

KEYENCE

NEW 3-Axis Fiber Laser Marker

MD-F3000 Series



30W The World's Smallest
3-Axis Control
Fiber Laser Marker



 **3-Axis**
30W Fiber Laser Marker

30W high-power marking realized in the world's smallest laser marker

The world's smallest* laser marker with a fanless architecture is possible due to original technology developed by KEYENCE.

The MD-F Series is a dramatic advancement in the evolution of direct part marking.

* As of April 2009, derived by internal market research.





MD-F Series



3-Axis

World's smallest fanless marking head

Space saving installation requires less than half the size of conventional models



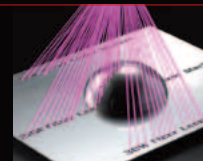
High-power 30W output

Significantly improved processing times for metal targets



3-Axis controls

High accuracy marking on complex 3D targets



Built-in power monitor

Easy preventive maintenance without external devices



Global model

Reliable design that meets global standards



3-Axis Fiber Laser Technology

What is a fiber laser?

A fiber laser marker utilizes a fiber optic cable that has been doped with Yb (Ytterbium) as a laser generating medium.

The fiber laser doesn't require an amplifier and offers higher performance compared to solid-state lasers, making it possible to decrease the size of the marker. A high light conversion ratio allows for decreased power consumption compared to conventional laser markers.

The MD-F Series combines a "high-power 30W output" and "naturally-cooled fanless marking unit" by maximizing the cooling effect using original technology developed by KEYENCE. This brings dramatic improvement to marking time and quality in most applications.



Power monitor

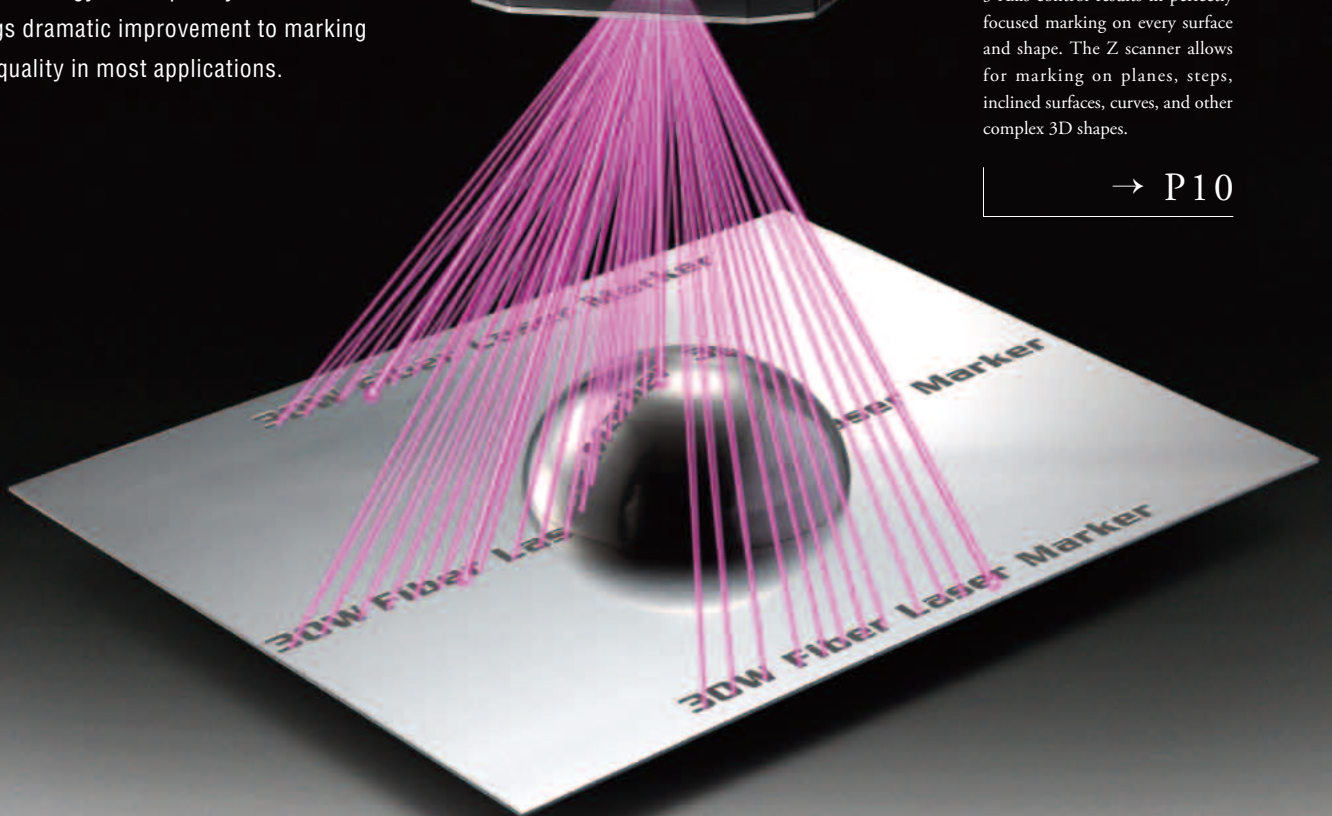
The MD-F Series measures the marking energy instead of the laser diode (LD) intensity. Thus, the MD-F Series can perform analysis on every mark, therefore, providing a constant, stabilized laser power and reliable preventive maintenance.

→ P9

Z scanner

3-Axis control results in perfectly focused marking on every surface and shape. The Z scanner allows for marking on planes, steps, inclined surfaces, curves, and other complex 3D shapes.

→ P10



Characteristics of a fiber laser

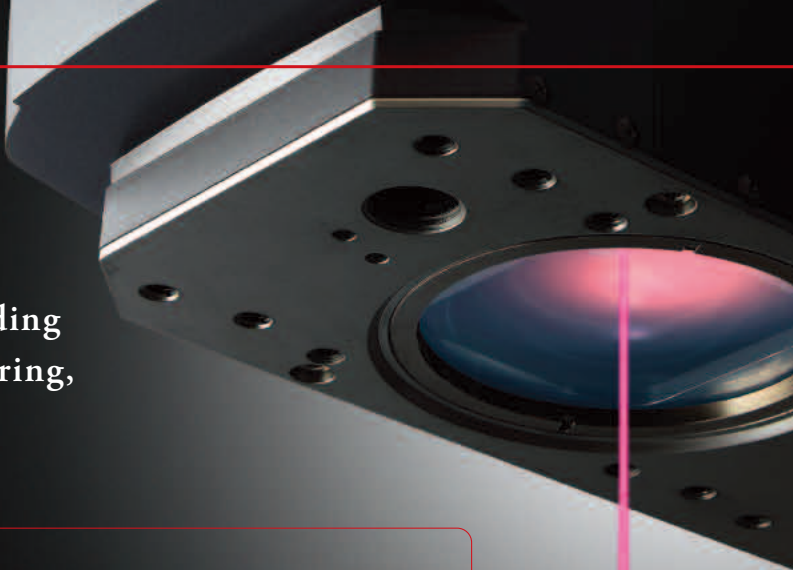
High optical conversion ratio

High beam stability

Efficient cooling

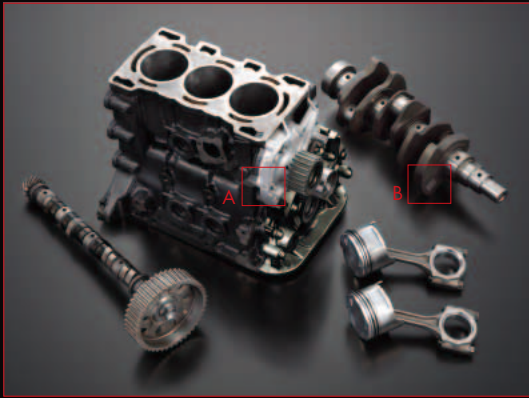
Reduced size

The high-power fiber laser marker plays an important role in every industry including the automotive, precision part manufacturing, and medical industries.



APPLICATIONS

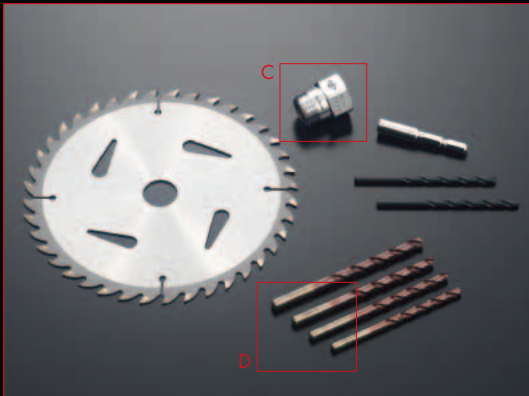
Automotive parts



Precise 2D codes can be marked on products at high speed, which greatly contributes to improved productivity for management of manufacturing history and process controls.



Precision metal components



For precision metal components, it is ideal to produce easy to read, black markings. The MD-F Series can generate highly-visible black markings while minimizing surface damage.



Medical equipment



With 2D codes, reliable distinct marks can be provided not only for the manufacturing history, but also for tracking equipment through the sterilization process, usage history, storage, and maintenance.



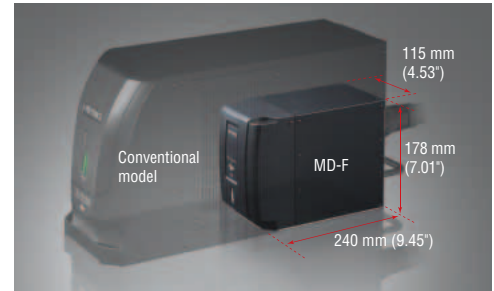
World's smallest fanless marking unit

KEYENCE's unique fanless marking technology provides for more stability, increased productivity, and more flexible mounting possibilities compared to conventional laser markers.

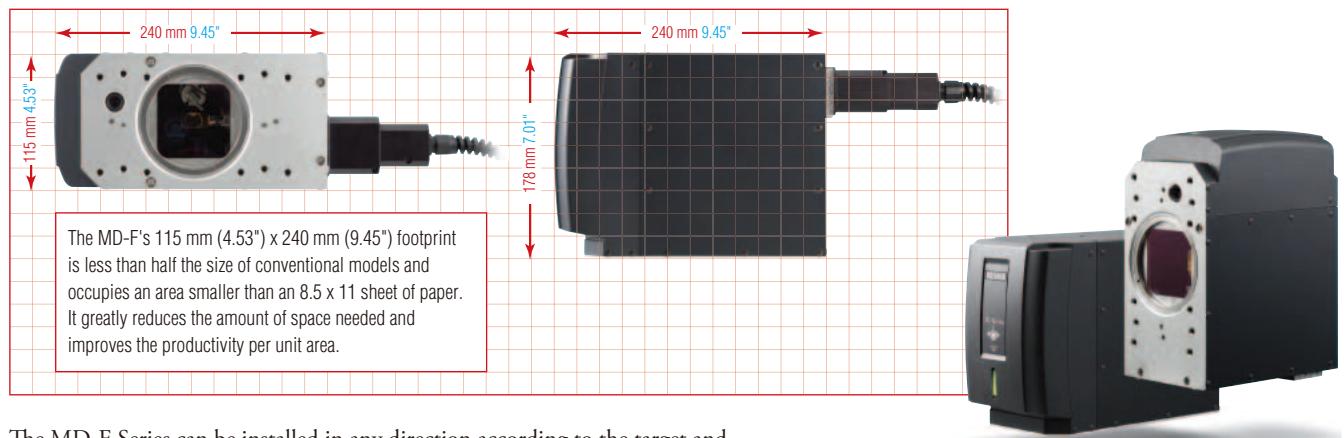


The world's smallest marking unit

The MD-F Series has a super compact design that comes with a footprint that is one third the size of conventional markers with greater mounting flexibility.



The MD-F Series markers allow for flexible installation in any orientation.



The MD-F's 115 mm (4.53") x 240 mm (9.45") footprint is less than half the size of conventional models and occupies an area smaller than an 8.5 x 11 sheet of paper. It greatly reduces the amount of space needed and improves the productivity per unit area.

The MD-F Series can be installed in any direction according to the target and production line, maximizing the advantage of its compact body.

“Fanless marking unit” realizes stable operations even in harsh environments.

The natural air cooled system developed by KEYENCE offers a completely sealed, fanless structure that is not affected by ambient temperatures. The optical components inside of the marking unit are fully protected by a special sealant that protects the unit from harsh environments.

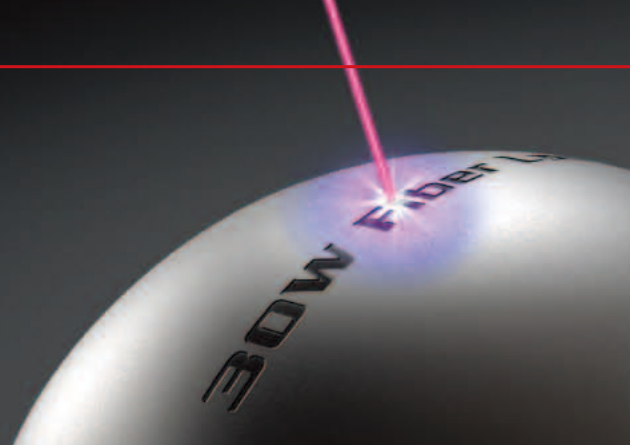


Easily replaceable “lens protection filter” *Optional

An easy to remove/replace protective lens filter is available as an optional accessory. This filter provides added protection from surrounding environments and reduces lens maintenance.

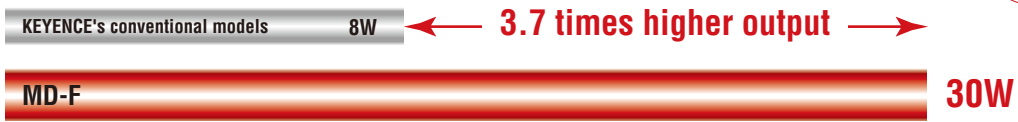


30W | From laser marking to laser engraving



The MD-F Series provides for high-power 30W marking that is 3.7 times higher than KEYENCE's conventional models, making it possible to perform high-speed marking on metal targets. Processing times and productivity are drastically improved.

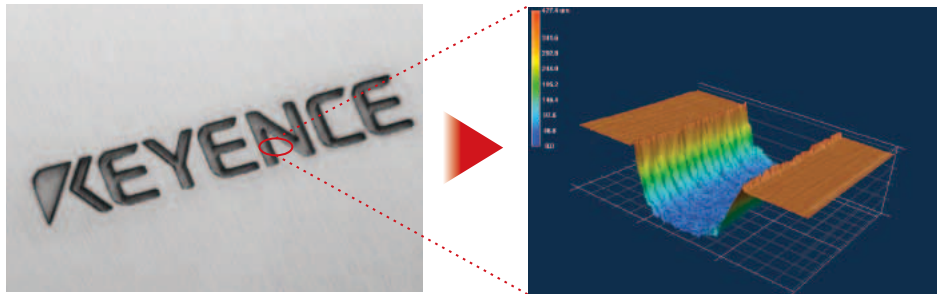
3.7 times higher power



Remarkable improvements in marking time

Deep engraving

This 30W fiber laser marker allows for deep engraving that is typically only possible with a marking press or engraving device. The MD-F Series expands marking possibilities as a "laser engraving machine".



Annealing (black marking)

The MD-F Series allows for high-speed marking on products which require minimal surface damage such as bearings and industrial tools. Significant improvements in productivity can be expected since the MD-F Series can normally process targets at least twice as fast as conventional KEYENCE laser markers due to its 3.7 times higher output power. In addition, the accurate and simple defocus function based on the 3-Axis controls allows for flexible, clear marking at high speed.



Intelligent Power Monitor

Visible, preventive maintenance realized

The MD-F Series has a built-in laser power monitor in this world's smallest marking unit. Thus, external devices are no longer necessary since it is now possible to do easy and accurate measurement of laser outputs without making contact with the equipment. This makes on-site preventive maintenance easy for any operator and will ensure that each mark is made with the same quality and consistency, regardless of the age of the marking head.

Automatic laser power check

The power monitor displays the actual marking power output instead of the LD intensity, which allows users to precisely monitor the state of the unit.



Power check examples

Measure with an external device



Before

Approx. 15 to 20 min.

- ▶ Open the safety cover
- ▶ Set the laser power meter
- ▶ The measured results have individual variations
- ▶ Change the jig

Built-in power monitor



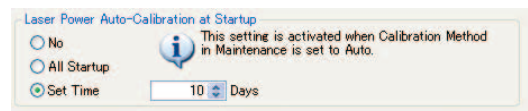
After

Approx. 10 sec.

- ▶ No need to change tools
- ▶ Easy measurement on a PC
- ▶ The measured results have no individual variations

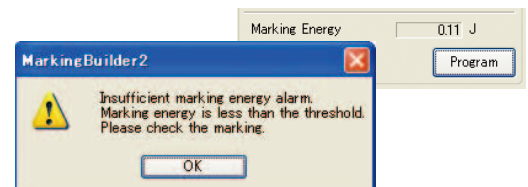
Automatic Calibration

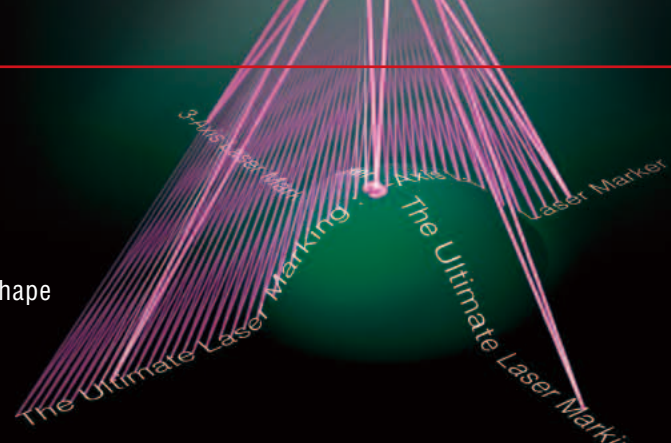
Calibration is automatically done at a preset timing so that the marking output maintains its initial power. As a result, daily maintenance is no longer necessary and optimum output is constantly maintained.



Marking Energy Check

Energy can be checked after each marking and an alarm is output when the marking energy drops below a specified threshold value. This function is the ultimate preventive maintenance and is only possible because of the built-in power monitor.





Flexible 3D marking

The Z-axis controls allow for precise marking on any surface or shape

Precise 3D marking is possible on complex shapes with 3-Axis marking controlled by the Z-axis scanner. With the 3D configuration software, marking on any target surface is easily programmed.

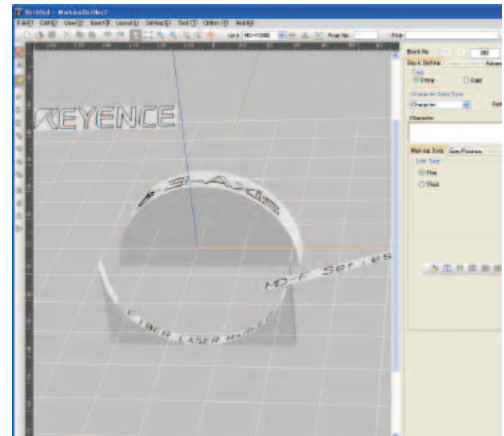
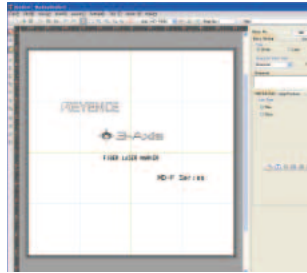
Easy 3D marking



Precise marking can be accomplished without distortions, even on curved surfaces.

(With the optional software: MB-H3D2)

The 3D configuration software allows users to precisely lay out what is to be marked on any shaped target in the 3D edit screen. Since it is possible to mark anywhere within the 3D marking field, mounting constraints can also be accounted for in the laser marker program adding flexibility in the placement of marking equipment on the production line.



Z-MAP Creator

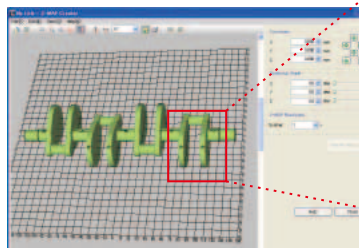


Import the product's 3D CAD data (STL) into Marking Builder.

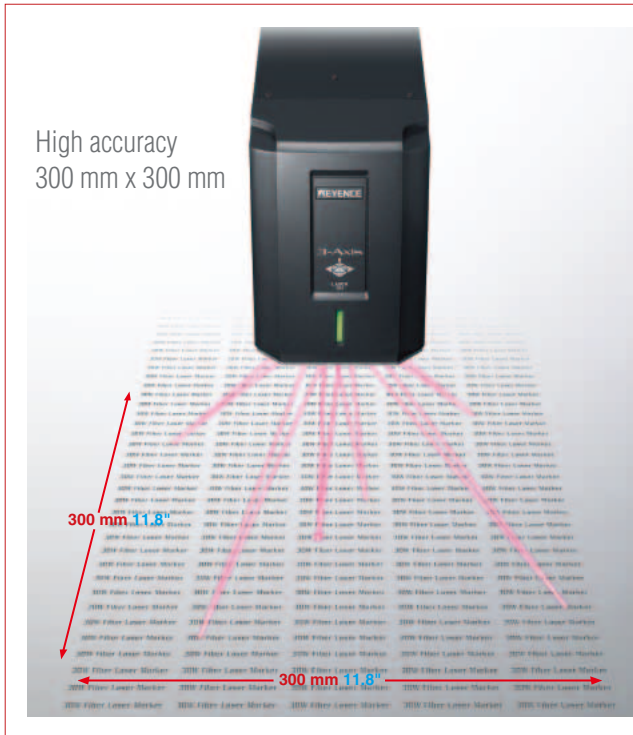
(With the optional software: MB-HZM)

Using 3D CAD data (STL format), the actual profile of the target can be imported into Marking Builder. The user can then lay out marks anywhere on the custom target.

Perfectly focused marks are able to be applied to any surface such as curves and inclined surfaces. Uninterrupted marking can be performed even on different surfaces without changing jigs.



Wide area

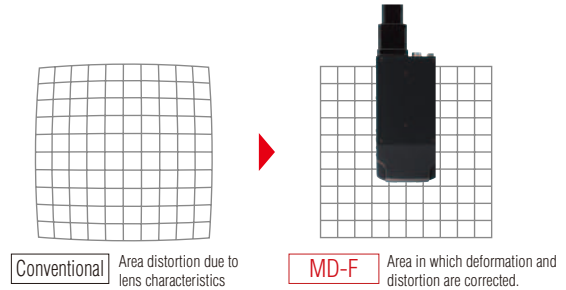


The MD-F Series provides precision marking for up to a 300 mm (11.8") x 300 mm (11.8") area. The Z-axis control maintains perfectly-focused marking throughout the entire marking field without distortion.

The installation position correction function allows for the correction of the marking unit inclination in the 3D edit screen after a target is set without the need for mechanical adjustment.

No misalignment or faint marking even over a wide area

Problems associated with the properties of the F0 lens used in conventional systems have been eliminated, thus characters stay clear and crisp over the entire marking area.



Spot variable sample marking function

In addition to the traditional combination of laser power, marking speed and Pulse frequency, the spot variable sample marking function features a useful feature that marks characters while changing the spot size (focal length). The optimum marking condition can be determined from the sample marking results. Even beginners can quickly find the best marking condition for difficult mark settings such as shallow marking on electronics components (resins) or black marking on tools (metals).



Traditional sample marking function

The spot size is fixed. Only the laser power, marking speed, and Pulse frequency can be set.

Variable spot sample marking function

In addition to the traditional functions, it is possible to set various conditions while changing the spot size.

Multiple Guide Laser Function

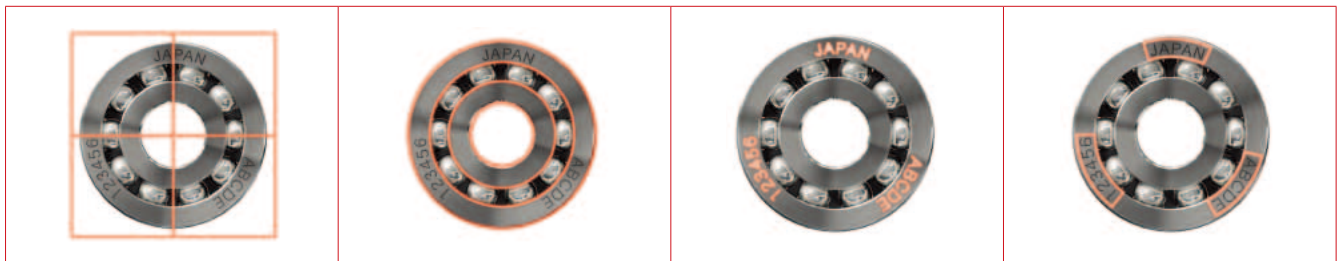
The multi-guide laser function scans a visible red laser beam at high speed to display the marking area and characters on the actual target. Choose to project the entire marking area, the exact position of each mark, or the shape of the target. Utilizing the guide laser will ensure the markings will never be out of position.

Area guide laser
(Available area for marking)

Workpiece image guide laser
(Profile of a marking target)

Guide laser
(one-time or continuous marking)
(Actual marking characters)

Block frame guide laser
(Character range to mark)



Marking Builder 2

The easy-to-use editing software tool that allows users to create their own custom marking layouts.



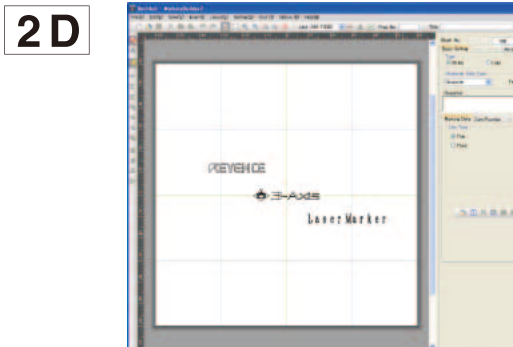
Marking Builder 2 (2D&3D) *Optional



Marking Builder 2 is a dedicated, easy-to-use editing software which allows for more flexible 2D and 3D marking. This software allows the user to create highly precise markings without complex editing.

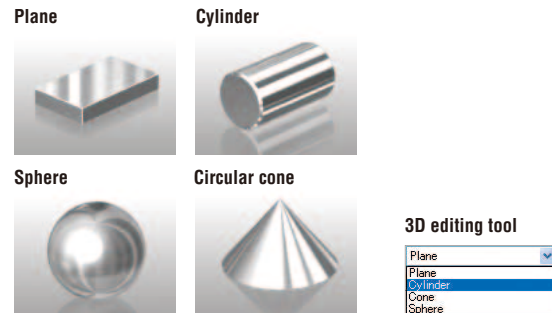
STEP 1

Lay out the marks in the 2D edit screen



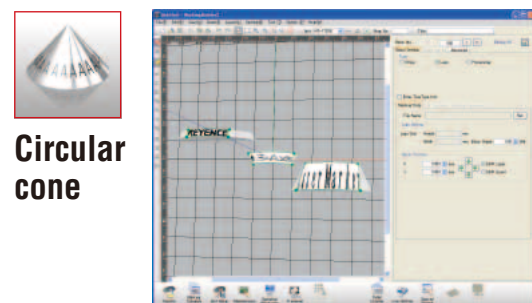
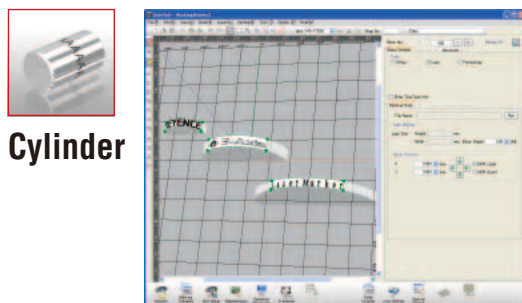
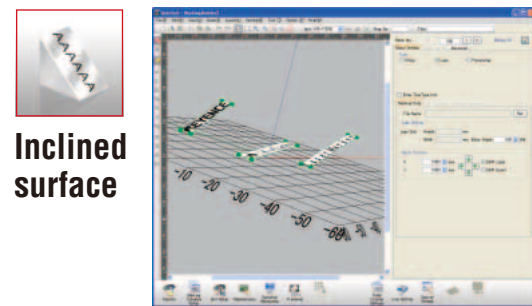
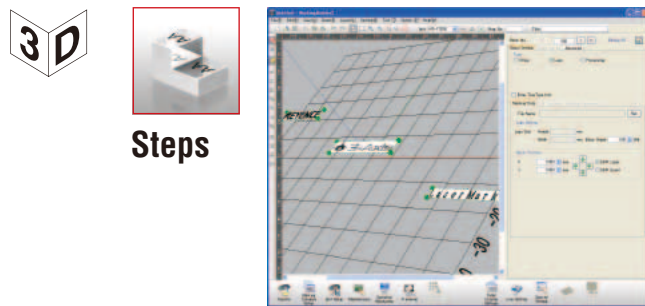
STEP 2

Select from the four standard shapes: plane, cylinder, sphere, and circular cone.



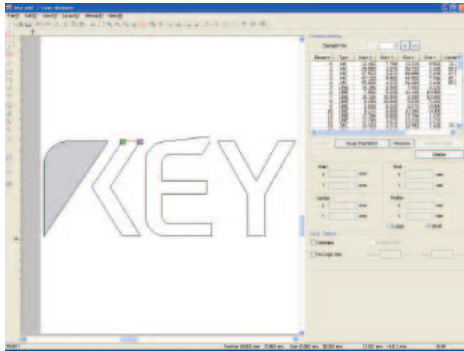
STEP 3

Switch to the 3D edit screen with just one click and fully manipulate in 3D.



Logo Designer *Optional

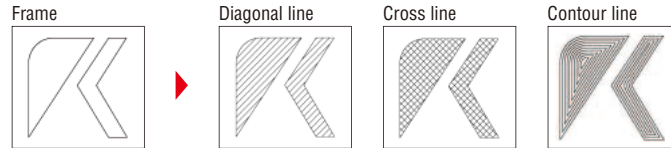
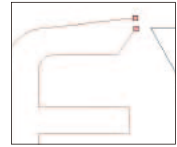
Logos can be further manipulated by adding the Logo Designer software package to Marking Builder 2. It allows for easy change-over of various patterns by just setting the parameters when creating a specific mark or processing pattern. Thus, it helps to always create the best marking in the shortest time.



It is possible to display start coordinates of the figure you are editing. Stroke order can also be changed freely.

Various hatching function

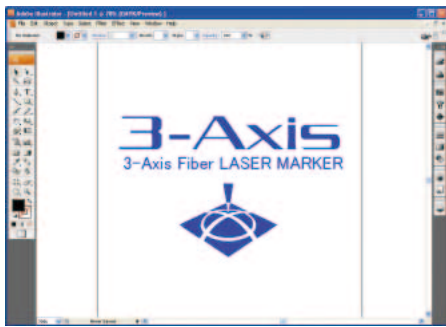
This function allows for easy editing in the software without the need to use CAD for logos, etc. In addition, an ideal hatching pattern can be selected including diagonal lines, cross lines, and contour lines according to the target to be marked.



Adobe Illustrator Plug-in * Included with Logo Designer

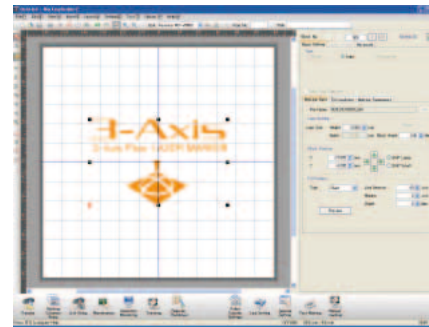
A logo created with Adobe Illustrator can be directly imported into the Marker Builder 2 software using the Illustrator Plug-in. The imported logo designs can be fully edited and hatched using the Logo Designer software.

Create a logo with Adobe® Illustrator®



Create a design with Adobe Illustrator.

The logo can be directly imported into Marking Builder

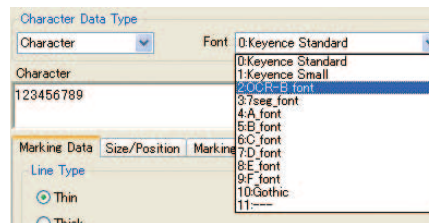
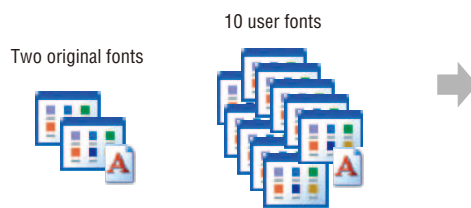


Hatching can be easily done on the Marking Builder screen.

*Adobe® Illustrator® is a registered trademark of Adobe Systems Incorporated

Font Architect

In addition to the two pre-installed original system fonts, ten additional fonts can be installed, allowing for greater variations in designs.



The selected font can be changed to one of the registered system fonts. Users can choose multiple fonts for one target.

Operations according to the working environment

The 8.4-inch large-size color LCD touch panel allows for operation in a harsh environment where it is difficult to use a PC. The laser marker can also be operated with a commercially available monitor and mouse.



Touch panel console MC-P1 (Optional)



Can be operated with a commercially available monitor and mouse.

3-Axis Control Laser Marker Lineup

The best solution for applications

High-power engraving on metal components, high-speed contrast marking, etc.

3-Axis Fiber Laser Marker
MD-F3000 Series



Thin film processing and general purpose uses such as marking on resins, metals, etc.

3-Axis YVO₄ Laser Marker
MD-V9900A Series



Marking on resins, paper/wood, glass, and film processing

3-Axis CO₂ Laser Marker
ML-Z9500 Series



MARKING EXAMPLES

<p>■ Character size (Typical examples)</p>	<p>■ Logo mark</p>	<p>■ 2D code</p>	<p>■ GS1 DataBar</p>	<p>■ bmp/jpg data</p>
<p>0123456789 ABCDEFGHIJKLMNPOQRSTUVWXYZ</p>				
<p>0123456789 ABCDEFGHIJKL abcdefghijkl</p>	<p>■ Barcode</p>	<p>Data Matrix</p>	<p>(01) 04912345678904</p>	



SPECIFICATIONS

		Standard area	Wide area
Model	Marking unit (Controller + Marking unit)	MD-F3000W	MD-F3020W
	Console (sold separately)		MC-P1
Marking method		XYZ 3-axis simultaneous scanning method	
Marking laser		Yb: Fiber Laser (class 4 Laser product (IEC60825-1))* ³	
Pulse frequency	Wavelength	1090 nm	
	Output	30 W	
Guide laser/Working distance pointer		Semiconductor laser, Wavelength: 655 nm (class 2 Laser product (IEC60825-1))* ³	
Marking area		120 x 120 x 42 mm 4.72" x 4.72" x 1.65"	300 x 300 x 42 mm 11.81" x 11.81" x 1.65"
Standard working distance (± variable width)		168 mm (±21 mm) 6.61" (±0.83")	300 mm (±21 mm) 11.81" (±0.83")
Marking resolution		2 μm	5 μm
Scan speed		Max. 12000 mm 472.4"/s	Max. 8000 mm 315"/s
Character type	Font	KEYENCE original font (number, letters, katakana, hiragana, kanji)/User font/True Type font	
	Barcode	CODE39/TF/2of5/NW7 (CODABAR)/JAN/CODE128	
	2D Code	QR code/Micro QR code/DataMatrix (ECC/GS1 DataMatrix)	
	GS1 DataBar	GS1 DataBar/GS1 DataBar CC-A/GS1 DataBar Stacked/GS1 DataBar Stacked CC-A/GS1 DataBar Limited/GS1 DataBar Limited CC-A	
	Logo image	Custom character font and logo CAD data (DXF), BMP/JPEG/PNG/TIF	
Machinery operation		Fixed point, straight line, dashed line, circle, oval	
Marking conditions	Marking style	Stationary marking, movement marking (constant, encoder)	
	Character size (marking height/width)	0.1 to 120 mm 0.004" to 4.724"	0.1 to 300 mm 0.004" to 11.81"
	Program	No. of registered programs	Max. 2000 programs
		No. of program blocks	256 blocks
I/O (Input-output)		Terminal block I/O, MIL connector I/O	
Interfaces		RS-232C/RS-422A/USB 2.0* ¹	
CF memory card slot		Compact flash memory card* ²	
Marking unit installation direction		All directions	
Marking unit cable length		5 m 16.4'	
Cooling method		Controller: Forced air cooling Head: Natural air cooling	
Rated voltage		100 to 120 VAC/200 to 240 VAC, 50/60 Hz	
Rated power consumption		550 VA	
Overvoltage category		II	
Pollution degree		2	
Environmental resistance	Ambient temperature for storage	-10 to 60°C (No freezing) 14 to 140°F	
	Ambient temperature for usage	0 to 40°C 32 to 104°F	
	Ambient humidity for storage		
	Ambient humidity for usage	30 to 85% (No condensation)	
Weight	Controller	27.6 kg	
	Marking unit	6.5 kg	
	Console	2.0 kg	

*1 The USB port is dedicated for PC software. *2 SanDisk cards are recommended. *3 The laser classification for FDA (CDRH) is implemented based on IEC 60825-1 in accordance with the requirements of Laser Notice No.50.

PC SOFTWARE SPECIFICATIONS (SOLD SEPARATELY)*⁴

Model		Overview
Marking Builder 2 (2D)	MB-H2D3-DVD	2D setting and editing software (focal distance, tilt correction, spot variation, distance pointer adjustment)
Marking Builder 2 (3D)* ⁵	MB-H3D2	3D setting and editing software (marking on plane, cylinder, cone, or sphere; Z-axis movement marking)
Logo Designer* ^{5,6}	MB-HLD	Software tool that converts DXF files into logo or custom character files and edits them.
Z-MAP Creator* ⁵	MB-HZM	Software tool that creates Z-MAP files from 3D CAD files (STL).

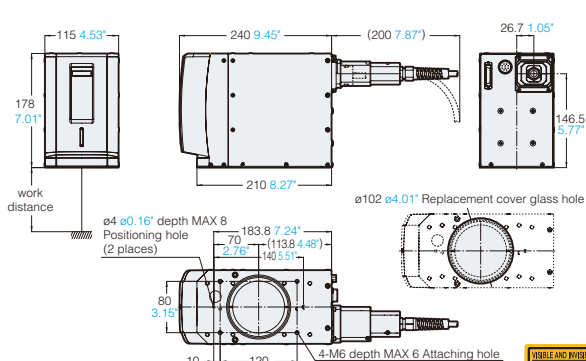
- *4 • Supported OS: Windows 7/Vista (SP1 or higher)/XP (SP3 or higher)
- Supported language: Japanese, English, Chinese (Simplified) and German (Chinese supports the simplified Chinese display, but does not support Chinese input.)
- For Windows 7/Vista, the 32 bit and 64 bit version are available. For Windows XP, only the 32 bit version is available.
- Windows is a registered trademark of Microsoft corporation in the U.S.A.

*5 2D setting and editing software MB-H2D3-DVD must be installed and the USB hardware key is required.

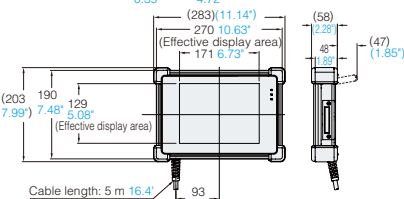
*6 Illustrator Plug-in Function supports Adobe® Illustrator® CS or higher. Adobe® Illustrator® is a registered trademark of Adobe Systems Incorporated.

DIMENSIONS

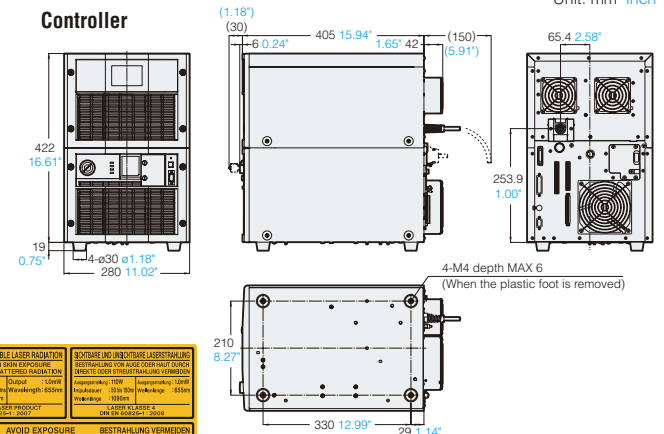
Head MD-F3000W/ MD-F3020W



Console MC-P1



Controller



MD-F3000 Series Safety precautions

- Before using the laser marker, be sure to refer to the User's Manual for thorough knowledge of the contents.
- Do not allow your eyes or skin to be exposed to a directly irradiated laser beam or a diffused reflection laser beam.

30W FIBER LASER MARKER

Global model

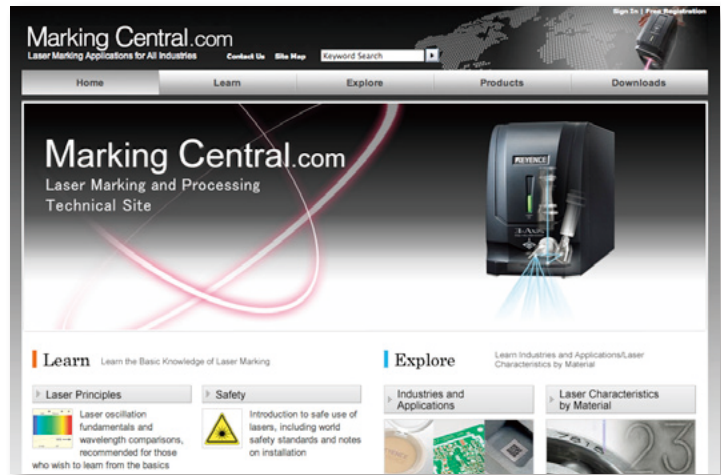
Reliable design that meets global standards



MARKING SOLUTIONS

www.marking-central.com

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SAFETY INFORMATION

Please read the instruction manual carefully in order to safely operate any KEYENCE product.

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