

SX - SERIES

Explosion-Proof Servo Motor
3" Frame

Motor Data (230V)

Performance Data (40 °C)	Symbol	Unit	M431-N	M432-N	M433-F	M433-H	M433-J
Continuous Rated Torque (Stall)	T_c	lb-in [Nm]	10.39 [1.17]	20.77 [2.35]	27.97 [3.16]	27.97 [3.16]	27.97 [3.16]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	2.79	5.22	4.06	4.50	5.08
Max. Continuous Power	P_{max}	HP [kW]	0.64 [0.48]	0.92 [0.69]	1.02 [0.76]	1.07 [0.80]	1.22 [0.91]
Torque @ Max. Power	T_p	lb-in [Nm]	7.32 [0.83]	11.21 [1.27]	25.78 [2.91]	22.52 [2.54]	21.94 [2.48]
Current @ Maximum Power	I_p	Amps (RMS)	2.51	4.70	3.65	4.05	4.57
Speed @ Max. Power (Amp. Dependent)	N_p	RPM	5500	5200	2500	3000	3500
Max. Continuous Speed (Amp. Dependent)	N_{max}	RPM	6210	6210	2911	3223	4122
Maximum Current (RMS)	I_m	Amps (RMS)	11.84	22.13	17.22	19.08	21.52
Peak Torque	T_{pk}	lb-in [Nm]	31.17 [3.51]	62.31 [7.05]	83.91 [9.48]	83.91 [9.48]	83.91 [9.48]
Rotor Inertia	J_m	lb-in-sec ² [kg-m ²]	0.0006 [0.00007]	0.0011 [0.00012]	0.0015 [0.00017]	0.0015 [0.00017]	0.0015 [0.00017]
Torque Constant (@ Max. Winding Temp.)	K_t	lb-in/Amps [Nm/Amp]	3.72 [0.42]	3.98 [0.45]	6.89 [0.78]	6.21 [0.70]	5.51 [0.62]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K_e	V/KRPM [V*Sec/Rad]	30.0 [0.29]	30.0 [0.29]	64.0 [0.61]	57.8 [0.55]	45.2 [0.43]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R_a	Ohm	5.30	2.00	4.40	3.50	2.50
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_a	millihenry	7.60	3.50	9.90	10.40	4.20
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	71034 [57196]	80074 [69356]	79048 [73192]	79048 [73192]	79048 [73192]
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	1.79	2.24	2.98	1.69
Mechanical Time Constant [brake]	T_m	msec	3.08 [3.83]	1.88 [2.17]	1.57 [1.70]	1.53 [1.65]	1.56 [1.69]
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]	9.46 [4.29]	12.43 [5.64]	13.42 [6.09]	13.42 [6.09]	13.42 [6.09]
Line Voltage	V	VAC	230	230	230	230	230

Performance Data (40 °C)	Symbol	Unit	M433-M
Continuous Rated Torque (Stall)	T_c	lb-in [Nm]	27.97 [3.16]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	7.44
Max. Continuous Power	P_{max}	HP [kW]	1.29 [0.96]
Torque @ Max. Power	T_p	lb-in [Nm]	16.24 [1.83]
Current @ Maximum Power	I_p	Amps (RMS)	6.7
Speed @ Max. Power (Amp. Dependent)	N_p	RPM	5000
Max. Continuous Speed (Amp. Dependent)	N_{max}	RPM	6210
Maximum Current (RMS)	I_m	Amps (RMS)	31.57
Peak Torque	T_{pk}	lb-in [Nm]	83.91 [9.48]
Rotor Inertia	J_m	lb-in-sec ² [kg-m ²]	0.0015 [0.00017]
Torque Constant (@ Max. Winding Temp.)	K_t	lb-in/Amps [Nm/Amp]	3.76 [0.42]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K_e	V/KRPM [V*Sec/Rad]	30.0 [0.29]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R_a	Ohm	1.07
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_a	millihenry	1.80
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	79048 [73192]
Thermal Time Constant [brake]	T_{th}	minute	30 [33]
Electrical Time Constant	T_e	msec	1.69
Mechanical Time Constant [brake]	T_m	msec	1.49 [1.61]
Static Friction	T_f	lb-in [Nm]	0.52 [0.06]
Weight	W	lb [kg]	13.42 [6.09]
Line Voltage	V	VAC	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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Explosion-Proof Servo Motor
3" Frame

Motor Data (460V)

Performance Data (40 °C)	Symbol	Unit	M431-N	M432-N	M433-F	M433-H	M433-J
Continuous Rated Torque (Stall)	T_c	lb-in [Nm]	9.8 [1.1]	19.5 [2.21]	26.3 [2.97]	26.3 [2.97]	26.3 [2.97]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	1.30	2.50	1.90	2.10	2.50
Max. Continuous Power	P_{max}	HP [kW]	0.6 [0.45]	0.87 [0.65]	0.96 [0.72]	1.01 [0.75]	1.15 [0.85]
Torque @ Max. Power	T_p	lb-in [Nm]	6.9 [0.78]	10.5 [1.19]	24.2 [2.74]	21.2 [2.39]	20.6 [2.33]
Current @ Maximum Power	I_p	Amps (RMS)	1.20	2.20	1.70	1.90	2.20
Speed @ Max. Power (Amp. Dependent)	N_p	RPM	5500	5200	2500	3000	3500
Max. Continuous Speed (Amp. Dependent)	N_{max}	RPM	6210	6210	2911	3223	4085
Maximum Current (RMS)	I_m	Amps (RMS)	5.60	10.40	8.10	9.00	10.40
Peak Torque	T_{pk}	lb-in [Nm]	29.4 [3.3]	58.5 [6.63]	78.9 [8.91]	78.9 [8.91]	78.9 [8.91]
Rotor Inertia	J_m	lb-in-sec ² [kg-m ²]	0.0006 [0.00007]	0.0011 [0.00012]	0.0015 [0.00017]	0.0015 [0.00017]	0.0015 [0.00017]
Torque Constant (@ Max. Winding Temp.)	K_t	lb-in/Amps [Nm/Amp]	7.45 [0.84]	7.96 [0.9]	13.75 [1.55]	12.43 [1.4]	10.71 [1.21]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K_e	V/KRPM [V*Sec/Rad]	60.0 [0.57]	60.0 [0.57]	128.0 [1.22]	115.7 [1.1]	91.2 [0.87]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R_a	Ohm	22.50	8.30	22.77	14.90	10.11
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_a	millihenry	30.40	14.00	61.50	41.70	30.70
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	66772 [53764]	75270 [65194]	74305 [68801]	74305 [68801]	74305 [68801]
Thermal Time Constant [brake]	T_{th}	minute	30 [33]	30 [33]	30 [33]	30 [33]	30 [33]
Electrical Time Constant	T_e	msec	1.35	1.69	2.70	2.80	3.04
Mechanical Time Constant [brake]	T_m	msec	3.28 [4.07]	2.00 [2.31]	2.03 [2.19]	1.63 [1.76]	1.62 [1.75]
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]	9.46 [4.29]	12.43 [5.64]	13.42 [6.09]	13.42 [6.09]	13.42 [6.09]
Line Voltage	V	VAC	460	460	460	460	460

Performance Data (40 °C)	Symbol	Unit	M433-M
Continuous Rated Torque (Stall)	T_c	lb-in [Nm]	26.3 [2.97]
Continuous Rated Current (RMS)	I_c	Amps (RMS)	3.6
Max. Continuous Power	P_{max}	HP [kW]	1.21 [0.9]
Torque @ Max. Power	T_p	lb-in [Nm]	15.3 [1.72]
Current @ Maximum Power	I_p	Amps (RMS)	3.3
Speed @ Max. Power (Amp. Dependent)	N_p	RPM	5000
Max. Continuous Speed (Amp. Dependent)	N_{max}	RPM	6210
Maximum Current (RMS)	I_m	Amps (RMS)	15.4
Peak Torque	T_{pk}	lb-in [Nm]	78.9 [8.91]
Rotor Inertia	J_m	lb-in-sec ² [kg-m ²]	0.0015 [0.00017]
Torque Constant (@ Max. Winding Temp.)	K_t	lb-in/Amps [Nm/Amp]	7.23 [0.82]
Back EMF Constant (L-L RMS) @ 25°C (77°F)	K_e	V/KRPM [V*Sec/Rad]	60.0 [0.57]
Stator Resistance ±10% (L-L) @ 25°C (77°F)	R_a	Ohm	4.69
Stator Inductance ±10% (L-L) @ 25°C (77°F)	L_a	millihenry	13.6
Max. Theoretical Acceleration @ Stall [brake]	AE	Rad/sec ²	74305 [68801]
Thermal Time Constant [brake]	T_{th}	minute	30 [33]
Electrical Time Constant	T_e	msec	2.91
Mechanical Time Constant [brake]	T_m	msec	1.70 [1.83]
Static Friction	T_f	lb-in [Nm]	0.52 [0.06]
Weight	W	lb [kg]	13.42 [6.09]
Line Voltage	V	VAC	460

Brake Information:

	Symbol	Unit	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]

SX - SERIES

Explosion-Proof Servo Motor
3" Frame

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