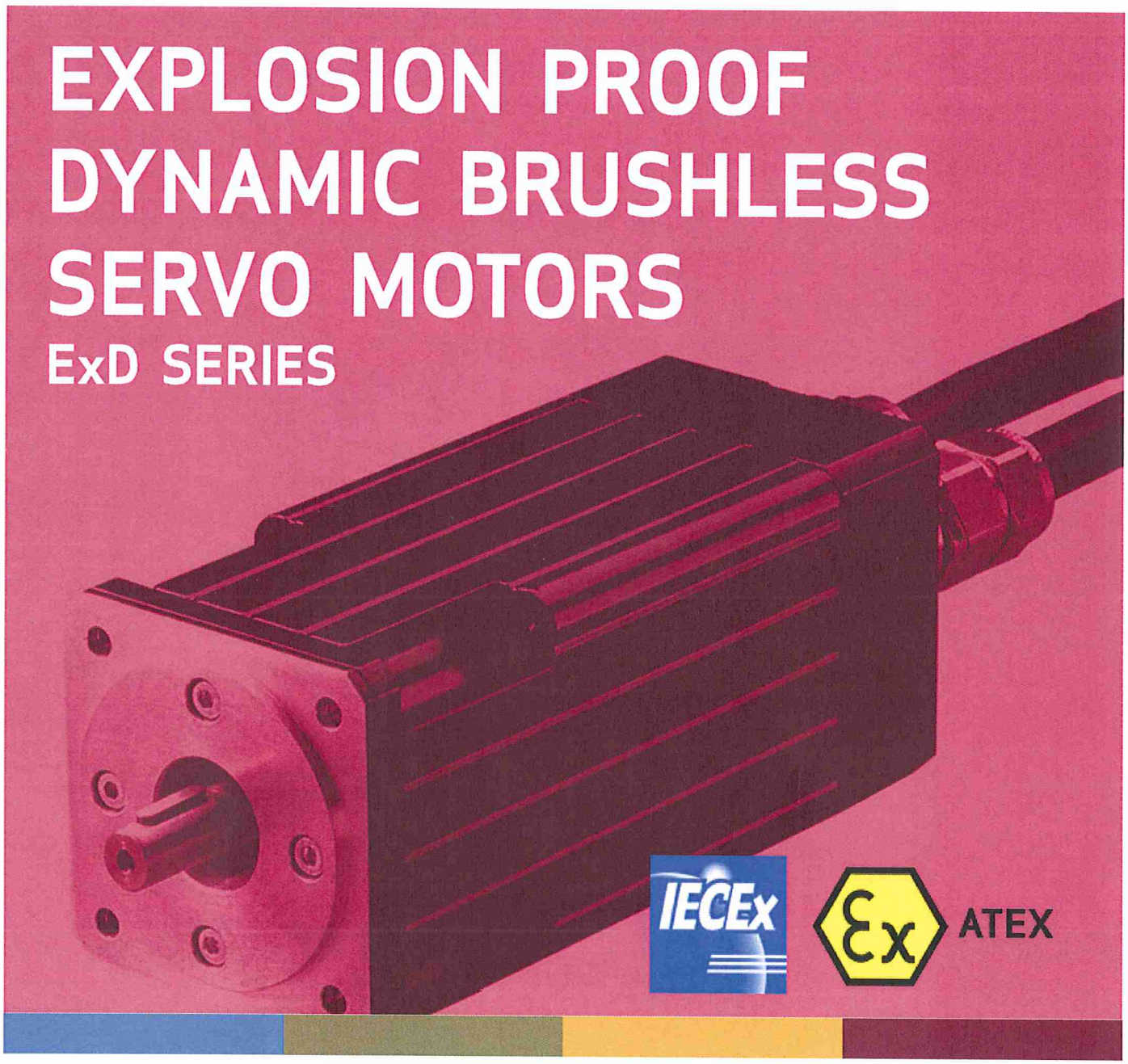
EXPLOSION PROOF DYNAMIC BRUSHLESS SERVO MOTORS

ExD SERIES



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OFFERING HIGH PERFORMANCE SERVO MOTORS
FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES
IN ACCORDANCE WITH ATEX AND IECEx

WHAT MOVES YOUR WORLD

MOOG

PRODUCT OVERVIEW

Moog Brushless Technology

For over two decades, the name Moog has been associated with brushless servo motors and servo drives offering the highest dynamics, power density and reliability. The products are designed as a system to deliver superior servo performance. Moog offers a broad range of standard models as well as custom solutions to meet your unique application requirements. Moog brushless servo motors and drives are found on a variety of applications; especially where dynamics, compact size and reliability are important.

ExD Series Servo Motors

Moog's Explosion Proof Dynamic Brushless Servo Motors (ExD Series) are electronically commutated synchronous AC motors with permanent magnet field excitation. The ExD Series Servo Motors are designed for highly dynamic applications where positioning times of 30 ms or less are often the norm. The ExD Series Servo Motors offers one of the industry's widest power ranges.

The modular design is supported by a variety of options with Moog's application engineers capable of helping you tailor the product to meet the exact specifications of your machine application. All Moog Servo Motors are manufactured in-house and the use of tight machining tolerances, precision balancing and thorough production testing guarantee a long service life.

The ExD Series Motors are designed and tested for operation in conditions where vapors or gases form flammable or explosive environments.The flameproof housing has been tested and proven capable to withstand internal explosions without bursting or allowing ignition to reach outside the motor frame. These servo motors are certified for use in potentially explosive atmosphere in accordance with ATEX 94/9/CE directive „D" type protection and IECEx for II C gases, with dust protection against III C.

Please refer to the Modular Multi-Axis Programmable Motion Control Servo Drive catalog for details of our Servo Drive offering.

Standards

These motors are certified to be in compliance with ATEX and IECEx standards:

- EN/IEC 60079-0 Explosive atmospheres - Part 0: Equipment - General requirements
- EN/IEC 60079-1 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures „d"
- EN/IEC 60079-31 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure „t"

Type of Protection

- Flameproof „d"
- Dust „tb"

Marking

- Ex II 2 G Ex d IIC T3-T6 Gb
- Ex II 2 D Ex tb IIIC T200 °C-T85 °C Db IP 65/67

Reference links

- ATEX Certificate
- IECEx Certificate

PRODUCT OVERVIEW

Servo Motor type[1]	Stall torque Nm (lbf in)	Maximum torque Nm (lbf in)	Rated speed r/min	Rotor inertia kg cm² (10^{-4} lbf in s²)	Square flange mm (in)
G-3LM2 (L05)	0.52 (4.6)	1.60 (14.2)	7,800	0.16 (1.4)	70 (2.8)
G-3LM4 (L15)	1.39 (12.3)	4.9 (43.4)	6,300	0.39 (3.5)	70 (2.8)
G-3LM6 (L25)	2.16 (19.1)	8.2 (72.6)	4,600	0.62 (5.5)	70 (2.8)
G-3LM8 (L40)	3.26 (28.9)	13.2 (117)	3,800	0.97 (8.6)	70 (2.8)
G-3LV2 (L05)	0.52 (4.6)	1.6 (14.2)	7,800	0.16 (1.4)	70 (2.8)
G-3LV4 (L15)	1.39 (12.3)	4.9 (43.4)	6,300	0.39 (3.5)	70 (2.8)
G-3LV6 (L25)	2.16 (19.1)	8.2 (72.6)	4,600	0.62 (5.5)	70 (2.8)
G-3LV8 (L40)	3.26 (28.9)	13.2 (117)	3,800	0.97 (8.6)	70 (2.8)
G-5LM2 (L10)	5.79 (51.2)	12.2 (108)	4,800	4.6 (40.7)	140 (5.5)
G-5LM4 (L20)	10.83 (95.9)	25.8 (228)	3,500	8.00 (70.8)	140 (5.5)
G-5LM6 (L30)	15.7 (139)	38.2 (338)	2,700	11.50 (102)	140 (5.5)
G-5LM8 (L50)	25.4 (225)	61.2 (542)	2,000	18.40 (163)	140 (5.5)
G-5LV2 (L10)	5.79 (51.2)	12.20 (108)	4,800	4.60 (40.7)	140 (5.5)
G-5LV4 (L20)	10.83 (95.9)	25.80 (228)	3,500	8.00 (70.8)	140 (5.5)
G-5LV6 (L30)	15.70 (139)	38.20 (338)	2,700	11.50 (102)	140 (5.5)
G-5LV8 (L50)	25.40 (225)	61.20 (542)	2,000	18.40 (163)	140 (5.5)
G-6LM2 (L15)	12.91 (114)	40.13 (355)	4,000	27.25 (241)	190 (7.5)
G-6LM4 (L30)	25.57 (226)	79.79 (706)	3,000	52.08 (461)	190 (7.5)
G-6LM6 (L45)	36.26 (321)	119.65 (1,059)	2,500	76.91 (681)	190 (7.5)
G-6LM8 (L60)	47.35 (419)	159.55 (1,412)	2,200	102.07 (903)	190 (7.5)
G-6LM9 (L90)	66.72 (591)	239.34 (2,118)	2,000	151.08 (1,337)	190 (7.5)
G-6LV2 (L15)	12.85 (114)	40.15 (355)	4,000	27.25 (241)	190 (7.5)
G-6LV4 (L30)	24.95 (221)	79.77 (706)	3,000	52.08 (461)	190 (7.5)
G-6LV6 (L45)	36.24 (321)	119.64 (1,059)	2,500	76.91 (681)	190 (7.5)
G-6LV8 (L60)	47.30 (419)	159.52 (1,412)	2,200	102.07 (903)	190 (7.5)
G-6LV9 (L90)	66.68 (590)	239.31 (2,118)	2,000	151.08 (1,337)	190 (7.5)

1) Motor type code [eg. G-3LM2 (L05), see back page for ordering reference]
G = Explosion proof Series Servo motor
3 = Flange size
M = Winding voltage (M = Low voltage, 325 V_{DC} with primary PTC thermal sensor)
V = Winding voltage (V = High voltage, 565 V_{DC} with primary PTC thermal sensor)
2 (L05) = Stack length

Notes:

1. Nominal speed can be easily adjusted by changing the stator windings. Please contact your local Moog application engineer for information.
2. All the above technical data is for explosion proof motor assuming T4 temparature class at +40 °C (+104 °F).

FEATURES AND BENEFITS

Features	Benefits
Certified for use in potentially hazardous environments	Offer greater safety and risk protection
Feature superior motor dynamics	Improves machine cycle time
Compact, lightweight construction and broad range of torque ratings offered	Simplifies machine design and streamlines supply chain
Proprietary, low cogging design	Delivers smooth low speed operation for machines
Ruggedized, maintenance free design with bearing greased for life	Boosts overall system availability
Flexible design options that can be tailored to exact specifications	Eases integration
Design that can be tailored to meet unique machine and application requirements	Enables a more flexible machine design
Built in PTC thermal sensor to protect motor from overheating and IP 65/67 protection class	Provides greater safety and reduces downtime

Superior Motor Dynamics Improves Cycle Time

The ExD Series Servo Motor combines a low inertia rotor with an electromagnetic design having exceptional overload capacity. The result is an increase in the effective torque available to accelerate and decelerate the load, enabling higher dynamics and improved cycle times.
ExD Series Servo Motors use a fully laminated, weight optimized, rotor to provide a significant inertia reduction over conventional solid rotor designs. It is able to achieve a high overload capacity through the use of high-energy rare earth magnets, a high pole count electrical design, and an efficient thermal construction.

Compact and Lightweight Construction Simplifies Machine Design

The ExD Series Servo Motor provides high torque in a compact and lightweight package to achieve both high power density and a high torque-to-weight ratio. The compact and lightweight package provides greater flexibility and often enables new cost-saving approaches to machine construction. In applications where the motor is mounted on a moving axis, the high torque-to-weight ratio allows greater payloads and/or increased acceleration.
ExD Series Servo Motors leverage an all-aluminum motor housing to achieve a significant weight reduction over low cost steel housings. A robust thermal design allows more power to be designed into a small, compact package.

Proprietary, Low-Cogging Design Delivers Smooth Low Speed Operation

The ExD Series Servo Motor includes several design enhancements to deliver smooth slow speed performance. The enhancements include the selection of a high pole count (8 to 12 poles) electromagnetic design, a stator with non-symmetric slot count and other proprietary features to minimize cogging.

Ruggedized, Maintenance-Free Design to Boost Overall System Availability

The ExD Series Servo Motor is designed and manufactured in accordance with strict standards, using ruggedized components with proven reliability in harsh thermal and shock load environments. These features combine to offer years of reliable, maintenance-free, operations and boost overall system availability. The use of high-reliability feedback devices, sealed lifetime lubricated bearings, precision balanced rotors (Class G6.3) of ISO 1940 and IP65 construction combine to extend service life.

Flexible Design Option Eases Integration

The ExD Series Servo Motor is available with thefollowing options:

- Integral holding brakes
- Resolver or encoder-based feedback
- Plain or slot and key type shafts
- Cable gland with cable

Fully Customized Designs Support Unique Application Requirements

The Moog ExD Series Servo Motors can be customized to meet your unique needs.

The following are some common requests supported by Moog's application staff:

- Custom motor windings
- Custom shafts and flanges
- Custom feedback devices