



SAF-FRO

DIGISTEEL III 320C
DIGIPULS III 320C



EN

SAFETY INSTRUCTIONS FOR OPERATION AND MAINTENANCE

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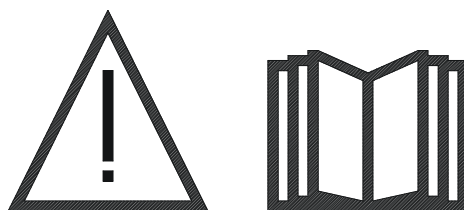


Contact :
<http://www.airliquidewelding.com/>



AIR LIQUIDE

WELDING™



EN Arc welding and plasma cutting may be dangerous for the operator and persons close to the work area. Read the operating manual.

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1 - GENERAL INFORMATION

1.1. PRESENTATION OF INSTALLATION

DIGISTEEL III 320C / DIGIPULS III 320C is a manual welding set that enables the following:

- ⇨ MIG-MAG welding with short arc, speed short arc, spray-arc, normal pulsed mode (only on DIGIPULS), using currents from 15A to 320A.
- ⇨ Feeding different types of wire
 - ⇒ Steel, stainless steel, aluminum and special wires
 - ⇒ solid and cored wires
 - ⇒ diameters from 0.6-0.8-1.0-1.2 mm
- ⇨ Coated electrode welding

1.2. WELDING SET COMPONENTS

The welding set consists of 4 main components :

- 1 - Power source including its primary cable (5m) and its ground strip (5m)
- 2 - Workshop trolley (optional),
- 3 - Universal trolley (optional),
- 4 - Cooler unit (optional)

Each item is ordered and supplied separately.

Options ordered with the welding set are delivered separately. To install these options, refer to the instructions supplied with the option.



WARNING :

The plastic handles are not intended for slinging the set. Stability of the equipment is guaranteed only for an incline of maximum 10°.

1.3. POWER SOURCES TECHNICAL SPECIFICATIONS

| | DIGISTEEL III 320C - W000385049 | DIGIPULS III 320C - W000385050 |
|---|---------------------------------|--------------------------------|
| Primary side | | |
| Primary power supply | 400V +/- 20% | 400V +/- 20% |
| Primary power supply frequency | 50/60Hz | 50/60Hz |
| Effective primary consumption | 12 A | 12 A |
| Maximum primary consumption | 18,7 A | 18,7 A |
| Fuse primary | 20 A Gg | 20 A Gg |
| Maximum apparent power | 13,1 KVA | 13,1 KVA |
| Maximum active power | 12,1 KW | 12,1 KW |
| Recommended power generator | 20 KVA | 20 KVA |
| Active power in standby (IDLE) | 50 W | 50 W |
| Efficiency at maximum current | 0,87 | 0,87 |
| Power factor at maximum current | 0,92 | 0,92 |
| Cos Phi | 0,99 | 0,99 |
| Secondary side | | |
| No load voltage (according standard) | 74 V | 74 V |
| Welding range Max MIG | 10V / 50V | 10V / 50V |
| Welding range Max MMA | 15A / 320A | 15A / 320A |
| Duty cycle at 100% (10 min cycle at 40°C) | 220A | 220A |
| Duty cycle at 60% (6 min cycle at 40°C) | 280A | 280A |
| Duty cycle at maximum current at 40°C | 320A | 320A |
| Wire feeder | | |
| Rollers plate | 4 rollers | |
| Wire feeding speed | 0,5 – 25,0 m / mn | |
| Wire diameter usable | 0.6 to 1,2 mm | |
| Weight, type, size of wire spool | 300 mm | |
| Maximum pressure of gas | 6 bar | |
| Miscellaneous | | |
| Dimensions (Lxwxh) | 755 x 300 x 523 mm | |
| Weight | 28 Kg | |
| Operating temperature | - 10°C/+40°C | |
| Storage temperature | - 20°C/+55°C | |
| Torch connection | "European type" | |
| Protection index | IP 23 | |
| Insulation class | H | |
| Standard | 60974-1 & 60974-5 & 60974-10 | |



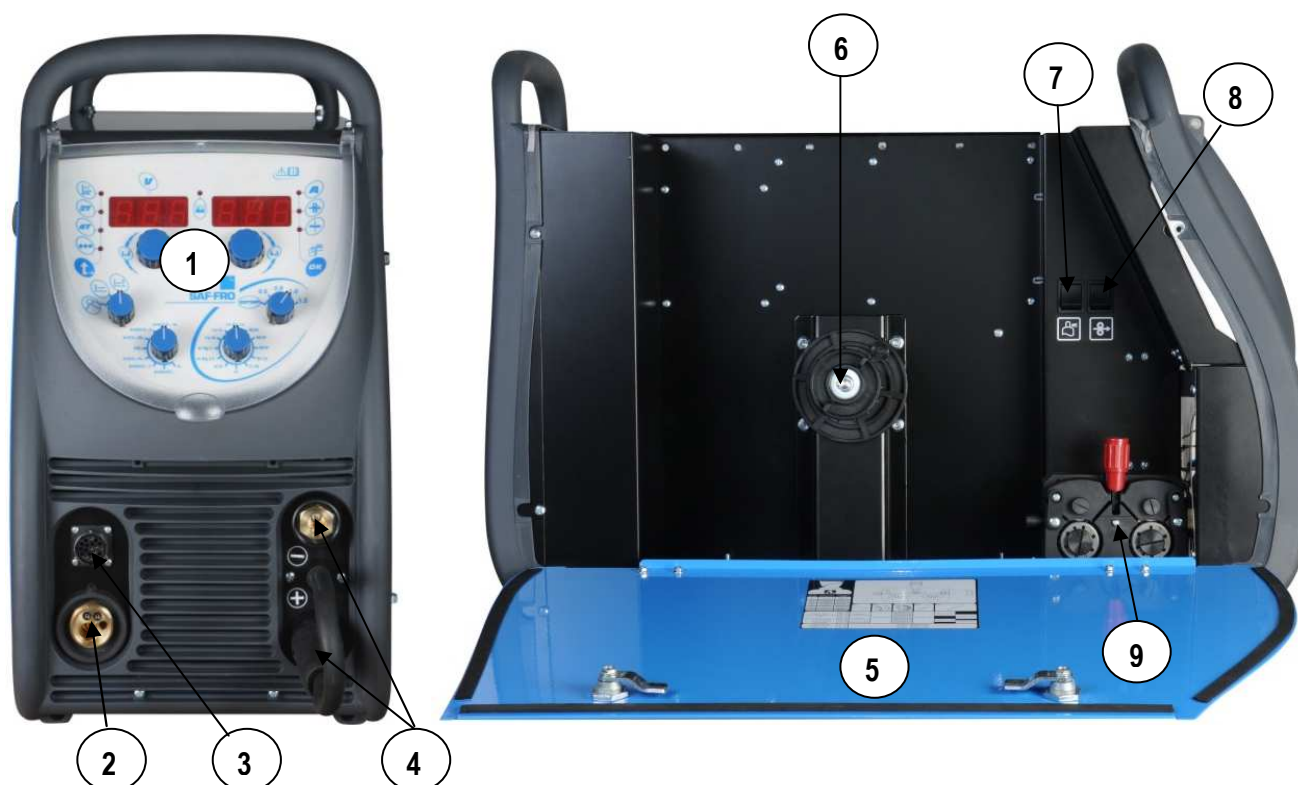
WARNING: This power source cannot be used in falling rain or snow. It may be stored outside, but it is not designed for use without protection during raining.

2 - STARTING UP

2.1. POWER SOURCE GENERAL DESCRIPTION

The power source is composed with :

- 1- Front panel display
- 2- European plug for torch
- 3- Additional plug for 2 potentiometers torch
- 4- Plug for ground cable and polarity inversion
- 5- Protection door for wire feeder section
- 6- Spool axle, shaft, axle nut
- 7- Gas purge button
- 8- Wire feeding button
- 9- Wire driver



2.2. ELECTRICAL CONNECTIONS TO THE MAINS

DIGISTEEL III 320C / DIGIPULS III 320C is a 400 V 3-phase welding set. If your mains supply corresponds to requirements, connect the "three-phase + ground" plug to the end of the power cable.



WARNING: Sous réserve que l'impédance de réseau public d'alimentation basse tension au point de couplage commun soit inférieure à $33 \text{ m}\Omega$, ce matériel est conforme à la CEI 61000-3-11 et à la CEI 61000-3-12, et peut être connecté aux réseaux publics d'alimentation basse tension. Il est de la responsabilité de l'installateur ou de l'utilisateur du matériel de s'assurer, en consultant l'opérateur du réseau de distribution si nécessaire, que l'impédance de réseau est conforme aux restrictions d'impédance.



WARNING: This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

2.3. CHOICE OF CONSUMABLES

Arc welding requires the use of wire of a suitable type and diameter as well as use of appropriate gas. Refer to the table of gases and synergies in Paraf 6.3.

**WARNING :**

The following wires are used in reverse polarity: SD ZN = SAFDUAL ZN.

2.4. POSITIONING THE WIRE

To set up the wire :

Turn the power source off.

Open the door of the wire-feeder unit [5] and ensure that it can not fall.

Unscrew the spool axle nut. [6].

Insert the spool of wire on the axis. Make sure that the locating pin of the shaft [6] is properly located into the reel locator.

Screw the spool nut [6] back on the shaft, turning it in the direction shown by the arrow.

Lower the lever of wire driver [9] in order to release the rollers.

Take the end of the wire of the spool and cut the distorted end piece.

Straighten the first 15 centimeters of wire.

Insert the wire via the inlet wire-guide of the plate.

Lower the rollers [9] and raise the lever in order to immobilise it.

Adjust the pressure of the rollers on the wire to the correct tension.

Wire feed

The wire feeding button (8) feeds the wire into the torch. The wire feeds over 1s at minimum speed and the speed increases gradually until the set wire speed is reached, but is limited to 12 m / min. The settings may be change at any time; the power source displays the speed.

To feed the wire through the torch

Maintain the wire feeding button (8).

Wire speed can be adjusted with the button on front panel.

To full the gas line or adjust the gas flow

Push the gas bleed button (9).

2.5. WIRE DRIVER WEAR PART

The wearing parts of the wire driver, whose role is to guide and advance the welding wire, must be adapted to the type and diameter of the welding wire used. On the other hand, their wear may affect the welding results. Is necessary to replace them.

Please refer to paragraph 5.5 to choose wearing parts for wire driver.

2.6. CONNECTION OF THE TORCH

The MIG welding torch is connected to the front of the wire feeder, after ensuring it has been properly outfitted with the wear parts corresponding to the wire used for welding.

For this purpose, please refer to the torch instructions.

2.7. GAS INLET CONNECTION

The gas outlet is positioned at the rear of the power source. Simply connect it to the pressure-regulator outlet of the gas cylinder.

☞ Place the gas cylinder on the trolley at the rear of the power source and fasten the bottle using the strap.

☞ Open the cylinder valve slightly to allow existing impurities to escape and then reclose it.

☞ Mount the pressure regulator/flowmeter.

☞ Open the gas cylinder.

During welding, the gas flow rate should be between 10 and 20l/min.

**WARNING :**

Be sure that the gas cylinder is properly secured on the trolley by attaching the safety strap.

2.8. SWITCH ON

1



The main switch is located at the rear of the power source.

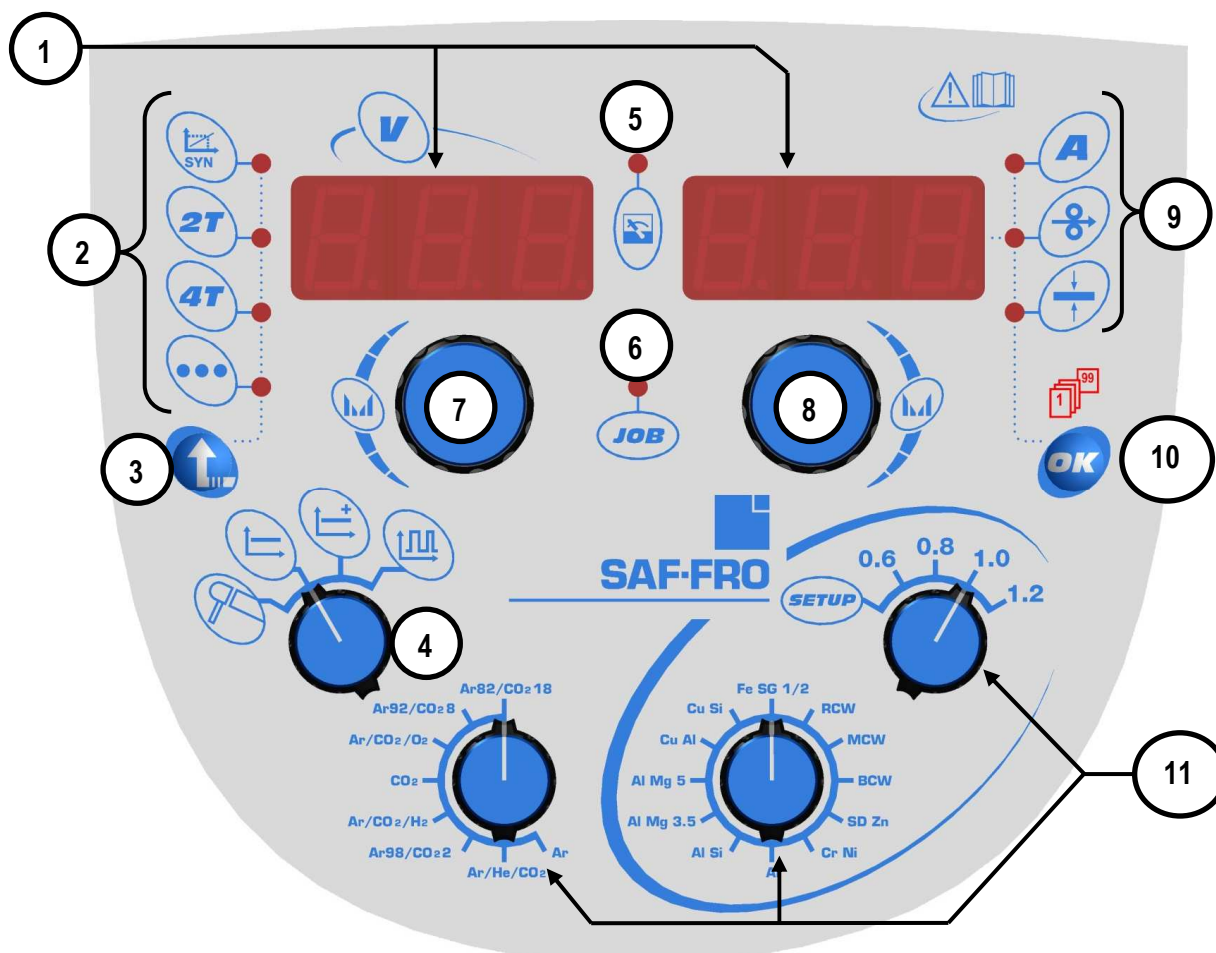
Flip this switch to turn the machine on.

Note: This switch must never be flipped during welding.

At each start-up, the power source displays the software version and recognized power.

3 - INSTRUCTIONS FOR USE

3.1. FRONT PANEL FUNCTIONS



Left display: Voltage, Right display: Current/ wire speed /wire thickness

1

Display for selection of welding mode

2

Selector button for welding mode / Button cancel in program mode

3

Selector switches for welding process

4

Measurement indicator of displayed values (pre-welding, welding and post-welding data)

5

Led indicator for program mode

6

Encoder voltage setup and navigation

7

Encoder for current, wirespeed, metal sheet thickness setup and navigation

8

Display mode indicator current, wirespeed, metal sheet thickness

9

Selector button for pre-display and program management

10

Selector switch for type of gas, wire diameter and type of welding wire

11

3.2. CALIBRATE THE POWER SOURCE



WARNING :

When starting up for the first time, the calibration is an unavoidable step to achieve quality welding. If polarity is reversed, this step must be repeated.

Step 1: Turn the wire diameter switch to SETUP position and press the OK button to access the **CONF** Setup screen.

Step 2: Select the **CL** parameter with the left-hand encoder and select **On** with the right-hand encoder.

Step 3: Press the OK button on the front panel. The display unit indicates **ErGEr**.

Step 4: Remove the torch nozzle.

Step 5: Cut the wire.

Step 6: Place the piece in contact with the contact tube.

Step 7: Press the trigger.

Step 8: The display will indicate the value of L (cable inductance).

Step 9: Display the value of R using the right-hand encoder (cable resistance).

Step 10: Exit Setup.

3.3. DISPLAY AND USE

3.3.1. Synergic mode

The Current, Voltage and Thickness values listed for each wire feed speed setting are provided for information purposes only. They correspond to measurements under given operating conditions, such as position, length of the end section (flat position welding, butt welding). The units current/voltage displayed correspond to the average measured values, and they may differ from the theoretical values.

Led indicator for program mode:

- ⇒ OFF: pre-welding display of instructions.
- ⇒ ON: Display of measurements (average values).
- ⇒ Flashing: Measurements during welding.

Selection of wire, diameter, gas, welding process

Select the type of wire, the wire diameter, the used welding gas and welding process by turning the appropriate switch.

Selection of the material will determine the available values for diameter, gas and processes.

If synergy does't exist, power source displays **not SYN, GAS SYN, IR SYN Or PRO SYN**.

Selection of welding mode, arc length and pre-welding display

Select welding mode 2T, 4T, spot, synergic and manual by using press button return (3). Arc length can be adjusted with left encoder (7) and pre-welding display adjustment is performed with right encoder (8). The selection of pre-welding preset is performed with press button OK. (10)

3.3.2. Manual mode

This is the disengaged mode of the welding machine. Adjustable parameters for it are wire speed, arc voltage and fine setting. In this mode, only the wire speed value is displayed.

3.3.3. SETUP mode

Accessing the SETUP:

The SETUP screen can only be accessed when no welding is in progress, by setting the Wire Diameter selector on the front panel to position 1.

It consist in two pull-down menu :

'**CYCLE**' → Setting for the cycle phases. Refer to paragraph 6.2 for details

'**CONF**' → Power source configuration

Configuring the SETUP:

In SETUP position, select **CYCLE** or **CONF** by pressing the OK button.

Turn the **left-hand** encoder to scroll through the available parameters.

Turn the **right-hand** encoder to set their value.

No welding start. All the changes are saved on exiting the SETUP menu.

List of accessible parameters in **CONF** menu

| Left display | Right display | Step | Default | Description |
|--------------|-------------------|--------|---------|---|
| GrE | On - OFF - Rwb | | Rwb | Configuration of the Water Cooling Unit. 3 possible states : - On : Forced on, watercooler is always activated - OFF : Forced off, watercooler is always deactivated - Rwb : Automatic mode, Watercooler works when according need |
| ScU | nc - no - OFF | | OFF | Security of water cooling. 3 possible states : - nc : Normally closed, - no : Normally open, - OFF : Desactivate |
| CPt | OFF - 0,01 - 1,00 | 0,01 s | 0,30 | Trigger holding time in order to call program (Only in 4T welding mode). Can be use only for welding program from 50 to 99. |
| PGn | no - YES | | no | Activate / deactivate program management mode |
| PGR | OFF - 000 - 020 % | 1 % | OFF | Use to setup available adjustment range of the following parameters: wire speed, arc voltage, arc dynamics, pulse fine-setting. Use only when program management is activated and programs are locked. |
| rC | no - YES | | no | This parameter activates / deactivates remote control or potentiometer torch when plug on power source. |
| CRl | OFF - on | | OFF | Calibration of torch & ground harness |
| L | 0 - 50 | 1 uH | 14 | Cable choke setting / display |
| r | 0 - 50 | 1 Ω | 8 | Cable resistor setting / display |
| SoF | no - YES | | no | Software update mode. |
| FRC | no - YES | | no | Factory settings reset. Pressing YES will cause a reset of the parameters to factory defaults when exit SETUP menu. |

List of accessible parameters in **CYCLE** menu

| Left display | Right display | Step | Default | Description |
|--------------|--------------------------|--------|---------|---|
| tPt | 00,5 - 10,0 | 0,1 s | 0,5 | Spot time. In Spot mode and in Manual mode, the Hot Start, Downslope and sequencer settings cannot be changed |
| PrG | 00,0 - 10,0 | 0,1 s | 0,5 | Pre-gas time |
| tHS | OFF - 00,1 - 10,0 | 0,1 s | 0,1 | Hot start time |
| iHS | -- 70 - 70 | 1 % | 30 | Hot start current (wire speed). X% ± the welding current |
| vHS | -- 70 - 70 | 1 % | 0 | Hot start voltage X% ± the arc voltage |
| dSt | OFF - 00,1 - 05,0 | 0,1 s | OFF | Down-slope time |
| dSt | -- 70 - 00,0 | 1 % | -- 30 | Down-slope current (wire speed). X% ± the welding current |
| dSt | -- 70 - 70 | 1 % | 0 | Down-slope voltage. X% ± the arc voltage |
| Pr_ | 0,00 - 0,20 | 0,01 s | 0,05 | Anti-stick time |
| PrS | no - YES | | no | Pr-Spray activation |
| PoG | 00,0 - 10,0 | 0,05 s | 0,05 | Post-gas time |
| dYn | -- 10 - 10 -- 20 - 20 | 1 % | 0 | Fine setting in short arc |
| rFP | -- 10 - 10 -- 20 - 20 | 1 % | 0 | Fine setting in pulse |
| dYR | 00 - 100 | 1 | 50 | Arc striking dynamics at electrode |
| tSE | OFF - 0,01 - 2,50 | 0,01 s | OFF | Sequencer time (Sequencer, only in synergic mode) |
| iSE | -- 50 - 50 | 1 % | 30 | Sequencer current level. X% ± the welding current |

3.3.4. Program management

DIGISTEEL III 320C / DIGIPULS III 320C allows creating, store and modifying up to 99 welding programs directly on front panel from program 00 to program 99. This function is activated by moving parameter PGn from no to YES in CONF menu.

P00 is the working program in any state. (Program management mode activated or deactivated). When power source is working on this program, the Led indicator "JOB" is switched off. All commutators are accessible in this mode, so it will be used to set programs.

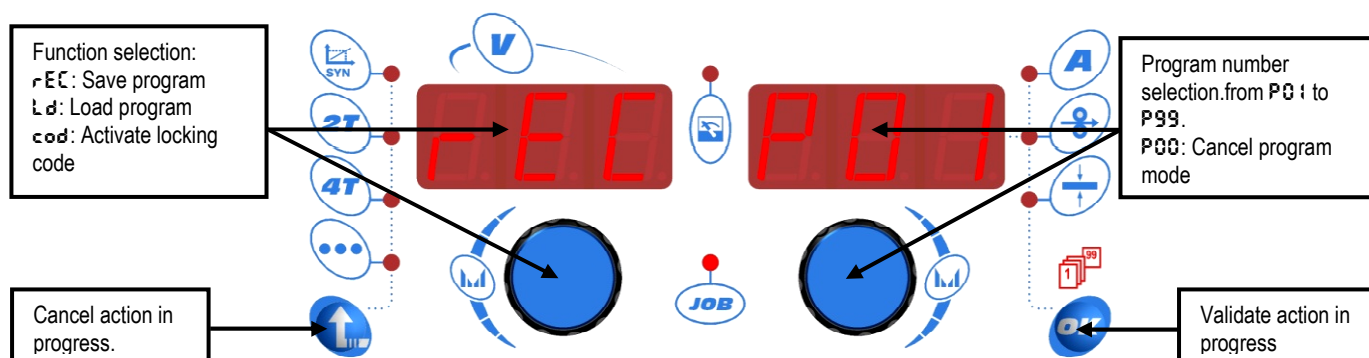
P01 to P99 are program saved, only if program management mode is activated. When power source is working on these programs, the led indicator "JOB" is switched on. In this mode, commutators welding process, wire diameter, gas and metal are not available. When a program selected has been modified, the indicator "JOB" blinks.



Create and save a program:

These paragraphs explain how to create, modify and save a welding program. Hereunder is explained the common menu used.

- 1) Activate program management mode SETUP → PGM → put YES → exit SETUP
- 2) Set your program with commutators then long push on button OK
- 3) Screen displays message as following:



NOTE : The DIGISTEEL III 320C / DIGIPULS III 320C allows to lock program menu. This function is available on program screen with the parameter cod. The locking key entered has to be written in order to deactivate the function lock.

3.3.5. Program call with trigger

This function allows to chain from 2 to 10 programs. This function is available in 4T welding mode only and program management mode has to be activated

Program chaining :

The function program call works with programs from P50 to P99 by ten.

⇒ P50→P59 ; P60→P69 ; P70→P79 ; P80→P89 ; P90→P99

Select first program with which you want to begin your chain. Then during welding, each time you will push trigger, program will change.

To chain less than ten programs, in the program following end of loop desired put a different parameter (As synergy or welding cycle).

It is possible to setup time of trigger push to detect change of program chain : SETUP → CPT → put value from 1 to 100 → exit SETUP

Example: Create a program list from P50 to P55 (6 programs).

- 1) In program P56, put different welding cycle or synergy than P55 in order to finish chain
- 2) Select program P50 (First program for start of welding)
- 3) Start welding
- 4) Each time trigger will be pushed, power source will change program until P55. When chain is finished, power source will restart to P50.

4 - OPTIONS, ACCESSORIES

1 - COOLER UNIT SYSTEM (On demand)



2 - REMOTE CONTROL RC SIMPLE Réf. W000275904



Remote control functions:
Adjust wire speed during welding and out of welding
Adjust arc voltage during welding and out of welding

3 - TROLLEY II NEW VERSION Réf. W000383000



It enables to easily move the power source in a workshop environment.

4 - UNIVERSAL TROLLEY Réf. W000375730



It enables to easily carrying the power source in a workshop environment.

STANDARD TORCH

| | |
|------------|-------------------|
| W000345066 | PROMIG NG 341 3 M |
| W000345067 | PROMIG NG 341 4 M |
| W000345068 | PROMIG NG 341 5 M |

| | |
|------------|---------------------|
| W000345069 | PROMIG NG 341 W 3 M |
| W000345070 | PROMIG NG 341 W 4 M |
| W000345071 | PROMIG NG 341 W 5 M |

| | |
|------------|-------------------|
| W000345072 | PROMIG NG 441 3 M |
| W000345073 | PROMIG NG 441 4 M |
| W000345074 | PROMIG NG 441 5 M |

WATERCOOLED TORCHES (to use only with watercooler option)

| | |
|------------|--------------------|
| W000345075 | PROMIG NG 441W 3 M |
| W000345076 | PROMIG NG 441W 4 M |
| W000345077 | PROMIG NG 441W 5 M |

| | |
|------------|--------------------|
| W000274865 | PROMIG NG 450W 3 M |
| W000274866 | PROMIG NG 450W 4 M |
| W000274867 | PROMIG NG 450W 5 M |

POTENTIOMETER TORCH (it enables adjusting the wire speed and arc length both during welding and out of welding)

| | |
|------------|---------------------|
| W000345014 | DIGITORCH P 341 4M |
| W000345016 | DIGITORCH P 341W 4M |
| W000345018 | DIGITORCH P 441W 4M |

5 - MAINTENANCE

5.1. GENERAL

Twice a year, depending on the use of the device, inspect the following:

- ⇒ cleanliness of the power source
- ⇒ electrical and gas connections

WARNING :

Never carry out cleaning or repair work inside the device before making sure that the unit has been completely disconnected from the mains.

Dismantle the generator panels and use suction to remove dust and metal particles accumulated between the magnetic circuits and the windings of the transformer.

Work must be performed using a plastic tip to avoid damage to the insulation of the windings.

At each start-up of the welding unit and prior to calling customer support for technical servicing, please check that:

- ⇒ Power terminals are not improperly tightened.
- ⇒ The selected mains voltage is correct.
- ⇒ There is proper gas flow.
- ⇒ Type and diameter of the wire. Torch condition.



TWICE PER YEAR

- ⇒ Perform calibration of the current and voltage settings.
- ⇒ Check electrical connections of the power, control and power supply circuits.
- ⇒ Check the condition of insulation, cables, connections and pipes.
- ⇒ Perform a compressed air cleaning



5.2. ROLLERS AND WIRE GUIDE

Under normal conditions of use, these accessories have a long serviceable life before their replacement becomes necessary.

Sometimes, however, after being used over a period of time, excessive wear or clogging due to adhering deposits may be noted.

To minimise such harmful effects, make sure the wire feeder plate remains clean.

The motor reduction unit requires no maintenance.

5.3. TORCH

Regularly check the proper tightness of the connections of the welding current supply. Mechanical stresses related to thermal shocks tend to loosen some parts of the torch, particularly:

- ⇒ The contact tube
- ⇒ The coaxial cable
- ⇒ The welding nozzle
- ⇒ The quick connector

Check that the gasket of the gas inlet spigot is in good condition.

Remove the spatter between the contact tube and the nozzle and between the nozzle and the skirt.

Spatter is easier to remove if the procedure is repeated at short intervals.

Do not use hard tools that may scratch the surface of these parts and cause spatter to become attached to it.

- ⇒ SPRAYMIG SIB, W000011093
- ⇒ SPRAYMIG H20, W000010001

Blow out the liner after each change of a spool of wire. Carry out this procedure from the side of the quick fitting connector plug of the torch.


If necessary, replace the wire inlet guide of the torch.

Severe wear of the wire guide may cause gas leaks towards the rear of the torch.

The contact tubes are designed for long use. Nevertheless, the passage of wire causes them to wear off, widening the bore more than the permissible tolerances for good contact between the tube and the wire.

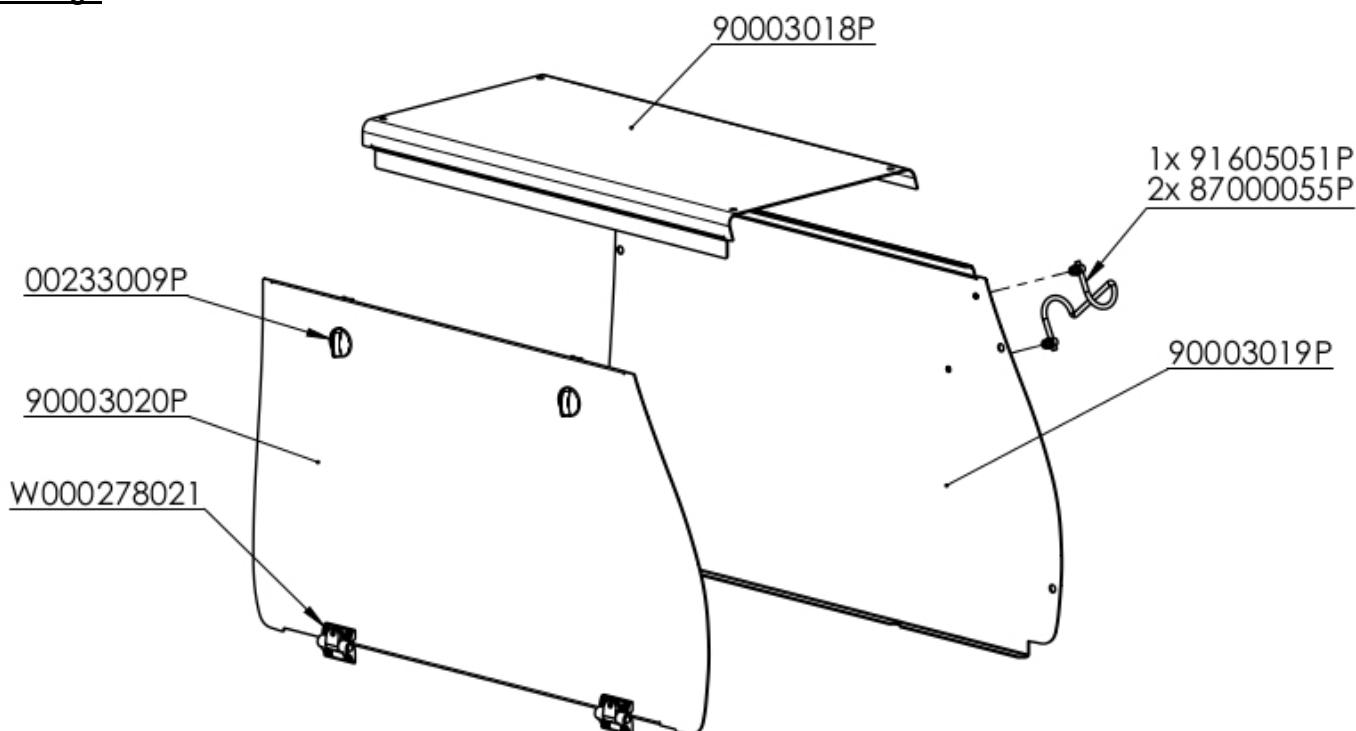
The need to replace them becomes clear when the metal transfer process becomes unstable, all the settings of the work parameters remaining otherwise normal.

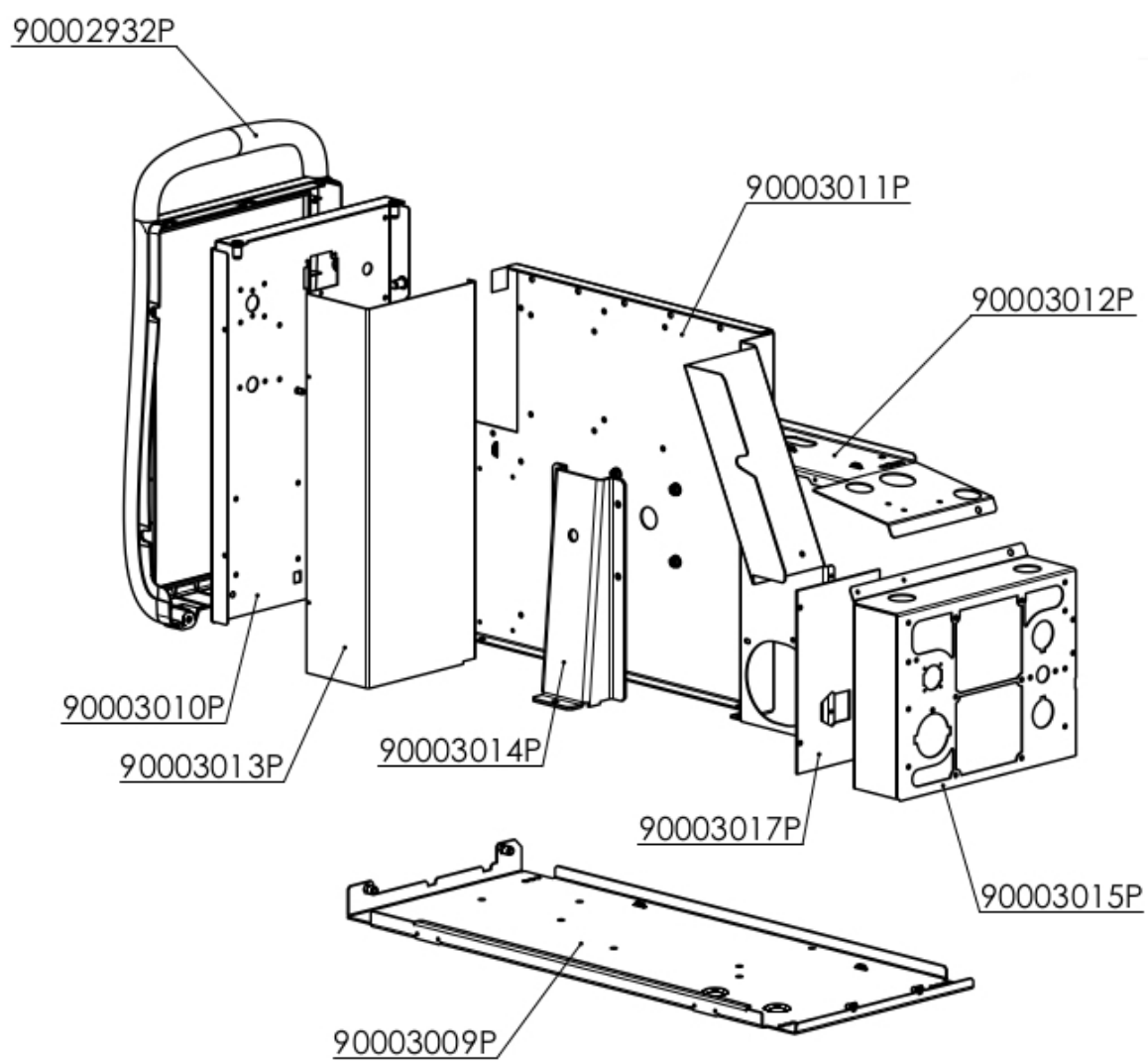
5.4. SPARE PARTS, COMPONENTS

The list below contains components that can be directly purchased from your local provider. For other codes, please refer to aftersales service.
( Please refer to exploded view for preview of components)

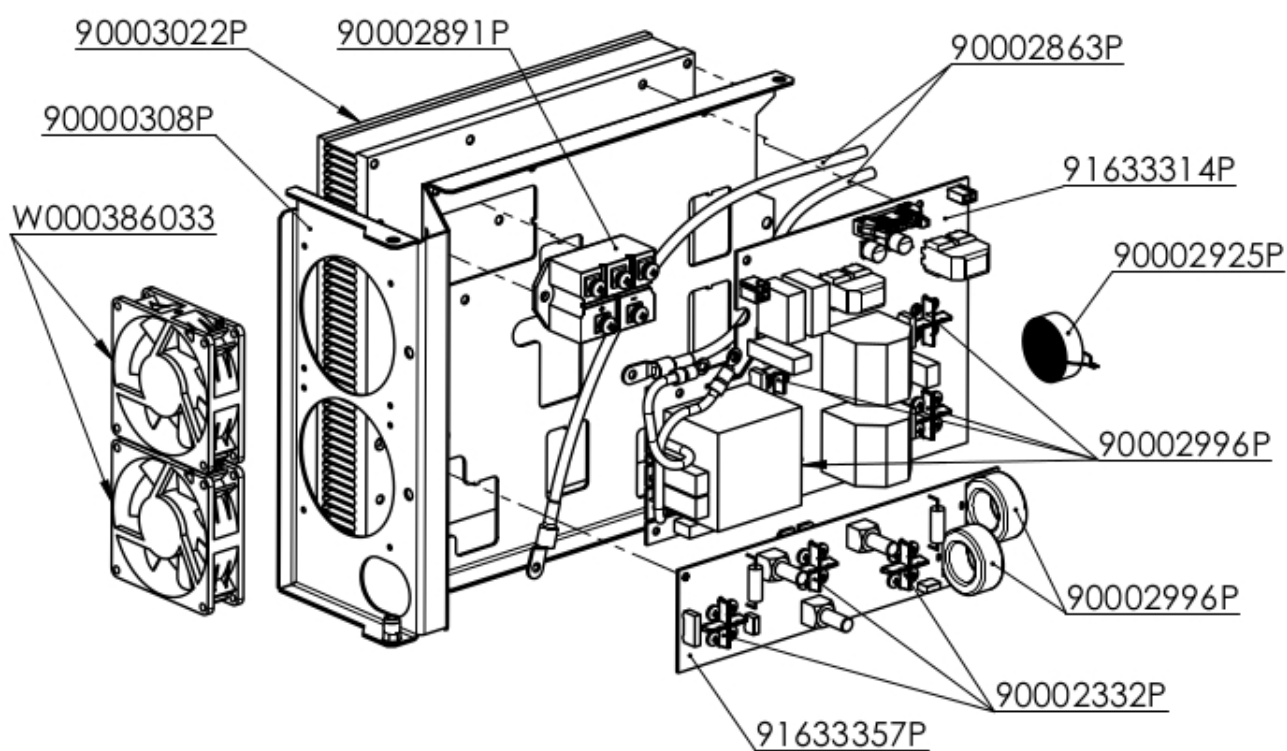
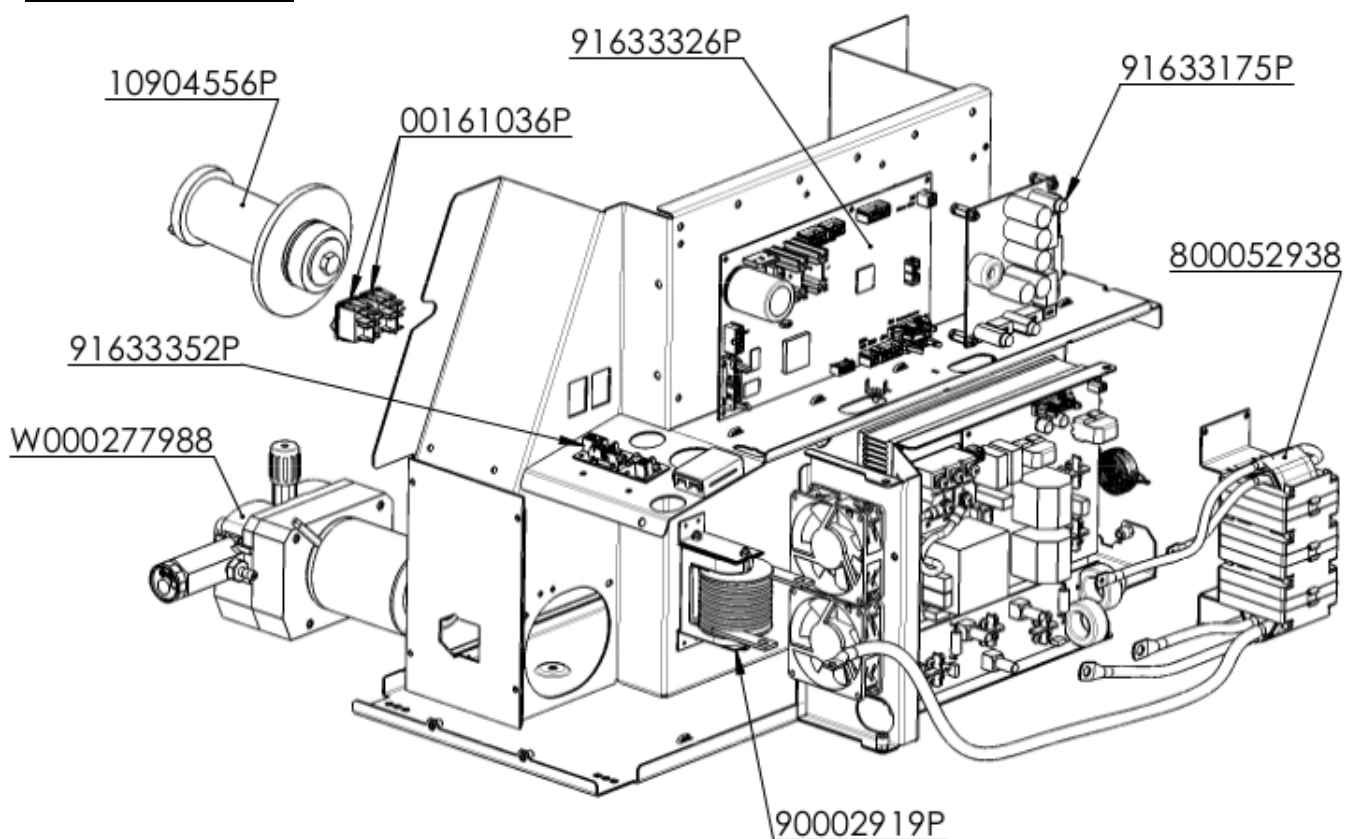
| REFERENCE | DESIGNATION |
|------------|--------------------------------|
| W000386033 | FANS 24VDC 80X25 QTY 2 |
| W000386036 | FRONT PANEL DIGISTEEL III 320C |
| W000386038 | FRONT PANEL DIGIPULS III 320C |
| W000386040 | TRANSPARENT PLASTIC COVER |
| W000386041 | AUXILIARY TRANSFORMER 200VA |
| W000384735 | RIBBON CABLES |
| W000278017 | SOLENOID VALVE 24V DC |
| W000277987 | EURO TORCH SOCKET |
| W000277882 | AUXILIARY POWER SUPPLY BOARD |
| W000385787 | SWITCH ON OFF 40A |
| W000241668 | MALE WELDING SOCKET |
| W000148911 | FEMALE WELDING SOCKET |
| W000265988 | BLUE BUTTONS KIT |
| W000277988 | FEEDING UNIT 4 ROLLS COD150P |
| W000277989 | COVER UNIT AND LEVER |
| W000278021 | LOCKING UNIT HINGE |

Casing :

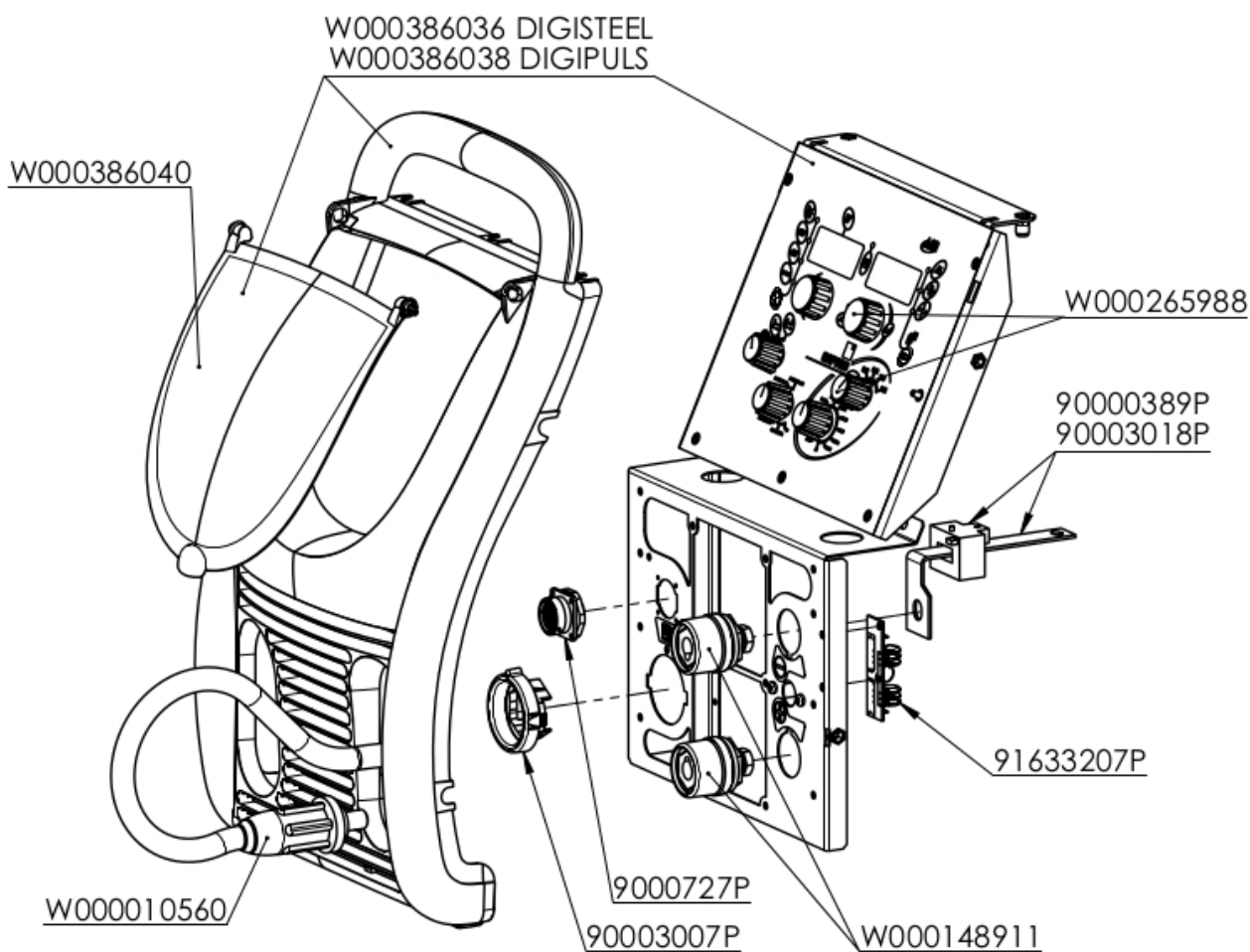
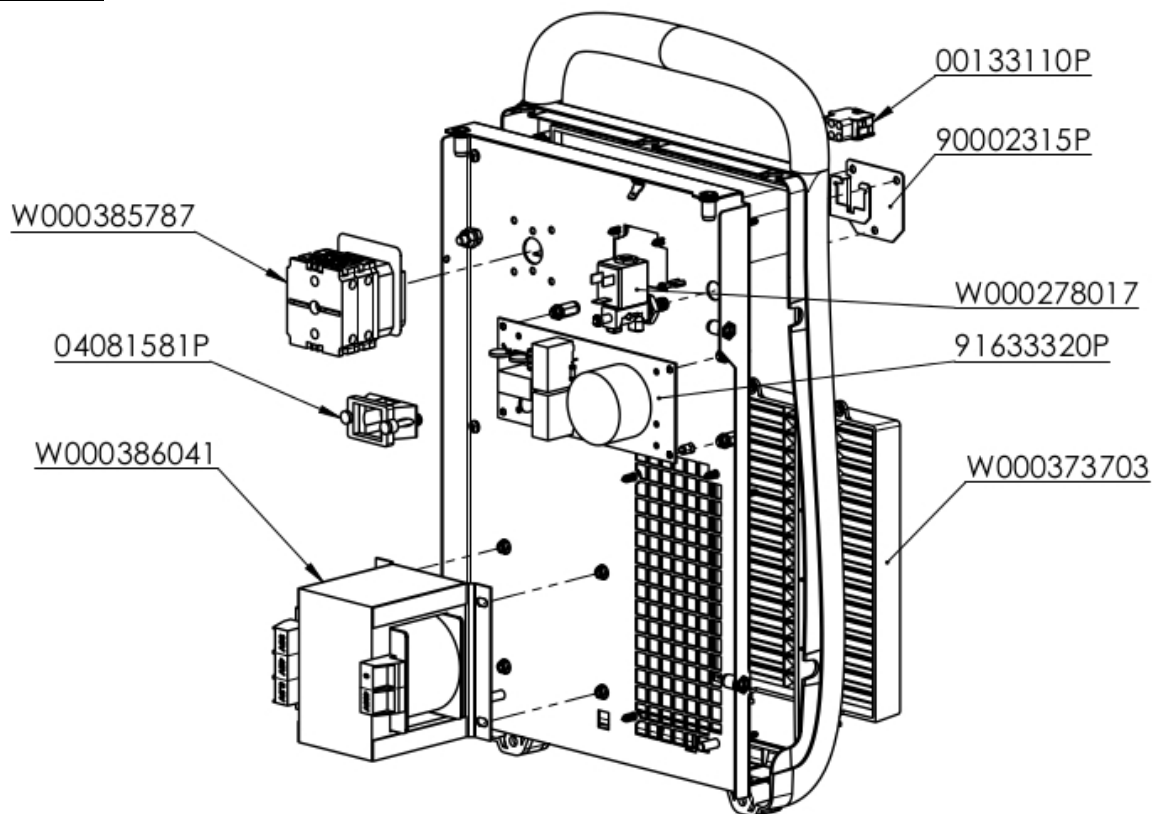




Internal and inverter :



Front and rear :



5.5. WEAR PARTS

The list below contains wear parts of the **DIGISTEEL III 320C / DIGIPULS III 320C** that can be directly purchased from your local provider.

| REFERENCE | DESIGNATION |
|------------|----------------------------|
| W000373703 | DUST FILTER |
| W000278018 | LOT OF 2 SCREWS FOR ROLLER |
| W000277338 | ROLLER ADAPTOR |

Wear parts for wire guide

| | | INPUT WIRE GUIDE | ADAPTATOR | ROLLER | INTERMEDIATE WIRE GUIDE | OUTPUT WIRE GUIDE | |
|--|-----------|-----------------------|------------|-------------------|----------------------------|----------------------|------------|
| STEEL Stainless STEEL | 0,6 / 0,8 | Plastic W000277333 | W000277338 | W000305125 | W000277334 | W000277335 | |
| | 0,9 / 1,2 | | | W000277008 | | W000277335 | W000277336 |
| | 1,0 / 1,2 | | | W000267599 | | | |
| | 1,2 / 1,6 | | | W000305126 | | | |
| | 1,4 / 1,6 | | | W000277009 | | W000277336 | |
| FLUX- CORED WIRE | 0,9 / 1,2 | W000277333 | W000277338 | W000277010 | W000277334 | W000277335 | |
| | 1,2 / 1,6 | | | W000266330 | | W000277335 | W000277336 |
| | 1,4 / 1,6 | | | W000277011 | | W000277336 | |
| LIGHT ALLOYS | 1,0 / 1,2 | | | ALUKIT W000277622 | | | |
| | 1,2 / 1,6 | | | ALUKIT W000277623 | | | |

Possible use of steel rollers ALU with steel wire and coated wire.

Mounting roller

The mounting of the rollers on the deck requires an adapter réf. W000277338.

5.6. TROUBLESHOOTING PROCEDURE

Servicing of electrical equipment must be performed by qualified personnel only.

| CAUSES | SOLUTIONS |
|---|--|
| GENERATOR IS ON WHILE THE FRONT PANEL IS OFF | |
| Power supply | Check the mains supply (to each phase) |
| DISPLAY OF THE MESSAGE E01-ond | |
| The maximum striking current of the power source was exceeded | Press the OK button to clear the fault. If the problem persists, call Customer Support |
| DISPLAY OF THE MESSAGE E02-ovv | |
| Poor recognition of the source of power – only at start-up –. Connectors in fault | Make sure that the ribbon cable between the inverter's main card and the cycle card is properly connected. |
| DISPLAY OF THE MESSAGE E07-400 | |
| Inappropriate main voltage | Make sure that the main voltage is in the +/- 20% acceptable range of primary power supply of the power source. |
| DISPLAY OF THE MESSAGE E24-5Er | |
| Temperature sensor in fault | Make sure that connector B9 is properly connected to the cycle card (if not, temperature measurement is not performed) The temperature sensor is out of order. Call Customer Support |
| DISPLAY OF THE MESSAGE E25-C | |
| Power source overheating | Let the generator cool down The fault disappears by itself after several minutes |
| Ventilation | Make sure that the inverter fan works. |
| DISPLAY OF THE MESSAGE E33-REn | |
| This message indicates that the memory is no longer operational | |
| Malfunctioning during saving of memory | Call Customer Service. |
| DISPLAY OF THE MESSAGE E43-brd | |
| Electronic board in default | Call Customer Service. |
| DISPLAY OF THE MESSAGE E50-H2o | |
| Cooler unit in default | Make sure that cooler unit is well plugged. Check cooler unit (Transformer, waterpump,...) If no cooler unit is used, deactivate parameter in SETUP menu. |
| DISPLAY OF THE MESSAGE E63-00 | |
| Mechanical problem | Pressure roller is too tight. Wire feed hose is clogged with dirt. The lock of the wire feed spool axle is too tight. |
| DISPLAY OF THE MESSAGE E65-00t | |
| Defective connectors | Check the connection of the encoder ribbon cable to the wire feeder's motor. Make sure that the wire feeder assembly is not blocked. Check the connection of the motor's power supply. Check F2 (6A) on the auxiliary power card. |
| Mechanical problem | |
| Power supply | |
| DISPLAY OF THE MESSAGE 5LE PUL | |
| Inverter not well recognized | Call Customer Service |
| DISPLAY OF THE MESSAGE I-R-ARM | |
| Maximum current of power source reached | Decrease wire speed or arc voltage |
| DISPLAY OF THE MESSAGE bP-on | |
| | Message indicating that the OK button is kept depressed at unexpected times |
| TRIGGER FAULT | |
| This message is generated when the trigger is pulled at a time when it can accidentally cause starting a cycle. | Trigger pulled before the power source is turned on or during a reset due to a fault. |

**NO WELDING POWER
NO ERROR MESSAGE**

Power cable not connected
Power source failure

Check the connection of the ground strip and the torch
In Coated Electrode mode, check for voltage between the welding terminals at the front of the generator. If no voltage, call Customer Support.

WELDING QUALITY

Wrong calibration
Change of torch and/or ground strip or workpiece
Unstable or fluctuating welding
Unstable or fluctuating welding
Limited range of adjustment settings
Poor power source power supply

Check the fine setting parameter (RFP = 0)
Perform re-calibration. (Verify proper electrical contact at the welding circuit).
Make sure that the sequencer is not activated. Check the Hot Start and the down-slope.
Select the manual mode. The limitation is imposed by synergy compatibility rules.
If using RC JOB make sure you have not activated the password-operated setting limitation
Check proper connection of the three power supply phases.

OTHER

Wire stuck in the molten pool or at the contact tube
Display of the **ERC** message when turning the power on.

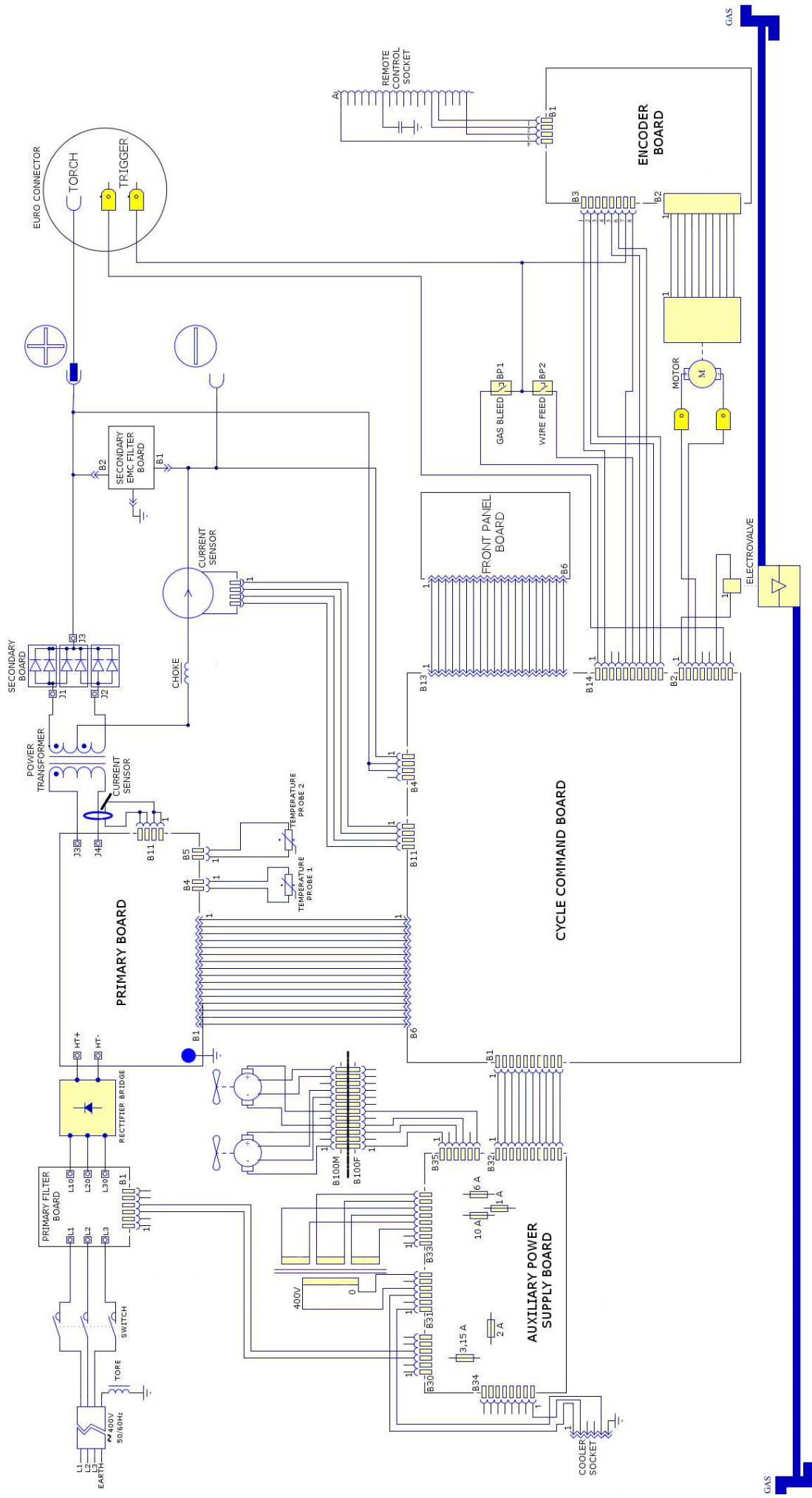
Optimise the arc extinction parameters: PR spray and post retract
The **ERC** message is displayed if the trigger is activated before switching on the welding set

If the problem persists, you may reset the parameters to factory defaults. For this purpose, with the welding unit turned off, select the Setup position at the front panel selector, press the OK button and keep it depressed while turning on the generator.

PLEASE NOTE

Consider recording your work parameters first, because this operation will erase all the programmes saved in memory. If RESETTING to factory values does not solve the problem, call Customer Support.

5.7. ELECTRICAL DIAGRAM



6 - ANNEXES

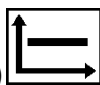
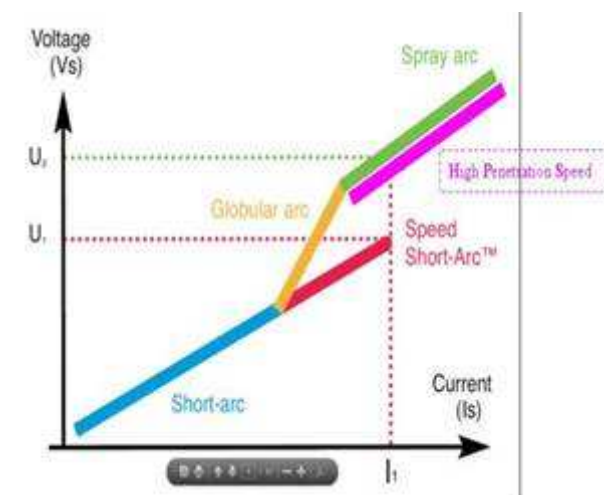
6.1. PRESENTATION OF WELDING PROCESSES

For carbon and stainless steels, DIGISTEEL III 320C / DIGIPULS III 320C uses 2 types of short arc:

- ⇒ “soft” or “smooth” short arc
- ⇒ The “dynamic” short arc or « SSA ».

Pulsed MIG may be used on all types of metal (steel, stainless steel and aluminium) with solid wires and some cored wires. It is particularly suitable for stainless steel and aluminium, for which it is the ideal process, eliminating spatter and achieving excellent wire fusion.

- ⇒ Characteristics of the power source arc



“Soft” or “Smooth” short arc (SA)

The “soft” short arc achieves **great reduction in spatter** when welding carbon steels, resulting in a very significant reduction in finishing costs.

It improves the appearance of the weld bead thanks to improved wetting of the molten pool.

The “soft” short arc is suitable for welding in all positions. An increase in wire feed speed enables entering spray arc mode without preventing transition into globular mode.

Waveform of short arc welding process



Note: The “soft” short arc is slightly more energetic than the “speed” short arc. Consequently the “speed” short arc may be preferable to the “soft” short arc for welding very thin sheets (≤ 1 mm) or for welding penetration passes.



“Dynamic” short arc or “Speed Short Arc” (SSA)

+

The Speed Short Arc or SSA allows greater versatility in welding carbon and stainless steels and absorbs fluctuations in the welder’s hand movements, for example when welding in a difficult position. It also helps compensate for differences in the preparation of the workpieces.

By increasing the wire feed speed, the SA mode enters seamlessly into SSA mode, while preventing the globular mode. Thanks to its quick arc control and using appropriate programming, DIGISTEEL III 320C / DIGIPULS III 320C can artificially extend the Short Arc range to higher currents, in the range of the **speed short arc**.

Waveform of speed short arc welding process



By eliminating the "globular" arc mode, which is characterized by heavy and sticky spatter and higher energy than the short arc, the speed short arc enables to:

- ⇒ Reduce the amount of distortions at high welding currents in the typical "globular" welding range
- ⇒ Reduce the amount of spatter compared to the globular mode
- ⇒ Achieve good weld appearance
- ⇒ reduce smoke emissions compared with the usual modes (up to 25% less)
- ⇒ Achieve good rounded penetration
- ⇒ Enable welding in all positions

Note: The CO₂ programmes automatically and exclusively use the "soft" short arc and do not enable access to the speed short arc. The "dynamic" short arc is not suitable for CO₂ welding due to arc instability.



NORMAL Pulsed MIG

Metal transfer in the arc takes place by detachment of droplets caused by current pulses. The microprocessor calculates all the Pulsed MIG parameters for each wire speed, to ensure superior welding and striking results.

The advantages of pulsed Mig are :

- ⇒ Reduced distortions at high welding currents in the customary "globular" welding and spray arc ranges
- ⇒ Enables all welding positions
- ⇒ Excellent fusion of stainless steel and aluminium wires
- ⇒ Almost complete elimination of spatter and hence of finishing work
- ⇒ good bead appearance
- ⇒ Reduced smoke emissions compared with customary methods and even-speed short-arc (up to 50% less);

Pulsed **DIGISTEEL III 320C / DIGIPULS III 320C** programs for stainless steel eliminate the small spatter that may occur on thin sheets at very low wire feed speeds. These "balls" are caused by slight spraying of the metal at the time of droplet detachment. The extent of this phenomenon depends on the type and origin of the wires.

These programmes for stainless steel have undergone improvements for operation at low currents and increasing the flexibility of use for thin sheet welding using Pulsed MIG method.

Excellent results for welding thin stainless steel sheets (1 mm) are obtained using the pulsed MIG method with Ø 1 mm wire in Arcal-12 or Noxalic-12 shield (average 30A is acceptable).

The appearance of joints processed using, **DIGISTEEL III 320C / DIGIPULS III 320C** is of a quality comparable with that achieved by TIG welding.

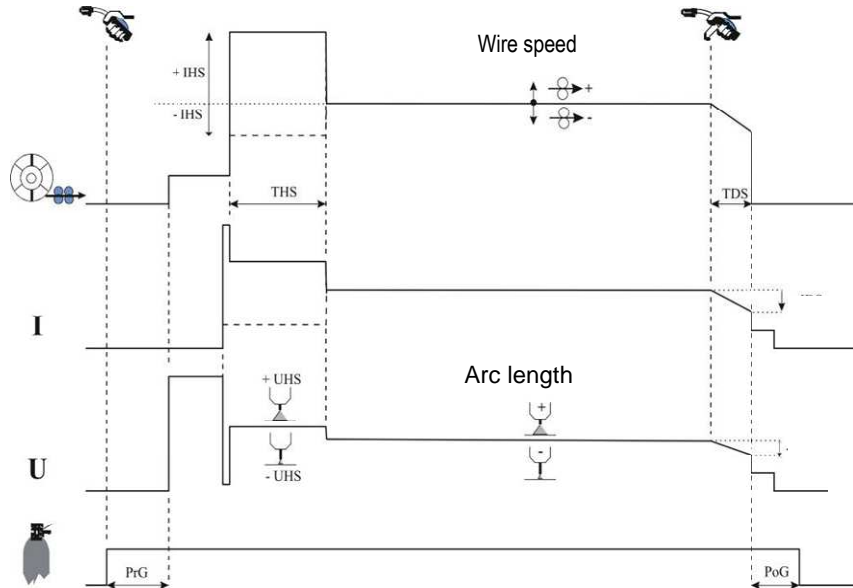
6.2. ADVANCED WELDING CYCLE

2- Step cycle

Pressing the trigger activates wire feed and pre-gas and turns on the welding current. Releasing the trigger causes the welding to stop.

The Hot Start cycle is validated by the **LHS=OFF** parameter in the general Cycle submenu of the SETUP. It enables starting the welding with a current peak that facilitates striking.

The down-slope enables weld bead finish with a decreasing level of welding.



4- Step cycle

Pulling the trigger the first time activates the pre-gas, followed by Hot Start. Releasing the trigger starts the welding.

If HOT START is not active, welding will start immediately after pre-gas. In such a case, releasing the trigger (2nd step) will have no effect, and the welding cycle will continue.

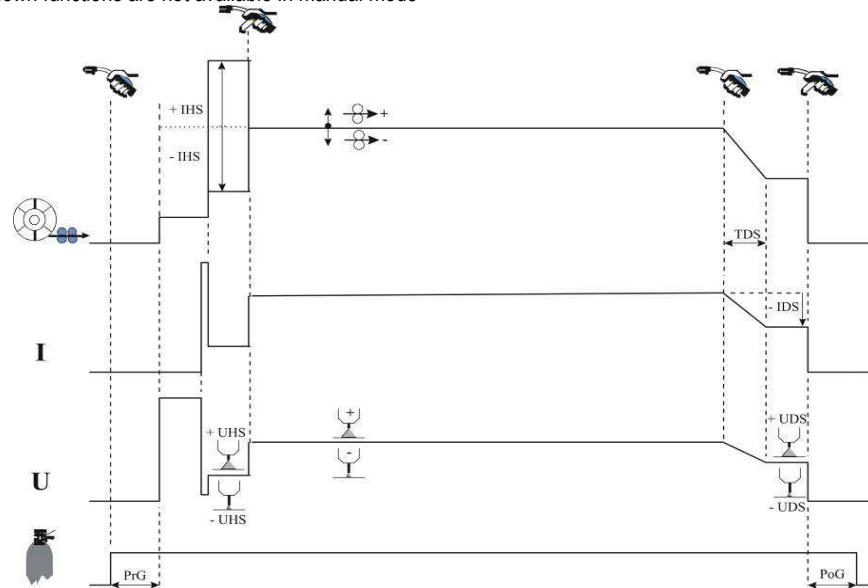
Pressing the trigger in the welding phase (3rd step) enables control of the duration of the down-slope and anti-crater functions, according to the pre-programmed time delay.

If there is no down-slope, releasing the trigger will immediately switch into post-gas (as programmed in the Setup).

In 4-Step mode (4T), releasing the trigger stops the anti-crater function if slope-down is ENABLED.

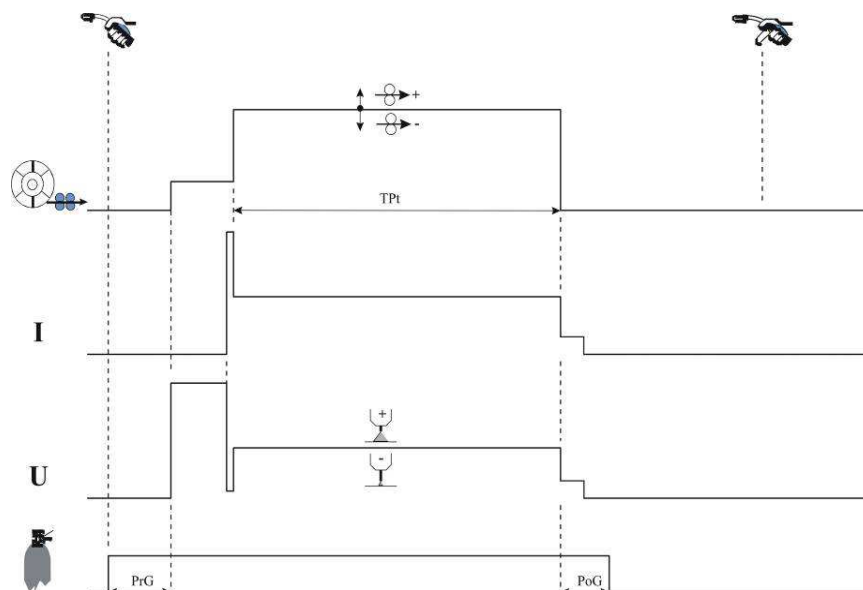
If slope-down is DISABLED, releasing the trigger will stop the POST-GAS.

The Hot Start and slope-down functions are not available in manual mode



Spot cycle

Pressing the trigger activates wire feed and pre-gas and turns on the welding current. Releasing the trigger causes the welding to stop. Adjustment of the Hot Start, down-slope and sequencer settings is disabled. At the end of the spot time-delay, welding stops.



Sequencer cycle

The sequencer is validated by the parameter **tSE ≠ OFF** in the specific cycle submenu of the SETUP.

To access it :

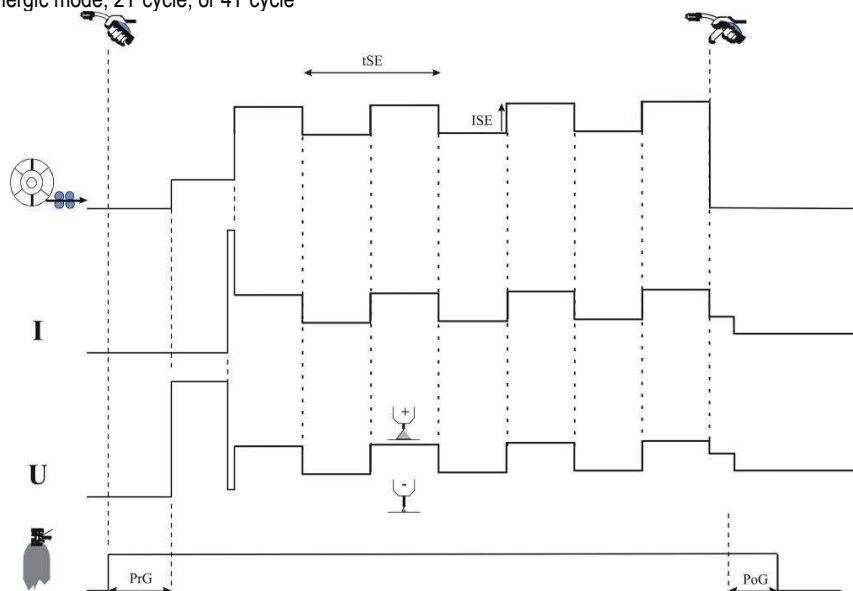
The "tSE" parameter is displayed in the "CYCLE" menu

Set this parameter to a value between 0 and 9.9 s.

tSE : Duration of the 2 plateaux if ≠ OFF.

ISE : 2nd level current as % of the 1st level.

Available only in synergic mode, 2T cycle, or 4T cycle



Fine setting (parameter adjustable in the "rFP" cycle setup menu)

In pulsed welding, the fine-setting function enables optimising the place of droplet detachment according to the variation in the compositions of utilized wires and welding gases.

When fine spatter that may adhere to the workpiece is observed in the arc, the fine-tune setting must be changed toward negative values.

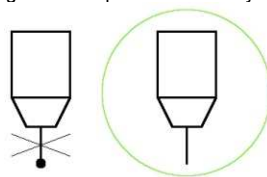
If large drops are transferred by the arc, the fine-tune setting must be changed towards positive values.

In Smooth mode (short arc), lowering the fine-tune setting enables achieving a more dynamic transfer mode and the possibility of welding while reducing the energy carried to the weld pool by shortening the arc length.

A higher fine-tune setting causes an increase in arc length. A more dynamic arc facilitates welding in all positions, but has the disadvantage of causing more spatters.

PR-spray or wire sharpening

The end of welding cycles can be modified to prevent the formation of a ball at the end of the wire. This wire operation produces almost perfect restriking. The selected solution consists in injecting a current peak at end of cycle, which causes the wire end to become pointed.



Note: This current peak at end of cycle is not always desirable. For instance, when welding thin sheet metal, such this mechanism can cause a crater.

6.3. LIST OF SYNERGIES

| | SHORT ARC | | | |
|-----------------|-----------|------------|------------|------------|
| | 0.6 mm | 0.8 mm | 1 mm | 1.2 mm |
| Fe SG 1/2 | ATAL 5 | ATAL 5 | ATAL 5 | ATAL 5 |
| | ARCAL 14 | ARCAL 14 | ARCAL 14 | ARCAL 14 |
| | ARCAL 21 | ARCAL 21 | ARCAL 21 | ARCAL 21 |
| | / | CO2 | CO2 | CO2 |
| CrNi | / | NOXALIC 12 | NOXALIC 12 | NOXALIC 12 |
| | / | ARCAL 12 | ARCAL 12 | ARCAL 12 |
| | / | ARCAL 121 | ARCAL 121 | ARCAL 121 |
| AlSi | / | / | ARGON | ARGON |
| Al | / | / | / | ARGON |
| AlMg3 | / | / | ARGON | ARGON |
| AlMg4,5 Mn | / | / | ARGON | ARGON |
| AlMg5 | / | / | ARGON | ARGON |
| Cupro SI | / | ARGON | ARGON | ARGON |
| Cupro Alu | / | / | ARGON | ARGON |
| SD ZN | / | / | ATAL 5 | ATAL 5 |
| RCW | / | / | ATAL 5 | ATAL 5 |
| SD 100 | / | / | CO2 | CO2 |
| MCW : SD 200 | / | / | ATAL 5 | ATAL 5 |
| BCW : SD 400 | / | / | / | ATAL 5 |
| | / | / | / | CO2 |

| | SPEED SHORT ARC | | | |
|-----------|-----------------|------------|------------|------------|
| | 0.6 mm | 0.8 mm | 1 mm | 1.2 mm |
| Fe SG 1/2 | ATAL 5 | ATAL 5 | ATAL 5 | ATAL 5 |
| | ARCAL 14 | ARCAL 14 | ARCAL 14 | ARCAL 14 |
| | ARCAL 21 | ARCAL 21 | ARCAL 21 | ARCAL 21 |
| CrNi | / | ARCAL 12 | ARCAL 12 | ARCAL 12 |
| | / | ARCAL 121 | ARCAL 121 | ARCAL 121 |
| | / | NOXALIC 12 | NOXALIC 12 | NOXALIC 12 |

| | PULSE | | | |
|---------------|--------|------------|------------|------------|
| | 0.6 mm | 0.8 mm | 1 mm | 1.2 mm |
| Fe SG 1/2 | / | ARCAL 14 | ARCAL 14 | ARCAL 14 |
| | / | ARCAL 21 | ARCAL 21 | ARCAL 21 |
| | / | NOXALIC 12 | NOXALIC 12 | NOXALIC 12 |
| CrNi | / | ARCAL 121 | ARCAL 121 | ARCAL 121 |
| | / | ARCAL 12 | ARCAL 12 | ARCAL 12 |
| | / | / | ARGON | ARGON |
| AlSi | / | / | / | ARGON |
| Al | / | / | ARGON | ARGON |
| AlMg 3 | / | / | ARGON | ARGON |
| | PULSE | | | |
| | 0.6 mm | 0.6 mm | 0.6 mm | 0.6 mm |
| AlMg4,5 Mn | / | / | ARGON | ARGON |
| AlMg5 | / | / | ARGON | ARGON |
| Cupro Si | / | / | ARGON | ARGON |
| Cupro Alu | / | / | ARGON | ARGON |
| MCW SD 200 | / | / | / | ATAL 5 |
| BCW SD 400 | / | / | / | ATAL 5 |

NOTE: For any other synergies, please contact our agency.

| GAZ TABLE | |
|-----------------------------|------------|
| Description on power source | Gaz name |
| CO2 | CO2 |
| Ar(82%) | ATAL 5 |
| CO2(18%) | ARCAL MAG |
| Ar(92%) | ARCAL 21 |
| CO2(8%) | |
| Ar CO2 | ARCAL 14 |
| O2 | |
| Ar CO2 | NOXALIC 12 |
| H2 | |
| Ar CO2 | ARCAL 12 |
| Ar CO2 | ARCAL 121 |
| He | |
| Ar | ARGON |

| WIRES TABLE | | |
|-----------------------------|-----------------|-----------|
| Description on power source | Wire name | |
| Fe SG 1/2 | Nertalic G2 | Filcord D |
| | Filcord | Filcord E |
| | Filcord C | Starmag |
| Solid wire galva | Filcord ZN | |
| CrNi | Filinox | |
| | Filinox 307 | |
| | Filinox 308 Lsi | |
| | Filinox 316 Lsi | |
| AlSi | Filalu AlSi5 | |
| Al | Filalu Al 99,5 | |
| AlMg3 | Filalu AlMg3 | |
| AlNi4,5Mn | Filalu AlMg4,5 | |
| AlMg5 | Filalu AlMg5 | |
| CuproSi | Filcord CuSi | |
| CuproAl | Filcord 46 | |