

SF - SERIES

Food Grade Servo Motor
3" Frame

Motor Data (230V)

Performance Data (40 °C)	Symbol	Unit	SF31-N	SF32-N	SF33-F	SF33-J	SF33-M
Continuous Rated Torque (Stall)	T_c	lb-in [Nm]	11.59 [1.31]	22.42 [2.54]	31.26 [3.53]	31.26 [3.53]	31.26 [3.53]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	2.95	5.23	4.28	5.36	7.86
Max. Continuous Power	P_{max}	HP [kW]	0.76 [0.57]	1.90 [1.42]	1.22 [0.90]	1.44 [1.08]	1.63 [1.22]
Torque @ Max. Power	T_p	lb-in [Nm]	8.74 [0.98]	19.95 [2.25]	30.59 [3.46]	26.03 [2.95]	20.52 [2.32]
Current @ Maximum Power	I_p	Amps (RMS)	2.65	4.85	3.86	4.83	7.07
Speed @ Max. Power (Amp. Dependent)	N_p	RPM	5500	6000	2500	3500	5000
Max. Continuous Speed (Amp. Dependent)	N_{max}	RPM	6933	7500	3250	4602	6933
Maximum Current (RMS)	I_m	Amps (RMS)	13.78	19.57	16.07	20.09	29.51
Peak Torque	T_{pk}	lb-in [Nm]	34.77 [3.93]	67.26 [7.62]	93.78 [10.59]	93.78 [10.59]	93.78 [10.59]
Rotor Inertia	J_m	lb-in-sec ² [kg-m ²]	0.0006 [0.00007]	0.0013 [0.00015]	0.0015 [0.00017]	0.0015 [0.00017]	0.0015 [0.00017]
Torque Constant (@ Max. Winding Temp.)	K_t	lb-in/Amps [Nm/Amp]	3.94 [0.45]	4.3 [0.48]	7.29 [0.82]	5.83 [0.66]	3.98 [0.45]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K_e	V/KRPM [V*Sec/Rad]	30.0 [0.29]	32.0 [0.31]	64.0 [0.61]	45.2 [0.43]	30.0 [0.29]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R_s	Ohm	5.30	1.97	4.40	2.50	1.07
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_s	millihenry	7.60	4.30	9.90	4.20	1.8
Max. Theoretical Acceleration @ Stall [brake]	\dot{A}	Rad/sec ²	92131 [74183]	72500 [67000]	82250 [76157]	82250 [76157]	82250 [76157]
Thermal Time Constant [brake]	T_{th}	minute	30 [33]	30 [33]	30 [33]	30 [33]	30 [33]
Electrical Time Constant	T_e	msec	1.43	2.06	2.24	1.69	1.69
Mechanical Time Constant [brake]	T_m	msec	2.91 [3.62]	1.95 [2.20]	1.48 [1.48]	1.48 [1.60]	1.41 [1.41]
Static Friction	T_f	lb-in [Nm]	0.52 [0.06]	0.52 [0.06]	0.52 [0.06]	0.52 [0.06]	0.52 [0.06]
Weight	W	lb [kg]	8.6 [3.90]	10.0 [4.55]	12.2 [5.53]	12.2 [5.53]	12.2 [5.53]
Line Voltage	V	VAC	230	230	230	230	230

Brake Information:

Fail safe, Electric release

Rated Holding Torque	T_s	lb-in [Nm]	40 [4.52]
Rated voltage	V	VDC	24
Rated current	I	Amp	0.45
Inertia	J_b	lb-in-sec ² [kg-m ²]	0.00017 [0.000017]
Weight Adder	W	lb [kg]	2.6 [1.2]

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Food Grade Servo Motor
3" Frame

Motor Data (460V)

Performance Data (40 °C)	Symbol	Unit	SF31-N	SF32-N	SF33-F	SF33-J	SF33-M
Continuous Rated Torque (Stall)	T_c	lb-in [Nm]	11.59 [1.31]	22.42 [2.54]	31.26 [3.53]	31.26 [3.53]	31.26 [3.53]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	1.47	2.14	2.15	2.68	3.93
Max. Continuous Power	P_{max}	HP [kW]	0.76 [0.57]	1.90 [1.42]	1.22 [0.90]	1.44 [1.08]	1.63 [1.22]
Torque @ Max. Power	T_p	lb-in [Nm]	8.74 [0.98]	19.95 [2.25]	30.59 [3.46]	26.03 [2.95]	20.52 [2.32]
Current @ Maximum Power	I_p	Amps (RMS)	1.33	2.42	1.93	2.41	3.53
Speed @ Max. Power (Amp. Dependent)	N_p	RPM	5500	6000	2500	3500	5000
Max. Continuous Speed (Amp. Dependent)	N_{max}	RPM	6933	7500	3250	4602	6933
Maximum Current (RMS)	I_m	Amps (RMS)	6.89	9.79	8.04	10.05	14.73
Peak Torque	T_{pk}	lb-in [Nm]	34.77 [3.93]	67.26 [7.62]	93.78 [10.59]	93.78 [10.59]	93.78 [10.59]
Rotor Inertia	J_m	lb-in-sec ² [kg-m ²]	0.0006 [0.00007]	0.0013 [0.00015]	0.0015 [0.00017]	0.0015 [0.00017]	0.0015 [0.00017]
Torque Constant (@ Max. Winding Temp.)	K_t	lb-in/Amps [Nm/Amp]	7.88 [0.90]	8.60 [0.96]	14.58 [1.64]	11.66 [1.32]	7.96 [0.90]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K_e	V/KRPM [V*Sec/Rad]	60.0 [0.58]	64.0 [0.62]	128.0 [1.22]	90.4 [0.86]	60.0 [0.58]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R_s	Ohm	10.60	3.94	8.80	5.00	2.14
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_s	millihenry	15.20	8.60	19.80	8.40	3.60
Max. Theoretical Acceleration @ Stall [brake]	ΔE	Rad/sec ²	92131 [74183]	72500 [67000]	82250 [76157]	82250 [76157]	82250 [76157]
Thermal Time Constant [brake]	T_{th}	minute	30 [33]	30 [33]	30 [33]	30 [33]	30 [33]
Electrical Time Constant	T_e	msec	1.43	2.06	2.24	1.69	1.69
Mechanical Time Constant [brake]	T_m	msec	2.91 [3.62]	1.95 [2.20]	1.48 [1.48]	1.48 [1.60]	1.41 [1.41]
Static Friction	T_f	lb-in [Nm]	0.52 [0.06]	0.52 [0.06]	0.52 [0.06]	0.52 [0.06]	0.52 [0.06]
Weight	W	lb [kg]	8.6 [3.90]	10.0 [4.55]	12.2 [5.53]	12.2 [5.53]	12.2 [5.53]
Line Voltage	V	VAC	460	460	460	460	460

Brake Information:

Fail safe, Electric release

Rated Holding Torque	T_s	lb-in [Nm]	40 [4.52]
Rated voltage	V	VDC	24
Rated current	I	Amp	0.45
Inertia	J_b	lb-in-sec ² [kg-m ²]	0.00017 [0.000017]
Weight Adder	W	lb [kg]	2.6 [1.2]

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Connection Data

Motor Connections

WIRE COLOR	AWG	FUNCTION
BLACK	16	ØA
WHITE	16	ØB
RED	16	ØC
GREEN	16	GROUND

Incremental Encoder Connections

WIRE COLOR	AWG	FUNCTION
RED/BLUE	24	+VDC
BLUE/RED	24	COMMON
WHITE/GREEN	24	OUTPUT A
GREEN/WHITE	24	OUTPUT A'
WHITE/BLUE	24	OUTPUT B
BLUE/WHITE	24	OUTPUT B'
WHITE/ORANGE	24	OUTPUT Z
ORANGE/WHITE	24	OUTPUT Z'
WHITE/GRAY	24	OUTPUT U
GRAY/WHITE	24	OUTPUT U'
WHITE/BROWN	24	OUTPUT V
BROWN/WHITE	24	OUTPUT V'
RED/ORANGE	24	OUTPUT W
ORANGE/RED	24	OUTPUT W'
WHITE	24	CASE GND (NOT USED)
DRAIN WIRE	24	SHIELD
BROWN	18	BRAKE (+) Optional
ORANGE	18	BRAKE (-) Optional
BLUE	18	OTL
BLUE	18	OTL

Absolute Encoder Connections

WIRE COLOR	AWG	FUNCTION
WHITE/BLUE	24	+VDC
BLUE/WHITE	24	COMMON
WHITE/ORANGE	24	+SIN
ORANGE/WHITE	24	REFSIN
WHITE/GREEN	24	+COS
GREEN/WHITE	24	REFCOS
WHITE/BROWN	24	DATA +
BROWN/WHITE	24	DATA -
DRAIN WIRE	24	SHIELD
BROWN	18	BRAKE (+) Optional
ORANGE	18	BRAKE (-) Optional
BLUE	18	OTL
BLUE	18	OTL

Resolver Connections

WIRE COLOR	AWG	FUNCTION
GRAY	24	R1 (+REF)
WHITE	24	R2 (-REF)
RED	24	S1 (+COSINE)
BLACK	24	S3 (-COSINE)
YELLOW	24	S2 (+SINE)
BLUE	24	S4 (-SINE)
GREEN	24	SHIELD
BROWN	18	BRAKE (+) Optional
ORANGE	18	BRAKE (-) Optional
BLUE	18	OTL
BLUE	18	OTL

SF - SERIES

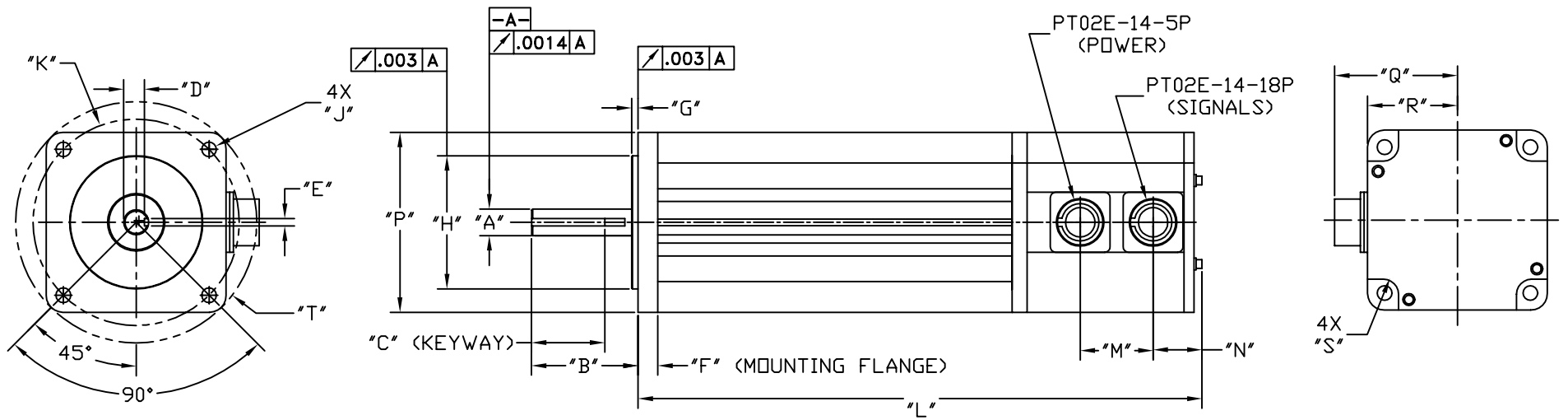
Food Grade Servo Motor
3" Frame

Motor Dimensions

Model	"A"	"B"	"C"	"D"	"E"	"F"	"G"
SF31	∅ 0.5000 0.4995	2.00	1.375	0.430 0.415	0.125 0.124	0.37	0.12
	∅ 14.012 14.001	30	20 (captive)	11	4.988 4.958	9	3
SF32	∅ 0.5000 0.4995	2.00	1.375	0.430 0.415	0.125 0.124	0.37	0.12
	∅ 14.012 14.001	30	20 (captive)	11	4.988 4.958	9	3
SF33	∅ 0.5000 0.4995	2.00	1.375	0.430 0.415	0.125 0.124	0.37	0.12
	∅ 14.012 14.001	30	20 (captive)	11	4.988 4.958	9	3

Model	"H"	"J"	"K"	"L"	"L" w/BRAKE	"M"	"N"
SF31	∅ 2.500 2.498	∅0.275	∅3.875	7.14	9.06	1.37	1.11
	∅ 80.012 79.093	∅7	∅100	181.36	230.12	34.8	28.9
SF32	∅ 2.500 2.498	∅0.275	∅3.875	8.64	10.56	1.37	1.11
	∅ 80.012 79.093	∅7	∅100	219.46	268.22	34.8	28.9
SF33	∅ 2.500 2.498	∅0.275	∅3.875	10.14	12.06	1.37	1.11
	∅ 80.012 79.093	∅7	∅100	257.56	306.32	34.8	28.9

Model	"P"	"Q"	"R"	"S"	"T"
SF31	∅3.38	2.31	1.69	R0.28	∅4.53
	∅85.8	58.7	43.0	R7.1	∅115
SF32	∅3.38	2.31	1.69	R0.28	∅4.53
	∅85.8	58.7	43.0	R7.1	∅115
SF33	∅3.38	2.31	1.69	R0.28	∅4.53
	∅85.8	58.7	43.0	R7.1	∅115



M43X OUTLINE