

USE AND MAINTENANCE MANUAL

MAGIC WELD 200 4D *MAGIC WELD 200 4DE*

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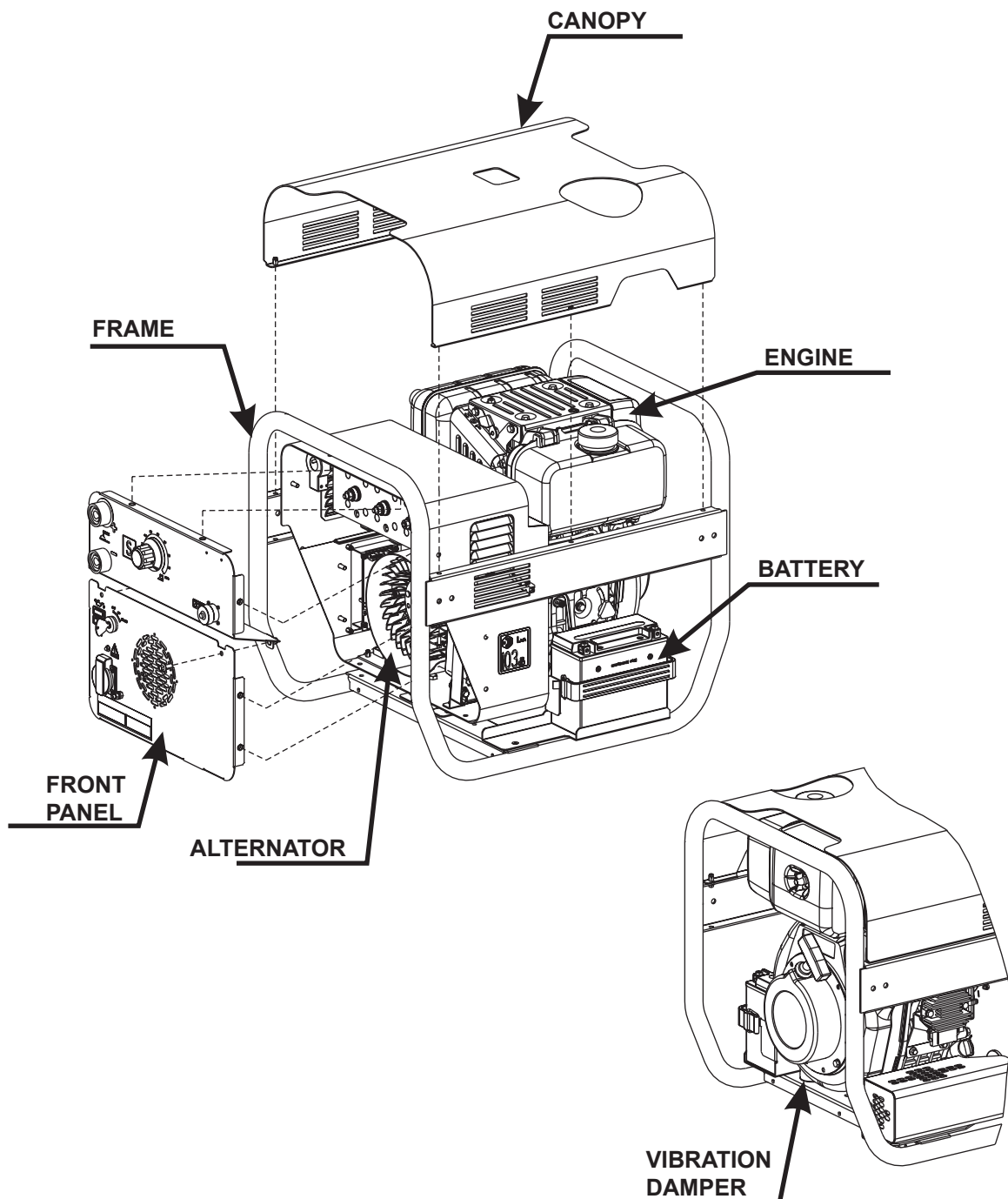
MADE IN ITALY

MOSA

The MAGIC WELD engine driven welder is a unit which ensures the dual function as:

- a) a current source for are welding
- b) current generator for generating auxiliary

Unit meant for industrial and professional use. Powered by an endothermic engine; it is composed of various parts such as: engine, alternator, electric and electronic controls, the fairing at a protective structure. The assembling is made on a steel structure, on which are provided elastic support which must damp the vibrations and also eliminate sounds which would produce noise.





UNI EN ISO 9001 : 2008

ISO 9001:2008 - Cert. 0192

MOSA has certified its quality system according to UNI EN ISO 9001:2008 to ensure a constant, high quality of its products. This certification covers the design, production and servicing of engine driven welders and generating sets.

The certifying institute, ICIM, which is a member of the International Certification Network IQNet, awarded the official approval to MOSA after an examination of its operations at the head office and plant in Cusago (MI), Italy.

This certification is not a point of arrival but a pledge on the part of the entire company to maintain a level of quality of both its products and services which will continue to satisfy the needs of its clients, as well as to improve the transparency and the communications regarding all the company's activities in accordance with the official procedures and in harmony with the MOSA Manual of Quality.

The advantages for MOSA clients are:

- Constant quality of products and services at the high level which the client expects;
- Continuous efforts to improve the products and their performance at competitive conditions;
- Competent support in the solution of problems;
- Information and training in the correct application and use of the products to assure the security of the operator and protect the environment;
- Regular inspections by ICIM to confirm that the requirements of the company's quality system and ISO 9001 are being respected.

All these advantages are guaranteed by the CERTIFICATE OF QUALITY SYSTEM No.0192 issued by ICIM S.p.A. - Milano (Italy) - www.icim.it

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ATTENTION

This use and maintenance manual is an important part of the machines in question.

The assistance and maintenance personnel must keep said manual at disposal, as well as that for the engine and alternator (if the machine is synchronous) and all other documentation about the machine.

We advise you to pay attention to the pages concerning the security (see page M1.1).



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INFORMATION

Dear Customer,
We wish to thank you for having bought a high quality set.

Our sections for Technical Service and Spare Parts will work at best to help you if it were necessary.

To this purpose we advise you, for all control and overhaul operations, to turn to the nearest authorized Service Centre, where you will obtain a prompt and specialized intervention.

☞ In case you do not profit on these Services and some parts are replaced, please ask and be sure that are used exclusively original parts; this to guarantee that the performances and the initial safety prescribed by the norms in force are re-established.

☞ *The use of **non original spare parts will cancel immediately any guarantee and Technical Service obligation.***

NOTES ABOUT THE MANUAL

Before actioning the machine please read this manual attentively. Follow the instructions contained in it, in this way you will avoid inconveniences due to negligence, mistakes or incorrect maintenance. The manual is for qualified personnel, who knows the rules: about safety and health, installation and use of sets movable as well as fixed.

You must remember that, in case you have difficulties for use or installation or others, our Technical Service is always at your disposal for explanations or interventions.

The manual for Use Maintenance and Spare Parts is an integrant part of the product. It must be kept with care during all the life of the product.

In case the machine and/or the set should be yielded to another user, this manual must also given to him.

Do not damage it, do not take parts away, do not tear pages and keep it in places protected from dampness and heat.

You must take into account that some figures contained in it want only to identify the described parts and therefore might not correspond to the machine in your possession.

INFORMATION OF GENERAL TYPE

In the envelope given together with the machine and/or set you will find: the manual for Use Maintenance and Spare Parts, the manual for use of the engine and the tools (if included in the equipment), the guarantee (in the countries where it is prescribed by law).

The Manufacturer shall not be liable for ANY USE OF THE PRODUCT OTHER THAN THAT PRECISELY SPECIFIED IN THIS MANUAL and is thus not liable for any risks which may occur as a result of IMPROPER USE. The Company does not assume any liability for any damage to persons, animals or property.

Our products are made in conformity with the safety norms in force, for which it is advisable to use all these devices or information so that the use does not bring damage to persons or things.

While working it is advisable to keep to the personal safety norms in force in the countries to which the product is destined (clothing, work tools, etc.).

Do not modify for any motive parts of the machine (fastenings, holes, electric or mechanical devices, others..) if not duly authorized in writing: the responsibility coming from any potential intervention will fall on the executioner as in fact he becomes maker of the machine.

☞ **Notice:** *the manufacturer, who keeps the faculty, apart the essential characteristics of the model here described and illustrated, to bring betterments and modifications to parts and accessories, without putting this manual uptodate immediately.*











 CE MARK
 


M
1.4
 REV.7-02/14





Any of our product is labelled with CE marking attesting its conformity to applicable directives and also the fulfillment of safety requirements of the product itself; the list of these directives is part of the declaration of conformity included in any machine standard equipment. Here below the adopted symbol:






CE marking is clearly readable and unerasable and it can be either part of the data-plate.

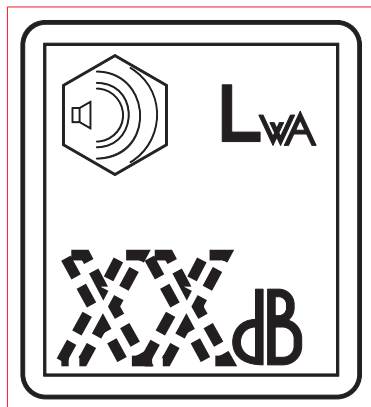
| | | | |
|---|--------------------|-------|----------------------|
|  | Made in UE-ITALY | TYPE | |
| | SERIAL N° | | |
|  | X | | |
| | I ₂ (A) | | |
|  | U ₂ (V) | | |
|  | I ₂ (A) | | |
|  | U ₂ (V) | | |
|  | Hz | KVA | |
| | P.F. | V (V) | |
| | | I (A) | |
|  | n | RPM | n ₁ RPM |
| | n ₀ | RPM | P _{1max} KW |
| | | | IP |
| | | | CL |

| | | | |
|--|-------------------------|-------------|---------------------------------------|
|  | Made in UE-ITALY | TYPE | |
| | Generating Set ISO 8528 | SERIAL N° | |
| | KVA | | |
| | V | | |
| | I | | |
| | Hz | P.F. | LTP POWER IN ACCORDANCE WITH ISO 8528 |
| | RPM | I CL | P |
| | ALTIT. 100 m | TEMP. 25 °C | MASS |

| | | |
|---|---------------------------------------|------------------|
|  | TYPE | |
| | SERIAL N° | Made in UE-ITALY |
|  | TYPE/N° | |
| | VOLTAGE(V) | |
| | POWER(W) | |
|  | Hz | KVA |
| | P.F. | V(V) |
| | I.C.L. | I(A) |
| | LTP POWER IN ACCORDANCE WITH ISO 8528 | |
|  | n | RPM |
| | P _{max} | TEMP. °C |
| | | IP |
| | | Kg |

| | | | |
|---|------------------|----------------|----------------------|
|  | Made in UE-ITALY | I.C.L. | |
| | IEC 60974-1 | IP | |
| | | Kg | |
|  | U ₀ | | |
| | X | I ₂ | U ₂ |
|  | n | RPM | n ₁ RPM |
| | n ₀ | RPM | P _{1max} kW |
| | | | P |
| | | | V |
| | | | I |

Furthermore, on each model it is shown the noise level value; the symbol used is the following:



The indication is shown in a clear, readable and indeleble way on a sticker.

BCS S.p.A.

Sede legale:
Via Marradi 1
20123 Milano - Italia

Stabilimento di Cusago, 20090 (Mi) - Italia

V.le Europa 59
Tel.: +39 02 903521
Fax: +39 02 90390466



ISO 9001:2008 - Cert. 0192

DICHIARAZIONE DI CONFORMITA'



Déclaration de Conformité – Declaration of Conformity – Konformitätserklärung
Conformiteitsverklaring – Declaración de Conformidad

BCS S.p.A. dichiara sotto la propria responsabilità che la macchina:
BCS S.p.A. déclare, sous sa propre responsabilité, que la machine:
BCS S.p.A. declares, under its own responsibility, that the machine:
BCS S.p.A. erklärt, daß die Aggregate:
BCS S.p.A. verklaard, onder haar eigen verantwoordelijkheid, dat de machine:
BCS S.p.A. declara bajo su responsabilidad que la máquina:

GRUPPO ELETTROGENO DI SALDATURA / WELDING GENERATOR

GRUPPO ELETTROGENO / POWER GENERATOR

TORRE FARO / LIGHTING TOWER

Marchio / Brand :

Modello / Model :

Matricola / Serial number :

FAC SIMILE

è conforme con quanto previsto dalle Direttive Comunitarie e relative modifiche:
est en conformité avec ce qui est prévu par les Directives Communautaires et relatives modifications:
conforms with the Community Directives and related modifications:
mit den Vorschriften der Gemeinschaft und deren Ergänzungen übereinstimmt:
in overeenkomst is met de inhoud van gemeenschapsrichtlijnen en gerelateerde modificaties:
comple con los requisitos de la Directiva Comunitaria y sus anexos:

2006/42/CE - 2006/95/CE - 2004/108/CE

Nome e indirizzo della persona autorizzata a costituire il fascicolo tecnico :
Nom et adresse de la personne autorisée à composer le Dossier Technique :
Person authorized to compile the technical file and address :
Name und Adresse der zur Ausfüllung der technischen Akten ermächtigten Person :
Persoon bevoegd om het technische document , en bedrijf gegevens in te vullen
Nombre y dirección de la persona autorizada a componer el expediente técnico :

ing. Benso Marelli - Consigliere Delegato / Managing Director ; V.le Europa 59, 20090 Cusago (MI) – Italy

Cusago,

Ing. Benso Marelli
Consigliere Delegato
Managing Director

| | | | |
|--------------|-----------------------|--------------------------------|---------------------------------------|
| I GB F | Technical data | MAGIC WELD 200 YD - YDE | M 1.5 REV.0-02/14 |
|--------------|-----------------------|--------------------------------|---------------------------------------|

| Technical data | MAGIC WELD 200 YD | MAGIC WELD 200 YDE |
|---|-------------------|---|
| A.C. GENERATION 50/60 Hz | | |
| Single-phase output 230V (max) | | 3.3 kVA / 230 V / 14.3 A |
| Single-phase output 230V (continuous) | | 3 kVA / 230 V / 13 A |
| Single-phase output 115V (max) | | 2.1 kVA / 110 V / 18.3A |
| Single-phase output 115V (continuous) | | 1.8 kVA / 110 V / 16.4 A |
| Cos φ | | 0.8 |
| ALTERNATOR | | |
| Type | | permanent magnet, self-excited, brushless |
| Insulating class | | H |
| ENGINE | | |
| Mark / Model | | YANMAR L70N |
| Type / Cooling system | | Diesel 4-stroke / Air |
| Cylinders / Displacement | | 1 / 320 cm ³ |
| Net power | | 4.9 kW (6.7 HP) |
| Speed | | 3600 rpm |
| Fuel consumption (Welding 60%) | | 1 l/h |
| Engine oil capacity | | 1.05 l |
| Starter | recoil | Electric |
| GENERAL SPECIFICATIONS | | |
| Tank capacity | | 3.3 l |
| Running time (Welding 60%) | | 3.3 h |
| Protection | | IP 23 |
| Dimensions max. on base LxIhx * | | 630x480x540 |
| *Weight (dry) | 72 Kg | 91 Kg |
| Acoustic power LwA (pressure LpA) | | 103 dB(A) (78 dB(A) @ 7 m) |
| * Dimensions and weight are inclusive of all parts. | | |

POWER

Declared power according to ISO 3046-1 (temperature 25°C, 30% relative humidity, altitude 100 m above sea level).

It's admitted overload of 10% each hour every 12 h.

In an **approximative** way one reduces: of 1% every 100 m altitude and of 2.5% for every 5°C above 25°C.

ACOUSTIC POWER LEVEL

ATTENTION: The concrete risk due to the machine depends on the conditions in which it is used. Therefore, it is up to the end-user and under his direct responsibility to make a correct evaluation of the same risk and to adopt specific precautions (for instance, adopting a I.P.D. -Individual Protection Device)

Acoustic Noise Level (LwA) - Measure Unit dB(A): it stands for acoustic noise released in a certain delay of time. This is not submitted to the distance of measurement.

Acoustic Pressure (Lp) - Measure Unit dB(A): it measures the pressure originated by sound waves emission. Its value changes in proportion to the distance of measurement.


The here below table shows examples of acoustic pressure (Lp) at different distances from a machine with Acoustic Noise Level (LwA) of 95 dB(A)

Lp a 1 meter = 95 dB(A) - 8 dB(A) = 87 dB(A)

Lp a 4 meters = 95 dB(A) - 20 dB(A) = 75 dB(A)

Lp a 7 meters = 95 dB(A) - 25 dB(A) = 70 dB(A)

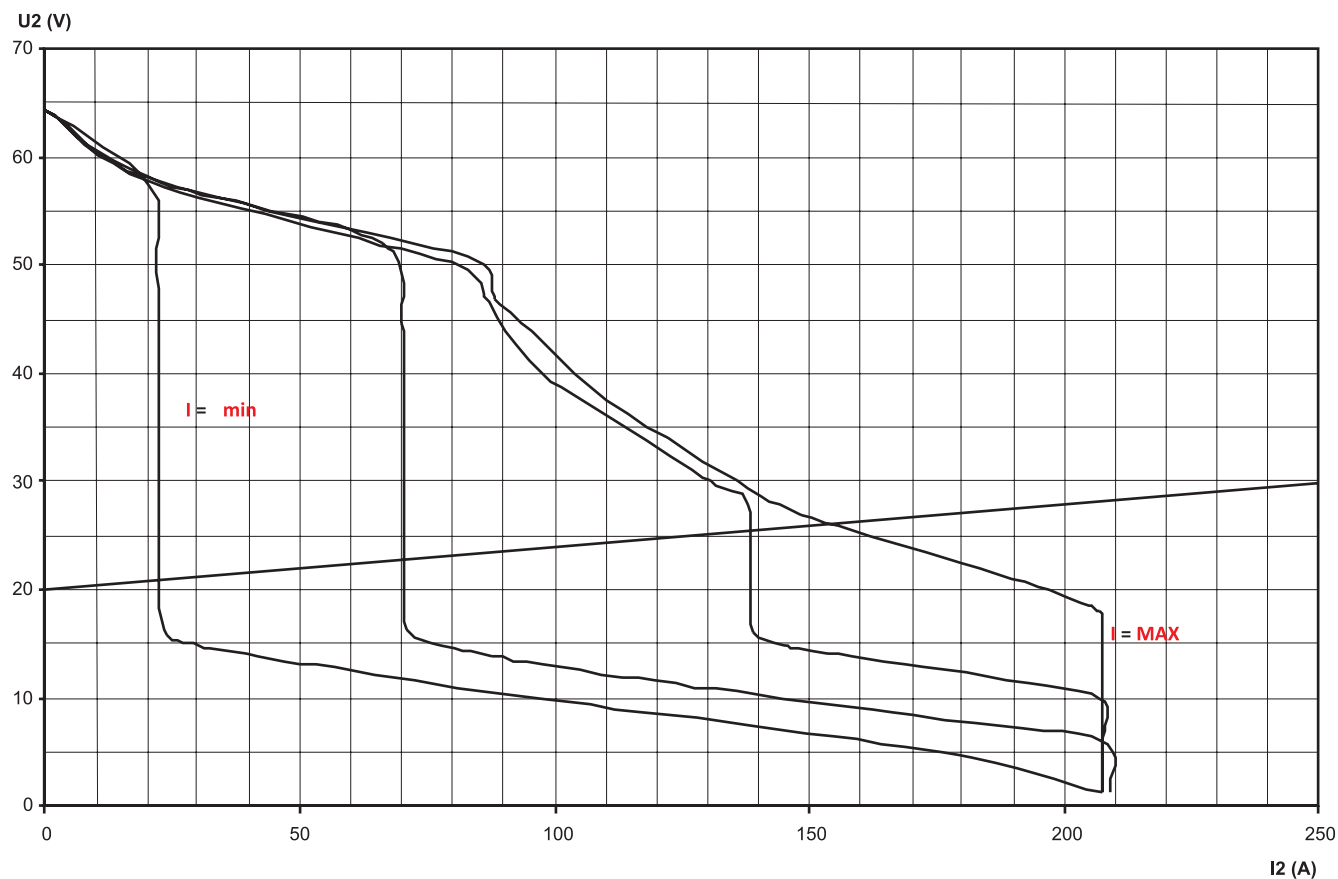
Lp a 10 meters = 95 dB(A) - 28 dB(A) = 67 dB(A)

PLEASE NOTE: the symbol  when with acoustic noise values, indicates that the device respects noise emission limits according to 2000/14/CE directive.

D.C. WELDING

Current range, continuous 20 - 200A
 Open circuit voltage 65V
 Duty cycle 200 A - 60%

OUTPUT CHARACTERISTIC




SIMULTANEOUS UTILIZATION FACTORS

In case **Welding** and **Generation** can be used simultaneously, however, the engine **cannot** be overloaded. The table below gives the maximum limits to be respected

| WELDING CURRENT | >150A | 125A | 100A | 75A | 50A | 0A |
|--------------------------|-------|---------|---------|---------|---------|---------|
| POWER GENERATION 230 Vac | 0 kVA | 0.8 kVA | 1.5 kVA | 2.1 kVA | 2.5 kVA | 3 kVA |
| POWER GENERATION 115 Vac | 0 kVA | 0.5 kVA | 1 kVA | 1.3 kVA | 1.5 kVA | 1.8 kVA |

The installation and general warnings regarding operations are aimed achieving correct use of the machine and/or apparatus in the place where it is used as a genset and/or motor welder.

- Advice to the User about the safety:

 NB: The information contained in the manual can be changed without notice.

Any damage caused in connection with the use of these instructions shall not be considered as they are only indicative.

Remember that the non observance of the indications reported by us might cause damage to persons or things. It is understood, that local dispositions and/or laws must be respected.

 **DANGEROUS**

This heading warns of an immediate danger for persons as well for things. Not following the advice can result in serious injury or death.

 **WARNING**

This heading warns of situations which could result in injury for persons or damage to things.

 **CAUTION**

To this advice can appear a danger for persons as well as for things, for which can appear situations bringing material damage to things.


 **IMPORTANT**

 **NOTE**

 **ATTENTION**


These headings refer to information which will assist you in the correct use of the machine and/or accessories.



 **FIRST AID.** In case the operator should be sprayed by accident, from corrosive liquids a/o hot toxic gas or whatever event which may cause serious injuries or death, predispose the first aid in accordance with the ruling labour accident standards or of local instructions.

| | |
|-------------------------------|--|
| Skin contact | Wash with water and soap |
| Eyes contact | Irrigate with plenty of water, if the irritation persists contact a specialist |
| Ingestion | Do not induce vomit as to avoid the intake of vomit into the lungs, send for a doctor |
| Suction of liquids from lungs | If you suppose that vomit has entered the lungs (as in case of spontaneous vomit) take the subject to the hospital with the utmost urgency |
| Inhalation | In case of exposure to high concentration of vapours take immediately to a non polluted zone the person involved |



 **FIRE PREVENTION.** In case the working zone, for whatsoever cause goes on fire with flames liable to cause severe wounds or death, follow the first aid as described by the ruling norms or local ones.

| EXTINCTION MEANS | |
|-----------------------|--|
| Appropriated | Carbonate anhydride (or carbon dioxide) powder, foam, nebulized water |
| Not to be used | Avoid the use of water jets |
| Other indications | Cover eventual shedding not on fire with foam or sand, use water jets to cool off the surfaces close to the fire |
| Particular protection | Wear an autorespiratory mask when heavy smoke is present |
| Useful warnings | Avoid, by appropriate means to have oil sprays over metallic hot surfaces or over electric contacts (switches, plugs, etc.). In case of oil sprinkling from pressure circuits, keep in mind that the inflammability point is very low. |

SYMBOLS



STOP - Read absolutely and be duly attentive



Read and pay due attention



GENERAL ADVICE - If the advice is not respected damage can happen to persons or things.



HIGH VOLTAGE - Attention High Voltage. There can be parts in voltage, dangerous to touch. The non observance of the advice implies life danger.



FIRE - Danger of flame or fire. If the advice is not respected fires can happen.



HEAT - Hot surfaces. If the advice is not respected burns or damage to things can be caused.



EXPLOSION - Explosive material or danger of explosion. in general. If the advice is not respected there can be explosions.



WATER - Danger of shortcircuit. If the advice is not respected fires or damage to persons can be caused.



SMOKING - The cigarette can cause fire or explosion. If the advice is not respected fires or explosions can be caused.



ACIDS - Danger of corrosion. If the advice is not respected the acids can cause corrosions with damage to persons or things.



WRENCH - Use of the tools. If the advice is not respected damage can be caused to things and even to persons.



PRESSION - Danger of burns caused by the expulsion of hot liquids under pressure.



ACCES FORBIDDEN to non authorized people.

PROHIBITIONS No harm for persons

Use only with safety clothing -



It is compulsory to use the personal protection means given in equipment.

Use only with safety clothing -



It is compulsory to use the personal protection means given in equipment.

Use only with safety protections -



It is a must to use protection means suitable for the different welding works.

Use with only safety material -



It is prohibited to use water to quench fires on the electric machines.

Use only with non inserted voltage -



It is prohibited to make interventions before having disinserted the voltage.

No smoking -



It is prohibited to smoke while filling the tank with fuel.

No welding -



It is forbidden to weld in rooms containing explosive gases.

ADVICE No harm for persons and things

Use only with safety tools, adapted to the specific use -

It is advisable to use tools adapted to the various maintenance works.

Use only with safety protections, specifically suitable



It is advisable to use protections suitable for the different welding works.

Use only with safety protections -



It is advisable to use protections suitable for the different daily checking works.

Use only with safety protections -




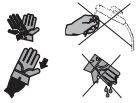








It is advisable to use all protections while shifting the machine.







Use only with safety protections -




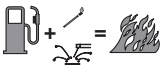




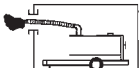





It is advisable to use protections suitable for the different daily checking works.and/or of maintenance.


ARC WELDING HAZARDS


| | |
|---|---|
|  | <p>Electric shock from welding electrode or wiring can kill.</p> |
|  | <p>Wear dry, hole-free insulating gloves and body protection. Do not touch electrode with bare hand. Do not wear wet or damaged gloves. Do not touch live electrical parts. Wet or confined spaces, or if their is una danger of falling. Use AC output ONLY if required for the welding process. If AC output is required, use remote output control if present on unit.</p> |
|  | <p>Magnetic fields can affect pace-makers. Pace-maker wearers keep away from arc welding and cutting operations and equipment. Wearers should consult their doctor before going near arc welding, gouging, arc cutting, or spot welding operations.</p> |
|  | <p>Protect yourself from electric shock by insulating yourself from work and ground. Use non-flammable, dry insulating material if possible, or use dry rubber mats, dry wood or plywood, or other dry insulating material big enough to cover your full area of contact with the work or ground, and watch for fire.</p> |
|  | <p>Breathing welding fumes can be hazardous to your health.</p> |
|  | <p>Keep your out of the fumes. Do not breathe the fumes. Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.</p> |
|  | <p>Use enough forced ventilation or local exhaust (forced suction) at the arc to remove the fumes from your breathing area.</p> |
|  | <p>Use a ventilating fan to remove fumes from the breathing zone and welding area. If adequacy of ventilation or exhaust is uncertain, have your exposure measured and compared to the T</p> |
|  | <p>Welding can cause fire or explosion.</p> |
|  | <p>Do not weld near flammable material. Move flammables at least (10 m) away or protect them with flame-proof covers.</p> |

| | |
|--|---|
|  | <p>Do not weld on drums, tanks, or any closed containers unless a qualified person has tested it and declared it or prepared it to be safe.</p> |
|  | <p>Welding sparks can cause fires. Have a fire extinguisher nearby, and have a trained fire watcher ready to use it.</p> |
|  | <p>Arc rays can burn eyes and skin.</p> |
|  | <p>Use welding helmet with correct shade of filter.</p> |
|  | <p>Wear welders cap and safety glasses with side shields. Use ear protection when welding out of position or in confined spaces. Button shirt collar.</p> |
|  | <p>Wear complete body protection. Wear oil-free protective clothing such as leather gloves, heavy shirt, cuffless pants, and hight boots.</p> |

ENGINE HAZARDS

| | |
|---|---|
|  | Fuel can cause fire or explosion. |
|  | Engine fuel plus flames or sparks can cause fire or explosion. Do not weld near engine fuel. Do not spill fuel. If fuel is spilled, clean it up and do not start engine until fumes are gone. |
|  | Do not smoke while fueling or if near fuel or fumes. |
|  | STOP engine before fueling. |
|  | DO NOT fuel a hot engine. Stop engine and let it cool off before checking or adding fuel. |
|  | Engine exhaust gases can kill. |
|  | Vent exhaust outside and away from any building air intakes. |
|  | Use unit outside in open, well ventilated areas. |
|  | Moving parts can cause injury. Keep hands, hair, loose clothing, and tools away from moving parts such as fans, belts, and rotors. Keep all doors, panels, and guards closed and secured. |
|  | Battery explosion can blind. Sparks can cause battery gases to explode. Do not smoke and keep matches and flames away from battery. Wear a face shield or safety glasses when working near or on a battery. |
|  | Battery acid can burn skin and eyes. Do not spill acid. Wear rubber gloves and a face shield or safety glasses when working on a battery. |
|  | Steam and hot coolant can burn. Check coolant level when engine is cold to avoid scalding. If the engine is warm and checking is needed, wear safety glasses and gloves and put a rag over radiator cap. Turn cap slightly and let pressure escape slowly before completely removing cap. |

| | |
|---|---|
|  | Exhaust sparks can cause fire. Use approved engine exhaust spark arrestor in required areas. Keep exhaust and exhaust pipes away from flammables. Do not locate unit near flammables. |
|---|---|

| | |
|---|--|
|  | Hot parts can cause severe burns. Do not touch hot welder with bare hand. If handling is needed, use proper tools and/or wear heavy, insulated welding gloves to prevent burns. Allow cooling period before handling parts or working on gun or torch. |
|---|--|

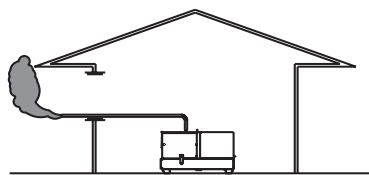
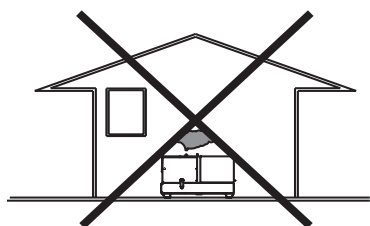
INSTALLATION AND ADVICE BEFORE USE

GASOLINE ENGINES

- ☞ Use in open space, air swept or vent exhaust gases, which contain the deadly carbone oxyde, far from the work area.

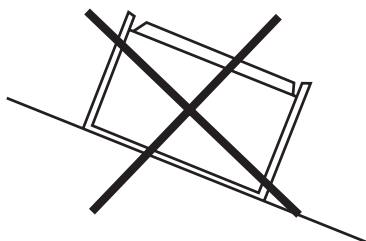
DIESEL ENGINES

- ☞ Use in open space, air swept or vent exhaust gases far from the work area.

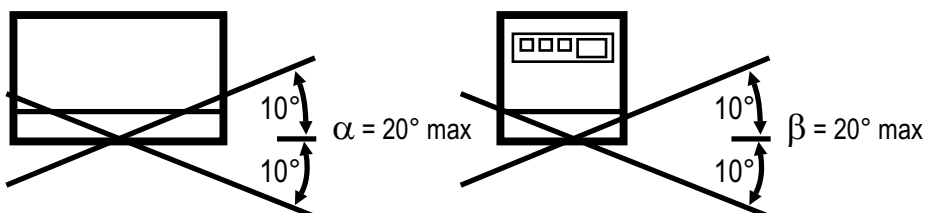


POSITION

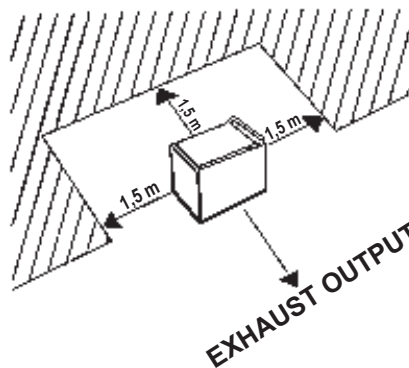
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



Maximum leaning of the machine (in case of dislevel)



Check that the air gets changed completely and the hot air sent out does not come back inside the set so as to cause a dangerous increase of the temperature.



- ☞ Make sure that the machine does not move during the work: **block** it possibly with tools and/or devices made to this purpose.

MOVES OF THE MACHINE

- ☞ At any move check that the engine is **off**, that there are no connections with cables which impede the moves.

PLACE OF THE MACHINE



ATTENTION



For a safer use from the operator **DO NOT** fit the machine in locations with high risk of flood.

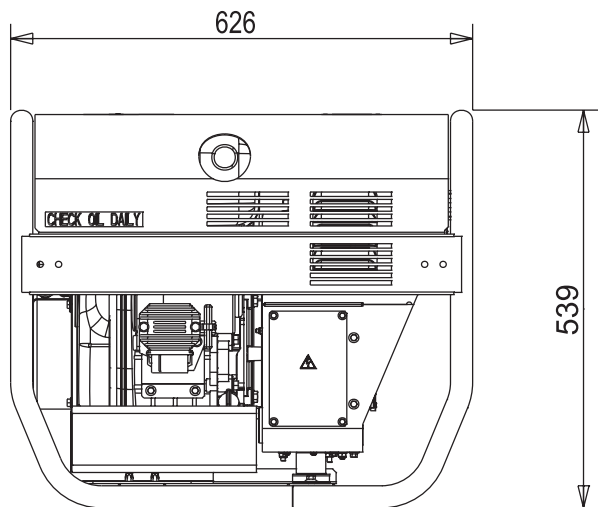
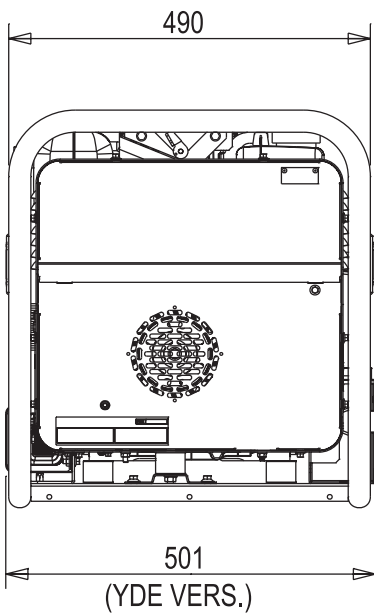
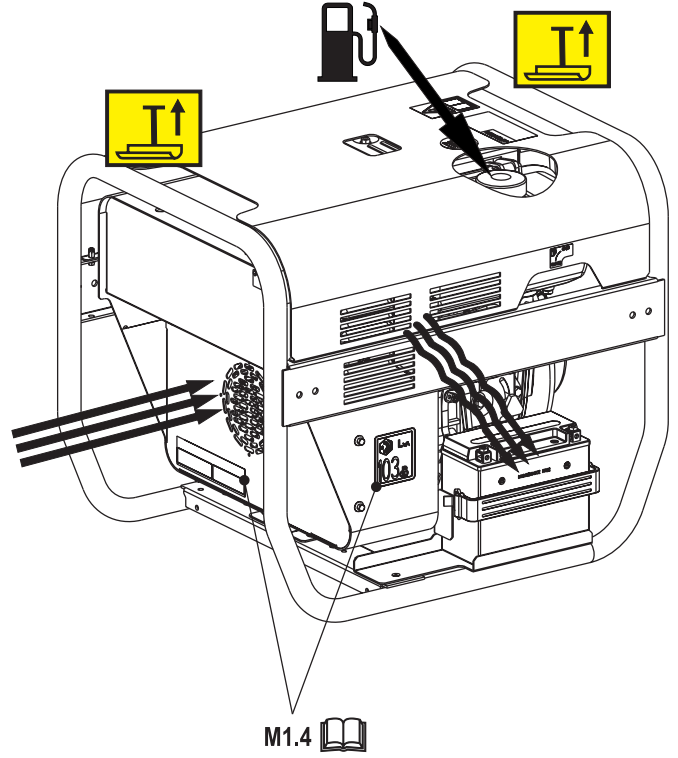
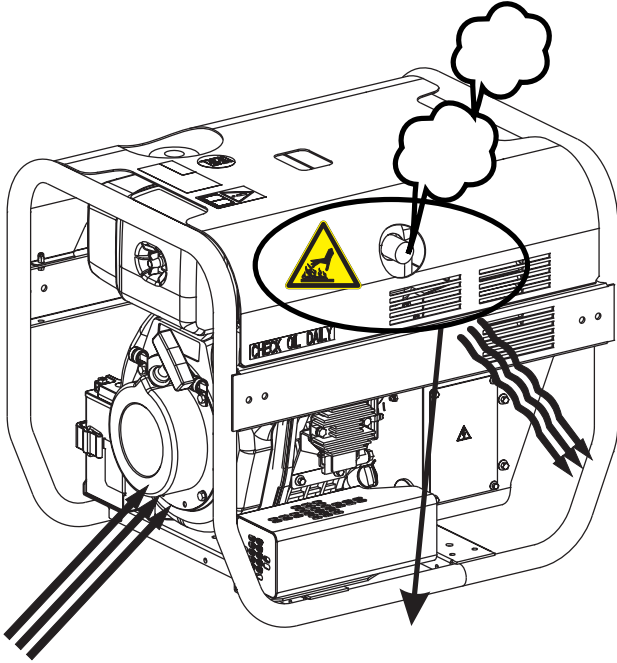
Please do not use the machine in weather conditions which are beyond IP protection shown both in the data plate and on page named "technical data" in this same manual.

ⓘ Installazione
ⓖⓔ Installation
ⓕ Installation

ⓓ Luftzirkulation
ⓔ Instalación
Ⓟ

MAGIC WELD 200 YD - YDE

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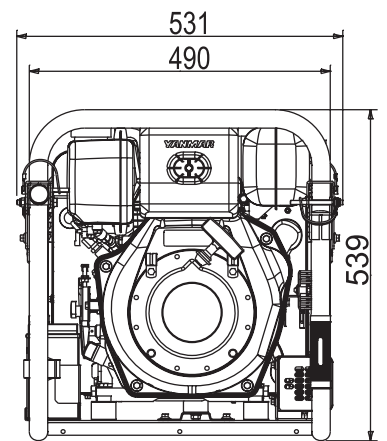
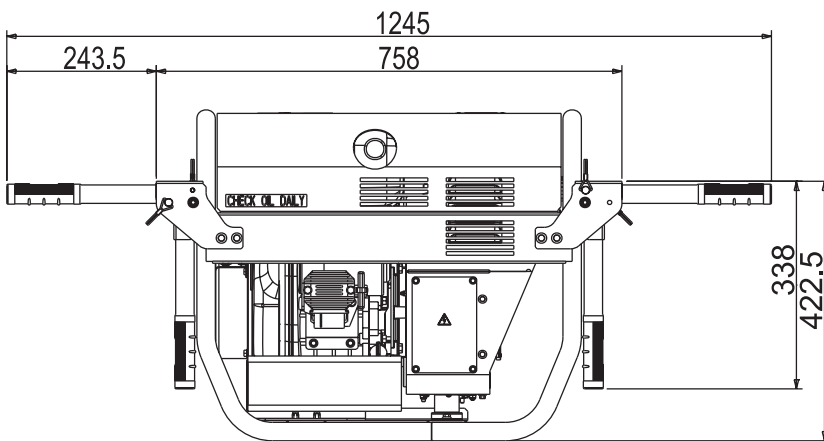
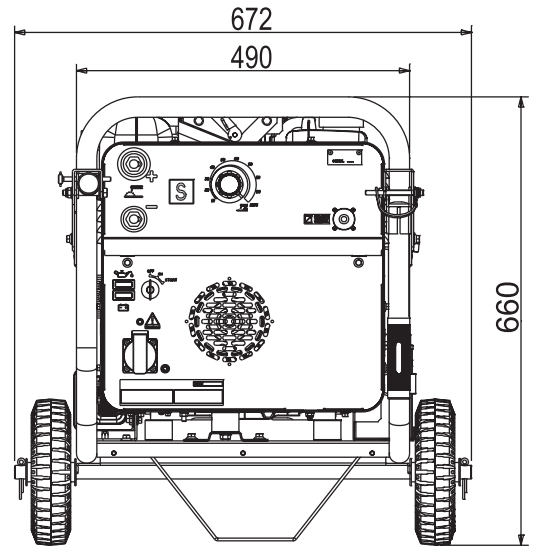
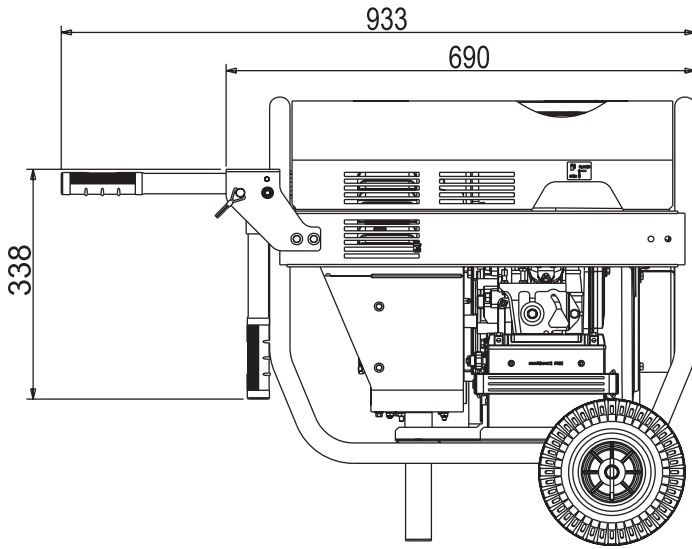


Ⓡ Installazione
Ⓢ Installation
Ⓣ Installation

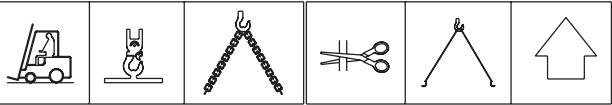
Ⓝ Luftzirkulation
Ⓞ Instalación
Ⓟ

MAGIC WELD 200 YD - YDE

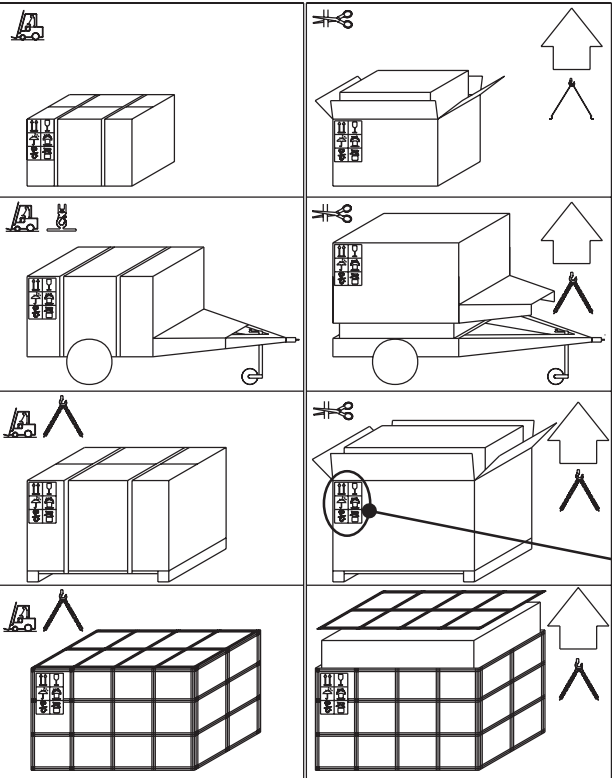
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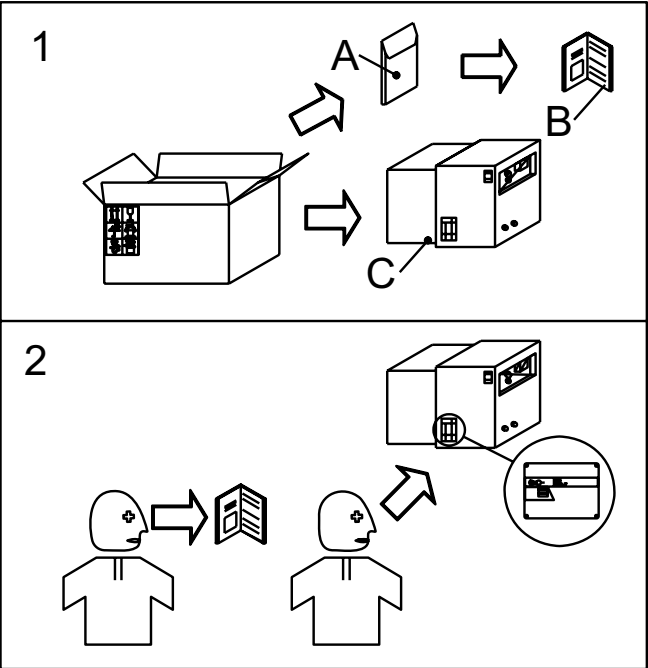
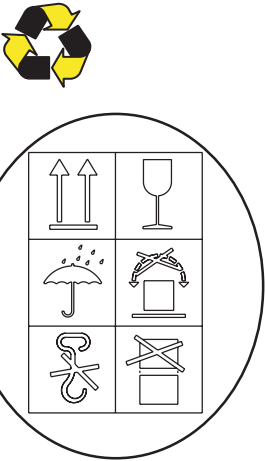
 **NOTE**



Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with its packaging, and conforms to local rules and regulations. When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling or taking away of parts contained inside the packing or in the set. In case you find damages, rough handling or absence of parts (envelopes, manuals, etc.), we advise you to inform immediately our Technical Service.



For eliminating the packing materials, the User must keep to the norms in force in his country.



- 1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
- 2) Read: the user's manual (B), the plates fixed on the machine, the data plate.



NOTE

Transportation must always take place with the engine off, electrical cables and starting battery disconnected and fuel tank empty.

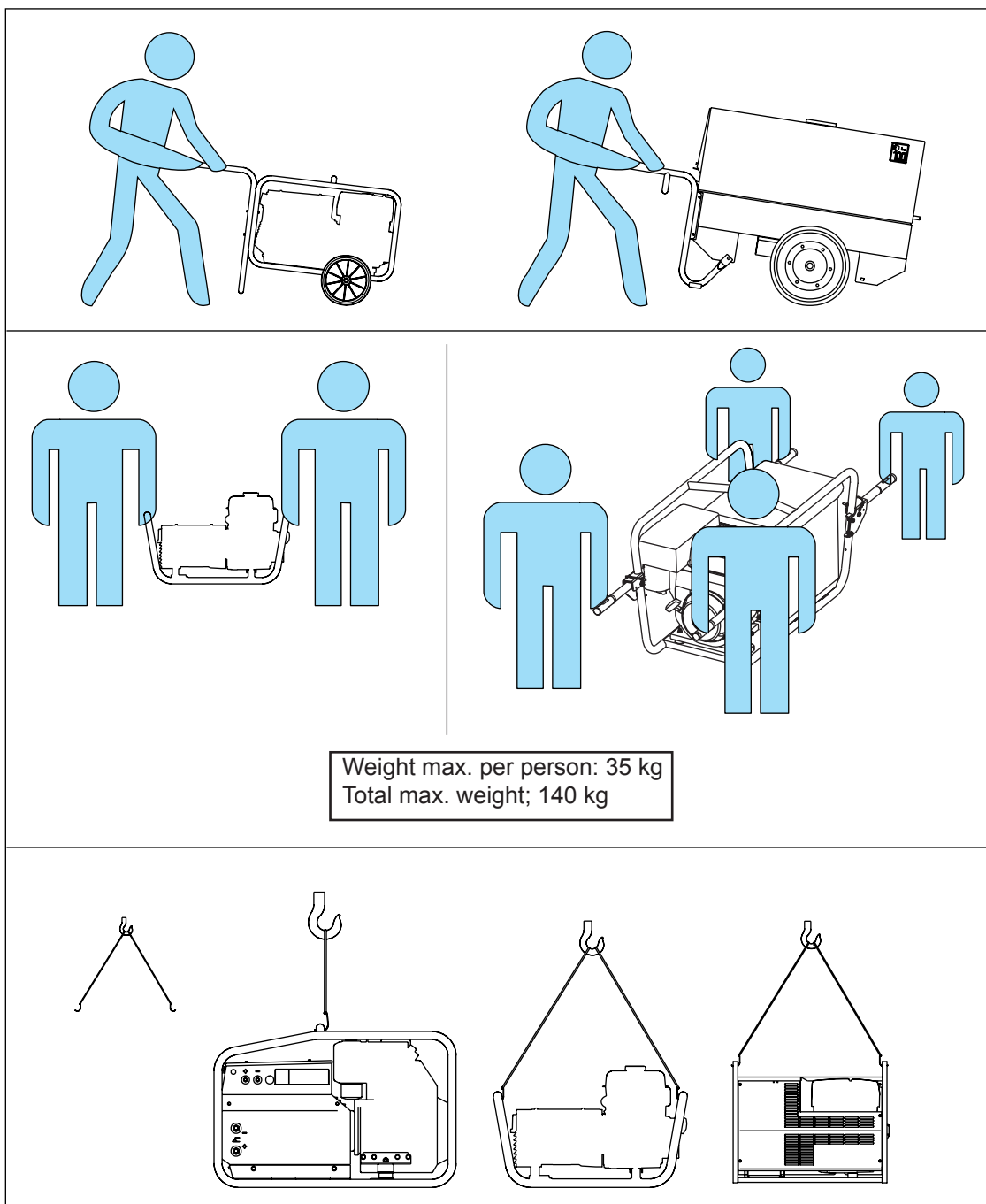
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with its packaging, and conform to local rules and regulations.

Only authorized persons involved in the transport of the machine should be in the area of movement.

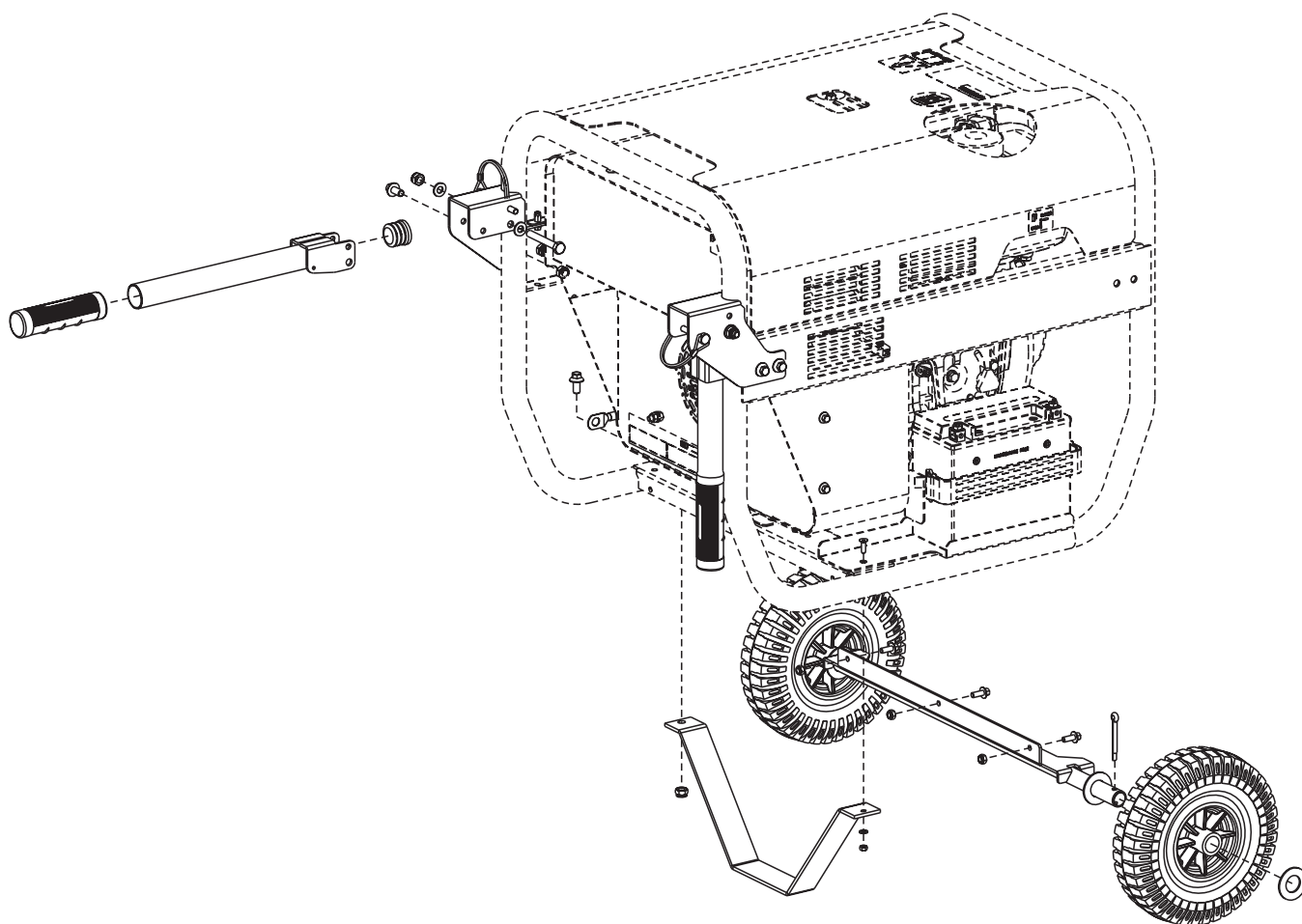
DO NOT LOAD OTHER PARTS WHICH CAN MODIFY WEIGHT AND BARICENTER POSITION.

IT IS STRICTLY FORBIDDEN TO DRAG THE MACHINE MANUALLY OR TOW IT BY ANY VEHICLE (model with no CTM accessory).

If you did not keep to the instructions, you could damage the structure of the machine.



Note: Lift the machine and assemble the parts as shown in the drawing

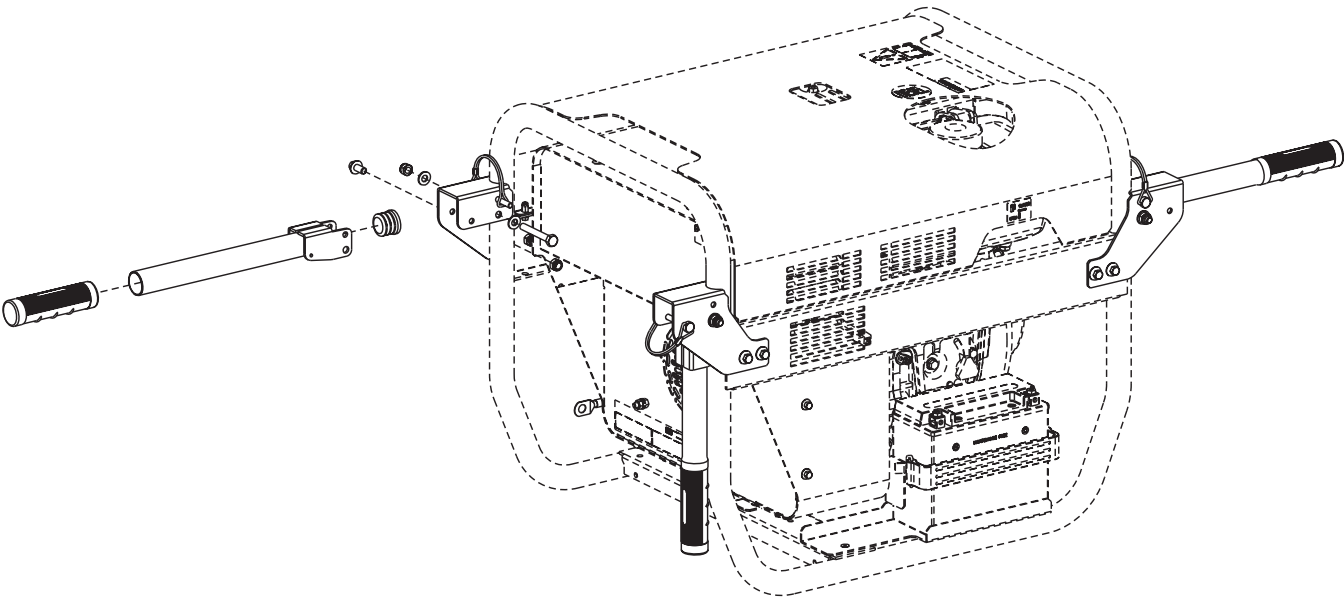


ATTENTION

The CTM accessory cannot be removed from the machine and used separately (actioned manually or following vehicles) for the transport of loads or anyway for used different from the machine movements.



Note: Lift the machine and assemble the parts as shown in the drawing



⚠ ATTENTION

The TRM accessory cannot be removed from the machine and used separately (actioned manually or following vehicles) for the transport of loads or anyway for used different from the machine movements.





BATTERY WITHOUT MAINTENANCE

(where it is assembled)

The included battery must be activated.
To activate it (fill the included acid) please follow the instructions shown on the manual attached to the battery.

When battery is activated, **DON'T** add any other liquid.



LUBRICANT

Please refer to the motor operating manual for the recommended viscosity.

RECOMMENDED OIL

The manufacturer recommends selecting AGIP engine oil.

Refer to the label on the motor for the recommended products.

|  PRODOTTI RACCOMANDATI RECOMMENDED PRODUCTS | |
|--|---|
| AGIP SIGMA TURBO PLUS 15W/40 API CG4 - ACEA E3 | OLIO MOTORE DIESEL DIESEL ENGINE OIL |
| AGIP SUPERMOTOROIL 20W/50 API CC-SF | OLIO MOTORE BENZINA GASOLINE ENGINE OIL |
| AGIP ANTIFREEZE EXTRA INIBITE ETHYLENE GLYCOL (50% + 50% + H ₂ O) | CIRCUITO DI RAFFREDDAMENTO COOLING CIRCUIT (CUNA NC 956-16 ED 97) |

REFUELLING AND CONTROL:

Carry out refuelling and controls with motor at level position.

1. Remove the oil-fill tap (24)
2. Pour oil and replace the tap
3. Check the oil level using the dipstick (23); the oil level must be comprised between the minimum and maximum indicators.



ATTENTION

It is dangerous to fill the motor with too much oil, as its combustion can provoke a sudden increase in rotation speed.



DRY AIR FILTER

Check that the dry air filter is correctly installed and that there are no leaks around the filter which could lead to infiltrations of non-filtered air to the inside of the motor.



FUEL



ATTENTION



Do not smoke or use open flames during refuelling operations, in order to avoid explosions or fire hazards. Fuel fumes are highly toxic; carry out operations outdoors only, or in a well-ventilated environment.



Avoid accidentally spilling fuel. Clean any eventual leaks before starting up motor.

Refill the tank with good quality diesel fuel, such as automobile type diesel fuel, for example.

For further details on the type of diesel fuel to use, see the motor operating manual supplied.

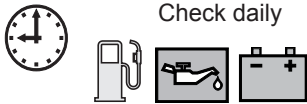
Do not fill the tank completely; leave a space of approx. 10 mm between the fuel level and the wall of the tank to allow for expansion.

In rigid environmental temperature conditions, use special winterized diesel fuels or specific additives in order to avoid the formation of paraffin.



GROUNDING CONNECTION

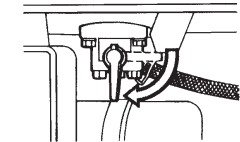
See section "Use as a generator" page M37.



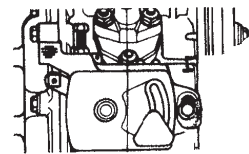
NOTE

Do not alter the primary conditions of regulation and do not touch the sealed parts.

RECOIL VERSION



1) Open fuel cock



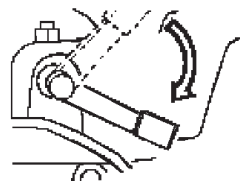
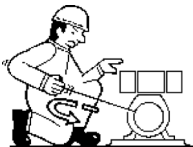
2) Accelerator lever must be in the "START" position.



3) Grasp the starter handle as shown



4) Pull the starter rope until you feel resistance and let it return slowly to its original position



5) lower the decompression lever

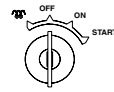


6) pull the rope firmly as far as it will go. If necessary use two hands

ELECTRIC STARTING

1) Carry out operations 1) and 5) as with pull start

2) Turn the starter key to the "ON" position, the accelerator control solenoid will automatically move the accelerator lever into the "START" position



3) Turn the starter key to the "ON" position, when the motor is running, let the key reposition itself to "ON"

4) When the motor is started, it will immediately reach the nominal RPM for approx. 6/7 seconds, after which time it will automatically go down to the minimum set by the solenoid which controls the accelerator lever.

5) When welding power or auxiliary generation is required, the motor will automatically go up to the nominal RPM necessary for the use of the machine.

EMERGENCY PULL START FOR ELECTRIC STARTER VERSIONS

If all the above conditions have been met, proceed as follows:

WARNING

The pull start, for electric starter versions, is only possible if the all the conditions listed below have been met:

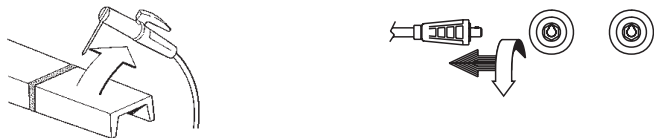
- the starter battery must remain connected to the electrical circuit;
- the starter battery must be able to power the accelerator control solenoid, check this condition turning the starter key to the "ON" position;
- unplug the pressure switch cable.

- 1) Open fuel cock
- 2) Turn the starter key into the "ON" position, check that the accelerator control solenoid moves the accelerator lever into the "START" position
- 3) Grasp the starter handle as shown
- 4) Pull the starter rope until you feel resistance and let it return slowly to its original position
- 5) lower the decompression lever
- 6) pull the rope firmly as far as it will go. If necessary use two hands.

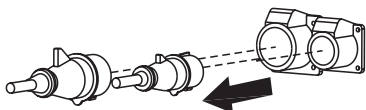


☞ Before stopping the engine it is compulsory to stop the load:

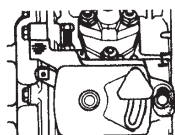
- stop welding;



- shut off any loads which are connected to the unit auxiliary outputs.

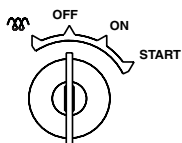


RECOIL VERSION



Let the motor run at no load for several minutes to allow for cooling and then move the accelerator control into the "STOP" position.

ELECTRIC STARTING

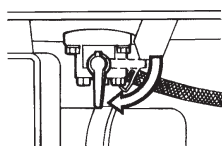


Wait for the motor to automatically go to the minimum RPM, 6/7 seconds after load release, leave the motor running under these conditions for several minutes in order to allow for cooling, then turn the starting key to the "OFF" position.



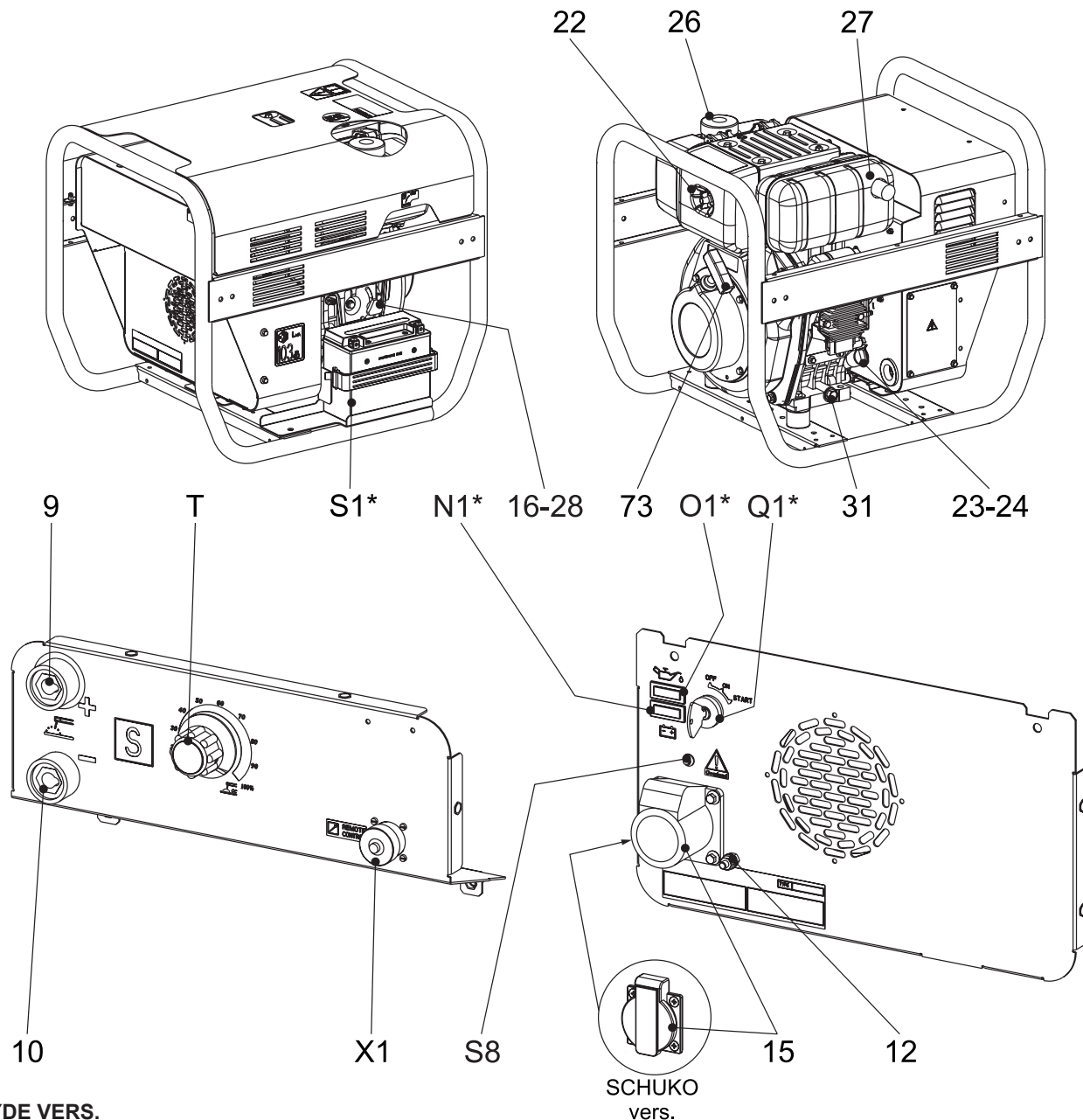
ATTENTION

To switch off the motor in case of emergency, either move the accelerator control to the "STOP" position immediately or move the starter key to the "ON" position.



Shut the fuel cock.

☞ NB.: for safety purposes remove the starter key from the machine at the end of every work session.



(*) YDE VERS.

| Pos. | Descrizione | Description | Description | Descripción |
|------|----------------------------------|----------------------------------|------------------------------------|-------------------------------------|
| 9 | Prese di saldatura (+) | Welding sockets (+) | Prises de soudage (+) | Tomas de soldadura (+) |
| 10 | Prese di saldatura (-) | Welding sockets (-) | Prises de soudage (-) | Tomas de soldadura (-) |
| 12 | Presa di messa a terra | Earth terminal | Prise de mise à terre | Toma de puesta a tierra |
| 15 | Presa di corrente in c.a. | a.c. socket | Prises de courant en c.a. | Toma de corriente en c.a. |
| 16 | Comando acceleratore | Accelerator control | Commande accélérateur | Mando de aceleración |
| 22 | Filtro aria motore | Engine air filter | Filtre air moteur | Filtro aire motor |
| 23 | Asta livello olio motore | Oil level dipstick | Jauge niveau huile moteur | Aguja nivel aceite motor |
| 24 | Tappo caricamento olio motore | Engine oil reservoir cap | Bouchon remplissage huile moteur | Tapón llenado aceite motor |
| 26 | Tappo serbatoio | Fuel tank cap | Bouchon réservoir | Tapón depósito |
| 27 | Silenziatore di scarico | Muffler | Silencieux d'échappement | Silenciador de descarga |
| 28 | Comando stop | Stop control | Commande stop | Mando stop |
| 31 | Tappo scarico olio motore | Oil drain tap | Bouchon décharge huile moteur | Tapón vaciado aceite motor |
| 73 | Comando manuale avviamento | Starting push button | Commande manuelle démarrage | Mando manual arranque |
| N1 | Spia carica batteria (*) | Battery charge warning light (*) | Voyant charge batterie (*) | Piloto carga batería (*) |
| O1 | Spia bassa pressione olio (*) | Oil pressure warning light (*) | Voyant lumineux pression huile (*) | Indicador luminoso pres. aceite (*) |
| Q1 | Chiave di avviamento (*) | Starter key (*) | Clé de démarrage (*) | Llave de arranque (*) |
| S1 | Batteria (*) | Battery (*) | Batterie (*) | Batería (*) |
| S8 | Led di sovraccarico | Overload led | Led Overload (surcharge) | Led sobrecarga |
| T | Regolatore corrente di saldatura | Welding current regulator | Régulateur courant soudage | Regulador corr. de soldadura |
| X1 | Presa per comando a distanza | Remote control socket | Prise pour télécommande | Toma para mando a distancia |



This symbol (Norm EN 60974-1 security standards for arc welders) signifies that the welders can be used in areas with increased risk of electrical shock.

ATTENTION

It is prohibited for any unauthorized persons to access areas adjacent to the engine driven welder or the welding process.

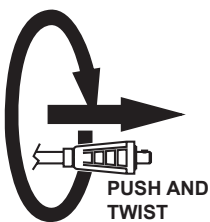
ATTENTION

To reduce the risk of electromagnetic interference, keep the welding cable length short and keep them on or near the ground. If possible, welding operations should not be done near sensitive electronic devices. If interference continues to occur, adopt additional measures: shift the group, use shielded cables, line filters, shield the entire work area. If the above solutions do not suffice, consult our Technical Servicing Department.

ATTENTION

With a welding cable length up to 10 m is suggested a section of 35 mm²; with longer cables a bigger section is required.

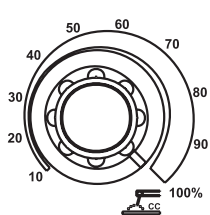
CONNECT WELDING CABLES



- Fully insert the welding cable plugs into the corresponding sockets turning them clockwise to lock them in position.
- Ensure that ground clamp, whose cable must be connected to the (-) socket or the (+)

socket, according to the type of electrode, makes good contact and that, if possible, it is close to the welding position. Pay attention to the two polarities of the welding circuit, which must not come into electrical contact with each other.

ADJUSTING THE WELDING CURRENT

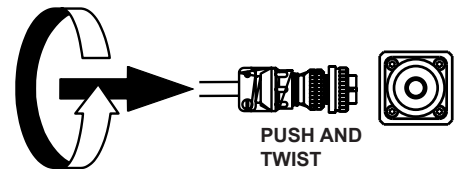


The welding current is regulated by turning knob "T" continuously. If set to the minimum (turned fully in an anticlockwise direction) it provides a current of approximately 30 A; if set to the maximum (turned fully in a clockwise direction) it

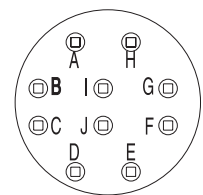
gives a maximum current of approximately 200A (20V).

REMOTE CONTROL

The welding machine is predisposed for connection to a remote control (optional) by means of the circular connector located on the front panel. Once the connection to the remote control has been made, the function of regulating the main potentiometer, located on the front panel, will be automatically switched to the remote control potentiometer.



The following table describes the functions of each of the connector's contacts.



| CONTATTI | DESCRIZIONE |
|---------------------|---|
| A (electric ground) | To the RC/TC potentiometer - GND terminal |
| B | To the RC/TC potentiometer - V _{CONTR} terminal |
| C | To the RC/TC potentiometer - V _{REF} terminal |
| D | Remote connection presence contact - wire bridge towards (C) cabling side |
| E | Non connected |
| F | |
| G | |
| H | |
| I | |
| J | |

AUTO IDLE Operation

When the engine is switched on it immediately reaches a maximum speed of 3720 rpm for approximately 6/7 seconds for easy start up, after which it automatically decreases and idles at 2650 rpm. It remains at this speed until current is drawn when set to weld or auxiliary power. When set to weld mode the machine reaches maximum engine speed as soon as there is minimum contact between the tip of the electrode and the piece to be welded and also when set to generation drawing a minimum of 250 - 300 W.

The machine returns to minimum 6/7 seconds later if power is not drawn during welding or generation.



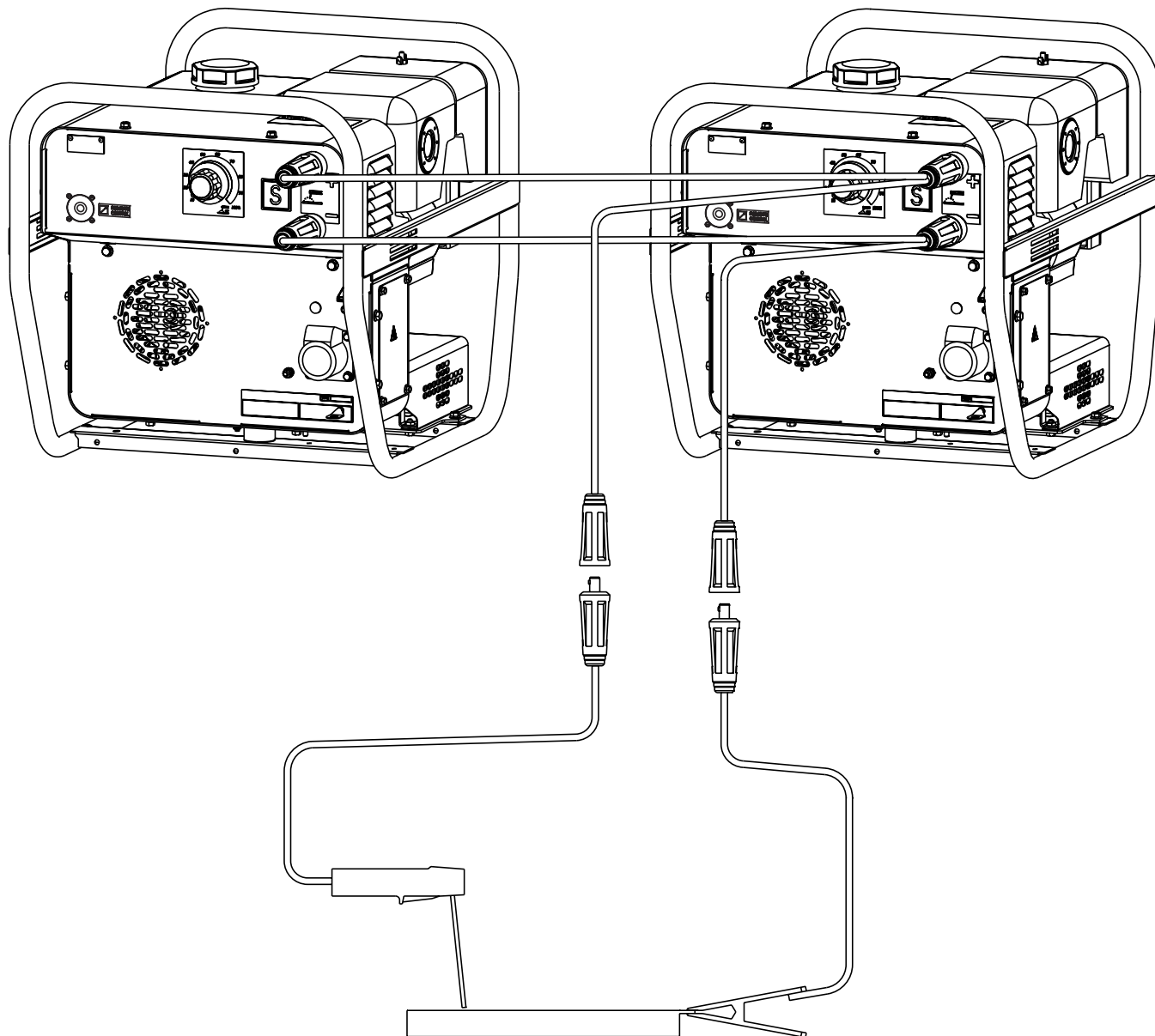
How to put two machines in parallel:

from the front panels of the machines connect the two positives welding sockets(+) between themselves and the two negative welding sockets between themselves.
To effect the connection ask for the accessory K2X150.

ATTENTION: use fit cables and tight at the connection point.

How to proceed:

- start the machine putting the two welding handles (T) in the wanted position (half of the total current);
- put in parallel with the right cables;
- proceed with welding.





Use as a generator

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ATTENTION

It is absolutely forbidden to connect the unit to the public mains and/or another electrical power source.

wiring it to the ground of the electrical plant with which the machine is going to work.

WARNING: bound the neutral to frame BEFORE the GFI.



ATTENTION



It is prohibited for any unauthorized persons to access areas adjacent to engine driven welder.


AUXILIARY GENERATION IN AC 230V/50Hz

The auxiliary output is drawn by means of a 3 pole socket, the two poles are live, phase and neutral, plus the earth for the machine.

The single phase generation of the machine was designed to supply small power tools (grinders, drills etc.) to assist the welding operations with a quick, safe connection without the need to connect to earth. In addition, supplying only one tool at a time, the protection against indirect contact is assured by "electrical separation".

Therefore, the machine **MUST NOT** be intentionally connected to earth, attaching cables must be of 3 wires and the electrical equipment on which it being used must have an extension length limited to 100-200 metres. This limitation of circuit extension length is fundamental for safety.

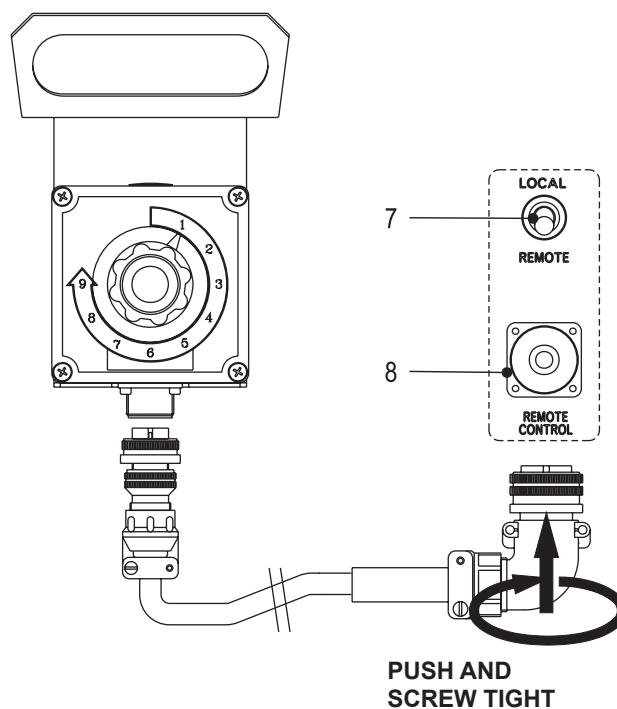
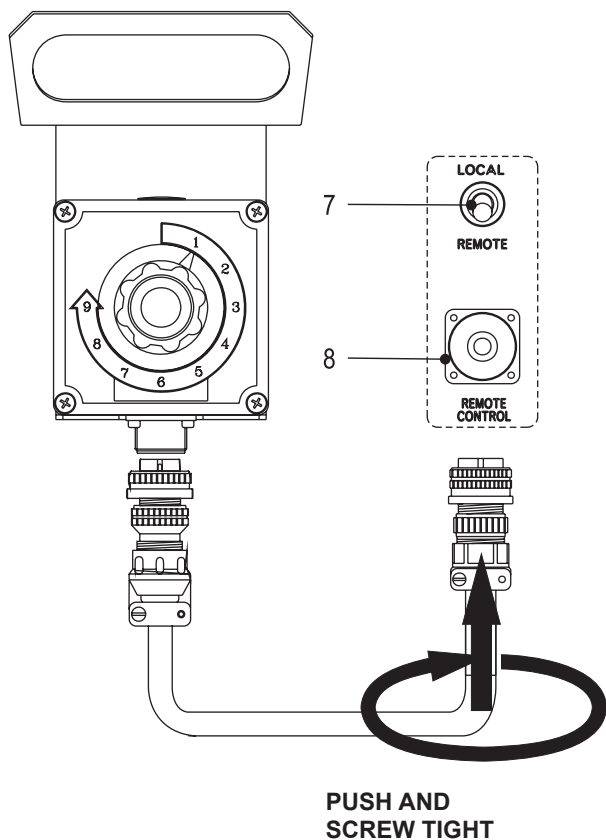
The cables must be SUITED to the environment in which they are to be used. Bear in mind that at temperatures below 5°C PVC cables become rigid and the PVC insulation tends to split at the first crease.

Using double insulated equipment is advisable, this is identifiable by the symbol  and for having no earth facility.

If the machine is designed to supply circuits which are particularly complex or in an area with potential electrical risk, it is required to interpose a complete electrical distribution panel, equipped with all electrical protections required, between the plug and loads.

For example: you can use a distribution system TN-S. In this case one of the phases, used as a neutral must be grounded; a bipolar 30mA differential switch (GFI) must be mounted inside the electrical box, before the sockets to which loads are connected; the terminal in the frontal panel of the generating set near the socket is to be used as earth connection,

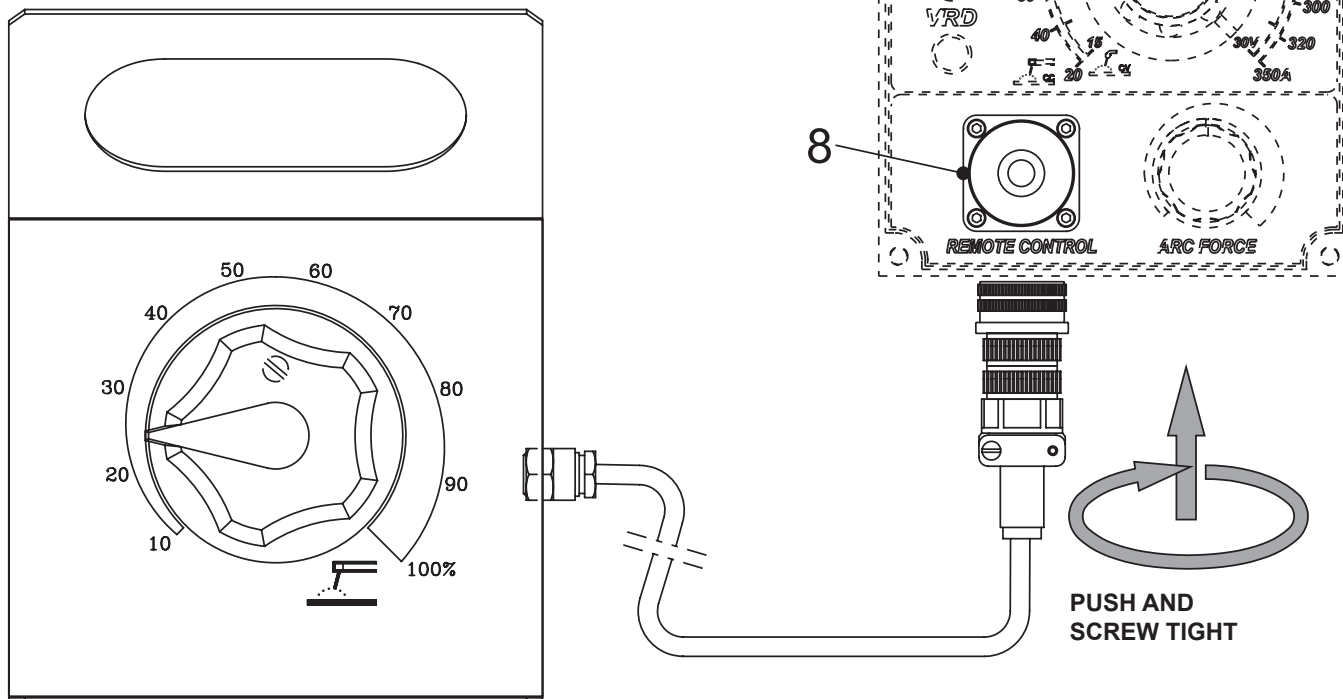




The remote control device for regulating the welding current is connected to the front panel by means of a multipole connector.

To regulate the current from the RC2, move the switch (7), located above the multipole connector (8), to "ON" position.

Position welding current adjusting (T) knob at the necessary current value for the diameter and type of electrode.



The remote control device for regulating the welding current is connected to the front panel by means of a multipole connector.

When the remote control is connected to the remote control connector (8), it is functional and automatically excludes the front panel regulation.

Position welding current adjusting (T) knob at the necessary current value for the diameter and type of electrode.

The engine is equipped with system protection (stop) in the event the oil pressure is too low.






In the event of a malfunction in the battery charging system, the warning light will come on without stopping the engine.



| Problem | Possible cause | Solution |
|--|--|--|
| MOTORE | | |
| The motor does not start up, or starts up and then stops immediately | 1) Lack of fuel in tank 2) Air in the fuel circuit 3) Incorrect position of accelerator control knob 4) Battery low 5) Battery cable terminals loose or corroded 6) Start-up motor defective 7) Faulty starter key 8) Faulty emergency stop of engine 9) Malfunction on electrical power circuit 10) Malfunction on feed circuit: defective pump, injector blocked 11) Air filter or fuel filter clogged 12) Other causes | 1) Rifornire il serbatoio 2) Check power supply circuit 3) Check position 4) Recharge or replace. Check the battery charge circuit. 5) Tighten and clean. Replace if corroded. 6) Repair or replace. 7) Replace 8) Replace 9) Check and repair 10) Ask for intervention of Service Department. 11) Clean or replace 12) Consult instruction and maintenance manual of the engine. |
| The motor does not accelerate. Inconstant speed. | 1) Air filter or fuel filter clogged. 2) Malfunction on feed circuit: defective pump, injector blocked. 3) Oil level too high. 4) Motor speed regulator defective. | 1) Clean or replace. 2) Ask for intervention of Service Department. 3) Eliminate excess oil. 4) Ask for intervention of Service Department |
| Black smoke | 1) Air filter clogged. 2) Overload. 3) Injectors defective. Injection pump requires calibration. | 1) Clean or replace 2) Check the load connected and diminish. 3) Ask for intervention of Service Department. |
| White smoke | 1) Oil level too high. 2) Motor cold or in prolonged operation with little or no load. 3) Segments and/or cylinders worn out. | 1) Eliminate excess oil. 2) Insert load only with motor sufficiently hot 3) Ask for intervention of Service Department. |
| Too little power provided by motor. | 1) Air filter clogged. 2) Insufficient fuel distribution, impurities or water in feed circuit. 3) Injectors dirty or defective. | 1) Clean or replace. 2) Check the feed circuit, clean and refill once again. 3) Ask for intervention of Service Department. |
| Low oil pressure | 1) Oil level insufficient 2) Air filter clogged. 3) Oil pump defective. 4) Alarm malfunction. | 1) Reset level. Check for leaks. 2) Replace filter. 3) Ask for intervention of Service Department. 4) Check the sensor and electrical circuit. |



| Problem | Possible cause | Solution |
|---|---|--|
| WELDING CIRCUIT | | |
| No current under no-load conditions in weld mode | <ol style="list-style-type: none"> 1) Faulty welding control board 2) Faulty Hall sensor | <ol style="list-style-type: none"> 1) With a voltmeter check that between pins A (-) and B (+) of the circular connector on the front panel there is 5 Vdc. Ask for intervention of Service Department to replace the board. 2) Ask for intervention of Service Department to replace the Hall sensor. |
| Irregular or inconsistent welding current | <ol style="list-style-type: none"> 1) Faulty welding control board 2) Faulty Hall sensor 3) Chopper bridge short circuit | <ol style="list-style-type: none"> 1) With a voltmeter check that between pins A (-) and B (+) of the circular connector on the front panel there is 5 Vdc. Ask for intervention of Service Department to replace the board. 2) Ask for intervention of Service Department to replace the Hall sensor. 3) Ask for intervention of Service Department to replace the Chopper Bridge. |
| Engine always at idle speed . Engine always at maximum speed | <ol style="list-style-type: none"> 1) Faulty welding control board 2) Fault to the Auto Idle - Economizer system | <ol style="list-style-type: none"> 1) With a voltmeter check that between pins A (-) and B (+) of the circular connector on the front panel there is 5 Vdc. Ask for intervention of Service Department to replace the board. 2) Ask for intervention of Service Department |
| AUXILIARY POWER GENERATION CIRCUIT | | |
| No current under no-load conditions in auxiliary power mode | <ol style="list-style-type: none"> 1) Auxiliary power diode bridge broken 2) Faulty inverter 3) Faulty alternator | Ask for intervention of Service Department |

|  WARNING | | |
|--|--|---|
|  | <ul style="list-style-type: none"> Have qualified personnel do maintenance and troubleshooting work. Stop the engine before doing any work inside the machine. If for any reason the machine must be operated while working inside, pay attention moving parts, hot parts (exhaust manifold and muffler, etc.) electrical parts which may be unprotected when the machine is open. Remove guards only when necessary to perform maintenance, and replace them when the maintenance requiring their removal is complete. Please wear the appropriate clothing and make use of the PPE (Personal Protective Equipment), according to the type of intervention (protective gloves, insulated gloves, glasses). Do not modify the components if not authorized. <p style="text-align: center; margin-top: 5px;">- See pag. M1.1 -</p> |  |
| MOVING PARTS can injure | | HOT surface can hurt you |

NOTE

By maintenance at care of the utilizer we intend all the operatios concerning the verification of mechanical parts, electrical parts and of the fluids subject to use or consumption during the normal operation of the machine.

For what concerns the fluids we must consider as maintenance even the periodical change and or the refills eventually necessary.

Maintenance operations also include machine cleaning operations when carried out on a periodic basis outside of the normal work cycle.

The repairs **cannot be considered** among the maintenance activities, i.e. the replacement of parts subject to occasional damages and the replacement of electric and mechanic components consumed in normal use, by the Assistance Authorized Center as well as by manufacturer.

The replacement of tires (for machines equipped with trolleys) must be considered as repair since it is not delivered as standard equipment any lifting system.

The periodic maintenance should be performed according to the schedule shown in the engine manual. An optional hour counter (M) is available to simplify the determination of the working hours.

maintenance intervals and specific checks for each model: it is necessary to consult the specific engine or alternator USER AND MAINTENANCE manual.

VENTILATION

Make certain there are no obstructions (rags, leaves or other) in the air inlet and outlet openings on the machine, alternator and motor.

ELECTRICAL PANELS

Check condition of cables and connections daily. Clean periodically using a vacuum cleaner, **DO NOT USE COMPRESSED AIR.**

DECALS AND LABELS

*All warning and decals should be checked once a year and **replaced** if missing or unreadable.*

STRENUOUS OPERATING CONDITIONS



Under extreme operating conditions (frequent stops and starts, dusty environment, cold weather, extended periods of no load operation, fuel with over 0.5% sulphur content) do maintenance more frequently.

**BATTERY WITHOUT MAINTENANCE
DO NOT OPEN THE BATTERY**

The battery is charged automatically from the battery charger circuit supplied with the engine.

Check the state of the battery from the colour of the warning light which is in the upper part.

- Green colour: battery OK
- Black colour: battery to be recharged
- White colour: battery to be replaced


|  IMPORTANT |
|--|
| <div style="display: flex; align-items: center;">  <p style="margin: 0;">In the maintenance operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place.</p> </div> |

ENGINE and ALTERNATOR

PLEASE REFER TO THE SPECIFIC MANUALS PROVIDED.

Every engine and alternator manufacturer has



|  NOTE |
|---|
| <p>THE ENGINE PROTECTION NOT WORK WHEN THE OIL IS OF LOW QUALITY BECAUSE NOT CHARGED REGULARLY AT INTERVALS AS PRESCRIBED IN THE OWNER'S ENGINE MANUAL.</p> |

In case the machine should not be used for more than 30 days, make sure that the room in which it is stored presents a suitable shelter from heat sources, weather changes or anything which can cause rust, corrosion or damages to the machine.

☞ Have **qualified** personnel prepare the machine for storage.

GASOLINE ENGINE

Start the engine: It will run until it stops due to the lack of fuel.

Drain the oil from the engine sump and fill it with new oil (see page M25).

Pour about 10 cc of oil into the spark plug hole and screw the spark plug, after having rotated the crankshaft several times.

Rotate the crankshaft slowly until you feel a certain compression, then leave it.

In case the battery, for the electric start, is assembled, disconnect it.

Clean the covers and all the other parts of the machine carefully.

Protect the machine with a plastic hood and store it in a dry place.

DIESEL ENGINE

For short periods of time it is advisable, about every 10 days, to make the machine work with load for 15-30 minutes, for a correct distribution of the lubricant, to recharge the battery and to prevent any possible blocking of the injection system.

For long periods of inactivity, turn to the after sales service of the engine manufacturer.

Clean the covers and all the other parts of the machine carefully.

Protect the machine with a plastic hood and store it in a dry place.

In case of necessity for first aid and of fire prevention, see page. M2.5.



IMPORTANT



In the storage operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place.

☛ Have **qualified** personnel disassemble the machine and dispose of the parts, including the oil, fuel, etc., in a correct manner when it is to be taken out of service.

In case of necessity for first aid and fire prevention, see page M2.5.

As cust off we intend all operations to be made, at utilizer's care, at the end of the use of the machine. This comprises the dismantling of the machine, the subdivision of the several components for a further reutilization or for getting rid of them, the eventual packing and transportation of the eliminated parts up to their delivery to the store, or to the bureau entrusted to the cust off or to the storage office, etc.

The several operations concerning the cust off, involve the manipulation of fluids potentially dangerous such as: lubricating oil and battery electrolyte.

The dismantling of metallic parts liable to cause injuries or wounds, must be made wearing heavy gloves and using suitable tools.

The getting rid of the various components of the machine must be made accordingly to rules in force of law a/o local rules.

Particular attention must be paid when getting rid of:

lubricating oils, battery electrolyte, and inflammable liquids such as fuel, cooling liquid.



The machine user is responsible for the observance of the norms concerning the environment conditions with regard to the elimination of the machine being cust off and of all its components.

In case the machine should be cust off without any previous disassembly it is however compulsory to remove:

- tank fuel
- engine lubricating oil
- cooling liquid from the engine
- battery

NOTE: The manufacturer is involved with custing off the machine **only** for the second hand ones, when not reparable.

This, of course, after authorization.

| | |
|---|--|
|  | |
| IMPORTANT | |
|  | In the cust-off operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place. |

The information here below are to be intended only as indicative since the above norm is much larger. For further details please see the specific norms and/or the manufacturers of the product to be used in the welding process.

RUTILE ELECTRODES: E 6013

Easily removable fluid slag, suitable for welding in all position. Rutile electrodes weld in d.c. with both polarities (electrode holder at + or -) and in a.c.. Suitable for soft steels R-38/45 kg/mm². Also for soft steels of lower quality.

BASIC ELECTRODES: E 7015

Basic electrodes weld only in d.c. with inverse polarity (+ on the electrode holder) ; there are also types for a.c. Suitable for impure carbon steels. Weld in all position.

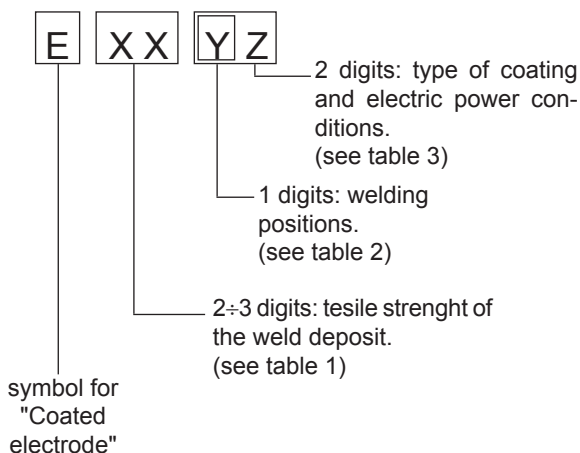
HIGH YIELD BASIC ELECTRODES: E 7018

The iron contained in the coating increases the quality of metal added. Good mechanical properties. Weld in all position. Electrode holder at + (inverse polarity). Weld deposit of nice aspect, also vertical. Workable; high yield. Suitable for steels with high contents of sulphur (impurities).

CELLULOSIC ELECTRODES: E 6010

Cellulosic electrodes weld only in d.c. with polarity + electrode holder - ground clamp. Special for steels run on pipes with R max 55 kg/mm². Weld in all position. volatile slag.

ELECTRODES IDENTIFICATION ACCORDING TO A.W.S. STANDARDS



| Number | Strength | |
|--------|----------|--------------------|
| | K.s.l. | Kg/mm ² |
| 60 | 60.000 | 42 |
| 70 | 70.000 | 49 |
| 80 | 80.000 | 56 |
| 90 | 90.000 | 63 |
| 100 | 100.000 | 70 |
| 110 | 110.000 | 77 |
| 120 | 120.000 | 84 |

Table 1

| | |
|---|-------------------------|
| 1 | for all positions |
| 2 | for plane and vertical |
| 3 | for plane position only |

Table 2

| N° | Descrizione |
|----|---|
| 10 | Cellulose electrodes for d.c. |
| 11 | Cellulose electrodes for a.c. |
| 12 | Rutile electrode for d.c. |
| 13 | Rutile electrode for a.c. |
| 14 | High yield rutile electrodes |
| 15 | Basic electrodes for d.c. |
| 16 | Basic electrodes for a.c. |
| 18 | High yield basic electrodes for d.c. (inverse polarity) |
| 20 | Acid electrodes for flat or front position welding for d.c. (- pole) and for a.c. |
| 24 | High yield rutile electrodes for flat or front plane position welding for d.c. and a.c. |
| 27 | High yield acid electrodes for flat or front plane position welding for d.c. (- pole) and a.c.. |
| 28 | High yield basic electrodes for flat or front plane position welding for d.c. (inverse polarity) |
| 30 | Extra high yield acid electrodes, extra high penetration if required, for flat position welding only for d.c. (- pole) and a.c. |

Table 3

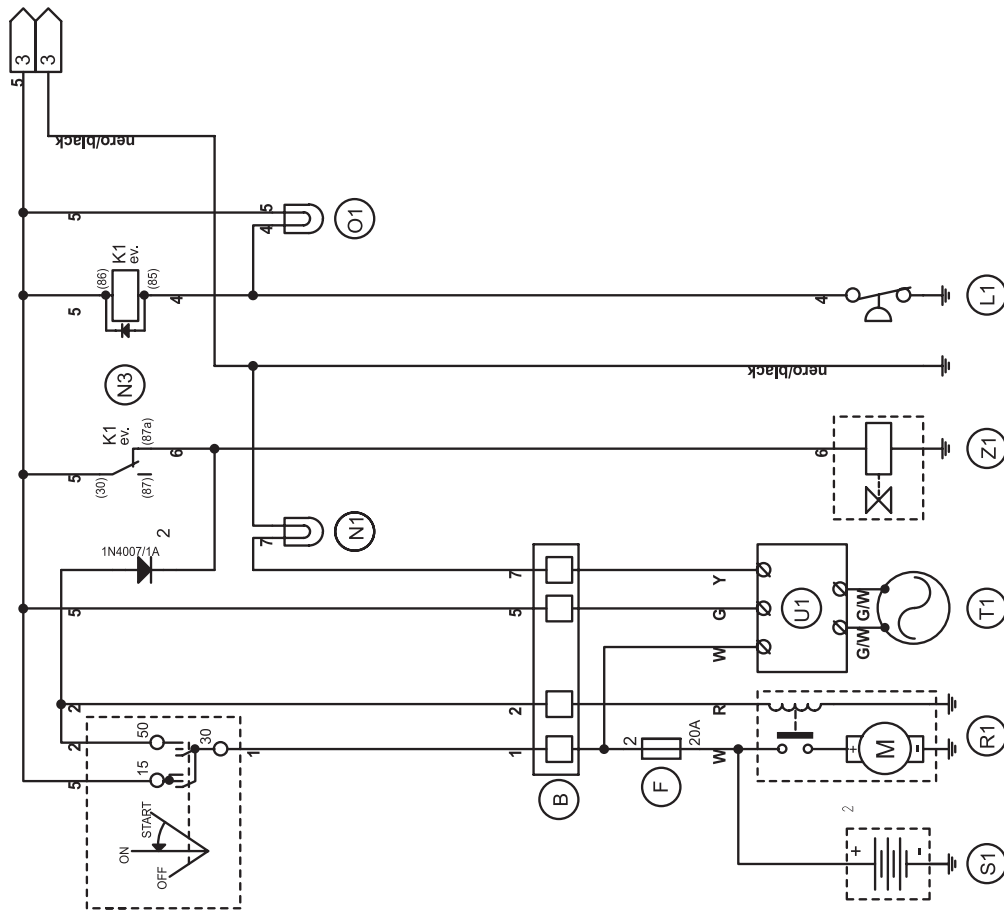


ELECTRICAL SYSTEM LEGENDE

M
60

REV.10-05/13

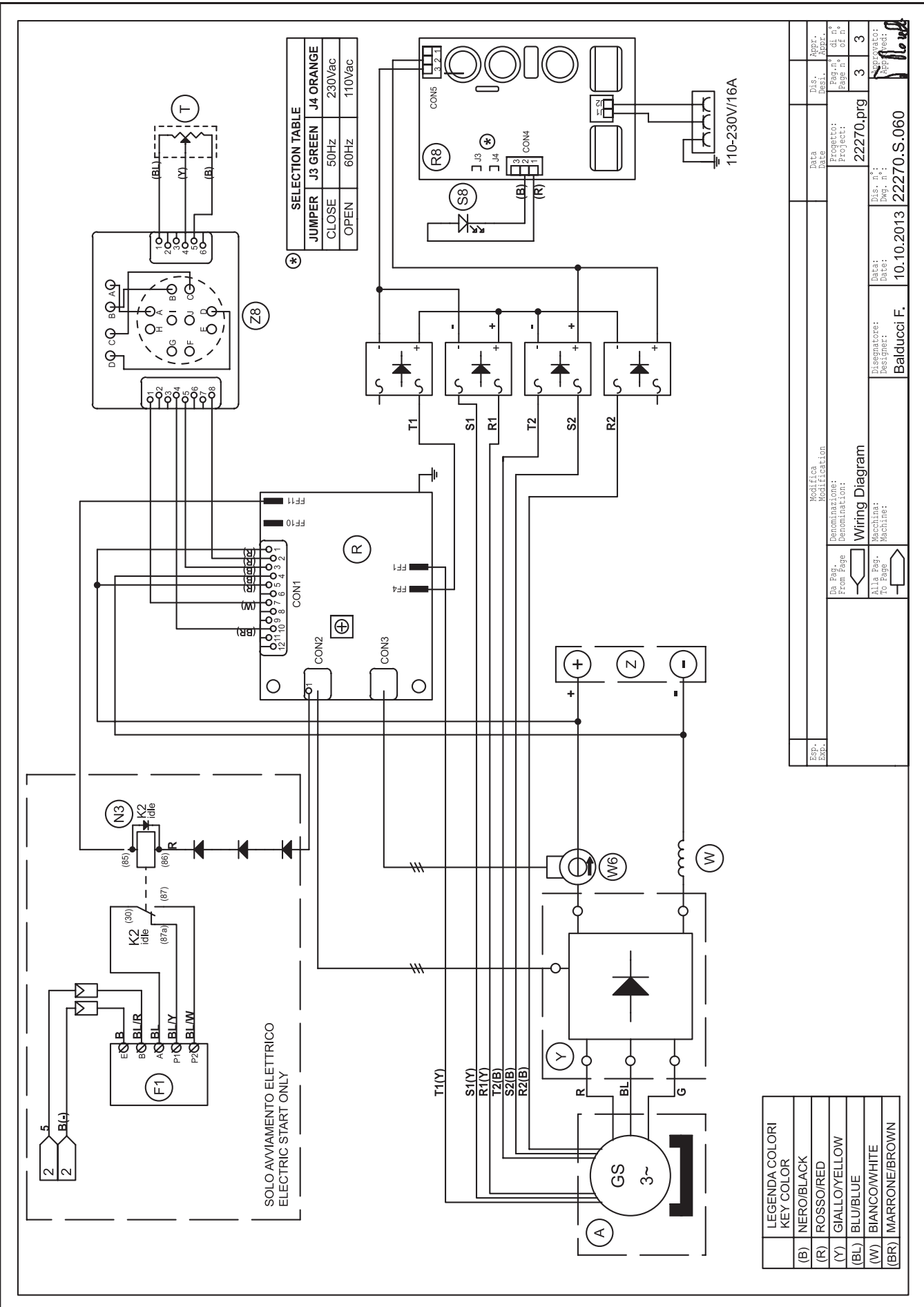
| | | | |
|---|--|--|------------------------------------|
| A : Alternator | E3 : Open circuit voltage switch | I6 : Start Local/Remote selector | N9 : UP/DOWN button mast |
| B : Wire connection unit | F3 : Stop push-button | L6 : Choke button | O9 : Hydraulic unit solenoid valve |
| C : Capacitor | G3 : Ignition coil | M6 : Switch CC/CV | P9 : Hydraulic unit engine |
| D : G.F.I. | H3 : Spark plug | N6 : Connector – wire feeder | Q9 : Ignitor |
| E : Welding PCB transformer | I3 : Range switch | O6 : 420V/110V 3-phase transformer | R9 : Lamp |
| F : Fuse | L3 : Oil shut-down button | P6 : Switch IDLE/RUN | S9 : Power system |
| G : 400V 3-phase socket | M3 : Battery charge diode | Q6 : Hz/V/A analogic instrument | T9 : |
| H : 230V 1phase socket | N3 : Relay | R6 : EMC filter | U9 : |
| I : 110V 1-phase socket | O3 : Resistor | S6 : Wire feeder supply switch | V9 : |
| L : Socket warning light | P3 : Sparkler reactor | T6 : Wire feeder socket | Z9 : |
| M : Hour-counter | Q3 : Output power unit | U6 : DSP chopper PCB | W9 : |
| N : Voltmeter | R3 : Electric siren | V6 : Power chopper supply PCB | X9 : |
| P : Welding arc regulator | S3 : E.P.4 engine protection | Z6 : Switch and leds PCB | Y9 : |
| Q : 230V 3-phase socket | T3 : Engine control PCB | W6 : Hall sensor | |
| R : Welding control PCB | U3 : R.P.M. electronic regulator | X6 : Water heater indicator | |
| S : Welding current ammeter | V3 : PTO HI control PCB | Y6 : Battery charge indicator | |
| T : Welding current regulator | Z3 : PTO HI 20 l/min push-button | A7 : Transfer pump selector AUT-0-MAN | |
| U : Current transformer | W3 : PTO HI 30 l/min push-button | B7 : Fuel transfer pump | |
| V : Welding voltage voltmeter | X3 : PTO HI reset push-button | C7 : "GECO" generating set test | |
| Z : Welding sockets | Y3 : PTO HI 20 l/min indicator | D7 : Flooting with level switches | |
| X : Shunt | A4 : PTO HI 30 l/min indicator | E7 : Voltmeter regulator | |
| W : D.C. inductor | B4 : PTO HI reset indicator | F7 : WELD/AUX switch | |
| Y : Welding diode bridge | C4 : PTO HI 20 l/min solenoid valve | G7 : Reactor, 3-phase | |
| A1 : Arc striking resistor | D4 : PTO HI 30 l/min solenoid valve | H7 : Switch disconnecter | |
| B1 : Arc striking circuit | E4 : Hydraulic oil pressure switch | I7 : Solenoid stop timer | |
| C1 : 110V D.C./48V D.C. diode bridge | F4 : Hydraulic oil level gauge | L7 : "VODIA" connector | |
| D1 : E.P.1 engine protection | G4 : Preheating glow plugs | M7 : "F" EDC4 connector | |
| E1 : Engine stop solenoid | H4 : Preheating gearbox | N7 : OFF-ON-DIAGN. selector | |
| F1 : Acceleration solenoid | I4 : Preheating indicator | O7 : DIAGNOSTIC push-button | |
| G1 : Fuel level transmitter | L4 : R.C. filter | P7 : DIAGNOSTIC indicator | |
| H1 : Oil or water thermostat | M4 : Heater with thermostat | Q7 : Welding selector mode | |
| I1 : 48V D.C. socket | N4 : Choke solenoid | R7 : VRD load | |
| L1 : Oil pressure switch | O4 : Step relay | S7 : 230V 1-phase plug | |
| M1 : Fuel warning light | P4 : Circuit breaker | T7 : V/Hz analogic instrument | |
| N1 : Battery charge warning light | Q4 : Battery charge sockets | U7 : Engine protection EP6 | |
| O1 : Oil pressure warning light | R4 : Sensor, cooling liquid temperature | V7 : G.F.I. relay supply switch | |
| P1 : Fuse | S4 : Sensor, air filter clogging | Z7 : Radio remote control receiver | |
| Q1 : Starter key | T4 : Warning light, air filter clogging | W7 : Radio remote control transmitter | |
| R1 : Starter motor | U4 : Polarity inverter remote control | X7 : Isometer test push-button | |
| S1 : Battery | V4 : Polarity inverter switch | Y7 : Remote start socket | |
| T1 : Battery charge alternator | Z4 : Transformer 230/48V | A8 : Transfer fuel pump control | |
| U1 : Battery charge voltage regulator | W4 : Diode bridge, polarity change | B8 : Ammeter selector switch | |
| V1 : Solenoid valve control PCB | X4 : Base current diode bridge | C8 : 400V/230V/115V commutator | |
| Z1 : Solenoid valve | Y4 : PCB control unit, polarity inverter | D8 : 50/60 Hz switch | |
| W1 : Remote control switch | A5 : Base current switch | E8 : Cold start advance with temp. switch | |
| X1 : Remote control and/or wire feeder socket | B5 : Auxiliary push-button ON/OFF | F8 : START/STOP switch | |
| Y1 : Remote control plug | C5 : Accelerator electronic control | G8 : Polarity inverter two way switch | |
| A2 : Remote control welding regulator | D5 : Actuator | H8 : Engine protection EP7 | |
| B2 : E.P.2 engine protection | E5 : Pick-up | I8 : AUTOIDLE switch | |
| C2 : Fuel level gauge | F5 : Warning light, high temperature | L8 : AUTOIDLE PCB | |
| D2 : Ammeter | G5 : Commutator auxiliary power | M8 : A4E2 ECM engine PCB | |
| E2 : Frequency meter | H5 : 24V diode bridge | N8 : Remote emergency stop connector | |
| F2 : Battery charge transformer | I5 : Y/▲ commutator | O8 : V/A digital instruments and led VRD PCB | |
| G2 : Battery charge PCB | L5 : Emergency stop button | P8 : Water in fuel | |
| H2 : Voltage selector switch | M5 : Engine protection EP5 | Q8 : Battery disconnect switch | |
| I2 : 48V a.c. socket | N5 : Pre-heat push-button | R8 : Inverter | |
| L2 : Thermal relay | O5 : Accelerator solenoid PCB | S8 : Overload led | |
| M2 : Contactor | P5 : Oil pressure switch | T8 : Main IT/TN selector | |
| N2 : G.F.I. and circuit breaker | Q5 : Water temperature switch | U8 : NATO socket 12V | |
| O2 : 42V EEC socket | R5 : Water heater | V8 : Diesel pressure switch | |
| P2 : G.F.I. resistor | S5 : Engine connector 24 poles | Z8 : Remote control PCB | |
| Q2 : T.E.P. engine protection | T5 : Electronic GFI relais | W8 : Pressure turbo protection | |
| R2 : Solenoid control PCB | U5 : Release coil, circuit breaker | X8 : Water in fuel sender | |
| S2 : Oil level transmitter | V5 : Oil pressure indicator | Y8 : EDC7-UC31 engine PCB | |
| T2 : Engine stop push-button T.C.1 | Z5 : Water temperature indicator | A9 : Low water level sender | |
| U2 : Engine start push-button T.C.1 | W5 : Battery voltmeter | B9 : Interface card | |
| V2 : 24V c.a. socket | X5 : Contactor, polarity change | C9 : Limit switch | |
| Z2 : Thermal magnetic circuit breaker | Y5 : Commutator/switch, series/parallel | D9 : Starter timing card | |
| W2 : S.C.R. protection unit | A6 : Commutator/switch | E9 : Luquid pouring level float | |
| X2 : Remote control socket | B6 : Key switch, on/off | F9 : Under voltage coil | |
| Y2 : Remote control plug | C6 : QEA control unit | G9 : Low water level warning light | |
| A3 : Insulation moiting | D6 : Connector, PAC | H9 : Chopper driver PCB | |
| B3 : E.A.S. connector | E6 : Frequency rpm regulator | I9 : Fuel filter heater | |
| C3 : E.A.S. PCB | F6 : Arc-Force selector | L9 : Air heater | |
| D3 : Booster socket | G6 : Device starting motor | M9 : ON/OFF switch lamp | |
| | H6 : Fuel electro pump 12V c.c. | | |



| STARTER KEY | |
|-------------|---------|
| 30 | 15 50 |
| OFF | ON |
| ON | ST |

| Spec. Exe. | Modifica | Data | Dis. Desi. | Appr. Addr. |
|------------|-----------------------------|-------------|------------|-------------|
| | Denominazione: From Page | 22270.prg | 2 | 2 |
| | Projecto: Project: | 22270.prg | 2 | 3 |
| | Disegnatore: Designer: | Balducci F. | | |
| | Macchina: Machine: | | | |
| | Data: Date: | 13.11.2013 | | |
| | Dis. n°: Dwg. n°: | 22270.S.010 | | |

- (I) Schema elettrico
- (GB) Electric diagram
- (F) Esquema eléctrico



| LEGENDA COLORI KEY COLOR |
|-----------------------------|
| (B) NERO/BLACK |
| (R) ROSSO/RED |
| (Y) GIALLO/YELLOW |
| (BL) BLU/BLUE |
| (W) BIANCO/WHITE |
| (BR) MARRONE/BROWN |

| Modifica Modification | Data Date | Dis. Desi. | Appr. Appr. |
|--------------------------|-------------------------|----------------------|----------------------|
| Da Pag. From Page | Progetto: Project: | Pag. n° Page n° | di n° of n° |
| Alla Pag. To Page | 22270.prg | 3 | 3 |
| Macchina: Machine: | Disegnato: Designer: | Dis. n°: Dwg. n°: | Approvato: Appr.: |
| | Balducci F. | 10.10.2013 | 22270.S.060 |

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