

# 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) should 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

This welding machine is a constant 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. IT MUST NOT BE USED TO DEFROST PIPES.

### 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 60974.10 CL. A - IEC 61000-3-11 - IEC 61000-3-12 (see note 2).

- N°. Serial number, which must be indicated on any type of request regarding the welding machine.
-  Three phase static transformer-rectifier frequency converter.
-  Drooping-characteristic.
- MMA 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
- 3~ 50/60Hz 50- or 60-Hz three-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 machine may be stored, but it is not suitable for use outdoors in the rain, unless it is protected.
-  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 61000-3-12 provided that the maximum permissible system impedance ZMAX is less than or equal to 0,137 (Art. 328) and 0,081 (Art. 335) 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 ZMAX less than or equal to 0,137 (Art. 328) and 0,081 (Art. 335).

### 2.3 DESCRIPTION OF PROTECTIVE DEVICES

#### 2.3.1 Thermal protection

This equipment is protected by a thermostat. When the thermostat is tripped, the machine stops delivering current but the fan continues to run. The yellow LED (B) lights to indicate when it is tripped. Do not shut off the welding machine until the LED has gone off.

## 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. 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. 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) Setting knob

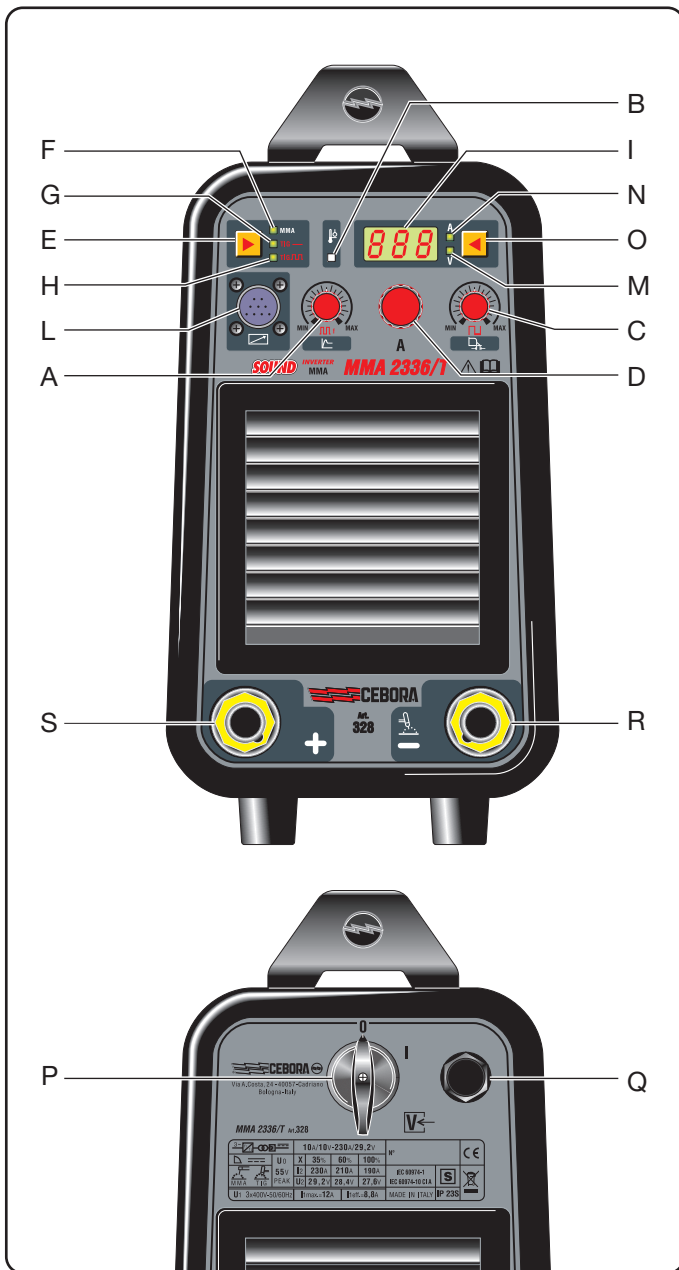
During MMA welding it adjusts the "hot-start" current time, expressed in hundredths of a second; essentially, it sets an overcurrent that serves to improve striking. It does not make any adjustment during **continuous TIG** welding.

In **pulsed TIG** welding, it adjusts the pulse frequency in Hz.

During welding processes in which the knob is active, the value of the adjustment is shown on the display I. Two seconds after the last adjustment the display returns to showing the figure previously selected using the selector switch O.


#### B) Thermostat LED

(see 2.3.1. Thermal protection).




### C) Setting knob



During **MMA** welding, it adjusts the percentage of “arc-force”  current; essentially it adjusts a current that produces the electrode transfer.

It does not make any adjustment during

**continuous TIG** welding.

In **pulsed TIG** mode, it adjusts the base current in  Amperes.

During welding processes in which the knob is active, its setting is shown on the display **I**. Two seconds after the last adjustment the display returns to showing the figure previously selected using the selector switch **O**.

### D) Welding current setting knob.



Adjusts the welding current in both MMA and continuous TIG mode.

In pulsed TIG welding it adjusts the peak current.

### E) Procedure selector switch.




Pressing this key allows you to choose the welding mode (**F**, **G** or **H**).

### F) Coated MMA welding.




Cellulosic electrodes can be melted only using art. 335 (A.W.S. 6010).


### G) Continuous TIG welding.

 The arc strikes by creating a short-circuit between the electrode and the workpiece; the welding current is adjusted by means of the knob **D**.

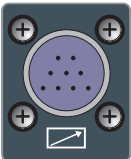
### H) Pulsed TIG welding.

 The arc strikes by creating a short-circuit between the electrode and the workpiece, the peak current is adjusted by means of the knob **D**, the base current is adjusted by means of the knob **C**, the frequency is adjusted by means of the knob **A**.


### I) Display.

 Displays the value of the Amperes or Volts based on the selections made using the button **O**. In addition, it displays the values set using the knobs **A** and **C**.


### L) Connector

 To which the remote controls are connected

### M) LED

 When lit, it indicates that display **I** is showing the welding voltage. Activated by means of selector switch **O**.

### N) LED

 When lit, it indicates that display **I** is showing the welding current. Activated by means of selector switch **O**.

### O) Selector switch.

 Pressing this key selects the LEDs **M** and **N**.

P) **On/Off switch.**

Q) **Power cord.**

R) **(-) Output terminal.**

S) **(+) Output terminal.**

## 3.3 MMA WELDING

- Make sure that the switch (**P**) is in position 0, then connect the welding cables, matching the polarity required by the manufacturer of the electrodes you will be using.

**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.

- Do NOT touch the torch or electrode clamp simultaneously with the mass terminal.
- Turn the machine on using the switch (**P**).
- Press the selector switch **E** until the LED **F** lights.
- Adjust the current based on the electrode diameter, welding position and type of joint to be made.
- Also adjust the hot-start using the knob **A** (recommended setting 15) and the arc-force using the knob **C** (recommended setting 30 for basic electrodes).

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

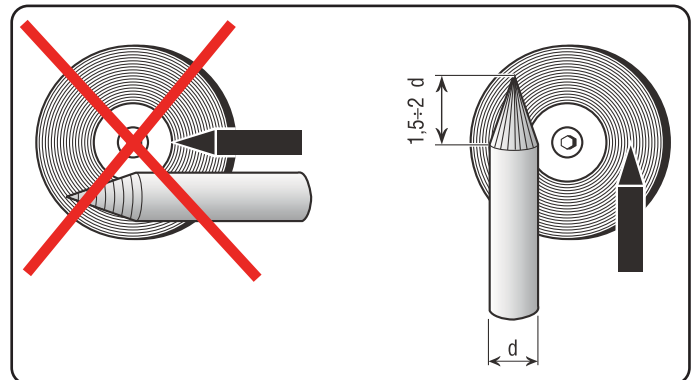
## 3.4 TIG WELDING

- This welding machine is suitable for welding the following materials using the TIG procedure: stainless steel, iron, copper.
- Make sure that the switch (**P**) is in position 0.
- 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.
- Connect the power connector of the TIG torch to the negative pole (-) of the welding machine.
- Connect the gas hose to the outlet of the pressure regulator, connected to an ARGON cylinder.
- Use a tungsten electrode with 2% thorium (red stripe).
- Do not touch the electrode and mass terminal simultaneously.
- Turn the machine on using the switch (**P**).
- Use the selector switch **E** to set the type of TIG welding, continuous or pulsed.
- 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.**

### 3.4.1 Preparing the electrode

Grind the electrode tip so that it has vertical grooves as shown in the figure.

- To profile the tungsten, use a hard, fine-grained abrasive grinding wheel used solely for this purpose.
- Be careful with metal particle.



## 4 ACCESSORIES.

This welding machine is intended for use with the following accessories:

**Art 181.** Foot control to adjust the welding current. Equipped with 5m of cable and ON-OFF switch.

**Art 187+ extension art 1192.** For current adjustment during MMA welding.

**Art 1284.05.** Clamp + earth 35mm<sup>2</sup> for MMA welding. (Art. 328).

**Art 1286.05.** Clamp + earth 50mm<sup>2</sup> for MMA welding. (Art. 335).

**Art 1432.** Trolley.

---

## 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 **P** 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 AMMATTITAITOISILLE HENKILÖKUNNALLE.

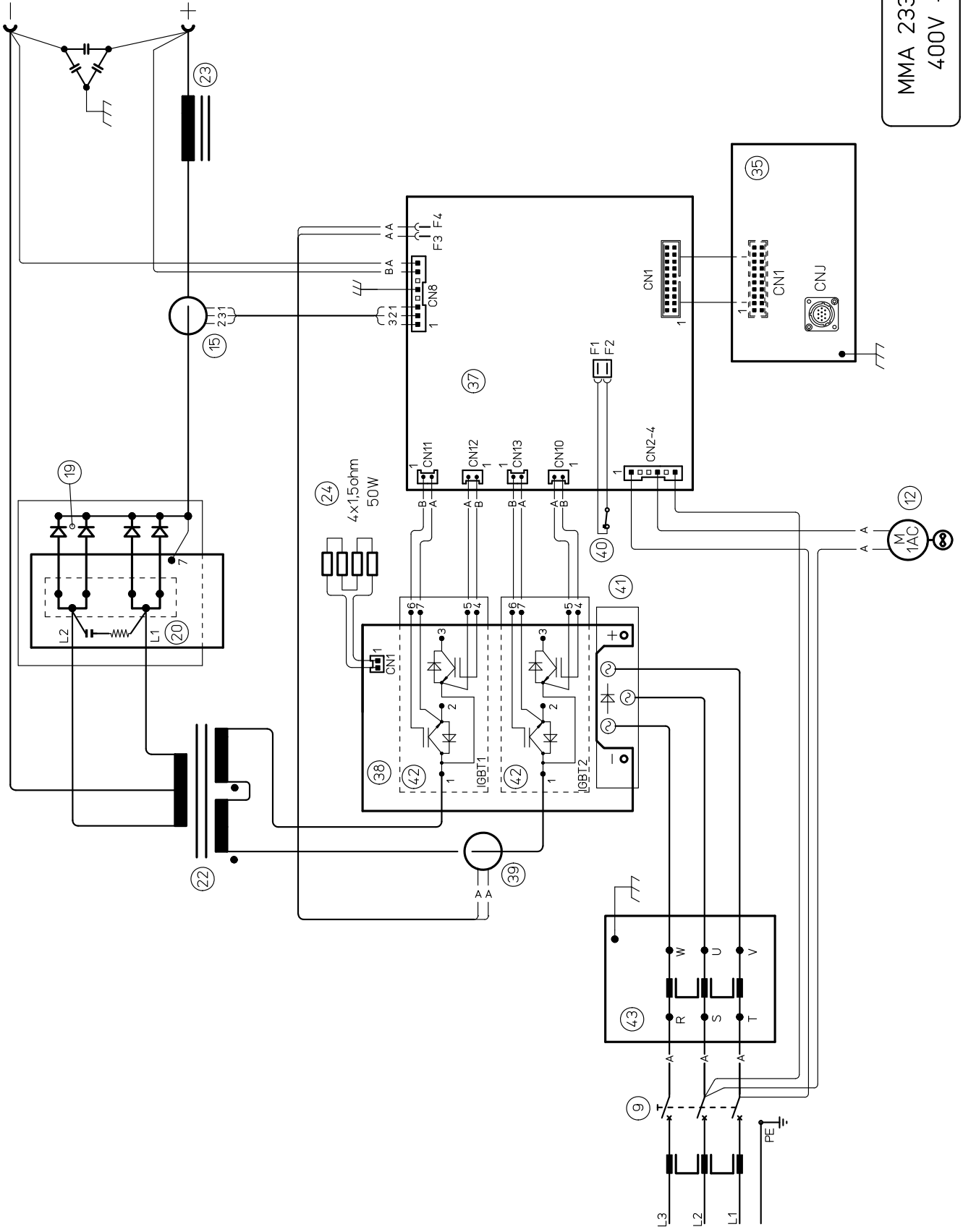
DETTE AFSNIT HENVENDER SIG UDELUKKENDE TIL KVALIFICERET PERSONALE.

DIT DEEL IS UITSLUITEND BESTEMD VOOR BEVOEGD PERSONEEL.

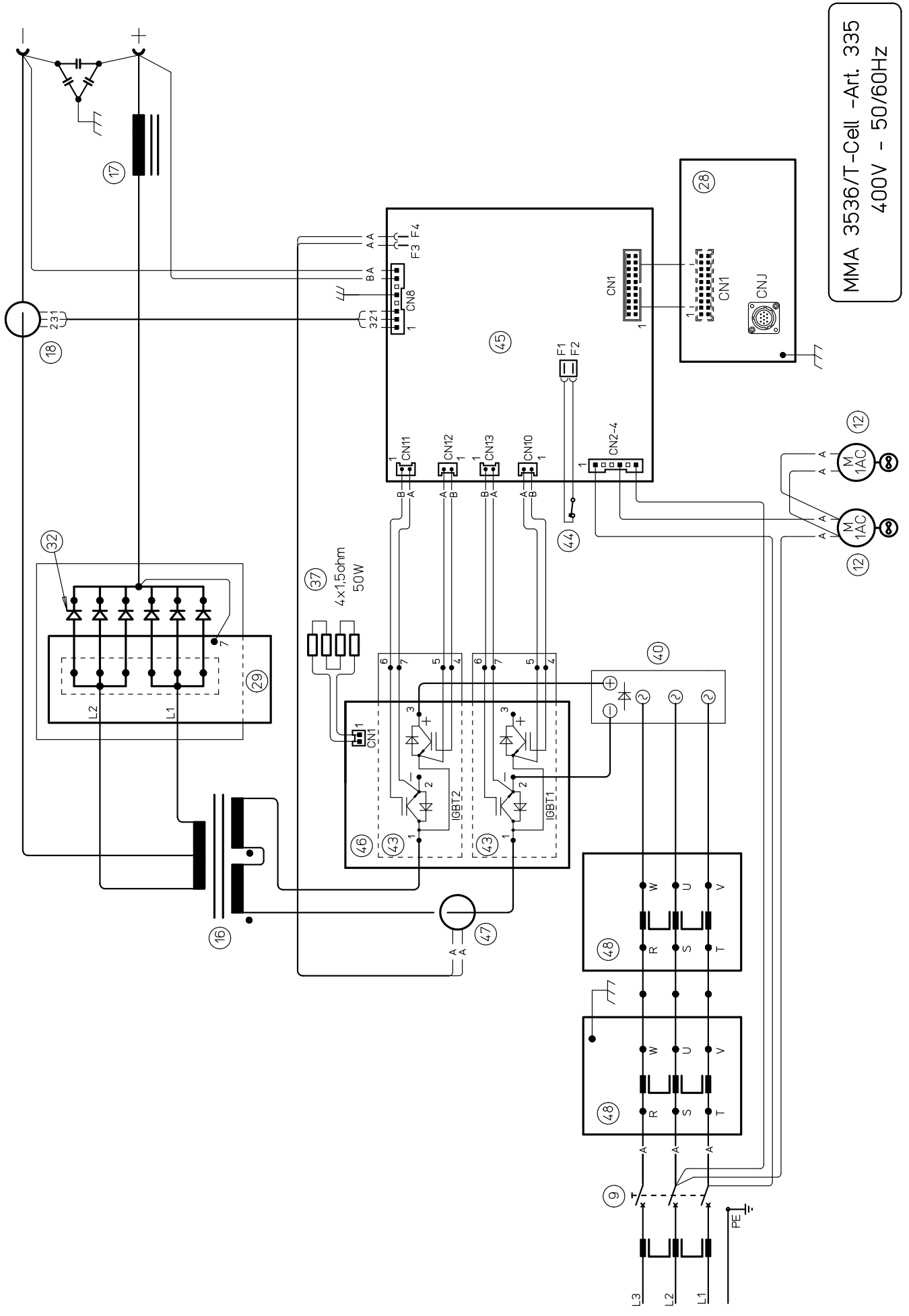
DENNA DEL ÄR ENDAST AVSEDD FÖR KVALIFICERAD PERSONAL.

ΑΥΤΟ ΤΟ ΤΜΗΜΑ ΠΡΟΟΡΙΖΕΤΑΙ ΑΠΟΚΛΕΙΣΤΙΚΑ ΓΙΑ ΤΟ ΕΙΔΙΚΕΥΜΕΝΟ ΠΡΟΣΩΠΙΚΟ.

	<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
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



MMA 2336/T - Art. 328  
400V - 50/60Hz



MMA 3536/T-Cell -Art. 335  
400V - 50/60Hz



### Art. 328

pos	DESCRIZIONE	DESCRIPTION
1	LATERALE	SIDE PANEL
2	COPERCHIO	COVER
3	SUPPORTO MANICO	HANDLE SUPPORT
4	MANICO	HANDLE
5	CORNICE	FRAME
6	PRESSACAVO	STRAIN RELIEF
7	CAVO RETE	POWER CORD
8	PROTEZIONE	PROTECTION
9	INTERRUTTORE	SWITCH
10	PANNELLO ALETTATO	FINNED PANEL
11	PANNELLO POSTERIORE	BACK PANEL
12	MOTORE CON VENTOLA	MOTOR WITH FAN
13	SUPPORTO SECONDARIO	SECONDARY SUPPORT
14	SUPPORTO TRASDUTTORE	TRANSUCER SUPPORT
15	TRASDUTTORE	TRANSUCER
16	ISOLAMENTO	INSULATION
17	CAVALLOTTO	JUMPER
18	CAVALLOTTO	JUMPER
19	DIODO	DIODE
20	CIRCUITO DI CONTROLLO	CONTROL CIRCUIT
21	DISSIPATORE	RADIATOR
22	TRASFORMATORE DI POTENZA	POWER TRANSFORMER
23	IMPEDENZA	CHOKER
24	RESISTENZA	RESISTANCE
25	SUPPORTO RESISTENZA	RESISTANCE SUPPORT
26	FONDO	BOTTOM
27	PIEDE	FOOT
28	PRESA GIFAS	GIFAS SOCKET
29	PASSACAVO	CABLE OUTLET
30	MANOPOLA	KNOB
31	MANOPOLA	KNOB
32	TAPPO	CAP
33	PANNELLO ANTERIORE	FRONT PANEL
34	PROLUNGA PULSANTE	SWITCH EXTENSION
35	CIRCUITO PANNELLO	PANEL CIRCUIT
36	SUPPORTO PRIMARIO	PRIMARY SUPPORT
37	CIRCUITO DI CONTROLLO	CONTROL CIRCUIT
38	CIRCUITO IGBT	IGBT CIRCUIT
39	TRASFORMA. DI SERVIZIO	AUXILIARY TRANSFORMER
40	TERMOSTATO	THERMOSTAT
41	RADDRIZZATORE	RECTIFIER
42	IGBT	IGBT
43	CIRCUITO FILTRO	FILTER CIRCUIT
44	DISSIPATORE	RADIATOR

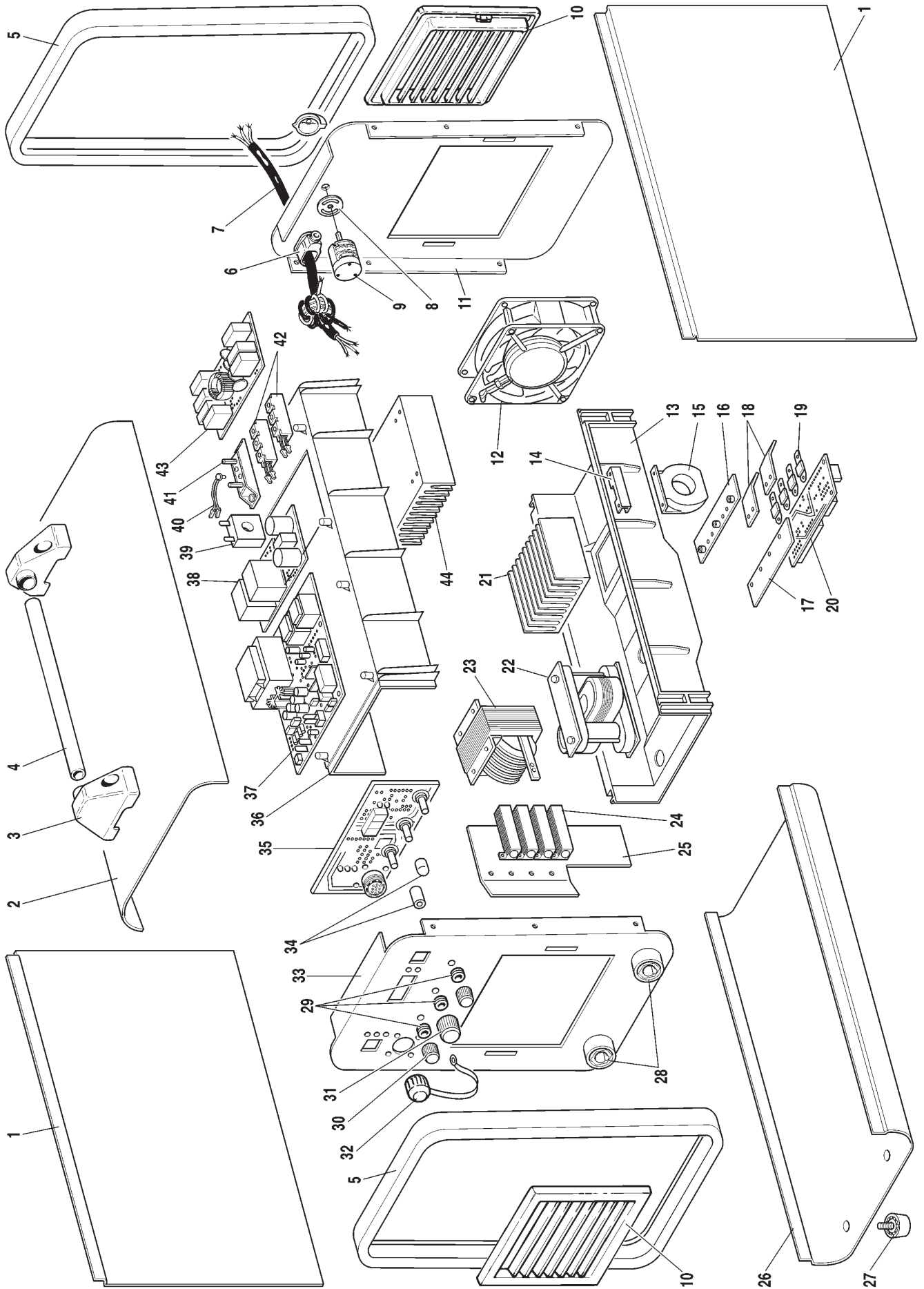
### Art. 335

pos	DESCRIZIONE	DESCRIPTION
1	LATERALE	SIDE PANEL
2	COPERCHIO	COVER
3	SUPPORTO MANICO	HANDLE SUPPORT
4	MANICO	HANDLE
5	CORNICE	FRAME
6	PRESSACAVO	STRAIN RELIEF
7	CAVO RETE	POWER CORD
8	PROTEZIONE	PROTECTION
9	INTERRUTTORE	SWITCH
10	PANNELLO ALETTATO	FINNED PANEL
11	PANNELLO POSTERIORE	BACK PANEL
12	MOTORE CON VENTOLA	MOTOR WITH FAN
13	SUPPORTO	SUPPORT
14	SUPPORTO CENTRALE DX	RIGH CENTRAL SUPPORT
15	SUPPORTO CENTRALE SX	LEFT CENTRAL SUPPORT
16	TRASFORMATORE DI POTENZA	POWER TRANSFORMER
17	IMPEDENZA	CHOKER
18	TRASDUTTORE	TRANSUCER
19	FONDO	BOTTOM
20	PIEDE	FOOT
21	PRESA GIFAS	GIFAS SOCKET
22	PANNELLO ANTERIORE	FRONT PANEL
23	PASSACAVO	CABLE OUTLET
24	MANOPOLA	KNOB
25	MANOPOLA	KNOB
26	TAPPO	CAP
27	PROLUNGA PULSANTE	SWITCH EXTENSION
28	CIRCUITO PANNELLO	PANEL CIRCUIT
29	CIRCUITO SECONDARIO	SECONDARY CIRCUIT
30	CAVALLOTTO	JUMPER
31	CAVALLOTTO	JUMPER
32	DIODO	DIODE
33	ISOLAMENTO	INSULATION
34	DISSIPATORE	RADIATOR
35	SUPPORTO SECONDARIO	SECONDARY SUPPORT
36	SUPPORTO RESISTENZA	RESISTANCE SUPPORT
37	RESISTENZA	RESISTANCE
38	SUPPORTO PRIMARIO	PRIMARY SUPPORT
39	DISSIPATORE	RADIATOR
40	RADDRIZZATORE	RECTIFIER
41	DISSIPATORE IGBT	IGBT RADIATOR
42	ISOLAMENTO	INSULATION
43	GRUPPO IGBT	IGBT UNIT
44	TERMOSTATO	THERMOSTAT
45	CIRCUITO DI CONTROLLO	CONTROL CIRCUIT
46	CIRCUITO IGBT	IGBT CIRCUIT
47	TRASFORMA. DI SERVIZIO	AUXILIARY TRANSFORMER
48	CIRCUITO FILTRO	FILTER CIRCUIT

La richiesta dei pezzi di ricambio deve indicare sempre il numero di articolo ,la posizione ,la quantità e la data di acquisto.

When ordering spare parts please always state item No., spare part ref. No., quantity and purchase date.

Art. 328



Art. 335

