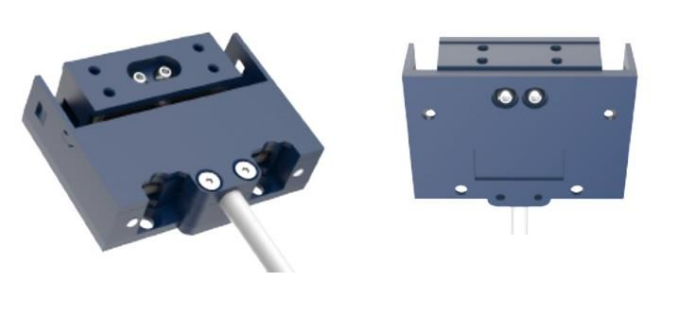
COMING SOON!

LRMO-5N - Miniature Piezoelectric Motor with High Force

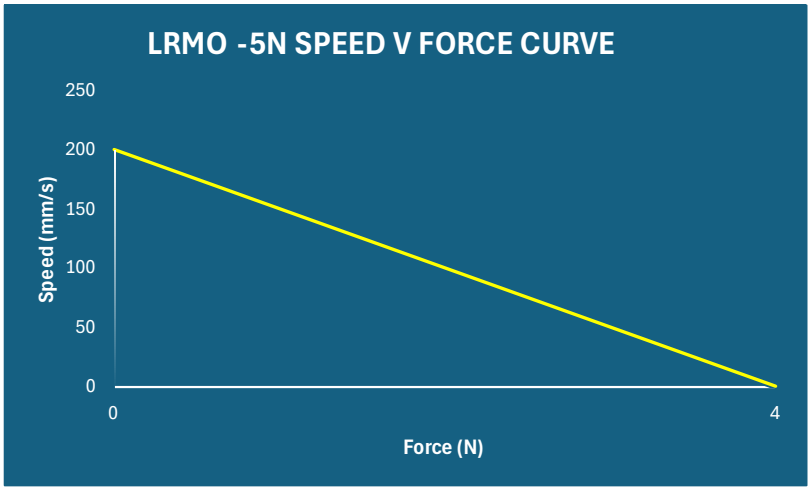
Introducing our new range of compact, lightweight linear piezoelectric actuators, designed to deliver superior precision and expanded functionality for advanced applications.

Key Advantages

- Superior stability of velocity control.
- Economical construction using thermoplastics for reliability and affordability.
- Unmatched precision and resolution.
- Ultra-fast response times and exceptional start-stop capabilities.
- High force density relative to size, provides excellent alternative to stepper lead screw designs.
- Stepping and continuous modes of operation with silent operation.
- Low power and low voltage requirement.



Model# LRMO-5N - Top and Bottom View



Key Features

- Superior Resolution: > 50 nm = 20,000 steps per mm of travel
- Force ≥4N
- Max Speed: ≈0.2 m/s
- Fast Response Time: ≈30 µs
- Low Voltage Design: 12 V DC
- Low Power: 4.2 W (@ max speed) or 0.42 W (@ 10 mm/s PWM mode)
- Energy efficient: Zero power consumption in hold mode

Principle of Operation

The LRMO-5N Linear piezo actuator operates based on a new technology. Electrical excitation of its piezoceramic body, or resonator, induces simultaneously two independent ultrasonic standing waves in two perpendicular directions. This action generates elliptical vibrations at the resonator's center, resulting in linear motion of the motor, which is passively in contact with the resonator body.

Electronic Driver Board

The electronic driver is designed to offer an economical interface for user control. Motion of the motor is achieved via PWM (Pulse Width Modulation) control signals applied to the external control input connector on the driver. Each driver PCB is pre-programmed for the specific motor model and allows for software configurability, optimizing drive signals and integrating controls. Motor operation can be finely regulated through closed-loop control using an optional encoder factory-installed on the actuator.

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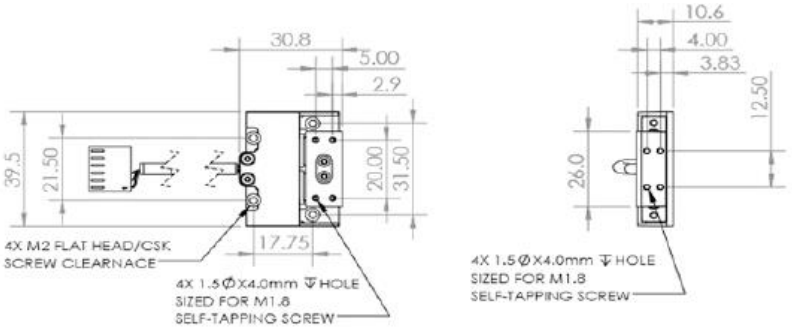
Technical Specifications

Part No. (Non-Encoder Version)	LRMO-xxx-xxx
Power Supply Voltage	12.0 V DC
Push/Pull Force	≥4 N
Self-Braking Force	≥4 N
Motor Response Time	≈30 µs
Travel Range	9.0 mm
Max Speed (continuous mode)	≈200 mm/s
Minimum Linear Step	<0.05 µm (<50 nm)
Linear Backlash at Change of Direction	<0.1 µm
Elastic Stiffness	≈200 mN/µm
Linear Hysteresis	<2.0 µm
Pitch	<450 µRad
Maximum Moment Mx	0.07 Nm
Roll	<225 µRad
Maximum Moment My	0.12 Nm
Yaw	<450 µRad
Maximum Moment Mz	0.9 Nm
Vertical Runout	3.0 µm
Horizontal Runout	6.0 µm
Frequency Response	4 kHz
Operating Temperature	-20 °C to 80 °C
Maximum Load (at listed specification)	400 g
Maximum Tolerable Load	4.2 kgf
Max Current (continuous mode)	350 mA
Max. Current at the velocity 10mm/s (PWM mode)	30-40 mA
Motor Weight	22 g
Motor Dimensions	40x31x11 mm
Driver PCB Dimensions	40x63x25 mm
Drive PCB Weight	25 g

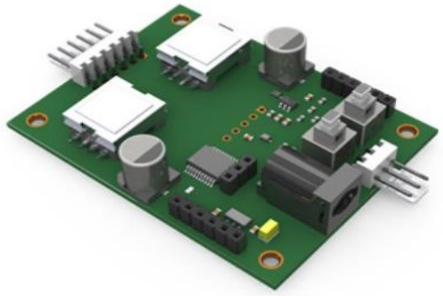
Mechanical Drawings



Schematic drawing (mm) of standard LRMO-5N (without factory installed encoder).

Electronic Driver Board

The electronic driver PCB generates the drive signals required by the piezomotor. Motion is created causing the slider of the motor to move forward and backwards. Manual movement of motor is achieved by pushing alternatively the two buttons on the driver board. Motion of the motor is achieved via PWM (Pulse Width Modulation) control signals applied to the external control input connector on the driver. Each driver PCB is pre-programmed for the specific motor model and allows for software configurability, optimizing drive signals and integrating controls.



Ordering Information

Part Number	Description
LRMO-009-0471	Linear motor without encoder evaluation kit*
LRMO-009-1471	Linear motor without encoder evaluation kit*

*Evaluation kit includes LRMO motor, Electronic Driver PCB, cables, 120/240 VAC to 125.0 VDC wall power adapter

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