




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


This welding machine is a DC power source built using INVERTER technology, engineered to weld with all types of coated electrodes (cellulosic type not included) and with TIG welding process with scratch starting and high frequency. 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 60974-3 - 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.

 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 0,426 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 0,426.

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 M lights.

2.3.2. Block protections.

If the open-circuit voltage exceeds the allowable value, the machine shuts off and the tripping of this protection device is signalled by LED N flashing.

In this case shut the machine off and turn it back on. If the situation persists, please contact technical service.

Another protection device is signalled by the wording E1 or E2 showing on display P. Also in this case please contact technical service.

2.3.3 Motor-driven generators

These must have a power equal to or greater than 6KVA, and must not deliver a voltage greater than 260V.

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 26-10 - CENELEC HD 427).

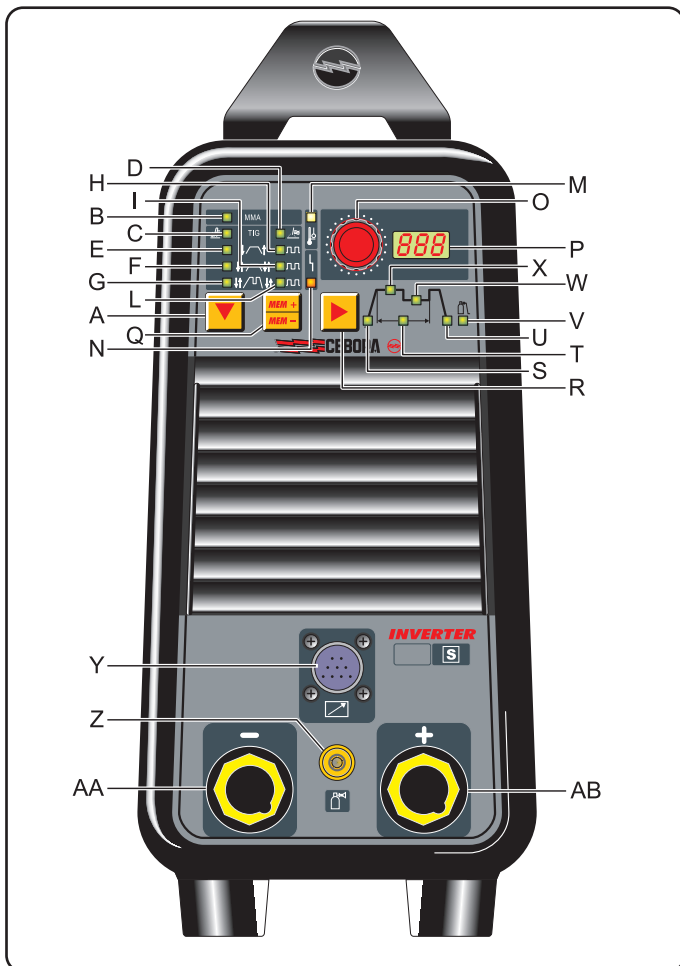
3.2 DESCRIPTION OF THE EQUIPMENT



A - Procedure and mode selector switch

This push-button selects the welding procedure (MMA or TIG) and mode.

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.

B - LED. MMA welding (Manual Metal Arc)

This machine can weld all types of covered electrodes* except for cellulosic. In this position, only the knob **O** is enabled, to adjust the welding current.

C - 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.

D - 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.

E - 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 reaches the value set by means of the knob **O**. 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.

F - 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.

G - LED. Continuous TIG welding with dual current level - 4 stages (automatic).

Set the two current levels before lighting the arc:

First level: press the **R** key until the LED **X** lights, and adjust the main current using the knob **O**.

Second level: press the **R** key until the LED **W** lights, and adjust the main current using the knob **O**.

When the torch trigger is pressed, the current begins to increase over the previously set "slope up" time (led **S** lit), until it reaches the value set by means of the knob **O**. The LED **X** lights and appears on the display **P**.

Should it be necessary to reduce the current during welding, without shutting of the arc (for instance when changing the welding material or working position, moving from horizontal to upright, etc...), press and immediately release the torch trigger: the current will switch to the second value selected, the LED **W** will light and **X** will go off.

To return to the previous main current, press and release the torch trigger once again. The LED **X** will light, and the LED **W** will go off. To stop welding at any time, simply hold down the torch trigger for more than 0.7 seconds, then release. The current begins to fall to zero within the previously set "slope down" time interval (LED **U** lit).

If you press and immediately release the torch trigger during the "slope down" phase, you will return to "slope up" if it is set to greater than zero, or to the lesser current value of those set.

NOTE: The expression "PRESS AND IMMEDIATELY RELEASE" refers to a maximum time of 0.5 seconds.

H - LED. Pulsed 2-stage TIG welding (manual).

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

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

I - 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.

L - LED. Pulsed TIG welding with dual current level - 4 stages (automatic).

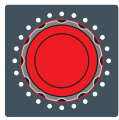
The welding mode is the same as described for LED **G**. After adjusting the peak and base currents for the first level, the relationship between the two will also be upheld in the second level.

M - 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.

 **N - BLOCK LED (see 2.3.2)**



O - KNOB

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

- adjust the second level of current **W**
- adjust the "slope up" **S**
- adjust the "slope down" **U**
- adjust the pulse frequency **T**
- adjust the post gas **V**



P - Display

It shows the welding current and the settings selected with the button **R** and adjusted with the knob **O**, as well as the block messages **E1** and **E2**.



Q - SELECTOR

Selects and saves programs.

The welding machine can save nine welding programs P01.....P09, and call them up using this button. **A** working program **PL** is also available.

Selecting

When this push-button is pressed briefly, the display **P** shows the next program number after the one being worked on. If it has not been saved the message will flash, otherwise it will remain steady.

Saving

Once the program has been selected, hold for more than 3 seconds to save the data. In confirmation, the program number on the display **P** will stop flashing



R - SELECTOR

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

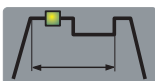


S - LED

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

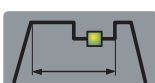
Warning: only those LEDs that refer to the chosen welding mode will light; i.e., in continuous TIG welding the LED **T**, representing the pulse frequency, will not light.

Each LED indicates the parameter that may be adjusted by means of the knob **O** 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 **X** lights.



X - LED

Main welding current.



W - LED

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



T - LED

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



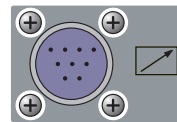
U - LED

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



V - LED

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



Y - 10-PIN CONNECTOR

The following remote controls are connected to this connector:

- a) foot control
 - b) torch with start button
 - c) torch with potentiometer
 - d) torch with up/down, etc...
- Between pin 3 and 6 the "ARC ON" function is available (clean contact 1A - 30V).



Z - 1/4 GAS FITTING

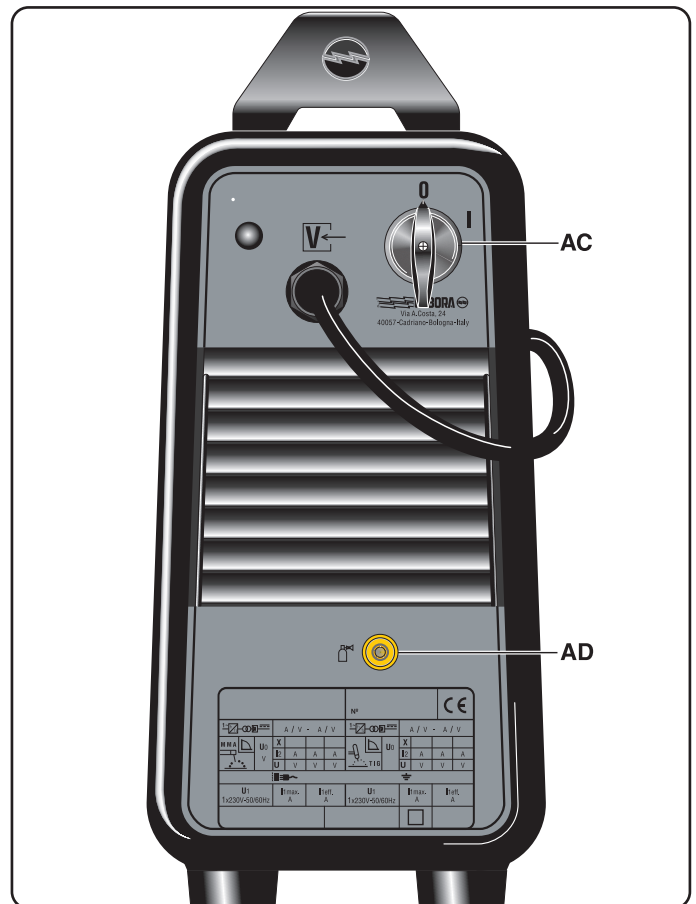
This is where the gas hose of the TIG welding torch is to be connected.



AA - Negative output terminal (-)



AB -Positive output terminal (+)





AC - switch

Turns the machine on and off

AD - gas intake fitting

3.3. GENERAL NOTES

Before using this welding machine, carefully read the standards CEI 26/9 - CENELEC HD 407 and CEI 26.11 - CENELEC HD 433. 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)

- This welding machine is suitable for welding all types of electrodes, with the exception of cellulosic (AWS 6010)*.
- Make sure that the switch **AC** 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 torch or electrode clamp simultaneously with the earth clamp.
- Turn the machine on using the switch **AC**.
- 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

This welding machine is suitable for welding stainless steel, iron, or copper using the TIG procedure.

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 **Y**.

Connect the torch gas hose fitting to the fitting **Z** on the machine, and the gas hose from the cylinder pressure regulator to the gas fitting **AD** 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 mode using the push-button **A** and the welding parameters by means of the key **R** and the knob **O** as described in paragraph 3.2.

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. The most commonly used gas is normally ARGON, because it is less costly than other inert gases, but you may also use blends of ARGON with a maximum of 2% HYDROGEN for welding stainless steel, and HELIUM or ARGON-HELIUM blends for welding copper. These blends increase the heat of the arc while welding, but are much more expensive.

If you are using HELIUM gas, increase the liters per minute to 10 times the diameter of the electrode (Ex. diameter 1.6 x10= 16 lt./min of Helium).

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

3.6. SAVING

You may save parameters only after welding.

Pressing the push-button Q briefly makes a selection; held down for more than 3 seconds, it saves the data. Each time it is turned on, the machine always shows the last welding condition used.

3.6.1. Saving data from the PL program

Using the machine for the first time

When the machine is turned on, the display shows the symbol **PL**; this disappears after 5 seconds, and a working current is displayed. Follow the instructions in paragraphs 3.2 and 3.5, then proceed as follows to save the data in the program **P01**:

- Briefly press the push-button **Q** (mem+mem-) the message **P01** will appear flashing.
- Press push-button **Q** for more than 3 seconds, until the symbol **P01** stops flashing: at this point, the data have been saved.
- Obviously, if you wish to save in a program other than **P01**, you should briefly press the push-button **Q** as many times as necessary to display the desired program. **P01** will be displayed the next time the machine is turned on.

PRESSING THE Q PUSH-BUTTON BRIEFLY MAKES A SELECTION, WHILE HOLDING IT DOWN FOR MORE THAN 3 SECONDS SAVES THE DATA.

3.6.2. Save from a free program

The operator may edit and save a selected program by proceeding as follows:

- Press the push-button **Q** briefly and select the desired program number.
- **The symbol of free programs is flashing.**
- Press the push-button **A** and select the welding procedure and mode (paragraph 3.1).
- Turn the knob **O** and set the welding current.
- If the TIG procedure has been selected, activate the LED **V** (post gas) by means of the push-button **R**, and set the desired value via the knob **O** (paragraph 3.1.)
- If you wish to adjust the "slope" times or other parameters, after making these adjustments which are **necessary in order to weld**, follow the steps described in paragraph 3.1.
- **Weld, even briefly, and decide where to save**
- To save in the previously selected program, press the button **Q** for more than 3 seconds, until the number stops flashing.

· To **save** in a different program, make your selection by briefly pressing the push-button **Q**, then hold down the push-button **Q** for more than 3 seconds.

3.6.3 Save from a saved program

Beginning with a previously saved program, the operator may edit the data in memory to update the program itself, or to find new parameters to save in another program.

3.6.3.1 Update

- After turning on the machine, select the parameters to be edited and edit them.
- Weld, even briefly.
- Hold down the **Q** button for more than 3 seconds, until the save is confirmed (program symbol changes from flashing to steady).

3.6.3.2 Save in a new program

- After turning on the machine, select the parameters to be edited and edit them.
- Weld, even briefly.
- Briefly press the selector **Q** until the desired program is displayed.
- Hold down the **Q** button until the save is confirmed (program symbol changes from flashing to steady).

4 REMOTE CONTROLS

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 (1262) TIG UP/DOWN Torch.

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

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

The remote control settings are always active in the **PL** program, while they are not active in a saved program.

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 **AC** 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.

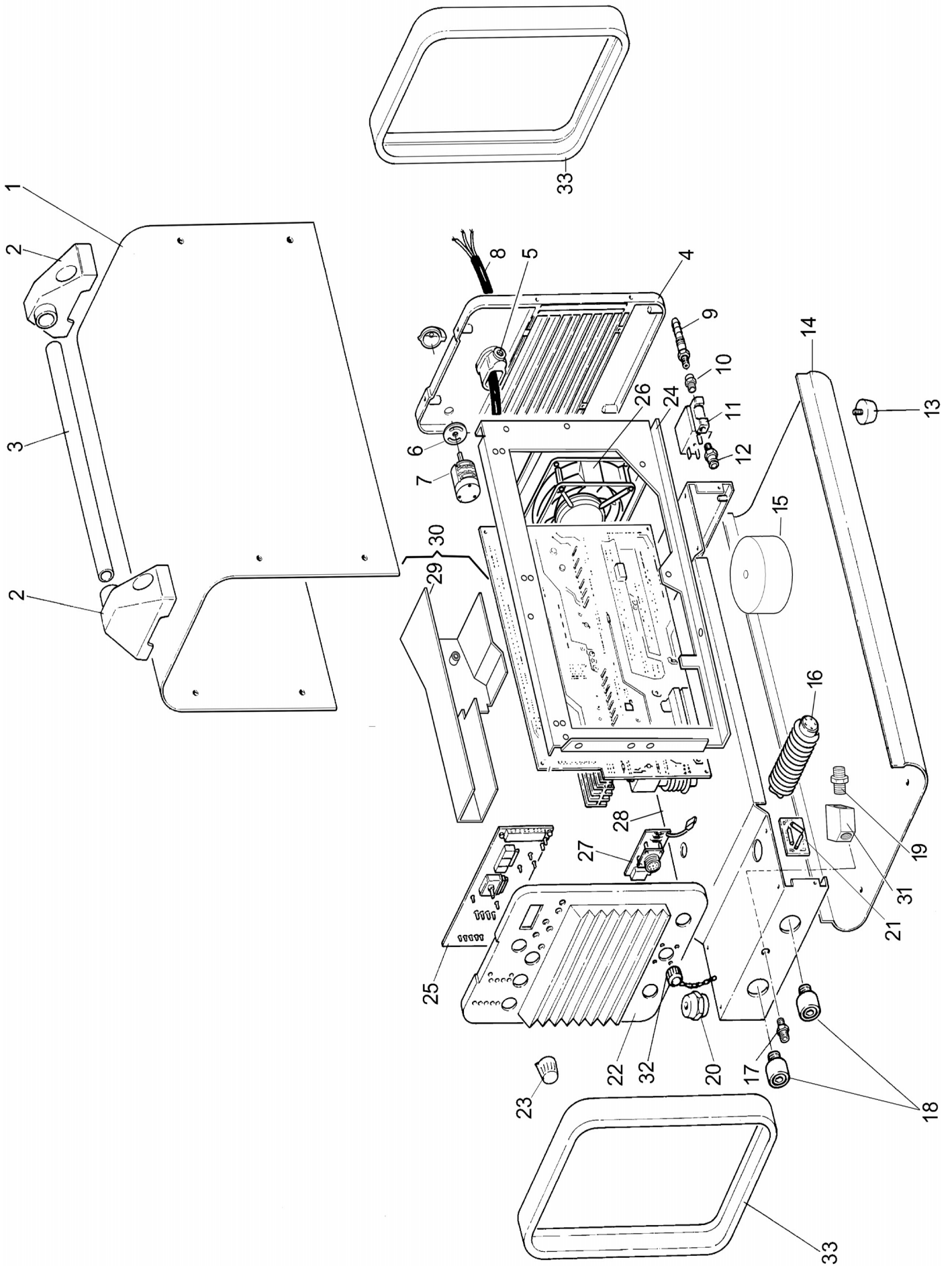
DETTE AFSNIT HENVENDER SIG UDELUKKENDE TIL KVALIFICERET PERSONALE.

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.

Art. 265



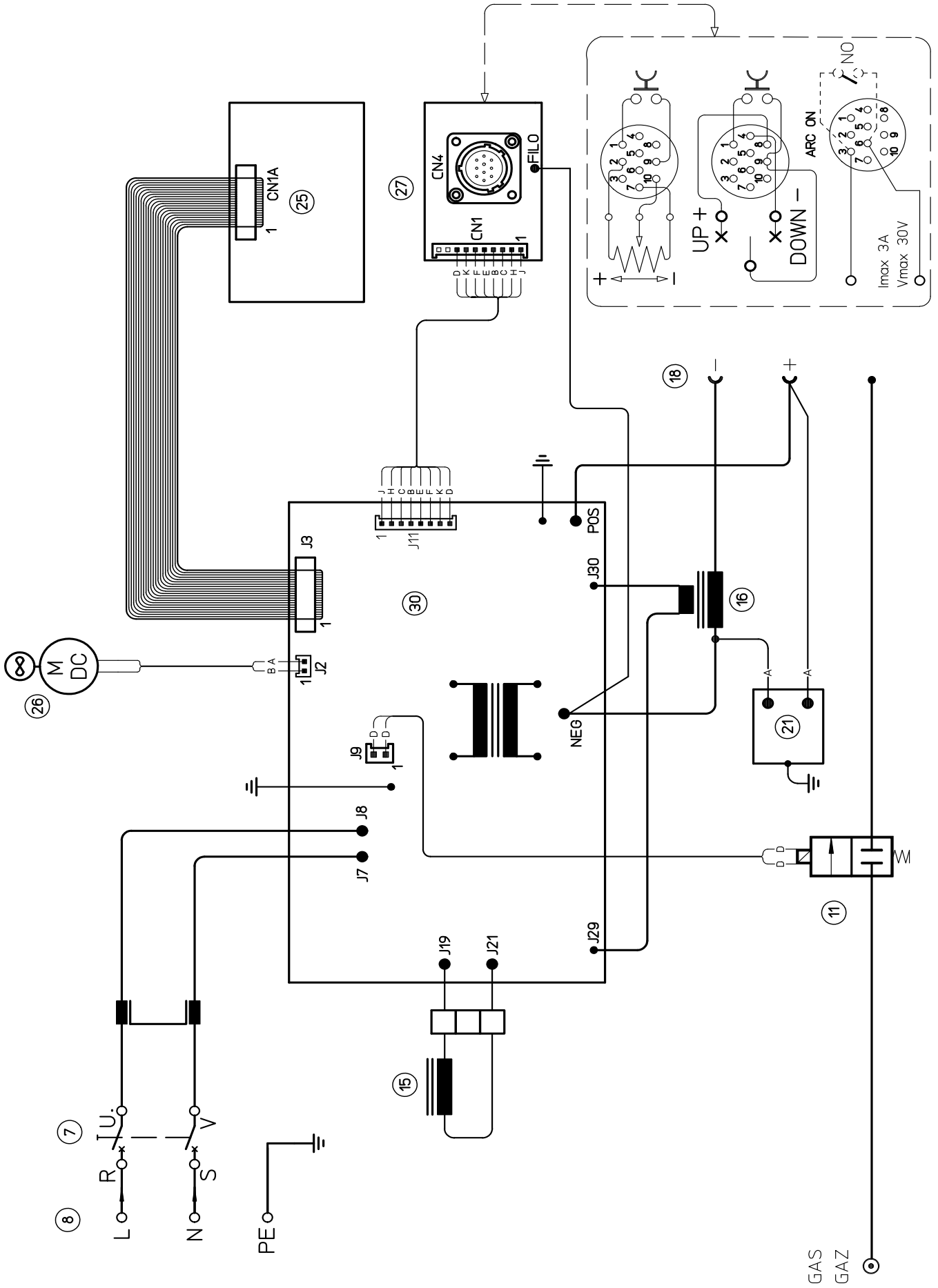
Art. 265

pos	DESCRIZIONE	DESCRIPTION
01	FASCIONE	HOUSING
02	SUPPORTO MANICO	HANDLE SUPPORT
03	MANICO	HANDLE
04	PANNELLO POSTERIORE	BACK PANEL
05	PRESSACAVO	STRAIN RELIEF
06	COPERTURA	COVER
07	INTERRUTTORE	SWITCH
08	CAVO RETE	POWER CORD
09	RACCORDO	FITTING
10	RACCORDO	FITTING
11	ELETTROVALVOLA	SOLENOID VALVE
12	RACCORDO	FITTING
13	PIEDE IN GOMMA	RUBBER FOOT
14	FONDO	BOTTOM
15	IMPEDENZA PFC	PFC CHOKE
16	TRASFORMATORE H.F.	H.F. TRANSFORMER
17	RACCORDO	FITTING

pos	DESCRIZIONE	DESCRIPTION
18	PRESA GIFAS	GIFAS SOCKET
19	RACCORDO	FITTING
20	SUPPORTO CIRCUITO	CIRCUIT BOARD SUPPORT
21	CIRCUITO FILTRO	FILTER CIRCUIT
22	PANNELLO ANTERIORE	FRONT PANEL
23	MANOPOLA	KNOB
24	SUPPORTO CIRCUITO	CIRCUIT BOARD SUPPORT
25	CIRCUITO DISPLAY	DISPLAY CIRCUIT
26	MOTORE CON VENTOLA	MOTOR WITH FAN
27	CIRCUITO CONNETTORE	CONNECTOR CIRCUIT
28	PIANO INTERMEDIO	INSIDE BAFFLE
29	COPERTURA	COVER
30	CIRCUITO DI POTENZA	POWER CIRCUIT
31	RACCORDO	FITTING
32	TAPPO	CAP
33	CORNICE	FRAME

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