

## LMF Fiber Marker Facility Requirements

### Effected Models:

LMF Series	P <sub>out</sub>	AMYA Model (U.S.)	AMY Model (EU/Asia)
8-79	50W	LMF50	ML-7350D
	35W	LMF35-HP	ML-7340D
	20W	LMF20-HP	ML-7320D
	20W	LMF20-SM	ML-7322D
	20W	LMF20	ML-7321D
	10W	LMF10	ML-7311D
8-77	50W	LMF5000	ML-7350C
	35W	LMF3500-HP	ML-7340C
	20W	LMF2000-SM	----
	20W	LMF2000-HP	ML-7320B/C
	20W	LMF2000	ML-7321B/C
	10W	LMF1000	ML-7311B/C
8-76	20W	LMF2000-HP	ML-7320B/C
	20W	LMF2000	ML-7321B/C
	10W	LMF1000	ML-7311B/C
8-75	20W	LMF2000	ML-7320AU

### Purpose:

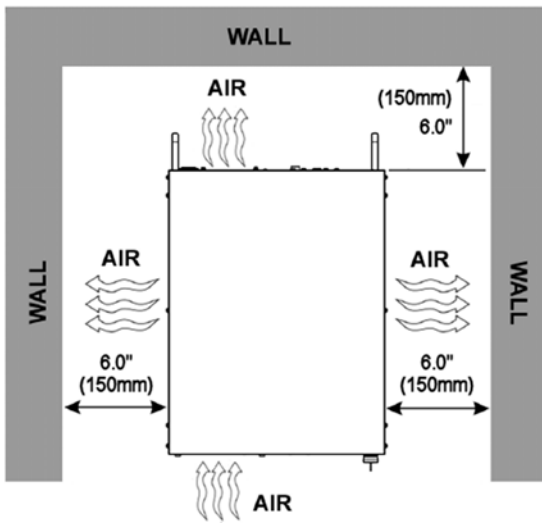
The purpose of this document is to describe the facility requirements for proper installation of the **LMF Series Fiber Laser Markers**. This document supplements the information found in the Laser Operator Manual. The contents of this document are subject to change without notice.

### Planning:

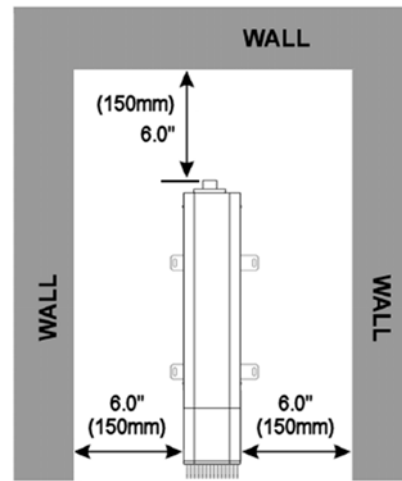
When planning for the installation of the Laser, verify that the following conditions are met:

- Install the laser in an isolated “laser operation area” away from common work areas (*unless the laser is used with a Class I workstation*).
- Appoint a Laser Safety Officer (LSO) to be responsible for the “laser operation area”.
- The LSO should be responsible for controlling the Laser Operation key-switch.
- Post warning signs to keep unauthorized personnel away from the “laser operation area”.
- Install the laser on a firm, level floor that is free from vibration or impact.
- Do not operate the laser where there is considerable dirt, dust, oil mist, chemicals, fumes, moisture, or near a high-frequency noise source.
- Use the laser only when the relative humidity < 90% (non-condensing).
- Operate the laser where the ambient temperature is above 41°F (5°C).
- Do not operate the laser where sudden temperature fluctuations can occur.
- Do not operate the laser in a confined space. Allow sufficient space as shown below. If mounted in a rack, both the front and back panels of the control unit must be unrestricted.
- Always wear protective eyewear when using the Laser Marker, unless Laser Head is mounted inside a Class I enclosure.
- Keep all combustible materials away from the Laser Marker.
- Do not install the Laser Marker in areas with sudden temperature fluctuations or in areas of high humidity.

**Clearance Requirements:**



**LMF Control Unit (all models)**



**Head Unit (all models)**

**Power Supply Requirements:**

The LMF/ML-7xxx Laser Markers operate off a single-phase power of 90-130VAC or 180-260VAC ( $\pm 10\%$ ), 50/60 Hz (with automatic switchover). Before applying power to the Marker, measure the available power at the installation site and verify it falls within the acceptable voltage ranges.

Model:	8-79	8-77	8-76	8-75
Input Voltage Range (50/60Hz):	90-130 VAC or 180-260 VAC ( $\pm 10\%$ ), 1 $\emptyset$			
Maximum Input Current (@110VAC):	7A	7A	7A	7A
Recommended Service (@110VAC):	10A	10A	10A	10A

**Grounding**

To ensure safety and optimal operation, the laser must be properly grounded. This Marker accepts a standard 'IEC320 C13' modular power cord and should be connected to the same A.C. service as the PC used to operate the Marker. **DO NOT operate the Marker without a proper ground connection.**

If the laser is being used in conjunction with a workstation or system, verify that the potential (voltage) between the Laser PE Ground and the Workstation/System PE Ground is at or near zero volts. In practice, it is best to measure this potential at multiple times throughout the day to verify that no other equipment is causing a potential difference due to leakage current. For more information on proper grounding techniques, consult an electrician that is familiar with the laws and regulations in your area. An improperly grounded system can damage the electronics in your equipment.

**Power Transformation and Protection**

If the available A.C. service voltage in your area does not fall within the required voltage range, a 1.5kVA (minimum) step-up or step-down transformer may be required. Amada Miyachi does not supply these transformers. Instead the best option is to consult a local electrician and they can recommend a suitable power transformer for your facility from a local electrical supply house.

The laser itself is fairly immune to power disturbances but is not immune to power surges due to electrical storms. In these areas, the use of an isolation transformer and noise filter may be needed to help suppress the large power transients. Consult with a local electrician for ways to protect the laser from lightning transients.

**Cooling Requirements:**

The temperature in the Marker is maintained by an internal cooling fan. In order to maintain a proper operating temperature, there must be adequate space around the Marker (see the “Clearance Requirements” section above for exact requirements). If the laser cannot maintain a proper operating temperature, a *Laser Temperature* error will appear and the Marker will stop operating.

Operating Temperature Range: 41°F - 95° (5°C - 35°C)  
 Relative Humidity: Less than 90% (*non-condensing*)

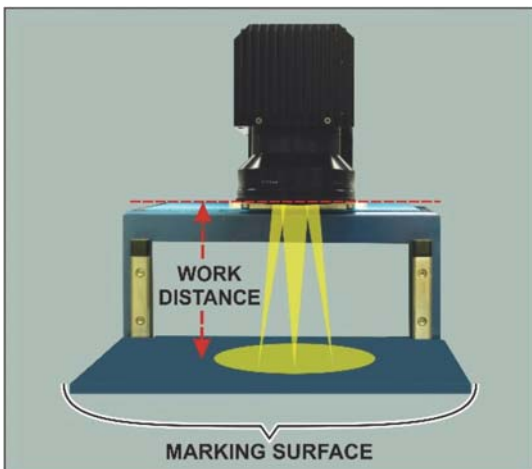
**Dimensions:**

Refer to the appropriate Operator Manual for dimensional data:  
 The operator manuals for each of the Markers is posted on-line at: [www.amyasupport.com/lsd](http://www.amyasupport.com/lsd)

Model	AMYA Model (LMF)	AMY Model (ML-)
8-79	990-559	990-561
8-77	990-552	990-555
8-76	990-552	990-555
8-75	990-298	990-300

**Working Distance:**

In order to achieve an acceptable mark, the working distance must be set in order to focus the laser beam onto the surface of the marking material. An incorrectly set working distance, will not produce an acceptable mark.



Set the distance as shown on the left. If the marking quality is unacceptable, then slightly adjust the marking material towards or away from the lens until the marking quality is acceptable. Measurements are given from the work surface to the lowest point of the lens ring on the lens assembly.

Note: Do not touch the cover glass while measuring the working distance.

The nominal working distance for each of the LMF Series is listed below. Use the working distance value as a starting point, then adjust to/from the lens until the desired mark is achieved.

**LMF Series Laser Markers – Working Distance**

<b>f-theta lens</b>	<b>Ultra-Compact Head</b>	<b>8-79</b>	<b>8-77 (R)</b>	<b>8-77 (N)</b>	<b>8-76</b>	<b>8-75</b>
100mm	3.86 ± 0.04 in. (98 ± 1 mm)	X	X	X	X	X
150mm	6.69 ± 0.08 in. (170 ± 2 mm)		X	X	X	
160mm	6.93 ± 0.08 in. (176 ± 2 mm)	X	X	X	X	X
163mm	7.28 ± 0.08 in. (185 ± 2 mm)			X	X	X
254mm	11.65 ± 0.12 in. (296 ± 3 mm)	X	X	X	X	X
420mm	19.45 ± 0.20 in. (494 ± 5 mm)	X	X	X	X	X
100mm AF (z = 0)	3.84 ± 0.04 in. (97.5 ± 1 mm)	X				
160mm AF (z = 0)	6.81 ± 0.08 in. (172.9 ± 2 mm)	X				
254mm AF (z = 0)	11.65 ± 0.12 in. (295.9 ± 3 mm)	X				

**Mass (Weight):**

<b>Component</b>	<b>8-79</b>	<b>8-77</b>	<b>8-76</b>	<b>8-75</b>
Control Unit	61 lbs (27.7kg)	61 lbs (27.7kg)	61 lbs (27.7kg)	52 lbs (23.5kg)
Ultra-Compact Head	8.4 lbs (3.8kg)	---	---	---
Compact Head (≤ 20W)	---	16 lbs (7.3kg)	16 lbs (7.3kg)	---
Compact Head (> 20W)	---	17.2 lbs (7.8kg)	17.2 lbs (7.8kg)	---
Standard Head	---	18 lbs (8.2kg)	18 lbs (8.2kg)	18 lbs (8.2kg)

**CDRH Accession:**

The LMF/ML-7xxx Series Laser Markers are sold worldwide under two different Model Numbers, **LMF** and **ML**. The **LMF** Series are sold by; Amada Miyachi America (AMYA), Amada Miyachi Japan (AMY), and Amada Miyachi Europe (AMYE). All LMF/ML-7xxx Series Laser Markers are Class IV devices that are fully compliant with all applicable standards and regulations as set forth by the United States of America's Health and Human Services (HHS), Food and Drug Administration (FDA), Center for Devices and Radiological Health (CDRH), standard 21 CFR 1040.10 for Class IV laser devices. The CDRH Accession Number is issued for both **LMF** & **ML** model numbers. The Accession Numbers are as follows:

Series	P <sub>out</sub>	AMYA <sup>1</sup> Unitek Model	AMY <sup>1</sup> Miyachi Model	Accession #
8-79	50W	LMF50	---	1320222-000
	50W	---	ML-7350D	1320222-002
	35W	LMF35-HP	ML-7340D	1320222-000
	20W	LMF20-HP	ML-7320D	1320222-000
	20W	LMF20-SM	ML-7322D	1320222-000
	20W	LMF20	ML-7321D	1320222-000
	10W	LMF10	ML-7311D	1320222-002
	35W	LMF35-HP-AF	ML-7340D-AF	1320222-005
	20W	LMF20-HP-AF	ML-7320D-AF	1320222-005
8-77	20W	LMF20-SM-AF	---	1320222-005
	50W	LMF5000	---	1020281-002
	50W	---	ML-7350C	1020281-004
	35W	LMF3500-HP	ML-7340C	1020281-000
	20W	LMF2000-HP	ML-7320B/C	1020281-000
	20W	LMF2000-SM	---	1020281-000
	20W	LMF2000	ML-7321B/C	1020281-000
8-76	10W	LMF1000	ML-7311B/C	1020281-000
	20W	LMF2000-HP	ML-7320B/C	1020281-000
	20W	LMF2000	ML-7321B/C	1020281-000
8-75	10W	LMF1000	ML-7311B/C	1020281-000
8-75	20W	LMF2000	ML-7320AU	0820530-000

- Both the AMYA and AMY models are functionally equivalent and differ only in labeling

### CSA Compliance:

The LMF/ML-7xxx Series Laser Markers are not CSA compliant at this time. However, the Marker can be CSA certified by a CSA approved agency at an additional cost.

### CE Documentation:

All LMF/ML-7xxx Series Laser Markers are CE compliant. A copy of the *Declaration of Conformity* is located in each Operator Manual. Please refer to the appropriate Operators Manual for more information.

### Service:

If the Laser produces an Error Code refer to the Operators Manual for resolution. If your marker is in need of service, contact the Amada Miyachi America at (626) 303-5676 during normal business hours (7:00 am – 5:00 pm PST).

For after-hours support, please call: **(866) 751-SERV (7378)**

**Spare Parts (AMYA Pt #):****Miscellaneous Components:**

Description	AMYA Pt #
Optical Lens Cleaner (RoHS compliant)	900-342
Lens Cleaning Tissue (7.75" x 4")	900-314
IR Safety Glasses ( $\lambda = 1064\text{nm}$ )	475-118
Over-the-Glasses IR Safety Glasses ( $\lambda = 1064\text{nm}$ )	475-160

**Maintenance Components:**

Description	8-79	8-77	8-76	8-75
Air Filter – Front Panel	4-68423-01 4-68424-01	4-65911-01	4-65911-01	4-65690-01
Lithium Battery, 3.0v, 190 mAH	145-017			
Fuse	330-210 (10A)		330-206 (8A)	
Power Cord	205-133			205-129
Cat 5e Ethernet Cable	205-318			
Collar O-Ring, Internal (1.364")	570-185	---	---	---
Collar O-Ring, External (1.739")	570-184	---	---	---

**Mating I/O Connectors + backshells/dust caps:**

Description	AMYA Pt #				
	8-79	8-77/76	8-75	Backshell	Dust Cap
2-pin - Remote I/L connector	---	250-715	250-715	678-162	---
4-pin – Remote I/L connector	250-717	---	---	678-400	---
4-pin - E-Stop connector	---	250-717	250-717		---
8-pin - User I/O connector	250-718	250-718	250-718	678-104	---
9-pin - User I/O connector	250-743	250-743	---	678-190	---
10-pin - System I/O connector	250-719	250-719	250-719	678-106	---
11-pin - System I/O connector	250-739	250-739	---	678-191	---
12-pin - E-Stop connector	250-744	---	---	678-192	---
12-pin - Job Select connector	---	250-744	---	678-192	---
50-pin – Extended I/O connector	250-597	---	---	250-598	260-061
9-pin (F) – COM1 / COM2 connector	250-798	250-798	250-798	250-194	260-062
15-pin (F) – COM3 connector	250-813	250-813	---	250-200	260-063
13W3 (M) – MTR1-4 connector	251-035	---	---	250-478	260-059
15-pin (M) – HEAD I/O connector	(contact AMYA for replacement cable)				260-058
25-pin (M) – Scanner connector	(contact AMYA for replacement cable)				260-059
9-pin (M) – Service connector	N/A	N/A	---	---	260-057

Note: The dust caps are used to protect the unused connectors.

**Spares Kits:**

Level	Controller	8-79	8-77	8-76	8-75
Level 1	All Versions	8-707-04-01	8-707-02-01	8-707-01-01	8-707-00-01
Level 2	LEC-1 <sup>1</sup>	8-707-04-02	8-707-02-02	8-707-01-02	8-707-00-02
	LEC-1 P6 <sup>2</sup>	8-707-04-03			
	LEC-2 ADV <sup>3</sup>	8-707-04-04			
	LEC-2 STD <sup>4</sup>	8-707-04-05			
	LEC-2 BSC <sup>5</sup>	8-707-04-06			

Note 1: Use for 8-79 LMF Marker configurations with part number: 8-79-xLx-xxx

Note 2: Use for 8-79 LMF Marker configurations with part number: 8-79-xBx-xxx

Note 3: Use for 8-79 LMF Marker configurations with part number: 8-79-xCx-xxx

Note 4: Use for 8-79 LMF Marker configurations with part number: 8-79-xDx-xxx

Note 5: Use for 8-79 LMF Marker configurations with part number: 8-79-xEx-xxx

**f-theta lens:**

f-theta Lens	f-theta Lens	Protective Glass	Lens Collar				
			8-79 (R)	8-77 (R)	8-77 (N)	8-76 (N)	8-75 (N)
f100	475-328	475-135	475-468	475-468	475-314	475-314	475-314
f150	475-342	475-259	---	475-469	475-343	---	---
f160	475-111	475-135	475-468	475-468	475-314	475-314	475-314
f163	475-324	475-491	---	---	4-66827-01	4-66827-01	475-326
f254	475-121	475-134	475-471	475-471	475-315	475-315	475-315
f420	475-120	475-134	475-471	475-471	475-315	475-315	475-315

Note: Part numbers should only be used for replacement. Not all lenses can be used with all power levels.

**Front / Rear Panel Components:**

Description	8-79	8-77/76	8-75
Key switch (switch + key)	680-512	680-443	680-443
E-Stop Switch	680-316	680-316	680-442
ON/OFF Power Switch	680-478	680-478	680-242
Air Filter Bezel (Air Filter Cover)	4-72051-01 (Black) 4-69357-01 (Gray)	4-65912-01	---

**Electronic Components:**

Description	8-79	8-77	8-76	8-75
Fan, Cooling	305-073	305-059	305-059	305-038
Power Supply, 24V, 600W	525-068	525-068	---	---
Power Supply, 24V, 250W	---	---	525-048	525-048
Power Supply, 24V, 3.2A, 75W	525-093	---	---	---
Power Supply, 15V, 5A, 75W	525-094	---	---	---
Power Supply, 5V, 5A, 25W	525-096	---	---	---
Power Supply, ±15V / 24V / 5V	---	525-061	525-061	525-061
Guide Beam	---	---	---	475-467

**PCB's:**

<b>Description</b>	<b>8-79</b>	<b>8-77/76</b>	<b>8-75</b>
Control PCB	4-68418-01	4-66002-01	4-65718-02
Front Control Panel PCB	4-68428-01	4-66010-01	---
I/O PCB	---	4-66006-01	4-65583-01
LEC Interface PCB <sup>1</sup>	4-69192-01	---	4-65686-01
Surge Absorber PCB	4-69512-01	---	---
SCSI PCB	---	---	4-65654-01
LEC-1 PCB	4-66600-01	4-66600-01	4-66600-01
LEC-1 Platform 6 PCB <sup>2</sup>	4-66600-04	---	---
LEC-2 Advanced PCB <sup>2</sup>	4-66600-05	---	---
LEC-2 Standard PCB <sup>2</sup>	4-66600-06	---	---
LEC-2 Basic PCB <sup>2</sup>	4-66600-07	---	---
Shutter PCB	4-71290-01	4-65664-01	4-65664-01

Note 1: The LEC Interface PCB is not used when the LMF Marker is configured with a LEC-2 Control PCB

Note 2: The LEC-1 P6 and LEC-2 PCB's are only available in the 8-79 Series LMF Markers.