

YAG LASER WELDER

ML-2350AF-CDRH
ML-2351AF-CDRH

OPERATION MANUAL



Thank you for purchasing our YAG Laser Welder **ML-2350AF/2351AF**.

ML-2350AF-CDRH and **ML-2351AF-CDRH** are the air-cooled versions of the standard **ML-2350A-CDRH** and **ML-2351A-CDRH**, respectively. This operation manual describes only the difference of the air-cooled versions from the standard ones.

See the operation manual of the standard version for how to use, such as operation method.

ATTENTION

In this manual, **ML-2350AF** denotes **ML-2350AF-CDRH**;
ML-2351AF, **ML-2351AF-CDRH**.

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1. Difference from the Standard Specifications

The **ML-2350AF/2351AF** eliminates city water to improve the factory environment.

- The laser power supply, oscillator head and cooler are accommodated in one body. Transportation and installation are easy because the piping for city water is not necessary.
- The air-cooled system does not waste water resources.

How to operate is just the same as the standard **ML-2350A-CDRH** and **ML-2351A-CDRH**.

2. Specifications

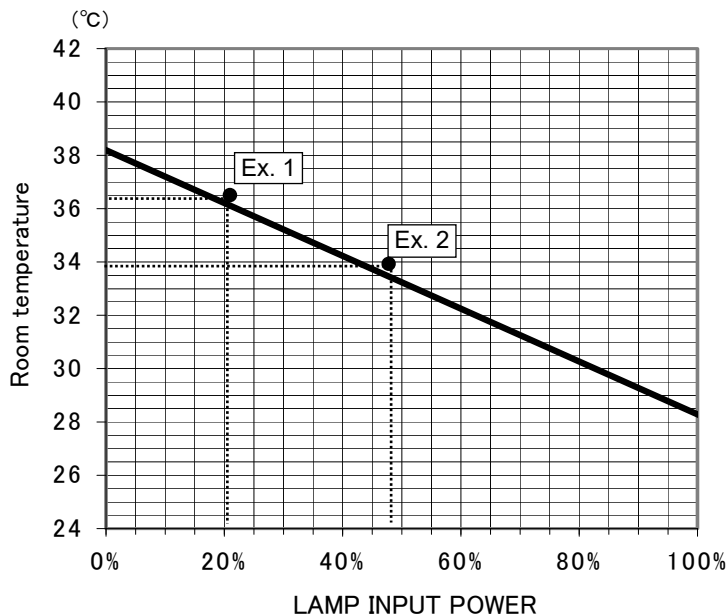
① Specifications List

Oscillator		ML-2350AF	ML-2351AF
	Maximum rated output	70W	50W
	Maximum output energy	70J/P (10ms Pulse width)	50J/P (10ms Pulse width)
	Maximum peak power	7kW	5kW
	Pulse width	Standard: 0.3–30.0ms (0.1ms steps) Fine setting: 0.25–5.00ms (0.05ms steps)	
	Pulse Repetition	1–200pps	
	Oscillation wavelength	1.064μm	
	Resonator shutter	With open/close sensor	
	Positioning guide beam	Built-in visible laser (Red)	
	Output stability *1	±3%	
Power Supply	Power supply	3-phase, 220V AC+10%-15%, 60Hz 3-phase, 380V AC±10%, 50/60Hz (Tap switching)	
	Max. input current	11A (at 220V AC) / 6.5A (at 380V AC)	
	Max. apparent power	3.8kVA (at 220V AC) / 4.5kVA (at 380V AC)	
	Power consumption	Maximum: 3.5kW / Stand-by: 0.45kW (at 220V AC) Maximum: 3.5kW / Stand-by: 0.49kW (at 380V AC)	
	Breaker rated current (to be supplied by customers)	For the power supply side, we earnestly recommend using a leakage breaker with the rated current of 20 A or more (at 220V) or 10 A or more (at 380V), which is applicable to harmonics and surges.	
	Ground	Class D (ground resistance: 100 Ω max.) (at 220V) Class C (ground resistance: 10 Ω max.) (at 380V)	
Cooler	Heat exchange method	Forced air-cooled	
	Operating room temperature	5°–30°C (40°C max. cooling water temp.) The temperature may varies depending on LAMP INPUT POWER (%) of 80% or higher and installation conditions. Refer to the Cooling Capability Chart below. (Provide the provision to measure the difference between room and coolant temperatures.)	
	NOTE: Heat of 2.5kW (2150 kcal/h) is discharged for the maximum rating.		

Laser Controller MLE-118A	Schedule setting	Up to 32 schedules can be set by combining <ul style="list-style-type: none"> ▪ Laser output waveform ▪ Laser energy for upper/lower limit judgment ▪ Number of outputs per second ▪ Number of repeated outputs
	Measurement function	Laser energy (J) Average power (W) } are measured and displayed.
	Counter	Displays total number of outputs (9 digits) Displays the number of acceptable outputs (9 digits)
	Length of cable	Standard 3m cable
Others	Mass	Approx. 220 kg (at 220 V AC) Approx. 250 kg (at 380 V AC)
	Dimensions	990 (H) x 521.1 (W) x 995 (D) mm

*1) Under the condition that laser output energy is at least 5 J per pulse and peak power is at least 1 kW.

② Cooling Capability



The chart at left depicts the cooling capability at 100% duty cycle. Do not use in room temperature exceeding the line shown.

See the examples below for less than 100% duty cycle:

[Example 1]

Letting LAMP INPUT POWER be 60%, and "1-s laser output—2-s pause" be repeated.

$$60 \times \frac{1}{3} = 20$$

LAMP INPUT POWER of 20% gives the room temperature of about 36°C.
Keep room temperature 36°C or less.

[Example 2]

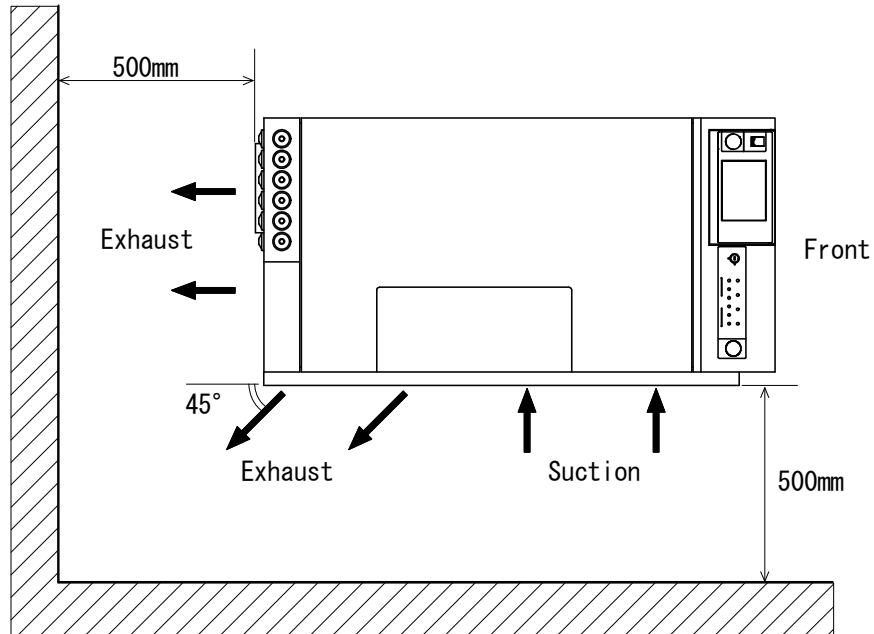
Letting LAMP INPUT POWER be 80%, and "3-s laser output—2-s pause" be repeated.

$$80 \times \frac{3}{5} = 48$$

LAMP INPUT POWER of 48% gives the room temperature of about 33.5°C.
Keep room temperature 33.5°C or less.

③ Clearances between the Laser and Surrounding Wall

ML-2350AF/2351AF are provided with vents on its left and rear sides for heat radiation. Install the Laser to secure the minimum clearances of 500 mm as shown; otherwise, full performance cannot be expected.



If you cannot provide clearances specified above, consult us.

3. Maintenance

(1) Maintenance Parts and Standard Intervals of Inspection/Replacement

In addition to maintenance parts for the standard model, perform inspection periodically referring to the following table.

Part name	Model No.	Item No.	Operation interval (standard) (*1)	Contents of operation (*2)
Air filter (side)	Z-01641-001	1018369	Every week	Clean
			1 year	Replace

*1: The operation interval means the maintenance time or expected life of the part, and is different from the guarantee period.

*2: Part replacement is performed when any damage or defect is found or the usable period ends.

(2) Maintenance of the Air Filter (Side)

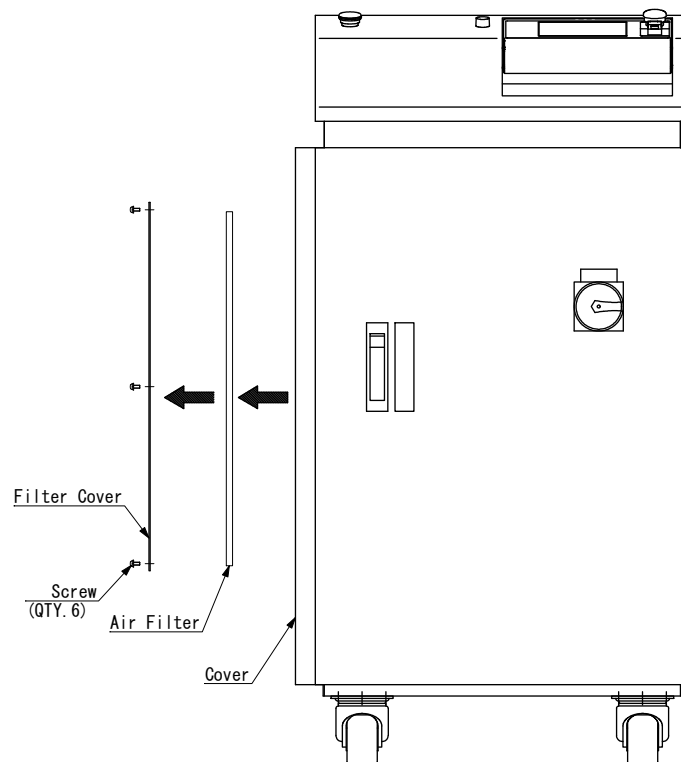
The air filter at the side of the main unit is provided at the air inlet of the radiator. Perform cleaning for this air filter at this portion every week.

Item required

Phillips screwdriver

Operating Procedure

- (1) Remove screws of the filter cover at the side of the main unit.

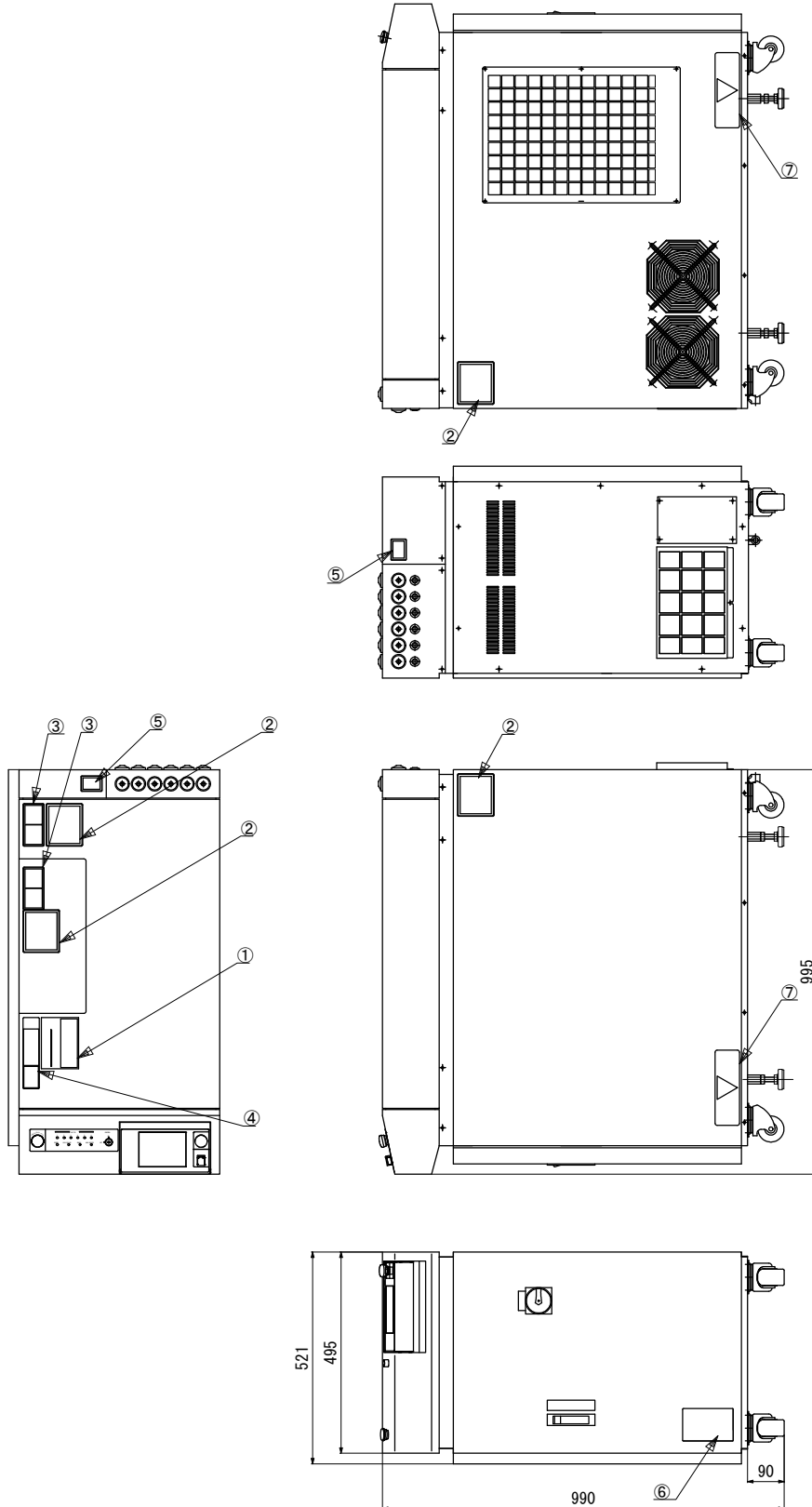


- (2) Take out the filter and wash it in tap water. Then, dry the air filter completely. When the air filter is very dirty, use a neutral cleaner.
- (3) Install the air filter by using the filter cover.

4. Outline Drawing

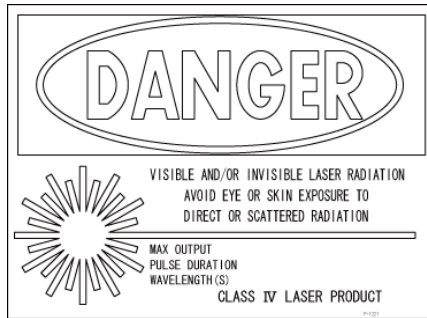
The Laser Outline and Location of Warning/Caution Label

See the next page for details of warning labels.



(Dimensions in mm)

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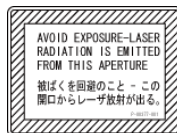
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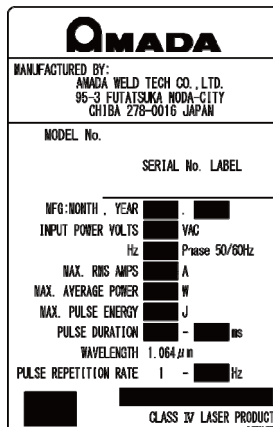
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⑤



⑥



⑦

