HAN'S LASER

MARS J SERIES

FIBER LASER MARKING

SUBASSEMBLY

SPECIFICATION SHEET

Version NO.20110301

International Technical Support Dept

Han's Laser Technology Co., Ltd

www.hanslaser.net

Contents

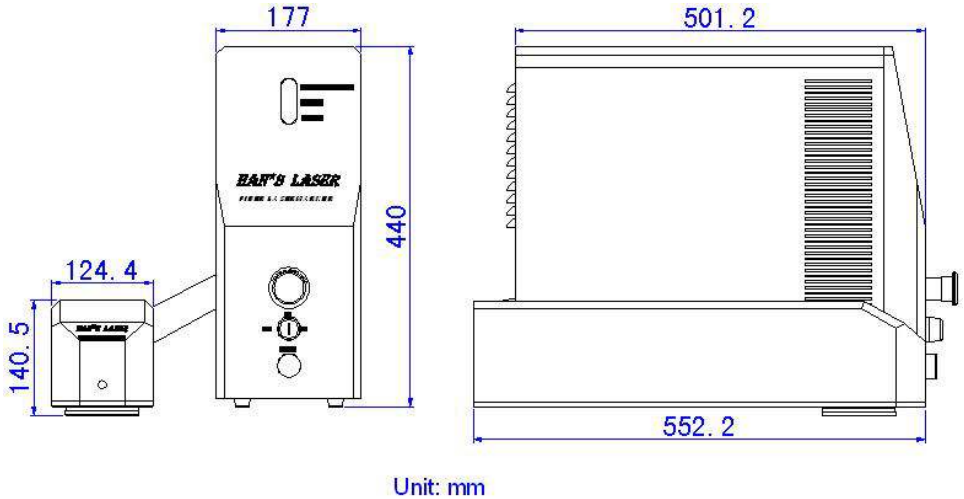
1. MARS J SERIES SUBASSEMBLY PICTURE

Picture 1 MARS J Series

2. SUMMARY DESCRIPTION

As the newest Hans Laser's product, the MARS J series fiber laser marker has the advantages of high quality of laser beam and high reliability and more. It can work on offline mode (without computer) that makes the marking more efficient and reliable. Plenty of I/O ports are good for function expansion and system integration. The marking control card integrates the encoder data port which can get the assembly line speed real time that is for fly marking application. Superior marking quality is suitable for all kinds for metal and some kinds of nonmetal material. It's the ideal solution for high precision, high speed and high quality marking application. MARS J series was developed according to CE and FDA/CDRH standard, meeting the strictest safety requirements.

3. SUBASSEMBLY COMPONENTS DESCRIPTION



Dimensions: Laser Head and Control Cabinet

3.1 Construction

The MARS J series fiber laser marking machine components include:

Control Cabinet

1) Fiber Laser Source

Available in two sizes, the IPG fiber laser source comes in 10 watt and 20 watt power levels. IPG Photonics manufactured fiber lasers are utilized world-wide and have the majority of fiber installations world-wide.

2) Base Control System.

The Base Control System directs the subassembly major components, including the fiber laser, beam delivery galvo with marking control system, power supply and the cooling system.

3) Cooling System

The cooling system for the laser and optics consists of air cooling combined with heat sinks.

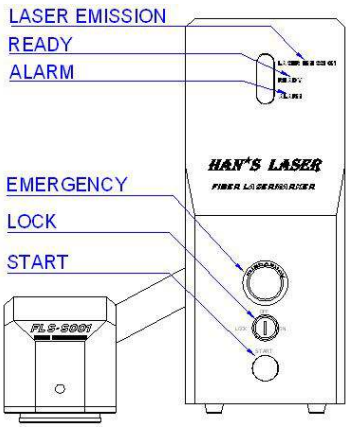
4) Marking Control System,

The advanced circuitry of the Marking Control System utilizes the EMCC3100 marking control card with a high precision D/A conversion port circuit all directed by Hans Lasers proprietary laser marking software.

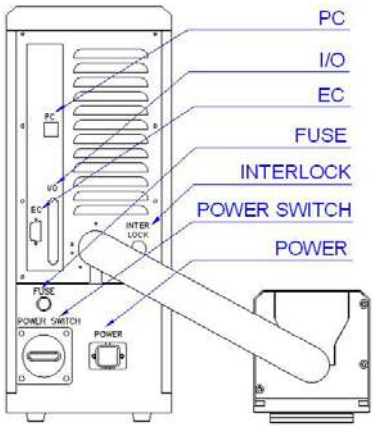
Laser Head

The laser head includes the laser oscillator, beam expander, scanning system and f-theta focusing lens. The scanning galvo is provided by ScanLab from Germany. All optical components and the laser are protected via a rear optical isolator that prevents back reflection into the fiber laser. All other optical components are high quality, providing maximum lifetime for the MARS.

3.2 Control Cabinet View



(a) Front view



(b) Back view

The action of Control Cabinet is to control the operation of the entire system, include the control and power supply of laser power, X and Y Scanner, Air-cooled system, fiber laser and the control and

indication of alert system. All control procedures of whole machine are reached through the operation panel on the front of Main Control Cabinet. All the connection ports are on the back of it.

The operation panel on the front of Control Cabinet consists of emergency switch, Key switch, Start button and indicators, and it should be understood completely before operating. The meanings of these symbols are shown as follows:

LASER EMISSION- Indicator (white light) when the laser beam emits, the indicator will be ON, otherwise will be OFF.
READY- Indicator (green light) when the machine is stand-by, the indicator will be ON.
ALARM - Indicator (red light) when any alarm occurs (laser power error, temperature alarm, etc), when the indicator is ON, the laser power and scan power will be OFF.
EMERGENCY - Emergency button is the emergency stop switch of whole laser marking system. The abnormal situation were shown when system was working, you must shut off the power of system immediately. While the marker is running, Press the "EMERGENCY" switch, the whole system will stop running.
LOCK – Power turn ON/OFF key switch. It is for normal starting the system. Turning this key switch clockwise to ON position and press the **START** button will start the machine. Turning it to OFF position will switch off this machine.
START – Push button. The **START** button is for start the machine and power failure protection. When the system stops working or power supply failure, it will not automatically restart when the power supply resumes, unless the user re-presses the **START** button. When the LOCK switch is ON position, pressing this button will immediately turn-on the power supply of machine. The indicator on the **START** button will be ON (white light).

Connection ports on the back of the Control Cabinet consists of PC port, I/O port, EC port, INTERLOCK port, FUSE port, POWER SWITCH and POWER port. They should be understood completely before operating. The meanings of these symbols are shown as follows:

PC – USB port. This is the communication port of the marking software and the EMCC3100 card.
I/O – External input and output port. Please refer to "Chapter 4 Hardware Operation" for its function and definition detail.
EC – Encoder port. It is assembly line speed data input port for fly marking application
FUSE – Fuse replace port.
INTERLOCK – Remote control interlock port. Here should put on an interlock defeat connector for common use. The signal can be used for remote control of stopping laser output for any emergency.
POWER SWITCH– Whole machine power switch. Turn it to ON before starting the machine.
POWER– Electricity power input port.

4. KEY FEATURES AND BENEFITS

1) The MARS J series utilizes the world's largest source of Fiber Lasers—IPG Photonics. The IPG fiber laser oscillator of the MARS J series adopts a multi mode pump light and single mode double layer fiber coupling technology. This versatile fiber laser also adopts a fixed side parallel pump fiber laser oscillator. The fiber laser features and benefits are as follows:

- Good laser beam quality, TEM00 single mode output, collimation laser beam diameter is 10mm, M2<1.6, angle of laser beam divergence is 0.24 mrad.
- After focus, the diameter of the laser beam become small and the peak value power density of work point is very high. (109W/cm2 is applied for precise marking)
- Pulse repetition frequency is high (20 KHz to 80 KHz), which is applied for high speed marking.
- Adopt a maintenance free surge power expanding technology along with a seed light source pulse. High reliability every time with an average working lifetime between before failure estimated at over 100 thousand hours. And with the air cooled system, the overall power savings is substantial compared to other YAG laser markers that required water cooling.
- Higher power conversion, small power system.

2) The MARS J series adopts the newest generation of laser marking control. The advanced circuitry utilizes the EMCC3100 marking control card with a high precision D/A conversion port circuit all directed by Han's marking software. The marking control system includes the marking control card EMCC, equipped with a D/A transform interface circuit and marking control software. The D/A transform interface circuit transforms the digit signal output by the PC into the simulating analog signal, then drives the optical system to pulse the laser according to the parameters set in the marking software, thus marking the content accurately and quickly on the work piece. There is a USB port on EMCC3100 card for communication with computer marking software. External digital I/Os include the functions of mark begin, marking, mark finish, enclosure safety door control and more. More than 24 bits of I/O port is good for function expansion and system integration. The Hans control software operates on the MS-WINDOWS XP platform. The interface is compatible with common file formats from other software suppliers including AutoCAD, CorelDraw, PhotoShop, and more. Equipped with bar code capability, 2D codes, graphics context, and more, all the major uses for laser marking are included. Commonly imported file formats include PLT, DXF, BMP, etc. SHX and TTF character stock can be used directly in the software. To make set-up easy, the Hans software enables the operator to program the automatic coding function, sequence numbers, date codes, and more quickly and easily. MARS J series also can work on OFFLINE mode that can work without the help of computer after downloading marking data from software to the marking control card.

3) Integrates the encoder data port which can get the assembly line speed real time that is for fly marking application.

4) Adopts one key starting with a simple interface.

5) The appearance is compact with a simplified air cooling system. The small footprint air cooling system enables stable laser operation at any power level, and provides fewer working parts for failure.

6) It was developed according to CE and FDA/CDRH standard, meeting the strictest safety requirements.

5. TECHNICAL SPECIFICATION

Model	MARS-10J	MARS-20J
Laser Output Power	10W	20W
Wavelength	1064nm	
Beam Quality	M^2< 1.6	
Laser Repetition Frequency	20-80KHz	
Marking Scope	100mm×100mm(std.), 150mmx150mm(opt.), 300mmx300mm(opt.)	
Marking Speed	≤7000mm/s	
Min. Line Width	0.012mm	
Min. Character Size	0.15mm	
Repetition Precision	±0.003mm	
Cooling	Air Cooled, Fan/Filter(no water cooling required)	
Input Power	110~230VAC, 50/60HZ	
Power Consumption	<500W	
Expected MTTF (Diode)	Greater than 100,000 hours	

6. SUBASSEMBLY COMPONENTS SOURCES

Component	Source/Location
Fiber Laser	IPG/ Germany
Galvo Scanhead	ScanLab/Germany
F-Theta Lens	Han's Laser/China
Software	Han's Laser/China
Control Card	Han's Laser/China

*Note: As products continue to update, please contact us for latest configuration.

7. ENVIROMENTAL REQUIREMENTS

- Operating temperature 15-30 deg C
- Humidity < 80%
- Power Supply 110~230V 5A, 50/60 Hz,
- Power supply net undulation: ±5%; Power net suited to the international standard. Area with voltage amplitude above 5% should have automatic digital voltage stabilization and steady flow system installed.
- Prevent strong electromagnetism signal interference around the equipment installed.
- Groundsill swill: less than 50um；Vibration acceleration: less than 0.05g.
- Prevent smoke and dust in the equipment space.
- Prevent static electricity. If required install anti-static matting or add electrical shielding

8. EXAMPLE MATERIAL AND INDUSTRIES

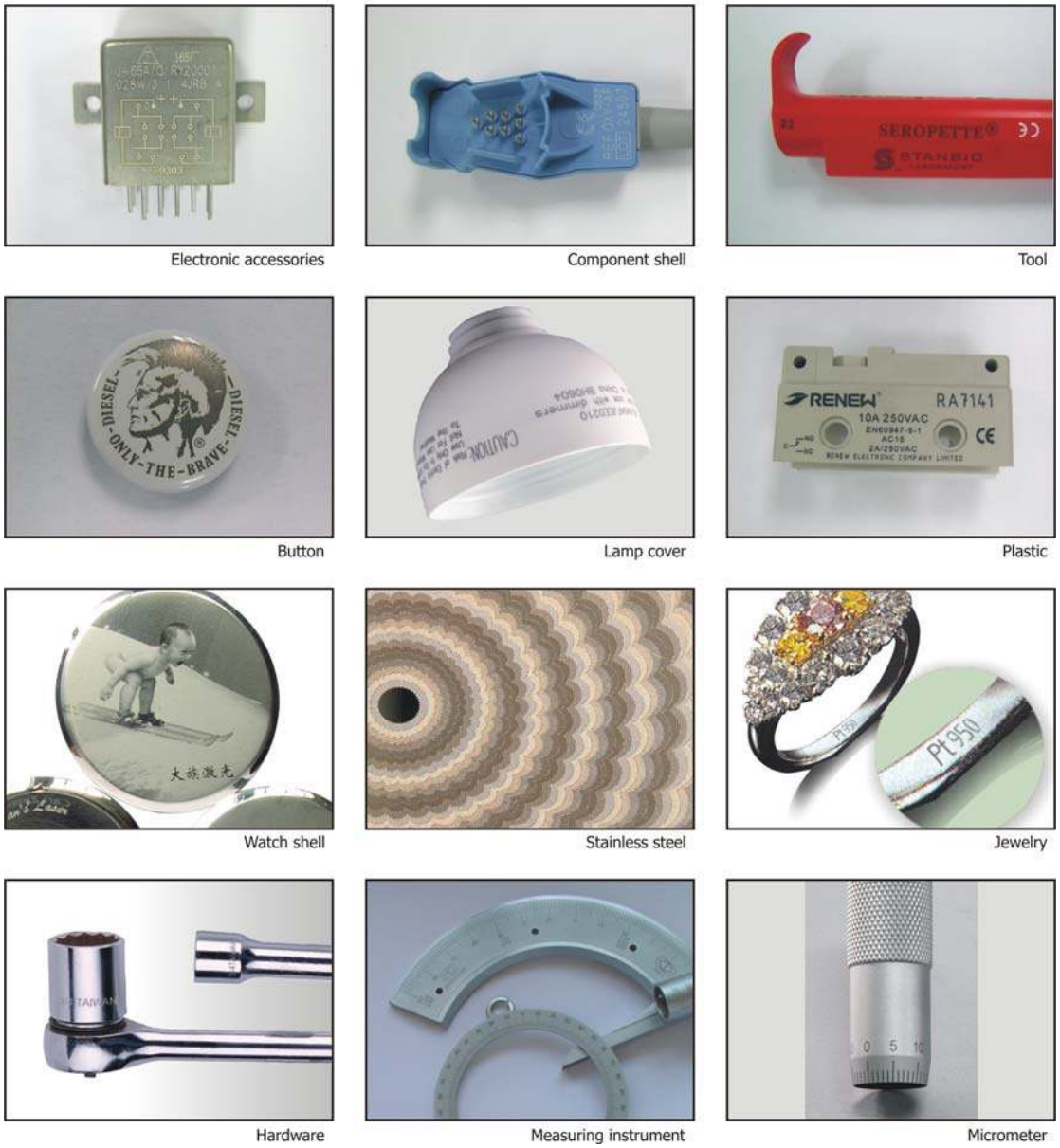
The MARS J series fiber laser marking subassembly has advantage of high beam quality and high reliability, making it suitable for a variety of materials. The laser marking quality can be excellent for materials that require deep marking depth, smoothness and accuracy.

Example Materials;

Steel
Aluminum
Silver
Gold
Silicon

Example Industries:

•Electronic components industry
•Medical device industry
•Glasses, watch and clock industry
•IC card industry
•Jewelry industry



Picture 2 Marking Samples