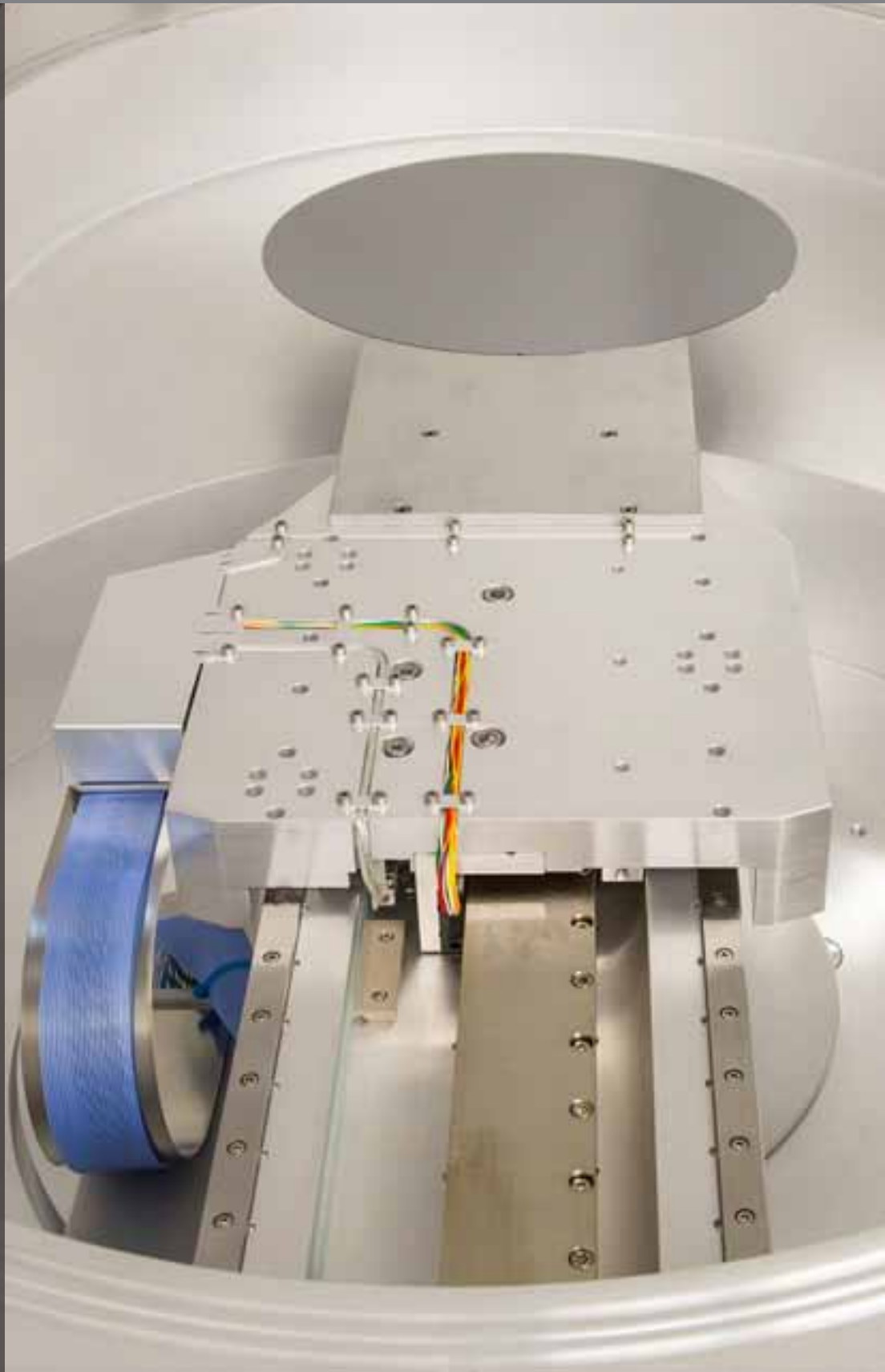


# Ultra High Vacuum Robot



## Ultra High Vacuum Robot

Trust Automation offers a customizable 300mm Ultra High Vacuum Robot that is a precision, in-chamber, wafer handling and positioning system configured for metrology processes. The UHV Robot is capable of X and Y precision to less than +/- 4  $\mu\text{m}$  over the full wafer envelope and less than +/- 0.2 $\mu\text{m}$  for the 50mm z axis. Coordinated with the 3 axes of the UHV robot an additional five axes of related motion can be incorporated.

The UHV robot interfaces with the chamber and application specific end effector (EE) offering a range of capabilities that can be customized to meet varying requirements and demands of any OEM semiconductor equipment manufacturer.

We provide ground-up custom solutions for our customers. Call us to discuss your specific needs and we'll design and manufacture a system for you.



### Class 10,000 Clean Room:

Trust Automaton's ISO7/ Class 10,000 hard wall clean room designed specifically for UHV and HV Robot assembly and in system test is capable of ISO6/ 1,000 standards. Our ability to not just design a UHV robot, but to also qualify these robots in vacuum to 10<sup>-9</sup> Torr makes us a viable partner who provides an end to end fully validated and qualified solution covering all engineering disciplines in house.

The modular design of the room, allows us to expand this clean room in blocks to accommodate future expansion. A common anteroom arrangement enables proper double bag procedures to be followed and compliments the room's nitrogen venting system and nitrogen bagging of the end robots. Not only will your UHV robot be built in a clean room, but it will be qualified under vacuum to your specifications. The final step is to remove the system and double bag the robot with a nitrogen fill for easy system integration of a qualified system at your factory.

### Benefits:

- High reliability
- Custom multiple axes
- Configurable to maximize efficiency
- Customizable form and fit for specific manufacturing applications
- High accuracy
- High throughput
- Increase product quality and reliability
- Superior customer service support

### Applications:

- Semiconductor
  - Wafer metrology / inspection
  - Wafer transfer
  - Wafer handling
- A three axes independent stage can be coordinated to the three axes robot. Anode stage will interface with chamber and end effector
- Consists of up to eight axes of motion coordinated or independent; R (X), Y, Z, e (rotation), and roll
- Flat Panel
  - Inspection
  - Transfer
  - Handling

## Specifications Range, UHV Robot is Customizable to Your Specifications:

DESCRIPTION	VALUE	COMMENTS
<b>X Axis</b>		
Accuracy – >50µm movement	< 10 µm positioning accuracy	See notes 1,2
Repeatability – >50µm movement	<2 µm positioning accuracy	See notes 1,2
Accuracy – <50µm movement	< 0.5 µm positioning accuracy	See notes 1,2
Repeatability – <50µm movement	< 1 µm positioning accuracy	See notes 1,2
Resolution	0.1µm	
Travel, variable	>500 mm	
Move Time	>0.38 sec for a 100mm move	With wafer on EE
Move Time	>0.25 sec for a 100mm move	Without a wafer on EE
<b>Theta Axis</b>		
Accuracy – >50µm transition	<4.5 arc sec	See notes 1,2
Repeatability – >50µm transition	<0.9 arc sec	See notes 1,2
Accuracy - <50µm transition	<0.225 arc sec	See notes 1,2
Repeatability - <50µm transition	<0.45 arc sec	See notes 1,2
Resolution	0.90 arc sec	
Travel	>300 degrees	
Move Time	>1.5 sec for a 90° move	With wafer on EE
Move Time	>0.25 sec for a 15° move	With wafer on EE
<b>Z Axis</b>		
Accuracy	5µm/1mm	
Repeatability	0.25µm	
Resolution	0.1µm	
Travel	>50mm	X and Y stability 0.5µm/100mm of Z travel
Move Time	>3mm/sec	
<b>Miscellaneous</b>		
Settling Time	<1 sec	Measured after arriving at requested position
Stability / Drift	<0.5µm/30 sec	During measurement – See note 1
Vibration	>100 Hz	Natural frequency of system
Vacuum Level	1e-8 Torr	Low to ultra high
Payload	>1.2 Kg	EE and 300 mm wafer or other component
Configurable Envelope	450mm wafer applications	
Duty Cycle – X axis	X%	
Duty Cycle – Theta axis	50%	
Duty Cycle – Z axis	20%	
Stray Magnetic Fields		
MCBF	>11 Million Cycles	LL to Analysis point and back

### Notes:

1. Accuracy and repeatability values include a 300mm wafer on the EE
2. These requirements could be achieved by mapping



