INSTRUCTION MANUAL FOR WIRE WELDING MACHINE

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 work-piece.
• 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. Wearing 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.

IN CASE OF MALFUNCTIONS, REQUEST ASSISTANCE FROM QUALIFIED PERSONNEL.

2 GENERAL DESCRIPTIONS

2.1 SPECIFICATIONS
This welding machine is a power source developed with inverter technology, suitable for MIG, TIG and MMA welding.

This welding machine must not be used to defrost pipes.

2.2 EXPLANATION OF TECHNICAL SPECIFICATIONS

IEC 60974.1-5-7-10 The welding machine is manufactured according to these international standards.

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

Single-phase static transformer-rectifier frequency converter.

MIG Suitable for MIG-MAG welding.

MMA Suitable for welding with covered electrodes.

TIG Suitable for TIG welding.

U0. Secondary open-circuit voltage.

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

I1 Max Max. absorbed current at the corresponding current I2 and voltage U2.

I1 eff 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. Protection rating for the housing. Grade 3 as the second digit means that this equipment is suitable for use outdoors in the rain.

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

**2.3 PROTECTIONS**

2.3.1 Block protection
In the event of a malfunction, a flashing number may appear on the display M, with the following meaning:
- 52 = Start button pressed during start-up.
- 53 = Start button pressed during thermostat reset.
- 56 = Extended short-circuit between the welding electrode and the material to be welded.

Shut the machine off and turn it back on. If different numbers appear on the display, contact technical service.

2.3.2 Overload cut-out
This machine is protected by a thermostat, which prevents the machine from operating if the allowable temperatures are exceeded. In these conditions the fan continues to operate and the display M flashes the abbreviation “tH.”

**3 CONTROLS ON THE FRONT PANEL.**

**Selection key V.** Each brief pressure selects the size, adjustable via the knob I. The values that may be selected are in relation to the type of welding process selected, and are displayed on the LEDs A/B/C/D. Holding the key down for more than three seconds will open the “service functions” menu. Within the “service functions,” holding the button down returns the selected function to the manufacturer setting; pressing it briefly confirms the changes made and returns to welding.

**LED A** Current. Indicates that the display M shows the reset welding current. Active in all welding processes.

**LED B** Wire speed. Indicates that the display M shows the MIG welding wire speed.

**LED C** Thickness. The display M shows the recommended thickness based on the current and wire speed set for MIG welding.

**LED D** PROG. Selected via the button V, and using the knob I sets:
- The numbers of the programs for MIG welding and TIG and MMA welding processes.
- The numbers and abbreviations are shown on the display M.

**Knob I.** In relation to the selected LED, regulates:
- Welding current, LED A, in any welding process.
- Wire speed (LED B), thickness (LED C) in MIG welding.
- Number of the MIG program or TIG or MMA welding processes. In the service functions select the abbreviations:
  - For the MIG: trg, SP, SPT, int, HSA, SC, SCT, slo, PrF, PoF, Acc, bb, L, Fac
  - For MMA: AF, tHS.

**Knob L.** In MIG adjusts the welding voltage, changing the arc length. Within the “service functions” menu, based on the abbreviation of the function set via the knob I activates and/or adjusts it.

**Display M.** In all welding processes, it numerically displays the selections made via the button V and adjusted via the knob I. For the welding current (LED A) it displays the Amperes. For the wire speed (LED B) it displays the meters per minute. For the thickness (LED C) it displays the millimeters. For (LED D) it displays the set program number. In service functions it displays the abbreviations: trg, SP, SPT, int, HSA, SC, SCT, slo, PrF, PoF, Acc, bb, L,
Fac, AF, tHS.
For the parameters within the service functions that are shown on the display M, see the paragraph on service functions.

Display N. In all welding processes, it displays the welding voltage; in MMA and TIG mode the open-circuit voltage, and during welding the load voltage. In MIG the preset voltage in relation to the wire speed; and the correction of the arc length set using the knob L (value between –9.9 and 9.9; zero is the recommended value). For the parameters in the MMA, TIG, MIG service function, that are shown on the display N, see the paragraph on service functions.

E - Central adapter.
This is where the welding torch is to be connected.

F – 2-pin socket.
This is where the MIG torch control cable connects.

G – Negative socket.
In MMA and MIG welding with gas, the earth cable connects here; in TIG and MIG welding with flux-cored wire without gas, insert the torch power cable.

H – Positive socket
In MMA welding, connect the electrode clamp; in MIG with gas, the power cable leaving the torch; in TIG and MIG welding with flux-cored wire without gas, the earth cable.

4 CONTROLS ON THE REAR PANEL.

T - Gas hose fitting.
U - Switch.
   Turns the machine on and off

5 SERVICE FUNCTIONS.

Press the key V, and hold it down for at least 3 seconds to enter the submenu. Turning the knob I selects the function, and using the knob L selects the type of operation or the value. To return to the normal display, press and release the key V immediately.

The appropriate service functions are displayed in relation to the selected program (LED D + knob I).

In MMA:
AF   Activated in MMA welding. You may adjust from 0 to 100%. Adjusts the dynamic characteristic of the arc, a value adjusted using the knob L.

HSA (Automatic Hot Start). Once the function has been enabled using the knob L, the operator may adjust the level of the starting current SC (Hot Start), with the possibility of adjusting from 1 to 200% of the welding current, a value adjusted using the knob L. The duration SCt of this current may also be adjusted from 0.1 to 10 seconds. The switching time Slo between the SC current and the welding current may also be adjusted from 0.1 to 10 seconds.

SP (spot-welding). Selecting the function Spt (spot time/spot welding time) adjusts the spot welding time from 0.3 to 5 seconds. Activating the function int (interval time) adjusts the pause time between spot-welds, and the time ranges from 0.3 to 5 seconds.

PrF (Pre-gas). Active in all MIG processes. The adjustment may range from 0 to 10 seconds. Pof (post gas). Active in all MIG processes. The adjustment may range from 0 to 25 seconds.

BB (Burn-back). Active in all MIG processes. The adjustment may range from 0 to 100%. Serves to adjust the length of the wire leaving the contact tip after welding. The higher the number, the more the wire burns. Manufacturer setting “Au” automatic.

L (impedance). Active in all MIG processes. The adjustment may range from 9.9 to +9.9. Zero is the manufacturer setting. If the number is negative, the impedance decreases and the arc becomes harder; if increased, it becomes softer.

Fac. (factory). The purpose is to return the welding machine to the original settings provided by the manufacturer. After the function is selected, the display N reads ( - - - )
To confirm the desired function, simply hold down the button V for 3 seconds. The abbreviation shown on the display N will begin flashing; after a few seconds, a sound will confirm that it has been saved.

6 INSTALLATION

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

6.1 PLACEMENT

Position the equipment in an area that ensures good stability, efficient ventilation so as to prevent metal dust (i.e., from grinding) from entering.

7 START-UP FOR MIG WELDING WITH GAS.

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.

Connect the gas hose of the welding machine al pressure regulator of the cylinder.

Mount the MIG torch supplied with the welding machine on the fitting E, and connect the power terminal leaving the torch to the positive pole (socket H).

Connect the 2-pin connector leaving the torch to the socket F.

Connect the power plug of the earth cable to the socket G and the earth clamp t the workpiece. Make sure that the groove of the rollers matches the wire diameter used. To replace if necessary (Fig. 3):

Open the side door. 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.

Remove the gas nozzle and unscrew the contact tip (located on the end of the torch). Press the torch trigger until the wire protrudes. CAUTION: keep your face away from the gun tube assembly while the wire is coming out. Tighten the contact tip and replace the gas nozzle. Open the reducer of the cylinder and adjust the gas flow to 8 – 10 l/min.

7.1 WELDING.

Select the PROG number based on the wire diameter to be used, the type and quality of the material, and the type of gas, using the instructions located inside the wire feeder compartment.

Use the button V to select the LED D (PROG), turning the knob I to set the program number indicated in the instructions.

Briefly press the button V until the LED C (thickness) lights, turning the knob I shows the thickness of the support material you used on the display M.

The machine is ready to weld.

7.2 MIG WELDING WITHOUT GAS

The actions to prepare the machine for welding are the same as those described previously, but for this type of welding proceed as follows:

Mount a coil of flux-cored wire for welding without gas. Connect the power cable leaving the torch to the negative pole (socket G).

Connect the earth cable to the positive pole (socket H).

Select a program suited for flux-cored wire.

7.3 WELDING WITH COVERED ELECTRODES.

It is recommended that you remove the MIG torch before welding.

Use the button V to select the LED D (PROG). Turn the knob I until the display M shows the abbreviation MMA. Briefly press the button V to select the LED A (Ampere), the display M shows the set current while the display N shows the open-circuit voltage.

Shut off the welding machine.

The electrode clamp must normally be connected to the socket H (positive polarity), and the earth cable to the negative polarity, socket G.

VERY IMPORTANT: Connect the terminal of the grounding cable to the workpiece, making sure that contact is good to ensure smooth equipment operation and avoid voltage dips with the workpiece.

Turn on the welding machine.

Do not touch the electrode clamp and the earth clamp simultaneously.

In any case, observe the polarity shown by the electrode manufacturer.

Always remember to shut off the machine and remove the electrode from the clamp after welding.

7.4 TIG WELDING

Shut off the welding machine, remove the MIG torch and mount the desired model of TIG torch.

Connect the mass cable connector to the positive pole (+) of the welding machine, and the clamp to the workpiece as close as possible to the welding point.
Turn on the machine using the switch U.
Use the button V to select the LED D (PROG). Turn the knob I until the display M shows the abbreviation TIG.
Using the knob L, select the type of procedure TIG to use, the display N displays 1T to use a torch without start button Art.1275, 2T for using the torch Art.1277 in 2-stage mode, and 4T to use the torch Art.1277 in 4-stage mode.
Connect the gas hose to the outlet of the pressure regulator of an ARGON cylinder.
Press the torch trigger and adjust the gas flow.
If using the torch Art. 1275 inside the torch is a valve that blocks the gas flow when the trigger is released.
Use a 2% thorium-covered tungsten electrode (red strip), diameter 1.6 (1/16”).
Adjust the welding current using the knob I.
Strike the arc by contact using a firm, rapid stroke.
Remember to shut off the machine and close the gas cylinder valve when you have finished welding.

8 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 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.