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HITACHI INDUSTRIAL UPS SYSTEM FOR LASER CUTTING MACHINES

ABOUT LASER CUTTING MACHINES

A Laser Cutting Machine is used in various industries Like automotive, aerospace, and electronics industries to cut Sheet of stainless steel, aluminium, copper, and other metals for precision cutting.

Function and Importance:

Laser cutting can achieve excellent cutting quality due to its small laser spot, high energy, and faster cutting speed.

Using the special laser cutting machine, the cutting speed with laser technology is 300% faster than that of plasma

One of the major advantages of using a laser cutting machine is its low usage and maintenance cost, which can greatly benefit the enterprise economy. Additionally, it requires less time for maintenance, allowing more time for cutting products and improving production.

Components of Laser Cutting Machine:

- Laser generator
- Reflector path
- CNC controller (electrical control)
- Cutting head
- Bed
- Beam transmission component
- Machine tool table
- Numerical control system
- Computer (hardware, software)
- Cooler
- Protective gas cylinder
- Dust collector
- Air dryer
- Slag discharge machine

Applications of Laser Cutting Machine in Industries

The automotive industry has widely adopted laser cutting for its ability to produce precise and complex parts. From cutting body panels to intricate components, laser cutting ensures high-quality results with minimal waste. The speed and accuracy of laser cutting also contribute to increased production efficiency, making it a valuable tool in the automotive manufacturing process.

In the aerospace industry, laser cutting is used to create components that require tight tolerances and high precision. The ability to cut lightweight materials, such as titanium and aluminium, with minimal

distortion is crucial for aerospace applications. Laser cutting also allows for the production of intricate designs and shapes, which are essential for optimizing the performance of aerospace components.

The electronics industry benefits from laser cutting's precision and ability to work with delicate materials. Laser cutting is used to create intricate circuit boards, microchips, and other electronic components. The non-contact nature of laser cutting ensures that sensitive materials are not damaged during the process, resulting in high-quality and reliable electronic products.

CHALLENGE/ISSUES

Laser-based machines are highly sensitive to power fluctuations. When power interruptions occur, there is a significant risk of the laser beam becoming defective. If the laser beam becomes defective, the machine will cease to operate. The failures/ breakdown of these Laser machines brings the production lines to a direct standstill without any alternative to run the process.

- Voltage Fluctuations: Inconsistent voltage can cause the laser to operate erratically, leading to poor cutting quality and potential damage to the machine.
- Power Outages: Sudden power outages can interrupt the cutting process, causing incomplete cuts and potential damage to the material and machine.
- Power Supply Failures: Failures in the power supply unit can lead to a complete shutdown of the laser cutting machine.
- Electrical Noise and Interference: Electrical noise and interference from other machinery can affect the performance of the laser cutting machine.
- Inadequate Power Capacity: Insufficient power capacity can prevent the laser cutting machine from operating at full efficiency.

NEED FOR THE SOLUTION

Laser cutting machines are highly sensitive to power quality and stability. Here are some key reasons why a robust power solution is essential:

- Preventing Downtime: Power outages can halt operations, leading to significant downtime and production delays.
- Maintaining Cutting Precision: Voltage fluctuations can cause inconsistent laser performance, affecting the precision and quality of cuts.
- Protecting Sensitive Components: Power surges and spikes can damage sensitive electronic components in laser cutting machines.
- Enhancing Operational Efficiency: Unstable power can lead to frequent machine resets and calibration issues, reducing overall efficiency.
- Extending Equipment Lifespan: Frequent power issues can accelerate wear and tear on laser cutting machines, shortening their lifespan.
- Ensuring Safety: Sudden power loss can pose safety risks, especially if the laser is in the middle of a cutting operation.

HITACHI INDUSTRIAL UPS SYSTEM FOR LASER CUTTING MACHINES

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HITACHI'S OFFERED PRODUCT / SOLUTION

It's highly important to have an uninterruptible power supply solution for laser cutting machines. This solution provides total protection to the machine by delivering constant and stable power, along with backup time for critical loads. Laser cutting machines are expensive, and power-related failures can lead to significant financial losses.

Industrial UPS System offers;

- Continuous and stable power to critical load against input voltage fluctuations without any interruptions, as long as the backup is required
- Stable voltage and frequency as per the requirement of machine, to protect its processors, PCBs and critical electrical components.
- Isolation between main supply and load
- Lesser machine repair cost
- Production growth and smoother operation
- Effective return on investment

Hitachi Industrial UPS Systems play a vital role in maximizing the efficiency of these laser machines, reducing the payback period, and lowering operational costs by keeping the plant running and minimizing breakdown expenses.

BENEFITS OF USING HITACHI INDUSTRIAL UPS SYSTEM FOR LASER CUTTING MACHINES

Hitachi Industrial UPS systems are specifically designed to provide reliable power protection for laser cutting machines. They ensure constant and stable power supply, protect against voltage fluctuations, and offer backup power during outages. This helps in maximizing the efficiency of laser cutting machines, reducing operational costs and minimizing downtime.

- Uninterrupted Operation: Provides backup power during outages, ensuring continuous operation of laser cutting machines. Prevents costly downtime and production delays, maintaining smooth workflow.
- Voltage Stabilization: Maintains consistent voltage levels, protecting the laser cutting machine from voltage fluctuations. Enhances cutting precision and prevents damage to sensitive components.
- Surge Protection: Shields the machine from power surges and spikes. Prevents potential damage to the laser and electronic components, extending the machine's lifespan.
- Cost Savings: Reduces the risk of costly repairs and replacements due to power-related damage. Lowers operational costs and improves the return on investment.
- Extended Equipment Lifespan: Reduces wear and tear on the machine by providing clean and stable power. Extends the operational life of the laser cutting machine.
- Suitable for Rugged Usage: Designed to withstand harsh industrial environments. Ensures reliable performance even under challenging conditions.
- Prevents data loss during power interruptions.
- Prevents incomplete cuts and material wastage. Reduces costs associated with raw material losses.
- Ensures consistent production helps suppliers to meet customer deadlines and commitments.

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ABOUT HITACHI INDUSTRIAL UPS SYSTEM FOR LASER CUTTING MACHINES

i6 Series Industrial UPS System

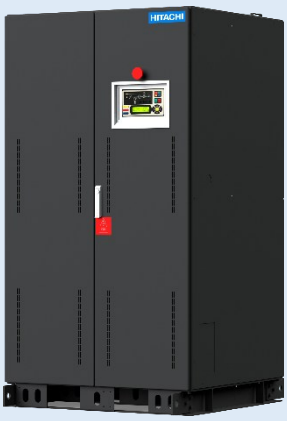
Range: 10 kVA to 500 kVA (3:3)

- Latest DSP controlled IGBT technology
- In-built output galvanic isolation
- Fully electronics static switch for inverter output as well as bypass side
- Input phase reversal protection
- True RMS power measurement facility
- Built-in advanced battery management system
- Highly efficient, latest and intelligent power device based inverter

i6et Industrial UPS System

Range: 30 kVA to 500 kVA (3:3)

- Highly efficient IGBT based rectifier and inverter
- High energy efficient product with in-built double wound isolation transformer
- 200% overload for 7 sec. (Specially design for motorised applications)
- Suitable for regenerative power
- Capacity enhancement possible up to 6 units
- Bi-directional, 100% electronic static switch
- User friendly HMI interface



ABOUT HITACHI INDUSTRIAL UPS URL:

https://www.hitachi-hirel.com/products/ups/three-phase-industrial-ups-system

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ABOUT HITACHI HI-REL POWER ELECTRONICS PRIVATE LIMITED

Founded & established in 1983 as Hi-Rel Electronics Pvt. Ltd., which later on in year 2015 had become the 100% subsidiary company of Hitachi, Japan which is one of the Global fortune 500 companies with a new name as Hitachi Hi-Rel Power Electronics Private Limited, which is being recognized as one of the pioneers in power electronics domain. Hitachi Hi-Rel, today, is a leading manufacturer of Industrial UPS, IT & Infra UPS, Medium & Low Voltage Variable Frequency Drives, Grid Tied Solar Inverters, Air Compressors and Railway Inverters.

Hitachi Hi-Rel has state-of-the art manufacturing facility at Sanand near Ahmedabad in Gujarat-India. Hitachi Hi-Rel is helping a wide array of industries and organizations to meet the mission critical demands through technologically superior, low polluting and innovative products Solutions and continue to offer world class power electronics products, value added services & customized solutions.

With a vision of “To be recognized as the most trusted Power Electronics Company by supplying superior products and services”, Hitachi Hi-Rel has garnered a significant level of trust in Indian power electronics market segment wherein it serves the entire gamut of Industries, particularly in mission critical applications for Refineries, Petro-Chemicals, Power Generation, Steel & Metals, and Process Industries as well as Critical Data Processing Applications. Besides offering greater energy efficiency & lower carbon footprint, each of the company product streams bears the hallmark of excellence with company accreditations. Hitachi Hi-Rel is an ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 & ISO/IEC 27001:2022 certified company having export house status. Hitachi Hi-Rel sales network & service infrastructure expands out to the world & with this network, we have made strong inroad in Global markets like South East Asia, Middle East, Africa and Brazil. Also, with a presence of strategically located skilled service engineers in India helps us to score high in terms of customer expectations on service deliverables & uptime of the product.

With expertise, experience and an efficient product line, Hitachi Hi-Rel will always try to be your power electronics partner. When you choose to do business with Hitachi Hi-Rel, you are partnering with a company who cares.

FOR MORE INFORMATION

To know more about Hitachi Hi-Rel Power Electronics Private Limited and its offered products and solutions, please visit www.hitachi-hirel.com

You may also share your requirements at https://www.hitachi-hirel.com/inquiry to receive the phone call or Hitachi product information email from our authorized sales representative of your region.