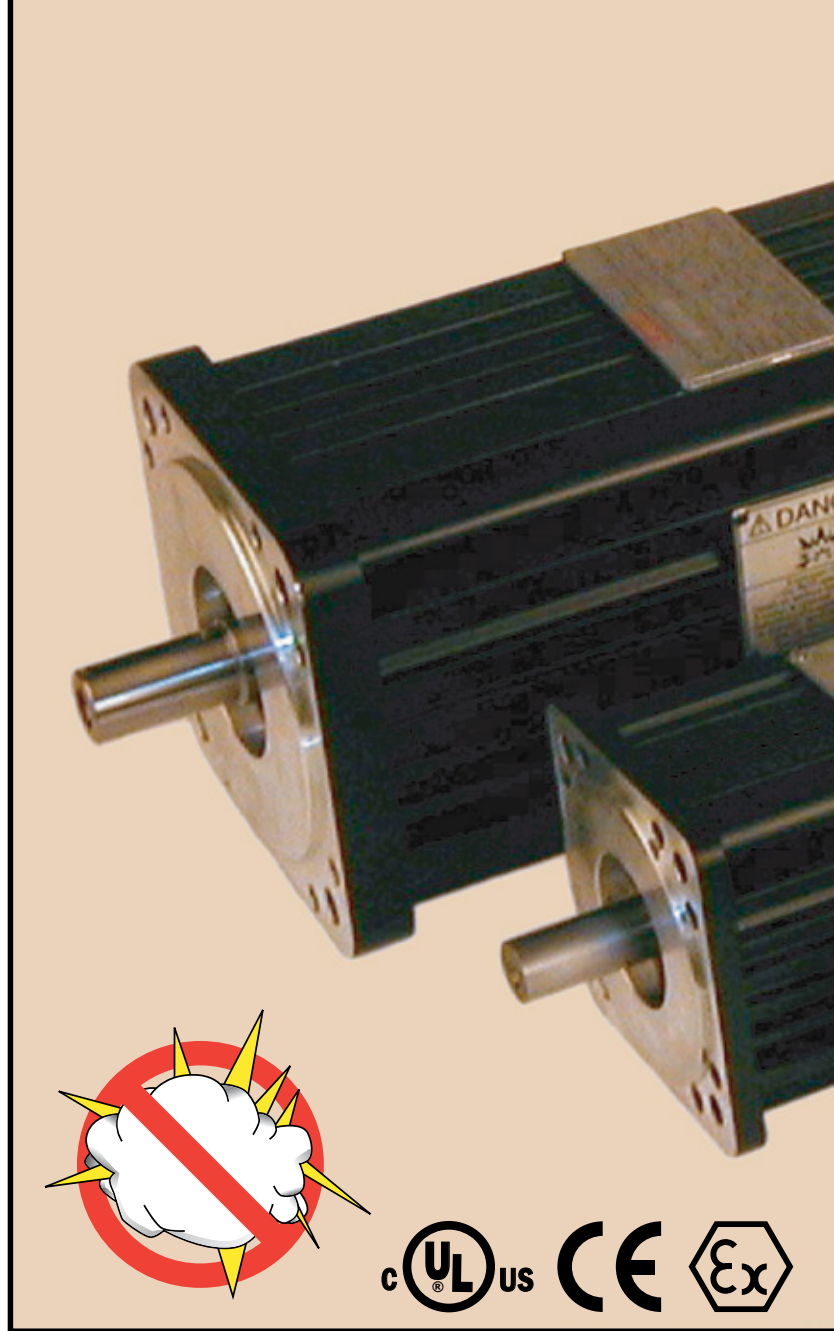


EXPLOSION-PROOF SERVO MOTORS

www.elwood.com



ELWOOD[®] HIGH PERFORMANCE
MOTORS
SERVOS - STEPPERS

ISO 9001
CERTIFIED COMPANY

SX SERIES

Enabled by
**Rockwell
Automation**
Technologies

Elwood's SX Series servo motors are available with frame sizes of 3.38 inch (86 mm), 4.30 inch (109 mm), 6 inch (152 mm), and 7 inch (178 mm). These models provide a continuous operating torque range of 1.2 Nm to 36 Nm with speeds to 6500 RPM at 40°C ambient temperature.

SX-Series motors balance smooth operation with high torque to inertia ratios. Rare earth magnets constructed of Neodymium Iron Boron and Samarium Cobalt are used. These materials produce excellent continuous and peak torque for quick acceleration rates and high torque values throughout a wide speed range.

Elwood's robust design offers features to promote reliable operation in industrial environments. Select from various windings for flexibility and suitability to specific application demands. Motor ball bearings are double shielded and permanently lubricated for long life in demanding applications. Sealed options are available for ingress protection against dust or liquids.

Flange mounting and output shaft options include metric (DIN), English, NEMA standard, or modified. SX-Series mountings allow mounting with major gear reducer manufacturers conforming to DIN and NEMA specifications. Elwood also supplies mounting configurations to customer specifications, upon request.

Applications include, paint, medical/hygenic sterilization, axis and spindle drives, packaging machinery, material handling systems, assembly equipment, grain handling/processing, sugar processing and munitions automation.

Standard Features

- UL® Listed (North America) and ATEX Certified (Europe) for hazardous locations
- Rare earth magnets for high torque to inertia ratios
- (UL only versions) TENV, washdown capability, shaft seal and O-ring/gasket construction
- 230V/460V windings
- Resolver or Encoder (Incremental) feedback
- NPT pipe thread bushing with individual flying lead exit

Optional Features

- High resolution/absolute single or multi-turn encoders
- Fail-safe electromechanical brake
- Custom shafts, keyways, mounting flanges

HAZARDOUS LOCATION CLASSIFICATIONS

The UL® Listed, ATEX, IECEx Certified SX-Series Brushless Servo Motors were designed for use in high performance industrial automation applications where dust, vapors, or gases form flammable or explosive environments when ignited by a spark or flame. Elwood's design delivers a totally-enclosed non-ventilated motor that does not require purge or pressure system.

Elwood's SX-Series servo motors for gas atmospheres conform to UL® Listed specification #674 (NEC Sec. #500), Class I, Division 1 and 2, Groups C and D, for hazardous locations based on the atmosphere in which the motor will be operating. European compliance is ATEX harmonised standard EN 60079-0 (General Requirements) and EN 60079-1 (Flameproof Enclosures "d").

SX-Series servo motors for dust atmospheres conform to UL® Listed specification #674 (NEC Sec. #500), Class II, Division 1 and 2, Groups E, F, and G for hazardous locations based on the atmosphere in which the motor will be operating. European compliance is ATEX. International compliance is IECEx. Harmonised standards are 60079-0 (General Requirements) and EN 60079-31 (Dust Ignition Protection by Enclosure "t").

Contact Elwood for help specifying a motor for your specific application. Listed below are examples of the atmospheric groups SX-Series Hazardous Location Servo Motors are suited for:

UL Class I, Division 1 & 2; ATEX

Group C - Ethylene Atmospheres

Acetaldehyde, allyl alcohol, n-butyraldehyde, carbon monoxide, crotonaldehyde, cyclopropane, diethyl ether, diethylamine, epichlorohydrin, ethylene, ethylenimine, ethyl mercaptan, ethyl sulfide, hydrogen cyanide, hydrogen sulfide, morpholine, 2-nitropropane, tetrahydrofuran, unsymmetrical dimethyl hydrazine (UDMH 1, 1-dimethyl hydrazine).

Group D - Propane Atmospheres

Acetic Acid (glacial), acetone, acrylonitrile, ammonia, benzene, butane, 1-butanol (butyl alcohol), 2-butanol (secondary butyl alcohol), n-butyl acetate, isobutyl acetate, di-isobutylene, ethane, ethanol (ethyl alcohol), ethyl acetate, ethyl acrylate (inhibited), ethylene diamine (anhydrous), ethylene dichloride, ethylene glycol monomethyl ether, gasoline, heptanes, hexanes, isoprene, isopropyl ether, mesityl oxide, methane (natural gas), methanol (methyl alcohol), 3-methyl-1 butanol (isoamyl alcohol), methyl ethyl ketone, methyl isobutyl ketone, 2-methyl-1-propanol (isobutyl alcohol), 2-methyl-2-propanol (tertiary butyl alcohol), petroleum naphthalene, pyridine, octanes, pentanes, 1-pentanol (amyl alcohol), propane, 1-propanol (propyl alcohol), 2-propanol (isopropyl alcohol), propylene, styrene, toluene, vinyl acetate, vinyl chloride, xylenes.

UL Class II, Division 1 & 2; ATEX; IECEx

Group E - Metal Dust

Group F - Coal Dust

Group G - Grain Dust

EXPLOSION-PROOF SERVOS

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Motor Data (230V)

Model	Cont. Rated Torque (Stall) lb-in (Nm)	Peak Torque lb-in (Nm)	Cont. Rated Current (RMS) Amps	Speed @ Max. Power (RPM)	Max. Cont. Speed (RPM)	Rotor Inertia lb-in-sec ² (kg-m ²)	Weight lb (kg)
M431-N	10.39 (1.17)	31.17 (3.51)	2.79	5500	6210	0.0006 (0.00007)	9.46 (4.29)
M432-N	20.77 (2.35)	62.31 (7.05)	5.22	5200	6210	0.0011 (0.00012)	12.43 (5.64)
M433-F	27.97 (3.16)	83.91 (9.48)	4.06	2500	2911	0.0015 (0.00017)	13.42 (6.09)
M433-H	27.97 (3.16)	83.91 (9.48)	4.50	3000	3223	0.0015 (0.00017)	13.42 (6.09)
M433-J	27.97 (3.16)	83.91 (9.48)	5.08	3500	4122	0.0015 (0.00017)	13.42 (6.09)
M433-M	27.97 (3.16)	83.91 (9.48)	7.44	5000	6210	0.0015 (0.00017)	13.42 (6.09)
M442-E	31.16 (3.52)	93.48 (10.56)	3.47	2500	2673	0.0036 (0.00041)	17.71 (8.03)
M442-K	31.16 (3.52)	93.48 (10.56)	6.26	4500	5118	0.0036 (0.00041)	17.71 (8.03)
M443-E	41.55 (4.69)	124.65 (14.07)	4.91	2500	2635	0.0045 (0.00051)	21.56 (9.78)
M443-K	41.55 (4.69)	124.65 (14.07)	9.64	4500	5204	0.0045 (0.00051)	21.56 (9.78)
M444-E	58.33 (6.59)	179.99 (19.77)	7.02	2500	2957	0.0056 (0.00063)	25.41 (11.52)
M444-H	58.33 (6.59)	179.99 (19.77)	9.31	3500	3764	0.0056 (0.00063)	25.41 (11.52)
M461-G	43.15 (4.88)	129.45 (14.64)	6.85	3000	3549	0.011 (0.0012)	26.4 (11.97)
M462-G	91.89 (10.38)	275.67 (31.14)	13.45	3000	3576	0.018 (0.0020)	37.4 (16.96)
M463-K	131.04 (14.81)	393.12 (44.43)	26.14	3500	4826	0.025 (0.0028)	41.8 (18.96)
M464-G	164.59 (18.6)	493.77 (55.8)	24.53	2500	3603	0.032 (0.0036)	49.5 (22.45)
M465-G	186.97 (21.13)	560.91 (63.39)	26.01	2500	3376	0.039 (0.0044)	57.2 (25.94)
M471-H*	59.5 (6.72)	178.5 (20.16)	8.82	3300	3539	0.0151 (0.00171)	27.5 (12.47)
M473-C*	142.22 (16.07)	426.66 (48.21)	11.34	1750	1937	0.0454 (0.00513)	55 (24.94)
M474-C*	180.57 (20.4)	541.71 (61.2)	15.06	1750	1971	0.0659 (0.00744)	66 (29.93)
M476-C*	278.85 (31.51)	836.55 (94.53)	23.10	1700	2001	0.0909 (0.0103)	88 (39.91)
M477-C*	316.4 (35.75)	949.2 (107.25)	26.06	1500	1990	0.106 (0.012)	99 (44.9)

Motor Data (460V)

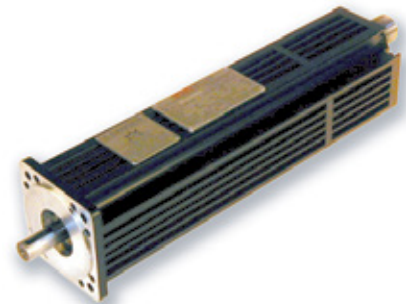
Model	Cont. Rated Torque (Stall) lb-in (Nm)	Peak Torque lb-in (Nm)	Cont. Rated Current (RMS) Amps	Speed @ Max. Power (RPM)	Max. Cont. Speed (RPM)	Rotor Inertia lb-in-sec ² (kg-m ²)	Weight lb (kg)
M431-N	9.8 (1.1)	29.4 (3.3)	1.30	5500	6210	0.0006 (0.00007)	9.46 (4.29)
M432-N	19.5 (2.21)	58.5 (6.63)	2.50	5200	6210	0.0011 (0.00012)	12.43 (5.64)
M433-F	26.3 (2.97)	78.9 (8.91)	1.90	2500	2911	0.0015 (0.00017)	13.42 (6.09)
M433-H	26.3 (2.97)	78.9 (8.91)	2.10	3000	3223	0.0015 (0.00017)	13.42 (6.09)
M433-J	26.3 (2.97)	78.9 (8.91)	2.50	3500	4085	0.0015 (0.00017)	13.42 (6.09)
M433-M	26.3 (2.97)	78.9 (8.91)	3.6	5000	6210	0.0015 (0.00017)	13.42 (6.09)
M442-E	29.3 (3.31)	87.9 (9.93)	1.60	2500	2673	0.0036 (0.00041)	17.71 (8.03)
M442-K	29.3 (3.31)	87.9 (9.93)	2.90	4500	5118	0.0036 (0.00041)	17.71 (8.03)
M443-E	39.1 (4.41)	117.3 (13.23)	2.30	2500	2635	0.0045 (0.00051)	21.56 (9.78)
M443-K	39.1 (4.41)	117.3 (13.23)	4.60	4500	5204	0.0045 (0.00051)	21.56 (9.78)
M444-E	54.2 (6.13)	162.6 (18.39)	3.30	2500	2957	0.0056 (0.00063)	25.41 (11.52)
M444-H	54.2 (6.13)	162.6 (18.39)	4.40	3500	3881	0.0056 (0.00063)	25.41 (11.52)
M461-G	39.3 (4.44)	117.9 (13.32)	3.10	3000	3549	0.011 (0.0012)	26.4 (11.97)
M462-G	83.6 (9.45)	251 (28.4)	5.70	3000	3751	0.018 (0.0020)	37.4 (16.96)
M463-K	119.2 (13.47)	357.6 (40.1)	11.90	3500	4826	0.025 (0.0028)	41.8 (19)
M464-G	149.8 (16.92)	449 (50.8)	11.10	2500	3603	0.032 (0.0036)	49.5 (22.4)
M465-G	170.1 (19.22)	510 (57.07)	11.80	2500	3375	0.039 (0.0044)	57.2 (25.9)
M471-H*	54.1 (6.12)	162.3 (18.36)	4.00	3300	3539	0.0151 (0.00171)	27.5 (12.47)
M473-C*	129.4 (14.62)	388.2 (43.86)	5.20	1750	1937	0.0454 (0.00513)	55 (24.94)
M474-C*	164.3 (18.57)	492.9 (55.71)	6.90	1750	1971	0.0659 (0.00744)	66 (29.93)
M476-C*	253.8 (28.67)	761.4 (86)	10.50	1700	2001	0.0909 (0.0103)	88 (39.91)
M477-C*	287.9 (32.53)	863.7 (97.59)	11.90	1500	1990	0.106 (0.012)	33 (44.9)

* Motors are not currently ATEX rated. Please consult Factory if application requires ATEX rating.

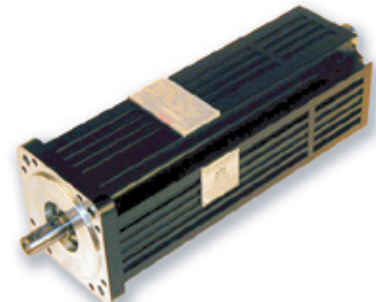
M43X 'SX'



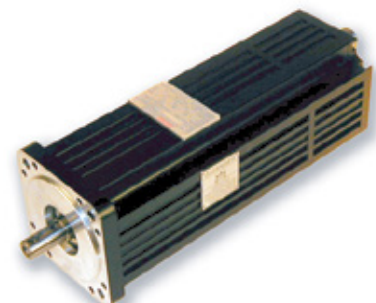
M44X 'SX'



M46X 'SX'



M47X 'SX'



SW SERIES

WASH-DOWN SERVO

Extremely rugged design for demanding environments such as automotive and machine tool industries. Custom solutions available to meet unique application requirements.



- 2, 3, 4, 6, & 7" Frame Sizes
- 0.6Nm to 50Nm Cont. Torque Range
- Designed for High Pressure Wash Down
- 115V / 230V / 460V Windings,
- Absolute (single or multi-turn) Resolver, or Encoder Feedback
- English, Metric (DIN), or NEMA Mounting
- Customs Available



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SF SERIES

FOOD-GRADE SERVO

Designed for the food and baking industries. Capable of withstanding repeated high pressure wash down. Smooth housing and special connectors reduce potential entrapment areas.



- 2, 3, 4, and 6" Frame Sizes
- "Finless" Extruded Aluminum Housing
- FDA-Approved Epoxy Coating
- 0.6Nm to 25Nm Cont. Torque Range
- Designed for High Pressure Wash Down
- 115V / 230V / 460V Windings
- English, Metric (DIN), or NEMA Mounting
- Customs Available



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H SERIES

LOW INERTIA SERVO

Authorized replacements for Rockwell Automation's H, S, W, and 1326AS Series servo motors. True drop-in, mechanically and electrically identical to originals.



- Rockwell Automation Encompass Partner
- Identical performance
- 0.8Nm to 37Nm Cont. Torque Range
- H-3000, H-4000, H-6000 Frames
- All OEM components
- Available indefinitely
- Rebuilds available regardless of original manufacturer
- Cable sets available
- Parts available
- Stators, Rotors, Feedback, etc.

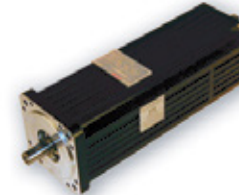


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SX SERIES

EXPLOSION-PROOF SERVO

Ideal for hazardous locations where dust, vapors, or gases form potentially flammable or explosive environments. Can be applied virtually worldwide.



- 3, 4, 6 & 7" Frame Sizes
- UL/cUL Listed (North America)
- Class I Div 1 & 2, Groups C, D
- Class II Div 1 & 2 Groups E, F, G
- 3, 4, & 6" Frame Sizes
- ATEX (Zone 1), Ex d IIB T3
- 3" Frame Size
- ATEX/IECEX (Zone 21&22)
- Ex tb IIIC T135C Db IP6X
- 1.2Nm to 36Nm Cont. Torque Range
- Sealed Lead Exit Design
- Many Feedback Options



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MOTORS
SERVOS - STEPPERS

ELWOOD HIGH PERFORMANCE MOTORS

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Rev. E