

AB Positioning Stage



Travel	80 inches	[2 m]
Velocity	200 inches / sec	[5 m/s]
Acceleration	9 G's	9 G's
Peak Force	240 lbs	[1067 N]
Continuous Force	71 lbs	[316 N]
Resolution	.00004" or .0002"	[1 or 5 micron]

The AB Positioning Stage is a high precision, granite base, air bearing positioning stage for high end positioning applications. . It is driven by an ironless core, non-cogging 3 phase brushless linear motor and guided by 5 flat magnetically preloaded air bearings floating on a granite base

The ironless core coil assembly is used as the drive mechanism for the AB stage because of its smooth, non-cogging operation. The lightweight of the coil and table assembly allows for high acceleration of light loads.

The air bearings, which are used for supporting and guiding the payload, float on a cushion of air. This ensures that there are no wearing components in the system. The air bearings are not limited to acceleration limits like their mechanical counterparts where balls and rollers can slide instead of roll at high accelerations.

The stiff cross section of the granite base of the stage ensures a flat straight stable platform for the payload to ride on and does not require any special mounting considerations.

The AB stage comes standard with bellows (folded way covers) with a 12:1 extension to compression ratio.

The power for the moving 3 phase coil assembly, encoder and limit switches is routed through shielded flat ribbon cable. Special consideration was made to separate the power and signal cables from each other to reduce the effects of noise on the system. The power cable for the coil assembly and a vacant cable for the customers payload power usage are installed on one side of the stage and the encoder signal, limit switch and an additional vacant signal cable for the customers payload signal usage is provided on the other side of the stage. Standard connectors are provided.

Advantages:

- Excellent flatness and straightness specifications
- Lowest velocity ripple
- No wearing parts
- Enclosed with bellows

Applications:

- Pick and Place
- Vision Inspection
- Parts transfer
- Clean room

The AB positioning stage incorporates the latest in linear motion technology:

- **Motors:** Non-contact 3 Phase Brushless Linear Motor, Ironless Core, commutated either sinusoidally or trapezoidally with Hall Effects. The encapsulated coil assembly moves and the multi pole permanent magnet assembly is stationary. The lightweight coil assembly allows for higher acceleration of light payloads.
- **Bearings:** Linear guidance is achieved by using magnetically preloaded, porous carbon or ceramic air bearings; 3 on the top surface and 2 on the side surface. The bearings are mounted on spherical surfaces. Clean, dry filtered air must be supplied to the moving table of the AB stage.
- **Encoders:** Non-contact glass or metal scale optical linear encoders with a reference mark for homing. Multiple reference marks are available and are spaced every 50 mm down the length of the scale. Typical encoder output is A and B square wave signals but sinusoidal output is available as an option
- **Limit Switches:** End of travel limit switches are included at both ends of the stroke. The switches can be either active high (5V to 24V) or active low. The switches can be used to shut down the amplifier or to signal the controller that an error has occurred. The limit switches are typically an integral part of the encoder, but can be mounted separately if required.
- **Cable Carriers:** Cable guidance is achieved by using flat, shielded ribbon cable. Two additional unused shielded flat ribbon cables are supplied for customer usage with the stage. The 2 power cables for the stage and customer payload are installed on one side of the stage and the 2 signal cables for encoder, limit switch and customer payload are installed separately on the of the stage.
- **Bellows:** The AB comes standard with neoprene / nylon bellows with Mylar stiffeners.

Required Electronics:

The motor requires a 3 phase brushless amplifier with power supply, which is rated with sufficient current and voltage to meet the motion requirements. The inductance of the linear motor coil should be greater than the minimum load inductance of the servo amplifier. A programmable motion controller is required to close the position loop on the system.

Environmental Considerations:

The stage is a precision device with sensitive components, it should not be mounted in an environment that is wet or excessively dirty. The optical encoder scale is open and it should be kept free of debris in order to operate properly. The stationary magnetic assembly is highly magnetic, it should not be placed in an area where loose steel particles can be drawn into the magnetic gap. The stage must not be mounted in an environment with high ambient temperatures (>50°C).

Mounting:

The stage should be mounted to flat and stiff surface. Counter bored thru holes are present in the stage to allow for the mounting of the stage to the customers system. The moving table assembly has threaded holes on the top surface for attaching the payload. The stage may be mounted in any orientation. When mounting the stage with the table moving vertical, it should be noted that the stage will be required to generate additional force due to gravity and that the stage will slide down to the bottom hard stop when power fails.

Maintenance:

The ball bearing guides in the stage should be periodically lubricated with the manufacturers recommended grease.

Ordering Info:

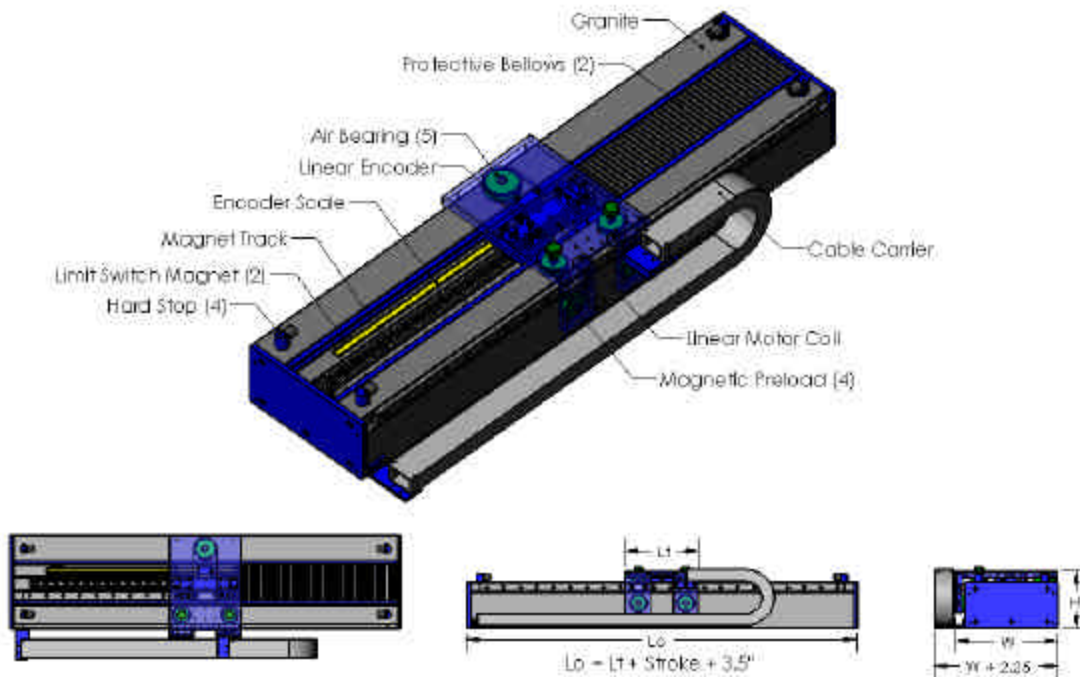
Stages can be ordered for any stroke up to 80 inches and any continuous force up to 24 lbs. The stages are built as the orders are placed, they are not stocked, as each customer requirement is different.

Model # ABS – AAA – BB – CCC - D
 where: AAA is the stroke in inches (30 inch stroke is -030)
 BB is the width of the stage (7 inch width is -07)
 CCC is the continuous force (24 lbs is -024)
 D is for special options
 (i.e. ABS-030-07-024-0 is a 7" wide AB stage with a 30" stroke, 24 lbs of continuous force and no special options)

Specifications:

Flatness	±.0001"/ft	±8 micron / meter
Straightness	±.0001"/ft	±8 micron / meter
Accuracy*	±.0002"/ft	±16 micron / meter
Repeatability*	±.0001"	±2.5 micron
Load Capacity	22 lbs	10 Kg

(*Encoder dependent)



Model #	Stage Width (W)	Stage Height (H)	Table Length (Lt)	Continuous Force	Peak Force
ABS-XXX-10-025A	9.5" [241 mm]	5.60" [142 mm]	6.35 [161 mm]	25 lbs [111 N]	80 lbs [356 N]
ABS-XXX-10-036A	9.5" [241 mm]	5.60" [142 mm]	8.75 [222 mm]	36 lbs [160 N]	120 lbs [533 N]
ABS-XXX-10-047A	9.5" [241 mm]	5.60" [142 mm]	11.15 [283 mm]	47 lbs [209 N]	160 lbs [711 N]
ABS-XXX-10-059A	9.5" [241 mm]	5.60" [142 mm]	13.55 [344 mm]	59 lbs [262 N]	200 lbs [889 N]
ABS-XXX-10-071A	9.5" [241 mm]	5.60" [142 mm]	15.95 [405 mm]	71 lbs [316 N]	240 lbs [1067 N]