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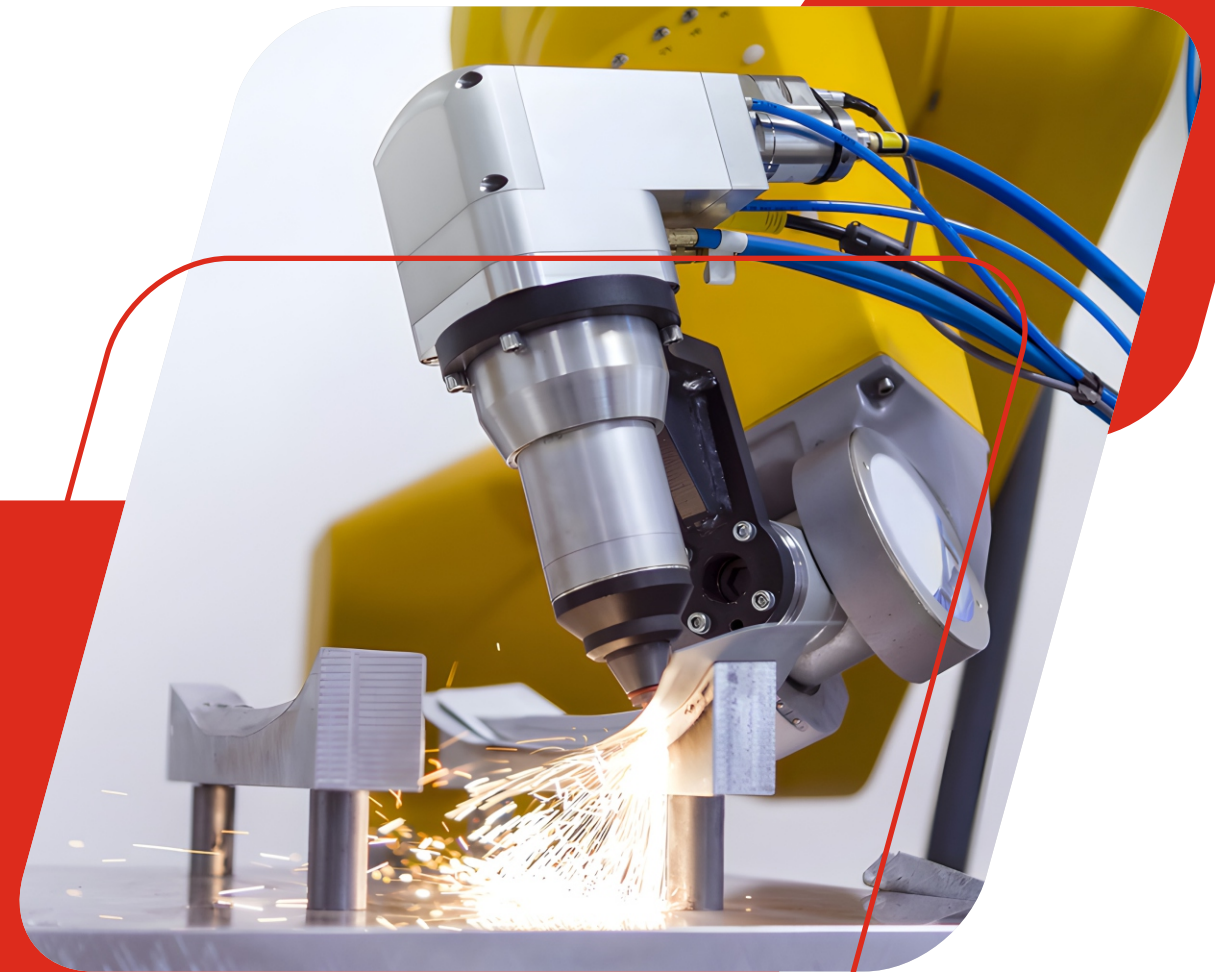
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**CUSTOMISED
LASER & SPM SOLUTIONS**

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ABOUT US

Since 2014, we've been a leading developer of Customized Laser Systems. With a wealth of experience, we thrive in handling challenging applications and complex tasks, offering tailor-made solutions from our diverse product range. Our meticulously designed system and machine solutions cater to specific job requirements like marking, cutting, welding materials such as metals, plastics, ceramics, glass and much more.

Our excellence lies in the seamless integration of robotic systems for laser welding and cutting machines. We specialize in delivering precision and efficiency in automation, particularly within diverse sectors such as the automobile, fabrication, medical implants, jewellery, agriculture, kitchenware, hardware, sanitary ware, plastics and many more.

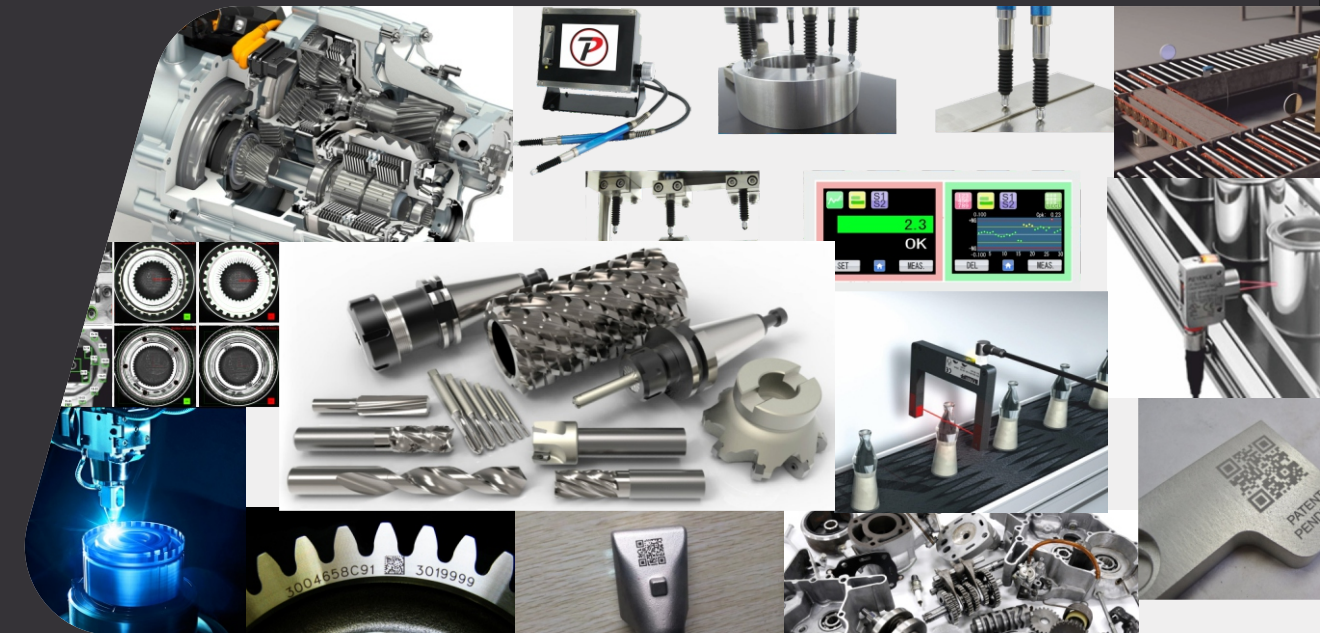
We've successfully developed customized Laser Systems for diverse applications, meeting the unique needs of our valued customers. Beyond laser systems, we provide automation solutions, including industrial gauging and Machine Vision systems for inspection, measurement, and POKA YOKE applications. With a proven track record, we're recognized for achieving the highest customer satisfaction.

We play a crucial role in advancing industries towards Industry 4.0, providing essential support for the integration of cutting-edge technologies. Our expertise enables businesses to embrace Industry 4.0 principles, facilitating the seamless convergence of digitalization, automation, and data exchange in manufacturing processes. Through our solutions, industries can optimize operations, enhance efficiency, and stay at the forefront of the fourth industrial revolution.

At our company, excellence isn't just a goal; it's a standard we consistently uphold to meet the needs of our valued customers.

CONTENT

About Us	01
Robotics	03
Handheld Laser Welding	05
Semi Automatic Laser Welding	07
Laser Cutting	09
Laser Scribing	11
Laser Marking	13
Vision System	15
Clientele	18



ROBOTICS

For Industrial Automation

"A Sustainable Path to Profit" for various industries involved in production or logistics, customers commonly assess businesses based on specific factors:

- Timely delivery and adaptability to evolving requirements.
- Ensuring uniform quality standards while keeping prices competitive.



Robotics guarantees consistent quality through

- **Precision and Consistency:** Robotic movements are focussed and precise, maintaining repeatability with accuracy for consistent results.
- **Fatigue-free Operations:** By employing robots, the risk of productivity loss due to fatigue, often experienced late in a shift or work week, is minimized.
- **Scalable Quality:** Easily scale up quality standards without the challenges of finding skilled workers, ensuring consistent quality irrespective of production volume."

Robotic automation offers sustained Return on Investment (ROI) through cost reduction and added value

- **Swift Implementation for Efficiency:** Robotic automation offers a quick and straightforward setup using pre-programmed work cells, typically becoming operational within a few days, ensuring efficiency in deployment.
- **Financial Optimization:** Capital expenses for robotics are easily financed, providing potential tax advantages. Managed through in-house specialists or robotics partners, ongoing costs are lower than training and maintaining an equivalent staff, contributing to overall financial optimization.
- **Robotic Longevity Boosts Profitability:** Beyond break-even points, robots' extended operational life supports re-manufacturing and versatile re-purposing. This, combined with sustained high-quality production, enhances profitability, ensuring competitiveness, customer retention, and business expansion

The path to achieving ROI involves a practical approach in applying the ideal level of automation for your specific process. Assisting you in finding this path is our core expertise.

Industrial Applications:

ROBOT WELDING (LASER / MIG / TIG / SPOT WELDING)
 MACHINE TENDING
 LOGISTICS
 MATERIAL HANDLING (PICK & PLACE / PELLETIZING)
 ASSEMBLY
 PAINTING & DISPENSING
 MEDICAL
 METAL FORMING
 METAL CUTTING

HANDHELD LASER WELDING

For Better Welding Quality

Laser welding or Laser Beam Welding (LBW), employs a focussed laser beam for melting and fusing metal components.

This process allows for high-speed welding of thin materials and produces narrow, deep welds for thicker materials, ensuring precision in joining metal parts.



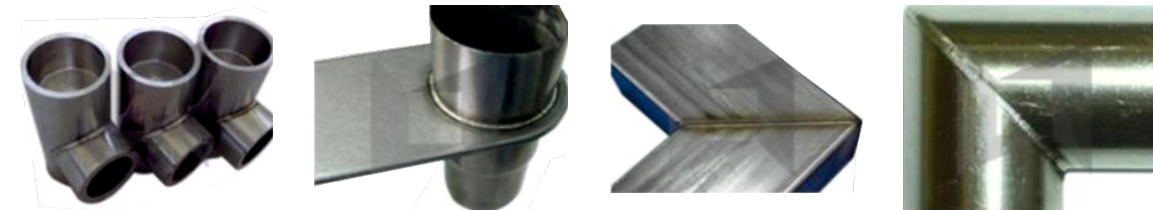
Laser Beam Welding

LBW is a versatile fusion welding method applicable to various materials, including carbon steels, HSLA steels, stainless steel, aluminum, and titanium. While it excels in high-quality welds, special attention is needed for high-carbon steels due to potential cracking from rapid cooling. The use of high-power gas lasers, particularly suitable for high-volume applications, makes LBW a prevalent choice in the automotive industry.

In fiber lasers, the main medium is the optical fiber itself. They are capable of power up to 50 kW and are increasingly being used for robotic industrial welding.

Laser Welding has many advantages over traditional welding methods

- **Precision and Control:** Laser welding offers precise control over heat input and weld placement. Efficiency: Rapid heating and cooling process reduces overall cycle time.
- **Strength and Versatility:** High temperatures achieved by lasers result in strong and durable welds, suitable for a wide range of materials and thicknesses.
- **Adaptability and Automation:** The process is easily automated and compatible with robotic machinery. Safety: Unlike some methods, laser welding doesn't generate x-rays. Clean and Precise: Lower porosity, less spatter, and low thermal impact contribute to clean and precise welds.
- **Deep and Narrow Welds:** Laser welding can achieve deep and narrow welds.
- **Electrode-Free:** The process doesn't require an electrode.



Specification of Laser Welding

Power	1000w, 1500w, 2000w, 3000w
Wave Length	1064nm
Welding Speed	0~2 m/min (depends on power, material type & thickness)
Welding Materials	Carbon Steel, Stainless Steel, Brass, Galvanized Steel, Aluminum, etc.
Welding Thickness	0.25 - 6mm
Support Gas	Argon, Nitrogen
Cooling System	Water Cooled

SEMI AUTOMATIC LASER WELDING

EQUIPPED WITH LINEAR & ROTARY ATTACHMENT

For Effortless Precision Welding

Introducing our cutting-edge semi-automatic welding machine – where precision meets efficiency! Designed for seamless welding experiences, this state-of-the-art machine combines the ease of automation with the skill of manual control. Designed for versatility and ease of use, this cutting-edge machine empowers welders to achieve impeccable welds with precision and speed. Whether you're a seasoned professional or a novice, our semi-automatic welding machine ensures a seamless welding experience, making your projects a masterpiece. Elevate your welding game with the perfect blend of automation and craftsmanship.



Semi Automatic Laser Welding has advantages over manual welding

- **Increased Efficiency:** It enhances productivity by automating repetitive tasks, allowing operators to focus on precise welding control.
- **Consistent Quality:** It ensures consistent weld quality through steady speed and electrode placement, mitigating challenges associated with human factors like fatigue and skill variability in manual welding.
- **Reduced Operator Fatigue:** It minimizes operator physical strain, enhancing comfort, reducing fatigue, and improving concentration for heightened job satisfaction.
- **Cost Savings:** It offers cost savings by boosting productivity and diminishing the reliance on highly skilled welders, presenting a cost-effective solution for diverse welding applications.

Semi Automatic Laser Welding has advantages over robotic welding

- **Flexibility and Adaptability:** It offers superior flexibility, easily adapting to diverse welding tasks and proving more suitable for small batch production or applications requiring frequent changes in welding parameters compared to robotic systems.
- **Lower Initial Investment:** Their lower initial costs as compared to fully automated robotic systems, provides more accessible options for smaller businesses or those with budget constraints.
- **Ease of Programming and Operation:** It offers simpler programming and operation while facilitating rapid learning and deployment by operators of varying expertise.
- **Space Requirements:** It requires less floor space than robotic cells, offering an advantage in environments with space constraints or frequent workspace reconfiguration needs.

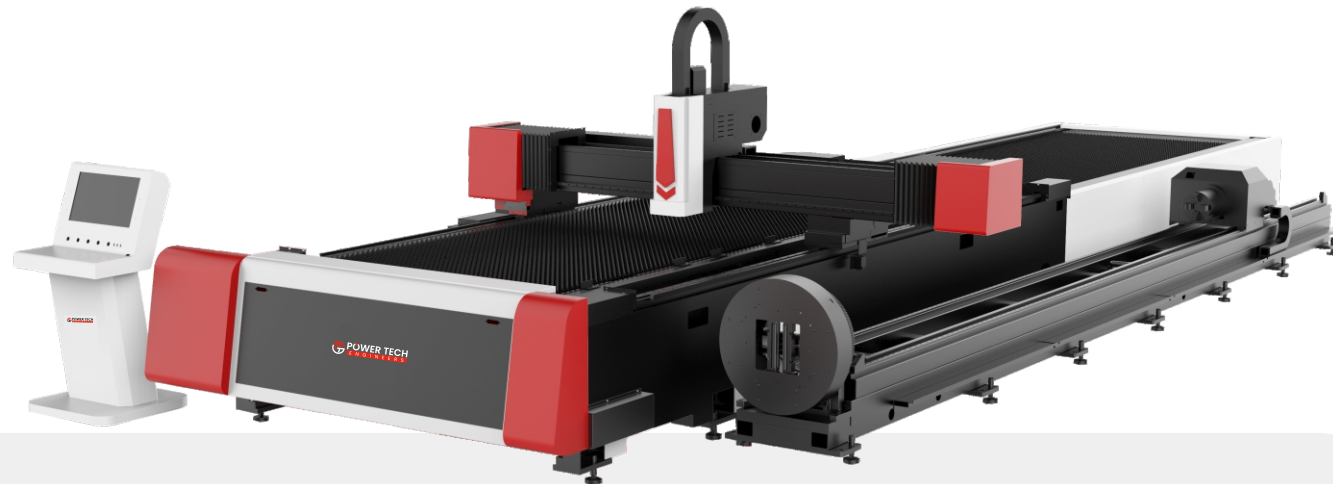
In summary, Semi-automatic welding machines provide a balanced solution, combining the precision and efficiency of automation with the flexibility of manual welding, finding application in scenarios requiring a middle-ground approach and offering advantages over both manual and robotic welding systems in specific contexts.

LASER CUTTING

For Accurate Sheet Metal Cut

Laser Cutting utilizes a high-power laser to vaporize materials, creating precise cuts. Originally an industrial method, it's now widely used in education, small businesses, architecture, and hobbies. The process involves directing a laser beam via optics and CNC technology to follow a predetermined pattern, melting or vaporizing the material.

Automation, controlled by CAD/CAM systems, is common, offering accuracy surpassing traditional cutting methods like plasma and oxy-fuel.



The focussed laser beam is directed at the material, which then either melts, burns, vaporizes away, or is blown away by a jet of gas, leaving an edge with a high-quality surface finish.

Improvements in accuracy, edge squareness and heat input control means that the laser process is increasingly replacing other profiling cutting techniques, such as plasma and oxy-fuel.

Advantages of Laser Cutting

- **Precision:** Laser cutting enables extremely precise cuts, even in intricate patterns.
- **Speed:** Often faster than traditional methods, leading to increased efficiency.
- **Energy Efficiency:** Reduced energy consumption results in lower bills and greater overall efficiency.
- **Productivity:** Higher productivity with lower operational costs offers a superior Return on Investment (ROI).
- **Material Versatility:** Capable of cutting a variety of materials, including highly reflective ones like copper and brass.
- **Contamination Control:** As the cutting is contact less, there is minimal contamination of the material.
- **Reduced Warping:** Laser systems have a small heat-affected zone, reducing the chance of material warping during cutting.
- **Metal Cutting Precision:** In metal cutting, laser cutting is more precise and energy-efficient compared to plasma cutting, especially for sheet metal.

Laser cutting is a versatile and efficient technology that has found widespread use across various industries due to its accuracy and speed.



Specification of Laser Cutting

Power	1000w, 1500w, 2000w, 3000w
Wave Length	1064nm
Sheet Size	3000x1500mm, 4000x2000mm, 6000x2500mm, 8000x2500mm
Positional Accuracy	±0.05 mm/m
Repeatability	±0.03 mm
Axis Moving Speed	80m/min
Min. Cutting Line Width	0.15mm
Max. Cutting Speed	≤ 35m/min (depends on material type & thickness)
Support Gas	Oxygen, Nitrogen
Cooling System	Water Cool

LASER SCRIBING

For High Quality Con Rod

Laser Scribing of connecting rods is a precision machining process that involves the use of a laser beam to make fine cuts or marks on the big end bore of connecting rod. Connecting rods are crucial components in internal combustion engines, and laser scribing is employed for various purposes in their manufacturing and assembly.



Here's how laser scribing of connecting rods is typically carried out

- **Material Preparation:** Connecting rods, typically made of steel or aluminum, are prepared and positioned.
- **Laser Generation:** A laser cutting machine with a suitable laser source is employed, selected based on the connecting rod material.
- **Fixturing:** Connecting rods are securely fixed in a precision fixture for stability during laser scribing.
- **Program Design:** A CNC system is used to program the desired scribing pattern into the laser cutting machine.
- **Laser Scribing:** The laser beam is directed onto the connecting rod's surface, creating fine cuts or marks with controlled depth and width.
- **Quality Control:** Post-scribing, quality checks are conducted to ensure the marks meet specified tolerances and standards.

Purpose of Scribing

Laser scribing is utilized in connecting rods to create weakened grooves for precision cutting. This involves making controlled marks on the rod's surface, serving as predetermined lines for subsequent cutting. This technique ensures accurate and controlled cuts, contributing to efficient production and structural integrity.

Advantages:

- **Precision:** Laser scribing provides high precision, allowing for intricate markings with minimal material removal.
- **Speed:** The process is generally fast and efficient.
- **Non-Contact:** Laser scribing is a non-contact process, minimizing the risk of damage to the connecting rod.

LASER MARKING

For Perfection & Detailed Marks

Laser Marking is a non-contact process widely employed in various industries.

Utilizing a laser beam, it precisely marks or engraves surfaces with notable advantages of permanence and speed. Unlike traditional methods, laser marking doesn't require tool bits or consumables, making it a clean and efficient technology.



Types of Laser Marking

- **Engraving:** Material removal creates a visible mark on the surface.
- **Annealing:** Laser-induced heat causes oxidation beneath the surface which results in a color change without material removal, providing a durable mark.
- **Foaming:** Certain materials foam and create a raised mark when the laser heats and vaporizes the surface which produces a distinctive raised mark on specific materials.
- **Coloration:** Some materials undergo a color change when exposed to the laser resulting in a color change on the material's surface without material removal.

Materials Suitable for Laser Marking

- **Commonly Marked Metals:** Steel, aluminum, brass, mild steel, titanium and
Widely used for precise marking on various metal surfaces.
- **Markable Plastic Types:** PPE, PET, UPVC, CPVC, HDPE, ABS.

Applications

- **Product Identification:** Commonly employed for part numbering, serial numbers, and barcode marking.
- **Branding and Logo Marking:** Companies utilize laser marking to add logos or brand names to their products.
- **Medical Device Marking:** Essential for marking medical instruments and devices with crucial information.
- **Automotive Components:** Marking parts for traceability and quality control in the automotive industry.

Advantages

- **High Precision:** Enables intricate and precise designs with accuracy.
- **Non-contact Process:** Eliminates tool wear and contamination, ensuring a clean marking process.
- **Durability and Resistance:** Laser marks are inherently durable and resistant to wear, constituting a permanent marking process.
- **Speed for High-volume Production:** Fast processing makes laser marking well-suited for high-volume production environments.

Specification of Laser Cutting

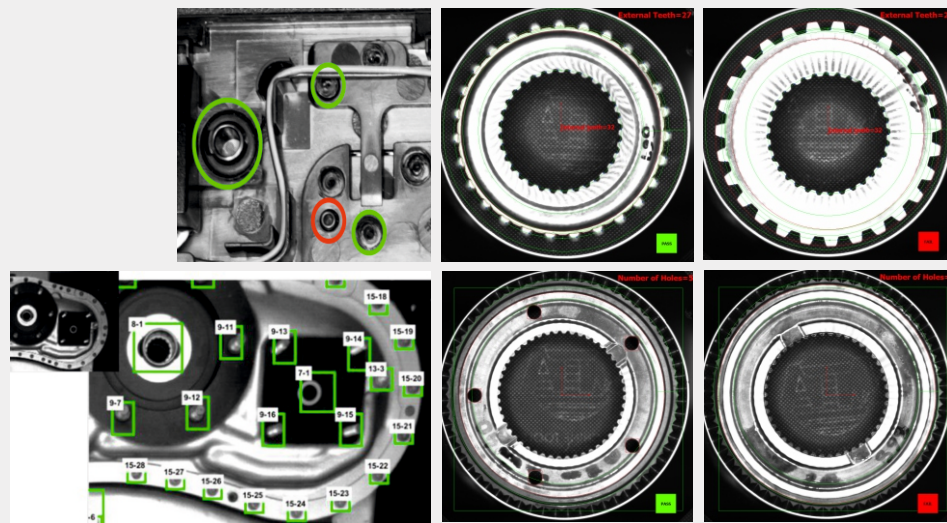
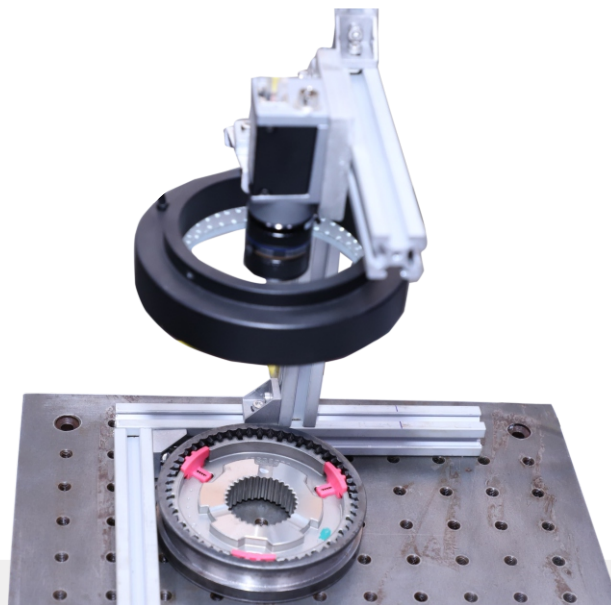
Power	20w, 30w, 50w, 100w
Marking Area	100 x 100, 150 x 150, 200 x 200, 250 x 250, 300 x 300 mm
Wave Length	1064nm
Marking Speed	8000CPS
Min. Line Width	0.03mm
Min. Character Size	≥ 0.5mm
Repeatability	100μrad
Marking Material	MS, SS, Aluminum, Brass, Plastic, Jewelry, etc.
Cooling System	Air Cool
Operating System	220 V ~ 50Hz/60Hz

VISION SYSTEM

For The Best Quality Inspection

A machine vision system integrates cameras, image processing software, and hardware to enable visual perception for various industrial applications. This technology plays a crucial role in tasks like quality control, inspection, measurement, and automation across diverse industries.

A well-integrated machine vision system relies on these components working in harmony, providing accurate and efficient visual perception for quality control, inspection, and automation in diverse industries.



Key Components of a Machine Vision System

- **Cameras:** Captures high-resolution visual information which is fundamental for collecting data from inspected objects.
- **Illumination:** Provides proper lighting for clear image capture which enhances visibility, highlighting specific features for analysis.
- **Lens:** Focuses light onto the camera sensor, influencing factors like field of view, used for determining optical characteristics for varied applications.
- **Vision Processor:** System's cognitive centre for image processing and analysis, which executes algorithms, interprets visual data, and makes decisions based on predefined criteria.
- **Communication Interface:** Facilitates communication with other machines or systems which enables seamless integration into larger automated processes.
- **Software:** Employs algorithms for image processing, pattern recognition, and decision-making hence allowing customization based on specific application requirements.

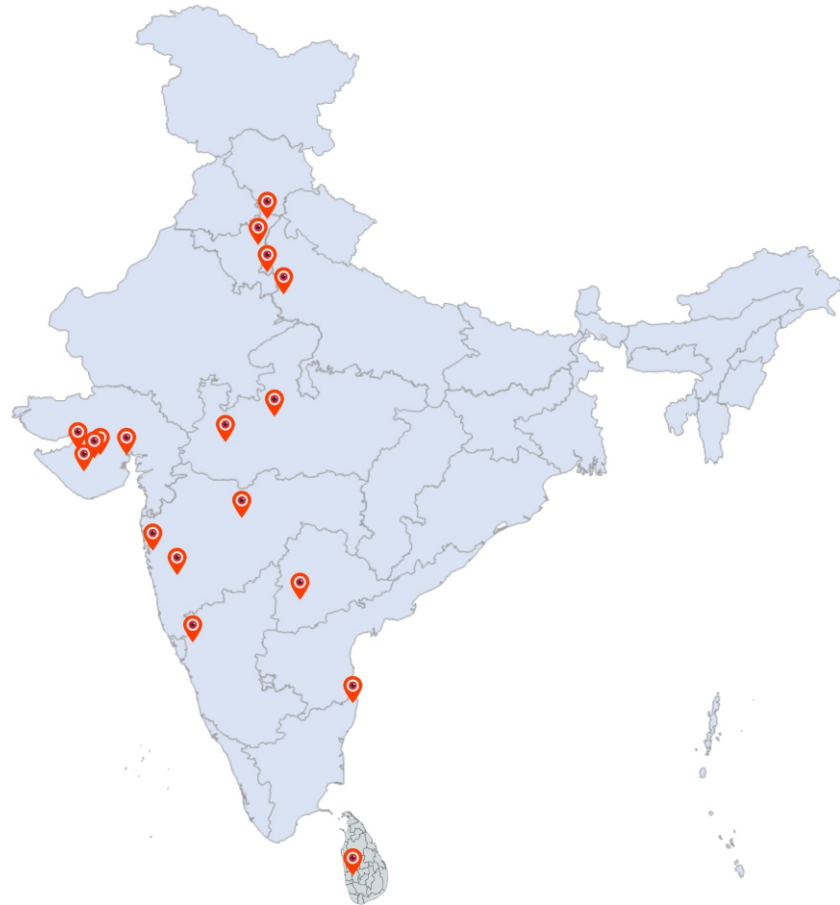
Key Functions of Machine Vision Systems

- **Inspection and Quality Control:** Ensures that products meet quality standards by detecting defects which is critical in manufacturing, electronics, and automotive industries.
- **Measurement and Dimensional Analysis:** Provides precise measurements, verifying dimensional accuracy, which is crucial for maintaining manufacturing process standards.
- **Identification and Recognition:** Identifies objects, patterns, codes, or text for tracking and authentication.
- **Guidance and Alignment:** Guides robotic systems or aligns components accurately during assembly which is essential in ensuring precise assembly processes in manufacturing.
- **Sorting and Classification:** Efficiently sorts or classifies objects based on visual characteristics and hence enhances material handling and distribution in logistics and production.
- **OCR (Optical Character Recognition):** Reads and interprets text, valuable for tasks like reading barcodes or product labels which is essential for accurate data retrieval and tracking.
- **Defect Detection:** Identifies and flags defects or irregularities in products and therefore helps in eliminating faulty items from the production line, maintaining quality standards.

Advantages

- **Accuracy and Precision:** High accuracy and precision in visual inspection, minimizing human error.
- **Speed and Efficiency:** Rapid image processing for quick analysis, enhancing overall process efficiency.
- **Consistency:** Ensures consistent performance, maintaining uniformity in inspection and quality control.
- **Non-Contact Inspection:** Minimizes the risk of damage to delicate or sensitive objects during inspection.
- **24/7 Operation:** Enables continuous, round-the-clock inspection and monitoring in industrial settings.

OUR PRESENCE



- DELHI
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- KARNATAKA
- MAHARASHTRA
- MADHYA PRADESH
- PUNJAB
- TAMIL NADU
- TELANGANA
- UTTAR PRADESH

- SRI LANKA

With our wide presence and trust

“Join Us in Shaping the Future,
 As we ascend to new heights in laser manufacturing,
 we invite you to be a part of our journey.
 If you are a manufacturer seeking cutting-edge solutions then
 we can shape the future of precision manufacturing.
 Thank you for considering POWERTECH ENGINEERS
 as your partner in laser manufacturing excellence!”



Join Our Esteemed Clientele

These partnerships represent just a glimpse of the diverse industries we serve and the trust our clients place in us. At Powertech Engineers, we are committed to deliver exceptional products and services that consistently exceed expectations.

We look forward for an opportunity to add your esteemed company to our list of satisfied clients. Contact us today to explore how our laser and SPM solutions can transform your manufacturing processes.