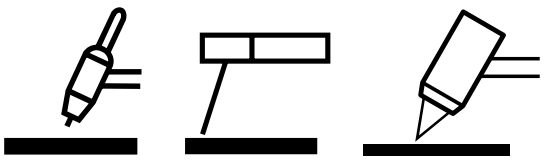
EN

INSTRUCTION MANUAL - Translation of the original instructions





WIN TIG



WIN TIG DC 340 T WIN TIG DC 350 T Robot	Art. 380 Art. 380.80	WIN TIG AC-DC 270 T WIN TIG AC-DC 270 T Robot	Art. 394 Art. 394.80
WIN TIG DC 500 T WIN TIG DC 500 T Robot	Art. 381 Art. 381.80	WIN TIG AC-DC 340 T WIN TIG AC-DC 340 T Robot	Art. 395 Art. 395.80
		WIN TIG AC-DC 450 T WIN TIG AC-DC 450 T Robot	Art. 396 Art. 396.80

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This manual is part of the overall documentation and is invalid unless it is used in conjunction with the following parts of the documentation that you can consult in the Support-Documentation section of the website welding.cebora.it:

3301151	**General warnings**
3301084	**WIN TIG Process Image manual**
3300948	**Cooling unit instruction**

IMPORTANT - Before using this device, read the instructions in this manual and in General Warnings manual code 3301151 carefully and make sure you understand them.
Always keep this manual at the place where the device is used.

The equipment can only be used for welding or cutting operations. Do not use this device to charge batteries, defrost pipes or start motors.

Only expert staff can install, operate, maintain and repair this device. An expert staff member means someone who can judge the work assigned to them and recognise possible risks based on their vocational training, knowledge and experience.

Liability regarding system operation is expressly limited to the system's function. Further liability of any kind is expressly excluded.
Any use that differs from what is expressly indicated and is implemented in different ways or contrary to what is indicated in this publication amounts to improper use. The manufacturer declines any liability arising from improper use that may cause accidents to people and possible system malfunctions.
This exclusion of liability is acknowledged upon commissioning of the system by the user.

The manufacturer is unable to monitor compliance with these instructions or device installation, operation and use, and maintenance conditions and methods provided in General Warnings manual code 3301151.

Observe the accident prevention regulations and the regulations in force in the country of installation (for example IEC EN 60974-4 and IEC EN 60974-9).

Inappropriate execution of the installation may lead to material damage and consequently to personal injury. Therefore, no liability is assumed for loss, damage or cost arising out of or in any way connected with improper installation, incorrect operation or inappropriate use and maintenance.
The manufacturer therefore disclaims all liability for malfunctions or damage to its welding/cutting power sources and system components resulting from improper installation.

The welding or cutting power source complies with the regulations set out on the power source technical data plate.
Use of the welding or cutting power source built into automatic or semi-automatic systems is permitted.
The system installer is responsible for checking the complete compatibility and correct operation of all components used in the system.

It is forbidden to connect two or more power sources in parallel without the prior written authorisation of the manufacturer, which will determine and authorise the procedures and conditions for the required application in compliance with current product and safety regulations.

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1 SYMBOLS

The colour of the box indicates the category into which the operation falls: DANGER, WARNING, CAUTION, NOTICE or INSTRUCTION.

⚠	**DANGER**	Indicates a situation of **imminent** danger that could cause severe injury to people
⚠	**WARNING**	Indicates a situation of **potential** danger that could cause severe injury to people
⚠	**CAUTION**	Indicates a situation of potential danger that could cause slight injury to people and material damage to equipment if not respected.
NOTICE		Provides important information to the user that could lead to damage to equipment if not observed.
INSTRUCTION		Procedure to be followed to achieve optimal use of the equipment.

1.1 Warning plate

The following numbered text reflects the numbered boxes on the plate.

B. Wire feed rollers can injure the hands.
C. The welding wire and wire feeder unit are live during welding. Keep hands and metal objects well away.



1. Electric shocks caused by the welding electrode or cable can be fatal. Protect yourself properly against the danger of electric shocks.
1.1 Wear insulated gloves. Never touch the electrode with bare hands. Never wear damp or damaged gloves.
1.2 Insulate yourself from the workpiece and the ground.

1.3 Disconnect the supply cable plug before working on the machine.
2. Inhaling fumes produced by welding can be harmful to the health.
2.1 Keep your head away from the fumes.
2.2 Use a forced ventilation system or local exhaust to remove fumes.
2.3 Use a suction fan to remove fumes.
3. Sparks generated by welding can cause explosions or fires.
3.1 Keep flammable materials well away from the welding area.
3.2 Sparks caused by welding can cause fires. Keep an extinguisher nearby and ensure that someone is ready to use it.
3.3 Never weld with closed containers.
4. Arc rays may injure the eyes and burn the skin.
4.1 Wear a safety helmet and goggles. Use appropriate ear protectors and overalls with the collar buttoned up. Use helmet masks with filters of the correct grade. Wear a full-body protection.
5. Read the instructions before using the machine or carrying out any operation on it.
6. Do not remove or cover warning labels.

2 WARNINGS

DANGER

Before handling, unpacking, installing and using the welding power source, it is obligatory to read the General warnings manual code 3301151.

2.1 Lifting and transport

DANGER

For lifting and transport methods, refer to General warnings Manual code 3301151.

3 INSTALLATION

WARNING

The machine must be installed by professional personnel. All connections must be carried out according to current regulations, and in full observance of safety laws (CEI 26-36 and IEC/EN 60974-9).

3.1 Mains connection

WARNING

Connecting high power devices to the mains could have negative repercussions on mains power quality. Line impedance values lower than the Zmax value indicated in the Technical specifications table may be required for compliance with IEC 61000-3-11 and IEC 61000-3-12. It is the responsibility of the installer or user to ensure that the device is connected to a line of correct impedance. It is advisable to consult your local electricity supplier.

DANGER

- Make sure that the mains voltage matches the voltage indicated on the specifications plate of the welding machine. Connect a plug of adequate capacity for the current consumption I1 indicated on the data plate. Make sure that the yellow/green conductor of the power cable is connected to the plug's earth contact.
- If mains power extensions are used, the cable supply cross-section must be appropriately sized. Do not use extensions longer than 30 m.
- It is essential to use the device only if connected to a power supply with an earth conductor.
- Using the device connected to the mains without an earth conductor or to a socket without a contact for this conductor constitutes very serious negligence. The manufacturer declines all responsibility for damage to people or property that may occur.
- The user is bound to have the efficiency of the earth conductor of the system and the device in use periodically checked by a qualified electrician.

3.2 Environmental and storage conditions

The device must be installed and operated only on an appropriate, stable, flat surface and not in the open air. The user must ensure that the ground is flat and not slippery and that the workplace is properly lit. Safe use of the device must be ensured at all times. The device can be damaged by particularly high quantities of dust, acids, gases or corrosive substances. Prevent the device from coming into contact with high quantities of smoke, steam, oil mist or grinding powders. Poor ventilation will result in reduced performance and damage to the device:

- Observe the recommended environmental conditions
- Leave cooling air inlets and outlets unobstructed
- Leave a minimum distance of 0.5 m from any obstructions

Ambient temperature range under working conditions from -10 °C to +40 °C, under transportation and storage conditions from -20 °C to +55 °C. Air relative humidity: up to 50% at 40 °C, up to 90% at 20 °C.

3.3 Gas cylinders

WARNING

Position the gas cylinders so that they are stable on a solid, flat base.
Secure the cylinders to prevent accidental falling: fasten the safety tape to the top of the gas cylinder. Never attach the safety tape to the cylinder neck.
Observe the gas cylinder manufacturer's safety instructions.

3.4 General Information

NOTICE

- During power-on with a high-frequency strike device, keep the earth cable and torch cable at least 30 cm apart to prevent sparking between them.
- The cable bundle must not exceed a total length of 30 m. Never stand between the welding cables. Connect the earth cable to the workpiece that is as close as possible to the welding or cutting area.
- In applications with multiple welding sources, make sure that the cable bundles of each source are spaced at least 30 cm apart.
- In applications with multiple sources, each power source must have its own connection to the welding workpiece. Never use a shared earth for multiple power sources.
- Install and use the device only in accordance with the protection class indicated on the data plate. During installation, leave a gap of 1 m around the device to ensure that cooling air can flow in and out freely.
- The use of non-original accessories may compromise the correct operation of the power source and even the integrity of the system, rendering any warranty and liability cover that the Manufacturer may provide for the welding power source null and void.

4 DESCRIPTION OF THE POWER SOURCE

This welding machine is an inverter power source built according to IEC 60974-1, IEC 60974-3, IEC 60974-10 (CL. A), IEC 61000-3-11 and IEC 61000-3-12 standards.
The power source is suitable for TIG welding with contact and high-frequency ignition. It also manages the MMA process (only for manual application). The power source can also be equipped with an external control panel Item No 438.
The robot version of the power source (Item No XXX.80) can be used for manual applications or in robotised applications (see chapter 14).
The power source is also equipped with an Ethernet port that allows connection to a local network (LAN) using the integral Webserver. Power source parameters and diagnosis can therefore be managed remotely via a simple browser (see chapter 13).

4.1 Front and rear view

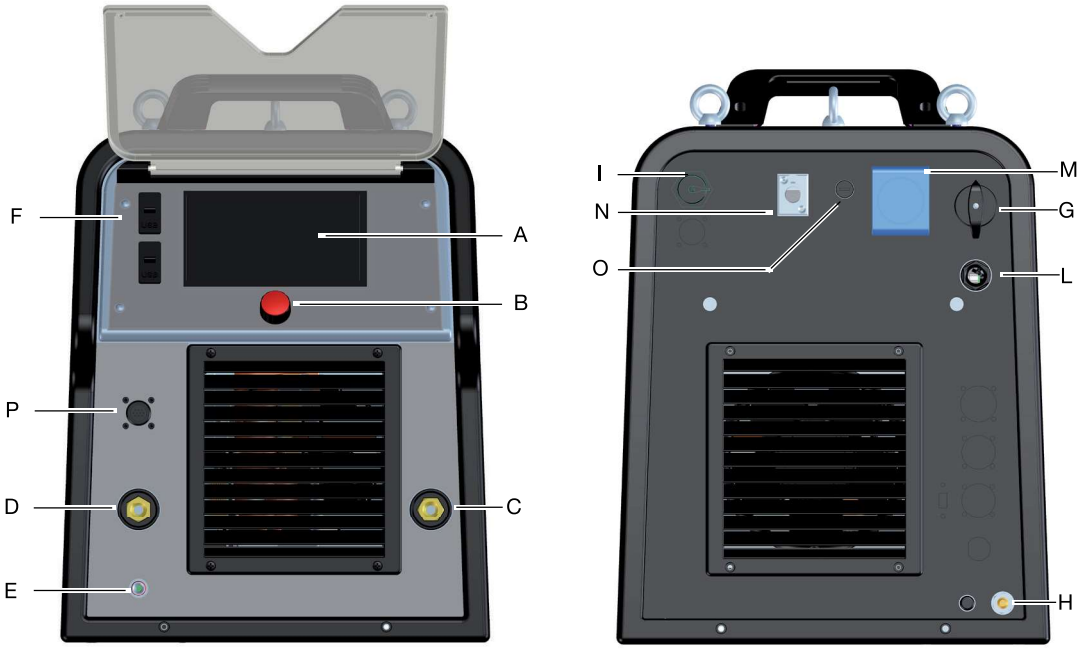
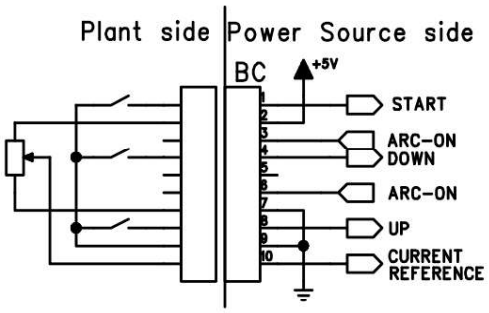


Fig. 4.1

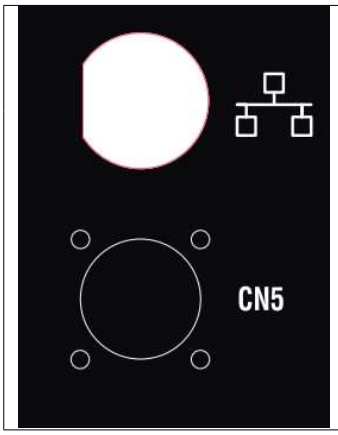
Pos.	Description
A	Display screen
B	Knob
C	Positive output terminal (+)
D	Negative output terminal (-)
E	Gas output fitting (1/4")
F	USB port
G	Switch
H	Gas inlet fitting
I	Ethernet socket
L	Mains cable
M	Cooling unit power supply circuit
N	Cooling unit pressure switch socket
O	Fuse holder
P	Torch remote control and start 10-pin connector

4.2 Front panel connectors

Pin	Description	Wiring diagram
1	**START** Digital input	
2	**+ 5 VDC** Output voltage for the power supply of the external potentiometer	
3-6	**ARC-ON** Relay contact (30 VDC 125 VAC, 0.5 A max). arc on = contact closed arc off = contact open	
4	**DOWN** Digital input for reducing the welding current setpoint	
5	n.c.	
7	**GND 0 V** Output voltage reference for the power supply of the external potentiometer	
8	**UP** Digital input for increasing the welding current setpoint	
9	**GND 0V** Output voltage reference for the power supply of the external controls	
10	**Current Ref**. Analog welding current setpoint signal	

4.3 Rear panel connectors

For connectors CN1, CN2, CN3 and CN4 refer to section 14.5.



	Ethernet 100Mbit (LAN) connector
CN5	The connector is optional and present if the optional 24 VDC power supply kit is present for external Wi-Fi router Item No 451. **Pin** / **Description** 1 / +24 VDC 2 A 2 / 0 VDC For details, refer to the instruction manual code 3301068.

4.3.1 Cooling unit connectors

The following are present in the section relating to the cooling unit shown in figure 4.1:

M Shuko **power supply socket**, maximum power 230 VAC 500 W

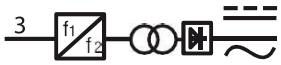
O **Fuse holder** for fuse T 2 A/230 V – Ø 5x20 mm

N **Pressure switch socket**: this socket manages the cooling unit pressure switch and unit recognition.

WARNING

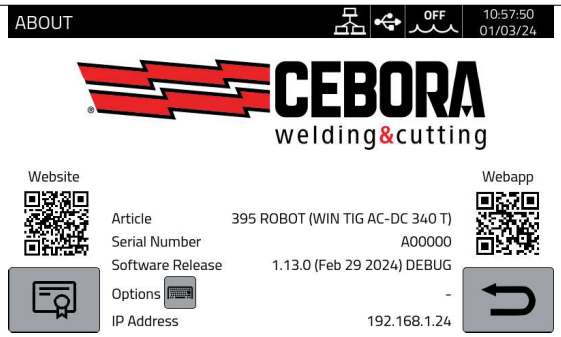
Socket M is used exclusively to connect cooling unit GRV12 Item No 1683 to the welding power source. Connecting other devices could affect the integrity of the welding power source or lead to operating anomalies. CEBORA declines any responsibility for improper use of the power source and the accessories connected to it.

4.4 Plate data symbols

No.	Serial number
	Three-phase static frequency converter
 MMA	Suitable for welding with coated electrodes
 TIG	Suitable for TIG welding
 PW	Suitable for Plasma Welding
U0	Secondary open-circuit voltage
X	Duty cycle. Indicates the interval of time, as a percentage of the reference period of 10 minutes, in which the power source can deliver the current I2 specified without interruption. For example, 60% @ 200A indicates that the power source is able to deliver 200 A current for 6 consecutive minutes followed by a 4-minute break.
Up	High-frequency ignition voltage for TIG process
U2	Secondary voltage with I2 current
U1	Rated supply voltage
3~ 50/60Hz	50 or 60-Hz three-phase power supply
I1max	Max. current consumption at the corresponding current I2 and voltage U2
I1eff	Maximum value of the actual current consumed, considering the duty cycle. This value corresponds to the capacity of the fuse (delayed type) to be used as a protection for the equipment.
IP23S	Degree of protection. The power source is protected against solid foreign bodies larger than 12 mm (IP2X) and against rain only if it is not powered (IPX3S).
	Device suitable for use in locations with increased electrical risk

5 DESCRIPTION OF DISPLAY FUNCTIONS

WIN TIG line power sources are equipped with a 7” LCD display (**A**) Fig. 1 and resistive touchscreen that can be used even when wearing welding gloves.



During start-up, for a few seconds the display presents all the information regarding the machine, the serial number, the software version, the software release date, the options installed and the IP address.

This screen can also be called up by pressing the ⓘ pushbutton in the menu.

The display then presents the main screen (factory setting).

The main screen is subdivided into sectors (S, R, Q...T see fig. 5) and each of these accepts a touch command. A description of the individual display sectors is given below.

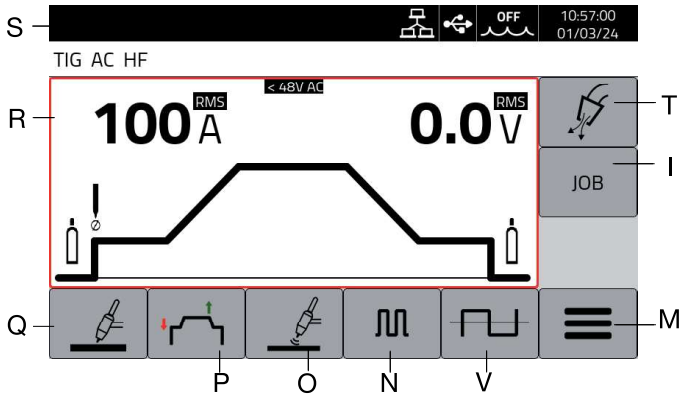
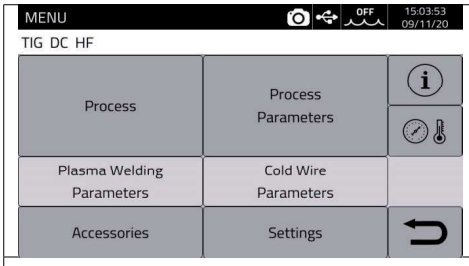


Fig. 5

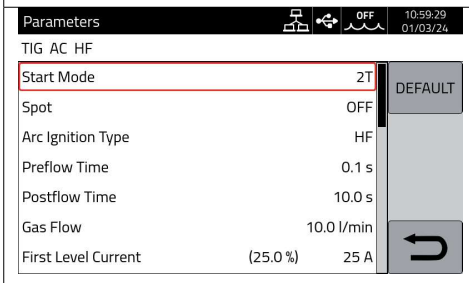
Sector	Description
S	Main screen status bar
R	Main welding parameter settings menu
Q	Selection of welding process type TIG DC, TIG DC APC, TIG XP, TIG AC, MIX AC, MMA DC, MMA AC Plasma Welding, TIG Cold Wire. (*)
P	Selection of start type: two stroke, four stroke, three level, four level.(**)
O	Selection of ignition type: HF, Lift, EVO Lift
N	Selection of DC pulse parameters (frequency, duty cycle, second current level)
V	Selection of AC process, frequency, horizontal balancing, vertical balancing, penetration waveform type and cleaning parameters.
M	Main menu for machine process setup, process parameters, accessories and settings.
I	JOB management menu
T	Gas test and motor speed menu

(*) If robot operating mode is activated, the TIG DC APC, MMA DC and MMA AC processes are not available.
(**) If robot operating mode is activated, only 2 stroke starting is available.



Main Menu

From the main menu the different submenus can be opened by touching the corresponding pushbutton



Secondary menus (submenus)

Turn knob **B** to select one item on the screen in use
Press knob **B** to enter a submenu or to enter modification mode.

Press  **BACK** to return to the previous menu.

NOTICE

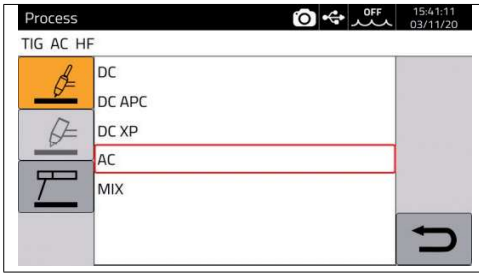
As this manual refers to software version 1.12 some screens and/or functions may differ to those of the power source used. Consult the website welding.cebora.it for the most up-to-date versions of the manuals and software.

6 TIG WELDING

Note: refer to manual code 3301084 for details of working modes and processes permitted via the robot interface.

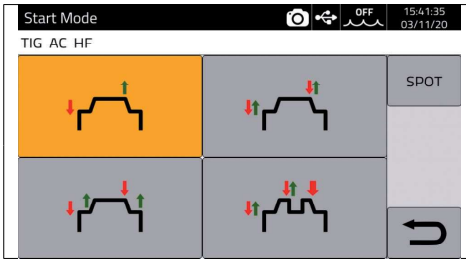
6.1 Select welding process

To choose the welding process from those available select pushbutton **Q** - Fig 5.

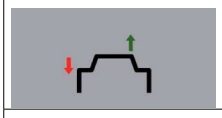
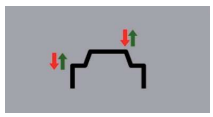
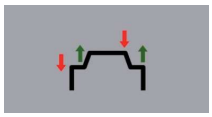
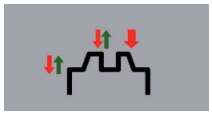
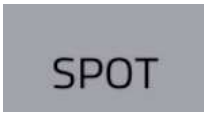
	Select the main process pushbutton **TIG:** the pushbutton turns orange. Select the relevant process from amongst those listed by turning knob **B** and confirm by pressing **B**.

6.2 Start mode

To choose the start mode, select pushbutton **P –** Fig. 5. Start modes are the same for all TIG processes.

		Start command pressed
		Start command released

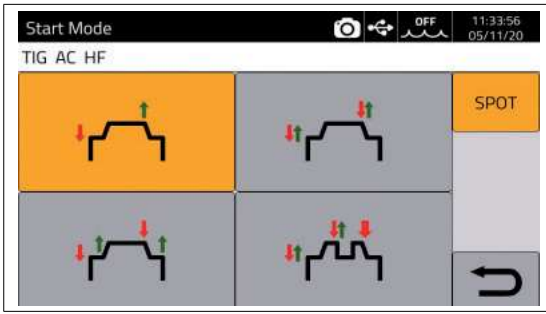
The **START** pushbutton for manual applications is present on connector **P** fig. 1.

	**2 stroke mode**	Mode appropriate for short welding bursts or automated robotised welding. Welding is started by pressing the torch trigger and ends when the trigger is released.
	**4 stroke mode**	Appropriate mode and perform long-term welding. Starting and stopping are controlled by pressing and releasing the torch trigger.
	**3 level mode**	The arc strikes when the torch trigger is pressed and the welding current remains at the 1st level for as long as the trigger is pressed. The current will be adjusted to the main current (2nd level) when the trigger is released. The next time the pushbutton is pressed, the current will be adjusted to the crater current (3rd level). When the torch trigger is released, the welding arc turns off.
	**4 level mode**	Ignition mode similar to the 4 stroke mode. The operator can switch between two levels (Main Current and Intermediate Current - see table 6.4 chap. 6.4). Welding ends when the pushbutton is pressed for longer than 0.7 seconds.
	**SPOT mode**	Spot welding mode (see section 6.2.1)

(**) If robot mode is activated, only 2 stroke mode is available.

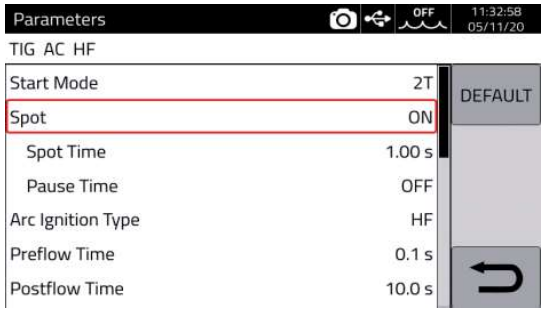
6.2.1 SPOT mode

The procedure may be used for fastening or for steel and CrNi alloy panel joint welding up to a thickness of approximately 2.5 mm. It is also possible to weld panels of different thickness placed on top of one another.



In **SPOT** mode, spot welding work can be carried out in combination with the 2 stroke and 4 stroke start modes described previously.
To activate the mode, select the **SPOT** pushbutton.
To select the **SPOT** mode parameters, follow the pathway:
Menu -> Process Parameters -> Spot

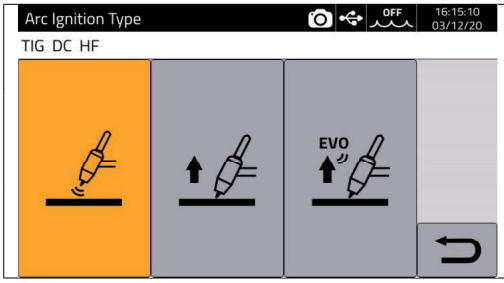
Setting **SPOT** mode parameters:



Spot	SPOT mode activation	OFF - ON
Spot Time	Weld spot duration	0.01-25.0 s
Pause Time	Time interval between two consecutive spots. (Intermittent function)	OFF–5.0 s

6.3 Arc striking modes

Weld arc ignition mode is chosen by selecting pushbutton **O –** Fig. 5.



	High-frequency ignition (**HF**)
	Contact ignition (**Lift**)
	**Evo Lift** ignition

6.3.1 HF High-frequency ignition

The arc is ignited by means of a high frequency/voltage discharge, the discharge stops as soon as welding current begins to circulate or after a timeout (3s). This type of ignition does not require the workpiece to be touched with the electrode tip. Unlike contact ignition, with HF ignition, there is no risk of contaminating the workpiece with the tungsten electrode. Always try to ignite the arc at a maximum distance of 2-3 mm from the workpiece.
When using HF ignition mode, another two parameters can be set: External HF unit (sect. 12.3.7) and HF Timeout (sect. 12.3.8).

WARNING

CEBORA WIN TIG range power sources comply with regulations governing strikers in the welding field. Take care when working with this type of procedure. Under certain circumstances, HF ignition may involve an electric shock that is perceptible but not damaging to the operator. To avoid this, wear appropriate equipment and take care not to work in wet or humid environments.

6.3.2 Lift contact ignition

This type of ignition involves the electrode coming into contact with the welding workpiece. The starting sequence is as follows:

- Touch the workpiece to be welded with the electrode tip.
- Press the torch trigger: a very low current now begins to circulate in the workpiece to be welded, which will not spoil the electrode at the stage when it is detached from the workpiece.
- Lift the electrode tip from the workpiece: the electric arc is now triggered, the required welding current begins to circulate in the workpiece and the shielding gas flow is activated.

6.3.3 EVO Lift ignition

This type of ignition is particularly well-suited for precision spot welding. It allows the workpiece to be contaminated as little as possible at the ignition point. The starting sequence is as follows:

- Touch the workpiece with the electrode tip
- Press the torch trigger.
- Lift the electrode tip; as soon as the electrode is raised, a high frequency/voltage discharge is generated which ignites the arc.

6.4 TIG parameter table

Process parameters can be set directly using the following sequence:

- press **B**
- turn **B** to select a single parameter
- press **B** to enter parameter modification mode (the parameter turns red)
- turn **B** to select the desired value
- press **B** again to exit modification mode

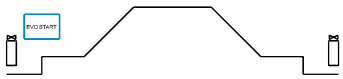
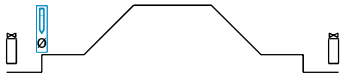
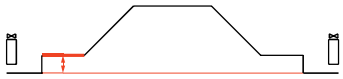
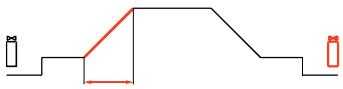
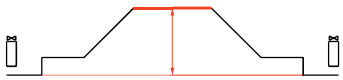
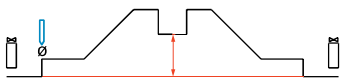
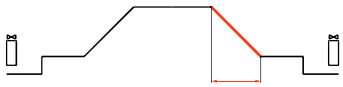
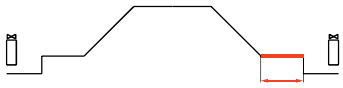
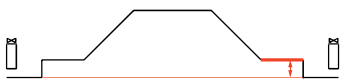
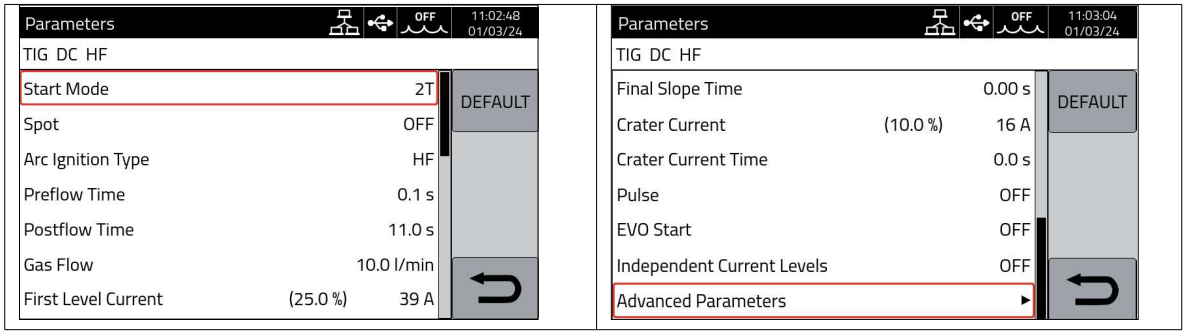
	Description	Min	Def	Max	U.M.	Sol.
	Pre-flow duration	0.1	0.1	10	s	0.1
	EVO START (**) (TIG DC HF)	OFF	OFF	1.0	s	0.1
	Hot Start AC (TIG AC, TIG MIX)	0.1	1.6	6.0	mm	0.1
	First Level Current	3	25	(I_SET)	A	1
	First Level Duration	0	0	30	s	0.1
	Initial Ramp Duration	0	1.0	10	s	0.1
	Main Current (I_SET)	3	100	I2_max(*)	A	1
	Intermediate current	5	50	I2_max(*)	A	1
	Final Ramp Duration	0	1.0	10	s	0.1
	Crater Current Duration	0	0	10	s	0.1
	Crater Current	3	10	(I_SET)	A	1
	Postflow duration	0.1	10	50	s	1 (0.1-25) s 5 (25-50) s

Table 6.4

(*) see technical specifications table in chapter 17.

The parameters set out in Table 6.4, ignition type (HF, Lift, etc.), start management (2 stroke, 4 stroke, etc.), the pulse parameters and all process parameters in general can be viewed and modified in the section ***Menu-> Process Parameters.***



If gas adjustment Kit Item No. 436 is present, the shielding gas setpoint can be set using the ***Gas Flow*** item. In the absence of this Kit, this parameter is used to count the gas delivered in weld counters.

The ***Independent Current Levels*** parameter can be used to set the adjustment mode of the First Level, Intermediate and Crater welding currents described in table 6.4:

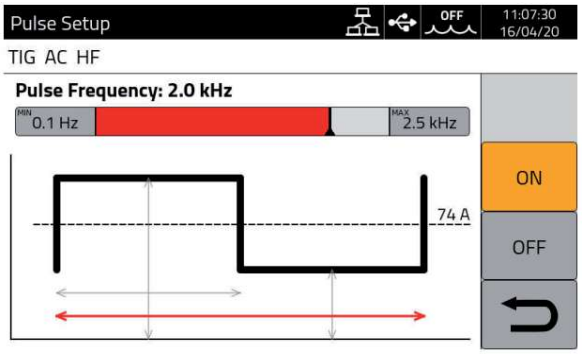
OFF	The three currents are managed as a % of the main current value (I_SET)
ON	The three currents are managed directly in Amps [A] regardless of the main current setpoint value

The ***EVO Start*** parameter generates a set of pulses at the start of the welding process to improve the joining of the two strips of material to be welded. The setting for this parameter depends on the geometrical shape of the parts to be welded.

The ***Advanced Parameters*** submenu contains the other TIG process settings, intended for use by expert welders and for which it is advisable to contact technical assistance.

6.5 Pulse Menu

The welding current, particularly on thin sheets, can lead to the weld bath dripping downwards if the current is high, or ineffective melting if the current is low. The TIG **Pulse** function is useful in such cases.
The TIG **Pulse** function can be used to quickly melt small sections of the weld spot, which re-set just as quickly. The TIG-Pulse function is used for welding thin sheets.
To access the Pulsed TIG parameters, select pushbutton **N –** Fig. 5, or select
Menu -> Process Parameters -> Pulse



Turn **B** to parameter to be changed, then press **B** to modify the parameter.
The current value shown on the right against the dotted line is the average set current.

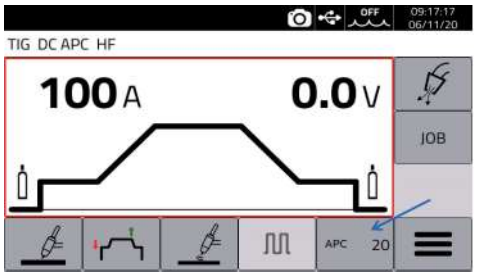
Parameter		Min	Def	Max	U.M.	Sol.
	Duty Cycle	10	50	90	%	1
	Pulse level	0	50	100	A	0.1
	Pulse frequency	0.1	1.0	2.500	Hz	0.1 (min)

Table 6.5

In pulsed TIG welding, the pulse level parameter performs the task of keeping the arc ignited and sufficiently fluid between two successive pulses; when the current level is high, the droplet is detached from the filler rod. The pulse frequency is particularly significant. Increasing the frequency makes the arc more stable and narrower, and penetration into the workpiece therefore increases. On the other hand, the duty cycle affects weld heat input.

7 TIG DC APC

The TIG DC APC (Active Power Control) process ensures that a constant heat input to the workpiece is maintained. When the arc length is reduced and therefore weld voltage is reduced, the current is automatically increased. Conversely, if arc length is increased and weld voltage increases accordingly, the current is automatically decreased. The operator then controls the heat gain and penetration just by moving the welding torch.
The current variation amplitude per unit of voltage is adjustable by means of the APC Regulation parameter: e.g. if 20 A/V is set and during welding the welding voltage increases by 1 V in relation to the TIG process nominal voltage, then the current decreases by up to 20 A in order to restore nominal voltage.
To activate the welding process, press pushbutton **Q** - Fig. 5 on the main screen and then select DC APC using knob **B**.



Select the display pushbutton shown in the figure and turn knob **B** to set the desired correction value.

The correction value can be set from the main screen or in the **Process parameter** menu: ***Menu -> Process Parameters -> APC Regulation***

APC Regulation	Min	Def	Max	U.M.	Sol.
	1	20	80	A/V	1

Note: the APC process is not available when robot mode is activated.

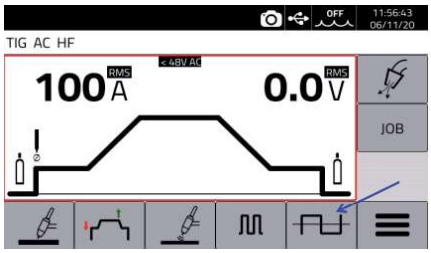
8 TIG DC XP

TIG DC XP (eXtra Pulse) is a welding process where the current pulses at very high frequency and creates a more concentrated and penetrating weld bath, as well as excellent acoustic comfort. Using this process enables higher welding speeds to be achieved than with the standard TIG DC process. Using this process, it is possible to set all applicable parameters for the standard TIG DC process, including pulse (but only up to 300 Hz, see Tab. 6.5).
To activate the welding process, press pushbutton **Q -** Fig. 5 on the main screen and then select **DC XP** using knob **B**.

9 TIG AC

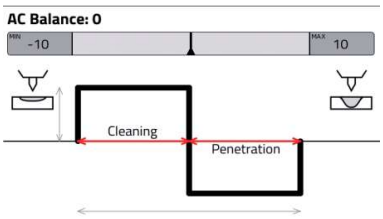
Note: the TIG AC process is not supported by TIG DC power sources Items No 380, 381.
AC welding is used to weld aluminium and aluminium alloys. The procedure involves continuous changes in the polarity of the tungsten electrode. Two phases are available (half-waves): a positive phase and a negative phase. The positive phase causes the aluminium oxide layer on the surface of the material to break down (cleaning effect), while at the same time a cap forms on the tungsten electrode tip. The size of this cap depends on the length of the positive phase. It should be noted that an over-large cap leads to a diffuse and unstable arc with reduced penetration. The negative phase cools the tungsten electrode while generating the necessary penetration. It is important to choose the correct time ratio (balance) between the positive phase (cleaning effect, cap size) and the negative phase (penetration depth). This requires the AC balance to be set. The factory setting is a zero balance.
To activate the welding process, press pushbutton **Q** - Fig. 5 on the main screen and then select AC using knob **B**.

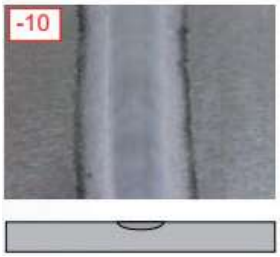
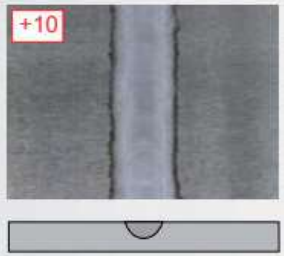
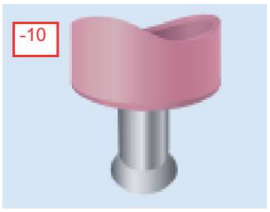
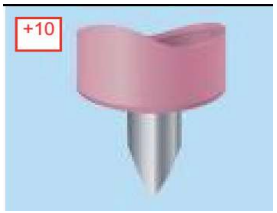
The TIG AC process shares most of the parameters already described for the TIG DC process (chap. 6) with the addition
of a set of specific parameters for the AC part**.**
To set them, go to ***Menu -> Process Parameters*** or use the dedicated screen.



From the main screen, select pushbutton **V –** Fig. 5, to set the parameters of the **TIG AC process.**
Turn knob **B** to select the parameter. Press **B** to enter parameter modification mode.

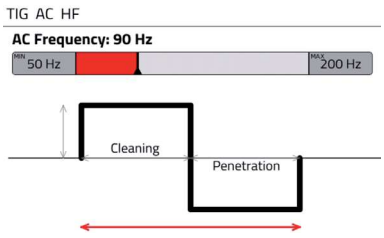
9.1 Balancing AC

	Adjust the duration of the penetration phase as a percentage of the duration of the cleaning phase. The longer the cleaning phase, the more the electrode is rounded.

	Min	Def	Max
Balancing	-10	0	+10
Cleaning	50%	33%	16%
Penetration	50%	67%	84%
Oxidation			
Electrode rounding	 high	moderate	 low

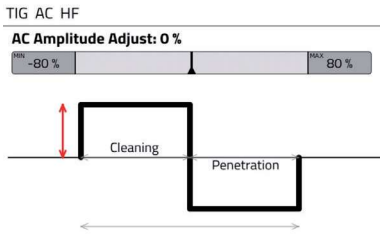
9.2 Frequency AC

Adjusting the frequency of the output waveform.
Increasing frequency AC decreases the width of the weld bath and makes the arc more stable, precise and manageable.

	Description	Min	Def	Max	U.M.	Sol.
	Frequency of the alternating output current	50	90	200	Hz	1

9.3 Amplitude AC adjustments

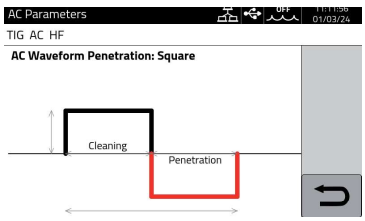
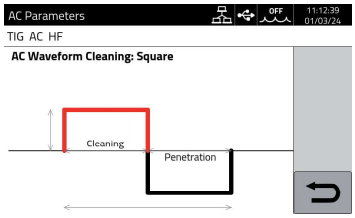
Adjustment of the cleaning half-wave amplitude in relation to the penetration half-wave.
This parameter can be used to control the heat on the workpiece and to improve the wear and rounding of the electrode.

	Description	Min	Def	Max	U.M.	Sol.
	Cleaning half-wave amplitude adjustment	-80	0	80	%	1

AC Amplitude Adjust	Description
-80%	Increased penetration and heat input, high welding speed, less electrode rounding, oxide removal area barely visible
+80%	Lower heat input, greater electrode rounding, oxide removal area highly visible.

9.4 AC waveforms

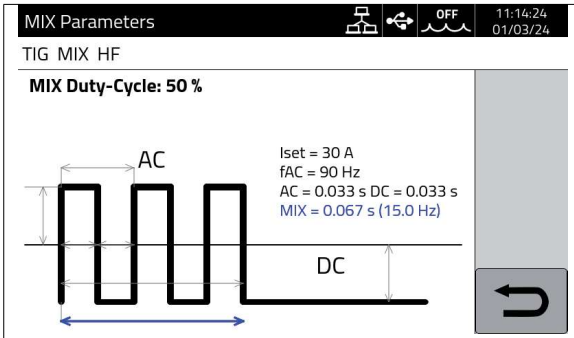
Independent adjustment of the penetration and cleaning half-wave form.

	Description
	**AC Waveform Penetration** Square Sine Triangular
	**AC Waveform Cleaning** Square Sine Triangular

AC waveform	Description
Square	Maximum bath control, high speed, stable arc and high noise level
Sinusoidal	Soft arc, high acoustic comfort and high melting of base metal
Triangular	Reduced heat input, high welding speeds, low workpiece deformation on thin sheets

10 TIG MIX

The purpose of this welding is to obtain greater penetration than with alternating current welding on aluminium and it is suitable for welding different thicknesses.
Greater penetration is obtained by alternating an AC (cleaning) phase with a DC (penetration) phase.
To activate the welding process, press pushbutton **Q -** Fig. 5 on the main screen and then select **MIX** using knob **B.**



On the main screen select pushbutton **Z -** Fig. 5.
Turn knob **B** to select the parameter.
Press **B** to enter parameter modification mode.

For the AC phase it is possible to adjust all the parameters already described in chap. 9 for the standard TIG AC process, with the addition of the number of AC waves in order to define the duration of the welding section.
The duty-cycle parameter defines the AC welding time as a percentage of the total MIX period: e.g. 50% means that the duration of the AC welding is the same as the DC welding.
For the DC welding section it is also possible to vary amplitude in relation to AC amplitude: e.g. 0% DC amplitude is equal to the RMS value of AC.

Parameter	Min	Def	Max	U.M.	Sol.
Duty Cycle	5	50	95	%	1
Number of waves	3	3	200	-	1
DC amplitude adjustment	-80	0	+80	%	1

All the significant parameters of the MIX waveform are shown and recalculated in real time on the right-hand side of the dedicated screen in order to facilitate adjustment by the welder.

Note: the TIG MIX process is not supported by TIG DC power sources Items No 380, 381.

11 MMA WELDING

WIN TIG range power sources are able to manage the MMA process in DC and AC mode. This welding machine is suitable for welding all types of electrodes, with the exception of cellulosic (AWS 6010).

- Make sure that the Power On switch is in position 0 (OFF), then connect the welding cables, respecting the polarity required by the manufacturer of the electrodes that you will be using and the terminal of the earth cable to the workpiece is at the closest point to the weld, ensuring that the electrical contact is good.
- Do not touch the torch or the electrode holder and the earth clamp simultaneously.
- Turn on the machine using the Power On switch.
- Select MMA process.
- Adjust the current based on the electrode diameter, welding position and type of weld to be made.
- After welding, always switch off the power source by removing the electrode from the electrode holder.

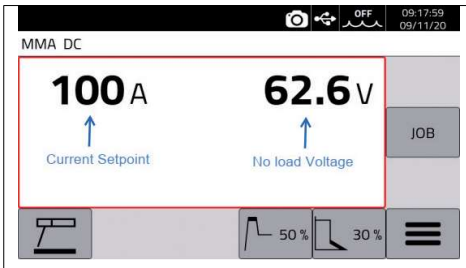
WARNING

Beware of electrical shocks
When the main switch is in ON position, the electrode and the non-insulated part of the electrode holder are live. Therefore, make sure that the electrode and the non-insulated part of the electrode holder do not come into contact with electrically conductive or earthed persons or components (e.g. outer casing, etc.).

Note: the MMA process is not available when robot mode is activated.

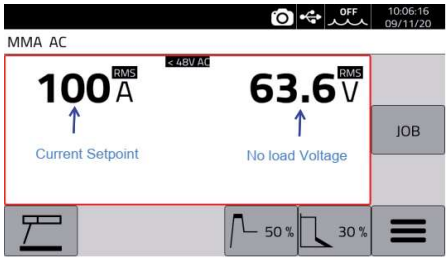
11.1 MMA DC Process

In section **Q** - fig. 5 of the main screen, select **DC**

	MMA DC Process main screen

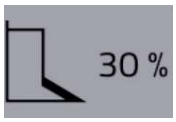
11.2 MMA AC Process

In section **Q** - fig. 5 of the main screen, select **AC**

	MMA AC Process main screen

In the MMA AC this process, the output current frequency is 50 Hz and the output waveform is square.

11.3 MMA process parameters

	Description	Min	Def	Max	U.M.	Sol.
	**Hot Start** Improves ignition even when using electrodes with poor ignition properties	0	50	100	%	1
	**Arc Force** 0 voltaic arc with little spatter, barely defined 100 voltaic arc with spatter, but stable	0	30	100	%	1
	Hot Start Time To be adjusted according to the diameter of the electrode to be welded	0	0.15	1.00	s	0.01
	Antistick Function that prevents the electrode from bonding to the workpiece	OFF	ON	ON	-	-
	Cut off Voltage Arc cut-off voltage. Once the set voltage is reached, the arc is extinguished, avoiding optical flashes and preserving the electrode for subsequent ignitions.	OFF	70	70	V	1
	VRD This function reduces power source no-load voltage, required in environments with a high explosion risk.	OFF	OFF	ON	-	-

Note: **MMA AC** process and **VRD** functions not available in 380, 381 power sources

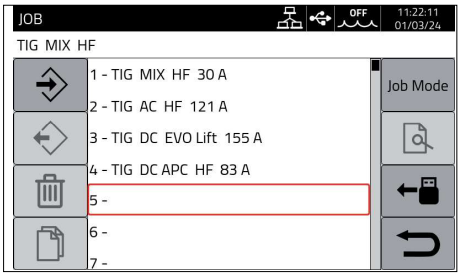
12 OTHER PANEL FUNCTIONS

12.1 JOB management

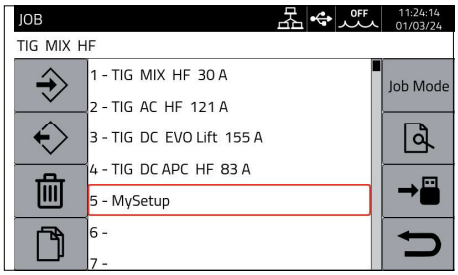
The storage of the welding parameter setup can be managed from the JOB screen.
There are 99 memory slots available in the internal memory of the power source.
To open the JOB screen, press pushbutton **I** fig. 5.
The operations that can be carried out on a JOB are:

	Save (section 12.1.1)
	Retrieve (section 12.1.2)
	Delete (section 12.1.3)
	Copy (section 12.1.4)
	Display parameters (section 12.1.5)
	Save JOBs on USB drive (section 12.1.6)

12.1.1 Saving a JOB

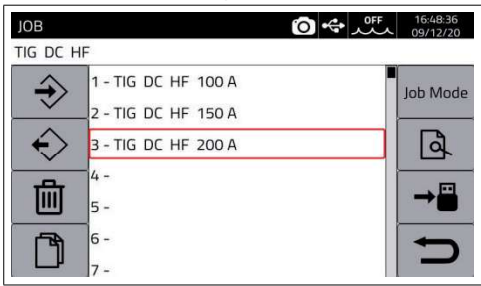
	Select a memory position using knob **B.** Save by pressing the key  If the position is NOT empty, confirmation that it is to be overwritten will be requested.
	Enter the name of the JOB and press the tick to confirm (optional)

12.1.2 Retrieving a JOB

	Select the memory position with the JOB in question (e.g. Job 5). Press pushbutton  to reload all the parameters saved in that JOB in the main working screen.

Any modification of the parameters can be saved either on the JOB itself or by creating a new one (section 12.1.1).

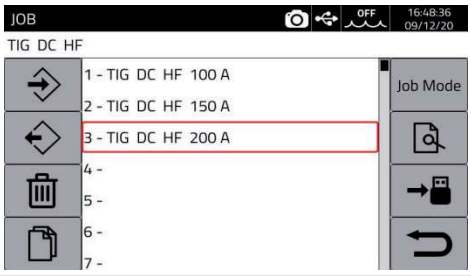
12.1.3 Deleting a JOB



Select the JOB memory position by turning knob **B**

Press pushbutton and the JOB will be deleted.

12.1.4 Copying a JOB

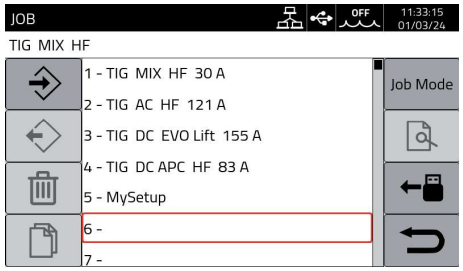


Select the memory position of the JOB to be copied by turning knob **B**

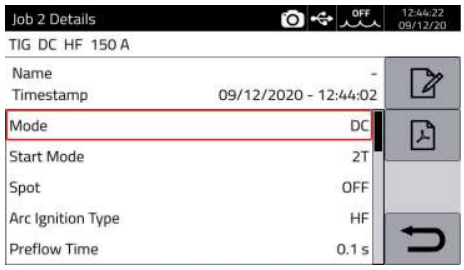
Press and the JOB will be copied to the memory.

Select a free memory location using **B** and press : the Job will be copied to the new position.

12.1.5 Displaying a JOB



Press pushbutton to display the parameters saved to a given memory slot without having to load the JOB beforehand



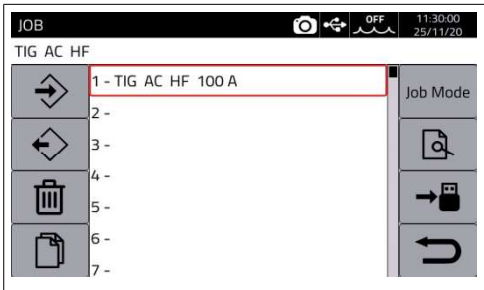
The following pushbuttons can be used:

to edit the JOB name.

export all settings saved in the JOB in PDF format to a USB drive.

12.1.6 Saving and loading an individual JOB from a USB drive

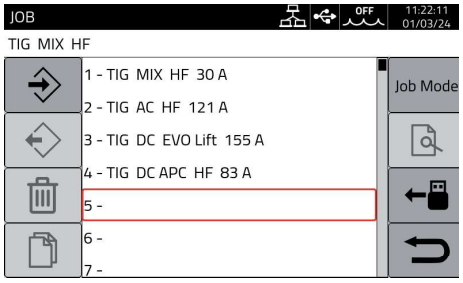
To save an individual JOB onto a USB drive:



Insert a backup drive into a USB port.
Select the JOB to be saved by turning **B.**

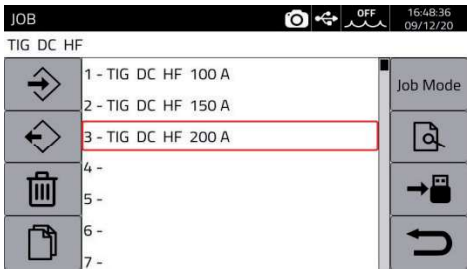
Press the pushbutton .
The JOB is saved as a ZIP file.

Loading an individual JOB from a USB drive:

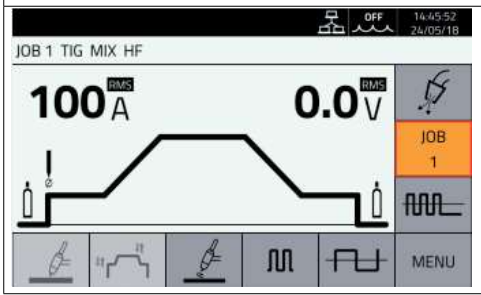


Insert a backup drive into a USB port.
Turn B and select a free memory position where the JOB is to be loaded.
Press pushbutton  and confirm by pressing **B**.
Select the ZIP file relating to a previously saved job from the USB drive.
The JOB is loaded in the chosen position.

12.1.7 Welding in JOB mode



Press the **Job Mode** pushbutton to activate JOB mode (the pushbutton turns orange).
Select the desired JOB using knob **B** and press to activate.



The **Job Mode** operating mode is active with the selected JOB (1 in the example).
Turn knob **B,** or, if present, use the UP/DOWN torch pushbuttons to call up the other memorised jobs in sequence.

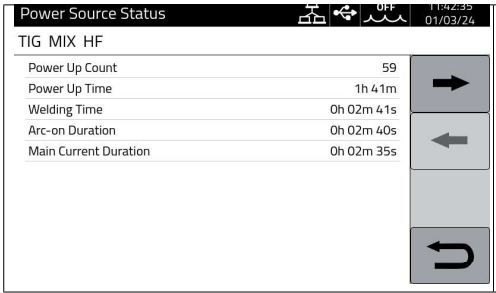
A JOB can be changed when the machine is in standby or while it is delivering current, provided the process of the new JOB is compatible with the one in use.
Switching between JOBS with the arc on is NOT allowed between processes:

- TIG <-> MMA
- TIG <-> PW
- TIG DC XP <-> TIG not DC XP

To exit JOB mode, return to the JOB management screen and click on the JOB Mode pushbutton again (the pushbutton turns grey).

12.2 Power source status menu

The power source status menu displays information about the welding time, number of ignitions, power source internal temperatures, amount of wire delivered, fan speed, gas pressures and flow rates.
To access the power source status menu, select ***Menu ->*** 



Use the arrows to scroll the various pages

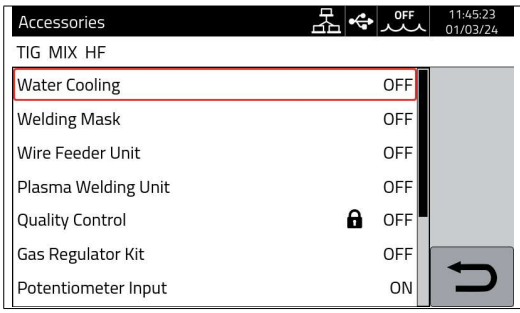
12.3 Accessories menu

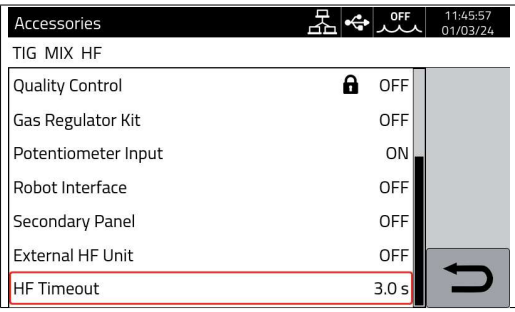
Activate the various accessories available for the power source from the following menu.

NOTICE

External welding system accessories must be connected to the power source before powering up. Connecting/ disconnecting accessories while the power source is switched on leads to system malfunctions and under extreme circumstances could compromise the integrity of the welding system. CEBORA does not provide warranty coverage for inappropriate use of the welding system.

To access the Accessories menu, select ***Menu->Accessories***





12.3.1 Cooling unit

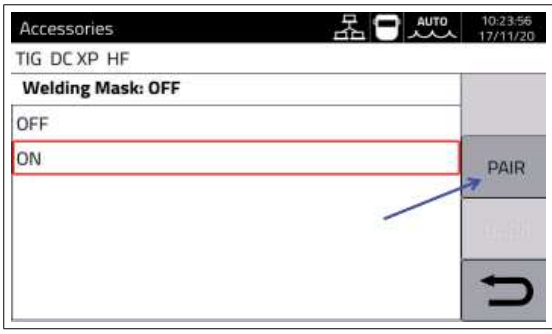
The cooling unit to be used with the WIN TIG power source is Item No 1683 - GRV12.
This accessory is optional on power sources Item No 380 and 394, while it is standard on other power sources Item No 381, 395, and 396.
The status bar **S** shows the cooling unit icon and unit status is shown in the upper part of the icon: OFF, ON, AUTO.



Knob **B** is used to select/activate the operating mode:
OFF Cooling unit disabled.
ON Cooling unit always on.
AUTO Cooling unit operates in synchrony with the welding process

12.3.2 Welding mask

T-LINK system that resets reaction time of the filter mounted on the welder's mask wirelessly, ensuring maximum eye protection and reduced eye fatigue. For details, refer to the user manual for Item No 434.



Select **ON** and press **PAIR** to pair a mask with the power source. If the mask is recognised, the icon appears in section **S** of the display .

To check the function, press the “DARK” key on the display and ensure the mask glass goes dark.

12.3.3 Gas regulation Kit

The kit allows precise adjustment of the gas flow during welding and can only be used for TIG type processes. For details, refer to the Item No 436 user manual.

12.3.4 Potentiometric input

Manage the potentiometric input on connector P (fig. 4.1) to partialise the current setpoint.

ON	Input activated
OFF	Input deactivated
OFF in SPOT	Input activated except in spot welding mode (see section 6.2.1).

12.3.5 Secondary panel

The WIN TIG series power sources can manage the remote panel accessory Item No 438. This panel can be used to set the main welding parameters in TIG processes. For more details, refer to the instruction manual of kit Item No 438.

NOTICE

For proper system operation, before connecting an external accessory, refer to the terminal table in section 14.3

12.3.6 Quality Control

Please refer to the user manual for the accessory Item No 273 code 3301266.

12.3.7 External HF unit

This setting is necessary to allow the power source to operate with an external HF cassette Item No 450.00. This remote ignition unit is used in systems where the torch is over 5 metres long. Using an external ignition unit means that high frequencies do not need to cover long distances, which would create excessive electromagnetic interference in the surrounding environment and HF power loss. For details, refer to the Item No 450.00 manual code 3301161.



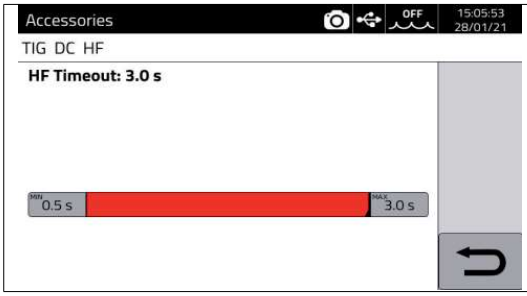
Select ***Menu -> Accessories -> External HF Unit.***

OFF default setting. The external HF unit cannot be used. The power source's internal HF unit is used for ignition.

ON the ignition power source internal HF is disabled and it is necessary to use the External HF unit for TIG applications.

12.3.8 HF timeout

This parameter allows HF duration to be changed during ignition. Once the timeout has elapsed, if the welding current is not circulating in the workpiece, the Start sequence must be repeated in both manual and robotised operating modes. This setting is useful for minimising interference generated by high frequency when ignition does not take place.

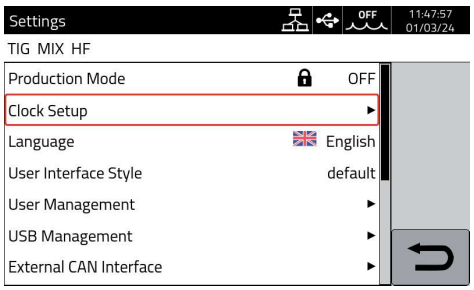


Select ***Menu -> Accessories -> HF Timeout***

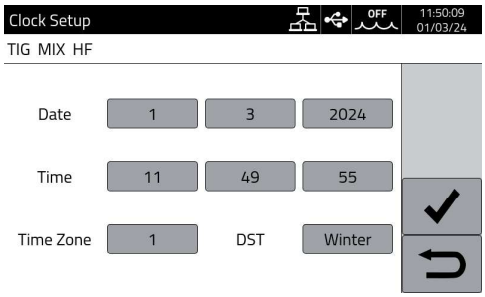
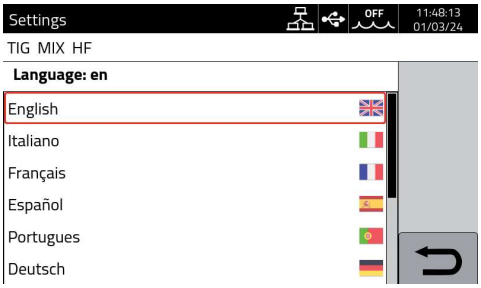
The default setting is 3s.

12.4 Settings Menu

This menu is used for the welding power source basic settings:

	Press ***Menu -> Settings*** to access the power source settings page.

12.4.1 Setting the clock, language

	Select ***Clock Setup*** and press **B.** Turn **B** to select the item to be set**.** Press **B** to confirm the item**.** Turn **B** to set the desired value. Press **B** to confirm the change**.**
	Select ***Language*** and press **B.** Turn **B** to set the desired language. Press **B** to confirm**.**

The user interface style can be selected in the same way: ***User Interface Style***

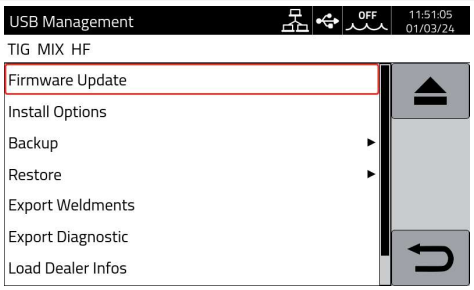
12.4.2 Production mode

For production mode, please refer to the manual for Item No 817 code 3301254.

12.4.3 USB management

This option can be used to carry out various operations with a USB pen drive inserted into one of the two USB ports on the power source front panel.

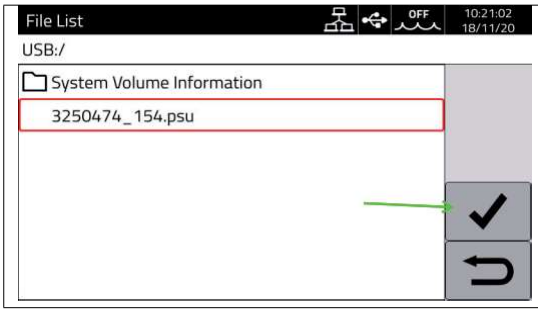
When a USB pen drive is inserted into one of the two USB ports, the status bar shows the icon 

	Select ***Menu -> Settings -> USB Management***. Turn **B** and select the relevant option

Press the eject pushbutton before removing the pen drive from the USB port. 

Firmware Update

Select this item to update the power source firmware.
The update operation does not mean that programs and welding data contained in the machine will be lost.
The update file loaded onto the USB pen drive must have the extension .psu.
Insert the pen drive into the power source USB port.

	Turn **B** and select ***Firmware Update.*** On the **File List** page, select the file to be loaded by turning **B** and confirm using the button with the checkmark indicated. Removal of the USB pen drive will then be requested and the machine will proceed with the update. After the update, the machine will restart by itself.

Install Options

Select this item to install optional software packages by uploading the activation code from a file on the USB pen drive.

Settings backup

Use this item to create a backup file of the power source settings.
It is possible to save all data, JOBs only or user configuration only.



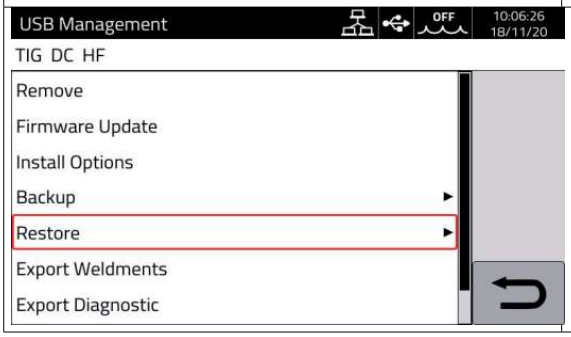
Turn **B** and select ***Backup.***
Select the relevant option.

All	Back up the jobs and user settings
Jobs Only	Back up jobs only
Users Only	Back up only the available user list using the option Item No 809

Loading settings

Use this item to reload settings previously saved as a file on a USB pen drive.

Turn **B** and confirm ***Restore***	Select the relevant option.

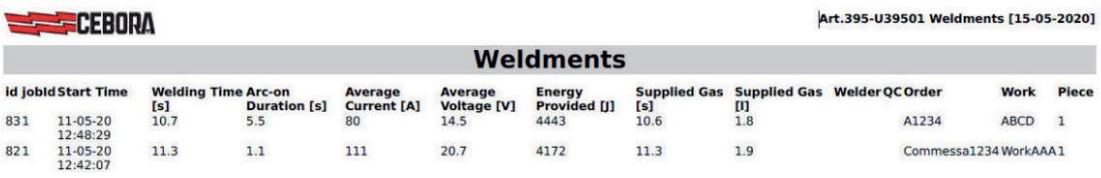




All	Restores all settings
Jobs Only (delete exisiting)	Restores the JOBs saved in the file and erases the existing ones
Jobs Only (overwrite exisiting)	Restores the JOBs saved in the file and overwrites the existing ones
Jobs Only (keeping exisiting)	Restores the JOBs saved in the file and retains the existing ones
Users Only	Restore only the list of users (Item No 809)

Weld export

A collection of information and data relating to the welds performed can be saved on a USB pen drive for archiving and/or further processing by the end customer.


CEBORA

Art.395-U39501 Weldments [15-05-2020]

Weldments

Id job	Start Time	Welding Time [s]	Arc-on Duration [s]	Average Current [A]	Average Voltage [V]	Energy Provided [J]	Supplied Gas [s]	Supplied Gas [l]	Welder QC	Order	Work	Piece
831	11-05-20 12:48:29	10.7	5.5	80	14.5	4443	10.6	1.8		A1234	ABCD	1
821	11-05-20 12:42:07	11.3	1.1	111	20.7	4172	11.3	1.9		Commessa1234	WorkAAA	1

These data can be exported in CSV or PDF form (in this case max. 1000 records per file).
The same data can be exported from a webapp with a PC connected to the power source via a LAN, using the Ethernet port fitted to each power source (section 12.4.4).

Export Diagnostic

Exports diagnostic data on errors that have occurred in the welding machine power source to a USB drive. The exported file is in PDF format.
The diagnostic data can also be exported from the webapp as described for Weldments.

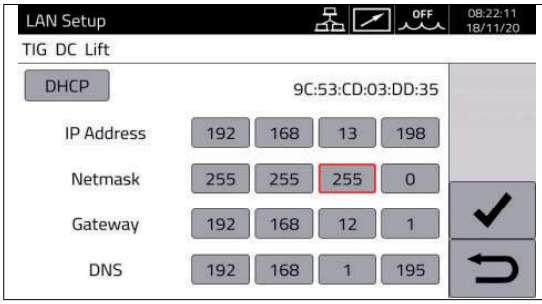
Load dealer's details

Allows the start-up screen to be customised with the dealer's details and logo (see section 12.6). For details, consult manual code 3301269.

12.4.4 LAN setup

The power source is equipped with a 100Mbit Ethernet port with built-in web server that can be connected to a LAN and therefore communicate with personal computers and other devices connected to the LAN quickly using standard protocols.
The network card MAC address is shown at the top right of the configuration screen.

Network configuration
Connect the Ethernet network cable to the connector on the back of the power source.



Select ***Menu -> Settings -> LAN Setup***
Turn **B** to select the desired field and press B to confirm, then change the desired values.
Confirm the address using the pushbutton with the checkmark.
Exit the menu by pressing the return pushbutton.

The network can be configured in manual or automatic mode.

DHCP not activated (Manual mode)	Set the value of each field between 0 and 255 for IP Address and Netmask. The Gateway and DNS fields can be left at 0.0.0.0 (they are currently unused). Confirm the configuration by pressing the pushbutton with the checkmark.
DHCP activated (Automatic mode)	If a DHCP server is configured in the network for automatic address allocation, select the DHCP pushbutton at the top left, then confirm using the pushbutton with the checkmark. Use the pushbutton ***MENU ->*** *Information* to check the IP number currently used in the power source.

If network communication is correctly established, a fixed icon appears on the status bar  .

Connection via browser
Start a browser (e.g. Google Chrome) on a personal computer and enter https://<IP Address> of the power source in the browser address bar (for example:https://192.168.14.157) and press Cebora to open the Cebora webapp homepage.

Certificate
Because connection is via the https secure profile (encrypted), up-to-date browsers display an information message regarding the trustworthiness of the site visited (the power source).
To overcome this check, a Trusted Root Certificate (file.crt) must be installed on your PC to allow connection to the entire power source family without further warnings.

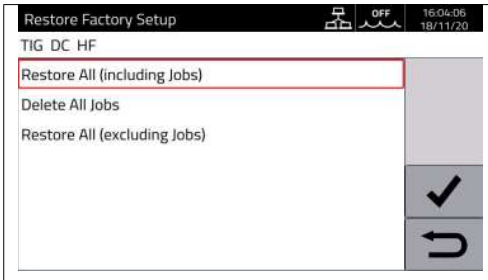
The file can be downloaded directly from the webapp via the icon  in the bottom left-hand corner (see chap. 13).
The certificate input procedure depends on the browser used and the type of operating system. For Chrome for Windows, go to:
Settings -> Advanced -> Privacy and security -> Manage certificates.

12.4.5 Advanced functionalities

For integration in advanced IT systems as required by Industria 4.0, the power source displays an API REST open interface that allows data exchange through standard commands. Detailed documentation on the application protocol is available on request.

12.4.6 Restore factory setup

Select this item to restore factory settings.



Select ***Select Menu -> Settings -> Restore Factory Setup***
Turn **B** to select and confirm the relevant option.

Restore All (Including Jobs)	Restore everything, which will also delete saved Jobs.
Delete All Jobs	Delete only all saved Jobs
Restore All (Excluding Jobs)	Restore all factory settings except saved Jobs.

12.4.7 User management

In WIN TIG range power sources, users who use the power source can be managed by subdividing them according to profile. Depending on their profile, they can or cannot use certain welding machine power source actions.

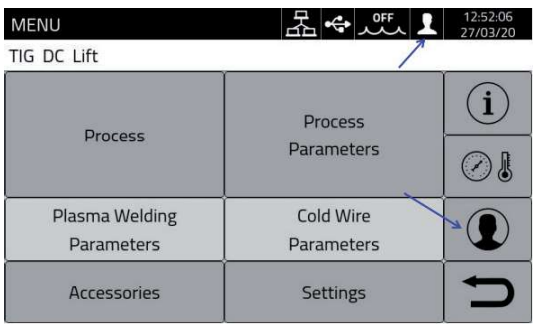


Select ***Menu -> Settings -> User Management***.
Select the relevant option:
OFF: User profile management not enabled
Basic: User profile basic management
Advanced: Advanced user profile management, available with software package Item No 809 (see manual code 3301265).

BASIC mode

BASIC mode includes three profile types:

Profile	Description	Pin	Default PIN	Icon
Normal	Only settings essential for welding are allowed	No	No	White
Expert	All settings for welding and accessories are allowed.	1-4 numerical characters	5555	Green
Administrator	All adjustments and machine settings are allowed	1-8 numerical characters	9999	Red

To access the desired profile, use knob **B** or press the desired button directly. Then push the *login* pushbutton	The icons shown in the figure will appear after selecting the profile type
	

A PIN number is required to access the Expert and Administrator profiles.
To change the PIN, select pushbutton and enter the new PIN.

Controlled functionalities.

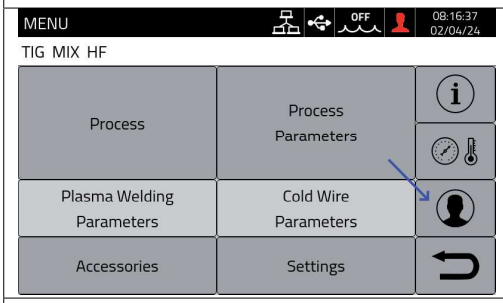
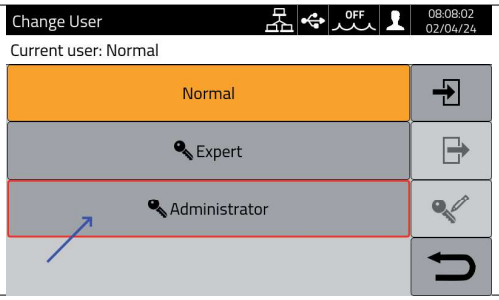
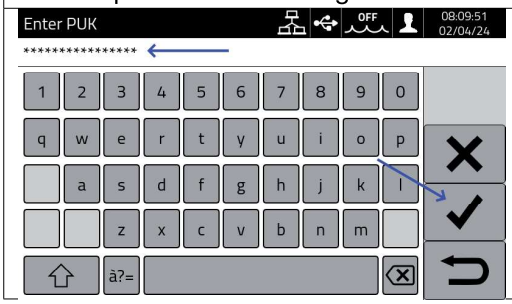
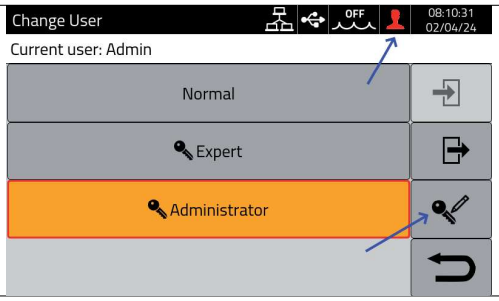
A list of possible functionalities that may change according to access type is given below.

Functionality	Normal	Expert	Admin
Process change (TIG – PW – MMA)	NO	YES	YES
TIG process mode change (DC/APC/XP/AC/MIX)	NO	YES	YES
TIG advanced parameters	NO	YES	YES
JOB management (save, delete, copy/paste, rename)	NO	YES	YES
JOB Mode activation/deactivation (ON/OFF)	NO	YES	YES
Use of JOBs (if JOB Mode= ON, only retrieve if JOB Mode= OFF)	YES	YES	YES
Access the Settings menu	NO	NO	YES
Web application (webapp)	NO (1)	YES (2)	YES (2)

(1) Access to the service panel is only available in “read” mode (e.g. Restore operation is not allowed).
Access to the control panel is not available.
(2) Full access and operation of both the service panel and control panel.
Log in using the pin of the respective user profile to access the control panel

PIN recovery procedure

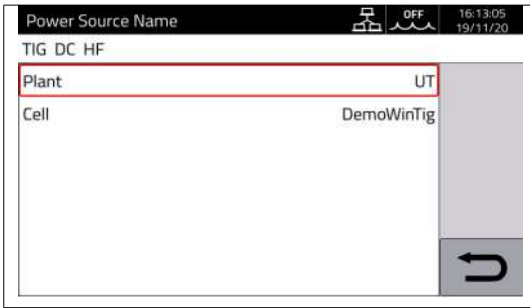
When a Normal or Expert user PIN is forgotten, simply login as Admin and reset a new user PIN.
When the Administrator PIN is forgotten, a general unlock code (PUK) requested from CEBORA assistance must be entered. The PUK is a 16-digit alphanumeric code that is different for each power source. After receiving the PUK, carry out the following procedure:

Open the user profile selection screen	Select the Administrator user profile, press knob B for at least 3 seconds
	
Enter the 16-digit PUK code and confirm with the pushbutton bearing the checkmark	**Set the new PIN for the Administrator profile**
	

ADVANCED mode
Please refer to the manual of Item No 809 code 3301265.

12.4.8 Allow JOB adjustment
Set this item to ON to be able to partially modify the setup of a JOB in use with JOB mode activated.

12.4.9 Name of power source and system
In this section a power source can be assigned a name related to the system and to the welding cell.

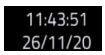
	Select ***Menu -> Settings -> Power Source Name*** Select the relevant item and enter the desired description

12.4.10 MQTT configuration
See manual code 3301267

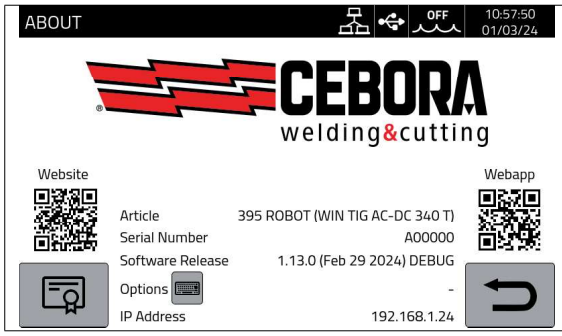
12.4.11 Calibration mode
Enables the power source calibration mode for the authorised technical assistance.

12.5 Status bar

Main menu sector **S –** Fig. 5 contains information on power source status

Symbol	Description
	Cooling unit: the cooling unit can be quickly deactivated or activated by tapping the icon.
	Indicates that Remote Control Item No 187 or Item No 193 is installed
	USB pen drive inserted: tap the icon for quick access to the USB management menu (see section 12.4.3)
	LAN connection activated: tap the icon for quick access to the LAN settings (see section 12.4.4)
	User management active: tap the icon for quick access to the user settings (see section 12.4.7)
	Robot interface active
	Displays the current data and time

12.6 Information Menu



To access the information menu:

Menu-> 

To open the power source page on the CEBORA website automatically, scan with a smartphone the QR code on the left.
To open the webapp automatically (chap. 13) scan with a smartphone the QR code on the right.
Turn **B** to display the distributor's information, where available (see manual code 3301269).

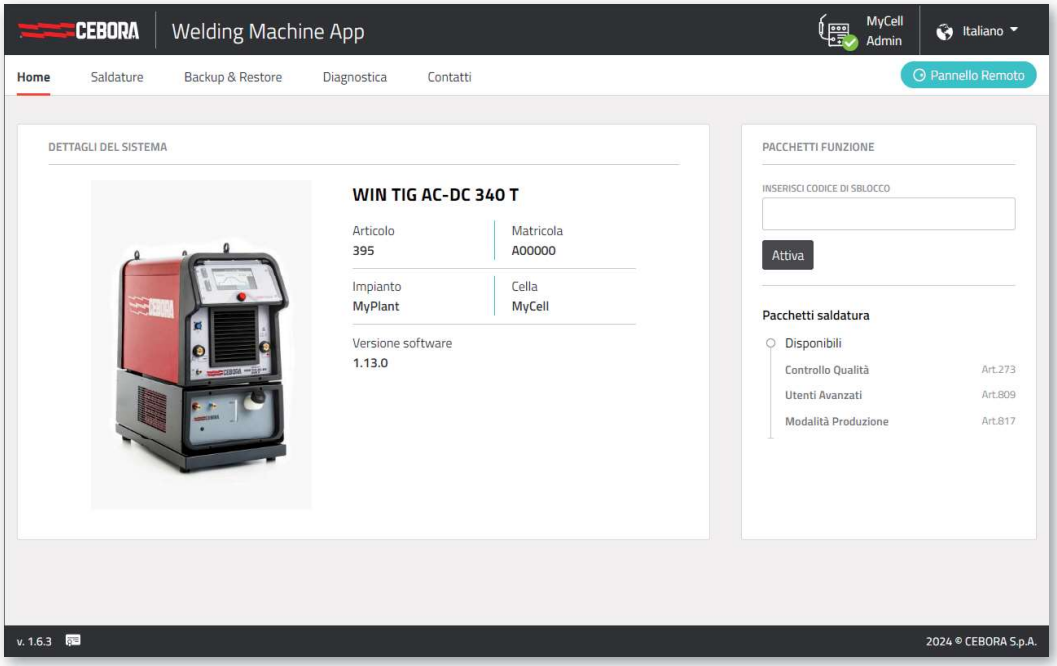
12.6.1 Option activation

The  pushbutton can be used to manually enter the activation code of the optional software packages.

13 WEB APPLICATION

WIN TIG range power sources have a built-in webserver that allows access to machine functions through an Ethernet link.
To configure the webserver, set the LAN parameters (see section 12.4.4).
The web application (Webapp) consists of a Service Panel from which it is possible to:

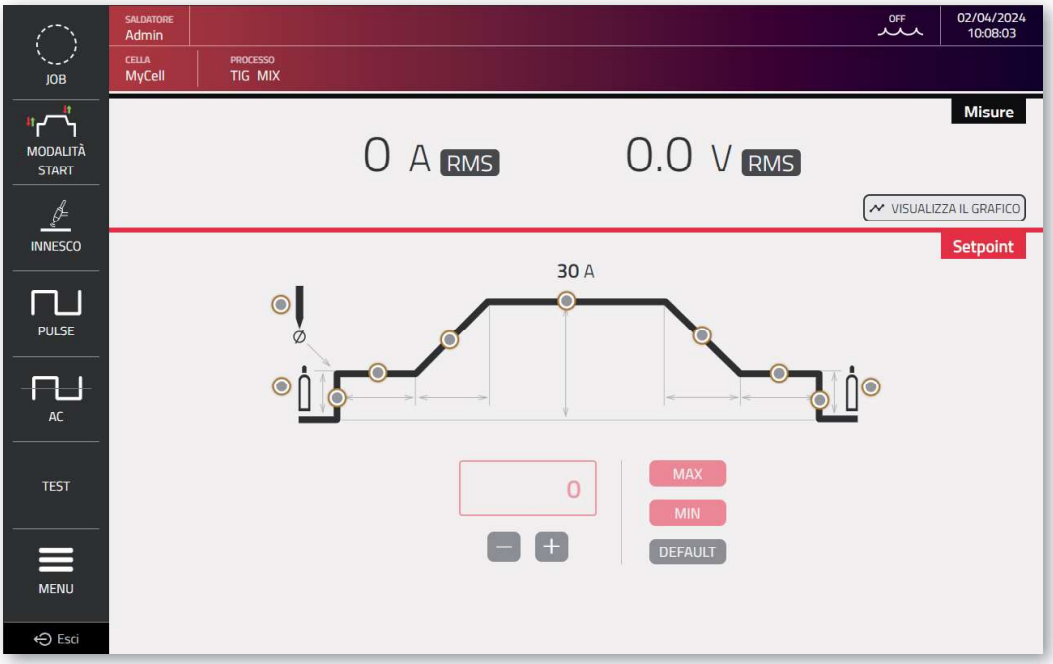
- Display parameter values of welds performed
- To back up and restore (see section 12.4.2)
- Display power source diagnostic data (see section 12.4.3)
- Activate optional software packages (see section 12.6.1)



The Webapp also has a virtual control panel (Remote Panel), which basically replicates the welding power source control panel on the screen and makes it possible to manage almost all welding settings.

The remote panel requires the use of a display of adequate size (at least 7”, such as the display on a tablet computer) and is not suitable for use by means of a smartphone.

User login is required to use the remote panel (see section 12.4.7).



14 ROBOT CONFIGURATION

The functions and processes previously described in this manual are also available for automation power sources, except for the following:

Chapter	Process/Functionality	Description
6.2.1	SPOT mode	Spot welding mode
7	TIG DC APC	APC mode with constant heat input
11	MMA	AC and DC electrode welding

14.1 System description

The CEBORA WIN TIG Welding System is a modular system suitable for the following welding processes:

- TIG without filler
- TIG with cold wire combined with wire feeder Item No 1649
- Plasma welding combined with gas console for Item No 465.01.

In the full configuration, the system is made up of a power source, a standard or optional external cooling unit, a wire feeder (optional), a Plasma Welding console (optional), a remote control panel (optional) and a robot interface (optional) - see Fig. 14.1.

In robotised applications, the welding power source is always a Slave node of the communication line, while the robot interface Item No 448/428.XX or the external robot control is the line Master node.

Before starting power source configuration, ensure that the resistance of the CANopen communication line between the Master node and the Slave node (pin A and B of CN2) is 60 Ohm.

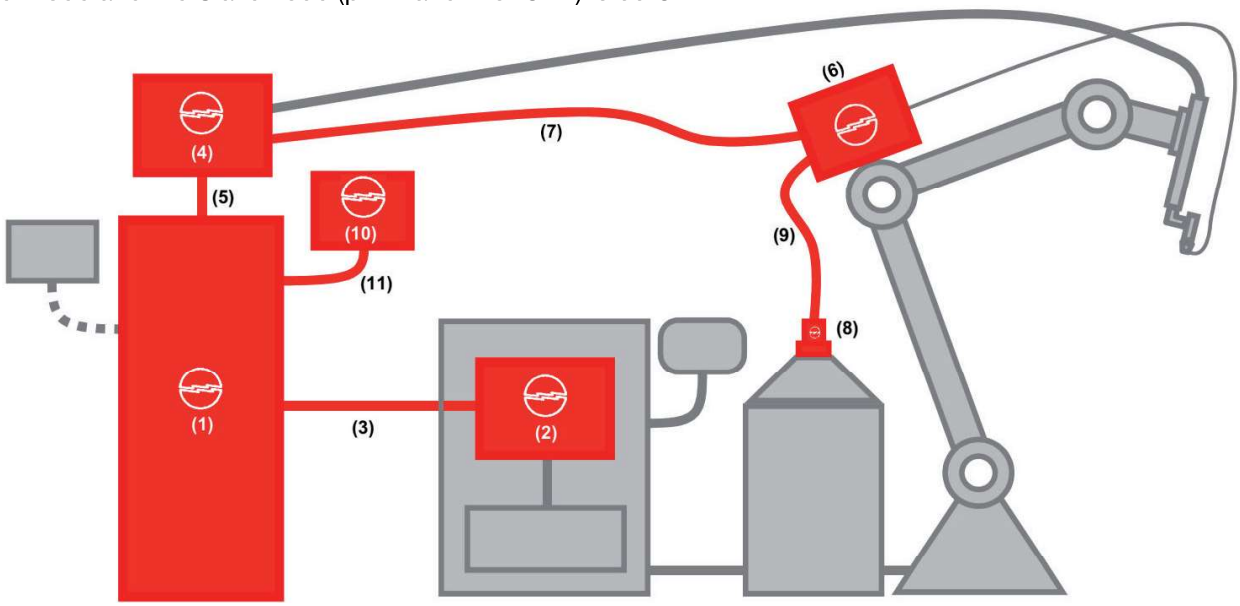


Fig. 14.1

Pos.	Description	Item No	Optional
1	WIN TIG Robot series power source	380.80 / 381.80 / 394.80 395.80 / 396.80	-
2	Robot interface	428.XX, 448	X
3	Power source-Robot interface connection	2063	-
4	Plasma Welding Console	465.01	X
5	Power Source- Plasma Welding Console Connection	2067	X
6	Cold Wire Feeder	1649	X
7	Plasma Console Plasma – Wire Feeder Connection	2062	X
8	Spool holder/snap-on	121/173	X
9	Wire guide sheath	1935	X
10	TIG/PW remote panel	438	X
11	Power source TIG/PW remote panel connection cable	2065	X

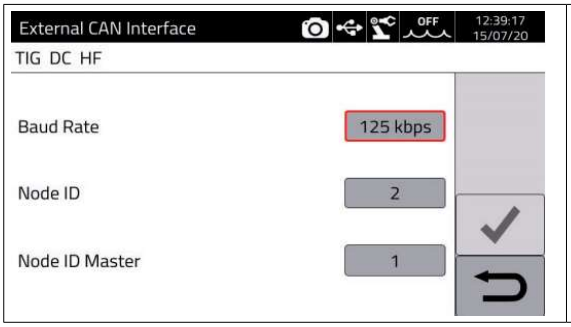
Interfacing with the robot control can take place in three ways:

- by means of discrete signals with the RAI Item No 448 analog interface
- by means of a fieldbus with the RDI Item No 428.XX digital interface
- direct connection via integrated communication bus CANopen profile DS401: in this case, interface (2) is not necessary and only optional connection Item No 2054 is used in its place.

Refer to the manuals for details of the signals available in robot mode:

Item No 448	3001070
Item No 428.XX	3300139
Process Image TIG	3301084

14.2 Configuration of the external CAN interface



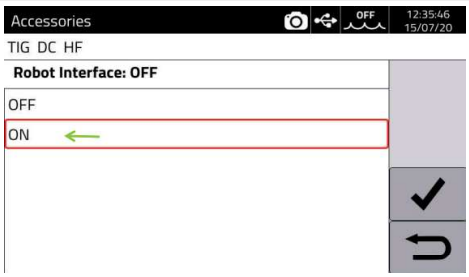
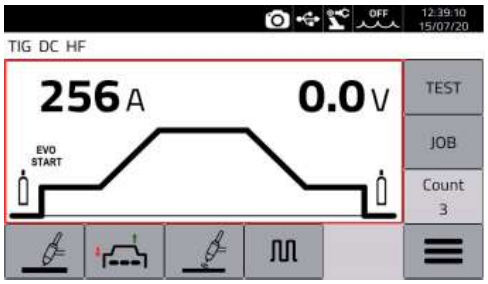
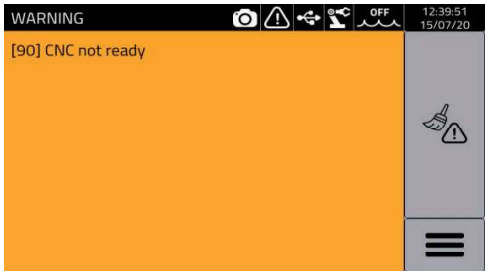
Select ***Menu -> Settings -> External CAN Interface.***
Set the CANopen bus parameters for the robot interface.
Confirm using the pushbutton with the checkmark.
Exit the menu by pressing the return pushbutton.

Parameter	Description	Range	Def
Baud Rate	Communication speed	125 - 500 kbps	125 kbps
Node ID	Slave node number (power source)	2 - 127	2
Node ID Master	Master node number (robot/CNC)	1 - 127	1

For connection with CEBORA RAI448 or RDI428 interfaces the Node ID and Node ID Master parameters must be left at the default values.
Note: the Node ID and Node ID Master parameters must never be the same.

14.3 Connection procedure

Once the CANopen bus (CAN2) has been configured to enable communication with 448/428.xx interfaces or directly with the robot control, proceed as follows:

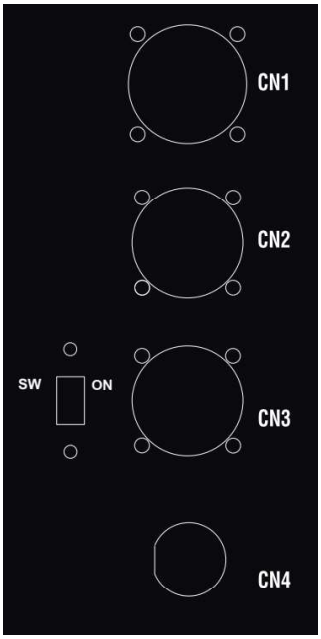
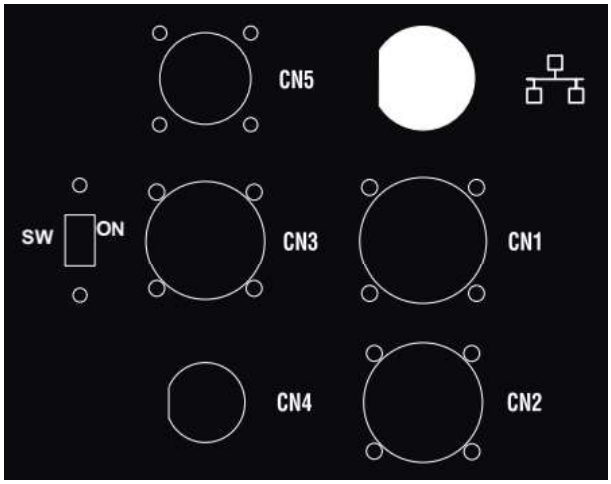
	Enable robot interface: ***Menu->Accessories->Robot Interface*** Select **ON** using knob **B**. Confirm using the pushbutton with the checkmark The power source will restart automatically.
	When communication with the Master node and Slave node (Interface/ Robot Control and power source) is correctly established, the icon in the status bar stops flashing.
	If the power source (slave node) does not receive an active Robot Ready signal from the CNC/Robot Control (master node) within 30 seconds, the machine enters WARNING status: screen background orange and error code [90].
When the CNC/Robot Control activates the Robot Ready signal, the power source leaves the WARNING condition and the welding system is ready to manage commands in accordance with the protocol and the operating procedures described in manual code 3301084.	

NOTE:
With the robot interface activated, regardless of the power source operating mode programmed by the Robot Control via the Operating Mode bits, press the icon to impose the Internal Parameter Selection operating mode directly from the power source by setting the item to ON.
At this point, the icon turns green and both programming and operating mode of the welding process can be fully managed from the power source touchscreen panel. To return to the operating mode programmed by the Robot Control and the associated welding parameter settings, deactivate ***Internal Parameter Selection:*** press the robot icon, which will become white again.

14.4 DIP switch and terminal settings

WIN TIG	465.01	1649	438	SW WIN TIG External	SW WIN TIG internal Pos. 57 SW2	SW 465.01 External SW1	SW 1649 internal Pos. 16 DIP1	SW 438 internal Pos. 6 DIP3
X	-	-	-	ON	ON	-	-	-
X	X	-	-	OFF	ON	ON	-	-
X	X	X	-	OFF	ON	OFF	ON	-
X	X	X	X	OFF	OFF	OFF	ON	ON
X	-	X	-	OFF	ON	-	ON	
X	-	X	X	OFF	OFF	-	ON	ON
X	-	-	X	OFF	ON	-	-	ON

14.5 Rear connectors for robot interface and accessories

Item No 380, 394, 395, 396	Item No 381
	

14.5.1 Connector CN1 - 10 pin female

Connect the welding power source to the cold wire feeder Item No 1649 or to the Plasma Welding gas console Item No 465.01.
The following are present in this connector:

- the power supply of the wire feeder motor: Pins D-E
- the power supply for the wire feeder control logic: Pins B-H
- the internal communication bus (CAN1) between the power source and the wire feeder or any automation line accessories.

Use only CEBORA original connections to connect the units.

CN1	
Pin	**Description**
A	Earth (Wire feeder case)
B	0V24
C	Earth
D	0V_Mot
E	+V_Mot
F	CAN1 +VDC
G	CAN1 High
H	+24V
I	CAN1 Low
J	CAN1 0 VDC

14.5.2 Connector CN2 - 7 pin female

Connector CN2 (silver) displays the CAN communication interface, which complies with the CANopenDS401 standard protocol, dedicated to interconnection with the robot (CAN2).

CN2	
Pin	**Description**
A	CAN2 High
B	CAN2 Low
C	Earth (*)
D	CAN2 +VDC
E	CAN2 0 VDC(**)
F	Not used
G	Not used

(*) The communication cable shield is connected to pin C.
(**) Pin E is earthed with a 10nF capacitor in parallel with a 10 MOhm resistor.

Refer to the digital protocol manual for WIN TIG power sources code 3301084 for the mapping of signals between power source and robot control.

14.5.3 Connector CN3 - 7 pin female

Connector CN3 is used to connect optional Control Panel Item No 438 via connection cable Item No 2065.

CN3	
Pin	**Description**
A	CAN1 High
B	CAN1 Low
C	Earth (*)
D	CAN1 +VDC
E	CAN1 0 VDC(**)
F	+ V_Panel
G	0V_Panel

(*) The communication cable shield is connected to pin C.
(**) Pin E is earthed with a 10nF capacitor in parallel with a 10 MOhm resistor.

For details, refer to the Item No 438 instruction manual code 3300149.

14.5.4 Connector CN4 - 10 pin female

Connector CN4 is used to interface with the Emergency+Varc optional kit Item No 449.
This kit allows management of an external emergency signal, according to **international standard EN954-1, category 3**, and also makes the power source welding voltage available at the output.

CN4		
Pin	**Type**	**Description**
1	DIn	+24VDC_EM1
2	DIn	0VDC_EM1
3	DIn	+24VDC_EM2
4	DIn	0VDC_EM2
5	-	Not used
6	DOut	Eme_State-1
7	DOut	Eme_State-2
8	AOut	V_Arc -
9		Not used
10	AOut	V_Arc +

For more details, refer to the instruction manual of kit Item No 449 code 3301060.

NOTICE

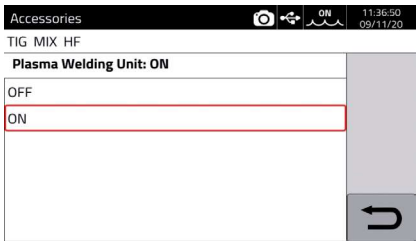
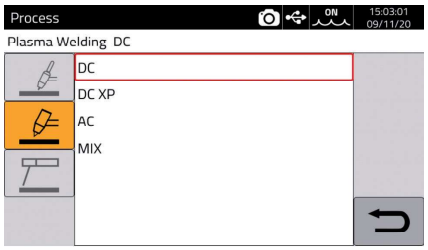
The use of non-original accessories may compromise the correct operation of the power source and even the integrity of the system, rendering any warranty and liability cover that CEBORA may provide for the welding power source null and void.

15 ADDITIONAL PROCESSES

This section describes additional processes available in automation version power sources.

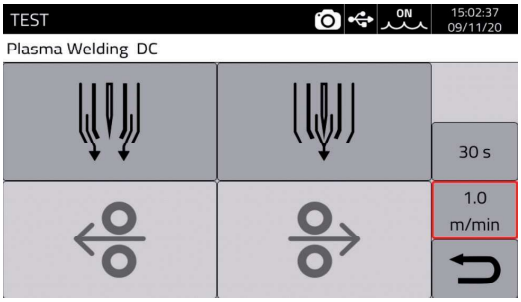
15.1 Plasma Welding Process

WIN TIG range power sources for automation can perform the DC and AC Plasma Welding process. In order to do this, it is necessary to use a gas console Item No 465.01. See Figure 14.1 for the connection procedure.
To enable the Plasma welding process, proceed as follows:

	***- Menu->Accessories*** **-** use **B** to select ***Plasma Welding Unit*** and confirm: OFF Plasma welding process disabled. ON Plasma welding process enabled.
	In section **Q,** select the Plasma Welding process type to be used

Select ***Menu->Plasma Welding Parameters*** to set the Plasma Welding process parameters. For a description of Plasma Welding process parameters, refer to the user manual of Item No 465.01 code 3301069

Select sector **T** – Fig. 5 to perform the following tests:

	Gas Test if Plasma Console Item No 465.01 is installed, duration of the current gas testing process is shown on the right. To perform the plasma gas test, tap the pushbutton:  To perform the shielding gas test, tap the pushbutton: 

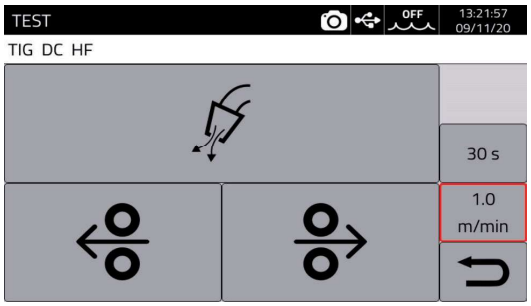
15.2 Cold wire TIG process

WIN TIG range power sources can also manage the cold wire TIG process in combination with the WF5 COLD WIRE feeder unit Item No 1649 and the power supply kit Item No 435.
See Figure 14.1 for the connection procedures.
To enable the TIG cold wire process, proceed as follows:



- Menu -> Accessories
- use **B** to select **Wire Feeder Unit** and confirm:
OFF Cold wire unit disabled
ON Cold wire unit enabled

To choose the wire feeder parameters, select: **Menu -> Cold Wire Parameters**
For all cold wire process settings, refer to the manual for Item No 1649 code 3301059.
The cold wire process can also be used in conjunction with the Plasma Welding process, both in AC and DC modes.



To perform the shielding gas test, tap the pushbutton:  the duration of the current test is indicated on the right

[Wire Inch/Retract if cold wire feeder Item No 1649 is present: tap pushbuttons:



Wire feed speed is shown on the right

16 ERROR CODES

Errors are divided into two categories:

- Hardware errors [E]. These cannot be reset and require the power source to be restarted. They are displayed on the screen with a red background.
- Alarms [W] linked to an external condition that can be reset by the user and does not require the power source to be restarted. These are displayed on the screen with an amber background.

Code	Type	Error Description	Action
3	[E]	General fault error detected by the power source internal slave board	Switch the power source off and on. If the problem persists, contact technical assistance
4	[E]	Error on database	Switch the power source on and off. If the error persists, contact technical assistance.
6	[E]	Communication error detected by master panel board on CAN-bus	Switch the power source on and off. If the error persists, contact technical assistance.
7	[W]	Communication error in CAN2	Check the accuracy of robot interface parameters, check the interface and power source terminal DIP switches. Check the connection between CN2 and robot interface. Switch the power source on and off. If the error persists, contact technical assistance.
8	[E]	Wire feeder not connected error	Check the connection leading from power source CN1 to wire feeder Item No 1649. Switch the power source on and off. If the error persists, contact technical assistance.
9	[E]	Panel Circuit not connected	Check the connection leading from power source CN3 to remote panel Item No 438. Switch the power source off and on. If the problem persists, contact technical assistance
10	[E]	Power output nil (I=0A, V=0V)	Hardware error, contact technical assistance. Probable break in inverter circuit of primary winding
11	[E]	Overload at output	Hardware error, contact technical assistance.
13	[E]	Login time too long	Hardware error, contact technical assistance.
14	[E]	Undervoltage error detected on inverter control board	Check machine supply voltages. If the problem persists, contact technical assistance.
20	[E]	Interlock signal absent	Switch the power source off and on. If the problem persists, contact technical assistance
22	[E]	Hardware key not readable	Switch the power source off and on. If the problem persists, contact technical assistance
23	[E]	Earth cable leakage	Switch the power source off and on. If the problem persists, contact technical assistance
25	[E]	Excessive primary winding current error	Switch the power source on and off. If the error persists, contact technical assistance. Probable break in output diodes or primary winding inverter circuit.
26	[E]	Time not set or battery flat	Switch the power source off and on. If the problem persists, contact technical assistance
28	[E]	Fan malfunction	Check there are no mechanical blockages in the rotating parts of the fan. If the problem persists, contact technical assistance.

Code	Type	Error Description	Action
30	[E]	Output current sensor offset reading problem	Switch the power source off and on. If the problem persists, contact technical assistance
32	[E]	Voltage measuring reference out of specifications	Check there are no voltages connected to the machine output terminals upon ignition. Switch the power source on and off. If the error persists, contact technical assistance.
42	[E]	Motor speed out of control (only with wire feeder Item No 1649)	Check there are no mechanical blockages in the wire feeder rollers. If the motor turns at an uncontrollable speed, check the wiring in the Item No 1649 and ensure the motor feed polarity is correct. If the error persists, contact technical assistance.
47	[E]	Low motor supply voltage error (only with wire feeder Item No 1649)	Check the connection between power source CN1 and wire feeder. Switch the power source on and off. If the error persists, contact technical assistance.
54	[E]	Current not zero when power source tested	Switch the power source on and off. If the error persists, contact technical assistance.
57	[E]	Excessive current on wire feeder motor (only with wire feeder Item No 1649)	Check there are no mechanical blockages in the wire feeder rollers. Switch the power source on and off. If the error persists, contact technical assistance.
58	[E]	Firmware upgrade error	Contact technical assistance
63	[E]	Incorrect mains voltage (no phase)	Check that the mains plug phases are properly connected. If the error persists, contact technical assistance.
68	[W]	Plasma gas pressure low (only with gas console Item No 465.01)	Check the pressure entering the plasma channel. It must be greater than the threshold imposed in the relevant gas console parameter. If the problem persists, contact technical assistance.
69	[W]	Plasma gas pressure high (only with gas console Item No 465.01)	Check the pressure entering the plasma channel. If the problem persists, contact technical assistance.
70	[W]	Gas Console not connected (only with gas console Item No 465.01)	Check gas console power supply. Check connection between power source CN1 and gas console. Check configuration of the DIP switches on the back of the machine. If the problem persists, contact technical assistance.
74	[W]	Thermal protection triggered due to excessive temperature in primary circuit.	Wait until the machine cools down. Check that the air intake and outlet grilles are not blocked. If the problem persists, contact technical assistance.
75	[W]	Coolant pressure too low	Check the coolant level. Check the centrifugal pump turns correctly. If it does not turn correctly, release using a release screw. If the problem persists, contact technical assistance.
76	[W]	Cooling unit not connected	Check the pressure switch connection is intact
77	[W]	Excessive temperature in secondary circuit	Wait until the machine cools down. Check that the air intake and outlet grilles are not blocked. If the problem persists, contact technical assistance.

Code	Type	Error Description	Action
78	[W]	Shielding gas pressure low (only with gas console Item No 465.01)	Check the pressure entering the shielding channel. It must be greater than the threshold imposed in the relevant gas console parameter. If the problem persists, contact technical assistance.
79	[W]	Shielding gas pressure high (only with gas console Item No 465.01)	Check the pressure entering the shielding channel. If the problem persists, contact technical assistance.
81	[E]	Gas kit not present (only with kit Item No 436)	Make sure that gas kit Item No 436 is correctly connected. Switch the power source on and off. If the problem persists, contact technical assistance.
84	[W]	Quality control option error	Check the parameters set are correct.
86	[E]	Problems regulating the plasma gas flow (only with gas console Item No 465.01)	Check there are no obstructions in the plasma gas hoses. Test the channel using the appropriate test command. Check the cylinder inlet pressure, because the desired flow cannot be regulated if it is too low. If the problem persists, contact technical assistance.
87	[E]	Problems regulating the shielding gas flow (only with gas console Item No 465.01).	Check there are no obstructions in the shielding gas hoses. Test the channel using the appropriate test command. Check the cylinder inlet pressure, because the desired flow cannot be regulated if it is too low. If the problem persists, contact technical assistance.
90	[W]	CNC not ready (only for robotised applications)	Check the robot ready signal is present on the interface or CNC. Turn off and on. If the problem persists, contact technical assistance.
95	[W]	Wireless mask not connected	Check the mask battery. Connect the mask to the power source in accordance with the procedure described in the relevant manual. If the problem persists, contact technical assistance.

17 TECHNICAL SPECIFICATIONS

Provided the impedance of the public low-voltage network at the point of common coupling (PCC) is lower than the Zmax value indicated in the tables below, this unit complies with standards IEC 61000 3-11 and IEC 61000 3-12 and can be connected to low-voltage networks.
It is the responsibility of the installer or user of the unit to ensure, by contacting the distribution network provider if necessary, that the network impedance is in compliance with the impedance restrictions specified.
The tables below show the technical data of the power sources for welding processes that can be used in manual mode (TIG and MMA) and in the field of automation (TIG and PW).

For the technical specifications of the Plasma Welding (PW) process marked with (*) consult manual code 3300399 for Item No 465.

WIN TIG DC 340T - Item No 380			
	TIG	MMA	PW
Mains voltage (U1)	3 x 400 V		
Mains voltage tolerance (U1)	±15%		
Mains frequency	50/60 Hz		
Mains fuse (delayed action)	16 A		
Power consumed	10 kVA 40%	9.8 kVA 40%	10.4 kVA 40%
	8.3 kVA 60%	9.5 kVA 60%	9.1 kVA 60%
	7 kVA 100%	8.7 kVA 100%	8.7 kVA 100%
Mains connection (Zmax)	87 mΩ		
Power factor (cosϕ)	0.99		
Welding current range	3 ÷ 340 A	10 ÷ 270 A	10 ÷ 250 A
Welding current 10 min/40 °C (IEC 60974-1)	340 A 40%	270 A 40%	250 A 30%
	300 A 60%	250 A 60%	230 A 60%
	270 A 100%	240 A 100%	210 A 100%
Open-circuit voltage (U0)	57 V		
Arc striking voltage (Up)	10.3 kV		(*)
Usable electrodes		Ø 1.5 ÷ 4.0 mm	
Max. gas inlet pressure	6 bar / 87 psi		(*)
Performance	> 85%		
Idle state power consumption	< 50 W		
Electromagnetic compatibility class	A		
Overvoltage class	III		
Degree of pollution (IEC 60664-1)	3		
Degree of protection	IP23S		
Cooling type	AF		
Working temperature	-10 °C ÷ 40 °C		
Transport and storage temperature	-25°C ÷ 55°C		
Marking and Certifications	CE UKCA EAC S		
Dimensions WxDxH	560 mm x 950 mm x 1010 mm		
Net weight	69 kg		

Motor generator power required: greater than or equal to 30 kVA

WIN TIG DC 500T - Item No 381			
	TIG	MMA	PW
Mains voltage (U1)	3 x 400 V		
Mains voltage tolerance (U1)	±15%		
Mains frequency	50/60 Hz		
Mains fuse (delayed action)	25 A	32 A	32 A
Power consumed			
	20.3 kVA 60%		23.2 kVA 60%
	16.5 kVA 100%	17.6 kVA 100%	20.1 kVA 100%
Mains connection (Zmax)	0.065 Ω		
Power factor (cosϕ)	0.99		
Welding current range	3 ÷ 500 A	10 ÷ 380 A	10 ÷ 420 A
Welding current 10 min/40 °C (IEC 60974-1)			
	500 A 60%		420 A 60%
	440 A 100%	380 A 100%	380 A 100%
Open-circuit voltage (U0)	70 V		
Arc striking voltage (Up)	12.1 kV		(*)
Usable electrodes		Ø 1.5 – 6.0 mm	
Max. gas inlet pressure	6 bar / 87 psi		(*)
Performance	> 85%		
Idle state power consumption	< 50 W		
Electromagnetic compatibility class	A		
Overvoltage class	III		
Degree of pollution (IEC 60664-1)	3		
Degree of protection	IP23S		
Cooling type	AF		
Working temperature	-10 °C ÷ 40 °C		
Transport and storage temperature	-25°C ÷ 55°C		
Marking and Certifications	CE UKCA EAC S		
Dimensions WxDxH	588 mm x 1120 mm x 1010 mm		
Net weight	108 kg		

Motor generator power required: greater than or equal to 40 kVA

Item No 394 - WIN TIG AC-DC 270 T			
	TIG	MMA	PW
Mains voltage (U1)	3 x 400 V		
Mains voltage tolerance (U1)	±15%		
Mains frequency	50/60 Hz		
Mains fuse (delayed action)	16 A		
Power consumed	7.8 kVA 40%	8 kVA 40%	9.1 kVA 40%
	7.4 kVA 60%	7.4 kVA 60%	7.3 kVA 60%
	6.3 kVA 100%	7 kVA 100%	7 kVA 100%
Mains connection (Zmax)	0.057 Ω		
Power factor (cosϕ)	0.99		
Welding current range	3 ÷ 270 A	10 ÷ 210 A	10 ÷ 210 A
Welding current 10 min/40 °C (IEC 60974-1)	270 A 40%	210 A 40%	210 A 40%
	250 A 60%	200 A 60%	175 A 60%
	230 A 100%	190 A 100%	165 A 100%
Open-circuit voltage (U0)	57 V		
Arc striking voltage (Up)	10.3 kV		(*)
Usable electrodes		Ø 1.5 ÷ 4 mm	
Max. gas inlet pressure	6 bar / 87 psi		(*)
Performance	> 80%		
Idle state power consumption	< 50 W		
Electromagnetic compatibility class	A		
Overvoltage class	III		
Degree of pollution (IEC 60664-1)	3		
Degree of protection	IP23S		
Cooling type	AF		
Working temperature	-10 °C ÷ 40 °C		
Transport and storage temperature	-25°C ÷ 55°C		
Marking and Certifications	CE UKCA EAC S		
Dimensions WxDxH	560 mm x 950 mm x 1010 mm		
Net weight	69 kg		

Motor generator power required: greater than or equal to 25 kVA

Item No 395 - WIN TIG AC-DC 340 T			
	TIG	MMA	PW
Mains voltage (U1)	3 x 400 V		
Mains voltage tolerance (U1)	±15%		
Mains frequency	50/60 Hz		
Mains fuse (delayed action)	16 A	20 A	20 A
Power consumed	11.3 kVA 40%	13.1 kVA 40%	12.6 kVA 40%
	10.3 kVA 60%	12.1 kVA 60%	11.6 kVA 60%
	9.7 kVA 100%	11.5 kVA 100%	11 kVA 100%
Mains connection (Zmax)	0.045 Ω		
Power factor (cosϕ)	0.99		
Welding current range	3 ÷ 340 A	10 ÷ 310 A	10 ÷ 270 A
Welding current 10 min/40 °C (IEC 60974-1)	340 A 40%	310 A 40%	270 A 40%
	320 A 60%	290 A 60%	250 A 60%
	310 A 100%	280 A 100%	240 A 100%
Open-circuit voltage (U0)	60 V		
Arc striking voltage (Up)	11.6 kV		(*)
Usable electrodes		Ø 1.5 ÷ 4.0 mm	
Max. gas inlet pressure	6 bar / 87 psi		(*)
Performance	> 80%		
Idle state power consumption	< 50 W		
Electromagnetic compatibility class	A		
Overvoltage class	III		
Degree of pollution (IEC 60664-1)	3		
Degree of protection	IP23S		
Cooling type	AF		
Working temperature	-10 °C ÷ 40 °C		
Transport and storage temperature	-25°C ÷ 55°C		
Marking and Certifications	CE UKCA EAC S		
Dimensions WxDxH	588 mm x 1120 mm x 1010 mm		
Net weight	109 kg		

Motor generator power required: greater than or equal to 25 kVA

Item No 396 - WIN TIG AC-DC 450 T			
	TIG	MMA	PW
Mains voltage (U1)	3 x 400 V		
Mains voltage tolerance (U1)	±15%		
Mains frequency	50/60 Hz		
Mains fuse (delayed action)	20 A	20 A	25 A
Power consumed	18.2 kVA 40%	17.8 kVA 40%	20.5 kVA 40%
	15.9 kVA 60%	15.2 kVA 60%	16.9 kVA 60%
	13.8 kVA 100%	13.9 kVA 100%	14.7 kVA 100%
Mains connection (Zmax)	0.024 Ω		
Power factor (cosϕ)	0.99		
Welding current range	3 ÷ 450 A	10 ÷ 360 A	10 ÷ 360 A
Welding current 10 min/40 °C (IEC 60974-1)	450 A 50%	360 A 45%	360 A 45%
	400 A 60%	340 A 60%	330 A 60%
	380 A 100%	320 A 100%	300 A 100%
Open-circuit voltage (U0)	68 V		
Arc striking voltage (Up)	13.8 kV		(*)
Usable electrodes		Ø 1.5 – 6.0 mm	
Max. gas inlet pressure	6 bar / 87 psi		(*)
Performance	> 80%		
Idle state power consumption	< 50 W		
Electromagnetic compatibility class	A		
Overvoltage class	III		
Degree of pollution (IEC 60664-1)	3		
Degree of protection	IP23S		
Cooling type	AF		
Working temperature	-10 °C ÷ 40 °C		
Transport and storage temperature	-25°C ÷ 55°C		
Marking and Certifications	CE UKCA EAC S		
Dimensions WxDxH	588 mm x 1120 mm x 1010 mm		
Net weight	112 kg		

Motor generator power required: greater than or equal to 30 kVA