

SW - SERIES

Wash Down Servo Motor
3" Frame

Motor Data (230V)

Performance Data (40 °C)	Symbol	Unit	MS31-N	MS32-N	MS33-F	MS33-J	MS33-M
Continuous Rated Torque (Stall)	T_c	lb-in [Nm]	12.2 [1.38]	23.6 [2.67]	32.9 [3.72]	32.9 [3.72]	32.9 [3.72]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	3.10	5.50	4.51	5.64	8.27
Max. Continuous Power	P_{max}	HP [kW]	0.80 [0.60]	2.00 [1.49]	1.28 [0.95]	1.52 [1.14]	1.71 [1.28]
Torque @ Max. Power	T_p	lb-in [Nm]	9.2 [1.03]	21.0 [2.37]	32.2 [3.64]	27.4 [3.10]	21.6 [2.44]
Current @ Maximum Power	I_p	Amps (RMS)	2.79	5.10	4.06	5.08	7.44
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)	14.50	20.60	16.92	21.15	31.02
Peak Torque	T_{pk}	lb-in [Nm]	36.7 [4.14]	70.8 [8.01]	98.7 [11.16]	98.7 [11.16]	98.7 [11.16]
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_a	Ohm	5.30	1.97	4.40	2.50	1.07
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_a	millihenry	7.60	4.30	9.90	4.20	1.8
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]	1.46 [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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Wash Down Servo Motor
3" Frame

Motor Data (460V)

Performance Data (40 °C)	Symbol	Unit	MS31-N	MS32-N	MS33-F	MS33-J	MS33-M
Continuous Rated Torque (Stall)	T_o	lb-in [Nm]	12.2 [1.38]	23.6 [2.67]	32.9 [3.72]	32.9 [3.72]	32.9 [3.72]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	1.55	2.25	2.26	2.82	4.14
Max. Continuous Power	P_{max}	HP [kW]	0.80 [0.60]	2.00 [1.49]	1.28 [0.95]	1.52 [1.14]	1.71 [1.28]
Torque @ Max. Power	T_p	lb-in [Nm]	9.2 [1.03]	21.0 [2.37]	32.2 [3.64]	27.4 [3.10]	21.6 [2.44]
Current @ Maximum Power	I_p	Amps (RMS)	1.40	2.55	2.03	2.54	3.72
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)	7.25	10.30	8.46	10.58	15.51
Peak Torque	T_{pk}	lb-in [Nm]	36.7 [4.14]	70.8 [8.01]	98.7 [11.16]	98.7 [11.16]	98.7 [11.16]
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_a	Ohm	10.60	3.94	8.80	5.00	2.14
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_a	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 Addler	W	lb [kg]	2.6 [1.2]

SW - SERIES

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Connection Data

Motor Connector PT02E-14-5P

PIN	AWG	FUNCTION
A	16	ØA
B	16	ØB
C	16	ØC
D	16	GROUND

Inc. Encoder Connector PT02E-14-18P

PIN	AWG	FUNCTION
X	24	+VDC
X	24	COMMON
X	24	OUTPUT A
X	24	OUTPUT A'
X	24	OUTPUT B
X	24	OUTPUT B'
X	24	OUTPUT Z
X	24	OUTPUT Z'
X	24	OUTPUT U
X	24	OUTPUT U'
X	24	OUTPUT V
X	24	OUTPUT V'
X	24	OUTPUT W
X	24	OUTPUT W'
X	24	CASE GND (NOT USED)
X	24	SHIELD
X	18	BRAKE (+) Optional
X	18	BRAKE (-) Optional
X	18	OTL
X	18	OTL

Abs. Encoder Connector PT02E-14-18P

PIN	AWG	FUNCTION
X	24	+VDC
X	24	COMMON
X	24	+SIN
X	24	REFSIN
X	24	+COS
X	24	REFCOS
X	24	DATA +
X	24	DATA -
X	24	SHIELD
X	18	BRAKE (+) Optional
X	18	BRAKE (-) Optional
X	18	OTL
X	18	OTL

Resolver Connector PT02E-14-18P

PIN	AWG	FUNCTION
A	24	R1 (+REF)
B	24	R2 (-REF)
C	24	S1 (+COSINE)
D	24	S3 (-COSINE)
N	24	S2 (+SINE)
P	24	S4 (-SINE)
R	24	SHIELD
G	18	BRAKE (+) Optional
H	18	BRAKE (-) Optional
E	18	OTL
F	18	OTL

SW - SERIES

Wash Down Servo Motor
3" Frame

Motor Dimensions

Model	"A"	"B"	"C"	"D"	"E"	"F"	"G"
MS31	∅ 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
MS32	∅ 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
MS33	∅ 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"
MS31	∅ 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
MS32	∅ 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
MS33	∅ 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"
MS31	∅3.38	2.31	1.69	R0.28	∅4.53
	∅85.8	58.7	43.0	R7.1	∅115
MS32	∅3.38	2.31	1.69	R0.28	∅4.53
	∅85.8	58.7	43.0	R7.1	∅115
MS33	∅3.38	2.31	1.69	R0.28	∅4.53
	∅85.8	58.7	43.0	R7.1	∅115