HIWIN®

Wafer Aligner

SEMI S2 CE RoHS

HIWIN Support

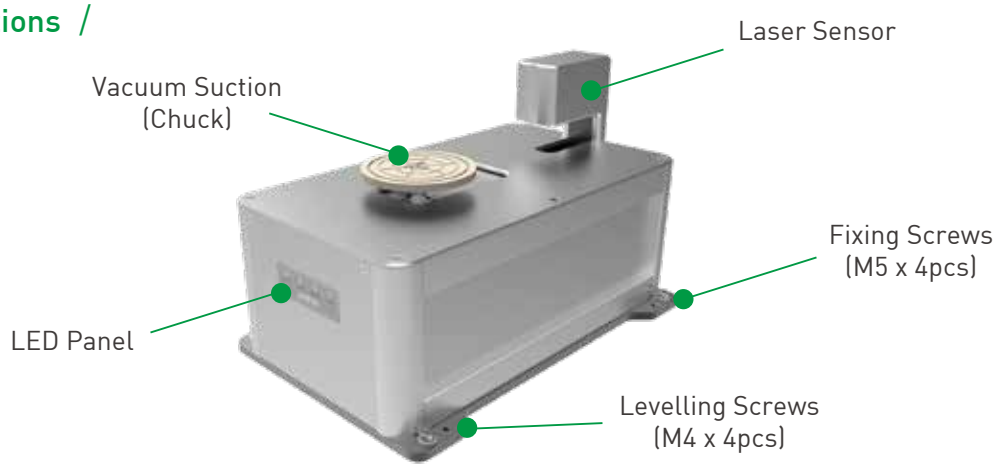
About HIWIN

Features /

- HPA series is a three-axis controlled wafer aligner, utilizing HIWIN mechatronic components for high speed, high precision and high efficiency.
- Integrated controller. External controller and cables are not needed, saving space and reducing design complexity.
- Equipped with a smart light-transmitting laser sensor that can support the profile detection function of transparent, translucent and opaque objects, it is applicable for wafers and glass with diameters in 2 inch~12 inch.
- Cleanliness level of the product is Class 1, suitable for applications in semiconductor and photonics.
- Wafer aligning, wafer centering, angle corrections and maintaining a centering repeatability of ± 0.1mm can be completed under 5 seconds.
- In compliance with relevant safety regulations and directives, the equipment provides a Category 0 stop function. It is recommended to integrate a safety circuit and various functional real-time monitoring modules such as motor control systems, sensing systems, and vacuum systems, ...etc with a system integration partner to offer users the most comprehensive and secure protection.
- Emergency Stop Function: Please use the external emergency stop circuit to cut off the power supply of the input side.
- User friendly design. Status indicators on the equipment exterior allowing user to monitor the status in real time.
- HIWIN's Wafer Aligner has obtained RoHS2 certification, and uses WGK1-compliant grease and NBSK-compliant environmentally friendly packaging.

System Structure /

Parts and Functions /

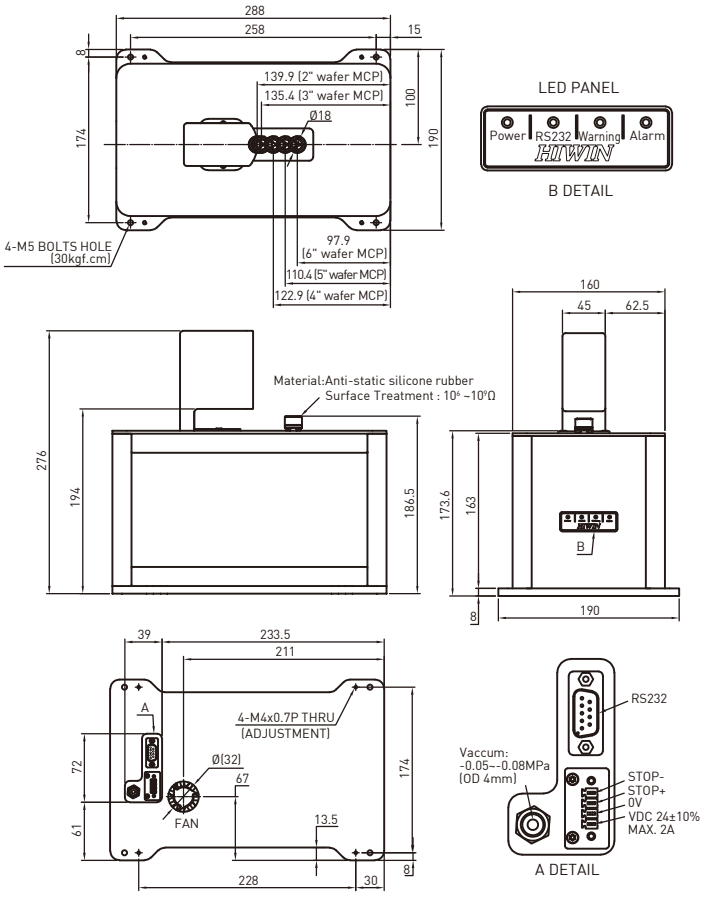


Specifications and Dimensions-HPA Series /

HPA26

Item	Specifications	
Model	2", 3", 4", 5", 6" shared type	
Model Number	HPA26	
Wafer Size	2", 3", 4", 5", 6"	
Wafer Material	Transparent, Translucent, Opaque*Note1	
Wafer Features	Flat / Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm*Note2	
Wafer Warpage	$<\pm$0.1 mm*Note2	
Number of Motion Axis	3-axis (X, Y, θ)	
Wafer Handling Method	Vacuum Suction (Chuck)	
Working Range	X	56 mm
	Y	$\pm$10 mm
	θ	Continuous
Allowable Wafer Offset	$\pm$R4 mm	
Accuracy (RP=Ave+3σ)	Centering	$<\pm$ 0.1 mm
	Notch Angle	$<\pm$ 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V $\pm$ 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Vacuum	Tube size	Ø4 mm
	Pressure	-0.05~-0.08 MPa
	Flow	10 L/min (ANR)
Ambient Temperature	5~40°C	
Ambient Humidity	30~65% (No condensation)	
Weight	6 kg	
Size	L288 mm x W190 mm x H276 mm	

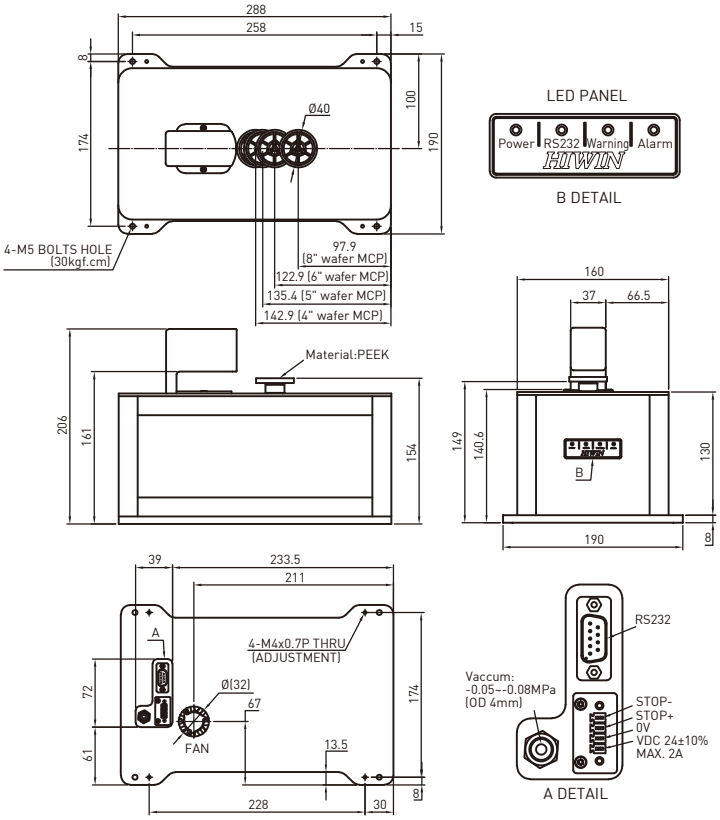
* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.



HPA48

Item	Specifications	
Model	4", 5", 6", 8" shared type	
Model Number	HPA48	
Wafer Size	4", 5", 6", 8"	
Wafer Material	Transparent, Translucent, Opaque*Note1	
Wafer Features	Flat / Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm*Note2	
Wafer Warpage	$<\pm$0.1 mm*Note2	
Number of Motion Axis	3-axis (X, Y, θ)	
Wafer Handling Method	Vacuum Suction (Chuck)	
Working Range	X	63 mm
	Y	$\pm$10 mm
	θ	Continuous
Allowable Wafer Offset	4 inch:$\pm$R5 mm ; 5, 6 inch:$\pm$R8 mm ; 8 inch:$\pm$R10 mm	
Accuracy (RP=Ave+3σ)	Centering	$<\pm$ 0.1 mm
	Notch Angle	$<\pm$ 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V $\pm$ 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Vacuum	Tube size	Ø4 mm
	Pressure	-0.05~-0.08 MPa
	Flow	10 L/min (ANR)
Ambient Temperature	5~40°C	
Ambient Humidity	30~65% (No condensation)	
Weight	5.8 kg	
Size	L288 mm x W190 mm x H206 mm	

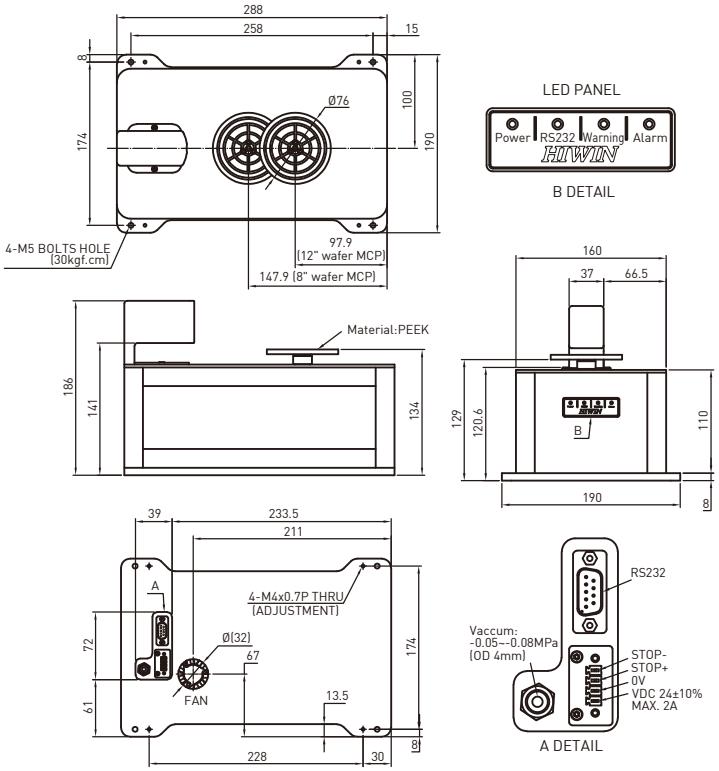
* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.



Specifications and Dimensions-HPA Series /

HPA812

Item	Specifications	
Model	8", 12" shared type	
Model Number	HPA812	
Wafer Size	8", 12"	
Wafer Material	Transparent, Translucent, Opaque *Note1	
Wafer Features	Flat / Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm *Note2	
Wafer Warpage	＜±0.1 mm *Note2	
Number of Motion Axis	3-axis (X、Y、θ)	
Wafer Handling Method	Vacuum Suction (Chuck)	
Working Range	X	70 mm
	Y	±10 mm
	θ	Continuous
Allowable Wafer Offset	± R10 mm	
Accuracy (RP=Ave+3σ)	Centering	＜ ± 0.1 mm
	Notch Angle	＜ ± 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V ± 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Vacuum	Tube size	Ø4 mm
	Pressure	-0.05~-0.08 MPa
	Flow	10 L/min (ANR)
Ambient Temperature	5~40 °C	
Ambient Humidity	30~65% (No condensation)	
Weight	5.5 kg	
Size	L288 mm x W190 mm x H186 mm	

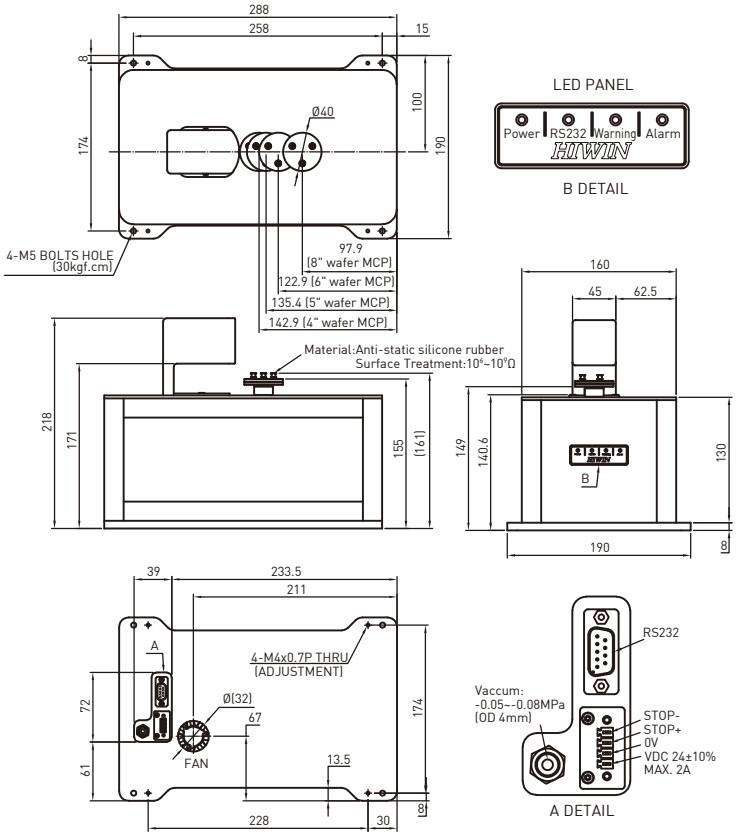


* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.

Specifications and Dimensions-HPA-W Series (Warped wafer) /

HPA48-W

Item	Specifications	
Model	4", 5", 6", 8" shared type	
Model Number	HPA48-W	
Wafer Size	4", 5", 6", 8"	
Wafer Material	Transparent, Translucent, Opaque*Note1	
Wafer Features	Flat / Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm*Note2	
Wafer Warpage	＜±1.5 mm (Difference of Height＜3mm)*Note2	
Number of Motion Axis	3-axis (X、Y、θ)	
Wafer Handling Method	Vacuum Suction (Chuck)	
Working Range	X	63 mm
	Y	±10 mm
	θ	Continuous
Allowable Wafer Offset	±R5 mm	
Accuracy*Note3 (RP=Ave+3σ)	Centering	＜ ± 0.1 mm
	Notch Angle	＜ ± 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V ± 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Vacuum	Tube size	Ø4 mm
	Pressure	-0.05~-0.08 MPa
	Flow	10 L/min (ANR)
Ambient Temperature	5~40°C	
Ambient Humidity	30~65% (No condensation)	
Weight	6.3 kg	
Size	L288 mm x W190 mm x H218 mm	

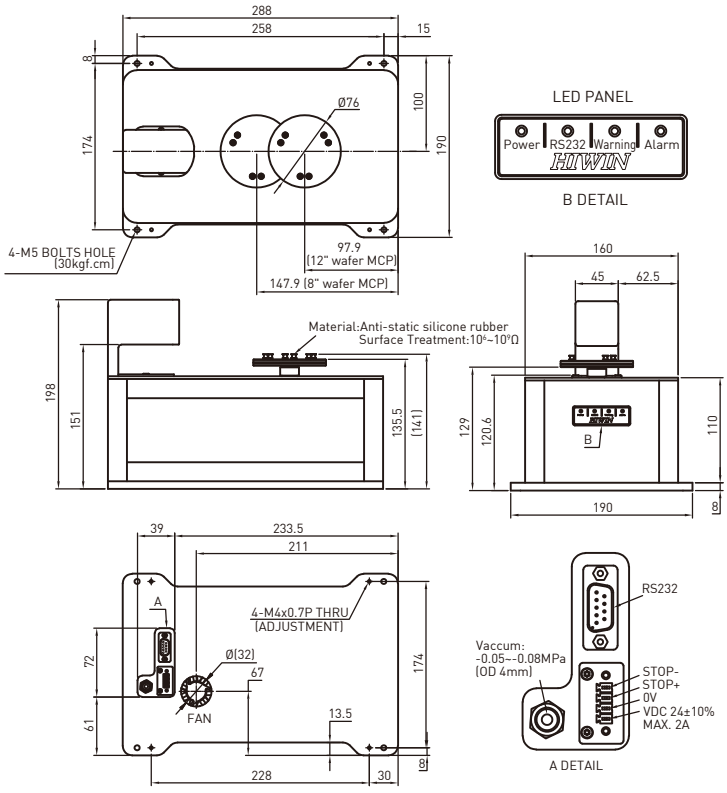


* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.
Note3 : This data is measured by dummy wafer, if there are other products, please contact HIWIN.

Specifications and Dimensions-HPA-W Series (Warped wafer) /

HPA812-W

Item	Specifications	
Model	8", 12" shared type	
Model Number	HPA812-W	
Wafer Size	8", 12"	
Wafer Material	Transparent, Translucent, Opaque *Note1	
Wafer Features	Flat / Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm*Note2	
Wafer Warpage	＜±1.5 mm (Difference of Height＜3mm)*Note2	
Number of Motion Axis	3-axis (X、Y、θ)	
Wafer Handling Method	Vacuum Suction (Chuck)	
Working Range	X	70 mm
	Y	±10 mm
	θ	Continuous
Allowable Wafer Offset	± R10 mm	
Accuracy*Note3 (RP=Ave+3σ)	Centering	＜ ± 0.1 mm
	Notch Angle	＜ ± 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V ± 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Vacuum	Tube size	Ø4 mm
	Pressure	-0.05~-0.08 MPa
	Flow	10 L/min (ANR)
Ambient Temperature	5~40 ℃	
Ambient Humidity	30~65% (No condensation)	
Weight	6 kg	
Size	L288 mm x W190 mm x H198 mm	

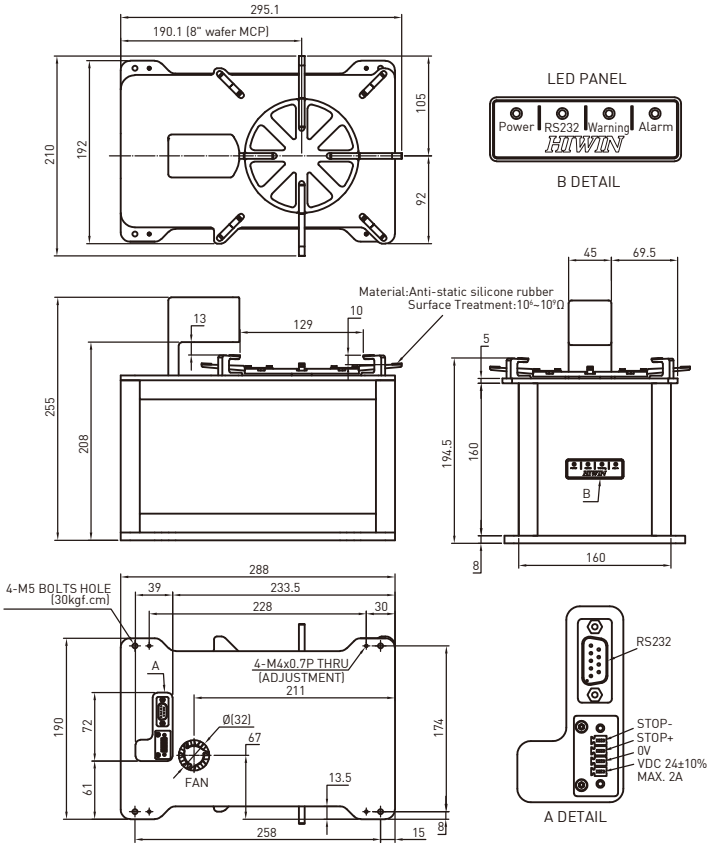


* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.
Note3 : This data is measured by dummy wafer, if there are other products, please contact HIWIN.

Specifications and Dimensions-HPA-E Series (Edge handling) /

HPA8-E

Item	Specifications	
Model	8"	
Model Number	HPA8-E	
Wafer Size	8"	
Wafer Material	Transparent, Translucent, Opaque*Note1	
Wafer Features	Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm*Note2	
Wafer Warpage	＜±0.1 mm *Note2	
Number of Motion Axis	3-axis (X、Z、θ)	
Wafer Handling Method	Edge Contact	
Working Range	X	8 mm
	Z	15.5 mm
	θ	Continuous
Allowable Wafer Offset	± R4 mm	
Accuracy (RP=Ave+3σ)	Centering	＜ ± 0.1 mm
	Notch Angle	＜ ± 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V ± 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Ambient Temperature	5~40 ℃	
Ambient Humidity	30~65% (No condensation)	
Weight	6.3 kg	
Size	L295.1 mm x W210 mm x H255 mm	



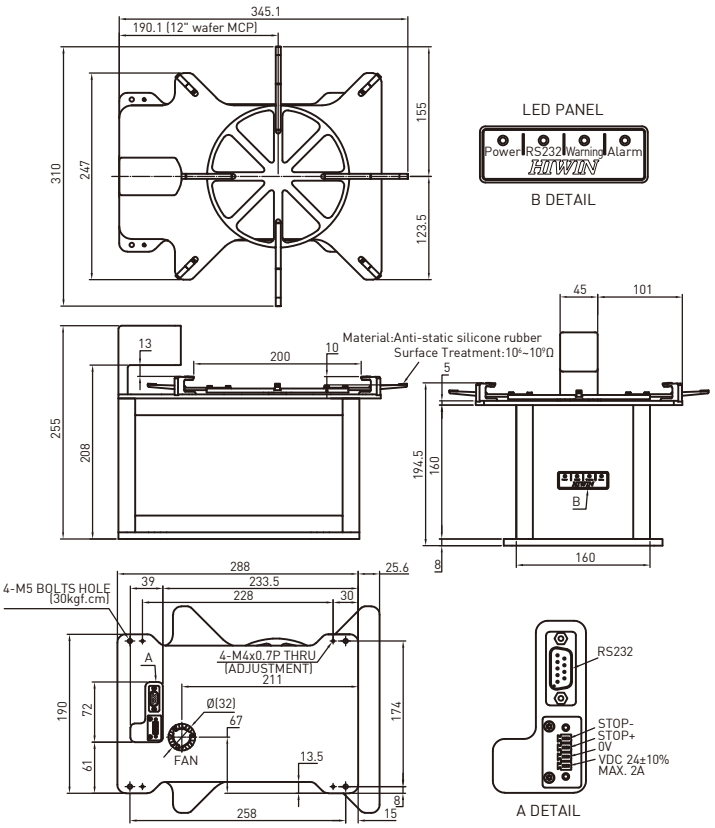
* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.

Specifications and Dimensions-HPA-E Series (Edge handling) /

HPA12-E

Item	Specifications	
Model	12"	
Model Number	HPA12-E	
Wafer Size	12"	
Wafer Material	Transparent, Translucent, Opaque*Note1	
Wafer Features	Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm*Note2	
Wafer Warpage	＜±0.1 mm*Note2	
Number of Motion Axis	3-axis (X、Z、θ)	
Wafer Handling Method	Edge Contact	
Working Range	X	8 mm
	Z	15.5 mm
	θ	Continuous
Allowable Wafer Offset	± R4 mm	
Accuracy (RP=Ave+3σ)	Centering	＜ ± 0.1 mm
	Notch Angle	＜ ± 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V ± 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Ambient Temperature	5~40 °C	
Ambient Humidity	30~65% (No condensation)	
Weight	6.4 kg	
Size	L345.1 mm x W310 mm x H255 mm	

* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.

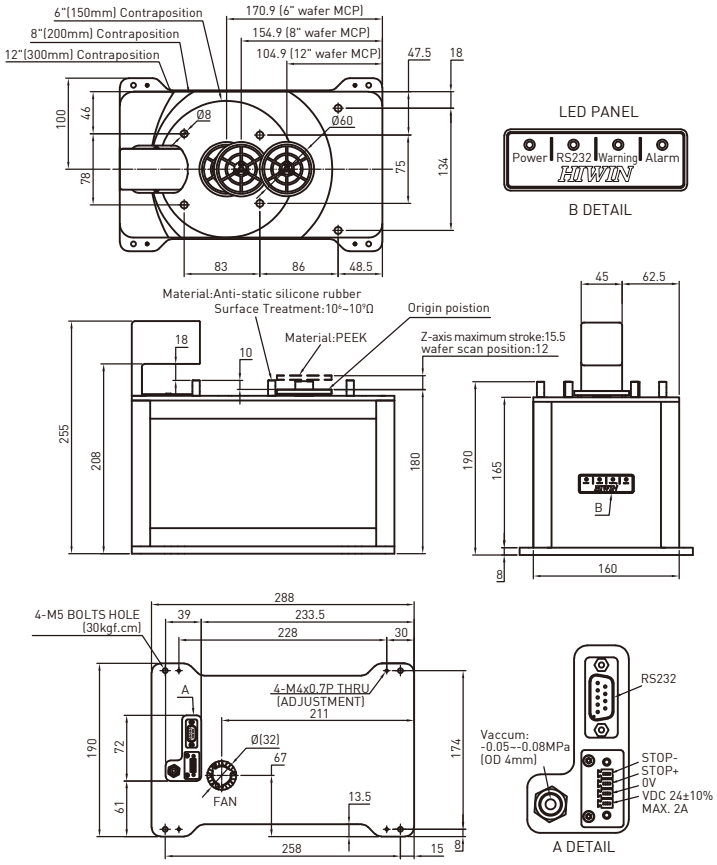


Specifications and Dimensions-HPA-S Series (Stand-alone) /

HPA612-S

Item	Specifications	
Model	6", 8", 12" shared type	
Model Number	HPA612-S	
Wafer Size	6", 8", 12"	
Wafer Material	Transparent, Translucent, Opaque *Note1	
Wafer Features	Flat / Notch (SEMI Standard)	
Wafer Thickness	0.4~0.8 mm*Note2	
Wafer Warpage	＜±0.1 mm *Note2	
Number of Motion Axis	3-axis (X、Z、θ)	
Wafer Handling Method	Vacuum Suction (Chuck)	
Working Range	X	75 mm
	Z	15.5 mm
	θ	Continuous
Allowable Wafer Offset	± R4 mm	
Accuracy (RP=Ave+3σ)	Centering	＜ ± 0.1 mm
	Notch Angle	＜ ± 0.2°
Communication Protocol	RS232	
Cleanliness Level	Class 1	
Power Supply	Voltage	DC 24V ± 10%
	Current	Max. 2A
Safety Circuit	After disconnected, the stop activates.	
Vacuum	Tube size	Ø4 mm
	Pressure	-0.05~-0.08 MPa
	Flow	10 L/min (ANR)
Ambient Temperature	5~40 °C	
Ambient Humidity	30~65% (No condensation)	
Weight	6.3 kg	
Size	L288 mm x W190 mm x H255 mm	

* Note1 : Suitable for materials such as silicon wafers, substrates and glass.
Note2 : For other specifications, please contact HIWIN to discuss customized development.



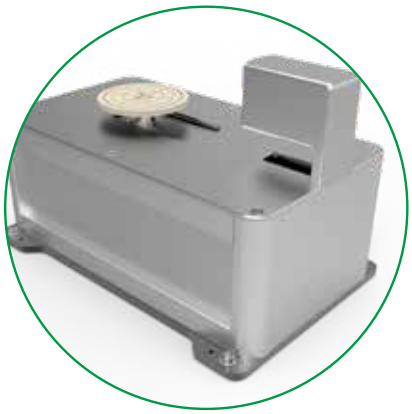
Model Selection Requirement Table

Company Name		Date	
Contact		Tel	
E-Mail		Fax	
Address			

Pre-selected Model Number	
Wafer Size	☐ 2 inch(50mm) ☐ 3 inch(75mm) ☐ 4 inch(100mm) ☐ 5 inch(125mm) ☐ 6 inch(150mm) ☐ 8 inch(200mm) ☐ 12 inch(300mm) ☐ Others:
Wafer Thickness	Wafer Thickness:_____ mm；Wafer Maximum Warpage:_____ mm
Wafer Features	☐ None ☐ Notch ☐ Flat ☐ Double-flat ☐ Others:
Wafer Material	☐ Wafer ☐ Glass ☐ Sapphire Substrate ☐ Others:
Wafer Loading Method	☐ Vacuum ☐ Edge handling ☐ Others:
Wafer Contact Material	☐ PEEK(Standard) ☐ PEEK_ESD(10^6~$10^9\Omega$) ☐ Aluminum ☐ Others:
Accuracy Requirements	
Alignment Time	
Communication Method	☐ Serial communication (RS232) ☐ Others:
Usage Environment	☐ Clean Room ISO Class: _____ ☐ Dust IP: ____X ☐ Water IP: X____ ☐ High Temperature _____°C ☐ Low Temperature _____°C ☐ Chemical Corrosion ☐ Humid ☐ Vibration ☐ Others:
Application Method/Process	
Remark	

Standard Items /

- Wafer Aligner unit: A total of 1 unit
- Power and stop connector: A total of 1 unit (Pin definitions: 24V, 0V, STOP+, STOP-)
- RS232 cable: A total of 1 cable (DB9-F connector on both ends, dual magnetic clasps, cable length 3 meters)
- Anti-static silicone rubber pads (back glue included): Eight pirces in total (HPA-E type only)
- Anti-static silicone rubber washers (back glue included): Six pirces in total (HPA-S type only)



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