MOPA^{II} - Active Fiber Laser Marking System

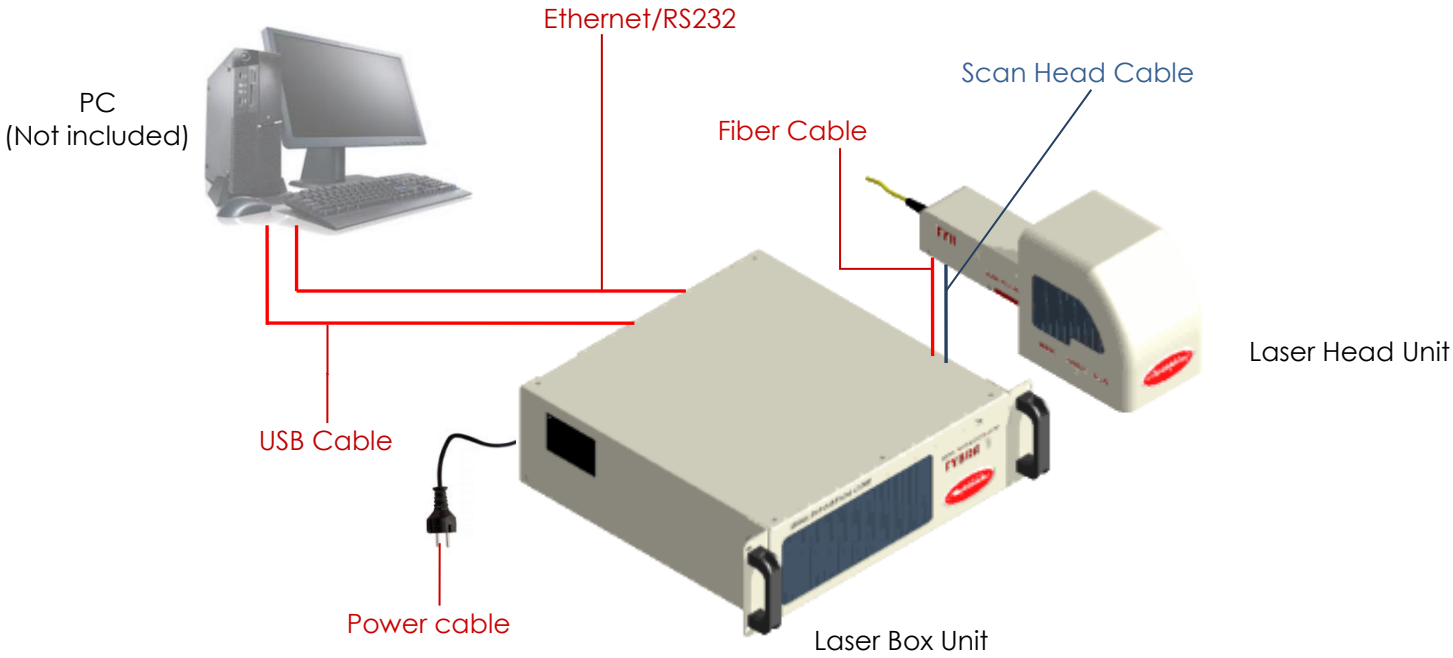
20 W Versions

System Overview

All AUTOMATOR fiber lasers are manufactured with the highest quality sources available today and are ideal for annealing and uniform, flat and coloured markings on metals. MOPA^{II} creates perfectly uniform and pure black markings thanks to the possibility for the operator to adjust the laser pulse width and frequency from 6 to 200 kHz.

MOPA^{II} comes with three main components: the BOX contains the source and the electrical components, The HEAD with a galvanometer for fast x/y movement and focal lens and the FIBER optic cable that connects the two. The AUTOMATOR MOPA^{II} couples the stability of a fiber laser with our proprietary EuGENIUS^{TM} software to create market leading "power-to-the-part" performance.

- ***Double-block optimized laser device***
- ***Designed for bad environments***
- ***Stand-alone version available (TCP/IP, RS232, Profinet, Ethernet IP interfaces)***
- ***Powerful and easy to use***
- ***Adjustable pulse width and frequency***



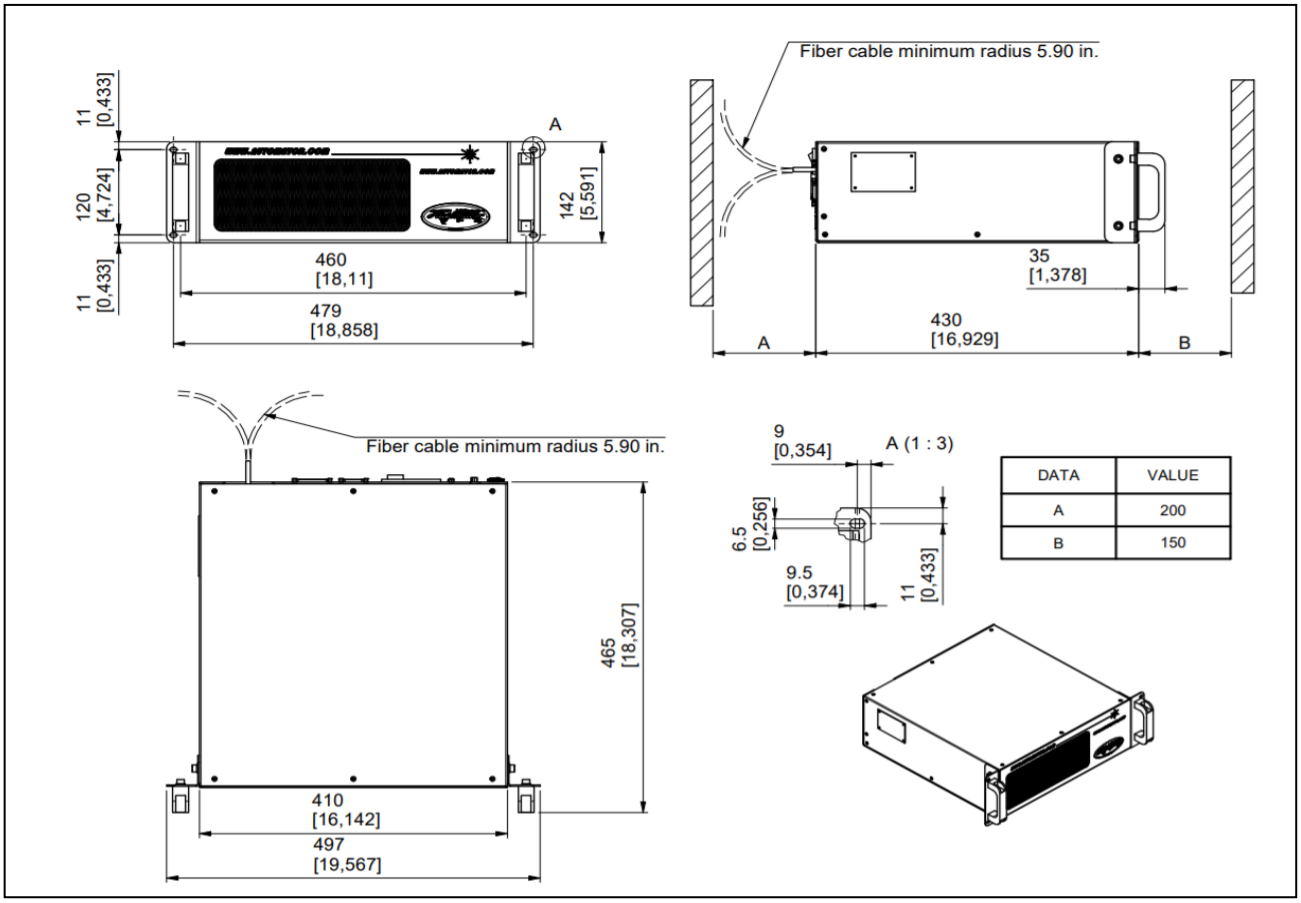
Options

Adjustable X-Y-Z axis, Rotating Theta axis, Safety Class 1 enclosures

Box unit

The box unit sets the electronic parts and the laser source in two separated cases. With this configuration, the laser source is protected by the dust and all the interferences coming from the external environment trough the fan chilling system.

Box unit - Technical drawings



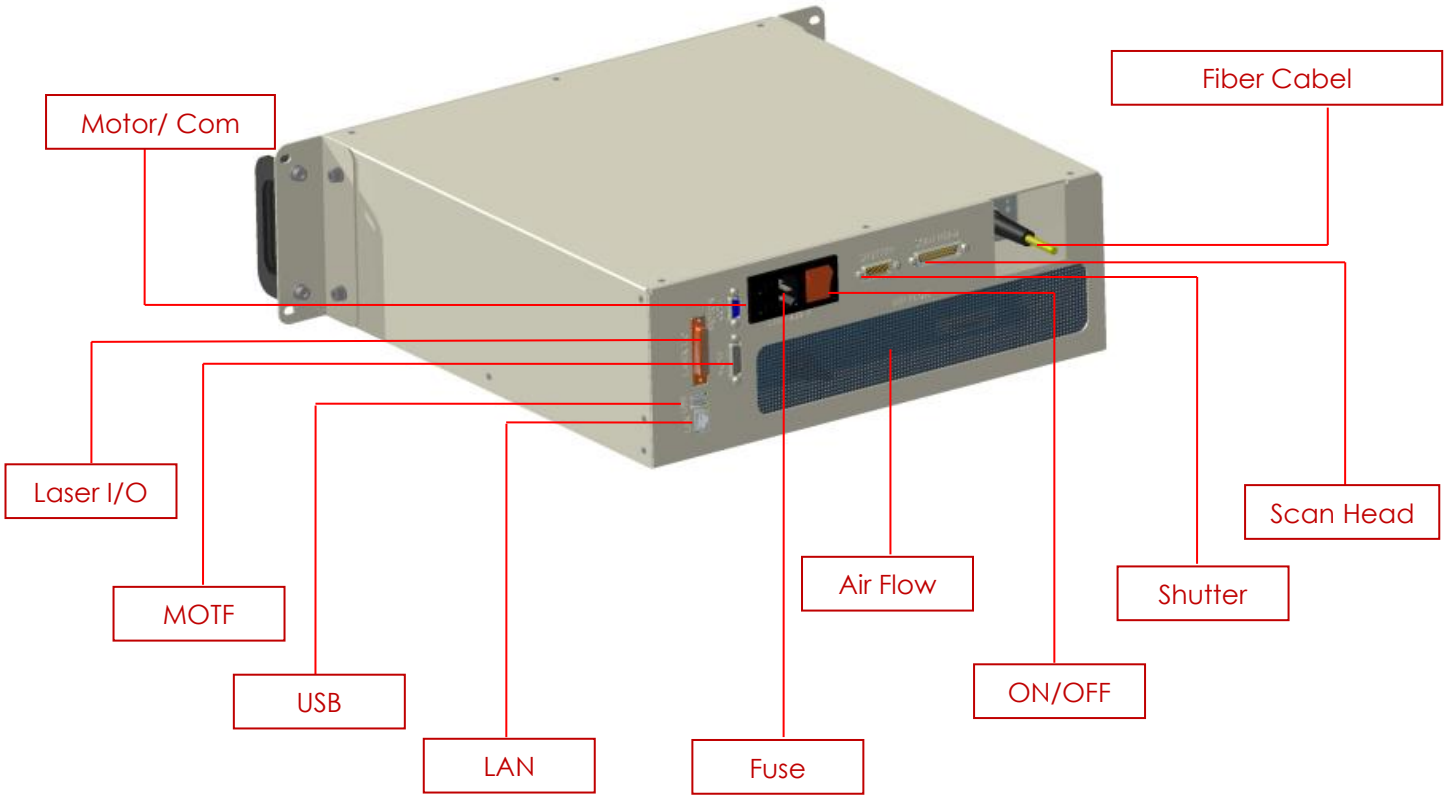
Box unit - Technical data

Overall Dimensions: LxWxH (mm • in):	465x497x142 • 18.3x19.5x5.6
Weight (kg - lb):	23,5 • 51,8
Laser type:	Active fiber laser
Power range (W):	20
Wavelenght (nm):	1060 – 1085
Polarization:	Random
Standard lens (mm - marking area):	F163 –110x110
Optical Isolator:	Si
External power supply:	100/240V 50/60Hz
Power consumption (20°C) (W):	500 W
Laser working voltage (VDC):	24 Vdc
Laser beam diameter, before lenses (mm):	7/8
Beam quality (M^2):	1.7
Pulse duration (ns) @20kHz:	6 to 200 adjustable
Standard fiber cable lenght (mm - in):	5.000 • 197
Operating temperature (°C • °F):	0 - +40 • 32 - 100,4
Store temperature (°C • °F):	-10 - +60 • 14 - 140
Humidity (%):	10-80
Cooling system:	Air cooled
Connectivity:	Power supply, ethernet, fiber cable, I/O
Directive 2011/65/EC - Restriction of Hazardous Substances (RoHS):	Compliant
Safety Class:	4
SIL:	3
MTBF (Working Hours):	125.000
IP Certification of the Cover: (CEI70-1)	30
Mark on the fly:	No
Available axis (depending by the softwares):	Z-X-Y, Rotary, up to 32 external axis

Box unit - Board

Board of PC interface with electronic control that handles the head and galvanometers for the two axes. The output-closing door signal management for the access to the marking area and Emergency safety Operator, according to the legislation in force, is responsibility of the integrator.

Box unit - Layout and connectivity



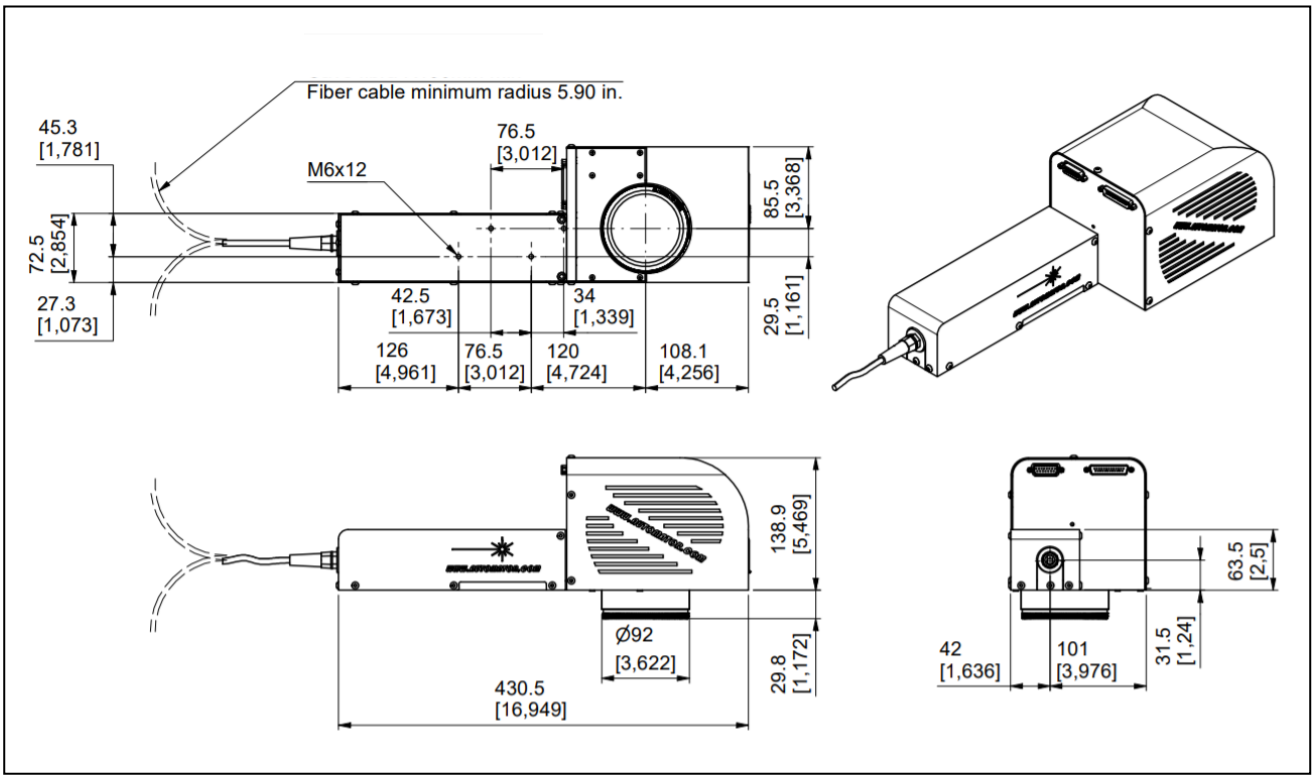
Head unit

The head unit sets the galvanometric system and the lenses to focus the laser beam generated by the active fiber source in the Box unit.

Head unit - Scanning head

Scanning head with flat field standard lens 110x110 mm. For other areas of marking see **Lenses range**.

Head unit - Technical drawings



Head unit - Technical Data

Overall Dimensions LxWxH (mm • in):	424x101x138 • 16.7x3.9x5.4
Weight (kg - lb):	6 • 13,22
***Fiber cable lenght* (mm • in):**	2.400 • 94.50
Marking Head installation directions:	All directions
IP Certification of the Cover (CEI70-1)	60 31

Head unit - Lenses range

Lens F163	Flat field focus – marking area 110x110 mm • 4,33"x4,33"
Lens F100	Flat field focus – marking area 60x60 mm • 2,36"x2.36"
Lens F254	Flat field focus – marking area 155x155 mm • 6,10"x6,10"
LENS F330	Flat field focus – marking area 200x200 mm • 7,87"x7,87"
Lens F430	Flat field focus – marking area 300x300 mm • 11,8"x11,8"

Head unit - Lenses focus lenght (these data are can vary lens by lens with a tolerance of 5%)

Lens F163 (mm • in)	190 • 7,48
Lens F100 (mm • in)	99 • 3,89
Lens F254 (mm • in)	298 • 11,7
Lens F330 (mm • in)	385 • 15,1
Lens F430 (mm • in)	492 • 19,3

Head unit - Red diode

Red diode pointing to 2 mw save (class 3A projecting the preview on the workpiece, so that the operator can easily check the positioning). The marked area is illuminated by a ring of LEDs, placed around the lens.

Marking Head - Shutter

The MOPA^{II} marking head integrates a shutter housing: this electro-mechanical actuator provides a millisecond shutter operation. During marking, the shutter stays in an open position and then closes when the operation is completed providing a safe condition of lockout. The shutter movement can be controlled by the laser hardware/software or by the I/O signals. An integrated certified safety sensor detects the shutter blade position in the housing, providing a critical information that confirms the state of the shutter position.

Head unit - FocusFinder

Automator MOPA^{II} is available, like any other Automator marking laser, even with **FocusFinder** focal distance detection system, which always detects the correct distance between the lens and the piece to be marked.

EuGENIUS™ Software

EuGenius Software has been projected and developed by Automator highly specialized team, consolidating the marked requests in the long term marking knowhow of more than 70 years in marking. Versatile in the applications and friendly to use, even by operators without highly technical specific training, such as CAD knowledge.

- Multilanguage menu
- Management barcode "Datamatrix", 2D code, QR code, PDF Queues
- Easy import of vector drawings, DXF
- Easy import of raster graphics, BMP, JPEG, .JPG, GIF
- Communication protocols management: Profinet, Profibus, CClink, Ethernet IP, GS1
- Complete set of laser parameters such as speed or power laser
- Texts, Text arcs, text on curved lines,
- Lines, rectangles, polygons, circles and arcs
- TTF Font ® (windows property)
- Graphic preview
- Texts with date, serial numbers, shift codes and year/month/day
- Multi fillings or single profile markings
- Templates (object to be marked as background)
- Proportion scale, move, rotate, group creation of each object on the screen
- Quick Test for an easy identification of the best laser parameters
- Automation & object tiling
- External axis commanded by software
- Shutter control

Communication protocols: proprietary | Remote Interface Protocol

Pin out – I/O scheme

Pin:	I/O 9 Female Poles (communications/motors)
1	(reserved)
2	RX2
3	TX2
4	(reserved)
5	0 Vdc
6	(reserved)
7	A
8	B
9	+24 Vdc

Com. IN
nc
Start Marking
JOB loading
USER 1
USER 2
USER 3
USER 4 (SHUTTER)
nc
nc
nc
nc
X1 , X2 (Com. Securty)
Com. OUT
System ON
System READY
Laser ON (armed)
nc
Ongoing marking
USER OUT 1
USER OUT 2
nc
Nc
Y1 (Security Channel 1)
Y2 (Security Channel 2)

Pin:	I/O 15 Female Poles (encoder)		
1	+24 Vdc	8	nc
2	0 Vdc	9	+5Vdc
3	A	10	/A
4	B	11	/B
5	Z	12	/Z
6	nc	13	nc
7	nc	14/15	nc