

**Option .11 — Features**

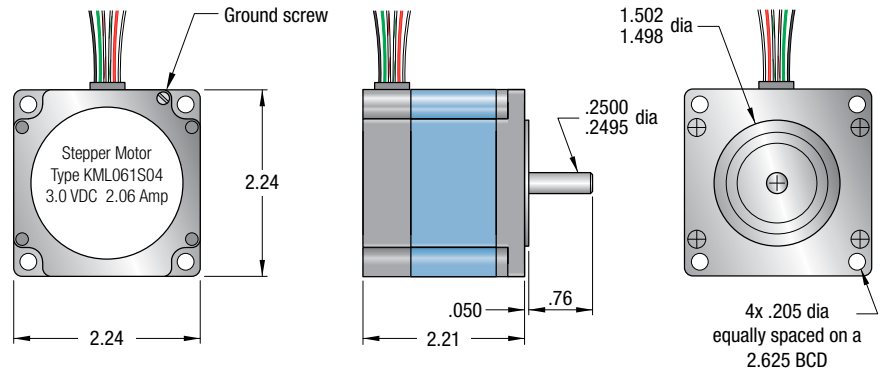
- NEMA standard 23D frame size
- ± 3% noncumulative step accuracy
- 48-50 tooth pitch
- 6 wire leads
- Contact factory for use in unipolar configuration

**DC Stepper Motor — Specifications / In Series Bipolar Wiring / 65°C / Air Service**

Connection Type	Leads	Torque, Holding (two phases on)	75 in-oz
Number of Leads	6	Torque, Residual	1 in-oz
Voltage, Input	5 VDC	Inertia, Rotor	0.04 lb-in <sup>2</sup>
Current, Input	0.7 A	Load, Overhang	15 lb
Temperature	-40 to 65°C	Load, Thrust	25 lb
Steps per Revolution	200	Weight	1.5 lb

Feedthroughs page 163 and 169, Motor drive and controller, page 178.

Motion



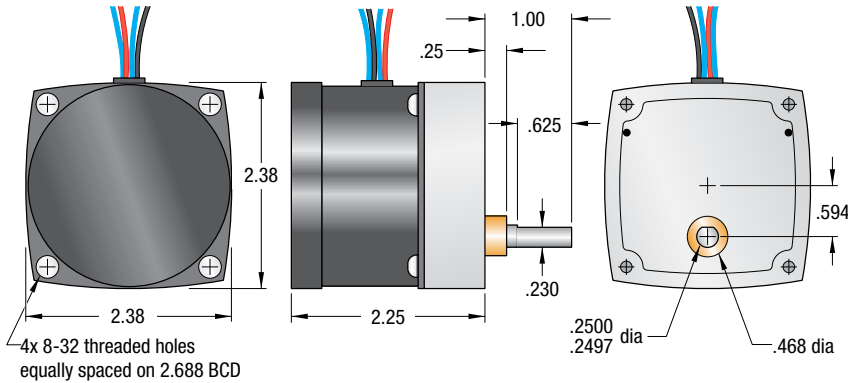
**Option .12 — Features**

- NEMA standard 23D frame size
- ± 2% noncumulative step accuracy
- 1.8° Full step increments (0.9° half step)
- Microstepped to 0.0072°
- Up to 20,000 steps/second (6,000 RPM)

**High Torque DC Stepper Motor — Specifications / In Series Bipolar Wiring / 65°C / Air Service**

Connection Type	Leads	Torque, Holding (two phases on)	170 in-oz
Number of Leads	6	Torque, Residual	1 in-oz
Voltage, Input	3 VDC	Inertia, Rotor	0.0034 oz-in <sup>2</sup>
Current, Input	2 A	Load, Overhang	15 lb
Temperature	-40 to 65°C	Load, Thrust	25 lb
Steps per Revolution	200	Weight	1.6 lb

Feedthroughs page 163 and 169, Motor drive and controller, page 178.



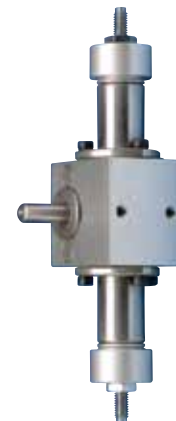
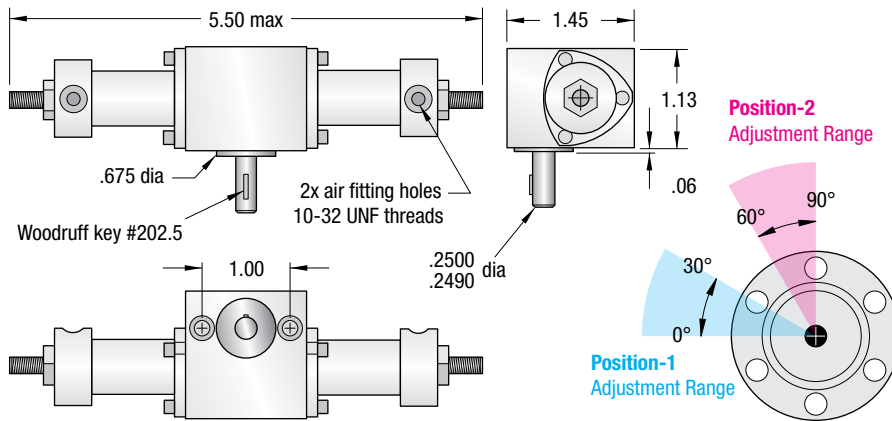
## Reversible AC Motor — Specifications / 65°C / Air Service

Connection Type	Leads	Temperature	-40 to 65°C
Number of Leads	4	Torque	126 in-oz
↻ Clockwise	Blue + Red	Speed, Output Shaft	10 RPM
↺ Counter-Clockwise	Blue + Black	Weight	3 lb
Voltage, Input	115 VAC / 60 Hz		
Power	7.5 W		

Feedthroughs page 163 and 169

## Option .21 — Features

- 10 RPM continuous motion
- 4 Wire leads plus capacitor
- Leads may be wired for switched direction reversing :
  - ↻ Clockwise, blue + red
  - ↺ Counter Clockwise, blue + black
- Economical actuator solution



## 90° Pneumatic Actuator — Specifications / 65°C / Air Service

Connections, Air Fitting	10-32 UNF	Weight	0.5 lb
Pressure, Maximum Air	150 PSI	Solenoid, 4-Way Electrical	115 VAC
Torque Capacity	.068 in-lb / PSI	Tube, 1/8 Inch Nylon	8 ft
Temperature	-29 to 93°C	Fitting, 1/8 Inch Tube / 10-32 UNF	5 pc
Rotation Angle, Maximum	90°	Fitting, 1/8 Inch FPT Tube	1 pc
Stop Adjustment (both ends)	30°		

Accu-Glass Products recommends installation of speed control valves when using a pneumatic actuator, page 169.

## Option .31 — Features

- 150 PSI Pneumatic Actuator
- 90° Maximum Rotation
- 30° Rotation Stop Adjustments
- Drive two-position devices like in-vacuum shutters
- Electrical solenoid, air fittings and lines included



110910 / Stepper Motor Drive



110911 / Stepper Motor Controller

### Motor Drive and Controller

The Motor Drive Controller is suitable for use with both of our DC stepper motor options listed on pages 176 and 177. See page 163 and 169 for compatible stepper-motor fitted feedthroughs. Manufactured by Applied Motion Products, Inc., the Si3540 features include:

- Powerful, precise and efficient MOSFET driver providing up to 3.5 amps per phase and microstepping to 50,800 steps per revolution.
- Reliable, efficient, low noise 40 VDC linear, toroidal power supply.
- Powerful, flexible, easy to use indexer.
- Connects by a simple cable to your PC for programming (cable included).
- Microsoft Windows™-based software for easy setup and programming.
- Eight inputs for interacting with the user and other equipment.
- Three outputs for coordinating external equipment.
- Accepts 110 or 220 volt AC power (factory preset for 110 volts).
- External trigger I/O is optically isolated, 5-24V, sinking or sourcing signals. PC/MMI port is RS-232.
- Sturdy 2.25 x 7.8 x 5 inch metal chassis.
- Pluggable screw terminal connectors for motor, AC power and I/O signals.
- Optional man machine interface (MMI) allows operator to enter distances, speeds, cycle counts and more.
- CE and TUV Compliant.

### Stepper Motor Controller — Motor Drive and Controller / Ambient Temperature / Atmosphere.

Bearing Type	Compatible Bearing Mount (Sold Separately)	Qty.	Model Number	Part Number	Unit Price \$
Motor Drive	Motor drive	1	MCC-3540	<b>110910</b>	1275
Motor Controller	with keypad for motor drive	1	MCC-MMI-01	<b>110911</b>	725

### Stepper Motor Step Accuracy

Accu-Glass uses Slo-Syn® DC stepper motors on rotary and linear actuators. The stepping action occurs when the power to the motor's winding is switched in a specific sequence by the motor controller. The motors are brushless, permanent magnetic motors that have full-step increments of 1.8° (200 steps per revolution). For increased accuracy, controllers are available that provide a half-step mode 0.9° (400 steps per revolution) and microstepping mode 0.014° (25714 steps per revolution) maximum. For specific information regarding half-step and microstep mode, refer to the manufacturer of the controller. When power is removed from a stepper operating in a half- or microstep mode the shaft will move to the closest full step position.

### Shaft Deflection Graphs

The graphs show the actual measured deflection for 0.125", 0.250" and 0.375" ground 304 stainless steel rods when a load is applied perpendicular to a shaft's axis of motion. Rods were mounted horizontally with one end fixed and supported while opposite ends were left free and unsupported. The actual deflection caused by a lateral or moment load applied of various weight and distance from the supported end was plotted. These graphs are for reference only and may vary from actual measurements. They should be used as visual aids to understand the effects of lateral loading on true position.

