

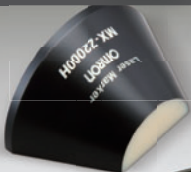
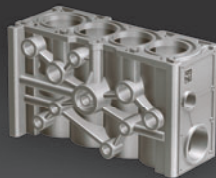
OMRON

NEW

Fiber Laser Marker  
MX-Z2000H series

Fast, High Quality, Easy

# Marking Flexibility



CE | FDA



OMRON  
MX-Z2000H  
Fiber Laser Marker

Great for either deep or shallow engraving in metals, marking on plastics/resins or plastic films, and for fine processing.

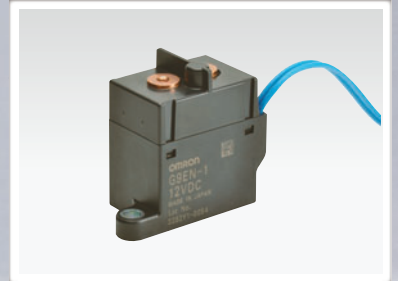
**Mark anything** from electronic parts to automotive parts.



Deep engraving in metal



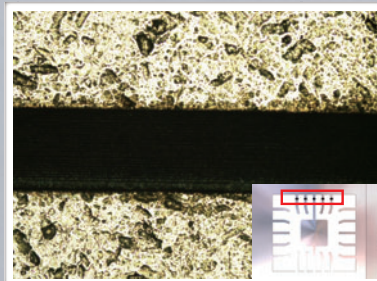
Shallow engraving in metal



Marking on plastics/resins



Marking on plastic films



Fine processing



Fine marking

The MX-Z2000H Series Provides Benefits in Many Arenas

High Speed and High Quality for a Wide Variety of Applications

# Marking Flexibility

Metals

Plastics/  
Resins

Plastic  
Film

Two operating modes meet the application marking demands.

Enhanced 3D marking features.

G-DAC enables high-speed, clear marking.

»P4







Fiber Laser Marker

MX-Z2000H Series

Enhanced functionality Improves Productivity

## Connectivity & Traceability

Direct finder link

Traceability log

EtherNet/IP™ ready

Data can be shared with external storage

»P6

Withstands Severe Ambient Conditions and Meets International Standards

## Durability/Safety

IP65 protection

Meets domestic and international safety standards

»P8

The OMRON Fiber Laser System ..... »P9

Operation Flexibility ..... »P10

High Speed and High Quality  
in a Wide Variety of Applications

# Marking Flexibility

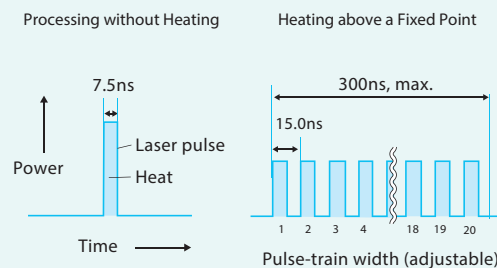


## Two Operating Modes Provide Fine Detail to Deep Engraving

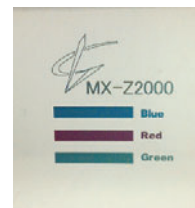
### Standard Mode

Our exclusive flexible pulse control (up to 1MHz, adjustable 1 - 20 pulses) enables optimum marking and processing for a variety of materials and applications, for a variety of materials and applications, including both heated and non-heated marking/processing, etc.

#### Laser Wave Examples



#### Color Marking (SUS304)



Solid material



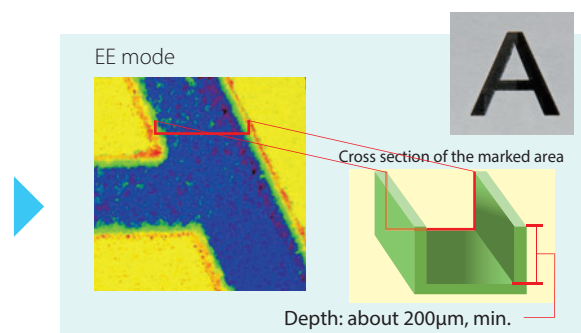
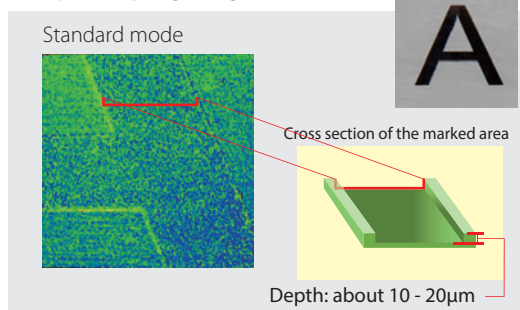
Hairline processing

NEW

### Optional EE Mode (Energy Enhanced Mode)

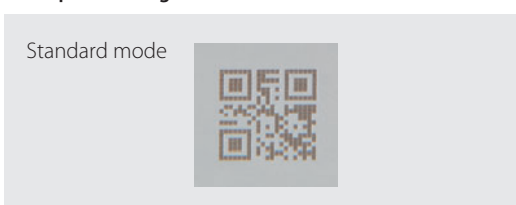
Deep engraving of metal, rough polishing, and other energy-intense processing becomes possible with an expanded and enhanced flexible pulse control, which provides pulse streams of up to 30 pulses.

#### Example: Deep Engraving on Metal



Note: This comparison uses specific conditions.

#### Example: Marking Black on Metal



Note: This comparison uses specific conditions.

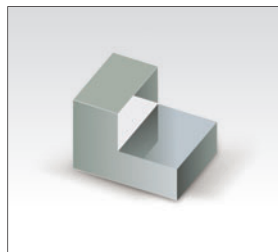
## Marking 3D Objects Is Simple Even on Cones and Spheres

### NEW High-precision Z-axis Flexibility

Clean marking is now possible for 3D surfaces, such as stepped, sloped, curved, conical and spherical surfaces without any additional software.



Cylinder



Steps



Slope



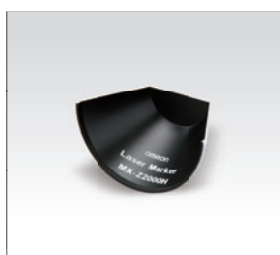
Sphere exterior



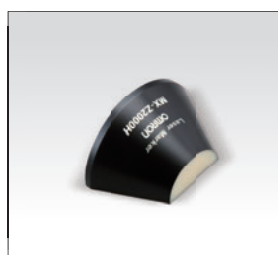
Truncated Cone



Truncated Cone interior



Half-cone interior



Half-cone exterior

The focus point can be moved  
170±10mm for the MX-Z2000H,  
and 220±10mm for  
the MX-Z2050H/Z2055H.



## Mark Clearly and Cleanly Even at High Speed

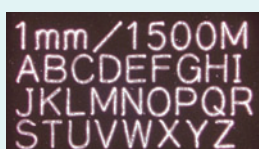
### <G-DAC>

G-DAC stands for the OMRON-developed **Galvano Dynamic Acceleration Control**.

The G-DAC feature adjusts the laser marking speed for optimum performance, based on the marking details. This speed flexibility enables high-speed, clean marking.

#### With/Without G-DAC

##### Marking time with the same data



Note: Marking conditions shown to the right.

Workpiece: Aluminium  
Letter height: 1mm

Without  
G-DAC

116ms

With  
G-DAC

54ms

Double the  
speed;  
about half the  
time

##### Marking at the same speed

Without G-DAC



With G-DAC



Improved  
performance

Note:

Laser conditions: 100kHz, 100%; Workpiece: Aluminium

Note: G-DAC performance depends on the application. Be sure to test your application in advance.



Enhanced Functionality  
Improves Productivity

# Connectivity & Traceability

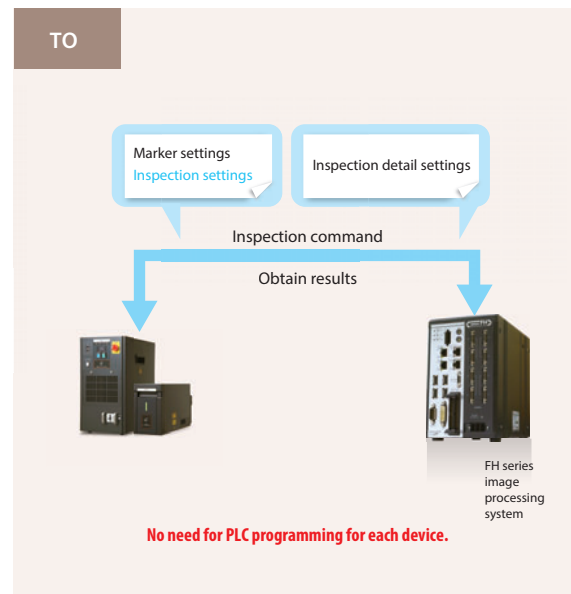
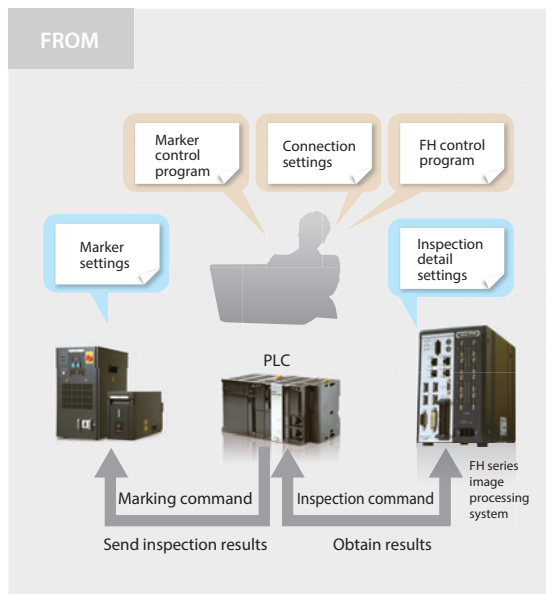


## Position-correction without the need of a PLC

NEW

### Direct Finder Link

The MX-Z2000H series enables direct connectivity between the image processing system and the laser marker that traditionally required PLC processing. This means, there is no need for a PLC to do the linking between the vision system and the laser marker.



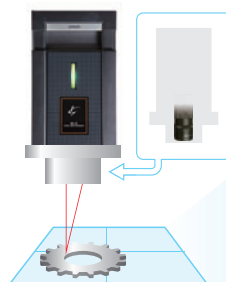
Notes: 1. The optional finder feature is required to use this function.

2. As of March 2016, the FH series is the only compatible image processing system. Talk to your local OMRON representative for OMRON FH series details.

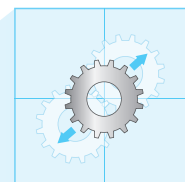
#### Example Application

To mark a product in the same area everytime, an image processing system measures the position reference, transfers the position coordinates and the laser marker adjusts itself to mark in the correct place. After the laser marking is completed, the image processing system can also read a 2D code or any other inspection of the data or images just marked on the product.

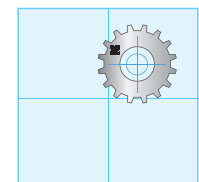
MX-Z2000H series laser marker  
+  
Finder option  
+  
FH series image processing device



1. Use image processing to measure the position difference.



2. Compensate for position differences and mark correctly.

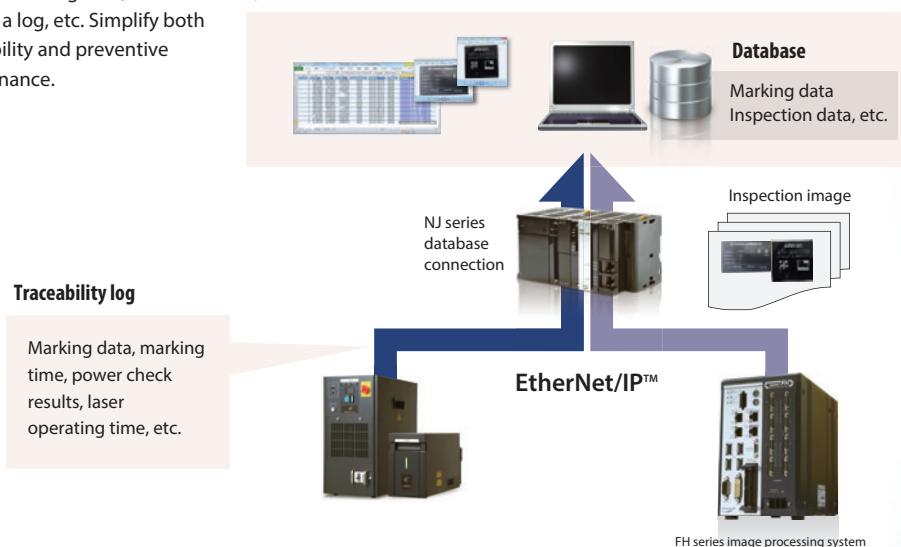


## Easily Configure a Traceability System

### NEW Traceability Log

Archive marking data, and other data to a log, etc. Simplify both traceability and preventive maintenance.

#### System Concept Example



## Smoothly Integrate External Control

### NEW EtherNet/IP™ Compatibility

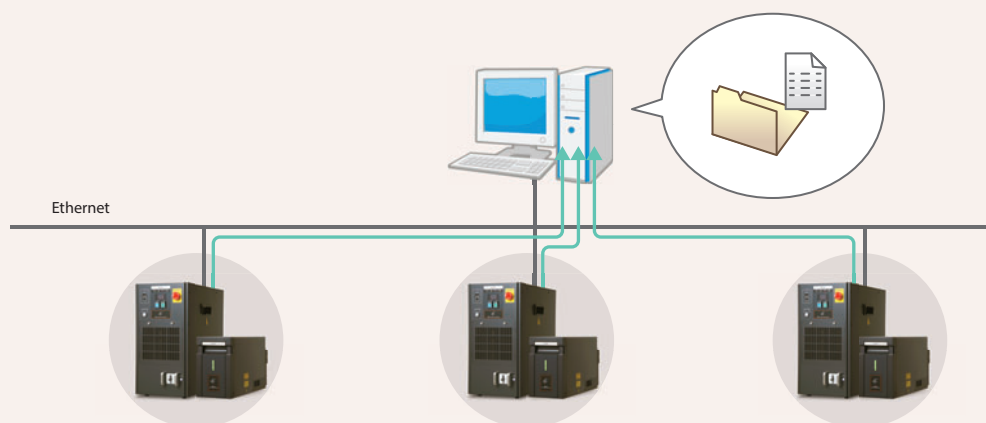
The MX-Z2000H series is compatible with various kinds of external control. Built-in I/O connections, RS-232C, Ethernet, and EtherNet/IP™ simplify programming to control the system from a PLC.

**EtherNet/IP™**

## Marking for Small Lots with Multiple Variants

### Data can be shared with external storage

The MX-Z2000H series can access the marking data that is stored on an Ethernet server to keep up with the tremendous amount of data used for multi-variant, small lot productions. This simplifies the switching of marking data for each variant.



Withstands Severe Conditions  
and Meets International Standards

# Durability/Safety



## Stable Operation Even in Dusty/Wet Environments

NEW

### Durable IP65 Head

The laser head (where the laser light is emitted) has a double glass cover to keep dust and moisture away and ensure air-tightness.

IP65 means dust-proof and wash-down capable, compatible with IEC60529. It consists of the two numbers, 6 and 5.

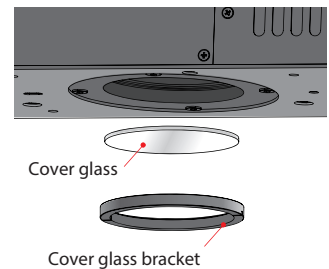
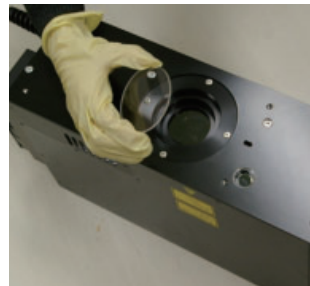
IP65

**Protection against water**  
5: Protection from water, up to water projected by a nozzle against the enclosure from any direction.

**Protection against solid objects**

6: Complete protection from dust.

The double glass cover makes it easier and safer to change the glass.



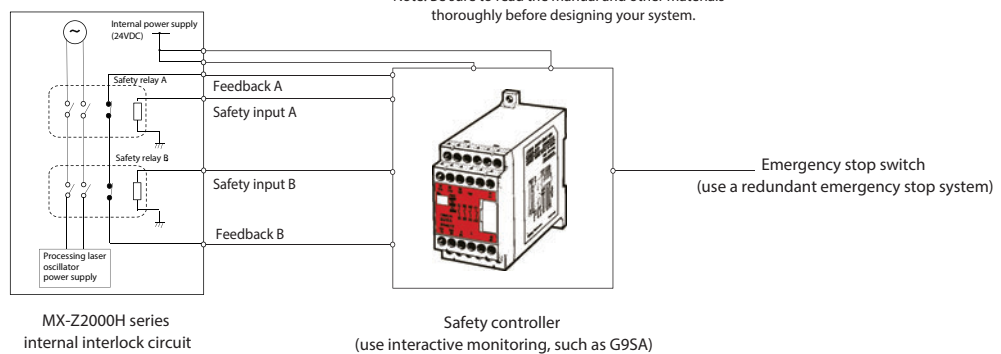
## Meets Safety Requirements and Standards

NEW

### Built-in Safety Relay Circuit

When building a product to meet the ISO 13849-1 (JIS-B9705-1) criteria, you have to provide safety measures for the total device in which the laser marker is installed. The MX-Z2000H series has 2 safety relays in the controller, and sending an emergency stop signal from an external controller to the interlock terminals will absolutely stop the power supply to the laser.

#### Interlock System Configuration Example



NEW

### Meets International Standards and Regulations

The laser markers meet each standard and regulation. They can now be used internationally.

Note: For details about exact countries and areas, contact your local OMRON representative.



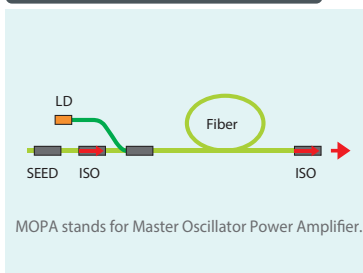
## OMRON's Fiber Lasers

# All-fiber Lasers Provide High Quality, High Stability, Long Life

## MOPA Fiber Laser

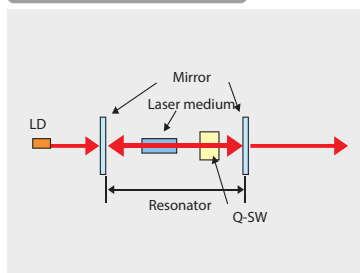
Typical solid-state lasers use mirrors to resonate and amplify the laser, and then Q-switching to output the laser. However, this approach makes it difficult to achieve a high quality and flexible laser. It also leaves something to be desired in the areas of reliability and durability. OMRON has achieved high quality, high stability, long life and flexibility by eliminating the resonator configuration and using the MOPA approach.

OMRON MOPA Fiber Laser



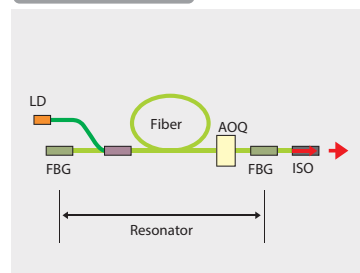
- Wide range of pulse repetition frequency settings.
- High flexibility for setting the pulse width and shape.
- High beam quality, high stability, long life.

Typical Solid-state Laser



- Pulse width depends on the repetition frequency.
- The laser diode is always on, accelerating deterioration.
- Issues with the durability of the Q switch, mirrors, etc.

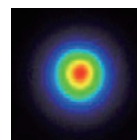
Typical Fiber Laser



- Difficult to achieve a high peak output.
- Narrow range of pulse repetition frequency settings.
- Pulse width depends on the frequency.

### High Beam Quality

The closer the beam is to a perfect circle, the higher the quality of the laser. OMRON lasers have a very round, high quality beam, as shown to the right.



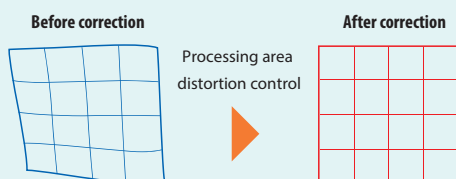
High beam quality

## Corrects for Lens Distortion

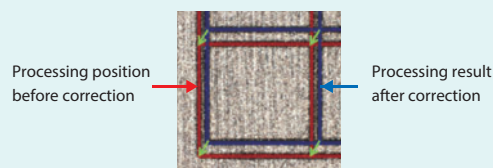
### High Position Resolution/Coordinate Correction

Precision positioning is now possible for fine detail, and processing area distortion is minimized. Coordinate correction is provided to eliminate errors based on installation.

#### High Position Resolution



#### Coordinate Correction



### Example Applications



Marking a scale



Marking on electronic parts in a tray

# Operation Flexibility Increases Throughput With Less Effort

## Edit the Marking Data Directly on the Laser Marker

### Editing Data

There is no need to buy separate editing software, or a computer to edit data. Data editing functionality is built right into the laser marker itself, simplifying the process.



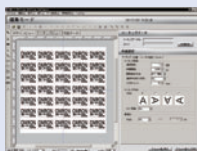
### Offline Editing Software is Also Standard

You can also use a separate computer if you choose, to create and edit the print data, including graphics, with the same functionality as is built into the laser marker.

#### Editing Data Offline

Create and edit the marking data directly.

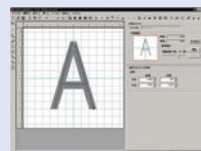
##### ■ Creating Marking Data



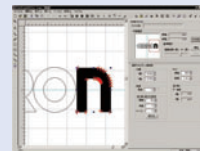
#### Editing Fonts and Logos

Optimize fonts, logos (graphics), and pattern data directly.

##### ■ Creating Original Data



##### ■ Creating Logo Data

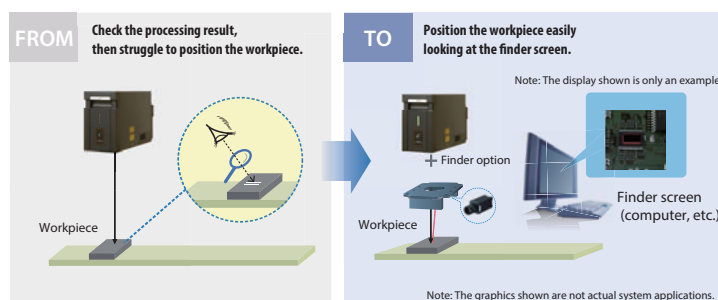


## Simplifying Positioning and Other Floor Work

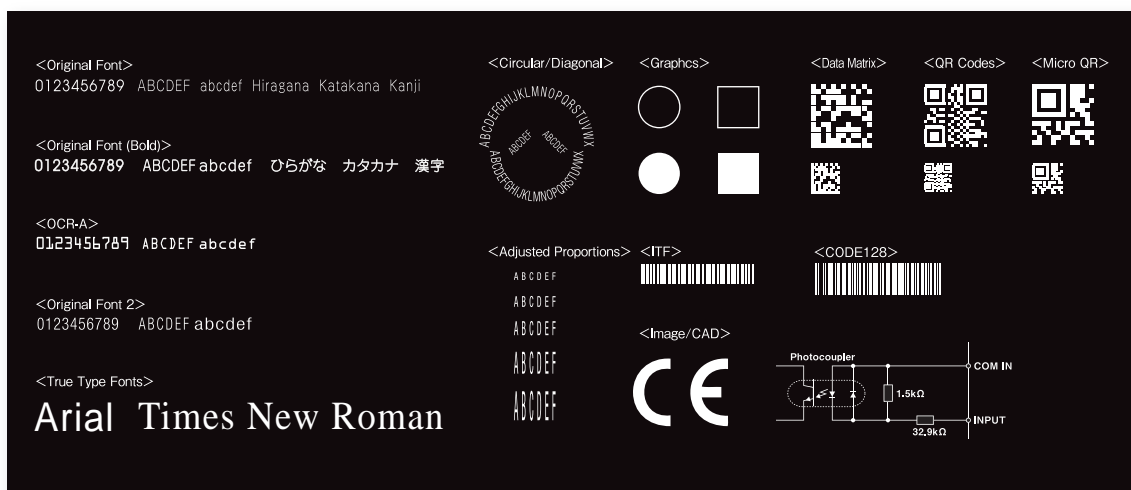
### Optional Features

#### Finder (Vision Attachment)

The Finder feature enables visual positioning of small parts for marking/processing, as well as automated positioning and inspection with an image processing system.



### Laser Marking Samples



## Specifications

Item		MX-Z2000H	MX-Z2050H	MX-Z2055H*1
Processing laser	Type	Fiber laser Wavelength : 1,062nm		
	Laser class	Class 4 (IEC60825-1)		
	Average output	20W (Fiber laser transmitter output)		
	Laser output mode	Standard mode/EE mode*2		
	Repetition frequency	Standard mode 10 to 1,000kHz in 0.1-kHz steps/EE mode*2 10 to 100kHz in 0.1-kHz steps		
	Pulse-train width(pattern)setting	Standard mode 7.5ns~300ns(15patterns)/EE mode*2 150ns~450ns (3patterns)		
Guide laser and focus pointer	Type	Semiconductor laser wavelength: 655nm		
	Laser class	Class 2 (IEC60825-1)		
Optical specifications	Marking area	90×90mm	160×160mm	160×160mm
	Working distance	170±10mm	220±10mm	220±10mm
Scanning specifications	Scan speed	1~12,000mm/s		
	Marking resolution	2μm	4μm	4μm
Detail of marking	Text	original / original2 / OCR-A / OCR-B / SEMI / LM font / True Type font		
	Bar code	CODE39 / NW-7 / ITF / CODE128 / JAN		
	2D code	GS1 Databar Omni-directional / GS1 Databar Truncated/GS1 Databar Expanded		
	shape	QR code / Micro QR code / DataMatrix(ECC200)/ GS1 DataMatrix(ECC200)		
	3D shapes	Fixed point / Straight line / Rectangle / Circle / Arc		
	Image and CAD	Slope / Step / Cylinder / Truncated Cone / Sphere		
Settings	No. of data/blocks	Marking data :10,000 ; blocks :2,048		
	Fiber cable	0.1mm~120mm		
Cables	Marker head control cable	4.5m Minimum bending radius: 100mm		
	Marker head power supply cable	5m Minimum bending radius: 100mm		
External interface	Terminal block and I/O connector	Terminal block input 20pins(NPN/PNP compatible); terminal block 14pins(NPN/PNP compatible) I/O connector 37pins(NPN/PNP compatible),interlock terminal I/O : 8pins		
	Serial communications	RS-232C/RS-422A		
	Ethernet communication	Ethernet(1000BASE-T/100BASE-TX/10BASE-T) / Ethernet/IP™		
Power supply voltage		100 to 120VAC,50/60Hz ; 200 to 240VAC,50/60Hz		
Over voltage category		CAT II		
Power consumption		at 100VAC: maximum 390VA , at 200VAC : maximum 420VA		
Ambient conditions	Operating ambient temperature,humidity	0 to 40°C, 35 to 85%RH(no condensation)		
	Storage ambient temperature*3,humidity	-10 to 60°C(no freezing) / 35 to 85%RH(no condensation)		
	Installation environment	Indoor , 3,000m, max		
Pollution degree		2		
Protection structure(head)*4		IP65		
Coolin method		Forced air cooling		
Weight		Marker head Approx.15kg, Controller Approx.25kg		
Size		Marker head W140×H230×D415mm(excluding projections), Controller W225×H430×D390mm(excluding projections)		
Installation direction		Marker head All directions of up, down, left and right (intake vent on the left side face must not be blocked.)Controller Must be installed vertically.		
USB interface*5		USB memory : Controller front panel, Type A connector, keyboard/mouse :controller back panel , TypeA connector		
Accessories		Marker head controll cable, Marker head power supply cable, System key , Removable terminals(input and output, 1each), Setup manual, CD-ROM(offline editing software*6, User's manual in PDF), Interlock release connector Terminal opener, cable tie		

## Notes

**Notes**

\*1 Faster marking for resins and plastics films (1.8x faster than MX-Z2050H, 2.0x faster than MX-Z2000H. In case of the fill marking on a plastic film )

\*2 EE mode : Energy Enhanced mode (optional)

\*3 The operating temperature may be limited due to the processing conditions. When using ther laser continuously or close to continuously for laser processing,etc. ,please contact OMRON in advance.

\*4 The head of this product is constructed for environmental protection under the conditions specified in IEC 60529 (JIS C0920), and is not guaranteed under any other conditions.

\*5 Do not use the USB interfaces for anything other than the specified applications.

\*6 The following environment is required for using the offline editing software and font logo editor

: Computer with a USB 2.0. or 1.1 port , Microsoft Windows® 8/Windows® 7 , Available hard disk space : 1GB. min. Display resolution : 1,024×768. min.

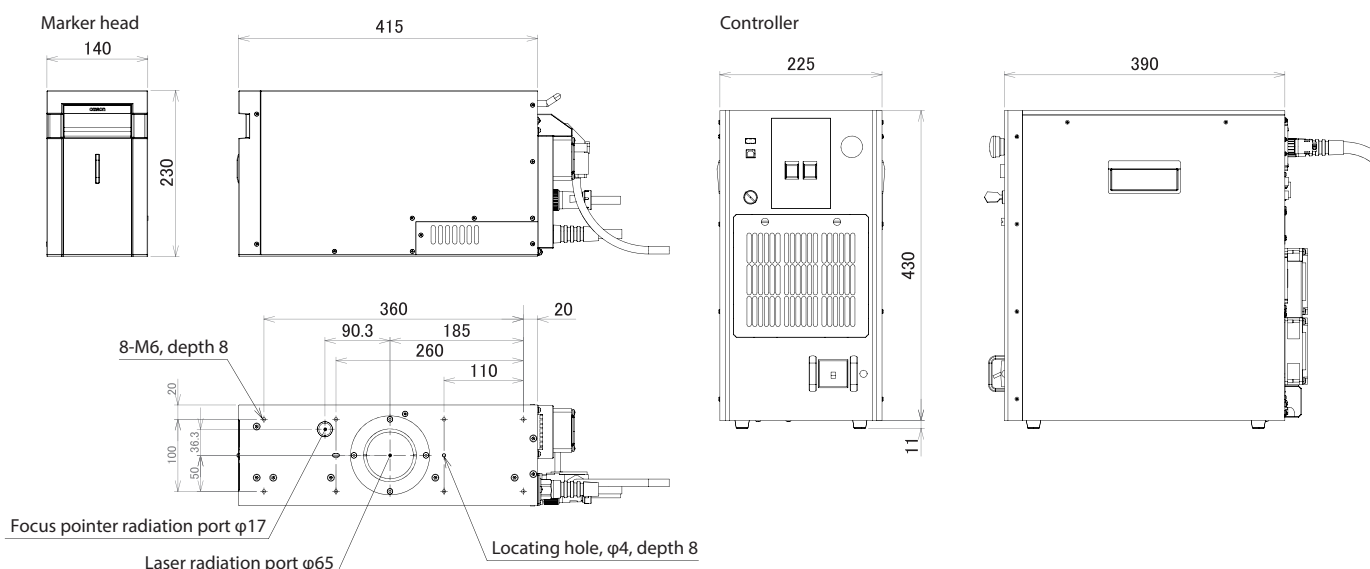
\*UL certified products are manufactured after Nov 2016.

**<Items Sold Separately>**

MX-9301	Controller power supply cable (PSE,UL) plug type B
MX-9302	Controller power supply cable (VDE,AS) plug type F
MX-9230	EE mode activation key
Other	Contact your local OMRON representative for details regarding the finder options, as well as replacement parts for the cover glass and other consumables.

Note: Use commercially available products for the other devices required: USB keyboard, USB mouse, and monitor (VGA 3-row 15-pin, or DVI-D input with 1,024×768 minimum resolution).

## External dimensions





# Terms and Conditions Agreement

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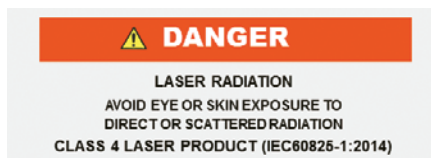
Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

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Kyoto, JAPAN

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