


Laser Drilling 4-Axis Workcell


Laser Drilling for Small Parts

DRILLING WORKCELL



Applications

- ▶ Engine Components
- ▶ Automotive Parts
- ▶ Turbine Blades
- ▶ Medical Sensors and Components
- ▶ Electronic Device Packaging
- ▶ Printed Circuit Boards




Features

- ▶ 4-Axis Part Movement
- ▶ 500 x 300 x 300 mm Work Envelope
- ▶ 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 Drilling 4-Axis Workcell is a highly cost-efficient tool for drilling 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 drilling.

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 Drilling Workcell and fiber laser are **designed, manufactured and supported by IPG**—your partner for precision laser drilling 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 Drilling

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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



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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System Specifications

Laser Power Options	CW: 300, 500, 1000, 2000 and 4000 W QCW: 150/1500, 300/3000 and 450/4500 W
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 ± 10 arc-sec, Repeatability ± 4 arc-sec Integral, Pneumatic ER25 Collet Chuck Gear Drive: Travel: 360° Continuous, Speed: 30 rpm max Accuracy ± 180 arc-sec, Repeatability ± 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 Process Gas up to 250 psi
Exhaust	4" Blast Gate with Exhaust Plenum for Optional 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 Drilling Workcell can be custom-configured by IPG to include additional rotary axes and part handling capabilities. Please consult IPG for custom-designed laser drilling solutions.

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rev. 07/15