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WELD THE WORLD

Pioneer
Pioneer Pulse

403MKS

Instruction Manual

Translation of original instructions

ENG

INDEX

1 INTRODUCTION 4
1.1 PRESENTATION 5
2 INSTALLATION 6
2.1 CONNECTIONS TO THE ELECTRICAL MAINS NETWORK 6
2.2 FRONT PANEL 6
2.3 REAR PANEL 7
2.4 Wire feeder compartment 8
2.5 MIG/MAG INSTALLATION 9
2.6 PREPARING FOR MMA WELDING 12
2.7 PREPARING FOR TIG WELDING 13
3 USER INTERFACE 15
4 UNIT POWER-UP 18
5 RESET (LOAD FACTORY SETTINGS) 18
5.1 PARTIAL RESET 19
5.2 TOTAL RESET 20
6 SET-UP (INITIAL SET-UP OF THE WELDING POWER SOURCE) 21
6.1 OPERATING HOUR COUNTER 23
6.2 SERVICE MENU 23
6.3 TRIGGER TYPE 25
6.4 LOCKING PROCEDURE 26
6.5 GAS FLOW ADJUSTMENT 28
6.6 TORCH LOADING 29
6.7 RESISTIVE CALIBRATION OF THE WELDING CIRCUIT 29
7 ALARM MANAGEMENT 32
8 PARAMETERS ACTIVATION 35
8.1 MIG/MAG WELDING PARAMETERS 36
8.2 MMA WELDING PARAMETERS 41
8.3 TIG WELDING PARAMETERS 41
9 CHARACTERISTICS OF THE MENU LEVELS 42
9.1 1ST LEVEL 42
9.2 2ND LEVEL 42
9.3 3RD LEVEL 43
10 WELDING SETTINGS 43
10.1 WELDING CURVES SELECTION 43
10.1.1 Special curves: POWER FOCUS and POWER ROOT 43
10.2 MANUAL MIG/MAG WELDING 45
10.2.1 Manual MIG/MAG parameters setting (1st level): inductance setting. 46
10.2.2 MANUAL MIG/MAG PARAMETERS SETTING (2ND LEVEL) 46
10.3 SYNERGIC MIG/MAG WELDING 47
10.3.1 Synergic MIG/MAG parameters setting (1st level): synergic curve setting 48
10.3.2 Manual MIG/MAG parameters setting (2nd level) 48
10.4 PULSED SYNERGIC MIG/MAG WELDING 51
10.4.1 Pulsed Synergic MIG/MAG parameters setting (1st level): synergic curve setting. 53
10.4.2 Pulsed Synergic MIG/MAG parameters setting (2nd level). 53
10.5 DOUBLE PULSED SYNERGIC MIG/MAG WELDING 55
10.5.1 Double pulsed synergic MIG/MAG parameters setting (1st level): synergic curve setting. 56

10.5.2 Double pulsed synergic MIG/MAG parameters setting (2nd level). 56
10.6 MMA WELDING 59
10.6.1 MMA Parameters Setting (1st Level): welding current setting 59
10.6.2 MMA Parameters Setting (2nd Level) 59
10.7 ARC AIR WELDING 60
10.7.1 ARC AIR parameters setting (1st level): current setting 61
10.7.2 ARC AIR Parameters Setting (2nd Level) 61
10.8 TIG WELDING 62
10.8.1 TIG Parameters Setting (1st Level): welding current setting 62
10.8.2 TIG Parameters Setting (2nd Level) 62

11 JOBS MANAGEMENT 64
11.1 SAVING A JOB 64
11.2 NAMING JOBS 66
11.3 LOADING A USER JOB 67
11.4 DELETING A JOB 68
11.5 EXPORTING/IMPORTING JOBs (through a USB memory stick) 69
11.6 EXPORTING A JOB 70
11.7 IMPORTING A JOB 71
11.8 SELECTING JOBS USING THE TORCH UP/DOWN BUTTONS 72

12 TORCH TRIGGER MODES 73
12.1 2T MIG/MAG WELDING 73
12.2 2T SPOT MIG/MAG WELDING 73
12.3 4T MIG/MAG WELDING 73
12.4 4T B-LEVEL MIG/MAG WELDING 73
12.5 2T - 3 LEVEL MIG/MAG WELDING 74
12.6 2T SPOT - 3 LEVEL MIG/MAG WELDING 74
12.7 4T - 3 LEVEL MIG/MAG WELDING 74
12.8 4T B-LEVEL - 3 LEVEL MIG/MAG WELDING 75

13 TECHNICAL DATA 76
13.1 PIONEER 403 MKS / PIONEER PULSE 403 MKS 77

14 WIRING DIAGRAM 78
14.1 REMOTE CONTROL CONNECTOR 83
14.1.1 RC03: Wiring diagram 83
14.1.2 RC04: Wiring diagram 83
14.1.3 RC05: Wiring diagram 84
14.1.4 RC06: Wiring diagram 84

15 SPARES 85
15.1 WIRE FEEDER MOTOR 89
15.2 WIRE FEEDER ROLLS 91

1 INTRODUCTION

IMPORTANT!

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

KEY

DANGER!

This pictogram warns of danger of death or serious injury.

WARNING!

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

CAUTION!

This pictogram warns of a potentially hazardous situation.

INFORMATION!

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

- ➲ This symbol identifies an action that occurs automatically as a result of a previous action.
- ⓘ This symbol identifies additional information or a reference to a different section of the manual containing the associated information.
- § This symbol identifies a reference to a chapter of the manual.
- *1 The symbol refers to the associated numbered note.

NOTES

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

1.1 PRESENTATION

Pioneer Pulse 403MKS is a professional three-phase inverter-based welding unit with 4-roll wire feeder designed to operate in extreme environmental conditions. This power source is ideal for workshop applications and the metalworking, automotive and transport industries requiring high quality construction work and it can be easily transported in difficult work areas thanks to its rugged frame.
Available MIG/MAG mode: manual, synergic, pulsed synergic and double pulsed synergic.
Pulsed Synergic and Double Pulsed Synergic modes ensure excellent appearance of the weld bead, without spatter or deformation when welding aluminium, stainless steel and regular steels.
A broad range of synergic MIG-MAG programs facilitates the selection of precise welding parameters rapidly and using all types of wire.

The welding modes and procedures available are those indicated in the table.

MODE		PROCEDURE	
	MANUAL MIG/MAG		TWO STROKE (2T) TWO SPOT STROKE (2T-SPOT)
			FOUR STROKE (4T)
	SYNERGIC MIG/MAG		TWO STROKE (2T) TWO SPOT STROKE (2T-SPOT)
	PULSED SYNERGIC MIG/MAG (available in PIONEER **PULSE** MKS line power sources)		FOUR STROKE (4T)
	DOUBLE PULSED SYNERGIC MIG/MAG (available in PIONEER **PULSE** MKS line power sources)		THREE LEVEL (3T)
	TIG		TWO STROKE (2T)
			FOUR STROKE (4T)
	MMA		
	ARC AIR		

2 INSTALLATION

DANGER!
Lifting and positioning

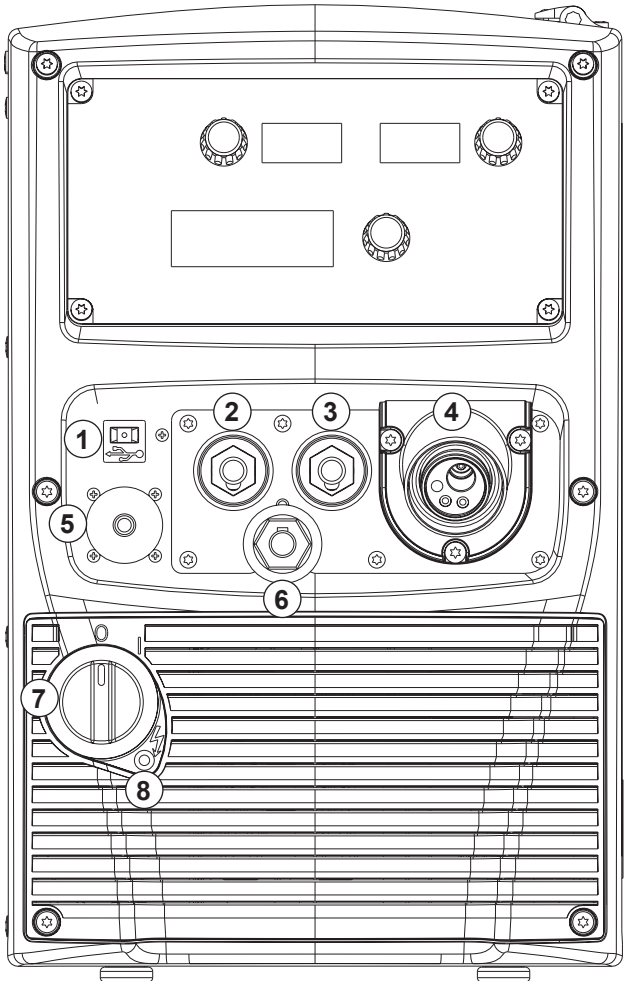
Read the warnings highlighted by the following symbols in the "General prescriptions for use".

2.1 CONNECTIONS TO THE ELECTRICAL MAINS NETWORK

The characteristics of the mains power supply to which the equipment shall be connected are given in the section entitled "TECHNICAL DATA" on page 76.
The machine can be connected to motorgenerators provided their voltage is stabilised.
Connect/disconnect the various devices with the machine switched off.

2.2 FRONT PANEL

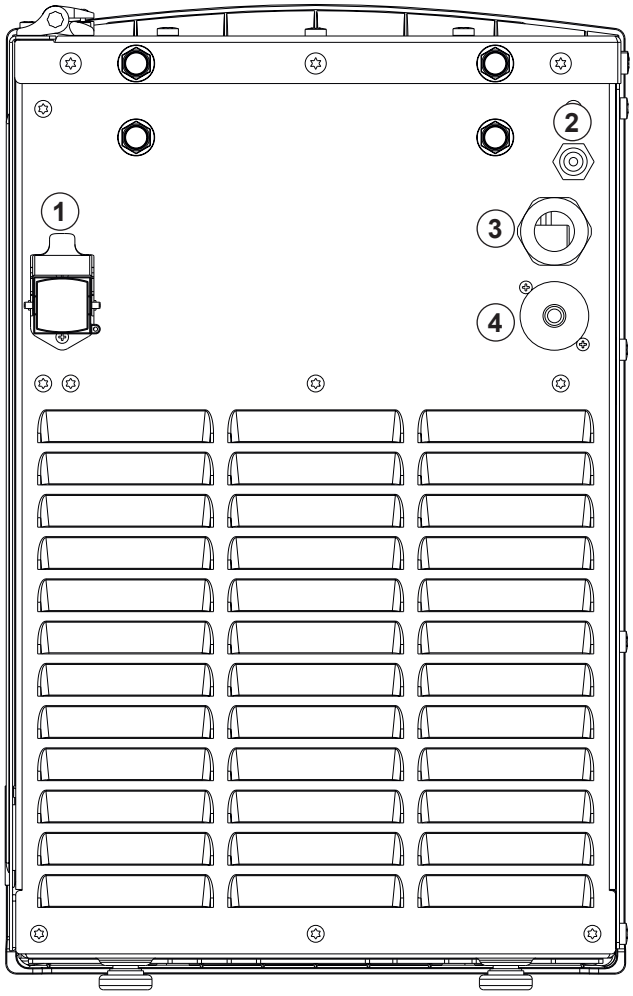
Pioneer Pulse 403MKS



1: Port provided to connect a USB memory stick to export/import JOBs.
2: Negative pole welding socket.
3: Positive pole welding socket.
4: EURO TORCH welding socket.
5: Remote controller connector.
6: Polarity selector cable.
7: Welding power source ON/OFF switch.
8: Mains protection ON LED.
This LED illuminates if an incorrect operating condition occurs:
- absence of a phase in the power supply line.

2.3 REAR PANEL

Pioneer Pulse 403MKS



1: Cooler power feeding connector.
- Voltage 400 V~
- Current Output 1.53 A
- IP protection rating IP20 (cap open) / IP66 (cap closed)

WARNING!
High voltage!

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

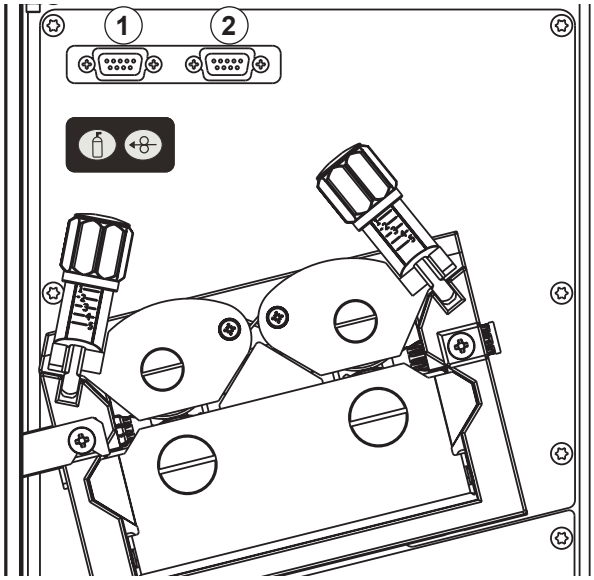
2: Connector for gas feed hose between the gas cylinder and the power source.

3: Power cable.

• Total length (including internal part)	4,5 m
• Number and Cross section of Wires	4 x 6,0 mm^2
• Power plug type	Not supplied

4: Signals connector for automatic application.

2.4 WIRE FEEDER COMPARTMENT

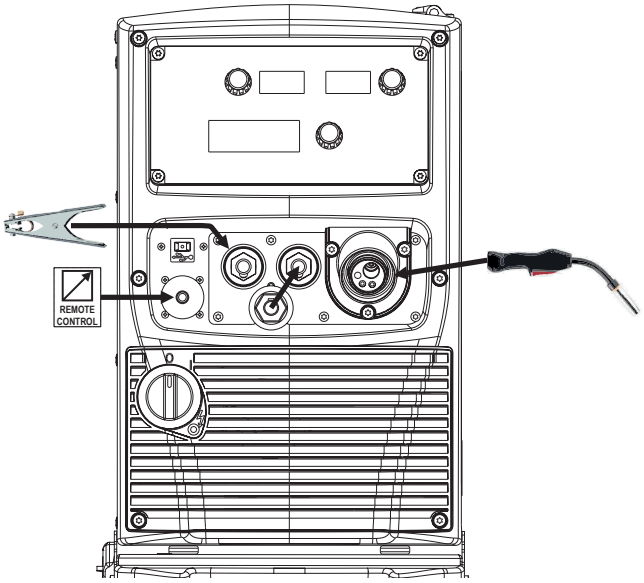
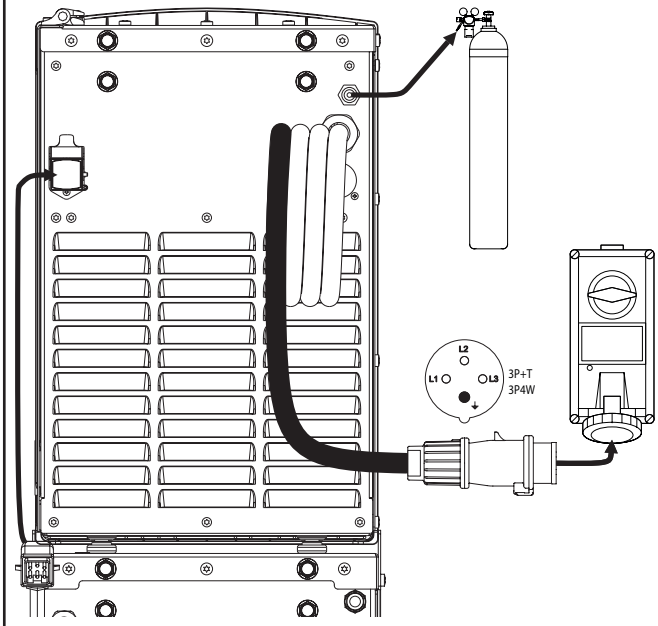


1: PROG-1: (Programming connector for the process circuit board). You can update the software of the equipment using the programming kit.
2: PROG-2: (Programming connector for the motor circuit board). You can update the software of the equipment using the programming kit.

2.5 MIG/MAG INSTALLATION

DANGER!
Electric shock hazard!

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

FRONT VIEW	REAR VIEW
	

1. Set the welding power source ON/OFF switch to "O" (unit switched off).
2. Connect the power source mains supply cable to the mains socket outlet.
3. Connect the gas hose from the welding gas cylinder to the relative socket.
4. Open the cylinder gas valve.
5. Connect the MIG/MAG torch plug to the EURO TORCH welding socket.
6. Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
7. Connect the plug of the polarity selector cable to the welding socket on the basis of the polarity required.
8. Connect the earth clamp to the workpiece being processed.
9. Set the welding power source ON/OFF switch to "I" (unit powered).
10. Select the following welding mode on the user interface: MIG/MAG
11. Press the key to feed the wire until it protrudes from the torch tip. The insertion speed is 2.0 m/min for 3 seconds, subsequently increasing to 15 m/min. When the button is released wire feed is interrupted. This function produces a slower feed rate and hence greater precision when inserting the wire when it enters the torch nozzle.
12. Select the torch trigger procedure on the user interface.
13. Open the gas solenoid valve by pressing and releasing the button . 14.
    Use the flow control valve to adjust the flow of gas as required while the gas is flowing out.
15. Close the gas solenoid valve by pressing and releasing the button.

16. Set the required welding parameter values on the user interface.

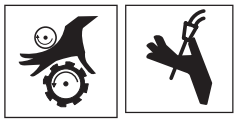
ⓘ On connecting and enabling a remote controller [RC] certain settings can be modified from said controller without having to take action on the user interface of the welding power source.

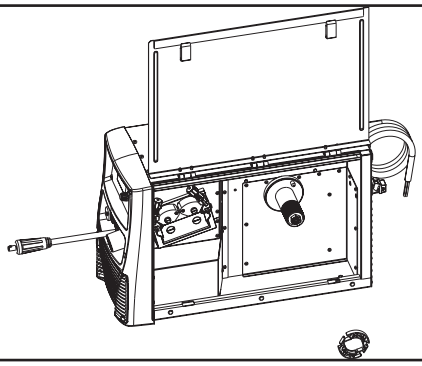
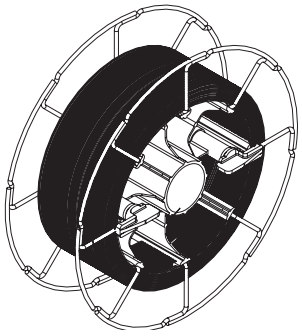
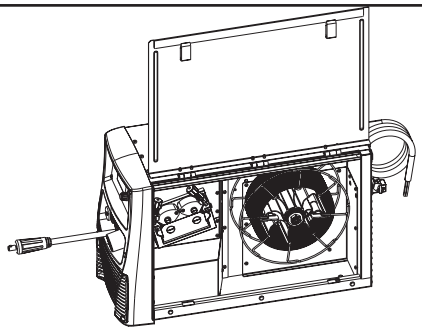
The system is ready to start welding.

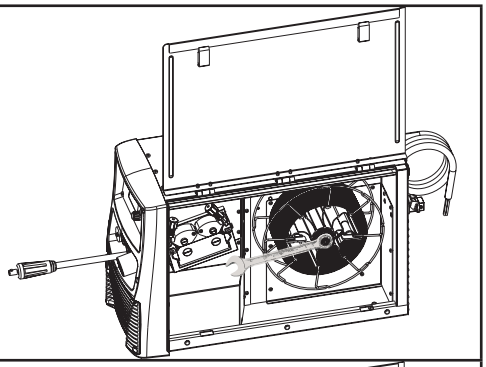
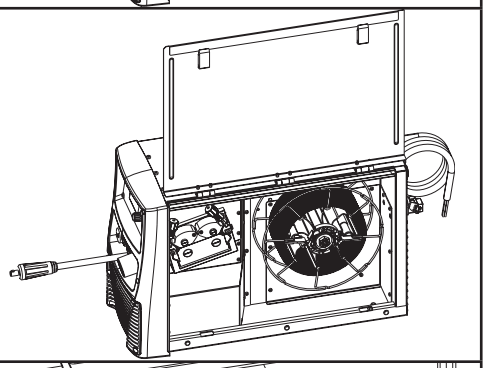
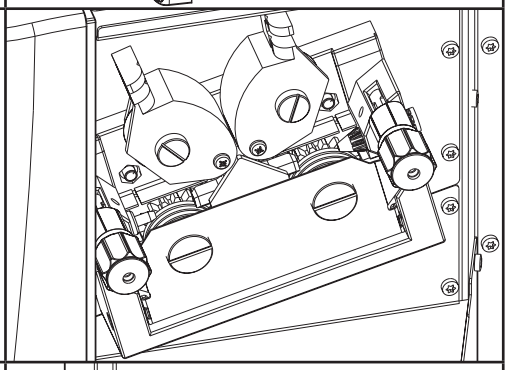
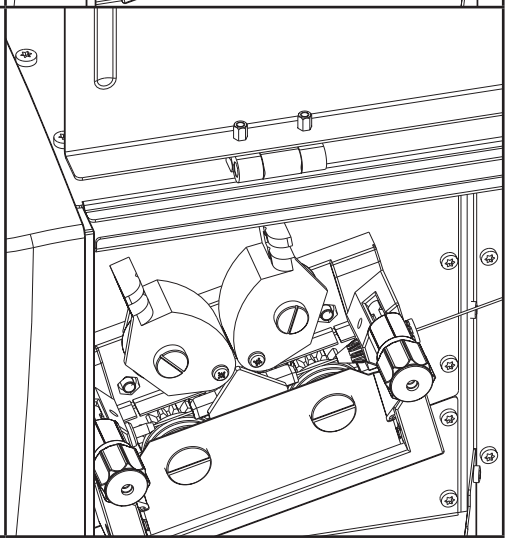
POSITIONING THE SPOOL AND THE WIRE IN THE WIRE FEEDER

WARNING!
Mechanical Hazards

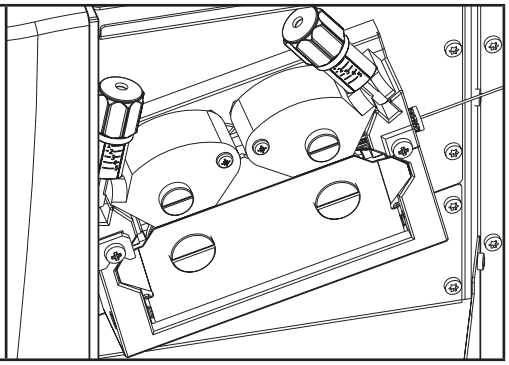
Read the warnings highlighted by the following symbols in the "General prescriptions for use".



1. Open the unit side door to gain access to the spool compartment. 2. Unscrew the cap of the spool holder.	
3. If necessary, fit an adapter for the wire spool.	
4. Fit the spool in the spool holder, ensuring it is located correctly.	

5. Adjust the spool holder braking system by tightening/ loosening the screw in such a way that the wire feed force is not excessive and when the spool stops rotating no excess wire is released.	
6. Refit the plug.	
7. Lower the wire feeder pressure devices. 8. Raise the wire feeder pressure arms.	
9. Remove the protective cover. 10. Check that the feed rolls are suitable for the wire gauge. • The diameter of the roll groove must be compatible with the diameter of the welding wire. • The roll must be of suitable shape in relation to the composition of the wire material. • The groove must be "U" shaped for soft materials (Aluminium and its alloys, CuSi3). • The groove must be "V" shaped for harder materials (SG2-SG3, stainless steels). • Rolls with a knurled groove profile are available for flux-cored wire. 11. Feed the wire between the wire feeder rolls and insert it into the MIG/MAG TORCH connector plug. 12. Make sure the wire is located correctly in the roll grooves.	

13. Close the wire feeder pressure arms.
14. Adjust the pressure system so that the arms press the wire with a force that does not deform it while also ensuring constant feed rate without slipping.
15. Refit the protective cover.
16. Set the welding power source ON/OFF switch to “I” (unit switched on).
17. Feed the wire through the torch until it protrudes from the tip, pressing button ⊕ on the unit front panel.
18. Close the spool compartment door in the side of the unit.

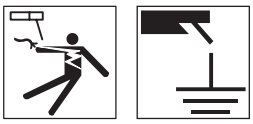


2.6 PREPARING FOR MMA WELDING

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

DANGER!
Electric shock hazard!

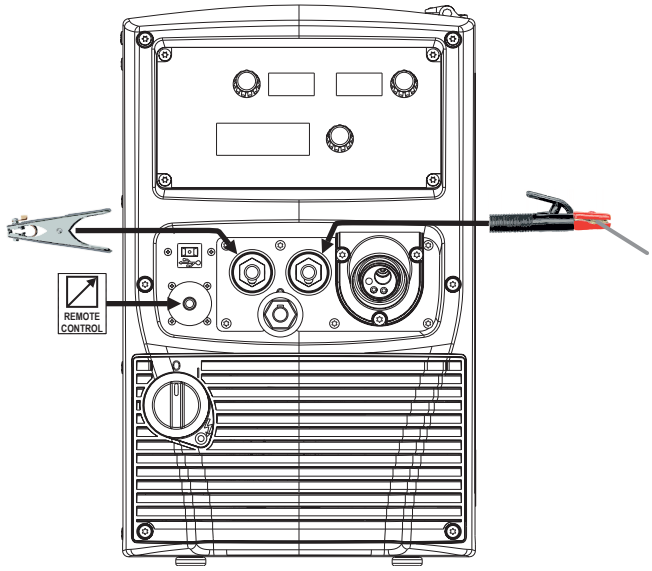
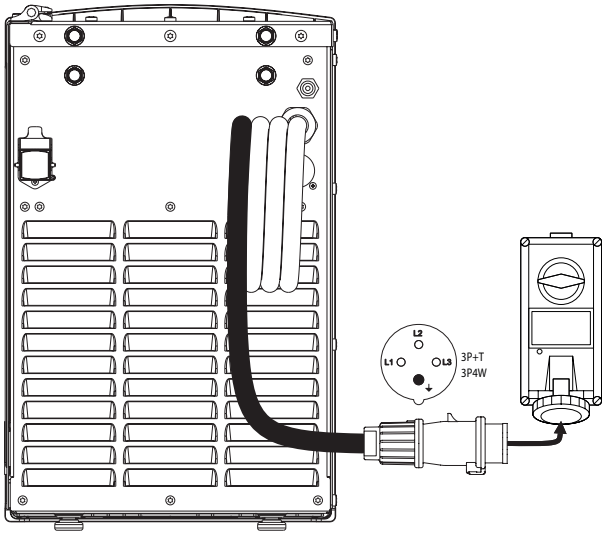
Read the warnings highlighted by the following symbols in the “General prescriptions for use”.



8. Set the welding power source ON/OFF switch to “I” (unit powered).
9. Select the following welding mode on the user interface: MMA
10. Set the required welding parameter values on the user interface.

ⓘ When the remote controller [RC] is connected and the relative locking screw is tightened, welding current can be adjusted using the remote controller.

The system is ready to start welding.

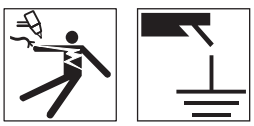
FRONT VIEW (polarity to basic electrode)	REAR VIEW
	

2.7 PREPARING FOR TIG WELDING

1. Set the welding power source ON/OFF switch to “O” (unit switched off).
2. Plug the power cable plug into a mains socket outlet.
3. Connect the gas hose from the welding gas cylinder to the rear gas connection.
4. Open the cylinder gas valve.
5. Connect the TIG torch plug to the EURO TORCH welding socket.
6. Choose the electrode based on the type of material and thickness of the workpiece to be welded.
7. Insert the electrode in the TIG torch.
8. Connect the torch plug to the welding socket on the basis of the polarity required by the type of electrode in question.
9. Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
10. Connect the earth clamp to the workpiece being processed.

DANGER!
Electric shock hazard!

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

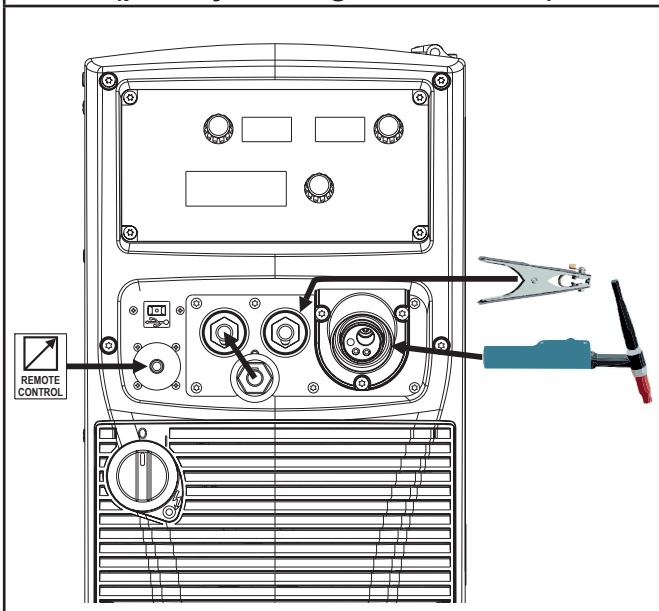
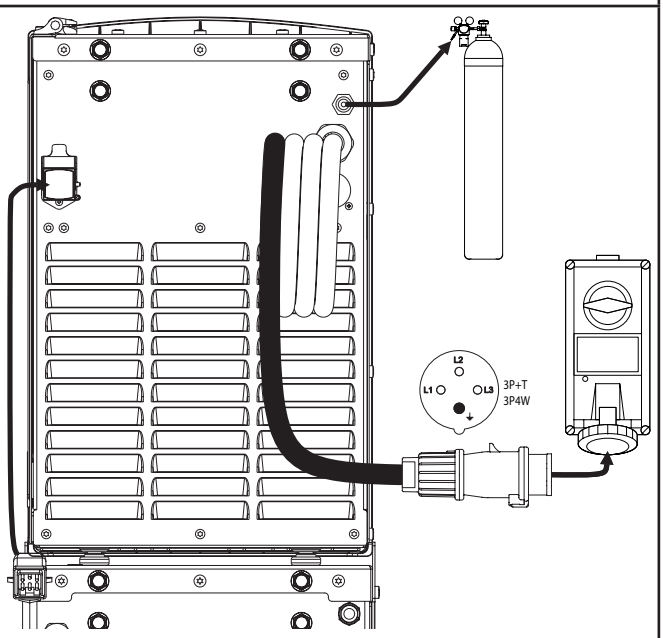


11. Set the welding power source ON/OFF switch to “I” (unit powered).
12. Select the following welding mode on the user interface: DC TIG
13. Press the torch trigger with the torch well clear of any metal parts. This serves to open the gas solenoid valve without striking the welding arc.
14. Use the flow control valve to adjust the flow of gas as required while the gas is flowing out.

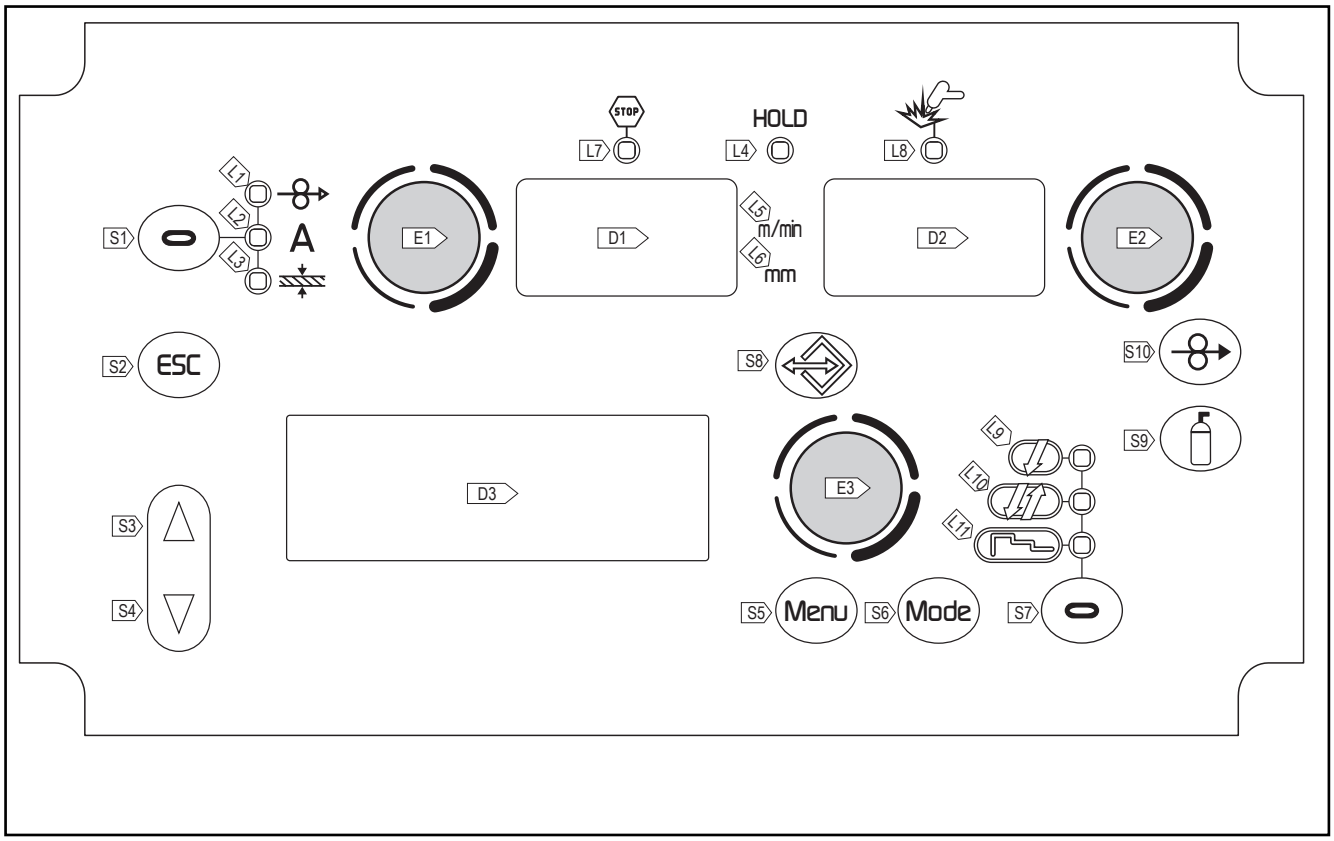
15. Set the required welding parameter values on the user interface.

ⓘ When the remote controller [RC] is connected and the relative locking screw is tightened, welding current can be adjusted using the remote controller.

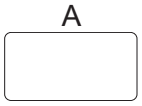
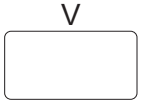
The system is ready to start welding.

FRONT VIEW (polarity for tungsten electrode)	REAR VIEW
	

3 USER INTERFACE

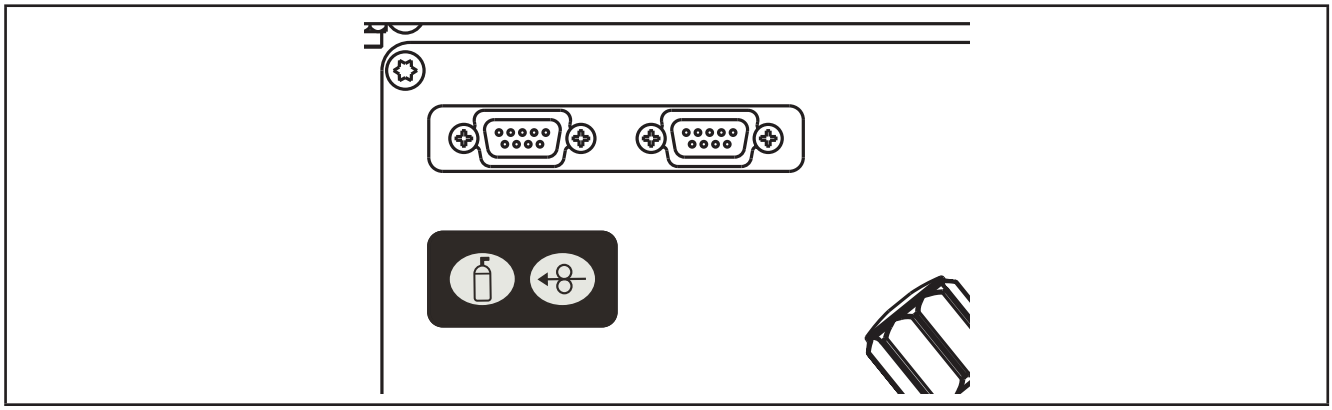


CODE	SYMBOL	DESCRIPTION
L1		illumination shows that the following parameter can be set: WIRE FEED RATE The value appears on the following display: D1
L2	A	**Short-Spray, pulsed and synergic MIG/MAG welding:** illumination shows that the following parameter can be set: WELDING CURRENT **HOLD function (at welding end):** Illuminates to show a value in the following unit of measurement: AMPERES The value appears on the following display: D1
L3		illumination shows that the following parameter can be set: WELDING THICKNESS (Reference is made to "T" fillet welds on identical thicknesses. The relative value is purely guideline). The value appears on the following display: D1
L4	HOLD	Illuminates to show the last voltage and current values measured during welding. The LED switches off when a new welding procedure is started, or when any of the welding settings is modified. The value appears on the display : D1-D2
L5	mm	Illuminates to show a value in the following unit of measurement: MILLIMETRES Illuminates together with the following LED: The value appears on the following display: D1
L6	m/min	Illuminates to show a value in the following unit of measurement: METRES PER MINUTE Illuminates together with the following LED: The value appears on the following display: D1
L7	STOP	This LED illuminates to show an anomaly in the operating conditions. An alarm message appears on the following display: D3 ⓘ § “7 ALARM MANAGEMENT”

CODE	SYMBOL	DESCRIPTION
L8		This LED illuminates to confirm the presence of power on the output sockets.
L9		Illumination shows that the following function has been activated: 2 stroke procedure ⓘ § “12.1 2T MIG/MAG WELDING” A flashing signal means the following function is activated: 2 stroke procedure ⓘ § “12.2 2T SPOT MIG/MAG WELDING”
L10		Illumination shows that the following function has been activated: 4 stroke procedure ⓘ § “12.3 4T MIG/MAG WELDING” / § “12.4 4T B-LEVEL MIG/MAG WELDING”
L11		Illumination shows that the following function has been activated: 3 levels procedure ⓘ § “12.5 2T - 3 LEVEL MIG/MAG WELDING” / § “12.6 2T SPOT - 3 LEVEL MIG/MAG WELDING” / § “12.7 4T - 3 LEVEL MIG/MAG WELDING” / § “12.8 4T B-LEVEL - 3 LEVEL MIG/MAG WELDING”.
D1		**During illumination of the following LEDs:** ⊸ / A / ⋇ The display shows the value of the selected parameter.
		Welding: The display shows the effective amperes value during welding.
		HOLD function (at welding end): The display shows the latest measured current value.
D2		**Data setting:** The display shows the value, in Volts, of the selected welding voltage.
		Welding: The display shows the effective voltage value during welding.
		HOLD function (at welding end): The display shows the latest measured voltage value.
D3		**Data setting:** The display shows the various welding menus relative to the selected processes. The display shows the selected parameter.
S1		**Manual MIG/MAG mode:** The button is not active.
		Synergic MIG/MAG mode: The button cycles through the following LEDs in sequence, selecting only one: ⊸ / A / ⋇
S2		The button restores the main menu of display D3, starting from any other page. The button serves to exit any menu without saving any changes.
S3		The button scrolls the selection made on the menus upwards or to the right.
S4		The button scrolls the selection made on the menus downwards or to the left.
S5		The button selects the various submenus visible in the following display: D3
S6		This button selects the welding mode.
S7		This button selects the torch trigger procedure. ⓘ § “12 TORCH TRIGGER MODES”
S8		The button enables management of the personalised programs that can be shown on the following display: D3 ⓘ § “11 JOBS MANAGEMENT”
E1		**Data setting:** The encoder adjusts the main welding (and synergy) parameter, shown on the following display: D1
		During welding operations with an active JOB: The encoder temporarily modifies the main welding parameter, shown on the following display: D1

CODE	SYMBOL	DESCRIPTION
E2		**Manual MIG/MAG mode:** The encoder adjusts the welding voltage, and the relative value is shown, in volts, on the following display: D2
		Synergic MIG/MAG mode: The encoder is used to correct the factory-set value of the selected synergic curve, the value of which is shown on the following display: D2
		During welding operations with an active JOB: The encoder temporarily modifies the main welding parameter, shown on the following display: D2
E3		The encoder changes the setting of the selected parameter shown on the following display: D3 The selected parameter is shown by the following symbol: ➔.
		Not welding, with a loaded JOB: Scrolling of JOBs belonging to the same sequence.

KEYS PROVIDED INSIDE THE WIRE FEEDER



S9		This button opens the gas solenoid valve to fill the circuit and calibrate the pressure with the regulator on the gas cylinder. ⓘ § “6.3 TRIGGER TYPE”
S10		This button activates wire feed to insert it through the MIG/MAG torch. The insertion speed is 2 m/min for 3 seconds, subsequently increasing to 10 m/min. This function produces a slower feed rate and hence greater precision when inserting the wire when it enters the torch nozzle.

4 UNIT POWER-UP

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

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

- The welding power source sets up for welding with the factory preset values..

Subsequent power-ups

- The welding power source sets up for welding in the latest stable welding configuration that was active at the time of power-off.
- During power-up all functions are inhibited and the following displays remain blank: D1, D2
- D3: The following messages will appear in sequence on this display:

Tab.1. - Messages at power-up

MOTOR BOARD FW: XX.XX.XXX	XX.XX.XXX= wire feeder software version.
PROGRAM UPDATE	The welding power source is synchronising the wire feeder and power source software.
PIONEER ZZZ FW: YY.YY.YYY WELDING MACHINE OK	ZZZ= Ampere value of the power source. YY.YY.YYY= power source software version.

5 RESET (LOAD FACTORY SETTINGS)

To perform a reset the power source must be managed via the remote control.

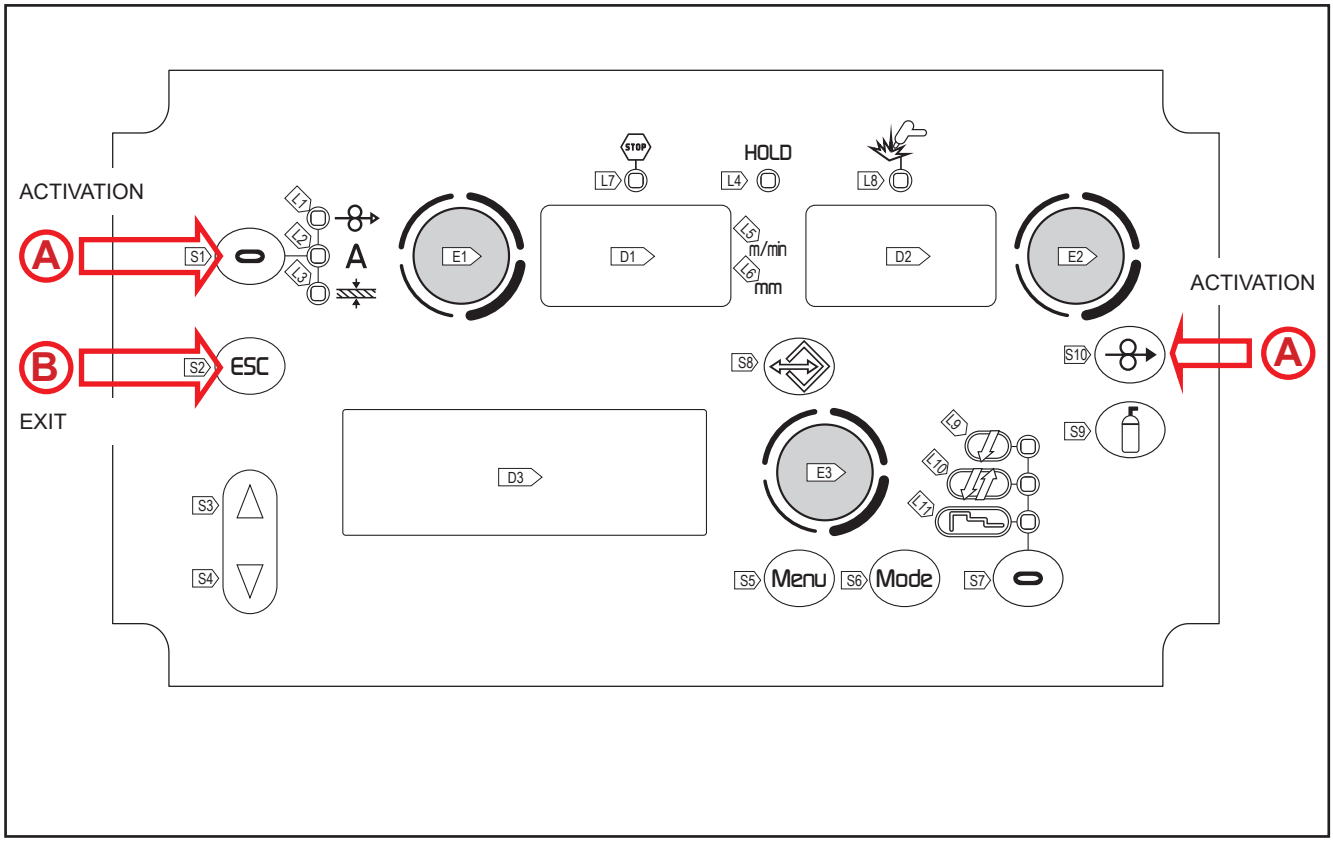
The reset procedure involves complete restoration of the default values, parameters and memory settings set in the factory.
The reset procedure is useful in the following cases:

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

5.1 PARTIAL RESET

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

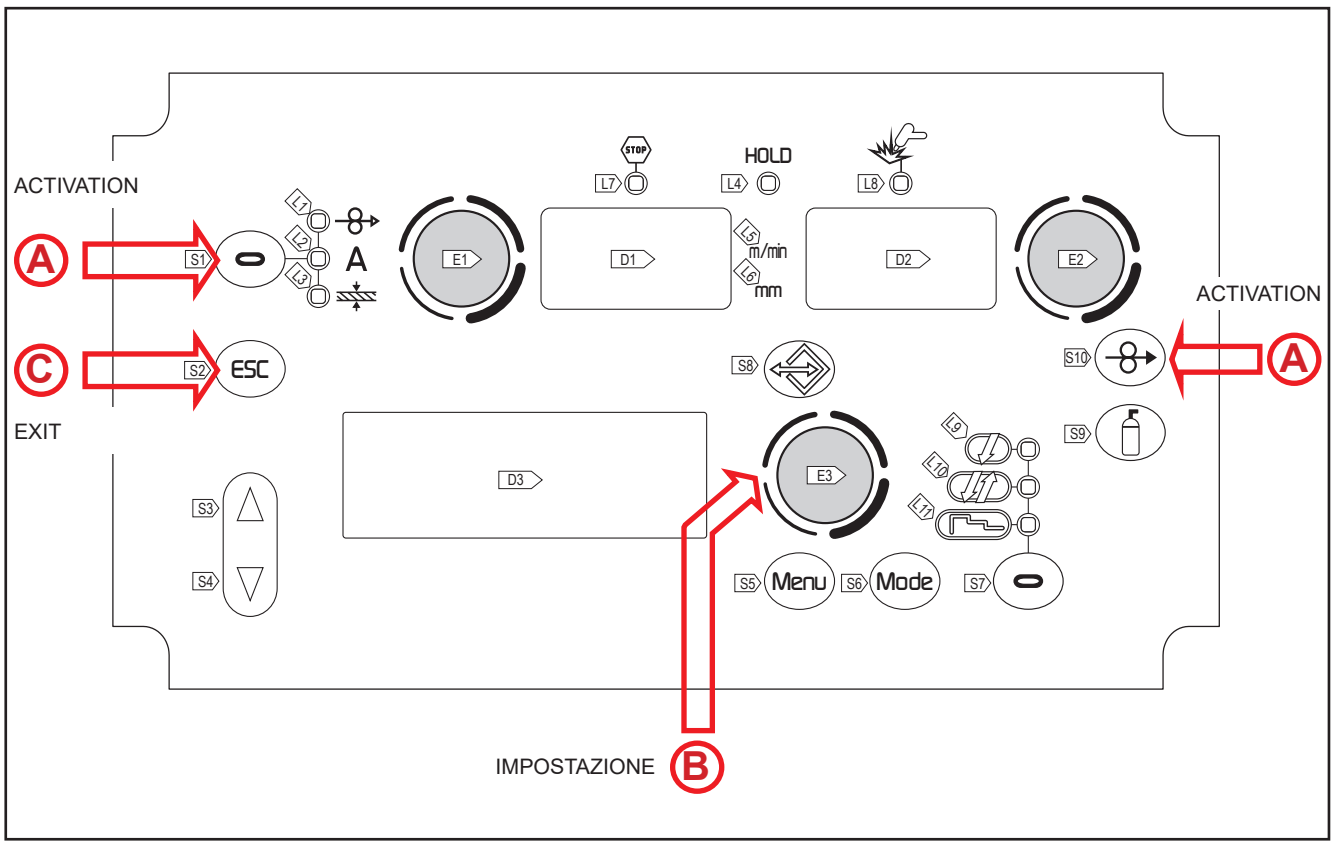
- Settings of the SETUP menu.
- saved JOBS.



A	○ Set the welding power source ON/OFF switch to “O” to switch the unit off. ○ Set the welding power source ON/OFF switch to “I” to switch on the unit. ○ Simultaneously press the keys **S1** and **S10** **[⚠ This operation must be carried out before the wording “PROGRAM UPDATE” appears in the following display: D3]** ○ ➲ **PARTIAL RESET SELECT TYPE OF RESET** : The message will appear on display: D3
B	○ **Exit without confirmation** - Set the welding power source ON/OFF switch to “O” to switch the unit off. - Set the welding power source ON/OFF switch to “I” to switch on the unit. ○ **Exit with confirmation** - Press **S2** ESC to save the setting and quit the menu. ➲ The display **D3** will show the message: **MEMORY CLEANING** - Wait for the memory clear procedure to terminate. ➲ The unit restarts with the power-up procedure.

5.2 TOTAL RESET

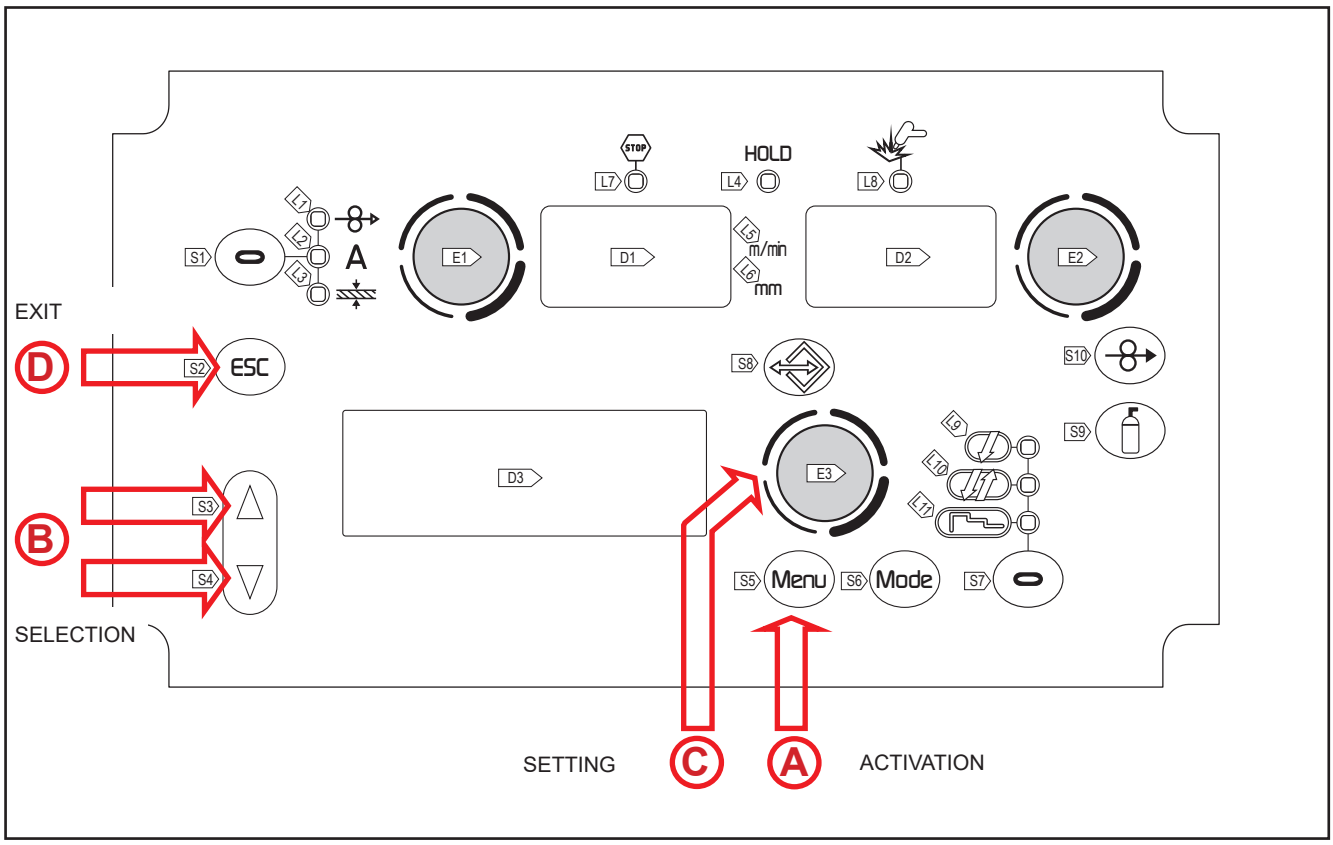
The reset procedure involves complete restoration of the default values, parameters and memory settings set in the factory.
All memory locations will be reset and hence all your personal welding settings will be lost!



A	○ Set the welding power source ON/OFF switch to “O” to switch the unit off. ○ Set the welding power source ON/OFF switch to “I” to switch on the unit. ○ Simultaneously press the keys **S1** and **S10** **[This operation must be carried out before the wording “PROGRAM UPDATE” appears in the following display: D3]** ➲ **PARTIAL RESET SELECT TYPE OF RESET** : The message will appear on display: D3
B	○ Use the **encoder E3**, to select the following “**TOTAL RESET** ”.
C	○ **Exit without confirmation** - Set the welding power source ON/OFF switch to “O” to switch the unit off. - Set the welding power source ON/OFF switch to “I” to switch on the unit. ○ **Exit with confirmation** - Press **S2** ESC to save the setting and quit the menu. ➲ The display **D3** will show the message: **MEMORY CLEANING** - Wait for the memory clear procedure to terminate. ➲ The unit restarts with the power-up procedure.

6 SET-UP (INITIAL SET-UP OF THE WELDING POWER SOURCE)

⚠	With locked status active it is not possible to access this function.
	ⓘ § “6.4 LOCKING PROCEDURE”.



A	**SET UP at machine power on** ○ Set the welding power source ON/OFF switch to “O” to switch the unit off. ○ Set the welding power source ON/OFF switch to “I” to switch on the unit. ○ Simultaneously press button **S5** (Menu) **[** ⚠ **This operation must be carried out before the wording “PROGRAM UPDATE” appears on the following display: D3]** ➲ **SET UP X/Y** : The message will appear for a few seconds on display **D3**. - X = number of the currently displayed menu page. - Y = total number of menu pages.
B	○ Press buttons **S3** (△) and **S4** (▽) to scroll down the list of settings to edit. - Activation of the ADJUSTMENTS BLOCK calls for a specific procedure. - ⓘ § “6.4 LOCKING PROCEDURE”.
C	○ Using the **encoder E3** ◯, edit the value of the selected setting.
D	○ Press **S2** (ESC) to save the setting and quit the menu. - The unit restarts with the power-up procedure..

NOTE: During the normal operation, the operator can enter the SET UP menu by pressing the key **S5** (Menu) for 5 seconds (SET UP can therefore be accessed with machine on).

Tab.2. - Setup settings

MENU PAGE	SETTING	MIN	DEFAULT	MAX	NOTES	
SET UP 1/11	SELECT LANGUAGE				ENGLISH, ITALIANO, FRANÇAIS, DEUTSCH, ESPAÑOL, PORTUGUES, DUTCH, CESKY, SRBSKI, POLSKI, SUOMI	
SET UP 2/11	COOLING TYPE	ON	AUTO	AUTO		
SET UP 3/11	DISPLAY CONTRAST	0 %	50 %	100 %		
SET UP 4/11	CONTROL TYPE	OFF	OFF	RC08	OFF	No control
					RC03	n°1 potentiometer
					RC04	n°2 potentiometers
					RC05	n°1 UP/DOWN
					RC06	n°2 UP/DOWN
					RC08	
SET UP 5/11	LOCK STATUS	OFF	OFF	LOCK 2	OFF	All adjustments enabled.
					LOCK 1	All adjustments are disabled with the exceptions shown in “- Functions not disabled by Locks” on page 27
					LOCK 2	
SET UP 6/11	ARC CORRECTION	VOLTS	VOLTS	m/min		
SET UP 7/11	HOUR COUNTER	0.0 h	0.0 h	0.0 h		
SET UP 8/11	SERVICE	INFO	INFO	CALI-BRA-TION		Access to the submenu of the calibration and validation services
SET UP 9/11	PUSH-PULL	OFF	OFF	ON		
SET UP 10/11	TRIGGER TYPE	OFF	OFF	T01	OFF	Normal operation of torch button.
					T01	Enable Job scroll function in welding by pressing the torch button.
SET UP 11/11	CONNECTION TYPE	OFF	OFF	NC02	OFF	Communication with the IR is disabled
					NC01	Data is being sent to the IR
					NC02	Data is being sent to and received by the IR

Cooler activation

- ON= The cooler is always running when the power source is switched on. This mode is preferable for heavy duty and automatic welding procedures.
- OFF= The cooler is always disabled because an air-cooled torch is in use.
- AUT= When the unit is switched on the cooler is switched on for 15 s. During welding procedures the cooler runs constantly. When welding is terminated the cooler continues to run for 90 s plus a number of seconds equivalent to the average current value shown using the HOLD function.

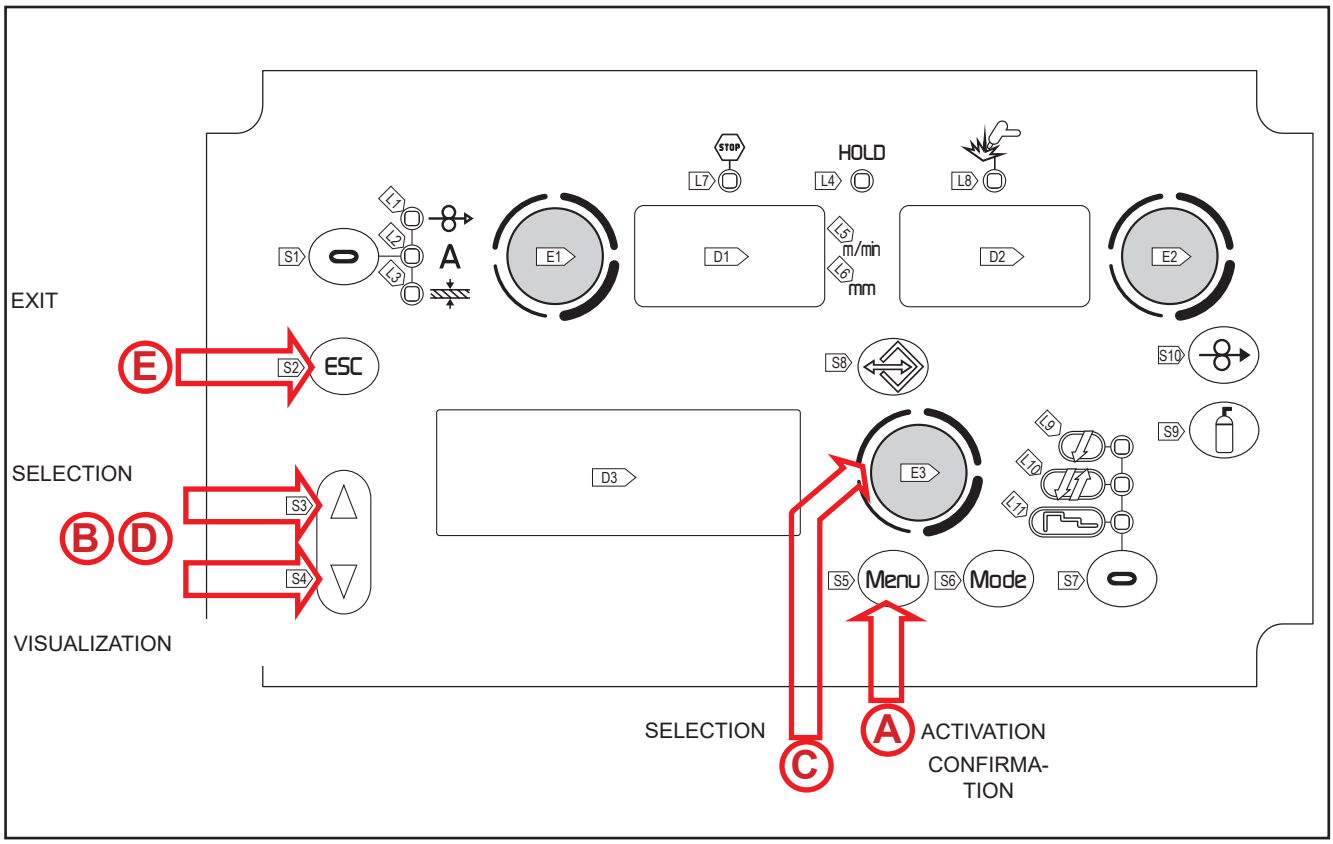
6.1 OPERATING HOUR COUNTER

The menu page shows the processing hour counters.

- **POWER ON** = Total number of hours the machine has been on (mains powered).
- **T.ARC ON** = Total number of hours of welding arc on.
- **P.ARC ON** = Partial number of hours of welding arc on.

SET UP	**7/11**
POWER ON	**7h 11'**
T. ARC. ON	**2h 10'**
P. ARC ON	**2h 20'**

6.2 SERVICE MENU



A	○ Press and hold down the key **S5** (Menu) for 3 seconds (SET UP with machine on).

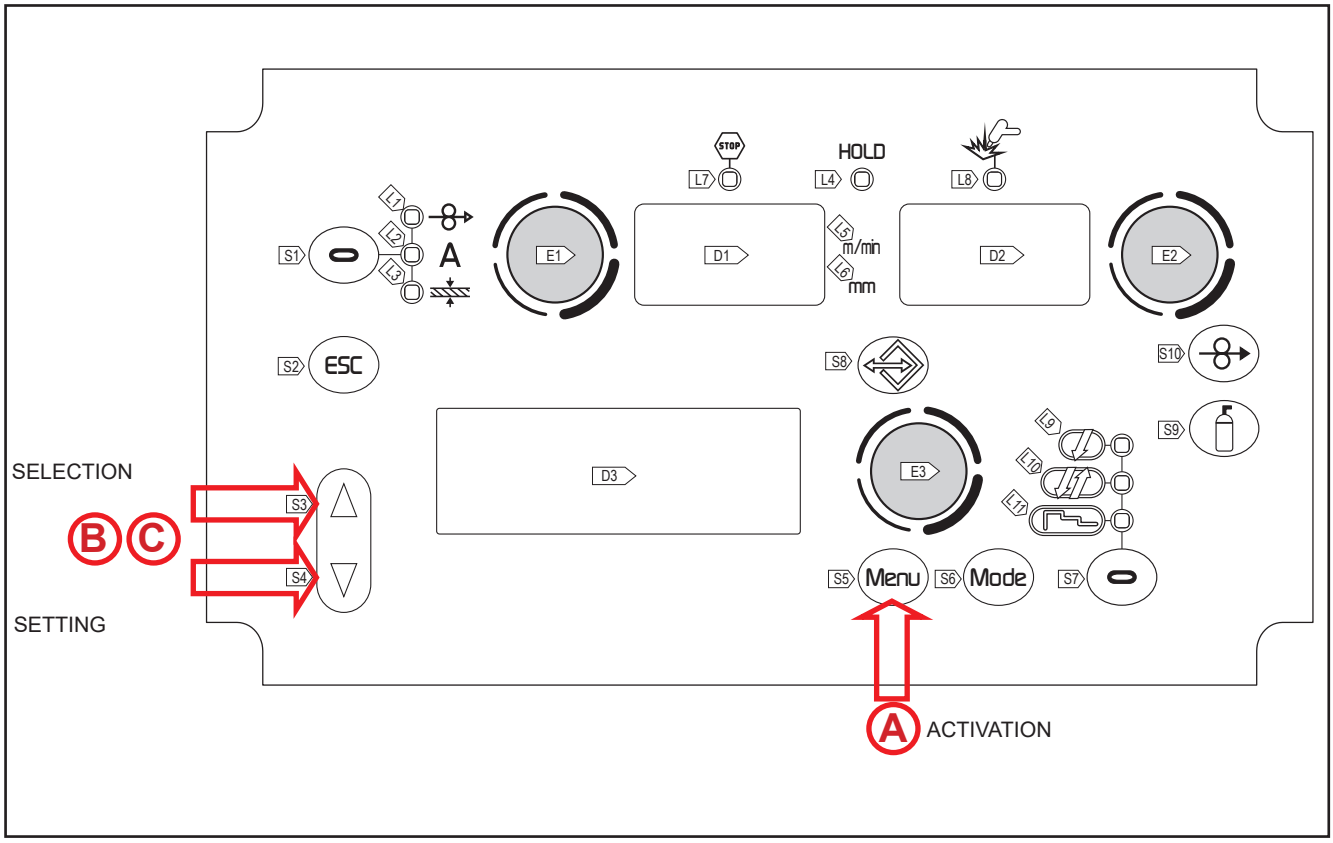
B	○ Press keys **S3** △ and **S4** ▽ to select line "**SET UP 8/8**".
A	○ Press the button **S5** (Menu) to enter the 2nd level menu.
C	○ Use the **encoder E3**, to select the requested item.
A	○ Press the **S5** (Menu) button to confirm.
D	○ Press buttons **S3** △ and **S4** ▽ to scroll down the pages to be displayed.
E	○ Press the **S2** button (ESC). ➲This action will automatically close the menu

- **INFO**
  The following information is displayed:
  ○ Software version and machine type (page 1/3)
  ○ Temperature measured by the thermal sensors inside the power generator (page 2/3)
  ○ Voltage display of the power generator 3 phases (page 3/3).
- **ALARMS LIST**
  The last 12 alarm codes are displayed with the counter value POWER ON when the alarm is triggered. The list is display on 4 pages.

Service procedures

This setting enables the machine validation (VAL.) and calibration (CALIBRATION) operations.
The SERVICE procedure is not described in this manual as it can be carried out only by specialised, suitably trained and equipped technical staff.
The testing methods and the equipment required are set out in the relevant technical standards.

- **CURRENT VAL.**
  ○ The validation procedure allows the current value (Ampere) to be correctly detected and displayed on the equipment display. The validation procedure requires the equipment to be connected to a suitable static load.
- **VOLTAGE VAL.**
  ○ The validation procedure allows the voltage value (Volt) to be correctly detected and displayed on the equipment display. The validation procedure requires the equipment to be connected to a suitable static load.
- **WIRE S. VAL.**
  ○ The validation procedure allows the wire feed rate (m/min) to be correctly detected and displayed on the equipment display.
- **CALIBRATION**
  ○ The calibration procedure allows the machine current to be calibrated.



A	**Partial count reset** ○ Press and hold down the key **S5** (Menu) for 3 seconds (SET UP with machine on).
B	○ Press keys **S3** (△) and **S4** (▽) to select line "**SET UP 7/11**".
C	○ Simultaneously hold down keys S3 (△) and S4 (▽) for 3 seconds. ➲ The value **P.ARC ON** will be taken to 0.0 h

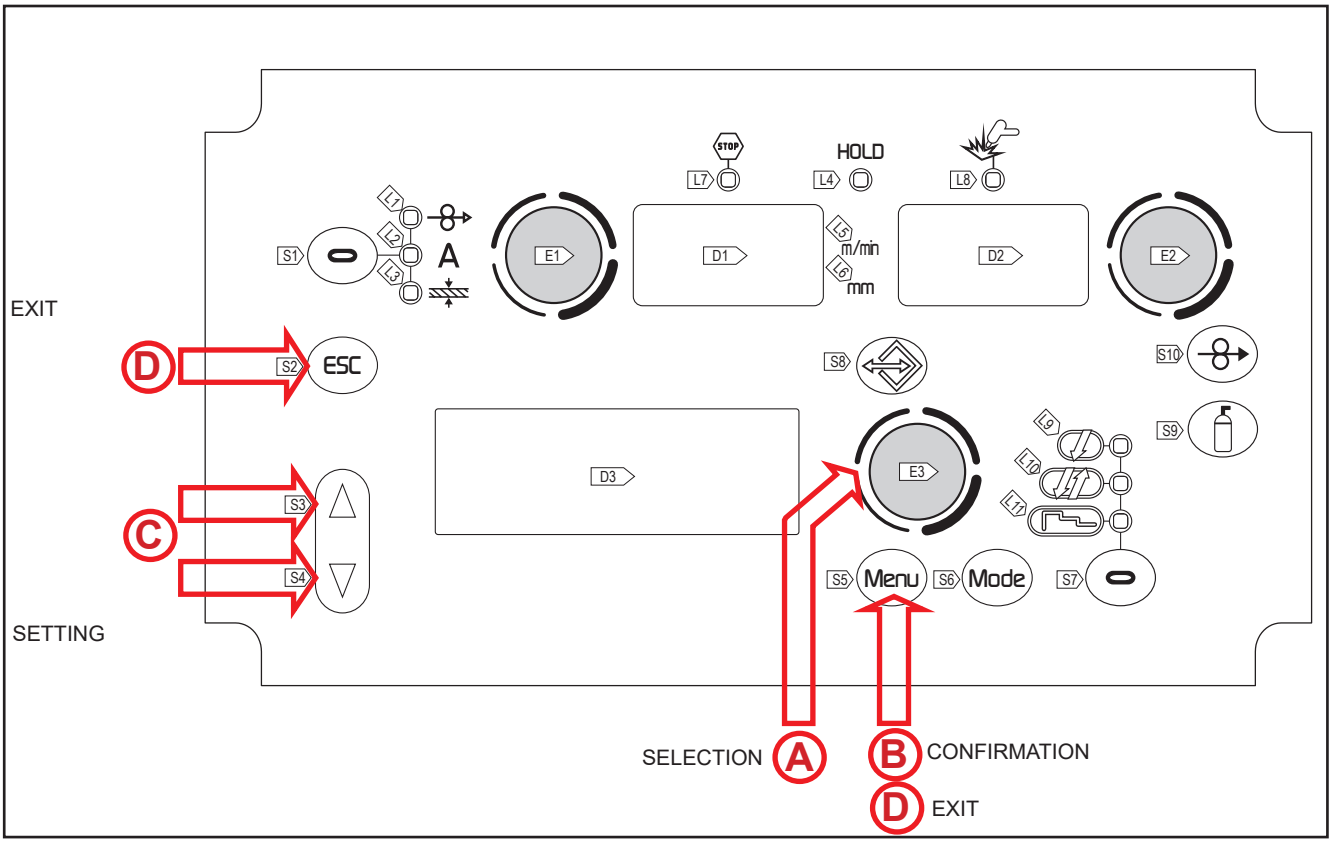
6.3 TRIGGER TYPE

If T01 mode is activated, the job scroll function in welding is enabled by pressing the torch button.
In T01 mode, the torch button operates in 4 strokes or 4 strokes 3 levels with Bilevel functions disabled. Therefore, if jobs are saved with different modes, they are automatically provided according to these conditions (which are not saved).

6.4 LOCKING PROCEDURE

The procedure inhibits unit adjustments, allowing the user to modify only certain settings depending on the selected lock status. The procedure is used to prevent accidental alteration of the unit settings and welding settings by the operator.

Enabling
If no locking status is selected (LOCK STATUS = OFF) and if you wish to set up a limitation on use of the welding power source, display page 5/11 of the SETUP menu. During the normal operation, the operator can enter the SET UP menu by pressing the key **S5** (Menu) for 5 seconds (SET UP can therefore be accessed with machine on).



A	○ Use the **encoder E3** to select the required lock status.
B	○ Press the **S5** (Menu) button to confirm. ➲ **ENTER PASSWORD: 000 -** The message wll appear on display: **D3** - ⓘ Default password: 000
C	○ Enter a 4 digit numerical password. ○ Use buttons **S3** (△) and **S4** (▽) to select the digit to be changed. ➲ The selected digit will flash **.** ○ Use **encoder E3** to set up the value.

Ⓓ	○ **Exit without confirmation** - Press the **S2** (ESC) button. ➲ This action will automatically close the menu ○ **Exit with confirmation** - Press the **S5** (Menu) button. ➲ The unit restarts with the power-up procedure. ⓘ **The password becomes active. Make a note of the password you set!**

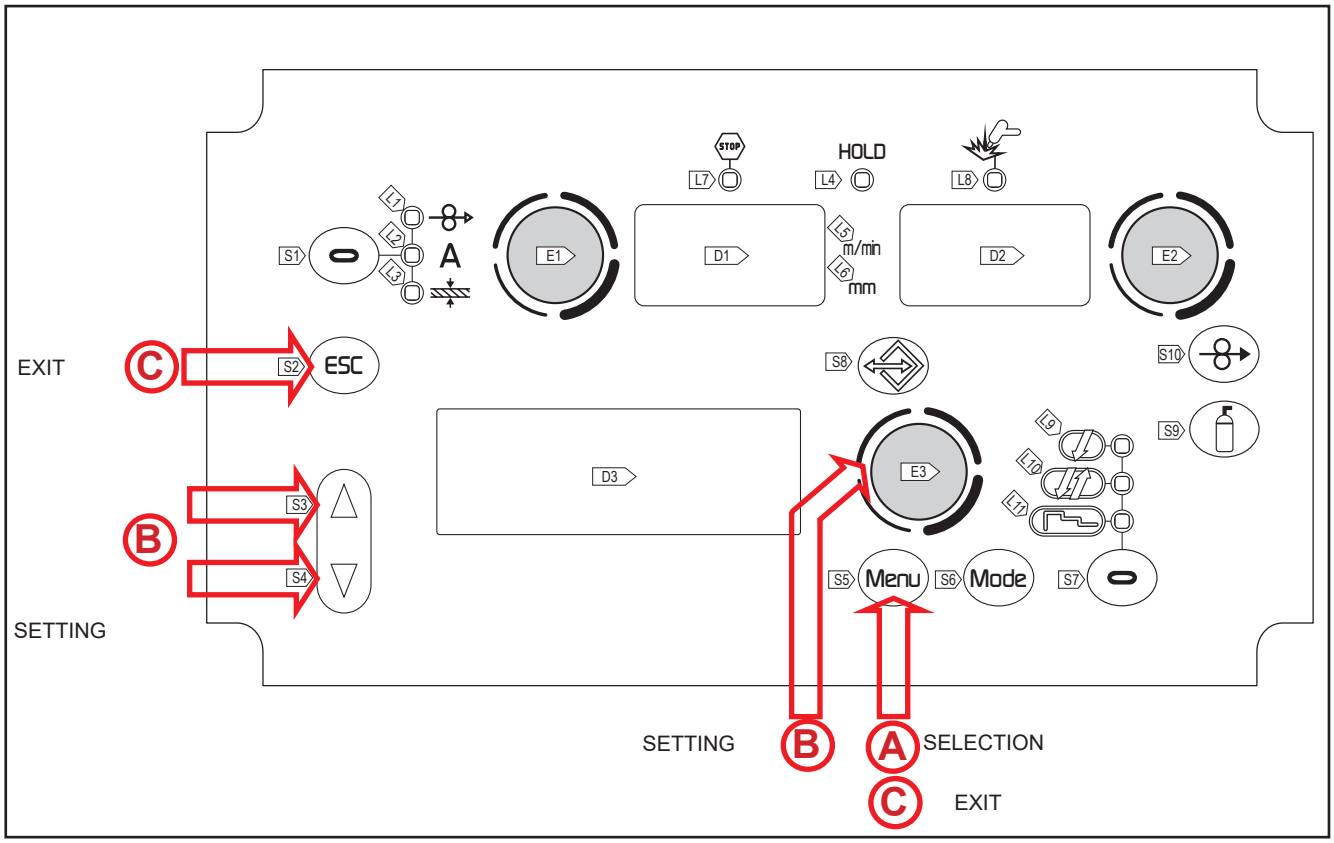
Tab.3. - Functions not disabled by Locks

	TYPE OF REMOTE CONTROL					
LOCK	**USER INTERFACE/RC08**	**RC03**	**RC04**	**RC05**	**RC06**	**NOTES**
OFF	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.	
1	Selection of torch trigger procedure (button **S7**) Display of main welding parameters (button **S1**) Arc correction (encoder **E2**) Wire insertion (button **S10**) Gas test (button **S9**)		Arc correction (Potentiometer PoS6)		Arc correction (UP/DOWN lever 2)	
2	Selection of torch trigger procedure (button **S7**) Display of main welding parameters (button **S1**) Arc correction (encoder **E2**) Synergy (encoder **E1**) Wire insertion (button **S10**) Gas test (button **S9**)	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.	

Disabling

If a lock status is selected, you can only edit parameters permitted by the currently active lock status. If you cannot recall the password the only way to exit lock status is to perform the welding power source RESET procedure.

NOTE: The welding power source must be on and set up for welding.



A	○ Press and hold down the button **S5** (Menu) for 5 second. ➲ The SET UP menu will be accessed, with the machine on. ➲ **LOCK...WRITE PASSWORD : 000 -** The message will appear on display: **D3** ○ Enter the active 4 digit numerical password.
B	○ Use buttons S3 (△) and S4 (▽) to select the digit to be changed. ➲ The selected digit will flash.. ○ Use **encoder E3** to set up the value.
C	○ **Exit without confirmation** - Press the **S2** (ESC) button. ➲ This action will automatically close the menu ○ **Exit with confirmation** - Press the **S5** (Menu) button. ➲ The unit restarts with the power-up procedure. Quit lock status.

6.5 GAS FLOW ADJUSTMENT

When the unit is powered on the solenoid valve opens for 1 second.
This serves to fill the gas circuit.

- ○ Open the gas solenoid valve by pressing and releasing button **S9** ().
- ○ Adjust the pressure of gas flowing from the torch by means of the flow meter connected to the gas cylinder.
- ○ Close the gas solenoid valve by pressing and releasing the button **S9** ().
- ○ The solenoid valve closes automatically after 30 seconds.

6.6 TORCH LOADING

WARNING!

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

Power-up with operation of the cooler set to "ON" or "AUTO" mode
A check is performed automatically of the presence of liquid in the cooling circuit and the cooler is switched on for 30 seconds.
If the coolant circuit is full, the power source sets up in the most recent stable welding configuration.
If the coolant circuit is not full, all functions are inhibited and there will be no output power present.

- **CHECK COOLING UNIT -** The message will appear in display: **D3**
  - Press button **S2** (ESC) or torch trigger to repeat the checking procedure for an additional 30 seconds.
    - If the problem persists rectify the cause of the alarm.
    - During this checking operation, the setup menu can be accessed by pressing button **S5** (Menu) for 5 seconds.

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

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

Torch change-over with operation of the cooler set to "AUTO"
Press and release the torch trigger.

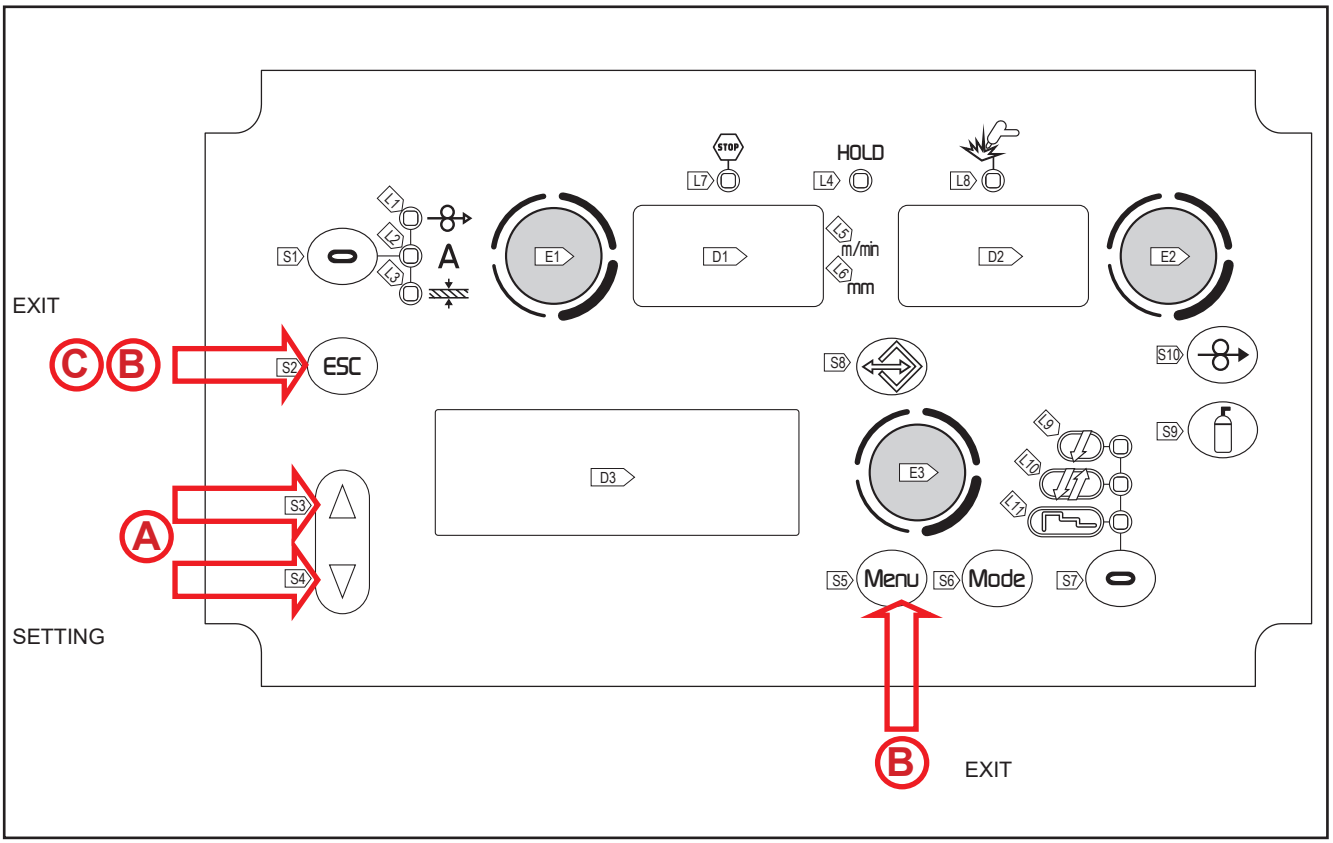
- This serves to start the cooler for 80 seconds to fill the torch cooling circuit.

6.7 RESISTIVE CALIBRATION OF THE WELDING CIRCUIT

When the wire feeder is used with the associated cable bundle, the welding circuit “r” resistance must be measured by using the calibration function. This allows to achieve a consistent welding quality when the cable bundle length and the torch is changed. The welding circuit resistance depends on the cable bundle and the torch used, therefore the calibration procedure must be repeated when these components are changed.

CALIBRATION after power source RESET
If the power source total RESET is carried out, the calibration value will be replaced by the default value.
If a partial RESET is carried out, the measured value will be stored.
Calibration is not compulsory therefore, should the user decide not to carry it out, the machine will keep the default value.

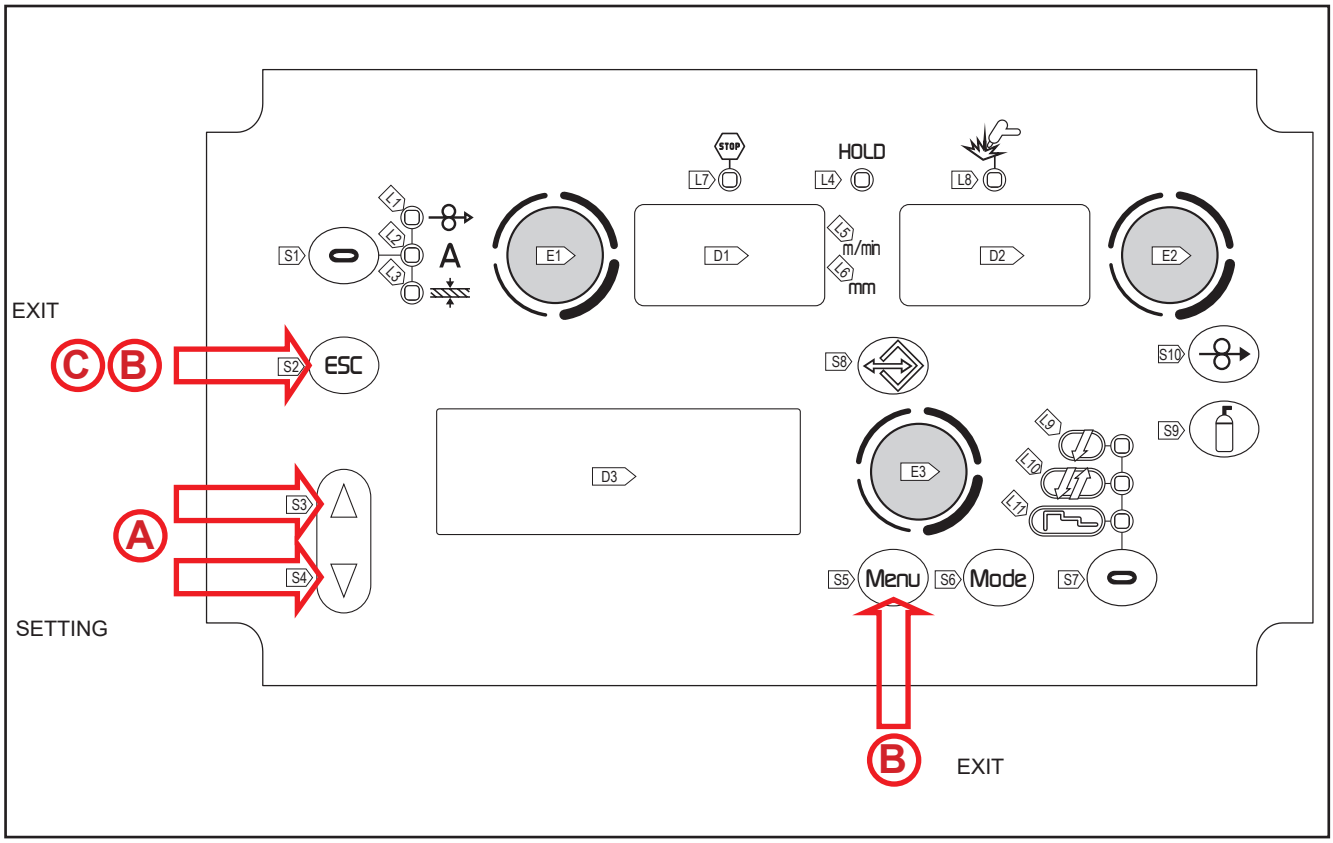
CALIBRATION PROCEDURE



The welding power source must be on and not set up for welding.
The power source remote control must be enabled.

A	○ Press and hold down for 3 seconds buttons **S3** △ and **S4** ▽ . ➲ **TOUCH THE WORKPIECE WITH THE GUIDE WIRE TIP AND PRESS THE TORCH TRIGGER-** The message will appear on display: **D3** ➲ **CAL -** The message will appear on display: **D1** ➲ Display D2 will show the welding circuit resistance value (mΩ) measured during the last calibration. After a total RESET, the default value will appear.

Remove the gas nozzle from the torch and lean the guide wire tip (without the wire) onto the surface of the workpiece, making sure it sticks well; check that the contact between the guide wire tip and the workpiece is on a clean area of the piece's surface. Press the torch button to perform the calibration.



Calibration carried out correctly

B	➲ **CALIBRATION SUCCESSFULLY COMPLETED -** The message will appear on display: **D3.** ➲ The calibration value appears on display : **D2**. You can make several subsequent calibrations by pressing and releasing the torch trigger. In this case the last value revealed is memorized. ○ **Exiting without saving** - Press the **S2** (ESC) button. ○ **Exit and save** - Press the **S5** (Menu) button.

Calibration carried out incorrectly

C	➲ **CAL. Err. -** The message will appear on display: **D1 - D2.** ➲ **REPEAT THE MEASUREMENT** The message will appear on display: **D3**. Press the torch trigger to perform the calibration. ○ **Exiting without saving** - Press the **S2** (ESC) button.

7 ALARM MANAGEMENT

STOP This LED illuminates if an incorrect operating condition occurs.
➲ An alarm message will appear on display **D3.**

Tab.4. - Alarm messages

MESSAGE CODE	MEANING	EVENT	CHECKS
E02	ALARM NTC DISCONNECTED It indicates that at least one of the NTC is disconnected	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	Qualified technical personnel are required.
E03	ALARM PRIMARY CURRENT It indicates that the primary current cabling is disconnected	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	Qualified technical personnel are required.
E04	ALARM, OPEN CIRCUIT VOLTAGE NOT PRESENT	All functions are disabled. Exceptions: • the cooling fan.	Ensure the welding sockets are not short circuiting before switching on the power source. If the problem persists: qualified technical personnel are required for maintenance jobs.
E05	ALARM TRIGGER PRESSED It indicates that at the welding system power-up or after an alarm reset, a short circuit was detected on the torch trigger input. When the problem is solved, the welding power source will reset automatically.	All functions are disabled. Exceptions: • the cooling fan.	• Make sure the torch trigger is not pressed, jammed, or short circuiting. • Make sure the torch and MIG/MAG torch connector are intact. • If the problem persists: qualified technical personnel are required.
E26	ALARM GROUND CURRENT Current is re-circulated on the ground circuit		Qualified technical staff must be called out to carry out the repairs/maintenance operations.
E27	ALARM UNDERVOLTAGE It indicates that the voltage on at least one phase is lower than the minimum threshold	The RED led next to the ON/OFF switch turns on. All functions are disabled. Exceptions: • the cooling fan.	Make sure that the welding system supply voltage complies with the plate values.
E28	ALARM OVERVOLTAGE It indicates that the voltage on at least one phase is greater than the maximum threshold	The led next to the ON/OFF switch turns on. All functions are disabled. Exceptions: • the cooling fan.	Make sure that the welding system supply voltage complies with the plate values.
E29	ALARM PHASE MISSING It indicates the absence of a phase in the equipment power supply line.	The led next to the ON/OFF switch turns on. All functions are disabled. Exceptions: • the cooling fan.	• Check if the equipment power supply line has all the phases.

MESSAGE CODE	MEANING	EVENT	CHECKS
E30	ALARM PRIMARY OVERCURRENT It indicates that the primary current surge protector has tripped. Exit the alarm status by performing one of the following actions: • Switch the power source off. • Press the following button: ESC	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	Qualified technical personnel are required.
E31	ALARM PRIMARY OVERTEMPERATURE It indicates that the welding power source thermal cut-out switch has tripped. Leave the equipment running so that the overheated components cool as rapidly as possible. When the problem is solved, the welding power source will reset automatically.	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	• Make sure that the power required by the welding process is lower than the maximum rated power output. • Check that the operating conditions are in compliance with the welding power source data plate specifications. • Check for the presence of adequate air circulation around the welding power source.
E32	ALARM SECONDARY OVERTEMPERATURE It indicates that the welding power source thermal cut-out switch has tripped. Leave the equipment running so that the overheated components cool as rapidly as possible. When the problem is solved, the welding power source will reset automatically.	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	• Make sure that the power required by the welding process is lower than the maximum rated power output. • Check that the operating conditions are in compliance with the welding power source data plate specifications. • Check for the presence of adequate air circulation around the welding power source.
E35	ALARM MAGNETIC OVERTEMPERATURE It indicates that the welding power source thermal cut-out switch has tripped. Leave the equipment running so that the overheated components cool as rapidly as possible. When the problem is solved, the welding power source will reset automatically.	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	• Make sure that the power required by the welding process is lower than the maximum rated power output. • Check that the operating conditions are in compliance with the welding power source data plate specifications. • Check for the presence of adequate air circulation around the welding power source.
E37	ALARM CURRENT LEVEL EXCEEDED It indicates that the welding power source current surge protector has tripped. Exit the alarm status by performing one of the following actions: • Switch the power source off. • Press the following button: ESC	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	• Check that the programmed arc voltage value is not too high in relation to the thickness of the workpiece to be welded. • Check the welding parameters. • RESET the parameters.
E40	ALARM CAN BUS COMMUNICATION It indicates a CAN communication problem. Exit the alarm status by performing one of the following actions: • Press the following button: ESC	All functions are disabled. Exceptions: • the cooling fan. • the cooling unit (if switched on)	• Check that the connecting cable between power source and wire feeder is intact and make sure the connectors are securely tightened. • If the problem persists: qualified technical personnel are required.

MESSAGE CODE	MEANING	EVENT	CHECKS
E49	ALARM DATA LOSS It indicates a factory setting data loss condition of the board	All functions are disabled. Exceptions: • the cooling fan.	Qualified technical personnel are required.
E50	COOLER ALARM Indicates insufficient pressure in the torch liquid cooling circuit.	All functions disabled. Exceptions: • Cooling fan. The alarm message persists on the display until the first operation is performed on the user interface. Signalling of the alarm depends on the following settings: • Coo = on: the alarm is signalled if the cooling unit is connected to the power source and if it is running. • Coo = oFF: the alarm is never signalled, irrespective of the circumstances. • Coo = Aut: the alarm is signalled if the cooling unit is connected to the power source and if it is running.	• Check that the connection to the cooler is correct. • Check that the "O/I" switch is set to "I" and that it illuminates when the pump is running. • Check that the cooler is filled with coolant. Check that the cooling circuit is liquid tight, notably the torch hoses, the fuse and the internal connections of the cooler.
E58	ALARM INTERNAL POWER SUPPLY It indicates a power supply problem in one of the electronic boards	All functions are disabled. Exceptions: • the cooling fan.	Qualified technical personnel are required.

8 PARAMETERS ACTIVATION

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

√ : always available.
1: available in HSL line power sources on selecting one of the "PF" curves (e.g.: SG2/SG3 **PF**)
2: Available selecting one of the "PR" curves (e.g.: SG2/SG3 **PR**)
3: available in PIONEER **PULSE** MKS line power sources

MENU ↓	MODE →	MANUAL										
	PROCEDURE →											
	PARAMETER ↓											
-	Arc correction in Volts			✓	✓	✓	3	3	3	3	3	3
-	Arc correction in metres per minute			✓	✓	✓	3	3	3	3	3	3
-	Arc correction with Power Root			2	2	2						
1st	Inductance	✓	✓									
2nd	Inductance			✓	✓	✓						
2nd	PR Start			2	2	2						
2°	Arc Set						3	3	3	3	3	3
2°	Pre Gas	✓	✓	✓	✓	✓	3	3	3	3	3	3
2°	Soft Start	✓	✓	✓	✓	✓	3	3	3	3	3	3
2°	Burn back	✓	✓	✓	✓	✓	3	3	3	3	3	3
2°	Post gas	✓	✓	✓	✓	✓	3	3	3	3	3	3
2°	Power focus			1	1	1						
2°	Spot time	✓		✓			3			3		
2°	B-level				✓	✓		3	3		3	3
2°	Start 3lev					✓			3			3
2°	Crater 3lev					✓			3			3
2°	Slope 3lev 1					✓			3			3
2°	Slope 3lev 2					✓			3			3
2°	Corr. 3lev1					✓						
2°	Corr. 3lev2					✓						
2°	Freq 2puls									3	3	3
2°	Range 2puls									3	3	3
2°	Cycle 2puls									3	3	3
2°	Arc2 2puls									3	3	3
2°	Arc2 2puls									3	3	3

8.1 MIG/MAG WELDING PARAMETERS

• Arc correction in volts
- ○ This parameter corrects the synergic voltage value relative to the synergic point of the synergic and pulsed MIG/MAG processes, while it manages correction of the voltage of the high value in the MIG/MAG double pulsed process.
- ○ The default value for horizontal and frontal welding is 0.0 V.
- - *NOTE: A value >0 produces an increase in the length of the welding arc, while a value <0 produces a shorter arc.*

• Arc correction in metres per minute
- ○ This parameter corrects the wire feed rate synergic value relative to the synergic point of the synergic and pulsed MIG/MAG processes, while it manages the wire feed rate of the high value in the MIG/MAG double pulsed process.
- ○ The default value for horizontal and frontal welding is 0.0 V.
- - *NOTE: A value <0 produces an increase in the length of the welding arc, while a value >0 produces a shorter arc.*

• Arc correction with Power Root
- ○ The parameter corrects the arc dynamics in the POWER ROOT process.
- ○ The default value is 0.
- - *NOTE Values >0 produce a «softer» weld, while values <0 produce a «harder» weld.*

• INDUCTANCE (MIG/MAG manual welding)
- - *Consequences of a higher value:*
  - "Softer" welding.
  - Less spatter.
  - Less positive starting.
- - *Consequences of a lower value:*
  - "Harder" welding.
  - More spatter.
  - More reliable starting.

• INDUCTANCE
- ○ The value SYN=0 denotes the optimal synergic inductance value chosen by the manufacturer.
- ○ IMPORTANT NOTE: This inductance value does not correspond to the equivalent number set in manual MIG/MAG welding.
- - *Consequences of a higher value:*
  - "Softer" welding.
  - Less spatter.
  - Less positive starting.
- - *Consequences of a lower value:*
  - "Harder" welding.
  - More spatter.
  - More reliable starting.

• PR START
- ○ The value SYN=0 denotes the optimal synergic inductance value chosen by the manufacturer.
- ○ IMPORTANT NOTE: This inductance value corresponds to start-up with the POWER ROOT curves.
- - *Consequences of a higher value:*
  - Less positive starting.

- *Consequences of a lower value:*
  - More reliable starting.

• ARC SET
- In pulsed synergic welding this parameter directly influences the size of the welding pulses.
- The value SYN=100 denotes the optimal synergic value chosen by the manufacturer.
- *IMPORTANT NOTE: This parameter should be adjusted as little as possible. To correct synergy it is advisable to use arc correction by means of the voltage parameter. This parameter can be useful if the material or gas used is different from that of the synergic curve.*
- If you set a value other than SYN, this value is stored and fixed.
- *Consequences of a higher value:*
  - Hotter welding.
- *Consequences of a lower value:*
  - Cooler welding.

• PRE GAS
- Time of gas delivery before the arc strike.
- *CAUTION: an excessively long value will slow the welding procedure. Other than in the presence of special requirements the value should generally be kept at 0.0 s or anyway very low.*
- *Consequences of a higher value:*
  - This parameter allows a shielded environment to be created, thereby eliminating contaminants at the start of the welding pass.

• SOFT START (MIG/MAG manual welding mode)
- The SOFT START is the wire approach speed to the workpiece.
- The value is expressed as a percentage of the set feed rate.
- *Consequences of a lower value:*
  - The start of welding is "softer".
- *Consequences of a higher value:*
  - The welding start may prove difficult.

• SOFT START
- The SOFT START is the wire approach speed to the workpiece.
- The value is expressed as a percentage of the set feed rate.
- In synergic welding the optimal SOFT START value (indicated with SYN) varies in general with variations of the synergic parameters.
- In synergic welding, if the value SOFT START = SYN is selected the welding power source will always have the optimal SOFT START value set when the main welding parameter changes.
- If you set a value other than SYN, this value is stored and fixed.
- *Consequences of a lower value:*
  - The start of welding is "softer".
- *Consequences of a higher value:*
  - The welding start may prove difficult.

• BURN BACK (MIG/MAG manual welding mode)
- The BURN BACK value is associated with the quantity of wire that is burnt at the end of the welding procedure.
- *Consequences of a higher value:*
  - Wire significantly retracted into the torch nozzle.
- *Consequences of a lower value:*
  - Stick-out at welding start is longer.

• BURN BACK

- ○ The BURN BACK value is associated with the quantity of wire that is burnt at the end of the welding procedure.
- ○ In synergic welding the optimal BURN BACK value (indicated with SYN) varies in general with variations of the synergic parameters.
- ○ In synergic welding, if the value BURN BACK = SYN is selected the welding power source will always have the optimal BURN BACK value set when the main welding parameter changes.
- ○ If you set a value other than SYN, this value is stored and fixed.

- - *Consequences of a higher value:*
  - Wire significantly retracted into the torch nozzle.
- - *Consequences of a lower value:*
  - Stick-out at welding start is longer.

• POST GAS

- ○ Time of post gas delivery when the welding arc is extinguished.
- ○ This is useful when welding at high current values or with materials that oxidise readily to cool the weld pool in an uncontaminated atmosphere.
- ○ In the absence of specific requirements the value should generally be kept low.

- - *Consequences of a higher value:*
  - More effective pickling (improved appearance of workpiece at the end of the welding pass).
  - Higher gas consumption.
- - *Consequences of a lower value:*
  - Lower gas consumption.
  - Oxidation of electrode tip (more difficult arc strike).

• POWER FOCUS

- ○ The parameter changes the concentration of the electric arc, increasing or reducing the energy transferred to the workpiece.

- - *Consequences of a higher value:*
  - Welding arc concentration.
  - Penetration increase.

• SPOT TIME

- ○ When the torch trigger is pressed the welding arc persists for the time set in the parameter.
- ○ Press the torch trigger again to resume the welding process.
- ○ The welding process cannot be interrupted once it has been started.
- ○ When the torch trigger is pressed, if the arc does not strike within 10 seconds, the process is deactivated.
- ○ The welding parameters can be modified during the welding process.

• B-LEVEL

- ○ The parameter enables a special torch trigger function.
- ○ Pressing and releasing the torch trigger rapidly in welding mode (in time 2) serves to switch from the main welding current to a secondary current.
- ○ Pressing and releasing the torch trigger again switches from the secondary current to the main current. This switching can be performed repeatedly at the discretion of the operator.
- ○ To close the welding cycle (time 3) operate the torch trigger with a prolonged press. When the trigger is released the welding cycle will close (time 4).

• START 3LEV

• Start in 3 levels operation

- ○ The parameter adjusts the 1st level wire feed rate as a percentage of the wire feed rate set for

welding (2nd level).
- ○ The time is determined by the operator on the basis of the time he presses the torch trigger during the third time.
- ○ This is helpful to start the weld run with different heat input compared to steady state welding conditions.
- ○ High values (e.g. 130 %) are generally required by aluminium alloys to create a weld pool.

• CRATER 3LEV
• Crater in 3 levels operation
- ○ The parameter adjusts the 3rd level wire feed rate as a percentage of the wire feed rate set for welding (2nd level).
- ○ The time is determined by the operator on the basis of the time he presses the torch trigger during the third time.
- ○ This is helpful to finish the weld run with different heat input compared to steady state welding conditions.
- ○ This function is generally required with aluminium alloys, in which the final crater must be filled.
- - *Consequences of a lower value:*
  - • Less formation of the welding final crater (crater filler).

• SLOPE 3LEV 1
• Initial slope in 3-level operation
- ○ The parameter controls the slope time connecting the HOT START level and the welding level.
- ○ The setting is dependent on the specific needs of the operator.
- ○ Values from 0.5 s to 1.0 s are suitable for the vast majority of applications.

• SLOPE 3LEV 2
• Final slope in 3-level operation
- ○ The parameter controls the slope time connecting the welding level and the crater filler level.
- ○ The setting is dependent on the specific needs of the operator.
- ○ Values from 0.5 s to 1.0 s are suitable for the vast majority of applications.

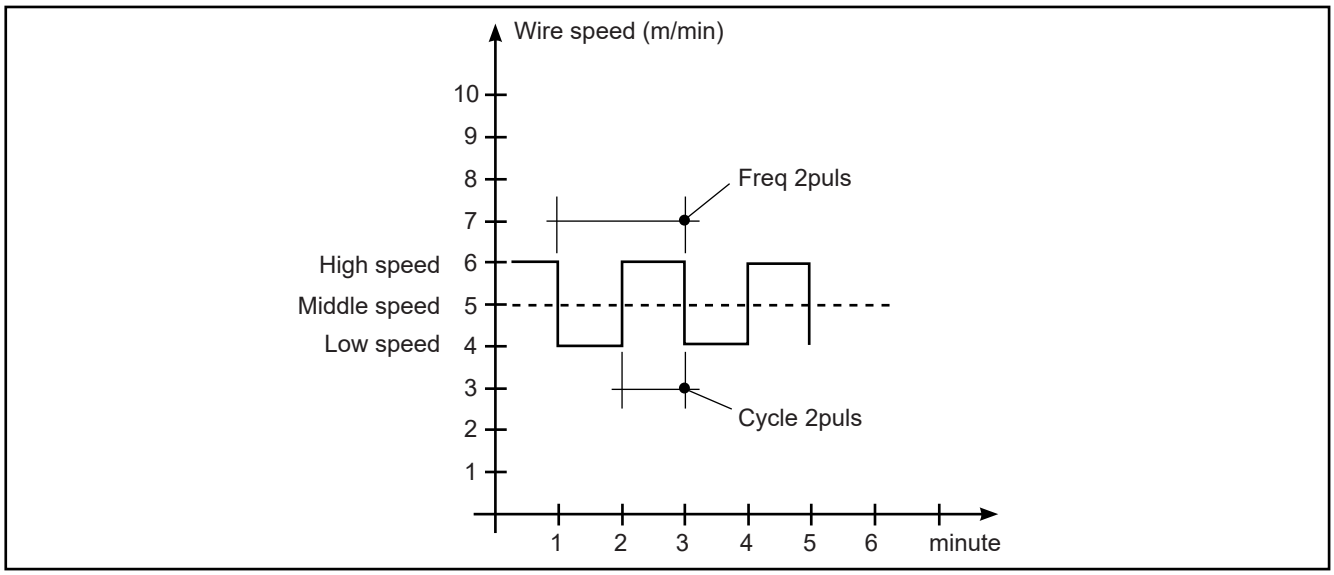
• CORR 3LEV 1
• Initial correction in 3-level operation
- ○ The parameter corrects the synergic value of the wire feed rate or of the arc tension during the Hot Start time.

• CORR 3LEV 2
• Final correction in 3-level operation
- ○ The parameter corrects the synergic value of the wire feed rate or of the arc tension during the down slope time.

• FREQ 2PULS
• Double pulsed frequency
- ○ This parameter adjusts the frequency of alternation of the two wire feed rates set with RANGE 2PULS parameter.
- ○ The setting is dependent on the specific needs of the operator.
- ○ The best results are obtained with frequencies of approximately 1.5 Hertz.

• RANGE 2PULS
• Double pulsed range
- ○ This parameter generates the two wire feed rates (high and low) utilised in double pulsed mode, which alternate with the frequency defined by the parameter FREQ 2PULS.

- Values that are not excessively high are preferable for stability of the welding arc.
- This value is expressed as a percentage of the set wire feed rate and it determines the high and low feed rate values in compliance with the following rule:
- High wire feed rate= wire feed rate (D1) + [wire feed rate (D1)*RANGE 2PULS]/2
- Low wire feed rate= wire feed rate (D1) - [wire feed rate (D1)*RANGE 2PULS]/2
- Example: if a rate of 5 m/min is set on the main adjustment (on display D1) (average feed rate) and 40 % on RANGE 2PULS (on display D4), the wire feed rate will vary between 4 m/min (low feed rate) and 6 m/min (high feed rate).



• CYCLE 2PULS
• Double pulsed duty cycle
- The parameter adjusts the high feed rate time.
- The value is expressed as a percentage over the pulse frequency period.

• ARC2 2PULS
• Arc2 voltage in double pulsed mode
- The parameter corrects the synergic voltage value relative to the low wire feed rate of double pulsed mode.
- *NOTE: A value >0 produces an increase in the length of the welding arc, while a value <0 produces a shorter arc.*

• ARC2 2PULS
• Arc2 wire feed rate in double pulsed mode
- The parameter corrects the synergic value of the wire feed rate relative to the low voltage value of double pulsed mode.
- *NOTE: A value <0 produces an increase in the length of the welding arc, while a value >0 produces a shorter arc.*

8.2 MMA WELDING PARAMETERS

• WELDING CURRENT

○ This parameter regulates the primary welding current value.

• HOT-START

○ This parameter aids electrode melting at the time of arc striking. It is set as a percentage referred to the value of the following parameter: WELDING CURRENT. The value is limited to 250A max.

- *Consequences of a higher value:*
  - Ease of activation; Greater starting spatter; increase in the activation area.
  - Consequences of a lower value:
  - Difficulty of activation; Less starting splatter; Reduction in the activation area.

• ARC FORCE

○ This parameter helps to avoid electrode sticking during welding. It is set as a percentage referred to the value of the following parameter: WELDING CURRENT

- *Consequences of a higher value:*
  - Fluency factors in welding; Arc welding stability;Increased melting of the electrode within the workpiece; More weld spatter.
- *Consequences of a lower value:*
  - The arc is extinguished more easily, less welding spatter.

8.3 TIG WELDING PARAMETERS

• DOWN SLOPE

○ Time during which the current changes from the welding value to the end value by means of a slope. Prevents the formation of craters in the process of turning off the arc. The parameter is not used during the welding process when the following setting is present: MULTI TACK = ON

• FINAL CURRENT

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

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

○ The parameter is displayed but it is not used during the welding process when the following setting is present: MULTI TACK = ON

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

• POST GAS TIME

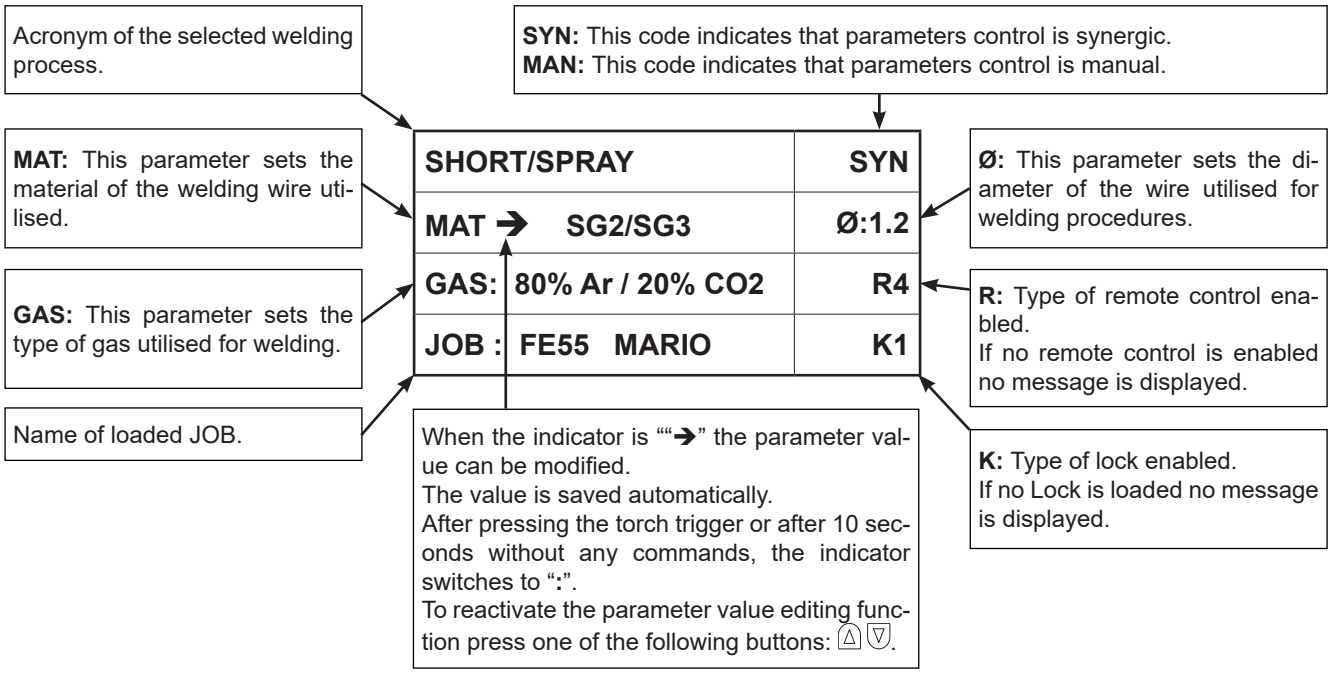
○ Time of post gas delivery when the welding arc is extinguished.

- Consequences of a higher value:
  - More effective pickling (improved appearance of workpiece at the end of the welding pass).
  - Higher gas consumption.
- Consequences of a lower value:
  - Lower gas consumption.
  - Oxidation of electrode tip (more difficult arc strike).

9 CHARACTERISTICS OF THE MENU LEVELS

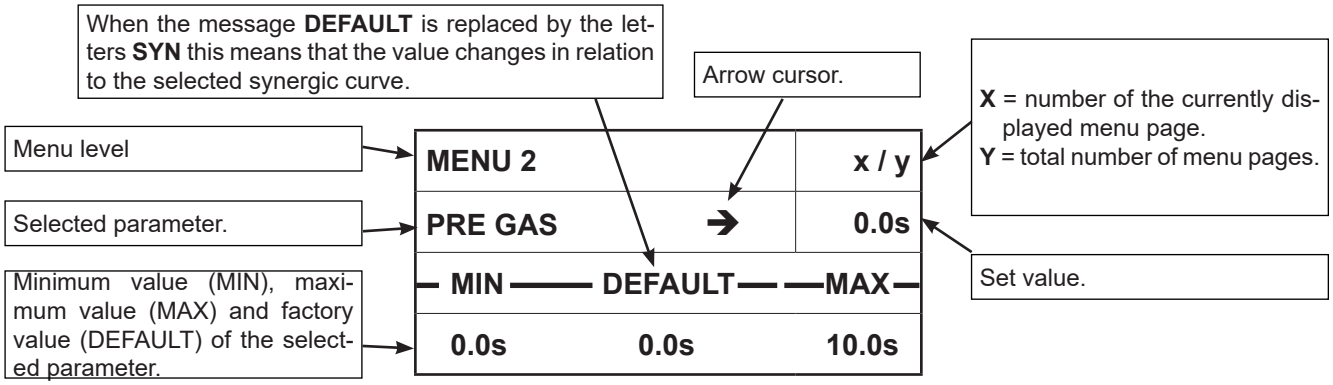
9.1 1ST LEVEL

The menu shows the setting of the most important welding parameters (or synergic settings) relative to the selected welding process.



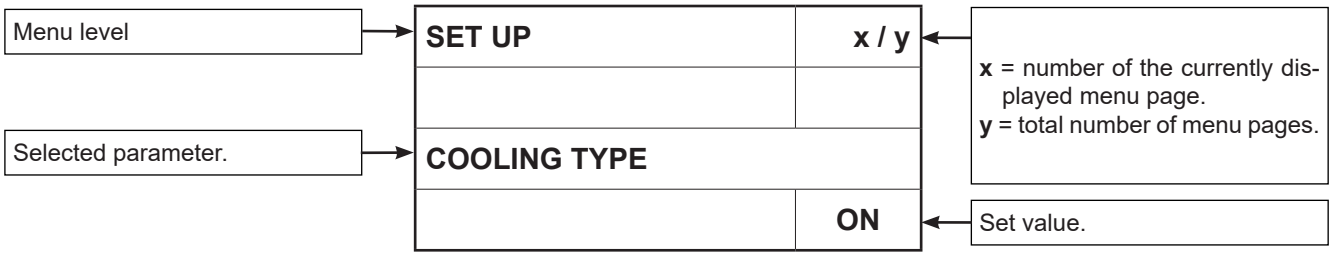
9.2 2ND LEVEL

For each process selection the menu shows the "secondary" welding parameters that can be modified with respect to their synergic values.
If the type of wire, gas, or diameter is changed within a welding process, the second level parameters return to their default values.
The changed parameters remain saved for the relative process selection (manual MIG/MAG, synergic, pulsed synergic, double pulsed synergic).
To save and retrieve the changes made, utilise the JOBs storage procedure.



9.3 3RD LEVEL

The menu contains the settings and values that are changed infrequently and are to be set up the first time the unit is powered up.
The changed parameters remain saved until the next modification or reset of the unit.
§ “6 SET-UP (INITIAL SET-UP OF THE WELDING POWER SOURCE)”.



10 WELDING SETTINGS

10.1 WELDING CURVES SELECTION

SHORT/SPRAY	SYN
MAT ➔ SG2/SG3	Ø:1.2
GAS: 80% Ar / 20% CO2	R4
JOB : FE55 MARIO	K1

○ Select parameter **MAT** by pressing buttons **S3** △ and **S4** ▽ .
- Using the **encoder E3** ◎, edit the value of the selected parameter.

○ Select parameter **Ø** by pressing buttons **S3** △ and **S4** ▽ .
- Using the **encoder E3** ◎, edit the value of the selected parameter.

○ Select parameter **GAS** by pressing buttons **S3** △ and **S4** ▽ .
- Using the **encoder E3** ◎, edit the value of the selected parameter.

10.1.1 Special curves: POWER FOCUS and POWER ROOT

No specific procedures are required to activate these curves. The special curves appear in the list together with the standard curves.

POWER FOCUS CURVES: the curves are available in HSL series power sources in SYNERGIC SHORT SPRAY MIG/MAG welding mode.
The difference between a standard MIG MAG and Power Focus is its concentration and pressure. The POWER FOCUS arc concentration allows the welder to focus the high temperature of the arc in the central section of the deposition, thus avoiding to overheat the sides of the welding. The thermally changed area with the Power Focus arc is less widespread.

These curves differ from the other standard curves because of the acronym **PF** which is displayed after the reference to the welding wire material.

Example:

SHORT/SPRAY	**SYN**
MAT → SG2/SG3 PF	**Ø:1.2**
GAS: 80% Ar / 20% CO2	**R4**
JOB : FE55 MARIO	**K1**

POWER ROOT CURVES: the curves are available in SYNERGIC SHORT SPRAY MIG/MAG welding mode.
Power Root is an optimised short arc transfer with the feature of having a cold drop transfer. Power Root allows to achieve a very high quality in root passes.

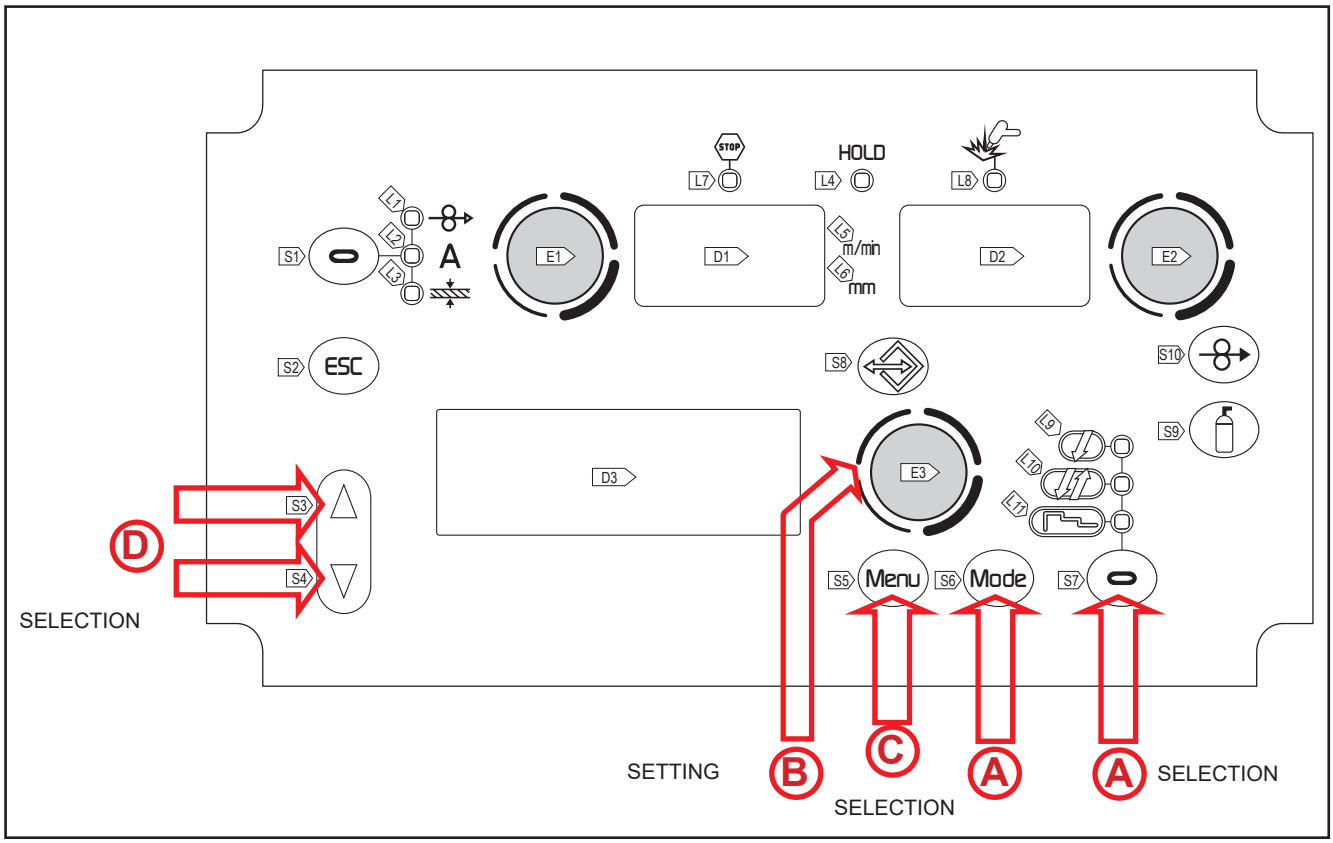
These curves differ from the other standard curves because of the acronym **PR** which is displayed after the reference to the welding wire material.

Example:

SHORT/SPRAY	**SYN**
MAT → SG2/SG3 PR	**Ø:1.2**
GAS: 80% Ar / 20% CO2	**R4**
JOB : FE55 MARIO	**K1**

10.2 MANUAL MIG/MAG WELDING

Welding is of the Short/Spray type.
Adjustment of the main welding parameters, wire feed rate and voltage is entirely at the discretion of the operator. The optimal work point must be identified for the required welding type.
During a welding operation with an active JOB, it is possible to temporarily change the parameters shown in the displays D1 and D2 with their encoders to test the temporary changes made to the welding operation. At the end of the welding operation (and HOLD is quit) the values of the loaded JOB are reset.
When the welding operation is not being carried out and a JOB is active through encoder E3, the JOBs belonging to its sequence can be scrolled.



A	**S6**	Mode	This button serves to select the following welding mode: MANUAL MIG/MAG
	S7		Use this button to select one of the following torch trigger procedures: 2 STROKE 2 STROKE SPOT: The procedure is active when the “SPOT TIME” parameter is set to a value other than “OFF”. 4 STROKE

Tab.5. - Main settings and displays in MANUAL MIG/MAG mode

	DISPLAY D1	DISPLAY D2
Data setting	Shows the wire feed rate setting in m/min, which can be altered by means of the following encoder: (E1).	Shows the set welding voltage, which can be adjusted with the following encoder: (E2).
Welding	Shows the average current measured during welding.	Shows the average voltage measured during welding.
HOLD function (At welding end)	Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during the last welding procedure performed.

10.2.1 Manual MIG/MAG parameters setting (1st level): inductance setting.

B	○ Using the **encoder E3**, edit the value of the selected parameter ⓘ The value is saved automatically.

IND: This parameter allows electronic adjustment of the welding inductance from the main menu.

→

SHORT/SPRAY MAN
IND ➔100

10.2.2 MANUAL MIG/MAG PARAMETERS SETTING (2ND LEVEL)

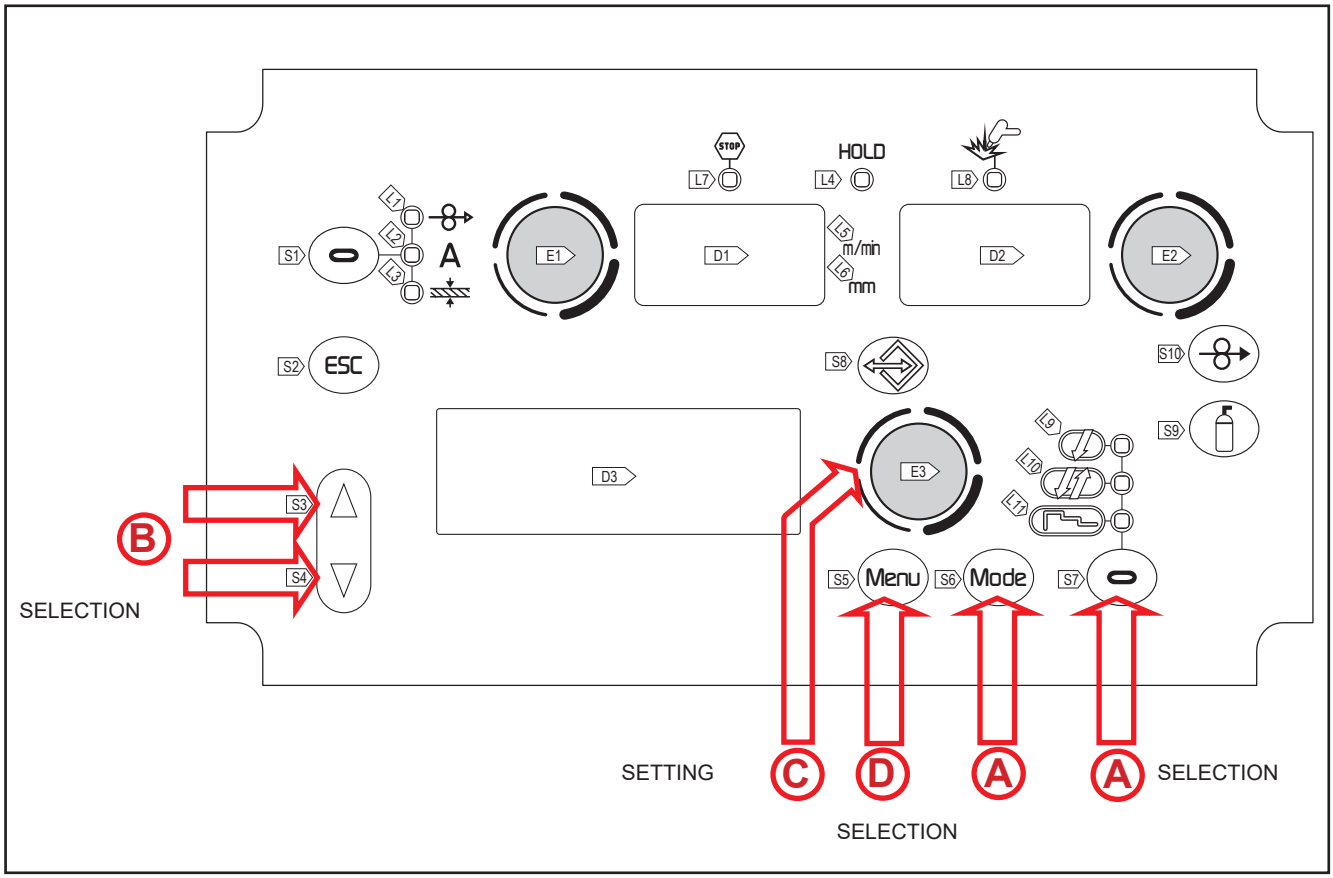
C	○ Press the button **S5** (Menu) to enter the 2nd level menu.
D	○ Scroll down the list of parameters to be edited by pressing buttons **S3** (△) and **S4** (▽)
B	○ Using the **encoder E3**, edit the value of the selected parameter ⓘ The value is saved automatically.

Tab.6. - 2nd level menu parameters in MANUAL MIG/MAG mode

PROCEDURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
2 STROKE 2 STROKE SPOT	INDUCTANCE	(row 1/6)	-100	0	100	
	PRE GAS	(row 2/6)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/6)	1 %	35 %	100 %	
	BURN BACK	(row 4/6)	1 %	25 %	200 %	
	POST GAS	(row 5/6)	0.0 s	1.0 s	10.0 s	
	SPOT TIME	(row 6/6)	0.1 s	OFF	25.0 s	The parameter value is saved for each welding mode.
4 STROKE	INDUCTANCE	(row 1/5)	-100	0	100	
	PRE GAS	(row 2/5)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/5)	1 %	35 %	100 %	
	BURN BACK	(row 4/5)	1 %	25 %	200 %	
	POST GAS	(row 5/5)	0.0 s	1.0 s	10.0 s	

10.3 SYNERGIC MIG/MAG WELDING

Set the welding data (material, wire diameter, gas type), shown on display D4 and just one welding parameter, chosen among wire feed rate, Amperes, and workpiece Thickness, shown on display D1.
NOTE: The synergic curves were created with reference to a fillet weld in position PB (horizontal-vertical) with 10 mm stick-out (distance from torch to workpiece).
In general, the parameter set is the wire feed rate (associated with the deposition of filler material) and the synergic welding power source automatically sets the most suitable welding voltage.
Encoder E2 can be adjusted to correct the arc shown on display D3, in order to make minor adjustments in accordance with requirements.
During a welding operation with an active JOB, it is possible to temporarily change the parameters shown in the displays D1 and D2 with their encoders to test the temporary changes made to the welding operation. At the end of the welding operation (and HOLD is quit) the values of the loaded JOB are reset.
When the welding operation is not being carried out and a JOB is active through encoder E3, the JOBs belonging to its sequence can be scrolled.
The welding power source also automatically adjusts several secondary parameters that are relevant for welding quality.



A	**S6** (Mode) This button serves to select the following welding mode: SYNERGIC MIG/MAG **S7** Use this button to select one of the following torch trigger procedures: 2 STROKE 2 STROKE SPOT: The procedure is active when the “SPOT TIME” parameter is set to a value other than “OFF”. 4 STROKE 4 STROKE B-LEVEL: The procedure is active when the “B-LEVEL” parameter is set to a value other than “OFF” 3 LEVEL 2 STROKE 3 LEVEL 2 STROKE SPOT: The procedure is active when the “SPOT TIME” parameter is set to a value other than “OFF”. If the "SPOT TIME" parameter is active in the 3 LEVELS procedure, its value denotes the time for which the main welding current is supplied. 3 LEVEL 4 STROKE 3 LEVEL 4 STROKE B-LEVEL: The procedure is active when the “B-LEVEL” parameter is set to a value other than “OFF”

Tab.7. - Main settings and displays in SYNERGIC MIG/MAG mode

	DISPLAY D1	DISPLAY D2
Data setting	Shows the main synergy parameter (wire feed rate, Amperes, recommended thickness), which can be adjusted with the following encoder: (E1).	Shows the set welding voltage, which can be adjusted with the following encoder: (E2). Shows the arc correction executed by the operator with encoder (E2). Shows the arc correction executed by the operator with encoder (E2).
Welding	Shows the average current measured during welding.	Shows the average voltage measured during welding.
HOLD function (At welding end)	Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during the last welding procedure performed.

10.3.1 Synergic MIG/MAG parameters setting (1st level): synergic curve setting

B	○ Scroll down the list of parameters to be edited by pressing buttons **S3** (△) and **S4** (▽)
C	○ Using the **encoder E3**, edit the value of the selected parameter ⓘ The value is saved automatically.

10.3.2 Manual MIG/MAG parameters setting (2nd level)

D	○ Press the button **S5** (Menu) to enter the 2nd level menu.
B	○ Scroll down the list of parameters to be edited by pressing buttons **S3** (△) and **S4** (▽)
C	○ Using the **encoder E3**, edit the value of the selected parameter ⓘ The value is saved automatically.

Tab.8. - 2nd level menu parameters in SYNERGIC MIG/MAG mode

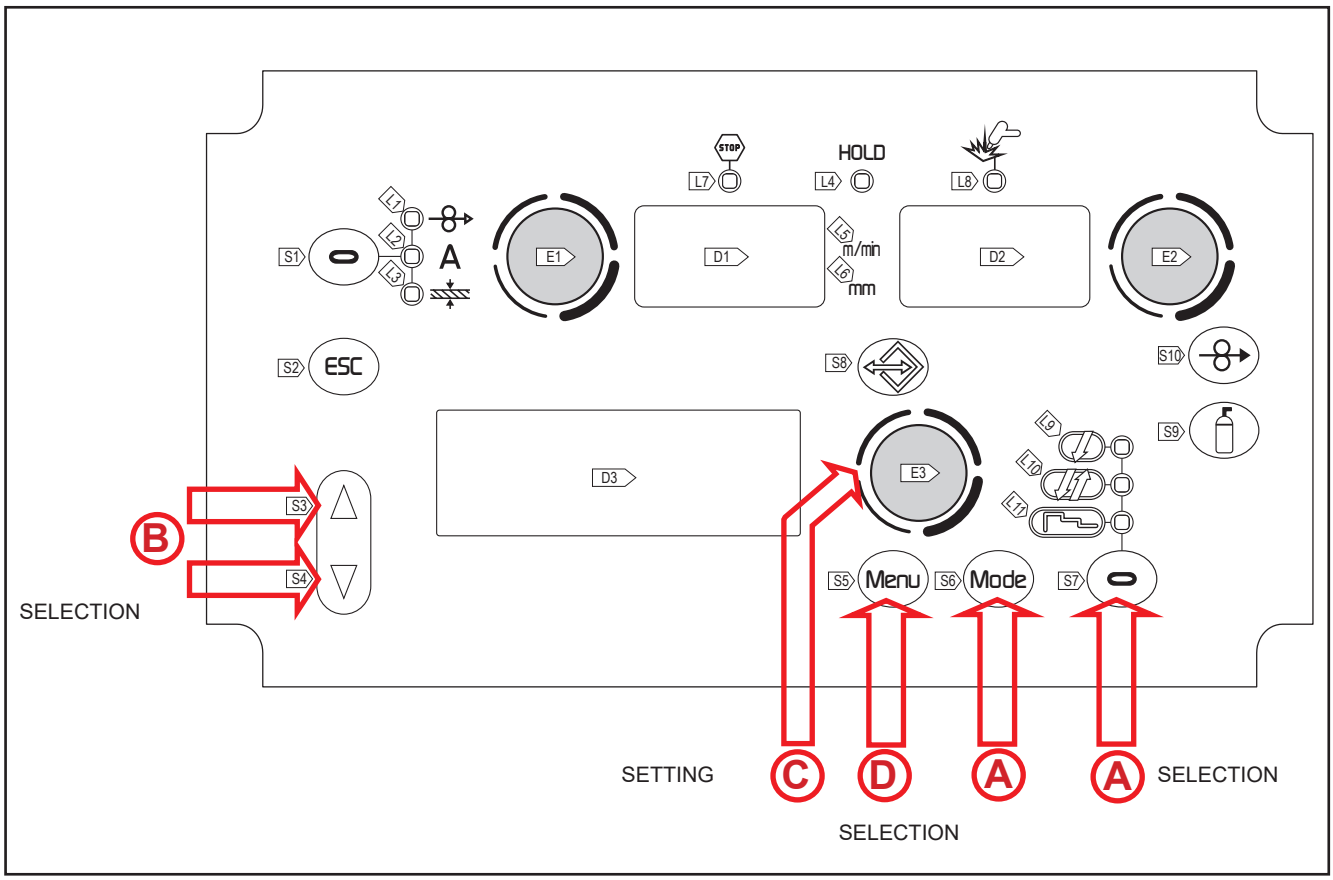
PROCE-DURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
2 STROKE 2 STROKE SPOT	INDUCTANCE	(row 1/6)	-100	SYN	100	
	PR START	(row 1/6)	1	SYN	200	This parameter is present exclusively with POWER ROOT.
	PRE GAS	(row 2/6)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/6)	1 %	SYN	100 %	
	BURN BACK	(row 4/6)	1 %	SYN	200 %	
	POST GAS	(row 5/6)	0.0 s	1.0 s	10.0 s	
	SPOT TIME	(row 6/6)	0.1 s	OFF	25.0 s	The parameter value is saved for each welding mode.
4 STROKE 4 STROKE B-LEVEL	INDUCTANCE	(row 1/6)	-100	SYN	100	
	PR START	(row 1/6)	1	SYN	200	This parameter is present exclusively with POWER ROOT.
	PRE GAS	(row 2/6)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/6)	1 %	SYN	100 %	
	BURN BACK	(row 4/6)	1 %	SYN	200 %	
	POST GAS	(row 5/6)	0.0 s	1.0 s	10.0 s	
	B-LEVEL	(row 6/6)	1 %	OFF	200 %	The parameter value is saved for each welding mode.
3 LEVEL 2 STROKE 3 LEVEL 2 STROKE SPOT	INDUCTANCE	(row 1/14)	-100	SYN	100	
	PR START	(row 1/14)	1	SYN	200	This parameter is present exclusively with POWER ROOT.
	PRE GAS	(row 2/14)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/14)	1 %	SYN	100 %	
	START 3LEV	(row 4/14)	10 %	130 %	200 %	
	START TIME	(row 5/14)	0.0 s	0.5 s	10.0 s	
	SLOPE 3LEV 1	(row 6/14)	0.1 s	0.5 s	10.0 s	
	CORR.3LEV1	(row 7/14)	-9.9 V -4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min	
	SLOPE 3LEV 2	(row 8/14)	0.1 s	0.5 s	10.0 s	
	CORR.3LEV2	(row 9/14)	-9.9 V -4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min	
	CRATER 3LEV	(row 10/12)	10 %	80 %	200 %	
	CRATER TIME	(row 11/14)	0.0 s	0.5 s	10.0 s	
	BURN BACK	(row 12/14)	1 %	SYN	200 %	
	POST GAS	(row 13/14)	0.0 s	1.0 s	10.0 s	
	SPOT TIME	(row 14/14)	0.1 s	OFF	25.0 s	The parameter value is saved for each welding mode.

PROCE-DURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
3 LEVEL 4 STROKE 3 LEVEL 4 STROKE B-LEVEL	INDUCTANCE	(row 1/10)	-100	SYN	100	
	PR START	(row 1/12)	1	SYN	200	This parameter is present exclusively with POWER ROOT.
	PRE GAS	(row 2/12)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/12)	1 %	SYN	100 %	
	START 3LEV	(row 4/12)	10 %	130 %	200 %	
	SLOPE 3LEV 1	(row 5/12)	0.1 s	0.5 s	10.0 s	
	CORR.3LEV1	(row 6/12)	-9.9 V -4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min	
	SLOPE 3LEV 2	(row 7/12)	0.1 s	0.5 s	10.0 s	
	CORR.3LEV2	(row 8/12)	-9.9 V -4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min	
	CRATER 3LEV	(row 9/12)	10 %	80 %	200 %	
	BURN BACK	(row 10/12)	1 %	SYN	200 %	
	POST GAS	(row 11/12)	0.0 s	1.0 s	10.0 s	
	B-LEVEL	(row 12/12)	1 %	OFF	200 %	The parameter value is saved for each welding mode.

10.4 PULSED SYNERGIC MIG/MAG WELDING

(available in PIONEER **PULSE** MKS line power sources)

Set the welding data (material, wire diameter, gas type), shown on display D4 and just one welding parameter, chosen among wire feed rate, Amperes, and workpiece Thickness, shown on display D1.
NOTE: The synergic curves were created with reference to a fillet weld in position PB (horizontal-vertical) with 10 mm stick-out (distance from torch to workpiece).
In general, the parameter set is the wire feed rate (associated with the deposition of filler material) and the synergic welding power source automatically sets the most suitable welding voltage.
Encoder E2 can be adjusted to correct the arc shown on display D3, in order to make minor adjustments in accordance with requirements.
During a welding operation with an active JOB, it is possible to temporarily change the parameters shown in the displays D1 and D2 with their encoders to test the temporary changes made to the welding operation. At the end of the welding operation (and HOLD is quit) the values of the loaded JOB are reset.
When the welding operation is not being carried out and a JOB is active through encoder E3, the JOBs belonging to its sequence can be scrolled.
The welding power source also automatically adjusts several secondary parameters that are relevant for welding quality.



Ⓐ	**S6** (Mode) This button serves to select the following welding mode: PULSED SYNERGIC MIG/MAG **S7** Use this button to select one of the following torch trigger procedures: 2 STROKE 2 STROKE SPOT: The procedure is active when the “SPOT TIME” parameter is set to a value other than “OFF”. 4 STROKE 4 STROKE B-LEVEL: The procedure is active when the “B-LEVEL” parameter is set to a value other than “OFF” 3 LEVEL 2 STROKE 3 LEVEL 2 STROKE SPOT: The procedure is active when the “SPOT TIME” parameter is set to a value other than “OFF”. If the "SPOT TIME" parameter is active in the 3 LEVELS procedure, its value denotes the time for which the main welding current is supplied. 3 LEVEL 4 STROKE 3 LEVEL 4 STROKE B-LEVEL: The procedure is active when the “B-LEVEL” parameter is set to a value other than “OFF”

Tab.9. - Main settings and displays in PULSED SYNERGIC MIG/MAG mode

	DISPLAY D1	DISPLAY D2	DISPLAY D3
Data setting	Shows the main synergy parameter (wire feed rate, Amperes, recommended thickness), which can be adjusted with the following encoder: (E1).	Shows the set welding voltage, which can be adjusted with the following encoder: (E2).	Shows the arc correction executed by the operator with encoder (E2). Displays D2 and D3 change simultaneously, but while display D2 shows the absolute value, display D3 shows the correction with respect to the standard and optimal value proposed by the manufacturer. Shows the arc correction executed by the operator with encoder (E2). Displays D2 and D3 change simultaneously, but while display D2 shows the absolute value, display D3 shows the correction with respect to the standard and optimal value proposed by the manufacturer. The parameter corrects the arc dynamics in the POWER ROOT process.
Welding	Shows the average current measured during welding.	Shows the average voltage measured during welding.	Shows the arc correction executed by the operator.
HOLD function (At welding end)	Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during the last welding procedure performed.	Shows the arc correction executed by the operator.

10.4.1 Pulsed Synergic MIG/MAG parameters setting (1st level): synergic curve setting.

B	○ Scroll down the list of parameters to be edited by pressing buttons **S3** △ and **S4** ▽
C	○ Using the **encoder E3**, edit the value of the selected parameter ⓘ The value is saved automatically.

10.4.2 Pulsed Synergic MIG/MAG parameters setting (2nd level).

D	○ Press the button **S5** (Menu) to enter the 2nd level menu.
B	○ Scroll down the list of parameters to be edited by pressing buttons **S3** △ and **S4** ▽
C	○ Using the **encoder E3**, edit the value of the selected parameter ⓘ The value is saved automatically.

Tab.10. - 2nd level menu parameters in PULSED SYNERGIC MIG/MAG mode

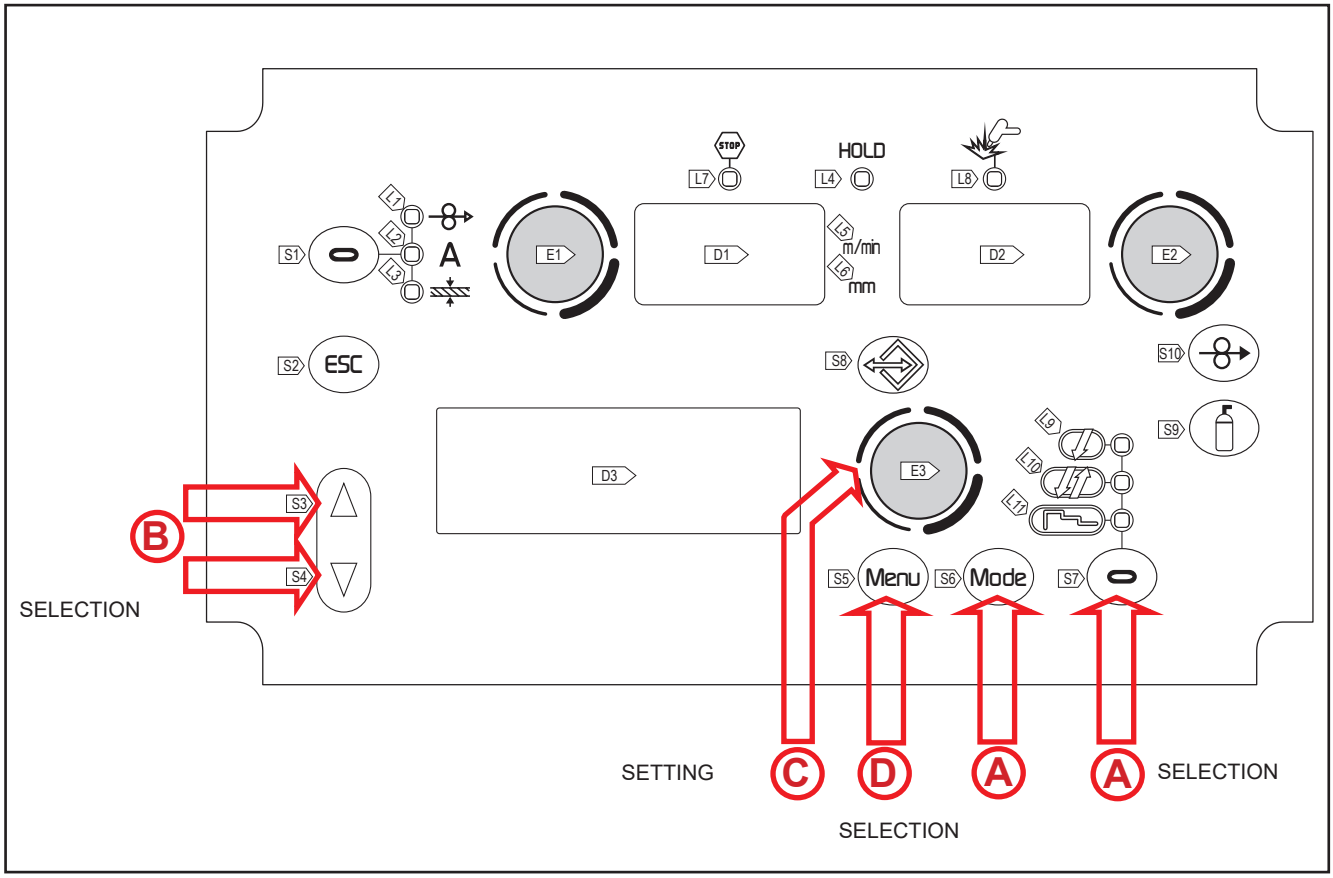
PROCEDURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
2 STROKE 2 STROKE SPOT	ARC SET	(row 1/6)	1	SYN	200	
	PRE GAS	(row 2/6)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/6)	1 %	SYN	100 %	
	BURN BACK	(row 4/6)	1 %	SYN	200 %	
	POST GAS	(row 5/6)	0.0 s	1.0 s	10.0 s	
	SPOT TIME	(row 6/6)	0.1 s	OFF	25.0 s	The parameter value is saved for each welding mode.
4 STROKE 4 STROKE B-LEVEL	ARC SET	(row 1/6)	1	SYN	200	
	PRE GAS	(row 2/6)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/6)	1 %	SYN	100 %	
	BURN BACK	(row 4/6)	1 %	SYN	200 %	
	POST GAS	(row 5/6)	0.0 s	1.0 s	10.0 s	
	B-LEVEL	(row 6/6)	1 %	OFF	200 %	The parameter value is saved for each welding mode.
3 LEVEL 2 STROKE 2 STROKE SPOT	ARC SET	(row 1/12)	1	SYN	200	
	PRE GAS	(row 2/12)	0.0 s	SYN	10.0 s	
	SOFT START	(row 3/12)	1 %	SYN	100 %	
	START 3LEV	(row 4/12)	10 %	130 %	200 %	
	START TIME	(row 5/12)	0.0 s	0.5 s	10.0 s	
	SLOPE 3LEV 1	(row 6/12)	0.1 s	0.5 s	10.0 s	
	SLOPE 3LEV 2	(row 7/12)	0.1 s	0.5 s	10.0 s	
	CRATER 3LEV	(row 8/12)	10 %	80 %	200 %	
	CRATER TIME	(row 9/12)	0.0 s	0.5 s	10.0 s	
	BURN BACK	(row 10/12)	1 %	SYN	200 %	
	POST GAS	(row 11/12)	0.0 s	1.0 s	10.0 s	
	SPOT TIME	(row 12/12)	0.1 s	OFF	25.0 s	The parameter value is saved for each welding mode.

PROCEDURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
 3 LEVEL 4 STROKE 4 STROKE B-LEVEL	ARC SET	(row 1/10)	1	SYN	200	
	PRE GAS	(row 2/10)	0.0 s	SYN	10.0 s	
	SOFT START	(row 3/10)	1 %	SYN	100 %	
	START 3LEV	(row 4/10)	10 %	130 %	200 %	
	SLOPE 3LEV 1	(row 5/10)	0.1 s	0.5 s	10.0 s	
	SLOPE 3LEV 2	(row 6/10)	0.1 s	0.5 s	10.0 s	
	CRATER 3LEV	(row 7/10)	10 %	80 %	200 %	
	BURN BACK	(row 8/10)	1 %	SYN	200 %	
	POST GAS	(row 9/10)	0.0 s	1.0 s	10.0 s	
	B-LEVEL	(row 10/10)	1 %	OFF	200 %	The parameter value is saved for each welding mode.

10.5 DOUBLE PULSED SYNERGIC MIG/MAG WELDING

(available in PIONEER **PULSE** MKS line power sources)

Set the welding data (material, wire diameter, gas type), shown on display D4 and just one welding parameter, chosen among wire feed rate, Amperes, and workpiece Thickness, shown on display D1.
NOTE: The synergic curves were created with reference to a fillet weld in position PB (horizontal-vertical) with 10 mm stick-out (distance from torch to workpiece).
In general, the parameter set is the wire feed rate (associated with the deposition of filler material) and the synergic welding power source automatically sets the most suitable welding voltage. Encoder E2 can be adjusted to correct the arc shown on display D3, in order to make minor adjustments in accordance with requirements. During a welding operation with an active JOB, it is possible to temporarily change the parameters shown in the displays D1 and D2 with their encoders to test the temporary changes made to the welding operation. At the end of the welding operation (and HOLD is quit) the values of the loaded JOB are reset.
When the welding operation is not being carried out and a JOB is active through encoder E3, the JOBs belonging to its sequence can be scrolled. The welding power source also automatically adjusts several secondary parameters that are relevant for welding quality. This mode involves a variable frequency pulse between two parameters of the Pulsed Synergic curve.



A	**S6** (Mode) This button serves to select the following welding mode: DOUBLE PULSED SYNERGIC MIG/MAG **S7** Use this button to select one of the following torch trigger procedures: 2 STROKE 2 STROKE SPOT: The procedure is active when the “SPOT TIME” parameter is set to a value other than “OFF”. 4 STROKE 4 STROKE B-LEVEL: The procedure is active when the “B-LEVEL” parameter is set to a value other than “OFF” 3 LEVEL 2 STROKE 3 LEVEL 2 STROKE SPOT: The procedure is active when the “SPOT TIME” parameter is set to a value other than “OFF”. If the "SPOT TIME" parameter is active in the 3 LEVELS procedure, its value denotes the time for which the main welding current is supplied. 3 LEVEL 4 STROKE 3 LEVEL 4 STROKE B-LEVEL: The procedure is active when the “B-LEVEL” parameter is set to a value other than “OFF”

Tab.11. - Main settings and displays in DOUBLE PULSED SYNERGIC MIG/MAG mode

	DISPLAY D1	DISPLAY D2	DISPLAY D3
Data setting	Shows the main synergy parameter (wire feed rate, Amperes, recommended thickness), which can be adjusted with the following encoder: (E1).	Shows the set welding voltage, which can be adjusted with the following encoder: (E2).	Shows the arc correction executed by the operator with encoder (E2). Displays D2 and D3 change simultaneously, but while display D2 shows the absolute value, display D3 shows the correction with respect to the standard and optimal value proposed by the manufacturer.
Welding	Shows the average current measured during welding.	Shows the average voltage measured during welding.	Shows the arc correction executed by the operator.
HOLD function (At welding end)	Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during the last welding procedure performed.	Shows the arc correction executed by the operator.

10.5.1 Double pulsed synergic MIG/MAG parameters setting (1st level): synergic curve setting.

B	○ Scroll down the list of parameters to be edited by pressing buttons **S3** (△) and **S4** (▽)
C	○ Using the **encoder E3**, edit the value of the selected parameter ⓘ The value is saved automatically.

10.5.2 Double pulsed synergic MIG/MAG parameters setting (2nd level).

D	○ Press the button **S5** (Menu) to enter the 2nd level menu.
B	○ Scroll down the list of parameters to be edited by pressing buttons **S3** (△) and **S4** (▽)

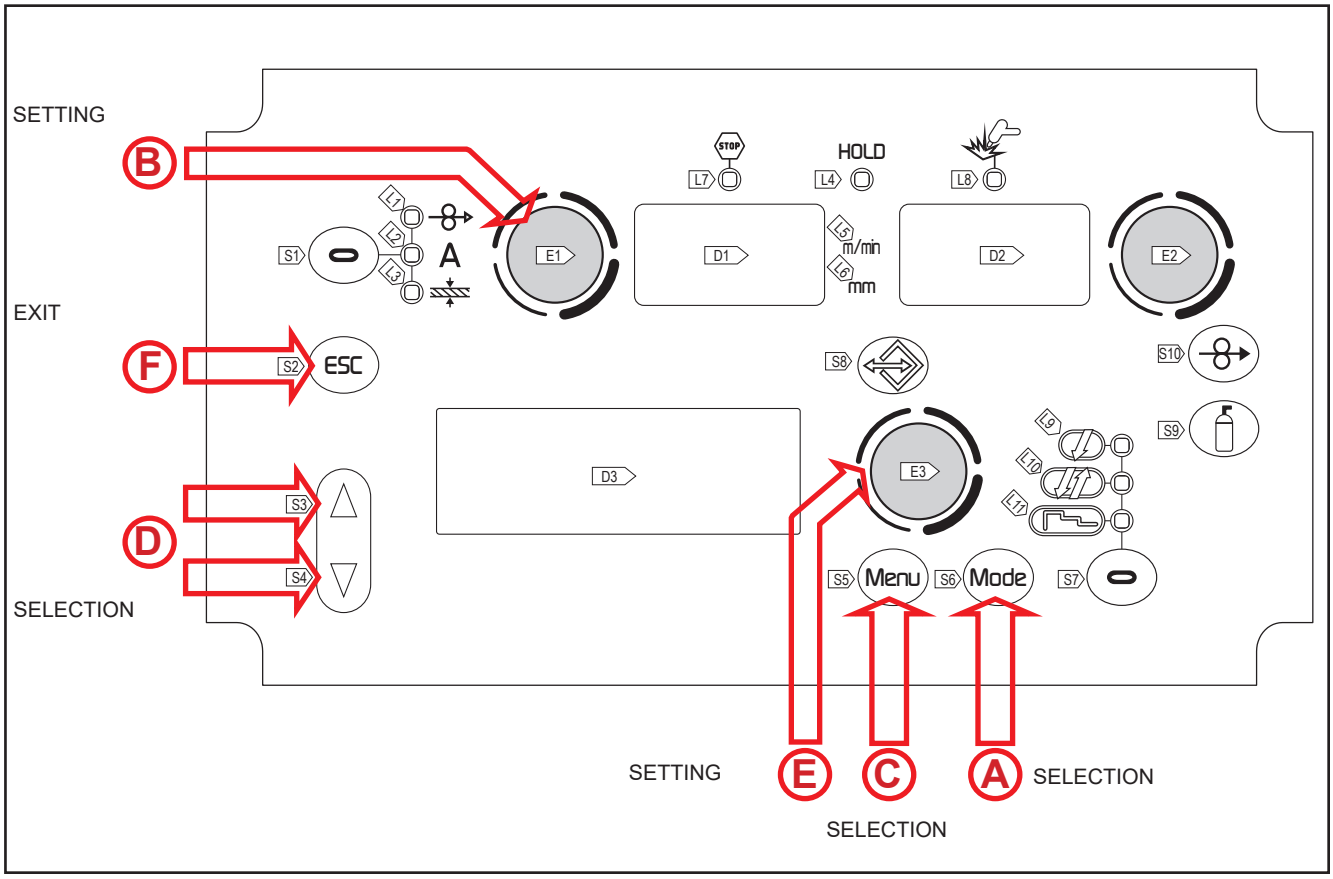
©	○ Using the **encoder E3**  , edit the value of the selected parameter ⓘ The value is saved automatically.

Tab.12. - 2nd level menu parameters in DOUBLE PULSED SYNERGIC MIG/MAG mode

PROCEDURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
 2 STROKE 2 STROKE SPOT	ARC SET	(row 1/10)	1	SYN	200	
	PRE GAS	(row 2/10)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/10)	1 %	SYN	100 %	
	BURN BACK	(row 4/10)	1 %	SYN	200 %	
	POST GAS	(row 5/10)	0.0 s	1.0 s	10.0 s	
	SPOT TIME	(row 6/10)	0.1 s	OFF	25.0 s	The parameter value is saved for each welding mode.
	FREQ 2PULS	(row 7/10)	0.1 Hz	1.5 Hz	10.0 Hz	
	RANGE 2PULS	(row 8/10)	10 %	50 %	90 %	
	CYCLE 2PULS	(row 9/10)	10 %	50 %	90 %	
	ARC2 2PULS	(row 10/10)	- 9.9 V	0.0 V	9.9 V	
			- 4.0 m/min	0.0 m/min	4.0 m/min	
 4 STROKE 4 STROKE B-LEVEL	ARC SET	(row 1/10)	1	SYN	200	
	PRE GAS	(row 2/10)	0.0 s	0.0 s	10.0 s	
	SOFT START	(row 3/10)	1 %	SYN	100 %	
	BURN BACK	(row 4/10)	1 %	SYN	200 %	
	POST GAS	(row 5/10)	0.0 s	1.0 s	10.0 s	
	B-LEVEL	(row 6/10)	1 %	OFF	200 %	The parameter value is saved for each welding mode.
	FREQ 2PULS	(row 7/10)	0.1 Hz	1.5 Hz	10.0 Hz	
	RANGE 2PULS	(row 8/10)	10 %	50 %	90 %	
	CYCLE 2PULS	(row 9/10)	10 %	50 %	90 %	
	ARC2 2PULS	(row 10/10)	- 9.9 V	0.0 V	9.9 V	
			- 4.0 m/min	0.0 m/min	4.0 m/min	
 3 LEVELS 2 STROKE 2 STROKE SPOT	ARC SET	(row 1/16)	1	SYN	200	
	PRE GAS	(row 2/16)	0.0 s	SYN	10.0 s	
	SOFT START	(row 3/16)	1 %	SYN	100 %	
	START 3LEV	(row 4/16)	10 %	130 %	200 %	
	START TIME	(row 5/16)	0.0 s	0.5 s	10.0 s	
	SLOPE 3LEV 1	(row 6/16)	0.1 s	0.5 s	10.0 s	
	SLOPE 3LEV 2	(row 7/16)	0.1 s	0.5 s	10.0 s	
	CRATER 3LEV	(row 8/16)	10 %	80 %	200 %	
	CRATER TIME	(row 9/16)	0.0 s	0.5 s	10.0 s	
	BURN BACK	(row 10/16)	1 %	SYN	200 %	
	POST GAS	(row 11/16)	0.0 s	1.0 s	10.0 s	
	SPOT TIME	(row 12/16)	0.1 s	OFF	25.0 s	The parameter value is saved for each welding mode.
	FREQ 2PULS	(row 13/16)	0.1 Hz	1.5 Hz	10.0 Hz	
	RANGE 2PULS	(row 14/16)	10 %	50 %	90 %	
	CYCLE 2PULS	(row 15/16)	10 %	50 %	90 %	
	ARC2 2PULS	(row 16/16)	- 9.9 V	0.0 V	9.9 V	
			- 4.0 m/min	0.0 m/min	4.0 m/min	

PROCEDURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
 3 LEVELS 4 STROKE 4 STROKE B-LEVEL	ARC SET	(row 1/14)	1	SYN	200	
	PRE GAS	(row 2/14)	0.0 s	SYN	10.0 s	
	SOFT START	(row 3/14)	1 %	SYN	100 %	
	START 3LEV	(row 4/14)	10 %	130 %	200 %	
	SLOPE 3LEV 1	(row 5/14)	0.1 s	0.5 s	10.0 s	
	SLOPE 3LEV 2	(row 6/14)	0.1 s	0.5 s	10.0 s	
	CRATER 3LEV	(row 7/14)	10 %	80 %	200 %	
	BURN BACK	(row 8/14)	1 %	SYN	200 %	
	POST GAS	(row 9/14)	0.0 s	1.0 s	10.0 s	
	B-LEVEL	(row 10/14)	1 %	OFF	200 %	The parameter value is saved for each welding mode.
	FREQ 2PULS	(row 11/14)	0.1 Hz	1.5 Hz	10.0 Hz	
	RANGE 2PULS	(row 12/14)	10 %	50 %	90 %	
	CYCLE 2PULS	(row 13/14)	10 %	50 %	90 %	
	ARC2 2PULS	(row 14/14)	- 9.9 V	0.0 V	9.9 V	
			- 4.0 m/min	0.0 m/min	4.0 m/min	

10.6 MMA WELDING



A	**S6**	Mode	This button serves to select the following welding mode: MMA

Tab.13. - Main settings and displays in MMA mode

	DISPLAY D1	DISPLAY D2
Data setting	Shows the preset welding current	Shows the tension between the welding sockets.
Welding	Shows the average current measured during welding.	Shows the average voltage measured during welding.
HOLD function (At welding end)	Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during the last welding procedure performed.

10.6.1 MMA Parameters Setting (1st Level): welding current setting

B	○ Using the **encoder E1** ◯, edit the value of the welding current. ⓘThe value is saved automatically.

10.6.2 MMA Parameters Setting (2nd Level)

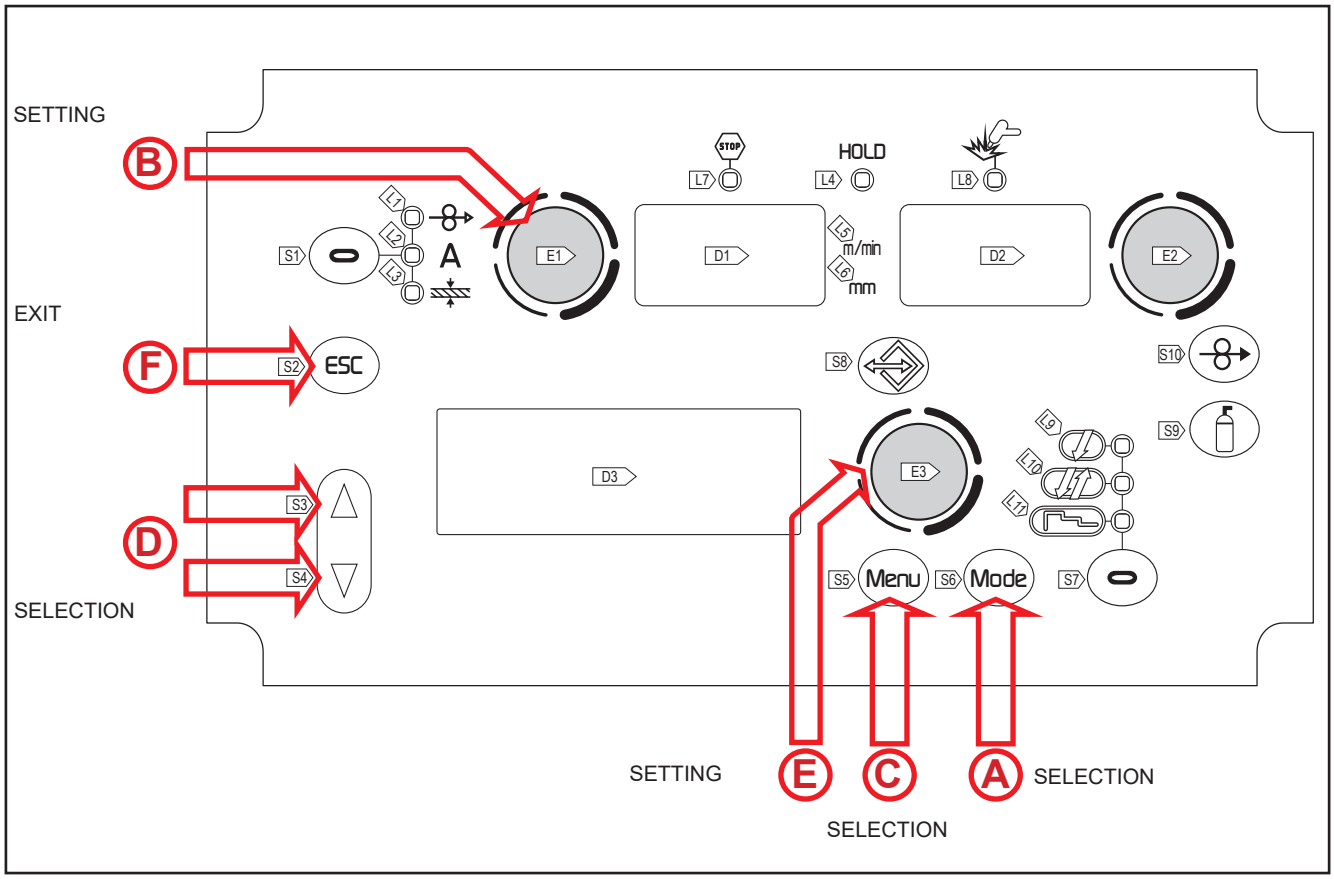
C	○ Press the button **S5** Menu to enter the 2nd level menu.

D	○ Scroll down the list of parameters to be edited by pressing buttons **S3** △ and **S4** ▽.
E	○ Using the **encoder E3**, edit the value of the selected parameter. ⓘ The value is saved automatically.
F	Exit with confirmation ○ Press the **S2** button (ESC). ➲ This action will automatically close the menu.

Tab.14. - Parameters of the 2nd level menu in MMA mode

PROCE-DURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
MMA	VRD	(riga 1/3)	OFF	OFF	ON	
	HOT START	(riga 2/3)	0 %	50 %	100 %	
	ARC FORCE	(riga 3/3)	0 %	30 %	100 %	

10.7 ARC AIR WELDING



A	**S6** (Mode) This button serves to select the following welding mode: ARC AIR

Tab.15. - Main settings and displays in ARC AIR mode

	DISPLAY D1	DISPLAY D2
Data setting	Shows the preset welding current	Shows the tension between the welding sockets.

	DISPLAY D1	DISPLAY D2
Welding	Shows the average current measured during welding.	Shows the average voltage measured during welding.
HOLD function (At welding end)	Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during the last welding procedure performed.

10.7.1 ARC AIR parameters setting (1st level): current setting

B	○ Using the **encoder E1**, edit the current value ⓘ The value is saved automatically.

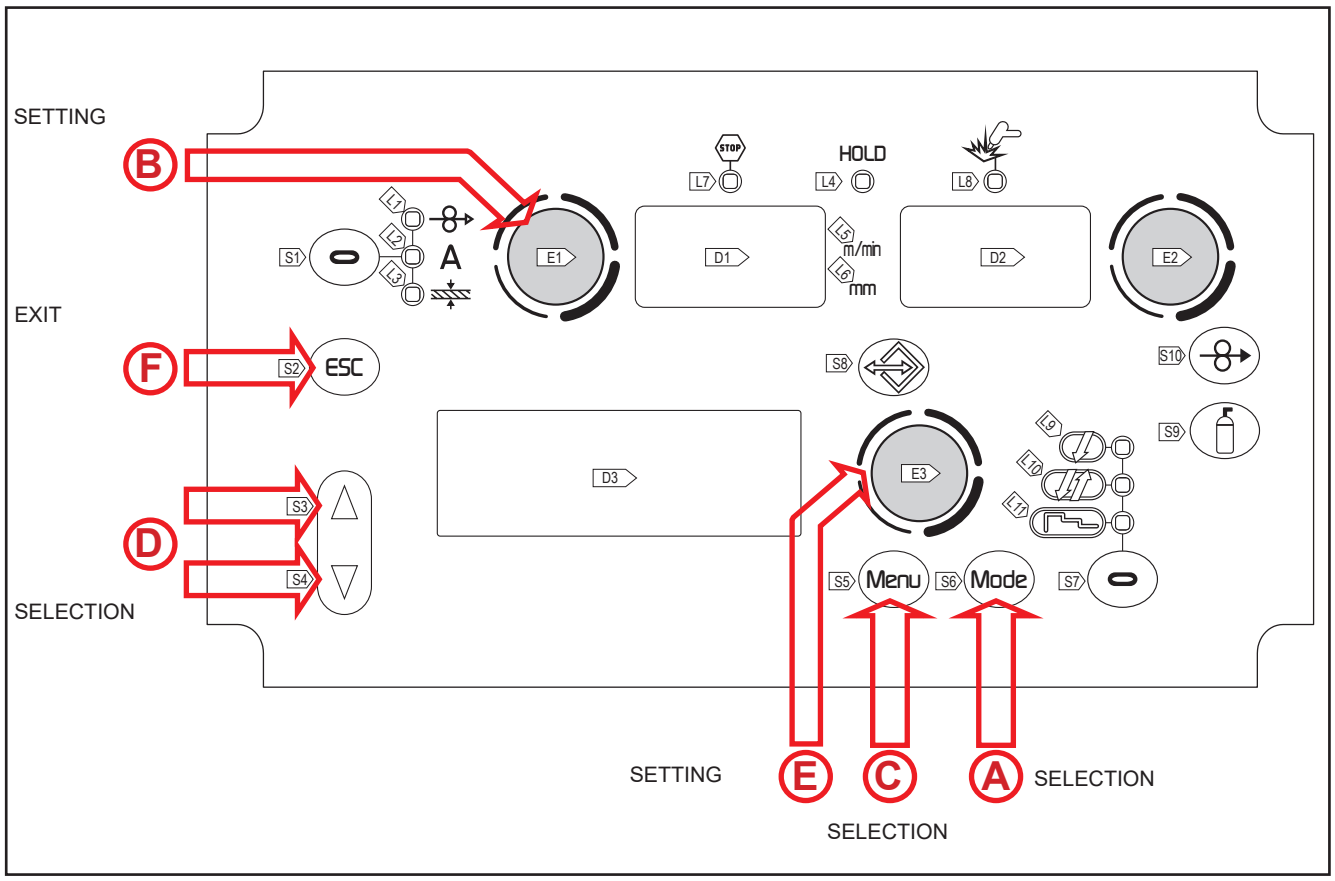
10.7.2 ARC AIR Parameters Setting (2nd Level)

C	○ Press the button **S5** (Menu) to enter the 2nd level menu.
D	○ Scroll down the list of parameters to be edited by pressing buttons **S3** (△) and **S4** (▽).
E	○ Using the **encoder E3**, edit the value of the selected parameter. ⓘ The value is saved automatically.
F	**Exit with confirmation** ○ Press **S2** (ESC). ➲ This action will automatically close the menu.

Tab.16. - Parameters of the 2nd level menu in ARC AIR mode

PROCEDURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
ARC AIR	VRD	(row 1/1)	OFF	OFF	ON	

10.8 TIG WELDING



A	**S6** (Mode)	This button serves to select the following welding mode: TIG

Tab.17. - Main settings and displays in TIG mode

	DISPLAY D1	DISPLAY D2
Data_setting	Shows the preset welding current	Shows the tension between the welding sockets.
Welding	Shows the average current measured during welding.	Shows the average voltage measured during welding.
HOLD function (At welding end)	Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during the last welding procedure performed.

10.8.1 TIG Parameters Setting (1st Level): welding current setting

B	○ Using the **encoder E1**, edit the value of the welding current. ⓘ The value is saved automatically.

10.8.2 TIG Parameters Setting (2nd Level)

C	○ Press the button **S5** (Menu) to enter the 2nd level menu.

D	○ Scroll down the list of parameters to be edited by pressing buttons **S3** △ and **S4** ▽ .
E	○ Using the **encoder E3** ◎,edit the value of the selected parameter. ⓘ The value is saved automatically..
F	**Exit with confirmation** ○ Press the **S2** button (ESC). ➲ This action will automatically close the menu.

Tab.18. - Parameters of the 2nd level menu in TIG mode

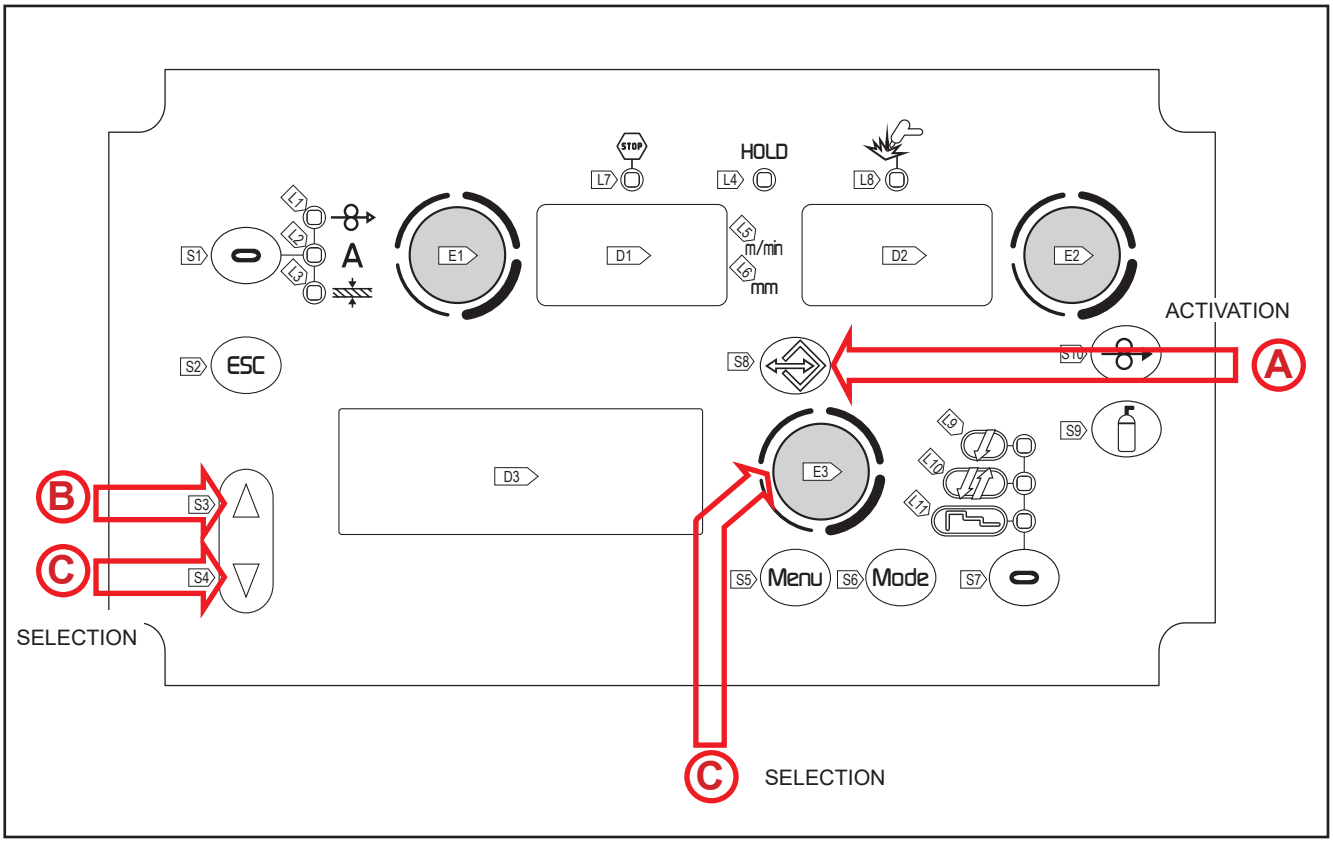
PROCE-DURE	PARAMETER		MIN	DEFAULT	MAX	NOTES
TIG	DOWN SLOPE	(row 1/3)	0.0 s	0.0 s	25.0 s	
	I FINAL	(row 2/3)	5 %	5 %	80 %	
	POST GAS	(row 3/3)	0.0 s	10.0 s	10.0 s	

11 JOBS MANAGEMENT

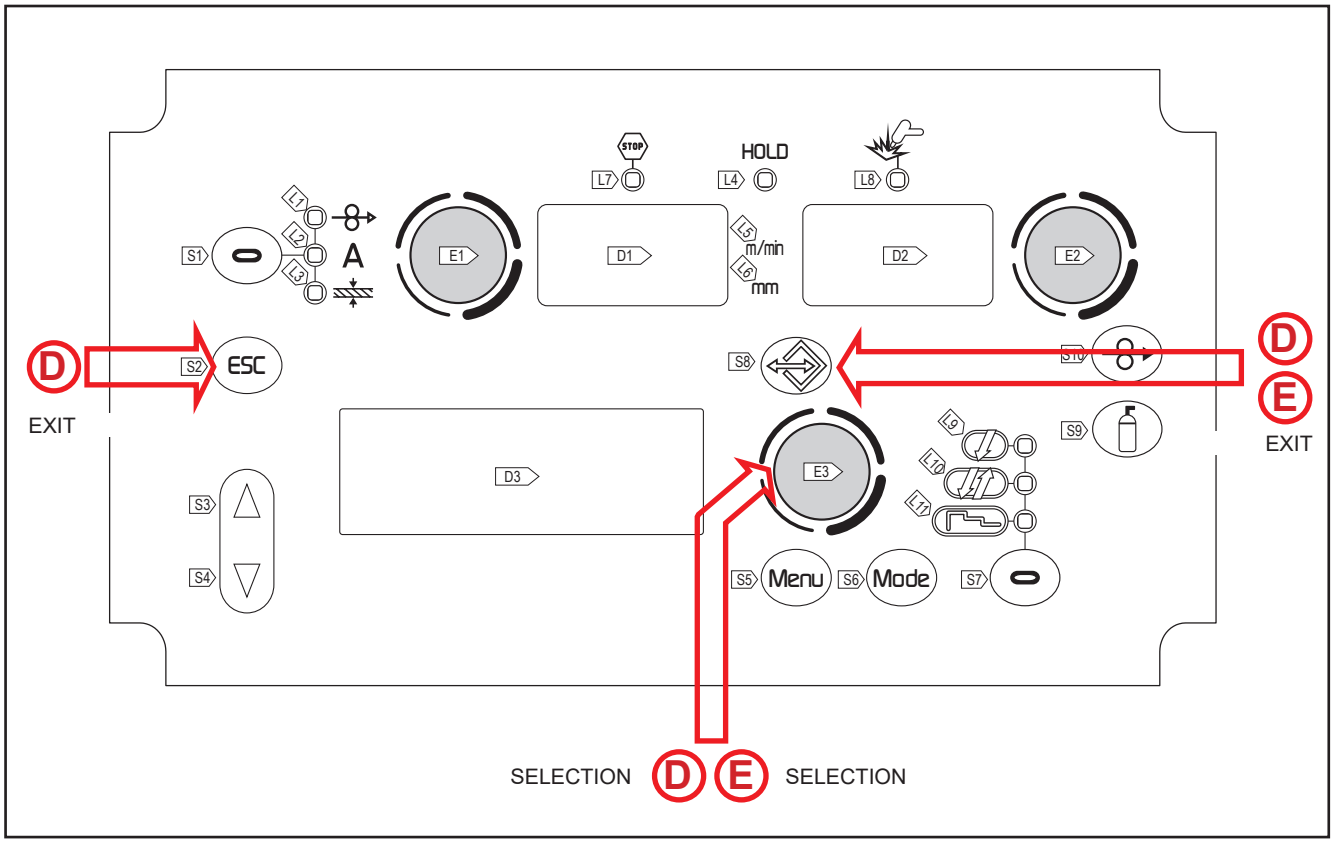
Personalised welding settings, or JOBs, can be saved in memory locations and subsequently uploaded.
Up to 99 jobs can be saved (j01-j99).
The settings of the SETUP menu are not saved.

11.1 SAVING A JOB

This function is available when welding mode is not active.



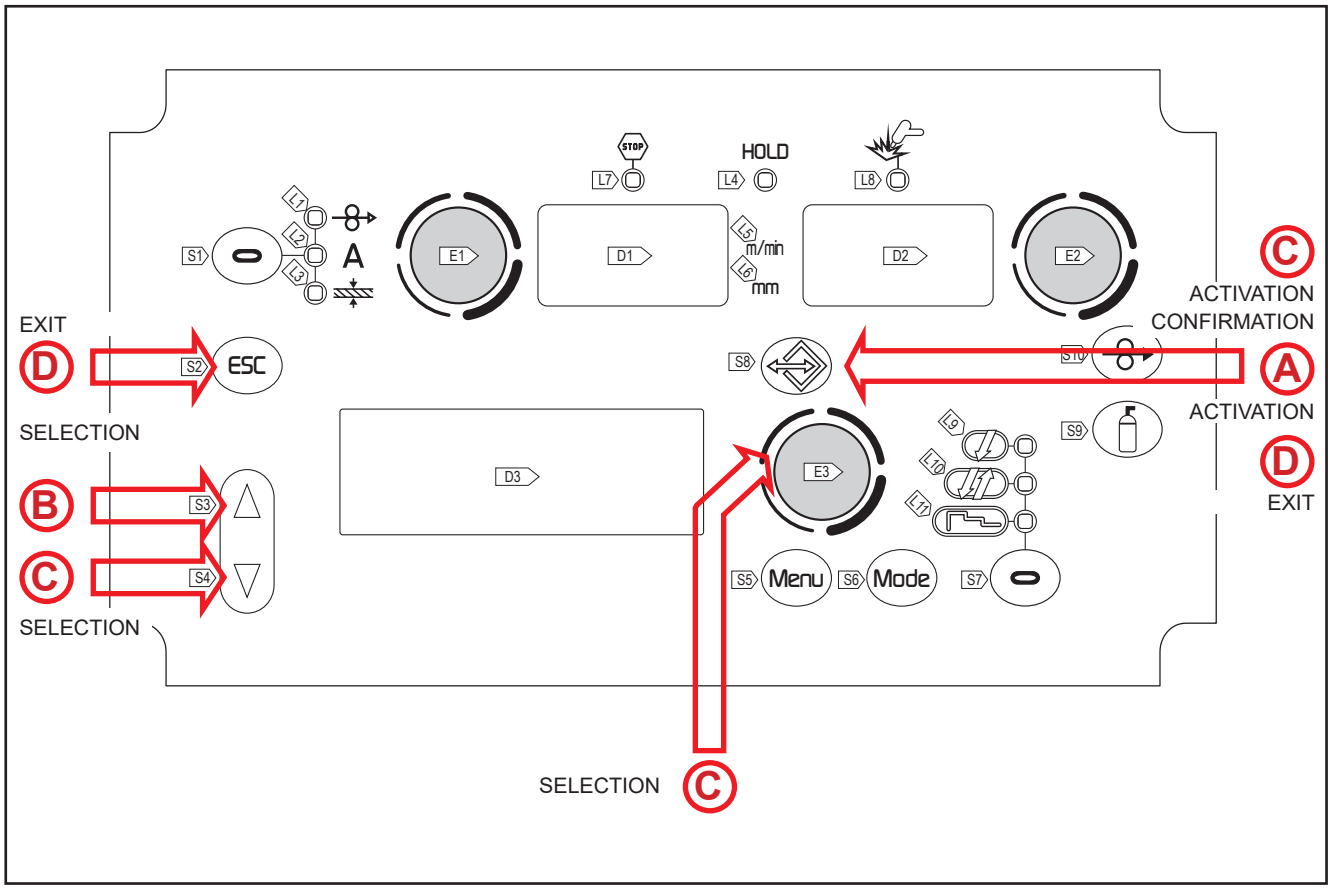
A	○ Hold down button **S8** to activate the job menu. ➲ The job menu appears in display: **D3**.
B	○ Press buttons **S3** and **S4** to select parameter **OPT**. ➲ The selected parameter is shown by the following symbol " ➔ ".
C	○ Use the **encoder E3**, to select the **SAVE** function. ○ Press buttons **S3** and **S4** to select parameter **JOB**. ⓘ The first free memory location is displayed. If all the memory locations are occupied, the word JOB flashes and the first JOB is displayed. If the memory location is already occupied by another job, when a new JOB is written to the location it will overwrite the existing JOB. The names of unnamed jobs are "-" after a space following the number corresponding to the memory location by default § "11.2 NAMING JOBS".



D	**Save and keep original** ○ Using the **encoder E3**, select one of the unoccupied jobs. **Exit without confirmation** ○ Press the **S2** ESC button. ➲ This action will automatically close the menu **Exit with confirmation** ○ Press the **S8** button. ➲ This action will automatically close the menu
E	**Save by overwriting** ○ Using the **encoder E3**, select one of the occupied jobs. ○ Press the **S8** button. ➲ **CONFIRM JOB CHANGE:** The message will appear on display **D3** **Exit without confirmation** Use the **encoder E3**, to select the “**NO**” function ○ Press the **S8** button. ➲ This action will automatically close the menu **Exit with confirmation** Use the **encoder E3**, to select the “**YES**” function ○ Press the **S8** button. ➲ This action will automatically close the menu

11.2 NAMING JOBS

JOBS can be named and renamed (maximum 9 characters) in the JOB MENU, LOAD, or SAVE. This function is available when welding mode is not active.



A	○ Hold down button **S8** to activate the job menu. ➲ The job menu appears in display: **D3**.
B	○ Press buttons **S3** △ and **S4** ▽ to select parameter **OPT**. ➲ The selected parameter is shown by symbol " ➔ ".
C	○ Use the **encoder E3**, to select the **LOAD/SAVE** function. ○ Press buttons **S3** △ and **S4** ▽ to select parameter **JOB**. ○ Use the **encoder E3** to select the position of the job to be renamed. ○ Hold down for 3 seconds button **S8**. ➲ The first letter of the name blinks. ○ Use the **encoder E3** to change the letter. ○ Press button **S8** to confirm. ○ Press buttons **S3** △ and **S4** ▽ to select the character to be changed.

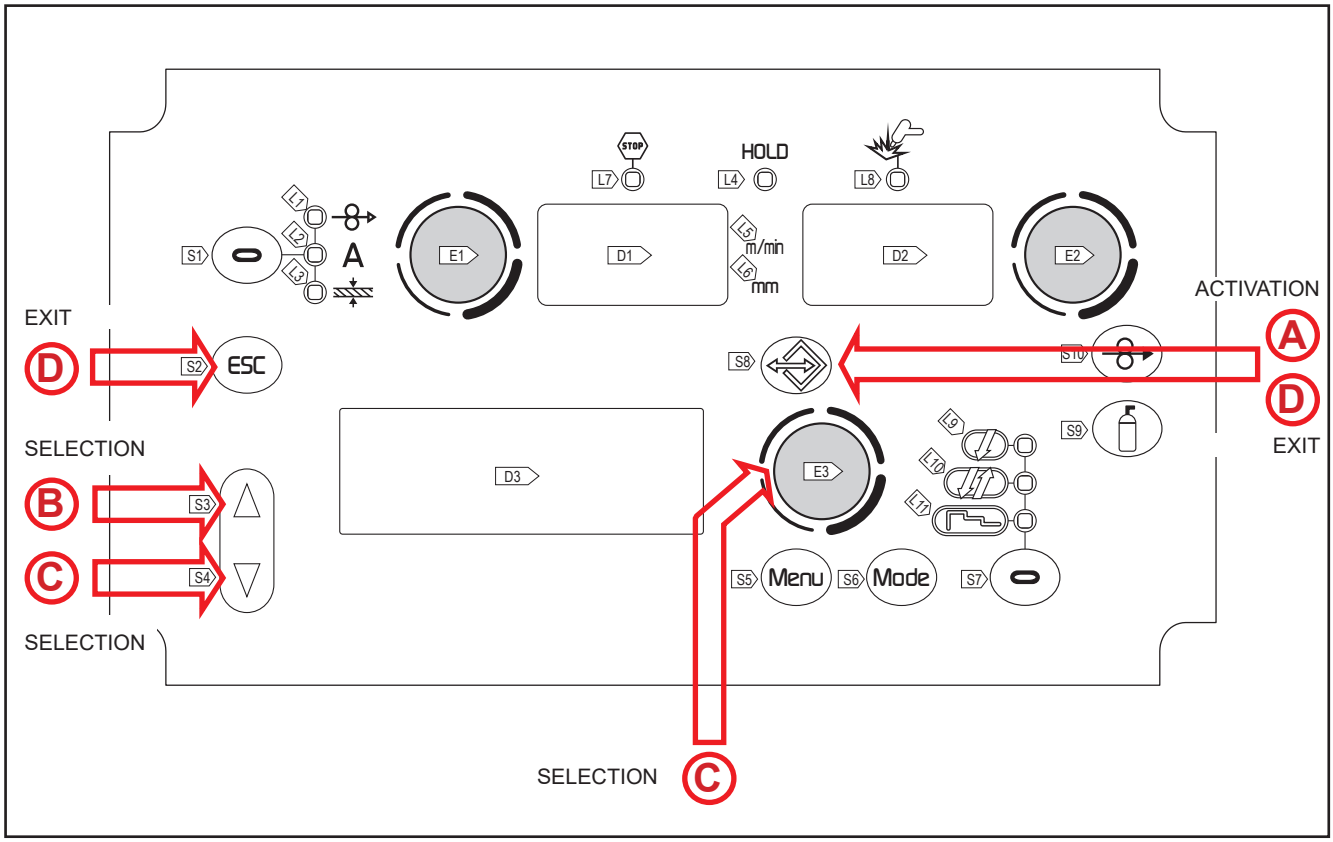
D	**Exit without confirmation** ○ Press the **S2** (ESC) button. ➲ Return to the job menu. ○ Press the **S2** (ESC) button to exit. **Exit with confirmation** ○ Hold down for 3 seconds button **S8**. ➲ Return to the job menu. ○ Press button **S8** again.

11.3 LOADING A USER JOB

If using a torch with UP/DOWN buttons you can scroll through the uploaded JOBs.
You can quit the uploaded job with the following methods:

- turn encoders **E1** - **E2** to change the welding current or voltage.
- press the welding mode selection button (button S6).
- Press the following button: (ESC)

If there are no JOBS loaded, the UP/DOWN buttons on the torch serve to adjust the welding current.
This function is available when welding mode is not active.

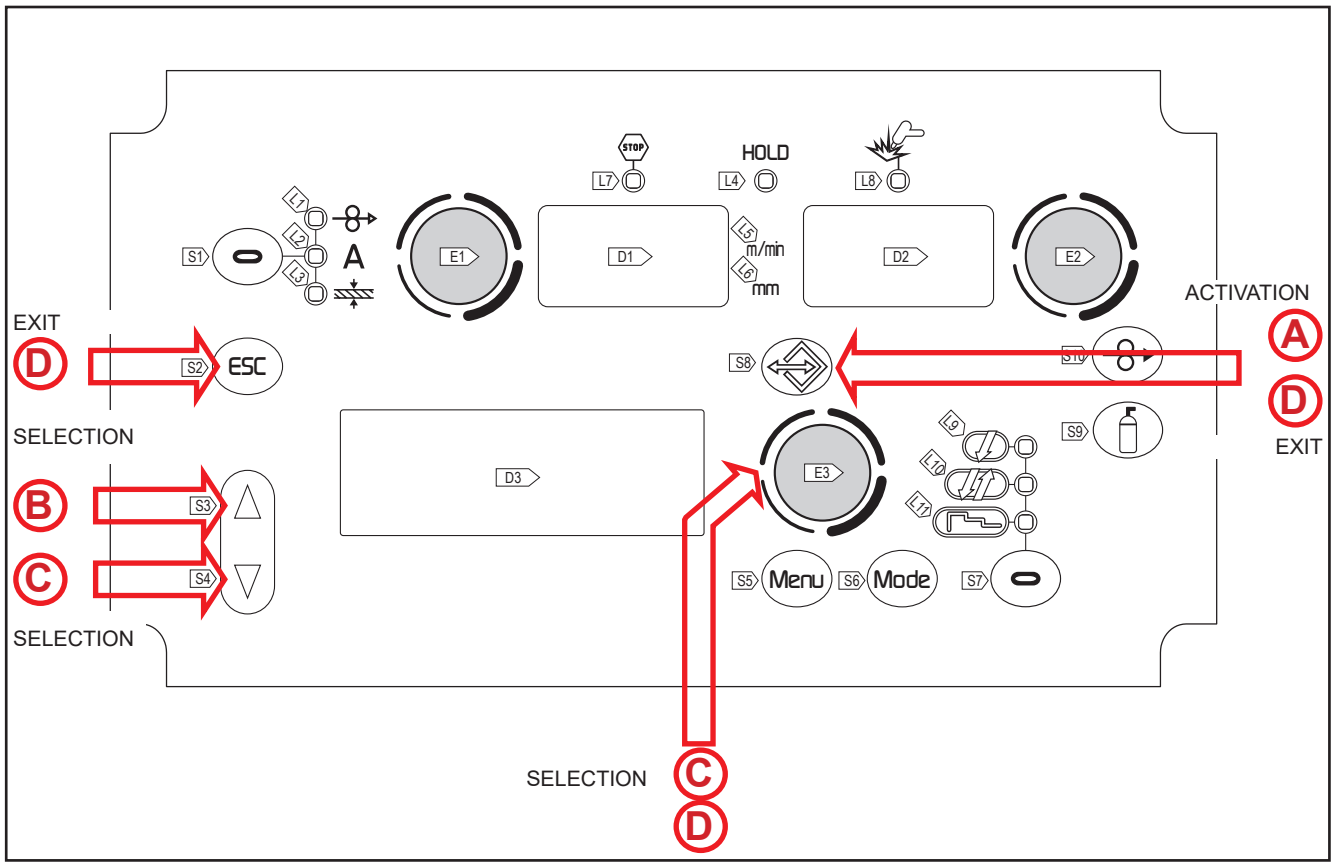


A	○ Hold down button **S8** to activate the job menu. ➲ The job menu appears in display: **D3**.
B	○ Press buttons **S3** (△) and **S4** (▽) to select parameter **OPT**. ➲ The selected parameter is shown by symbol " ➔ ".

C	○ Use the **encoder E3**, to select the **LOAD** function. ○ Press buttons **S3** and **S4** to select parameter **JOB**. ➲ The JOB displayed is the one that was most recently used. ➲ When there are no saved jobs the following message appears on the bottom line: **NO JOB** ○ Using the **encoder E3**, select one of the jobs displayed.
D	**Exit without confirmation** ○ Press the **S2** ESC button. ➲ This action will automatically close the menu **Exit with confirmation** ○ Press the **S8** button. ➲ This action will automatically close the menu

11.4 DELETING A JOB

This function is available when welding mode is not active.



A	○ Hold down button **S8** to activate the job menu. ➲ The job menu appears in display: **D3**.
B	○ Press buttons **S3** and **S4** to select parameter **OPT**. ➲ The selected parameter is shown by symbol " ➔ ".

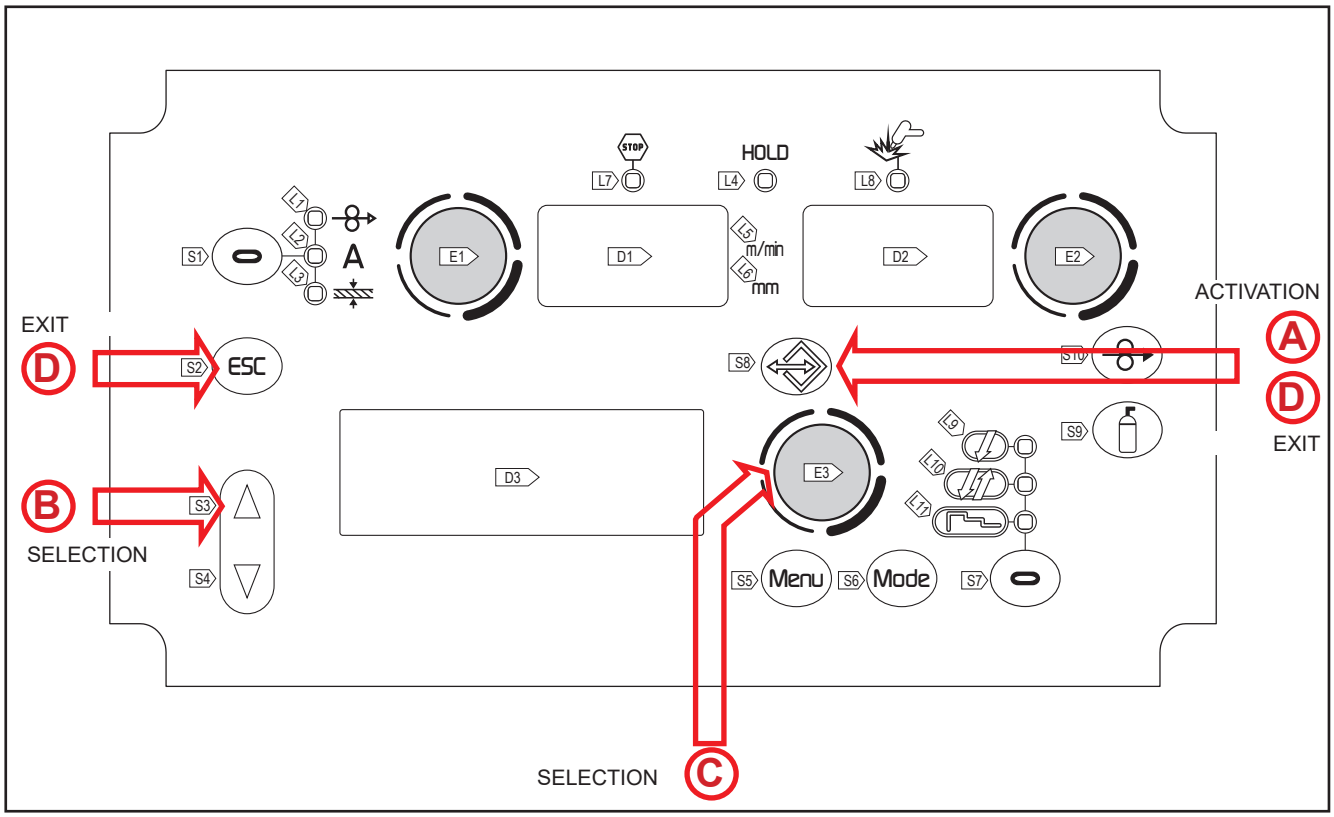
Ⓒ	○ Use the **encoder E3**, to select the **DELETE** function. ○ Press buttons **S3** and **S4** to select parameter **JOB**. ➲ The JOB displayed is the one that was most recently used. ➲ When there are no saved jobs the following message appears on the bottom line: **NO JOB** ○ Using the **encoder E3**, select one of the jobs displayed.
Ⓓ	**Exit without confirmation** ○ Press the **S2** (ESC) button. ➲ This action will automatically close the menu **Exit with confirmation** ○ Press the **S8** button. ➲ The message "**CONFIRM JOB ERASURE**" appears on display **D3.** ○ Use the **encoder E3**, to select the **NO** function" ○ Press the **S8** button. ➲ This action will automatically close the menu **Exit with confirmation** ○ Use the **encoder E3**, to select the **NO** function" ○ Press the **S8** button. ➲ This action will automatically close the menu

11.5 EXPORTING/IMPORTING JOBs (through a USB memory stick)

By using a USB memory stick, the JOBs saved on the panel can be imported into another panel.
When a USB memory stick is connected, the JOB MENU will display the items related to the importing and exporting procedure.

WARNING! The JOBs are exported to the USB memory stick with the name of the location where they are saved on the panel. If the file names of the JOBs saved onto the USB memory stick are changed by using a PC, after they are imported into the destination panel, they will still be saved in their original location. This means that, if the destination panel already contains JOBs saved in the same location as those exported to the memory stick, they will be overwritten.
We recommend not to change the name of the files exported to the USB memory stick. The file extension (.bin) must never be changed.
JOBs to be kept must be moved in a location of the destination panel different from the location of the JOBs exported to the USB memory stick.
To be usable, the memory stick must be formatted as FAT32.

11.6 EXPORTING A JOB



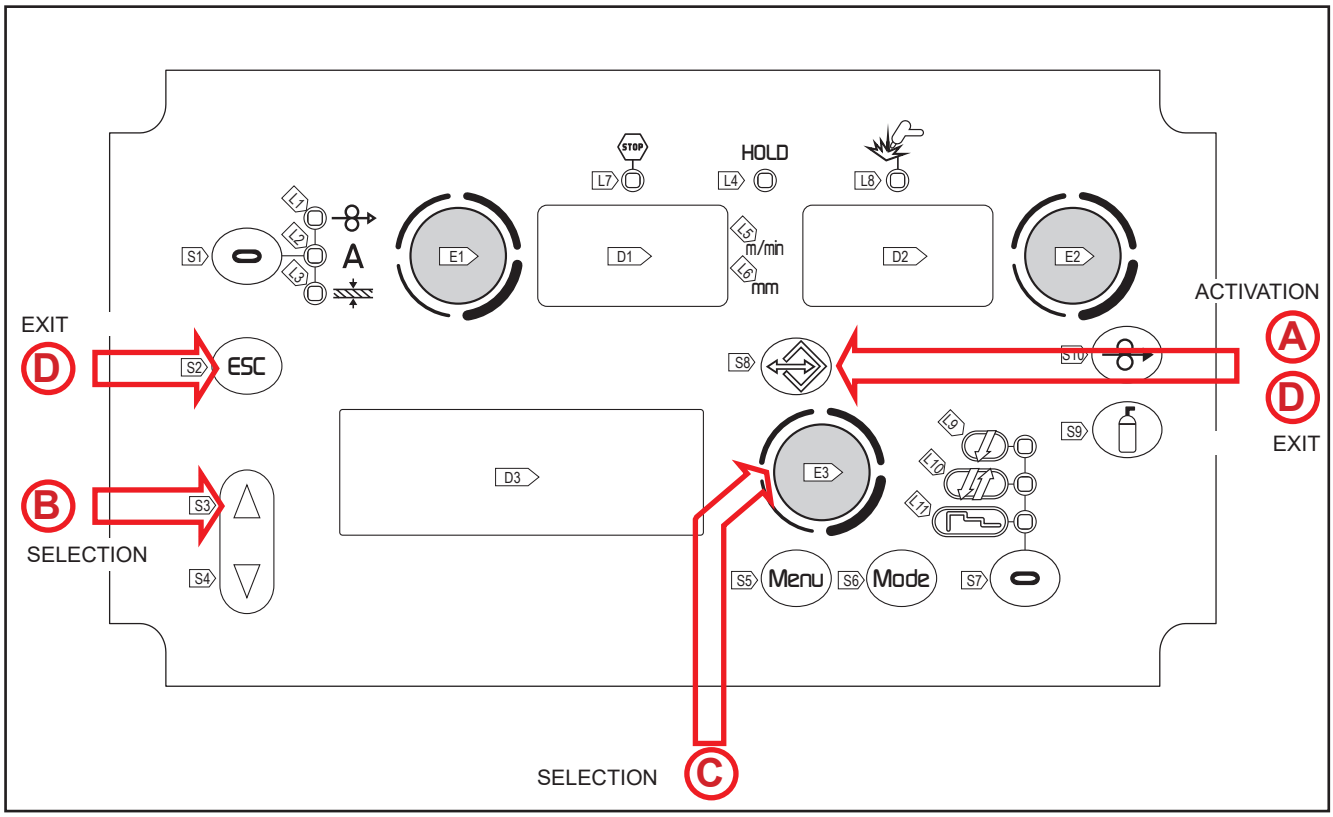
A	○ Insert the memory stick in the USB port. ○ Hold down button **S8** to activate the job menu. ➲ The job menu appears in display: **D3**.
B	○ Press buttons **S3** △ and **S4** ▽ to select parameter **OPT**. ➲ The selected parameter is shown by symbol " ➔ ".
C	○ Use the **encoder E3**, to select the **USB EXPORT** function. ➲ When there are no saved jobs the following message appears on the bottom line: **NO JOB**
D	**Exit without confirmation** ○ Press the **S2** ESC button. ➲ This action will automatically close the menu **Exit with confirmation** ○ Press the **S8** button.

Tab.19. - JOB exporting operation messages

MESSAGE	MEANING	CHECKS
USB DEVICE NOT FOUND	USB device not found	- incorrectly inserted memory stick - memory stick removed before completing the operation.
EXPORT FAILED	- memory stick removed before completing the operation.	- USB not formatted as FAT32. - unidentifiable generic error: re-insert the memory stick and retry. - the connected USB drive is damaged.
EXPORT IN PROGRESS	The JOBs saved on the panel are being exported	

MESSAGE	MEANING	CHECKS
EXPORT COMPLETE	Exporting procedure completed	

11.7 IMPORTING A JOB



A	○ Insert the memory stick in the USB port. ○ Hold down button **S8** to activate the job menu. ➲ The job menu appears in display: **D3**.
B	○ Press buttons **S3** △ and **S4** ▽ to select parameter **OPT**. ➲ The selected parameter is shown by symbol " ➔ ".
C	○ Use the **encoder E3**, to select the **USB IMPORT** function.
D	**Exit without confirmation** ○ Press the **S2** ESC button. ➲ This action will automatically close the menu **Exit with confirmation** ○ Press the **S8** button.

Tab.20. - JOB importing operation messages

MESSAGE	MEANING	CHECKS
USB DEVICE NOT FOUND	USB device not found	- incorrectly inserted memory stick - memory stick removed before completing the operation.
FILE NOT FOUND	File not found	- there are no JOBs loaded onto the USB memory stick.
IMPORT FAILED	Importing procedure failed.	- USB not formatted as FAT32. - unidentifiable generic error: re-insert the memory stick and retry. - the connected USB drive is damaged.
IMPORT IN PROGRESS	The JOBs saved on the USB memory stick are being imported	
IMPORT COMPLETE	Importing procedure completed	

11.8 SELECTING JOBS USING THE TORCH UP/DOWN BUTTONS

When an UP/DOWN torch is installed, JOBs can be selected in a JOB sequence using the buttons on the welding torch.
JOBs can be scrolled only when the welding operation is not being carried out.
During the welding operation (with an active JOB) the parameter values displayed can be temporarily changed with the UP/DOWN keys; at the end of the welding operation, the original values are restored.
When a DIGIMANAGER torch is installed the operations described above can be carried out, with the following differences:

- a job can be loaded directly from the torch
- jobs can be scrolled regardless of the sequence they belong to.

Sequence 1			JOB not saved	Sequence 2			JOB not saved	Sequence 3		
J.01	J.02	J.03		J.05	J.06	J.07		J.09	J.10	J.11

Select and upload one of the JOBs belonging to the desired sequence (e.g. J.06) through the power source user interface.
Use the torch buttons to scroll through the JOBs of sequence 2 (J.05, J.06, J.07).

12 TORCH TRIGGER MODES

12.1 2T MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) and keep the torch trigger pressed.

➲ The wire advances at the approach speed until making contact with the material. If the arc does not strike after 10 cm wire protrusion, wire feeding is locked and the welding unit outputs are de-energized.
The arc strikes and the wire feeder accelerates to the set feed rate value.

3. Release (2T) trigger to start the weld completion procedure.

➲ Gas flow continues for the time set in the post gas parameter (adjustable time).

12.2 2T SPOT MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) and keep the torch trigger pressed.

➲ The wire advances at the approach speed until making contact with the material. If the arc does not strike after 10 cm wire protrusion, wire feeding is locked and the welding unit outputs are de-energized.
The arc strikes and the wire feeder accelerates to the set feed rate value.
The welding procedure continues, at the preset current, for the time set with the spot time parameter.
The welding completion procedure starts.
The arc is extinguished.
Gas flow continues for the time set in the post gas parameter (adjustable time).

12.3 4T MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) and release (2T) the torch trigger.

➲ The wire advances at the approach speed until making contact with the material. If the arc does not strike after 10 cm wire protrusion, wire feeding is locked and the welding unit outputs are de-energized.
The arc strikes and the wire feeder accelerates to the set feed rate value.

3. Press (3T) the trigger to start the weld completion procedure.

➲ Gas flow continues until the torch trigger is released.

4. Release (4T) the torch trigger to start the post gas procedure (adjustable time).

12.4 4T B-LEVEL MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) and release (2T) the torch trigger.

➲ The wire advances at the approach speed until making contact with the material. If the arc does not strike after 10 cm wire protrusion, wire feeding is locked and the welding unit outputs are de-energized.
The arc strikes and the wire feeder accelerates to the set feed rate value.
During normal speed welding, press and immediately release the torch trigger to switch to the second welding current.

ⓘ The trigger must not be pressed for more than 0.3 seconds; otherwise, the weld completion stage will start.
When the trigger is pressed and released immediately, the system returns to the welding current.

3. Press (3T) trigger and keep it pressed to start the weld completion procedure.

- Gas flow continues until the torch trigger is released.

4. Release (4T) torch trigger to start the post gas procedure (adjustable time).

12.5 2T - 3 LEVEL MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) torch trigger.

- The wire advances at the approach speed until making contact with the material. If the arc does not strike after 10 cm wire protrusion, wire feeding is locked and the welding unit outputs are de-energized.
  The welding arc strikes and the wire feed rate changes to the first welding level (hot start), which is set as a percentage of the normal welding feed rate.

ⓘ This first level is used to create the weld pool: for example, when welding aluminium a value of 130 % is recommended.
The hot start level continues for the start time, which is settable in seconds; then switch to normal welding speed is performed in accordance with the start slope, which can be set in seconds.

3. Release (2 T) the torch trigger to switch to the third welding level (crater filler), which is set as a percentage of the normal welding feed rate.

ⓘ The switch of welding current level in terms of crater filling is performed in accordance with the crater slope, which can be set in seconds.
This third level is used to complete the weld and fill the final crater (crater filler) in the weld pool: for example, when welding aluminium a value of 80 % is recommended.

4. The crater filler level continues for the crater time, which is settable in seconds; at the end of this time welding is interrupted and the post gas stage is performed.

12.6 2T SPOT - 3 LEVEL MIG/MAG WELDING

The welding process is the same as the 2T - 3 LEVELS process, except that the welding procedure continues, at the preset current, for the time set with the spot time parameter.
The weld is closed in the same way as with the 2T - 3 LEVELS process.

12.7 4T - 3 LEVEL MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) torch trigger.

- The wire advances at the approach speed until making contact with the material. If the arc does not strike after 10 cm wire protrusion, wire feeding is locked and the welding unit outputs are de-energized.
  The welding arc strikes and the wire feed rate changes to the first welding level (hot start), which is set as a percentage of the normal welding feed rate.

ⓘ This first level is used to create the weld pool: for example, when welding aluminium a value of 130 % is recommended.

3. Release (2T) trigger to switch to normal welding speed; then switch to normal welding speed is performed in accordance with the start ramp, which can be set in seconds.
4. Press the torch trigger again (Level 3) to switch to the third welding level (crater filler), which is set as a percentage of the normal welding feed rate.

ⓘ The switch of welding current level in terms of crater filling is performed in accordance with the crater slope, which can be set in seconds.
This third level is used to complete the weld and fill the final crater (crater filler) in the weld pool: for example, when welding aluminium a value of 80 % is recommended.

5. Release the torch trigger a second time (4T) to close the weld and run the post gas procedure.

12.8 4T B-LEVEL - 3 LEVEL MIG/MAG WELDING

ⓘ The welding process is the same as the 4T - 3 LEVELS process except that during normal speed welding pressing and immediately releasing the torch trigger switches the unit to the second welding current.
The trigger must not be pressed for more than 0.3 seconds; otherwise, the weld completion stage will start.
When the trigger is pressed and released immediately, the system returns to the welding current.

1. Press (3T) trigger and keep it pressed to start the crater filler procedure.

ⓘ The weld is closed in the same way as with the 4T - 3 LEVELS process.

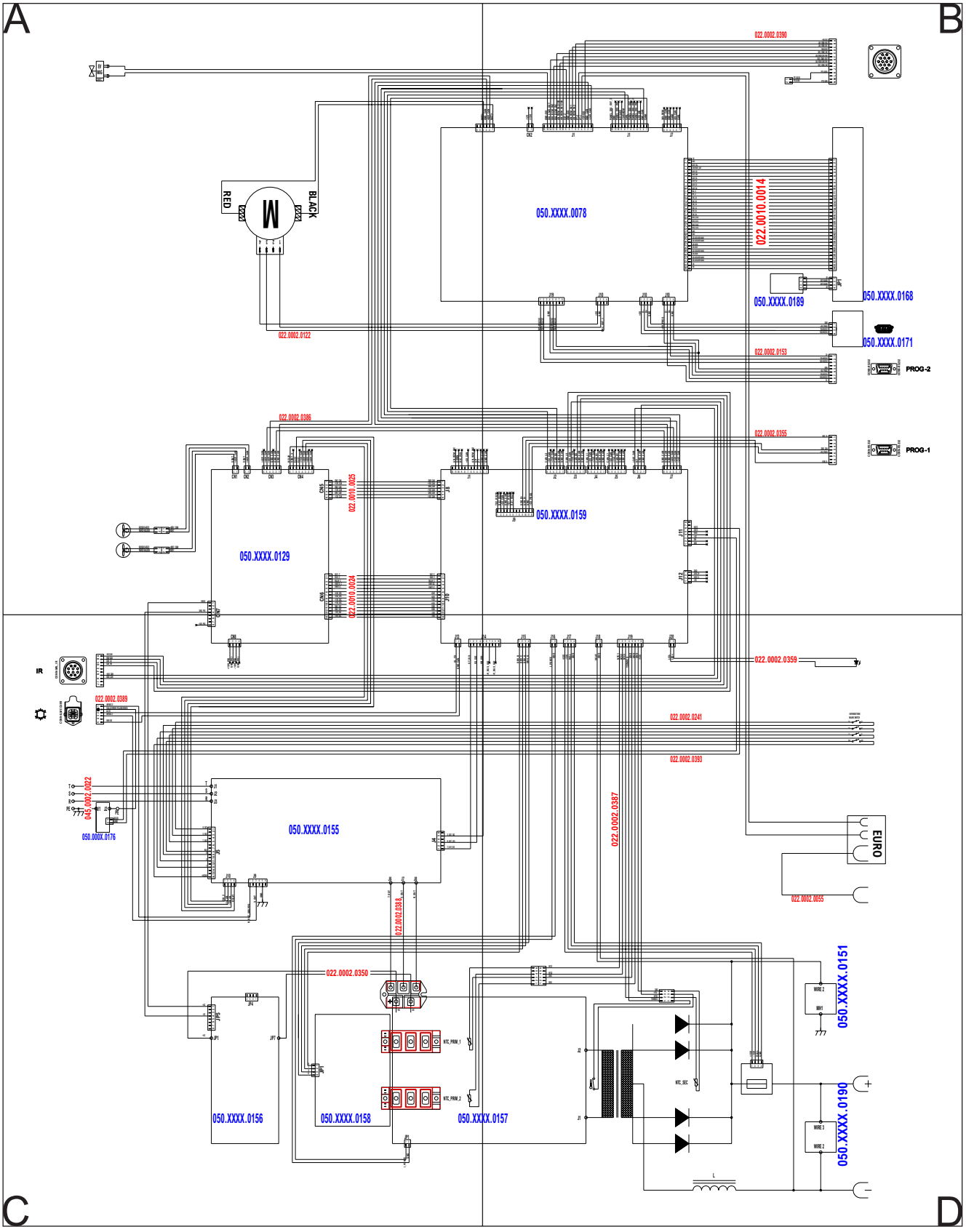
13 TECHNICAL DATA

Directives applied	Waste electrical and electronic equipment (WEEE)
	Electromagnetic compatibility (EMC)
	Low voltage (LVD)
	Restriction of the use of certain hazardous substances (RoHS)
Construction standards	EN 60974-5; EN 60974-10 Class A
Conformity markings	CE Equipment compliant with European directives in force
	S Equipment suitable in an environment with increased hazard of electric shock
	Equipment compliant with WEEE directive
	RoHS Equipment compliant with RoHS directive

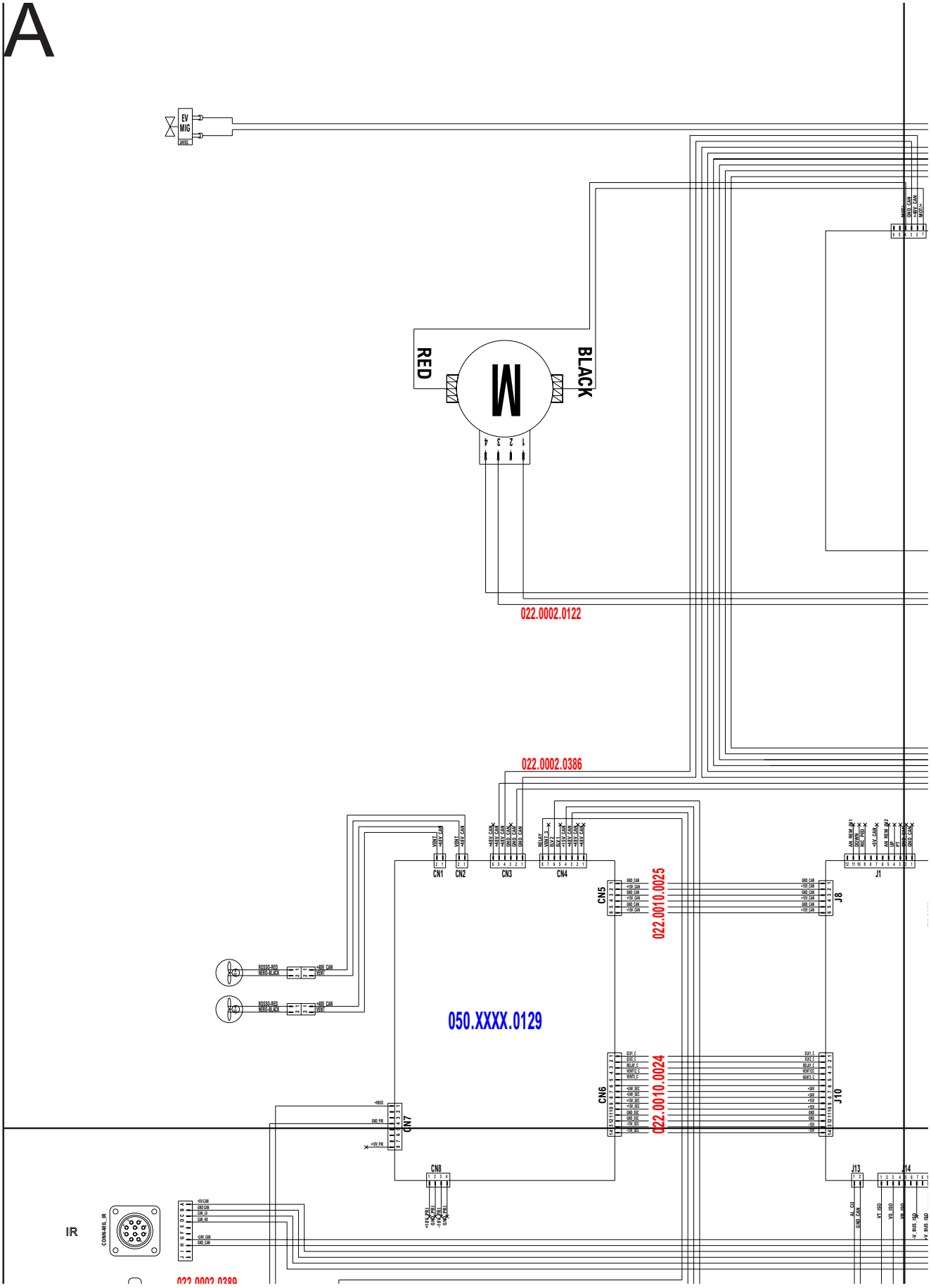
13.1 PIONEER 403 MKS / PIONEER PULSE 403 MKS

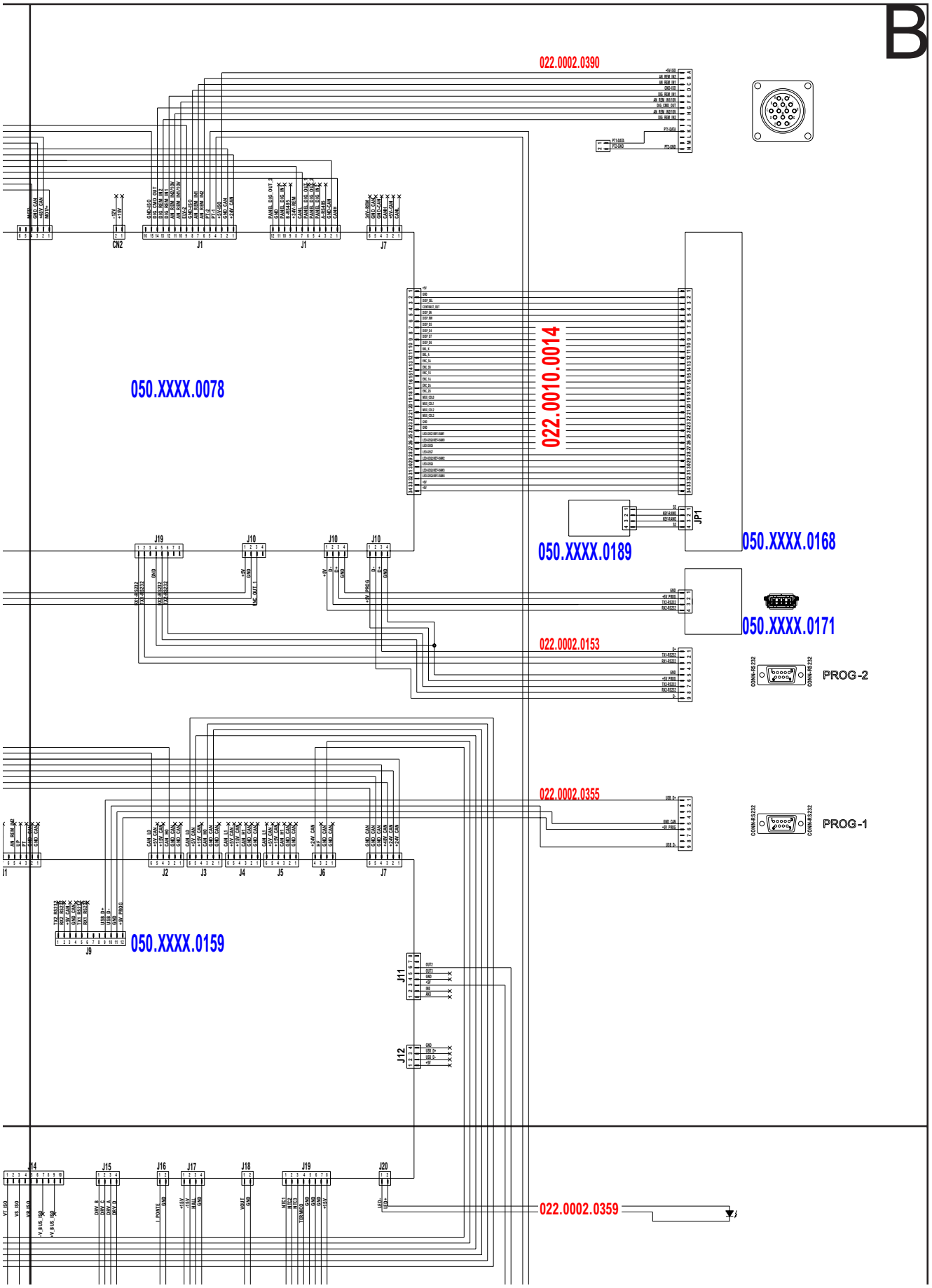
Supply voltage	3 x 400 Va.c. ± 15 % / 50-60 Hz			
Mains protection	25 A 500 V Delayed			
Zmax	This equipment complies with IEC 61000-3-12 provided that the maximum permissible system impedance is less than or equal to 21 mΩ at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with maximum permissible system impedance less than or equal to 21 mΩ.			
Dimensions (D x W x H)	700 x 300 x 570 (power source)			
Weight	90.4 kg (power source)			
Insulation class	H			
Protection rating	IP23			
Maximum gas pressure	0,5 MPa (5 bar)			
Motor speed	1.0-24.0 m/min			
Wire spool: (dimensions/weight)	200 mm / 5 kg – 300 mm / 15 kg			
Cooling	AF: Air-over cooling (fan assisted)			
Static characteristic	MMA  Falling characteristic			
	TIG  Falling characteristic			
	MIG/MAG  Flat characteristic			
Welding mode		MIG/MAG	TIG	MMA
Current and voltage adjustment range		10 A / 14.5 V 400 A / 34.0 V	10 A / 10.4 V 400 A / 26.0 V	10 A / 20.4 V 400 A / 36.0 V
Welding current / Working voltage	40% (40° C)	400 A / 34.0 V	400 A / 26.0 V	400 A / 36.0 V
	60% (40° C)	350 A / 31.5 V	350 A / 24.0 V	350 A / 34.0 V
	100% (40° C)	320 A / 30.0 V	320 A / 22.8 V	320 A / 32.8 V
Maximum input power	40% (40° C)	18.3 kVA - 15.5 kW	14.4 kVA - 12.1 kW	18.9 kVA - 16.3 kW
	60% (40° C)	15.3 kVA - 12.7 kW	12.2 kVA - 9.9 kW	16.2 kVA - 13.6 kW
	100 % (40° C)	13.6 kVA - 11.1 kW	11.0 kVA - 8.7 kW	14.7 kVA - 12.0 kW
Maximum supply current	40% (40° C)	26.4 A	20.8 A	27.3 A
	60% (40° C)	22.1 A	17.7 A	23.3 A
	100 % (40° C)	19.6 A	15.9 A	21.1 A
Maximum Effective Supply Current	40% (40° C)	16.7 A	13.2 A	17.3 A
	60% (40° C)	17.1 A	13.7 A	18.0 A
	100 % (40° C)	19.6 A	15.9 A	21.1 A
No-load voltage (U0)	62V			
Reduced no-load voltage (Ur)	10V			
Power source efficiency	Efficiency (400A / 36,0V): 87,4%			
	No-Load condition power consumption (U1= 400 Va.c.): 26 W			
Essential raw materials	According to the information provided by our suppliers, this product does not contain essential raw materials in quantities greater than 1g per component.			

14 WIRING DIAGRAM



A


EV MIG
RED
BLACK
M
1 2 3 4
022.0002.0122
022.0002.0386
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
J1
J8
J10
J13
J14
022.0010.0025
022.0010.0024
050.XXXX.0129
IR


B
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PROG-1
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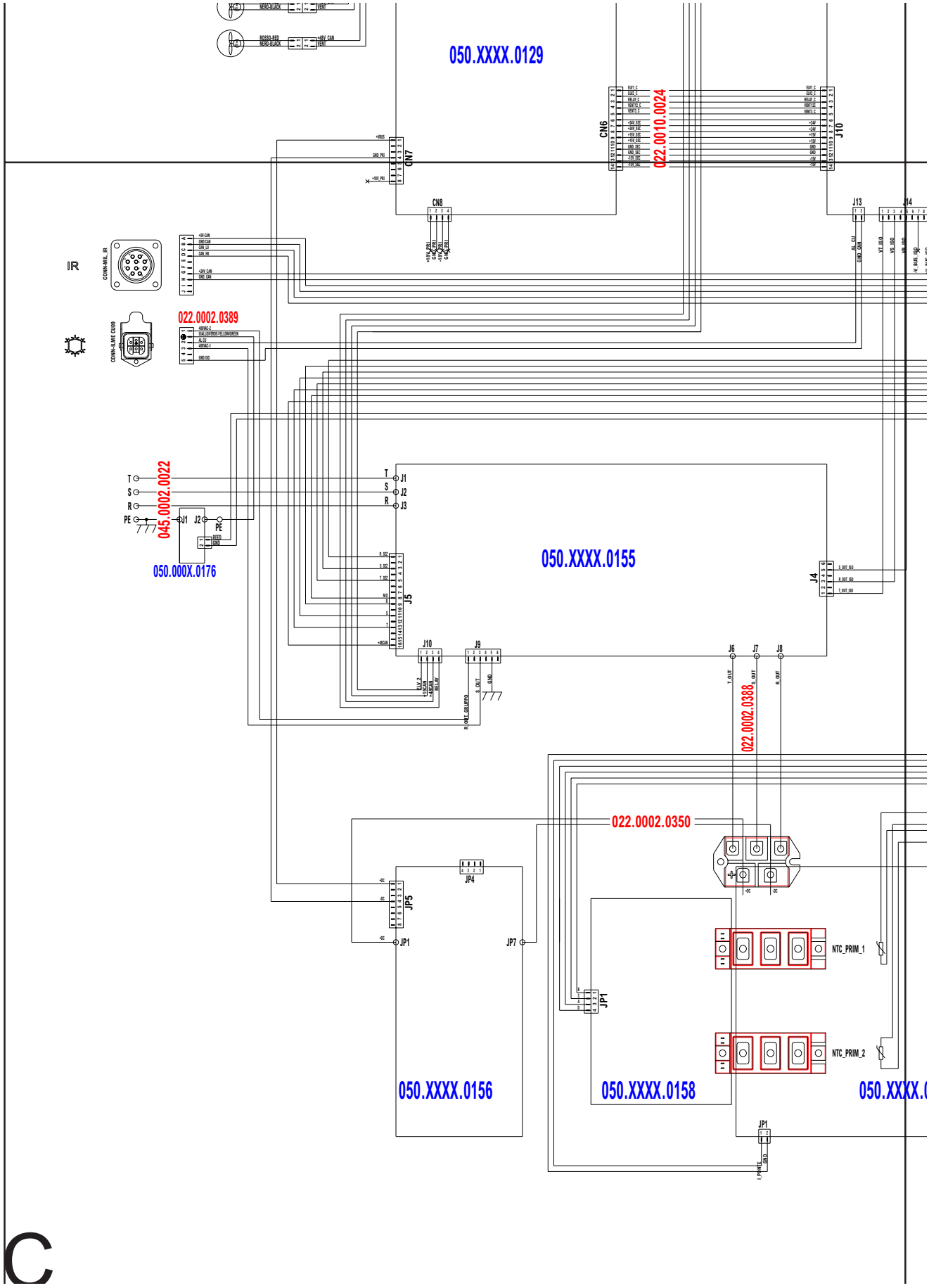
022.0002.0359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CN6
J10
CN7
CN6
J13
J14
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CONN-MIL_IR
CONN-LAKE D309
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T
S
R
PE
045.0002.0022
J1
J2
PE
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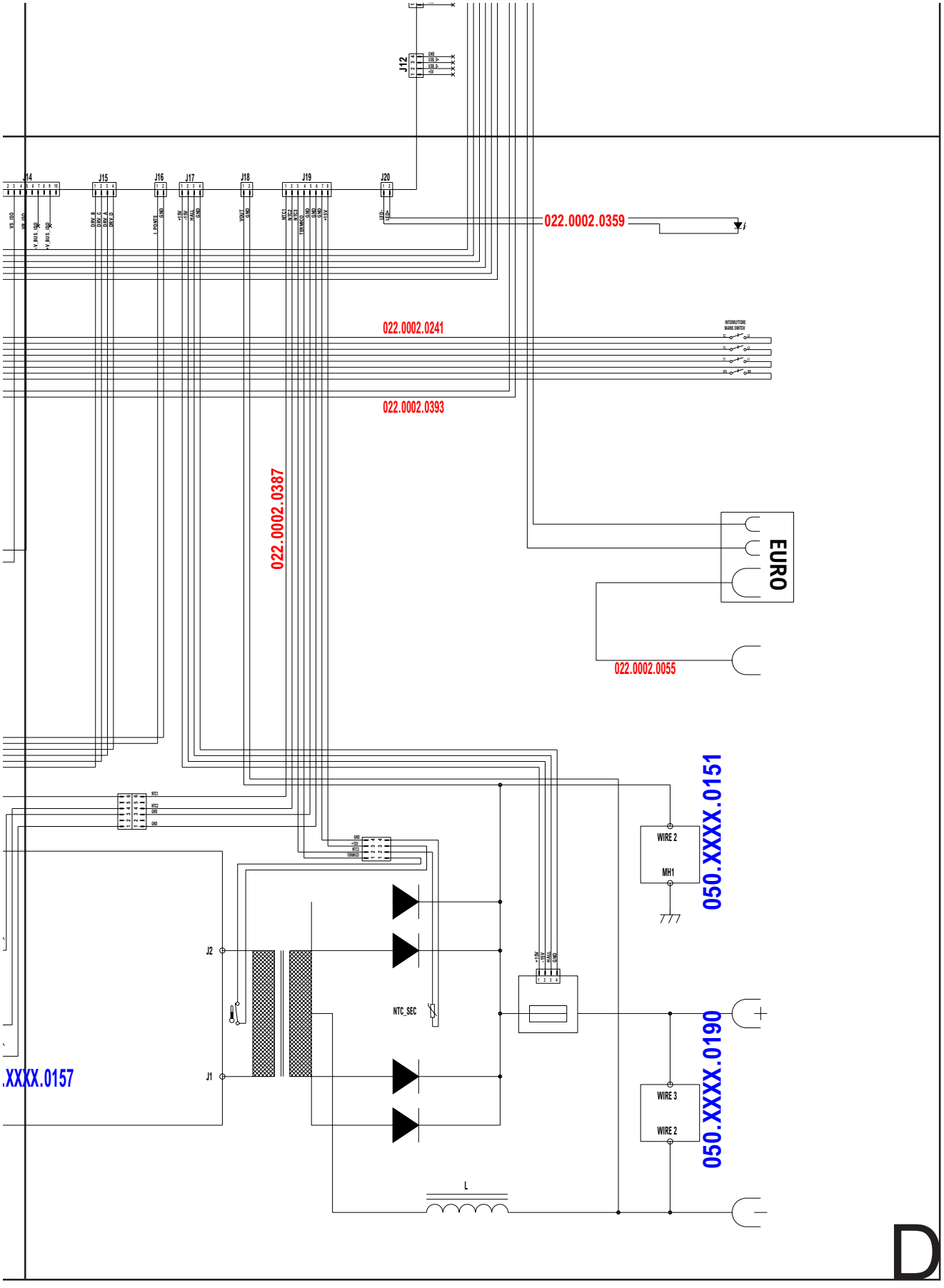
050.XXXX.0155
J1
J2
J3
J5
J4
J10
J9
J6
J7
J8
T_OUT
S_OUT
R_OUT
022.0002.0388
022.0002.0350
JP4
JP5
JP1
JP7
JP1
NTC_PRIM_1
NTC_PRIM_2
050.XXXX.0156
050.XXXX.0158
050.XXXX.(
JP1
C


J12
J14
J15
J16
J17
J18
J19
J20
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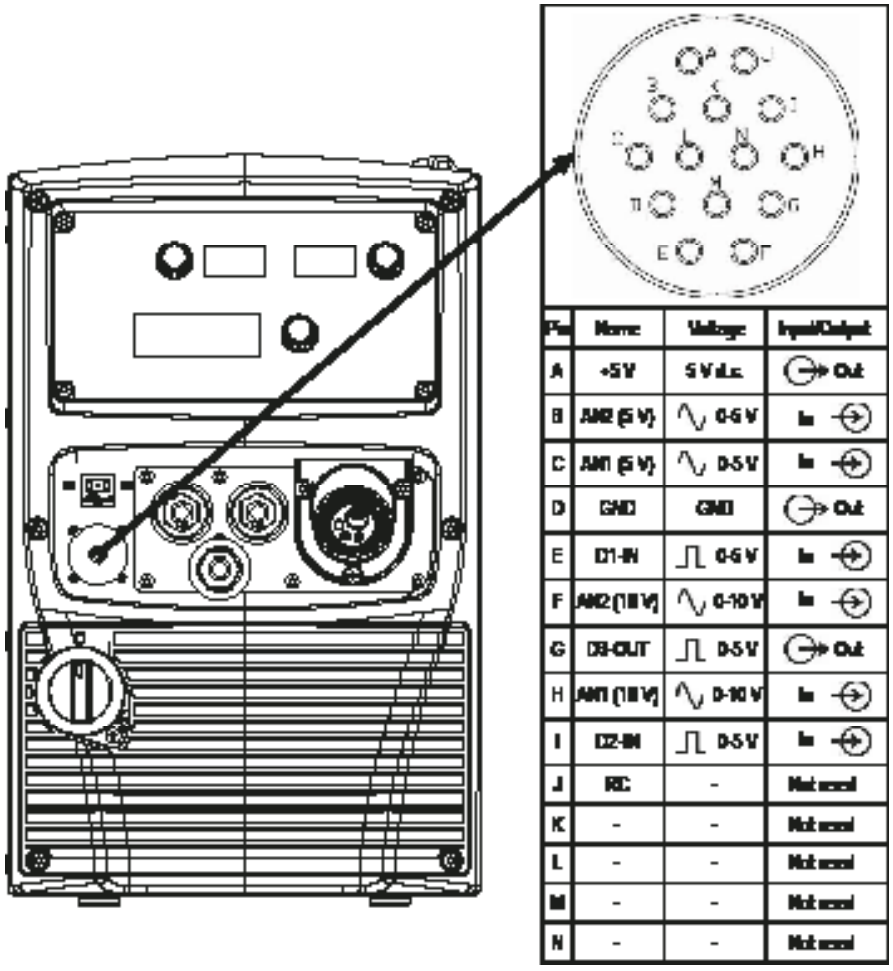
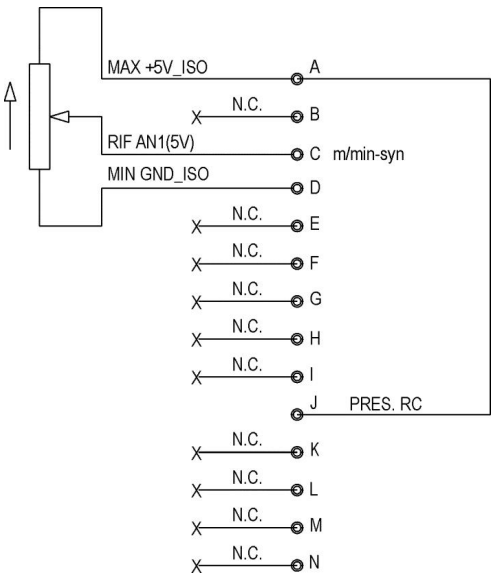
022.0002.0241
022.0002.0393
022.0002.0387
EURO
022.0002.0055
050.XXXX.0151
WIRE 2
MH1
J2
NTC_SEC
J1
.XXXX.0157
050.XXXX.0190
WIRE 3
WIRE 2
L
D

14.1 REMOTE CONTROL CONNECTOR



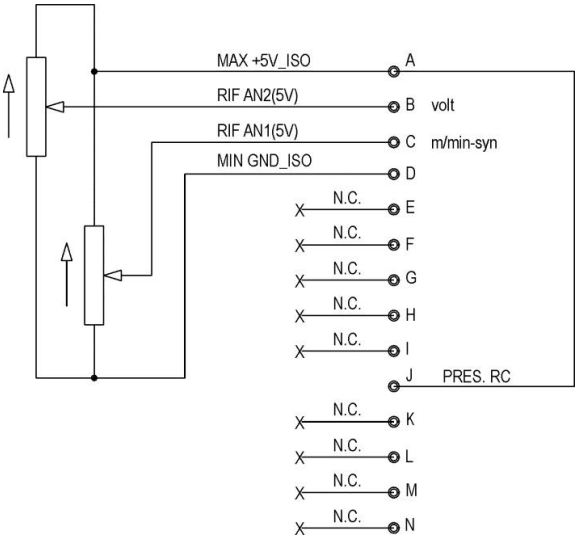
Pin	Name	Voltage	Input/Output
A	+5V	5 V d.c.	Out
B	AN2 (5 V)	0-5 V	In
C	AN1 (5 V)	0-5 V	In
D	GND	GND	Out
E	DI1-IN	0-5 V	In
F	AN2 (10 V)	0-10 V	In
G	DI3-OUT	0-5 V	Out
H	AN1 (10 V)	0-10 V	In
I	DI2-IN	0-5 V	In
J	RC	-	Not used
K	-	-	Not used
L	-	-	Not used
M	-	-	Not used
N	-	-	Not used

14.1.1 RC03: Wiring diagram



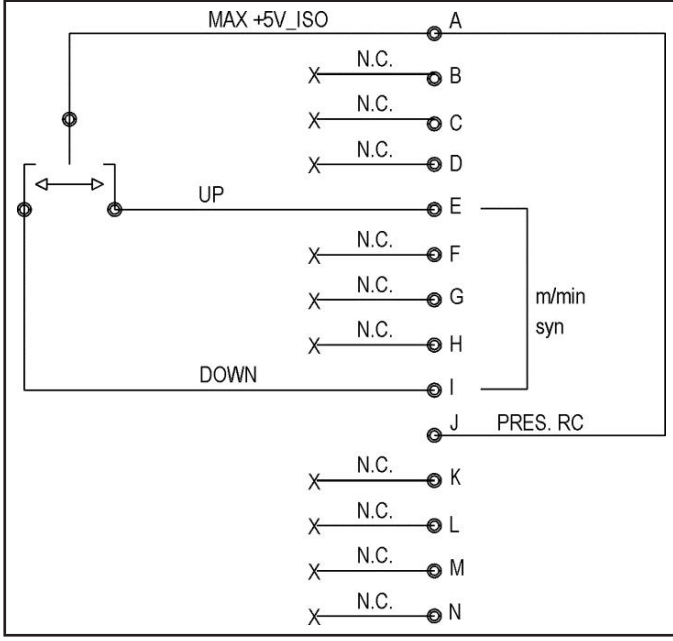
10 kOhm - 100 kOhm potentiometer

14.1.2 RC04: Wiring diagram

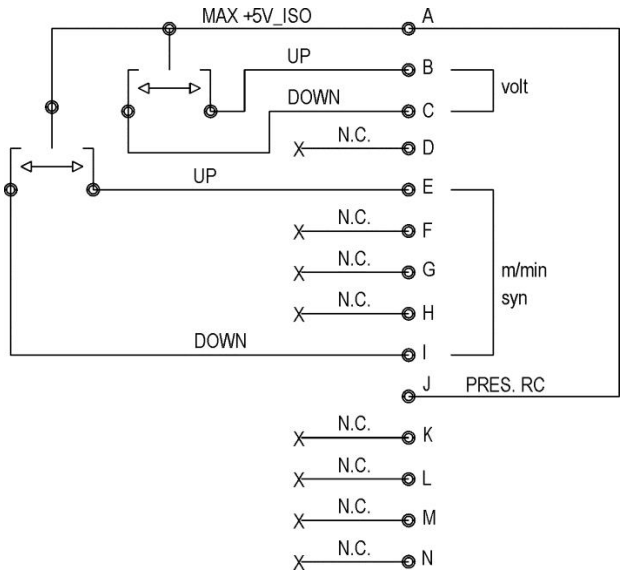


10 kOhm - 100 kOhm potentiometer

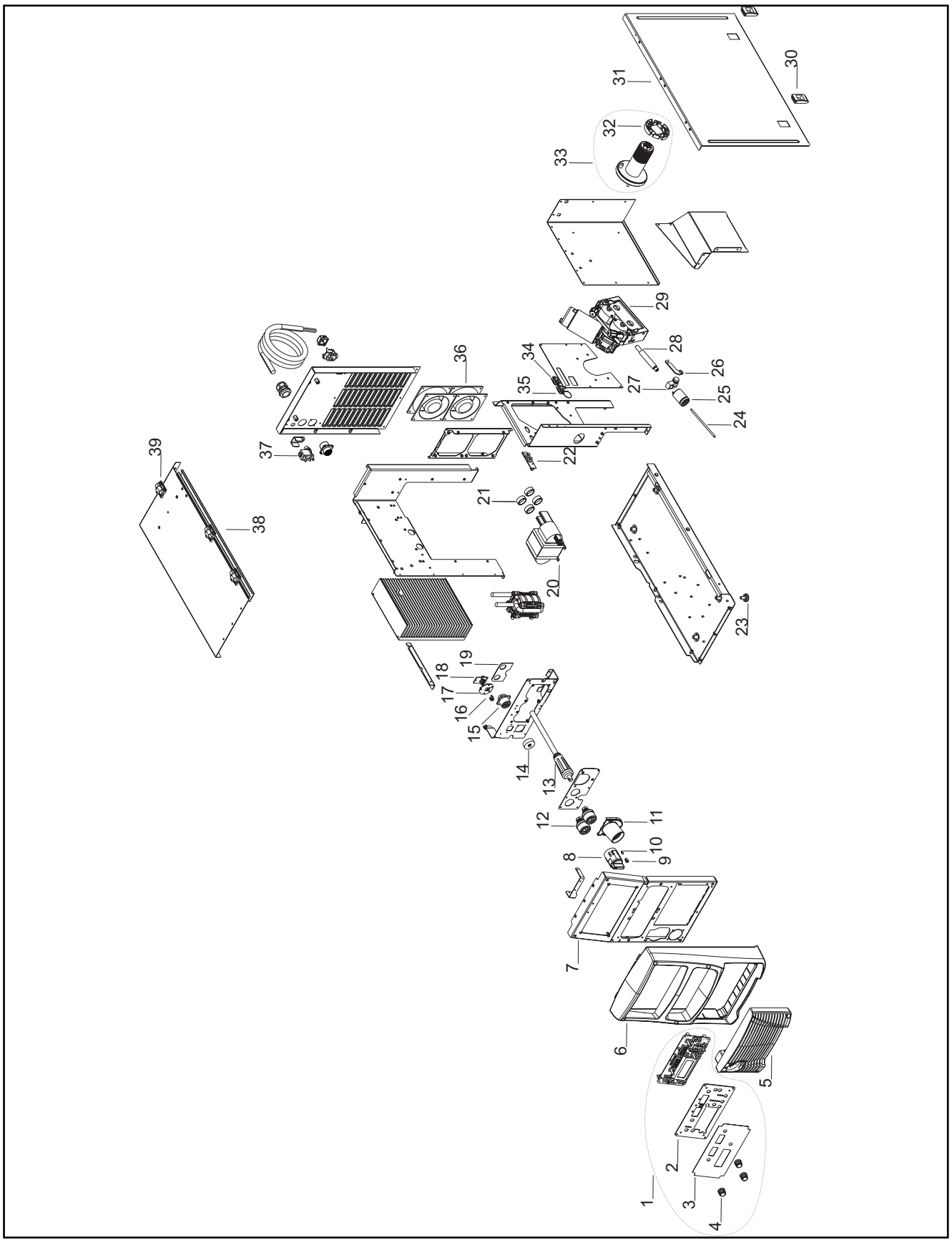
14.1.3 RC05: Wiring diagram



14.1.4 RC06: Wiring diagram



15 SPARES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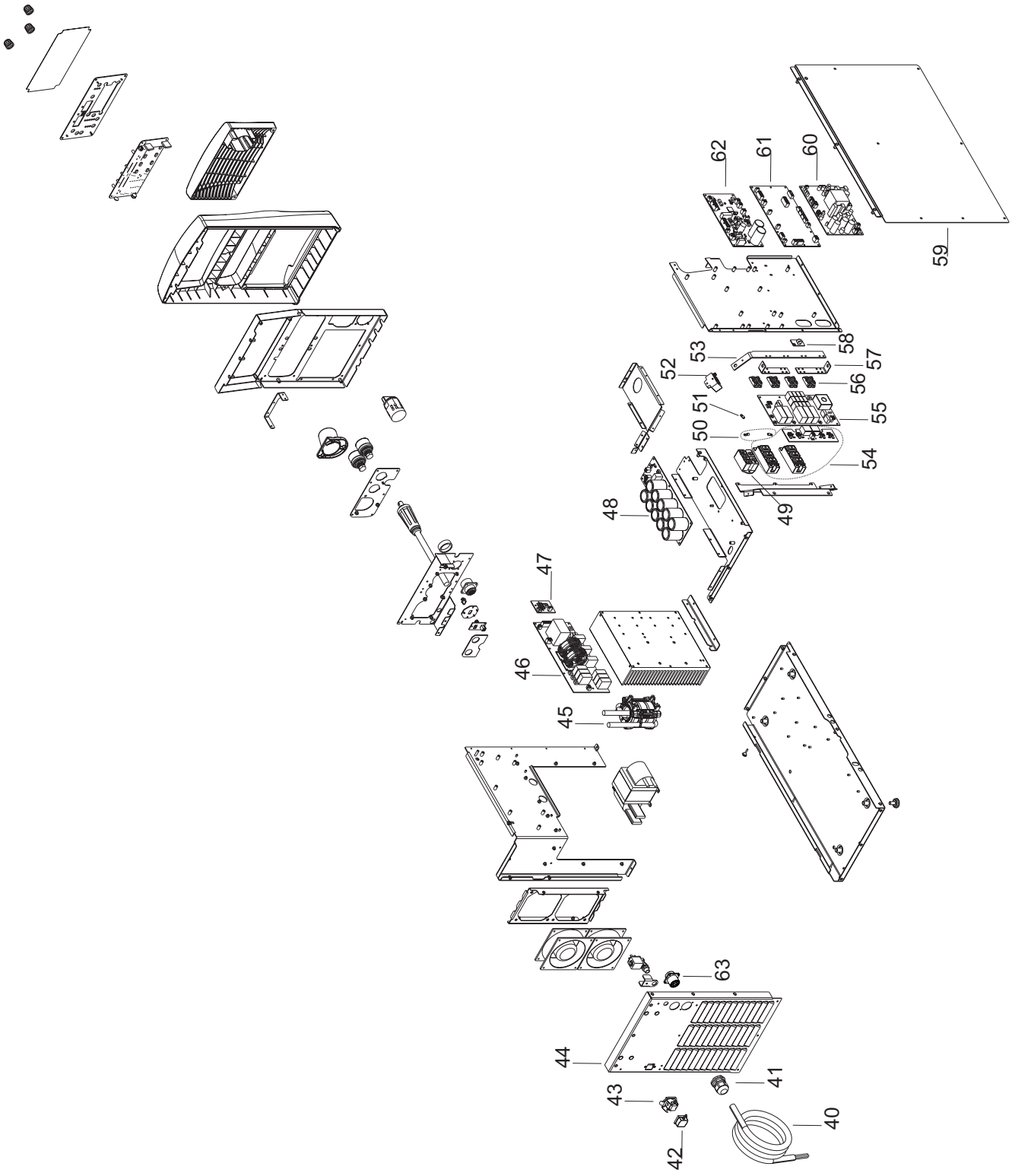
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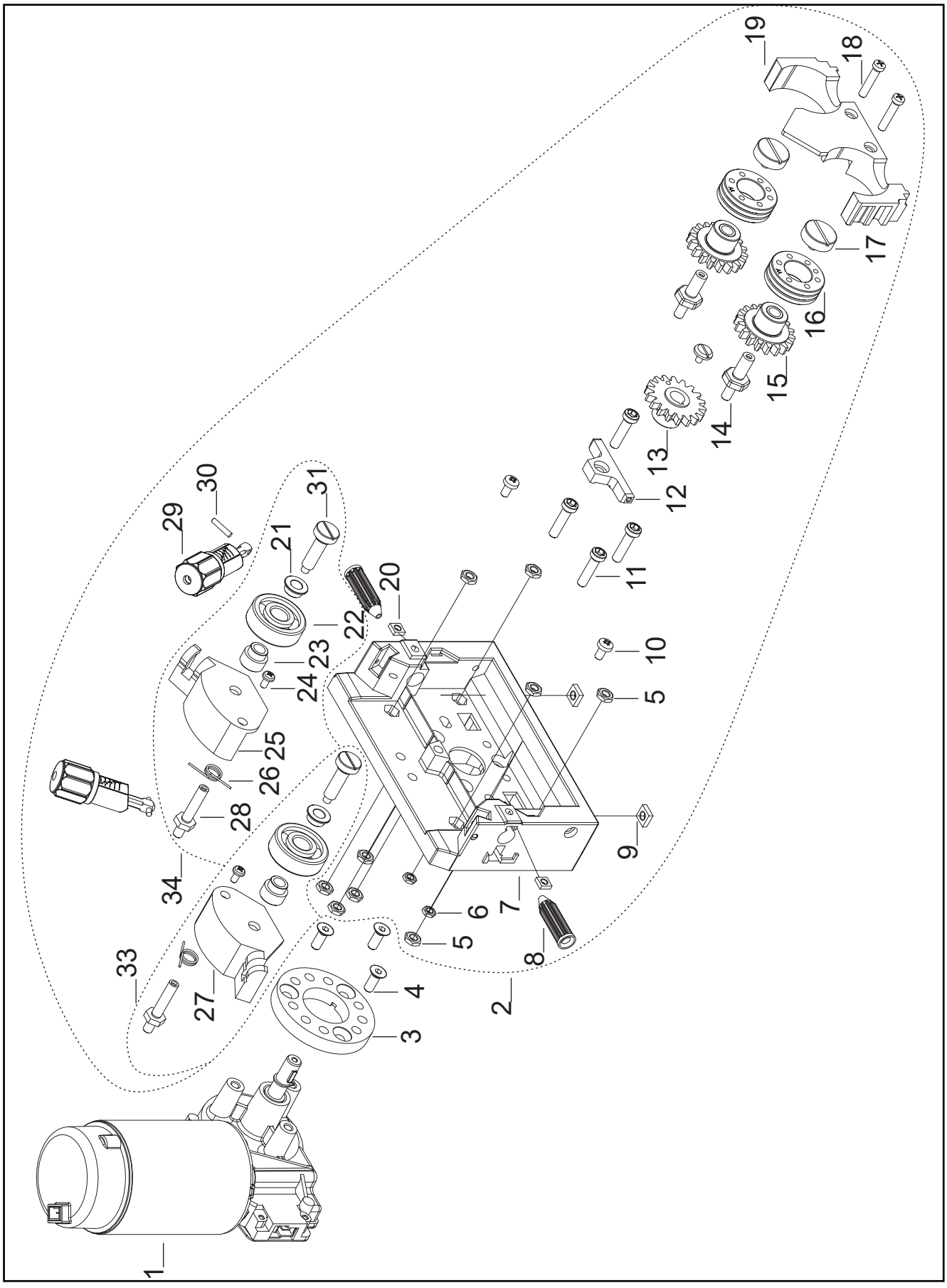
No.	CODE	DESCRIPTION
1	050.5184.0000	COMPLETE FRONT PANEL (403 MKS)
2	013.0000.8042	FRONTAL PANEL PLATE
3	013.0018.1501	FRONT PANEL LABEL (403 MKS)
4	014.0002.0002	KNOB
5	012.0007.0020	PLASTIC LOUVRE
6	012.0007.0010	FRONT PLASTIC
7	011.0013.0021	FRONT PLATE
8	040.0001.0016	FOUR-POLE SWITCH
9	016.4107.0001	LED HOLDER
10	022.0002.0359	LED WIRING
11	012.0019.0010	PLASTIC HOUSING
12	021.0001.0259	OUTPUT SOCKET
13	022.0002.0055	MOVABLE PLUG
14	021.0004.2994	TAPPO PER CONNETTORE MS-20
15	022.0002.0390	RS-232 WIRING
16	021.0015.0002	USB(A) CAP
17	011.0014.0076	USB PLATE
18	050.0001.0171	USB(A) BOARD
19	050.0001.0190	OUTPUT VOLTAGE BOARD
20	042.0003.0052	POWER TRANSFORMER
21	043.0002.0676	VAC TOROID
22	050.0001.0189	KEY BOARD
23	016.0009.0003	RUBBER FOOT
24	021.0001.2022	CAPILLARY TUBE
25	021.0001.2000	COUPLING EURO
26	011.0002.0041	WIRE FEED MOTOR-STING BLOCK BRACKET
27	021.0001.2010	CURRENT CLAMP FOR BRASS GUIDE FOR EURO CONNECTOR
28	021.0001.2017	STING
29	002.0000.0025	WIRE FEEDER
30	011.0006.0002	SLIDE CLOSURE
31	011.0000.1181	RIGHT COVER
32	002.0000.0287	CAP FOR SPOOL HOLDER
33	011.0006.0062	COMPLETE SPOOL SUPPORT
34	022.0002.0153	RS-232 WIRING (1)
35	022.0002.0355	RS-232 WIRING (2)
36	003.0002.0020	FAN
37	017.0001.5542	SOLENOID VALVE
38	011.0013.0211	UPPER COVER
39	011.0006.0007	PLASTIC HINGE
40	045.0002.0022	SUPPLY CABLE
41	045.0000.0017	CABLE CLAMP
42	021.0013.0007	ILME CONNECTOR CAP
43	022.0002.0389	CU SUPPLY CABLE
44	011.0013.0210	REAR PLATE
45	044.0004.0029	OUTPUT INDUCTOR
46	050.0001.0155	MAINS FILTER BOARD

No.	CODE	DESCRIPTION
47	050.0001.0176	REED SENSOR BOARD
48	050.0001.0156	ELECTROLYTIC CAPACITOR BOARD
49	032.0001.8216	THREE PHASE RECTIFIER BRIDGE
50	040.0003.1011	THERMAL CUT-OUT 2x NTC 10K
51	040.0003.1012	THERMAL CUT-OUT NTC 10K
52	041.0004.0502	HALL EFFECT SENSOR
53	045.0006.0122	OUTPUT BRACKET
54	050.0001.0158	DRIVER BOARD
55	050.0001.0157	PRIMARY BOARD
56	032.0002.2403	ISOTOP DIODE
57	045.0006.0114	DIODES-TRANSFORMER COPPER BRACKET
58	050.0002.0151	EMI CAPACITORS BOARD
59	011.0000.1171	LEFT COVER
60	050.0008.0129	SUPPLIES BOARD
61	050.0008.0159	CONTROL BOARD (403MKS)
	050.0009.0159	CONTROL BOARD (403MKS PULSE)
62	050.0032.0078	MOTOR BOARD
63	022.0002.0404	CABL. REMOTE 403/503 ROBOT

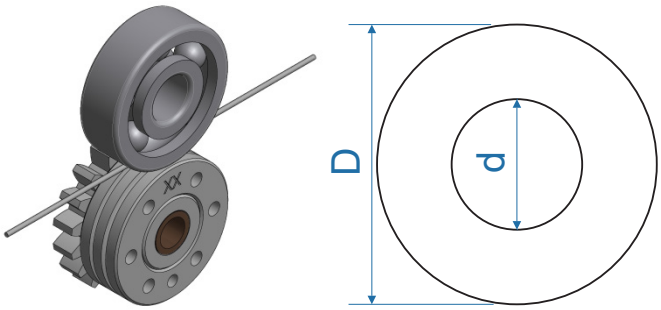
15.1 WIRE FEEDER MOTOR

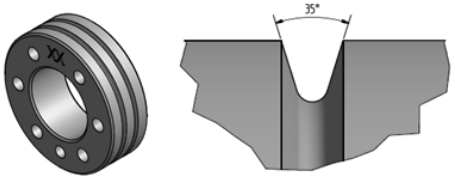
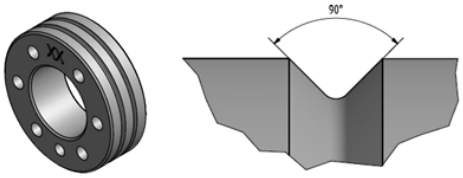
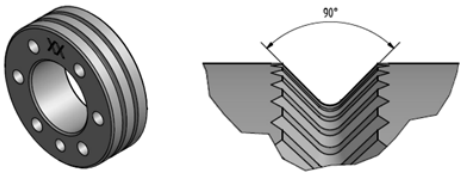


N°	CODE	DESCRIPTION
1	002.0000.0254	MOTOR COIL
2	002.0000.0062	COMPLETE WIRE FEEDER
3	002.0000.0391	SPACER RING
4	016.0300.0411	COUNTERSUNK SCREW M6x12
5	002.0000.0349	M6 HEXAGONAL NUT
6	002.0000.0384	M5 HEXAGONAL NUT
7	002.0000.0373	FEED PLATE
8	002.0000.0297	INLET GUIDE WITH SOFT LINER
9	002.0000.0385	M6 SQUARE NUT
10	002.0000.0324	SCREW M5x10
11	002.0000.0387	SCREW M6x25
12	002.0000.0294	INTERMEDIATE GUIDE
13	002.0000.0300	MAIN GEAR DRIVE
14	002.0000.0374	SHAFT
15	002.0000.0299	GEAR ADAPTOR FEED ROLL (BRONZE BUSHING)
	002.0000.0309	GEAR ADAPTOR FEED ROLL (BALL BEARING)
16	002.0000.0142	FEED ROLL
17	002.0000.0383	RETAINING SCREW M4
18	002.0000.0382	SCREW M5x30
19	002.0000.0388	INTERNAL PROTECTION
20	002.0000.0386	M5 SQUARE NUT
21	002.0000.0315	DISTANCE RING 1
22	002.0000.0303	SMOOTH DRIVE ROLL
23	002.0000.0314	DISTANCE RING 2
24	002.0000.0318	SCREW M4x8
25	002.0000.0379	RIGHT PRESSURE ARM
26	002.0000.0317	SPRING
27	002.0000.0378	LEFT PRESSURE ARM
28	002.0000.0375	JOINT AXLE
29	002.0000.0381	COMPLETE PRESSURE DEVICE
30	002.0000.0319	PIN
31	002.0000.0380	PRESSURE ROLL AXLE
32	002.0000.0304	SCREW M4x10
33	002.0000.0376	COMPLETE LEFT PRESSURE ARM
34	002.0000.0377	COMPLETE RIGHT PRESSURE ARM

15.2 WIRE FEEDER ROLLS

Standard

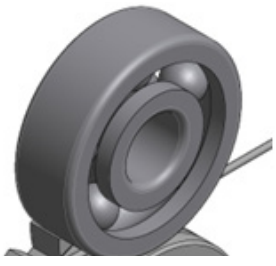


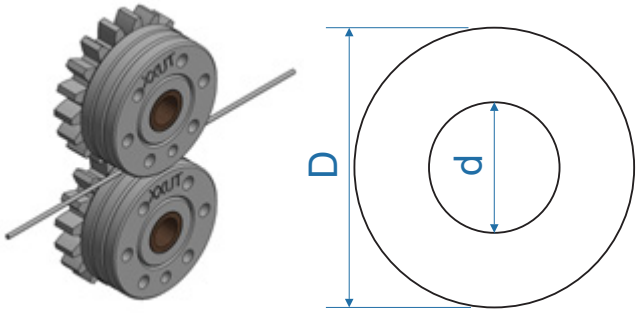
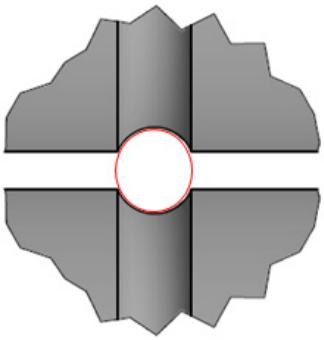
CODE	Ø WIRE	TYPE	Ø ROLL	GROOVE	
002.0000.0140	0.6-0.8	V groove Solid wire	D=37x12/d=19 V	35° V	
002.0000.0141	0.8-1.0				
002.0000.0142	1.0-1.2				
002.0000.0143	1.2-1.6				
002.0000.0144	0.6-0.8	U shape Aluminium wire	D=37x12/d=19 U	90° V	
002.0000.0145	1.0-1.2				
002.0000.0146	1.2-1.6				
002.0000.0147	1.6-2.0				
002.0000.0148	2.4-3.2				
002.0000.0149	1.0-1.2	VK shape	D=37x12/d=19 VK	90° V	
002.0000.0150	1.2-1.6				
002.0000.0151	2.4-3.2				

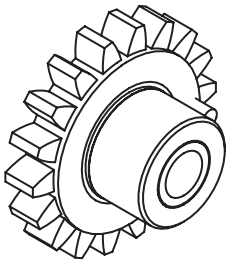
Arm with standard roll

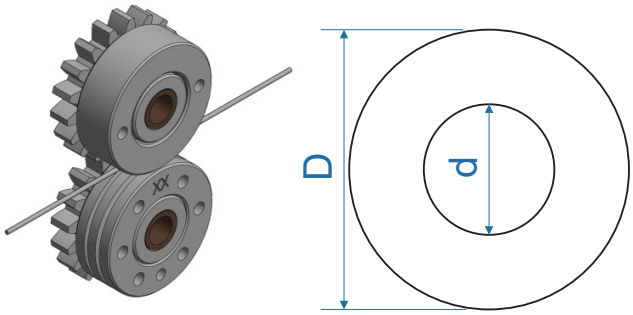
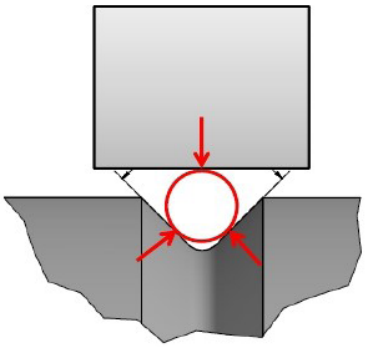
Smooth

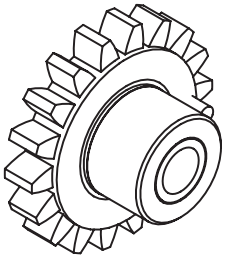
CODE	Ø ROLL
002.0000.0303	D=37x12/d=12 Smooth standard

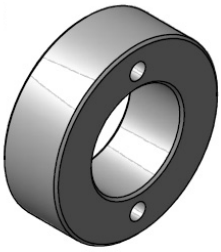
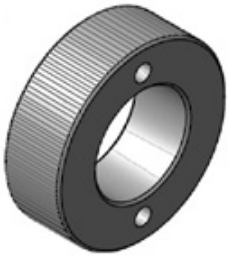


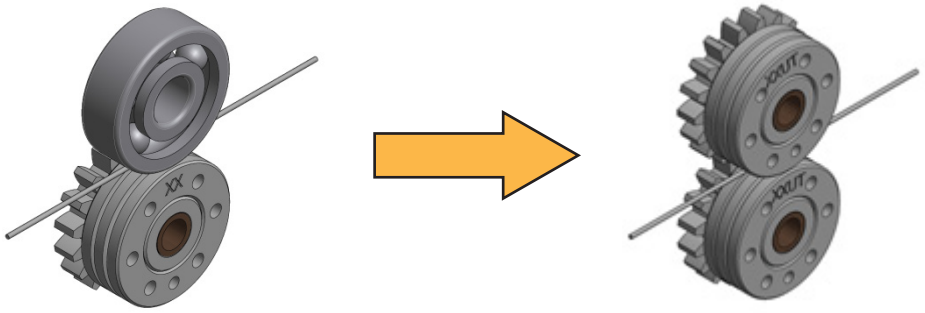
Double driving roll (4 roll with groove) - RECOMMENDED CONFIGURATION			
			
CODE	**Ø WIRE**	**Ø ROLL**	
002.0000.0168	1.0-1.2	D=37x12/d=19 U DOUBLE D.	 
002.0000.0169	1.2-1.6	D=37x12/d=19 U DOUBLE D.	
002.0000.0171	1.0-1.2	D=37x12/d=19 UT TEFLON.	
002.0000.0172	1.2-1.6	D=37x12/d=19 UT TEFLON	

GEAR ADAPTOR FEED ROLL	
	
002.0000.0299	GEAR ADAPTOR FEED ROLL (BRONZE BUSHING)
002.0000.0309	GEAR ADAPTOR FEED ROLL (BALL BEARING)

Double driving roll (2 roll with groove + 2 flat roll)			
			
CODE	**Ø WIRE**	**Ø ROLL**	
002.0000.0168	1.0-1.2	D=37x12/d=19 U DOUBLE D.	
002.0000.0169	1.2-1.6	D=37x12/d=19 U DOUBLE D.	
002.0000.0171	1.0-1.2	D=37x12/d=19 UT TEFLON.	
002.0000.0172	1.2-1.6	D=37x12/d=19 UT TEFLON	

GEAR ADAPTOR FEED ROLL	
	
002.0000.0299	GEAR ADAPTOR FEED ROLL (BRONZE BUSHING)
002.0000.0309	GEAR ADAPTOR FEED ROLL (BALL BEARING)

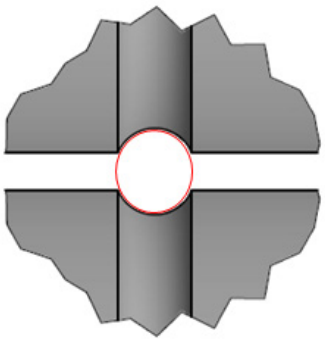
Arm with double driving roll			
Smooth		**Knurled**	
CODE	**Ø ROLL**	**CODE**	**Ø ROLL**
002.0000.0152	D=37x12/d=19 SMOOTH double driving	002.0000.0153	D=37x12/d=19 KNURLED double driving
			

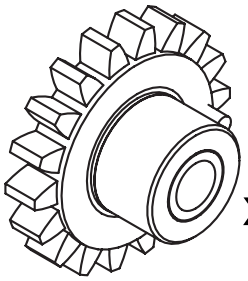
Transformation KIT from STANDARD wire feeder to Double driving roll wire feeder	
Standard	Double driving roll
	

If you want to change the configuration ot the STANDARD wire feeder to DOUBLE DRIVE ROLL configuration, you need to order the following items:

N° 4 Special rolls “U DOUBLE D” (see Part. A)

N° 2 Gear adaptor feed rolls (see Part. B) [it is recommended with bronze bushing]

CODE	Ø WIRE	Ø ROLL	
002.0000.0168	1.0-1.2	D=37x12/d=19 U DOUBLE D.	A  x 4 
002.0000.0169	1.2-1.6	D=37x12/d=19 U DOUBLE D.	

GEAR ADAPTOR FEED ROLL for Double driving roll		
002.0000.0299	GEAR ADAPTOR FEED ROLL (BRONZE BUSHING)	B  x 2
002.0000.0309	GEAR ADAPTOR FEED ROLL (BALL BEARING)	

Cod. 006.0001.2230
22/07/2022 V.1.1

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