



MagnaTran[®] 7 SCARA Robot

Wafer Transfer Robot for Vacuum Applications Requiring a High Reach/Containment Ratio

AUTOMATION

Features

- Handles wafer sizes through 300mm and non-standard substrates
- Compact, direct drive technology with no dynamic seals, drive belts or cables
- Proven > 11 million MCBF reliability
- Integrally mounted, DSP based control electronics
- Patented Time Optimal Trajectory
- Workspace user programmable access zones
- Advanced software for local and remote monitoring and diagnostics
- Single or dual end effector configurations
- CE and SEMI S2 compliant

Benefits

- Compatible with state-of-the-art cluster tools.
- High reach/containment ratio
- Low cost of ownership
- VHV compatibility
- Wafer and equipment safety
- Global serviceability
- Facilitates upgrade for increased productivity

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

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

High throughput is achieved by Time Optimal Trajectory™ algorithms which result in transfer speeds 15 to 30 percent 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 Workspace user programmable access zones prevent possible collision during manual operation thus ensuring the safety of high value wafers and process equipment. Comprehensive diagnostics may be 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.



MAG 7 S with Dual End Effector SCARA Arm shown

WAFER SIZES

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

CAPACITY (Typical, application dependant)

1.0 kg (2.2 lbs)* with standard capacity arm
2.0 kg (4.4 lbs)* with high capacity arm

MOUNTING CONFIGURATION

Top mount flange (VacuTran™ 5, MultiTran® 5, and MagnaTran® 6 compatible)
Top access bolt configuration option

AXES OF MOTION

3 axes in cylindrical envelope: Radial (R), Rotational (θ), and Vertical (Z)

WEIGHT

30 kg (66 lbs)	Drive Assembly (35mm Z)
3-7 kg (6-16 lbs)	Arm Assembly
37 kg (82 lbs)	Drive Assembly (135mm Z)

VACUUM PERFORMANCE

Leak rate:	< 1 x 10E ⁻⁹ std. cc/sec He
Base operating pressure:	5 x 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 ▪ Molybdenum
- Nickel ▪ Magnetic materials ▪ Glass
- Viton ▪ Perfluoroelastomer ▪ Castrol Braycote 601EF
- Castrol Microcote 296

ETHERNET CONTROL INTERFACE

RS-232/RS-422 serial (switch selectable); for control interface (or remote linked service terminal). Ethernet (100mm for high speed control interface. Dedicated RS-232 serial port for hand held control module. 1 additional RS-232 serial port for operation of peripheral device(s), miscellaneous Digital 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:	0.1mm (3s)
θ (Rotational) Axis:	0.006° (3s)
Z (Vertical) Axis:	0.05mm (3s)

PLACEMENT REPEATABILITY

0.2mm TIR (in horizontal plane, at appropriate speeds)

WAFER TRANSFER PERIOD

Typically 6.0 to 13.0 seconds

(Transfer = pick, rotate 180° & place), depending upon arm extension and upon substrate size, temperature, and material.

OPTIONS AND ACCESSORIES

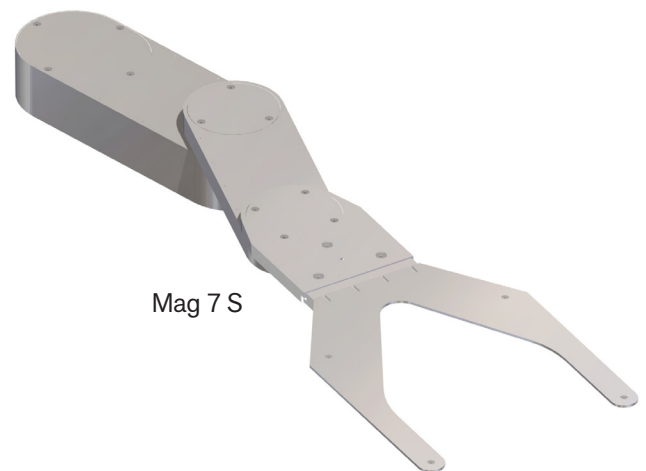
Control Display Module (CDM) - hand held terminal for operation, position teaching, and limited diagnostics (standard)
Fixture - for precision mounting of arm assembly (standard)

End Effectors - Existing and optional custom design and end effectors available

AWC (Automatic Wafer Centering) - with customer provided external sensors

Operating Manual - on CDROM (optional)

Spares - components kits (optional)

LAYOUT: SINGLE END EFFECTOR SCARA ARM

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

