

## **SOLUTIONS IN MOTION®**



PATENTED ARM DESIGN



IMPROVED PART ACCESS



INTEGRATED UTILITIES

### TOP REASONS TO BUY

- Longest-reach arc welding robot with integrated torch cable
- Streamlined design improves torch access into tight spaces
- Patented multiple robot control allows more arms to be combined in workcell
- Extra-long arm reduces need for tracks

MA3100 • ARC WELDING •

### Payload: 3 kg Mounting Options: Ceiling/Wall (MA3100T)

The MA3100 "Master Arc" welding robot features an integrated torch cable and offers the longest reach in its class. It is ideally suited for use in workcells with larger workpieces, as well as for applications that require access to parts in tight spots or those with potential interference from fixtures.

#### "Master Arc" Welding Robot Extra-Long, Streamlined and Powerful

- Reduces welding cycle time due to cuttingedge Sigma-5 AC servo motor control technology and new ARM (Advanced Robot Motion) control.
- 3,121 mm reach; ±0.15 mm repeatability.
- Integrated through-the-arm torch cabling eliminates cable interference, simplifies programming and reduces cable wear.
- Feeder cable and welding utilities (gas and air hoses) can be routed through robot base to upper arm.
- Hollow upper arm maintains optimum bend radius of welding torch cable, maximizing weld performance. T-axis can rotate torch ±200 degrees without cable interference.
- Arm design prevents bent, pinched or stretched cables regardless of torch orientation or part size or shape; minimizes wire feed problems and optimizes weld performance.
- Floor-mounted model is standard. Ceiling- or wall-mounted versions (MA3100T) available.

 Backed by industry's first two-year torch cable warranty.

#### DX100 Controller

- Patented multiple robot control supports up to 8 robots/72 axes.
- Windows<sup>®</sup> CE programming pendant with color touch screen and USB interface.
- DX100 welding full function arc welding software including graphics-based weld file settings.
- Faster processing speeds for smoother interpolation. Quicker I/O response. Accelerated Ethernet communication.
- Extensive I/O suite includes integral PLC and touch screen HMI, 2,048 I/O and graphical ladder editor.
- Supports all major fieldbus networks, including EtherNet/IP, DeviceNet, Profibus-DP and many others.
- Compliant to ANSI/RIA R15.06-1999 and other relevant ISO and CSA safety standards. Optional Category 3 functional safety unit.

# **MA3100 ROBOT**

All dimensions are metric (mm) and for reference only. Please request detail drawings for all design/engineering requirements.





Structure     Vertical jointed-arm type       Controlled Axes     6       Payload     3 kg (6.6 lbs)       Vertical Reach     5,615 mm (221.1")       Horizontal Reach     3,121 mm (122.9")       Repeatability     ±0.15 mm (±0.006")       Maximum     S-Axis (Turning) L-Axis (Loper Arm)     ±180°       Motion Range     S-Axis (Upper Arm)     +135'-90°       N-Axis (Upper Arm)     ±150°     ±150°       R-Axis (Upper Arm)     ±150°     ±150°       Naximum Speed     S-Axis     180°/s       L-Axis (Twist)     ±200°     ±150°       Naxis (Twist)     ±200°     ±150°       Naxis (Twist)     ±150°     ±150°       Naxis (Twist)     ±200°     ±150°       L-Axis (Twist)     ±200°     ±150°       Naxis (Twist)     ±200°     ±150°       L-Axis (Twist)     ±200°     ±150°       L-Axis (Twist)     ±150°     ±150°       Naxis (Twist)     ±150°     ±150°       R-Axis     178°/s     178°/s       U-Axis (Twist)     ±200°     ±150°       F-Axis     400°/s     ±160°/s       Alproximate Mass     501 kg (1,104.7 lbs)     ±160°/s       B-Axis     8.8 N · m     ±160°/s       Allowable Moment<	MA3100 SPECIFICATIONS		
Controlled Axes     6       Payload     3 kg (6.6 lbs)       Vertical Reach     5,615 mm (221.1")       Horizontal Reach     3,121 mm (122.9")       Repeatability     ±0.15 mm (±0.006")       Horizontal Reach     ±0.15 mm (±0.006")       Maximum     S-Axis (Turning)     ±180°       Maximum     S-Axis (Lower Arm)     +135°/-90°       Motion Range     R-Axis (Upper Arm     ±150°       R-Axis (Upper Arm Twist)     ±150°       B-Axis (Pitch/Yaw)     +180°/-45°       T-Axis (Twist)     ±200°       L-Axis     178°/s       U-Axis (Twist)     ±200°       L-Axis     178°/s       U-Axis     178°/s       B-Axis     610°/s       Approximate Mass     501 kg (1,104.7 lbs)       Brakes     Allaxes       Power Consumption     2.5 kVA       Allowable Moment     R-Axis       0-Axis     2.9 N • m       1-Axis     2.9 N • m       Allowable Moment	Structure		Vertical jointed-arm type
Payload         3 kg (6.6 lbs)           Vertical Reach         5,615 mm (221.1")           Horizontal Reach         3,121 mm (122.9")           Repeatability         ±0.15 mm (±0.006")           Maximum         S-Axis (Turning)         ±180°           Maximum         S-Axis (Lower Arm)         +135°/-90°           Motion Range         S-Axis (Loyer Arm)         +351°/-160°           Maximum         B-Axis (Upper Arm Twist)         ±150°           B-Axis (Twist)         ±200°         ±150°           R-Axis (Twist)         ±200°         ±160°/-45°           L-Axis (Twist)         ±200°         ±160°/-45°           L-Axis (Twist)         ±200°         ±150°           Maximum Speed         S-Axis         178°/s           U-Axis (Twist)         ±160°/s         ±200°           Approximate Mass         178°/s         U-Axis           B-Axis         400°/s         501 kg (1,104.7 lbs)           Brakes         501 kg (1,104.7 lbs)         17-4xis           Power Consumption         2.5 kVA         2.5 kVA           Allowable Moment         R-Axis         8.8 N • m           T-Axis         0.27 kg • m²         0.27 kg • m²           Allowable Moment         B-A	Controlled Axes		6
Vertical Reach         5,615 mm (221.1")           Horizontal Reach         3,121 mm (122.9")           Repeatability         ±0.15 mm (±0.006")           Maximum         S-Axis (Turning)         ±180°           Maximum         L-Axis (Lower Arm)         +135°/-90°           Motion Range         S-Axis (Upper Arm)         +251°/-160°           Maximum Speed         S-Axis (Upper Arm Twist)         ±150°           B-Axis (Vist)         ±200°         ±150°           L-Axis (Twist)         ±200°         ±150°           L-Axis (Twist)         ±200°         ±160°/s           Maximum Speed         S-Axis         178°/s           L-Axis (Twist)         ±200°         ±150°           L-Axis (Twist)         ±200°         ±160°/s           Axis         178°/s         U-Axis           U-Axis (Twist)         ±200°         ±160°/s           R-Axis         400°/s         501 kg (1,104.7 lbs)           B-Axis         501 kg (1,104.7 lbs)         501 kg (1,104.7 lbs)           Brakes         Allowable Moment         8.4 N • m           Allowable Moment of Inertia         R-Axis         8.8 N • m           R-Axis         0.27 kg • m²         0.27 kg • m²           R-Axi	Payload		3 kg (6.6 lbs)
Horizontal Reach         3,121 mm (122.9")           Repeatability         ±0.15 mm (±0.006")           Maximum         L-Axis (Lower Arm)         ±180°           Motion Range         L-Axis (Lower Arm)         ±251°/-160°           P-Axis (Upper Arm Wist)         ±150°         ±150°           P-Axis (Upper Arm Twist)         ±150°         ±150°           P-Axis (Twist)         ±200°         ±150°           Maximum Speed         S-Axis (Titoth/Yaw)         ±180°/-45°           L-Axis (Twist)         ±200°         ±20°           Allowable Moment         S-Axis         180°/s           Power Consumption         2.5 kVA         8.8 N • m           Allowable Moment         R-Axis         0.27 kg • m²           Allowable Moment         R-Axis         0.27 kg • m²           Ginertia         0.03 kg • m²         0.03 kg • m²	Vertical Reach		5,615 mm (221.1")
Repeatability         ±0.15 mm (±0.006")           Maximum         S-Axis (Turning) L-Axis (Lower Arm)         ±180°           Motion Range         U-Axis (Upper Arm)         +135'/-90°           R-Axis (Upper Arm)         +251'/-160°           R-Axis (Upper Arm Twisht)         ±150°           B-Axis (Pitch/Yaw)         ±150°           T-Axis (Twist)         ±200°           Maximum Speed         S-Axis           S-Axis         180°/s           L-Axis         178'/s           U-Axis         178'/s           U-Axis         178'/s           B-Axis         400'/s           B-Axis         410'/s           R-Axis         410'/s           B-Axis         410'/s           B-Axis         610°/s           Brakes         All axes           Power Consumption         2.5 kVA           Allowable Moment of Inertia         R-Axis B-Axis         8.8 N · m           R-Axis         0.27 kg · m²           B-Axis         0.27 kg · m²           T-Axis         0.03 kg · m²	Horizontal Reach		3,121 mm (122.9")
S-Axis (Turning) L-Axis (Lower Arm)         ±180°           Maximum Motion Range         U-Axis (Upper Arm) R-Axis (Upper Arm Twist) B-Axis (Pitch/Yaw)         ±150°           B-Axis (Twist)         ±200°           T-Axis (Twist)         ±200°           Maximum Speed         S-Axis           S-Axis         180°/s           L-Axis         178'/s           U-Axis         178'/s           U-Axis         178'/s           B-Axis         178'/s           B-Axis         400°/s           B-Axis         410°/s           B-Axis         610°/s           B-Axis         610°/s           Brakes         All axes           Power Consumption         2.5 kVA           Allowable Moment of Inertia         R-Axis B-Axis         8.8 N • m           R-Axis         0.27 kg • m²           B-Axis         0.03 kg • m²	Repeatability		±0.15 mm (±0.006")
Maximum opecal         R-Axis B-Axis T-Axis         400°/s 410°/s           Approximate Mass T-Axis         501 kg (1,104.7 lbs)           Brakes         501 kg (1,104.7 lbs)           Power Consumption         2.5 kVA           Allowable Moment of Inertia         R-Axis R-Axis         8.8 N ⋅ m 8.8 N ⋅ m T-Axis           Allowable Moment of Inertia         R-Axis R-Axis         0.27 kg ⋅ m <sup>2</sup> 0.03 kg ⋅ m <sup>2</sup>	Maximum Motion Range	S-Axis (Turning) L-Axis (Lower Arm) U-Axis (Upper Arm) R-Axis (Upper Arm Twist) B-Axis (Pitch/Yaw) T-Axis (Twist) S-Axis L-Axis U-Axis	±180° +135°/-90° +251°/-160° ±150° +180°/-45° ±200° 180°/s 178°/s 178°/s
Approximate Mass         501 kg (1,104.7 lbs)           Brakes         All axes           Power Consumption         2.5 kVA           Allowable Moment of Inertia         R-Axis T-Axis         8.8 N · m 2.9 N · m           Allowable Moment of Inertia         R-Axis T-Axis         0.27 kg · m <sup>2</sup> 0.03 kg · m <sup>2</sup>	Maximum Speed	R-Axis B-Axis T-Axis	400°/s 410°/s 610°/s
Brakes         All axes           Power Consumption         2.5 kVA           Allowable Moment of Inertia         R-Axis B-Axis T-Axis         8.8 N · m 2.9 N · m 2.9 N · m           Allowable Moment of Inertia         R-Axis B-Axis D-27 kg · m <sup>2</sup> T-Axis         0.27 kg · m <sup>2</sup> 0.03 kg · m <sup>2</sup>	Approximate Mass		501 kg (1,104.7 lbs)
Power Consumption         2.5 kVA           Allowable Moment         R-Axis B-Axis T-Axis         8.8 N · m 2.9 N · m           Allowable Moment of Inertia         R-Axis B-Axis D-27 kg · m <sup>2</sup> D-3xis         0.27 kg · m <sup>2</sup> 0.03 kg · m <sup>2</sup>	Brakes		All axes
Allowable Moment         R-Axis B-Axis T-Axis         8.8 N · m 2.9 N · m           Allowable Moment of Inertia         R-Axis B-Axis T-Axis         0.27 kg · m <sup>2</sup> 0.27 kg · m <sup>2</sup>	Power Consumption		2.5 kVA
Allowable Moment of Inertia         R-Axis B-Axis         0.27 kg • m² 0.27 kg • m²           T-Axis         0.03 kg • m²	Allowable Moment	R-Axis B-Axis T-Axis	8.8 N • m 8.8 N • m 2.9 N • m
	Allowable Moment of Inertia	R-Axis B-Axis T-Axis	0.27 kg • m <sup>2</sup> 0.27 kg • m <sup>2</sup> 0.03 kg • m <sup>2</sup>

DX100 CONTROI	LER SPECIFICATIONS**	
Dimensions (mm)	800 (w) x 1,000 (h) x 650 (d) (31.5" x 39.4" x 25.6")	
Approximate Mass	250 kg max. (551.3 lbs)	
Cooling System	Indirect cooling	
Ambient Temperature	During operation: 0° to 45° C (32° to 113° F) During transit and storage: -10° to 60° C (14° to 140° F)	
Relative Humidity	90% max. non-condensing	
Primary Power Requirements	3-phase, 240/480/575 VAC at 50/60 Hz	
Digital I/O NPN-Standard PNP-Optional	Standard I/O: 40 inputs/40 outputs consisting of 16 system inputs/ 16 system outputs, 24 user inputs/24 user outputs 32 Transistor Outputs; 8 Relay Outputs Max. I/O (optional): 2,048 inputs and 2,048 outputs	
Position Feedback	By absolute encoder	
Program Memory	JOB: 200,000 steps, 10,000 instructions CIO Ladder Standard: 15,000 steps Expanded: 20,000 steps	
Pendant Dim. (mm)	169 (w) x 314.5 (h) x 50 (d) (6.7" x 12.4" x 2")	
Pendant Weight	.998 kg (2.2 lbs)	
Interface	One Compact Flash slot; One USB port (1.1)	
Pendant Playback Buttons	Teach/Play/Remote Keyswitch selector Servo On, Start, Hold, and Emergency Stop Buttons	
Programming Language	INFORM III, menu-driven programming	
Maintenance Functions	Displays troubleshooting for alarms, predicts reducer wear	
Number of Robots/Axes	Up to 8 robots, 72 axes	
Multi Tasking	Up to 16 concurrent jobs, 4 system jobs	
Fieldbus	DeviceNet Master/Slave, AB RIO, Profibus, Interbus-S, M-Net, CC Link, EtherNet IP/Slave	
Ethernet	10 Base T/100 Base TX	
Safety	Dual-channel Emergency Stop Pushbuttons, 3-position Enable Switch, Manual Brake Release Meets ANSI/RIA R15.06-1999, ANSI/RIA/ISO 10218-1-2007 and CSA Z434-03	

\*\*See DX100 Controller data sheet (DS-399) for complete specifications

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