

# NACHI ROBOTICS

## Robot Features

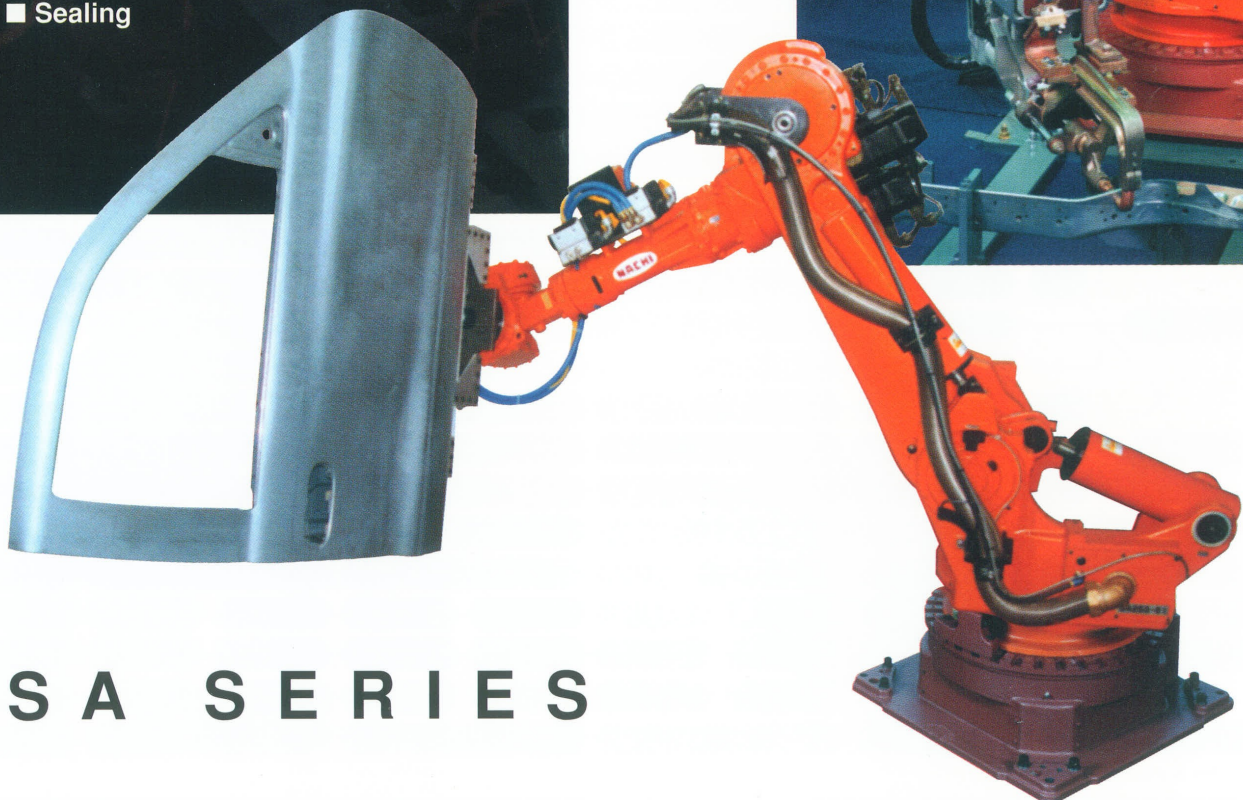
- Space-saving design
- Large working envelope
- Improved accuracy and speed
- Fewer grease points
- Reduced cable and hose wear
- Lightweight design

## Controller Features

- Improved ergonomic design
- User-friendly, easy operation teach pendant
- Flex Panel®
- Simultaneous 12 axes control
- Hot edit
- Serial interface with PLC
- Menu-driven interactive teaching
- SLIM robot language
- Integrated weld board interface
- Interface with servo gun

## Robot Applications

- Spot welding
- Material handling
- Palletizing
- Machine loading/unloading
- Deburring
- Sealing



# SA SERIES



## Technical Specifications

Versatile and powerful, the SA Series of robots offers a space-saving design engineered for maximum reliability, low maintenance, a larger working envelope and increased cell and systems application capabilities. The SA Series of robots are ideally suited for spot welding or heavy duty material handling applications. All SA Series robots offer user-friendly set-up and are backed by Nachi's 24 hour telephone hot-line for technical assistance and product support.

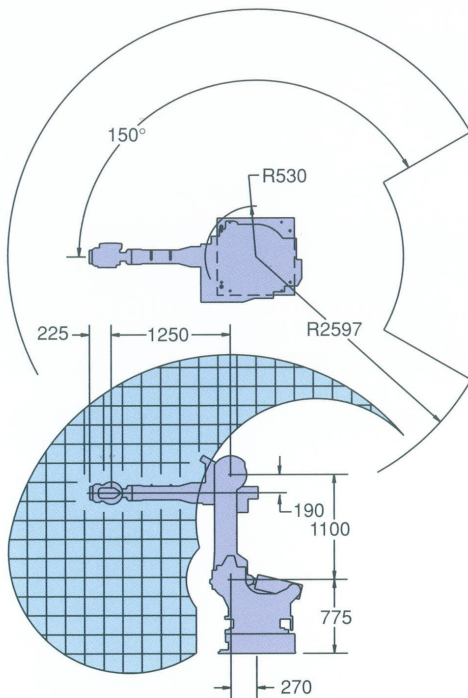
The SA Series comes with Nachi's easy-to-use AR Controller which employs fully-digital servo drives for excellent path accuracy. The multi-tasking AR Controller provides a menu-driven interface with powerful user options. It can simultaneously control up to twelve axes. The AR Controller also provides the ability to make changes on-line while running a production application.

Nachi Robotic Systems Inc. is a full-service robotics supplier providing a range of cost saving high quality robotic applications from 4 to 300kg. Nachi Robotic Systems Inc. is a subsidiary of Nachi-Fujikoshi Corporation. Quality awards include ISO 9001, the Chrysler Gold Pentastar and the coveted Deming Award. Nachi Robotic Systems Inc. is supported by distributor partners and offices throughout the United States, Canada and Mexico.

BASIC SPECIFICATION		SA100/100T	SA130/130T	SA160/160T	SA200/200T
CONSTRUCTION		Articulated	Articulated	Articulated	Articulated
DEGREE OF FREEDOM		6	6	6	6
DRIVE		AC Servo motor	AC Servo motor	AC Servo motor	AC Servo motor
MAXIMUM STROKE	ARM	S SWIVEL	$\pm 150^\circ$	$\pm 150^\circ$	$\pm 150^\circ$
		H BACK & FORTH	$+75^\circ$ to $-55^\circ$	$+75^\circ$ to $-55^\circ$	$+75^\circ$ to $-55^\circ$
		V UP & DOWN	$+145^\circ$ to $-115^\circ$ $+165^\circ$ to $-90^\circ$	$+145^\circ$ to $-115^\circ$ $+165^\circ$ to $-90^\circ$	$+145^\circ$ to $-115^\circ$ $+60^\circ$ to $-55^\circ$
	WRIST	R2 ROTATION 2	$\pm 360^\circ$	$\pm 360^\circ$	$\pm 360^\circ$
		B BEND	$\pm 125^\circ$	$\pm 125^\circ$	$\pm 125^\circ$
MAXIMUM VELOCITY		R1 ROTATION 1	$\pm 360^\circ$	$\pm 360^\circ$	$\pm 360^\circ$
	ARM	S SWIVEL	120°/sec	120°/sec	70°/sec
		H BACK & FORTH	120°/sec 100°/sec	120°/sec 100°/sec	70°/sec
		V UP & DOWN	120°/sec	100°/sec	70°/sec
	WRIST	R2 ROTATION 2	160°/sec	125°/sec	100°/sec
LOADING WEIGHT		B BEND	160°/sec	125°/sec	100°/sec
		R1 ROTATION 1	245°/sec	200°/sec	150°/sec
	WRIST	WRIST	100 kg	130 kg	200 kg
WRIST TORQUE		UPPER ARM	50 kg	25 kg	0 kg 20 kg
		R2 ROTATION 2	57 kgf • m	75 kgf • m	130 kgf • m
		B BEND	57 kgf • m	75 kgf • m	130 kgf • m
REPEATABILITY		R1 ROTATION 1	35 kgf • m	40 kgf • m	70 kgf • m
		REPEATABILITY	$\pm 0.3$ mm	$\pm 0.3$ mm	$\pm 0.5$ mm
AMBIENT TEMPERATURE		0~45° C (32~113°F)	0~45°C (32~113°F)	0~45°C (32~113°F)	0~45°C (32~113°F)
INSTALLATION		Floor Shelf	Floor Shelf	Floor Shelf	Floor Shelf
ROBOT BODY WEIGHT		1,300 kg 1,400 kg	1,300 kg 1,400 kg	1,300 kg 1,400 kg	1,350 kg 1,400 kg
POWER REQUIREMENTS		2,860 lbs 3,080 lbs	2,860 lbs 3,080 lbs	2,860 lbs 3,080 lbs	2,970 lbs 3,080 lbs
		480 VAC 3ø	480 VAC 3ø	480 VAC 3ø	480 VAC 3ø

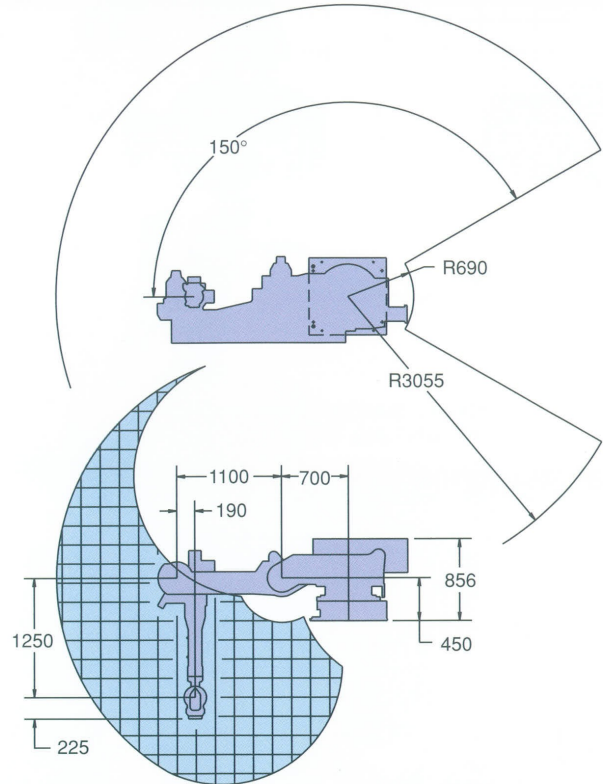


## SA100, SA130, SA160



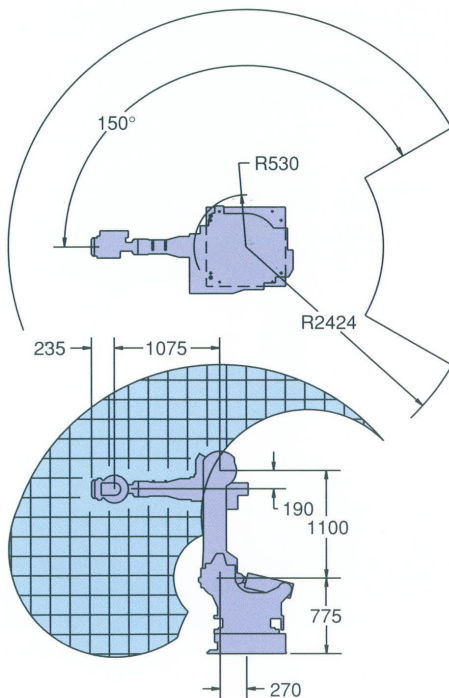
**SA100, SA130, SA160 ENVELOPE**  
GRID SIZE = 200X200

## SA100T, SA130T, SA160T



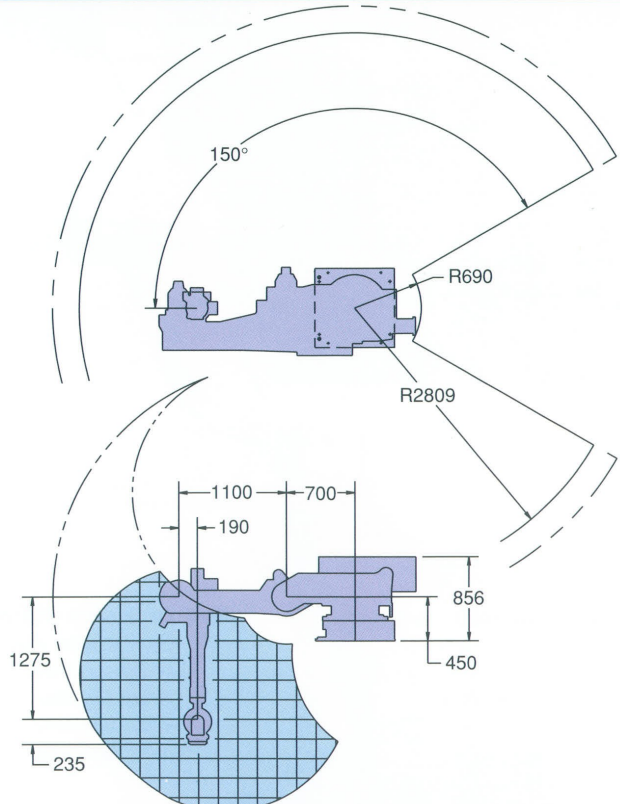
**SA100T, SA130T, SA160T ENVELOPE**  
GRID SIZE = 200X200

## SA200



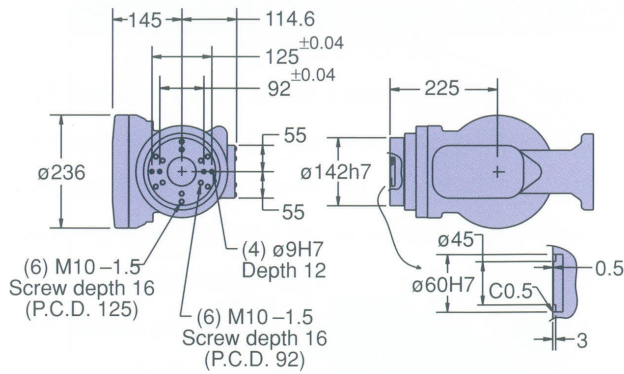
**SA200 ENVELOPE**  
GRID SIZE = 200X200

## SA200T

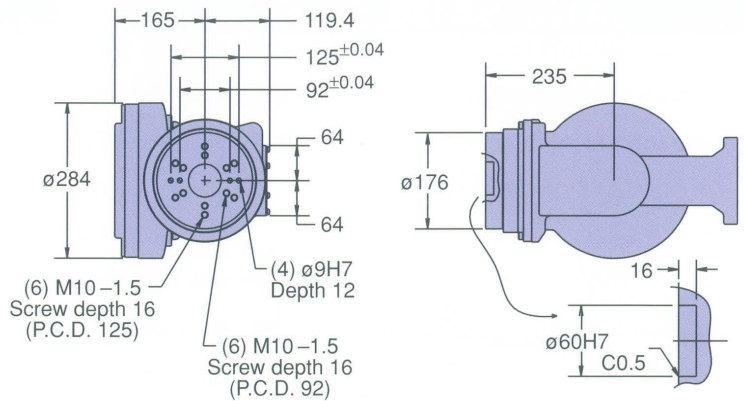


**SA200T ENVELOPE**  
GRID SIZE = 200X200

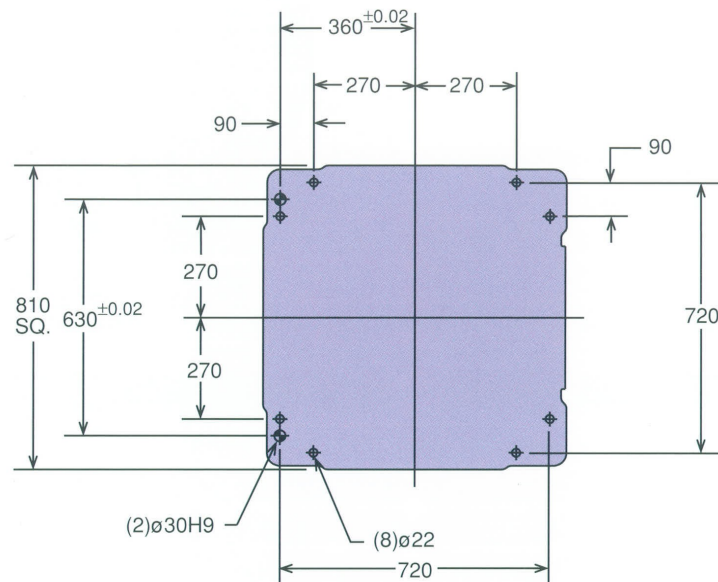
## Wrist Mount and Foot Print



**SA100(T), SA130(T), SA160(T)  
WRIST MOUNTING CONFIGURATION**



**SA200(T)  
WRIST MOUNTING CONFIGURATION**



**ROBOT FOOTPRINT FOR ALL SA SERIES**

All dimensions are in millimeters

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Nachi Robotic Systems Inc. reserves the right  
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## SA Fast Series

# SA100F/130F/160F/200F

(Spot welding, Material handling)

## No.1 Technology of Fast Series

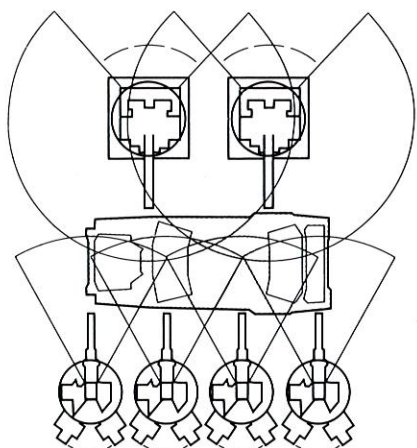
The SA Fast Series features the fastest, a space-saving design, a large work envelope, low maintenance requirements, and improved repeatability. The compact, but powerful, SA Fast Series has a streamlined profile, reduced interference zones, and has a 36% smaller footprint than earlier models. The SA Fast Series also eliminates parallel linkage, resulting in space-saving robots and increased flexibility. Despite their reduced size, the SA Fast robots deliver more power and a larger work envelope than many conventional robots. Additionally, the SA Fast Series lowers maintenance needs through fewer grease points and longer-life components. The SA Fast robots reduce cable and hose wear by incorporating a built-in air hose, with built-in I/O connections, a water hose, and a primary welding cable optionally available. Finally, to ensure accuracy, the SA Fast Series has improved repeatability, from 0.5 to 0.3 millimeters.



### Innovative No.1 technology of Fast Series Features:

- ☐ The fastest robot  
35% speed up with feed-forward and vibration control
- ☐ Space-Saving Design
- ☐ Larger Working Envelope  
(1.9 times larger)
- ☐ Compact body
- ☐ Improved Accuracy  
(Repeatability of  $\pm 0.3\text{mm}$ )
- ☐ Fewer Grease Points
- ☐ Reduced Cable and Hose Wear  
by using Built-in Air Hose, and Optional Built-in I/O Connections, Water Line, and Primary Welding Cable
- ☐ Small, High-Torque Wrist
- ☐ Larger 50kg. Load Capacity on Forearm
- ☐ Shelf-Mount Model Available

CONVENTIONAL ROBOTS



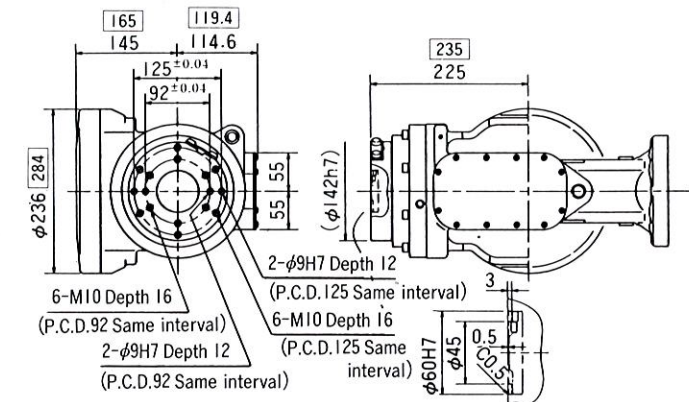
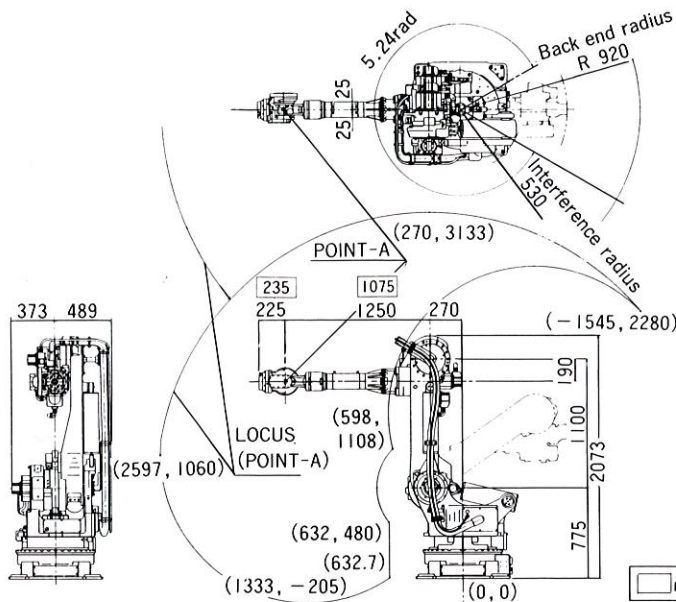
### Robot Applications:

- ☐ Spot Welding
- ☐ Material Handling/Palletizing
- ☐ Machine loading and Unloading
- ☐ Plasma Cutting
- ☐ Sealing



## ■ Basic Specification

Item				Specification			
Robot Model				SA100F	SA130F	SA160F	SA200F
Construction				Articular	Articular	Articular	Articular
Number of Axis				6	6	6	6
Drive				AC servo motor	AC servo motor	AC servo motor	AC servo motor
Maximum Strike	Arm	S	Swivel	±2.62rad	±2.62rad	±2.62rad	±2.62rad
		H	Back & Forth	+1.31～-0.96rad	+1.31～-0.96rad	+1.31～-0.96rad	+1.31～-0.96rad
		V	Up & Down	+2.53～-2.01rad	+2.53～-2.01rad	+2.53～-2.01rad	+2.53～-2.01rad
	Wrist	R2	Rotation 2	±6.28rad	±6.28rad	±6.28rad	±6.28rad
		B	Bend	±2.18rad	±2.18rad	±2.18rad	±2.18rad
		R1	Rotation 1	±6.28rad	±6.28rad	±6.28rad	±6.28rad
Maximum Velocity	Arm	S	Swivel	2.09rad/s	2.09rad/s	1.75rad/s	1.22rad/s
		H	Back & Forth	2.09rad/s	2.09rad/s	1.75rad/s	1.22rad/s
		V	Up & Down	2.09rad/s	2.09rad/s	1.75rad/s	1.22rad/s
	Wrist	R2	Rotation 2	2.79rad/s	2.79rad/s	2.18rad/s	1.75rad/s
		B	Bend	2.79rad/s	2.79rad/s	2.18rad/s	1.75rad/s
		R1	Rotation 1	4.28rad/s	4.28rad/s	3.49rad/s	2.62rad/s
Loading Weight		Wrist	100kg	130kg	160kg	200kg	
		Forearm	50kg	25kg	25kg		
Wrist Torque		R2	Rotation 2	559N·m	735N·m	882N·m	1274N·m
		B	Bend	559N·m	735N·m	882N·m	1274N·m
		R1	Rotation 1	343N·m	392N·m	441N·m	686N·m
Repeatability				±0.3mm	±0.3mm	±0.3mm	±0.5mm
Ambient Temperature				0～45℃	0～45℃	0～45℃	0～45℃
Installation				Floor	Floor	Floor	Floor
Robot Body Weight				1280kg	1280kg	1280kg	1330kg

$$\begin{aligned} 1 \text{ rad} &= 57.3^\circ \\ 1 \text{ N} &= 0.102 \text{ kgf} \end{aligned}$$


※ Working envelope of SA200F is different from the above.

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