Laser Marking +
Engraving Solutions

FOBA®
Laser at your service

FOBA Y-Series

High potential fiber marking lasers: More clarity, less complexity

Laser marking has become one of the preferred methods for product identification, decoration and material processing. Many applications have been developed. Almost any material can be marked. And still, new fields of use arise. Due to ever increasing quality standards, new legal and industrial regulations, or the manufacturer's intent to add value and safety to their products. This constant demand has lead to a proliferation of lasers and solutions that challenge a customer's ability to integrate laser marking technology and put it into use.

This is where the Y-Series comes into play. The proven fiber laser markers have been developed to create more clarity and take the complexity out of laser marking. With the Y-Series, FOBA offers a modular platform consisting of both compact and flexible fiber marking lasers that address most of today's and tomorrow's product marking needs.

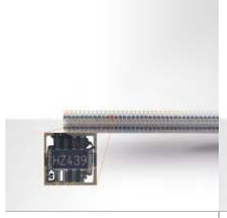
Ignition distributor with color change mark
Medical saw with black marking

Your product benefits

- **High integration capability and flexibility:** For customers, who have to integrate marking lasers in production systems, we provide one compact, modular system that fully integrates a wide range of lasers and optics, a patented vision system and standard customer interfaces.
- **High speed and high quality:** For customers, whose speed and quality requirements vary, due to the variety of products they mark or due to changing future needs, we offer an economic one laser scan head solution that can provide the optimal configuration at each time.
- **High precision:** For customers requiring high accuracy marking in order to reduce cost and non-conforming products while improving product appeal and quality, the Y-Series fiber laser markers offer best-in-class mark placement and high quality marking.

The full range of proven fiber laser marking technology:
For a wide variety of applications

Be it on metal, plastic or other challenging substrates. Be it for medical, automotive or any other industrial application. We have the right laser solution for your direct part marking application. The Y-Series includes 8 different fiber laser sources, spanning power and pulse width ranges on one modular platform.

Applications				
Low-cost marking on certain foils, plastics and epoxies (e.g. electronic components)	Cost-efficient marking on most common materials including metals and most plastics	High contrast marking like black marking on aluminum	Marking on (anodized) aluminum (white, grey, black marks) and high contrast marking on some metals (e.g. nickel alloys, some steels, titanium, etc.)	Very dark, smooth-to-the-touch markings on some metals. Anneal marking on stainless steel (especially medical part marking)
				
SMD strip, color change on epoxy	*Tachometer frames by Fremach Morava, s.r.o.*	*Black marking on aluminum*	*Graded white, grey and black marks on (anodized) aluminum*	*Umbilical cord scissor with UDI code, anneal mark on stainless steel*
Suitable fiber laser marking technology				
Y.0050-cw, Y.0100-cw	**Y.0100, Y.0200, Y.0300, Y.0500**	**Y.1000**	**Y.0201 – the universal marking laser**	
Continuous wave Yb fiber laser; 5W, 10W	Pulsed Yb fiber laser; 10W, 20W, 30W, 50W	Pulsed Yb fiber laser; 100W	Short pulse Yb fiber laser; adjustable pulse width; 20W	

Enjoy high integration capability and flexibility:
All-in-one fiber laser markers for many uses

For Integrators, OEMs, Automators

Integrators have to deliver their solutions to their customers speedily, reliably and cost effectively. FOBA's compact and modular Y-Series fiber laser markers integrate easily and quickly with various production systems and FOBA workstations. They feature a highly integrated marking unit that combines a wide range of lasers, optics and marking fields, a patented vision system and standard customer interfaces.

Fully integrated: **Vision inside**

One fits all: **8 different fiber laser sources fitting in one housing**

Electrical signals for direct access to control and status functions: **customer interface**

4 *Adaptable to every application:* **1 scan head, 4 optics, manyfold use cases**

Now integrated: **Machine safety module**

Flexible and adjustable: **Vision lighting**

Ready for **integration in all FOBA workstations**

Benefit from high speed, enjoy high marking quality:
One laser for the freedom of not having to decide between both

For all who value high accuracy, and the freedom of flexibility

Do you want to manufacture at the highest speeds possible without compromising quality? Do you value precisely marked parts and zero defects? Do you have to improve product appeal?

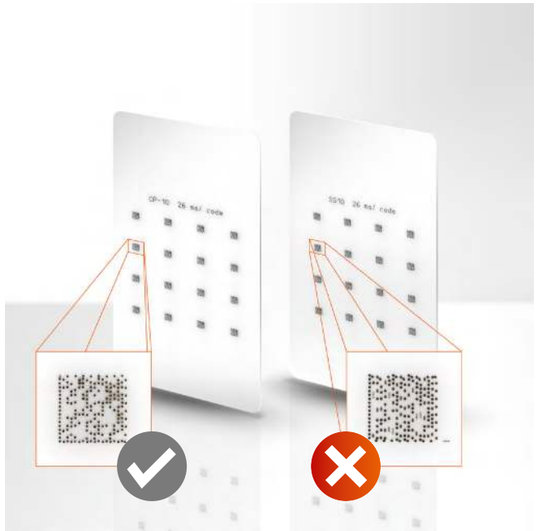
The tunable scan head provides the optimal configuration for each use case, and let's you enjoy all the freedom and flexibility to go for quality today and choose high speed tomorrow. FOBA's fiber laser markers ensure best-in-class mark placement and code integrity. Together with a FOBA workstation, you benefit from high accuracy and stability. Our vision-guided Holistic Enhanced Laser Process 'HELP' ensures precision and process reliability.

What you need is what you get

Your requirements:	Our solution:	Your benefits:
→ High speed marking → High product appeal and quality → High precision/accuracy → Code and data integrity → Fewer non-conforming parts → Cost reduction	**High-S (Speed) scan head tuning** → Parameter set for optimizing speed. Perfect for applications that require high speed marking. **High-Q (Quality) scan head tuning** → Parameter set for optimizing quality and accuracy: High-Q ensures low scan noise/ripple and high quality marking results. Enjoy straight lines vs. wobbly ones. Even very small marks have high fidelity. **HELP: Holistic Enhanced Laser Process** → Vision-assisted marking with IMP (Intelligent Mark Positioning) and Point & Shoot function. → 3-stage HELP for improved process reliability during laser marking with pre- and post-mark validation (part validation, pre-mark verification, mark alignment, mark verification, optical character verification, 2D code validation incl. UDI-Unique Device Identifier).	→ **Higher productivity** → **Highly accurate marks** → **Improved quality** → **Lower defect rates** → **Cost-effective production** → **Improved process stability**
Your marking challenges:		
→ Tiny components → Small parts in large trays → Large marks with uncompromising quality → Varying speed and quality requirements → Large product variety → Strict quality requirements		

High-S scan head tuning

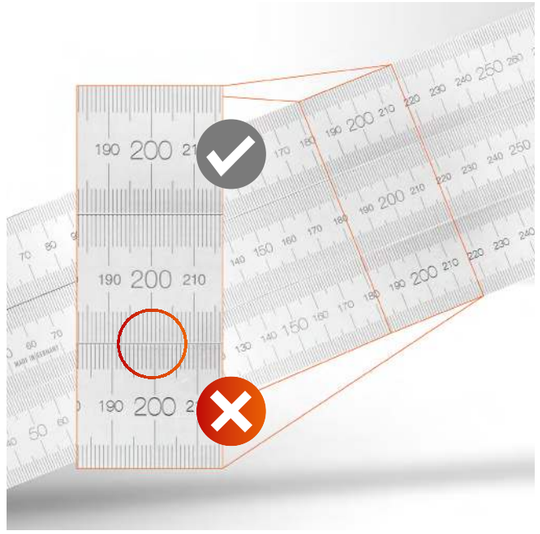
Readable codes at higher speeds.

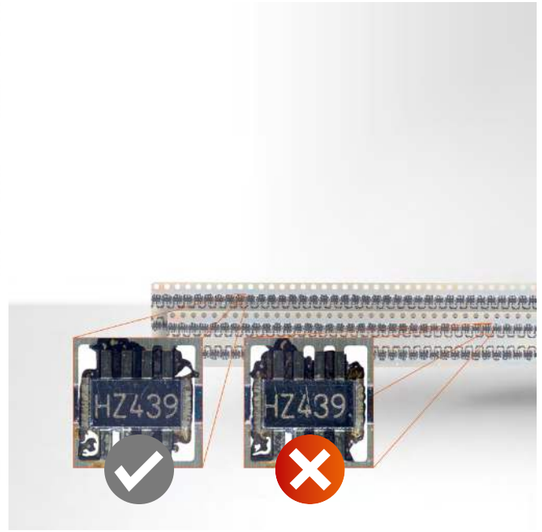


Higher marking quality at high speeds.

High-Q scan head tuning

Best-in-class mark quality.

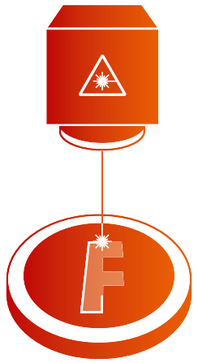




HELP in three stages:

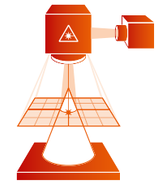
Vision-aided laser marking with pre- and post-mark validation avoids marking errors

HELP (Holistic Enhanced Laser Process) offers verification prior to marking and validation right after. Particularly important for users with strict quality and code integrity requirements: During the unique post-mark verification process, the content of 1D and 2D codes is directly read. Both characters and marks can be verified immediately.

1: Pre-mark verification	2: Laser marking (product identification)	3: Post-mark verification
Part validation: Validates correct part and prevents marking of wrong or defective parts.		**Mark verification:** Validates that marks have been placed correctly (positioning, alignment, size).
Pre-mark verification: Confirms that only unmarked parts are being processed.		**Optical Character Verification (OCV):** Validates that every character marked by the laser matches the expected content.
Mark alignment: Aligns the mark relative to the position of the part.		**2D code validation and code reading:** Reads the contents of 1D and 2D codes (Datamatrix, e.g. ECC 200, GS1; QR) and compares the results to the expected content. A classification of the code into quality classes is possible.

Take advantage of precision and process reliability:

Patented and proven imaging and solid workstations for integration



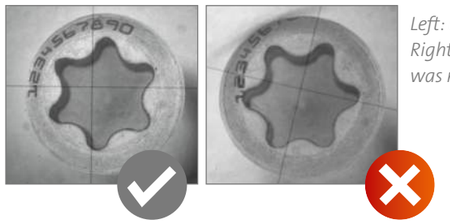
FOBA's patented vision system for alignment and verification IMP (Intelligent Mark Positioning) and the solid construction of our M2000 and M3000 laser marking workstations ensure high precision and process reliability. As a result, all marks and processes are executed with precision and high repeatability.

Mark alignment and pre- and post-mark verification

The patented camera system IMP automatically locates products and positions, and adjusts the marking/engraving accordingly, making it ideal for automated batch production.

→ **Mark alignment:** Mark position accuracy is significantly ipmortant: IMP validates the part integrity, measures its position and automatically aligns the mark relative to the part. Wrong parts are rejected. IMP ensures **less scrap and fewer mismarked products.**

→ **Pre-/post-mark verification:** IMP's pre-mark verification feature prevents users from marking already marked parts. The post-mark verification validates that the mark placement is accurate. This feature can also validate mark contrast.



Left: IMP aligned mark. Right: Misaligned mark, IMP was not used.

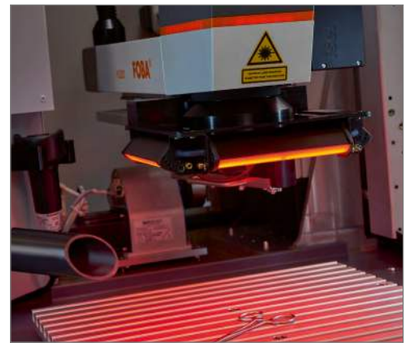
→ **IMP: Values**

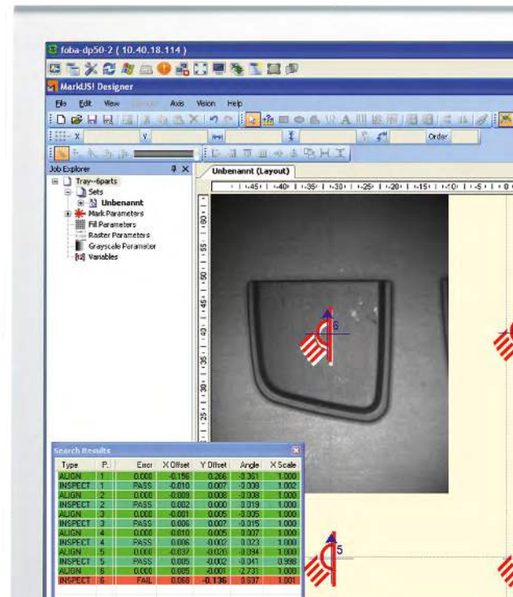
+ *Ideal for automated processing*
+ *Consistent high processing quality*
+ *Higher accuracy*
+ *Increased efficiency*
+ *Increased productivity*
+ *Fewer non-conforming parts*

Verification report: Due to bumps on the surface of the raw material, part #6 failed the inspection, the Y position exceeded the 0.1mm tolerance.

Polymer concrete workstations

The M-Series workstation's polymer concrete slab is float-mounted on the machine frame. As a result, all M-Series workstations are insensitive to variations in temperature and external vibrations and ensure **process reliability and stability.**





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FOBA Y-Series Fiber Laser Markers

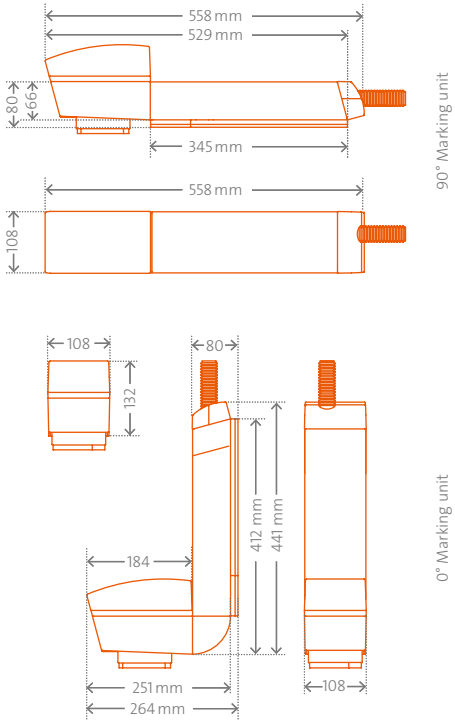
Technical Data

Available laser systems (fiber marking lasers)

Y.0100, Y.0200, Y.0300, Y.0500, Y.1000, Y.0201, Y.0050-cw, Y.0100-cw

Marking features

Marking head	CP10 with various precision optics for focusing (f = 100/163/254/420 mm)
Marking field*	Various fields, ranging from 60 x 76 mm² (f = 100 mm) up to 315 x 368 mm² (f = 420 mm)
Marking speed*	Up to 1,000 characters/sec.* (up to 1,200 characters/sec.* with High-S tuning)



Laser sources

Type	**Pulsed Ytterbium fiber lasers (Yb):** Y.0100 (10W), Y.0200 (20W), Y.0300 (30W), Y.0500 (50W), Y.0201 (20W), Y.1000 (100W), several pulse frequency ranges, wavelength 1064 nm **CW Ytterbium fiber lasers (Yb):** Y.0050-cw (5W), Y.0100-cw (10W), wavelength 1064 nm
Laser class	4 (according to IEC 60825-1)

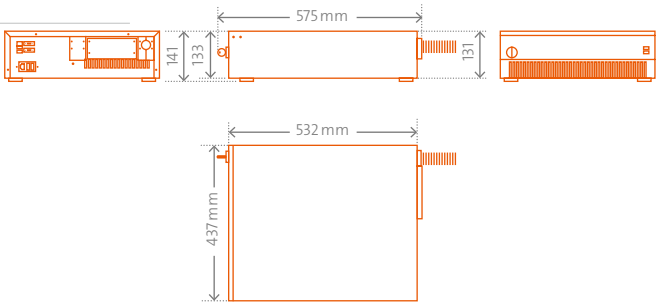
Interfaces

→ PC software FOBA MarkUS and FOBA Draw (on separate, external, optional Windows 10 PC)
→ TCP/IP, Profibus, Profinet, EtherCAT

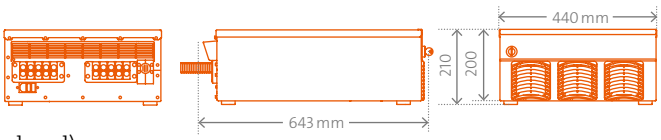
Supply

Electrical requirements	L/N/PE 100 – 240 VAC, 50/60 Hz
Power consumption	Y.0100, Y.0200, Y.0300, Y.0201: 400 VA Y.0500, Y.1000: 700 VA
IP rating	→ Marking unit IP54 → Supply unit IP21 (Y.1000 IP22)
Cooling	Air-cooled, auto overheat protection
Temperature	5 – 40 °C
Humidity	10 – 90 %, non-condensing
Weight	→ Marking unit ~ 8 kg → Supply unit ~ 20 kg (Y.1000 ~ 25 kg)

Supply unit Y0XXX



Supply unit Y.1000



Scope of delivery

→ Marking laser with selectable tunings (High-Q and High-S tuning) and pilot laser

Options, accessories

→ IMP camera (integrated in CP10 marking head)
→ Lighting for camera systems IMP, Point & Shoot
→ Exhaust systems

* Depends on the application

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