
2		29.4	V rms/Krpm	± 10%	
3		10.68	milliseconds	nominal	
4		1.46	milliseconds	nominal	
5		32	minutes	nominal	
6	Torque (s): Continuous, Stall Continuous, Stall Continuous, Rated Peak, Max w/o Saturation Static Friction Ripple (of Rated Torque)	367	oz-in	min. [1]	
7		346	oz-in	min. [2]	
8		321	oz-in	min. [2]	
9		1085	oz-in	min. [1]	
10		0.96	oz-in	max.	
11		5	percent	max. [3]	
12	Speed:	Rated	6200	rpm	reference
13		Maximum	6200	rpm	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		99.6	kgm ² * 1E-6	nominal
24	Damping		0.96	oz-in / krpm	nominal
25	Weight		10	lbs.	max.
26	Winding Temperature		170 [4]	°C (Celsius)	max.
27	Winding Temperature Rise (Above Ambient) [1]		145	°C (Celsius)	reference
28	Insulation Class		H	—	reference
29	Thermostat TRIP Temperature		170	°C (Celsius)	± 5° C
30	Thermostat RESET Temperature		135	°C (Celsius)	± 10° C
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.
32	Winding Capacitance-to-Frame		0.00122	µF	max.
33	IP Classification		65 (Shaft [8])	rated	standard
34	Shaft: Radial-Play (Front to Back) Material [5] Magnet Type Loading [6]	1000 rpm	1.4E-5/8E-6	in/lb	reference
35		2000 rpm	RC-#30	—	reference
36		3000 rpm	NdFeB	—	—
37		4000 rpm	85.4	lbs.	max. [7]
		5000 rpm	67.8	lbs.	max. [7]
			59.1	lbs.	max. [7]
		53.8	lbs.	max. [7]	
		50	lbs.	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference
39	Bearing Grease		SRI #2	Manufacturer	reference
40	Shaft Seal Pressure		0.21 (3)	kg/cm ² (psi)	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	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 7 arc min.		
44	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39		
45	Standard Resolver Cable Part Number		71-011777-xx		
46	Standard Motor Cable Part Number		71-011774-xx		
47	Options:	Brake—24VDC (0.57A)—960 oz-in Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway			
[1] 25° C Ambient		[5] Rotor steel is rated as <i>fatigue proof</i>			
[2] 40° C 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		[8] The motor shaft is IP30 rated.			

Z605 Motor Specifications

	Motor Size: Z606	Value	Units	Tolerance		
1	Constant (s):	Torque	120	oz-in/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	34	minutes	nominal	
6	Torque (s):	Continuous, Stall	672	oz-in	min. [1]	
7		Continuous, Stall	634	oz-in	min. [2]	
8		Continuous, Rated	576	oz-in	min. [2]	
9		Peak, Max w/o Saturation	1957	oz-in	min. [1]	
10		Static Friction	0.96	oz-in	max	
11		Ripple (of Rated Torque)	5	percent	max. [3]	
12	Speed:	Rated	3600	rpm	reference	
13		Maximum	3600	rpm	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		172.9	kgm ² * 1E-6	nominal	
24	Damping		1.344	oz-in / krpm	nominal	
25	Weight		13.4	lbs.	max.	
26	Winding Temperature		170 [4]	°C (Celsius)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145	°C (Celsius)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170	°C (Celsius)	± 5 °C	
30	Thermostat RESET Temperature		135	°C (Celsius)	± 10 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance to Frame		0.00201	µF	max.	
33	IP Classification		65 (Shaft [8])	rated	standard	
34	Shaft:	Radial-Play (front to back)	1.4E-5/8E-6	in/lb	reference	
35		Material [5]	RC-#30	—	reference	
36		Magnet Type	NdFeB	—	—	
37		Loading [6]	1000 rpm	90.1	lbs.	max. [7]
			2000 rpm	71.6	lbs.	max. [7]
		3000 rpm	62.4	lbs.	max. [7]	
		4000 rpm	N/A	lbs.	max. [7]	
		5000 rpm	N/A	lbs.	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		0.21 (3)	kg/cm ² (psi)	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	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 7 arc min.			
44	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
45	Standard Resolver Cable Part Number		71-011777-xx			
46	Standard Motor Cable Part Number		71-011774-xx			
47	Options:	Brake—24VDC (0.57A)—960 oz-in Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25° C Ambient		[5] Rotor steel is rated as <i>fatigue proof</i>				
[2] 40° C 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		[8] The motor shaft is IP30 rated.				

Z606 Motor Specifications

	Motor Size: Z610	Value	Units	Tolerance		
1	Constant (s):	Torque	61.4	oz-in/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	36	minutes	nominal	
6	Torque (s):	Continuous, Stall	977	oz-in	min. [1]	
7		Continuous, Stall	921.6	oz-in	min. [2]	
8		Continuous, Rated	653	oz-in	min. [2]	
9		Peak, Max w/o Saturation	2630	oz-in	min. [1]	
10		Static Friction	0.96	oz-in	max	
11	Ripple (of Rated Torque)	5	percent	min. [3]		
12	Speed:	Rated	7000	rpm	reference	
13		Maximum	7000	rpm	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		251.2	kgm ² * 1E-6	nominal	
24	Damping		1.728	oz-in / krpm	nominal	
25	Weight		16.35	lbs.	max.	
26	Winding Temperature		170 [4]	°C (Celsius)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145	°C (Celsius)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170	°C (Celsius)	± 5 °C	
30	Thermostat RESET Temperature		135	°C (Celsius)	± 10 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance-to-Frame		0.00205	µF	max.	
33	IP Classification		65 (Shaft [8])	rated	standard	
34	Shaft:	Radial-Play (front to back)	1.4E-5/8E-6	in/lb	reference	
35		Material [5]	RC-#30	—	—	
36		Magnet Type	NdFeB	—	max. [7]	
37		Loading [6]	1000 rpm	93.5	lbs.	max. [7]
			2000 rpm	74.2	lbs.	max. [7]
		3000 rpm	64.8	lbs.	max. [7]	
		4000 rpm	59	lbs.	max. [7]	
		5000 rpm	54.7	lbs.	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		0.21 (3)	kg/cm ² (psi)	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	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 7 arc min.			
44	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
45	Standard Resolver Cable Part Number		71-011777-01			
46	Standard Motor Cable Part Number		71-011775-01			
47	Options:	Brake—24VDC (0.57A)—960 oz-in Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25° C Ambient		[5] Rotor steel is rated as <i>fatigue proof</i>				
[2] 40° C 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		[8] The motor shaft is IP30 rated.				

Z610 Motor Specifications

	Motor Size:	Z620	Value	Units	Tolerance	
1	Constant (s):	Torque	124.2	oz-in/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	40	minutes	nominal	
6	Torque (s):	Continuous, Stall	1974	oz-in	min. [1]	
7		Continuous, Stall	1862	oz-in	min. [2]	
8		Continuous, Rated	1632	oz-in	min. [2]	
9		Peak, Max w/o Saturation	5299	oz-in	min. [1]	
10		Static Friction	25	oz-in	max.	
11		Ripple (of Rated Torque)	4.5	percent	min. [3]	
12	Speed:	Rated	3700	rpm	reference	
13		Maximum	3700	rpm	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		656	kgm ² * 1E-6	nominal	
24	Damping		2.496	oz-in / krpm	nominal	
25	Weight		29	lbs.	max.	
26	Winding Temperature		170 [4]	°C (Celsius)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145	°C (Celsius)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170	°C (Celsius)	± 5 °C	
30	Thermostat RESET Temperature		135	°C (Celsius)	± 10 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance-to-Frame		0.0034	µF	max.	
33	IP Classification		65 (Shaft [8])	rated	standard	
34	Shaft:	Radial-Play	2E-5/7E-6	in/lb	reference	
35		Material [5]	RC-#30	—	reference	
36		Magnet Type	NdFeB	—	—	
37		Loading [6]	1000 rpm	154.7	lbs.	max. [7]
			2000 rpm	122.8	lbs.	max. [7]
		3000 rpm	107.2	lbs.	max. [7]	
		4000 rpm	N/A	lbs.	max. [7]	
		5000 rpm	N/A	lbs.	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		0.21 (3)	kg/cm ² (psi)	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	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 7 arc min.			
44	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
45	Standard Resolver Cable Part Number		71-011777-xx			
46	Standard Motor Cable Part Number		71-011775-xx			
47	Options:	Brake—24VDC (0.93A)—1140 oz-in Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25° C Ambient		[5] Rotor steel is rated as <i>fatigue proof</i>				
[2] 40° C 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		[8] The motor shaft is IP30 rated.				

Z620 Motor Specifications

	Motor Size: Z630	Value	Units	Tolerance		
1	Constant (s):	Torque	175.3	oz-in/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	43	minutes	nominal	
6	Torque (s):	Continuous, Stall	2788	oz-in	min. [1]	
7		Continuous, Stall	2630	oz-in	min. [2]	
8		Continuous, Rated	2304	oz-in	min. [2]	
9		Peak, Max w/o Saturation	7488	oz-in	min. [1]	
10		Static Friction	40.7	oz-in	max.	
11		Ripple (of Rated Torque)	4.5	percent	min. [3]	
12	Speed:	Rated	2500	rpm	reference	
13		Maximum	2500	rpm	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		929	kgm ² * 1E-6	nominal	
24	Damping		2.88	oz-in / krpm	nominal	
25	Weight		32	lbs.	max.	
26	Winding Temperature		170 [4]	°C (Celsius)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145	°C (Celsius)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170	°C (Celsius)	± 5 °C	
30	Thermostat RESET Temperature		132	°C (Celsius)	± 5 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance to Frame		0.0038	µF	max.	
33	IP Classification		65 (Shaft [8])	rated	standard	
34	Shaft:	Radial-Play	2E-5/7E-6	in/lb	reference	
35		Material [5]	RC-#30	—	reference	
36		Magnet Type	NdFeB	—	—	
37		Loading [6]	1000 rpm	160	lbs.	max. [7]
			2000 rpm	127.1	lbs.	max. [7]
		3000 rpm	N/A	lbs.	max. [7]	
		4000 rpm	N/A	lbs.	max. [7]	
		5000 rpm	N/A	lbs.	max. [7]	
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		0.21 (3)	kg/cm ² (psi)	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	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 7 arc min.			
44	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
45	Standard Resolver Cable Part Number		71-011777-xx			
46	Standard Motor Cable Part Number		71-011775-xx			
47	Options:	Brake—24VDC (0.93A)—8.0 Nm Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25 °C (Celsius) ambient		[5] Rotor steel is rated as <i>fatigue proof</i>				
[2] 40 °C (Celsius) 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		[8] The motor shaft is IP30 rated.				

Z630 Motor Specifications

	Motor Size: Z635		Value	Units	Tolerance	
1	Constant (s):	Torque	175.3	oz-in/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):	Continuous, Stall	2605	oz-in	min. [1]	
7		Continuous, Stall	2458	oz-in	min. [2]	
8		Continuous, Rated	2054	oz-in	min. [2]	
9		Peak, Max w/o Saturation	7008	oz-in	min. [1]	
10		Static Friction	69	oz-in	max.	
11	Ripple (of Rated Torque)	4.5	percent	min. [3]		
12	Speed:	Rated	3000	rpm	reference	
13		Maximum	3000	rpm	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		1028	kgm ² * 1E-6	nominal	
24	Damping		2.88	oz-in / krpm	nominal	
25	Weight		37	lbs.	max.	
26	Winding Temperature		170 [4]	°C (Celsius)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145	°C (Celsius)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170	°C (Celsius)	± 5 °C	
30	Thermostat RESET Temperature		135	°C (Celsius)	± 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	2E-5/7E-6	in/lb	reference	
35		Material [5]	RC-#30	—	reference	
36		Magnet Type	NdFeB	—	—	
37		Loading [6]	1000 rpm	243.5	lbs.	max. [7]
			2000 rpm	193.3	lbs.	max. [7]
3000 rpm	168.8		lbs.	max. [7]		
4000 rpm	N/A		lbs.	max. [7]		
5000 rpm	N/A		lbs.	max. [7]		
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		0.21 (3)	kg/cm ² (psi)	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	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 7 arc min.			
44	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
45	Standard Resolver Cable Part Number		71-011777-xx			
46	Standard Motor Cable Part Number		71-011775-xx			
47	Options:	Brake—24VDC (0.93A)—8.0 Nm holding torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25 °C Ambient		[5] Rotor steel is rated as <i>fatigue proof</i>				
[2] 40 °C 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				
[4] Rated for 20,000 hours or 40,000 hours @ 155° C		radial and two times the axial does not exceed this figure.				

Z635 Motor Specifications

	Motor Size: Z640	Value	Units	Tolerance		
1	Constant (s):	Torque	291.5	oz-in/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):	Continuous, Stall	4640	oz-in	min. [1]	
7		Continuous, Stall	4378	oz-in	min. [2]	
8		Continuous, Rated	3955	oz-in	min. [2]	
9		Peak, Max w/o Saturation	12461	oz-in	min. [1]	
10		Static Friction	73	oz-in	max.	
11		Ripple (of Rated Torque)	4.5	percent	max. [3]	
12	Speed:	Rated	1600	rpm	reference	
13		Maximum	1600	rpm	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		2034	kgm ² * 1E-6	nominal	
24	Damping		15.36	oz-in / krpm	nominal	
25	Weight		51	lbs.	max.	
26	Winding Temperature		170 [4]	°C (Celsius)	max.	
27	Winding Temperature Rise (Above Ambient) [1]		145	°C (Celsius)	reference	
28	Insulation Class		H	—	reference	
29	Thermostat TRIP Temperature		170	°C (Celsius)	± 5 °C	
30	Thermostat RESET Temperature		135	°C (Celsius)	± 10 °C	
31	Dielectric Strength, (Winding-to-Frame)		1750	VAC	min.	
32	Winding Capacitance to Frame		0.0082	µF	max.	
33	IP Classification		65 (Shaft [8])	rated	standard	
34	Shaft:	Radial-Play	1E-5/4E-6	in/lb	reference	
35		Material [5]	RC-#30	—	reference	
36		Magnet Type	NdFeB	—	—	
37		Loading [6]	1000 rpm	255.6	lbs.	max. [7]
			2000 rpm	N/A	lbs.	max. [7]
3000 rpm	N/A		lbs.	max. [7]		
4000 rpm	N/A		lbs.	max. [7]		
5000 rpm	N/A		lbs.	max. [7]		
38	Bearing Class, Internal/External		1/Class 3	ABEC/AFBMA	reference	
39	Bearing Grease		SRI #2	Manufacturer	reference	
40	Shaft Seal Pressure		0.21 (3)	kg/cm ² (psi)	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	Resolver Type/Accuracy		Single-Speed; Rotor-Excited; ± 7 arc min.			
44	Resolver Manufacturer/Model #		Fasco # 21-BRCX-335-J39			
45	Standard Resolver Cable Part Number		71-011777-xx			
46	Standard Motor Cable Part Number		71-011776-xx			
47	Options:	Brake—24VDC (1.27A)—6816 oz-in Holding Torque IP67 Classification Incremental Encoder Tachometer No Keyway				
[1] 25 °C (Celsius) ambient		[5] Rotor steel is rated as <i>fatigue proof</i>				
[2] 40 °C (Celsius) 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		[8] The motor shaft is IP30 rated.				

Z640 Motor Specifications

Speed/Torque Curves

The speed/torque curves below represent available shaft torque at different speeds. Operation at 120VAC and 240VAC is shown for each motor size. Actual motor torque may vary $\pm 10\%$ due to motor manufacturing variances. For operation from a 1-phase 120VAC, the output torque stays relatively constant and the top-end speed falls off at the ratio of the input voltage (i.e., A Z610 operating at 240VAC has a rated speed of 7000 rpm; operating at 120VAC, it will have a rated speed of 3500 rpm). **Continuous Duty** means steady state operation for drive ambient temperatures of 0°C to 50°C. **Intermittent Duty** means operation for 3.3 seconds or less.



