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EN 2 / 28-52 / 104-109

DE 2 / 53-77 / 104-109

ES 2 / 78-103 / 104-109

TITANIUM 400 AC/DC

FIG-1

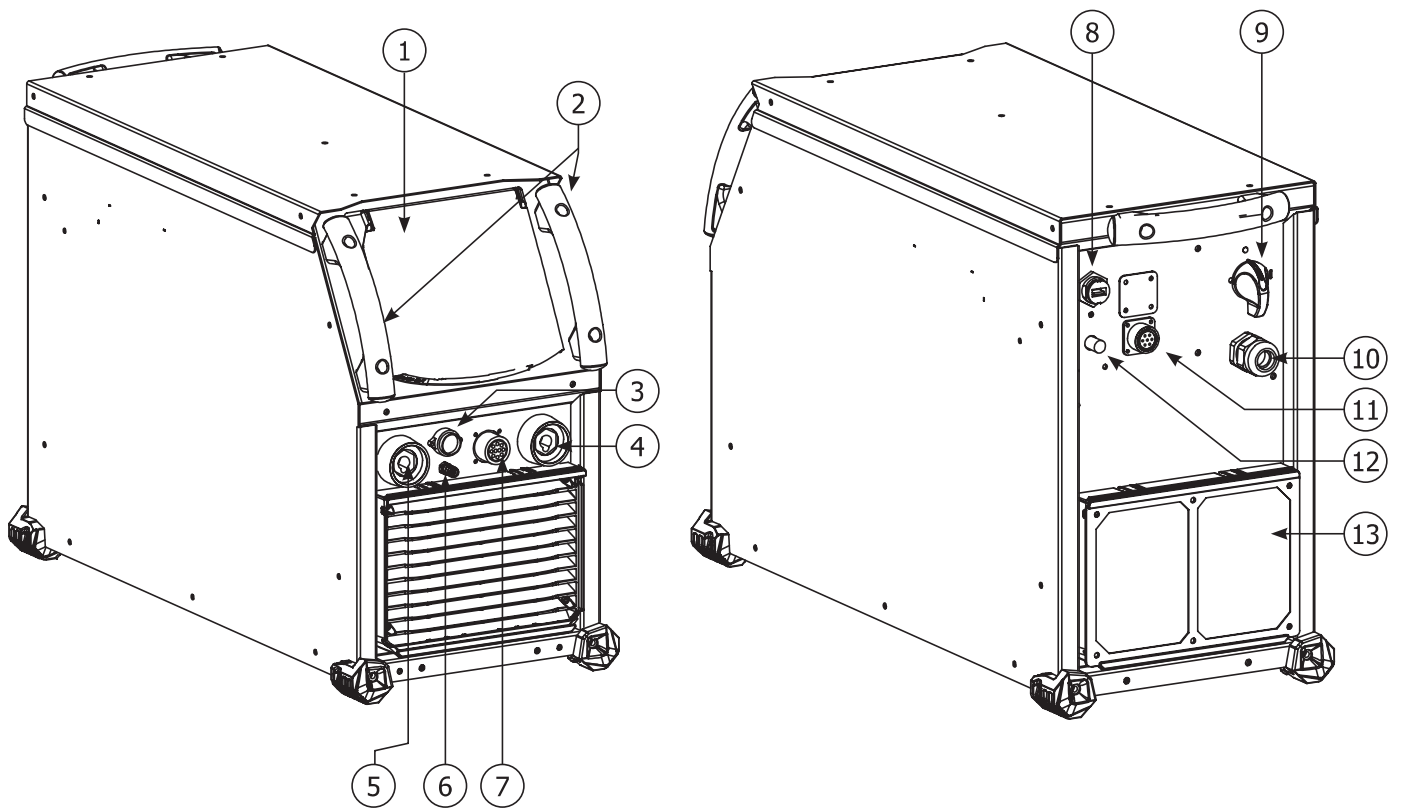


FIG-2



WARNING - SAFETY RULES

GENERAL INSTRUCTIONS



Read and understand the following safety instructions before use.

Any modification or updates that are not specified in the instruction's manual should not be undertaken.

The manufacturer is not liable for any injury or damage 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



Fumes, gas and dust produced during welding are hazardous to health. It is mandatory to ensure adequate ventilation and/or extraction to keep fumes and gas away from the work area. Using an air fed welding helmet is recommended in case of insufficient ventilation in the workplace.

Check that the air supply is effective by referring to the recommended safety regulations.

Precautions must be taken when welding in small areas, and the operator will need supervision from a safe distance. In addition, the welding of certain materials containing lead, cadmium, zinc, mercury or beryllium may be particularly harmful.

Also remove any grease on the metal pieces before welding.

Gas cylinders must be stored in an open or ventilated area. They must be stored vertically and held by a support or trolley to limit the risk of fall.

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

FIRE AND EXPLOSION RISKS



Protect the entire welding area. Flammable materials 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 fire or explosion. Keep people, flammable materials/objects and containers that are under pressure at a safe distance. Welding in closed containers or pipes should be avoided and, if they are opened, they must be emptied of any flammable or explosive material (oil, fuel, gas ...). Grinding operations should not be carried out close to the power supply or any flammable materials.

GAS CYLINDERS



Gas leaking from the cylinders can lead to suffocation if present in high concentration around the work area (ventilation required). Transport must be done safely: cylinders closed and welding machine switched off. They must be stored vertically and held by a support to limit the risk of falling.

Close the cylinder between two uses. Beware of temperature variations and sun exposure. The cylinder must not be in contact with a flame, electric arc, torch, earth clamp or all other sources of heat. Always keep gas cylinders away from electrical circuits, and therefore never weld a cylinder under pressure. 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



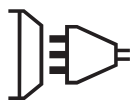
The electrical mains used must have an earth terminal. Use the recommended fuse size. An electric shock could cause serious injuries or potentially even deadly accidents.

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 the earth clamp at the same time. Ensure that cables and torches are replaced by qualified and authorized persons if they are damaged. Make sure that the cable cross section is adequate with the usage (extensions and welding cables). Always wear dry clothes which are in good condition in order to be isolated from the welding circuit. Wear insulating shoes, regardless of the workplace/environment in which you work in.

EMC MATERIAL CLASSIFICATION



This Class A machine is not intended to be used on a residential site where the electric current is supplied by the domestic low-voltage power grid. There may be potential difficulties in ensuring electromagnetic compatibility at these sites, due to conducted interferences as well as radiation.



This equipment does not comply with IEC 61000-3-12 and is intended to be connected to private low-voltage systems interfacing with the public power grid only at the medium- or high-voltage level. If connected to a public low-voltage power grid, the installer or user of the machine has to ensure, by checking with the network operator, that the device can be connected.



This equipment complies with the IEC 61000-3-11 standard.

ELECTROMAGNETIC INTERFERENCES



The electric current flowing through any conductor causes electrical and magnetic fields (EMF). The welding current generates an EMF around the welding circuit and the welding equipment.

The EMF electromagnetic fields can interfere with certain medical implants, such as pacemakers. Protective measures must be taken for people having medical implants. For example, by restricting access to passers-by or conducting an individual risk evaluation for the welders.

All welders must use the following procedures to minimize exposure to electromagnetic fields from the welding circuit:

- position the welding cables together - fix them with a clamp, if possible;
- position yourself (torso and head) as far away from the welding circuit as possible;
- never wrap the welding cables around the body;
- do not position the 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 transporting the welding machine or its wire feeder.



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

RECOMMENDATIONS FOR WELDING AREA ASSESSMENT AND WELDING

Overview

The user is responsible for the installation and use of the arc welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected, the user is responsible for resolving the situation with the manufacturer's technical assistance. In some cases, this corrective 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 inconvenient.

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. The following elements should be taken into account:

- the presence (above, below and next to the arc welding machine) of other power cables, remote cables and telephone cables;
- television transmitters and receivers;
- computers and other hardware;
- critical safety equipment such as industrial machine protections;
- the health and safety of the people in the area such as people with pacemakers or hearing aids;
- calibration and measuring equipment;
- the isolation of other pieces of equipment which are in the same area.

The operator has to ensure that the devices and equipment used in the same area are compatible with each other. This may require extra precautions;

- the time of day during the welding or other activities have to be performed.

The dimension of the cutting area that has to be considered depends on the size and shape of the building and the type of work undertaken. The area taken into consideration might go beyond the limits of the installations.

Welding area assessment

Besides the welding area assessment, the assessment of the arc welding systems installation 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.

RECOMMENDED METHODS TO REDUCE ELECTROMAGNETIC EMISSIONS

a. National power grid: the arc welding machine must be connected to the national power grid in accordance with the manufacturer's recommendation. In case of interferences, it may be necessary to take additional precautions such as the filtering of the power supply network. Consideration should be given to shielding the power supply cable in a metal conduit or equivalent of permanently installed arc welding equipment. It is necessary to ensure the electrical continuity of the frame along its entire length. The shielding should be connected to the welding current source to ensure a good electrical contact between the conduit and the casing of the welding current source.

b. Maintenance of the arc welding equipment: The arc welding machine should be subject to a routine maintenance check according to the recommendations of the manufacturer. 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. Equipotential bonding: consideration should be given to bond all metal objects in the surrounding area. However, metal objects connected to the workpiece increase the risk of 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, the connection of the part to be soldered to earth should be made directly, but in some countries where this direct connection is not allowed, the connection should be made with an appropriate capacitor and chosen according to national regulations.

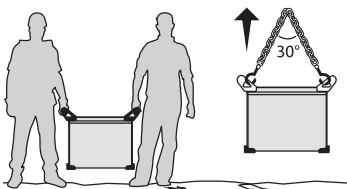
f. Protection and shielding: The selective protection and shielding of other cables and devices in the area can reduce perturbation issues. The protection of the entire welding area can be considered for specific situations.

TRANSPORT AND TRANSIT OF THE WELDING MACHINE



The machine is equipped with two handles to facilitate transport, which requires two people. Be careful not to underestimate the weight of the machine.

Do not use the cables or torch to move the machine. The welding equipment must be moved in an upright position.



Do not place/carry the unit over people or objects. Never lift the machine while there is a gas cylinder on the support shelf. The transport rules applying to each item are different.

EQUIPMENT INSTALLATION

- Put the machine on the floor (maximum incline of 10°).
 - Provide an adequate area to ventilate the machine and access the controls.
 - This equipment must be used and stored in a place protected from dust, acid, gas or any other corrosive substance.
 - The machine must be placed in a sheltered area away from rain or direct sunlight.
 - The equipment protection is rated IP23 meaning that :
 - sensitive parts of the equipment are protected from objects with a diam >12.5 mm and,
 - it is protected again rainfall with a 60° vertical incline.
- The equipment can be used outside in accordance with the IP23 protection certification.

Power cables, extension leads and welding cables must be fully uncoiled to prevent overheating.



The manufacturer does not accept any liability in relation to damages caused to objects or harm caused to persons as the result of incorrect and/or dangerous use of the machine.

MAINTENANCE / RECOMMENDATIONS



- Maintenance should only be carried out by a qualified person. A yearly maintenance is recommended.
- Ensure the machine is unplugged from the mains, and then wait 2 minutes before carrying out maintenance work. High Voltage and Currents inside the machine.

- Remove regularly the casing and any excess of 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 is damaged, it must be replaced by the manufacturer, its after sales service or an equally qualified person to prevent danger.
- Ensure the vents 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.

INSTALLATION – PRODUCT OPERATION

Only qualified personnel authorised by the manufacturer should perform the installation of the welding equipment. During the installation, the operator must ensure that the machine is disconnected from the mains. Connecting generators in serial or in parallel is forbidden.

EQUIPMENT DESCRIPTION (FIG-1)

The TITANIUM 400 AC/DC is an inverter welding current source for welding to the coated electrode (MMA) and refractory electrode (TIG) in direct current (TIG DC) and alternating current (TIG AC).

The MMA process allows to weld all types of electrodes : rutile, basic, stainless and cellulosic.
TIG welding requires gas shield protection of pure gas (Argon).

This material can be connected to a remote control (ref. 045675), a foot pedal (ref. 045682) or an automated system (CONNECT-5).

- | | |
|--|---------------------------------|
| 1- HMI | 8- USB connector |
| 2- Handles | 9- ON / OFF switch |
| 3- Torch button connector | 10- Power supply cable |
| 4- Positive polarity plug | 11- Remote controller connector |
| 5- Polarity plug | 12- Gas bottle connector |
| 6- Torch gas connector | 13- Filter (option ref. 046580) |
| 7- Wire feeder connector or MMI remote interface | |

INTERFACE (MMI) (FIG-2)

- 1- Button for accessing the various menus and parameters
- 2- Adjustment wheel left screen
- 3- Adjustment wheel right screen

ACCESSORIES AND OPTIONS

			Remote controllers		
Trolley 10 m ³	Cooling unit WCU1KW_C	ABITIG torches liquids - 450 W - 8 m	Pedal RC-FA1 4 m	Manual RC-HA1 8 m	Filter
037328	013537	Double button: 037366 Lamella: 037359 Potentiometer: 060760	045682	045675	046580

POWER SWITCH

- This equipment is supplied with a 32A 3-phase 5-pin socket (3P+N+PE) of the EN 60309-1 type and is powered by a 400V (50-60Hz) 3-phase electrical installation WITH neutral grounded.
 - The absorbed effective current (I_{1eff}) is displayed on the machine, for optimal use. Check that the power supply and its protection (fuse and/or circuit breaker) are compatible with the current needed by the machine. In some countries, it may be necessary to change the plug to allow the use at maximum settings. The user has to make sure that the plug can be reached.
 - The device turns into protection mode if the power supply tension is below or above the 15%. To indicate this default, the screen displays an error code.
 - The power is switched on by rotating the on/off switch to position I (fig 1 - 9), conversely the power is switched off by rotating it to position O.
- Attention! Never disconnect the power supply when the welding electrical distribution is in operation.**
- Fan: in MMA mode, the fan works continuously. In TIG mode, the fan works only when welding, then stops after cooling.

CONNECTION TO A GENERATOR

This welding power source can operate with generators provided that the auxiliary power meets the following requirements:

- The voltage must be alternative, adjusted as specified and with a peak voltage of less than 700 V,
- The frequency must be between 50 and 60 Hz.

It is imperative to check these requirements as certain generators can create high voltage peaks that can damage these machines.

USE OF EXTENSION LEADS

All extension cables must have an adequate size and section, relative to the machine's voltage. Use an extension lead that complies with national safety regulations.

Voltage input	Thickness of the extension lead (Length < 45m)
400 V	6 mm ²

GAS CONNECTION

The TITANIUM 400 AC/DC is equipped with two connections. A cylinder connection (Fig 1 - 12) for the inlet of the welding gas into the station, and a torch gas connector (Fig 1 - 6) for the outlet of the gas at the end of the torch. We recommend that you use the adapters supplied with your set to ensure an optimal connection.

GENERAL ORGANIZATION OF THE INTERFACE

<p>Product configuration :</p> <ol style="list-style-type: none"> 1/ Information: all product information is gathered there (Model, S/N.....) 2/ Process: allows you to choose the welding process: MMA or TIG. 3/ Settings: the advanced product settings are combined (display mode, device name, language...) 4/ Calibration: allows you to start the calibration of the torches and earth clamps to refine the voltage and current measurements. 5/ Portability: allows to load or download from a USB key the user JOBS as well as the machine configuration, 6/ Traceability: allows to start the backup of all welding seams as well as its export on USB key 	
<p>Process: corresponds to the MMA or TIG welding interface, it gives access:</p> <ul style="list-style-type: none"> • Gas purge: by long pressing the process icon • Process parameter: allows process settings, • At the different setting windows, • JOB: gives access to the different JOB reminder modes. 	
<p>Process parameters: corresponds to the process parameter setting window:</p> <ul style="list-style-type: none"> • In MMA: allows the adjustment of the sub-process (STD, PLS or AC), the type of electrode, the anti-sticking..... • In TIG: allows the adjustment of the process (DC, AC or Synergic), the sub-process (STD, PLS or AC), the electrode diameter... <p>Remote control: configuration of remote controls (TIG mode).</p> <p>Energy: configuration of the energy mode, developed for welding with energy control supervised by a DMOS (see next page for more details).</p>	

4 **HOME JOB** : corresponds to the program reminder modes window:

- JOB: create, save, delete and recall JOB.
- QUICKLOAD: JOB trigger recall without welding.
- MULTIJOB : JOB reminder to the trigger in welding.
- Connect-5 (C5): Automatically recall JOBS.

HOME JOB

●

○ [●] ○

[○-○-○]

C5
Connect-5

←
✓

ELECTRODE WELDING (MMA / SMAW)

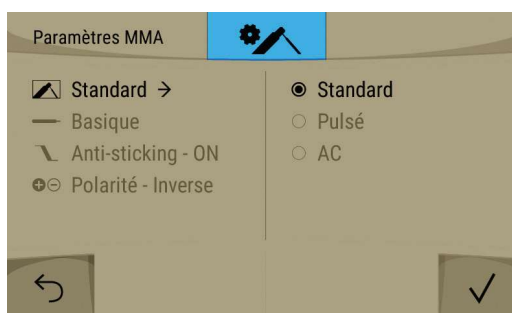
CONNECTION AND ADVICE

- Connect the cables, electrode holder and ground clamp to the connection connectors.
- Observe the welding polarities and intensities indicated on the electrode boxes.
- Remove the electrode from the electrode holder when the machine is not in use.
- The machine has 3 features exclusive to Inverters:
 - The Hot Start creates an overcurrent at the beginning of the welding.
 - The Arc Force creates an overcurrent which prevents the electrode from sticking to the weld pool.
 - The Anti-Sticking technology makes it easier to unstick the electrode from the metal.

CHOICE OF COATED ELECTRODES

- Rutile electrode: very easy to use in all positions with DC and AC current.
- Basic Electrode: used in all DC and AC positions, it is suitable for safety work due to its increased mechanical properties.
- Cellulosic electrode: very dynamic arc with a high melting rate, its use in all positions makes it especially suitable for pipeline work.

THE SETTINGS OF THE COATED ELECTRODE PROCESS (MMA/SMAW)

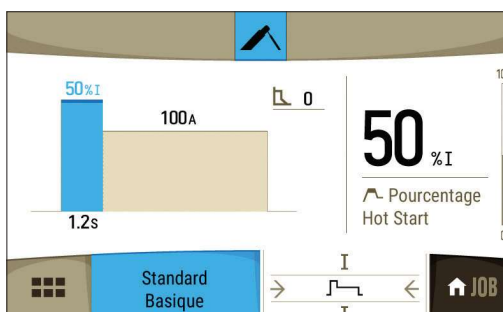
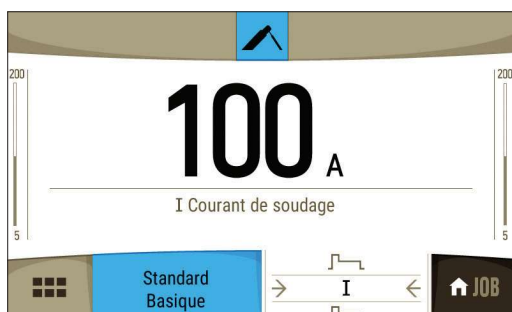


Settings	Designation	Adjustable settings	Standard (CC)	Pulsed	AC	Recommendations
	Electrode type	Rutile Basic Cellulosic	✓	✓	✓	The electrode type determines specific parameters according to the type of electrode used in order to optimize its weldability.
	Anti-Sticking	OFF - ON	✓	✓	✓	Anti-gluing is recommended to safely remove the electrode if it is glued to the part to be welded (the power is automatically cut off).
	Choice of polarity	Directe (+++ et ---) Inverse (+-- et -++)	✓	✓		The replacement of accessories in case of direct or reverse polarity is carried out at the product level.

COATED ELECTRODE WELDING (MMA/SMAW)

• MMA Standard

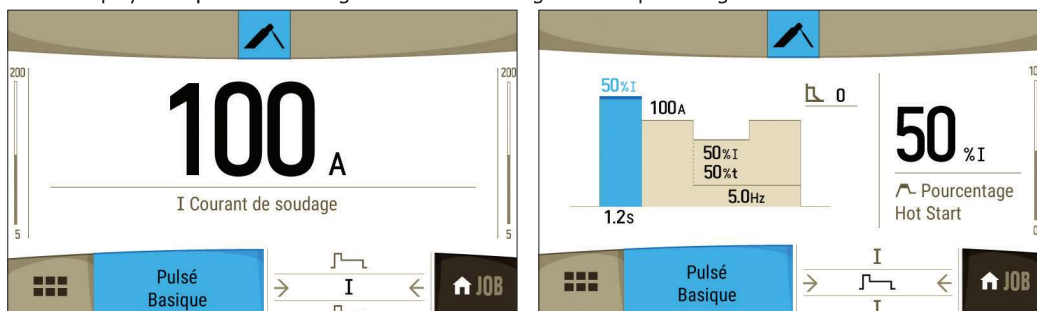
This MMA Standard welding mode is suitable for most applications. It can weld any type of electrode : rutile, basic, cellulosic... and on any material: steel, stainless steel, cast iron.



Settings	Designation	Adjustable settings	Description & advice
	Percentage of Hot Start	0 - 100 %	The Hot Start is an overcurrent during priming to prevent the electrode from sticking to the part to be welded. It is adjustable in intensity (% of welding current) and time (seconds).
	Time of Hot Start	0 - 2 sec.	
	Welding current	10 - 400 A	The welding current is adjusted according to the type of electrode chosen (refer to the electrode packaging).
	Arc Force	-10 > +10%	The Arc Force is an overcurrent delivered when the electrode or drop comes into contact with the solder bath in order to avoid sticking.

• **MMA Pulse / SMAW Pulse**

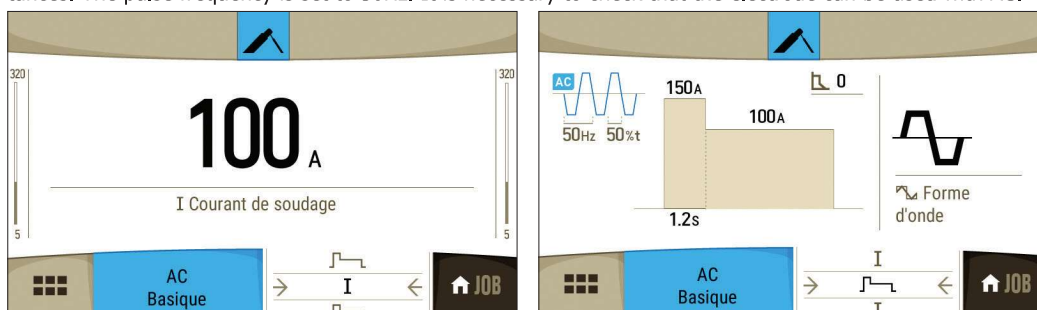
This MMA Pulse welding mode is suitable for applications in the vertical up position (PF). The pulse mode keeps the weld pool cold and eases the transfer of matter. Without the pulse mode, vertical-up welding requires a difficult «Christmas tree» shape triangular movement. With the MMA Pulsed mode, this movement is no longer required and a simple straight up movement is enough (depending on the thickness of the workpiece). If you wish to widen your weld pool, a simple lateral movement is enough (similar to normal welding). In this case the pulse current frequency can be adjusted on the display. This process allows greater control during vertical-up welding.



Settings	Designation	Adjustable settings	Description & advice
	Percentage of Hot Start	0 - 100 %	The Hot Start is an overcurrent during priming to prevent the electrode from sticking to the part to be welded. It is adjustable in intensity (% of welding current) and time (seconds).
	Time of Hot Start	0 - 2 sec.	
	Welding current	10 - 400 A	The welding current is adjusted according to the type of electrode chosen (refer to the electrode packaging).
	Cold current/Background current)	20 - 80%	Second welding current known as «cold».
	Frequency of pulse	0.4 - 20 Hz	PULSATION frequency of the PULSE mode (Hz)
	Arc Force	-10 > +10%	The Arc Force is an overcurrent delivered when the electrode or drop comes into contact with the solder bath in order to avoid sticking.

• **MMA AC / SMAW AC**

The MMA AC mode is recommended in some very specific cases when the arc is not stable or straight, which may happen around magnets (magnetised weldpiece, magnetic field in the vicinity).. The AC (alternative current) prevents electrical interference and keeps the stable under these circumstances. The pulse frequency is set to 50Hz. It is necessary to check that the electrode can be used with AC.



Settings	Designation	Adjustable settings	Description & advice
	Percentage of Hot Start	0 - 100 %	The Hot Start is an overcurrent during priming to prevent the electrode from sticking to the part to be welded. It is adjustable in intensity (% of welding current) and time (seconds).
	Time of Hot Start	0 - 2 sec.	
	Welding current	10 - 400 A	The welding current is adjusted according to the type of electrode chosen (refer to the electrode packaging).
	Arc Force	-10 > +10%	The Arc Force is an overcurrent delivered when the electrode or drop comes into contact with the solder bath in order to avoid sticking.

	AC wave shape		AC waveform. The trapezoidal shape is preferred.
	Welding frequency	15 - 150 Hz	Frequency of polarity reversals welding - pickling
	Percentage of pickling	20 - 80%	Percentage of the welding period dedicated to pickling (default 30-35%)

ADJUSTMENT TIPS



- Low hot start for thin sheets and high start for thicker and more difficult metals (dirty or oxidized parts).
- The Arc Force can be adjusted from -10 to +10 manually or an electrode selection is possible (Rutile, Basic or Cellulosic) by continuing the adjustment beyond +10. Arc Low force, for rutile electrodes, stainless steel. Strong arc force, for basic, cast iron and cellulosic electrodes.

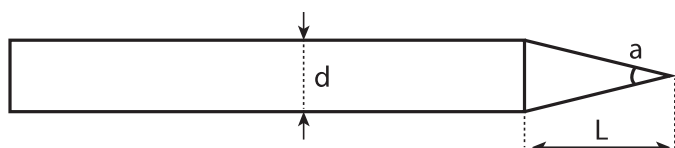
TUNGSTEN ELECTRODE WELDING WITH INERT GAS (TIG MODE)

CONNECTION AND ADVICE

- DC TIG welding requires gas protection (Argon).
- Connect the earth clamp to the positive connector (+). Connect the power cable to the negative plug (-), as well as the torch and the gas connections.
- Ensure that the torch is equipped and ready to weld, and that the consumables (Vice grip, ceramic gas nozzle, collet and collet body) are not damaged.

ELECTRODE GRINDING

For optimal operation, it is recommended to use a sharpened electrode as follows:



a = Ø 0.5 mm
 L = 3 x d for a low current.
 L = d for a high current

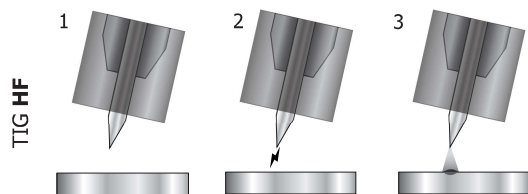
CHOICE OF ELECTRODE DIAMETER

Ø Électrode (mm)	TIG DC		TIG AC	
	Pure tungsten	Tungsten with oxides	Pure tungsten	Tungsten with oxides
1	10 > 75 A	10 > 75 A	15 > 55 A	10 > 70 A
1.6	60 > 150 A	60 > 150 A	45 > 90 A	60 > 125 A
2	75 > 180 A	100 > 200 A	65 > 125 A	85 > 160 A
2.5	130 > 230 A	170 > 250 A	80 > 140 A	120 > 210 A
3.2	160 > 310 A	225 > 330 A	150 > 190 A	150 > 250 A
4	275 > 450 A	350 > 480 A	180 > 260 A	240 > 350 A
~ 80 A per mm de Ø			~ 60 A per mm de Ø	

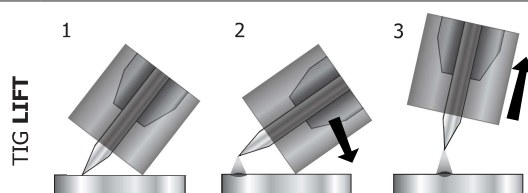
SELECT IGNITION MODE

TIG HF: High Frequency start without contact

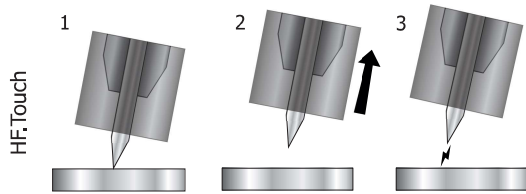
TIG LIFT : Arcing by contact (for environments where HF is not desirable).



- 1- Place the torch in the welding position above the part (distance of about 2-3 mm between the electrode tip and the part).
- 2- Press the torch trigger (the arc starts without contact using High Frequency impulsions).
- 3- The initial welding current circulates, the welding carries on according to the welding cycle.



- 1- Position the torch nozzle and the tip of the electrode on the piece of metal and press the trigger.
- 2- Position the torch to create a gap of roughly 2-3 mm between the tip of the electrode and the metal. The arc starts.
- 3- Put the position back into position to start the welding cycle.



1- Position the electrode tip on the workpiece and press the torch button.
 2- Lift the electrode from the workpiece.
 3- After a delay of 0.2s, the arc is ignited without contact using HF high voltage ignition pulses, the initial welding current flows and the weld is continued according to the welding cycle.

The arc priming and stabilization device is designed for manual and mechanically guided operation.

Warning: increasing the length of the torch or earth return cables beyond the maximum length specified by the manufacturer will increase the risk of electric shock.

In «Advanced» HMI mode only, the HF is adjustable in time and voltage :

Parameter	Designation	Setting	Description and advice
Duration HF	HF duration	0-3 s	HF time before it stops
HF level	HF voltage	0-+10	Index adjusting the voltage from 5kV to 14 kV

TIG PROCESS SETTINGS

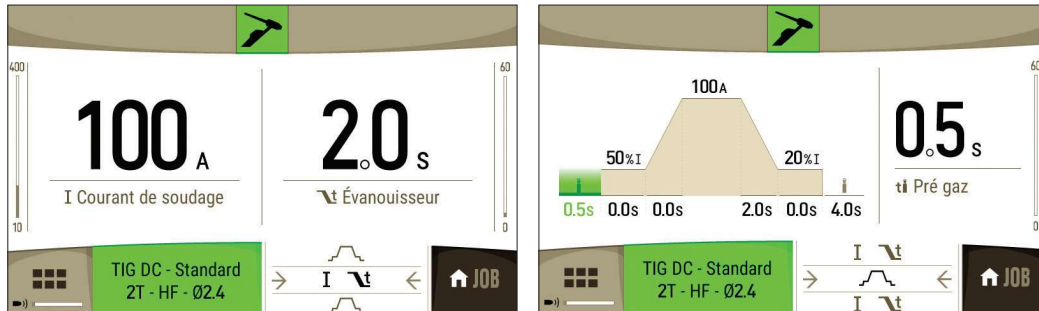
- TIG DC is designed to the welding of ferrous metals such as steel, stainless steel, but also copper and its alloys and titanium.
- TIG AC is dedicated to the welding of aluminium and its alloys, but also copper.
- The Synergic TIG no longer works on the choice of a DC or AC current type and the settings of welding cycle parameters, but integrates experience-based welding rules/synergies. This mode therefore restricts the number of settings to three basic settings:
 - The type of material.
 - The thickness to be welded.
 - The welding position.
- The TIG Wizard Lab is dedicated to complex applications where classical TIG processes (DC/AC/Synergic) reach their limits and allows for the creation of customised welding waveforms.

Settings	Designation	Adjustable settings	TIG DC	TIG AC	TIG Synergic	TIG Wizard		Recommendations
						Wizard Lab	Wizard ALU	
	Standard	Smooth current	-	✓	✓	-	✓	
	Pulsed	Pulse current	-	✓	✓	-	-	
	Fast Pulsed	Inaudible pulsed current	-	✓	✓	-	-	
	Spot	Smooth pointing	-	✓	✓	-	✓	
	Tack	Pulse pointing	-	✓	✓	-	-	
	Multi SPOT	Repeated smooth pointing	-	✓	✓	-	-	
	Multi TACK	Repeated pulsed pointing	-	✓	-	-	-	
	AC MIX	Mixing current AC and DC	-	-	✓	-	-	
	Type of materials	Fe, Al, etc.	-	-	✓	-	-	Choice of the material to be welded
	Diameter of the Tungsten electrode	1 - 4 mm	✓	✓	✓	✓	✓	Choice of electrode diameter. Allows to refine HF priming currents and synergies.
	Type of priming	HF LIFT HF.Touch	✓	✓	✓	✓	✓	Select Starting Function. In ADVANCED display mode, the HF is adjustable in time [0.01s; 3s] and voltage indexed from [0;+10].
	Trigger mode	2T - 4T - 4TLOG	✓	✓	✓	✓	2T - 4T	Choice of trigger welding management mode.
	Constant energy welding	ON - OFF	✓	✓	-	-	-	Constant energy welding mode with correction of arc length variations

TIG DC WELDING

TIG DC - Standard

The TIG DC Standard welding process allows high quality welding on most ferrous materials such as steel, stainless steel, but also copper and its alloys, titanium... The many possibilities of current and gas management allow you to perfectly control your welding operation, from priming to final cooling of your welding rod.



Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	Starting current	10 - 200 %	This starting bearing current is a phase before the current rise ramp.
	Starting time	0 - 10 sec.	
	Rising current	0 - 60 sec.	Current rise ramp.
	Welding current	3 - 400 A	Welding current.
	Downslope	0 - 60 sec.	Downslope current.
	End current	10 - 200%	This stopping stop current is a phase after the current descent ramp.
	End duration	0 - 10 sec.	
	PostGas	0 - 60 sec.	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 down.

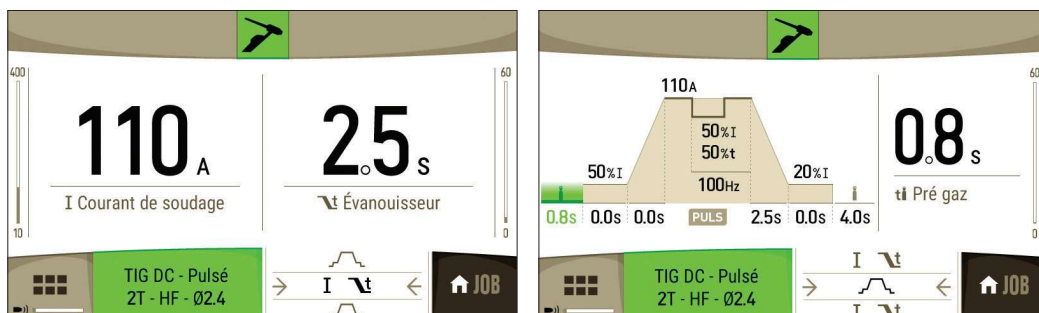
TIG DC - Pulse

This pulsed current welding mode is a combination of high current pulses (I , welding pulse) and low current pulses (I_{Cold} , part cooling pulse). This pulse mode allows to assemble pieces while keeping the machine cooler.

Example :

The I welding current is set to a 100A and $\% (I_{cold}) = 50\%$, thus a Cold current of $= 50\% \times 100A = 50A$.

$F(Hz)$ is set to 10Hz, the signal period will be $1/10Hz = 100ms \rightarrow$ every 100ms, one pulse at 100A then another at 50A will follow one another.



Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	Starting current	10 - 200 %	This starting bearing current is a phase before the current rise ramp.
	Starting time	0 - 10 sec.	
	Rising current	0 - 60 sec.	Current rise ramp.
	Welding current	3 - 400 A	Welding current.
	Wave shape		Waveform of the pulsed part.
	Cold current/Background current)	20 - 80%	Second welding current known as "cold" welding current

	Cold weather	20 - 80%	Time balance of the warm current (I) of the pulsation
	Pulse frequency	0.1 - 2500 Hz	Pulse frequency
	Downslope	0 - 60 sec.	Downslope current.
	End current	10 - 200 %	This stopping stop current is a phase after the current descent ramp.
	End duration	0 - 10 sec.	
	PostGas	0 - 60 sec.	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 down.

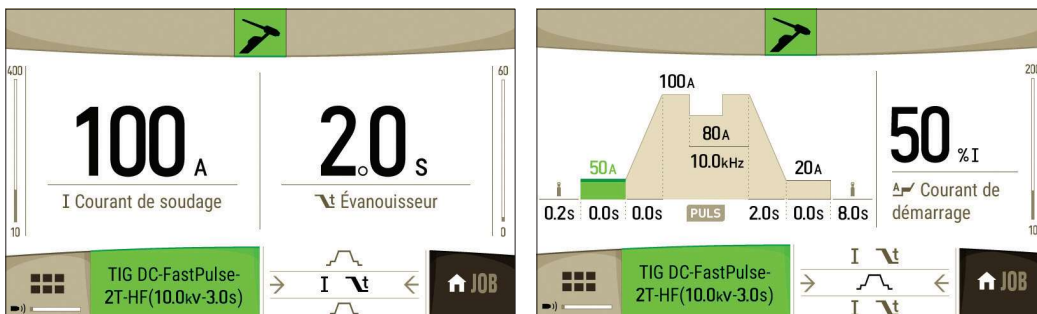


ADJUSTMENT TIPS : The choice of frequency

- If welding with manual metal input, then F(Hz) synchronized to the input gesture,
- If thin without supply (< 0.8 mm), F(Hz) > 10Hz
- Welding in position, then F(Hz) < 100Hz

TIG DC – Fast Pulse

This very high frequency pulsed current welding mode combines high current pulses (I, welding pulse) with low current pulses (I_Cold, part cooling pulse). Fast Pulse mode allows to keep the arc constriction properties of Pulse mode at high frequencies but still on less unpleasant or even inaudible sound frequencies for the welder.

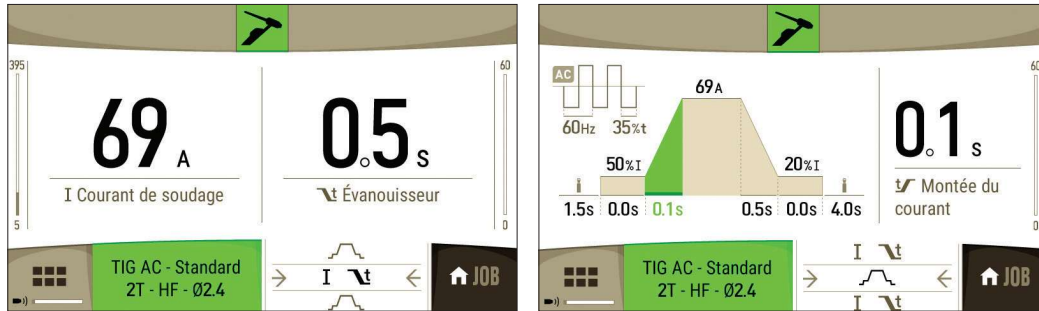


Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	Starting current	10 - 200 %	This starting bearing current is a phase before the current rise ramp.
	Starting time	0 - 10 sec.	
	Rising current	0 - 60 sec.	Current rise ramp.
	Welding current	3 - 400 A	Welding current.
	Cold weather	80% - 100 %	Second welding current known as «cold» welding current
	Pulse frequency	2.5 - 20 kHz	Pulse frequency
	Downslope	0 - 60 sec.	Downslope current.
	End current	10 - 200 %	This stopping stop current is a phase after the current descent ramp.
	End duration	0 - 10 sec.	
	PostGas	0 - 60 sec.	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 down.

TIG AC WELDING

TIG AC - Standard

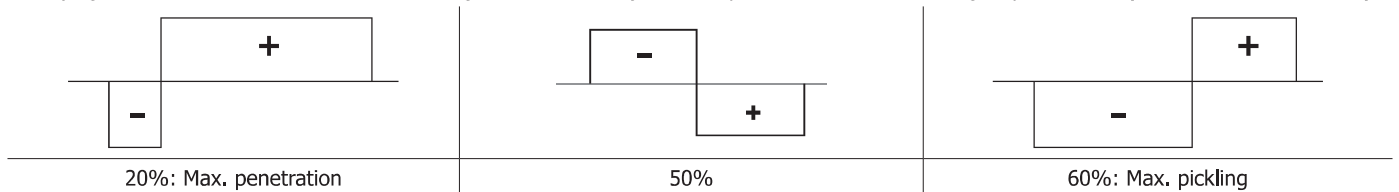
This TIG AC - Standard welding mode is dedicated to welding aluminium and its alloys (Al, AlSi, AlMg, AlMg, AlMn...). Alternating current allows the pickling of aluminium essential for welding.



Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	Starting current	10 - 200 %	This starting bearing current is a phase before the current rise ramp.
	Starting time	0 - 10 sec.	
	Rising current	0 - 60 sec.	Current rise ramp.
	Welding current	3 - 400 A	Welding current.
	Downslope	0 - 60 sec.	Downslope current.
	End current	10 - 200%	This stopping stop current is a phase after the current descent ramp.
	End duration	0 - 10 sec.	
	PostGas	0 - 60 sec.	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 down.
	AC wave shape		AC waveform.
	Welding frequency	20 - 300 Hz	Frequency of polarity reversals welding - pickling
	Percentage of pickling	20 - 60 %	Percentage of the welding period dedicated to pickling (default 30-35%)

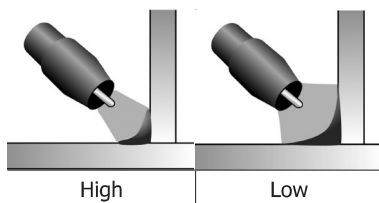
The Balance (%T_AC):

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



The frequency (AC Hz):

the frequency allows you to adjust the concentration of the arc. The higher the frequency, the more concentrated the arc. The lower the frequency the wider the arc will be.



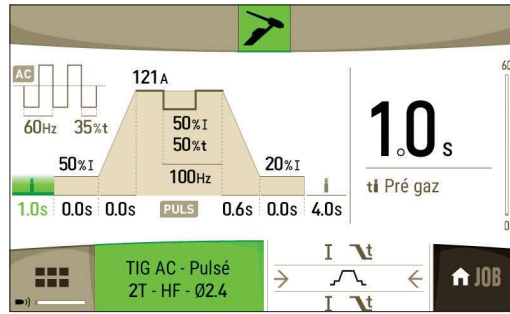
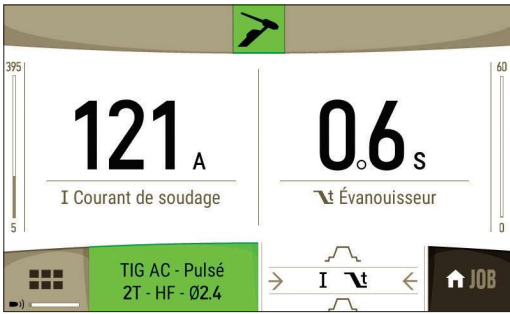
TIG AC - Pulse

This pulsed current welding mode is a combination of high current pulses (I, welding pulse) and low current pulses (I_Cold, part cooling pulse). This pulse mode allows to assemble pieces while keeping the machine cooler.

Example :

The I welding current is set to a 100A and % (I_cold) = 50%, thus a Cold current of = 50% x 100A = 50A.

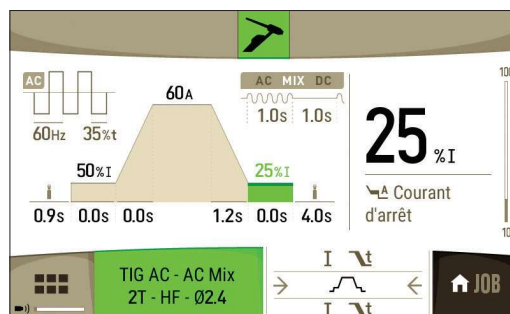
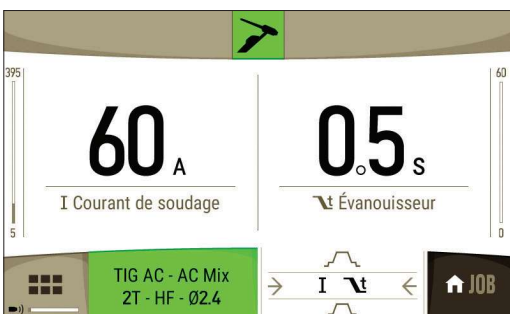
F(Hz) is set to 2Hz, the signal period will be 1/2Hz = 500ms -> every 250ms, one pulse at 100A then another at 50A will follow one another.



Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	Starting current	10 - 200%	This starting bearing current is a phase before the current rise ramp.
	Starting time	0 - 10 sec.	
	Rising current	0 - 60 sec.	Current rise ramp.
	Welding current	3 - 400A	Welding current.
	Wave shape		Waveform of the pulsed part.
	Cold current/Back-ground current)	20 - 80%	Second welding current known as "cold" welding current
	Cold weather	20 - 80%	Time balance of the warm current (I) of the pulsation
	Frequency of pulsation	0,1 - 500 Hz	Pulse frequency
	Downslope	0 - 60 sec.	Downslope current.
	End current	10 - 200%	This stopping stop current is a phase after the current descent ramp.
	End duration	0 - 10 sec.	
	PostGas	0 - 60 sec.	Duration for which gas is released after the arc has stopped. It protects the weld pool and the electrode against oxidisation when the metal is cooling down.
	AC wave shape		AC waveform.
	Frequency of welding	20 - 300 Hz	Frequency of polarity reversals welding - pickling
	Penetration and cleaning (%)	20 - 60%	Percentage of the welding period dedicated to pickling (default 30-35%)

TIG AC - MIX

This method of alternating current welding is used to weld aluminium and its thick alloys. It mixes DC periods whilst welding in order to increase the energy flow to the workpiece. The final goal is to accelerate the work advance and therefore productivity on aluminium assemblies. This mode produces less pickling so it is necessary to work on clean sheets.

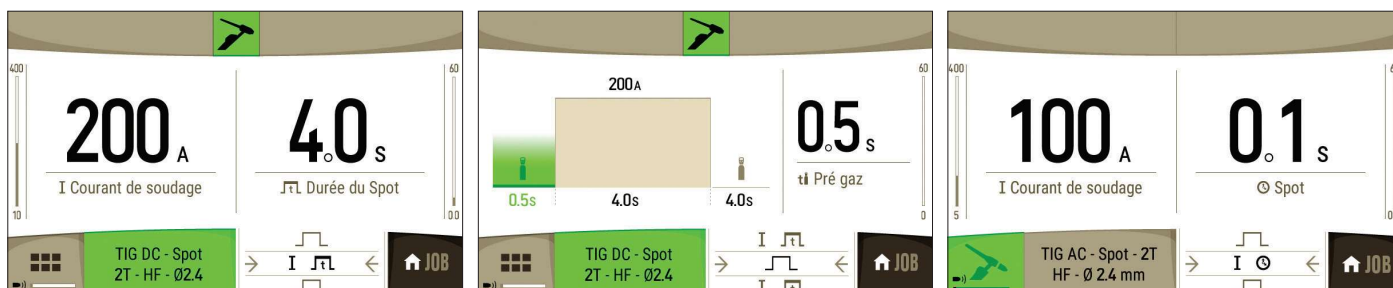


Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	Starting current	10 - 200 %	This starting bearing current is a phase before the current rise ramp.
	Starting time	0 - 10 sec.	
	Rising current	0 - 60 sec.	Current rise ramp.
	Welding current	3 - 400 A	Welding current.
	Downslope	0 - 60 sec.	Down slope current.
	End current	10 - 200 %	This stopping stop current is a phase after the current descent ramp.
	End duration	0 - 10 sec.	
	PostGas	0 - 60 sec.	Duration for which gas is released after the arc has stopped. It protects the weld pool and the electrode against oxidisation when the metal is cooling down.
	AC wave shape		AC waveform.
	Frequency welding	20 - 300 Hz	Frequency of polarity reversals welding - pickling
	Penetration and cleaning (%)	20 - 60 %	Percentage of the welding period dedicated to pickling (default 30-35%)
	AC time	0 - 10 sec.	Welding time in AC TIG welding
	DC time	0 - 10 sec.	Welding time in DC TIG welding

THE TIG DC or AC TIG POINTAGE

SPOT (TIG DC or AC)

This welding mode allows the pre-assembly of the parts before welding. Scoring can be manual by trigger or delayed with a predefined scoring delay. This pointing time allows a better reproducibility and the realization of non-oxidized point (accessible in the advanced menu).

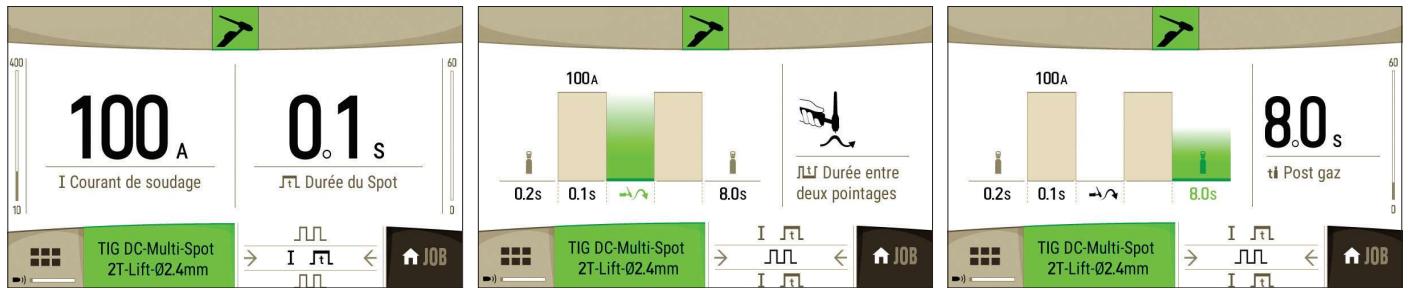


Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	Welding current	3 - 400 A	Welding current.
	Spot	, 0 - 60 sec.	Manual or a defined time.
	PostGas	0 - 60 sec.	Duration for which gas is released after the arc has stopped. It protects the weld pool and the electrode against oxidisation when the metal is cooling down.
	AC wave shape		AC waveform.
	Frequency of welding	20 - 300 Hz	Frequency of polarity reversals welding - pickling
	Penetration and cleaning (%)	20 - 60%	Percentage of the welding period dedicated to pickling (default 30-35%)

ONLY AC

MULTI SPOT (TIG DC or AC)

This is a scoring mode similar to the TIG SPOT, but with a combination of scoring and stopping time defined as long as the trigger is held in.



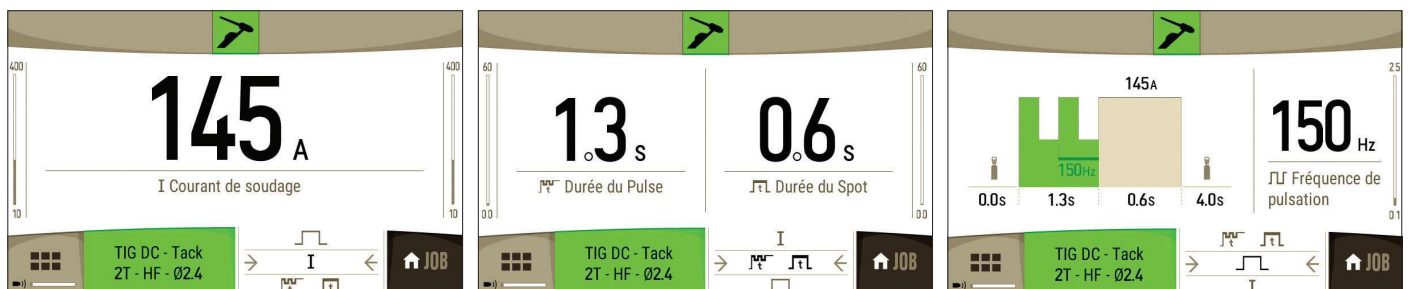
Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
I	Welding current	3 - 400 A	Welding current.
	Spot	, 0 - 60 sec.	Manual or a defined time.
	PostGas	0 - 60 sec.	Duration for which gas is released after the arc has stopped. It protects the weld pool and the electrode against oxidisation when the metal is cooling down.
	Duration between 2 points	0,1 - 20 sec.	Time between the end of a point (excluding PostGaz) and the recovery of a new point (including PreGas).
	AC wave shape		AC waveform.
	Frequency of welding	20 - 300 Hz	Frequency of polarity reversals welding - pickling
	Penetration and cleaning (%)	20 - 60%	Percentage of the welding period dedicated to pickling (default 30-35%)

ONLY AC

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.

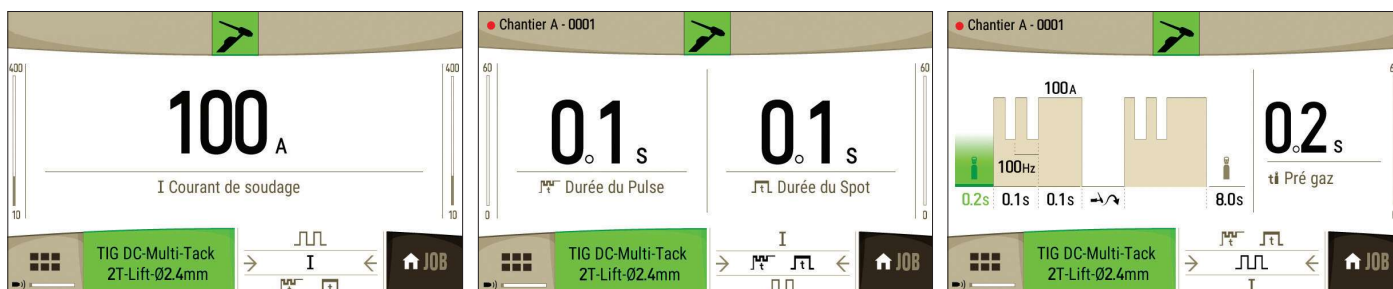
The adjustable duration of each phase enables control of the weld time for better spot welding results and an non-oxidised spot.



Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
I	Welding current	3 - 400 A	Welding current.
	Pulsed duration	, 0 - 60 sec.	Manual pulsation phase or of a defined duration
	Frequency of pulsation	0.1 - 2500 Hz	Pulse frequency
	Non-pulsed duration	, 0 - 60 sec.	Smooth current phase manual or of a defined duration
	PostGas	0 - 60 sec.	Duration for which gas is released after the arc has stopped. It protects the weld pool and the electrode against oxidisation when the metal is cooling down.

MULTI TACK (TIG DC)

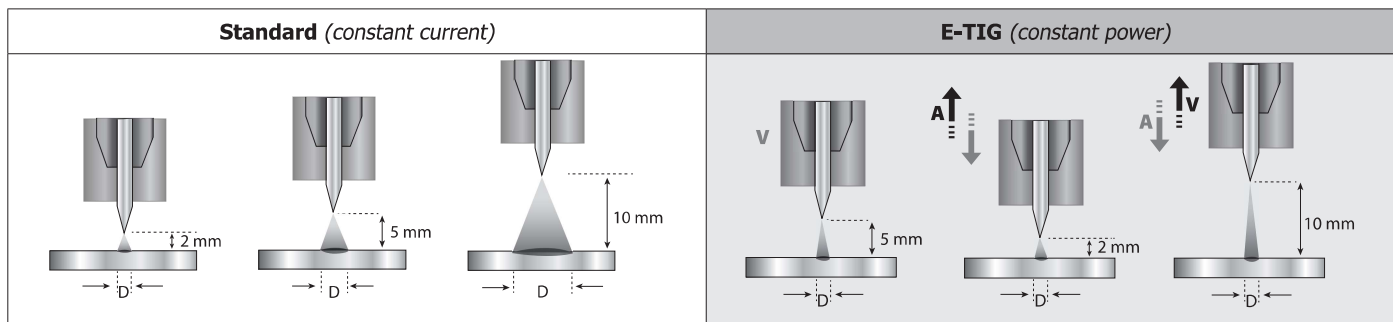
This is the same mode as the TIG DC TACK, but with a sequence of scores and defined stopping times as long as the trigger is held in.



Settings	Designation	Adjustable settings	Description & advice
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
I	Welding current	3 - 400 A	Welding current.
	Pulsed duration	, 0 - 60 sec.	Manual pulsation phase or of a defined duration
	Frequency of pulsation	0.1 - 2500 Hz	Pulse frequency
	Non-pulsed duration	, 0 - 60 sec.	Smooth current phase manual or of a defined duration
	PostGas	0 - 60 sec.	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 down.
	Duration between 2 points	0.1 - 20 sec.	Time between the end of a point (excluding PostGas) and the recovery of a new point (including PreGas).

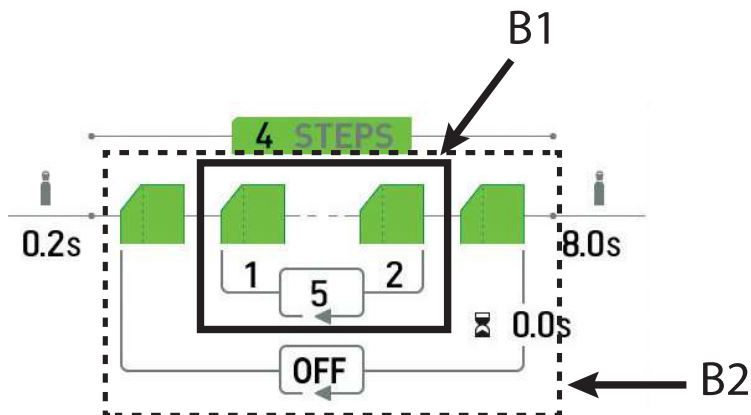
Welding in E.TIG mode


This mode allows constant power welding by measuring arc length variations in real time to ensure constant bead width and penetration. In case the assembly requires the welding power to be controlled, the E.TIG mode can be used as it is designed to ensure that the welding power remains the same regardless of the position of the torch.



Wizard Lab

The Wizard Lab mode is only accessible in the «Advanced» display mode and is dedicated to the TIG welding process. It allows the realization of complex welding cycles (non-standard) by a succession of Steps. Each Step is determined by a ramp and a current level and a type of current (DC/AC/Pulsed) during it. The configuration of the Wizard Lab is done in three steps: the definition of the welding cycle (number of Steps, loops...), the setting of each Step (ramp, current type...) and finally the settings of the specific advanced parameters.



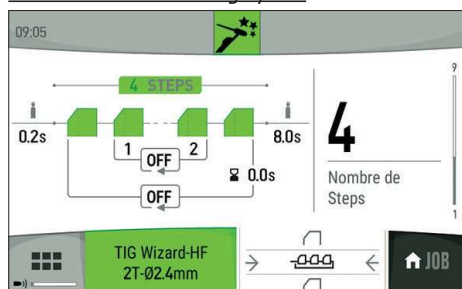
STEP : A Step, represented with a pictogram , can be customized (see part «Setting a STEP») with the current mode (DC or AC), the current shape (Standard or Pulsed), a ramp to the set welding current. Each step is customisable.

Welding cycle : a welding cycle consists of a PreGas, one or more Steps (see «Welding cycle definition») and a PostGas.

Loops: There are two different loops (see «Definition of the welding cycle»):

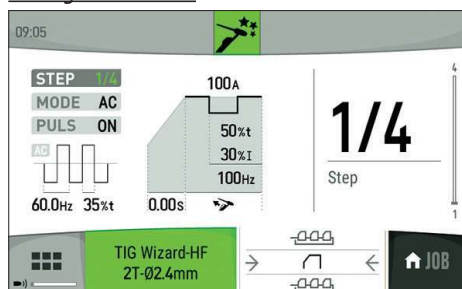
- The internal loop of the cycle (B1): within the cycle, the user can choose to make one or more or even infinite loops (repetition of two or more cycles) according to his application (example of welding in AC MIX, which repeats two DC and AC Steps).
- The cycle loop (B2): the user can choose to repeat his cycle (excluding PreGas and PostGas) one, several or even infinitely many times and adjust a delay between two repetitions if necessary (example of welding in MULTITACK, which repeats the TACK welding cycle with a delay between two points as long as the trigger is held down)

Definition of the welding cycle :



Parameters	Designation	Settings	Description & advice
STEPS	Number of Steps	1 - 9	The number of steps defines the welding cycle
	PreGas	0 - 60 sec.	Time to purge the flare and create the gas shield before ignition.
-	Number of Steps loop	∞, OFF, 1 - 100	Definition of a repeat loop in the welding cycle (B1).
-	Input step	1 - 8	Step to start the repeat loop in the cycle.
-	Output step	2 - 8	End step of the repeat loop in the cycle.
-	Number of loops in the cycle	∞, OFF, 1 - 100	Definition of a repeat loop for the entire welding cycle (B2).
	Inter loop time	0 - 60 sec.	Definition of the time between two repetitions of the entire welding cycle (B2).
	Post Gas	0 - 60 sec.	Duration of the gas protection after the arc has been extinguished. It protects the workpiece and the electrode against oxidation.

Settings of a STEP :



Parameters	Designation	Settings	Description & advice
STEP	-	1 - 9	Selection of the STEP to be configured.
MODE	Welding current mode	DC+ / DC- / AC	Selection of the type of welding current of the Step.
PULS	Activation of the PULSE	ON / OFF	Pulses the set current type.
	AC waveform		AC waveform.
	Welding frequency	0.1 - 300 Hz	Frequency of polarity reversals welding - pickling
	Percentage of pickling	20 - 80%	Percentage of the welding period dedicated to pickling
	Rising current	0 - 60 sec.	Transition ramp between the current step value of the previous step and the current step value.
	Welding current	3 - 400A	Welding current.
	Waveform		Waveform of the pulsed part.
	Cold current	1 - 99%	Second «cold» welding current

	Cold time	1 - 99%	Time balance of the hot current (I) of the pulse
	Pulse frequency	0.1 - 2.5 Hz	Pulse frequency
	Duration of the step	 0 - 90 min.	Duration of the Step welding current or trigger mode (*).

* : the step duration setting allows in 2T mode to manage the duration of the configured section at trigger release, the cycle will end from the exit section to the last one.

the step duration setting allows in 4T mode and with a two-button torch only to switch from Step to press and release button 2.

The advanced settings (accessible in the process menu) :

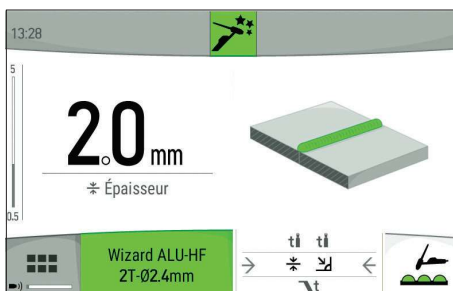
Parameter	Setting	Description & advice
HF level	1 - 10	Index adjusting the voltage from 5 kV to 14 kV
HF duration	0 - 3 sec.	HF time before it stops
Breaking voltage	OFF, 0 - 50 V	Upper arc voltage before stopping the welding generator
Time to break	0 - 10 sec.	Duration of consideration of the breaking voltage
Bonding tension	OFF, 0 - 50 V	Lower arc voltage before stopping the welding generator (anti-sticking)
Delay before gluing	0 - 10 sec.	Duration of time for taking into account the bonding tension.

Wizard Alu

This operating mode allows you to pre-assemble or weld aluminium parts. The pre-installed user settings, known as synergies, monitor the work-piece's thickness and the type of welding joint (butt joint, lap joint, corner joint or fillet joint).



Pre-assembly



Welding

To switch from one mode to another, press button #4 .



Pre-assembly mode



Welding mode

Parameter	Designation	Setting	Description & advice
	Thickness	0,5 - 5 mm	Thickness of the workpiece
	Assembly	Butt joint, lap joint, fillet joint	Welding position
	Downslope	0 - 60 sec.	Down slope current. Welding only
	PreGas	0 - 60 sec.	Time to purge the torch and to protect the area with gas before ignition
	PostGas	0 - 60 sec.	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 down.

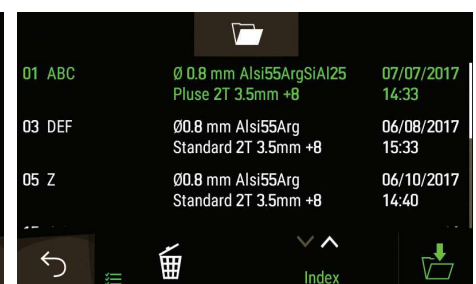
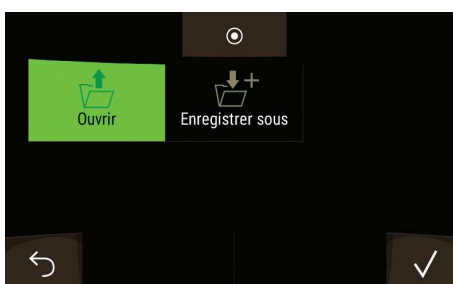
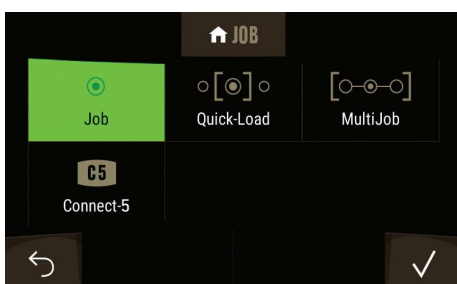
JOB MEMORIZATIONS AND REMINDERS

The current settings are automatically saved and loaded at start up.

In addition to the current settings, it is possible to save and recall so-called «JOB» configurations.

There are 100 JOBS per welding process, the memorization concerns:

- The main parameter,
- The secondary parameter (MMA, TIG),
- Subprocesses and button modes.



JOB MODE

This JOB mode allows you to create, save, recall and delete JOBs.

QUICK LOAD – Reminder of the JOBs to the trigger out of welding.

The Quick Load is a JOB recall mode (20 max) excluding welding and possible only in TIG process.

From a Quickload list of previously created JOBs, JOB reminders are made by short pull of the trigger. All trigger modes (2T/4T/4T/4Tlog) and welding modes (SPOT/STD/PLS) are supported.

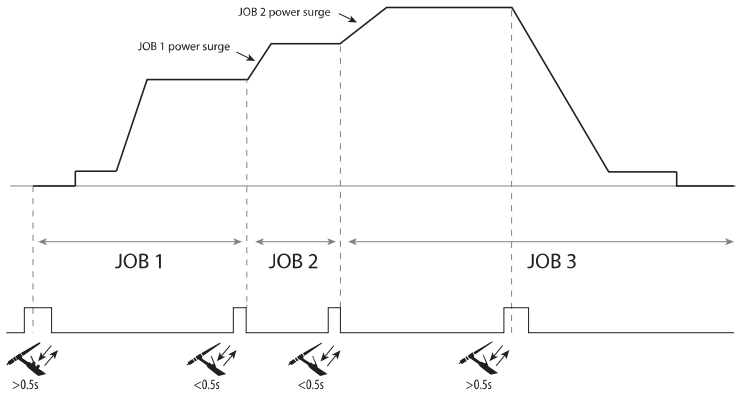
MULTIJOB – Reminder of the JOBs to the trigger in welding.

From a MultiJOB list of previously created JOBs, this chaining mode allows you to weld by chaining up to 20 JOBs without interruption.

When the mode is activated, JOB N°1 in the list is loaded and displayed. The trigger mode is forced in 4T.

During welding, this mode allows you to sequence the JOBs in the loaded list by briefly pressing the buttons on the torch.

Welding stops by pressing the buttons on the torch for a long time and once the welding cycle is complete, JOB N°1 is recharged for a future welding sequence.



When the mode is activated, JOB N°1 in the list is loaded and displayed.

The recall of the JOBs in the sequence is in loop: when the last JOB in the list is reached, the next one will be JOB N°1.

Welding is activated by pressing and holding the buttons on the torch.

C5

From a C5 list of 5 JOBs previously created, this simple automation mode from the Remote Control connection allows JOBs to be recalled via a PLC (see note on the website - <https://goo.gl/i146Ma>).

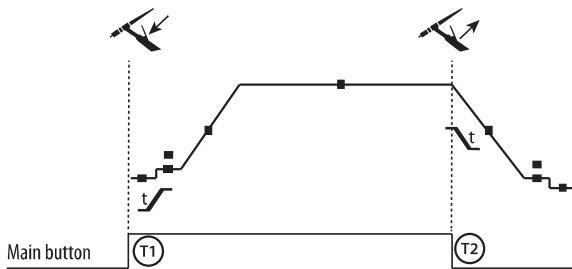
COMPATIBLE TORCHES AND TRIGGER BEHAVIOURS

<p>Trigger</p>	<p>Double Button</p>	<p>Double Button + Potentiometer</p>	<p>Up & Down</p>
✓	✓	✓	✓

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

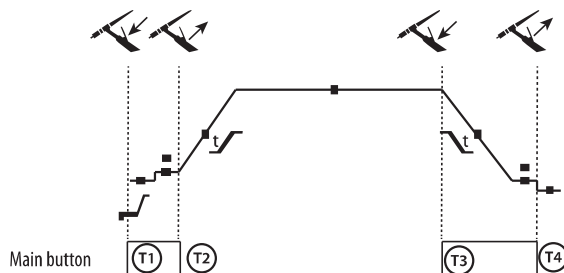


T1 - The main button is pressed, the welding cycle starts (PreGas, I_Start, UpSlope and welding).

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.

4T MODE



T1 - The main button is pressed, the cycle starts at PreGas and stops in the I_Start phase.

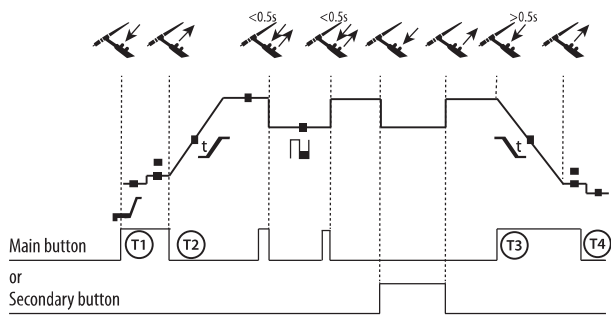
T2 - The main button is released, the cycle continues in UpSlope and in welding.

T3 - The main button is pressed, the cycle switches to DownSlope and stops in I_Stop.

T4 - The main button is released, the cycle ends with PostGas.

Nb : for torches, double button and double button with potentiometer => command « up/welding current » and active potentiometer, command «low » inactive.

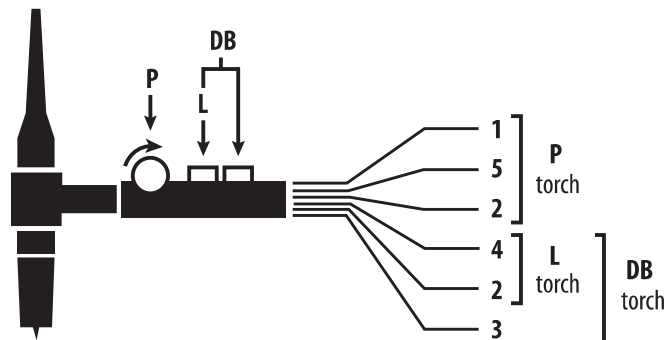
4T MODE log



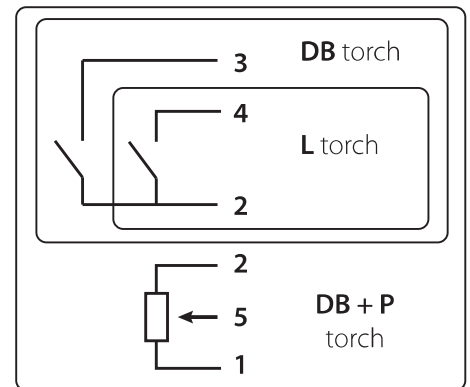
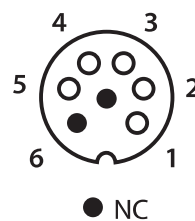
T1 - The main button is pressed, the cycle starts at PreGas and stops in the I_Start phase.
 T2 - The main button is released, the cycle continues in UpSlope and in welding.
 LOG : this mode is used during welding :
 - A brief press of the main button (<math><0.5s</math>), the current switches from I welding current to I cold and vice versa.
 - the secondary button is kept pressed, the welding current switches from I welding current to I cold
 - the secondary button is kept released, the welding current switched from I cold to I welding current.
 T3 - A long press on the main button (>0.5s), the cycle switches to DownSlope and stops in the I_Stop phase.
 T4 - The main button is released, the cycle finishes with PostGas.

For this mode it may be convenient to use the dual button torch option or dual button with potentiometer. The «up» command keeps the same function as the single button or trigger torch. The «down» button can, when pressed, switch to the cold current. The potentiometer of the torch, where available, can control of the welding current from 50% to 100% of the value displayed. The Up & Down functions allow the adjustment of the lamp current.

COMMAND TRIGGER CONNECTOR

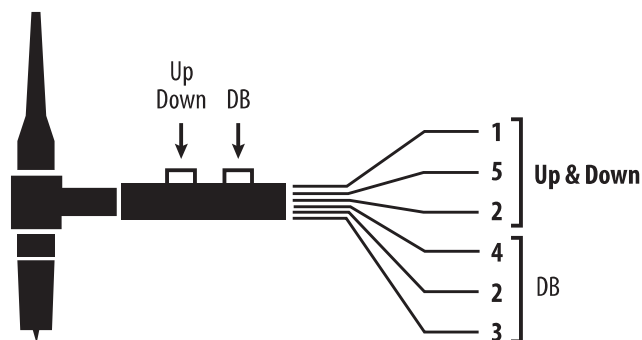


Cabling diagram for the SRL18 torch.

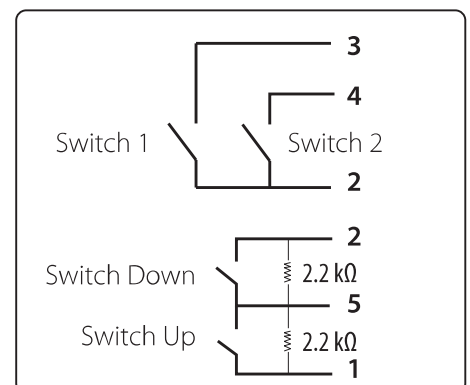
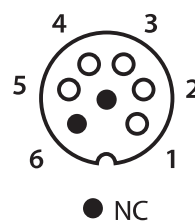


Electric diagram based on type of torch used.

Torch type			Wire description	Pin
Torch double button + potentiometer	Torch double button	Torch with trigger	Common/Earth	2 (green)
			Button 1	4 (white)
			Button 2	3 (brown)
			Common/Potentiometer earth	2 (grey)
			10 V	1 (yellow)
			Cursor	5 (pink)

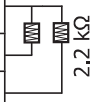


Up & Down torch wiring diagram.



Electrical diagram of the Up & Down torch.

Torch type	Wire description	Pin
Up & Down Torch	Commun Switch 1 & 2	2
	Switch 1	4
	Switch 2	3
	Commun Switch Up & Down	5
	Switch Up	1
	Switch Down	2

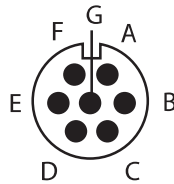


REMOTE CONTROL

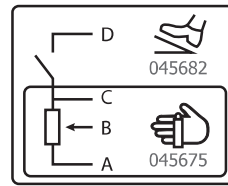
The analog remote control operates in TIG and MMA processes.



ref. 045699



External view



Electric diagram according to the remote control type.

Connection:

- 1- Plug the remote control into the connection at the back of the machine.
- 2- The HMI detects the presence of a remote control and offers a selection choice accessible by wheel.

Connection:

The TIG is equipped with a female socket for a remote control. The specific 7 pin male plug (option ref.045699) enables connection to the different types of 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	10 V	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.

The digital remote control allows to connect a remote HMI or a TIG dispenser.

COOLING FAN

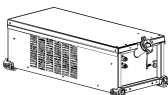
To minimise sound and dust aspiration, the station integrates a controlled fan system. The fan's rotation speed depends on the temperature and the machine's settings.

ENERGY MODE

This mode developed for welding with energy control framed by a DMOS allows, in addition to the energy display of the bead after welding, to set:

- The thermal coefficient according to the standard used: 1 for ASME standards and 0.6 (TIG) or 0.8 (MMA) for European standards. The energy displayed is calculated taking this coefficient into account.
- The length of the weld seam (OFF - mm): if a length is recorded, then the energy display is no longer in joule, but in joule / mm (the unit on the display «J» flashes).

COOLING UNIT

 <p>WCU1kW_C</p>	<p>P 1L/min = 1000 W Capacity = 5 L U1 = 400 V +/- 15%</p>	<p>The cooling unit is controlled in 400 V +/-15%.</p>
---	--	--

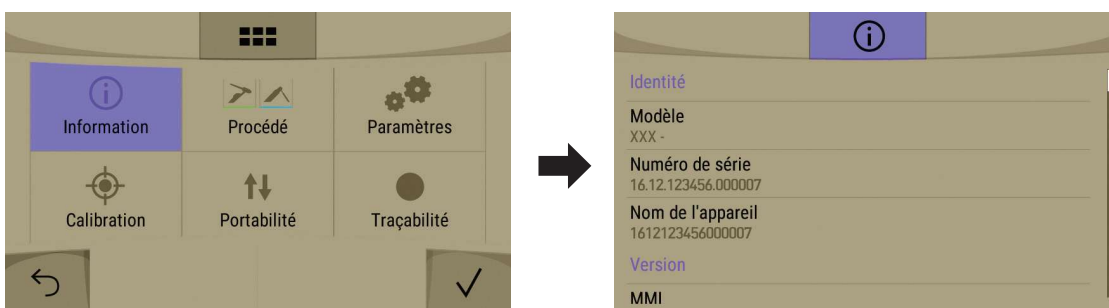
The cooling unit is automatically detected by the machine. In the «Settings» menu / Cooling unit: the cooling unit can be disabled. The protections supported by the cooling unit to ensure the protection of the torch and the user are:

- Minimum coolant level.
- Minimum flow rate of coolant flowing through the torch.
- Thermal protection of the coolant.



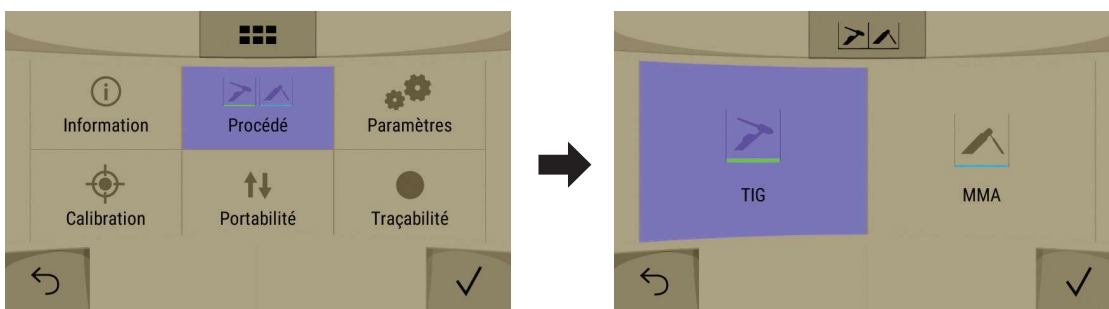
Make sure that the cooling unit is turned off before disconnecting the inlet and outlet hoses for torch liquid. The coolant is harmful and irritates the eyes, the mucous membranes and the skin. Hot liquid may cause burns.

PRODUCT CONFIGURATION



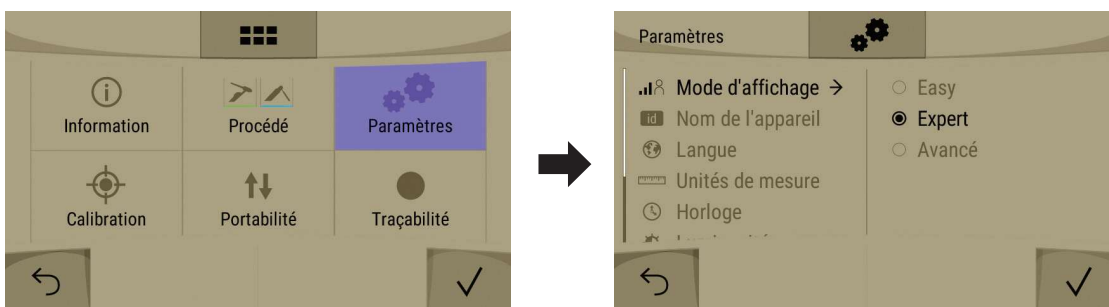
INFORMATION

This menu provides access to the version numbers of the cards and software.



PROCESS

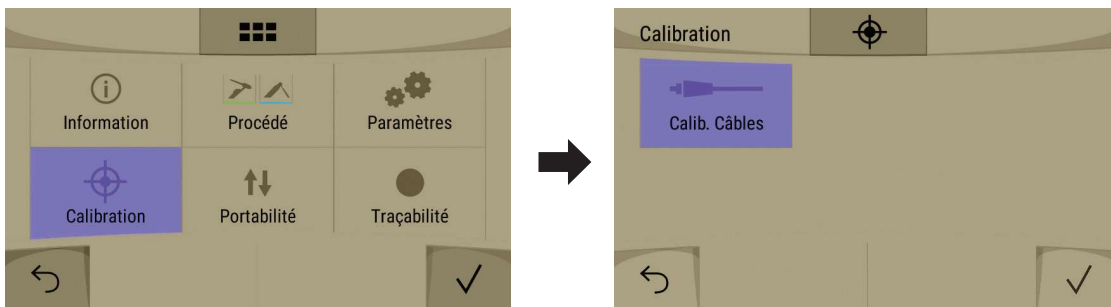
This menu allows you to choose the welding process: TIG or MMA (SMAW)



SETTINGS

This menu allows you to set:

	The display mode gives access to more or less welding parameters and configurations. - Easy: reduced display and functionality; no access to the welding cycle. - Expert: full display, allows to adjust the durations and times of the different phases of the welding cycle. - Advanced: full display, allows adjustment of all parameters of the welding cycle.
	The name of the device and the possibility of customizing it.
	Supported languages: FR, UK.....
	The Units of Measurement: International (SI) or Imperial (USA).
	Naming material: EN (European) or AWS (USA) Example: Fe (EN) -> Steel (AWS), CrNi 308 (EN) -> ER 308L (AWS)
	The time and its format.
	Screen brightness
	The cooling unit (AUTO / ON / OFF) and the PURGE function of the cooling unit: - AUTO: activation during welding and deactivation of the cooling unit 10 minutes after the end of welding. - ON: the cooling unit is permanently controlled. - OFF: the group is disabled. - PURGE: function dedicated to purging the cooling unit or filling beams, the protections are then inhibited.
	Product Reset (Partial / Total) : - Partial (default value of the welding cycle). - Total (factory configuration).

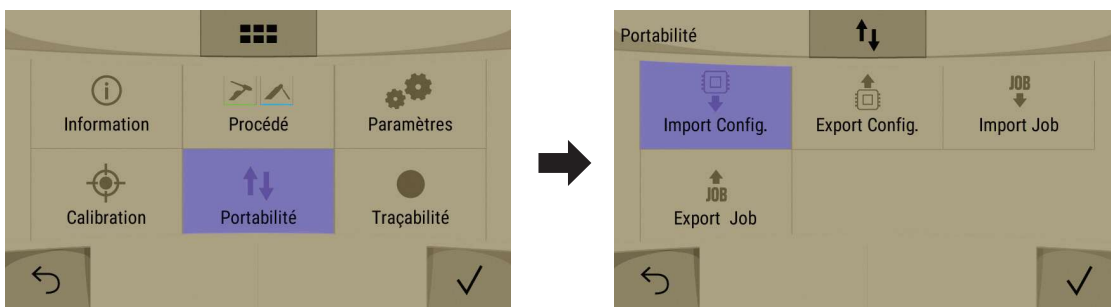


CALIBRATION

This mode is dedicated to the calibration of welding accessories such as torch, cable + electrode holder and cable + earth clamp. The calibration is designed to compensate variables such as the length of the accessories in order to adjust the measurement of the voltage and improves the calculation of the energy. The procedure once launched is explained with an animation on the screen.

PORTABILITY

This feature allows you to save the welding configuration of the machine. It also allows you to load a recovered configuration on another machine and inject it into another.



Import Config. : Importing a USB key one or more «USER» configurations and its JOBS.

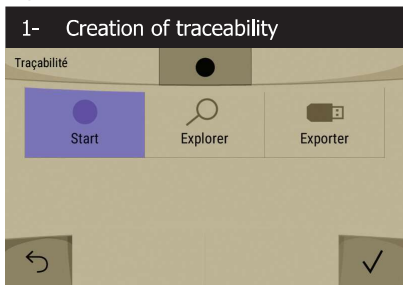
Export Config : export the current «USER» configuration and its JOBS to a USB stick.

JOB import: import of JOBS present under the USB directory of a USB key.

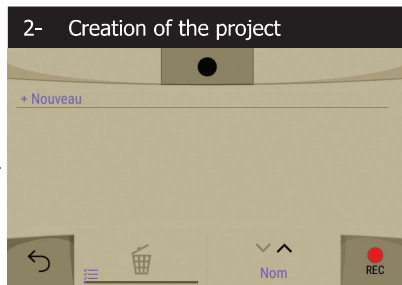
JOB export : export the JOBS to a USB key according to the processes in a USB\Portability directory.

TRACEABILITY

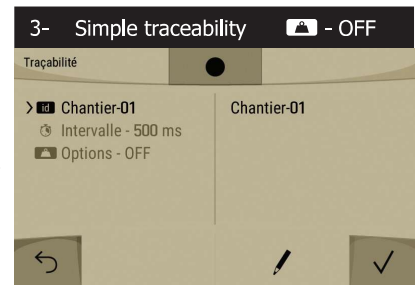
This welding management interface is designed to trace/record all the steps of the welding operation, bead by bead, during manufacturing. This quality based approach enables post-production analysis, evaluation, reporting and documentation of the recorded welding parameters. This functionality allows the accurate and fast collection and storage of the data requested under EN ISO 3834. The recovery of this data is possible via an export to a USB stick.



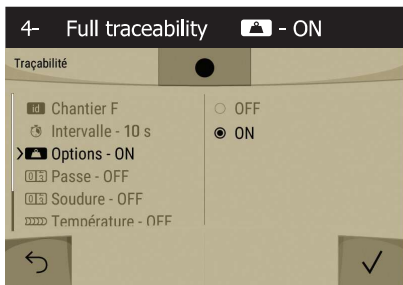
Select «START»



Select «REC»



- Project name
- Sampling interval :
 - Hold: No recording of Current/Voltage values.
 - 250 ms, 500 ms, etc. : Recording of current/voltage values every X times.



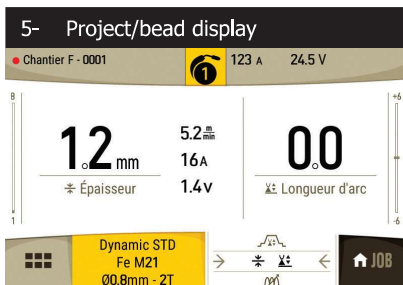
Definition :

- A welding CORD corresponds to a welding cycle.
- The PASS corresponds to welding over the entire perimeter of the part to be welded.
- The WELD is the end junction of the two joined up plates. The weld is therefore made of one or more passes.
- The PROJECT is made of one or more finished welds.

- Temperature* ON : Temperature of the plate to be welded at the beginning of the cord.
- Length* ON : Cord length

**the measurement units are displayed based on the selection defined in PARAMETERS/Units.*

- 0 1 3 Pass (ON/OFF)
- 0 1 3 Welding (ON/OFF)
- Temperature (ON/OFF)
- Length (ON/OFF)



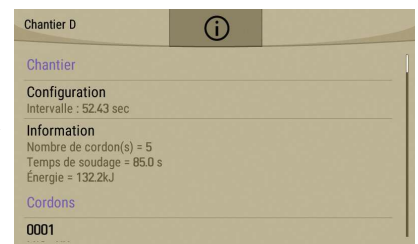
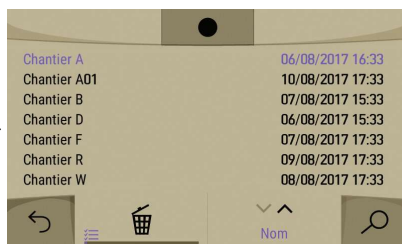
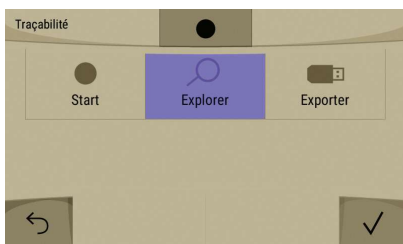
At the top left, the project name and bead number are displayed.
(The bead number is automatically incremented and cannot be modified)



At each end of the cord, an identification window is displayed: Pass number, Weld number, Temperature of the plate and/or length of the cord.



The validation can be done using the interface or by pulling the trigger.



The «Explore» function allows you to access the list of work sessions created, sort them and also delete them. The pictogram shows the details of each session with the following information: sampling frequency, number of recorded beads, total welding time, welding current supplied, configuration of each bead (process, time stamp, welding time and welding U-I).

Numero de chantier	Date	Job	Utilisateur	Mode	Soudure Pulse	Température (température)	USET 1	USET 2	USET 3	USET 4	USET 5	USET 6	USET 7	USET 8	USET 9	USET 10	USET 11	USET 12	USET 13	USET 14	USET 15	USET 16	USET 17	USET 18	USET 19	USET 20			
Chantier MARI0_0001	12/10/2000 22:00	J001	Mario	TIG DC	TIG-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0002	12/10/2000 22:05	J001	Mario	TIG DC	TIG-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0003	12/10/2000 22:10	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0004	12/10/2000 22:15	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0005	12/10/2000 22:20	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0006	12/10/2000 22:25	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0007	12/10/2000 22:30	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0008	12/10/2000 22:35	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0009	12/10/2000 22:40	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0010	12/10/2000 22:45	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0011	12/10/2000 22:50	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0012	12/10/2000 22:55	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0013	12/10/2000 23:00	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0014	12/10/2000 23:05	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0015	12/10/2000 23:10	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0016	12/10/2000 23:15	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0017	12/10/2000 23:20	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0018	12/10/2000 23:25	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0019	12/10/2000 23:30	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	
Chantier MARI0_0020	12/10/2000 23:35	J001	Mario	TIG AC	Standard-UP	0-750-000	1	1	300	147	87	6500004																	

The transfer of this information is done by exporting the data to a USB key. The CSV data can be processed using spreadsheet software (Microsoft Excel®, Calc OpenOffice®, etc.).

ERROR MESSAGE, ANOMALIES, CAUSES AND SOLUTIONS

This device integrates a default management system. In the event of a failure, the following error messages may appear:

ERROR CODE / SYMPTOMS	CAUSES	SOLUTIONS
OVERVOLTAGE FAULT Check the electrical installation	Mains voltage out of tolerance.	Have your electrical installation checked by an authorised person. The voltage between the 3 phases must be between 340 Veff and 460 Veff.
UNDERVOLTAGE FAULT Check the electrical installation	Mains voltage out of tolerance.	
PHASE FAULT Check the electrical installation	The installation has a missing or unbalanced phase	
GENERATOR Thermal protection	- Exceeding the duty cycle. - Blocked air inlets.	- Wait for the indicator to turn off before resuming welding. - Observe the operating factor and ensure good ventilation. - The use of the optional dust filter (ref. 046580) reduces the duty cycle of the machine.
FAN Fan failure	The fan is not running at the right speed.	Please disconnect the machine, check and restart.
COOLING UNIT FAILURE Cooling unit not detected	The cooling unit is not detected.	Check the connection between the cooling unit and the appliance.
FAILURE DEBIT Blocked cooling circuit	The debit is below the recommended minimum level for water cooled torches.	Check the continuity of the circulation of the cooling liquid in the torch.
WATER LEVEL FAILURE Check the water level	The level is below the minimum	Fill the cooling unit's tank.
COLD GROUP Thermal protection	- Exceeding the duty cycle. - Blocked air inlets.	- Wait for the indicator to turn off before resuming welding. - Dust off the cooling unit by blowing air.

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.

GARANTÍA

La garantía cubre todos los defectos o vicios de fabricación durante 2 años, a partir de la fecha de compra (piezas y mano de obra)

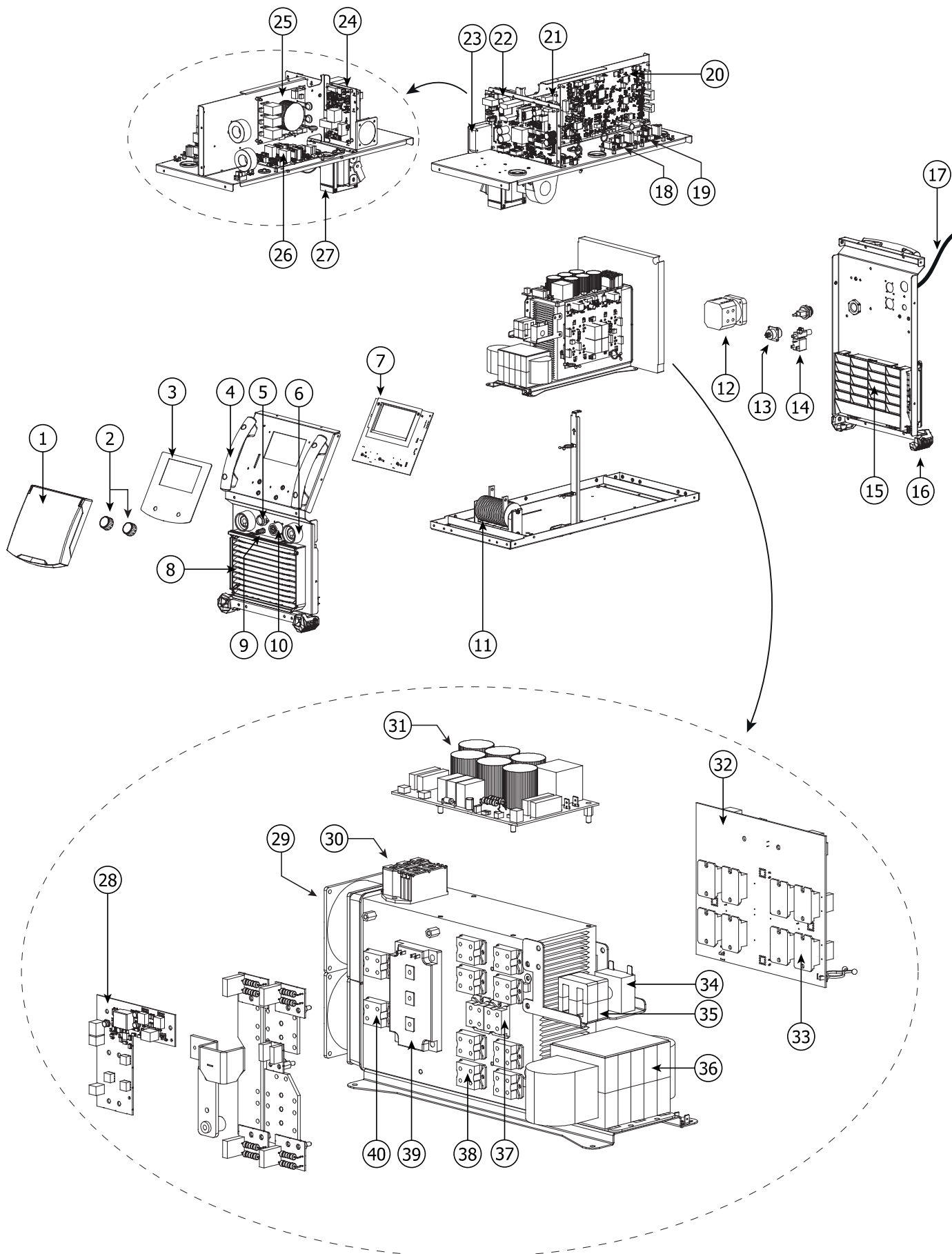
La garantía no cubre:

- Todas las otras averías resultando del transporte
- El desgaste normal de las piezas (cables, pinzas...)
- Los incidentes resultando de un mal uso (error de alimentación, caída, desmontaje)
- Los fallos relacionados con el entorno (polución, oxidación, polvo...)

En caso de fallo, regresen la maquina a su distribuidor, adjuntando:

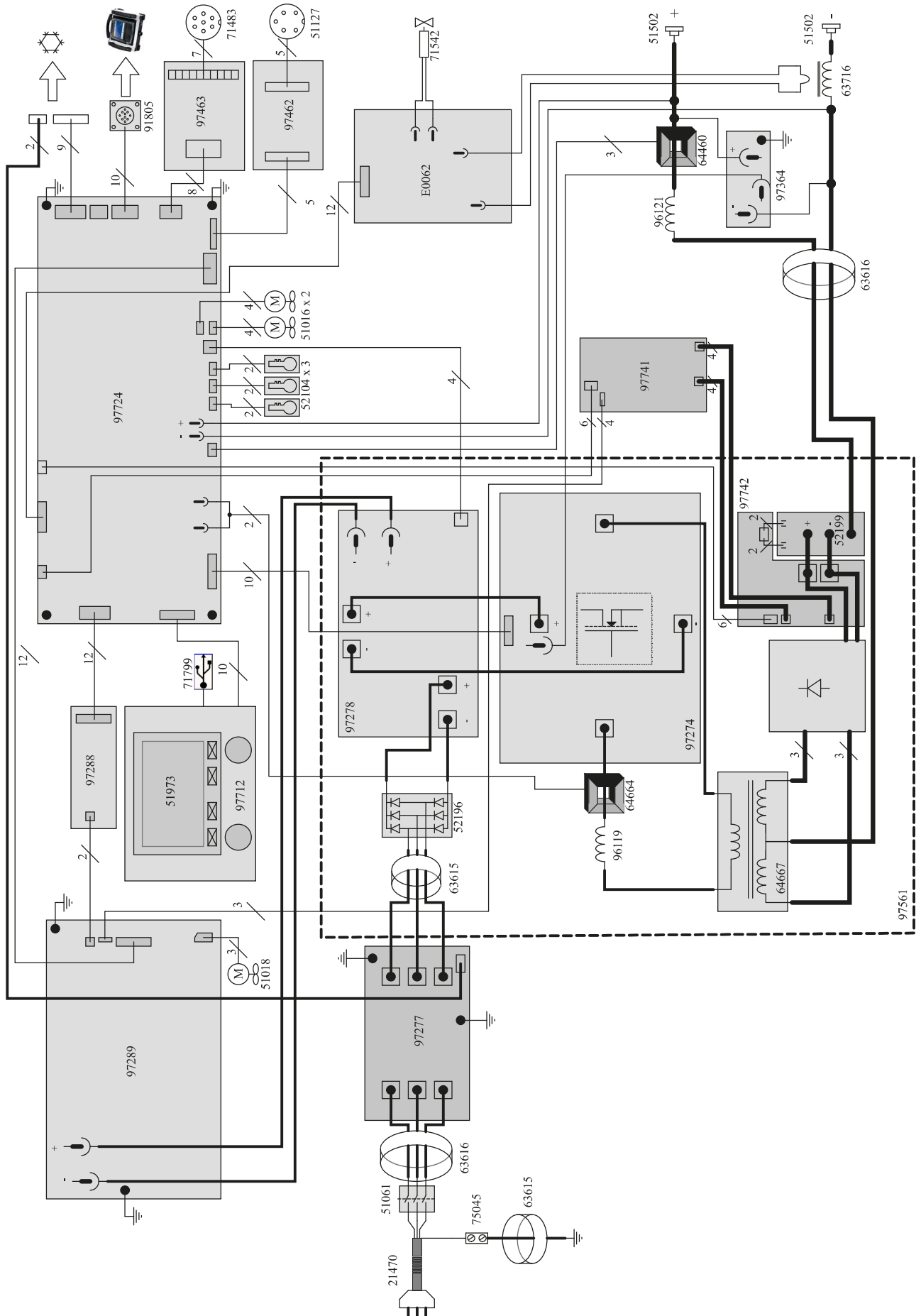
- Un justificativo de compra con fecha (recibo, factura...)
- Una nota explicativa del fallo

PIÈCES DE RECHANGE / SPARE PARTS / ERSATZTEILE / PIEZAS DE RECAMBIO / ЗАПЧАСТИ / RESERVE ONDERDELEN / PEZZI DI RICAMBIO



1	Carter plastique / Plastic Crankcase / Carcasa de plástico	56199	
2	Bouton noir 28 mm / Black button 28 mm / Botón negro 28 mm	73016	
3	Clavier / Keypad / Bedienfeld / Teclado	51973	
4	Poignée / Handle / Handgriff / Mango	56047	
5	Faisceau Torche / Torch connection cable / Brenner-Schlauchpaket / Cable conexión Antorcha	91847	
6	Embase Texas OF 95.24 HF Femelle / DINS plate OF 95.24 Female / Texas-Anschlussbuchse OF 95.24 HF / Conector Texas OF 95.24 HF Hembra	51502	
7	Circuit IHM / MMI circuit / Displayplatine / Tarjeta Interfaz	Si fabrication avant 07/2021 If manufactured before 07/2021	97746C
		Si fabrication après 07/2021 If manufactured after 07/2021	97712C
		Si fabrication pendant 07/2021 If manufactured during 07/2021	consulter SAV
8	Grille de protection extérieure / External protection grill / Äußeres Schutzgitter / Rejilla de protección exterior	56094	
9	Coupleur gaz BSP20 / Gas coupler BSP20 / Schutzgaskupplung BSP20 / Acople gas BSP20	55090	
10	Faisceau connectique dévidoir ou IHM déportée / Wire feeder connector or MMI remote interface / Kabel Anschluss Drahtvorschub oder externes Bedienfeld / Cable conexión devanadera o IHM a distancia	96000	
11	Transformateur HF / HF transformer / Trafo HF / Transformador HF	63716	
12	Commutateur triphasé / Three phase switch / Dreiphasiger Schalter / Conmutador trifásico	51061	
13	Faisceau CAD / CAD connection cable / CAD Kabelbaum / Cable CAD	71483	
14	Electrovanne / Solenoid valve / Schutzgasmagnetventil / Electroválvula	70991	
15	Grille de protection intérieure / Internal protection grill / Inneres Schutzgitter / Rejilla de protección interior	56095	
16	Patin / Pad / Gummifuß / Soporte	56120	
17	Cordon secteur 3P+Terre 4mm ² / Power supply cable 3P + Earth 4 mm ² / Netzkabel 3 ph. + Schutzleiter 4mm ² / Cable de red eléctrica 3P + Tierra 4mm ²	21470	
18	Circuit filtrage bouton / Filter circuit button / Taste Filter Kreislauf / Circuito de filtrado Botón	97462C	
19	Circuit filtrage CAD / Filter circuit CAD / gefilterter Stromkreis CAD / Circuito de filtrado CAD	97463C	
20	Circuit de contrôle / Control circuit / Steuerkreis / Circuito de control	97724C	
21	Circuit d'alimentation auxiliaire n°2 / Auxiliary supply circuit n°2 / Hilfsversorgungsschaltung Nr.2 / Circuito alimentación auxiliar n°2	97288C	
22	Circuit d'alimentation auxiliaire n°1 / Auxiliary supply circuit n°1 / Hilfsversorgungsschaltung Nr.1 / Circuito alimentación auxiliar n°1	97289C	
23	Ventilateur 24V (petit) / 24V fan (small) / Lüfter 24V (klein) / Ventilador 24V (pequeño)	51018	
24	Circuit HF / HF circuit / HF-Platine / Circuito HF	E0062C	
25	Circuit CEM / CEM circuit / EMV-Platine / Tarjeta CEM	97277C	
26	Circuit CAIP / CAIP circuit / CAIP-Platine / Circuito CAIP	97741C	
27	Self DC / Self DC / Self DC / Self DC	96121	
28	Circuit Onduleur / Inverter circuit / Wechselrichterplatine / Circuito inversor	97742C	
29	Ventilateur 24V / 24V fan / Lüfter 24V / Ventilador 24V	51016	
30	Pont de diode de puissance / Power relay diode bridge / Leistungsdiodenbrücke / Puente de diodos de potencia	52196	
31	Circuit Entrée puissance / Circuit power input / Leistungseingangsschaltung / Circuito de entrada de potencia	97278C	
32	Circuit primaire de puissance / Primary power relay circuit / Primäre Leistungsplatine / Circuito primario de potencia	97274C	
33	Transistor de puissance / Power relay transistor / Leistungstransistor / Transistor de potencia	52198	
34	Transformateur de courant / Current transformer / Leistungstrafo / Transformador de corriente	64664	
35	Self primaire / Self primary / Primärspule / Inductancia primaria	96119	
36	Transformateur de puissance / Power transformer / Netztransformator / Transformador de potencia	64667	
37	Résistance de puissance 5R / Power resistor 5R / Leistungsdiode 5R / Resistencia de potencia 5R	51417	
38	Diode de puissance / Power relay diode / Leistungsdiode / Diodo de potencia	52197	
39	Module IGBT / IGBT module / IGBT-Modul / Módulo IGBT	52199	
40	Résistance de puissance 10R / Power resistance 10R / Leistungsdiode 10R / Resistencia de potencia 10R	51424	

SCHÉMAS ÉLECTRIQUES / CIRCUIT DIAGRAM / SCHALTPLÄNE / ESQUEMAS ELÉCTRICOS / ЭЛЕКТРИЧЕСКИЕ СХЕМЫ / ELEKTRISCHE SCHEMA / SCHEMI ELETTRICI



SPÉCIFICATIONS TECHNIQUES / TECHNICAL SPECIFICATIONS / TECHNISCHE DATEN / ESPECIFICACIONES TÉCNICAS / ТЕХНИЧЕСКИЕ СПЕЦИФИКАЦИИ / TECHNISCHE GEGEVENS / SPECIFICHE TECNICHE

		TITANIUM 400 AC/DC			
Primaire / Primary / Primär / Primario / Первичка / Primaire / Primario					
Tension d'alimentation / Power supply voltage / Stromversorgung / Tensión de red eléctrica / Напряжение питания / Voedingsspanning / Tensione di alimentazione		400 V +/- 15%			
Fréquence secteur / Mains frequency / Netzfrequenz / Frecuencia / Частота сети / Frequentie sector / Frequenza settore		50 / 60 Hz			
Fusible disjoncteur / Fuse / Sicherung / Fusible disyuntor / Fusible disyuntor / Плавкий предохранитель прерывателя / Zekering hoofdschakelaar / Fusibile disgiuntore		32 A			
Secondaire / Secondary / Sekundär / Secundario / Вторичка / Secondair / Secondario		MMA	TIG DC	TIG AC	
Tension à vide / No load voltage / Leerlaufspannung / Tensión al vacío / Напряжение холостого хода / Nullastspanning / Tensione a vuoto		85 V			
Tension crête du dispositif d'amorçage manuel (EN60974-3) / Manual striking system's maximum voltage (EN60974-3) / Spitzenspannung des manuellen Startgerätes (EN60974-3) / Tensión pico del dispositivo de cebado manual (EN60974-3) / Пиковое напряжение механизма ручного поджига (EN60974-3) / Piekspanning van het handmatige startsysteem (EN60974-3) / Tensione di picco del dispositivo di innesco manuale (EN60974-3)		-	9 kV		
Courant de sortie nominal (I ₂) / Normal current output (I ₂) / nominaler Ausgangsstrom (I ₂) / Corriente de salida nominal (I ₂) / Номинальный выходной ток (I ₂) / Nominale uitgangsstroom (I ₂) / Corrente di uscita nominale (I ₂)		5 → 400 A	3 → 400 A	5 → 400 A	
Tension de sortie conventionnelle (U ₂) / Conventional voltage output (U ₂) / entsprechende Arbeitsspannung (U ₂) / Tensión de salida convencional (U ₂) / Условные выходные напряжения (U ₂) / Conventionele uitgangsspanning (U ₂) / Tensione di uscita convenzionale (U ₂)		20.2 → 36 V	10.12 → 26 V	10.2 → 26 V	
- Facteur de marche à 40°C (10 min)* Norme EN60974-1. - Duty cycle at 40°C (10 min)* Standard EN60974-1. - Einschaltdauer @ 40°C (10 min)* EN60974-1 -Norm.		- Ciclo de trabajo a 40°C (10 min)* Norma EN60974-1 - ПВ% при 40°C (10 мин)* Норма EN60974-1. - Inschakelduur bij 40°C (10 min)* Norm EN60974-1.		Imax	60 %
				60%	400 A
				100%	360 A
Consommation à vide / No-load power consumption / Leerlaufleistung / Consumo en vacío / Consumo a vuoto / Verbruik apparaat in stand-by		170 W	35 W		
Rendement à I _{max} / Efficiency at I _{max} / Maximalleistung / Rendimiento a I _{max} / Rendimento a I _{max} / Rendement bij I _{max}		87 %			
Température de fonctionnement / Functioning temperature / Betriebstemperatur / Temperatura de funcionamiento / Рабочая температура / Gebruikstemperatuur / Temperatura di funzionamento		-10°C → +40°C			
Température de stockage / Storage temperature / Lagerungstemperatur / Temperatura de almacenaje / Температура хранения / Bewaarstemperatuur / Temperatura di stoccaggio		-20°C → +55°C			
Degré de protection / Protection level / Schutzgrad / Grado de protección / Степень защиты / Beschermingsklasse / Grado di protezione		IP23			
Dimensions (LxHxh) / Dimensions (LxHxh) / Abmessung (LxBxH) / Dimensiones (LxHxh) / Размеры (ДxШxВ) / Afmetingen (LxHxh) / Dimensioni (LxHxh)		680 x 300 x 540 mm			
Poids / Weight / Gewicht / Peso / Bec / Gewicht / Peso		43 kg			

*Les facteurs de marche sont réalisés selon la norme EN60974-1 à 40°C et sur un cycle de 10 min.

Lors d'utilisation intensive (> au facteur de marche) la protection thermique peut s'enclencher, dans ce cas, l'arc s'éteint et le témoin s'affiche. Laissez le matériel alimenté pour permettre son refroidissement jusqu'à annulation de la protection. La source de courant de soudage décrit une caractéristique de sortie tombante.

*The duty cycles are measured according to standard EN60974-1 à 40°C and on a 10 min cycle.

While under intensive use (> to duty cycle) the thermal protection can turn on, in that case, the arc switches off and the indicator switches on. Keep the machine's power supply on to enable cooling until thermal protection cancellation. The machine has a specification with a "dropping current output".

*Einschaltdauer gemäß EN60974-1 (10 Minuten - 40°C).

Bei sehr intensivem Gebrauch (>Einschaltdauer) kann der Thermoschutz ausgelöst werden. In diesem Fall wird der Lichtbogen abgeschaltet und die entsprechende Warnung erscheint auf der Anzeige. Das Gerät zum Abkühlen nicht ausschalten und laufen lassen bis das Gerät wieder bereit ist. Die Schweißstromquelle besitzt eine fallende Spannungskennlinie.

*Los ciclos de trabajo están realizados en acuerdo con la norma EN60974-1 a 40°C y sobre un ciclo de diez minutos.

Durante un uso intensivo (superior al ciclo de trabajo), se puede activar la protección térmica. En este caso, el arco se apaga y el indicador se enciende. Deje el aparato conectado para permitir que se enfríe hasta que se anule la protección. La fuente de energía de soldadura posee una salida de característica descendente.

*ПВ% указаны по норме EN60974-1 при 40°C и для 10-минутного цикла.

При интенсивном использовании (> ПВ%) может включиться тепловая защита. В этом случае дуга погаснет и загорится индикатор. Оставьте аппарат подключенным к питанию, чтобы он остыл до полной отмены защиты. Источник сварочного тока имеет выходную характеристику «падающего типа».








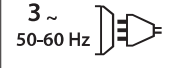

*De inschakelduur is gemeten volgens de norm EN60974-1 bij een temperatuur van 40°C en bij een cyclus van 10 minuten.

Bij intensief gebruik (superieur aan de inschakelduur) kan de thermische beveiliging zich in werking stellen. In dat geval gaat de boog uit en gaat het beveiligingslampje gaat branden. Laat het apparaat aan de netspanning staan om het te laten afkoelen, totdat de beveiliging afslaat. De lasstroombron beschrijft een dalende uitgangskarakteristiek.

*I cicli di lavoro sono realizzati secondo la norma EN60974-1 a 40°C e su un ciclo di 10 min.

Durante l'uso intensivo (> al ciclo di lavoro) la protezione termica può attivarsi, in questo caso, l'arco si spegne e la spia si illumina. Lasciate il dispositivo collegato per permettere il suo raffreddamento fino all'annullamento della protezione. La fonte di corrente descrive una caratteristica di uscita di tipo «discendente».

ICÔNES / SYMBOLS / ZEICHENERKLÄRUNG / ZEICHEN / СИМВОЛЫ / PICTOGRAMMEN

	<ul style="list-style-type: none"> - Attention ! Lire le manuel d'instruction avant utilisation. - Warning ! Read the instructions manual before use. - Внимание! Прочтите инструкцию перед использованием - ¡Cuidado! Lea el manual de instrucciones antes de su uso. - Let op! Lees voor gebruik aandachtig de gebruiksaanwijzing door. - Attenzione! Leggere il manuale d'istruzioni prima dell'uso.
	<ul style="list-style-type: none"> - Source de courant de technologie onduleur délivrant un courant C.C. et C.A. - Inverter technology current source delivering DC and AC current. - Wechselrichtertechnologie Stromquelle zur Lieferung von Gleich- und Wechselstrom - Fuente de corriente de tecnología de inversor que suministra corriente continua y alterna. - Источник тока инверторной технологии, подающий постоянный и переменный ток. - Omvormertechnologie stroombron die gelijkstroom en wisselstroom levert. - Sorgente di corrente con tecnologia ad inverter che fornisce corrente CC e CA.
	<ul style="list-style-type: none"> - Soudage à l'électrode enrobée - MMA (Manual Metal Arc) - MMA welding (Manual Metal Arc) - Schweißen mit umhüllter Elektrode (E-Handschweißen) - Soldadura con electrodo revestido - (MMA - Manual Metal Arc) - Сварка электродом с обмазкой (MMA – Manual Metal Arc) - Lassen met beklede elektrode - MMA (Manual Metal Arc) - Saldatura ad elettrodo rivestito - MMA (Manual Metal Arc)
	<ul style="list-style-type: none"> - Soudage TIG (Tungsten Inert Gaz) - TIG welding (Tungsten Inert Gaz) - TIG- (WIG-)Schweißen (Tungsten (Wolfram) Inert Gas) - Soldadura TIG (Tungsten Inert Gaz) - Сварка TIG (Tungsten Inert Gaz) - TIG lassen (Tungsten Inert Gaz) - Saldatura TIG (Tungsten Inert Gaz)
	<ul style="list-style-type: none"> - Convient au soudage dans un environnement avec risque accru de choc électrique. La source de courant elle-même ne doit toutefois pas être placée dans de tels locaux. - Suitable for welding in an environment with an increased risk of electric shock. However, the machine itself should not be placed in such an environment. - Geeignet für Schweißarbeiten im Bereich mit erhöhten elektrischen Risiken, Trotzdem sollte die Schweißquelle nicht unbedingt in solchen Bereichen betrieben werden. - Adaptado para soldadura en lugar con riesgo de choque eléctrico. Sin embargo, la fuente eléctrica no debe estar presente en dichos lugares. - Подходит для сварки в среде с повышенным риском удара током. В этом случае источник тока не должен находиться в том же самом помещении. - Geschikt voor het lassen in een ruimte met verhoogd risico op elektrische schokken. De voedingsbron zelf mag echter niet in een dergelijke ruimte worden geplaatst. - Adatto per saldatura in un ambiente con alto rischio di scosse elettriche. La fonte di corrente non deve essere comunque localizzata in tali locali.
	<ul style="list-style-type: none"> - Courant de soudage continu - Direct welding current - Gleichschweißstrom - Corriente de soldadura continua - Постоянный сварочный ток. - DC lasstroom - Corrente di saldatura continua..
	<ul style="list-style-type: none"> - Courant de soudage alternatif - Alternating welding current - Wechselschweißstrom - Переменный сварочный ток - Wisselstroom
<p>U₀</p>	<ul style="list-style-type: none"> - Tension assignée à vide - Off load voltage - Tensión asignada en vacío - Leerlaufspannung - Номинальное напряжение холостого хода - Nullastspannung - Tensione assegnata a vuoto
<p>U_p</p>	<ul style="list-style-type: none"> - Tension de crête assignée - Allocated peak voltage - Tensión de pico asignada - Nominale piekspanning - Tensione di picco assegnata
<p>X(40°C)</p>	<ul style="list-style-type: none"> - Facteur de marche selon la norme EN60974-1 (10 minutes – 40°C). - Duty cycle according to standard EN 60974-1 (10 minutes – 40°C). - Einschaltdauer: 10 min - 40°C, richlinienkonform EN60974-1 - Ciclo de trabajo según la norma EN60974-1 (10 minutos – 40°C). - ПВ% согласно норме EN 60974-1 (10 минут – 40°C). - Inschakelduur volgens de norm EN60974-1 (10 minuten – 40°C). - Ciclo di lavoro conforme alla norma EN60974-1 (10 minuti – 40°C).
<p>I₂</p>	<ul style="list-style-type: none"> - I₂: courant de soudage conventionnel correspondant / I₂: Corresponding conventional welding current / I₂: entsprechender Schweißstrom / I₂: corriente de soldadura convencional correspondiente / I₂: соответствующий номинальный сварочный ток. / I₂: corresponderende conventionele lasstroom / I₂: corrente di saldatura convenzionale corrispondente
<p>A</p>	<ul style="list-style-type: none"> - Ampères - Amperes - Ampere - Amperios - Амперы - Ampère - Amper
<p>U₂</p>	<ul style="list-style-type: none"> - U₂: Tensions conventionnelles en charges correspondantes / U₂: Conventional voltage in corresponding loads. / U₂: entsprechende Arbeitsspannung / U₂: Tensiones convencionales en cargas correspondientes. / U₂: Номинальные напряжения при соответствующих нагрузках. / U₂: Conventionele spanning bij overeenkomstige belasting / U₂: Tensioni convenzionali in cariche corrispondenti
<p>V</p>	<ul style="list-style-type: none"> - Volt - Volt - Volt - Voltio - Вольт - Volt
<p>Hz</p>	<ul style="list-style-type: none"> - Hertz - Hertz - Hertz - Hercios - Герц - Hertz
	<ul style="list-style-type: none"> - Alimentation électrique triphasée 50 ou 60Hz. - Three-phase power supply 50 or 60Hz - Dreiphasige Netzversorgung mit 50 oder 60 Hz - Alimentación eléctrica trifásica 50 o 60Hz - Трёхфазное электропитание 50 или 60Гц - Driefasige elektrische voeding 50 of 60 Hz. - Alimentazione elettrica trifase 50 o 60Hz.
<p>U₁</p>	<ul style="list-style-type: none"> - Tension assignée d'alimentation - Rated power supply voltage - Netzspannung - Номинальное напряжение питания. - Nominale voedingsspanning - Tensione assegnata d'alimentazione
<p>I_{1max}</p>	<ul style="list-style-type: none"> - Courant d'alimentation assigné maximal (valeur efficace). - Maximum rated power supply current (effective value). - Maximaler Versorgungsstrom (Effektivwert) - Corriente de alimentación eléctrica asignada máxima (valor eficaz). - Максимальный сетевой ток (эффективное значение). - Nominale maximale voedingsstroom (effectieve waarde). - Corrente di alimentazione nominale massima (valore efficace).
<p>I_{1eff}</p>	<ul style="list-style-type: none"> - Courant d'alimentation effectif maximal - Maximum effective rated power supply current - Maximaler tatsächlicher Versorgungsstrom - Corriente de alimentación efectiva máxima - Максимальный эффективный сетевой ток. - Maximale effectieve voedingsstroom - Corrente di alimentazione effettiva massima.
	<ul style="list-style-type: none"> - Matériel conforme aux directives européennes. La déclaration UE de conformité est disponible sur notre site (voir à la page de couverture). - Device complies with Europeans directives. The EU Declaration of Conformity is available on our website (see cover page). - Die Geräte entsprechen die europäischen Richtlinien. Die Konformitätserklärung finden Sie auf unsere Webseite. - Aparato conforme a las directivas europeas. La declaración de conformidad UE está disponible en nuestra página web (dirección en la portada). - Apparaat in overeenstemming met de Europese richtlijnen. De E.U. verklaring van overeenstemming kunt u downloaden op onze website (adres vermeld op de omslag). - Dispositivo conforme alle direttive europee La dichiarazione UE di conformità è disponibile sul nostro sito internet (vedere alla pagina di copertina).