# X252_X380_MG380 Hybrid Matintenance Manual


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# Chapter 1 Overview

## 1.1 Introduction

This manual is prepared for distributors to maintain or repair X252、X380、MG380 Hybrid. Briefly,

- Chapter 1 is the introduction of contents, safety and operating enviroment
- Chapter 2, we have diagrams to show the part number for every part in different sections.
- Chapter 3, introduction for electrical system
- Chapter 4, introduction to show you how to replace parts
- Chapter 5, deals with the laser system for laser tube、beam & opitcal alignment.
- Chapter 6, an instruction to show you how to upgrade firmwar
- Chapter 7, trouble shooting & system diagnostics
- Chapter 8, basic maintenance
- Chapter 9, Q&A

Manual contents may be subject to change without notice. Please contact GCC Customer Service by calling at 886-2-2694-6687 or e-mailing to tech.support@gccworld.com for services.

## 1.2 Safety

### 1.2.1 The Safety Interlock System

The laser system is equipped with a safety interlock system utilizing magnetic sensors on the top and side access doors, laser-activation and door LED lights on the control panel. The magnetic sensors will deactivate the laser when either door is opened. At this time, the “door” LED light found on the control panel will illuminate, indicating an open or improperly closed door. When the laser is in operation, the “laser” LED will illuminate to inform the operator that the laser is activated. If at any time, any of the access doors are open and the “laser” LED is illuminated, **IMMEDIATELY** unplugs the laser system and contact GCC technical support for service instructions.

**WARNING**

- DO NOT operate the laser system if any component of the safety system is malfunctioning.
- DO NOT attempt to remove or modify any component of the safety interlock system.

### 1.2.2 Product Label

This label is located at the right-back side of machine. All the product information such as Serial Number, Model Numbers, Laser Power and Electric power can be found here. Before requiring any tech support, always provide service person the information on this label.

### 1.2.3 Safety Measures

**LASER RADIATION WARNING:** Exposure to laser radiation may result in physical burns and severe eye damage. Proper use and regular maintenance of this machine is important to the

safety of all people in the immediate area.
Prior to operation, carefully read and familiarize yourself with the warning labels located on both your laser system and in this manual.
Never leave the machine unattended during the laser cutting process. The laser may ignite combustible materials. A well-maintained fire extinguisher and operational smoke or fire detector should be kept in the vicinity of the machine
Resulting debris from laser cutting are very dangerous and may cause fire hazard.
Caution—Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
DO NOT leave debris and scraps inside laser machine after job finished. Must keep machine clean after job finished.

> ***NOTE***
> SmartGUARD™ is an optional fire detection alarm system developed by GCC. Contact your local GCC authorized distributor for more details for having this safety option installed onto your system.

Always wear safety goggles when the laser system is in operation. Reflective materials such as mirrors, enameled brass and anodized aluminum may partially-reflect some of the invisible laser radiation. Severe eye damage may occur if appropriate safety goggles are not worn.

> ***NOTE***
> Each LaserPro laser machine is shipped with a single pair of safety goggles. If additional safety goggles are required, please contact GCC directly or an authorized GCC distributor. If you wish to purchase one on your own, please make sure the safety goggles meet these requirements:
>
> **9000-11000nm OD5+**
> **Visible Light Transmission: 92.9%**

Connect the machine to a properly grounded power outlet. Ensure the voltage of the power source is identical to the voltage of the machine.
Do not open the laser access panel when the machine is plugged in.
Do not attempt to modify or disassemble the laser module.
Do not attempt to remove or modify any component of the machine's laser interlock safety system.
Ensure the immediate work area of the machine is well-ventilated. Odors, vapors, and dust are byproducts generated during the laser cutting process. An exhaust system, vacuum cutting box, and honeycomb table are recommended. Please contact GCC or your local GCC distributor for more information.
Do not laser heat-sensitive surfaces or materials that may generate toxic fumes, such as PVC and Teflon.
Regularly clean and maintain your machine according to our cleaning and maintenance instructions. Doing so will ensure a machine that will operate effectively and safely over a long period of time.

### 1.2.4 Operating Environment

Please follow the guidelines when considering a suitable location to set the LaserPro X252RX、X380RX、MG380 Hybrid. Improper work environments may lead to operational malfunction and/or unsafe working conditions. The LaserPro X252RX、X380RX、MG380 Hybrid should be placed

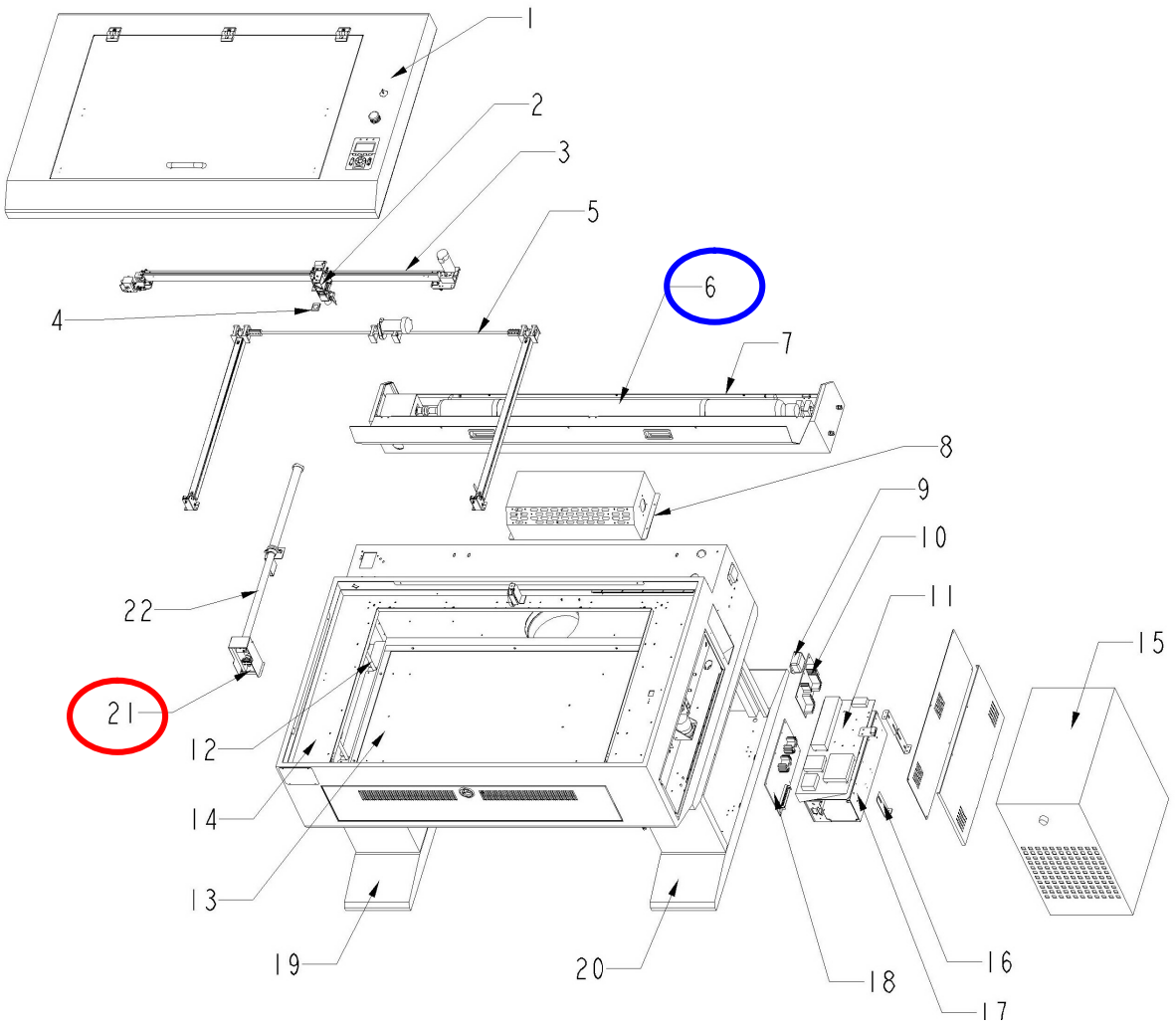
and operated in a standard office-type environment.

Avoid environments where the machine is exposed to high levels of dust, temperature (temperatures exceeding 30°C or 85°F) or humidity (humidity exceeding 70% or where the ambient temperature is near the dew point).
Avoid small, enclosed areas with poor ventilation.
Avoid areas with high levels of noise and electrical noise.
Select a location that is large enough to accommodate the laser machine, an exhaust system, a computer and a work or storage table.
Select a location in which the ambient temperature remains between 15°C and 30°C (60°F to 85°F).
Select a location in which there is a short, direct path to the fume exhaust system.
Set the laser machine on a floor surface that is completely even.
Make sure your smoke or fire detection system in the immediate area is functioning.

> ***NOTE***
> SmartGUARD™ is an optional fire detection alarm system developed by GCC. Contact your local GCC authorized distributor for more details for having this safety option installed onto your system.

# Chapter 2 Mechanical System

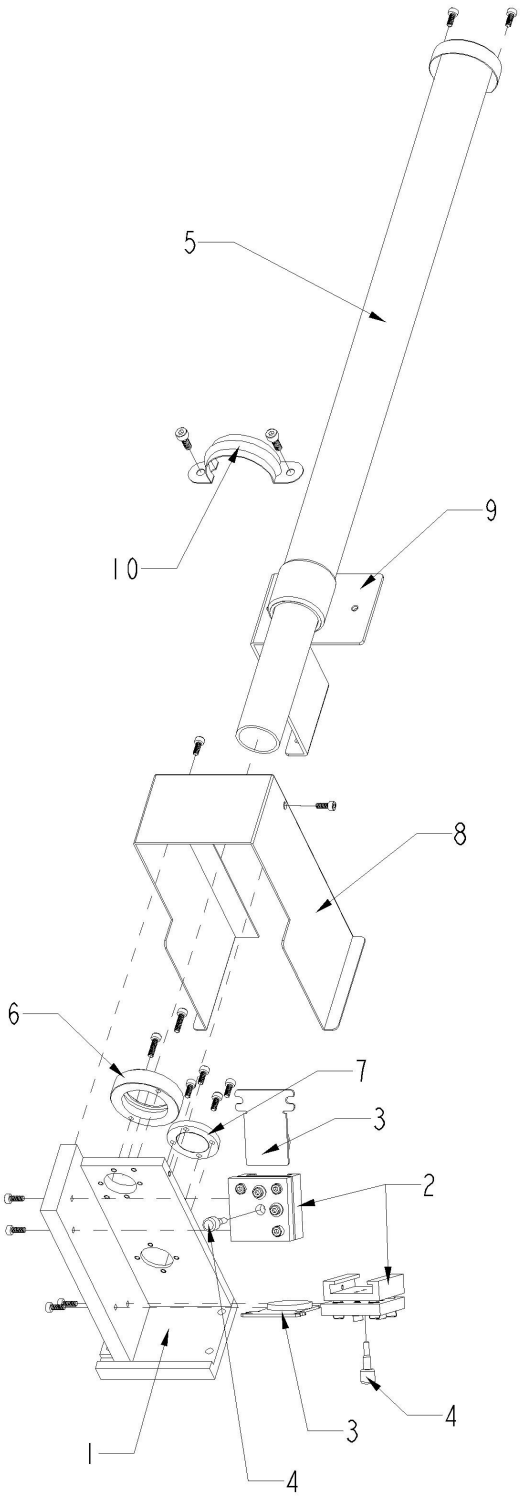
## 2.1 Overall



Parts List :

| No. | Part No. | | | Description | Remark |
|---|---|---|---|---|---|
| | X252 | X380 | MG380 Hybrid | | |
| 1 | 290065260G | 29006150G | 29006150G | Top Cover Assembly | |
| 2 | 290066910G | 29005771G | 29005771G | Lens Carriage Assembly | |
| 3 | 290065030G | 29006159G | 29006159G | X Axis Assembly | |
| 4 | 290069590G | 290069590G | 290069590G | Mercury 2” Lens Assembly | |
| 5 | 29004375G | 29004901G | 29004901G | Y Axis Assembly | |
| 6 | N/A | 290065320G | N/A | 100S Laser Unit Assembly | For X380LS-100W |
| 6 | 290102840G | 290102840G | 290102840G | 100Y Laser Unit Assembly | For X380RX-100W |
| 6 | 290066630G | N/A | N/A | New Reci 80W laser tube | |
| 7 | 290065000G | 29006160G | 290081270G | Laser Case Assembly | |
| 8 | N/A | 24403678G | 24403678G | Lower Induced Draft Box | |
| 9 | 21800007G | 21800007G | 21800007G | EMI Filter YE10T1L2 | |
| 10 | 29001488G | 29001813G | 29001813G | Power Board | |
| 11 | N/A | 29005745G | 29005745G | 100S Electric Devices Fixture Assembly | |
| 12 | 29006276G | 29005057G | 29005057G | Z Axis Assembly | |
| 13 | 22801939G | 22802920G | 22802920G | Engraving Platform | |
| 14 | 290065040G | 20200257G | 20200257G | Frame of Main Body And Front Door Assembly | |
| 15 | 29005925G | 29005925G | 29005925G | Water Cooler (KW-4PTS 4000btu) | |
| 16 | N/A | 24403560G | 24403560G | Fixture for Power | |
| 17 | 24500091G | 24500081G | 24500081G | High voltage power supply | |
| 18 | 290068170G | 29005838G | 29005838G | Main board | |
| 19 | N/A | 24403556G | 24403556G | Left Stand | |
| 20 | N/A | 24403796G | 24403796G | Right Stand | |
| 21 | N/A | 29006153G | 29006153G | Front Prism Assembly | |
| 22 | N/A | 29004168G | 29004168G | N-4_Dust-Proof Tube Assembly | |

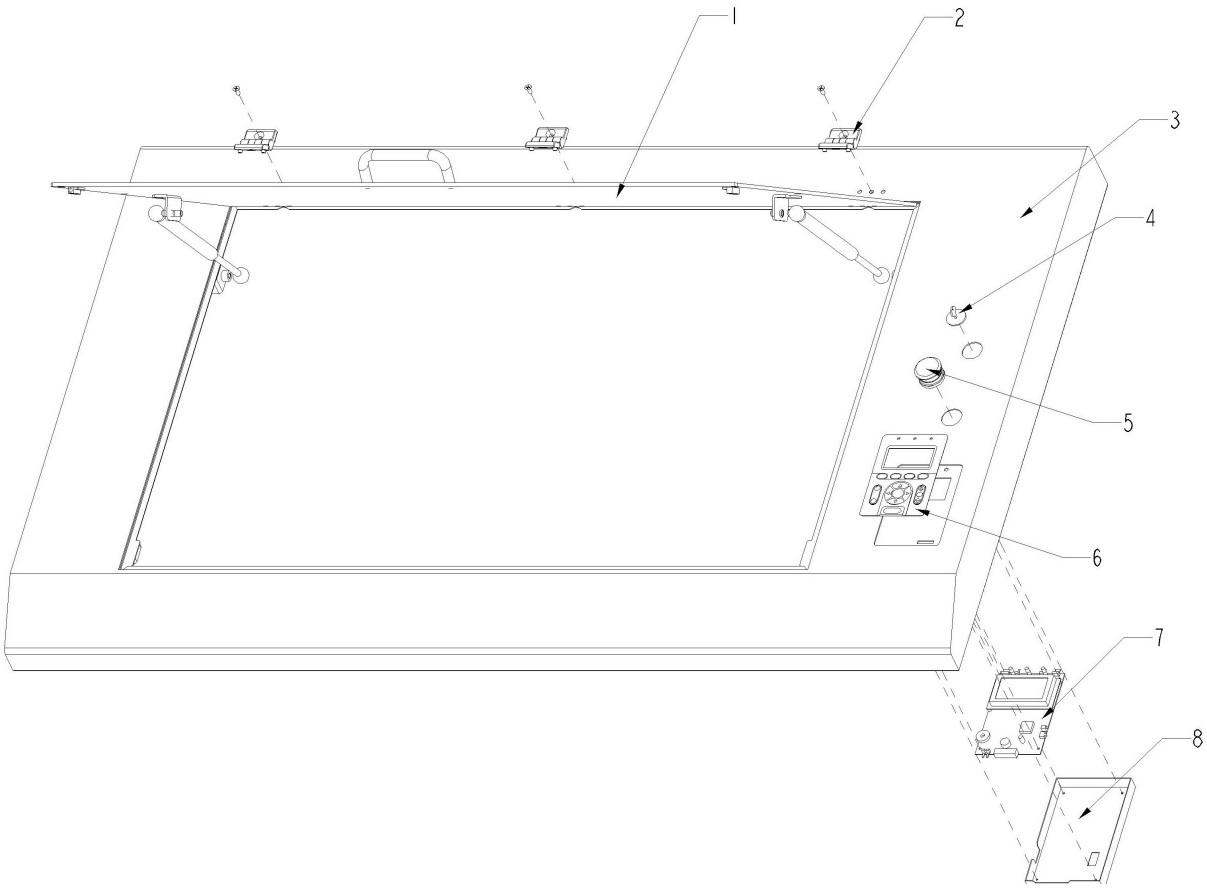
## 2.2. Front Prism Assembly for X380 and 380 Hybrid (**29006153G_ See above diagram for red circle**) and Dust-Proof Tube Assembly



Parts List :

| No. | Parts No. for X380_MG380 Hybrid | Description |
|---|---|---|
| 1 | 29006153G | Front Prism Assembly |
| 2 | 20200110G | Prism Mount Assembly |
| 3 | 29004329G | 1" Mirror Holder Assembly |
| 4 | 22800914G | Mirror Screw |
| 5 | 29004168G | N-4_Dust-Proof Tube Assembly |
| 6 | 22802184G | F201 Under Aeroseal Fixed Stand |
| 7 | 29005970G | Collimator Assembly |
| 8 | 24403801G | Front Prism Assembly |
| 9 | 24403804G | Support for Dust-Proof Pipe |
| 10 | 23300321G | 1.5" piece |

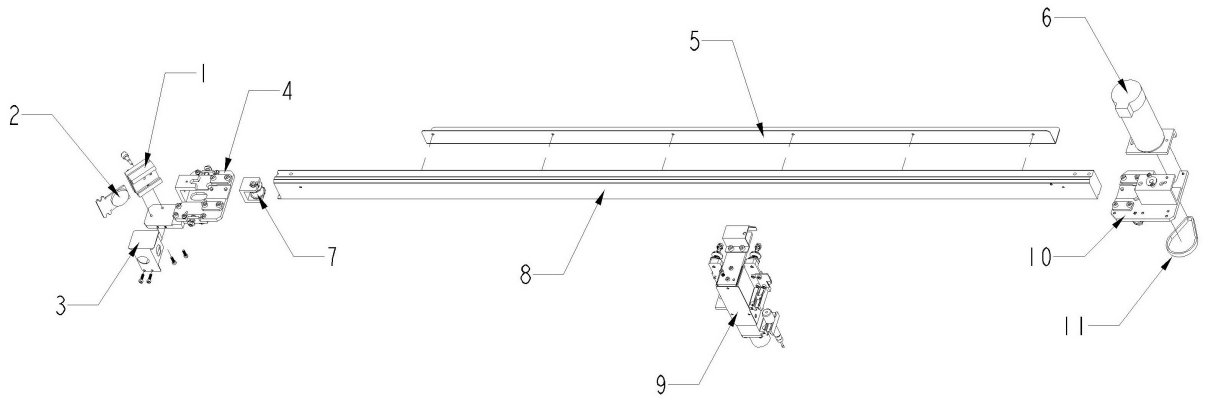
## 2.3 Top Cover




Part List :

| No. | Part No. | | | Description |
|---|---|---|---|---|
| | X252 | X380 | MG380 Hybrid | |
| 1 | 29003833G | 29005122G | 29005122G | Window Assembly |
| 2 | 26500166G | 26500166G | 26500166G | Window Hinge |
| 3 | 244040360G | 24403795G | 24403795G | New External Frame on Steady Seat |
| 4 | 257000970G | 25700094G | 25700094G | Key Switch |
| 5 | 25700095G | 25700035G | 25700035G | Emergency Switch |
| 6 | 23400020G | 23400020G | 23400020G | Control Panel Sticker |
| 7 | 290068430G | 29005274G | 29005274G | Key Board Assembly |
| 8 | 24400995G | 24400995G | 24400995G | Key Board Dust Proof Cover |

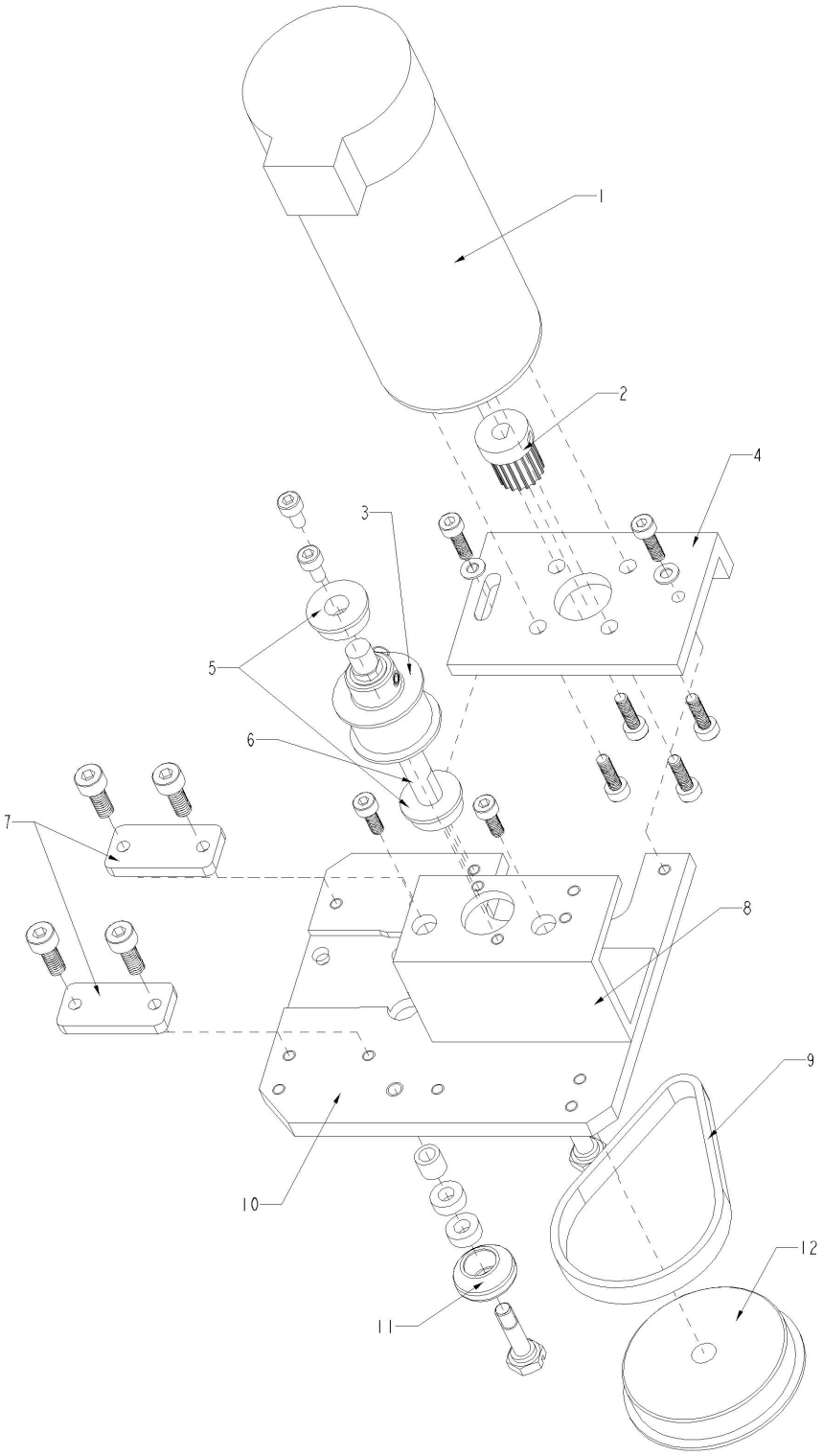
## 2.4 X-axis assembly




Parts List :

| No. | Part No. | | | Description |
|---|---|---|---|---|
| | X252 | X380 | MG380 Hybrid | |
| 1 | 20200262G | 20200262G | 20200262G | Prism Mount Assembly |
| 2 | 290069520G | 29006373G | 29006373G | 1" Mirror Holder Assembly |
| 3 | 290069520G | 290069520G | 290069520G | X Axis Mirror Cover |
| 4 | 290065020G | 29006149G | 29006149G | X Axis Left Block |
| 5 | 24400137G | 24403709G | 24403709G | Fixing Plate for Pipes |
| 6 | 29001140G | 29001140G | 29001140G | X Motor Assembly |
| 7 | 29001139G | 29001139G | 29001139G | X Axis Pulley |
| 8 | 22800641G | 22802226G | 22802226G | X Axis Rail |
| 9 | 290066910G | 29005771G | 29005771G | Lens Carriage Assembly |
| 10 | 29004908G | 29004908G | 29004908G | X Axis Right Block |
| 11 | 20600126G | 20600126G | 20600126G | X Motor Belt |

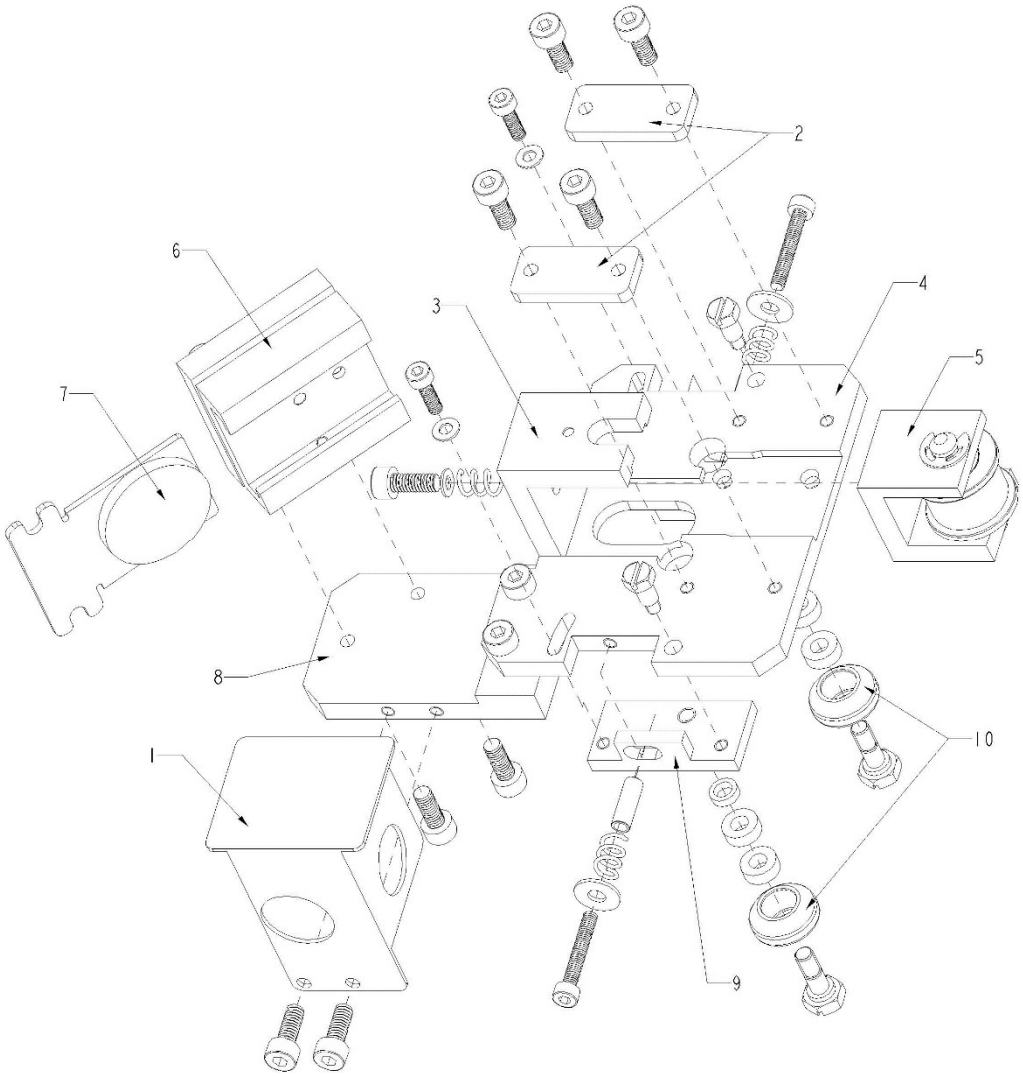
## 2.5 X-axis right block assembly



Parts List :

| No. | Parts No. for **X252_X380_MG380 Hybrid** | Description |
|---|---|---|
| 1 | 23100013G | X Motor 500 Count |
| 2 | 21700009G | X Motor Pulley |
| 3 | 22802696G | X Axis Belt Pulley |
| 4 | 22800140G | X Motor Bracket |
| 5 | 20700027G | Bearing |
| 6 | 22800619G | X Axis Shaft |
| 7 | 24100262G | Belt Retainer-B |
| 8 | 22800141G | X Axis Shaft Bracket |
| 9 | 20600126G | X Motor Belt |
| 10 | 22800615G | X Axis Right Base |
| 11 | 29001105G | A Roller |
| 12 | 22802697G | Big X Axis Belt Pulley |

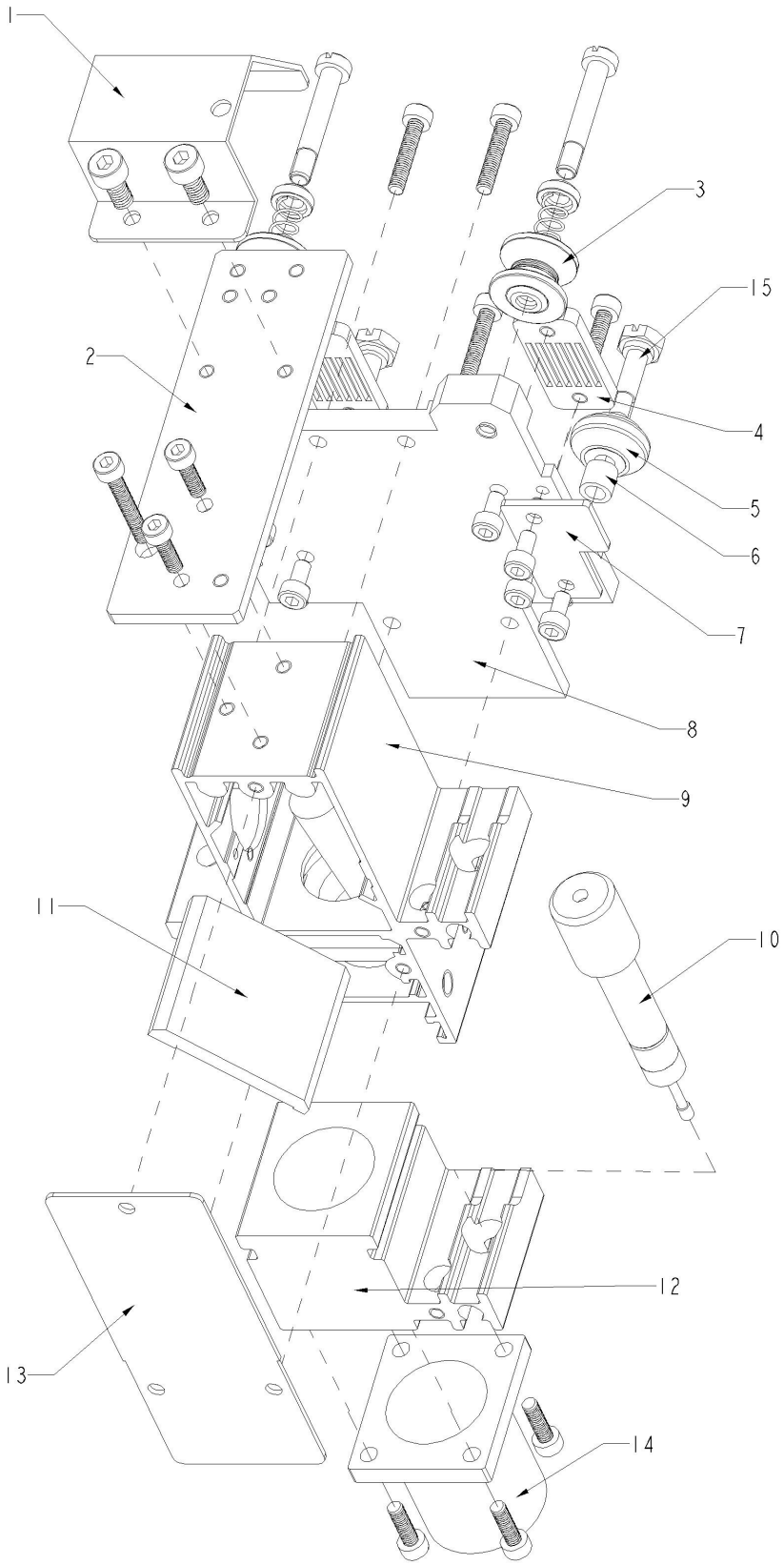
## 2.6 X-axis Left Block Assembly




Parts List :

| No. | Part No. | | | Description |
|---|---|---|---|---|
| | X252 | X380 | MG380 Hybrid | |
| 1 | 24402436G | 24402436G | 24402436G | X Axis Mirror Cover |
| 2 | 24100262G | 24100262G | 24100262G | Belt Retainer-B |
| 3 | 22800652G | 22800652G | 22800652G | X Axis Idle Pulley Bracket |
| 4 | 22800614G | 22800614G | 22800614G | X Axis Left Base |
| 5 | 29001139G | 29001139G | 29001139G | X Axis Idle Pulley |
| 6 | 20200262G | 20200262G | 20200262G | Prism Mount |
| 7 | 290069520G | 29006373G | 29006373G | 1" Mirror Holder Assembly |
| 8 | 22802219G | 22802219G | 22802219G | Mirror Bracket for X Axis |
| 9 | 22800616G | 22800616G | 22800616G | A Roller Bracket(Front) |
| 10 | 29001105G | 29001105G | 29001105G | A Roller |

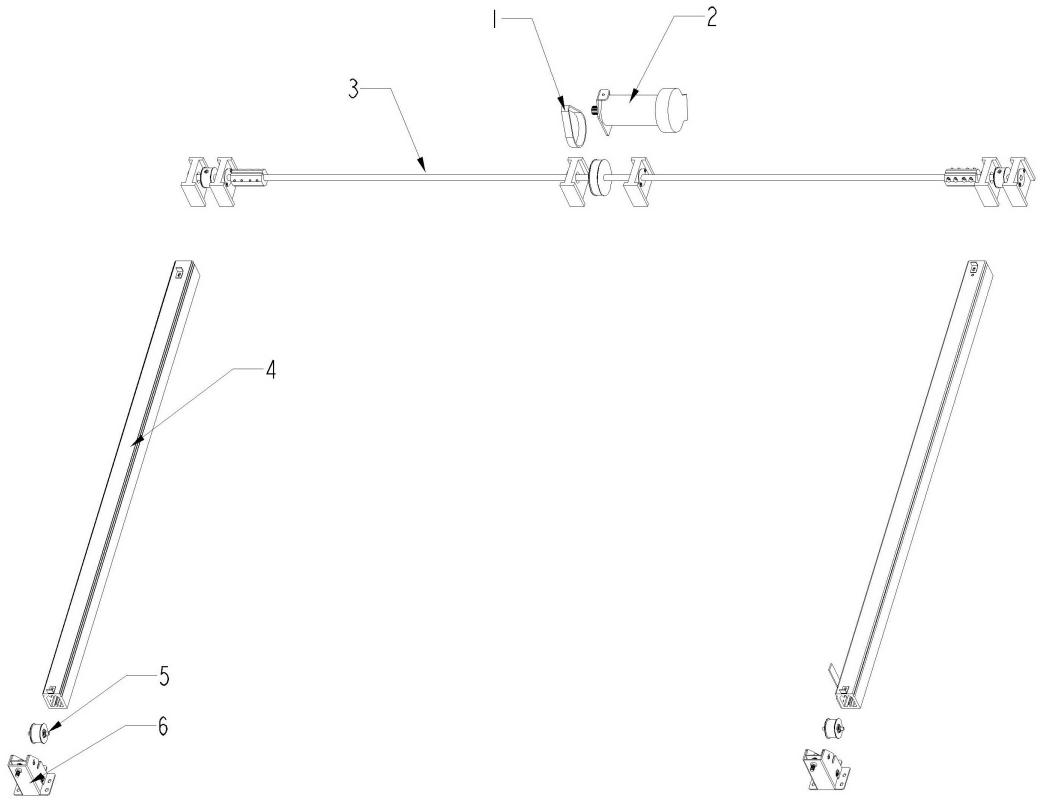
## 2.7 Lens carriage



Parts List :

| No. | Part No. | | | Description |
|---|---|---|---|---|
| | X252 | X380 | MG380 Hybrid | |
| 1 | 24400583G | 24400574G | 24400574G | Cover for Carriage PCB |
| 2 | 228032530G | 22802921G | 22802921G | Lens Carriage Assist Base |
| 3 | 29001112G | 29001112G | 29001112G | DU Roller Assembly |
| 4 | 24100277G | 24100277G | 24100277G | Belt Retainer |
| 5 | 29001105G | 29001105G | 29001105G | Small Roller Assembly |
| 6 | 22800066G | 22800066G | 22800066G | Spacer |
| 7 | 29000254G | 29000254G | 29000254G | X Axis Flag |
| 8 | 22800645G | 22800645G | 22800645G | Carriage Bracket |
| 9 | 22800273G | 22800273G | 22800273G | Lens Carriage Chassis |
| 10 | 29001108G | 29005976G | 29005976G | Auto focus Pin Assembly |
| 11 | 290069500G | 29001107G | 29001107G | 1" Carriage Mirror |
| 12 | N/A | 22802997G | 22802997G | Fixture for Air Nozzle |
| 13 | 24400577G | 24400577G | 24400577G | Front Cover |
| 14 | 22800630G | 22802996G | 22802996G | Air Nozzle |
| 15 | 22800063G | 22800063G | 22800063G | Small Roller Screw |

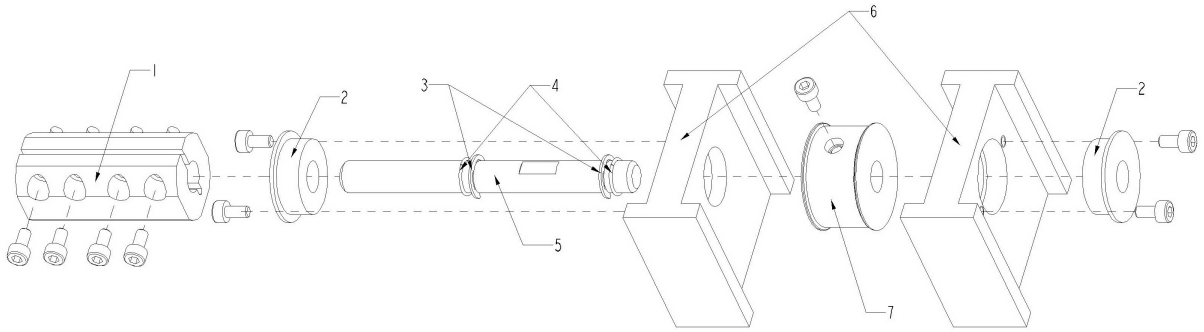
## 2.8 Y-axis assembly




Parts List :

| No. | Part No. | | | Description |
|---|---|---|---|---|
| | X252 | X380 | MG380 Hybrid | |
| 1 | 20600016G | 20600076G | 20600076G | Y Motor Belt |
| 2 | 29004372G | 29004905G | 29004905G | Y Motor Assembly |
| 3 | 29001131G | 29004902G | 29004902G | Y Axis Synchronizer Assembly |
| 4 | 22800144G | 22802227G | 22802227G | Y Axis Rail |
| 5 | 29001133G | 29001133G | 29001133G | Y Axis Idle Pulley |
| 6 | 29001132G | 29001132G | 29001132G | Y Axis Idle Pulley Fixture |

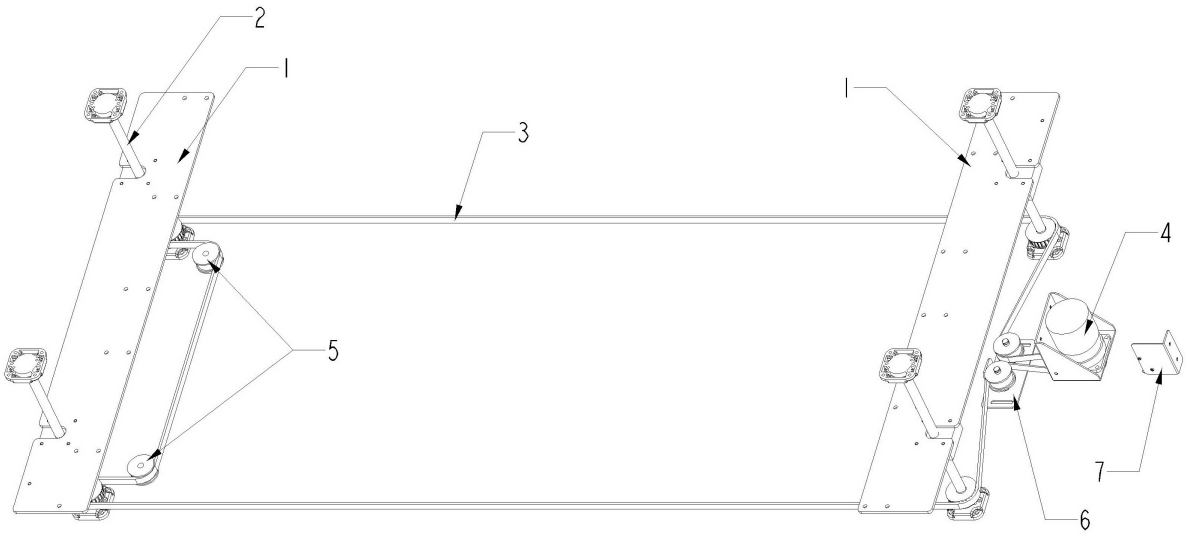
## 2.9 Y-axis transmit assembly for X380 and X380 Hybrid




Parts List :

| No. | Part No for **X380_MG380 Hybrid** | Description |
|---|---|---|
| 1 | 22800935G | 8mm Coupling |
| 2 | 20700052G | Bearing |
| 3 | 24900010G | E-shape Retaining Ring |
| 4 | 25500048G | Wire Ring φ8 |
| 5 | 22802222G | Y Axis Pulley Shaft |
| 6 | 22802220G | Y Transmit Shaft Seat |
| 7 | 22802287G | Small Gear _Small Pulley |

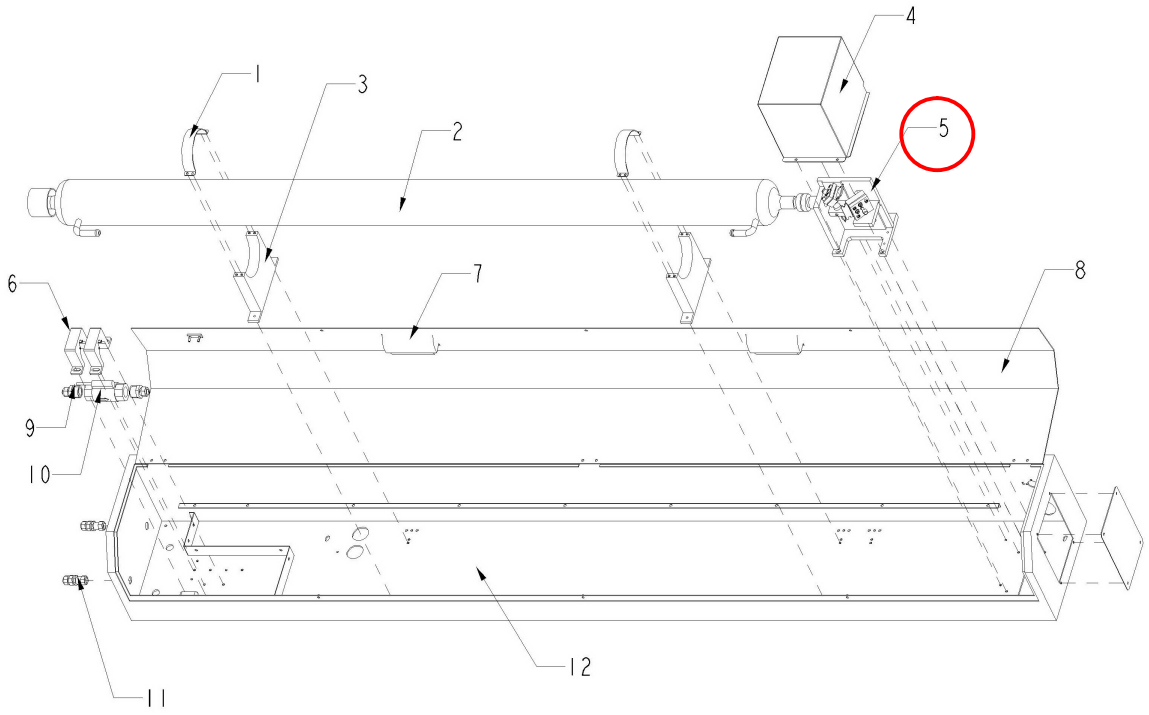
## 2.10. Z-platform




Part List :

| No. | Part No. | | | Description |
|---|---|---|---|---|
| | X252 | X380 | MG380 Hybrid | |
| 1 | 29000205G | N/A | N/A | Screw Bar Assembly_Left |
| 1 | 29000206G | N/A | N/A | Screw Bar Assembly_Right |
| 1 | N/A | 29005058G | 29005058G | Screw Bar Assembly |
| 2 | 22801022G | 22801022G | 22801022G | Lead Screw Bar |
| 3 | 20600024G | 20600027G | 20600027G | Z Axis Belt |
| 4 | 29004491G | 29005784G | 29005784G | Z Motor Assembly |
| 5 | 22800084G | 22800084G | 22800084G | Idle Pulley |
| 6 | N/A | 29002521G | 29002521G | Z Axis Idle Wheel Seat Assembly |
| 7 | N/A | 29005124G | 29005124G | Z Axis Down Limit Switch Assembly |

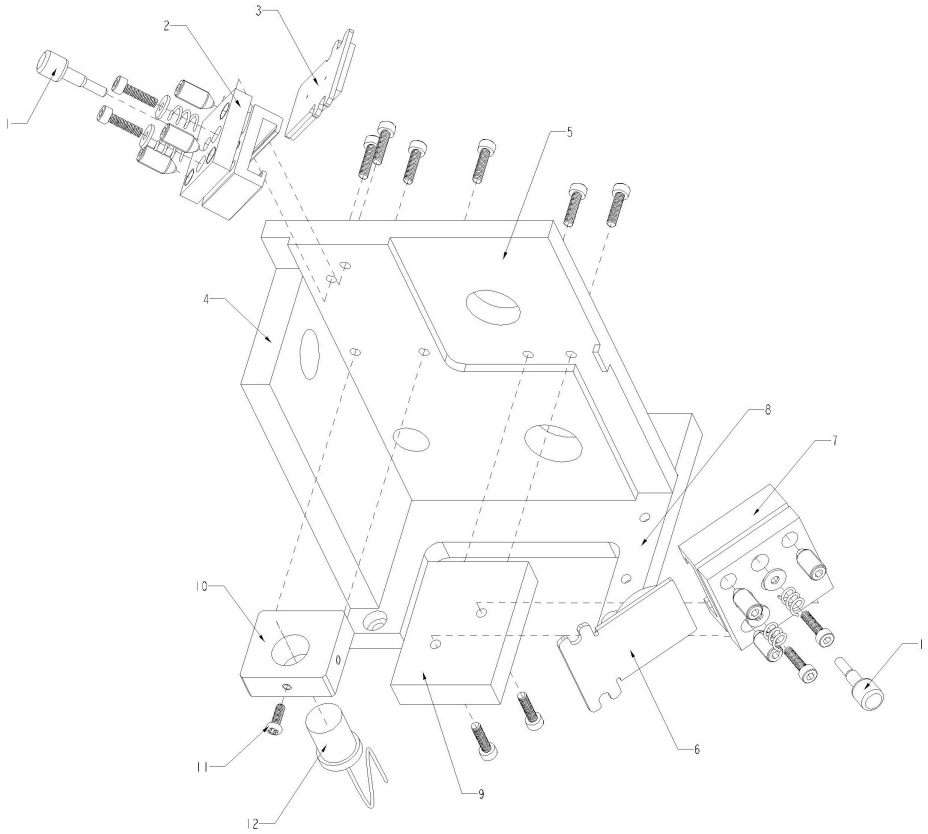
## 2.11 Laser unit for X380 only




Parts List :

| No. | Part No. | Description |
|---|---|---|
| 1 | 24403515G | Glass Laser Tube Fixed Plate |
| 2 | 29005706G | 100S Laser Unit Assembly |
| 3 | 22803081G | Glass Laser Tube Holder |
| 4 | 24403802G | Back Prism Dust-Proof Cover |
| 5 | 29006152G | Back Prism Assembly |
| 6 | 22802976G | Flow Switch Mount |
| 7 | 23300387G | Plastic Embedded Pulls |
| 8 | 24403516G | Glass Laser Tube Cover |
| 9 | 23300347G | CB10-04 φ10mm*1/2"T _ water flow sensor screw |
| 10 | 25700052G | Water Flow Sensor |
| 11 | 23300346G | Partition Connect (UCB.φ10mm) _Copper screw connector |
| 12 | 24403797G | Case for Laser |

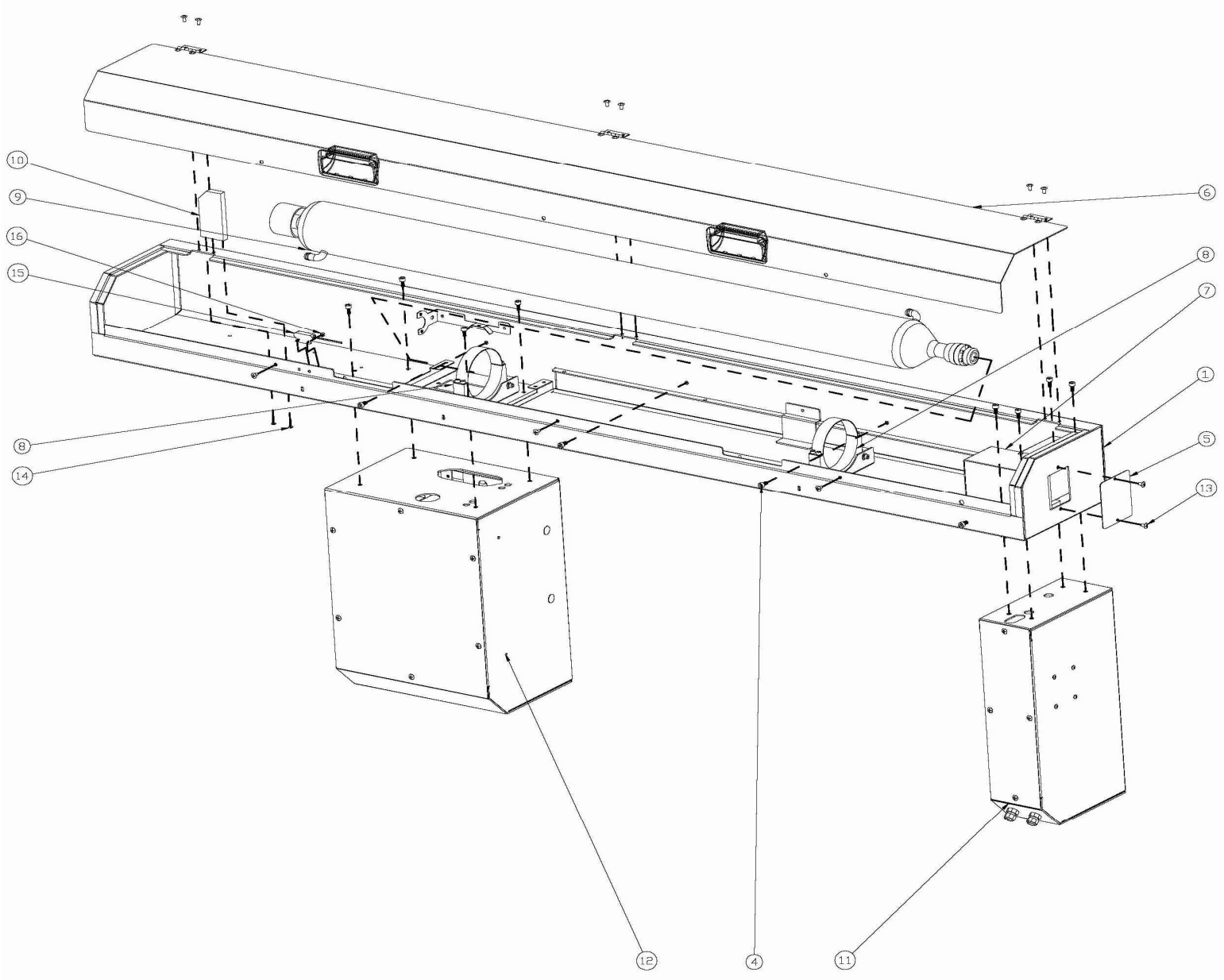
## 2.12. Back Prism Assembly for X380 only (29006152G_ See above diagram for red circle)




Parts List :

| No. | Part No. | Description |
|---|---|---|
| 1 | 22800914G | Mirror Screw |
| 2 | 20200185G | Prism Mounts Assembly |
| 3 | 29001109G | Red Beam Mirror Assembly |
| 4 | 22803076G | Prism Mounts Holder -2 |
| 5 | 22803075G | Prism Mounts Holder -1 |
| 6 | 29004329G | 1" Mirror Holder Assembly |
| 7 | 20200110G | Prism Mount |
| 8 | 22802924G | Prism Mounts Holder -3 |
| 9 | 22803077G | Prism Mounts Holder -4 |
| 10 | 22802886G | Red Light Holder |
| 11 | 25200127G | Pan Head Machine Screw(M3*8L) |
| 12 | 23600028G | Laser Diode Module |

## 2.13 Laser unit for X252 only

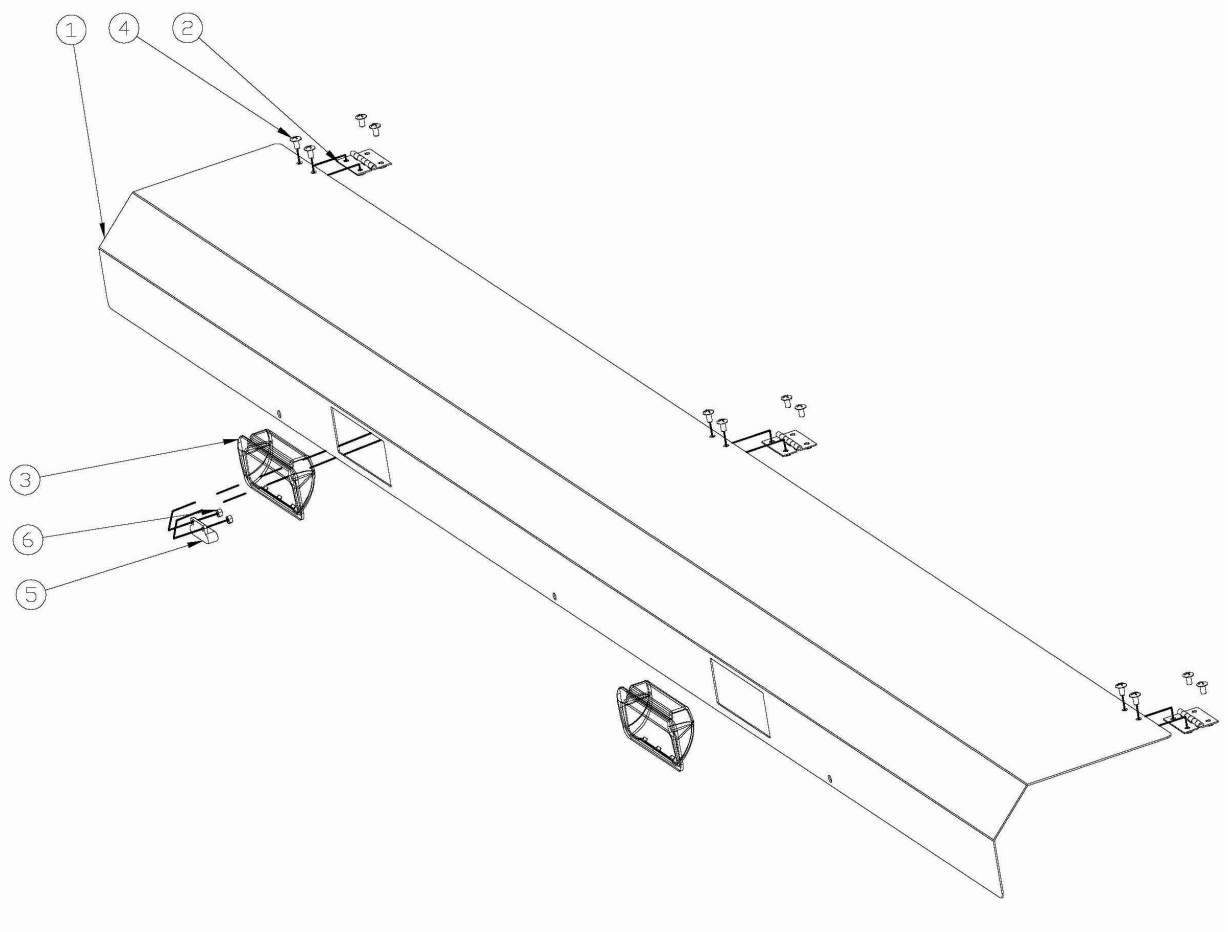


Parts List

| No. | Part No. | Description |
|---|---|---|
| 1 | 244040370G | Case for Laser |
| 2 | 26500245G | 25mm Snap bushing (SB-2530) |
| 3 | 23301151G | SNAP BUSHING (0813C) |
| 4 | 25200274G | Socket head set screw.(M5*10L) |
| 5 | 244040410G | Metal Box Side Cover |
| *6 | 290065070G | Metal box cover Assembly |
| *7 | 290065090G | Back Prism Assembly |
| *8 | 290065080G | tuning bracket (Laser tube) |
| 9 | 22900066G | Reci glass laser tube-V2-1150-80W |
| 10 | 228032000G | Position Block |
| *11 | 290065060G | Left Pillar Unit Assembly |
| *12 | 290065120G | Right Pillar Unit Assembly (80R) |
| 13 | 25200385G | Truss head machine screw(M4*8) |
| 14 | 25200144G | Truss head machine screw(M3*10L). |
| 15 | 25700015G | Magnetic Switch |
| 16 | 23500013G | Nut(M3xt2.4xS5.5) |

## 2.14 Laser unit for X252

### 290065070G Metal box cover Assembly

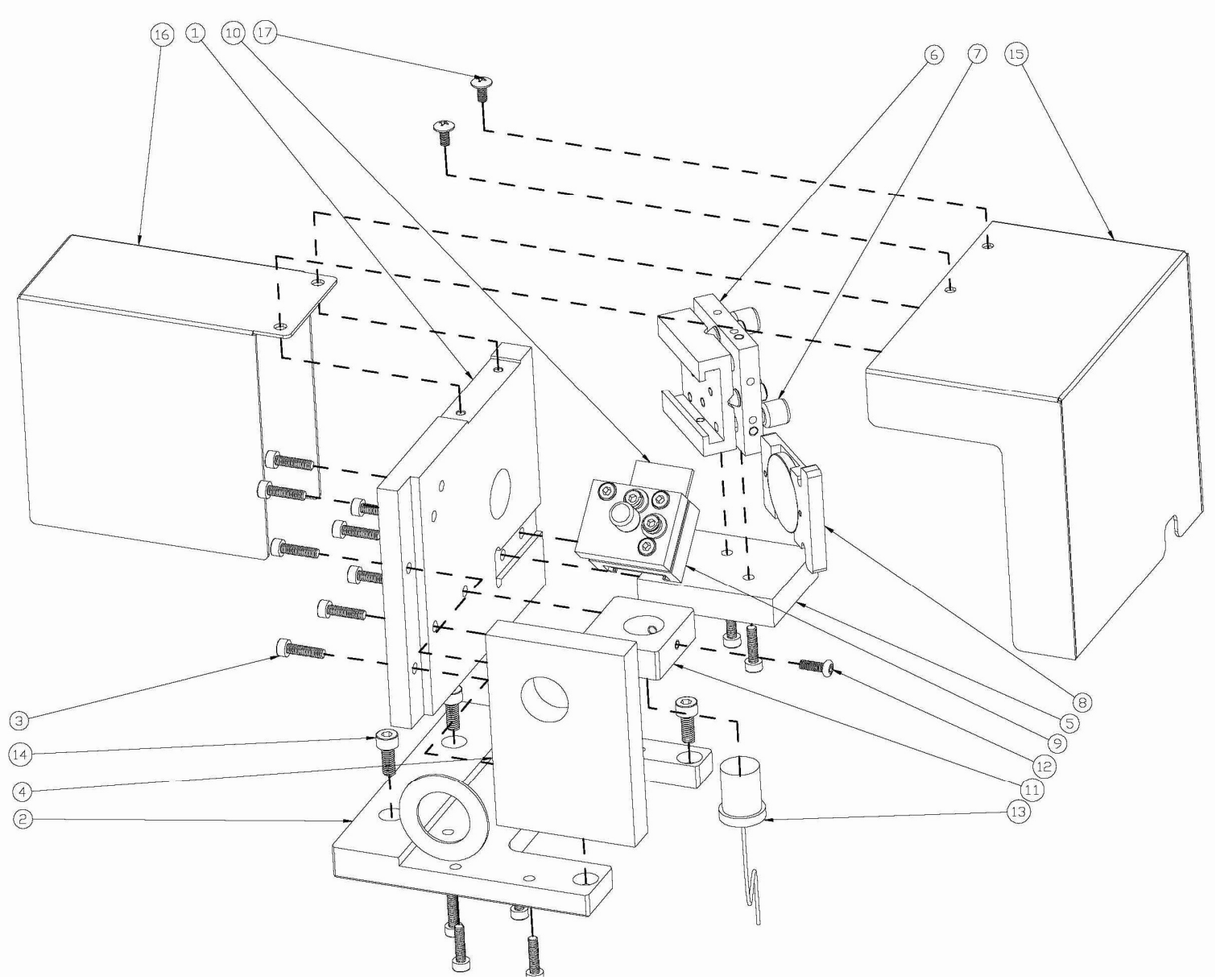



Parts List :

| No. | Part No. | Description |
|---|---|---|
| *6 | 290065070G | Metal box cover Assembly |
| 1 | 244040400G | Cover for Laser Tube Case |
| 2 | 24400991G | plank hinge |
| 3 | 23300387G | Plastic Embedded Pulls |
| 4 | 25200385G | Truss head machine screw(M4*8) |
| 5 | 22000045G | Magnet MC-12 |
| 6 | 23500013G | Nut(M3xt2.4xS5.5) |

## 2.15 Laser unit for X252

290065090G Back Prism Assembly

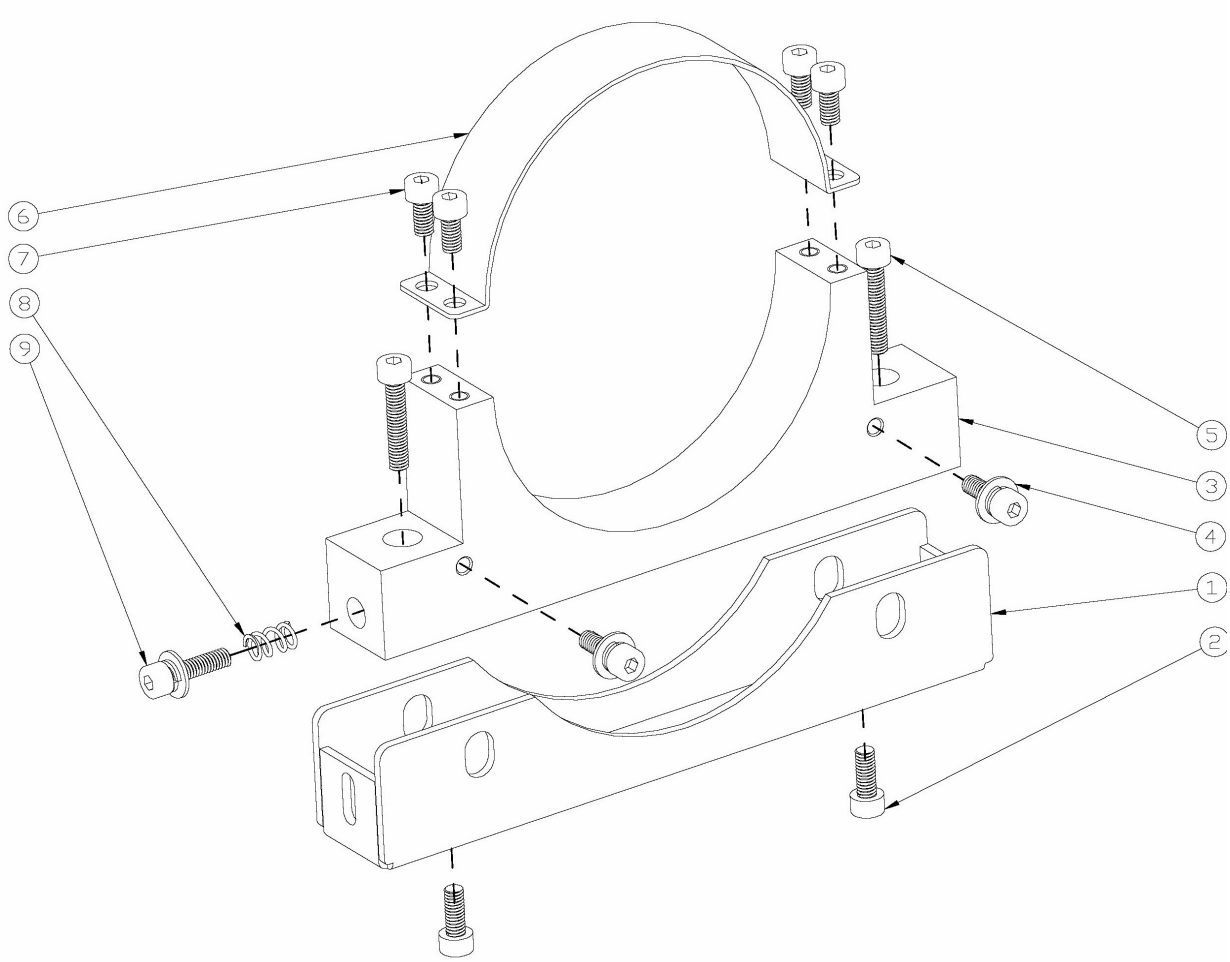


Parts List :

| No. | Part No. | Description |
|---|---|---|
| *7 | 290065090G | Back Prism Assembly |
| 1 | 228032010G | Prism Mounts Holder -1 |
| 2 | 22802924G | prism mounts holder -3 |
| 3 | 25200138G | Socket head set screw.(M3*10L sus+coating) |
| 4 | 228032020G | Prism Mounts Holder -2 |
| 5 | 228032030G | Prism Mounts Holder -3 |
| 6 | 20200262G | Prism Mount |
| 7 | 22800914G | mirror pin |
| 8 | 290069520G | 1" Mirror holder assembly |
| 9 | 20200185G | prism mounts Assembly |
| 10 | 29001109G | Red Beam Mirror Assembly |
| 11 | 22802886G | red light holder |
| 12 | 25200127G | Pan head machine screw(M3*8L) |
| 13 | 290065010G | Red Pointer Assembly |
| 14 | 25200205G | Socket head set screw.(M4*10L) |
| 15 | 244040460G | Prism Dust Cover |
| 16 | 244040470G | Optical Dust Cover |
| 17 | 25200144G | Truss head machine screw(M3*10L). |

## 2.16 Laser unit for X252

290065080G tuning bracket (Laser tube)

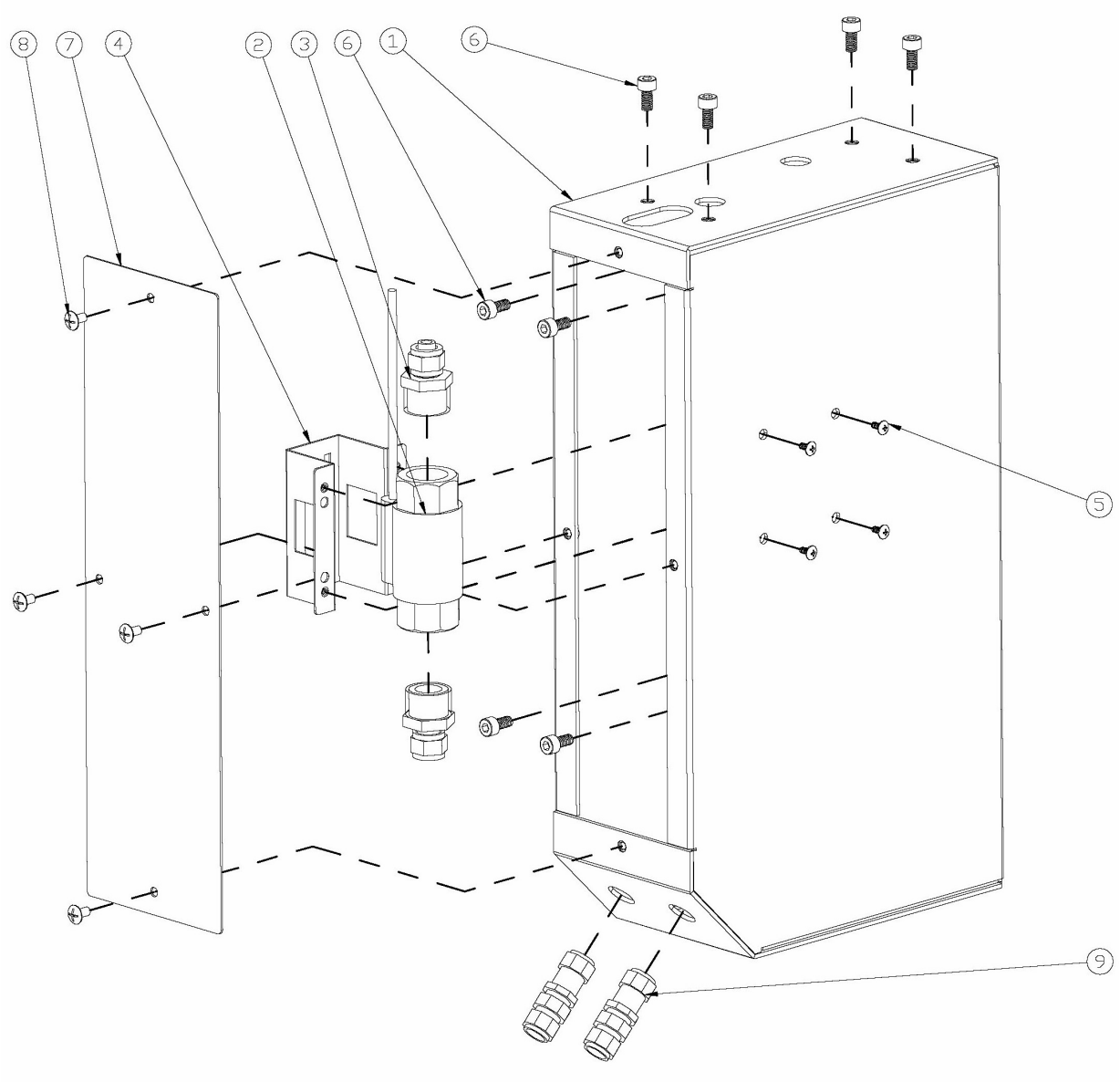



Parts List :

| No. | Part No. | Description |
|---|---|---|
| *8 | 290065080G | tuning bracket (Laser tube) |
| 1 | 244040480G | Prism Base |
| 2 | 25200205G | Socket head set screw.(M4*10L) |
| 3 | 228032040G | Glass Laser Tube Holder |
| 4 | 25200212G | HexagonalSocketHead including spring&flat washer. |
| 5 | 25200240G | Socket head set screw.(M*20L) |
| 6 | 24403515G | glass laser tube fixed plate |
| 7 | 25200191G | Socket head set screw.(M4*8L)sus |
| 8 | 25500023G | Spring |
| 9 | 25200228G | HexagonalSocketHead including spring&flat washer. |

## 2.17 Laser unit for X252

### 290065060G Left Pillar Unit Assembly

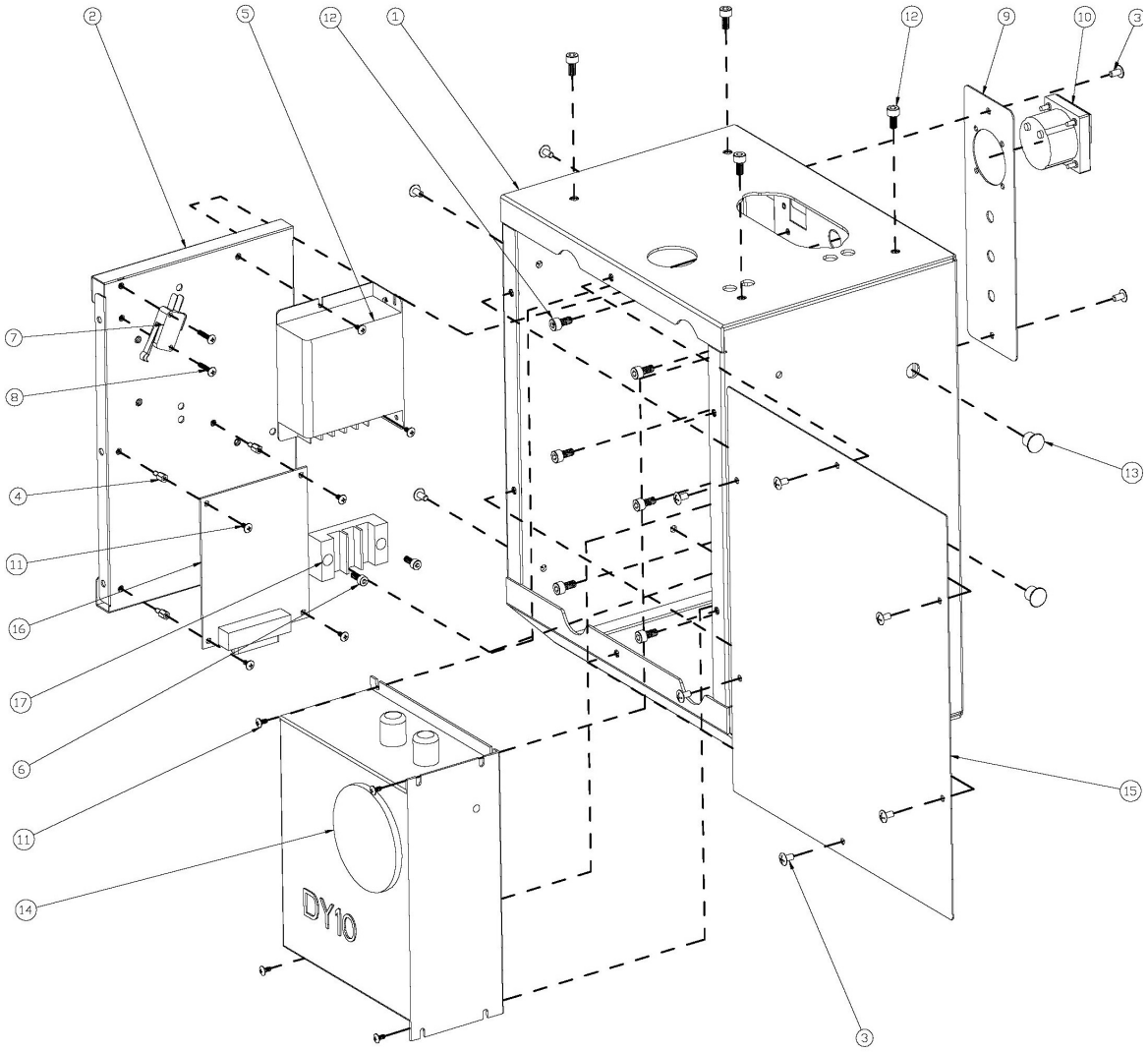



Parts List :

| No. | Part No. | Description |
|---|---|---|
| *11 | 290065060G | Left Pillar Unit Assembly |
| 1 | 244040380G | Left Side of The Pillar |
| 2 | 25700052G | Flow Sensor (LFS-050SVS5-PVNO) |
| 3 | 23300347G | CB10-04 φ10mm*1/2"T (NO3-C4010) |
| 4 | 244040490G | Water Sensor Holder |
| 5 | 25200144G | Truss head machine screw(M3*10L). |
| 6 | 25200274G | Socket head set screw.(M5*10L) |
| 7 | 244040420G | Left Pillar Cover |
| 8 | 25200385G | Truss head machine screw(M4*8) |
| 9 | 23300346G | partition connect UCB.φ10mm (N10-C10) |

## 2.18 Laser unit for X252

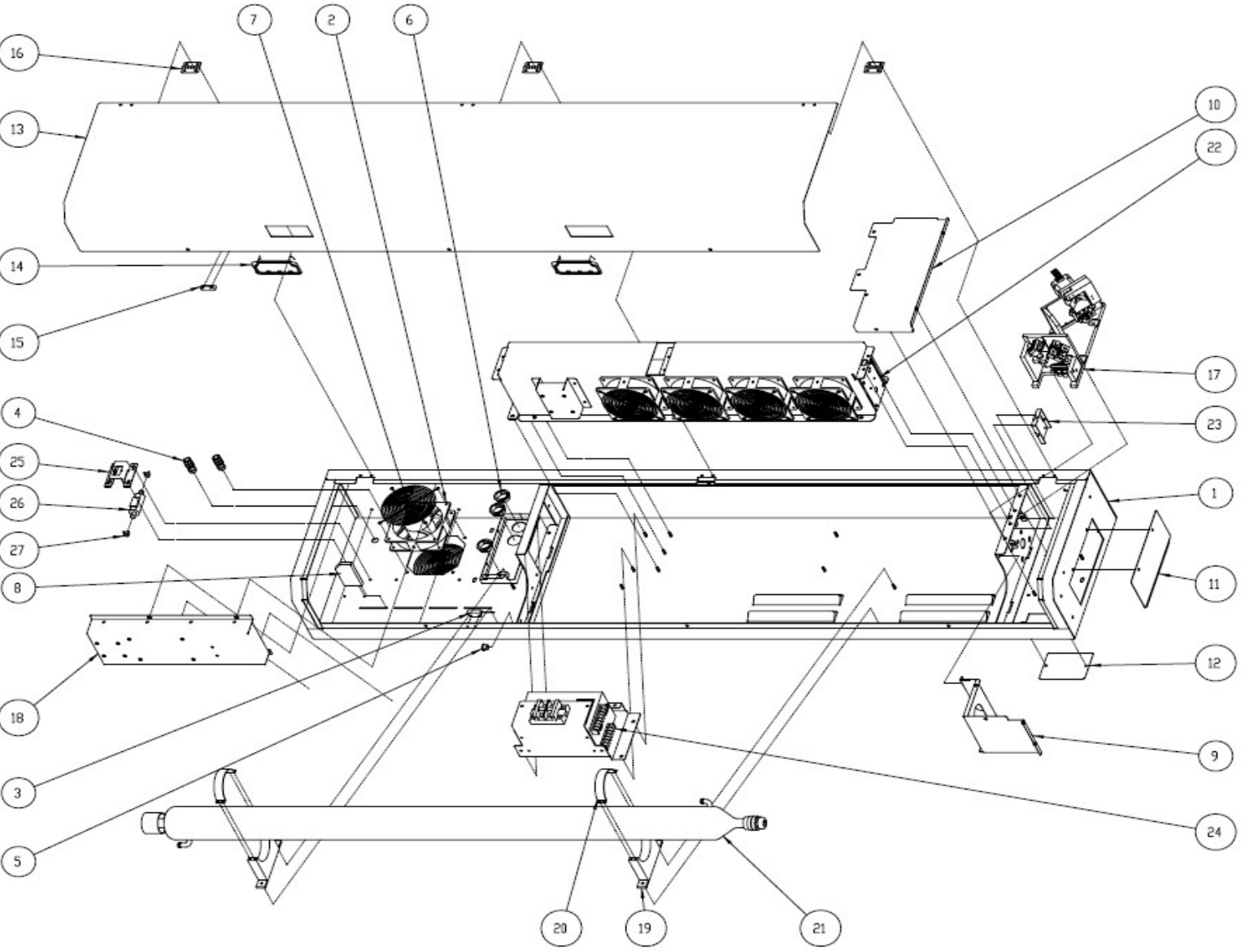
### 290065120G Right Pillar Unit Assembly (80R)



Parts List :

| No. | Part No. | Description |
|---|---|---|
| *12 | 290065120G | Right Pillar Unit Assembly (80R) |
| 1 | 244040390G | Right Side of The Pillar |
| 2 | 244040450G | Control Floor |
| 3 | 25200385G | Truss head machine screw(M4*8) |
| 4 | 22000094G | Hex Screw M3*6 |
| 5 | 24500087G | Power Supply (RS-35-12) |
| 6 | 25200205G | Socket head set screw.(M4*10L) |
| 7 | 25700002G | Lever Switch (VM3-04N-80S-U3 (390)) |
| 8 | 25200017G | Truss head machine screw(M3*15L).black |
| 9 | 244040440G | Indicator Panel |
| 10 | 22000426G | CURRENT GAUGE 0~50mA (DE-430 D.C.50mA) |
| 11 | 25200115G | Truss head machine screw(M3*6L SUS). |
| 12 | 25200274G | Socket head set screw.(M5*10L) |
| 13 | 23301255G | Cover(M-11) |
| 14 | 24500091G | Reci High Voltage Power Supply (DY-10) |
| 15 | 244040430G | Right Pillar Cover |
| 16 | 29006036G | High voltage control board module for CDGRI & Reci |
| 17 | 21100236G | MOLDED TERMINAL (GD40-25A-3P) |

## 2.19 Laser unit for MG380 Hybrid only(290081270G)

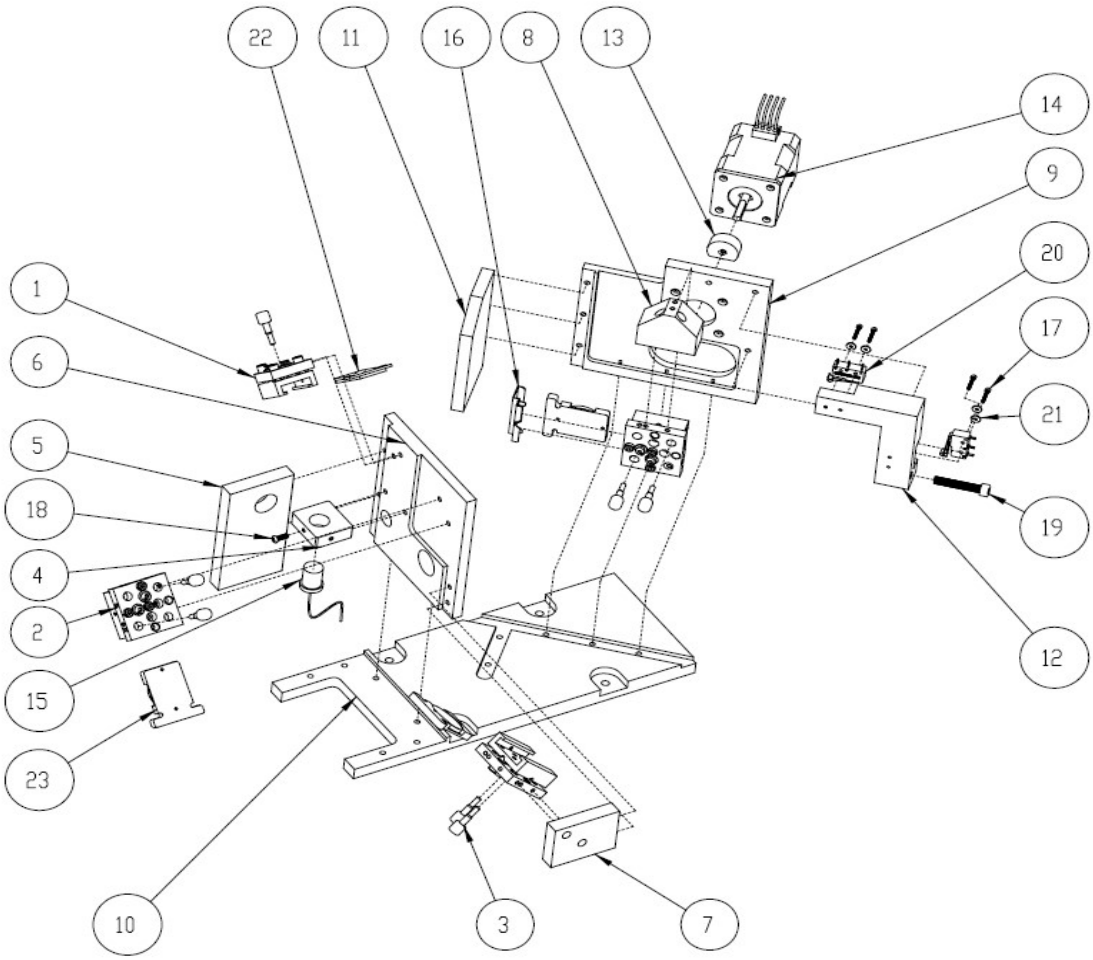


Parts List :

| No. | Part No. | Description |
|---|---|---|
| 1 | 244047480G | Laser case |
| 2 | 22200024G | FAN DC12V (AD1212HB-51(N)LF) |
| 3 | 25700015G | Magnetic Switch |
| 4 | 23300346G | partition connect UCB.φ10mm (N10-C10) |
| 5 | 23301151G | SNAP BUSHING (0813C) |
| 6 | 26500245G | 25mm Snap bushing (SB-2530) |
| 7 | 22000106G | Fan finger guard 12cm(008170)(G12B8-4HA)(S109-8) |
| 8 | 228032000G | Position Block |
| 9 | 244047560G | Front bulkhead |
| 10 | 244047550G | Partition plate |
| 11 | 244047570G | Side cover |
| 12 | 244047580G | Bottom cover |
| 13 | 244047490G | Adapter Box |
| 14 | 23300387G | Plastic Embedded Pulls |
| 15 | 25700015G | Magnetic Switch |
| 16 | 24400991G | plank hinge |
| ***17** | **290081310G** | **Back Prism Assembly** |
| ***18** | **290081350G** | **Control Box Assembly** |
| 19 | 22802888G | glass laser tube holder |
| 20 | 24403515G | glass laser tube fixed plate |
| 21 | 290065310G | Reci glass laser tube-Z4-1400-100W |
| ***22** | **290081360G** | **25W Laser tube Assembly** |
| 23 | 244047540G | Ray base |
| ***24** | **290081390G** | **25W Power supply Assembly** |
| 25 | 244040491G | Water Sensor Holder |
| 26 | 257001010G | Flow Sensor (SK-1010CL) |
| 27 | 233013330G | Hose Clamp (HP-10D) |

## 2.20 Laser unit for

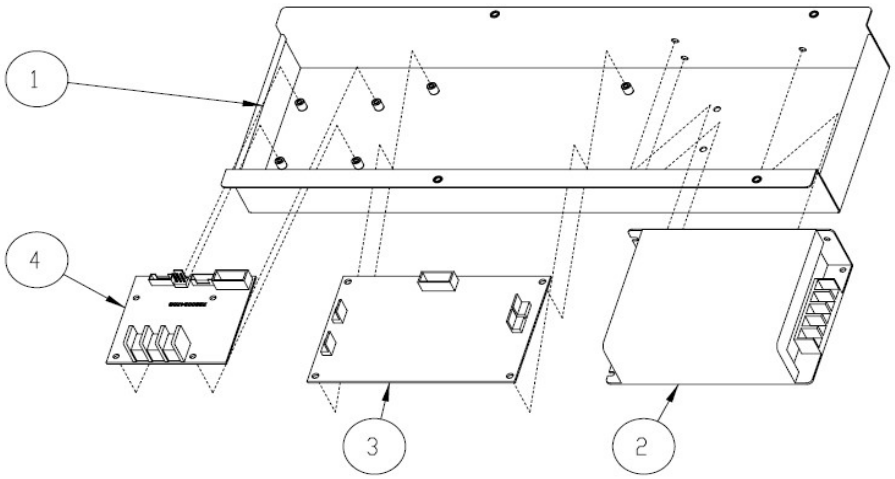
### X380 Hybrid_290081310G Back Prism Assembly



Parts List :

| No. | Part No. | Description |
|---|---|---|
| 1 | 20200262G | Prism Mount |
| 2 | 202003240G | Prism Mounts Assembly |
| 3 | 22800914G | mirror pin |
| 4 | 22802886G | red light holder |
| 5 | 22802925G | prism mounts holder -2 |
| 6 | 22802926G | prism mounts holder -1 |
| 7 | 22803003G | prism mounts holder -4 |
| 8 | 228036170G | Ray base |
| 9 | 228036180G | Motor bracket |
| 10 | 228036200G | Prism mounts holder |
| 11 | 228036210G | Bracket Mount |
| 12 | 228036220G | Limit holder |
| 13 | 228036690G | Damper Block |
| 14 | 23100039G | step motor 17HS5005-26B |
| 15 | 23600028G | Laser Diode module |
| 16 | 244047590G | Press board |
| 17 | 25200073G | Socket head set screw.(M2*12L) |
| 18 | 25200127G | Pan head machine screw(M3*8L) |
| 19 | 25200377G | Socket head set screw (M5*30) |
| 20 | 25700008G | Level Limited Switch |
| 21 | 26000020G | Flat washer. (d2xD6xt0.7)  SUS |
| 22 | 29001109G | Red Beam Mirror Assembly |
| 23 | 290076790G | 1" Mirror holder assembly |

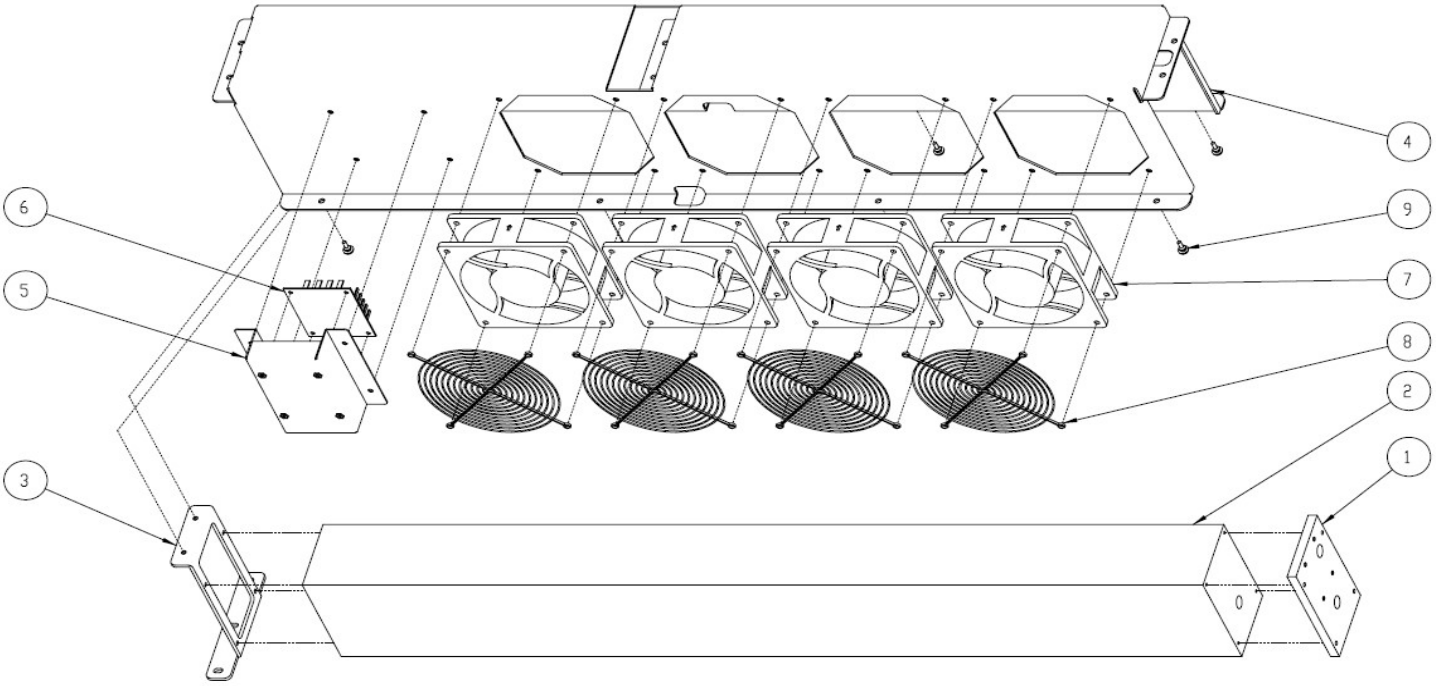
## 2.21 Laser unit for MG80 Hybrid_290081350G Control Box Assembly




Parts List :

| No. | Part No. | Description |
|---|---|---|
| 1 | 244047500G | Adapter Box |
| 2 | 24500071G | Auto Switch Power Supply(RS-75-24) - Vogue |
| 3 | 290068650G | Laser Roll to Roll Control Board Set(with roll to roll installation program) |
| 4 | 290068300G | Roll to Roll Transfer PCB Set |

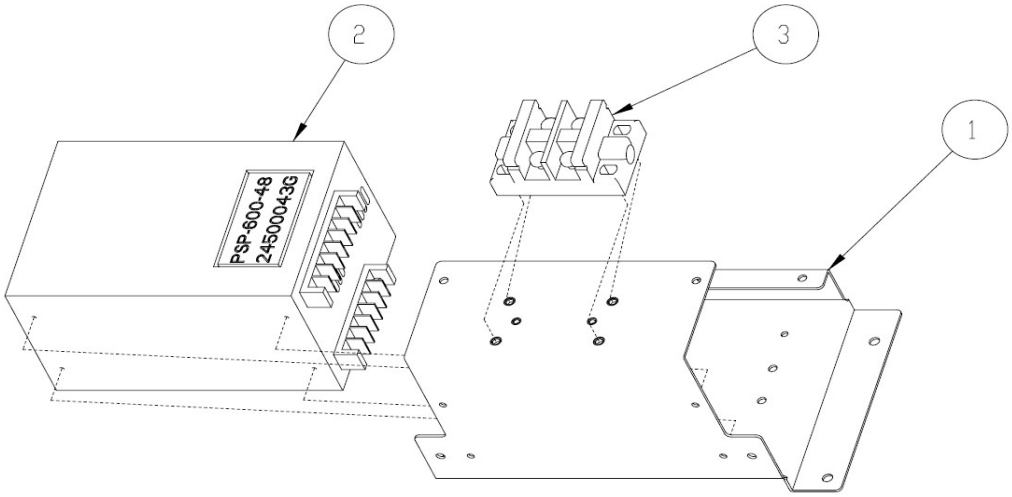
## 2.22 Laser unit for MG380 Hybrid_290081360G 25W Laser tube Assembly




Parts List :

| No. | Part No. | Description |
|---|---|---|
| 1 | 228036190G | Laser front bracket |
| 2 | 22900002G | Synrad 25W Laser Tube |
| 3 | 244047510G | Laser fixture board |
| 4 | 244047520G | Heat Sink Cover |
| 5 | 244042400G | Adapter cover |
| 6 | 29005059G | DC12V POWER MODULE |
| 7 | 22200024G | FAN DC12V (AD1212HB-51(N)LF) |
| 8 | 22000106G | Fan finger guard 12cm(008170)(G12B8-4HA)(S109-8) |
| 9 | 26500210G | Rubber Foot TNF-1 |

## 2.23 Laser unit for MG380 Hybrid_290081390G 25W Power supply Assembly



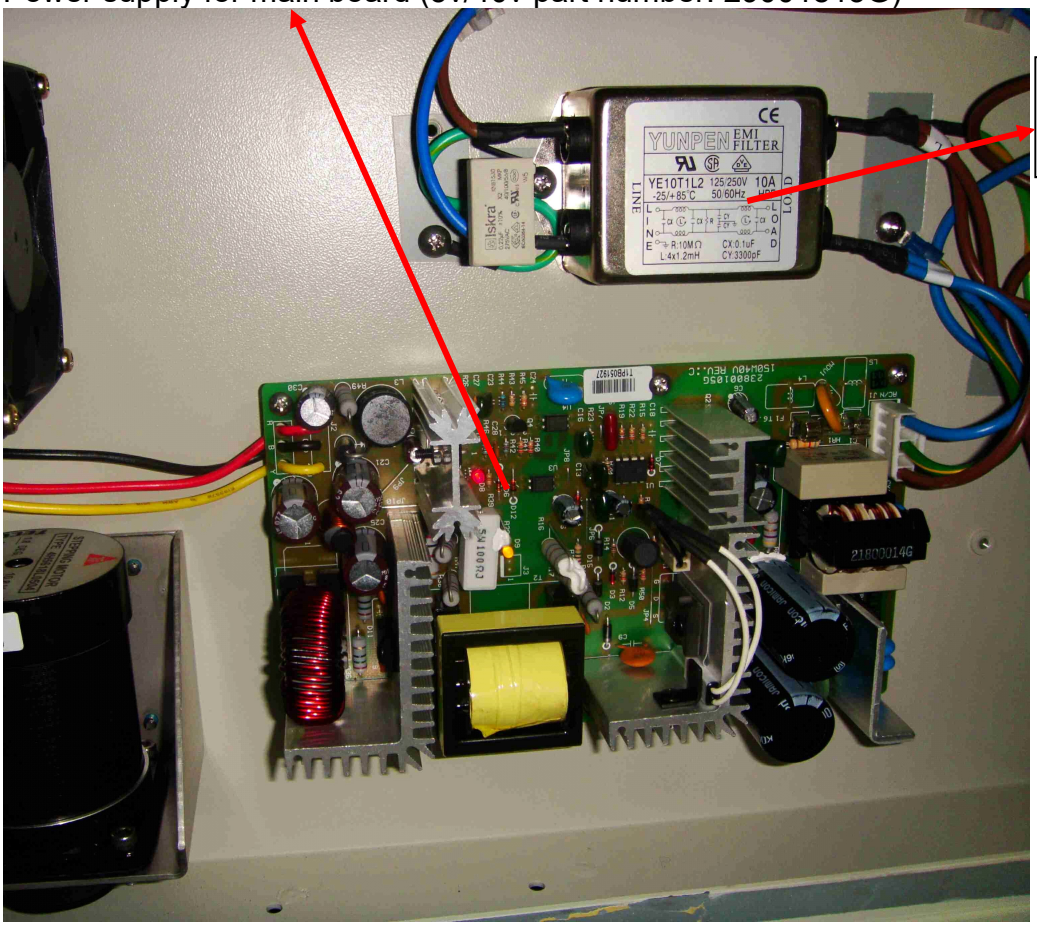

Parts List :

| No. | Part No. | Description |
|---|---|---|
| 1 | 244047530G | Power fixed board |
| 2 | 24500043G | Power Supply (PSP-600-30GCN) |
| 3 | 21100345G | 60A TERMINAL 2PIN(GGD50-60A-2P) |

# Chapter 3 Electrical System

## 3.1 Power System

Power supply for main board (5v/40v part number: 29001813G)

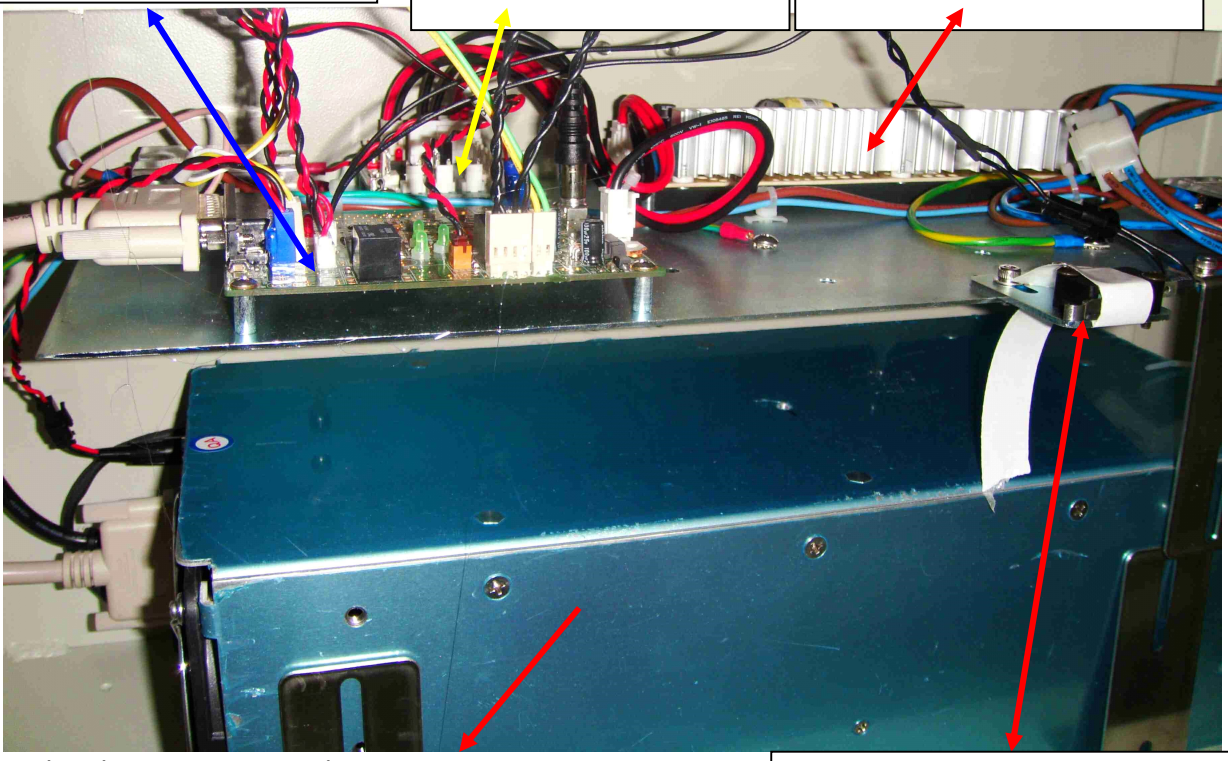



EMI filter: P/N; 21800007G

X 380 100W SIGNAL PCB (P/N: 23800313G)

DC 12v Power module (P/N: 29005059G)

DC 12v Power Supply for LED (P/N: 24500023G)



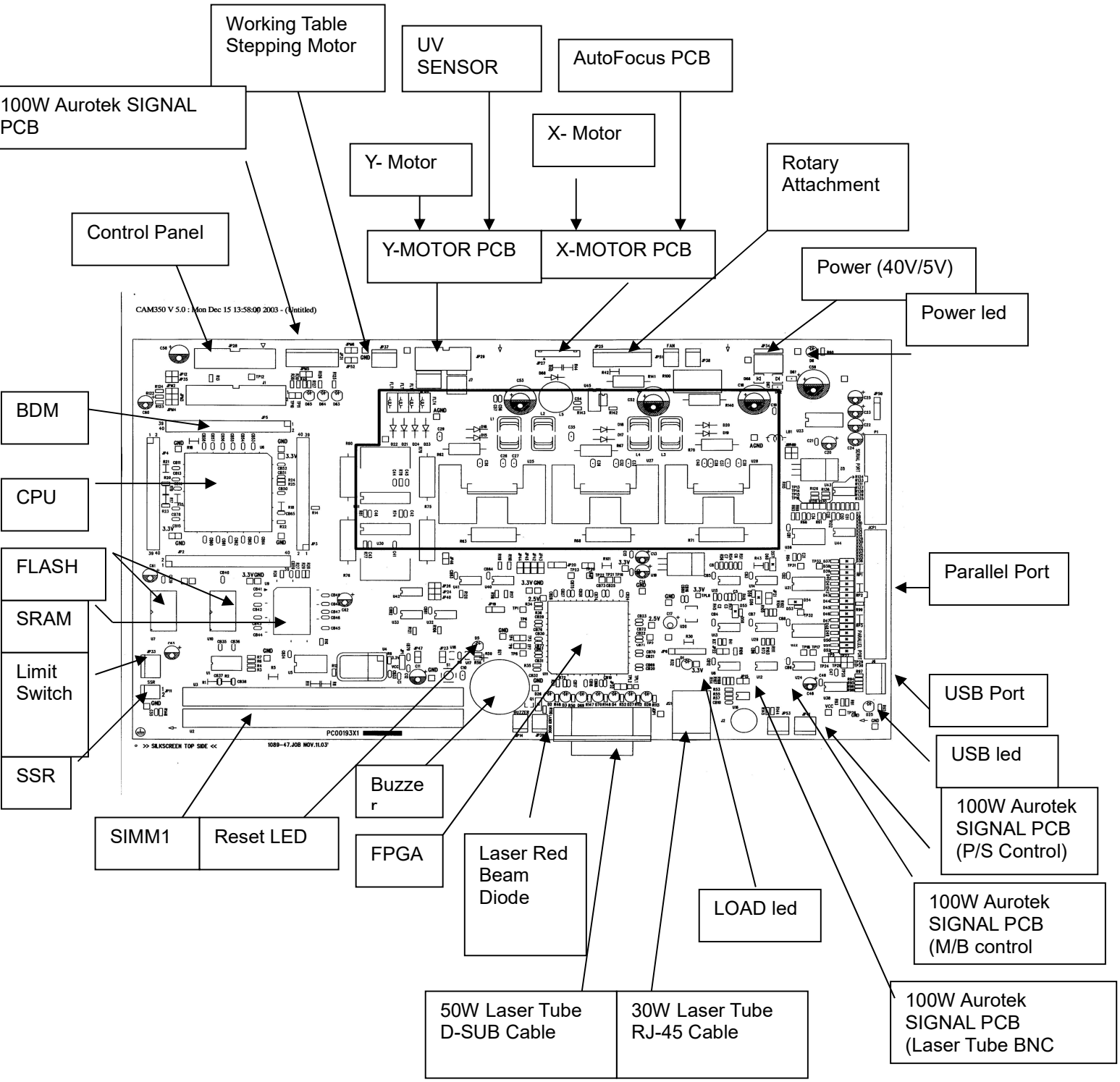
High voltage power supply

- 80W (P/N: 245001060G)
- 100W (P/N : 245001080G

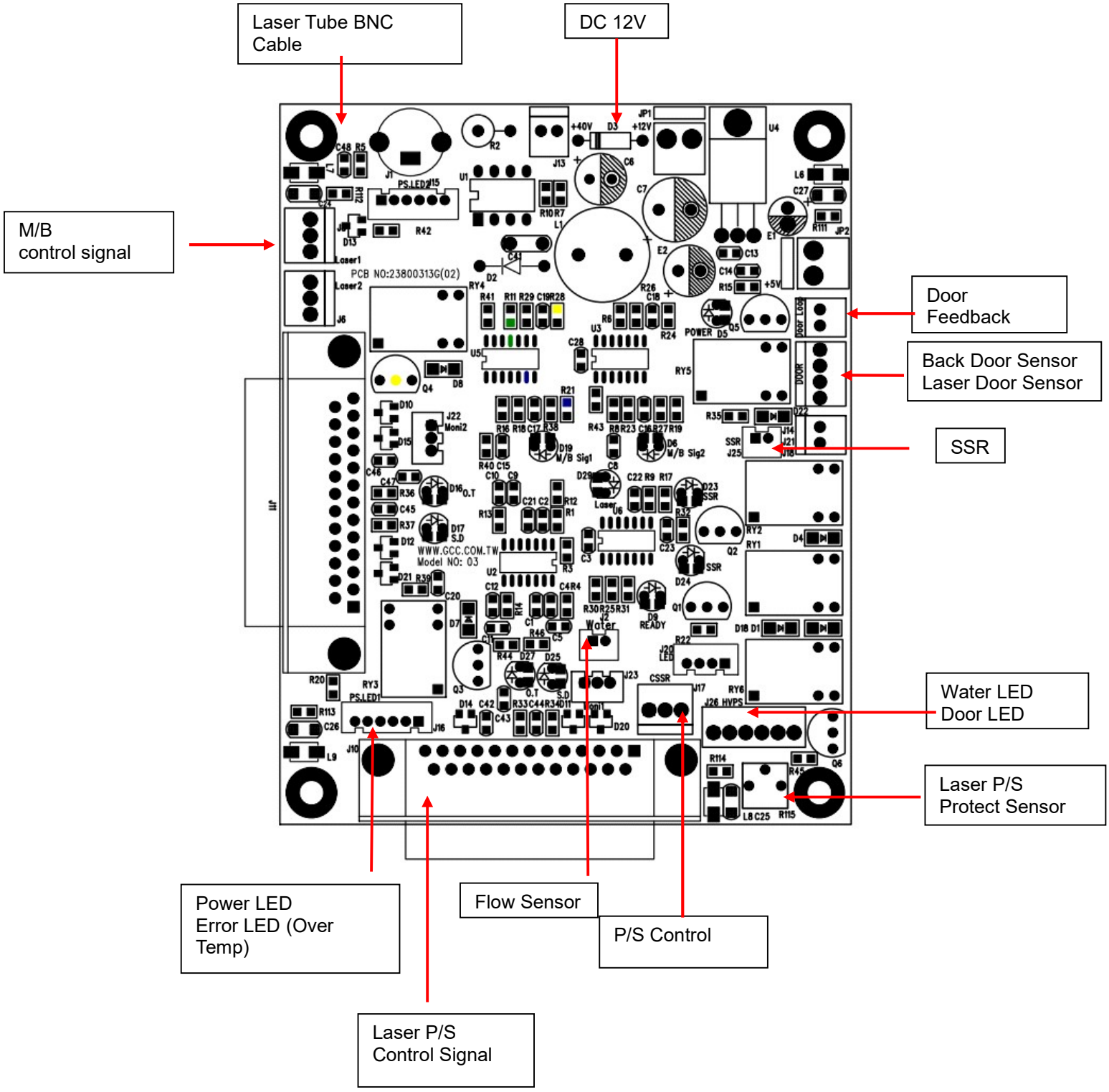
Back Door Sensor(is also level switch): P/N; 25700002G.
When back door is open, the high voltage power supply will be turn off. For safety reason.

## 3.2 Electrical System

- X380_X380 Hybrid_X252 MAINBOARD DIAGRAM (5206E)

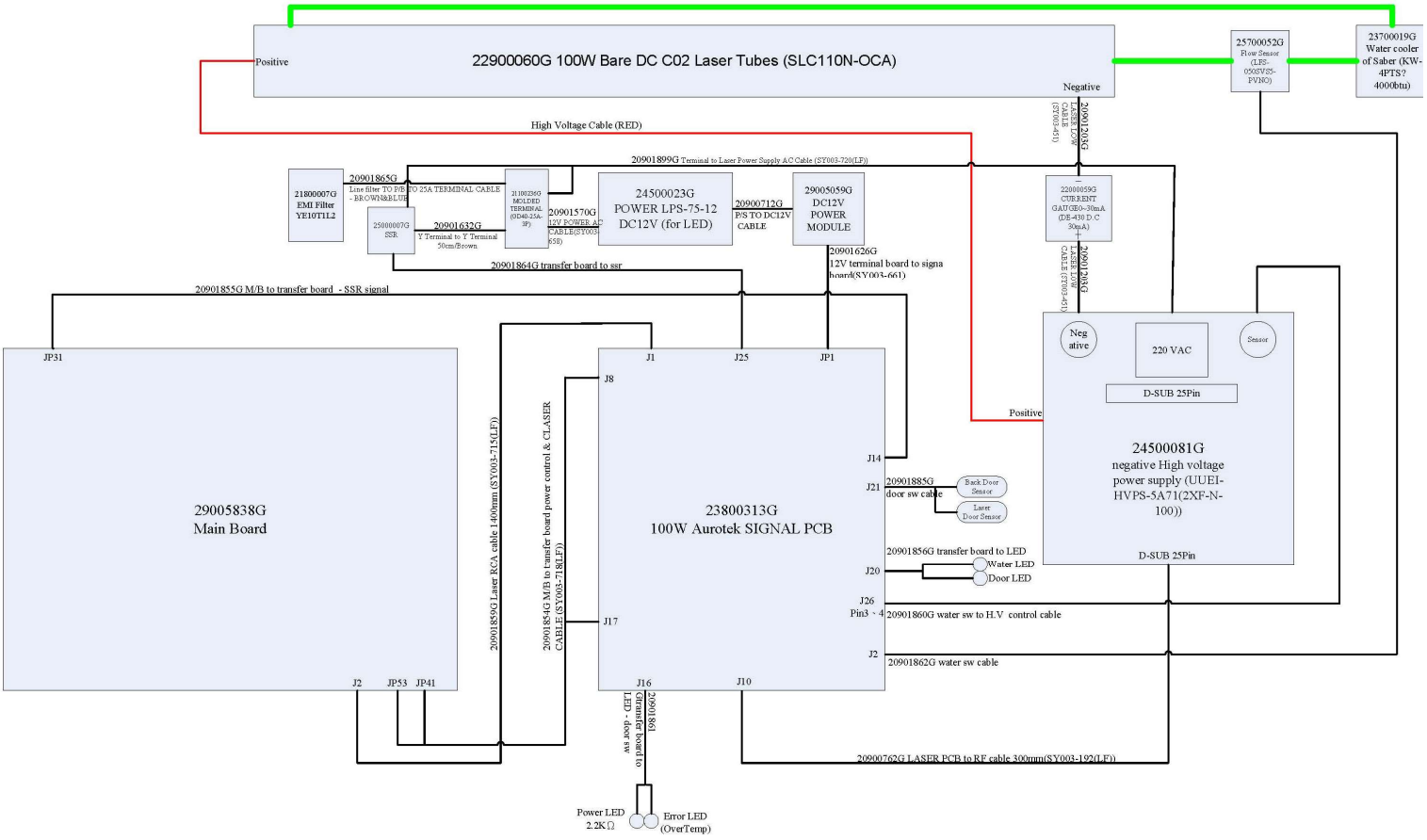


- X 380 100W SIGNAL PCB (23800313G) DIAGRAM

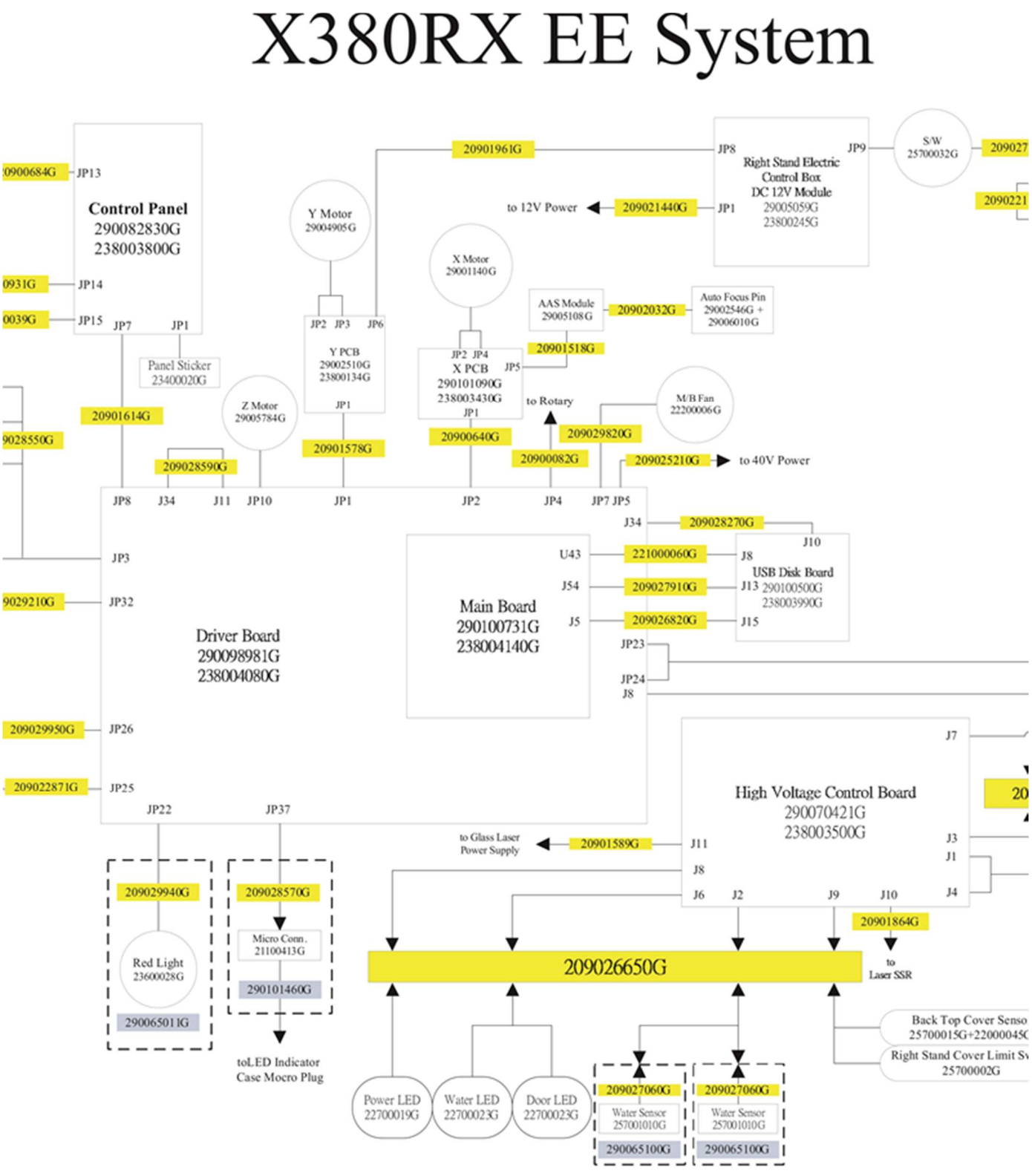


System Diagram for X380 LS

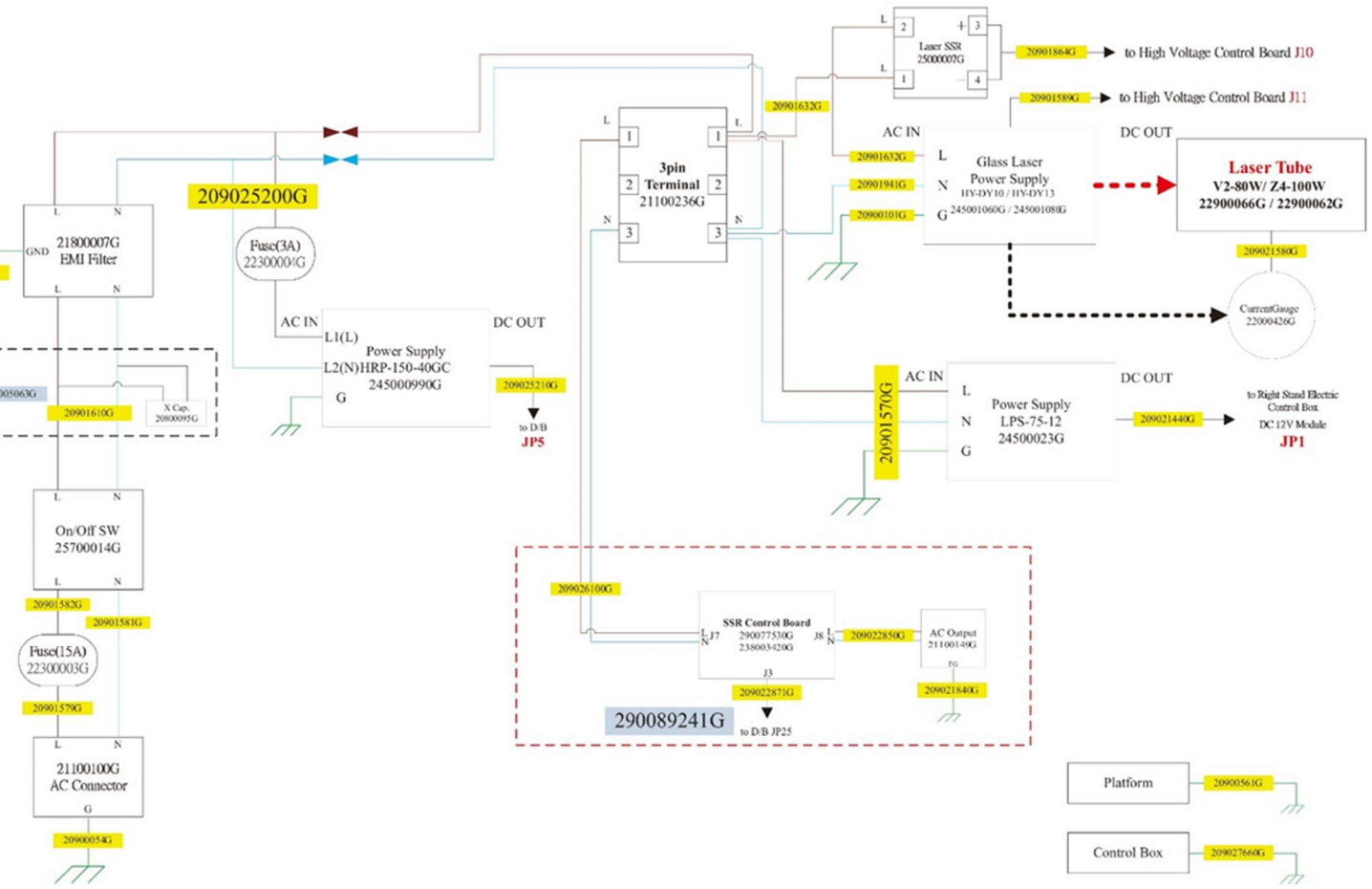
- System Diagram for X380LS



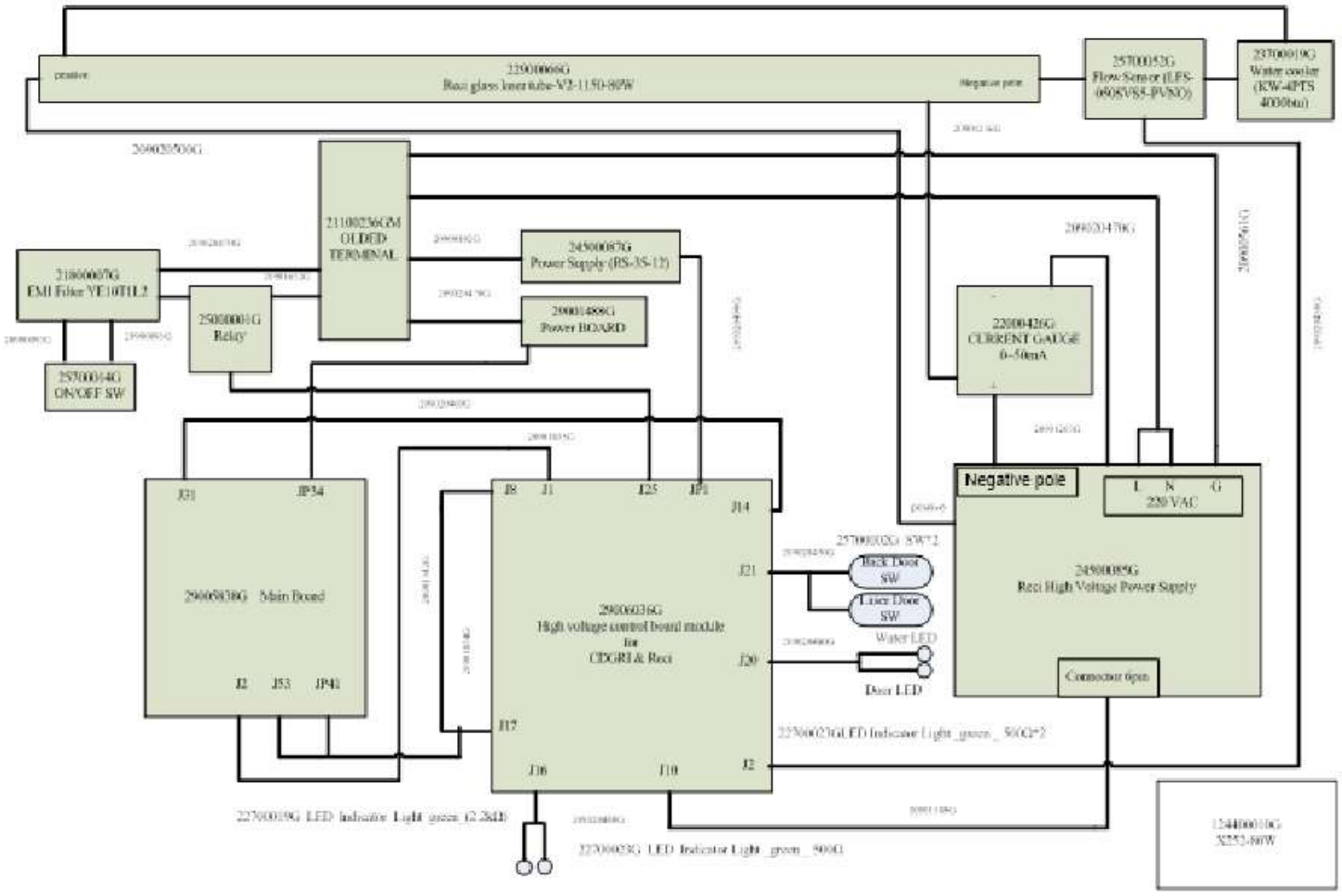
- System Diagram for X380RX (5272V2 Mainboard)



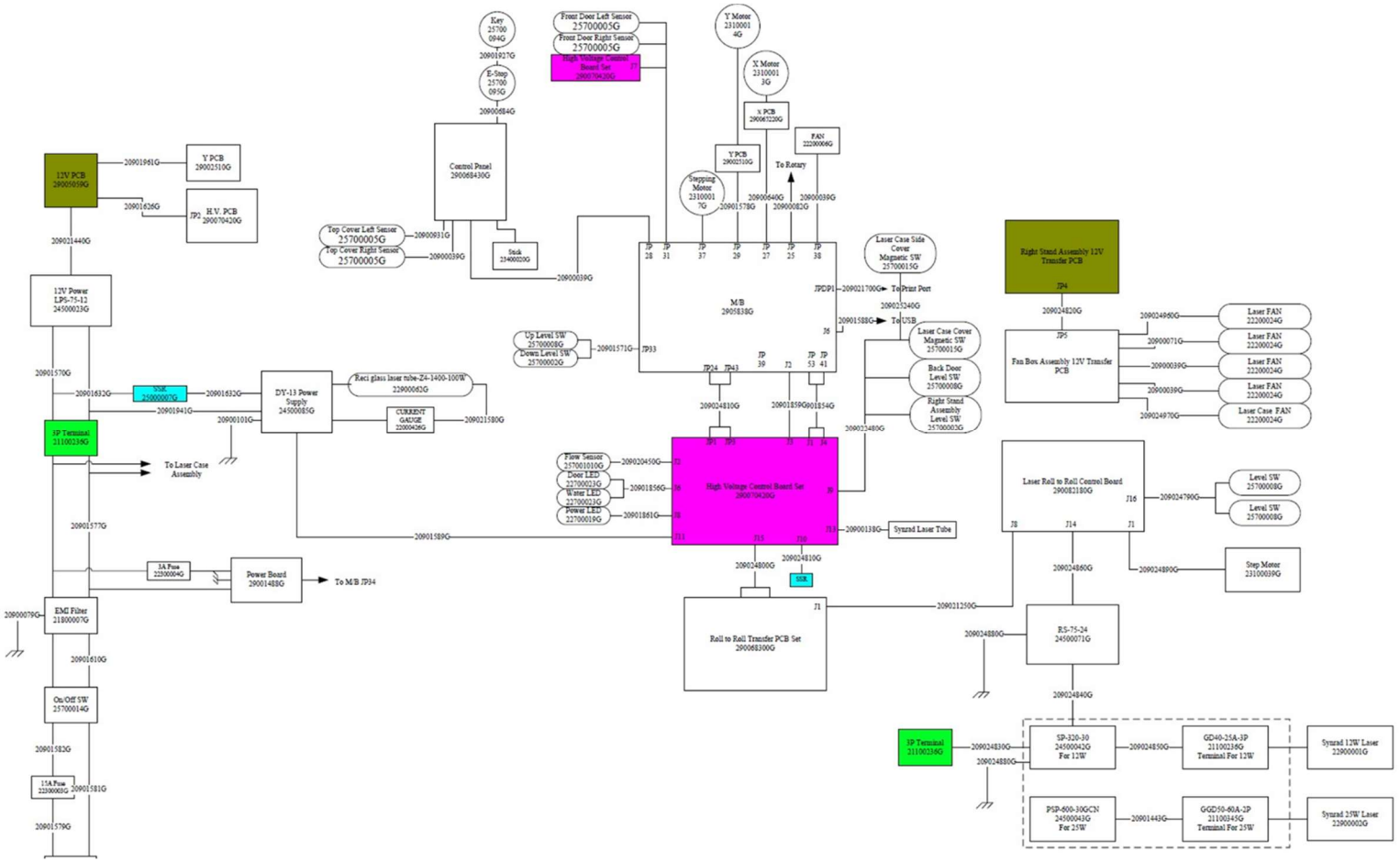
# X380RX AC Power System



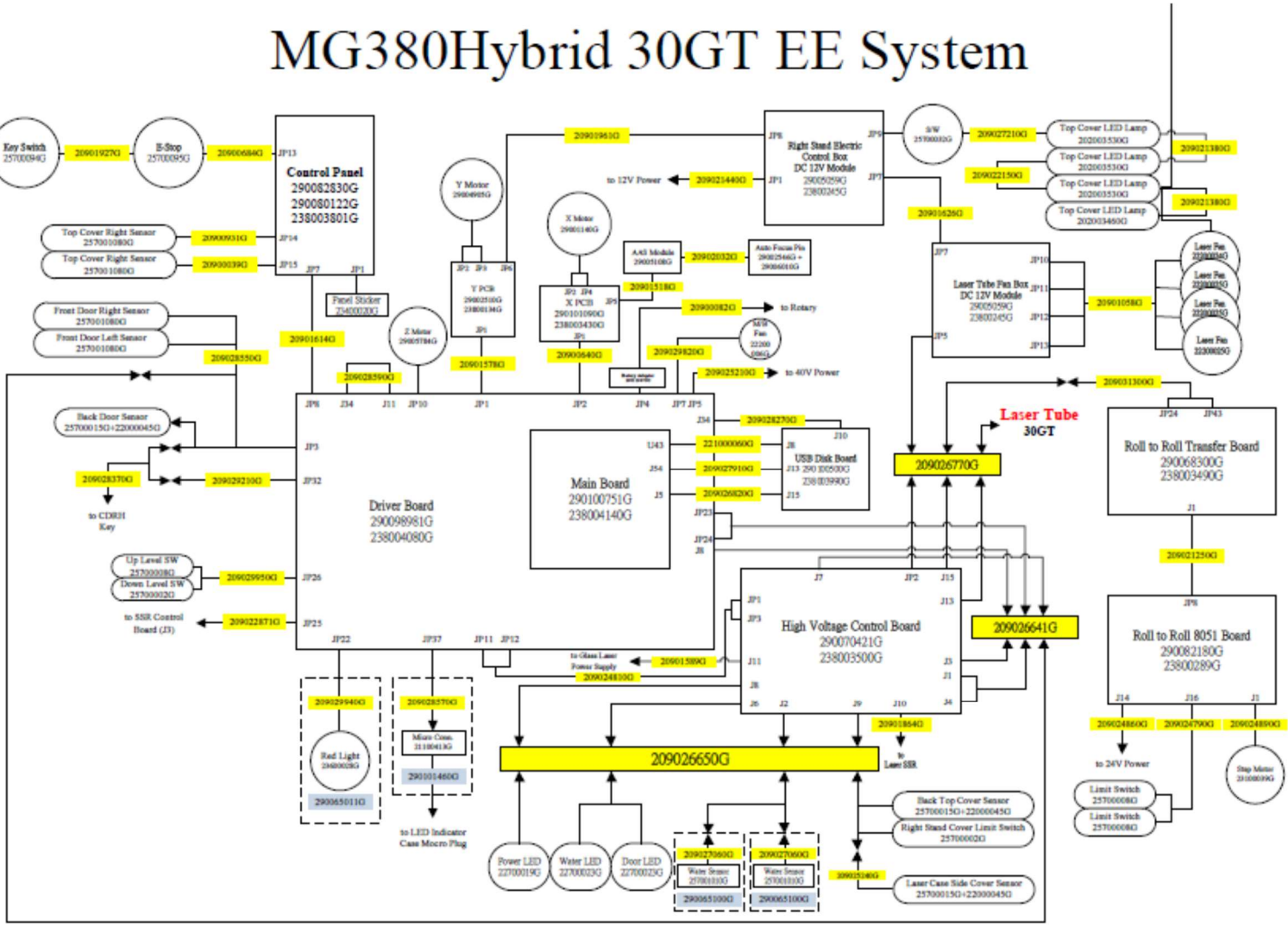
- System Diagram for X252 (5206e Mainboard)



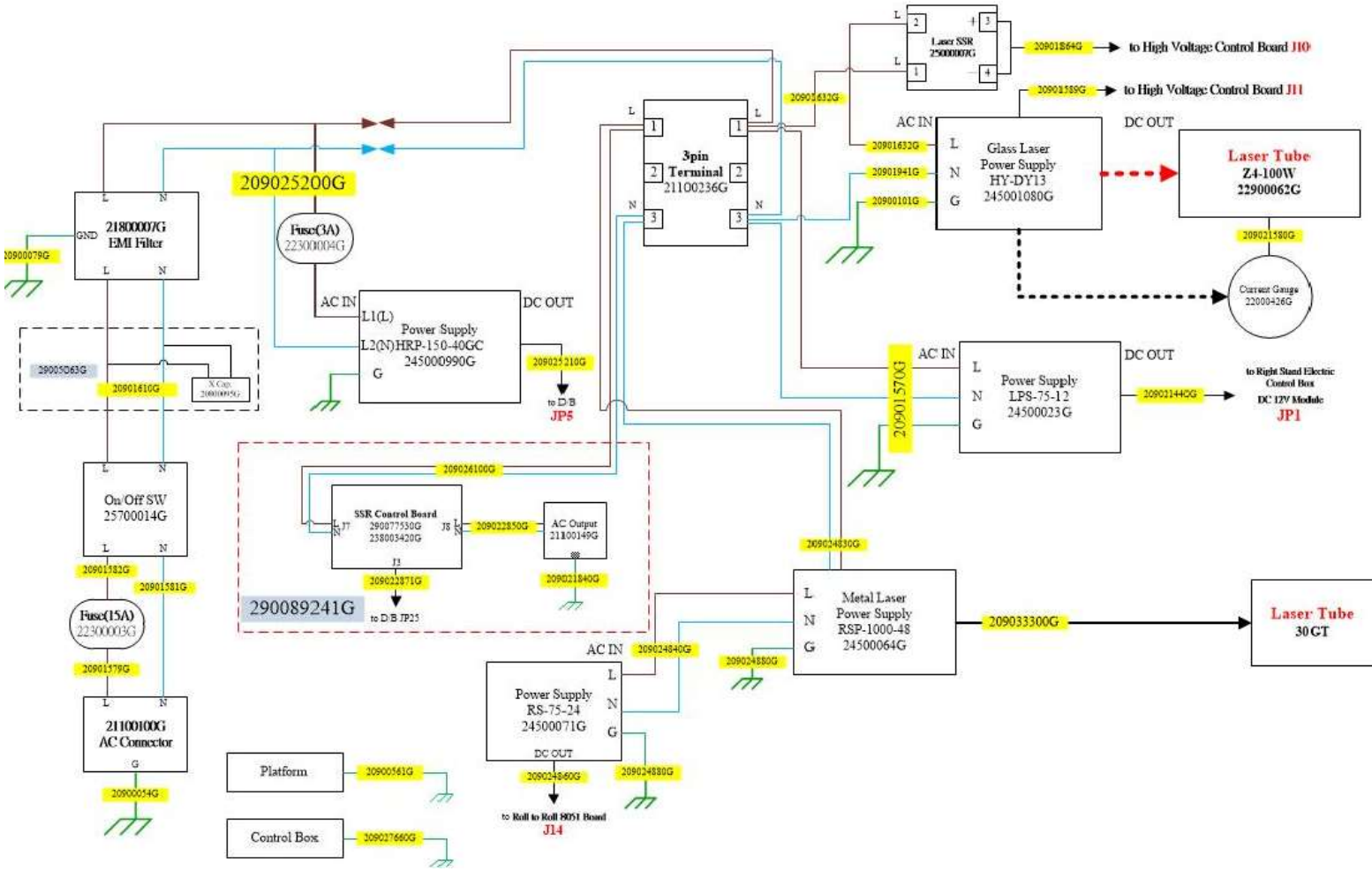
- System Diagram for MG380 Hybrid (5206e Mainboard)



- System Diagram for MG380 Hybriad (30GT) – 5272V3 M/B



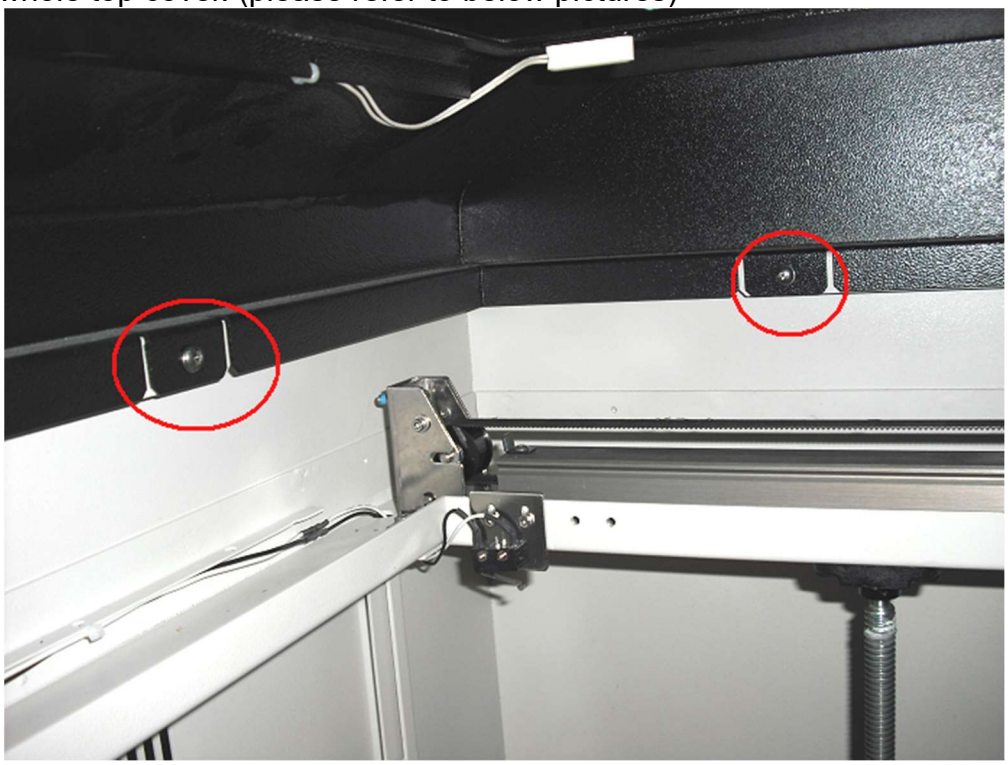
# MG380Hybrid 30GT AC Power System

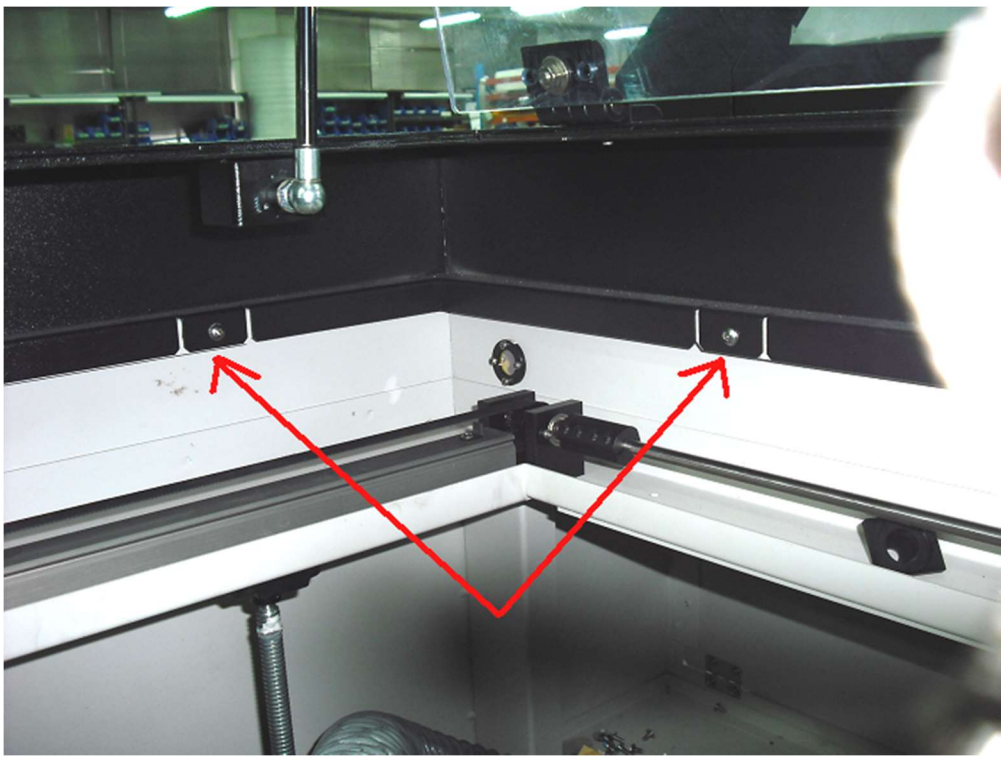


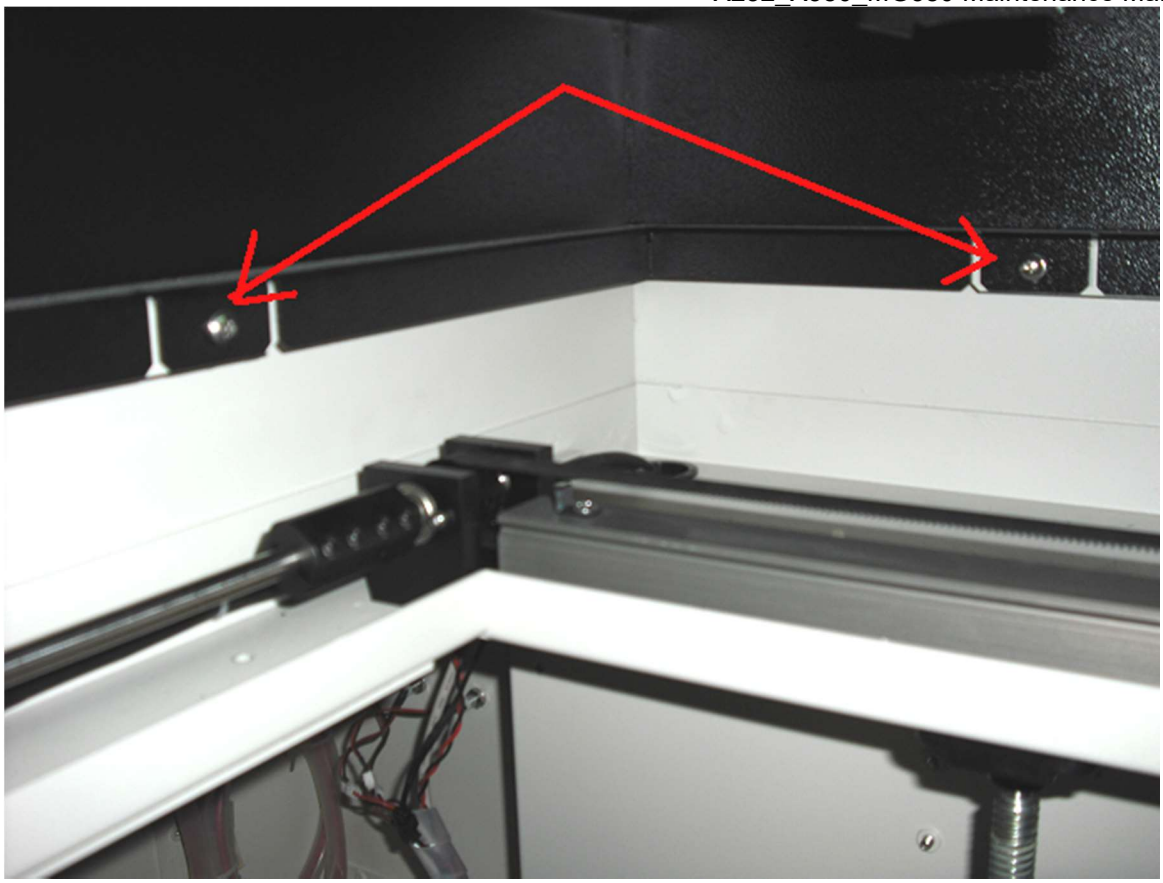
# Chapter 4 Components Replacement

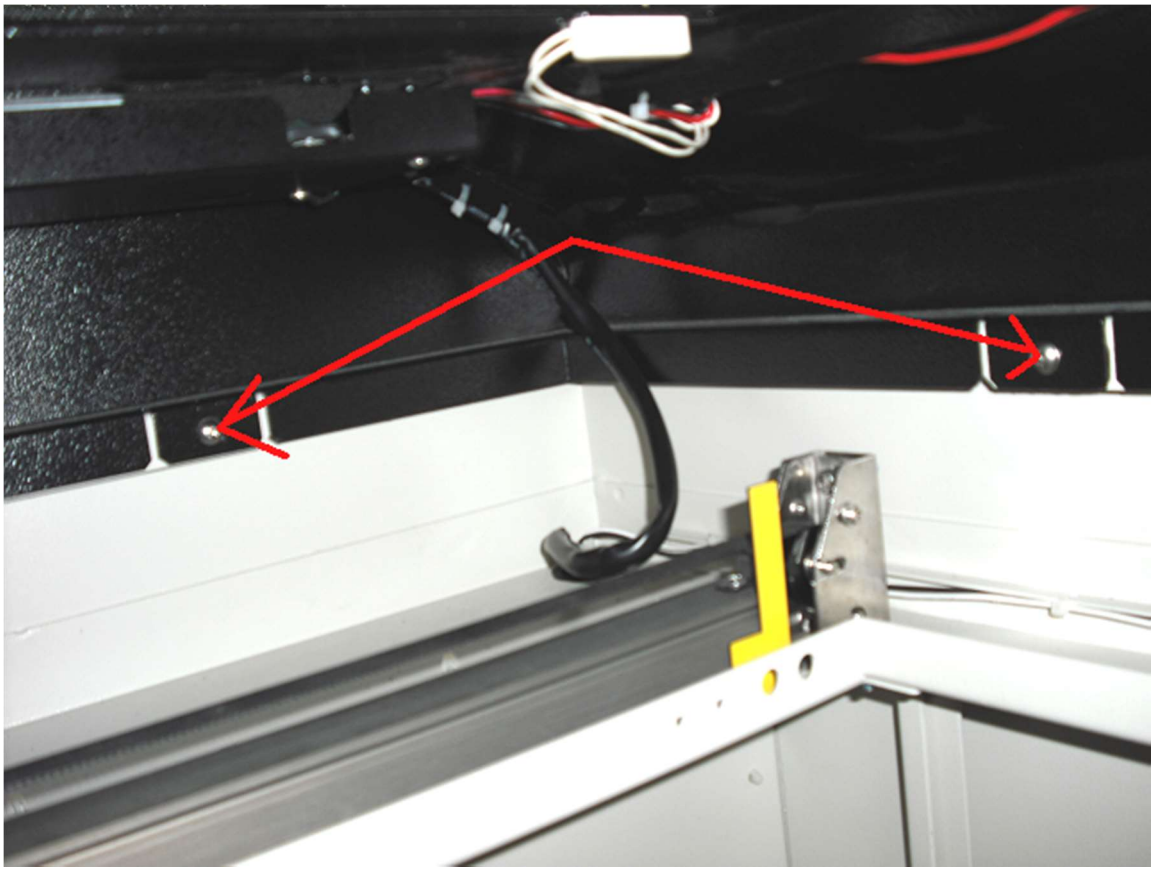
## 4.1 X252 & X380 Control Panel Changing process

1. Open the top window, and loosen eight screws inside, then you can remove the whole top cover. (please refer to below pictures)

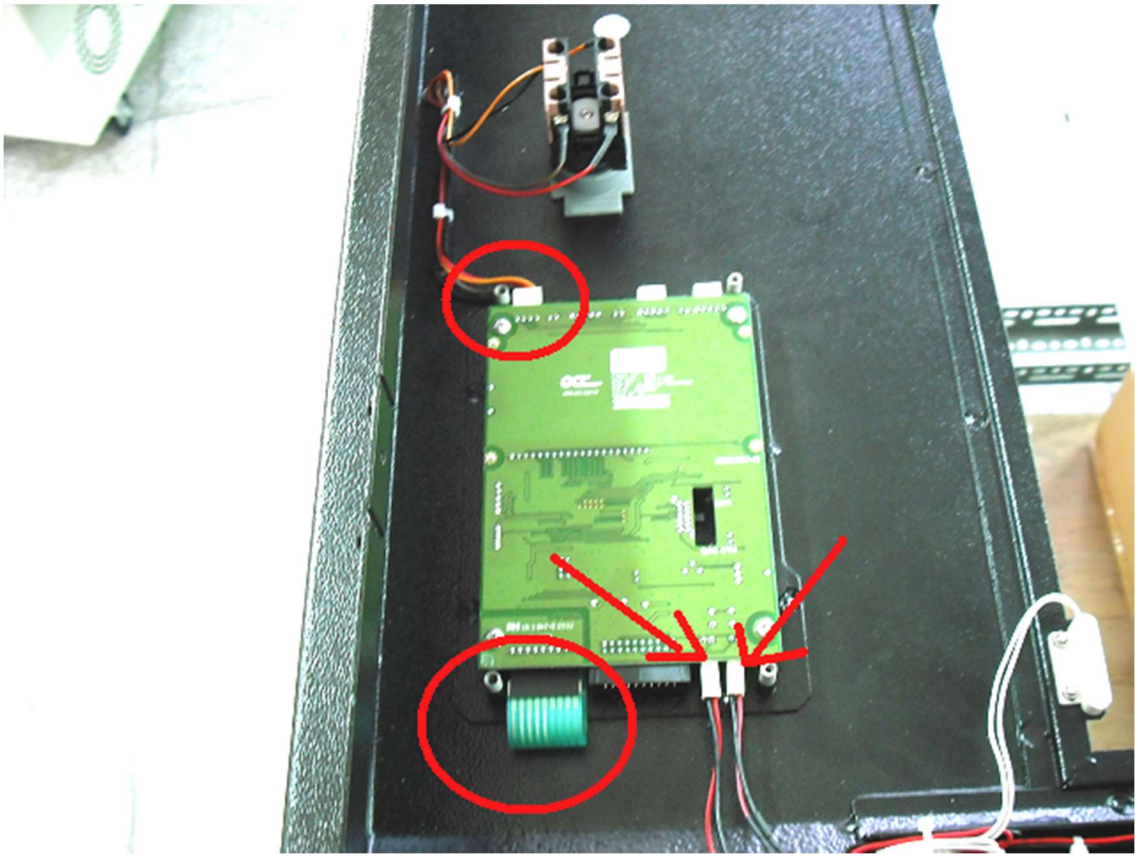




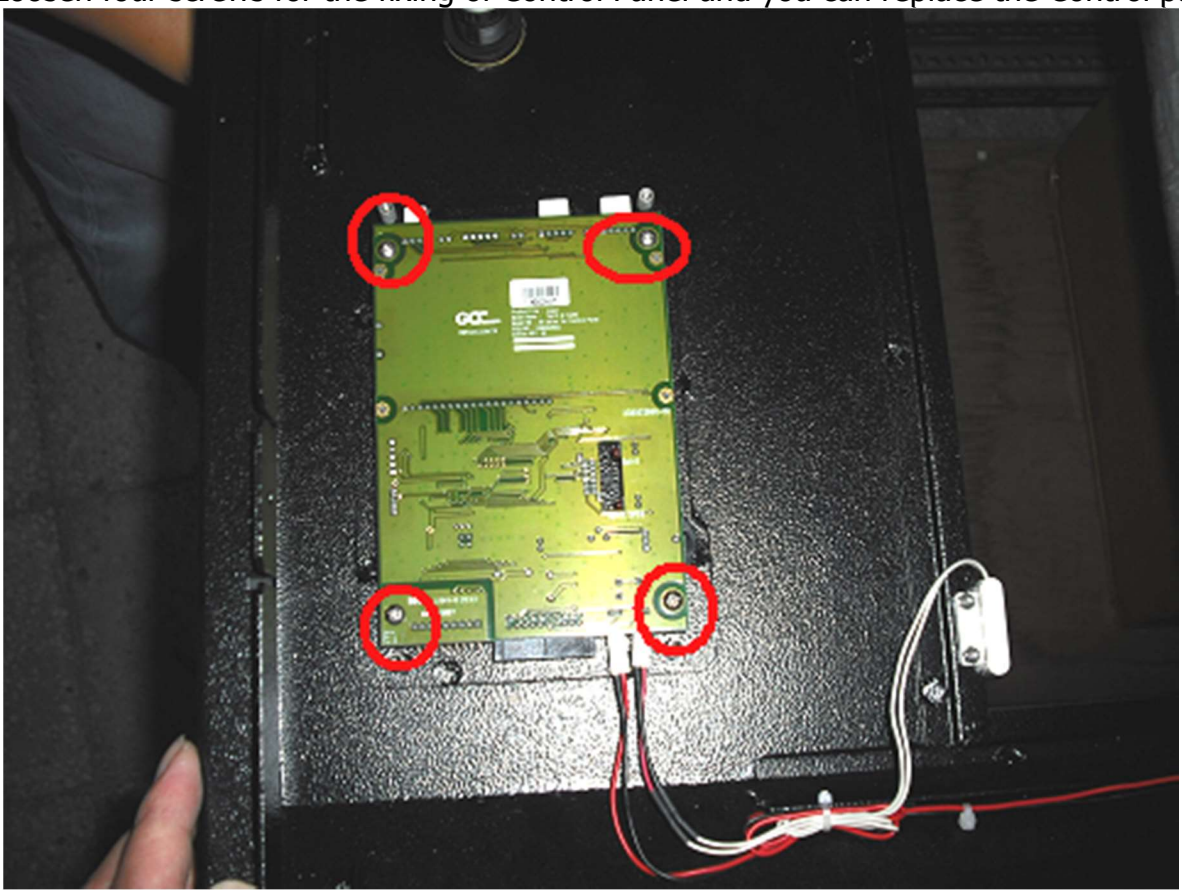




2. Disconnect circles cables show in below picture



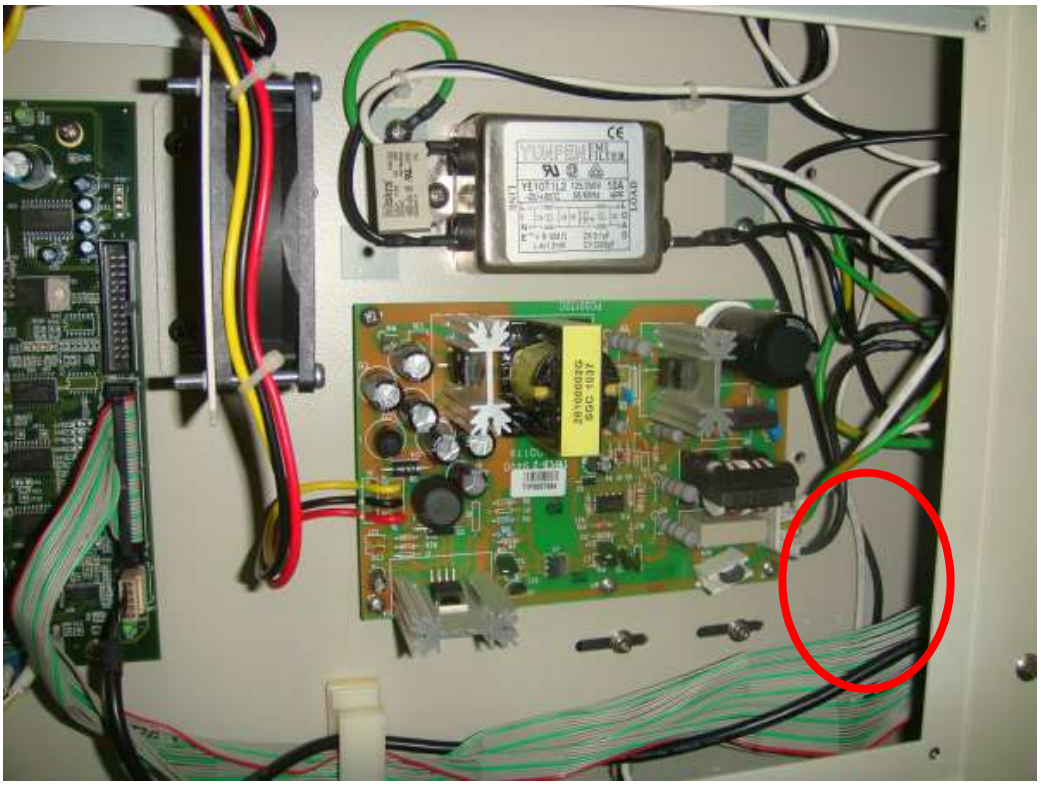
3. Loosen four screws for the fixing of Control Panel and you can replace the Control panel



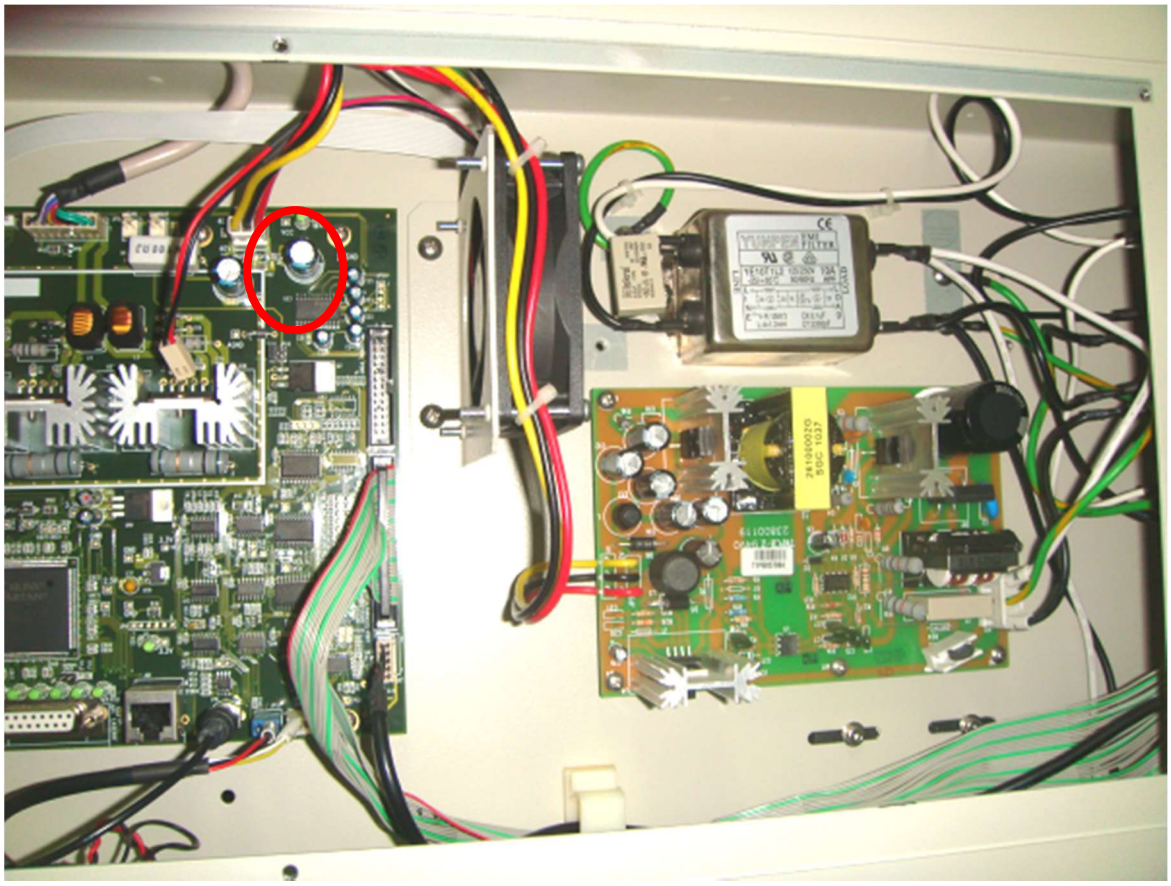
## 4.2 X252 & X380 Power board changing process

1. Dismount six screws on the side panel (see red arrows below)

2. Disconnect the AC cable (see picture below)



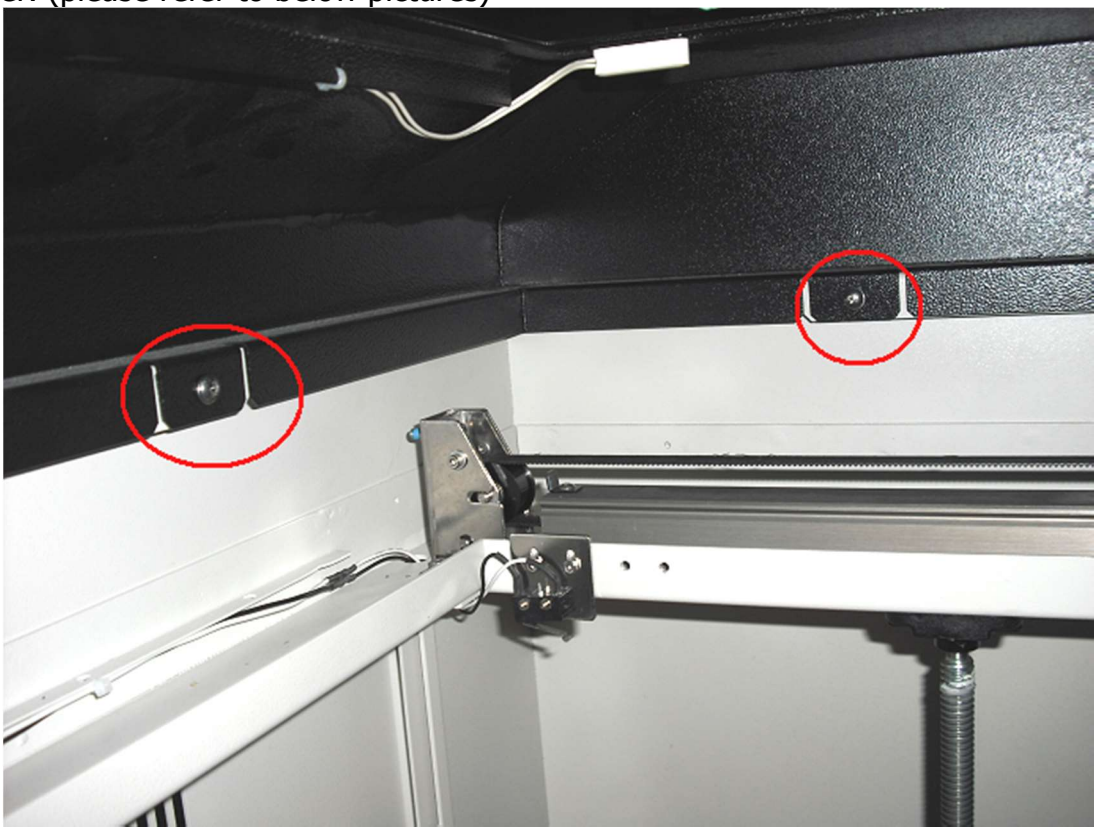
3. Disconnect the DC cable (see picture below)

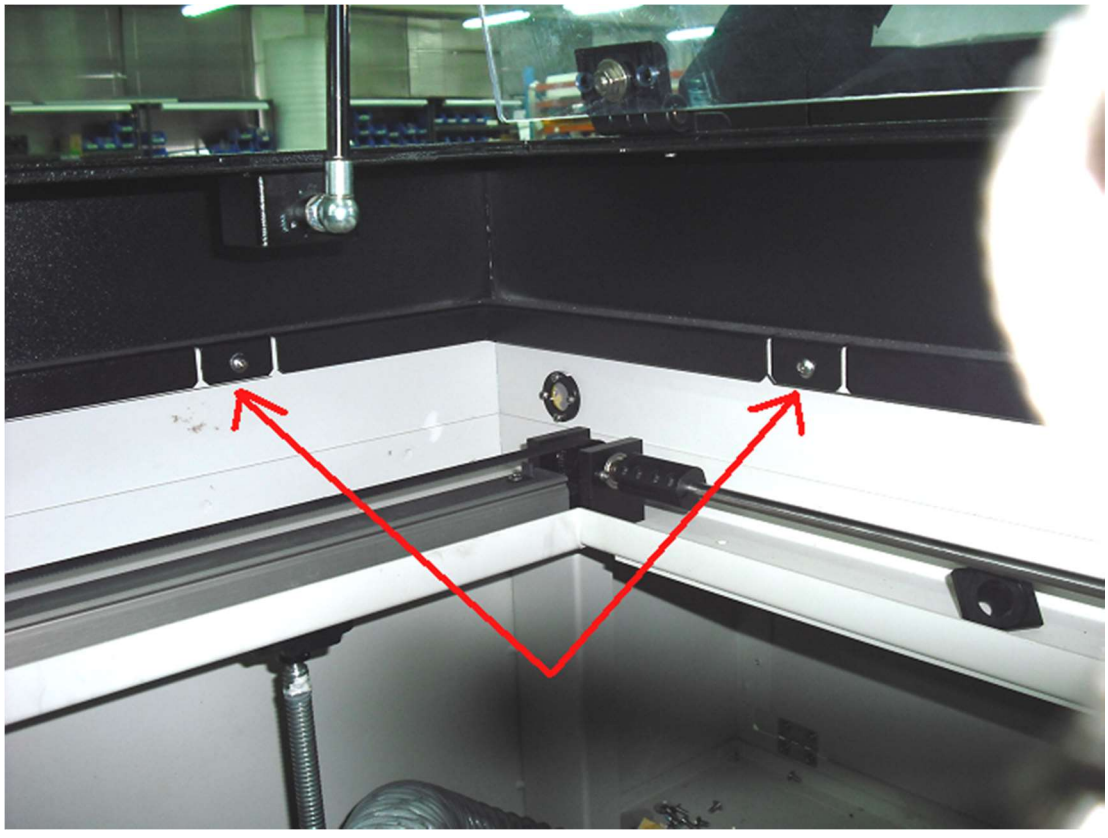


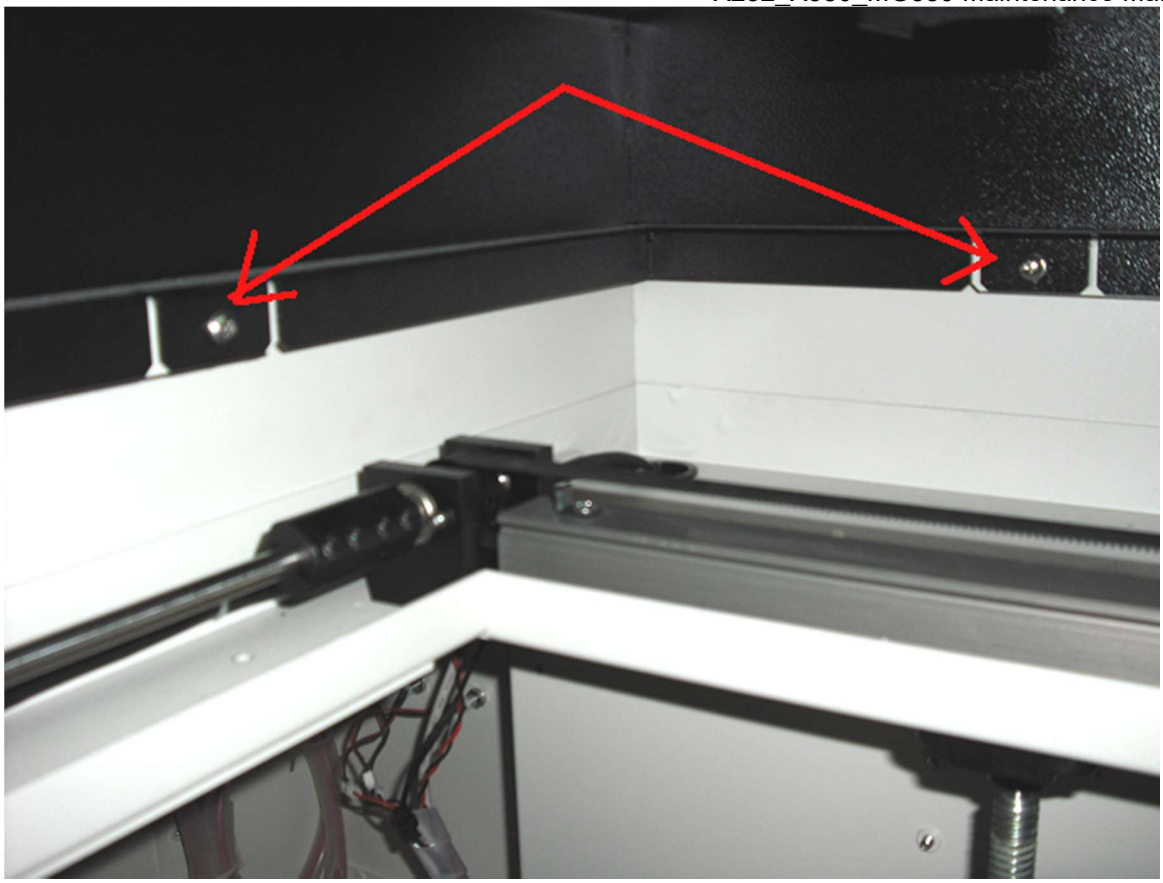
4. Loosen five screws to remove the power board (see picture below)

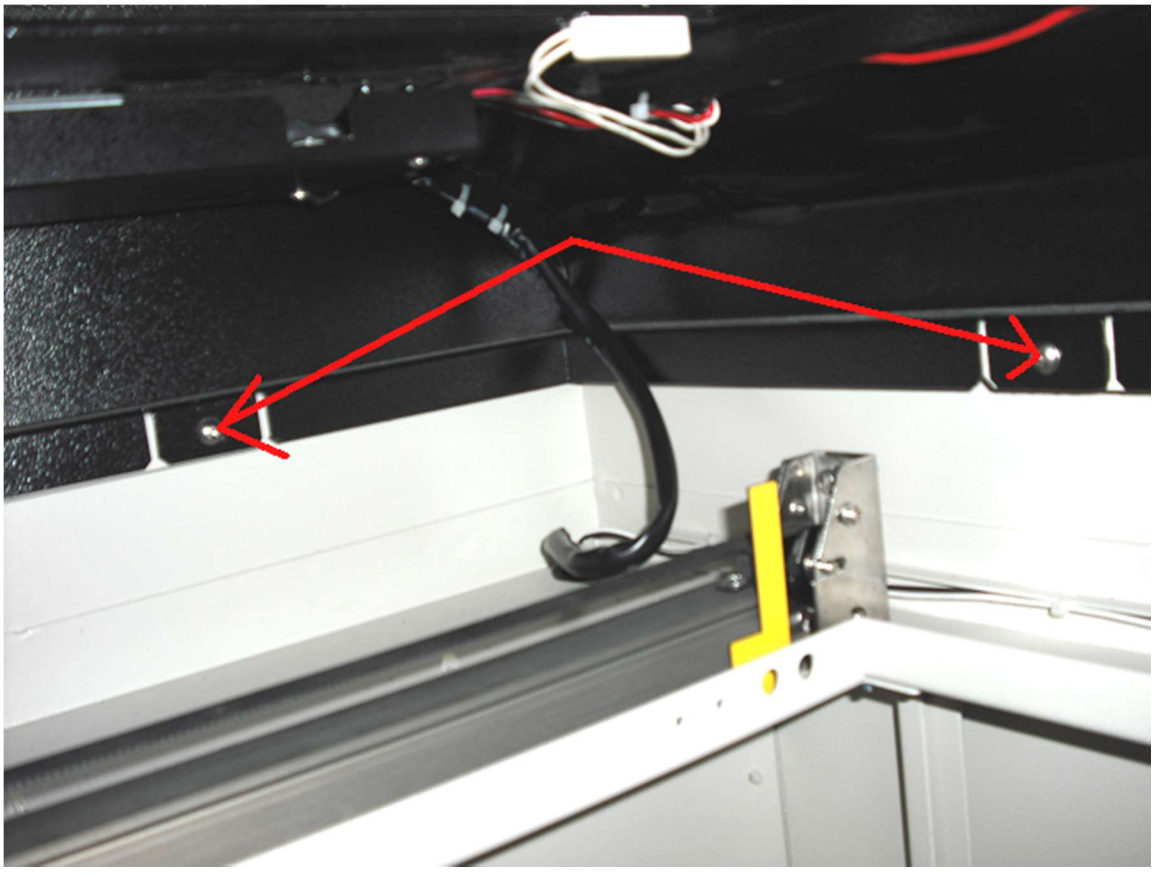
### 4.3 X252 & X380 X motor & auto focus cable changing process

1. Open the top window, and loosen eight screws inside, then you can remove the whole top cover. (please refer to below pictures)

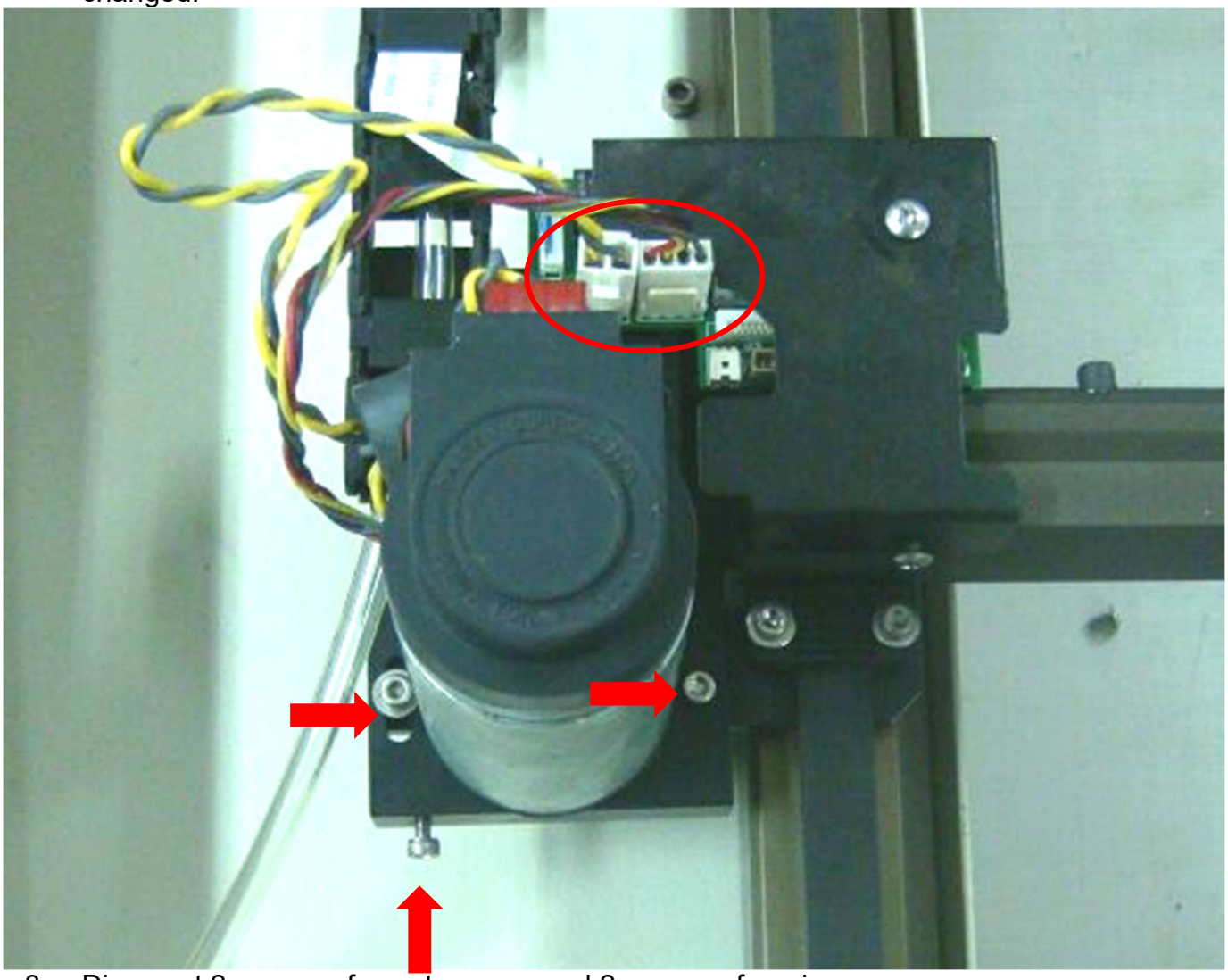




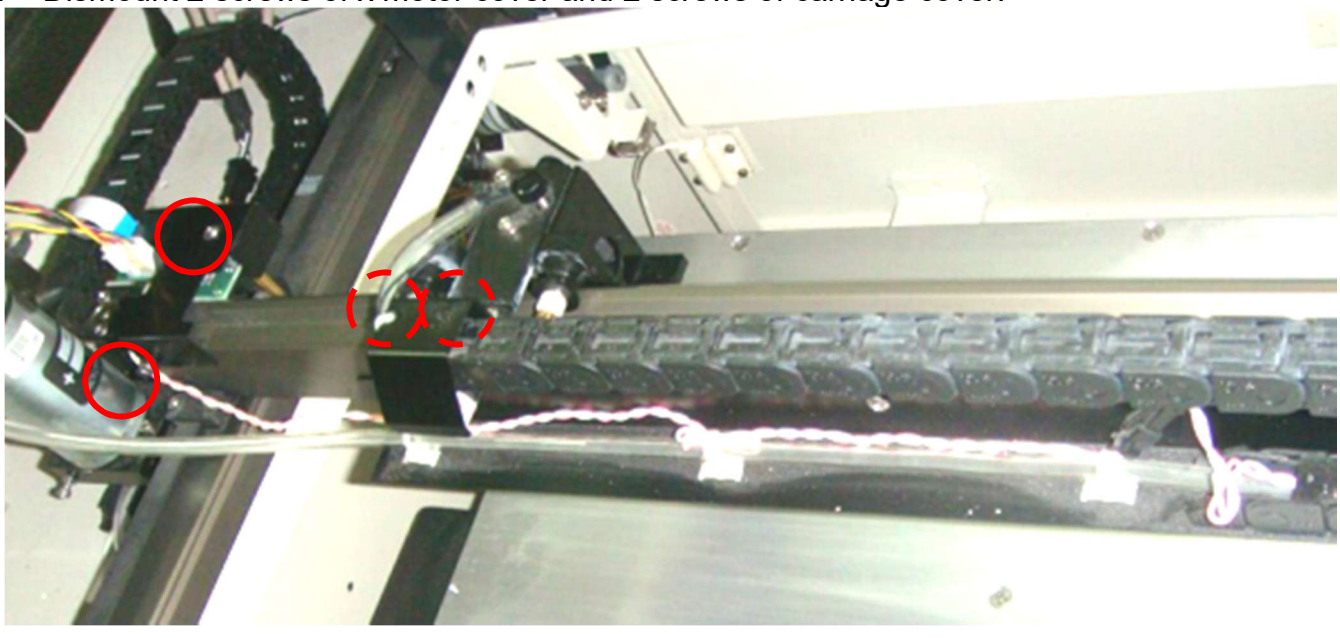




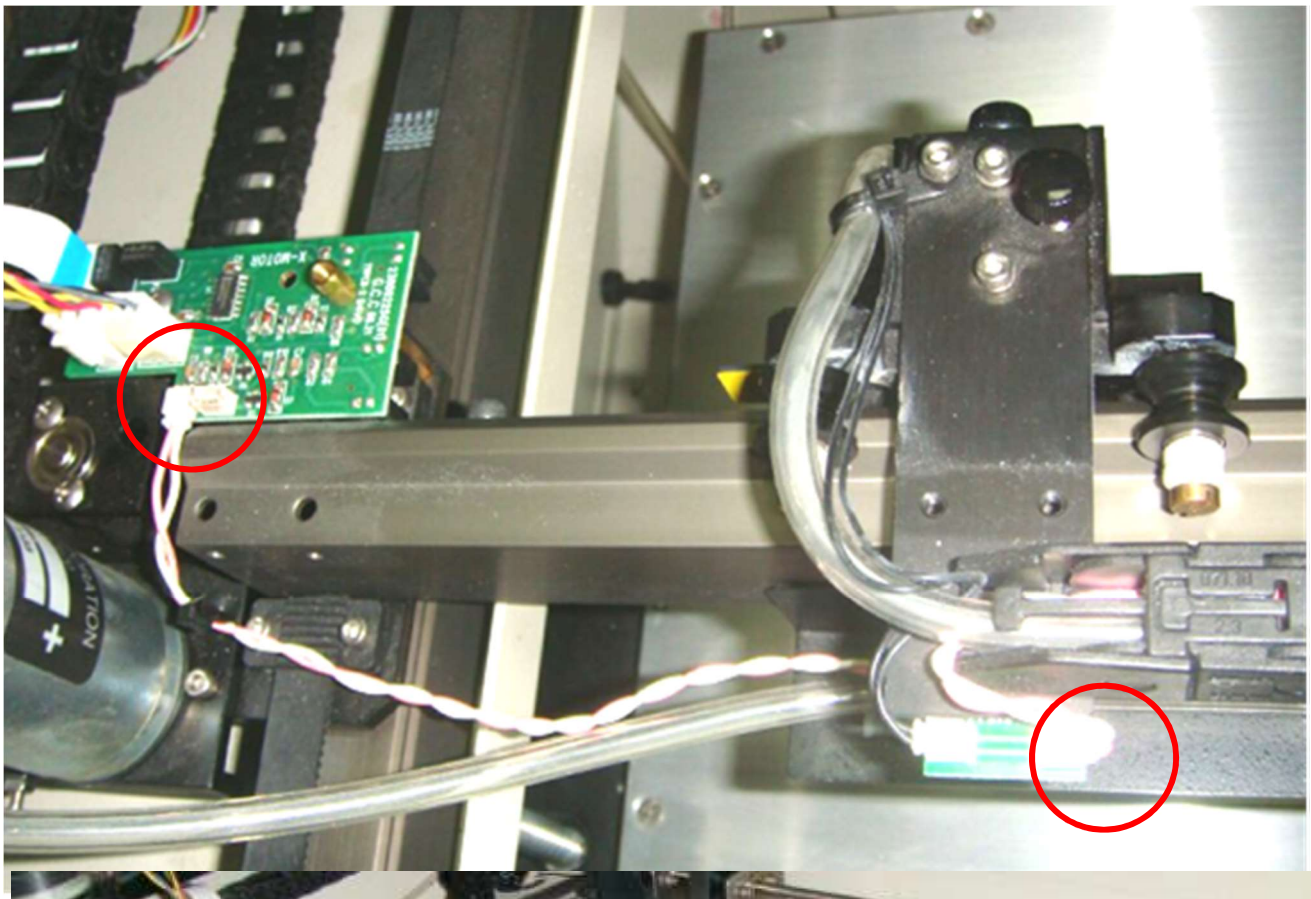
2. Dismount 3 screws of x motor (red arrow below) and the x motor cable be removed and changed.



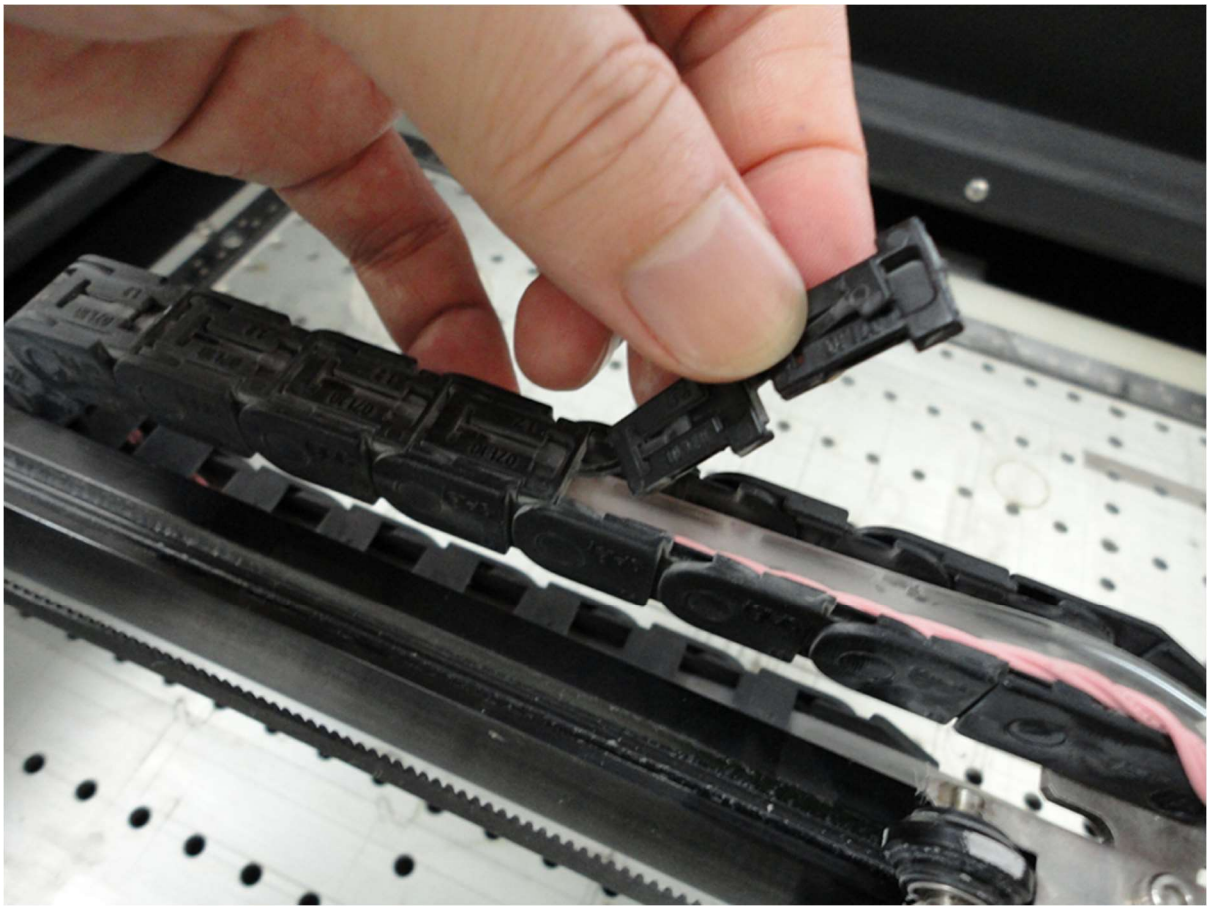
3. Dismount 2 screws of x motor cover and 2 screws of carriage cover.

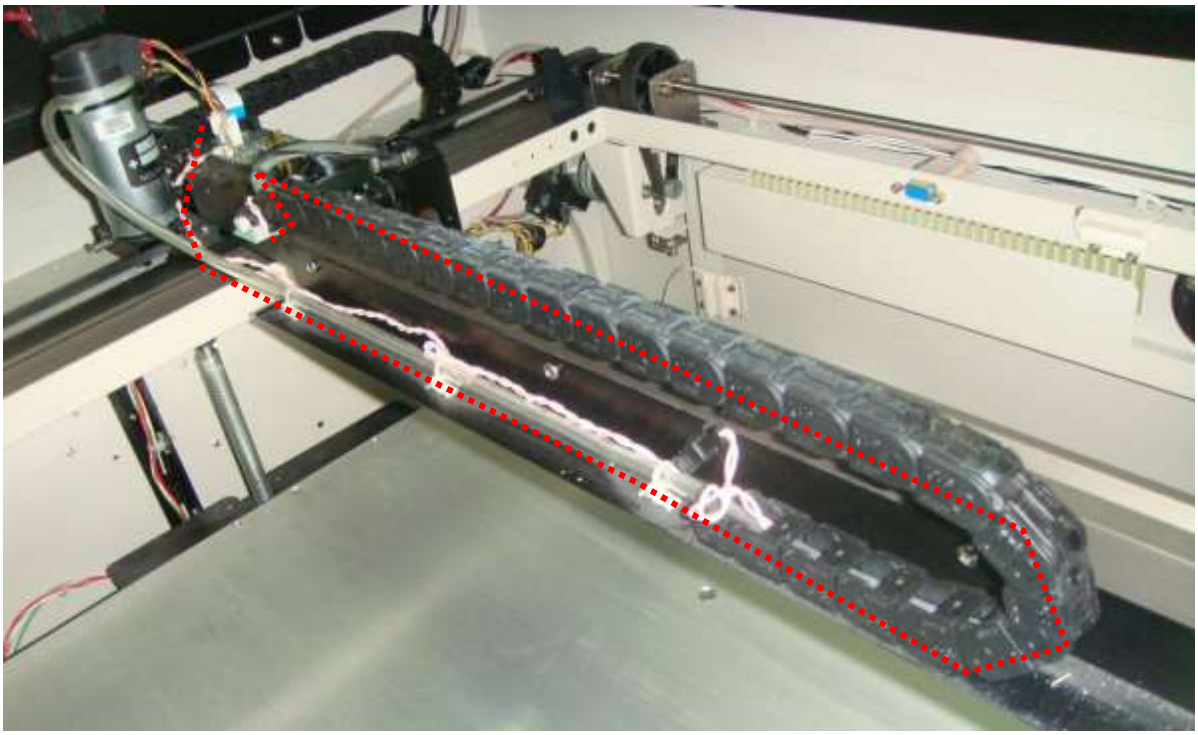


4. For changing auto focus cable, first remove the auto focus cable from x motor pcb (see red circle below).
On lens carriage side, remove the auto focus cable also (it is tight, so use tweezers will be helpful).



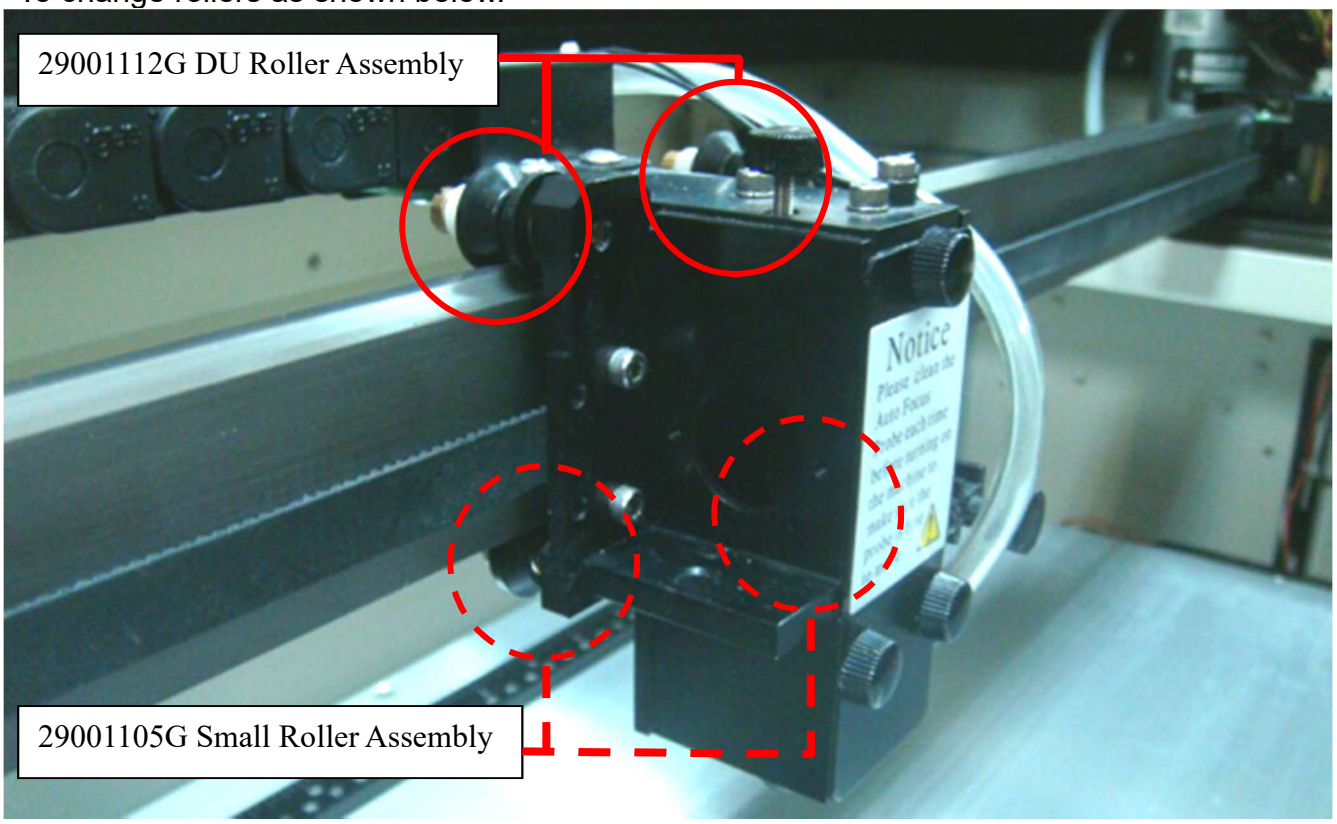
5. Pull out some joint will be easier to change auto focus cable.



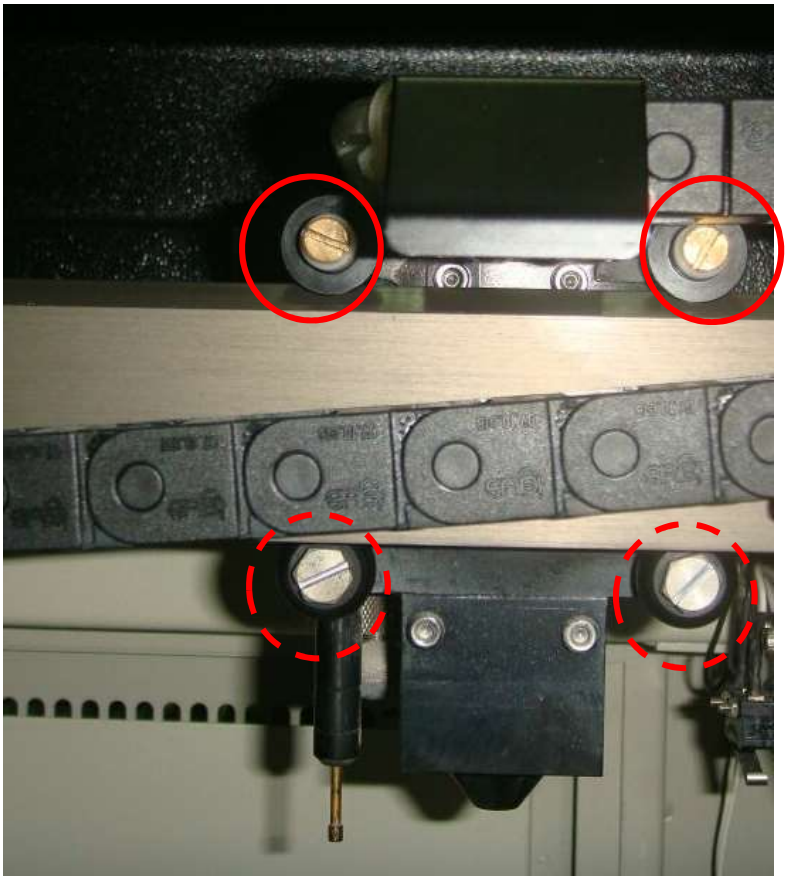


### 4.4 Changing the X rollers

1. To change rollers as shown below.




2. Unscrew the following screws to remove the small roller and DU roller.

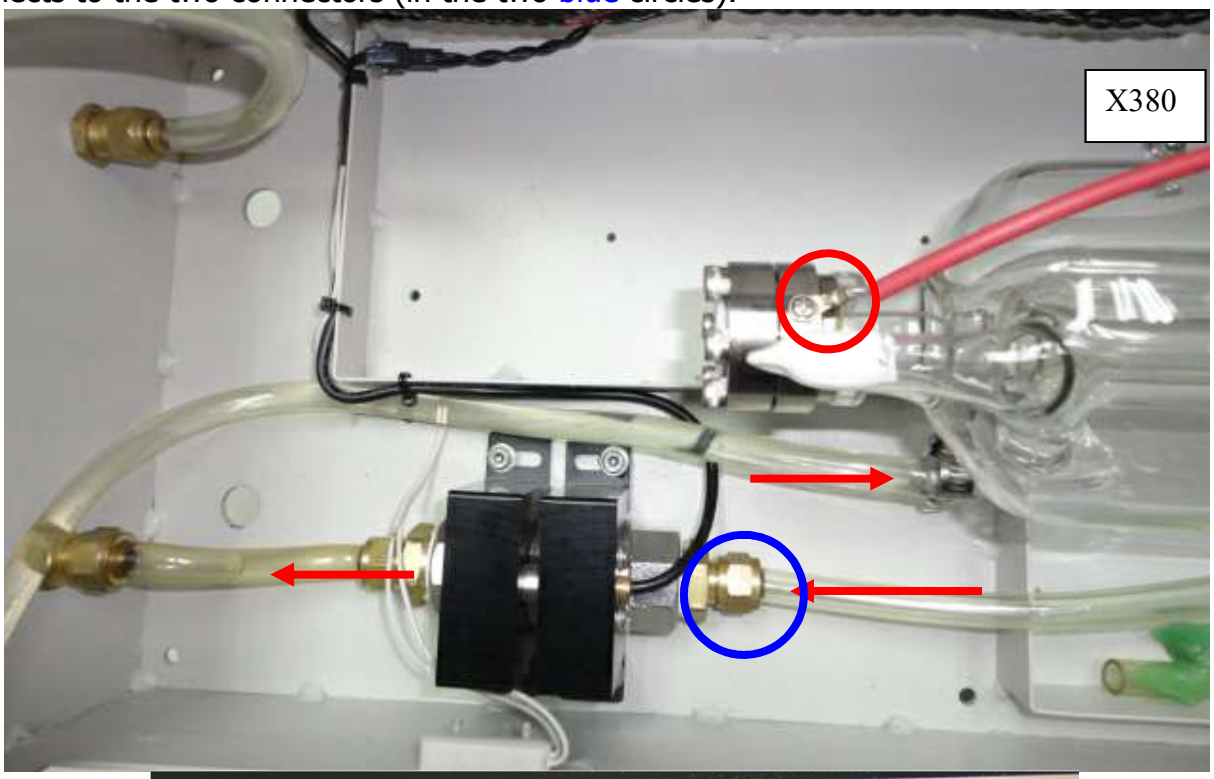


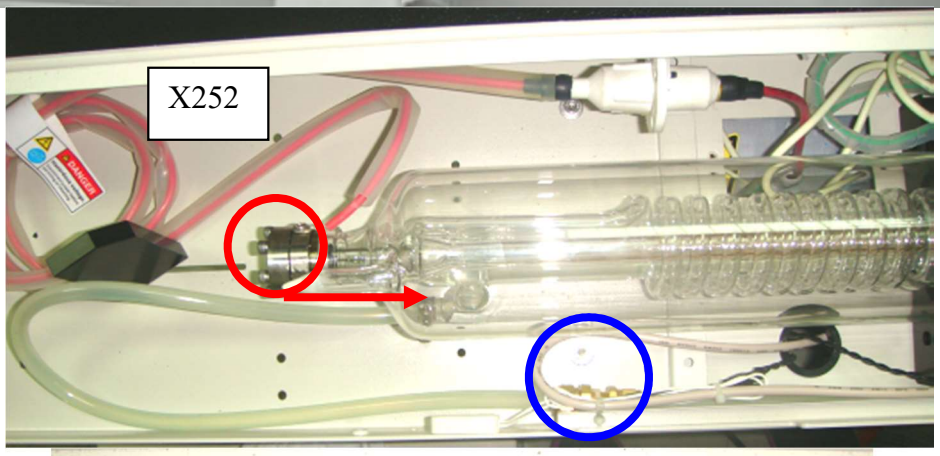
## 4.5 X252 & X380 Reci 80/100w laser tube replacement process

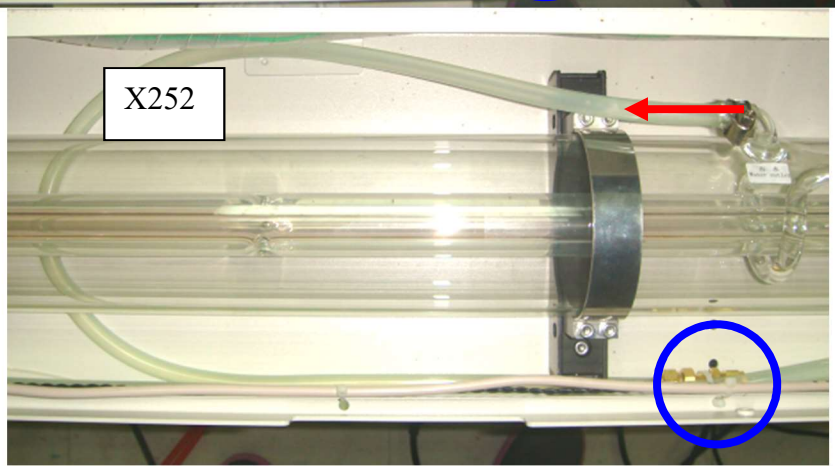
**X252 & X380 & MG380 Hybrid laser tube is glass tube and the DC power is high voltage,so the first thing is to turn off machine power before changing laser tube.**

1. Open the laser tube cover and then remove the glass cover from the back of glass tube.

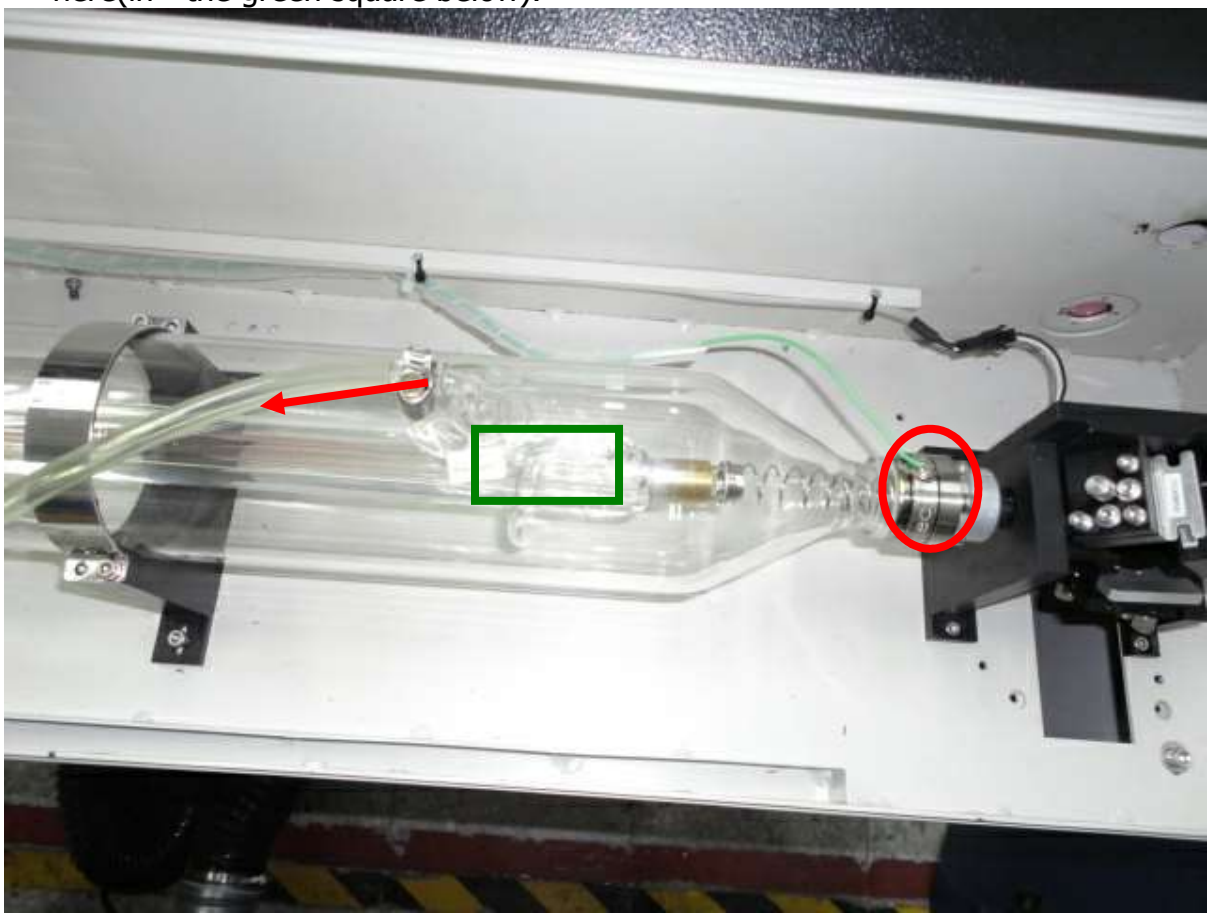
2. Remove the high voltage red positive wire (+) from the back side of laser tube (remove the screw in the red circle below). And remove the water pipe. From the picture below, the red arrow shows the direction of water flow. When GCC send new glass tube, the new glass tube will come with the new water pipe (already connected to new glass tube), so the new pipe connects to the two connectors (in the two blue circles).



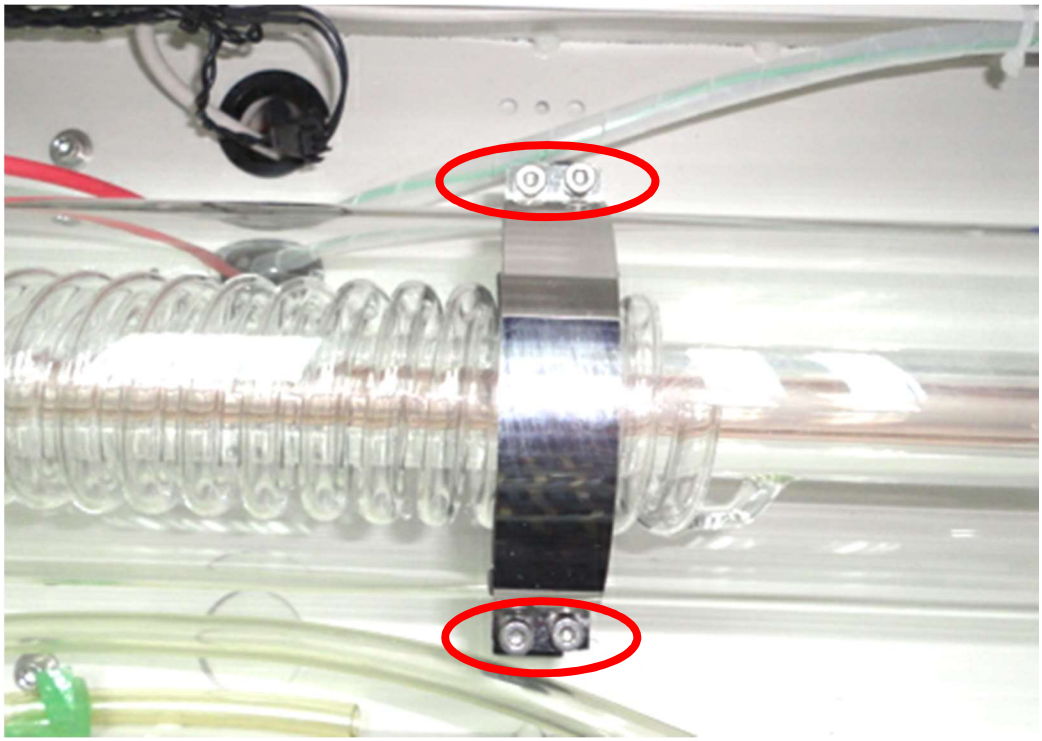



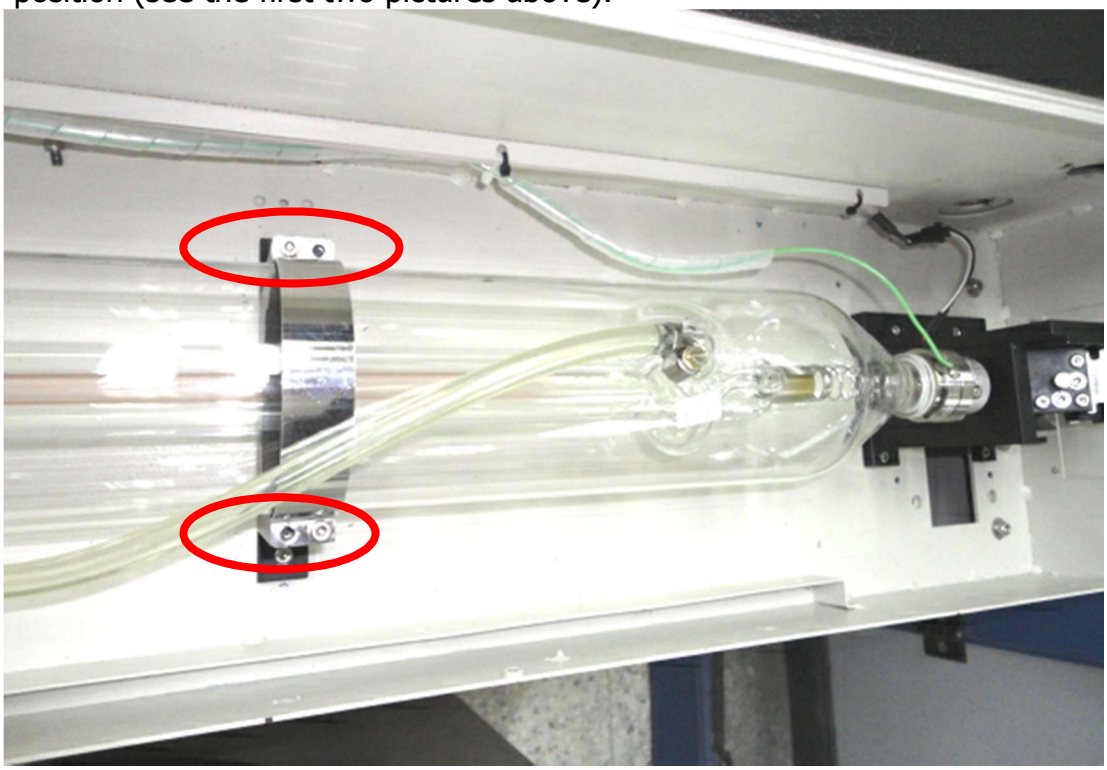
2. On the front side of laser tube, the green negative wire (-) needs to remove. The red arrow shows the water flow direction. There is a sticker shows that the water out from here(in the green square below).



3. Then remove the tube holder screws. There are 4 screws on the back and 4 screws on the front. See red circles below. The laser tube now can be removed and change a new tube back.



5. *** Then tighten all the tube holder screws and then connect the red positive wire (+) and green negative wire(-) to its position. Then connect the water pipe to its correct water flow position (see the first two pictures above).



# Chapter 5 Laser System

5.1 How to measure the power output of a laser tube?

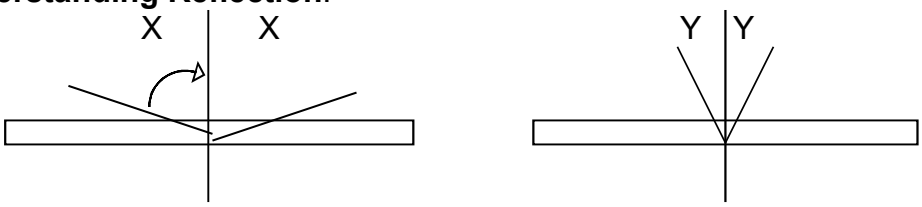
In order to measure the power output of a laser tube, we need to use a power meter (12170001G) that will measure the heat generated and convert it to a power reading. The best place to measure the laser output power is at the immediate output of the laser tube (before to mirror 1).

5.2 How does the laser beam travel to the working area ?

The laser beam generated by the laser source is reflected and guided by 4 optical lenses on to the working area. Therefore the proper adjustment and maintenance of them are crucial.

5.2.1 Optical Alignment

**Understanding Reflection**.



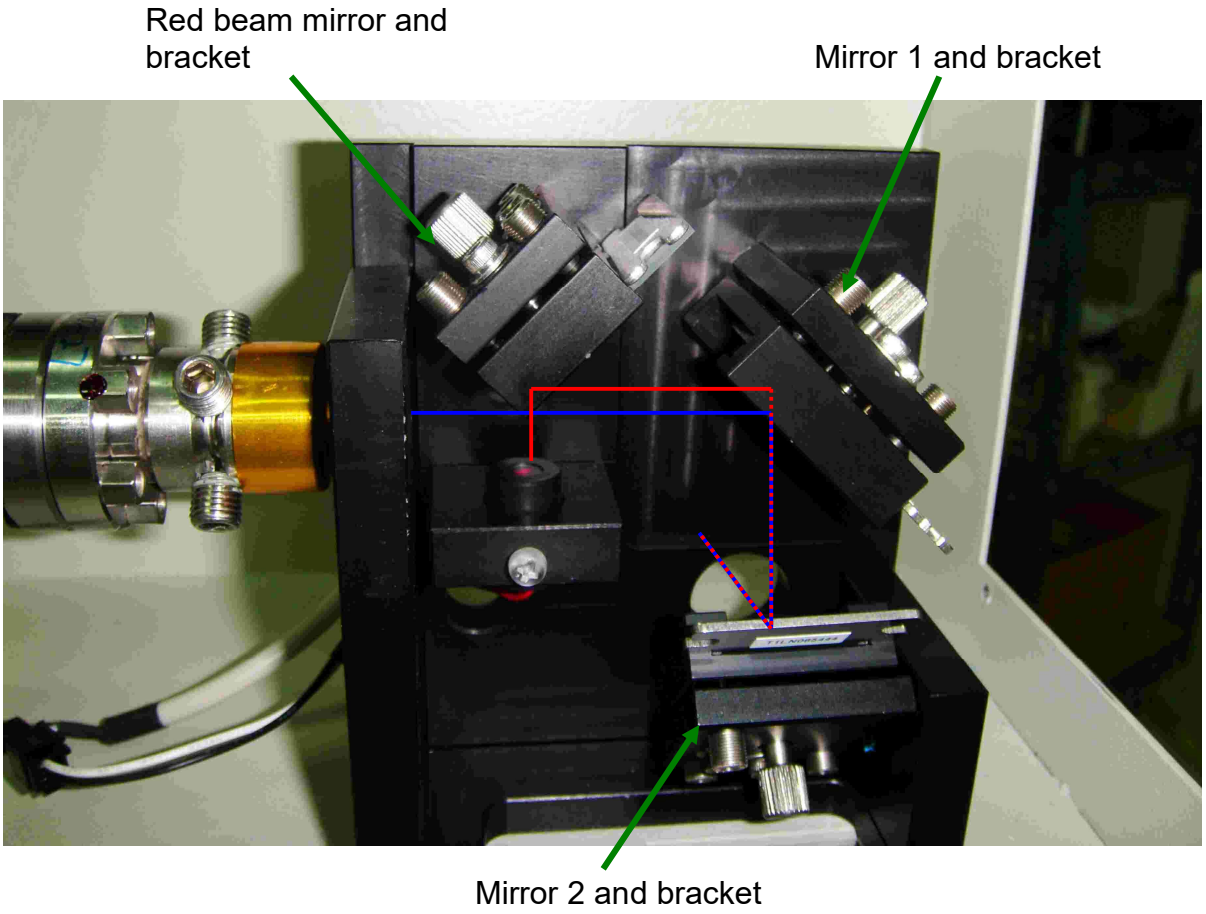

Light enters at an angle and leaves at an angle.
If light enters at an angle X, it will leave at an angle X.
If light enters at an angle Y, it will leave at an angle Y.

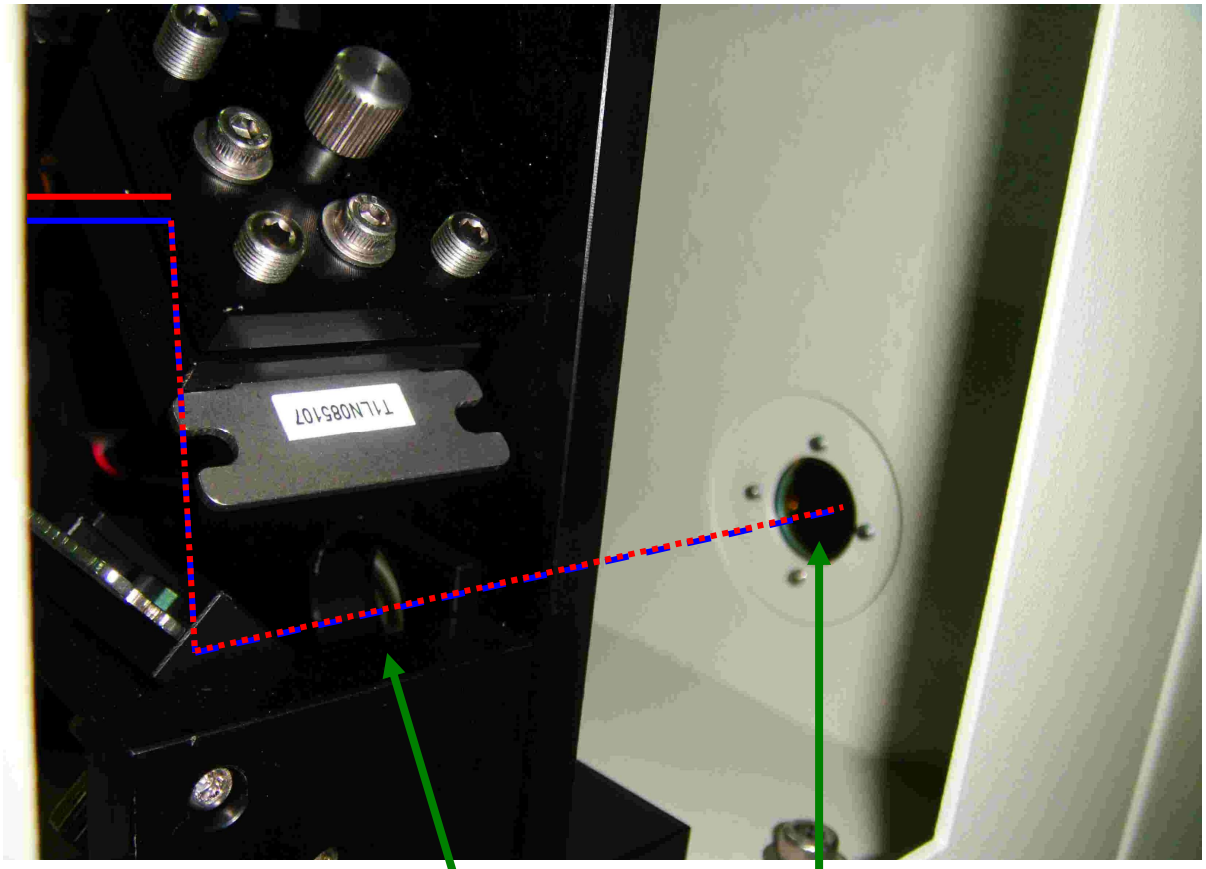
5.2.2 Basic Beam Alignment

The laser beam is guided to the top of the working area by using 4 reflective mirrors. Therefore, these mirror adjustments are crucial to the proper functioning of the machine. If the laser beam is not aligned correctly, the beam path will be shifted or tilted and both rastering and vectoring quality will be affected.

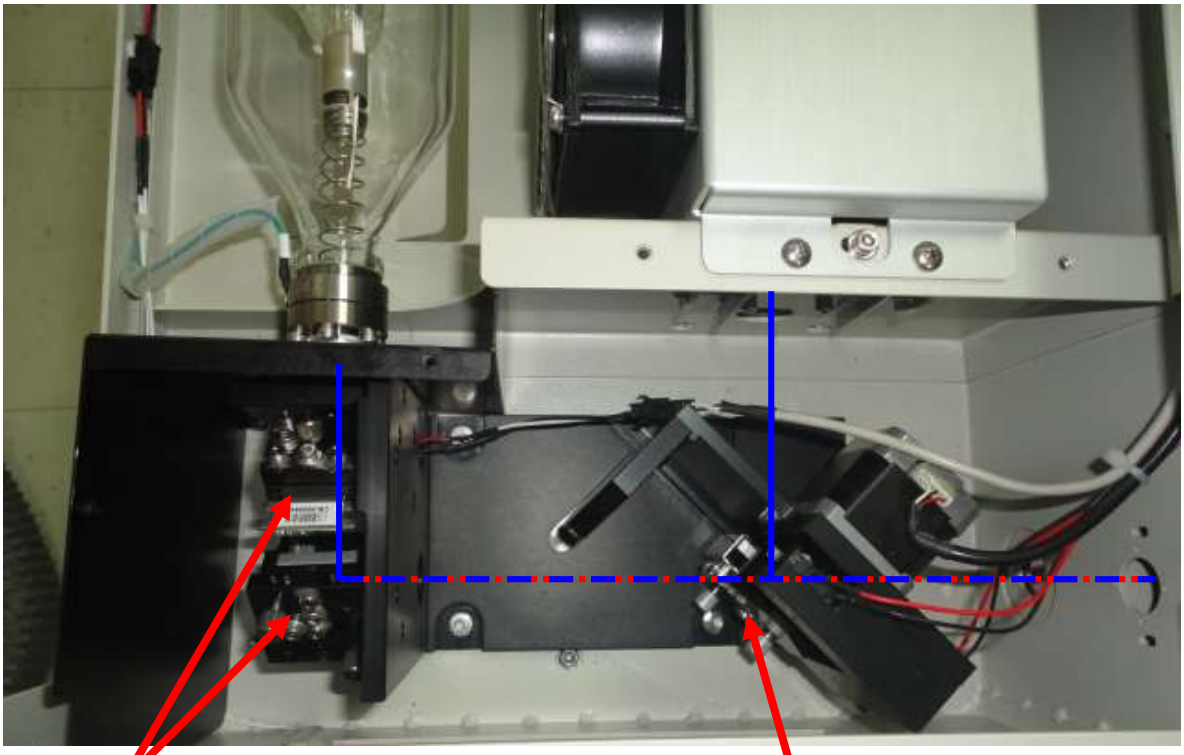
Step 1: Unscrew cover of laser tube. Turn on the machine and enter the hidden diagnostic menu by holding down the Autofocus keys while turning on the machine. Select test laser source. Set laser power to about 5%. Remove the dust cover of Mirror 1. Since the red beam mirror, mirror 1 and mirror 2 are all close to each other, the red beam and laser tube will be close together. So just put a piece of masking tape on mirror 3 cover hole and make sure the laser beam and red beam pass through the hole of mirror 1 bracket and the hole of machine chassis.

For X380 and X252 the mirror 1 and red beam mirror location are below:



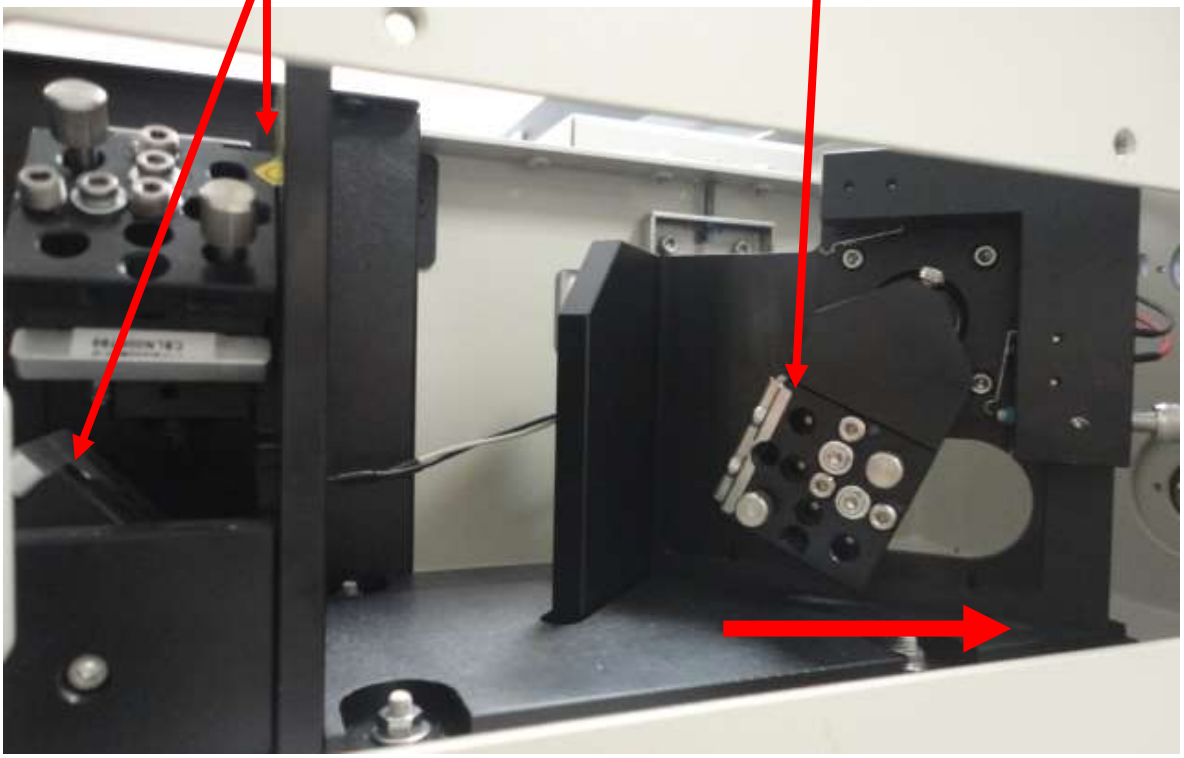



For MG380 Hybrid, the mirror 1 and red beam mirror location are below:



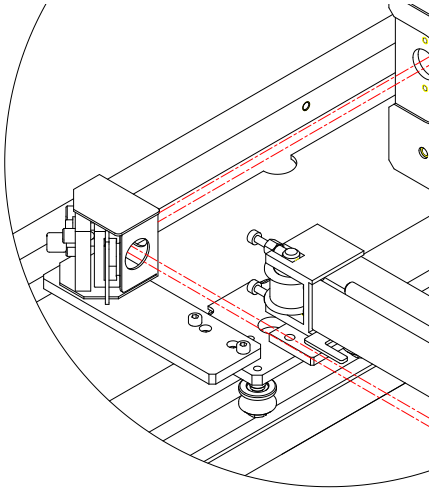
Glass tube mirror 1 and red beam mirror

Synrad 25w tube mirror 1

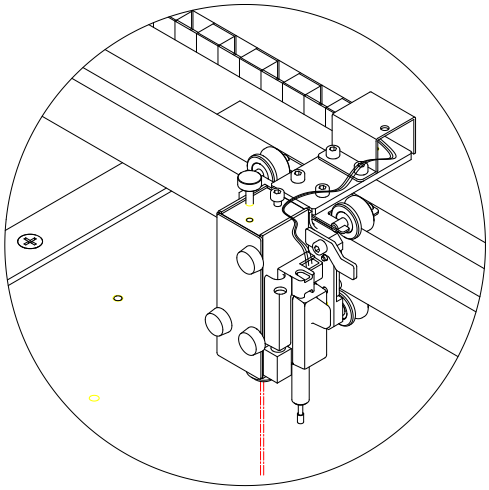


For alignment, Synrad 25w metal tube mirror 1 need to move to the end of right side and then tune

Step 2: Place a masking tape on the opening before Mirror 3. Move the rail along the Y-axis so that Mirror 3 is close to Mirror 2. Fire the laser and see if the laser beam goes through the center of the circle. Then move the rail so that Mirror 3 is to the far end of Mirror 2. Fire the laser and see if it leaves a mark at the same location when it was close to Mirror 2. Adjust Mirror 2 repeatedly so that the burnt mark is at the center and on top of one another when Mirror 3 is both close and far from Mirror 2.

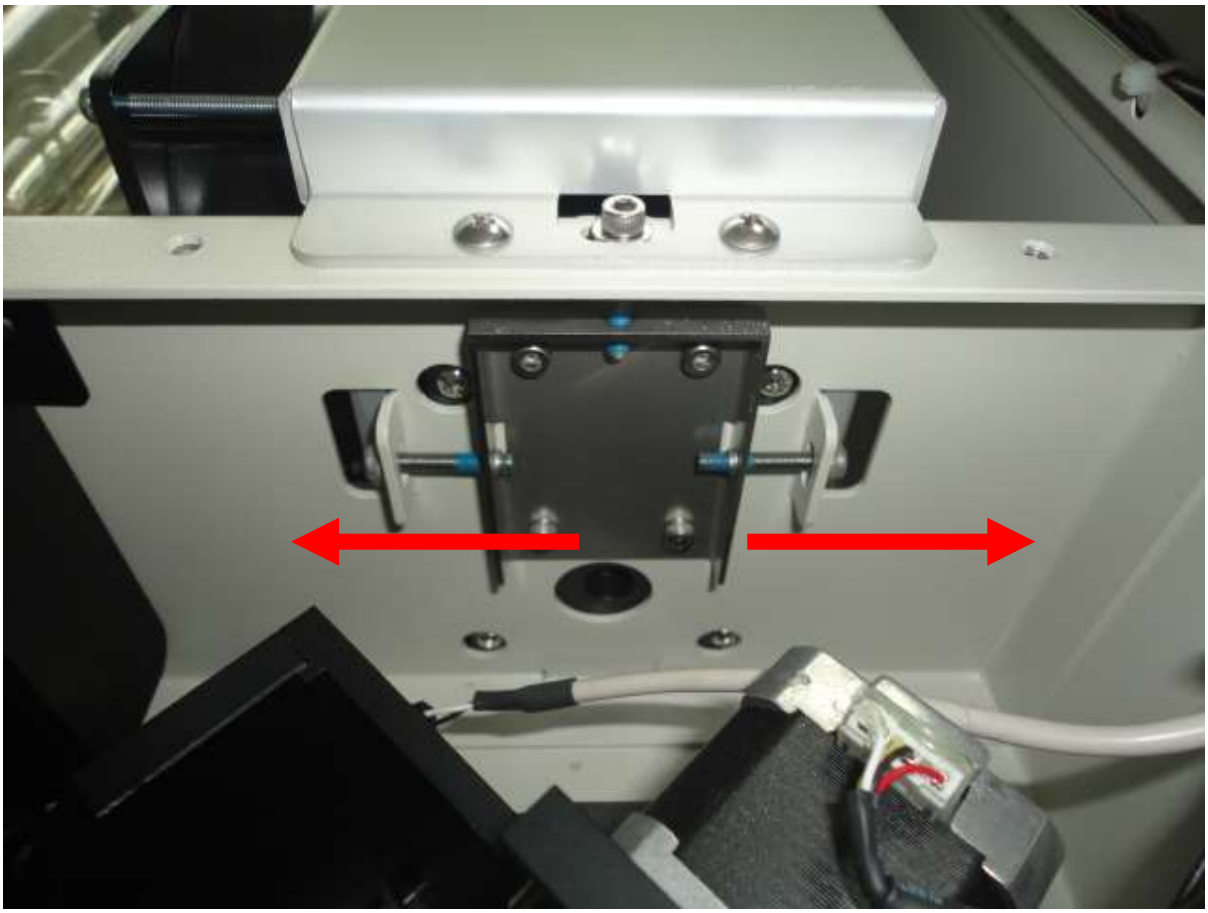


Step 3: Place a masking tape on the opening before Mirror 4. Move the pen carriage to the upper left corner of the working area. Fire the laser and adjust Mirror 3 so the laser beam passes through the center of the opening. Move the pen carriage to the upper right end of the working table. Fire the laser and adjust Mirror 3 so the laser beam passes through the center of the opening. The laser should pass through the same spot when the pen carriage is positioned at upper left and upper right. Do the same for the bottom left corner and bottom right corner.
Place a masking tape over the nozzle opening. Position the pen carriage at one of the 4 corners of the working area. Fire the laser and adjust Mirror 1 so the laser passes through the center of the nozzle opening. Repeat for all 4 corners of the working area. After adjusting Mirror 1, you may have to re-adjust Mirror 2 and Mirror 3 as well.
If the laser beam passes through the center of the nozzle opening at all 4 corners, then the laser beam should have been aligned properly. Cut four 20x20 mm squares at the four corners of the working area to double check that the edges of the square are not slanted



Step 4: When glass tube and Synrad 25w metal tube beam alignment is not match (for example: top left corner are same, but down right corner has gap), then can tune Synrad laser tube bracket screws to fix it.

Normally, the top and down will be OK, the only need to tune is left and right. To move the laser bracket to right side, first loosen left screw and then tighten right screw to PULL laser tube bracket to right side.
To move the laser bracket to left side, first loosen right screw and then tighten left screw to PULL laser tube bracket to left side.

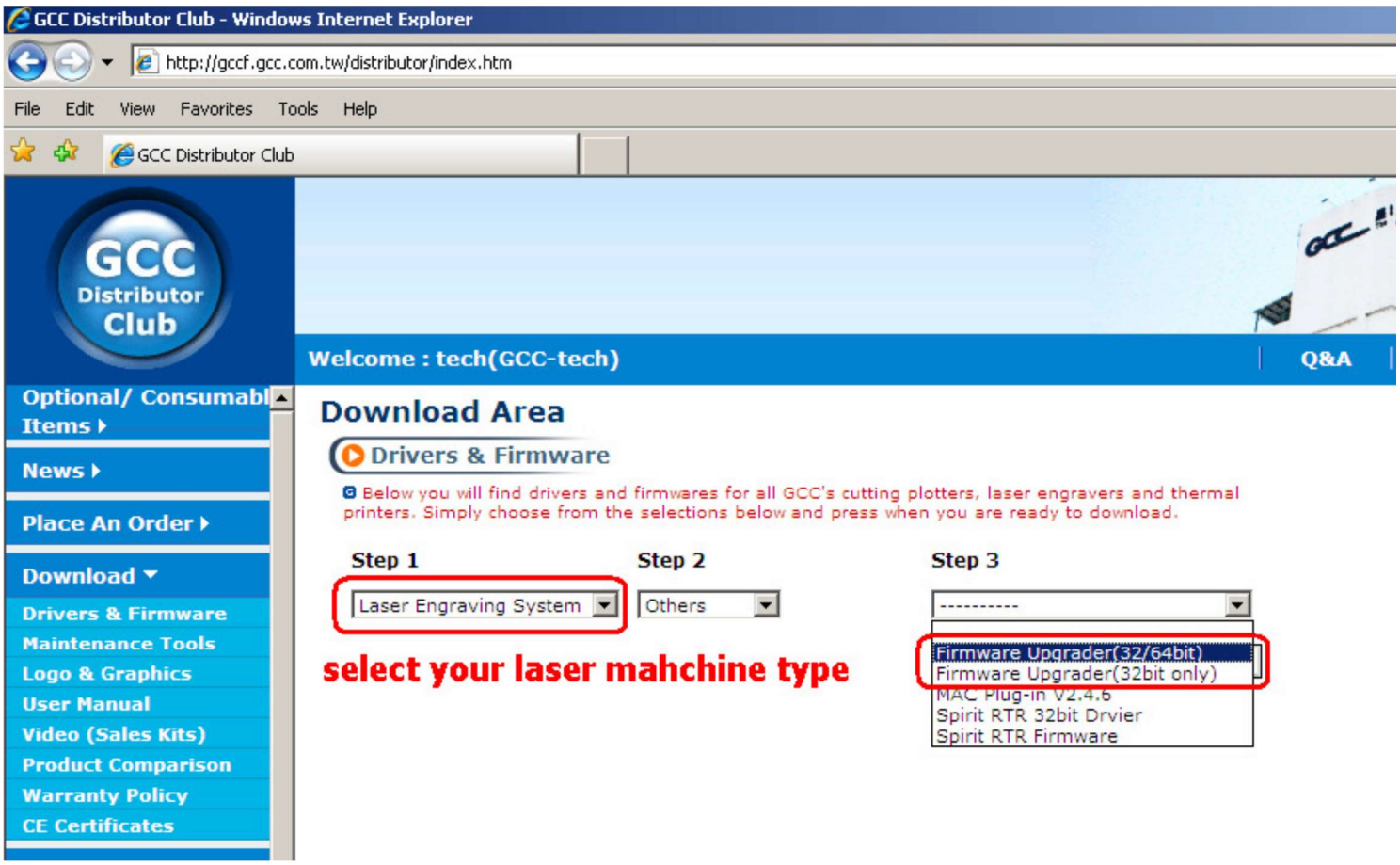


# Chapter 6 Software

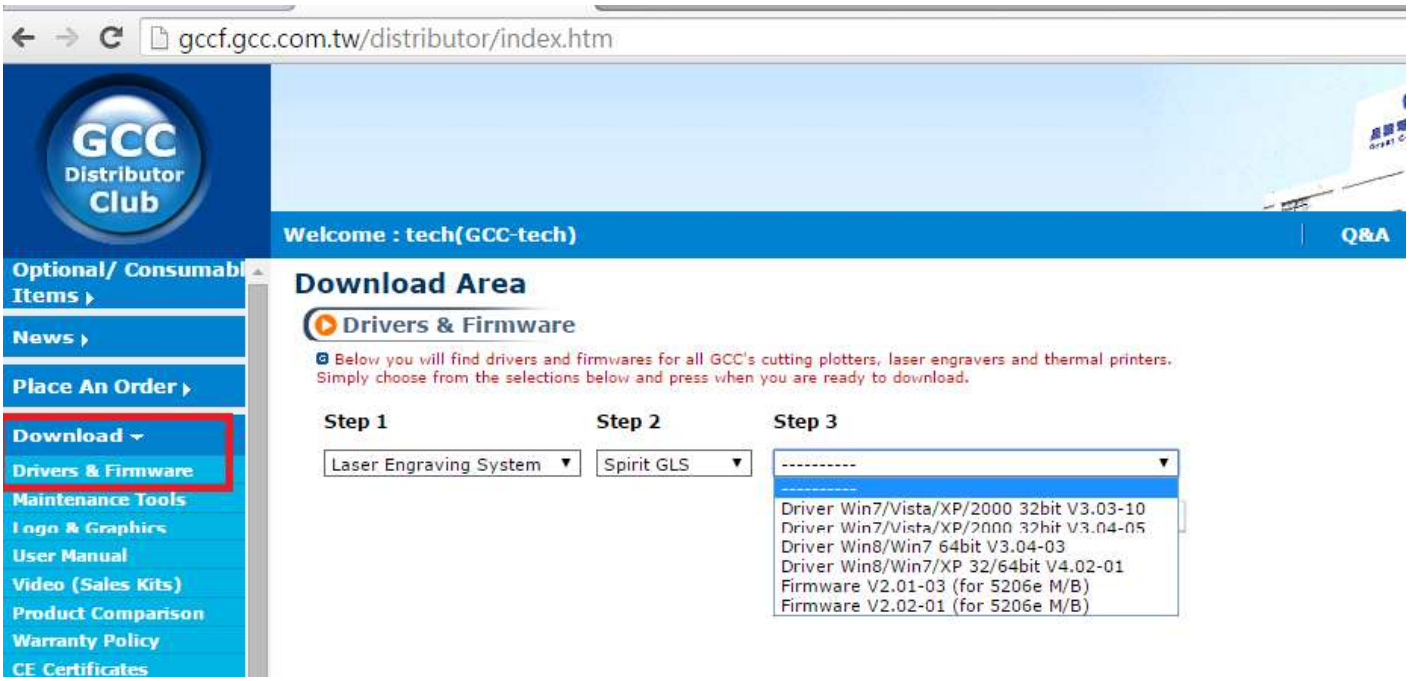
## 6.1 How to upgrade firmware

GCC machines require a firmware uploader program to upload the firmware of machine through USB/Parallel port.

### 6.1.1 The Firmware Uploader can be downloaded from GCC Distributor Club website : http://gccf.gcc.com.tw/distributor/login.aspx

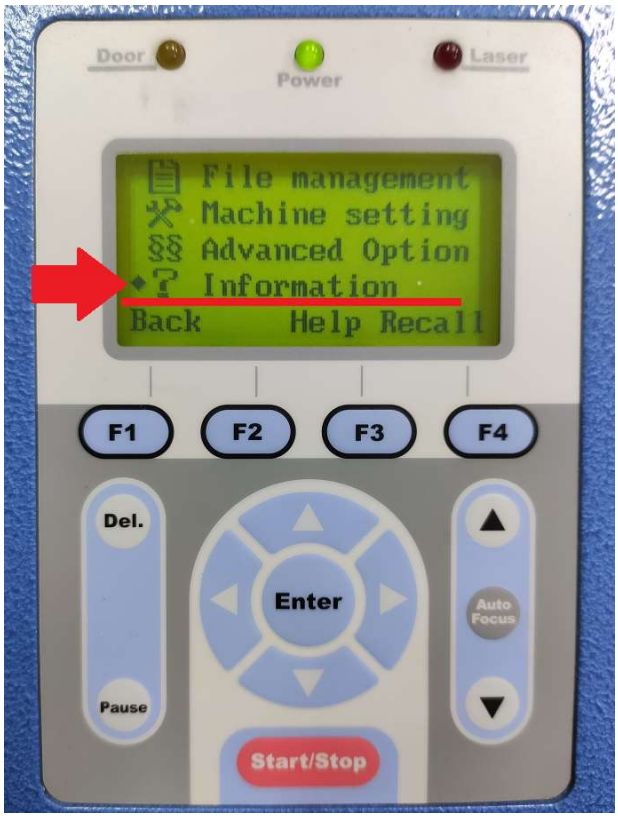


6.1.2. Firmware can be downloaded from GCC Distributor Club
http://gccf.gcc.com.tw/distributor/login.aspx

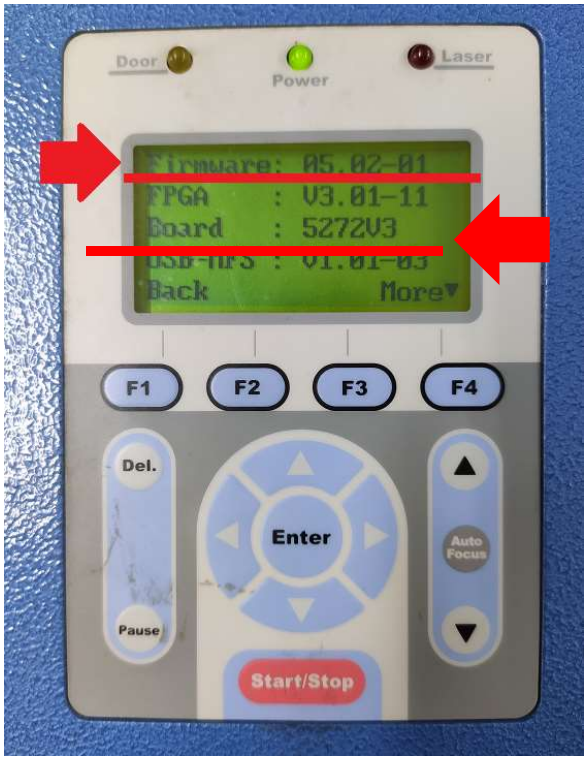



6.1.3. Check the version of firmware installed on the machine and the mainboard type first.
a. Press F4 to enter “Func” page

b. Select “Information”




c. Press “Down” arrow key to enter the information page, the firmware version and mainboard type will show.

### 6.1.4 **For older machines:**

For machines with 5272V1 mainboard equipped which have older firmware installed(*1) , and all machines with 5206E mainboard equipped, please follow below step 1 ~ step 5 to finish the firmware upgrade.

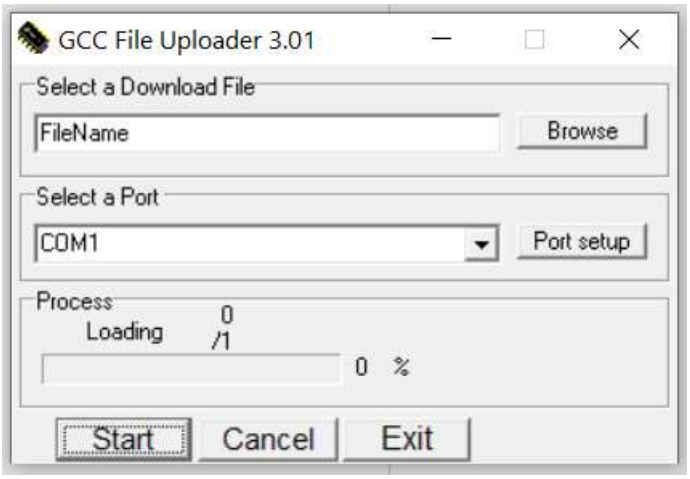
*1 Refer to this firmware version dividing line chart to judge if the firmware in your machine is an older version.

| Model | Firmware version dividing line |
|---|---|
| Spirit | 3.03-09 |
| Spirit LS | 3.03-04 |
| Spirit GLS | 3.03-04 |
| X252RX | 1.02-08 |
| X380RX | 1.03-01 |
| S290LS | 3.02-05 |
| VenusII | 1.03-06 |
| C180II | 1.03-07 |
| Mercury III | 3.03-02 |
| MG380Hybrid | 1.03-06 |

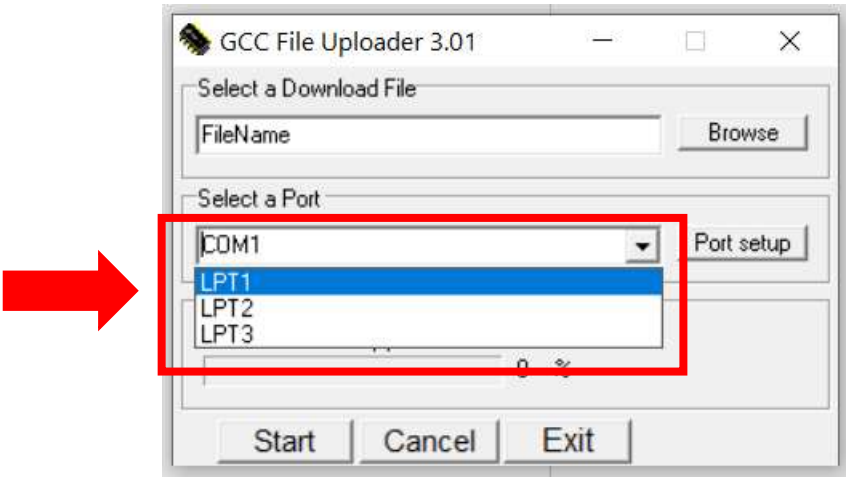
**Step1.** Refer to below chart, turn on the machine with pressing and holding the corresponding button, the machine will be boot in transfer mode using the communication port according to the button you press when turning on the machine.

| Model | Parallel port | Common USB | GCC USB |
|---|---|---|---|
| LaserPro,Mercury I, Mercury II, Venus series | Resume key + Power ON | N/A | N/A |
| Explorer, ExplorerII, Spirit, Spirit GE, Spirit_GX, Spirit LS, Spirit GLS, GAIA, GAIAII, MercuryIII, S290, S290LS, X252RX, X380RX/LS, X500RX/LS, X500III, C180II, FMC280, T500 | F2 key + power on | F1 key + power on | F3 key + power on |
| C180 | A/F key + power on | UP key + power on | Down key + power on |

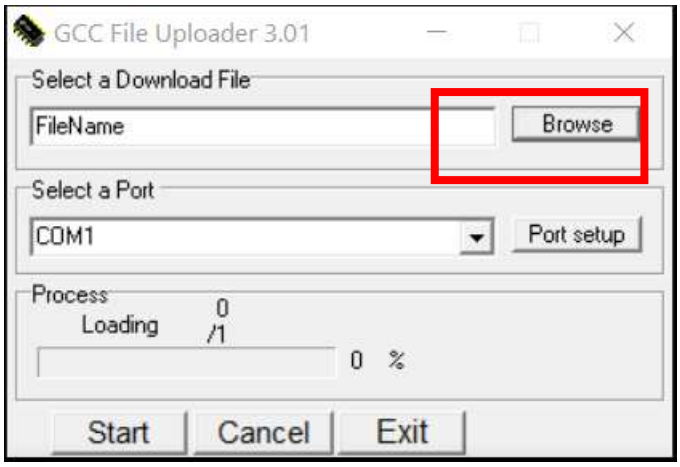
**Step 2.** Connect the USB / LPT cable between PC and Laser machine then run firmware uploader



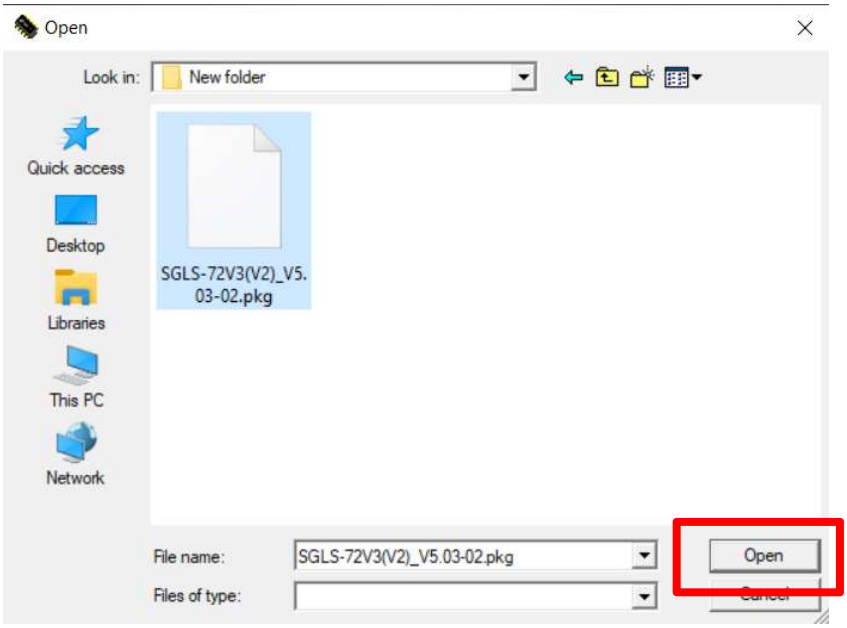

**Step 3.** Pull down the dropdown list of “Select a port”, select the port you want to use to upload the firmware (according to what you did on Step 1)

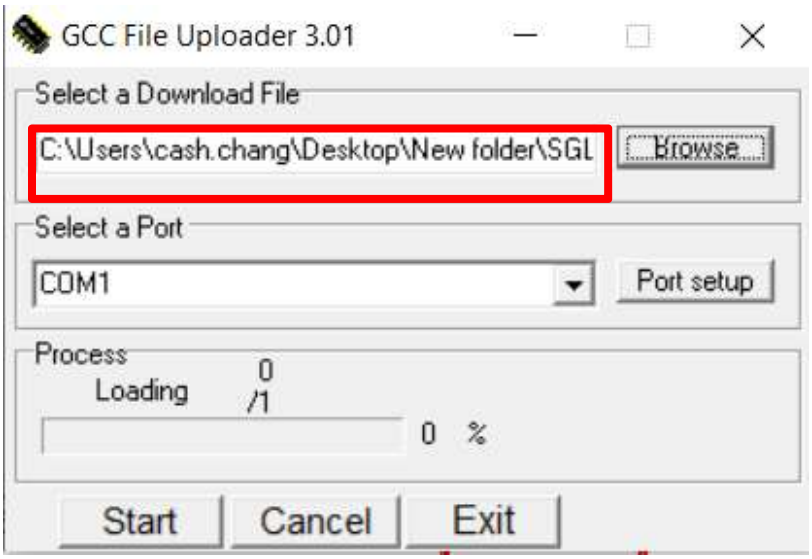



**Step 4**. Press the button “Browse” and select the firmware file you want to upload.



Press “Open” to select the firmware file




**Firmware file is selected.**

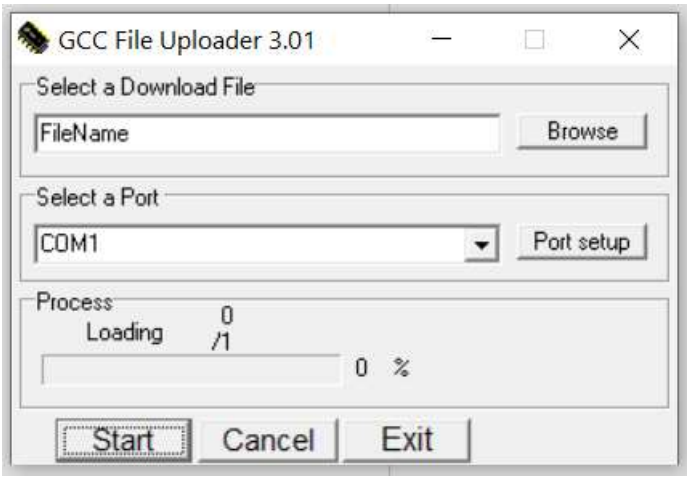
**Step 5.** Press the “Start” button, the upgrading process will start, wait until the process is done, the machine will reboot automatically.

6.1.5 **For new version machines** (only USB is supported)

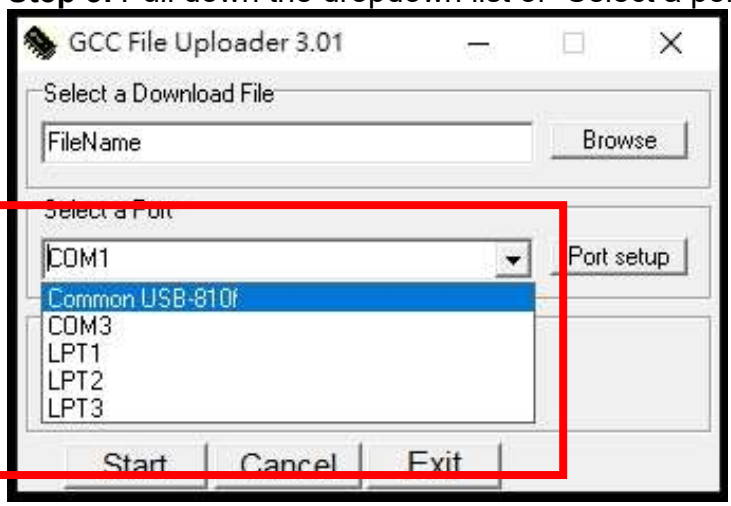
For machines with 5272V1 mainboard equipped which have new firmware installed (refer to the dividing line chart at 6.1.4) , and machines with 5272V2、5272V3 mainboard equipped, please follow below step 1 ~ step 5 to finish the firmware upgrade.

**Step .1** Press and hold “F1” and turn on the machine, machine will be boot in “USB Print support” mode.

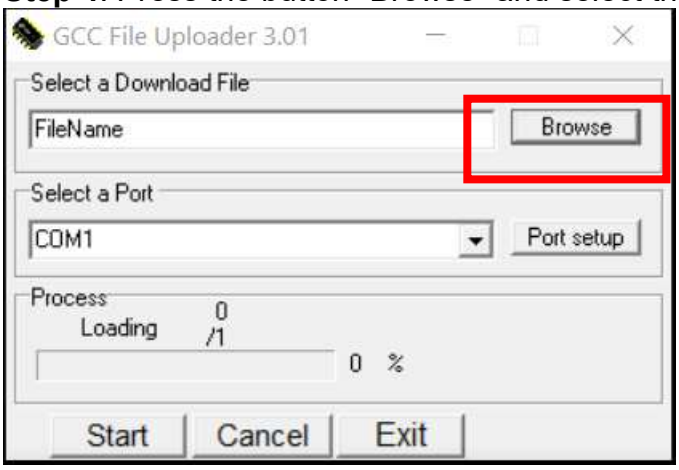

**Step .2** Connect the USB cable between PC and Laser machine then run firmware uploader



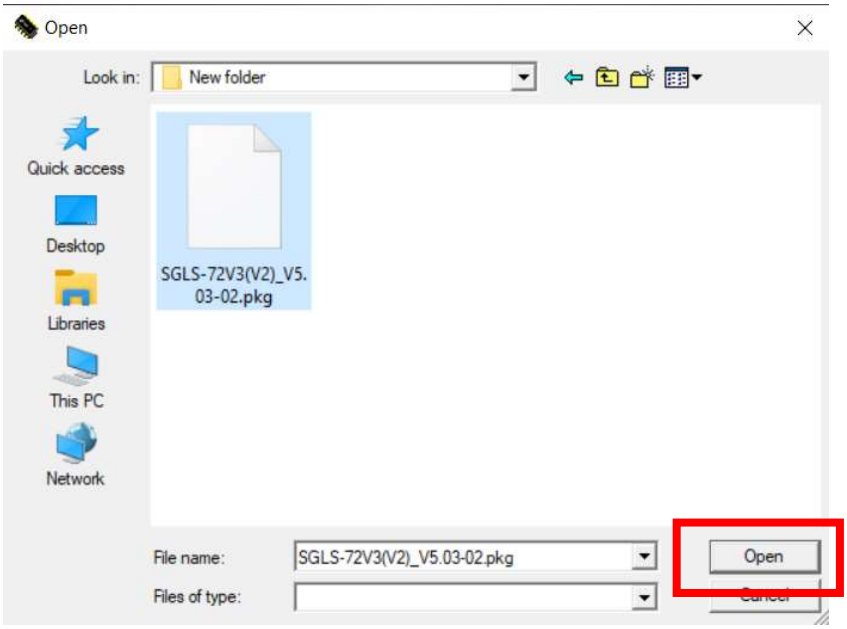
**Step 3.** Pull down the dropdown list of “Select a port”, select “Common USB-XXXX”

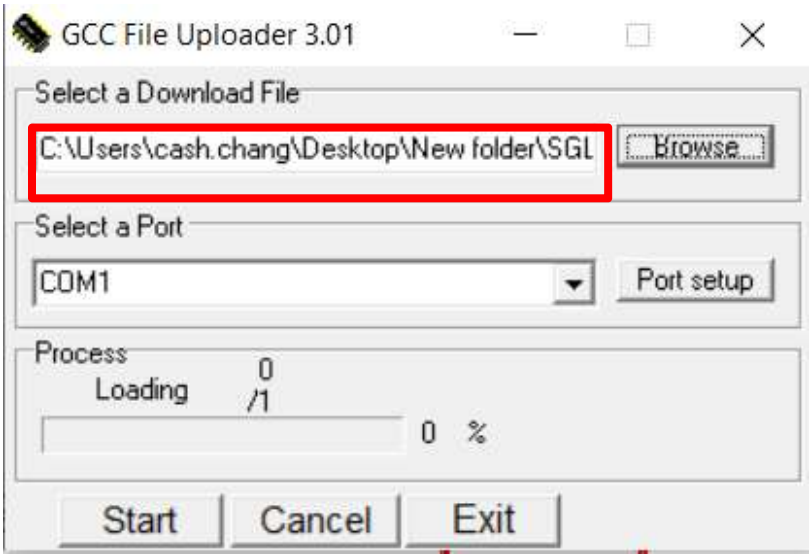



**Step 4**. Press the button “Browse” and select the firmware file you want to upload.




Press “Open” to select the firmware file






**Firmware file is selected.**

**Step 5.** Press the “Start” button, the upgrading process will start, wait until the process is done, the machine will reboot automatically.

6.2. How to set the proper USB mode on GCC Laser Machine and printer port setting of windows system ?
(For older machine only, refer to 6.1.4)

**Step 1 Check loader version installed on the machine**

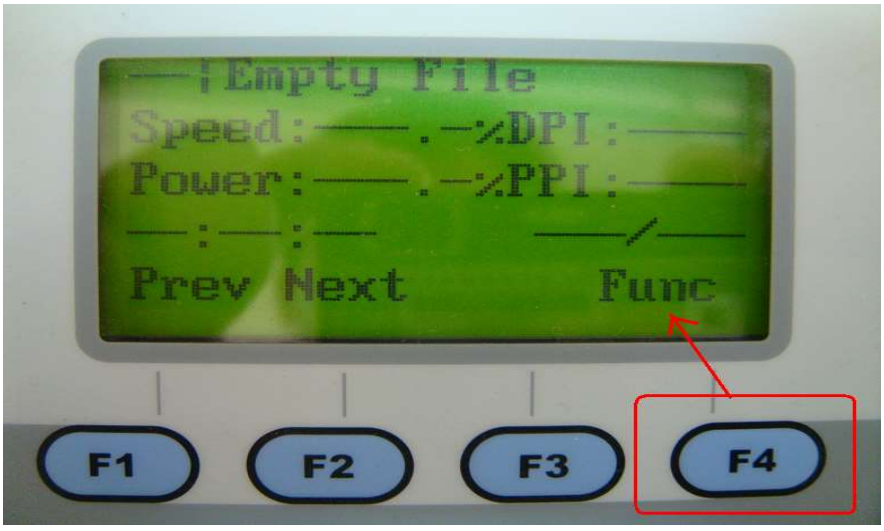
Press and hold “F4” on Control Panel then turn on the machine, if below page appears, the loader installed on the machine is the new loader, if the control panel shows nothing, the loader is an old loader.

**Step 2** Set the proper USB mode on both the machine and printer port setting of windows system according to following table :

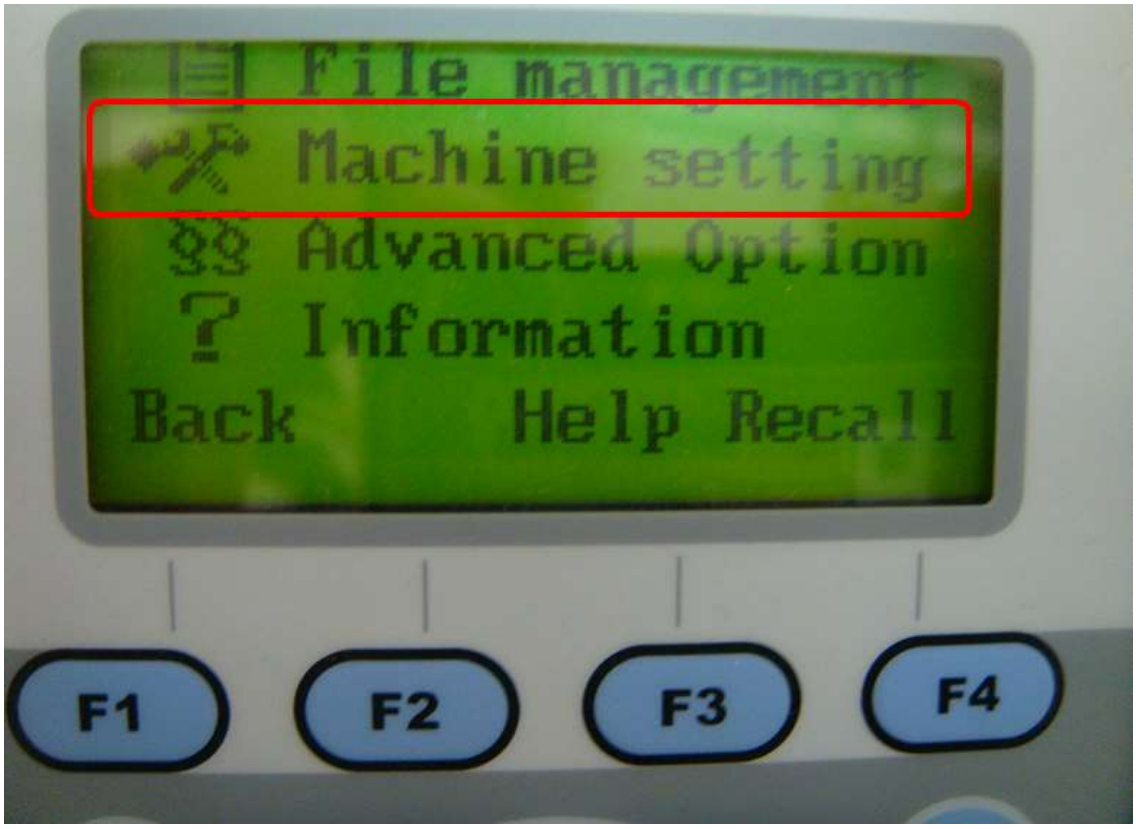
| Laser series | Loader version | Windows XP/Windows Vista/Windows 7 | |
|---|---|---|---|
| | | 32 bit | 64 bit |
| Spirit/LS/C180 | New | GCC USB or Common USB mode | Common USB mode |
| | Old | GCC USB mode | X |
| SGX/GLS | New | GCC USB or Common USB mode | Common USB mode |
| | Old | GCC USB mode | X |
| Mercury | | Parallel | X |
| Mercury II/III | New | GCC USB or Common USB mode | Common USB mode |
| | Old | | |
| S290/S290LS | New | GCC USB or Common USB mode | Common USB mode |
| | Old | | |
| X252/X380/X500 | New | GCC USB or Common USB mode | Common USB mode |
| | Old | | |
| Gaia/Gaia II | New | GCC USB or Common USB mode | Common USB mode |
| | Old | | |

- Machine setting

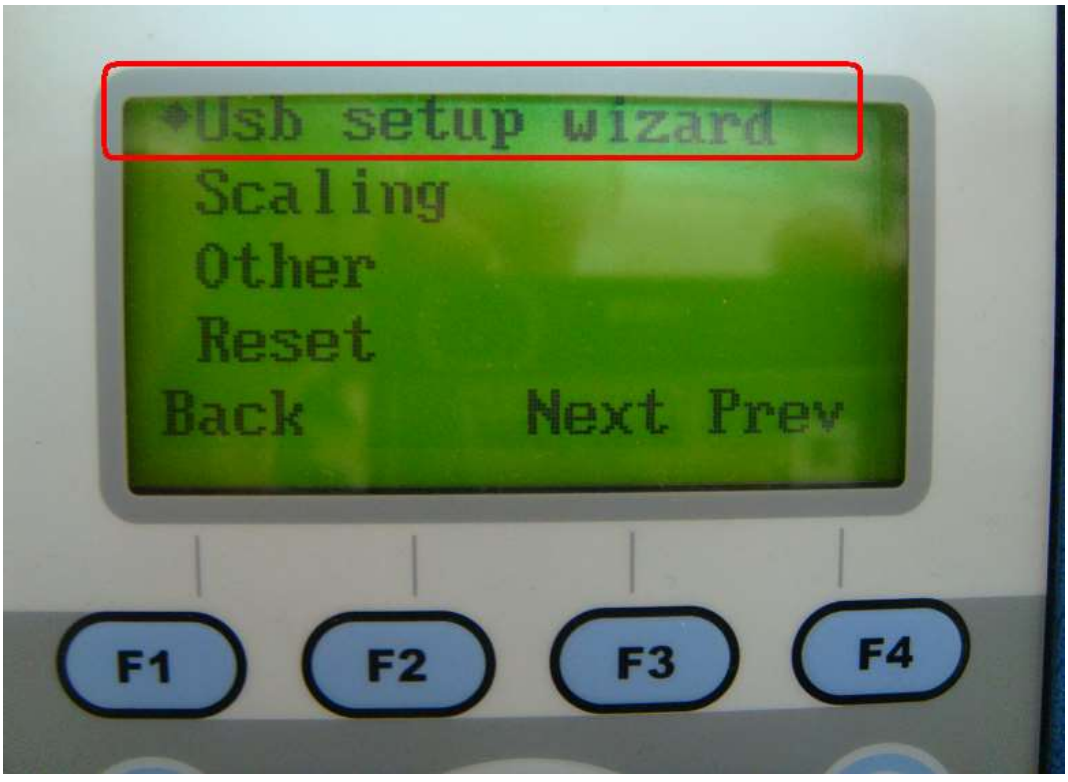
I. Press F4 button on control panel home page to enter Function page



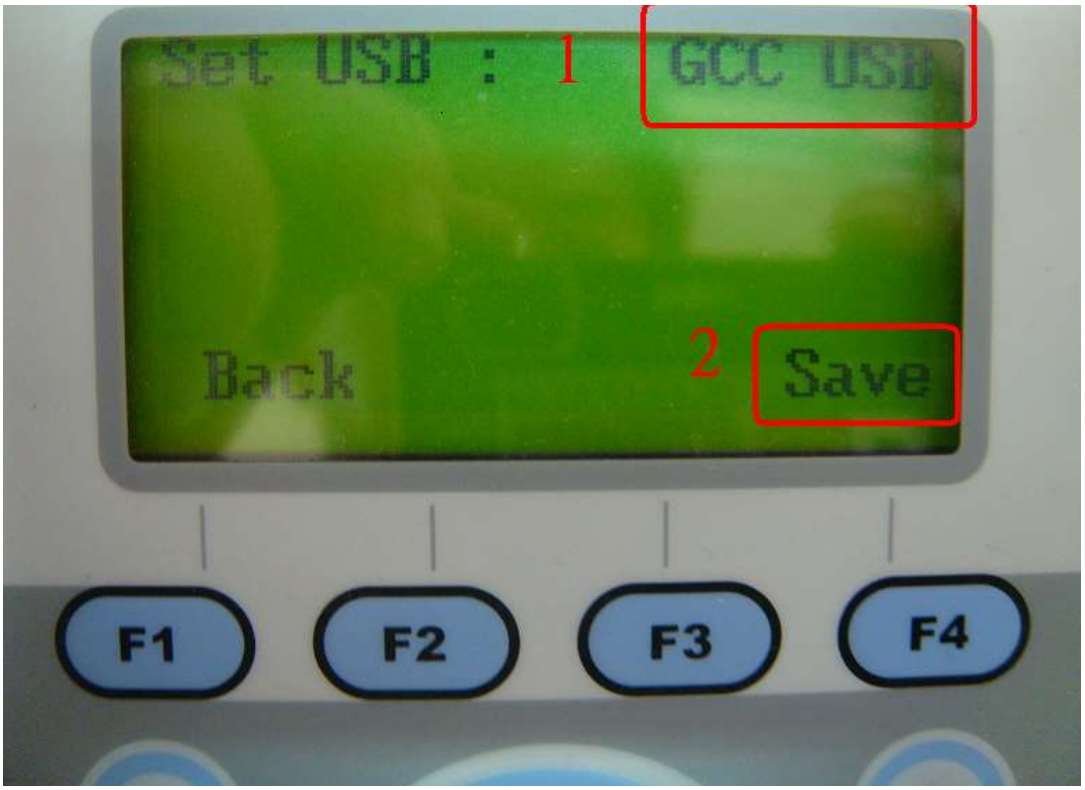
II. Select “Machine setting”




III. Select “Usb setup wizard”

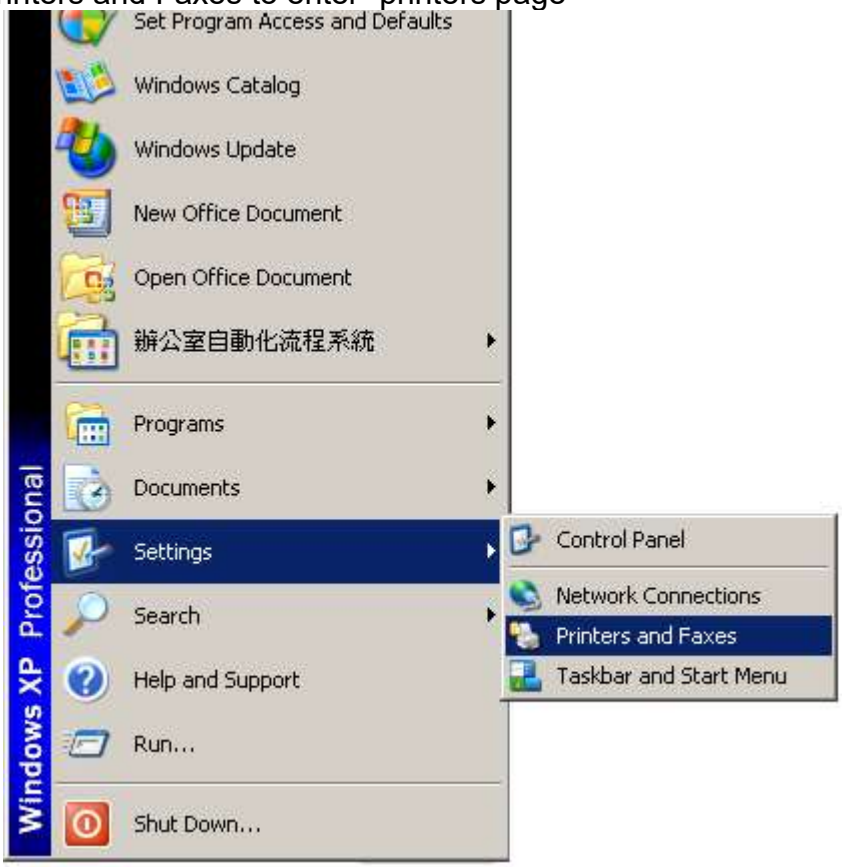


III. Choice the USB mode you want to use and save it.

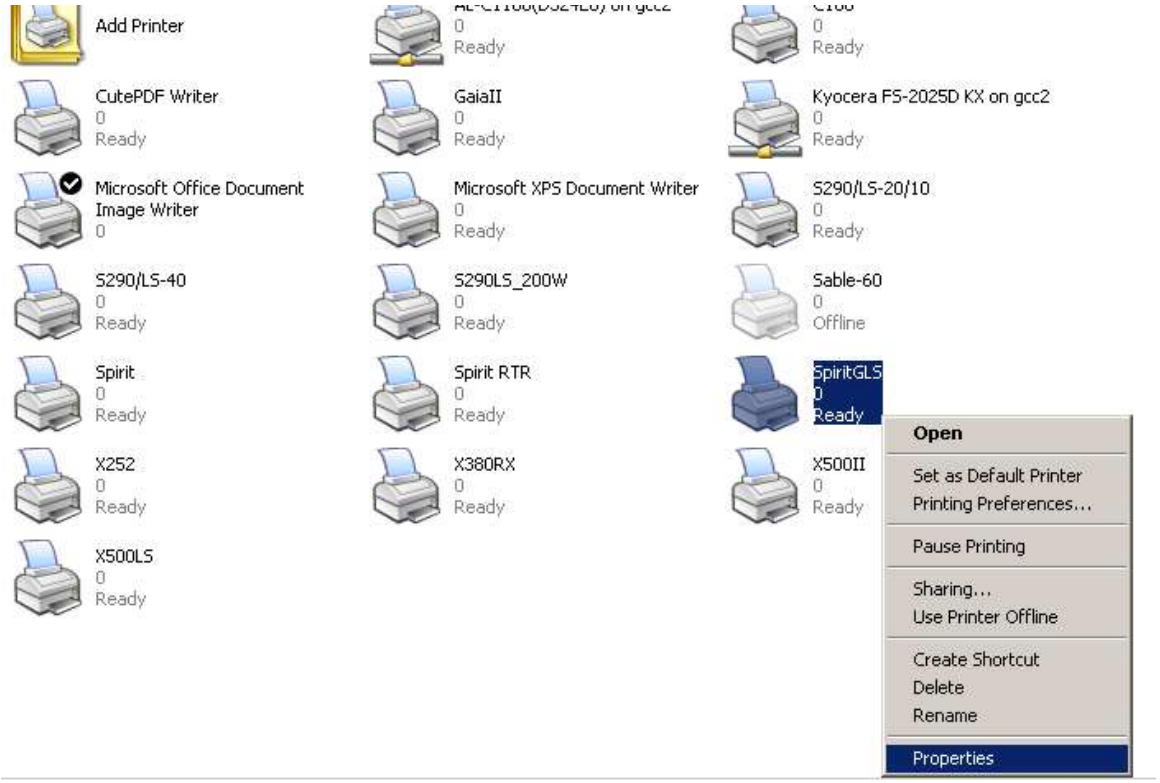



- Printer port setting

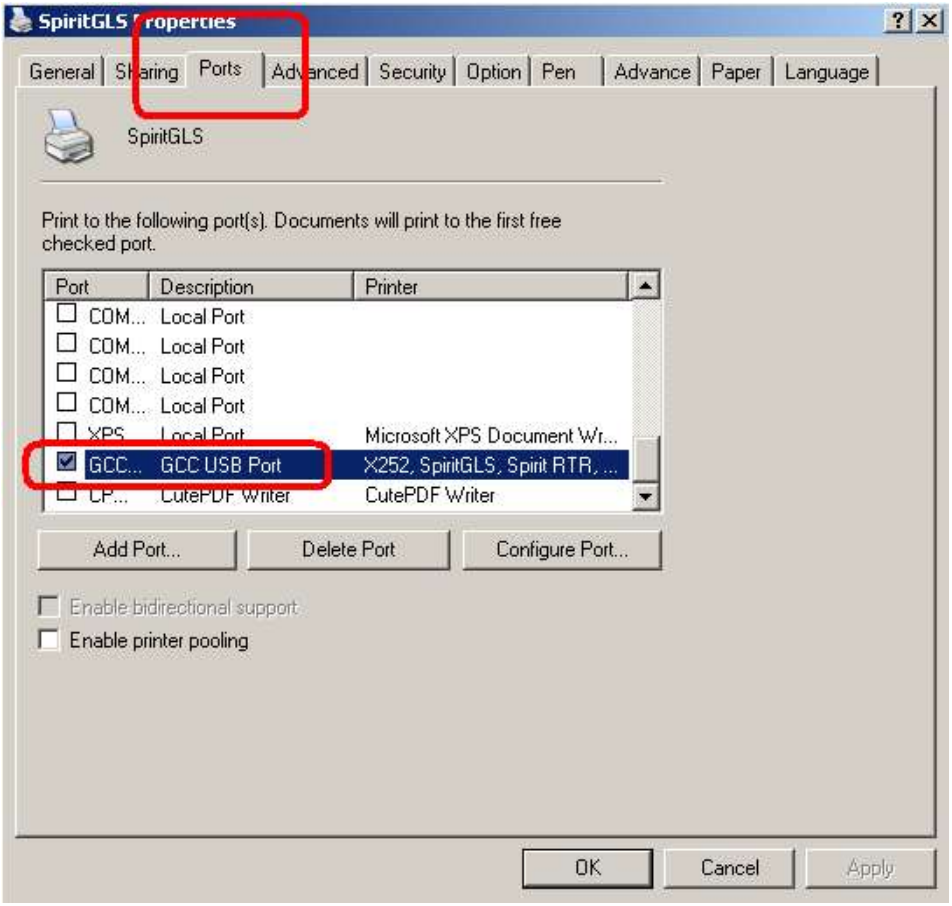
I. Start→Settings→Printers and Faxes to enter “printers page”



II. Right click on the printer you want to set the port and select “Properties”




III. Turn to “Port” tab, select the proper port you want to set (in this case, it’s GCC USB)



# Chapter 7 Trouble Shooting & Diagnostic

## 7.1 Firmware Error Message

| | |
|---|---|
| **Message** | Laser Tube Error Laser tube is overheat press any key to stop |
| **Cause** | V30 laser tube responses the over-temp signal for a period of time, and firmware recognizes the laser tube is over temperature. |
| **Solution** | Check the temperature is down to normal level , turn off the machine,wait for the laser tube be cooled. |

| | |
|---|---|
| **Message** | Invalid file, check output file or reset command mode. press any key to stop |
| **Cause** | PCL command error |
| **Solution** | Check the output file command |

| | |
|---|---|
| **Message** | WARNING! SmartGUARD fire alarm system is activated,please reboot machine |
| **Cause** | Flame detected by SmartGUARD |
| **Solution** | Reboot the machine |

| | |
|---|---|
| **Message** | WARNING! Emergency stop is activated, please free the emergency stop to continue next job |
| **Cause** | Emergency stop is activated |
| **Solution** | Release the emergency stop button |

| | |
|---|---|
| **Message** | Please install the Auto Focus pin first before performing the auto focusing or focus tuning |
| **Cause** | Auto Focus pin is not installed |
| **Solution** | Check if the autofocus pin is installed |

| | |
|---|---|
| **Message** | HPGL Command Error Command: Address: Please press any key to stop |
| **Cause** | HPGL command of printing file is not defined. |
| **Solution** | Check the HPGL command |

| | |
|---|---|
| **Message** | Working table has reached the limit, please lower the table. |
| **Cause** | 1. Platform reach the top limit<br>2. Platform reach the bottom limit<br>3. Certain object touches the limit switch<br>4. Limit switch malfunction |
| **Solution** | 1. UP/Down platform to avoid the limit level<br>2. Remove the objects which touch the limit switch<br>3. Replace the limit switch |

| | |
|---|---|
| **Message** | PCL Command Error Command: Address: Please press any key to stop |
| **cause** | PCL command of printing file is not defined. |
| **Solution** | Check the PCL command |

| | |
|---|---|
| **Message** | Error! Please make sure the work piece or carriage within work area |
| **Cause** | The design object is out of working area |
| **Solution** | Verification:<br>1. Check if the size of design exceed the working area defined.<br>2. Check if the design is in the default working page.<br>3. Check the position mode<br>Solution::<br>1. Place the object in the default page of driver<br>2. Select proper position mode. |

| | |
|---|---|
| **Message** | Language Error Please upload properlanguage pack. |
| **Cause** | While using multi-language, precise language file is not imported. |
| **Solution** | Import correct language pack file. |

| | |
|---|---|
| **Message** | No Language Data Please upload proper language data first |
| **Cause** | While using multi-language, precise language file is not imported. |
| **Solution** | Import correct language pack file. |

| | |
|---|---|
| **Message** | SmartMEMORY is full.Please remove some file |
| **Cause** | SmartMEMORY buffer is full |
| **Solution** | Delete files in SmartMEMORY |

| | |
|---|---|
| **Message** | SmartMEMORY is not dectected. Please check the device |
| **Cause** | SmartMEMORY is not installed |
| **Solution** | Install the SmartMemory |

| | |
|---|---|
| **Message** | X motor malfunction For service please contact your local distributor |
| **Cause** | X motor is abnormal |
| **Solution** | Verification:<br>1. Check if the cable connections of X motor are correct<br>2. Check if there were any abnormal sounds from X motor<br>Solution: Re-install the motor cable. |

| | |
|---|---|
| **Message** | Y motor malfunction For service please contact your local distributor |
| **Cause** | Y motor is abnormal |
| **Solution** | Verification:<br>1. Check if the cable connections of Y motor are correct<br>2. Check if there were any abnormal sounds from Y motor<br>Solution: Re-install the motor cable. |

| | |
|---|---|
| **Message** | Z motor malfunction For service please contact your local distributor |
| **Cause** | Z motor is abnormal |
| **Solution** | Verification:<br>1. Check if the cable connections of Z motor are correct<br>2. Check if there were any abnormal sounds from Z motor<br>Solution:<br>1. Re-install the motor cable<br>2. Adjust the speed of table moving |

| | |
|---|---|
| **Message** | Laser Warming Up Please Wait |
| **Cause** | Laser tube is warming up |
| **Solution** | Wait for the laser tube warm up |

| | |
|---|---|
| **Message** | Please install the Auto Focus pin first before performing Please press any key to stop |
| **Cause** | Auto Focus pin is abnormal |
| **Solution** | Check Auto Focus pin |

| | |
|---|---|
| **Message** | CCD Error! Move carriage to first mark or reset CCD Thank you |
| **Cause** | CCD didn't recognize the object successfully |
| **Solution** | Do the recognition again. |

| | |
|---|---|
| **Message** | CCD Offset Error Please change your media or confirm CCD focus distance |
| **Cause** | The pattern is too close to the boundary and the carriage goes out of the boundary after the recognition is finished. |
| **Solution** | Move the pattern to the center of the table |

| | |
|---|---|
| **Message** | WARNING!The CCD unitis not detected. Press Back to leave CCD offset mode. |
| **Cause** | CCD is not installed |
| **Solution** | Install the CCD |

| | |
|---|---|
| **Message** | WARNING! No CCD Please remove include CCD command file |
| **Cause** | CCD is not installed |
| **Solution** | Install the CCD |

| | |
|---|---|
| **Message** | Door is Open; Please Close Door and press BACK to operate |
| **Cause** | Top cover is opened while a job is running |
| **Solution** | Verification:<br>1. Check if the top cover is opened<br>2. Check if the Door sensor worked fine<br>Solution:<br>1. Close the top cover<br>2. Replace Door sensor |

| | |
|---|---|
| **Message** | WARNING! Laser Head Temp. over ; please close machine and check Laser Head |
| **Cause** | Fibre laser tube over temperature |
| **Solution** | Check if the temperature of tube is really too high |

| | |
|---|---|
| **Message** | Error Code : please wait |
| **Cause** | Error code responsed by Fiber laser |
| **Solution** | Check the definition of the Code. |

| | |
|---|---|
| **Message** | Fail to locate registration mark. Align red beam to the first mark |
| **Cause** | The first registration mark can’t be recognized |
| **Solution** | Move the red beam to the first mark and do the recognition again. |

| | |
|---|---|
| **Message** | Object is out of bound. Please place object within the valid working area. |
| **Cause** | The pattern is too close to the boundary |
| **Solution** | Place the pattern to the proper position |

| | |
|---|---|
| **Message** | Auto Focus disabled Please use the and keys to move the working table |
| **Cause** | Auto focus function is disable，please up/down the table manually |
| **Solution** | Check Auto focus function |

| | |
|---|---|
| **Message** | WARNING! Machine ; Initialization error Please free the emergency stop then restart the machine |
| **Cause** | Emergency stop button is pressed while the machine is booting |
| **Solution** | Release the Emergency stop button |

| | |
|---|---|
| **Message** | Permit Expired!! |
| **Cause** | Time locker date is expired |
| **Solution** | Check the expiration of time locker. |

| | |
|---|---|
| **Message** | Invalid Timer |
| **Cause** | Time locker's effective time is different from firmware internal time. |
| **Solution** | Confirm the effective time in Time Locker. |

| | |
|---|---|
| **Message** | Drive Not Found!! |
| **Cause** | USB storage dose not plug. |
| **Solution** | Confirm if USB storage is plugged or try to replug again. |

| | |
|---|---|
| **Message** | No Valid File!! |
| **Cause** | File name is Chinese version or there is no prn and/or plt file mode under the folder. |
| **Solution** | Change file name to be English or check if there is prn and/or plt file mode under the folder. |

| | |
|---|---|
| **Message** | USB drive error. GCCcertified USB drive models w/FAT 16/32 format is required |
| **Cause** | Format is not FAT16 or FAT32 |
| **Solution** | Confirm the format of USB storage. |

## 7.2 Hidden Diagnostics

To enter the hidden Diagnostics menu, hold down the Autofocus button and turn on the machine.

There are 11 tests under the hidden diagnostics menu.

1. LCM Key Test

   LCM Key test will test the functionality of the keys on the keypad.

2. LCM Interface Test

   LCM Interface test will display a series of different shapes on the LCM to allow user to detect any malfunction on the display unit.

3. Parallel port test

   Parallel port test checks that the parallel port is functional by asking the user to send a file through the parallel port.

4. Serial port test

   Serial port test checks that the serial port is functional by asking the user to send a file through the serial port. (The serial port is for diagnostic purposes only. Please do not use.)

5. USB test

   USB port test checks that the USB port is functional by asking the user to send a file through the USB port.

6. DRAM test

   DRAM test checks the functionality of the DRAM.

7. Laser test

   Laser test allow you to fire the laser tube at a selected laser power. (This is also the utility that you use to perform beam alignment.)

8. X motor test

   X motor test checks that the X motor is functional by asking user to use the keys on the control panel to move the pen carriage along the X axle.

9. Y motor test

   Y motor test checks that the Y motor is functional by asking user to use the keys on the control panel to move the pen carriage along the Y axle.

10. Z motor test

    Z motor test checks that the Z motor is functional by asking user to use the keys on the

control panel to move the platform up and down the Z axle.

11. Hard Stop test

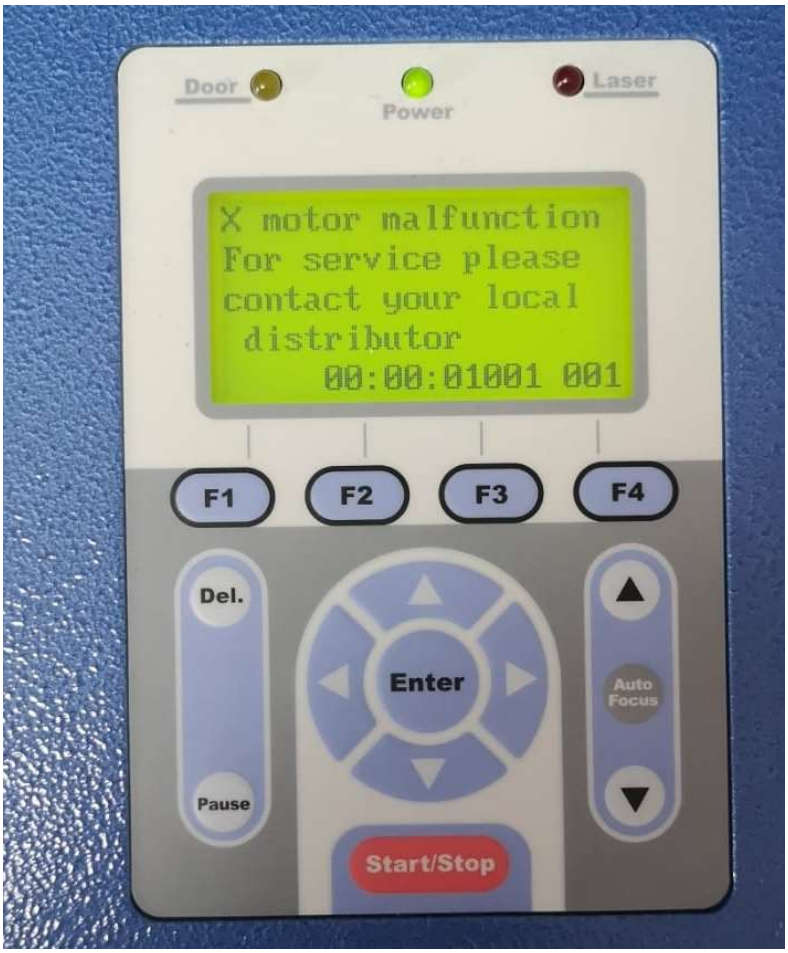
Hard Stop test checks that the X and Y sensors are functional by asking the user to manually move the pen carriage towards the X and Y sensor flags

7.3 LED status:
On side of machine, there are three LED. When the machine is running normally, all these LED are On (and the color is green). If any of these LED is Off, that mean that part is defective or loosen.


7.4 Setting tickle pulse on machines equipped with Synrad laser sources.

By nature, Synrad laser sources require a tickle pulse to keep the laser ready for firing. The tickle pulse signal required depends on the individual laser tube. The usual setting is at 5k, however, it may be required to adjust the tickle pulse rate. If the laser is too weak, we can set it to 7k and if the laser is bleeding, then we can set it to 3k.
Hold the “down arrow key” when turning on the machine until “Laser Tube Model Number” shows on the display. Wait till the lens carriage comes to a stop. Press the Enter key to get to the Model Number selection page. Select the corresponding laser tube model from this page. Press F4 and then the Start/Stop key to save and restart the machine.

7.5 When turns on machine, control panel shows “X motor malfunction” (see picture below) and machine cannot finish initialization.




Diagnostic process:

Every GCC laser x/y table machine will have initialization process when machine turns on. Machine will first rotate x motor and let the lens carriage move to right side and touch the x axis sensor on x motor pcb. Then the whole x axis rail move to front side (y axis) and touch the y axis sensor on x motor pcb. And then the lens carriage will move to top-left corner (origin position) and finish initialization process. When machine cannot finish initialization process and shows “X motor malfunction”, there are four parts could be the reason: X motor, main board, x motor pcb and x motor flat cable.

The logic is that main board needs to control x motor and get the feedback signal from x motor and x motor pcb. When main board cannot do these, these four parts are the related parts.

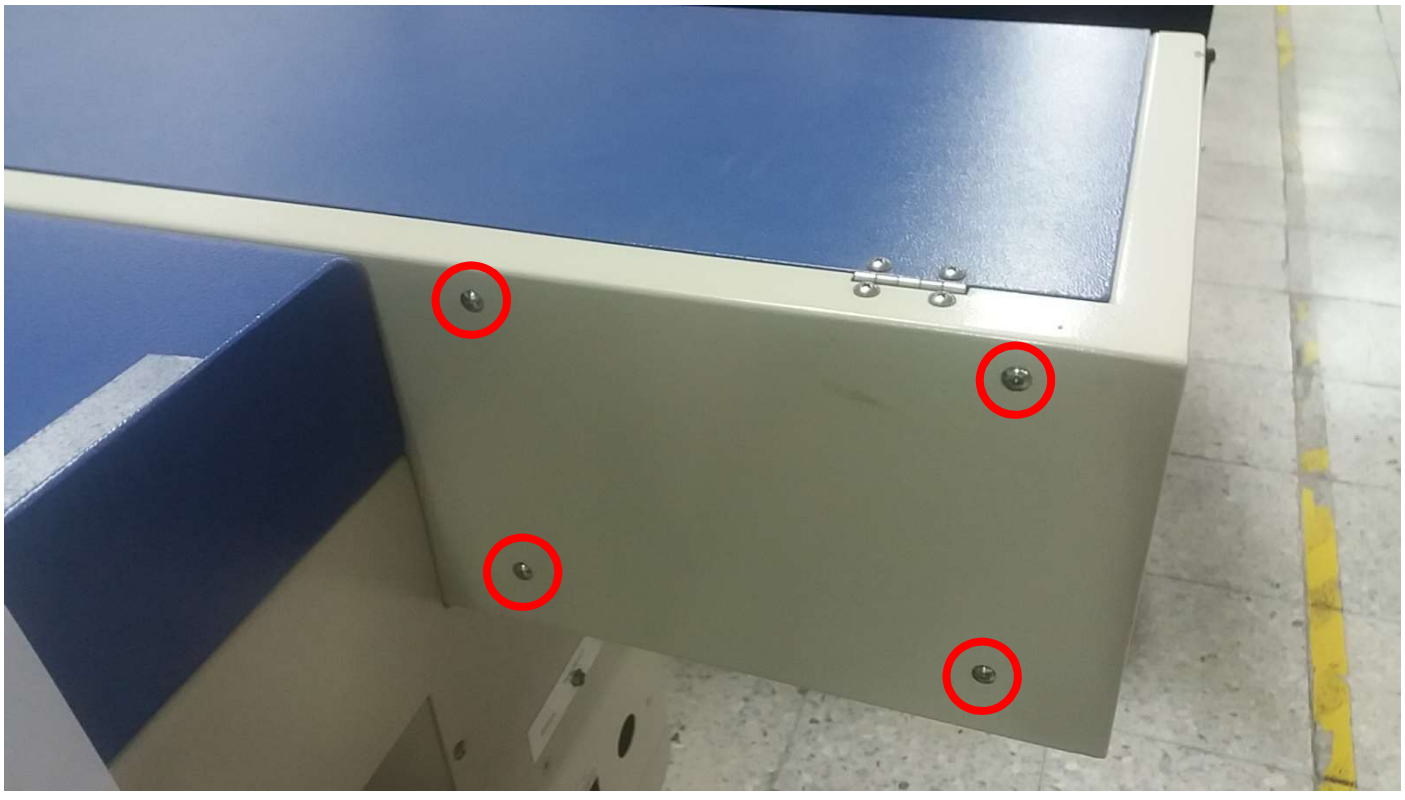
Situation 1: When lens carriage does not move at all and already shows “X motor malfunction”, that means the x motor is defective or main board (x motor chip) is defective or x motor flat cable is broken somewhere or does not connect well.

Situation 2: When lens carriage can move to right side but it stops there and shows “X motor malfunction”. The most possible part is x motor pcb (the x axis sensor is defective). The next possible part is x motor flat cable (broken somewhere and cause the signal cannot send back to main board).

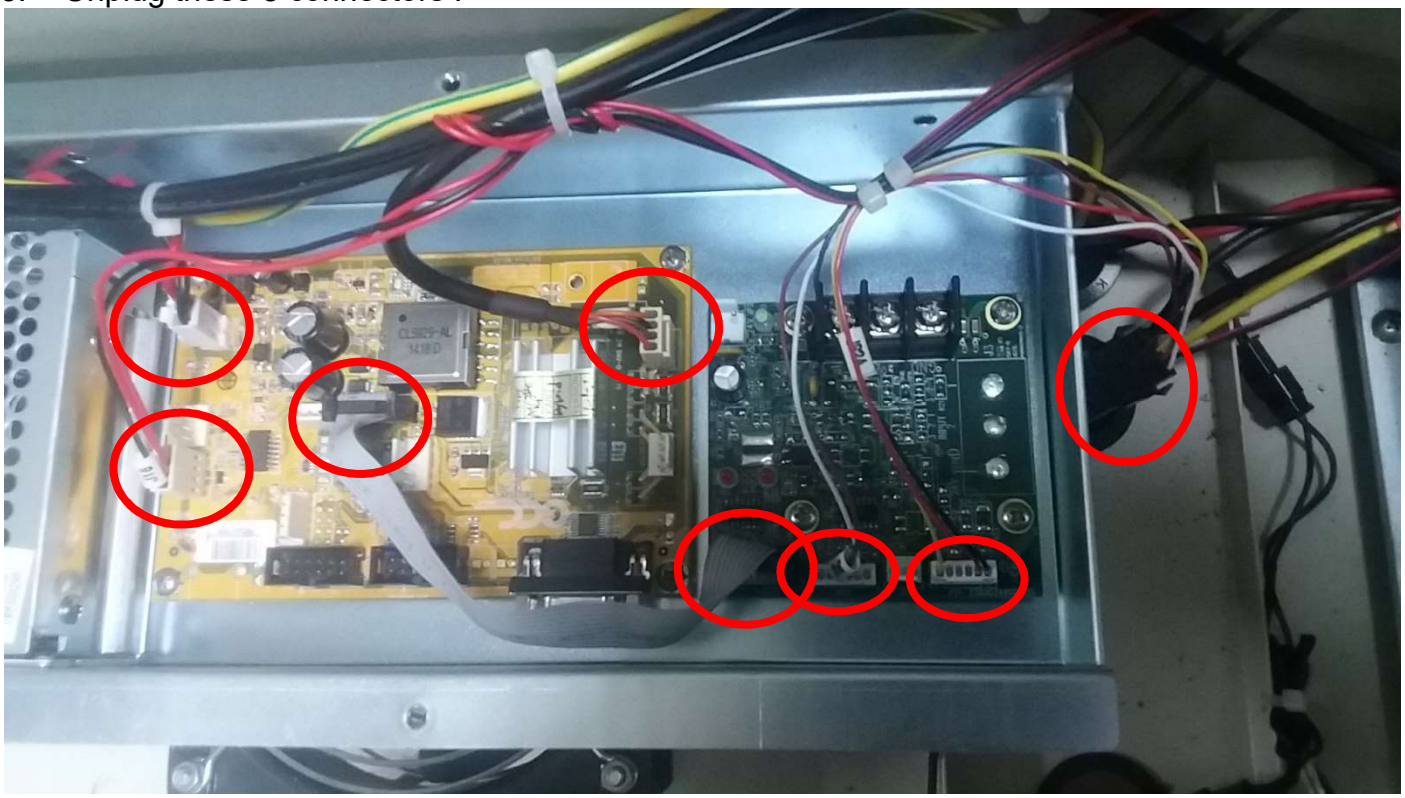
7.6 , For some (older) MG380 machines, sometimes that laser cannot fire or missing fire during a job. Especially when doing engraving and cutting in one job. One of the reason is the mirror shutter (the first mirror for metal tube) is not moving to correct position or it keeps moving up and down. This symptom needs to replace some newer parts. The parts replace process is below:

1. Remove these 3 screws :

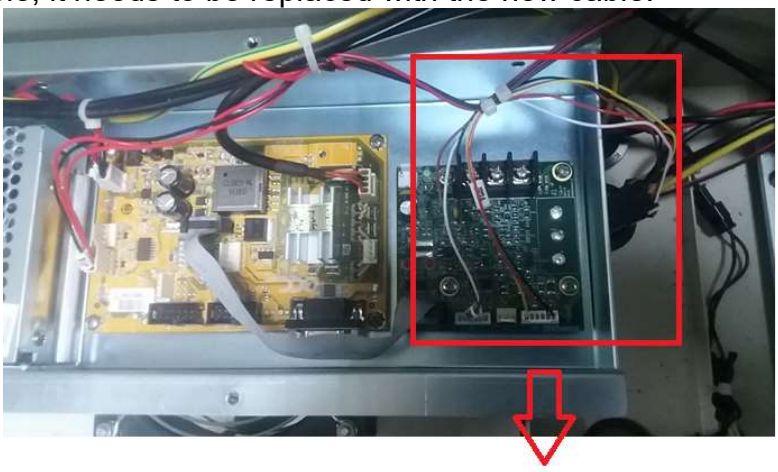
2. Remove these 4 screws :

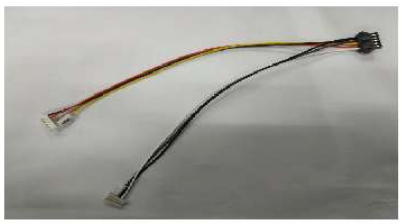


3. Unplug these 8 connectors :



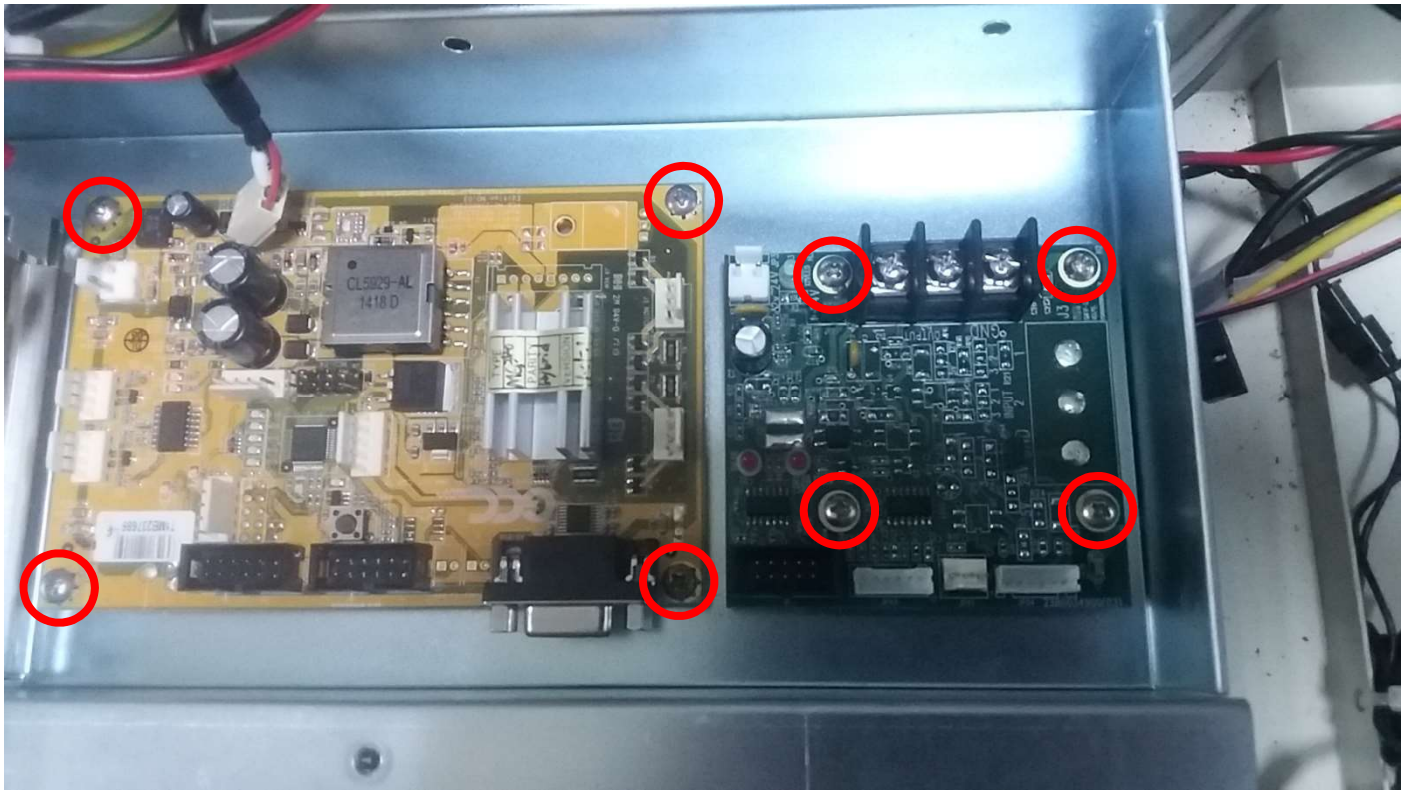
4. Remove this cable, it needs to be replaced with the new cable.



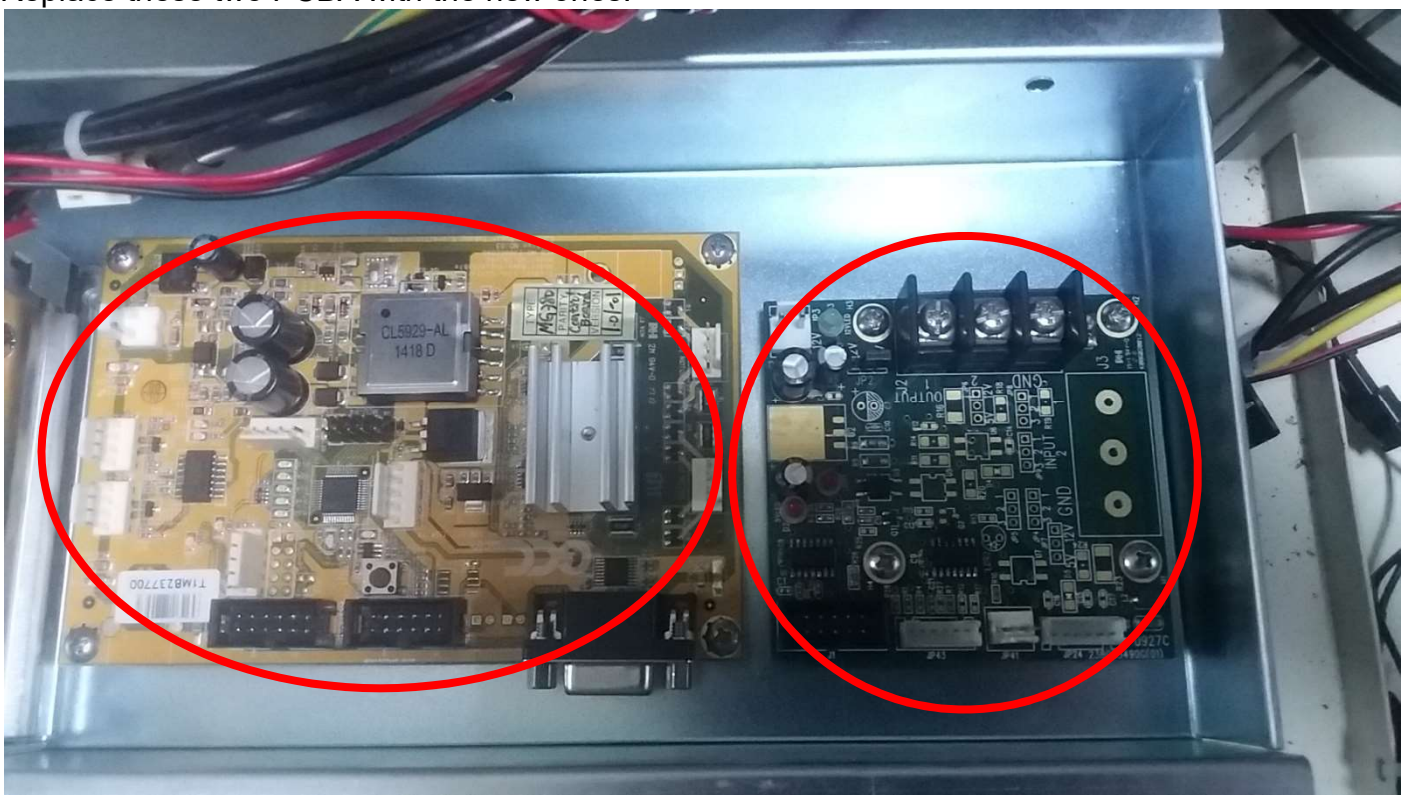


This cable needs to be replaced with the new one.

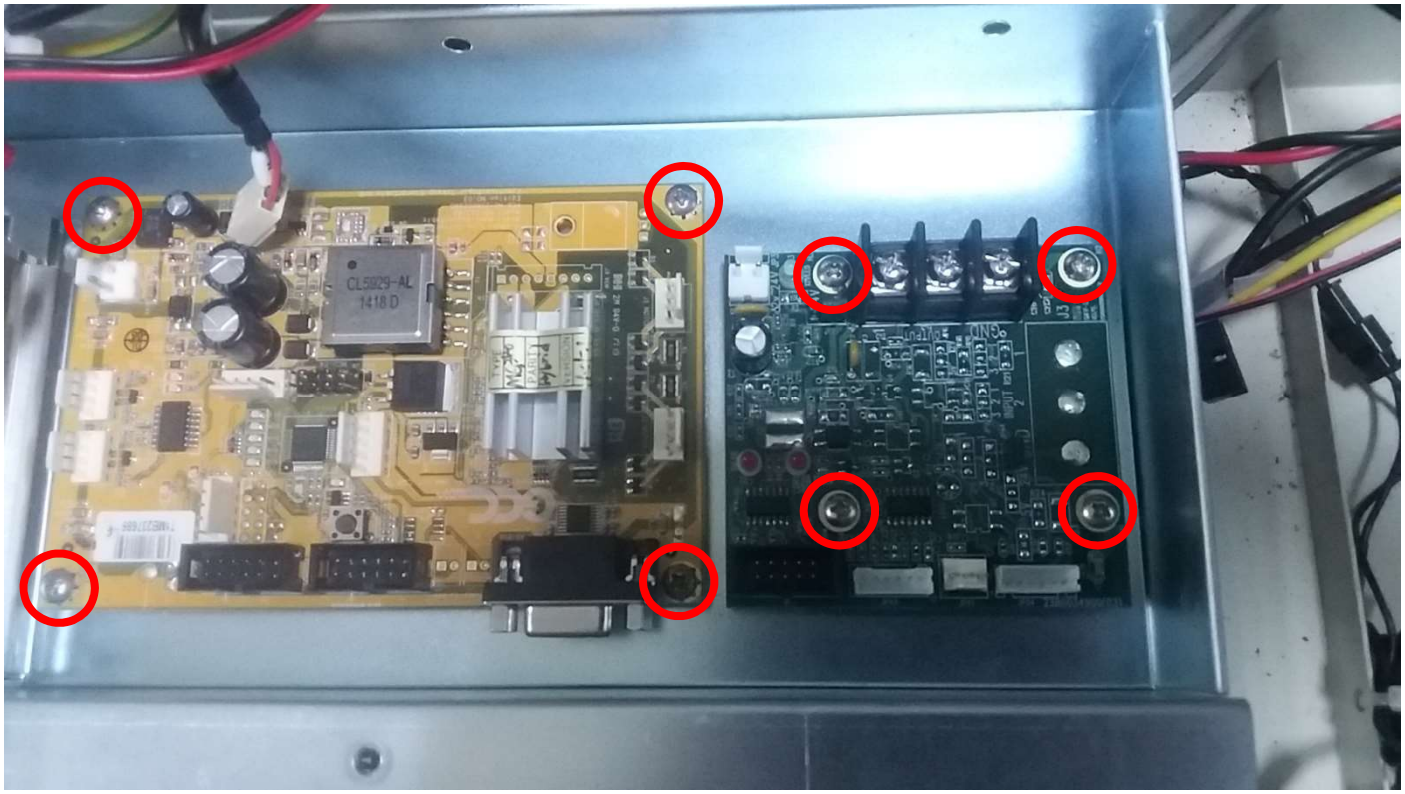
5. Remove these 8 screws



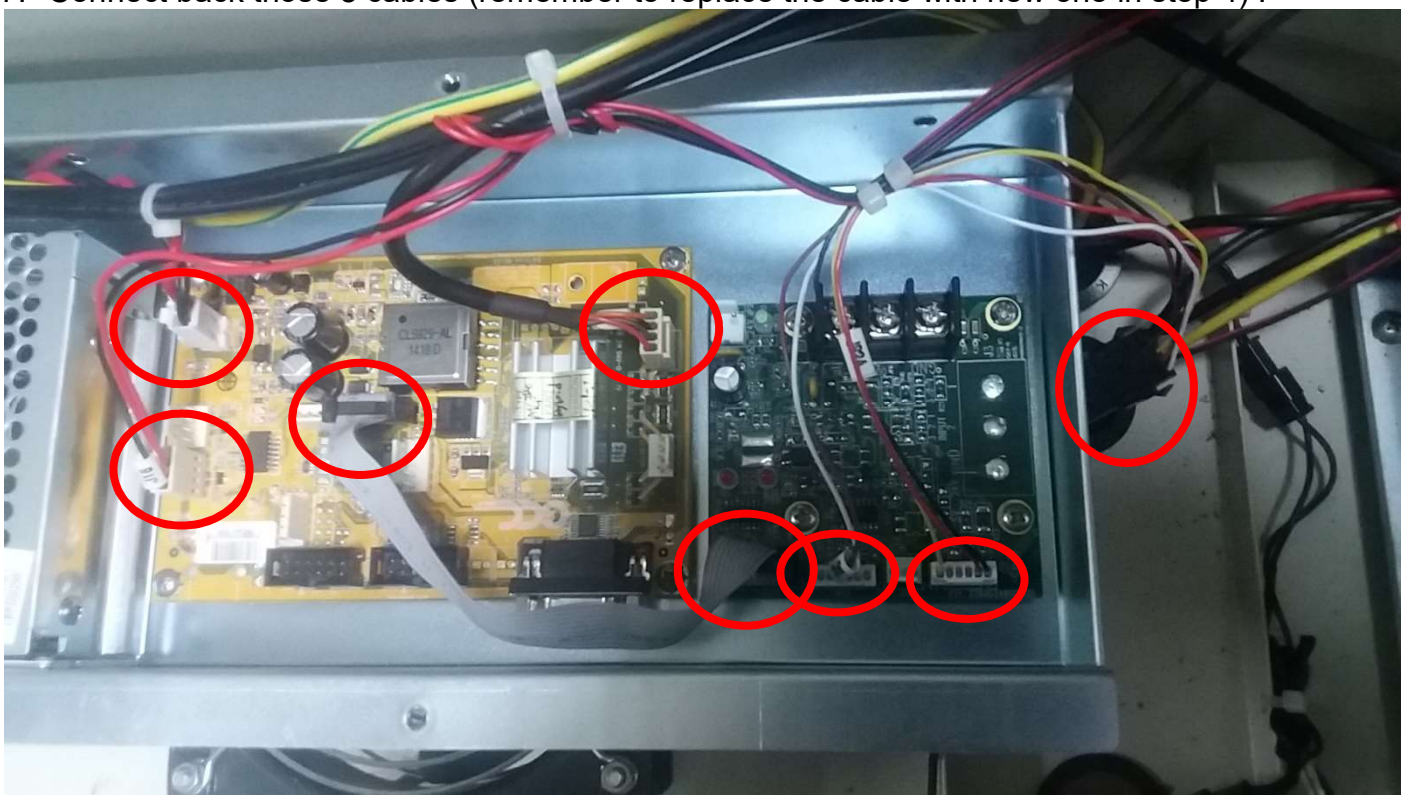
Replace these two PCBA with the new ones:



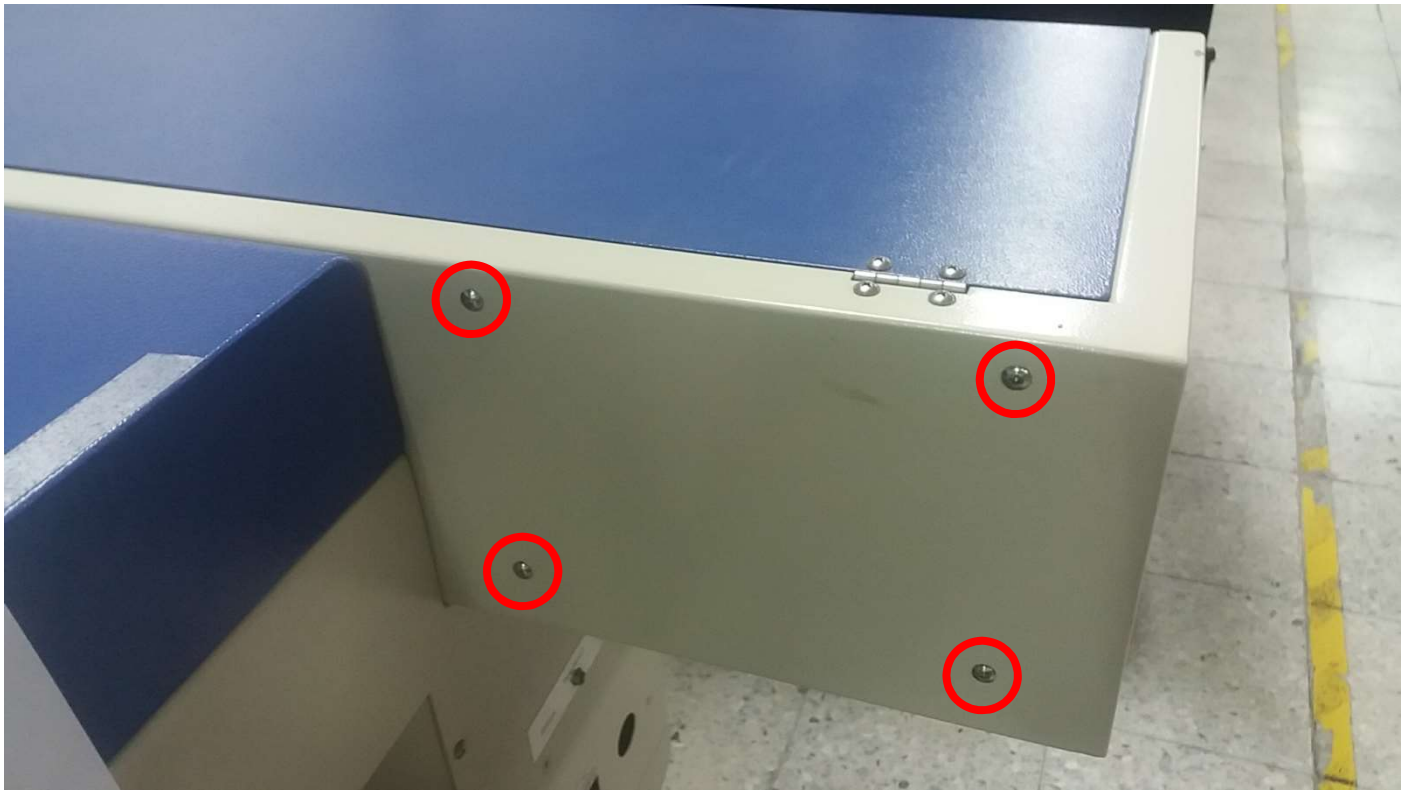
6. Fasten these 8 screws



7. Connect back those 8 cables (remember to replace the cable with new one in step 4) :



8. Fasten these 4 screws :



9. Fasten these 3 screws :

# Charper 8 Basic Maintenance

Keeping your LaserPro X252RX、 X380RX、MG380 Hybrid clean and well maintained will ensure quality output, consistent reliability, and extended product life. Smoke, dust or residue build-up inside the laser system or the mechanical components can cause a reduction in the laser power, irregularities in the motion system, reduced product life cycle, and a host of other avoidable problems. This section will cover how to perform regular maintenance on the X252RX、X380RX、MG380 Hybrid's worktable, motion system, mirrors, and focal lens.

The frequency of the cleaning schedule will depend on number of variables such as the types of material you work with, the immediate work environment, the frequency of use, the quality of the exhaust system, etc.

***WARNING***

- Electrical Shock may occur if you do not turn off and unplug the X252RX、X380RX 、MG380 Hybrid before cleaning.
- Damage may occur to the system if you do not turn off and unplug the X252RX、X380RX、MG380 Hybrid before cleaning.
- Always turn off and unplug the X252RX、X380RX、MG380 Hybrid before cleaning!

## 8.1Suggested Cleaning and Maintenance Supplies

| Cleaning / Maintenance Tool | Special notes |
|---|---|
| Soap Solution or All-Purpose Cleaner | |
| Paper Towels | |
| Cotton Cloth | |
| Denatured Alcohol | DO NOT use alcohol on any painted surface, plastic, or the laser system! |
| Acetone | ONLY to be used on the working table |
| Vacuum Cleaner with a Flexible Nozzle | Only to be used in and around the worktable and motion system |
| Light Grade Machine Oil | |
| Cotton Swabs | Supplied |
| Lens Cleaner | 1pc supplied; suggest search locally* |
| Lint Free Lens Tissue | Supplied |
| #2 Phillips Screwdriver | |
| Allen Wrench .050" | |

*The recommended lens cleaner is Eclipse Cleaning System Solution from Photographic Solutions or HPLC grade Methanol. Search "Eclipse Cleaning System Solution" on Amazon or eBay to get the solution locally.
http://www.amazon.com/Photographic-Solutions-ECDCS-Cleaning-Solution/dp/B0000AUR1I


Eclipse Cleaning System Solution

## 8.2 Maintaining the Worktable and Motion System

### 8.2.1 Accessing the Worktable and Motion System

Remove the screws of the top of the machine and lift the top off.

### 8.2.2 Cleaning the Worktable and Motion System

#### 8.2.2.1 Cleaning the Worktable and Motion System

Clean the working table and the motion system on a weekly basis through the following steps:

1) Turn the power off and unplug the X252RX & X380RX before cleaning.
2) Use a vacuum cleaner with a flexible nozzle to remove dust and debris from the worktable and motion system.
3) Apply small amounts of all-purpose cleaner, alcohol, or acetone to a paper or cotton towel to clean the working table.
4) Apply a soap solution, all-purpose cleaner, or alcohol to a paper or cotton towel to wipe down the rails of the motion system.
5) Wait for all cleaning residue to dry completely before plugging in and operating the X252RX & X380RX.

***CAUTION***

- Never pour or spray alcohol or acetone directly to the working table.
- Oil, alcohol and acetone can cause fires or smoke build-up if improperly used.

***TIP***

Please clean the AutoFocus pin each time after completing the engraved job to make sure the AutoFocus pin is free to move.

#### 8.2.2.2 Lubrication of the X / Y Rails

In order to keep the motion system running smoothly, the X / Y rails of the motion system will need lubrication on a weekly basis. Use a small amount of light grade machine grease to a paper or cotton towel and apply to the rails.

> **NOTE**
> • Always clean and lubricate the rails after working with materials that produce lots of debris (such as wood).
> • Too much oil applied to the X / Y rails will accelerate the build up of debris.

## 8.3 Cleaning the Optics System

### 8.3.1 Removing the Mirrors

We recommend you check the mirrors once or twice a week to see if they require cleaning. If any debris or smoke residue is present, use the following steps to clean them.

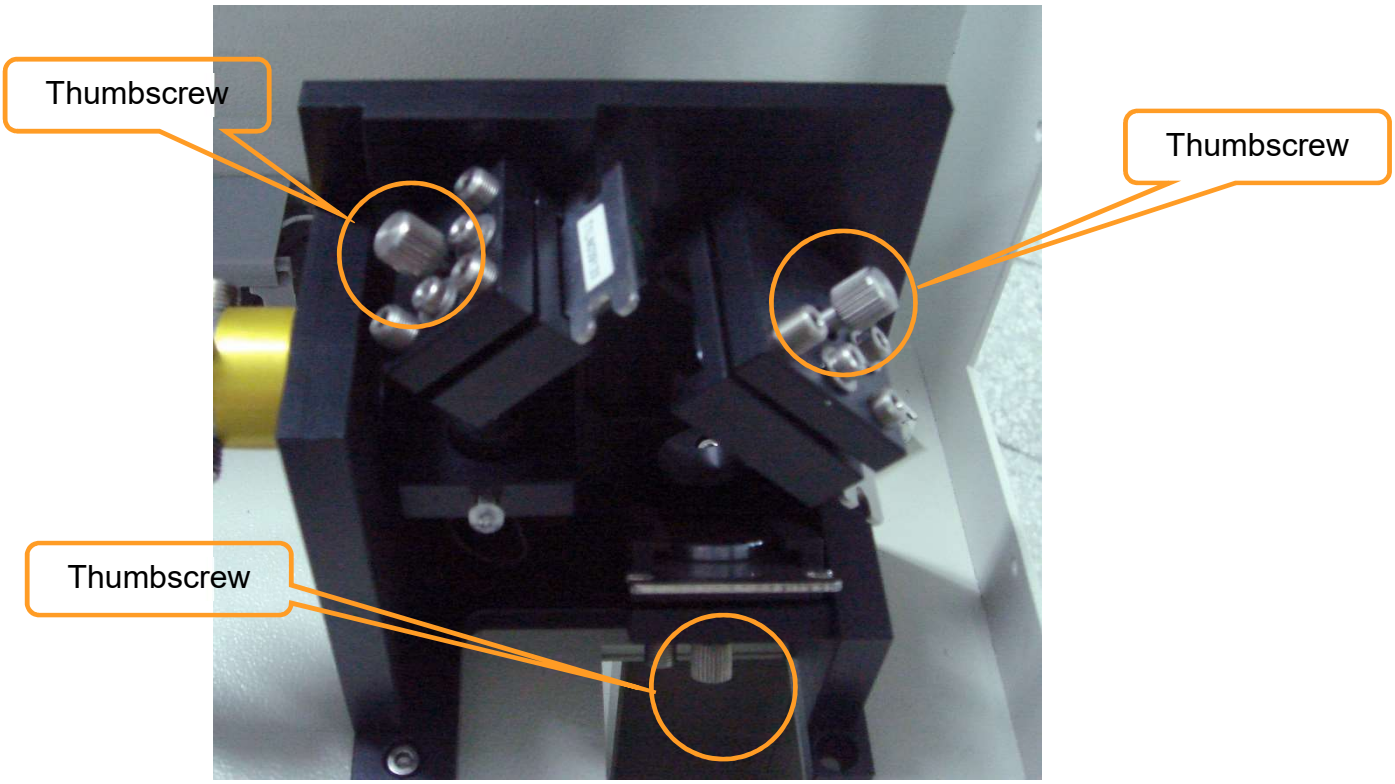
> **NOTE**
> - It is highly recommended you remove, clean and replace each mirror **one at a time**!

The following section will detail how to access and remove each of the four mirrors found on the LaserPro X252RX、X380RX、MG380 Hybrid for cleaning.

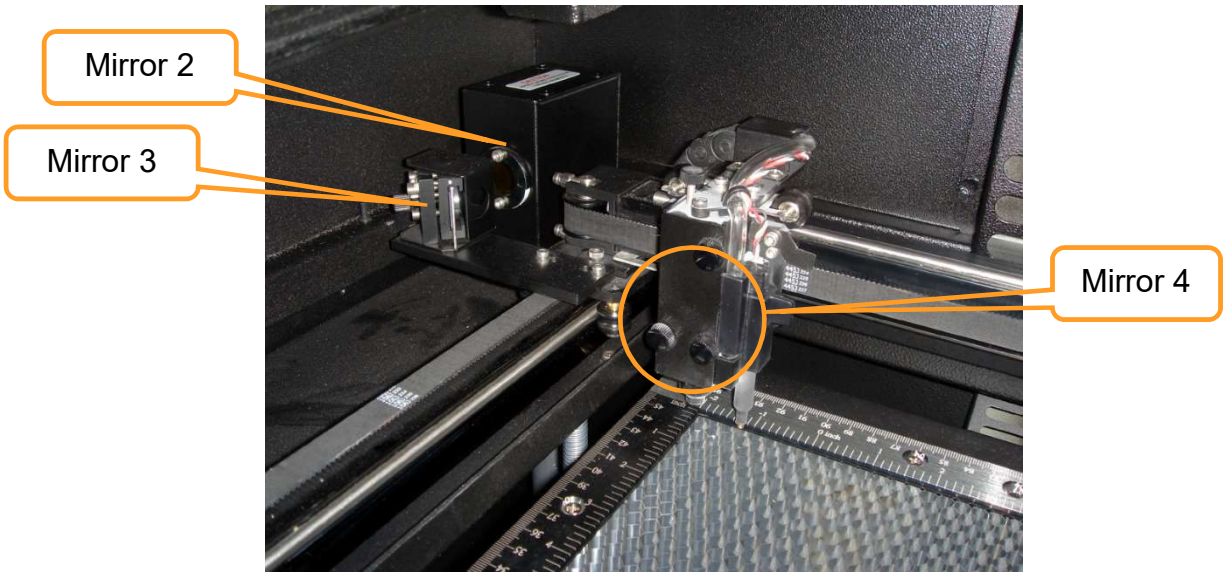
- **X252 & X380**

**Mirror 1**
This mirror is located inside the laser cabinet of the LaserPro X252RX、X380RX、MG380 Hybrid

1) Use a #2 Phillips Screwdriver to open the rear laser cabinet of the LaserPro X252RX & X380RX.
2) Loosen the thumbscrew and remove the dust cover securing the mirror. (As shown in the picture below).
3) Clean the lens in the proper manner.
4) Re-install the mirror after cleaning.
5) Tighten the thumbscrew.
6) Replace and secure the outer access panel.




**Mirror 2, 3, 4**
These mirrors are located in the worktable area of the LaserPro X252RX & X380RX.




**Mirror 2**

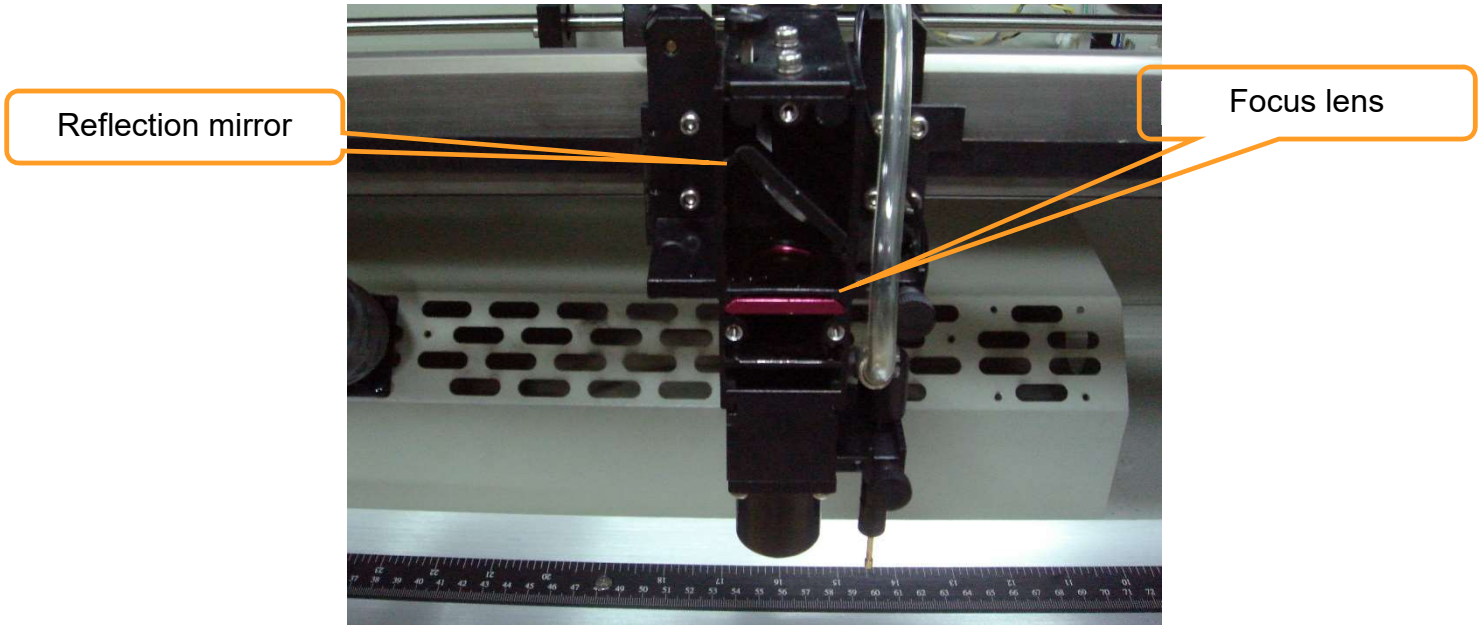
1) Unscrew and remove the black dust cover covering mirror 2.
2) Unscrew the thumbscrew holding mirror 2 in place.
3) Clean the lens in the proper manner.
4) Re-install mirror 2 after cleaning.
5) Tighten the thumbscrew.
6) Replace and secure the black dust cover.

**Mirror 3**

1) Unscrew the thumbscrew holding mirror 3 in place.
2) Clean the lens in the proper manner.
3) Re-install mirror 3 after cleaning.
4) Tighten the thumbscrew.

**Mirror 4**

1) Unscrew the three thumbscrews (front face of the laser head) securing the laser carriage panel and remove the laser carriage panel to reveal mirror 4 and the focal lens.
2) Loosen the top thumbscrew to remove mirror 4 (as shown in the picture below).

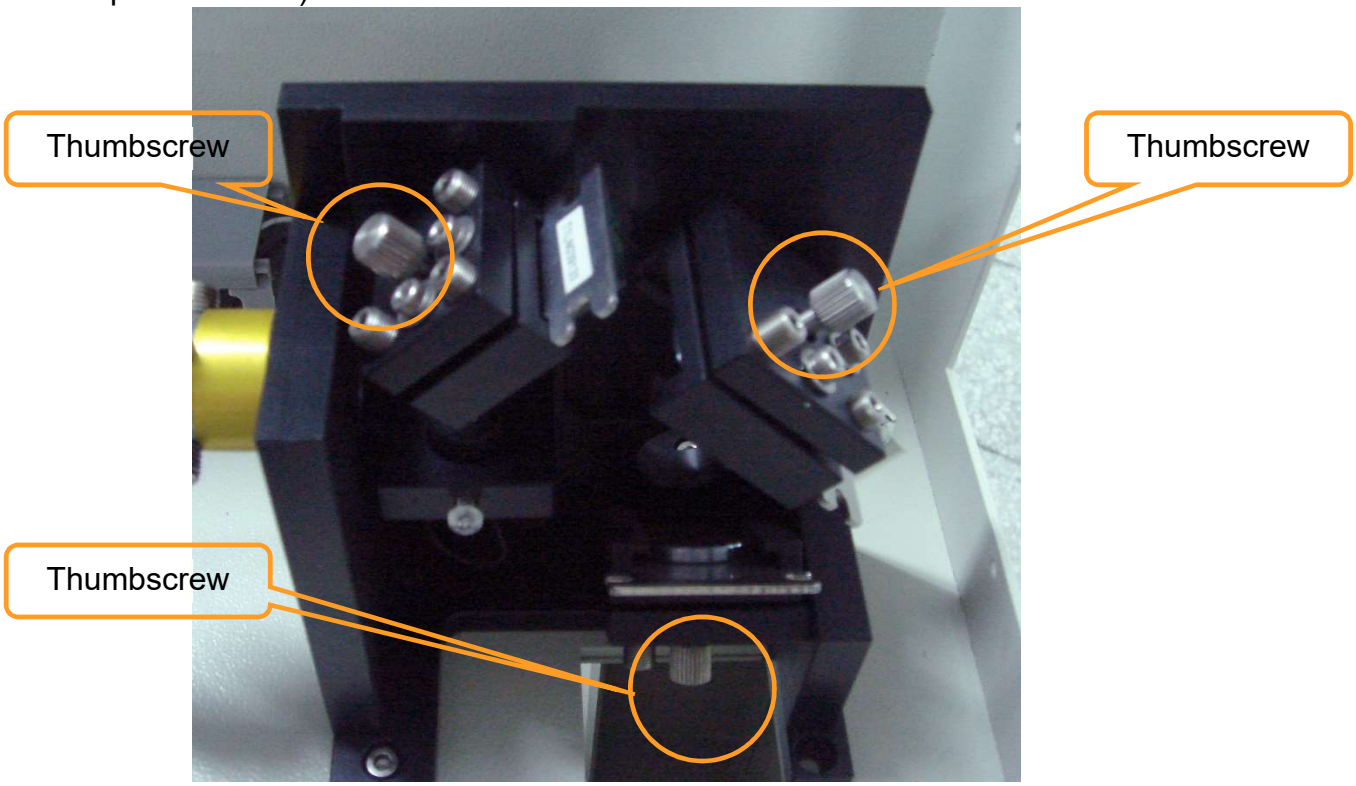



3) Clean the lens in the proper manner.
4) Re-install mirror 4 after cleaning.
5) Tighten the top thumbscrew.
6) Reinstall the laser carriage panel and tighten the three thumbscrews.

## MG380 Hybrid

**Mirror 1**
This mirror is located inside the laser cabinet of the LaserPro MG380Hybrid.

1) Use a #2 Phillips Screwdriver to open the rear laser cabinet of the LaserPro MG380Hybrid.
2) Loosen the thumbscrew and remove the dust cover securing the mirror. (As shown in the picture below).




3) Clean the lens in the proper manner.
4) Re-install the mirror after cleaning.
5) Tighten the thumbscrew.
6) Replace and secure the outer access panel.

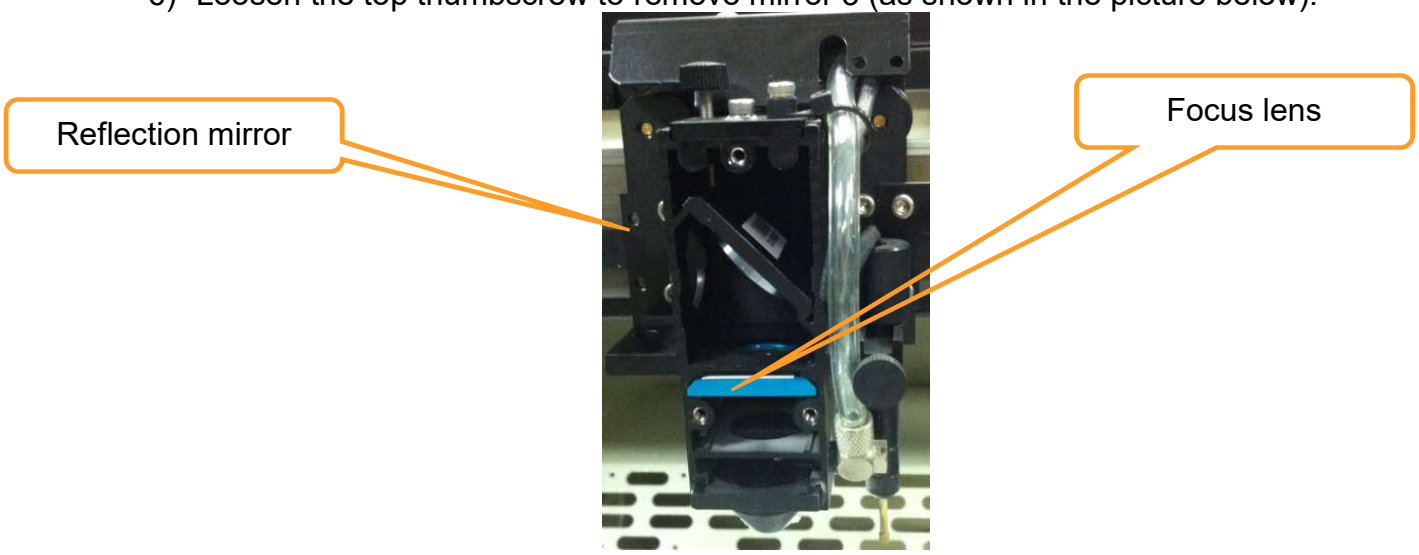
**Mirror 2, 3**
These mirrors are located in the worktable area of the LaserPro MG380Hybrid.

**Mirror 2**

1) Unscrew the thumbscrew holding mirror 2 in place.
2) Clean the lens in the proper manner.
3) Re-install mirror 2 after cleaning.
4) Tighten the thumbscrew.

**Mirror 3**

5) Unscrew the three thumbscrews (front face of the laser head) securing the laser carriage panel and remove the laser carriage panel to reveal mirror 4 and the focal lens.
6) Loosen the top thumbscrew to remove mirror 3 (as shown in the picture below).

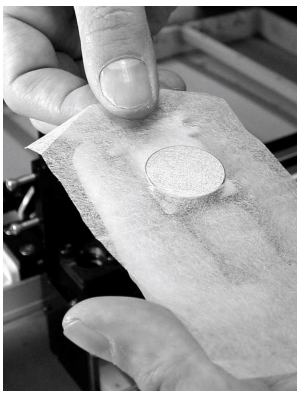



7) Clean the lens in the proper manner.
8) Re-install mirror 3 after cleaning.
9) Tighten the top thumbscrew.
10) Reinstall the laser carriage panel and tighten the three thumbscrews.

8.3.2 Cleaning the Mirrors

After you have removed each mirror, you will want to inspect each mirror for scratches, smoke residue, or debris. If any residue or debris is present, use the following steps to clean the mirror.

1) Hold the mirror with the reflective side up, without touching the reflective side of the mirror (DO NOT apply any finger pressure or any other cleaning solutions to the mirror surface).
2) Drape a new sheet of lens tissue over the mirror.
3) Apply a few drops of lens cleaner on the tissue covered mirror (apply enough so that the tissue absorbs just enough to cover the mirror surface).
4) Pull the tissue across the mirror in only one direction.
5) Repeat the cleaning processes if the mirror is not completely clean after the first attempt.
6) Make sure that the mirror is completely dry before reinstalling it.

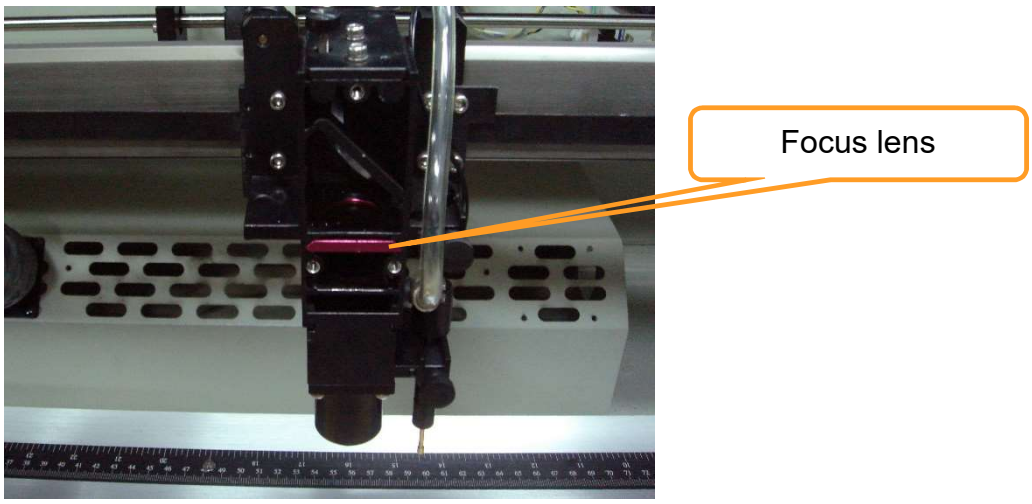


**CAUTION**

- If the center of the mirror is scratched, contact your LaserPro X252RX & X380RX dealer for a replacement.

### 8.3.3 Removing and Cleaning the Focal Lens

1) Unscrew the three thumbscrews (front face of the laser head) securing the laser carriage panel and remove the laser carriage panel to reveal the focal lens.
2) Carefully pull out the focal lens (as indicated in the picture below).

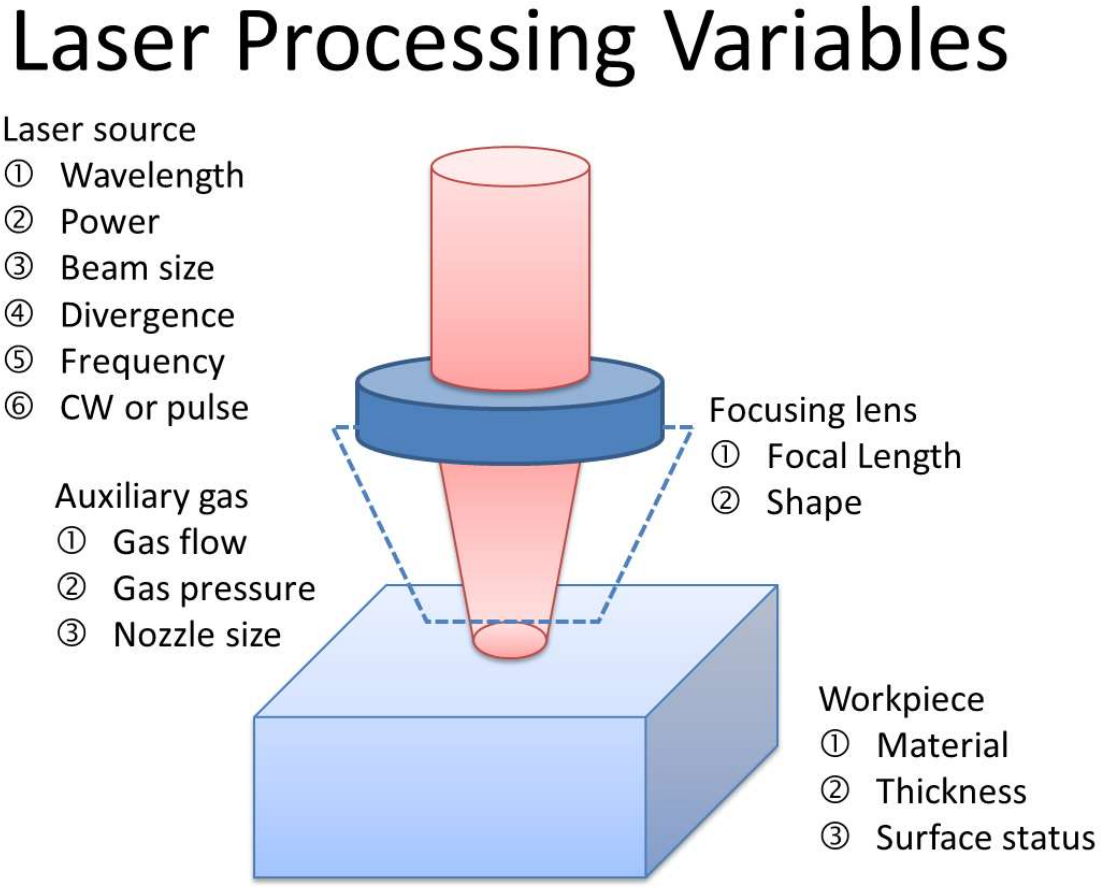



3) Clean the focal lens with a cotton swab and lens cleaner solution. Be sure to clean both sides of the focal lens (DO NOT apply any finger pressure or other cleaning solutions to the lens surface).
4) After cleaning, use a cotton swab to gently dry the focal lens and lens cover.

# Chapter 9 Q&A

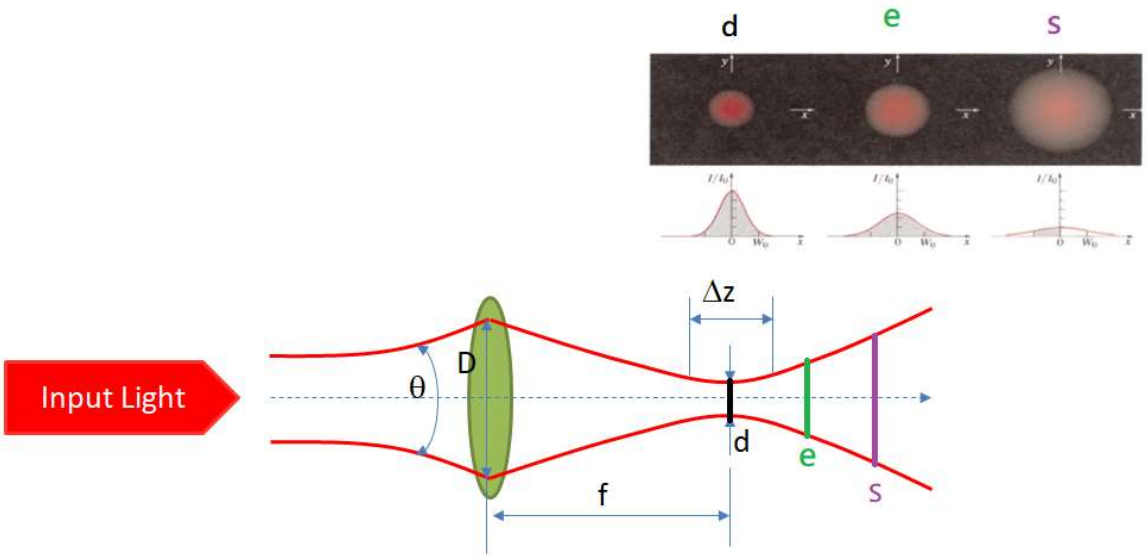
9.1 For laser machines, what factors affect cutting throughput?

Explain: many factors will affect cutting throughput. See “Laser Processing Variables” image below.



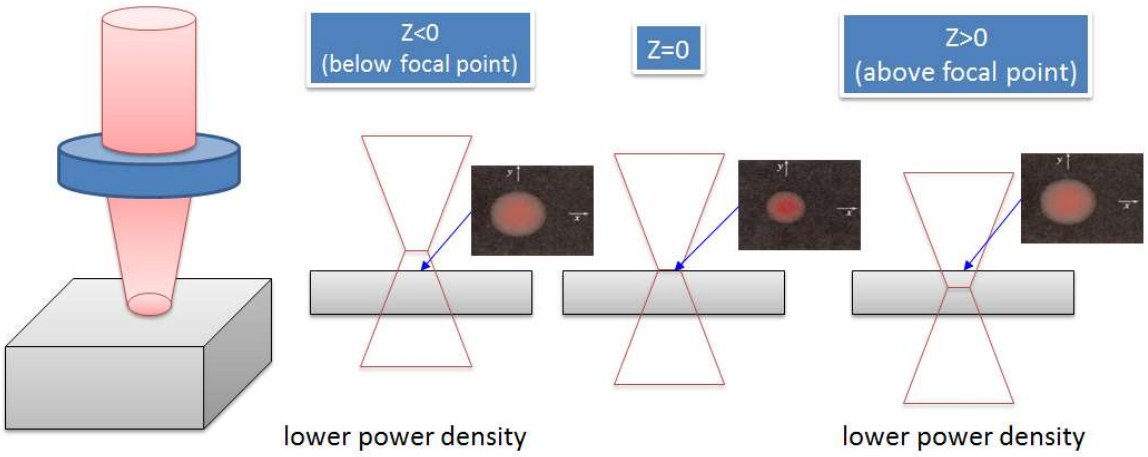

For laser machine users, the major factor that user can control is focusing distance. The correct focusing point will have highest power density. If the focusing point is not on the correct focus point, the power density will be lower and the laser beam will be bigger. See “Laser Optics (Focusing lens)” image below: The correct focus point is the position of “d” (the black text and black line below). When the focus distance move to the position of “e” (the green text and green line below), the power density will be lower and the beam size will be bigger. If the focus distance move more to the position of “s” (the purple text and purple line below), the power density will be even lower and the beam size will be much bigger.

# Laser Optics (Focusing lens)



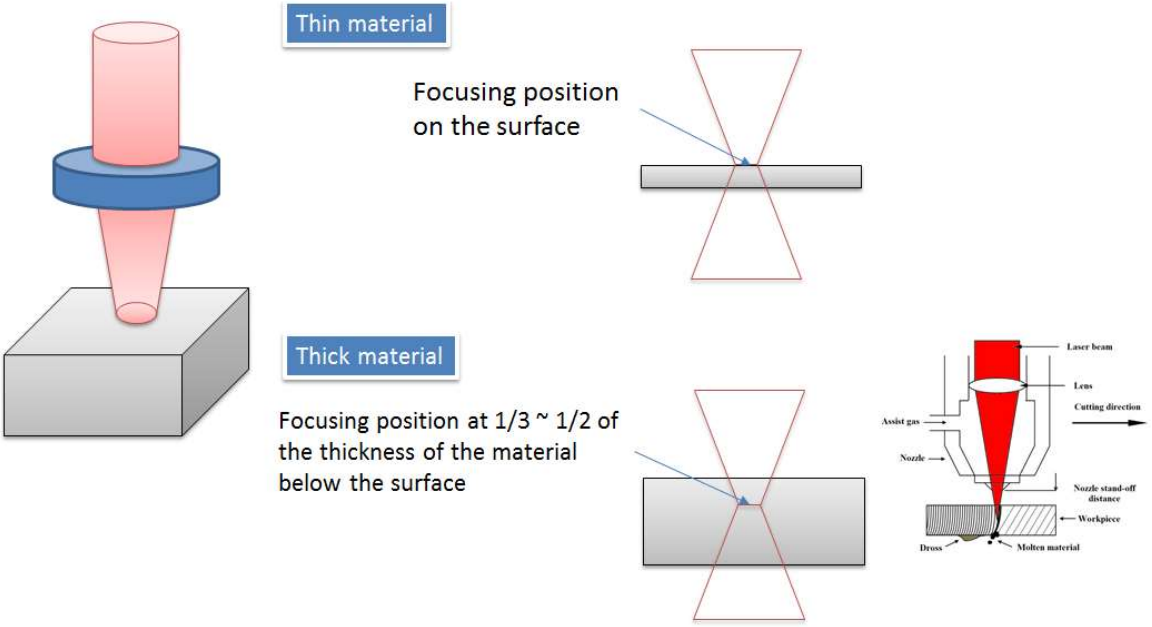

From the following picture, right focusing position will provide the maximum power density for laser cutting.

## Different Focusing Positions



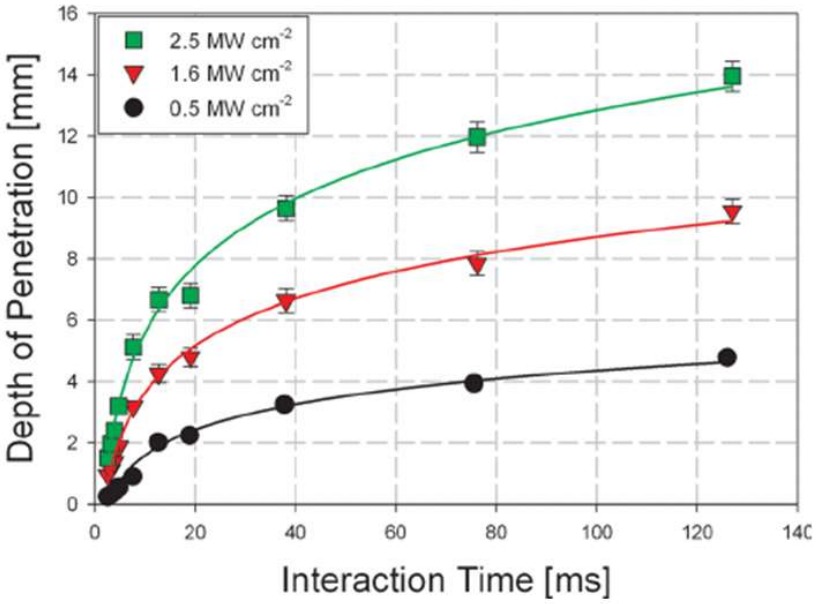

About different thicknesses of materials, it needs to take different focusing positions for cutting. In general, focusing position is right on the surface for the thin materials. However, in order to get the better cutting quality for thick materials, adjusting the focusing position to 1/3~1/2 of thickness of the material below the surface makes the material cover with high power density range during cutting processing and it makes the better cutting quality.

# Different Focusing Positions for Different Thicknesses of Materials




For the relationship of cutting throughput and the power density, there is a lot of information we can find from Internet. One of the good examples is the “Laser-Material Interaction” image below:

# Laser-Material Interaction




Ref:
https://www.researchgate.net/figure/Depth-of-penetration-as-a-function-of-power-density-and-interaction-time-for-a-beam_fig3_252017073

9.2 When cutting thick material (10mm acrylic for example), why the cutting edge is slant?

**Explain: The problem is that the laser beam path does not pass through the center of focus lens. It's conventional to see some slant in the thick material cutting because of the mechanical accuracy and the lens focuses in then out. Please refer to the diagram below. If the Slant is very serious, please refer to "Optical Alignment" in the maintenance manual to improve the situation.**