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M3-S20 Automated Pipe Spool Welding System



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Scope

The M3-S20 Automated Pipe Spool Welding System is a large-scale, servo-driven system that will maximize the operator's productivity and efficiency on large-scale industrial projects. The M3-S20 possesses single-point power distribution with 3-phase, 208-amp power. The modular design allows for long-term repairability, and its flexible configuration makes this machine suitable for machine shops of all sizes. In addition to its versatility, the M3-S20 exponentially increases productivity and quality. Allowing the operator to perform multiple weld passes under a single arc, the M3-S20 provides arc-on times of 90%. SEC Industrial also offers custom fixturing for more unique welding applications.

The M3-S20's dual touchscreen console allows the operator to perform and monitor welds with ease. No separate programming or software is required for the user-friendly, PLC-controlled console. The system's program also allows the user to log weld data for each welding operation. The M3-S20 also comes with a Xiris Weld Vision Package, so the operator can view welds being performed in real-time on a separate monitor.

The M3-S20 Automated Pipe Spool Welding System possesses 3 CNC controlled axes of motion and 2 mechanized axes of motion, which include:

- **Headstock Rotation:** The headstock can be programmed to rotate to allow the weld head to access the entire diameter of the pipe or tube. The rotation speed and direction can be changed using the M3-S20 program.
- **X-Axis Travel:** Precision linear guide rails combined with a precision ball screw and traveling cart allow the weld head to move along the length of the pipe. In addition to standard travel along the pipe length, the servo driven X-axis travel allows the weld head to oscillate across a weld joint. The oscillation length and speed can be adjusted using the M3-S20's dual-monitor touch screen.

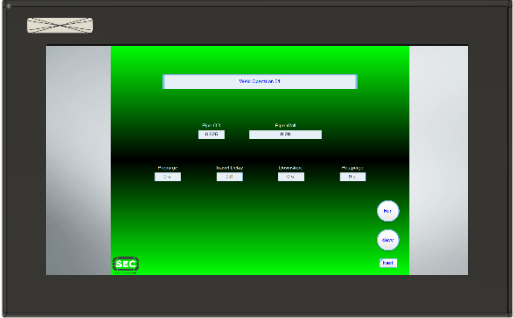

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- **AVC Travel:** The Z-axis travel provides servo driven AVC control to maintain the torch offset position relative to the weld joint. The torch offset position can be adjusted using the M3-S20's dual-monitor touch screen.
- **Y-Axis Travel:** The Y-axis travel allows the operator to adjust to boom position perpendicular to the pipe. This allows for a precise set-up prior to any weld operations being performed.
- **Hot Wire Feeder:** The hot wire feeder on the M3-WL03 allows the operator to adjust the wire speed via the M3 Touchscreen Controller.

The M3-S20 allows for a wide range of pipe sizes and materials to be welded. The 3,000 lb positioner is heavy enough to support the 20 ft maximum pipe length and 1-24 in. pipe size that the system offers. Using the TIP TIG Hotwire Feeder allows the operator to weld pipe made of steel, stainless steel, and specialty metals.

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Component Listing and Specifications

Part Illustration	Description and Specs.
<p data-bbox="256 367 667 401">M3 Touchscreen Controller</p>  <p>The image shows a 19.5-inch multi-touch resistive touchscreen monitor with a green background. The screen displays a control interface with several white buttons and text labels, including 'SEC' in the bottom left corner. The interface appears to be for adjusting welding parameters.</p>	<ul style="list-style-type: none"> • HIS-UM19.5-CPVB Touchscreen Monitor for easy-to-use weld operation adjustments • 19.5" multi-touch resistive touch screen • AVC and X-axis jogging travel • Adjustable primary and background amperage • Adjustable primary and background pulse time • Adjustable arc voltage • Adjustable travel speed and wire feed speed • Adjustable oscillation amplitude • Adjustable in and out dwell • Adjustable excursion time • Additional 19.5" to monitor welds in real-time
<p data-bbox="293 1190 630 1224">Headstock Rotation</p>  <p>The image shows a grey SV2A-2200 servo drive. It is a rectangular unit with a cooling fan on the top and various ports on the front panel, including a terminal block and a connector.</p>	<ul style="list-style-type: none"> • SV2A-2200 servo drive is configured for rotation control of the M3-WL03 Headstock • Programmable: <ul style="list-style-type: none"> ○ Rotation Speed ○ Direction ○ Delays (start & stop) • Manual jog and continuous rotation set on M3 Touchscreen Controller • Programmable synchronized motion with the Y-axis and Rotation Axis

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X-Axis Travel



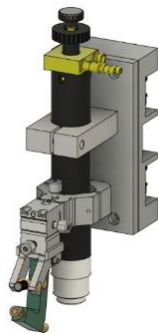
- SV2A-2040 servo drive is configured for linear travel control along the X-axis
- Precision servomotor with encoder for integrating to motorized linear device
- Programmable:
 - Travel Speed
 - Direction
 - Delays (start & stop)
- Manual jog is controlled by M3 Touchscreen Controller
- Oscillation capable

AVC Travel






- SV2A-2040 servo drive is configured for linear travel control along the Z-axis
- Precision linear guide rail assembly with torch mount
- Precision servomotor with encoder and limit switches
- Programmable voltage by segment
- Programmable voltage sensitivity
- Programmable start delay
- Touch retract for setting initial torch stand off from part
- Home position and travel extent limit switches included
- Brake for slide used in vertical orientation

TIG Torch





- MT500C-7 Barrel Machine TIG Torch
- Amperage: 500 A
- Cable Type: 1-Piece Standard
- Rated Output: 500 A ACHF or DCSP
- Adjustable wire feed manipulator

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<p>TIP TIG Hotwire Feeder</p>  <p>A blue industrial machine with a control panel and a hot wire feeder mechanism. The text 'TIP TIG' is visible on the side.</p>	<ul style="list-style-type: none">• TIP TIG – AllinOne cold wire and hot wire feeder for increased deposition rate• 400% improvement in deposition rate• Dilution is reduced by up to 80%
<p>M3-S20 Workstation</p>  <p>A large industrial workstation with a yellow frame and a green control unit. It features a long, narrow table and a complex mechanical assembly on top.</p>	<ul style="list-style-type: none">• Maximum pipe length: 20'• 3,000 lb. positioner weight (1360 kg)• Pipe size range of 1" to 24"• Precision servomotor with encoder for control and feedback of headstock rotation
<p>Miller Maxstar 400</p>  <p>A blue Miller Maxstar 400 TIG welder with a black control panel and a carrying handle on top. The Miller logo is visible on the side.</p>	<ul style="list-style-type: none">• Miller Maxstar 400 TIG Weld power supply• Weldable Metals:<ul style="list-style-type: none">○ Specialty Metals○ Stainless Steel○ Steel• Input Voltage:<ul style="list-style-type: none">○ 208 V○ 220/230/240 V○ 380/400 V○ 460/480 V○ 575 V• Input Phase: 1- and 3- Phase• Input Hz: 50/60 Hz• Current Type: DC• Max Open Circuit Voltage: 75 VDC• Amperage Min/Max: 3 – 400 A

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<p>Miller Coolmate 3.5</p>  A blue industrial water cooler with a black front panel featuring a large vented grille and two yellow electrical outlets on the left side.	<ul style="list-style-type: none">• Miller Coolmate 3.5 water cooler• Max Cooling Capacity: 4140• Input Hz: 50/60 Hz• Rated Cooling Capacity: 1660• Tank Capacity 13.2 l
<p>Single Point Power Distribution</p>  A silver and blue industrial DIN rail power supply with a green terminal block on top and a blue front panel with a red 'MAX' logo and 'SDR-480-24' text.	<ul style="list-style-type: none">• SDR-480-24 Mean Well AC-DC Industrial DIN rail power supply• Power Output: 480 W• Output Voltage: 24 V• Output Current: 20 A• Input Voltage:<ul style="list-style-type: none">○ 110/230 V universal input○ 90-264 V

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