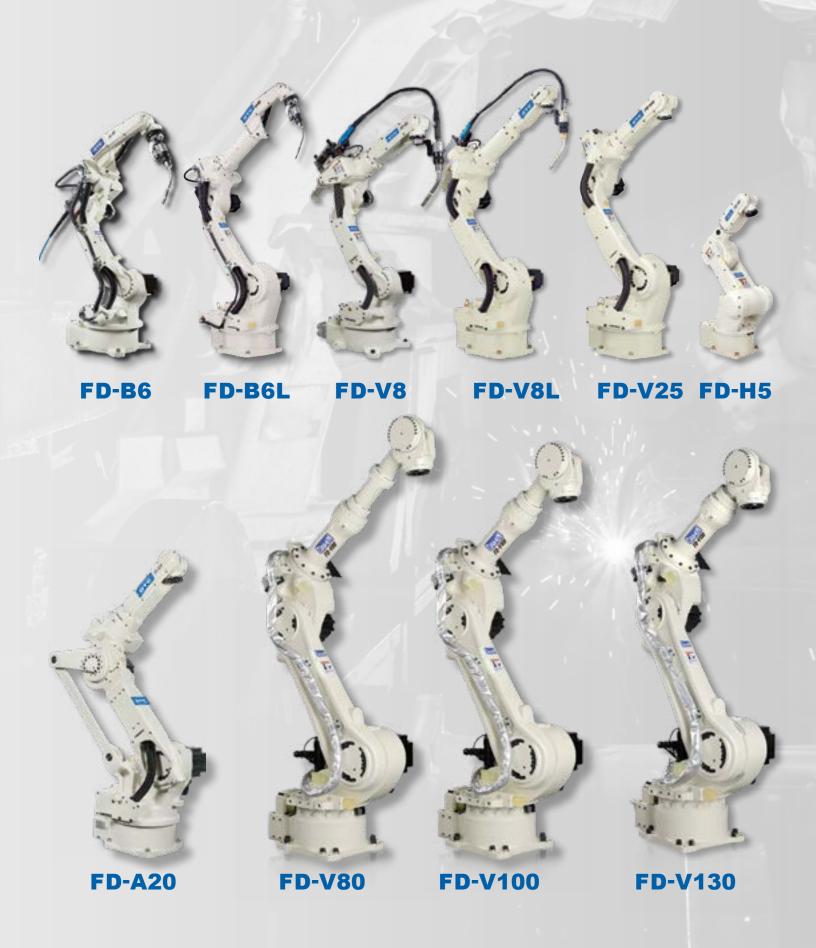


FD Friendly series

COMPLETE ROBOTIC ARC WELDING SYSTEMS

WWW.DAIHEN-USA.COM

THE IDEAL SOLUTION FOR AUTOMATION OF WELDING



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 FunctionsEasy 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

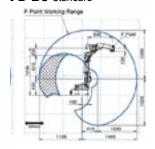




RANGE OF MOTION MANIPULATOR WORKING RANGE / SPECIFICATIONS



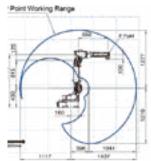
FD-B6 Standard



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



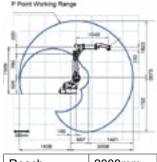
FD-V8 Standard



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



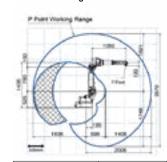
FD-B6L Long Reach



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



FD-V8L Long Reach



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



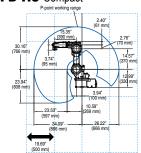
FD-V25 Standard



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



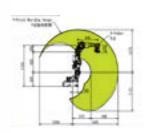
FD-H5 Compact



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



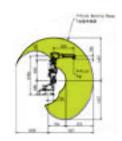
FD-B4S



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



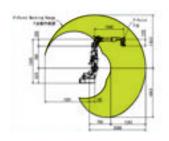
FD-V6S



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



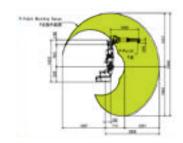
FD-B4LS



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



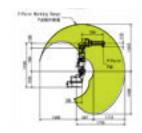
FD-V6LS



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



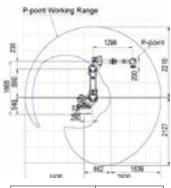
FD-V20S



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



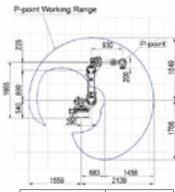
FD-V80



Reach	2500mm
Payload	80kg
Axes	6
Repeatability	± 0.08mm



FD-V130



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



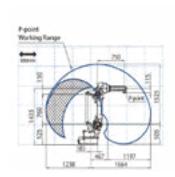
FD-V100



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



FD-A20



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

Specifications: Manipulator for 6 axis

_			-		
			FD-B6	FD-B6L	FD-V8
Model			NB6	NB6L	NV8
Number of axes		es	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) ⁽¹⁾	±0.003" (±0.08mm) ⁽¹⁾	±0.003" (±0.08mm) ⁽¹⁾
Hor	izontal Rea	ach	56.88" (1445mm)	79.06" (2008mm)	55.29" (1402mm)
Verl	tical Reach		84.80" (2154mm)	138.75" (3575mm)	90.67" (2430mm)
Driv	ring capaci	ty	3132 W	4832 W	3016 W
		J1 (Rotation)	±170° (±50°)(2)	±170° (±50°)(2)	±170° (±50°) ⁽²⁾
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°
rking		J4 (Swing)	±155°(±170°) (5)	+/- 155° (+/- 170°) ⁽⁵⁾	±180°
Wo	Wrist	J5 (Bending)	-45° to +225°(6)	-45° to +225°(6)	-50° to +230°
		J6 (Twist)	±205°(±360)(5,6)	+/- 205° (±360°) ^(5,6)	±360°
	_	J1 (Rotation)	4.19 rad/s {240°/s} (3.32 rad/s {190°/s}) (2)	3.40 rad/s (195°/s) (3.05 rad/s (175°/s}) ⁽²⁾	4.19 rad/s {240°/s} (3.32 rad/s {190°/s}) ⁽²⁾
pee	Arm	J2 (Lower arm)	4.19 rad/s {240°/s}	3.49 rad/s {200°/s}	4.19 rad/s {240°/s}
n sp		J3 (Upper arm)	4.01 rad/s {230°/s}	3.49 rad/s {200°/s}	4.01 rad/s {230°/s}
Motion speed		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}
Q	ole nt	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
/able	₹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
Wrist allowable load	Wrist allov Allowable moment of inertia	J5 (Bending)	0.28 kg•m²	0.28 kg•m²	0.43 kg•m²
A Allo	Alk mon	J6 (Twist)	0.06 kg•m²	0.06 kg•m²	0.09 kg•m²
Arm cross-sectional area 3.57 m² x		3.57 m² x 340°	6.37 m ² x 340°	3.11 m² x 340°	
Environmental conditions		32 to 11	3° F (0 to 45° C), 20 to 80% RH	(no condensation)	
Mass / weight 320 lbs (145kg)		320 lbs (145kg)	611 lbs (277kg)	613 lbs (278kg)	
Maximum load of upper arm 22.05 lbs (10kg) ⁽⁷⁾		22.05 lbs (10kg) ⁽⁷⁾	44.09 lbs (20kg) ⁽⁶⁾	44.09 lbs (20kg) ⁽⁷⁾	
Installation method		thod	Floor/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	FD-H5	FD-V25
NV8L	NH5	NV25
6	6	6
13.2 lbs (6kg)	11.02 lbs (5kg)	44.09 lbs (25kg)
±0.003" (±0.08mm) ⁽¹⁾	±0.002" (±0.05mm) ⁽¹⁾	±0.003" (±0.07mm) ⁽¹⁾
78.98" (2006mm)	34.09" (866mm)	67.32" (1710mm)
140.55" (3570mm)	54.1" (1374mm)	117.28" (2979mm)
5000 W	1440 W	5600 W
±170° (±50°)(2)	±170° (±50°) ⁽²⁾	±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°
3.40 rad/s (195°/s) 3.05 rad/s (175°/s) ⁽²⁾	3.49 rad/s (200°/s) 2.79 rad/s (160°/s) ⁽²⁾	3.40 rad/s (195°/s) 3.05 rad/s (175°/s) ⁽²⁾
3.49 rad/s (200º/s)	3.49 rad/s (200°/s)	3.32 rad/s (190°/s)
3.49 rad/s (200º/s)	4.54 rad/s (260°/s)	3.14 rad/s (180°/s)
7.50 rad/s (430°/s)	6.63 rad/s (380°/s)	6.98 rad/s (400°/s)
7.50 rad/s (430°/s)	6.63 rad/s (380°/s)	6.98 rad/s (400°/s)
11.00 rad/s (630°/s)	8.95 rad/s (510°/s)	10.47 rad/s (600°/s)
17.6 N•m	11.9 N•m	52.6 N•m
17.6 N•m	11.9 N•m	52.6 N•m
7.8 N• m	5.21 N•m	25.4 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 m² x 340°	1.22 m² x 340°	5.27 m ² x 340°
602 lbs (273kg)	128 lbs (58kg)	613 lbs (278kg)
44.09 lbs (20kg) ⁽⁵⁾	2.21 lbs (1kg) ⁽⁶⁾	22.05 lbs (10kg) ⁽⁵⁾

- 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	
Number of axes		axes	7	7	7	7	
Ма	aximum ca	pacity	8.8 lbs (4kg)	8.8 lbs (4kg)	13.23 lbs (6kg)	13.23 lbs (6kg)	
Pos	itional rep	eability	±0.003" (±0.08mm) ⁽¹⁾	±0.003" (±0.08mm) ⁽¹⁾	±0.003" (±0.08mm) ⁽¹⁾	±0.003" (±0.08mm) ⁽¹⁾	
Н	orizontal F	Reach	56.50" (1435mm)	79.06" (2008mm)	55.29" (1427mm)	78.98" (2006mm)	
\	/ertical Re	each	96.30" (2446mm)	138.75" (3508mm)	90.67" (2424mm)	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°	
orkin	Wrist	J5 (Bending)	-45° to +225°(2)	-45° to +225°(5)	-50°~ +230° ⁽²⁾	-50° to +230° (2)	
Š		J6 (Twist)	±205°(2)	±205°(2)	+/- 360° (2)	±360° (2)	
		J1 (Rotation 1)	3.66 rad/s (210º/s)	3.40 rad/s (195°/s)	3.66 rad/s (210°/s)	3.40 rad/s (195º/s)	
	Ε	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)	
	Arm	J7(Rotation 2)	3.14rad/s (180°/s)	2.79rad/s (160°/s)	3.14rad/s (180°/s)	2.79rad/s (160°/s)	
pee		J3 (Upper arm)	3.66 rad/s (210º/s)	3.49 rad/s (200°/s)	3.66 rad/s (210°/s)	3.49 rad/s (200°/s)	
Motion speed		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)	
ъ	nt nt	J4 (Swing)	10.1 N*m	10.1 N*m	11.8 N*m	11.8 N*m	
Wrist allowable load	Allowable moment	J5 (Bending)	10.1 N*m	10.1 N*m	9.8 N*m	9.8 N*m	
vable	₹ E	J6 (Twist)	2.94 N*m	2.94 N*m	5.9 N*m	5.9 N*m	
allov	ole t of	J4 (Swing)	0.38kg*m²	0.38kg*m²	0.30kg*m ²	0.30kg*m²	
/rist	Allowable moment of inertia	J5 (Bending)	0.38kg*m²	0.38kg*m ²	0.25kg*m ²	0.25kg*m²	
>	E E	J6 (Twist)	0.03kg*m²	0.03kg*m²	0.06kg*m ²	0.06kg*m²	
	Arm cross-sectional area		2.57 m ² x 340°	5.28 m ² x 340°	5.28 m ² x 340°	5.40 m ² x 340°	
Environmental conditions		ental conditions	32 to 113° F (0 to 45° C), 20 to 80% RH (no condensation)				
	Mas	s / weight	416.67 lbs (189kg)	707.68 lb (321kg)	392.42lb(178 kg)	696.67lbs (316kg)v	
M	aximum lo	oad of upper arm	22.05 lbs (10kg) ⁽³⁾	22.05 lbs (10kg) ⁽³⁾	22.05 lbs (10kg) ⁽³⁾	44.09 lbs (20kg) ⁽³⁾	
Ins	Installation method		Floor				
Paint color		or	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.

 ⁽¹⁾ The value of the positional repeatability is at the tool center point (TCP) 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

- 1

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*m²

0.24kg*m²

 $3.91m^2 \ x \ 340^o$

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		
Model			NV80	NV100	NV130		
Number of axes		6	6	6			
Max	ximum cap	pacity	176.37 lbs (80 kg)	220.46 lbs (100 kg)	286.60 lbs (130 kg)		
Pos	sitional rep	eatability	±0.003" (±0.08mm)				
Hor	izontal Re	ach	2500 mm 2236 mm 2139 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°				
y Ra		J3 (Upper arm)		-185° to +220°			
Working Range		J4 (Swing)		±360°			
% Mo	Wrist	J5 (Bending)	-35° to +215°				
		J6 (Twist)		±360°			
		J1 (Rotation)	2.44 rad/s (140º/s)				
eq	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 (175º/s)				
Š	Wrist	J5 (Bending)	3.05 rad/s (175°/s)				
		J6 (Twist)	4.45 rad/s (255°/s)				
<u> </u>	ble	J4 (Swing)	433.0 N•m 721.0 N•m				
e los	Allowable moment	J5 (Bending)	433.0 N•m 721.0 N•m		0 N•m		
Wrist allowable load	₹₽	J6 (Twist)		294.0 N•m			
allo	ole t of	J4 (Swing)	31.4 kg•m² 60.0 kg•m²		kg•m²		
Vrist	Allowable moment of inertia	J5 (Bending)	31.4 kg•m²	60.0	kg•m²		
>	A P	J6 (Twist)	11.9 kg•m²	33.7 kg•m²			
Arm	Arm cross-sectional area		9.53 m ² x 360°	7.56 m ² x 360°	6.83 m² x 360°		
Env	Environmental conditions		32 to 113° F (0 to 45° C), 20 to 80% RH (no condensation)				
Mass / weight		t	780 kg	770kg	765 kg		
Max	Maximum load of upper arm		50 kg ⁽²⁾				
Installation method		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:

⁽¹⁾ 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	
Number of axes		:S	6	
Maximum capacity		acity	44.09 lbs (20kg)	
Pos	itional repe	eatability	±0.003" (±0.07mm) ⁽¹⁾	
Hor	izontal Rea	ich	1664mm	
Vert	ical Reach		2030mm	
Driv	ing capacit	ty	7900W	
		J1 (Rotation)	±170°	
nge	Arm	J2 (Lower arm)	-70° to +60°	
Working Range		J3 (Upper arm)	-140° to +240°(2)	
rking		J4 (Swing)	±180°	
% Mo	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)	
g	ble	J4 (Swing)	43.7N•m	
Wrist allowable load	Allowable moment	J5 (Bending)	43.7N•m	
vabl		J6 (Twist)	19.6N•m	
allo	Allowable moment of inertia	J4 (Swing)	1.09kg•m²	
Vrist		J5 (Bending)	1.09kg•m²	
>	₽ E i	J6 (Twist)	0.24kg•m²	
Arm cross-sectional area		tional area	3.32m²×340°	
Environmental conditions		conditions	32 to 113° F (0 to 45° C), 20 to 80% RH (no condensation)	
Mass / weight			783 lbs (355kg)	
Maximum load of upper arm		of upper arm	44.09 lbs (20kg) ⁽³⁾	
Installation method		thod	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.

- 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.

SINGLE SOURCE ADVANTAGE

Our single source approach is simple: we provide all the equipment needed for robotic or manual arc welding. One call solves it all!

- Seamless digital integration for maximum control
- Reduced maintenance time for greater uptime and productivity
- Expert service from experienced support staff



ROBOT,
WELDING POWER SOURCE,
WIRE FEEDER,
TORCH.
WE PROVIDE IT ALL.

SEAMLESS SOLUTIONS

DAIHEN INC.

Our cells can provide arc welding solutions for a range of parts from small to large size, with minimal operator movement required and little to no part positioning. The compact designs reduce required manufacturing floor space. All cells include an arc welding robot, a robot controller, a teach pendant and a positioner.





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