



AUTOMATION SYSTEMS
GROUP

MagnaTran® 7 Leapfrog® Robot

Dual Arm, Same Side Wafer Transfer Robot for Highest Throughput Applications in Vacuum Cluster Tools

TOOL AUTOMATION

The MagnaTran® 7 Leapfrog® (MAG 7 X) robot retains all of the features and benefits of the MagnaTran Product Family while having the highest throughput available in demanding cluster tool applications.

Features

- Highest throughput MagnaTran Robot
- Handles wafer sizes through 300mm
- Compact, direct drive technology with no dynamic seals, drive belts or cables
- Proven > 11 million MCBF reliability
- Integrally mounted, DSP based control electronics
- Advanced firmware for local and remote monitoring and diagnostics
- Optional PowerPak™ accessory includes battery backup
- CE and SEMI S2 compliant

Benefits

- Compatible with state-of-the-art cluster tools
- Very high throughput
- VHV compatibility
- Low cost of ownership
- Maximum operating speed
- Global serviceability
- Safer recovery from power loss.

Ultra high throughput is achieved by use of Time Optimal Trajectory™ algorithms. Continuous rotation capability precludes the need for moves of more than 180 degrees. Direct drive servo and proprietary DSP controller minimize vibration. The patented Leapfrog® arm enables both wafer exchange and buffering.

Best-In-Class MagnaTran technology features a direct magnetic drive. Low friction, less wear and tear with lower torque produce fewer failures. Vibration and particles are also kept at a minimum. This design facilitates high positional accuracy without edge contact. No lip seals or ferro-fluidic seals result in better vacuum performance, no water in the transport chamber and better deposition of PVD films. Integral control electronics provide a smaller footprint, lower susceptibility to electronic interference, smaller packaging and higher reliability.

Comprehensive diagnostics routines can be monitored by graphic interface on a remote, modem linked, service terminal. A view-trace utility enables monitoring of programmed and actual acceleration at the end effector. Error logging with prior events are time and date stamped. Cycle counters operate in non-volatile memory. In summary, graphic monitoring of critical performance characteristics is possible.

Multi-Sensor Interfacing via high speed PIO enables direct interface to substrate sensors and other peripheral modules such as valves. Real time information enables position referencing by edge sensing of moving components. Dynamic Sensing in user specified radial positions enables independent wafer sending on the Leapfrog arm.

The PASIV™ Safety Feature (Programmable Access Safety Inclusion Volumes) provides user programmable access zones to prevent possible collision during manual operation thus ensuring a high level of safety for valuable wafers and process equipment.



MAG7X robot shown

WAFER SIZES

100, 125, 150, 200, and 300mm (end effectors available for each size)

CAPACITY

1.0 kg (2.2 lbs) each end effector

MOUNTING CONFIGURATION

Top mount flange (VacuTran™ 5, MultiTran® 5, and MagnaTran® 6 compatible)

AXES OF MOTION

3 axes in cylindrical envelope (R, I, and Z)

WEIGHT

30 kg (66 lbs) Drive Assembly
4-9 kg (9-20 lbs) Arm Assembly

VACUUM PERFORMANCE

Leak rate: $< 1 \times 10E^{-9}$ std. cc/sec He
Base operating pressure: 5×10^{-9} Torr

MAXIMUM TEMPERATURE

Drive assembly: 120° C maximum exposure (mounting flange only), 50° C maximum operation.

Arm/End Effector: 120° C maximum (exposure and operation)

EXPOSED MATERIALS

• Aluminum • Stainless Steel • AM350 (Bellows) • Molybdenum • Nickel • Elgiloy • Magnetic materials • Quartz • Glass • Viton • Perfluoroelastomer • Castrol Braycote 601EF

CONTROL INTERFACE

RS-232/RS-422 serial (switch selectable); for control interface (or remote linked service terminal). Dedicated RS-232 serial port for hand held control module. 1 additional RS-232 serial port for operation of peripheral device(s), miscellaneous parallel I/O (22 inputs, 20 outputs) for wafer sensing safety interlocks, position sensing and/or correction, or for control.

INPUT POWER

24 VDC + 10%, -0 at 20 Amp

REPEATABILITY

R (Radial) Axis: 0.05mm (3 σ)
 θ (Rotational) Axis: 0.003° (3 σ)
Z (Vertical) Axis: 0.05mm (3 σ)

PLACEMENT REPEATABILITY

0.1mm TIR (in horizontal plane, at appropriate speeds)

WAFER EXCHANGE TIME

Typically 3.0 to 5.0 seconds (exchange = pick & place), depending upon arm extension and upon substrate size, temperature, and material.

OPTIONS AND ACCESSORIES

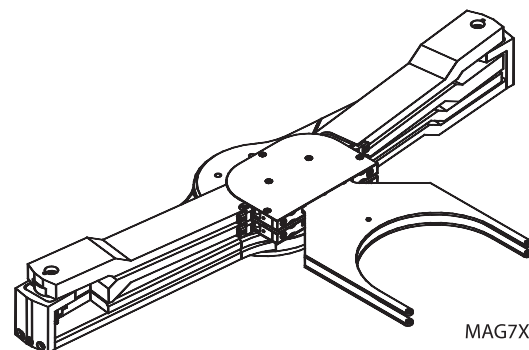
Control Display Module (CDM) - hand held terminal for operation, position teaching, and limited diagnostics (standard)
Fixture - for precision mounting of arm assembly (standard)

End Effectors - Existing and optional custom design end effectors available

PowerPak™ - battery backup module for safe recovery from EMO or power failure, directly attachable to drive assembly (optional)

Operating Manual - on CDROM

Spares - components kits (optional)

LAYOUT:

For more information, please contact your local Brooks Automation sales representative or visit www.brooks.com.

