

**General Manual**



***zetalase™***

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## **Technical Specifications**

Your Zetalase™ Laser Marking System is available in different laser models, options, and accessories depending on marking application and customer specifications. Please reference your Sales Order for system details.

### **Zetalase™ Laser Marking System**

- \* Electrically powered Z-Axis for focal length adjustment
- \* Large Operator Sliding Part Loading Door
- \* Fully Opening Service Door for 180 degree work access
- \* Auto/Manual Mode for Part Marking Cycle Start
- \* T-Slotted 18" X 24" Aluminum Work Surface
- \* Full Size Viewing Window with Laser Safety Glass
- \* Front Panel Mounted Operator Control Panel with Safety Key Lock/Shutter/Start/E-stop
- \* Operator HMI for Quick Program Select and Part Changeover
- \* 10" Touch Screen Integrated Monitor
- \* External Keyboard/Mouse/USB/Network/Monitor Ports
- \* Integrated Focus Finder
- \* Class 1 Safety Interlocking
- \* 100-240V one plug operation
- \* Laser programming software included
- \* Air-Cooling
- \* Max part height - 9.5" with FL160 (S) lens / 5.5" with FL254 (S) lens
- \* Dimensions 40"W x 26"D x 35"H
- \* Total System Weight - 306 Lbs.

### **--Laser Specifications:**

- \* Laser Source - Solid State Fiber
- \* Wavelength 1060-1080nm
- \* Average Power 10, 20, or 30W(+/- 10%) Depending on Model
- \* Frequency Range 1-200K (10-20W), 1-1000K (30W)
- \* Red Pointing laser, wavelength 635 nm, Class 2M
- \* Focusing lense: FL 160mm (Optional FL100, 254S, and 254L)
- \* Marking field: 100 mm x 100 mm with FL160

## Laser Safety

The Zetalase™ is a Class 1 laser marking system designed, developed, and manufactured in accordance with EC directives, DIN EN 60825-1, ANSI Z136.1, and Complies with FDA Performance Standards for Laser Products.

Class I laser systems are completely safe for operators to use under normal working conditions. However, it may be possible during machine maintenance or physical modification to be exposed to direct and/or scattered laser radiation. The following section describes laser basics and potential safety hazards they may produce in these unlikely circumstances.

The word laser is an acronym for Light Amplification by Stimulated Emission of Radiation. In this document, the word laser will be limited to electromagnetic radiation-emitting devices using light amplification by stimulated emission of radiation at wavelengths from 180 nanometers to 1 millimeter. The electromagnetic spectrum includes energy ranging from gamma rays to electricity. Figure 1 illustrates the total electromagnetic spectrum and wavelengths of the various regions.

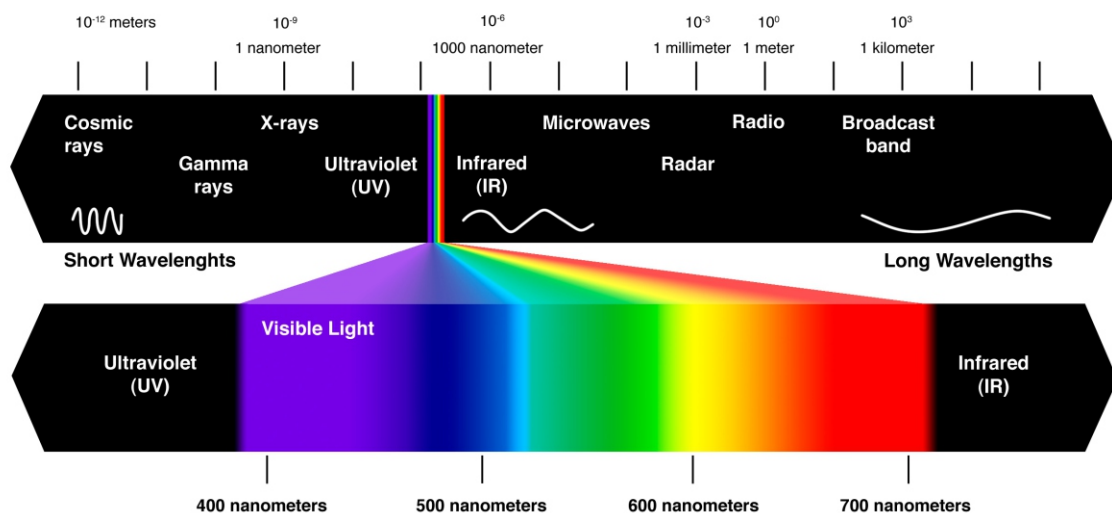


Figure 1. Electromagnetic Spectrum

The primary wavelengths for lasers include the ultraviolet, visible and infrared regions of the spectrum. Ultraviolet radiation for lasers consists of wavelengths between 180 and 400 nanometers (nm). The visible region consists of radiation with wavelengths between 400 and 700 nm. This is the portion we call visible light. The infrared region of the spectrum consists of radiation with wavelengths between 700 nm and 1 mm.

The color or wavelength of light being emitted depends on the type of lasing material being used. For example, if a Neodymium:Yttrium Aluminum Garnet (Nd:YAG) crystal is used as the lasing material, light with a wavelength of 1064 nm will be emitted. Table 1 illustrates various types of material currently used for lasing and the wavelengths that are emitted by that type of laser. Note that certain materials and gases are capable of emitting more than one wavelength. The wavelength of the light emitted in this case is dependent on the optical configuration of the laser.

While not strictly adopted by OSHA, the ANSI standard, Z136.1-2000, "Safe Use of Lasers", is considered an appropriate guideline for ensuring a safe environment where lasers are present. The ANSI standard requires that companies using Class IV lasers have a designated Laser Safety Officer (LSO). The LSO is one who has authority to monitor and enforce the control of laser hazards. Typically the Industrial Hygiene department or the company Safety Specialist oversees the implementation of laser safety.

## Laser Safety

OSHA information concerning laser hazards can be assessed through the following link:

[http://www.osha-slc.gov/dts/osta/otm/otm\\_iii\\_6.html](http://www.osha-slc.gov/dts/osta/otm/otm_iii_6.html)

### Common Laser Hazards

Other than the light that is emitted, lasers generate the same hazards as many other types of equipment. Common hazards are high voltage, compressed gases and intense radio frequency energy. The presence of these hazards depends upon the specific laser technology employed. For example, pulsed CO<sub>2</sub> lasers can generate internal voltages in excess of 25,000 volts and often contain large capacitors capable of delivering over 200 Joules of energy. These lasers have interlocked enclosures, which should not be defeated. When opening the enclosures of these lasers, capacitive discharge procedures should be understood and strictly followed.

Pulsed lasers also typically use a flowing gas design, requiring connection to a cylinder of compressed gas. While most laser gases are very safe, pressurized cylinders can be hazardous and must be properly restrained during use and transportation.

Radio frequency energy can cause severe burns. Only trained personnel should service laser equipment employing RF generators (like sealed CO<sub>2</sub> lasers). Connections carrying RF energy should never be touched during operation.

Often materials being marked give off fumes and gases. Sometimes these gases are noxious or even toxic. Fumes from laser marking should be controlled with an adequate fume extraction system. When in doubt, a chemical analysis of the fumes is suggested to determine if any fume hazards exist.

### Light Hazards

Laser systems are typically designed to prevent a beam from directly contacting a person. Risks, therefore, are more a result of unintentional reflected light. Reflected light falls into two categories, diffuse and specular. Diffuse reflections result when reflective surface irregularities scatter light in all directions. Diffuse reflections are typically much safer as the energy is split into many directions.

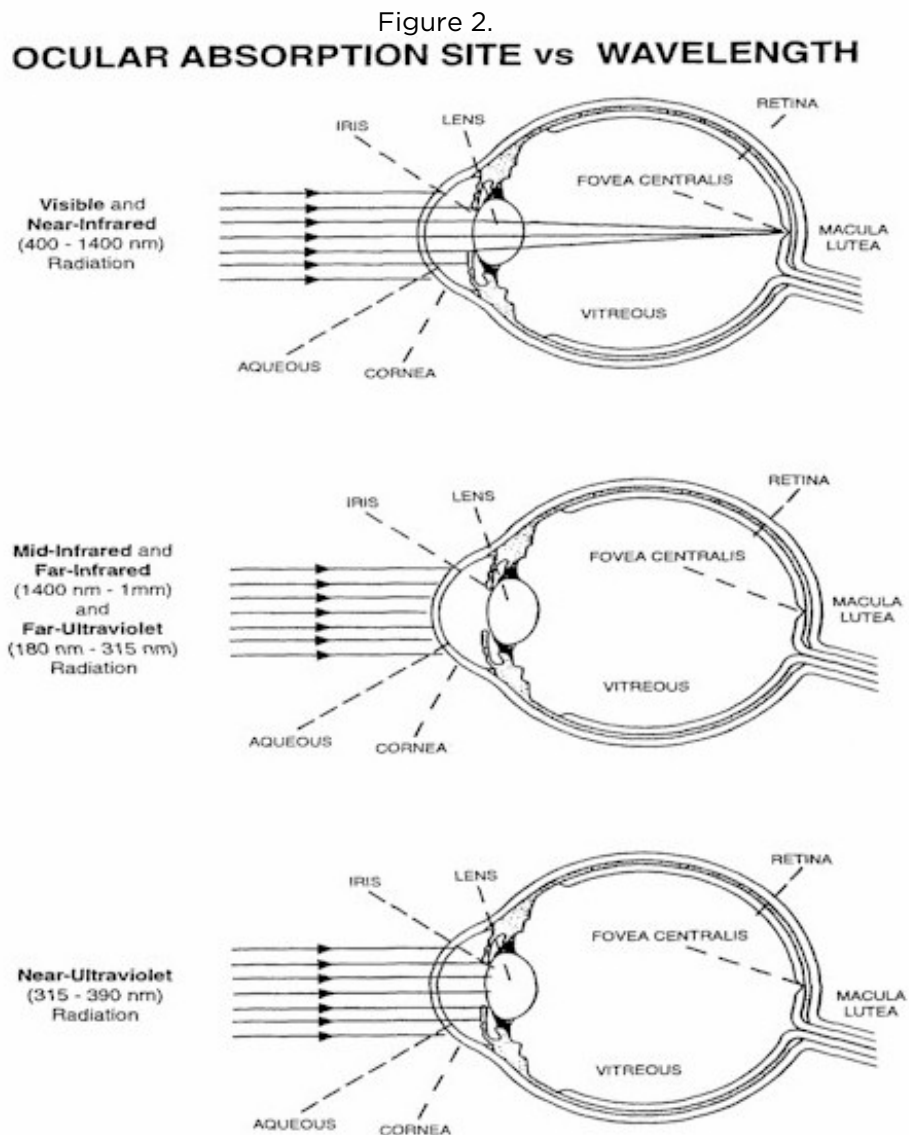
Specular reflections are mirror-like reflections and can reflect close to 100% of the incident light. Because such a large percentage of the energy can be redirected, specular reflections are more hazardous. Note that as the diameter of the laser beam increases, the ability to cause damage decreases. Laser intensity is measured in power or energy over a measured area (W/cm<sup>2</sup>). While focused laser beams produce a very small spot size (and very intense energy) at the mark point, they are typically safer than unfocused beams because the laser beam size spreads out much more rapidly as the distance from the mark point increases.

While specular reflections are more hazardous, they are much less common. Most laser marking systems can be designed to eliminate specular reflective surfaces in the beam path.

## Laser Safety

### Laser Radiation Effects on the Eye - Visible Light and Infrared-A (400-1400 nm)

The marking laser most commonly used in this category is the Q-switched Nd:YAG laser, which operates at a typical wavelength of 1,064 nm. Eye exposure to this laser beam is more hazardous since at this wavelength the laser beam is transmitted through the eye and focused onto the retina. Exposure may initially go undetected because the beam is invisible and the retina lacks pain sensory nerves. Visual disorientation due to retinal damage may not be apparent to the operator until considerable thermal absorption has occurred. Since the energy is concentrated by the eye's lens, the strength of the laser beam that is required to damage the eye is significantly less. Figure 2. shows various laser wavelengths and their effect on the eye.



## **Laser Safety**

While specular reflections are more hazardous, they are much less common. Most laser marking systems can be designed to eliminate specular reflective surfaces in the beam path.

### **Visible Light and Infrared-A (400-1400 nm)**

The marking laser most commonly used in this category is the Q-switched Nd:YAG laser, which operates at a typical wavelength of 1,064 nm. Eye exposure to this laser beam is more hazardous since at this wavelength the laser beam is transmitted through the eye and focused onto the retina. Exposure may initially go undetected because the beam is invisible and the retina lacks pain sensory nerves. Visual disorientation due to retinal damage may not be apparent to the operator until considerable thermal absorption has occurred. Since the energy is concentrated by the eye's lens, the strength of the laser beam that is required to damage the eye is significantly less.

### **Laser Radiation Effects on Skin**

Skin effects are generally considered of secondary importance with lasers used for most marking applications. High power infrared lasers, like those used in cutting and welding applications, pose a larger skin effect hazard. Lasers emitting radiation in the visible and infrared regions produce effects that vary from mild reddening to blisters and charring. These conditions are usually repairable or reversible. However, de-pigmentation, ulceration, scarring of the skin and damage to underlying organs may occur from extremely high powered lasers.

### **Maximum Permissible Exposure (MPE)**

The MPE is defined in ANSI Z-136.1-1993 as “The level of laser radiation to which a person may be exposed without hazardous effect or adverse biological changes in the eye or skin.” The MPE is not a distinct line between safe and hazardous exposures. Instead they are general maximum levels to which various experts agree should be occupationally safe for repeated exposures. The biological effects of laser radiation are dependent on the wavelength and exposure duration. The goal of any control measures is to ensure that any laser radiation contacting a person is below the MPE.

### **Nominal Hazard Zone (NHZ)**

In many marking applications, and most packaging applications, it is not practical to fully enclose the area where the laser beam is delivered onto the product. In these instances, it is necessary to define an area of potentially hazardous laser radiation. This area is called the Nominal Hazard Zone (NHZ). The NHZ is the space within which the level of direct, scattered or reflected laser radiation exceeds the MPE. The purpose of a NHZ is to define an area in which control measures are required. The Laser Safety Officer should determine the NHZ and the control measures to protect the laser worker from exposure to radiation above the MPE.



## **Laser Safety**

To quote the OSHA Technical Manual, Section III, Chapter 3: “This (NHZ), is an important factor since, as the scope of laser uses has expanded, controlling lasers by total enclosure in a protective housing or interlocked room is limiting and in many instances an expensive overreaction to the real hazards.”

Carefully designed guarding can eliminate any real light hazards associated with laser radiation during equipment operation. This guarding can often be of very simple design. For example, the infrared emissions from a CO<sub>2</sub> laser can be blocked by clear polycarbonate (lexan) sheet. Often a simple tunnel through which the product passes while being marked provides reliable, adequate protection, preventing unsafe exposure from the direct beam or any diffuse reflections.

## **Control Measures**

Certain control measures need to be in place wherever there are lasers in use. The extent of the control measures is a function of the type of equipment installed, the nature of any shielding, and any maintenance procedures that may be undertaken. These control measures include:

### **Engineering Controls**

Engineering controls include proper shield interlock designs (when required), and safe system operation controls, as in situations where the laser will be integrated into another control system.

### **Electrical Hazards**

The use of lasers or laser systems can present an electric shock hazard. This may occur from contact with exposed utility power utilization, device control, and power supply conductors operating at potentials of 50 volts or more. These exposures can occur during laser set-up or installation, maintenance and service, where equipment protective covers are often removed to allow access to active components as required for those activities. The effect can range from a minor tingle to serious personal injury or death. Protection against accidental contact with energized conductors by means of a barrier system is the primary methodology to prevent electrical shock.

Additional electrical safety requirements are imposed upon laser devices, systems and those who work with them by the federal Occupational Safety and Health Administration (OSHA), the National Electric Code and related state and local regulations. Individuals who repair or maintain lasers may require specialized electric safety-related work practices training.

## Laser Safety

### Personal Protective Equipment - Protective Eyewear



In the case of virtually all laser marking installations, personal protective equipment is limited to the use of proper eyewear. Protective eyewear must be chosen with regard to the wavelength of the laser light and, where appropriate, the wavelength of any light emitted from the material surface during the marking process.

Table 2. Optical Densities for Protective Eyewear for Q-Switched Nd:Yag

<i>Laser Type/ Power</i>	<i>Wavelength (? m)</i>	<i>OD 0.25 seconds</i>	<i>OD 10 seconds</i>	<i>OD for 600 seconds</i>	<i>OD for 30,000 seconds</i>
<b><i>Nd:YAG (Q-switch)<sup>b</sup></i></b>	<b><i>1.064<sup>a</sup></i></b>	<b><i>---</i></b>	<b><i>4.5</i></b>	<b><i>5.0</i></b>	<b><i>5.4</i></b>

## Laser Safety

### Administrative and Procedural Controls

These controls largely involve access to the laser-controlled area. Any controls put in place during abnormal conditions, such as equipment repair and maintenance; and general safety rules (such as insisting the equipment be operated with shielding removed) are “at risk” situations based on individual company management policies.

Table 3. Control Measures for the Four Laser Classes

Control Measures	Classification					
	1	2a	2	3a	3b	4
Engineering Controls	X	X	X	X	X	X
Protective Housing	X	X	X	X	X	X
Without Protective Housing	Laser Safety Officer establishes alternative controls					
Interlocks on protective housing	?	?	?	?	X	X
Service Access Panel	?	?	?	?	X	X
Key Control	--	--	--	--	?	X
Viewing Portals	--	--	MPE	MPE	MPE	MPE
Collecting Optics	MPE	MPE	MPE	MPE	MPE	MPE
Totally Open Beam Path	--	--	--	--	X NHZ	X NHZ
Limited Open Beam Path	--	--	--	--	X NHZ	X NHZ
Enclosed Beam Path	None required if protective housing in place					
Remote Interlock Connector	--	--	--	--	?	X
Beam Stop or Attenuator	--	--	--	--	?	X
Activation Warning Systems	--	--	--	--	?	X
Emission Delay	--	--	--	--	--	X
Temporary Laser Controlled Area	?	?	?	?	--	--
	MPE	MPE	MPE	MPE		

## Laser Safety

Table 3 continued. Control Measures for the Four Laser Classes

Control Measures	Classification					
	Class 1	Class 2	Class 3R	Class 3B	Class 4	Class 4
Remote Firing and Monitoring	--	--	--	--	--	?
Labels	X	X	X	X	X	X
Area Posting	--	--	--	?	X NHZ	X NHZ
<b>Administrative and Procedural Controls</b>						
Standard Operating Procedure	--	--	--	--	?	X
Output Emission Limitations	--	--	--	--	LSO Determines	
Education and Training	--	--	?	?	X	X
Spectator Controls	--	--	--	--	?	X
Service Personnel	?	?	?	?	X	X
	MPE	MPE	MPE	MPE		
Laser Fiber Optic Systems	MPE	MPE	MPE	MPE	X	X
Eye Protection	--	--	--	--	?	X
					MPE	MPE
Protective Windows	--	--	--	--	X NHZ	X NHZ
Protective Barriers and Curtains	--	--	--	--	?	?
Skin Protection	--	--	--	--	X MPE	X MPE
<b>LEGEND</b>	<b>X = shall ? = should -- = no requirement NHZ = NHZ analysis required</b> <b>? = shall if enclosed Class 3b or 4 MPE = shall if MPE is exceeded</b>					

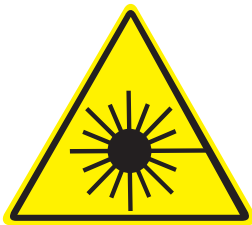
## Laser Safety

### Warning Signs and Labels

All laser equipment must be labeled indicating hazard classification, output power/energy, and lasing material or wavelength with words and symbols as indicated below:

Class 4 laser equipment: DANGER, Laser Radiation (or laser symbol) - Avoid Eye or Skin Exposure to Direct or Scattered Radiation

Labels and warning signs should be displayed conspicuously in areas where they would best serve to warn individuals of potential safety hazards. Normally, signs are posted at entryways to laser controlled areas and labels are affixed to the laser in a conspicuous location.



#### Universal Laser Warning Sign

EXPOSURE TO THE LASER BEAM MAY CAUSE PHYSICAL BURNS AND CAN CAUSE SEVERE EYE DAMAGE.

Proper use and care of this system are essential to safe operation.



#### Danger Sign

Exposure to the laser beam possible when interlocks are defeated

EXPOSURE TO THE LASER BEAM MAY CAUSE PHYSICAL BURNS AND CAN CAUSE SEVERE EYE DAMAGE.



#### Universal Avoid Exposure Sign

### Conclusion

Laser marking systems can be operated safely and in compliance with national and regional safety requirements, often with very simple shielding and controls. The above material has been produced as guide for your company. It is the responsibility of each company to develop a laser safety program that complies with the national standard.

## Introduction

Thank you for purchasing the TYKMA™ Zetalase™ Laser Marking System. Ideal for single or multiple part marking on all metals, hard plastics, and painted or anodized materials. Mark text, graphics, barcodes, 2D, Data Matrix™, UID codes and much more.

In the past, laser marking systems have required elaborate, time consuming set-up, plus complex assembly and training sessions. But simple, powerful, affordable laser systems from TYKMA™ come fully assembled and can be up and running within an hour.

If, at any time, you experience difficulties or have installation or operation questions, please call TYKMA™ 24/7 - toll free at 877-318-9562 for technical assistance.

### Let's Get Started!

Zetalase™ is shipped fully assembled. If, however, your unit is customized with a rotary, Fumex Air Filtration unit, or other part handling equipment, those items need to be installed separately.

First, unscrew the crate side panels and packing. Using a pallet jack or fork lift, raise the pallet carefully and move it to the work area. Zetalase™ is a tabletop or workbench system, so you will need a sturdy 40" wide x 26" deep workbench with the following access area: at least 70" of headroom, and an additional 180° radius of 26" on the left side of the system to accommodate access door swing. The unit weighs approximately 300lbs, so four people will be needed to lift the Zetalase™ from the pallet and set it in place.

**LIFT ZETALASE™ FROM THE BOTTOM BASEPLATE ONLY. DO NOT PUT ANY PRESSURE ON THE FRONT OR SIDE ACCESS DOORS TO AVOID DAMAGING THE FRAME. THE NON-LIFT POINTS ARE CALLED OUT AND LABELED ON YOUR ZETALASE™ SYSTEM.**

Once set in place remove the protective sheet wrap from the machine. Please locate the following items included inside of your Zetalase and set aside for installation:

- One (1) Power Cord
- One (1) USB Keyboard
- One (1) USB Mouse
- Two (2) Laser Enable Keys
- One (1) USB Stick (with Manuals & Software)

## Machine Overview

Your Zetalase™ comes configured as a Class I Laser Marking System ready for marking right out of the box. Each system is configurable based on application and laser type so please check your order confirmation for exact system configuration. Please reference the below diagram for identification of components and terms used in this manual.



- |                                      |                          |
|--------------------------------------|--------------------------|
| 1) Laser Scan Head                   | 8) Door Interlock        |
| 2) Focusing Lens                     | 9) T-Slot Toolplate      |
| 3) Operator Control Pendant          | 10) Adjustable Z-Axis    |
| 4) Touchscreen Interface             | 11) Fume Extraction Port |
| 5) Sliding Operator Door             | 12) Cooling Fan          |
| 6) Laser Safety Glass Viewing Window |                          |
| 7) Side Access Door                  |                          |

## System Setup

STEP 1: After Zetalase™ is secure on a worktable, check the front sliding access door for smooth operation, making sure there are no obstructions in the upper or lower door channels. Also check the side access door. There is a small locking pin at the front left of the door. Pull upward on the pin to release the interlock and make sure the door swings fully to the left.

The top of the door is held in place by tension fit. To open the door apply pressure



*Step 1: Side Access Door Opening*

The side door can also be removed to provide full access to the T-Slot bedplate for tooling and fixture modifications or adjustments. To remove the side door, open the door more than 30 degrees and simply lift up and off.



*Step 1: Side Access Door Removal*



## System Setup

STEP 2: Plug the supplied USB Keyboard & Mouse into the USB ports labeled on the back of the workstation.

STEP 3: *Optional.* If desired, plug an external monitor for programming purposes into the “External Monitor” port. You may also utilize the top AC power receptacle to power your monitor or other low power device.

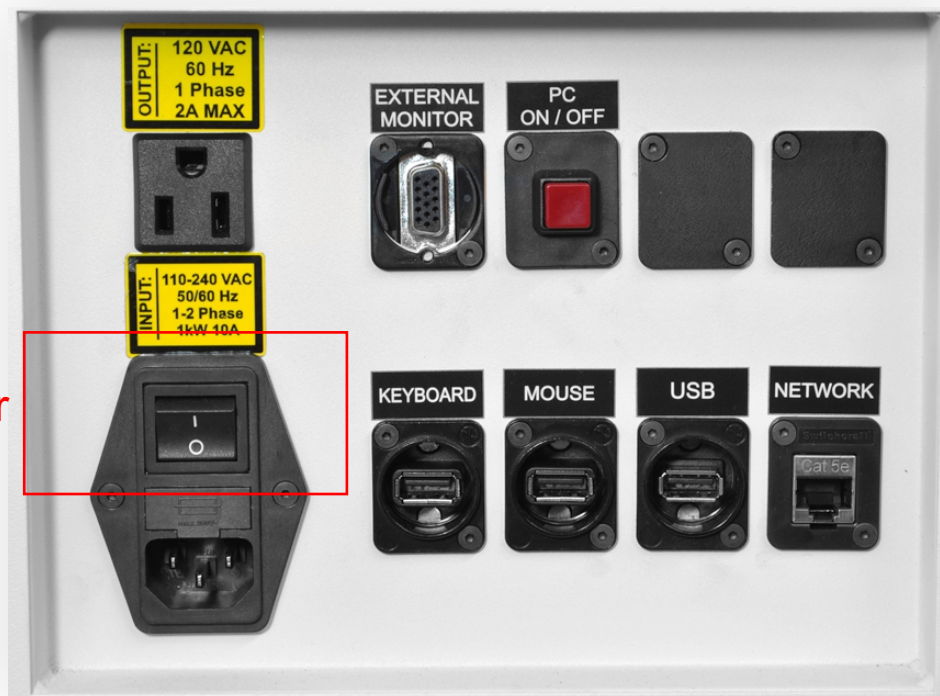
**\*\*\*Do not exceed 2A maximum current draw on this port!**

**\*\*\*If you purchased a Fume Extraction Unit do not plug into this port!**

STEP 4: Your Zetalase™ comes with a “Network” port to connect the embedded PC of the laser to your work network. It is recommended to network your PC for online service and support capability with one of TYKMA’s experienced technicians.

STEP 5: Connect the supplied Power Cord to the Input Power port. Plug in the other end of the Power Plug into a Power Strip with Surge Protection. TYKMA highly recommends the use of surge protection for safe operation of your laser marking system.

STEP 6: Power ON your system by pressing the rocker switch next to the power port.



## Operator Pendant

Reference the figure below for Operator Pendant layout and descriptions on Zetalase Fiber models.



- |                                     |                                                                                       |
|-------------------------------------|---------------------------------------------------------------------------------------|
| 1) System Power                     | 8) Manual Start/Stop                                                                  |
| 2) Laser Enable Key Switch          | 9) Z-Axis Up/Down or Overtravel Bypass<br><small>(On Automatic Z-Axis Models)</small> |
| 3) Auto/Manual Mode Selector Switch | 10) USB Ports for Embedded PC                                                         |
| 4) Interior Lamp                    |                                                                                       |
| 5) Emergency Stop                   |                                                                                       |
| 6) Laser Status Indicator           |                                                                                       |
| 7) Shutter Open/Close               |                                                                                       |

## **Operator Pendant**

- 1) System Power - Turns on power to the Zetalase.
- 2) Laser Enable - Left is Off. Right is On. Should you wish to protect the system from unauthorized operation, simply remove the “Laser Enable Key” and store in a safe location when not in use.
- 3) Auto/Manual Switch - Manual is Left. Auto is Right. Auto mode will fire the laser automatically when the door is shut and the Shutter is OPEN. Manual Mode requires Shutter OPEN and physical “Start” button pressed or software start.
- 4) Interior Lamp - Turns ON/OFF the interior lamp inside the Zetalase.
- 5) Emergency Stop - Will disable the laser and any moving axis.
- 6) Zetalase™ Status Indication
  - Green Laser Ready - LED is illuminated when the software is ready
  - Yellow Laser Busy - LED is illuminated when laser process is busy
  - Marking Complete - LED is illuminated when marking is complete
  - System Fault - LED is illuminated with an Emergency Stop or Blinking with Interlock Error
- 7) Shutter - Push Open/Close. Shutter is open when pressed and doors are closed with safety interlocks engaged.
- 8) Start/Stop - Starting or stopping the laser process in Manual mode.
- 9) Axis Control - On standard Zetalase models this will move laser Z-Axis UP/Down. On optional Automatic Z-Axis models this is an overtravel bypass button.
- 10) USB Ports - Provides access to embedded PC for transfer of files VIA removeable USB media or connection of peripheral equipment (Barcode Scanners, Mouse, Keyboard)

## System Operation

### STEP 1

**Turning on the Laser** - Press the “System Power” Button to turn on the machine and wait until the PC has booted to the Windows Desktop.

### STEP 2

**Enabling the Laser** - Insert a Laser Enable Key into the “Laser OFF/ON” switch and turn it to the RIGHT. Please wait 5-10 seconds for the laser to warm up.

\*\*\*Should you wish to protect the system from unauthorized operation, simply remove the “Laser Enable Key” and store in a safe location when not in use.



*Step 1 & 2 : Power ON & Laser Enable*

## System Operation

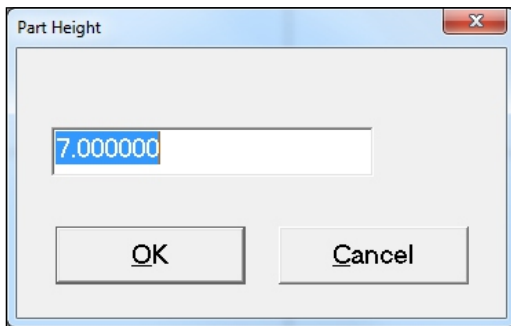
**STEP 3** Open Minilase Pro SE - Locate the “Minilase Pro SE” link on the desktop and double click to open.



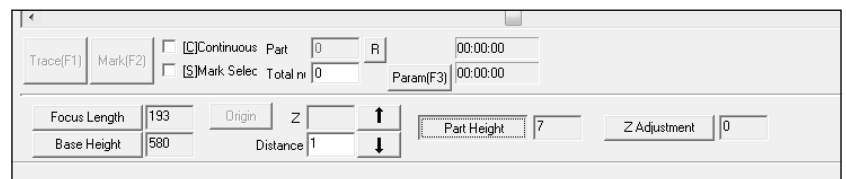
Step 3: Open “Minilase Pro SE”

**STEP 4** Verify System Status - Confirm the Laser and Computer are connected through the software by opening software. Should the laser not be connected the software will state “No Laser System Present”. If you have no connection contact TYKMA Service & Support (1-877-318-9562).

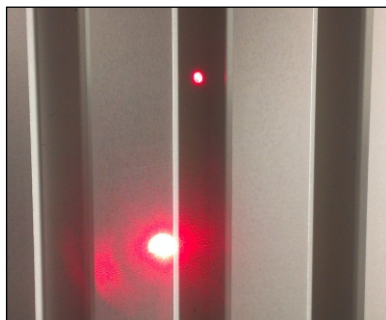
**STEP 5** Focus the Laser - For a “Power Z-axis”, press the up and down arrows on the Operator Pendant until the focusing beams converge. For an “Automatic Programable Z-axis”, click “Part Height” and type in the height of your part and then click “Trace”. The Z axis will then move to the correct focal position.



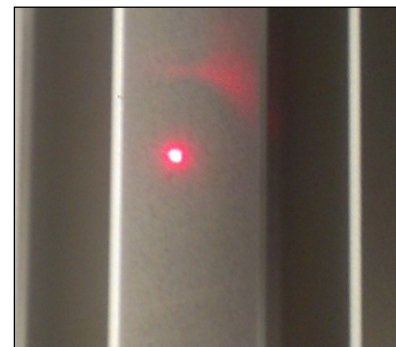
Step 5: Enter part height click “OK”



Step 5: Programable 7 click “Part Height”



Step 5: Aiming Beams not Focused (non-converged)



Step 5: Aiming Beams in Focus (converged)

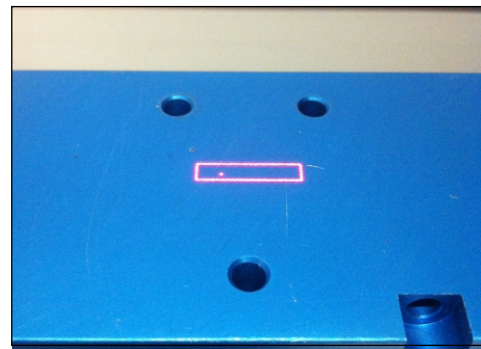
## System Operation

**STEP 6 Preview Laser** - After creating your text and/or graphics for laser marking you may then use the “Trace” function to align your mark to your part. Click the button that says “Trace”. You will see a red outline simulation in the Zetalase machine. Move your part or move the mark to align to the desired location. When completed with alignment click “Stop” to close the screen.

\*\*\*Please refer to the Minilase™ Pro SE Software Manual for instructions on creating graphics and configuring laser settings

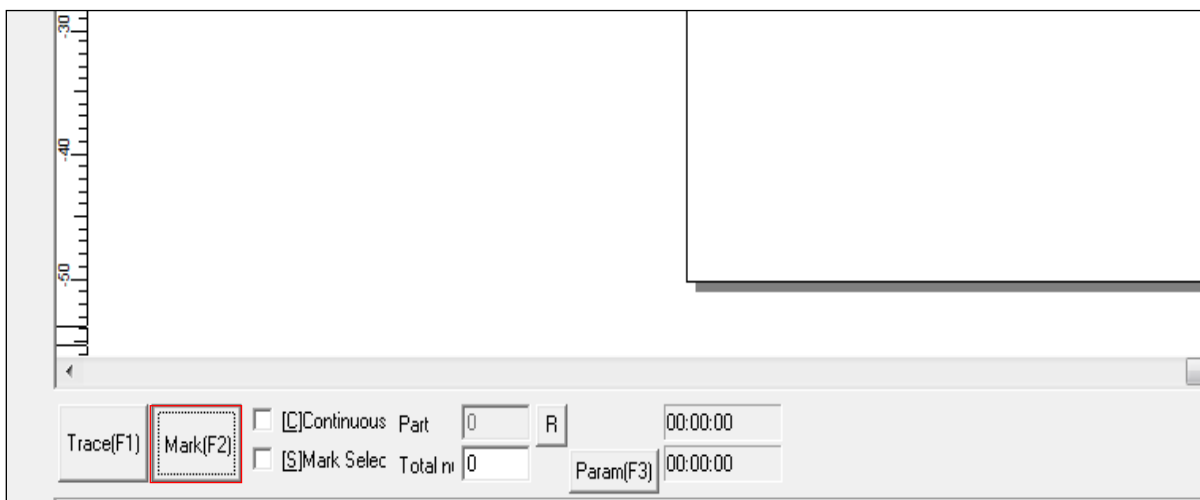


Step 6: “Trace”



Step 6: “Trace”

**STEP 7 Marking with the Laser** - To mark with the laser, close the door, press “Start” or click the “Mark (F2)” button, this will start the marking for all active objects on your workspace.



## System Operation

**STEP 7 continued...** **Marking with the Laser** - After clicking “Mark” a pop up window will appear and the Laser will be marking. “Laser Busy” will be indicated on the operator pendant and “Cycle Complete” will illuminate when the marking is finished. Click “Stop” only if there is something wrong with your marking.



## **Maintenance Schedule**

Your Zetalase™ system requires little maintenance since it is air cooled and has very few mechanical or moving parts.

Maintenance Schedule:

Below is the recommended maintenance schedule for the Zetalase.

Cooling Fan Filter - Replace every 3 months (shorter intervals may be required in dirty / oily environments). See “Cooling Fan Filter Replacement” procedure.

Laser Lens - The focusing lens on your laser should be cleaned once every 3 months (shorter intervals may be required in dirty / oily environments). See “Laser Lens Cleaning” procedure.

Z-Axis Lubrication - The Motor Driven Z-Axis should be lubricated with Velmex BL-1 oil a minimum of once a year. See “Z-Axis Lubrication” procedure.

Please see the following pages for information on performing routine maintenance.



## Maintenance Procedures

### Cooling Fan Filter Replacement

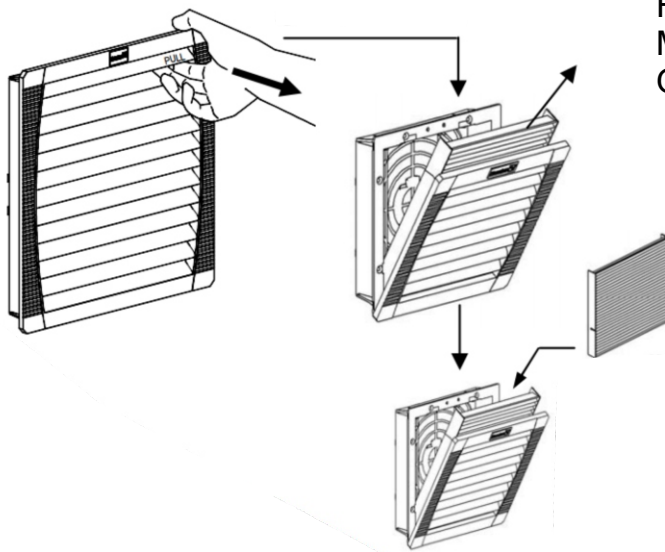
The cooling fan on the upper left side pane (above the access door) has a removable cover. Push down and out on the fan cover to gain access to the replaceable filter media. See picture below.



Step 1



Step 2



Filter PN: 11720003055  
Manufacturer: pfannenberg  
Order from TYKMA or direct

## Maintenance Procedures

### Laser Lens

The laser focusing lens on the Zetalase should be cleaned once every 3 months (shorter intervals may be required in dirty / oily environments).

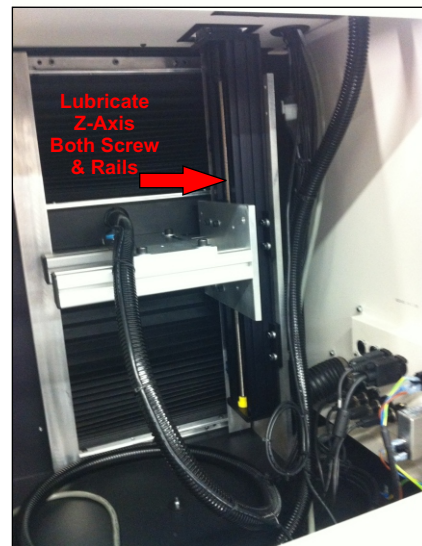
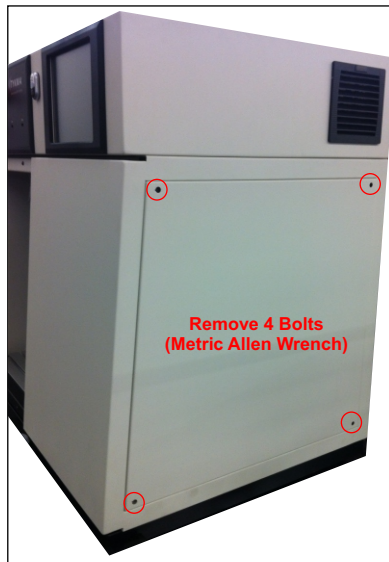
Use a mixture of 90% water 10% Acetone to clean the lens using a lint free cloth. Visually inspect the lens for cleanliness and scratches or cracks.



## Maintenance Procedures

### Z-Axis Lubrication

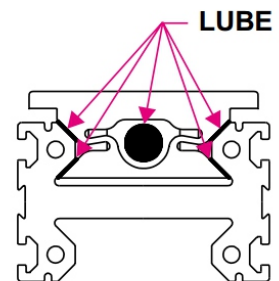
The Motor Driven BiSlide Z-Axis should be lubricated with Velmex BL-1 oil a minimum of once a year. To access the Z-Axis you must remove the right service panel of the Zetalase by removing the 4 bolts shown below. Remove the side access panel and set aside. See Velmex lubrication illustration for details on lubricating the Z-Axis below.



Lubrication PN: BL1  
 Manufacturer: Velmex  
 Order from TYKMA or direct

## Lubrication

Motor Driven BiSlide Assemblies should be lubricated with Velmex BL-1 oil if minimum friction, maximum life, and repeatability are a concern. Using any other than BL-1 lubricant may damage bearing pads, nut, or lead screw support bearing. Re-lube when the lead screw and ways appear dry of lubricant. Continuous use applications with heavy loads may necessitate daily lubrication.



To lubricate BiSlide Assembly, traverse carriage near center of travel and apply 3 to 4 drops of oil to the end of carriage at the way surfaces and on the lead screw threads. Apply oil to both end of carriage, refer to the diagram above for lube points.

Occasionally apply 1 to 2 drops of BL-1 to the point where the lead screw enters the lead screw support bearing (end plate end).



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