IMPORTANT: BEFORE STARTING THE EQUIPMENT, READ THE CONTENTS OF THIS MANUAL, WHICH MUST BE STORED IN A PLACE FAMILIAR TO ALL USERS FOR THE ENTIRE OPERATIVE LIFE-SPAN OF THE MACHINE. THIS EQUIPMENT MUST BE USED SOLELY FOR WELDING OPERATIONS.

1 SAFETY PRECAUTIONS

WELDING AND ARC CUTTING CAN BE HARMFUL TO YOURSELF AND OTHERS. The user must therefore be educated against the hazards, summarized below, deriving from welding operations. For more detailed information, order the manual code 3.300.758

ELECTRIC SHOCK - May be fatal.
- Install and earth the welding machine according to the applicable regulations.
- Do not touch live electrical parts or electrodes with bare skin, gloves or wet clothing.
- Isolate yourselves from both the earth and the workpiece.
- Make sure your working position is safe.

FUMES AND GASES - May be hazardous to your health.
- Keep your head away from fumes.
- Work in the presence of adequate ventilation, and use ventilators around the arc to prevent gases from forming in the work area.

ARC RAYS - May injure the eyes and burn the skin.
- Protect your eyes with welding masks fitted with filtered lenses, and protect your body with appropriate safety garments.
- Protect others by installing adequate shields or curtains.

RISK OF FIRE AND BURNS
- Sparks (sprays) may cause fires and burn the skin; you should therefore make sure there are no flammable materials in the area, and wear appropriate protective garments.

NOISE
This machine does not directly produce noise exceeding 80dB. The plasma cutting/welding procedure may produce noise levels beyond said limit; users must therefore implement all precautions required by law.

PACEMAKERS
- The magnetic fields created by high currents may affect the operation of pacemakers. Wearingers of vital electronic equipment (pacemakers) should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

EXPLOSIONS
- Do not weld in the vicinity of containers under pressure, or in the presence of explosive dust, gases or fumes. All cylinders and pressure regulators used in welding operations should be handled with care.

ELECTROMAGNETIC COMPATIBILITY
This machine is manufactured in compliance with the instructions contained in the harmonized standard IEC 60974-10, and must be used solely for professional purposes in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in non-industrial environments.

DISPOSAL OF ELECTRICAL AND ELECTRONIC EQUIPMENT
Do not dispose of electrical equipment together with normal waste! In observance of European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative. By applying this European Directive you will improve the environment and human health!

IN CASE OF MALFUNCTIONS, REQUEST ASSISTANCE FROM QUALIFIED PERSONNEL.

2 GENERAL DESCRIPTIONS

The Sound MIG 5040/T Pulse machine is a multi-process system suitable for pulsed synergic MIG/MAG welding, non-pulsed synergic MIG/MAG, conventional MIG/MAG, TIG (DC) with scratch starting of the arc and MMA, developed using inverter technology.

The welding machine is supplied complete with WF4/P four roll wire feeder, and cooling unit GR52.

The equipment may be used only for the purposes described in the manual.

The equipment must not be used to defrost pipes.

2.1 POWER SOURCE

2.1.1 EXPLANATION OF TECHNICAL SPECIFICATIONS

IEC 60974.1 The welding machine is manufactured according to these international standards.

N° Serial number. Must be indicated on any request regarding the welding machine.

Three-phase static frequency converter transformer-rectifier.

MIG Suitable for MIG welding.

MMA Suitable for welding with covered electro-des.

TIG Suitable for TIG welding.

U0 Secondary open-circuit voltage.

X Duty cycle percentage

The duty cycle expresses the percentage of 10 minutes during which the welding machine may run at a certain current without overheating.

I2 Welding current

U2 Secondary voltage with current I2

U1 Rated supply voltage

3~ 50/60Hz 3-phase power supply

I1 Max Max. absorbed current at the corresponding
current $I_2$ and voltage $U_2$.

This is the maximum value of the actual current absorbed, considering the duty cycle. This value usually corresponds to the capacity of the fuse (delayed type) to be used as a protection for the equipment.

**IP23 C.** Protection rating for the housing.

Grade 3 as the second digit means that this equipment is suitable for use outdoors in the rain. The additional letter C means that the equipment is protected against access to the live parts of the power circuit by a tool (diameter 2.5 mm).

Suitable for use in high-risk environments.

**NOTE:** The welding machine has also been designed for use in environments with a pollution rating of 3. (See IEC 60664).

### 2.1.2 Description of the power source (Fig. 1)

**BO - Socket:**

In MIG welding, connect the earth cable connector. For TIG welding, connect the patch connector of the power source/wire feeder connection power cable.

**BP - Connector:**

Connector type DB9 (RS 232) to be used to update the microprocessor programs.

**BR - Socket:**

In MIG welding, connect the patch connector of the power source/wire feeder connection power cable (pole +).

**BS - Connector**

Connect the connector of the power source/wire feeder connection service cable.

**BU - Switch ON/OFF.**

**BV - Power cord.**

### 2.2 WIRE FEEDER

#### 2.2.1 Description of the wire feeder (Fig. 1)

**BA - Central adapter:**

Connect the MIG or TIG welding torch.

**BB - Connector:**

Connect the MIG or TIG welding torch.
for connecting the remote controls.

A clean contact is available between pins 4 and 5 that closes when the arc is lit (Arc On).

Between pins 1 and 9 it is possible to command the welding start and stop.

**BC - Support :** Support for the welding torch

**BD - Connector:**
Connect the connector of the power source/wire feeder connection service cable

**BE - Gas hose fitting:**
Connect the gas hose of the power source/wire feeder connection

**BF - Socket:**
Connect the patch connector of the power source/wire feeder connection power cable

**BG - Opening:**
Slot for cooling hoses

**BH - Quick-fitting sockets:**
Connect the red and blue tubes of the wire feeder/machine connection.

**BI - Quick-fitting sockets:**
Connect any hoses leaving a water-cooled torch.

**BJ - Door.**

**BL - Wire coil cover.**

**BM - Coil support:**
Suitable for standard coils up to Ø 300 mm, 16 Kg.

**BN - Adjustment knob:**
Use this knob to adjust the pressure of the wire feeder rollers on the welding electrode. NOTE: set to minimum values when welding aluminum.

### 2.3 COOLING UNIT

This cooling unit has been designed to cool the torches used for TIG and MIG/MAG welding.

Must be used exclusively with this power source.

#### 2.3.1 Explanation of technical specifications

<table>
<thead>
<tr>
<th>U1</th>
<th>Rated supply voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x400V</td>
<td>Single-phase power supply</td>
</tr>
<tr>
<td>50/60 Hz</td>
<td>Frequency</td>
</tr>
<tr>
<td>I1max</td>
<td>Maximum absorbed current</td>
</tr>
<tr>
<td>Pmax</td>
<td>Maximum pressure</td>
</tr>
<tr>
<td>P (1l/min)</td>
<td>Refrigerant power measured at 1L/min</td>
</tr>
</tbody>
</table>

#### 2.3.2 DESCRIPTION OF PROTECTIONS

**2.3.2.1 Coolant pressure protection**
This protection is achieved by means of a pressure switch, inserted in the fluid delivery circuit, which controls a microswitch.

**2.3.2.2 Fuse (T 1.6A/400V/Ø 6.3x32)**
This fuse was inserted to protect the pump, and is located on the control circuit inside the unit. The message H2O flashes on the display O to indicate low pressure (control panel instructions).

### 2.3.3 DESCRIPTION OF THE COOLING UNIT (Fig. 1)

**BX - Slot:**
Slot to inspect the coolant fluid level

**BQ - Quick-fitting sockets:**
Use only for TIG welding systems.

**BW - Cap.**

**BT - Quick-fitting valves:**
Connect the red and blue lines of the wire feeder/machine connection.

**BJ - Door.**

**BL - Wire coil cover.**

**BM - Coil support:**
Suitable for standard coils up to Ø 300 mm, 16 Kg.

### 2.3.4 INSTALLATION

Unscrew the cap BW and fill the tank (the equipment is supplied with approximately one liter of fluid). It is important to periodically check, through the slot BX, that the fluid remains at the "max" level. As a coolant, use water (preferably deionized) mixed with alcohol in percentages defined according to the following table:

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Water/alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°C up to -5°C</td>
<td>4L/1L</td>
</tr>
<tr>
<td>-5°C up to -10°C</td>
<td>3.8L/1.2L</td>
</tr>
</tbody>
</table>

**2.4 TROLLEY (Fig. 1)**

**BY - Cylinder support.**

**BZ - Cylinder holding straps.**

**BK - Hole:**
Fasten the plate connected to the wire feeder/ power source connection.

### 3 DESCRIPTION OF THE PANEL (Fig. 2)

The panel commands are divided into 4 sectors, plus a menu of secondary functions, and are described in the following paragraphs:

3.1 Setting up the welding process
3.2 Accessory functions for the P1 panel
3.3 Displaying and adjusting the welding parameters
3.4 Service functions
3.5 Secondary functions menu

#### 3.1 SETTING UP THE WELDING PROCESS

**3.1.1 AI Button - Choosing the welding process.**
Each time this button is pressed, the LED corresponding to the selection lights.

**MIG**

**LED R1**
Pulsed synergic MIG/MAG welding.

**MIG**

**LED R2**
Non-pulsed synergic MIG/MAG welding.

**MIG**

**LED R3**
Conventional MIG/MAG welding.

**TIG**

**LED R4**
TIG welding

The arc is started by means of a short-circuit.

**MMA**

**LED R5**
MMA (Manual Metal Arc) welding.
3.1.2 AJ Button Selecting the operating mode.

- Each time this button is pressed, the LED corresponding to the selection lights.
- **LED S-Two-stage**
  The machine begins welding when the torch trigger is pressed, and stops when released.
  NOTE: This mode is active in all MIG and TIG processes.
- **LED T-Four-stage**
  To begin welding press and release the torch trigger; to interrupt, you must press and release it again.
  NOTE: This mode is active in all MIG and TIG processes.
- **LED U-Welding with three levels of current.**
  NOTE: this mode is active in synergic MIG processes in TIG mode.

Especially recommended for MIG welding of aluminium. Three currents are available, which may be called up during welding using the torch start button. The "slope" current may be set as described in paragraph 3.2 "accessory functions": LEDs AB, AC, AD.

**- Operation in MIG mode:**
Welding begins when the torch button is pressed. The welding current used will be the one set with the LED AB. This current will be kept for as long as the torch trigger is held down; when released, the first current changes to the welding current, set with the knob N, within the time established by the LED AC, and will be kept until the torch trigger is pressed again. The next time the torch button is pressed, the welding current will switch to the third current or "crater-filler" current, set with the LED AD, in the time established by the LED AC, and will be maintained for as long as the torch trigger is held down. Welding stops when the button is released. Starting from version 06 of art. 287 and version 13 of art. 289, the parameters set via the LEDs AB, AC, AD may be viewed and adjusted in the service functions menu (paragraph 3.5), and will be abbreviated as follows, respectively:

- **SC** = starting current corresponding to the LED AB.
- **Slo** = Slope (interface time) corresponding to the LED AC.
- **CrC** = Crater current corresponding to the LED AD, expressed as a percentage of the wire speed in welding.

**- Operation in TIG mode:**
To start the arc, briefly press and release (< 0.7 sec.) the torch trigger, and within three seconds create a brief short-circuit between the tungsten electrode and the workpiece. The arc lights and the welding current will be the one set with the LED AB. This current will be maintained until the torch trigger is pressed briefly and released. At this commands the first current switches to the welding current, set with the knob N, in the time established by the LED AC and will be maintained until the torch trigger is once again briefly pressed and released. At this point the welding current will switch to the third current, or "crater-filler" current, set with the LED AD, in the time established by the LED AC. To shut off the arc, briefly press and release the button. At any time during welding, pressing the torch button for more than 0.7 seconds will shut off the arc.

NOTE: moving the reference current, thus the one set with knob N, automatically changes to percentages the current set with the LEDs AB and AD.
3.1.3 Button AK Choice of the wire diameter.

Every time this button is pressed, it lights the LED (V1, V2, V3, V4) corresponding to the wire diameter that the machine is set to weld.

NOTE: This selection is active only with synergic MIG processes.

3.1.4 Button AL Choice of filler material

With each press, the LED corresponding to the choice will light.

- LED W1 for iron,
- LED W2 for aluminium,
- LED W3 for stainless steel.

The LED X displays the choice of other special types of wires. As a result of the choices made using the above buttons:

- The display AN1 displays the welding programs that exist for the various types of material, specifically:
  - if selected FE SG2 etc.
  - if selected Al AlSi 5, AlMg 5, Al 99,5 etc.
  - if selected SS 308L, 316L etc.
  - if selected Sp Al Bz8, CuSi 3, Rutile, Basic, Metal, CrNi etc.

The materials may be chosen using the button AM.

NOTE: This selection is active only with MIG processes.

- The display AN2 displays the welding programs that exist for the gas types associated with the types of material, specifically:
  - if FE is selected CO2, Ar 18CO2 etc.
  - if Al is selected Ar
  - if SS is selected Ar 2CO2, Ar 2O2 etc.
  - if SP is selected Ar, Ar 30He, Ar 18CO2 etc.

The gas may be chosen using the torch trigger AX.

NOTE: This selection is active only with MIG processes.

NOTE: If, after setting your choices, there is no program to weld the wire diameter selected, the displays O and P will display the message NO-PRG.

3.2 ACCESSORY FUNCTIONS

3.2.1 AH Button

When this button is pressed the display AN2 shuts off and the display AN1 numerically displays the value of the size selected.

This is signaled by the corresponding LED, which lights, and is adjustable via the buttons AM and AX. If the numerical value is not changed within 5 seconds, the displays AN2 and AN1 return to the previous configuration.

NOTE: the last values shown on the display AN1 are saved.

- LED Z Post-gas Adjustment 0 - 30 sec.
  Active in all MIG processes and in TIG mode.

- LED AA Soft Start Adjustment 1 - 100%
  Active in all MIG processes.

It is the wire speed, expressed as a percentage of the speed set for the welding, before the wire touches the workpiece.

NOTE: This adjustment is important in order to always achieve good starts.

Manufacturer setting "auto" automatic.

- LED AB "Hot start" current Adjustment 1 - 200% of the welding current (adjusted with the knob N)
  Active in synergic MIG programs and in TIG mode when the three-level welding mode has been selected (LED U).
  Active with "AHS-ON" see 3.5.2.

- LED AC Slope Adjustment 1 - 10 sec.
  Defines the time for switching between the first "Hot start" current and the second "welding" current, and from the second to the third "crater filler" current.
  Active in synergic MIG programs and in TIG mode. when the three-level welding mode has been selected (LED U).
  Active with "AHS-ON" see 3.5.2.

- LED AD "Crater filler" current Adjustment 1 - 200% of the welding current (adjusted with the knob N)
  Active in synergic MIG programs and in TIG mode only when three-level welding mode has been selected (LED U).
  Active with "AHS-ON" see 3.5.2.

- LED AE Burn - back Adjustment 4 - 250 ms
  Serves to adjust the length of the wire leaving the contact tip after welding.
  Active in all MIG processes.

The higher the number, the more the wire burns manufacturer setting "auto" automatic.

- LED AF Hot - start for MMA Adjustment 0 - 100%
  Overcurrent output when the arc is first struck.
  Active in MMA.

- LED AG Arc - force Adjustment 0 - 100%
  This is the adjustment of the dynamic characteristic of the pilot arc.
  Active in MMA.

3.3 DISPLAYING AND ADJUSTING THE WELDING PARAMETERS.

Knob N

In relation to the type of process selected, this knob is used to adjust the following values:

- synergic pulsed MIG and synergic MIG:
thickness (LED B),
wire speed (LED C),
Current (LED D).

- conventional MIG:
wire speed (LED C)

- TIG and MMA:
current (LED D)

In the service functions select the functions indicated by the abbreviations: H2O, SP, HSA, CrA, dP, Ito, rob, FAC.
NOTE: in synergic programs, adjusting one size will also vary the others consequently.

**Button E**

Each press selects the value adjustable via the knob N. The values that may be selected are in relation to the type of welding process selected.

**LED B Thickness**
The display O shows the recommended thickness based on the current and wire speed set. Active in synergic MIG welding.

**LED C Wire speed**
Indicates that the display O shows the welding wire speed. Active in all MIG welding operations.

**LED D Current**
Indicates that the display O shows the preset welding current or, in combination with the lighting of the LED F, the actual welding current. Active in all welding processes.

**Knob Q**
In relation to the type of process selected, this knob is used to adjust the following values:

- **synergic pulsed MIG and synergic MIG:**
  - length of the arc (K)
  - Impedance (L)

- **conventional MIG:**
  - welding voltage (J)
  - Impedance (L)

  · Within the saved programs select the desired program number.
  All of these values are shown on the display (P) and are selected by the button I.

In the service functions select the abbreviations: OFF, OnC, OnA, SAu, rES, On.

**Button I**

Each press selects the value adjustable via the knob Q. The values that may be selected are in relation to the type of welding process selected.

**LED J Voltage**

In all MIG welding processes, indicates that the display P shows the preset voltage or, in combination with the lighting of LED F, the actual welding voltage. In TIG and MMA modes it always remains lit, and may not be selected. Indicates that the display P displays the open-circuit voltage or welding voltage or, in combination with LED F lit, the actual welding voltage.

**LED K Arc length**
Adjustment -9.9 ÷ +9.9.

In all synergic MIG programs the display P shows a number. Zero is the manufacturer setting; if the number is set to negative, the arc length diminishes, if set to positive it extends. The arc length is also displayed by turning the knob Q while displaying the LED J; 3 seconds after the last correction, LED K shuts off and LED J comes back on.

**LED L Impedance**
Adjustment -9.9 ÷ +9.9.

In all MIG programs the display P shows a number. Zero is the manufacturer setting, if the number is set to negative impedance it decreases, and the arc becomes harder; if it increases, the arc becomes softer.

**LED A globular position**
May not be selected. Active in non-pulsed synergic MIG mode. When this occurs, it signals that the pair of values selected for welding may create unstable, spattering arcs.

**LED F Hold**
May not be selected. Activated in MIG, TIG, and MMA welding and signals that the values shown on the displays O and P (normally Ampere and Volt) are those used in welding. Activated at the end of each welding session.

**LED G Thermostat**
It lights to signal that the overload cut-out has been tripped.

**LED H Safety**
Signals that all buttons are locked. The operator may adjust only the welding parameters in the AY section.
To activate the function, first press the button AO and, holding it down, briefly press the button I. The LED H lights and displays that the function is active. To exit, press the buttons AO and I again in the same way.
LED M Programs saved

This LED lights when you press the key AO (PRG). See paragraph 3.4.1.

Display O

In all welding processes, it numerically displays the selections made via the button I and adjusted via the knob N.

For the welding current (LED D) it displays the Amperes.

For the wire speed (LED C) it displays the meters per minute.

For the thickness (LED B) it displays the millimeters.

If no program exists within the selected settings, it displays NO (abbreviation NO-PRG).

While preparing for operation of the cooling unit, it displays the abbreviation H2O. It flashes the message "OpN" if the wire feeder door is open.

In error messages it displays the abbreviation "Err".

In service functions it displays the abbreviations: H2O, SP, HSA, CrA, dP, Ito, rob, FAC.

Display P

In all welding processes, it numerically displays the selections made via the button I and adjusted via the knob Q.

For the welding voltage (LED J) it displays the Volts.

For the arc length (LED K) it displays a number between -9.9 and +9.9; zero is the recommended setting.

For impedance (LED L) it displays a number between -9.9 and +9.9, zero is the recommended setting.

Within the memories it displays the program number selected.

While preparing for operation of the cooling unit, it displays the message OFF, On-C (continuous operation), On-A (automatic operation).

If no program exists in the selected settings, it displays PRG (abbreviation NO-PRG).

In error messages it displays the error number.

In service functions it displays the abbreviations: OFF, OnC, OnA, (H2O).

In the function "HSA" it displays the messages OFF / On.

In double pulse functions:

- FdP reads OFF - 0.1-5
- ddP reads 0.1-3
- tdP reads 25-75
- AdP reads -9.9-9.9

In the function "CP" it displays the messages - - - , SAu and rES.

In the function "rob" it displays the messages OFF, on (if the robot interface is not inserted the display O will show the flashing message rob) in the function "FAc" it displays the message - - - , ALL, noP, PrG.

3.4 SERVICE FUNCTIONS

Button AR Wire test

It allows it to move forward at 8 m/min without voltage and gas.

Button AQ Gas test

When this key is pressed, gas begins to flow out; press it again to stop the output. If it is not pressed again, the gas output stops after 30 sec.

3.4.1 Saving and calling up saved programs.

Button AP Saving

Press the key AP, the LED M lights along with AT if the torch with U/D command is inserted. The display O displays the abbreviation STO, and the display P indicates the number (flushing if free, steady if occupied).

The first free program number is displayed; use the knob Q to select the desired program number, then press the key AP for more than 3 sec. When saving is complete, the program number will stop flashing and remain steady. Release the AP button to exit saving; the LED M shuts off. Should you intend to overwrite a program, when the button AP is held down for longer than 3 sec, the number starts flashing, then returns to steady mode to signal overwriting.

Saving must take place within the time in which the display P shows the program number (5 sec).

Note: The program n° may be selected both by turning the knob Q or, if the torch with the U/D button is inserted, by pressing the left U/D key on the handle.

If you briefly press the AP button to display the memories and do not intend to use or change them, briefly press the button AO to exit.

It is also possible to delete a saved welding program.

To do so, proceed as follows:

Press the key AP; the display O shows the abbreviation Sto and display P gives the number. Use the knob Q to select the saved welding program number. Turn the knob N until the abbreviation “del” appears on the display O. Hold down the AP Button for more than 3 sec.

If you wish to call up a saved program to change it, repeat the steps described above, but use the knob N to select the abbreviation “rCL” (recall - memory recall). Hold down the AP button for more than 3 sec; the LED M shuts off, and all of the settings of the program in question are set on the panel.

Button AO Calling up saved programs

To call up a saved program, briefly press the button AO. The display O shows the abbreviation PRG and the display P indicates the number of the last program used or, if they have never been used, the last program saved. The LED M lights, use the knob Q or the left button of the U/D torch to select the program number. Five seconds after choosing the displays O and P show the values saved, and the machine is ready to weld.

When the LEDs M and AT (if the UD torch is inserted) are lit, all adjustments are forbidden.

Note: You may display, but not edit, the values shown by the LEDs J - K - L and B - C - D.

The remote controls will be inhibited.

To exit the saved programs press the button AO (twice if the program number has disappeared), the LEDs M and AT (if the torch UD is inserted) will shut off, and the machine displays the last setting before the PRG button was pressed.

Note: With the U/D button of the torch you may change the program even while welding, and call up all of the saved programs in sequence.

You may also call up in sequence welding programs of
the same type saved consecutively and bounded by two free programs. 
This function is carried out with the arc in use.

3.5 SERVICE FUNCTIONS MENU

3.5.1 Managing the cooling unit

Press the button AO and, holding it down, press the button E to enter in a submenu.
Use the knob N to make your choice: H2O
Turn the knob Q to select the operating mode:
· OFF = off.
· On C = always lit
· On A = automatic start-up. When the machine starts, if the torch trigger is not pressed, it shuts off after 15 seconds. When the torch button is pressed, the unit begins operating, and shuts off 3 minutes after the button itself is released.
Press the keys AO and E again to exit.
If the coolant pressure is too low, the power source delivers no current and the message H2O will appear, flashing, on the display O.

3.5.2 SP Spot-welding and stitch welding.

Active in two-stage (LED S) or four-stage welding (LED T). Select using the knob N. The display P reads OFF. Turn the knob Q until the message On appears on the display P to activate the function.

Turning the knob N, select the item “tSP” (spot welding time). The display P displays the time of 1 second. Use the knob Q to set the time, between 0.3 and 5 seconds.

If you want to set stitch welding (welding with automatic pause time), turn the knob N again so that the display P reads “tIn” (stitch time). The display P reads OFF. Turn the knob Q until a number appears, which will be the time you select between welds.

3.5.3 Automatic Hot Start.(HSA).

Press the button AO and, while holding it down, press the button E to enter a submenu.

Turn the knob N to select: HSA
Turn the knob Q to select the type of operation:
OFF = Off
On = Active
The function is active in synergic MIG programs when two-stage welding (LED S) or four-stage (LED T) is selected.

The operator may adjust:
1. The level of the “hot-start” current, LED AB.
2. Its duration, LED AD, range from 0.1-10 seconds.
3. The time to switch between the “hot-start” current and welding current, LED AC.

Starting from version 06 of art. 287 and version 13 of art. 289, the parameters set with the LEDs AB, AC, and AD may be selected (knob N) and adjusted (knob Q) after selecting the HSA function. The following items are available:
SC = starting current corresponding to the LED AB.
Slo = Slope (interface time) corresponding to the LED AC.
tSC = Starting current time corresponding to the LED AD.

3.5.4 CrA (crater filler- final crater filling).

The function may be selected using the knob N, and operates in two-stage (LED S) or four-stroke welding (LED T) and if you wish, also in combination with the HSA function. After activating the function by selecting “On” with the knob Q, turn the knob N to display the items:
Slo = Interface time between the welding current and crater current. Default 0.5 sec. Adjustment range 0.1 –10 sec.
CrC = crater current expressed as a percentage of the wire speed in welding. Default 60%. Adjustment range 10 – 200%.

3.5.5 dP Double pulse (Art. 287 Optional).

This type of welding varies the current intensity between two levels and may be included in all synergic programs. Before setting, it is necessary to make a short bead to determine the speed closest to the type of welding that you will be doing. This determines the reference speed. Proceed as follows to activate the function:
1. Press the button AO and, while holding it down, press the button E to enter a submenu.
2. Turn the knob N until the abbreviation “dP” appears on the display O. Activate the function by turning the knob Q until the message On appears on the display P.
3. Turn the knob N until the message FdP (double pulse frequency) appears on the display O. Display P shows the message OFF. Turn the knob Q to select the working frequency (range from 0.5 to 5 Hz). The value selected is shown on display P.
4. Turn the knob N until the message ddP (double pulse difference in m/min) appears.

Turn the knob Q to select the meters per minute (range 0.1-3 m/min) that will be added to and subtracted from the reference speed (default 1 m/min).
5. Turn the knob N until the message tdP appears. This is the duration of the highest wire speed, thus the highest current. It is expressed as a percentage of the time gained from the frequency Fdp (see figure 3).

![Diagram](image-url)

- Ddp = 0.1÷3 m/min
- TdP = 25÷75% di T
- Fdp = (0,5÷5 Hz)
- T = 1/ Fdp

Turn the knob Q to adjust the percentage. Range between 25 and 75% (default 50%).

6. Turn the knob N until the message AdP appears (arc length of the highest current). Range -9.9 - 9.9 (default 0).

Make sure that the arc length in welding is the same for both currents; turn the knob Q to correct if necessary.

Note: it is possible to weld within the double pulse functions.
Once these adjustment have been made, to return to the normal panel configuration press the button AO and, while holding it down, press the button E. Should it be necessary to adjust the arc length of the lowest current/lowest speed, adjust the arc length of the reference speed (LED K activated). When the reference speed moves, the previous settings must also be repeated for the new speed.

3.5.6 ITO (inching time out) function.
The purpose is to stop the welding machine if the wire flows lengthwise after starting with no passage of current. Press the button AO and, while holding it down, press the button E to enter a submenu. Turn the knob N to select: ITO. Turn the knob Q to select the type of operation: OFF = Off. Adjustment range = 5 – 50 cm.

3.5.7 Robot (“rob”) functions.
Valid only for robot versions.

3.5.8 FAC (factory) Function. Activation:
The purpose is to return the welding machine to the original settings provided by the manufacturer. Press the button AO and, while holding it down, press the button E to enter a submenu. Turn the knob N to select: FAC. Turning the knob Q allows you to select the items: noP = Restores operation as set by the manufacturer without erasing saved programs. The cooling unit is shut off. Prg = All saved programs are deleted. ALL = Restores operation as set by the manufacturer. The cooling unit is shut off. To activate the function press the button AP.

4 INSTALLATION

The welding machine must be installed by skilled personnel. All connections must be made in full compliance with current safety laws.

4.1 PLACEMENT
The weight of the welding machine is 108 Kg, thus for lifting see Fig. 4. Position the equipment in an area that ensures good stability, efficient ventilation so as to prevent metal dust (i.e., from grinding) from entering.

4.2 SETUP
Position the wire feeder WF4-P on the power source. Connect the wire feeder to the power source via the connection art. 1197 or 1197-20, using the plate provided to fasten it to the point BK on the trolley shelf. NOTE: avoid coiling the connection to reduce to a minimum the inductive effects that could affect the results in pulsed MIG/MAG welding. Assemble the DIGIBOX panel. Mount the plug on the power cord, being especially carefully to connect the yellow/green conductor to the earth pole. Make sure that the supply voltage corresponds to the rated voltage of the welding machine. Size the protective fuses based on the data listed on the technical specifications plate. Position the cylinder on the support BY, fasten it with the straps BZ and connect the gas hose to the pressure regulator output. Assemble the torch. Make sure that the groove of the rollers matches the wire diameter used. To replace see Fig. 5:

Open the door BJ, remove the cover CA, release the wire press rollers using the pressure setting knob BN, replace the rollers and remount the cover CA. Mount the wire coil and slip the wire into the feeder and torch sheath. Block the wire press rollers with the knob BN and adjust the pressure. Turn on the machine. Adjust the gas using the key AQ, then move the wire forward using the key AR. The machine is supplied with the cooling unit set to OFF. If a water-cooled torch is used, set the operation of the cooling unit as described in paragraph 3.5.1 of the control panel manual.
5 WELDING

5.1 SYNERGIC PULSED MIG (LED R1) OR SYNERGIC NON-PULSED MIG WELDING (LED R2)

Select this process via the button AI.
Then choose the mode, wire diameter, type and quality of the material and the type of gas.
Adjust the accessory functions according to the instructions in paragraph 3.2.
Adjust the welding parameters using the knobs N and Q.

5.2 CONVENTIONAL MIG WELDING (LED R3)

Select this process via the button AI.
Then choose the mode, wire diameter, type and quality of the material and the type of gas.
Adjust the accessory functions following the instructions in paragraph 3.2 of the control panel manual.
Adjust the wire speed and the welding voltage, respectively, using the knobs N and Q.

5.3 TIG WELDING (LED R4) ONLY FOR PANEL P1

Connect the earth cable to the positive pole BR and the connector of the trolley/power source connection power cable to the negative pole BO.
Connect the TIG torch to the connector BA.
Select this process via the button AI.
Then choose the mode via the button AJ.
Adjust the accessory functions following the instructions in paragraph 3.2 of the control panel manual.

5.4 MMA WELDING (LED R5) ONLY FOR PANEL P1

NOTE: the wire feeder must remain connected to the power source.
Connect the connectors of the electrode holder and earth cable to the connectors BO and BR, observing the polarity stated by the electrode manufacturer.

6 ACCESSORIES

6.1 CONTROL BOX TO REGULATE CURRENT ART. 187 (POTENTIOMETER) + EXTENSION CORD (M5) ART. 1192 + ADAPTER CABLE ART. 1191

Possible settings in the various welding processes:
MMA Adjusts the current from the minimum (10A) to the current set with the knob N on the panel.
TIG The control box carries out the same function as MMA.

6.2 FOOT CONTROL ART. 193 + ADAPTER CORD ART. 1191

Use with TIG welding process.
The current is adjusted using this accessory, while the start command is given by means of the torch trigger.
It is possible to adjust the current from the minimum up to the maximum of the value set with the knob N on the panel.

6.3 TIG TORCH ART 1265
TIG torch type SR 26 uncooled 4m

6.4 MIG TORCH ART 1243
MIG Torch type CEBORA PW 500 water-cooled 3.5 m

6.5 MIG TORCH ART. 1245 (with dual U/D command)
MIG Torch type CEBORA PW 500 U/D water-cooled 3.5 m

The left U/D command:
· in synergic programs, adjusts the welding parameters along the synergic curve.
· in conventional MIG, adjusts the wire speed.
· within saved programs, selects them numerically.
If you intend to save with the U/D torch inserted (LED AT lit), you may choose the program number via the U/D button.
The right U/D command:
· in synergic programs, adjusts the arc length.
· in conventional MIG, adjusts the voltage
· not active within saved programs
When the U/D torch connector is inserted, the LED AS lights to indicate that the torch has been recognized.

6.6 Kit for welding with push-pull torches.

Installing this optional board makes it possible to use push-pull torches with the torch motor at 42V.

7 MAINTENANCE

Periodically make sure that the welding machine and all connections are in good condition to ensure operator safety.
After making a repair, be careful to arrange the wiring in such a way that there the parts connected to the power supply are safely insulated from the parts connected to the welding circuit.
Do not allow wires to come into contact with moving parts or those that heat up during operation. Mount the clamps as on the original machine to prevent, if a conductor accidentally breaks or becomes disconnected, a connection from occurring between power supply and the welding circuits.