

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.

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 0,117(Art. 362) - 0,137 (Art. 360) 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 0,117(Art. 362) - 0,137 (Art. 360).

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 protection art. 338

This welding machine is equipped with various safety devices that stop the machine before it can suffer damage. The welding machine may operate within the following voltage ranges:

For rated voltage 208/220/230V, from 175 to 270V

For rated voltage 400/440V, from 340 to 490V

Caution: if the supply voltage does not fall between the above values, no LED will light and the fan is powered.

If the phases are not properly connected, 3 light points will appear (steadily lit) on the display **P** when the machine is started.

If, with the machine on, the voltage falls below 175 V (U1 = 230V) or 340 V (U1 = 400V), the display **P** will show the abbreviation **E3**.

If, with the machine on, the voltage rises above 275 V (U1 = 230V) or 490 V (U1 = 400V), the display **P** shows the abbreviation **E4**.

In this case turn off the machine, restore the proper voltage and restart. If the problem has been corrected, the welding machine will begin operating again.

If, with the machine on, the display **P** shows the message **E2** or **E1**, check the supply voltage of the machine; if it is correct, the machine requires technical service.

If a low water level is detected for the cooling unit the abbreviation H2O flashes on the display P.

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.

WARNING! Extension cords of up to 30m must have a cross-section of at least 2.5 mm².

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 60974.3 - IEC 60974.10 CL. A - IEC 61000-3-11 - 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

The machine has an automatic supply voltage selector.

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 equipment may be stored, but it is not suitable for use outdoors in the rain, unless it is protected.

 Suitable for hazardous environments.

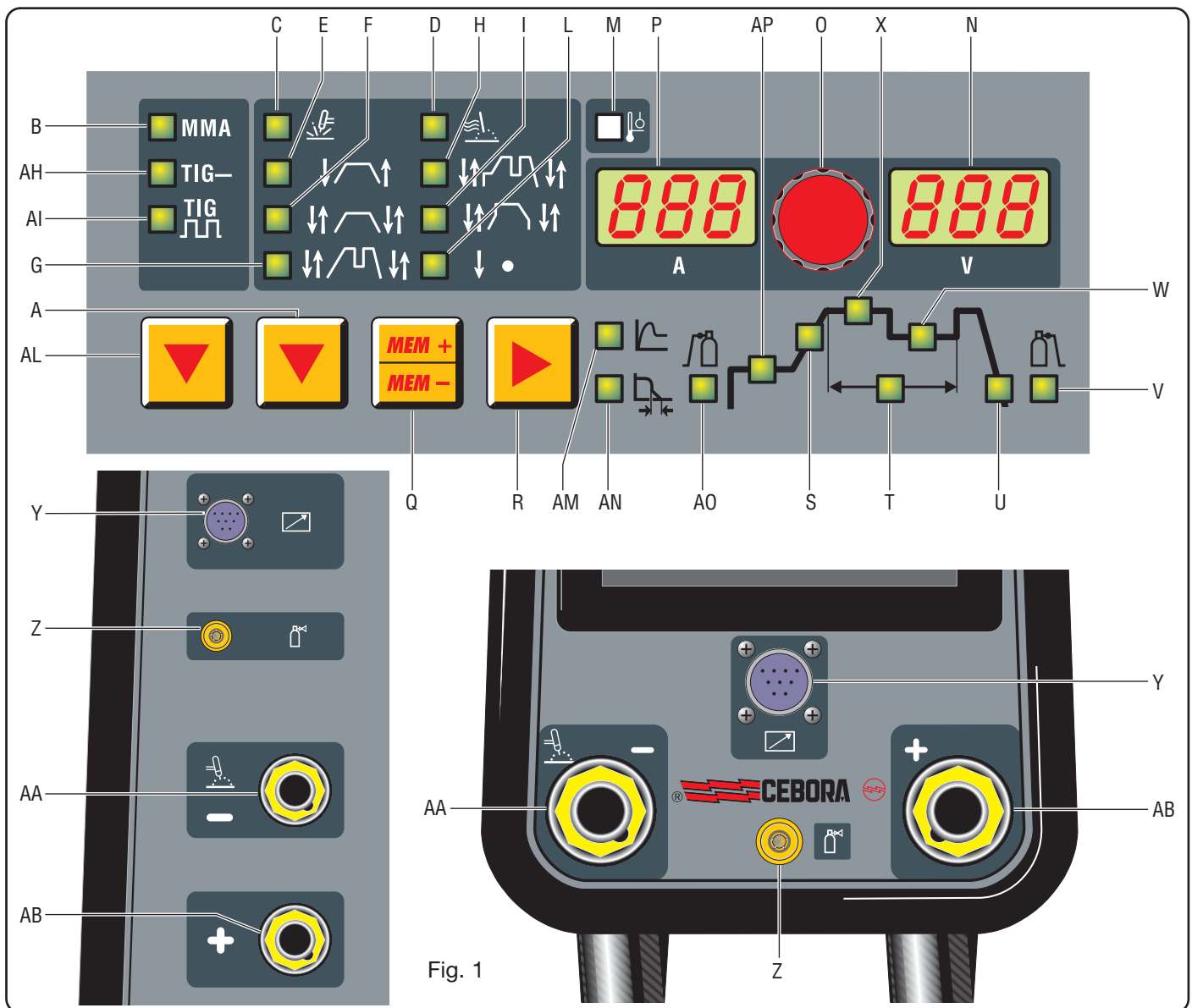


Fig. 1

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.

3.2 DESCRIPTION OF THE EQUIPMENT

AL - Process selector switch
 This button is used to choose the welding process (MMA or TIG). The selection changes each time it is pressed. The LEDs light alongside the various symbols to display your choice.

MMA B - MMA welding LED
 This machine can weld all types of coated electrodes except cellulosic. With this process the current is adjusted using the knob **O**, and it is possible to adjust the "arc force" (LED **AN**) and "hot start" function (LED **AM**).

TIG- AH - Continuous TIG welding LED

TIG AI - Pulsed TIG welding LED
 The pulse frequency is adjustable from 0.16 to 500Hz (LED

T), the peak current and the base current may be activated via the LEDs **X** and **W**, respectively, and are adjustable using the knob **O**.

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

A - Mode selector switch
 The selection changes each time it is pressed, and is displayed by lighting the LED **C** or **D** together with other LEDs displaying the welding mode.

C - Arc starting without high frequency LED.
 To light the arc, press the torch trigger, touch the workpiece with the tungsten electrode, and lift it again. This move must be quick and decisive.

D - Arc starting with high frequency LED.
 To light the arc, press the torch trigger: a high voltage/frequency pilot spark will light the arc.

E - 2-stage TIG welding LED (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 - 4-stage TIG welding LED (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 - four-stage TIG welding LED with dual current level, (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 - four-stage TIG welding LED with three levels of current (automatic).

To set the three minimum welding currents, proceed as follows:

Press the selector switch **R** until the LED **X** lights, then adjust the maximum current value using the knob **O**.

Press the selector switch **R** until the LED **W** lights, then adjust the intermediate current value using the knob **O**.

Press the selector switch **R** until the LED **AP** lights, then adjust the starting current value using the knob **O**.

The operating logic is the same as previously described for welding with dual current level (LED **G**).

I - special program LED

To light the arc, press the torch trigger and hold it down; the current begins to increase at a fixed rate. If the torch trigger is released, the current immediately rises to the welding value (LED **X**). To stop welding, press the torch trigger and hold it down; the current begins to drop at a fixed rate. The current immediately returns to zero if the trigger is released.

L - spot-welding LED (Manual).

After selecting the welding current (LED **X**) and the spot welding time (LED **T**) using the selector switch **R**, set the values using the knob **O**.

This welding mode is to be used only if start-up with high frequency is selected (LED **D** lit). In this welding mode, the operator presses the torch trigger, the arc lights, and after the set spot welding time the arc shuts off automatically. To do the next spot, you must therefore release the torch trigger and press it again.

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.

O - Knob

Normally adjusts the welding current.

Also, if you select a function with the selector switch **R**, this knob adjusts its size.

P - Display

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

In the machine blocking procedures (see 2.3.2), it displays:

Three flashing or steadily lit points

The abbreviations **E1 E2 E3 E4**

The abbreviation **H20**

N - Display

Normally displays the arc voltage in relation to the current welding process.

When setting the cooling unit operation, it displays the status of the unit.

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:

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.

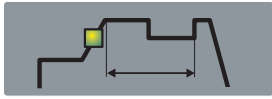
Each LED indicates the parameter that may be adjusted by means of the knob **O** while the LED itself is lit. Five seconds after the last variation, the LED involved will shut off; the main welding current will be displayed, and the corresponding LED **X** lights.



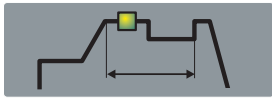
AO - Pre-gas LED
Adjustment 0.05-2.5 seconds. Gas output time before starting welding.



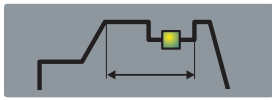
AP - Welding start current LED.
Welding start current. This is a percentage of the welding current (LED X).



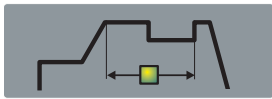
S - Slope up LED .
This is the time in which the current, starting from the minimum, reaches the set current value. (0-10 sec.)



X - Main welding current LED .



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



T - Pulse frequency LED (0.16-550 Hz).
The peak and base times are equal.

When spot-welding is selected (LED L) this LED lights to indicate that the display H displays the spot welding time that may be adjusted using the knob O from 0.1 to 3 seconds.



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



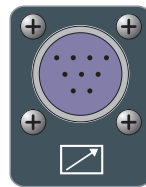
V - Post gas LED.
Adjusts the time gas flows after welding ends. (0-30 sec.)

AM - Hot-Start LED

May be selected via the button R only if MMA welding is selected (LED B).
This LED lights to indicate that the display P displays the time, expressed in seconds, during which the welding machine delivers an overcurrent to improve electrode starting. It may be adjusted using the knob O.

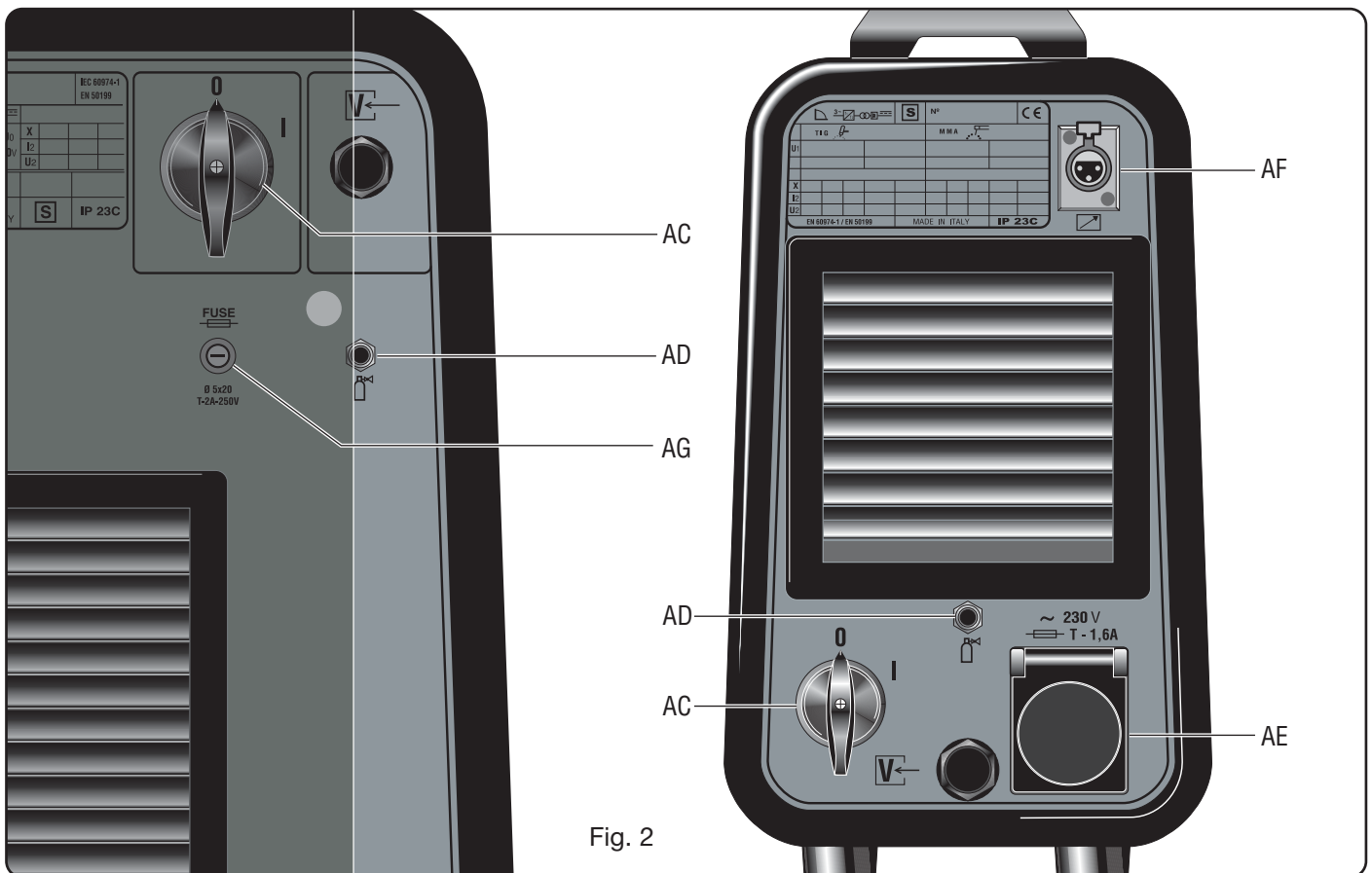
AN - Arc-force LED

May be selected via the button R only if MMA welding is selected (LED B).
It is a percentage of the welding current. The display P displays its value, and the knob O adjusts it. This overcurrent essentially aids in the transfer of drops of molten metal.



Y - 10-pin connector

This connector is connected to the remote controls described in paragraph 4.
A clean contact is available between pins 3 and 6 to signal when the arc is lit (5A 230V).





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

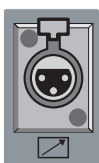


AD - gas intake fitting



AE - Socket

To which to connect the cooling unit Art. 1341
Caution: Max. power: 360VA - Amps: 1.6.
Do not connect tools such as polishers or similar.



AF - Connector

Three-pin connector to which to connect the wire of the cooling unit pressure switch.



AG - Fuse Holder

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.**
- If you wish to adjust the Hot-start (LED **AM**) and Arc force functions (LED **AN**), see the previous paragraph.

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.

3.5.1 Cooling unit

If using a water-cooled torch, use the cooling unit.

3.5.1.1 Explanation of technical specifications

U1	Rated supply voltage
1x400V	Single-phase power supply
50/60 Hz	Frequency
I1max	Maximum absorbed current
Pmax	Maximum pressure
P (1l/min)	Refrigerant power measured at 1L/min

3.5.1.2 Description of protections

- Coolant pressure protection

This protection is achieved by means of a pressure switch, inserted in the fluid delivery circuit, which controls a microswitch.

- Fuse (T 2A/250V-Ø 5x20)

This fuse was inserted to protect the pump.

3.5.1.3 Installation

Unscrew the cap and fill the tank (the equipment is supplied with approximately one liter of fluid).

It is important to periodically check, through the slot, that the fluid remains at the "max" level.

As a coolant, use water (preferably deionized) mixed with alcohol in percentages defined according to the following table:

temperature	water/alcohol
0°C up to -5°C	4L/1L
-5°C up to -10°C	3.8L/1.2L

NOTE If the pump turns with no coolant present, you must remove all air from the tubes.

If so, turn off the power source, disconnect the torch hoses, fill the tank, connect a hose to the fitting (⊕), Insert the other end of the hose in the tank. Start the power source for approximately 10/15 seconds, then connect the torch hoses.

Turn on the machine. To select the operating mode of the cooling unit, proceed as follows:

1. Select any TIG welding mode.
2. Press the key **Q** and, while holding it down, press the key **R**. Keep them pressed until the abbreviation H2O appears on the display **P**.
3. Select the operating mode using the knob **O**, keeping in mind that the numbers that appear on the display **N** have the following meaning:
 - 1 = Unit off,
 - 2 = Continuous operation,
 - 3 = Automatic operation.

To exit selection, briefly press the key Q.

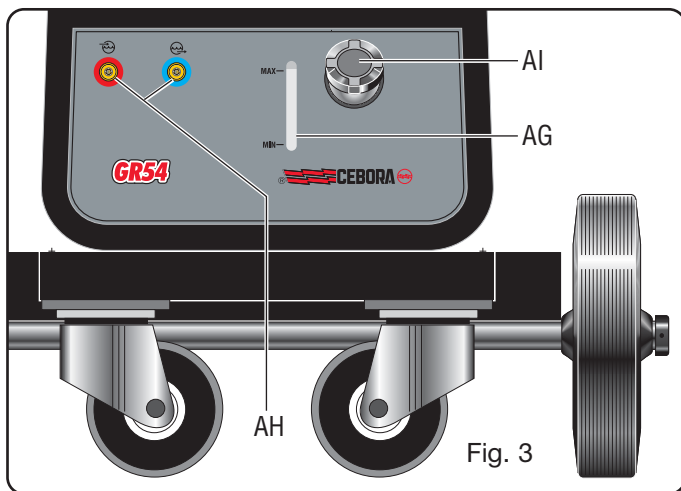
NOTE: "Automatic mode" means that the cooling unit starts when the torch button is pressed and stops running approximately 2 minutes after the torch button is released.

Warning! If MMA electrode welding is selected, cooling is not on and may not be selected. It is normal for the machine display **P** to display, on start-up, the flashing abbreviation H2O.

3.5.1.4 Cooling unit for Art. 360

If using a water-cooled torch, use the cooling unit. The trolley Art. 1432 is required to position and transport the welding machine together with the cooling unit. After filling the tank with coolant, connect the plug of the mains cable to the socket **AE** of the welding machine, then connect the 3-pin male patch connector to the connector **AF**.

3.5.1.5 Description of the cooling unit for Art.362 (Fig. 3)



AG - Slot:

Slot to inspect the coolant fluid level

AH - Quick-fitting sockets:

Use only for TIG welding systems.

NOTE: they must not be linked together.

AI - Cap.

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 through-

put 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 button **AL** and choose the welding procedure, press the torch trigger **A** to select the 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. 1270 TIG torch button only.(air-cooling)

Art. 1273 TIG torch button only.(water-cooling)

Art. 1266 TIG torch UP/DOWN.(air-cooling)

Art. 1274 TIG torch UP/DOWN.(water-cooling)

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.

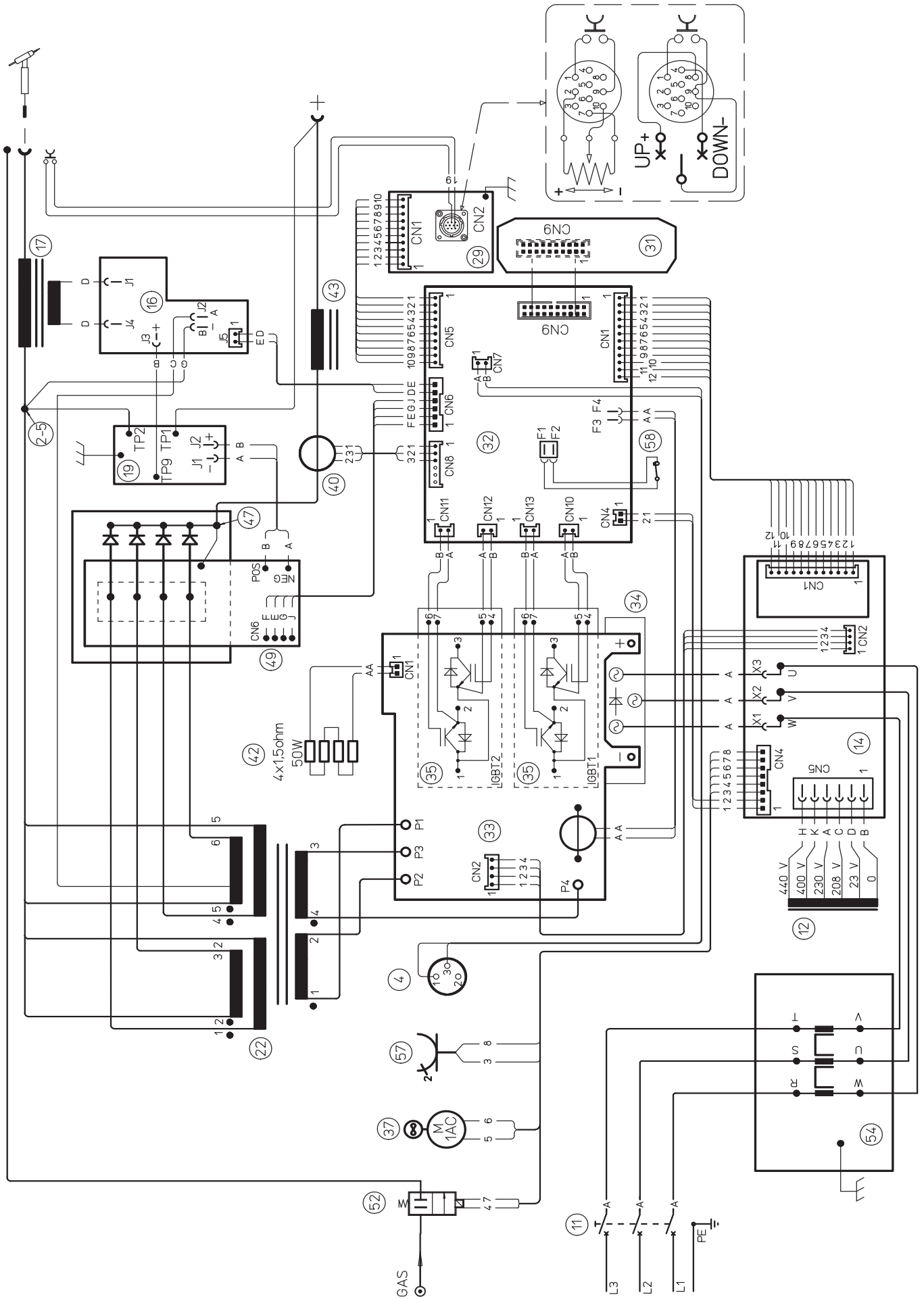
TÄMÄ OSA ON TARKOITETTU AINOASTAAN AMMATTITAITOISELLE HENKILÖKUNNALLE.

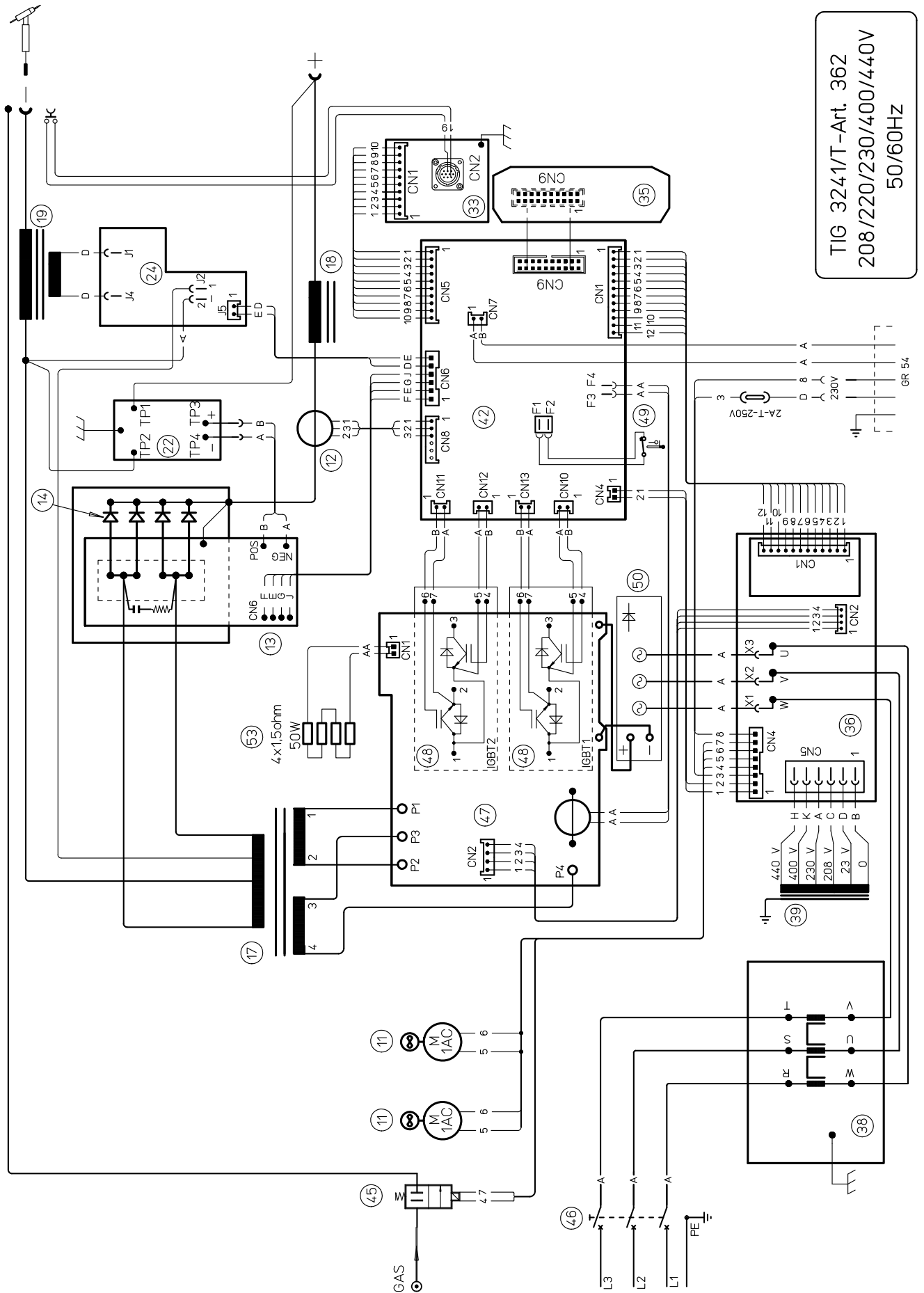
DETTE AFSNIT HENVENDER SIG UDELUKKENDE TIL KVALIFICERET PERSONALE.

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.



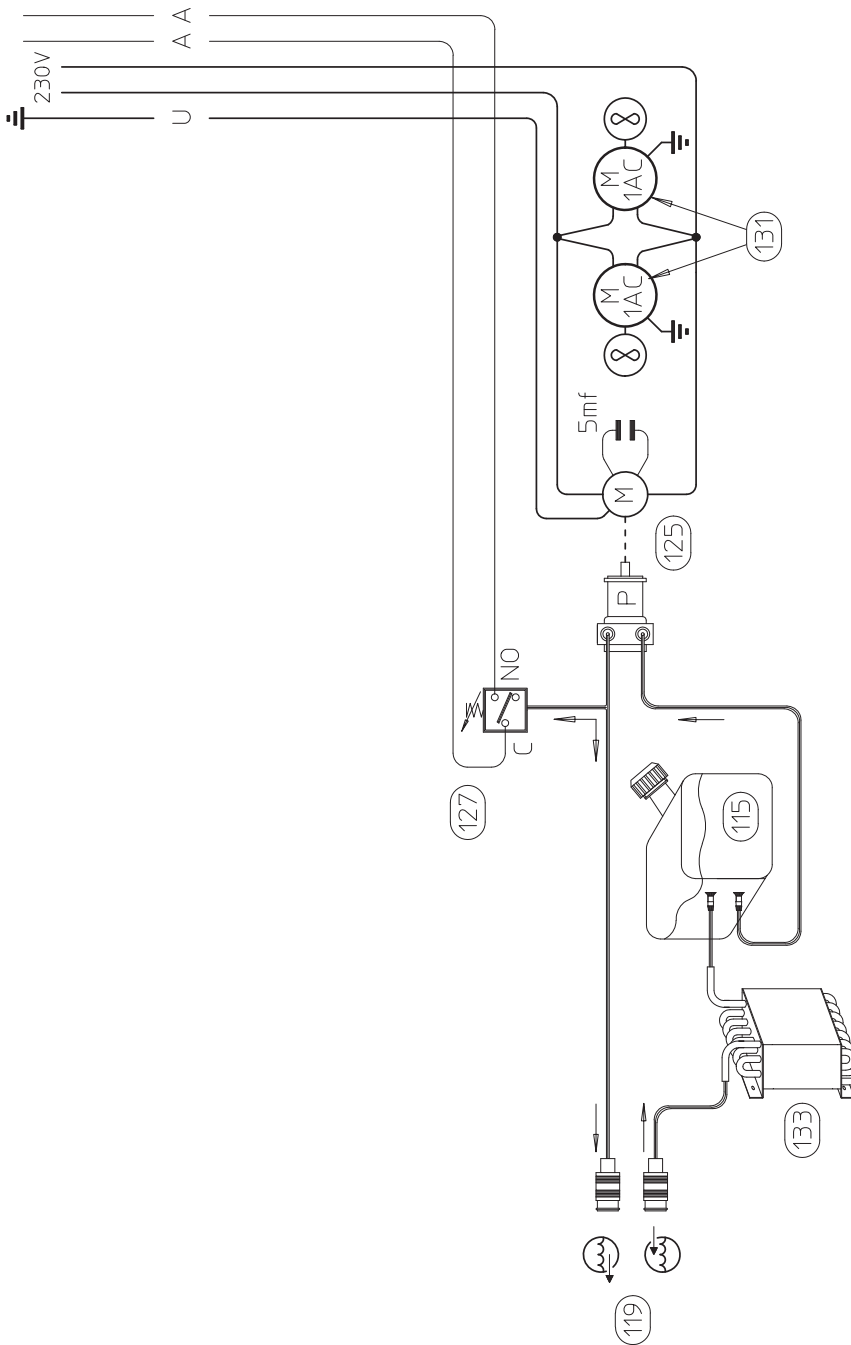


TIG 3241/T -Art. 362
208/220/230/400/440V
50/60HZ

GR 54

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



GR 54

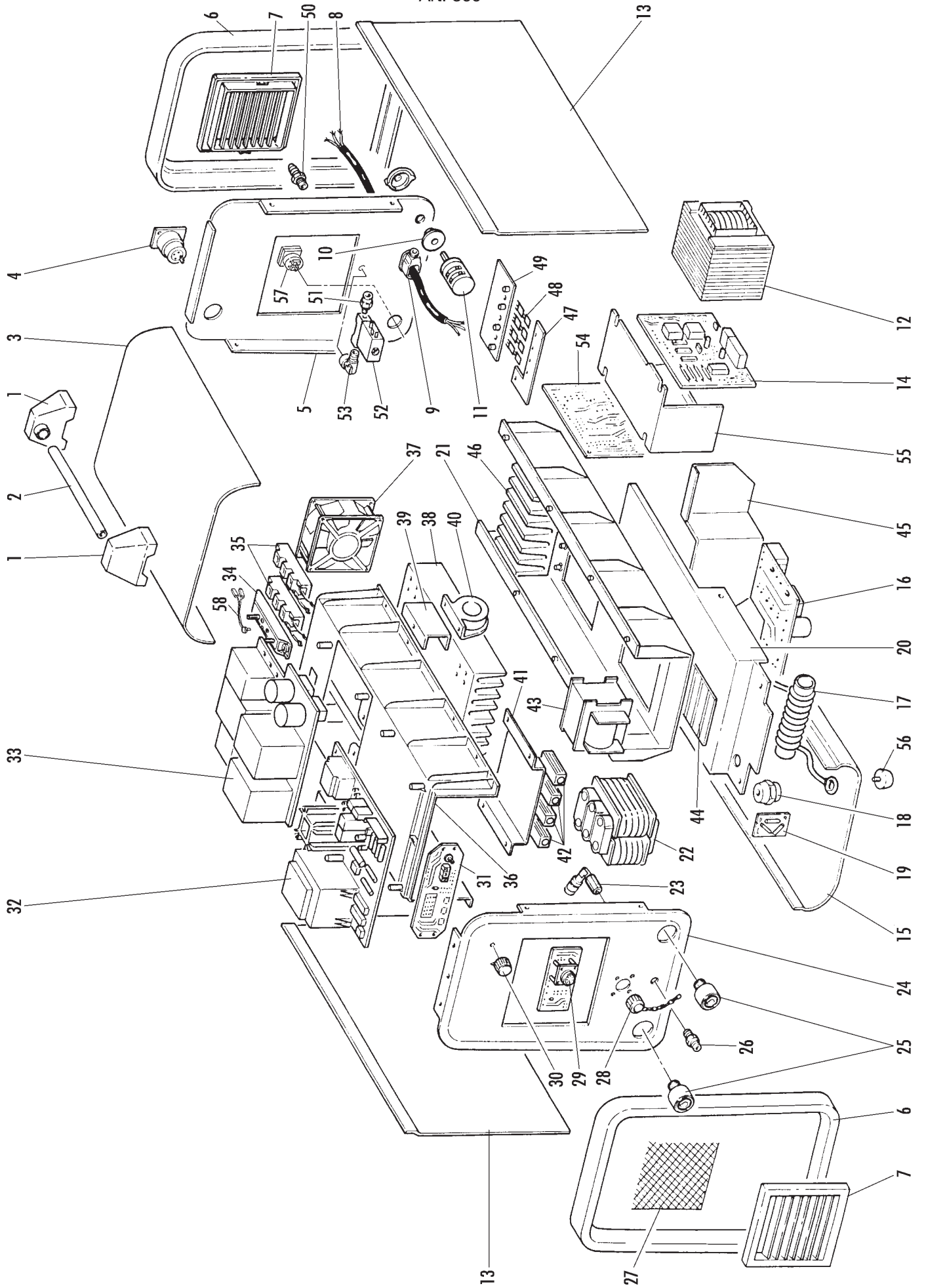
Art. 360

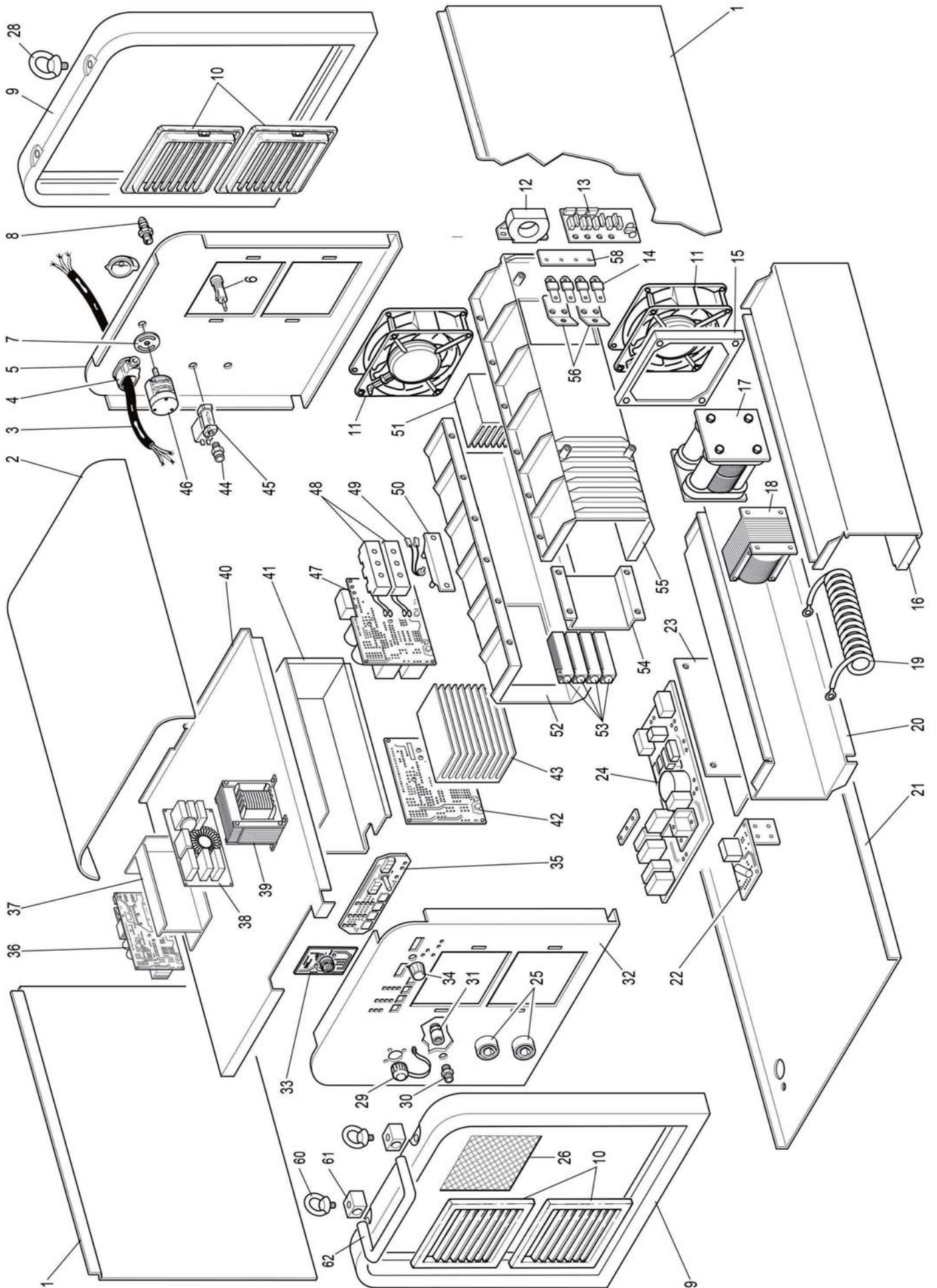
pos	DESCRIZIONE	DESCRIPTION
01	SUPPORTO MANICO	HANDLE SUPPORT
02	MANICO	HANDLE
03	COPERCHIO	COVER
04	CONNETTORE + CAVO	CONNECTOR + CABLE
05	PANNELLO POSTERIORE	BACK PANEL
06	CORNICE	FRAME
07	PANNELLO ALETTATO	FINNED PANEL
08	CAVO RETE	POWER CORD
09	PRESSACAPO	STRAIN RELIEF
10	PROTEZIONE	PROTECTION
11	INTERRUTTORE	SWITCH
12	TRASFORMATORE	TRANSFORMER
13	LATERALE	SIDE PANEL
14	CIRCUITO DI SERVIZIO	AUXILIARY CIRCUIT
15	FONDO	BOTTOM
16	CIRCUITO ALTA FREQUENZA	HIGH-FREQ. CIRCUIT
17	TRASFORMATORE H.F.	H.F. TRANSFORMER
18	SUPPORTO	SUPPORT
19	CIRCUITO FILTRO	FILTER CIRCUIT
20	PIANO INTERMEDIO	INSIDE BAFFLE
21	SUPPORTO CENTRALE SEC.	SEC CENTRAL SUPPORT
22	TRASFORMAT. DI POTENZA	POWER TRANSFORMER
23	RACCORDO A GOMITO	UNION ELBOW
24	PANNELLO ANTERIORE	FRONT PANEL
25	PRESA GIFAS	GIFAS SOCKET
26	RACCORDO	FITTING
27	RETE METALLICA	WIRE NETTING
28	TAPPO	CAP
29	CIRCUITO CONNETTORE	CONNECTOR CIRCUIT

pos	DESCRIZIONE	DESCRIPTION
30	MANOPOLA	KNOB
31	CIRCUITO PANNELLO	PANEL CIRCUIT
32	CIRCUITO DI CONTROLLO	CONTROL CIRCUIT
33	CIRCUITO IGBT.	IGBT CIRCUIT
34	RADDRIZZATORE	RECTIFIER
35	IGBT	IGBT
36	SUPPORTO CENTRALE PRIM.	PRIM. CENTRAL SUPPORT
37	MOTORE CON VENTOLA	MOTOR WITH FAN
38	DISSIPATORE	RADIATOR
39	SUPPORTO TRASDUTTORE	TRANSDUCER SUPPORT
40	TRASDUTTORE	TRANSDUCER
41	SUPPORTO RESISTENZE	RESISTANCE SUPPORT
42	RESISTENZA	RESISTANCE
43	IMPEDENZA SECONDARIO	SECONDARY CHOKE
44	SUPPORTO IMPEDENZA	CHOKES SUPPORT
45	PIANO INTERMEDIO	INSIDE BAFFLE
46	DISSIPATORE	RADIATOR
47	CAVALLOTTO	JUMPER
48	DIODO S.C.R.	S.C.R. DIODE
49	CIRCUITO SECONDARIO	SECONDARY CIRCUIT
50	RACCORDO A RESCA	FITTING
51	RACCORDO	FITTING
52	ELETTRORVALVOLA	SOLENOID VALVE
53	RACCORDO A GOMITO	UNION ELBOW
54	CIRCUITO FILTRO	FILTER CIRCUIT
55	SUPPORTO CIRCUITO	CIRCUIT BOARD SUPPORT
56	PIEDE IN GOMMA	RUBBER FOOT
57	PRESA	SOCKET
58	TERMOSTATO	THERMOSTAT

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.

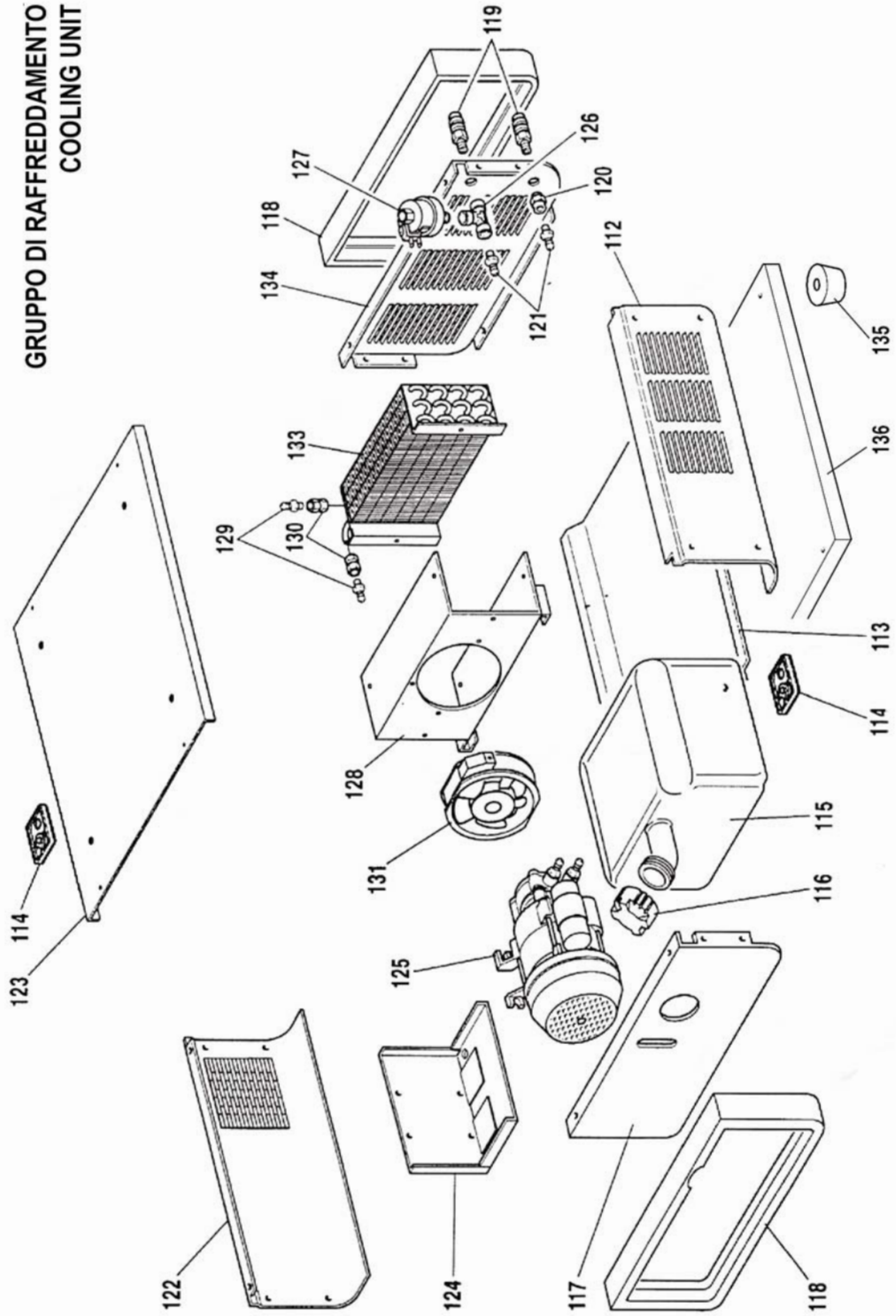




pos	DESCRIZIONE	DESCRIPTION
001	LATERALE FISSO	FIXED SIDE PANEL
002	COPERCHIO	COVER
003	CAVO RETE	POWER CORD
004	PRESSACAVO	STRAIN RELIEF
005	PANNELLO POSTERIORE	BACK PANEL
006	PORTA FUSIBILE	FUSE HOLDER
007	PROTEZIONE	PROTECTION
008	RACCORDO	FITTING
009	CORNICE	FRAME
010	PANNELLO ALETTATO	FINNED PANEL
011	MOTORE CON VENTOLA	MOTOR WITH FAN
012	TRASDUTTORE	TRANSDUCER
013	CIRCUITO SECONDARIO	SECONDARY CIRCUIT
014	DIODO S.C.R.	S.C.R. DIODE
015	SUPPORTO MOTORE	MOTOR \SUPPORT
016	SUPPORTO CENTRALE DX.	RIGHT CENTRAL SUPPORT
017	TRASFORMATORE DI POTENZA	POWER TRANSFORMER
018	IMPEDENZA	IMPEDANCE
019	TRASFORMATORE H.F.	H.F. TRANSFORMER
020	SUPPORTO CENTRALE SX.	LEFT CENTRAL SUPPORT
021	FONDO	BOTTOM
022	CIRCUITO FILTRO	FILTER CIRCUIT
023	SUPPORTO	SUPPORT
024	CIRCUITO ALTA FREQUENZA	HIGH-FREQ. CIRCUIT
025	PRESA	SOCKET
026	PROTEZIONE	PROTECTION
028	GOLFARA	EYEBOLT
029	TAPPO	CAP
030	RACCORDO	FITTING
031	RACCORDO	FITTING

pos	DESCRIZIONE	DESCRIPTION
032	PANNELLO ANTERIORE	FRONT PANEL
033	CIRCUITO CONNETTORE	CONNECTOR CIRCUIT
034	MANOPOLA	KNOB
035	CIRCUITO DI CONTROLLO	CONTROL CIRCUIT
036	CIRCUITO DI SERVIZIO	AUXILIARY CIRCUIT
037	SUPPORTO CIRCUITO	CIRCUIT BOARD SUPPORT
038	CIRCUITO FILTRO	FILTER CIRCUIT
039	TRASFORMATORE DI SERVIZIO	AUXILIARY TRANSFORMER
040	PIANO INTERMEDIO	INSIDE BAFFLE
041	PROTEZIONE	PROTECTION
042	CIRCUITO DI CONTROLLO	CONTROL CIRCUIT
043	DISSIPATORE	RADIATOR
044	RACCORDO	FITTING
045	ELETTROVALVOLA	SOLENOID VALVE
046	INTERRUTTORE	SWITCH
047	CIRCUITO IGBT	IGBT CIRCUIT
048	IGBT	IGBT
049	TERMOSTATO	THERMOSTAT
050	RADDRIZZATORE	RECTIFIER
051	DISSIPATORE	RADIATOR
052	SUPPORTO CENTRALE PRIM.	PRIM. CENTRAL SUPPORT
053	RESISTENZA	RESISTANCE
054	SUPPORTO RESISTENZE	RESISTANCES SUPPORT
055	SUPPORTO CENTRALE SEC.	SEC. CENTRAL SUPPORT
056	CAVALLOTTO	JUMPER
058	CAVALLOTTO	JUMPER
059	ISOLAMENTO	INSULATION
060	GOLFARA	EYEBOLT
061	SUPPORTO MANICO	HANDLE SUPPORT
062	MANICO	HANDLE

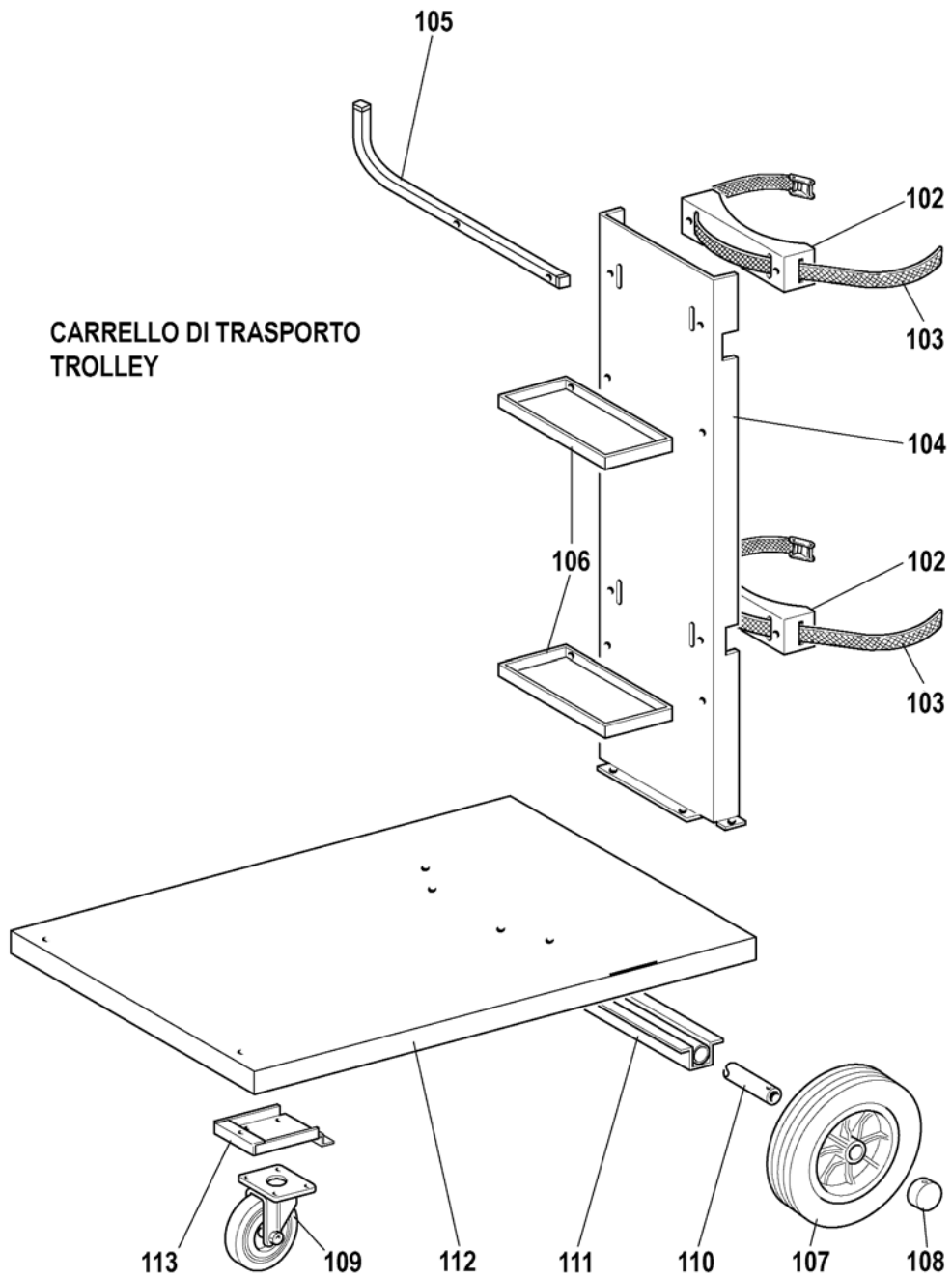
**GRUPPO DI RAFFREDDAMENTO
COOLING UNIT**



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.

pos	DESCRIZIONE	DESCRIPTION
112	LATERALE DESTRO	RIGHT SIDE PANEL
113	FONDO GRUPPO DI RAFF.	COOLING UNIT BOTTOM
114	APPOGGIO	REST
115	SERBATOIO	TANK
116	TAPPO	CAP
117	PANNELLO ANTERIORE	FRONT PANEL
118	CORNICE	FRAME
119	RACCORDO	FITTING
120	RACCORDO	FITTING
121	RACCORDO	FITTING
122	LATERALE SINISTRO	LEFT SIDE PANEL
123	COPERCHIO	COVER
124	SUPPORTO	SUPPORT
125	ELETTROPOMPA	MOTOR PUMP
126	RACCORDO A TRE VIE	T-FITTING
127	PRESSOSTATO	PRESSURE SWITCH
128	SUPPORTO VENTOLE	FANS SUPPORT
129	RACCORDO	FITTING
130	RACCORDO BICONO	BICONICAL FITTING
131	MOTORE CON VENTOLA	MOTOR WITH FAN
133	RADIATORE	RADIATOR
134	PANNELLO POSTERIORE	BACK PANEL
135	PIEDE	FOOT
136	FONDO	BOTTOM



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.

pos	DESCRIZIONE	DESCRIPTION
102	APPOGGIO BOMBOLA	GAS CYLINDER SUPPORT
103	CINGHIA + FIBBIA	BELT
104	MONTANTE CARRELLO	GAS CYLINDER SUPPORT
105	SUPPORTO CAVI	CABLE SUPPORT
106	ATTACCO SUPER. BOMBOLA	ATTACK BOTTLE SUPPORT
107	RUOTA FISSA	FIXED WHEEL
108	TAPPO	CAP
109	RUOTA PIROETTANTE	SWIVELING WHEEL
110	ASSALE	AXLE
111	SUPPORTO ASSALE	AXLE SUPPORT
112	FONDO	BOTTOM
113	SUPPORTO RUOTE	WHEELS BRACKET



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