

operating instruction and spare parts

Micro Pulse 300



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Keep for further use.

EU declaration of conformity

No. CMM0516QNMIP3_01

Product description: MIG/MAG welding machine
Model name: QINEO MICRO PULSE 300
Serial number: Refer to the nameplate on the back of the device
Manufacturer: CARL CLOOS Schweisstechnik GmbH
Address: Industriestrasse 22-36
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Germany

The manufacturer bears sole responsibility for issuing the declaration of conformity.

The aforementioned products covered by the declaration satisfy the relevant statutory provisions of the Union:

Low Voltage Directive:

2014/35/EU Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of laws of Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits; Official Journal of the EU L96, 29/03/2014, Pages 357 - 374

EMC Directive:

2014/30/EU Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of laws of Member States relating to electromagnetic compatibility; Official Journal of the EU L96, 29/03/2014, Pages 79 - 106

RoHS Directive:

2011/65 /EU Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of use of certain hazardous substances in electrical and electronic equipment; Official Journal of the EU L174, 01/07/2011, Pages 88 - 110

Agreement of the product stated with the regulations in the directives applied is verified with conformance to the following standards and regulations:

- EN 60974-1 Arc Welding Equipment
Part 1: Welding Power Sources
- EN 60974-5 Arc Welding Equipment
Part 5: Wire Feed Units
- EN 60974-10 Arc Welding Equipment
Part 10: Requirements of Electromagnetic Compatibility (EMC)

Major conversions and add-ons which are not carried out by the manufacturer or the manufacturer's authorised representative(s) result in termination of this declaration of conformity.

Signed for and in the name of:
CARL CLOOS Schweisstechnik GmbH

35708 Haiger, 30/05/16

Signature:
Identification of signatory:



Gerald Mies
Managing director

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1 INTRODUCTION



IMPORTANT!

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


KEY


DANGER!


This pictogram warns of danger of death or serious injury.


WARNING!

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


CAUTION!

This pictogram warns of a potentially hazardous situation.


INFORMATION

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

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

NOTES

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

INTRODUCTION

Micro Pulse 300 is a compact and rugged three-phase, synergic inverter power source for MIG/MAG, MMA and TIG Lift welding. Easy to transport, only 22 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 300.

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

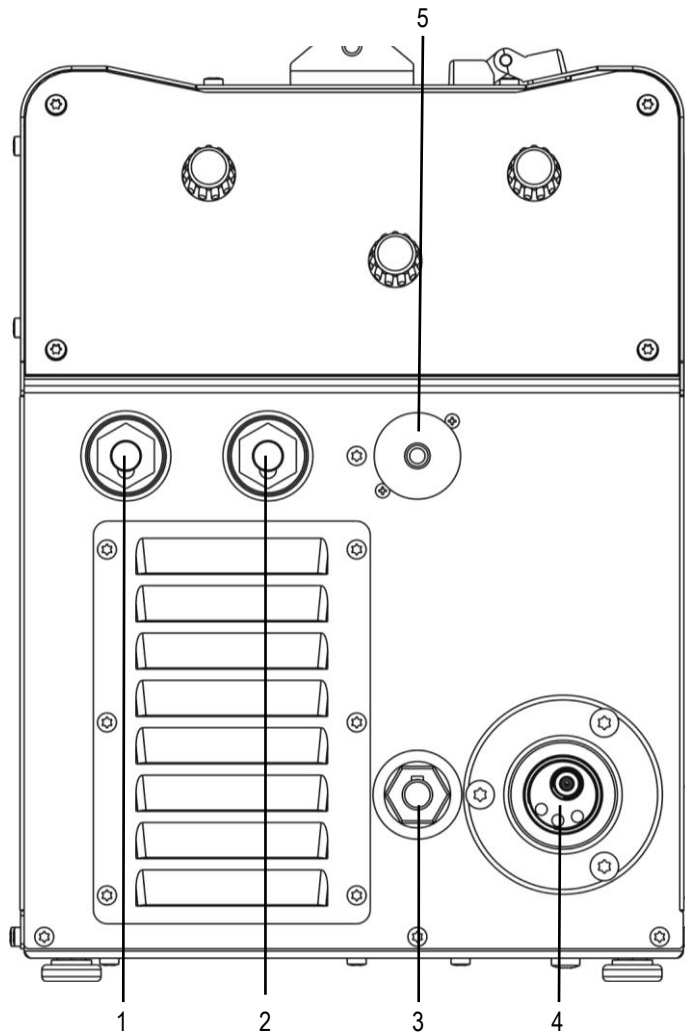
Read the warnings highlighted by the following symbols in the "General prescriptions for use".



2.1 CONNECTIONS TO THE ELECTRICAL MAINS NETWORK

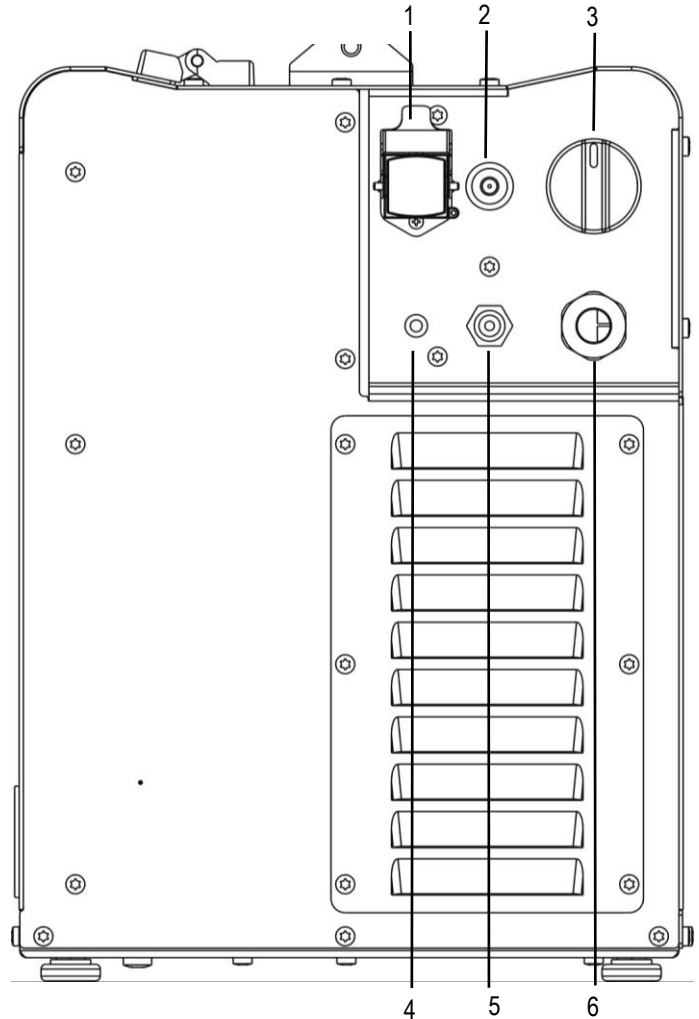
The characteristics of the mains power supply to which the equipment shall be connected are given in the section entitled "Technical data" on page 38.
The machine can be connected to motorgenerators provided their voltage is stabilised.
Connect/disconnect the various devices with the machine switched 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 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!

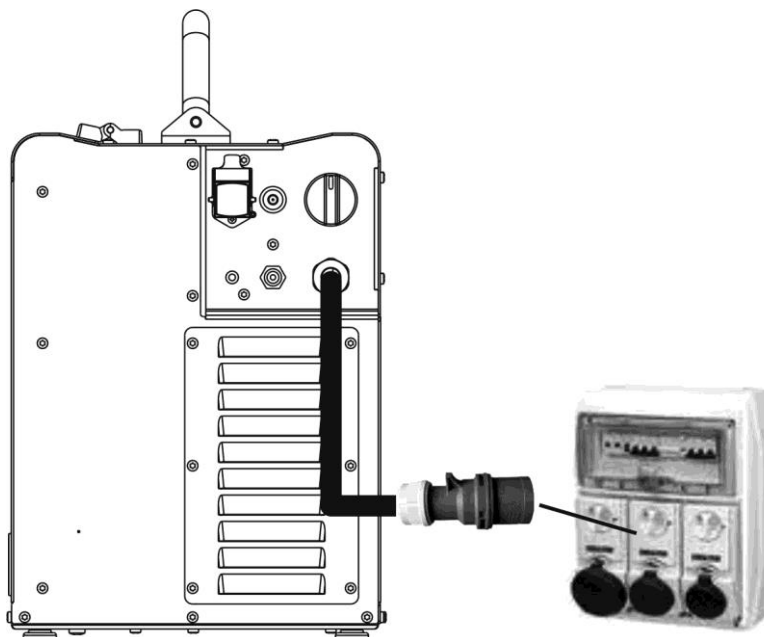
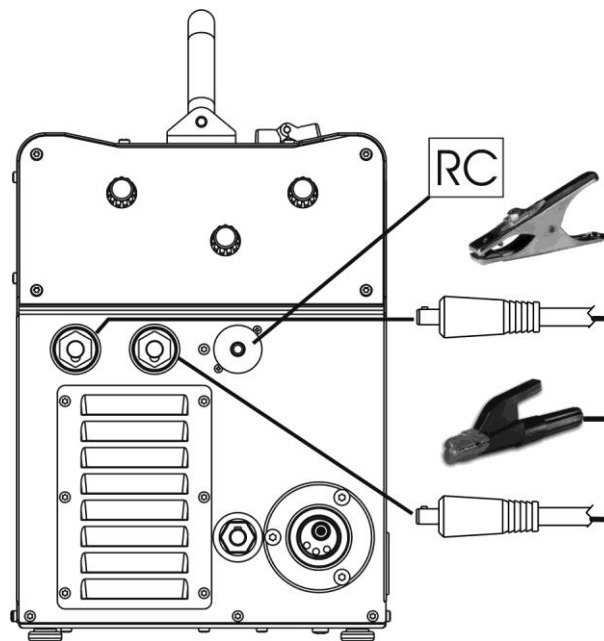
Read the warnings highlighted by the following symbols in the "General prescriptions for use".



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.

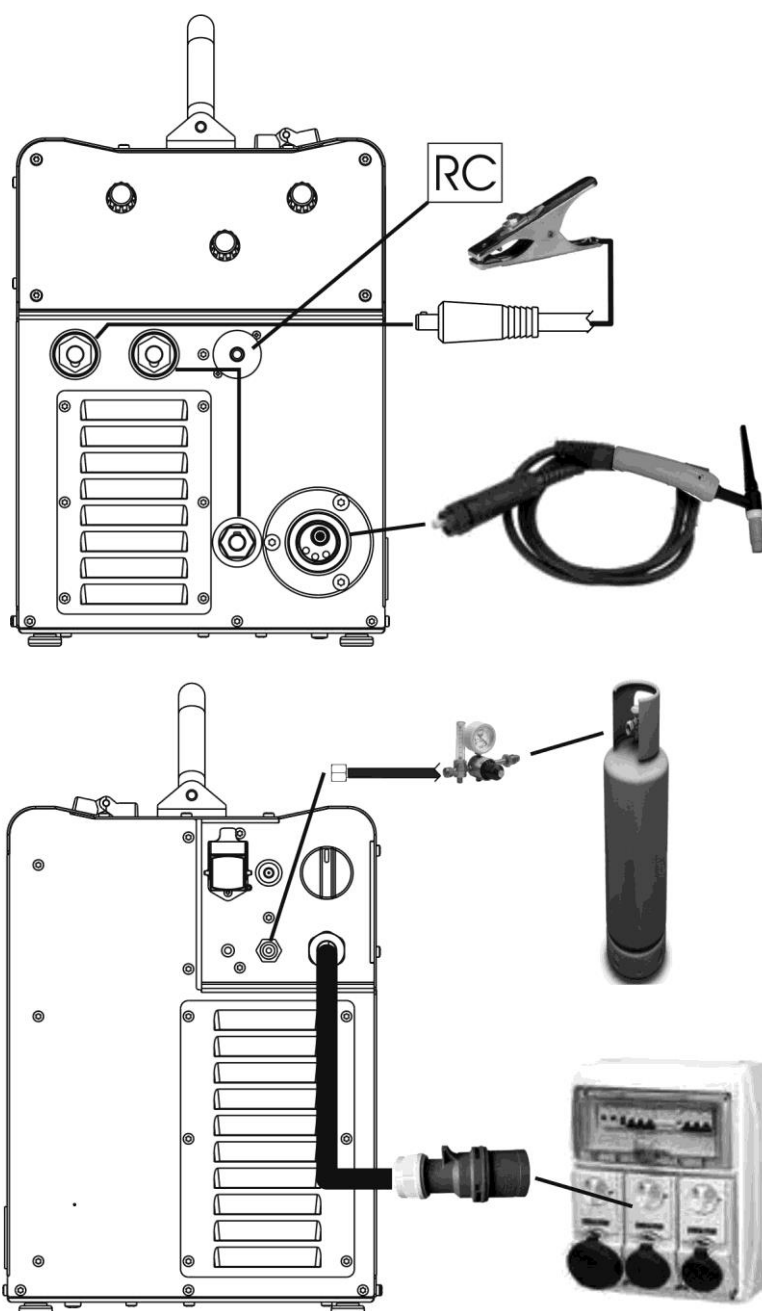
The system is ready to start welding.



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.



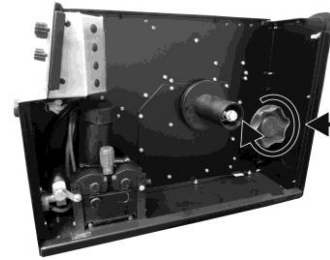
4. Choose the wire on the basis of the workpiece thickness and material type.
5. Fit the spool in the spool holder, ensuring it is located correctly.



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.

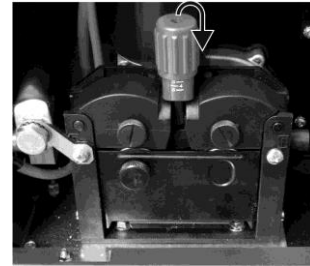


7. Refit the plug.

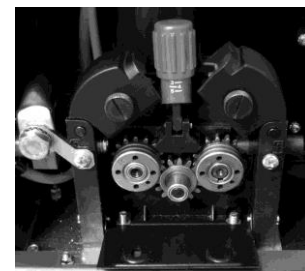


2.6.2 POSITIONING THE WIRE IN THE WIRE FEEDER

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 44.)

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

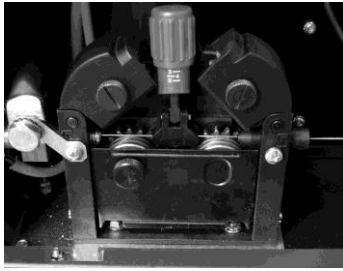
The roll must be of suitable shape in relation to the composition of the wire material.

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

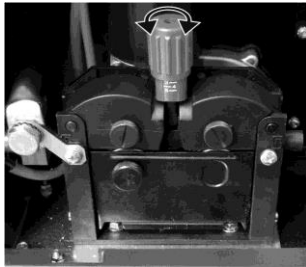
The groove must be "V" shaped for harder materials (SG2-SG3, stainless steels).

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

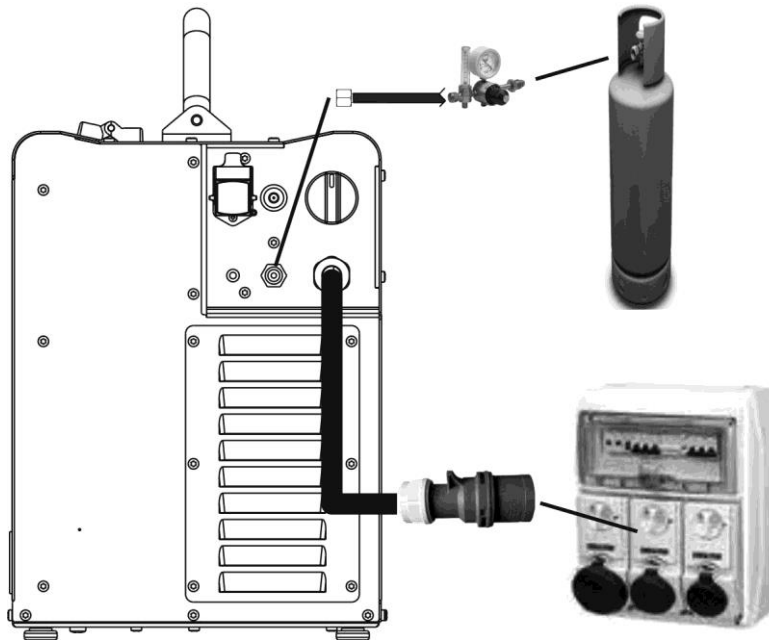
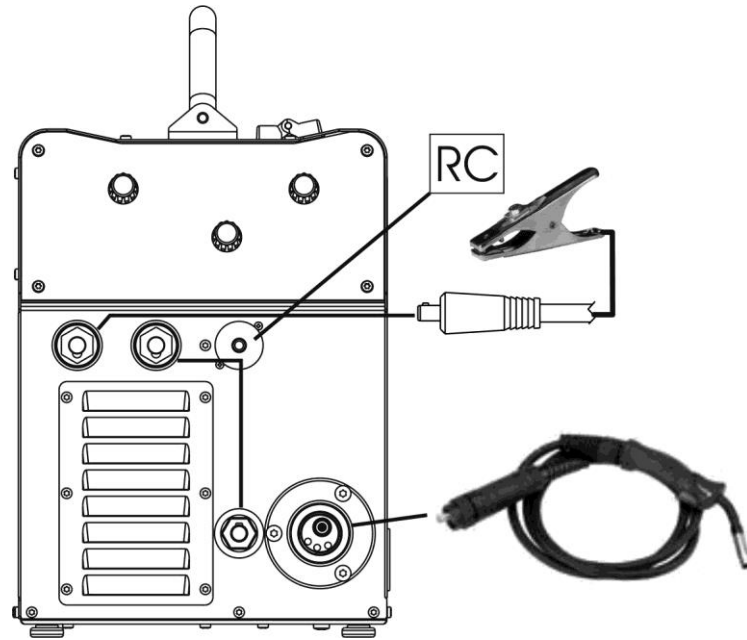
1. Set the welding power source ON/OFF switch to "O" (unit de-energized).
2. Plug the power cable plug into a mains socket outlet.
3. Connect the gas hose from the welding gas cylinder to the relative socket.
4. Open the cylinder gas valve.
5. Connect the MIG/MAG torch plug to the EURO TORCH welding 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.

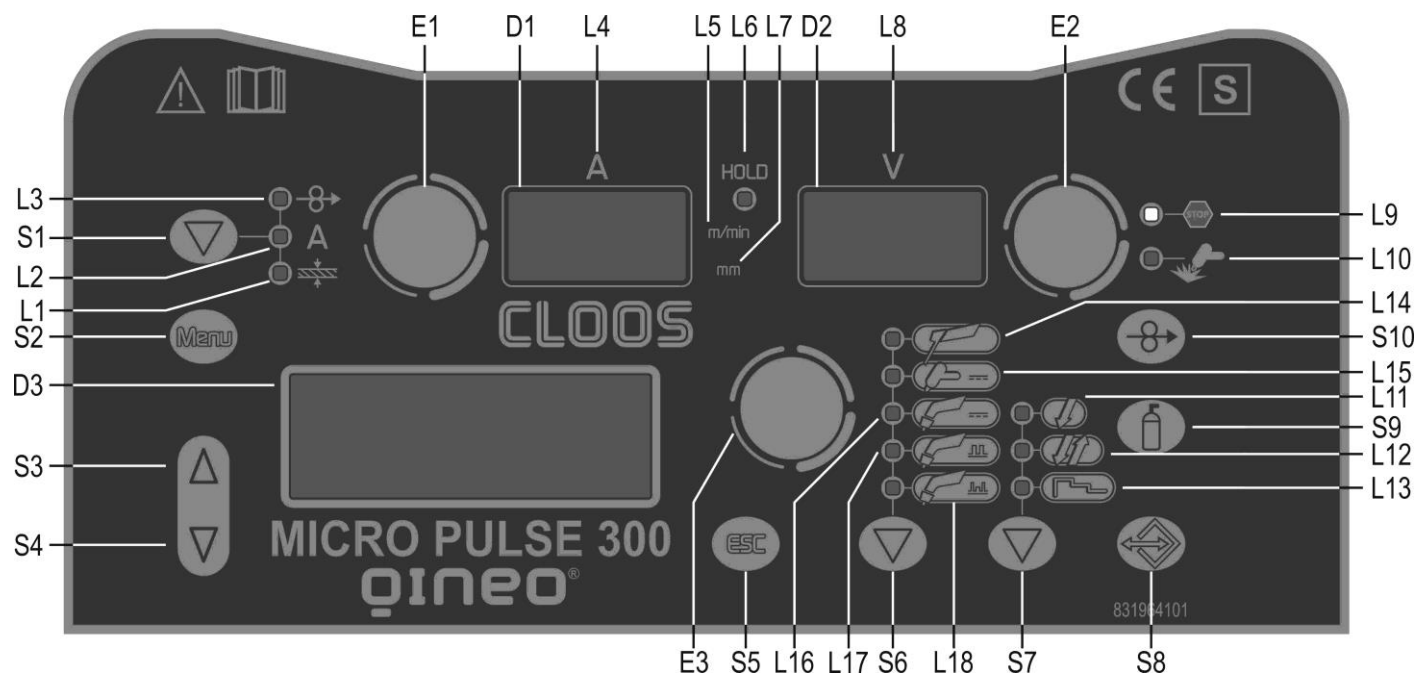
 On connecting and enabling a remote controller [RC] certain settings can be modified from said controller without having to take action on the user interface of the welding power source.

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 § 3.8 ALARMS MANAGEMENT page 18.
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 19.</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 "1" to switch on the unit.

MOTOR
MICROPULSE 302
FW: XX.XX.XXX
PROGRAM
UPDATE
MICRO PULSE
302
FW: YY.YY.YYY
POWER SOURCE
OK

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

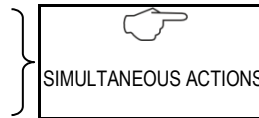
The reset procedure involves restoration of the parameter values and settings, except the following settings:

- 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.

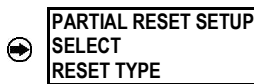
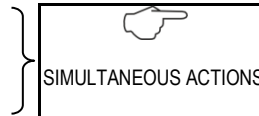
Wait for the memory clear procedure to terminate.

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.
① § 3.5 LOCKING PROCEDURE

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.
§ 3.5 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.

Tab. 1 - Setup settings

MENU PAGE	SETTING	MIN	DEFAULT	MAX	
SET UP 1/7	LANGUAGE				ENGLISH ITALIANO FRANÇAIS DEUTSCH ESPAÑOL PORTUGUES DUTCH CESKY SRBSKI POLSKI SUOMI
SET UP 2/7	COOLING TYPE	ON	OFF	AUTO	
SET UP 3/7	DISPLAY CONTRAST	0 %	80 %	100 %	
SET UP 4/7	CONTROL TYPE	OFF	OFF	RC06	OFF RC03 RC04 RC05 RC06
SET UP 5/7	LOCK STATUS	OFF	OFF	LOCK 3	OFF LOCK 1 LOCK 2 LOCK 3
SET UP 6/7	ARC CORRECTION	VOLTS	VOLTS	m/min	
SET UP 7/7	PUSH-PULL	OFF	OFF	ON	

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.

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 16.




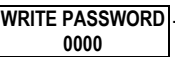





3.5 LOCKING PROCEDURE

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 5/7 of the SETUP menu.

- E3  Use the encoder to select the required lock status.
- S2  Press the button to confirm.
-   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




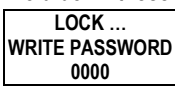




LOCKED STATUS SELECTED	ADJUSTMENT DEVICE				
	USER INTERFACE	RC03	RC04	RC05	RC06
OFF	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.	All adjustments enabled.
1	Selection of torch trigger procedure (button S7) Display of main welding parameters (button 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.

- S2  S3  Hold down these buttons simultaneously for 3 seconds.
-   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.

3.6 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.

3.7 TORCH LOADING**WARNING!**


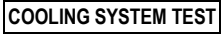

Make sure the torch in use is correctly sized in relation to the welding current required and for the available and selected cooling type. This prevents the risk of burns to which the operator is potentially exposed, potential faults, and irreversible damage to the torch and the system. If a torch is 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.


-   The message appears on the following displays: D3
- (any)  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.

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.

3.8 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	<p>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.</p>	<p>All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.</p>	<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.
	<p>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.</p>	<p>All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.</p>	<ul style="list-style-type: none"> - Check if the equipment power supply line has all the phases. <p>If the problem persists:</p> <ul style="list-style-type: none"> - qualified technical personnel are required for repair/maintenance jobs.
WARNING NO COMMUNICATIONS	<p>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.</p>	<p>All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.</p>	<ul style="list-style-type: none"> - Qualified technical personnel are required for repair/maintenance jobs.
WARNING TRIGGER	<p>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.</p>	<p>All functions disabled.</p>	<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	<p>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: </p>	<p>All functions disabled. Exceptions: - cooling fan.</p>	<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	<p>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: </p>	<p>All functions disabled. Exceptions: - Cooling fan. - Cooler alarm.</p>	<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.
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 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.
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).

4.1.3 4T MIG/MAG WELDING

1. Bring the torch up to the workpiece.
2. Press (1T) and release (2T) the torch trigger.
 - ➡ The wire advances at the approach speed until making contact with the work.
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).

4.1.4 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.
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).

4.1.5 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.
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.

4.1.6 4T B-L/3L MIG/MAG WELDING


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

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.

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.

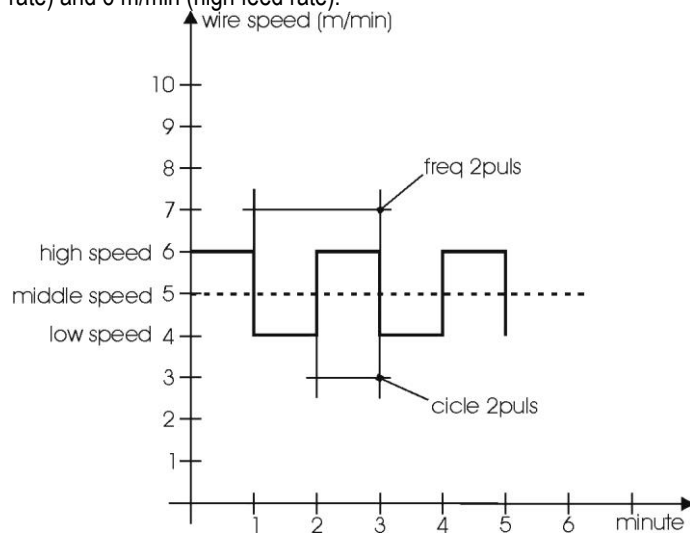
Values that are not excessively high are preferable for stability of the welding arc.

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.

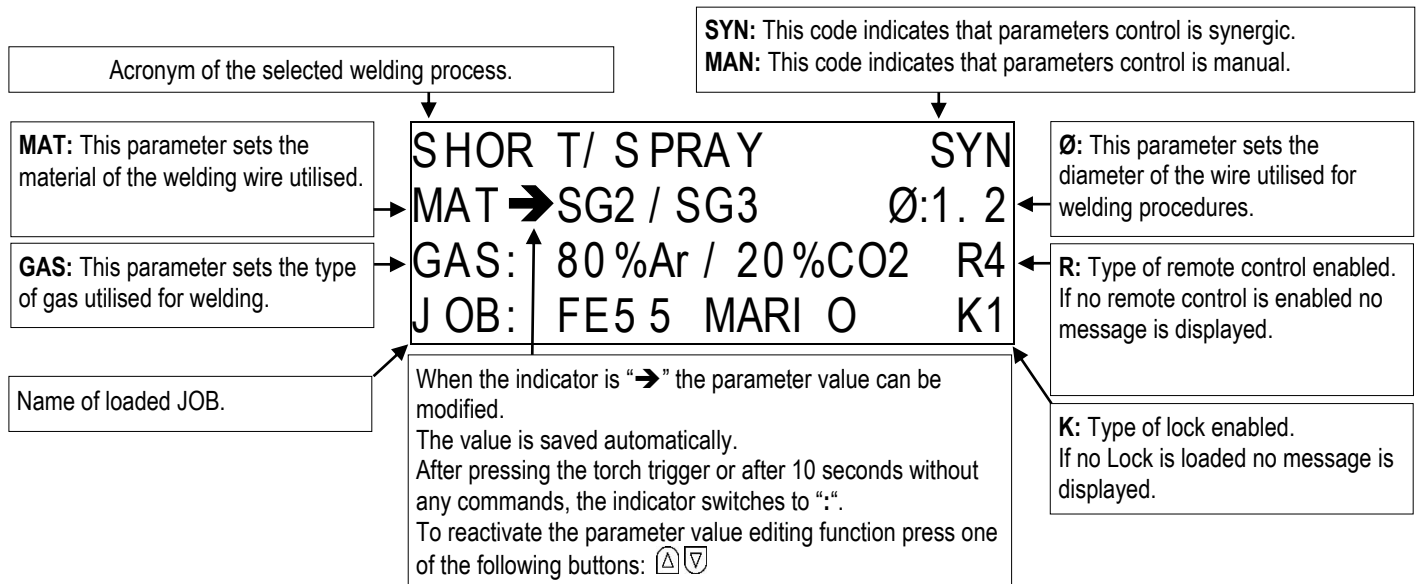
1: available selecting one of the "PF" curves (e.g.: SG2/SG3 PF)

MENU ↓	MODE →	 MANUAL		 SYNERGIC								
	PROCEDURE →											
	PARAMETER ↓											
-	ARC CORRECTION IN VOLTS			✓	✓	✓	✓	✓	✓	✓	✓	✓
-	ARC CORRECTION IN METRES PER MINUTE			✓	✓	✓	✓	✓	✓	✓	✓	✓
1°	INDUCTANCE	✓	✓									
2°	INDUCTANCE	✓	✓	✓	✓	✓						
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

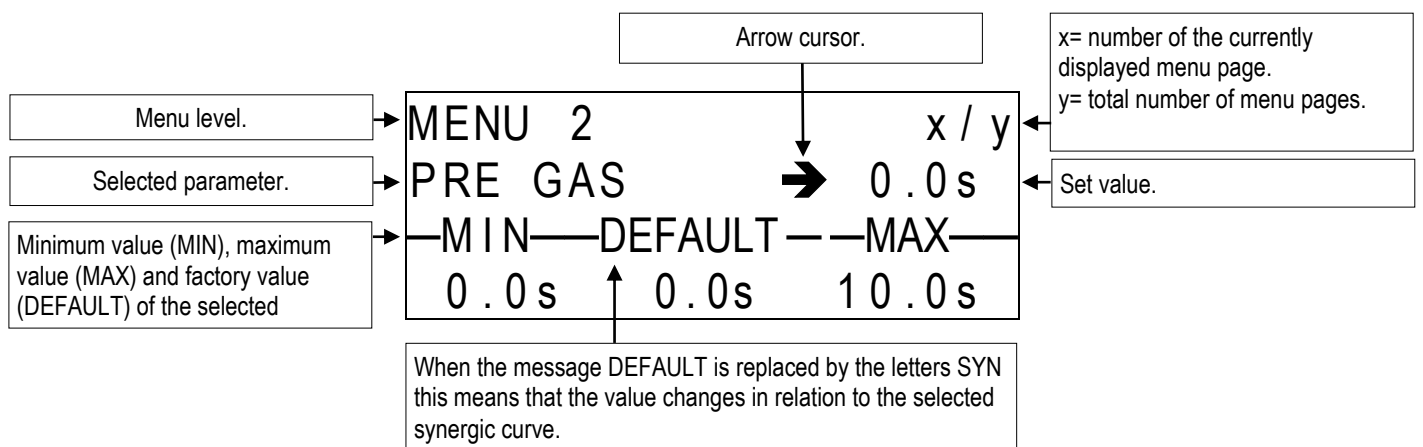
5.1 1ST LEVEL

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: HS AND POWER FOCUS

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

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

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.

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











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 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.
Welding HOLD function (At welding end)	Shows the average current measured during welding. Shows the average current measured during the last welding procedure performed.	Shows the average voltage measured during welding. 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 STROKE LIFT-ARC 2 STROKE SPOT	INDUCTANCE (row 1/7)	1	SYN	200
	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	100 %
	POST GAS (row 5/7)	0.0 s	0.3 s	10.0 s
	SPOT TIME (row 6/7)	0.1 s	OFF	25.0 s
	POWER FOCUS (row 7/7)	1 %	SYN	100 %
 4 STROKE LIFT-ARC 4 STROKE B-LEVEL	INDUCTANCE (row 1/7)	1	SYN	200
	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	100 %
	POST GAS (row 5/7)	0.0 s	0.3 s	10.0 s
	B-LEVEL (row 6/7)	1 %	OFF	200 %
	POWER FOCUS (row 7/7)	1 %	SYN	100 %
 3 LEVEL 4 STROKE 3 LEVEL 4 STROKE B-LEVEL	INDUCTANCE (row 1/11)	1	SYN	200
	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 %
	CRATER 3LEV (row 6/11)	10 %	80 %	200 %
	SLOPE 3LEV 1 (row 5/11)	0.1 s	0.5 s	10.0 s
	SLOPE 3LEV 2 (row 7/11)	0.1 s	0.5 s	10.0 s
	BURN BACK (row 8/11)	1 %	SYN	100 %
	POST GAS (row 9/11)	0.0 s	0.3 s	10.0 s
	B-LEVEL (row 10/11)	1 %	OFF	200 %
	POWER FOCUS (row 11/11)	1 %	SYN	100 %







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 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)

- 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. 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	0.3 s	10.0 s
	SPOT TIME (row 6/6)	0.1 s	OFF	25.0 s
 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	0.3 s	10.0 s
	B-LEVEL (row 6/6)	1 %	OFF	200 %
 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 %
	CRATER 3LEV (row 6/10)	10 %	80 %	200 %
	SLOPE 3LEV 1 (row 5/10)	0.1 s	0.5 s	10.0 s
	SLOPE 3LEV 2 (row 7/10)	0.1 s	0.5 s	10.0 s
	BURN BACK (row 8/10)	1 %	SYN	100 %
	POST GAS (row 9/10)	0.0 s	0.3 s	10.0 s
	B-LEVEL (row 10/10)	1 %	OFF	200 %

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 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)

- 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. 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	0.3 s	10.0 s
	SPOT TIME (row 6/10)	0.1 s	OFF	25.0 s
	FREQ 2PULS (row 7/10)	0.1 Hz	1.0 Hz	10.0 Hz
	RANGE 2PULS (row 8/10)	10 %	20 %	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 1/11)	1	SYN	200
	PRE GAS (row 2/11)	0.0 s	0.0 s	10.0 s
	SOFT START (row 3/11)	1 %	SYN	100 %
	BURN BACK (row 4/11)	1 %	SYN	100 %
	POST GAS (row 5/11)	0.0 s	0.3 s	10.0 s
	B-LEVEL (row 6/11)	1 %	OFF	200 %
	FREQ 2PULS (row 7/11)	0.1 Hz	1.0 Hz	10.0 Hz
	RANGE 2PULS (row 8/11)	10 %	20 %	90 %
	CYCLE 2PULS (row 9/11)	10 %	50 %	90 %
	ARC2 2PULS (row 10/11)	- 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 1/15)	1	SYN	200
	PRE GAS (row 2/15)	0.0 s	SYN	10.0 s
	SOFT START (row 3/15)	1 %	SYN	100 %
	START 3LEV (row 4/15)	10 %	130 %	200 %
	CRATER 3LEV (row 6/15)	10 %	80 %	200 %
	SLOPE 3LEV 1 (row 5/15)	0.1 s	0.5 s	10.0 s
	SLOPE 3LEV 2 (row 7/15)	0.1 s	0.5 s	10.0 s
	BURN BACK (row 8/15)	1 %	SYN	100 %
	POST GAS (row 9/15)	0.0 s	0.3 s	10.0 s
	B-LEVEL (row 10/15)	1 %	OFF	200 %
	FREQ 2PULS (row 11/15)	0.1 Hz	1.0 Hz	10.0 Hz
	RANGE 2PULS (row 12/15)	10 %	20 %	90 %
	CYCLE 2PULS (row 13/15)	10 %	50 %	90 %
	ARC2 2PULS (row 14/15)	- 9.9 V	0.0 V	9.9 V
	(row 15/15)	- 4.0 m/min	0.0 m/min	4.0 m/min

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.
- 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: **SAVE**
- S3 S4 Use these buttons to select the following parameter: **JOB**
- E3 Use the encoder to select the position of the job to be renamed.
- S8 Hold down the button for 3 seconds.
- The first letter of the name blinks.
- E3 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.
- Return to the job menu.
- S5 Press the button.

Exit with confirmation

- S8 Hold down the button for 3 seconds.
- 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.
- 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: **LOAD**
- 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.
- This action will automatically close the menu.






6.8.3 DELETING A JOB

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

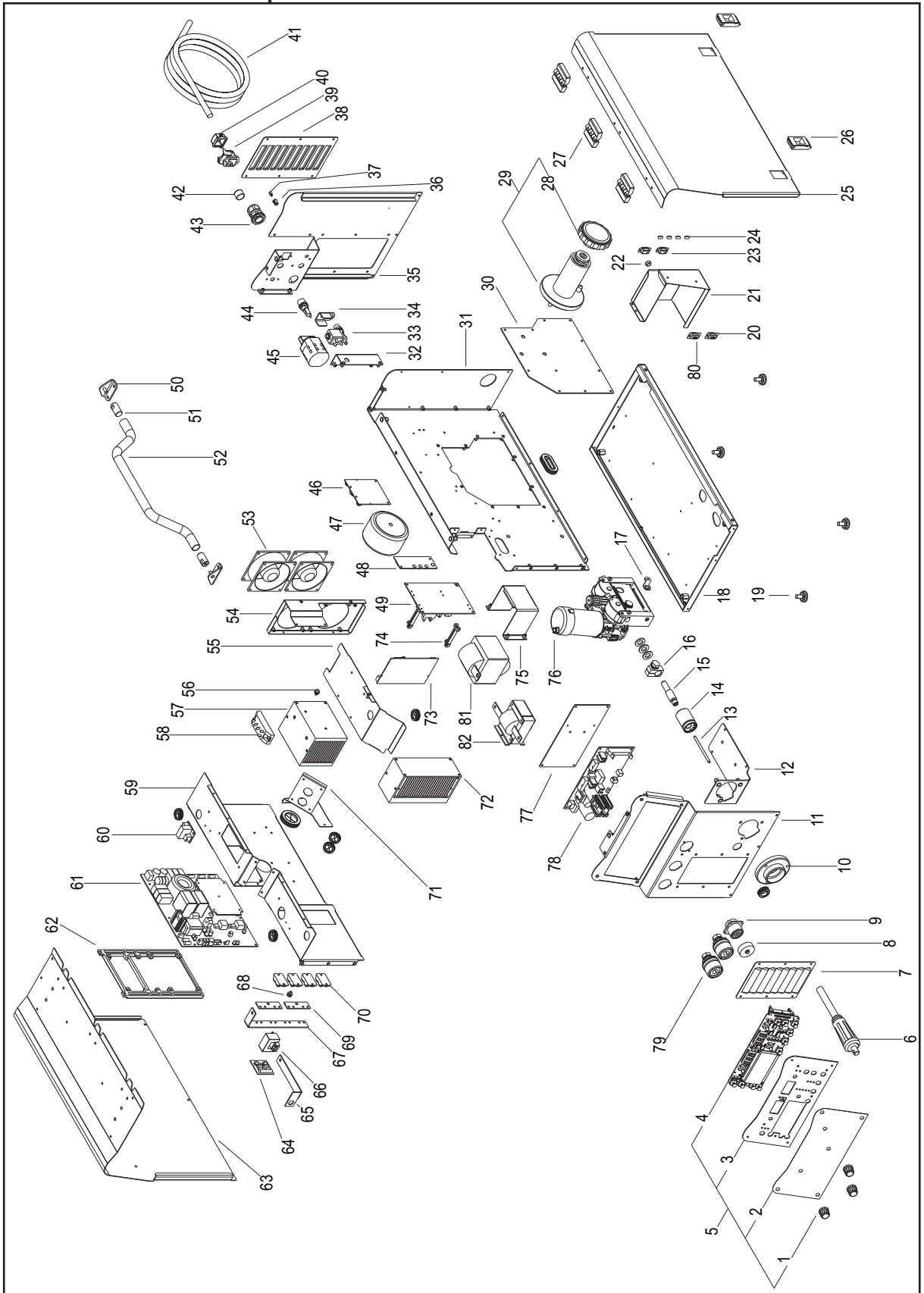
- S8  Press the button.
-  **CONFIRM JOB ERASURE** The message appears on the following displays: D3
- E3  Use the encoder to select the following setting: **NO**, or **YES**
- S8  Press the button.
-  This action will automatically close the menu.

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. ± 15 % / 50-60 Hz		
Mains protection	16 A Delayed		
Z_{max}	If this equipment is connected to a public low voltage system, it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected.		
Dimensions (L x D x H)	560 x 280 x 390 mm		
Weight	22.0 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

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	

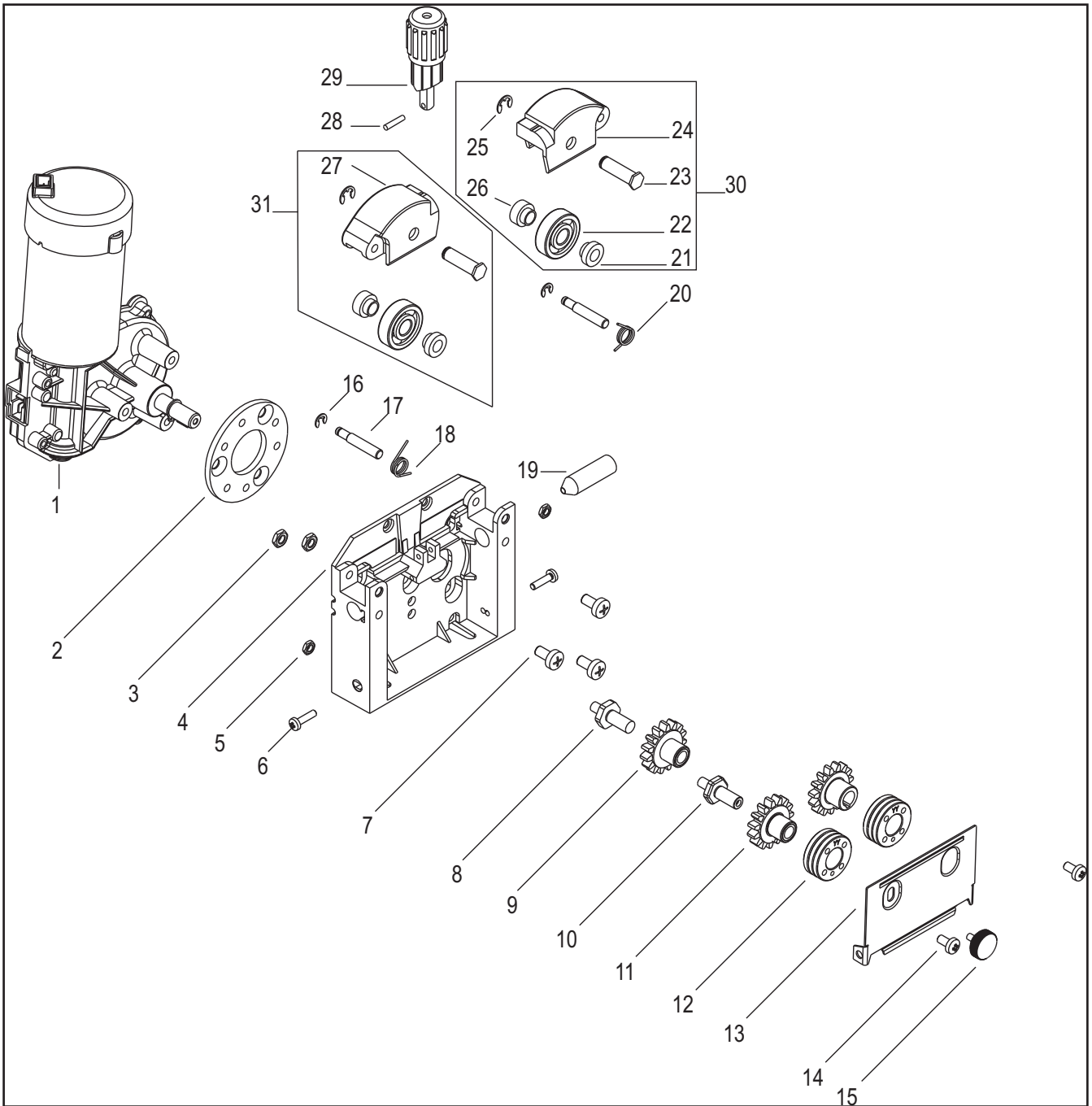
Spare Parts Micro Pulse 300



No.	order number	description
1	0831 96 41 00	KNOB WITHOUT POINTER
2	0831 96 41 01	FRONT PANEL LABEL
3	0831 96 41 02	LOGIC BOARD PLATE
4	0831 96 41 03	LOGIC BOARD
5	0831 96 41 04	COMPLETE FRONT LOGIC PANEL
6	0831 93 00 07	POLARITY SELECTOR CABLE
7	0831 93 00 08	BLIND METAL FRONT PLATE
8	0831 96 41 05	REMOTE CONNECTOR CAP
9	0831 96 41 06	REMOTE LOGIC CABLE
10	0831 93 00 09	PLASTIC HOUSING
11	0831 96 41 07	FRONT PLATE
12	0831 93 00 15	MOTOR SUPPORT PLATE
13	0831 93 00 11	CAPILLARY TUBE FOR EURO CONNECTOR
14	0831 93 00 12	AXIAL EURO BODY
15	0831 93 00 14	BRASS GUIDE FOR EURO CONNECTOR
16	0831 93 00 13	CURRENT CLAMP FOR BRASS GUIDE
17	0831 96 41 08	BRASS GUIDE BLOCK BRACKET
18	0831 93 00 20	LOWER COVER
19	0835 21 00 15	RUBBER FOOT
20	0831 96 41 09	RS232 CABLE (COM2)
21	0831 96 41 10	LOGIC PROTECTION PLATE
22	0831 96 41 11	CAP Ø=12
23	0831 96 41 12	RS232 CONNECTOR CAP
24	0831 93 00 17	CAP Ø=10
25	0831 96 41 13	DOOR PLATE
26	0831 93 00 19	PLATE SLIDE CLOSURE
27	0831 93 00 26	PLASTIC HINGE
28	0831 96 41 14	SCREW CAP FOR SPOOL SUPPORT
29	0831 93 00 24	SPOOL SUPPORT
30	0831 96 41 15	INTERNAL PLATE
31	0831 96 41 16	INTERNAL PLATE
32	0831 93 00 35	REAR FIXING PLATE
33	0831 93 00 29	SOLENOID VALVE
34	0835 21 00 37	SOLENOID VALVE BLOCK PLATE
35	0831 93 00 27	REAR PLATE
36	0835 27 41 23	LED HOLDER
37	0831 93 00 30	RED LED CABLE
38	0831 93 00 28	BLIND METAL REAR PLATE
39	0831 96 41 18	C.U. POWER SUPPLY WIRING
40	0835 21 00 34	C.U. POWER CONNECTOR CAP
41	0835 23 00 17	NEOPRENE CABLE
42	0831 96 41 19	FUSE HOLDER CAP
43	0835 21 00 31	COMPLETE CABLE CLAMP
44	0831 93 00 31	FUSE HOLDER
45	0835 23 00 19	THREE-POLE SWITCH
46	0831 93 00 36	THREE-PHASE POWER INPUT PROTECTION BOARD
47	0831 96 41 20	AUXILIARY TRANSFORMER
48	0835 23 41 07	PRIMARY CAPACITOR BOARD
49	0831 96 41 22	BUS BOARD
50	0831 93 00 32	HANDLE TUBE SUPPORT PLATE
51	0831 93 00 33	PIN
52	0831 93 00 34	HANDLE TUBE

No.	order number	description
53	0831 93 00 42	FAN
54	0831 93 00 43	FANS SUPPORT PLATE
55	0831 93 00 57	INTERNAL DEFLECTOR PLATE
56	0831 93 00 40	THERMAL CUT-OUT 75°C
57	0831 93 00 59	HEAT SINK
58	0831 93 00 41	THREE PHASE BRIDGE RECTIFIER
59	0831 93 00 46	DEFLECTOR PLATE
60	0831 93 00 39	FAN CONTROL BOARD
61	0831 93 00 47	POWER BOARD
62	0831 93 00 48	INTERNAL FRAMEWORKS
63	0831 96 41 23	COVER PLATE
64	0831 96 41 24	SNUBBER BOARD
65	0831 93 00 51	HALL-SOCKET COPPER BRACKET
66	0831 96 41 25	HALL EFFECT SENSOR
67	0831 93 00 53	DIODES-HALL COPPER BRACKET
68	0831 93 00 49	THERMAL CUT-OUT 85°C
69	0831 93 00 54	DIODES-TRANSFORMER COPPER BRACKET
70	0835 21 00 21	ISOTOP DIODE
71	0831 93 00 56	OBLIQUE PLATE FOR DEFLECTOR
72	0831 93 00 58	HEAT SINK
73	0831 96 41 26	PULSE BOARD
74	0835 21 00 40	BOARDS SUPPORT GUIDE
75	0831 93 00 44	TRANSFORMER SUPPORT PLATE
76	0831 96 41 27	WIRE FEED MOTOR
77	0831 96 41 28	MOTOR BOARD SUPPORT PLATE
78	0831 96 41 29	MOTOR BOARD
79	0835 21 00 11	COMPLETE FIXED SOCKET
80	0831 96 41 30	RS232 CABLE (COM1)
81	0831 93 00 45	POWER TRANSFORMER
82	0831 93 00 55	INDUCTANCE

WIRE FEEDER MOTOR



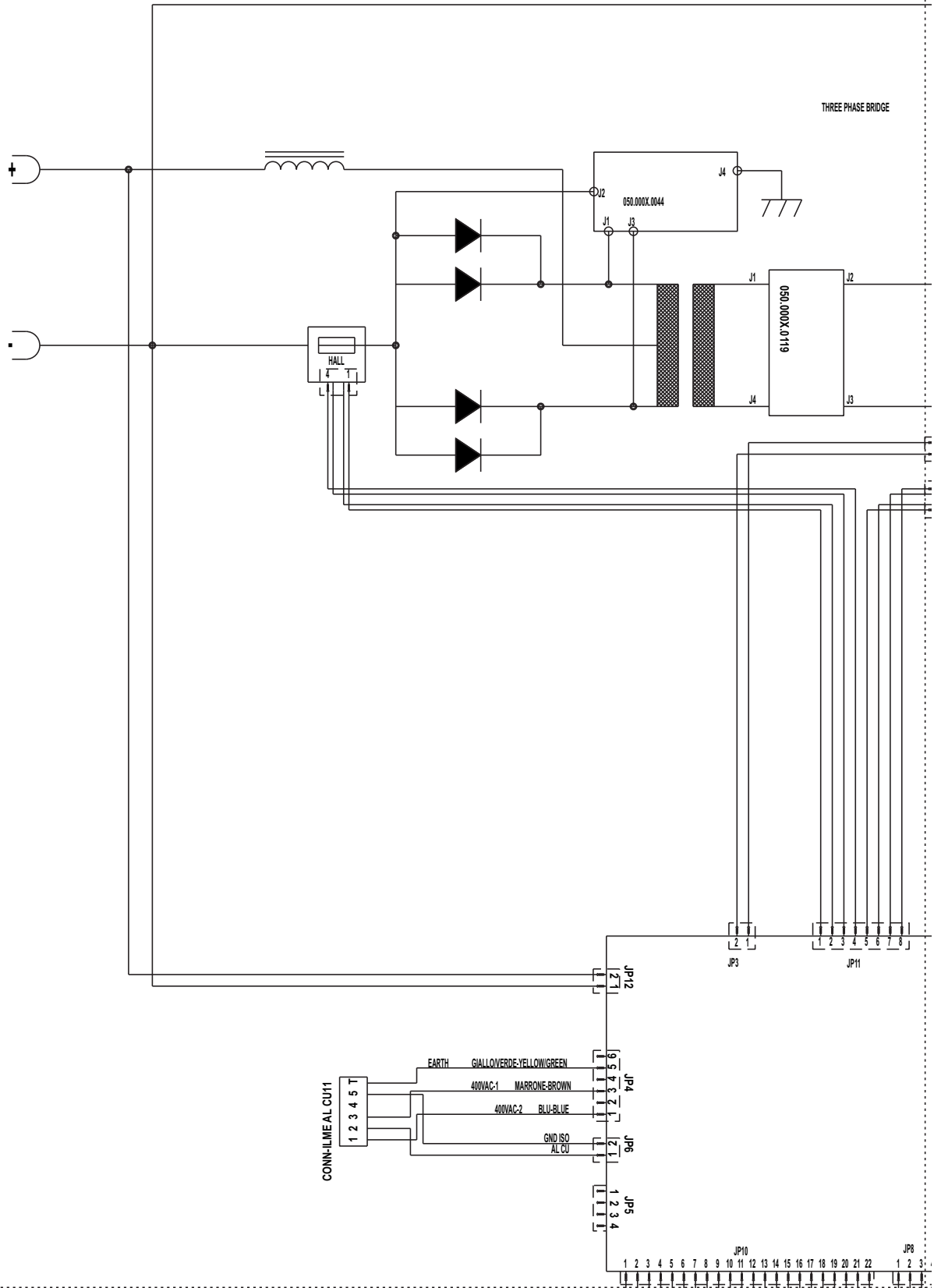
No.	order number	description
1	0831 96 42 00	MOTOR COIL
2	0831 96 42 01	DISTANCE RING
3	0831 96 42 02	NUT M6
5	0831 96 42 03	NUT M5
4	0831 96 42 04	FEED PLATE
6	0831 96 42 05	SCREW M4x18
7	0831 96 42 06	SCREW M6x12

No.	order number	description
8	0831 96 42 07	SHAFT (1)
9	0831 96 42 08	MAIN GEAR DRIVE
10	0831 96 42 09	SHAFT (2)
11	0831 96 42 10	GEAR DRIVE
12	0046 03 45 12	FEED ROLL
13	0831 96 42 11	INTERNAL PROTECTION PLATE
14	0831 96 42 12	SCREW M5x10
15	0831 96 42 13	RETAINING SCREW M5x6
16	0831 96 42 14	SNAP RING 4 mm
17	0831 96 42 15	JOINT AXLE
18	0831 96 42 16	LEFT SPRING
19	0831 96 42 17	INLET GUIDE WITH SOFT LINER
20	0831 96 42 18	RIGHT SPRING
21	0831 96 42 19	DISTANCE RING (1)
22	0831 96 42 20	KNURLED DRIVE ROLL
23	0831 96 42 21	PRESSURE ROLL AXLE
24	0831 96 42 22	RIGHT PRESSURE ARM
25	0831 96 42 23	SNAP RING 6 mm
26	0831 96 42 24	DISTANCE RING (2)
27	0831 96 42 25	LEFT PRESSURE ARM
28	0831 96 42 26	PIN
29	0831 96 42 27	COMPLETE PRESSURE DEVICE
30	0831 96 42 28	COMPLETE RIGHT PRESSURE ARM
31	0831 96 42 29	COMPLETE LEFT PRESSURE ARM

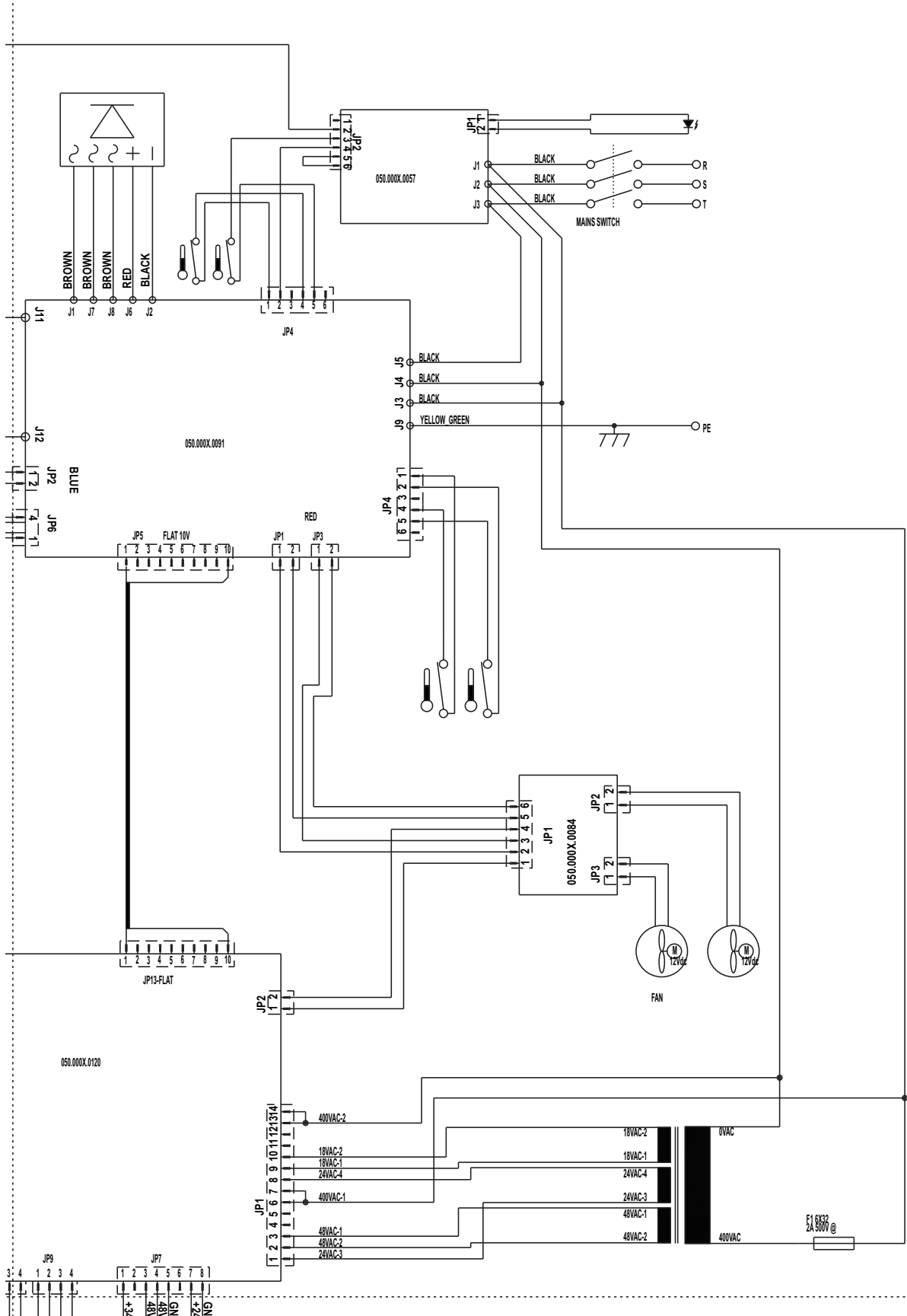
WIRE FEED ROLLERS

No.	order number	description
Steel, V-Groove		
1	0046 03 45 08	ST Ø0,6, Ø0,8; Ø30;Ø14
2	0046 03 45 10	ST Ø0,8, Ø1,0; Ø30;Ø14
3	0046 03 45 12	ST Ø1,0, Ø1,2; Ø30;Ø14
4	0046 03 45 16	ST Ø1,2, Ø1,6; Ø30;Ø14
Fluxed core wire, V-Groove, knurled		
5	0046 03 46 12	R Ø1,0, Ø1,2; Ø30;Ø14
6	0046 03 46 16	R Ø1,2, Ø1,6; Ø30;Ø14
Aluminium, U-Groove		
7	0046 03 47 10	AL Ø0,8, Ø1,0; Ø30;Ø14
8	0046 03 47 12	AL Ø1,0, Ø1,2; Ø30;Ø14
9	0046 03 47 16	AL Ø1,2, Ø1,6; Ø30;Ø14

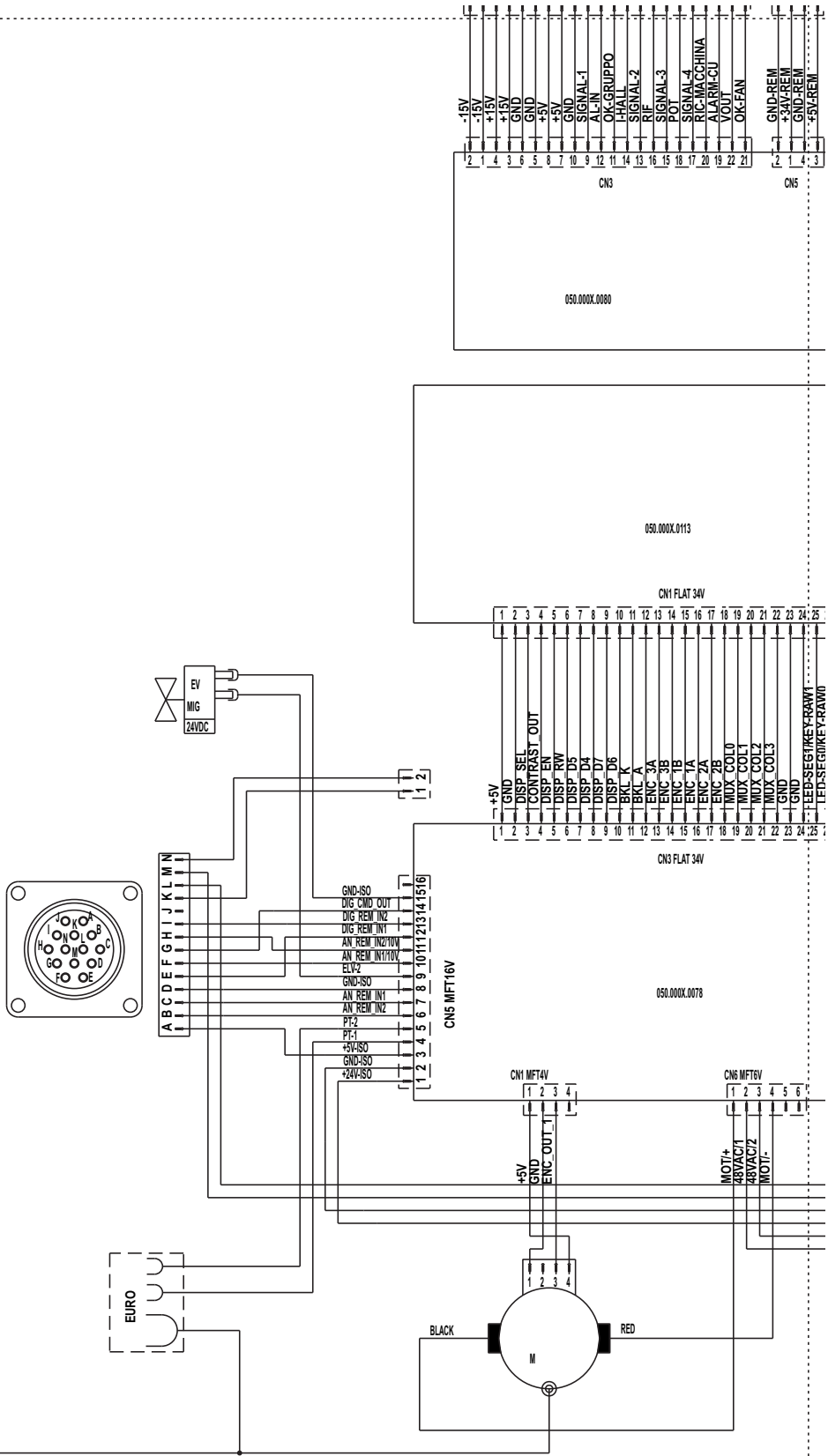
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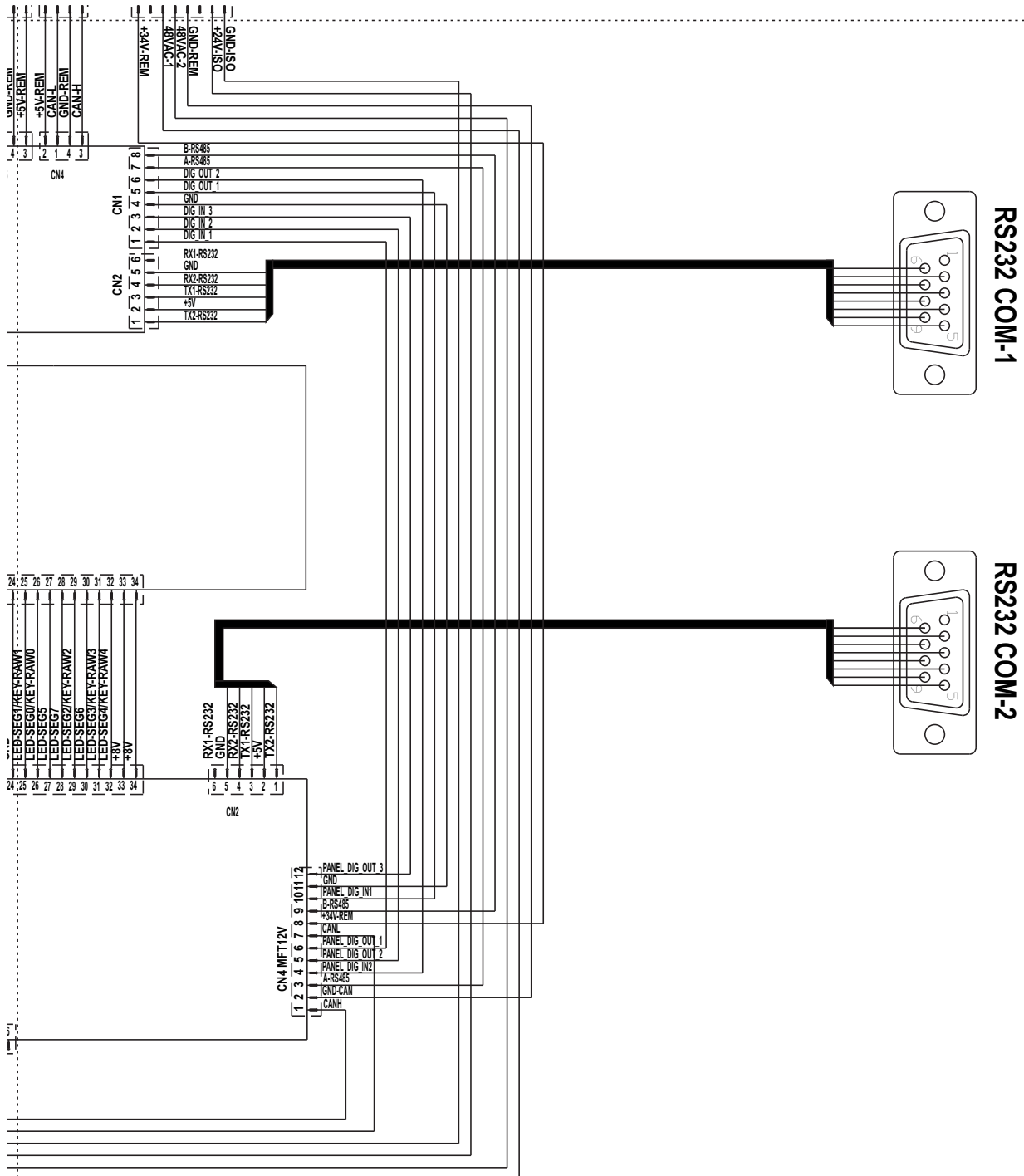


B



C CHANGE POLARITY





CLOOS

Weld your way.