

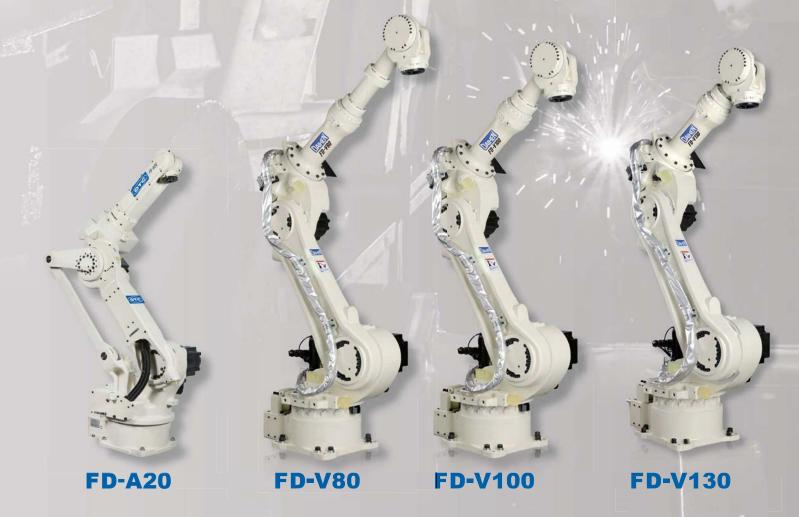
# COMPLETE ROBOTIC ARC WELDING SYSTEMS

WWW.DAIHEN-USA.COM

## THE IDEAL SOLUTION FOR AUTOMATION OF WELDING



FD-B6 FD-B6L-S2 FD-V8 FD-V8L-S2 FD-V25-S2 FD-H5



## **CHANGING THE FUTURE OF MANUFACTURING**

### **OPTIMUM TEACHING**

Easy teaching, even for a two-electrode torch



Our arc welding robots are ideal for many welding and air plasma cutting applications.

They can be used for mild steel, stainless steel, aluminum, titanium and other exotic metals.

While some models feature a compact design, robots can handle a variety of jobs ranging from small to large in size.

All robots include a FD21 robot controller and a teach pendant.





Intuitive Operation
Touch panel and jog dial
ensure easy operation.



**Quality Control Functions**Easy quantitative management of welding procedures.



Compact and Eco-Friendly
Space-saving design with
reduced standby power
consumption.



### **FD21 TEACH PENDANT**

### Redesigned for comfortable, extended use

- 66% less arm fatigue
- Weight reduced by 15%
- · Grip redesigned with comfortable 3D contouring
- Easy-to-press keypad with lighter press force
- · Keypad delivers tactile <click> feedback
- Raised features on keypad for tactile, "no-look" navigation
- Added two (2) quick-keys for HOME SCREEN and MENU for faster navigaion
- · Redesigned for reliability
- Weld-spatter-resistant border around touch-screen
- · Pluggable teach pendant cable for rapid damaged cable replacement
- Hanger hook is now a replaceable, wear item
- · Touch-screen upgraded
- Improved resolution and contrast
- Faster response
- Finer touch resolution
- · Supports touch-screen only program editing
- Scroll with swiping action
- On-screen keypad for numeric entry
- Menu icons for tablet/phone-like operation

### **FD21 ROBOT CONTROLLER**

### Versatility to "Connect" with facilities, devices and users.

- Easily "CONNECTS" with peripheral equipment through simplified system configuration
- "CONNECTS" from anywhere in the world
- Expanded motion control via "connectable" external axis unit
- Improved "Connectivity" for multiple robots and multiple auxiliary axes
- Enhance your system by "connecting" commercial peripherals
- Offline teaching "CONNECTS" you to uninterrupted production

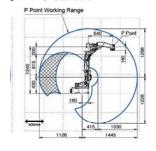




## RANGE OF MOTION MANIPULATOR WORKING RANGE / SPECIFICATIONS



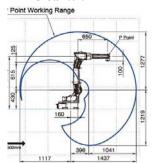
FD-B6 Standard



Reach	1445mm
Payload	6kg
Axes	6
Repeatability	± 0.08mm



FD-V8 Standard



Reach	1402mm
Payload	8kg
Axes	6
Repeatability	± 0.08mm



FD-B6L-S2 Long Reach



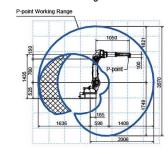
For welding applications. 

| For other from the above | For other from the above |

Reach	2008mm
Payload	6kg
Axes	6
Repeatability	± 0.08mm



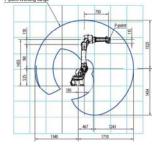
FD-V8L-S2 Long Reach



Reach	2006mm
Payload	8kg
Axes	6
Repeatability	± 0.08mm



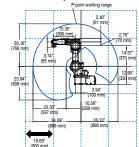
FD-V25-S2 Standard



Reach	1710mm
Payload	25kg
Axes	6
Repeatability	± 0.08mm



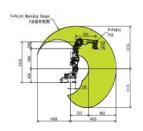
FD-H5 Compact



Reach	866mm
Payload	5kg
Axes	6
Repeatability	± 0.08mm



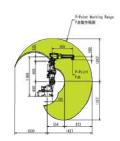
## FD-B4S



Reach	1435mm
Payload	4kg
Axes	7
Repeatability	± 0.08mm



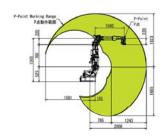
## FD-V6S



Reach	1427mm
Payload	6kg
Axes	7
Repeatability	± 0.08mm



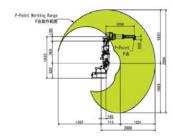
FD-B4LS



Reach	2008mm
Payload	4kg
Axes	7
Repeatability	± 0.08mm



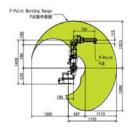
FD-V6LS



Reach	2006mm
Payload	6kg
Axes	7
Repeatability	± 0.08mm
кереатаршту	± 0.0011111



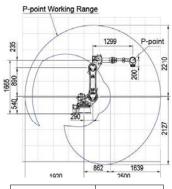
**FD-V20S** 



Reach	1710mm
Payload	20kg
Axes	7
Repeatability	± 0.08mm



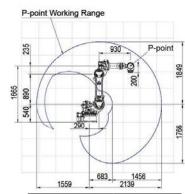
## FD-V80



	7-441
Reach	2500mm
Payload	80kg
Axes	6
Repeatability	± 0.08mm



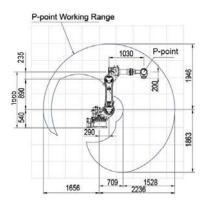
## FD-V130



Reach	2139mm
Payload	130kg
Axes	6
Repeatability	± 0.08mm



FD-V100



Reach	2236mm
Payload	100kg
Axes	6
Repeatability	± 0.08mm



FD-A20

500mm	75	50_	
150			115
98		P-poin	1 2
143			200

Reach	1664mm
Payload	20kg
Axes	6
Repeatability	± 0.07mm

## Specifications: Manipulator for 6 axis

			FD-B6	FD-B6L-S2	FD-V8	
Model			NB6	NB6L	NV8	
Nun	Number of axes 6 6 6		6			
Maximum capacity		acity	13.2 lbs (6kg)	13.2 lbs (6kg)	17.6 lbs (8kg)	
Pos	itional repe	eatability	±0.003" (±0.08mm) <sup>(1)</sup>	±0.002" (±0.05mm) <sup>(1)</sup>	±0.003" (±0.08mm) <sup>(1)</sup>	
Hor	izontal Rea	ach	56.88" (1445mm)	79.06" (2008mm)	55.29" (1402mm)	
Vert	tical Reach		84.80" (2154mm)	138.75" (3575mm)	90.67" (2430mm)	
Driv	ing capaci	ty	3132 W	4632 W	3016 W	
		J1 (Rotation)	±170° (±50°)(2)	±170° (±50°)(2)	±170° (±50°) <sup>(2)</sup>	
ge	Arm	J2 (Lower arm)	-155° to +90° (3)	-155° to +100°	-155° to +90° (3)	
Working Range		J3 (Upper arm)	-170° to +245° (4)	-170° to +190°	-170° to +190°	
king		J4 (Swing)	±155°(±170°) (5)	±155° (±170°) <sup>(5)</sup>	±180°	
Wor	Wrist	J5 (Bending)	-45° to +225°(6)	-45° to +225°(6)	-50° to +230°	
		J6 (Twist)	±205°(±360)(5,6)	± 205° (±360°) <sup>(5,6)</sup>	±360°	
	_	J1 (Rotation)	4.19 rad/s {240°/s} (3.32 rad/s {190°/s}) (2)	3.93 rad/s[225°/s] (3.05 rad/s [175°/s]) (2)	4.19 rad/s {240°/s} (3.32 rad/s {190°/s}) <sup>(2)</sup>	
pee	Arm	J2 (Lower arm)	4.19 rad/s {240°/s}	3.58 rad/s[205°/s]	4.19 rad/s {240°/s}	
Motion speed		J3 (Upper arm)	4.01 rad/s {230°/s}	3.84 rad/s[220°/s]	4.01 rad/s {230°/s}	
lotio		J4 (Swing)	7.50 rad/s {430°/s}	7.50 rad/s {430°/s}	7.50 rad/s {430°/s}	
2	Wrist	J5 (Bending)	7.50 rad/s {430°/s}	7.50 rad/s [430°/s]	7.50 rad/s {430°/s}	
		J6 (Twist)	11.00 rad/s {630°/s}	11.00 rad/s {630°/s}	11.00 rad/s {630°/s}	
О	nt Se	J4 (Swing)	10.5 N•m	10.5 N•m	17.6 N•m	
loa	Allowable moment	J5 (Bending)	10.5 N•m	10.5 N•m	17.6 N•m	
Wrist allowable load	₹ĕ	J6 (Twist)	5.9 N•m	5.9 N•m	7.8 N•m	
allow	ole t of	J4 (Swing)	0.28 kg•m²	0.28 kg•m²	0.43 kg•m²	
/rist	Allowable moment of inertia	J5 (Bending)	0.28 kg•m²	0.28 kg•m²	0.43 kg•m²	
\$	All Mor	J6 (Twist)	0.06 kg•m²	0.06 kg•m²	0.09 kg•m²	
Arm	cross-sec	tional area	3.57 m² x 340°	6.37 m <sup>2</sup> x 340°	3.11 m² x 340°	
Environmental conditions		32 to 11	3° F (0 to 45° C), 20 to 80% RH (	(no condensation)		
Mas	ss / weight		320 lbs (145kg)	611 lbs (277kg)	613 lbs (278kg)	
Max	kimum loac	of upper arm	22.05 lbs (10kg) <sup>(7)</sup>	44.09 lbs (20kg) <sup>(6)</sup>	44.09 lbs (20kg) <sup>(7)</sup>	
Inst	allation me	thod	Floor/0	Ceiling/Wall		
Pair	nt color		White (Munsell notation 10GY 9/1)			

- (1) The value of the positional repeatability is at the tool center point (TCP) in compliance with ISO 9283.
- (2) The value in parentheses indicates wall mounted.
- (3) Working range of J2 axis may be restricted when wall mounted.
  (4) The operation range of the J3 axis is restricted to -170° to +205°) when floor based welding is applied.
- (5) Working range of the J6 axis may be restricted by the position of the J5 axis.
- (6) When loading, the maximum payload as the end effector.
- (7) This value changes according to placement and load conditions of the wrist.

FD-V8L-S2	FD-H5	FD-V25-S2
NV8L	NH5	NV25
6	6	6
13.2 lbs (6kg)	11.02 lbs (5kg)	44.09 lbs (25kg)
±0.002" (±0.05mm) <sup>(1)</sup>	±0.002" (±0.05mm) <sup>(1)</sup>	±0.002" (±0.04mm) <sup>(1)</sup>
78.98" (2006mm)	34.09" (866mm)	67.32" (1710mm)
140.55" (3570mm)	54.1" (1374mm)	117.28" (2979mm)
4800 W	1440 W	5400 W
±170° (±50°) <sup>(2)</sup>	±170° (±50°) <sup>(2)</sup>	±170° (±50°)(2)
-155° to +100°(3)	-125° to +90°	-155° to +100° (3)
-170° to +260°(4)	-140° to +245°	-170° to +260°(4)
±180°	±190°	±180°
-50° to +230°	-30° to +210°	-50° to +230°
±360°	±360°	±360°
3.93 rad/s[225°/s] (3.05rad/s [175°/s]) <sup>(2)</sup>	3.49 rad/s {200°/s} (2.79 rad/s {160°/s}) <sup>(2)</sup>	3.93 rad/s{225°/s} (3.05rad/s {175°/s}) <sup>2)</sup>
3.58 rad/s[205°/s]	3.49 rad/s {200°/s}	3.58 rad/s {205°/s}
4.45 rad/s[255°/s]	4.54 rad/s {260°/s}	4.45 rad/s {255°/s}
7.85 rad/s[450°/s]	6.63 rad/s {380°/s}	7.85 rad/s {450°/s}
7.50 rad/s (430°/s)	6.63 rad/s {380°/s}	7.68rad/s{440°/s}
11.00 rad/s (630°/s)	8.95 rad/s {510°/s}	10.60rad/s{605°/s}
17.6 N•m	11.9 N•m	2.6 N•m
17.6 N•m	11.9 N•m	52.6 N•m
7.8 N•m	5.21 N•m	24.5 N•m
0.43kg•m²	0.303kg•m²	1.24kg•m²
0.43kg•m²	0.303kg•m²	1.24kg•m²
0.09kg•m²	0.061kg•m²	0.33kg•m²
7.48 m <sup>2</sup> x 340°	1.22 m <sup>2</sup> x 340°	5.27 m <sup>2</sup> x 340°
602 lbs (273kg)	128 lbs (58kg)	613 lbs (278kg)
44.09 lbs (20kg) <sup>(5)</sup>	2.21 lbs (1kg) <sup>(6)</sup>	22.05 lbs (10kg) <sup>(5)</sup>

- Through-arm cable design improves torch reach & wire feeding
- Offers a wide working range with an independently articulated arm
- Seamless digital connection with all OTC DAIHEN brand welding power supplies
- Improved vibration restraining control provides smooth robot movement
- Built-in mechanical shock sensor
- Single source technology all components are manufactured by OTC DAIHEN
- Highly versatile design supports most welding applications

## Specifications: Manipulator for 7-axis

			FD-B4S	FD-B4LS	FD-V6S	FD-V6LS
Model			NB4S	NB4LS	NV6S	NV6LS
N	Number of axes		7	7	7	7
Ма	Maximum capacity 8.8 lbs (4kg) 8.8 lbs (4kg) 13.23 lbs (6kg) 13.23 lbs		13.23 lbs (6kg)			
Pos	itional rep	eability	±0.003" (±0.08mm) <sup>(1)</sup>	±0.003" (±0.08mm) <sup>(1)</sup>	±0.003" (±0.08mm) <sup>(1)</sup>	±0.003" (±0.08mm) <sup>(1)</sup>
Н	orizontal R	leach	56.50" (1435mm)	79.06" (2008mm)	55.29" (1427mm)	78.98" (2006mm)
\	Vertical Reach 96.30" (2446mm) 138.75" (3508mm) 90.67" (2424mm) 137.95"		137.95" (3504mm)			
D	riving cap	acity	3550W	5650W	3600W	6000W
		J1 (Rotation 1)	±170°	±170°	±170°	±170°
	Ε	J2 (Lower arm)	-145° to +70°	-145° to +70°	-145° to +70°	-145° to +70°
	Arm	J7(Rotation 2)	±90°	±90°	±90°	±90°
ange		J3 (Upper arm)	-170° to +142.6°	-170°~ +154°	-170°~ +149°	-170° to +160°
Working Range		J4 (Swing)	±155°	±155°	+/- 180°	±180°
orki	Wrist	J5 (Bending)	-45° to +225°(2)	-45° to +225°(5)	-50°~ +230° <sup>(2)</sup>	-50° to +230° (2)
>		J6 (Twist)	±205 <sup>o(2)</sup>	±205°(2)	+/- 360° (2)	±360° (2)
		J1 (Rotation 1)	3.66 rad/s (210°/s)	3.40 rad/s (195°/s)	3.66 rad/s (210°/s)	3.40 rad/s (195°/s)
	Arm	J2 (Lower arm)	3.66 rad/s (210°/s)	3.49 rad/s (200°/s)	3.66 rad/s (210°/s)	3.49 rad/s (200°/s)
	Ā	J7(Rotation 2)	3.14rad/s (180°/s)	2.79rad/s (160°/s)	3.14rad/s (180°/s)	2.79rad/s (160°/s)
eed	Motion speed	J3 (Upper arm)	3.66 rad/s (210°/s)	3.49 rad/s (200°/s)	3.66 rad/s (210°/s)	3.49 rad/s (200°/s)
u sp		J4 (Swing)	7.33 rad/s (420°/s)	7.33 rad/s (420°/s)	7.33 rad/s (420°/s)	7.33 rad/s (420°/s)
lotio	Wrist	J5 (Bending)	7.33 rad/s (420°/s)	7.33 rad/s (420°/s)	7.33 rad/s (420°/s)	7.33 rad/s (420°/s)
2		J6 (Twist)	10.5 rad/s (600°/s)	10.5 rad/s (600°/s)	10.82 rad/s (620°/s)	10.82 rad/s (620°/s)
Б	ble	J4 (Swing)	10.1 N*m	10.1 N*m	11.8 N*m	11.8 N*m
e loa	Allowable moment	J5 (Bending)	10.1 N*m	10.1 N*m	9.8 N*m	9.8 N*m
owable load	₹E	J6 (Twist)	2.94 N*m	2.94 N*m	5.9 N*m	5.9 N*m
	ble t of	J4 (Swing)	0.38kg*m²	0.38kg*m <sup>2</sup>	0.30kg*m <sup>2</sup>	0.30kg*m²
Wrist all	Allowable moment of inertia	J5 (Bending)	0.38kg*m²	0.38kg*m <sup>2</sup>	0.25kg*m <sup>2</sup>	0.25kg*m²
>	E C E	J6 (Twist)	0.03kg*m²	0.03kg*m²	0.06kg*m <sup>2</sup>	0.06kg*m²
	Arm cross-sectional area		2.57 m <sup>2</sup> x 340°	5.28 m <sup>2</sup> x 340°	5.28 m <sup>2</sup> x 340°	5.40 m <sup>2</sup> x 340°
I	Environmental conditions			32 to 113° F (0 to 45° C), 20 to 80% RH (no condensation)		
	Mass	s / weight	416.67 lbs (189kg)	707.68 lb (321kg)	392.42lb(178 kg)	696.67lbs (316kg)v
M	aximum lo	ad of upper arm	22.05 lbs (10kg) <sup>(3)</sup>	22.05 lbs (10kg) <sup>(3)</sup>	22.05 lbs (10kg) <sup>(3)</sup>	44.09 lbs (20kg) <sup>(3)</sup>
Ins	tallation m	nethod	Floor			
Paint color White (Munsell notation 10GY 9/1)			Y 9/1)			

<sup>(1)</sup> The value of the positional repeatability is at the tool center point (TCP) in compliance with ISO 9283.

 <sup>(1)</sup> The value of the positional repeatability is at the tool center point (1CP) in compliance with ISO 9283.
 (3) Working range of J2 axis may be restricted when wall mounted.
 (4) The operation range of the J3 axis is restricted to -170° to +205°) when floor based welding is applied.
 (5) Working range of the J6 axis may be restricted by the position of the J5 axis.
 (6) When loading, the maximum payload as the end effector.
 (7) This value changes according to placement and load conditions of the wrist.

### **FD-V20S**

NV20S

7

44.09lbs (20kg)

±0.003" (±0.08mm)(1)

67.32" (1710mm)

114.69"(2913mm)

6600W

±170°

-145° to +70°

±90°

-1710° to +160°

±180°

-50° to +230° (2)

±360° (2)

3.40 rad/s (195°/s)

3.32 rad/s (190°/s)

3.14 rad/s (180°/s)

6.98 rad/s (400°/s)

6.98 rad/s (400°/s)

10.5 rad/s {600°/s}

43.7N\*m

43.7N\*m

19.6 N\*m

1.09 kg\*m²

1.09 kg\*m<sup>2</sup>

0.24kg\*m<sup>2</sup>

3.91m<sup>2</sup> x 340°

707.69lbs (321kg)

44.09lbs (20kg)(3)

## **ULTRA-FLEX Series**

The ULTRA-FLEX SERIES arc welding robots are OTC DAIHEN's solution to avoid interference with the work and tooling without changing the position and/or attitude of the robot. Access to a proper welding position is possible without a positioner. The result is savings in space and costs compared to a conventional 6-axis sytem.

Five models available. A perfect robot for every application.



## Specifications: Manipulator for FD-V100 SERIES

			FD-V80 FD-V100 FD-V130		FD-V130	
Mod	Model		NV80	NV100	NV130	
Nur	Number of axes		6	6	6	
Max	Maximum capacity		176.37 lbs (80 kg)	220.46 lbs (100 kg)	286.60 lbs (130 kg)	
Pos	itional rep	eatability	±0.003" (±0.08mm)			
Hor	izontal Re	ach	2500 mm 2236 mm 2139 mm			
Ver	tical Reac	h	4337 mm	3809 mm	3615 mm	
Driv	ing capac	ity	15100W			
	_	J1 (Rotation)		±180°		
nge	Arm	J2 (Lower arm)		-155° to +90°		
g Ra		J3 (Upper arm)		-185° to +220°		
Working Range		J4 (Swing)		±360°		
8	Wrist	J5 (Bending)		-35° to +215°		
		J6 (Twist)		±360°		
	_	J1 (Rotation)	2.44 rad/s (140°/s)			
þ	Arm	J2 (Lower arm)	1.92 rad/s (110º/s)			
Motion speed		J3 (Upper arm)	2.44 rad/s (140°/s)			
otion	+	J4 (Swing)	3.05 rad/s (175°/s)			
Ž	Wrist	J5 (Bending)	3.05 rad/s (175°/s)			
		J6 (Twist)	4.45 rad/s (255°/s)			
g	ble	J4 (Swing)	433.0 N•m	N•m 721.0 N•m		
e 108	Allowable moment	J5 (Bending)	433.0 N•m	721.	0 N•m	
Wrist allowable load	₹₽	J6 (Twist)		294.0 N•m		
allo	ble it of a	J4 (Swing)	31.4 kg•m²	60.0	kg•m²	
Vrist	Allowable moment of inertia	J5 (Bending)	31.4 kg•m²	60.0	kg•m²	
>	E m	J6 (Twist)	11.9 kg•m²	33.7	kg•m²	
Arm	n cross-se	ctional area	9.53 m <sup>2</sup> x 360°	7.56 m <sup>2</sup> x 360°	6.83 m <sup>2</sup> x 360°	
Env	Environmental conditions		32 to 113° F (0 to 45° C), 20 to 80% RH (no condensation)			
Mas	Mass / weight		780 kg 770kg 765 kg			
Max	ximum loa	d of upper arm	50 kg <sup>(2)</sup>			
Inst	allation m	ethod	Floor/Ceiling			
Paint color			White (Munsell notation 10GY 9/1)			

Optimized for the speed, lifting capacity

- Slim wrist and upper arm
- Small mounting footprint
- DeviceNet
- Discrete I/O
- Pneumatic lines
- User application cable conduit (Robot base-toshoulder routing included)

NOTES:

<sup>(1)</sup> The value of the positional repeatability is at the tool center point (TCP) in compliance with ISO 9283.

## Specifications: Manipulator FD-A20

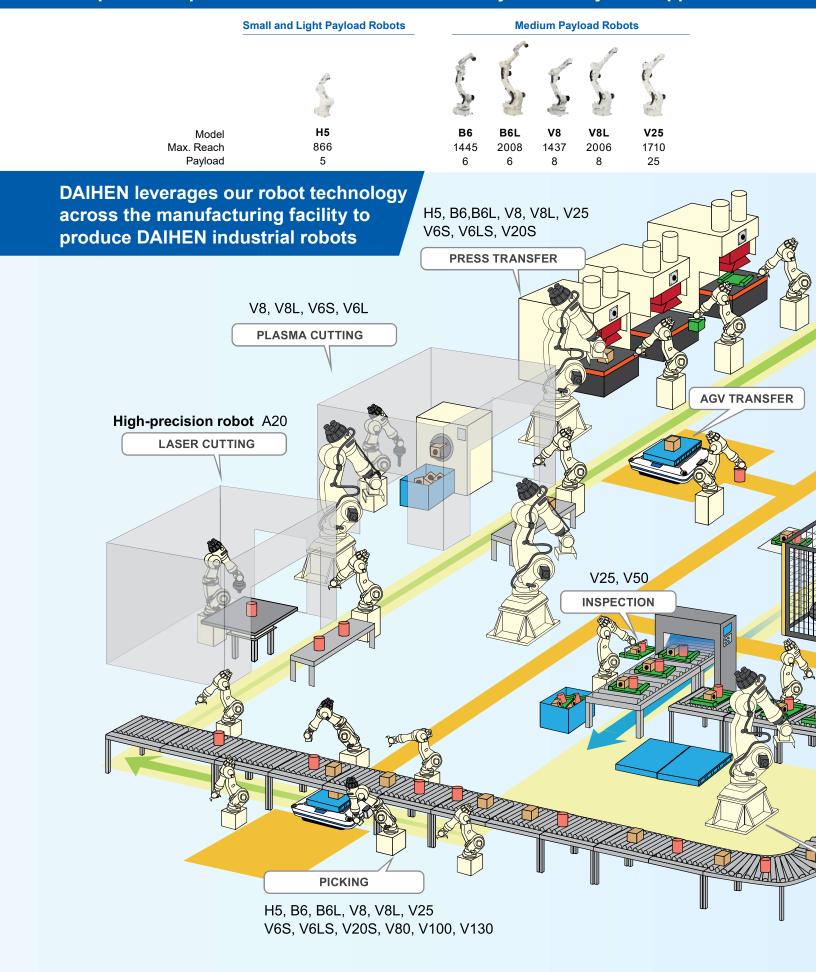
			FD-A20	
Model			NA20	
Nun	Number of axes		6	
Max	timum capa	acity	44.09 lbs (20kg)	
Pos	itional repe	eatability	±0.003" (±0.07mm) <sup>(1)</sup>	
Hor	izontal Rea	ıch	1664mm	
Vert	tical Reach		2030mm	
Driv	ing capaci	ty	7900W	
		J1 (Rotation)	±170°	
nge	Arm	J2 (Lower arm)	-70° to +60°	
Working Range		J3 (Upper arm)	-140° to +240° <sup>(2)</sup>	
rking	+	J4 (Swing)	±180°	
Wo	Wrist	J5 (Bending)	-50° to +230°	
		J6 (Twist)	±360°	
	_	J1 (Rotation)	3.40 rad/s(195°/s)	
eq	Arm	J2 (Lower arm)	3.32 rad/s(190°/s)	
Motion speed		J3 (Upper arm)	3.14 rad/s(180°/s)	
otion		J4 (Swing)	6.98 rad/s(400°/s)	
Š	Wrist	J5 (Bending)	6.98 rad/s(400°/s)	
		J6 (Twist)	10.5 rad/s(600°/s)	
ō	ble	J4 (Swing)	43.7N•m	
Wrist allowable load	Allowable moment	J5 (Bending)	43.7N•m	
vabl	₹⊑	J6 (Twist)	19.6N•m	
allo	ble it of a	J4 (Swing)	1.09kg•m²	
Vrist	Allowable moment of inertia	J5 (Bending)	1.09kg•m²	
>	E m	J6 (Twist)	0.24kg•m²	
Arm	cross-sec	tional area	3.32m²×340°	
Env	Environmental conditions		32 to 113° F (0 to 45° C), 20 to 80% RH (no condensation)	
Mas	Mass / weight		783 lbs (355kg)	
Max	Maximum load of upper arm		44.09 lbs (20kg) <sup>(3)</sup>	
Inst	Installation method		Floor/Ceiling	
Paint color			White(Munsell 10GY9/1)	

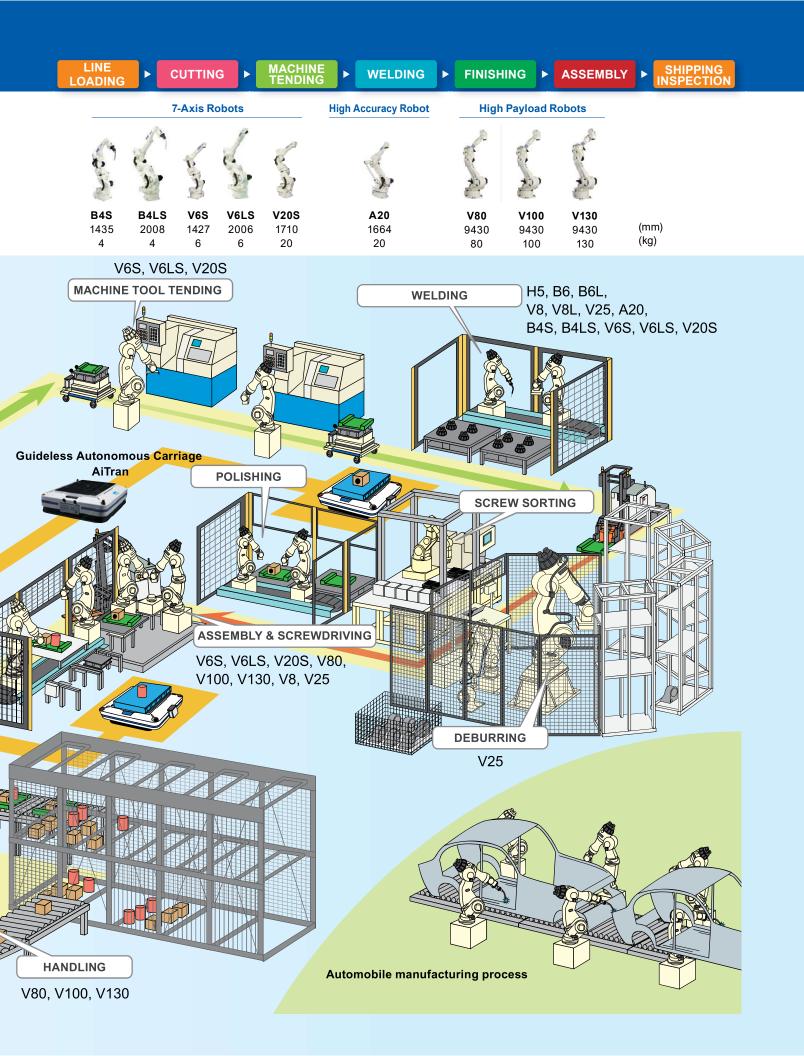
- High tracking accuracy throughout the entire robot work envelope.
- High accuracy delivered in both straight-line and small-arc applications.
- The best choice for laser welding and cutting, TIG, and other tasks requiring high accuracy.

### Notes

- 1. Positional repeatability of the tool center point (TCP) value complies with the JIS-B-8432 Standard.
- 2. The working range of the J3 axis is restricted to -140 degrees to +165 degrees when floor-based welding is applied.
- 3. The capacity of the upper arm varies with the wrist capacity.

## Complete lineup of industrial robots to meet all of your factory floor applications!





## SINGLE SOURCE ADVANTAGE

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WELDING POWER SOURCE,

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