PMC
PIEZO
MOTOR COMPANY

www.piezomotors.com

ROMO-LG Series

Piezoelectric Rotary Motors

Innovation In The Design And
Manufacturing Of Piezoelectric Motors

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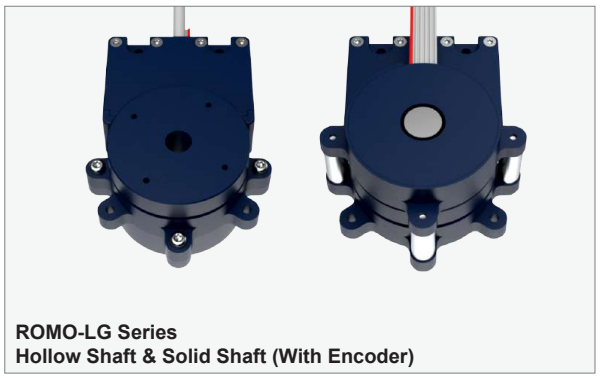
ROMO-LG Series

Piezoelectric Rotary Motors

INTRODUCTION

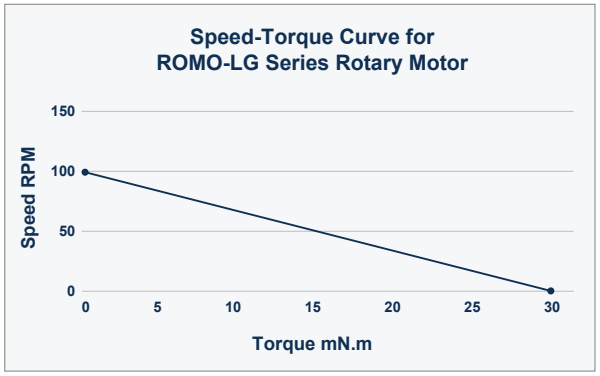
Piezo Motor Company's novel series of rotary piezoelectric motors represent a quantum leap in the design and construction of compact, high-precision performance rotary motor technologies. Manufactured from modern lightweight, reinforced thermoplastics, this new range of rotary motors combine superior angular precision and ultrafast response 30 µs to 50 µs with ~625,000 steps in a single rotation with each at full torque, stepping in <10 µrad increments.



ROMO-LG Series
Hollow Shaft & Solid Shaft (With Encoder)

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.

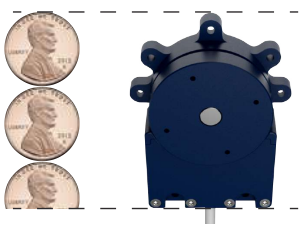


PERFORMANCE & BENEFITS

- ≥30 mNm stall torque for high-load direct drive.
- Stable velocity control across temperature and load changes.
- High precision: 10 µrad steps (>600k steps/rev).
- Fast response and start-stop (~30 µs).
- Supports stepping and continuous modes.
- Available in hollow-shaft (HS) and solid-shaft (SS) versions.

KEY FEATURES

- Hollow-shaft or solid-shaft design
- Ultra-fast response (~30 µs)
- High torque relative to size: ≥30 mNm
- Silent operation
- Stepping and continuous modes
- Low voltage operation: 12.0 V DC



ROMO-HS-LG

Open-Loop Rotary Piezo Motor - Hollow Shaft

Plastic Enclosure | Hollow Shaft | No Encoder

ROMO-HS-LG (Front)
Hollow Shaft, Without Encoder

ROMO-HS-LG (Rear)
Hollow Shaft, Without Encoder

INTRODUCTION

PMC's Hollow-shaft rotary piezoelectric actuator, open-loop PWM control. Available in plastic (ROMO-HS-LG) enclosure with metal rotor. The hollow shaft enables routing of wires, fibres, or light directly through the rotor axis.

MOTOR SPECIFICATIONS	
Power Supply Voltage	12.0 V DC
Stall Torque	≥ 30 mNm
Self-Braking Torque	≥ 40 mNm
Actuator Response Time	< 30 µs
Max Speed	> 100 rpm
Minimum Angular Step	10 µrad
Angular Backlash	<10 µrad
Angular Hysteresis	<10 µrad
Frequency Response	4 KHz
Operating Temperature	-20 °C to 80 °C
Maximum Axial Load	1000g
Maximum Radial Load	1000g
Moment Inertia	82 g.mm²
Current over velocity range	30 mA to 350 mA
Motor Runout	≤50 µm
DIMENSIONS & WEIGHT	
Actuator Dimensions	66 × 52 × 20 mm
Actuator Weight	69 g
Driver PCB Dimensions	48 x 63 x 15 mm
Driver PCB Weight	25g

ORDERING INFORMATION

Model	Enclosure	Shaft	Encoder	Part Number	Kit Number*
ROMO-HS-LG	Plastic	Hollow	No	ROMO-P011-0480-1000	ROMO-P011-0481-1000

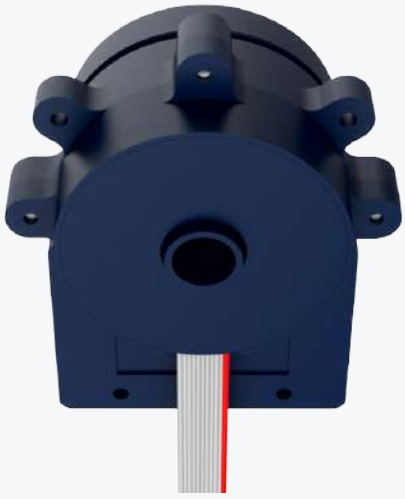
***Evaluation kit includes motor, Open-Loop Driver PCB, 110/240 VAC to 12 V DC power adapter, cables.**

ROMO-HS-E-LG

Close-Loop Rotary Piezo Motor - Hollow Shaft

Plastic Enclosure | Hollow Shaft | With Encoder

ROMO-HS-E-LG (Front)
Hollow Shaft, With Encoder



ROMO-HS-E-LG (Rear)
Hollow Shaft, With Encoder

INTRODUCTION

Identical to ROMO-LG base motor with factory-fitted optical encoder. Encoder signal output enables closed-loop control via your controller.

MOTOR SPECIFICATIONS	
Power Supply Voltage	12.0 V DC
Stall Torque	≥ 30 mNm
Self-Braking Torque	≥ 40 mNm
Actuator Response Time	< 30 µs
Max Speed	> 100 rpm
Minimum Angular Step	10 µrad
Encoder Resolution (after quadrature)	196 µrad
Minimum Controlled Angular Step	196 µrad
Uni-directional Repeatability	196 µrad
Angular Backlash	<10 µrad
Angular Hysteresis	<10 µrad
Frequency Response	4 KHz
Operating Temperature	-20 °C to 80 °C
Maximum Axial Load	1000g
Maximum Radial Load	1000g
Moment Inertia	82 g.mm²
Current over velocity range	30 mA to 350 mA
Motor Runout	≤50 µm
DIMENSIONS & WEIGHT	
Actuator Dimensions	66 × 52 × 31 mm
Actuator Weight	76 g
Driver PCB Dimensions	48 x 63 x 25 mm
Driver PCB Weight	25g

ORDERING INFORMATION

Model	Enclosure	Shaft	Encoder	Part Number	Kit Number*
ROMO-HS-E-LG	Plastic	Hollow	Yes	ROMO-P011-1480-1000	ROMO-P011-1481-1000

***Evaluation kit includes motor, Close-Loop Driver PCB, 110/240 VAC to 12 V DC power adapter, cables.**

ROMO-SS-LG

Open-Loop Rotary Piezo Motor - Solid Shaft

Plastic Enclosure | Solid Shaft | Without Encoder

ROMO-SS-LG (Front)
Solid Shaft, Without Encoder

ROMO-SS-LG (Rear)
Solid Shaft, Without Encoder

INTRODUCTION

PMC's solid-shaft rotary piezoelectric actuator, open-loop PWM control. Available in plastic (ROMO-SS-LG) enclosure with metal rotor and shaft. The solid shaft provides a robust mechanical interface for direct-drive coupling to loads.

MOTOR SPECIFICATIONS	
Power Supply Voltage	12.0 V DC
Stall Torque	≥ 30 mNm
Self-Braking Torque	≥ 40 mNm
Actuator Response Time	< 30 µs
Max Speed	> 100 rpm
Minimum Angular Step	10 µrad
Angular Backlash	10 µrad
Angular Hysteresis	10 µrad
Frequency Response	4 KHz
Operating Temperature	-20 °C to 80 °C
Maximum Axial Load	1000g
Maximum Radial Load	1000g
Moment Inertia (with metal rotor)	82 g.mm²
Current over velocity range	30 mA to 350 mA
Motor Runout (with metal rotor)	≤50 µm
DIMENSIONS & WEIGHT	
Actuator Dimensions	66 × 52 × 20 mm
Actuator Weight	86 g
Driver PCB Dimensions	48 x 63 x 15 mm
Driver PCB Weight	25g

ORDERING INFORMATION

Model	Enclosure	Shaft	Encoder	Part Number	Kit Number*
ROMO-SS-LG	Plastic	Solid	No	ROMO-P011-0470-1001	ROMO-P011-0471-1001

***Evaluation kit includes motor, Open-Loop driver PCB, 110/240 VAC to 12 V DC power adapter, cables.**

ROMO-SS-E-LG

Close-Loop Rotary Piezo Motor - Solid Shaft

Plastic Enclosure | Solid Shaft | With Encoder

ROMO-SS-E-LG (Front)
Solid Shaft, With Encoder

ROMO-SS-E-LG (Rear)
Solid Shaft, With Encoder

INTRODUCTION

PMC's solid-shaft rotary piezoelectric actuator, open-loop PWM control. Available in plastic (ROMO-SS-LG) enclosure with metal rotor and shaft. The solid shaft provides a robust mechanical interface for direct-drive coupling to loads.

MOTOR SPECIFICATIONS	
Power Supply Voltage	12.0 V DC
Stall Torque	≥ 30 mNm
Self-Braking Torque	≥ 40 mNm
Actuator Response Time	< 30 µs
Max Speed	> 100 rpm
Minimum Angular Step	10 µrad
Angular Backlash	10 µrad
Angular Hysteresis	10 µrad
Frequency Response	4 KHz
Operating Temperature	-20 °C to 80 °C
Maximum Axial Load	1000g
Maximum Radial Load	1000g
Moment Inertia (with metal rotor)	82 g.mm²
Current over velocity range	30 mA to 350 mA
Motor Runout (with metal rotor)	≤50 µm
DIMENSIONS & WEIGHT	
Actuator Dimensions	66 × 52 × 31 mm
Actuator Weight	94 g
Driver PCB Dimensions	48 x 63 x 25 mm
Driver PCB Weight	25g

ORDERING INFORMATION

Model	Enclosure	Shaft	Encoder	Part Number	Kit Number*
ROMO-SS-E-LG	Plastic	Solid	Yes	ROMO-P011-1470-1001	ROMO-P011-1471-1001

***Evaluation kit includes motor, Close-Loop driver PCB, 110/240 VAC to 12 V DC power adapter, cables.**

ROMO-LG Motion Control

and Driver Electronics

PLC | Serial | Open-loop & Closed-loop

INTRODUCTION

Control of the ROMO-LG Series Rotary Motor is simple and flexible. Each motor is operated via a dedicated driver PCB, which converts motion commands into precise electrical excitation using optimized frequency and amplitude signals to actuate the piezo resonator.

The driver supports multiple control interfaces, including PWM & serial, enabling seamless integration into a wide range of systems. Each PCB is pre-configured for the specific motor model, with additional software configurability to optimize performance and system integration.

A companion daughter board provides closed-loop feedback and serial communication, enabling accurate position control via Piezo Motor Company's software or external controllers.

The ROMO-LG driver architecture offers a compact, cost-effective control solution, while enabling fine motion regulation through closed-loop operation when required.

ROMO-LG OPEN LOOP DRIVER PCB OPTIONS

Standard Open Loop Driver PCB
Part No.: ROLR-PPCB-0470-0000

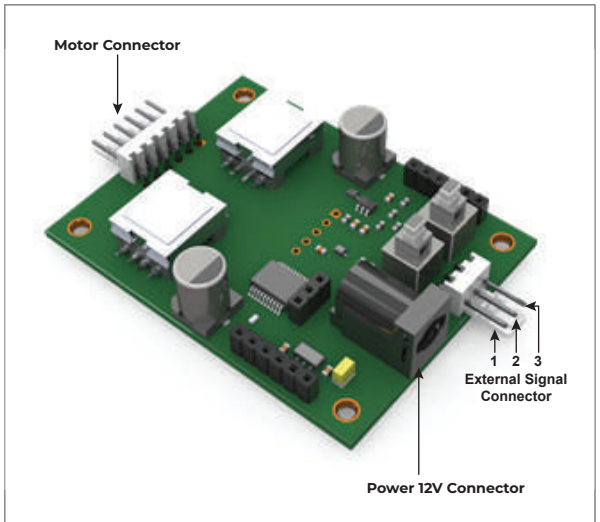
The driver board can be controlled using an external signal source PWM (Pulse Width Modulation) mode. Control signals are applied to the External Signal Connector to generate the desired rotation and speed. Control of speed using PWM is implemented by varying the pulse duration and repetition rate of 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 30µs.

The ROMO driver PCB is compatible with both ROMO-LG (non-encoder) and ROMO-LG-E (encoder-equipped) motors. For applications requiring closed-loop control with the Open-Loop driver, the control loop must be implemented externally by the user using encoder feedback and a third-party controller.

Control Interface	
PWM (TTL-compatible)	via J1 connector

Additional Features:

- Manual control via two onboard push-buttons.
- Compact, low-overhead solution for cost-sensitive for open-loop applications using a single motor.



Electronic PCB Driver for ROMO-LG Piezomotors

ROMO-LG-E Motion Control

and Driver Electronics

PLC | Serial | Open-loop & Closed-loop

ROMO-LG-E CLOSED LOOP DRIVER PCB OPTIONS

Standard Closed Loop Driver PCB
Part No.: ROLR-PPCB-1480-0000

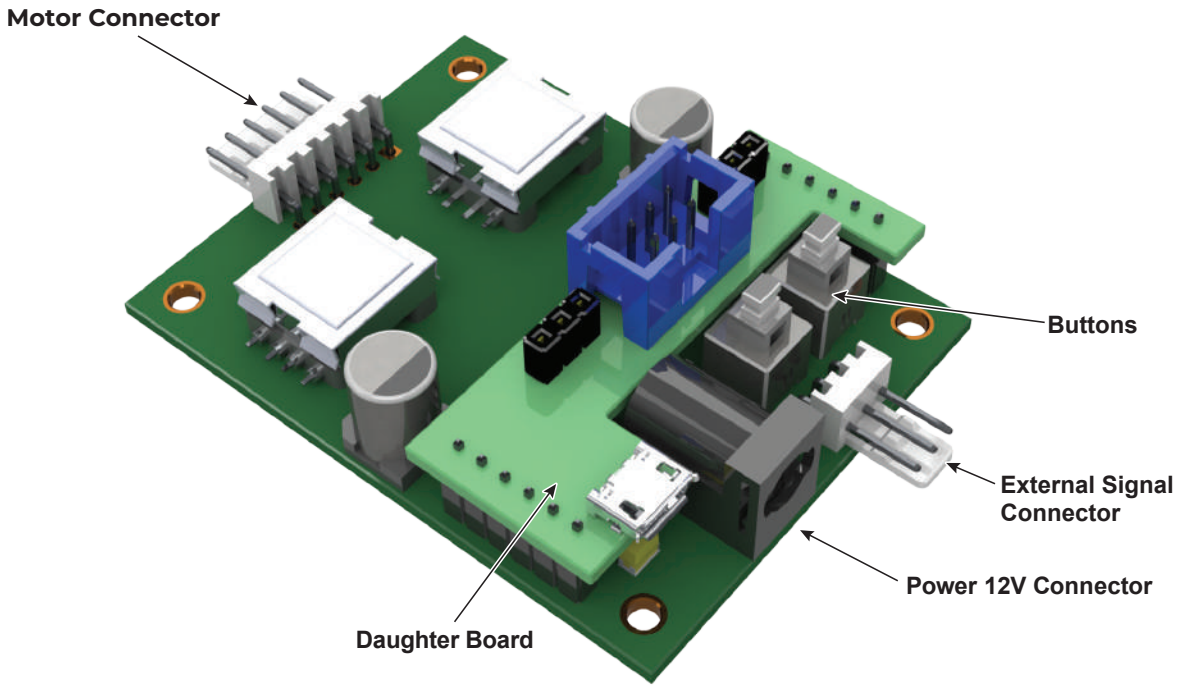
In closed-loop control (feedback control) mode, an additional daughter PCB is mounted on driver PCB. Feedback from an external optical encoder, mounted on the piezo motor, is fed to the daughter board and used to close the loop. The position and speed of the motor can then be controlled through an elaborate set of commands via either a USB port (through Piezo Motor Company (PMC)'s GUI) or serial (RS 232) port commands.

The Close loop driver PCB is compatible with ROMO-LG-E (encoder-equipped) motors only and is designed for use with PMC's close loop software, enabling simple integration and high-precision motion control.

Control Interfaces	
PMC's PLC Software (Windows)	
RS 232	Serial commands

Additional Features:

- Manual control via two onboard push-buttons.
- Compact, low-overhead solution for cost-sensitive for open-loop applications using a single motor.



Performance Chart
and Ordering Information

Motor/Driver Part Configurations — All Variants

PART NUMBERING

ROMO	—	Material	—	Encoder	Driver	Firmware	Kit	—	Customisation
ROMO	—	P011	—	1	4	7	1	—	1001
ROMO		P011 = Plastic		0 = without 1 = with	4 = 12V	7 = Open Loop 8 = Close Loop	0 = Motor Only 1 = Eval Kit		0 = Hollow Shaft 1 = Solid Shaft

ROMO-P011-1471-1001: ROMO Series, Plastic, with Encoder, 12V Driver, Open Loop Firmware, Evaluation Kit, Solid Shaft

MOTOR CONFIGURATIONS

Model	Shaft	Encoder	Torque	Min Step	Max Speed	Power Supply	Part Number	Kit Available
ROMO-HS-LG	Hollow	Without	≥ 30 mNm	10 µrad	> 100 RPM	12 V DC	ROMO-P011-0480-1000	✓
ROMO-HS-E-LG	Hollow	With	≥ 30 mNm	10 µrad	> 100 RPM	12 V DC	ROMO-P011-1480-1000	✓
ROMO-SS-LG	Solid	Without	≥ 30 mNm	10 µrad	> 100 RPM	12 V DC	ROMO-P011-0470-1001	✓
ROMO-SS-E-LG	Solid	With	≥ 30 mNm	10 µrad	> 100 RPM	12 V DC	ROMO-P011-1470-1001	✓

PART NUMBERS & EVALUATION KIT DETAILS

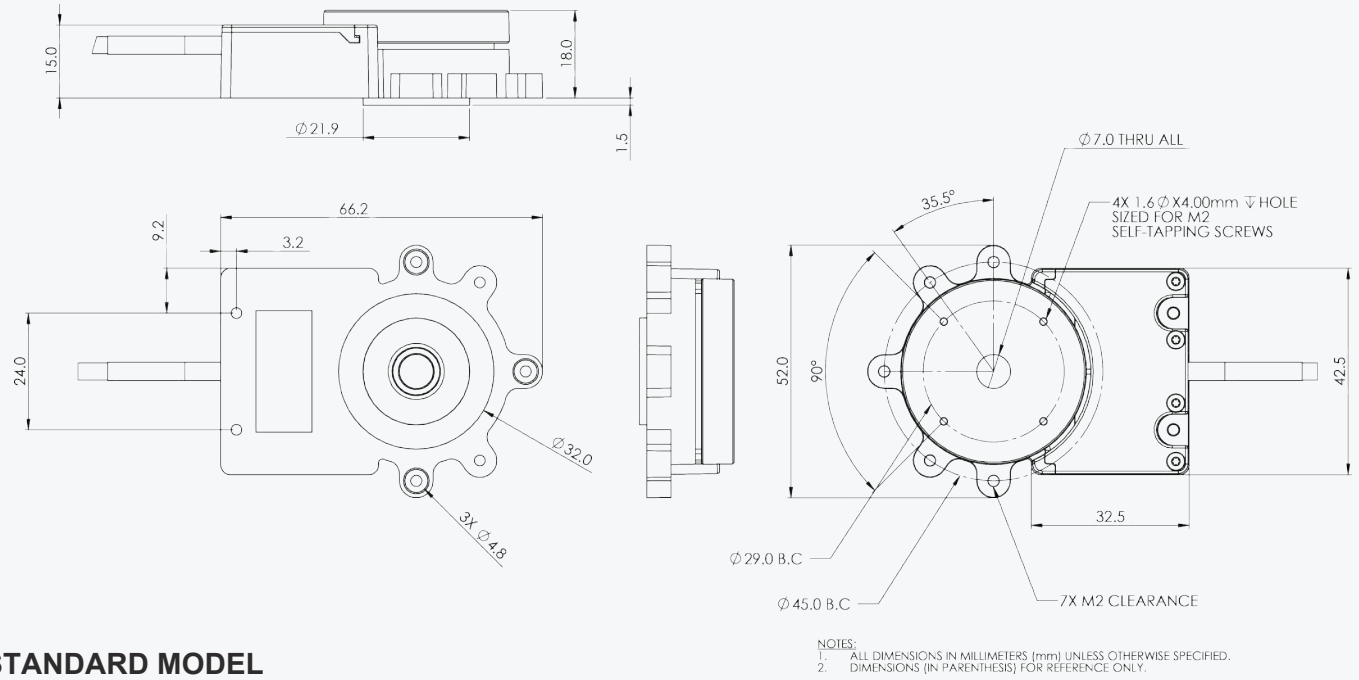
Model	Part Number	Kit Number	Evaluation Kit Description
ROMO-HS-LG	ROMO-P011-0480-1000	ROMO-P011-0481-1000	Includes Hollow-Shaft Motor without encoder, Electronic Driver PCB, Metal Rotor, Plastic Enclosure 110/240 VAC to 12 V DC Power Adapter, Cables.
ROMO-HS-E-LG	ROMO-P011-1480-1000	ROMO-P011-1481-1000	Includes Hollow-Shaft Motor with encoder, Electronic Driver PCB, Metal Rotor, Plastic Enclosure 110/240 VAC to 12 V DC Power Adapter, Cables.
ROMO-SS-LG	ROMO-P011-0470-1001	ROMO-P011-0471-1001	Includes Solid-Shaft Motor without encoder, Electronic Driver PCB, Metal Rotor, Plastic Enclosure 110/240 VAC to 12 V DC Power Adapter, Cables.
ROMO-SS-E-LG	ROMO-P011-1470-1001	ROMO-P011-1471-1001	Includes Solid-Shaft Motor with encoder, Electronic Driver PCB, Metal Rotor, Plastic Enclosure 110/240 VAC to 12 V DC Power Adapter, Cables.

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

Mechanical Drawings

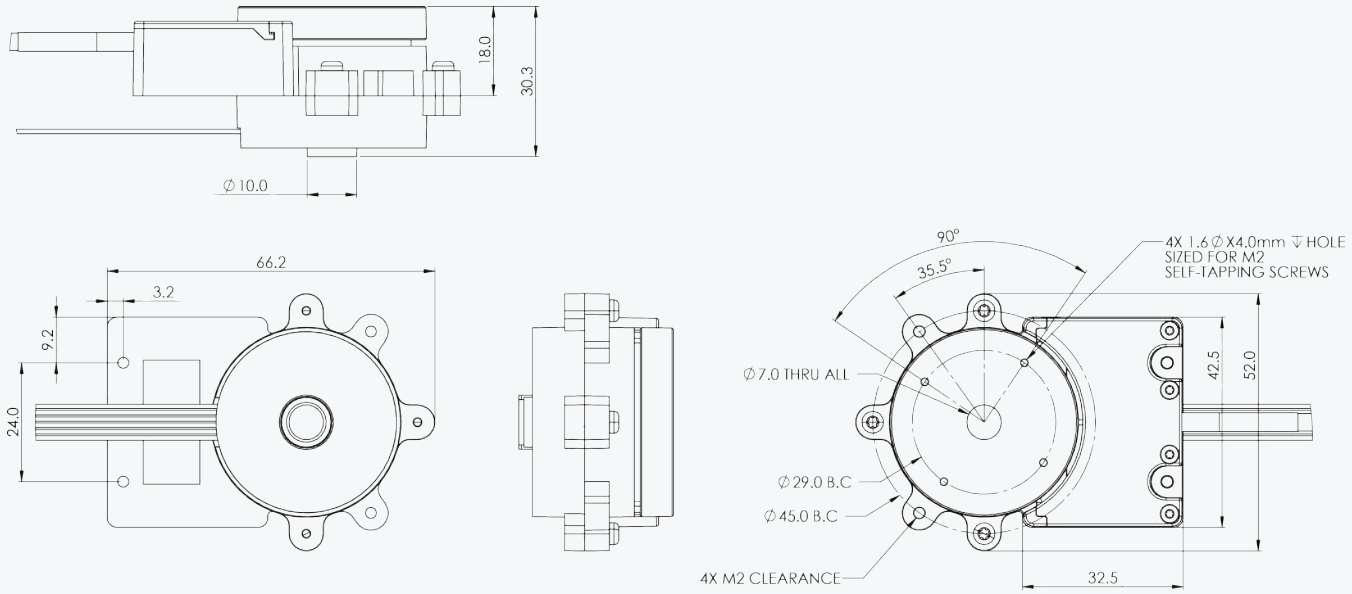
ROMO-LG Hollow Shaft Series

Standard and Encoder Models | All Dimensions in mm



STANDARD MODEL
HOLLOW SHAFT

Dimensions in mm



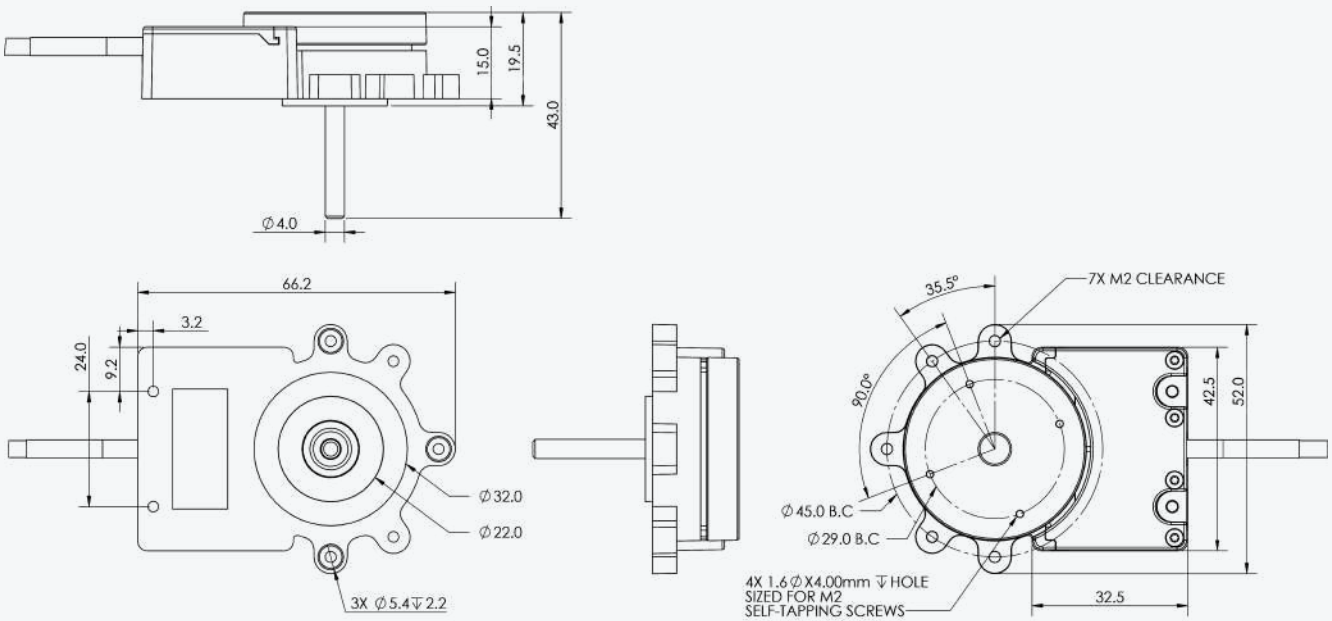
ENCODER MODEL
HOLLOW SHAFT

Dimensions in mm

Mechanical Drawings

ROMO-LG Solid Shaft Series

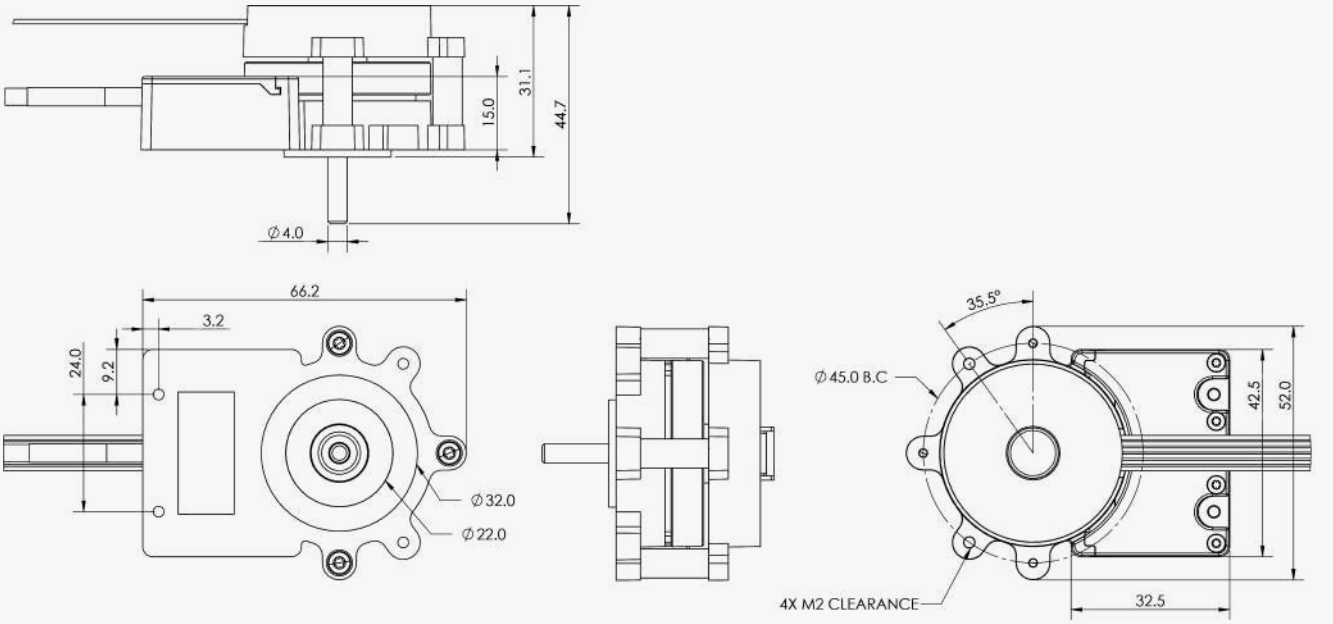
Standard and Encoder Models | All Dimensions in mm



STANDARD MODEL
SOLID SHAFT

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

Dimensions in mm



ENCODER MODEL
HOLLOW SHAFT

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

Dimensions in mm

Why Piezo Motors?

ROMO Series vs. Conventional Motor Technologies

TECHNOLOGY COMPARISON

Feature	ROMO-LG Series	DC Motor	Stepper Motor	Voice Coil
Zero holding power	✓ Zero current	— Continuous draw	— Current in hold	— Current in hold
Self-braking torque	✓ ≥30 mNm	— None	— Detent only	— None
Hollow shaft	✓ Yes	— Not standard	— Not standard	— N/A
Non-magnetic*	✓ Yes	— No	— No	✓ Yes
Sub-30 µs response	✓ ~30 µs	■ ~ms range	■ Step limited	✓ Fast
Size / torque ratio	✓ Excellent	■ Good	■ Moderate	— Low
Silent operation	✓ Yes	■ Brushless: yes	■ Acoustic noise	✓ Yes
Positional resolution	✓ 10 µrad	■ Encoder limited	■ Step limited	■ Sensor limited
Gearbox required	✓ No	■ Often yes	✓ No	✓ No
Voltage	✓ 12.0 V	■ Varies	■ Varies	■ Varies

***Contact PMC for details**

ABOUT PIEZO MOTOR COMPANY

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.

CONTACT US: Order an evaluation kit or contact our engineering team to discuss your application.
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Applications

The ROMO series is engineered for demanding OEM applications where precision, compactness, and energy efficiency are critical. The hollow shaft, zero holding-power consumption, and sub-30 µs response time open up design possibilities that are not achievable with conventional electromagnetic motors.

PHOTONICS & FIBER OPTICS
Polarisation control, variable attenuators, wave-length-selective switches.

MICROSCOPY & IMAGING
Objective turrets, polarisation rotators, confocal beam scanners.

MEDICAL & DIAGNOSTIC
OCT scanners, surgical robotics, drug delivery micro-pumps

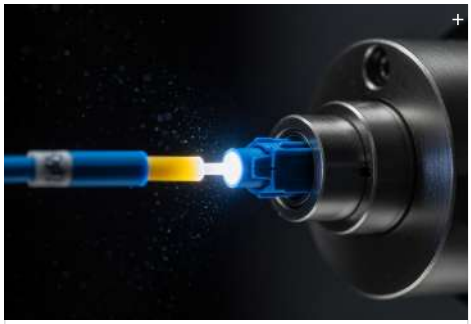
SCIENTIFIC INSTRUMENTATION
Cryogenic stages, vacuum-compatible mecha-nisms, spectroscopy platforms.

ROBOTICS & AUTOMATION
Pick-and-place, collaborative robot joints, gripper mechanisms.

AEROSPACE & DEFENCE
Antenna pointing, gimbal drives, electro-optical payloads.

OPTICAL FILTER WHEELS
Fast, silent filter changes in microscopy and spectroscopy.

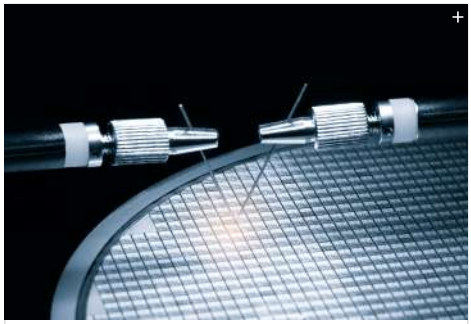
BEAM STEERING
Precision angular adjustment of optical paths and mirrors.



FIBRE ALIGNMENT
Sub-µrad alignment of fibre optic components.

MICRO ROBOTICS
Compact direct-drive joints and end-effectors.

MEDICAL DEVICES
Drug delivery, lab-on-chip, and surgical robotics.



SEMICONDUCTOR
Wafer handling and mask alignment systems.

+ = Stock Image