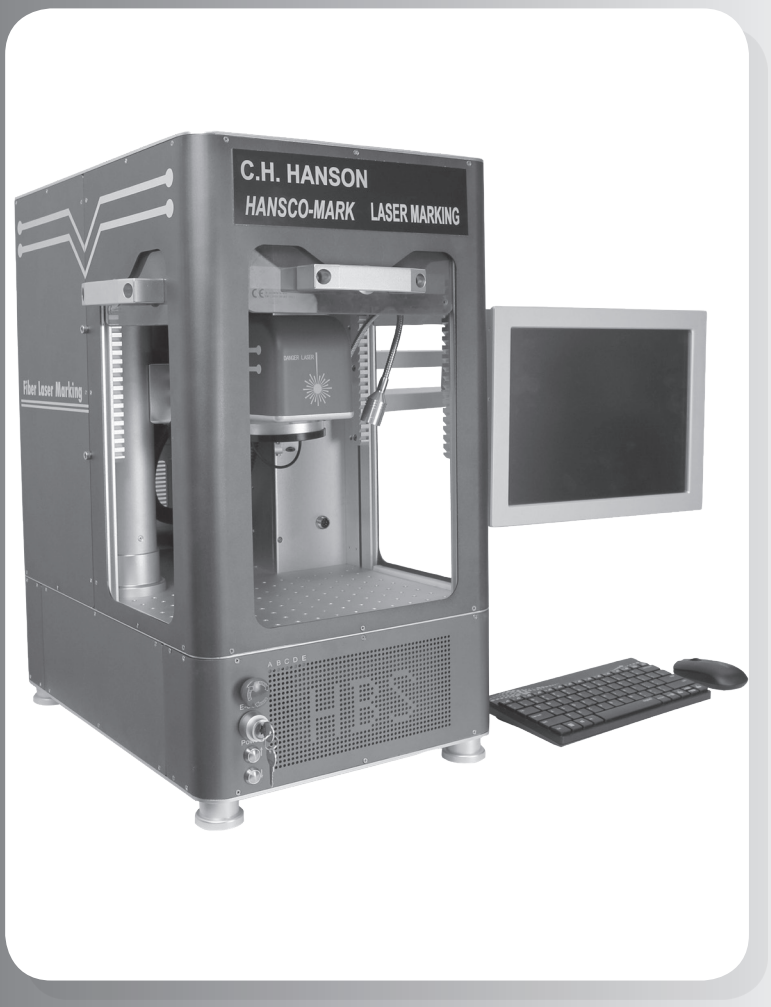
C.H. HANSON®

Since 1866 • Tools for Generations™



Laser Marking Machine

Model 21020

9643582.01

C.H. HANSON®

Since 1866 • Tools for Generations™

PLEASE READ AND SAVE THESE INSTRUCTIONS. READ CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED.

PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

PLEASE REFER TO BACK COVER FOR INFORMATION REGARDING DAYTON'S WARRANTY AND OTHER IMPORTANT INFORMATION.

Model #: _____

Serial #: _____

Purch. Date: _____

GETTING STARTED

Save this manual

You will need this manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts lists and diagrams. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep this manual and invoice in a safe and dry place for future reference.

Structural requirements

Make sure all supporting structures and load attaching devices are strong enough to hold your intended loads. If in doubt, consult a qualified structural engineer.

Electrical requirements

The power supply to the Laser Marking Machine needs to be AC110V 60Hz.

Tools needed

Standard professional mechanic's hand tool set (i.e. hammer, screwdrivers, wrenches, socket wrenches, pliers, etc.).

UNPACKING

When unpacking, check to make sure all parts listed below are included. If any parts are missing or broken, please contact your local retailer.

IMPORTANT: Many unpainted steel surfaces have been coated with a protectant. To ensure proper fit and operation, remove the coating. Coating can be easily removed with mild solvents, such as mineral spirits, and a soft cloth. Avoid getting solution on paint or any of the rubber/plastic parts. Solvents may deteriorate these finishes. Use soap and water on paint, plastic or rubber components. After cleaning, cover all exposed surfaces with a light coating of oil.

⚠ CAUTION ***Never use highly volatile solvents. Avoid getting cleaning solution on paint as it may tend to deteriorate these finishes. Use soap and water on painted components.***

Contents:

- Manual
- Machine Body
- Controller
- Non-standard cables
- Door kit
- Moniter
- Moniter mounting
- Gooseneck lamp
- Table(floor model only)
- Circuit board
- Lense

Unpack

Remove all the over packing materials, but leave unit attached to its pallet. Do not discard packing materials until after the machine has been inspected for damage and completeness. Locate loose parts and set aside.

Inspect

- After unpacking the unit, carefully inspect for any damage that may have occurred during transit. Check for loose, missing or damaged parts. Shipping damage claims must be filed with the carrier.
- All tools should be visually inspected before use, in addition to regular periodic maintenance inspections.
- Be sure that the voltage labeled on the unit matches your power supply.

SAFETY RULES

⚠ WARNING ***Completely read and understand this owner's manual before assembly or tool operation. Read and understand the warnings shown on the machine and in this manual. Failure to comply with all of these warnings may cause serious injury or death.***

PROPOSITION 65 WARNING: Some dust created by using power tools contain chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

Some Examples of these chemicals are:

- Lead from lead-based paints
- Crystalline silica from bricks and cement and other masonry products.
- Arsenic and chromium from chemically-treated lumber

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area and work with approved safety equipment. Always wear an **OSHA/NIOSH** approved, properly fitting face mask or respirator when using such tools.

⚠ WARNING ***Always follow proper operating procedures as defined in this manual even if you are familiar with the use of this or similar tools. Remember that being careless for even a fraction of a second can result in severe personal injury.***

Preparing for your job

- Wear proper apparel. Do not wear loose clothing, neckties, rings, bracelets or other jewelry which may get caught up in moving parts of machine. Do NOT wear gloves.
- Wear protective hair covering to contain long hair.
- Wear safety shoes with non-slip soles.
- Wear safety glasses complying with United States ANSI Z87.1. Everyday glasses have only impact resistant lenses. They are not safety glasses. Use guards and eye shields.
- Wear face mask or dust mask if operation is dusty.
- Wear ANSI approved ear protection for extended operation.

C.H. HANSON
Since 1866 • Tools for Generations

SAFETY RULES (CONTINUED)

- Some coolants used for machining contain chemicals that may be hazardous to your health if not used properly. Read and understand all information on the coolant container and protect yourself accordingly.
- Be alert and think clearly. Never operate power tools when tired, intoxicated or when taking medications that cause drowsiness.
- Focus your attention completely on your work. Looking around, careless actions and other distractions can result in serious injury.

Preparing the work area for your job

- Do not use this machine in dangerous environments. Do not use it in damp or wet locations. Do not expose it to rain.
- Keep the work area clean. Cluttered work areas and work benches invite accidents. Keep the area around the machine clean of scrap metal, oil and grease.
- Keep visitors at a safe distance from work area.
- Keep children out of workplace. Make workshop childproof. Use padlocks, master switches or remove switch keys to prevent any unintentional use of power tools.
- Provide adequate space around the turret mill and light the area properly with non-glare, overhead lighting.
- Make certain the turret mill is securely anchored before use.

Maintaining your tool

- Failure to follow the guidelines in this manual can result in serious injury.
- Disconnect the tool completely from its power supply before performing any service, maintenance, repair or adjustments.
- Follow OSHA lock-out, tag-out procedures to prevent accidental machine starts.
- Consult this manual for the proper use of cutters and other tool accessories.
- Consult this manual for specific maintenance and adjustment procedures.
- Keep tool lubricated and clean for safest operation.
- Read and understand warnings posted on the machine and in this manual. Replace the warning labels if they become obscured or removed. Failure to comply with all of these warnings can result in serious injury.
- Before turning on the machine, check for damaged parts. Guards or other parts that are even slightly damaged should be carefully examined to ensure they will function correctly. Check for alignment of moving parts, binding, breakage, mounting issues and any other conditions that may affect the tools operation. Replace any guard or damaged part that does not function properly before using the tool.
- Maintain this tool and its attachments and cutters with care. Ensure cutters are sharp and clean for optimum, safe performance. Follow all instructions for lubricating and changing accessories.
- Before cleaning, turn off the machine and disconnect it from its power source. Use compressed air or a suitable brush to clear chips or debris — do not use your hands.

Know how to use your tool

⚠ WARNING ***The operation of any power tool can result in foreign objects being thrown into the eyes, which can result in severe eye damage. Always wear safety goggles complying with United States ANSI Z87.1. before commencing power tool operation.***

Think safety! Safety is a combination of operator common sense and alertness at all times when tool is being used.

- The Model 21020 20 Watt bench laser is designed and intended for use by properly trained operators. You must be familiar with the proper and safe operation of a laser marking machine. Obtain proper training and knowledge before operating this machine.
- Do not use the Model 21020 20 Watt bench laser for any use than its intended application. Improper use of this tool revokes and voids any real or implied warranty. The manufacturer is not responsible for any injury that may result from improper use of the machine.
- Do not force an attachment to do a job it was not intended or designed for.
- Never stand on the machine or work in an awkward position. Maintain your balance. Never lean against the machine, over reach or use excessive force when working. You could tip or fall into the machine causing serious injury.
- Remove adjusting keys and wrenches. Form a habit of checking to see that keys and adjusting wrenches are removed from the machine before turning it on.
- Before connecting the machine to a power supply check to ensure the switch is in the OFF position.
- The machine must be properly grounded.
- Safety guards must be in place and operate properly in place at all times. If any guards, covers or safety devices are removed for maintenance purposes they must be replaced before using the machine.
- Never leave the machine running while it is unattended. Turn off the power and stay with the machine until it comes to a complete, full stop.
- Know your tool. Learn the tool's operation, application and specific limitations. Never force the machine to do a task it was designed for.
- Use recommended accessories. Understand and obey all safety instructions supplied with accessories. The use of improper accessories may cause risk of injury to persons.
- Always use guards and eyeshields.

Note: all images in the manual are only for reference, except for special explanation. The equipment which provided for user is based on actual products.

- The platform and lifting system are aluminum alloy, with high rigidity, stability and shock resistance.
- The machine head consists of high-speed XY galvanometer that has advantage of overvoltage & over-current protection and can track the motor angular by position sensor to achieve closed-loop control.
- The main chip is imported DSP chip with windows interface control software, much powerful and stable, the program interface is simple and convenient.
- The Z-axis stepper motor is connected with chuck through coupling, ensure the reliability of transmission accuracy.
- The controller is separated with machine head, this design is easy for installation and commissioning.
- Compatible with a variety of graphic formats, it's easy to print out a variety of graphics.
- The controller has one extended axis, easy for marking or controlling round work-piece or another operation platform.
- Equipped with a DC24V power supply, can control the air cylinder, supplying 24V power during marking and switch off while marking completed.
- Equipped with one external pedal switch(), can be connected with mechanical switch or electric switch.
- Is equipped with 1 external pedal switch (can control the marking instruction), can be connected to a mechanical switch or a photoelectric switch.

2.3 Main uses and working scope

Laser marking is the fastest and most widely used marking method in marking industry. Comparing with the traditional marking method, laser marking is more efficient, stable and much faster, with deeper marking depth and operates more flexibly etc. Laser marking is widely used in electronics, electrical equipment, electric power, communications, molding automobile, heavy machines, aerospace, weapons manufacturing, shipbuilding, foundry, machinery, metal materials etc.

2.4 Working environment

- Power supply: AC110V 60Hz;
- The main engine power: 450W
- Power requirement: voltage fluctuation: <5%.
- Ground protection requirement: three electrical plug board with grounding wire, grounding resistance less than4Ω.
- Require good ventilation, dust-free, corrosion-free and pollution-free environment.
- Keep marking machine at least 0.5m away from wall or other objects, the distance between controller and machine shall not more than 1m.
- The core parts, which includes controller, galvanometer, laser source, have a strict requirement for environment. Avoid the machine from interference of electromagnetic wave, such as electric arc welding and electrical discharge machining, to ensure the normal performance of marking machine.

2.5 Influence for environment and energy

- In the process of marking, the laser beam will effect on the metal surface, producing metal powder and debris, please clean immediately as needed.
- The principle for laser marking machine is using laser beam scorch on surface of work-piece speedily to produce the designed characters. During this procedure, for different materials, it will cause different noise or smoke. Generally the noise is not more than 40 dB but some waste smoke is harmful (especially mark on PVC and plastics). So when marking these special materials, it is necessary to purify the exhaust gas before discharging outside.
- The laser source of the marking machine is class 4 laser products. The laser beam or the reflection beam and diffuse reflection is harmful for human body(especially eyes), person at presence should take protection measures. It is important to prevent fire hazard all the time.
- The internal power consumption for laser marking machine is 220V 60Hz 450W(depends on the different laser source), due to transformer.

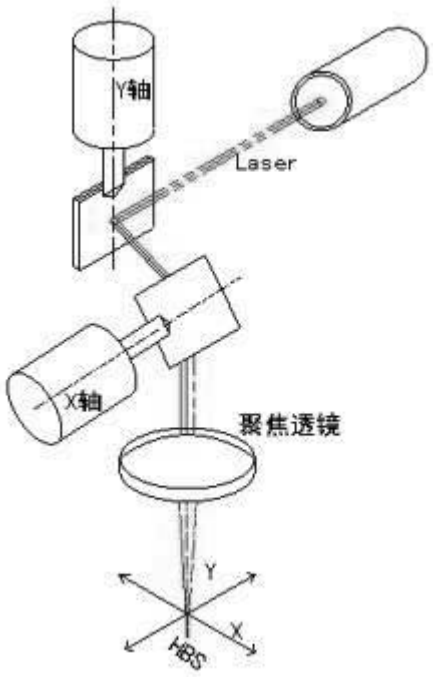
2.6 Products structure and working principle

The main components for laser marking machine are: controller and main machine.

The control system consists of power module, marking module card, motor drive, laser source, foot switch and electric cable for signal connection.

The main machine is composed of basic table, a lifting system and a machine head.

The marking work is conducted by scanning. Firstly, the laser beam is incident to the two mirror, and then the scanning motor, which conducted by computer, will drive the mirror rotate along the X and Y axis, when the laser beam focus on the work-piece, the marking will occur. The working principle is as follows:



2.6.1 Main structure and working principle, operating characteristics

The machine body is the most important part for main machine, mainly effecting the marking precision, which consist of bedplate, a lifting mechanism and machine head. The machine head is consists of X—Y Two-dimensional galvanometer board, X/Y galvanometer motor, X/Y driver board and focusing lens.

2.6.2 Structure, function and working principle for main parts or functional unit

Marking controlling system: as one of the core component of the whole system which run

together with computer software. It controls laser source, XY galvanometer, expansion shaft, IO expansion etc… to realize morking.

Laser source: as the lighting source of the whole laser system, the laser source can achieve the different laser frequency and power by inputting different parameters, to realize the marking on a variety of materials.

Power module: provide different power supply for the laser source, marking controlling system, XY galvanometer etc..

Driver: receive the data from marking controlling system, amplify the driving current and transfer to expansion shaft motor.

XY galvanometer system: the galvanometer system is consists of optical scanner and servo control. The design and manufacture of the whole system adopts new technology, new materials, new technology, new working principle.

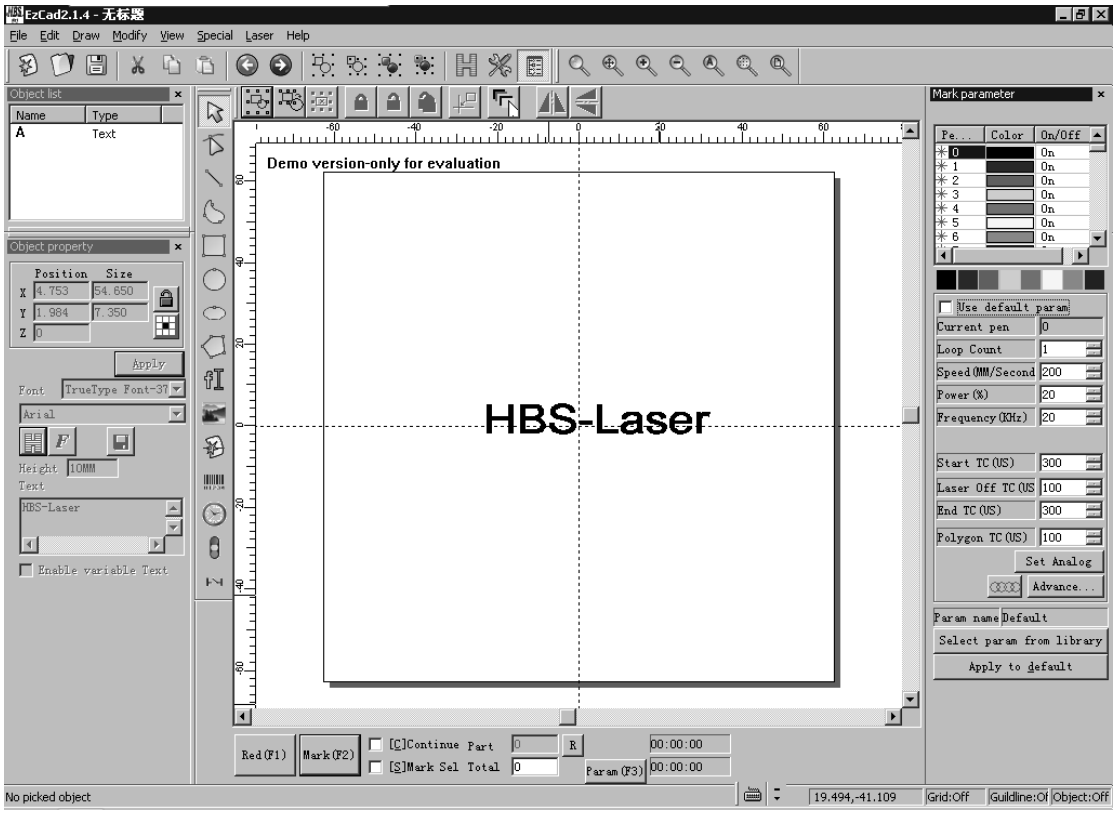
The optical scanner adopts servo motor which is dynamic magnetic deflection system, has advantages of large scanning angle, high peak torque, large load inertia, small electromechanical time constant, fast working speed, stable and reliable. Precise bearing tolerance-elimination mechanism provides the lowest axial and radial jumping error. "electronic torsion bar" replace the traditional elastic torsion bar that greatly improves the service lifetime and reliability. Arbitrary position zero power to keep working principle so as to reduce the use of power and reduce heating effect of components that save the thermostat system. Advanced high stability precision position detection sensor technology provides high linearity, high resolution, high reproducibility and low tolerance.

The optical scanner is divided into the X-axis scanning system and the Y-axis scanning system, and each servo motor shaft is fixed with a laser reflective mirror. Each servo motor is controlled by a computer that controls the scanning process.

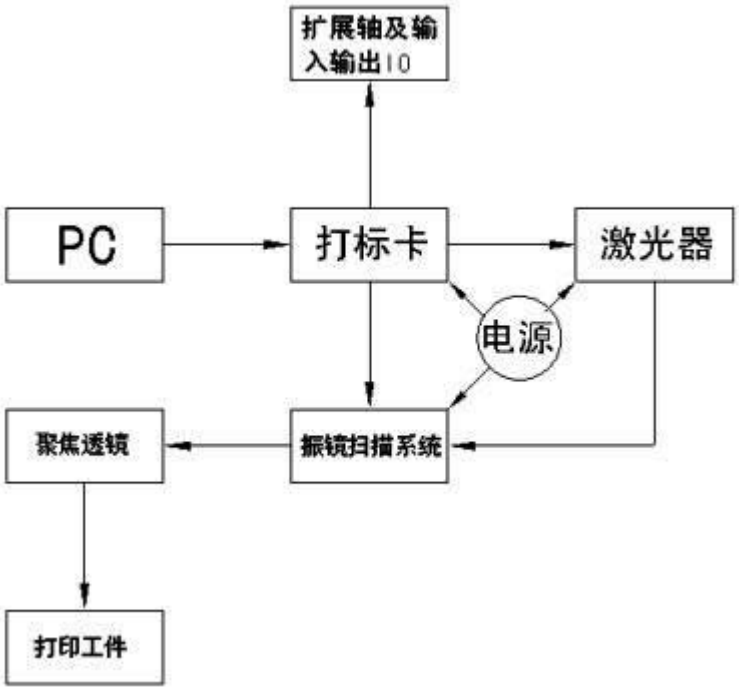
Focusing lens: the laser beam from laser source can not directly meet the requirement of marking, the focusing lens can focus the laser beam into a tiny spot and the laser spot will generate energy which is required energy for marking.

Marking software: the interface of the standard software is used for the standard Windows

style, which is convenient for the operator to master the various editing functions of the standard file.



2.6.3 Electromechanical connection between different parts



3. Safety instructions and preventive measures

3.1 Summary

Before the operation and daily maintenance, operator should read this instruction carefully, acquire the knowledge of safety measures and requirements of equipments, comply with the relevant safety precautions.

3.2 Safety warning signs and instructions

 Caution of high voltage, or will causing death and injury.

 Caution of laser beam, don't put hands through the laser beam, or will cause burns and even endanger human life.

3.3 Operator safety protection

Metal powder and debris: in the marking process, the laser beam ablates the metal surface, will produce metal powder and debris. To avoid human inhalation, the operator should wear proper mask during operation.

Smoke and waste: when the laser ablates the metal surface, will produce smoke and fumes that is harmful to human(especially print PVC and plastics), during the marking for special materials, it is necessary to add suction device, and discharge the smoke and fumes before purification treatment.

Laser: when the laser ablates the metal surface in the marking process, will produce sparks, the strong light will injure the retina of operator if long time stare. The operator should not stare at the laser focus during operation. Due to the high transmittance of YAG laser with long wavelength, the damage is more harmful.

3.4 Electrical safety

- Do not touch any switch with wet hands to avoid the electric shock. The parts, which affixed with lightning signs, have high voltage electric devices or l components. The

operator should avoid any electric shock during operation and maintenance. Such as: protective cover of the motor, the air plug behind the vertical plate, connections behind the controller etc.

- Read the manual and electrical schematics carefully in order to familiar with various functions and corresponding operation method.
- Don't open the controller and change the fixed parameters, potentiometer and switch. If it's necessary to change, must be trained by the manufacturer or changed by professional engineers, be sure to record the parameters before change in order to restore the original state if necessary.
- Don't touch the components in electric cabinet when the power is on, such as: marking controller, all PCB boards, power module and driver etc;

3.5 Mechanical Protection

- Designate safety personnel to determine the scope of responsibility, to proceed safety operation and education for the operator.
- Designate the marking security area and set up warning signs, including marking machine powers, marking types and methods, no entry signs, eyes protection, name of the operator and supervisor etc.
- Turn off the power when the marking machine is free of work. The machine should be protected and supervised by special person to avoid strangers or other person touch the machine and cause injury and malfunction of equipments.

3.6 Operator' common sense

- Before operating of marking machine, the operator must be trained to reach a certain skill and get the permit from the safety supervisor.
- The operator must ware protective goggles in a bright working environment, to ensure smooth operation.

4. Installation and commissioning

4.1 Checking before delivery

4.1.1 Unpacking notice

- Open the packing according to the instructions to avoid the damage of equipment in boxes. Don't use sharp tools to gash when the equipment wrapped with protective film, otherwise will damage the power cable, connections or scratches the surface of the equipment. Such damages or loss will be at buyer's responsibility.

4.1.2 Checking Item

- Check the equipments and confirm whether the equipments is your required one.
- Check and confirm if the equipment is damaged during delivery.
- Check the packing list if there is any miss of spare parts or damage.
- If any unconformity of products model, loss of spare parts, damage against delivery, please contact us immediately.

4.2 Environment requirement for installation

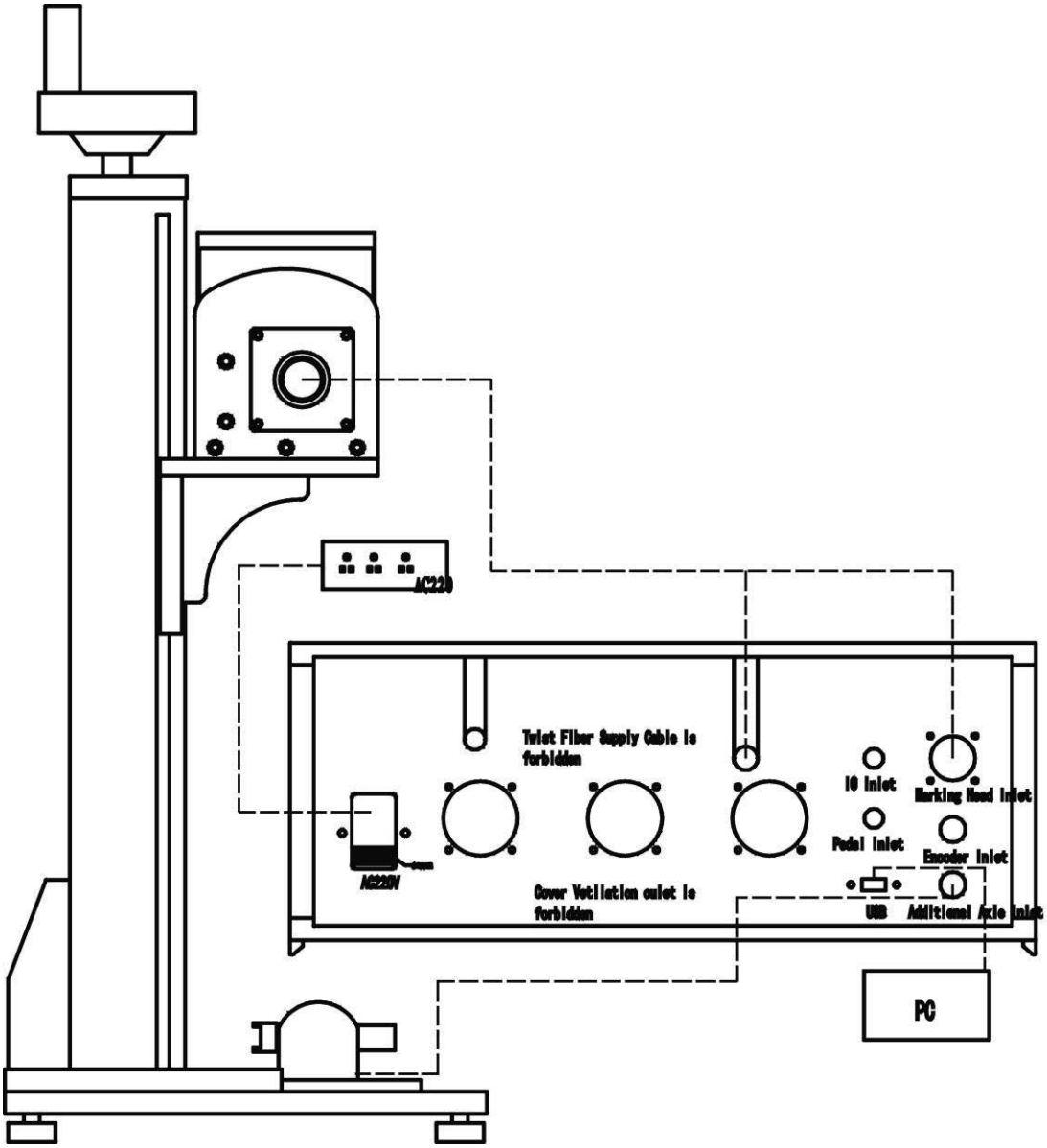
- During installation and fixing of marking machine, please do follow up the hoisting installation diagram, layout, power cable diagram and don't damage the equipments. Contact us immediately if any problem.

4.3 Installation method and notice

- During installation and fixing machine body, please do follow up installation diagram, power cable diagram and don't damage the equipments. Contact us immediately if any problem.

4.4 Electromechanical connection

- The electric connection of marking machine must be carried out in accordance with relevant regulations by professional engineers. Acquire the performance and characteristics as well as technical specifications before commissioning. It's essential to connect cable properly to make sure normal operation. Contact us if any questions.



4.5 Commission method and related notice

- Commission must be carried out in accordance with relevant regulations by professional engineers. Acquire the characteristics and technical specifications before commissioning. The proper commission can ensure the normal operation. Contact us if any questions, we will give you a satisfied answer soonest.

4.5.1 Checking for machine head

- Check the machine head if damaged during delivery. For laser head, red light parallelism, coaxial degree, pulling them and check if there is loose. If so, please adjust the coaxial degree and fix screw properly.

- Check all the cable connections of machine head and confirm if affected or damaged during delivery.
- Check the focusing lens if damaged due to delivery or contaminated by dirt.
- Fix the power plug inside machine head, and fix the marking unit on it's working table.

4.5.2 Checking for controlling system

- Check the integrity of the controller, open the controller and check if any damage or loose due to delivery.
- Check the internal cable of controller if disconnected, loose or broken.
- Turn on the power of controller, check if all indicator light and power voltage are normal.
- After the above mentioned items are checked, fix the cover with screw and place on operating table properly.

4.5.3 Marking Machine electricity adjustment

- Firstly, switch on the power for controller(Switch on three buttons in sequence, firstly marking controlling system, then galvanometer, and then laser source). Secondly, click open the laser marking software 'HBS Laser' in computer and then enter the marking control software. Thirdly, create a rectangular box according to operation manual of marking controlling software, and then press F1(red light), to check if the red light is match with the software interface display. (Before click open the software, please install laser marking controlling system and dongle driver in your computer. See following software inrtoduction)

[warning] If marking head vibrate or whistling, the red light jump randomly or keep still, immediately switch off power of controller to prevent any damage to marking head and controller. Restart after trouble is released.

4.6 Method for acceptance test after installation

- Acceptance of equipments according to contract technical provisions.

5. Use of software

5.1 Summary

- The software is suit for Windows operating system, simple operation, low failure etc.

5.2 Preparation and checking before use

- Check if the power supply is normal, if not, re-check the power circuit(check if the emergency stop is off).
- Check if the cover of focusing lens is taken off.
- Check if the marking sample is put in proper marking position.

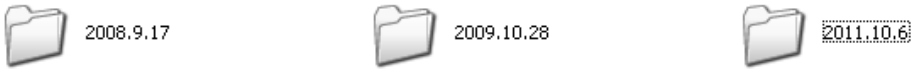
5.3 Software operation guide

- Sequence of starting/booting: turn on 220V power supply --- turn on marking controlling system --- then galvanometer --- then laser source --- then open the software --- then open the file to be marked or create new file.
- Sequence of shutdown: save the file --- laser source --- galvanometer --- marking controlling system --- power supply.

5.3.1 Installation of software driver

Installation of software for marking controlling system

a. Find the CD disc in computer and choose the proper install version



b. Select the installation driver according to computer operating system.

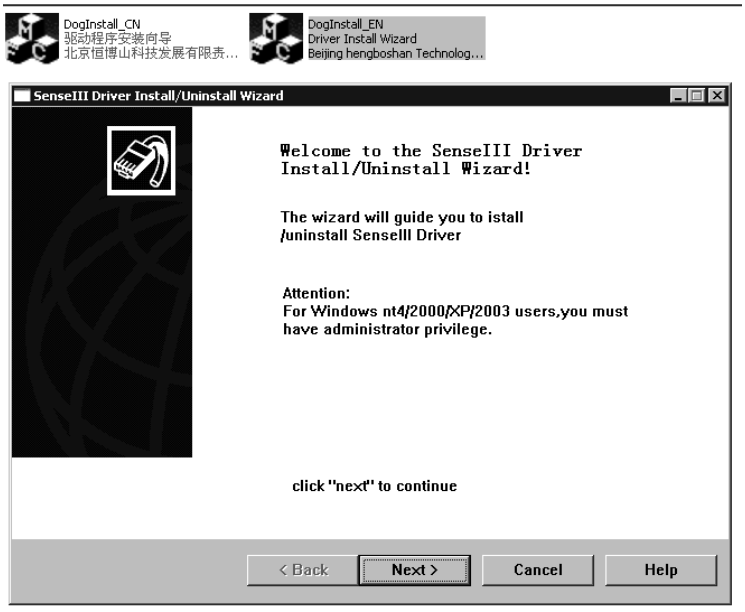
c. Next step

d. Select file, right-click to install.

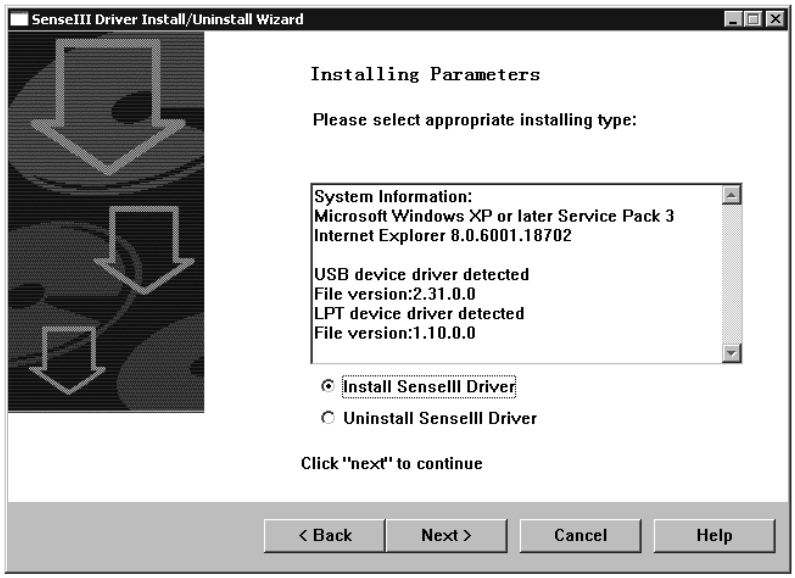
Installation for soft-dog driver

a. Select Chinese/English version and next step

b. Next step



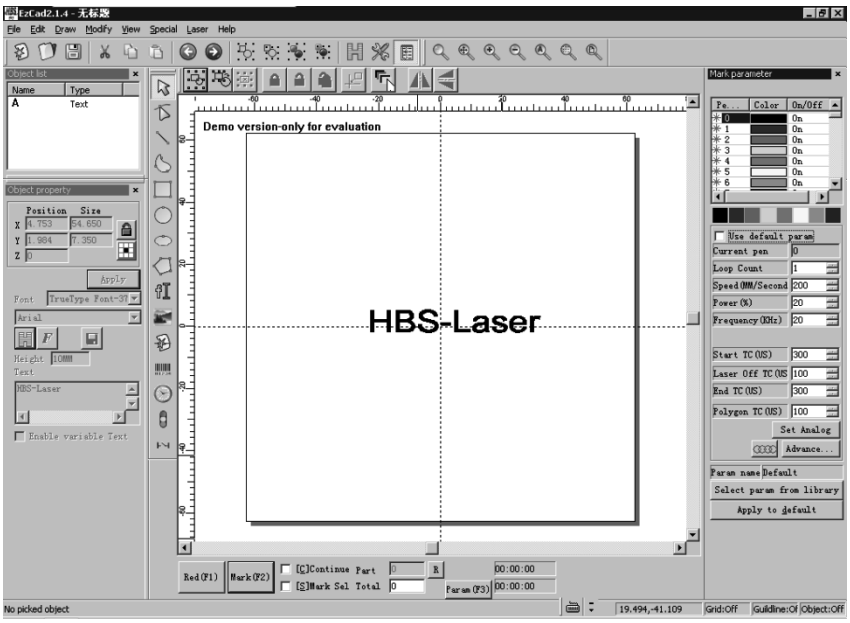
c. Next step



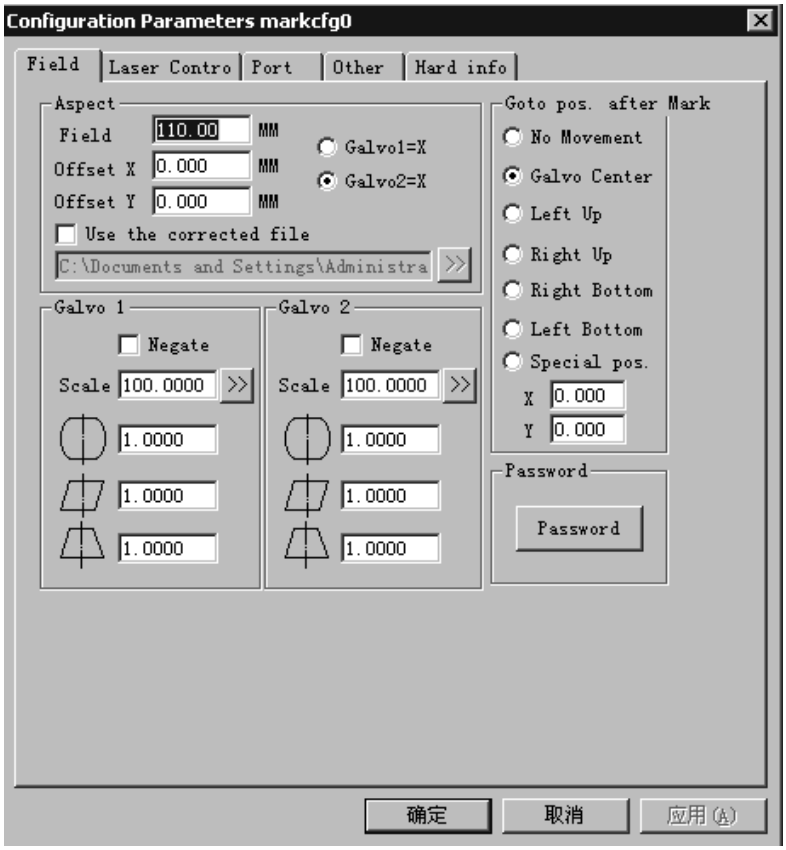
d, Completed

5.3.2 Parameters setting

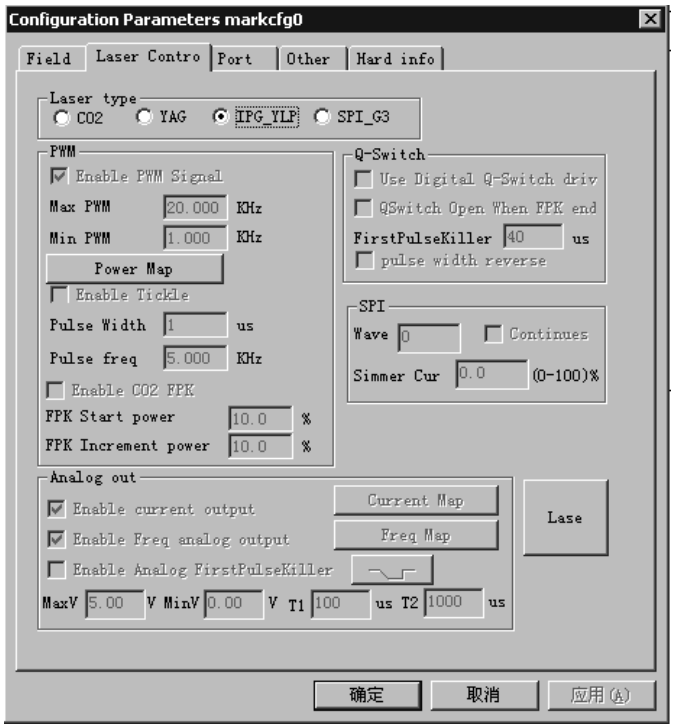
a. Enter the software in computer



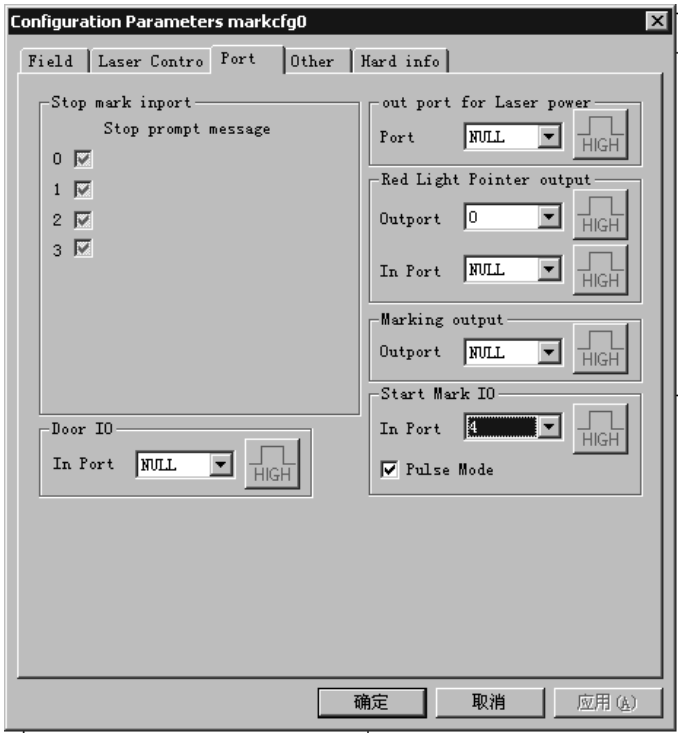
b. Press F3 to set the marking area and Galvo2=X



c, Selection of laser source



d, Selection of in port or out port



6. Maintenance and troubleshooting

6.1 Summary

- Daily maintenance is highly required to ensure the normal use of laser marking machine. Due to the high precision of components, the maintenance should be strictly comply with the instructions and maintained by professional engineers. Maloperation are prohibited for avoiding the damage of components.
- The principle of laser marking machine is: The marking work is conducted by scanning. Firstly, the laser beam is incident to the two mirror, and then the scanning motor, which conducted by computer, will drive the mirror rotate along the X and Y axis, when the laser beam focus on the work-piece, the marking will occur. According to this principle, here have the following conclusions:
- The marking depth is influenced by the materials of work-piece, laser focus distance, marking speed. Generally, the more materials absorb the laser light, the deeper it will be marked; The nearer the laser focus to the work-piece, the deeper it will be marked; marking slower, mark deeper.
- The line width of marking is influenced by distance of laser focus. The nearer the laser focus to the work-piece, the slimmer the line of marking.
- The continuity of marking line is influenced by marking speed. The faster the marking, the worse continuity of the line

Conventional spare parts

a) skim cotton: 1 pcs.

b) alcohol: 500ml, purity: more than 99.5%.

c) ball blowing: 1pcs

d) needle dropper: 1pcs (medical use).

e) cotton stick: 2pcs

f) tweezers

6.2 Daily maintenance

- Before operation starting, carefully check the external connection or power plugs, clear the trouble if required.
- Check the status button whether damaged or not(indicating light), check the emergency stop works properly or not.
- Check the lubricant for lifting mechanism, fill lubricant if needed.
- After operation, check whether the focusing lens is contaminated with dirt or not.
- After operation, clean the working site, keep everything in order and clean. It's very important to clean every part of the equipment.
- After operation, shutdown the equipments by switch off every button in sequence, and then cut down main power.

6.2.1 Inspection/cleaning of the marking head optical system

- In the process of marking, the surface of work-piece will be scorched and fume, producing dust, debris, smoke etc., all of that will influenced the operation. Check and clean the focusing lens every 3-5 working days(**Shutdown the power before clean the optical focusing lens**)

  - **Notice**

  a. Don't touch the surface of optical lens (mirror, focusing lens etc.) to avoid any scratch. If there is oil or dust on the lens surface, it will affect the operation, should clean them immediately.

  b. Don't use water and detergent to clean the optical lens, otherwise they will be damaged because all the lens are coated with special film.

  c. Don't put the lens in dark/wet place that cause the surface of lens to be aged.

  d. Keep the surface of lens clean, if the dust, pollutes, moisture absorb the laser, they will damage the surface film of lens and affect the laser beam. What's more, there is no laser beam come out.

  e. when the lens get damaged, send back to factory for repairing immediately. Don't use the damaged lens that can be repaired, otherwise the lens will be damaged even

worse and can't repair any more.

f. During the fixing/replace of the mirror or focusing lens, don't give too much strength on them or it will get distortion of the lens, affecting the quality of the beam.

- Installation or replacement of optical lenses

a. Before fix the optical lens, the operator should wear clean cloths, clean hands with detergents, wear soft gloves, don't touch the lens directly with hands. When take the lens, hold the edge of the lens and don't touch the surface film.

b. Don't blowing the mirror with mouth when assembling, mat a special paper before place the mirror on table. Avoid any carefulness to touch or damage the mirror , don't press the surface of the mirror. Use special clean air spray gun to clean the mirror seat and then place the mirror into the mirror seat.

c. When placing the mirror into the mirror seat, don't apply too much force during fixing in order to avoid the distortion of mirror and affect the quality of laser beam.

d. Notice for replacing optical lens: take out the mirror from packing carefully to prevent any bumps on the mirror; when take out the mirror and focusing lens, the operator should ware clean gloves, hold the edge of the lens and then take out. When remove the wrapping paper of the lens, should avoid dust fallen on the lens. Use a spray gun to remove dust on the mirror and then laid the lens on the special optical lens paper. Clean lens support frame structure and avoid any tiny objects fall on lens during fixing. After fixing, clean the lens and supporting frame again with gas spray gun.

e. How to clean the lens?

For example, the concrete steps of cleaning the focusing lens are as follows:

Clean the lens with cotton swab: firstly, use gas spray gun clean out the dust from lens and then use cotton swab remove the remaining dirt. Wet the cotton swab with high purity alcohol or acetone, and then clean from the center of the lens along with the circular motion, change a new swab once moved one circle and the repeat until the lens get cleaned. Use a clean cloth clean the lens again(avoid scratch the lens).

Take the cleaned lens under light and observe if it's cleaned exactly or not, if the reflection of light is satisfied, it means the lens is well cleaned, or clean the lens again until it get well cleaned. Don't use cotton swab if it's used. After cleaning, fix the lens to the lens seat carefully.

- Storage of optical lens

a. Store the optical lens properly can keep the perfect performance.

b. the proper storage temperature is 10℃ to 30℃, if the lens is in the freezing or similar environment, the lens surface will frost and get damage easily. If the temperature is higher than 30℃, it will affect the surface coating.

c. Store the lens in box and placed in a non vibration environment, otherwise it will easily lead to distortion of the lens, affecting the performance.

6.2.2 Inspection/filling of lubricant for lifting system

No need to inspect/refill of lubricant frequently, the lifting system has lubrication systems itself.

6.2.3 Inspection/cleaning for air system

The priority of checking is: check the stability of the power voltage, cleaning and ventilation of the electrical cabinet. Check the integrity and safety of the cable.

During the long term operation of controller, it will produce dirt of oil, grease, the operator should clean it every 5-6 months; at the same time, the cable connection will get loose or aged, so they should be checked every 10-12 months.

6.3 Maintenance against long-term non-operation

If non-operation for a long time, the equipment should be well protected, apply lubricating oil(30＃) for the lifting mechanism and wrap it with anti-rust paper. Check the equipment timely whether the components are rusted, clear the rust if necessary(if possible, can apply a dust cover on the machine). Regular cleaning and checking are needed during non-operation period.

6.4 Failure checking and troubleshooting

Common failure and malfunction

Failure or malfunction	Analysis of reason	Troubleshooting Method	Remarks
No red light output	1. In software, the red light is off 2. Red light plug is loose 3. Red light base and machine body are conductive 4. Red light base is loose, red light is blocked 5. Red light device out of work	1. start red light port in software 2. Connect red light plug again 3. Insulate the red light and machine body 4. Adjust the red light base 5. Change the red light system	
No laser output	1. Wrong laser source setting in software 2. Bad connection between laser source and marking controlling system 3. Laser source base is loose, laser is cut off 4. Laser source get damaged;	1. Select the proper laser in software 2. Check and reconnect; 3. Adjust the position of laser source base 4. replace with new laser source	
Can not open LMC1 driver	1. Marking controlling system driver is not proper installed. 2. Marking controlling system and computer USD are not proper connected or loose 3. Marking controlling system get damaged.	1. Reinstall marking controlling system driver 2. Reconnect USB again 3. Replace the marking controlling system.	
Only mark out a vertical or horizontal line	1. Connection of galvanometer is loose 2. Connection of marking controlling system COM1 port is loose 3. Check if the power supply of X/Y galvanometer driver is off 4. X/Y galvanometer get damaged	1. Reconnect the galvanometer 2. Reconnect the marking controlling system COM1 port 3. Check the power supply 4. Replace the galvanometer	
Marking and marking angle is different from the design in software	1. In the software setting, haven't choose galvanometer 2=X 2. The connection for marking controlling system COM1 port is wrong	1. Set the galvanometer 2=X in software 2. Weld the COM1 connection again	
The marking scale/size is different from design in software	The X/Y galvanometer ratio and deformation ratio is wrong	Adjust parameters setting for X/Y galvanometer ratio and deformation ratio	

The scale and position for red light output is different from design	1. Red light base loose; 2. Red light in software is not well calibrated;	1. Adjust the red light base in comply with laser out put 2. Adjust parameters in F3- other - red light indicator	
Short of power supply for main equipment or other modules	1. The main power supply is off or its fuse is cut. 2. The fuse for marking controlling system is cut; power supply is cut; 4. The fuse for laser source is cut;	1. Switch on the main power supply or replace the fuse; 2. Check the marking controlling system and replace its fuse; 3. Check the galvanometer and replace its fuse; 4. Check the laser source and replace the fuse;	

7. Packing, delivery and store

7.1 Packing

- All of the component for laser marking machine, such as machine body, marking controller, Z axis structure, table and other accessories, are wrapped with polyethylene and protective film, and then packed with paper boxes, protect them from scratch or damage.

7.2 Delivery/Loading method and notice

- During delivery, the equipment should be well protected from drench, damp, tilt, rodents, potholes and other hazards, should ensure good ventilation. The delivery environment temperature should be -10℃～+40℃, and humidity should less than 80%. Avoid long time exposure out of door. If the equipment free from work for a long time, the operator should check it timely to ensure the normal performance.
- Climbing, standing or placing heavy objects on the packing is prohibited,
- Use separate power supply, don't share power supply with other electric equipments.
- Collision, scratching the panel and lens are prohibited.
- The packing box should avoid wet, rain and directly sunshine.
- Pay attention to the equipments when lifting, should avoid any scratching.

7.3 Storage condition, period and notice

- Equipment storage should avoid drench, damp, tilt, rodents, potholes and other hazards. Good ventilation are recommended and ensure the storage temperature-10℃～+40℃, relative humidity is less than 80%. Avoid long time exposure out of door. If the equipment free from work for a long time, the operator should check it timely to ensure the normal performance.

8. Technical specification

Main parameters for Laser Marking Machine

Model / Parameters	HBS-GQ-10	HBS-GQ-20	HBS-DB5	HBS- CO_2 -30
Laser Power W	10	20	5	30
Laser Wavelength nm	1064±4	1064±4	1064±4	1055-1070
Laser Frequency KHz	20-60	20-70	20	20-200
Pulse Energy/mj(20KHz)	0.5-0.6	0.8-1	0.6	1-1.01
Marking Depth/mm	≤1.2mm(depends on materials)	≤1.2mm(depends on materials)	≤1.2mm(depends on materials)	≤1.2mm(depends on materials)
Min. Line Width/mm	0.01	0.01	0.02	0.03
Min. Font Size/mm	0.3	0.3	0.3	0.3
Marking Speed	≤12000mm/s	≤12000mm/s	≤7000mm/s	≤7000mm/s
Repetition Accuracy/mm	±0.001mm	±0.001mm	±0.001mm	±0.001mm
Marking Area/mm	110x110	110x110	110x110	110x110
Environment Temperature ℃	0-42	0-42	15-40	15-40
Environment Humidity	0-95% Moisture free	0-95% Moisture free	0-95% Moisture free	0-95% Moisture free
Machine Power/W	≤500	≤500	≤500	≤1200
Cooling	Air cooling	Air cooling	Air cooling	Air cooling

C.H. HANSON®
Since 1866 • Tools for Generations™

REPAIR PARTS LIST FOR 21020 20 WATT FLOOR LASER

Ref. No.	Description	Part No.
1	Chuck	9643584.01
2	Non-standard cable kit	9643587.01
3	Door kit (2 side, 1 front, and 1 bottom	9643589.01
4	Moniter	9639501.01
5	Moniter mounting	9639502.01
6	Gooseneck lamp	9639503.01
7	Table	9639504.01
8	Circuit board	9639505.01
9	Lens	9639506.01

(Δ) Not Shown (*) Standard hardware item available locally (N/A) Not available as replacement part

NOTES

C.H. HANSON WARRANTY

C.H. Hanson warrants their products to be free of defects in material or workmanship. This warranty does not cover defects due directly or indirectly to misuse, abuse, normal wear and tear, failure to properly maintain the product, heated, ground or otherwise altered, or used for a purpose other than that for which is was intended.

The warranty does not cover expendable and/or wear part (i.e. v-belts, screws, abrasives, jaws), damage to tools arising from alteration, abuse or use other than their intended purpose, packing and freight. The duration of this warranty is expressly limited to the terms noted below beginning from the date of delivery to the original user.

The C.H. Hanson branded items car the following • warranties on parts:

All vises, clamps, positioning tables, tombstones, jack screws and vise accessories - LIFETIME.

All bench grinders, drill presses, tapping machines, band saws, lathes, milling machines, arbor presses, abrasive finishing machines and work stands - 3 YEARS.

The obligation of C.H. Hanson is limited solely to the repair or replacement, at our option, at its factory or authorized repair agent of any part that should prove inoperable. Purchaser must lubricate and maintain the product under normal operating conditions at all times. Prior to operation become familiar with product and the included materials, i.e. warnings, cautions and manuals.

Failure to follow these instructions will void the warranty.

This warranty is the purchaser's exclusive remedy against C.H. Hanson for any inoperable parts in its product. Under no circumstances is C.H. Hanson liable for any direct, indirect, incidental, special or consequential damages including loss of profits in any way elated to the use or inability to use our products. This warranty gives you specific legal rights which may vary from state to state.

C.H. Hanson Company
2000 N. Aurora Rd., Naperville, IL 60540 U.S.A.
or call 1-800-827-3398