DYNAMIC BRUSHLESS SERVO MOTORS FOR MANAGED PRESSURE DRILLING

Designed and tested for safe and reliable operation in hazardous environments

YOUR EXPERIENCED PROVIDER FOR SAFE AND RELIABLE BRUSHLESS DRILLING MOTORS

Moog is a leader in motion control technology and has provided reliable products and solutions for a wide range of industries for more than 65 years, including 35 years serving the oil & gas industry. Going beyond the capabilities of traditional component providers, our team of Engineers meet customer needs through consultation and custom designed solutions as needed. With a full compliment of standard and custom products available for the upstream oil & gas industry, Moog has the experience and capabilities to provide a complete solution or assimilate components to an existing system.

In the topside oil & gas industry, managers of Managed Pressure Drilling (MPD) operations are continually looking to improve safety, reliability, and efficiency in their systems. The Moog ExD Size 5 Dynamic Brushless Servo Motors meet that demand with a ruggedized design built to excel in the harshest environments with explosion proof certifications. The G495L motor is capable of working full-time in the presence of ignitable flammable gases, vapors or liquids in groups C and D, in zone 1 and 2 production areas.

FEATURES AND BENEFITS

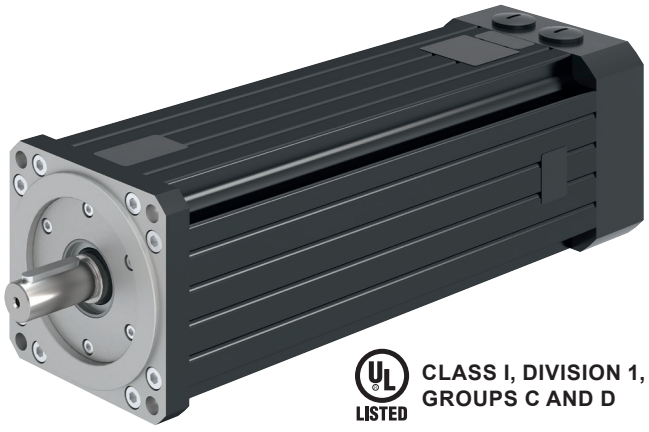
Features	Benefits
Ruggedized aluminum housing with built-in PTC thermal sensor	High power density and high torque-to-weight ratio in a durable design certified for use in hazardous environments
Customizable flanges sizes and shaft	Allows for a seamless integration to existing systems without the need to re-engineer infrastructure
Proprietary low cogging design	Smooth low-speed performance with increased productivity and accurate control
Four motor lengths with a range of performance characteristics	High torque motor capabilities to meet high volume system requirements

ADVANTAGES

- Certified to operate in Class I, Division I hazardous locations
- Available in 4 different lengths with varying levels of performance
- Sealed design with lifetime lubricated bearings and IP 65/67 complaint construction for extended service life
- Seamless integration with existing infrastructure, reducing the need for system redesigns
- Ruggedized aluminum housing with a self-cooled design

OTHER APPLICATIONS

- Pipe Handling Robotics
- Ball Screw Actuators
- Valve Actuators



CLASS I, DIVISION 1, GROUPS C AND D

Ex d IIB T4 Gb

WHAT MOVES YOUR WORLD

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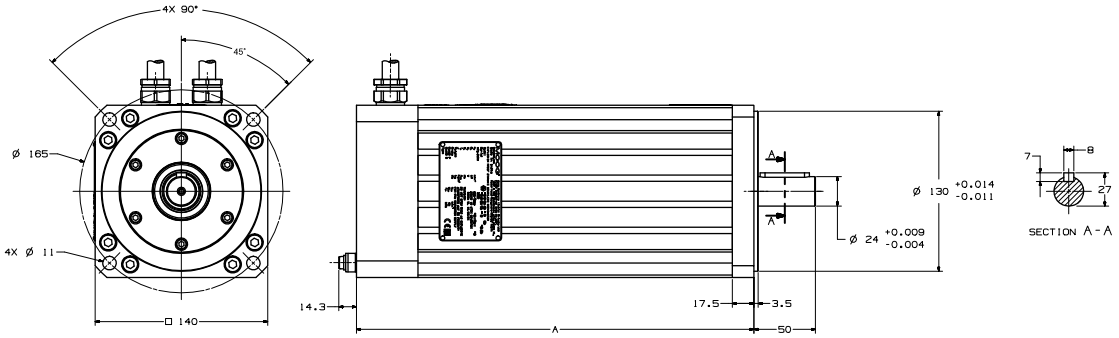
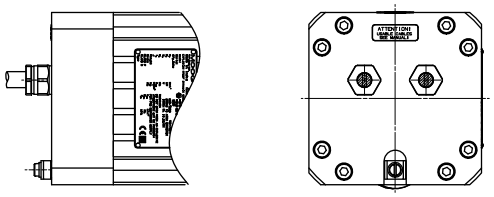
SPECIFICATIONS

G495L DYNAMIC BRUSHLESS SERVO MOTOR





Motor Length	"A" Resolver/Encoder with brake	"A" Resolver/Encoder without brake
	mm (in)	mm (in)
G-5LM2	322.5 (12.7)	264.5 (10.4)
G-5LM2	347.5 (13.7)	289.5 (11.4)
G-5LM6	373 (14.7)	315 (12.4)
G-5LM8	424 (16.7)	366 (14.4)

Stack Length	Maximum torque Nm (lbf in.)	Maximum current A_{rms}	Continuous stall torque Nm (lbf in.)	Continuous stall current Arms	Maximum speed Rpm	Winding resistance Ohms	Rotor inertia Kgcm2 (10-4 lbf in S2)	Weight (without brake) Kg (lb)
	M_{max} Nm	I_{max}	M_o M_n	I_o	N_{max}	R_{tt}	K	m
G-5LM2	12.2 (108)	24.2	5.79 (512)	9.4	5600	0.814	4.6 (40.7)	12.1 (26.7)
G-5LM2	25.8 (228)	33	10.83 (95.9)	10.76	4100	0.709	8 (70.8)	14.3 (31.5)
G-5LM6	38.2 (338)	38.1	15.7 (139)	12.27	3300	0.634	11.5 (102)	16.5 (36.4)
G-5LM8	61.2 (542)	43	25.3 (224)	14.52	2400	0.554	18.4 (163)	21 (46.3)

APPLICATION CASE STUDY

An international Oil & Gas service company, located in Houston, Texas, USA, contacted Moog for a solution to their difficult choke valve actuation application. The customer, a leader in onshore and offshore drilling rig services, provides end users with Managed Pressure Drilling systems. They continually innovate for safety, durability and efficiency of their systems.

In a collaboration with Moog Industrial engineering teams, the goal was to create an efficient integrated control solution that worked within tight space constraints of Managed Pressure Drilling (MPD) applications. When operating an MPD system it is critical to have precise control of the choke valve. The choke valve position determines the open or close ratio and therefore can control the well pressure and flow rates during active drilling operations. Controlling the downhole pressures allows for a safer drilling and rig operation. MPD choke valves are commonly located below the drilling rig's deck near the well head, attention to the hazardous areas where the system is located must be considered.

Moog provided this customer with a Class I, Division 1 hazardous area UL listed G Series, Size 5 servo motor coupled to a gearbox, and a Moog G359 cold plate servo drive to power and control the motor's exact positioning to less than .1 degrees of accuracy. The complete Moog system is certified for applications from -20°C to 60°C and has global hazardous area certifications allowing for equipment to be easily relocated on drilling rigs installed internationally. The servo drive integrates seamlessly with the customers existing control system, providing critical feedback for PID loop control of the choke valve position.

Moog's new G495L Servo Motor is designed to withstand frequent washdowns with an IP67 rating, it has a robust mounting flange to tolerate unforeseen impacts and a sufficient torque range to handle the customer's full line of available choke valve sizes.

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Dynamic Brushless Servo Motors for Managed Pressure Drilling
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