Vacuum Load Locks
Wafer Handling Load Locks
Hine Automation’s Star Systems are automated load locks compatible with high vacuum environments. Hine’s vacuum load locks are designed to eliminate the need to vent and evacuate the OEMs process chamber during every substrate cycle. The SL-200 accommodates substrates up to 200mm in diameter. The load locks offer various levels of functionality and integration that meet technical and budgetary requirements of most OEMs. Vacuum and gas plumbing, slit valve, end effector, and Hine’s integrated control module are options available to OEMs. Additionally, Hine’s load locks offer the Z-lift mechanism. The Z-lift provides vertical motion to pick-up an drop-off substrates in a process chamber without lift pins. Thanks to its MESC mounting interface and the various options of controller interface, Hine’s vacuum load locks can be easily integrated with any thin-film OEM.
SL-300 Vacuum Load Lock
Wafer Handling Load Locks

FEATURES
- Handles wafer sizes up to 300mm
- High vacuum compatibility
- Custom end effectors
- Linear Motion Mechanism (RS-232, Ethernet, DeviceNet)
- Wafer and Cassette Sensors
- CE compliant
- Plug and Play Vacuum Transport System

OPTIONS
- Vertical motion – Z lift
- Vacuum and gas plumbing
- Integrated transfer control module

Hine Automation’s Star Systems are automated load locks compatible with high vacuum environments. Hine’s vacuum load locks are designed to eliminate the need to vent and evacuate the OEMs process chamber during every substrate cycle. The SL-300 accommodates substrates up to 300mm in diameter. The load locks offer various levels of functionality and integration that meet technical and budgetary requirements of most OEMs. Vacuum and gas plumbing, slit valve, end effector, and Hine’s integrated control module are options available to OEMs. Additionally, Hine’s load locks offer the Z-lift mechanism. The Z-lift provides vertical motion to pick-up an drop-off substrates in a process chamber without lift pins. Thanks to its MESC mounting interface and the various options of controller interface, Hine’s vacuum load locks can be easily integrated with any thin-film OEM.
SL-450 Vacuum Load Lock
Wafer Handling Load Locks

FEATURES
- Handles wafer sizes up to 450mm
- High vacuum compatibility
- Custom end effectors
- Linear Motion Mechanism (RS-232, Ethernet, DeviceNet)
- Wafer and Cassette Sensors
- CE compliant
- Plug and Play Vacuum Transport System

OPTIONS
- Vertical motion – Z lift
- Vacuum and gas plumbing
- Integrated transfer control module

Hine Automation’s Star Systems are automated load locks compatible with high vacuum environments. Hine’s vacuum load locks are designed to eliminate the need to vent and evacuate the OEMs process chamber during every substrate cycle. The SL-450 accommodates substrates up to 450mm in diameter. The load locks offer various levels of functionality and integration that meet technical and budgetary requirements of most OEMs. Vacuum and gas plumbing, slit valve, end effector, and Hine’s integrated control module are options available to OEMs. Additionally, Hine’s load locks offer the Z-lift mechanism. The Z-lift provides vertical motion to pick-up and drop-off substrates in a process chamber without lift pins. Thanks to its MESC mounting interface and the various options of controller interface, Hine’s vacuum load locks can be easily integrated with any thin-film OEM.
# Vacuum Load Locks  Wafer Handling Load Locks

## SL-200/300/450 AVAILABLE CONFIGURATIONS

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(T) Telescoping</td>
<td>Offers telescoping drive rail with the ability to obtain standard reach requirements in a compact design.</td>
</tr>
<tr>
<td>(MW) Multi-Wafer</td>
<td>Offers the ability to process multiple wafers using a single drive rail unit.</td>
</tr>
<tr>
<td>(GB) Glove Box</td>
<td>Offers glove box mounting flange with easy access for operators and maintenance door.</td>
</tr>
<tr>
<td>(HL) High Load</td>
<td>Offers the ability to process higher loads than standard unit due to the robust drive rail. (Often used for carriers rather than wafers.)</td>
</tr>
</tbody>
</table>

### KEY

† SEMI standard sizes available and custom end effectors available upon request.
‡ Measured as three standard deviations (3σ)
* End effector design may impact max payload capability
** Maximum reach measured from the edge of the slit valve
*** Vertical stroke is optional
# Vacuum Load Locks Wafer Handling Load Locks

## PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>SL-200</th>
<th>SL-300</th>
<th>SL-450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>≤ 1 x 10^{-3} Torr (with mechanical pump)</td>
<td>≤ 1 x 10^{-6} Torr (with high vacuum pump)</td>
<td>≤ 1 x 10^{-9} SCC He/Sec</td>
</tr>
<tr>
<td>Leak Rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach*</td>
<td>305mm beyond 50mm thick slit valve</td>
<td>380mm beyond 60mm thick slit valve</td>
<td>410mm beyond 60mm thick slit valve</td>
</tr>
<tr>
<td>Standard Drive Chamber Reach*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended Drive Chamber Reach*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach accuracy</td>
<td>± 0.12 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placement accuracy</td>
<td></td>
<td>± 0.20mm @ Full Extension</td>
<td></td>
</tr>
<tr>
<td>Payload*</td>
<td>2.2Kg [5.0 Lbs.] (at full extension)</td>
<td>2.2Kg [5.0 Lbs.] (at full extension)</td>
<td>5.4Kg [12.0 Lbs.] (at full extension)</td>
</tr>
<tr>
<td>Droop*</td>
<td>≤ 2.0mm</td>
<td>≤ 2.0mm</td>
<td>≤ 23.0mm</td>
</tr>
<tr>
<td>Z-travel</td>
<td>+20mm (measured at the bellows feedthrough)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-accuracy</td>
<td>±0.01mm (measured at the bellows feedthrough)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particle performance†</td>
<td>&lt;0.1 particle adders/cm²/Pass for particles of &lt;0.5μm</td>
<td>&lt;0.02 particle adders/cm²/Pass for particles of &gt;1.0μm</td>
<td></td>
</tr>
</tbody>
</table>

**KEY**

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‡ Measured as three standard deviations (3σ)
* End effector design may impact max payload capability
** Maximum reach measured from the edge of the slit valve
*** Vertical stroke is optional
# Vacuum Load Locks

**Wafer Handling Load Locks**

## SL-200/300/450 PHYSICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>SL-200</th>
<th>SL-300</th>
<th>SL-450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Chamber</td>
<td>381mm x 340mm x 104mm</td>
<td>432mm x 440mm x 104mm</td>
<td>670mm x 622mm x 133mm</td>
</tr>
<tr>
<td>Drive Chamber</td>
<td>363mm x 122mm x 87mm</td>
<td>432mm x 122mm x 91mm</td>
<td>425mm x 184mm x 118mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>628mm x 184mm x 118mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Extended**)</td>
</tr>
<tr>
<td>Lid Dimensions</td>
<td>368mm x 340mm x 35mm</td>
<td>418mm x 440mm x 35mm</td>
<td>650mm x 622mm x 36mm</td>
</tr>
<tr>
<td>Chamber Volume</td>
<td>~ 12 liters</td>
<td>~ 16 liters</td>
<td>~ 43 liters</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>~ 46 liters (Extended**)</td>
</tr>
<tr>
<td>Weight</td>
<td>~ 34 kilograms</td>
<td>~ 42 kilograms</td>
<td>~ 104 kilograms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>~ 111 kilograms (Extended**)</td>
</tr>
<tr>
<td>Interface</td>
<td>200mm MESC (46mm x 236mm)</td>
<td>300mm MESC (50mm x 336mm)</td>
<td>450mm MESC (56mm x 496mm)</td>
</tr>
</tbody>
</table>

**KEY**

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‡ Measured as three standard deviations (3σ)

* End effector design may impact max payload capability

** Maximum reach measured from the edge of the slit valve

*** Vertical stroke is optional
About Hine Automation

Hine Automation, LLC is a designer and manufacturer of automation systems and robotic components. We serve Original Equipment Manufacturers (OEMs) in the semiconductor, solar, flat panel display and related industries across the globe. Our robotic components satisfy a wide range of needs; from flexible research and development environments to stringent manufacturing environments. Combining our unsurpassed quality and reliability with modular and versatile designs to meet today’s automation challenges, our products provide functional and economical solutions.

OUR MISSION

Our goal is to design and manufacture the most cost effective automation solutions and deliver unparalleled customer service and support.

OUR STRENGTHS

- Demonstrated Reliability
- Cost Effective Solutions
- Custom Solutions
- Lightning Speed Response and Turn-around Times
- Knowledge, Experience-driven Designs.

OUR PRODUCTS

- **Integrated Wafer Handling Systems:**
  - Atmospheric Systems
  - Vacuum Systems
- **Wafer Handling Load Locks:**
  - Vacuum Load Locks
  - Custom Load Locks
- **Wafer Handling Robotic Components:**
  - Atmospheric Elevators
  - Atmospheric Aligners
  - Atmospheric Robots
  - Atmospheric Cassette Load Ports
  - Vacuum Elevators
  - Vacuum Aligners
  - Vacuum Robots
  - Vacuum Cassette Load Ports