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 followingprocedures 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.

HIGH FREQUENCY

• High frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
• Have only qualified persons familiar with electronic equipment perform this installation.
• The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
• If notified by the FCC about interference, stop using the equipment at once.
• Have the installation regularly checked and maintained.
• Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

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.

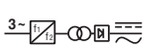
2 GENERAL DESCRIPTIONS

The welding machine is a system suitable for synergic MIG/MAG and pulsed synergic MIG/MAG welding, developed with inverter technology.
It is equipped with a 4-roller gearmotor.
This welding machine must not be used to defrost pipes.

2.1 EXPLANATION OF TECHNICAL SPECIFICATIONS

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).

No. Serial number. Must be indicated on any request regarding the welding machine.

 Three-phase static transformer-rectifier frequency converter.

 MIG Suitable for MIG-MAG welding.

 TIG Suitable for TIG welding.

 MMA Suitable for MMA welding.

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 I2 current
U1. Rated supply voltage.
1~ 50/60Hz Single-phase 50 or 50 Hz power supply.
I1 Max Max. absorbed current at the corresponding I2 current and U2 voltage.
I1 eff This is the maximum value of the actual current absorbed, considering the duty cycle. This value usually corresponds to the capacity of the fuse (delayed type) to be used as a protection for the equipment.
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.
S Suitable for use in high-risk environments.

NOTES:
1- The equipment has also been designed for use in environments with a pollution rating of 3. (See IEC 60664).
2- This equipment complies with a IEC 61000-3-12 standard provided that the allowed maximum impedance Zmax of the unit is lower or equal to 0.068Ω at the interface point between the user unit and the mains. The fitter or the unit user are responsible for connecting the unit to a power supply with a maximum allowed system impedance Zmax lower or equal to 0.068Ω.

2.2 PROTECTION DEVICES

2.2.1 Bloch protection
In case of welding machine malfunction, the display screen **1** will show the message WARNING to identify the type of fault. If this message does not disappear when the machine is switched off and back on, contact the after-sales service.

2.2.2 Thermal cutout
This appliance is protected by a thermostat which prevents machine operation whenever acceptable temperatures are exceeded. In these conditions, the fan continues to operate and the display screen **1** shows the message WARNING tH in flashing mode.

2.3.3 Positioning on sloping planes.
Since this welding machine is equipped with wheels without brake, do not position it on sloping planes, to prevent machine tilting or uncontrolled movement.

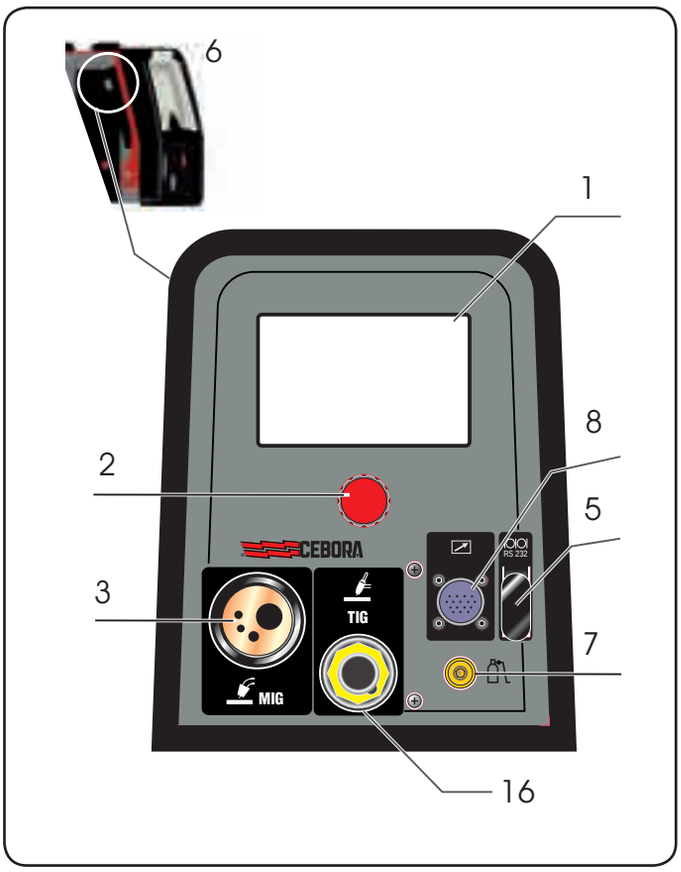
3 CONTROLS LOCATED ON FRONT PANELS.

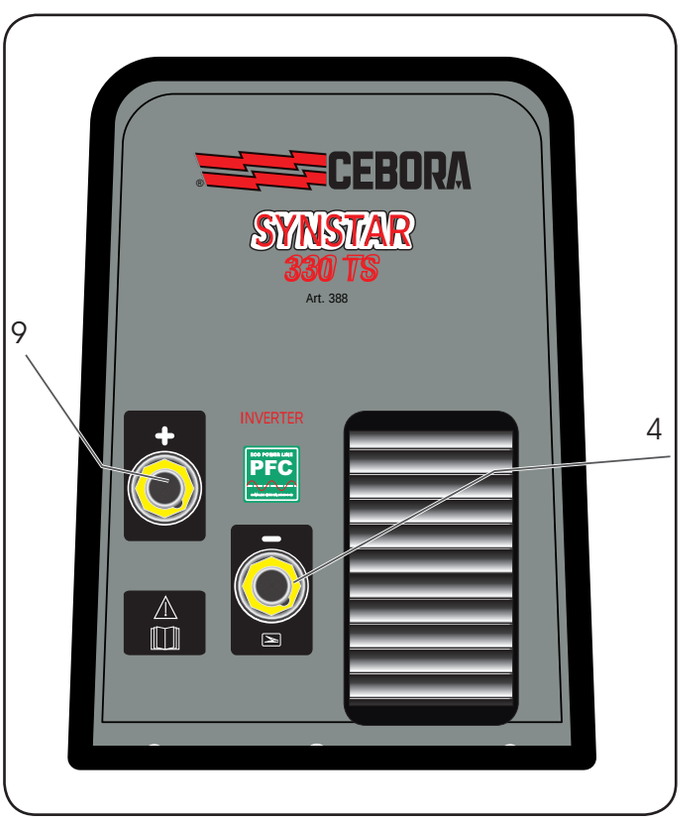
1 – DISPLAY SCREEN.
This displays both the welding parameters and all the welding functions.

2 - KNOB
Selects and adjusts both the welding functions and parameters.

3 – CENTRALIZED COUPLING
To which the welding torch must be connected.

4 – SOCKET (-) to which you should connect the earth cable connector in MIG-MAG welding and the power source-trolley extension connector in TIG welding**.**





5 – CONNECTOR
DB9 type (RS 232) connector to be used for updating the welding programs.

6 – CONNECTOR
USB-type connector to be used for updating the welding programs.

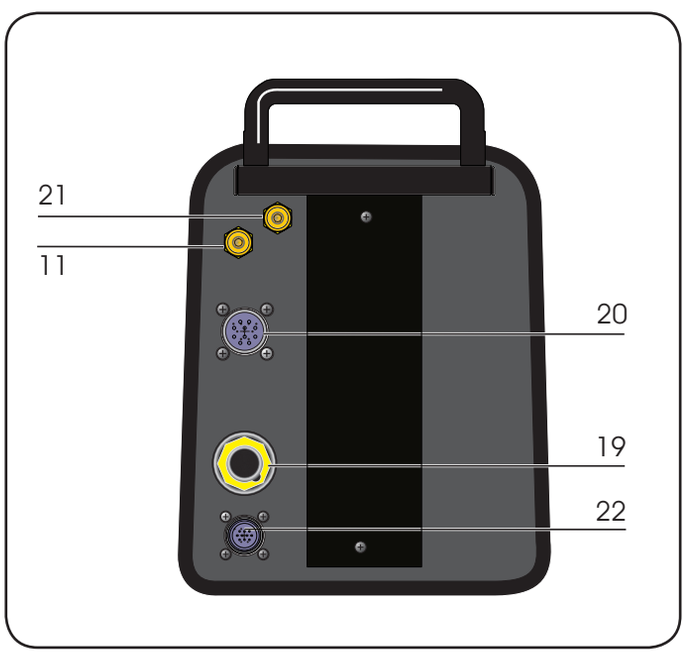
7 - FITTING
This is where the gas hose from the TIG torch is to be connected.

8 – CONNECTOR
This is where the control cable of the Push Pull welding torch is connected.

9 - SOCKET (+)
Socket where you must connect the earth cable connector in Tig welding.

16 – SOCKET to which you should connect the electrode holder in MMA welding or the TIG torch power connector

4 CONTROLS LOCATED ON REAR PANELS.



10 - FUSE HOLDER.

11 – GAS HOSE FITTING, MIG-MAG WELDING

12 – SWITCH.
Starts and stops the machine

13 – MAINS CABLE

14 – PRESSURE SWITCH CONNECTOR.
Connector which receives the cable from the pressure switch Art.1681 (optional).

15 – SOCKET.
Socket which receives the power cord from the cooling unit Art.1681 (optional).

17 – SOCKET to which you should connect the electrode holder in MMA welding or the TIG torch power connector.

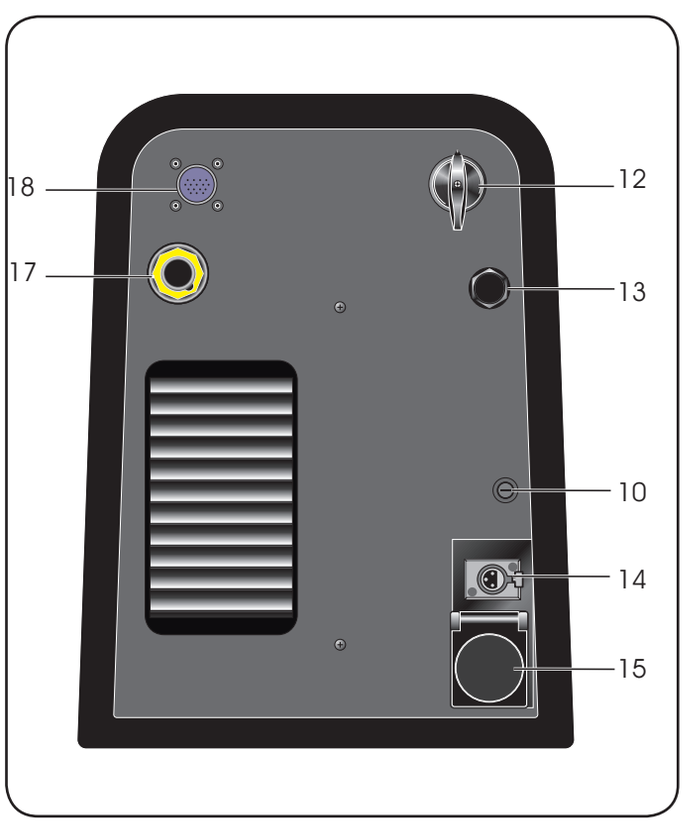
18 – SOCKET Socket to which you should connect the cable connector of the power source-trolley connection service cable.

19 – PLUG to which you should connect the cable connector of the power source-trolley extension power cable.

20– SOCKET to which you should connect the cable connector of the power source-trolley connection service cable.

21 – GAS HOSE, TIG WELDING.

22 – SOCKET (OPTIONAL) to which you should connect the cable connector of the Data Logger art.408 (optional).



5 INSTALLATION AND START-UP

- Position the welding machine so as to allow the free circulation of air inside and, as much as possible, prevent metal or other dusts from penetrating.
- The machine must be installed by professional personnel.
- All the connections must be performed in compliance with applicable standards (IEC/CEI EN 60974-9) and with accident-prevention laws.
- Make sure the power supply voltage corresponds to the welding machine rating.
- The protection fuses must be sized according to the details shown on the technical data plate.
- All power sources must be fitted with axle and then rear wheels (fig. 2) .

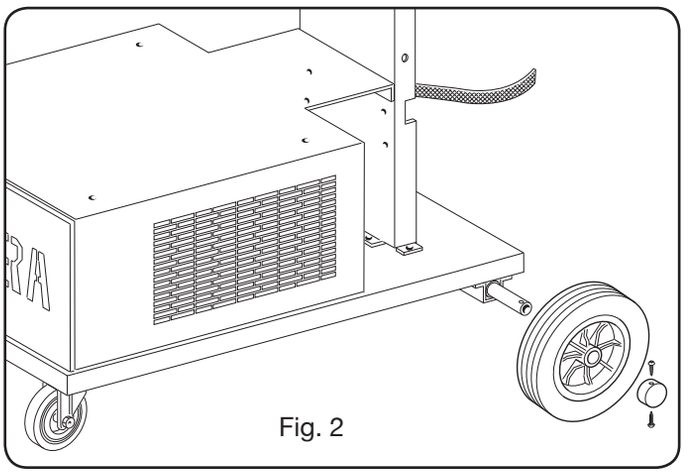


Fig. 2

- For machines with trolley, the pivoting system must be mounted both on the wire feeder trolleys and the power source; the small wheels provided together with the screws must be mounted at the bottom of the wire feeder trolley as well as the welding torch support, then place the trolley in its position. (see figure 3).

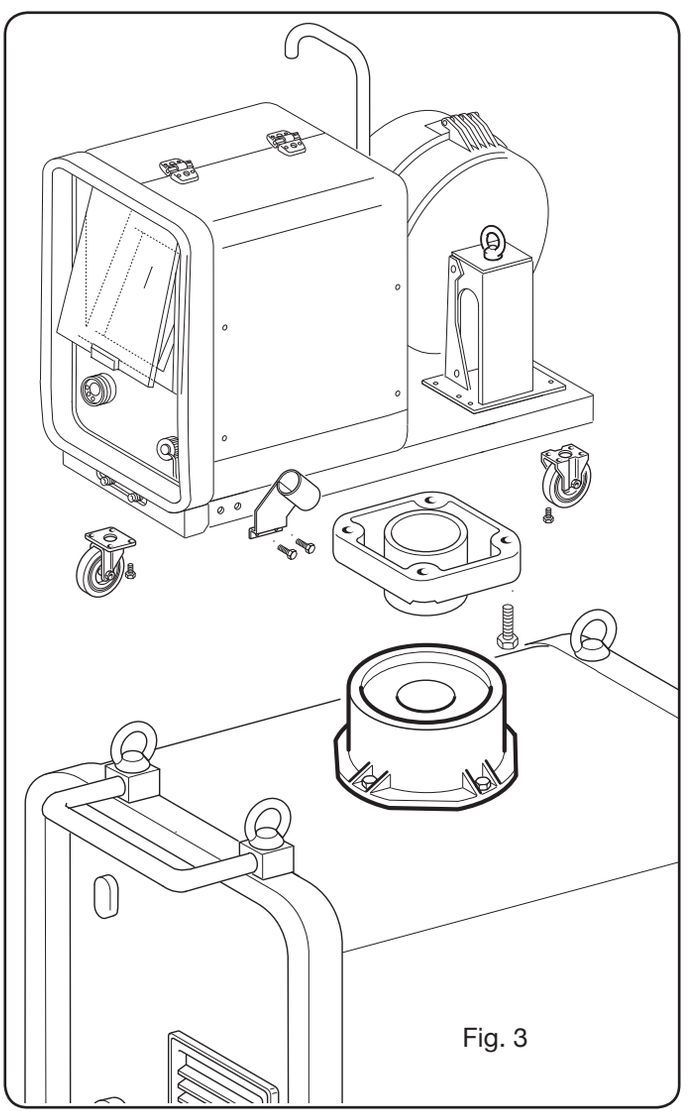


Fig. 3

- Block one end of connection **BA**, by fixing the tip **BB** to the bottom of the machine as shown in fig. 4.

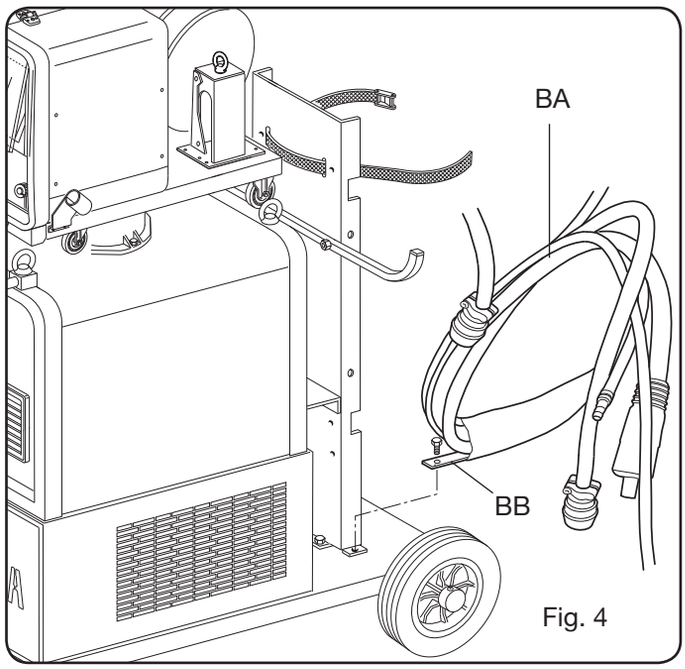


Fig. 4

- Connect all wiring on the back of the power source, as shown in fig. 5.

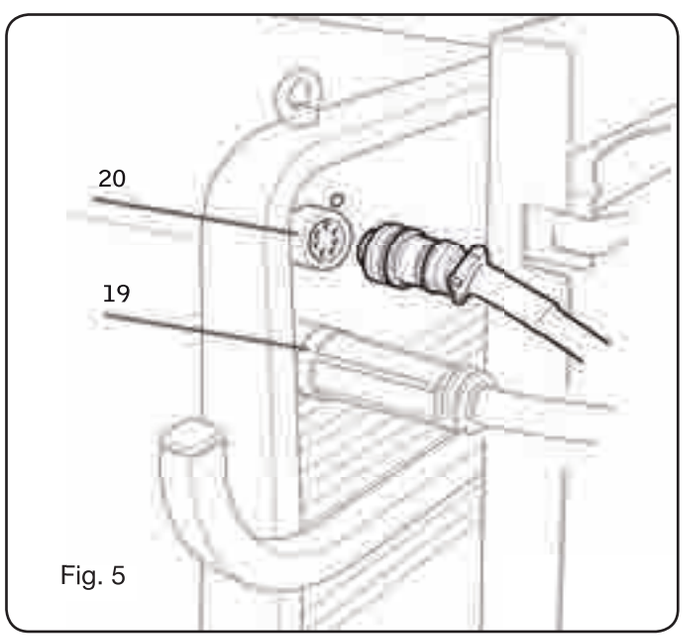


Fig. 5

- Avoid coiling the connection to reduce to a minimum the inductive effects that could affect welding results.
- Connect the other end of connection BA to the wire feeder trolley as shown in fig. 6.

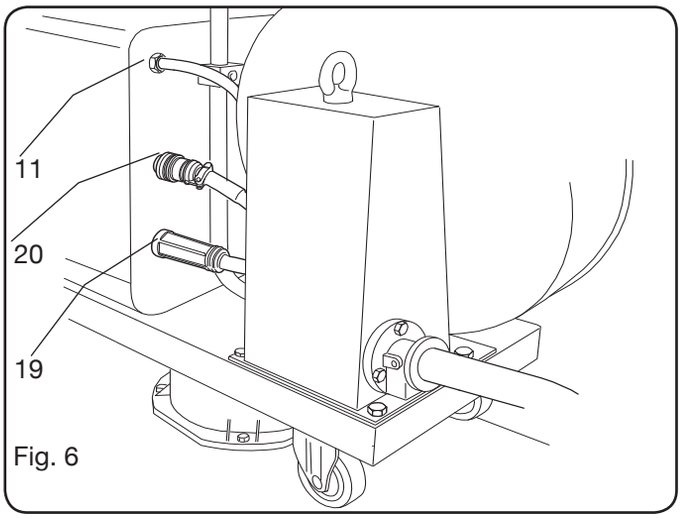


Fig. 6

- The coolant fluid hoses must be connected to the quick-fitting valves located below the lower part of the wire feeder trolley (see fig. 7), by matching the colours appearing on the trolley front side.

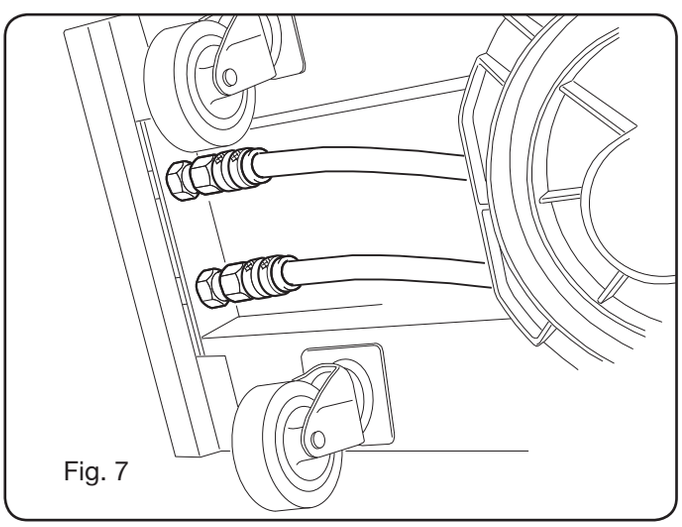


Fig. 7

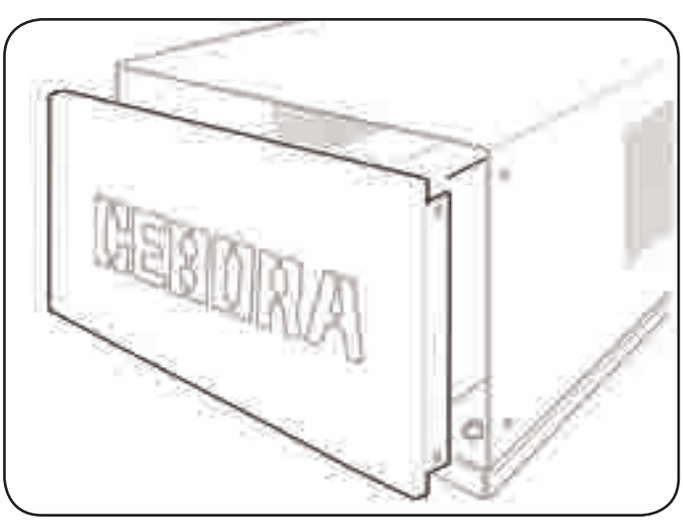
- Position the cylinder on the support and fix it with the 2 straps; ensure that the straps are secured tightly to the cylinder to prevent dangerous tilting.
- Connect the gas hose to the outlet of the pressure regulator.
- Open the side door.
- Connect the power cord to the socket **4** and through the clamp to the workpiece.
- Connect the earth lead clamp **4** to the piece to be welded.
- Fit the wire coil on the support inside the compartment. The coil must be fitted so that the wire unwinds in an anticlockwise direction.
- Make sure the drive roller is correctly positioned according to the diameter and type of wire used.
- Cut the welding wire with a well-sharpened tool, keeping it between your fingers so that it cannot unwind, insert it inside the pipe exiting from the gear motor and, with the aid of a finger, insert it inside the steel tube until it comes out of the adapter.
- Fit the welding torch.

After fitting the reel and torch, switch on the machine, select the suitable synergic curve, following the instructions given

in the service functions (**PROCESS PARAMS**) paragraph. Remove the gas nozzle and unscrew the current nozzle of the torch. Press the torch button until the wire comes out. **BE CAREFUL to keep your face away from the end lance while the wire is coming out**, screw up the current nozzle and fit the gas nozzle.
Open the canister adapter and adjust the gas flow to 8 – 10 l/min.
During welding, the display screen **1** displays the actual work current and voltage. The displayed values may be slightly different to those set. This can depend on numerous different factors - type of torch, thickness different to nominal thickness, distance between current nozzle and the material being welded, and the welding speed.
The current and voltage values, at the end of the welding operation remain stored on the display **1** where the word "HOLD is displayed. To display the set values, the handle **2** will have to be moved slightly, while, by pushing the torch button without welding, the display screen **1** shows the empty voltage value and a current value of 0.
If, while welding the maximum current and voltage values are exceeded, said values are not stored on the display and the written "HOLD" is not displayed.
• In order to mount the cooling unit Art.1681 (optional) remove the closing panel (see drawing) and follow the instructions located inside the relevant compartment.

NOTE If 0.6mm diameter wires are used the welding torch sheath should be replaced with one of suitable internal diameter. If the internal diameter of the sheath is too big it does not guarantee smooth wire feeding.

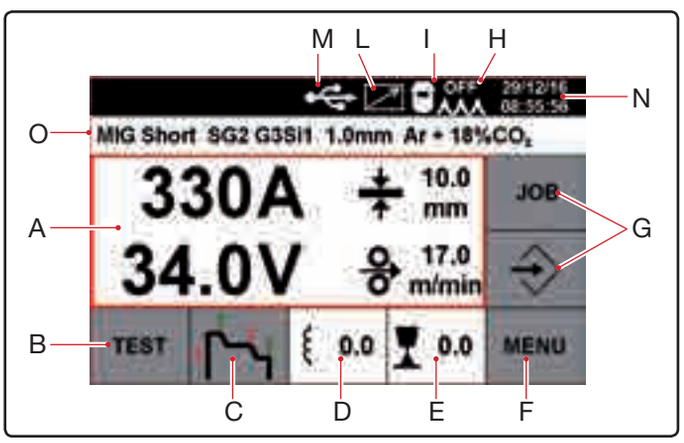
Sloping planes.
Since this welding machine is equipped with wheels without brake, do not position it on sloping planes, to prevent machine tilting or uncontrolled movement.



6 DESCRIPTION OF THE TOUCH SCREEN 1 DISPLAY FUNCTIONS .

When the machine is switched on, for a few moments the display shows: the article number of the machine, the serial number, the Firmware version, the date of the Firmware development and the release number of the synergic curves table and the power supply options. This information is also given in menu ⓘ.

6.1 MIG PROCESS. INITIAL DISPLAY.



The screen displays the welding current in Amperes, la welding voltage in Volts, the suggested thickness in mm and the welding wire speed in m/min. During welding the display shows the current and voltage values in a continuous manner and, once welding is completed, the last value in Amperes and Volts is displayed along with the HOLD word.
When the display is in HOLD, BLUE color appears. If If we press on the center of the display opens a screen that displays the main parameters of the last welding: the arc time in seconds switched on, the main current time in seconds, the average current in amperes, the average voltage Volt and the total energy in Kj.
Ampere and volt parameters are synergically adjusted by means of knob **2**.

B TEST To carry out the gas test and the wire test select the corresponding symbol.

When you press the key (test gas), the gas is released from the welding torch for a time period that is adjusted by means of the key **30**; the value is adjusted by means of the knob **2**, from 1 to 60 seconds. To interrupt the gas release press the key again.
When you press the button (wire test), the wire comes out of the welding torch at a speed that can be adjusted by means of the key **8.0**; the speed value, 1 to 22 meters/minute, can be set using the knob **2**, and the key must be

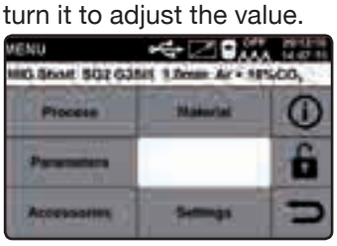
pressed for the whole duration of the test.
To return to the previous menu, press the key ⮌.

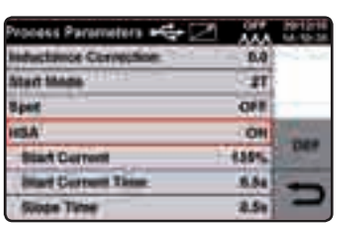
C Start stop.

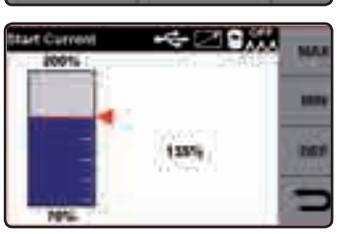
To choose the welding start mode, **2T**, **4T** or **3L**, select the corresponding symbol.

Mode 2T.
The machine begins welding when the torch trigger is pressed, and stops when released. With mode **2T** , you can also choose the parameter HSA (Automatic Hot Start) and the parameter CRA (Final Crater filler).
The 2 parameters **HSA** and **CRA** can be enabled at the same time, or individually.

Once the parameter HSA has been enabled, the operator can adjust the **Start current** from 10 to 200% of the welding current.
The **Current time** can also be adjusted from 0.1 to 10 seconds. The **Connection time** between the Start current and the welding current can also be adjusted from 0.1 to 10 seconds. To adjust **Start current** values, **Current time** and **Connection time**, enter **Main Menu** by selecting the key **F** MENU and using the key PARAMETERS enter the **process parameters menu**. Turn knob **2** to select the parameter, press it to enter the regulation screen and turn it to adjust the value.





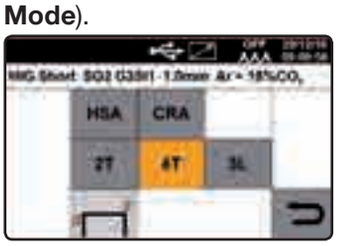


Press that key DEF to reset the manufacturer set parameters.
After activating the parameter CRA, the operator can adjust the **connection time** between the welding current and the **crater filling current** (Crater Current) from 0.1 to 10 seconds. The operator can also adjust the **crater filling current** from 10 to 200% of the welding current.
The duration of this current can also be adjusted from 0.1 to 10 seconds of the **Crater filling time**.

To adjust the values of **connection time**, **crater filling current** and **crater filling time** enter the main menu by selecting key **F** MENU and enter the **process parameters** menu. Turn knob **2** to select the parameter, press it to enter the regulation screen and turn it to adjust the value.

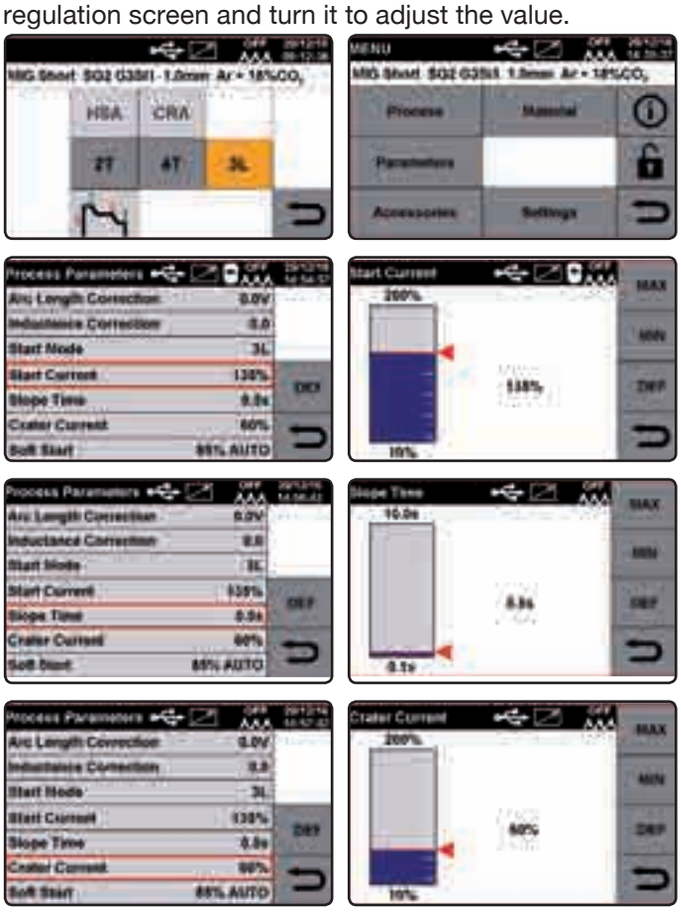
Press the key DEF to reset the factory set parameters.

Mode 4T.
To begin welding press and release the torch trigger; to stop welding press and release it again. Together with **mode 4T** you may also select function **HSA** (automatic hot start) and function **CRA** (final crater filling). (See **2T Mode**).



Mode 3L.
Specially well suited to weld aluminium. The **HSA** and **CRA** functions are inhibited when mode **3L** is activated. 3 currents are available that can be used in welding by means of the welding torch start key.
The current and the connection time values are set as follows:
Start Current. Start current, adjustable from 10 to 200% of set welding current.
Connection Time. Possibility of adjusting from 0.1 to 10 seconds. Defines the connection time between **Start Current** and **welding current** and between **welding current** and **crater filling current** (crater filling at the welding end)
Crater current may be adjusted from 10 to 200% of set welding current.
Welding starts at the welding torch key pressure.
The recalled current will be the **Start current**.
This current is kept as long as the welding torch trigger is held down; when the welding torch trigger is released this current connects to the welding current, which is

kept as long as the welding torch trigger is pressed again. When the torch trigger is pressed again, the welding current will connect to the crater filling current and it will be maintained until the torch trigger is released.
To adjust the values of the **Start current**, of the connection time and of the **crater filling** current enter the Main Menu with key **F** MENU and enter the **process parameters menu.**
Turn knob **2** to select the parameter, press it to enter the regulation screen and turn it to adjust the value.



Press the key DEF to reset the factory set parameters.

D 0.0 **Inductance.**

The adjustment can vary from -9.9 to +9.9. Zero is the number set by the factory: if the number is negative, the impedance decreases and the arc becomes harder; if increased, it becomes softer.
To enter the function select it with your finger. To adjust the value just turn the knob **2**.

E 0.0 **Arc Correction.**

To modify the arc length select it with your finger. To adjust this value just turn the knob **2**.

F MENU **Menu.**

To use this function select it with your finger.
By selecting it you enter the **Main Menu**.

Process **SELECTION OF THE WELDING PROCESS MIG, TIG OR MMA.**

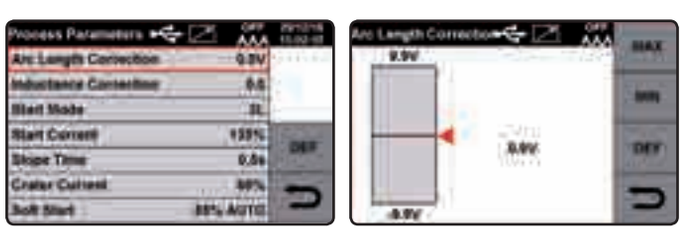
After having selected the **MIG**, welding process with knob **2** you can select the arc transfer type: **MIG Pulse**, **MIG Short** and **MIG Manual**.
To confirm the selection press knob **2** or the key ⮌.

Material **SELECTION OF THE WIRE TYPE, DIAMETER AND WELDING GAS.**

To confirm the selection press knob **2** or the key ⮌.

Parameters **PROCESS PARAMETERS SELECTION.**

- **Arc length correction**.
  Turn knob **2** to select the parameter and confirm the selection by pressing the same knob.
  The value is adjusted by turning the knob **2**.
  To confirm the selection press knob **2** or the key ⮌.
  Press the key DEF to reset the factory set parameters.

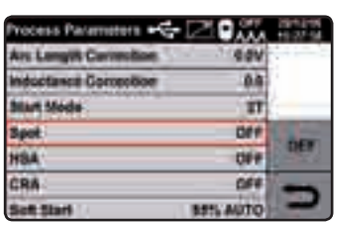
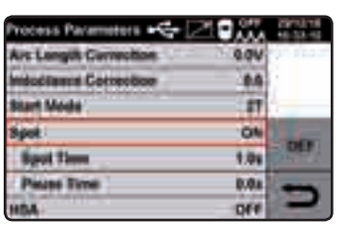


- **Inductance Correction**.
  Turn knob **2** to select the parameter and confirm the selection by pressing the same knob.

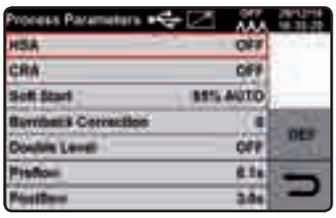
The value is adjusted by turning the knob **2**.
To confirm the selection press knob **2** or the key ⮌.
Press the key DEF to reset the factory set parameters.


- **Torch trigger**.
  The selection is between **Mode 2T**, **Mode 4T** and **Mode 3L.**
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  To select the Mode turn knob **2** To confirm the selection press knob **2** or the key ⮌.

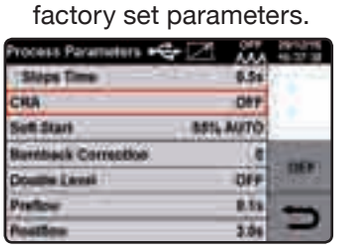

- **Spot**.
  The selection is between **spot time and intermittency**.
  This function is blocked when function 3L is activated.
  When selecting the **Spot time** on **ON**, the screen displays the function **Spot time**. While selecting it you can adjust it by means of the adjustment bar.
  In addition to the **Spot time**, the display shows the **Pause time**. By selecting this, by means of the adjustment bar, it is possible to regulate the pause time between one welding spot or section and another.
  Turn knob **2** to select the parameter and confirm the selection by pressing the same knob.
  The value is adjusted by turning the knob **2**. To confirm the selection press knob **2** or the key ⮌.
  Press the key DEF to reset the factory set parameters.

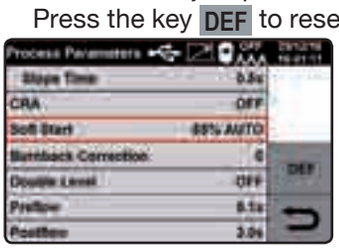
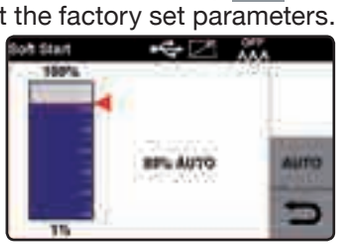

- **HSA, (Automatic Hot Start).**
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  When selecting **HSA** on **ON** the screen displays the **Start Current**, the **Current time** and the **Connection time**. To adjust these parameters see chapter **Start Mode**. Press the key DEF to reset the factory set parameters.




- **CRA, (final crater filling).**
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  When selecting **CRA** on **ON** the screen displays the **Connection time**, the **Crater filling current** and the **Crater filling time**. To adjust these parameters see chapter **Start Mode**. Press the key DEF to reset the factory set parameters.



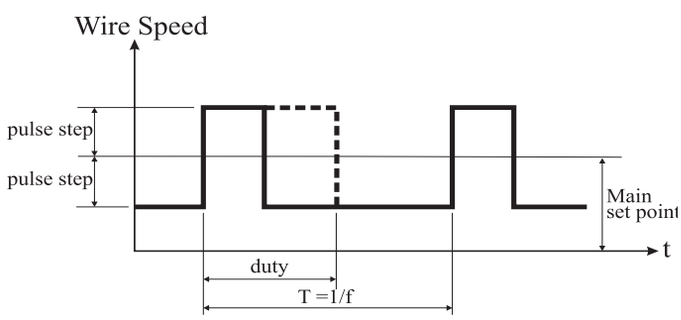

- **Soft Start.**
  Adjustment can vary from 0 to 100%. This is the wire speed expressed in percentage of the speed set for welding, before the wire touches the piece to be welded.
  This adjustment is important to always obtain good starts.
  The factory adjustment is Auto (Default function)
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  The value is adjusted by turning the knob **2**. To confirm the selection just press the knob 2 or the key ⮌.
  Press the key DEF to reset the factory set parameters.

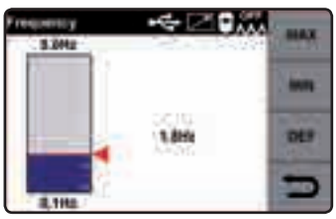
- **Burnback correction**.
  The adjustment can vary from -9.9 to +9.9. Its purpose is to adjust the length of the wire coming out of the gas nozzle after welding. A positive figure corresponds to greater wire burning.
  The factory adjustment is 0 (Default function).
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  The value is adjusted by turning the knob **2**. To confirm the selection just press the knob **2** or the key ⮌.
  Press the key DEF to reset the factory set parameters.

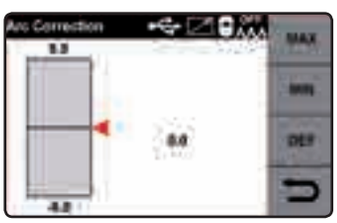
- **Double Level**.
  Active in synergic MIG/MAG processes. This type of welding varies the current intensity between two levels. Before setting the double level welding, it is necessary to make a short bead to determine the wire speed and the current to obtain the penetration and the bead width closest to the type of welding to be made.
  In this way the wire feed speed value (and the corresponding current) is determined; the meters per minute that will be set will be alternatively added to and subtracted from this value.
  Before start working you should not forget that for a correct bead, the minimum overlapping between two “meshes” must be 50%.

	MIN	MAX	DEF
Frequency	0.1 Hz	5.0 Hz	1.5 Hz
Speed difference	0.1 m/min	3.0 m/min	1.0 m/min
Duty cycle	25%	75%	50%
Arc correction	-9,9	9,9	0,0

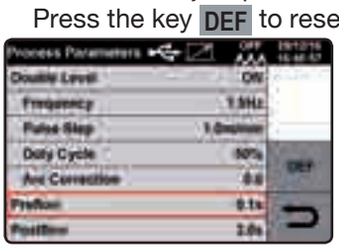


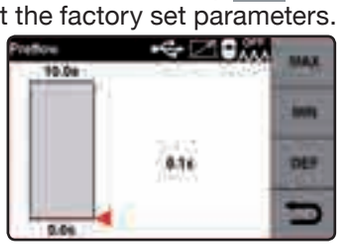
Double level frequency.
The Herz frequency is the number of periods per second.
Period means the speed alternating from the higher to the lower values.
The lower value, that does not penetrate, is used by the operator to change from one mesh to the next one; the higher speed, corresponding to the maximum current, is the penetrating speed and the mesh execution. The operator will stop to make the mesh.
The speed difference. Is the amplitude of the speed change in m/min.
The speed change determines the sum and the subtraction of m/min from the reference speed described above. Parameters being the same, when the number increases the mesh is wider and penetration is deeper.
Duty cycle. The double level time expressed as a percentage, is the higher speed/current time as compared to period duration. Parameters being the same, it determines the mesh diameter and therefore the penetration.
Arc correction. Sets arc length of the higher speed/current.
Important: make sure that the arc length is the same for both currents.
Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
The value is adjusted by turning the knob **2**. To confirm the selection simply hold down the knob **2** or the key ⮌.
Press the key DEF to reset the factory set parameters.





- **Preflow**.
  The adjustment may range from 0 to 10 seconds
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  The value is adjusted by turning the knob **2**. To confirm the selection just press the knob **2** or the key ⮌.
  Press the key DEF to reset the factory set parameters.

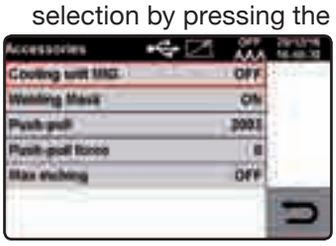
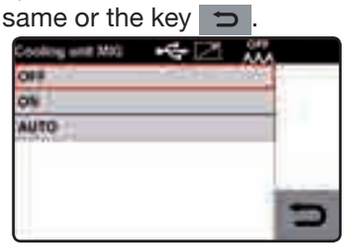




- **Postflow**.
  The adjustment may range from 0 to 25
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  The value is adjusted by turning the knob **2**. To confirm the selection simply hold down the knob **2** or the key ⮌.
  Press the key DEF to reset the factory set parameters.

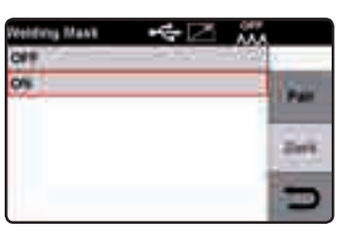

Accessories USE OF THE MACHINE ACCESSORIES.

- **Cooling unit use instructions**.
  This function allows the setting of the cooling unit start-up.
  Selections are **OFF** – **ON** – **AUTO**, default value is **OFF**.
  If "**AUTO**" is selected, when the machine is switched on, the cooling unit starts, if the torch trigger is not pressed after 30 seconds, it shuts off. By pressing the torch trigger the group starts again and shuts off 3 minutes after releasing the trigger
  Turn knob **2** to select the parameter and confirm the selection by pressing the same or the key ⮌.

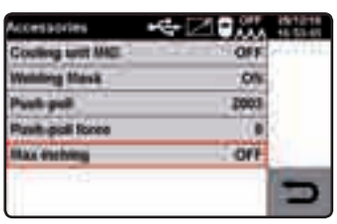
- **Bluetooth controlled welding mask. (optional)**.

In order to use the mask, the kit must be already assembled in the power source. You simply turn on the welding mask, activate the function on the power source display, setting to ON and pair via Bluetooth the welding power source to the mask by selecting the "PAIR" function. To test the function, simply press the "DARK" button on the display ensuring that the mask glass becomes dark.

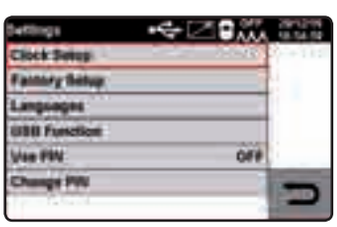
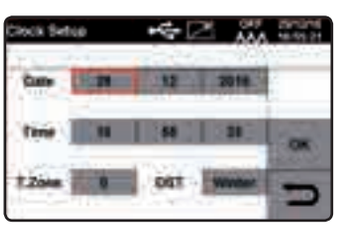
- **Push-pull torch use instructions**.
  Adjustment of the Push-pull force can vary from -99 to +99.
  This function adjusts the drive torque of the push-pull motor in order to make the wire feed linear.
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  The value is adjusted by turning the knob **2**. To confirm the selection press knob 2 or the key ⮌.
  Press the key DEF to reset the factory set parameters.
  This function will be displayed on the screen only after this accessory is assembled inside the power supply.


- **Maximum inching**.
  The purpose is to stop the welding machine if the wire flows for the preset length in cm after starting with no passage of current. Adjustment **OFF** - 50 cm.
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  To confirm the value, simply hold down the knob **2** or the key ⮌.
  Press the key DEF to reset the factory set parameters.




Settings MACHINE SETTINGS MENU.

- **Date and Time Setting**.
  Turn the knob **2** to select parameter "Clock " and confirm the selection by holding down the knob.
  Values are adjusted by turning the knob **2** and are confirmed by holding the knob down.
  To confirm date and time press the key OK.
  To exit the function press the key ⮌.

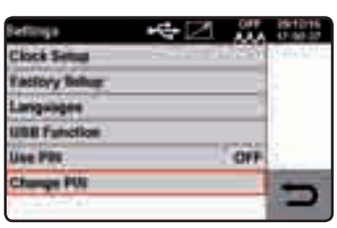
- **Factory setup resetting**.
  This function allows return to the factory preset values.
  Three resetting modes are possible:
  - All.
  - Resets only stored "job" working programs.
  - Excludes the "jobs": Resets all but saves "Job" working programs.
  Turn the knob **2** to select the function and confirm the selection by holding down the knob.

To confirm the value simply hold down the knob **2**.
To exit the function press the key ⮌.


- **Languages.** Language selection.
  Turn the knob **2** to select the function and confirm the selection by holding down the knob.
  To confirm the language simply hold down knob **2**.
  To exit the function press the key ⮌


- **USB Port Function.**
  This function is activated only when a USB key is plugged into the connector **6**.
  Turn the knob **2** to select the function and confirm the selection by holding down the knob.
  To confirm the selection simply hold down knob **2**.
  To exit the function press the key ⮌.


- **Use PIN**
  You can block the use of the PROCESSES, MATERIALS and PARAMETERS using a lock code.

G JOB **Job Menu.**

In this section you can save, modify, restore, copy or cancel the working programs.

Saving of a "JOB" program".
After finding the ideal welding condition to be saved, press the key ⮚, the screen displays the first available job number; to confirm the selection press the key SAVE.
The saved string shows the process, the type and the diameter of the wire.
Before saving the working program, you may select the number under which you want to save it by simply turning the knob **2** onto the selected number.
The job screen shows the job knob SAVE and two additional buttons COPY and DEL if you press the first button you can copy any save any job program and save it again onto another number while with the "del" button you can delete any saved job program.
If you press the button JOB you open the screen with all the saved job programs while by pressing the button RCL and the button OK you can recall any program among the saved ones, to modify it.
The button with the selected program number JOB 1 is displayed on the main screen shot ; if you turn the knob **2** you may recall one after the other all the saved job programs in order to modify them.


H **Accessory presence - Cooling unit.** (optional).

I **Accessory presence - welding mask.** Bluetooth controlled (optional).

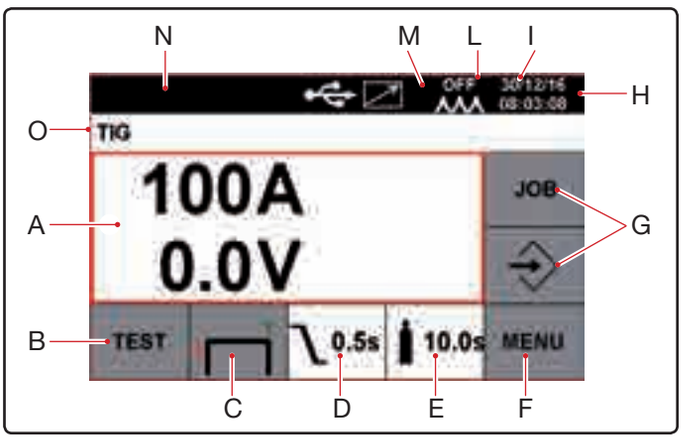
L **Accessory presence - Push Pull torch** (optional).

M **USB key plugged into the connector 6.**

N **Date and Time.**

O **Welding program description.**

6.2 TIG PROCESS.



A The screen displays the welding current in Amperes and the welding voltage in Volts.

B TEST To carry out the gas test refer to the relevant paragraph in "**MIG PROCESS**".

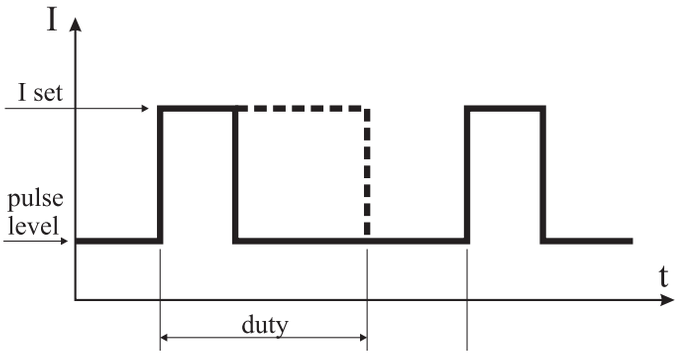
C **Start mode.**

Mode 2T and 4T.
For the operation instructions refer to the relevant paragraphs in "**MIG PROCESS**".

Mode 3L.
3 currents are available that can be used in welding by means of the welding torch start key. The current and the connection time values are set as follows:
Start Current, adjustable from 10 to 200% of set welding current.
Slope time, possibility of adjusting from 0.1 to 10 seconds. Defines the connection time between **Start current** and welding current and between welding current and **crater filling current** or crater filling at the welding end
Start Current, adjustable from 10 to 200% of set welding current.
Welding starts at the torch trigger pressure. The recalled current will be the start current. This current is kept as long as the welding torch trigger is held down; when the welding torch trigger is released this current connects to the welding current, which is kept till the welding torch trigger is pressed again.
When the torch trigger is pressed again, the welding current will connect to the **Crater filling current** and it will be maintained until the torch trigger is released.

Pulsed (Can be used in Mode 2T-4T and 3L).
Pulsed TIG welding.

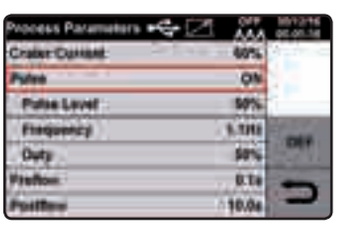
In this type of welding, current intensity varies between two levels; this variation occurs at a given frequency.



Impulse
This item allows the setting of the lower current between the two currents that are required for this welding process; the percentage of this current is displayed related to the main current.
This impulse can be adjusted from 1% al 100% of the main current.

Frequency
It is the pulse frequency.
This value can be adjusted from 0.1Hz to 500Hz.

Duty cycle
This is the duration of the highest current, expressed in percentage, compared to frequency time.
This value can be adjusted from 10% to 90%.



D 0.5s **Current slope down**.
Adjustable from 0 to +10 seconds.

E 10.0s **Post gas**.
Adjustable from 0 to 25 seconds.

F MENU **Menu.**
To enter this function select it with your finger.
Selecting it you enter the **Main Menu**.

Process **SELECTION OF THE WELDING PROCESS, MIG, TIG** or **MMA** (see explanation under chapter **MIG Process**).

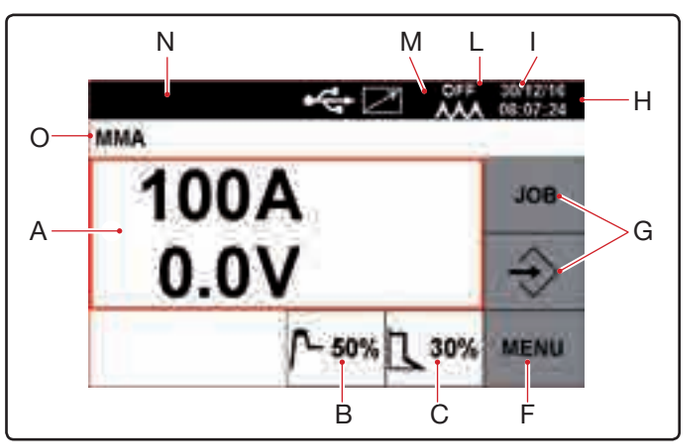
Parameters **SELECTION OF PROCESS PARAMETERS** (see explanation under paragraph **Start Mode** mode **3L** of chapter **MIG Process**).

Accessories **USE OF MACHINE ACCESSORIES** (see explanation under chapter **MIG Process**).

Settings **MACHINE SETTINGS MENU** (see explanation under chapter **MIG Process**).

G JOB **Job Menu** (see explanation under chapter **MIG Process**).

6.3 MMA PROCESS.



A The screen displays the welding current in Amperes and the welding voltage in Volts.

B 50% **Hot Start**.

It is the overvoltage supplied at the arc ignition time.
It is adjustable from 0 to 100% of set welding current.

C 30% **Arc Force.**

It is the adjustment of the arc dynamic chara teristic.It is adjustable from 0 to 100% of set welding current.

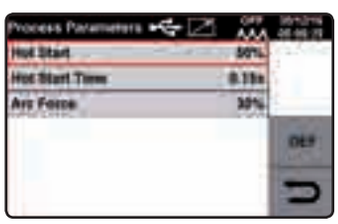
F MENU **Menu.**

To enter this function select it with your finger.
Selecting it you enter the **Main Menu**.

Process **SELECTION OF THE WELDING PROCESS, MIG, TIG** or **MMA (**see explanation under chapter **MIG Process)**.

Parameters **PROCESS PARAMETERS SELECTION.**

- **Hot Start.**
  It is the time of overvoltage supplied at the arc ignition time.
  Range from 0 to 100 sec.
  Turn the knob **2** to select the parameter and confirm the selection by pressing the knob.
  To adjust the value simply turn the knob **2**. To confirm the selection press knob **2** or the key ⮌.
  Press the key DEF to reset the factory set parameters.



- **Hot Start Time.**
  It is the time of overvoltage supplied at the arc ignition time.
  Range from 0 to 100 sec.
  Turn the knob 2 to select the parameter and confirm the selection by pressing the knob.
  To adjust the value simply turn the knob 2. To confirm the selection press knob 2 or the key ⮌.
  Press the key DEF to reset the factory set parameters.

- **Arc Force.**
  It is the adjustment of the arc dynamic characteristic.
  It is adjustable from 0 to 100% of set welding current.
  Turn the knob 2 to select the parameter and confirm the selection by pressing the knob.
  This value is adjusted by turning the knob 2. To confirm the selection simply hold down the knob 2 or the key ⮌.
  Press the key DEF to reset the factory set parameters.

Accessories **USE OF MACHINE ACCESSORIES** (see explanation under chapter **MIG Process**).

Settings **MACHINE SETTINGS MENU** (see explanation under chapter **MIG Process**).

JOB **Job Menu** (see explanation under chapter **MIG Process**).

7 MIG/MAG WELDING

Connect the earth cable to the socket 4 (-).
Connect the cable connector of the power source-trolley connection to the rear socket 17.
Connect the service connector of the power source-trolley connection to the rear connector 18.
Connect the cable connector of the power source-trolley connection to the rear plug of the trolley 19.
Connect the service connector of the power source-trolley connection to the rear connector of the trolley 20.
Connect the gas hose coming out of the power source-trolley connection to the rear fitting of the trolley 11.
After selecting the process you can select the welding mode **MIG: Pulsed Mig**, **Mig Short** or **Mig manual**.
For pulsed MIG welding you must select the wire type, diameter and gas; this selection must be made inside the **Main Menu**, by means of keys process and **material**.
The welding parameters are synergically set by means of the knob.
In this welding process the filler material is transferred with an impulsive controlled energy waveform with a resulting constant detachment of melted material drops that reach the workpiece without splatters. The result is a melted material welding cord that is transferred to the workpiece without splatters. The welding cord is thus well connected with any material type or thickness.
All types of wire, diameter and gas that can be used are also shown on a plate inside the mobile side panel.

Mig Short.
For MIG short welding you must select the wire type, diameter and gas; this selection must be made inside the **main menu** and, by means of keys **process** and **material**.
The welding parameters are synergically set by means of the knob.
All types of wire, diameter and gas that can be used are also shown on a plate inside the mobile side panel.
Mig Manual.
For MIG manual welding you must select the type of wire, diameter and gas; this selection must be made inside the **Main Menu**, and by means of keys **process** and **material**.
For welding using this process you must adjust the wire speed and the welding voltage. Pressing the knob on the main screen you can select the wire speed as well as welding voltage and value.
All types of wire, diameter and gas that can be used are also shown on a plate inside the mobile side panel.

8 MMA WELDING

Connect the electrode clamp cable connector to connector **16** or **9** and the earth cable clamp to connector **4** (observing the polarity stated by the electrode manufacturer).
In order to prepare the machine for MMA welding, follow the instructions previously described in the menu.

9 TIG WELDING

Connect the cable connector of the power source-trolley connection to the front socket 4 (-).
Connect the earth cable to the socket 9 (-).
Connect the power connector of the TIG torch to the socket 16.
Connect the gas hose coming out of the TIG torch to the fitting 7.
Connect the service connector of the TIG torch to the connector 8.
Connect the gas hose coming out of the power source-trolley connection to the fitting 21.
To set up the machine for TIG welding follow the instructions previously described in the menu.

10 ACCESSORIES

- **MIG TORCH ART. 1239**
  Air-cooled CEBORA MIG welding Torch 380 A, 3.5m.
- **MIG TORCH ART. 1241**
  Water-cooled CEBORA MIG welding Torch 380 A 3.5m.
- **PUSH-PULL UP/DOWN TORCH, air cooled Art. 2003**.
- **COOLING UNIT ART. 1681.**

11 MAINTENANCE

All maintenance jobs must be performed by professional personnel according to the CEI 26-29 (IEC 60974-4) standard.

11.1 GENERATOR MAINTENANCE

In case of maintenance inside the appliance, make sure the switch **12** is in “O” position and that the power supply cable is disconnected from the mains.
Periodically, also clean the inside of the appliance and remove any metal dust using compressed air.

11.2 HOW TO PROCEED AFTER MAKING REPAIRS.

After making repairs, always ensure the wires are fully insulated between the primary side and the secondary side of the machine. Avoid the wires coming into contact with moving parts or parts that heat up during operation. Fit all the clamps back as on the original machine so as to avoid any contact between the primary and secondary in case of accidental lead breakage or disconnection.
Also fit the screws back on with the toothed washers as on the original machine.

QUESTA PARTE È DESTINATA ESCLUSIVAMENTE AL PERSONALE QUALIFICATO.

THIS PART IS INTENDED SOLELY FOR QUALIFIED PERSONNEL.

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.

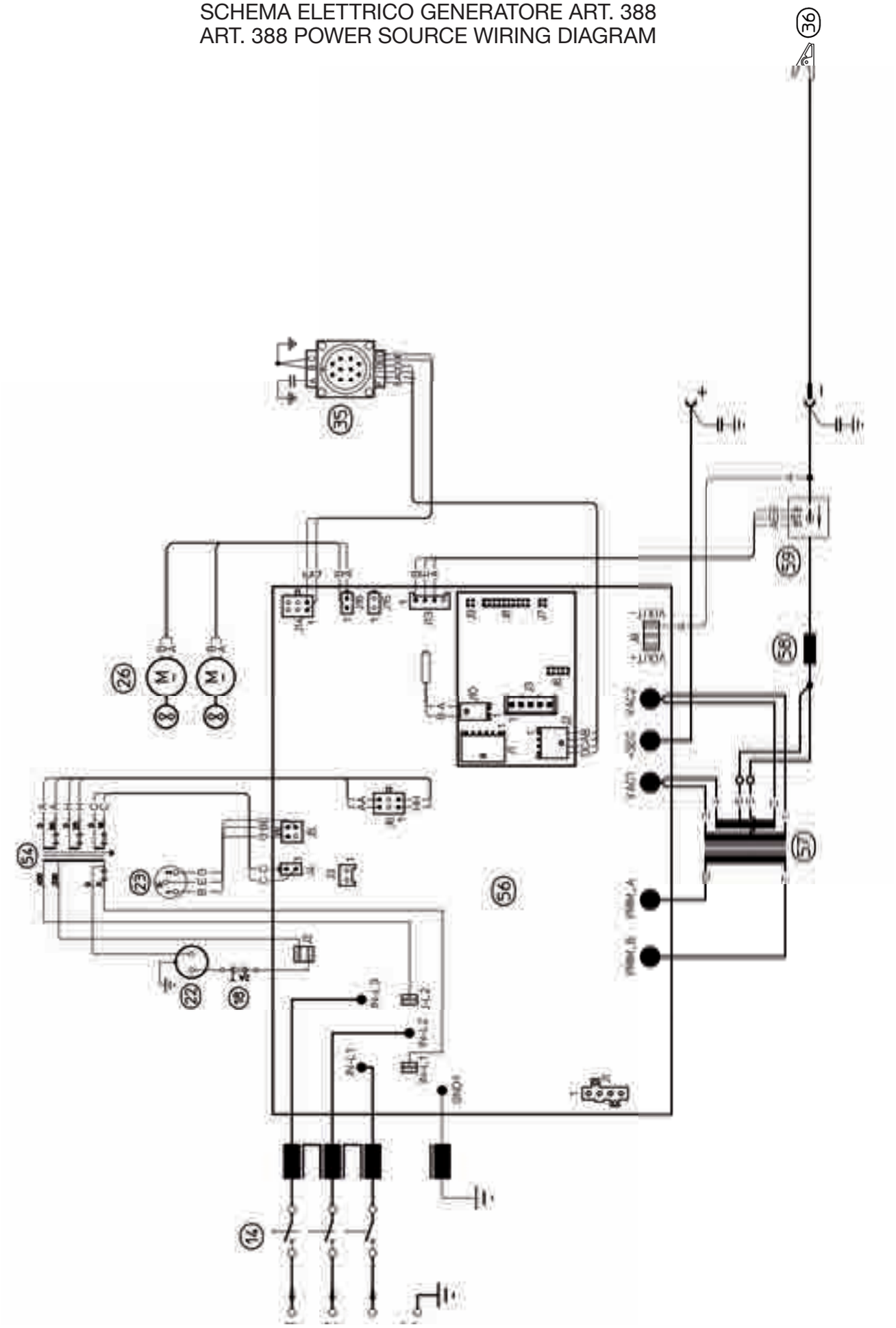
DENNA DEL ÄR ENDAST AVSEDD FÖR KVALIFICERAD PERSONAL.

ΑΥΤΌ ΤΟ ΤΜΉΜΑ ΠΡΟΟΡΊΖΕΤΑΙ ΑΠΟΚΛΕΙΣΤΙΚΆ ΓΙΑ ΤΟ ΕΙΔΙΚΕΥΜΈΝΟ ΠΡΟΣΩΠΙΚΌ.

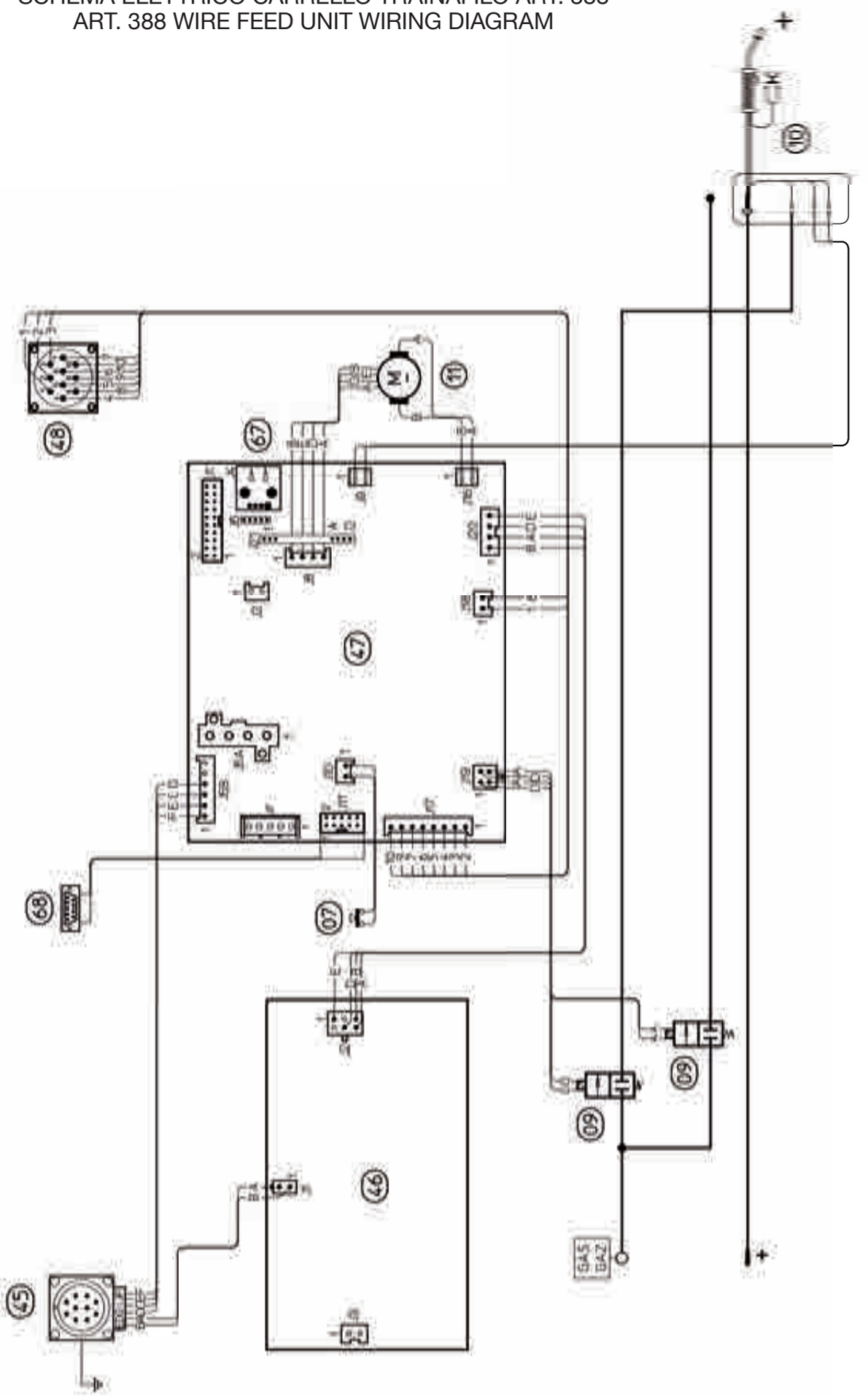
CODIFICA COLORI CABLAGGIO ELETTRICO		WIRING DIAGRAM COLOUR CODE
A	NERO	BLACK
B	ROSSO	RED
C	GRIGIO	GREY
D	BIANCO	WHITE
E	VERDE	GREEN
F	VIOLA	PURPLE
G	GIALLO	YELLOW
H	BLU	BLUE
K	MARRONE	BROWN
J	ARANCIO	ORANGE
I	ROSA	PINK

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	LIGHT-BLUE

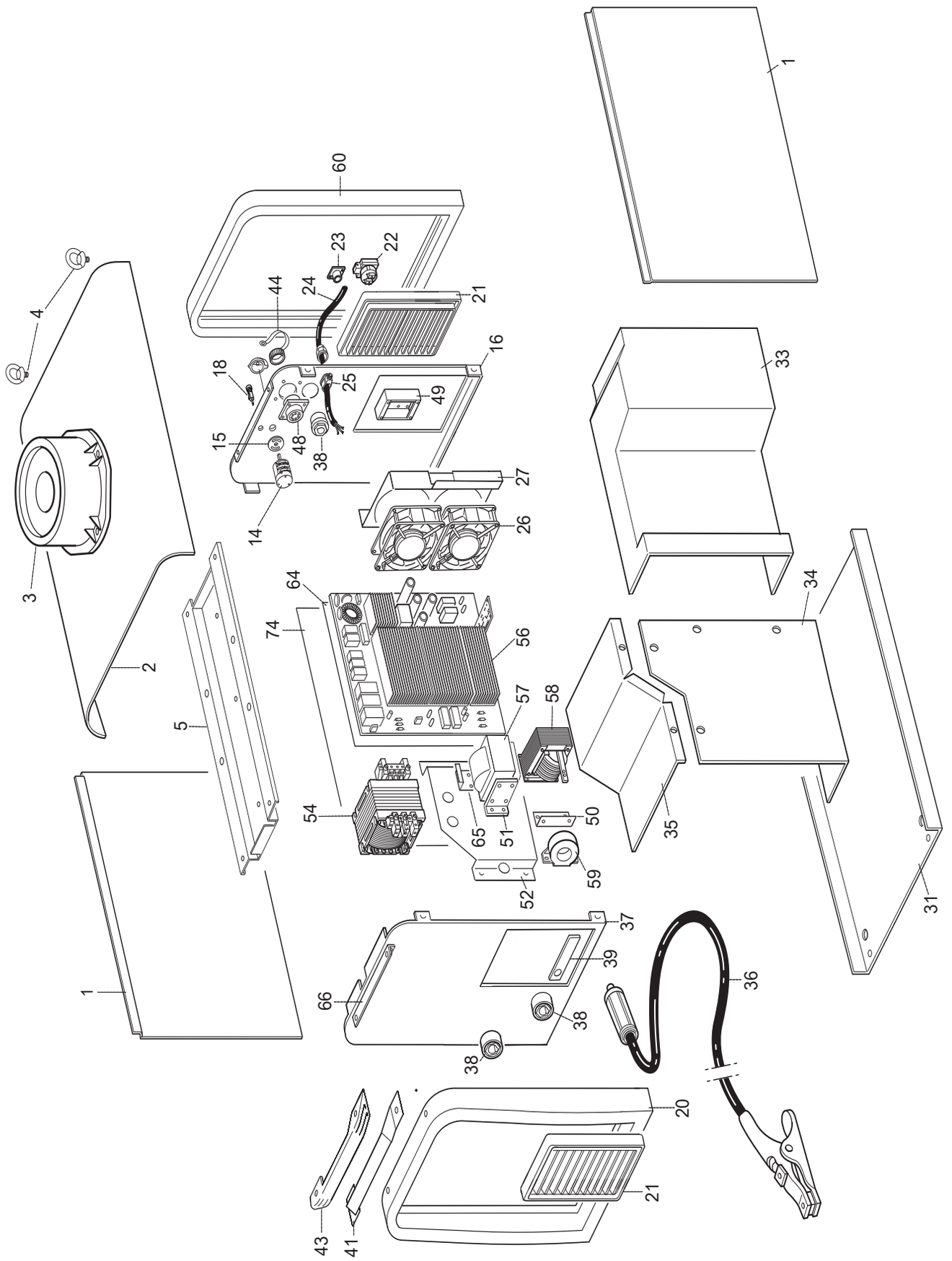
SCHEMA ELETTRICO GENERATORE ART. 388
ART. 388 POWER SOURCE WIRING DIAGRAM



SCHEMA ELETTRICO CARRELLO TRAINAFILO ART. 388
ART. 388 WIRE FEED UNIT WIRING DIAGRAM



ART. 388



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
01	LATERALE	SIDE PANEL
02	COPERCHIO	COVER
03	SUPPORTO GIREVOLE	SWIVELLING SUPPORT
04	GOLFARE	EYEBOLTS
05	RINFORZO COPERCHIO	REINFORCEMENT CART
14	INTERRUTTORE	SWITCH
15	PROTEZIONE	PROTECTION
16	PANNELLO POSTERIORE	BACK PANEL
18	PORTA FUSIBILE	FUSE HOLDER
20	CORNICE	FRAME
21	PANNELLO ALETTATO	FINNED PANEL
22	PRESA	SOCKET
23	CONNESSIONE PRESSOSTATO	PRESSURE SWITCH CONNECTION
24	CAVO RETE	POWER CORD
25	PRESSACAVO	STRAIN RELIEF
26	MOTORE CON VENTOLA	MOTOR WITH FAN
27	SUPPORTO VENTOLE	FANS SUPPORT
31	FONDO GENERATORE	BOTTOM
33	COPERTURA SCHEDA	COVER
34	CARTER DI PROTEZIONE	PROTECTION CASE
35	CARTER DI PROTEZIONE	PROTECTION CASE
36	CAVO MASSA	EARTH CABLE
37	PANNELLO ANTERIORE	FRONT PANEL

POS	DESCRIZIONE	DESCRIPTION
38	PRESA	SOCKET
39	CAVALLOTTO CU	JUMPER CU
41	SUPPORTO MANICO	HANDLE SUPPORT
43	MANICO	HANDLE
44	TAPPO	CAP
48	CONNESSIONE GENERATORE	POWER SOURCE CONNECTION
49	SUPPORTO	SUPPORT
50	SUPPORTO	SUPPORT
51	SUPPORTO	SUPPORT
52	CONVOGLIATORE	CONVEYOR
54	TRASFORMATORE DI SERVIZIO	AUXILIARY TRANSFORMER
56	CIRCUITO POTENZA COLLAUDATO	POWER CIRCUIT
57	TRASFORMATORE DI POTENZA	POWER TRANSFORMER
58	IMPEDENZA SECONDARIA	SECONDARY IMPEDANCE
59	TRASDUTTORE	TRASDUCER
60	CORNICE	FRAME
64	ISOLAMENTO	INSULATION
65	APPOGGIO	REST
66	SUPPORTO MANICO	HANDLE SUPPORT
74	PIANO INTERMEDIO	INSIDE BAFFLE

CARRELLO TRAINAFILO PER ART. 388
WIRE FEED UNIT FOR ART. 388

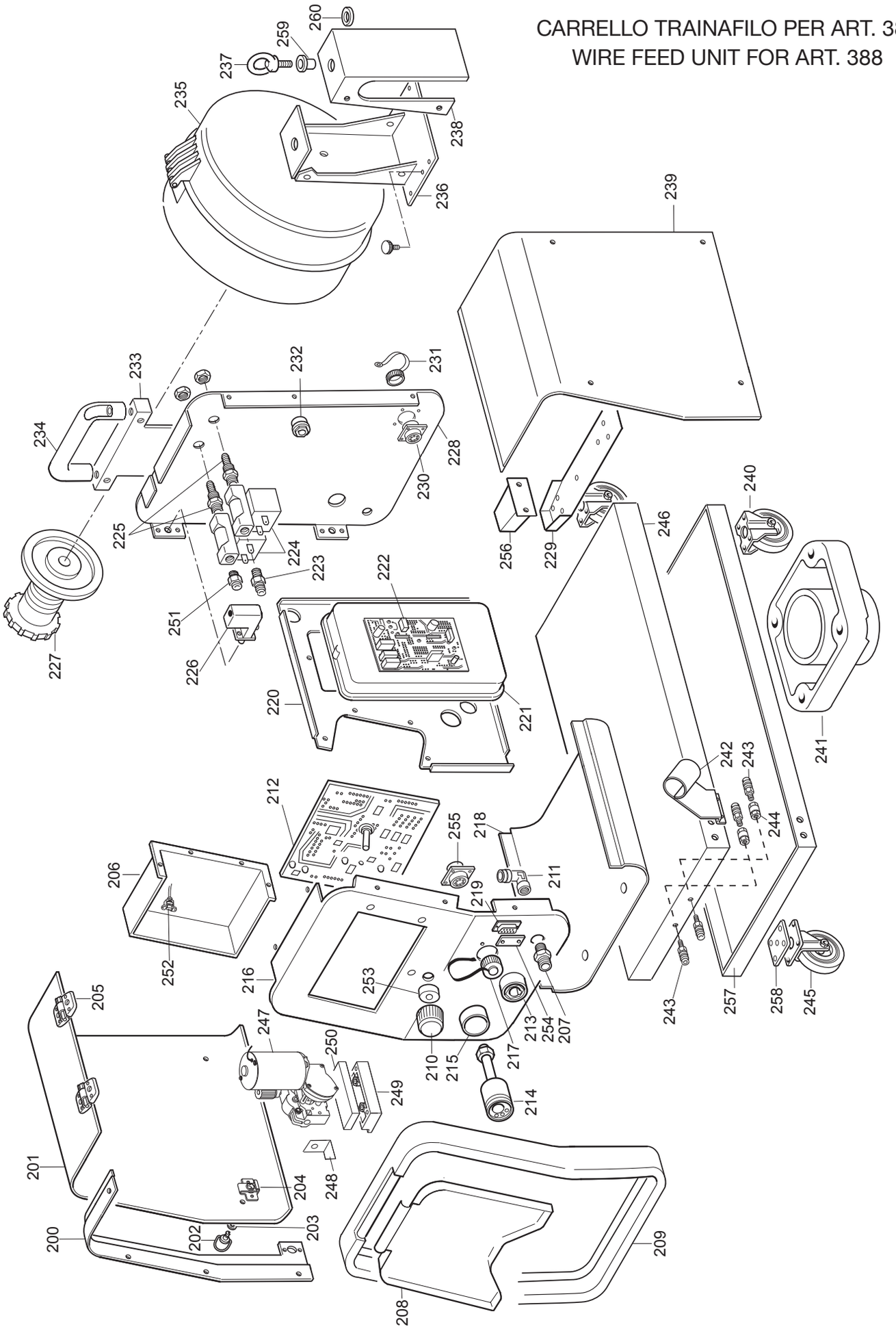
POS	DESCRIZIONE	DESCRIPTION
200	LATERALE SX	LEFT SIDE PANEL
201	LATERALE MOBILE	HINGED SIDE PANEL
202	CHIUSURA MASCHIO	LOCKING DEVICE
203	ROSETTA	WASHER
204	CHIUSURA FEMMINA	CLOSING
205	CERNIERA	HINGE
206	PROTEZIONE SCHEDA	CIRCUIT PROTECTION
207	RACCORDO	FITTING
208	PANNELLO CHIUSURA	CLOSING PANEL
209	CORNICE	FRAME
210	MANOPOLA	KNOB
211	RACCORDO	FITTING
212	CIRCUITO PANNELLO	PANEL CIRCUIT
213	INNESTO FEMMINA	SOCKET
214	CORPO ADATTATORE	ADAPTOR BODY
215	GHIERA P/ADATTATORE	RING NUT
216	PANNELLO ANTERIORE	FRONT PANEL
217	TAPPO CONNETTORE	CAP
218	FONDO SUPERIORE	UPPER BOTTOM
219	CONNESSIONE PROGRAM-MAZIONE	PROGRAMMING CONNEC-TION
220	PIANO INTERMEDIO	INSIDE BAFFLE
221	PROTEZIONE MOTORE	MOTOR PROTECTION
222	CIRCUITO ALIMENTATORE	SUPPLY CIRCUIT
223	RACCORDO	FITTING
224	ELETTROVALVOLA	SOLENOID VALVE
225	RACCORDO	FITTING
226	PULSANTE	SWITCH
227	PORTA BOBINA	COIL SUPPORT
228	PANNELLO POSTERIORE	BACK PANEL
229	SUPPORTO RUOTE	WHEELS BRACKET
230	CONNESSIONE CON CONNETTORE	CONNECTOR

POS	DESCRIZIONE	DESCRIPTION
231	TAPPO CONNETTORE	CAP
232	SPINA	PLUG
233	SUPPORTO MANICO	HANDLE SUPPORT
234	MANICO	HANDLE
235	COPERTURA	COVER
236	SUPPORTO BOBINA	COIL SUPPORT
237	GOLFARA	EYEBOLT
238	RINFORZO BOBINA	STRENGTHENING COIL
239	LATERALE DX	RIGHT SIDE PANEL
240	RUOTA FISSA	FIXED WHEEL
241	SUPPORTO GIREVOLE	SWIVELLING SUPPORT
242	SUPPORTO TORCIA	TORCH SUPPORT
243	RACCORDO	FITTING
244	RACCORDO	FITTING
245	RUOTA PIROETTANTE	SWIVELING WHEEL
246	FONDO CARRELLO	TROLLEY BOTTOM
247	MOTORIDUTTORE	WIRE FEED MOTOR
248	CAVALLOTTO CU	JUMPER CU
249	DISTANZIALE MOTORE INFERIORE	SPACER LOWER MOTOR
250	DISTANZIALE MOTORE SUPERIORE	SPACER UPPER MOTOR
251	RACCORDO	FITTING
252	CONNESSIONE USB	USB CONNECTION
253	PROTEZIONE IN GOMMA	RUBBER PROTECTION
254	PROTEZIONE CONNETTORE	CONNECTOR PROTECTION
255	CONNESSIONE PUSH-PULL	PUSH-PULL CONNECTION
256	RINFORZO	REINFORCEMENT
257	RINFORZO FONDO	REINFORCEMENT
258	SUPPORTO RUOTE	WHEELS BRACKET
259	BOCCOLA	BUSH
260	BOCCOLA	BUSH

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.

CARRELLO TRAINAFILO PER ART. 388
WIRE FEED UNIT FOR ART. 388

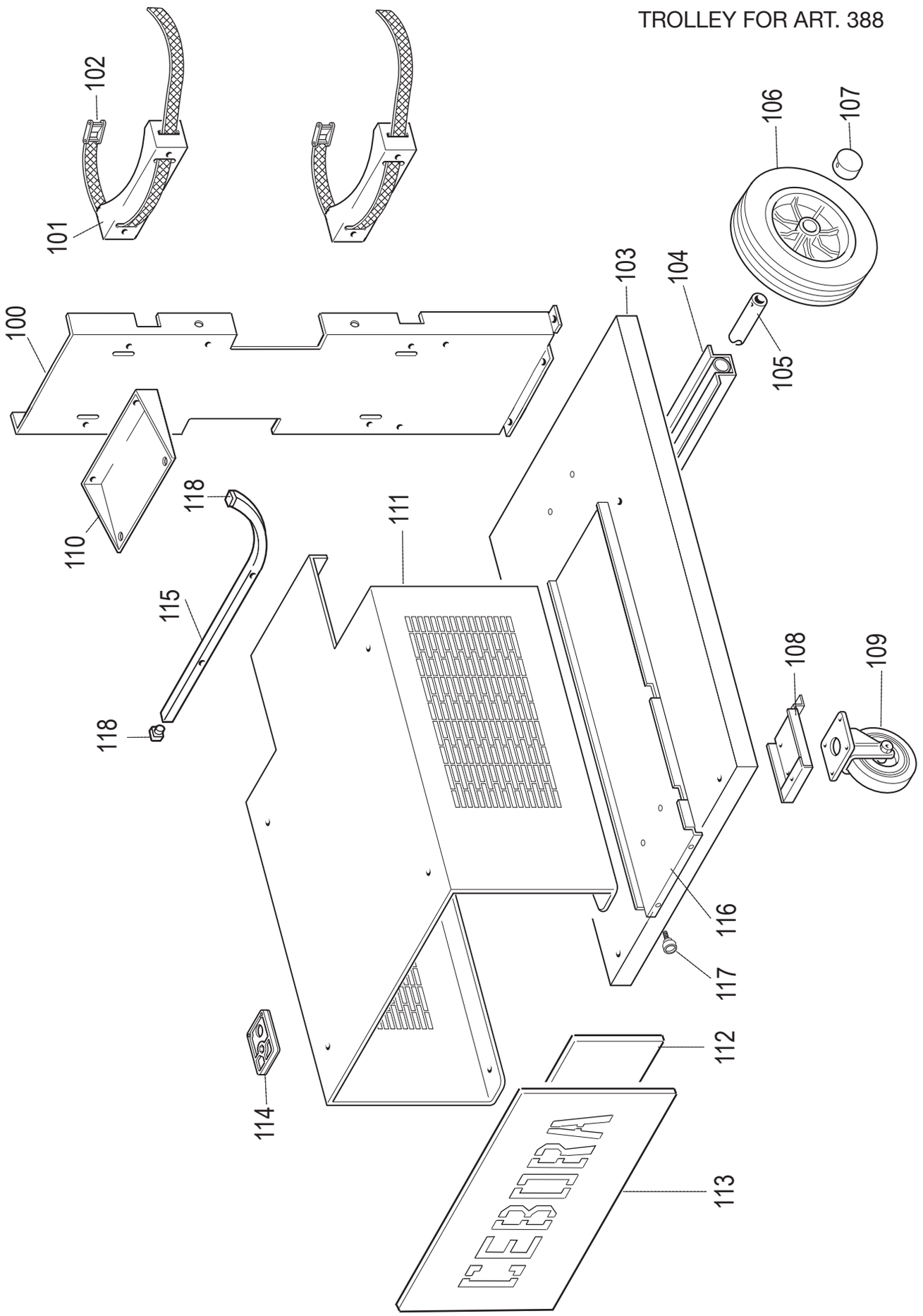


CARRELLO DI TRASPORTO PER ART. 388
TROLLEY FOR ART. 388

POS	DESCRIZIONE	DESCRIPTION
100	SUPPORTO BOMBOLA	GAS CYLINDER SUPPORT
101	APPOGGIO BOMBOLA	GAS CYLINDER SUPPORT
102	CINGHIA + FIBBIA	BELT
103	FONDO CARRELLO	TROLLEY BOTTOM
104	SUPPORTO ASSALE	AXLE SUPPORT
105	ASSALE	AXLE
106	RUOTA FISSA	FIXED WHEEL
107	TAPPO	CAP
108	SUPPORTO RUOTE	WHEELS BRACKET
109	RUOTA PIROETTANTE	SWIVELING WHEEL

POS	DESCRIZIONE	DESCRIPTION
110	SUPPORTO MONTANTE	PILLAR BRACKET
111	SUPPORTO GENERATORE	POWER SOURCE SUPPORT
112	PANNELLO INTERNO	INSIDE PANEL
113	PANNELLO CHIUSURA	LID
114	APPOGGIO	REST
115	SUPPORTO CAVI	CABLES SUPPORT
116	SUPPORTO	SUPPORT
117	VOLANTINO	HAND WHEEL
118	TAPPO CHIUSURA	CLOSING CAP

CARRELLO DI TRASPORTO PER ART. 388
TROLLEY FOR ART. 388



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