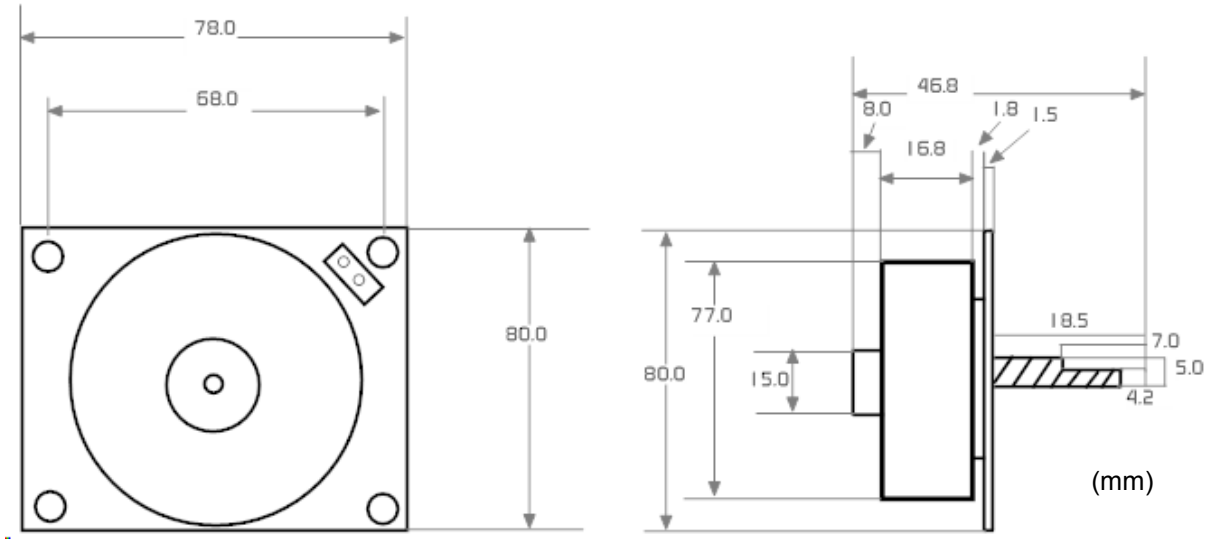
Piezomotor Model #UPM-46 Ø80mm

Technical Data Sheet

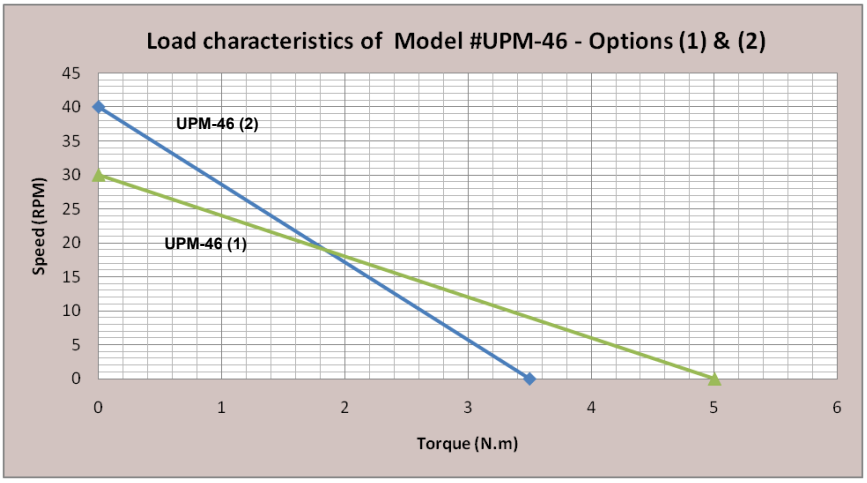
Motor Specifications	Option 1	Option 2	Voltage
Encoder*	None	Optional	
Mode of Operation	Continuous & Stepping mode	Continuous step & Stepping Mode	
Uni/Bi-Directional	Uni-Directional	Uni Directional	
Maximum torque (N.m.)	5	3.5	
Self-braking torque (N.m.)	5	3.5	
Maximum speed (rpm)	>30	>40	
Minimum Angular Step (arc-sec)	0.3 (1.5 µrads)	0.3 (1.5 µrads)	
Dynamic Range (kHz)	2	2	
Supply Voltage for Driver (V)			12 VDC
Operating Current (mA)	1,500-1,800	2,500 - 2,800	
Motor Weight (g)	250	250	
Dimension Motor (mm x mm)	Ø80x28 (w/o shaft)	Ø80x28 (w/o shaft)	
	Ø80x46 (w/ shaft)	Ø80x46 (w/ shaft)	
Electronic Driver Board (pcb)			
Driver Board Dimensions (mm x mm)	40 x 40	40 x 40	

*Contact DTI for encoder options

Dimensional Drawing



Performance



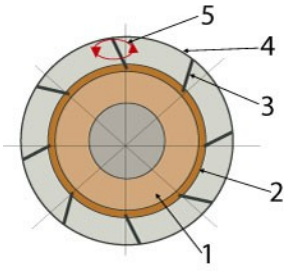
Key Benefits of Piezomotors vs. EM Motor

- **Performance**—(e.g. > 1000 X's resolution, >100 X's reaction time, >10 X's greater torque)
- **Special Characteristics**—(e.g. direct drive eliminates gear systems, backlash and hysteresis)
- **Scalable Design**—(custom designs from 11mm O.D. to 1m O.D.)[1]
- **Energy Efficiency**—(e.g. zero power consumption in hold position)
- **Environmental**—(manufactured using ceramic)
- **Simplified Power Requirements**—low voltage (e.g. <12 VDC) with analog/digital control
- **Low Temporal Drift**—self-decelerating torque locks drive with negligible angular drift (i.e. <1 arc-sec/hour)

[1]Contact DTI

Principles of Operation

DTI' s piezomotors work on the principal of excitation of ultrasonic standing wave(s) within a piezoelectric resonator. A schematic of one of DTI's ultrasonic motors with piezoelectric ring resonator (**1**) and stainless steel pushers (**3**) is shown in the figure. Pushers (**3**) are attached to the piezoresonator through a vibrational shell (**2**). An ultrasonic radial standing wave is excited in the resonator causing the ring to expand and contract in radial direction, stimulating movement of the pushers along the radius. Because of their elasticity, the pushers vibrate with the same frequency, although phase shifted, in a direction orthogonal to the radius of the ring. The superposition of the two orthogonal movements results in elliptical movements (**5**) of the pushers. Because the pushers are held pressed against the rotor (**4**), their movement, via friction at the pusher contact area, causes rotation of the rotor.

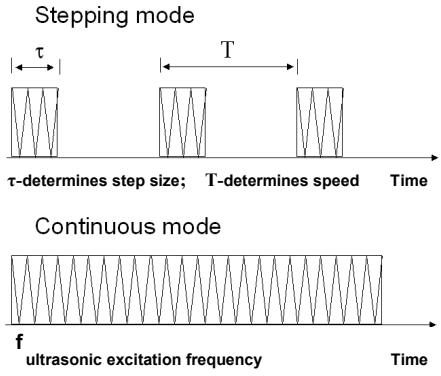


Encoder Configurations

Contact DTI for a wide range of encoder options and custom configurations.

Driver Electronics

Control of the piezomotor is straightforward using an external signal source applied through three pins located on the driver board (not shown). The driver board is supplied with the piezomotor. Control is achieved by a train of electrical pulses supplied by a digitally controlled AC voltage source directly to the piezoelement. Motor speed is altered by varying either the repetition rate of the pulses or duration of each individual pulse (i.e. PWM). Modulation of the excitation voltage source enables the piezomotor to rotate either continuously or in a precise stepping mode.




Model UPM-46

Ordering Information

DTI Part Number: B25-4150
UPM-46 EK Piezoelectric Motor—Evaluation kit: Rotary motor on a PCB board, driver board, manual control board, power supply and cables

Contact Information

DISCOVERY TECHNOLOGY INTERNATIONAL, LLLP
6578 Palmer Park Circle
Sarasota, FL 34238
Phone: 941-921-5111
Fax: 941-921-5114
Toll free: 877-725-3384
Email: info@discovtech.com
www.dti-piezotech.com

