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WELD THE WORLD

Micro Pulse 302 MFK





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1 INTRODUCTION

INTRODUCTION



IMPORTANT!

This handbook must be consigned to the user prior to installation and commissioning of the unit.

Read the "General prescriptions for use" handbook supplied separately from this handbook before installing and commissioning the unit.

The meaning of the symbols in this manual and the associated precautionary information are given in the "General prescriptions for use".

If the "General prescriptions for use" are not present, it is mandatory to request a replacement copy from the manufacturer or from your dealer.

Retain these documents for future consultation.

KEY



DANGER!

This pictogram warns of danger of death or serious injury.



WARNING!

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



CAUTION!

This pictogram warns of a potentially hazardous situation.



INFORMATION

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

- ☞ This symbol identifies an action that occurs automatically as a result of a previous action.
- ⓘ This symbol identifies additional information or a reference to a different section of the manual containing the associated information.
- § This symbol identifies a reference to a chapter of the manual.

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.

Micro Pulse 302 MFK is a compact and rugged three-phase, synergic inverter power source for MIG/MAG, MMA and TIG Lift welding. Easy to transport, only 24 kg, it is the best option for maintenance and repair on field, shipyard and off-shore operations. Polarity change allows welding with self shielded wires. 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. A perfect wire feeding is guaranteed thanks to a 4-rolls motor drive included in Micro Pulse 302 MFK.

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

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

Accessories that can be connected to the unit:

- Manual remote controller for remote adjustment of the welding current.

2 INSTALLATION


DANGER!
Lifting and positioning

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



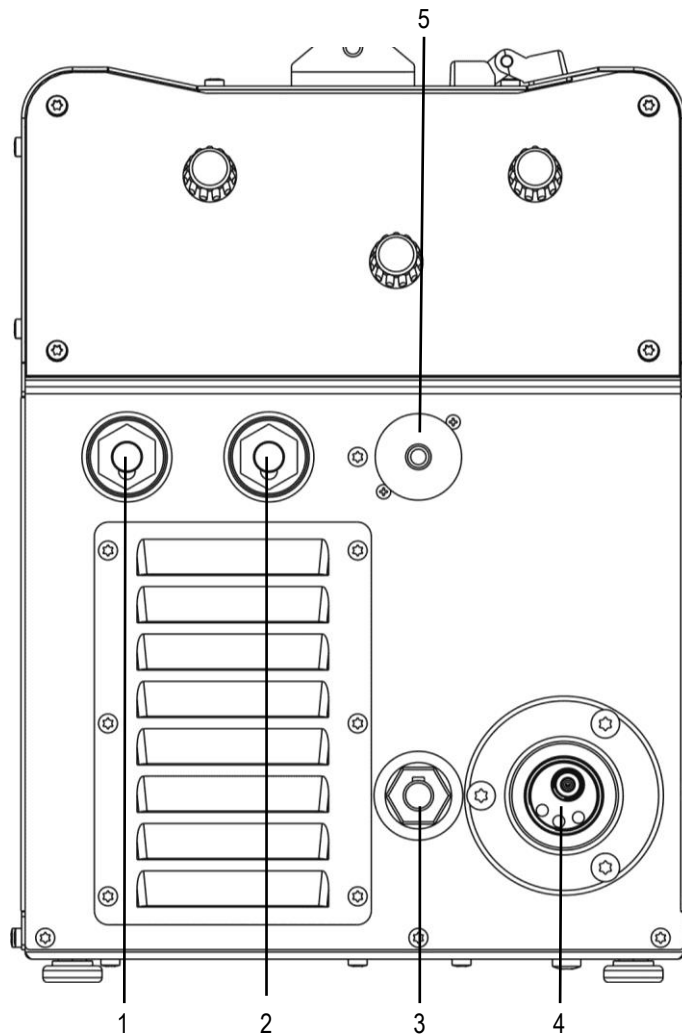
2.1 CONNECTIONS TO THE ELECTRICAL MAINS NETWORK

The characteristics of the mains power supply to which the equipment shall be connected are given in the section entitled "Technical data" on page 43.

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

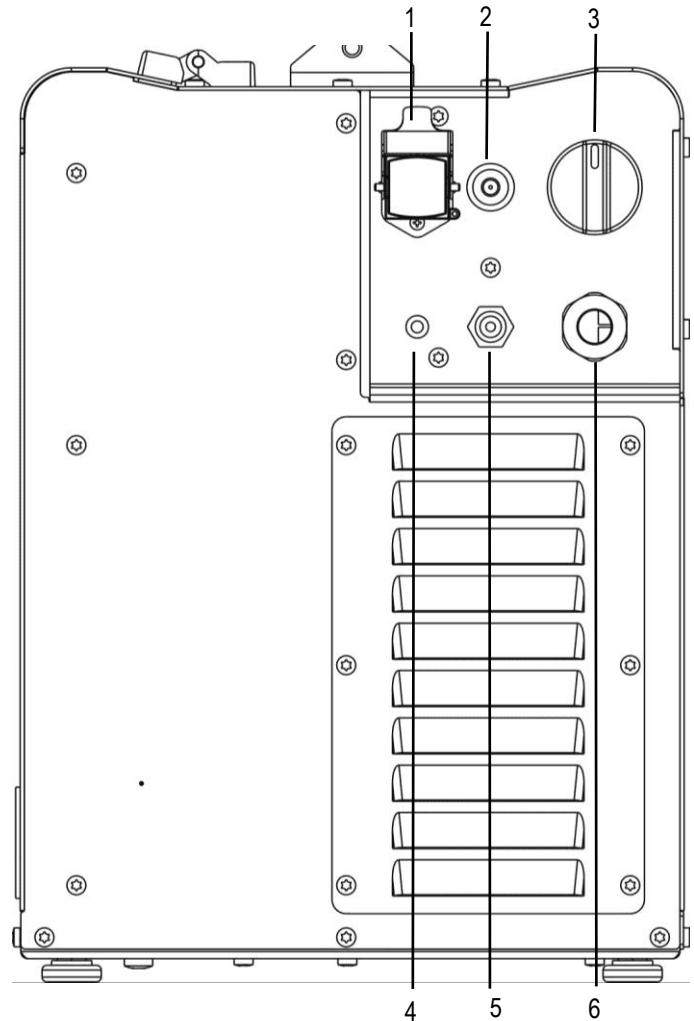
Connect/disconnect the various devices with the machine switched off.

2.2 FRONT PANEL



1. Negative pole welding socket.
2. Positive pole welding socket.
3. Polarity selector cable.
4. EURO TORCH welding socket.
5. Remote controller connector.

2.3 REAR PANEL



1. Cooler power feeding connector.
Voltage: 400 Va.c.
 ⓘ Current Output: 0.8 A
 IP protection rating: IP20 (cap open) / IP66 (cap closed)
2. Wire feed motor power transformer fuse.
Type: Delayed acting (T)
 ⓘ Amperage: 1.6 A
 Voltage: 500 V
3. Welding power source ON/OFF switch.
4. Mains protection ON LED.
This LED illuminates if an incorrect operating condition occurs:
 - absence of a phase in the power supply line.
5. Connector for gas feed hose:
cylinder → power source
6. Power cable.
Total length (including internal part): 3,5 m
 ⓘ Number and cross section of wires: 4 x 2,5 mm²
 Power plug type: not supplied

2.4 PREPARING FOR MMA WELDING

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




DANGER!
Electric shock hazard!

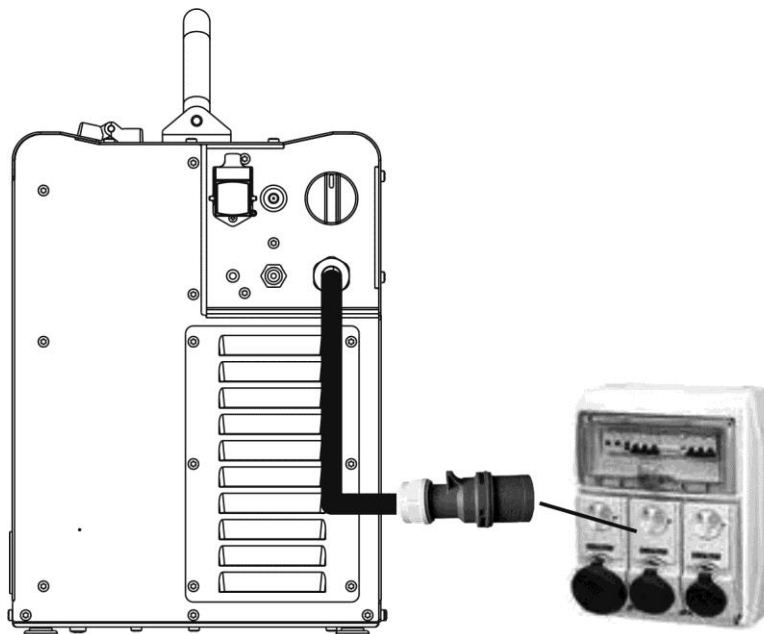
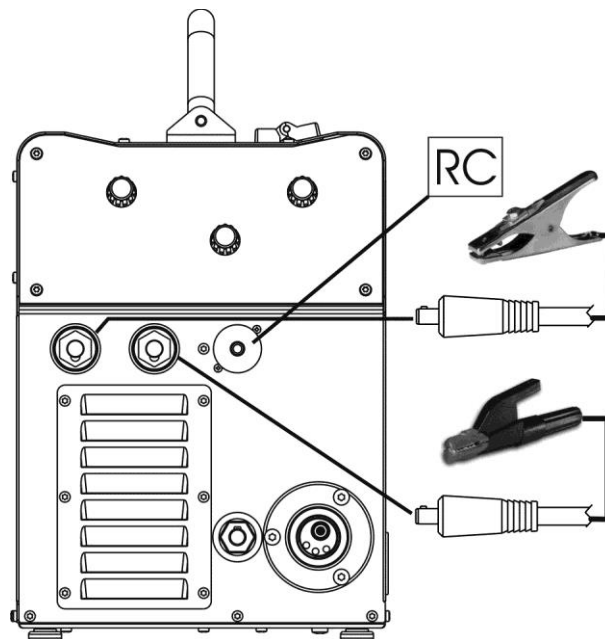
Read the warnings highlighted by the following symbols in the "General prescriptions for use".




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

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

The system is ready to start welding.



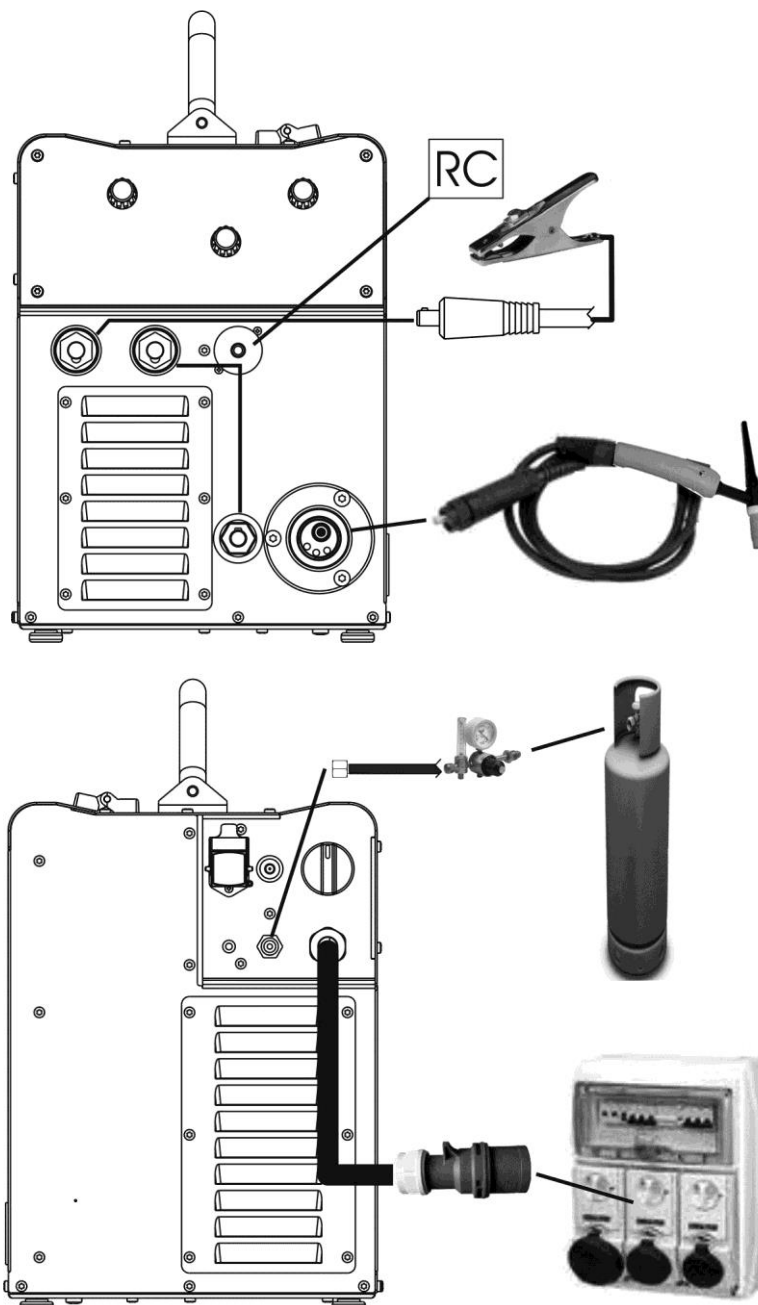
2.5 PREPARING FOR TIG WELDING

1. Set the welding power source ON/OFF switch to "O" (unit de-energized).
2. Plug the power cable plug into a mains socket outlet.
3. Connect the gas hose from the welding gas cylinder to the rear gas socket.
4. Open the cylinder gas valve.
5. 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 plug of the polarity selector cable to the welding socket on the basis of the polarity required.
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.
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 control pedal is connected and the relative locking screw is tightened the welding current will vary in relation to the pressure exerted on the pedal.

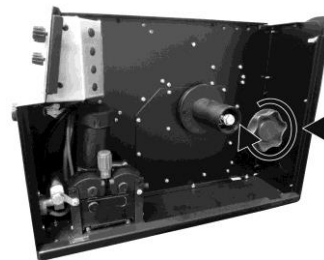
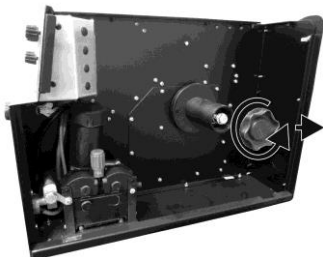
The system is ready to start welding.



2.6 PREPARING FOR MIG/MAG WELDING

2.6.1 WIRE SPOOL POSITIONING

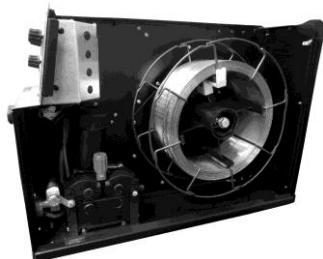
1. Open the unit side door to gain access to the spool compartment.
2. Unscrew the cap of the spool holder.



3. If necessary, fit an adapter for the wire spool.



4. Choose the wire on the basis of the workpiece thickness and material type.
5. Fit the spool in the spool holder, ensuring it is located correctly.



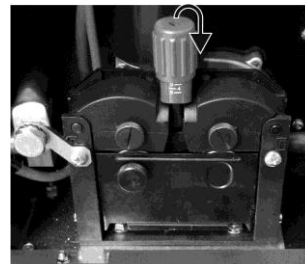
6. Adjust the spool holder braking system by tightening/loosening the screw in such a way that the wire feed force is not excessive and when the spool stops rotating no excess wire is released.



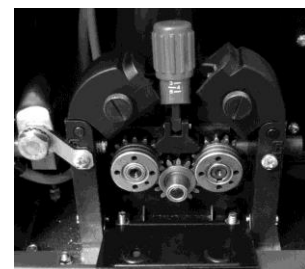
7. Refit the plug.

2.6.2 POSITIONING THE WIRE IN THE WIRE FEEDER

1. Lower the wire feeder pressure devices.



2. Raise the wire feeder pressure arms.
3. Remove the protective cover.



4. Check that the feed rolls are suitable for the wire gauge.

(See § 8.3 page 49.)

The diameter of the roll groove must be compatible with the diameter of the welding wire.

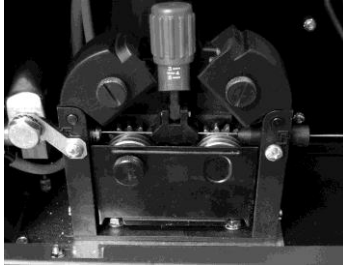
The roll must be of suitable shape in relation to the composition of the wire material.

- ⓘ The groove must feature a "U" profile for soft materials (Aluminium and its alloys, CuSi3).

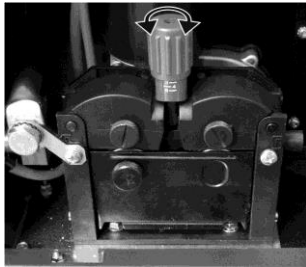
The groove must be "V" shaped for harder materials (SG2-SG3, stainless steels).

Rolls with a knurled groove profile are available for flux-cored wire.

5. Feed the wire between the wire feeder rolls and insert it into the MIG/MAG TORCH connector plug.
6. Make sure the wire is located correctly in the roll grooves.








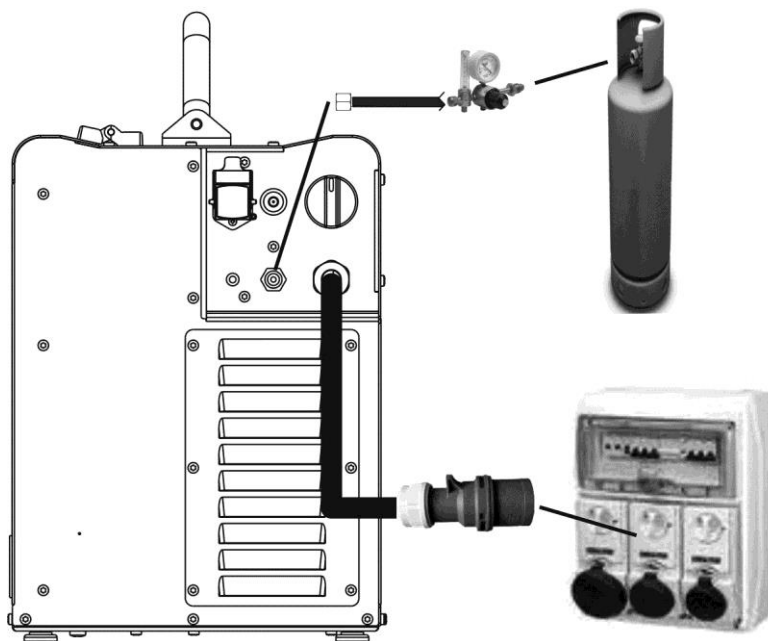
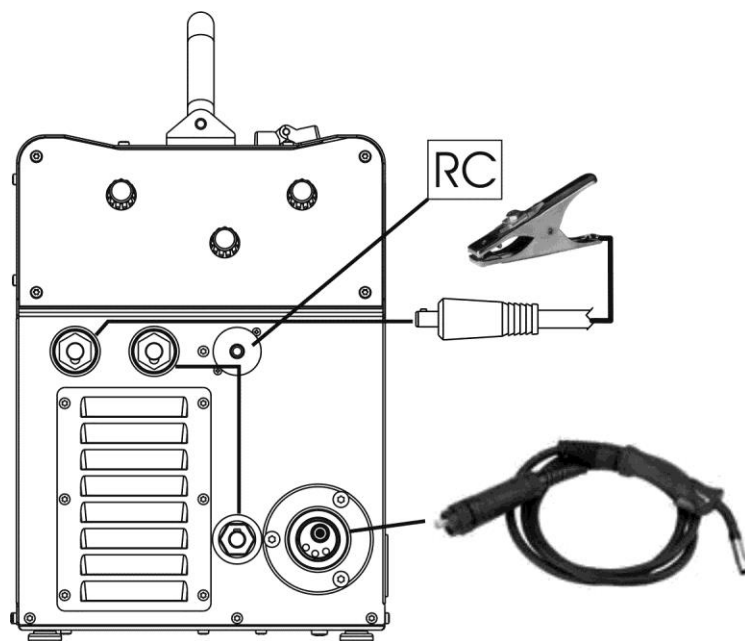
7. Close the wire feeder pressure arms.
8. Adjust the pressure system so that the arms press the wire with a force that does not deform it while also ensuring constant feed rate without slipping.



9. Refit the protective cover.
10. Close the spool compartment door in the side of the unit.

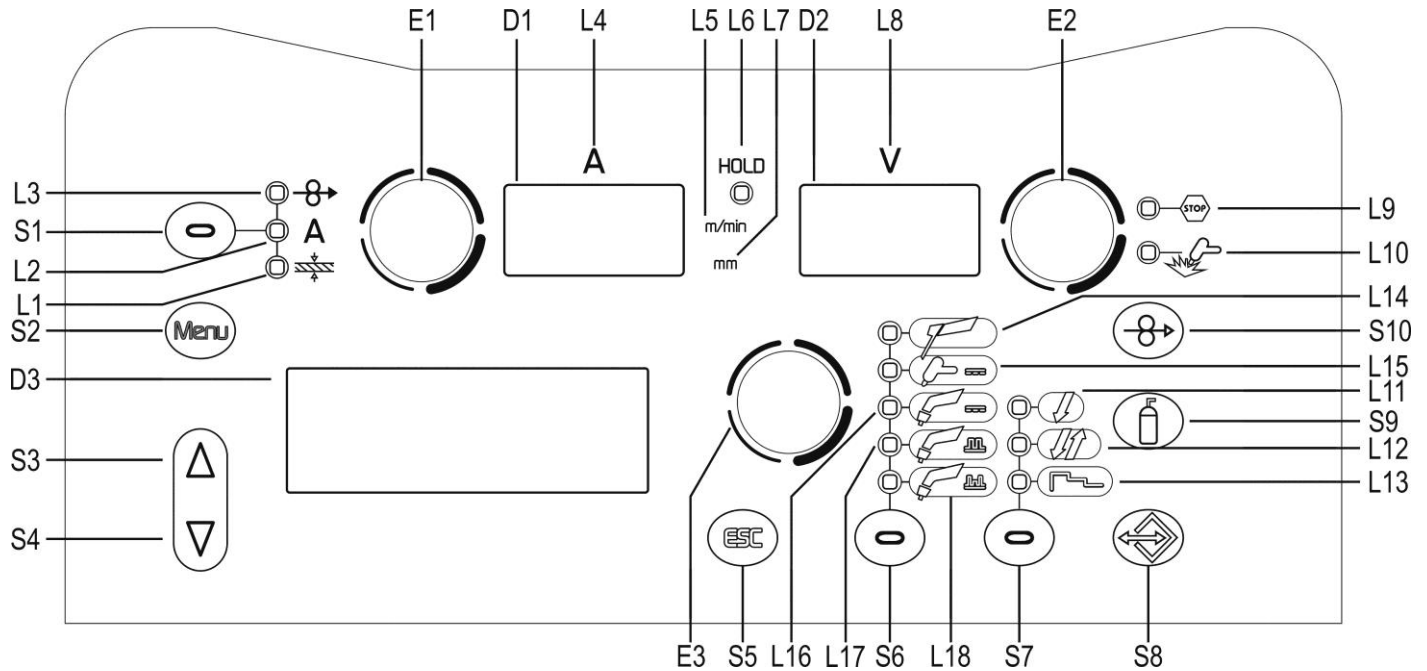
2.6.3 CONNECTIONS TO SOCKETS



















1. Set the welding power source ON/OFF switch to "O" (unit de-energized).
2. Plug the power cable plug into a mains socket outlet.
3. Connect the gas hose from the welding gas cylinder to the 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. Feed the wire through the torch until it protrudes from the tip, pressing button  on the unit's user interface.
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.



3 COMMISSIONING

3.1 USER INTERFACE

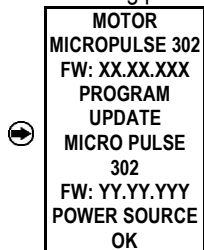


CODE	SYMBOL	DESCRIPTION
L1		MIG/MAG mode: When this LED illuminates the following parameter can be set: WELDING THICKNESS
L2		MIG/MAG mode: When this LED illuminates the following parameter can be set: WELDING CURRENT
L3		MIG/MAG mode: When this LED illuminates the following parameter can be set: WIRE FEED RATE
L4		Illuminates to show a value in the following unit of measurement: AMPERES
L5		Illuminates to show a value in the following unit of measurement: METRES PER MINUTE
L6		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.
L7		Illuminates to show a value in the following unit of measurement: MILLIMETRES
L8		Illuminates to show a value in the following unit of measurement: VOLTS
L9		This LED illuminates to show an anomaly in the operating conditions. ① See § 3.10 ALARMS MANAGEMENT page 20.
L10		This LED illuminates to confirm the presence of power on the output sockets.
L11		Illumination shows that the following function has been activated: 2 stroke procedure. A flashing signal means the following function is activated: 2 stroke spot procedure.
L12		Illumination shows that the following function has been activated: 4 stroke procedure.
L13		Illumination shows that the following function has been activated: 3 levels procedure.
L14		This LED illuminates to show that the following welding mode is selected: MMA
L15		This LED illuminates to show that the following welding mode is selected: TIG CONTINUOUS
L16		This LED illuminates to show that the following welding mode is selected: MANUAL MIG/MAG - SYNERGIC MIG/MAG
L17		This LED illuminates to show that the following welding mode is selected: PULSED SYNERGIC MIG/MAG
L18		This LED illuminates to show that the following welding mode is selected: DOUBLE PULSED SYNERGIC MIG/MAG

CODE	SYMBOL	DESCRIPTION
D1		<p>During illumination of the following LEDs: </p> <p>The display shows the value of the selected parameter.</p> <p>Welding: The display shows the effective amperes value during welding.</p> <p>HOLD function: The display shows the latest measured current value.</p>
D2		<p>Parameters/functions setting: The displays show the value of the following parameter: WELDING VOLTAGE</p> <p>Parameters/functions setting (Synergic MIG/MAG welding): The display shows the arc correction value imposed by the operator with respect to the default value of the synergic curve. Arc correction is performed by means of encoder E2. After 3 seconds the display shows the effective volts value during welding.</p> <p>Welding: The display shows the effective voltage value during welding.</p> <p>HOLD function: The display shows the latest measured voltage value.</p>
D3		<p>Data setting: The display shows the various welding menus relative to the selected processes. The display shows the selected parameter.</p>
S1		The button selects one of the following settings: WIRE FEED RATE - WELDING CURRENT - THICKNESS
S2		<p>Press the button once to select the parameters of the first level menu.</p> <p>Hold down the button for 3 seconds to gain access to the second level menu.</p> <p>Hold down the button at the time of power-on to gain access to the SETUP menu.</p>
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		<p>The button restores the main menu of display D3, starting from any other page.</p> <p>The button serves to exit any menu without saving any changes.</p>
S6		This button selects the welding mode.
S7		<p>This button selects the torch trigger procedure.</p> <p> See § 4.1 page 21.</p>
S8		<p>Press and release: the button opens the JOBs upload menu.</p> <p>Hold down for 3 seconds: the button opens the JOBs save and delete menu.</p>
S9		<p>This button opens the gas solenoid valve to fill the circuit and calibrate the pressure with the regulator on the gas cylinder.</p> <p>GAS menu function: Hold down the button for 3 seconds to open the menu.</p>
S10		MIG/MAG mode: this button activates wire feed to insert it through the MIG/MAG torch.
E1		Data setting: The encoder adjusts the main welding (and synergy) parameter, shown on the following display: D1
E2		<p>Manual MIG/MAG mode: The encoder adjusts the welding voltage, and the relative value is shown, in volts, on the following display: D2</p> <p>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</p>
E3		<p>The encoder changes the setting of the selected parameter shown on the following display: D3</p> <p>The selected parameter is shown by the following symbol: </p>

3.2 UNIT POWER-UP

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



The message appears on the following displays: D3

XX.XX.XXX= motor board software version.
YY.YY.YYY= pulsed board software version.

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

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

Subsequent power-ups

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

During power-up all functions are inhibited and the following displays remain blank: D1-D2

3.3 RESET (LOAD FACTORY SETTINGS)

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

The reset procedure is useful in the following cases:

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

3.3.1 PARTIAL RESET

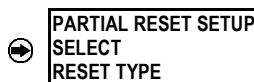
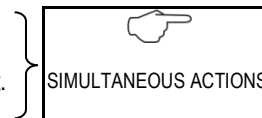
The reset procedure involves restoration of the parameter values and settings, except the following settings:

- Settings of the SETUP menu.
- saved JOBS.
- Set language.

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

S1  S10  Hold down both buttons simultaneously.

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




The message appears on the following displays: D3


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

S5  Press the button.

 **MEMORY CLEANING** The message appears on the following displays: D3

 This action will automatically close the menu.

Wait for the memory clear procedure to terminate.

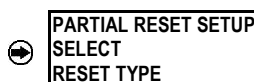
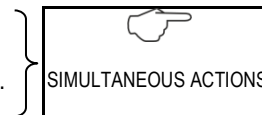
3.3.2 TOTAL RESET

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

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

S1  S10  Hold down both buttons simultaneously.

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



The message appears on the following displays: D3

E1  Select the following setting with the encoder: **FACTORY SETUP**


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

S5  Press the button.

 **MEMORY CLEANING** The message appears on the following displays: D3

 This action will automatically close the menu.

Wait for the memory clear procedure to terminate.

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

With locked status active it is not possible to access this function.
 § 3.6 LOCKING PROCEDURE

SET UP when device is switched on

Set the welding power source ON/OFF switch to “0” to switch the unit off.
 Set the welding power source ON/OFF switch to “1” to switch on the unit.

S2 Hold down the button. }
 Perform this operation before the message “SYNCHRONISATION” appears on the following display: D3

SET UP x/y The message appears on the following displays: D3
 x= number of the currently displayed menu page.
 y= total number of menu pages.

- S3 S4 Use these buttons to scroll through the list of settings to edit.
- Activation of the LOCK STATUS setting calls for a specific procedure.
§ 3.6 LOCKING PROCEDURE
- E1 Using the encoder, edit the value of the selected setting.
- S4 Press any button to save the setting and quit the menu.
- The unit restarts with the power-up procedure.

NOTE: During normal use of the generator, to enter SET UP menu, press S7 for 5 seconds (enter SET UP with machine switched on).

Tab. 1 - Setup settings

MENU PAGE	SETTING	MIN	DEFAULT	MAX	
SET UP 1/8	LANGUAGE				ENGLISH ITALIANO FRANÇAIS DEUTSCH ESPAÑOL PORTUGUES DUTCH CESKY SRBSKI POLSKI SUOMI
SET UP 2/8	COOLING TYPE	ON	OFF	AUTO	
SET UP 3/8	DISPLAY CONTRAST	0 %	50 %	100 %	
SET UP 4/8	CONTROL TYPE	OFF	OFF	RC08	OFF RC03 RC04 RC05 RC06 RC08
SET UP 5/8	LOCK STATUS	OFF	OFF	LOCK 3	OFF LOCK 1 LOCK 2 LOCK 3
SET UP 6/8	ARC CORRECTION	VOLTS	VOLTS	m/min	
SET UP 7/8	PUSH-PULL	OFF	OFF	ON	
SET UP 8/8	COUNTER	0.0 h	0.0 h	0.0 h	

COOLING TYPE

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

3.5 WORK HOURS COUNTER

The menu page shows the work hours counters.

POWER ON= number of hours during which the machine was powered on (supplied from the mains).


T.ARC ON= number of hours during which the welding arc was powered on.



P.ARC ON= partial count of the number of hours during which the welding arc was powered on.



SET UP	8 / 8
POWER ON	7.2 h
T . ARC ON	5.3 h
P . ARC ON	0.7 h


The readings are taken at the following times:
7 hours and (0.2x60) 12 minutes.

Partial count reset

To enter SET UP menu, press S7  for 3 seconds (SET UP with machine switched on).

S5  S6  Use these buttons to select the following line: **SET UP 8/8**

S5  S6  Hold down these buttons simultaneously for 3 seconds.

 The P.ARC ON value is taken to 0.0 h

CONTROL TYPE

- OFF=** No remote controller enabled.
- RC03=** The unit is enabled to receive commands from a remote control equipped with 1 potentiometer.
- RC04=** The unit is enabled to receive commands from a remote control equipped with 2 potentiometer.
- RC05=** The unit is enabled to receive commands from a remote control equipped with 1 UP/DOWN lever.
- RC06=** The unit is enabled to receive commands from a remote control equipped with 2 UP/DOWN levers.

LOCK STATUS









- OFF=** All adjustments enabled.
- LOCK 1 - LOCK 2 - LOCK 3=** All adjustments are disabled with the exceptions shown in Tab. 2 page 17.

3.6 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 (LOCKED STATUS = OFF) and if you wish to set up a limitation on use of the welding power source, display page 5/8 of the SETUP menu.

- E3  Use the encoder to select the required lock status.
- S2  Press the button to confirm.
-  WRITE PASSWORD
0000 The message appears on the following displays: D3
-  Default password: 0000
- Enter the 4 digit numerical password.
- S3  S4  Use these keys to select the digit to be modified.
-  The selected digit blinks.
- E3  Use this encoder to select the value.

Exit without confirmation

- S5  Press the button.
-  This action will automatically close the menu.

Exit with confirmation

- S2  Press the button.
 -  The unit restarts with the power-up procedure.
- The password becomes the active password. Make a note of the password you set!

Tab. 2 – Functions not disabled by Locks

LOCKED STATUS SELECTED	ADJUSTMENT DEVICE				
	USER INTERFACE/RC08	RC03	RC04	RC05	RC06
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 Pot2)		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.
3 (*1)	Selection of torch trigger procedure (button S7) Display of main welding parameters (button S1) JOB selection (encoder E2) Wire insertion (button S10) Gas test (button S9)			Scroll JOBS (UP/DOWN lever 1)	Scroll JOBS (UP/DOWN lever 1)

*1: The LOCK 3 setting becomes active only when a JOB is loaded. When no JOB is loaded, the user interface is completely unlocked.


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 locked status is to perform the welding power source RESET procedure.



NOTE: the generator has to be powered on and ready for welding.

S7  Hold down the button for 5 seconds.


 Enter the SET UP menu when the machine is switched on.

  The message appears on the following displays: D3

Enter the active 4 digit numerical password.

S3  S4  Use these keys to select the digit to be modified.

 The selected digit blinks.

E3  Use this encoder to select the value.


Exit without confirmation

S5  Press the button.

 This action will automatically close the menu.

Exit with confirmation

S2  Press the button.

 The unit restarts with the power-up procedure.
Quit locked status.


3.7 GAS FLOW ADJUSTMENT

When the unit is powered on the solenoid valve opens for 1 second.

This serves to fill the gas circuit.

S9  Open the gas solenoid valve by pressing and releasing the button.

Adjust the pressure of gas flowing from the torch by means of the flow meter connected to the gas cylinder.

S9  Close the gas solenoid valve by pressing and releasing the button.

The solenoid valve closes automatically after 30 seconds.

3.8 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.

 **COOLING SYSTEM TEST** The message appears on the following displays: D4

S4  Press the button or torch trigger to repeat the checking procedure for an additional 30 seconds.

If the problem persists rectify the cause of the alarm.

During checking, in order to enter the set up menu press S7  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.

3.9 CALIBRATING THE WELDING CIRCUIT

When using the wire feed trolley with associated umbilical, it is advantageous practice to measure welding circuit impedance "r" using the calibration function. This makes it possible to achieve constant welding quality irrespective of the length of the umbilical and torch. Welding circuit impedance depends on the umbilical and torch installed, so the calibration procedure must be repeated whenever these components are changed.

CALIBRATION following a power source RESET

If you perform a total power source RESET the calibration value will return to the default setting.



In the case of a partial RESET the last measured value will remain saved in the memory.

Calibration is not therefore obligatory, and if the user decides to dispense with the procedure the unit will simply operate on the basis of a default value.

CALIBRATION PROCEDURE

The power source must be powered on and must not be in welding mode.

Power source management with remote controller must be enabled.

S3  S4  Hold down these buttons simultaneously for 3 seconds.

- ➡ TOUCH THE WORKPIECE WITH THE WIRE
GUIDE TIP AND PRESS THE TORCH TRIGGER The message appears on the following displays: D3
- ➡ CAL The message appears on the following displays: D1
- ➡ Display D2 will show the welding circuit impedance value (mΩ) measured at the time of the most recent calibration.
After a total RESET the default value will be displayed.

Remove the torch gas nozzle and place the wire guide tip (without protruding wire) on the surface of the workpiece ensuring it is firmly located; check that the wire guide tip is in contact with a clean area of the workpiece surface. Press the torch button to perform the calibration.

Calibration performed correctly

- ➡ CALIBRATION COMPLETED SUCCESSFULLY The message appears on the following displays: D3
- ➡ The calibration value is shown on the following displays: D2

You can make several subsequent calibrations by pressing and releasing the torch button. In this case the last value revealed is memorized.

Output without memorizing

S5  Press the button.

Output with memorizing

S2  Press the button.

Calibration not performed correctly

- ➡ CAL. Err. The message appears on the following displays: D1-D2
- ➡ REPEAT MEASUREMENT The message appears on the following displays: D3

Press the torch button to perform the calibration.

Output without memorizing

S5  Press the button.

3.10 ALARMS MANAGEMENT





This LED illuminates if an incorrect operating condition occurs.



An alarm message appears on the following display: D3

Tab. 3 - Alarm messages

MESSAGE	MEANING	EVENT	CHECKS
WARNING POWER SOURCE	Overheating alarm Indicates tripping of the welding power source thermal protection. Leave the unit running so that the overheated components cool as rapidly as possible. When the unit has cooled, the welding power source will reset automatically.	All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.	<ul style="list-style-type: none"> - 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.
	Phase missing alarm Indicates the absence of a phase in the power supply line. The message appears when the mains protection activation LED switches on.	All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.	<ul style="list-style-type: none"> - Check if the equipment power supply line has all the phases. If the problem persists: - qualified technical personnel are required for repair/maintenance jobs.
WARNING NO COMMUNICATIONS	Indicates the presence of problems in data communication between the power source and wire feeder. When the unit has cooled, the welding power source will reset automatically. Exit the alarm state by performing one of the following actions: - Switch the power source off.	All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.	<ul style="list-style-type: none"> - Qualified technical personnel are required for repair/maintenance jobs.
WARNING TRIGGER	Indicates that when the wire feeder was powered up a short circuit was detected on the torch trigger input. When the unit has cooled, the welding power source will reset automatically.	All functions disabled.	<ul style="list-style-type: none"> - Make sure the torch trigger is not pressed, jammed, or short circuiting. - Make sure the torch and MIG/MAG torch connector are intact.
WARNING COOLING SYSTEM	Indicates insufficient pressure in the torch liquid cooling circuit. To exit the alarm condition and perform an operating check of the cooling unit press the following button: 	All functions disabled. Exceptions: - cooling fan.	<ul style="list-style-type: none"> - 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 and the internal connections of the cooler.
WARNING PROTECTION CURRENT	Indicates tripping of the welding power source current surge protection. Exit the alarm state by performing one of the following actions: - Switch the power source off. - Press the following button: 	All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.	<ul style="list-style-type: none"> - Check that the programmed arc voltage value is not too high in relation to the thickness of the work to be welded.

4 WELDING SETTINGS

4.1 TORCH TRIGGER MODES

4.1.1 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 work.
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) the trigger to start the weld completion procedure.
 - ➡ Gas flow continues for the time set in the post gas parameter (adjustable time).

4.1.2 2T/3L 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 work.
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; the switch to normal welding speed is performed in accordance with the start ramp, which can be set in seconds.
3. Release (2T) 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 ramp, 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.

4.1.3 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 work.
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).

4.1.4 2T/3L SPOT MIG/MAG WELDING

The welding process is the same as the 2T/3L 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/3L process.

4.1.5 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 work.
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).

4.1.6 4T B-L 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 work.
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) the trigger and keep it pressed 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).

4.1.7 4T/3L MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) the torch trigger.
 - ➡ The wire advances at the approach speed until making contact with the work.
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) the trigger to switch to normal welding speed; the 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 ramp, 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.

4.1.8 4T B-L/3L MIG/MAG WELDING

- ⓘ The welding process is the same as the 3L 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) the trigger and keep it pressed to start the crater filler procedure.
 - ⓘ The weld is closed in the same way as with the 3L process.

4.2 SELECTION OF THE WELDING MODE AND TORCH TRIGGER PROCEDURE

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

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

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

KEY

2T: 2 STROKE LIFT-ARC

2T/3L: 3 LEVEL 2 STROKE

2T SPOT: 2 STROKE SPOT

2T SPOT/3L: 3 LEVEL 2 STROKE SPOT

4T/3L: 3 LEVEL 4 STROKE

4T B-L/3L: 3 LEVEL 4 STROKE B-LEVEL

4T: 4 STROKE LIFT-ARC

4T B-L: 4 STROKE B-LEVEL

✓: Always available.

1: The procedure is active when the "SPOT TIME" parameter is set to a value other than "OFF".

2: The procedure is active when the "B-LEVEL" parameter is set to a value other than "OFF".

S6 Use this button to select one of the following welding modes.

S7 Use this button to select one of the following torch trigger procedures.

MODE	PROCEDURE							
	2T	2T SPOT	4T	4T B-L	2T/3L	2T SPOT/3L	4T/3L	4T B-L/3L
MMA								
TIG DC CONTINUOUS	✓		✓					
MANUAL MIG/MAG	✓	1	✓					
SYNERGIC MIG/MAG	✓	1	✓	2	✓	2	✓	2
PULSED SYNERGIC MIG/MAG	✓	1	✓	2	✓	2	✓	2
DOUBLE PULSED SYNERGIC MIG/MAG	✓	1	✓	2	✓	2	✓	2

4.3 WELDING PARAMETERS

WELDING CURRENT

Output current value during welding.

HOT-START

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

Consequences of a higher value:

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

Consequences of a lower value:

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

ARC-FORCE

This parameter helps to avoid electrode sticking during welding.

Consequences of a higher value:

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

Consequences of a lower value:

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

VRD

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

The arc strike procedure is as follows:

- Touch the workpiece with the electrode tip.
- Raise the electrode.

Power is released for several seconds.

- Touch the workpiece with the electrode tip.

The welding arc will strike.

SLOPE DOWN

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

FINAL CURRENT

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

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

POST GAS

Time 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).

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 IN POWER ROOT

This parameter corrects the dynamic arc in the Power Root process.

The default value is 0.

NOTE: A value >0 produces a "Softer welding", while a value <0 produces a "Harder welding".

INDUCTANCE (MIG/MAG manual welding mode)

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=100 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=100 denotes the optimal synergic inductance value chosen by the manufacturer.

IMPORTANT NOTE: This inductance value correspond to the start of Power Root

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.

WARNING: 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.

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 ramp in 3-level operation**

The parameter controls the ramp 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 ramp in 3-level operation

The parameter controls the ramp 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.

FREQ 2PULS

Double pulsed frequency

This parameter adjusts the frequency of alternation of the two wire feed rates set with the 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.

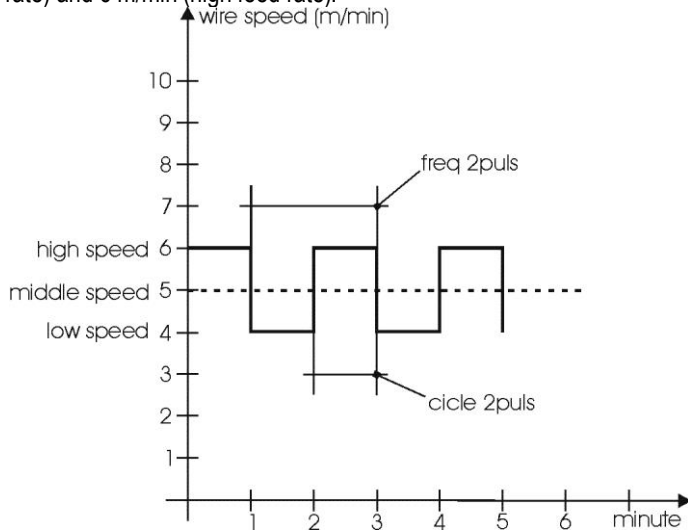
Values that are not excessively high are preferable for stability of the welding arc.

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 D3), 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.

4.4 PARAMETERS ACTIVATION

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

KEY

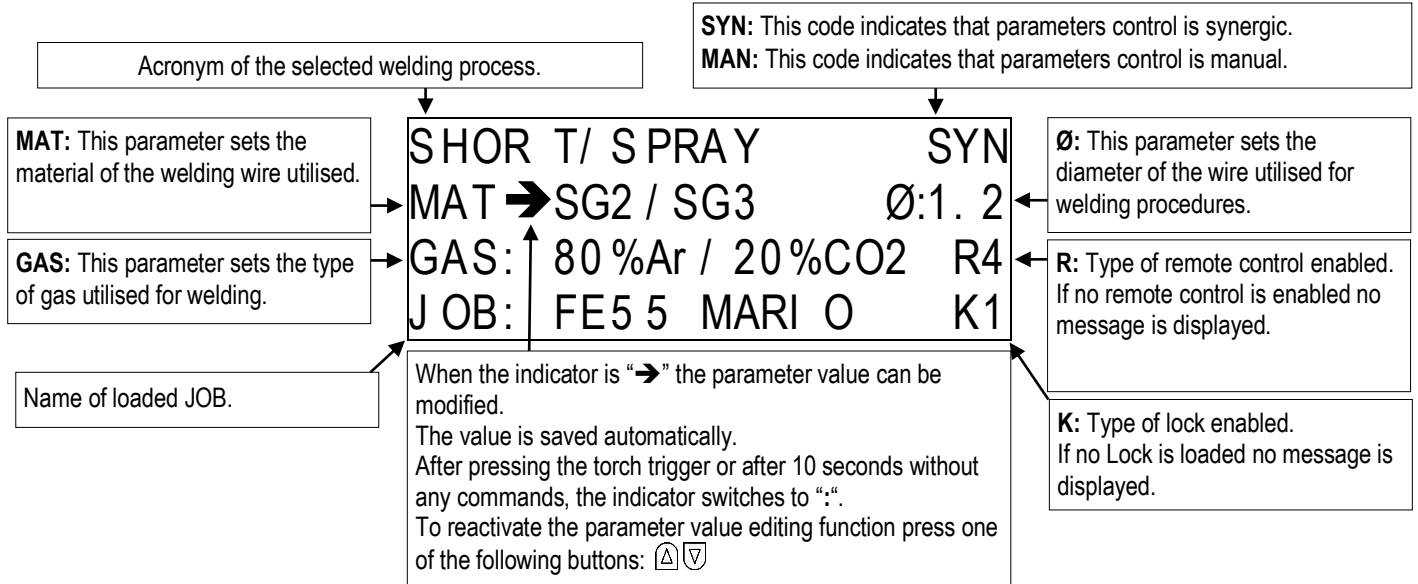
- ✓: Always available.
- 1: available selecting one of the "PF" curves (e.g.: SG2/SG3 **PF**)
- 2: available on selecting one of the "PR" curves (e.g.: SG2/SG3 **PR**)

MENU ↓	MODE →	 MANUAL		 SYNERGIC								
	PROCEDURE →											
	PARAMETER ↓											
-	ARC CORRECTION IN VOLTS			✓	✓	✓	✓	✓	✓	✓	✓	✓
-	ARC CORRECTION IN METRES PER MINUTE			✓	✓	✓	✓	✓	✓	✓	✓	✓
-	ARC CORRECTION IN POWER ROOT			2	2	2						
1°	INDUCTANCE	✓	✓									
2°	INDUCTANCE	✓	✓	✓	✓	✓						
2°	PR START			2	2	2						
2°	ARC SET						✓	✓	✓	✓	✓	✓
2°	PRE GAS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2°	SOFT START	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2°	BURN BACK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2°	POST GAS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2°	POWER FOCUS			1	1	1						
2°	SPOT TIME	✓		✓			✓			✓		
2°	B-LEVEL				✓	✓		✓	✓		✓	✓
2°	START 3LEV					✓			✓			✓
2°	CRATER 3LEV					✓			✓			✓
2°	SLOPE 3LEV 1					✓			✓			✓
2°	SLOPE 3LEV 2					✓			✓			✓
2°	FREQ 2PULS									✓	✓	✓
2°	RANGE 2PULS									✓	✓	✓
2°	CYCLE 2PULS									✓	✓	✓
2°	ARC2 2PULS									✓	✓	✓

5 CHARACTERISTICS OF THE MENU LEVELS

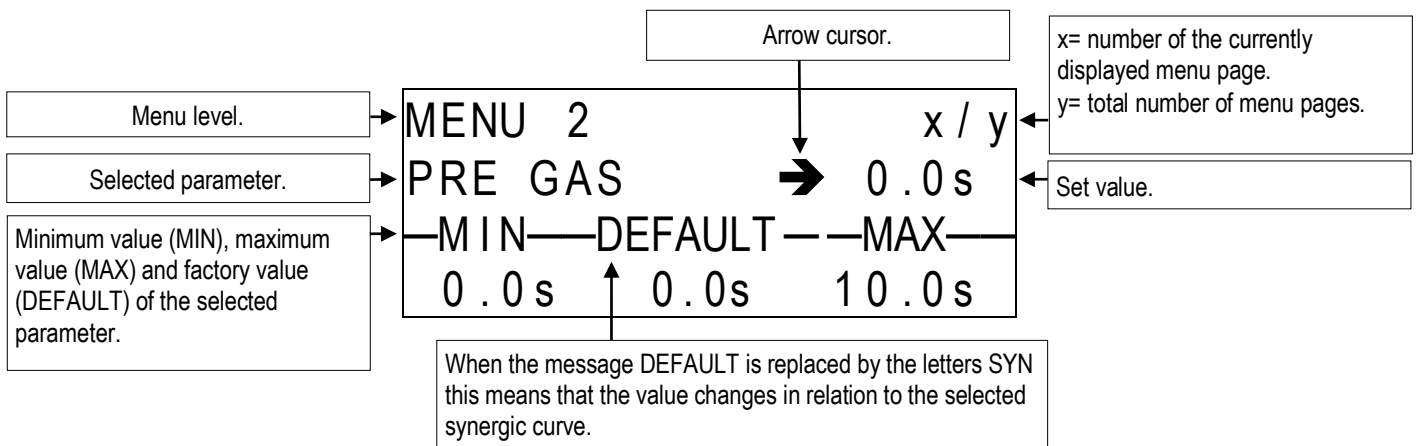
5.1 1ST LEVEL

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



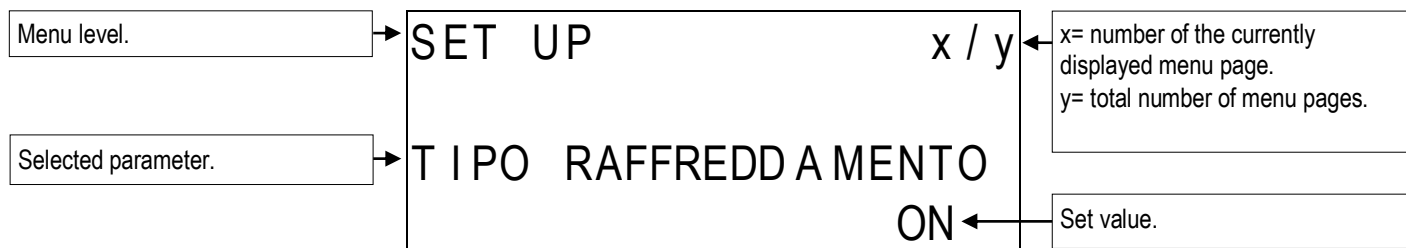
5.2 2ND LEVEL

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, synergic, pulsed synergic, double pulsed synergic MIG/MAG). To save and retrieve the changes made, utilise the JOBS storage procedure.




5.3 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 WELDING SETTINGS

6.1 ELECTRODE WELDING (MMA)

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





6.1.1 PARAMETERS SETTING

- E1  Using the encoder, edit the value of the parameter.
 The value appears on the following display: D1
 The value is saved automatically.

Tab. 4 - Main welding parameters: MMA mode

PARAMETER	MIN	DEFAULT	MAX
WELDING CURRENT	10 A	80 A	250 A


6.1.2 PARAMETERS SETTING: (2ND LEVEL)

- S7  Press the button to enter the 2nd level menu.
 S5  S6  Use these buttons to scroll through the list of parameters to edit.
 E3  Using the encoder, edit the value of the selected parameter.
 The value is saved automatically.



Tab. 5 - Parameters of the 2nd level menu: MMA mode

PARAMETER	MIN	DEFAULT	MAX
HOT-START	0 %	50 %	100 %
ARC-FORCE	0 %	30 %	100 %
VRD MMA	OFF	OFF	ON

6.2 DC TIG WELDING

S6  This button serves to select the following welding mode:
TIG





6.2.1 PARAMETERS SETTING

- E1  Using the encoder, edit the value of the parameter.
 The value appears on the following display: D1
 The value is saved automatically.

Tab. 6 - Main welding parameters: DC TIG mode

PARAMETER	MIN	DEFAULT	MAX
WELDING CURRENT	10 A	80 A	250 A







6.2.2 PARAMETERS SETTING: (2ND LEVEL)

- S3  S2  Press the button to enter the 2nd level menu.
 S4  Use these buttons to scroll through the list of parameters to edit.
 E3  Using the encoder, edit the value of the selected parameter.
 The value is saved automatically.


Tab. 7 - Parameters of the 2nd level menu: DC TIG mode

PARAMETER	MIN	DEFAULT	MAX
SLOPE DOWN	0.0 s	0.0 s	25.0 s
FINAL CURRENT	5 %	5 %	80 % *1
POST GAS	0.0 s	10.0 s	10.0 s

6.3 MIG/MAG WELDING**6.3.1 WELDING CURVES SELECTION**

- S3  S4  Use these buttons to select the following parameter: **MAT**
 S3  S4  Use these buttons to select the following parameter: **Ø**
 S3  S4  Use these buttons to select the following parameter: **GAS**

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

- E3  Using the encoder, edit the value of the selected parameter.

6.3.2 SPECIAL CURVES: HIGH SPEED, POWER FOCUS E POWER ROOT

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

HIGH SPEED CURVES: the curves are available in HSL series power sources in PULSED MIG/MAG - DOUBLE PULSED MIG/MAG welding mode.

Pulsed HS is a special function in pulsed MIG/MAG welding mode that is characterised by a very short and intense welding arc that the welder can manage EASILY. Pulsed HS, unlike other welding systems with great deposits, provides the welder with an arc that can be managed comfortably without increasing stress.

These curves differ from the other standard curves in that the acronym **HS** is displayed after the reference to the welding wire material.

Example:

PULSATO	SYN
MAT → SG2 / SG3 HS	Ø:1.2
GAS : 80%Ar / 20%CO2	R4
JOB : FE55 MARIO	K1

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 arc and a Power Focus arc consists of its concentration and pressure. The concentration of the POWER FOCUS arc enables the high temperature of the arc to be concentrated in the central part of the deposit, thus avoiding overheating the welding sides. The Power Focus arc affects a smaller heat-affected zone.

These curves differ from the other standard curves in that the acronym **PF** 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 characteristic of a cold droplet transfer. Power Root permits very high quality root passes.

These curves differ from the other standard curves in that the acronym **PR** is displayed after the reference to the welding wire material.

Example:



WELD THE WORLD

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


6.5 SYNERGIC MIG/MAG WELDING

Set the welding data (material, wire diameter, gas type), shown on display D3 and just one welding parameter, chosen from 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 D2, in order to make minor adjustments in accordance with requirements. The welding power source also automatically adjusts several secondary parameters that are relevant for welding quality.


S6  This button serves to select the following welding mode:

 MIG/MAG


S6  Press the button again.

 Near the message SHORT/SPRAY, "SYN" appears on the first line.

S7  Use this button to select one of the following torch trigger procedures:

 2 STROKE LIFT-ARC

2 STROKE SPOT: The procedure is active when the "SPOT TIME" parameter is set to a value other than "OFF".

 4 STROKE LIFT-ARC

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 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). Encoder E2 can be adjusted to correct the arc shown on display D2, in order to make minor adjustments in accordance with requirements. This parameter corrects the dynamic arc in the Power Root process.
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.

6.5.1 SYNERGIC MIG/MAG PARAMETERS SETTING (1ST LEVEL): SYNERGIC CURVE SETTING




S3  S4  Use these buttons to scroll through the list of parameters to edit.

E3  Using the encoder, edit the value of the selected parameter.
The value is saved automatically.

6.5.2 PARAMETERS SETTING: (1ST LEVEL)

- S1  Press this button to scroll the list of settings to edit.
-  The LED associated with the selected setting will illuminate.
-  The value relative to the selected setting appears on the following displays: D1
- E1  Using the encoder, edit the value of the selected setting.
The value is saved automatically.

Tab. 12 - Parameters of the 1st level menu: MIG/MAG mode

	PARAMETER	MIN	DEFAULT	MAX
	WIRE FEED RATE	1.5 m/min	Syn	22.0 m/min *1
	WELDING CURRENT	Syn	Syn	Syn *1
	THICKNESS	Syn	Syn	Syn *1 *2

Syn: By synergy we mean a simple and fast way to regulate the generator. Through this function, an optimum balancing of all the welding parameters in every position can be granted, thus helping the user.





This is the reason why the synergic curves of most of the wire types have been introduced, however these curves can be easily modified so as to allow the user to optimise his own welding procedure.

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).





*1: By changing the main adjustment value shown on display D1, the voltage value of the synergic curve shown on display D2 changes accordingly.

*2: Reference is made to "T" fillet welds on identical thicknesses. The relative value is purely guideline.

6.5.3 SYNERGIC MIG/MAG PARAMETERS SETTING (2ND LEVEL)

- S2  Press the button to enter the 2nd level menu.
- S3  S4  Use these buttons to scroll through the list of parameters to edit.
- E3  Using the encoder, edit the value of the selected parameter.
The value is saved automatically.

Tab. 13 - 2nd level menu parameters in SYNERGIC MIG/MAG mode

PROCEDURE	PARAMETER	MIN	DEFAULT	MAX	
 2 STEP 2 TIMES SPOT	INDUCTANCE (row 1/7)	1	SYN	200	
	PR START (row 1/7)	1	SYN	200	*2
	PRE GAS (row 2/7)	0.0 s	0.0 s	10.0 s	
	SOFT START (row 3/7)	1 %	SYN	100 %	
	BURN BACK (row 4/7)	1 %	SYN	200 %	
	POST GAS (row 5/7)	0.0 s	1.0 s	10.0 s	
	SPOT TIME (row 6/7)	0.1 s	OFF	25.0 s	*1
	POWER FOCUS (row 7/7)	-100 %	SYN	100 %	
 4 STEP 4 STEP B-LEVEL	INDUCTANCE (row 1/7)	1	SYN	200	
	PR START (row 1/7)	1	SYN	200	*2
	PRE GAS (row 2/7)	0.0 s	0.0 s	10.0 s	
	SOFT START (row 3/7)	1 %	SYN	100 %	
	BURN BACK (row 4/7)	1 %	SYN	200 %	
	POST GAS (row 5/7)	0.0 s	1.0 s	10.0 s	
	B-LEVEL (row 6/7)	1 %	OFF	200 %	*1
	POWER FOCUS (row 7/7)	-100 %	SYN	100 %	
 3 LEVEL 2 STROKE 3 LEVEL 2T SPOT	INDUCTANCE (row 1/13)	1	SYN	200	
	PR START (row 1/13)	1	SYN	200	*2
	PRE GAS (row 2/13)	0.0 s	0.0 s	10.0 s	
	SOFT START (row 3/13)	1 %	SYN	100 %	
	START 3LEV (row 4/13)	10 %	130 %	200 %	
	START TIME (row 8/13)	0.0 s	0.0 s	10.0 s	
	SLOPE 3LEV 1 (row 5/13)	0.1 s	0.5 s	10.0 s	
	SLOPE 3LEV 2 (row 7/13)	0.1 s	0.5 s	10.0 s	
	CRATER 3LEV (row 6/13)	10 %	80 %	200 %	
	CRATER TIME (row 9/13)	0.0 s	0.0 s	10.0 s	
	BURN BACK (row 10/13)	1 %	SYN	200 %	
	POST GAS (row 11/13)	0.0 s	1.0 s	10.0 s	
	SPOT TIME (row 12/13)	0.1 s	OFF	25.0 s	*1
POWER FOCUS (row 13/13)	-100 %	SYN	100 %		
 3 LEVEL 4 STEP 3 LEVEL 4 STEP B-LEVEL	INDUCTANCE (row 1/11)	1	SYN	200	
	PR START (row 1/11)	1	SYN	200	*2
	PRE GAS (row 2/11)	0.0 s	0.0 s	10.0 s	
	SOFT START (row 3/11)	1 %	SYN	100 %	
	START 3LEV (row 4/11)	10 %	130 %	200 %	
	SLOPE 3LEV 1 (row 5/11)	0.1 s	0.5 s	10.0 s	
	SLOPE 3LEV 2 (row 6/11)	0.1 s	0.5 s	10.0 s	
	CRATER 3LEV (row 7/11)	10 %	80 %	200 %	
	BURN BACK (row 8/11)	1 %	SYN	200 %	
	POST GAS (row 9/11)	0.0 s	1.0 s	10.0 s	
	B-LEVEL (row 10/11)	1 %	OFF	200 %	*1
POWER FOCUS (row 11/11)	-100 %	SYN	100 %		

*1: The parameter value is saved for each welding mode.

*2: The parameter is available on POWER ROOT.

6.6 PULSED SYNERGIC MIG/MAG WELDING

Set the welding data (material, wire diameter, gas type), shown on display D3 and just one welding parameter, chosen from 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 D2, in order to make minor adjustments in accordance with requirements. The welding power source also automatically adjusts several secondary parameters that are relevant for welding quality.

S6 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 LIFT-ARC

2 STROKE SPOT: The procedure is active when the "SPOT TIME" parameter is set to a value other than "OFF".

4 STROKE LIFT-ARC

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. 14 - Main settings and displays in PULSED 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). Encoder E2 can be adjusted to correct the arc shown on display D2, in order to make minor adjustments in accordance with requirements.
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.

6.6.1 PULSED SYNERGIC MIG/MAG PARAMETERS SETTING (1ST LEVEL): SYNERGIC CURVE SETTING

S3 S4 Use these buttons to scroll through the list of parameters to edit.

E3 Using the encoder, edit the value of the selected parameter.
The value is saved automatically.

6.6.2 PARAMETERS SETTING: (1ST LEVEL)

S1 Press this button to scroll the list of settings to edit.

The LED associated with the selected setting will illuminate.

The value relative to the selected setting appears on the following displays: D1

E1 Using the encoder, edit the value of the selected setting.
The value is saved automatically.

Tab. 15 - Parameters of the 1st level menu: MIG/MAG mode

PARAMETER	MIN	DEFAULT	MAX
WIRE FEED RATE	1.5 m/min	Syn	22.0 m/min *1
WELDING CURRENT	Syn	Syn	Syn *1
THICKNESS	Syn	Syn	Syn *1 *2

Syn: By synergy we mean a simple and fast way to regulate the generator. Through this function, an optimum balancing of all the welding parameters in every position can be granted, thus helping the user.

This is the reason why the synergic curves of most of the wire types have been introduced, however these curves can be easily modified so as to allow the user to optimise his own welding procedure.

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).

*1: By changing the main adjustment value shown on display D1, the voltage value of the synergic curve shown on display D2 changes accordingly.

*2: Reference is made to "T" fillet welds on identical thicknesses. The relative value is purely guideline.

6.6.3 PULSED SYNERGIC MIG/MAG PARAMETERS SETTING (2ND LEVEL)

- S2 Press the button to enter the 2nd level menu.
 S3 S4 Use these buttons to scroll through the list of parameters to edit.
 E3 Using the encoder, edit the value of the selected parameter.
 The value is saved automatically.

Tab. 16 - 2nd level menu parameters in PULSED SYNERGIC MIG/MAG mode

PROCEDURE	PARAMETER	MIN	DEFAULT	MAX
2 STROKE LIFT-ARC 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	100 %
	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 *1
4 STROKE LIFT-ARC 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	100 %
	POST GAS (row 5/6)	0.0 s	1.0 s	10.0 s
	B-LEVEL (row 6/6)	1 %	OFF	200 % *1
3 LEVEL 2 STROKE 3 LEVEL 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	0.0 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	0.0 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 *1
3 LEVEL 4 STROKE 3 LEVEL 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 % *1

*1: The parameter value is saved for each welding mode.

6.7 DOUBLE PULSED SYNERGIC MIG/MAG WELDING

Set the welding data (material, wire diameter, gas type), shown on display D3 and just one welding parameter, chosen from 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 D2, in order to make minor adjustments in accordance with requirements.

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.

- S6 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 LIFT-ARC
 - 2 STROKE SPOT: The procedure is active when the "SPOT TIME" parameter is set to a value other than "OFF".
 - 4 STROKE LIFT-ARC
 - 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. 17 - Main settings and displays in DOUBLE PULSED 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). Encoder E2 can be adjusted to correct the arc shown on display D2, in order to make minor adjustments in accordance with requirements.
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.

6.7.1 DOUBLE PULSED SYNERGIC MIG/MAG PARAMETERS SETTING (1ST LEVEL): SYNERGIC CURVE SETTING

- S3 S4 Use these buttons to scroll through the list of parameters to edit.
- E3 Using the encoder, edit the value of the selected parameter. The value is saved automatically.

6.7.2 PARAMETERS SETTING: (1ST LEVEL)

- S1 Press this button to scroll the list of settings to edit.
- The LED associated with the selected setting will illuminate.
- The value relative to the selected setting appears on the following displays: D1
- E1 Using the encoder, edit the value of the selected setting. The value is saved automatically.

Tab. 18 - Parameters of the 1st level menu: MIG/MAG mode

PARAMETER	MIN	DEFAULT	MAX
WIRE FEED RATE	1.5 m/min	Syn	22.0 m/min *1
WELDING CURRENT	Syn	Syn	Syn *1
THICKNESS	Syn	Syn	Syn *1 *2

Syn: By synergy we mean a simple and fast way to regulate the generator. Through this function, an optimum balancing of all the welding parameters in every position can be granted, thus helping the user.





This is the reason why the synergic curves of most of the wire types have been introduced, however these curves can be easily modified so as to allow the user to optimise his own welding procedure.

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).





*1: By changing the main adjustment value shown on display D1, the voltage value of the synergic curve shown on display D2 changes accordingly.

*2: Reference is made to "T" fillet welds on identical thicknesses. The relative value is purely guideline.

6.7.3 DOUBLE PULSED SYNERGIC MIG/MAG PARAMETERS SETTING (2ND LEVEL)

- S2  Press the button to enter the 2nd level menu.
- S3  S4  Use these buttons to scroll through the list of parameters to edit.
- E3  Using the encoder, edit the value of the selected parameter.
The value is saved automatically.

Tab. 19 - 2nd level menu parameters in DOUBLE PULSED SYNERGIC MIG/MAG mode

PROCEDURE	PARAMETER	MIN	DEFAULT	MAX
 2 STROKE LIFT-ARC 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	100 %
	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 *1
	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 - 4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min
 4 STROKE LIFT-ARC 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	100 %
	POST GAS (row 5/10)	0.0 s	1.0 s	10.0 s
	B-LEVEL (row 6/10)	1 %	OFF	200 % *1
	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 - 4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min
 3 LEVEL 2 STROKE 3 LEVEL 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	0.0 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	0.0 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 *1
	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 - 4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min
 3 LEVEL 4 STROKE 3 LEVEL 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 *1
	B-LEVEL (row 10/14)	1 %	OFF	200 %
	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 - 4.0 m/min	0.0 V 0.0 m/min	9.9 V 4.0 m/min

*1: The parameter value is saved for each welding mode.

6.8 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.

JOBS can be managed only when the unit is not in welding mode.




6.8.1 SAVING A JOB

- S8  Press the button.
- S3  S4  The job menu appears in the following displays: D3
- S3  S4  Use these buttons to select the following parameter: **OPT**
- S3  S4  Use these buttons to select the following parameter: **SAVE**
- S3  S4  Use these buttons to select the following parameter: **JOB**
- S3  S4  Use these buttons to select the position of the job to be renamed.
- S8  Hold down the button for 3 seconds.
- S8  The first letter of the name blinks.
- S3  S4  Use the encoder to change the letter.
- S3  S4  Use these buttons to select the character to be modified.

Exit without confirmation

- S5  Press the button.
- S5  Return to the job menu.
- S5  Press the button.

Exit with confirmation

- S8  Hold down the button for 3 seconds.
- S8  Return to the job menu.
- S8  Press the button.

6.8.2 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).

-pressing the following button: 



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

- S8  Press the button.
 - S3  S4  The job menu appears in the following displays: D3
 - S3  S4  Use these buttons to select the following parameter: **OPT**
 - S3  S4  Use these buttons to select the following parameter: **LOAD**
 - S3  S4  Use these buttons to select the following parameter: **JOB**
 - S3  S4  The JOB displayed is the one that was most recently used.
 - E3  Use the encoder to select one of the existing jobs.
- When there are no saved jobs the following message appears on the bottom line: **NO JOB**












Exit without confirmation

- S5  Press the button.
- S5  This action will automatically close the menu.



Exit with confirmation

- S8  Press the button.
- S8  This action will automatically close the menu.






6.8.3 DELETING A JOB

- S8  Press the button.
-  The job menu appears in the following displays: D3
- S3  S4  Use these buttons to select the following parameter: **OPT**
-  The selected parameter is shown by the following symbol: 
- E3  Use the encoder to select the following setting: **DELETE**
- S3  S4  Use these buttons to select the following 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**
- E3  Use the encoder to select one of the existing jobs.








Exit without confirmation

- S5  Press the button.
-  This action will automatically close the menu.

Exit with confirmation

- S8  Press the button.
-  **CONFIRM JOB ERASURE** The message appears on the following displays: D3
- E3  Use the encoder to select the following setting: **NO**, or **YES**
- S8  Press the button.
-  This action will automatically close the menu.

7 TECHNICAL DATA

Directives applied	Waste electrical and electronic equipment (WEEE)		
	Electromagnetic compatibility (EMC)		
	Low voltage (LVD)		
Construction standards	Restriction of the use of certain hazardous substances (RoHS)		
	EN 60974-1; EN 60974-5; EN 60974-10 Class A		
Conformity markings		Equipment compliant with European directives in force	
		Equipment suitable in an environment with increased hazard of electric shock	
		Equipment compliant with WEEE directive	
		Equipment compliant with RoHS directive	
Supply voltage	3 x 400 Va.c. \pm 15 % / 50-60 Hz		
Mains protection	16 A Delayed		
Z _{max}	This equipment complies with IEC 61000-3-12 provided that the maximum permissible system impedance is less than or equal to 158 m Ω 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 158 m Ω .		
Dimensions (L x D x H)	560 x 280 x 390 mm		
Weight	24.0 kg		
Insulation class	H		
Protection rating	IP23S		
Cooling	AF: Air-over cooling (fan assisted)		
Maximum gas pressure	0,5 MPa (5 bar)		
Motor speed	1.5 - 22.0 m/min		
Wire spool: (dimensions/weight)	300 mm / 15 kg		
Static characteristic	MMA	 Drooping characteristic	
	TIG	 Drooping characteristic	
	MIG/MAG	 Flat characteristic	
Current and voltage adjustment range	MMA	10 A / 20.4V - 250 A - 30.0 V	
	TIG	10 A / 10.4 V - 250 A - 20.0 V	
	MIG/MAG	5 A / 14.2 V - 300 A - 29.0 V	
Welding current / Working voltage	MMA	40 % (40° C)	250 A - 30.0 V
		60 % (40° C)	220 A - 28.8 V
		100 % (40° C)	190 A - 27.6 V
	TIG	50 % (40° C)	250 A - 20.0 V
		60 % (40° C)	240 A - 19.6 V
		100 % (40° C)	210 A - 18.4 V
	MIG/MAG	35 % (40° C)	300 A - 29.0 V
		60 % (40° C)	230 A - 25.5 V
		100 % (40° C)	200 A - 24.0 V
Maximum input power	MMA	40 % (40° C)	8.7 kVA - 8.4 kW
		60 % (40° C)	7.3 kVA - 7.0 kW
		100 % (40° C)	6.1 kVA - 5.8 kW
	TIG	50 % (40° C)	6.1 kVA - 5.8 kW
		60 % (40° C)	5.8 kVA - 5.5 kW
		100 % (40° C)	4.8 kVA - 4.5 kW
	MIG/MAG	35 % (40° C)	10.3 kVA - 9.7 kW
		60 % (40° C)	6.9 kVA - 6.5 kW
		100 % (40° C)	5.8 kVA - 5.5 kW
Maximum supply current	MMA	40 % (40° C)	12.7 A
		60 % (40° C)	10.6 A
		100 % (40° C)	8.8 A
	TIG	50 % (40° C)	8.8 A
		60 % (40° C)	8.3 A
		100 % (40° C)	6.8 A
	MIG/MAG	35 % (40° C)	15.0 A
		60 % (40° C)	10.0 A
		100 % (40° C)	8.4 A

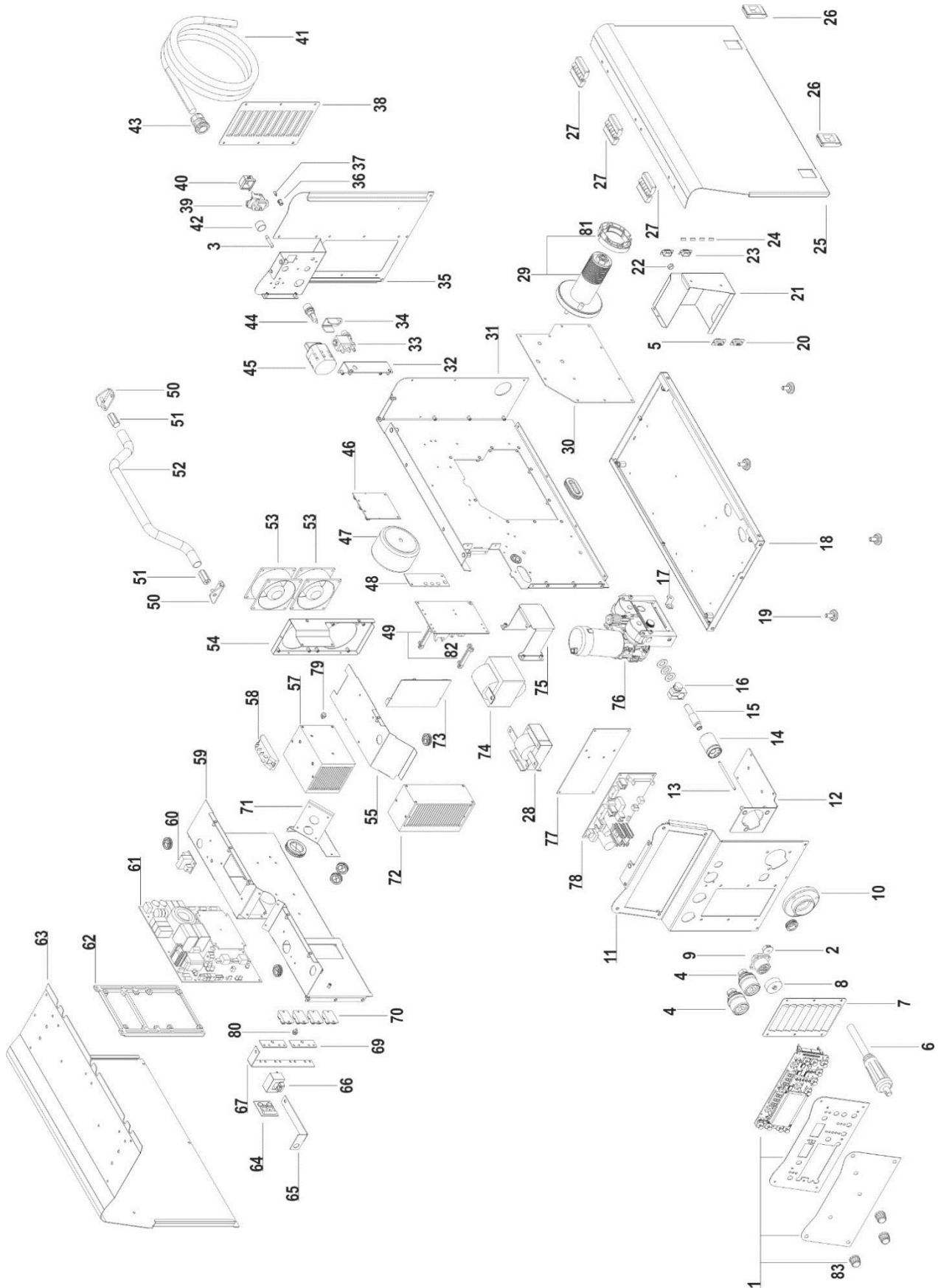


WELD THE WORLD

Maximum effective supply current	MMA	40 % (40° C)	8.0 A
		60 % (40° C)	8.2 A
		100 % (40° C)	8.8 A
	TIG	50 % (40° C)	6.2 A
		60 % (40° C)	6.4 A
		100 % (40° C)	6.8 A
	MIG/MAG	35 % (40° C)	8.8 A
		60 % (40° C)	7.7 A
		100 % (40° C)	8.4 A
No-load voltage (U₀)	MMA	60 V	
	TIG	60 V	
	MIG/MAG	60 V	
Reduced no-load voltage (U_r)	MMA	11 V	
	TIG	11 V	
	MIG/MAG	11 V	

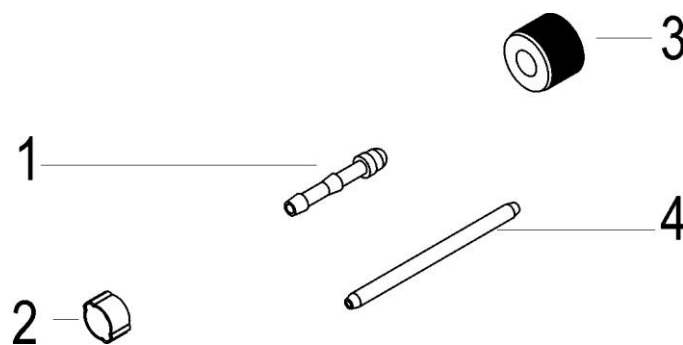
8 SPARE PARTS

8.1 MICRO PULSE 302 MFK



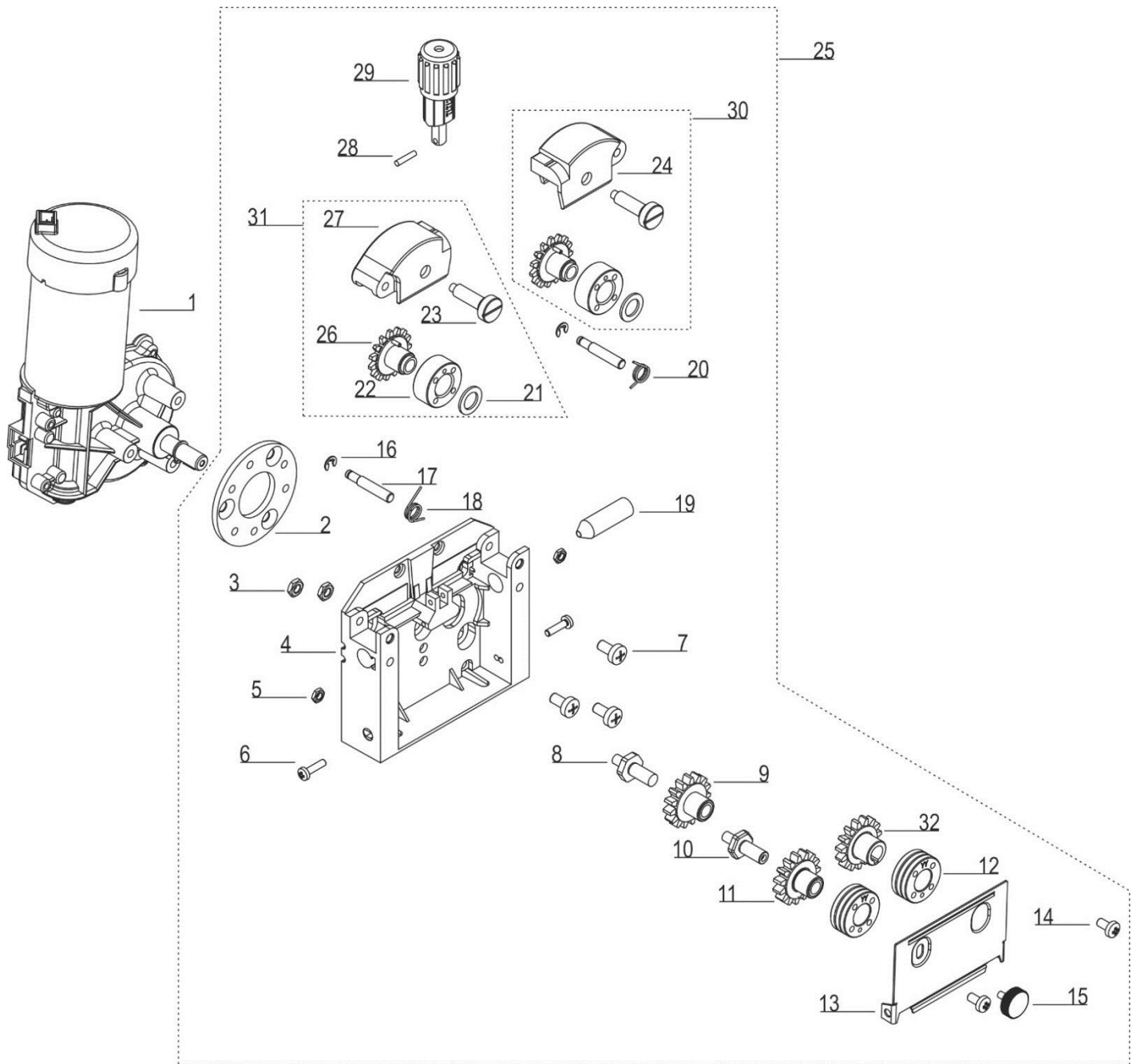
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1	050.5121.0000	COMPLETE FRONT LOGIC PANEL
2	016.0011.0004	CAP
3	040.0007.1160	FUSE
4	021.0001.0259	COMPLETE FIXED SOCKET
5	022.0002.0270	RS232 CABLE (COM1)
6	022.0002.0055	POLARITY SELECTOR CABLE
7	011.0009.0208	BLIND METAL FRONT PLATE
8	021.0004.2994	REMOTE CONNECTOR CAP
9	022.0002.0266	REMOTE LOGIC BOARD WIRING
10	021.0001.2005	EURO CONNECTOR HOUSING
11	011.0009.0221	FRONT PLATE
12	011.0009.0224	MOTOR SUPPORT PLATE
13	021.0001.2028	CAPILLARY TUBE FOR EURO CONNECTOR
14	021.0001.2001	AXIAL EURO BODY
15	021.0001.2015	BRASS GUIDE FOR EURO CONNECTOR
16	021.0001.2010	CURRENT CLAMP FOR BRASS GUIDE FOR EURO CONNECTOR
17	011.0002.0037	BRASS GUIDE BLOCK BRACKET
18	011.0009.0200	BASE PLATE
19	016.0009.0003	RUBBER FOOT
20	022.0002.0153	RS232 CABLE (COM2)
21	011.0009.0222	LOGIC PROTECTION PLATE
22	016.0011.0008	CAP Ø=12
23	021.0014.0302	RS232 CONNECTOR CAP
24	016.0011.0001	CAP Ø=10
25	011.0000.0891	DOOR COVER PANEL
26	011.0006.0002	PLATE SLIDE CLOSURE
27	011.0006.0006	PLASTIC HINGE
28	044.0004.0013	OUTPUT INDUCTANCE
29	011.0006.0062	SPOOL HOLDER
30	011.0009.0219	INTERNAL PLATE
31	011.0009.0220	INTERNAL SUPPORT PLATE
32	011.0009.0203	REAR FIXING PLATE
33	017.0001.5542	SOLENOID VALVE
34	011.0002.0018	SOLENOID VALVE BLOCK PLATE
35	011.0009.0202	REAR PLATE
36	016.4107.0001	LED HOLDER
37	022.0002.0198	RED LED CABLE
38	011.0009.0206	BLIND METAL REAR PLATE
39	022.0002.0073	C.U. POWER SUPPLY WIRING
40	021.0013.0007	C.U. POWER CONNECTOR CAP
41	045.0002.0005	NEOPRENE CABLE
42	016.0011.0004	FUSE HOLDER CAP
43	045.0000.0007	COMPLETE CABLE CLAMP
44	040.0006.1880	FUSE HOLDER
45	040.0001.0015	THREE-POLE SWITCH
46	050.0002.0057	THREE-PHASE SUPPLY PROTECTION BOARD
47	041.0006.0009	AUXILIARY TRANSFORMER
48	050.0001.0119	PRIMARY CAPACITOR BOARD
49	050.0001.0120	BUS BOARD
50	011.0009.0213	HANDLE TUBE SUPPORT PLATE
51	016.0002.0001	PIN
52	011.0009.0214	HANDLE TUBE
53	003.0002.0015	FAN
54	011.0009.0207	FANS SUPPORT PLATE
55	011.0009.0204	INTERNAL DEFLECTOR PLATE
56	040.0003.1003	THERMAL CUT-OUT 75°C
57	015.0001.0013	HEAT SINK
58	032.0001.8215	THREE PHASE BRIDGE RECTIFIER
59	011.0009.0209	DEFLECTOR PLATE
60	050.0001.0084	FAN CONTROL BOARD

N°	CODE	DESCRIPTION
61	050.0003.0091	POWER BOARD
62	012.0003.0000	INTERNAL FRAMEWORKS
63	011.0000.0881	COVER PANEL
64	050.0003.0044	SNUBBER BOARD
65	045.0006.0079	HALL-SOCKET COPPER BRACKET
66	041.0004.0501	HALL EFFECT SENSOR
67	045.0006.0078	DIODES-HALL COPPER BRACKET
68	040.0003.1007	THERMAL CUT-OUT 85°C
69	045.0006.0053	DIODES-TRANSFORMER COPPER BRACKET
70	032.0002.2003	ISOTOP DIODE
71	011.0009.0205	OBLIQUE PLATE FOR DEFLECTOR
72	015.0001.0014	HEAT SINK
73	050.0023.0080	PULSE BOARD
74	042.0003.0003	POWER TRANSFORMER
75	011.0009.0121	TRANSFORMER SUPPORT PLATE
76	002.0000.0019	WIRE FEEDER MOTOR
77	011.0009.0223	MOTOR BOARD SUPPORT PLATE
78	050.0024.0078	MOTOR BOARD
79	040.0003.1003	THERMAL CUT-OUT 75°C
80	040.0003.1007	THERMAL CUT-OUT 85°C
81	002.0000.0287	RING FOR SPOOL HOLDER
82	016.0010.0001	BOARDS SUPPORT GUIDE
83	014.0002.0002	KNOB WITHOUT INDEX



N°	CODE	DESCRIPTION
	021.0000.0009	TORCH CONNECTORS COMPLETE KIT
1	016.5001.0822	SLEEVE HOSE ADAPTER FOR RUBBER HOSE
2	016.0007.0001	HOSE CLAMP Ø= 11-13
3	016.5001.0823	NUT 1/4
4	021.0001.2028	CAPILLARY TUBE

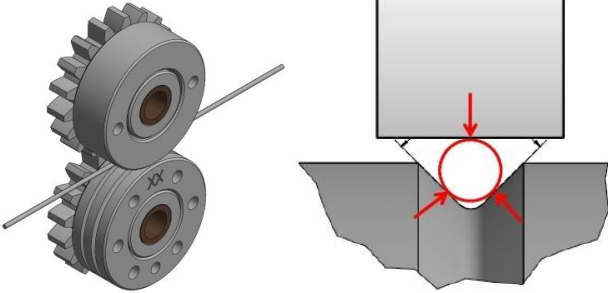
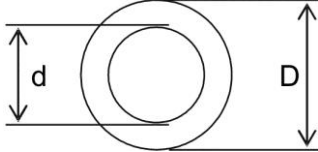
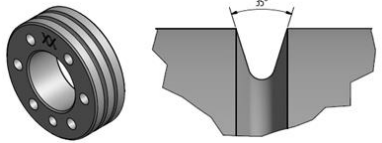
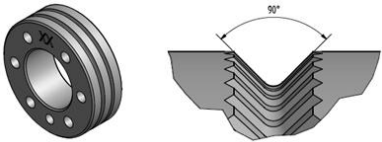
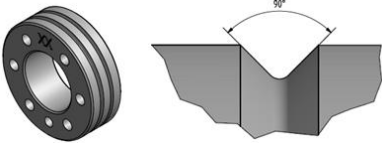


8.2 WIRE FEEDER MOTOR



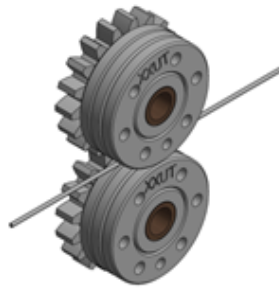


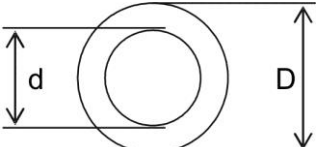
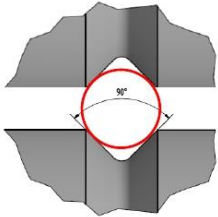
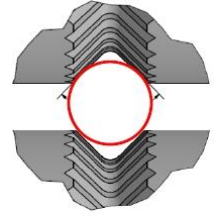

N°	CODE	DESCRIPTION
1	002.0000.0353	MOTOR COIL
2	002.0000.0308	SPACER RING
3	002.0000.0349	NUT M6
5	002.0000.0348	NUT M5
4	002.0000.0327	FEED PLATE
6	002.0000.0347	SCREW M4x18
7	002.0000.0350	SCREW M6x12
8	002.0000.0341	SHAFT (1)
9	002.0000.0343	MAIN GEAR DRIVE
10	002.0000.0340	SHAFT(2)
11	002.0000.0342	GEAR DRIVE
12	002.0000.0121	FEED ROLL
13	002.0000.0345	INTERNAL PROTECTION PLATE
14	002.0000.0324	SCREW M5x10
15	002.0000.0346	RETAINING SCREW M5x6
16	002.0000.0352	SNAP RING 4 mm
17	002.0000.0336	JOINT AXLE
18	002.0000.0337	LEFT SPRING
19	002.0000.0297	INLET GUIDE WITH SOFT LINER
20	002.0000.0338	RIGHT SPRING
21	002.0000.0371	WASHER
22	002.0000.0370	PRESSURE ROLL
23	002.0000.0372	PRESSURE ROLL AXLE
24	002.0000.0368	RIGHT PRESSURE ARM
25	002.0000.0061	COMPLETE WIRE FEEDER
26	002.0000.0369	HIGHER DRIVE GEAR
27	002.0000.0367	LEFT PRESSURE ARM
28	002.0000.0319	PIN
29	002.0000.0339	COMPLETE PRESSURE DEVICE
30	002.0000.0366	COMPLETE RIGHT PRESSURE ARM
31	002.0000.0365	COMPLETE LEFT PRESSURE ARM
32	002.0000.0344	LOWER DRIVE GEAR

8.3 WIRE FEEDER ROLLS

DOUBLE DRIVING ROLL (2 ROLL WITH GROOVE + 2 FLAT ROLL)			
			
CODE	Ø WIRE	Ø ROLL 	GROOVE TYPE
002.0000.0120	0.8-1.0	ROLL 0.8/1.0 D=30x12/d=14 V	
002.0000.0121	1.0-1.2	ROLL 1.0/1.2 D=30x12/d=14 V	
002.0000.0124	1.0-1.2	ROLL 1.0/1.2 D=30x12/d=14 VK	
002.0000.0122	0.8-1.0	ROLL 0.8/1.0 D=30x12/d=14 U	
002.0000.0123	1.0-1.2	ROLL 1.0/1.2 D=30x12/d=14 U	
002.0000.0369	GEAR ADAPTOR FEED ROLL (BRONZE BUSHING)		
002.0000.0370	SMOOTH DOUBLE DRIVING		

DOUBLE DRIVING ROLL (4 ROLL WITH GROOVE) - RECOMMENDED CONFIGURATION



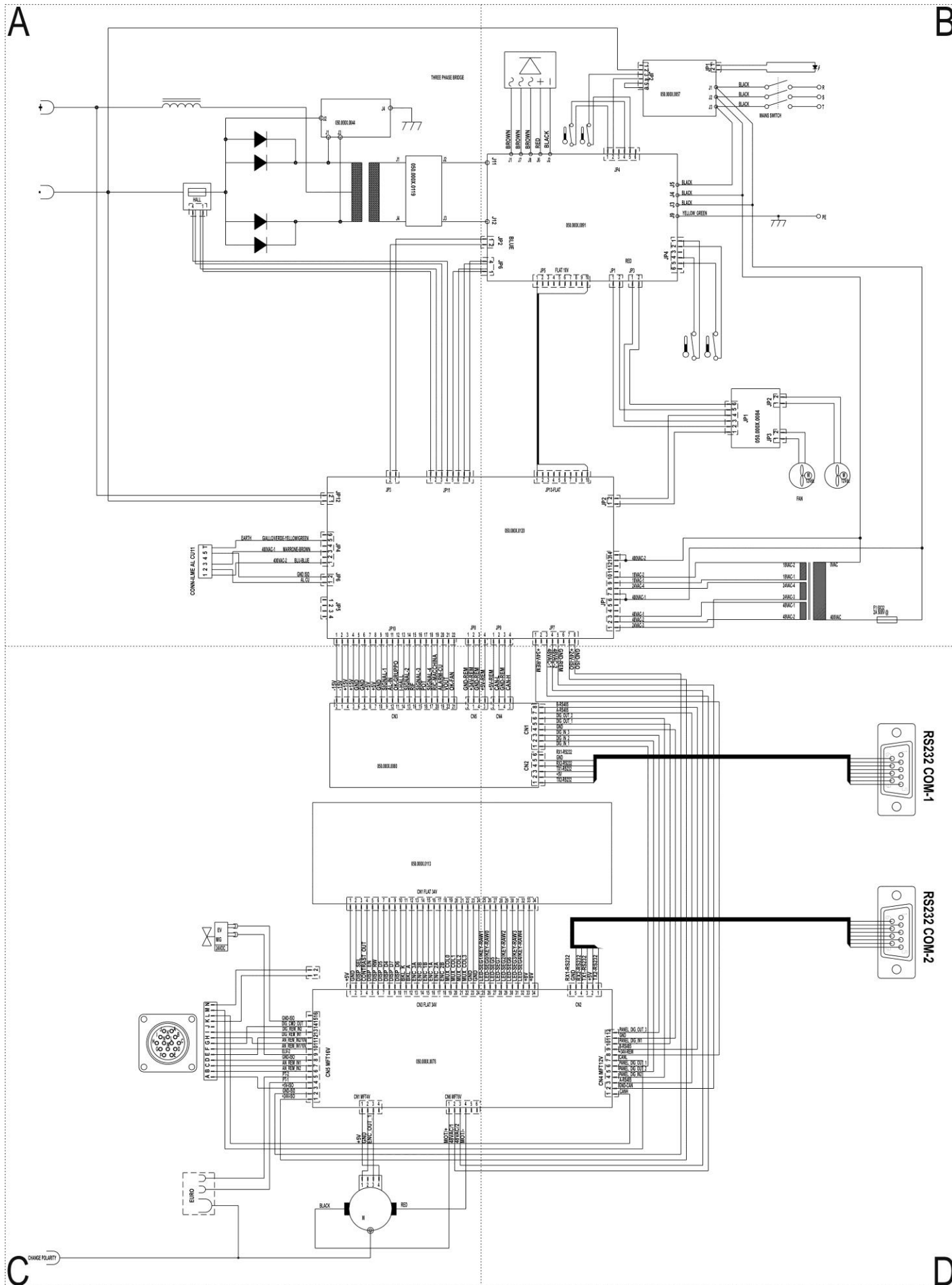
CODE	Ø WIRE	<p style="text-align: center;">Ø ROLL</p> 	GROOVE TYPE
002.0000.0170	0.8-1.0	D=30X12/d=14 V DOUBLE D.	
002.0000.0178	1.0-1.2	D=30X12/d=14 VK DOUBLE D.	
002.0000.0369	GEAR ADAPTOR FEED ROLL (BRONZE BUSHING)		

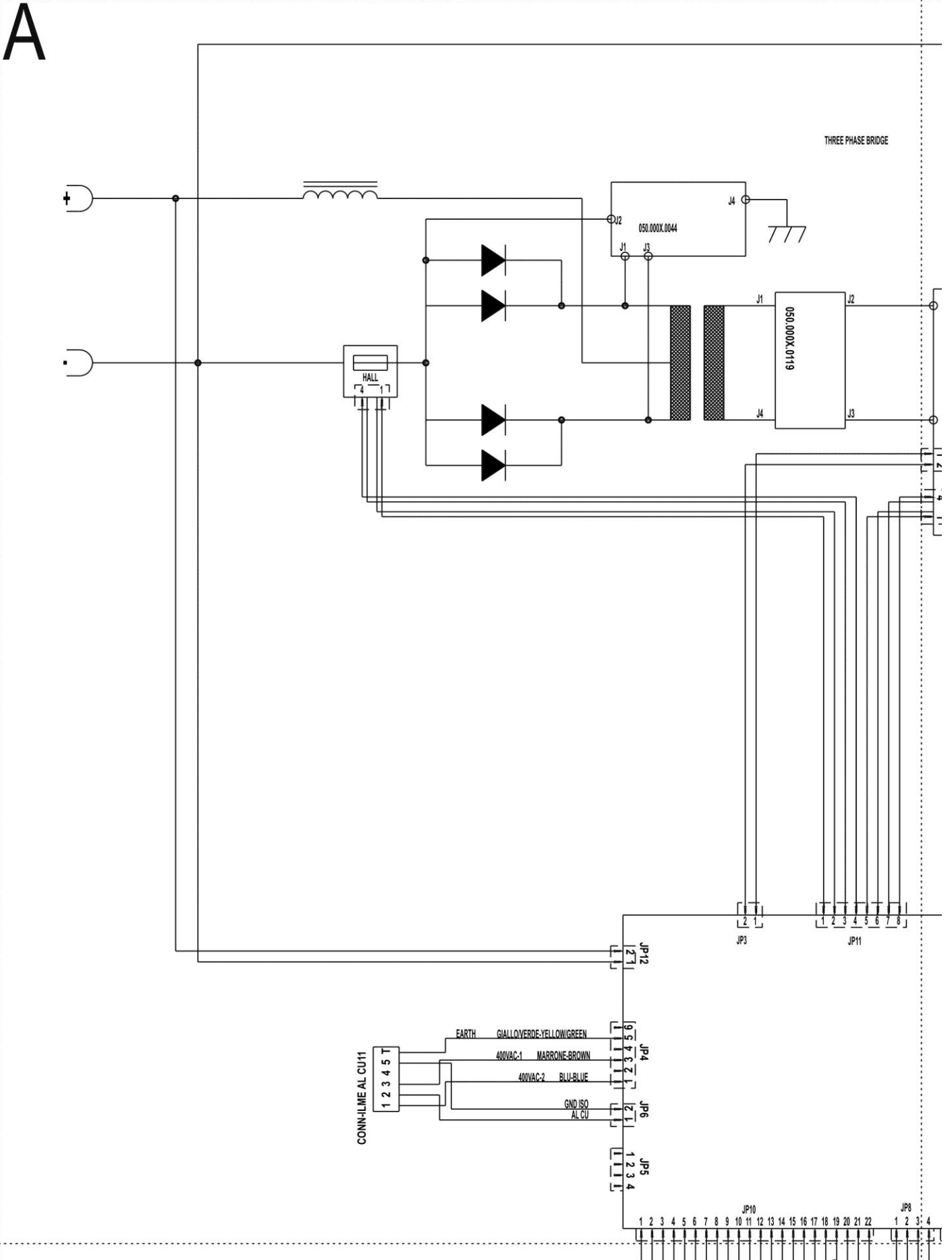
STANDARD FEED ROLLS VS TWIN FEED ROLLS	
Standard feed rolls	Twin feed rolls
Position of the wire centre in relation to the groove borders	



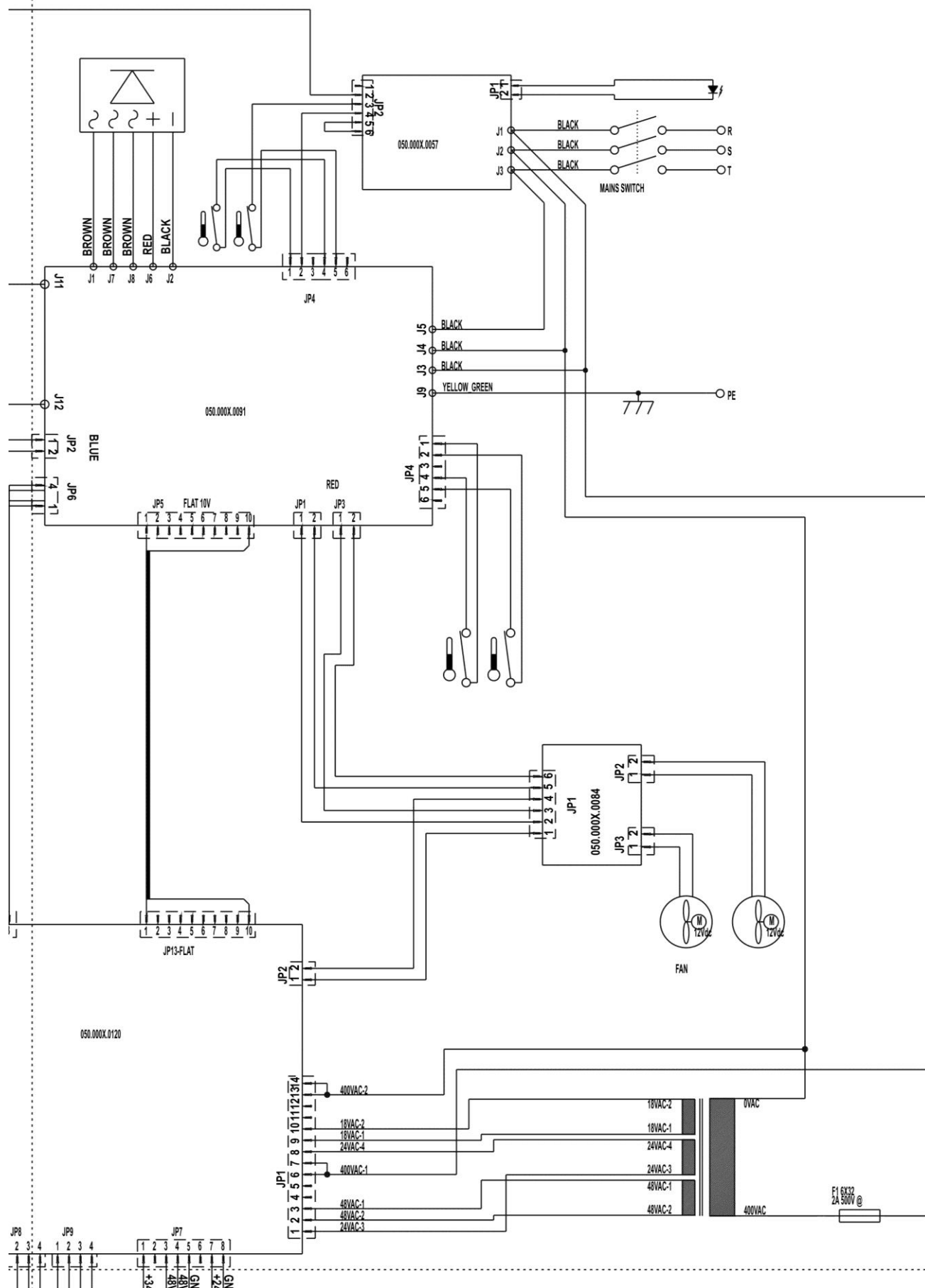
WELD THE WORLD

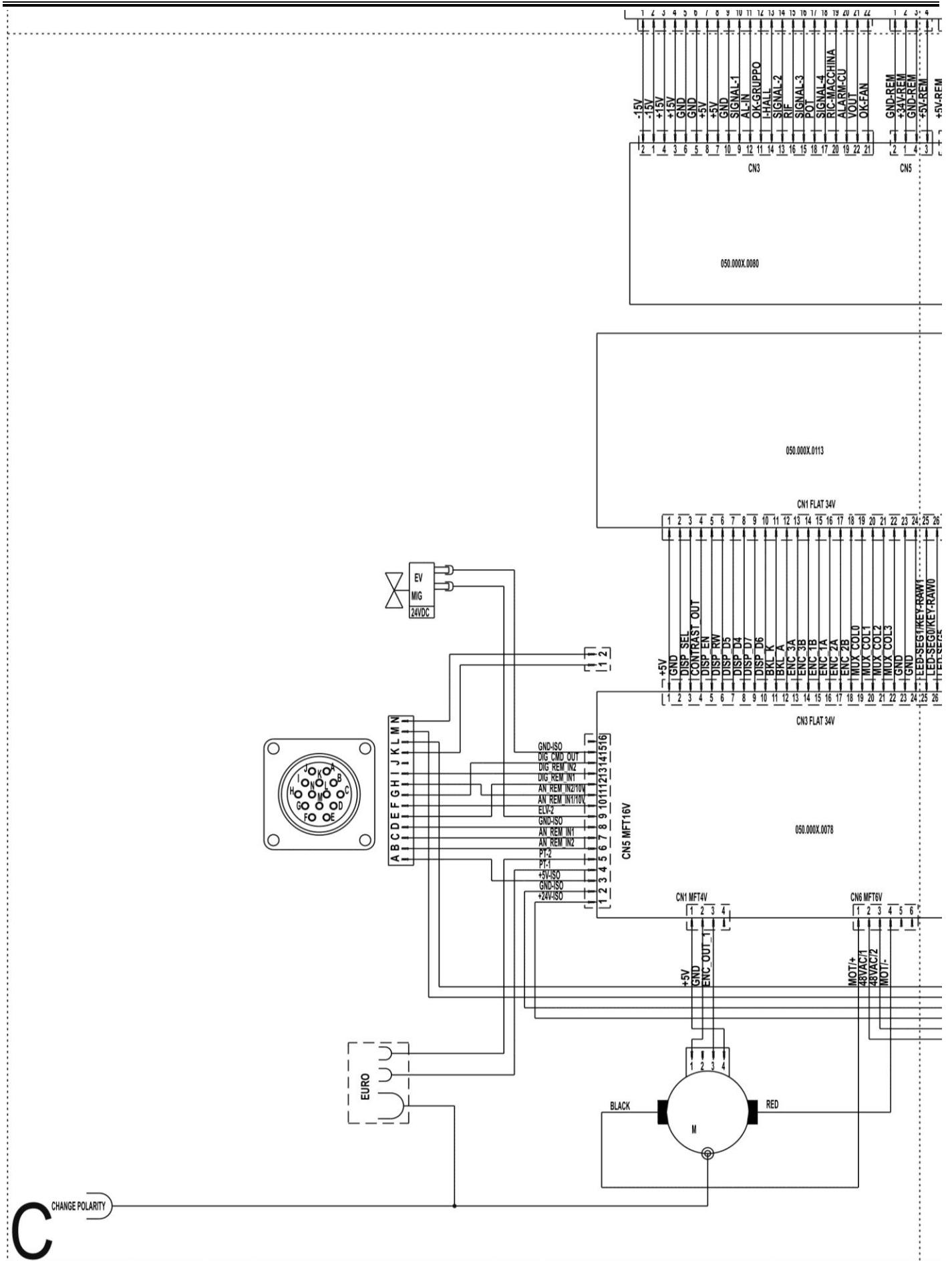
9 ELECTRICAL DIAGRAM

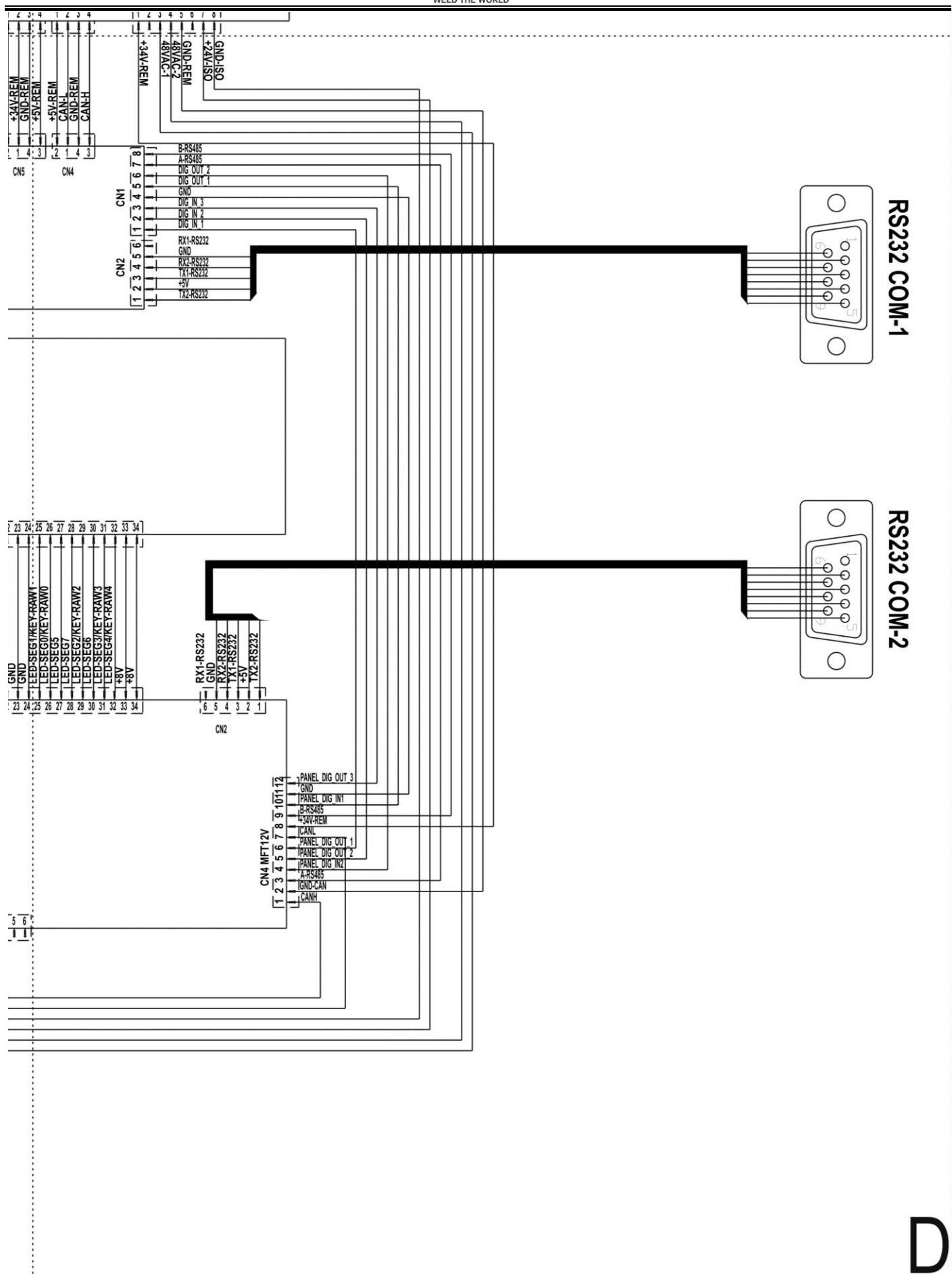




B

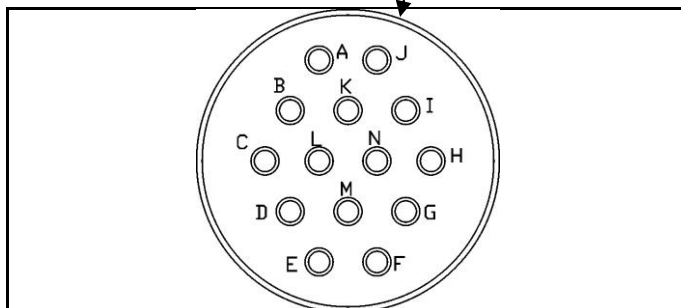
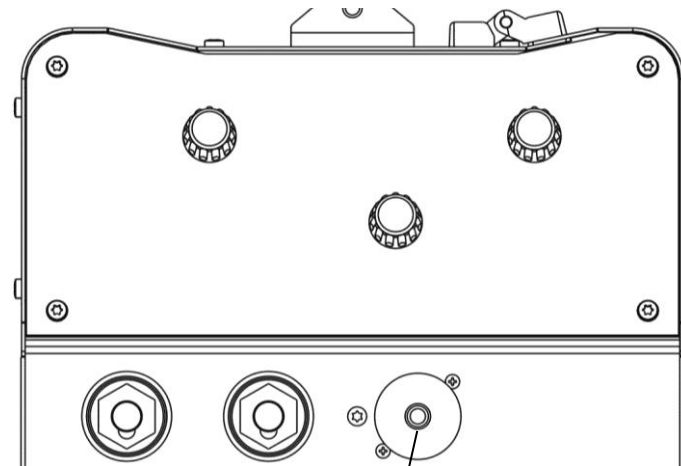






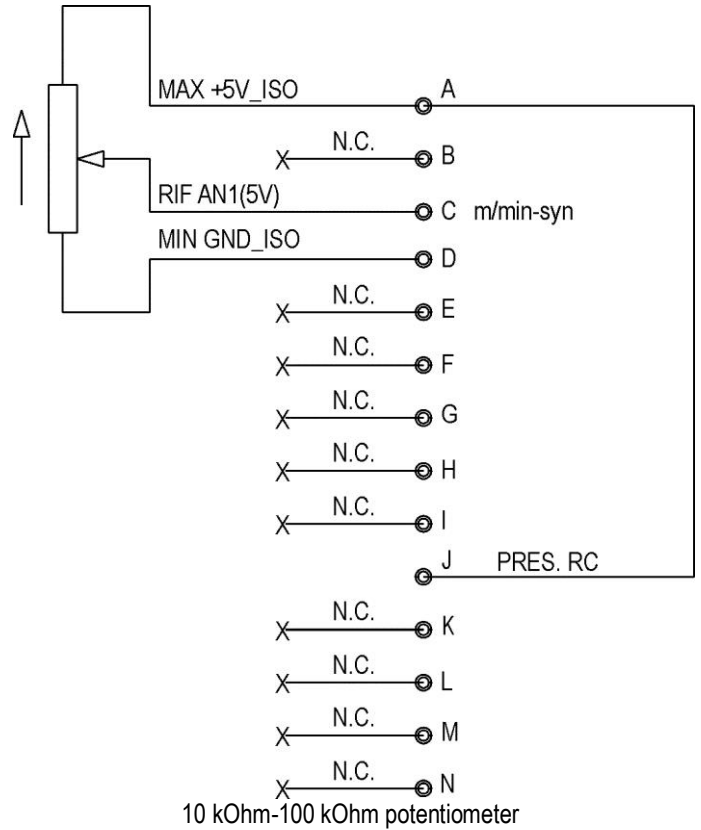
D

9.1 REMOTE CONTROLLER

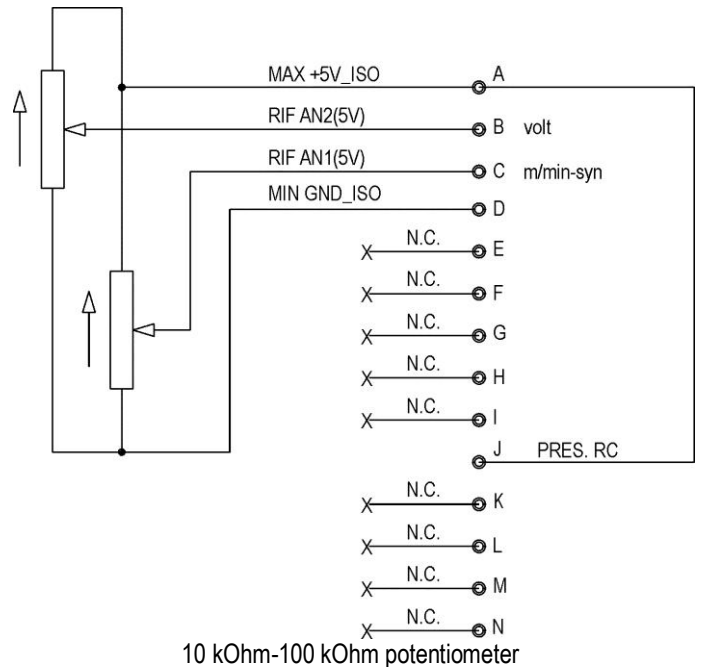


Pin	Name	Voltage	Input/Output
A	+5V-ISO	5 Vd.c.	Out
B	AN REM IN2	0-5 Va.c.	In
C	AN REM IN1	0-5 Va.c.	In
D	GND-ISO	GND	Out
E	DIG REM IN1	0-5 Vd.c.	In
F	AN REM IN1/10V	0-10 Va.c.	In
G	DIG CMD OUT	0-5 Vd.c.	Out
H	AN REM IN2/10V	0-10 Va.c.	In
I	DIG REM IN2	0-5 Vd.c.	In
J	-	-	Not used
K	-	-	Not used
L	-	-	Not used
M	-	-	Not used
N	-	-	Not used

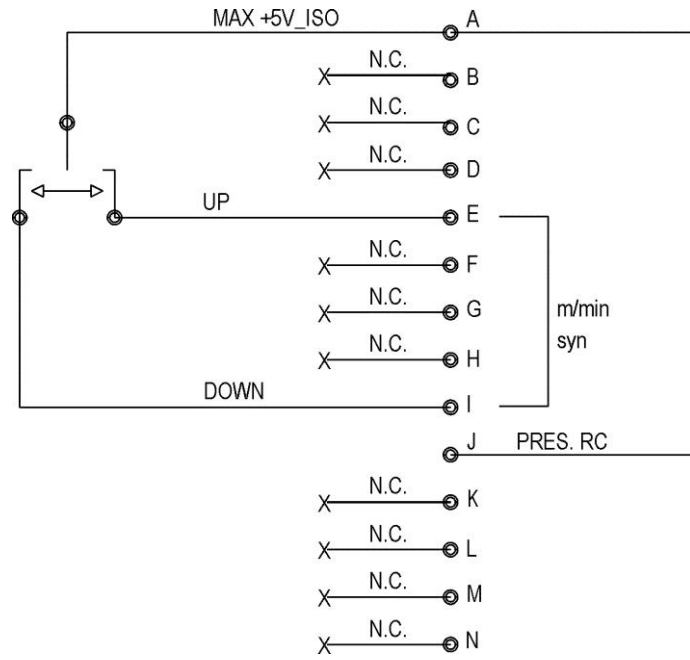
9.1.1 RC03: ELECTRICAL DIAGRAM



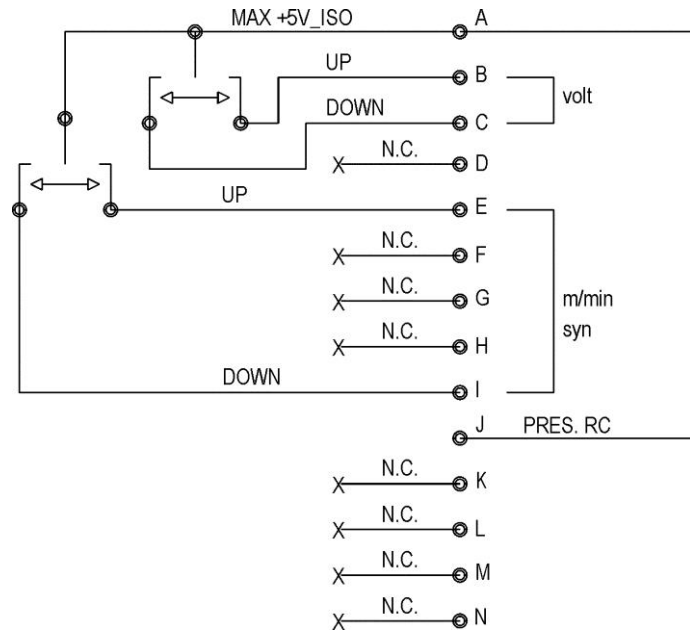
9.1.2 RC04: ELECTRICAL DIAGRAM



9.1.3 RC05: ELECTRICAL DIAGRAM



9.1.4 RC06: ELECTRICAL DIAGRAM





WELD THE WORLD