



# 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 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.

- 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 welding current I2.  
 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 Maximum absorbed current value.  
 I1 eff This is the maximum value of the actual current absorbed, considering the duty cycle.
- IP21S Protection rating for the housing.  
 Grade 1 as the second digit means that this equipment is suitable for use outdoors.  
 Suitable for use in high-risk environments.



NOTES:

- 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 61000-3-12 provided that the maximum permissible system impedance  $Z_{max}$  is less than or equal to 0,088 (Art. 643) - 0,132 (Art. 647) 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 0,088 (Art. 643) - 0,132 (Art. 647).

## 2 GENERAL DESCRIPTION

### 2.1 SPECIFICATIONS

This manual has been prepared for the purpose of educating personnel assigned to install, operate and service the welding machine.

This equipment is a constant-voltage power source, suitable for MIG/MAG and OPEN-ARC welding.

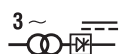
Upon receiving the machine, make sure there are no broken or damaged parts.

**The purchaser should address any complaints for losses or damage to the vector. Please indicate the article and serial number whenever requesting information about the welding machine.**

### 2.2 EXPLANATION OF TECHNICAL SPECIFICATIONS

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

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



Three-phase transformer-rectifier.



Flat characteristic.

MIG/MAG. Suitable for continuous electrode welding.

I2 max Unconventional welding current.  
 This value represents the max. limit attainable in welding.

### 2.3 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.

## 3 INSTALLATION

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

Make sure that the supply voltage corresponds to the value indicated on the power cable. If it is not already fitted, connect a plug suited to the power cable, making sure that the yellow/green conductor is connected to the earth pin.

The capacity of the overload cutout switch or fuses installed in series with the power supply must be equivalent to the absorbed current I1. of the machine.

### 3.1 PLACEMENT

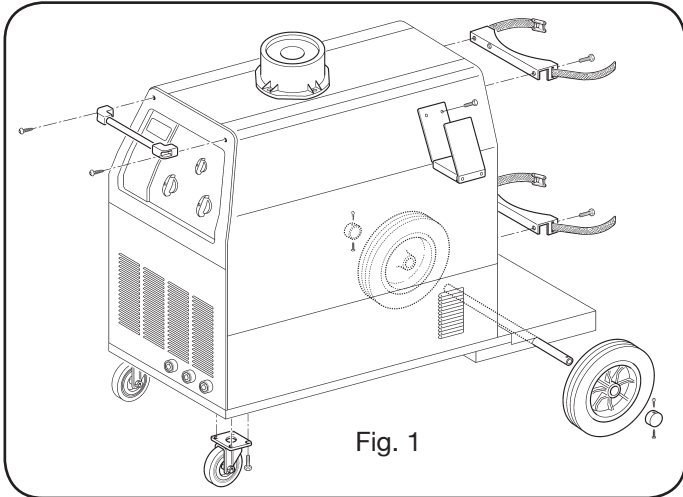


Fig. 1

Mount the handle, rear wheels and the two cylinder supports. **The handle must not be used for lifting the welding machine.**

Place the welding machine in a ventilated area.

Dust, dirt, and any other foreign matter entering the welding machine can interfere with ventilation and thus with smooth operation. Therefore, in relation to the environment and working conditions, it is important to keep the internal parts clean. Clean using a jet of dry, clean air, being careful to avoid damaging the machine in any way. Before working inside the welding machine, make sure it is unplugged from the power mains.

**Any intervention carried out inside the welding machine must be performed by qualified personnel.**

#### 3.1.1 Assembling the cooling unit (optional).

Remove the 2 cylinder supports **A** fastened to the rear panel **B** of the welding machine. Unscrew the 2 knobs **C**, slide the mobile cylinder support **D** back, mount the cooling unit support **E** on the rear panel **B** and screw the mobile cylinder support **D** back in using the 2 knobs **C** on the bottom **F** of the welding machine. (See fig.2).

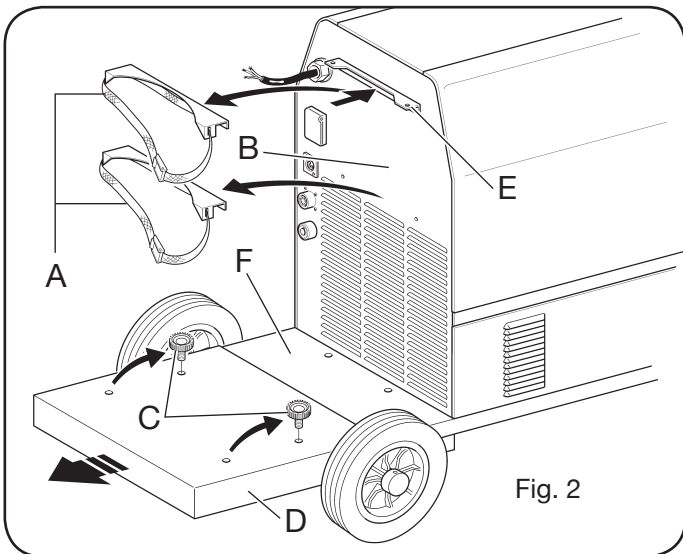


Fig. 2

Fasten the cooling unit to the support **E** on the rear panel **B** and to the base **F**. (See fig.3).

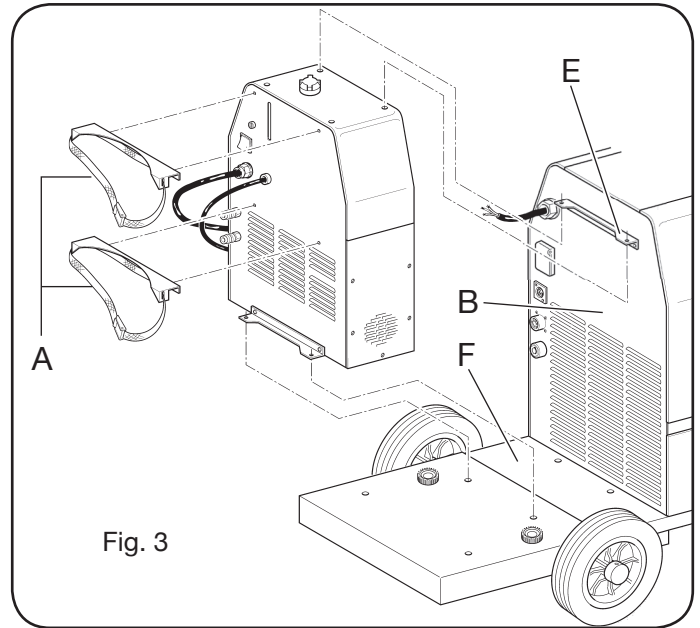


Fig. 3

Once the cooling unit is attached, insert the 2 red and blue water hoses leaving the connection into the corresponding quick fittings **G** of the unit, being especially careful to match the colors, the power connection **O** into the socket **P**, the service connection **Q** into the socket **R**, the power cord **H** of the unit into the socket **I** on the power source, and the service connection **L** into the connector **M** on the welding machine.

Remount the 2 cylinder supports **A** on the panel **N** of the cooling unit. (See fig.4).

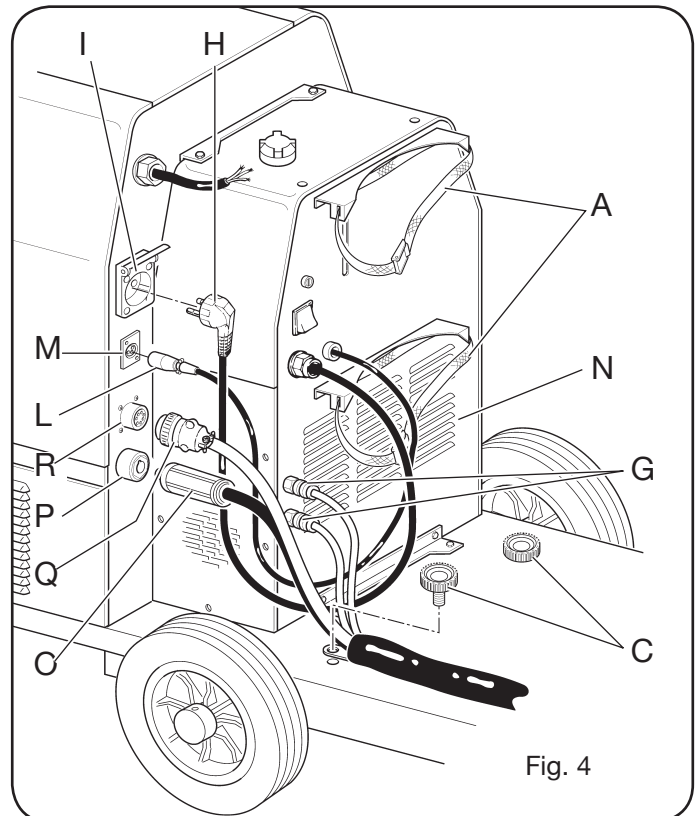


Fig. 4

## 3.2 INTERNAL CONNECTIONS

- Any intervention carried out inside the welding machine must be performed by qualified personnel.
- Before working inside the welding machine, make sure that the plug is disconnected from the power mains.
- After final inspection, the welding machine is connected to the voltage indicated on the power supply cable.
- To change the supply voltage, remove the right side panel and arrange the voltage change terminal board connections as shown in the figure 5.

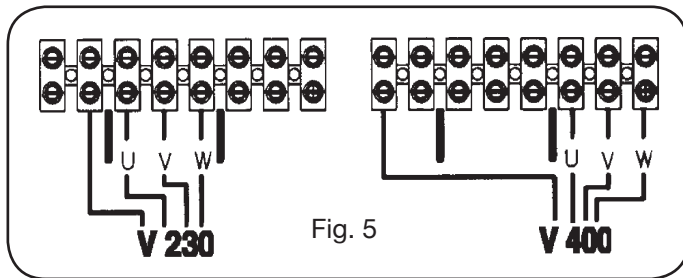


Fig. 5

- The supply voltage may not be changed on single-phase power sources.
- Do not use the welding machine without its cover or side panels for obvious safety reasons, and to avoid altering the cooling conditions for internal components.

## 3.3 EXTERNAL CONNECTIONS

### 3.3.1 Connecting the mass clip.

- Connect the earth cable terminal to the socket **V** of the welding machine, and connect the earth clamp to the workpiece.

### 3.3.2 Cylinder placement and connecting the gas hose

- Position the cylinder on the cylinder holder of the welding machine, using the straps provided to fasten it to the rear panel of the machine.
- Periodically check for wear on the straps, and order replacements if necessary.
- The cylinder must be equipped with a pressure regulator complete with flow gauge.
- Only after positioning the cylinder, connect the outgoing gas hose from the rear panel of the machine to the pressure regulator.
- Adjust the gas flow to approximately 10/18 liters/minute.

### 3.3.3 Connecting the wire feeder

This power source accepts the wire feeders Art.1652 and Art. 1662. To connect the power source and wire feeder, use the extension Art. 1182 (5 m) or Art. 1182.20 (10 m).

The performance and operating options of the wire feeder are described in the instructions enclosed with the wire feeder itself.

## 4 DESCRIPTION OF CONTROLS

### 4.1 CONTROLS ON THE FRONT OF THE MACHINE.

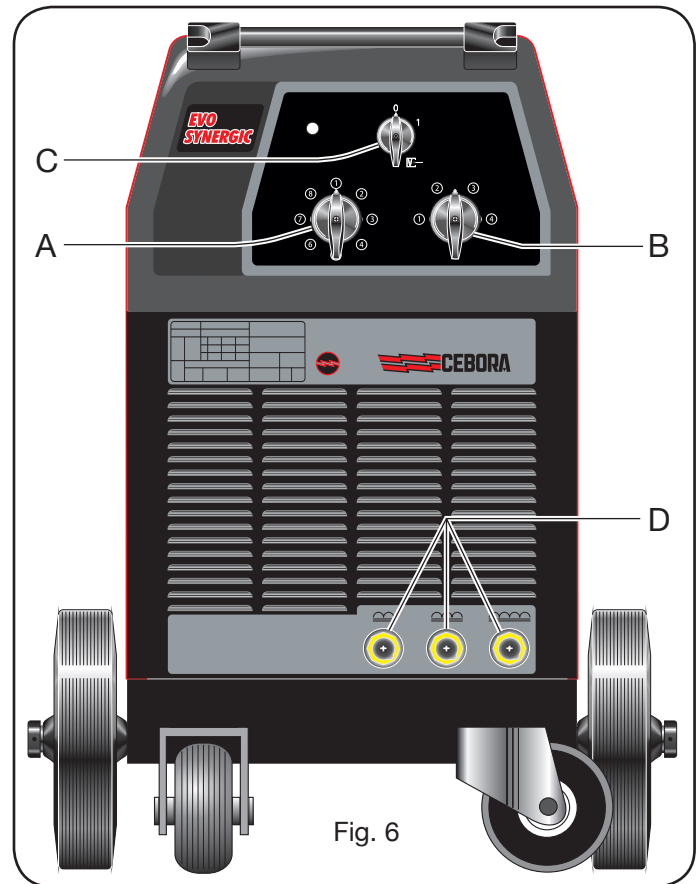
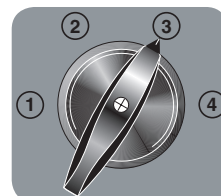


Fig. 6



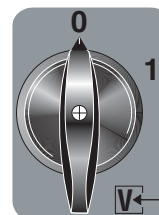
#### A - Selector switch

Fine-tunes the welding voltage within the range previously selected via selector switch **S**.



#### B- Selector switch

Select the ranges of welding voltage.



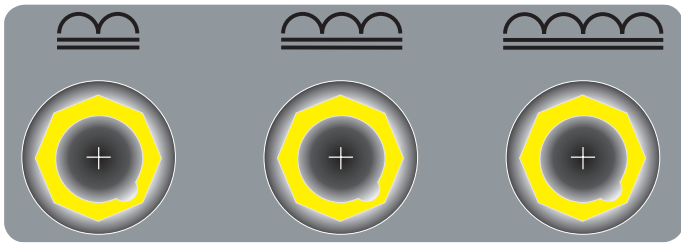
#### C - Switch

Turns the machine on or off.



#### D- Earth sockets.

Sockets to which to connect the earth cable.



#### 4.2 CONTROLS ON GENERATOR REAR PANEL

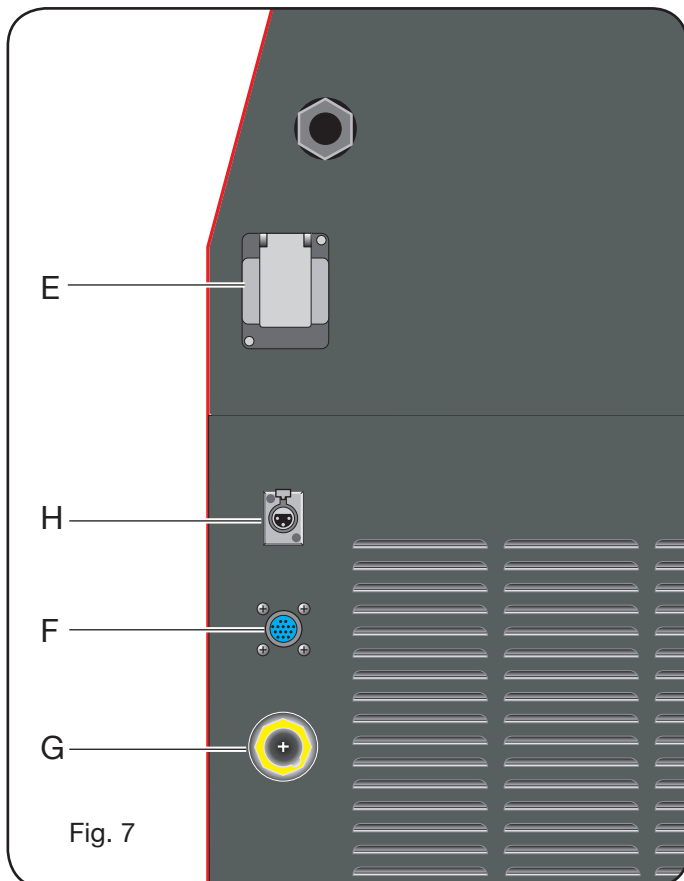


Fig. 7

#### E - 230V power supply socket.

440 W max. power. For cooling unit only. (**Warning: Do not connect other equipment to this socket.**)

#### F - 6-pin socket connector.

For the 6-pin plug connector on extension lead.

#### G - Socket.

For the extension lead power supply connector ('+' pole).

#### H - Socket.

For connection to the safety device on the cooling unit.

**N.B. If no cooling unit is used with the machine, plug the connector supplied with the machine into the socket H.**

### 5 WELDING

#### 5.1 Installation

Make sure that the wire diameter corresponds to the diameter indicated on the wire feeder roller, and that the selected program is compatible with the material and type of gas. Use wire feeder rollers with a "U"-shaped groove for aluminum wires, and with a "V"-shaped groove for other wires.

#### 5.2 THE MACHINE IS READY TO WELD

- Connect the earth clamp to the workpiece.
- Set the switch **Q** to **1**.
- Remove the gas nozzle.
- Unscrew the contact tip.
- Insert the wire in the wire liner of the torch, making sure that it is inside the roller groove and that the roller is in the correct position.
- Press the torch trigger to move the wire forward until it comes out of the torch.
- **Caution: keep your face away from the gun tube assembly while the wire is coming out.**
- Screw the contact tip back on, making sure that the hole diameter is the same as that of the wire used.
- Assemble the gas nozzle.

#### 5.3 WELDING CARBON STEELS WITH GAS PROTECTION.

In order to weld these materials you must:

- Use a welding gas with a binary composition, usually ARGON + CO<sub>2</sub> with percentages of Argon ranging from 75% up. With this blend, the welding bead will be well jointed and attractive. Using pure CO<sub>2</sub> as a protection gas will produce narrow beads, with greater penetration but a considerably increase in splatters.
- Use a welding wire of the same quality as the steel to be welded. It is best to always use good quality wires, avoiding welding with rusted wires that could cause welding defects.
- Avoid welding rusted parts, or those with oil or grease stains.

#### 5.4 WELDING STAINLESS STEEL

Series 300 stainless steels must be welded using a protection gas with a high Argon content, containing a small percentage of O<sub>2</sub> or carbon dioxide CO<sub>2</sub> (approximately 2%) to stabilize the arc.

Do not touch the wire with your hands. It is important to keep the welding area clean at all times, to avoid contaminating the joint to be welded.

#### 5.5 WELDING ALUMINUM

In order to weld aluminum you must use:

- Pure Argon as the protection gas.
- A welding wire with a composition suitable for the base material to be welded.
- Use mills and brushing machines specifically designed for aluminum, and never use them for other materials.

## 6 WELDING DEFECTS

- 1 DEFECT- Porosity (within or outside the bead)  
CAUSES
- Electrode defective (rusted surface)
  - Missing shielding gas due to:
    - low gas flow
    - flow gauge defective
    - regulator frosted due to no preheating of the CO<sub>2</sub> protection gas
    - defective solenoid valve
    - contact tip clogged with spatter
    - gas outlet holes clogged
    - air drafts in welding area.
- 2 DEFECT - Shrinkage cracks  
CAUSES
- Wire or workpiece dirty or rusted.
  - Bead too small.
  - Bead too concave.
  - Bead too deeply penetrated.
- 3 DEFECT - Side cuts  
CAUSES
- Welding pass done too quickly
  - Low current and high arc voltages.
- 4 DEFECT - Excessive spraying  
CAUSES
- Voltage too high.
  - Insufficient inductance.
  - No preheating of the CO<sub>2</sub> protection gas.

## 7 MAINTENANCE

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

### 7.1 GENERATOR MAINTENANCE

In the case of maintenance inside the machine, make sure that the switch 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.

### 7.2 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.

## 8 ACCESSORIES

- Art. 1680 Cooling unit.  
Art. 1652 Wire feeder with 2 rollers.  
Art. 1662 Wire feeder with 4 rollers.  
Art. 1182 Connection (5 m) between power source and wire feeder.  
Art. 1182.20 Connection (10 m) between power source and wire feeder.

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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.

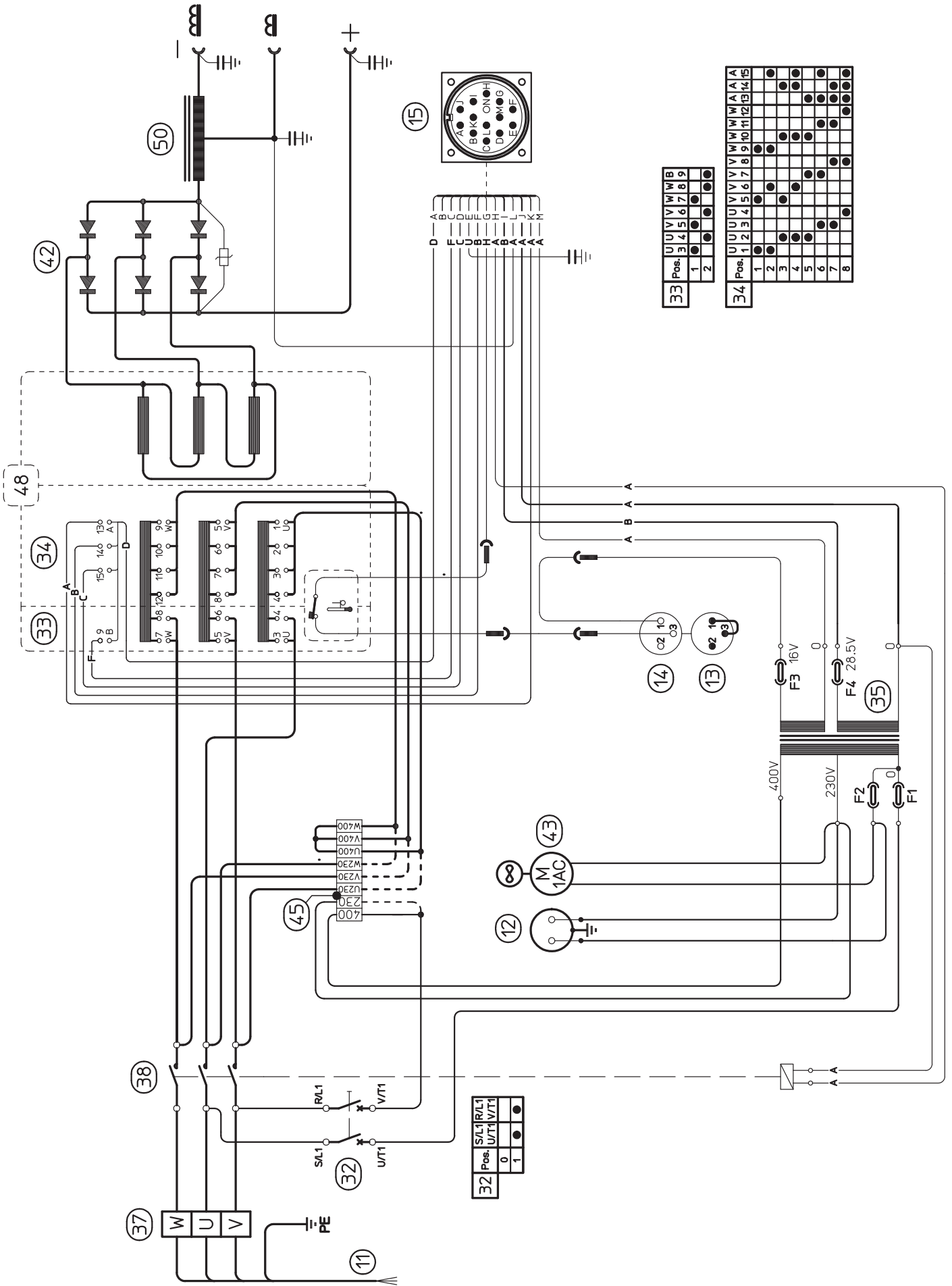
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<b>CODIFICA COLORI CABLAGGIO ELETTRICO</b>		<b>WIRING DIAGRAM COLOUR CODE</b>
A	NERO	BLACK
B	ROSSO	RED
C	GRIGIO	GREY
D	BIANCO	WHITE
E	VERDE	GREEN
F	VIOLA	PURPLE
G	GIALLO	YELLOW
H	BLU	BLUE
K	MARRONE	BROWN
J	ARANCIO	ORANGE
I	ROSA	PINK

<b>CODIFICA COLORI CABLAGGIO ELETTRICO</b>		<b>WIRING DIAGRAM COLOUR CODE</b>
L	NROSA-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



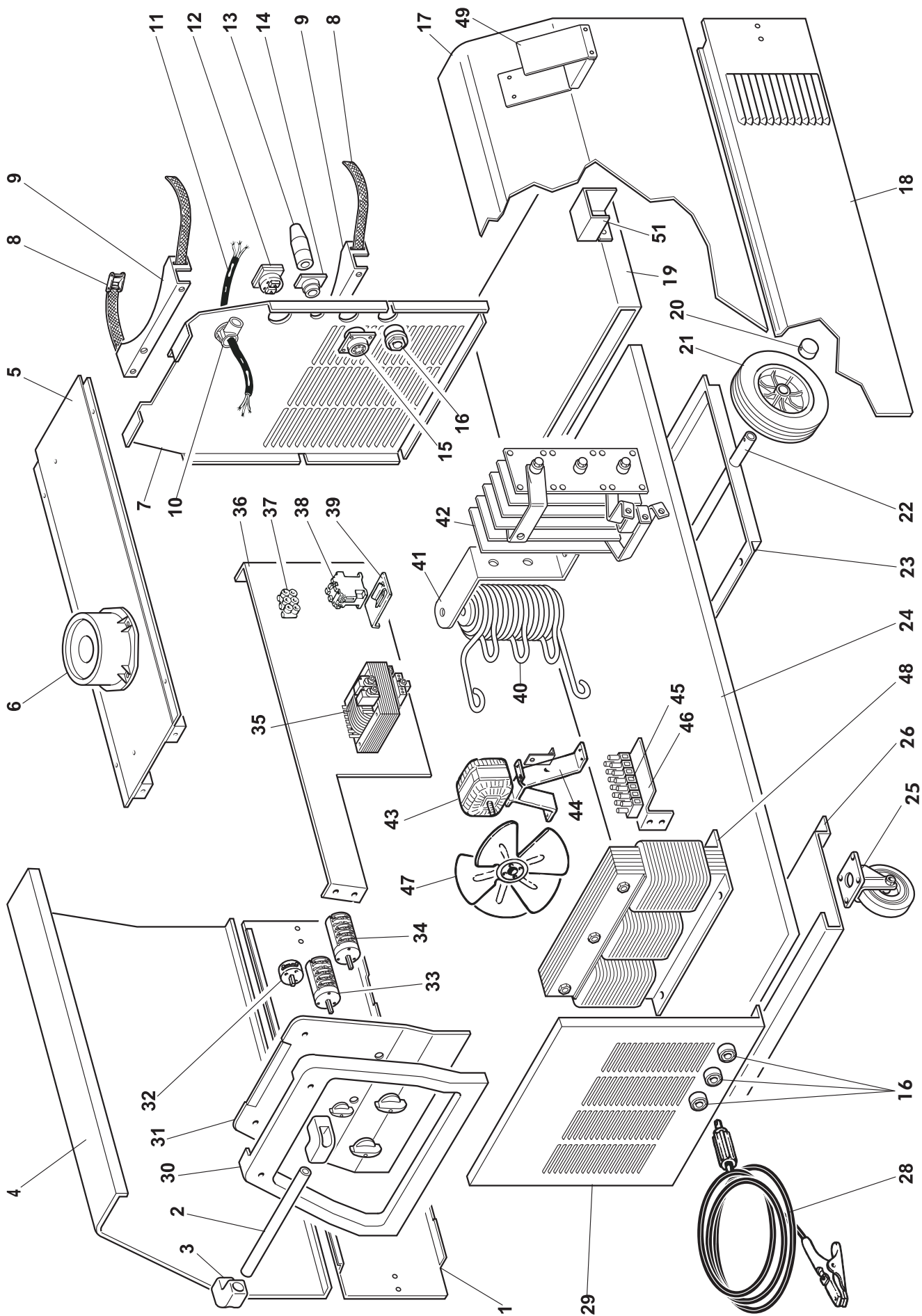




32	S/L1	R/L1	U/T1	V/T1
Pos.	0	1	•	•

33	U	V	V	W	B
Pos.	3	4	5	6	7
	•	•	•	•	•
	•	•	•	•	•

34	U	U	U	V	V	V	W	W	W	A	A	A
Pos.	1	2	3	4	5	6	7	8	9	10	11	12
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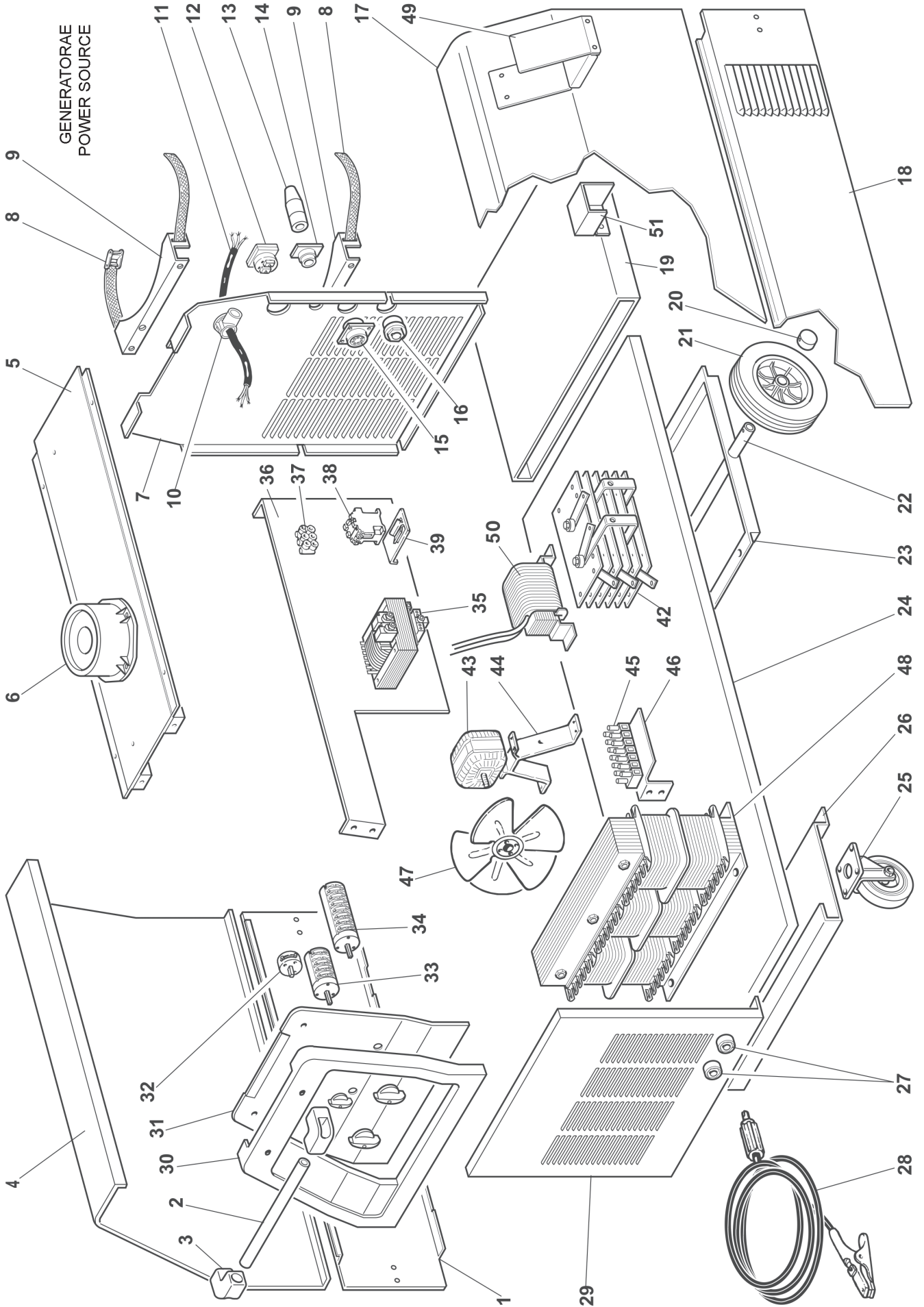


Art. 647

POS	DESCRIZIONE	DESCRIPTION
01	LATERALE SINISTRO	LEFT SIDE PANEL
02	MANICO	HANDLE
03	SUPPORTO MANICO	HANDLE SUPPORT
04	LATERALE FISSO	FIXED SIDE PANEL
05	COPERCHIO	COVER
06	SUPPORTO GIREVOLE	SWIVELLING SUPPORT
07	PANNELLO POSTERIORE	BACK PANEL
08	CINGHIA	BELT
09	APPOGGIO BOMBOLA	GAS CYLINDER SUPPORT
10	PRESSACAVO	STRAIN RELIEF
11	CAVO RETE	POWER CORD
12	PRESA	SOCKET
13	CONNETTORE	CONNECTOR
14	CONNETTORE	CONNECTOR
15	CONNETTORE	CONNECTOR
16	PRESA GIFAS	GIFAS SOCKET
17	LATERALE FISSO	FIXED SIDE PANEL
18	LATERALE DESTRO	RIGHT SIDE PANEL
19	SUPPORTO BOMBOLA	GAS CYLINDER SUPPORT
20	TAPPO	CAP
21	RUOTA FISSA	FIXED WHEEL
22	ASSALE	AXLE
23	SUPPORTO	SUPPORT
24	FONDO	BOTTOM
25	RUOTA PIROETTANTE	SWIVELING WHEEL
26	SUPPORTO	SUPPORT
28	CAVO MASSA	EARTH CABLE
29	PANNELLO ANTERIORE	FRONT PANEL
30	CORNICE	FRAME
31	PANNELLO COMANDI	CONTROL PANEL
32	INTERRUTTORE	SWITCH
33	COMMUTATORE	SWITCH
34	COMMUTATORE	SWITCH
35	TRASFORMATORE DI SERVIZIO	AUXILIARY TRANSFORMER
36	PIANO INTERMEDIO	INSIDE BAFFLE
37	MORSETTIERA	TERMINAL BOARD
38	TELERUTTORE	CONTACTOR
39	SUPPORTO TELERUTTORE	CONTACTOR SUPPORT
40	IMPEDENZA	CHOKE
41	SUPPORTO IMPEDENZA	CHOKE SUPPORT
42	RADDRIZZATORE	RECTIFIER
43	MOTORE	MOTOR
44	SUPPORTO MOTORE	MOTOR SUPPORT
45	MORSETTIERA	TERMINAL BOARD
46	SUPPORTO MORSETTIERA	TERMINAL BOARD SUPPORT
47	VENTOLA	FAN
48	TRASFORMATORE	TRANSFORMER
49	SUPPORTO	SUPPORT
51	SUPPORTO	SUPPORT

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.



Art. 643

POS	DESCRIZIONE	DESCRIPTION
01	LATERALE SINISTRO	LEFT SIDE PANEL
02	MANICO	HANDLE
03	SUPPORTO MANICO	HANDLE SUPPORT
04	LATERALE FISSO	FIXED SIDE PANEL
05	COPERCHIO	COVER
06	SUPPORTO GIREVOLE	SWIVELLING SUPPORT
07	PANNELLO POSTERIORE	BACK PANEL
08	CINGHIA	BELT
09	APPOGGIO BOMBOLA	GAS CYLINDER SUPPORT
10	PRESSACAVO	STRAIN RELIEF
11	CAVO RETE	POWER CORD
12	PRESA	SOCKET
13	CONNETTORE	CONNECTOR
14	CONNETTORE	CONNECTOR
15	CONNETTORE	CONNECTOR
16	PRESA GIFAS	GIFAS SOCKET
17	LATERALE FISSO	FIXED SIDE PANEL
18	LATERALE DESTRO	RIGHT SIDE PANEL
19	SUPPORTO BOMBOLA	GAS CYLINDER SUPPORT
20	TAPPO	CAP
21	RUOTA FISSA	FIXED WHEEL
22	ASSALE	AXLE
23	SUPPORTO	SUPPORT
24	FONDO	BOTTOM
25	RUOTA PIROETTANTE	SWIVELING WHEEL
26	SUPPORTO	SUPPORT
27	PRESA GIFAS	GIFAS SOCKET
28	CAVO MASSA	EARTH CABLE
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30	CORNICE	FRAME
31	PANNELLO COMANDI	CONTROL PANEL
32	INTERRUTTORE	SWITCH
33	COMMUTATORE	SWITCH
34	COMMUTATORE	SWITCH
35	TRASFORMATORE DI SERVIZIO	AUXILIARY TRANSFORMER
36	PIANO INTERMEDIO	INSIDE BAFFLE
37	MORSETTIERA	TERMINAL BOARD
38	TELERUTTORE	CONTACTOR
39	SUPPORTO TELERUTTORE	CONTACTOR SUPPORT
42	RADDRIZZATORE	RECTIFIER
43	MOTORE	MOTOR
44	SUPPORTO MOTORE	MOTOR SUPPORT
45	MORSETTIERA	TERMINAL BOARD
46	SUPPORTO MORSETTIERA	TERMINAL BOARD SUPPORT
47	VENTOLA	FAN
48	TRASFORMATORE	TRANSFORMER
49	SUPPORTO	SUPPORT
50	IMPEDENZA	CHOKER
51	SUPPORTO	SUPPORT

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