NANOMUSCLE

Advanced Miniature Motion

70 Gram HS/HE Linear Actuator

Features

- Silent operation
- Affordable miniature motion
- Integrated digital controller
- Integrated power drivers
- Built-in limit-stop detection
- Suitable for battery powered equipment

Benefits

- Eliminates mechanical and electrical noise
- Affordable for high volume makers of consumer devices
- Compatible with complex as well as simple external systems
- Reduces overall system cost and time to market
- Allows seamless integration with a digital system
- Ideal for use with portable consumer devices

The best way to evaluate NanoMuscle products is by purchasing our demonstration kit. Order yours today!

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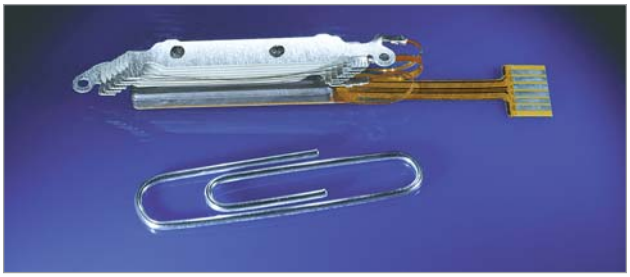
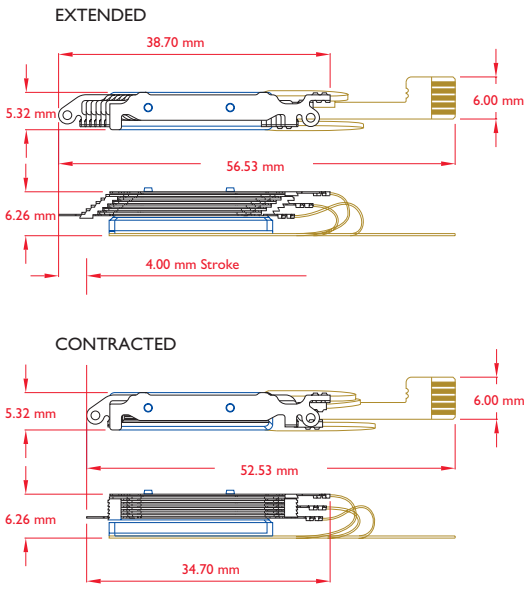
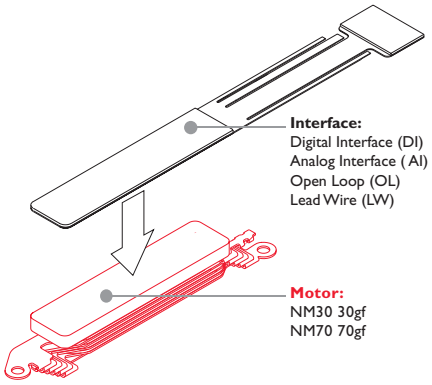


The NanoMuscle 70 Gram High Speed/High Efficiency Linear Actuator contracts when activated and requires a return force, such as a spring, to bring the actuator back to its initial configuration. In its extended configuration, the actuator is prepared to contract again. The NM70 offers low power consumption, and has a cycle life of well over 1,000,000 repetitions. All NanoMuscle Motors are available in Economy Grade or Commercial Grade versions. The Economy Grade version is designed for applications with less stringent cycle life and environmental tolerances.

Motor External Dimensions





Both a NanoMuscle Motor and an Interface must be selected to make a complete actuator system. When selecting an appropriate actuator, please refer to the data sheets for both the NanoMuscle Motors and Interfaces.

Specifications

Rated Voltage	
HS	4.0 V @ 470 mA
HE	3.5 V @ 410 mA
Resistance	8.5 Ω
Stroke	4.0 mm
Rated Load	70 g
Weight	1.1 g
Cycle Life	1,000,000+
Optimal Ambient Temperature	-70°C — +75°C

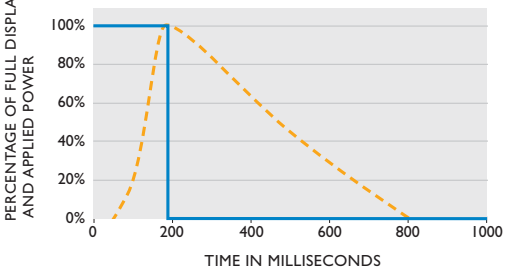
PERFORMANCE DATA CHARTS. Note: A return or extension force is required for each Motor.

Displacement

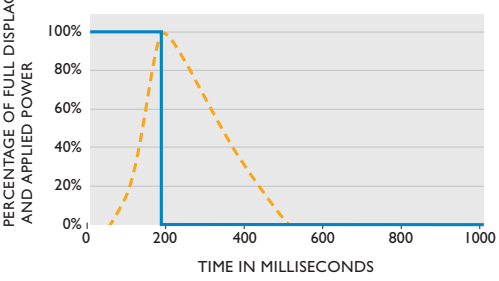
POSITION

POWER

NM-70 High Efficiency
Position vs Time
First Cycle | 70 gram load | 25 C | 3.5 volts



NM-70 High Speed
Position vs Time
First Cycle | 70 gram load | 25 C | 4 volts



Speed

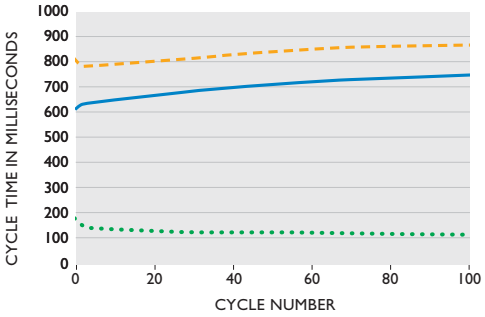
As the Motor cycles continuously, the cycle time increases until the unit reaches thermal equilibrium. The thermal equilibrium point varies with the ambient temperature and application.

CYCLE TIME (MS)

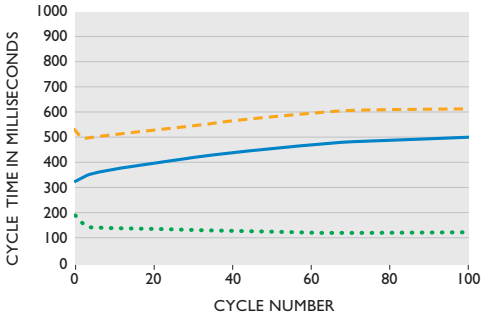
EXTENSION TIME (MS)

CONTRACTION TIME (MS)

NM-70 High Efficiency
Cycle Time vs Number of Completed Cycles
3.5 volts | 70 gram load | 25 C

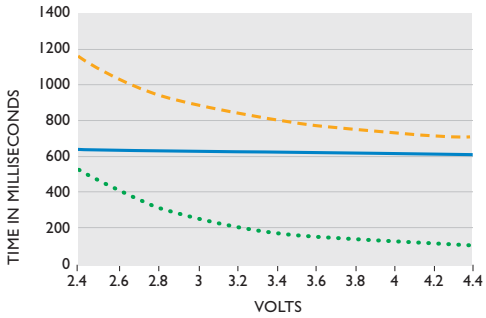


NM-70 High Speed
Cycle Time vs Number of Completed Cycles
4 volts | 70 gram load | 25 C

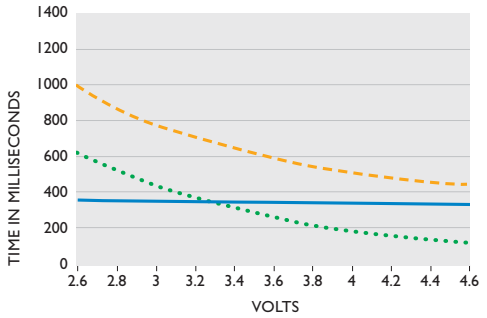


Increasing the applied voltage heats the device more quickly enabling the device to cycle faster.

NM-70 High Efficiency
Voltage vs First Cycle Time
70 gram load | 25 C



NM-70 High Speed
Voltage vs First Cycle Time
70 gram load | 25 C

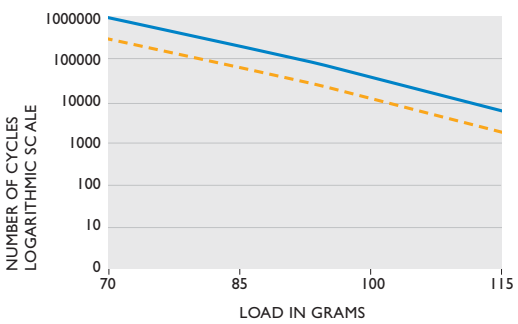


Load & Temperature

Load vs Cycle Life
Note: higher cycle lives are achieved with decreased loads.

Time vs Temperature
Depending on the application, the cycle time of the Actuator will vary. The graph illustrates the behavior of the Actuator in three different applications with optimum applied voltage. In a number of applications, the actuator can cycle faster or at higher temperatures than indicated. Please contact NanoMuscle for more information.

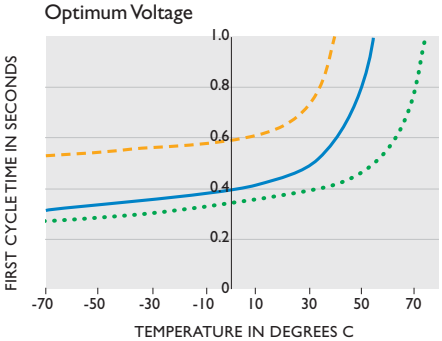
NM-70 High Efficiency/Speed
Load vs Cycle Life



ECONOMY GRADE

COMMERCIAL GRADE

NM-70 High Speed
First Cycle Time vs Temperature
Optimum Voltage



LOW RETURN FORCE

MEDIUM RETURN FORCE

VERY HIGH RETURN FORCE