

## operating instructions and spare parts

### GLW 322



Carl Cloos Schweisstechnik GmbH

Industriestrasse

35708 Haiger

Germany

Telefon (0 27 73) 85-0

Telefax (0 27 73) 85-275

E-Mail: [info@cloos.de](mailto:info@cloos.de)

Internet: <http://www.cloos.de>

RW - FP - Rev.0

Ausgabedatum 3. 02 2015

Keep for further use.

CARL CLOOS Schweißtechnik GmbH  
Industriestrasse  
35708 Haiger  
Tel.(+49) 2773/85-0  
Fax.(+49) 2773/85-275  
mail: info@cloos.de  
www.cloos.de



Document: QIGLW322

Month/Year: 01/14

**EC-Declaration of Conformity  
in accordance with EC Directives 2006/95/EG (low voltage) and 2004/108/EG (EMV)**

We herewith certify that the welding machine mentioned below has been developed, designed and manufactured in accordance with the EC Directives and brought on the market.

**Designation of the machine:** TIG welding machine  
**Type:** QINEO GLW 322  
**Serial number:** see type plate (on the rear of the machine)

**The following EC Directives have been applied:**

- EC Low voltage directives (2006/95/EG)
- EC Directives on Electromagnetic compatibility (2004/108/EG)
- EC Directives RoHS (2011/65/EU)

**The following harmonised standards have been applied:**

- EN 60974-1 Arc welding equipment  
Part 1: Welding power sources
- EN 60974-3 Arc welding equipment  
Teil 3: Arc striking and stabilizing devices
- EN 60974-10 Arc welding equipment  
Part 10: Electromagnetic compatibility (EMC) requirements

Any significant modifications or extensions on the machine which are not carried out by the above manufacturer or his authorised representative will invalidate this Declaration of Conformity.

Manufacturer's signature:  
Information on the signatory:



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Gerald Mies  
Managing Director



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## 1 INTRODUCTION



### IMPORTANT!

This handbook must be consigned to the user prior to installation and commissioning of the unit.  
Read the "General prescriptions for use" handbook supplied separately from this handbook before installing and commissioning the unit.  
The meaning of the symbols in this manual and the associated precautionary information are given in the "General prescriptions for use".  
If the "General prescriptions for use" are not present, it is mandatory to request a replacement copy from the manufacturer or from your dealer.  
Retain these documents for future consultation.

### KEY




#### DANGER!

This pictogram warns of danger of death or serious injury.




#### WARNING!

This pictogram warns of a risk of injury or damage to property.




#### CAUTION!


This pictogram warns of a potentially hazardous situation.



#### INFORMATION

This pictogram gives important information concerning the execution of the relevant operations.

 This symbol identifies an action that occurs automatically as a result of a previous action.

 This symbol identifies additional information or a reference to a different section of the manual containing the associated information.

§ This symbol identifies a reference to a chapter of the manual.

\*1 The symbol refers to the associated numbered note.

### NOTES

The figures in this manual are purely guideline and the images may contain differences with respect to the actual equipment to which they refer.

## INTRODUCTION

GLW 322 is an advanced technology three-phase welding power source for AC and DC TIG welding operations. Mild steel, stainless steel and copper can be easily welded in DC TIG. AC TIG functions are ideal for aluminum, magnesium and related alloys welding.

AC TIG welding is optimized thanks to:

- Synergic arc ignition selection located on the front panel, it modifies the ignition according to electrode diameter.
  - Extra fusion function maximizes arc focusing for considerable thin material in AC TIG welding.
  - Mixed AC/DC increases arc penetration for thick aluminum plates.
  - Pulsed AC TIG mode which prevents the risk of deformation of the workpiece in the case of prolonged welding operations.
- Up to 6,00 mm diameter electrode welding is possible in MMA.


**Fan.** The fan is turned on only during welding, at the end of the welding process it remains on for a fixed period of time according to welding conditions.

The fan is nonetheless controlled by specific thermal sensors that guarantee a correct cooling of the machine.

#### Accessories/ancillary devices that can be connected to the unit:

- UP/DOWN torch or torch with potentiometer to adjust the welding current from a distance.
- Manual remote controller for remote adjustment of the welding current.
- Foot-pedal remote controller for TIG torch arc striking and remote adjustment of welding current.

The maximum and minimum TIG welding current values can be set with the foot pedal controller.

 If both remote controllers are connected, the foot pedal assumes priority over the UP/DOWN or potentiometer TIG torch.

- Liquid cooler for TIG torches.
- Power source trolley.

Consult your dealer for an updated list of accessories and the latest available new products.

## 2 INSTALLATION

**DANGER!**  
**Lifting and positioning**

Read the warnings highlighted by the following symbols in the "General prescriptions for use".

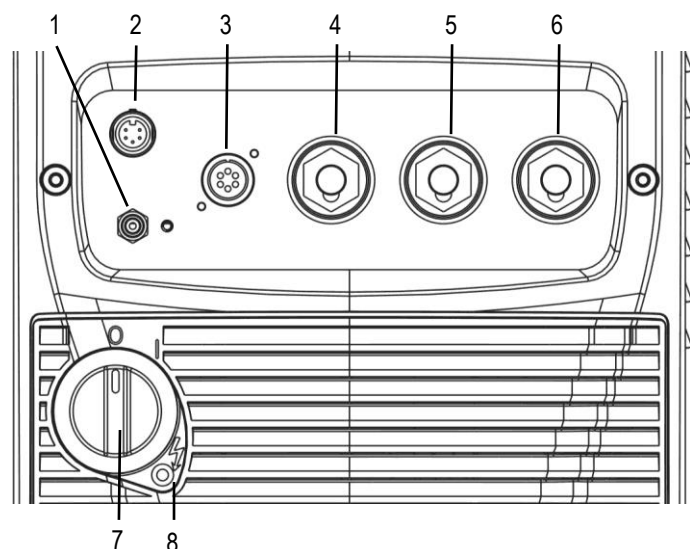
### 2.1 CONNECTIONS TO THE ELECTRICAL MAINS NETWORK

The characteristics of the mains power supply to which the equipment shall be connected are given in the section entitled "Technical data" on page 31.

The machine can be connected to motorgenerators provided their voltage is stabilised.

Connect/disconnect the various devices with the machine switched off.

### 2.2 FRONT PANEL

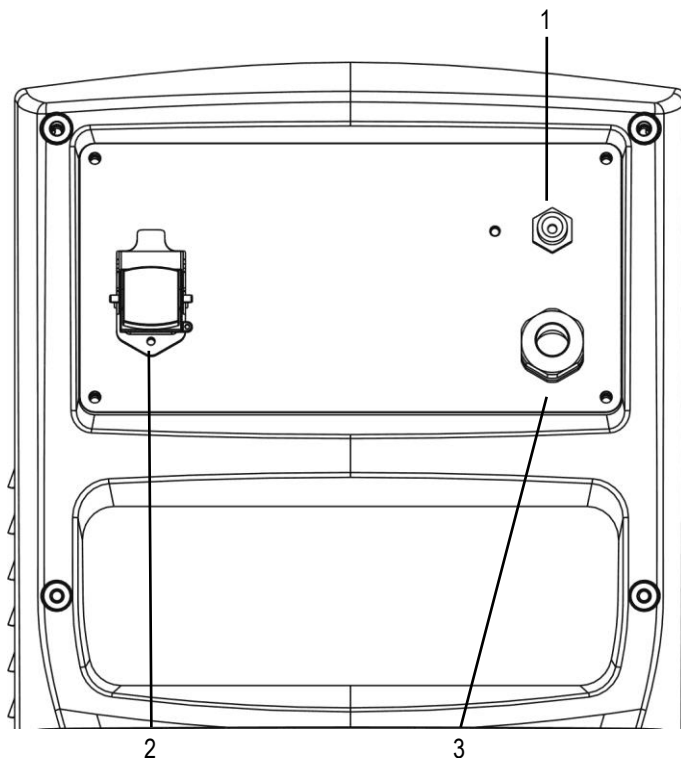


1. Connector for gas feed hose: power source → torch
2. Connector for logic signals of TIG torch.
3. Remote controller connector.
4. TIG TORCH welding socket.
5. Negative pole welding socket.
6. Positive pole welding socket.
7. Welding power source ON/OFF switch.
8. Mains protection ON LED.

This LED illuminates if an incorrect operating condition occurs:

- absence of a phase in the power supply line.

### 2.3 REAR PANEL



1. Connector for gas feed hose: cylinder → power source
2. Cooler power feeding connector.  
Voltage: 400 V a.c.  
ⓘ Current output: 1.0 A  
IP protection rating: IP20 (cap open) / IP66 (cap closed)
3. Power cable.  
Total length (including internal part): 5,0 m  
ⓘ Number and cross section of wires: 4 x 2,5 mm<sup>2</sup>  
Power plug type: not supplied

**DANGER!**  
**High voltage!**

If the socket is not connected to any devices always close the cap: presence of hazardous voltage levels!

3. Power cable.  
Total length (including internal part): 5,0 m  
ⓘ Number and cross section of wires: 4 x 2,5 mm<sup>2</sup>  
Power plug type: not supplied

## 2.4 PREPARING FOR MMA WELDING

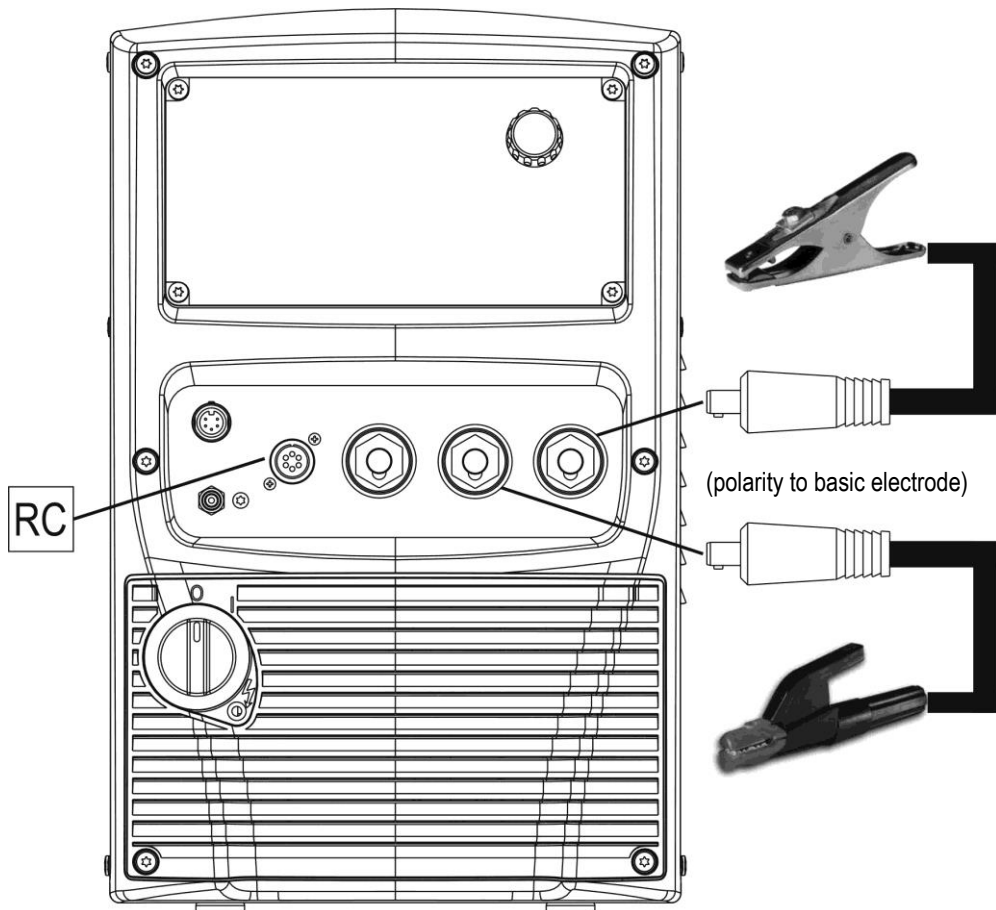
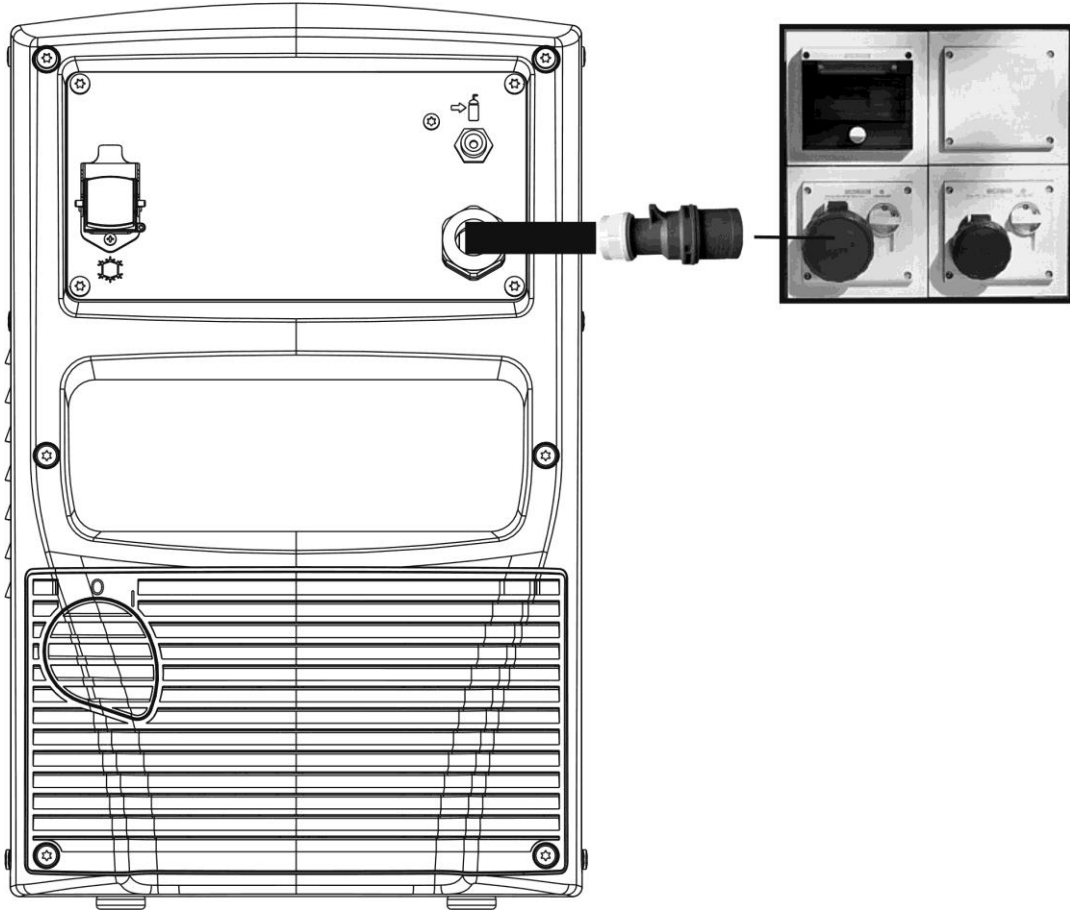
1. Set the welding power source ON/OFF switch to "O" (unit de-energized).
2. Plug the power cable plug into a mains socket outlet.
3. Choose the electrode based on the type of material and thickness of the workpiece to be welded.
4. Insert the electrode in the electrode holder.
5. Connect the electrode holder cable to the welding socket based on the polarity requested by the type of electrode used.
6. Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
7. Connect the earth clamp to the workpiece being processed.

**DANGER!**  
**Electric shock hazard!**

Read the warnings highlighted by the following symbols in the "General prescriptions for use".



8. Set the welding power source ON/OFF switch to "I" (unit powered).
9. Select the following welding mode on the user interface: MMA
10. Set the required welding parameter values on the user interface.  
When the remote controller [RC] is connected and the relative locking screw is tightened, welding current can be adjusted using the remote controller.  
The system is ready to start welding.

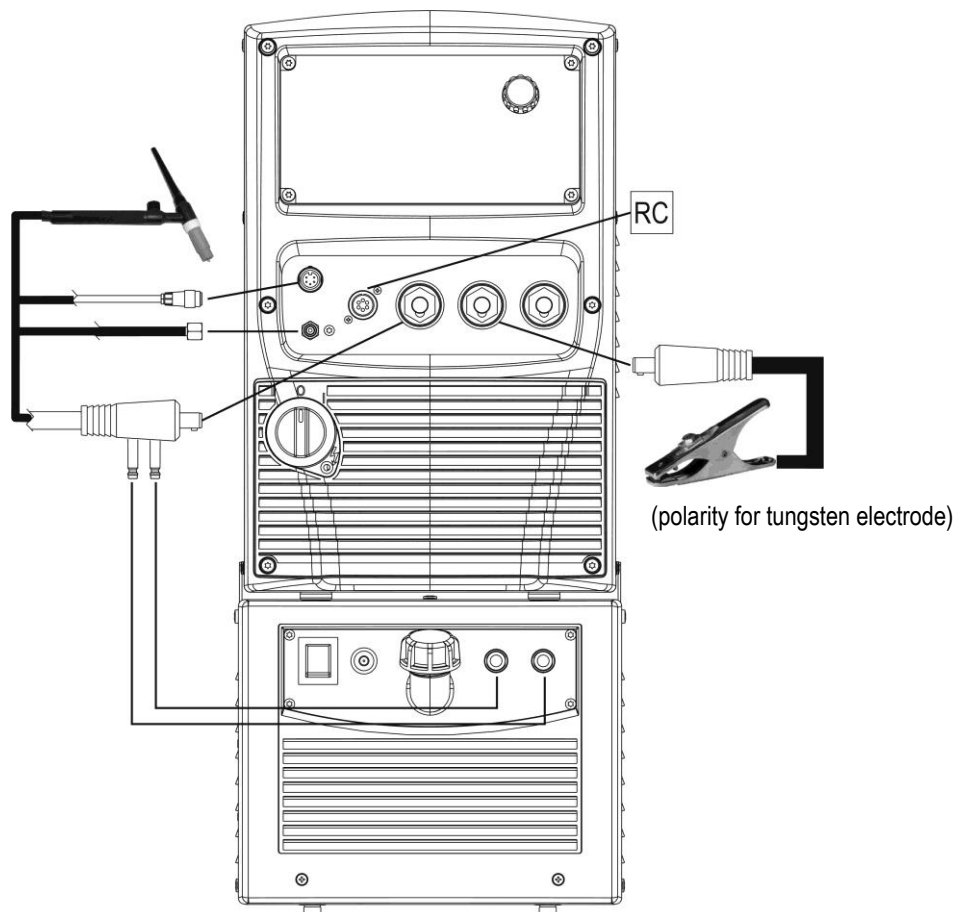
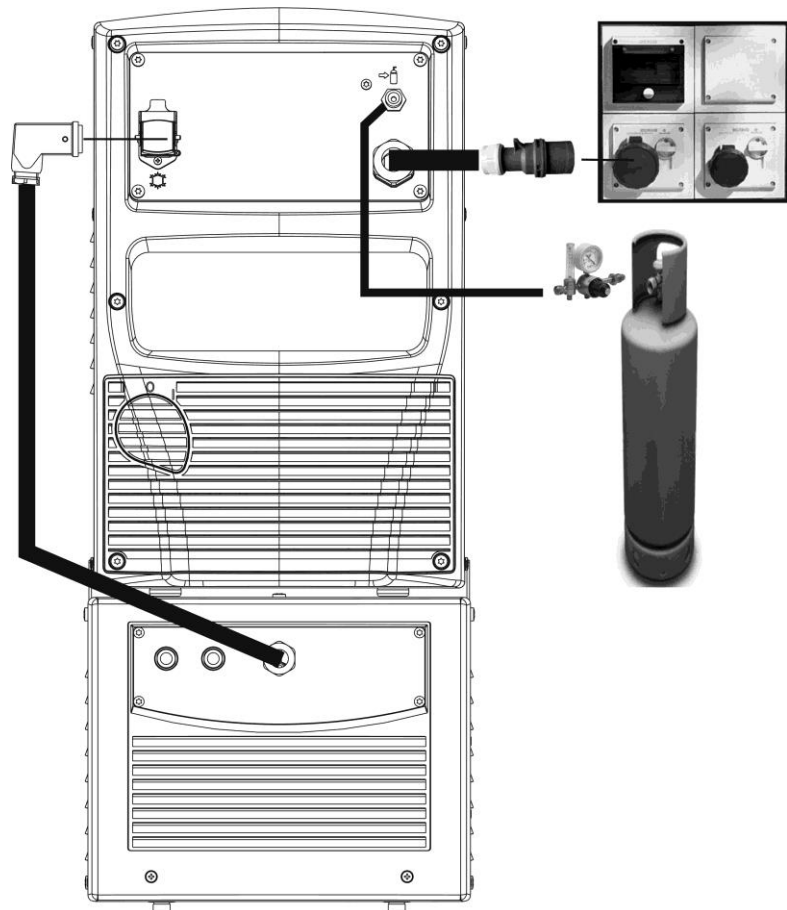




## 2.5 PREPARING FOR TIG WELDING

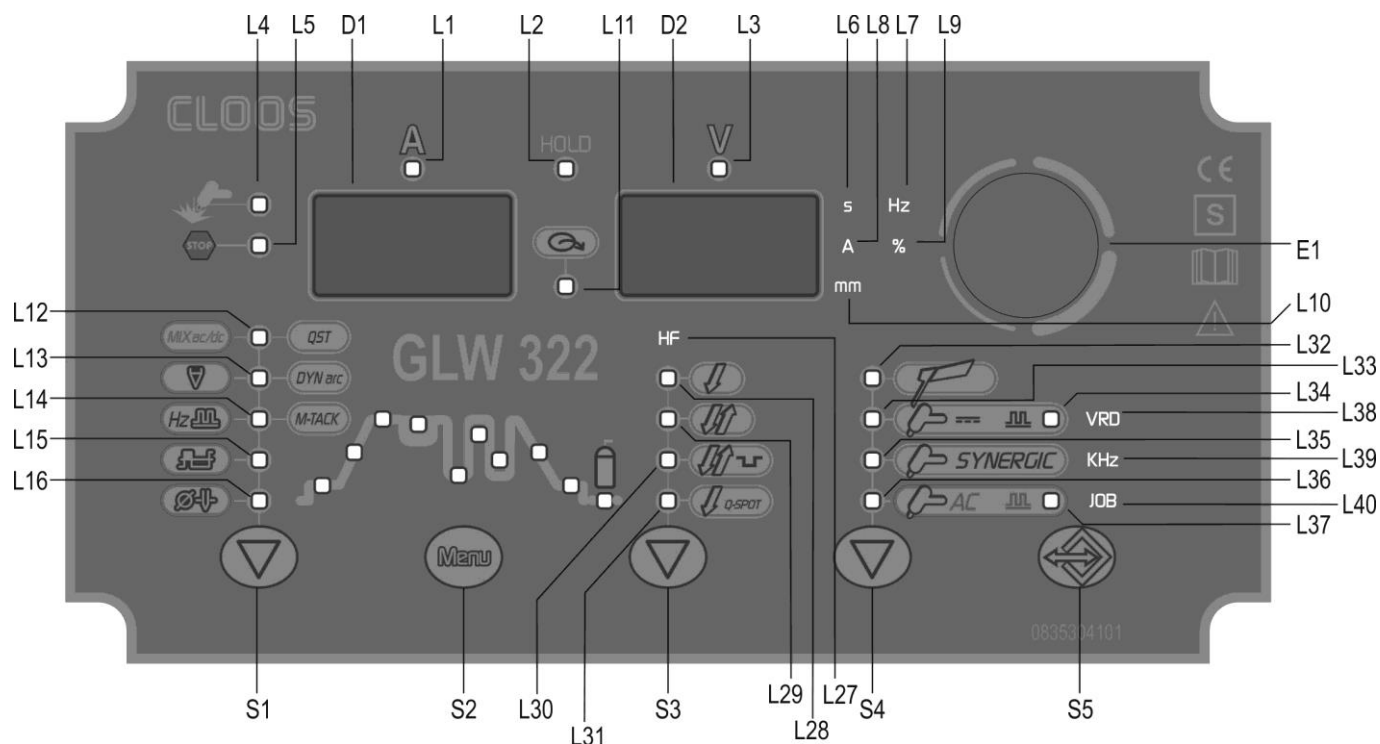
**i** NOTE: For the cooler to power source assembly procedure refer to the cooler instruction manual.

1. Set the welding power source ON/OFF switch to "O" (unit de-energized).
  2. Plug the power cable plug into a mains socket outlet.
  3. Connect the gas hose from the welding gas cylinder to the rear gas socket.
  4. Open the cylinder gas valve.
  5. Choose the electrode based on the type of material and thickness of the workpiece to be welded.
  6. Insert the electrode in the TIG torch.
  7. Connect the torch plug to the welding socket on the basis of the polarity required by the type of electrode in question.
  8. Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
  9. Connect the gas hose from the welding torch to the front gas socket.
  10. Couple the welding torch connector to the TIG torch signals connector.
  11. Connect the earth clamp to the workpiece being processed.
  12. Set the welding power source ON/OFF switch to "I" (unit powered).
  13. Select the following welding mode on the user interface: TIG DC / TIG AC
  14. Press the torch trigger with the torch well clear of any metal parts. This serves to open the gas solenoid valve without striking the welding arc.
  15. Use the flow control valve to adjust the flow of gas as required while the gas is flowing out.
  16. Set the required welding parameter values on the user interface.
- i** When the remote control pedal is connected and the relative locking screw is tightened the welding current will vary in relation to the pressure exerted on the pedal.
- The system is ready to start welding.
































## 3 COMMISSIONING

### 3.1 USER INTERFACE




CODE	SYMBOL	DESCRIPTION
L1	<b>A</b>	Illuminates to show a value in the following unit of measurement: AMPERES
L2	<b>HOLD</b>	Illuminates to show the last voltage and current values measured during welding. The value appears on the following displays: D1-D2 The LED switches off when a new welding procedure is started, or when any of the welding settings is modified.
L3	<b>V</b>	Illuminates to show a value in the following unit of measurement: VOLTS
L4		This LED illuminates to confirm the presence of power on the output sockets.
L5		This LED illuminates to show an anomaly in the operating conditions. ① See § 3.6 ALARMS MANAGEMENT page 16.
L6	<b>S</b>	Illuminates to show a value in the following unit of measurement: MILLISECONDS/SECONDS
L7	<b>Hz</b>	Illuminates to show a value in the following unit of measurement: HERTZ
L8	<b>A</b>	Illuminates to show a value in the following unit of measurement: AMPERES
L9	<b>%</b>	Illuminates to show a value in the following unit of measurement: PERCENTAGE
L10	<b>mm</b>	Illuminates to show a value in the following unit of measurement: MILLIMETRES
L11		This LED indicates that the current reference setting is imposed by the remote controller.
L12	<b>QST</b>	<b>DC TIG mode:</b> When this LED illuminates the following parameter can be set: Q-START
L13	<b>Mix AC</b>	<b>AC TIG mode:</b> When this LED illuminates the following parameter can be set: MIX AC
L13	<b>DYN arc</b>	<b>DC TIG mode:</b> When this LED illuminates the following parameter can be set: DYNAMIC ARC
L14		<b>AC TIG mode:</b> When this LED illuminates the following parameter can be set: FUSIONE EXTRA
L14	<b>M-TACK</b>	<b>DC TIG mode:</b> When this LED illuminates the following parameter can be set: MULTI TACK
L15	<b>Hz</b>	<b>AC TIG mode:</b> When this LED illuminates the following parameter can be set: AC FREQUENCY
L15		<b>AC TIG mode:</b> When this LED illuminates the following parameter can be set: AC TIG BALANCE
L16		<b>AC TIG mode:</b> When this LED illuminates the following parameter can be set: ELECTRODE DIAMETER
L17		When this LED illuminates the following parameter can be set: STARTING CURRENT
L18		When this LED illuminates the following parameter can be set: SLOPE UP

CODE	SYMBOL	DESCRIPTION
L19		When this LED illuminates the following parameter can be set: WELDING CURRENT
L20		When this LED illuminates the following parameter can be set: SECOND CURRENT B-LEVEL
L21		When this LED illuminates the following parameter can be set: BASE CURRENT
L22		When this LED illuminates the following parameter can be set: PEAK TIME
L22+L23		When this LED illuminates the following parameter can be set: PULSED CURRENT FREQUENCY
L23		When this LED illuminates the following parameter can be set: BASE TIME
L24		When this LED illuminates the following parameter can be set: DOWN SLOPE
L25		When this LED illuminates the following parameter can be set: FINAL CURRENT
L26		When this LED illuminates the following parameter can be set: POST-GAS
L27	<b>HF</b>	Illumination shows that the following function has been activated: HIGH FREQUENCY ARC STRIKE (HF)
L28		Illumination shows that the following function has been activated: 2 stroke procedure.
L29		Illumination shows that the following function has been activated: 4 stroke procedure.
L30		Illumination shows that the following function has been activated: 4 stroke B-level procedure + high frequency arc strike (HF).
L31		Illumination shows that the following function has been activated: 2 stroke spot procedure.
L32		This LED illuminates to show that the following welding mode is selected: MMA
L33		This LED illuminates to show that the following welding mode is selected: TIG DC CONTINUOUS
L34		This LED illuminates to show that the following welding mode is selected: PULSED DC TIG
L35		This LED illuminates to show that the following welding mode is selected: SYNERGIC PULSED DC TIG When this is on, it means that the synergic mode is active and that the operator can set just the welding current while the other parameters are automatically regulated by the machine. The synergy is optimised by angle welding.
L36		This LED illuminates to show that the following welding mode is selected: TIG AC CONTINUOUS
L37		This LED illuminates to show that the following welding mode is selected: PULSED AC TIG
L38	<b>VRD</b>	<b>MMA mode:</b> Illumination shows that the following function has been activated: VRD (reduced output voltage). The no-load voltage between the welding sockets is switched from $U_0$ to $U_r$ (see technical data).
L39	<b>KHz</b>	<b>PULSED TIG DC mode:</b> Illuminates to show a value in the following unit of measurement: KILOHERTZ
L40	<b>JOB</b>	Illuminates to show that a previously saved JOB has been loaded.

CODE SYMBOL	DESCRIPTION
D1	 <b>Data setting:</b> The display shows the selected parameter.
	 <b>Welding:</b> The display shows the effective amperes value during welding. <b>HOLD function:</b> The display shows the average current value measured over the entire welding period (excluding the starting and ending ramps).
D2	 <b>Data setting:</b> The display shows the value of the selected parameter.
	 <b>Welding:</b> The display shows the effective voltage during welding operations. <b>HOLD function:</b> The display shows the average voltage value measured over the entire welding period (excluding the starting and ending ramps).
S1	 <b>DC TIG mode:</b> Press the button to select the parameter to be set. Possible choices: Q-START - DYNAMIC ARC - MULTI TACK
	 <b>AC TIG mode:</b> Press the button to select the parameter to be set. Possible choices: MIX AC - EXTRA FUSION - AC FREQUENCY - AC BALANCE - ELECTRODE DIAMETER
S2	 <b>Press and release:</b> the button selects the first level menu parameters.
	 <b>Hold down for 3 seconds:</b> the button opens the second level menu. When in the menu press and release the button to select the parameters. <b>Keep the button pressed while powering on the power source:</b> the button opens the SETUP menu.
S3	 This button selects the torch trigger procedure.  See § 4.1 page 17.
S4	 This button selects the welding mode.
S5	 <b>Press and release:</b> the button opens the JOBS upload menu.
	 <b>Hold down for 3 seconds:</b> the button opens the JOBS save and delete menu.
E1	 <b>Data setting:</b> The encoder sets the value of the selected parameter.
	 <b>Welding:</b> The encoder sets the value of the following parameter: WELDING CURRENT

## 3.2 UNIT POWER-UP

Set the welding power source ON/OFF switch to "1" to switch on the unit.

-  **AL. HEA.** The message appears on the following displays: D1-D2  
 x.x= software version

### First power-up or power-ups following a RESET procedure

The welding power source sets up for welding with the factory presets.

### Subsequent power-ups

The welding power source sets up for welding in the latest stable welding configuration that was active at the time of power-off.

## 3.3 RESET (LOAD FACTORY SETTINGS)

The reset procedure involves complete restoration of the default values, parameters and memory settings set in the factory.

The reset procedure is useful in the following cases:

- Too many changes made to the welding parameters so user finds it difficult to restore defaults.
- Unidentified software problems that prevent the welding power source from functioning correctly.

### 3.3.1 PARTIAL RESET

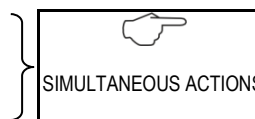
The reset procedure involves restoration of the parameter values and settings, except the following settings:

- Settings of the SETUP menu.
- saved JOBS.

Set the welding power source ON/OFF switch to "0" to switch the unit off.



- S1  S5  Hold down both buttons simultaneously.

Set the welding power source ON/OFF switch to "1" to switch on the unit.





-  **REC PAR** The message appears on the following displays: D1-D2

#### Exit without confirmation

-  Press any button (except S5).
-  This action will automatically close the menu.

#### Exit with confirmation



- S5  Press the button.  
 Wait for the memory clear procedure to terminate.
-  This action will automatically close the menu.

### 3.3.2 TOTAL RESET

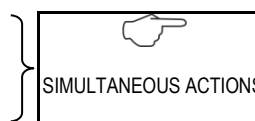
The reset procedure involves complete restoration of the default values, parameters and memory settings set in the factory.

All memory locations will be reset and hence all your personal welding settings will be lost!


Set the welding power source ON/OFF switch to "0" to switch the unit off.

- S1  S5  Hold down both buttons simultaneously.



Set the welding power source ON/OFF switch to "1" to switch on the unit.





-  **REC PAR** The message appears on the following displays: D1-D2

- E1  Select the following setting with the encoder: **REC FAC**

#### Exit without confirmation

-  Press any button (except S5).
-  This action will automatically close the menu.

#### Exit with confirmation

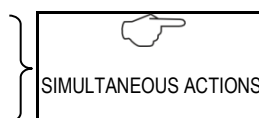
- S5  Press the button.  
 Wait for the memory clear procedure to terminate.
-  This action will automatically close the menu.


## 3.4 SET-UP (INITIAL SET-UP OF THE WELDING POWER SOURCE)


Set the welding power source ON/OFF switch to "O" to switch the unit off.


S2  Press the button.


Set the welding power source ON/OFF switch to "I" to switch on the unit.




 **SEt UP** The message appears for a few seconds on the following displays: D1-D2


 The acronym relative to the setting to be edited appears on the following displays: D1


 The value relative to the selected setting appears on the following displays: D2

S2  Use this button to scroll the settings to edit.

E1  Using the encoder, edit the value of the selected setting.

### Exit with confirmation

 Press any button (except S2).

 This action will automatically close the menu.

**Tab. 1 - Setup settings**

ACRONYM	SETTING	MIN	DEFAULT	MAX
Coo	COOLER ACTIVATION	oFF	Aut	on
St.C.	STARTING CURRENT	%	A	A
F.Cu.	FINAL CURRENT	%	A	A
HF.C.	HF CURRENT	20 A	SYn	320 A
PUL.	TYPE OF PULSED CURRENT	SLo.	SLo.	FA.
P.A.	PILOT ARC	oFF	oFF	on

### COOLER ACTIVATION

**ON=** The cooler is always running when the power source is switched on. This mode is preferable for heavy duty and automatic welding procedures.

**OFF=** The cooler is always disabled because an air-cooled torch is in use.

**AUT=** When the unit is switched on the cooler is switched on for 15 s. During welding procedures the cooler runs constantly. When welding is terminated the cooler continues to run for 90 s + a number of seconds equivalent to the average current value shown using the HOLD function.

### STARTING CURRENT

The value of this parameter can be set as a percentage of the welding current or as an absolute value expressed in Amperes.

### FINAL CURRENT

The value of this parameter can be set as a percentage of the welding current or as an absolute value expressed in Amperes.

### HF CURRENT

This parameter establishes the current value during HF discharge. The value of this parameter can be set as an absolute value or in SYN.

With SYN setting the HF current value is calculated automatically on the basis of the preset welding current value.

Consequences of a higher value:

- Arc striking is facilitated, even on very dirty workpieces.
- Risk of piercing excessively thin gauge workpieces.

### TYPE OF PULSED CURRENT

**SLo.=** This setting enables slow pulsed mode.

**FA.=** This setting enables fast pulsed mode.

### PILOT ARC

The function enables the output of a low current between the 1st and 2nd times of the torch trigger to shield the mask in advance and avoid the risk of blinding flashback caused by the welding current.

### 3.5 TORCH LOADING



#### WARNING!

Make sure the torch in use is correctly sized in relation to the welding current required and for the available and selected cooling type. This prevents the risk of burns to which the operator is potentially exposed, potential faults, and irreversible damage to the torch and the system. If a torch is installed or replaced while the unit is running, the circuit of the newly installed must be filled with coolant to avoid the risk of damage to the torch in the case of high voltage arc strikes without any liquid in the circuit.

#### Power-up with operation of the cooler set to "ON" or "AUT" mode

A check is performed automatically of the presence of liquid in the cooling circuit and the cooler is switched on for 15 seconds. If the coolant circuit is full, the power source sets up in the most recent stable welding configuration. If the coolant circuit is not full, all functions are inhibited and there will be no output power present.

- ➡ **AL. Coo.** The message appears on the following displays: D1-D2
- (any) ⏴ Press the button or torch trigger to repeat the checking procedure for an additional 15 seconds. If the problem persists rectify the cause of the alarm.

#### Power-up with operation of the cooler set to "OFF"

Operation of the cooler and the cooler alarm are disabled. Welding is performed without liquid cooling of the torch.

#### Torch change-over with operation of the cooler set to "ON"


Press and release the torch trigger.

- ➡ This serves to start the cooler for 15 seconds to fill the torch cooling circuit.



## 3.6 ALARMS MANAGEMENT

 This LED illuminates if an incorrect operating condition occurs.

 An alarm message appears on the following displays: D1-D2

**Tab. 2 - Alarm messages**

MESSAGE	MEANING	EVENT	CHECKS
AL. HEA.	<p><b>Overheating alarm</b> Indicates tripping of the welding power source thermal protection. Leave the unit running so that the overheated components cool as rapidly as possible. When the unit has cooled, the welding power source will reset automatically.</p>	<p>All functions disabled. Exceptions: - Cooling fan. - Cooler (if switched on).</p>	<ul style="list-style-type: none"> <li>- Make sure that the power required by the welding process is lower than the maximum rated power output.</li> <li>- Check that the operating conditions are in compliance with the welding power source data plate specifications.</li> <li>- Check for the presence of adequate air circulation around the welding power source.</li> </ul>
AL. Co.	<p><b>Cooler alarm</b> Indicates insufficient pressure in the torch liquid cooling circuit.</p>	<p>All functions disabled. Exceptions: - Cooling fan. The alarm message persists on the display until the first operation is performed on the user interface. Signalling of the alarm depends on the following settings: - Coo = on: the alarm is signalled if the cooling unit is connected to the power source and if it is running. - Coo = oFF: the alarm is never signalled, irrespective of the circumstances. - Coo = Aut: the alarm is signalled if the cooling unit is connected to the power source and if it is running.</p>	<ul style="list-style-type: none"> <li>- Check that the connection to the cooler is correct.</li> <li>- Check that the "O/I" switch is set to "I" and that it illuminates when the pump is running.</li> <li>- Check that the cooler is filled with coolant.</li> <li>- Check that the cooling circuit is liquid tight, notably the torch hoses and the internal connections of the cooler.</li> </ul>

## 4 WELDING SETTINGS

### 4.1 TORCH TRIGGER PROCEDURE

#### 2 STROKE LIFT-ARC WELDING (2T)

1. Touch the workpiece with the torch electrode.
2. Press (1T) and keep the torch trigger pressed.
3. Slowly lift the torch to strike the arc.
- ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
4. Release (2T) the trigger to start the weld completion procedure.
- ➡ The current reaches the end current value in the time set in the down slope time parameter.
- ➡ The arc is extinguished.
- ➡ Gas delivery continues for the time set in the post gas parameter.

#### 2 STROKE WELDING WITH HIGH FREQUENCY ARC STRIKE (2T HF)

1. Bring the torch up to the work until the electrode tip is approximately 2 or 3 mm away.
2. Press (1T) and keep the torch trigger pressed.
- ➡ The arc strikes without contact with the workpiece and the voltage discharges (HF) cease automatically.
- ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
3. Release (2T) the trigger to start the weld completion procedure.
- ➡ The current reaches the end current value in the time set in the down slope time parameter.
- ➡ The arc is extinguished.
- ➡ Gas delivery continues for the time set in the post gas parameter.

#### 4 STROKE LIFT-ARC WELDING (4T)

1. Touch the workpiece with the torch electrode.
2. Press (1T) and release (2T) the torch trigger.
3. Slowly lift the torch to strike the arc.
- ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
4. Press (3T) the trigger and keep it pressed to start the weld completion procedure.
- ➡ The current reaches the end current value in the time set in the down slope time parameter.
- ➡ The arc continues and the current output will be the value set in the end current parameter.
- ⓘ In these conditions the weld pool can be closed (crater filler current).
5. Release (4T) the trigger to extinguish the arc.
- ➡ Gas delivery continues for the time set in the post gas parameter.

#### 4 STROKE WELDING WITH HIGH FREQUENCY ARC STRIKE (4T HF)

1. Bring the torch up to the work until the electrode tip is approximately 2 or 3 mm away.
2. Press (1T) and release (2T) the torch trigger.
- ➡ The arc strikes without contact with the workpiece and the voltage discharges (HF) cease automatically.
- ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
3. Press (3T) the trigger and keep it pressed to start the weld completion procedure.
- ➡ The current reaches the end current value in the time set in the down slope time parameter.
- ➡ The arc continues and the current output will be the value set in the end current parameter.
- ⓘ In these conditions the weld pool can be closed (crater filler current).
4. Release (4T) the trigger to extinguish the arc.
- ➡ Gas delivery continues for the time set in the post gas parameter.

#### 4 STROKE B-LEVEL WELDING (4T B-L)

1. Touch the workpiece with the torch electrode.
2. Press (1T) and release (2T) the torch trigger.
3. Slowly lift the torch to strike the arc.
- ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
3. Press and immediately release the torch trigger to switch to the second welding current.
- ⓘ The trigger must not be pressed for more than 0.3 seconds; otherwise, the weld completion stage will start.
- ⓘ When the trigger is pressed and released immediately, the system returns to the welding current.
4. Press (3T) the trigger and keep it pressed to start the weld completion procedure.
- ➡ The current reaches the end current value in the time set in the down slope time parameter.
- ➡ The arc continues and the current output will be the value set in the end current parameter.
- ⓘ In these conditions the weld pool can be closed (crater filler current).
5. Release (4T) the trigger to extinguish the arc.
- ➡ Gas delivery continues for the time set in the post gas parameter.

## 4 STROKE B-LEVEL WELDING WITH HIGH FREQUENCY ARC STRIKE (4T B-L HF)

1. Bring the torch up to the work until the electrode tip is approximately 2 or 3 mm away.
2. Press (1T) and release (2T) the torch trigger.
  - ➡ The arc strikes without contact with the workpiece and the voltage discharges (HF) cease automatically.
  - ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
3. Press and immediately release the torch trigger to switch to the second welding current.
  - ⓘ The trigger must not be pressed for more than 0.3 seconds; otherwise, the weld completion stage will start.
  - ⓘ When the trigger is pressed and released immediately, the system returns to the welding current.
4. Press (3T) the trigger and keep it pressed to start the weld completion procedure.
  - ➡ The current reaches the end current value in the time set in the down slope time parameter.
  - ➡ The arc continues and the current output will be the value set in the end current parameter.
  - ⓘ In these conditions the weld pool can be closed (crater filler current).
5. Release (4T) the trigger to extinguish the arc.
  - ➡ Gas delivery continues for the time set in the post gas parameter.

## 2 STROKE TACKING WELDING (2T SPOT)

1. Touch the workpiece with the torch electrode.
2. Press (1T) and keep the torch trigger pressed.
3. Slowly lift the torch to strike the arc.
4. Release (2T) the torch trigger.
  - ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
  - ➡ The welding procedure continues, at the preset current, for the time set with the spot time parameter.
  - ➡ The current reaches the end current value in the time set in the down slope time parameter.
  - ➡ The arc is extinguished.
  - ➡ Gas delivery continues for the time set in the post gas parameter.

## 2 STROKE TACKING WELDING WITH HIGH FREQUENCY ARC STRIKE (2T SPOT HF)

1. Bring the torch up to the work until the electrode tip is approximately 2 or 3 mm away.
2. Press (1T) the torch trigger.
  - ➡ The arc strikes without contact with the workpiece and the voltage discharges (HF) cease automatically.
3. Release (2T) the torch trigger.
  - ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
  - ➡ The welding procedure continues, at the preset current, for the time set with the spot time parameter.
  - ➡ The current reaches the end current value in the time set in the down slope time parameter.
  - ➡ The arc is extinguished.
  - ➡ Gas delivery continues for the time set in the post gas parameter.

## Keep pressed torch trigger procedure

1. Bring the torch up to the work until the electrode tip is approximately 2 or 3 mm away.
2. Press (1T) the torch trigger.
  - ➡ The arc strikes without contact with the workpiece and the voltage discharges (HF) cease automatically.
  - ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.
  - ➡ The welding procedure continues, at the preset current, for the time set with the spot time parameter.
  - ➡ The current reaches the end current value in the time set in the down slope time parameter.
  - ➡ The arc is extinguished.
  - ➡ Gas delivery continues for the time set in the post gas parameter.
3. Touch the workpiece with the torch electrode.
4. Slowly lift the torch to strike the arc.

---

**PILOT ARC WELDING**

The pilot arc can be activated in the following torch trigger procedures:

- 4T WELDING
- 4T HF WELDING
- 4T B-L HF WELDING

The welding procedure with pilot arc differs with respect to the procedure without pilot arc in the part of the torch trigger procedure described below.

**LIFT-ARC Welding**

1. Touch the workpiece with the torch electrode.
2. Press (1T) and keep the torch trigger pressed.
3. Slowly lift the torch to strike the arc.
- ➡ The arc strikes, the welding current assumes the pilot current value.
4. Release (2T) the torch trigger.
- ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.  
etc.

**Welding with HF**

1. Press (1T) and keep the torch trigger pressed.
- ➡ The arc strikes without contact with the part and the voltage discharges (HF) cease automatically, the welding current will assume the pilot current value.
2. Release (2T) the torch trigger.
- ➡ The welding current reaches the preset value, by way of a up slope time, if programmed.  
etc.

## 4.2 SELECTION OF THE WELDING MODE AND TORCH TRIGGER PROCEDURE


Specific torch trigger procedures are available in accordance with the selecting welding mode.


The availability of certain procedures depends on whether or not certain parameters or functions of the unit are enabled or set in the associated menus.











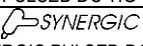

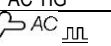
The table shows the settings to be made to enable each procedure.

### KEY

- 2T: 2 STROKE LIFT-ARC
- 2T HF: 2 STROKE WITH HIGH FREQUENCY ARC STRIKE (HF)
- 4T: 4 STROKE LIFT-ARC
- 4T HF: 4 STROKE WITH HIGH FREQUENCY ARC STRIKE (HF)
- 4T B-L: 4 STROKE B-LEVEL
- 4T B-L HF: 4 STROKE B-LEVEL WITH HIGH FREQUENCY ARC STRIKE (HF)
- 2T SPOT: 2 STROKE TACKING
- 2T SPOT HF: 2 STROKE TACKING WITH HIGH FREQUENCY ARC STRIKE (HF)
- ✓: Always available.
- 1: Available with the following setting: HF ARC START = ON

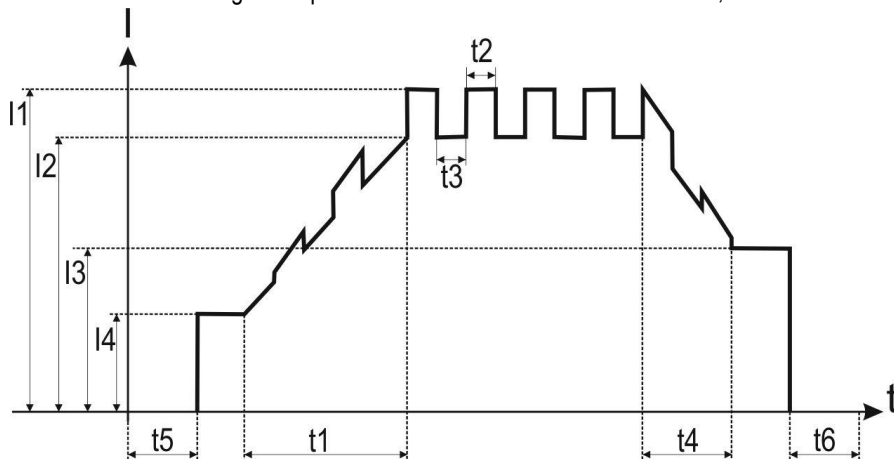
S4  Use this button to select one of the following welding modes.

S3  Use this button to select one of the following torch trigger procedures.

MODE	PROCEDURE							
								
MMA								
 TIG DC CONTINUOUS	✓	1	✓	1	✓	1	✓	1
 PULSED DC TIG	✓	1	✓	1	✓	1	✓	1
 SYNERGIC PULSED DC TIG	✓	1	✓	1	✓	1	✓	1
 AC TIG	✓	1	✓	1	✓	1	✓	1
 PULSED AC TIG	✓	1	✓	1	✓	1	✓	1

### 4.3 WELDING PARAMETERS

For a better understanding of the parameter functions described in the table, refer to the following diagram.



- (I1) WELDING CURRENT
- (I2) BASE CURRENT
- (I3) FINAL CURRENT
- (I4) STARTING CURRENT
- (t1) UP SLOPE TIME
- (t2) PEAK TIME
- (t3) BASE TIME
- (1/t2+t3) PULSED CURRENT FREQUENCY
- (t4) DOWN SLOPE TIME
- (t5) PRE GAS TIME
- (t6) POST GAS TIME

#### WELDING CURRENT

Output current value during welding.

- This parameter allows a shielded environment to be created, thereby eliminating contaminants at the start of the welding pass.

#### MAXIMUM CURRENT WITH REMOTE CONTROLLER

Maximum output current value that can be achieved with remote controller external reference.

#### STARTING CURRENT

Unit current output value immediately after the arc strike. The usefulness of having an adjustable initial welding current is that of avoiding welding the part with excessively high current values and thus potentially damaging it.

#### HOT-START

This parameter aids electrode melting at the time of arc striking.

Consequences of a higher value:

- Easier arc strike.
- Increased spatter at welding start.
- Increase of strike area.

Consequences of a lower value:

- More difficult arc strike.
- Less spatter at welding start.
- Smaller strike area.

#### SLOPE UP

Time during which the current changes from the starting value to the welding value by means of a slope.

This setting is used to avoid damaging the edges of the joint with excessively high current values at the moment of arc striking. The value of the main welding current is increased gradually in order to control the uniformity of material deposition and weld penetration.

#### ARC FORCE

This parameter helps to avoid electrode sticking during welding. During electrode fusion low conductivity parts of the coating become detached and tend to become interposed between the electrode tip as it is fusing and the workpiece. This condition results in an interruption of the arc. In addition, it may occur that the electrode comes into contact with the workpiece creating a short circuit and consequent quenching of the arc. To avoid arc quenching the power source therefore delivers instantaneous peak currents in correspondence with preset arc voltage thresholds.

Consequences of a higher value:

- Fluidity during welding.
- Welding arc stability.
- Greater electrode fusion in workpiece.
- More welding spatter.

Consequences of a lower value:

- The arc is extinguished more easily.
- Less welding spatter.

#### SECOND CURRENT B-LEVEL

With a rapid press and release (less than 0.5 seconds) of the torch trigger during welding, the output current value switches to the value set by means of the "B-level second current" parameter.

This function makes it possible to avoid interrupting the welding process when the geometry of the workpiece changes; alternatively, the welding current can be reduced to decrease heating of the part if it becomes too hot during execution of the welding process.

In DC TIG welding, the parameter is useful when welding different gauge workpieces during the same pass; when moving between different gauges the output current can be changed simply by pressing the torch trigger.

#### BASE CURRENT

Pulsed wave minimum current.

Consequences of a higher value:

- Faster creation of weld pool.
- Increase of heat-affected zone.

#### PRE-GAS TIME

Time of gas delivery before the arc strike.

This adjustment is required when fixing points must be created or when welding in hard-to-reach positions that call for the presence of inert atmospheres before striking the arc.

Consequences of a higher value:

## PEAK TIME

Time for which the current pulse is at the maximum value.

Consequences of a higher value:

- Greater weld penetration.
- Facility to make deeper cuts.

Consequences of a lower value:

- Reduction of heat-affected zone.
- Difficult to create a weld pool.

## PULSED CURRENT FREQUENCY

Consequences of a higher value:

- Slower melt speed.
- Reduction of heat-affected zone.

## BASE TIME

Time during which current output is at the base value.

Consequences of a higher value:

- The filler material is spread more evenly.
- Increase of heat-affected zone.

## DOWN SLOPE

Time during which the current changes from the welding value to the end value by means of a slope.

## FINAL CURRENT

During electrode welding the parameter makes it possible to obtain a uniform deposit of filler material from the start to the end of the welding process, closing the deposition crater with a current such as to deposit a final droplet of filler material.

By keeping the torch trigger pressed during the 3rd time, the crater filler current is maintained thereby ensuring optimal crater filling, until the post gas time is started by releasing the torch trigger (4th time).

## POST GAS TIME

Time of post gas delivery when the welding arc is extinguished.

Consequences of a higher value:

- More effective pickling (improved appearance of workpiece at the end of the welding pass).
- Higher gas consumption.

Consequences of a lower value:

- Lower gas consumption.
- Oxidation of electrode tip (more difficult arc strike).

## VRD

This parameter reduces the potential across the welding sockets when welding is not in progress.

The arc strike procedure is as follows:

- Touch the workpiece with the electrode tip.
- Raise the electrode.
- Power is released for several seconds.
- Touch the workpiece with the electrode tip.
- The welding arc will strike.

## LONG ARC VOLTAGE

This parameter inhibits power output when the potential between electrode and workpiece exceeds the preset threshold level.

Consequences of a higher value:

- The welding arc persists even with a significant distance between the electrode and the workpiece.

Consequences of a lower value:

- Faster exit from weld.

## REMOTE CONTROL ACTIVATION

This parameter enables the unit to receive the current reference signal from a remote control.

## SPOT TIG TIME

When the torch trigger is pressed the welding arc persists for the time set in the parameter.

Press the torch trigger again to resume the welding process.

The result of this is a very precise, not oxidized welding spot without any plastic deformation of the sheet.

## HF ARC START

This parameter enables the arc strike in the TIG welding procedure by means of a high frequency (HF) current discharge.

The high frequency arc strike (HF) prevents the inclusion of impurities at the start of the weld pass.

WARNING: The high frequency arc strike (HF) can harm electronic boards when welding is performed on equipment that incorporates such devices.

## MINIMUM PEDAL CURRENT

Minimum output current value with foot pedal controller external reference.

The current is set as a percentage with respect to the "maximum foot pedal current" parameter.

## AC WAVEFORM

This parameter allows selection of the required AC waveform.

AC WAVEFORM	CHARACTERISTICS
Sine	Low noise
Square	High noise Greater penetration Reduced pickling
Sawtooth	Medium noise

## Q-START

This parameter allows the unit to start in synergic pulsed TIG mode for the preset time interval, before switching automatically to the welding procedure selected on the interface panel.

The parameter creates a weld pool faster with respect to the standard starting procedure.

This parameter is useful when spot welding thin gauge sheet.

## DYNAMIC ARC

Welding power remains constant even when the distance between electrode and workpiece changes.

Consequences of a higher value:

- The welding arc concentration remains unchanged.
- Prevents electrode sticking.
- Thin workpieces may become deformed more easily.

## MULTI TACK

This parameter allows thin gauge sheet to be welded without deformation.

Consequences of a higher value:

- Welding of thinner gauge sheet without deformation.
- Less melting of material, slower welding process.

**MIX AC**

This parameter serves to set the AC wave percentage with respect to the DC current output.

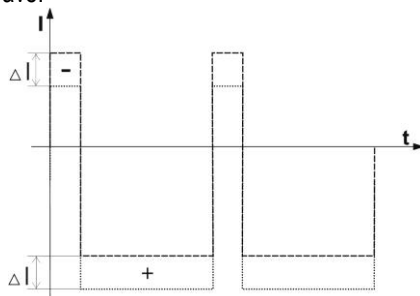
Consequences of a higher value:

- Greater weld penetration.
- Less deformation.
- Faster creation of the weld pool.
- Reduced cleanliness of the workpiece.
- Loss of arc.

**FUSIONE EXTRA**

This parameter establishes the percentage of the positive current wave (pickling) that is subtracted and added to the negative current (fusion).

The following picture shows the positive wave interval  $\Delta I$  that, if subtracted and added to the negative wave, forms the new form of broken line wave.

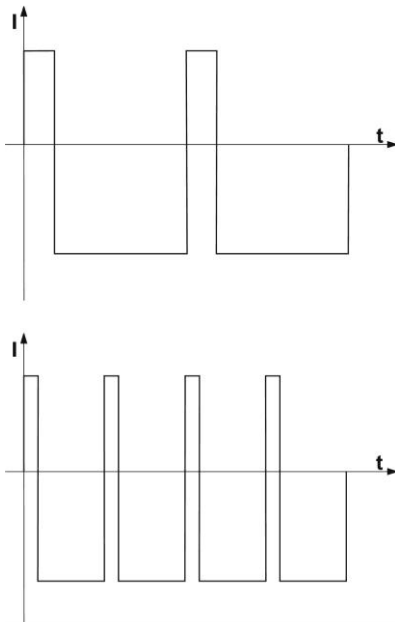


Consequences of a higher value:

- Tighter arc.
- Greater weld penetration.
- Reduced pickling.
- Loss of arc.
- Less deformation of the electrode.

**AC FREQUENCY**

The picture below shows the example where the wave on the second graph has a double frequency compared with the first.



Consequences of a higher value:

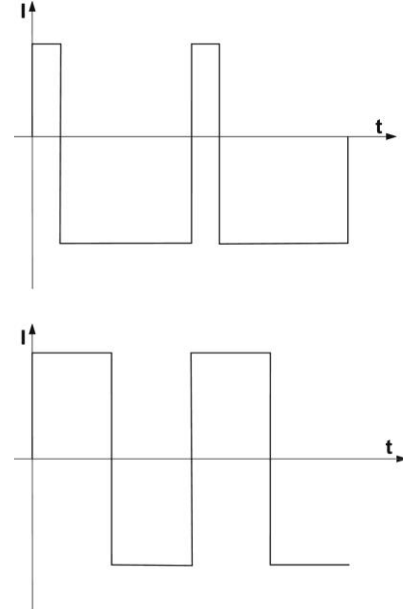
- Arc concentration.
- Reduction of heat-affected zone.
- Slower melt speed.

**AC BALANCE**

This parameter establishes the positive wave vs. negative wave time ratio.

The following figure shows two graphs with different balance value: the first graph represents the curve of the current with a negative value balance (more penetration) in which it can be seen that there is a low percentage of positive wave compared with the negative.

In the second graph the current curve is shown with a positive value balance (more cleaning); in this case the percentage of the positive wave is greater than the negative one.



Consequences of a higher value:

- Greater weld penetration.
- Less cleanliness.

**ELECTRODE DIAMETER**

The parameter optimizes the AC TIG welding arc strike on the basis of the diameter of the chosen electrode.



## 4.4 PARAMETERS ACTIVATION

The welding parameters are available in accordance with the selected welding mode and procedure.  
Certain parameters are available only after other parameters or functions of the unit have been enabled or set.  
The table shows the settings required to enable each parameter.





### KEY

- ✓: Always available.
- 1: Available when remote control is disabled.
- 2: Available when remote control is enabled and a remote control pedal is connected to the unit.
- 3: Available with the following setting: HF ARC START = ON
- 4: Available with the following setting: MULTI TACK = OFF
- 5: Available with the following setting: TYPE OF PULSED CURRENT = SLO.
- 6: Available with the following setting: TYPE OF PULSED CURRENT = FA.






### Meaning of symbols

1+2= All conditions must be fulfilled (both 1 and 2).

MENU	MODE →													
↓	PROCEDURE →													
	PARAMETER ↓													
1°	WELDING CURRENT	1	1	1	1	1	1	1	1	1	1	1	1	1
1°	MAXIMUM CURRENT WITH REMOTE CONTROLLER	2	2	2			2	2			2	2		
1°	HOT-START	✓												
1°	ARC FORCE	✓												
1°	PRE-GAS TIME		3	3	3	3	3	3	3	3	3	3	3	3
1°	STARTING CURRENT		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1°	SLOPE UP		4	4	4	4	4	4	4	4	4	4	4	4
1°	SECOND CURRENT B-LEVEL					✓				✓				✓
1°	BASE CURRENT						✓	✓	✓	✓	✓	✓	✓	✓
1°	PEAK TIME						✓	✓	✓	✓	✓	✓	✓	✓
1°	PULSED CURRENT FREQUENCY						6	6	6	6	6	6	6	6
1°	BASE TIME						5	5	5	5	5	5	5	5
1°	DOWN SLOPE		4	4	4	4	4	4	4	4	4	4	4	4
1°	FINAL CURRENT		4	4	4	4	4	4	4	4	4	4	4	4
1°	POST GAS TIME		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2°	VRD	✓												
2°	LONG ARC VOLTAGE	✓												
2°	REMOTE CONTROL ACTIVATION	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2°	SPOT TIG TIME			✓				✓				✓		
2°	HF ARC START		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2°	MINIMUM PEDAL CURRENT		2	2			2	2			2	2		
2°	AC WAVEFORM													
SPECIAL	Q-START		3	3	3	3	3	3	3	3	3	3	3	3
SPECIAL	DYNAMIC ARC	✓	✓		✓		✓		✓		✓		✓	
SPECIAL	MULTI TACK		3	3	3		3	3	3		3	3	3	
SPECIAL	MIX AC													
SPECIAL	FUSIONE EXTRA													
SPECIAL	AC FREQUENCY													
SPECIAL	AC BALANCE													
SPECIAL	ELECTRODE DIAMETER													







MENU	MODE →	AC				AC 			
									
↓	PROCEDURE →								
	PARAMETER ↓								
1°	WELDING CURRENT	1	1	1	1	1	1	1	1
1°	MAXIMUM CURRENT WITH REMOTE CONTROLLER	2	2			2	2		
1°	HOT-START								
1°	ARC FORCE								
1°	PRE-GAS TIME	3	3	3	3	3	3	3	3
1°	STARTING CURRENT	✓	✓	✓	✓	✓	✓	✓	✓
1°	SLOPE UP	✓	✓	✓	✓	✓	✓	✓	✓
1°	SECOND CURRENT B-LEVEL				✓				✓
1°	BASE CURRENT					✓	✓	✓	✓
1°	PEAK TIME					✓	✓	✓	✓
1°	PULSED CURRENT FREQUENCY					6	6	6	6
1°	BASE TIME					5	5	5	5
1°	DOWN SLOPE	✓	✓	✓	✓	✓	✓	✓	✓
1°	FINAL CURRENT	✓	✓	✓	✓	✓	✓	✓	✓
1°	POST GAS TIME	✓	✓	✓	✓	✓	✓	✓	✓
2°	VRD								
2°	LONG ARC VOLTAGE								
2°	REMOTE CONTROL ACTIVATION	✓	✓	✓	✓	✓	✓	✓	✓
2°	SPOT TIG TIME		✓				✓		
2°	HF ARC START	✓	✓	✓	✓	✓	✓	✓	✓
2°	MINIMUM PEDAL CURRENT	2	2			2	2		
2°	AC WAVEFORM	✓	✓	✓	✓	✓	✓	✓	✓
SPECIAL	Q-START								
SPECIAL	DYNAMIC ARC								
SPECIAL	MULTI TACK								
SPECIAL	MIX AC	✓	✓	✓	✓	✓	✓	✓	✓
SPECIAL	FUSIONE EXTRA	✓	✓	✓	✓	✓	✓	✓	✓
SPECIAL	AC FREQUENCY	✓	✓	✓	✓	✓	✓	✓	✓
SPECIAL	AC BALANCE	✓	✓	✓	✓	✓	✓	✓	✓
SPECIAL	ELECTRODE DIAMETER	✓	✓	✓	✓	✓	✓	✓	✓

## 4.5 PARAMETERS SETTING: (1ST LEVEL)

- S2  Press this button to scroll the list of settings to edit.
-  The acronym relative to the setting to be edited appears on the following displays: D1
-  The value relative to the selected setting appears on the following displays: D2
- E1  Using the encoder, edit the value of the selected setting.  
The value is saved automatically.
-  Press any key (except S2) to save the setting and quit the menu.

**Tab. 3 - Parameters of the 1st level menu: MMA mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX	
-	WELDING CURRENT MAXIMUM CURRENT WITH REMOTE CONTROLLER	10 A	10 A	300 A	*3
Ho.S.	HOT-START	0 %	50 %	100 %	*1
Ar.F.	ARC FORCE	0 %	30 %	250 %	*1

- S2  Hold down the button for 3 seconds to gain access to the 2nd level menu.
-  The acronym relative to the setting to be edited appears on the following displays: D1
-  The value relative to the selected setting appears on the following displays: D2
- S2  Press this button to scroll the list of settings to edit.
- E1  Using the encoder, edit the value of the selected setting.  
The value is saved automatically.
-  Press any key (except S2) to save the setting and quit the menu.

**Tab. 4 - Parameters of the 1st level menu: CONTINUOUS DC TIG mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX	
Pr.G.	PRE-GAS TIME	0.0 s	0.1 s	10.0 s	
St.C.	STARTING CURRENT	2 % 5 A	50 % 40 A	200 % 320 A	*2
Sl.u.	SLOPE UP	0.0 s	0.0 s	25.0 s	
	WELDING CURRENT MAXIMUM PEDAL CURRENT	5 A	80 A	320 A	*3
S.Cu.	SECOND WELDING CURRENT	10 %	50 %	200 %	*1
Sl.d.	DOWN SLOPE	0.0 s	0.0 s	25.0 s	
F.Cu.	FINAL CURRENT	5 % 5 A	5 % 5 A	80 % 320 A	*2
Po.G.	POST GAS TIME	0.0 s	10.0 s	25.0 s	

**Tab. 5 - Parameters of the 1st level menu: PULSED TIG DC mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX	
Pr.G.	PRE-GAS TIME	0.0 s	0.1 s	10.0 s	
St.C.	STARTING CURRENT	2 % 5 A	50 % 40 A	200 % 320 A	*2
Sl.u.	SLOPE UP	0.0 s	0.0 s	25.0 s	
	WELDING CURRENT MAXIMUM PEDAL CURRENT	5 A	80 A	320 A	*3
S.Cu.	SECOND WELDING CURRENT	10 %	50 %	200 %	*1
b.Cu.	BASE CURRENT	1 %	40 %	200 %	
PE.t.	PEAK TIME	1 % 0.1 s	50 % 5.0 s	99 % 5.0 s	*2
P.Fr.	PULSED CURRENT FREQUENCY	0.1 Hz	100 Hz	2.5 KHz	
bA.t.	BASE TIME	0.1 s	5.0 s	5.0 s	
Sl.d.	DOWN SLOPE	0.0 s	0.0 s	25.0 s	
F.Cu.	FINAL CURRENT	5 % 5 A	5 % 5 A	80 % 320 A	*2
Po.G.	POST GAS TIME	0.0 s	10.0 s	25.0 s	

\*1: This parameter is set as a percentage referred to the value of the following parameter: WELDING CURRENT

\*2: The value of this parameter can be set as a percentage of the welding current or as an absolute value expressed in Amperes.

\*3: This setting is used to adjust both parameters.

**Tab. 6 - 1st level menu parameters in SYNERGIC TIG mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX	
Pr.G.	PRE-GAS TIME	0.0 s	0.1 s	10.0 s	
St.C.	STARTING CURRENT	2 %	50 %	200 %	*2
		5 A	40 A	320 A	
Sl.u.	UP SLOPE TIME	0.0 s	0.0 s	25.0 s	
	WELDING CURRENT				*2
	MAXIMUM PEDAL CURRENT	5 A	80 A	320 A	
S.Cu.	SECOND WELDING CURRENT	10 %	50 %	200 %	*1
b.Cu.	BASE CURRENT	*Syn	*Syn	*Syn	
PE.t.	PEAK TIME	*Syn	*Syn	*Syn	
P.Fr.	PULSED CURRENT FREQUENCY	*Syn	*Syn	*Syn	
Sl.d.	DOWN SLOPE TIME	0.0 s	0.0 s	25.0 s	
F.Cu.	FINAL CURRENT	5 %	5 %	80 %	
		5 A	5 A	320 A	
Po.G.	POST-GAS TIME	0.0 s	10.0 s	25.0 s	

**Tab. 7 - 1st level menu parameters in AC TIG mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX	
Pr.G.	PRE-GAS TIME	0.0 s	0.1 s	10.0 s	
St.C.	STARTING CURRENT	2 %	50 %	200 %	
		5 A	40 A	320 A	
Sl.u.	UP SLOPE TIME	0.0 s	0.0 s	25.0 s	
	WELDING CURRENT				*2
	MAXIMUM PEDAL CURRENT	5 A	80 A	320 A	
S.Cu.	SECOND WELDING CURRENT	10 %	50 %	200 %	*1
Sl.d.	DOWN SLOPE TIME	0.0 s	0.0 s	25.0 s	
F.Cu.	FINAL CURRENT	5 %	5 %	80 %	
		5 A	5 A	320 A	
Po.G.	POST-GAS TIME	0.0 s	10.0 s	25.0 s	

**Tab. 8 - 1st level menu parameters in PULSED AC TIG mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX	
Pr.G.	PRE-GAS TIME	0.0 s	0.1 s	10.0 s	
St.C.	STARTING CURRENT	2 %	50 %	200 %	
		5 A	40 A	320 A	
Sl.u.	UP SLOPE TIME	0.0 s	0.0 s	25.0 s	
	WELDING CURRENT				*2
	MAXIMUM PEDAL CURRENT	5 A	80 A	320 A	
S.Cu.	SECOND WELDING CURRENT	10 %	50 %	200 %	*1
b.Cu.	BASE CURRENT	1 %	40 %	200 %	
PE.t.	PEAK TIME	1 %	50 %	99 %	
		0.1 s	5.0 s	5.0 s	
P.Fr.	PULSED CURRENT FREQUENCY	0.1 Hz	100 Hz	2.5 kHz	
bA.t.	BASE TIME	0.1 s	5.0 s	5.0 s	
Sl.d.	DOWN SLOPE TIME	0.0 s	0.0 s	25.0 s	
F.Cu.	FINAL CURRENT	5 %	5 %	80 %	
		5 A	5 A	320 A	
Po.G.	POST-GAS TIME	0.0 s	10.0 s	25.0 s	

\*1: This parameter is set as a percentage referred to the value of the following parameter: WELDING CURRENT

\*2: This setting is used to adjust both parameters.






\*SYN: This code indicates that parameters control is synergic.

The optimal value of this parameter is set automatically by the microprocessor on the basis of the preset welding current value.

When SYN is installed, to display the synergic value press the following button: S3







This value can be displayed but it is not user-adjustable.

## 4.6 PARAMETERS SETTING: (2ND LEVEL)

- S2  Press this button to scroll the list of settings to edit.
-  The acronym relative to the setting to be edited appears on the following displays: D1
-  The value relative to the selected setting appears on the following displays: D2
- E1  Using the encoder, edit the value of the selected setting.  
The value is saved automatically.
-  Press any key (except S2) to save the setting and quit the menu.

**Tab. 9 - Parameters of the 2nd level menu: MMA mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX
Urd	OUTPUT VOLTAGE REDUCTION	oFF	oFF	on
U.EL.	LONG ARC VOLTAGE	37	47	65
rC	REMOTE CONTROLLER ACTIVATION	oFF	oFF	on *1

- S2  Hold down the button for 3 seconds to gain access to the 2nd level menu.
-  The acronym relative to the setting to be edited appears on the following displays: D1
-  The value relative to the selected setting appears on the following displays: D2
- S2  Press this button to scroll the list of settings to edit.
- E1  Using the encoder, edit the value of the selected setting.  
The value is saved automatically.
-  Press any key (except S2) to save the setting and quit the menu.










**Tab. 10 - Parameters of the 2nd level menu: CONTINUOUS DC TIG mode, PULSED DC TIG mode, SYNERGIC DC TIG mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX
SP.t.	SPOT TIG TIME	0.01 s	0.01 s	10.0 s
HF	HF ARC STRIKE ENABLE	on	on	oFF
rC	REMOTE CONTROL ACTIVATION	on	oFF	on *2
r.P.C.	MINIMUM PEDAL CURRENT	1 %	5 %	90 %

**Tab. 11 - 2nd level menu parameters in AC TIG mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX
AC	AC WAVEFORM	1	1	9
SP.t.	SPOT TIG TIME	0.01 s	0.1 s	10.0 s
HF	HF ARC STRIKE ENABLE	on	on	oFF
rC	REMOTE CONTROL ACTIVATION	on	oFF	on
r.P.C.	MINIMUM PEDAL CURRENT	1 %	5 %	90 %

VALUE	DC+	WAVEFORM	DC-
1	sine		sine
2	rectangular		rectangular
3	triangular		triangular
4	sine		rectangular
5	rectangular		sine
6	sine		triangular
7	triangular		sine
8	rectangular		triangular
9	triangular		rectangular

\*1: Remote control types:

- manual remote controller.

\*2: Remote control types:






- UP/DOWN or potentiometer TIG torch.
- foot pedal controller.

The maximum and minimum TIG welding current values can be set with the foot pedal controller.

The up slope and down slope cannot be controlled via the foot pedal.

The following welding procedures can be selected with the foot pedal: 2T LIFT ARC - 2T HF - 2T SPOT - 2T SPOT HF

**4.7 PARAMETERS SETTING: SPECIAL FUNCTIONS**

- S1  Press this button to scroll the list of settings to edit.
-  The acronym relative to the setting to be edited appears on the following displays: D1
-  The value relative to the selected setting appears on the following displays: D2
- E1  Using the encoder, edit the value of the selected setting.  
The value is saved automatically.
-  Press any key (except S1) to save the setting and quit the menu.

**Tab. 12 - Special functions in MMA mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX
d.Ar.	DYNAMIC ARC	oFF	oFF	on

**Tab. 13 - SPECIAL FUNCTIONS menu parameters: CONTINUOUS DC TIG mode, PULSED DC TIG mode, SYNERGIC DC TIG mode**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX
q.St.	Q-START	0.1 s	oFF	60.0 s
d.Ar.	DYNAMIC ARC	1	oFF	50
M.tA.	MULTI TACK	0.5 Hz	oFF	6.0 Hz *1

**Tab. 14 - Special functions in AC TIG and PULSED AC TIG modes**

ACRONYM	PARAMETER	MIN	DEFAULT	MAX
M.AC.	MIX AC	10 %	oFF	80 %
E.Fu.	FUSIONE EXTRA	0.0 %	oFF	80 %
F.AC.	AC INVERSION FREQUENCY	20 Hz	65 Hz	200 Hz
bAL	AC BALANCE	-10	0	+10
d.EL.	AC TIG ELECTRODE DIAMETER	1,0 mm	2,4 mm	4,0 mm

\*1: When this function is active welding is performed without the following parameters: SLOPE UP - SLOPE DOWN - START CURRENT - FINAL CURRENT

## 4.8 JOBS MANAGEMENT


Personalised welding settings, or JOBS, can be saved in memory locations and subsequently uploaded. Up to 50 JOBS can be saved (j01-j50). JOBS can be managed only when the unit is not in welding mode.


The SETUP menu settings cannot be saved by means of the JOBS.

When a JOB is loaded and an UP/DOWN torch is installed, press the torch triggers to select the saved JOBS.


If there are no JOBS loaded, the UP/DOWN buttons on the torch serve to adjust the welding current.


### 4.8.1 SAVING A JOB

S5  Hold down the button for 3 seconds.

 **SA. Job** The message appears on the following displays: D1-D2

S5  Press the button to confirm.


 **SA. J.xx** The message appears on the following displays: D1-D2  
xx= number of the first free job.

E1  Use the encoder to select the required job number.

On selecting a currently occupied memory location, the job number flashes.

If you confirm at this point, the new job will overwrite the previously saved settings.

#### Exit without confirmation

 Press any button (except S5).


 This action will automatically close the menu.


#### Exit with confirmation


S5  Press the button.


 This action will automatically close the menu.

### 4.8.2 LOADING A USER JOB OF FACTORY SET JOB


S5  Press and release the button.

 **Lo. J.xx** Only when the jobs have been uploaded, the message is shown on the following displays: D1-D2  
xx= number of the latest job used.

 **no Job** If there are no jobs in the memory the message is shown on the following displays: D1-D2


E1  Use the encoder to select the number of the job to be uploaded.


#### Exit without confirmation

 Press any button (except S5).

 This action will automatically close the menu.

#### Exit with confirmation


S5  Press the button.


 **J.xx** The message appears on the following displays: D2  
xx= number of loaded job.


 **JOB** The LED illuminates.

 This action will automatically close the menu.

### 4.8.3 DELETING A JOB


S5  Hold down the button for 3 seconds.


 **SA. Job** The message appears on the following displays: D1-D2

E1  Select the following setting with the encoder: **Er. Job**


The message appears only if there are saved JOBS, on the following displays: D1-D2

S5  Press the button to confirm.

 **Er. J.xx** The message appears on the following displays: D1-D2  
xx= number of the latest job used.

E1  Use the encoder to select the number of the job to be deleted.

#### Exit without confirmation

 Press any button (except S5).







 This action will automatically close the menu.

#### Exit with confirmation

S5  Press the button.

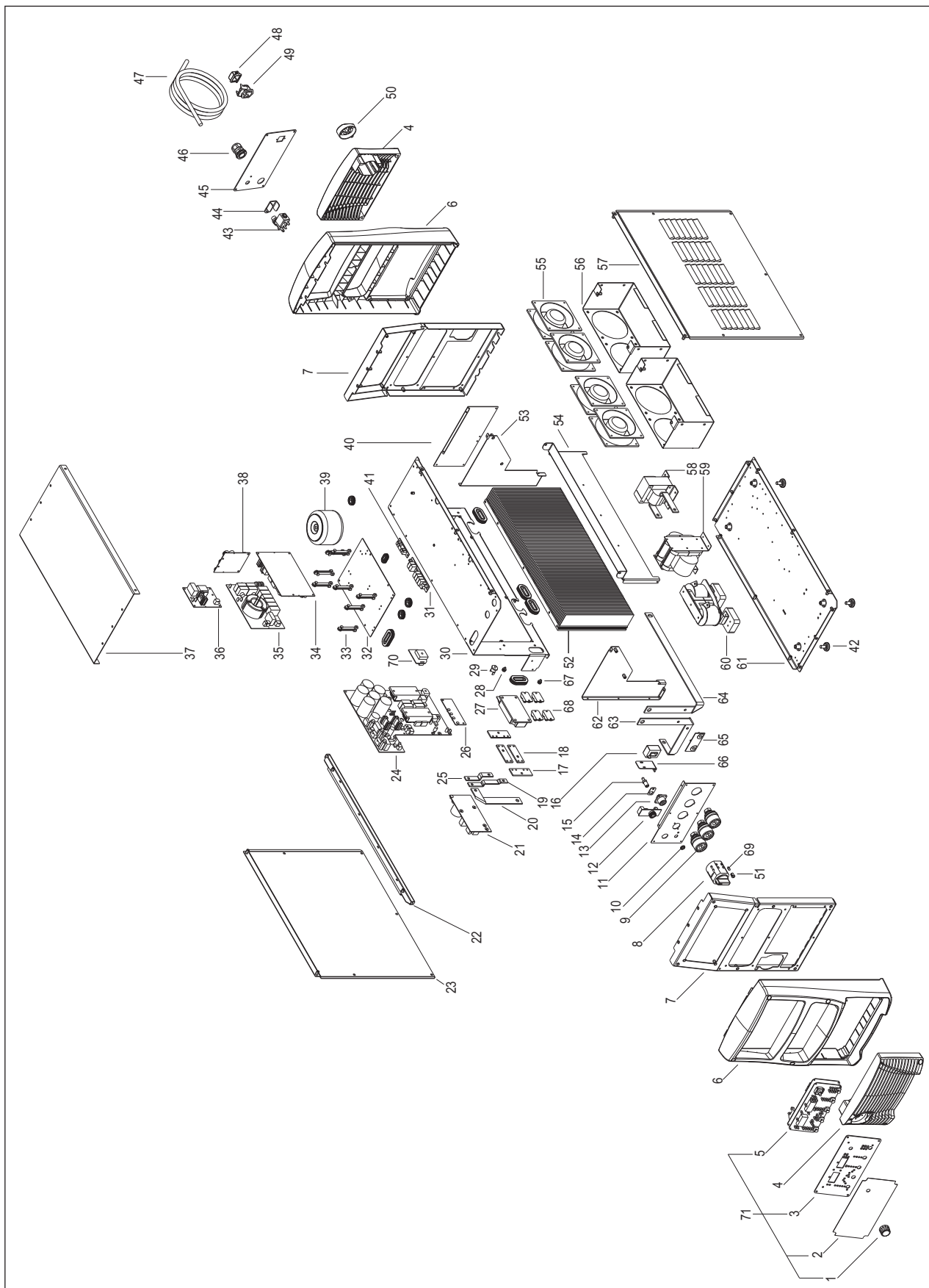
 This action will automatically close the menu.

## 5 TECHNICAL DATA

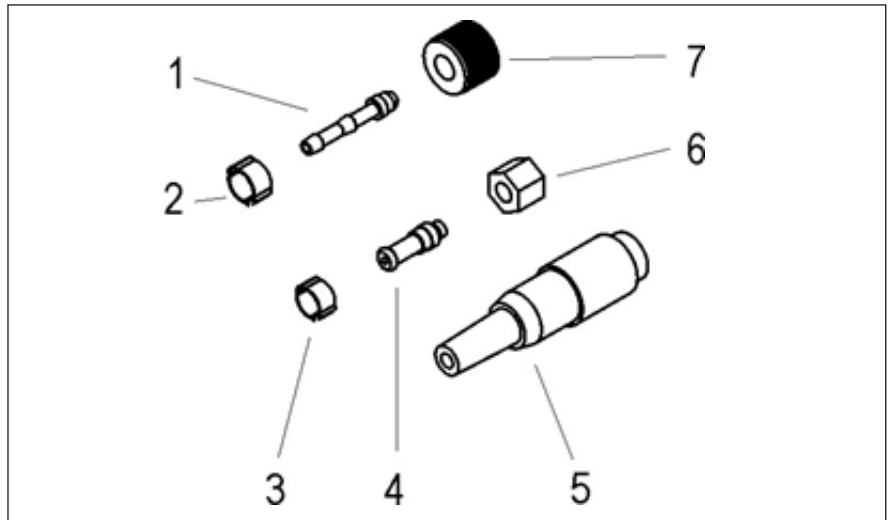
Directives applied	Waste electrical and electronic equipment (WEEE)		
	Electromagnetic compatibility (EMC)		
	Low voltage (LVD)		
	Restriction of the use of certain hazardous substances (RoHS)		
Construction standards	EN 60974-1; EN 60974-3; EN 60974-10 Class A		
Conformity markings		Equipment compliant with European directives in force	
		Equipment suitable in an environment with increased hazard of electric shock	
		Equipment compliant with WEEE directive	
		Equipment compliant with RoHS directive	
Supply voltage	3 x 400 Va.c. ± 15 % / 50-60 Hz		
Mains protection	25 A 500 V Delayed		
Z <sub>max</sub>	If this equipment is connected to a public low voltage system, it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected.		
Dimensions ( L x D x H )	690 x 290 x 450 mm		
Weight	42.6 kg		
Insulation class	H		
Protection rating	IP23S		
Cooling	AF: Air-over cooling (fan assisted)		
Maximum gas pressure	0,5 MPa (5 bar)		
Static characteristic	MMA	 Drooping characteristic	
	TIG	 Drooping characteristic	
Current and voltage adjustment range	MMA	10 A / 20.4 V - 300 A / 32.0 V	
	TIG	5 A / 10.2 V - 320 A / 22.8 V	
Welding current / Working voltage	MMA	50 % (40° C)	300 A - 32.0 V
		60 % (40° C)	280 A - 31.2 V
		100 % (40° C)	240 A - 29.6 V
	TIG	45 % (40° C)	320 A - 22.8 V
		60 % (40° C)	280 A - 21.2 V
		100 % (40° C)	240 A - 19.6 V
Maximum input power	MMA	50 % (40° C)	15.5 kVA – 12.1 kW
		60 % (40° C)	13.2 kVA – 10.7 kW
		100 % (40° C)	11.2 kVA – 8.6 kW
	TIG	45 % (40° C)	13.1 kVA – 9.9 kW
		60 % (40° C)	10.5 kVA – 7.9 kW
		100 % (40° C)	8.6 kVA – 6.3 kW
Maximum supply current	MMA	50 % (40° C)	22.4 A
		60 % (40° C)	19.5 A
		100 % (40° C)	16.2 A
	TIG	45 % (40° C)	18.8 A
		60 % (40° C)	14.8 A
		100 % (40° C)	12.5 A
Maximum Effective Supply Current	MMA	50 % (40° C)	15.8 A
		60 % (40° C)	15.1 A
		100 % (40° C)	16.2 A
	TIG	45 % (40° C)	12.6 A
		60 % (40° C)	11.4 A
		100 % (40° C)	12.5 A
No-load voltage (U <sub>0</sub> )	MMA	71 V	
	TIG	66 V	
Reduced no-load voltage (U <sub>r</sub> )	MMA	8 V	
	TIG	8 V	
Rated HF peak voltage (U <sub>p</sub> )	11.3 kV		
	Arc striking device designed to work with manual guided torch.		



# Spare Parts

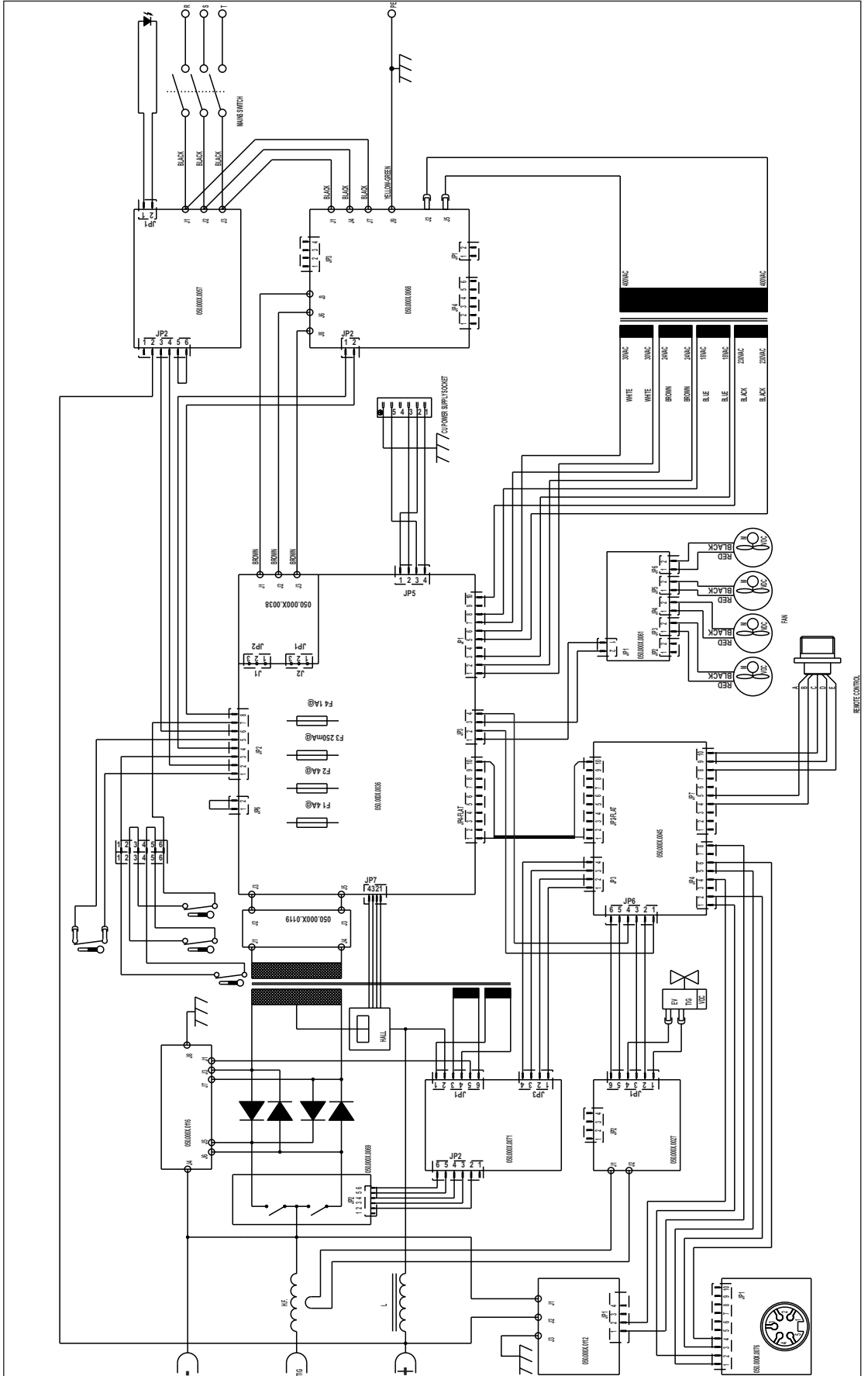


No.	order number	description
1	0835 27 41 00	KNOB WITH CAP
2	0835 30 41 01	FRONT PANEL LABEL
3	0835 30 41 02	LOGIC BOARD PLATE
4	0835 27 41 53	PLASTIC LOUVRE
5	0835 30 41 03	FRONT BOARD
6	0835 27 41 05	FRONT/REAR PLASTIC PANEL
7	0835 27 41 06	FRONT/REAR PLATE
8	0835 23 41 15	THREE-POLE SWITCH
9	0835 27 41 37	OUTPUT SOCKET
10	0835 26 41 03	RINGNUT
11	0835 27 41 09	BOARDS SUPPORT
12	0835 21 00 13	AMPHENOL CONNECTOR BOARD
13	0835 30 41 04	REMOTE LOGIC CABLE
14	0835 27 41 10	SOLENOID VALVE BLOCK
15	0835 26 41 04	HOSE ADAPTER
16	0831 93 00 52	HALL EFFECT SENSOR
17	0835 23 41 22	DIODE/TRANSFORMER COPPER BRACKET
18	0835 23 41 23	(-/+ ) DIODE COPPER BRACKET
19	0835 23 41 20	(-) INVERSION MODULE COPPER BRACKET
20	0835 30 41 05	DIODE/SOCKET COPPER BRACKET
21	0835 27 41 17	SNUBBER BOARD
22	0835 27 41 19	COVER PANEL SUPPORT PLATE
23	0835 27 41 20	LEFT COVER PANEL
24	0835 23 41 08	COMPLETE POWER BOARD
25	0835 23 41 19	INVERSION MODULE (+) BRACKET
26	0835 23 41 07	PRIMARY CAPACITOR BOARD
27	0835 30 41 06	INVERSION MODULE
28	0835 30 41 07	THERMAL CUT-OUT
29	0835 23 00 06	THERMAL CUT-OUT
30	0835 27 41 36	UPPER PLATE
31	0835 27 41 25	OUTPUT FILTER BOARD
32	0835 30 41 08	FRONT SOCKETS PLATE
33	0835 21 00 40	BOARDS SUPPORT GUIDE
34	0835 23 41 09	INVERSION BOARD
35	0835 30 41 09	MAINS FILTER BOARD
36	0835 27 41 30	HF BOARD
37	0835 27 41 31	UPPER COVER
38	0831 93 00 36	POWER SUPPLY CONTROL BOARD
39	0835 23 00 20	AUXILIARY TRANSFORMER
40	0835 30 41 10	REAR PLATE
41	0835 27 41 35	FAN AND C.U. CONTROL BOARD
42	0835 21 00 15	RUBBER FOOT
43	0831 93 00 29	SOLENOID VALVE
44	0831 21 00 37	SOLENOID VALVE PLATE
45	0835 30 41 11	RÜCKWAND
46	0835 21 00 31	CABLE CLAMP
47	0835 30 41 12	SUPPLY CABLE
48	0835 21 00 34	ILME CONNECTOR CAP
49	0835 30 41 13	C.U. POWER SUPPLY WIRING
50	0835 27 41 52	CAP
51	0835 27 41 23	LED HOLDER
52	0835 27 41 61	HEAT SINK
53	0835 27 41 38	RIGHT TUNNEL SUPP. PLATE
54	0835 27 41 39	VENTILATION SHROUD
55	0835 27 41 54	FAN
56	0835 27 41 56	INTERNAL FAN SUPPORT
57	0835 27 41 55	RIGHT COVER PANEL
58	0835 30 41 14	OUTPUT INDUCTOR
59	0835 30 41 15	POWER TRANSFORMER
60	0835 30 41 16	HF COIL
61	0835 27 41 59	LOWER COVER
62	0835 27 41 62	LEFT TUNNEL SUPP. PLATE
63	0835 27 41 65	(-) SOCKET COPPER BRACKET
64	0835 27 41 64	(+) SOCKET COPPER BRACKET
65	0835 27 41 66	OUTPUT FILTER BOARD
66	0835 27 41 11	HALL SUPPORT PLATE
67	0835 21 00 04	THERMAL CUT-OUT
68	0835 27 41 12	ISOTOP DIODE
69	0835 27 41 22	LED WIRING
70	0835 23 41 27	DIODE BRIDGE BOARD
71	0835 30 41 17	COMPLETE FRONT PANEL

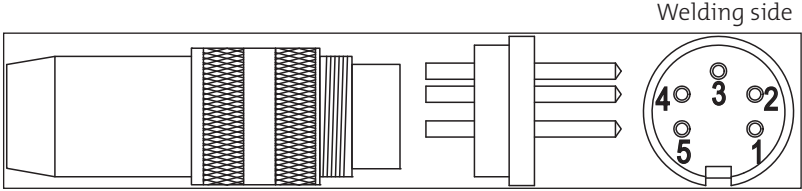


No.	ordner number	description
		TORCH CONNECTORS COMPLETE KIT
1	0835 21 00 43	SLEEVE HOSE ADAPTER FOR RUBBER HOSE 1/4
2	0835 21 00 41	HOSE CLAMP $\varnothing=11-13$
3	0835 21 00 45	HOSE CLAMP $\varnothing=07-09$
4	0835 21 00 46	SLEEVE HOSE ADAPTER FOR RUBBER HOSE M10
5	0835 21 00 47	AMPHT3360-001 M/5V. VOL. CONNECTOR
6	0835 21 00 48	NUT M10
7	0835 21 00 49	NUT 1/4

# ELECTRICAL DIAGRAM GLW 322

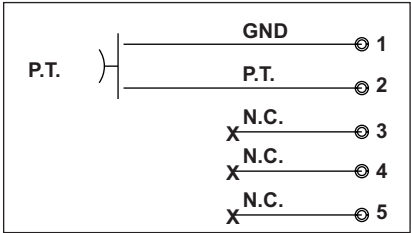


# TORCH CONNECTOR

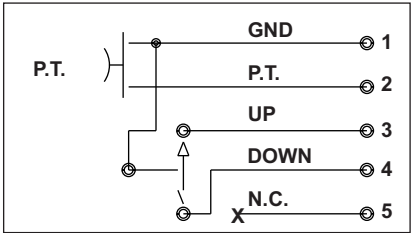


order no. 083521004

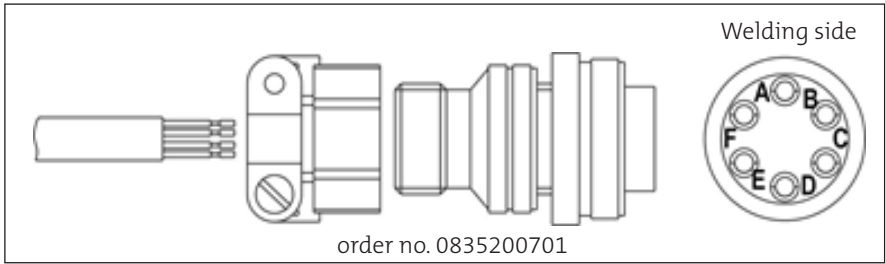
- Torch



- Up & Down Torch

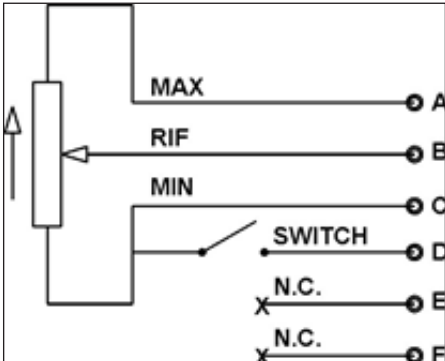


# REMOTE CONTROLLER CONNECTOR



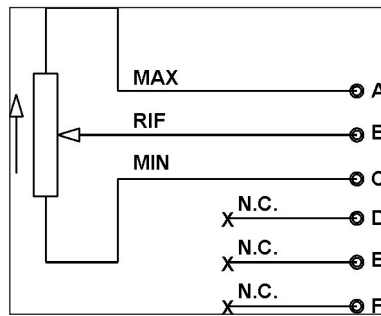
order no. 0835200701

- Torch with potentiometer



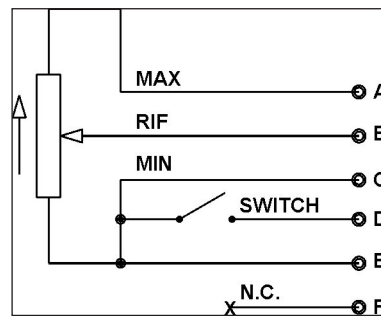
Potentiometer 2kΩ ... 10kΩ

- Remote Controller



Potentiometer 2kΩ ... 10kΩ

- Foot pedal controller



Potentiometer 2kΩ ... 10kΩ

CLOOS

Weld your way.