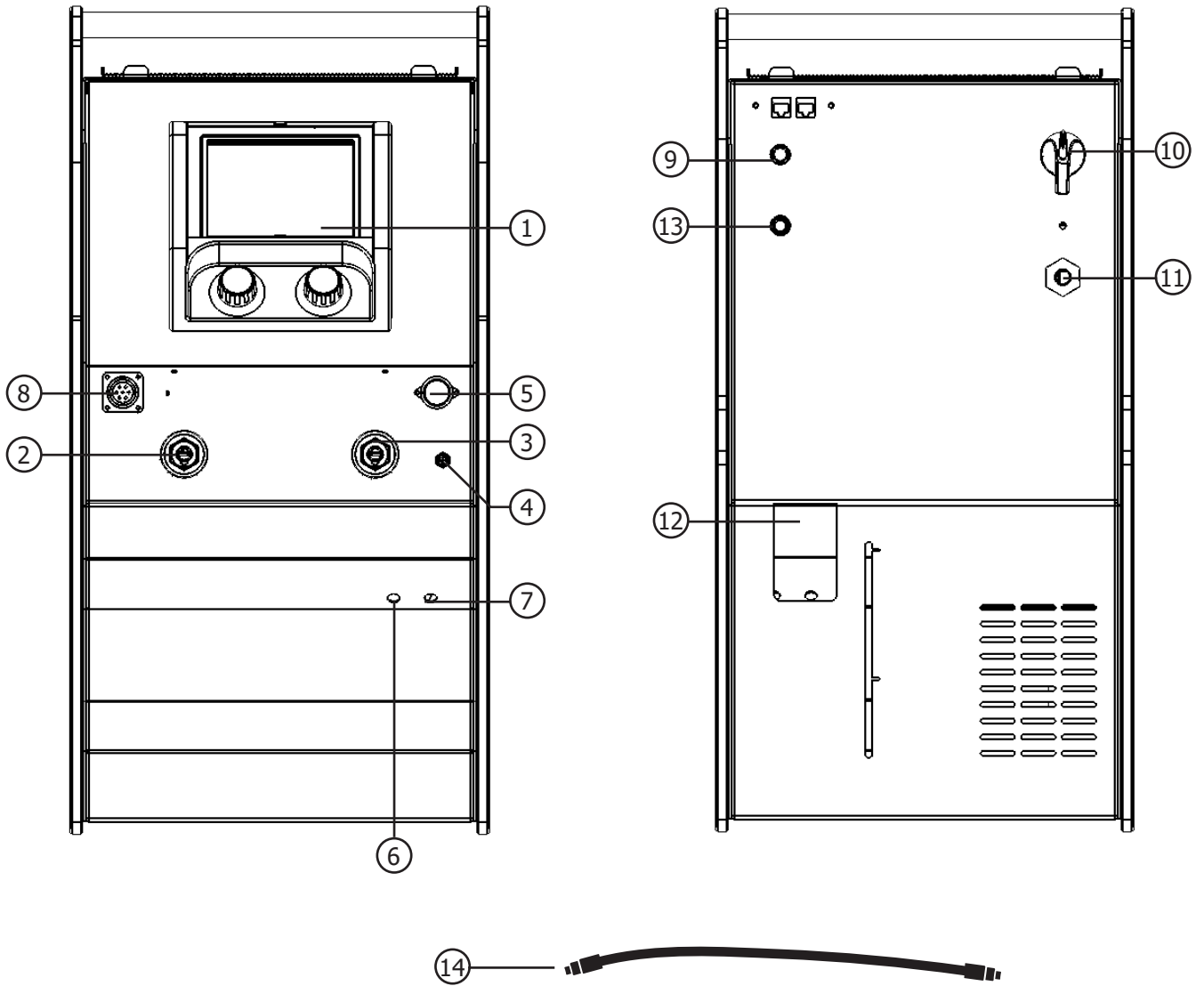
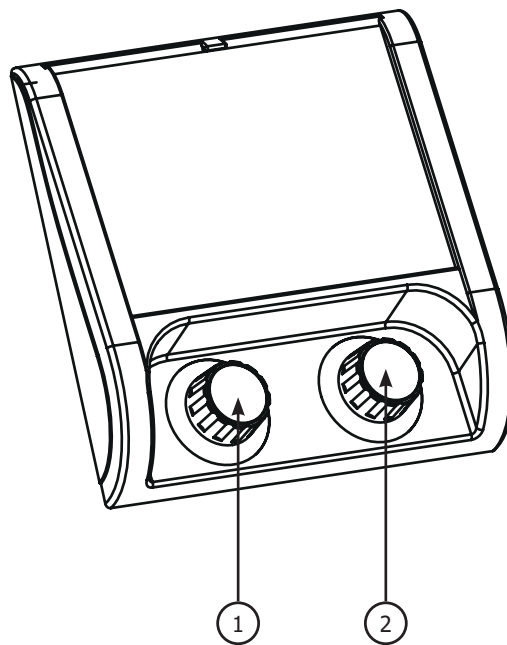


**FIG-1**



**FIG-2**



## WARNING - SAFETY RULES

### GENERAL INSTRUCTIONS



Read and understand the following safety recommendations before using or servicing the unit. Any change or servicing that is not specified in the instruction manual must not be undertaken.

The manufacturer is not liable for any injury or damage caused due to non-compliance with the instructions featured in this manual. In the event of problems or uncertainties, please consult a qualified person to handle the installation properly.

### ENVIRONMENT

This equipment must only be used for welding operations in accordance with the limits indicated on the descriptive panel and/or in the user manual. Safety instructions must be followed. In case of improper or unsafe use, the manufacturer cannot be held liable.

This equipment must be used and stored in a room free from dust, acid, flammable gas or any other corrosive agent. The same rules apply for storage. Operate the machine in an open, or well-ventilated area.

Operating temperature:

Use between -10 and +40°C (+14 and +104°F).

Storage between -20 and +55°C (-4 and 131°F).

Air humidity:

Lower or equal to 50% at 40°C (104°F).

Lower or equal to 90% at 20°C (68°F).

Altitude: Up to 1000 meters above sea level (3280 feet).

### INDIVIDUAL PROTECTION & OTHERS

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

Welding exposes the user to dangerous heat, arc rays, electromagnetic fields, risk of electric shock, noise and gas fumes. People wearing pacemakers are advised to consult a doctor before using the welding machine.

To protect oneself as well as others, ensure the following safety precautions are taken:



In order to protect you from burns and radiations, wear clothing without turn-up or cuffs. These clothes must be insulating, dry, fireproof, in good condition and cover the whole body.



Wear protective gloves which guarantee electrical and thermal insulation.



Use sufficient welding protective gear for the whole body: hood, gloves, jacket, trousers... (varies depending on the application/operation). Protect the eyes during cleaning operations. Contact lenses are prohibited during use. It may be necessary to install fireproof welding curtains to protect the area against arc rays, weld spatter and sparks. Inform the people around the working area to never look at the arc nor the molten metal, and to wear protective clothes.



Ensure ear protection is worn by the operator if the work exceeds the authorised noise limit (the same applies to any person in the welding area).

Keep hands, hair and clothes away from moving parts such as fans, and engines.

Never remove the safety covers from the cooling unit when the machine is plugged in. The manufacturer is not liable for any injury or damage caused due to non-compliance with the safety precautions.



Parts that have just been welded will be hot and may cause burns when touched. When servicing the torch or electrode holder, make sure that it is cold enough by waiting at least 10 minutes before doing so. When using a water-cooled torch, make sure that the cooling unit is switched on to avoid any burns that could potentially be caused by the liquid.

It is important to secure the working area before leaving it to ensure protection of the goods and the safety of people.

### WELDING FUMES AND GAS



The fumes, gases and dust issued by the welding are dangerous for the health. It is mandatory to ensure adequate ventilation and/or extraction to keep fumes and gases away from the work area. A fresh air mask is recommended in cases in case of insufficient ventilation in the workplace.

Check that the aspiration it is efficient by controlling compared safety standards.

Care must be taken when welding in small areas, and the operator will need supervision from a safe distance. Welding certain pieces of metal containing lead, cadmium, zinc, mercury or beryllium can be extremely toxic. The user will also need to degrease the workpiece before welding.

Gas cylinders must be stored in an open or ventilated area. The cylinders must be in a vertical position secured to a support or trolley.

Do not weld in areas where grease or paint are stored.

## FIRE AND EXPLOSION RISKS



Protect the entire welding area. Compressed gas containers and other inflammable material must be moved to a minimum safe distance of 11 meters.

A fire extinguisher must be readily available near the welding operations.

Be careful of spatter and sparks, even through cracks.

It can be the source of a fire or an explosion.

Keep people, flammable objects and containers under pressure at a safe distance.

Welding of sealed containers or closed pipes should be prohibited, and if opened, the operator must remove any inflammable or explosive materials (oil, petrol, gas...).

Grinding operations should not be directed towards the device itself, the power supply or any flammable materials.

## GAS BOTTLE



Gas leaking from the cylinder can lead to suffocation if present in high concentrations around the work area.

Transport must be done safely: Cylinders closed and product off. Always keep cylinders in an upright position securely chained to a fixed support or trolley.

Close the bottle after any welding operation. Be wary of temperature changes or exposure to sunlight.

Cylinders should be located away from areas where they may be struck or subjected to physical damage.

Always keep gas bottles at a safe distance from arc welding or cutting operations, and any source of heat, sparks or flames.

Be careful when opening the valve on the gas bottle, it is necessary to remove the tip of the valve and make sure the gas meets your welding requirements.

## ELECTRICAL SAFETY



The machine must be connected to an earthed electrical supply. Use the recommended fuse size.

An electrical discharge can directly or indirectly cause serious or deadly accidents.

Do not touch any live part of the machine (inside or outside) when it is plugged in (Torches, earth cable, cables, electrodes) because they are connected to the welding circuit.

Before opening the device, it is imperative to disconnect it from the mains and wait 2 minutes, so that all the capacitors are discharged.

Do not touch the torch or electrode holder and earth clamp at the same time.

Damaged cables and torches must be changed by a qualified and skilled professional.

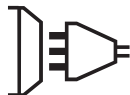
Always use the correct size of DIN connectors.

Always wear dry clothes in good condition, in order to be insulated from the electrical circuit. Wear insulating shoes, regardless of the environment in which you work in.

## EMC CLASSIFICATION



These Class A devices are not intended to be used on a residential site where the electric current is supplied by the public network, with a low voltage power supply. There may be potential difficulties in ensuring electromagnetic compatibility on these sites, because of the interferences, as well as radio frequencies.



This equipment does not comply with IEC 61000-3-12 and is intended for connection to private low voltage networks connected to the public supply network only at medium and high voltage level. If connected to a public low voltage supply network, it is the responsibility of the installer or user of the equipment to ensure, by consulting the distribution network operator, that the equipment can be connected.



## ELECTROMAGNETIC INTERFERENCES



The electric currents flowing through a conductor cause electrical and magnetic fields (EMF). The welding current generates an EMF field around the welding circuit and the welding equipment.

The EMF fields may disrupt some medical implants, such as pacemakers. Protection measures should be taken for people wearing medical implants. For example, access restrictions for passers-by or an individual risk evaluation for the welders.

All welders should take the following precautions in order to minimise exposure to the electromagnetic fields (EMF) generated by the welding circuit::

- position the welding cables together – if possible, attach them;
- keep your head and torso as far as possible from the welding circuit;
- never enroll the cables around your body;
- never position your body between the welding cables. Hold both welding cables on the same side of your body;

- connect the earth clamp as close as possible to the area being welded;
- do not work too close to, do not lean and do not sit on the welding machine
- do not weld when you're carrying the welding machine or its wire feeder.



People wearing pacemakers are advised to consult their doctor before using this device. Exposure to electromagnetic fields while welding may have other health effects which are not yet known.

## RECOMMENDATIONS TO ASSESS THE WELDING AREA AND WELDING INSTALLATION

### Overview

The user is responsible for installing and using the arc welding equipment in accordance with the manufacturer's instructions. If electromagnetic disturbances are detected, it is the responsibility of the user of the arc welding equipment to resolve the situation with the manufacturer's technical assistance. In some cases, this remedial action may be as simple as earthing the welding circuit. In other cases, it may be necessary to construct an electromagnetic shield around the welding power source and around the entire piece by fitting input filters. In all cases, electromagnetic interferences must be reduced until they are no longer bothersome.

### Welding area assessment

Before installing the machine, the user must evaluate the possible electromagnetic problems that may arise in the area where the installation is planned.

In particular, it should consider the following:

- a) the presence of other power cables (power supply cables, telephone cables, command cable, etc...) above, below and on the sides of the arc welding machine;
  - b) television transmitters and receivers;
  - c) computers and other hardware;
  - d) critical safety equipment such as industrial machine protections;
  - e) the health and safety of the people in the area such as people with pacemakers or hearing aids;
  - f) calibration and measuring equipment;
  - g) the isolation of the equipment from other machinery.
- The user will have to make sure that the devices and equipments that are in the same room are compatible with each other. This may require extra precautions;
- h) make sure of the exact hour when the welding and/or other operations will take place.

The surface of the area to be considered around the device depends on the the building's structure and other activities that take place there. The area taken in consideration can be larger than the limits determined by the companies.

### Welding area assessment

Besides the welding area, the assessment of the arc welding systems intallation itself can be used to identify and resolve cases of disturbances. The assessment of emissions must include in situ measurements as specified in Article 10 of CISPR 11. In situ measurements can also be used to confirm the effectiveness of mitigation measures.

## RECOMMENDATION ON METHODS OF ELECTROMAGNETIC EMISSIONS REDUCTION

**a. National power grid:** The arc welding machine must be connected to the national power grid in accordance with the manufacturer's recommendation. If interferences occur, it may be necessary to take additional preventive measures such as the filtering of the power suply network. Consideration should be given to shielding the power supply cable in a metal conduit. It is necessary to ensure the shielding's electrical continuity along the cable's entire length. The shielding should be connected to the welding machine to ensure good electrical contact between the metal conduit and the casing of the welding machine.

**b. Maintenance of the arc welding equipment:** The arc welding machine should be submitted to a routine maintenance check according to the manufacturer's recommendations. All accesses, service doors and covers should be closed and properly locked when the arc welding equipment is on.. The arc welding equipment must not be modified in any way, except for the changes and settings outlined in the manufacturer's instructions. The spark gap of the arc start and arc stabilization devices must be adjusted and maintained according to the manufacturer's recommendations.

**c. Welding cables:** Cables must be as short as possible, close to each other and close to the ground, if not on the ground.

**d. Electrical bonding :** consideration should be given to bonding all metal objects in the surrounding area. However, metal objects connected to the workpiece increase the riskof electric shock if the operator touches both these metal elements and the electrode. It is necessary to insulate the operator from such metal objects.

**e. Earthing of the welded part :** When the part is not earthed - due to electrical safety reasons or because of its size and its location (which is the case with ship hulls or metallic building structures), the earthing of the part can, in some cases but not systematically, reduce emissions It is preferable to avoid the earthing of parts that could increase the risk of injury to the users or damage other electrical equipment. If necessary, it is appropriate that the earthing of the part is done directly, but in some countries that do not allow such a direct connection, it is appropriate that the connection is made with a capacitor selected according to national regulations.

**f. Protection and plating :** The selective protection and plating of other cables and devices in the area can reduce perturbation issues. The protection of the entire welding area can be considered for specific situations.

## TRANSPORT AND TRANSIT OF THE MACHINE



The welding power source is equipped with top handles for hand carrying. Be careful not to underestimate its weight. The handles are not considered as a means of slinging.

Do not use the cables or torch to move the welding current source. It must be moved in a vertical position.  
Do not move the power source over people or objects.  
Never lift a gas cylinder and the power source at the same time. Their transport standards are different.

## INSTALLATION

Rules to follow:

- Put the machine on the floor (maximum incline of 10°.)
  - Ensure the work area has sufficient ventilation for welding, and that there is easy access to the control panel.
  - The machine must not be used in an area with conductive metal dusts.
  - The machine must be placed in a sheltered area away from rain or direct sunlight.
  - The machine protection level is IP23, which means :
    - Protection against access to dangerous parts from solid bodies of a  $\geq 12.5\text{mm}$  diameter and,
    - Protection against the rain inclined at 60% towards the vertical.
- These devices can be used outside in accordance with the IP23 protection index.

The power cables, extensions and welding cables must be fully uncoiled to prevent overheating.



The manufacturer does not incur any responsibility regarding damages to both objects and persons that result from an incorrect and/or dangerous use of the machine.

## MAINTENANCE / RECOMMENDATIONS



- Maintenance should only be carried out by a qualified person. Annual maintenance is recommended.
- Ensure the machine is unplugged from the mains, and wait for two minutes before carrying out maintenance work. DANGER High Voltage and Currents inside the machine.

- Remove the casing 2 or 3 times a year to remove any excess dust. Take this opportunity to have the electrical connections checked by a qualified person, with an insulated tool.
- Regularly check the condition of the power supply cable. If the power cable or connection cables are damaged, they must be replaced by the manufacturer, its after sales service or an equally qualified person to prevent danger.
- Ensure the ventilation holes of the device are not blocked to allow adequate air circulation.
- Do not use this equipment to thaw pipes, to charge batteries, or to start any engine.
- Do not use this welding current/voltage source for thawing pipes, recharging batteries/accumulators or starting motors.



The coolant should be changed every 12 months to avoid deposits that could disrupt the cooling system of the torch. Any leaks or residues of the product, after use, should be treated in an appropriate purification plant. If possible, the product should be recycled. Spent fluid must not be emptied into waterways, pits or drainage systems. Diluted fluid should not be emptied into the sewerage system, unless permitted by local regulations.

## INSTALLATION – PRODUCT OPERATION

Only qualified personnel authorized by the manufacturer should perform the installation of the welding equipment. During set up, the operator must ensure that the machine is unplugged. Connecting generators in a series or a parallel circuit is forbidden.

### HARDWARE DESCRIPTION (FIG-1)

The TIG 250 AC/DC is an Inverter welding unit to be used with refractory electrodes (TIG) in direct (DC) or alternative (AC) current.

TIG welding requires gas shield protection of pure gas (Argon).

The MMA process can weld all types of electrodes : rutile, basic, stainless and cast iron.

The TIG 250 AC/DC can be equipped with a remote control (ref. 045675), foot pedal (ref. 045682) or an automatic command (CONNECT-5).

- |                                  |                             |
|----------------------------------|-----------------------------|
| 1- Display + incremental buttons | 8- Input for remote control |
| 2- Positive Polarity socket      | 9- 5A fuse holder           |
| 3- Negative polarity socket      | 10- ON / OFF switch         |
| 4- Torch gas connection          | 11- Power cable             |
| 5- Trigger connector             | 12- Coolant tank inlet      |
| 6- Coolant inlet connector       | 13- Gas connection          |
| 7- Coolant outlet connector      | 14- Priming hose            |

### INTERFACE (MMI) (FIG-2)

The control board is made of a colour TFT screen and two potentiometers. It can be operated in 3 different modes:

- **Mode 1** or Standby mode: with potentiometer 1 you will be able to set the welding current, and with potentiometer 2 the parameters related to the welding current.
- **Mode 2** ou Welding mode : by pushing potentiometer 1 you will have access to the top menu. Then by turning the button, you may select the welding mode. You may exit this menu by waiting 8s or by pushing potentiometer 2 -> back to Mode 1.
- **Mode 3** ou Settings mode : by pushing potentiometer 2 you will have access to the welding parameters and may select one of them by turning the potentiometer. You may exit this menu by waiting 8s or by pushing potentiometer 2 -> back to Mode 1.

**POWER SUPPLY-START-UP**

- This equipment is supplied with a 16A EN 60309-1 type plug and should only be used on a three-phase 400V (50-60 Hz) four-wire electrical installation with an earthed neutral.  
The effective absorbed current (I<sub>1eff</sub>) is indicated on the equipment, for maximum use conditions. Check that the power supply and its protection (fuse and/or circuit breaker) are compatible with the current required for use. In some countries, it may be necessary to change the plug to allow use in maximum conditions.
- The power source is designed to operate on 400V +/- 15%. It goes into protection if the supply voltage is less than 330Vrms or greater than 490Vrms. (a fault code will appear on the display).
- Switching on is done by turning the on/off switch (I-10) to position I, conversely switching off is done by turning to position O. Caution! Never switch off the power supply when the welding current source is under load.
- Fan behaviour: In MMA mode, the fan runs continuously. In TIG mode, the fan runs only during the welding phase and then stops after cooling.

**CONNECTION TO A GENERATOR**

This equipment can operate with generators provided that the auxiliary power meets the following requirements:  
 - The voltage must be alternating, with an effective value of 400 V +/- 15%, and a peak voltage of less than 700 V,  
 - The frequency must be between 50 and 60 Hz.  
 It is imperative to check these conditions, as many generators produce high voltage spikes that can damage the equipment.

**USE OF EXTENSION CORDS**

All extension cords must be of a size and cross-section appropriate for the voltage of the equipment. Use an extension cord that complies with national regulations. Power, extension and welding cables should be fully unwound to avoid overheating.

Input voltage	Length - Section of the extension cable (Length < 45m)
400 V	4 mm <sup>2</sup>

**PRIMING OF THE COOLING UNIT**

- When using the product for the first time or after the coolant tank has been completely emptied, the following procedure must be followed to prime the circulator with liquid:
- Fill the reservoir to its maximum level with coolant.
  - Connect the coolant priming kit (I-14) to the unit's coolant connector (blue fitting). Place the other end of the kit in an empty container.
  - Turn on the liquid circulator. To activate it, depending on the product, you will need to connect a torch and then pull the welding trigger, or simply power up the unit.
  - The circulator should start instantly and the liquid should flow into the container. If the circulator still does not prime, turn off the power supply, inject compressed air into the Priming Kit to flush the liquid from the pipes and then restart the circulator.
  - Once the pump has been primed (container filling with coolant), stop the chiller by pressing one of the buttons on the HMI.
  - As soon as the liquid flows, the circulator is primed. Turn off the unit, disconnect the Priming Kit, top up the coolant in the reservoir and connect your system to the unit's fluid connections. Your cooling unit is primed and ready for operation.















**LIQUID COOLING**

The tank of the cooling unit must be filled to the recommended MAX level of the gauge on the front of the cooling unit, but never below the MIN level unless a warning message is displayed.  
 It is essential to use a specific coolant for welding machines with low electrical conductivity, being anti-corrosion and anti-freeze.  
 The use of other coolants, and in particular standard automotive coolant, can lead to the accumulation of solid deposits in the cooling circuit through electrolysis, thus degrading the cooling, and even clogging the circuit.  
 This recommended MAX level is essential to optimise the operating factors of the associated water-cooled torch.  
 Any damage to the machine caused by the use of a coolant other than the recommended type will not be considered under the warranty.  
 Ensure that the cooling unit (or generator with cooling unit) is disconnected from the power supply before connecting or disconnecting the torch liquid cooling hoses (inlet and outlet).

**FUNCTION, MENU AND PICTOGRAM DESCRIPTIONS**

Function	Name on the display interface	Pictogram	TIG DC	TIG AC	MMA	Comment
Welding current	Welding current		X	X	X	The required welding current depends on the thickness and the type of metal, as well as the work category / work piece. (A)
Welding voltage	Voltage		X	X	X	Welding voltage measured (V)
HotStart	Overcurrent				X	Adjustable overcurrent at the beginning of the welding (%)
ArcForce	ArcForce				X	Overcurrent delivered to prevent sticking when the electrode enters the welding pool (%)
Polarity reversal					X	Easy reversal of the polarity in order to weld with different type of electrodes, without the need to disconnect the earth clamp and electrode holder
Position of the negative polarity					X	NEGATIVE polarity (-)

Indicator of the place of the positive polarity					X	POSITIVE polarity (+).
HF ignition	HF		X	X		Arc ignition without contact
Lift ignition	LIFT		X	X		Arc ignition with contact
Pre-gas	Pre-gas		X	X		Time to purge the torch and to protect the area with gas before ignition
Starting current	Starting current		X	X		Pre current (A)
Initial time	Starting current		X	X		Pre current duration (S)
Up slope current	Upslope		X	X		Minimum current to welding current (upslope phase) duration (S)
Cold current (4TLog)	I cold		X	X		Background welding current or cold current activated with a double button torch or in 4T LOG (A)
Cold current	I cold		X	X		Base current or cold current in PULSE mode (A)
Pulse balance	Pulse duration		X	X		Base current or cold current balance in PULSE mode (%)
PULSE Frequency	Pulse frequency		X	X		PULSATION frequency of the PULSE mode (Hz)
Down slope current	Downslope		X	X		Welding current to minimum current (downslope phase) duration, I Stop (S) to avoid weld defects and craters.
Ending current	End current		X	X		Pre current (A)
Ending time	End duration		X	X		Pre current duration (S)
Post gas	Post gas		X	X		Duration for which gas is released after the arc has stopped. It protects the weld pool and the electrode against oxidation when the metal is cooling (S).
AC balance	Penetration and cleaning (%)				X	Wave balance control of penetration and cleaning (%)
AC frequency	AC frequency				X	AC welding frequency (Hz)
AC time	T AC				X	AC welding duration in AC MIX (S)
DC time	T DC				X	DC welding duration in AC MIX (S)
Spot time	Welding duration		X	X		Spot time (s)
TACK time	T Pulse		X			Spot pulse duration (s)
Electrode diameter	∅		X	X		Recommended diameter of the tungsten electrode to optimise the arc ignition in SYNERGIC mode (mm)
Metal to weld	Fe, CrNi, Cu/CuZn, AlMg, AlSi, Al99		X	X		Selection of the metal to weld: Steel, Nickel-Chromium, Copper or brass, Aluminium-Magnesium, Aluminium-Silicon in SYNERGIC mode
Lap welding			X	X		SYNERGIC Mode.
Butt welding			X	X		SYNERGIC Mode.
Fillet welding			X	X		SYNERGIC Mode.
Vertical down weld			X	X		SYNERGIC Mode.
Thickness of the workpiece			X	X		Thickness adjustment of the workpiece in SYNERGIC mode
MMA process	MMA				X	
TIG AC process	AC				X	
TACK mode	TACK				X	
TIG AC MIX mode	AC MIX				X	

TIG DC process	DC		X			
SYNERGIC process	SYN		X	X		
Standard mode	STD		X	X		
Pulse mode	PULSE		X	X		
Spot mode	SPOT		X	X		
2T	2T		X	X		2T (time) torch mode
4T	4T		X	X		4T (time) torch mode
4T LOG	4T LOG		X	X		4T (time) LOG torch mode
Languages			X	X	X	Language selection
Interface lock			X	X	X	Locking the interface to prevent access to menus and parameters
Interface unlock			X	X	X	Unlocking the interface to allow access to menus and parameters (default code: 0000)
Password modification			X	X	X	Allow the modification of the password
Parameters reset	RESET		X	X	X	Allow to restore to factory settings
Identification	ID		X	X	X	After Sales module to identify the machine
Backup menu			X	X	X	Menu to access to welding parameters features.
Save			X	X	X	Save the welding settings under the existing name.
Save as			X	X	X	Save the welding parameters under a new name.
Open			X	X	X	Open an existing saved setting
Delete			X	X	X	Delete an existing saved setting
Welding current when a remote control is connected	Current		X	X	X	Current value adjustment when a remote control is present.
Cooling unit			X	X	X	Cooling unit
Presence of a torch with potentiometer			X	X		Presence of a torch with potentiometer
Presence of a remote control			X	X	X	Pictogram signalling that a remote control presence
Thermal protection			X	X	X	Pictogram signalling thermal protection mode

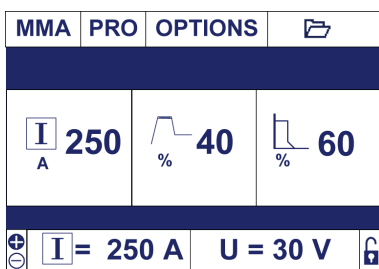
**ELECTRODE WELDING (MMA PROCESS)**

**CONNECTIONS AND RECOMMENDATIONS**

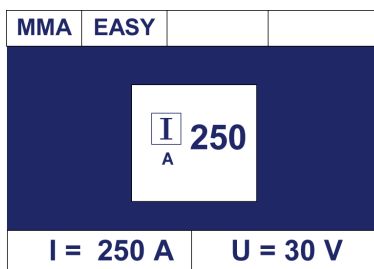
- Connect the cables, electrode holder and earth clamp in the connectors,
- Respect the welding polarities and intensities indicated on the electrodes boxes,
- Remove the electrode from the electrode holder when the machine is not in use.

**MMA WELDING PROCESSES**

MMA PRO



MMA EASY



PRO mode gives access to all product functions and settings.

EASY mode allows for a simplified interface with a single current setting.



PRO and EASY mode options:

	% HotStart	% ArcForce	Reverse polarity
EASY mode	(40%)	(40%)	
PRO mode	0 - 100%	0 - 100%	X

**RECOMMENDATIONS**

• **ArcForce**

Depending on the electrode type and the welding position, we recommend the following settings :

Arc Force	PA	PF	PE
Rutile	40%	20%	0%
Basic	60%	60%	20%
Cellulosic	80%	-	50%

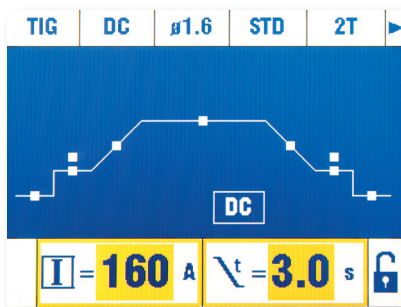
**TIG WELDING WITH INERT GAS (TIG PROCESS)**

**CONNECTIONS AND RECOMMENDATIONS**

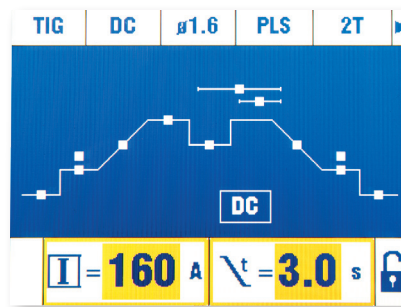
Connect the earth clamp to the positive connector (+).

Connect the torch to the negative plug (-), the trigger cable and the gas hose. Ensure that the torch is equipped and ready to weld, and that the consumables (Vise grip, ceramic gas nozzle, collet and collet body) are not damaged.

**TIG WELDING PROCESSES**



TIG DC STD



TIG DC PULSE

• **TIG DC STANDARD**

The TIG DC Standard process is recommended for high quality welding on most ferrous materials such as steel, stainless steel, but also copper, copper alloys, titanium...

The many settings for current and gas allow to fine tune any welding operation, from the ignition to the cooling of the weld bead.

• **TIG DC PULSE**

The TIG DC Pulse is recommended for thin metal sheets or for certain materials. This mode alternates between hot and cold current, which reduces the energy directed towards the workpiece

The settings are:

- The "I Cold" current is in percentage and sets up between 20% and 80% of the welding current.

The colder the current, the further it reduces the heat input during welding.

- The Pulse frequency (Hz Pulse) adjustable from 0.1 Hz to 2500Hz.

Thin sheets : Hz Pulse between 0.1 and 5Hz,

Downhand welding (PE): Hz Pulse between 5 and 20Hz,

Specific materials : Hz Pulse between 100 and 2500Hz,

The Pulse balance (%T\_PULSE) is the % of cold current set up during a period (1: Period = 1/Hz Pulse)

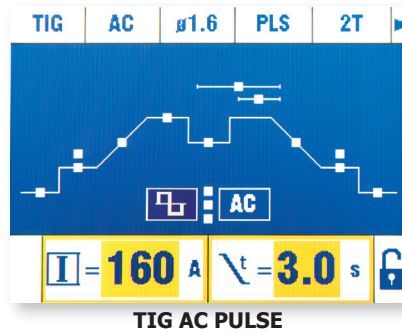
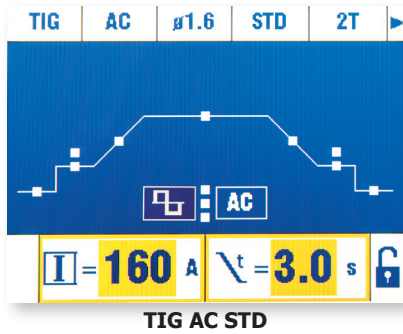
Example:

The welding current "I" is set up at 100A..

I\_Cold = 50%, which means = 50% of 100A = 50A.

Hz\_Pulse is set up at 10Hz and %T\_PULSE at 30%. The period of the signal will be at 1/10Hz = 100ms. The time of « I Cold » will be at 30% of this period, 30ms.

**TIG AC WELDING PROCESSES**

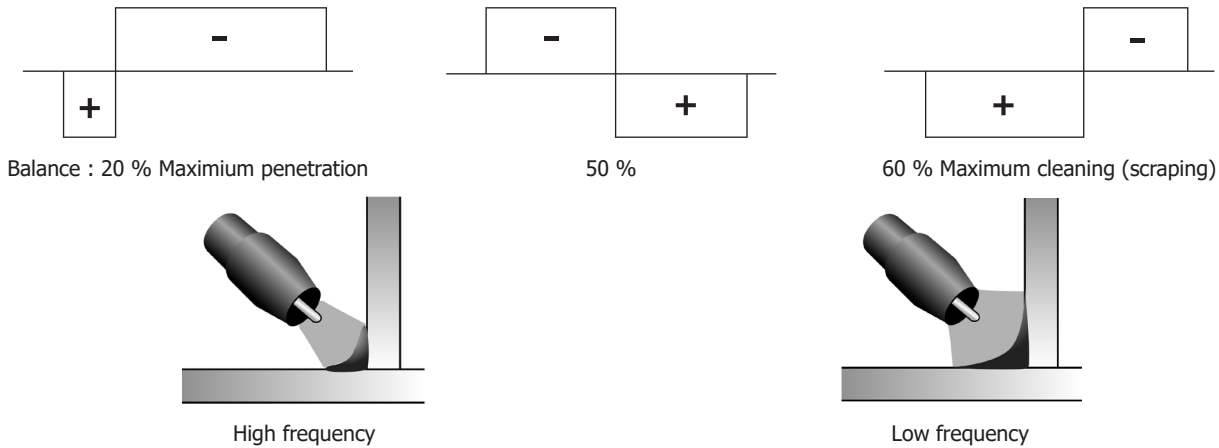


**• TIG AC STANDARD**

This TIG AC Standard mode is recommended to weld aluminium and alloys. (Al, AlSi, AlMg, AlMn...). AC current is essential to weld aluminium.

Balance (%T<sub>AC</sub>) : during the positive wave, oxidation is broken. During the negative wave, the electrode cools and the parts are welded (penetration). By modifying the ratio between 2 alternatives through the balance adjustment, you choose either cleaning or penetration (the default value is 30%).

Frequency (Hz AC): the frequency enables adjustment of the arc concentration. The higher the frequency, the more concentrated the arc. The lower the frequency the wider the arc will be.



**• TIG AC PULSE**

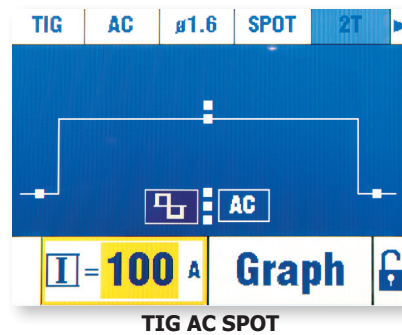
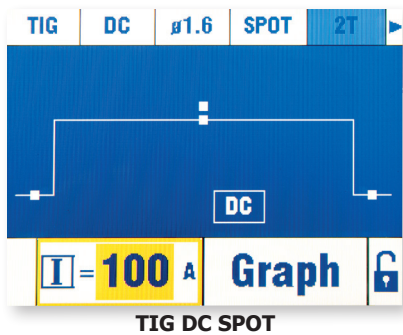
The TIG AC Pulse is recommended for thin metal sheets, see details in the TIG DC PULSE section.

**TIG AC/DC SPECIAL WELDING PROCESSES**

**• Le pointage - SPOT**

This mode is recommended to pre-assemble workpieces before welding.

The adjustable spot weld duration enables control of the weld time for better spot welding results and an non-oxidised spot.

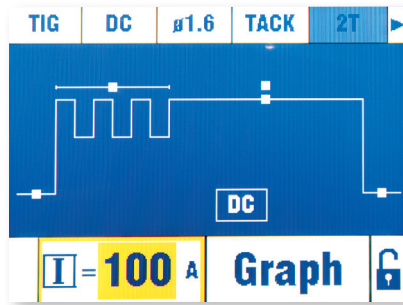


**Settings and options**

Pictogram	
Designation	Spot time
Value	Manual, 0.1s – 20s

• **Spotting - TACK (TIG DC)**

This mode can also pre-assemble workpieces, but in two phases : first phase is DC pulse which concentrates the arc for enhanced penetration, followed by a DC standard phase which enlarges the arc and the weld pool for a good spot. The adjustable duration of each phase enables control of the weld time for better spot welding results and an non-oxidised spot.



**Settings and options**

Pictogram		
Designation	Spot pulse duration (s)	Spot time
Value	0.1s - 20s	Manual, 0.1s – 20s

**TIG SYNERGIC**

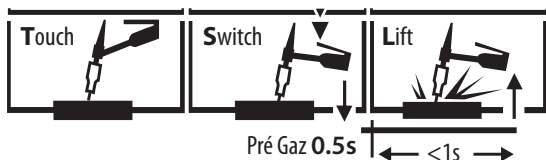
The SYNERGIC mode is a simplified mode which offers an advised configuration for the welding from 4 essential data.. The four settings are :

- 1- **The type of metal of the workpiece:** Iron and Steel (Fe), Nickel Chromium (NiCr), Copper and alloys (Cu/CuZn), Aluminium Magnesium, Aluminium Silicon and Aluminium 99% (Al99).
- 2- **The type of joint:** fillet , butt , lap and vertical down welding .
- 3- **The diameter of the tungsten** used in order to set the range of welding current without deteriorating it, and to optimise the ignition.
- 4- **The thickness of the metal to weld**

This mode can be of help to easily set weld parameters when you have just bought the machine. At any moment, the operator will be able to come back to the normal mode without losing the current parameters set up in STD mode. Every SYNERGIC setting will be saved and the user will be able to change them afterwards. This allows the operator to start welding with a number of parameters already set up.

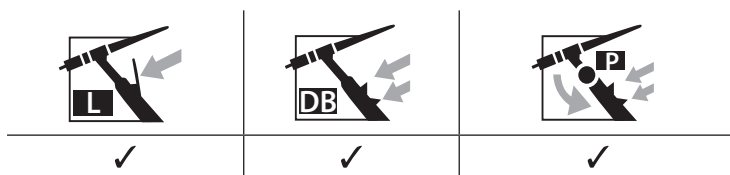
**SELECT IGNITION MODE**

TIG HF: High Frequency start without contact  
 TIG LIFT : Contact start (for environments sensitive to HF disturbances).



- 1- Touch the workpiece with the electrode
- 2- Press the trigger on the torch
- 3- Pull back the torch to lift the electrode.

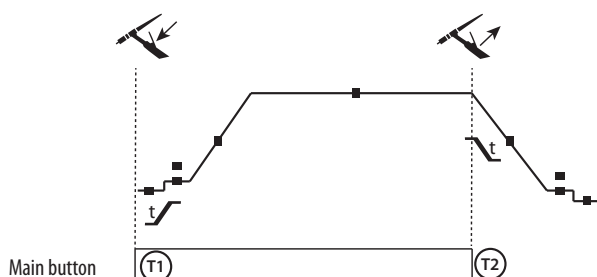
**COMPATIBLE TORCHES**



**TORCHES AND TRIGGER MODES**

For the 1 button torch, the button is called «main button».  
 For the 2 buttons torch, the first button is called «main button» and the second button is called «secondary button».

**2T MODE**



T1 - The main button is pressed, the welding cycle starts (PreGas, I\_Start, UpSlope and welding).

T2 - The main button is released, the welding cycle is stopped (DownSlope, I\_Stop, PostGas).

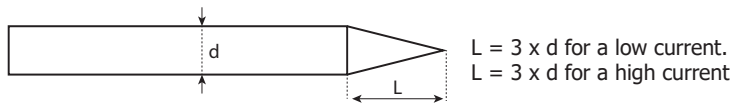
For the double button torch and in 2T mode only, the secondary button works like the main button.



**ELECTRODE GRINDING**

**In Tig DC mode :**

To optimise the welding process, it is recommended to grind the electrode prior to welding as described below :



The recommended electrodes are : E3, WL15.

**In Tig AC mode :**

The electrode does not need to be grinded, except for very low currents <50A. It is normal for a ball to appear at the end of the electrode. The ball size will become larger as the current and cleaning (scraping) is increased.

The recommended electrodes are : WP PUR, E3 and WL.

**SAVE AND LOAD WELDING SETTINGS**

The available save slots are : 100 in MMA, 100 in TIG DC and 50 in TIG AC.

**Save a welding setting under a chosen name.**

In the file menu, the function « SAVE AS » is identified with the pictogram :



The operator can enter the name of the setting by typing it on the keyboard. Once back in the welding menu, the screen will display the name of the setting. If the saved setting is amended, the name will appear in red.

**Enregistrer une configuration**

If the saved setting is not accurate anymore and some modifications have been made : in the file menu , the function «SAVE», identified by icon , overwrites the old configuration and saves the new one. If the the saved setting is amended, the name will appear in red.

**Open a saved setting**

In the file menu , the function «OPEN» gives access to the current list of settings

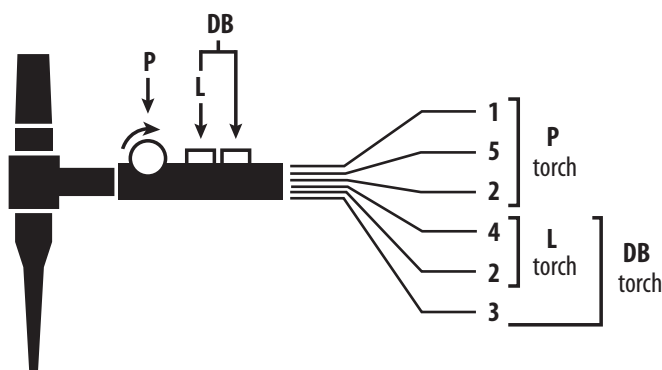
**Password:**

The default password for unlocking is: 0000.

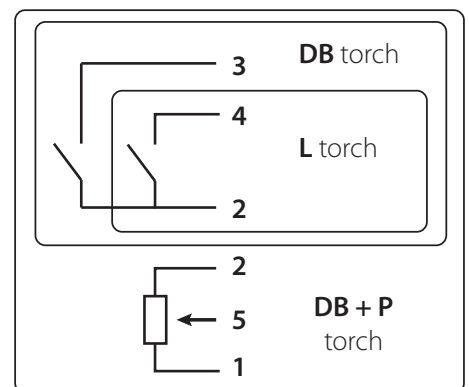
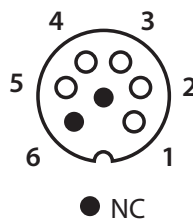
If the password has been lost, the super password enables to unlock the product: MORFRES

The standard password is reset to: 0000.

**COMMAND TRIGGER CONNECTOR**



Cabling diagram for the SRL18 torch.



Electric diagram according to torch type.

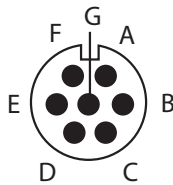
Torch type		Wire description	Pin
Torch 2 triggers + potentiometer	Torch 2 triggers	Common/Earth	2 (green)
		Trigger 1	4 (white)
		Trigger 2	3 (brown)
	Torch 1 trigger	Common/Potentiometer earth	2 (grey)
		VCC	1 (yellow)
		Cursor	5 (pink)

**REMOTE CONTROL**

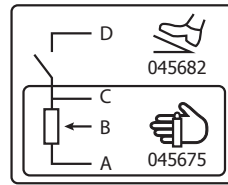
The remote control operates in TIG mode and in MMA.



ref. 045699



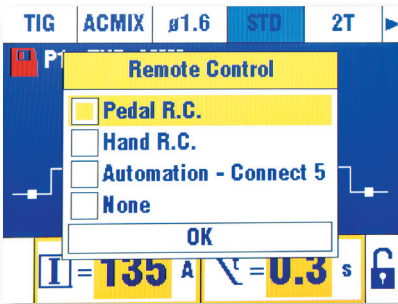
External view



Electric diagram according to the remote control type.

**Connections:**

- 1- Plug the remote control into the connection at the back of the machine.
- 2- The machine will detect automatically the remote control and open a selection menu:



- 3- Select the remote control type

**Connection**

The machine is equipped with a female socket for remote control. The specific 7 pin male plug (optional ref.045699) enables connection to a manual remote control or foot pedal. For the cabling layout, please see the diagram below.

REMOTE CONTROL TYPE		Wire description	Pin
CONNECT-5	Foot pedal	VCC	A
		Cursor	B
	Manual remote control	Common/Earth	C
		Switch	D
		AUTO-DETECT	E
		ARC ON	F
		REG I	G

**Operating :**

• **Manual remote control (option ref. 045675)**

The remote control enables the variation of current from 50% to 100% of the set intensity In this configuration, all modes and functions of the machine are accessible and can be set.

• **Foot pedal (option ref. 045682) :**

The pedal control enables variation of the current from the minimum current to 100% of the set intensity.

In TIG, the welding machine only operates in 2T mode. The upslope and downslope are not automatically managed by the current source, and are controlled by the user with the foot pedal.

• **Connect 5 - automaton mode:**

This mode enables to pilot the TIG 250 AC/DC from a console or from an automaton due to 5 pre-saved programs.

For the foot pedal, the «Switch (D)» enables to start or stop welding according to the chosen cycle. The voltage value for the «slider (B)» matches a program or the actual status.

This voltage must be between 0 and 5V (step of 0.5V) which is linked to a program reminder:

- Actual status : 0 - 0.5V
- Program 1 : 0.5- 1V
- Program 2 : 1.0 - 1.5V
- Program 3 : 1.5 - 2V
- Program 4 : 2 - 2.5V
- Program 5 : 2.5 - 3.3V

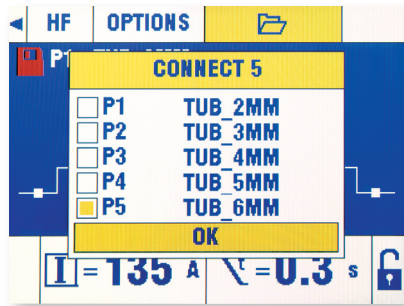
An additional potentiometer enables to change the current (+/- 15%) either whilst welding or not. The information ARC ON (arc presence) enables the automaton to synchronise itself (Pull Up 100k entry, automaton side). Put the pin AUTO\_DETECT to the earth enables to start the product without going through the selection window where you can select the type of remote control used.

The 5 loaded settings correspond to the first 5 saved programs (P1 to P5).

The signals' I/O (input/output) are protected at 6.1V.

Additional explanations are available on our website. (<https://goo.gl/i146Ma>).

**Loading settings:**



**TROUBLESHOOTING**

This device integrates a default management system.

A series of messages displayed on the control board allows for a fault and anomalies diagnosis.

ABNORMALITIES	CAUSES	SOLUTIONS
The machine does not deliver any current and the yellow pictogram ↓ signalling thermal protection is on.	The thermal protection has switched on.	Wait the end of the cooling cycle of about 5 min. The pictogram ↓ disappears.
The indicator is on but the product does not deliver any current.	The earth clamp or the electrode holder is not connected to the unit.	Check the connections
Voltage error	The product is protected against overvoltage.	An power surge is at the origin of this message.
Despite the filling the tank, the error message is still on.	The cooling liquid system is still not working and the fan is not on.	Check the fuse.
Unstable arc	Fault due to the tungsten electrode	Use an electrode size which is more suitable to the thickness of your metal / workpiece. Use a tungsten electrode which is properly handled / prepared.
	Gas flow too high	Reduce the gas flow
The tungsten becomes oxidised and dull at the end of the welding	Welding area.	Protect the welding area against draught.
	Post gas fault.	Increase the post gas duration Check and tighten every gas connection. Check the flowmeter with an no load ignition.
The tungsten electrode melts	Polarity error	Check that the earth is connected to the +
Water level fault	This default is due to an insufficient amount of cooling liquid in the system. The cooling unit is equipped with a water level sensor to ensure that the product operates normally	Fill up the tank to the indicated MAX level.
Despite the filling the tank, the error message is still on.	The cooling liquid system is still not working and the fan is not on.	Check the fuse.
Flow fault	This default is due to a obstructed torch (in its water circuit). The cooling unit is equipped with a water level sensor to ensure that the product operates normally	
Cooling unit fault	This occurs when the cooling unit is not detected anymore.	Switch off the product and check the electrical connection of the cooling unit.

**WARRANTY**

The warranty covers faulty workmanship for 2 years from the date of purchase (parts and labour).

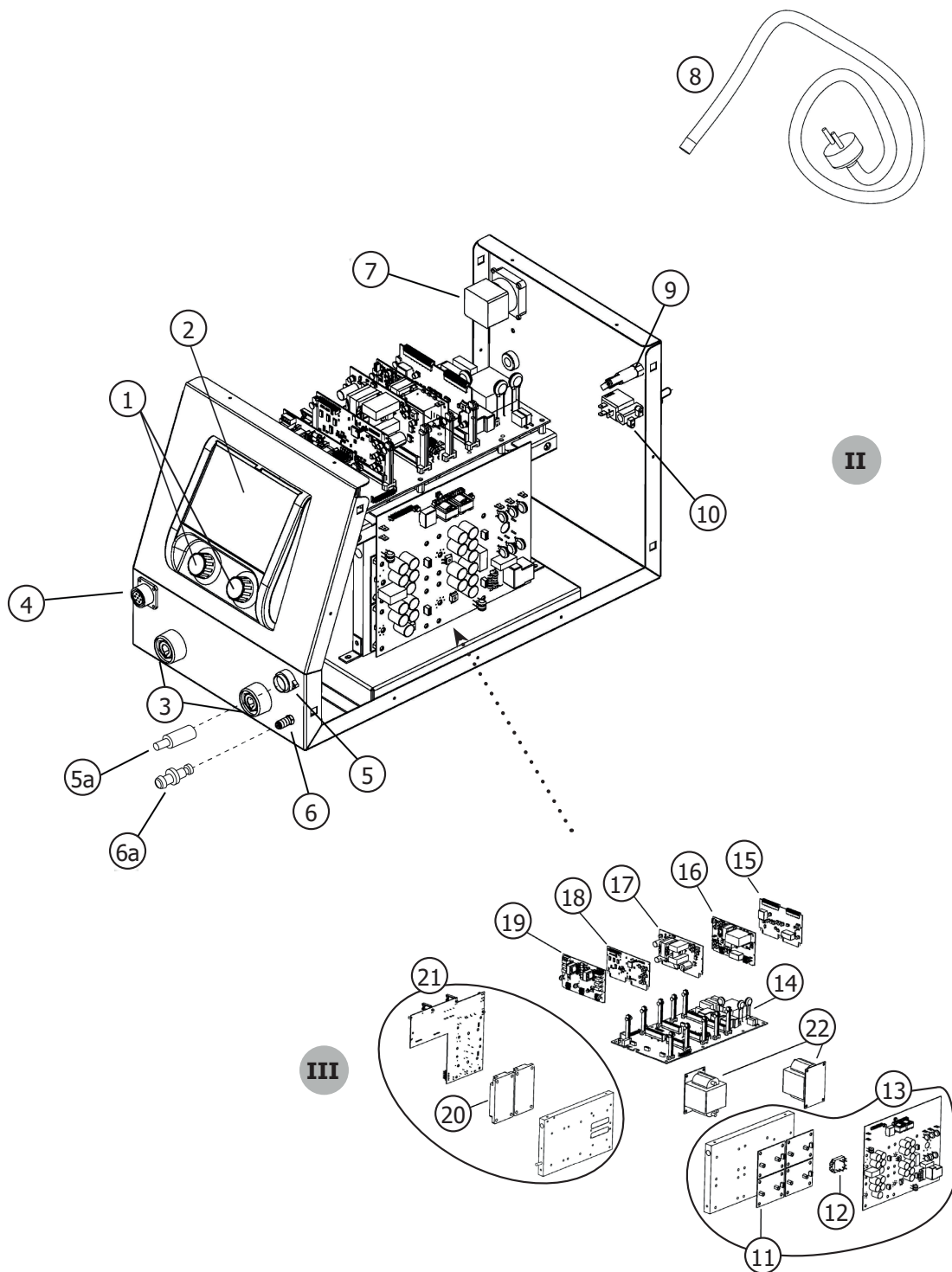
The warranty does not cover:

- Transit damage.
- Normal wear of parts (eg. : cables, clamps, etc..).
- Damages due to misuse (power supply error, dropping of equipment, disassembling).
- Environment related failures (pollution, rust, dust).

In case of failure, return the unit to your distributor together with:

- The proof of purchase (receipt etc ...)
- A description of the fault reported

**PIÈCES DE RECHANGE / SPARE PARTS / ERSATZTEILE / PIEZAS DE RECAMBIO / ЗАПЧАСТИ / RE-SERVE ONDERDELEN / PEZZI DI RICAMBIO**







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