Cost Effective Equipment

Apogee™ Bonder – Equipment Overview

Apogee ™ Physical System Dimensions

Apogee™ System – Front View, With Dimensions

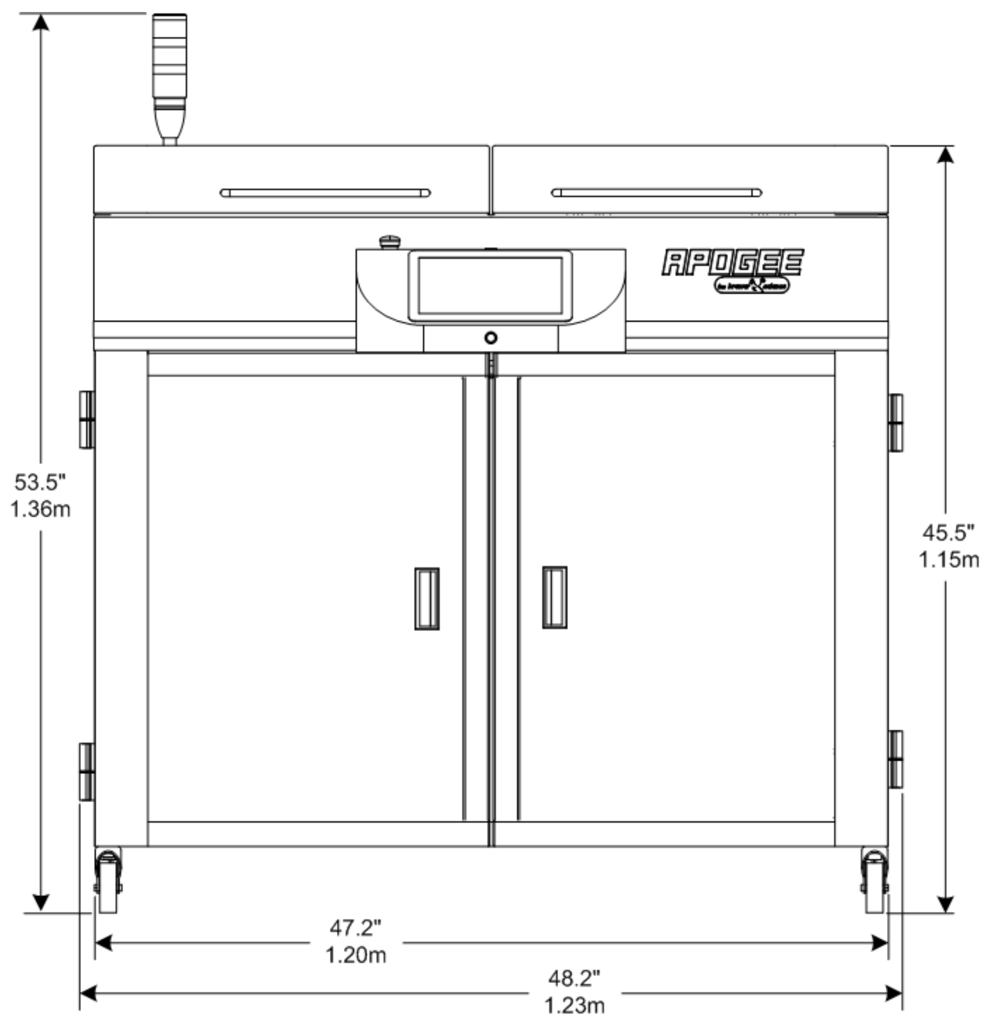

Figure 1: Apogee™ System
Front View – With Dimensions

Apogee™ System – Side View – With Dimensions

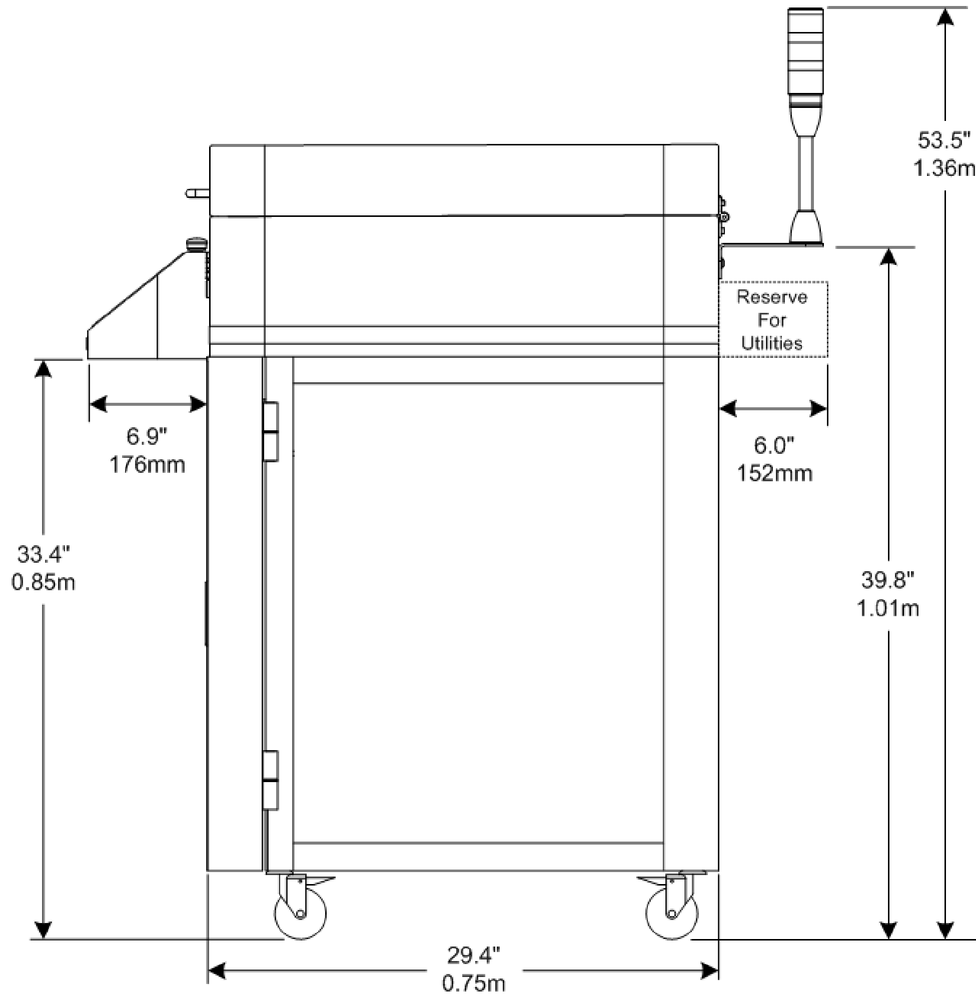

Figure 2: Apogee™ System
Right-Side View – With Dimensions

Apogee™ System – Side view with covers open – With Dimensions

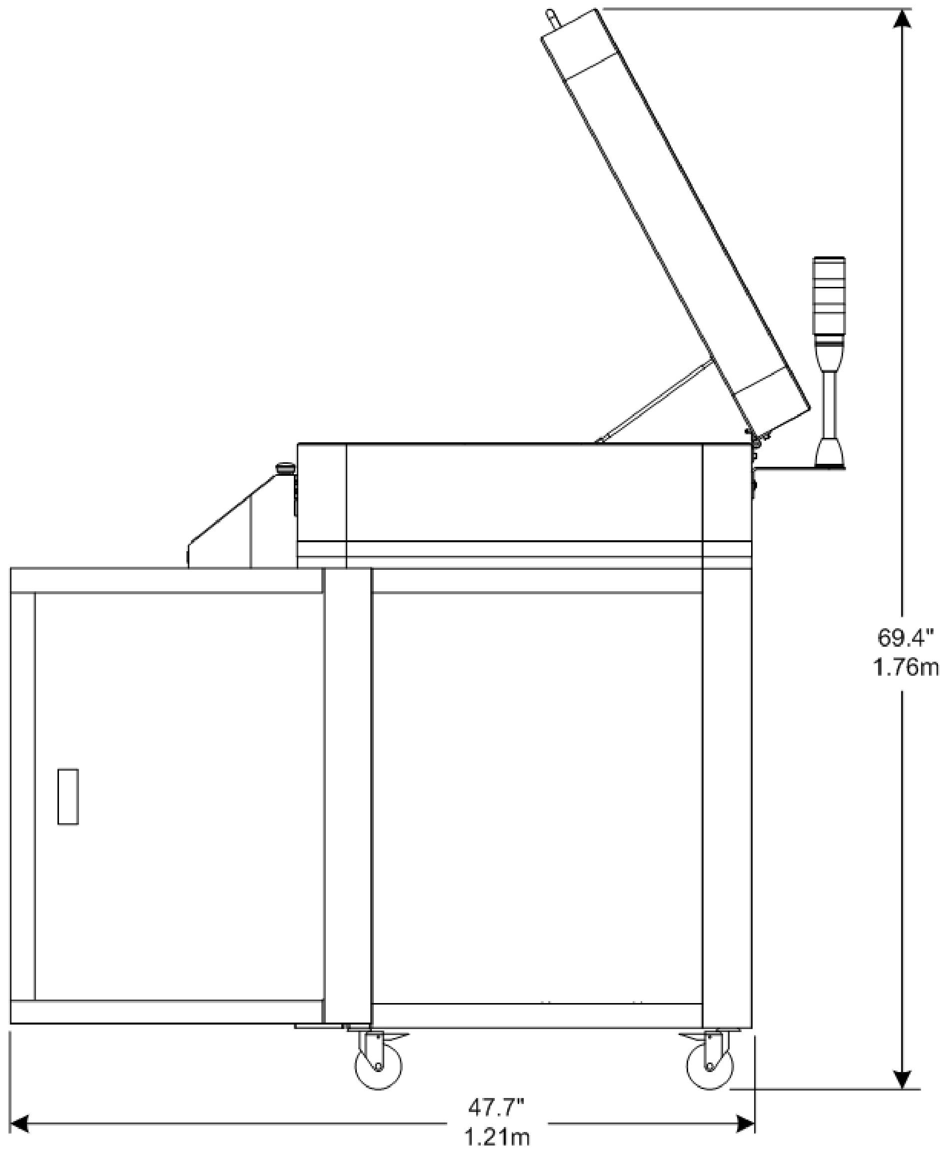

Figure 3: Apogee™ System
Right-Side View (Open Covers) – With Dimensions

Apogee™ System Top View with covers open – With Dimensions

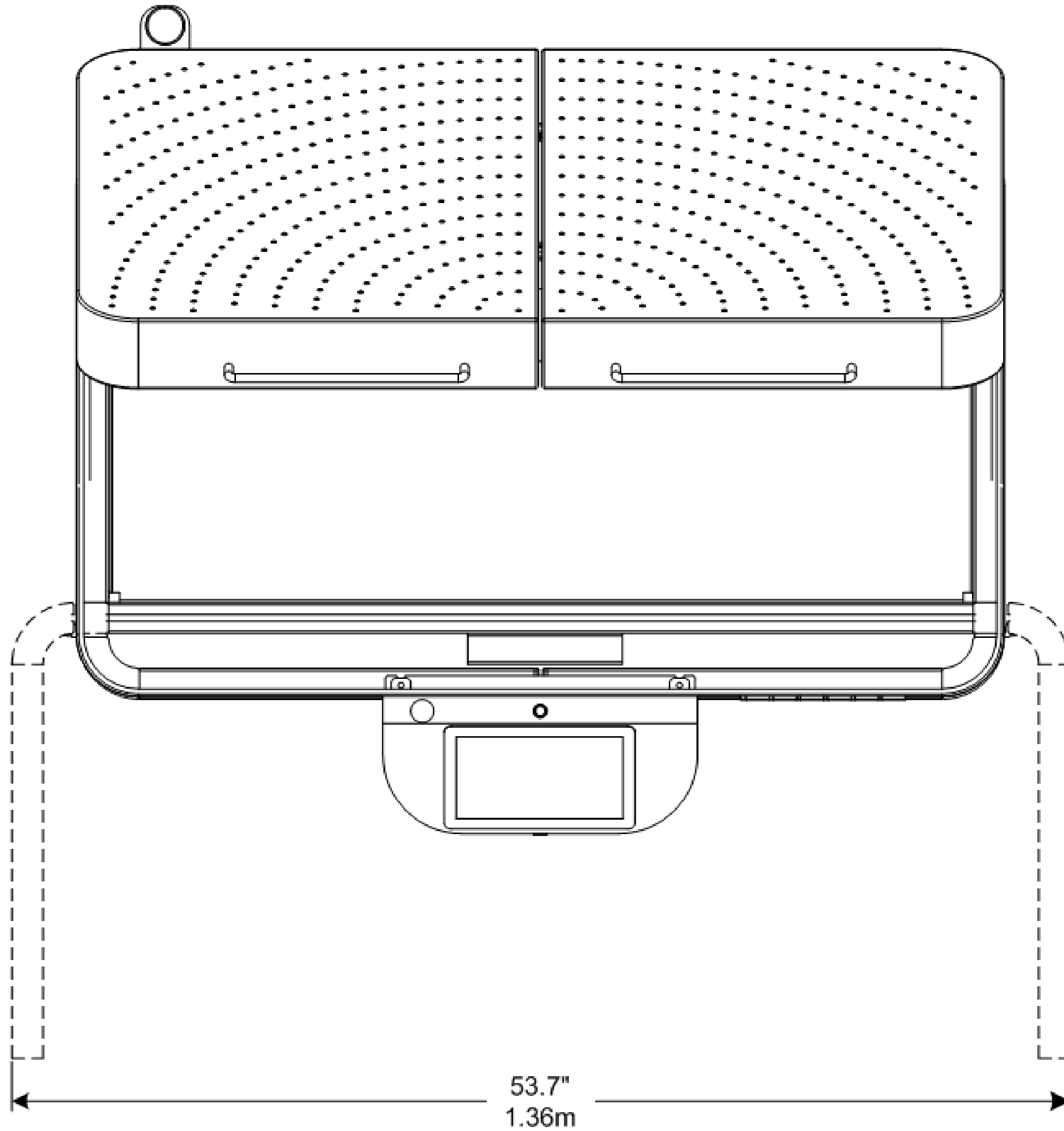

Figure 4: Apogee™ System
Top View (Open Covers) – With Dimensions

The Apogee™ Vacuum Pump Assembly is depicted in Figure 5 (below).

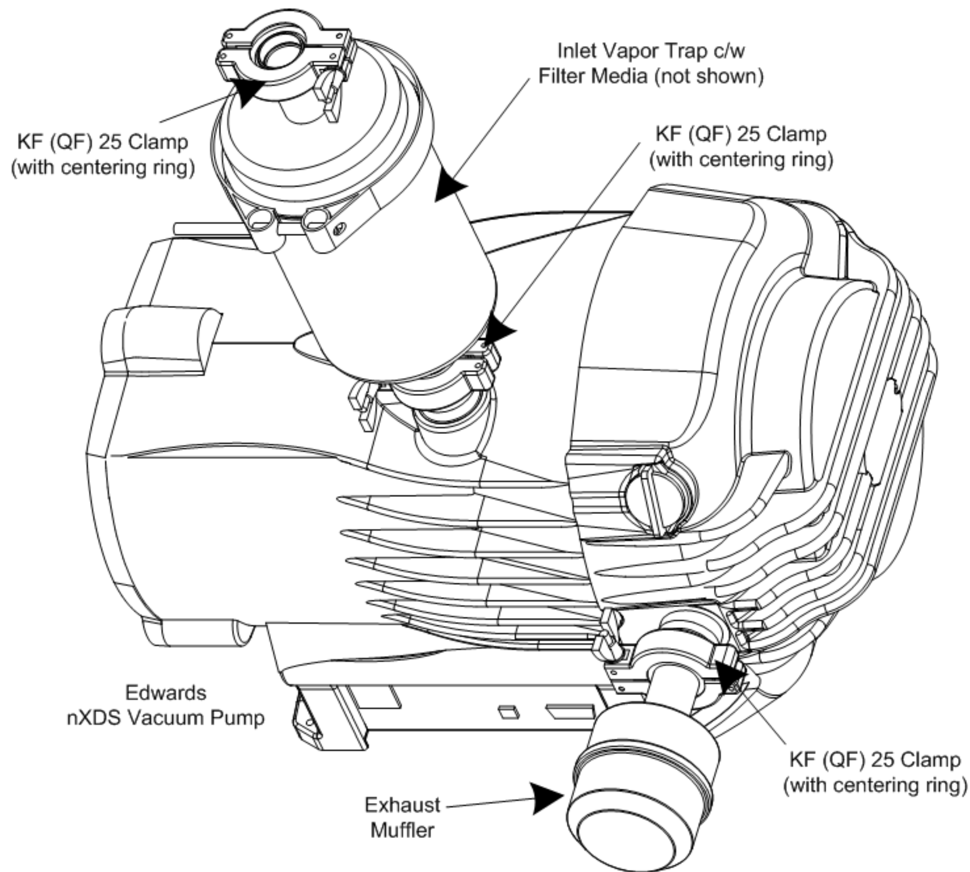

Figure 5: Apogee™ Vacuum Pump Assembly

The purpose of the vacuum pump assembly is to provide a source of vacuum tor Apogee™ Bonder operation. This is done by way of an Edwards nXDS series dry scroll pump. The pump is located in the cabinet beneath the bonder main assembly, and is automatically activated by the Apogee™ Bonder control system whenever vacuum is required for a bonding process. No further operator interaction is required.

Included in this assembly are the connection elements necessary to interface the pump to the Apogee™ Bonder. Additionally, convenience elements such as an exhaust muffler and input vapor trap are included.

For additional information please refer to Edwards vacuum pump manual.

The Apogee™ Lower Chamber is depicted in Figure 6 (below).

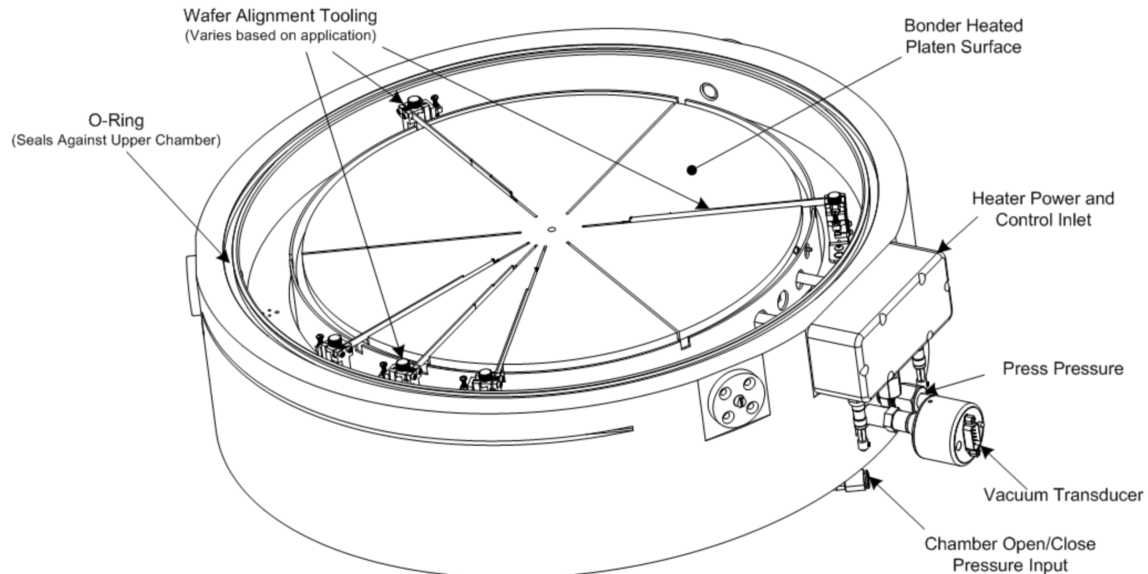

Figure 6: Apogee™ Lower Chamber Assembly

The Apogee™ lower chamber is where the wafers are loaded in advance of being bonded. The press platen surface is heated to the process temperature programmed in the bonding recipe, and size-specific wafer alignment fixtures keep both carrier and device wafer precisely aligned during the bonding stage.

When closed (against the upper chamber) the space inside is evacuated via the vacuum pump system. The level of vacuum is measured by way of a vacuum transducer located on the side of the chamber and is controlled by a solenoid valve on the baseplate

During bonding, the press platen is forced upward at the force programmed in the bonding recipe. The force is measured by way of the upper chamber vacuum transducer & the lower chamber vacuum transducer, and is controlled by software actuated solenoid valves on the baseplate.

Please refer to System Operations Manual for additional information.

The Apogee Upper Chamber is depicted in Figure 7 & 8 (below).

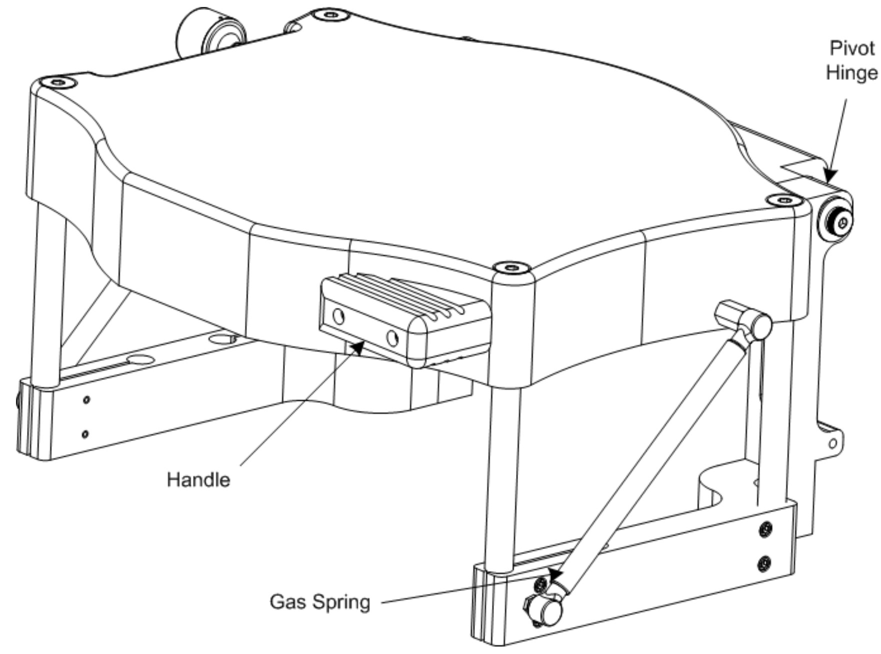

Figure 7: Apogee™ Upper Chamber Assembly (Front)

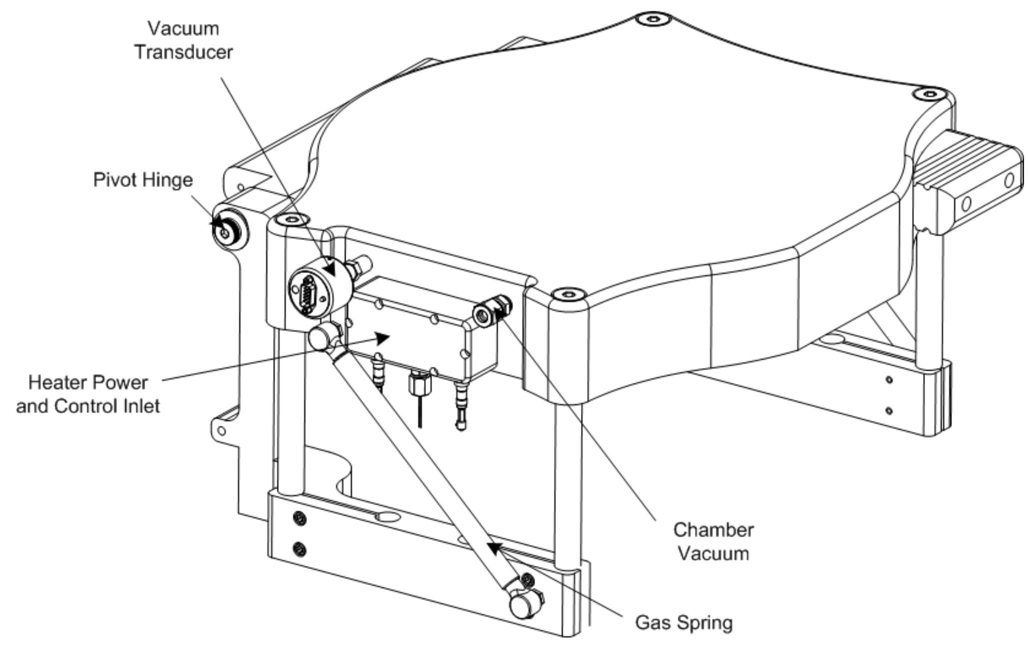

Figure 8: Apogee™ Upper Chamber Assembly (Rear)

In conjunction with the lower chamber, The Apogee™ upper chamber completes the bond chamber system. A heated platen in this upper chamber is heated to the process temperature programmed in the bonding recipe and ensures thorough bonding of your wafer stack.

When closed (against the lower chamber) the space inside is evacuated via the vacuum pump system. The level of vacuum is measured by way of a vacuum transducer located on the side of the chamber and is controlled by a solenoid valve on the baseplate.

The chamber can be pivoted upward for easy cleaning and maintenance. The supplied gas springs will keep the chamber open without the need to physically keep the chamber lifted. The chamber handle provides a facility to lift the chamber open for cleaning while keeping personnel safe from burns or other hazards.

Please refer to System Operations Manual for additional information.

The Apogee™ User Interface assembly is depicted in Figure 9 (below).

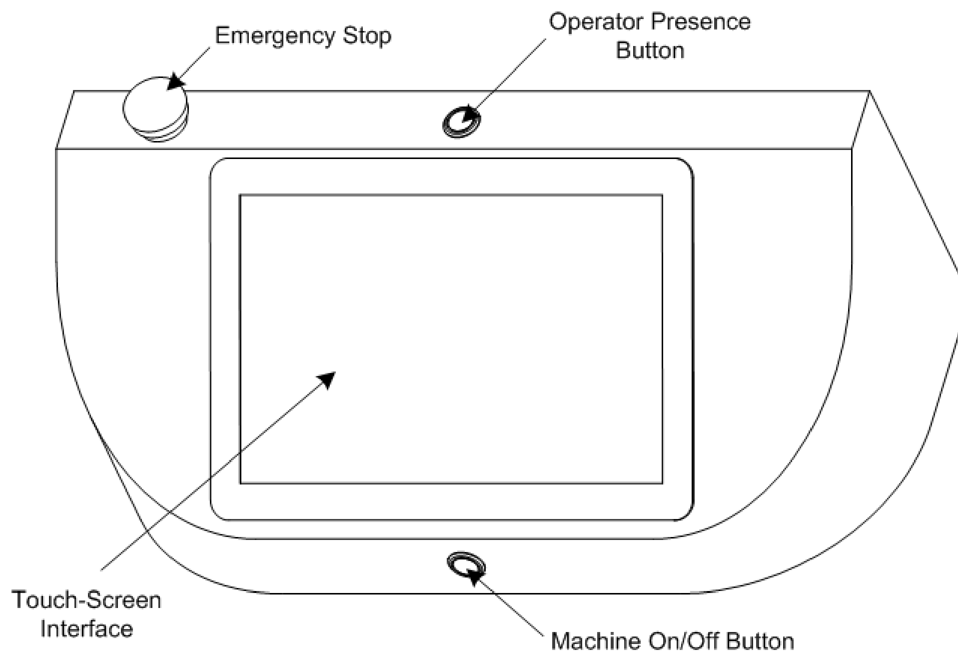

Figure 9: Apogee™ User Interface

It contains all elements used by the operator to interact with and control the Apogee Bonder. It includes physical elements such as the touch screen interface & EMO control and is located on the front of the machine for easy operator access.

Please refer to System Operations Manual for additional information.

The Apogee™ Baseplate Assembly is depicted in Figure 10 (below). The assembly / construction is divided up into the main areas identified in the image.

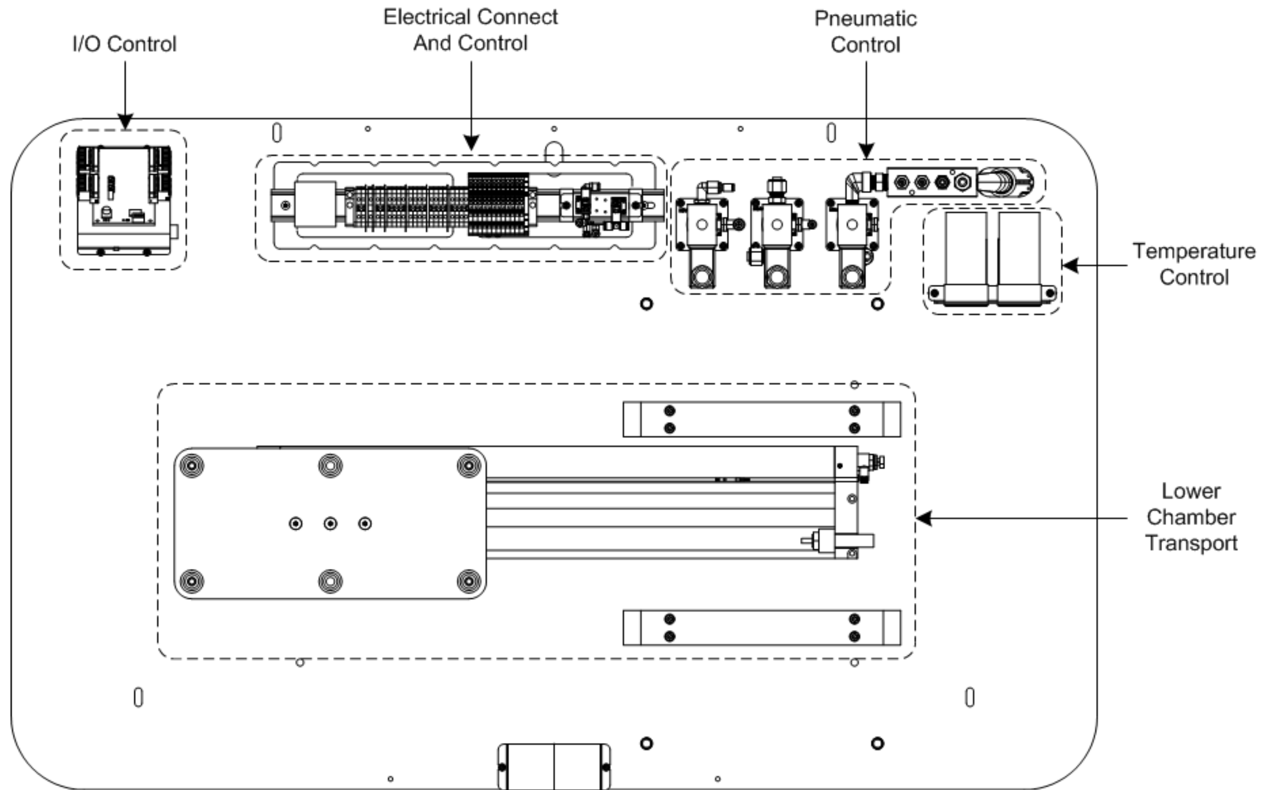

Figure 10: Apogee™ Baseplate Assembly

The I/O Control portion contains all electronic input / output signals in the system.

The Electrical connect and control section contains electrical connectivity elements and wire management.

The Apogee™ Utility Bracket is depicted in Figure 11 (below).

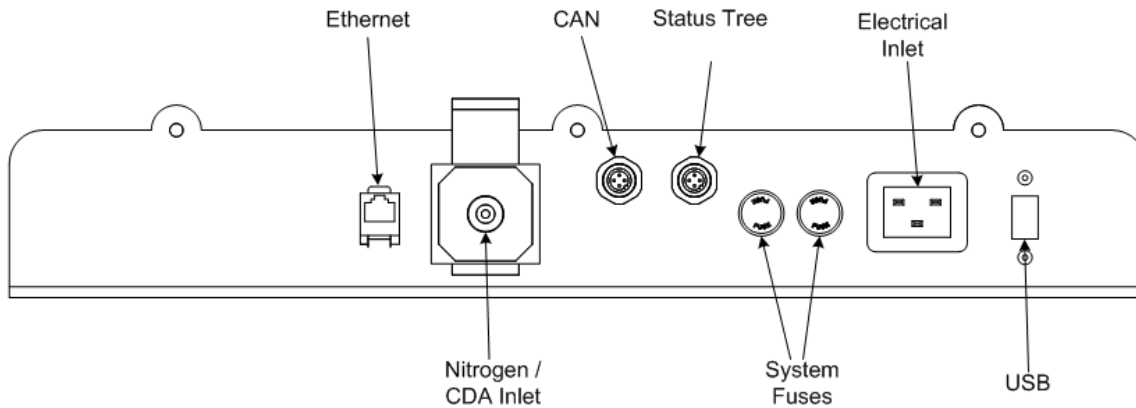

Figure 11: Apogee™ Utility Bracket Assembly

Apogee™ System utility connections are made via this panel. Be certain to allow sufficient space behind this area of the tool for wires & hoses, and connections for same. Please refer to Figure 2 (above) for suggested reserved spacing behind this panel.

Please refer to System Operations Manual for additional information.

Apogee™ Basic Wafer Alignment Hardware BSI P/N: 902518

The Apogee Basic Wafer Alignment Hardware is depicted in Figure 12 (below).

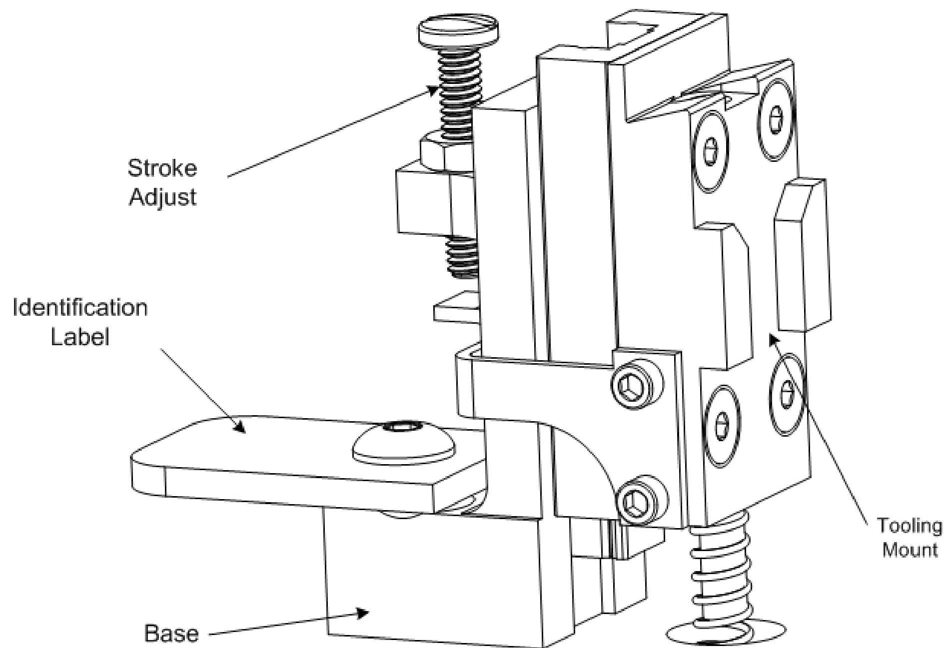

Figure 12: Apogee™ Basic Wafer Alignment Hardware

The Basic Wafer Alignment Hardware consists of the base alignment mechanism upon which all of the size-specific alignment pieces attach. This hardware assembly is installed at the factory and no further adjustment is typically required.

There is a stroke adjustment provided to accommodate different wafer stack thicknesses or other process parameters. The tooling mount is spring-loaded to provide the necessary support to the wafers during the bonding process.

A station identification label is also provided to make fitting the size-specific alignment parts easier and to reduce the incidence of fitting incorrect parts for the specific process being carried out. The various types of labels used in the Apogee™ are shown in Figure 13 (below).

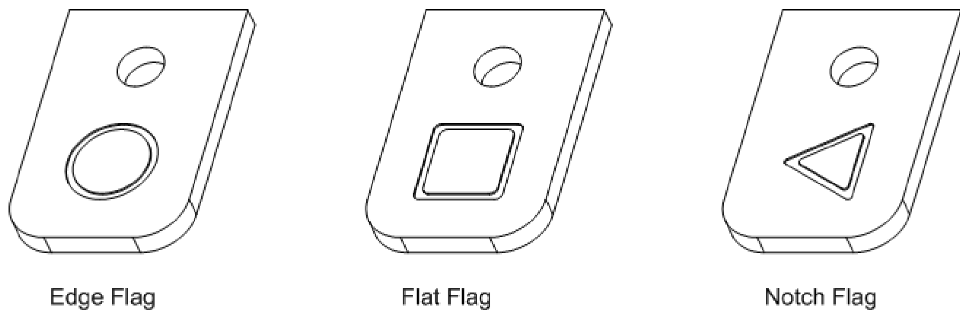

Figure 13: Apogee™ Basic Wafer Alignment Hardware Identification

The symbol depicted on the label corresponds to a symbol located on the particular alignment hardware piece for the associated station. The shape of the symbol is meant to have an intuitive meaning for the location it identifies.

- The label with a circle indicates a station associated with the edge of the wafer stack
- The label with a square indicates a station associated with the wafer flat of the stack (when using flatted wafers)
- The label with triangle indicates a station associated with the wafer notch of the stack (when using notched wafers).

Please refer to System Operations Manual for additional information.

100mm x 102mm Wafer Alignment BSI P/N: 902519

The 100mm x 102mm Wafer Alignment assembly is depicted in the figure below. It consists of all the pieces required to configure the tool for successfully aligning a 100mm device wafer and 102mm carrier wafer for off-size bonding.

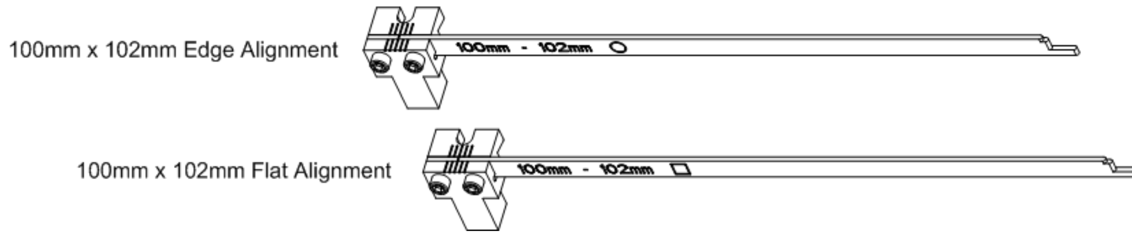

Figure 14: Apogee™ 100mm x 102mm Wafer Alignment

The user will note that the parts are clearly labeled with the size application for which the parts are intended as well as the symbol to indicate the alignment station where the part is intended to be fitted. Please refer to Figure 13 (above) for more information regarding the meaning of the symbols.

It should be noted that there are no notch alignment parts associated with this wafer bonding application due to standard wafers of this size being flatted only.

100mm x 152mm Wafer Alignment BSI P/N: 902520

The 100mm x 152mm Wafer Alignment assembly is depicted in the figure below. It consists of all the pieces required to configure the tool for successfully aligning a 100mm device wafer and a 152mm carrier wafer for off-size bonding.

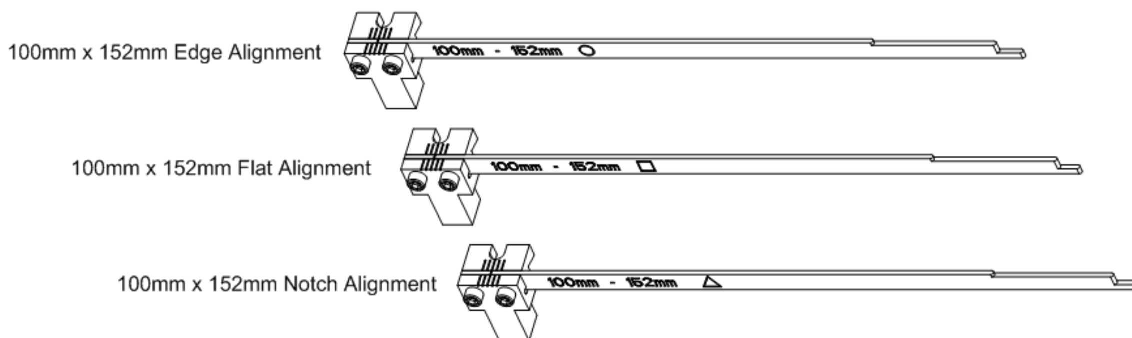

Figure 15: Apogee™ 100mm x 152mm Wafer Alignment

The user will note that the parts are clearly labeled with the size application for which the parts are intended as well as the symbol to indicate the alignment station where the part is intended to be fitted. Please refer to Figure 12 (above) for more information regarding the meaning of the symbols.

150mm x 152mm Wafer Alignment BSI P/N: 902521

The 150mm x 152mm Wafer Alignment assembly is depicted in the figure below. It consists of all the pieces required to configure the tool for successfully aligning a 150mm device wafer and a 152mm carrier wafer for off-size bonding.

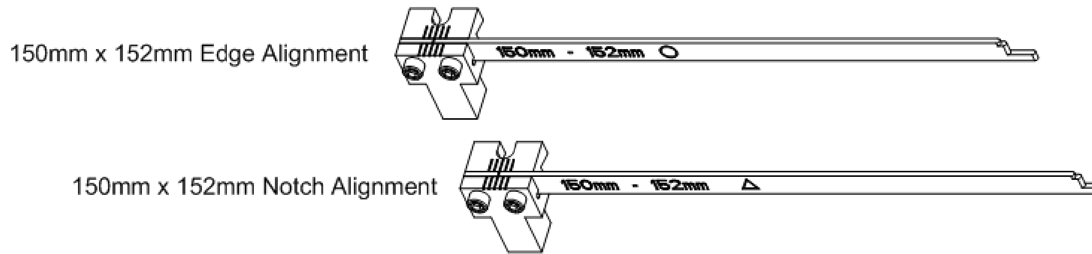

Figure 16: Apogee™ 150mm x 152mm Wafer Alignment

The user will note that the parts are clearly labeled with the size application for which the parts are intended as well as the symbol to indicate the alignment station where the part is intended to be fitted. Please refer to Figure 12 (above) for more information regarding the meaning of the symbols.

It should be noted that there are no flat alignment parts associated with this wafer bonding application due to standard wafers of this size being notched only.

200mm x 202mm Wafer Alignment BSI P/N: 902522

The 200mm x 202mm Wafer Alignment Assembly consists of all the pieces required to configure the tool for successfully aligning a 200mm device wafer and a202mm carrier wafer for off-size bonding.

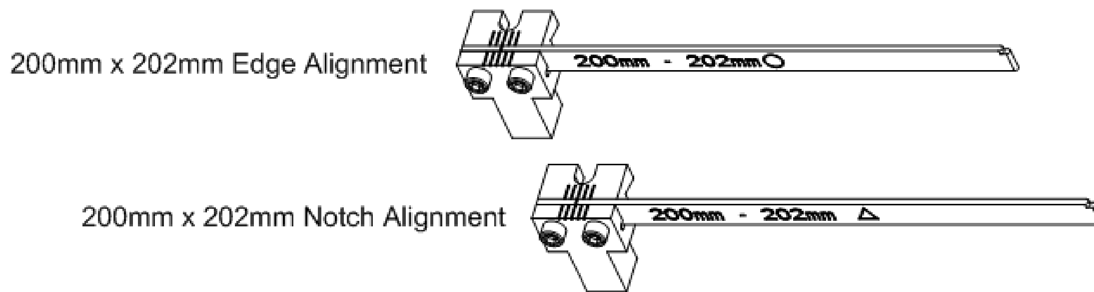

Figure 17: Apogee™ 200mm x 202mm Wafer Alignment

The user will note that the parts are clearly labeled with the size application for which the parts are intended as well as the symbol to indicate the alignment station where the part is intended to be fitted. Please refer to Figure 12 (above) for more information regarding the meaning of the symbols.

It should be noted that there are no flat alignment parts associated with this wafer bonding application due to standard wafers of this size being notched only.

Please refer to System Operations Manual for additional information.