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IMPORTANT: BEFORE USING THIS DEVICE, READ THIS MANUAL CAREFULLY AND MAKE SURE YOU UNDERSTAND ITS CONTENTS.

IMPORTANT: Before reading the following instruction manual, read the instructions in General Warnings manual 3301151 carefully and make sure you understand them.

Copyright.

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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.

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 Manufacture is unable to monitor compliance with these instructions or device installation, operation and use, and maintenance conditions and methods.

Inappropriate execution of the installation may lead to material damage and possible 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.

It is not permitted to connect two or more power sources in parallel.

sources and system components due to the installer's failure to perform these checks.

If you wish to connect several power sources in parallel, ask for written authorisation from CEBORA which will determine and authorise procedures and conditions for the required application in compliance with current product and safety regulations.

The installation and management of this device/system must comply with the IEC EN 60974-4 standard.

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The welding/cutting power source complies with the regulations set out on the power source technical data plate. Use of the welding/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. Cebora S.p.A. therefore disclaims all liability for malfunctions/damage to its welding/cutting power

1 <u>SYMBOLS</u>

	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 peop		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.

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

2 <u>WARNINGS</u>

Before handling, unpacking, installing and using the welding power source, it is obligatory to read the WAR-NINGS set out in manual 3301151.

2.1 <u>Warning plate</u>

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 cut 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

3 GENERAL DESCRIPTION

This welding machine is an inverter power source. The power source is built according to IEC 60974-1, IEC 60974-2, IEC 60974-5 IEC 60974-10 (CL. A), IEC 61000-3-11 and IEC 61000-3-12 standards.

The power source is suitable for MIG/MAG, TIG welding with contact ignition. It also manages the MMA process (TIG and MMA only for manual application). The power source can also be equipped with an external control panel Item 452.

The robot version of the power source (Item No XXX.80) can be used for manual applications or in robotised applications where controls are managed by means of a fieldbus or using an analogue RAI 448 interface or a digital 428.XX interface.

The power source is also equipped with an Ethernet port that allows connection to a local network (LAN) with built-in Webserver. Power source parameters and diagnosis can therefore be managed remotely via a simple browser.

3.1 Explanation of plate data

No.	Serial number, to be indicated on any request regarding the weldin machine.	
	Single-phase static frequency converter transformer-rectifier.	
	Three-phase static frequency converter	
MIG/MAG	Suitable for MIG/MAG welding.	
TIG	Suitable for TIG welding.	
MMA	Suitable for MMA welding.	
UO	Secondary open-circuit voltage.	
Х	Duty cycle percentage. The duty cycle expresses the percentage of 10 minutes during which the welding machine can run at welding current I2.	
U2	Secondary voltage with I2 current.	
U1	Rated supply .	
1~ 50/60Hz	50 or 60-Hz single-phase power supply.	
3~ 50/60Hz	50 or 60-Hz three-phase power supply	
J1max	Max. absorbed current at the corresponding I2 current and U2 voltage.	
l1eff	This is the maximum value of the actual current consumed, considering the duty cycle. This value usually corresponds to the capacity of the fuse (delayed type) to be used as a protection for the equipment.	
IP23S	Degree of housing protection. Grade 3 as the second digit means that this machine may be stored, but it is not suitable for use outdoors in the rain, unless it is protected	
S	Device suitable for use in locations with increased electrical risk	

3.2 Installation



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 table may be required for compliance with IEC 61000-3-12 and IEC 61000-3-11. 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.

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.



The capacity of the overload cut-out switch or fuses, positioned between the power supply network and the device, must

be adequate for current I1 consumed by the machine. Check the device's technical data.

WARNING! If mains power extensions are used, the cable supply cross-section must be appropriately sized. Do not use extensions longer than 30 m.



Disconnect the device from the power supply before transporting it.

During transport of the device, ensure that all applicable local accident prevention guidelines and regulations are observed.

Use a fork lift truck to lift the power source; consider the position of the device's centre of gravity when positioning the lift truck forks.



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.

NOTICE

When switch G is set to OFF position, the display shows the message: Power Off Wait for this message to disappear from the screen before turning back on. If the power source is turned on with the Power Off message active, the power-on stage will be unsuccessful.

3.3 Mains connection

The power source can be supplied by a motor generator. Follow the values indicated in table 1 when choosing the motor generator power.

	Table 1
Item No	Motor generator power required
372	greater than or equal to 35 kVA
374	greater than or equal to 50 kVA

3.4 Lifting and transport



3.5 Installation and start up

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). Make sure that the mains voltage matches the voltage indicated on the specifications plate of the power
Source. 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. The capacity of the overload cut-out switch or fuses, positioned between the power supply network and the power source, must be adequate for current I1 consumed by the power source. The power source is turned on and off using switch R.

3.5.1 Installing power source and wire feeder.

Fit the axle and secure the rear wheels to the power source (see Fig. 1).



Fig. 1

Fit the male support to the wire feeder and the female support to the power source. Fit the four wheels provided to the base of the wire feeder and also secure the torch support. Position the assembled wire feeder on the power source support (see Fig. 2).



Fig. 2

Block one end of connection FA, by fixing the tab FB to the machine base (see Fig. 3). Connect the connection to the power source (see Fig. 4).



Connect the other end of connection BA to the wire feeder (see Fig. 5). Avoid creating coils in order to minimise the inductive effect of the cable.

Connect the coolant hoses to the quick-fitting valves located below the base of the wire feeder (see Fig. 6), by observing the colour coding on the front side.







3.6 Power source description



Fig. 7

- H -DISPLAY SCREEN
- I -ENCODER KNOB
- K -POSITIVE OUTPUT TERMINAL (+)
- L -NEGATIVE OUTPUT TERMINAL (-)
- F -SRS HOLDER TERMINAL CONNECTOR
- G -SRS HOLDER PROTECTION FUSE
- J -USB PORT
- **R** -MAINS SWITCH
- S -MAINS CABLE
- T -PROTECTION FUSE FOR THE 230 VAC SOCKET
- U -COOLING UNIT 230 VAC SOCKET
- V -COOLING UNIT PRESSURE SWITCH CONNECTOR
- N -POSITIVE OUTPUT TERMINAL (+)
- M -CONNECTOR CN1 10 PIN FEMALE
- P -ETHERNET CONNECTOR
- W -CONNECTOR CN2 7 PIN FEMALE
- X -CONNECTOR CN3 7 PIN FEMALE
- Y -CONNECTOR CN4 10 PIN FEMALE
- Z -CONNECTOR CN5 10 PIN FEMALE
- Q -CONNECTOR CN6 SRS DRIVE
- O -CONNECTOR CN7 SRS CONTROL

3.7 <u>Wire feeder description</u>



Fig. 8

- A -CONTROL PANEL
- B -CENTRAL ADAPTER
- C -ELECTRODE HOLDER SOCKET FOR MMA OR TIG TORCH ATTACHMENT
- D -TIG TORCH GAS FITTING
- E -REMOTE CONTROL CONNECTOR (SEE SECTION 3.7)
- F -SRS HOLDER TERMINAL CONNECTOR
- G -SRS HOLDER PROTECTION FUSE
- W -MIG GAS INLET FITTING
- Y -CONNECTOR FOR POWER SOURCE-WIRE FEEDER CONNECTION
- **χ** -TIG GAS INLET FITTING
- Z -POSITIVE OUTPUT TERMINAL
- AA -SRS CONTROL

3.7.1 Wire feeder panel description





AN - Knob

Press knob AN to select LEDs AQ AP AO. Turn to adjust the current/wire speed/thickness shown on display AR.

AR - Display

This shows the value of magnitudes adjusted by means of knob AN.

AO - LED Thickness

Select LED **AO**, display **AR** shows the thickness in mm of the workpiece to be welded in relation to the set current and wire speed. Active in synergic MIG/MAG processes.

AP - LED Wire speed

Select LED **AP**, display **AR** shows the welding wire speed in metres per minute. Active in synergic MIG/MAG processes.

AQ - LED Welding current

Select LED AQ, display AR shows the welding current in amps.

AW - Knob

Press knob **AS** to select LEDs **AT AU AV**. Turn to adjust the respective arc length/impedance values shown on display **AS**.

In MIG/MAG processes with LED **AT** on, when **AW** is turned, the selection automatically shifts to LED **AU** and arc length is adjusted.

AS - Display

This shows the value of magnitudes adjusted by means of knob AW.

AT - LED Welding voltage

With LED **AT se**lected, the arc voltage is shown on display **AS**. When the arc is off, the voltage displayed is the preset voltage. During welding, the voltage measured by the power source is displayed.

AU - LED Arc length

Select LED AU, display AS shows the welding arc correction (see section 4.3.3).

AV - LED Impedance

Select LED AV, display AS shows the impedance correction (see section 4.3.3).

BA - LED Globular position

With MIG Short process selected, this indicates that the pair of current and voltage values chosen for welding may give rise to unstable arcs and spatter, material transfer in globular position.

BB - LED HOLD

This lights up automatically at the end of the welding process, displays AR and AS show the most recent measured arc current and voltage values.

BD - JOB retrieval key

Press key BD to call up the JOB function (see section 7). They can be selected by turning knob AW

BC - LED JOB

This lights up when the JOB is selected

BE - LED Remote control

This lights up when a remote control is connected to connector E of the wire feeder (see section 3.8).

BG - LED Cooling unit

This lights up when the cooling unit is activated (see section 7.3.1)

BF - Wire Rewind key

When this key is pressed, the motor rewinds the wire by a few centimetres without any voltage and welding gas in the torch.

BH - Wire Feed key

When this key is pressed, the motor feeds the wire, without any voltage and welding gas in the torch.

BL - Gas test key

When this key is pressed, the gas flows out for 30 seconds. If pressed again during gas flow, the flow stops.

BI - LED Quality control

This lights up when quality control is active (see section 7.3.6)

3.8 Manual wire feeder panel connector description

Pin	Description	Wiring diagram
1	Start Digital input	
2	Down-Volt Digital input for decreasing welding voltage	
3	Down-Mot Digital input for decreasing motor speed	
4	Arc-ON Clean contact (30 VDC, 125 VAC, 0.5 A max)	
5	Arc-ON Clean contact (30 VDC, 125 VAC, 0.5 A max)	Wire Feeder Torch side
6	Up-Mot Digital input for increasing motor speed	
7	Current Ref. Current reference potentiometric input	RL1 6 6 6
8	Mot_PP Push-Pull motor positive	+12V-ISO UP-MOT - 9 POT-CUR - 9 B
9	Start Digital input	
10	Up-Volt Digital input for increasing welding voltage	
11	+ 5 VDC Potentiometer power supply	CHD(+SV) 39 PEC_AM 19 FC_AM 19 FC_BER
12	Rec_AN External control analogue recognition	
13	Gnd Potentiometer input ground reference	
14	NC	
15	+ 12 VDC Insulated digital input reference	
16	Rec_AN External control analogue recognition	
17	Mot_PP Push-Pull motor negative	
18	NC	
19	NC	

3.8.1 Power source rear panel connector description

	율	Ethernet 100Mbit (LAN) connector	
CN5		The connector is optional and pre supply kit is present for external Wi	esent if the optional 24 VDC power -Fi router Item No 451.
$0 \frown 0$		CN5	
		Description	Pin
() CN5		1	+24 VDC 2 A
		2	0 VDC
0 - 0		For more details, refer to the instruct 3301068.	ction manual of kit Item No 451 code

For connectors CN1, CN2, CN3 and CN4 refer to section 9.4.

3.8.2 Cooling unit interface.

The following are present in the section relating to the cooling unit shown in figure 7:

- U -Shuko cooling unit socket maximum power 230 VAC 500 W
- T -Fuse holder fuse T 2 A/230 V 0 5x20 mm
- V -Cooling unit pressure switch socket this socket manages the cooling unit pressure switch and unit recognition.



3.9 Description of display

KINGSTAR robot power sources are equipped with resistive touchscreen LCDs with 7" diagonal (H) Fig. 7. A knob is also present with rotary encoder and pushbutton (I) Fig. 7 for scrolling through the list parameters and confirming the selected item.



The MIG process main screen is subdivided into sectors (DN, DB, DC...DM see Fig. 10) and each of these accepts a touch command. A description of the individual display sectors is given below.



Fig. 10

Sector	Description
DN	Main screen status bar
DB	Main welding parameter settings menu
DC	Pushbutton for selecting type of welding process MIG pulse, Pulse HD, 3D Pulse, Short, Short HD, SRS, Root, and Manual, TIG DC, TIG DC APC, TOG DC XP, MMA DC (*)
DE	Pushbutton for selecting start type, 2 stroke, 4 stroke, three level, HSA, CRA, SPOT (**)
DF	Double level function selection pushbutton. Active in synergic MIG/MAG processes only
DG	Machine inductance value adjustment pushbutton (only MIG process)
DH	Machine arc length value adjustment pushbutton (only MIG process)
DI	Menu pushbutton for machine process set-up, process parameters, accessories and settings.
DL	Job management menu pushbutton
DM	Gas test and motor speed menu pushbutton.

(*) If robot interface is activated, the TIG DC / APC / XP MMA processes are not available.

(**) If robot interface is activated, only 2 stroke start-up is available.



NOTICE

The software could have been updated, therefore the device in use may offer functions not described in these user instructions, or the opposite may apply. Individual figures may also deviate slightly from the control elements present on the device in use. The operation of these control elements is nevertheless identical.

4 MIG WELDING

4.1 Power source-wire feeder connection

Connect the earth cable to the socket L(-).

Connect the power cable of the power source-wire feeder connection to rear socket N (+).

Connect connector of power source-wire feeder service connection to rear connector M.

Connect the connectors for managing SRS Item No 443 (option) of the power source-wire feeder connection to rear connectors **O-Q**.

Connect wire feeder Item No 5690133 (manual) or Item No 1648 (Robot, see instruction Item No 3301052) to the power source via the power source-wire feeder connection Item No 2061

4.2 <u>Selecting the synergistic curve:</u>

Select the DC pushbutton or access the submenu using pushbutton DI (see Fig 10)

MENU	Select the Material
MIG Short SG2 (G3Si1) 1.2 mm Ar + 18% CO2	
Material SWPS	Material
Accession and accession accession and accession accessio	
Material Constant Auto 08:14:36 23/04/19 MIG SG2 (G3Si1) 1.0 mm Ar + 18% CO2	Select the wire type
SG2 (G3Si1) 100S T1 308L 316L AlMg5 (5356) AlSi5 (4043) AlSi12 (4047)	
Material 23/06/19	Select wire diameter
MIG SG2 (G3Si1) 1.0 mm Ar + 18% CO2	Ø
Material B 08:15:07 23/04/19	Select the gas type
100% CO2 C1 Ar + 18% CO2 M20 Ar + 18% CO2 M21 ✓ ✓	
Process 2 400 12:0347 23/04/19	Select the welding process
Pulse Pulse BD Pulse HD Short Short HD Root Manual	Use pushbutton I (Fig. 7) to select the welding process from among those available based on the previous selections, confirmed by pressing the knob I.

4.2.1 Description of the welding process

For all the processes indicated below (except for MIG Manual), the welding parameters are adjusted synergically using knob **I**. Individual processes are available only for the individual synergic curves for which they have been developed or which are allowed by the process.

Process Process Off Off <th< th=""><th colspan="2">MIG Pulse. When this welding process is selected, the filler material is transferred via a controlled energy pulsed waveform to achieve constant detachment of molten material droplets that are transferred to the workpiece without spatter. The result is a strip of molten welding material that joins any material thickness or type effectively, with no spatter on the workpiece.</th></th<>	MIG Pulse . When this welding process is selected, the filler material is transferred via a controlled energy pulsed waveform to achieve constant detachment of molten material droplets that are transferred to the workpiece without spatter. The result is a strip of molten welding material that joins any material thickness or type effectively, with no spatter on the workpiece.		
Pulse Pulse HD Short HD Root Manual	pulsed process. More wire is deposited for the same current setting: see MIG Short HD for programming details.		
MIG Short S52 (G3Si1) 1.2 mm Ar + 18% CO2 MIG Short S52 (G3Si1) 1.2 mm Ar + 18% CO2 Pulse Pulse HD Short Short HD Root Manual	MIG Short. Wh different ways: S wire speed and s	MIG Short . When this process is selected, the material can be transferred in different ways: Short Arc, Globular, Spray Arc and it depends on the ratio between wire speed and set welding voltage.	
Process Classical and Classica	Kernel Science 42 min 4 x Hores 2000 A C 22.1 V → 3.8 - 分 7.3 min ✓ 5 Min 10 Min 2010 A C 20.0 Min ✓ 10 Min 2010 A C 20.0 Min ✓ 10 Min 2010 A C 20.0 Min ✓ 3.9 - 分 3.3 min ✓ 3.9 - 分 3.3 min ✓ 10 Min 2010 A C 20.0 Min ✓ 3.9 - 分 3.3 min	MIG Short HD . MIG Short process offers the option of increasing wire speed for the same welding voltage. Set the desired voltage and current value using sector DH , change m/min by adjusting knob I . The m/min correction is indicated on the display as a percentage and as an absolute value.	
MIG Root SG2 (G3S1) 1.2 mm Ar + 18% CO2 MIG Root SG2 (G3S1) 1.2 mm Ar + 18% CO2 Pulse Pulse HD Short Short HD Root Manual	MIG Root . Designed for first-pass welds, descending vertical butt joints, and open-lap joints. Reduction in spatter. Good root execution and secure fusion of edges. Process for welding on iron and stainless steel.		
Processo MIG SRS SG2 (G3S11) 1.0 mm Ar + 18% CO2 Pulse HD Short HD Root SRS 3DPulse Ar SDPulse SDPUlse SD	MIG SRS . Designed for first-pass welds, butt joints on thin panels, and open-lap joints. Minimisation of spatter. Reduced heat-affected zone. Arc control has been optimised to manage short circuits during Short Arc welding more effectively.		
Processo MIG 3DPulse 308L 1.0 mm Ar + 2% CO2 Pulse Pulse Pulse HD Short HD Short HD SRS 3DPulse Manuale	MIG 3D Pulse. Designed to optimise filler metal transfer with less heat and faster joint execution speed.Better-looking finished joint. Less preparation of the joint between passes. Lower residual stresses in the welded workpiece. Superior arc stability in all positions. Better control of the weld bath in position.		
Process Process MiG Manual SG2 (G3Si1) 1.2 mm Ar + 18% CO2 Pulse Pulse HD Short HD Root Manual	E Rend (2020) (J with In 90.00)	MIG Manual . After selecting MIG Manual, select the type of wire, diameter and gas from the main menu. Select the m/min and set the motor speed, selecting the welding voltage. Press knob I for longer than one second. The voltage for the m/min set will be shown on the display. Now the m/min can be increased without changing the voltage.	

4.3 Start mode

To choose the start mode, select pushbutton **DE (see Fig. 10)**. **Start modes are the same for all MIG/MAG processes.**



The **START** control for manual applications is available in the wire feeder and on the torch attachment. It can be activated using the corresponding pushbutton on the torch as well as on the remote control connector.

+	2 stroke mode
↓ 2T	Mode appropriate for short welding bursts or automated robotised welding.
_ · ·	released
	HSA and CRA functions can be activated in 2 stroke mode.
	Automatic mode or 4 stroke mode
4 4T	Appropriate mode and perform long-term welding. Starting and stopping are controlled by pressing and releasing the torch START pushbutton. Not available with Robot interface activated. HSA and CRA functions can be activated in 4 stroke mode.
t i	3 level mode
الحبر عد	When the arc strikes, the current is set to the first level. As long as the START pushbutton is pressed, the current remains on the first level. Upon releasing the START pushbutton,
	the current passes from first to second level within the slope time; once the second level is
	reached, this is maintained. The next time the START pushbutton is pressed, the welding
	is released welding stops and the post-flow procedure is run. The HSA and CRA functions
	are inhibited in 3-level mode
	Not available with Robot interface activated.
	HSA mode
	first current level and the first level ramp time at the final welding current.
HSA	When the START command is activated, the set values are automatically carried out.
_ _	
	CRA mode
	By activating CRA mode, the operator can adjust the final current level (crater current), the
CRA	time spent at final current level and the time of the ramp down from the welding current to
	carried out.
	SPOT mode
СРОТ	
SPUT	
· · · · · · · · · · · · · · · · · · ·	

4.3.1 SPOT mode

The operator can choose between **Spot time and pause time function**. This function is not available with **3L** mode active.

— — — —	1
Spot Time: 1.0 s	Spot time . Adjustable from 0.3 to 25 seconds.
Pause Time: 0.5 s	Pause time. Possibility of regulating the pause time between one welding spot or section and the next from 0 to 5 seconds.
·	Key showing mode 2T with spot function active
· İ	Key showing mode 2T with spot and pause time functions active
*	Key showing mode 4T with spot function active
41 H	Key showing mode 4T with spot and pause time functions active

4.3.2 DOUBLE LEVEL mode

To choose the **DOUBLE LEVEL** mode, select pushbutton **DF**:

				Press pushbutton (DF) on the display and it becomes possible to activate the function using the ON pushbutton, which turns orange when pressed.
Double Level MIG Short 308L 1.2 mm Ar + 2% CO2 Arc Length Correction: 0.9 V	DEFAULT			Active in synergic MIG/MAG processes only. This mode involves changing wire speed (and consequently also current intensity) between two levels. Before setting double level welding, make a short bead to determine the wire speed and hence the current to obtain the optimum bead penetration and width for the type of weld to be performed. In this way the wire feed speed is determined; the set SPEED DIFFERENCE parameter will be added to or subtracted from this value. Before start working you should not forget that for a correct bead, the minimum overlap between one mesh and another must be 50%.
	MIN.	MAX.	DEF.	Double level frequency . Frequency is the number of periods per second expressed in Hz. Period means the duration of a complete speed high-low
FREQUENCY	0.1 Hz	10 Hz	1.5 Hz	variation cycle.
DUTY CYCLE	25%	75%	50%	relation to the overall period duration.
SPEED DIFFERENCE	0.1 m/min	3.0 m/min	1.0 m/min	in m/min in relation to the reference speed.
ARC CORRECTION	-9.9	+9.9	0.0	Arc correction. Sets a higher speed/current arc length.
UP SLOPE	0.1	10.0	0.8	Down/Up Slope . The up or down ramp set for the transition from the minimum motor speed value to
DOWN SLOPE	0.1	10.0	0.3	the maximum value and vice versa. DEFAULT to reset all the parameters to the factory settings.

4.3.3 Setting welding parameters

DG/DH quick pushbuttons for selecting welding parameters

ξ 0.0	Adjusting inductance . This can be selected using pushbutton DG . This function can be used to switch between a narrow, hard arc with deep penetration (negative values) and a broad, smooth arc (positive values). The adjustment can range between +/- 9.9, 0 is the factory setting.
0.0	Adjusting arc length . This can be selected using pushbutton DH . If necessary, arc length (welding voltage) can be corrected by +/- 9.9 V for the specific welding job, 0 is the factory setting.

Set the following values using the "PARAMETERS" pushbutton on the main menu:

Preflow Time: 0.1 s	Preflow . Adjustment ranges from 0.1 to 10 seconds Turn knob I to change the value, press to confirm.
Postflow Time: 3.0 s	Postflow . Adjustment ranges from 0.1 to 25 seconds Turn knob I to change the value, press to confirm.
Gas Flow: 10.0 I/min	Gas Flow . Active only with Kit 436. Adjustment ranges from 5 to 30 l/ min. Turn knob I to change the value, press to confirm.
Gas Flow 10.0 l/min Wire Weight 6.23 g/m Arc Length Correction 0.0 V	Wire Weight . Welding wire consumption is shown in grams per metre to calculate spool consumption. The value must be preset. Use the default value if the weight of the wire is not known.
Soft-Start: 96 % (AUTO)	Soft Start . The adjustment can vary from 10 to 100%. This is the wire feed speed expressed as a percentage of the speed set for welding, before the wire touches the workpiece to be welded. This adjustment is important for achieving effective start-ups. Press AUTO to call up the factory settings.
Burnback Correction: 0 ms	Burnback . The adjustment can vary from -125 to +125 ms. Its purpose is to adjust the length of wire emerging from the gas nozzle after welding. A positive figure means more wire has been burnt and the amount sticking out is shorter. Press 0 to call up the factory settings.

5 <u>TIG DC WELDING.</u>

TIG process not available with robot mode activated.

5.1 <u>Select welding process:</u>

To choose the welding process from those available select pushbutton DC - Fig. 10.

Process	OFF 08:50:17 15/02/21	Select the main process pushbutton TIG: the pushbutton turns
TIG DC APC Lift		orange.
DC APC		Select the relevant process from amongst those listed by turning knob I and confirm by pressing I.
	Ð	

5.2 Start mode

To choose the start mode, select pushbutton **DE - Fig. 10**. Start modes are the same for all TIG processes.



The START pushbutton for manual applications is present on the wire feeder remote control connector.

۲	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 same is released.
ار کا را	4 stroke mode	Appropriate mode and perform long-term welding. Starting and stopping are controlled by pressing and releasing the torch trigger.
<mark>۱</mark> ۴–۴	3 level mode	When the arc strikes, the current is set to the first level. As long as the torch trigger is pressed, the current remains on the first level. Upon releasing the torch trigger, the current passes from first to second level within the slope time; once the second level is reached, this is maintained. In order to pass to the third current level, simply press the torch trigger and the current is adjusted to the third value selected within the set slope time. When the torch trigger is released welding stops and the post-flow procedure is run.
^{۱۱} ۲ ^۰ ۲۰	4 level mode	When the torch trigger is pressed and released, the torch switches between two preset levels as many times as the operator wishes. Welding stops when the operator holds the torch trigger continually pressed for at least 1 second

5.3 Arc striking modes.

5.3.1 Lift contact ignition.

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

- 1- Touch the workpiece to be welded with the electrode tip.
- 2- 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.
- 3- 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.

5.4 <u>TIG parameter settings table.</u>

Process parameters can be set directly using the following sequence:

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

Description	Min.	DEF.	Max.	UM	Sol.
Preflow	0.1	0.1	10	S	0.1
EVO START	OFF	OFF	1.0	S	0.1
First Level Current	3	25	I_SET	A	1
First Level Time	0	0	30	S	0.1
First Slope Time	0	1.0	10	S	0.1
Main Current Setpoint	3	100	l2_max(*)	A	1
Final Slope Time	0	1.0	10	S	0.1
Crater Time	0	0	10	S	0.1
Crater Current	3	10	I_SET	A	1
Postflow time	0.1	10	50	S	1 (0.1-25) s 5 (25-50) s

Table 1

(*)	
Item no.	l2_max
372	400 A
374	500 A

The parameters set out in Table 1, start management (2 stroke, 4 stroke etc.) and the pulse parameters can be set in the section *Menu->Process Parameters*.

Parameters	⑦ 法 ↔ 0ff 09:54:14 15/02/21	Parameters	⑦ 品 ◆ パチ 09:54:26 15/02/21
TIG DC Lift		TIG DC Lift	
Start Mode		Main Current Setpoint	
Preflow Time	0.1 s	Final Slope Time	0.00 s
Postflow Time	10.0 s	Crater Current	(10 A) 10.0 %
Gas Flow	10.0 l/min	Crater Current Time	0.0 s
First Level Current	(25 A) 25.0 %	Pulse	OFF
First Level Time	0.0 s	EVO Start	OFF
First Slope Time	0.00 s	Extended Limits	OFF

The gas flow parameter indicates the setpoint of the shielding gas if Kit Item 436 is present. In the absence of Kit Item 436, this kit is used to count the gas delivered in weld counters (weldments).

An additional *"Extended Limits"* item is present on the menu. When this function is activated, the "First level current" and "Crater current" are extended from 100% to 400%.

5.5 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 **DF – Fig. 10**, or select

Menu -> Process Parameters -> Pulse



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

Parameter	Min.	DEF.	Max.	UM	Sol.
Duty Cycle	10	50	90	%	1
Pulse level	0	50	100	А	0.1
Pulse frequency	0.1	1.0	2.5 kHz	Hz	0.1

In pulsed TIG welding, the **Pulse level** parameter performs the task of keeping the arc ignited and the weld bath 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. The duty cycle affects weld heat input.

5.6 TIG DC APC

This 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 parameter.

E.g. if APC adjustment is equal to 20 A/V 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. This variation is automatically reset to 0 when the voltage is restored to the nominal value.

To activate the welding process, press pushbutton **DC** - Fig. 10 on the main screen and then select **DC** APC using encoder I.



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

APC Regulation	(1 – 80) A/V
-----------------------	--------------

5.7 <u>TIG DC XP</u>

TIG DC XP is a welding process where the current pulses at very high frequency and allows a more concentrated and penetrating weld bath, as well as improved 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.

The welding parameters to be set are the same as for the TIG DC process see Tab1.

To activate the welding process, press pushbutton **DC - Fig. 10** on the main screen and then select **DC XP** using encoder **I**.

The only difference between the TIG DC and TIG DC XP processes is the pulse function.

For TIG DC XP, the maximum frequency that can be set is 300 Hz while for TIG DC it is 2.5 kHz. Refer to Table 1 for the parameter settings.

6 MMA WELDING

MMA process not available with robot mode activated.

KINGSTAR range power sources are able to manage the MMA process in DC 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.



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.).

NOTICE

The MMA process is not available when robot mode is activated.

6.1 MMA DC Process

In section DC - Fig. 10 of the main screen, select MMA

	OFF 09:17:59 09/11/20		Parameters	⑦ 器 ♥ ff 10:37:32 15/02/21
MMA DC			MMA DC	
400.	C2 C		Current Setpoint	
TUUA	62.6V		Hot Start	50 %
↑	Лов	MMA Process main screen	Hot Start Time	0.15 s
Current Setpoint	No load Voltage		Arc Force	30 %
	-		Antistick	ON
7	<u> </u>		Cut-off Voltage	70 V

6.2 MMA process parameters

	Description	Min.	DEF.	Max.	UM	Sol.
50 %	Hot Start Improves ignition even when using electrodes with poor ignition properties	0	50	100	%	1
30 %	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	S	0.01
	Antistick. Function that prevents the electrode from bonding to the workpiece	OFF	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

7 **OTHER PANEL FUNCTIONS**

7.1 JOB management

A welding programme and its parameters (process, ignition, mode etc.) can be saved on the JOB page. The available JOBS are numbered and range from 1 to 99. The operations that can be carried out on a JOB are listed below:

\Rightarrow	Save
\Leftrightarrow	Retrieve
圓	Delete
	Сору
ð	View details of the saved JOB.
→	Saving a particular job on a USB drive. The target file format is <i>file_name.zip</i> . The icon appears only if a physical USB backup drive is inserted.

7.1.1 Saving a welding JOB

JOB		Select the JOB memory position, turning knob L
MIG Pulse HD SG2 (G3Si1)	1.2 mm Ar + 18% CO2	
1 - MIG Short SC	52 (G3Si1) 1.2 mm Ar + 1	A description of the saved process will now appear in the selected position.
€ 3 -	a.	
±4 - 5 -		Save by pressing the key
6 - 7 -	C	

7.1.2 Modifying a JOB

	Select the relevant JOB by turning knob I.
JOB Image: Second state s	Retrieve by pressing pushbutton 🔶.
2 - MIG SRS 308L 1.2 mm Ar + 2% CO2 ¢ 3 - MIG Short HD 308L 1.2 mm Ar + 2% C	Modify the welding parameters.
4 - MIG Manual 308L 1.2 mm Ar + 2% CO 5 - →	Select JOB section DL – Fig. 10.
	Overwrite the previous JOB or create a new one by selecting a free memory location and pressing \Rightarrow

7.1.3 **Deleting a JOB**

	-		
J OB MIG Pulse	o 品 ◆ ∠ パパ SG2 (G3Si1) 1.2 mm Ar + 18% CO2	15:56:50 05/02/21	Select the JOB memory position by turning knob I.
↓	1 - MIG 3DPulse 308L 1.2 mm Ar + 2% C(2 - MIG SRS 308L 1.2 mm Ar + 2% C02 € 3 - MIG Short HD 308L 1.2 mm Ar + 2% C 4 - MIG Manual 308L 1.2 mm Ar + 2% C0 5 -	Job Mode	Press pushbutton and the JOB will be deleted.
	7-	Ð	

7.1.4 Copying a JOB

JOB Auro 1556500 MIG Pulse SG2 (G3511) 1.2 mm Ar + 18% CO2 05/0271 MIG Pulse 308L 1.2 mm Ar + 2% C(1.0 Mode	Select the memory position of the JOB to be copied by turning knob I.	JOB 〇品 (C) 2005 MIG SRS 308L 1.2 mm Ar + 2% CO2	12:35:47 23/02/21
✓ 2 - MIG SR5 308L 1.2 mm Ar + 2% CO2 € ✓ 3 - MIG Short HD 308L 1.2 mm Ar + 2% C ✓ 4 - MIG Short HD 308L 1.2 mm Ar + 2% C	Press 📋 and the JOB will be copied to the	2 -	
4 - Mits Manual 308L 1.2 mm Ar + 2% CO 5 - 6 -	and press A the JOB will be copied to the	4 - 5 - 6 -	← □
	new position.		

7.1.5 Welding with a JOB

JOB 日本 (25) 15:55:50 MIG Pulse SG2 (G3Si1) 1.2 mm Ar+ 18% CO2	Select the memory position of the JOB to be used by turning knob I.
→ 1 - MIG 3DPulse 308L 1.2 mm Ar + 2% C(2 - MIG SRS 308L 1.2 mm Ar + 2% CO2 €	Press the Job Mode pushbutton to activate welding with the selected JOB
4 3 - MIG Short HD 308L 1.2 mm Ar + 2% C 4 MIG Short HD 308L 1.2 mm Ar + 2% C	
4 - MiG Manual 308L 1.2 mm Ar + 2% CO 5	
の品・164334 JOB 1 MIG Short SG2(G3Si1) 1.2 mm Ar + 18% CO2	The Job Mode operating mode is active with the selected JOB (1 in the
400 A 36 8 V	example).

Set Job Mode and turn knob **I**, or the torch UP/DOWN pushbuttons to navigate between saved JOBS. A JOB can be selected when the machine is in standby or while it is delivering power.

Switching between JOBS with the arc on is NOT allowed when they relate to different processes, e.g.:

- MIG/-TIG,
- TIG -> MMA

7.1.6 JOB Details

JOB 回居 (05/02/21) MIG Pulse HD SG2 (G3Si1) 1.2 mm Ar + 18% CO2	Select the JOB memory position by turning knob I.
1 - MIG Short SG2 (G3Si1) 1.2 mm Ar + 1 2 - 3 - 4 -	Press the pushbutton
Job 1 Details MIG Short SG2 (G3Si1) 1.2 mm Ar + 18% (O2, 12,0 m/min)	The following pushbuttons can be used:
Name Timestamp 04/02/2021 - 09:13:48	- Cr to edit the JOB name.
Filler Metal SG2 (G3Si1)	
Diameter 1.2 mm	- Losave all JOB settings in PDE format onto a USB drive
Gas Ar + 18% CO2	
Wire Speed 12.0 m/min	

7.1.7 Allow adjustment of a JOB



7.1.8 Saving and loading an individual JOB from a USB drive

To save an individual JOB onto a USB drive:

JOB のたいの使し 150923 69/02/21 MIG Pulse HD SG2 (G3Si1) 1.2 mm Ar + 18% CO2 1 - MIG Short SG2 (G3Si1) 1.2 mm Ar + 1 Job Mode 2 - 3 - 4 - 3 - 1 - MIG Short SG2 (G3Si1) 1.2 mm Ar + 1 Job Mode	Insert a backup drive into a USB port. Select the JOB to be saved by knob I . Press the pushbutton
4- 5- 6- 7- → ●	The JOB is saved in <i>file_name.zip.</i>

Loading an individual JOB from a USB drive:

JOB 💿 品 🗢 🖉 🚛 15:56:50 05/02/21	Insert a backup drive into a USB port.
MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2	Turn knob I and select the memory location to load the JOB
2 - MIG SRS 308L 1.2 mm Ar + 2% CO2 €	← ■
3 - MIG Short HD 308L 1.2 mm Ar + 2% C	Press the pushbutton .
4 - MIG Manual 308L 1.2 mm Ar + 2% CO	Select the previously saved job <i>file_name.zip</i> from the USB drive and confirm
	by pressing knob I.
	The JOB is loaded in the chosen position.

7.2 Power source status menu

The power source status menu displays information about the welding time, number of ignitions, power source output voltage and current, power source internal temperatures, voltage and current of the motor, the amount of wire fed.

To access the power source status menu, select *Menu ->*

MIG Short 308L 1.2 mm Ar + 2% CO2
Water Unit OFF
Welding Mask OFF
Push-Pull Torch OFF
Torch Calibration
Max Inching OFF
Quality Control OFF
Gas Regulator Kit OFF

7.3 Accessories menu

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

NOTICE If accessories are present in the welding system, they 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 SpA does not provide warranty coverage for inappropriate use of the welding system.

To access the Accessories menu, select Menu->Accessories

Accessories	⑦ 品 ◆ 乙 が 23/02/21		Accessories	▶ 品 ↔ 🖉 👫 09:02:49 23/02/21	
MIG Short 308L 1.2 mm Ar	r + 2% CO2		MIG Short 308L 1.2 mm Ar + 2% CO2		
Water Unit	OFF		Torch Calibration	•	
Welding Mask	OFF		Max Inching	OFF	
Push-Pull Torch	OFF	Accessories main screen	Quality Control	OFF	
Torch Calibration	•		Gas Regulator Kit	OFF	
Max Inching	OFF		Potentiometer Input	ON	
Quality Control	OFF		Robot Interface	OFF	
Gas Regulator Kit	OFF		Secondary Panel	OFF	

7.3.1 Cooling unit

The cooling unit to be used with the KINGSTAR power source is Item No 1683 - GRV12.

On power source Item No 372.XX it is optional, but standard on power source Item No 374.XX.

The status bar **DN** always shows the cooling unit icon and unit status is shown in the upper part of the icon: OFF, ON, AUTO.

Accessories ⊙ 品 ← 2 Auto 09:58:33 MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2	Encoder I is used to select/activate the operating mode:
Water Unit: AUTO	OFF Cooling unit disabled.
OFF	
ON	ON Cooling unit always on.
AUTO	
	AUTO Cooling unit operates in synchrony with the welding process
ר	

7.3.2 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.

Accessories O Z C AUTO MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2	09:59:07 08/02/21	Select ON and press PAIR	Accessories 이 문 수 기 고 세 MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2	10:15:29 08/02/21
Welding Mask: OFF	-		weiding Mask: OFF	
UFF			UFF	
ON	PAIR		ON	PAIR
	DARK			DARK
	C			C
	·	d	— ,	

If the mask is recognised, the icon appears in section **DN** of the display

As soon as welding current starts to flow through the workpiece, the mask is automatically darkened. To check the function, press the "DARK" key on the display and ensure the mask glass goes dark.

7.3.3 Push-Pull Torch

Activates only when Item No 447 KIT DRIVER PUSH-PULL is installed.

Accessories ⓒ 本 ↔ 2 0°FF 16:48.02 22/02/21 MIG Short 308L 1.2 mm Ar + 2% CO2		Use encoder I to select Push-Pull Torch mode. Two types of torch can be called up:
OFF Binzel Custom	Ĵ	Binzel torch: connect a Binzel torch with 42 VDC motor to the wire feeder, the machine is ready to weld. Both wire feed motors, the main and the Push-Pull motor, are already synchronised. Custom torch : if a general Push-Pull torch with 42 VDC motor is connected to the wire feeder, the main motor must be synchronised with the Push-Pull motor

7.3.3.1 Push-Pull Torch Custom

Ac	cessories	◙‱♥⊵෴	09:56:09 23/02/21	Use enco	oder I to	o select cust	om Pus	h-Pull r	node.		
MI	G Short 308L 1.2 mn	n Ar + 2% CO2									
Wa	ater Unit	OFF		Activate	torch	calibration	mode	using	this	selection;	"Push-Pull
We	elding Mask	OFF		Calibratio	on"						
Pu	sh-Pull Torch	Custom									
F	Push-Pull Force	0									
F	Push-Pull Calibration	•									
To	rch Calibration	•									
Ma	ax Inching	OFF									

7.3.3.2 Push-Pull Calibration

Use encoder I to select Push-Pull Calibration mode.

Insert the welding wire into the Push-Pull torch, ensuring that it emerges from the torch current nozzle. When indicated, open and close both rollers, i.e. for the main motor and for the Push-Pull motor.



7.3.3.3 Push-Pull Force

Accessories OF 1648.14 MIG Short 308L 1.2 mm Ar + 2% CO2	Use knob I to select Push-Pull Force mode.
Push-Pull Force: 0	This is active for both <i>Binzel Push-Pull</i> and <i>Custom Push-Pull</i> .
	This function adjusts the drive torque of the Push-Pull motor in order to ensure the welding wire feed is linear.
****-99 *****99	Adjust by turning knob I, confirm by pressing.
	The adjustment ranges from +99 to -99

7.3.4 Torch Calibration

This activates only when Item No 443 KIT SRS - SPATTER REDUCTION SYSTEM is installed.

Torch Calibration 的 品 中区 如 10:18:00 08/02/21 MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2		Use knob I to select Torch Calibration mode. Connect the terminal provided in the kit to the part to be welded.
NOTE: please connect the measure clip! Test 1 76 Test 2 46 Test 3 3496	Enable Calib. Save	Press the Enable Calibration pushbutton. Rest the electrode of the MIG torch against the part to be welded and ensure there is a good contact. Press the torch pushbutton 2/3 times, checking that the parameters displayed are almost the same (Test1 and Test2). Press the SAVE pushbutton to save the parameters. Exit Torch Calibration mode, keeping the terminal provided with the kit connected to the part to be welded.

7.3.5 Max Inching

=		
Accessories 〇 子 令 2 400 11: MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2	:20:21 /02/21	Use knob I to select Max Inching mode.
Max Inching: 1.0 cm		preset maximum length in cm after starting with no passage of current. Adjustment OFF - 10 cm.
		Use knob I to set the desired value. Press to confirm.
MNOFF		
•		

7.3.6 Quality Control

Please refer to the manual of Item 273.

7.3.7 Gas regulation Kit

The kit allows precise adjustment of the gas flow during welding and can only be used for MIG type processes. For details, refer to the Item 436 user manual.

7.3.8 Input potentiometer

ON allows the potentiometric input on the connector on the wire feeder front panel to be read. OFF potentiometric input variations are ignored.

NOTICE

Whenever an external accessory is connected to the CAN channel, refer to the terminal table in section 9.3 for correct system operation.

7.4 <u>Settings menu</u>

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

Settings	OFF 17:52:59 OFF 25/01/21		Settings 🙆 🐟	OFF 17:53:07 25/01/21
MIG Short SG2 (G3Si1) 1.0 mm	Ar + 18% CO2		MIG Short SG2 (G3Si1) 1.0 mm Ar + 18% C	02
Production Mode	OFF		User Management	•
Clock Setup	•	Press Menu -> Settings to	USB Management	•
Language	🚟 English	access the power source settings	External CAN Interface	► I
User Interface Style	default	page.	LAN Setup	•
User Management	▶	P-39-1	Allow Job Adjustments	OFF
USB Management			Restore Factory Setup	
External CAN Interface			Power Source Name	

7.4.1 Production Mode

This is a power source software option: please refer to the Item No 817 manual

7.4.2 Setting the clock, language

Clock Setup 조	Select <i>Clock Setup</i> and press I. Turn I to select the item to be set.
Date 30 4 2019 Time 9 30 34	Press I to confirm the item. Turn I to set the desired value. Press I to confirm the change.
Time Zone 1 DST Summer	
Settings 2 0FF 09:33:04 30/04/19	Select Language and press I.
MIG Pulse 308L 1.0 mm Ar + 2% CO2	Turn I to set the desired language.
Language: English	Press I to confirm.
English	
Italiano	
Français	
Español	
Portugues	
Deutsch	

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

7.4.3 User management

In KINGSTAR 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 settings/actions.

Settings 이 문 수 👫	15:30:47 04/02/21	Select Menu -> Settings -> User Management.
MIG Pulse HD SG2 (G3Si1) 1.2 mm Ar + 18% CO2		Select the relevant option:
User Management	9 🖂	OFF: User profile management not enabled
OFF		Basic: User profile basic management
Basic		Advanced: Advanced user profile management, only
Ivanced	available if software option Item 809 has already been activated.	

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 icon
Expert	All settings for welding and accessories are allowed.	1-4 numerical characters	5555	Green icon
Administrator	All adjustments and machine settings are allowed	1-8 numerical characters	9999	Red icon

To access the desired profile, use encoder I or press the desired pushbutton directly. Then press the <i>login</i> pushbutton		The icons shown the profile type.	in the figure will ap	opear after selecting
Change User 조 소 양 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오 오	13:17:25 27/03/20	MENU MIG Pulse HD SG2 (G3Si1)	○ 品 ◆ 上 1.2 mm Ar + 18% CO2 /	15:40:39 04/02/21
Normal	÷	Matavial	CINDS	í
Expert		Materia	C-10/C	
🔦 Administrator	e.	Process	Parameters	
	C	Accessories	Settings	D

A PIN number is required to access the Expert and Administrator profiles.

To change the PIN, select pushbutton 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 (MIG -TIG - MMA)	×	~	\checkmark
MIG synergic curve change	×	✓	\checkmark
MIG process mode change (short/pulse/root/etc.)	✓	✓	\checkmark
Process parameters adjustment	✓	✓	\checkmark
JOB management (save, delete, copy/paste, rename)	×	~	\checkmark
JOB Mode activation/deactivation (ON/OFF)	×	~	\checkmark
Use of JOBs (if JOB Mode= ON, only retrieve if JOB Mode= OFF)	✓	✓	✓
WPS Mode activation/deactivation (ON/OFF)	×	\checkmark	\checkmark
Access the Settings menu	×	×	\checkmark
Web application (webapp)	×	\checkmark	\checkmark

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. 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 an Expert user PIN is forgotten, simply login as Administrator 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:

Select User Setti	ngs	Select the Administrator user option:
MENU MIG Short SG2 (G3Si1) 1.2	<u></u> Rm Ar + 18% CO2	Cambio Utente Image: Cambio Utente Image: Cambio Utente Select a user from the list below
Materiale	swps	Normal 🔁
Processo	Parametri	7 Administrator
Accessori	Impostazioni	PREMERE LA MANOPOLA PER ALMENO 3 SECONDI
Enter the 16-digi pushbutton bear	t PUK code and confirm with the ing the checkmark	Set a new Administrator profile PIN
Inserisci PUK 2EAB3277225A585B DIG	五 ◆ 0ff 10.08:30 26/03/20	Cambio Utente □
1 2 3 4 5	6 7 8 9 0	Normal
QWERT		Sexpert
ASDF	G H J K	Administrator
Z X C		CLICCARE QUI PER CAMBIARE IL PIN

ADVANCED mode

Please refer to the manual of Item 809.

7.4.4 **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



B Management Off 17:56:46 25/01/21 5 Short SG2 (G3Si1) 1.0 mm Ar + 18% CO2	Select USB Management and press I. Turn I and select the relevant item
ove	
ware Update	
up ►	
ore •	
rt Weldments rt Diagnostic	

Remove

Select this option before removing the pen drive from the USB port.

Firmware Update

Select this item to update the power source firmware. The update file loaded onto the USB pen drive must have the extension .psu. Insert the pen-drive into the power source USB port

INSTRUCTION

The update operation does not mean that programs (JOB) and welding data contained in the machine will be lost.



Install Options

Select this item to install the software options in the power source.

The option release file loaded on the USB drive must have the extension .txt and is supplied by Cebora after purchasing the option.

Insert the pen-drive into the power source USB port

Lista dei File 回品 🕫 🖉 🗸 1656-22 28/01/21	Turn I and select Install Options.
	On the File List page, select the file to be loaded by
E72882.txt	turning I, the name must be the same as the machine
	serial number and confirm using the pushbutton with the
	checkmark indicated.
	Removal of the USB pen drive will then
	be requested and the machine will
↓ ↓	install the requested options.

Backup

Select this item to back up the jobs and/or user settings.

Backup 6 品 中 2 点100 日本 12% Backup 8 SG2 (G3Si1) 1.2 mm Ar + 18% CO2	17:04:52 28/01/21	Turn I and select <i>Backup</i> . Select the relevant option.
All		•
Jobs Only		
Users Only		
	-	

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

Restore

Select this job to restore jobs and/or user settings previously saved on a USB pen drive. Insert the pen drive into one of the two USB ports on the front panel.

Turn I and confirm <i>Restore</i>	Select the relevant option.
USB Management 6 品 🗢 🔽 🗤 17:35:19 28/01/21	Restore (Ŏ 🛣 ↔ 📿 🏧 28/01/21
MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2	MIG Pulse SG2 (G3Si1) 1.2 mm Ar + 18% CO2
Remove	All
Firmware Update	Jobs Only (delete existing)
Install Options	Jobs Only (overwrite existing)
Backup	Jobs Only (keep existing)
Restore	Users Only
Export Weldments	
Export Diagnostic	

All	Restore all jobs and user settings.
Jobs Only (delete exisiting)	Restore jobs saved on the pen drive by deleting existing ones
Jobs Only (overwrite exisiting)	Restore jobs saved on the pen drive by overwriting existing ones
Jobs Only (keeping exisiting)	Restore jobs saved on the pen drive, keeping the existing ones
Users Only	Restore only the list of users (Item No 809 CHECK)

Export Weldments

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.

The data are exported in CSV format.

Weldments 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. The exported data can be saved in CSV or PDF format, with up to 1000 records per file.

CEBO	Art.374-P1624C Weldments [04-02-2021]												
					We	ldmen	ts						
id jobid Start Tir	ne Welding Time [s]	Arc-on Duration [s]	Main Current Duration [s]	Average Current [A]	Average Voltage [V]	Energy Provided [k]]	Wire Speed [m/min]	Motor Current [A]	Supplied Wire [m]	Supplied Wire [g]	Supplied Gas [s]	Supplied Gas [1]	Welder
2150 28-01-21 15:15:32	25.0	21.8	21.8	133	24.4	71.1	3.8	0.5	1.37	12	24.9	4.2	
2149 28-01-21 15:14:46	21.6	18.4	18.4	190	21.9	75.6	4.7	0.5	1.44	13	21.6	3.6	

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 Infos

Allows a second power source start-up screen to be customised with the dealer's data and logo. Ask CEBORA technical assistance for details of the procedure.

7.4.5 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 guickly using standard protocols.

The network card MAC address is shown at the top right of the configuration screen.

Network configuration :

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

LAN Setup	◙ᄰ᠅◪ᄴ	11:40:06 04/02/21	Select Menu -> Settings -> Lan Setup
MIG Pulse SG2 (G	3Si1) 1.2 mm Ar + 18% CO2		Turn I to choose the required field and press I to confirm, then change
DHCP	9C:53:CD:03:DD:35		the required values.
IP Address	192 168 13 198		Confirm the address using the pushbutton with the checkmark.
Netmask	255 255 252 0		Exit the menu by pressing the return pushbutton.
Gateway	192 168 12 1		
DNS	192 168 1 195	Ĵ.	

The network can be configured in manual or automatic mode.

Manual	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 because they are currently unused.
	Confirm the configuration by pressing the pushbutton with the checkmark.
Automatic	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://192.168.13.198) and press Cebora to open the Cebora webapp homepage.

7.4.6 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.

NOTE.

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 v. 1.3.3



The certificate input procedure depends on the browser used and the type of operating system. For Chrome for Windows, go to:

Settings \rightarrow Advanced \rightarrow Privacy and security \rightarrow Manage certificates. The Windows Certificates dialogue box will open. Click on the Trusted Root Certification Authorities tab, click the Import key, select the .crt file provided and click Next until the procedure is complete.

7.4.7 Restore factory setup

Select this item to restore factory settings.

Restore Factory Setup OFF 17.57.85 25/01/21 MIG Short SG2 (G3Si1) 1.0 mm Ar + 18% CO2 1.0 mm Ar + 18% CO2	Select <i>Menu -> Settings</i> -> <i>Restore Factory Setup</i>
Restore All (including Jobs)	furnitio select and committine relevant option
Delete All Jobs	
Restore All (excluding Jobs)	

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.

7.4.8 Name of power source and system

Information on the power source name can be entered in this section.

Power Source Name MIG Short SG2 (G3Si1)	OFF 17:58:01 1.0 mm Ar + 18% CO2 25/01/21	Select <i>Menu -> Settings -> Power Source Name.</i> Select the relevant item and enter the desired description
Plant	MyPlant	
Cell	MyCell	
	Ţ	

7.5 Status bar

Main menu sector **DN – Fig. 10** 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 is installed.
• ;	USB pen drive inserted: tap the icon for quick access to the USB management menu, see section 7.4.4.
品	LAN connection activated: tap the icon for quick access to the LAN settings, see section 7.4.5
Д	User management active: tap the icon for quick access to the user settings, see section 7.4.3.
◎-≎	Robot interface active.
11:43:51 26/11/20	Date and Time: tap the icon for quick activation of date and time settings, see section 7.4.2.

7.6 Info Menu



To open the Cebora website page automatically:

To open the Cebora webbapp automatically:

Turn I to display information on the distributor, if available.

Installing options in the power source.

Ask Cebora for the option release code

On the Info menu press the pushbutton "Options" Options , the following window appears:

Installa Op	zioni			と	•	PP [<u>/</u> .	٥ff کرک	15:13:17 16/03/21
									1
1 2	3	4	5	6	7	8	9	0	
qw	E	r	t	y	u	i	0	р	X
A	s	D	F	g	h	j	k	Ι	
	z	x	С	V	В	n	m		
	à?=							\mathbf{X}	ſ

Enter the release code and confirm.

8 <u>WEBAPP</u>

KINGSTAR 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 7.4.5).

- The Webapp consists of a Service Panel where it is possible to:
 - Display available synergic curves
 - Display parameter values of welds performed
 - To back up and restore (see section 7.4.4).
 - Display power source diagnostic data (see section 7.2).

ETTAGLI DEL SISTE	MA			PACCHETTI FUNZIONE	
		KINGSTAR 52	0 TS	INSERISCI CODICE DI SBLOCCO	
		ARTICOLO 374	MATRICOLA A00000	Attiva	
f.		MPIANTO MyPlant	cella MyCell	Parchetti saldatura	
		VERSIONE SOFTWARE		Attivati	
	0	1.4.1		MIG Doppio Livello	Art.23
				🔿 Controllo Qualità	Art,27
				MIG Pulsato	Art.23
				O WPS	Art.80
				Contatori	Art.905
				TIG Full Optional	Art.B04
				MIG 3DPulse	Art.81
				💿 optDLog	Art.NA

The Webapp can also manage a virtual control panel (Remote Panel), which basically replicates the welding power source control panel on the PC or tablet.



The *Remote Panel* requires the use of a display of adequate size, i.e. at least 7", like the display on a tablet. A smartphone display is not big enough.

9 ROBOT CONFIGURATION

THE FUNCTIONS AND PROCESSES PREVIOUSLY DESCRIBED IN THIS MANUAL ARE ALSO AVAILABLE FOR AUTOMATION .80 VERSION POWER SOURCES, EXCEPT FOR THE FOLLOWING:

Chapter	Process/Functionality	Description
5	TIG DC/APC/XP	TIG DC mode
6	MMA welding	Electrode welding

WARNING:

WHEN ROBOT OPERATING MODE IS DISABLED IN AUTOMATION .80 VERSION POWER SOURCES, THE FUNCTIONS AND PROCESSES LISTED ABOVE, WHICH ARE NORMALLY INHIBITED, BECOME AVAILABLE, BECAUSE WHEN THE POWER SOURCE IS CONFIGURED IN THIS WAY, IT OPERATES IN THE SAME WAY AS MANUAL POWER SOURCE VERSIONS.

ALL FUNCTIONS AND SETTINGS EXCLUSIVE TO AUTOMATION VERSION POWER SOURCES WITH ROBOT OPERATING MODE ACTIVATED ARE DESCRIBED BELOW.

9.1 Description of the system

The CEBORA KINGSTAR Welding System is

a modular system designed for MIG/MAG welding with synergic control, developed for use in combination with a welding robot arm on automated welding systems.

In the full configuration, the system is made up of a power source, cooling unit, wire feeder, remote control panel (optional) and a robot interface (optional) (Fig. 11).

In robotised applications, the welding power source is always a Slave node of the communication line, while the robot interface Item 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, section 9.4.2) is 60 Ohm:



Fig. 11

Position	Description	Item	Optional
1	KINGSTAR Robot series power source	372, 374.	-
2	Robot interface	428.XX, 448	(X)
3	CAN2 Robot Control Power Source connection	2063	-
4	Robot wire feeder	1648	-
5	Power source-wire feeder robot connection	2061	-
6	Spool holder/snap-on	121/173	Х
7	Wire guide sheath	1935	Х
8	Remote control panel	452	Х
9	Remote panel power source connection	2065	X

The robot control interface can be formed in three different ways;

- Via an analogue interface Item No 448
- Via a digital interface Item No 428.XX
- 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.

9.2 Connection procedure

To configure CANopen (CAN2) for interfacing with 448/428.xx interfaces or directly with the robot control, proceed as follows:

External CAN Interface 🔞 🛠 🕵 👘 17:29:49 09/02/21	Setting robot interface communication parameters:
MIG Short 308L 1.0 mm Ar + 2% CO2	Menu->Settings->External CAN Interface
Baud Rate 125 kbps	
Node ID 2	
	Use knob I to select and set CANopen-CAN2 network parameters.
Node ID Master	Confirm using the pushbutton with the checkmark.
	See section 9.5
Accessories (0) ↔ 📽 🕂 (17.29.23 09/02/21	Enable robot interface:
Robot Interface: ON	Menu->Accessories->Robot Interface
OFF ON	Select ON using encoder I.
	Confirm using the pushbutton with the checkmark
D	The power source will restart automatically.
	The icon flashes in the status har
(○ •C+ S*C 0FF, 17:31:18	When communication between the Interface/Robot Control and
MIG Short 308L 1.0 mm Ar + 2% CO2	
	power source is correctly established, the icon
→ 1.7 mm	
WARNING	If the Slave node (power source) does not receive an active Robot
[90] CNC not ready	Ready signal from the master CNC/Robot Control within 30 seconds,
A	error code [90].
When the master node sends a Robot Ready s	signal to the power source, the welding system is ready to manage
commands sent by the CNC/Robot control ac	cording to the protocol and the operating procedures described in

manual code 3301099.

NOTE:



To return to the operating mode programmed by the Robot Control and the associated welding parameter settings, deactivate *Internal Parameter Selection* from the control panel.

Press the green icon on the robot and set this mode in the screen that appears on the display to **OFF**; the icon will turn white.

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

Item no 448	3001070
Item no 428.01/02/03	3300139
Process Image MIG	3301099

9.3 DIP switch and terminal settings

POWER SOURCE	1648	452	SW MIG internal Pos. 70 DIP1 pin 1-2	SW 1648 internal Pos. 16 DIP1 pin 1-2	SW 452 internal DIP3 pin 1-2
Х	Х	-	ON	ON	-
Х	Х	Х	-	ON	ON

9.4 Rear connectors for robot interface and accessories



9.4.1 Connector CN1 - 10 pin female

Connect the welding power source to the wire feeder WF5 Item No 1648.

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 to the power source.

	CN1			
Pin	Description			
A	Earth (Wire feeder case)			
В	0V35			
С	Earth			
D	0V_Mot			
E	+70V_Mot			
F	CAN1 +Vdc			
G	CAN1 High			
Н	+35V			
I	CAN1 Low			
J	CAN1 0Vdc			

9.4.2 Connector CN2 - 7 pin female

Connector CN2 (silver) connects the power source directly to the Robot control in CANopen-CAN2 or to a CEBORA proprietary analogue robot interface Item No 448 or Digital Interface Item No 428.XX via communication cable Item No 2063. The ROBOT version of the power source has an integrated CANopen-CAN2 communication interface compliant with the CANopen standard protocol profile DS401.

CN2		
Pin	Description	
A	CAN2 High	
В	CAN2 Low	
С	Earth (*)	
D	CAN2 +Vdc	
E	CAN2 0Vdc(**)	
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 MIG KINGSTAR power source Item No 3301099 for the mapping of signals between power source and robot control.

To enable the digital interface, select the item **Accessories -> Robot Interface** from the main menu and set the communication parameters correctly

9.4.3 Connector CN3 - 7 pin female

Connector CN3 is used to connect optional Control Panel Item no 452 via connection cable Item no 2065.

CN3		
Pin	Description	
A	CAN1 High	
В	CAN1 Low	
С	Earth (*)	
D	CAN1 +Vdc	
E	CAN1 0Vdc(**)	
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 452 instruction manual code 3301082.

9.4.4 Connector CN4 - 10 pin female

Connector CN4 is used to interface with the Emergency+Varc optional kit Item 449. This kit allows management of an external emergency signal, according to international standard EN954-1, category 3.

CN4			
Pin	Туре	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 - Not used	
9		Not used	
10	AOut	V_Arc + Not used	

For more details, refer to the instruction manual of the 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 S.p.A. may provide for the welding power source null and void.

9.4.5 CN6- SRS Control connector

The floating connector from accessory Item No 443 SRS is connected here.

9.4.6 CN7- SRS Control connector

The floating connector coming from the power source-wire feeder connection is connected here.

9.5 Robot interface configuration parameters

After enabling the robot interface, see section 9.2, set the communication parameters



Parameter	Description	Range
Baud rate	Communication bus speed	125 - 500 kbps.
Node ID	Slave node number	2 -126
Node ID Master	Master node number	1-126

10 QUALITY CONTROL

Please refer to the user manual for the accessory Item 273.

11 TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS TABLE				
	372		3	74
	MIG/MAG-TIG	MMA	MIG/MAG-TIG	MMA
Mains voltage U ₁	3 x 400 V		3 x 400 V	
Tolerance U ₁	+15%/-20%		+15%/-20%	
Mains frequency	50/6	60 Hz	50/60 Hz	
Delayed fuse	20A	22A	30A	32A
Power consumed	18.8 kVA 40% 16.4 kVA 60% 14.2 kVA 100%	17.7 kVA 40% 15.8 kVA 60% 15.3 kVA 100%	25.8 kVA 40% 23.7 kVA 60% 20.7 kVA 100%	26.1 kVA 40% 23.2 kVA 60% 22.1 kVA 100%
Mains connection Zmax	Ω 0.090		0.050 Ώ	
cos Phi	0.99		0.99	
Welding current range	10 - 400A	10÷ 400 A	10 – 520A	10-500A
X (duty cycle) According to standard IEC 60974-1	400 A 40%380 A 40%500 A 40%370 A 60%350 A 60%470 A 60%340 A 100%330 A 100%440 A 100%		500A 40% 460A 60% 440A 100%	
Open-circuit voltage U ₀	68V		80V	
Maximum welding gas pressure	6 bar / 87 psi	-	6 bar / 87 psi	-
EMC emissions class	A		A	
Performance	>85%		>85%	
Consumption in stand-by	< 50W		< 50W	
Overvoltage class				
Degree of pollution according to IEC 60664	3		3	
Certifications	S, CE		S, CE	
Degree of protection	IP23S		IP23S	
Weight	120 kg		130 kg	
Dimensions (WxDxH)	588x1120x1380 mm		588x1120x1380 mm	

This equipment complies with standards IEC 61000-3-12 and IEC61000-3-11 provided that impedance of the supply line in the PCC is less than Zmax shown in the table. The fitter or the unit user are responsible for ensuring, consulting the distribution network operator if necessary, that the equipment is connected to a power supply with a maximum system impedance lower than Zmax.

The tables in section 11 show the technical data of welding power sources for the two processes used in the field of industrial automation, which are the MIG/MAG processes. When in manual mode, the power sources are able to weld using also coated (MMA) and TIG electrodes. For more details, refer to the instruction manual.

12 ERROR CODES

Error management is divided into two categories:

- 1) 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.
- 2) 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	Туре	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, con- tact 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, con- tact technical assistance.
7	[E]	Communication error in CAN2.	Check the connection between CN2 and robot interface. Switch the power source on and off. If the error persists, con- tact technical assistance.
8	[E]	Communication error between master board and motor control board	Check connection between power source and wire feeder, manual Item No 5690133 or Robot Item No 1648. Switch the power source on and off. If the error persists, contact technical assistance.
9	[E]	Communication error between Slave board and Master board	With the power source in manual mode, check connection between power source and wire feeder. In robot mode, check the connection between power source and remote panel Item No 452. 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, con- tact 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 on and off. If the error persists, con- tact technical assistance.
23	[E]	Earth cable leakage	Switch the power source on and off. If the error persists, con- tact technical assistance.
25	[E]	Excessive primary winding cur- rent error	Probable break in output diodes or primary winding inverter cir- cuit. Switch the power source on and off. If the error persists, contact technical assistance.
26	[E]	Time not set or battery flat	Switch the power source on and off. If the error persists, con- tact technical assistance.
29	[E]	SRS kit Item No 443 not working.	Check the connection between power source and SRS kit Item No 443. If the problem persists, contact technical assistance.
30	[E]	Output current sensor offset rea- ding problem	Switch the power source on and off. If the error persists, con- tact technical assistance.

Code	Туре	Error Description	Action
42	[E]	Motor speed out of control.	Check there are no mechanical blockages in the wire feeder rollers. If the motor turns at an uncontrollable speed, check the wiring in the wire feeder and ensure the motor feed polarity is correct. If the error persists, contact technical assistance.
47	[E]	Low motor supply voltage error.	Check connection between power source and wire feeder. Switch the power source on and off. If the error persists, con- tact technical assistance.
54	[E]	Current not zero when power source tested	Switch the power source on and off. If the error persists, con- tact technical assistance.
56	[E]	Excessive duration of short-cir- cuit at output	Switch the power source on and off. If the error persists, con- tact technical assistance.
57	[E]	Excessive current on wire feeder motor	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 Or impose firmware update by turning DIP3 on the master panel board ON.
60	[E]	Average current above maximum limit for too long	Switch the power source on and off. If the error persists, con- tact technical assistance.
63	[E]	Incorrect mains voltage (no pha- se)	Check that the mains plug phases are properly connected. If the error persists, contact technical assistance.
72	[W]	Thermal protection triggered due to excessive temperature in SRS kit, Item No 443.	Wait until the machine cools down. Check that the air intake and outlet grilles are not blocked. If the problem persists, con- tact technical assistance.
73	[W]	Thermal protection triggered due to excessive temperature in ou- tput diode unit.	Wait until the machine cools down. Check that the air intake and outlet grilles are not blocked. If the problem persists, con- tact technical assistance.
74	[W]	Thermal protection triggered due to excessive temperature in IGBT assembly.	Wait until the machine cools down. Check that the air intake and outlet grilles are not blocked. If the problem persists, con- tact 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. If the problem persists, contact technical assistance.
78	[W]	Combined with Item No 102 indi- cates that shielding gas pressure is low.	Check the pressure entering the solenoid valve. It must be gre- ater than the threshold set in the relevant gas console parame- ter. If the problem persists, contact technical assistance.
79	[W]	Combined with Item No 102 indi- cates that shielding gas pressure is high.	Check the pressure entering the solenoid valve. If the problem persists, contact technical assistance.
81	[E]	Gas kit not present in combina- tion with Kit Item No 436.	Make sure that gas Kit Item 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.
85	[W]	Error during USB firmware upda- ting	Switch the power source on and off. If the error persists, con- tact technical assistance.
87	[E]	Gas flow sensor error	Check there are no obstructions in the shielding gas pipes. Test the channel using the appropriate test command. Check the cylinder inlet pressure, because the desired flow cannot be re- gulated if it is too low. If the problem persists, contact technical assistance.

Code	Туре	Error Description	Action
90	[W]	CNC not ready. In robotised applications with connection to interface Items 448, 428.XX or direct connection to CNC.	Check connection to power source CN2, check the robot ready signal is present on the interface or CNC. Check the accuracy of robot interface parameters, check the interface and power source terminal DIP switches. Turn off and on. If the problem persists, contact technical assistance.
91	[W]	Wire stuck error "STI"	Active only in robot mode. Check that the welding wire is not attached to the workpiece. If the error persists, contact technical assistance.
92	[W]	End of wire error "END"	Active only in robot mode. Check for wire in the spool. If the error persists, contact technical assistance.
95	[W]	Bluetooth mask not connected	Check the mask battery. Connect the mask to the power source in accordance with the procedure described in the ma- nual. If the problem persists, contact technical assistance.
97	[W]	Voltage measurement cable not connected	Check that the cable supplied is properly connected to SRS kit Item No 443 or to UPGRADE 3D-Pulse Item No 814. If the error persists, contact technical assistance.
98	[W]	Arc does not strike within the timeout	Section 7.3.4 of the manual, check that the parameter is pro- perly set. If the problem persists, contact technical assistance.
99	[E]	Machine is powering down.	Wait for the power source to power down. During this stage, do not turn the power source back on by turning the mains switch because the power source would lock. Turn off the machine, wait for at least 30 seconds and turn back on.