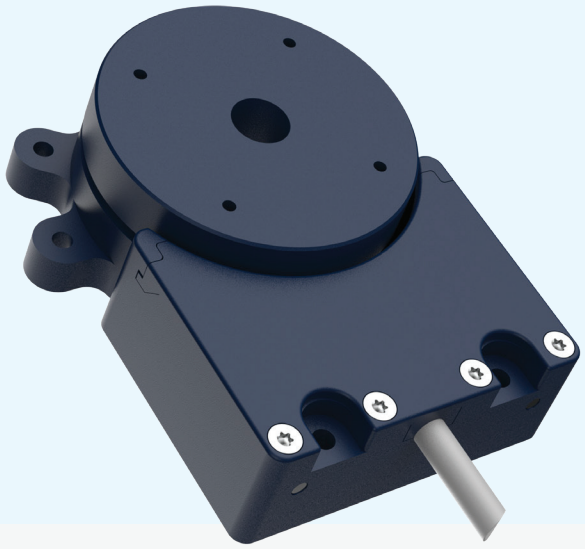
PMC
PIEZO
MOTOR COMPANY

Rotary Piezomotor ROMO-LG Series

Piezo Motor Company's novel series of rotary piezoelectric motors represent a quantum leap in the design and construction of compact, high-precision performance rotary motor technologies. Manufactured from modern lightweight, reinforced thermoplastics, this new range of rotary motors combine superior angular precision and ultrafast response.



Performance and Benefits of ROMO-LG Series Rotary Motors

1,000 TIMES GREATER PRECISION

While most stepper motors have a maximum of 400 steps per revolution, a Piezo Motor Company rotary piezo motor has ~625,000 steps in a single rotation with each at full torque, stepping in <10 µrad increments.

FORM FACTOR

Our piezo resonator design allows for a low profile Z-height for our rotary motors.

FAST RESPONSE

Within 30 µs to 50 µs, the piezo motor has made its first step and motion has commenced, compared to a stepper motor with a typical 15 to 20 ms to start motion.

ZERO POWER TO HOLD

Piezo Motor Company's rotary motors consume zero power at holding torque and very low power at slow speed (0.1 W at 1 RPM); yielding the possibility of very efficient overall duty.

SPECIAL PROPERTIES

Piezo Motor Company motors are immune to EMI and RF interference and have no emissions, making them ideal for a range of sensitive applications. For specialized applications (including MRI) please contact our technical team.

LIGHTWEIGHT

Piezo Motor Company motors contain no copper windings, magnets, or ferrous laminations making them ideally suited to weight-critical applications. Our motor housings are lightweight, reinforced thermoplastic, and they will operate at ultrasonic frequencies, making them virtually silent.

RELIABLE

Our reduced part count means fewer failures. With no bi-material joints to delaminate or multilayer stack joints to crack, there is no susceptibility to moisture or shorting.

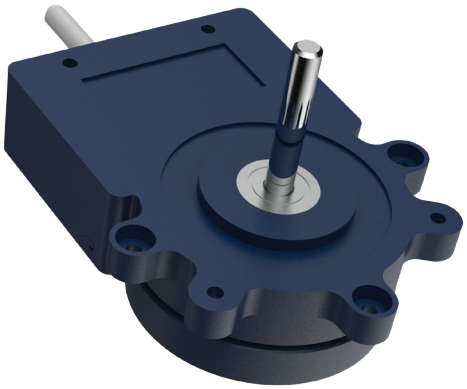
ROMO-LG Series Motor Specifications

	Standard	Encoder	
Mode of Operation	**Stepping & Continuous**	**Stepping & Continuous**	
Encoder Type	**N/A**	**Optical**	
Maximum Torque	**>30 mN.M**	**>30 mN.M**	
Self-Braking Torque	**>40 mN.M**	**>40 mN.M**	
Response Time	**30-50 µsec**	**30-50 µsec**	
Maximum Speed	**>100 rpm**	**>100 rpm**	
Minimum Angular Step	**<10 µrad**	**<10 µrad**	
Min. Controlled Angular Step	**N/A**	**196 µrad**	
Uni-Directional Repeatability	**N/A**	**+/- 1 arc-min**	
Dynamic Range	**4 kHz**	**4 kHz**	
Angular Hysteresis of Rotational Axis at Direction	**<10 µrad**	**<10 µrad**	
Supply Voltage for Driver	**12 VDC**	**12 VDC**	
Max Current Over Velocity Range	**350 mA**	**350 mA**	Note 1
Operating Temperature	**-20 to 80 °C**	**-20 to 80 °C**	
Motor Weight	**69 g**	**85.5 g**	Note 2
Motor Dimensions	**66x52x20 mm**	**66x52x31 mm**	
Driver PCB Dimensions	**48x63x15 mm**	**48x63x15 mm**	
Control	**PWM**	**PWM and/or Closed Loop**	

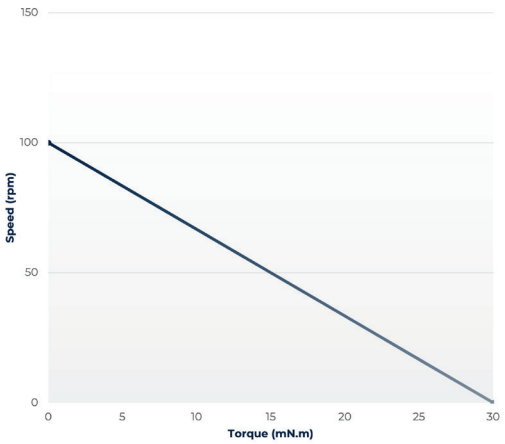
Note 1: Maximum current in continous mode. Use of PWM with different duty cycle will proportionally reduce average current.

Note 2: Weight for solid shaft: Standard: **(85.5 g)** Encoder: **(93.6 g)**

ROMO-LG Series



ROMO-LG Series Rotary Motor Solid Shaft



Speed-Force Curve for ROMO-LG Series Rotary Motor

UNIQUE PROPERTIES

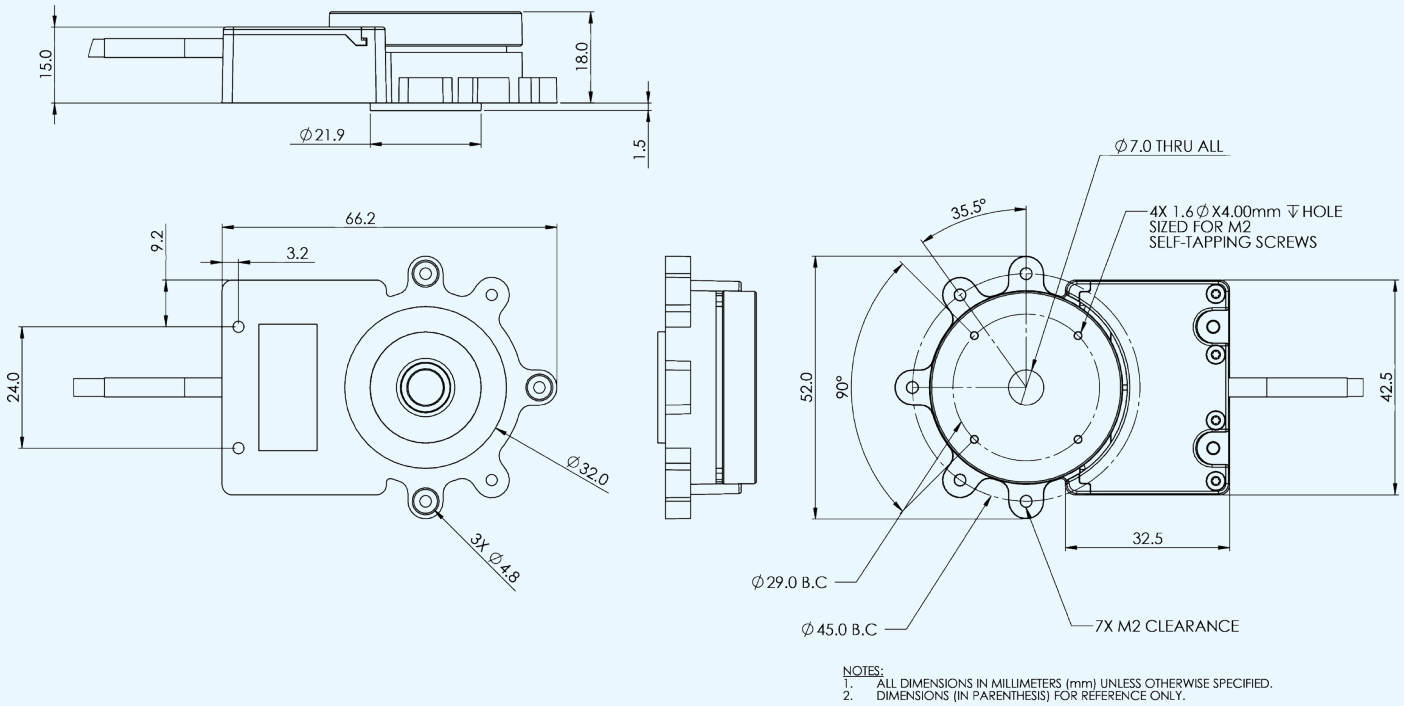
- Lightweight
- Low voltage
- 625,000 steps per rotation
- Superior precision and resolution
- Direct drive with range of torques
- Six orders of magnitude speed dynamic range
- Yields high resolution without sacrificing the torque output
- Designed for direct drive applications
- 100 rpm max speed
- Silent operation in continuous mode
- Ultra-Fast response time with superior start-stop characteristics
- High torque for size
- Energy efficient, zero power consumption in hold mode
- Stepping and Continuous mode of operation

Principle of operation

Piezo Motor Company's rotary piezo motors work on a principle of excitation of ultrasonic standing waves within a piezoelectric resonator. Piezo Motor Company's electronic drivers have been designed to provide an economical user-control interface. Each driver PCB is pre-programmed for the specific motor model and is software configurable to provide optimization of drive signals and integrated controls. Closed-loop control of the motor is achieved via an encoder mounted on the motor.

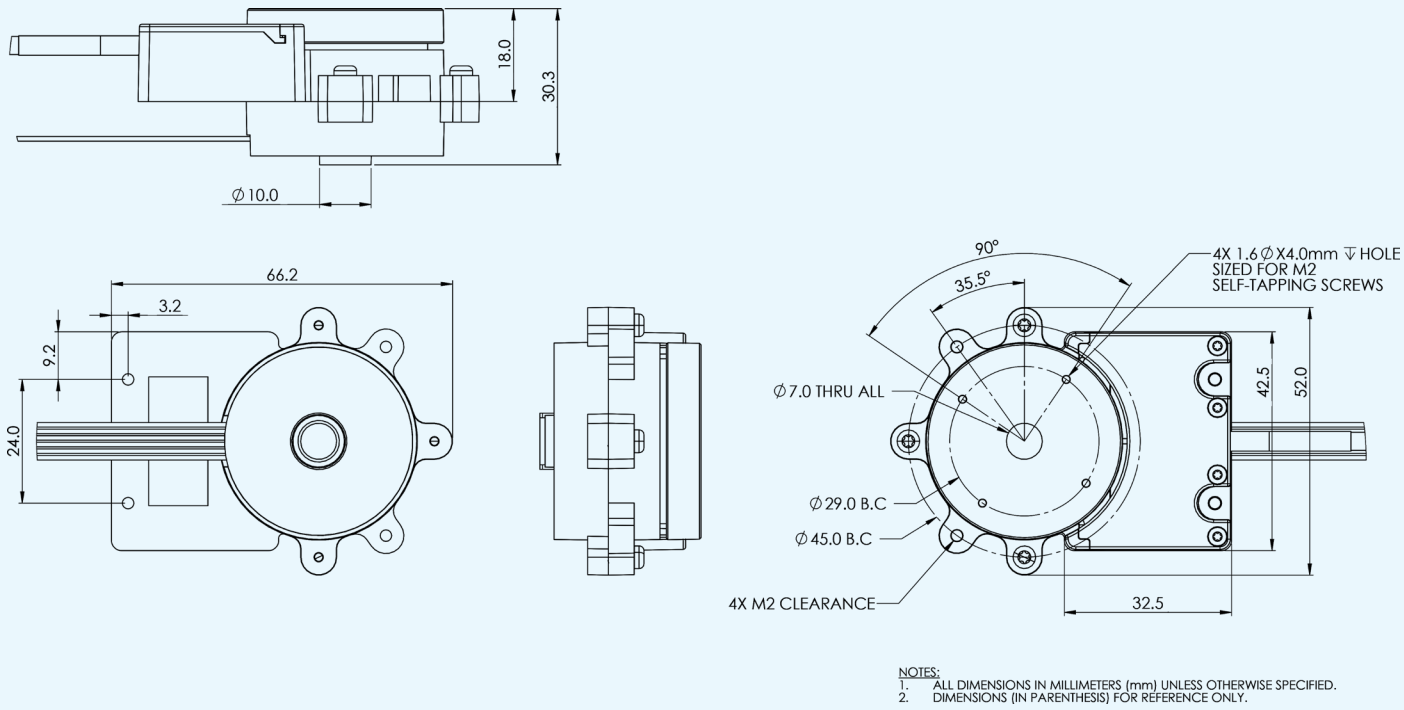
ROMO-LG Series Hollow Shaft dimensional drawings

STANDARD MODEL



NOTES:
1. ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS (IN PARENTHESIS) FOR REFERENCE ONLY.

ENCODER MODEL



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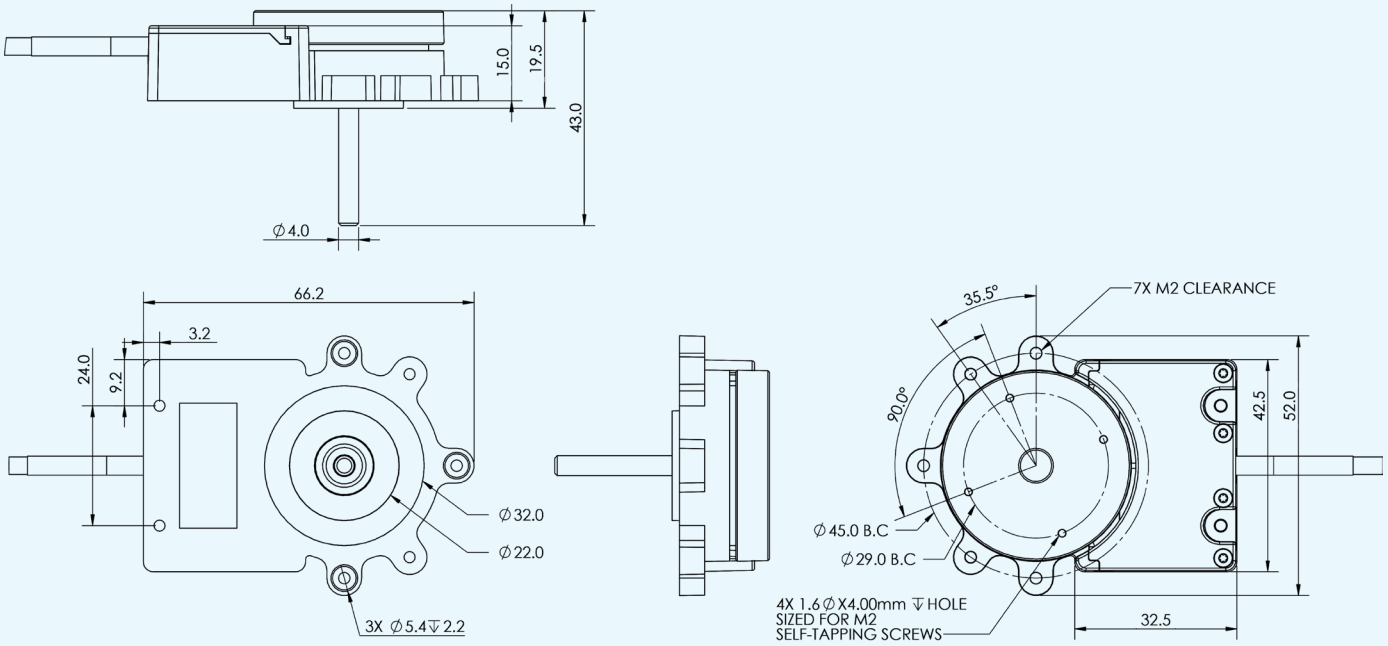
ROMO-LG Series Solid Shaft dimensional drawings

STANDARD MODEL



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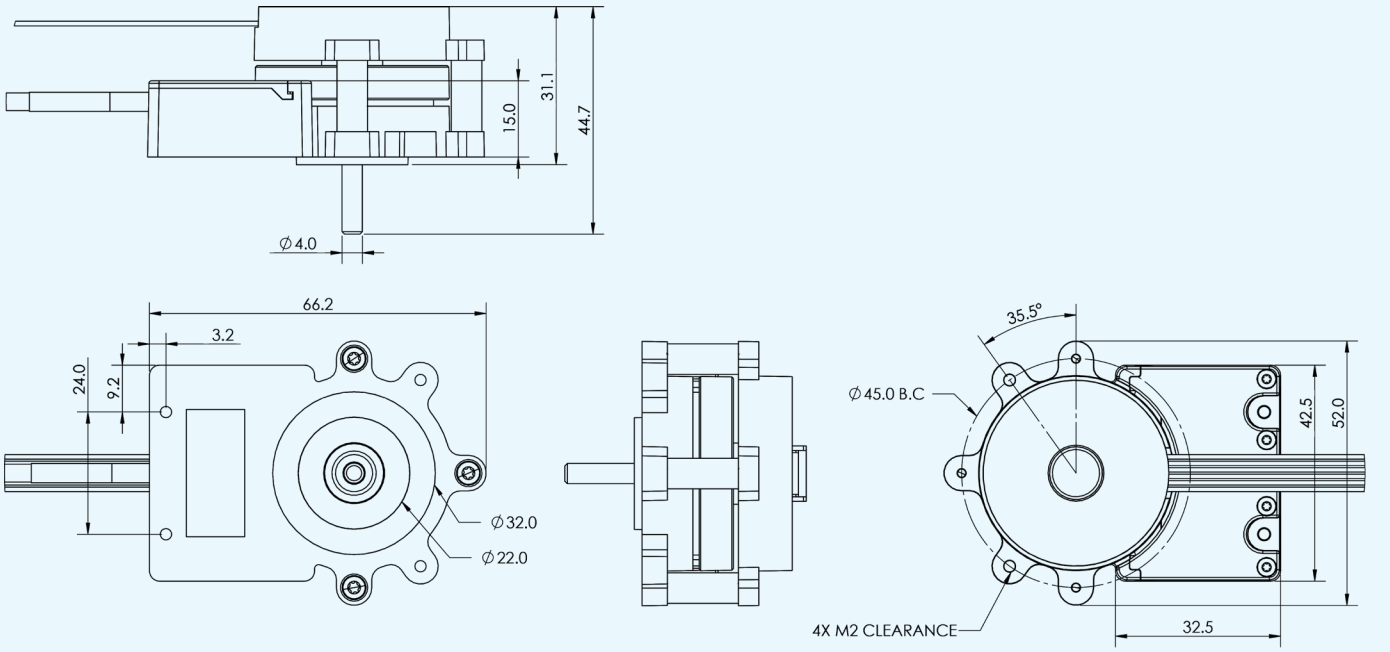

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Motor control

The control of the ROMO-LG Series Rotary Motor is straightforward, each motor requires a driver board. This board will convert desired motion input instructions to the necessary electrical processes using specific frequency and amplitude values. This creates excitation of the piezo resonator and makes the motor perform the desired motion. For motors with an encoder, a daughter board is attached to the driver board to provide both closed-loop feedback as well as serial interfacing for external programming capabilities via Piezo Motor Company's software or serial commands.

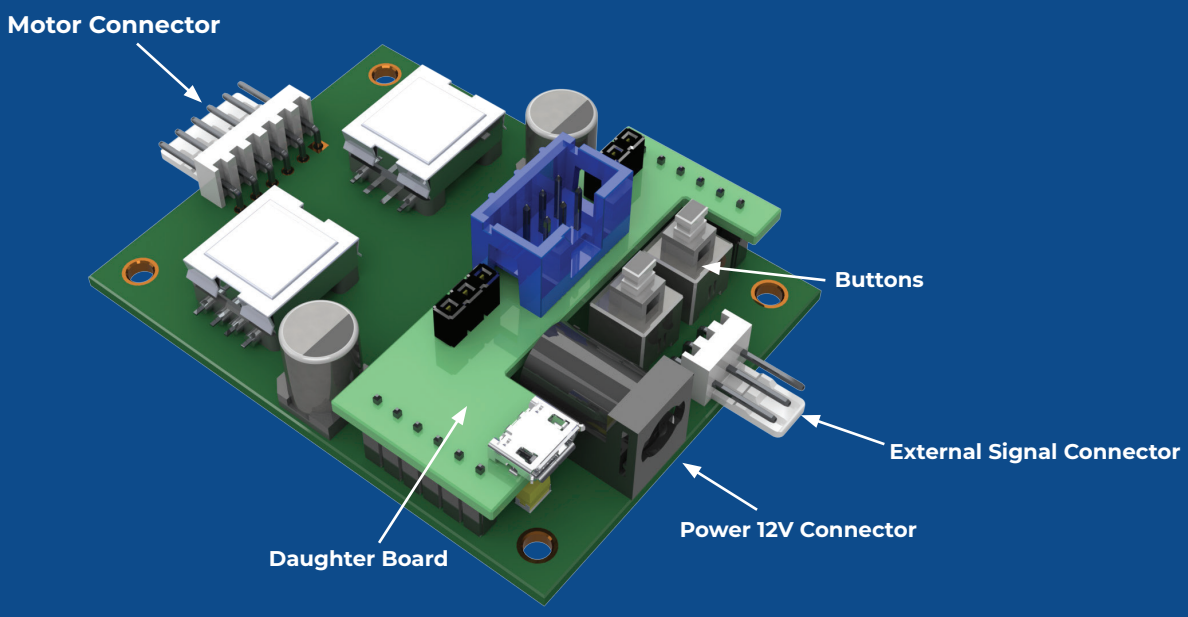
OPEN LOOP

The driver board can be controlled using an external signal source PWM (Pulse Width Modulation) mode. Control signals are applied to the External Signal Connector to generate the desired rotation and speed. Control of speed using PWM is implemented by varying the pulse duration and repetition rate of input signals onto the two directional control pins. Size of step is determined by the pulse duration, and speed is determined by pulse rate. The minimum pulse duration is approximately 30 µs.

CLOSED-LOOP

Pre-programmed motion control algorithms enable the implementation of several commands for specific motion control. The key commands are for defining the speed and the movement to a defined position. These commands are resident within a library which can be accessed using either Piezo Motor Company's control software or via the serial port using TTL serial commands. Motor Control can also be implemented with Python commands using Piezo Motor Company's Motor API.

Electronic PCB Driver for **ROMO-LG Series Piezo Motors**



ELECTRONIC DRIVERS

ROLR-LG-PCB Electronic PCB Driver - Open Loop board only

ROLR-LG-CL-PCB Electronic PCB Driver - Closed Loop board only

Control architecture & options

Piezo Motor Company motors are available as a basic motor or with a fitted encoder. Piezo Motor Company electronic drivers are available as open-loop or closed-loop drivers which are fitted with an encoder daughter board. Motors can be simply controlled in open-loop mode with several options for achieving closed-loop motion control. To learn more, visit https://piezomotors.com/products/

	Open-Loop Driver	Closed-Loop Driver with Encoder board
Base Motor	Open-Loop Control or third party controller command motor with PWM control and close control loop with external sensor	
Motor with Encoder	Open-Loop Control or third party controller command motor with PWM control and close control loop Piezo Motor Company Encoder output	Motor Control with: Piezo Motor Company's Control Software on Windows OS device or Piezo Motor Company Python API on third party controller or TTL Serial Port Commands

DRIVER BOARDS ROMO-LG & LRMO-LG SERIES

Model	ROLR-LG-PCB	ROLR-LG-PCB
Part Number	ROLR-LG-PCB (Standard)	ROLR-LG-CL-PCB (Encoder)
Description	Standard 12 VDC Driver board for ROMO-LG and LRMO-LG	Close-Loop Driver PCB 12 VDC for use with ROMO-E-LG and LRMO-E-LG

Performance Chart and **Motor/Driver Part Configurations**

Motor Type	HOLLOW SHAFT	HOLLOW SHAFT	SOLID SHAFT	SOLID SHAFT
Model	ROMO-HS-LG	ROMO-HS-E-LG	ROMO-SS-LG	ROMO-SS-E-LG
Part Number	ROMO-011-0380	ROMO-011-1380	ROMO-011-0390	ROMO-011-1390
Encoder	without encoder	with Optical Encoder	without encoder	with Optical Encoder
Rotor/Shaft	Metal Rotor	Metal Rotor	Metal Rotor/shaft	Metal Rotor/shaft
Enclosure	Plastic Enclosure	Plastic Enclosure	Plastic Enclosure	Plastic Enclosure
Torque (mN.m)	>30.0	>30.0	>30.0	>30.0
Resolution	> 600,000 steps per rotation	> 600,000 steps per rotation	> 600,000 steps per rotation	> 600,000 steps per rotation
Max speed	>100 RPM	>100 RPM	>100 RPM	>100 RPM
Supply	12 V DC	12 V DC	12 V DC	12 V DC
Kit Ordering Number	ROMO-HS-LG-KIT	ROMO-HS-E-LG-KIT	ROMO-SS-LG-KIT	ROMO-SS-E-LG-KIT
Part	ROMO-011-0381	ROMO-011-1381	ROMO-011-0391	ROMO-011-1391
Supply	110/240 VAC to 12 V DC power adapter, cables	110/240 VAC to 12 V DC power adapter, cables	110/240 VAC to 12 V DC power adapter, cables	110/240 V AC to 12 V DC power adapter, cables
Includes	Hollow-Shaft Motor without encoder	Hollow-Shaft Motor with optical encoder	Solid-Shaft Motor without encoder	Solid-Shaft Motor with Encoder

For custom inquires, contact us at info@piezomotorco.com

About Piezo Motor Company LLC

Founded in 2024, Piezo Motor Company is at the forefront of innovation in the design and manufacturing of piezoelectric motors. Headquartered in the USA, we have a global reach through a network of international distributors, delivering cutting-edge technology to clients worldwide.

Our team comprises highly skilled experts with extensive experience in piezoelectric motor and actuator design and physics. We are passionate about harnessing the unique properties of piezoelectric materials to create motors that offer unmatched precision, efficiency, and reliability. Our solutions are tailored to meet the diverse needs of industries ranging from medical devices to aerospace and robotics.

We pride ourselves on our commitment to excellence and innovation, continuously pushing the boundaries of what piezoelectric technology can achieve. Our dedication to research and development ensures that we remain leaders in this dynamic field, providing our clients with the most advanced and effective solutions available. Join us on our journey as we revolutionize the world of motion control with piezoelectric technology.

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