



M-Series

*Advanced laser workstations with integrated vision inspection
for economic direct part marking and reliable product traceability*



Dual mass flywheel with 2D code (ZF), dental implant with micro 2D code, automotive day/night design panel (laser lacquer removal)

The M-Series consists of advanced manually loaded laser marking workstations for the precise and economic processing of small, large and geometrically complex workpieces as well as small and large batches of parts. The M-Series is available in two sizes (M2000, M3000) and three model options each (B: with worktable, R: with turntable, P: with axes X/Y/Z). Advanced fiber and UV laser markers are available for integration as well as fully integrated vision inspection solutions.

- **The general purpose B models:** programmable Z-axis, worktable, electric lift door; ideal for almost any direct part marking application – among others in the automotive, aerospace, medical, tools, metal, plastic processing and mechanical engineering industries.
- **The flexible P models:** programmable axes (X, Y, Z; optionally expandable to five axes), electric lift door; perfect for batch processing and small parts in trays/pallets, but also for larger parts where marking positions are outside the marking field or where marks have to be applied at several positions.
- **The rotating high-throughput R models:** programmable Z-axis, automated two-position rotary table; perfect for marking all kinds of serial parts (i.e. vehicle interior parts, metal components, tools, medical devices, implants or surgical instruments).

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The M-Series features at a glance:

Programmable axes, high-throughput rotary tables and integrated vision tools for economic high-precision markings

Your product benefits at a glance

- **Precision and process reliability:**
 - Rigid machine (polymer concrete) 1
 - Laser marking with fully integrated vision alignment and inspection (option) 2
- **Flexibility:**
 - Integration into customer processes (interfaces, additional axes) 3
 - Various laser systems available 4
 - Accessories and options for optimal customization
- **Economy:**
 - Small footprint 5
 - Optimal accessibility 6
 - Air-cooled laser systems 4
- **Ergonomic workstations:**
 - Height adjustable for standing/seated work (option) 7
 - Configurable control panel position (left, right) 8
- **Productivity:**
 - High throughput with two-position rotary table (R-models) 9

For precision and process reliability:

Rigid workstations with integrated vision inspection

The robust construction of the M-Series and the laser integrated vision alignment and inspection systems ensure ultimate precision and process reliability. As a result, all marks are executed precisely and with repeat accuracy.

Rigid polymer concrete workstations

The workstation's polymer concrete slab is float-mounted on the machine frame. As a result all M-Series workstations are insensitive to variations in temperature and external vibrations and ensure ultimate **process reliability and stability**.

Mark alignment and pre- and post-mark inspection reduce scrap

With its inspection features, our vision system provides the capability to achieve **pre-and post-mark verifications** that help to increase precision, economy, manufacturing efficiency and overall processing quality during laser marking. Simultaneously, scrap is reduced drastically and close to zero defect marking is ensured.

FOBA's vision features ...

... prior to marking

- Automatic focus adjustment with patented Autofocus tool
- Pre-mark verification (check if a part is not already marked)
- Check if the part is the correct one
- Alignment of the to-be-marked content to the part

... directly after marking

- Check that the mark is aligned to the part and positioned according to tolerance requirements
- Read mark contents: Verification that the right content has been marked by verifying every marked character (Optical Character Verification)
- Code validation (1D/2D)
- Logging of images and inspection results.

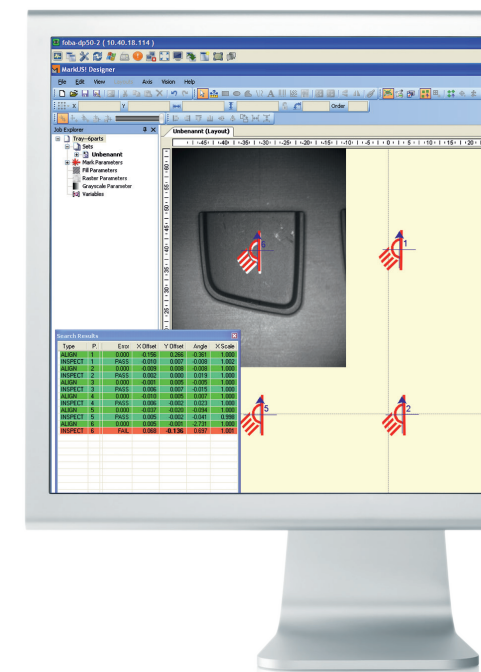
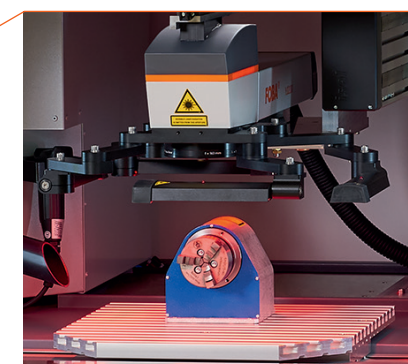
FOBA's laser integrated vision system is the heart of the market's simplest, most complete laser marking workflow solution which we simply call HELP, Holistic Enhanced Laser Process. HELP is a **unique 360° part marking process that ensures highest production performance**.

Our fully integrated imaging solution results in superior marking quality that offers a quick ROI through reduced:

- setup time costs
- scrap costs
- process integration costs

Right: verification report. Due to the material's uneven surface, part #6 failed the inspection, the Y position exceeded the 0.1mm tolerance.

*Top: Customer process with added rotary axis
Bottom: the polymer concrete base inside the machine*





More flexibility for individual processes

The M-Series adapts to the customer's laser process and not vice versa. The workstation provides the flexibility that is needed to design, extend, ensure and implement these laser processes.

Interfaces in the working chamber of the workstation for the integration of auxiliary equipment or instruments (cameras, measurement devices, sensors, etc.) are available as an option.

Flexible machine control for the integration of additional process steps for quality assurance (1) and quality control (2)

- 1 *Quality assurance with Laser Power Meter:
Monitoring of laser power ensures high marking quality*
- 2 *Quality control with integrated vision:
post-mark inspection, OCV, code validation*

More efficiency in the smallest space

The minimal footprint and optimal workstation accessibility ensure more efficiency in the smallest space. The compact laser marking workstations are designed for maximum utilization of space and optimal service and maintenance accessibility.

Footprint:

- M2000-B/P – 1 m² | M2000-R – 1.3 m²
- M3000-B/P – 1.5 m² | M3000-R – 1.8 m²
- M3000-B/P UV – 2 m²

Access:

- or loading: from the front
- Access for service and maintenance:
from the front and through all side doors

Easy setup:

- with side windows in R-models
- fast and easy setup with open front door
(optional) for B/P-models

*M3000-P with open front door
(electric lift door) and open
side doors.*



More productivity for higher throughputs

With the 2 position rotary table workstations idle times are avoided, and production throughputs are increased. While parts are loaded to one position of the table, products are marked in the other position.

Rotary times of rotary tables

- M2000-R (180°): 1.2 s
- M3000-R (180°): 1.7 s

Flexibly positionable extraction nozzles directly on the rotation table: → less debris, higher marking quality, a range of fume nozzles available



More ergonomics for maximum ease of use

Designed for both standing and seated work, and highly adaptable to individual needs, the M-Series workstations provide maximum ease of use and meet all requirements for ergonomic working.

Electrical height adjustment

- height adjustment range: 750 – 1,050 mm (height work-table) (lowest position: 1,899 mm, maximum position: 2,199 mm, height adjustable in mm-steps to accommodate different operator sizes)
- for seated or standing work

Control panel (with monitor, keyboard and computer mouse)

- panel on the left (option) or right (standard) side
- footswitch to trigger start of marking process (optional)



LED1: green LED2 LED3: green LED4: green

- LED 1 steady light: part on outer table
LED 1 flashes: request to change part
- LED 2 flashes: request to push start button
(table rotates, marking process starts)
LED 2 steady light: start button has been pushed
- LED 3 steady light: part on inner table
- LED 4 steady light: marking process is running

Major control elements and status displays are directly integrated in the front of the workstation to ensure optimal visibility and accessibility.

Entire machine room is accessible

- loading from the front
- workstation access (for service, maintenance) from the front and from all side doors

Entire machine room is visible

- both during and after the processing with the front door opened
- evenly illuminated working area
- large laser safety window for good visibility of the working area during processing (with the front door closed), additional side windows in R-models

Sensors for part detection (option) and **status LEDs** (standard in R-models) add ease-of-use.





TECHNICAL DATA → M2000/3000-B/P with Yb

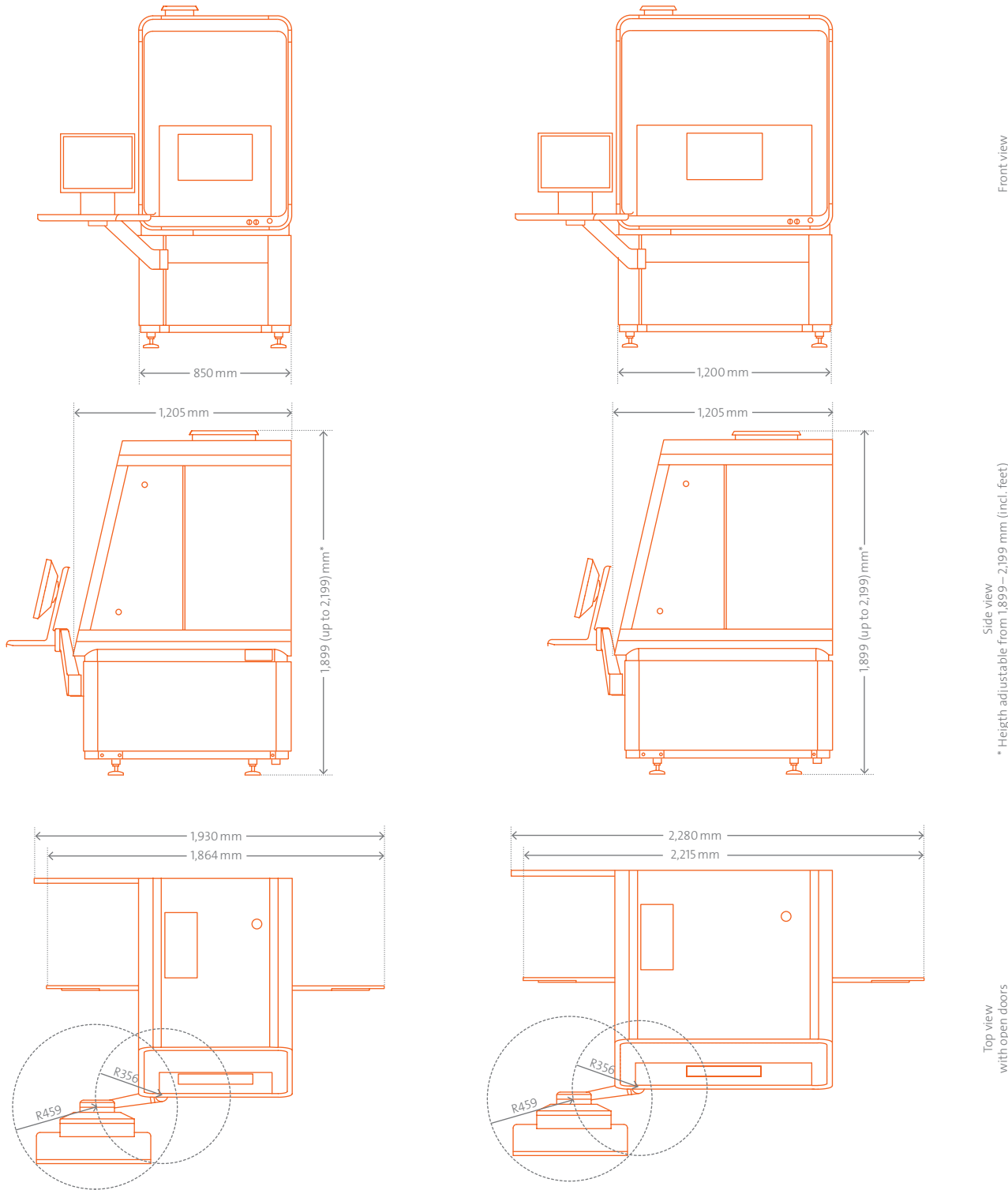
Model	B: Laser marking workstation with worktable and programmable Z-axis P: Laser marking workstation with programmable axes (X, Y, Z)	
Available laser systems	Yb: Y.0100, Y.0200, Y.0201, Y.0300, Y.0301, Y.0500, Y.0050-cw, Y.0100-cw	
Workstation	M2000-B/P	M3000-B/P
Features	B: Worktable, Z-axis, electric lift door P: Axes X, Y, Z, electric lift door	
User interfaces	Laser marking software FOBA MarkUS	
Axes***	Programmable Z-axis → Travel 350 mm → Travel speed 25 mm/s (1.5 m/min) Programmable axes X and Y → Travel X-axis 315 mm → Travel Y-axis 190 - 255 mm → Travel speed 100 mm/s (6 m/min) each	Programmable Z-axis → Travel 350 mm → Travel speed 25 mm/s (1.5 m/min) Programmable axes X and Y → Travel X-axis 520 mm → Travel Y-axis 180 - 255 mm → Travel speed 100 mm/s (6 m/min) each
Dimensions (WxDxH, mm)	850x1,205x(1,899 up to 2,199)*	with Yb: 1,200x1,205x(1,899 up to 2,199)*
Footprint (m²)	1	with Yb: 1.5
Working chamber (m³)	0.136	0.2
Door opening (WxH, mm)	620x450	970x450
Weight** (kg)	approx. 630	approx. 650
Safety classes	→ Laser class 1 (according to IEC 60825-1) → IP22	
Max. load (kg)	B: 50 P: 30	B: 50 P: 30
Max. workpiece size (WxDxH, mm)	B: 620x380x450 P: 620x490x450	B: 970x380x450 P: 970x490x450
Supply	→ Depends on workspace and utilized laser system	
Electrical requirements	1/N/PE, AC 110/230V, 50/60 Hz	
Power consumption	Depends on utilized laser system, < 2 kW	
Temperature Humidity	15–35 °C (dependig on laser system also up to 40 °C) 10–90 %, non-condensing	
Options/accessories	→ Exhaust systems → Vision systems → Other axes on request → Interfaces for the integration of client processes → Laser Power Meter → Plugins (Advanced Operator PlugIn) → Footswitch	

AVAILABLE WORKSTATIONS FOBA M-SERIES

Two housing sizes	for processing medium-size (M2000) and large (M3000) parts
Three workstation models	→ with worktable (M2000-B, M3000-B) → with three axes (X/Y/Z) (M2000-P, M3000-P) > other axes on request → with 2-station turntable (M2000-R, M3000-R)

DIMENSIONED DRAWINGS

M2000-B/P with Yb	M3000-B/P with Yb
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* Height adjustment range (incl. feet) ** Without laser and external components *** Depends on configuration and laser and mounting position



TECHNICAL DATA → M3000-B/P WITH UV

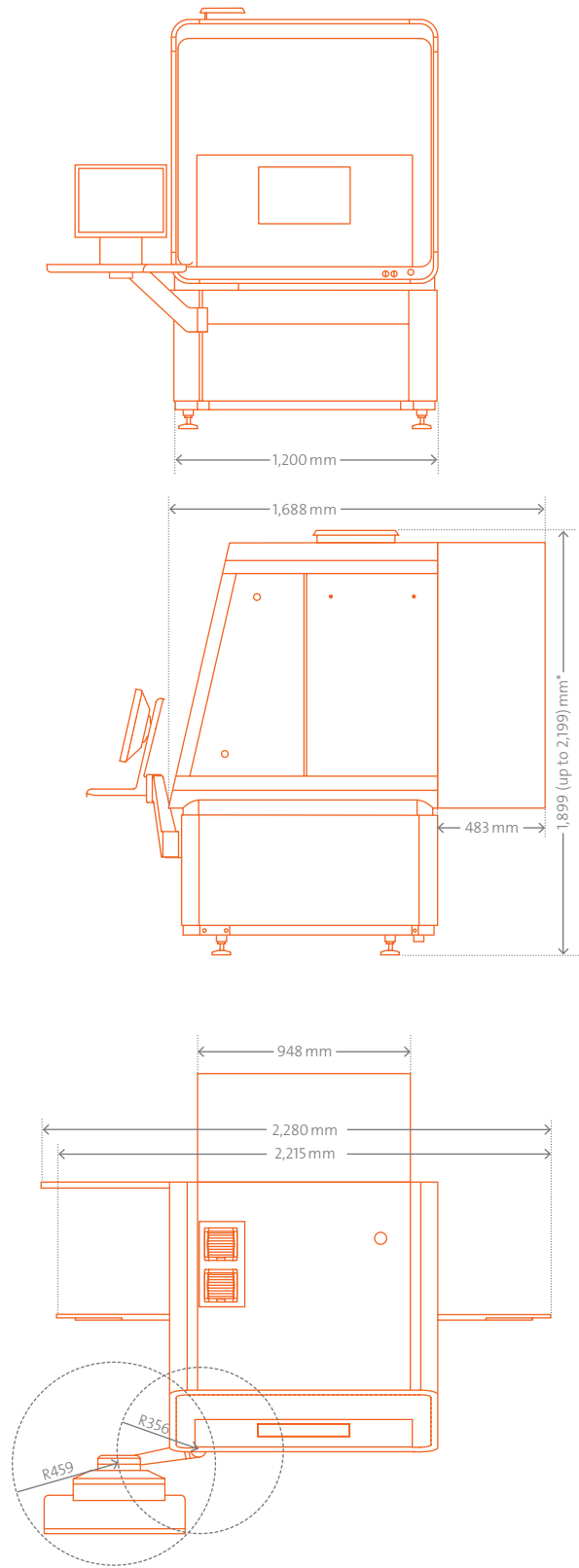
Model	B: Laser marking workstation with worktable and programmable Z-axis P: Laser marking workstation with programmable axes (X, Y, Z)
Available laser systems	UV: V.0020-uv
Workstation	M3000-B/P UV
Features	B: Worktable, Z-axis, electric lift door P: Axes X, Y, Z, electric lift door
User interfaces	Laser marking software FOBA MarkUS
Axes***	Programmable Z-axis → Travel 350 mm → Travel speed 25 mm/s (1.5 m/min) Programmable axes X and Y → Travel X-axis 520 mm → Travel Y-axis 150 - 225 mm → Travel speed 100 mm/s (6 m/min) each
Dimensions (WxDxH, mm)	with UV: 1,200x1,688x(1,899 up to 2,199)*
Footprint (m²)	with UV: 2
Working chamber (m³)	0.2
Door opening (WxH, mm)	970x450
Weight** (kg)	with UV approx. 675
Safety classes	→ Laser class 1 (according to IEC 60825-1) → IP22
Max. load (kg)	B: 50 P: 30
Max. workpiece size (WxDxH, mm)	B: 970x380x450 P: 970x490x450
Supply	→ Depends on workspace and utilized laser system
Electrical requirements	1/N/PE, AC 110/230V, 50/60 Hz
Power consumption	Depends on utilized laser system, < 2 kW
Temperature Humidity	15–35 °C (dependig on laser system also up to 40 °C) 10–90 %, non-condensing
Options/accessories	→ Exhaust systems → Vision systems → Other axes on request → Interfaces for the integration of client processes → Laser Power Meter → Plugins (Advanced Operator PlugIn) → Footswitch

AVAILABLE WORKSTATIONS FOBA M-SERIES WITH UV MARKING LASER V.0020-UV

One housing size	for processing medium-size and large (M3000) parts
Two workstation models	→ with worktable (M3000-B UV) → with three axes (X/Y/Z) (M3000-P UV) > other axes on request

DIMENSIONED DRAWINGS

M3000-B/P with UV marking laser



Front view

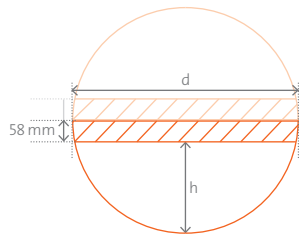
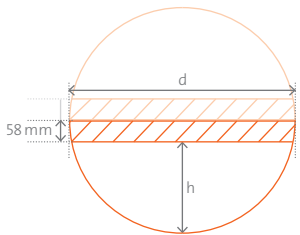
* Height adjustable from 1,899 – 2,199 mm (incl. feet)

Top view
with open doors

* Height adjustment range (incl. feet) ** Without laser and external components *** Depends on configuration and laser and mounting position



TECHNICAL DATA → M2000/3000-R with Yb

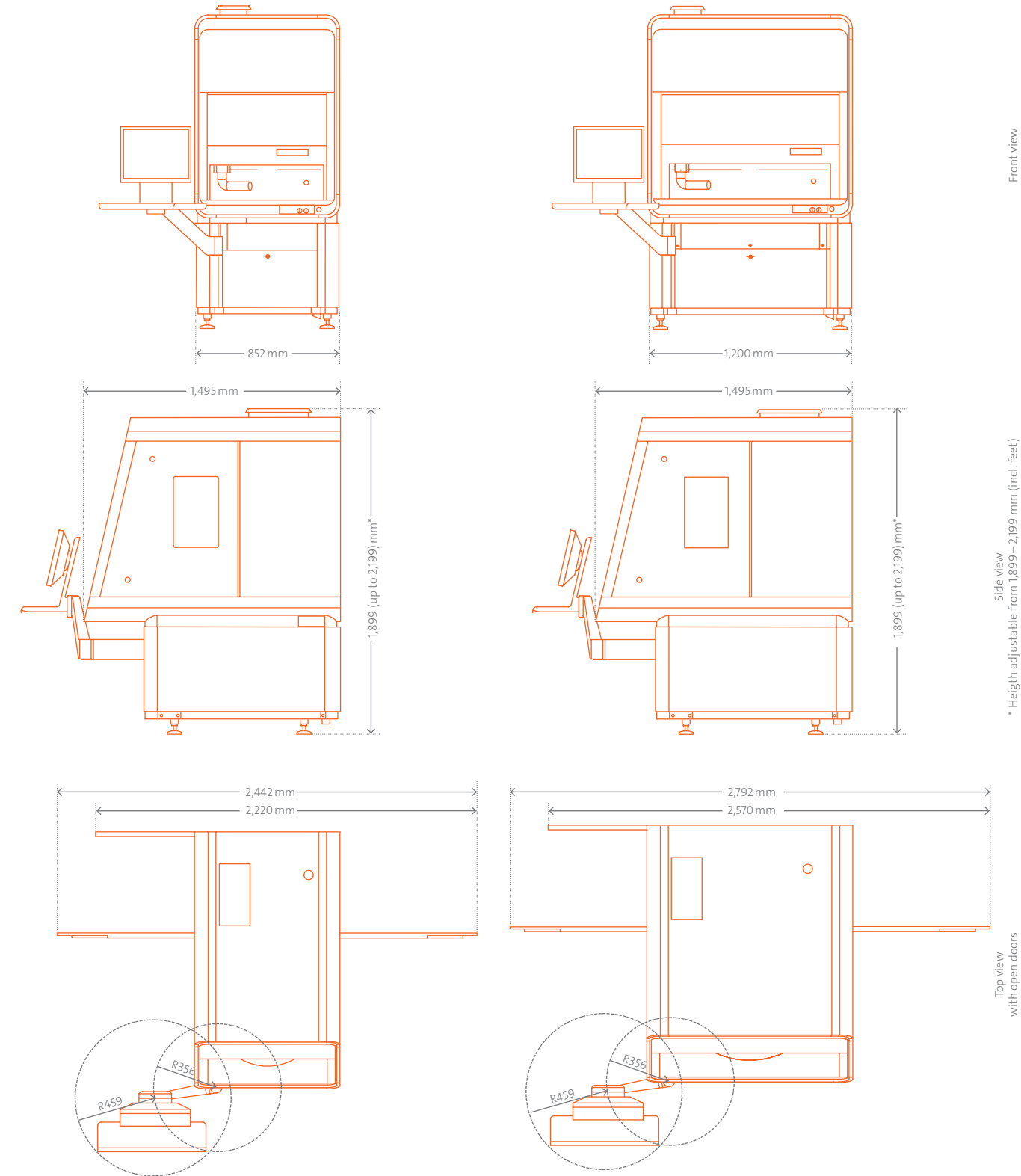
Model	Laser marking workstation with 2-station rotary table and programmable Z-axis	
Available laser systems	Yb: Y.0100, Y.0200, Y.0201, Y.0300, Y.0301, Y.0500, Y.0050-cw, Y.0100-cw	
Workstation	M2000-R	M3000-R
Features	2 position rotary table, Z-axis, turning bulkhead wall	
User interfaces	Laser marking software FOBA MarkUS	
Axes***	Programmable Z-axis → Travel 350 mm → Travel speed 25 mm/s (1.5 m/min)	Programmable Z-axis → Travel 350 mm → Travel speed 25 mm/s (1.5 m/min)
Rotary table	2 station rotary table, ø 670 mm Rotary time (180°) = 1.2 sec.	2 station rotary table, ø 950 mm Rotary time (180°) = 1.7 sec.
Dimensions (W x D x H, mm)	852 x 1,495 x (1,899 up to 2,199)*	1,200 x 1,495 x (1,899 up to 2,199)*
Footprint (m²)	1.3	1.8
Weight** (kg)	approx. 700	approx. 750
Safety classes	→ Laser class 1 (according to IEC 60825-1) → IP22	
Max. load (kg)	2 x 10	2 x 10
Max. workpiece size (W x D x H, mm)	H=200, W x D see graphic for working area below	H=200, W x D see graphic for working area below
Working area per station (mm)	d = 670 h = 277 	d = 950 h = 417 
Supply	→ Depends on workspace and utilized laser system	
Electrical requirements	1/N/PE, AC 230V (optionally AC 110V), 50/60 Hz	
Power consumption	Depends on utilized laser system, < 2 kW	
Temperature Humidity	15–35 °C (dependig on laser system also up to 40 °C) 10–90%, non-condensing	
Options/ accessories	→ Exhaust systems → Vision systems → Other axes on request → Interfaces for the integration of client processes → Laser Power Meter → Plugins (Advanced Operator PlugIn) → Footswitch	

AVAILABLE WORKSTATIONS FOBA M-SERIES

Two housing sizes	for processing medium-size (M2000) and large (M3000) parts
Three workstation models	→ with worktable (M2000-B, M3000-B) → with three axes (X/Y/Z) (M2000-P, M3000-P) > other axes on request → with 2-station turntable (M2000-R, M3000-R)

DIMENSIONED DRAWINGS

M2000-R with Yb	M3000-R with Yb
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M-Series Lookbook



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Your local agency:

