

Semiconductor Wafer Handling Robot SEMISTAR-MR124

Pre-aligner : SEMISTAR-PVR1130
Controller : SR100

Evolved Robot from SEMISTAR-M Series Industry-leading Performance!

Features

Throughput **50% UP**

- ◆ Robot arm optimum design
light weight and Low inertia moment
- ◆ Velocity composition functionality
Optimize single axis motion and composed axes motion
- ◆ Shortcut motion path generating functionality
Determines the shortest path with the starting and ending points.

Wafer placement repeatability **50% UP**

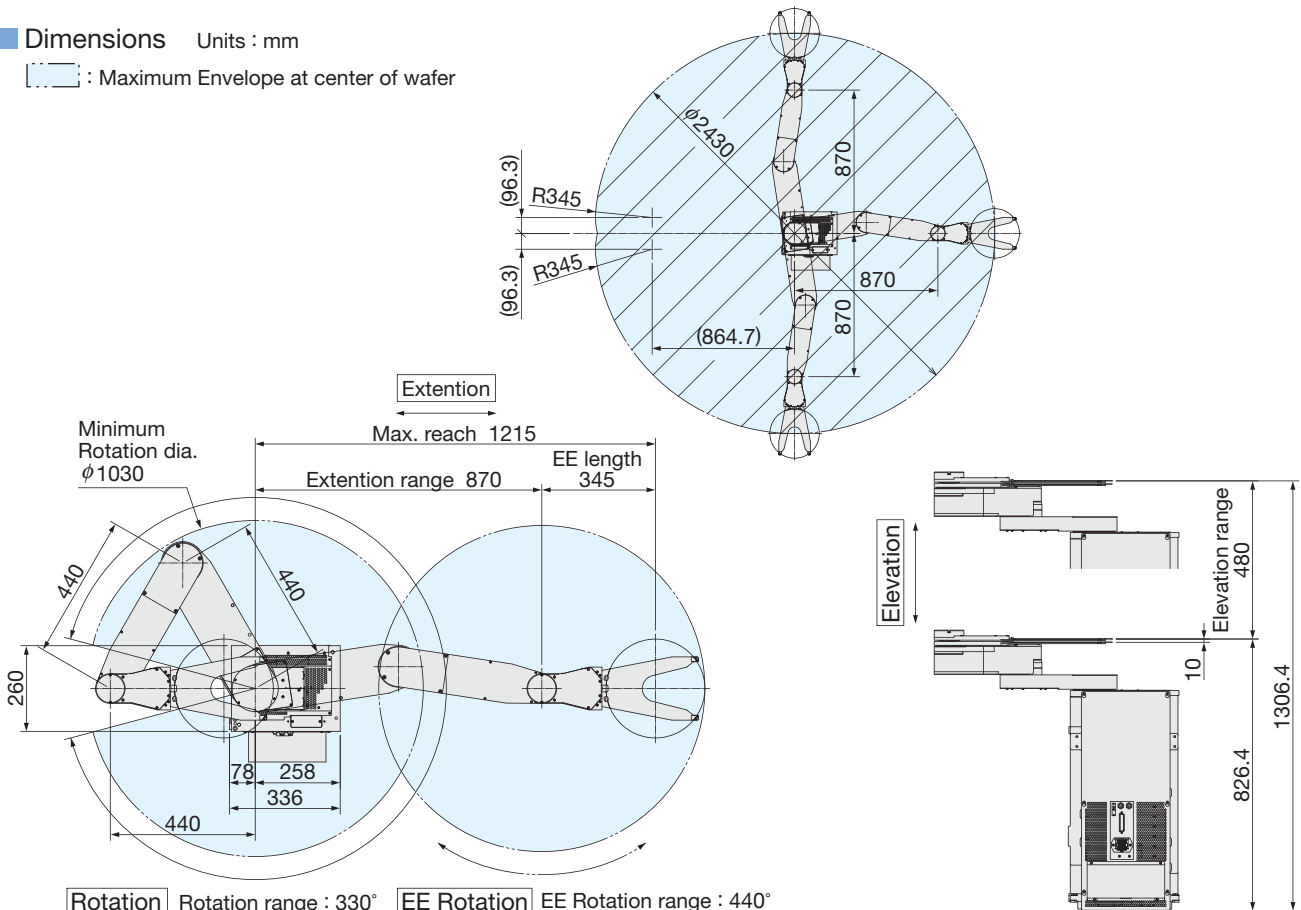
Motion range **30% UP**

One robot can cover excellently widely.



Dimensions Units : mm

: Maximum Envelope at center of wafer



SEMISTAR-MR124

■ Manipulator & Pre-aligner Specifications

Items		Specifications	
Manipulator	Applicable Wafer Size	300 mm (450 mm)*1	
	Applicable Wafer Grip System	Vacuum or Edge grip	
	The Length of Standard EE*2	345 mm for 300 mm wafer	
	The Number of Axis	5 axes	
	Arm Type	Single	
	Motion Range	R-axis (Extend/Retract)*3	1215 mm
		θ -axis (Rotate)	330°
		Z-axis (Up/Down)	480 mm
		B-axis (EE rotation)	440°
	Minimum Rotation Radius*2	510 mm	
	Max. Speed*2	Extend/Retract	260°/s
		Rotation	330°/s
Up/Down		550 mm/s	
EE Rotation		350°/s	
Linear Motion		2000 mm/s	
Position Repeatability*2	0.1 mm (P-P)		
Mass	66 kg		
Pre-aligner	Applicable Wafer Size	300 mm	
	Applicable Wafer Grip System	Vacuum	
	Detecting Subject	Notch	
	Material of Wafer	Silicon*4	
	Wafer Edge Detection Sensor	LED + CCD line sensor	
	Motion Range	Rotation	No limit
		Max. Speed (Acc/Dec Time) Rotation	1000°/s (0.1 s/0.1 s)
	Alignment Accuracy	$\pm 0.03^\circ$	
	Alignment Time	1.7 s or less	
	Mass	5.8 kg	
	Ambient Conditions	Clean Class*5	ISO class 1
Operating Environment		Temperature : 20 – 30°C	
		Humidity : 35 – 55%RH (no-condensing)	
Storage Environment		Temperature : 0 – 40°C	
		Humidity : 20 – 80%RH (no-condensing)	
Altitude		1000 m or below	
Ambient	Free from explosive, inflammable, and corrosive gasses		
MCBF	15 M cycles		

- * 1 : Yaskawa's standard EE (300 mm : EG/VG, 450 mm : VG)
* 2 : 300 mm wafer (SEMI compliant), using Yaskawa's standard 300 mm EE
* 3 : From the 1st arm rotation center to Wafer center on the Yaskawa's standard EE (for 300 mm wafer)
* 4 : SEMI compliant wafer. If using special wafer, contact your Yaskawa representative. Quartz wafer might be applicable (We have experiences), but the parameter value depends on the Quartz specification. We need to evaluate and adjust the parameters.
* 5 : By Vacuum suction with 0.3 m/s down flow

■ Controller Specifications

Items	Specifications
Configuration	Self-stand/Forced air cooling (Air inlet on the front, top, bottom and right side panel, and air outlet on the rear panel)
	External Dimensions
Approx. Mass	19.5 kg
Installation Direction	Horizontal/Vertical
Accessibility to Connector and Switch	Only front panel
Case Surface	Painted
Operating Temperature/Humidity	0 – +40°C, 90% max. (non-condensing)
Storage Temperature /Humidity	- 10°C – +60°C, 90% max. (non-condensing)
Altitude	1000 m or below (Derated if over than 1000 m)
Ambient	Free from explosive, inflammable, and corrosive gasses
Vibration Resistance /Shock Resistance	9.8 m/s ² / 49 m/s ²
Input Power Supply	3-phase 200 – 230 VAC, +10%/–15%, 50/60 Hz
Grounding	Ground resistance 100Ω or less
Communication (for HOST)	Ethernet 10BASE-T/100BASE-TX, 2 port (HUB)
Optional Board Slot	2 slot capability. · I/O board (32 inputs/32 outputs), (1 slot size) · RS-232C communication board (1 slot size)
	AC Servo Driver
Position Control	Serial communication (absolute encoder)
Acceleration and Deceleration Control	Software servo control
Applicable Motor	YASKAWA sigma V servomotors
Battery	For SRAM
Stop Functionality when Turning Off the Power	Dynamic brake stop
Instantaneous Power Interruption Capability	20 ms
SEMI F47	Met by software (Limitation)
Safety Function	Design in according to ISO 13849-1, category 3 (PL=d)
Pre-aligner Interface	1 Pre-aligner capability (Pre-aligner board is already installed.)
Teaching Pendant	Optional parts. (Dummy connector is attached on controller)
MTBF	More than 100,000 hours (calculation)

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YASKAWA ELECTRIC CORPORATION

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