



Almega Friendly series II

Robot Product Catalog



In accordance with DAIHEN's policy to make continuing improvements, design and/or specifications are subject to change without notice and without any obligation on the part of manufacturer.

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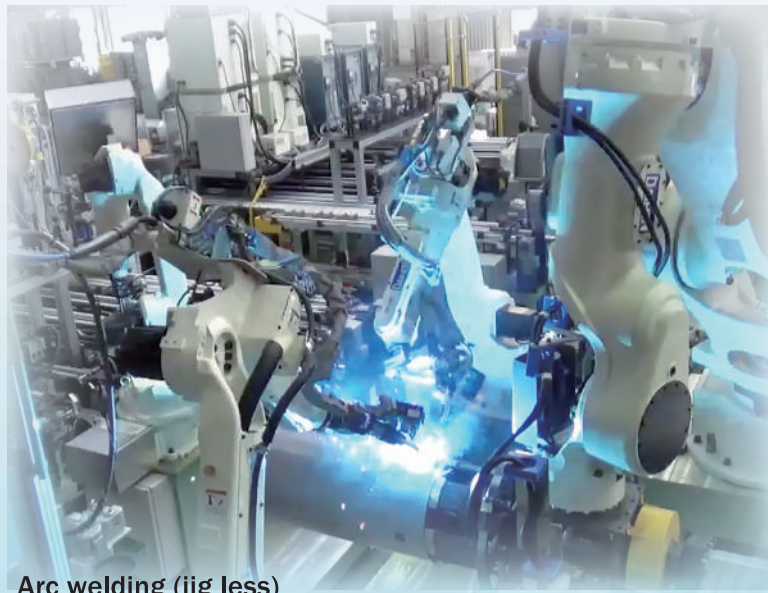
CAT NO. R21658 12.2019. IN JAPAN

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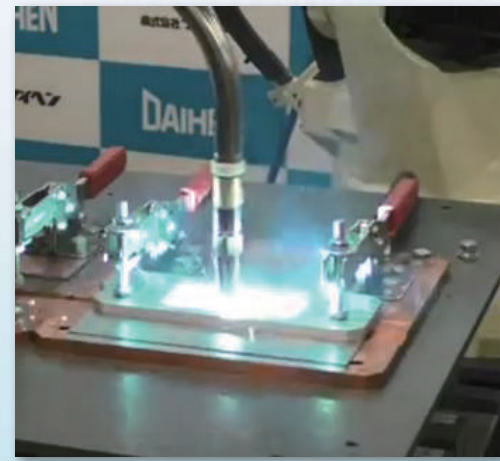
- The information contained in this catalog is current as of December 2019 and is subject to revision without notice.
- This product is made of FSC®-certified and other controlled material.



Arc welding robot



Arc welding (jig less)



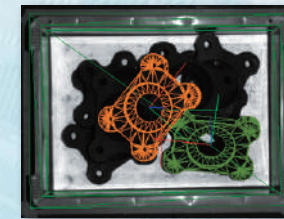
Synchro-Feed



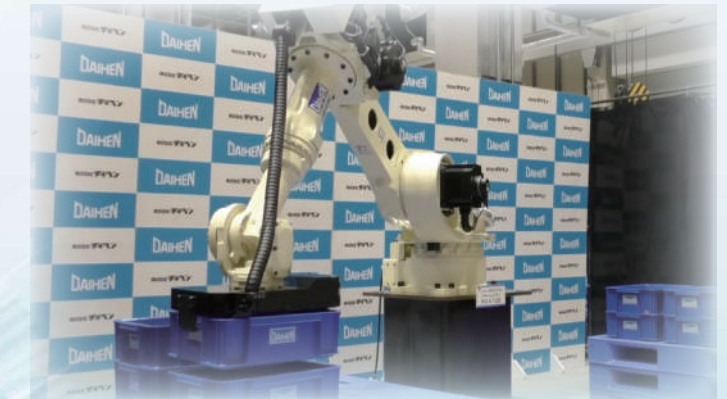
3D Vision Sensor



2D Vision Sensor



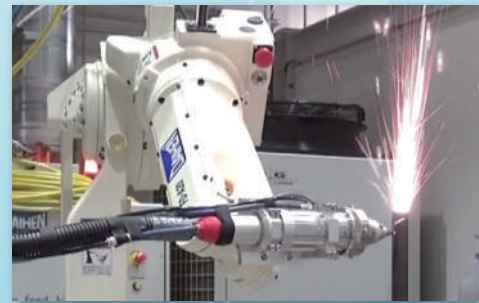
Picking



Palletizing system

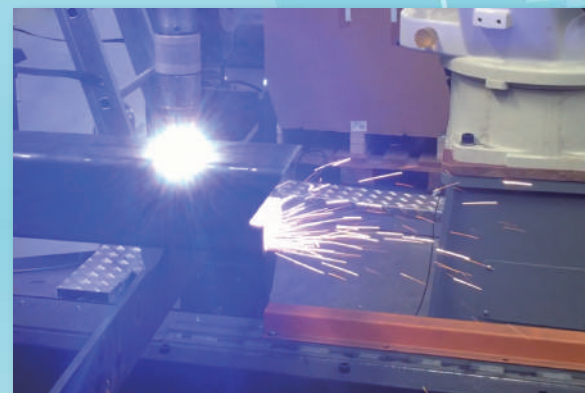


Conveyor picking

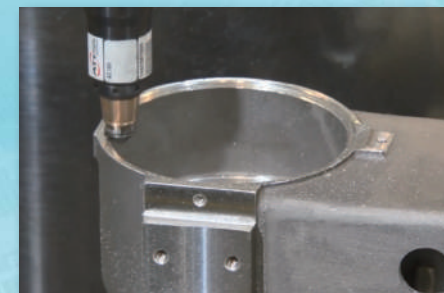


Laser cutting

DAIHEN Robot solutions meet the demands of factory automation.



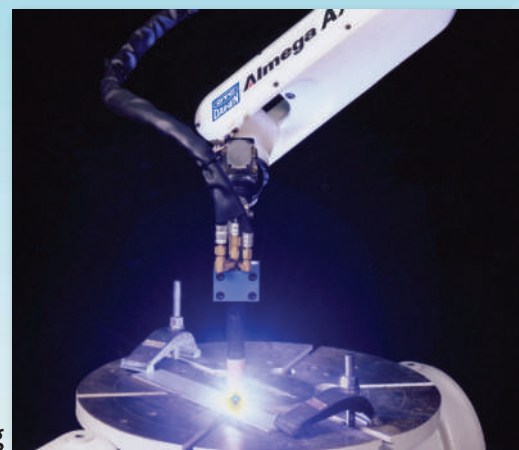
Plasma cutting



Edge trimming



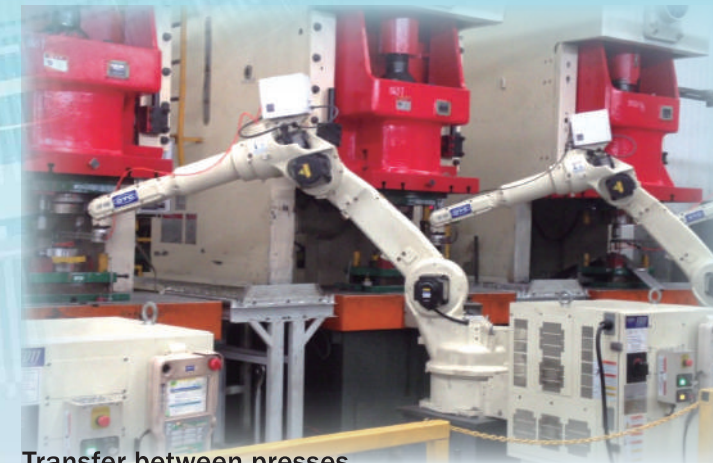
Sealing



TIG welding



Spot welding



Transfer between presses



Fitting

FD19 CONTROLLER The limitless potential of extensive "connectivity"

Meet the demands from introduction to advanced automation.

Easily "connects" with peripheral equipment
Simple connection to the host system
by built-in PLC

High-performance built-in software PLC



Graphical interface offers the functionality of popular PLCs.

"Connects" with IoT remote service

Remote TP

Remote Diagnosis

Remote Software update



"Connecting" Variation
Compact body and high expandability

Built-in amplifier and external 2-axis unit

Supports high-capacity (7kW) motors

Increased number of "connectable" motors



* Feature available beginning January 2020



FD19 CONTROLLER

Improved "connectivity" with welders

Greatly improved synchronization with welders

Simultaneous welding with multiple robots yields greatly improved quality.



Enhance your system by "connecting" commercial peripherals.

3D Vision System

2D/3D Vision System

Offline teaching system

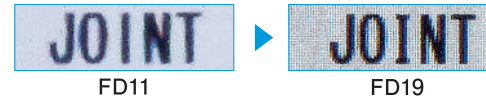
Laser oscillator



Revolutionary Ease of Use

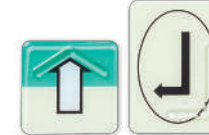
Clear and legible screen

Higher contrast with clearer details



Comfortable touch-typing

Embossed main keys



Lightweight with ergonomic grip

15% lighter + enhanced grip design = 66% less arm fatigue

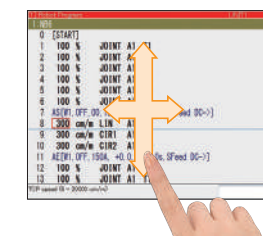


TEACH PENDANT

Tablet-like operation

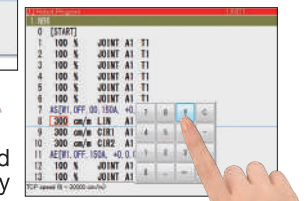


Menu icons



Scroll screen by swipe operation

Touch screen keypad for numeric entry



Enhanced Basic Performance

Small footprint

25% narrower than the previous model
Ideal for high-density installations



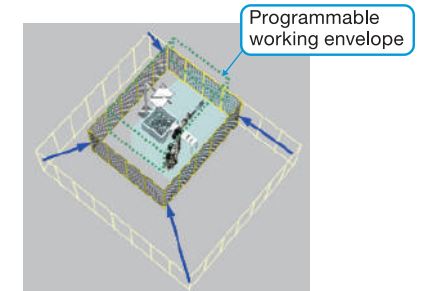
300mm



FD19 CONTROLLER

Complies with the latest international safety standards.

Supports multiple safety control standards for emergency stop: Cat. 4, PLe, and SIL3.

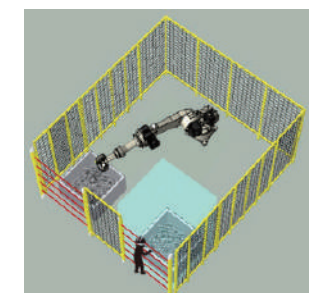


Programmable working envelope

Safer working environment

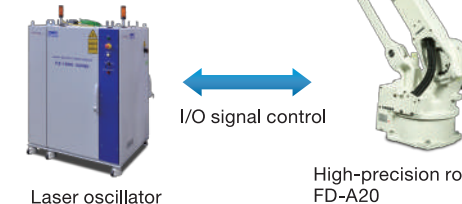
- RMU* constantly monitors robot movement.
- Restricts robot movement when worker is present in a shared area.

* Robot Monitoring Unit



Optimized for high-precision laser & plasma processing

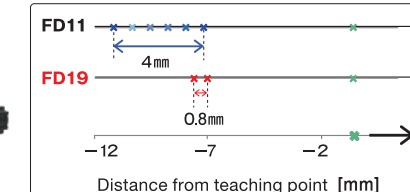
Six times faster synchronization with external devices for high-precision laser and plasma processing



Laser oscillator

High-precision robot FD-A20

80% reduced! the variation in the position of signal output.

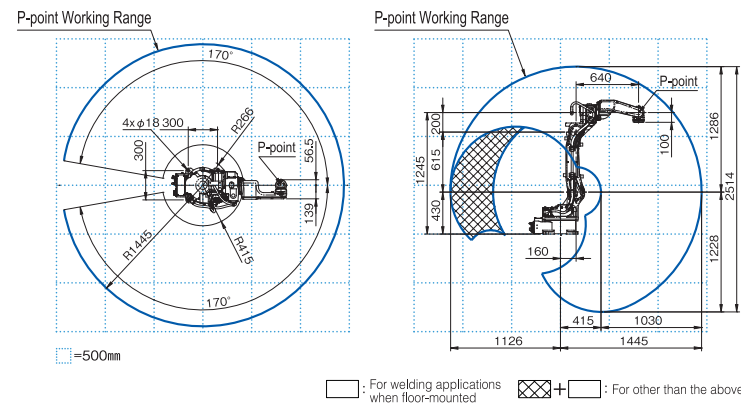


* At high speed operation of 10m/min.

* The figures below show working range of P-point with no torch mounted.

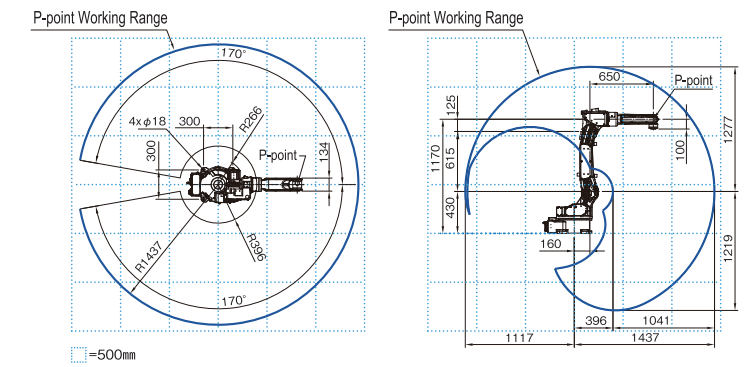
Internal cable type

FD-B6



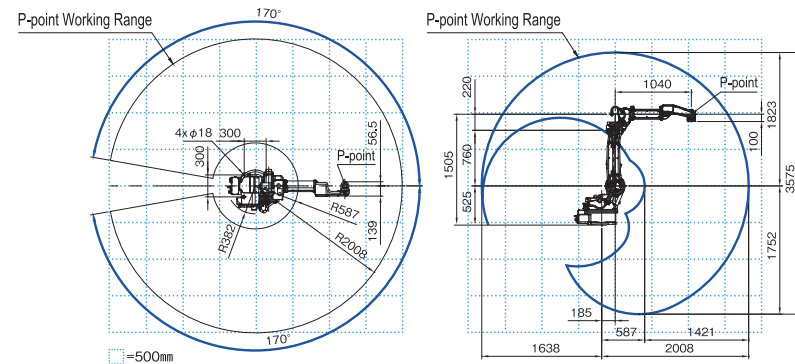
Standard type

FD-V8



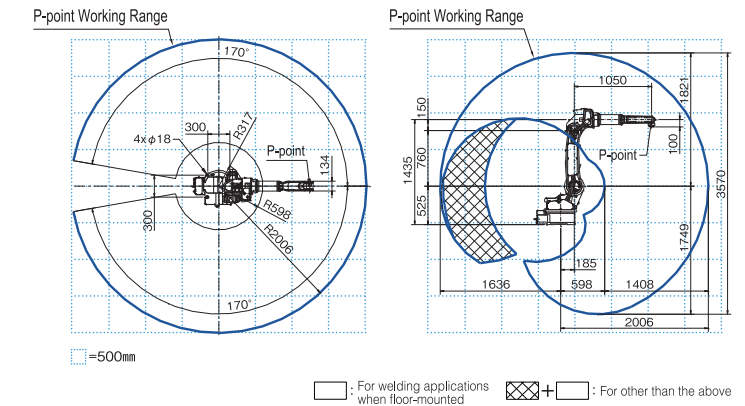
Internal cable type

FD-B6L



Standard type

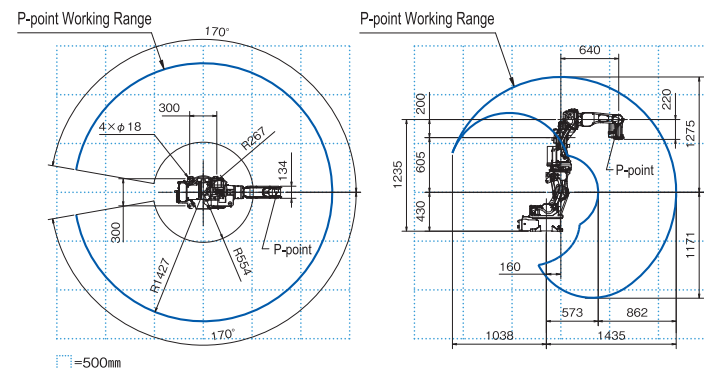
FD-V8L



Internal cable type

FD-B4S

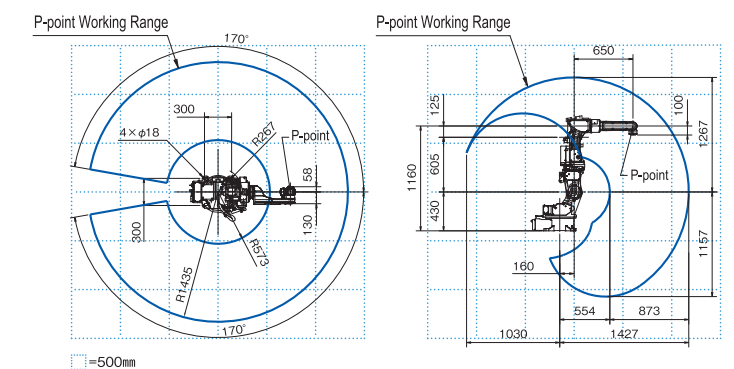
7-axis



Standard type

FD-V6S

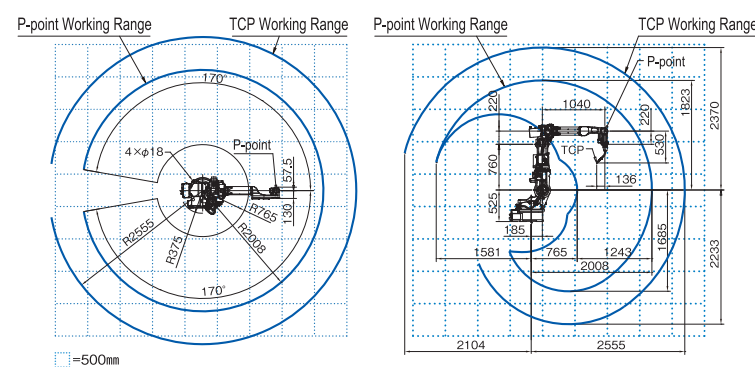
7-axis



Internal cable type

FD-B4LS

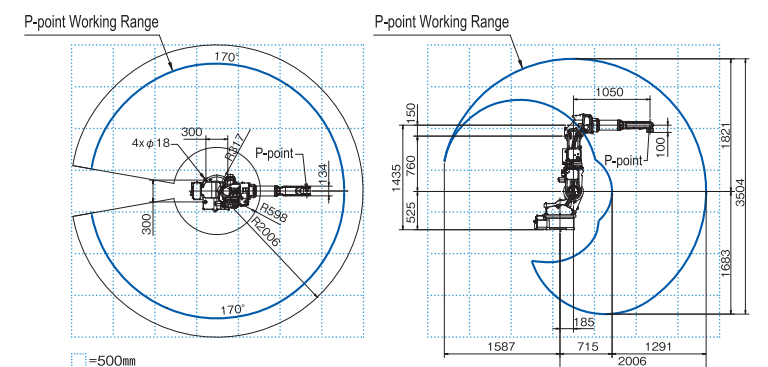
7-axis



Standard type

FD-V6LS

7-axis



Range of motion Manipulator Working Range/Specifications

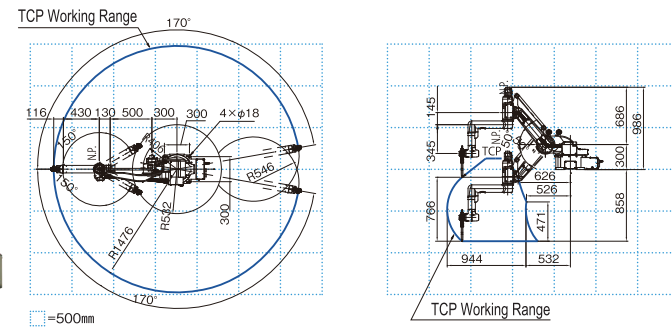
Meets a Variety of Needs, from Space-Efficiency to High-Precision Robot

Handles a Variety of Medium-to-High-Duty Tasks

* The figures below show working range of P-point with no torch mounted.

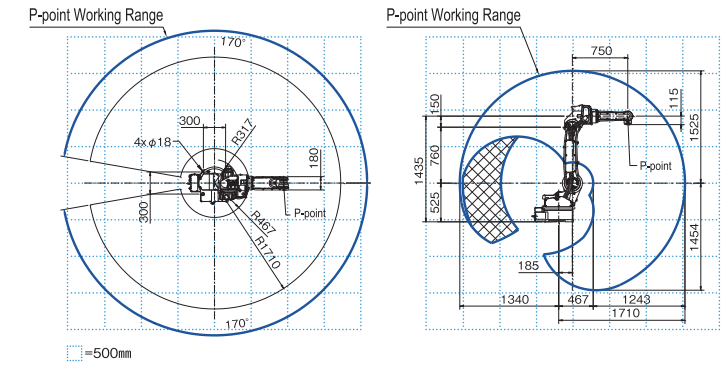
Space-efficient type

FD-G3



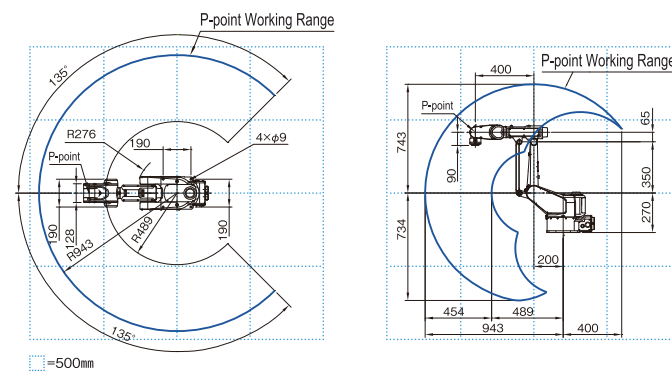
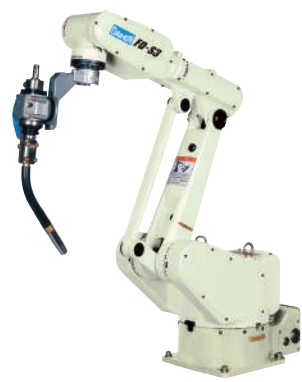
Versatile handling

FD-V25



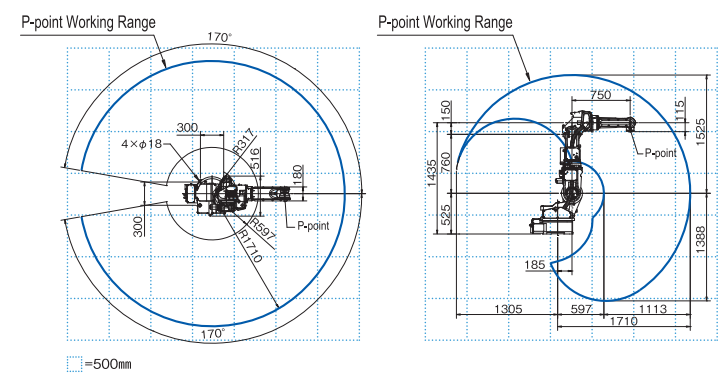
Compact & lightweight

FD-S3



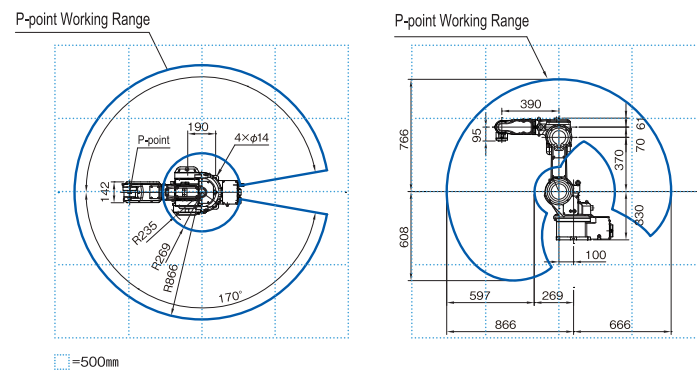
Versatile handling

FD-V20S



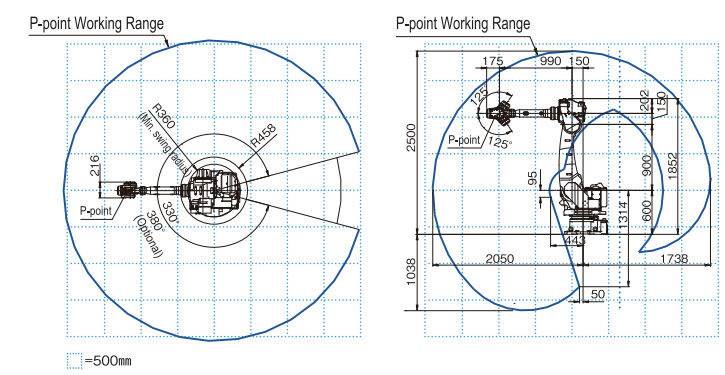
Compact & powerful

FD-H5



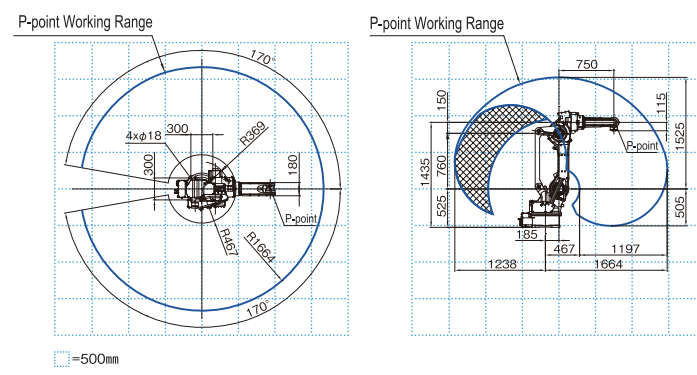
Versatile handling

FD-V50



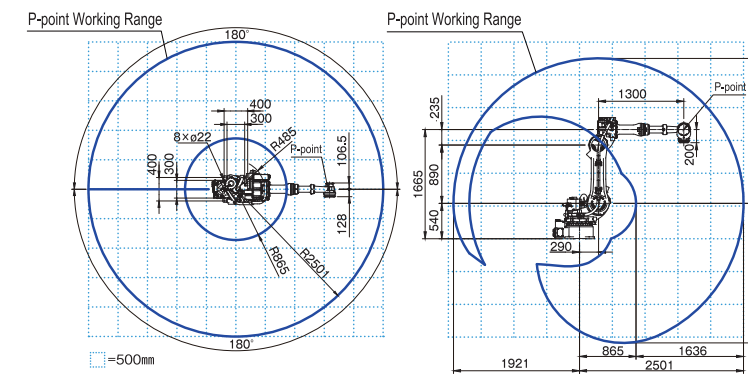
High-accuracy robot

FD-A20



Versatile handling

FD-V80

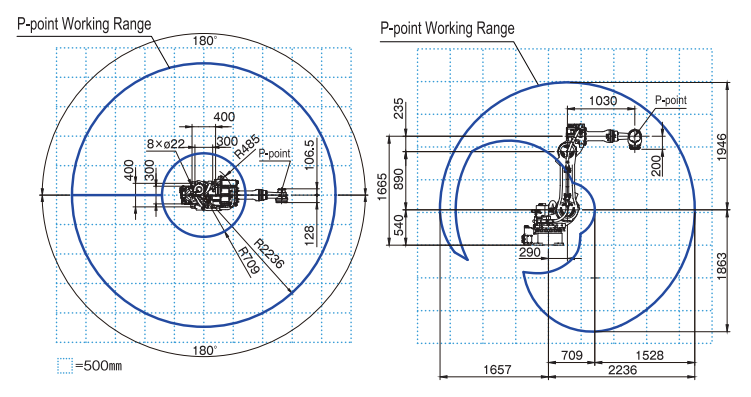


Range of motion Manipulator Working Range/Specifications
Handles a Variety of Medium-to-High-Duty Tasks

* The figures below show working range of P-point with no torch mounted.

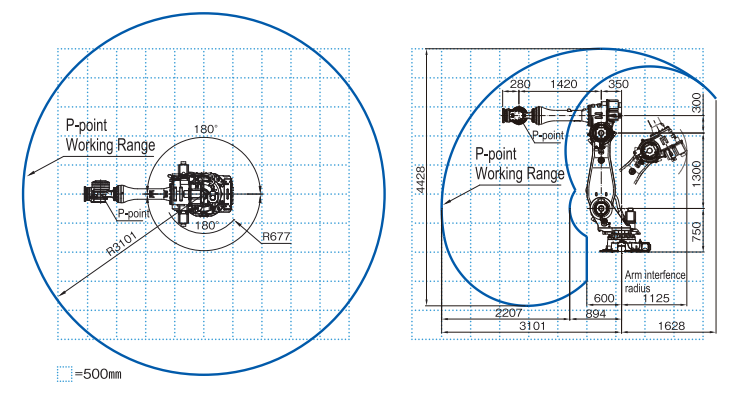
Versatile handling

FD-V100



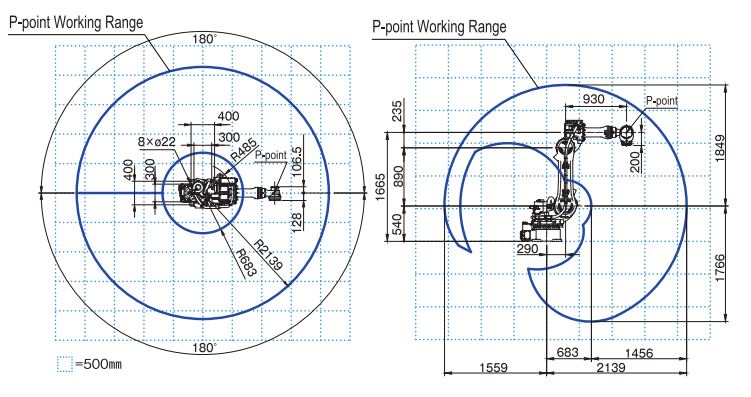
Heavy-load type

FD-V280L



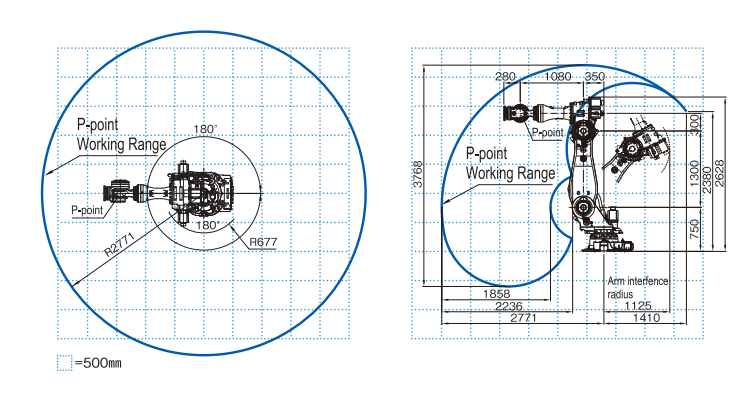
Versatile handling

FD-V130



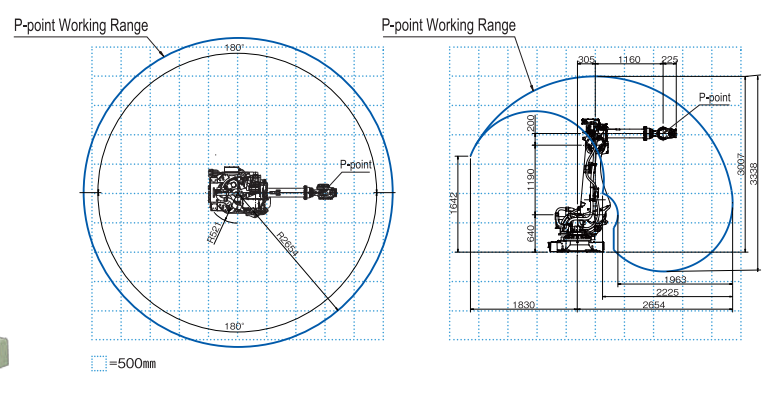
Heavy-load type

FD-V350



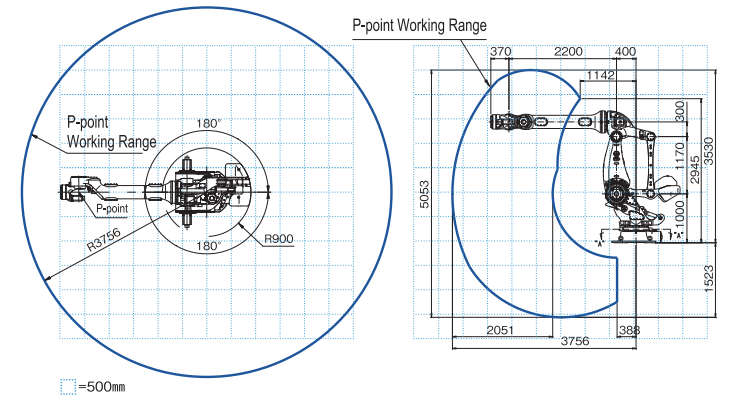
Versatile handling

FD-V166



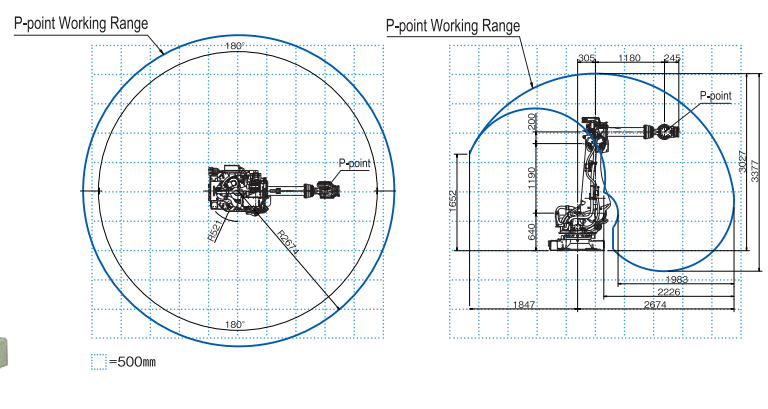
Heavy-load type

FD-V400L



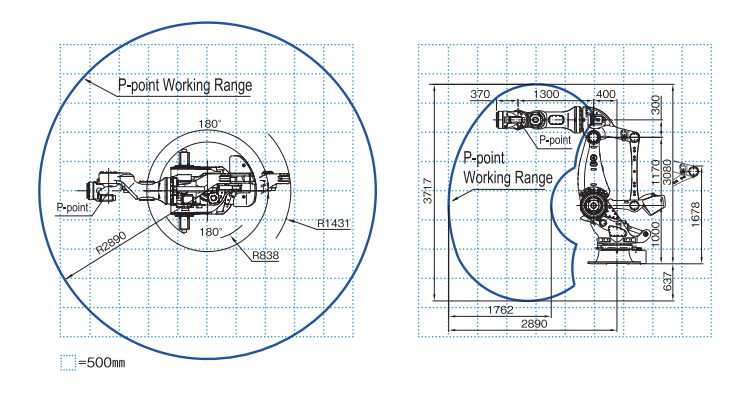
Versatile handling

FD-V210



Heavy-load type

FD-V600/V700



Specification

Manipulator Specifications

	FD-B6	FD-B6L	FD-B4S	FD-B4LS	FD-V8	FD-V8L	FD-V6S	FD-V6LS		
Model	NB6	NB6L	NB4S	NB4LS	NV8	NV8L	NV6S	NV6LS		
Structure	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type		
Number of Axes	6	6	7	7	6	6	7	7		
Wrist Capacity	6kg	6kg	4kg	4kg	8kg	8kg	6kg	6kg		
Positional Repeatability (Note 1)	±0.08mm	±0.08mm	±0.08mm	±0.08mm	±0.08mm	±0.08mm	±0.08mm	±0.08mm		
Driving Method	AC servo motor	◀	◀	◀	◀	◀	◀	◀		
Driving Capacity	3132W	4832W	3550W	5650W	3016W	5000W	3600W	6000W		
Positional Feedback	Absolute encoder	◀	◀	◀	◀	◀	◀	◀		
Working Range	Arm	J1 (Rotation 1)	±170°(±50°)(Note 2)	±170°(±50°)(Note 2)	±170°	±170°	±170°(±50°)(Note 2)	±170°(±50°)(Note 2)	±170°	
		J2 (Front/back)	-155° to +90° (Note 3)	-155° to +100° (Note 3)	-145° to +70°	-145° to +75°	-155° to +90°	-155° to +100°	-145° to +70°	-145° to +75°
		J7 (Rotation 2)	-	-	±90°	±90°	-	-	±90°	±90°
	Wrist	J3 (Up/down)	-170° to +245° (Note 4)	-170° to +190°	-170° to +142.6°	-170° to +154°	-170° to +190°	-170° to +260°	-170° to +149°	-170° to +160° (Note 4)
		J4 (Swing)	±155° (±170°) (Note 5)	±155° (±170°) (Note 5)	±155°	±155°	±180°	±180°	±180°	±180°
		J5 (Bending)	-45° to +225°	-45° to +225°	-45° to +225°	-45° to +225°	-50° to +230°	-50° to +230°	-50° to +230°	-50° to +230°
J6 (Twist)	±205° (±360°) (Note 5,6)	±205° (±360°) (Note 5,6)	±205° (Note 6)	±205° (Note 6)	±360° (Note 6)	±360° (Note 6)	±360° (Note 6)	±360° (Note 6)		
Maximum Speed	Arm	J1 (Rotation 1)	4.19rad/s[240°/s] (3.32rad/s[190°/s])(Note 2)	3.40rad/s[195°/s] (3.05rad/s[175°/s])(Note 2)	3.66rad/s[210°/s]	3.40rad/s[195°/s]	4.19rad/s[240°/s] (3.32rad/s[190°/s])(Note 2)	3.40rad/s(3.05) [195°/s(175°/s)]	3.66rad/s[210°/s]	3.40rad/s[195°/s]
		J2 (Front/back)	4.19rad/s [240°/s]	3.49rad/s [200°/s]	3.66rad/s[210°/s]	3.49rad/s[200°/s]	4.19rad/s [240°/s]	3.49rad/s [200°/s]	3.66rad/s[210°/s]	3.49rad/s[200°/s]
		J7 (Rotation 2)	-	-	3.14rad/s[180°/s]	2.79rad/s[160°/s]	-	-	3.14rad/s[180°/s]	2.79rad/s[160°/s]
	Wrist	J3 (Up/down)	4.01rad/s [230°/s]	3.49rad/s [200°/s]	3.66rad/s[210°/s]	3.49rad/s[200°/s]	4.01rad/s [230°/s]	3.49rad/s [200°/s]	3.66rad/s[210°/s]	3.49rad/s[200°/s]
		J4 (Swing)	7.50rad/s [430°/s]	7.50rad/s [430°/s]	7.33rad/s [420°/s]	7.33rad/s [420°/s]	7.50rad/s [430°/s]	7.50rad/s [430°/s]	7.33rad/s [420°/s]	7.33rad/s [420°/s]
		J5 (Bending)	7.50rad/s [430°/s]	7.50rad/s [430°/s]	7.33rad/s [420°/s]	7.33rad/s [420°/s]	7.50rad/s [430°/s]	7.50rad/s [430°/s]	7.33rad/s [420°/s]	7.33rad/s [420°/s]
J6 (Twist)	11.00rad/s [630°/s]	11.00rad/s [630°/s]	10.5rad/s [600°/s]	10.5rad/s [600°/s]	11.00rad/s [630°/s]	10.99rad/s [630°/s]	10.82rad/s [620°/s]	10.82rad/s [620°/s]		
Wrist Allowable Load	Allowable Moment	J4 (Rotation)	10.5N·m	10.5N·m	10.1 N·m	10.1 N·m	17.6N·m	17.6N·m	11.8 N·m	11.8 N·m
		J5 (Bending)	10.5N·m	10.5N·m	10.1 N·m	10.1 N·m	17.6N·m	17.6N·m	9.8 N·m	9.8 N·m
		J6 (Twist)	5.9N·m	5.9N·m	2.94 N·m	2.94 N·m	7.8N·m	7.8N·m	5.9 N·m	5.9 N·m
	Allowable Moment of Inertia	J4 (Rotation)	0.28 kg·m ²	0.28 kg·m ²	0.38 kg·m ²	0.38 kg·m ²	0.43 kg·m ²	0.43 kg·m ²	0.30 kg·m ²	0.30 kg·m ²
		J5 (Bending)	0.28 kg·m ²	0.28 kg·m ²	0.38 kg·m ²	0.38 kg·m ²	0.43 kg·m ²	0.43 kg·m ²	0.25 kg·m ²	0.25 kg·m ²
		J6 (Twist)	0.06 kg·m ²	0.06 kg·m ²	0.03 kg·m ²	0.03 kg·m ²	0.09 kg·m ²	0.09 kg·m ²	0.06 kg·m ²	0.06 kg·m ²
Arm Cross-sectional Area	3.59m ² ×340°	6.37m ² ×340°	2.57m ² ×340°	5.28m ² ×340°	3.11m ² ×340°	7.48m ² ×340°	2.58m ² ×340°	5.40m ² ×340°		
Environmental Conditions	Temp: 0 to 45°C, Hmd: 20 to 80%RH (No Condensation)	◀	◀	◀	◀	◀	◀	◀		
Mass (weight)	145kg	278 kg	189 kg	321 kg	140 kg	273kg	178 kg	316 kg		
Capacity of Upper Arm	10 kg (Note 7)	20kg (Note 7)	10 kg (Note 7)	10 kg (Note 7)	10 kg (Note 7)	20kg (Note 7)	10 kg (Note 7)	20 kg (Note 7)		
Installation Method	Floor-/Ceiling-/Wall-mounted	Floor-/Ceiling-/Wall-mounted	Floor-mounted	Floor-mounted	Floor-/Ceiling-/Wall-mounted	Floor-/Ceiling-/Wall-mounted	Floor-mounted	Floor-mounted		
Paint Color	White (Munsell notation 10GY 9/1)	◀	◀	◀	◀	◀	◀	◀		

- Notes
1. Positional repeatability of the tool center point (TCP) value complies with the JIS-B-8432 Standard.
 2. The value in the parentheses indicates the wall-mounting condition.
 3. Working range of J6 axis may be restricted by the position of J5 axis.
 4. When loading the Max. payload capacity as the end effector.

5. The capacity of the upper arm varies with the wrist capacity.
 6. Working range of J2 axis may be restricted when wall-mounting.
 7. The operation range of the J3 axis is restricted to -170 degrees to +205 degrees when floor-based welding is applied.
 8. This value changes by placement and load conditions of a wrist.
- *These specifications are subject to change without prior notice.

Specification

Manipulator Specifications

	FD-G3	FD-S3	FD-H5	FD-A20	FD-V25	FD-V20S	FD-V50	FD-V80		
Model	NG3	NS3	NH5	NA20	NV25	NV20S	NV50	NV80		
Structure	Horizontally articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type		
Number of Axes	5	6	6	6	6	7	6	6		
Wrist Capacity	3kg	3kg	5kg	20kg	25kg	20kg	50kg	80kg		
Positional Repeatability (Note 1)	±0.08mm	±0.08mm	±0.05mm	±0.07mm	±0.07mm	±0.08mm	±0.07mm	±0.08mm		
Driving Method	AC servo motor	◀	◀	◀	◀	◀	◀	◀		
Driving Capacity	1400W	390W	1440W	7900W	5600W	6600W	14750W	15100W		
Positional Feedback	Absolute encoder	◀	◀	◀	◀	◀	◀	◀		
Working Range	Arm	J1 (Rotation 1)	±170°	±135°(±45°) (Note 2)	±170°	±170°	±170°(±50°) (Note 2)	±170°	±165°	±180°
		J2 (Front/back)	±50°	-160° to +65°	-125° to +90°	-70° to +60°	-155° to +100° (Note 3)	-145° to +75°	+80° to -135°	-155° to +90°
		J7 (Rotation 2)	-	-	-	-	-	±90°	-	-
	Wrist	J3 (Up/down)	±150°	-130° to 125°	-140° to +245°	-140° to +240° (Note 4)	-170° to +260° (Note 4)	-170° to +160°	+260° to -146°	-185° to +220°
		J4 (Swing)	±210°	±180°	±190°	±180°	±180°	±180°	±360°	±360°
		J5 (Bending)	±130°	-40° to +220°	-30° to +210°	-50° to +230°	-50° to +230°	-50° to +230°	±125°	-35° to +215°
J6 (Twist)	-	±360° (Note 6)	±360° (Note 6)	±360° (Note 6)	±360° (Note 6)	±360° (Note 6)	±360° (Note 6)	±450°	±360°	
Maximum Speed	Arm	J1 (Rotation 1)	2.09rad/s{120°/s}	1.05rad/s{60°/s}	3.49rad/s{200°/s} (2.79rad/s{160°/s}) (Note 2)	3.40 rad/s{195°/s}	3.40rad/s{195°/s} (3.05rad/s{175°/s})	3.40rad/s{195°/s}	3.14 rad/s{180°/s}	2.44rad/s{140°/s}
		J2 (Front/back)	2.79rad/s{160°/s}	1.05rad/s{60°/s}	3.49rad/s{200°/s}	3.32 rad/s{190°/s}	3.32rad/s{190°/s}	3.32rad/s{190°/s}	3.14 rad/s{180°/s}	1.92rad/s{110°/s}
		J7 (Rotation 2)	-	-	-	-	-	2.79rad/s{160°/s}	-	-
	Wrist	J3 (Up/down)	4.19rad/s{240°/s}	1.05rad/s{60°/s}	4.54rad/s{260°/s}	3.14 rad/s{180°/s}	3.14rad/s{180°/s}	3.14rad/s{180°/s}	3.14 rad/s{180°/s}	2.44rad/s{140°/s}
		J4 (Swing)	9.42rad/s{540°/s}	3.14rad/s{180°/s}	6.63rad/s{380°/s}	6.98 rad/s{400°/s}	6.98rad/s{400°/s}	6.98rad/s{400°/s}	4.45 rad/s{255°/s}	3.05rad/s{175°/s}
		J5 (Bending)	9.42rad/s{540°/s}	3.14rad/s{180°/s}	6.63rad/s{380°/s}	6.98 rad/s{400°/s}	6.98rad/s{400°/s}	6.98rad/s{400°/s}	4.45 rad/s{255°/s}	3.05rad/s{175°/s}
J6 (Twist)	-	3.14rad/s{180°/s}	8.90rad/s{510°/s}	10.5 rad/s{600°/s}	10.47rad/s{600°/s}	10.5rad/s{600°/s}	6.46 rad/s{370°/s}	4.45rad/s{255°/s}		
Wrist Allowable Load	Allowable Moment	J4 (Rotation)	-	7.94 N·m	11.9 N·m	43.7Nm	52.6N·m	43.7 N·m	210 N·m	433 N·m
		J5 (Bending)	2.5N·m	6.47 N·m	11.9 N·m	43.7Nm	52.6N·m	43.7 N·m	210 N·m	430 N·m
		J6 (Twist)	-	4.12 N·m	5.2 N·m	19.6Nm	24.5N·m	19.6 N·m	130 N·m	294 N·m
	Allowable Moment of Inertia	J4 (Rotation)	0.074 kg·m ²	0.219 kg·m ²	0.303 kg·m ²	1.09kgm ²	1.24 kg·m ²	1.09 kg·m ²	30 kg·m ²	31.4 kg·m ²
		J5 (Bending)	0.037 kg·m ²	0.145 kg·m ²	0.303 kg·m ²	1.09kgm ²	1.24 kg·m ²	1.09 kg·m ²	30 kg·m ²	31.4 kg·m ²
		J6 (Twist)	-	0.059 kg·m ²	0.061 kg·m ²	0.24kgm ²	0.33kg·m ²	0.24 kg·m ²	12 kg·m ²	11.9 kg·m ²
Arm Cross-sectional Area	0.69m ² × 340°	0.82m ² × 270°	1.22m ² × 340°	3.32m ² × 340°	5.27m ²	3.91m ² × 340°	7.4 m ² × 330°	9.53m ² × 360°		
Environmental Conditions	Temp: 0 to 45°C, Hmd: 20 to 80%RH (No Condensation)	◀	◀	◀	◀	◀	◀	◀		
Mass (weight)	144 kg	31 kg	58 kg	355 kg	278 kg	321 kg	640 kg	780 kg		
Capacity of Upper Arm	40 kg	1 kg	1 kg	20 kg (Note 7)	10 kg (Wrist capacity: 25kg)(Note 7)	5 kg (Note 7)	15 kg (Note 7)	50 kg		
Installation Method	Floor-mounted	Floor-/Ceiling-/Wall-mounted	Floor-/Ceiling-/Wall-mounted	Floor-/Ceiling-mounted	Floor-/Ceiling-/Wall-mounted	Floor-mounted	Floor-mounted	Floor-/Ceiling-mounted		
Paint Color	White (Munsell notation 10GY 9/1)	◀	◀	◀	◀	◀	◀	◀		
IP code	-	-	-	-	-	-	-	Wrist axes:IP65/67 Base axes:IP54		

Notes
 1. Positional repeatability of the tool center point (TCP) value complies with the JIS-B-8432 Standard.
 2. The value in the parentheses indicates the wall-mounting condition.
 3. Working range of J6 axis may be restricted by the position of J5 axis.
 4. When loading the Max. payload capacity as the end effector.

5. The capacity of the upper arm varies with the wrist capacity.
 6. Working range of J2 axis may be restricted when wall-mounting.
 7. The operation range of the J3 axis is restricted to -170 degrees to +205 degrees when floor-based welding is applied.
 8. This value changes by placement and load conditions of a wrist.
 *These specifications are subject to change without prior notice.

Specification

Manipulator Specifications

	FD-V100	FD-V130	FD-V166	FD-V210	FD-V280L	FD-V350	FD-V400L	FD-V600	FD-V700		
Model	NV100	NV130	NV166	NV210	NV280L	NV350	NV400L	NV600	NV700		
Structure	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type	Vertically articulated type		
Number of Axes	6	6	6	6	6	6	6	6	6		
Wrist Capacity	100kg	100kg	166kg	210kg	280kg	350kg	400kg	600kg	700kg		
Positional Repeatability (Note 1)	±0.08mm	±0.08mm	±0.1mm	±0.15mm	±0.2mm	±0.2mm	±0.3mm	±0.3mm	±0.3mm		
Driving Method	AC servo motor	◀	◀	◀	◀	◀	◀	◀	◀		
Driving Capacity	15100W	15100W	18kW	18kW	30kW	◀	27kW	◀	◀		
Positional Feedback	Absolute encoder	◀	◀	◀	◀	◀	◀	◀	◀		
Working Range	Arm	J1 (Rotation 1)	±180°	±180°	±180°	±180°	±180°	±180°	±180°	±180°	
		J2 (Front/back)	-155° to +90°	-155° to +90°	-80° to +60°	-80° to +60°	-100° to +40°	-100° to +40°	-105° to +60°	-105° to +60°	-105° to +60°
		J3 (Up/down)	-185° to +220°	-185° to +220°	-146.5° to +150°	-146.5° to +150°	-147° to +130°	-180° to +130°	-130° to +30°	-140° to +30°	-140° to +30°
	Wrist	J4 (Swing)	±360°	±360°	±360°	±360°	±360°	±360°	±210°	±210°	±210°
		J5 (Bending)	-35° to +215°	-35° to +215°	±135°	±130°	±125°	±125°	±120°	±120°	±120°
		J6 (Twist)	±360°	±360°	±360°	±360°	±360°	±360°	±210° (±360°) (Note 8)	◀	◀
Maximum Speed	Arm	J1 (Rotation 1)	2.44rad/s{140°/s}	2.44rad/s{140°/s}	2.18rad/s{125°/s}	2.01rad/s{115°/s}	1.83rad/s{105°/s}	1.83rad/s{105°/s}	1.57rad/s {90°/s}	1.57rad/s {90°/s}	1.40rad/s {80°/s}
		J2 (Front/back)	1.92rad/s{110°/s}	1.92rad/s{110°/s}	2.01rad/s{115°/s}	1.83rad/s{105°/s}	1.83rad/s{105°/s}	1.66rad/s {95°/s}	1.57rad/s {90°/s}	1.57rad/s {90°/s}	1.40rad/s {80°/s}
		J3 (Up/down)	2.44rad/s{140°/s}	2.44rad/s{140°/s}	2.11rad/s{121°/s}	1.97rad/s{113°/s}	1.66rad/s {95°/s}	1.66rad/s {95°/s}	1.57rad/s {90°/s}	1.57rad/s {90°/s}	1.40rad/s {80°/s}
	Wrist	J4 (Swing)	3.05rad/s{175°/s}	3.05rad/s{175°/s}	3.14rad/s{180°/s}	2.44rad/s{140°/s}	2.09rad/s{120°/s}	1.92rad/s{110°/s}	1.92rad/s{110°/s}	1.92rad/s{110°/s}	1.74rad/s{100°/s}
		J5 (Bending)	3.05rad/s{175°/s}	3.05rad/s{175°/s}	3.02rad/s{173°/s}	2.32rad/s{133°/s}	2.09rad/s{120°/s}	1.92rad/s{110°/s}	1.92rad/s{110°/s}	1.92rad/s{110°/s}	1.74rad/s{100°/s}
		J6 (Twist)	4.45rad/s{255°/s}	4.45rad/s{255°/s}	4.54rad/s{260°/s}	3.49rad/s{200°/s}	3.49rad/s{200°/s}	3.14rad/s{180°/s}	3.14rad/s{180°/s}	3.14rad/s{180°/s}	2.79rad/s{160°/s}
Wrist Allowable Load	Allowable Moment	J4 (Rotation)	721 N·m	721 N·m	951 N·m	1,337 N·m	1921 N·m	2750 N·m	3450 N·m	3450 N·m	3450 N·m
		J5 (Bending)	721 N·m	721 N·m	951 N·m	1,337 N·m	1921 N·m	2750 N·m	3450 N·m	3450 N·m	3450 N·m
		J6 (Twist)	294 N·m	294 N·m	490 N·m	720 N·m	988 N·m	1235 N·m	1725 N·m	1725 N·m	1725 N·m
	Allowable Moment of Inertia	J4 (Rotation)	60.0 kg·m ²	60.0 kg·m ²	88.9 kg·m ²	141.1 kg·m ²	400 kg·m ²	400 kg·m ²	600 kg·m ²	600 kg·m ²	600 kg·m ²
		J5 (Bending)	60.0 kg·m ²	60.0 kg·m ²	88.9 kg·m ²	141.1 kg·m ²	400 kg·m ²	400 kg·m ²	600 kg·m ²	600 kg·m ²	600 kg·m ²
		J6 (Twist)	33.7 kg·m ²	33.7 kg·m ²	45.0 kg·m ²	79.0 kg·m ²	250 kg·m ²	250 kg·m ²	400 kg·m ²	400 kg·m ²	400 kg·m ²
Arm Cross-sectional Area	7.56m ² × 360°	6.83m ² × 360°	6.58m ² × 360°	6.67m ² × 360°	8.72m ² × 360°	6.77m ² × 360°	10.72m ² × 360°	6.60m ² × 360°	6.60m ² × 360°		
Environmental Conditions	Temp: 0 to 45°C, Hmd: 20 to 80%RH (No Condensation)	◀	◀	◀	◀	◀	◀	◀	◀		
Mass (weight)	770kg	765kg	1010kg	1040kg	1660kg	1620kg	3050kg	2850kg	3320kg		
Capacity of Upper Arm	50kg	50kg	45kg (90kg max.) (Note 7)	45kg (90kg max.) (Note 7)	25kg max. (Note 7)	50kg max. (Note 7)	50kg max. (Note 7)	50kg max. (Note 7)	25kg max. (Note 7)		
Installation Method	Floor-/Ceiling-mounted	Floor-/Ceiling-mounted	Floor-mounted	◀	◀	◀	◀	◀	◀		
Paint Color	White (Munsell notation 10GY 9/1)	◀	◀	◀	◀	◀	◀	◀	◀		
IP code	Wrist axes:IP65/67 Base axes:IP54	◀	-	-	Wrist axes:IP67P Base axes:IP54P	◀	◀	◀	◀		

Notes

1. Positional repeatability of the tool center point (TCP) value complies with the JIS-B-8432 Standard.
2. The value in the parentheses indicates the wall-mounting condition.
3. Working range of J6 axis may be restricted by the position of J5 axis.
4. When loading the Max. payload capacity as the end effector.

5. The capacity of the upper arm varies with the wrist capacity.
 6. Working range of J2 axis may be restricted when wall-mounting.
 7. The operation range of the J3 axis is restricted to -170 degrees to +205 degrees when floor-based welding is applied.
 8. This value changes by placement and load conditions of a wrist.
- *These specifications are subject to change without prior notice.

Peripheral Equipment Jig Positioner

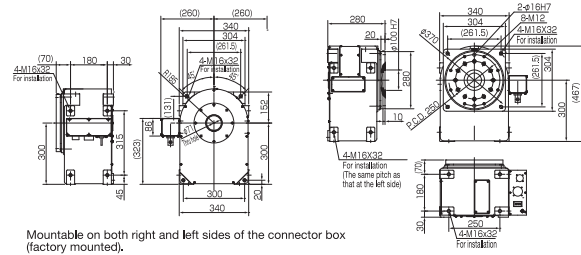
- 8 models of positioners available from 250 kg to 1,000 kg payload capacity.
- Operation of the positioner is totally controlled by the robot teaching pendant.
- Positioners can be operated independently or synchronized with the robot.
- High accuracy operation is made possible by the same AC servo motor and non-backlash reduction gear that is used for the robot.
- Synchronized motion when using with the OTC robot.

Positioner

Positioner Headstock 1PB Series

- Can be used to build varied jig systems with a large degree of positioning flexibility.
- A hole through the center of the rotary table, enabling cables and hoses to be routed through easily.

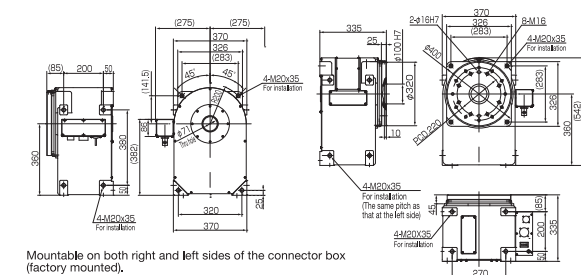
1PB250



Mountable on both right and left sides of the connector box (factory mounted).

Model Name	A2PB252-E
Max. Payload Capacity	250 kg
Rotating Speed	2.6 rad/s [150°/s]
Allowable Rotating Torque	206 N·m
Position Repeatability	±0.1 mm (Position at R300 mm)
Stop Position	Random
Mass (Weight)	110 kg

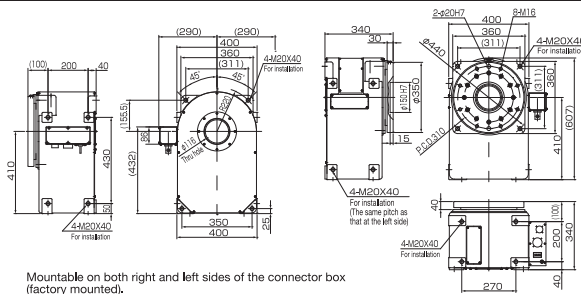
1PB500



Mountable on both right and left sides of the connector box (factory mounted).

Model Name	A2PB502-E
Max. Payload Capacity	500 kg
Rotating Speed	2.1 rad/s [120°/s]
Allowable Rotating Torque	490 N·m
Position Repeatability	±0.1 mm (Position at R300 mm)
Stop Position	Random
Mass (Weight)	170 kg

1PB1000



Mountable on both right and left sides of the connector box (factory mounted).

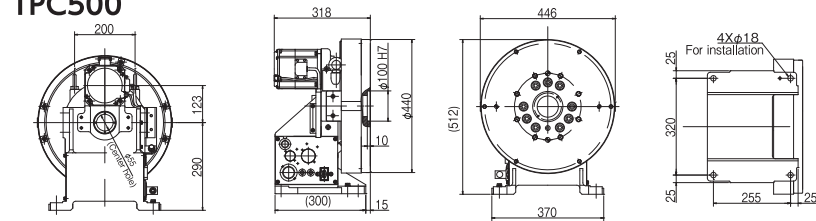
Model Name	A2PB1002-E
Max. Payload Capacity	1000 kg
Rotating Speed	1.3 rad/s [72°/s]
Allowable Rotating Torque	1078 N·m
Position Repeatability	±0.1 mm (Position at R300 mm)
Stop Position	Random
Mass (Weight)	220 kg

Positioner

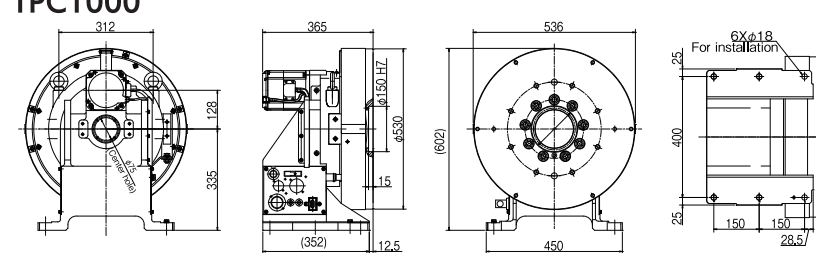
Positioner Headstock 1PC Series

- Designed for Compact, lightweight and easy installation.
- A hole through the center of the rotary table, enabling cables and hoses to be routed through easily.

1PC500



1PC1000



Model Name	PC501	PC1001
Max. Payload Capacity	500kg	1000kg
Rotating Speed	2.1 rad/s [120°/s]	1.3 rad/s [72°/s]
Allowable Rotating Torque	490N·m	1078N·m
Position Repeatability	±0.1 mm (Position at R300 mm)	±0.1 mm (Position at R300 mm)
Stop Position	Random	Random
Mass (Weight)	110kg	193kg



1PC500

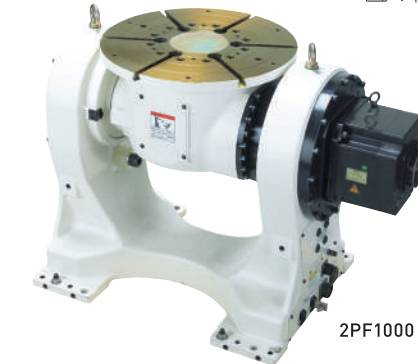
Peripheral Equipment Jig Positioner,Slider

Positioner

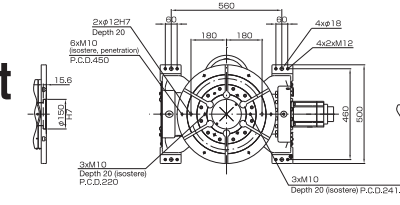
2-Axes Double Support Positioner 2PF Series

- High-speed motion increases production efficiency. An increase in the maximum rotation speed of the tilting axis by 2.5 times and in rotation axis by two times was achieved in comparison with the conventional machine 300 kg payload type.

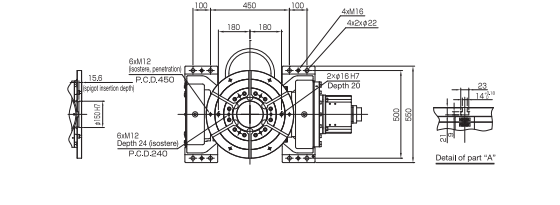
2PF300·500·1000



2PF300·500



2PF1000

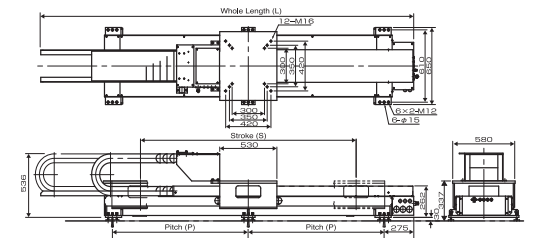
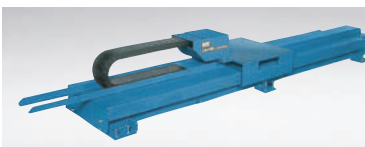


Model Name	A2PF301-ENN	A2PF501-ENN	A2PF1001-ENN
Max. Payload Capacity	300 kg	500 kg	1000 kg
Rotating Speed	3.1 rad/s [180°/s]	2.8 rad/s [162°/s]	2.9 rad/s [166°/s]
Tilting Speed	2.2 rad/s [125°/s]	1.5 rad/s [84°/s]	1.4 rad/s [82°/s]
Rotating Torque	294 N·m	392 N·m	882 N·m
Tilting Torque	882 N·m	1347 N·m	3704 N·m
Position Repeatability	±0.08 mm (Position at R250 mm)	±0.08 mm (Position at R250 mm)	±0.08 mm (Position at R250 mm)
Stop Position	Random	Random	Random
Mass (Weight)	260 kg	260 kg	470 kg

- Sliders are available in 12 models with strokes between 1 m and 6.9 m.
- Employment of an AC servo motor and non-backlash reduction gear provides the same high accuracy operation as that of robots.
- Combination with the OTC robot allows synchronized operation.
- The cable bearer is provided in the center of the slider, which allows space-saving installation.

Slider

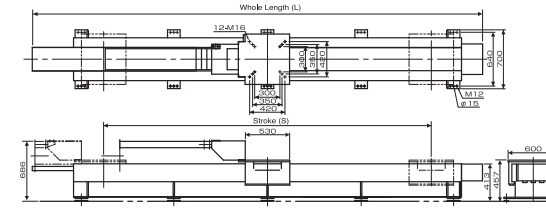
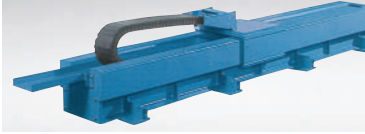
Linear Sliders (Light Duty) Model 1SB



- A maximum of 330 kg can be loaded.
- Dust-proof structure prevents spatter, oil and dust from entering.

Slider

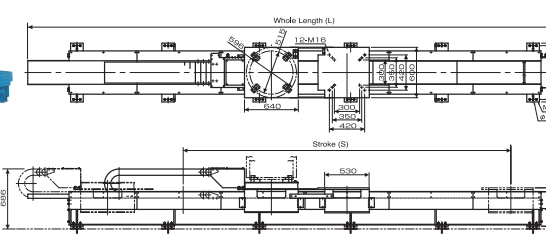
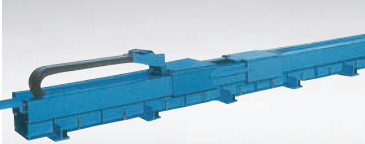
Linear Sliders (Standard Duty) Model 1SR



- Standard Duty with a maximum loading weight of 330 kg
- Dust-proof structure prevents spatter, oil and dust from entering.

Slider

Linear Sliders (with Carriage Duty) Model 1SR-P



- The wire pack can be mounted on the truck connected to the robot-mounting part.
- Dust-proof structure prevents spatter, oil and dust from entering.

	Model 1SB	Model 1SR	Model 1SR-P
Model Name	A2SB102-E, A2SB202-E	A2SR292-E, A2SR392-E, A2SR492-E, A2SR592-E, A2SR692-E	A2SR19P2-E, A2SR29P2-E, A2SR39P2-E, A2SR49P2-E, A2SR59P2-E
Stroke Length	1 m, 2 m	2.9 m, 3.9 m, 4.9 m, 5.9 m, 6.9 m	1.9 m, 2.9 m, 3.9 m, 4.9 m, 5.9 m
Max. Moving Speed	0.3 m/s	0.295 m/s	0.295 m/s
Max. Moving Capacity	330 kg	330 kg	660 kg (330 kg for each table)
Position Repeatability	±0.1 mm	±0.1 mm	±0.1 mm
	A2SB102-J, A2SB202-J	A2SR292-J, A2SR392-J, A2SR492-J, A2SR592-J, A2SR692-J	A2SR19P2-J, A2SR29P2-J, A2SR39P2-J, A2SR49P2-J, A2SR59P2-J
Stroke S (mm)	1000, 2000	2900, 3900, 4900, 5900, 6900	1900, 2900, 3900, 4900, 5900
Whole Length L (mm)	2510, 3510	4500, 5500, 6500, 7500, 8500	4500, 5500, 6500, 7500, 8500
Mass (kg)	450, 550	650, 750, 850, 950, 1050	800, 900, 1000, 1100, 1200

* Ensure that the total mass of the manipulator and other peripherals does not exceed the payload capacity.

Internet connecting service

Robots can be connected to service centers via the Internet to remotely provide advice on construction conditions and operations

Remote maintenance



Start service in 3 easy steps

- Step 1** Connect communication equipment to the robot controller
- Step 2** Call DAIHEN service center Notify one-time password
- Step 3** Enable remote maintenance operation and input on-time password

Customer preparations

The internet connection environment will be prepared by the customer

LTE router

- Data communication SIM card
- LAN cable
- ※Recommended: UD-LT1/EX(Made by IO data)(Consumable goods)



Smartphone

- ※Use tethering function of Android phone. (USB cable)



Internal LAN

- Internet connection
- LAN cable

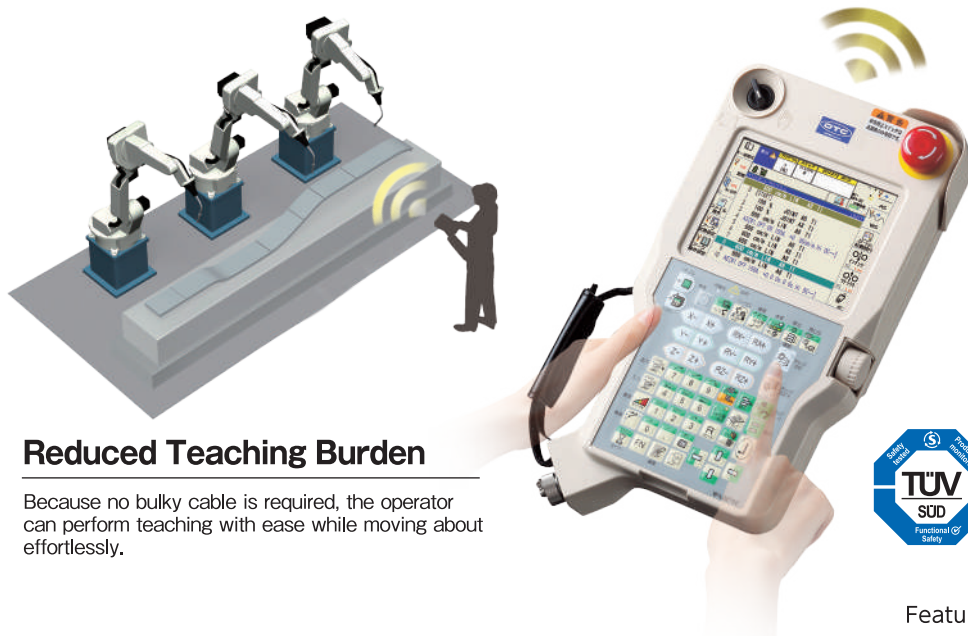


1)Data communication charges will be borne by the customer.
2)This system uses communication equipment, so it may not be possible to use the function as intended due to communication status or interference.

Wireless teach pendant

Enables robot to be operated wirelessly. Supports all current models.

WiTP Wireless Teach Pendant



Reduced Teaching Burden

Because no bulky cable is required, the operator can perform teaching with ease while moving about effortlessly.

Operates Multiple Robots with a Single Pendant

To switch between robots, simply select the desired robot number with the pendant and perform identification steps according to the guide.

Certified for Wireless Operation — An Industry First

Features the servo block function activated by a robot emergency stop button and an enable switch.

This device has already been certified by TÜV SÜD as meeting the IEC61508 SIL2 and ISO 13849 Cat. 3 PL d standards for functional safety.

Certification No.: Z10 14 08 88597 003



Feature available beginning February 2020.

PC software

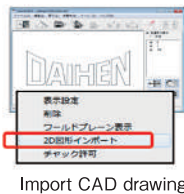
High-accuracy/high-performance teaching & simulation achieved by the same operation as that of robot!

Offline teaching system FD-ST

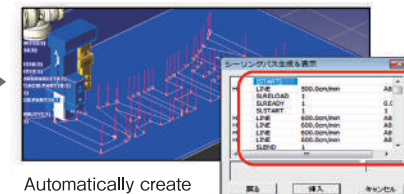
New function realizing simplified operation!

Cooperation with CAD

Automatically generates teaching program from CAD data. And direct transfer to the robot controller.



Import CAD drawing



Automatically create teaching program

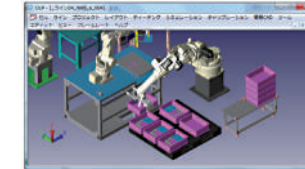
Fully compatible with the controller FD19



This teaching system can be operated by the same operation of the robot controller FD19. If OTC standard robot system is provided, the setup can be completed only by reading the backup data.

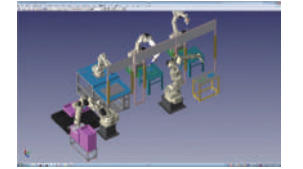
Handling support

Simulate attach/detach action of work piece. Reduce the verification time of actual robot.



Product line simulation

The multiple ROBOT teaching and simulation output on the PC and possible to teaching and verification for cooperation of these robots.



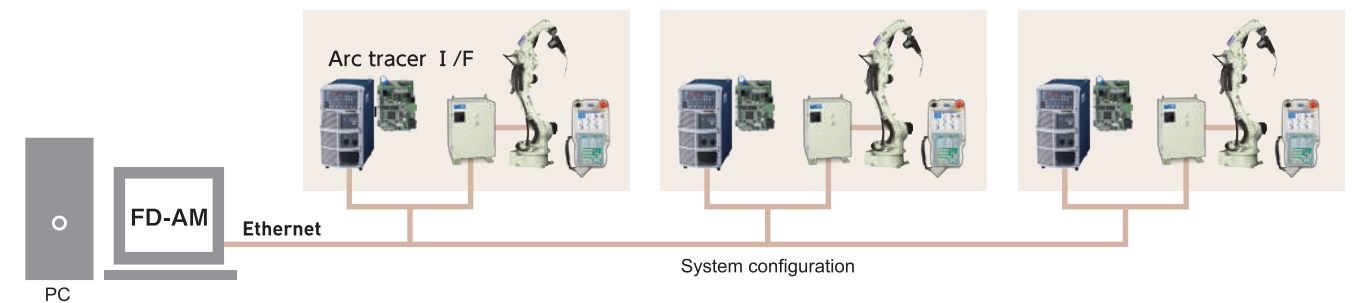
PC software

PC-based Welding Quality Control

Robot Welding Control System FD-AM

Simple configuration and collect all welding data.

With the teach pendant, the operator can monitor conditions during the welding process and even record welding data on a PC. This makes it possible to manage all aspects of welding, including "when, where, what and how."



Teach Pendant Monitor

Item	Details
Maximum sampling frequency (Maximum sampling cycle)	20 Hz (50 ms) Maximum sampling frequency can be set individually for each monitored parameter.
Monitored parameters (11 in total)	Electric current, voltage, feed load, feed speed (feed device), feed speed (measurement unit)*, feed motor electric current**, gas flow quantity*, gas pressure*, welding power supply primary-side voltage**, welding power supply internal temperature**, welding power supply fan rotation rate**
Indication style	Numerical values indicated with a wave pattern
Welding result indications	Mean value, maximum value, minimum value, welding time, welding distance

* Optional ** All models of the Welbee Inverter series only.

FD-AM (PC software)

Item	Details	
Maximum sampling frequency (Maximum sampling cycle)	10 Hz (Electric current & voltage: 100 μs, Other: 50 ms) Maximum sampling frequency can be set individually for each recorded parameter.	
Recorded parameter	Commands (5 in total)	
	Monitored parameters (11 in total)	Electric current, voltage, feed load, feed speed (feed device) Feed speed (measurement unit)*, feed motor electric current**, gas flow quantity*, gas pressure*, welding power supply primary-side voltage**, welding power supply internal temperature**, welding power supply fan rotation rate**
Welding result indications	Real time	Mean value, maximum value, minimum value, welding time, welding distance
	History	Mean value, welding time, welding distance, welding abnormalities
Communication method	Via Ethernet. Features automatic connection and reconnection with robots.	
Welding point identification	Robot control device name, program comment, work name, work serial number, welding section name	
Abnormality monitoring function	Divergence from command value, deviation from rated value	
Abnormality indication	Abnormal number and error message indication	

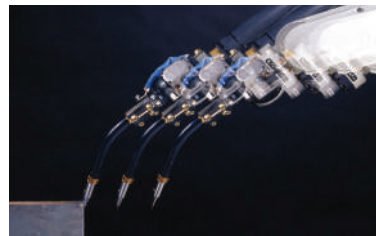
*Optional ** All models of the Welbee Inverter series only.

Workpiece position detection sensor

Touch sensor FD-WD

Workpiece position detection sensor by touching the welding wire

- Applicable to all the workpieces with a medium thickness or thicker.
- Most inexpensive among all workpiece position detection sensors.
- Requires no separate sensor unit because this sensor has a built-in controller.
- Allows high-speed search at up to 360 cm/min.
- A separate sensor unit (optional) is ready for hardly energized surfaces such as rust and black scale.



Tracking sensor for CO₂/MAG welding

Arc sensor FD-AR

Automatic seam tracking by weaving

- This sensor allows correction of curved workpiece or thermal distortion which can't be corrected only by detecting workpiece position.
- Applicable to workpieces with medium thickness or thicker.
- Most inexpensive among all the tracking sensors.
- Easy to use from the viewpoints of interference of workpieces and maintenance because this sensor requires no additional parts around the torch.
- *Can't be used for tracking on aluminum.

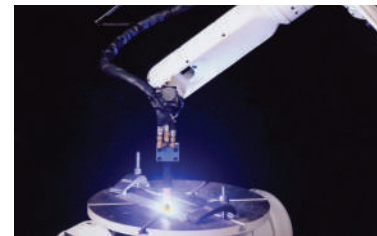


Tracking sensor for TIG welding

TIG arc sensor FD-TR

Automatic seam tracking in TIG welding

- Allows arc length constant control (vertical tracking) in TIG.
- Allows stable execution of welding by keeping the arc length constant to the thermal distortion of thin plate.
- Allows high-accuracy tracking even in pulse TIG welding.
- Easy to use from the viewpoints of interference of workpieces and maintenance, because it requires no additional parts around the torch.



Workpiece position detection	(The maximum two-way displacement detection rate per site is about 5 seconds.)	×	×
Seam tracking	×	○	○ (only vertical tracking)
Recognition of groove shape	×	×	×
Combination with other sensors	This sensor can be used together with an arc sensor or TIG arc sensor.	Combination use of the touch sensor and laser sensor is possible.	Combination use of the touch sensor and laser sensor is possible.
Applicable workpieces	Plate thickness: 3.2 mm or more	Plate thickness: 3.2 mm or more	(Plate thickness: 1.0 mm or more)
Accuracy	±1.0 mm (provided that the bend of wire does not change)	±1.0 mm (provided that arc and pool are stable)	±0.5 mm (when the electrode is not worn)
Workpiece material	All the materials and surfaces to be energized	Iron system, stainless steel system	All the materials which can be welded

Laser start point detection sensor

Laser search FD-QD

High-accuracy workpiece position detection sensor using laser

- Realizes higher speed and higher accuracy than those of the touch sensor.
- Allows high accuracy detection for a wide spectrum of applications from thin plate to medium thickness plate.
- Allows recognition of various welding joints by easy operation.
- Allows visual check of the recognition result using a teach pendant.
- Enables automatic change of the welding condition based on the recognition result.
- Can be used for applications other than welding.

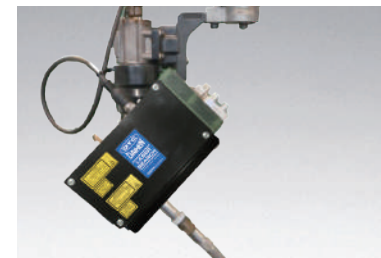


High-speed and high-accuracy laser start point detection sensor

Laser Search FD-QF

High-speed workpiece position detection sensor using laser

- Thanks to the two-dimensional laser, the cross-section of a groove can be instantaneously detected without movement of the robot (detection time is 1/5 or less compared with that of a touch sensor).
- The high-speed and high-accuracy detection is highly adaptable to thin-plate welding.
- Also accommodates thick-plate applications with high accuracy thanks to improved environmental resistance.
- Enables automatic change of the welding condition based on the recognition result.

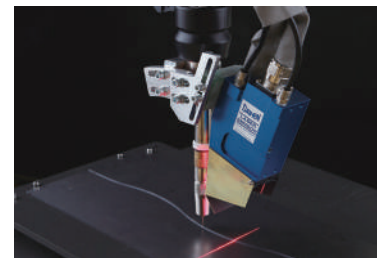


Laser tracking sensor

Laser sensor FD-QT

High accuracy welding line tracking by laser

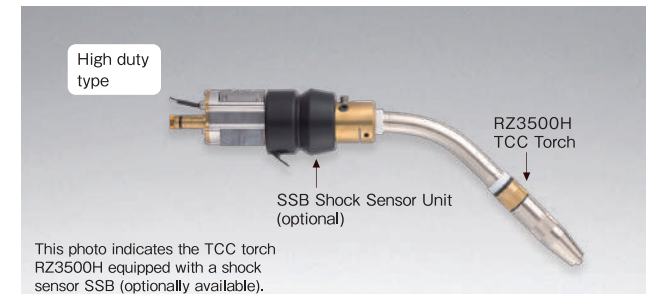
- High accuracy 3D tracking for complex shape work piece.
- The sensor automatically adjusts optimal position and posture with simple teaching.
- Workpiece position detection
- For thin material and high accuracy
- Real time adjustment of welding conditions by adaptive control
- TIG welding also possible



Workpiece position detection	(The maximum two-way displacement detection rate per site is about 1.5 seconds)	(The maximum one-way displacement detection rate is about 0.3 seconds.)	○
Seam tracking	×	×	○
Recognition of groove shape	○	○	○
Combination with other sensors	This sensor can be used together with the touch sensor, arc sensor or TIG arc sensor.	This sensor can be used together with the touch sensor, arc sensor or TIG arc sensor.	Unnecessary (Welding line tracking and position detection is possible.)
Applicable workpieces	(Plate thickness: 1.0 mm or more)	(Plate thickness: 0.5 mm or more)	Plate thickness 0.1 mm or more
Accuracy	±0.5 mm (Search speed 100 cm/min or less. For stand-alone robot)	±0.2 mm (provided that cross-sectional shape of detection area does not change)	±0.4mm (provided that cross-sectional shape of detection area does not change)
Workpiece material	The surface shall not be glossy (nonmetal is permitted).	The surface shall not be glossy (nonmetal is permitted).	The surface shall not be glossy (nonmetal is permitted).

Torch for robot

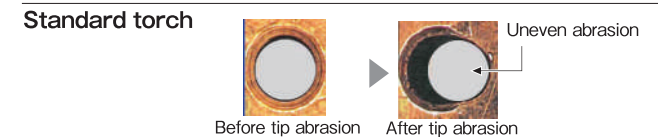
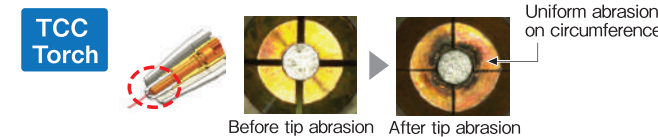
Achieving stable welding operation which enables prevention of welding interruption and reduction in costs of consumables
Forced pressurized power feeding torch (TCC torch)



Model	Maximum welding current (MAG welding)	Rated duty cycle (MAG welding)
RZ3500S/L/H	350A (350A)	80% (60%)
RZ3510S/L/H	350A (250A)	50% (50%)
RZ5000S/L/H	500A (400A)	70% (60%)

Deviation of wire position prevented

This torch improves the deviation of wire position by about 50 percent or more compared with the standard torch.



Improved durability of the tip

Durability of the tip holder improved about 20 times or more compared with the standard robot tip.

Reliable power supply

Compared to a conventional standard torch, this offers improved welding quality thanks to the stable wired power supply.

Welding peripherals

For automatic removal of spatters in the nozzle
Air blow kit



Only addition of the air blow kit to CO₂/MAG standard torch enables quick-change into the air blow style tip body!

Advantages of air blow specification

- Automatic removal of spatters in the nozzle with air, prevention of welding interruption.
- Enhancement of the life of nozzle by cooling the nozzle with air, reduction in the running cost.

Note: Compatible with RT3500*, RT5000* and RZ35***

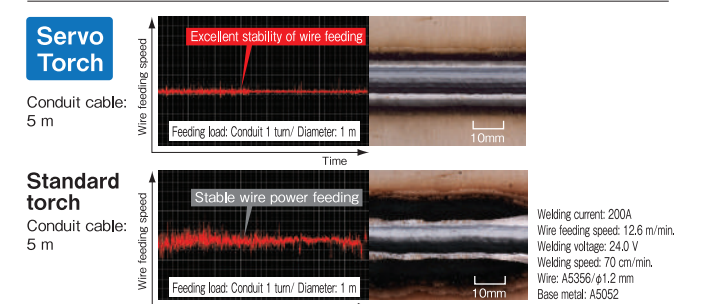
Torch for robot

For improving welding quality
Compact servo torch



CO ₂ /MAG Welding Torch			MIG Welding Torch		
Model	Maximum welding current (MAG welding)	Rated duty cycle (MAG welding)	Model	Maximum welding current	Rated duty cycle
MTXC-3541PS	350A (250A)	50% (50%)	MTXCA-3041PS	300A	50%
MTXCW-5041PS	500A (300A)	70% (50%)	MTCAW-4041PS	400A	70%

Excellent stability of wire feeding



Decrease in deviated wire position

The compact servo torch has realized reduction in deviated wire position to one third or lower compared with the standard torch (about 0.2 mm or less), and also reduction in welding defects such as bead deviation and burn through.

Optional software dedicated to servo torch

RS control realizes secure arc start by instantaneously raising the wire which makes contact with the base metal, and allows reduction of spatters at the start of welding.

*The RS control is limited in applicable robot model, welding power source, and welding mode.
**This model requires optional software.

Torch for robot

Our bestselling CO₂/MAG torch compatible with a shock sensor
Torch



Model	Maximum welding current (MAG welding)	Rated duty cycle (MAG welding)
RT3500S/L/H	350A (350A)	80% (60%)
RT5000S/L/H	500A (350A)	50% (70%)
RTW5000S/L/H	500A (400A)	70% (60%)