Capital Robotics is a wholly-owned subsidiary of Capital Machine Technologies, Inc. Capital is the largest provider of Robotic Welding & Fabricating Technology in the South.

Company resources include: Technology Centers with operational Robotic Cells and in-house training classes. Our staff includes Welding Engineers, Applications Engineers, and Service Engineers. Capital Machine Technologies, Inc. (CMT) has an abundant inventory of robotic welding parts and consumables. CMT and OTC-DAIHEN offer a unique partnership for total customer satisfaction.

OTC-DAIHEN is dedicated to providing welding, plasma cutting, and automation solutions through the innovative application of their specialized knowledge and expertise. “TOTAL TECHNOLOGY, SINGLE SOURCE” has remained the primary focus and strength of OTC.

Internationally recognized as the leading producer of advanced welding and robotic systems, their expertise and technological advancements provide their customers with true state-of-the-art capabilities.
Choosing the right welding technology is a critical investment decision for any size company. Capital has the experience and tools to help your company make a thorough analysis. Our proven “Weld Cost Analysis” was developed with input from highly experienced engineers and significant data collection. With your input, we can help your company quickly evaluate your return-on-investment potential.

**Capital Robotics Welding ROI Summary**
Fusion Arc Weld Cell

Introducing our new line of Fusion Arc Welding Cells

We have re-engineered our cells from the ground up, starting with the base of the unit which uses slot-and-tab construction to provide a ridged foundation. This minimizes resonance, which enables the Fusion Arc cell to take advantage of the new FD’s unmatched speeds. Capital Robotics offers a selection of pre-configured Cells that are engineered as a complete solution for a host of applications.

Fusion Arc designates our family of cells available in a range of sizes and configurations. These pre-engineered systems provide a fully enclosed environment that remains functional, flexible and meets most safety requirements while remaining very cost-effective. Each cell is available with a host of productivity options and the space-saving design makes for easy placement and relocation in your manufacturing area.

- Replaceable Metal Side Panels.
- Optimized for the Working Envelope of the Robotic Manipulator.
- Power Source, Shielding Gas, Wire, Control Unit, Teach Pendent, Robot Manipulator and Worktables all on one moveable unit.
- Improved Safety Doors.
- Easily Customized, Offered Pre-drilled & Tapped for Accessories.
- Rigid Slot & Tab Construction.
- New Space Saving Design.
Another unique feature of our Fusion Arc Cell is it comes fully assembled, saving valuable set-up time.

**A typical customer set-up would consist of:**

- Placing the cell on your shop floor.
- Providing 3 Phase power.
- Providing compressed air for the safety doors.
- Feed the filler material.
- And finally providing the shielding gas.

*It’s that Easy!*

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**Matrix-Tooling Table**

As an option, Capital Robotics can provide our Matrix-Tooling Tabletop. The hole pattern can be labeled with letters and numbers, further defining fixture placement.

This feature greatly reduces fixture set-up time and allows for easy changes in the future. Tabletops are designed to last a lifetime and can be reversed if surface becomes damaged.

**Designed for the Future...**

The new modular construction enables us to integrate additional peripheral axes or stations, adapting to the customers needs as required.

After years of implementing automated welding, Capital Robotics continues to acknowledged our extensive customer base.

Listening to our customers, Capital Robotics has re-designed our Fusion Arc Cells, utilizing fresh, new integration techniques.
Standard Weld Cell Configurations
(Total Customizing available)

Capital Robotics offers a complete line of pre-configured weld cells. Each cell is optimized for the working envelope of the robotic manipulator they are designed for. While these cells are pre-configured they do offer simple expansion and come pre-drilled and tapped to accept many optional accessories. If a custom configuration is required, please call and find out how we can meet your needs while supplying a safe and efficient custom weld cell.

**FA100**
(Also available in an extended reach format, the 100L)
Compact design allows for ease of loading/unloading on the same side. Less investment when compared to a turntable.

**FA180**
(Also available in an extended reach format, the 180L)
Dual station with larger openings. Modular design allows floor placement changes after purchase.

**FA200**
(Also available in an extended reach format, the 200L)
Dual station cell with larger openings than the FA100. Same facet loading/unloading.

**FA300**
(Also available in an extended reach format, the 300L)
Triple Station weld cell. Options are endless. Our most versatile package.
FD Series Arc Welding Robots

Changing The Future Of Manufacturing

Leading the evolution of manufacturing, setting new standards in automation:
Intuitive operation, advanced quality control, and eco-friendly solutions.

FD-B6
FD-B4L
FD-V6

FD-V20
FD-V6L
FD-B4S
FD-B6

Streamlined Welding Robot

The FD-B6 arc welding robot utilizes a streamlined, through-arm coaxial cable, which gives you maximum mobility in tight workspaces. Compact design makes welding in confined spaces or complicated fixtures a snap. The FD-B6’s streamlined coaxial cable improves wire feeding, giving you better overall weld quality.

FD-B4L

Extended Reach

For extended reach with a through-arm, the FD-B4L is your best-in-class solution from Daihen. The through-arm coaxial cable design of the FD-B4L gives you maximum mobility in tight workspaces. The FD-B4L makes welding large pieces in confined spaces or complicated fixtures a snap.

For large parts and fixtures, the FD-B4L’s streamlined coaxial cable improves wire feeding, giving you better overall weld quality. The FD-B4’s streamlined coaxial cable improves wire feeding, giving you better overall weld quality.
FD-V6
Standard Arc Welding Robots

General Purpose Welding Robot
The FD-V6 is suitable for virtually all MIG, MAG, CO₂, and TIG welding applications, and Air Plasma Cutting applications. The FD-V6 may be used for common materials such as mild steel, stainless steel, aluminum, titanium, as well as other exotic metals.

FD-V6L
Ideal for Most Medium to Large Parts
Daihen’s extended reach arm is ideal for working with large parts and fixtures. As with all FD Series robots, the FD-V6L also features individual servo shock sensors on each axis to prevent damage to the robot.
Unmatched Freedom of Movement

The B4S offers a through-arm design providing a slim manipulator without exterior cables or conduits that may impede movement or snag in hard to reach or crowded areas. Making this 4-kg payload welding robot ideal for short and medium reach tight spaces in crowded welding zones.

Rotation of the seventh axis enables interference avoidance without changing the position and/or attitude of the tool. Maintaining the optimum attitude at all times results in the enhancement of weld quality.

FD11 Controller

**Dimensions:** Inches: 22.83 W x 21.34 D x 25.59 H  
mm: 580 W x 542 D x 650 H  
**Mass:** approximately 137 lbs (62 kg)  
**Ambient temperature range:** 32 to 113° F (0 to 45° C)  
**Ambient relative humidity range:** 20 to 80% RH (non condensing)  
**Power supply:** 3-phase 480/240 VAC ±10% -15%, 50/60 Hz  
**"General purpose physical I/O":** 40 inputs, 40 outputs (standard)  
**Memory capacity:** 160,000 instructions by PTP instruction in a single mechanism  
**Number of task programs:** 9,999  
**External memory:** USB (Robot Control: 1 slot, Teach Pendant: 1 slot optional)  
**Color:** Munsell notation 10GY 9/1

Teach Pendant

**Dimensions:** Inches: 6.89 W x 12.83 D x 3.19 H  
mm: 580 W x 542 D x 650 H  
**Mass:** Approximately 137 lbs (62 kg)  
**Operation device:** Axis keys, TP selector switch, jog dial, enable switch, operation ready ON key, emergency stop button, USB memory slot (1 slot)  
**Display:** 5.7 inches, 640 x 480 pixels, 65536 colors, touch panel LED backlit  
**IEC protection class:** IP65  
**Cable length:** 26.25 ft (8 m) standard 49.21 ft (15 m) optional
## Specifications

<table>
<thead>
<tr>
<th>Manipulator / Controller / Teach pendant</th>
<th>FD-B4L</th>
<th>FD-B6</th>
<th>FD-V6</th>
<th>FD-V6L</th>
<th>FD-V20</th>
<th>FD-B4S</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>NB4L</td>
<td>NB6</td>
<td>NV8</td>
<td>NV6L</td>
<td>NV20</td>
<td>NB4S</td>
</tr>
<tr>
<td>Number of Axes</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>7</td>
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<tr>
<td>Maximum Capacity</td>
<td>8.82 lbs (4 kg)</td>
<td>13.23 lbs (6 kg)</td>
<td>13.23 lbs (6 kg)</td>
<td>13.23 lbs (6 kg)</td>
<td>44.09 lbs (620 kg)</td>
<td>8.82 lbs (4 kg)</td>
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<tr>
<td>Positional Repeatability</td>
<td>±0.003” (±0.08 mm)(1)</td>
<td>±0.003” (±0.08 mm)(1)</td>
<td>±0.003” (±0.08 mm)(1)</td>
<td>±0.003” (±0.08 mm)(1)</td>
<td>±0.003” (±0.07 mm)(1)</td>
<td>±0.003” (±0.08 mm)(1)</td>
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<tr>
<td>Horizontal Reach</td>
<td>79.06” (2008 mm)</td>
<td>56.89” (1445 mm)</td>
<td>55.20” (1402 mm)</td>
<td>78.98” (2006 mm)</td>
<td>67.32” (1710 mm)</td>
<td>56.50” (1435 mm)</td>
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<td>Vertical Reach</td>
<td>140.74” (3575 mm)</td>
<td>98.98” (2514 mm)</td>
<td>90.67” (2430 mm)</td>
<td>140.55” (3570 mm)</td>
<td>117.28” (2979 mm)</td>
<td>96.30” (2446 mm)</td>
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<tr>
<td>Driving Capacity</td>
<td>4650 W</td>
<td>3132 W</td>
<td>2600 W</td>
<td>5000 W</td>
<td>5600 W</td>
<td>3550 W</td>
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<tr>
<td>J1 (Rotation)</td>
<td>±170° (±50°)(2)</td>
<td>±170° (±50°)(2)</td>
<td>±170° (±50°)(2)</td>
<td>±170° (±50°)(2)</td>
<td>±170° (±50°)(2)</td>
<td>±170°</td>
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<tr>
<td>J2 (Lower arm)</td>
<td>-155° to +100°(3)</td>
<td>-155° to +90°</td>
<td>-155° to 90°</td>
<td>-155° to +100°(3)</td>
<td>155° to +100°</td>
<td>-145°±70°</td>
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<tr>
<td>J3 (Upper arm)</td>
<td>-170° to +190°</td>
<td>-170° to 245°</td>
<td>-170° to +190°</td>
<td>-170° to +260°</td>
<td>-170° to +260°</td>
<td>-170°+142.6°</td>
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<tr>
<td>J4 (Swing)</td>
<td>±155°</td>
<td>±155°</td>
<td>±180°</td>
<td>±180°</td>
<td>±180°</td>
<td>±155°</td>
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<tr>
<td>J5 (Bending)</td>
<td>-45° to +225°(5)</td>
<td>-45° to +225°(5)</td>
<td>-50° to +230°</td>
<td>-50° to +230°</td>
<td>-50° to +230°</td>
<td>-45°+225°</td>
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<tr>
<td>J6 (Twist)</td>
<td>±205°(5)</td>
<td>±205°(5)</td>
<td>±360°</td>
<td>±360°</td>
<td>±360°</td>
<td>±205°</td>
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<tr>
<td>J1 (Rotation)</td>
<td>3.40 rad/s (195°/s)</td>
<td>3.05 rad/s (175°/s)(2)</td>
<td>4.19 rad/s (240°/s)</td>
<td>3.32 rad/s (190°/s)(2)</td>
<td>3.66 rad/s (210°/s)</td>
<td>3.32 rad/s (190°/s)(2)</td>
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<tr>
<td>J2 (Lower arm)</td>
<td>3.49 rad/s (200°/s)</td>
<td>3.66 rad/s (210°/s)</td>
<td>3.49 rad/s (200°/s)</td>
<td>3.66 rad/s (210°/s)</td>
<td>3.32 rad/s (190°/s)</td>
<td>3.66 rad/s (210°/s)</td>
</tr>
<tr>
<td>J3 (Upper arm)</td>
<td>3.49 rad/s (200°/s)</td>
<td>4.01 rad/s (230°/s)</td>
<td>3.49 rad/s (200°/s)</td>
<td>3.49 rad/s (200°/s)</td>
<td>3.14 rad/s (180°/s)</td>
<td>3.66 rad/s (210°/s)</td>
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<tr>
<td>J4 (Swing)</td>
<td>7.33 rad/s (420°/s)</td>
<td>7.50 rad/s (430°/s)</td>
<td>7.33 rad/s (420°/s)</td>
<td>7.33 rad/s (420°/s)</td>
<td>6.98 rad/s (400°/s)</td>
<td>7.33 rad/s (420°/s)</td>
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<tr>
<td>J5 (Bending)</td>
<td>7.33 rad/s (420°/s)</td>
<td>7.50 rad/s (430°/s)</td>
<td>7.33 rad/s (420°/s)</td>
<td>7.33 rad/s (420°/s)</td>
<td>6.98 rad/s (400°/s)</td>
<td>7.33 rad/s (420°/s)</td>
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<tr>
<td>J6 (Twist)</td>
<td>10.5 rad/s (600°/s)</td>
<td>11.00 rad/s (630°/s)</td>
<td>10.82 rad/s (620°/s)</td>
<td>10.82 rad/s (620°/s)</td>
<td>10.5 rad/s (600°/s)</td>
<td>10.5 rad/s (600°/s)</td>
</tr>
<tr>
<td>J1 (Rotation)</td>
<td>10.1 N·m</td>
<td>10.5 N·m</td>
<td>11.8 N·m</td>
<td>11.8 N·m</td>
<td>43.7 N·m</td>
<td>10.1 N·m</td>
</tr>
<tr>
<td>J2 (Lower arm)</td>
<td>10.1 N·m</td>
<td>10.5 N·m</td>
<td>9.8 N·m</td>
<td>9.8 N·m</td>
<td>43.7 N·m</td>
<td>10.1 N·m</td>
</tr>
<tr>
<td>J3 (Upper arm)</td>
<td>2.94 N·m</td>
<td>5.9 N·m</td>
<td>5.9 N·m</td>
<td>5.9 N·m</td>
<td>19.6 N·m</td>
<td>2.94 N·m</td>
</tr>
<tr>
<td>J4 (Swing)</td>
<td>0.38 kg·m²</td>
<td>0.28 kg·m²</td>
<td>0.30 kg·m²</td>
<td>0.30 kg·m²</td>
<td>1.09 kg·m²</td>
<td>0.38 kg·m²</td>
</tr>
<tr>
<td>J5 (Bending)</td>
<td>0.38 kg·m²</td>
<td>0.28 kg·m²</td>
<td>0.25 kg·m²</td>
<td>0.25 kg·m²</td>
<td>1.09 kg·m²</td>
<td>0.38 kg·m²</td>
</tr>
<tr>
<td>J6 (Twist)</td>
<td>0.03 kg·m²</td>
<td>0.06 kg·m²</td>
<td>0.06 kg·m²</td>
<td>0.06 kg·m²</td>
<td>0.24 kg·m²</td>
<td>0.03 kg·m²</td>
</tr>
<tr>
<td>Arm cross-sectional area</td>
<td>6.37 m² x 340°</td>
<td>3.59 m² x 340°</td>
<td>3.14 m² x 340°</td>
<td>7.48 m² x 340°</td>
<td>5.27 m² x 340°</td>
<td>2.57 m² x 340°</td>
</tr>
<tr>
<td>Environmental conditions</td>
<td>32 to 113° F (0 to 45 C), 20 to 80% RH (no condensation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass / weight</td>
<td>611 lbs (277 kg)</td>
<td>318 lbs (145 kg)</td>
<td>317 lbs (144 kg)</td>
<td>602 lbs (273 kg)</td>
<td>613 lbs (278 kg)</td>
<td>417 lbs (189 kg)</td>
</tr>
<tr>
<td>Maximum load of upper arm</td>
<td>44.09 lbs (20 kg)</td>
<td>22.05 lbs (10 kg)</td>
<td>44.09 lbs (20 kg)</td>
<td>44.09 lbs (20 kg)(6)</td>
<td>44.09 lbs (20 kg)(6)</td>
<td>22.05 lbs (10 kg)</td>
</tr>
</tbody>
</table>

**NOTES:**

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. When loading, the maximum payload as the end effector.
5. This value changes according to placement and load conditions of the wrist.
Smart Controller

FD 11

**Electric conservation**
*Up to 50% reduction in power consumption* using the power conservation mode (energy conservation timer function and external servo OFF function).

**Minimal maintenance**
*Addition of axes* is simple and fast.
*30% fewer parts.*

**Space conservation**
*20% less volume* than previous model.
*Additional clearance above the controller.*

**Smart welding**

**Improved operability**
Corrective teaching to improve welding quality is made possible in a shorter amount of time.

**Improved movement performance**
By increasing the robot response speed-to-weld start signals, arc start failures are reduced and high-quality bead appearance is achieved.

By greatly reducing residual vibrations, high-speed approaches are possible.

**Increased reliability**
When a welding error occurs, trouble shooting can be done easily, leading to reduced downtime.

**Easy troubleshooting** (optional)
When a welding error occurs, data is backed up automatically. This helps find the cause of the trouble, leading to reduced downtime.

**Traceability can be done easily** (optional) by connecting a computer.

**Downsized**
*Improved space utilization*  
Height of the controller has been reduced.
Smooth Operations

Teach Pendant

Compact and light weight
- **27% lighter** than previous model, making teaching sessions easier.
- **40% smaller** than previous model, making it easier to handle in tight spaces.

Smooth teaching
- **Touch panel** provides simple operation.
- **Jog dial** allows simple adjustment.

Smooth backups
- **USB memory slot** makes data saving and reading easy.

Smooth welding
- **Welding conditions guide function**
  Helps you find better welding conditions with one-touch operation.

Smooth operation
- **Jog dial**
  It is possible to scroll through programs, make an adjustment to wire aiming position, and to do wire inching and retract movement with jog dial, jog dial can provide intuitive operation to multiple items.

Improved display
- By improving the display of characters, the display is easier to read.

Iconified operation buttons
- By improving the display of characters, the display is easier to read.

One-touch access
- The touch panel provides one-touch access to teaching items, reducing the number of times keys are pressed.
**M350 & M500**

Significant improvement in the arc stability, from a low to a high electric current range.
Realization of a beautiful weld bead appearance with uniform weld bead end and less voltage fluctuation even during high-speed welding.

**W400**

Significant improvement in the arc stability, from a low-to-high electric current ranges.
Realization of a beautiful weld bead appearance with uniform weld bead end and less voltage fluctuation even during high-speed welding.

**P400**

Realization of high-quality pulse welding by utilizing an optimized waveform control according to various kinds of materials.
The arc stability is perfect even in a high-speed welding.

**M350L**

Significant reduction in spatter generation, in the transitional arc (150-230A). Thanks to the newly developed “CBT-EX” process.

**P500L**

The top model, achieving an optimum welding performance in welding of steel, stainless, and aluminum. It combines the new features of the M350/500, the M350L and the P400 model and is the perfect choice for all kinds of applications.
**M350**

Multi-purpose Welding Power Sources for your demanding applications

**M500**

**Better welding by maintaining arc stability performance when it matters most.**

High-performance welding for manual or automatic applications through optimized waveform control to match your material and application.

![Uniform and beautiful weld bead appearance.](image)

Welding current: 130A  
Welding voltage: 16.5V  
Shield gas: 80Ar/20% CO₂  
Plate thickness: 1.6mm Plate

A stable arc is realized even if the stickout changes or during weaving operations.

![Realization of a flat weld bead appearance.](image)

Welding current: 300A  
Welding voltage: 30V  
Wire size: 1.2mm, Mid steel flux-cored  
Plate thickness: 9mm  
Weaving frequency: 2.5Hz Amplitude 1.5mm

A further increase in speed is realized via the new integrated high-speed welding mode

Excellent welding performance and reduced arc voltage fluctuations during the High-Speed Welding mode prevents defects in the bead.

![Uniform and beautiful weld bead appearance.](image)

Welding current: 250A  
Welding speed: 100 cm/min  
Welding voltage: 25V  
Wire size: 1.2mm

You can easily adjust the weld bead width to increase the tolerance range.

Arc start performance is improved by the implemented digital start

The arc start performance in Stainless Mode is significantly improved by the Digital Turbo Start and the End Pulse functions are unique to DAIHEN which can optimize the wire tip shape.

![Significant reduction of arc start failure.](image)
M350L  Multi-purpose Welding Power Source with L-Mode (Low-Spatter Mode)

Low-Spatter Mode reduces welding spatter in both size and quantity in all welding current modes (Low, Mid, and High).

Realization of a low spatter generation equivalent to MAG welding even by CO₂ welding.

Maximum spatter reduction even in MAG welding.

With reduction of welding spatter quantity and size, less spatter sticks to your part or welding jig, greatly reducing man-hours required for post-welding, clean up.

Creating an excellent flat weld bead appearance

The M350L moderates the weld bead through short circuiting to achieve flat weld bead with low spatter.

Realization of a flat weld bead appearance with an excellent heat input and a deep penetration.

Increases in speed and welding tolerance

Tolerance of the lower limit voltage is expanded and spatter generation is reduced even in high speed mode, realizing a high quality welding.

Realization of a low spatter generation equivalent to MAG welding even by CO₂ welding.

Welding current: 135A  Welding voltage: 18V  Shield gas: CO₂  Plate thickness: 1.6mm  Wire size: Ø 1.2mm  Welding speed: 70 cm/min

Welding current: 220A  Welding speed: 100 cm/min  Shield gas: CO₂  Wire size: Ø 1.2mm  Plate thickness: 1.6mm  Gap: 1.6mm

Reduction in frequency of undercut occurrence and humping in high-speed welding.
W400  Better productivity, better weld quality!
The Welbee W400 is full of advantages.

Avoiding burn-thru while welding thin plates

Bridged gap in comparison
Travel speed: 60cm/min, Base material: A5052 (hard aluminum)

Burn-thru is a common problem when welding a thin plate. Electrode negative control of the arc delivers excellent weld penetration while putting more heat into the wire and less into the substrate material.

Even in the welding of very thin aluminum plates, welding of the workpieces is controlled properly while preventing wire melting, resulting in high-quality welds with no burn-thru.

Horizontal welding on gap in comparision
Travel speed: 75cm/min, Base material: ss400 (ASTM A36, EN S275)

Even when a gap is bigger than the workpiece’s plate thickness, sufficient deposition can be secured by adjusting the EN ratio. Therefore, even if a joint has a large gap in the welding zone, steady welding of such difficult joints is possible.

The W400 can produce high-quality welding on a variety of applications

Aluminum
Generated weld fumes and smut are minimized while beautiful beads appear.

Mild Steel
AC pulse welding utilizes the high EN ratio which allows for sufficient deposition and high-quality welds even while performing at high speeds.

Stainless Steel
The SUS ferrite mode is incorporated in addition to the conventional SUS solid mode. Wide application range including the welding of very thin plates for the mufflers of motorbikes, etc. is provided.

Improve bead appearance while eliminating weld defects

WavePulse technology improves weld quality and reduces weld defects.
What is pulse welding?

Pulse welding is a type of metal transfer in which a high current (peak current) and a low current (base current) are applied at intervals to break away a single droplet formed at the tip of the wire by the electromagnetic pinch force generated by the pulse current.

DAIHEN’s newly developed pulse waveform control for a top-quality weld

The Welbee inverter series offers the following strong points by utilizing an optimum waveform control according to welding materials.

- You can realize an arc with minimized spatter generation, from a low current to a high current range.
- You can realize excellent welding results even for surface treated steel materials including galvanized steel.
- You can increase the deposition rate and easily secure the desired bead width even at high-speed welding.

Improving the welding quality of galvanized steel

Even in the case of strong occurrence of zinc vapor during welding of galvanized steel, an optimized new intelligent filter will enable you to perform a stable weld. In addition, you can easily realize an even bead with a uniform end.

Even for galvanized steel which is likely to generate blow holes, you can reduce the number of blow holes dramatically by vibrating the molten weld pool using the wave pulse welding method.

Welding current: 230A
Welding voltage: 23.5V
Shield gas: 80% Ar + 20% CO₂
Welding base material: Galvanized steel: 45g/m²
Welding speed: 100 cm/min
Wire diameter: 1.2mm
Welded joint: Overlapped fillet welding

Welding current: 200A
Welding voltage: 25V
Thickness of galvanized steel: 9mm
Wire diameter: 1.2mm
Welding speed: 30 cm/min
Wave frequency: 3 Hz
Easy high-speed welding of thin stainless steel

Obtain a good bead even at high-speed welding of stainless steel, with the pulse waveform control that is exclusive for stainless steels and is uniquely developed by DAIHEN. The pulse waveform control can safely realize droplet transfer even for a highly viscous stainless wire.

Welding current: 145A
Welding voltage: 23V
Sheet thickness: 2.0mm
Wire diameter: 1.2mm
Welding speed: 100cm/min

Beautiful bead appearance by using the Aluminum MIG pulse waveform

Significantly reduce the generation of dustlike spatter by utilizing DAIHEN’s original and new pulse waveform control in which the current is changed moderately.

You can easily create a beautiful bead appearance with modulation equivalent to that of TIG welding by controlling the arc length and the wire feed speed using the wave pulse welding method.

Welding current: 280A
Welding voltage: 21V
Sheet thickness: 1.5mm
Wire diameter: 1.2mm
Welding speed: 160 cm/min

Welding current: 120A
Welding voltage: 16V
Sheet thickness: 3.0mm
Wire diameter: 1.2mm
Welding speed: 50cm/min

High speed pulse mode

In combination with Robots of OTC’s FD series, you can optimize the performance of Welbee. You can carry out high-speed pulse welding by setting parameters automatically interlocking with the speed information specified from the teaching pendant.

Welding current: 300A
Welding voltage: 22V
Sheet thickness: 3.2mm
Wire diameter: 1.2mm
Welding speed: 150 cm/min
Wire feeding speed: 11.0m/min
Protrusion: 1.5mm
Quality Control by IT Introduction

You can easily edit “Welding condition memory functions” or its backup data with your PC via the USB port.

Welding monitor (optional)

You can collect detailed data in large quantities through USB network by mounting the expansion board. Accordingly, you can confirm detailed information on when and what happened, and thereby can utilize this for improvement in quality control through traceability as well as for troubleshooting.

Parameters in which data can be saved

<table>
<thead>
<tr>
<th>Welding current (Setup)</th>
<th>Welding voltage (Setup)</th>
<th>Welding current (Measured value)</th>
<th>Welding voltage (Measured value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding speed</td>
<td>Startup signals</td>
<td>Input voltage at the primary side</td>
<td>Motor electric current</td>
</tr>
<tr>
<td>Inching signals</td>
<td>Power supply</td>
<td></td>
<td>FAN revolution</td>
</tr>
<tr>
<td></td>
<td>internal temperature</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adoption of a digital meter that has excellent visibility even in a dark place

You can confirm not only the welding current and voltage under welding operation but also the average welding current and voltage after completing welding operation. In addition, you can easily take measures against troubles referring to the error code display.

Welding condition memory function (100 conditions)

One-touch memory/regeneration function of welding conditions according to work pieces is available. Improvement in workability and repeatability of the welding conditions is realized.

Function key: Operators can easily set up a desired special function, since functions that were set up with the internal switches for welding power supply in the past can be set up on the front panel.

Selection of welding modes: A desired welding process and wire size can be easily set up on the touch panel. Taking a glance at the LED display will allow you to confirm the present settings.

Easy condition setup with a dial: Repeatability is also excellent since a precise setup by the unit of 1A or 0.1V has become possible.

Arc characteristics: You can easily achieve a desired arc. According to use, you can choose the optimal arc status.

Various kinds of functions settings: You can also easily set up various kinds of functions to achieve a high-quality welding via touch panel.

Optional modes: This welding machine can easily cope with welding for special materials by installing software as an optional mode to meet various needs.

Hardware requirements:
For Windows 7/Vista: Pentium 4 1GHz or more/RAM 1GB or more/Screen 1024 x 768 or larger
For Windows XP, 2000: Pentium M 1GHz or more/RAM 512M byte or more/Screen 1024 x 768 or larger
* A LAN connector (fixed cable) is necessary.

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<td>Power supply</td>
<td></td>
<td>FAN revolution</td>
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* A LAN connector (fixed cable) is necessary.
Durability/maintainability, and easy connection

High dust resistance
Improvement in reliability is realized by adopting a separation structure which prevents dust from entering into the area in which electronic components etc. are mounted.

Easy maintenance
Due to the revolution control of the cooling fan according to its duty cycle or ambient air temperature, the design prevents dust from entering the area where electronic components are installed.

Dust penetration into the electronic parts is reduced by about 98%.

Easy connection to external devices
The machine’s capability is maximized by connecting it to the FD robot series.

You can easily connect the machine to a FD series robot, by using the integrated I/F board.

- Easily set up conditions on the Welbee special screen.
- Easily confirm welding status on the arc monitor screen.
- You can also monitor the wire feeding speed.
- Required monitoring terms are arranged in an easy-to-see way by utilizing the customization function.

Easy connect to external equipment using the connection terminal box
The connection terminal is located at the rear of the machine and can be opened easily.
XTEND-ARC
Feeders

OTC's XTEND-ARC feeders are enclosed in a plastic case that protect the workings of the feeder from the harsh elements of the field welding environment. There are no circuit boards onboard making for a rugged, weather-resistant unit. This helps protect the spool from the dirt and grime of the work area.

XTEND-ARC 12
The XTEND-ARC 12 holds a standard AWS 8” spool (with supplied adapter) or standard 12” spool of wire and can feed steel, stainless steel, copper-nickel, aluminum bronze, silicon bronze, Inconel, titanium and aluminum (aluminum kit supplied with feeder). This unit has five rugged latches that keep the durable case closed even in the abusive conditions of field work and an industrial-sized handle for added mobility.

XTEND-ARC 8
The XTEND-ARC 8 holds a standard AWS 8” spool of wire and can feed steel, stainless steel, copper-nickel, aluminum bronze, silicon bronze, Inconel, titanium and aluminum (aluminum kit supplied with feeder). The cases two rugged latches keep the durable case closed even in the abusive conditions of field work. An industrial-sized handle allows the welder to move the XTEND-ARC 8 feeder with ease.

OTC Daihen umbilical cables come pre-assembled with a protective covering to absorb the abuse of the field environment and are available in 5m (16’), 10m (33’) and 20m (66’) lengths. All the necessary items for a complete hook-up between the feeder and the power supply (power, gas, remote control and feeder cables) for the Air-Cooled torch version and all of the above plus water lines for the Water-Cooled torch versions.
DA 300P  Digital AC + DC Hybrid Pulsed TIG Welding Machine

True Digital Support for Pulse TIG Applications

Features & Benefits

- Improved arc concentration improves overall welding capabilities, from fillet to thin plate materials.
- Several different welding modes (Aluminum, Steel, Stainless) that improve weld quality.
- Silent Pulse function improves thin plate weld material.
- AC frequency range from 50-200 Hz improves heat input control.
- Improved instant arc starts.
- AC+DC Hybrid mode provides long life for Tungsten electrode.
- Capable of Standard, Hard and Soft AC waveforms for high-quality aluminum welding.
- Support for manual and robotic applications.
- User-friendly touch panel.
- Analog and digital remote pendants optionally available.
- Improved crater fill repeat function that prevents damage to the electrode and base material.

Variable AC Frequency Control

The DA300P features an all-new AC Frequency variable control system that provides the ideal conditions for various aluminum thin plate welding applications. The AC Frequency has a greater arc concentration when compared with conventional machines, and this allows the user to obtain the desired weld penetration and heat input.

The AC Frequency control can be set between 50 and 200 Hz for desired frequency and bead shape, while keeping noise in the production environment to a minimum.

AC Frequency Control

Even when the AC frequency is increased, there is only a slight decrease in welding current, resulting in consistent weld quality.

AC Frequency and Weld Penetration Comparison

<table>
<thead>
<tr>
<th>Frequency</th>
<th>50Hz</th>
<th>100Hz</th>
<th>200Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Section</td>
<td>Wide Bead</td>
<td>Narrow Bead Increased Penetration</td>
<td></td>
</tr>
</tbody>
</table>

Weld Current: 200A, Travel Speed 40cm/min, Plate Thickness: 6mm (A5052)
Features and Benefits

- Production cut up to 2 inch.
- Maximum cut up to 2-1/2 inch.
- Water cooled-100% duty cycle.
- Built-in water circulator extends torch and consumable life.
- Faster, safer, and more economical than oxy-fuel on 1” carbon steel.
- I/O receptacle for automated cutting.
- Built-in torch guard function (Alarm indicates replacement time of tip and electrode).
- Wide operation area (Up to 100ft. torch option).
- Advanced safety protection circuits.
- Fully variable output.
- Cruise control.
- Pulsed pilot arc start reduces electrode wear.
- Diagnostic Indications for troubleshooting.
- Wheels provided for greater maneuverability.

Capable of clean cutting nearly 2-inch carbon steel

The D-12000 is a safe and economical alternative to oxyfuel cutting. This system offers more unique, user-friendly features than any machine in its class.

Upon turning on the power source a self-diagnosis function takes place that will not allow the system to operate if an abnormal condition exist. Indicator lamps identify operational problems. Alarms will sound when unsafe conditions happen such as removing torch consumables with control power on.

OTC’s patented “TOURCH GUARD” feature monitors electrode consumption and indicates replacement time avoiding torch head damage from over use of the electrode.
System Peripherals

Capital Robotics supplies weld-positioning equipment such as head and tailstocks, welding turntables and multi-axis positioners that manipulate the part for precise and controlled weld positioning. Simultaneous coordinated motion through the robot controller is attained without complex integration since OTC supplies most of these components.

Positioner Headstock All - 1PB

- Improved arc concentration improves overall welding capabilities, from fillet to thin plate materials.
- The 5 sides of the housing are provided with tapped mounting holes, which permit random mounting positions allowing various jig systems to be set up.
- A hole through the center of the rotary table, enabling cables and hoses to be routed through easily.
- A secondary terminal for welding (500A) is provided as standard built-in equipment.

<table>
<thead>
<tr>
<th>Name</th>
<th>Positioner Headstock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model name</td>
<td>A2PB252-E</td>
</tr>
<tr>
<td>Max. Payload Capacity</td>
<td>250kg</td>
</tr>
<tr>
<td>Rotating Speed</td>
<td>2.6 rad/s (150°/s)</td>
</tr>
<tr>
<td>Allowable Rotation Torque</td>
<td>208N•m</td>
</tr>
<tr>
<td>Position Repeatability</td>
<td>±0.1mm (Position at R300mm)</td>
</tr>
<tr>
<td>Stop Position</td>
<td>Random</td>
</tr>
<tr>
<td>Mass (Weight)</td>
<td>110kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Positioner Headstock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model name</td>
<td>A2PB502-E</td>
</tr>
<tr>
<td>Max. Payload Capacity</td>
<td>500kg</td>
</tr>
<tr>
<td>Rotating Speed</td>
<td>2.1 rad/s (120°/s)</td>
</tr>
<tr>
<td>Allowable Rotation Torque</td>
<td>490N•m</td>
</tr>
<tr>
<td>Position Repeatability</td>
<td>±0.1mm (Position at R300mm)</td>
</tr>
<tr>
<td>Stop Position</td>
<td>Random</td>
</tr>
<tr>
<td>Mass(Weight)</td>
<td>170kg</td>
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</tbody>
</table>
## System Peripherals

<table>
<thead>
<tr>
<th>Name</th>
<th>Positioner Headstock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model name</td>
<td>A2PB1002-E</td>
</tr>
<tr>
<td>Max. Payload Capacity</td>
<td>1000kg</td>
</tr>
<tr>
<td>Rotating Speed</td>
<td>1.3 rad/s (72°/s)</td>
</tr>
<tr>
<td>Allowable Rotation Torque</td>
<td>1078N•m</td>
</tr>
<tr>
<td>Position Repeatability</td>
<td>±0.1mm (Position at R300mm)</td>
</tr>
<tr>
<td>Stop Position</td>
<td>Random</td>
</tr>
<tr>
<td>Mass (Weight)</td>
<td>220kg</td>
</tr>
</tbody>
</table>

**Positioner Headstock AII - 1PB**

- Improved arc concentration improves overall welding capabilities, from fillet to thin plate materials.
- High-speed motion increases production efficiency!
- An increase in the maximum rotation speed of the tilting axis by 2.5 times was achieved in comparison with the conventional machine 300kg payload type.
- Continuous welding (100% duty cycle) at 500A can be standard.
- Providing a collecting brush additionally as an option can increase the maximum welding current up to 1000A at 60% duty cycle.
- Our product line includes a model with a maximum payload capacity of 1000kg, for large workpieces.
Sensing Solutions

Seam Tracking / Laser Search / Laser Tracking / Arc Sensor

FD-LT
Laser Tracking Sensor
• High-end technology.
• Designed for arc welding environments.
• Relatively compact and low-cost maintenance.

FD-WD (H)
Touch Sensor
• Conventional sensing with modern functions.
• Simple and easy-to-use maintenance.

FD-TR2
TIG Arc Sensor
• Higher versatility.
• Full operation via teaching pendant.
• No problem in TIG welding environments.

FD-AR2
Through the Arc Seam Tracking
• Simple & Easy operation.
• No additional torch components for easy maintenance.
• Most popular sensor worldwide.
• High-reliability and versatility.

FD-QD
• Unique sensing functions with lower costs.
• Designed for arc welding applications.
• Full operation from teaching pendant.

Going Beyond Your Expectations...
Leading Sensory Technology...
From The Leading Company In Welding Innovations
Sensor Selection Guide

Frequently Asked Questions

Q1. What is a robotic sensor?
• A1. A robotic sensor is a system that detects variations in parts and compensates for the variation by shifting the robotic programs.

Q2. When is it effective and / or applicable?
• A2. A sensor is effective when it is difficult to keep programmed points in consistent locations and there are part accuracy problems requiring the operator to frequently adjust taught robot points. When this occurs, sensors can be used to automatically shift the welding points.

**Note: Sensors cannot create teaching programs - it can only shift the current programs. Teaching an initial program is always required.**

Q3. How can we determine which sensor is best?
• A3. DAIHEN can provide various types of sensors for almost any situation. Please refer to the chart below to find the best sensor for your application.

Giving You The Best Choice From A Wide Selection...
For The Best Welding Results And Quality!
Experience the “Capital Advantage” from our experienced team of Welding Engineers, Applications Engineers and Service Engineers to on-site training classes, service and preventative maintenance programs. Capital’s abundant inventory of robotic welding parts & consumables is available keep your shop’s production running strong. Our Atlanta Technology & Training Center functions as our robotics headquarters and is also home to OTC-DAIHEN’s Atlanta office.

A true “Hands-on” Experience

All of Capital’s Showrooms maintain a large inventory of today’s most advanced metal fabricating equipment. We provide our customers with the ability to have a unique “Hands-on” experience by offering a wide range of equipment under power at all times. This allows the customer to see how the equipment can fit their requirements and how one process can vary from another.

Virtual Showroom

Learning about our equipment has never been easier, with the use of our online Virtual Showroom. You control the view and can interact with the demonstration, providing instant feedback and answers to the questions you want to know, all at the convenience of your own desk.

Mobile Demonstration Unit

With our Mobile Robotic Demo Units we can provide you with a fully functional Robotic Cell at your facility. Each unit is capable of demonstrating the many benefits of robotic welding from part programming to setting up a production line.
Custom Cells & Systems

Capital Robotics supplies weld-positioning equipment such as head and tailstocks, welding turntables and multi-axis positioners that manipulate the part for precise and controlled weld positioning.

Simultaneous coordinated motion through the robot controller is attained without complex integration since OTC supplies most of these components.

OPTICAM Fixture provides an automated solution for the creation of inexpensive component fixtures formed from interlocking flat sheet material profiles.

OPTICAM Fixture drastically reduces design complexities, time and cost consumed by traditional fixture design methods. Available in two variants, Elite and Lite (there’s an option to suit all needs and budgets).
Since 1984, Capital Machine Technologies (CMT), Inc. has been committed to delivering the latest technologically advanced metal fabrication equipment to its client base of job shops and manufacturers. CMT has a broad range of new machines and Robotic Welding systems under power to provide you a live demonstration in person or remotely from the comfort of your own computer monitor. Capital Machine Technologies is a privately owned company in Tampa, FL.