

INSTRUCTION MANUAL FOR ARC 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

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.

ELECTRIC AND MAGNETIC FIELDS - May be dangerous.

· Electric current following through any conductor causes localized Electric and Magnetic Fields (EMF). Welding/cutting current creates EMF fields around cables and power sources.
· The magnetic fields created by high currents may affect the operation of pacemakers. Wearers of vital electronic equipment (pacemakers) shall consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

· Exposure to EMF fields in welding/cutting may have other health effects which are now not known.

· All operators should use the following procedures in order to minimize exposure to EMF fields from the welding/cutting circuit:

- Route the electrode and work cables together - Secure them with tape when possible.
- Never coil the electrode/torch lead around your body.
- Do not place your body between the electrode/torch lead and work cables. If the electrode/torch lead cable is on your right side, the work cable should also be on your right side.
- Connect the work cable to the workpiece as close as possible to the area being welded/cut.
- Do not work next to welding/cutting power source.

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 standard IEC 60974-10 (CL. A), **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.

1.1 WARNING LABEL

The following numbered text corresponds to the label numbered boxes.



B. Drive rolls can injure fingers.

C. Welding wire and drive parts are at welding voltage during operation — keep hands and metal objects away.

1 Electric shock from welding electrode or wiring can kill.



1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.

1.2 Protect yourself from electric shock by insulating

- yourself from work and ground.
- 1.3 Disconnect input plug or power before working on machine.
 - 2 Breathing welding fumes can be hazardous to your health.
 - 2.1 Keep your head out of fumes.
 - 2.2 Use forced ventilation or local exhaust to remove fumes.
 - 2.3 Use ventilating fan to remove fumes.
 - 3 Welding sparks can cause explosion or fire.
 - 3.1 Keep flammable materials away from welding.
 - 3.2 Welding sparks can cause fires. Have a fire extinguisher nearby and have a watchperson ready to use it.
 - 3.3 Do not weld on drums or any closed containers.
 - 4 Arc rays can burn eyes and injure skin.
 - 4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.
 - 5 Become trained and read the instructions before working on the machine or welding.
 - 6 Do not remove or paint over (cover) label.

2 GENERAL DESCRIPTIONS

2.1 SPECIFICATIONS


By selecting TIG AC welding mode  you may weld aluminium, aluminium alloys, brass and magnesium, while selecting TIG DC  allows you to weld stainless steel, iron and copper.


This welding machine is a direct and alternating current power source built using INVERTER technology, designed to weld covered electrodes (not including cellulosic) and for TIG procedures, with contact starting and high frequency

2.2 EXPLANATION OF THE TECHNICAL SPECIFICATIONS LISTED ON THE MACHINE PLATE.

This machine is manufactured according to the following international standards: IEC 60974.1 - IEC 60974.3 - IEC 60974.10 CL. A - IEC 61000-3-12 - IEC 61000-3-11 (see note 2).

N°. Serial number, which must be indicated on any type of request regarding the welding machine.

 Single-phase static transformer-rectifier frequency converter.

 Drooping characteristic.

SMAW. Suitable for welding with covered electrodes.

TIG Suitable for TIG welding.

U0. Secondary open-circuit voltage

X. Duty cycle 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

The machine has an automatic supply voltage selector.

1~ 50/60Hz 50- or 60-Hz single-phase power supply

I1 max. This is the maximum value of the absorbed current.

I1 eff. This is the maximum value of the actual current absorbed, considering the duty cycle.

IP23S Protection rating for the housing. Grade **3** as the second digit means that this equipment may be stored, but it is not suitable for use outdoors in the rain, unless it is protected.

S Suitable for hazardous environments.

Note:

- 1- The machine has also been designed for use in environments with a pollution rating of 1. (See IEC 60664).
- 2- This equipment complies with IEC 61000-3-11 provided that the maximum permissible system impedance Z_{max} is less than or equal to 0,362 at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with maximum permissible system impedance Z_{max} less than or equal to 0,362.

2.3 DESCRIPTION OF PROTECTIVE DEVICES

2.3.1. Thermal protection

This machine is protected by a temperature probe, which prevents the machine from operating if the allowable temperatures are exceeded. Under these conditions the fan keeps running and the LED **J** lights.

2.3.2. Block protections

This welding machine is equipped with various safety devices that stop the machine before it can suffer damage.

In the event of a malfunction, the letter E may appear on the display Z, followed by a flashing number:

52 = Start button pressed during start-up.

53 = Start button pressed during thermostat reset.

In both cases, release the start button.

The machine stop is signalled by the LED (**J**).

If the message E1÷E10 appears on the display, the machine requires technical intervention.

3 INSTALLATION


Make sure that the supply voltage matches the voltage indicated on the specifications plate of the welding machine.

When mounting a plug, make sure it has an adequate capacity, and that the yellow/green conductor of the power supply cable is connected to the earth pin.

3.1 START-UP

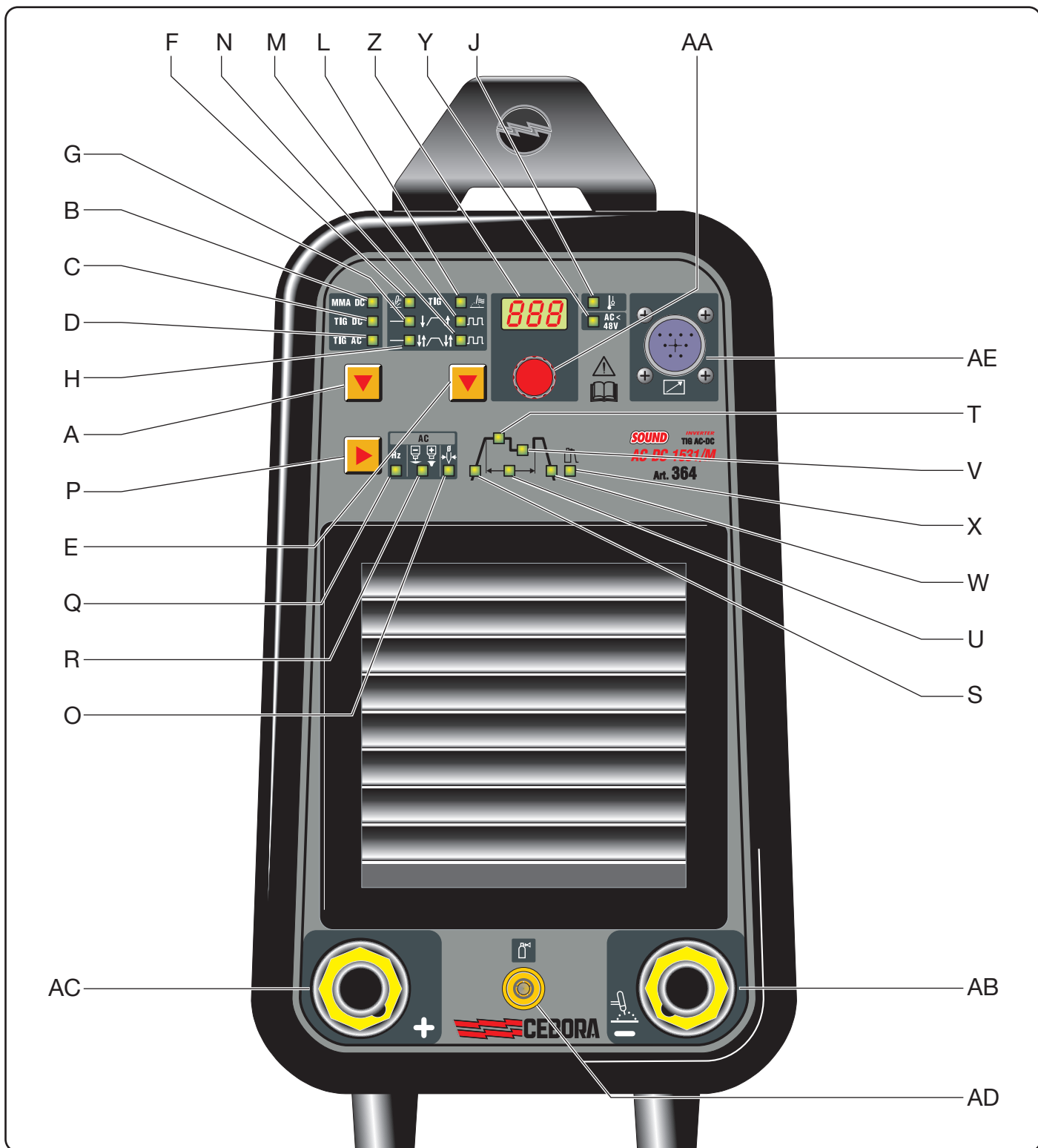
Only skilled personnel should install the machine. All connections must be carried out according to current regulations, and in full observance of safety laws (regulation CEI 26-23- IEC/TS 62081).

3.2 DESCRIPTION OF THE EQUIPMENT

A - Procedure selector switch
 This push-button selects the welding procedure (MMA or TIG).

When selected, one of the following LEDs lights:

B  , **C**  , or **D**  .



Mode key E.

When selected, one of the following LEDs lights: **F, G, H, L, M, N.**

In TIG mode there will always be two LEDs lit: one indicating HF or striking start mode, and the other indicating continuous or pulse mode with 2- or 4-stage command. The selection changes each time the button is pressed. The LEDs light alongside the various symbols to display your choice:



F - LED. TIG welding with arc started without high frequency.

To light the arc, press the torch trigger and touch the tungsten electrode to the workpiece, then lift it. This move must be quick and decisive (0.3 sec.).



L - LED. TIG welding with arc started with high frequency.

To light the arc, press the torch trigger: a high voltage/frequency pilot spark will light the arc.



G - LED. Continuous 2-stage TIG welding (manual).

When the torch trigger is pressed, the current begins to increase over the previously set "slope up" time, until it rea-

ches the value set by means of the knob **AA**. When the trigger is released, the current begins to drop over the previously set "SLOPE DOWN" time, until it returns to zero. In this position, you may connect the pedal control accessory ART. 193.

 **H - LED. Continuous 4-stage TIG welding (automatic).**

This program differs from the previous one in that the arc is both started and shut off by pressing and releasing the torch trigger.

 **M - LED. Pulsed 2-stage TIG welding (manual).**

From a pulse frequency of 0.16 to 1.1Hz, the display **Z** alternately shows the peak (main) current and the base current. The LEDs **T** and **V** light alternately; beyond 1.1Hz the display **Z** shows the mean of the two currents, and the LEDs **T** and **V** both remain lit.

In this position, you may connect the pedal control accessory ART. 193.

 **N - LED. Pulsed 4-stage TIG welding (automatic).**

This program differs from the previous one in that the arc is both started and shut off by pressing and releasing the torch trigger.

 **J - LED - THERMAL PROTECTION**

Lights when the operator exceeds the duty cycle or percentage intermittence admissible for the machine, and simultaneously blocks the current output.

NOTE: In this condition the fan continues cooling the power source.

 **Y - LED**

This LED must always be lit to ensure safe welding conditions in AC mode.

 **AA - KNOB**

Adjusts the welding current. Also, in combination with the push-button **P**, you may:

- adjust the second level of current **V**
- adjust the "slope up" **S**
- adjust the "slope down" **W**
- adjust the pulse frequency **U**
- adjust the post gas **X**
- adjust the current frequency in AC welding **Q**
- adjust the wave balance in AC welding **R**
- adjust the arc striking in relation to the diameter of the electrode used in TIG AC mode (LED **O**).

 **Z - Display**

Displays the welding current and the settings selected by means of the push-button **P** and adjusted via the knob **AA**.

 **P - SELECTOR**

When this button is pressed, the LEDs light in succession:

 **Q - LED**

Current frequency in AC welding (50 - 150 Hz).

 **R - LED**

Wave balance in AC welding (balance = 0; Cleaning = from -1 to -8, Penetration = from 1 to 8).

 **O - Led**

Displays the electrode diameter. The choice of electrode diameter ranges from 0,5mm to 4mm. Use the knob **AA** to change the diameter.

The functions Q, R and O are active only for AC TIG welding.

 **S - LED**

Slope up. This is the time in which the current, starting from the minimum, reaches the set current value. (0-10 sec.)

 **T - LED**

Main welding current. (10-130A in MMA, 5-150A in TIG DC and 10-150A in TIG AC)

 **V - LED**

Second level of welding or base current. This current is always a percentage of the main current.

 **U - LED**

Pulse frequency (0.16-250 Hz)
The peak and base times are equal

 **W - LED**

Slope down. This is the time in which the current reaches the minimum value and the arc shuts off. (0-10 sec.)

 **X - LED**


Post gas. Adjusts the time gas flows after welding ends. (0-30 sec.)

Warning: only those LEDs that refer to the chosen welding mode will light; i.e., in continuous TIG welding the LED **U**, representing the pulse frequency, will not light.

Each LED indicates the parameter that may be adjusted by means of the knob **AA** while the LED itself is lit. Five seconds after the last variation, the LED involved will shut off; the main welding current will be displayed, and the corresponding LED **T** lights.

 **AE - 10-PIN CONNECTOR**

The following remote controls are connected to this connector:
a) foot control
b) torch with start button
c) torch with up/down, etc...

 **AD - 1/4 GAS FITTING**

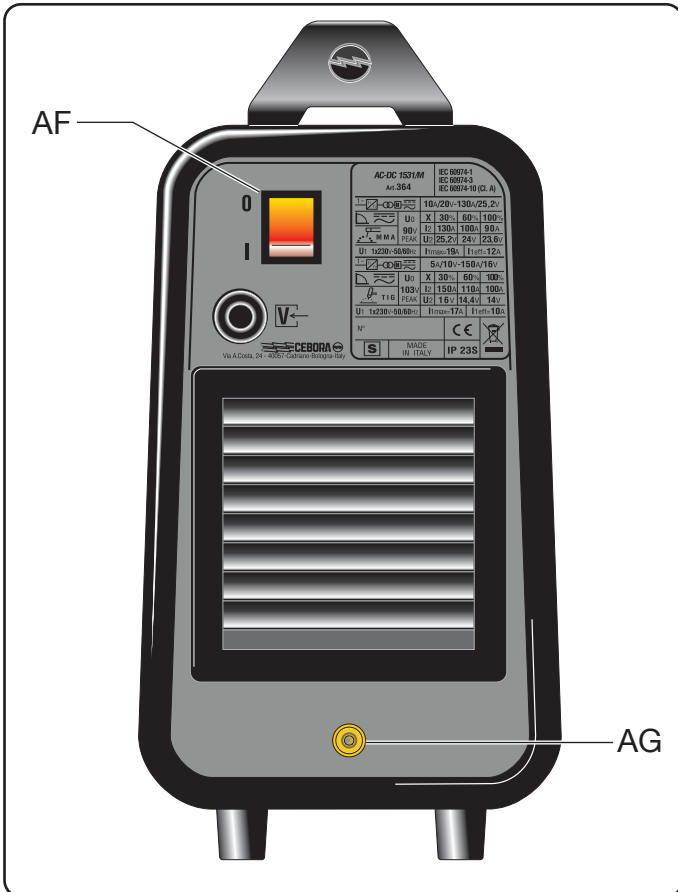
This is where the gas hose of the TIG welding torch is to be connected.



AB - Negative output terminal (-)



AC -Positive output terminal (+)



AF - switch

Turns the machine on and off



AG - gas intake fitting

3.3. GENERAL NOTES

Before using this welding machine, carefully read the standards CEI 26-23 / IEC-TS 62081. Also make sure the insulation of the cables, electrode clamps, sockets and plugs are intact, and that the size and length of the welding cables are compatible with the current used.

3.4 MMA WELDING (MANUAL METAL ARC)

- Make sure that the switch **AF** is in position 0, then connect the welding cables, observing the polarity required by the manufacturer of the electrodes you will be using; also connect the clamp of the ground cable to the workpiece, as

close to the weld as possible, making sure that there is good electrical contact.

- Do NOT touch the electrode clamp simultaneously with the earth clamp.



- Turn the machine on using the switch **AF**.

- Select the MMA procedure by pressing the button **A**: LED **B** lit.

- Adjust the current based on the diameter of the electrode, the welding position and the type of joint to be made.

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

3.5 TIG WELDING

By selecting TIG AC welding mode  you may weld aluminium, aluminium alloys, brass and magnesium, while selecting TIG DC  allows you to weld stainless steel, iron and copper.

Connect the earth cable connector to the positive pole (+) of the welding machine, and the clamp to the workpiece as close as possible to the welding point, making sure there is good electrical contact.

Connect the power connector of the TIG torch to the negative pole (-) of the welding machine.

Connect the torch connector to the welding machine connector **AE**.

Connect the torch gas hose fitting to the fitting **AD** on the machine, and the gas hose from the cylinder pressure regulator to the gas fitting **AG** on the rear panel.

Turn on the machine.

Do not touch live parts and output terminals while the machine is powered.

The first time the machine is turned on, select the process and mode using the push-buttons **A** and **E**, and the welding parameters by means of the key **P** and the knob **AA** as described in paragraph 3.2.

The type and diameter of the electrode to be used must be selected according to table A:

The flow of inert gas must be set to a value (in liters per minute) approximately 6 times the diameter of the electrode. If you are using gas-lens type accessories, the gas throughput may be reduced to approximately 3 times the diameter of the electrode. The diameter of the ceramic nozzle must be 4 to 6 times the diameter of the electrode.

Use D.I.N. 10 protective glasses for up to 75A, and D.I.N. 11 from 75A up.

4 REMOTE CONTROLS AND ACCESSORIES

The following remote controls may be connected to adjust the welding current for this welding machine:

Art. 193 Foot control (used in TIG welding)
Art. 1260 BINZEL "ABITIG 200" Torch (200A – 35%) – m4
Art. 1262 BINZEL "ABITIG 200" Up/Down Torch (200A – 35%) – m4

Art. 1656 Power source trolley
Art. 1281.03 Accessory for MMA welding

Art 1192+Art 187 (used in MMA welding)
ART. 1180 Connection to simultaneously connect the torch and the pedal control.

ART. 193 may be used in any TIG welding mode with this accessory.

Remote controls that include a potentiometer regulate

	D.C.	A.C. (frequency 50 Hz)					
		Pos. Max Penetration		Pos. Balanced zero		Pos. Max Cleaning	
Electrode Type ▶ ∅ ▼	Tungsten Thorium 2% Red	Tungsten Pure Green	Tungsten Zr 0,8% White	Tungsten Pure Green	Tungsten Zr 0,8% White	Tungsten Pure Green	Tungsten Zr 0,8% White
1,6	70A ÷ 150A	50A ÷ 100A	70A ÷ 150A	30A ÷ 60A	50A ÷ 80A	20A ÷ 40A	30A ÷ 60A
2,4	150A ÷ 250A	100A ÷ 160A	140A ÷ 235A	60A ÷ 120A	80A ÷ 140A	40A ÷ 100A	60A ÷ 120A
3,2	200A ÷ 350A	150A ÷ 210A	225A ÷ 325A	80A ÷ 160A	100A ÷ 180A	60A ÷ 140A	80A ÷ 160A
4	300A ÷ 400A	200A ÷ 275A	300A ÷ 400A	100A ÷ 240A	150A ÷ 280A	80A ÷ 200A	150A ÷ 250A

Table A

the welding current from the minimum to the maximum current set via the knob AA.

Remote controls with UP/DOWN logic regulate the welding current from the minimum to the maximum.

5 MAINTENANCE

Any maintenance operation must be carried out by qualified personnel in compliance with standard CEI 26-29 (IEC 60974-4).

5.1 GENERATOR MAINTENANCE

In the case of maintenance inside the machine, make sure that the switch Af is in position "O" **and that the power cord is disconnected from the mains.**

It is also necessary to periodically clean the interior of the machine from the accumulated metal dust, using compressed air.

5.2 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.

QUESTA PARTE È DESTINATA ESCLUSIVAMENTE AL PERSONALE QUALIFICATO.

THIS PART IS INTENDED SOLELY FOR QUALIFIED PERSONNEL.

DIESER TEIL IST AUSSCHLIEßLICH FÜR DAS FACHPERSONAL BESTIMMT.

CETTE PARTIE EST DESTINEE EXCLUSIVEMENT AU PERSONNEL QUALIFIE.

ESTA PARTE ESTÁ DESTINADA EXCLUSIVAMENTE AL PERSONAL CUALIFICADO.

ESTA PARTE È DEDICADA EXCLUSIVAMENTE AO PESSOAL QUALIFICADO.

TÄMÄ OSA ON TARKOITETTU AINOASTAAN AMMATTITAITOISELLE HENKILÖKUNNALLE.

DETTE AFSNIT HENVENDER SIG UDELUKKENDE TIL KVALIFICERET PERSONALE.

DIT DEEL IS UITSLUITEND BESTEMD VOOR BEVOEGD PERSONEEL.

DENNA DEL ÄR ENDAST AVSEDD FÖR KVALIFICERAD PERSONAL.

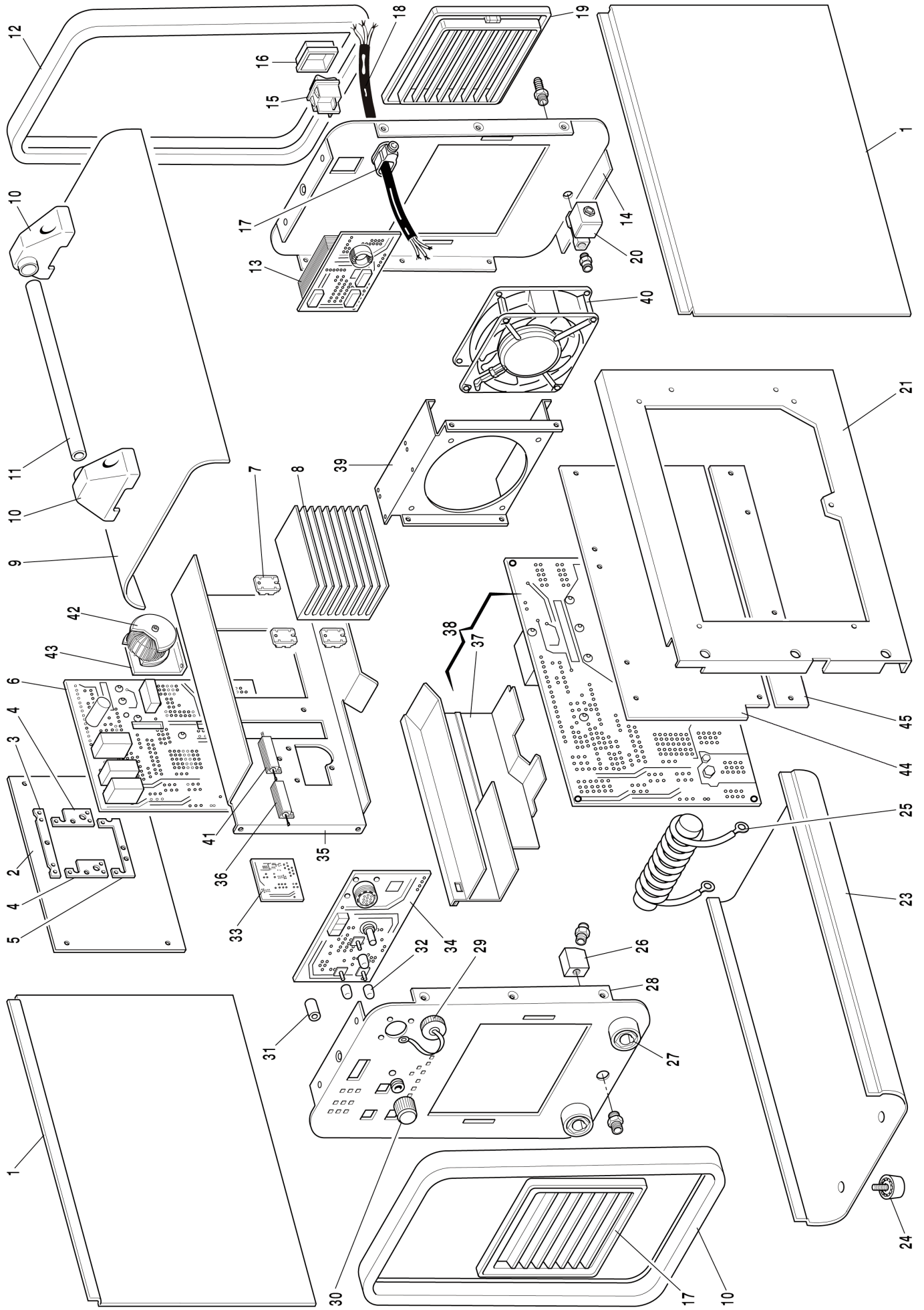
ΑΥΤΟ ΤΟ ΤΜΗΜΑ ΠΡΟΟΡΙΖΕΤΑΙ ΑΠΟΚΛΕΙΣΤΙΚΑ ΓΙΑ ΤΟ ΕΙΔΙΚΕΥΜΕΝΟ ΠΡΟΣΩΠΙΚΟ.

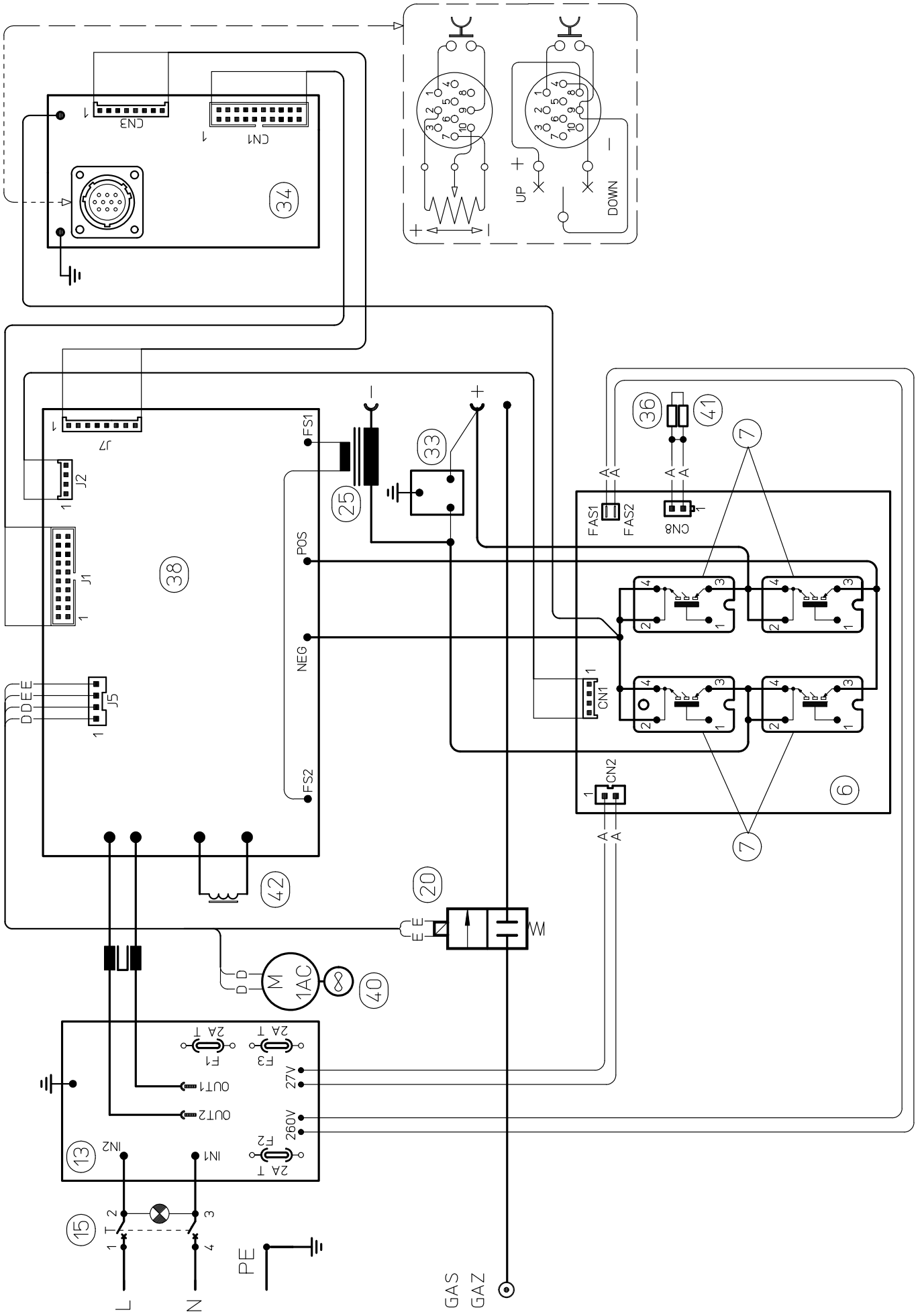
pos	DESCRIZIONE	DESCRIPTION
01	FASCIONE	HOUSING
02	ISOLAMENTO	INSULATION
03	CAVALLOTTO	JUMPER
04	CAVALLOTTO	JUMPER
05	CAVALLOTTO	JUMPER
06	CIRCUITO DI CONTROLLO	CONTROL CIRCUIT
07	KIT DIODI CON ISOLAMENTO	DIODES WITH INSULATION KIT
08	DISSIPATORE	RADIATOR
09	COPERCHIO	COVER
10	SUPPORTO MANICO	HANDLE SUPPORT
11	MANICO	HANDLE
12	CORNICE	FRAME
13	TRASFORMAT. DI SERVIZIO	AUXILIARY TRANSFORMER
14	PANNELLO POSTERIORE	BACK PANEL
15	INTERRUTTORE	SWITCH
16	COPERTURA	COVER
17	PASSACAVO	CABLE OUTLET
18	CAVO RETE	POWER CORD
19	PANNELLO ALETTATO	FINNED PANEL
20	ELETTROVALVOLA	SOLENOID VALVE
21	SUPPORTO	SUPPORT
23	FONDO	BOTTOM

pos	DESCRIZIONE	DESCRIPTION
24	PIEDE IN GOMMA	RUBBER FOOT
25	TRASFORMATORE H.F.	H.F. TRANSFORMER
26	RACCORDO	FITTING
27	PRESA GIFAS	GIFAS SOCKET
28	PANNELLO ANTERIORE	FRONT PANEL
29	TAPPO	CAP
30	MANOPOLA	KNOB
31	PROLUNGA	EXTENSION
32	PROLUNGA	EXTENSION
33	CIRCUITO FILTRO	FILTER CIRCUIT
34	CIRCUITO PANNELLO	PANEL CIRCUIT
35	SUPPORTO IGBT	IGBT SUPPORT
36	RESISTENZA	RESISTANCE
37	COPERTURA	COVER
38	CIRCUITO DI POTENZA	POWER CIRCUIT
39	SUPPORTO VENTOLA	FAN SUPPORT
40	MOTORE CON VENTOLA	MOTOR WITH FAN
41	RESISTENZA	RESISTANCE
42	INDUTTANZA	CHOKE
43	SUPPORTO INDUTTANZA	SUPPORT CHOKE
44	ISOLAMENTO CIRCUITO	CIRCUIT INSULATION
45	ISOLAMENTO	INSULATION

La richiesta di pezzi di ricambio deve indicare sempre: numero di articolo, matricola e data di acquisto della macchina, posizione e quantità del ricambio.

When ordering spare parts please always state the machine item and serial number and its purchase data, the spare part position and the quantity.





CODIFICA COLORI CABLAGGIO ELETTRICO		WIRING DIAGRAM COLOUR CODE
A	NERO	BLACK
B	ROSSO	RED
C	GRIGIO	GREY
D	BIANCO	WHITE
E	VERDE	GREEN
F	VIOLA	PURPLE
G	GIALLO	YELLOW
H	BLU	BLUE
K	MARRONE	BROWN
J	ARANCIO	ORANGE
I	ROSA	PINK

CODIFICA COLORI CABLAGGIO ELETTRICO		WIRING DIAGRAM COLOUR CODE
L	ROSA-NERO	PINK-BLACK
M	GRIGIO-VIOLA	GREY-PURPLE
N	BIANCO-VIOLA	WHITE-PURPLE
O	BIANCO-NERO	WHITE-BLACK
P	GRIGIO-BLU	GREY-BLUE
Q	BIANCO-ROSSO	WHITE-RED
R	GRIGIO-ROSSO	GREY-RED
S	BIANCO-BLU	WHITE-BLUE
T	NERO-BLU	BLACK-BLUE
U	GIALLO-VERDE	YELLOW-GREEN
V	AZZURRO	BLUE



CEBORA S.p.A - Via Andrea Costa, 24 - 40057 Cadriano di Granarolo - Bologna - Italy
Tel. +39.051.765.000 - Fax. +39.051.765.222
www.cebora.it - e-mail: cebora@cebora.it