**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. Wearers 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.

**2 INSTALLATION**

Remove the machine from its packing, assemble the wheels and the handle, following the instructions in Fig. 1.

Do not use the handle to lift the unit.

**2.1 TORCH DESCRIPTION**

This power source is suitable only for CEBOGRA torches and is supplied with model CP95 C (IT Pat. Pending). This torch has been manufactured in full observance of the safety precautions contained in the standard EN50192. This standard requires that the live nozzle placed vertically on a horizontal surface may not be touched by the conventional test probe, the specifications for which are set forth by the standard itself. In observance of this requirement, it is now impossible to use the parts previously manufactured, since it would not have been possible to avoid contact with the test probe when using long electrodes and gas nozzles. A gas nozzle holder has therefore been designed with a protective tube that prevents any accidental contact with live parts, and allows the use of a new long nozzle that can cut in corners or recesses. To avoid the hazards created by using the previous parts, this nozzle holder has been designed with a left-hand thread, and must therefore be screwed on counter-clockwise.
### 2.2 Description of Devices on the Machine

A) Power cord  
B) Compressed air fitting (1/4" female gas thread)  
C) Mains power switch  
E) Pressure regulator knob  
F) Pressure gauge  
G) Thermostat LED  
H) Grounding clamp  
I) Water trap  
L) Low air pressure LED  
M) Mains power led.

### 2.3 Safety Devices

This system comes equipped with the following safety devices:

**Overload cutout:**
To avoid overloads. It is evidenced by the G led continuously on (see fig.2).

**Pneumatic:**
Located on the torch inlet to prevent low air pressure. The LED L lights when tripped (see fig.2).

**Electrical:**
Located on the torch body, to prevent hazardous voltages from occurring on the torch when, swirl ring, electrode or nozzle holder are replaced;

The machine is also equipped with an error detection system, summarized in the table in paragraph 6.1.1

- **Do not remove or short-circuit the safety devices.**  
- **Use only original spare parts.**  
- **Always replace any damaged parts of the machine with original materials.**  
- **Do not run the machine without its housings. This would be dangerous to the operator and anyone else in the work area, and would prevent the machine from being cooled properly.**

### 2.4 Explanation of Technical Specifications

IEC 60974.1 The equipment is built according to these standards.  
EN 50192  
EN 50199  
N°. Serial number. Must be indicated on any type of request regarding the device.  
Downslope.  
Suitable for plasma cutting.  
**TORCH TYPE**
Type of torch that may be used with this machine to form a safe system.  
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 I₂ and voltage U₂ without overheating.  
I₂.  Cutting current.  
U₂.  Secondary conventional voltage with welding current I₂. This voltage depends on the distance between the contact tip and the workpiece.  
If this distance increases, the cutting voltage also increases and the duty cycle X% may decrease.  
U₁.  Rated supply voltage.  
1~ 50/60Hz  50- or 60-Hz Single-phase power supply.  
3~ 50/60Hz  50- or 60-Hz three-phase power supply.  
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.  
IP21 C.  Protection rating for the housing.
Grade 1 as the second digit means that this equipment is not 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. 
NOTES: The machine has also been designed for use in environments with a pollution rating of 3. (See IEC 664).

2.5 START-UP

The machine must be installed by qualified personnel. All connections must be made in compliance with current safety standards and full observance of safety regulations (see CEI 26-10 CENELEC HD427).

Connect the air supply to the fitting B.

If the air supply comes from a pressure regulator of a compressor or centralized system, the regulator must be set to an output pressure of no more than 8 bar (0.8 Mpa). If the air supply comes from a compressed air cylinder, the cylinder must be equipped with a pressure regulator. Never connect a compressed air cylinder directly to the regulator on the machine! The pressure could exceed the capacity of the regulator, which might explode!

Make sure that the supply voltage matches the one shown on the front panel of the machine. The voltage may be changed by turning the disc located below the mains power switch knob (see fig. 3. For Art.961 only).

Connect the grounding clamp to the workpiece. The cutting circuit must not be deliberately placed in direct or indirect contact with the protective wire except in the workpiece.

If the workpiece is deliberately grounded using the protective conductor, the connection must be as direct as possible and use a wire of at least the same size as the cutting current return wire, and connected to the workpiece at the same point as the return wire using the return wire clamp or a second grounding clamp placed in the immediate vicinity. Every precaution must be taken to avoid stray currents.

Use the nozzle supplied with the torch. Since cutting takes place through contact, the nozzle tends to become easily clogged as molten metal waste forms around it. It is therefore a good practice to keep it clean from any waste that may harden on it.

Make sure that the grounding clamp and workpiece have a good electrical contact, especially with painted, oxidized or insulated sheet metal. Do not connect the grounding clamp to the part of the material that is to be removed.

Press the torch trigger to strike the pilot arc. Hold the torch upright while cutting. Cutting should be done by pulling the torch whenever possible: pulling is usually easier than pushing (see Fig. 5). When you have finished cutting and released the trigger, air will continue to leave the torch for approximately 60 seconds to allow the torch to cool down.

It is best not to turn the machine off until this cool-down period is complete.

When you have finished cutting, the pilot arc remains lit as long as the torch trigger is held down: this function may be useful when cutting perforated sheets or metal grids. Should you need to make holes or begin cutting from the center of the workpiece, you must hold the torch at an angle and slowly straighten it so that the nozzle does not spray molten metal (see fig. 4). This must be done when making holes in pieces more than 2 mm thick.

When making circular cuts, we recommend using the special compass available upon request. It is important to remember that use of the compass may make it necessary to use the starting technique described above (fig.2). Do not keep the pilot arc lit in the air when not needed, to avoid unnecessary consumption of the electrode, swirl ring or nozzle.

Turn the machine off when the task is completed.
4 CUTTING ERRORS

4.1 INSUFFICIENT PENETRATION

This error may be caused by the following:
- high speed. Always make sure that the arc fully penetrates the workpiece and is never held at a forward angle of more than 10 -15° (see fig. 5). This will avoid incorrect consumption of the nozzle and burns to the nozzle holder.
- Excessively thick workpiece (see cutting speed diagram, fig. 6)
- Grounding clamp not in good electrical contact with the workpiece.
- Worn nozzle and electrode.

NOTE: When the arc does not penetrate, the molten metal scraps obstruct the nozzle.

4.2 THE CUTTING ARC GOES OFF

This error may be caused by:
- worn nozzle, electrode or swirl ring
- air pressure too high
- supply voltage too low

4.3 SLANTED CUT

If the cut appears slanted, turn the machine off and replace the nozzle.

4.4 EXCESSIVE WEAR ON CONSUMABLE PARTS

This problem may be caused by:
a) air pressure too low compared to the recommended level.
b) excessive burns on the end of the nozzle holder.

5 HELPFUL HINTS

- If the system air contains considerable amounts of moisture and oil, it is best to use a drying filter to avoid excessive oxidation and wear on consumer parts, damage to the torch and a reduction in the speed and quality of the cutting.
- The impurities in the air encourage oxidation of the electrode and nozzle, and may make it difficult to strike the pilot arc. If this occurs, use fine sandpaper to clean the end of the electrode and the interior of the nozzle.
- Make sure that the new electrode and nozzle to be mounted are thoroughly clean and degreased.
- Always use original spare parts to avoid damaging the torch.

6 MAINTENANCE

Always cut off the power supply to the machine before any operation, which must always be carried out by qualified personnel.

6.1 GENERATOR MAINTENANCE

In the case of maintenance inside the machine, make sure that the switch C is in position "O" and that the power cord is disconnected from the mains.
Even though the machine is equipped with an automatic condensation drainage device that is tripped each time the air supply is closed, it is good practice to periodically make sure that there is no condensation accumulated in the water trap I (fig.2). It is also necessary to periodically clean the interior of the machine from the accumulated metal dust, using compressed air.

6.1.1 Troubleshooting

<table>
<thead>
<tr>
<th>LED</th>
<th>LED STATUS</th>
<th>CONDITION</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>1 flash, then pause for 1 second</td>
<td>Button pressed during equipment start-up</td>
<td>Release the button during equipment start-up</td>
</tr>
<tr>
<td>G</td>
<td>2 flashes, then pause for 1 second</td>
<td>Short-circuit in the torch (for ex. between electrode and nozzle)</td>
<td>Shut off the machine and remove the problem</td>
</tr>
</tbody>
</table>

6.2 TORCH MAINTENANCE

In reference to Fig. 7, the parts subject to wear are the electrode A, the swirl ring B and the nozzle C; these must be replaced after first unscrewing the gas nozzle holder D. The electrode A must be replaced when it has a crater in the center approximately 1.5 mm deep. CAUTION: do not use sudden force to unscrew the electrode; work gradually to release the thread. The new electrode must be screwed into the seat and fastened in place without tightening fully.

The nozzle C must be replaced when the central hole is damaged or wider than that of a new part. Delays in replacing the electrode or nozzle will cause the parts to overheat, and jeopardize the life-span of the swirl ring B. Make sure that the gas nozzle holder D is firmly tightened after replacement. CAUTION: Screw the gas nozzle holder D onto the torch body only with the electrode A, swirl ring B and nozzle C mounted.

If any of these parts are missing, this will interfere with smooth operation of the machine and, especially, jeopardize operator safety.

6.3 PRECAUTIONS AFTER REPAIRS.

After making repairs, take care to organize the wiring so that there is secure insulation between the primary and secondary sides of the machine. Do not allow the wires to come into contact with moving parts or those that heat up during operation. Reassemble all clamps as they were on the original machine, to prevent a connection from occurring between the primary and secondary circuits should a wire accidentally break or be disconnected. Also mount the screws with geared washers as on the original machine.