



SQ-100 Series Motors

(incl. vacuum & non-magnetic options)
for research, test and manufacturing



FEATURES

- High resolution (20 nm)
- Long travel (to 50 mm)
- Fast, quiet and smooth
- Holds position with power off
- Replaces manual micrometer in commercial linear stages
- Vacuum-compatible models (10^{-7} Torr)
- Custom non-magnetic models available

APPLICATIONS

- Laser alignment
- Optical microscopy
- Scanning electron microscopy (SEM)
- Focused ion beam spectroscopy (FIB)
- Scanning ion mass spectroscopy (SIMS)
- High-energy particle accelerators, synchrotrons, and beamlines
- Medical instrumentation & drug discovery
- Wafer inspection and nanolithography

The SQ-100 Series SQUIGGLE motor is a patented piezoelectric motor for nanopositioning applications in research, testing and manufacturing.

This motor can directly replace the manual micrometer in many commercial linear stages. A light spring preload is required to hold a flat surface on the moving stage against the motor's lead screw. A knob on the motor allows for manual screw rotation and gross stage positioning.

New Scale offers standard and vacuum-compatible stages with light spring loads. We also offer an ultra-thin closed-loop stage with integral SQUIGGLE motor and encoder.

Vacuum-Compatible and Non-Magnetic Options

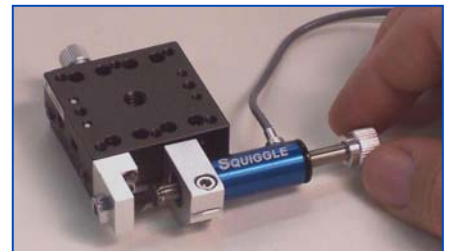
Vacuum-compatible SQUIGGLE motors operate to 10^{-7} Torr, automating in-vacuum alignment without mechanical feed-throughs. They provide high resolution with ultra-low outgassing and heating.

We also offer custom non-magnetic SQUIGGLE motors constructed entirely of non-ferrous materials. Because SQUIGGLE ultrasonic motors generate no magnetic fields in operation, these non-magnetic motors are MRI safe and image compatible for medical applications.

MC-2300 Controller and PC Software

New Scale motor controllers generate ultrasonic signals to vibrate the motor's piezoelectric element. You control the SQUIGGLE motor motion via PC interface using the intuitive New Scale Pathway software, included. Use the GUI or call ActiveX commands from the Pathway application or third-party software such as LabVIEW. Build custom scripts using the intuitive scripting interface. Alternatively you can provide an analog input or use the optional manual handset.

The controller accepts input from position sensors for closed-loop motion control.



A SQUIGGLE motor with light pre-load can replace a micrometer in many commercial stages.

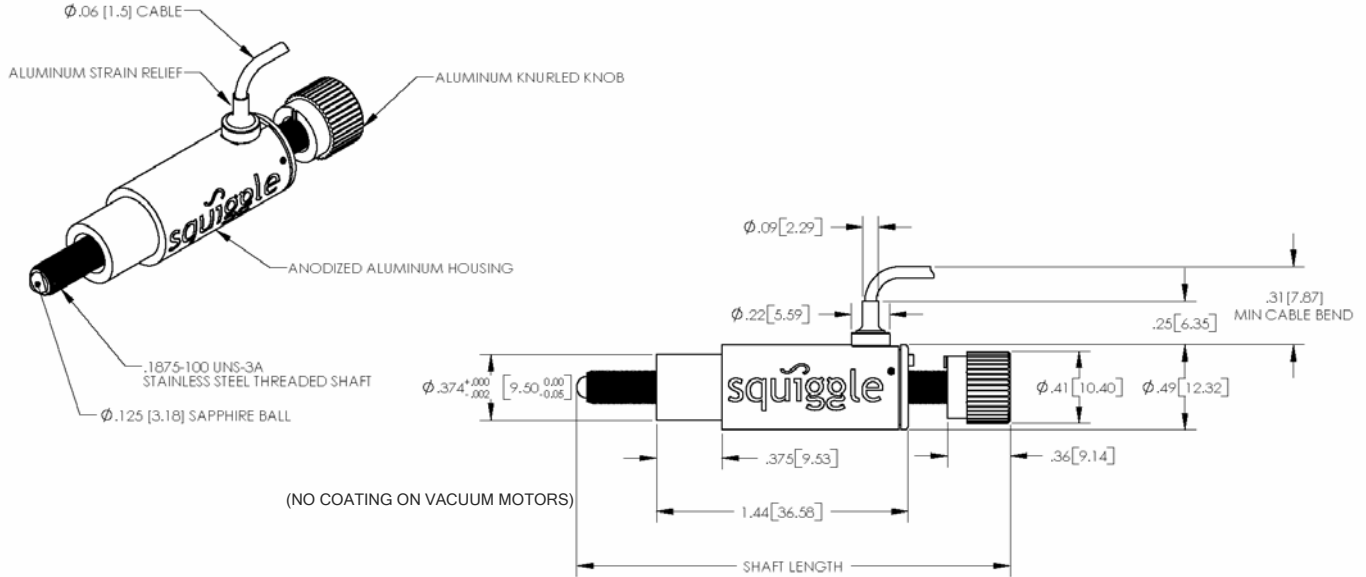


SQ-2300 controller with optional SQ-2301 manual handset.



New Scale Pathway™ software provides point-and-click PC control, Active X command library and an intuitive scripting interface.

SQ-100, SQ-100NM, and SQ-100V Series SQUIGGLE Motor



Specifications

SQ-100 Series Motor	
Housing Diameter	12.3 mm max.
- Mounting Diameter	9.5 mm
Housing Length	36.6 mm
Shaft Diameter/Thread	3/16" x 100 threads/in (4.76 mm x 0.25 mm lead)
Shaft Length	See Ordering Information
Stall Force	5 N
Resolution (typical)	20 nm (without encoder)
Start/Stop Time	0.2 ms
Speed Range	0.001 to 2 mm/s
Range of Motion	See Ordering Information
Off-Power Hold	Yes (self-locking threads)
Operating Temperature	-20 to 40 °C

Motor Ordering Information

Model	Travel/Shaft length ¹
SQ-115-C1	15 mm / 63 mm
SQ-115V-C1 ²	15 mm / 63 mm
SQ-150-C1	50 mm / 103 mm

¹ Custom shaft length and range of motion on request.

² Vacuum motor operates to 10⁻⁷ Torr. Vacuum feed-throughs not included. Requirements: 3 wires, 30 gauge or greater, 200 V RMS.

SQ-2300 Controller (required, one per motor)	
Input Power	12 or 24 V @ 500 mA. AC wall adapter included.
Typical Current	< 200 mA
Output Voltage	~ 200 V RMS
Electrical On/Off Time	0.100 ms
Speed Control (Selectable)	PWM duty cycle adjust (motor rapidly turns on/off) OR changing output voltage
PC Interface	USB interface, New Scale Pathway™ software included
Position Feedback Input	Digital (quadrature RS-422) or Analog (0-3.3V)
Dimensions (l x w x h)	3.5" x 4.2" x 1.6"
SQ-2301 Handset (optional)	
Speed Control (Knob)	Continuously variable from µm/sec. to mm/sec.
Motion Control (Buttons)	JOG forward, JOG reverse (motor moves as long as button is held)
Connection	RS-485 on SQ-2300 front

