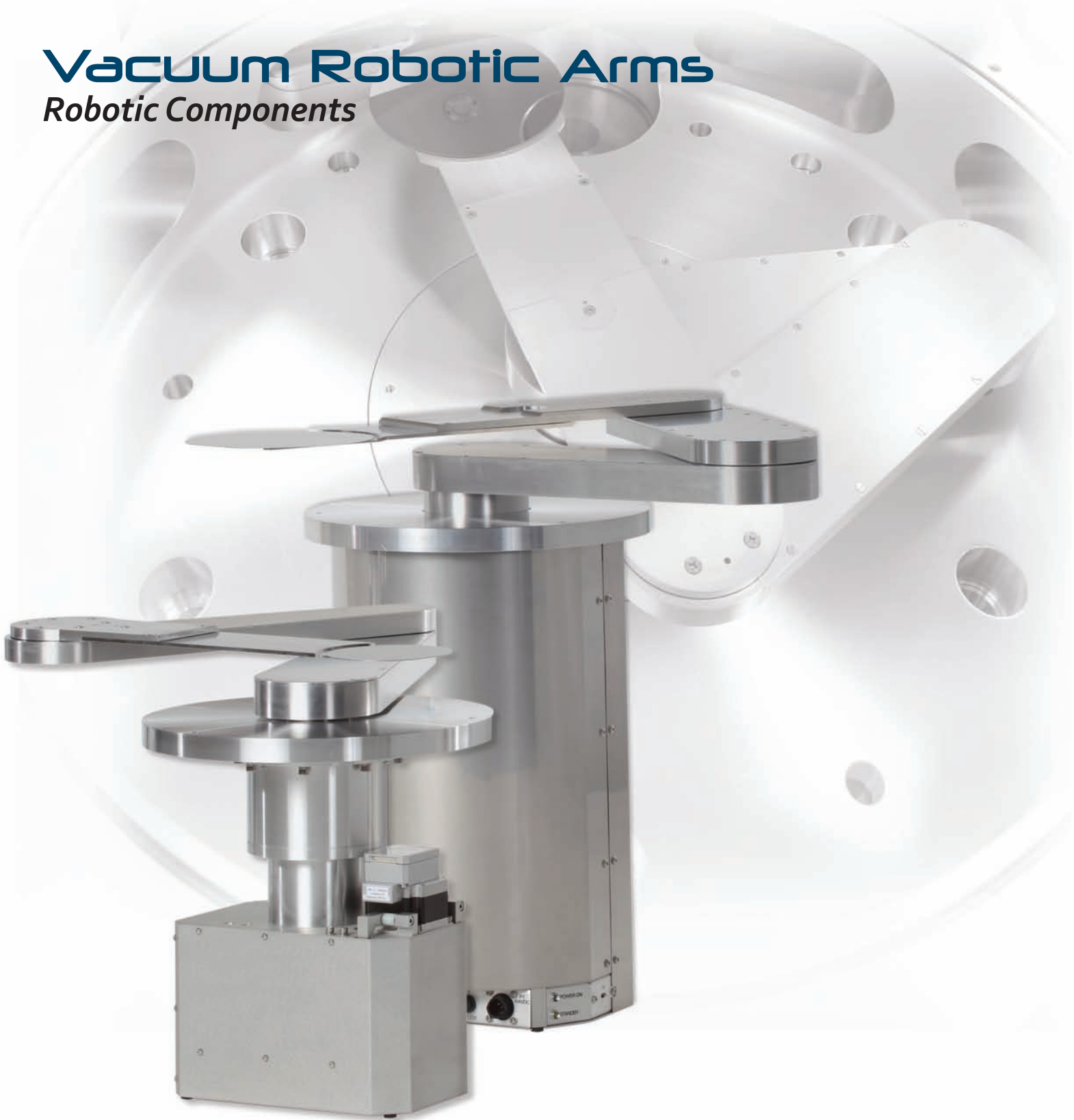




# Vacuum Robotic Arms

*Robotic Components*





# HA-3.0 Vacuum Robotic Arms

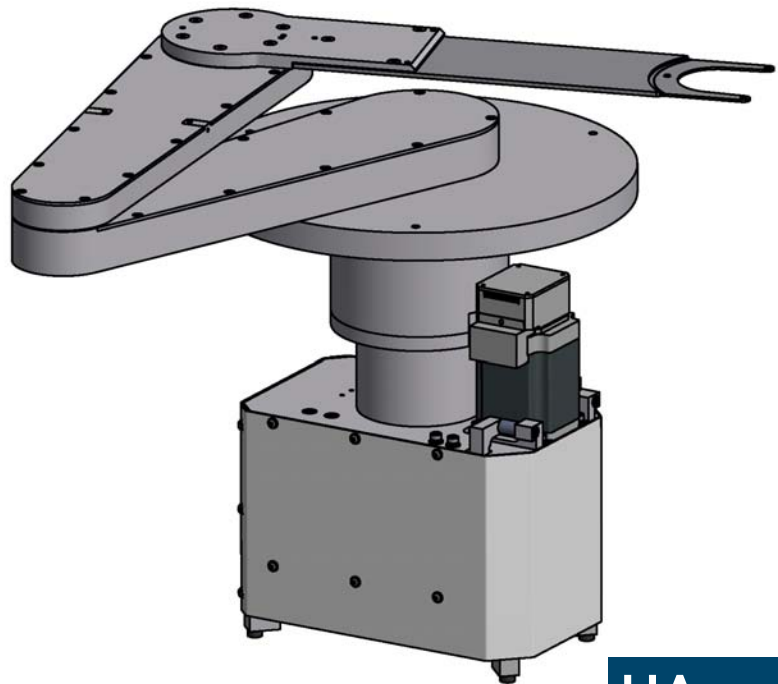
## Robotic Components

### FEATURES

- High reliability of > 3 million MCBF
- 2-axis motion control
- Pay load up to 4.5kg
- Standard and custom size arm segments
- Standard and custom end effectors (single or dual)
- Compact design including integrated controller
- RS-232 / Ethernet control interface
- CE/S2 compliant
- High vacuum compatible
- Class 1 cleanroom compatible

### OPTIONS

- Arm Segments Sizes
- Single and Dual End Effectors
- Payloads between 1.5kg and 4.5kg
- Custom substrate sizes



HA-3.0

Hine Automation's Vacuum Robotic Arms are the next generation Vacuum SCARA Robots. Designed as an entry level product, the HA-3.0 Vacuum Robotic Arm offers "straight-line" horizontal motion in an economic package. The HA-3.0 is a perfect fit for budget sensitive projects where no vertical travel is required. With its proprietary drive mechanism, the HA-3.0 has the appropriate accuracy and repeatability to become the central handler of any vacuum cluster system. Arm segments and end-effectors can be easily customized to be compatible with nearly any material cassette or process module configuration. For applications where vertical motion is required, Z-travel can be added prior or post installation.



# HA-5.0 Vacuum Robotic Arms

## Robotic Components

### FEATURES

- High reliability of > 3 million MCBF
- 3-axis motion control
- Pay load up to 4.5kg
- Standard and custom size arm segments
- Standard and custom end effectors (single or dual)
- Compact design including integrated controller
- RS-232 / Ethernet control interface
- CE/S2 compliant
- HA-5.0 is the best replacement for the Hine Design robotic arm model 4.5
- High vacuum compatible
- Class 1 cleanroom compatible

### OPTIONS

- Arm Segments Sizes
- Single and Dual End Effectors
- Payloads between 1.5kg and 4.5kg
- Custom substrate sizes



Hine Automation's Vacuum Robotic Arms are the next generation Vacuum SCARA Robots. Designed as the central handling robot for Hine's Constellation systems, the HA-5.0V can be integrated with any vacuum cluster system. Arm segments and end-effectors of the HA-5.0 can be easily customized to meet nearly any OEM requirement. Thanks to its ferrofluidic rotary seals, harmonic drive brushless DC motors, and high strength undercarriage, the HA-5.0 Vacuum Robotic Arm transfers substrates with high precision and repeatability within high vacuum environments. The HA-5.0 features identical command sets and form factor as the vacuum robotic arm manufactured previously by Hine Design® and can be used as a replacement for the 4.5 model.



# Vacuum Robotic Arms

## Robotic Components

	HA-3.0	HA-5.0
Wafer Sizes	300mm†	300mm†
Pay Load	1.5kg*	4.5kg*
Mounting configuration	Top	Top
Axes of Motion	R, $\theta$	R, $\theta$ , Z
Weight	15kg	35kg
Vacuum performance		
Base operating pressure	<5.00E-06 Torr	<5.00E-06 Torr
Leak Rate	1.00E-09 scc He/sec	1.00E-09 scc He/sec
Input Power	24V DC at 3.0 Amps	24V DC at 5.0 Amps
Maximum Temperature	100°C	100°C
Exposed Materials	6061-T6 Aluminum, Stainless Steel 300 and 400 Series, Viton	6061-T6 Aluminum, Stainless Steel 300 and 400 Series, Viton
Control Interface	RS-232 / Ethernet	RS-232 / Ethernet
MCBF	>3.00E+06	>3.00E+06
SEMI S2	compliant	compliant
CE	compliant	compliant
Repeatability		
R	0.10mm‡	0.05mm‡
$\theta$	0.02°‡	0.01°‡
Z	NA‡	0.05mm‡
Vertical Stroke	NA	35mm

† Hine Automation offers end effector for SEMI standard sizes up to 300mm. Other sizes are available upon request.

\* Payload depends on end effector. Higher payloads available upon request

‡ Measured as three standard deviations (3 $\sigma$ )



## 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

- **Cluster Systems:**  
Constellation Systems
- **Automated Load Locks:**  
Star Systems
- **Robotic Components:**  
Vacuum Robotic Arms  
Vacuum Elevators  
Vacuum Aligners  
Atmospheric Robotic Arms  
Atmospheric Elevators  
Atmospheric Aligners

