



AUTOMATION SYSTEMS
GROUP

MagnaTran[®] 7 Frogleg[™] Robot

Wafer Transfer Robot for Vacuum Cluster Tool Applications

TOOL AUTOMATION

The MagnaTran[®] 7 Frogleg[™] (MAG 7 F) robot incorporates all the technical advantages of the MagnaTran Product Family resulting in a demonstrated mean cycle between failures (MCBF) of > 11 million.

Features

- Handles wafer sizes through 300mm
- Patented Frogleg[™] Arm
- Proven > 11 million MCBF reliability
- Patented Time Optimal Trajectory[™]
- PASIV user programmable access zones
- Optional PowerPak[™] accessory includes battery backup
- CE and SEMI S2 compliant

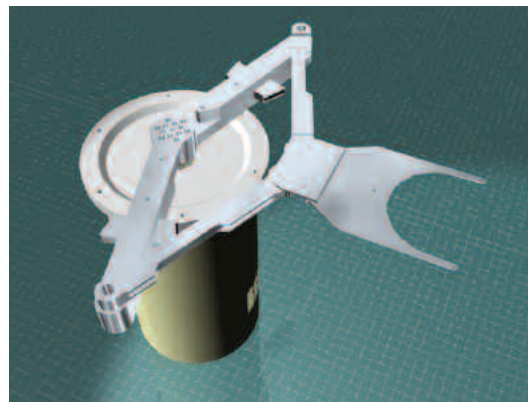
Benefits

- Compatible with state-of-the-art cluster tools
- High throughput
- Compact footprint
- VHV compatibility
- Low cost of ownership
- Maximum operating speed
- Global serviceability
- Safer recovery from power loss
- Facilitates upgrade for increased productivity

The simple design has a minimum of moving parts. Its direct magnetic drive has no dynamic vacuum seals thus reducing friction, wear, tear, and torque resulting in fewer failures. Less vibration, low particles, and high positional accuracy without edge contact are achieved by the elimination of stepper motors. The integral field-proven electronics not only provides a smaller footprint but also a lower susceptibility to electronic interference resulting in higher reliability.

High throughput is achieved by use of Time Optimal Trajectory[™] algorithms which result in transfer speeds 15-30% faster than s-curve profiles. The continuous rotation capability precludes the need for moves of more than 180 degrees and the direct drive servo with Brooks' proprietary DSP controller minimizes vibration.

The PASIV[™] user programmable safety zones prevent possible collision during manual operation thus insuring the safety of high value wafers and process equipment. Comprehensive diagnostics are accomplished with a graphic interface at a remote, modem linked, service terminal. Error logging with prior events are time and date stamped. Cycle counters are in non-volatile memory and critical performance characteristics are monitored graphically. Multi-Sensor Interfacing is accomplished by high speed PIO which enables a direct interface to substrate sensors and other peripheral modules such as valves. Real time information allows position referencing by edge sensing of moving components. The wafer presence may be referenced in macro sequences for safety.



MAG7 F robot shown

WAFER SIZES

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

CAPACITY

1.0 kg (2.2 lbs)

MOUNTING CONFIGURATION

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

AXES OF MOTION

3 axes in cylindrical envelope: Radial (R), Horizontal (i), and Vertical (Z)

WEIGHT

30 kg (66 lbs) Drive Assembly
3-7 kg (6-16 lbs) Arm Assembly

VACUUM PERFORMANCE

Leak rate: $< 1 \times 10^{-9}$ 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 5.0 to 10.0 seconds (exchange = pick, rotate 180° & place), depending upon arm extension and upon substrate size, temperature, and material.

OPTIONS AND ACCESSORIES

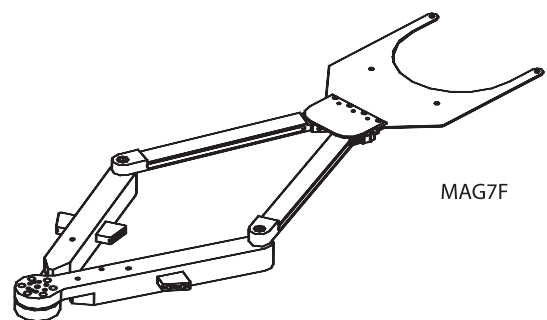
Control Display Module (CDM) - hand held terminal for operation, position teaching, and limited diagnostics (standard)
Fixture - for precision mounting of arm assembly (standard)

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 Manuals - on CDROM (optional)

Spares - components kits (optional)

ARM:

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

