Ultra High Vacuum Induction Annealing Tool w/ Load Lock

Parts

Chambers (mounted to an extruded aluminum system support frame)
- Main chamber: nominally 30" long x 18" deep x 12" high
- Load Lock: compatible with substrates up to 200mm diameter

Vacuum
- Pfeiffer 790L/s turbomolecular pump with 3-position pneumatically actuated isolation gate valve
- Pfeiffer 67 L/s turbomolecular pump and all appropriate gauging
- Mechanical Scroll Pump: Edwards NXDS10I

Pressure Control
- (1) Fujikin FCST1000F flow controller (0-100 sccm), all cables, and PID upstream pressure control electronics
- (1) Inficon CDG025D Capacitance Manometer 100 mTorr (0.13 mbar) pressure transducer

Transfer arm
- Fully automated high precision heavy duty motion control linear transfer arm (LRP)

DESCRIPTION
CHAMBER • Chamber nominally 30" long x 18" deep x 12" high Aluminum chamber • O-ring sealed hinged top-plate with viewport. • Viewport to accomodate customer supplied pyrometer. • Flange on bottom of chamber for **integration of customer supplied Induction Heating assembly**. Flange size to be determined at time of order. ***Note: Customer supplied Induction heating assembly is not controlled by KJLC eKLipse or incorporated in to system controls.** • Ports for pumping, gauging, gas flow and other process equipment as required
CHAMBER VACUUM PUMPING & GAUGING • 790L/s Pfeiffer turbomolecular pump with 3-position pneumatically actuated isolation gate valve • Edwards nXDS10 dry scroll roughing pump used to back turbo • Pneumatic roughing, foreline, and vent valves • Wide range vacuum gauging is included • The base pressure specification for the system is 7 x 10-7 Torr or lower for a properly conditioned chamber.
SUBSTRATE TRANSPORT MECHANISM • Fully automated high precision heavy duty motion control linear transfer arm (LRP) • Substrates are carried in a holder on end effector of LRP that is scanned over the Induction Heating assembly • Accomodates up to a 200mm (8") diameter substrate in a holder. • LRP reaches thru Annealing chamber to pick up substrate holder off of pedestal in Load Lock.

DESCRIPTION
ENGINEERING FOR SUBSTRATE FIXTURE • Engineering time for design of custom holder to accommodate customer metal foil samples • Deliverable is an engineering drawing that will be used to receive quotes from identified vendors; intention is a ceramic holder • **NOTE: *No physical holder is included in this system quote***
SYSTEM FRAMEWORK • Chamber is mounted to an extruded aluminum system support frame • Stand-alone instrument rack is provided for system electronics • Power distribution housed in instrument rack • Casters and leveling pads
WATER DISTRIBUTION MANIFOLD • Manifold for water distribution to system components • Shut off valves • Interlocked flow switches to critical components
POWER DISTRIBUTION • Single service drop (208VAC, 60Hz, 3 phase) • Component wiring is routed to a centralized power distribution panel • EMO protection • Isolation transformer provides safe operation while sputtering and substrate heating • Appropriate safety interlocks • NOTE: A dedicated earth ground is required; **Customer supplied components not integrated to power distribution.**

eKLipse COMPUTER CONTROL PACKAGE

- User Interface via .NET application run on Windows PC
- Standalone Real Time Controller (RTC)
- RTC provides uninterrupted operation, independent of the Windows Computer and User Interface status
- All In One (AIO) PC, full HD touch-screen monitor, keyboard with touch pad
- PC provides supervisory interface to RTC, facilitates monitoring and manual actuation of vacuum, transfer, maintenance, and deposition process components
- UI Navigation and Title Panel: Display and control of System status messages, user login/logout, operation mode, & system abort

--Vacuum Screen: Visual display of valve position and pump status

--Deposition Screen: Indication of shutter position, deposition source status, source material log

--Cooling Screen: Water flow switch status for all cooling channels

- Fully customizable recipe control and process automation
- Graphical Recipe Builder generates a recipe via mouse or touchscreen selectable user interface
- Recipe Database Screen provides selection & editing of standard recipes, with copy functionality for modification of existing & saving of new recipes
- Programming/control via a keyboard/touch pad or pop-up window on touch screen
- Four standard user security levels with user access assignable to controls via user security level
- Provides full user log with csv file export functionality (for spreadsheet import)
- **To the extent possible basic saftey Interlock controls will be put in place between KJLC eKLipse controls and customer supplied induction heater.**

UPSTREAM PRESSURE CONTROL

• One process gas channel; (1) Fujikin FCST1000F flow controller (0-100 sccm), all cables, and PID upstream pressure control electronics

• One (1) Inficon CDG025D Capacitance Manometer 100 mTorr (0.13 mbar) pressure transducer

• Orbitally welded gas lines provide maximum vacuum integrity

• All MFC's will be calibrated for N2. Correction factors are used in eKLipse™ software to adjust to individual gases

• MFCs are manifolded and plumbed into proximity of each sputter source

ENTRY LOCK CHAMBER

• Single Substrate Load Lock compatible with substrates up to 200mm diameter or adapter for smaller substrates

• Substrate in holder sits on pedestal within Load Lock with z-shift for "hand off" to LRP

• Accomodates slit valves on both sides of chamber for integration to Anneal chamber and future Octos chamber; for 200mm substrate in holder

• Single slit valve for 200mm substrate in holder isolationg Load Lock from Annealing chamber

• 67 L/s turbomolecular pump and all appropriate gauging

• Roughing pump shared with process chamber

• Load lock HiVac valve provides isolation between load lock chamber and turbo pump