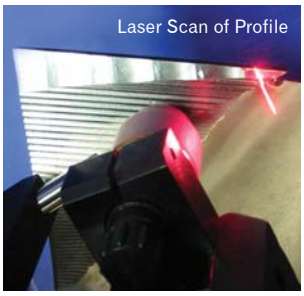
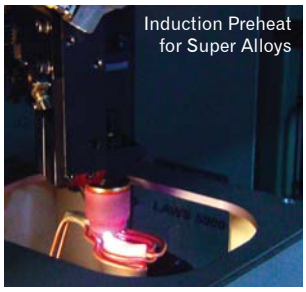
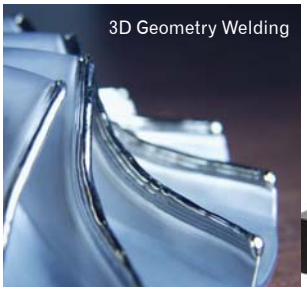
LAWS 5000™

Liburdi Automated Welding Systems


Laser Scan of Profile


Induction Preheat for Super Alloys


3D Geometry Welding

Specifically designed for

Large cases up to 1500 lbs

up to 1 m diameter

up to 2 m in length

Wide-Chord Fan Blades

Impellers

Blisks

The LAWS-5000™ 5-7 axis, fully coordinated motion welding system offers computer synchronized pulsing of the wire and current to yield exceptional heat management at the torch. This unequalled heat management feature allows the LAWS-5000™ to process critical aerospace parts like thin knife edge seals, turbine cases and combustor liners with superior results.

Liburdi Robotic Controller™ (LRC)
Powerful PC based controller for high reliability and ease of maintenance, graphic display features for critical weld parameters, easy to use English language programming and multi feature pendant designed specifically for welding.

Liburdi Seam Tracker™ (LST)
The latest in innovative laser line scanning technology designed especially for the LAWS™ system. This is a flexible structured light sensory system using high resolution 3-D laser system and multiple cameras for superior imaging and feature recognition. The information is processed by the PC based Liburdi Robotic Controller™ (LRC) for precise telemetry feedback to the motion system. Even the most difficult geometry can be welded automatically with the vision technology.

We also offer the option of Liburdi's "Turn-Key" systems, which include the development of the weld process, NDT examination, metallurgical certification, training and start-up.

The unique open architecture provides a large working envelope, ergonomically designed for safety and ease of operation, with 360° of access around the work piece. X, Y and Z axis are positioned overhead for accuracy and operating convenience.

Available in TIG, Plasma and Laser variants.

LIBURDI AUTOMATION®

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www.liburdi.com

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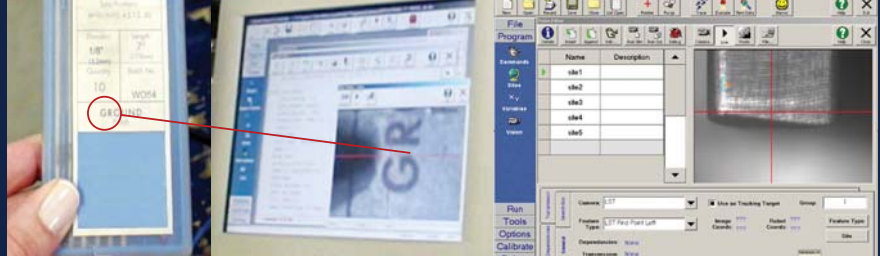


Physical Characteristics

		**Laser Option*
Height:	145" (368 cm)	*144" (366 cm)*
Length:	110" (279 cm)	*98" (249 cm)*
Width:	95" (241 cm)	*98" (249 cm)*
Weight:	6500 lbs (2950 kg)	
Number of Axes:	3 overhead axis (x, y, z) are standard along with 2 axis positioner (rotary and tilt). Optional torch rotation breakaway available. Torch rotation available with fibre laser.	

Utilities

		**Laser Option*
Primary Voltage:	220- 240 VAC, Three Phase 50 or 60 Hz	*400-480 VAC, Three Phase*
Optional:	Step-down transformer available for 600 VAC	
Current:	40 Amp	
Argon:	60 psi (regulated) (410 kPa)	
Air:	100 psi (depending on tooling) (700 kPa)	
Water:	60 psi @ .3 gpm (depending on tooling) (410 kPa @ 1.2 l/min)	

Postioner Capacity

1500 lbs (680 kg)
(6" max. from faceplate,
6" max. eccentricity)

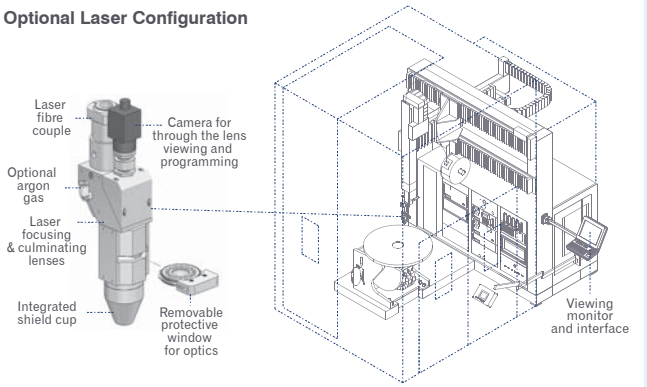
Servo Axis Specifications

Axis	Travel	Velocity	Repeatability	Accuracy
X	60" (152 cm)	200 IPM (84 mm/sec)	± .001" (± .025 mm)	± .002" (± .050 mm)
Y	30" (76 cm)	200 IPM (84 mm/sec)	± .001" (± .025 mm)	± .002" (± .050 mm)
Z	30" (76 cm)	200 IPM (84 mm/sec)	± .001" (± .025 mm)	± .002" (± .050 mm)
R - Rotary (Table)	∞°	5 RPM	± .01°	± .05°
T- Tilt (Table)	-5° to +125°	2 RPM	± .01°	± .05°

Optional Torch Rotation Specification

Axis	Travel	Velocity	Repeatability	Accuracy
W - Rotary (Torch)	± 360°	11.7 RPM	± .01°	± .05°
TT - Tilt (Torch)	*± 45°*	*5 RPM*	*± .01°*	*± .05°*

Optional Laser Configuration



Optional Laser Power Supply Specifications

Standard:	500 watt CW (Continuous Wave) ND:YAG
Duty:	Continuous 100%
Pulsation:	100 Hz to 500 Hz
Optional:	System can be configured to use other lasers, types & powers

Optional Powderfeed Assembly

- Program controlled powder delivery
- Fast response rate (1.5 seconds)
- Feed rate of 1 to 5 grams per second

Options

- Power supply and torch for tacking
- Liburdi Vision System™ (LVS), latest 3-D version 3.0
- Laser Seam Tracking™ (LST)
- Real time weld monitoring and video playback
- Printer
- Off-line computer programming
- Torch breakaway device
- Mass flow controller for PAW orifice gas
- Powder Feeder
- Service Plus: Bronze, Silver, Gold, and Platinum

Operating Environment

Temperature:	50 °F to 100 °F (10 °C to 38 °C)
Relative Humidity:	10% to 80% (Non-Condensing)

Gas Console

- Gas scrubber cartridge system
- Typical gases include Argon, Argon/Helium and Argon/Hydrogen

Welding Power Supply Specifications

Standard:	Liburdi Pulsweld® P200 GTAW/PAW Power Source
Current:	1 - 200 Amps - <0.5 % peak-to-peak ripple
Accuracy:	Better than 1 %
Power:	2 kW average
Duty:	Continuous 100%
Pulsation:	Up to 20,000 Hz
Optional:	Pulsweld® 50,100,400 and 600 Amp GTAW/PAW current sources available in straight and Variable Polarity

Liburdi Robotic Controller™ (LRC)

- English language programming, designed for welding
- PC based, high performance, easily upgradable
- Fully integrated with vision system, graphical user interface
- Weld parameter generator and data logging capability
- Articulated pendant control with overrides

Weld Head Assembly

- Features precision wire motion and pulsing technology
- Micrometer adjustment for torch centering and wire positioning
- Single or dual wirefeed available (up to 100 ipm feed rate)
- Compact reliable design

Arc Voltage Control (AVC)

- Constant arc voltage gap is maintained using precision digital filters

Standard System Includes

- Air conditioned cabinet and integral fixture cooling system
- Specialized precision GTAW or PAW torches

Wirefeed Assembly

- Micrometer adjustment for torch/wire position
- Compact motor drives located at the weld head near the torch
- Precision feed and retract under computer control

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