This equipment has been designed in accordance with safety standards CEI EN 61010-1 and CEI EN 60825-1 to prevent injury to the operator if used correctly and properly. However, no engineering design can make sure this device if it is not used and maintained with due care and in compliance with the rules. This manual should be read carefully and in its entirety before performing any operation. Failure to follow the instructions and safety precautions can result in damage to the operator or the equipment.
LASER Welding Equipment with Touch Screen

Series

GENERAL WARRANTY TERMS AND CONDITIONS

All rights are reserved. Neither part of this editing can be reproduced in form, recorded onto informatics systems or transmitted in whatever forms or means, electronic, mechanic, photocopying, recording or others if not a previously written consent is given by Orotig Srl. All hereafter information pertains the LASER model XXS-EVO ONLY. Orotig Srl is not liable if these instructions are used about other LASER welding units.

Orotig Srl and its associates are not liable neither towards the purchaser of this product nor third parties for damages, losses, costs or expenses borne or caused to the purchaser or related third parties because of: accidents, misuse or abuse of this product or modifications, repairs or alterations not authorized by written or missing to strictly observe the operating and maintenance instructions given by Orotig Srl.

Orotig Srl is not liable for damages or problems caused using consumables either not provided originally by Orotig nor approved by Orotig.

The Manufacturer guarantees the absence of defects in the new equipment from factory, taking into the account the actual technology state, for the period of one year from the delivery date indicated in the formal delivery note. As per the temporal limit above stated, this warranty is extended to other original accessories, components and parts not manufacture by OROTIG S.r.l., except for light bulbs, fuses and all the consumables. The Manufacturer would either repair or change found defective parts at its own discretion and per the technical feasibility. Once agreed and accepted to act under these General Warranty Terms and Conditions, the Manufacturer will carry with the cost of any intervention. OROTIG S.r.l. will change those equipment parts and/or pieces with material or manufacturing defects and/or those been consequently damaged by the faulty ones. Parts and pieces exchanged by OROTIG S.r.l. will become of its property. The warranty time limit for parts and/or pieces changed under warranty by OROTIG S.r.l. will match the expiration of the warranty time of the original equipment to which they pertain to.

ANY INTERVENTION WILL BE MADE AT OROTIG'S OWN FACILITIES. IT IS STRONGLY ADVISED TO KEEP SAFELY THE ORIGINAL PACKAGING FOR ANY EVENTUAL FUTURE SHIPPING BACK OF THE EQUIPMENT.

There shall be no warranty when the malfunctioning is due to the following:

- The Purchaser has not notified, by writing or by placing a firmly intervention/change order, the malfunctions/defects to the manufacturer within eight (8) days from the equipment delivery date as indicated in the formal delivery note;
- The equipment or its parts have been used improperly or for a different purpose they were built to;
- The equipment or its parts have been previously set for repair by someone else but OROTIG or without the latter expressed authorization;
- The equipment has been assembled with parts and pieces whose use had not been approved/authorized by OROTIG S.r.l. or either the equipment or parts and pieces have been modified without OROTIG S.r.l. expressed authorization;
- Instructions concerning equipment operations and maintenance procedures were not accordingly followed as specified in the Operator’s Manual.
- There is evidence of opening of covering panels and warranty label is broken as well.
- There are also out of warranty all faults, manufacturing defects and damages caused by the normal and standard use of the equipment, parts and components and/or due to natural causes or events.
- When equipment is returned to OROTIG S.r.l. facilities for any ordinary or extraordinary maintenance/services, OROTIG S.r.l. shall NOT be deemed responsible for damages occurred during its transportation if the equipment is not travelling inside its original packaging.

Out of these General Warranty Terms and Conditions, it is expressly stated that the Purchaser can never resolve this contract.

OROTIG S.r.l. will carry with the cost of eliminating any defect found during the warranty period, accordingly to the herein stated General Warranty Terms and Conditions.

The Acknowledgement of this Warranty shall never entitle to demand for losses of any nature.

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Technical data

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<th></th>
<th>Evo 30</th>
<th>Evo 60</th>
<th>Evo 100</th>
<th>Evo 125</th>
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<tr>
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<td>1-ph, 230 VAC ± 10%, 50/60Hz, 6 A</td>
<td>1-ph, 115-230 VAC±10%, 50/60Hz, 16 A</td>
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<td>Spot Size</td>
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<td>Stereomicroscope</td>
<td>10X at 45° binoculars and cross-hair by Leica</td>
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<td>Pulse-Shaping programs</td>
<td>5 preset</td>
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<td>Programmable Memory-cells</td>
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<td>52 x 68 x 34 cm</td>
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**EVO series unique features:**

- All models can be supplied, upon request, with a built-in system: integrated camera + display (OBC system). Further this OBC system is available in Wi-Fi mode, always upon request (OBC/Wi-Fi).
- All OBC models have an additional analogue video composite PAL output, on this output you can connect a video-grabber to acquire images in digital mode on PC’s.
- Lighting can be fitted both with the standard dichroic lamps and the special cold-light LEDs for better efficiency and brightness.
- As further improvement, a patented spotlight system, coaxial to the LASER beam aperture, to get rid of, once for all, unpleasant shadow effects and enhance the overall brightness.
- All models are available with single or double hand-entry variant.

The equipment has been built per dispositions contained in European Directives 89/336/EEC and 73/23/EEC, modified by Directives 2004/108/EC and 2006/95/EC for the legal apposition of the CE mark.

Reference Standards:

**EN60825-1**  Safety of laser products
- Part1: Equipment classification and requirements

**EN61326-1**  Electrical equipment for measurement, control and laboratory use EMC requirements. Part 1: General requirements

**EN61010-1**  Safety for electrical equipment for measurement, control and laboratory use.
Safety Warnings

Read carefully this User Manual before operating the equipment; the improper use of this equipment can be hazardous to health and affect the proper functioning of the device itself.

LASER-WELDING CAN BE HAZARDOUS:
Protect yourself and others from possible serious injury or death: Keep children away:
Pacemaker wearers keep away until consulting the doctor.
During LASER-welding, as in most jobs, exposure to certain hazards may occur. The risk of any LASER-welding operation is mostly limited to the manipulation by hand of work-pieces inside the welding-chamber for both the heat and/or the LASER-beam presence. LASER-welding is safe when precautions are taken; that’s why the equipment must be used only by authorized, well trained and skilled operators ONLY.
HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORKS PERFORMED ONLY BY VERY QUALIFIED AND TRAINED PERSONNEL.

ELECTRIC SHOCK CAN KILL:
Touching live electric parts can cause fatal shocks and severe burns. Incorrectly installed or improperly grounded equipment is hazardous.
• Do not touch live electric parts.
• Turn off power source and disconnect input power before installing or servicing the LASER-welding equipment.
• Install and ground properly this LASER-welding equipment according to the Operator’s Manual and European, National, Regional and Local codes.
• Turn off the equipment when not in use.
• Do not use worn, damaged, undersized or poorly spliced cables.
• Do not wrap cables around your body.
• Use only well-maintained equipment; repair or replace damaged parts at once.
Keep all panels and covers securely in place.

FUMES AND GASES CAN BE HAZARDOUS TO THE HEALTH:
LASER-welding may produce fumes and gases; breathing them can be hazardous.
• Keep your head out of the fumes; do not breathe them.
• Ventilate the area and/or use exhaust to remove welding fumes and gases.
• Read the manufacturer’s instructions for metals, consumables, coatings, cleaners and shielding inert gas characteristics.
• Work in a wide space specifically provided for the working of this equipment. If the confined space is a reduced room, be sure it is adequately ventilated. Shielding gases used for LASER-welding can displace air causing injury or death; be sure the breathing air is safe.
• Do not LASER-weld in locations near degreasing, cleaning or spraying operations. The heat and the radiation can react with vapours forming highly toxic and irritating gases. Verify metals have no impurities so when LASER-welded cannot react by forming highly toxic and irritating gases.

GAS-CYLINDER CAN EXPLODE IF DAMAGED:
Shielding inert-gas cylinders contain gas under high pressure. If damaged, a cylinder can explode.
• Protect compressed gas cylinders from excessive heat and mechanical shocks and LASER rays.
• Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent them from falling or tipping.
• Keep cylinders away from any welding and/or other electrical circuits.
• Use only correct shielding inert gas cylinders, regulators, hoses, and fitting designed for the specific application; maintain them and associated parts in good conditions.
• Turn face away from valve outlet when opening cylinder valve.
• Keep protective cap in place over valve except when cylinder is in use or connected for use.
WARNING! Read and follow specific instructions and Safety Standards on compressed gas cylinders and the associated equipment.

LASER-WELDING CAN CAUSE FIRE OR EXPLOSIONS:
Sparks and weld spatter as well as hot metals, work-pieces, and equipment can cause fires and burns. Accidental contact of LASER-beam to compressed gas-cylinder can cause explosion.

- Protect your hands from sparks and hot metal by wearing gloves made from durable, approved, flame-resistant material. never LASER-weld where flammable materials can be fired up by sparks.
- Remove all flammables close to the LASER-welding equipment; were this impossible, protect and cover them accurately with approved flame-resistant clothing.

Watch for fire and keep a fire extinguisher nearby.

LASER-RADIATION CAN BE DANGEROUS:
LASER-rays from LASER-welding operations produce very intensive heat which can burn the skin and strong LASER- and ultraviolet-radiation can perhaps injure eye’s retina.

- Never introduce mirrors or very reflecting surfaces inside the welding-chamber with the unit ready to LASER-shoot.
- Look at the pieces being welded through the front inspection window ONLY.
- Never remove for any possible reason leather curtains from hands’ accesses.
- Keep off kids from working room.

It is advisable to protect operator’s hands by wearing adequate and certified working gloves.

To protect the global environment and as an environment, OROTIG Srl must remember you that Under the European Union (“EU”) Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of “electrical and electronic equipment” cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. OROTIG Srl will comply with the product take back requirements at the end of life of OROTIG Srl-branded products that are sold into EU. You can return these products to local collection points.

Use foreseen for the equipment
Use the equipment to weld specific metal alloys. Only the following alloys can be welded:

- Gold
- Palladium
- Chromium Cobalt (CrCo)
- Silver
- Titanium
- Platinum
- Steel

The above listed metals alloys that don’t contain any of the listed metal between the “not foreseen Use”

It is advised to use only gas Argon for the products protection to weld. Use only Orotig Srl parts and consumables. For assistance, contact Orotig service department. Once worn the consumption parts must be changed. Follow all prescriptions and safety rules described in the standards ANSI Z136,1 IEC 60825-1 (section user), OSHA and this user manual. Follow the maintenance memorandum book (see the maintenance section, and the maintenance check list)

Not foreseen uses
Don’t modify the equipment. Don’t weld metals or alloys that include one of the following materials: Beryllium, Uranium, Plutonium, Cadmium, Magnesium, Sodium, Potassium, Mercury, Lead , Arsenic
Don’t use toxic gas or combustibles as: Oxygen, Hydrogen, Fluorine, Chlorine, Any form of hydrocarbon gas. Any Hydrogen and Nitrogen mixture.

Don’t use Nitrogen when you are welding Titanium. Don’t put inflammable material along the LASER bundle run. Don’t use toxic materials or that emit explosive gas. Don’t fasten the LASER bundle without the protection glasses. Don’t leave human clothes along the LASER bundle run. Don’t introduce living organisms or dead (as animals) in the LASER bundle. Don’t use the LASER welder to heat the food. Don’t use the LASER welder to dry clothes and materials in general.
Safety Labels Positioning

1. Emergency Button: if pressed, it disconnects the mains from the device.

2. Aperture label (ETI00129): **LASER APERTURE**, this label indicates the LASER beam output spot.

3. LASER Radiation Specifications label (ETI00175/176/250/256 depends on chosen model): This label provides info as for the LASER beam radiation specifications, among which:
   - The maximum output of LASER radiation (E)
   - The emitted wavelength (λ)
   - The pulse duration (t)
   - The average power (P)
It states also the referencing law as for LASER devices safety.

4. Warning label (ETI00131): **INVISIBLE LASER RADIATION. AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION. CLASS IV LASER PRODUCT.**
   This label underlines the danger deriving from the misuse of this LASER device equipped with a LASER generator classified as CLASS IV as for the output power.

The safety devices present on the equipment are:
- Protective glass LASER radiation KG3, under the microscope
- Leather stripes curtains protecting the welding chamber access
- Radiation protection glass on the LASER inspection windows
- Emergency button
- Remote interlock connector
- Blinking LASER emission symbol on the display when machine is ready to emit LASER radiation
- PIN code to avoid the equipment’s use by unauthorized personnel
Check the package contents

Inside the package you will find those items:

1. Laser Welding equipment LASER XXS EVO
2. Plastic cone for Argon output (LE100100)
3. INOX metal plate 20x30 thick 1,5 (LXA10001)
   INOX wire Ø 0.3mm (LXA10002)
4. Protective glass AF45 @ 1064 nm D. 40 1 mm (ATE00018)
5. Hex key LTS 2,5 (GAL01000)
6. Microscope oculars
7. Bi-distilled water (available only if the shipping period is in winter time)
8. Syringe for liquid refill C/Cat 50x50 (LXA10004)
9. RL 3/8 – 4 FOX adapters for air/argon (MWW00214)
10. Support gig (D2116466)
12. Rilsan blue tube Ø8x6 (MWW00703)
13. Power cord
14. Footswitch pedal
Locate the parts

1. Stereo-microscope.
2. Inspection window with 1064 nm LASER ray filter.
3. Working chamber access doors.
4. Display with touch-screen for user setup parameters.
5. OBC display (optional)
6. Back connection (see paragraph)
7. Radiator cooling, no cover this, leave at least 5cm of free space between the rear side and the wall.
8. Water level, for the proper equipment functioning, the cooling level must always reach the MAX. Use bi-distilled water ONLY for refilling/filling up.

Back connection

Connection for EVO 30 only
1. Resettable fuses
2. Power outlet
3. Main switch
4. Shielding gas input

Connection for 60,100 and 125 versions
5. Air compressed input, if provided
6. Foot switch connector
7. Remote interlock
8. Video composite output (only on OBC models)

The composite video connection is PAL standard analogue (75 Ω 1Vpp).

WARNING! Always refer to the operating voltage indicated near the power socket, before plug the equipment verifies the electrical conditions.
Inside welding chamber

1. Dichroic lamp (20W 12VAC)
2. SPOT diameter regulator
3. Dimmer for lamp
4. Joystick for setting the working parameters
5. Exhaust smoke filter
6. Plastic cone for Argon output
7. USB starting key
8. Nozzle for air
9. New bright LED illumination system
10. LED lights version and unique input for Air/Protection Gas

Camera Display (only for version OBC and OBC/Wi-Fi)

All EVO Series equipment's either with OBC and OBC/Wi-Fi have a camera set directly under the left eyetube of the microscope and a high-res TFT display.

To set the display parameters as Colour, Brightness, Contrast, etc., there are 3 switch:

1. This switch decrease the parameter or move the menu downwards
2. This switch enter the menu and selects parameters
3. This switch increase the parameter or move the menu upwards
Using the dispenser Air/Gas Protection

All devices are equipped with:
1. A pipe jointed to the orientation of the air or protective gas.
2. A door with glass door cone.
3. A glass door without paying.

If you wish, you can use one system or the other for the 'supply of shielding gas or air cooling. The output of the gas / air is controlled by a solenoid valve, which is activated by depressing the pedal if the "GAS" on the display is set to a value other than 0 (see section "Working Session").

The inlet pressure must not exceed 4 bar. Do not connect pressure higher than the maximum allowed as this may damage the solenoid valve.

The configuration is recommended for welding titanium, cobalt chromium and steels in general. The recommended pressure for use with protective gas (argon) is 0.1 / 0.2 bar, a soft blow is sufficient for the protection of articles made of titanium, cobalt chromium and steels in general. Use the special transparent cone inserted in the cone holder for conveying the flow at the point of welding, as shown in Figure 1.

Figure 1 – Example of use of the door slide door with cone

This configuration is recommended for welding objects in Silver or Gold is advisable to connect compressed air (up to 4 bar) to cool the metal during welding prolonged. (See Figures 1 and 2).
Warning and starting the equipment

Warning about location

When positioning the LASER welding unit XXS EVO take care of the following:

- Lay the equipment on a sturdy flat surface exceeding the equipment’s footprint on all sides. Place it against the wall but leaving at least 10 cm between the rear side and the same wall.
- Leave all around the equipment enough space to allow an adequate ventilation.
- Avoid keeping the equipment in places subject to sudden temperature and humidity variations. Keep off from straight sunrays, strong light sources or heat sources.
- Avoid keeping the LASER welding unit nearby equipment’s producing humidity, dust or heat (sandblasters, steamers, electro-erosion, ovens etc. etc.).
- While storing the equipment inside its own packaging, do not tilt it, put vertical nor turn upside down, otherwise water leakage is possible.
- Place the equipment near a plug socket easy to detach, if needed.

Precaution when using the equipment

When using the LASER welding equipment have in mind what follows

- NEVER slip into any openings present on the equipment case objects of whatever kind.
- Pay attention not to pour liquids on the LASER welding equipment.
- Always stop operating, after each working session, the equipment by means of the “Stop” key button on the touch-screen display. Only after having switched it off, power it off by means of the main switch on the back.
- Inside the welding chamber are there two dichroic bulb lamps. Pay attention because they become hot.

Foot switch and power cord connections

- Please verify the electric requirements of your electric line before installing the equipment; check the data sheet stuck on the back of the equipment for more information.

**WARNING!** Make sure that the mains plug is of the appropriate type (Schuko model); the equipment absorption is 16A at 110VAC.

- Insert, now, the foot switch cable into the serial port and tighten it by means of the provided screws. Then power on the equipment with the main switch.

**ATTENTION!** If the equipment shouldn’t start up, check if fuses are fine and in case reset it/them if required.

- On display a welcoming screen will appear.

**ATTENTION!** At the start up, if the USB key is not well fitted, the warning message number 4 is displayed and it’s not possible to save session parameters on it, check and refit the USB key and turn on the machine again.

- After the welcome screen, if everything is working properly, you are asked to enter PIN code to start up. The PIN code set by default in the factory is 0000.

**WARNING!** It’s advisable to change the default PIN code after the first use of the equipment; refer to the proper section of this manual for further instruction. Do not DISABLE the PIN access code, to keep safe the machine and avoid its use by unskilled/unauthorized operators.
**Set-up the microscope oculars**

Remove the caps protecting the Stereo microscope, and store them in a safe place. Now slip in the oculars and tighten them by means of the small provided screw.

**ATTENTION!** Only one of the two oculars own the crosshair for targeting the delivery point. This is usually in the right eye ocular, but it can be easily swapped.

It’s also possible to adjust the lack of dioptre; once set the oculars on” zero” turn rightwards or leftwards to find the proper settings for the operator’s eyes. Please check the scale marked on each ocular.

**ATTENTION!** Store the packages an all internal parts for next uses.

**Wi-Fi connection PC/LASER equipment (only for model OBC/Wi-Fi)**

Refer to the step by step instruction attached to this manual for setting the PC parameters.

**ATTENTION!** For all models provided with OBC or OBC/Wi-Fi it is possible to connect a Video Grabber system to the analogue video composite output (available in all hardware stores worldwide); it’s meant to record the welding sessions.
Removable front door LAC00904

All big-Evo family welders can have removable LAC00904 front door in place of protective tendons. Removing the door favours the insertion of voluminous objects but prevents it from working with the laser welding machine, a warning message is displayed until the door is restored to the safe position.

Detail of the door when removed (LAC00904).

Note the pressure points for removing and inserting the hatch.

Detail of the removed door, to note the metal lip where the door fits

Insert the door into place and fit it between the plastic and the metal lip

Machine with door positioned and ready to work.
Use of the welding LASER equipment

This paragraph explains how to use and the meaning of each menu/screen loaded into the LASER welding unit.

Stand-by

Immediately after the introductory screen, the LASER runs into the Stand-by mode and the following main menu screen is displayed. The Information Bar above makes aware the operator about the actual running mode (Stand-by, Ready, etc. ...), the date and time, the coolant temperature etc. ...
Menu OPTIONS

The Key Field Options leads into the first of the 2 screen pages of this menu:

- Key field for entering the Language setting menu
- Key field for entering the LASER Information menu
- Key field for entering the LASER Shot Counter menu
- Key field for scrolling pages
- Key field for going back to the main screen
- Key field for entering the Language setting menu
- Key field for entering the Timeout settings menu, either for the Display and LASER
- Key field for entering the menu enabling the setting of the PIN code
- Key field for entering the Water Flux menu
- Key field for entering the Gas setting menu (Gas release when pressing the Pedal)
- Key field for entering the FW-upgrading menu. By means of USB Pen-Drive
- Key field for entering the Service menu, only for authorized personnel
- Key field for set Date and Time. Through this button, you can set the time on the displayed in stand-by screen

Press the key field \(\downarrow\) go forward to the next Options screen page:

- Key field for entering the Pre-Gas menu
- Key field for entering the Service menu
- Key field for entering the FW. Upgrade menu
- Key field for entering the Date and Time menu

Press the key field \(\uparrow\) to go back to the previous Options screen page. Press the key field \(\leftarrow\) for returning to the main screen.
Menu LANGUAGE

From this selection you can change the language that shows the menu.

Menu INFO

In this screen, all information regarding the device are displayed, even the last Software version uploaded in the equipment.
Menu Shots Counter

This menu displays the partial and total number of shots so far done by the machine. The partial counter is useful for checking the number of shots done from last assistance made.

Menu Timeout Display and LASER

Ticking Timeout Display: 1min o 5min, when the LASER is in Stand-by mode, will automatically be displayed the Screen Saver after 1 or 5 minutes of inactivity respectively.

Ticking Timeout LASER: 10min, the LASER in Ready mode will restore automatically in the Stand-by mode after 10 minutes of inactivity.
Menu PIN code

By means of this menu is possible to set a log in PIN code to be typed any time at start up of the equipment. This code is enabled by the manufacturer and the default PIN code is 0000.

Choosing the Key field **New PIN** is possible to change/save the PIN code by means of the Touch-screen keyboard as explained hereinafter. First of all the old PIN code must be entered:

Once typed the old PIN code press **OK**. Only if correct the operator will be asked to enter the new PIN code (New 1):

Type the New PIN code and press **OK**. Now the operator will be asked to re-enter such code (New 2) for confirmation.

Type again the New PIN and press **OK**, if all procedure has been stored and saved automatically will be redirected to the Menu **PIN code**.

**WARNING!** Disabling the PIN code can lead to an improper use of the device, by unauthorized/unskilled personnel, the manufacturer declines any responsibility in case of improper use of the equipment by disabling the PIN code.
Menu H2O Pump and cooling system check:

This is for checking the proper cooling system functioning. Press the Key field ON for priming the pump and verify on indicator the refrigerant flux (L/min). If working properly after few seconds, the needle gets position within the green area (flux over 4 litres per minute)
In the case of low flux (needle on the yellow or even worst red area), check the refrigerant level, add some more refrigerant liquid into the reservoir or replace it completely.

Menu Pre-Gas setting

By means of this menu the operator can set when enabling the electro valve opening. The electro valve rules the shielding GAS flow and accordingly when into the menu OFF is ticked, the electro valve gets open together with the first shot when pressing the foot-switch; instead when ON is ticked only the electro valve gets open by pressing the foot-switch once, then the foot-switch must be released and pressed twice for starting shooting (Pre-Gas enabled).
Menu Firmware Upgrading

By means of this menu and the USB Pen-drive it’s possible to update the LASER firmware. Remove the Pen-drive from the welding chamber, connect it into a PC for copying the updating file XXSEvoFW.hex (Important!! The file name must be compulsorily the indicated one); remove now the USB pen-drive and connect it at the LASER; now go to the FW Upgrade menu.

Press the Key field **Upgrade**: On display appears the notice making aware not to detach the Power Supply because the Upgrading is running.

After a few seconds the screen becomes completely white and so lasts for around 30 seconds until the upgrading is over. When the Upgrade is ended up the main screen is displayed and the operator now can start working as usual. To verify the Firmware edition updating, simply go into the menu **Info**.
Menu Service

**WARNING!** This menu is protected by Password and can be used ONLY by authorized personnel for the equipment’s service.

Menu Time
From this screen menu, you can set the time displayed on the stand-by screen.

![Time Setting Menu Diagram](image)

- **Hour setting**
- **Minute setting**
- **Increase the selected parameter**
- **Decrease the selected parameter**
- **Return to the previous menu**
- **Confirm modification**
Working session

When in Stand-by mode press the Key field START for starting the working session. Below in the middle appears a clepsydra meaning “wait” because are running checks for starting working.

Once completed this phase the LASER is now Ready and appears the next screen:

The Key fields **Power, Time, Freq, Spot, Wave form, Post-Gas, + and –** are all selectable via Touch-screen and through the Joy-stick, located inside the welding chamber, as well. When selected all above Key fields turn into an orange color.

The Key field for **recalling/saving** the settings and for **switching off** the LASER are selectable only by Touch-screen.
The **Spot** size can be changed only by means of the lever located on the left, inside of the welding chamber.

**Welding parameters:**
- **Power:** The minimum settable power of the LASER pulse is **0.5kW** and can go up to a maximum of **4kW**, in steps of **0.1kW**.
- **Time:** The LASER pulse duration starts from a minimum of **0.5mS** up to a maximum of **15mS**, in steps of **0.1mS** up to reaching **10mS** and **of 1mS** from **10mS** up to **15mS**.
- **Freq:** The LASER pulse frequency starts from a minimum of **0.0Hz** (Single Pulse for each foot-switch pressing) up to a maximum of **15Hz** in steps of **0.5Hz** up to reaching **1Hz** and **of 1Hz** up to **15Hz**.
- **Wave Forms:** It is possible to select the following wave forms of the LASER pulse.

- **Post-Gas:** The post-gas duration starts from a minimum of **0 seconds** (No post-gas) up to a maximum of **9 seconds** in steps of 3 seconds.
- **Spot:** The spot size can be changed per the following 9 steps: **0.3mm 0.4mm 0.6mm 0.7mm 0.9mm 1.00mm 1.2mm 1.3mm 1.5mm**. The box of the spot welding is green when the present value equals the value stored in the program selected, and flashes when this does not match. This function is useful for storing values of spots on program on the program is inked thereafter.

**How to save/store the working parameters**

Once found the proper parameters per each specific welding task, can be saved into a customizable settings program.

Press the Key-field **to enter the Menu Load/Save**, you can save up to 16 programs within the machine (ROM) and 16 in the USB stick, the support is selected via the button "Media".

Press the Key fields **to go forward/backward to the next/previous page of the Menu Load/Save:**
Press the Key field \[←\] to go back without acting (no programs are loaded nor saved)

**How to proceed for saving the parameters**
Once found the proper parameters per each specific welding task (e.g. for welding silver) follow the instructions below for storing/saving the parameters:

Press the Key field \[←\] to go back without acting (no programs are loaded nor saved). Press the Key field \[\rightarrow\] to go forward and find a program cell to store the proper parameters. Then press the Key field \[→\] to go back to the name field. Choose the memory cell where store into, for instance, Program1, press the Key field \[→\] to go forward to the name field. Press the Key field \[\rightarrow\] to go back to the name field for saving the settings into the cell. Press now the Key field \[\rightarrow\] and \[→\] to get access the Touch Screen Keyboard and so type the desired program Name:

**Example of USB storage/retrieve page**

**Press the Key field \[←\] to go back without acting (no programs are loaded nor saved)**

**How to proceed for saving the parameters**
Once found the proper parameters per each specific welding task (e.g. for welding silver) follow the instructions below for storing/saving the parameters:

Press the Key field \[←\] to go back without acting (no programs are loaded nor saved). Press the Key field \[→\] to go forward and find a program cell to store the proper parameters. Then press the Key field \[→\] to go back to the name field. Choose the memory cell where store into, for instance, Program1, press the Key field \[→\] to go forward to the name field. Press the Key field \[→\] and \[→\] to get access the Touch Screen Keyboard and so type the desired program Name:

Type the name by means of the Keyboard and press the Key field OK to confirm, or the Key field to quit without saving. Press the Key field and the name Program1 will be replaced by the new name typed (“Argento” in this case). For recalling this program and so having the unit set with this working parameters, simply press the Key field.
Maintenance

**WARNING!** Maintenance and all the operations listed in this chapter are dependent on the User, and **MUST BE CARRIED OUT WHILE HAVING THE EQUIPMENT TURNED OFF TOGETHER WITH THE POWER CORD DISCONNECTED.**

**WARNING!** It could be DANGEROUS to have the equipment serviced while it is turned on and ready to shot!!!

Check out the Schott protecting glass giving visual accesses to the welding chamber as well as the related leather curtains daily: call for service if they need to be replaced. It is DANGEROUS to eyes to inspect the welding chamber having the Schott protecting glass broken or without the leather curtains!

Check out the state and integrity of the safety and manufacturer labels every six months: call for service if they are faded or no longer readable.

**Cooling liquid**
The equipment is provided of a cooling system working with bi-distilled water. The water shall be replaced at least every 12 months to avoid having algae or limestone, which along time may deposit in the cooling pipes or in the LASER pool cavity.

Open up the rear pipes seat and pull out the 2 pipe caps. Pour the water (around 2 litres) into a basin.

**Removal of the cooling liquid**
Pull the small pipe located underneath the LASER base, remove the cap (see picture); place the basin under the opened pipe and wait the water tank to be fully emptied (around 2 litres).

**Refilling the cooling liquid**
Use the syringe provided as a standard accessory with the equipment. Insert the syringe with double distilled water into one of pipes (any pipe) und fill up to the level indicated on the panel. The equipment holds roughly 800ml of bi-distilled water. If overfilled the water will drain out from the other pipe.

**WARNING!** Before closing the rear panel, verify the presence of the stoppers on the 2 small tubes.
Replacing the dichroic lamps

The lamps are mounted on supports that do not need tools for their substitution. It is sufficient to pull the lamps out as shown in the figure. Replace the dichroic lamp with one of the same type (12V, 20W).

**WARNING!** Have the equipment turned off and the power cord disconnected before replacing the dichroic lamps. It is DANGEROUS to replace the lamps while having the equipment switched on and ready to shot. Pay attention to the lamps while replacing them: they could be hot!

Cleaning / substitution of air filter

Unscrew the 2 screws black arrowed in the picture; to remove it first push the grid down then pull it out.

Replace the filter when it is very dirty with the same filter type (Code RIC00041).

Replace regularly this filter because when full of dust and dirt may compromise the proper functioning of the equipment.

Substitution of the glass protection mirror

Verify at least once every month the condition of the glass placed inside of the welding chamber (see picture). To remove the glass holder, unscrew the 2 pawls in brass indicated in the picture. In case the glass is dirty by metal drops stuck or damaged, replace it with one new (Code ATE00018).

**WARNING!** If the glass is very dirty or damaged, the power of the equipment can drop even up to 80% compared to standard performances.

Substitution of the components of the patented spotlight system assembly

Verify at least once every month the condition of the glass placed inside the welding chamber. Loose the screw (1) that holds the LED lamp until it comes out from his seat, you can see a gap (blue arrowed) between the LED lamp and the plastic cone holder see arrow.

Loose the 2 captive screws (2) and remove the plastic cone. Check the integrity of the glass (3) clean it or change if it’s damaged or too dirty (Code ATE00018).

During this operation pay attention to the O-Ring placed just over the glass. (4 – Code BON00111)

**WARNING!** If the glass is very dirty or damaged, the power of the equipment can drop even up to 80% compared to standard performances.

Check the status of the black paper cone, change if damaged (5 – Code D2139193). The purpose of such black cone is to avoid a too much brighter intensity of light within the welding chamber, that might trouble the user.
Cleaning and control of the air filter

On the bottom of the machine, there are two water filters; they must be cleaned up every 6 months (Ref.1). To do so, unscrew the fixing screws of the grill and clean up with compressed air.

If the filter is too much dirty or damaged, replace it (Code RIC00040).

Check regularly the carbon active filter and replace it every 6 months. Unscrew the 2 pawls and remove the filter by pulling downwards.

**ATTENTION!** Do not cover the exhausting grids with clothes or other things and leave enough space (at least 10cm) from the rear grid and the wall.

Alignment of the cross hair

**ATTENTION!** Inspect the inside of the welding chamber only through the special window, always keep your hands out of the path of the beam LASER.

When the spot welding does not hit the centre of the crosshairs you can correct it by acting as described below:

Verify the alignment

1. Set the following parameters power 1.0kW, time 1mS, frequency 0Hz and SPOT dimension lowest.
2. Place a piece of flat metal plate on the support gig (D2116466) and make a spot.
3. Verify the position of the spot with respect to the crosshair; if the spot intersects the crosshair in the centre of the realignment is not necessary adjust the alignment.

**ATTENTION!** Be very careful to avoid inadvertently activate the LASER emission during realignment.

With the device in stand-by mode, locate the screws close to the cone slide door as shown in the figure.

Never touch the lives signed three, one placed between the other two screws without a guide. This screw is placed by the manufacturer. Using the 3-mm Allen supplied adjust screws 1 and 2.

- Moving the screw 1 moves the welding point in a horizontal manner.
- Moving the screw 2 moves the welding point in vertical

Acting with small movements and a spot check by the piece of metal the position of the cross. Continue until the target mark coincides with the spot welding.

**ATTENTION!** Inspect the inside of the welding chamber exclusively through the appropriate window, it is good practice to put the equipment in stand-by mode before operating on the adjustment screws.
Troubleshooting

Errors

If any of the below errors appear on display please follow related” Solution”.

Error 1: H2O flux failure

Problem: The flux sensor does not measure the presence of liquid in the cooling system.

Solution: Check out the coolant level
Check out and clean up the water filter
Call for service

Error 2: Cap. Charge fail

Problem: Internal capacitors are not fully charged or not charged at all

Solution: • Check the power line
• Check if there are problems on the power supply electric network
• Check the actual working voltage
• Call for service

Error 3: Simmer failure

Problem: The flash lamp is not ignited (Simmering)

Solution: • Check the shoots made
• Call for service

Error 4: Shutter failure

Problem: The cavity safety fails to close or is malfunctioning

Solution: Call for service

Error 5: RS-232 fail

Problem: The communication between the circuit board inside the machine is not working

Solution: Call for service
Warnings

All the below “Warning” messages are displayed because of external conditions affecting the proper functioning of the equipment and can be solved without switching it off.

**Warning 1: Remote interlock**
Symptom: Remote interlock open
Solution: Close the remote interlock contact to start working again

**Warning 2: H2O too hot**
Symptom: Cooling liquid temperature too high
Solution: Wait until the machine re-starts automatically. (Do not turn the system off!)
If the machine doesn’t start automatically call for the service

**Warning 3: CCPS too hot**
Symptom: Electronics temperature too high
Solution: Wait until the machine re-starts automatically. (Do not turn the system off!)
If the machine doesn’t start automatically call for the service

**WARNING!** Do not place the equipment in a hot environment. An increased ambient temperature reduces the efficiency of the cooling system.

**Warning 4: USB Pen drive not found**
Symptom: The pen drive was not detected in the appropriate housings.
Solution: Check for correct insertion of the pen drive. If the machine doesn’t start automatically call for the service

**Warning 5: Filters Cleaning**
Symptom: Filters placed on the intake vents have reached 300 hours of operation.
Solution: Tap the screen to remove the index and replace the filters on the machine.

**Warning 6: LASER temperature too cold**
Symptom: The temperature of the internal electronics is too low
Solution: Install the equipment in a warmer place, avoid sudden changes in temperature too high. Wait until the device resets automatically, do not turn left on to speed up the process.
If the machine doesn’t start automatically call for the service

**Warning 10: Safety Panel Open**
Symptom: The hatch has been removed or is not inserted correctly
Solution: Replace the door in its seat.