



SQ-100 Series Motors

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



FEATURES	APPLICATIONS
<ul style="list-style-type: none"> 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) Non-magnetic models 	<ul style="list-style-type: none"> 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, test 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 (*see the SQ-2115 data sheet*).

Vacuum-Compatible Motors and Stages

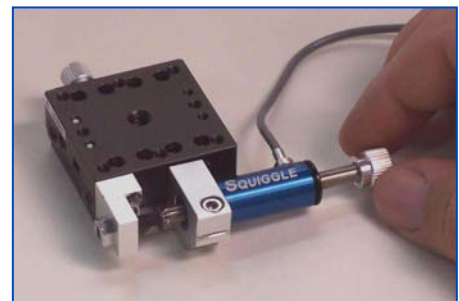
Vacuum-compatible SQUIGGLE motors operate to 10^{-7} Torr, automating in-vacuum alignment without mechanical feed-throughs. They provide high resolution with ultra-low outgassing and heating. (*We also make UVH motors; see the SQ-100UHV series data sheet.*)

Non-Magnetic Motors

Non-magnetic SQUIGGLE motors are 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.

Drive Electronics

New Scale motor controllers generate ultrasonic signals to vibrate the motor's piezoelectric element. You control the SQUIGGLE motor motion control via computer interface, analog input, or a manual handset. We offer both benchtop controllers for laboratory use, and credit-card sized PCB drive cards for easy integration into OEM systems and instruments. (*See the drive electronics data sheets.*)

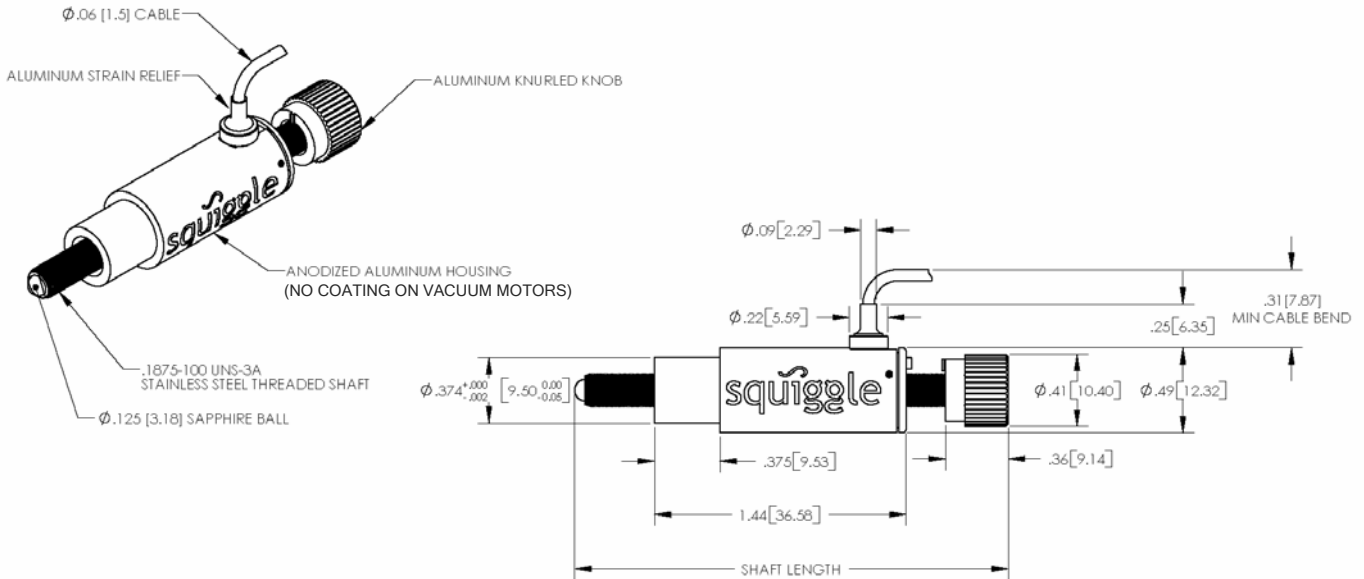


A SQUIGGLE motor and light spring pre-load can directly replace the manual micrometer in many commercial stages.



Vacuum compatible models offer low outgassing to 10^{-7} Torr, for precision positioning without mechanical feed-throughs.

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



Motor Specifications

SQ-100 Series	
Housing Diameter	12.3 mm max.
- Mounting Diameter	9.5 mm
Housing Length	36.6 mm
Shaft Diameter/Thread	3/16 in 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 ¹	Range of motion ²	Shaft length ²
SQ-115	15 mm	63 mm (2.54 in)
SQ-125	25 mm	77.6 mm (3.055 in)
SQ-150	50 mm	103 mm (4.055 in)

- ¹ SQUIGGLE motor model numbers are **SQ-XYA-B** where **X** = series and **YY** = range of motion
A = environment option **V** for Vacuum (10⁻⁷ Torr)
 **NM** for non-magnetic
B = housing option..... **N** for no housing (see SQ-100-N data sheet for drawings)
- ² Custom shaft length and range of motion on request.
- ³ Vacuum feed-throughs not included.
 Requirements: 3 wires, 30 gauge or greater, 200 V RMS.