

LMF Fiber Marker Facility Requirements

Effected Models: LMF1000, LMF2000(-HP), ML-7311B/C, ML-7321B/C, ML-7320B/C

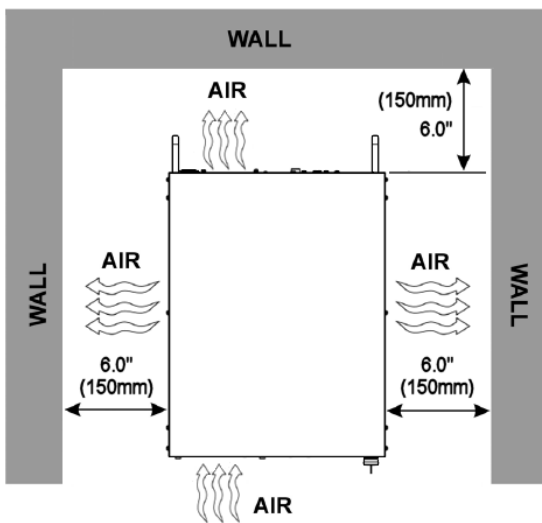
Purpose:

The purpose of this document is to describe the facility requirements for proper installation of the LMF1000, LMF2000(-HP), ML-7311B/C, ML-7321B/C, ML-7320B/C Fiber Laser Marker(s). For the rest of this document all laser models will be simply referred to as the **LMF Series Markers**. This document supplements the information found in the Laser Operator Manual. The contents of this document are subject to change without notice.

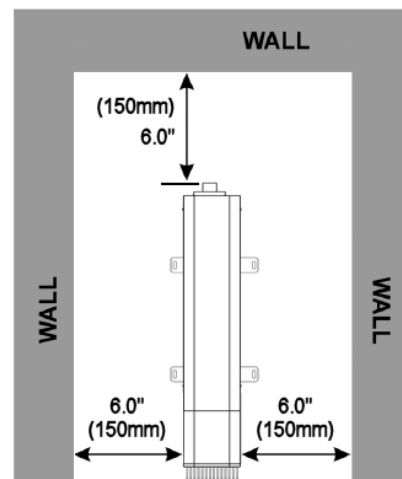
Planning:

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.
- The Control Unit and Oscillator must be placed within 2m (6.5 ft) of each other.
- 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 $\leq 90\%$ (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.



Control Unit



Oscillator

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.

Input Voltage Range:	90-130 VAC or 180-260 VAC ($\pm 10\%$), 50/60 Hz
Maximum Input Current:	7A @ 110VAC
Recommended Service:	10A

Grounding

To ensure safety and optimal operation, the laser must be properly grounded. This Marker accepts a standard IEC-320 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 7kVA (minimum) step-up or step-down transformer may be required. These power transformers can be very heavy and extremely expensive to ship. 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.

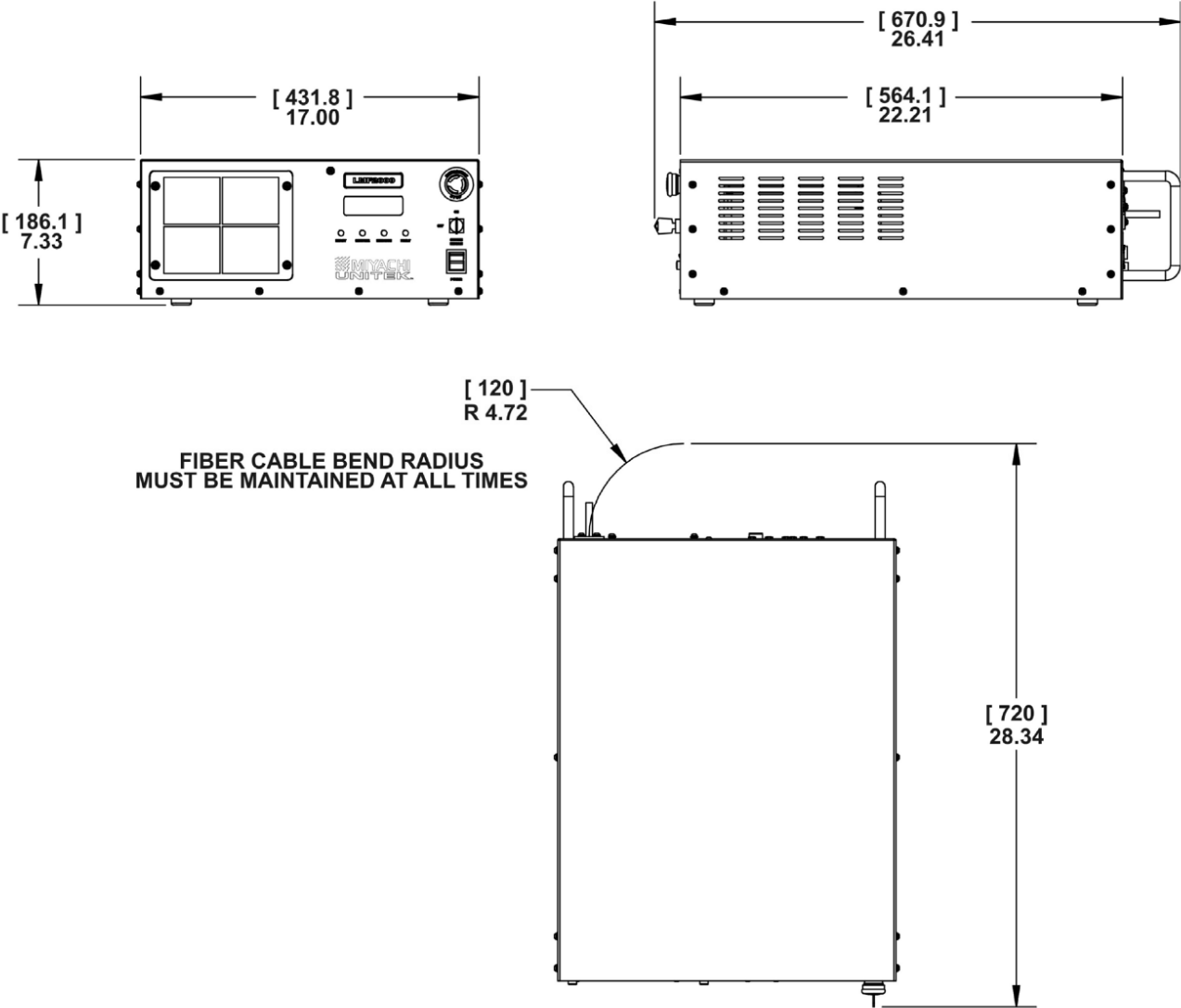
The laser itself is fairly immune to power disturbances but is not immune to power surges due to electrical storms. In these areas, the use of an isolation transformer and noise filter may be needed to help suppress the large power transients. Consult with a local electrician for ways to protect the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

Cooling Requirements:

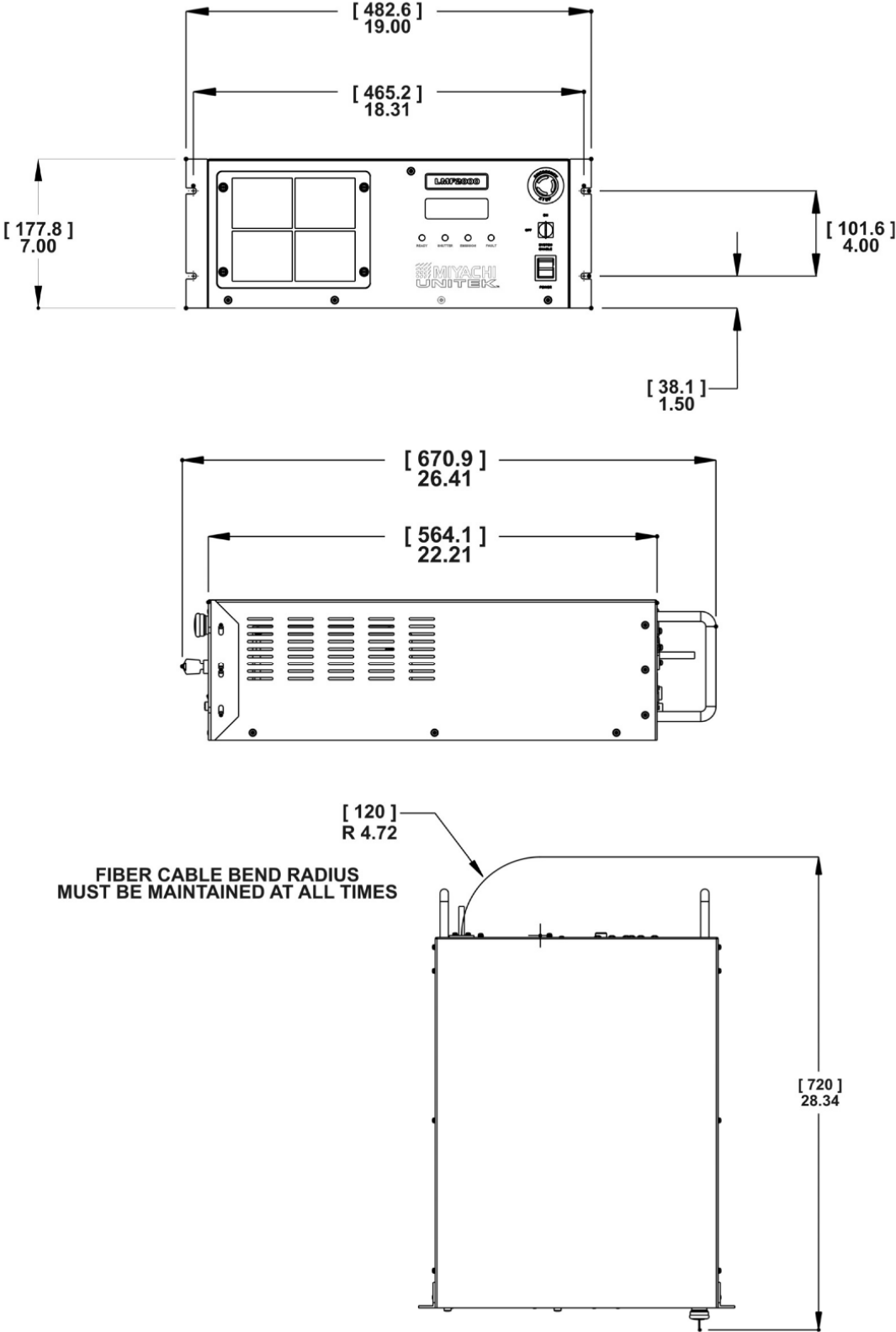
The temperature in the Marker is maintained by an internal cooling fan. In order to maintain a proper operating temperature, there must be adequate space around the Marker (*see the "Planning" section above for exact requirements*). If the laser cannot maintain a proper operating temperature, a *Laser 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)

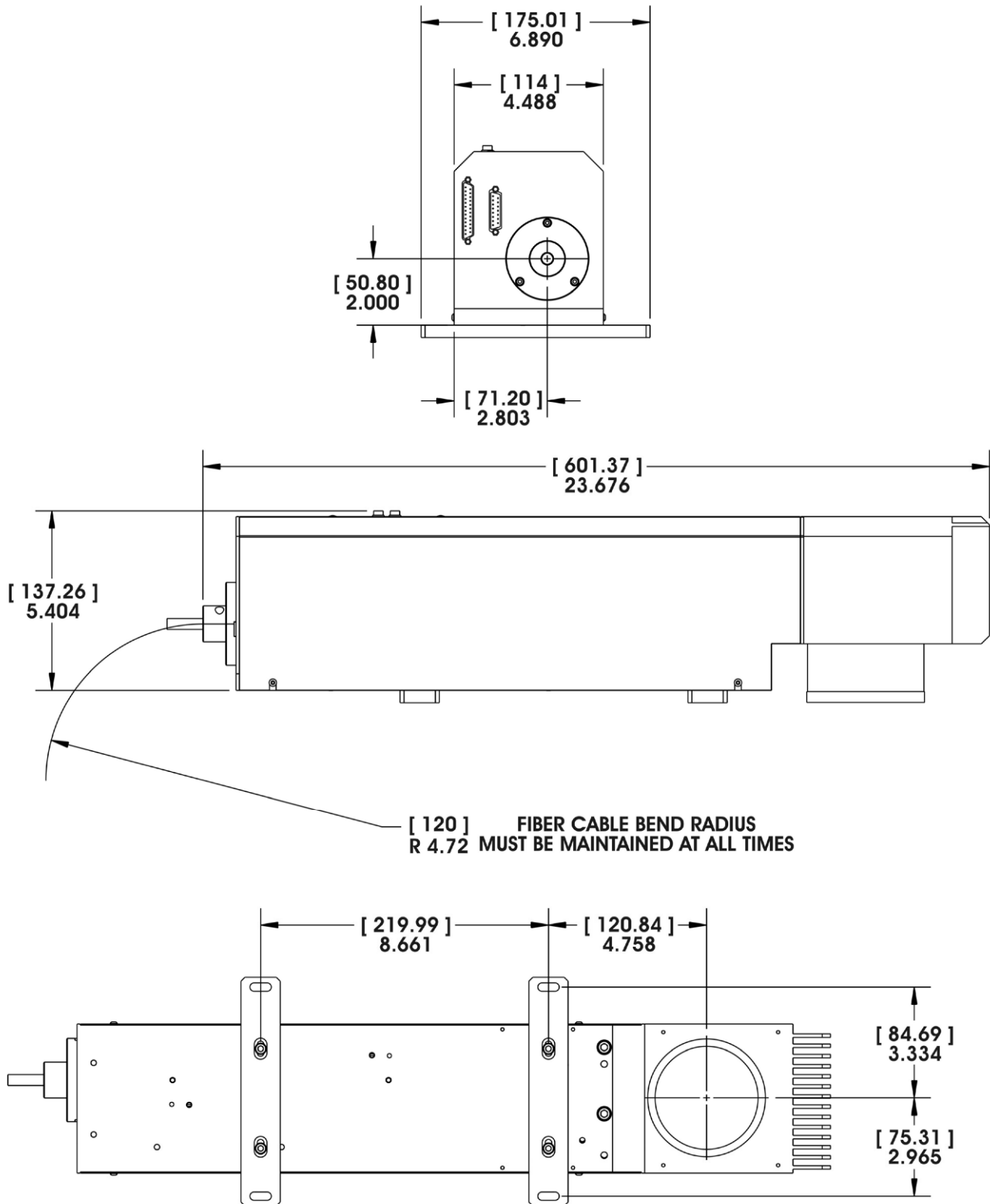
Dimensions: Control Unit – Benchtop



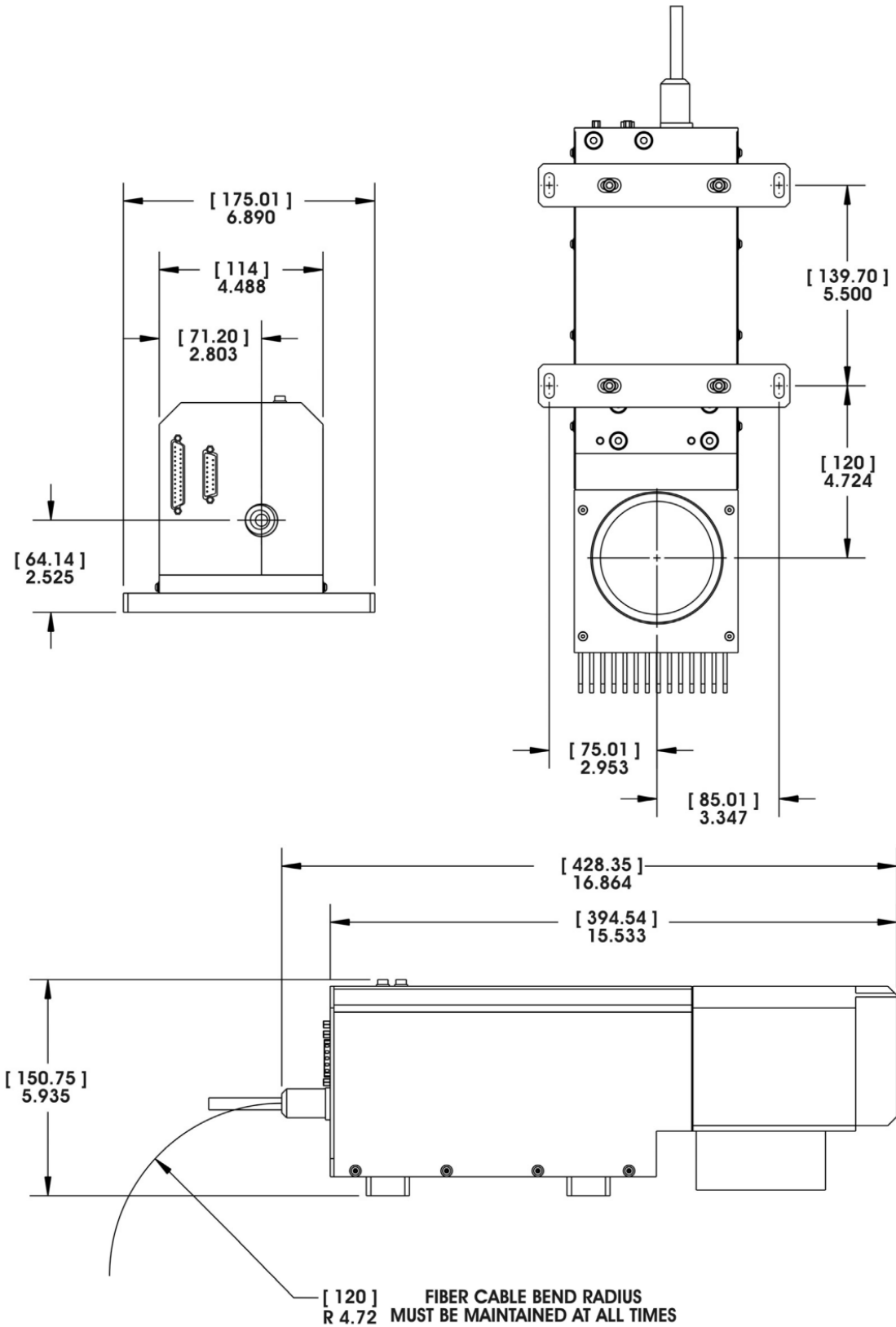
Dimensions: Control Unit – Rack Unit



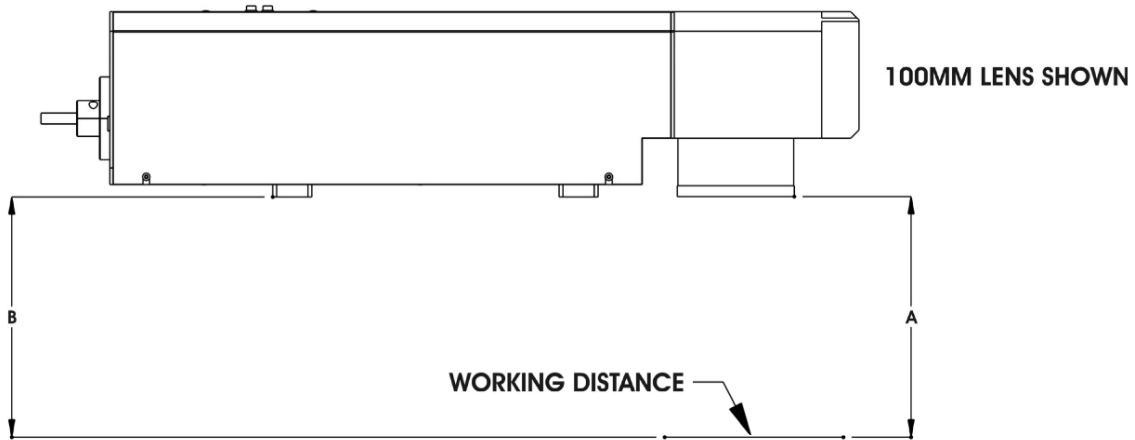
Dimensions: Oscillator – Standard Head



Dimensions: Oscillator – Compact Head

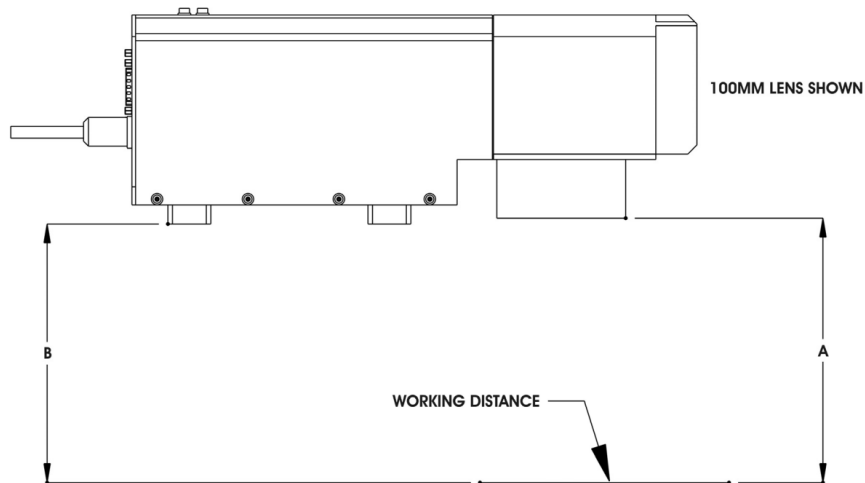


Working Distance (Standard Head):



<i>f</i> -theta Lens					
Dimension	100mm	160mm	163mm	254mm	420mm
A	3.86" ± 0.04" (98 ± 1mm)	6.93" ± 0.08" (176 ± 2mm)	7.28" ± 0.08" (185 ± 2mm)	11.65" ± 0.12" (296 ± 3mm)	19.45" ± 0.20" (494 ± 5mm)
B	3.84" ± 0.04" (97.5 ± 1mm)	6.91" ± 0.08" (175 ± 2mm)	7.91" ± 0.08" (200.8 ± 2mm)	12.72" ± 0.12" (323.2 ± 3mm)	3.86" ± 0.04" (521.2 ± 5mm)

Working Distance (Compact Head):



<i>f</i> -theta Lens					
Dimension	100mm	160mm	163mm	254mm	420mm
A	3.86" ± 0.04" (98 ± 1mm)	6.93" ± 0.08" (176 ± 2mm)	7.28" ± 0.08" (185 ± 2mm)	11.65" ± 0.12" (296 ± 3mm)	19.45" ± 0.20" (494 ± 5mm)
B	3.84" ± 0.04" (93.7 ± 1mm)	6.91" ± 0.08" (171 ± 2mm)	7.91" ± 0.08" (197 ± 2mm)	12.72" ± 0.12" (319.4 ± 3mm)	3.86" ± 0.04" (517 ± 5mm)

Mass (Weight):

The LMF/ML-7xxx Control Unit weighs 61 lbs (27.7 kg).

The LMF/ML-7xxx Standard Oscillator Head weighs 18 lbs (8.2 kg).

The LMF/ML-7xxx Compact Oscillator Head weighs 16 lbs (7.3 kg).

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 Miyachi Unitek (MUC) and the **ML** Series are sold by Miyachi Japan (MHC). 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:

Model ¹	Wavelength	Average Output Power	Accession #
LMF1000	1060 - 1150nm	10W	0820530-000
LMF2000	1060 - 1150nm	20W	0820530-000
ML-7311B/C	1060 - 1150nm	10W	0820530-000
ML-7321B/C	1060 - 1150nm	20W	0820530-000
ML-7320B/C	1060 - 1150nm	20W	0820530-000

- Both the MUC and MHC 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. For convenience, the CE declaration is included at the end of this document.

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 Miyachi Unitek Corporation 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 (parts used on all models, except as noted):

Description	MUC Pt #
Air Filter – Front Panel	4-65911-01
Lithium Battery, 3.0v, 190 mAH Lithium Coin Cell (CR2032)	145-017
O-Ring, Laser Head, 1.051" ID x 1.21" OD	570-185
O-Ring, Beam Expander, 24.7mm ID x 31.7mm OD	570-184
Power Supply, Quad (+/-15V, 24V, 5V)	4-66021-01
Power Supply, LD, +24V, 250W	4-66016-01
Fan, Cooling, 24VDC (5.0" X 5.0")	305-038
Guide Beam Assembly	4-65719-01
Fuse, Fast-Acting, 8A	330-206
Fuse Drawer for the Power Entry Module	550-166
Key switch (switch + key sold together)	680-443
E-Stop Switch	680-316
Front Panel Power Switch	680-242
Front Panel Overlay	4-65910-02
Air Filter Bezel	4-65912-01
I/O PCB	4-66006-01
f-theta Lens, f100	475-328
└ f100/ f160 protective lens	475-135
f-theta Lens, f160	475-111
└ f100/ f160 protective lens	475-135
f-theta Lens, f163	475-324
└ f163 protective lens	TBD
f-theta Lens, f254	475-121
└ f254/ f420 protective lens	475-134
f-theta Lens, f420	475-120
└ f254/ f420 protective lens	475-134
2-pin - Remote I/L connector	250-715
4-pin - E-Stop connector	250-717
8-pin - User I/O Out connector	250-718
9-pin - User I/O In connector	250-743
10-pin - System I/O Out connector	250-719
11-pin - System I/O In connector	250-739
12-pin - Job Select connector	250-744
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



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RV98009A-002

Declaration of Conformity

Application of Council Directive: 2004/108/EC

Standards To Which
Conformity Is Declared:

EN61326: 2006
EN55011 Class A Group 1
EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11

Manufacturer's Name:

Miyachi Unitek

Manufacturer's Address:

1820 S. Myrtle Avenue
Monrovia, CA 91016
626-303-5676

Equipment Description:

Laser Marker

Equipment Class:

Electrical Equipment Measurement,
Control & Laboratory Use - Industrial

Model Numbers:

LMF2000/ML-7320C

*I the undersigned, hereby declare that the equipment specified above, conforms to the above
Directive(s) and Standard(s).*

Monrovia, CA USA
Place: _____
Signature: David Cieluski
Signature: DAVID CIELUSKI
Full Name: VICE PRESIDENT, STD
Position: PRODUCT DEVELOPMENT