



AXM 400 Series

Wafer Handling Atmospheric Robots

Hardware

The world standard in wafer handling atmospheric robots

Highly functional, repeatable and dependable, Brooks Automation's Atmospheric Bottom Mount (ABM)-400 and Atmospheric Top Mount (ATM)-400 Class 1 clean-room compatible wafer handling robots are designed to handle wafers up to 300mm in diameter. The ATM robot is mounted at the top flange, while the ABM's base-mount design is ideal for use with our Linear Track.

The 400 Series is backed by Brooks' unsurpassed expertise in developing advanced automation systems and software for the semiconductor industry. With more than 3,500 300mm AXM400 robots shipped to date, Brooks has more atmospheric wafer handling robot production experience than all other American manufacturers combined.

Designed for superior performance

Robust, balanced design is central to the outstanding performance of these systems. Large motors and smooth anti-backlash transmissions allow rapid motion with no sensitivity loss within the closed-loop DC servo system. No motors, belts or pulleys are exposed above the mounting surface at any time, keeping particulate contamination to a minimum.

Reliability is the cornerstone of every Brooks product. The AXM 400's patented mechanical system has very few moving parts, and the flexible internal printed circuit boards have life expectancies of over 10 million cycles. These features, combined with a high ESD immunity tolerance, contribute to each unit's high MTBF of greater than 40,000 hours.

BENEFITS:

The AXM 400 Series top-mount and bottom-mount atmospheric robots provide an optimal combination of precision, speed and reliability.

- > Robot mechanics are free of backlash, providing highly repeatable positioning.
- > All system parts are located below the wafer plane, minimizing particulate contamination.
- > Low-inertia design allows rapid motion with no sensitivity loss within the closed-loop DC servo system.
- > Highly configurable to accommodate a variety of application requirements.
- > Built-in reliability and high ESD immunity tolerance ensure dependable operation for many years.

- > Brooks-PRI Automation's AXM 400 Series atmospheric robots are designed for handling wafers and reticles up to 300mm.



Highly configurable for all applications

ATM and ABM robots are available in a variety of configurations with a range of payload capacities, Z-axis vertical travel and radial reach capabilities. Standard arm links are 5.25" per link, making total available reach equal to 10.50" plus end-effector length. When extra reach is required, links of 7.2" are available. For applications requiring minimized footprint and reach, 4.45" arm links are available. New revisions to the arm links maximize stiffness for increased planarity under greater loads, such as edge-gripping technology.

Available options include multiple vacuum lines, cassette scanner, CE mark and S2-93 compliance.

Intelligent controls

Each robot runs with the ESC-200 Series Equipe-brand Smart Controller, a fully programmable controller for wafer handling robots. The controller enables the user to supplement the standard command library with customized macro commands. The servo card utilizes "S" curve velocity profiling and high sampling frequency for better performance. Brooks also offers versions of the AXM-400 that are compatible with the hardware and software of most other robots on the market.

Mounting specifications

Robot hole dia.	11.500"
Robot bolt pattern	3 x 0.25" thru on dia. 12.350"
End effector	4 x 4-40 on dia. 1.390" (404, 405, 407) 4 x 6-32 on dia. 2.000" (407B, 407C)
Dead zone	25°

General specifications

	404	405	407	407B	407C
Payload	1 lb.	1 lb.	1 lb.	1.5 lbs	4 lbs
Droop	< 0.020" for rated payloads				
Z Drop	< .010" in the event of a servo off with brake				
Noise	Shall not exceed 72dB at 400 to 20000 Hz with 1001-0430 lead screw				
Substrate sensors	Vacuum				
Throughput	< 4 seconds / wafer / pick and place				
Cleanliness	Class 1 compatible				
Weight	60 lbs.				
Vacuum required	18-24 inches Hg				
Power required	100-240 VAC, 50/60 Hz				
MTBF	>40,000 hours				

Axes specifications

Range of motion	
Radial axis	2 x (4.45," 5.25" or 7.20")
Theta axis	335°
Z axis	13"
Repeatability (Typical)	
Radial axis	± 0.002" @3 σ
Theta axis	± 0.02° @3 σ
Z axis	± 0.002" @3 σ
Speed (Typical)	
Radial axis	24 inches/sec
Theta axis	360°/sec
Z axis	10 inches/sec

Brooks delivers total automation. The company's hardware, software and services can manage every wafer, reticle and data movement in the fab, helping semiconductor manufacturers accelerate time-to-market while reducing their risk. Brooks products are used in virtually every fab in the world.



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