

EN

1-24

## TIG 250 AC/DC





## SAFETY INSTRUCTIONS

Thank you for choosing this machine! To get the best use from your machine please read the following carefully. This User Manual is designed to help you get the most out of your welding equipment. Read and understand the following safety recommendations before using or servicing the unit.

Any modification or maintenance not indicated in the manual must not be carried out.

The manufacturer is not responsible for any injury to the operator or damage to the equipment or surrounding area, due to failure to follow the instructions detailed in this manual.

If there is any issue or uncertainty, please consult a qualified individual to operate the equipment correctly.

## WORKPLACE

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. The operator must respect the safety precautions that apply to this type of welding. The manufacturer is not responsible for any incorrect or dangerous operation.

According to the standard IEC 60974-10, this class A device is designed to be used in an industrial or professional environment.

It can be difficult to ensure electromagnetic compatibility, due to conducted disturbances as well as radiation.

This equipment must be used and stored in a place protected from dust, acid or any other corrosive. Operate the machine in an open, or well-ventilated area.

Operating temperature:

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

Store between -25 and +55°C (-13 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).

Up to 2,000m above the sea level (6500 feet).

Do not use this equipment to thaw pipes, to charge batteries, or to start any engine.

## INDIVIDUAL PROTECTION

Arc welding can be dangerous and can cause serious and even fatal injuries.

Protect yourself and protect others.

Welding exposes the user to dangerous heat, arc rays, electromagnetic fields, noise, gas fumes, and electrical shocks.

People wearing pacemakers are advised to see their doctor before using this device.

In order to protect against burns and arc eye, protective clothing should be worn at all times: fire-proof clothing (cotton, overalls or jeans), protective gloves and a fire-proof apron, ensuring whole body is covered.

Wear protective gloves which guarantee you an electrical and thermal insulation.

It may be necessary to install fireproof welding curtains to protect others against arc rays, weld spatters and sparks.

Inform the people around the working area to not look at the arc ray or the molten metal and to wear protective clothes.

It is necessary to protect yourself with a welding hood (rated NR.10 or higher) and to protect your eyes during the operation.

Do not operate whilst wearing contact lenses.

Ensure ear protection is worn by the operator and anyone in the surrounding area if the work exceeds the authorised noise limit.

DO NOT TOUCH moving parts (e.g. engine, fan...) with hands, hair, clothes etc...

The rollers must not be touched when the wire feeder is working.

Never remove the safety cover of the wire feeder when the machine is plugged in - The manufacturer is not responsible for any accident or injury that happens as a result of not following these safety precautions.

Do not point the torch towards any part of the body when the wire feeder is working - the wire can cause injuries when exiting the torch.

**CAUTION:** the workpiece can still be hot after welding has finished and can cause burns if handled.

The user must ensure that the torch has sufficiently cooled down before starting any cleaning operation. A cool-down period of 10 minutes after each welding operation is required. When working with a water cooled torch, make sure that the water cooling system is on to avoid any burns caused by the liquid.

**ALWAYS** ensure the working area is left as safe and secure as possible to prevent damage or accidents.





## TIG 250 AC/DC



### WELDING FUMES AND GAS

The fumes, gases and dust produced during welding are hazardous. It is mandatory to ensure adequate ventilation and/or extraction to keep fumes and gases away from the work area. An air fed helmet is recommended in cases of insufficient air supply in the workplace. Check that the air intake is in compliance with safety standards.

Care must be taken when welding in small areas, and the operator will need supervision from a safe distance.

Welding certain pieces of metal containing lead, cadmium, zinc, mercury or beryllium can be extremely toxic. The user will also need to degrease the workpiece before welding.

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

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

### FIRE AND EXPLOSION RISKS

Protect the entire welding area.

Compressed gas containers and other inflammable material must be moved to a minimum safe distance of 11 meters.

Welding of sealed containers or closed pipes should not be undertaken, and if opened, the operator must remove any inflammable or explosive materials (oil, petrol, gas...). A fire extinguisher must be readily available.

Be careful - spatter and sparks can create fire or explosion.

Grinding work must not be carried out close to this welding equipment.

### GAS CYLINDERS

Gas leaking from the cylinder can create a hazard if present in high concentrations around the work area.

Always keep cylinders in an upright position securely chained to a fixed support or trolley.

Close the bottle after any welding operation. Be careful with gas bottles placed in areas of high temperature, or in sunlight.

Cylinders should be located away from areas where they may be struck or subjected to physical damage. Always keep gas bottles at a safe distance from arc welding or cutting operations, and any source of heat, sparks or flame.

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

### ELECTRICAL SAFETY

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

An electrical shock can cause severe injuries or even death directly or indirectly.

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

ALWAYS unplug the machine and wait for 2 minutes before opening the machine - this allows the capacitors to discharge.

Never weld in rain or on a wet surface. The electrical cables must never be in contact with liquid.

Do not touch the torch and earth cable at the same time.

Damaged cables and torches must be changed by a qualified and skilled professional. Always use the correct size of DIN connectors.

Always wear dry clothes in good condition to be insulated from the electrical circuit. Always wear insulated shoes in any welding area.

### MAGNETIC FIELDS AND INTERFERENCES

An electromagnetic field is created around the cables by current flow.

According to the standard IEC 60974-10, this class A device is designed to be used in an industrial or professional environment. It can be difficult to ensure electromagnetic compatibility, due to conducted disturbances as well as radiation.

This equipment must be used and stored in a place protected from dust, acid, gas or any other corrosive substance.

Attention: this equipment does not comply with the standard IEC61000-3-12. If the machine is connected to the public network on low voltage, the installer and operator must ensure that the machine can be connected - consult your power supplier if necessary.

In order to reduce possible electromagnetic disturbances, you can:

Install electric filters close to the socket in case of excessive conducted disturbances. The earth and torch cables should be as short as possible and be placed close together as far as possible from any other cable, power tool or electrical cables.





## TIG 250 AC/DC



**The electromagnetic fields can disturb other equipment, eg; pacemaker or hearing aid.  
People wearing pacemakers are advised to consult their doctor before using this device.**

**Do not use the welding unit to thaw pipes.**

**Handle gas cylinders with care. There is increased danger if the bottle or it's valve are damaged.**

Electric and magnetic fields may interfere with network cables and may cause disturbances.

Never wrap the welding leads around your body. Do not place your body between the earth and the torch cable, they should be placed on the same side.

Electromagnetic disturbances should be reduced as much as possible if they disturb the operator's activity. The operator is responsible for the installation and the use of the welding equipment and should seek advice from the manufacturer if required.

### ELECTRIC WIRING RULE TO REDUCE DISTURBANCES

It is sometimes useful to set all the parts at the same voltage (while respecting the standards in place for each).

Installing an earth connection to the workpiece may reduce the disturbances, and will not increase the risk to the operator or any other electrical appliances.

The shielding of the welding cables and of any other cables may be useful.

### IP PROTECTION

#### IP23S

- Protection prevents access to hazardous parts with fingers or other solid foreign bodies with a diameter equal to or higher than 12.5mm
- Protective grid - against rain fall at an angle of 60°.
- Case protects against effects of water/dust penetration when the equipment is not in use.

### SET UP

Only qualified personnel authorized by the manufacturer should perform the installation of the welding equipment.

During set up, the operator must ensure that the machine is unplugged. The serial or parallel connections on a generator are prohibited.

### TRANSPORTATION OF THE MACHINE

Two handles are fitted on the equipment to carry it easily, be careful to not underestimate its weight.

This machine is not equipped with a lifting facility - the operator is required to make the necessary arrangements for safe lifting and transport of the machine (be careful not to tilt the machine).

Do not use the cables or torch to move the machine. The welding equipment must be moved in an upright position. Never lift the machine while there is a gas cylinder on the support shelf - follow the separate movement guidelines specified for the gas bottle.

The removal of the wire reel from the machine is recommended before undertaking any lifting operation.

### SETTING UP THE MACHINE

Rules to follow:

- Put the machine on the floor (maximum incline of 15°.)
- Ensure the work area has sufficient ventilation for welding, and that there is easy access to the control panel.
- The machine must be placed in a sheltered area away from rain or direct sunlight.





# TIG 250 AC/DC



FIG-1

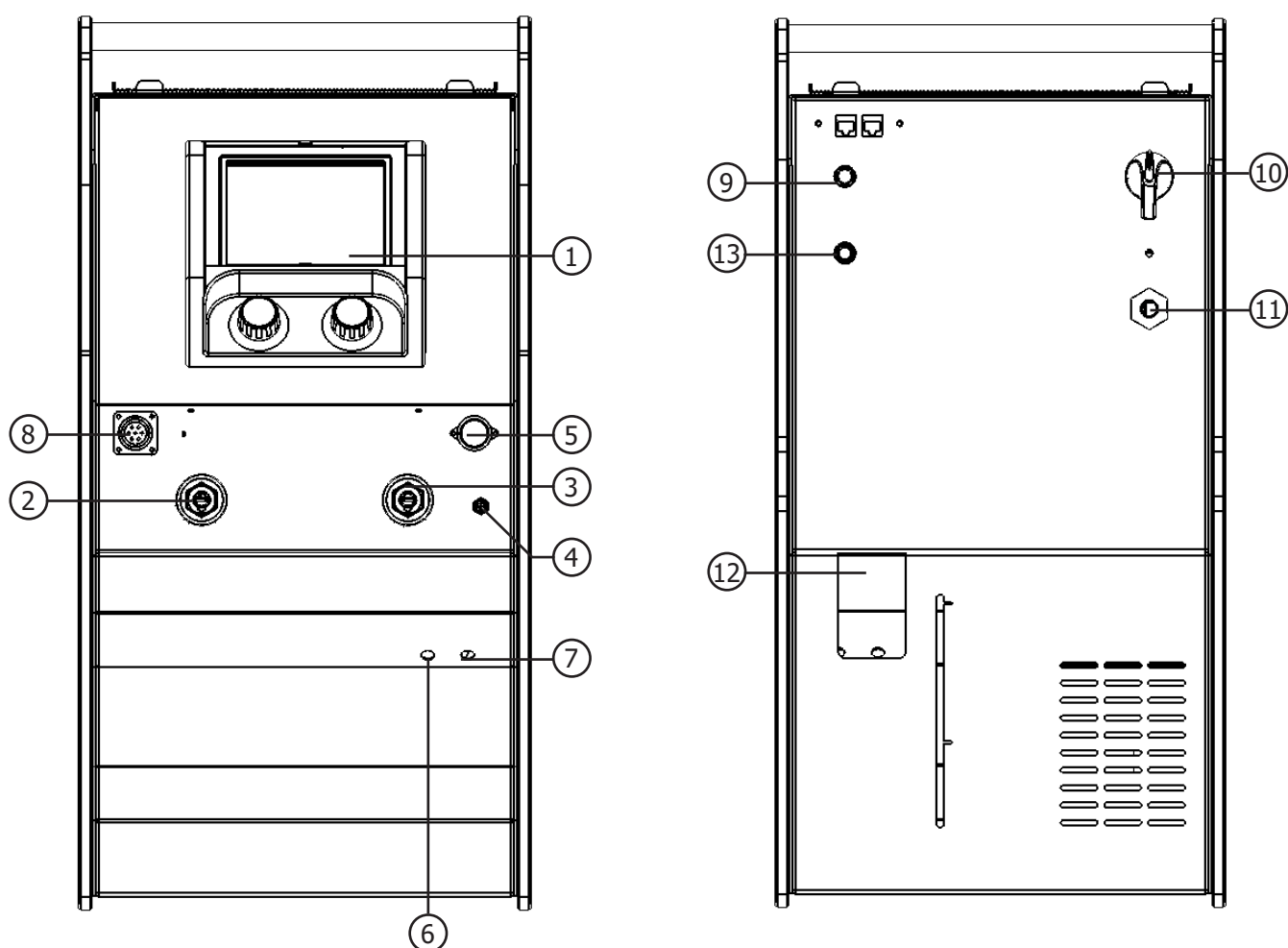
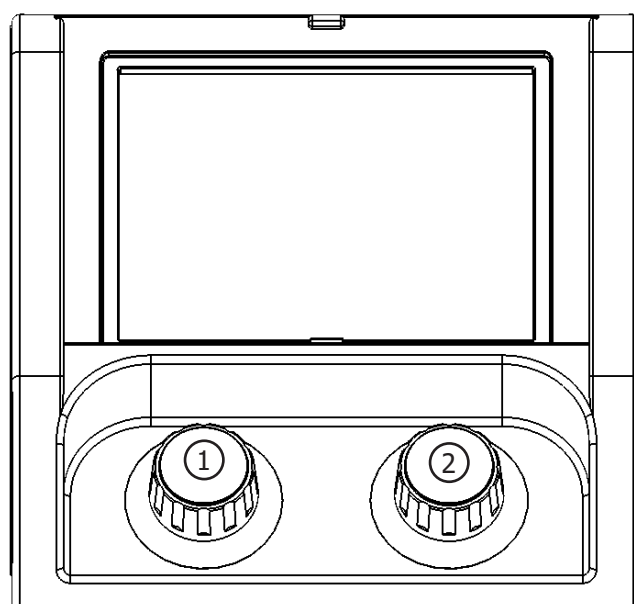


FIG-2







## TIG 250 AC/DC



### DESCRIPTION

*Thank you for choosing this machine! To get the best use from your machine please read the following carefully.*

The TIG 250 AC/DC is a portable, single phase, ventilated Inverter welding unit to be used with non consumable electrode (TIG) in direct (DC) or alternative (AC) current. TIG welding requires a gas shield protection of pure(Argon). In MMA mode, it allows you to weld with any kind of electrodes: rutile, basic, stainless steel or cast iron.

The TIG 250 AC/DC can be equipped with a remote control or foot pedal.

The TIG 250 AC/DC has an integrated liquid cooling system to connect liquid cooled torches.

### POWER SUPPLY – STARTING UP

- This machine is delivered with a 5 pin three-phase plug (3P + N + PE) 400V 16A type CEE17. The TIG 250 AC/DC must be connected to a 400 V socket (50 - 60 Hz) WITH earth protected by a 16A circuit breaker and a 30mA overcurrent discontactor. The absorbed current (I<sub>1eff</sub>) is indicated on the device, for its maximum setting. 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.

This unit has an internal cooling liquid system which has 2 main functions: the cooling of the water torch if connected and the cooling of internal spare parts. So the tank of the unit needs to be filled to the maximum line indicated at the back of the machine.

- The starting up is made by pushing on the standby button.
- The device turns into protection mode if the power supply tension is under 360V or over 440V or if a phase is missing. To indicate this default, the screen displays. Once in protection mode, you have to unplug the device and plug it back into a socket delivering the correct voltage (see the table of error messages).
- Fan: in MMA mode, the fan works nonstop. In TIG mode, the fan works only when welding, then stops after cooling.
- These are Class A devices. They are designed to be used in an industrial or professional environment. In a different environment, it can be difficult to ensure electromagnetic compatibility due to conducted disturbances as well as radiation. They comply with the norm CEI 61000-3-12.

### DESCRIPTION DU POSTE (FIG-1)

- |   |                                     |
|---|-------------------------------------|
| <b>1-</b> Screen + potentiometers             | <b>8-</b> Remote control connection |
| <b>2-</b> + polarity plug                     | <b>9-</b> 5A fuse support           |
| <b>3-</b> - polarity plug                     | <b>10-</b> ON / OFF switch          |
| <b>4-</b> Gas connection for torch            | <b>11-</b> Power cable              |
| <b>5-</b> Trigger connection                  | <b>12-</b> Tank                     |
| <b>6-</b> Water input for water cooled torch  | <b>13-</b> Gas inlet                |
| <b>7-</b> Water output for water cooled torch |                                     |

### CONTROL BOARD (IHM) (FIG-2)

The control board is made of a colour TFT screen and two potentiometers. How it works in 3 states:

State 1 or Standby mode: with the potentiometer 1 you will be able to set the welding current, and with the potentiometer 2 the parameters related to the welding current.

State 2 or Welding mode: by pushing the potentiometer 1 you will have access to the top menu. Then by turning the button you will select the welding mode. You will exit this menu by waiting 8s or by pushing the potentiometer 2 -> back to State 1.

State 3 or Welding parameters mode: by pushing the potentiometer 2 you will have access to the welding parameters and you will see the selection by turning the button. You will exit this menu by waiting 8s or by pushing the potentiometer 2 -> back to State 1.





# TIG 250 AC/DC



## FUNCTION, MENU AND PICTOGRAM DESCRIPTIONS

Functions	Description	Pictogram	Functions available on			Comments
			TIG DC	TIG AC	MMA	
Welding current	Current				X	Value of the welding current needed depends on the thickness and the type of metal, as well as on the welding joint. (A)
HotStart	HotStart				X	Adjustable overcurrent at the beginning of the welding (%)
ArcForce	ArcForce				X	Overcurrent delivered to avoid sticking when the electrode enters the welding pool (%)
Polarity reversal					X	Easy reversal of the polarity in order to weld with different type of electrodes
HF arcing	HF	-	X	X		Ignition without contact
LIFT arcing	LIFT	-	X	X		Ignition with contact
Pre-Gas	Pre-Gas		X	X		Time to purge the torch and to protect the area with gas before ignition
Starting current	I Start		X	X		Pre current (A)
Starting time	T Start		X	X		Pre current time (S)
Up slope	UpSlope		X	X		Time needed to go from minimum current to welding current (S)
Cold current (4TLog)	I Froid		X	X		Background welding current or cold current activated with a double button torch or in 4T LOG (A)
PULSE cold current	I Froid		X	X		Base current or cold current in PULSE mode (A)
PULSE balance	%T Pulse		X	X		Cold current balance (%)
PULSE frequency	Hz Pulse		X	X		Pulse frequency (Hz)
Down slope	DownSlope		X	X		Time needed to shift from welding current to minimum current, I Stop (S) to avoid weld defects and craters.
Ending current	I Stop		X	X		Post Welding current (A)
Ending time	T Stop		X	X		Post Welding time (S)
Post Gas	Post Gas		X	X		Length of time in which gas is released after the arc has stopped. It protects the weld pool and the electrode against oxidization when the metal is cooling.
AC balance	%T AC			X		Wave balance control of penetration and cleaning (%)
AC frequency	Hz AC			X		Welding frequency in AC (Hz)
Electrode diameter	Ø		X	X		Diameter of the electrode tungsten recommended to optimize the arcing and the welding of certain thickness of metal in SYNERGIC mode
Metal to weld	Fe, CrNi, Cu/ CuZn, AlMg, AlSi, Al99		X	X		Selection of the metal to weld: Steel, Nickel-Chromium, Cusi or brass, Aluminium-Magnesium, Aluminium-Silicon in SYNERGIC mode
Butt weld			X	X		SYNERGIC mode
Fillet weld			X	X		SYNERGIC mode





# TIG 250 AC/DC



Vertical Down weld			X	X		SYNERGIC mode
Delai Spot			X	X		Spot time
Thickness of the metal to be welded			X	X		Material thickness guide in SYNERGIC mode
MMA process	MMA				X	
TIG AC process	AC			X		
TIG DC process	DC		X			
SYNERGIC mode	SYNERGIC		X	X		
Standard mode	STD		X	X		
Pulse mode	PULSE		X	X		
Spot mode	SPOT		X	X		
2T	2T		X	X		2 Time torch mode
4T	4T		X	X		4 Time torch mode
4T LOG	4T LOG		X	X		4 Time LOG torch mode
Languages			X	X	X	Selection of the language
Control board locking			X	X	X	Locking the control board to stop accessing to menus and parameters
Control board unloc- king			X	X	X	Unlocking the control board to open back the access to menus and parameters (default code: 0000)
Password modification			X	X	X	Allow the modification of the password
Reset parameters	RESET		X	X	X	Allow to restore the original parameters
Identification	ID		X	X	X	After Sales module to identify the machine
Backup menu			X	X	X	Menu where old welding parameters are saved
Save			X	X	X	Save the welding parameters under the name given
Save as			X	X	X	Save the welding parameters with a new name
Open			X	X	X	Open a welding configuration saved previously
Delete			X	X	X	Delete a welding configuration saved previously
Thermal protection			X	X	X	Symbol indicating the state of the thermal protection
Connect-5			X	X		PLC mode

## MMA WELDING (ELECTRODE)

### Getting Started

- Connect the electrode holder and earth clamp to the corresponding sockets.
- Ensure that the welding polarities and intensities indicated on the electrode packaging are observed.
- Remove the electrode from the electrode holder when the machine is not in use.





# TIG 250 AC/DC



## CONTROL BOARD SCREEN

### MMA PRO

MMA	PRO	OPTIONS	
<b>250</b> A	<b>40</b> %	<b>60</b> %	
	<b>I = 250 A</b>	<b>U = 30 V</b>	

### MMA EASY

MMA	EASY		
<b>250</b> A			
<b>I = 250 A</b>		<b>U = 30 V</b>	

The **PRO** mode gives access to every function and parameter of the machine.  
The **EASY** mode gives an easier menu with only the setting of the welding current.

### The options of the PRO and EASY modes

EASY MODE	(40%)	(40%)	
PRO MODE	0 - 100%	0 - 100%	X

## TIG WELDING (TIG MODE)

### Connection and advice

Connect the earth clamp to the positive plug (+).  
Connect the torch to the negative plug (-), the trigger cable and the gas hose.  
Ensure that the torch is equipped ready to weld with the consummables (Ceramic gas nozzle,collet body,collet,back cap and tungsten)

### User interface in TIG welding

TIG	DC	Ø 1.6	STD	2T	
<b>I = 160 A</b>		<b>= 3 S</b>			

**TIG DC STD (normal TIG DC mode)**

TIG	DC	Ø 1.6	PLS	2T	
<b>I = 160 A</b>		<b>= 3 S</b>			

**TIG DC PULSE (Pulse TIG DC mode)**

TIG	AC	Ø 1.6	STD	2T	
<b>I = 160 A</b>		<b>= 3 S</b>			

**TIG AC STD (normal TIG AC mode)**

TIG	AC	Ø 1.6	PLS	2T	
<b>I = 160 A</b>		<b>= 3 S</b>			

**TIG AC PULSE (Pulse TIG AC mode)**





## THE WELDING TIG PROCESS

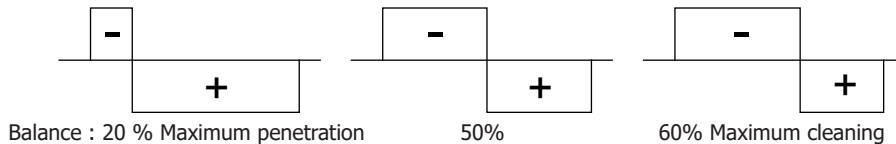
### TIG DC

This welding mode in direct current (DC) is designed for ferrous metal such as steel, stainless steel or even copper and its alloys.

### TIG AC

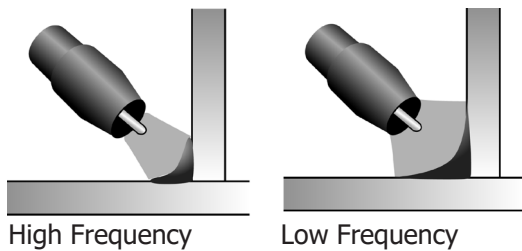
This welding mode in alternating current (AC) is used to weld aluminium and alloys. This process is set up with two parameters:

*Balance (%T\_AC) :*



An alternating current is used to weld aluminium and its alloys. During the positive wave, oxidation is broken (cleaning). During the negative wave, the electrode cools and the parts are welded (penetration). By modifying the ratio between 2 alternatives through the balance adjustment, you choose either cleaning or penetration.

*Frequency principle ( Hz AC ) :*



The frequency enables adjustment of the arc concentration. The higher the frequency, the more concentrated the arc. The lower the frequency the wider the arc will be. In AC mode, the frequency is manually adjusted. When using AC Easy mode, this setting is automatically adjusted according to the diameter of the electrode used and welding current. It is recommended to use AC in Easy mode.

### TIG Pulse (Pulse)

This welding mode is an independant process, different from welding on standard DC or AC. It is not available on 4T LOG.

The pulses match the alternated increase and decrease of the current (peak current, base current). With the pulse mode you will have greater control when welding thin gauge pieces of metal together with a lower degree of distortion.

In pulse mode, the settings are:

- The "I Cold" current is in percentage and sets up between 20% and 80% of the welding current. The cold current reduces heat input during welding.
- The Pulse frequency (Hz Pulse) is set up between 0.1 Hz to 250Hz.
- The Pulse balance (%T\_PULSE) is the % of cold current set up during a period (1: Period = 1/Hz Pulse)

Example:

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

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

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

Advice: the lower the current will be (thin metal sheet), the higher the pulse frequency will be. Conversely when the current is high, it is better to use low frequencies. For  $I > 100\text{A}$ ,  $F (\text{Hz}) \leq 100 \text{ Hz}$

### TIG AC/DC SPOT

This mode is separate from the DC or AC process. It is only available on 2T TIG HF.

It aims at preparing the workpieces to be assembled by spot and preferably at regular intervals to avoid any distortion during welding.

Once the joint is done by spot, the Standard or Pulse TIG welding mode can be used.

Un temps de pointage est réglable










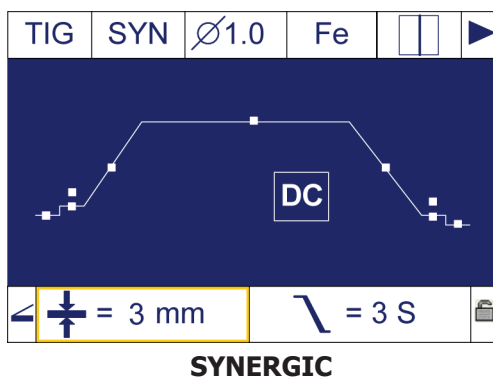
# TIG 250 AC/DC



## SYNERGIC

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

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

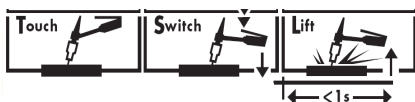


This mode can be of help to easily set weld parameters when you have just bought the machine. At any moment the operator will be able to come back to the normal mode without losing the parameters set up. Every SYNERGIC setting will be saved and the user will be able to change them afterwards. This allows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

## SELECT STARTING FUNCTION

HF TIG: High Frequency start without contact



TIG LIFT: Contact start (for environments sensitive to HF disturbances)



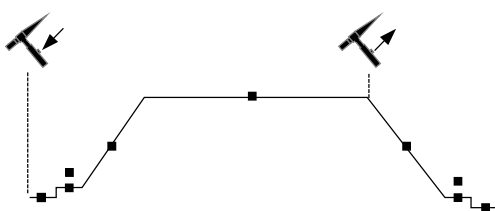
- 1- Touch the work-piece with the electrode
- 2- Press the trigger on the torch
- 3- Lift the electrode.

## Trigger behaviour

Compatible torches :

			
TIG 250 AC/DC	•	•	•

## 2T Mode



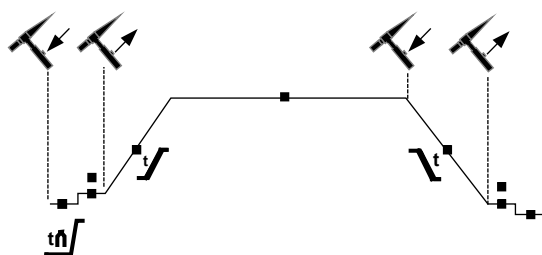
- 1- Press and hold trigger: pre-gas, up slope, welding
- 2- Release trigger: down slope, post-gas

NB: For dual control torches and dual potentiometer > command "up / warm current" and potentiometer active, command «low / cold current» inactive





## 4T Mode

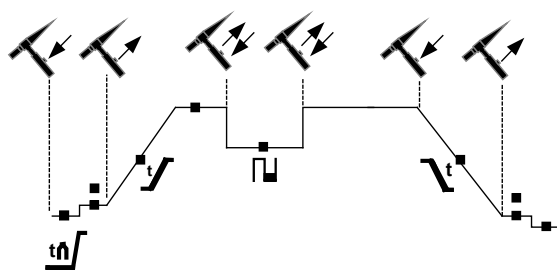


- 1- Press trigger: Pre-gas, followed by start. In order to make positioning the electrode easier, a low current is supplied acting like a light beam. (=Adjust Ideal Position)
- 2- Release trigger: Up-slope until the displayed instruction, welding
- 3- Press trigger: Down-slope to low current (allows good closure of the crater)
- 4- Release trigger: stops the current and post-gas.

Nb: For dual controls torches and dual potentiometer ▷ command "up / warm current" and potentiometer active, command «low / cold current» inactive

## 4T Log Mode

This mode is the same as the 4T mode but when in welding phase, a short tap on the trigger allows a shift to a previously set cold current



- 1- Press trigger: pre-gas, followed by starting. In order to make the electrode positioning easier, a low current is supplied, acting like a light beam. (=Adjust Ideal Position)
- 2- Release trigger: elevation of the current to the «hot» welding current (displayed instruction)  
short impulse : shift to cold current (%I)  
short impulse : back to the «hot» current.
- 3- Press trigger: down slope to low current (for a good closure of the crater)
- 4- Release trigger: stops the current and post-gas.

Nb: For dual controls torches and dual potentiometer ▷ command "up / warm current" and command» low / cold current" + active potentiometer. For this mode it may be convenient to use the dual torch option or dual command + potentiometer.

The «up» command keeps the same function as the simple torch command or slip. The «down» command can, when pressed, switch to the cold current. The potentiometer of the torch, where available, allows control of the welding current 100% of the value displayed.

## Summary of the fuctions available by welding process, by arcing mode and by type of trigger

TIG welding process	Start		Trigger			TIG Process													
	HF	Lift	2T	4T	4T log														
AC / DC STD	•	•	•	•	•	•	•	•	•	• (*)		•	•	•	•			• (**)	• (**)
AC / DC Pulse	•	•	•	•		•	•	•	•	•		•	•	•	•	•		• (**)	• (**)
AC / DC SPOT	•		•			•				•					•			• (**)	• (**)

(\*) only on 4T LOG

(\*\*) only on AC







## TIG 250 AC/DC



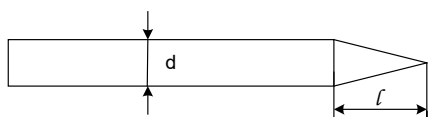
### Recommended combinations

		Current (A)	Ø Electrode (mm) = Ø wire (filler metal)	Ø Nozzle (mm)	Flow rate (Argon L/min)
DC	0,5-5	10-130	1,6	9,5	6-7
	4-6	130-160	2,4	11	7-8
	6-9	160-250	3,2	11-12.5	8-9
		Current (A)	Ø Electrode (mm) = Ø wire (filler metal)	Ø Nozzle (mm)	Flow rate (Argon L/min)
AC	1-2,4	50-90	1,6	9,5	6-7
	2,4-3,2	80-150	2,4	9,5	7-8
	3,2-5,0	120-200	2-2,4	9.5-12.5	8-10
	5-6,5	200-250	3,2	12.5-19.5	10-12

### Electrode grinding

On TIG DC mode

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



$L = 3 \times d$  for a low current.

$L = d$  for a strong current.



On TIG AC mode

The electrode will need a chamfer ground on the end, except when using a very low current grind to a point. It is normal for a ball to appear at the end of the electrode. The ball size will become larger as the current and balance is increased.

### SAVE AND LOAD THE WELDING CONFIGURATIONS

There are 100 memories: 100 in MMA, 100 in TIG DC and 50 in TIG AC.



#### Save a welding configuration as

In the file menu , the function « Save as » with the pictogram  :

ENREGISTRER SOUS								
TIG DC ép 4mm en Acier								
A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	_
0	1	2	3	4	5	6	7	8
9	DEL	OK						



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

#### Save a configuration

If the configuration saved is not accurate anymore and some modifications have been done: in the file menu , the function « Save »  overwrite the old configuration and save the new one.



If the the saved configuration is amended, the name will appear in red.

#### Open a saved configuration

In the file menu , the function « Open »  gives access to the list of configurations already saved. Once back to the welding menu, the name will be displayed on the screen.

If the the saved configuration is amended, the name will appear in red.

#### Delete a saved configuration

In the menu file , the function « Delete »  gives the operator access to the configurations saved and the possibility by selecting one to delete it.

#### Password

The password by default is: **0000**.

In case of loss, the super user password allows you to unlock the unit: **MORWAS**

The standard password **0000** is reactivated.



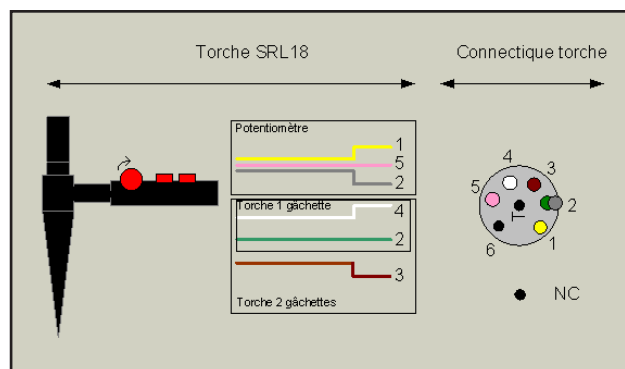


# TIG 250 AC/DC

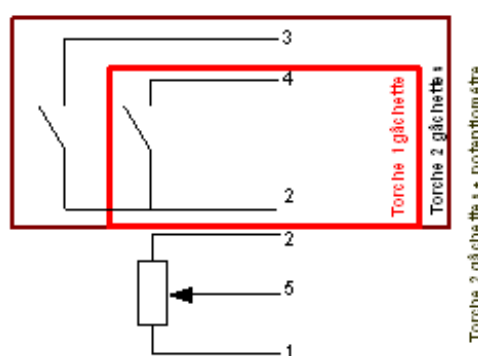


## TRIGGER CONNECTION

SRL18 connection diagram



Electrical diagram according to the type of trigger



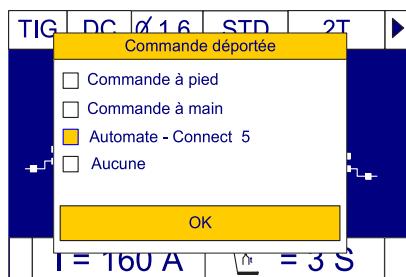
Torch type			Wire description	Pin
Torch 2 triggers + potentiometer	Torch 2 triggers	Torch 1 triggers	Main	2 (green)
			Switch trigger 1	4 (white)
			Switch trigger 2	3 (brown)
			Main / Potentiometer	2 (grey)
			3,3V	1 (yellow)
			Cursor	5 (pink)

## REMOTE CONTROL

The remote control operates in TIG and MMA mode.

### Connection

- 1- Plug the remote control into the connection in the front.
- 2- The machine will detect automatically the remote control and open the following menu:



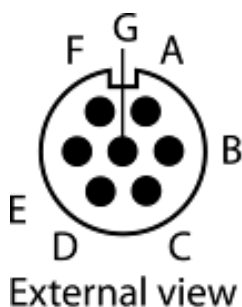
- 3- Select your type of remote control.

### Connector technology

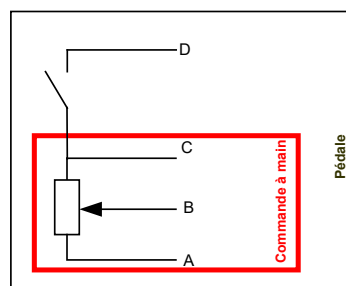
The TIG 250 AC/DC is equipped with a female socket for a remote control. The specific 7 pin male plug (JBDC product ref.045699) enables connection to a manual remote control (RC) or foot pedal (PEd). For the cabling lay out, please see the diagram below.



ref. 045699



External view



Electrical diagram according to the remote control

Pédale

Commande à main





## TIG 250 AC/DC



TYPE OF REMOTE CONTROL		Wire description	Pin
Foot Pedal	Remote Control	Main	C
		Switch	D
		3,3V	A
		Cursor	B

### Functions

#### • Manual remote control (JBDC product ref.045675):

The remote control enables the variation of current from minimum intensity (DC: 5A / AC: 10A / MMA: 10A) to an intensity defined by the user.

In this configuration, all modes and functions of the machine are accessible and can be set.

#### • Foot pedal (JBDC product ref.045682):

In all modes excluding « Spot » mode, the pedal control enables variation of the current from the minimum intensity (DC: 5A / AC: 10A / MMA: 10A) to an intensity defined by the user.

In TIG mode, the machine will only operate in two-stage welding (2T mode). The upslope and downslope are not automatic, and are controlled by the User with the foot pedal.

In « Spot » mode, the pedal control replaces the torch trigger (the pedal position has no effect on the current).

#### - Connect 5 - PLC mode:

This mode allows the TIG 250 AC/DC to be controlled from a console or a PLC thanks to the recall of 5 pre-recorded programs.

The «Switch (D)» is used to start or stop the welding process according to the selected cycle. The voltage value applied to the «Cursor (B)» corresponds to a program or the current context.

This voltage must be between 0 and 3.3V in steps of 0.5V corresponding to a program recall:

- Current context: 0 - 0.5V

- Program 1: 0.5 - 1V

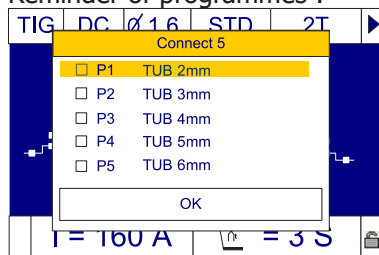
- Program 2: 1.0 - 1.5V

- Program 3: 1.5 - 2V

- Program 4: 2 - 2.5V

- Program 5: 2.5 - 3.3V

Reminder of programmes :



Before connecting to the PLC, it is important to perform the program allocation /CONNECT 5. To do this, go to the menu File /CONNECT 5. There are 5 programs and they must be allocated to an already registered memory.

By default, if a program does not have a memory allocation, the current context applies.

### COOLING SYSTEM

This machine is equipped with an internal liquid cooling system with 2 main functions; the cooling of the water torch and the cooling of the engine parts.

The operator must fill the tank up to its maximum indicated on the back of the machine but never under the minimum line or a warning message will be displayed on the screen.

The CORAGARD CS330 cooling liquid (or equivalent), recommended by JBDC, must be used (more information on the website: <http://www.aqua-concept-gmbh.eu>). The use of any other coolant, and including the special automotive one, can lead, by electrolysis effect, to the accumulation of dumps in the cooling system, damaging it and even more by blocking the circuit.

The maximum level indication is essential to optimize the duty cycle of the machine.

Any damage caused to the machine by the use of another cooling liquid will not be taken under warranty.

**The integrated cooling unit is designed to detect if a water cooled torch is connected or not. Please do not short-circuit the cooling unit. If you do so, the machine will not be able to work to its full specifications.**





## TIG 250 AC/DC



### DUTY CYCLE

- The machine has a specification with a "constant current output". The duty cycles according to the normal EN60974-1 (@ 40°C during 10min) are indicated in the following table:

X (40°C)	MMA			TIG DC		TIG AC	
	40%	60%	100%	60%	100%	60%	100%
I2	250A	230A	200A	250A	200A	250A	200A
U2	30V	29,2V	28V	20V	18V	20V	18V

### MAINTENANCE/ ADVICE

- Maintenance should only be carried out by a qualified person.
- Ensure the machine is unplugged, and that the ventilator inside has stopped before carrying out maintenance work. (DANGER High Voltage and Currents).
- JBDC recommends removing the steel cover 2 or 3 times a year to remove any excess dust. Take this opportunity to have the electrical connections checked by a qualified person with an insulated tool.
- Regularly check the condition of the power supply cable. If damaged, it will need to be replaced by the manufacturer, its' after sales service or a qualified person.
- Ensure the ventilation holes of the device are not blocked to allow adequate air circulation.
- Before each use, check the state of welding cables of the torch and earth clamp (The conductive metal should not be exposed).

### SAFETY

**Arc welding can be dangerous and can cause serious and even fatal injuries.**

**Protect yourself and others. Ensure the following safety precautions are taken:**

- Arc radiation :** Protect yourself with a helmet fitted with filters in compliance with EN169 or EN 379.
- Rain, steam, damp :** Use your welding unit in a clean/dry environment (pollution factor  $\leq 3$ ), on a flat surface, and more than one meter from the welding work-piece. Do not use in rain or snow.
- Electric shock :** This device must only be used with an earthed power supply. Do not touch the parts under high voltage. Check that the power supply is suitable for this unit.
- Falls :** Do not place/carry the unit over people or objects.
- Burns :**  
Wear protective (fire-proof) clothing (cotton, overalls or jeans).  
Wear protective gloves and a fire-proof apron.  
Ensure other people keep a safe distance from the work area and do not look directly at the welding arc.  
Protect others by installing fire-proof protection curtains.
- Fire risks :** Remove all flammable products from the work area. Do not work in presence of flammable gases.
- Fumes :** Do not inhale welding gases and fumes. Use the device in a well ventilated environment, with artificial extraction if welding indoors.
- Additional Precautions :** Any welding operation undertaken in :  
- rooms where there is an increased risk of electric shocks,  
- Poorly ventilated rooms,  
- In the presence of flammable or explosive material,  
Use should always be approved by a «responsible expert», and made in presence of people trained to intervene in case of emergency.  
Technical protection as described in the Technical Specification CEI/IEC 62081 must be implemented. Welding in raised positions should not be undertaken, except in case of safety platforms use.





# TIG 250 AC/DC



**People wearing Pacemakers are advised not to use this machine, however if necessary, please seek medical advice prior to use.**  
**Do not use the welding unit to unfreeze pipes.**  
**Handle gas bottles with care - there is increased danger if the bottle or its valve are damaged.**

## MESSAGES D'ERREUR, ANOMALIE, CAUSE, REMÈDE

SYMPTOMS	CAUSES	REMEDIES
The machine has stopped working and the yellow pictogram  about the thermal protection is on.	The cooling cycle has started.	Wait the end of the cycle of about 5 min. The pictogram  will disappear.
The indicator is on but the unit doesn't arc.	The earth clamp or the electrode holder is not connected to the unit.	Check the connections.
<div>PROBLEME</div> <div>           DEFAULT EAU Remplir le réservoir         </div>	There is not enough coolant in the tank. The tank is equipped with a sensor to ensure the machine will be able to work correctly.	Fill the tank up to the maximum line indicated on the back of the machine.
Despite the filling of the tank, the error message is still on.	The cooling liquid system is still not working and the fan is not on.	Check the fuse.
<div>PROBLEME</div> <div>           DEFAULT SECTEUR Vérifier l'installation         </div>	The unit is protected against underloads, overloads and phase missing.	Check the phases are correctly working on your electrical network. Check the intensity between each phase (400Veff +/- 15%).  If everything is fine with the phase but the error message is not anymore on, that is to say an overload may have caused the warning (lightning...).
Unstable arc	Fault due to tungsten	Use a size of tungsten more suitable to the thickness of your metal. Use tungsten properly prepared.
	Gas flow too high	Reduce the gas flow
The tungsten becomes oxidized and dull at the end of the welding	Welding area	Protect the welding area against draught.
	Post gas fault	Increase the time of post gas Check and tighten every gas connection. Check the flowmeter with an unload start.
The tungsten is melted	Polarity error	Check the earth is on +.
<div>PROBLEME</div> <div>           DEFAULT INTERNE 1         </div>	INTERNAL ERROR follows with a number	Contact the After Sales Service.





## TIG 250 AC/DC

### 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:






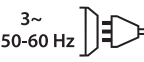



- The proof of purchase (receipt etc ...)
- A description of the fault reported





# TIG 250 AC/DC

## ICONES/SYMBOLS/ ZEICHENERKLÄRUNG

<b>A</b>	Ampères - Amps - Ampere
<b>V</b>	Volt - Volt - Volt
<b>Hz</b>	Hertz - Hertz - Hertz
	<ul style="list-style-type: none"> <li>- Soudage à l'électrode enrobée (MMA – Manual Metal Arc)</li> <li>- Electrode welding (MMA – Manual Metal Arc)</li> <li>- Schweißen mit umhüllter Elektrode (E-Handschweißen)</li> </ul>
	<ul style="list-style-type: none"> <li>- Soudage TIG (Tungsten Inert Gaz)</li> <li>- TIG welding (Tungsten Inert Gas)</li> <li>- TIG (WIG) Schweißen (Tungsten Inert Gas)</li> </ul>
	<ul style="list-style-type: none"> <li>- 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.</li> <li>- Adapted for welding in environments with increased risk of electrical shock. However, the welding machine should not be placed in such places.</li> <li>- Geeignet für Schweißarbeiten im Bereich mit erhöhten elektrischen Risiken. Trotzdem sollte die Schweißquelle nicht unbedingt in solchen Bereichen betrieben werden.</li> </ul>
<b>IP 23</b>	<ul style="list-style-type: none"> <li>- Protégé contre l'accès aux parties dangereuses des corps solides de diam &gt;12,5mm et chute d'eau (30% horizontal)</li> <li>- Protected against access to dangerous parts by any solid body which is Ø &gt; 12,5mm and against rain-fall (30% horizontal)</li> <li>- Gegen Eindringen von Körpern mit einem Durchmesser &gt; 12,5mm und gegen Sprühwasser geschützt (Einfallwinkel 30% horizontal)</li> </ul>
	Courant de soudage continu - Welding direct current - Gleichschweisstrom
	Courant de soudage alternatif - Alternating welding current - Wechselstrom
	<ul style="list-style-type: none"> <li>- Alimentation électrique Triphasée 50 ou 60Hz</li> <li>- Three phase power supply 50 or 60Hz</li> <li>- Dreiphasige Netzversorgung mit 50 oder 60Hz</li> </ul>
<b>U0</b>	Tension assignée à vide - Rated no-load voltage - Leerlaufspannung
<b>U1</b>	Tension assignée d'alimentation - rated supply voltage - Netzspannung
<b>I1max</b>	<ul style="list-style-type: none"> <li>- Courant d'alimentation assigné maximal (valeur efficace)</li> <li>- Rated maximum supply current (effective value)</li> <li>- Maximaler Versorgungsstrom (Effektivwert)</li> </ul>
<b>I1eff</b>	<ul style="list-style-type: none"> <li>- Courant d'alimentation effectif maximal</li> <li>- Maximum effective supply current</li> <li>- Maximaler tatsächlicher Versorgungsstrom</li> </ul>
<b>EN60974-1</b>	<ul style="list-style-type: none"> <li>- L'appareil respecte la norme EN60974-1</li> <li>- The device complies with EN60974-1 standard relative to welding units</li> <li>- Das Gerät entspricht der Norm EN60974-1 für Schweißgeräte</li> </ul>
<b>EN60974-2</b>	L'appareil respecte la norme EN60974-2 : Systèmes de refroidissement par liquide Sources de courant de soudage
<b>EN60974-3</b>	L'appareil respecte la norme EN60974-3 : Dispositifs d'amorçage et de stabilisation de l'arc
	Source de courant de technologie onduleur délivrant un courant CA/CC
<b>X</b> ...%	X : Facteur de marche à ...% - X : duty cycle at ...% - X : Einschaltdauer ...%
<b>I2</b> ...%	I2 : courant de soudage conventionnel correspondant - I2 : corresponding conventional welding current - I2 : entsprechender Schweißstrom
<b>U2</b> ...%	U2 : Tensions conventionnelles en charges correspondantes - U2 : conventional voltages in corresponding load - U2 : entsprechende Arbeitsspannung
	Ventillé - Ventilated - Lüfter
	<ul style="list-style-type: none"> <li>- Matériel conforme aux directives européennes. La déclaration UE de conformité est disponible sur notre site (voir à la page de couverture).</li> <li>- Device(s) compliant with European directives. The certificate of compliance is available on our website.</li> <li>- Die Geräte entsprechen die europäischen Richtlinien. Die Konformitätserklärung finden Sie auf unsere Webseite.</li> </ul>





## TIG 250 AC/DC

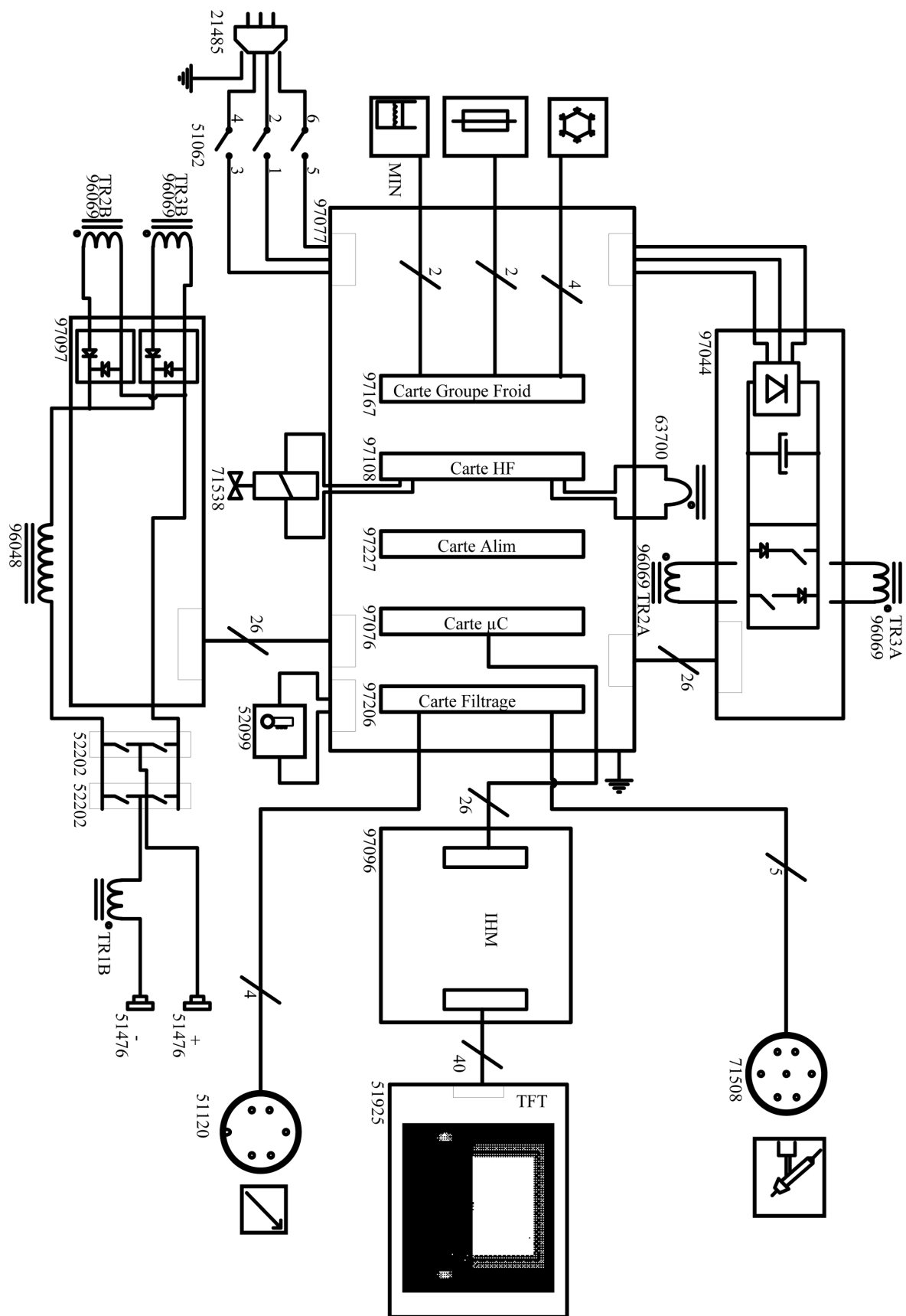
	<ul style="list-style-type: none"> <li>- Matériel conforme aux exigences britanniques. La déclaration de conformité britannique est disponible sur notre site (voir à la page de couverture).</li> <li>- Equipment in compliance with British requirements. The British Declaration of Conformity is available on our website (see home page).</li> <li>- Das Gerät entspricht den britischen Richtlinien und Normen. Die Konformitätserklärung für Grossbritannien ist auf unserer Internetseite verfügbar (siehe Titelseite).</li> </ul>
	<ul style="list-style-type: none"> <li>- Marque de conformité EAC (Communauté économique Eurasienne).</li> <li>- EAC Conformity marking (Eurasian Economic Community).</li> <li>- EAC-Konformitätszeichen (Eurasische Wirtschaftsgemeinschaft)</li> </ul>
	<ul style="list-style-type: none"> <li>- Produit recyclable qui relève d'une consigne de tri.</li> <li>- Recyclable product that is subject to a sorting requirement.</li> <li>- Wiederverwertbares Produkt, das einer Sortieranweisung unterliegt.</li> </ul>
	<ul style="list-style-type: none"> <li>- Matériel conforme aux normes Marocaines. La déclaration C<sub>ρ</sub> (CMIM) de conformité est disponible sur notre site (voir à la page de couverture).</li> <li>- Equipment in conformity with Moroccan standards. The declaration C<sub>ρ</sub> (CMIM) of conformity is available on our website (see cover page).</li> <li>- Das Gerät entspricht die marokkanischen Standards. Die Konformitätserklärung C<sub>ρ</sub> (CMIM) ist auf unserer Webseite verfügbar (siehe Titelseite).</li> </ul>
	<ul style="list-style-type: none"> <li>- L'arc électrique produit des rayons dangereux pour les yeux et la peau (protégez-vous !)</li> <li>- The electric arc produces dangerous rays for eyes and skin (protect yourself!)</li> <li>- Der elektrische Lichtbogen verursacht Strahlungen auf Augen und Haut (schützen Sie sich!)</li> </ul>
	<ul style="list-style-type: none"> <li>- Attention, souder peut déclencher un feu ou une explosion.</li> <li>- Caution, welding can result in fire or explosion.</li> <li>- Achtung : Schweißen kann Feuer oder Explosion verursachen</li> </ul>
	<ul style="list-style-type: none"> <li>- Attention ! Lire le manuel d'instruction avant utilisation</li> <li>- Caution ! Read the user manual</li> <li>- Achtung : Lesen Sie die Betriebsanleitung</li> </ul>
	<ul style="list-style-type: none"> <li>- Système de refroidissement par liquide</li> <li>- Liquid cooling system</li> <li>- Wasserkühlgerät</li> </ul>
<b>P 1l/min... kW</b>	<ul style="list-style-type: none"> <li>- Puissance de refroidissement assignée à un débit de volume de 1l/min à 25°C</li> <li>- Cooling power indicated by volumetric flow of 1l/min at 25°C</li> <li>- Kühlleistung: Volumenstrom von 1l/min bei 25°C</li> </ul>
<b>p max... MPa (bar)</b>	Pression maximale - Maximum pressure - Maximaldruck MPa
	<ul style="list-style-type: none"> <li>- Fusible pour le groupe de refroidissement</li> <li>- Fuse for the liquid cooling system</li> <li>- Sicherung des Wasserkühlgerätes</li> </ul>
	<ul style="list-style-type: none"> <li>- Entrée du liquide de refroidissement</li> <li>- Coolant input</li> <li>- Wasservorlauf</li> </ul>
	<ul style="list-style-type: none"> <li>- Entrée du liquide de refroidissement pour la torche</li> <li>- Coolant input for torch</li> <li>- Brenner-Wasservorlauf</li> </ul>
	<ul style="list-style-type: none"> <li>- Sortie du liquide de refroidissement pour la torche</li> <li>- Coolant output for torch</li> <li>- Brenner-Wasserrücklauf</li> </ul>
	<ul style="list-style-type: none"> <li>- Produit faisant l'objet d'une collecte sélective- Ne pas jeter dans une poubelle domestique !</li> <li>- Separate collection required – Do not dispose of in domestic waste bins</li> <li>- Produkt für selektives Einsammeln. Werfen Sie diese Geräte nicht in die häusliche Mülltonne.</li> </ul>
	<ul style="list-style-type: none"> <li>- Information sur la température (protection thermique).</li> <li>- Temperature information (thermal protection).</li> <li>- Information zur Temperatur (Thermoschutz).</li> </ul>





# TIG 250 AC/DC

## CIRCUIT DIAGRAM

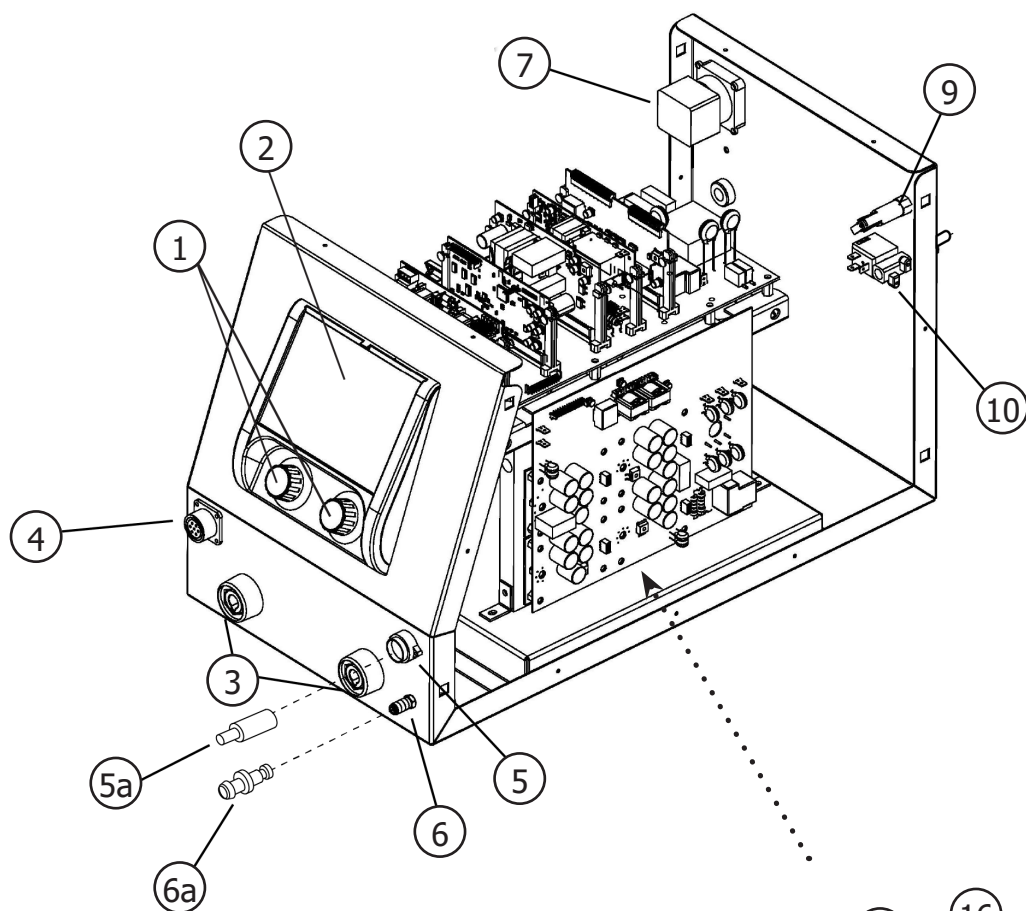
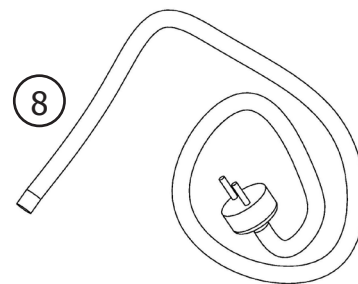






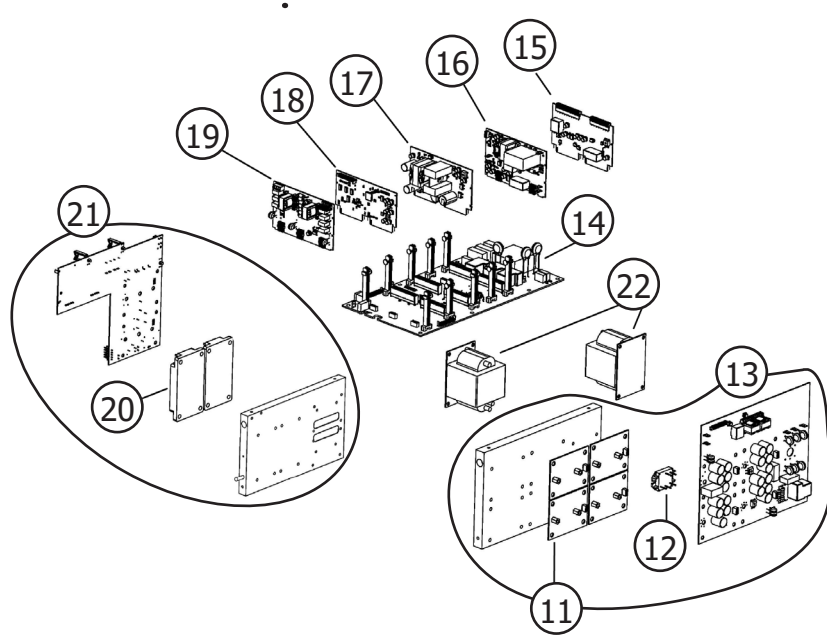
# TIG 250 AC/DC

## SPARE PARTS



II

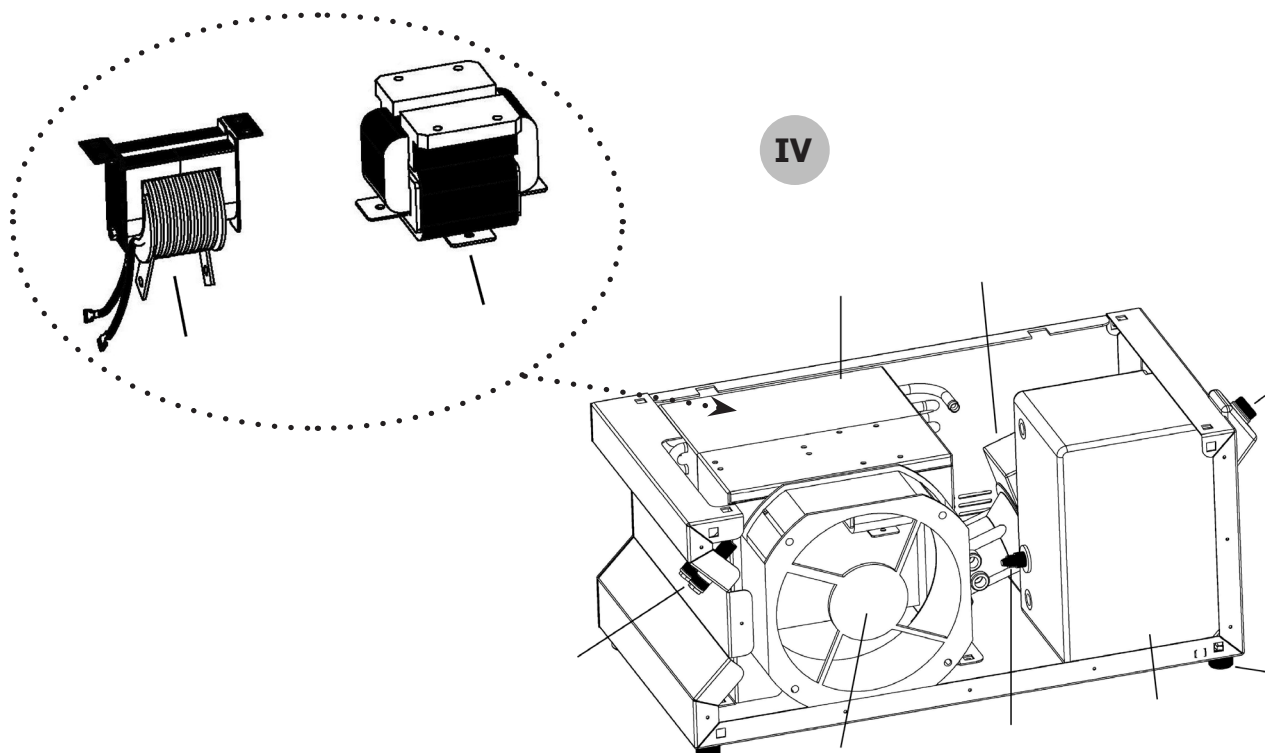
III







## TIG 250 AC/DC



N°	Désignation / Description / Beschreibung	Ref.
<b>I</b>		
1	capuchon noir / Black caps for potentiometer / Kappe f.Potentiometer-Knopf schwarz	73096
2	Bouton noir 31 mm / Black potentiometer 31mm / Potentiometer-Knopf schwarz 31 mm	73097
3	Support écran / Screen frame / Displayrahmen	56005
4	Vitre amovible de protection TFT / Thin film transistor LCD display / TFT-Display	56008
5	Carte IHM / Control circuit board / Display Platine	97096
<b>II</b>		
6	Douille femelle Texas 50 / Female texas connection 50 / Texasanschluss 50	51461
7	Faisceau connectique commande à distance / Remote control connection / Anschluss Fernregler	71508
8	Connecteur torche / Torch connection / Anschluß Brennertasterleitung	51120
9	Coupleur gaz BSP20 / BSP20 gas connection / BSP20 Schutzgasanschluss	55090
10	Commutateur 2P Tri / 2P Tri switch / Ein/Aus-Schalter	95570
11	Cordon secteur 3P + Terre 16mm <sup>2</sup> / Mains power lead 3ph with 16mm <sup>2</sup> earth connection / 16mm <sup>2</sup> Netzkabel 3P + Erde	21485
12	Porte fusible IP68 / IP68 fuse holder / IP68 Netzsicherungshalter	51441
13	Electrovanne 2 voies 24V / 24V double solenoid valve / 24 V Doppelmagnetventil	71542





## TIG 250 AC/DC

III		
14	Thermistance / Thermistor / Wärmetauscher	52099
15	Circuit SMI primaire / Primary IMS / primäres Leistungsteil	97260C
16	Pont de diode / Diode bridge / Diodenbrücke	64457
17	Circuit primaire / Primary circuit board / Primärplatine	97044C
18	Circuit principal / Main circuit board / Hauptplatine	97077C
19	Carte groupe froid / Liquid cooling system circuit board / Platine Wasserkühlgerät	97167C
20	Circuit HF / HF circuit board / HF Platine	97108C
21	Circuit alimentation auxiliaire / Auxiliary power supply circuit board / Platine Hilfsspannungsversorgung	97227C
22	Circuit microcontrôleur / Microcontroller circuit board / Platine Mikroprozessor	97076C
23	Circuit de commande à distance / Remote control circuit board / Platine Fernregelung	97206C
24	Circuit SMI secondaire / Secondary IMS / sekundäres Leistungsteil	97280C
25	Module IGBT / IGBT module / IGBT Modul	52202
26	Circuit secondaire / Secondary circuit board / Sekundärplatine	97097C
27	Transformateur de puissance / Power transformer / Leistungs- transformator	96069
IV		
28	Transformateur HF / HF transformer / HF Transformator	63700
29	Self DC / Self DC / Drossel	96048
30	Condenseur / Condenser / Kondensator	71753
31	Pompe 10L/min 400V 50/60 Hz / 10L/min 400V 50/60 Hz pump / Kühlmittelpumpe 10L/m 400V 50/60Hz	71744
32	Coupleur gaz BSP21 / BSP21 gas coupler / BSP21 Schutzgaskup- plung	71317
33	Ventilateur 400V 50/60 Hz / 400V 50/60 Hz fan / 400V 50/60Hz Ventilator	51003
34	Capteur de niveau d'eau / Water level sensor / Kühlmittelsensor	71766
35	Réservoir 5,5L / 5.5l tank / 5,5L Tank	71756
36	Bouchon du réservoir / Tank cap / Tankdeckel	71326
37	Pied butée Diam 20mm / rubber feet 20mm diameter / Gum- mifüße, Durchmesser 20mm	71140



**GYS**

1, rue de la Croix des Landes  
CS 54159  
53941 SAINT-BERTHEVIN Cedex  
France