

# Laser Welding 4-Axis Workcell

## Automotive Components & Electrical Enclosures

### WELDING WORKCELL



### Applications

- ▶ Spot Welding
- ▶ Seam Welding
- ▶ Tube to Plates
- ▶ Shafts to Collars
- ▶ Heat Exchangers
- ▶ Batteries
- ▶ Pressures Sensors
- ▶ Fuel Delivery Components
- ▶ Electrical Contacts
- ▶ Electronics Enclosures
- ▶ Capacitor Cans
- ▶ Electrode Welding



### Features

- ▶ Highly Configurable and Versatile
- ▶ Choice of IPG's Lasers: CW and QCW
- ▶ Rotation about any Axis
- ▶ CDRH Class 1 Laser Safety Enclosure



IPG's Laser Welding 4-Axis Workcell is a highly cost-efficient tool for welding of a wide range of metal components, enclosures and fabrications. The high pulsed mode peak power of the QCW laser provides deep penetration in highly reflective materials for low heat, constant quality welding.

With a rugged industrial construction, this system includes a granite table and superstructure for thermal and mechanical stability and is easily programmed for maximum tool flexibility. The Laser Welding Workcell, fiber laser and welding head are **designed, manufactured and supported by IPG**—your partner for precision laser welding systems.



### Optional System Features

- ▶ X-Y-Z Precision Linear Stages
- ▶ Fume Extraction System
- ▶ Automatic Door Mechanism
- ▶ Automatic Vision Feature Recognition
- ▶ Laser Power Meter
- ▶ Beam Expansion for High Power Welding

# Laser Welding 4-Axis Workcell

Laser Welding for Small Parts

## Laser Options

- CW: 300, 500, 1000, 2000 and 4000 W
- QCW: 150/1500, 300/3000 and 450/4500 W
- Lasers below 1000 W can be Internally Mounted Saving Space
- YLS Lasers >1000 W Housed in NEMA 12 Air-conditioned and Sealed Cabinet
- YLS Lasers have Module Redundancy for Increased Tool Availability
- Wide Choice of IPG Fiber Lasers Available (Other Lasers Available; Please Discuss with IPG)

## System Enclosure

- CDRH Class 1 Enclosure with Laser-safe Viewing Windows
- Front Doors Available as Manual or Automatic Operation from HMI or G-code Programmable
- Access Panels on Front and Sides of Cell for Easy Access and Maintenance

## Modular Work Area

- 500 mm X Travel, 300 mm Y Travel, 300 mm Z Travel
- Aluminum T-slot Tooling Table
- Rotary Stages Available



## Beam Delivery

- IPG's FLW-D30 Welding Head Standard, Power up to 6 kW
- Lightweight for High-speed Part Processing
- Maintenance-free Fiber Feed to Head
- Coverslide with Integrated Contamination Sensor
- Computer Controlled Welding Gas Supply
- Coaxial Vision System and Display

## User Interface

- Intuitive HMI for Machine Control
- Multiple Screens for Programming All Process Parameters
- G/M-code Programming
- CAD/CAM Software (Optional)

## Up to 4-Axes of Coordinated Motion for 2D, Tube and 3D Materials Processing

- Linear Stages for Demanding Applications Requiring High Speed and High Accuracy
- Stages are Sealed to Protect against Damage, Contamination and Debris

## Compact Footprint

- 1600 D x 1300 W x 2220 H mm (63 x 51 x 88")
- Minimizes Floor Space Requirements
- Easy to Install
- Ergonomic Work Height- Easy Part Loading and Unloading



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## Automotive Components & Electrical Enclosures

### System Specifications

Laser Power Options	CW: 300, 500, 1000, 2000 and 4000 W QCW: 150/1500, 300/3000 and 450/4500 W
Beam Delivery	IPG Photonics' FLW-D30 Welding Head Includes Co-axial Viewing System
Work Envelope	X: 500 mm (19.6 in.); Y: 300 mm (12 in.); Z: 300 mm (12 in.)
X Stage Option Y Stage Option	Drive: Travel: 500 mm, Accuracy $\pm 8 \mu\text{m}$ , Repeatability $\pm 2 \mu\text{m}$ , Velocity 1 m/sec Direct Drive: Travel: 300 mm, Accuracy $\pm 8 \mu\text{m}$ , Repeatability $\pm 2 \mu\text{m}$ , Velocity 1 m/sec
Z-Stage Options	Ball-screw Drive: Travel: 300 mm, Accuracy $\pm 25 \mu\text{m}$ , Repeatability $\pm 3 \mu\text{m}$ , Velocity 400 mm/sec
Tooling	Aluminum T-slot Table
Rotation Stage Options (about X-axis)	Direct Drive: Travel: 360° Continuous, Speed: 600 rpm max Accuracy $\pm 10$ arc-sec, Repeatability $\pm 4$ arc-sec Integral, Pneumatic ER25 Collet Chuck Gear Drive: Travel: 360° Continuous, Speed: 30 rpm max Accuracy $\pm 180$ arc-sec, Repeatability $\pm 45$ arc-sec 5C Collet, 3 Jaw Chuck
Controls/ Interface	Industrial Motion Controller, Full Look-ahead Contouring Capability Laser Power Proportional to Velocity, Windows-based CNC Interface G/M-code Programming, Editable Materials and Laser Parameter Database
Process Gas	Manually Adjustable Pressure Regulator and Computer Controlled Solenoid Valve for Welding Gas up to 250 psi
Exhaust	4" Blast Gate with Exhaust Plenum for Optional Welding Table
Safety	CDRH Class I Laser System (Complies with 21 CFR Chapter 1, Subchapter J)
Dimensions, LxWxH, mm in.	1600 x 1300 x 2220 63 x 51 x 88

*The Laser Welding Workcell can be custom-configured by IPG to include additional rotary axes and part handling capabilities. Please consult IPG for custom-designed laser welding solutions.*

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