Turn To The Industry Experts

Instruction manual

Lase One

MA-002-L1 REV02

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Dear Customer,

The purpose of this manual is to help you become familiar with the operation and maintenance of your Lase One. Please read the instructions carefully and apply them properly, in order to optimize the operation of your welding unit. Proper handling guarantees reliability, quality and longevity.

The Lase One must be handled only by qualified personnel presenting all the skills required for its operation. The manufacturer disclaims all responsibility for damage resulting from the improper operation of this device.

Before switching on the machine, it's highly recommended to read the "general safety" and "personal protection" sections.

Please keep this manual in a safe place within reach.

CE

The equipments we manufacture comply with all the stipulated requirements for the CE marking, and their manufacturing process complies with the VDE regulations.

For the revisions or interventions associated with the reconditioning of the device, please use only original spare parts. Our customer service is at your disposal with a permanent complete stock of all spare parts for our entire range of equipment, accessories and consumables. Express deliveries are possible worldwide.

The device may be opened (or modified) only by a certified service technician. Non-compliance with this instruction will bring an end to the warranty.

The user's manual must be read and understood before using the device.

Precautions must be taken to avoid any accident. The device may deliver dangerous voltage to the torch, don't touch the electrode with bare hands while the unit is in operation.

Exposure to a thermal danger. Take precautions to avoid the risk of burns. During use, the electrode and the welding point can reach a high temperature.

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SECTION 1 INTRODUCTION

The "Lase One" is the universal microwelding solution. It helps obtain welding results similar to the pulsed YAG laser technology, with a light, easy to use solution which is both low cost and low maintenance.

This unique plasma arc welding unit is the result of mastery completed with power electronics, of transforming energy and welding applications.

Its compact shape, light weight and versatility are some of the most important advantages it has to offer. Its excellent ignition and welding characteristics allow its use in a wide range of applications, both industrial and in the orthodontics, dental prosthesis and fine jewelry fields.

SECTION 2 SCOPE OF APPLICATION

Compliance clause for the operation of the equipment

The Lase One welding unit is **intended for** :

- Performing welding overlay with filler material on ferrous metals, alloy steels, stainless steels, aluminium, bronze, brass and alloys, as well as precious materials.
- Performing connections by spot or beads welds on the same materials as above.
- Performing tricky or complex positioning operations with spot welds before soldering.

The Lase One **should not be used for** :

- Soldering work
- Other works than those above-mentioned

SECTION 3 SAFETY REGULATIONS

3.1 GENERAL SAFETY REGULATIONS

Please read carefully those instructions before using the machine.

Any modification or maintenance not specified in the manual must not be undertaken. The manufacturer, declines all responsibility and voids any warranty in case the power plug is changed without prior agreement, as well as any other changes to the generator or accessories.

For any further assistance about the use of Lase One, please contact our technical team.

- Use only the original equipment and accessories supplied with Lase One.
- The operation of the device may be hazardous if the device has visible damages and/or proven failures.
- Comply with safety instructions regarding the handling of gas cylinders under pressure.
- Keep the device out of the reach of children, persons with reduced mental capacity, persons unfamiliar with the tool or these instructions.
- Stay focused and cautious when using the machine.
- The Lase One is not to be used by a person particularly tired, under the influence of drugs, alcohol or pills.

3.2 ENVIRONMENT

- This equipment is to be used only for welding operations.
- Follow the safety guidelines, in case of improper or dangerous use, the manufacturer will not be held responsible.
- Installation and storage should be done in a room free of dust, acid, flammable gases or other corrosive substances and ensure air circulation during use. (ATEX zone forbidden)
- A clean and tidy workstation optimizes the quality of work and personal safety.

Temperature ranges :

- Use between 0 and +40°C (+32 and +104°F)
- Storage between -20 and +55°C (-4 and 131°F)

Air humidity :

- Below or equal to 50% at 40°C (104°F)
- Below or equal to 50% at 20°C (68°F)

Altitude :

- Up to 1000 m above sea level (3280 feet).

3.3 INDIVIDUAL BODY PROTECTION AND RISKS

Arc welding can be dangerous and cause serious injury or death.

- It is recommended to use gloves and protective footwear when spot welding as a protection against any risk of sparks and particules projections.
- Wear appropriate clothing. Synthetic clothes are not appropriate.
- Protect visible skin areas before prolonged use of the Lase One.
- Lase One emits UV. In order to avoid any risks while operating the Lase One, always use the binocular microscope and/or the eye protection mask, each equipped with a LCD shutter connected and controlled by the generator. Because of their long latency time, automatic masks are not recommended.
- Any person standing around the electric arc must also be aware of the hazards and wear the required protective equipment. Install protective screens or walls, if necessary.
- While welding with a Lase One, some smoke or gaz may be released. Ensure the proper ventilation of the place where the operation takes place.
- Residues potentially present on the parts to be welded can result in a risk of explosion; never weld elements or components that may have contained gases, fuel, mineral oil, etc.

Please strictly stick to the rules applying to premises at risk of fire and/or explosion.

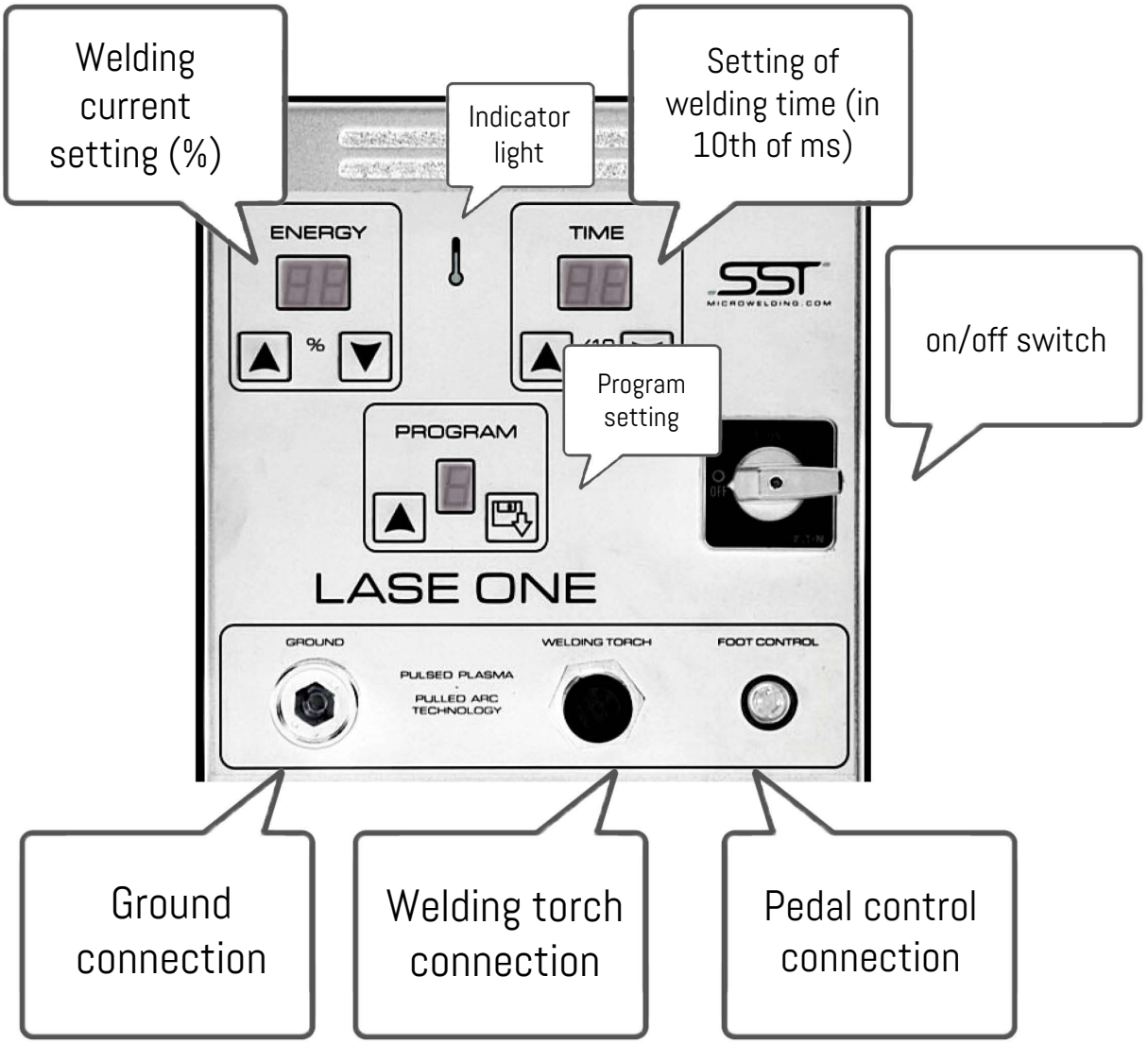
Please always keep this manual close to the unit when using it.

SECTION 4 INSTALLATION AND OPERATION

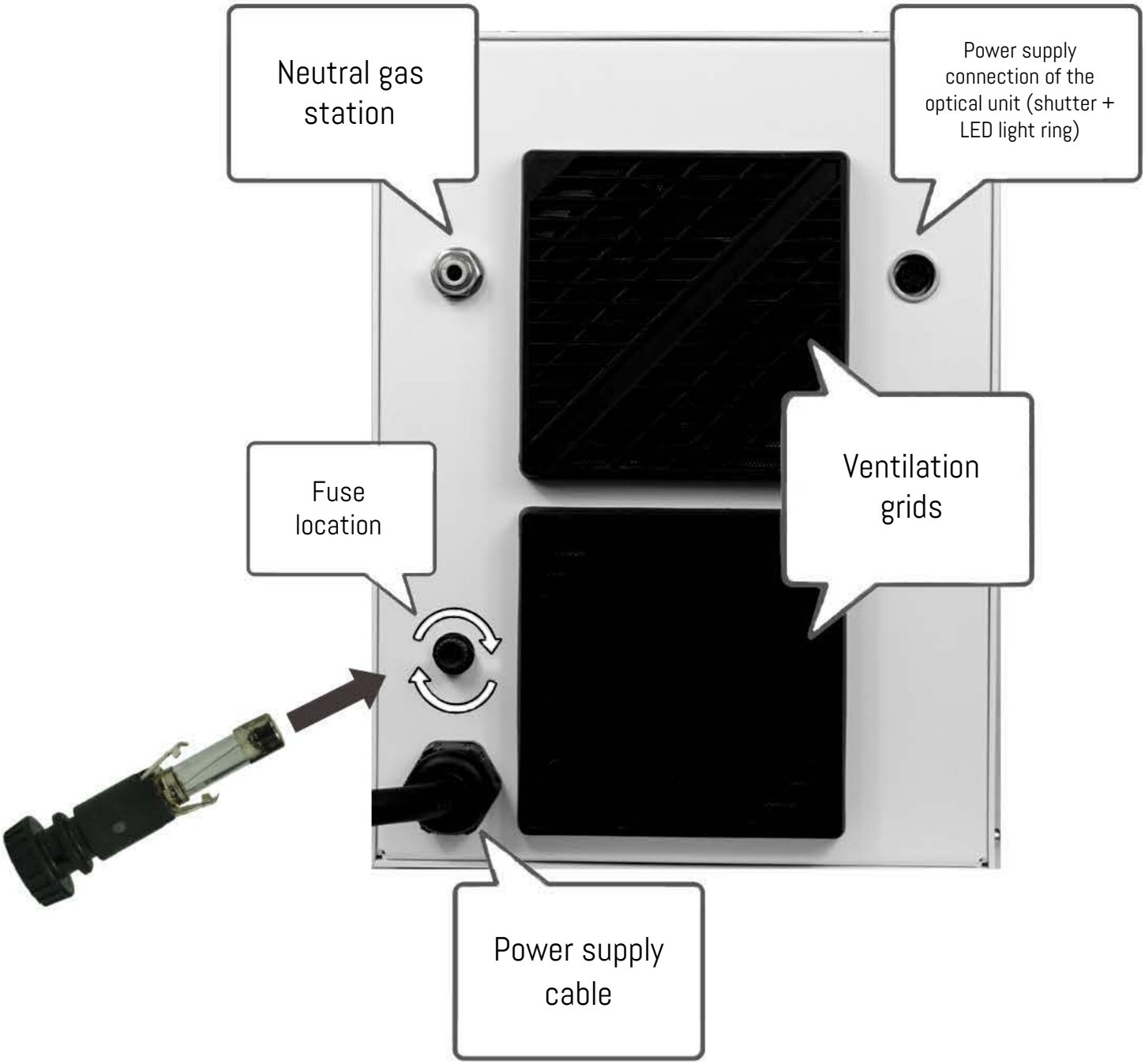
4.1 REQUIREMENTS

- When installing the welding unit, ensure the air cooling system is not obstructed. Poor ventilation may lead to overheating of the generator and malfunctions.
- The welding unit should not be covered while powered.
- Install the welding unit on a flat, resistant, insulated and non-flammable base.

4.2 DESCRIPTION OF THE CONTROLS LOCATED ON THE FRONT PANEL OF THE DEVICE



4.3 DESCRIPTION OF THE CONTROLS LOCATED ON THE BACK PANEL OF THE DEVICE

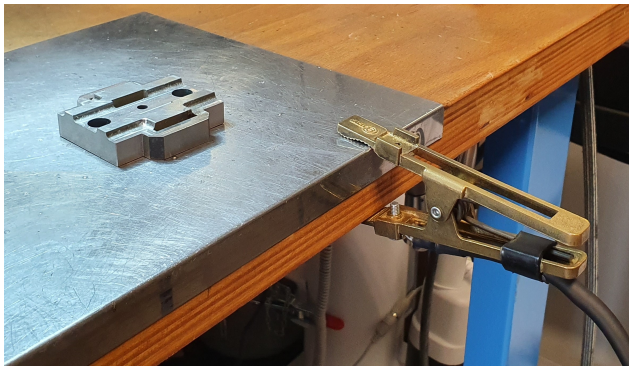


4.4 COMMISSIONING AND CONNECTION OF THE DEVICE

1

Connect the ground cable to the ¼ turn socket on the front panel.

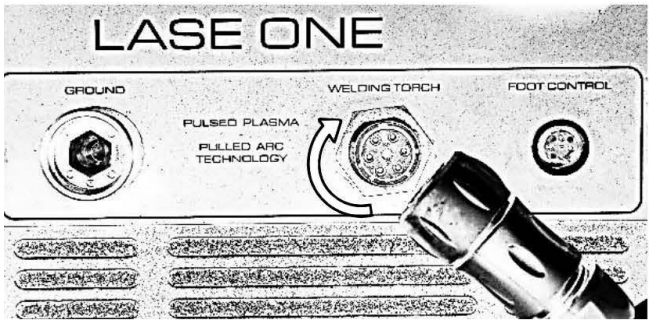
2



Connect the workpiece to the machine's ground clamp, either directly, or via a welding table, or via a current-conducting clamping or positioning accessory.

Connect the power cord plug directly to a wall socket (never use a power strip).

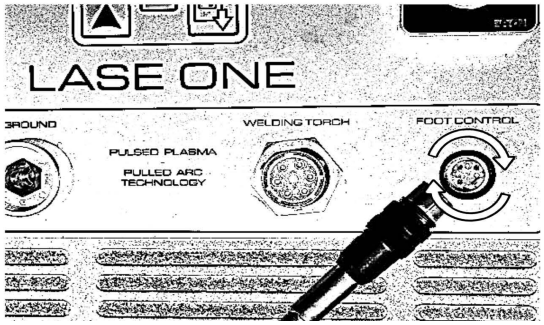
3



Connect the welding torch to the socket, screw clockwise by hand.

⚠ Don't force, don't use pliers in order not to damage the connector.

4



⚠ Screw the foot switch connector. The connector must be screwed on manually, don't use any tools.

⚠ Position according to the keyed connection.

5

Connect the 4-pin round male connector (shutter / LED ring or welding mask connector) to the connector found on the back panel of the unit.

⚠ The connector must be screwed on manually, don't use any tools.

⚠ Position according to the keyed connection

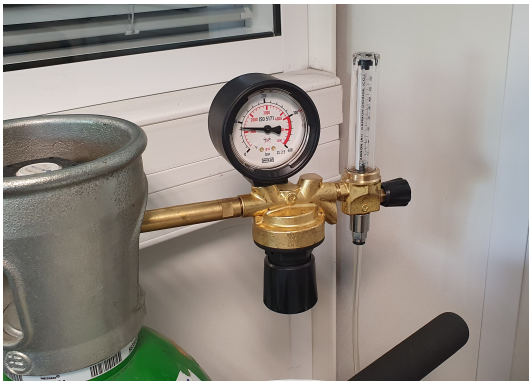
Ideally use pure argon at 99.9% (e.g., argon "4.5" or UN1006). The quality of the welding depends on the quality of the used gas.

6

<u>For disconnection</u> :

1 - Close the gas inlet
2 - Purge the network by starting a welding cycle by touching the electrode with a control part connected to the generator's ground, always in ON mode.
3 - Remove the translucent tube by pressing on the coupling ring

7



In the same way, connect the translucent gas hose to the pressure reducer, correctly screwed to the argon gas cylinder.

<u>Commissioning of gas</u> :

- Fully open the cylinder valve
- Setting the argon gas flow rate :

6 to 8 L/mn for steels and coppers
8 to 12 L/min for aluminum alloys

Your equipment is operational !

SECTION 5 OPERATION AND WELDING

Refer to the electrode sharpener user's manual (MA-003/004-AF)

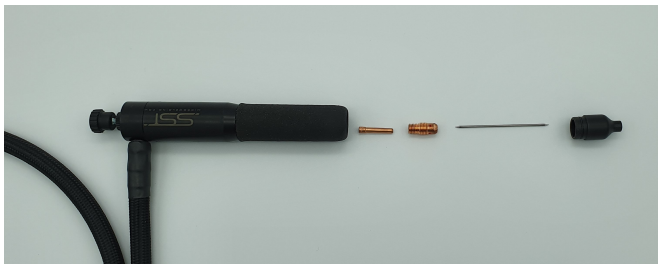
5.1 SETTING WITHDRAWAL OF ELECTRODES

The adjustment screw located on the Lase One micro welding torch allows the electrode amplitude to be adjusted in order to get various electric arcs. This allows to optimize the results according to the materials and applications.

- Release the locknut
- Tighten or untighten the screw located at the rear end of the welding torch, in order to obtain the desired value (1 to 5 mm).

A short arc will be accurate; a long arc will be powerful. For overlay applications, we recommend an electrode withdrawal of about 3 mm.

5.2 ELECTRODE ADJUSTMENT

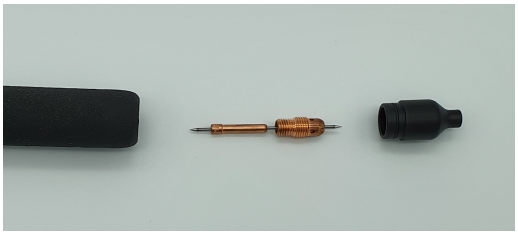


Overall picture with all the accessories.

1

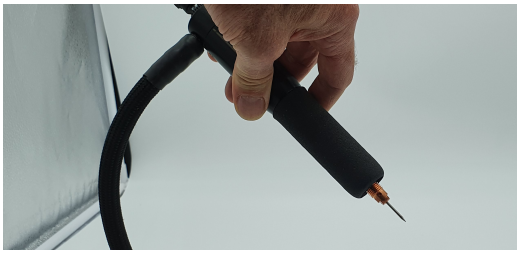
Remove the nozzle of the welding torch (held only by simple fitting.)

2



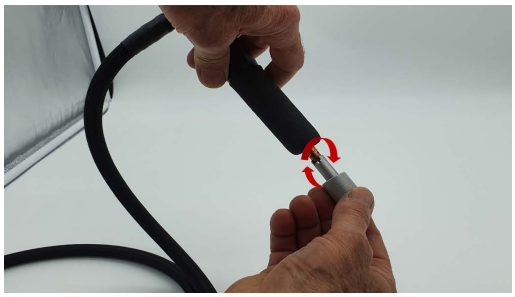
Take an electrode and put on the electrode holding gripper that corresponds to its diameter. Install the collet body, which also corresponds to the diameter of the electrode, over the electrode holding gripper.

3



The electrode should stick out about 30 mm and then manually screw on the collar support while holding the end of the electrode.

4



Tighten the collet body with the electrode positioner adjustment. Make sure the electrode is held securely.

5

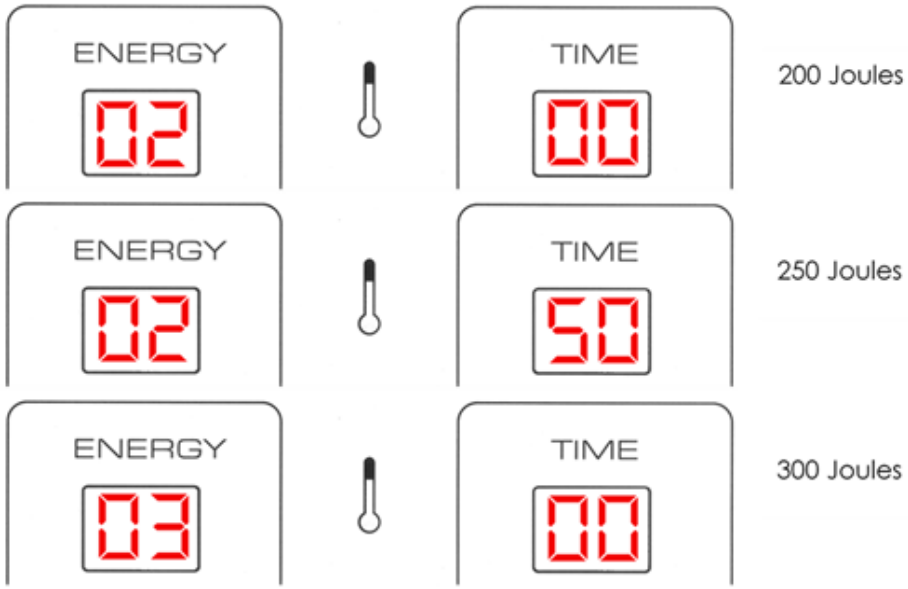
Put the nozzle back on the torch by slightly rotating it until they properly stick together. Check that the end of the electrode sticks out from the nozzle by about 5 to 6 mm.

⚠ *A larger value is possible if it's necessary. However, don't exceed 7 mm.*

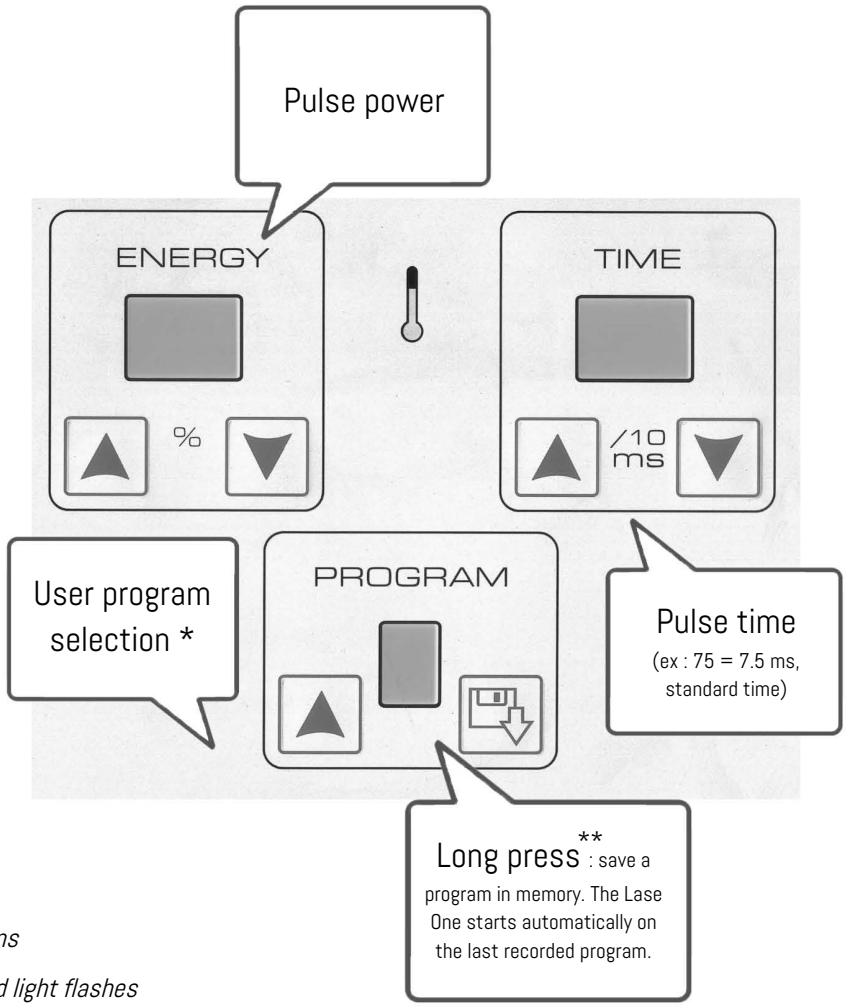
Your welding torch is ready to use !

5.3 SETTINGS OF THE GENERATOR

When switched on, the Lase One displays its maximum power...



...then it switches to normal operating mode.



** 9 available programs*

*** press until the red light flashes*

- The power of the arc is expressed as a percentage of the total power of the unit (200J, 250J and 300J.)

NOTA : Setting a power lower than 10% or more than the previous value makes it necessary to validate the setting by making a welding point in order to unload the equipment and activate the new settings.

- A long pulse results in a deeper penetration and/or better fusion of materials difficult to weld. A short pulse lessens the thermal alteration.
- At any time it is possible to store 9 programs, each allowing different combinations of power and time. The information is saved by pressing for 3 seconds the touch button of the "PROGRAM" module. To scroll through the programs, just press the up arrow.
- The generator starts on the last program during switching on.

When starting-up, the generator will display the last program saved. The Lase One is delivered with the following factory settings.

FACTORY SETTINGS OF LASE ONE GENERATOR

PROGRAM (N°)	1	2	3	4	5	6	7	8	9
ENERGY (%)	20	25	30	35	40	45	50	55	60
DURATION PULSE (1/10 MS)	80	80	80	80	80	80	80	80	80

5.4 PREPARATION FOR WELDING

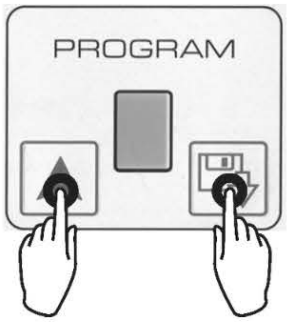
Either way, make sure the current flow is good. A partial or total failure may cause a deterioration of the quality and performance of the welding, even prevent any electrical arc.

Lase One is equipped with filters preventing the propagation of harmful electrical currents, such as a high-frequency current coming mainly from other TIG welding systems used nearby or on the same electrical grid. Nevertheless, it is not recommended to use Lase One near a TIG station which is either operating or with the ground cables in direct or indirect contact (welding table).

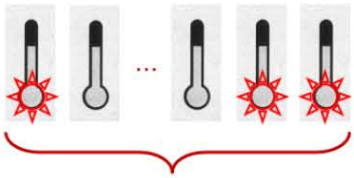
- The workpiece to be welded must be in contact with the support (welding table or direct ground).
- Always use eye protection.
- The torch should be held as vertically as possible according to the surface to be welded. This position optimizes the arc withdrawal and therefore its quality.

5.5 RESET TO FACTORY CONFIGURATION

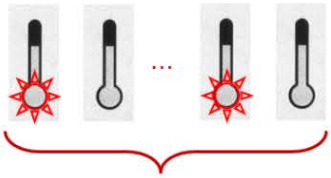
This procedure resets the Lase One (user memories, user settings and factory settings).



At power up, hold the button "Save".



Hold the button until the light stops flashing

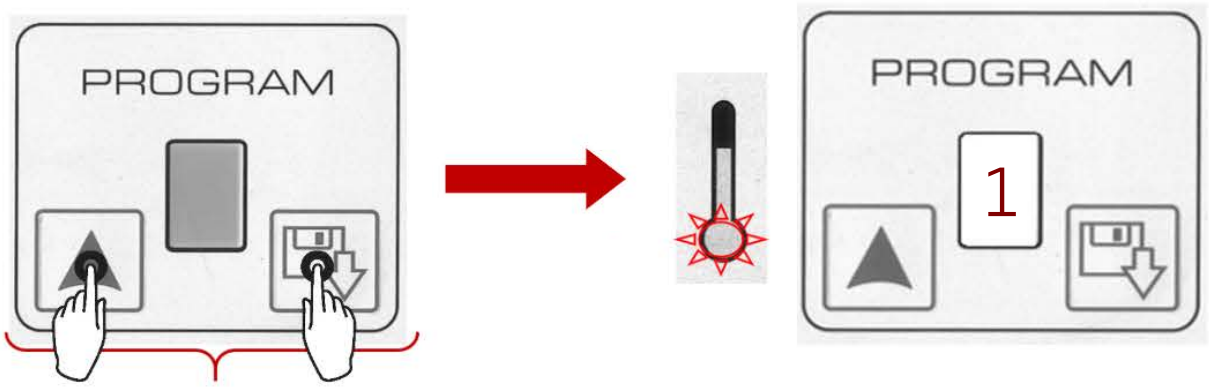


Release the button, the LED flashes 3 times rapidly and the Lase One restarts.

5.6 ADVANCED FUNCTIONS OF LASE ONE

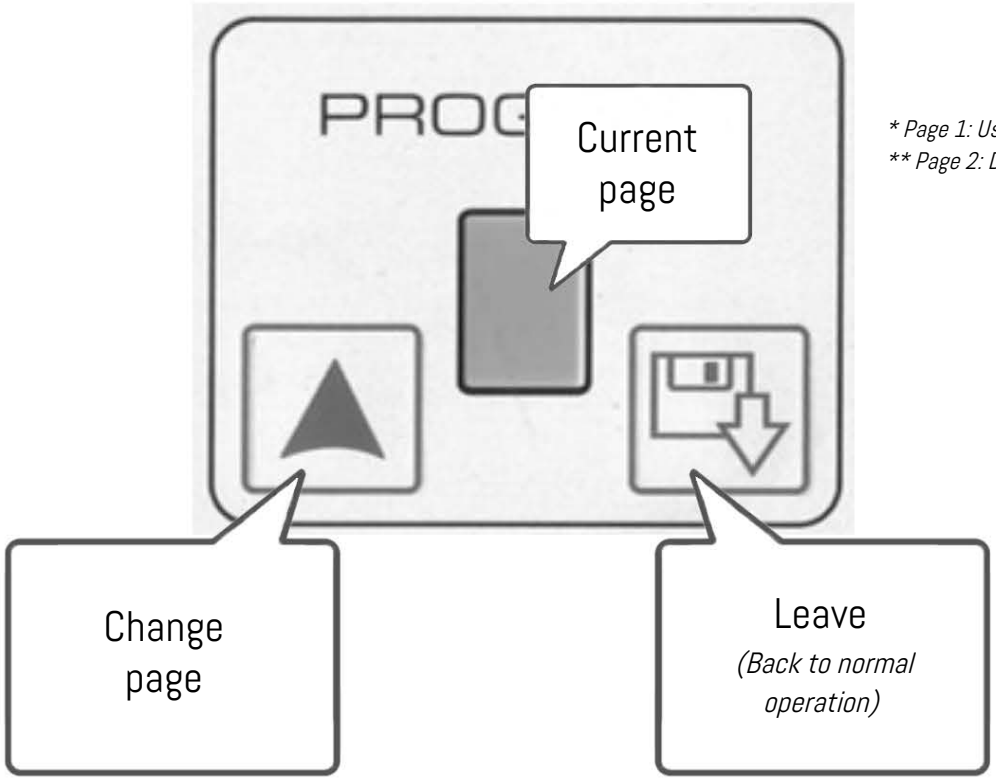
Enter the advanced functions :

You can access the advanced functions of Lase One at any time by pressing the "Program selection" and "Save program" buttons. To indicate that you have entered the advanced functions, the red LED lights up permanently and the "PROGRAM" display shows "1" (for page 1).



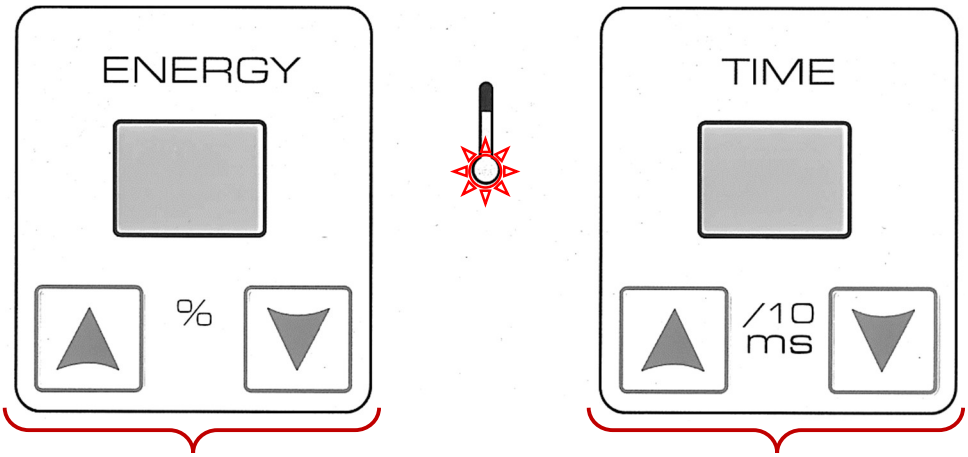
Pressing simultaneously

The advanced functions are organized in several pages, change the page with the button : 
The selected page is shown on "PROGRAM".



** Page 1: User settings*
*** Page 2: Diagnosis*

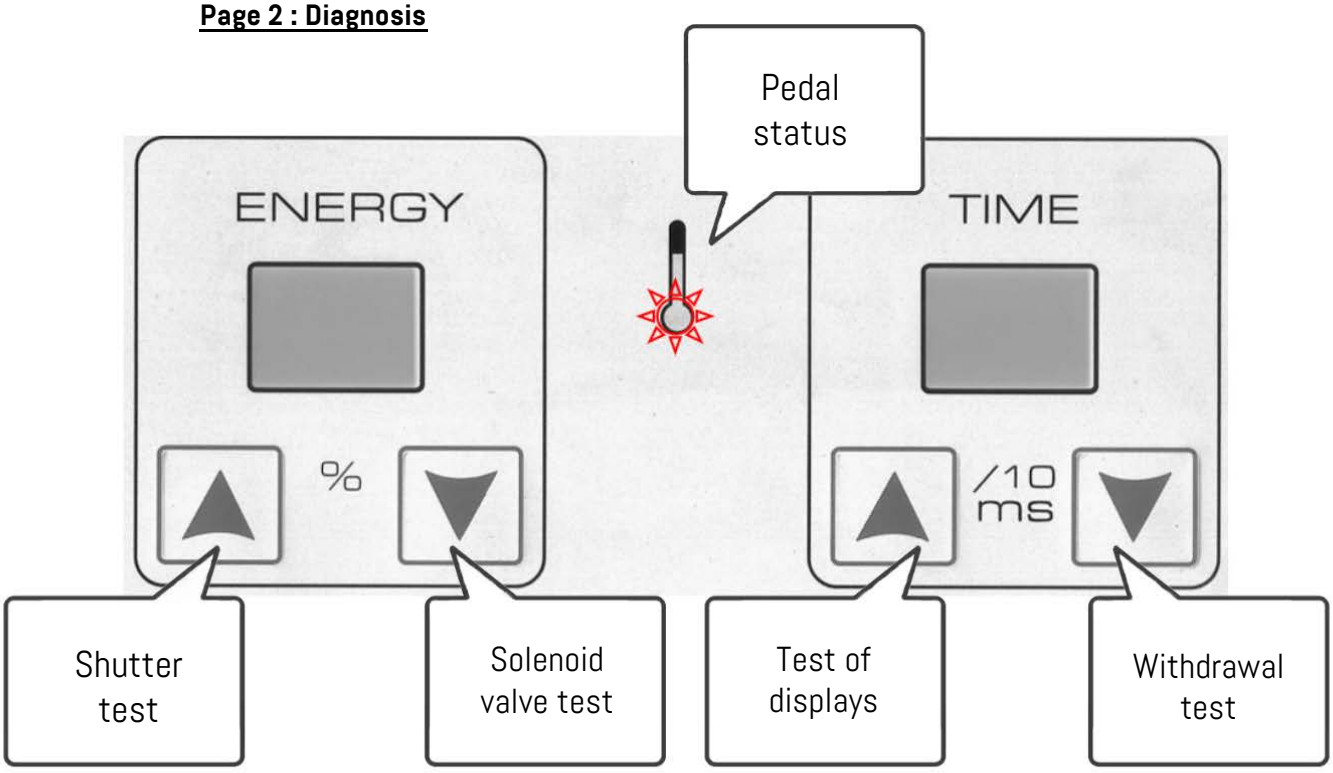
Page 1 : User settings



PARAMETERS		DESCRIPTION
1	AUTO mode	Allows not to use the pedal This mode is automatically deactivated at restart **CAUTION: The discharge is triggered by the slightest touch of the torch**
2	Shutter	Modifies the shutter closing time
3	Withdrawal	Modifies the withdrawal power of the torch
4	Gas	Time of gas release before the first spot
5	End cycle	Non-contact gas hold time
6	Speed limiter	Limits the maximum number of pulses per second

The Lase One automatically determines the pulse rate in order to optimize the welding quality (optimization of the reloading time of the capacities).
At low speed/low pulse duration, the rate may be too high. In order to give the user control over the pulse rate, it is possible to restrict it via parameter 6.

Page 2 : Diagnosis



This mode allows to quickly test different elements of the Lase One.

The "ENERGY" and "TIME" displays indicate the Firmware version. (example : 01 10 → Firmware 1 version J)

When the torch is connected to ground, the display changes to "00" to indicate that the torch contact detection is working properly. When the contact between the lamp and the ground is no longer established, the display returns to the Firmware indication.

Error codes :
The error codes are displayed simultaneously on the "ENERGY" and "TIME" displays.

Code / Error	Meaning
01	Pedal engaged at power-up.
Overheating	In case of overheating, a delay is activated. The count is indicated on the displays: - ENERGY" display, for the minutes. - "TIME" display, for the seconds.
Gas leak	Check the presence of the red seal in the connection socket of the welding torch.

5.7 BASICS AND RECOMMENDATIONS

- Take the time to get familiar with the device and its maintenance.
- Test the device by setting it to the different power and time levels.
- Adjust the power level, and the time if necessary, considering the thickness of the material(s) to be welded, as well as their nature.
- Use a properly sharpened and clean electrode.
- If there are any problems for the first welding, apply slight lateral pressure to the electrode. This method also allows you to position the welding spot in the desired direction.

5.8 CARE AND MAINTENANCE

"Lase One" is designed to require minimum maintenance if used correctly. In order to maximize the lifetime of your Lase One, the following actions are recommended :

- Regularly check the conditions of the mains cable, welding and ground cables.
- Regularly check the proper ventilation ot the unit.
- Clean the threaded connection of the electrode (pen torch) in order to ensure a perfect contact between the two.
- When changing a fuse, replace it with one presenting the same characteristics.
- Clean the filters

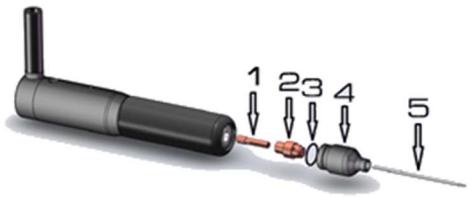
The warranty becomes void in case of damage due to the use of an oversized fuse.

SECTION 6 TECHNICAL SPECIFICATIONS

- Plasma arc welding unit (spot welding) to be used in a dry place
- Power Source : 230Vac / 50-60 Hz +/- 10 %
- Mains fuse : F5 A
- Maximum output energy : 200-250-300 Joules
- Maximum output voltage : 90 V
- Maximum pulse time : 10 ms
- Minimum pulse time : 100 µs
- Inert gas : Argon 99.9 % (Ref. Argon U 1006 or 4.5 grade minimum)
- Maximum gas pressure : 1 bar
- Protection class : I
- Type of protection : IP 30
- Dimensions (L x H x W) in mm : 370 x 220 x 240
- Weight : 24 Kg

SECTION 7 ACCESSORIES AND SPARE PARTS

7.1 WELDING TORCH AND SPARES



ITEM	DESCRIPTION	REFERENCE
Welding torch	Micro-welding torch for the Lase One generator Available in two lengths: 1.5m and 3 m.	Length 1,5 meters : L1-TM-15 Length 3,0 meters : L1-TM-30
1	Electrode holding gripper Ø 1,6 mm *Available diameters: Ø 1,0 mm and Ø 2,4 mm*	L1-PE-16
2	Collet body Ø 1,6 mm *Available diameters: Ø 1,0 mm and Ø 2,4 mm*	L1-SC-16
3	O-ring	L1-BU-OR
4	Nozzle	L1-BU
5	Lase One Electrode Ø 1,6 x 70 mm *Available diameters: Ø 1,0 mm and Ø 2,4 mm*	ELA20-1670
Pad foam	Foam wrist support (blister of 2)	SST-MSP

7.2 LIST OF ACCESSORIES

Lase One foot switch pedal

Available in two lengths: 2.0 and 4.0 meters.

Length 2.0 meters : SST-PDC-20
Length 4.0 meters : SST-PDC-40

Ground cable

Available in two lengths: 2.0 and 4.0 meters.

Length 2.0 meters : L1-CM-20
Length 4.0 meters : L1-CM-40

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