sincosald
EMPOWER YOUR WELDING

MODEL

EVOLUTION SP3-C
EVOLUTION SP4-E
EVOLUTION SP5-E
FEEDER EVO-4R
G.R. EVO

INSTRUCTION MANUAL
for installation,
use and maintenance
of welding
machines.

Original instructions in Italian.
Please keep for future use.

1.995.220 EN - Rev. 1.1

CE

Contents

6. MACHINE USE 24

1. PREFACE

1.1. PURPOSE OF THE INSTRUCTION MANUAL FOR USE AND MAINTENANCE

This manual has been designed to provide the user with general knowledge of the machine and to allow it to be used safely.
This instruction manual is an integral part of the machine and has the purpose of providing all the information necessary to ensure:

1. safe handling of the machine, either packaged and unpackaged;
2. correct machine installation;
3. knowledge of the technical specifications of the machine;
4. thorough understanding of machine operations and limitations;
5. indication of the qualifications and specific training required of those operating and carrying out maintenance work on the machine
6. in-depth knowledge of its intended, unforeseen and prohibited uses;
7. its proper and safe use;
8. how to carry out correct and safe maintenance and repair operations;
9. technical assistance and management of spare parts;
10. disposal of waste produced by the machine;
11. the safe dismantling of the machine in accordance with applicable regulations to protect workers' health and the environment.
    This document assumes that the applicable occupational health & safety and hygiene regulations are complied with at the site where the machine will be used.

IMPORTANT: Those in charge have the responsibility, in accordance with current legislation, to carefully read the contents of this Instruction Manual and ensure that operators and maintenance personnel read the parts relevant to them.

The customer has the responsibility to make sure that, if this document is modified by the Manufacturer, only the updated versions of the manual are actually present at the workplace.
The instructions, documentation and drawings found in this Manual are of a confidential technical nature and strictly the property of the Manufacturer, therefore, aside from the purpose for which it was produced, any reproduction in whole or in part of the contents and/or format must have the prior consent of the Manufacturer.

THE OFFICIAL LANGUAGE CHOSEN BY THE MANUFACTURER IS ITALIAN. The manufacturer cannot be held liable for translations in other languages that do not conform to the original meaning (ORIGINAL INSTRUCTIONS).

1.2. RECIPIENTS

This Instruction Manual is intended for the installer, the operator/user, the system manager, the system safety manager and the qualified or qualified and authorised technician authorised to maintain the machine.

INSTALLER: Technician authorised by the manufacturer and expert in handling, installation, connection and adjustment of the machine.

OPERATOR/USER: This is the person in charge of using the machine and cleaning it.

PLANT MANAGER: The individual who makes the adjustments and the programming.

PLANT SAFETY MANAGER: Person responsible for verifying that all applicable safety regulations and the provisions set out in this manual are observed.

QUALIFIED TECHNICIAN: Qualified person who, by virtue of an accurate technical knowledge of the machine and all the safety procedures, performs ordinary maintenance and minor repairs.

QUALIFIED AND AUTHORISED TECHNICIAN: Highly qualified person, trained and authorised by the manufacturer to make significant adjustments and extraordinary maintenance or repairs during the warranty period.

EXPOSED PERSON: Any person who is wholly or partly in a dangerous area (near the machine and exposed to risk due to his or her safety).

The machine is intended for industrial use, so its use is strictly for qualified, skilled technical personnel, in particular those:

- over 18 years of age;
- physically and psychologically capable of performing particularly difficult technical work;
- sufficiently trained to use the machine and carry out maintenance work on it;
- deemed suitable for carrying out the task entrusted to them by their employer;

- capable of comprehending and interpreting the operator manual and the safety instructions;
- familiar with the emergency procedures and how to implement them;
- have understood the operational procedures established by the machine's Manufacturer.

1.3. STORAGE OF THE INSTRUCTION MANUAL

The Instruction Manual must be carefully stored and must accompany the machine each time it changes hands throughout its life cycle.
It should be kept in good condition by handling it with care, with clean hands, and not placing it on dirty surfaces.
Parts of the manual must not be removed, torn or changed.
The Manual should be kept close to the machine to which it refers in an environment free from humidity and heat.

1.4. UPDATING THE INSTRUCTION MANUAL

The Manufacturer is only liable for the Instructions issued and validated by itself (Original Instructions); any translations MUST always be accompanied by the Original Instructions to verify the correctness of the translation. In any case, the Manufacturer is not liable for translations that have not been approved by the Manufacturer himself, thus if an inconsistency is detected, attention must be paid to the original language and, if necessary, the manufacturer's sales office should be contacted, which will make the changes deemed appropriate.
The Manufacturer reserves the right to make changes to the project, changes/improvements to the machine and updates to the Instruction Manual without previously informing Customers. However, should changes be made to the machine installed at the Customer's site, in agreement with the Manufacturer and involving the adaptation of one or more chapters of the Instruction Manual, the Manufacturer shall provide the Customer with the parts of the Instruction Manual that concern the change, with the new global revision model. The Customer shall be responsible, following the instructions that accompany the updated documentation, for replacing any parts that are no longer valid with the new ones.

1.5. HOW TO READ THE INSTRUCTION MANUAL

The Manual is split into chapters, each one dedicated to a specific category of information addressed to the personnel for whom the relevant qualifications have been defined.
To facilitate immediate comprehension of the text, terms, abbreviations and pictograms are used, the meanings of which can be found in Paragraph 1.6.

1.6. TERMS, SYMBOLS AND PICTOGRAMS

To highlight parts of text of significant importance the following symbols were adopted:

ATTENTION: Indicates the need to adopt appropriate behaviours so as not to put people's health and safety at risk and not to cause damage to the machine or the environment.

HAZARD: Indicates situations of serious danger that can seriously endanger the health and safety of people.

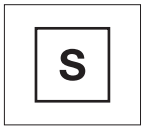
IMPORTANT: Indicates technical information of particular importance which should not be neglected.

The following pictogram stickers are affixed to the machine, depending on the version:

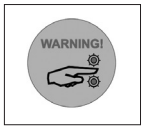
The product complies with the safety requirements provided by the applicable EU directives or regulations.


Carefully read the instructions listed in the manual.


Machine subjected to general danger (see instruction manual).



Machine used in environments with a high risk of electric shock.



WARNING!
Moving mechanical parts.
(For MIG generators only)

2. GENERAL INFORMATION

2.1. MANUFACTURER IDENTIFICATION DATA

MANUFACTURER: **SINCOSALD S.r.l**

HEADQUARTERS - OFFICES
via della Fisica, 26/28
20864 Agrate Brianza (MB) Italy
Tel: +39 039 641171
Fax: +39 039 6057122

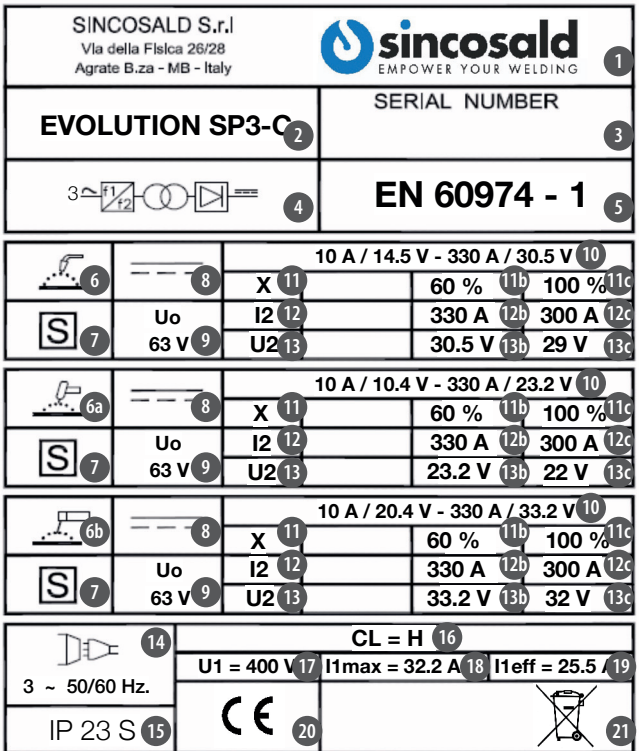
CONTACTS:
export@sincosald.it www.sincosald.it

2.2. MACHINE IDENTIFICATION DATA AND PLATES

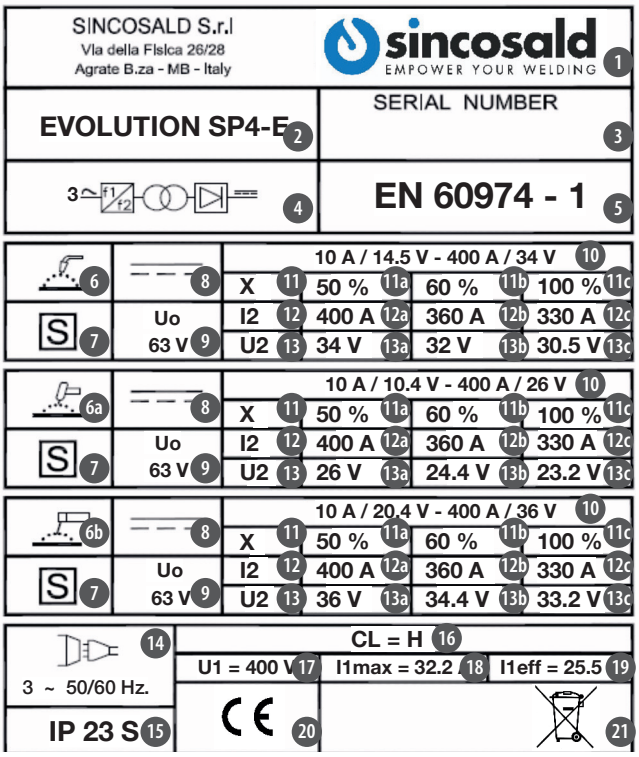
Each machine is identified by a CE plate on which its reference data is indelibly marked. For any communication with the manufacturer or service centre always quote these references.

IMPORTANT: The plate must not be removed for any reason, under penalty of forfeiture of the guarantee and the unavailability of spare parts due to failure to be identified. The position of the nameplate on the Machine can vary from machine to machine.

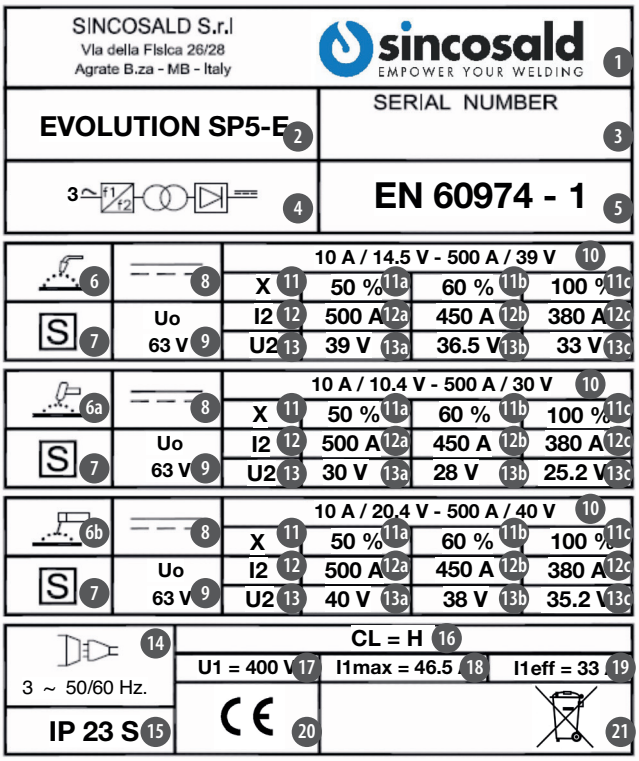
EVOLUTION SP3-C plate



EVOLUTION SP4-E plate



EVOLUTION SP5-E plate

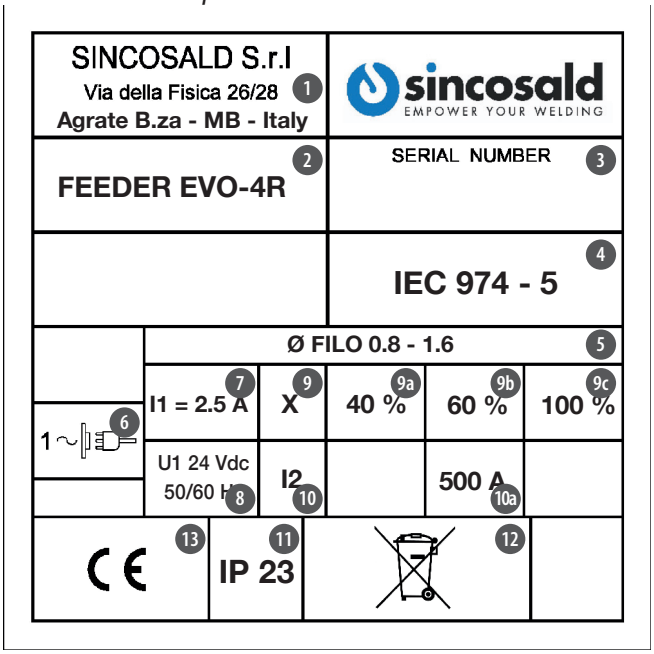


EVOLUTION plate explanation

Pos. 1 Name and address of the manufacturer and trademark
Pos. 2 Identification of the welding machine model
Pos. 3 Welding machine serial number

Pos. 4 Welding machine type symbol: Transformer - Rectifier for arc welding
Pos. 5 Reference to the legislation followed for welding machine construction: EN 60974-1
Pos. 6 Welding with MIG/MAG procedure
Pos. 6a Welding with TIG procedure
Pos. 6b Welding with MMA procedure
Pos. 7 Symbol indicating that the welding machine can be used in environments with an increased risk of electric shock
Pos. 8 Welding current symbol: Direct Current / Alternating Current
Pos. 9 Rated no-load voltage U0 in V
Pos. 10 Electric adjustment range of the welding machine: minimum and maximum rated welding current, with the relevant charged voltages
Pos. 11 Welding machine service factor (X): this figure indicates the welding machine service factor as a percentage of a 10-minute work cycle. Example X = 60% - I2 350 A, these data indicate that the welding machine on a work cycle can weld with a current I2 = 350 A for a time of 6 minutes out of 10, that is 60%.
Pos. 11a Service factor: 50 %
Pos. 11b Service factor: 60 %
Pos. 11c Service factor: 100 %
Pos. 12 Rated welding current (I2)
Pos. 12a Value of the rated welding current at 50%
Pos. 12b Value of rated welding current at 60%
Pos. 12c Value of rated welding current at 100%
Pos. 13 Conventional load voltage (U2)
Pos. 13a Voltage at 50 % load
Pos. 13b Voltage at 60 % load
Pos. 13c Voltage at 100 % load
Pos. 14 Symbol for the welding machine power supply and number of phases followed by the direct/alternating current symbol
Pos. 15 Indicates the degree of welding machine protection: IP 23
Pos. 16 Insulation class
Pos. 17 Rated power voltage
Pos. 18 Maximum current in MIG welding
Pos. 19 Actual current in MIG welding
Pos. 20 Product complies with the safety requirements established by the applicable EU directives or regulations
Pos. 21 See chapter 9. ADDITIONAL INSTRUCTIONS

FEEDER EVO - 4R plate



Explanation of the FEEDER EVO - 4R plate

Pos. 1 Name and address of the manufacturer and trademark
Pos. 2 Feeder model identification
Pos. 3 Feeder serial number
Pos. 4 Reference to the regulation followed for feeder construction. IEC 974-5
Pos. 5 Weldable wire diameter
Pos. 6 Power voltage symbol: single phase
Pos. 7 Absorbed current
Pos. 8 Applied voltage
Pos. 9 Feeder service factor (X): this data indicates the feeder service factor as a percentage of a 10-minute work cycle. Example X = 60% - I2 350 A, these data indicate that the feeder on a work cycle can weld with a current I2 = 350 A for a time of 6 minutes out of 10, that is 60%.
Pos. 9a Service factor: 40 %
Pos. 9b Service factor: 60 %
Pos. 9c Service factor: 100 %
Pos. 10 Rated welding current (I2)
Pos. 10a Value of the rated welding current at 60%
Pos. 11 Feeder protect ion grade: IP 23
Pos. 12 See chapter 9. ADDITIONAL INSTRUCTIONS
Pos. 13 Product complies with the safety requirements established by the applicable EU directives or regulations

2.3. DECLARATIONS OF CONFORMITY

The machine is constructed in compliance with the relevant EU Directives, applicable at the time of its entering onto the market.

2.4. SAFETY STANDARDS

The machine was built in accordance with the following standards and directives:

Harmonised standards
IEC 60974-1 - IEC 60974-5 - IEC 60974-10
Directives
EN 60204-1 - 2014-35-EV - 9231 EEC - 9368 EEC
Standards
EN/IEC 61000-3-12 - EN/IEC 61000-3-11 - EN/IEC 61000-3-3

2.5. INFORMATION ON TECHNICAL ASSISTANCE

The machines are covered by a warranty, as provided for in the general conditions of sale.
If during the warranty period you experience a malfunction or failure of the machine parts, which fall under the cases covered by the warranty, the manufacturer, after the necessary machine checks, will repair or replace defective parts.

The goods travel at the customer's risk; product damage caused by transportation or unloading is not covered by the warranty. All equipment and consumables supplied with the product are also excluded from the warranty.
It is reminded that any modifications carried out by the user, without the express written consent of the manufacturer, will void the warranty and free the manufacturer from any liability for damage caused by a defective product.
This applies in particular to alterations made to safety devices that reduce their effectiveness.
The same considerations apply when using non-original spare parts or those different to the ones explicitly specified by the manufacturer.
For these reasons, we recommend our customers to always contact our Customer Service.

2.6. PREPARATION BY THE CUSTOMER

Unless otherwise agreed in the contract, the following are normally the Customer's responsibility:

- Room preparations, including any building work and/or ducting systems required;
- Electrical supply of the equipment, in compliance with the standards in force in the country of use. Particular care must be given to the protective conductor commonly known as "earthing" and to the efficiency of the circuit breaker installed to protect the power outlet. It is the purchaser's responsibility to keep the above system adequately efficient, in compliance with current accident prevention regulations.
- Consumables or material normally subject to wear;
- Equipment unloading at delivery and the consequent liabilities.

3. SAFETY

3.1. GENERAL SAFETY WARNINGS

WARNING: your safety depends on you!!!

- *Follow all safety rules carefully.*
- *It is your duty to protect yourself and others from the risks of welding operations.*
- *The operator is responsible for his own safety and that of those in the work area. He must therefore know all the safety rules and observe them.*

Nothing can replace common sense!!!

IMPORTANT: Before operating the machine, carefully read the instructions contained in this manual and follow them thoroughly.

The manufacturer has made every effort to design this machine and to make it as **INTRINSICALLY SAFE** as possible.
The manufacturer has also equipped the machine with all the protective and safety devices considered necessary. Finally, it has provided enough information for it to be used safely and correctly.

IMPORTANT: This information must be scrupulously followed..

The user may chose to appropriately add to the information provided by the manufacturer with additional processing instructions, which, obviously, do not contradict that contained in this Instruction Manual, in order contribute to safe machine use.
For example, you must pay close attention to the clothing that anyone working on the machine is wearing:

- Avoid using clothes with hooks that can remain attached to parts of the machine;
- Avoid using ties or other fluttering clothing parts;
- Avoid wearing bulky rings or bracelets that may get caught in parts of the machine.

Whenever necessary, further recommendations for use will be provided in the Manual for the user related to preventive measures, personal protective equipment, information to prevent human error and any reasonably foreseeable prohibited behaviour.

It is, however, essential to diligently follow the following indications:

- It is absolutely forbidden to operate the machine automatically with the fixed and/or mobile guards removed;
- It is strictly prohibited to disable the safety mechanisms installed on the machine;
- Operations at reduced safety levels must be carried out in strict accordance with the instructions given in the relevant descriptions;
- After any operation with reduced safety levels, guards/safety devices should be replaced on the machine as soon as possible;
- Any cleaning must be carried out with the electrical and pneumatic separation devices sectioned.
- Do not alter parts of the machine for any reason; in the event of malfunction, due to non-compliance with the above, the manufacturer cannot be held liable for the consequences. We recommend that you request any changes to be made directly to the manufacturer;
- Clean the casing of the machines, the panels and the controls with soft cloths that are dry or have been lightly soaked in a mild detergent solution; do not use any type of solvent, such as alcohol or petrol, as the surfaces may be damaged;
- Position the machines as determined at the time of order according to the diagrams provided by the manufacturer, otherwise it cannot be held liable for any problems.

ATTENTION:
The Manufacturer cannot be held liable for damage caused by the machine to persons, animals or property in the event of:

- **use of the machine by personnel who are not adequately trained;**
- **improper use of the machine;**
- **electrical, hydraulic or pneumatic power supply faults;**
- **incorrect installation;**
- **failure to perform scheduled maintenance;**
- **unauthorised modifications or operations;**
- **the use of spare parts that are not original or not specific to the model;**
- **total or partial failure to follow the instructions;**
- **use contrary to the specific national regulations;**
- **calamities and exceptional events.**

General requirements
The moving parts must always be used according to the manufacturer's instructions, as indicated in this manual, which must always be available at the workplace.

All safety features placed on moving parts to prevent accidents and safeguard safety can not be modified or removed, but must be adequately safeguarded.
The user must promptly inform the employer or his direct superior of any defects or anomalies presented on the mobile parts.

A) Electric shock
ELECTRIC SHOCK CAN BE FATAL!!!
- All electric shocks are potentially fatal.
- Do not touch live parts.
- Insulate yourself from the piece to be welded and from the earth, wearing insulating gloves and clothes.
- Keep clothing (gloves, shoes, headgear, clothes) and body dry.
- Do not work in damp or wet environments. Do not lean on the piece to be welded.
- If you have to work near or in an area at risk, use all possible precautions.
- If you also feel a little electric shock, stop welding immediately; do not use the device until the problem is identified and resolved.
- Provide an automatic wall switch, of adequate capacity and possibly in the vicinity of the machine, to immediately cut off the device in the event of an emergency situation.
- Frequently inspect the power cord.
- Disconnect the power cord from the mains before working on the cables or before opening the machine.
- Do not use the machine without the protective bulkheads.
- Always replace any damaged parts of the machine with original materials.
- Never bypass machine safety devices.
- Make sure that the power supply line is equipped with an efficient earth socket.
- Make sure that the work bench and the work piece are connected to an efficient earth socket.
- Never electrically and simultaneously touch "hot" parts of pliers connected to two welders because the voltage between the two can be the total of the no-load voltage of both welding machines.
- Any maintenance must be performed only by expert personnel, aware of the risks due to the voltages necessary for the operation of the equipment.

B) Radiation
Ultraviolet radiation, emitted from the electric arc, can damage the eyes and burn the skin.
Follow the instructions below:
- Wear appropriate clothing and protective masks.
- DO NOT use CONTACT LENSES!!! The intense heat emanating from the electric arc could stick them to the cornea.
- Use masks with lenses, with a minimum DIN 10 or DIN 11 protection grade.
- Protect people near the welding area.
- **REMEMBER:** The arc can blind or damage your eyes. The arc is dangerous up to a distance of 15 metres. Never look at the arc with the naked eye!
- Prepare the welding area so as to reduce reflection and transmission of ultraviolet radiation: paint walls and exposed surfaces black to reduce reflection, installing protective screens or curtains, to reduce ultraviolet transmissions.
- Replace the mask lenses when they are damaged or broken.

C) Welding wire
Attention: the welding wire can cause perforated wounds.
- Do not press the button on the welding torch before carefully reading the instructions for use.
- Do not point the torch towards parts of the body, other people or metals, when mounting the welding wire on the welding machine.

D) Explosions
- Do not weld above or near pressurised containers.
- Do not weld in an atmosphere containing explosive powders, gases or vapours.

This welder uses inert gases such as CO2, ARGON, or ARGON + CO2 mixtures to protect the arc, therefore it is necessary to pay the utmost attention to:

1) Cylinders:
- Handle or use pressurised cylinders in accordance with the regulations in force.
- Do not connect the cylinder directly to the machine's gas pipe, without using a pressure regulator.
- Do not use cylinders that leak or are physically damaged.
- Do not use cylinders that are not well secured to the welding machine or to suitable supports.
- Do not transport cylinders without the valve protection fitted.
- Do not use cylinders whose contents have not been clearly identified.
- Do not put the cylinder in electrical contact with the arc.

- Do not expose cylinders to excessive heat, sparks, molten slag or flames.
- Do not tamper with the cylinder valves.
- Do not attempt to unlock blocked valves with hammers, keys, tools or other systems.
- Never delete or alter the name, number or other markings on the cylinders. It is illegal and dangerous.
- Do not lift the cylinders from the ground by holding them by the valve or by the cap, or by using chains, slings or magnets.
- Do not attempt to mix any gas inside the cylinders.
- Never refill the cylinders, but have them refilled by specialised companies.
- Do not modify or exchange the cylinder fittings.

2) Pressure regulators:
- Keep pressure regulators in good condition. Damaged regulators can cause damage or serious accidents; they must be repaired only by qualified personnel.
- Do not use regulators for gases other than those for which they were manufactured.
- Never use a regulator that leaks or appears physically damaged.
- Never lubricate a regulator with oil or grease.

3) Hoses:
- Replace hoses that appear damaged.
- Keep hoses taut to avoid accidental creases.
- Keep the excess hose collected and keep it out of the work area to prevent damage.

E) Fire
- Avoid igniting fire due to sparks and hot slag or incandescent parts.
- Ensure that appropriate fire protection devices are available near the welding area.
- Remove flammable and combustible materials from the welding area and the surrounding area (minimum 10 metres).
- Do not weld on fuel and lubricant containers, even if empty; these must be carefully cleaned before being welded.
- Allow the welded piece to cool before touching it or putting it in contact with combustible or flammable materials.
- Do not weld on parts with cavities containing flammable materials.
- Do not operate in atmospheres with high concentrations of combustible vapours, flammable gases or dust.
- Always check the work area thirty minutes after the end of welding operations to ensure that there are no fires.
- Do not keep combustible materials such as lighters or matches in your pocket.

F) Burns
Protect the skin against burns caused by ultraviolet radiation emitted by the electric arc, by sparks and slag from molten metal, using fireproof clothing, which covers all exposed surfaces of the body.
Wear protective clothing and welder gloves, headgear and high shoes with safety tip. Button the shirt collars and pocket flaps and wear trousers without cuff to avoid the entry of sparks and slag.
Wear a mask with protective glass on the outside and adiactinic glass filter inside. This is MANDATORY for welding operations, in order to protect the eyes from radiant energy and volatile metals. Replace the protective glass if it is broken, pitted or spotted. Avoid oily or greasy clothes; a spark could ignite them. Incandescent metal parts, such as work pieces, should always be handled with gloves.
First aid equipment and a qualified person should be available for each shift, unless there are health facilities nearby for immediate treatment of eye and skin burns.

G) Fumes
Welding operations produce harmful fumes and metal dust, which can damage health:
- Do not work in spaces without adequate ventilation. Keep your head out of the fumes.
- In closed environments, use suitable exhaust fans. If ventilation is not adequate, use suitable respirators.
- Clean the material to be welded if there are solvents or halogen degreasers, which give rise to toxic gases. During welding, some chlorinated solvents can decompose in the presence of radiation emitted by the electric arc and produce phosgene gas.
- Do not weld coated metals or those containing lead, graphite, cadmium, zinc, chromium, mercury or beryllium, unless a suitable respirator is available.

The electric arc generates ozone. Prolonged exposure, in environments with high concentrations of ozone, can cause headaches, irritation of the nose, throat and eyes and severe congestion and chest pain.

IMPORTANT: DO NOT USE OXYGEN FOR VENTILATION!!!

Gas leaks must be avoided in small spaces. Large gas leaks can dangerously change the oxygen concentration. Do not place cylinders in small spaces.

DO NOT WELD or cut where solvent vapours can be drawn into the welding atmosphere or if radiant energy can penetrate into atmospheres containing even tiny amounts of trichloroethylene and perchlorethylene.

H) Moving parts can cause damage

Moving parts, such as the fan, can cut fingers and hands and catch clothes.
Keep all doors, covers and guards closed and securely in place.
Protections and coverings can be removed, for possible maintenance and checks, only by qualified personnel.
Keep hands, hair, loose clothing and tools away from moving parts.
Refit the covers and guards and close the doors when the operation is completed and before restarting the machine.

I) Noise

These welders do not in themselves produce any noise exceeding 70 dB. Arc welding processes can produce noise levels above this limit. Therefore, users must implement the precautions required by law.
Ear plugs should be used when working overhead or in a small space.
A rigid helmet should be used when others work in the area above.
Welders should not use flammable hair products.

WARNINGS ABOUT ELECTROMAGNETIC COMPATIBILITY

Although these welding machines have been built according to the regulations, they can generate electromagnetic disturbances, that is disturbances to the telecommunication systems (telephone, radio, television) or to the control and safety systems. Read the instructions carefully to eliminate or minimise interference.

ATTENTION: the welding machine has been designed to work in an industrial environment, therefore, to operate in domestic environments it may be necessary to observe special precautions in order to avoid possible electromagnetic interference.

You must install and use the welding machine according to the manufacturer's instructions. If electromagnetic interference is detected, countermeasures must be taken to eliminate the problem, possibly using the manufacturer's technical assistance. In any case, do not modify the welding machine without the manufacturer's approval.

Work area control to prevent E.M. interference

Before installing the welding machine it is necessary to check the work area to detect the existence of services that could malfunction in the event of electromagnetic disturbances.
Below is a list of services to consider:

a) Power cables, control cables, transmission system and telephone cables that pass near the welding machine.
b) Radio or television transmitters and receivers.
c) Computer or control equipment.
d) Safety and industrial process control equipment.
e) Calibration and measurement instruments.
f) Check the level of electromagnetic immunity of the equipment operating in the work area.
g) The health of people in the vicinity, for example people who use pacemakers and earphones for hearing.
h) The daily duration of welding operations or other activities.

The other devices must be electromagnetically compatible. This operation may require additional protective measures.
The dimensions of the area to be considered depend on the structure of the building and the type of activity in progress.

PACEMAKERS AND HEARING AIDS

Magnetic fields deriving from high currents can affect the correct functioning of pacemakers and hearing aids. Wearers of electronic equipment should consult a physician before approaching arc welding operations.

METHODS FOR REDUCING EMISSIONS

A) Power supply

The welding or cutting device must be connected to the power supply following the manufacturer's recommendations.
When interference problems arise, it may be necessary to take measures to solve the problem, such as the addition of filters on the power supply.
In the case of permanent installation of the equipment, the metal shielding of the power cables can be taken into consideration. The shielding must be connected to the welding machine so that there is good electrical contact between it and the mantle of the welding machine itself.

B) Welding machine maintenance

The welding machine must be periodically subjected to maintenance, according to the manufacturer's instructions.
Remove dust or foreign materials every 6 months,

which may have been deposited on the transformer or on the diodes of the rectifier unit; to do this use a jet of dry, clean air.
The mantle and all the possible accesses inside the welding machine must be correctly closed during the welding and cutting operations. The welding machine must never be modified in any part except for modifications planned and authorised by the manufacturer and carried out by persons authorised by the manufacturer.
In particular, the distance of the arc from the work piece and the stabilisation devices must be adjusted and maintained according to the manufacturer's recommendations.

C) Welding cables
Welding cables must be kept as short as possible and must be placed close to each other and passed on the floor or as low as possible.

D) Work piece earthing
The earth connection of the work piece can reduce electromagnetic emissions in some cases.
The operator must pay attention to avoid that the earthing of the piece is not a source of danger for people and damage to the equipment. Where necessary, earthing must be carried out with a direct connection between the work piece and the ground, while in countries where this is not permitted, the connection must be made using a capacitor in accordance with the regulations of the country.

E) Shielding
Cable and equipment shielding in the work area can reduce interference. Shielding of the entire welding or cutting installation can be considered for special applications.

F) Equipotential connections
The equipotential connections of all metal components in and near welding installations should be considered.
In any case the metal components connected to the piece to be welded will increase the risk for the operator to receive an electric shock from the simultaneous contact with these metal components and the electrode. The operator should be isolated from all these metal components rendered equipotential.

Checks and inspections
Checks must be carried out by a qualified technician or a qualified and authorised technician; they must be visual and functional, with the aim of guaranteeing the safety of the machine.
They include:
- inspection of all supporting structures, which must not show any signs of cracking, breakage, damage, deformation, corrosion, wear or alteration to the original characteristics;
- checking all mechanical parts;
- inspection of all the safety devices installed on the machine;
- ll connections with pins and screws;
- inspection of the machine operations;
- inspection of the machine status;
- verification of the correct operation and efficiency of the electrical system;
- checking the seal and efficiency of the pneumatic and/or hydraulic system.

The results of these checks must be reported on a specific sheet.

ATTENTION: If worn or faulty parts are not promptly replaced, the manufacturer cannot be held in any way liable for the damage caused by accidents that may result.
If faults or anomalies are detected, they must be eliminated before the machine is put into operation, and the expert carrying out the inspection will have to certify that the repair has been made, thus allowing the machine to be used.
If the person performing the inspection detects hazardous faults, they must promptly inform the machine manufacturer.
Place the machine out of service if operating faults are found while performing the appropriate checks/inspections and/or repairs. Check that no objects are left between the moving parts after any maintenance work.
In order to guarantee maximum safety of the machine it is, nonetheless, PROHIBITED to:
- Tamper with any part of the machine;
- Leave moving parts unattended;
- Use the machine when not operating at full efficiency;
- Modify the machine to change the originally established use, without explicit authorisation from the Manufacturer;
- Run moving parts with manual operations in case of power failure.

3.2. INTENDED USE

The welding system should only be used for the purpose for which it was manufactured meaning to generate an electrical arch for MIG/MAG, TIG, MMA welding accordingly.

ATTENTION: It cannot therefore be used as a device tor thaw pipes; any improper use automatically voids the warranty and excludes the manufacturer from any liability in case of damage to persons and property.

3.3. CONTRAINDICATIONS FOR USE

The machine must not be used:

- For uses other than those specified by the manufacturer, for different uses or not mentioned in this manual;
- In explosive, corrosive atmospheres or with a high concentration of dust or oily substances suspended in the air;
- In atmospheres with high fire risks;
- Exposed to adverse weather conditions;
- With safety devices bypassed or out of order;
- With electrical bridges and/or other means that exclude power/parts of the machine.

3.4. HAZARDOUS AREAS

The work area pertaining to the operator which is substantially the entire perimeter of the machine is considered hazardous.
It is the responsibility of the operator to keep the work area clear of persons or objects while using the machine and to avoid damage to persons, things or animals.
The use of the machine near other equipment or machines introduces additional risks. The operator is asked to evaluate these risks in order to prevent accidents.

3.5. SAFETY DEVICES

Welding machines are equipped with safety devices designed to prevent damage to the operator or to the welding machine itself. A safety device is any object or system that can reduce the risk of such damage.
Do not tamper with active safety devices or their connections.
Do not operate with the welding machine without the metal covers or with non-insulated connections.
If necessary, during installation and connection, they must be integrated with others in order to guarantee compliance with the laws in force.

IMPORTANT: Daily check that the safety devices are functioning properly and efficient.

3.6. SIGNS

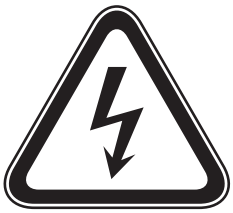
The safety signs must always be clearly visible and it is absolutely forbidden to remove or hide them.
Generally there are signals or signs on the machine or in the work environment that indicate dangerous situations, prohibitions or instructions during use or operations connected to it, as in the following examples:

mission of optical radiation:
The risk of optical radiation exists
where the sign is affixed. Cat. 2 (EN 12198).

Fire hazard:
Fire hazards exist
where the sign is affixed.

General warning:
This symbol indicates a hazard of any nature that may cause personal and property damages.

Explosion hazard:
This symbol indicates the presence of explosive substances or explosion hazard.



Warning:
Contact injuries may occur in this point (i.e. Electrical shock).

Blinding:
Protection goggles or mask must be worn near this symbol.

Fatal hazard:
Pay the utmost attention near this indication!!! Never touch the area indicated by this symbol since it indicates a fatal hazard.

Noise:
Protection goggles or mask near this symbol.

3.7. RESIDUAL RISKS

Careful use of the machine minimises the probability of accidents; however, during the use of the machine it is necessary to strictly observe the safety rules described in this manual.

4. INSTALLATION

4.1. SHIPPING

The shipment, also depending on the destination, can be carried out by different means.
The packed machine must be properly anchored to the means of transport in order to avoid uncontrolled movements.
The shipment is always carried out under the responsibility of the purchaser who assumes all charges for accidents and thefts that could occur during the transport itself.

4.2. PACKAGING

The machine is shipped packed in a special container and, if necessary, it is suitably stabilised with shockproof material to ensure its integrity.
The packaging is made, with containment of the overall dimensions, also depending on the type of transport adopted.
To facilitate transport, the shipment can be performed with some components disassembled and properly protected and packaged.

THE PACKAGING CONTAINS:
- **EVOLUTION C version**
  N°1 **EVOLUTION** welding machine
  N°1 **G.R. EVO** cooling unit (if requested)
  N°1 Instruction manual
- **EVOLUTION E version**
  N°1 **EVOLUTION** welding machine
  N°1 **FEEDER EVO-4R** wire feeder
  N°1 **G.R. EVO** cooling unit
  N°1 Extension
  N°1 Instruction manual

OPTIONAL ACCESSORIES:
No. 1 Earth cable
No. 1 Clamp cable
No. 1 Welding torch

4.3. MACHINE RECEIPT

Upon receipt of the machine, check that the information in the shipping document actually corresponds to the material received and check that the packaging is perfectly intact.

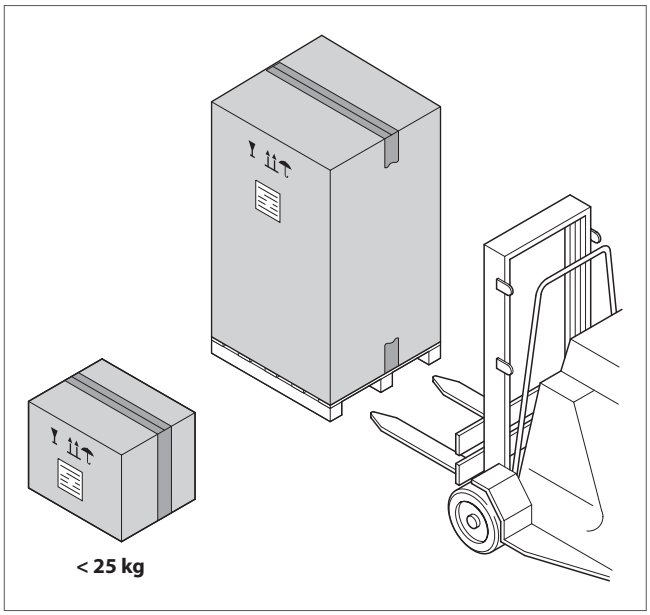
IMPORTANT: in case of damage or absence of some parts, immediately report the anomaly to the carrier, making any descriptive notes of the damage on the transport document before signing.
Do not use the machine, but contact the seller to agree on the procedure to be adopted.
To this end, it is advisable to carry out a check of the packaging during the unloading phase and, in suspicious cases, open the packaging and to verify the safety of the machine and any loose units.

4.4. HANDLING AND LIFTING

ATTENTION: handling and lifting must be carried out by trained and qualified operators, using appropriate means and methods, to avoid risks to personal health and damage to the machine. Before carrying out handling and lifting, check the position of the centre of gravity of the load; always check the correct weight balance of the machine when it is transported, so as to prevent unexpected machine movements or falls. It is recommended to always use vehicles capable of supporting the weight and dimensions of the machine ("TECHNICAL SPECIFICATIONS" paragraph of this manual), so as to avoid damage to the machine or to persons or things around it.

IMPORTANT: the customer is always exclusively liable during the equipment loading and unloading phases.

For transport to the final installation site, it is preferable to use a forklift or pallet truck, taking care that the lifting forks support the entire crate.



For movements within the plant, the machine may be transported with a crane by properly harnessing it using cables with the appropriate resistance characteristics, depending on the weight of the machine itself. If the supply includes only the welding machine, generally weighing less than 25 kg, the packaging consists of a cardboard box without lifting pallets. It can be easily lifted by two operators and taken to the place of use.

ATTENTION: The machine must remain packed during unloading from the means of transport and until it is transferred to its destination.

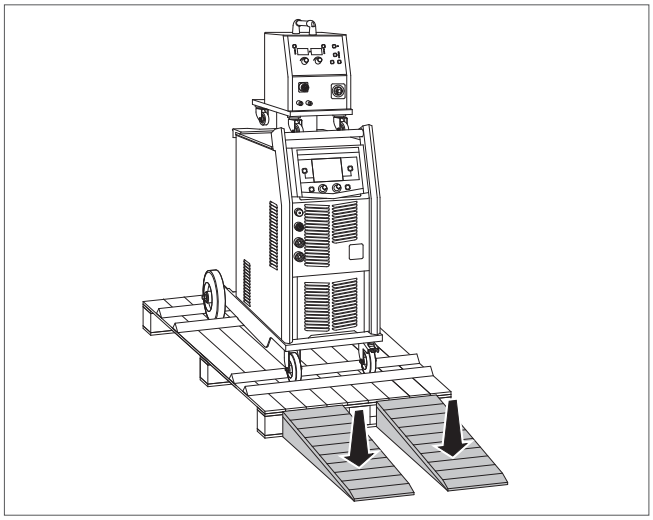
IMPORTANT: The Manufacturer cannot be held liable for damage caused to persons or property due to utilising lifting systems other than those described above.

4.5. UNPACKING

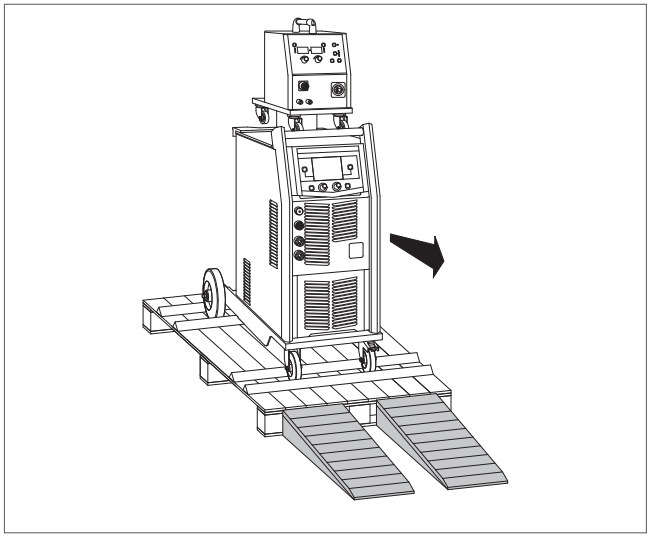
IMPORTANT: Consult the "Handling and lifting" paragraph to correctly handle the machine.

ATTENTION: To remove the machine from the packaging, use appropriate means and methods to avoid risks to human health. The packaging material must be properly disposed of in compliance with the laws in force.

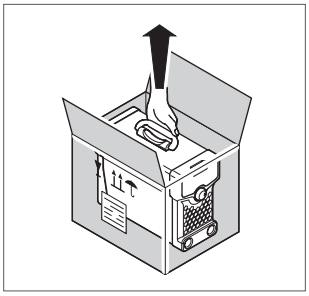
- Remove the protective covers such as straps, boxes, etc. using appropriate tools so as not to ruin the content.
- Remove the protective covers such as straps, boxes, etc. using appropriate tools so as not to ruin the content.
- Position appropriate descent ramps from the pallet verifying that the slides are well hooked to the pallet.



- Complete the unloading operations by carefully lowering the machine from the pallet.



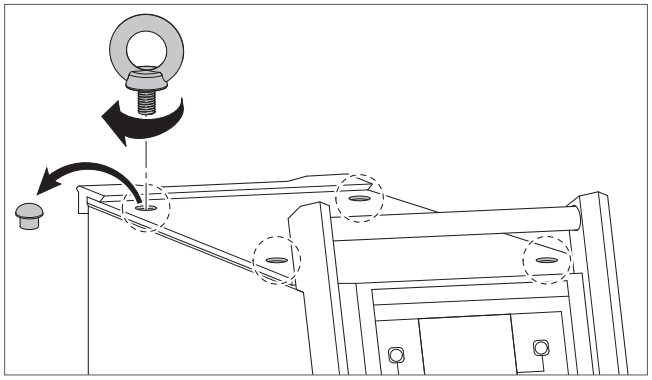
If only the welding machine is present, this must be handled using the convenient handle on the upper part of the welding machine itself.



ATTENTION: risk of overturning when unloading the machine from the pallet equipped with descent ramps.

ATTENTION: when carrying out unpacking operations, it may be necessary to have two persons equipped with suitable personal protective equipment.

IMPORTANT: in addition to handling the machine using the special trolley, it can be lifted from the ground after having wrapped it with lifting straps, by slinging it from the bottom in a stable and safe way.
If provided, the machine must be lifted only and exclusively by using M10 eye-bolts which are not supplied.
Remove the protective caps from the threaded holes and tighten up the lifting eye-bolts.



Do not lift the machine by the FEEDER or generator handles.
The welder has a sturdy handle integrated in the frame for handling.
N.B. These lifting and handling devices comply with the provisions prescribed by European standards. Do not use other devices such as lifting and handling equipment.

ATTENTION: do not lift and / or move the system with the gas cylinder connected.

4.6. STORAGE

In the case of inactivity, the machine must be stored in compliance with the following precautions:

- Store the machine in an enclosed area accessible only to employees; the storage area must have a stable support surface with an adequate load coefficient and must be free of fire and/or explosion risk; it must have adequate humidity and temperature and sufficient lighting.
- Protect the machine from any impact and stresses;
- Protect the machine from humidity and high temperatures;
- Ensure the machine does not come into contact with corrosive substances;
- In the event of prolonged storage, periodically check that there are no variations in the condition of the packages.

4.7. PREPARATIONS

Installation preparations
For the installation, it is necessary to prepare a manoeuvring area suited to the machine dimensions and selected lifting means. The machine must be positioned so that it is ideally ergonomic and provides maximum safety in the work place: leave an area around it large enough to allow easy operations and handling of the material to be processed and for maintenance and adjustment operations to be carried out.
Before installing the machine, check that the selected area is suitable and has the necessary authorisations to carry out the activity, sufficiently ventilated and illuminated, with a stable and levelled support surface.
For installations on a raised floor, check that the slab can withstand the load.

Electrical system preparation
Connection to the electrical system which powers and combines the synchronisation with other machines should be done by specialised and qualified staff following the wiring diagram and arrangements set out in Laws and/or Technical Standards currently in force for safety in workplaces and electrical installations.
Appropriate safety devices must be provided for its operation in line with those required in the area of safety in the workplace.

IMPORTANT: The manufacturer cannot held liable for any damage to property, persons and/or animals caused by non-compliance with this provision.
To achieve an adequate level of safety, the electrical system to which the machine is connected must provide, at the user's full charge, an earthing system according to the provisions of the user's country, a circuit breaker to protect the power supply socket with value ΔI (current variation) not less than 30mA and anything else for a correct execution in a workmanlike manner, according to Laws and/or Technical standards in matters of safety in the workplace and electrical systems. Prepare connections for earthing the machine casing.

ATTENTION: These preparations are always the sole liability of the user and nothing can be attributed to the manufacturer for damage to property, persons and/or animals due to poor electrical connections.

4.8. ASSEMBLY/POSITIONING

WARNING: the assembly of any detached units and the installation of the machine must be carried out exclusively by technicians authorised by the manufacturer.

To allow for correct operations, the machine must always be positioned in places that comply with the environmental conditions described in this manual.
The machine must always be positioned in a perfectly levelled area; levelling can also be carried out using any adjustment systems present on the machine.

ATTENTION: The machine must be positioned so as not to obstruct the entry and exit of the air from the cooling slots. REDUCED FLOW OF AIR causes overheating and possible damage to internal parts. Keep at least 500 mm of free space around the device.
IMPORTANT: Do not place any filtering device on the air intake passages of this welding machine. The warranty is void if any type of filtering device is used.

4.9. CONNECTIONS

Electrical connections
The machine's internal connections are carried out by qualified personnel sent by the manufacturer. The electrical connection between the machine panel and the customer's power distribution supply line must be carried out by qualified personnel from the Customer.
IMPORTANT: The personnel qualified to carry out the electrical connection must make sure of the perfect efficiency of the earthing of the electrical system and must check that the line voltage and the frequency correspond to the data shown on the identification plate. Incorrect supply voltages can cause serious damage to the system.

If the system is set to operate at single-phase 230 V at 50-60 Hz, wire the end of the power cable to an EEC plug with the same capacity as the socket on the line switch as per the following diagram:

SINGLE-PHASE connections

Wire colour	Connection
Brown	"S" phase
Blue	Neutral
Yellow/Green	Earth

If the system is set to operate at three-phase 400 V at 50-60 Hz, wire the end of the power cable to an EEC plug with the same capacity as the socket on the line switch as per the following diagram:

THREE-PHASE connections

Wire colour	Connection
Black	"R" phase
Brown	"S" phase
Grey	Fase "T"
Yellow/Green	Earth

ATTENTION: Make sure the system line switch is in the "0" position before connecting the power cable.

ATTENTION: It is mandatory to install a circuit breaker with interlocked CEE socket, of adequate capacity and verifying that the earth socket is efficient and separate from the rest of the electrical system of the working environment.

ATTENTION: the yellow-green wire of the welding machine power cable must always be connected to the protection conductor (system earth). The yellow-green wire should NEVER be combined with another phase wire for a voltage withdrawal. Do not touch live parts.

Gas hose connection

ATTENTION: Cylinders can explode if damaged!!!

- Keep the cylinders upright and chained to the appropriate support.
- Keep the cylinders in a place where they cannot be damaged accidentally.
- Do not lift the machine with the cylinder attached.
- Never touch the cylinder with the welding wire.
- Keep the cylinder away from the welding area or from non-insulated electrical circuits.

The inert gas cylinder must be equipped with a pressure reducer and possibly also a flow meter. Only after having correctly positioned the cylinder, connect the gas hose, exiting from the rear of the machine, to the pressure reducer. Next you can open the cylinder and adjust the pressure reducer.

4.10. PRELIMINARY CHECKS

It is necessary to carry out the following operations before each machine start-up:

- Check all the safety systems;
- Check protection and signs.

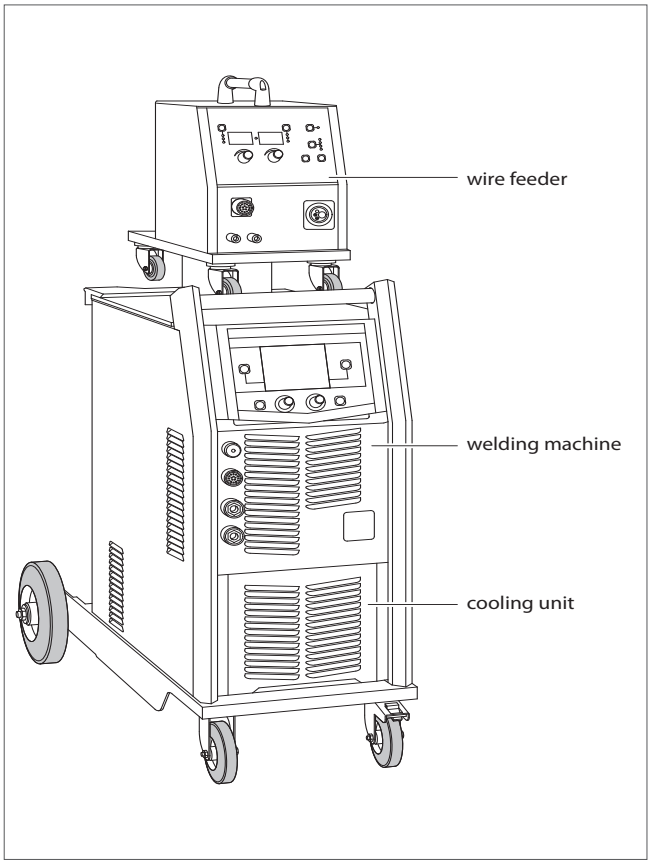
Before putting the machine into operation, a number of checks and controls must be carried out in order to prevent errors or accidents during the Start-up phase:

- Check that the machine has not been damaged during assembly;
- Verify, with particular care, the integrity of the electrical panels, control panels, electrical wiring and tubing;
- Check the exact connection of all external power sources;
- Check the free movement and free rotation of all moving parts;
- Check that hydraulic and pneumatic connections are tight so that they do not cause dangerous leakage.

5. OVERVIEW

5.1. OPERATING PRINCIPLE

EVOLUTION series welding systems have been designed for continuous wire welding under protection of gas, in short and spray arc, with the use of solid and animated steel, stainless steel and aluminium wires.
The **EVOLUTION**.series welding system composition is shown below.



5.2. FEATURES AND MAIN COMPONENTS

MIG/MAG features description

- The new INVERTER is fitted with new generation components enabling the achievement of excellent results performances .
- The generous microprocessor has 222 synergy curves to suit a wide range of materials and processes, as well as several types of welding applications included in the settings menu.
- In addition to classic welding processes such as: MIG/MAG Manual – MIG SYN – MIG Pulse – MIG double pulse, there are 4 new high-performance procedures:

EVO SPEED – EVO FORCE – EVO PIPE – EVO COLD
Within the research and development context, 3 new MIX processes have been developed:
EVO PULSE SPEED
EVO PULSE FORCE
EVO PULSE RISE
- It is possible to operate with 99 JOB (working points) 100% customisable.
- It is possible to connect the smart torch POWER MASTER and REMOTE CONTROL UP/DOWN.
- It is possible to work with several PUSH PULL torches thanks to a new application in the synchronisation board.
- The use of V.R.D. mode is available.
- The wire feeder mounts a towing device with quick release rollers in different colours based on the materials used and the diameters.
- A specially designed electronic circuit limits the starting currents when the Generator is switched on.
- A latest generation Analog/Digital interface facilitates the connection to the welding ROBOT installed on automated systems.

TIG - Features description
- EVOLUTION has been designed for valve torch TIG welding.
- The arc starting system is LIFT ARC, with automatic shut-down mode that prevents the inconvenient stretching of the arc itself.
- It is possible to activate the descent and ascent slope and the pulsed welding.

MMA – Features description
- The MMA procedure retrievable from the Generator menu makes welding with Rutile and Basic electrodes of all materials possible.
- It is provided with HOT START, ARC FORCE and anti-bonding wire mode.
- From the machine's main menu it is possible to set up different electrode types to optimise welding performance to the utmost.

5.3. ENVIRONMENTAL CONDITIONS

The machine does not require particular environmental conditions. The machine must be installed indoors in a well-lit, ventilated industrial building with solid and level flooring.

The machine is suitable for operating in environments that:
- have an altitude not exceeding 2000 m a.s.l.;
- temperature between + 5 ° and + 35 ° C;
- relative humidity not higher than 80%.

It is forbidden to use the machine in environments that are:
- dusty;
- in corrosive atmosphere;
- at fire risk;
- in an explosive atmosphere.

ATTENTION: The welding machine has an IP 23 protection grade, therefore its use is precluded in certain environmental situations, such as rain, excessive presence of metallic dust, presence of acids and corrosive atmospheres.

5.4. LIGHTING

The lighting of the area of installation must comply with the laws in force in the country where the machine is installed and must, however, ensure good visibility at all points, not create hazardous reflections and allow clear reading of the control panels as well as identification of emergency buttons.
As the machine does not have its own light, it is necessary for the working environment to be equipped with general lighting to guarantee the machine has a value of 200 and 300 lux at all points of the machine.

5.5. VIBRATIONS

Under operating conditions that comply with the indications for proper use, the vibrations are not such as to cause hazardous situations. If this happens, you must request technical assistance and suspend the use of the equipment until the fault is resolved.

5.6. NOISE

The equivalent continuous A-weighted sound pressure level, emitted by the machine at the workplace in full operating conditions, is less than 70 dB (A). These emissions comply with the limits of the regulations in force and are not such as to generate danger for operators.
Arc welding processes can, however, produce noise levels above this limit. Therefore, users must implement the precautions required by law.

5.7. TECHNICAL SPECIFICATIONS

The following table shows the main technical specifications relating to the machine:

EN 60974-1		EVOLUTION		
		SP3-C	SP4-E	SP5-E
3 Phase Input		400 V - 50/60 Hz	400 V - 50/60 Hz	400 V - 50/60 Hz
Fuse		25 A	32 A	40 A
MAX power		16,5 KW	19.5 KW	26.2 KW
Noise emissions		< 70 dB	< 70 dB	< 70 dB
MAX current		26.5 A (MIG)	31.5 A (MIG)	42 A (MIG)
Performance 100%		300 A	330 A	380 A
Performance 60%		330 A	360 A	450 A
Performance 50%		-	400 A	500 A
Performance 40%		-	-	-
Open circuit voltage		62 V	62 V	62 V
Power factor		0.9	0.99	0.99
Welding current range		10 - 330 A	10 - 400 A	10 - 500 A
Efficiency (%)		82	88	89
Max energy consumption value in the inactive state (W)		20	20	20
Compliant with standards		EN 60974-1 - 5 - 10	EN 60974-1 - 5 - 10	EN 60974-1 - 5 - 10
Application class		S	S	S
Insulation class		F	F	F
Protection class		IP23 S	IP23 S	IP23 S
Cooling system		AF	AF	AF
Operating temperature		- 10 + 40 ° C	- 10 + 40 ° C	- 10 + 40 ° C
Wire diameters	Steel	0.8 - 1.2 mm	0.8 - 1.6 mm	0.8 - 1.6 mm
	STAINLESS steel	0.8 - 1.2 mm	0.8 - 1.6 mm	0.8 - 1.6 mm
	Aluminium	1.0 - 1.6 mm	1.0 - 1.6 mm	1.0 - 1.6 mm
Weldable electrodes diameters		1.0 - 4.0 mm	1.0 - 4.0 mm	1.0 - 4.0 mm
Wire feed speed		0.6 - 25 Mt./min	0.6 - 25 Mt./min	0.6 - 25 Mt./min
Wire spool capacity		16 Kg	16 Kg	16 Kg
Dimensions, mm (L x l x H)		1100 x 590 x 1000	1100 x 590 x 1000	1100 x 590 x 1000
Weight, kg		110	115	120

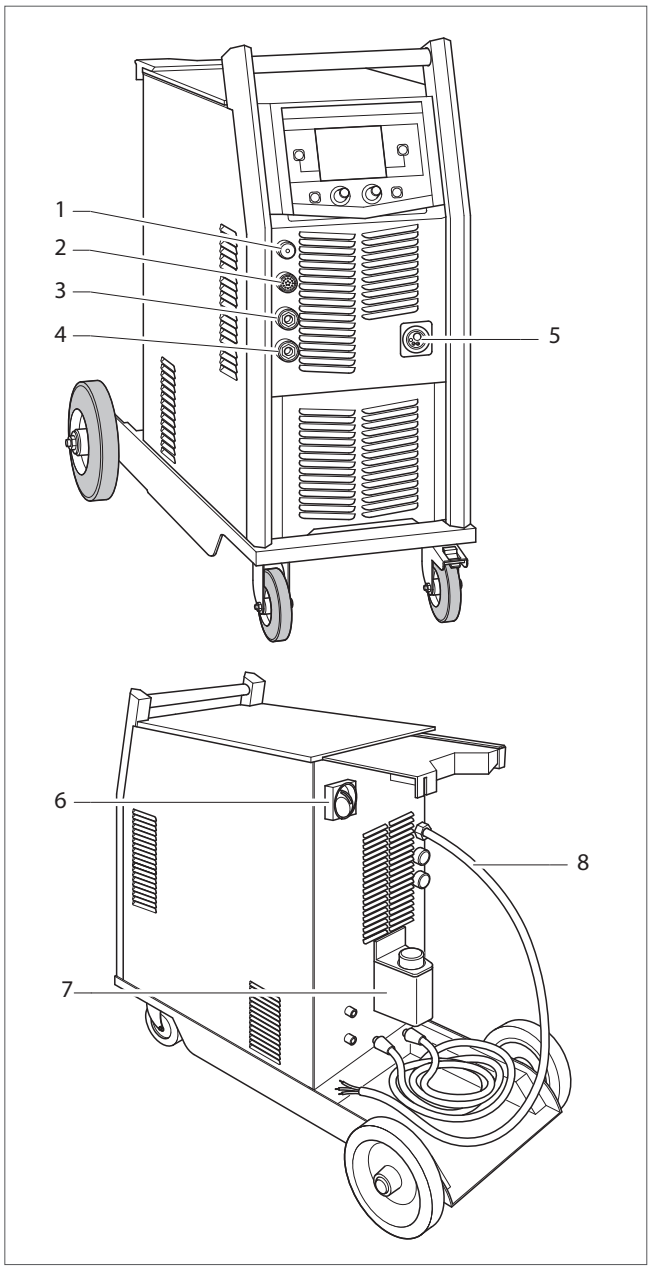
EN 60974-5		FEEDER EVO-4R
Wire diameter	mm	0.8 – 1.6
Usable wire reels	kg	15
Number of rollers	N°	4
Motor power supply voltage	Vcc	24
Motor max power	W	100
Gear motor speed	rpm	270
Dimensions: length x width x height	mm	650 x 320 x 400
Weight	kg	19

EN 60974-2		G.R. EVO
3 Phase Input	V	400
Max current	A	0.93
Cooling power (1L/min)	kW	0.725
MAX pressure	MPa	0.32
Tank capacity	L	11
Dimensions: length x width x height	mm	650 x 280 x 250
Weight with coolant	kg	25

6. MACHINE USE

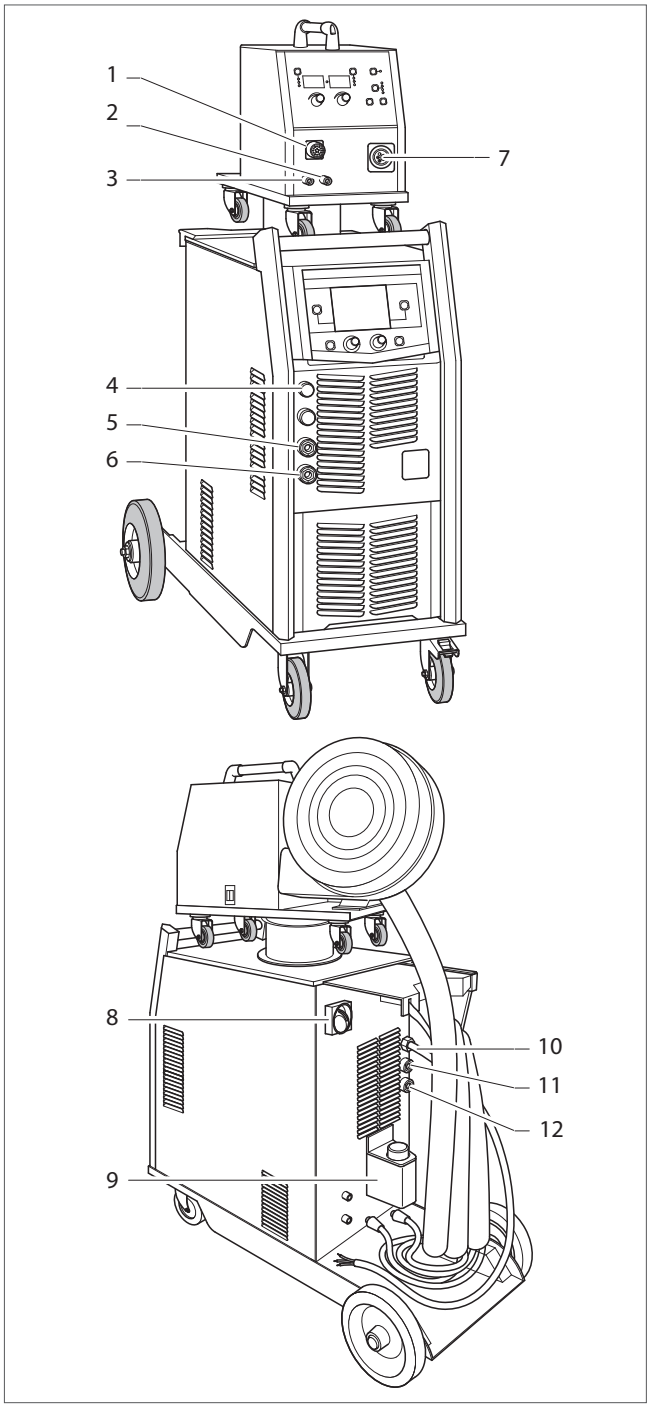
6.1. MACHINE LAYOUT DESCRIPTION

6.1.1. Front and rear layout EVOLUTION version C



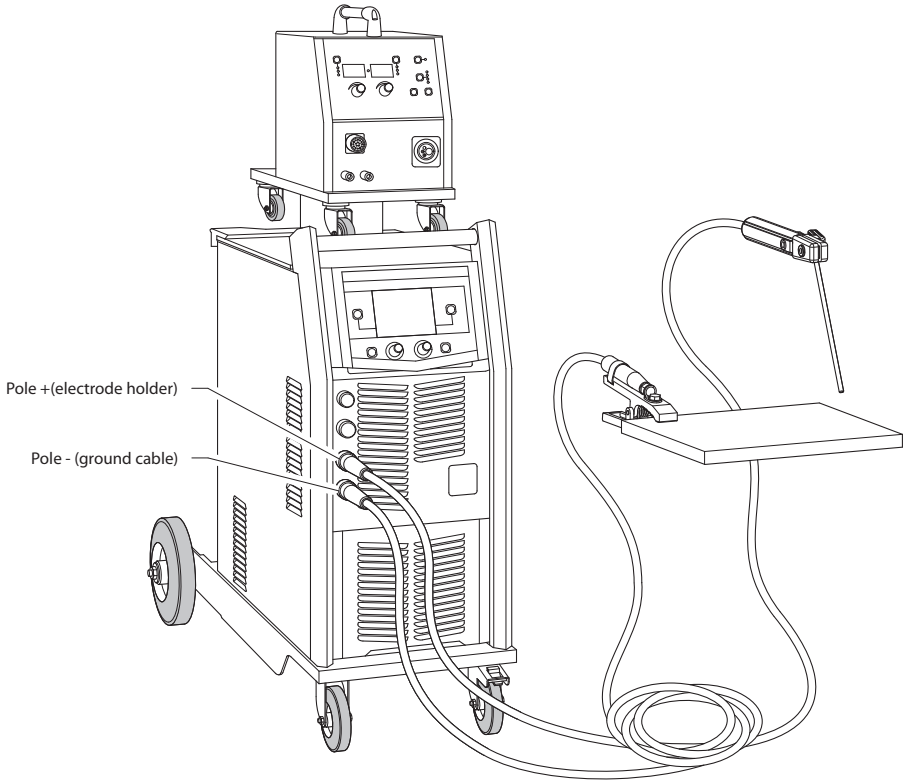
1. USB port
2. Remote control.
3. Pole +.
4. Pole -.
5. MIG/MAG Euro torch connection
6. Power switch ON/OFF
7. Sincofluid tank
8. Power cable

6.1.2. Front and rear layout EVOLUTION version E

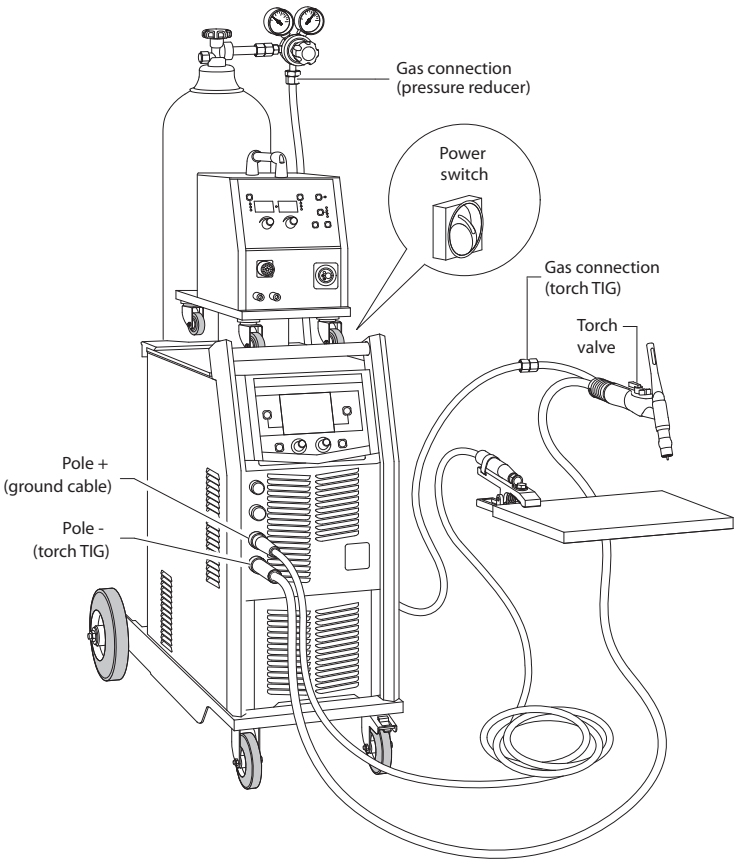


1. Remote control
2. Water inlet (red)
3. Water outlet (blue)
4. USB port
5. Pole +
6. Pole -
7. MIG/MAG Euro torch connection
8. Power switch ON/OFF
9. Sincofluid tank
10. Power cable
11. Signals connector (extension)
12. Pole +

6.2. INSTALLATION & OPERATION FOR MMA WELDING



6.3. TIG WELDING WITH "LIFT"



In the TIG process welding is achieved by melting the two metal pieces to be joined, with the possible addition of material from the outside, using an arc ignited by a tungsten electrode. The "Lift" type ignition used in EVOLUTION equipments makes it possible to reduce tungsten inclusions on ignition to a minimum.
The molten bath and the electrode are protected by and inert gas (for example, Argon). This type of welding is used to weld thin sheet metal or when elevated quality is required.

1) Connecting the welding cables:
   - Connect one end of the gas hose to the gas connecter on the TIG torch and the other end to the pressure reducer on the inert gas cylinder (Argon or similar).
   - With the machine switched off:
     - Connect the ground cable to the snap-on connector marked + (positive).
     - Connect the relative ground clamp to the workpiece or to the workpiece support in an area free of rust, paint, grease, etc..
     - Connect the TIG torch power cable to the snap-on connector marked - (negative).
2) Switch the welding machine on by moving the power supply switch to I.
3) Make the adjustments and do the parameter settings on the control panel.
4) Open the gas cylinder and regulate the flow by adjusting the valve on the TIG torch by hand.
5) Ignite the electric arc by contact, using a decisive, quick movement without dragging the tungsten electrode on the piece to be welded ("Lift" type ignition).
6) The welder has a SWS "Smart Welding Stop" system for the end of TIG welding. Lifting up the torch without switching off the arc will introduce a slope down and it will switch off automatically.
7) When you have finished welding remember to shut the valve on the gas cylinder.

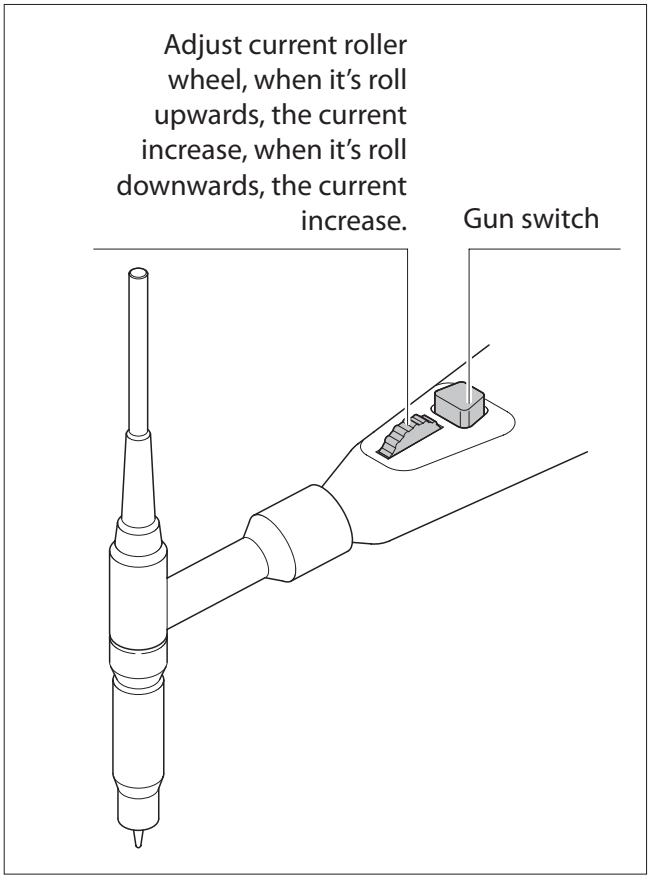
Table shows the currents to use with the respective electrodes for TIG DC welding. This input is not absolute but is for your guidance only; read the electrode manufacturers' instructions for a specific choice. The diameter of the electrode to use is directly proportional to the current being used for welding.

Ø ELECTRODE (mm)	**ELECTRODE TYPE Current adjustment field (A)**	
	TIG DC	
	Tungsten Ce 1% Grey	**Tungsten Rare ground 2% Turchoise**
1	10-50	**10-50**
1,6	50-80	**50-80**
2,4	80-150	**80-150**
3,2	150-250	**150-250**
4	200-400	**200-400**

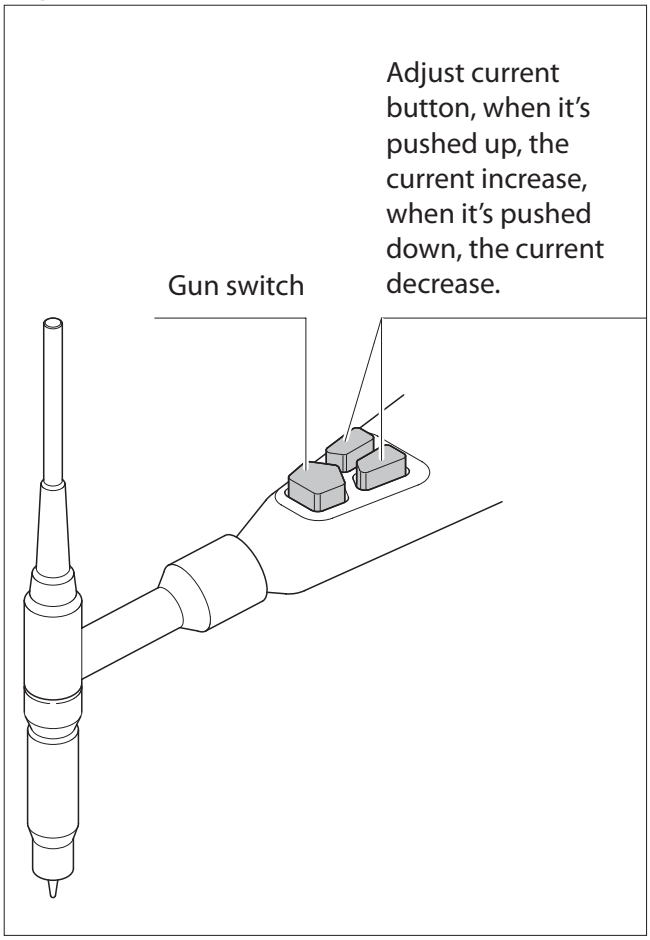
6.3.1. Remote current control

The welding machine can accept remote current control from a potentiometer/ analogue signal or a digital up/down button signal. Potentiometer remote control will change the current from the 5A minimum to the maximum set using the machine current control. Using an up/ down button remote signal, the current may be increased or decreased in 1A increments, or 'scrolls' up to 30A at a time if the button is held down. This is very useful for precision work.

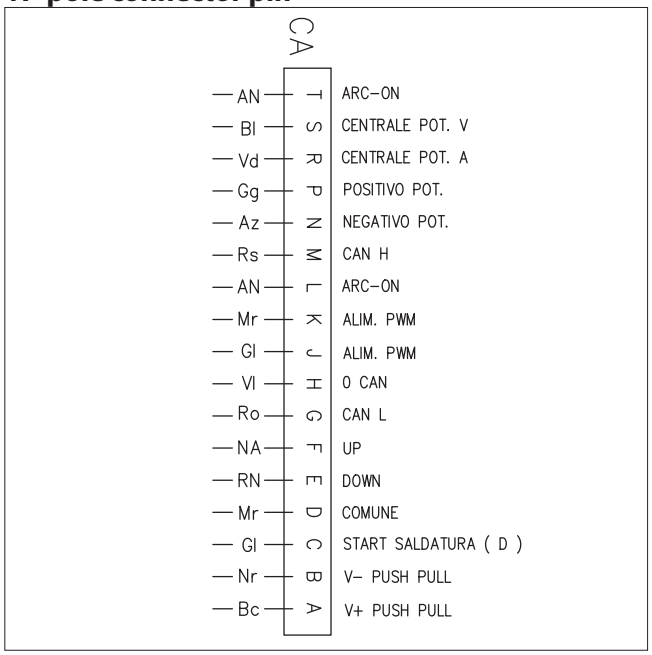
POTENTIOMETER



UP/DOWN



17-pole connector pin



Simple automation

This paragraph describes how to interface the welding machine with an automatic welding equipment. The connection signs are marked and available on the "17-pole connector for accessory / optional extra connections" (Connector CA - see the "Wiring diagram" and "Wiring Diagram Legend" paragraphs).

DIGITAL INPUTS

Activating a digital input signal means applying a clean closed contact to it.

- TORCH BUTTON • Terminals **C / D (COM)**
  When this signal is activated, the welding machine starts the welding process.
- UP SIGNAL • Terminals **D (COM) / F**
  When this signal is activated, the welding machine increases the value set beforehand for the welding synergy parameters.
- DOWN SIGNAL • Terminals **D (COM) / E**
  When this signal is activated, the welding machine decreases the value set beforehand for the welding synergy parameters.

ANALOGUE INPUTS

These inputs must be piloted by a direct voltage that can be regulated between 0V and 10V.
Their input impedance exceeds 400 kΩ (to enable functionality of these inputs the voltage between terminals **P(-)** and **R (+)** must exceed 0,5V).

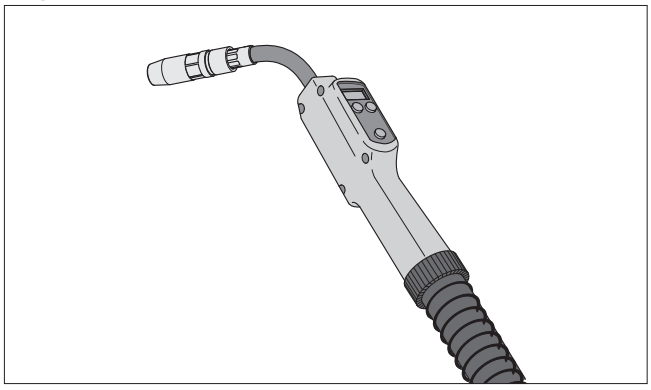
- PARAMETER REGULATION - A • Terminals **P(-) / R (+)**
  By regulating the voltage on this input between 1V and 10V the welding synergy parameters (WELDING WORKPIECE THICKNESS, WELDING CURRENT, WIRE SPEED) are regulated from the minimum to the maximum value.
- PARAMETER REGULATION - V • Terminals **P(-) / S (+)**
  By regulating the voltage on this input between 1V and 10V the welding parameters (ARC LENGTH, WELDING VOLTAGE, ELECTRONIC INDUCTANCE) are regulated from the minimum to the maximum value.

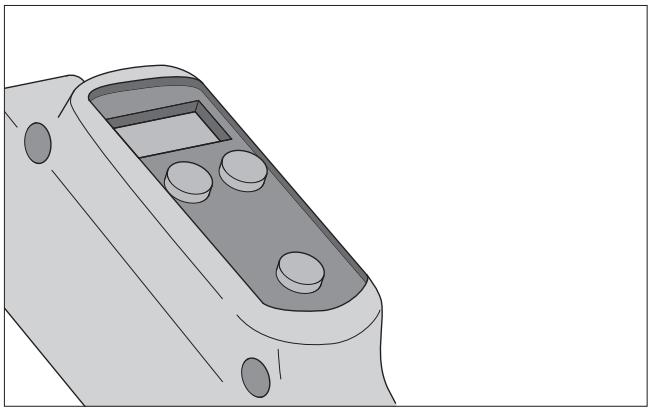
DIGITAL OUTPUTS

Activating digital output signals means closing a clean contact.

- ARC ON • Terminals **T / L**
  The welding machine activates this signal when it detects current passing through the welding circuit.

UP/DOWN BUTTONS POWER MASTER TORCH



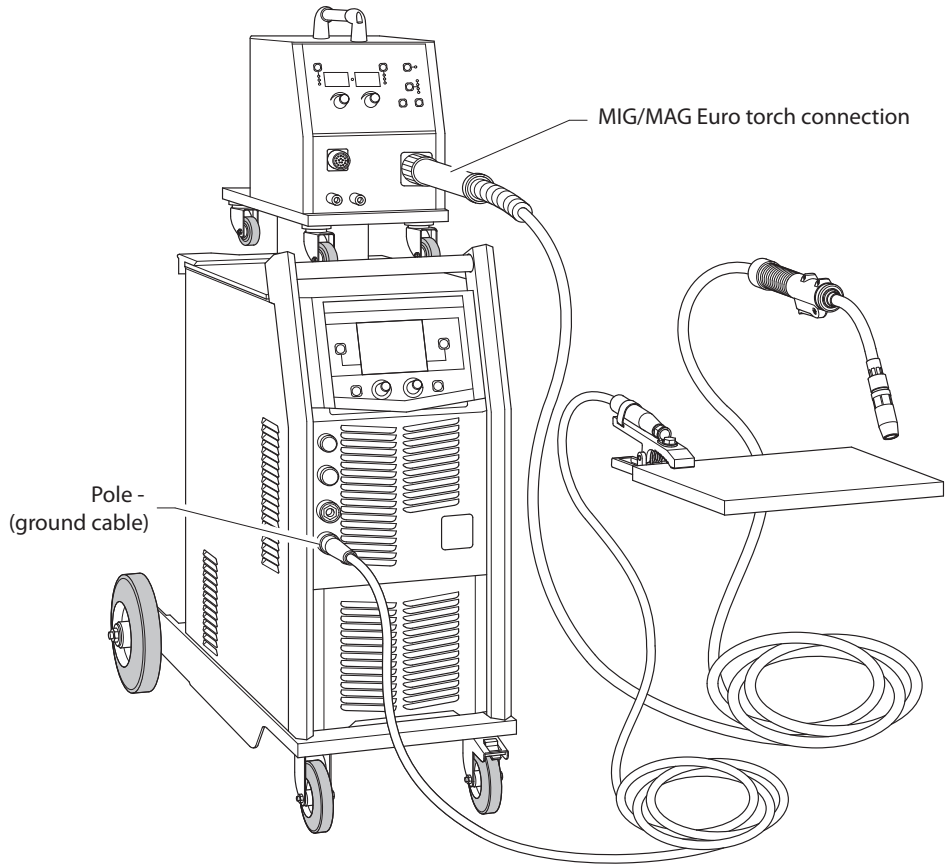


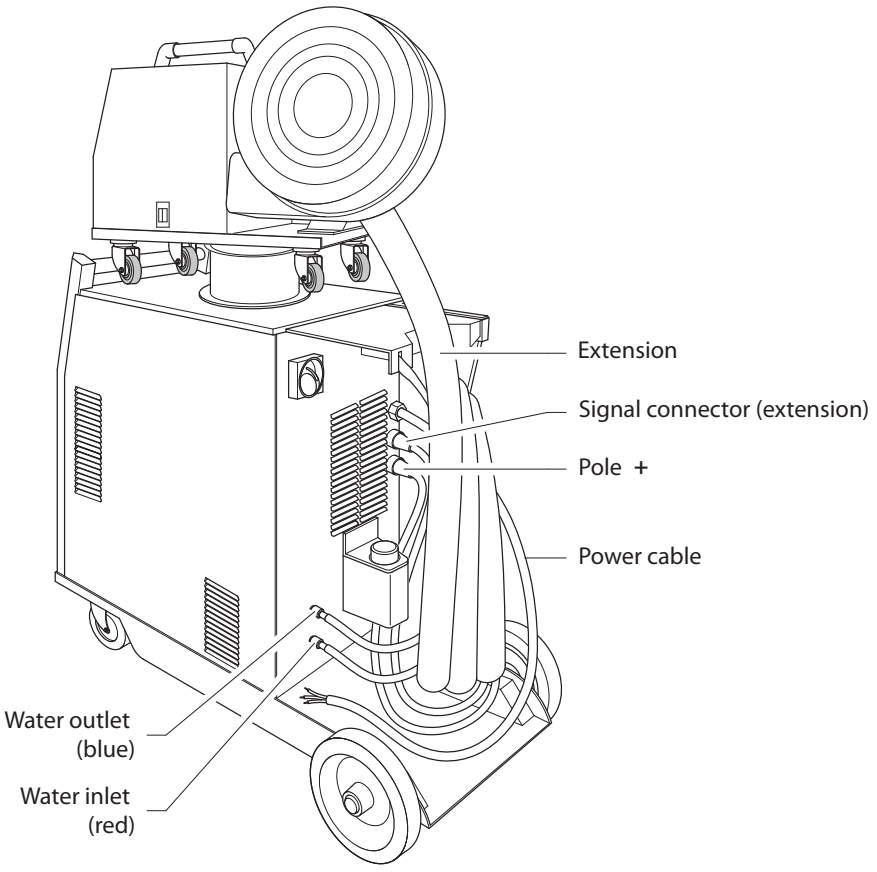
The new Power Master keep all information within easy reach. The innovative microcontroller with display integrated into the grip allows the main welding parameters to be displayed and adjusted:

- Current
- Thickness of material
- Wire speed
- Arc length
- Electronic inductance
- Memorised programme number

Press the up/down buttons, depending on the selected operating method, to move from one programme to another or increase and decreases the parameters on the synergic curves in use.

6.4. INSTALLATION & OPERATION FOR MIG/MAG WELDING





6.5. OPERATOR SOFTWARE

6.5.1. Introduction

This manual describes the functions of the software operating the following control panels:

- **EVOLUTION SP3-C**
- **EVOLUTION SP4-E + FEEDER EVO-4R**
- **EVOLUTION SP5-E + FEEDER EVO-4R**

Functioning of the panels listed above is identical (the functions are the same but the characteristics differ depending on the type of machine they are fitted on (e.g.: current regulation field).

6.5.2. General notes

- Any adjustments/changes made on the welder control panel are also displayed automatically on the drag-and-drop control panel and vice versa, the images on the displays of both weld system components could however differ one from the other, as the displays are consistent with adjustments/changes but also independent as far as visualization is concerned.
- The adjustments / changes made are immediately available to the operator, unless indicated otherwise in the manual.

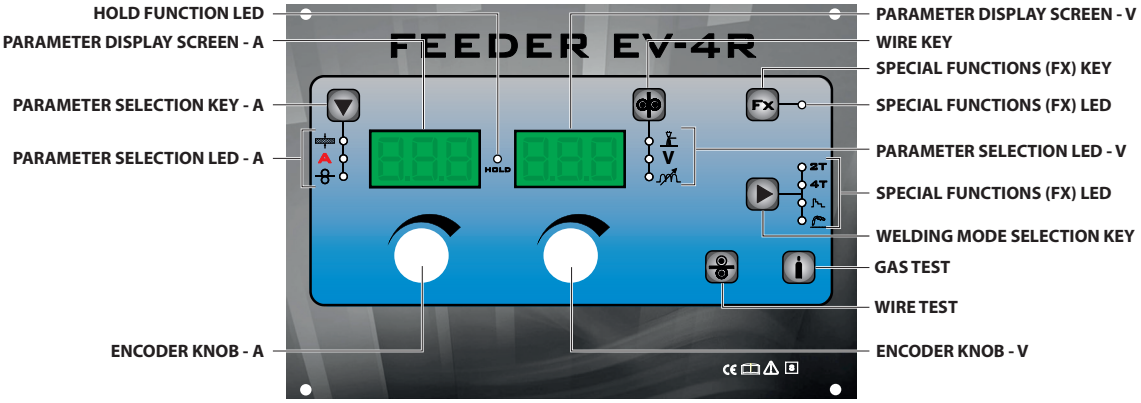
6.5.3. Welding machine control panel

The panel on the generator has four keys, two encoders, and a colour display. The figure below shows the panel. The figure below shows the image of the panel.

"EVOLUTION" control panel

6.5.4. Wire feeder control panel (not used with EVOLUTION SP3-C)

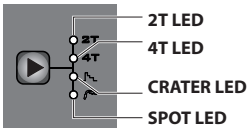
The FEEDER EVO-4R wire feeder panel has 2 keys, 2 encoders and 7 LEDs in the upper section and 4 keys and 5 LEDs in the lower section. The figure below shows the panel. The figure below shows the image of the panel.



"FEEDER EVO-4R" control panel

6.5.4.1. WELDING MODE SELECTION Key (not used with EVOLUTION SP3-C)

Each time this is pushed the following welding modes can be selected (only for pulsed and double pulsed MIG, synergic and manual welding processes) on the feeder (on the welding machine the welding mode is selected using a specific menu - see the appropriate paragraphs) according to a specific sequence:



Welding mode selection led

TWO STROKE (2T)	**LED 2T** switched on
Pressing the TORCH TRIGGER starts the welding cycle, which will stop when it is released.	
FOUR STROKE (4T)	**LED 4T** switched on
1. Pressing and releasing the TORCH TRIGGER will start the welding cycle. 2. Pressing and releasing the TORCH TRIGGER will stop the welding cycle.	
CRATER 2T	**LED 2T** switched on - **LEDCRATER** switched on
1. When the TORCH TRIGGER is pushed the arc ignites and the parameters assume the values for the "initial crater" for a time set by means of the INITIAL CRATER DURATION (F10) function. After that the parameter values become those for "welding" for a time defined by the INITIAL SLOPE (F11) function. 2. When the TORCH TRIGGER is released the parameters take on the "final crater" values for a time set by means of the FINAL CRATER TIME (F15) function, for a period of time set using the FINAL SLOPE (F12) function.	

CRATER 4T	**LED 4T** switched on - **LEDCRATER** switched on

1. 1When the TORCH TRIGGER is pushed the arc ignites and the parameters assume the values for the "initial crater".
2. When the TORCH TRIGGER is released the parameters take on the "welding" values for a time set using the INITIAL SLOPE (F11) function.
3. When the TORCH TRIGGER is pushed again the parameters take on the "final crater" values for a time defined using the FINAL SLOPE (F12) function.
4. Releasing the TORCH TRIGGER will end the welding cycle.

SPOT WELDING	**LED 2T** switched on - **LED SPOT** switched on

This is used so that on pressing the TORCH TRIGGER spot welding is done for a time period set beforehand (in seconds), after which the arc switches off automatically.

STITCH WELDING	**LED 2T** switched on - **LED SPOT** flashing

To begin stitch welding:

1. Press the TORCH TRIGGER to start the welding current and wire feed. At this point the welding machine automatically carries out a succession of welded portions followed by a pause, according to the times entered previously. This procedure stops automatically only when the TORCH TRIGGER is released.
2. When the TORCH TRIGGER is pushed again the torch begins a new interval welding cycle.

CYCLE	**LED 4T** switched on - **LEDCRATER** flashing

• STANDARD

1. When the TORCH TRIGGER is pushed the arc ignites and the parameters assume the values for the "initial crater".
2. When the TORCH TRIGGER is released the parameters take on the "welding" values for a time set using the INITIAL SLOPE (F11) function.
3. When the TORCH TRIGGER is pushed and released within 1 second, the parameters activated are those set for the "cycle" functions. The operation can be repeated by switching between the "cycle" level and the "welding" level an infinite number of times.
4. When the TORCH TRIGGER is pushed and held down for a period of time of **more than 1** second, the parameters activated are those with the values for the "final crater" for a period of time defined using the FINAL SLOPE (F12) function. Releasing the TORCH TRIGGER will end the welding cycle.

• ADVANCED

In ADVANCED operating mode, in addition to the settings described above, the welder is able to set the up "slope" (FIRST SLOPE (F18)) and down "slope" (SECOND SLOPE (F21)) for the "cycle" level.

6.5.5. Switching on the welding machine

When the unit is switched on the welding machine's **EVOLUTION SCREEN**, shows the logo as shown below:

EVOLUTION Screen

During this operation, on the DH / VS panel:

- All the keys and all the encoders are disabled.

6.5.6. Language selection

"EVOLUTION" control panel

On the **EVOLUTION SCREEN** the DEFAULT language set by is ENGLISH.
To select another language, proceed as follows:

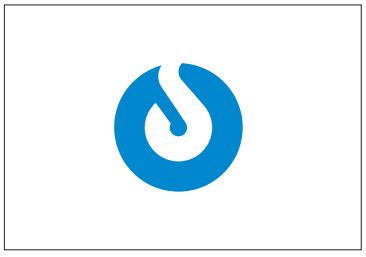
- Open the SETUP Menu by holding the **SX KEY** down for at least 5 consecutive seconds.
- Select the CONFIG Menu by rotating the **ENCODER KNOB - SX** until the correct icon is reached.
- Push the **ENTER/MEM KEY** to open the CONFIG Menu.
- Select the LANGUAGE Sub-menu by rotating the **ENCODER KNOB - SX.**
- Select the language required by rotating the **ENCODER KNOB - DX.**
- Push the **MENU KEY** to close the CONFIG Menu.
- Push the **MENU KEY** to close the SETUP Menu.

Once this has closed, the **EVOLUTION SCREEN** will show the various text / screens in the language selected.

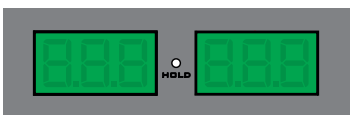
6.5.7. Screen saver

After a pause or period of inactivity of the welding machine:

- The **EVOLUTION SCREEN** shows the SCREEN SAVER.
- On both the FEEDER EVO-4R displays for the wire feeder, "CEA" appears and scrolls continuously..



EVOLUTION Screen



Display FEEDER EVO-4R
(not used with EVOLUTION SP3-C)

The SCREEN SAVER mode can be exited in one of the following ways:

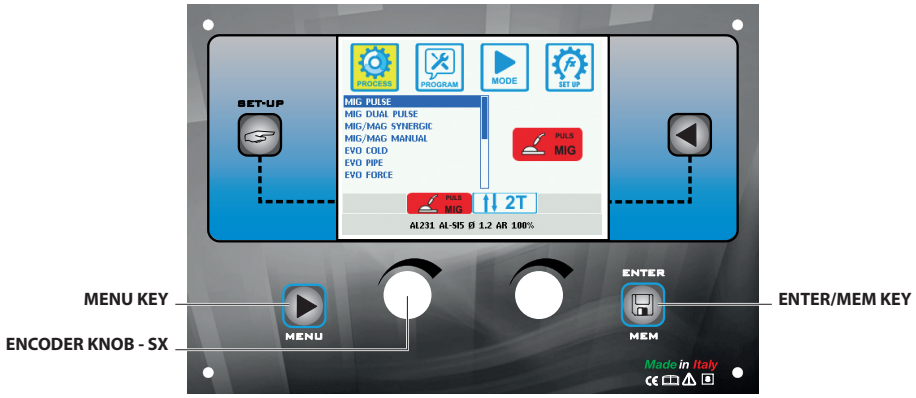
- By pushing any key or moving any knob on the welding machine's panel or that of the wire feeder.
- Starting the welding process, in which case the welding is activated in context.
- Moving a remote control.

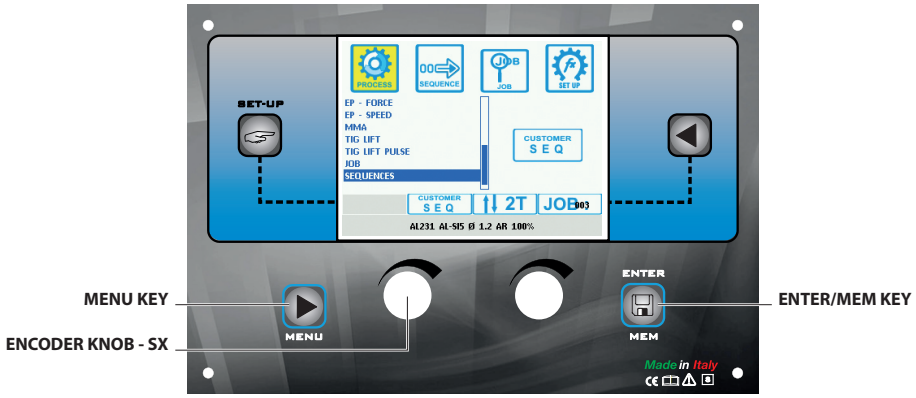
When the SCREEN SAVER is exited, the welding machine goes back to the working condition prior to activation of the screen saver.

6.5.8. WELDING PROCESS SELECTION Menu (PROCESS)

"EVOLUTION" CONTROL PANEL

To access the PROCESS SELECTION Menu (PROCESS) push the **MENU KEY**.





MENU KEY	Provides access to the next menus.
ENCODER KNOB - SX	Select the welding process.
ENTER/MEM KEY	This key is used to access *PRE-SETTING* for the process selected.

The following processes are available:

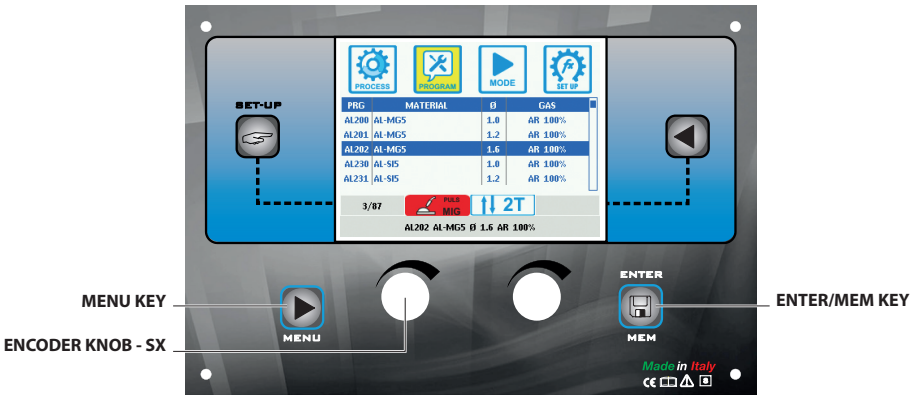
- MIG PULSE (only DH)
- MIG DUAL PULSE (only DH)
- MIG-MAG SYNERGIC
- MIG-MAG MANUAL
- EVO.COLD
- EVO.PIPE
- EVO.POWER
- EVO.ULTRASPEED
- EP-RISE
- EP-FORCE
- EP-SPEED
- MMA
- TIG LIFT
- TIG LIFT PULSE
- JOB (if JOBS have been created)
- SEQUENCES (if SEQUENCES have been created)

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)
is not possible to access the PROCESS SELECTION Menu (PROCESS) via the FEEDER EVO-4R control panel.

6.5.9. MIG-MAG, MIG pulse/dual pulse

6.5.9.1. PROGRAM SELECTION Menu (PROGRAM)

"EVOLUTION" CONTROL PANEL
To access the PROGRAM SELECTION Menu (PROGRAM) push the **MENU KEY.**

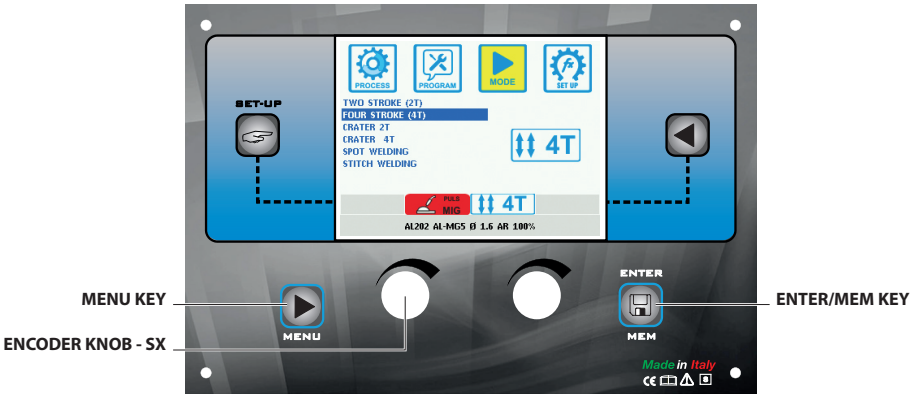


MENU KEY	Used to access subsequent menus if there are any.
ENCODER KNOB - SX	Selection of the material to be used.
ENTER/MEM KEY	Used to access *PRE-SETTING* of the program selected.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)
It is not possible to access the *PROGRAM SELECTION Menu (PROGRAM)* via the FEEDER EVO-4R control panel.

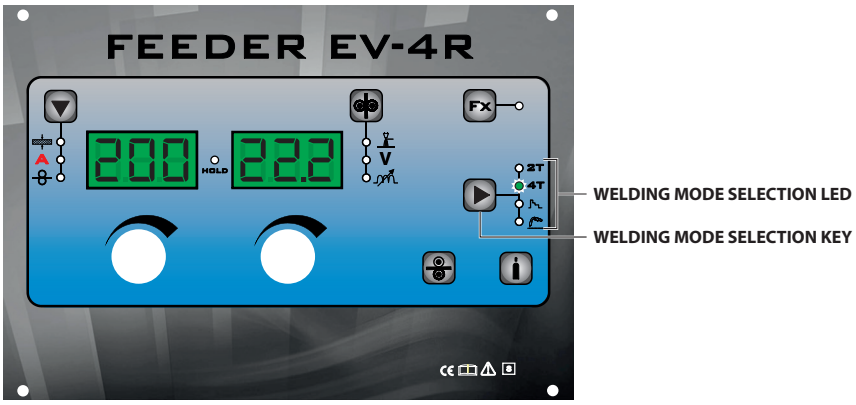
6.5.9.2. WELDING MODE SELECTION Menu (MODE)

"EVOLUTION" CONTROL PANEL
To access the *WELDING MODE SELECTION Menu (MODE)* push the **MENU KEY**.



MENU KEY	Used to access subsequent menus if there are any.
ENCODER KNOB - SX	Select the welding mode.
ENTER/MEM KEY	Used to access the PRE-SETTING for the program selected beforehand, in the MODE chosen.

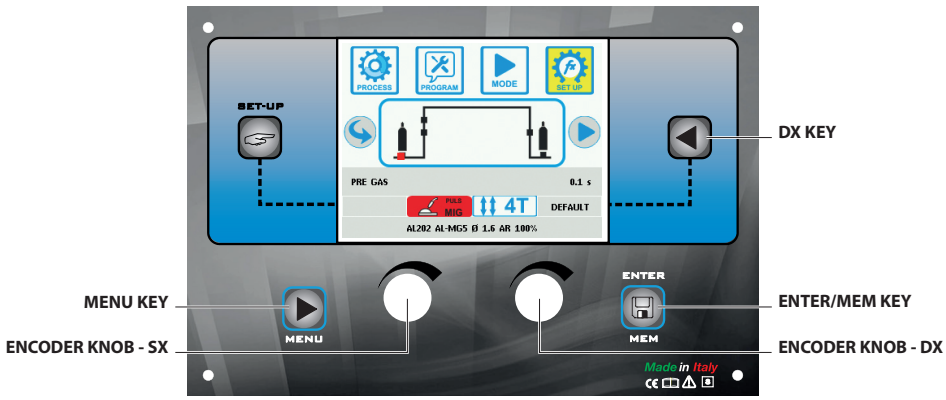
"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)
To access the *WELDING MODE SELECTION Menu (MODE)* push the **WELDING MODE SELECTION KEY.**



WELDING MODE SELECTION KEY	Scrolls the various welding modes available in succession.
WELDING MODE SELECTION LED	Displays the welding mode selected.

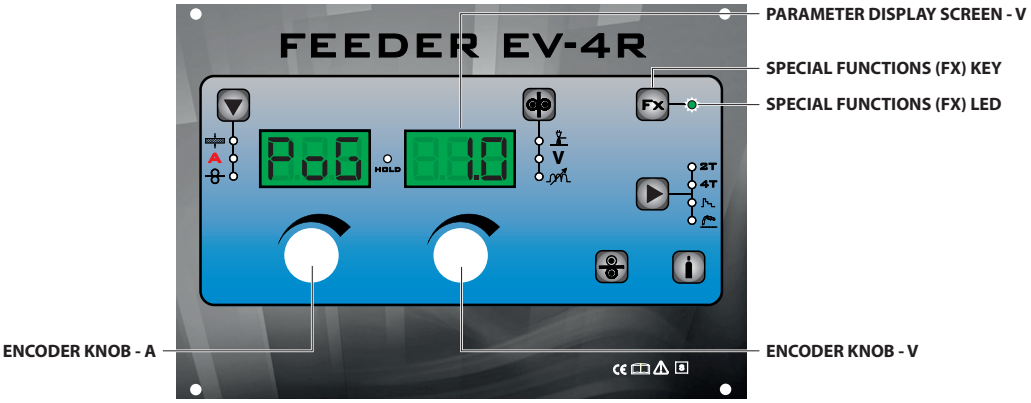
6.5.9.3. SPECIAL FUNCTIONS Menu (SET UP Fx)

"EVOLUTION" CONTROL PANEL
To access the *SPECIAL FUNCTIONS Menu (SET UP Fx)* push the MENU KEY.



MENU KEY	Used to access subsequent menus if there are any.
ENCODER KNOB - SX	Used to select the various *SPECIAL FUNCTIONS (Fx).*
ENTER/MEM KEY	Used to access the PRE-SETTING for the program selected beforehand, in the MODE chosen and with the changes made to the SPECIAL FUNCTIONS (Fx).
DX KEY	If held down for 2 seconds it makes it possible to return the value for the SPECIAL FUNCTION (Fx) selected to the DEFAULT value.
ENCODER KNOB - DX	Used to change the selected SPECIAL FUNCTION (Fx) value.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)
To access the *SPECIAL FUNCTIONS Menu (SET UP Fx)* push the **SPECIAL FUNCTIONS (FX) KEY.**



PARAMETER DISPLAY SCREEN - A	Displays the selected *SPECIAL FUNCTION (Fx).*
ENCODER KNOB - A	Used to select the various *SPECIAL FUNCTIONS (Fx).*
PARAMETER DISPLAY SCREEN - V	Displays the value for the selected *SPECIAL FUNCTION (Fx).*
ENCODER KNOB - V	Used to change the selected *SPECIAL FUNCTION (Fx)* value.
SPECIAL FUNCTIONS (FX) KEY	Only enables entering and exit afterwards from the *SPECIAL FUNCTIONS Menu (SET UP Fx)* on the FEEDER EVO-4R panel and not on the DH/VS panel.
SPECIAL FUNCTIONS (FX) LED	The operator must press the **SPECIAL FUNCTIONS (SET UP FX) KEY** for it to light up and be included in the *SPECIAL FUNCTIONS Menu (SET UP Fx).*

The *SPECIAL FUNCTIONS (Fx) related to the MIG-MAG synergic, MIG pulsed, MIG double pulsed, EVO.PIPE, EVO. COLD, EVO.POWER, and EVO.ULTRASPEED processes*, correspond to the feeder (when fitted) as follows:

Fx Adjustable special functions											
Special function	**PARAMETER DISPLAY Screen - A**	**PARAMETER DISPLAY Screen - V**		**Welding mode**							
		Default	**Range**	**TWO STROKE (2T)**	**FOUR STROKE (4T)**	**CRATER 2T**	**CRATER 4T**	**SPOT WELDING**	**STITCH WELDING**	**CYCLE STANDARD**	**CYCLE ADVANCED**
PRE GAS	PrG	0.1s	(0.0 - 2.0)s	•	•	•	•	•	•	•	•
STARTING SPEED	StS	0	-30 - +30	•	•	•	•	•	•	•	•
HOT START	Hot	0	-30 - +30	•	•	•	•	•	•	•	•
STITCH TIME	F05	1.0s	(0.1 - 20.0)s						•		
STITCH PAUSE	F06	1.0s	(0.1 - 20.0)s						•		
SPOT TIME	F07	3.0s	(0.1 - 20.0)s					•			
INITIAL CURRENT	F08	20%	-50% - +100%			•	•			•	•

F_x Adjustable special functions											
Special function	**PARAMETER DISPLAY Screen - A**	**PARAMETER DISPLAY Screen - V**		**Welding mode**							
		Default	**Range**	**TWO STROKE (2T)**	**FOUR STROKE (4T)**	**CRATER 2T**	**CRATER 4T**	**SPOT WELDING**	**STITCH WELDING**	**CYCLE STANDARD**	**CYCLE ADVANCED**
INITIAL ARC LENGTH	F09	0	-30 - +30			(*)	(*)			(*)	(*)
INITIAL CRATER TIME	F10	1.0s	(0.0 - 20.0)s			•					
INITIAL SLOPE	F11	1.0s	(0.0 - 20.0)s			•	•			•	•
FINAL SLOPE	F12	1.0s	(0.0 - 20.0)s			•	•			•	•
FINAL CURRENT	F13	-30%	-100% - +50%			•	•			•	•
FINAL ARC LENGTH	F14	0	-30 - +30			(*)	(*)			(*)	(*)
FINAL CRATER TIME	F15	0.0s	(0.0 - 20.0)s			•					
BURN BACK	bub	0	-30 - +30	•	•	•	•	•	•	•	•
POST GAS	PoG	1.0s	(0.0 - 10.0)s	•	•	•	•	•	•	•	•
FIRST SLOPE (**I1** TO **I2**)	F18	0.05s	(0.00 - 2.00)s								•
CYCLE CURRENT	F19	20%	-99% - +100%							•	•
CYCLE ARC LENGTH	F20	0	-30 - +30							•	•
SECOND SLOPE (**I2** TO **I1**)	F21	0.05s	(0.00 - 2.00)s								•
FIRST SLOPE (**I1** TO **I2**)	F22 *	5	(0 - 100)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)
DUAL PULSE DELTA CURRENT	F23 *	50%	-100% - +200%	•	•	•	•	•	•	•	•
DUAL PULSE ARC LENGTH	F24 *	0	-30 - +30	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)
DUAL PULSE BALANCE	F25 *	0%	-40% - +40%	•	•	•	•	•	•	•	•
DUAL PULSE FREQUENCY	F26 *	2.7Hz	(0.1 - 5.0)Hz	•	•	•	•	•	•	•	•
SECOND SLOPE (**I2** TO **I1**)	F27 *	5	(0 - 100)	(°)	(°)	(°)	(°)	(°)	(°)	(°)	(°)
SLOPE JOB	F28	0.5s	(0.1 - 20.0) s	•	•	•	•	•	•	•	•
DYNAMICS	din **	0	-30 - +30	•	•	•	•	•	•	•	•
FIRST SLOPE (**I1** TO **I2**)	F32 ***	5	(0 - 100)	•	•	•	•	•	•	•	•
BALANCING	F25 ***	0	-40 - +40	•	•	•	•	•	•	•	•
FEQUENCY EP-RISE EP-FORCE EP-SPEED	F26 ***	 1.0 Hz 5.0 Hz 8.0 Hz	 (0.1 - 10.0)Hz (0.1 - 20.0)Hz (0.1 - 20.0)Hz	 • • •	 • • •	 • • •	 • • •	 • • •	 • • •	 • • •	 • • •

Fx Adjustable special functions											
Special function	**PARAMETER DISPLAY Screen - A**	**PARAMETER DISPLAY Screen - V**		**Welding mode**							
		Default	**Range**	**TWO STROKE (2T)**	**FOUR STROKE (4T)**	**CRATER 2T**	**CRATER 4T**	**SPOT WELDING**	**STITCH WELDING**	**CYCLE STANDARD**	**CYCLE ADVANCED**
SECOND SLOPE (**I2** TO **I1**)	F33 ***	5	(0 - 100)	•	•	•	•	•	•	•	•

Table A

* Only for the MIG double pulsed process.
** Only for the EVO.ULTRASPEED process.
*** Only for the *EP-RISE, EP-FORCE, EP-SPEED* process.

WARNING:

- The STANDARD or ADVANCED welding CYCLE mode can only be activated by opening the ADVANCED SET-UP Menu - ADVANCED MODE - CYCLE (for further explanations, see the relevant paragraph).
- (*) This SPECIAL FUNCTION is only to be found if the ADVANCED CRATER function has been activated by accessing the ADVANCED
- SETUP Menu - ADVANCED MODE - CRATER - ADVANCED (for further explanations, see the relevant paragraph).
- (°) These SPECIAL FUNCTIONS can only be activated for all the welding machine's welding modes but going to the ADVANCED SETTINGS Menu - ADVANCED MODE - DOUBLE PULSED - ADVANCED (for further explanations, see the relevant paragraph).
- It is possible to access editing of the SPECIAL FUNCTIONS (Fx) during welding.
- Some of the values edited will be used immediately by the operator, while others will be active from when the next welding task begins.
- The HOLD function is not active within the SPECIAL FUNCTIONS Menu (SET UP Fx).

The *SPECIAL FUNCTIONS (Fx)* for the *MIG-MAG* manual process correspond to the feeder (when fitted) as follows:

Fx Adjustable special functions											
Special function	**PARAMETER DISPLAY Screen - A**	**PARAMETER DISPLAY Screen - V**		**Welding mode**							
		Default	**Range**	**TWO STROKE (2T)**	**FOUR STROKE (4T)**	**CRATER 2T**	**CRATER 4T**	**SPOT WELDING**	**STITCH WELDING**	**CYCLE STANDARD**	**CYCLE ADVANCED**
PRE GAS	PrG	0.1s	(0.0 - 2.0)s	•	•	•	•	•	•	•	•
STARTING SPEED	StS	0	-30 - +30	•	•	•	•	•	•	•	•
HOT START	Hot	0	-30 - +30	•	•	•	•	•	•	•	•
STITCH TIME	F05	1.0s	(0.1 - 20.0)s						•		
STITCH PAUSE	F06	1.0s	(0.1 - 20.0)s						•		
SPOT TIME	F07	3.0s	(0.1 - 20.0)s					•			
INITIAL WIRE SPEED	F08	5.0m/min	(0.6-MAX)m/min			•	•			•	•
INITIAL VOLTAGE	F09	25.0V	(10 - MAX)V			•	•			•	•
INITIAL CRATER TIME	F10	1.0s	(0.0 - 20.0)s			•					
INITIAL SLOPE	F11	1.0s	(0.0 - 20.0)s			•	•			•	•
FINAL SLOPE	F12	1.0s	(0.0 - 20.0)s			•	•			•	•
FINAL WIRE SPEED	F13	5.0m/min	(0.6-MAX)m/min			•	•			•	•
FINAL VOLTAGE	F14	25.0V	(10 - MAX)V			•	•			•	•
FINAL CRATER TIME	F15	0.0s	(0.0 - 5.0)s			•					
BURN BACK	bub	0	-30 - +30	•	•	•	•	•	•	•	•
POST GAS	PoG	1.0s	(0.0 - 10.0)s	•	•	•	•	•	•	•	•
FIRST SLOPE (**I1** TO **I2**)	F18	0.05s	(0.00 - 2.00)s								•
CYCLE WIRE SPEED	F19	5.0m/min	(0.6-MAX)m/min							•	•
CYCLE VOLTAGE	F20	25.0V	(10 - MAX)V							•	•
SECOND SLOPE (**I2** TO **I1**)	F21	0.05s	(0.00 - 2.00)s								•
SLOPE JOB	F28	0.5s	(0.1 - 20.0) s	•	•	•	•	•	•	•	•

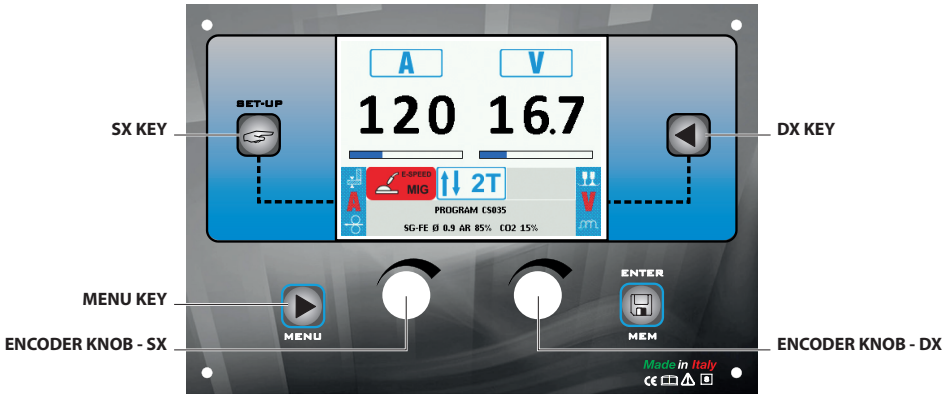
Table B

WARNING:

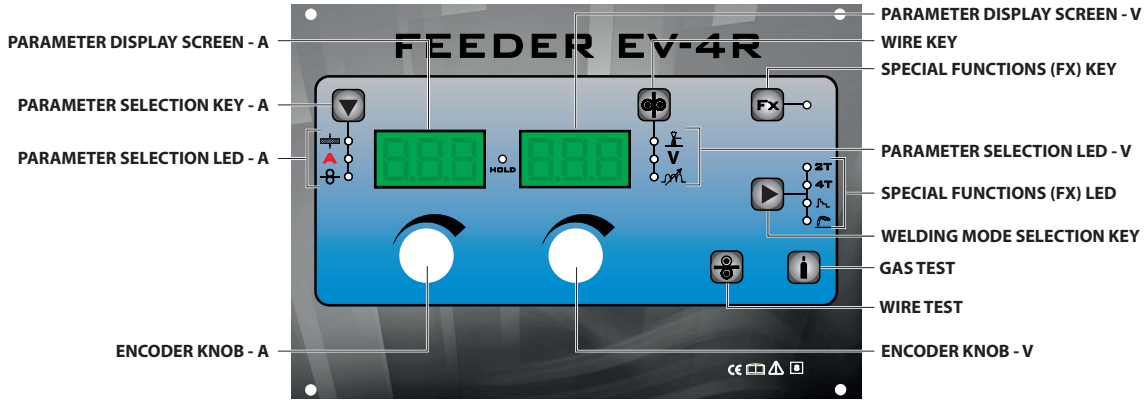
- *The STANDARD or ADVANCED welding CYCLE mode can only be activated by opening the ADVANCED SETUP Menu - ADVANCED MODE - CYCLE (for further explanations, see the relevant paragraph).*
- *It is possible to access editing of the SPECIAL FUNCTIONS (Fx) during welding.*
- *Some of the values edited will be used immediately by the operator, while others will be active from when the next welding task begins.*
- *The HOLD function is not active within the SPECIAL FUNCTIONS Menu (SET UP Fx).*

6.5.9.4. PRE-SETTING

"EVOLUTION" CONTROL PANEL



MENU KEY	Used to access the *PROCESS SELECTION Menu (PROCESS)* and subsequent menus, as applicable.
SX KEY	Scrolls in succession THICKNESS OF WELDED ITEM - WELDING CURRENT **A** - WIRE SPEED - WELDING POWER [kJ/min] (**W**) only on the **EVOLUTION SCREEN** (this operation is activated when the key is released).
ENCODER KNOB - SX	Adjusts the parameter selected using the **SX KEY.**
DX KEY	Scrolls in succession ARC LENGTH ADJUSTMENT - WELDING VOLTAGE **V** - ELECTRONIC INDUCTANCE only on the **EVOLUTION SCREEN** (this operation is activated when the key is released).
ENCODER KNOB - DX	Adjusts the parameter selected using the **DX KEY.**



"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

PARAMETER DISPLAY SCREEN - A	Shows the value for the parameter indicated by the **PARAMETER SELECTION LED - A.**
PARAMETER SELECTION LED - A	The LED unit shows the welding parameter selected using the **PARAMETER SELECTION KEY - A.** Note: the WELDING POWER selection is indicated by the flashing LED .
PARAMETER SELECTION KEY - A	Scrolls in succession THICKNESS OF WELDED ITEM - WELDING CURRENT **A** - WIRE SPEED - WELDING POWER [kJ/min] (flashing).
ENCODER KNOB - A	Adjusts the parameter displayed by the **PARAMETER DISPLAY SCREEN - A.**

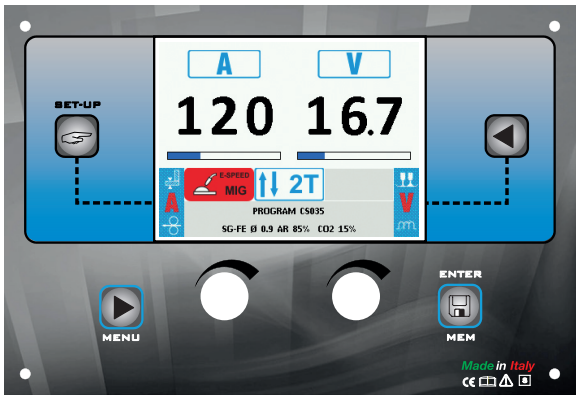
(continued)

WIRE KEY	Activates loading of the wire.
WELDING MODE SELECTION KEY	Scrolls the various welding modes in succession.
WELDING MODE SELECTION LED	The LED unit indicates the welding mode selected according to the **EVOLUTION SCREEN.**
PARAMETER DISPLAY SCREEN - V	Shows the parameter indicated by the **PARAMETER SELECTION LED - V.**
PARAMETER SELECTION LED - V	The LED unit indicates the welding parameter selected using the **PARAMETER SELECTION KEY- V.**
PARAMETER SELECTION KEY - V	Scrolls in succession ARC LENGTH ADJUSTMENT - WELDING VOLTAGE **V** - ELECTRONIC INDUCTANCE.
ENCODER KNOB - V	Adjusts the parameter displayed by the **PARAMETER DISPLAY SCREEN - V.**
GAS KEY	Activates the flow of gas.
SPECIAL FUNCTIONS (FX) KEY	Only enables entering and exit afterwards from the SPECIAL FUNCTIONS Menu (SET UP Fx) on the FEEDER EVO-4R panel and not on the DH panel.

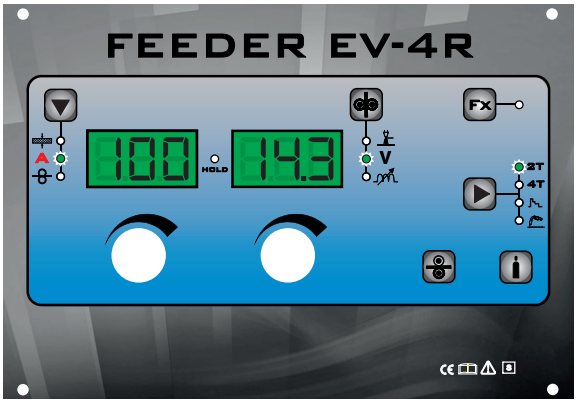
6.5.9.5. WELDING

When welding takes place the fields in the displays show the same values as those included for pre-setting **with the difference that now they are those measured.**

"EVOLUTION" CONTROL PANEL



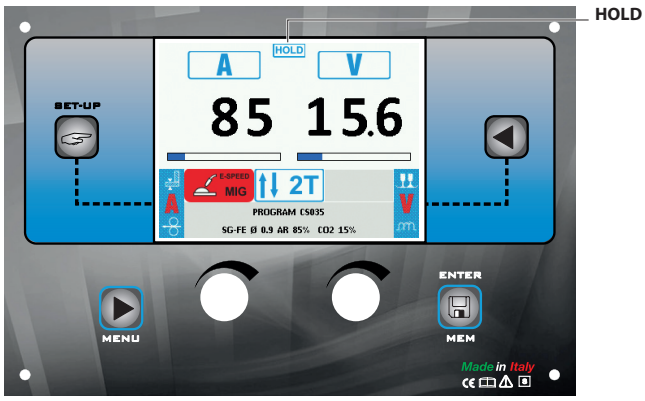
"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)



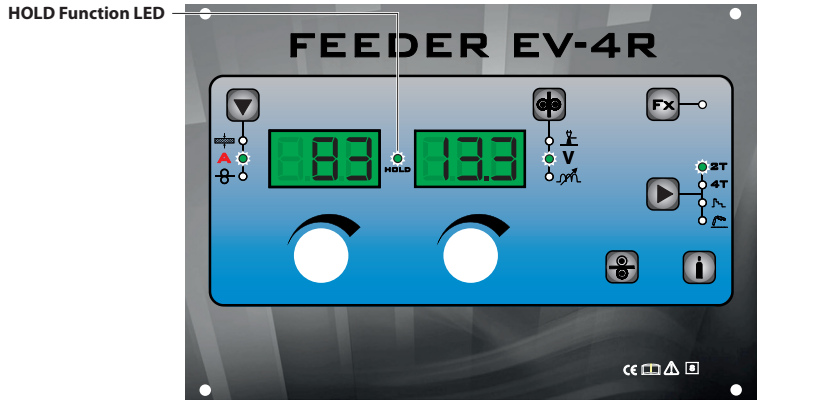
6.5.9.6. HOLD (real current reading)

When welding ends the fields in the display must show the same values that were displayed during welding, with the difference that they are now values defined as . In this phase the **EVOLUTION SCREEN** shows the *HOLD* box highlighted, while on the FEEDER EVO-4R panel the **HOLD FUNCTION LED** flashes until the end of the *HOLD Function*. If the *HOLD Function* is Interrupted via a panel (e.g. DH), it will also be interrupted automatically on the other (FEEDER EVO-4R) and vice-versa.

"EVOLUTION" CONTROL PANEL

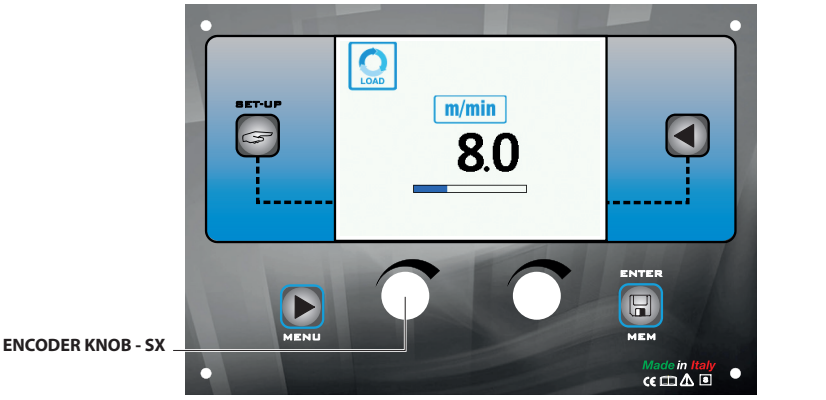


"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

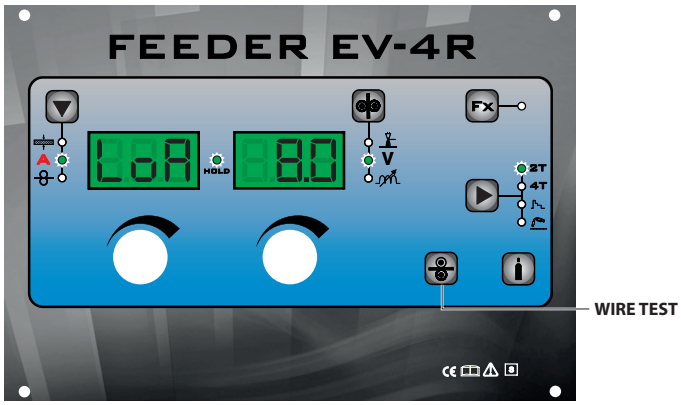


6.5.9.7. WIRE LOADING

The purpose of this menu it to allow the operator to load the welding wire and set the loading speed, **only when welding is not is progress.** If the wire loading function is activated (also see the CONFIG menu), to enable it hold the torch button or the load- ing button on the feeder down for 4 seconds.



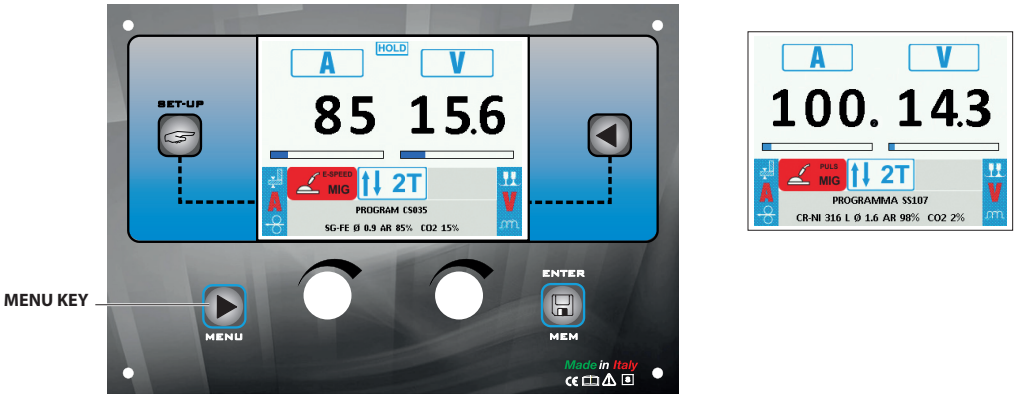
Rotate the **ENCODER KNOB - SX** the wire loading speed can be changed from 1,0 to 22,0 (default 8,0). The other keys and knobs are not active.
When the torch button or the wire loading key on the FEEDER EVO-4R feeder are released, the machine goes back to its previous status. **In models that do not include the FEEDER EVO-4R wire feeder, i.e. EVOLUTION SP3-C, the wire loading is provided only by means of the torch button.**
NOTE: *Wire loading cannot be accessed when their are errors on the machine or in the set-up procedure.*



Rotate the **ENCODER KNOB - SX** the wire loading speed can be changed from 1,0 to 22,0 (default 8,0). The other keys and knobs are not active.

6.5.9.8. DOUBLE FEEDER

Two feeders can be connected to the same generator simultaneously. Once everything has been configured correctly, as indicated in the FEEDER EVO-4R operator's manual and set as indicated in the equipment layout section, the machine's display shows one of the following two images.
The number ❶ or ❷ on the display indicates that the feeder in use at that time is number 1 or 2. If no number is displayed, this means that only one feeder has been configured.



MENU KEY	To switch from one feeder to the other, hold down the **MENU KEY**. (*)

(*) Switching from one feeder to the other can also be done by pushing the relevant torch button.

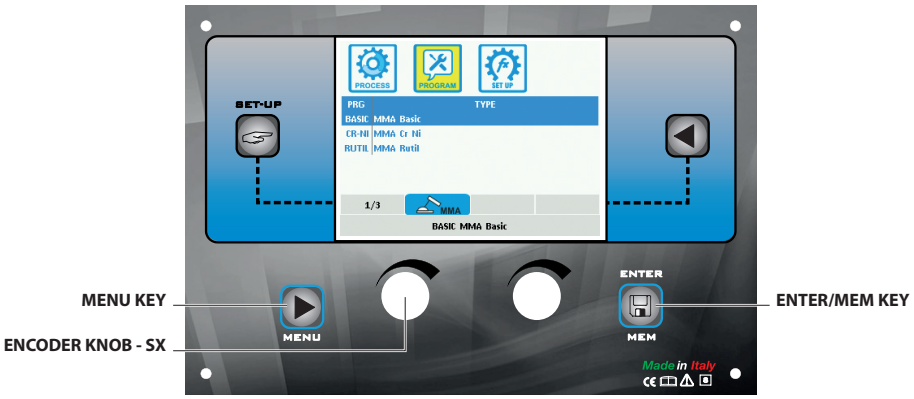
6.5.10. MMA

Select the MMA welding process by using the MENU KEY.

6.5.10.1. PROGRAM SELECTION Menu (PROGRAM) MMA

"EVOLUTION" CONTROL PANEL

To access the *PROGRAM SELECTION Menu (PROGRAM)* push the **MENU KEY**.



MENU KEY	Used to access subsequent menus if there are any.
ENCODER KNOB - SX	Select the welding program.
ENTER/MEM KEY	Used to access PRE-SETTING of the program selected.

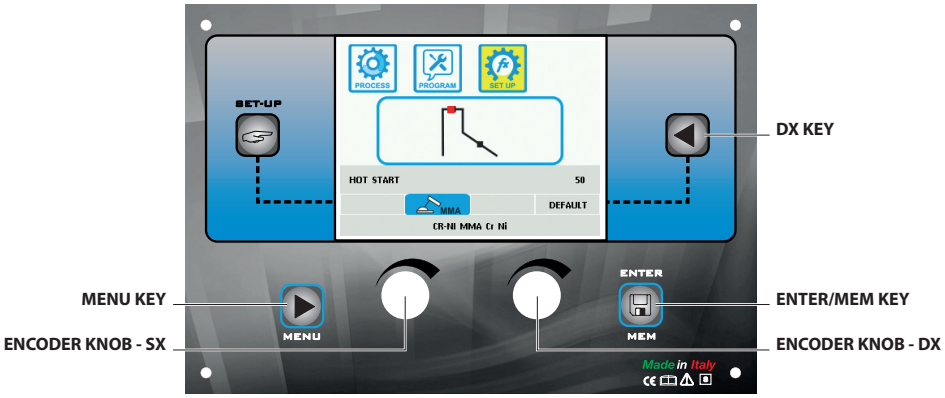
"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

It is not possible to access the *PROGRAM SELECTION Menu (PROGRAM)* via the FEEDER EVO-4R control panel.

6.5.10.2. SPECIAL FUNCTIONS Menu (SET UP Fx) MMA

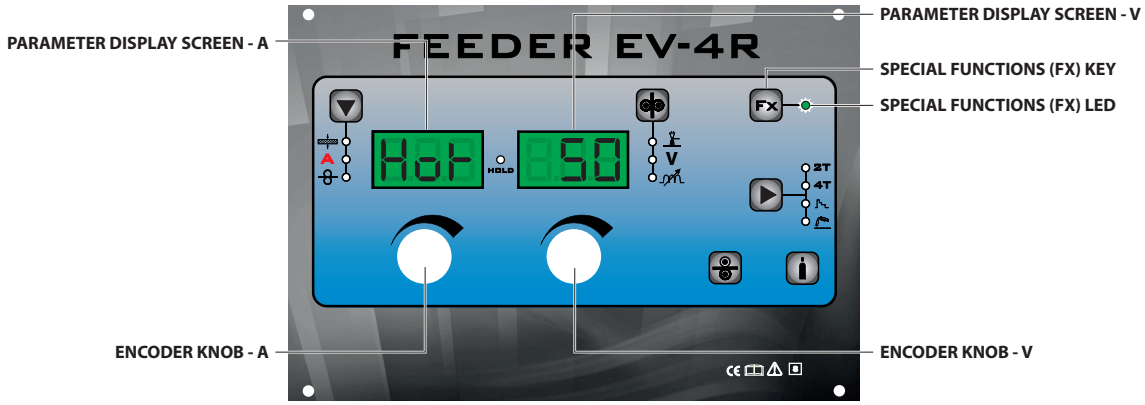
"EVOLUTION" CONTROL PANEL

To access the *SPECIAL FUNCTIONS Menu (SET UP Fx)* push the **MENU KEY**.



MENU KEY	Used to access subsequent menus if there are any.
ENCODER KNOB - SX	Used to select the various *SPECIAL FUNCTIONS (Fx)*.
ENTER/MEM KEY	Used to access the *PRE-SETTING* with the changes made to the *SPECIAL FUNCTIONS (Fx)*.
DX KEY	If held down for 2 seconds it makes it possible to return the value for the *SPECIAL FUNCTION (Fx)* selected to the DEFAULT value.
ENCODER KNOB - DX	Used to change the selected *SPECIAL FUNCTION (Fx)* value.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)
To access the *SPECIAL FUNCTIONS Menu (SET UP Fx)* push the **SPECIAL FUNCTIONS (FX) KEY**.



PARAMETER DISPLAY SCREEN - A	Displays the selected SPECIAL FUNCTION (Fx).
ENCODER KNOB - A	Used to select the various SPECIAL FUNCTIONS (Fx).
PARAMETER DISPLAY SCREEN - V	Displays the value for the selected SPECIAL FUNCTION (Fx).
ENCODER KNOB - V	Used to change the selected SPECIAL FUNCTION (Fx) value.
SPECIAL FUNCTIONS (FX) KEY	Only enables entering and exit afterwards from the SPECIAL FUNCTIONS Menu (SET UP Fx) on the FEEDER EVO-4R panel and not on the DH/VS panel.
SPECIAL FUNCTIONS (FX) LED	The operator must press the SPECIAL FUNCTIONS (SET UP FX) KEY for it to light up and be included in the SPECIAL FUNCTIONS Menu (SET UP Fx).

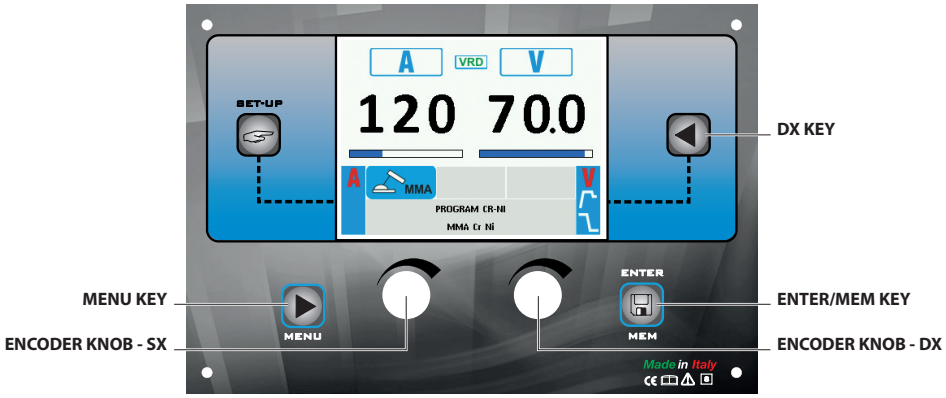
The *SPECIAL FUNCTIONS (Fx)* related to the MMA process correspond as follows to those on the wire feeder:

Fx Adjustable special functions			
Special function	**PARAMETER DISPLAY Screen - A**	**PARAMETER DISPLAY Screen - V**	
		Default	**Range**
HOT START	Hot	50	(0 - 100)
ARC FORCE	ArC	50	(0 - 100)

WARNING:
- It is possible to access editing of the *SPECIAL FUNCTIONS (Fx)* during welding.
- Some of the values edited will be used immediately by the operator, while others will be active from when the next welding task begins.
- The *HOLD* function is not active within the *SPECIAL FUNCTIONS Menu (SET UP Fx)*.

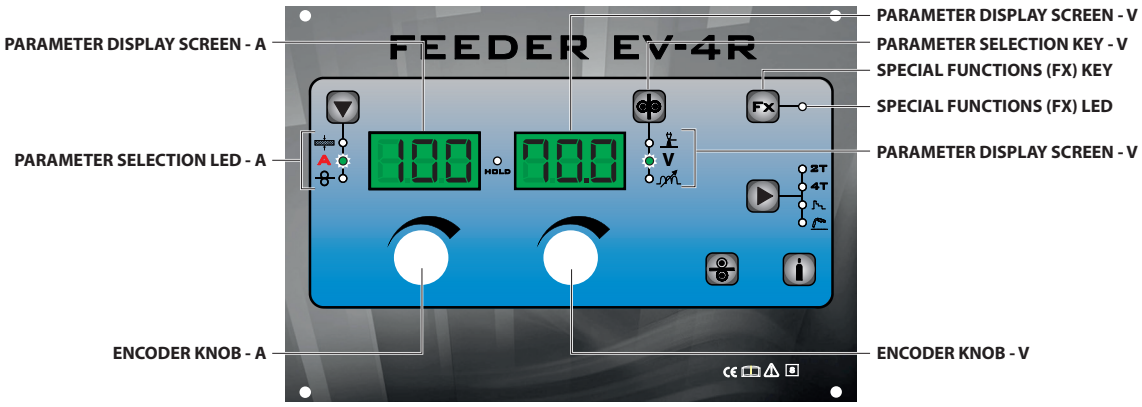
6.5.10.3. PRE-SETTING MMA

"EVOLUTION" CONTROL PANEL



MENU KEY	Used to access the PROCESS SELECTION Menu (PROCESS) and subsequent menus, as applicable.
ENCODER KNOB - SX	Adjust the value of the parameter WELDING CURRENT **A**.
DX KEY	*Scrolls in succession WELDING VOLTAGE* **V** *- HOT START - ARC FORCE* only on the **EVOLUTION SCREEN** (the operation is activated when the key is released).
ENCODER KNOB - DX	Adjusts the parameter selected using the **DX KEY** (only HOT START-ARC FORCE).

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

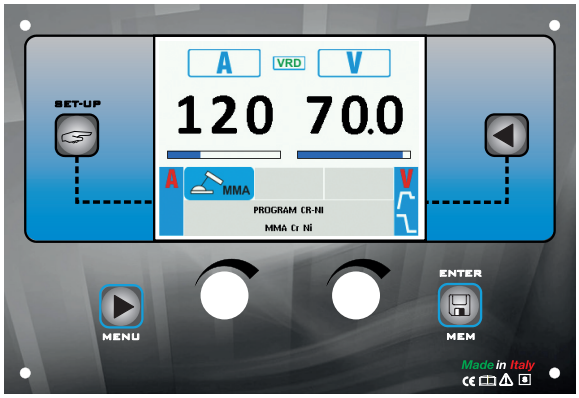


PARAMETER DISPLAY SCREEN - A	Displays the value of the parameter WELDING CURRENT **A**.
PARAMETER SELECTION LED - A	The LED unit shows the WELDING CURRENT **A** switched on.
ENCODER KNOB - A	Adjust the value of the parameter WELDING CURRENT **A**.
PARAMETER DISPLAY SCREEN - V	Shows the parameter indicated by the **PARAMETER SELECTION LED - V**. The *WELDING VOLTAGE* shown is the measured voltage.
PARAMETER SELECTION LED - V	The LED unit indicates the welding parameter selected using the **PARAMETER SELECTION KEY- V.**
PARAMETER SELECTION KEY - V	Scrolls in succession the parameters HOT START - ARC LENGTH - WELDING VOLTAGE **V** - ARC FORCE .
ENCODER KNOB - V	Adjusts the parameter displayed by the **PARAMETER DISPLAY SCREEN - V.**
SPECIAL FUNCTIONS (FX) KEY	Only enables entering and exit afterwards from the SPECIAL FUNCTIONS Menu (SET UP Fx) on the FEEDER EVO-4R panel and not on the DH/VS panel.

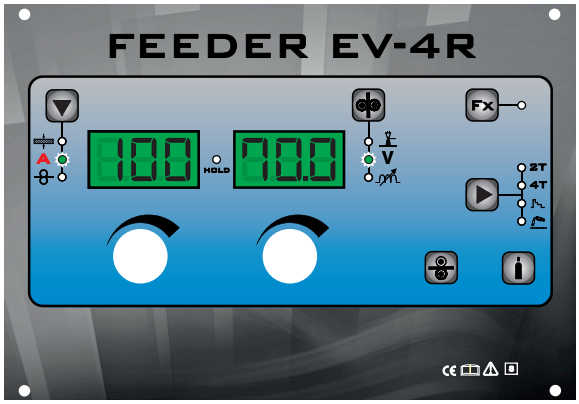
6.5.10.4. WELDING MMA

When welding takes place the fields in the displays show the same values as those included for pre-setting **with the difference that now they are those measured**.

“EVOLUTION” CONTROL PANEL



“FEEDER EVO-4R” CONTROL PANEL (not used with EVOLUTION SP3-C)

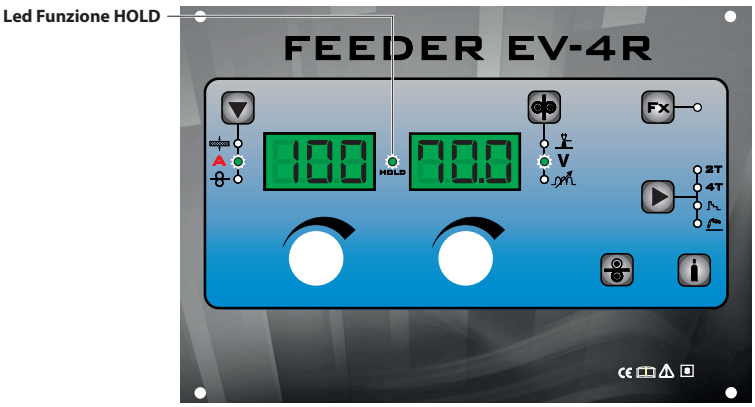


6.5.10.5. HOLD MMA

When welding ends the fields in the display must show the same values that were displayed during welding, with the difference that they are now values defined as *HOLD*. In this phase the **EVOLUTION SCREEN** shows the *HOLD* box highlighted, while on the FEEDER EVO-4R panel the **HOLD FUNCTION LED** flashes until the end of the *HOLD Function*. If the *HOLD Function* is Interrupted via a panel (e.g. DH), it will also be interrupted automatically on the other (FEEDER EVO-4R) and vice-versa.

“EVOLUTION” CONTROL PANEL

“FEEDER EVO-4R” CONTROL PANEL (not used with EVOLUTION SP3-C)

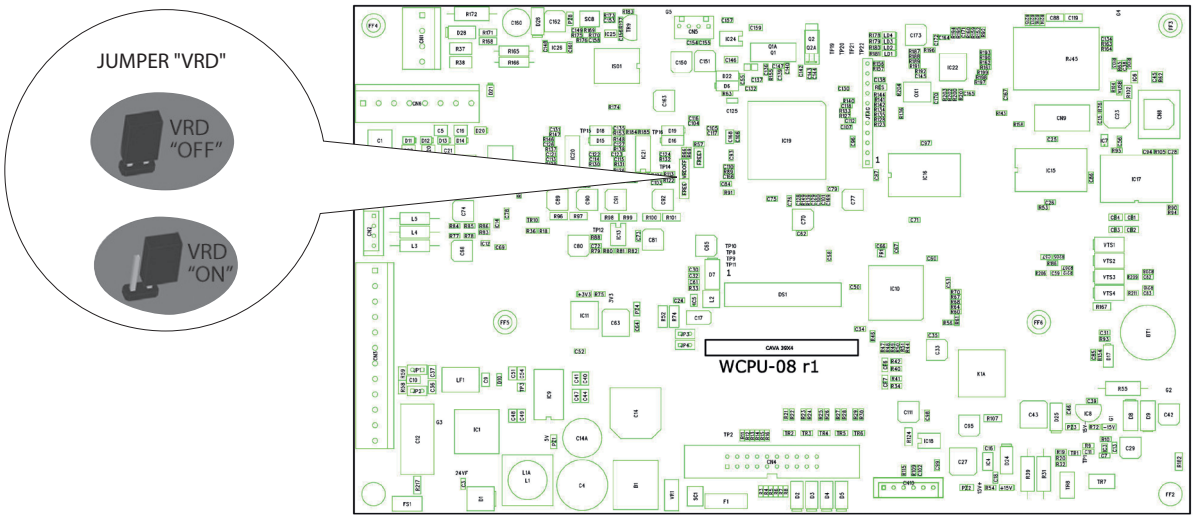


6.5.10.6. ATTIVAZIONE DEL DISPOSITIVO VRD MMA

The Voltage Reduction Device (VRD) is a safety device that reduces voltage. It prevents voltages forming on the output termi- nals that may pose a danger to people. The standard settings and those defined beforehand by do not provide for the VRD to be active on the welding machine and so the **EVOLUTION SCREEN** does not normally provide any indication.

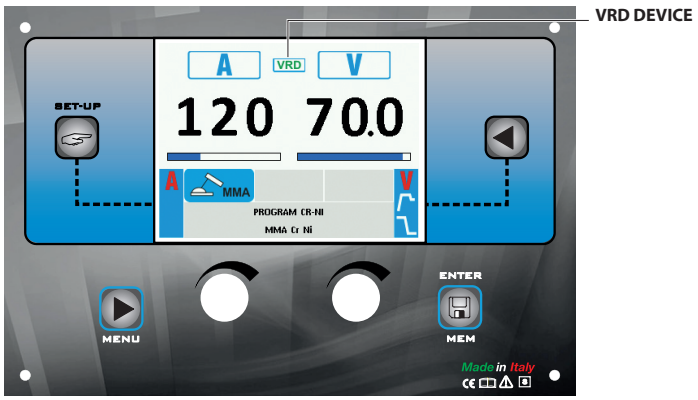
If the operator wishes to weld in MMA using the VRD device (which must be done with the welding machine switched off), they must:

1. Use a suitable screwdriver to unscrew the 4 screws that fix the DH/VS control panel to the welding machine.
2. Remove the "VRD" JUMPER on the DIGITAL INTERFACE PCB (see figure).



3. Use a suitable screwdriver to tighten the 4 screws that fix the DH/VS control panel to the welding machine.
4. Start the welding machine by turning the switch on the rear panel to position I.

When it switches on, but with the machine in stand-by, the DH/VS control panel shows that the VRD device is active (indication on the **EVOLUTION SCREEN** green colour - see enclosed image: MMA - PRE-SETTING).



During the welding phase the VRD device is activated (indication on the **EVOLUTION SCREEN** red colour (does not indicate malfunction- ing of the welding machine) - see enclosed image: MMA - WELDING) and when welding is ended the voltage will be reduced within a maximum time of **0,3** seconds.

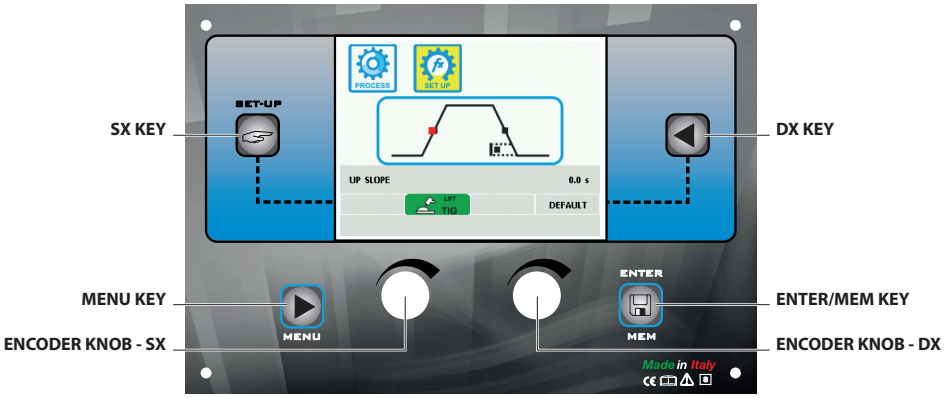
6.5.11. TIG LIFT

Select the TIG LIFT welding process by using the MENU KEY.

6.5.11.1. SPECIAL FUNCTIONS Menu (SET UP Fx) TIG LIFT

"EVOLUTION" CONTROL PANEL

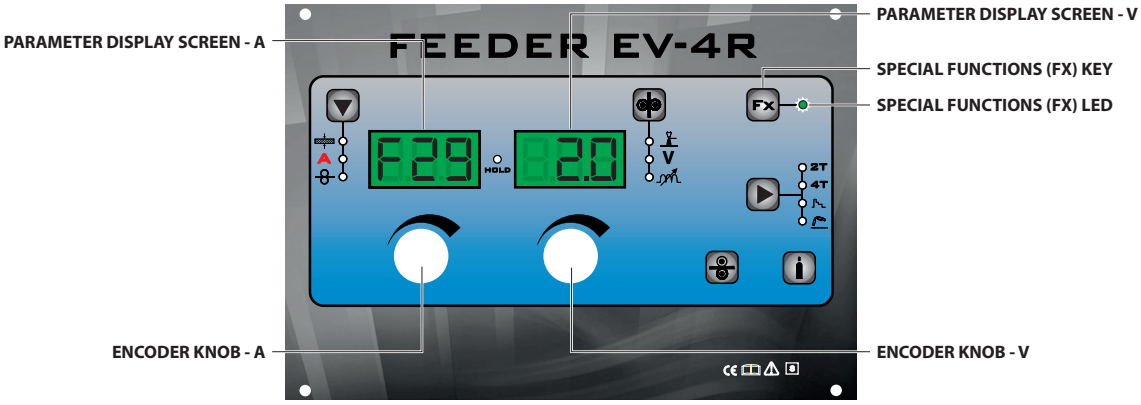
To access the *SPECIAL FUNCTIONS Menu (SET UP Fx)* push the **MENU KEY**.



MENU KEY	Used to access subsequent menus if there are any.
ENCODER KNOB - SX	Used to select the various *SPECIAL FUNCTIONS (Fx)*.
ENTER/MEM KEY	Used to access the *PRE-SETTING* with the changes made to the *SPECIAL FUNCTIONS (Fx)*.
DX KEY	If held down for **2** seconds it makes it possible to return the value for the *SPECIAL FUNCTIONS (Fx)* selected to the DEFAULT value.
ENCODER KNOB - DX	Used to change the selected *SPECIAL FUNCTIONS (Fx)* value.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

To access the *SPECIAL FUNCTIONS (Fx)* push the **SPECIAL FUNCTIONS (FX) KEY**.



PARAMETER DISPLAY SCREEN - A	Displays the selected *SPECIAL FUNCTIONS (Fx)*.
ENCODER KNOB - A	Used to select the various *SPECIAL FUNCTIONS (Fx)*.
PARAMETER DISPLAY SCREEN - V	Displays the value for the selected *SPECIAL FUNCTIONS (Fx)*.
ENCODER KNOB - V	Used to change the selected *SPECIAL FUNCTIONS (Fx)* value.
SPECIAL FUNCTIONS (FX) KEY	Only enables entering and exit afterwards from the on the FEEDER EVO-4R panel and not on the DH/VS panel.
SPECIAL FUNCTIONS (FX) LED	The operator must press the **SPECIAL FUNCTIONS (SET UP FX) KEY** for it to light up and be included in the *SPECIAL FUNCTIONS Menu (SET UP Fx)*.

The *SPECIAL FUNCTIONS (Fx)* related to the *TIG LIFT* process correspond as follows to those on the wire feeder:

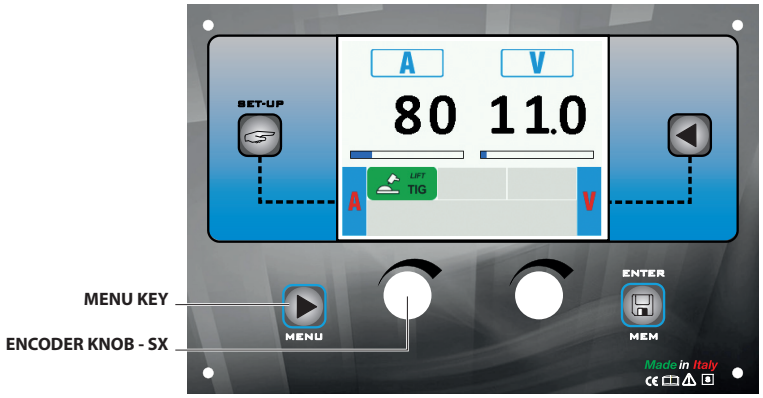
Fx Adjustable special functions			
Special function	**PARAMETER DISPLAY Screen - A**	**PARAMETER DISPLAY Screen - V**	
		Default	**Range**
UP SLOPE	F29	0.0s	(0.0 - 5.0)s
DOWN SLOPE	F30	2.0s	(0.0 - 8.0)s
SWS VOLTAGE THRESHOLD	F31	0	-30 - +30
TIG PULSE DELTA CURRENT	F23	-50%	(-100 ÷ 1000)%
TIG PULSE BALANCE	F25	0	(-40 ÷ 40)%
TIG PULSE FREQUENCY	F26	100.0Hz	(0.1 ÷ 500.0)Hz

WARNING:

- It is possible to access editing of the *SPECIAL FUNCTIONS (Fx)* during welding.
- Some of the values edited will be used immediately by the operator, while others will be active from when the next welding task begins.
- The *HOLD* function is not active within the *SPECIAL FUNCTIONS Menu (SET UP Fx)*.

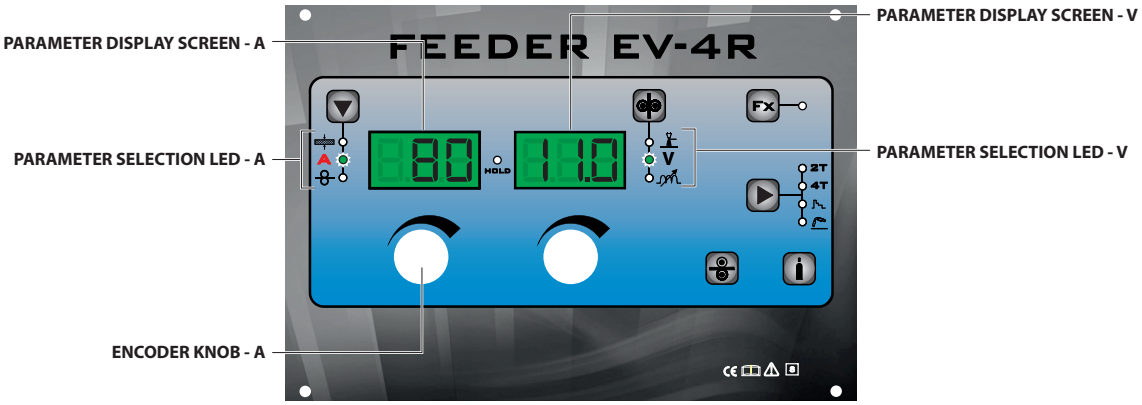
6.5.11.2. PRE-SETTING — TIG LIFT

"EVOLUTION" CONTROL PANEL



MENU KEY	Used to access the *PROCESS SELECTION Menu (PROCESS)* and subsequent menus, as applicable.
ENCODER KNOB - SX	Adjust the value of the parameter WELDING CURRENT **A**.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

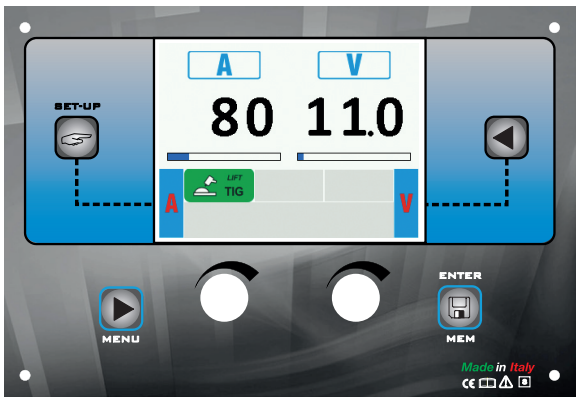


PARAMETER DISPLAY SCREEN - A	Displays the value of the parameter *WELDING CURRENT* **A**.
PARAMETER SELECTION LED - A	The LED unit shows the *WELDING CURRENT* **A** switched on.
ENCODER KNOB - A	Adjust the value of the parameter *WELDING CURRENT* **A**.
PARAMETER DISPLAY SCREEN - V	Displays the value of the parameter *WELDING VOLTAGE* **V**. The *WELDING VOLTAGE* shown is the measured voltage.
PARAMETER SELECTION LED - V	The LED unit shows the *WELDING VOLTAGE* **V** switched on.

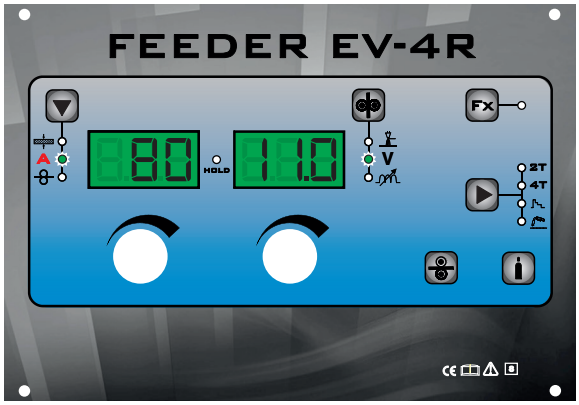
6.5.11.3. WELDING — TIG LIFT

When welding takes place the fields in the displays show the same values as those included for pre-setting **with the difference that now they are those measured**.

"EVOLUTION" CONTROL PANEL



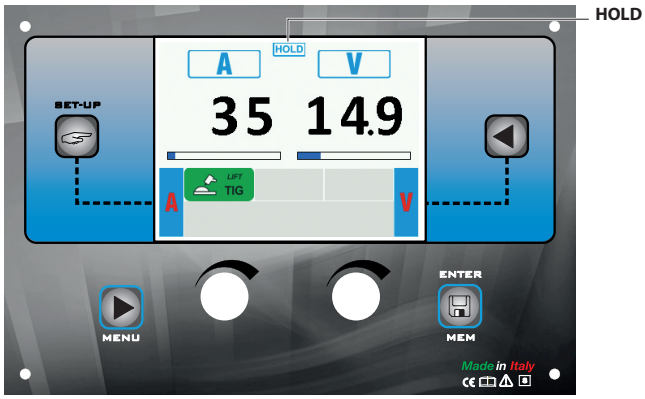
"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)



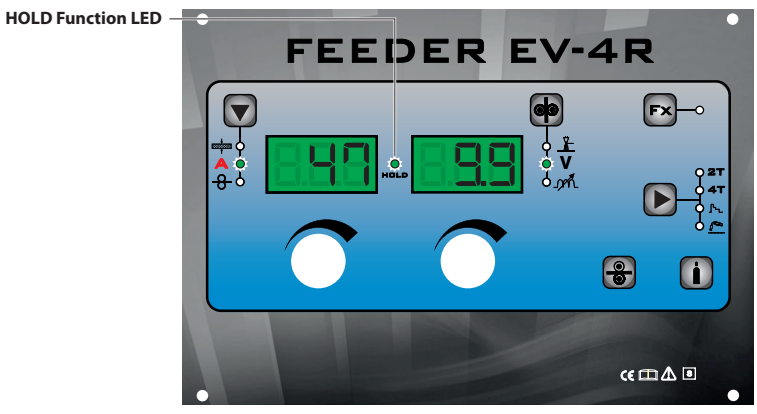
6.5.11.4. HOLD TIG LIFT

When welding ends the fields in the display must show the same values that were displayed during welding, with the difference that they are now values defined as *HOLD*. In this phase the **EVOLUTION SCREEN** shows the *HOLD* box highlighted, while on the FEEDER EVO-4R panel the **HOLD FUNCTION LED** flashes until the end of the *HOLD Function*. If the *HOLD Function* is Interrupted via a panel (e.g. DH), it will also be interrupted automatically on the other (FEEDER EVO-4R) and vice-versa.

"EVOLUTION" CONTROL PANEL



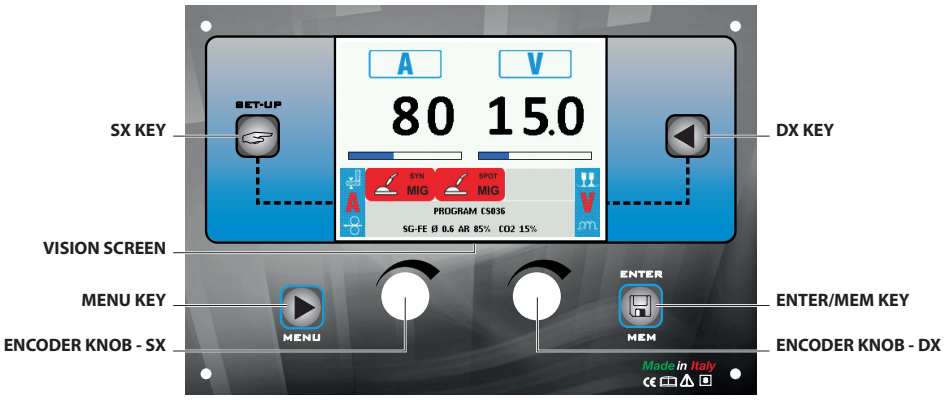
"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)



6.5.12. JOB/SEQUENZE

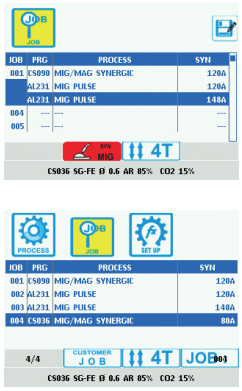
6.5.12.1. Creating and saving / editing and overwriting a JOB/SEQUENCES (*) JOB/SEQUENCES

“EVOLUTION” CONTROL PANEL



(*) For the sequences, see the relevant paragraph in the settings menu.

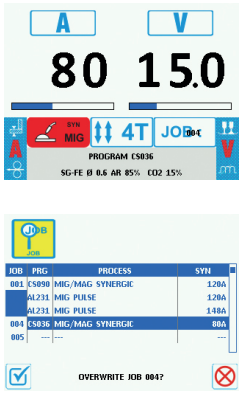
CREATING AND SAVING A JOB



To create and save a *JOB (welding point)* proceed as follows:

- During any welding process and at any time, once you have acquired the necessary parameters, hold the **ENTER/MEM KEY** down for **3** consecutive seconds.
- The **EVOLUTION SCREEN** automatically goes to the first free position in the *JOB* table.
- Choose the position in which the *JOB* is to be saved by rotating the **ENCODER KNOB - SX**.
- Push the **ENTER/MEM KEY** to confirm and finalise saving of the *JOB* created.

EDITING AND OVERWRITING A JOB



To edit and/or overwrite a *JOB* proceed as follows:

- During any welding process and at any time push the **MENU KEY** to exit the welding phase.
- Select the welding process *JOB* by rotating the **ENCODER KNOB - SX**.
- Push the **MENU KEY** to open the *JOB* table.
- Select the *JOB* to be edited by rotating the **ENCODER KNOB - SX**.
- Push the **ENTER/MEM KEY** to view the settings on the **EVOLUTION SCREEN** for the *JOB* to be edited.
- Hold down the **ENTER/MEM KEY** for about **3** consecutive seconds, until the **EVOLUTION SCREEN** loads all the parameters / data for the *JOB* onto the screen (making them available to the operator).
- Acquire the parameters necessary for editing the *JOB*.
- Hold down the **ENTER/MEM KEY** for **3** consecutive seconds.
- The **EVOLUTION SCREEN** automatically goes to the first free position in the *JOB* table.
- Choose the free position in which the edited *JOB* is to be saved, or a position already occupied in which the edited *JOB* will be overwritten, by rotating the **ENCODER KNOB - SX**.
- Push the **ENTER/MEM KEY** to confirm the operation.
- Push the **SX KEY** to confirm the overwriting operation or the **DX KEY** to cancel it.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

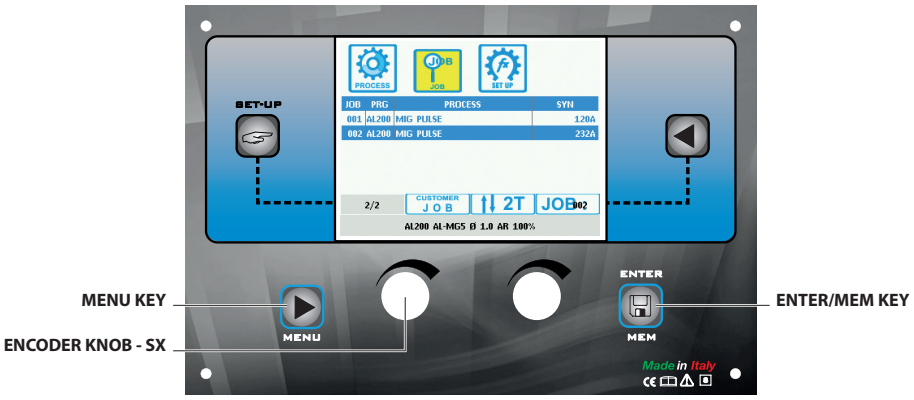
It is not possible to create, save, edit or overwrite a *JOB/SEQUENCE* using the "FEEDER EVO-4R" control panel.

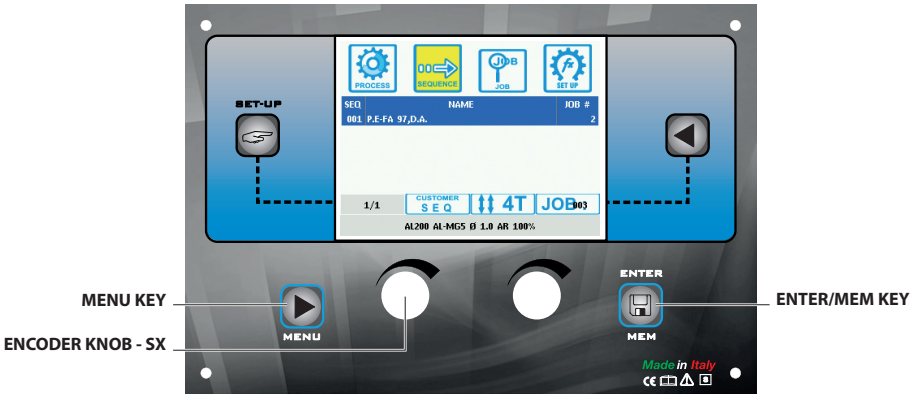
6.5.12.2. JOB/SEQUENCES SELECTION Menu JOB/SEQUENCES

WARNING:
All the parameters saved within a JOB/SEQUENCE (including SPECIAL FUNCTIONS (Fx)) can be viewed but not edited!

"EVOLUTION" CONTROLPANEL

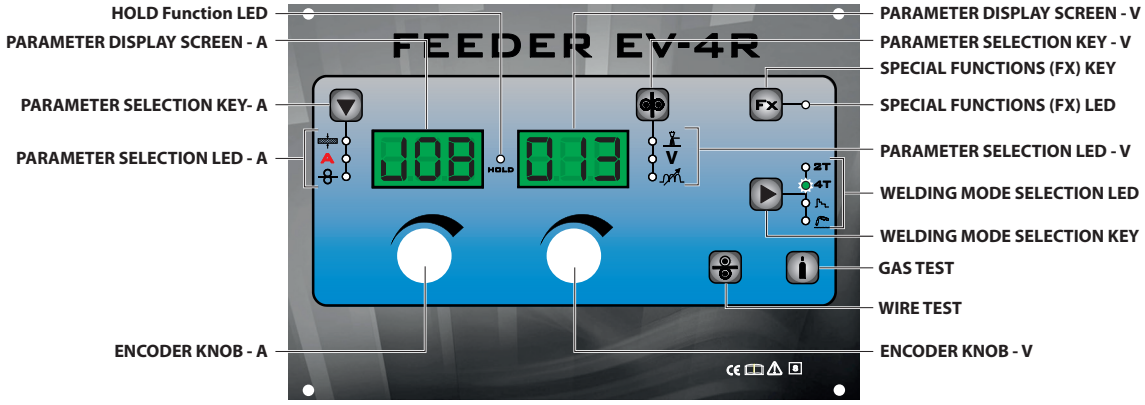
To access the *JOB/SEQUENCES SELECTION Menu* push the **MENU KEY**.





MENU KEY	Used to access subsequent menus.
ENCODER KNOB - SX	Used to scroll and select a *JOB/SEQUENCES*.
ENTER/MEM KEY	Used to select the *JOB/SEQUENCE* displayed.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)



PARAMETER DISPLAY SCREEN -A	Shows the JOB term or value of the parameter indicated by the **PARAMETER SELECTION LED - A**.
PARAMETER SELECTION LED - A	The LED unit shows the welding parameter selected using the **PARAMETER SELECTION KEY - A**.
PARAMETER SELECTION KEY -A	Scrolls the active parameters in succession, based on the type of welding process saved in the *JOB* selected.
WIRE KEY	Activates loading of the wire.
WELDING MODE SELECTION LED	The LED unit indicates the welding mode saved in the *JOB* selected, which is coherent with the **EVOLUTION SCREEN**.
PARAMETER DISPLAY SCREEN - V	Displays the *JOB* number also selected in the *SEQUENCES* or the value for the parameter indicated by the **PARAMETER SELECTION LED - V**.
PARAMETER SELECTION KEY - V	Scrolls the active parameters in succession, based on the type of welding process saved in the *JOB* selected.
ENCODER KNOB - V	Used to scroll through the *JOBS* in the *SEQUENCES* as well.
GAS KEY	Activates the flow of gas.
SPECIAL FUNCTIONS (FX) KEY	Used to access displaying of the *SPECIAL FUNCTIONS (Fx)* saved in the *JOB* selected.

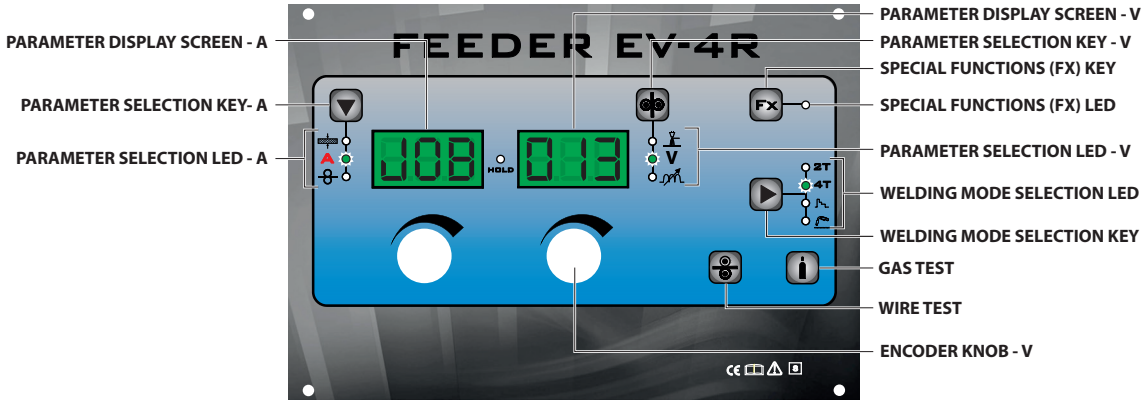
6.5.12.3. PRE-SETTING JOB/SEQUENCES

WARNING:
All the parameters saved within a JOB (including SPECIAL FUNCTIONS (Fx)) can be viewed but not edited!

"EVOLUTION" CONTROLPANEL

MENU KEY	Used to access the *PROCESS SELECTION Menu (PROCESS)* and subsequent menus, as applicable.
SX KEY	Scrolls the active parameters in succession, based on the type of welding process saved in the *JOB* selected.
ENTER/MEM KEY	If held down for a period of about **3** consecutive seconds, this key allows the **EVOLUTION SCREEN** to load all the parameters for the *JOB* onto the screen (making them available to the operator).
DX KEY	Scrolls the active parameters in succession, based on the type of welding process saved in the *JOB* selected.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

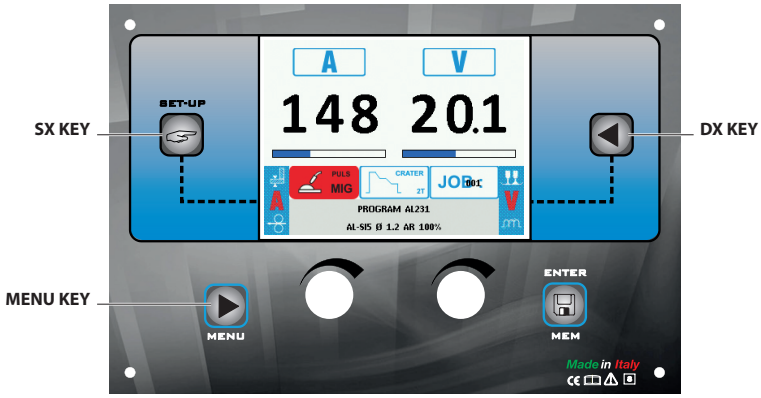


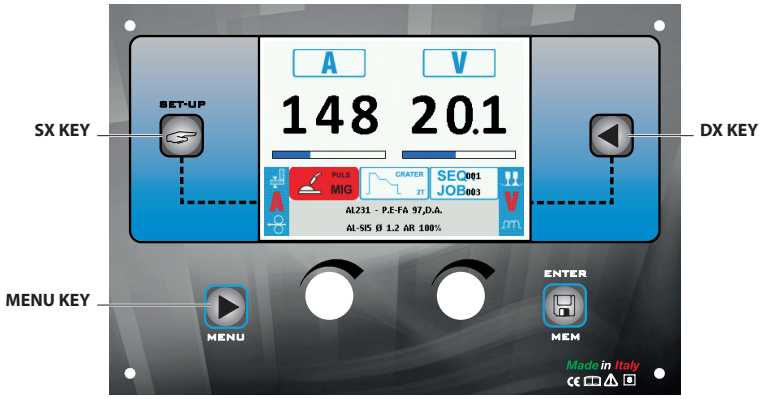
PARAMETER DISPLAY SCREEN -A	Shows the JOB term or value of the parameter indicated by the **PARAMETER SELECTION LED - A**.
PARAMETER SELECTION LED - A	The LED unit shows the welding parameter selected using the **PARAMETER SELECTION KEY - A**.
PARAMETER SELECTION KEY -A	Scrolls the active parameters in succession, based on the type of welding process saved in the *JOB* selected.
WIRE KEY	Activates loading of the wire.
WELDING MODE SELECTION LED	The LED unit indicates the welding mode saved in the *JOB* selected, which is coherent with the **EVOLUTION SCREEN**.
PARAMETER DISPLAY SCREEN - V	Displays the *JOB* number also selected in the *SEQUENCES* or the value for the parameter indicated by the **PARAMETER SELECTION LED - V**.
PARAMETER SELECTION LED - V	The LED unit indicates the welding parameter selected using the **PARAMETER SELECTION KEY- V**.
PARAMETER SELECTION KEY - V	Scrolls the active parameters in succession, based on the type of welding process saved in the *JOB* selected.
ENCODER KNOB - V	Used to scroll through the *JOBS* in the *SEQUENCES* as well.
GAS KEY	Activates the flow of gas.
SPECIAL FUNCTIONS (FX) KEY	Used to access the *SPECIAL FUNCTIONS (Fx)* saved in the *JOB* selected.

6.5.12.4. WELDING JOB/SEQUENCES

WARNING:
All the parameters saved within a JOB (including SPECIAL FUNCTIONS (Fx)) can be viewed but not edited!

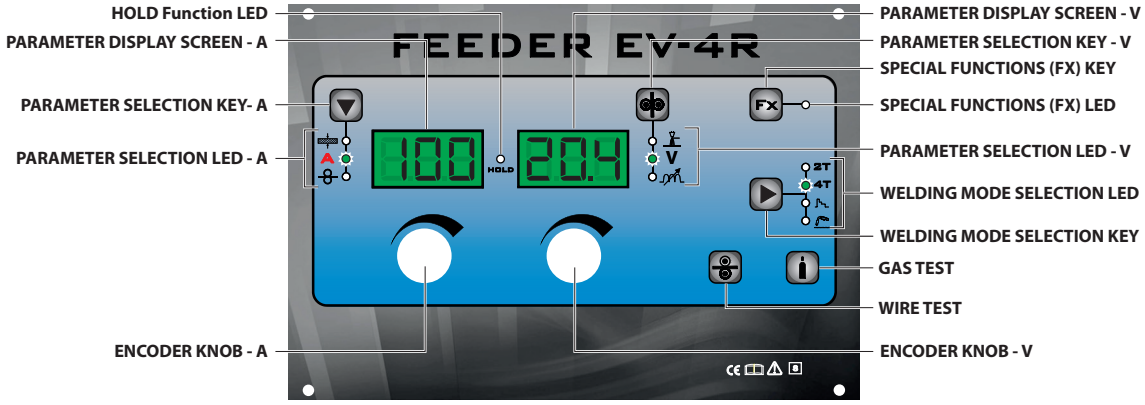
"EVOLUTION" CONTROLPANEL





MENU KEY	Used to access the *PROCESS SELECTION Menu (PROCESS)* and subsequent menus, as applicable.
SX KEY	Scrolls the active parameters in succession, only on the **EVOLUTION SCREEN**, based on the type of welding process saved in the *JOB* selected. In this case, where possible, the values displayed will be those measured.
DX KEY	Scrolls the active parameters in succession, only on the **EVOLUTION SCREEN**, based on the type of welding process saved in the *JOB* selected. In this case, where possible, the values displayed will be those measured.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)



PARAMETER DISPLAY SCREEN -A	Shows the JOB term or value of the parameter indicated by the **PARAMETER SELECTION LED - A**.
PARAMETER SELECTION LED - A	The LED unit shows the welding parameter selected using the **PARAMETER SELECTION KEY - A**.
PARAMETER SELECTION KEY -A	Scrolls the active parameters in succession, based on the type of welding process saved in the *JOB* selected. In this case, where possible, the values displayed will be those measured.
WELDING MODE SELECTION LED	The LED unit indicates the welding mode saved in the *JOB* selected, which is coherent with the **EVOLUTION SCREEN**.
PARAMETER DISPLAY SCREEN - V	Displays the *JOB* number also selected in the *SEQUENCES* or the value for the parameter indicated by the **PARAMETER SELECTION LED - V**.
PARAMETER SELECTION LED - V	The LED unit indicates the welding parameter selected using the **PARAMETER SELECTION KEY - V**.
PARAMETER SELECTION KEY - V	Used to access displaying of the *SPECIAL FUNCTIONS (Fx)* saved in the *JOB* selected.
ENCODER KNOB - V	Used to scroll through the *JOBS* in the *SEQUENCES* as well, only if these are coherent. (*)
SPECIAL FUNCTIONS (FX) KEY	Used to access the *SPECIAL FUNCTIONS (Fx)* saved in the *JOB* selected.

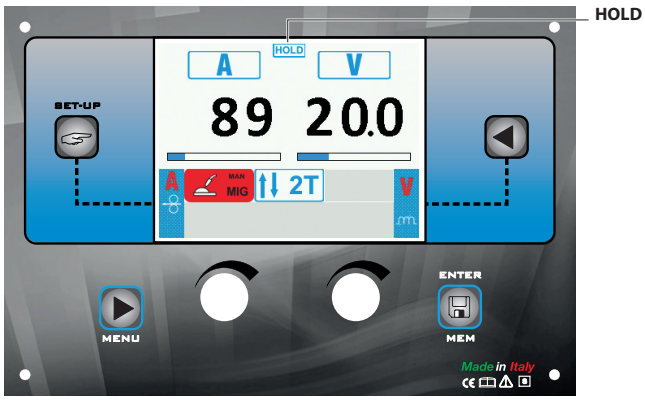
(*) The JOBS included in the SEQUENCES as well as considered to be coherent when the last three figures (wire type, gas, wire diameter) are equal. WHEN THIS IS THE CASE JOBS CAN BE CHANGED DURING WELDING WITHOUT INTERRUPTION.

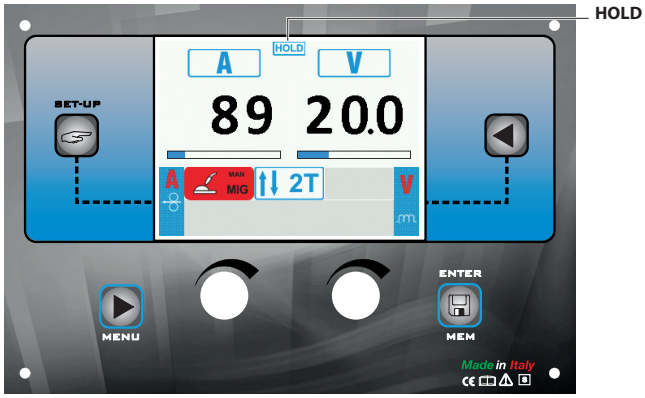
6.5.12.5. HOLD JOB/SEQUENCES

When welding ends the fields in the display must show the same values that were displayed during welding, with the difference that they are now values defined as *HOLD*. In this phase the **EVOLUTION SCREEN** shows the *HOLD* box highlighted, while on the FEEDER EVO-4R panel the **HOLD FUNCTION LED** flashes until the end of the *HOLD Function*. If the *HOLD Function* is Interrupted via a panel (e.g. DH), it will also be interrupted automatically on the other (FEEDER EVO-4R) and vice-versa.

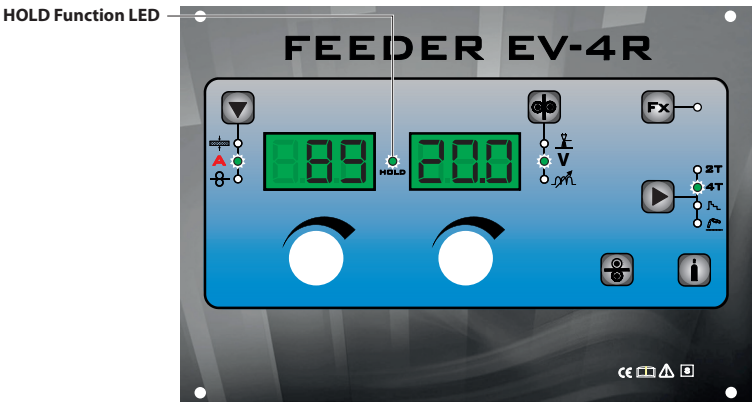
WARNING: *All the parameters saved within a JOB (including SPECIAL FUNCTIONS (Fx)) can be viewed but not edited!*

"EVOLUTION" CONTROLPANEL





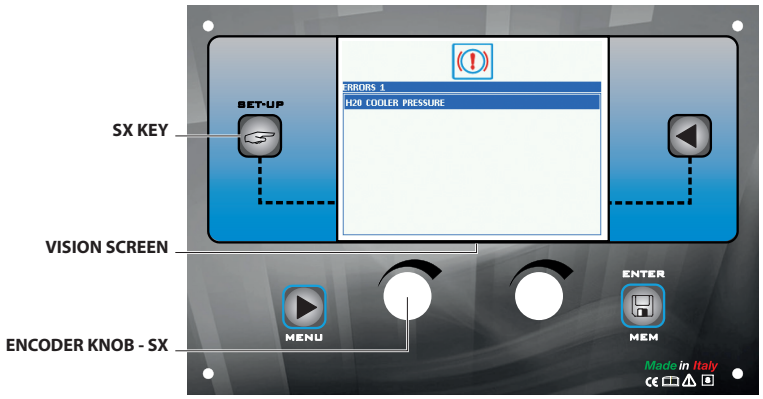
"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)



6.5.13. Error condition

WARNING: *Under normal conditions of use it is not possible to open the "ERROR LOG Menu" display since the alarm message appears instantaneously on the* **EVOLUTION SCREEN** *as soon as the problem arises on the welding plant.* At this stage it is not possible to weld!
As soon as the error message appears:

"EVOLUTION" CONTROL PANEL

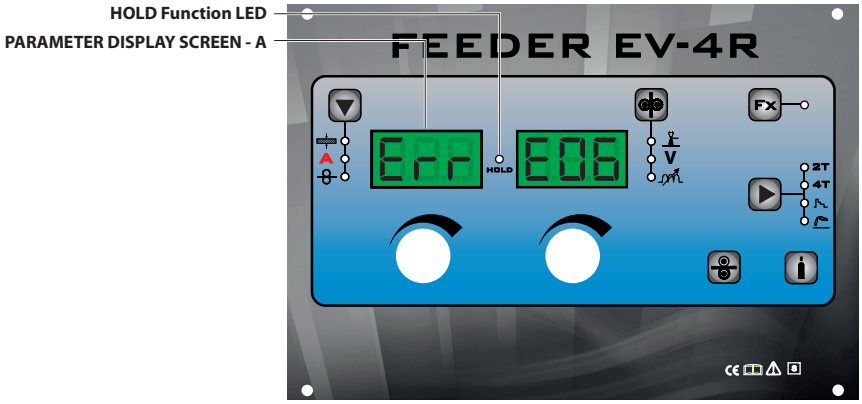


SX KEY	If held down for a period of about **5** consecutive seconds it takes the **EVOLUTION SCREEN** to the *SETUP Menu*.
ENCODER KNOB - SX	Used to scroll the alarms activated.
DISPLAY EVOLUTION	Shows the alarm signal (ⓘ), number of the errors that have occurred (e.g. ERRORS 1) and an indication of what happened (e.g. E.06 WATER COOLER MISSING) of the welding machine.

In the case of an **Automatically reset error** once the alarm condition has ended (reinstatement completed correctly), the welding plant is once again ready and the operator can recommence welding! The alarm state disappears and the **EVOLUTION SCREEN** returns to precisely the same point at which it was operating previously.
PLEASE NOTE: *After resetting has been completed, during normal operation of the machine, the* **EVOLUTION SCREEN** *will still show the error signal to inform the operator of the event (ⓘ), but this can be removed visually from the display by simply pushing the* **MENU KEY**.

WARNING: *This only removes the visual error indication but not the history of what happened!*
In the case of **NON automatically reset errors**, to remove the alarm status and reinstate correct operation of the machine, the welding plant must be switched off.
When it is switched on again, the machine will be working again and the operator can weld again!
PLEASE NOTE: If, when switching on, the error status presents itself again, immediately contact's Technical Assistance Department.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)



PARAMETER DISPLAY SCREEN -A	Displays the error message (e.g. Err.).
PARAMETER DISPLAY SCREEN - V	Shows the alarm code (e.g. E0.6) of in succession, the codes for the alarms in succession if there are a number of errors.

In the case of an **Automatically reset error** once the alarm condition has ended (reinstatement completed correctly), the welding plant is once again ready and the operator can recommence welding! The alarm state disappears and the **EVOLUTION SCREEN** returns to precisely the same point at which it was operating previously.

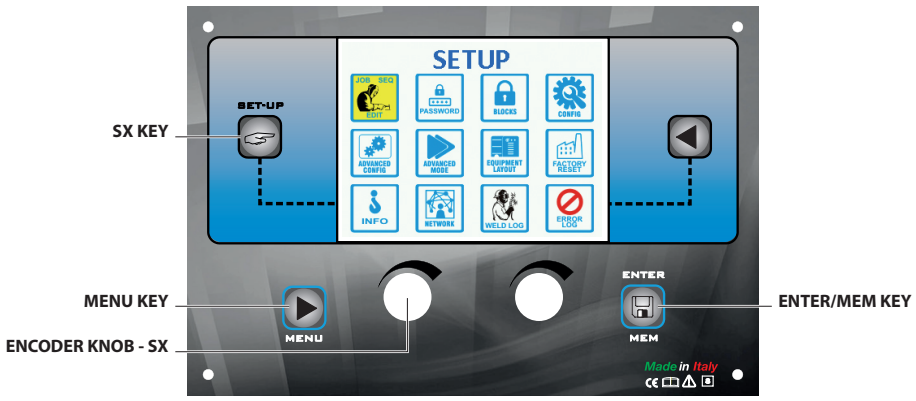
PLEASE NOTE: *After resetting has been completed, during normal operation of the machine, the* **EVOLUTION SCREEN** *will still show the error signal to inform the operator of the event ( ), but this can be removed visually from the display by simply pushing the* **MENU KEY**.

WARNING: *This only removes the visual error indication but not the history of what happened!*
If an **Error NOT automatically resettable** arises, to eliminate the alarm state and reinstate correct functioning of the machine, switch the plant off and then on again, or hold down the **DX KEY**.
When it is switched on again, the machine will be working again and the operator can weld again!
PLEASE NOTE: If, when switching on, the error status presents itself again, immediately contact Technical Assistance Department.

6.5.14. SETUP Menu

"EVOLUTION" CONTROLPANEL

To access the *SETUP Menu* hold down for at least **5** consecutive seconds the **SX KEY**.



MENU KEY	Used to exit the *SETUP Menu* and take the **EVOLUTION SCREEN** back to the entry phase.
ENCODER KNOB - SX	Used to scroll the various icons (sub-menus) in the menu and then select them.
ENTER/MEM KEY	Used to access the menu related to the icon selected.

WARNING:

- It is impossible to weld!
- If the **EVOLUTION SCREEN** is protected by a password, access to this menu will only be allowed by entering the correct password.

The icons (sub-menus) available and that can be viewed within the *SETUP Menu* are:

- JOB EDIT
- SEQ EDIT
- PASSWORD
- BLOCKS
- CONFIG
- ADVANCED CONFIG
- ADVANCED MODE
- EQUIPMENT LAYOUT
- FACTORY RESET
- INFO
- NETWORK
- WELD LOG
- ERROR LOG

ACCESSING THE SUB-MENUS	
	To access the sub-menus included in the *SETUP Menu*, you must: • Turn the **ENCODER KNOB - SX** to select the desired icon. • Push the **ENTER/MEM KEY**.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

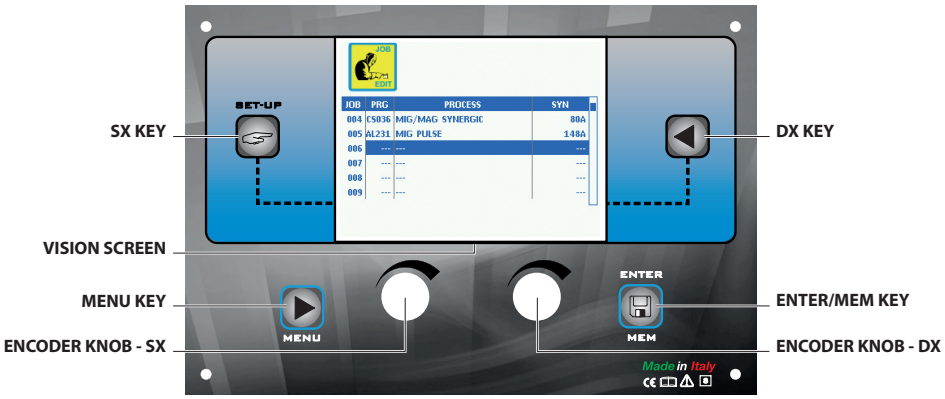
It is not possible to access the *SETUP Menu* and all the related sub-menus using the "FEEDER EVO-4R" control panel.

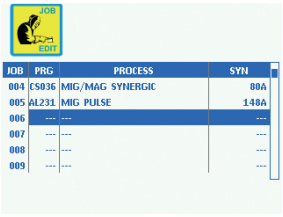
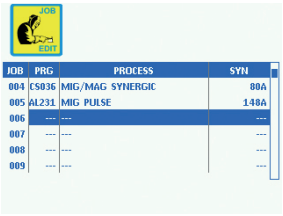
6.5.14.1. JOB EDIT

SETUP Menu

The purpose of this menu is to allow the operator to copy or delete a *JOB* (automatic welding point) entered previously.

To access the *JOB EDIT Menu* from the *SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



COPYING THE JOB SELECTED	
	To copy the *JOB* selected, proceed as follows: • Select the *JOB* to be copied by rotating the **ENCODER KNOB - SX**. • Push the **SX KEY**. • Choose the position to which the *JOB* selected is to be copied (or overwritten *) by rotating the • **ENCODER KNOB - SX**. • Push the **ENTER/MEM KEY** to confirm and finalise copying of the *JOB* selected. * In the case of overwriting, confirmation will be requested.
DELETING THE JOB SELECTED	
	To delete the *JOB* selected, proceed as follows: • Select the *JOB* to be deleted by rotating the **ENCODER KNOB - SX**. • Push the **DX KEY**. • Push the **SX KEY** to confirm and finalise deletion of the *JOB* selected. • To cancel the operation of deleting the *JOB* selected, push the **DX KEY**.

To exit the *JOB EDIT Menu* and go back to the *SETUP Menu*:
- Push the **MENU KEY**.

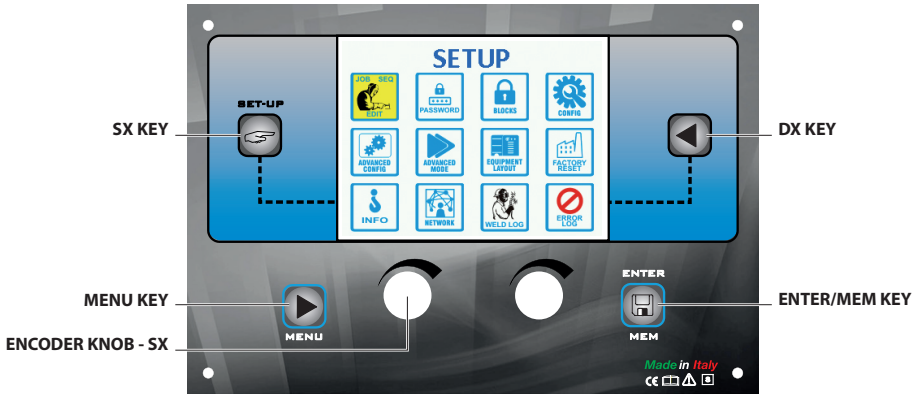
6.5.14.2. SEQ EDIT

SETUP Menu

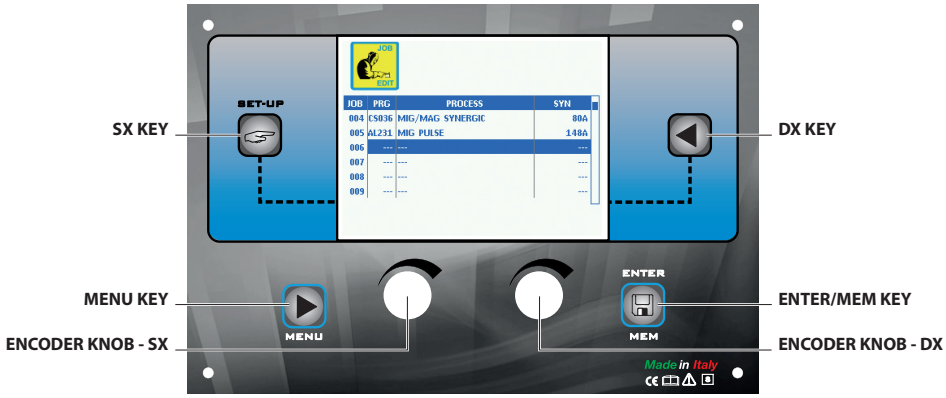
The purpose of this menu is to allow the operator to create, copy, overwrite, or delete a welding sequence.

To access the *SEQ EDIT Menu* from the *SETUP Menu*:

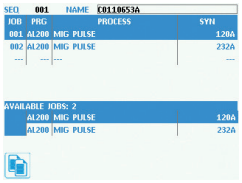
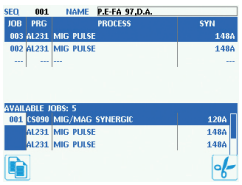
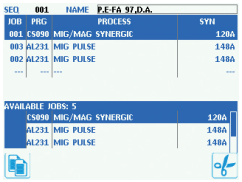
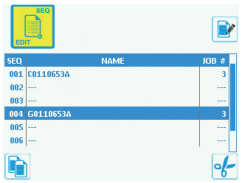
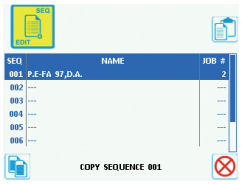
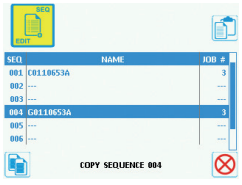
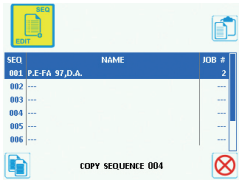
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



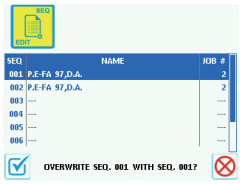
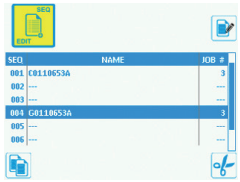
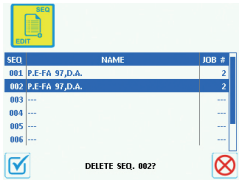
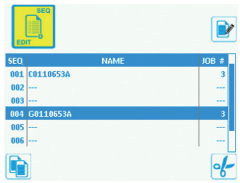
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



The following image appears:

CREATING A SEQUENCE	
	Use the **ENTER/MEM KEY** to create a new sequence.
	Use the **SX KEY** to add the JOB selected using the **ENCODER KNOB - DX** to the section of the sequence selected using the **ENCODER KNOB - SX**. The image shows the two jobs (001 and 003) added to the sequence. The yellow colour indicates that the JOBS have already been used. The JOBS already used can be used again in other sections of the sequence.
	Use the **DX KEY** to remove the JOB from the section of the sequence selected using the **ENCODER KNOB - SX**. Push the **ENTER/MEM KEY** to be able to edit the sequence name.
	Use the **ENCODER KNOB - DX** and the **ENCODER KNOB - SX** SX respectively to select the which of the characters available is required, and to move to the position of the next or the previous character. Once creation of the sequence has been completed, push the **MENU KEY** to save it. As you can see, the sequence number is shown on the left, the name of the sequence in the centre, and the total number of jobs used for the sequence on the right. Once the welding sequence has been created, the **SX KEY** can be used to copy it, the **DX KEY** to delete it, or the **ENTER/MEM KEY** to edit it.
COPYING A SEQUENCE	
	Select the sequence to be copied using the **ENCODER KNOB - SX** and push the **SX KEY**.
	The copy sequence 004 message displayed indicates that sequence 4 has been selected.
	Select the position of the sequence to be added, using the **ENCODER KNOB - SX** (e.g. in this case, position 6). Until the **DX KEY** is pushed of a new sequence is selected using the **SX KEY**, sequence 004 can be added in all the positions it is required.
	Push the **ENTER/MEM KEY** to copy the sequence.

(continued)

	If the sequence position chosen is already in use, when the **ENTER/MEM KEY** is pushed the image to the left is displayed. Push the **SX KEY** and sequence4 6 will be replaced by sequence 4, whereas the **DX KEY** cancels everything.
DELETING A SEQUENCE	
	Select the sequence to be deleted using the **ENCODER KNOB - SX** and push the **SX KEY**.
	Confirm using the **SX KEY** or cancel using the **DX KEY**.
EDITING A SEQUENCE	
	Select the position of the sequence to be edited using the **ENCODER KNOB - SX** and push the **ENTER/MEM KEY**. The sequence to be edited will be displayed, with all already described for creating the sequence.

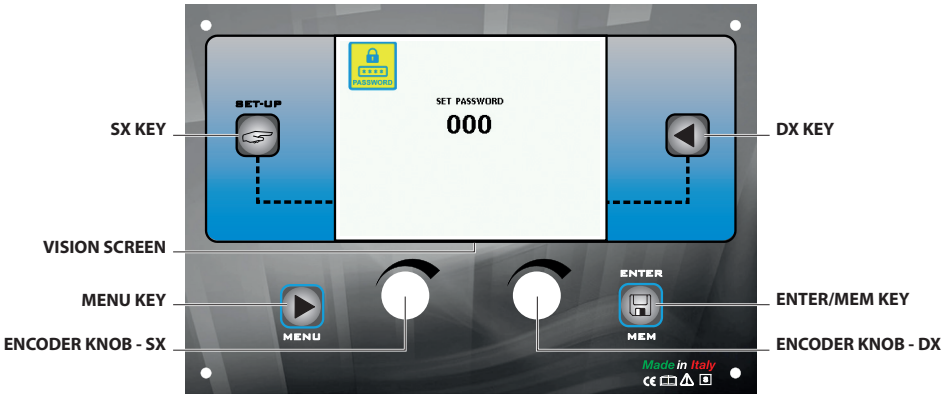
To exit the *JOB EDIT Menu* and go back to the *SETUP Menu*:

- Push the **MENU KEY**.

6.5.14.3. PASSWORD SETUP Menu

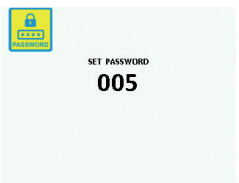
The purpose of this menu is to allow the operator to enter a *PASSWORD* for accessing the *SETUP Menu*.

To access the *PASSWORD Menu* from the *SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



The **EVOLUTION SCREEN** can have various configurations, the meaning of which is indicated in the table below.

Display EVOLUTION DESCRIPTION	Meaning
000	The *SETUP Menu* **ARE NOT** protected by any *PASSWORD*.
***	The *SETUP Menu* **ARE** protected by any *PASSWORD*.
Number between 001 and 999	The *SETUP Menu* **ARE** protected by a *PASSWORD* and this can be seen by the operator only because they are working inside the *SETUP Menu*.

ENTERING A NEW PASSWORD	
	To enter a new *PASSWORD* proceed as follows: • Make sure that the **EVOLUTION SCREEN** displays the text **000**. • Choose the new *PASSWORD* to be entered by rotating the **ENCODER KNOB - DX**. • Push the **ENTER/MEM KEY** to confirm the operation of entering the *PASSWORD*. • Push the **SX KEY** to confirm and finalise entering of the new *PASSWORD*. • To cancel the operation of entering a *PASSWORD* push the **DX KEY**.
EDITING THE EXISTING PASSWORD	
	**WARNING:** *This operation is only possible after having accessed the SETUP Menu using the password you wish to edit!* To edit the existing *PASSWORD* proceed as follows: Make sure the **EVOLUTION SCREEN** shows the *PASSWORD* entered previously (**a number that must be between 001 and 999**). • Choose the new *PASSWORD* to be entered by rotating the **ENCODER KNOB - DX**. • Push the **ENTER/MEM KEY** to confirm the operation of editing the *PASSWORD*. • Push the **SX KEY** to confirm and finalise editing of the *PASSWORD*. • To cancel the operation of editing a *PASSWORD* push the **DX KEY**.

(continued)

DELETING THE EXISTING PASSWORD	
	**WARNING:** *This operation is only possible after having accessed the SETUP Menu using the password you wish to delete!* To delete the existing *PASSWORD* proceed as follows: Make sure the **EVOLUTION SCREEN** shows the *PASSWORD* entered previously (**a number that must be between 001 and 999**). • Take the **EVOLUTION SCREEN** to number **000** by rotating the **ENCODER KNOB - DX**. • Push the **ENTER/MEM KEY** to confirm the deletion of the *PASSWORD*. • Push the **SX KEY** to confirm and finalise deleting of the *PASSWORD*. • To cancel the operation of deleting a *PASSWORD* push the **DX KEY**.

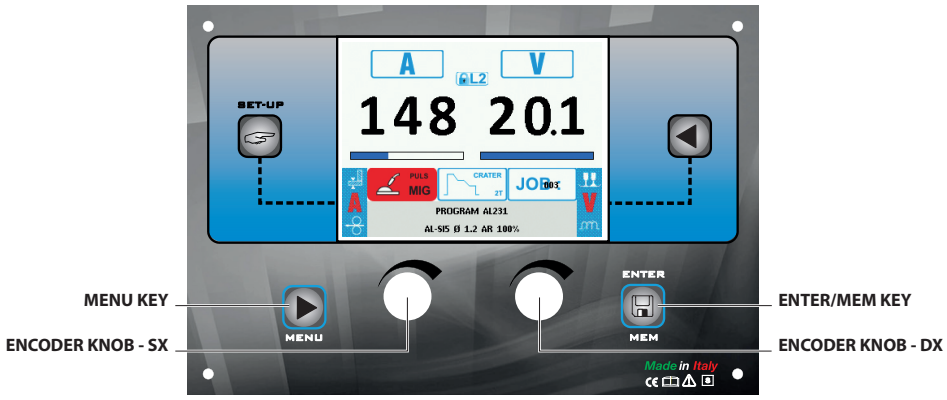
To exit the *PASSWORD Menu* and go back to the *SETUP Menu*:
- Push the **MENU KEY**.

6.5.14.4. BLOCKS **SETUP Menu**

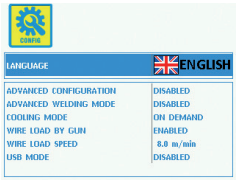
The purpose of this menu is to allow the operator to block or limit use of the welding machine and/or certain welding parameters / functions.

To access the *BLOCKS Menu* from the *SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.

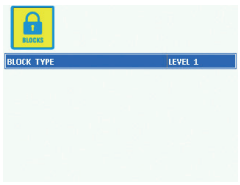
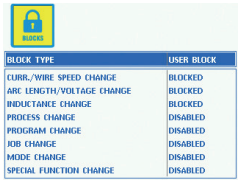
The image graphically shows how the type of block is shown on the **EVOLUTION SCREEN** when the welding machine is operating normally.



Within the *BLOCKS Menu* it is possible to select, by rotating the **ENCODER KNOB - DX**, the block required **(this operation does not require confirmation)** from the **4** options available:

Block type	Description
NONE 	BLOCK ABSENT or RELEASE MACHINE Does not allow any block to be activated on the welding machine, but allows the operator to release the machine if its was blocked previously.

(continued)

Block type	Description
LEVEL 1 	PARTIAL BLOCK The operator can weld using the parameters set prior to the block and may make adjustments and/or changes to the welding parameters using the knobs on the control panels on the welding machine and the wire feeder (if fitted).
LEVEL 2 	TOTAL BLOCK The operator can weld only using the parameters set prior to the block and cannot adjust and/or edit the welding parameters.
USER BLOCK 	PERSONALISED BLOCK Used to block or limit some adjustments and/or functions of the welding machine.

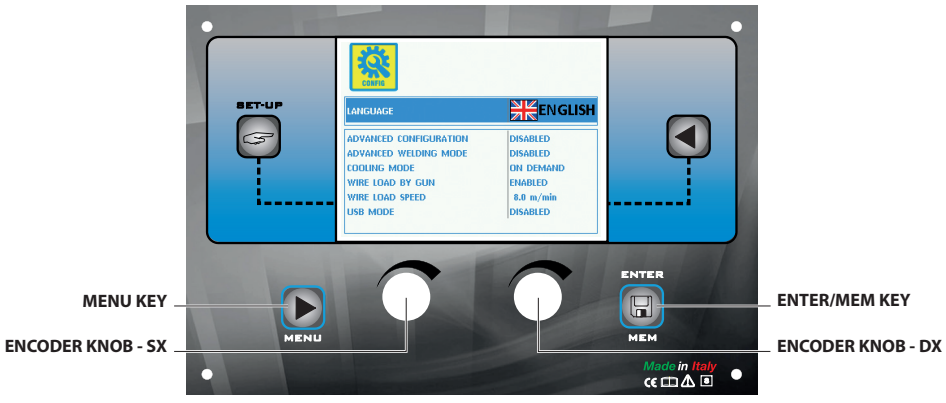
To exit the *BLOCKS Menu* and go back to the *SETUP Menu*:
- Push the **MENU KEY**.

6.5.14.5. CONFIG

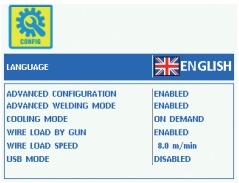
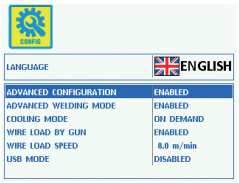
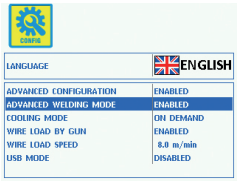
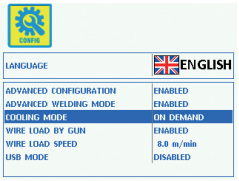
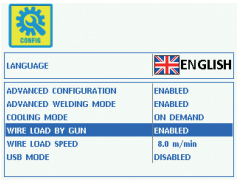
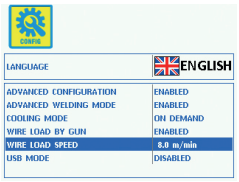
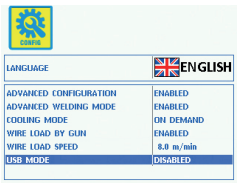
SETUP Menu

The purpose of this menu is to allow the operator to select the language used for the **EVOLUTION SCREEN**, change the *SETTINGS menu* to *ADVANCED SETTINGS menu*, enter advanced welding mode, set how cooling is managed, and set wire loading via the torch button.

To access the *CONFIG Menu* from the *SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



When the *CONFIG Menu* is open, the **ENCODER KNOB - SX** can be rotated to select the which of the 6 functions available is required. This can be enabled (**the operation does not require confirmation**) by rotating the **ENCODER KNOB - DX**.

Advanced function	Description
LANGUAGE 	Indicates the languages that can be set for the **EVOLUTION SCREEN**. As regards the procedure for selecting a language on the **EVOLUTION SCREEN** see the relevant paragraph in the manual ("Language Selection").
ADVANCED CONFIGURATION 	If enabled, this configuration offers the welder the following additional menus (the following icons will be created in the *ADVANCED SETUP Menu*): • ADVANCED CONFIG • WELD LOG
ADVANCED WELDING MODE 	If enabled, this configuration allows the welder to have further welding modes available to them (the following icons will be created in the *ADVANCED SETUP Menu*): • ADVANCED MODE
COOLING MODE 	This configuration allows the welder to set cooling as follows: WHEN REQUESTED. IIn this case, cooling is managed in relation to the welding done. ALWAYS ON. In this case, cooling comes on when the machine is switched on, and stays on until the machine is switched off. Cooling only stops when an alarm is activated.
WIRE LOAD BY GUN 	This configuration allows the welder to enable or disable the type of wire loading from the torch: ACTIVE. In this case wire loading is activated from the torch (also see relevant section). NOT ACTIVE. In this case, wire loading can only be done using the relevant button on the feeder.
WIRE LOAD SPEED 	The parameter is used to set the loading speed, both for the torch (if active) and for the feeder. The range for this parameter is 1,0 m/min to 22,0 m/min.
USB MODE 	ENABLE or DISABLE the USB port of the welding machine.

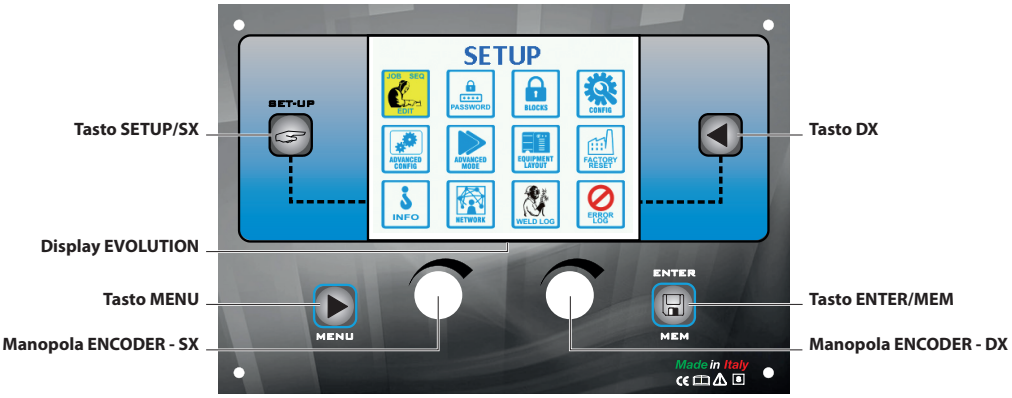
WARNING: *The additional menus are explained in the manual, in the "ADVANCED SETUP Menu" paragraph.*

To exit the *CONFIG Menu* and go back to the *SETUP Menu*:

- Push the **MENU KEY**.

6.5.15. ADVANCED SETUP Menu

"EVOLUTION" CONTROLPANEL



To access the *ADVANCED SETUP Menu* from any point on the control panel:

- Open the *SETUP Menu* by holding the **SX KEY** down for at least **5** consecutive seconds.
- Open the *CONFIG Menu* by rotating the **ENCODER KNOB - SX** until the icon required is reached, and then push the **ENTER/MEM KEY**.
- Access the ADVANCED CONFIGURATION function by rotating the **ENCODER KNOB - SX** and select ACTI-VATE by rotating the
- **ENCODER KNOB - DX**.
- Access the ADVANCED WELDING MODE function by rotating the **ENCODER KNOB - SX** and select ACTI-VATE by rotating the **EN- CODER KNOB - DX**.
- Access the PLANT CONFIGURATION function by rotating the **ENCODER KNOB - SX** and select ACTIVATE by rotating the **ENCOD- ER KNOB - DX**.
- Exit the *CONFIG Menu* by pushing the **MENU KEY**.
- At this stage the *SETUP Menu* has been transformed into the *ADVANCED SETUP Menu* and the **EVOLUTION SCREEN** displays the following additional icons:
  - ADVANCED CONFIG
  - ADVANCED MODE
  - EQUIPMENT LAYOUT
  - WELD LOG

MENU KEY	Used to exit the *ADVANCED SETUP Menu* and take the **EVOLUTION SCREEN** back to the welding phase.
ENCODER KNOB - SX	Used to scroll the various icons (sub-menus) in the menu and then select them.
ENTER/MEM KEY	Used to access the menu related to the icon selected.

WARNING:

- It is impossible to weld!
- If the **EVOLUTION SCREEN** is protected by a password, access to this menu will only be allowed by entering the correct password.

ACCESSING THE SUB-MENUS	
	To access the sub-menus included in the *ADVANCED SETUP Menu*, you must: • Turn the **ENCODER KNOB - SX** to select the desired icon. • Push the **ENTER/MEM KEY**.

"FEEDER EVO-4R" CONTROL PANEL (not used with EVOLUTION SP3-C)

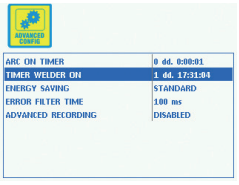
It is not possible to access the *ADVANCED SETUP Menu* and all the related sub-menus using the "FEEDER EVO-4R" control panel.

6.5.15.1. ADVANCED CONFIG — ADVANCED SETUP Menu

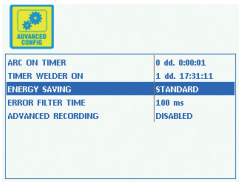
The purpose of this menu is to allow the operator to know the actual working time and operation of the welding machine, to con- figure the ENERGY SAVING mode in the best way to allow the best energy saving on the welding plant, and to be able to enable an analogue output on the welding plant that can be used for connecting total remote controls equipped with automatic recognition.

To access the *ADVANCED CONFIG Menu* from the *ADVANCED SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.

Within the *ADVANCED CONFIG Menu* the operator can view:

Advanced function	Description
ARC ON TIMER 	Indicates the actual time the machine is used for welding. **WARNING:** *This time can only be zeroed by means of a TOTAL RESET (see the relevant paragraph) of the welding plant.*
TIME WELDER ON 	Indicates the actual time the machine works, even when the screen saver is activated. **WARNING:** *This time can only be zeroed by means of a TOTAL RESET (see the relevant paragraph) of the welding plant.*

WARNING: *The content of the part of the menu described above is for information only, the operator cannot make any changes, they can only view and read the information available on the screen.*

Advanced function	Description
ENERGY SAVING 	By rotating the **ENCODER KNOB - DX** (**this operation does not require confirmation**) it is possible to choose the energy saving mode you prefer from the **3** available for the welding plant: • **STANDARD -** Energy saving is achieved by the screen saver being activated for the screens on both the generator and the feeder after a set time that cannot be changed by the operator (see the relevant paragraph). • **ULTRA -** Energy saving is obtained by the screens on the generator and the feeder being switched off after a set time, equal to that for the screen saver, which cannot be changed by the operator. • **EXTRA -** Energy saving is obtained by the screens on the generator and the feeder switching off as soon as the machine is switched on.
ERROR FILTER TIME 	This is used to set the minimum time an alarm remains active before it is displayed.
	Allows CQM software (if installed) to be used in free (inactive) or automatic (active) recording mode.

To exit the *ADVANCED CONFIG Menu* and go back to the *ADVANCED SETUP Menu*:
- Push the **MENU KEY**.

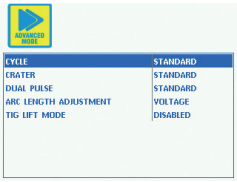
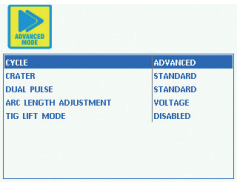
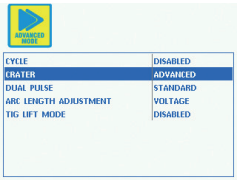
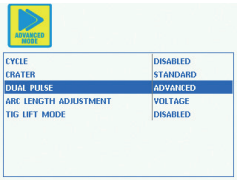
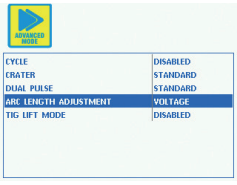
6.5.15.2. ADVANCED MODE

ADVANCED SETUP Menu

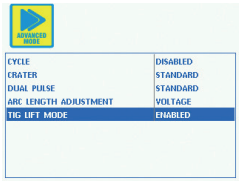
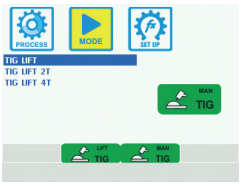
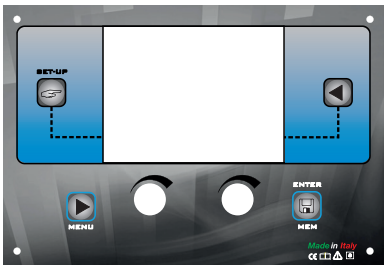
The purpose of this menu is to allow the operator to further refine adjustments to the welding parameters for the machine.

To access the *ADVANCED MODE Menu* from the *ADVANCED SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.

Within the *ADVANCED MODE Menu* it is possible, by rotating the **ENCODER KNOB - SX**, to choose the advanced welding mode re- quired from the **4** available (according to the welding process selected) and this can be ACTIVATED **(this operation does not require confirmation)** by rotating the **ENCODER KNOB - DX**.

Advanced function	Description
CYCLE   	If enabled, when operating in STANDARD or ADVANCED mode, this function provides the operator with a further welding mode (CYCLE) and the special functions associated with it, when using MIG (pulsed, double pulsed, synergic, or manual) welding processes: • CURRENT CYCLE, CYCLE WIRE SPEED (see TAB. A/B parameter F19). • CYCLE ARC LENGTH, CYCLE VOLTAGE (see TAB. A/B parameter F20). • FIRST SLOPE (from I1 to I2) see TAB. A/B parameter F18) - advanced cycle only. • SECOND SLOPE (from I2 to I1) (see TAB. A/B parameter F21) - advanced cycle only. The *WELDING MODE SELECTION Menu (MODE)* menu will therefore be changed. This function can only be activated, with the above procedure, on the **EVOLUTION DISPLAY**, whilst it can also be set on the FEEDER EVO-4R drag-and-drop once it is activated. See the special "WELD MODE SELECTION Key" paragraph for correct functioning of the CYCLE welding mode.
CRATER  	If enabled, when working in ADVANCED mode, this function provides the operator with further welding modes related to the CRATER as well as the **2** special functions explained below that make it possible to vary the length of the arc in the welding crater, when using MIG (pulsed, double pulsed, synergic, and manual) welding processes. • INITIAL ARC LENGTH, INITIAL VOLTAGE (see TAB. A/B parameter F09) • FINAL ARC LENGTH, FINAL VOLTAGE (see TAB. A/B parameter F14)
DOUBLE PULSED  	If enabled, when working in ADVANCED mode, this function provides the operator with the following special functions, when using the double pulsed MIG welding process: • DOUBLE PULSED ARC LENGTH (F24) Allows the welder to adjust the length of the arc on both double pulsed levels. • FIRST SLOPE (from **I1** to **I2**) (see TAB. A parameter F22) • SECOND SLOPE (from **I2** to **I1**) (see TAB. A parameter F27) These two special functions allow the welder to adjust the ramp for passing between the two double pulsed levels.
ARC LENGTH ADJUSTMENT  	This function allows an operator using the (pulsed, double pulsed, synergic and manual) MIG welding process to adjust the *ARC LENGTH ADJUSTMENT* (⏚) parameter with the *WELDING VOLTAGE* **V** or the *WIRE SPEED* (⊖).

(continued)

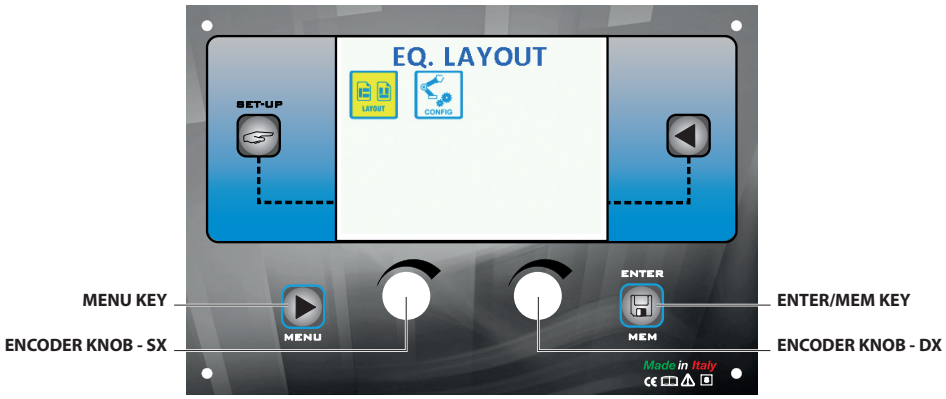
Advanced function	Description
MODO TIG LIFT   	If activated, this function makes an additional welding mode known as TIG LIFT TORCH TRIGGER available to an operator using the TIG LIFT welding process. In this mode the welder can control the *WELDING CURRENT* (**A**) parameter, using the button on the TIG torch. ***WARNING: To allow TIG LIFT WITH TORCH TRIGGER welding, the DIGITECH*** ***PULSE needs a specific female connector to be fitted on it (NON-STANDARD MACHINE) to which the corresponding male connector on the TIG torch is to be connected.*** Therefore, for the TIG LIFT welding process, a new menu will be created (see figure) named *WELDING MODE SELECTION Menu (MODE)*. **WELDING MODE SELECTION Menu(MODE)** To access the *WELDING MODE SELECTION Menu (MODE)* push the **MENU KEY**.
 	**"EVOLUTION"CONTROL PANEL** **MENU KEY** - Used to access subsequent menus, where applicable. **ENCODER KNOB - SX** - Selects the welding mode. **ENTER/MEM KEY** - Used to access the *PRE-SETTING* for the program selected beforehand, with the welding *MODE* chosen. **"FEEDER EVO-4R" CONTROL PANEL** It is not possible to access the *WELDING MODE SELECTION Menu (MODE)* via the "FEEDER EVO-4R" control panel.

To exit the *ADVANCED MODE Menu* and go back to the *ADVANCED SETUP Menu*:
- Push the **MENU KEY**.

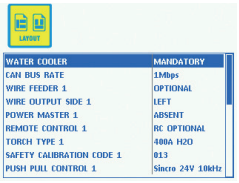
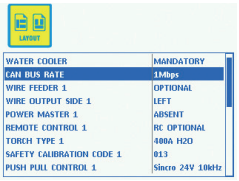
6.5.15.3. EQUIPMENT LAYOUT — ADVANCED SETUP Menu

The purpose of this menu is to allow the operator to manage connections of components and accessories that are part of the welding plant.

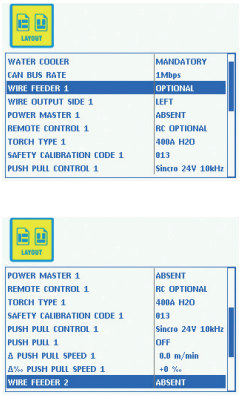
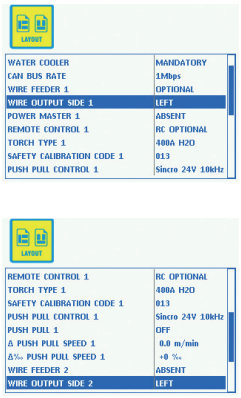
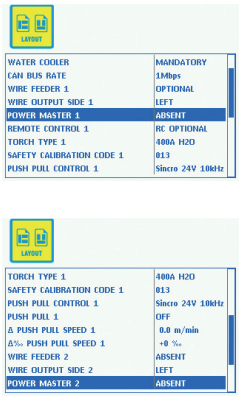
To access the *EQUIPMENT LAYOUT Menu* from the *SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



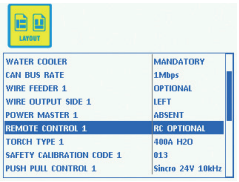
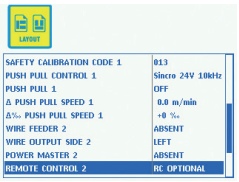
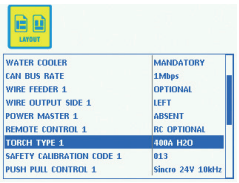
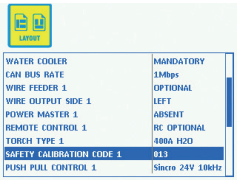
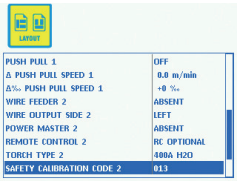
Within the *EQUIPMENT LAYOUT Menu*, it is possible, by rotating the **ENCODER KNOB - SX**, to select the component of the welding plant, while by rotating the **ENCODER KNOB - DX**, you can decide the type of connection required (e.g. Optional) or the type of component (e.g. Torch 400 A H2O) that is to be connected to the plant **(this operation does not require confirmation)**.

Advanced function	Description
WATER COOLER 	OPTIONAL - Means that the water cooler system may or may not be connected to the welding machine. OBLIGATORY - Means that it is obligatory for the water cooler system to be connected to the welding plant. A error condition is generated when: • Switching on or at any other time if the welding plant does not detect the presence. • During normal operation if the water cooler system is disconnected. Also see the CONFIG menu if it is necessary to keep the cooling system working continuously.
CAN BUS SPEED 	1Mbps - Means that the transmission speed on the CAN BUS is set to 1Mb per second. 1Mbps - Means that the transmission speed on the CAN BUS is set to 500Kb per second (only for extensions exceeding 40m)

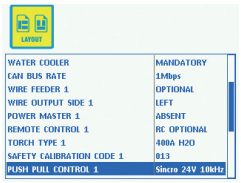
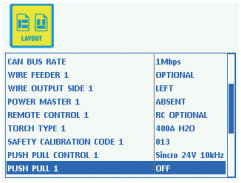
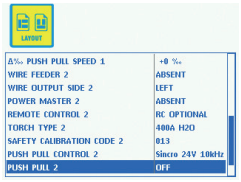
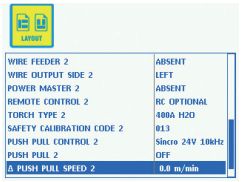
(continued)

Advanced function	Description
WIRE FEEDER 1 / WIRE FEEDER 2  	OPTIONAL - This means that FEEDER 1-2 can or cannot be connected to the welding plant. Once feeder 1-2 is detected when the plant is switched on, its presence becomes obligatory. OBLIGATORY - This means that it is obligatory for FEEDER 1-2 to be connected to the welding plant, even when the plant is switched on. A error condition is generated when: • When switched on, if the welding plant does not detect its presence. • During normal operation if the wire feeder is disconnected. MISSING - Means that feeder 2 must not be managed by the plant, even if it is connected up. **NOTE:** *If the second feeder is not connected up, all the settings relate to feeder 1.* **NOTE:** *The FEEDER 2 section must also be set to allow feeder 2 to work in a robotised plant.*
LATO USCITA FILO 1 / LATO USCITA FILO 2  	Shows the exit point (right or left) of the welding rod away from the control panel.
POWER MASTER 1 / POWER MASTER 2  	OPTIONAL - Means that POWER MASTER 1-2 may or may not be connected to the welding system. Once POWER MASTER 1-2 is detected during system start-up, its presence becomes mandatory. MANDATORY - It means that it is mandatory to connect POWER MASTER 1-2 to the welding system also when turning on the system. Error condition is generated when: • At start-up if the welding system does not detect its presence. • During ordinary operation if it is disconnected. ABSENT - Means that POWER MASTER 2 must not be managed by the system even if it is being connected. **NOTE:** Section POWER MASTER 2 must be set up also for POWER MASTER 2 operation in a robotic system.

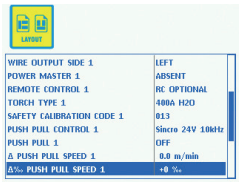
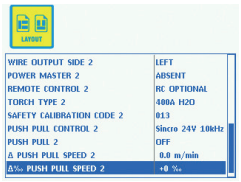
(continued)

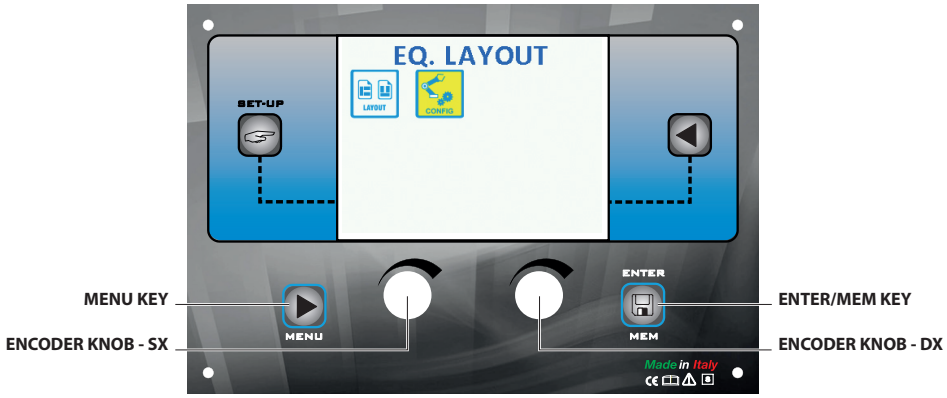
Advanced function	Description
REMOTE CONTROL 1 / REMOTE CONTROL 2   	DISABLED - Means that REMOTE CONTROL 1-2 must not be managed by the plant, even if it is connected up. OPTIONAL - This means that REMOTE CONTROL 1-2 can or cannot be connected to the welding plant. If it is disconnected while the plant is running, no alarm is raised. OBLIGATORY - This means that it is obligatory for REMOTE CONTROL 1-2 to be connected to the welding plant, even when the plant is switched on. A error condition is generated when: • Switching on or at any other time if the welding plant does not detect the presence (only if set as obligatory). • During normal operation, if the remote control is disconnected. **WARNING:** *For indications on use and functioning of the ANALOGIC RC remote control see the manuals for the welding machine and the wire feeder, enclosed with the documentation.*
TORCH TYPE 1 / TORCH TYPE 2   	Used to set the TORCH TYPE 1/2 that will subsequently be connected to the welding plant. This operation must be done in order to size the plant correctly and as a result, the welding parameters.
SAFETY CALIBRATION CODE 1 / SAFETY CALIBRATION CODE 2   	By turning **ENCODER KNOB - DX**, go to CALIBRATION value to read and check instruments values (voltmeter and ammeter) of the power source.

(continued)

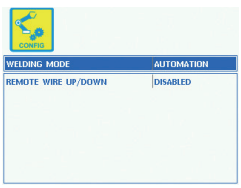
Advanced function	Description
CONTROLLO PUSH PULL 1 / CONTROLLO PUSH PULL 2   	Indicates the PUSH PULL HARDWARE control type inside the welding machine and more specifically: • RESIST. 24 if there is a resistance. - Sincro 24 if there is a synchro card.
PUSH PULL 1 / PUSH PULL 2   	Indicates the PUSH PULL type used. When the knob is moved to the OFF position the push pull is not managed.
Δ VELOCITÀ PUSH PULL 1 / Δ VELOCITÀ PUSH PULL 2   	Indicates the absolute speed deviation of the push pull 1-2 from the factory default value.

(continued)

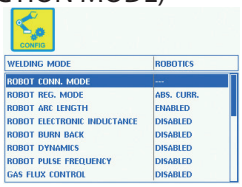
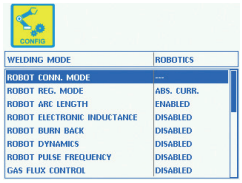
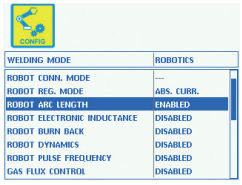
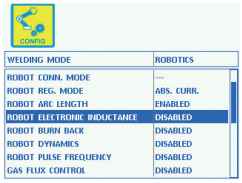
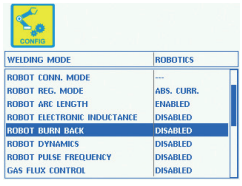
Advanced function	Description
Δ ‰ VELOCITÀ PUSH PULL 1 / Δ ‰ VELOCITÀ PUSH PULL 2   	Indicates the relative speed deviation of the push pull 1-2 from the factory default value.



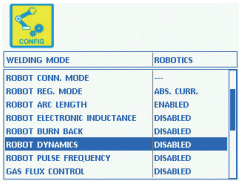
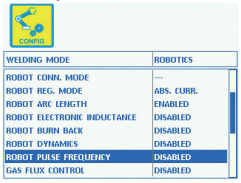
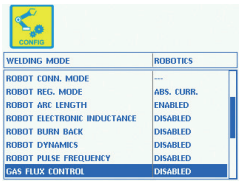
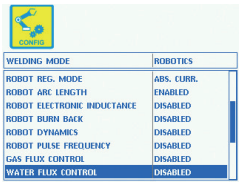
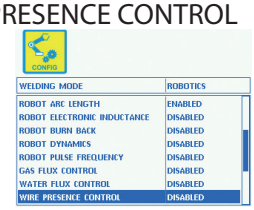
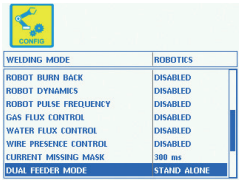
When in the *CONFIG menu*, rotate the **ENCODER KNOB - SX** to select activation of robot configuration.
NOTE: *If robot configuration is activated when no robot interface is connected, an error message will be displayed and it will not be possible to weld.*

Advanced function	Description
ROBOT WELDING   	MANUAL SELECTION - Means that manual welding is used. AUTOMATIC SELECTION/ROBOT - Means that welding is enabled with the robot interface board. Once this function has been selected, the welding plant will require the robot interface board to be connected correctly. If this is not the case, an error message will be displayed and it will not be possible to weld.

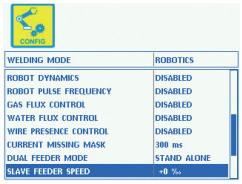
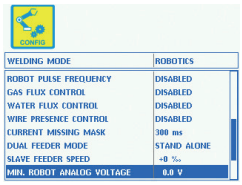
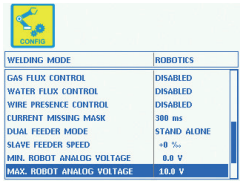
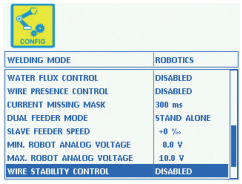
(continued)

Advanced function	Description
ROBOT CONN. MODE (ROBOT CONNECTION MODE) 	RI-A 1 - Means that the presence of an interface board for analogue / digital type robots is detected RI-D 2 - Means that the presence of an interface board for Device net type robots is detected ------- - Means that no type of robot board is detected
ROBOT REG. MODE (ROBOT REGULATION MODE) 	ASS. CURRENT - In this mode, a MINIMUM ROBOT ANALOGUE V - MAXIMUM ROBOT ANALOGUE V (*) input corresponds to a current supplied of 0-500A. REL. CURRENT - In this mode, a MINIMUM ROBOT ANALOGUE V - MAXIMUM ROBOT ANALOGUE V (*) input corresponds to extreme currents on the welding curve used. ASS. WIRE SPEED - In this mode, a MINIMUM ROBOT ANALOGUE V - MAXIMUM ROBOT ANALOGUE V (*) input corresponds to a wire speed of 0-25 m/min. REL. WIRE SPEED - In this mode, a MINIMUM ROBOT ANALOGUE V - MAXIMUM ROBOT ANALOGUE V (*) input corresponds to extreme wire speeds on the welding curve used. (*) These values can be set as described below.
ROBOT VOLTAGE 	NOT ACTIVE - In this mode, regulation of the ARC LENGTH is active, via the welding machine's panel. ACTIVE - In this mode, regulation of the ARC LENGTH is active, via the robot interface board.
ROBOT ELECTRONIC INDUCTANCE 	NOT ACTIVE - In this mode, regulation of the ELECTRONIC INDUCTANCE is active, via the welding machine's panel. ACTIVE - In this mode, regulation of the ELECTRONIC INDUCTANCE is active, via the robot interface board.
ROBOT BURN BACK 	NOT ACTIVE - In this mode, regulation of the BURN BACK is active, via the welding machine's panel. ACTIVE - In this mode, regulation of the BURN BACK is active, via the robot interface board.

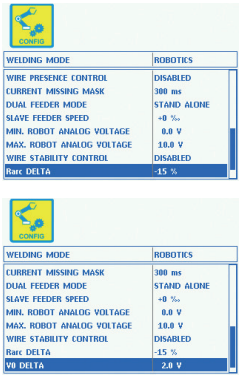
(continued)

Advanced function	Description
ROBOT DYNAMICS 	NOT ACTIVE - In this mode, DYNAMIC regulation is active, via the welding machine's panel. ACTIVE - In this mode, DYNAMIC regulation is active, via the robot interface board.
ROBOT PULSE FREQ. (ROBOT PULSE FREQUENCY) 	NOT ACTIVE - In this mode, PULSATION FREQUENCY regulation is active, via the welding machine's panel. ACTIVE - In this mode, PULSATION FREQUENCY regulation is active, via the robot interface board.
GAS FLUX CONTROL 	NOT ACTIVE - In this mode the GAS FLOW input for the MCB-3 motor control box is ignored. ACTIVE - In this mode the GAS FLOW input for the MCB-3 motor control box is checked, and if necessary the relevant alarm is activated.
WATER FLUX CONTROL 	NOT ACTIVE - In this mode the WATER FLOW input for the MCB-3 motor control box is ignored. ACTIVE - In this mode the WATER FLOW input for the MCB-3 motor control box is tested, and if necessary the relevant WATER FAULT alarm is activated via the output of the box.
WIRE PRESENCE CONTROL 	NOT ACTIVE - In this mode the WIRE PRESENCE input for the MCB-3 motor control box is ignored. ACTIVE - In this mode the WIRE PRESENCE input for the MCB-3 motor control box is tested, and if necessary the relevant WIRE MISSING alarm is activated via the robot interface board.
CURRENT MISSING MASK 	XXX [ms] - During and on completion of welding, this indicates the time lapse between current zeroing and deactivation of the CURRENT SENSE digital output on the robot interface board.
DUAL FEEDER MODE 	SEPARATE - If a double feeder is chosen in the EQUIPMENT LAYOUT menu, in this mode the second feeder operates separately from the first. SLAVED - If a double feeder is chosen in the EQUIPMENT LAYOUT menu, in this mode the second feeder operates simultaneously with and parallel to the first.

(continued)

Advanced function	Description
SLAVE FEEDER SPEED 	The parameter indicates the speed difference in ‰ for the slave feeder, compared to the main feeder.
MIN. ROBOT ANALOG VOLTAGE  MAX. ROBOT ANALOG VOLTAGE 	These parameters are used to set the maximum and minimum voltage settings used to control the robot board's analogue inputs. The settable values are: MINIMUM ROBOT ANALOGUE V from 0V to 2V MAXIMUM ROBOT ANALOGUE V from 5V to 14,5V
WIRE STABILITY CHECK 	If enabled, it is possible to check the wire stability during welding, based on the values recorded during the acquisition procedure described below. If the thresholds are exceeded, when the control is enabled, an error is generated which immediately stops the welding (see E9.2 in the section describing errors). **ACQUISITION PROCEDURE DESCRIPTION** **(only in robotics and pulsed process)** It is possible to enable the wire stability check procedure (pulsed arc) as follows: • Turn the parameter on (in the CONFIG menu select ENABLE). At this point, go back to the welding window displaying the icon in the top left corner indicating that the control is active without calibration. • Start the robot welding process several times until the desired result is achieved. At this point, while welding, press the red keys simultaneously for at least 5 seconds. • The relevant icon will appear during acquisition. • Once the welding is complete, the icon in the top left corner will appear, indicating that the control is active, calibrated and waiting to start. • Enable welding, the WARM UP icon will appear during the first 3 seconds. • Then will appear the icon indicating that the system will activate the welding control, generating, if necessary, error E9.2 that will immediately stop the welding if values acquired during calibration are not respected.

(continued)

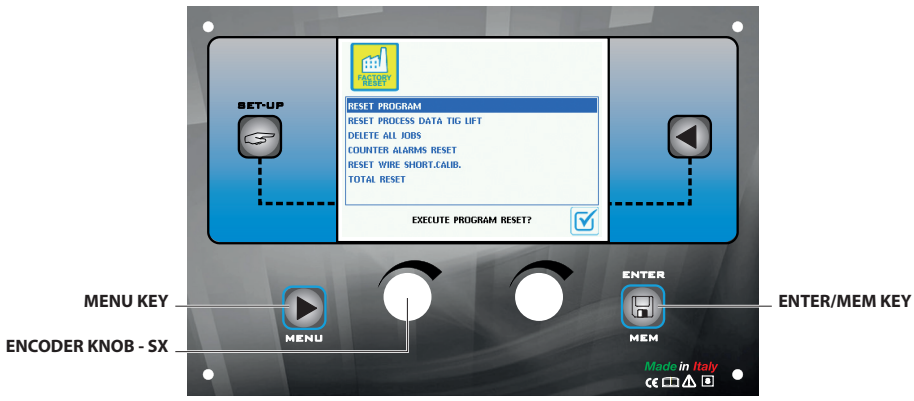
Advanced function	Description
VAR. Rarc - VAR V0 	Setting these parameters defines the thresholds (absolute values and percentages) of system intervention in relation to the values acquired during the calibration procedure described above.

Per uscire dal *Menu EQUIPMENT LAYOUT* e ritornare al *Menu IMPOSTAZIONI AVANZATE*:
- Push the **MENU KEY**.

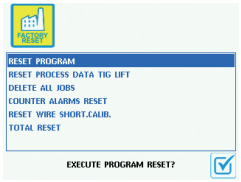
6.5.15.4. FACTORY RESET — SETUP Menu

The purpose of this menu is to allow the operator to return the welding machine partially or totally to the factory settings.

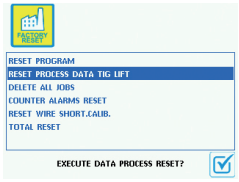
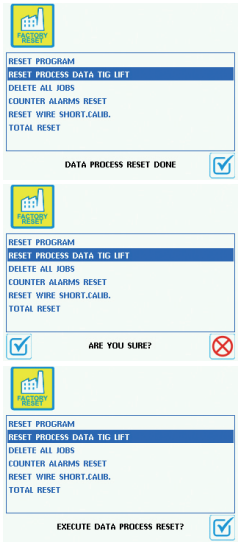
To access the *FACTORY RESET Menu* from the *SETUP Menu*:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



Within the *FACTORY RESET Menu* it is possible, by rotating the **ENCODER KNOB - SX**, to select the individual *RESET* required, from the **5** functions available:

Function	Description
RESET PROGRAMMA 	Used to return the *Special functions (Fx)* of the PROGRAM that the operator is using to their DEFAULT settings (only for welding processes for which welding programs are set beforehand). **NOTE:** *The welding PROGRAM NUMBER for which the Special Functions (Fx) are to be returned to the factory settings is indicated on the* **EVOLUTION SCREEN**.

(continued)

Function	Description
RESET DATI PROCESSO 	Used to return the *Special functions (Fx)* of the welding PROCESS the operator is using to their DEFAULT settings. **NOTE:** *The welding PROCESS for which the Special Functions (Fx) are to be returned to the factory settings, is indicated on the* **EVOLUTION SCREEN**.
DELETE ALL JOBS 	Used to delete all the *JOBS* saved previously by the operator. **WARNING:** *Remember that, when it leaves the factory the welding machine DOES NOT HAVE any JOB saved in it!*
COUNTER ALARMS RESET 	Used to reset the counters for all the alarms (Curr. - Tot see *ERROR LOG Menu*) that have occurred in the welding plant. **WARNING:** *This operation resets the counters for the alarms but does not delete the individual alarms!*
TOTAL RESET 	Used to return the welding plant to the factory settings. **WARNING: Resetting will take place as soon as the key is released to confirm the operation!**
	All the functions included in this menu can be used as follows: Choose the function (e.g. RESET PROCESS DATA) that you intend to use by rotating the **ENCODER KNOB - SX**. EXECUTE PROCESS DATA RESETTING by pushing the **DX KEY**. PROCEED by finalising the reset by pushing the **SX KEY** or cancel the operation by pushing the **DX KEY**.

To exit the *FACTORY RESET Menu* and go back to the *SETUP Menu*:

- Push the **MENU KEY**.

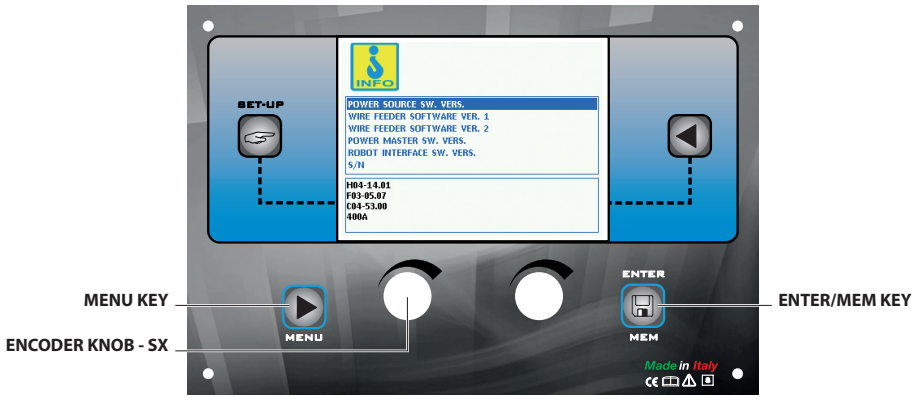
6.5.15.5. INFO

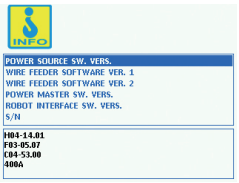
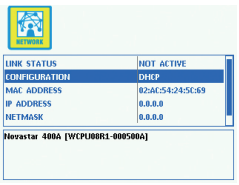
SETUP Menu

The purpose of this menu is to allow the operator to know what version of the software has been loaded into each component that is part of the welding plant.

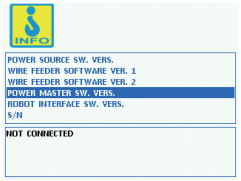
To access the *INFO Menu* from the *SETUP Menu*:

- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.

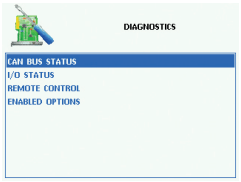
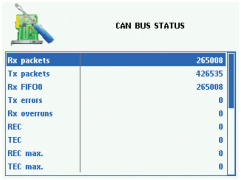
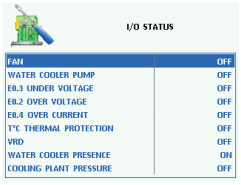
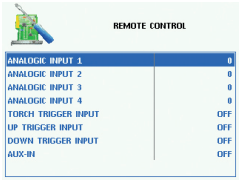


Software	Description
POWER SOURCE SW. VERS. 	Indicates the version of the software loaded into the welding machine.
WIRE FEEDER SOFTWARE VERS. 1/2 	This indicates the software version loaded in feeder 1/2, if applicable.
ROBOT INTERFACE SW. VERS. 	This indicates the software version loaded in the robot interface board, if applicable.

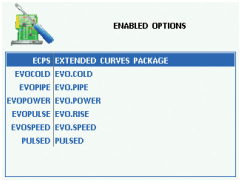
(continued)

Software	Description
S/N 	This indicates the serial number for the microprocessor contained in the digital interface board. This is the serial number required for loading special functions at additional cost.
NETWORK BRIDGE SOFTWARE VERSION 	This indicates the network interface software version loaded in the board. There are also identity codes that are only required for assistance, and can be requested if the network malfunctions.

A diagnostics menu can also be accessed by holding down the **DX KEY** and the **DX KEY** for three seconds.

Software	Description
DIAGNOSTICS MENU 	This menu has 4 diagnostics windows: • CAN BUS STATUS • I/O STATUS • REMOTE CONTROLS STATUS • ENABLED OPTIONS
CAN BUS STATUS 	Number of packages transmitted and received (Rx.. and TX..) and the number of transmission errors.
I/O STATUS 	The status of the inputs and outputs on the generator.
REMOTE CONTROLS STATUS 	The status of the inputs: • ANALOGUE INPUT 1 (synergic remote control input) • ANALOGUE INPUT 2 (arc length remote control input) • ANALOGUE INPUTS 3 & 4 not connected • TORCH BUTTON • UP AND DOWN BUTTONS on the torch • AUX-IN not connected

(continued)

Software	Description
ENABLED OPTIONS 	The special programs enabled, specifically: • PULSED • ECP estended curves package • EVO.COLD • EVO.PIPE • EVO.POWER • EVO.ULTRASPEED

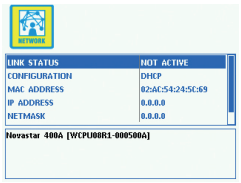
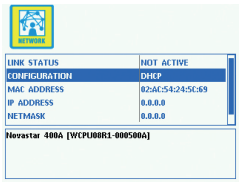
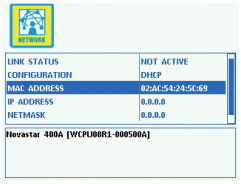
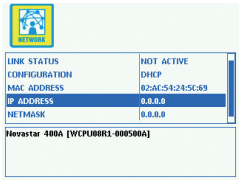
The contents of thus menu are for information only, the operator cannot change anything they can only read the information con- tained by scrolling the various options available in the menu by rotating the **ENCODER KNOB - SX**.
To exit the *INFO Menu* and go back to the *SETUP Menu*:

- Push the **MENU KEY**.

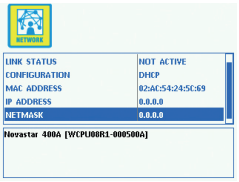
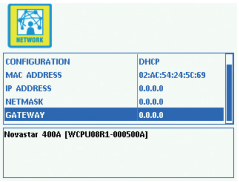
6.5.15.6. NETWORK

SETUP Menu

This menu is used to view the settings for the Ethernet network if connected. If not, the following image is displayed:

Function	Description
LINK STATUS 	This indicates that the welding machine has an active connection to the Ethernet network.
CONFIGURATION 	This indicates the type of network configuration used. The DHCP protocol is obligatory.
MAC ADDRESS 	Indicates the MAC ADDRESS type used.
IP ADDRESS 	This indicates the IP address to which the welding machine has been assigned.

(continued)

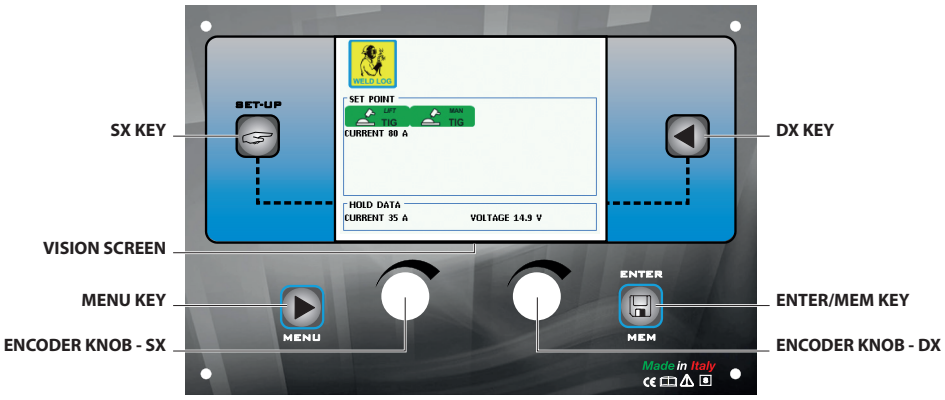
Function	Description
NETMASK 	This indicates the sub-network template number to which the welding machine has been assigned.
GATEWAY 	This indicates the gateway number to which the welding machine has been assigned.

To exit the *DATA IN-OUT Menu* and go back to the *SETUP Menu*:
- Push the **MENU KEY**.

6.5.15.7. WELD LOG **ADVANCED SETUP Menu**

The purpose of this menu is to allow the operator to know the latest welding parameters set on the machine, as well as the latest data saved on the machine.

To access the WELD LOG Menu from the ADVANCED SETUP Menu:
- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY.**



The content of this menu is for information only, the operator cannot make any changes, they can only read the information available on the screen.

To exit the WELD LOG Menu and go back to the ADVANCED SETUP Menu:
- Push the **MENU KEY.**

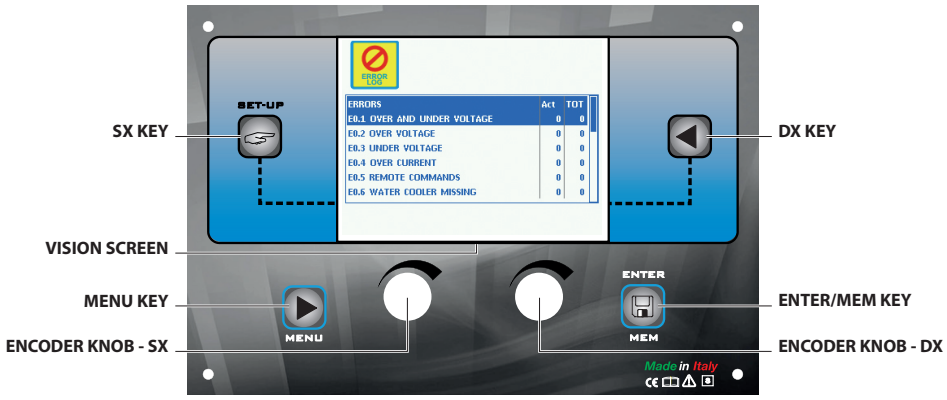
6.5.15.8. ERROR LOG

SETUP Menu

The purpose of this menu is to allow the operator to know, interpret, and understand error conditions that have occurred or may be encountered on the welding plant.

To access the *ERROR LOG Menu* from the *SETUP Menu*:

- Turn the **ENCODER KNOB - SX** to select the desired icon.
- Push the **ENTER/MEM KEY**.



Within the menu the following is indicated for each individual error:

- Its code (e.g. E1.0).
- A short description (e.g. no configuration file).
- The number of times this has occurred since the last time the machine was switched on (Curr).
- The number of times this has occurred since the last ALARM COUNTER RESET or TOTAL RESET (Tot.) of the welding machine.
- Errors that have occurred on the welding plant and subsequently been corrected, but not yet partially reset, are highlighted in yellow.
- Errors that have occurred on the welding machine, but that have not yet been resolved and so are still active, are highlighted in red.

RESET Curr (RESET PARTIAL ERROR COUNT)	
	The counter that indicates how many times a error or alarm has occurred since the last time the machine was switched on is part of this menu, and can be zeroed as follows: • Choose the error for which the partial counter (Curr) must be reset by rotating the **SX - ENCODER KNOB**. • The **EVOLUTION SCREEN** displays an icon in the bottom right corner (see image) that indicates that you can proceed with resetting. • Hold down the **DX KEY** until resetting of the (Curr) counter has been completed.

Within the menu, by rotating the **ENCODER KNOB - SX** it is possible to scroll the errors (also indicated in the table below), view them and select them.

Error condition	Error code	Error description and possible diagnosis
Err	E0.0	POWER SUPPLY FAILURE **NON automatic reset error.** This error can only arise when switching on and not when the welding plant is working normally. Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E0.1	OVER AND UNDER VOLTAGE Automatic reset error.
Err	E0.2	OVER VOLTAGE Automatic reset error.
Err	E0.3	UNDER VOLTAGE Automatic reset error.
Err	E0.4	OVER CURRENT Automatic reset error.
Err	E0.5	REMOTE COMMANDS No feed for remote commands. **NON automatic reset error.**
Err	E0.6	WATER COOLER MISSING **NON automatic reset error.** Check that the WATER COOLER SYSTEM - OBLIGATORY function is included within the *ADVANCED SETUP Menu / EQUIPMENT LAYOUT*. After this initial check you need to know that this error can only occur in the following cases: • Water cooler system not connected to the welding machine. • The welding machine does not recognise the water cooler system, even though it is connected correctly. • Water cooler system disconnected when the machine is operating normally. Once the water cooler system has been reactivated, this error condition **resets itself automatically**! If the alarm occurs even when the WATER COOLER SYSTEM - OPTIONAL function is included in the *ADVANCED SETUP Menu / EQUIPMENT LAYOUT*, **call Technical Assistance Department immediately**.
Err	E0.7	MOTOR FAULT **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.

(continued)

Error condition	Error code	Error description and possible diagnosis
Err	E0.8	WIRE FEEDER MISSING **NON automatic reset error.** Check that the WIRE FEEDER - OBLIGATORY function is included within the *ADVANCED SETUP Menu / EQUIPMENT LAYOUT*. After this initial check you need to know that this error can only occur in the following cases: • Wire feeder not connected to the welding machine. • The welding machine does not recognise the wire feeder, even though it is connected correctly. • Wire feeder disconnected when the machine is operating normally. Once the wire feeder has been reactivated, this error condition **resets itself automatically**! If the alarm occurs even when the WIRE FEEDER - OPTIONAL function is included in the *ADVANCED SETUP Menu / EQUIPMENT LAYOUT*, **call Technical Assistance Department immediately**.
Err	E0.9	CAN INTERNAL ERROR Faulty communication between the generator and the feeder. **NON automatic reset error.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	T°C	THERMAL PROTECTION The welding stops due to an excessively high temperature (thermostat activated). Automatic reset error.
Err	H2O	COOLER PRESSURE The fluid in the cooling system is at low pressure. **NON automatic reset error.**
Err	E1.0	CONFIG. FILE MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E1.1	USER FILE MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E1.2	TORCH FILE MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E1.3	CALIBRATION FILE MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.

(continued)

Error condition	Error code	Error description and possible diagnosis
Err	E1.6	MMA DEFAULTS MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E1.7	TIG DEFAULTS MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E1.8	MIG DEFAULTS MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E1.9	WELDER DEFAULTS MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E2.0	FILE SYSTEM ERROR **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E3.2	STICKING This error is displayed when a short-circuit has been formed between the machine's output terminals for more than 1.2 seconds. **NON automatic reset error.** To remove the error state, eliminate the short circuit so that the voltage on the torch goes above the threshold value again. At this stage the error condition disappears and the welding machine goes back to the mode prior to the sticking. If the torch trigger is still pushed, it must be released and pressed again to begin welding again.
Err	E3.3	MOTOR SPEED FAULT **NON automatic reset error.** Check that the rollers on the wire feeder mechanism are not stuck and that the welding wire comes out correctly, otherwise **contact Technical Assistance Department immediately**.
Err	E3.4	CIRCUIT CALIBRATION FAULT **NON automatic reset error.** The error occurs when the welding circuit detection procedure has not been carried out.
Err	E4.0	LAST SETUP NOT VALID **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.

(continued)

Error condition	Error code	Error description and possible diagnosis
Err	E4.1	JOBS WRONG **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E4.2	MIG SYN SPECIAL FUNCTION (Fx) WRONG **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E4.3	MIG MAN SPECIAL FUNCTION (Fx) WRONG **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E4.4	SPECIAL PULSED MIG FUNCTIONS (Fx) NOT VALID **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E4.5	SPECIAL DOUBLE PULSED MIG FUNCTIONS (Fx) NOT VALID **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E5.0	MIG PROGRAMS MISSING **NON automatic reseterror.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E5.1	PULSED MIG WELDING PROGRAMMES MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E5.3	MMA PROGRAMS MISSING **NON automatic reseterror.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E5.4	TIG PROGRAMS MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.

(continued)

Error condition	Error code	Error description and possible diagnosis
Err	E5.5	MIG MANUAL PROGRAMS MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E5.6	DOUBLE PULSED PROGRAMS ABSENT **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E6.0	FEEDER EVO-4R CAN LINK MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.**
Err	E6.1	ROBOT LINK MISSING **NON automatic reset error.** **Immediately contact technical assistance dept.**
Err	E6.4	POWER MASTER MISSING **NON automatic reset error.** Check that the POWER MASTER - OBLIGATORY function is included within the ADVANCED SETUP Menu / EQUIPMENT LAYOUT. After this initial check you need to know that this error can **only** occur in the following cases: • POWER MASTER not connected to the welding machine. • The welding machine does not recognise the POWER MASTER, even though it is connected correctly. • POWER MASTER disconnected when the welding machine is working normally. Following the reactivation of the POWER MASTER, the error condition **is automatically reset!** If the alarm occurs even when the WIRE FEEDER - OPTIONAL function is included in the ADVANCED SETUP Menu / EQUIPMENT LAYOUT, **call Technical Assistance Department immediately.**
Err	E6.5	NO ROBOT INTERFACE Automatic reset error.
Err	E7.0	RC ANALOGIC MISSING **NON automatic reset error.** Check that the ANALOGIC RC - OBLIGATORY function is included within the *ADVANCED SETUP Menu / EQUIPMENT LAYOUT*. After this initial check you need to know that this error can **only** occur in the following cases: ANALOGIC RC remote control not connected to the relevant connector. The welding plant does not recognise the ANALOGIC RC remote control, even though it is connected correctly. The ANALOGIC RC remote control disconnected when the welding plant is working normally. As soon as the remote control is connected again this error condition **resets itself automatically!** If the alarm occurs even when the ANALOGIC RC - OPTIONAL function is included in the *ADVANCED SETUP Menu / EQUIPMENT LAYOUT*, **call Technical Assistance Department immediately.**

(continued)

Error condition	Error code	Error description and possible diagnosis
Err	E8.3	NO GAS FLOW Error reset by a command from the robot's board (see robot interface manual).
Err	E8.4	NO H2O FLOW Error reset by a command from the robot's board (see robot interface manual).
Err	E8.5	INVALID SEQUENCES **NON automatic reset error.** **Immediately contact technical assistance dept.** Error visible on **EVOLUTION SCREEN** ONLY in the event of a fault and NOT in the *ERROR LOG Menu*.
Err	E8.6	ROBOT INTERFACE NOT SUPPORTED The alarm occurs when there is no compatibility between the generator software and the robot interface board. **NON automatic reset error.** **Immediately contact technical assistance dept.**
Err	E8.7	NO WELDING WIRE Error reset by a command from the robot's board (see robot interface manual).
Err	E9.0	ROBOT CONNECTION MISSING Error reset by a command from the robot's board.
Err	E9.1	CONSENT NOT RECEIVED For more information see CQM software manual.
Err	E9.2	WIRE STABILITY CHECK The alarm intervenes during welding if the values detected during the calibration procedure described in the appropriate paragraph are exceeded. **NON automatic reset error.**
AUT	ADJ	POWER LIMITATION This alarm appears if the power limit is exceeded. The alarm alternates with the standard display every 1.5 seconds, despite which the machine continues to weld, supplying limited power, but complying with the values shown on the data plate.

La tabella riassume in modo semplice tutte le condizioni di errore che si possono presentare sull'impianto di saldatura e, dove possibile, il comportamento che l'operatore deve tenere per cercare di risolvere il problema.

- The table includes **2** types of errors:
  Automatic reset error: Once the alarm condition has been resolved the welding machine starts working again and the opera- tor can weld again! The **EVOLUTION SCREEN** goes back to exactly the same point it was at prior to signalling the alarm!
  PLEASE NOTE: *After resetting has been completed, during normal operation of the machine, the* **EVOLUTION SCREEN** *will still show the error signal to inform the operator of the event (⚠), but this can be removed visually from the display by simply pushing the* **MENU KEY**.
  WARNING: *This only removes the visual error indication but not the history of what happened!*
- **NON automatic reset error:** To remove the alarm status and reinstate correct operation of the machine, the welding plant must be switched off.
  The machine will then be working again and the operator can weld again!
  PLEASE NOTE: If, when switching on, the error status presents itself again, immediately contact Technical Assis- tance Department.
  This is necessary so that our technical assistance dept (**that must be contacted each time the error messages appear on the welding machine's operator interface**) is able to resolve the problems more easily and as quickly as possible, thanks to the reports by the user, and also because, in the meantime the welding machine does not allow the operator to do their work.

To exit the *ERROR LOG Menu* and go back to the *SETUP Menu*:

- Push the **MENU KEY**.

6.6. START-UP

After turning on machine or line power, conduct a careful visual inspection of the entire machine and make sure that no persons or material are obstructing its normal operation, and that no objects have inadvertently been left on it.
Check that all the machine safety devices are enabled; if necessary, reset them, and in particular check for:

- Unlocked emergency stops;
- Correct operation of the safety barriers, if installed, or the guards not removed
- Protection guard.

6.7. NORMAL STOP

Turn the switch on the welder panel to **OFF**.
To completely disconnect the power supply from the power line, turn the switch on the main panel to O.

6.8. DECOMMISSIONING

During long periods of inactivity it is necessary to:

- Disconnect the power supply from the general electrical panel and all other power supplies (pneumatic and/or hydraulic) which the machine needs.
- Perform all maintenance operations.
- Accurately clean the machine.
- Store the machine in a protected area with a stable support surface.
- Cover the machine to avoid dust accumulation.
- Make sure that the environmental conditions are suitable for preserving the machine over time.

7. MAINTENANCE

7.1. MACHINE ISOLATION

Before carrying out any type of Maintenance or Repair, it is necessary to isolate the machine from the power supply and from all other energy sources present.

7.2. SPECIAL PRECAUTIONS

When carrying out any maintenance or repair work, the following recommendations should be followed:

- Before starting work, display a sign stating "MACHINE UNDER MAINTENANCE" in a visible spot;
- Do not use flammable materials or solvents;
- Be careful not to pollute the environment with coolants;
- To access the highest parts of the machine, use the appropriate means and procedures;
- Do not climb on the machine parts, as they are not designed to support people;
- When finished, refit and properly secure all safety guards and devices that may have been removed or opened.

IMPORTANT: The Manufacturer cannot be held liable for the failure to comply with the aforementioned recommendations nor for any other use that is inconsistent or not mentioned in these instructions.

7.3. CLEANING

Before carrying out any cleaning operation, disconnect the device from the mains and from the energy sources present.
Do not use corrosive cleaning products, flammable or containing substances harmful to health.
Make sure that the parts being cleaned are completely cold.
Do not wet the internal parts to avoid damaging the electrical and electronic components.
Do not direct any jets of compressed air directly on the electrical and electronic components so as not to damage them.

ATTENTION: Always use the appropriate PPE such as gloves, mask, glasses according to current safety standards.

7.4. ROUTINE MAINTENANCE

General requirements
The machine is designed to minimise routine maintenance, thus it is up to the operator to assess its condition and suitability for use.
It is recommended to stop and perform maintenance whenever non-optimal operation is detected, so as to ensure maximum efficiency at all times.
Check the operation of safety devices monthly.
In the event of faults or malfunction, entrust only qualified personnel to search for the fault or call the manufacturer's technical support. Check the continuity of the earth circuit every 2 years by performing the continuity measurement according to the provisions of the CEI 44 - 5 III Art. 19 standard.
Visually check the condition of the individual parts of the machine, verifying that there is no alteration due to sagging or deformation.
At each use of the machine, if equipped with a cooling unit, check the coolant level and top up if necessary.
ATTENTION: Use only "SincoFluid" coolant supplied on request by the manufacturer or an authorised dealer.
The use of different coolants automatically voids the warranty and excludes the manufacturer from any liability.

ATTENTION: Allow the system to cool before proceeding with maintenance; hot surfaces can cause serious burns.

ATTENTION: For the entire duration of maintenance, it is necessary to stop the system by disconnecting the plug from the mains power supply or by disconnecting the power supply from the main panel circuit breaker, moving it to the "O" position and locking it with a special padlock.

Always use the appropriate PPE - Personal Protective Equipment:

- Gloves;
- Non-slip shoes;
- Suitable clothing.

Scheduled maintenance
The operations described below must be carried out in line with the schedules indicated.

IMPORTANT: Failure to comply with the above shall exempt the manufacturer from any liability as specified in the Warranty.

ATTENTION: These operations, although simple, must be performed by a Qualified and Authorised Technician.

Remove dust or foreign materials every 6 months, which may have been deposited on the transformer or on the diodes of the rectifier unit; to do this use a jet of dry, clean air.
Do not direct the compressed air jet directly onto the electrical and electronic components so as not to damage them.
When reassembling the wire feeder roller, after having cleaned or replaced it, make sure that the groove is aligned with the wire and that it corresponds to the diameter of the wire used.
Keep the inside of the gas nozzle constantly clean, so as to avoid metal bridges consisting of welding sprays between the gas nozzle and the contact tip.
Make sure that the output hole of the current collector nozzle is not excessively enlarged, otherwise replace it.
Absolutely avoid beating the torch or subjecting it to violent impacts.

7.5. WELDING MACHINE REPAIRS

Experience has shown that many accidents originate from repairs not performed to perfection.
For this reason, careful and complete control over a repaired welding machine is just as important as that performed on a new welding machine. Moreover, in this way, manufacturers can be protected from being held liable for defects, when the liability is to be attributed to others.
Welding machine repairs must be carried out exclusively by trained and qualified personnel, in possession of the necessary requisites to guarantee a workmanlike repair and in full compliance with safety standards EN 60974-4.

A) Instructions for repairs

- After rewinding the transformer or the inductances, the welding machine must pass the same applied voltage tests, passed at the time of the first test according to the regulations in force.
- If no rewinding has been carried out, a welding machine, which has been cleaned and/or overhauled, must pass a particular applied voltage test with values given by current regulations.
- After rewinding and/or replacing parts, the no-load voltage must not exceed certain values given by current regulations.
- If repairs are not carried out by the manufacturer, repaired welding machines, in which some components have been replaced or modified, must be marked so that the person who carried out the repair can be identified.

B) Additional repair Instructions

- After having carried out a repair, be careful to re-order the wiring, so that there is a secure insulation between the primary side and the secondary side of the machine.
- Do not allow the wires to come into contact with moving parts (i.e. with the fan motor) or parts that become hot during operation.
- Also re-assemble all the clamps that hold the wiring, as originally arranged on the machine, so that, if a conductor is accidentally broken or disconnected, it is still possible to avoid a connection between the primary and the secondary.
- Avoid cleaning the electronic boards with a jet of compressed air to preserve the integrity of the components.
- At the end of any repair, make sure that you have not forgotten any tools inside the machine and close the machine with all the bulkheads available and taking care to replace all the fixing devices of the bulkheads themselves.

8. ACCESSORIES AND SPARE PARTS

8.1. CUSTOMER SERVICE

The Manufacturer is always at your disposal for any type of information regarding the use, maintenance, and installation of the equipment.
It is suggested that the Customer asks clear questions, making reference to this Manual and the instructions listed.

8.2. SPARE PARTS

IMPORTANT: ALWAYS USE ORIGINAL SPARE PARTS. The Manufacturer cannot be held liable for breakages, malfunctions or damage to persons or property arising from the use of non-original parts.

In the event that non-original spare parts are used, the conditions of the Warranty (if still in place) and of the Manufacturer's liability in the use of the machine and any damage deriving to persons and/or property are void.

9. ADDITIONAL INSTRUCTIONS

9.1. WASTE DISPOSAL

It is the responsibility of the user, in accordance with the laws in force in their country, to ensure correct disposal of the waste produced by the machine during production.
The disposal of hydraulic oil lubricants and the replaced parts must be carried out in compliance with the regulations in force in the country where the machine is in use.

9.2. DECOMMISSIONING AND DISMANTLING

With reference to the WEEE Directive 2012/19 / EU (Waste Electrical and Electronic Equipment), the user, during disposal, must dispose of the equipment in the appropriate authorised collection centres, or return it still installed to the seller at the time of a new purchase.

IMPORTANT: do not dispose of polluting materials in the environment. Dispose of such products in compliance with legislation in force.

IMPORTANT: the illegal disposal of Waste Electrical and Electronic Equipment is punished with sanctions regulated by the laws in force in the territory in which the infringement is ascertained. Waste Electrical and Electronic Equipment may contain hazardous substances with potentially harmful effects on the environment and on people's health. It is recommended to dispose of it properly.

WEEE refers to Waste Electrical and Electronic Equipment (EEE) including all components, sub-assemblies and consumables that are an integral part of the product at the time the decision is made to discard it.
The law divides these into 2 main categories called **PROFESSIONAL WEEE** or **DOMESTIC WEEE.**
PROFESSIONAL WEEE means all waste electrical and electronic equipment intended for purely industrial use.
DOMESTIC WEEE means all waste electrical and electronic equipment intended for mixed use both in an industrial environment and in a domestic environment.
DOMESTIC WEEE is identified as all single-phase power supply generators with output current MAX <= 200A with their accessories.

There are 2 ways to discard **DOMESTIC WEEE**:

a) If you decide to buy a new equivalent equipment, the user can deliver it to the distributor, who will have to collect it for free.
b) Alternatively, it must be deposited in the Municipal pitch, in the container or specific area identified as "GROUPING 4".

As of the date of preparation of the Instruction Manual, as the application of the Regulations is not yet definitive, please contact the distributor and/or the manufacturer for information on **PROFESSIONAL WEEE** disposal.

THE SYSTEM DESCRIBED IN THE MANUAL BELONGS TO CATEGORY: PROFESSIONAL "EEE"

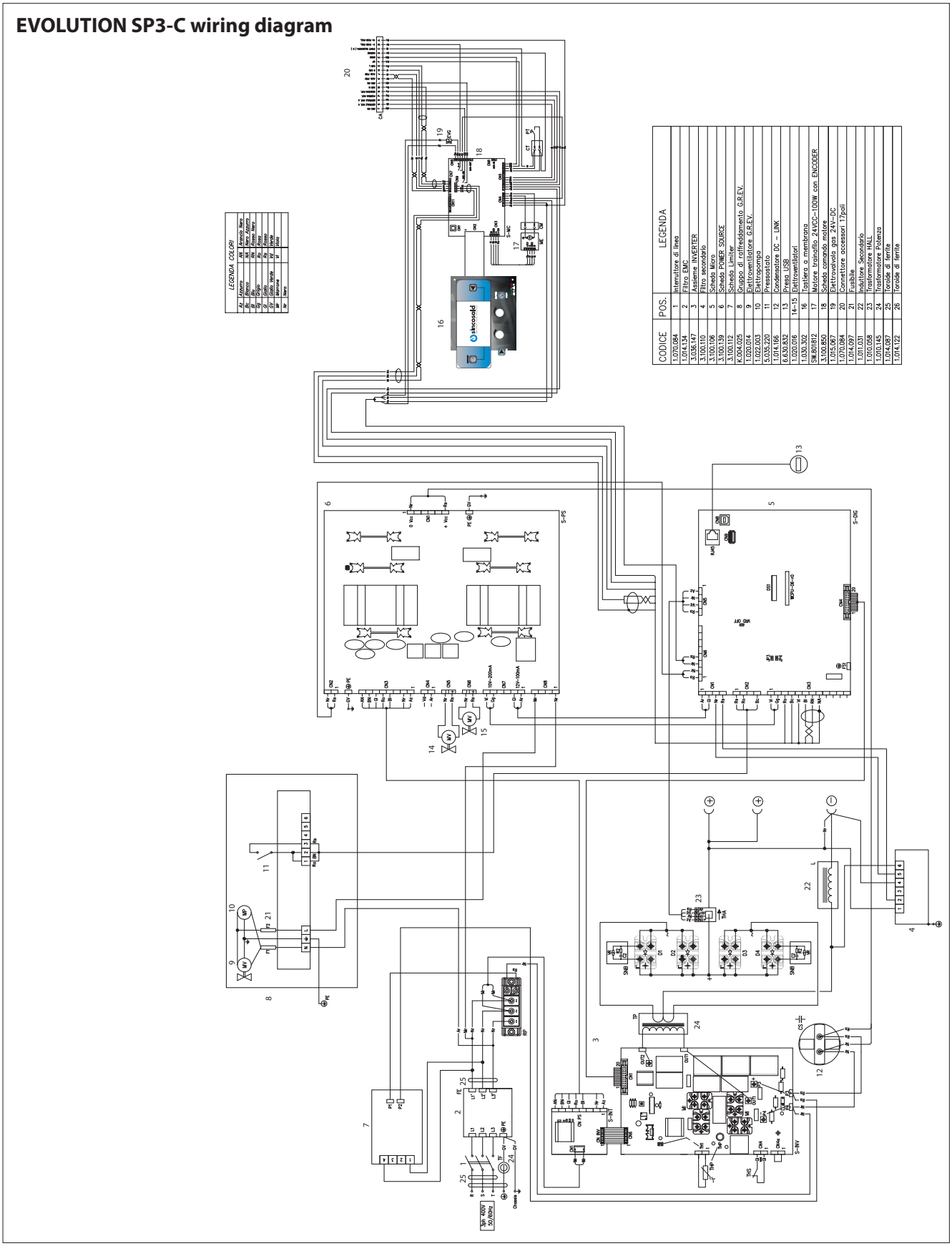
For the management of "WEEE", SINCOSALD relies on Erion Consortium.

AS OF THE DATE OF THE PREPARATION OF THIS INSTRUCTION MANUAL THIS INFORMATION SHOULD BE CONSIDERED TO BE NON-DEFINITIVE AS SUBJECT TO POSSIBLE CHANGES ACCORDING TO THE OBLIGATIONS LINKED TO LEGISLATIVE DECREE N ° 151/2005 THAT WILL COMPLETE DIRECTIVE 2002/96/EC.

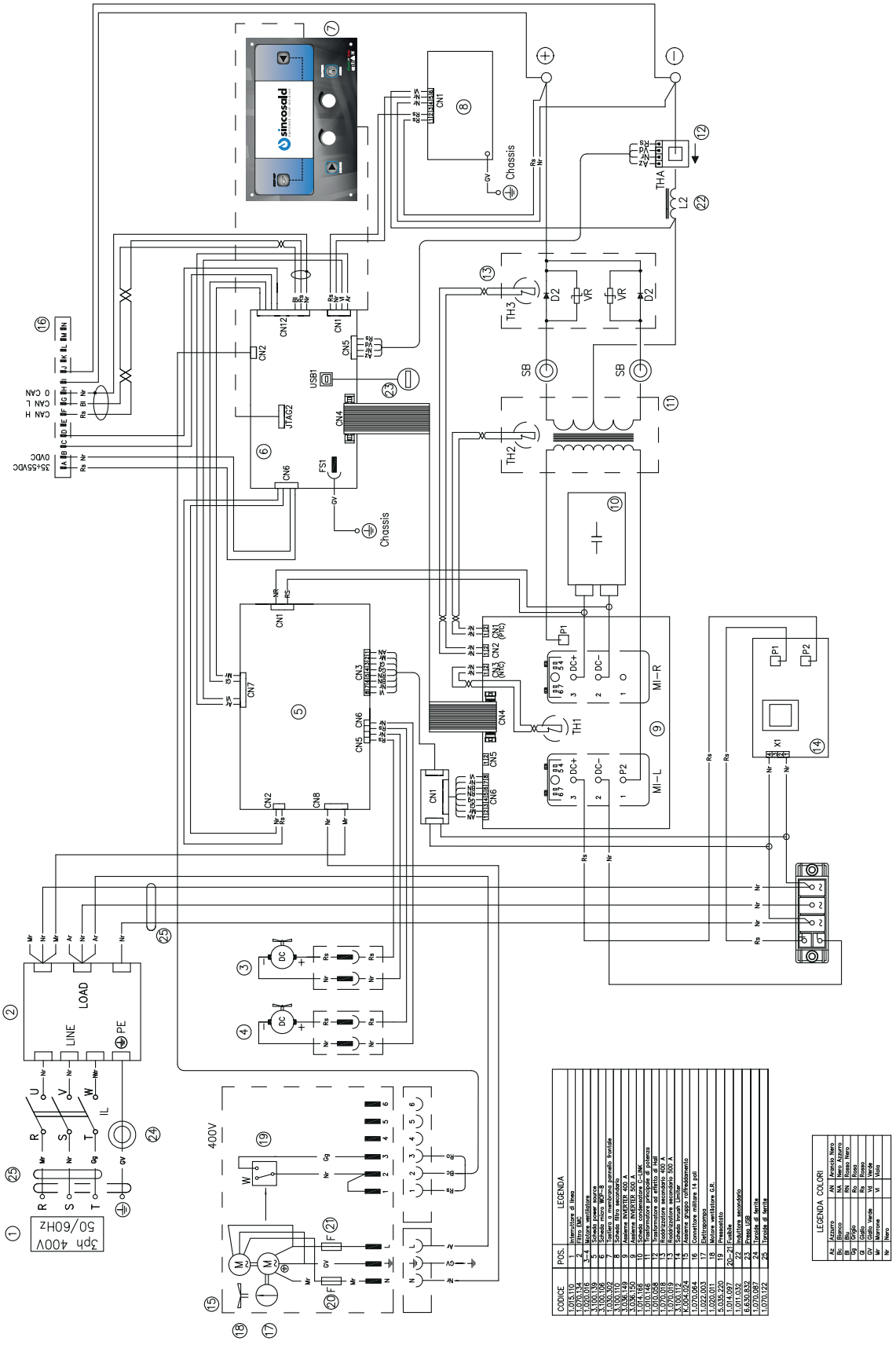
10. ANNEXES

10.1. WIRING DIAGRAMS

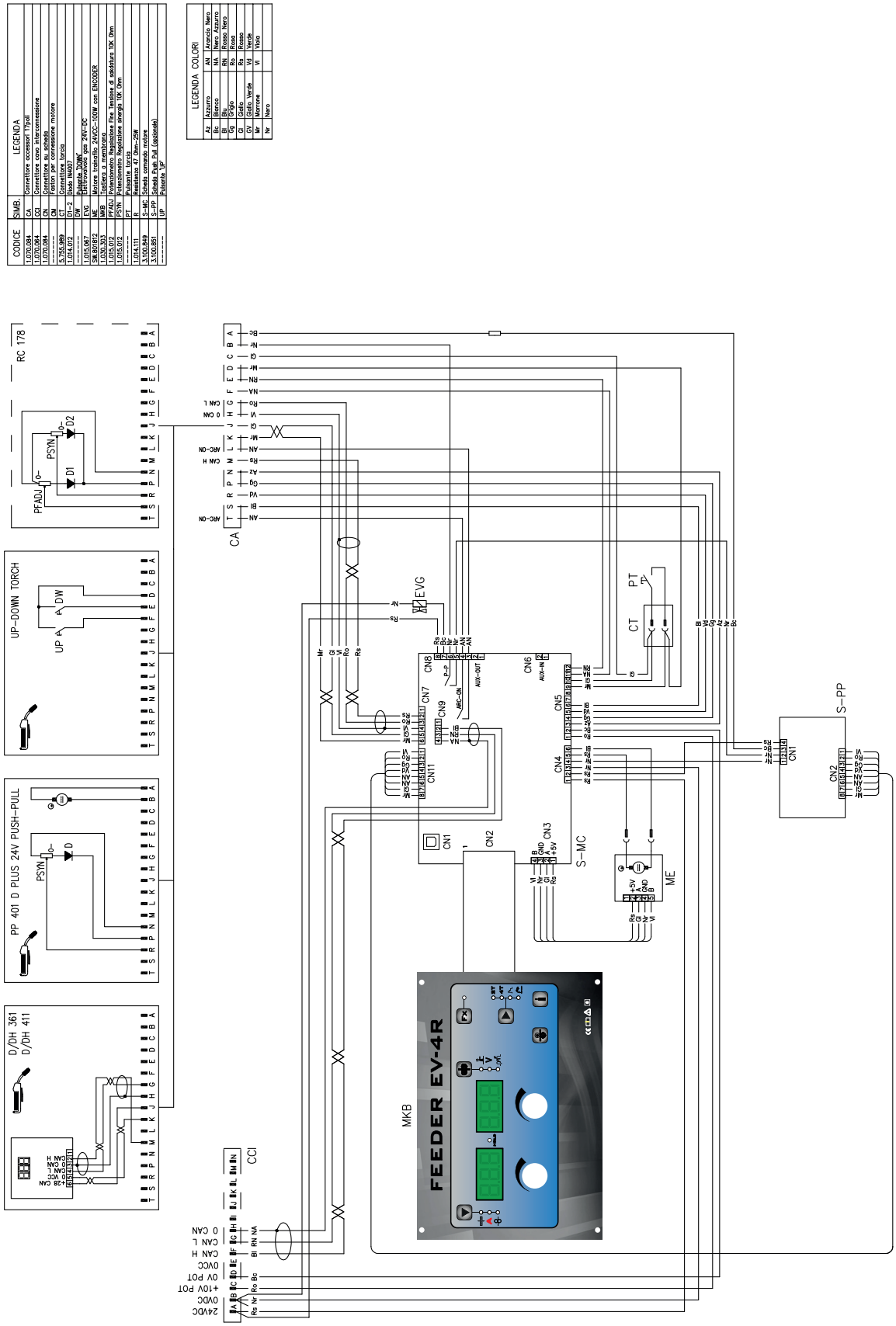
EVOLUTION SP3-C wiring diagram



EVOLUTION SP4-E / SP5-E wiring diagram

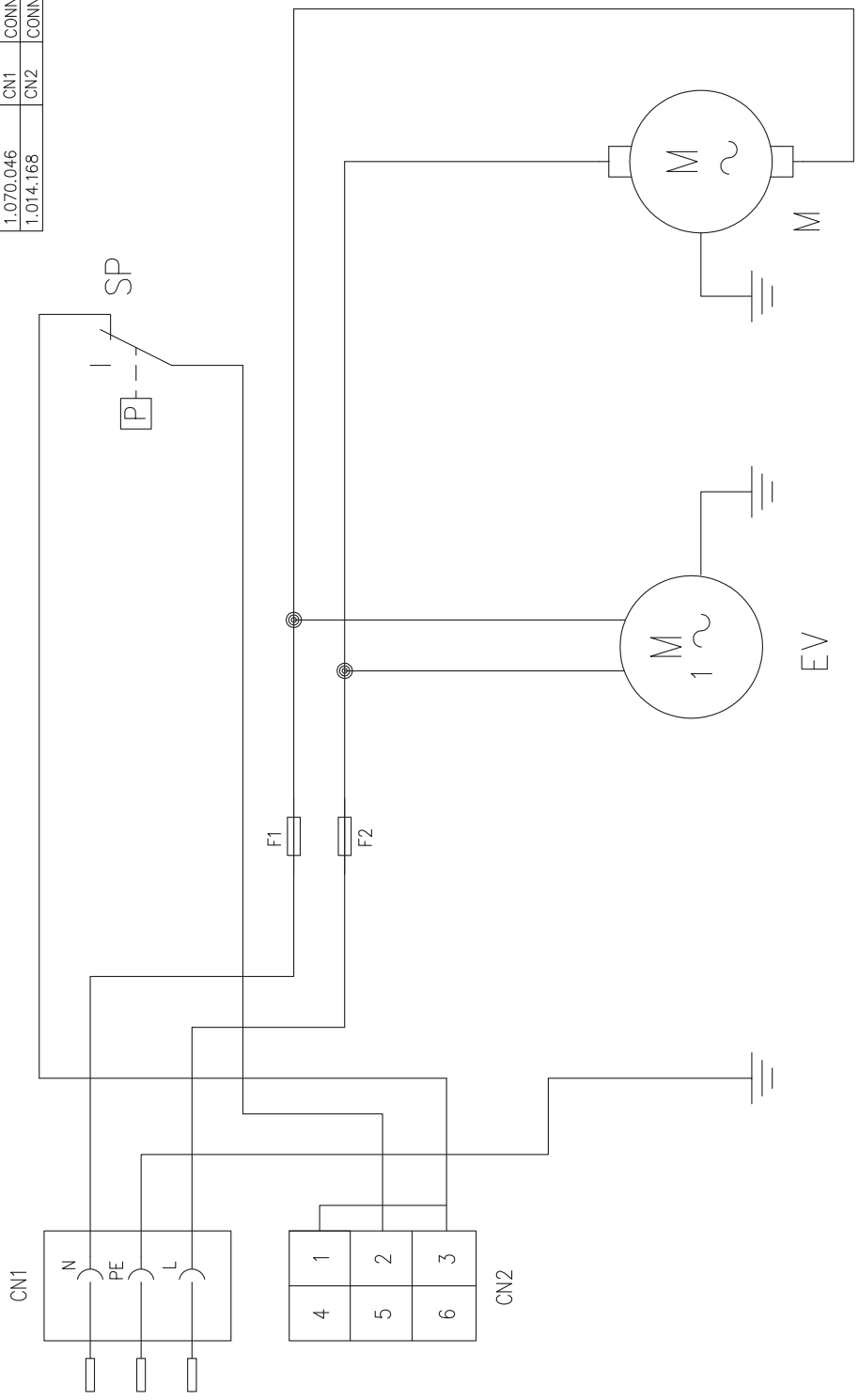


FEEDER EVO-4R wiring diagram



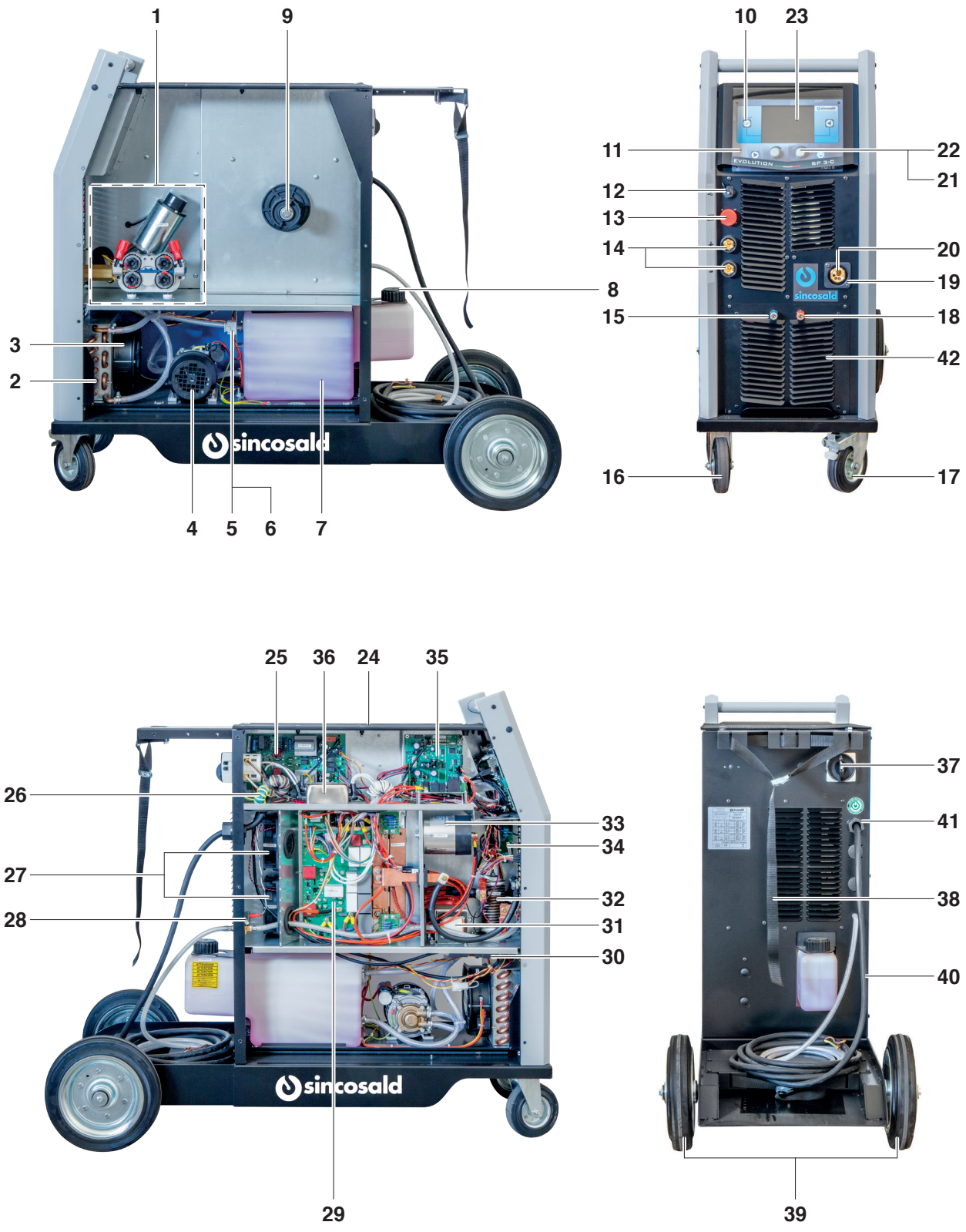
G.R. EVO wiring diagram

CODICE	SIMB.	DESCRIZIONE
5.035.220	SP	PRESSOSTATO
1.022.003	M	ELETTROPOMPA
5.125.030	EV	ELETTROVENTILATORE
1.014.097	F1	FUSIBILE 2.5A
1.014.097	F2	FUSIBILE 2.5A
1.070.046	CN1	CONNETTORE MINIFIT 6 POLI
1.014.168	CN2	CONNETTORE SPINA MASCHIO



10.2. SPARE PARTS

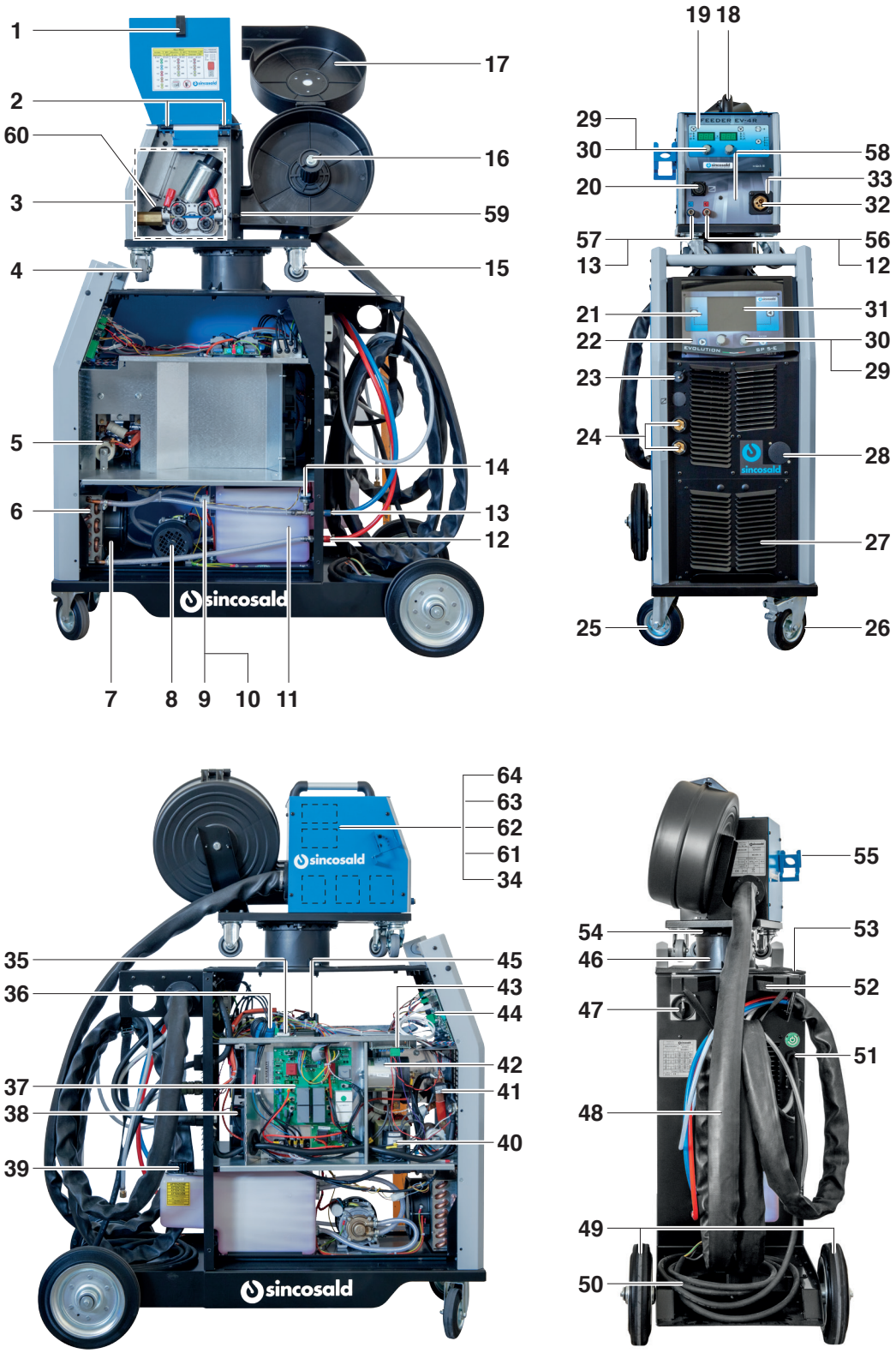
EVOLUTION SP3-C



Pos.	Code	Description	Qt.
1	SW.801012	FEEDER 4R	1
2	5.725.035	RADIATOR	1
3	1.020.011	FAN	1
4	3.022.004	ELECTROPUMP	1
5	1.014.082	FUSE HOLDER	1
6	1.014.097	FUSE	1
7	1.023.033	TANK 11 Lt.	1
8	5.590.444	PLUG	1
9	3.630.031	BRAKE FOR HOLDER COIL	1
10	1.030.302	FRONTAL PANEL EVOLUTION	1
11	1.700.364	GLASS PROTECT PANEL	1
12	6.630.832	USB CABLE	1
13	1.070.084	CONNECTOR 17 POLES	1
14	5.105.550	FIX FEMALE FITTING 50 MMQ	2
15	5.465.152/B	QUICK CONNECTION BLUE	1
16	1.019.011	SWIVEL WHEEL	1
17	1.019.010	SWIVEL WHEEL WITH BRAKE	1
18	5.465.152/R	QUICK CONNECTION RED	1
19	SW.24506	COVER FOR EURO ADAPTOR	1
20	5.755.989	EURO CONNECTOR	1
21	1.997.007	CAP D.22 GREY	2

Pos.	Code	Description	Qt.
22	5.005.051/MG	POTENTIOMETER D. 22	2
23	3.100.144	FRONTAL INTERFACE BOARDS	1
24	1.090.015	MAT EVOLUTION	2
25	3.100.139	POWER SOURCE BOARD	1
26	1.014.087	TOROIDAL CORE FILTER	1
27	1.020.016	FAN	2
28	1.015.067	SOLENOID VALVE	1
29	3.036.139	INVERTER MODULE	1
30	5.035.223	PRESSURE SWITCH	1
31	1.010.145	MAIN TRANSFORMER SP3-C	1
32	1.011.031	INDUCTOR SP3-C	1
33	1.014.166	CAPACITOR DC-LINK	1
34	1.010.058	HALL TRANSFORMER	1
35	3.100.850	CONTROL MOTOR BOARD	1
36	1.014.134	EMC FILTER	1
37	1.015.089	MAIN SWITCH	1
38	7.410.012	TANK STRAP	2
39	1.019.012	WHEEL D. 250	2
40	6.630.805	POWER CABLE 4 x 4,0 mmq	5
41	1.016.004	CABLE GLAND	1
42	5.079.531	FRONTAL PROTECT PANEL	1

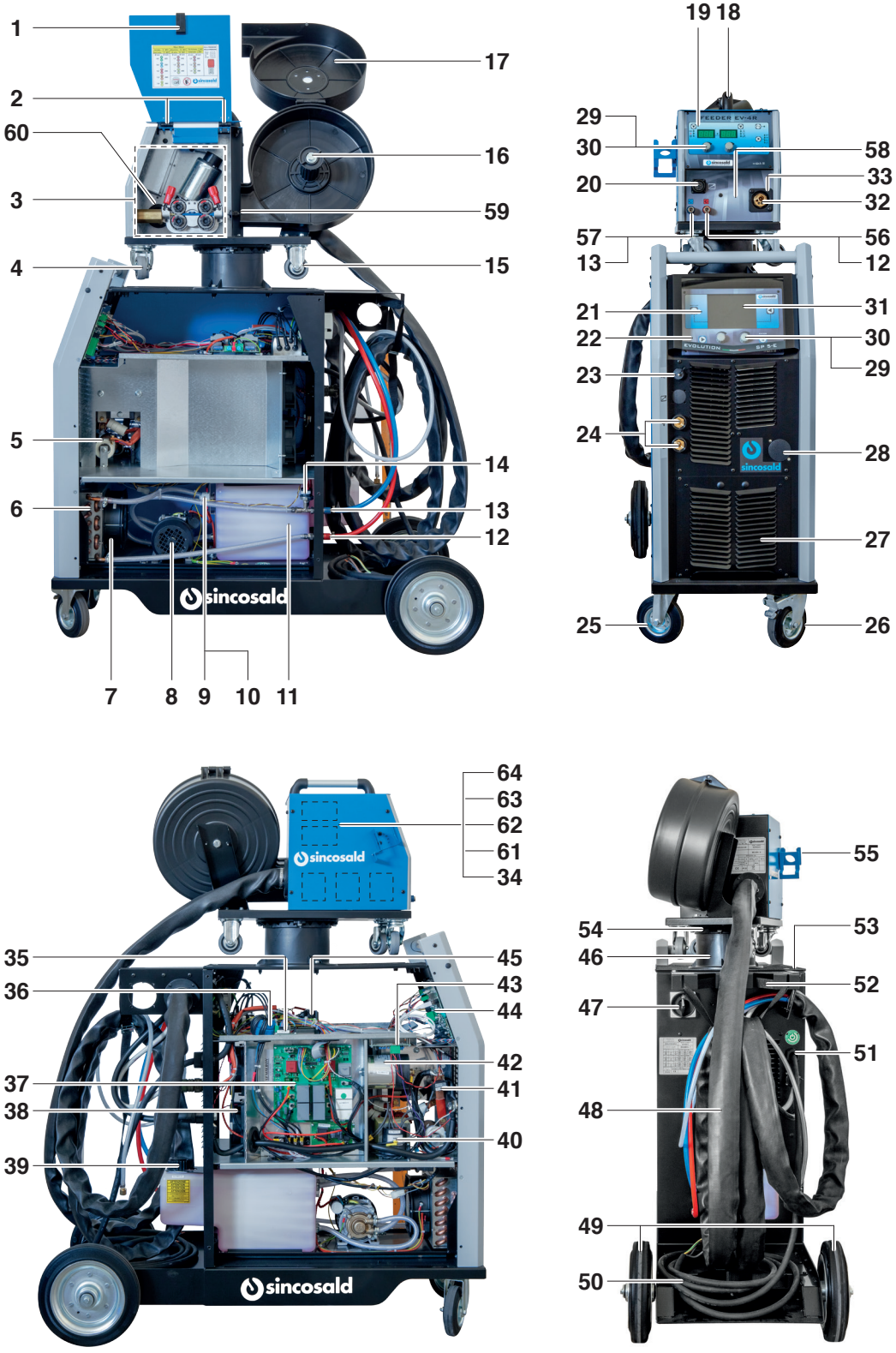
EVOLUTION SP4-E



Pos.	Code	Description	Qt.
1	1.997.004	LOCK	1
2	1.997.063	HINGE	2
3	SW.801012	FEEDER 4R	1
4	1.019.009	SWIVEL WHEEL	2
5	1.011.032	INDUCTOR	1
6	5.725.035	RADIATOR	1
7	1.020.011	FAN	1
8	3.022.004	ELECTROPUMP	1
9	1.014.082	FUSE HOLDER	1
10	1.014.097	FUSE	1
11	1.023.033	TANK 11 Lt.	1
12	5.465.152/R	QUICK CONNECTION RED	2
13	5.465.152/B	QUICK CONNECTION BLUE	2
14	5.035.223	PRESSURE SWITCH	1
15	1.019.008	FIX WHEEL	2
16	3.630.031	BRAKE FOR HOLDER COIL	1
17	8.256.005	COIL HOLDER	1
18	1.997.045	HANDLE	1
19	1.030.303	FRONTAL PANEL FEEDER EVO 4R	1
20	1.070.084	CONNECTOR 17 POLES	1
21	1.030.302	FRONTAL PANEL EVOLUTION	1
22	1.700.364	GLASS PROTECT PANEL	1
23	6.630.832	USB CABLE	1
24	5.105.570	FEMALE FIX FITTING 70 mmq	2
25	1.019.011	SWIVEL WHEEL	1
26	1.019.010	SWIVEL WHEEL WITH BRAKE	1
27	5.079.531	FRONTAL PROTECT PANEL	1
28	1.997.068	PLUG	1
29	1.997.007	CAP D.22 GREY	4
30	5.005.051/MG	POTENTIOMETER D. 22	4
31	3.100.144	FRONTAL INTERFACE BOARDS	1
32	5.755.989	EURO CONNECTOR	1
33	SW.24506	COVER FOR EURO ADAPTOR	1

Pos.	Code	Description	Qt.
34	1.015.067	SOLENOID VALVE	1
35	3.100.111	ADAPTOR BOARD	1
36	1.014.087	TOROIDAL CORE FILTER	1
37	3.036.149	EVOLUTION SP4-E INVERTER MODULE	1
38	1.020.016	FAN	2
39	5.590.444	PLUG	1
40	1.010.146	MAIN TRANSFORMER	1
41	1.010.058	HALL TRANSFORMER	1
42	1.014.166	CAPACITOR DC-LINK	1
43	3.100.110	FILTER BOARD	1
44	3.100.106	MICRO BOARD	1
45	3.100.139	POWER SOURCE BOARD	1
46	1.997.048	SUPPORT WIRE FEEDER	1
47	1.015.110	MAIN SWITCH	1
48	3.017.176	EXTENSION CABLE H2O	5 m
49	1.015.110	MAIN SWITCH	1
49	1.019.012	WHEEL D. 250	2
50	6.630.810	POWER CABLE 4 x 6,0 mmq	5
51	1.016.004	CABLE GLAND	1
52	7.410.012	TANK STRAP	2
53	1.090.015	MAT EVOLUTION	2
54	1.997.047	WIRE FEEDER SUPPORT FLANGE	1
55	5.079.551	TORCH HOLDER	1
56	5.465.151/R	QUICK CONNECTION RED	1
57	5.465.151/B	QUICK CONNECTION BLUE	1
58	1.030.304	STICKER FEEDER EVO 4R	1
59	1.016.086	LOCK NUT PG07	1
60	5.005.328	MEMBRANE PASS DG 48	1
61	5.105.790	MALE FIX FITTING 70 mmq	1
62	3.013.218	CABLE FEEDER EVO 4R	1
63	5.466.700	HOSE FITTING	1
64	6.630.190	BLACK WELDING ROPE 70 mmq	0,15

EVOLUTION SP5-E



Pos.	Code	Description	Qt.
1	1.997.004	LOCK	1
2	1.997.063	HINGE	2
3	SW.801012	FEEDER 4R	1
4	1.019.009	SWIVEL WHEEL	2
5	1.011.032	INDUCTOR	1
6	5.725.035	RADIATOR	1
7	1.020.011	FAN	1
8	3.022.004	ELECTROPUMP	1
9	1.014.082	FUSE HOLDER	1
10	1.014.097	FUSE	1
11	1.023.033	TANK 11 Lt.	1
12	5.465.152/R	QUICK CONNECTION RED	2
13	5.465.152/B	QUICK CONNECTION BLUE	2
14	5.035.223	PRESSURE SWITCH	1
15	1.019.008	FIX WHEEL	2
16	3.630.031	BRAKE FOR HOLDER COIL	1
17	8.256.005	COIL HOLDER	1
18	1.997.045	HANDLE	1
19	1.030.303	FRONTAL PANEL FEEDER EVO 4R	1
20	1.070.084	CONNECTOR 17 POLES	1
21	1.030.302	FRONTAL PANEL EVOLUTION	1
22	1.700.364	GLASS PROTECT PANEL	1
23	6.630.832	USB CABLE	1
24	5.105.570	FEMALE FIX FITTING 70 mmq	2
25	1.019.011	SWIVEL WHEEL	1
26	1.019.010	SWIVEL WHEEL WITH BRAKE	1
27	5.079.531	FRONTAL PROTECT PANEL	1
28	1.997.068	PLUG	1
29	1.997.007	CAP D.22 GREY	4
30	5.005.051/MG	POTENTIOMETER D. 22	4
31	3.100.144	FRONTAL INTERFACE BOARDS	1
32	5.755.989	EURO CONNECTOR	1
33	SW.24506	COVER FOR EURO ADAPTOR	1

Pos.	Code	Description	Qt.
34	1.015.067	SOLENOID VALVE	1
35	3.100.111	ADAPTOR BOARD	1
36	1.014.087	TOROIDAL CORE FILTER	1
37	3.036.150	EVOLUTION SP5-E INVERTER MODULE	1
38	1.020.016	FAN	2
39	5.590.444	PLUG	1
40	1.010.146	MAIN TRANSFORMER	1
41	1.010.058	HALL TRANSFORMER	1
42	1.014.166	CAPACITOR DC-LINK	1
43	3.100.110	FILTER BOARD	1
44	3.100.106	MICRO BOARD	1
45	3.100.139	POWER SOURCE BOARD	1
46	1.997.048	SUPPORT WIRE FEEDER	1
47	1.015.110	MAIN SWITCH	1
48	3.017.176	EXTENSION CABLE H2O	5 m
49	1.015.110	MAIN SWITCH	1
49	1.019.012	WHEEL D. 250	2
50	6.630.810	POWER CABLE 4 x 6,0 mmq	5
51	1.016.004	CABLE GLAND	1
52	7.410.012	TANK STRAP	2
53	1.090.015	MAT EVOLUTION	2
54	1.997.047	WIRE FEEDER SUPPORT FLANGE	1
55	5.079.551	TORCH HOLDER	1
56	5.465.151/R	QUICK CONNECTION RED	1
57	5.465.151/B	QUICK CONNECTION BLUE	1
58	1.030.304	STICKER FEEDER EVO 4R	1
59	1.016.086	LOCK NUT PG07	1
60	5.005.328	MEMBRANE PASS DG 48	1
61	5.105.790	MALE FIX FITTING 70 mmq	1
62	3.013.218	CABLE FEEDER EVO 4R	1
63	5.466.700	HOSE FITTING	1
64	6.630.190	BLACK WELDING ROPE 70 mmq	0,15

gf|studio

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