

DIAMOND SERIES



DIAMOND H4 WAFER HANDLING ROBOTS



The Diamond H4 series Dual-Arm atmospheric robots represent a significant engineering advancement in the design and reliability of wafer handling equipment.

Two independent arms (R1 and R2) attached to a common rotary axis (T) allow fast swapping or simultaneous transfer of two wafers.

Benefiting from technologically superior components, the robots utilize ultra low inertia, high-response brushless servomotors coupled with zero-backlash Harmonic Drive® gears to achieve greatly enhanced dexterity and precision.

The innovative, all-in-one, class 1 clean room compatible design incorporates the motion controller, servo amplifiers, and power supply within the robot's industry standard footprint.

High-strength structural members enable top, bottom or side mount configurations without compromising the system rigidity.

A 32-bit, real-time kernel delivers accurate motion profiling along smooth continuous trajectories, while the distributed control architecture allows a seamless integration with linear tracks, pre-aligners, and other sub-components.

Networkable RS-485 and Ethernet interfaces complement the standard RS-232 and teach pendant connections. Powerful native wafer handling and scripting languages facilitate rapid software development for embedding the robots into an OEM application environment. Comprehensive emulation of legacy robot "macro" commands offers a drop-in compatibility with a wide variety of existing semiconductor tools.

FEATURES

- Excellent structural rigidity
- Modular and highly customizable design
- Arm length 13.70"
- Vertical travel 13"
- Fully integrated motion controller, servo amplifiers and power supply
- High response brushless motors and precise zero-backlash Harmonic Drive® gears
- Optional absolute encoders eliminating the initial homing procedure
- Handling radial and in-line equipment placement
- Seamless integration with prealigner, linear track and other peripheral components
- Standard RS-232 interface and Ethernet (Telnet) interfaces to the host computer
- Advance 32-bit real-time motion control kernel
- Powerful wafer handling firmware
- Comprehensive software tools and utilities
- Software emulation for legacy robot macro commands
- Optional teach pendant terminal
- General purpose digital inputs and outputs for custom use
- Class 1 clean-room environment compatibility
- Reliability – MTBF > 60,000 hours, (MCBF > 10,000,000 cycles)

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DIAMOND H4 DATA SHEET

Axis	Motion range	Maximum velocity	Maximum acceleration	Axis Repeatability
T	> 390°	400 °/s	1500 °/s ²	±0.01°
R1, R2	±13.6"	50 inch/s	300 inch/s ²	±0.001" (0.025mm)
Z	13"	18 inch/s	44 inch/s ²	±0.001" (0.025mm)

WAFER SIZE

2"(50mm) to 12"(300mm)

PAYLOAD

2.2 lbs (1.0 kg) per arm

ENCODERS

Incremental, 10.000 pulse/rev

MOTOR TYPE

Brushless, low inertia high response

WEIGHT

84 lbs (38.1 kg)

CLEANLINESS

Class 1 clean room environment compatible

OPERATING TEMPERATURES

50°F-104°F (10°C to 40°C)

FACILITY REQUIREMENTS

Voltage range

100-120AVC, 200-240VAC

Vacuum supply

11.8" Hg (-5.8psi) / 0.1CFM airflow

