Panasonic

3D Control

FAYb Laser Marker

LP-M SERIES

FDA Conforming to FDA regulations

CE

HIGH POWER × 3D CONTROL × SAFETY

2019.06 | industrial.panasonic.com/ac/e/

Productivity and safety in one
New 3D fiber laser marker LP-M series

Since its release of fiber laser marker in 1999,
constantly evolving Panasonic products have contributed to improve productivity.
These days new safety standards are established and more strict safety measures are required,
because manufacturing equipment powered by laser is widely spread.
Safety functions included on the **LP-M** series comply with new safety standards.
The **LP-M** series contributes to establish safer equipment design, in addition to improve productivity.

HIGH POWER

The 40 W high-power laser enables deeper and faster marking and processing. Takt time reduction significantly improves productivity.

3D CONTROL

Mark based on the size or shape of a workpiece. Production lines are easy to design and stages can be changed smoothly.

FAYb Laser Marker

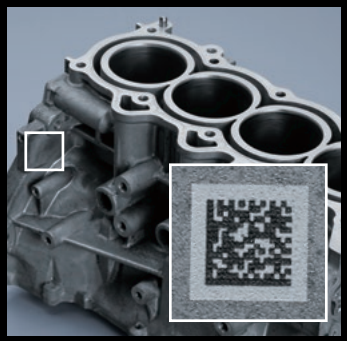
LP-M series

SAFETY

Redundant safety measures for controlling the hazard source（laser beam）make it easier to improve safety level.

HIGH POWER

Panasonic Industrial Devices SUNX's top-level 40 W high output FAYb laser marker marks or processes deeper and faster on metallic workpieces. Handles an expanded range of laser marker marking / processing applications.



Engine block［marking］

Connecting rod［marking］

Engine part［marking］

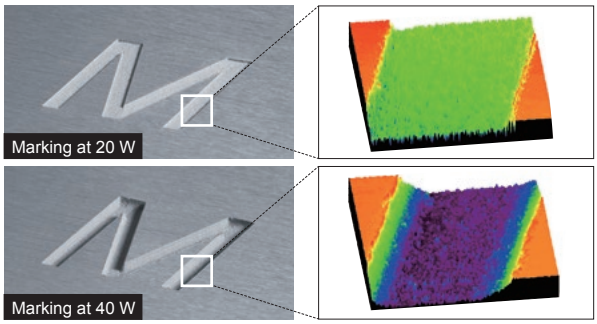
Gasket［coating removal］

High power laser for deep engraving and high-speed marking

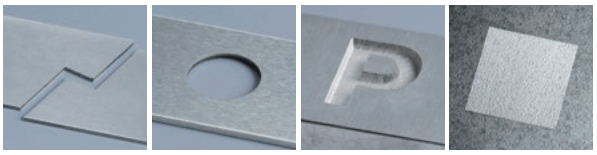
Deep engraving marking / laser processing

Allows deeper and sharper marking and processing to handle demanding applications.
No blade is used for high-quality, stable processing.

Deep engraving sample [image]



Laser processing sample [image]

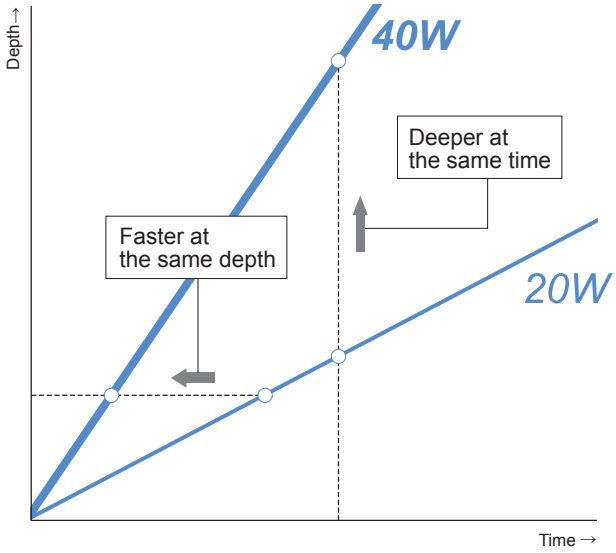


Cutting | Holing | Engraving | Surface processing

High-speed marking

The larger the energy amount sent to the workpiece, the faster and deeper the marking / processing.
Takt time reduction greatly enhances productivity.

Image of high-speed deep engraving



PLUS More **Environmental resistance**

Durable protective structure is a benefit in harsh environments containing dust and water

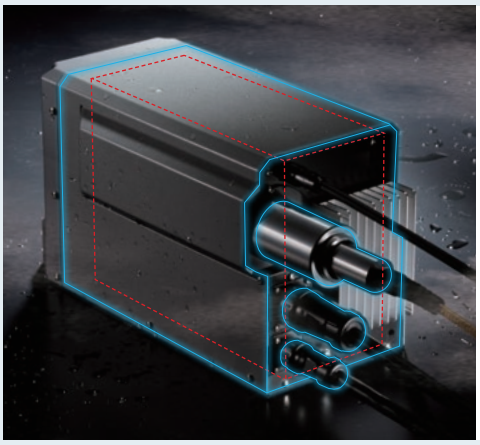
IP64 fanless small head

Fanless small head

Significant improvements in radiation performance enabled a small and fanless head design which is capable of high output.
Install with confidence, free from worry about fan clogs.

IP64 Head Protective Design

Employs an inner and outer layer Double Protective Design for better airtightness inside the head. The complete air tight seal prevents dust and water entering from any direction for stable operation on the production floor.



What is IP?

IP indicates the degree of protection from water, the human body, or solid foreign objects, based on IEC / JIS standards.

Dust does not enter the interior. (Completely prevented)

IP 6 4

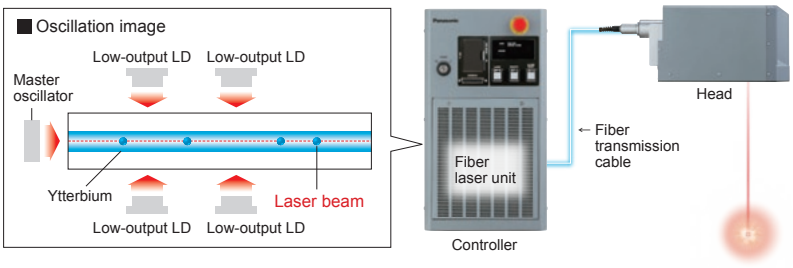
Does not receive adverse effects from water spray from any direction.

*Anti-dust / waterproof design as per conditions stipulated in IEC / JIS standards. *Parts must be attached correctly to realize the FAYb laser environmental resistance properties.

Principles and features of FAYb laser oscillation

In a revolutionary method, the FAYb laser amplifies a weak laser beam from a master oscillator as it passes through a fiber treated with the element Ytterbium to emit a strong laser beam. Conversion loss is minimal as the FAYb laser amplifies laser beams in the fiber and achieves an excellent beam-to-beam conversion efficiency of approximately 50%. Power consumption is minimized despite high output and contributes to reduced carbon footprint.

Weak pulse laser beams are amplified by absorbing low-output LD beams as they pass through the fiber.



3D CONTROL

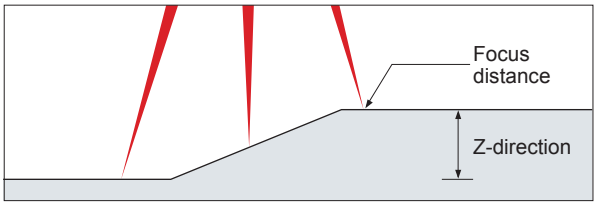
3D Control capability allows marking on various types of products and complicated shapes to meet a large number of application needs.
Enables the best marking on every product type.
The LP-M series contributes to production efficiencies, equipment miniaturization and reduced costs.

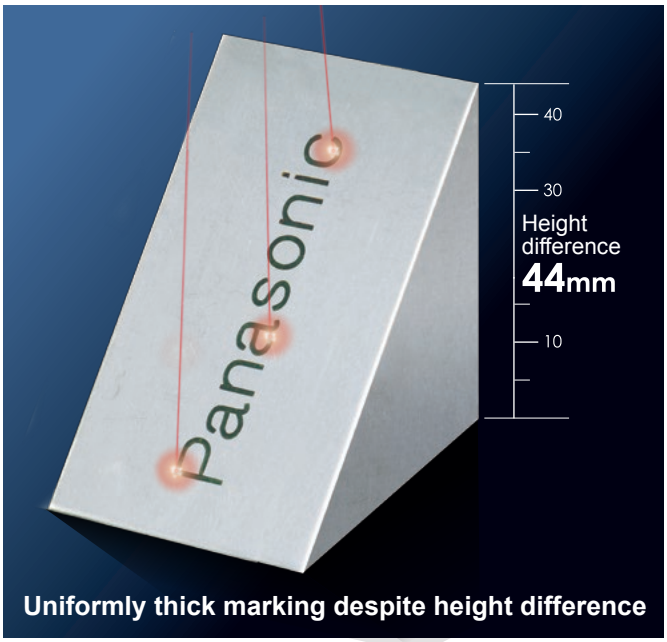
Optimum marking quality on every workpiece

High performance Z-axis stroke mechanism

The Z-axis stroke mechanism controls the laser beam focal point in the Z-direction to enable marking on an item with height differences. Marks clearly with no distortion on slanted, curved and stepped surface shapes. Spot average marking enables control of the laser beam spot diameter for uniform marking thickness and depth.

Variable control of focus distance via Z-axis stroke

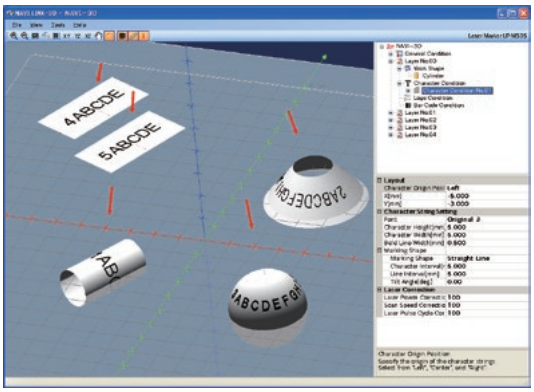




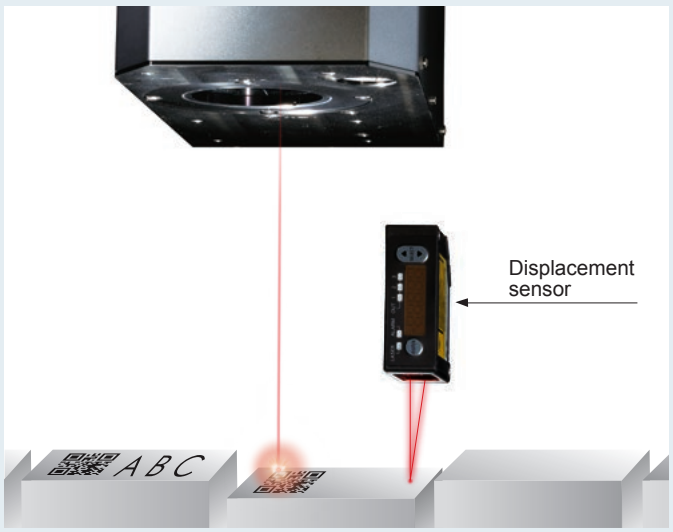
Uniformly thick marking despite height difference

Simple 3D settings: **NAVI LINK-3D** Optional

Easy-to-use software enables you to create marking data by simply overlapping a workpiece shape with the characters and shape data to mark. Check the workpiece from any angle on the image screen to make simple adjustments. For use in overseas factories, English is also available in addition to Japanese.



PLUS More **Marking stability features**



Use the displacement sensor for the best marking on every piece

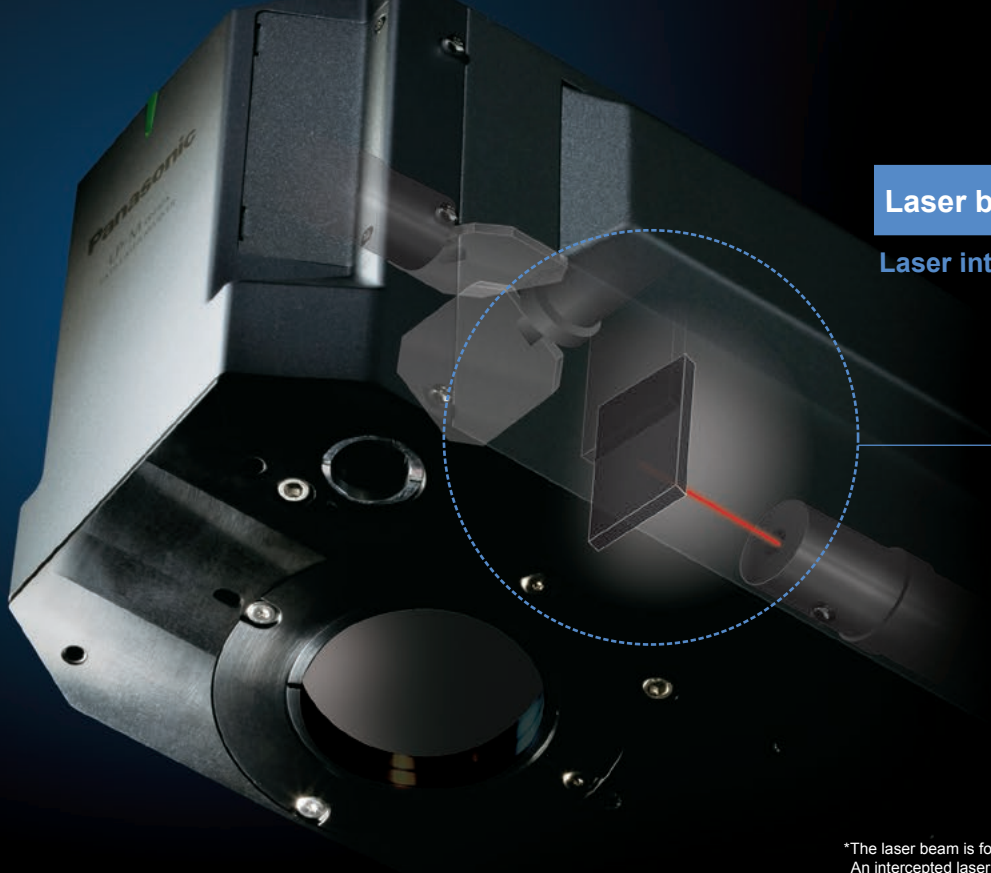
Displacement input

Varying workpiece heights during production causes discrepancies in printing quality. The **LP-M** series can measure workpiece height data directly with the displacement sensor. All workpiece heights can be checked before marking for stable production quality.

Sample marked at a position 2mm away from the correct height

Uncorrected

Corrected



Laser beam interception

Laser interception structure

*The laser beam is for illustration purposes.
An intercepted laser beam is not reflected.

SAFETY

Concern for machine safety has increased as globalization progresses.
A way to safely intercept or stop the laser beam, which is a hazard source in a laser device, is essential.
（Compliant with international standard ISO 11553-1）
Two newly mounted safety mechanisms improve both Productivity and Safety.

Stopping the laser power source

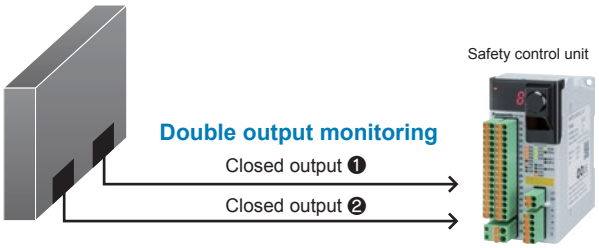
Duplicate interlock circuits

Two new functions simplify safe circuit design

Laser interceptor [-S type only]

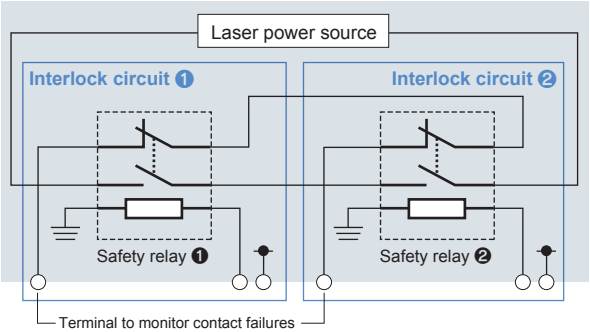
Durability has vastly improved since the first laser interceptor developed. Two outputs can be monitored to check laser interception. Safety is ensured even when the laser power source is on, preventing productivity losses.

Laser interception image



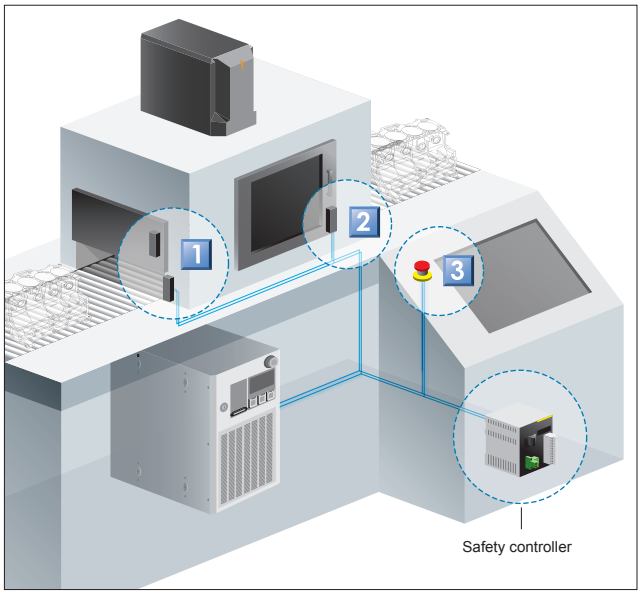
Duplicate interlock circuits

Mounted with 2 interlock circuits instead of one. A safety relay is also deployed to ensure the laser power source is stopped.



Safety control system structure

International standard ISO 13849-1 (JIS B 9705-1) regulates safety function of safety-related parts of control systems, and requires safeguards be taken for an entire system embedded with a laser marker.



1 Safeguards for the shutter where workpiece is loaded / unloaded

Safe structure with Laser Intercept Feature

Each time a workpiece is loaded or unloaded, the shutter opens and closes. When the shutter is open, the laser intercept mechanism closes to ensure safety. Impacts on production efficiency during mass production are avoided because the laser power source does not need to be stopped each time it opens or closes.

[Operation safety device] Safety magnetic switch, etc.

2 Safeguards for Maintenance Shutter

Safe structure with Laser Intercept Feature

The shutter opens and closes during maintenance or fine tuning. When the shutter is open, the laser intercept mechanism closes to ensure safety. Work efficiency during mass production is not lost because the laser power source does not need to be stopped each time it opens or closes.

[Operation safety device] Safety door switch, etc.

3 Safeguards for Emergencies

Safe structure with Interlock Circuits

In an emergency, forces the laser power source (hazard source) to stop.

[Operation safety device] Emergency stop switch

PLUS More **Useful, reassuring features to prevent accidents**

Reassuring features used in production

■ Marking energy measurement
Measures the power when marking, when outside a set range, uses error output to notify.

■ Broken line notification
Stops laser immediately if a severed fiber line is detected.

■ Erroneous irradiation detection
Stops laser immediately if unforeseen laser irradiation is detected.

■ Emergency stop switch
Also equipped to the laser marker controller. Can be stopped individually.

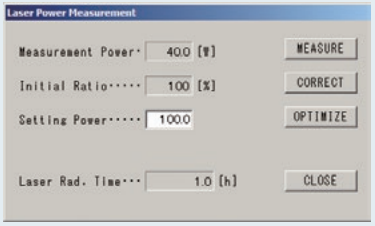
Convenient safety inspection functions

■ Laser output measurement
Measures the current laser output.

■ Laser output check
Monitor laser output attenuation from the time of purchase.

■ Laser output correction
Calibrate with a commercially available power meter.

■ Error history view
Displays error time, date and details.

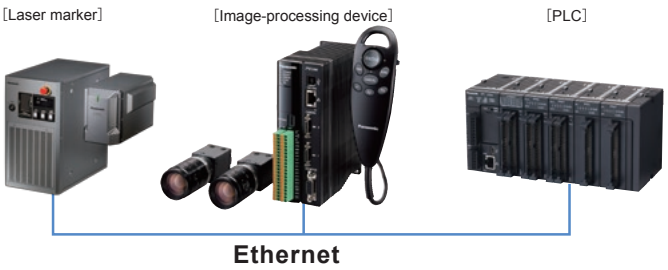


PLUS More **User-friendliness**

Multiple functions added to the design make work on the factory floor easier.

Supports Ethernet

Simple connection to multiple laser markers and peripherals.



PC software: laser marker NAVI plus

Includes PC software for simple configuration of marking data. Data can even be created off-site (Multiple languages supported). Package includes software to create logos, software to create fonts, and Adobe® Illustrator® Plug-In. Create any kind of data.

*Adobe® and Illustrator® are registered trademarks of Adobe Systems Incorporated.

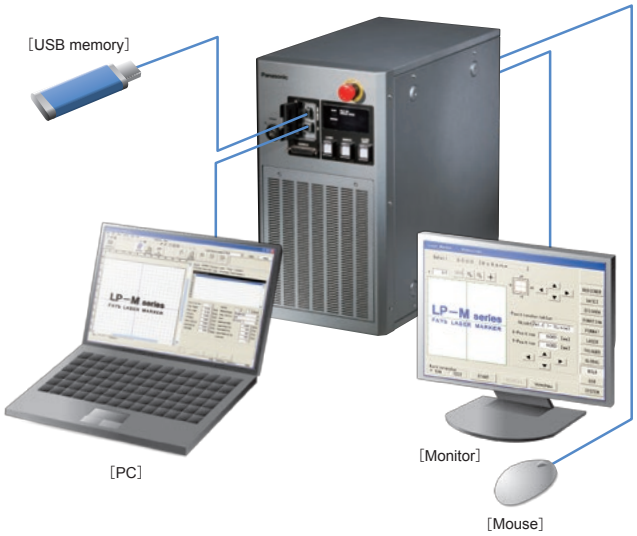
Monitor display

Connect a monitor and mouse to operate the unit using a large screen.

USB connector standard feature

Settings can be saved to a commercially available USB flash drive source to backup marking conditions, or copy data to multiple laser markers.

*Requires an operation check in advance.



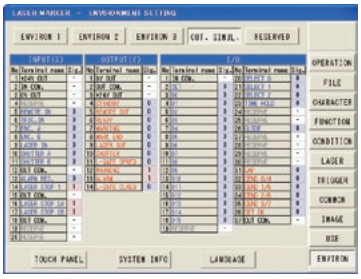
Multiple language support

Easily switch among Japanese, English, simplified Chinese, Korean and German.

*The console is optional.

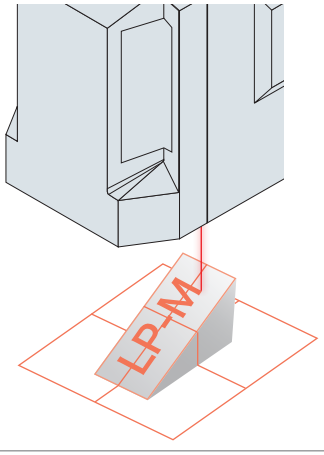
I/O check monitor

Connector I/O can be checked on a monitor. Signals can be quickly checked at equipment startup.



Guide image display

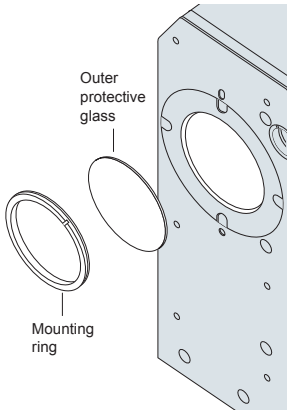
The marking area or characters to be marked are traced with a red light. Time required for marking can be measured in advance, aiding pre-marking check tasks.



Protective glass

The laser beam port is constructed of double-layered protective glass. The outer layer of protective glass is removable, and cleaning is easy. If an extra protective glass* procured in advance and used, the production line does not have to be stopped even during cleaning. The laser beam port is protected from dust or damage, reducing maintenance costs.

*Extra protective glass is optional.



Specifications

Model No.		LP-M500				LP-M200			
		LP-M500	LP-M500-S	LP-M505	LP-M505-S	LP-M200	LP-M200-S	LP-M205	LP-M205-S
Work distance		190 ±22 mm 7.480 ±0.866 in		220 ±22 mm 8.661 ±0.866 in		190 ±22 mm 7.48 ±0.866 in		220 ±22 mm 8.661 ±0.866 in	
Marking field		120 × 120 mm 4.724 × 4.724 in		220 × 220 mm 8.661 × 8.661 in		120 × 120 mm 4.724 × 4.724 in		220 × 220 mm 8.661 × 8.661 in	
Marking laser		Class 4 Yb fiber laser, λ= 1,064 nm 0.0419 mil laser							
	Average output*1	40 W ±5 % (pulse oscillation)				16 W ±5 % (pulse oscillation)			
Guide laser / pointer		Red semiconductor laser, λ= 655 nm 0.026 mil, Class 2 laser: Maximum output 1 mW or less							
Scanning method		X-, Y- and Z-axis directions, 3D scanning method							
Scan speed		Maximum 12,000 mm/sec. 472.441 in/sec.							
Character settings (character height, width)		0.1 to 120 mm 0.004 to 4.724 in (configurable in 0.001 mm 0.0004 in steps)		0.1 to 220 mm 0.004 to 8.661 in (configurable in 0.001 mm 0.0004 in steps)		0.1 to 120 mm 0.004 to 4.724 in (configurable in 0.001 mm 0.0004 in steps)		0.1 to 220 mm 0.004 to 8.661 in (configurable in 0.001 mm 0.0004 in steps)	
Setting range (Straight Line, Proportional, Justify)	Character spacing	0 to 120 mm 0 to 4.724 in		0 to 220 mm 0 to 8.661 in		0 to 120 mm 0 to 4.724 in		0 to 220 mm 0 to 8.661 in	
	Line pitch								
Setting range (Arc)	Radius	0 to 999.999 mm 0 to 39.370 in (configurable in 0.001 mm 0.0004 in steps)							
	Angle	-180° to +180° (configurable in 0.01° steps)							
	Line pitch radius	0 to 120 mm 0 to 4.724 in (configurable in 0.001 mm 0.0004 in steps)		0 to 220 mm 0 to 8.661 in (configurable in 0.001 mm 0.0004 in steps)		0 to 120 mm 0. to 4.724 in (configurable in 0.001 mm 0.0004 in steps)		0 to 220 mm 0 to 8.661 in (configurable in 0.001 mm 0.0004 in steps)	
Logo data		VEC*2, DXF, BMP, HPGL, JPEG, AI, EPS							
Marking shape		Straight Line, Arc, Propotional, Justify							
Character types		English uppercase letters, English lowercase letters, numerals, katakana, hiragana, kanji (JIS No. 1 and No. 2 standards), symbols, user-registered characters (up to 50)							
Barcodes		CODE39, CODE128, ITF, NW-7, EAN / UPC, GS1 DataBar (GS1 DataBar Limited, GS1 DataBar Stacked, etc.), GS1 composite code (GS1 DataBar Limited CC-A, GS1 DataBar Stacked CC-A, GS1-128 CC-A, etc.)							
2D codes		QR Code, Micro QR Code, Data Matrix, GS1 Data Matrix							
I/O port		I/O terminal, I/O connector, interlock connector, displacement sensor input connector, laser gate terminal (**-S** type only)							
Serial communication interface		EIA-RS-232C, Ethernet							
Displacement sensor input		Analog current input (4 to 20 mA)							
Cooling method		Head: Naturally air cooling, Controller: Forced air cooling							
Power supply		90-132 V AC, or 180-264 V AC (including voltage fluctuation range of ±10 %) , 50/60 Hz (Auto-switching)							
Power consumption		580 VA or less (100 V AC), 720 VA or less (200 V AC)				390 VA or less (100 V AC), 510 VA or less (200 V AC)			
Laser gate		Not equipped	Equipped in Head	Not equipped	Equipped in Head	Not equipped	Equipped in Head	Not equipped	Equipped in Head
Ambient temperature		0 to +40 °C +32 to +104 °F (Controller, Head) (No dew condensation or icing allowed)							
Ambient temperature for storage		-10 to +60 °C +14 to +140 °F (Controller, Head) (No dew condensation or icing allowed)							
Ambient humidity		35 to 85 % RH (Controller, Head) (No dew condensation or icing allowed)							
Protection degree		IP64*3							
Applicable standards		FDA regulations,CE marking,GB standard,KC mark							
Net weight		Head: 12 kg approx., Controller: 28 kg approx.							
Supported OS*4	Laser Marker Utility*5	Microsoft Windows® 10 Pro (32-bit / 64-bit) / 8.1 Pro (32-bit / 64-bit) / 7 Professional SP1 (32-bit / 64-bit)							
	NAVILINK-3D*5 (sold separately)	Microsoft Windows® 10 Pro (32-bit / 64-bit) / 8.1 Pro (32-bit / 64-bit) / 7 Professional SP1 (32-bit / 64-bit)							

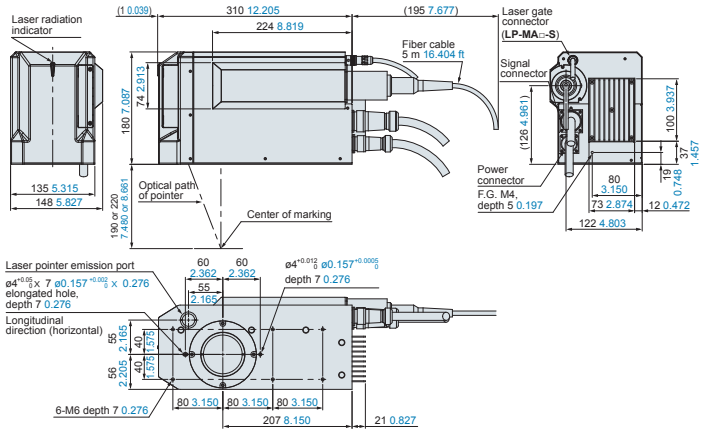
*1 Output at product processing edge (at configured power of 100, standard factory settings).
*2 File format (logo file) that can be used by the laser marker.
*3 The head is IP64 only in regions where an electrical or optical part is deployed.
*4 OS versions of which Microsoft has ended support are excluded.
*5 To use Export Vec, Adobe® Illustrator® must be installed. Please contact us about the version corresponding to Adobe® Illustrator®. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

China models are available, too.Please contact our sales office.

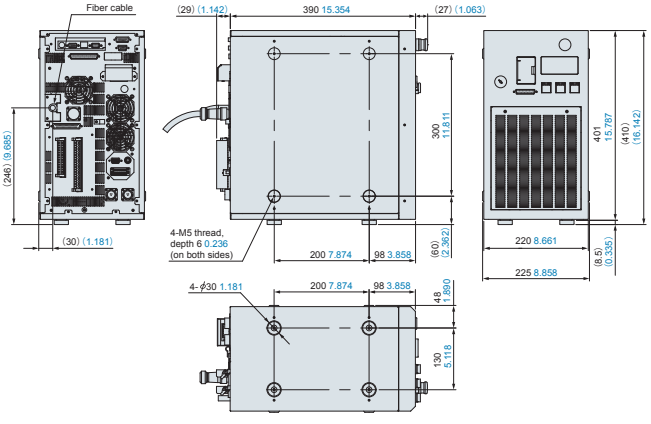
Dimensions [Unit: mm in]

*The CAD data with the dimensions listed can be downloaded from our website.

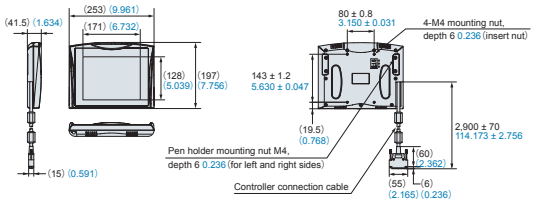
Head



Controller



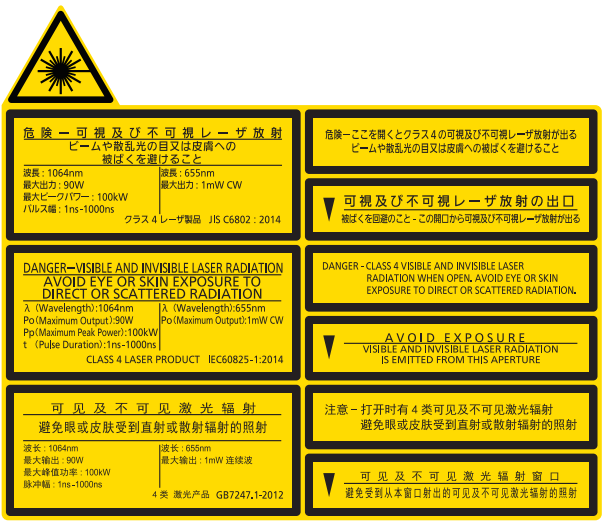
Console **LP-ADP40** [sold separately]



Precautions for Proper Use

Laser safety

- This product is classified as a Class 4 Laser Product in IEC/JIS/FDA regulations 21 CFR 1040.10 and 1040.11. Never look at or touch the direct laser beam and its reflection.
- The following labels are attached to the **LP-M500** series. Handle the product according to the instruction given on the warning labels.
  (Warning labels are not shown in the product photographs in this catalog.)
- The laser used by this product generates infrared light that is invisible to the human eye. Use particular caution when the laser is operating.



Maintenance

- **Air filter**: Regularly clean the air filter attached to the FAYb Laser Marker to maintain cooling effects.
- **Laser pointer emission port**: Dust or chips adhering to the laser pointer emission port may affect the printing quality or seriously damage the laser marker. Clean the laser pointer emission port regularly.

Recommended use of a dust collector

- Depending on the object being marked, harmful gasses or smoke that have a detrimental effect on the human body or the laser marker may be generating during marking. If your application falls under this description, use a dust collector.

*For more information, contact your sales representative.

Laser Marker Lineup

A full series for every application.

High-power output & Environmental resistance

FAYb Laser Marker

LP-S SERIES

The 42 W high-power output enables high-speed deep engraving. Combining IP67G and detachable fiber offers simplified installation in harsh environments.

Camshaft


Engine valve

Short pulse laser marker for clear high contrast marking on resin surfaces

FAYb Laser Marker

LP-V SERIES

Enables beautiful high contrast marking on resin surfaces by fully utilizing the characteristics of short pulse laser beams with minimal thermal influence.

IC

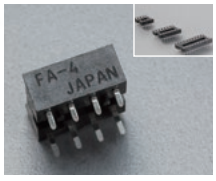
Resin molded product

Compact CO_2 laser marker with Z-axis control mechanism

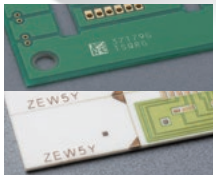
CO_2 Laser Marker

LP-GS SERIES

Enables high-quality marking on small components such as connectors, circuit boards and resin molded products. Even object having the difference in level can be engraved by the Z-axis control mechanism.



Connector



Circuit board

Disclaimer

The applications described in the catalog are all intended for examples only. The purchase of our products described in the catalog shall not be regarded as granting of a license to use our products in the described applications. We do NOT warrant that we have obtained some intellectual properties, such as patent rights, with respect to such applications, or that the described applications may not infringe any intellectual property rights, such as patent rights, of a third party.

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