TS 600 PS-BC

1 2 1 1

766059003 - GB

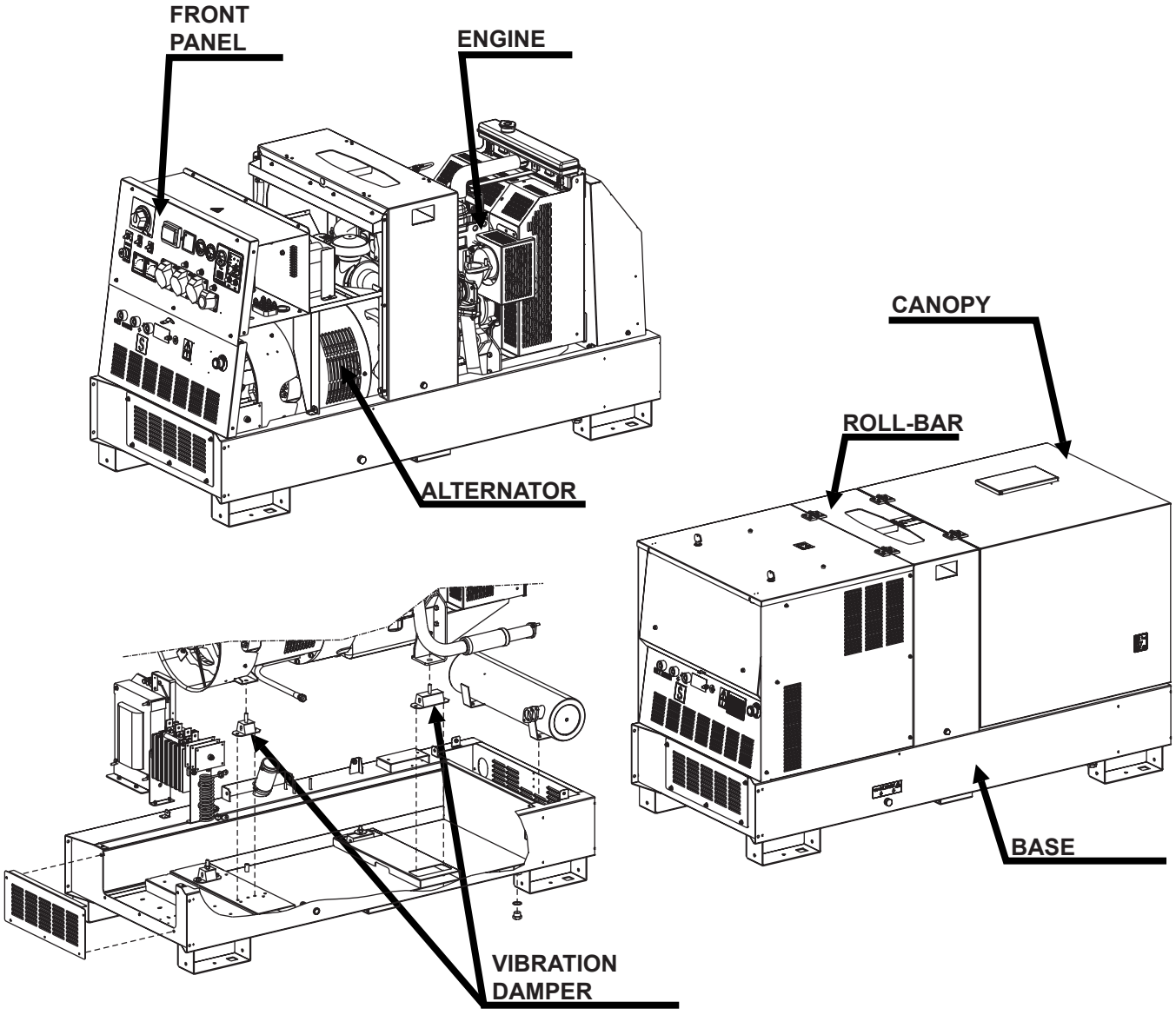
USE AND MAINTENANCE MANUAL
SPARE PARTS CATALOG

preparato da UPT
approvato da DITE

The TS 600 engine driven welder is a unit which ensures the function as:
a) a current source for welding
b) a current source for the auxiliary generation

The welding generator set is a source of DC electric power, driven by an internal combustion engine, which allows to perform arc welding processes with different types of electrodes. Besides, the generation set can provide ac 50 Hz auxiliary power, both three-phase and single phase, usable for the various needs associated with the welding. The engine which drives the generator set is a three-cylinder diesel type, water cooled, while the alternator is an asynchronous three-phase type. The welding current control is performed by means of a semi-controlled thyristor rectifier (SCR), while the regulation board is implemented with analogue technology.
From a mechanical viewpoint, the machine is composed of a bunded basement and a roll-bar, which support the engine-alternator assembly. The canopy includes a protection cover for the front panel and one rear cover intended to allow the routine maintenance operations.

On the front panel there are:
- the engine protection unit (EP7) which includes the start key and a few indicator lights which monitor the engine status.
- welding devices and the adjustment knob of welding current.
- the auxiliary power sockets and the welding sockets.



IQNet
THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

CISQ/ICIM

hereby certify that the organization

BCS S.p.A.

Head Office and Operative Unit: Viale Mazzini, 161 - I-20081 Abbiategrasso (MI)
Operative Units:Via Valbrina, 17/19 - I-42045 Luzzara (RE)
Viale Europa, 59 - I-20090 Cusago (MI)

for the following field of activities

Design, production and servicing of tractors, agricultural and green maintenance machines, engine driven welders and generating sets.

has implemented and maintains a

Quality Management System

which fulfills the requirements of the following standard

ISO 9001:2008

Issued on: **2012-03-06**
Validity date: **2015-03-05**

Registration Number: IT-3722

Michael Drechsel
President of IQNET

Gianrenzo Prati
President of CISQ

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ICIM
www.icim.it

CERTIFICATO n. 0192/6
CERTIFICATE No.

SI CERTIFICA CHE IL SISTEMA DI GESTIONE PER LA QUALITA' DI
WE HEREBY CERTIFY THAT THE QUALITY MANAGEMENT SYSTEM OPERATED BY

BCS S.p.A.
UNITA' OPERATIVE
OPERATIVE UNITS
Sede e Unità Operativa
Viale Mazzini, 161 - 20081 Abbiategrasso (MI)
Unità Operative
Via Valbrina, 17/19 - 42045 Luzzara (RE)
Viale Europa, 59 - 20090 Cusago (MI)
Italia

E' CONFORME ALLA NORMA
IS IN COMPLIANCE WITH THE STANDARD

UNI EN ISO 9001:2008

PER LE SEGUENTI ATTIVITA'
FOR THE FOLLOWING ACTIVITIES

EA: 18

Progettazione, produzione ed assistenza di trattori, macchine per agricoltura e manutenzione del verde, motosaldatrici e gruppi elettrogeni.

Design, production and servicing of tractors, agricultural and green maintenance machines, engine driven welders and generating sets.

Riferirsi al Manuale della Qualità per l'applicabilità dei requisiti della norma di riferimento.
Refer to Quality Manual for details of application to reference standard requirements.
Il presente certificato è soggetto al rispetto del regolamento per la certificazione dei sistemi di gestione per la qualità delle aziende.
The use and the validity of this certificate shall satisfy the requirements of the rules for the certification of company quality management systems.

Data emissione *First issue*	Emissione corrente *Current issue*	Data di scadenza *Expiring date*
30/05/1994	06/03/2012	05/03/2015

ICIM S.p.A.
Piazza Don Enrico Mapelli, 75 – 20099 Sesto San Giovanni (MI)

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

CISQ è la Federazione Italiana di Organismi di Certificazione dei sistemi di gestione aziendale.
CISQ is the Italian Federation of management system Certification Bodies.

FEDERAZIONE CISQ
www.cisq.com

ICIM CISQ IQNet
ISO 9001:2008 - Cert. 0192

UNI EN ISO 9001 : 2008

MOSA has certified its quality system according to UNI EN ISO 9001:2008 to ensure a constant, highquality of its products. This certification covers thedesign, production and servicing of engine drivenwelders and generating sets.

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

This certification is not a point of arrival but a pledgeon the part of the entire company to maintain a levelof quality of both its products and services whichwill continue to satisfy the needs of its clients, aswell as to improve the transparency and thecommunications regarding all the company's activesin accordance with the official procedures and inharmony with the MOSA Manual of Quality.

The advantages for MOSA clients are:

·Constant quality of products and services at thehigh level which the client expects;

· Continuous efforts to improve the products andtheir performance at competitive conditions;

· Competent support in the solution of problems;

· Information and training in the correct applicationand use of the products to assure the security ofthe operator and protect the environment;

· Regular inspections by ICIM to confirm that therequirements of the company's quality systemand 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

19/01/11 373121-I

⚠ ATTENTION

This use and maintenance manual is an important part of the machines in question.
The assistance and maintenance personel 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).

MOSA

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 arts 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).

Our products have been designed for the use of generation for welding, electric and hydraulic system; ANY OTHER DIFFERENT USE NOT INCLUDED IN THE ONE INDICATED, relieves the manufacturer from the risks which could happen or, anyway, from that which was agreed when selling the machine. The manufacturer excludes any responsibility for damages to the machine, to the things or to persons in this case.

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.

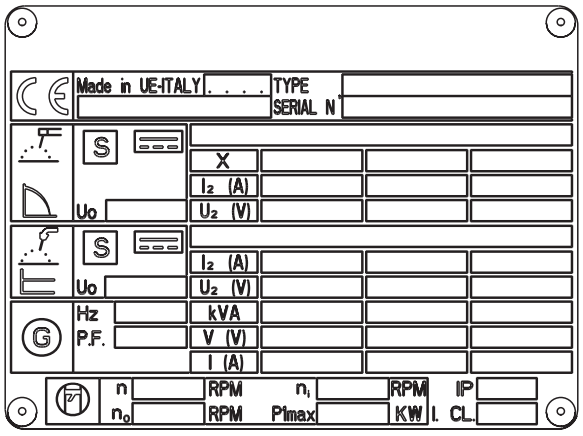
While working it is advisable to keep to the personal safety norms in force in the countries to which the product is destined (clothing, work tools, etc.).

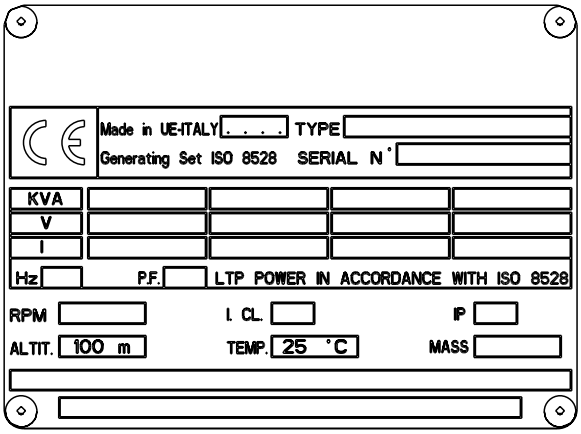
Do not modify for any motive parts of the machine (fastenings, holes, electric or mechanical devices, others..) if not duly authorized in writing: the responsibility coming from any potential intervention will fall on the executioner as in fact he becomes maker of the machine.

☞ *Notice: this manual does not engage 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.*

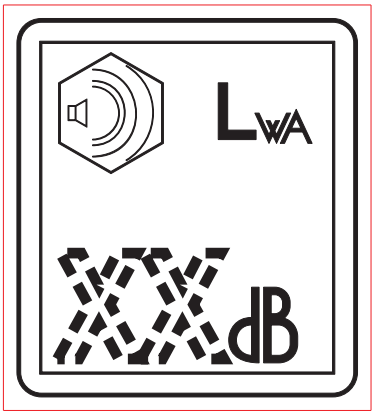
Any of our product is labelled with CE marking attesting its conformity to appliable directives and also the fulfillment of safety requirements of the product itself; the list of these directives is part of the declaration of conformity included in any machine standard equipment.
Here below the adopted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

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





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 9001:2000 - Cert. 0192

DICHIARAZIONE DI CONFORMITA'

CE

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 ☐

Marchio / Brand : _MOSA_____

Modello / Model : _____

Matricola / Serial number : _____

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 gemeenschapsrichtlijnemen gerelateerde modificaties:
comple con los requisítos 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 - Amministratore Delegato / CEO; V.le Europa 59, 20090 Cusago (MI) - Italy

Cusago,

Ing. Benso Marelli
Amministratore Delegato
CEO

Technical data	TS 600 PS-BC
DC WELDING	
Duty cycle	600A/35% - 550A/60% - 500A/100%
Welding current regulation (I scale)	20 - 600A
Welding voltage	75V
GENERATOR	
Three-phase generation	40 kVA / 400 V / 57.7 A
Single-phase generation	15 kVA / 230 V / 65.2 A
Single-phase generation	8 kVA / 110 V / 72.7 A
Single-phase generation	5 kVA / 48 V / 104 A
Frequency	50 Hz
Cos φ	0.8
ALTERNATOR	Self-excited, self-regulated
Type	three-phase, asynchronous
Insulating class	H
ENGINE	
Mark / Model	Perkins 1103A-33TG1
Type / Cooling system	Diesel 4-stroke / water
Cylinders / Displacement	3 / 3300 cm^3
Output	45.6 kW (62 HP)
Speed	1500 rpm
Fuel consumption (welding 60%)	6 l/h
Engine oil capacity	7.8 l
Starter	Electric
GENERAL SPECIFICATIONS	
Tank capacity	65 l
Running time (welding 60%)	10.5 h
Protection	IP 23
*Dimensions / max. Lxwxh (mm)	2030x870x1130
*Weight	1025 Kg
Measured acoustic power LwA (pressure LpA)	96 dB(A) (71 dB(A) @ 7 m)
Guaranteed acoustic power LwA (pressure LpA)	97 dB(A) (72 dB(A) @ 7 m)

* Dimensions and weight are inclusive of all parts without wheels and towbar (CTM)

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 (L_{WA}) - 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 (L_{WA}) 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)

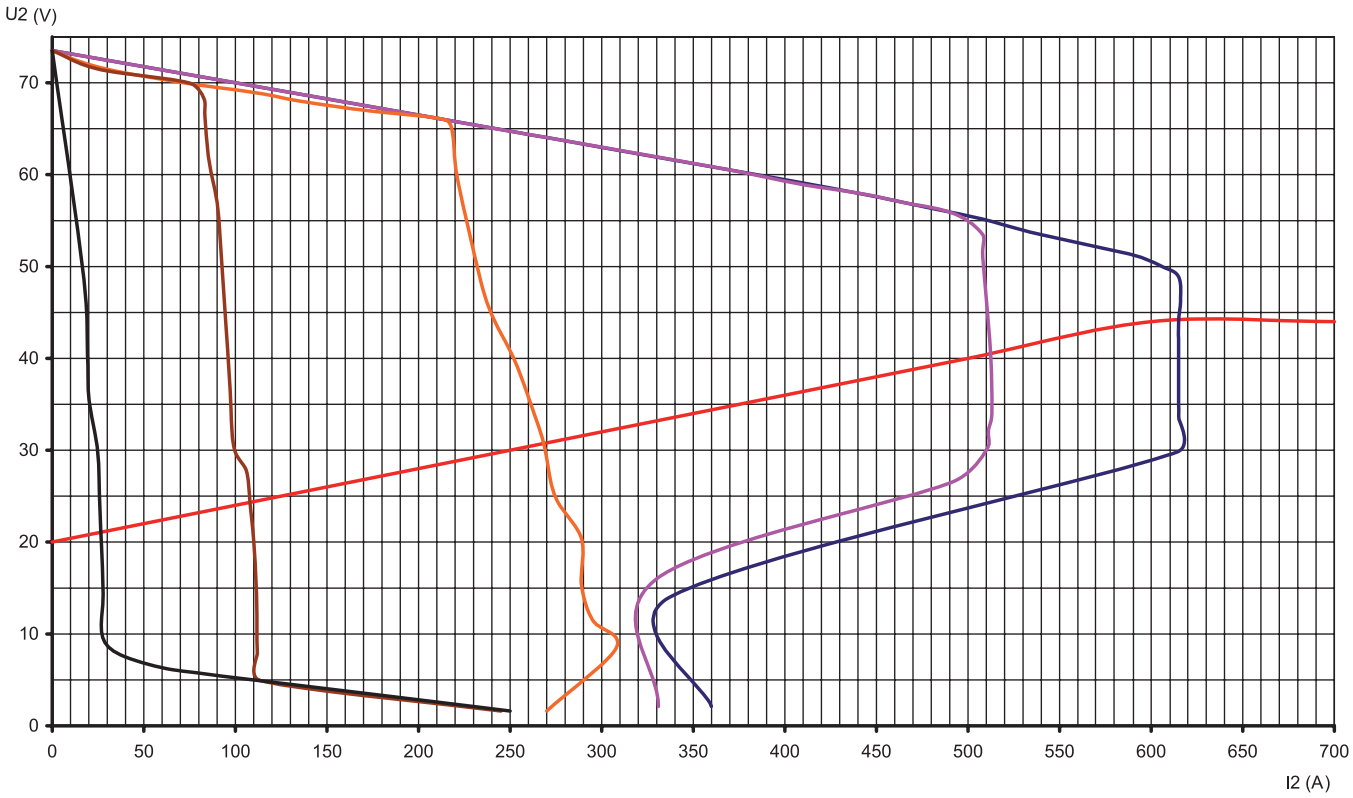
PLEASE NOTE: the symbol LWA when with acoustic noise values, indicates that the device respects noise emission limits according to 2000/14/CE directive.

Technical data

D.C. WELDING

Welding current electronic regulation (on 2 scales)	20-200 / 20-600A
Service	600A/35% - 550A/60% - 500A/100%
Striking voltage	75V

C.C. STATIC CHARACTERISTICS



SIMULTANEOUS UTILISATION LIMITS							
WELDING CURRENT	≤100A	150A	200A	250A	300A	350A	≥400A
AUXILIARY POWER 3-PHASE 400V	40 kVA	31 kVA	25.5 kVA	17.5 kVA	9 kVA	6 kVA	0 kVA
AUXILIARY POWER 1-PHASE 230V	15 kVA	15 kVA	15 kVA	10 kVA	4.7 kVA	3 kVA	0 kVA
AUXILIARY POWER 1-PHASE 110V	8 kVA	8 kVA	7 kVA	6.5 kVA	5.5 kVA	3 kVA	0 kVA

SYMBOLS IN THIS MANUAL

- The symbols used in this manual are designed to call your attention to important aspects of the operation of the machine as well as potential hazards and dangers for persons and things.

IMPORTANT ADVICE

- Advice to the User about the safety:

☞ N.B.: The information contained in the manual can be changed without notice. Potential damages caused in relation to the use of these instructions will not be considered because these 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.

WARNING

Situations of danger - no harm to persons or things

Do not use without protective devices provided
Removing or disabling protective devices on the machine is prohibited.

Do not use the machine if it is not in good technical condition
The machine must be in good working order before being used. Defects, especially those which regard the safety of the machine, must be repaired before using the machine.

SAFETY PRECAUTIONS

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

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

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

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

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 authorizad* peaple.

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 <u>No harm for persons and things</u>

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.

⚠ The installation and the general advice concerning the operations, are finalized to the correct use of the machine, in the place where it is used as generator group and/or welder.

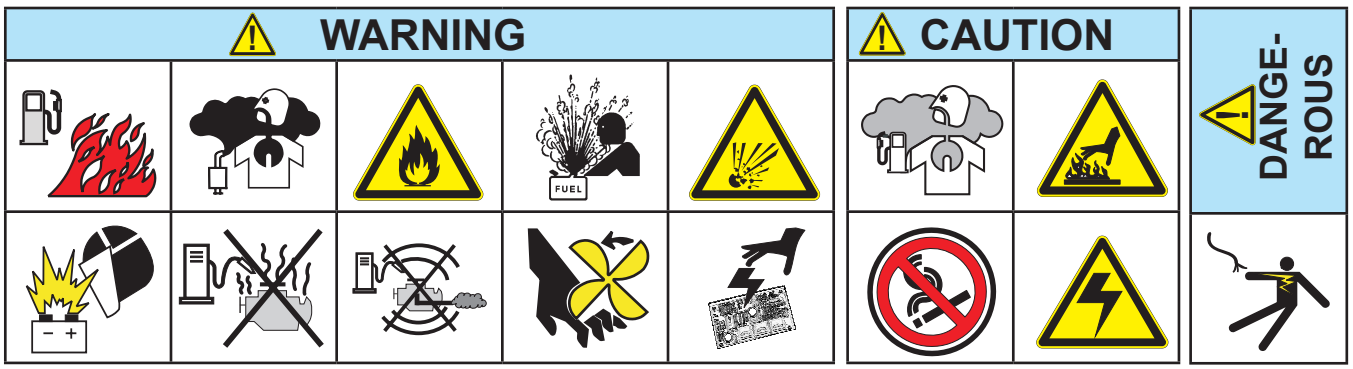
ENGINE	CHECKING BOARD
Stop engine when fueling	Do not touch electric devices if you are barefoot or with wet clothes.
Do not smoke, avoid flames, sparks or electric tools when fueling.	Always keep off leaning surfaces during work operations.
Unscrew the cap slowly to let out the fuel vapours.	Static electricity can demage the parts on the circuit.
Slowly unscrew the cooling liquid tap if the liquid must be topped up.	An electric shock can kill
The vapor and the heated cooling liquid under pressure can burn face, eyes, skin.	
Do not fill tank completely.	
Wipe up spilled fuel before starting engine.	
Shut off fuel of tank when moving machine (where it is assembled).	
Avoid spilling fuel on hot engine.	
Sparks may cause the explosion of battery vapours	

☞ **FIRST AID.** In case the operator shold 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 dioxyde) 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 inflamability point is very low.



⚠ WARNING	*THE MACHINE MUST NOT BE USED IN AREAS WITH EXPLOSIVE ATMOSPHERE*

INSTALLATION AND ADVICE BEFORE USE

The operator of the welder is responsible for the security of the people who work with the welder and for those in the vicinity.
The security measures must satisfy the rules and regulations for engine driven welders.
The information given below is in addition to the local security norms.

Estimate possible electromagnetic problems in the work area taking into account the following indications.

1. Telephonic wirings and/or of communication, check wirings and so on, in the immediate vicinity.
2. Radio and television receptors and transmettors.
3. Computer and other checking devices.
4. Critical devices for safety and/or for industrial checks.
5. Peapol who, for instance, use pace-maker, hearing-aid for deaf or something and else.
6. Devices used for rating and measuring.
7. The immunity of other devices in the operation area of the welder. Make sure that other used devices are compatible. If it is the case, provide other additional measures of protection.
8. The daily duration of the welding time.

Make sure that the area is safe before starting any welding operation.

- Do not touch any bare wires, leads or contacts as they may be live and there is danger of electric shock which can cause death or serious burns. The electrode and welding cables, etc. are live when the unit is operating.
- Do not touch any electrical parts or the electrode while standing in water or with wet hands, feet or clothes.
- Insulate yourself from the work surface while welding. Use carpets or other insulating materials to avoid physical contact with the work surface and the floor.
- Always wear dry, insulating glovers, without holes, and body protection.
- Do not wind cables around the body.
- Use ear protections if the noise level is high.
- Keep flamable material away from the welding area.
- Do not weld on containers which contain flamable material.
- Do not weld near refuelling areas.
- Do not weld on easily flamable surfaces.
- Do not use the welder to defrost (thaw) pipes.
- Remove the electrode from the electrode holder, when not welding.
- Avoid inhaling fumes by providing a ventilation system or, if not possible, use an approved air breather.
- Do not work in closed areas where there is no fresh air flow.
- Protect face and eyes (protective mask with suitable dark lens and side screens), ears and body (non-flamable protective clothers).

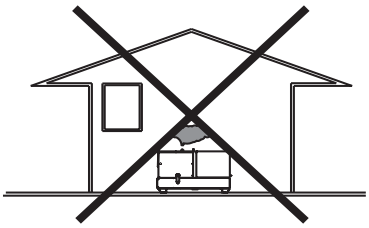
INSTALLATION AND ADVICE BEFORE USE

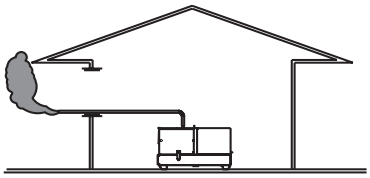
GASOLINE ENGINES

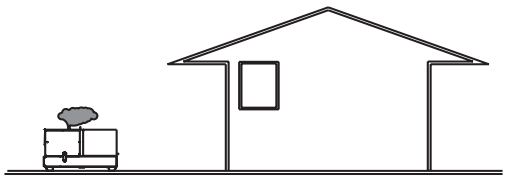
☞ Use in open space, air swept or vent exhaust gases, which contain the deathly carbone oxyde, far from the work area.

DIESEL ENGINES

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

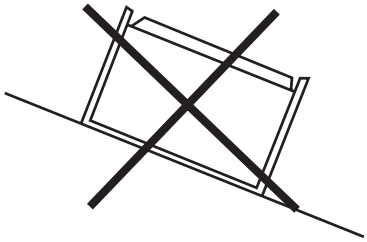




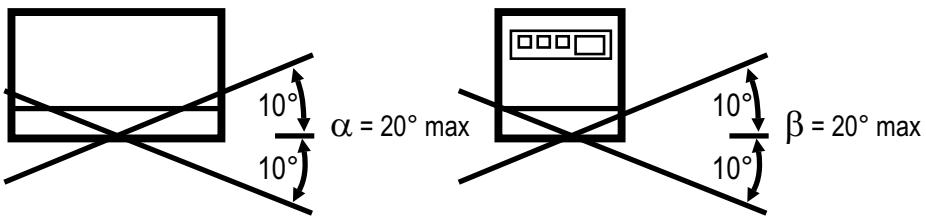


POSITION

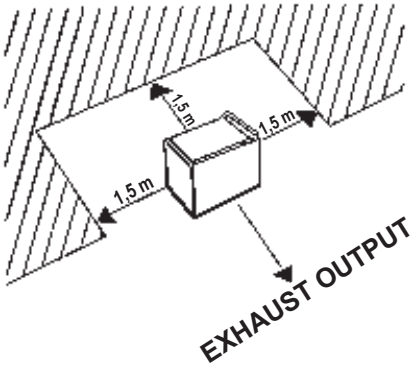
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



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.

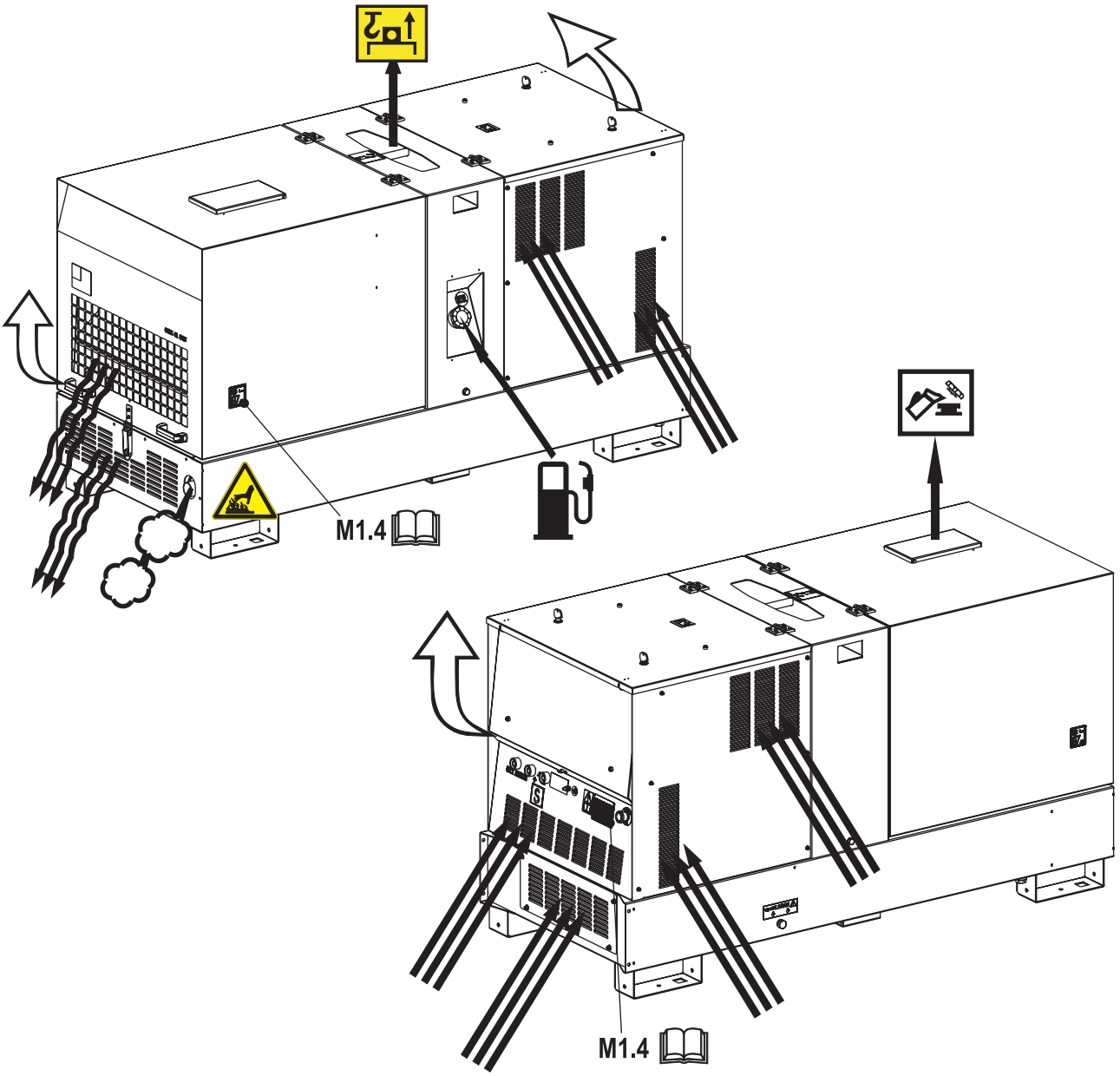
MOVES OF THE MACHINE

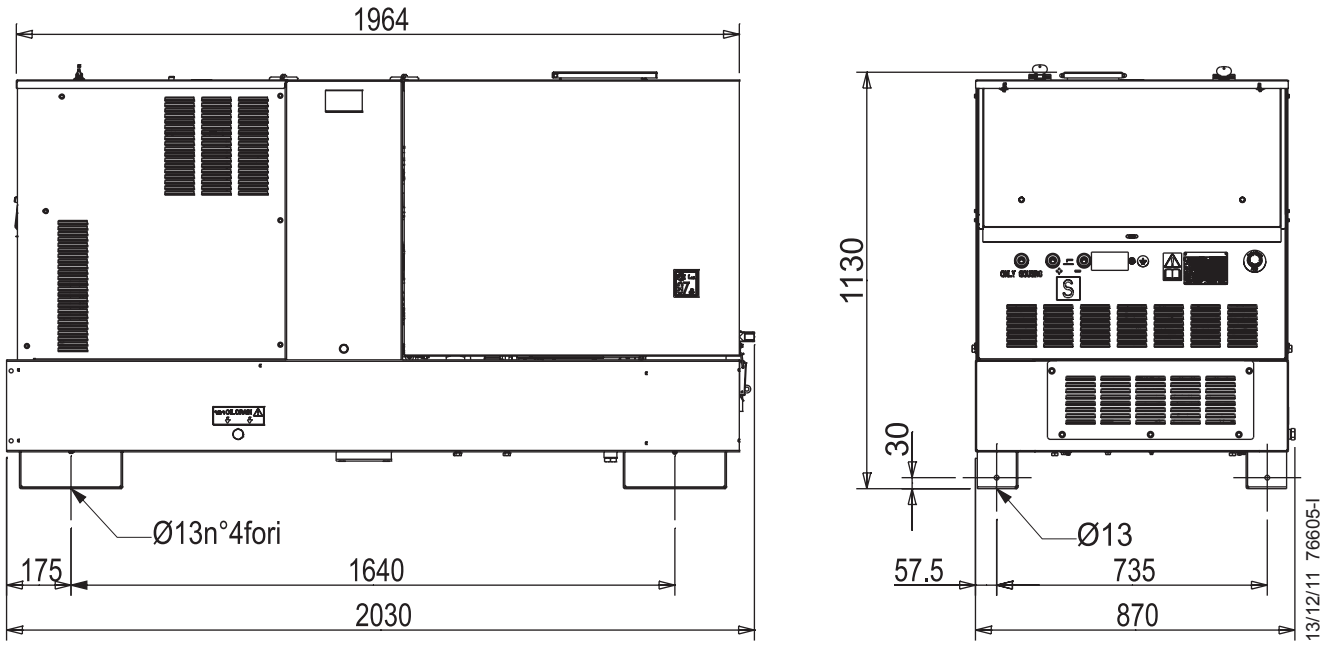
☞ At any move check that the engine is **off**, that there are no connections with cables which impede the moves.

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.


M1.4
M1.4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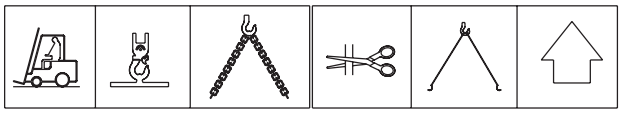
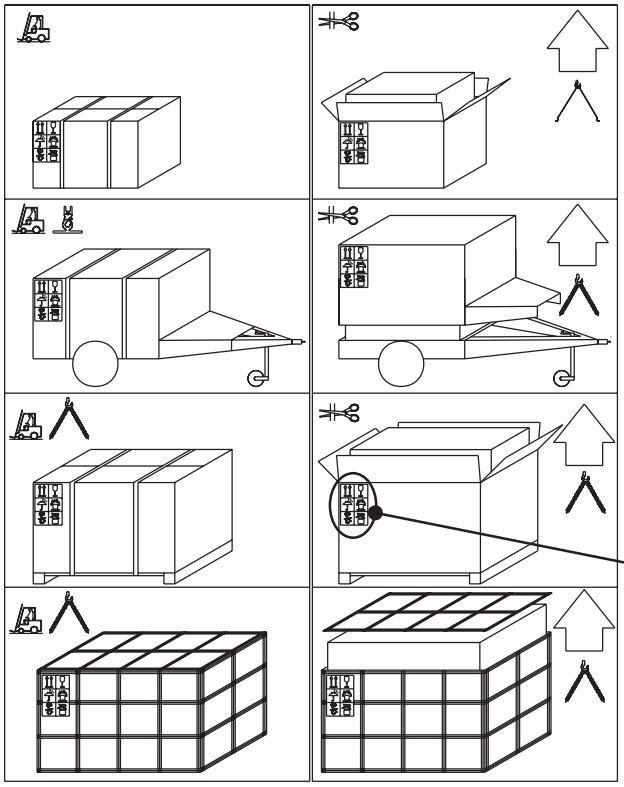
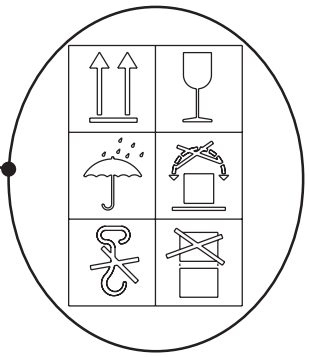
NOTE

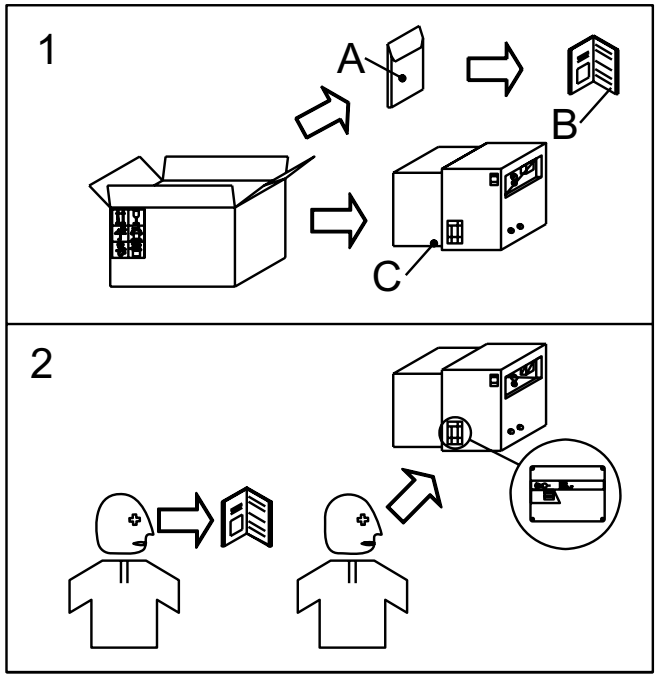




☞ Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conforms to local rules and regulations.
When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling 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.



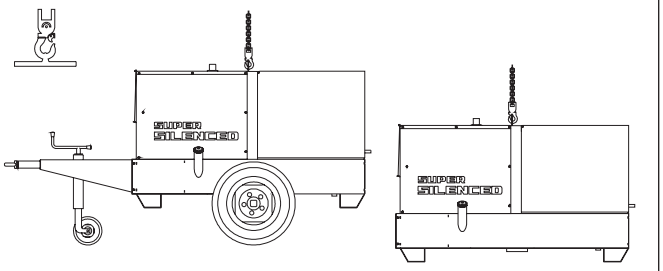


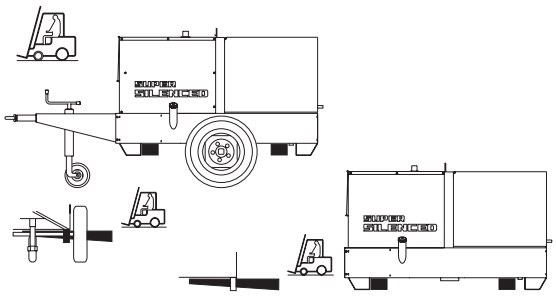
1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
2) Read: the user's manual (B), the plates fixed on the machine, the data plate.

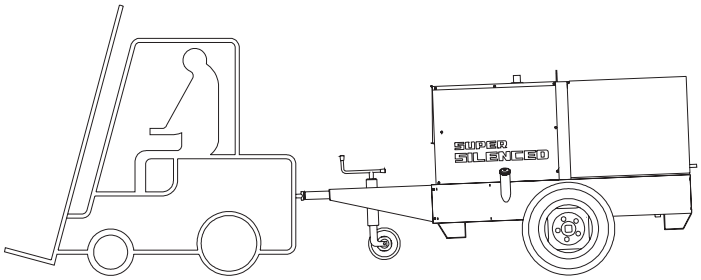
NOTE

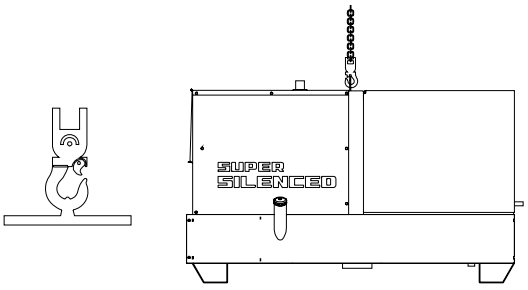
Transportation must always take place with the engine off, electrical cables and starting battery disconnected and fuel tank empty.
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conform to local rules and regulations.
Only authorized 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 CTL accessory).
If you did not keep to the instructions, you could damage the structure of the machine.

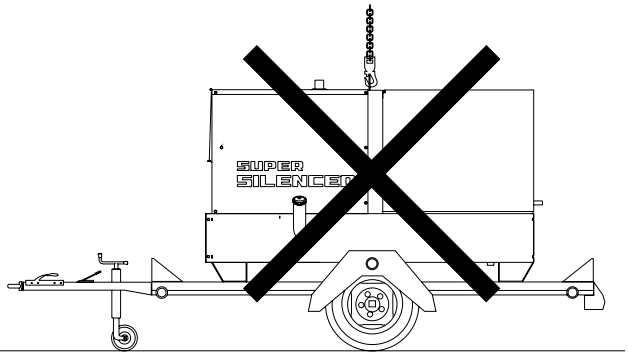








LIFT ONLY THE MACHINE



DO NOT LIFT THE MACHINE AND TRAILER

DANGER: LIFTING EYE IS NOT DESIGNED TO SUPPORT ADDED WEIGHT OF ROAD TOW TRAILER

⚠ ATTENTION

The CTL 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.

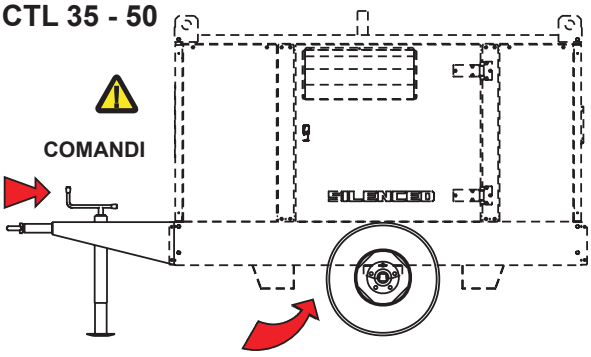
TRAILERS

The machines provided for assembling the CTL accessory (slow towing trolley) can be towed up to a **maximum** speed of **40 Kms/hour** on asphalted surfaces.

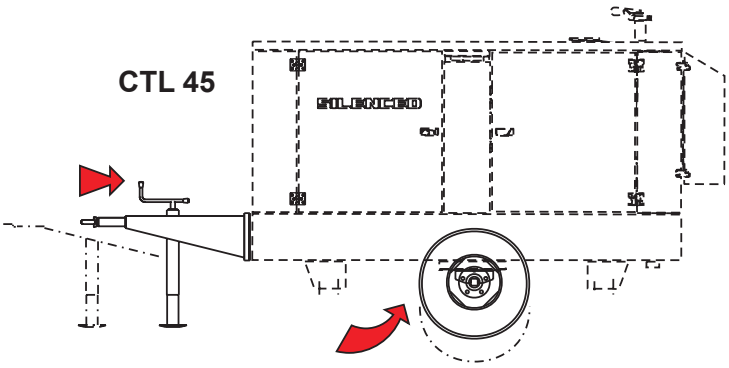
Towing on public roads or turnpikes of any type **IS EXCLUDED**, because **not** in possesion of the requirements by national and foreign traffic norms.

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

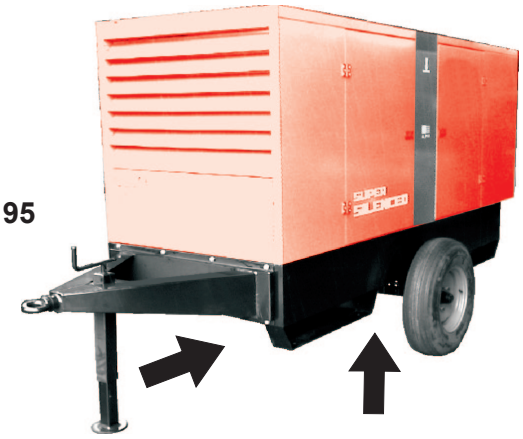
CTL 35 - 50

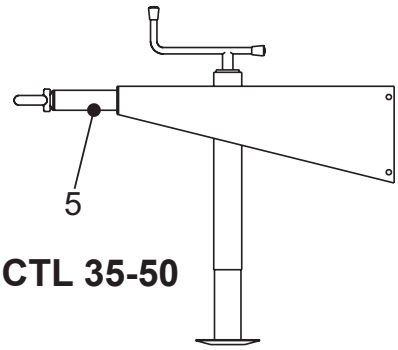


CTL 45

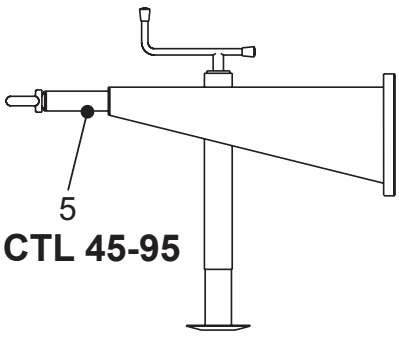


CTL 95





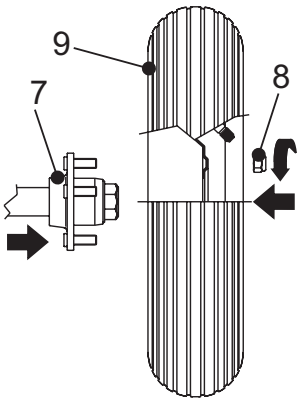
CTL 35-50



CTL 45-95

For assembling the generating set on the trolley CTL 35-45 -50 - 95 please keep to following instructions:

1)- Lift thr generating set (by means of suitable hook)
6)- Assemble on the machine the towbar (5) complete offoot with the M10x20 screws,nuts and washers.
7)- Assemble the axle (7) to the base of the machine withthe M10x20 screws and relative washers (two perpart) so that their supports coincide.
8)- Insert the wheel (9) on the axle then twist theselfblocking nut (8).
9)- Pump the tyre (9) bringing the pressure to 4 atms forthe CTL 35-45-50 and 5/6 for the CTL 95.
10)- Lower the machine to the ground and place the parkingfoot definitively (regulating at the best height).



⚠ **ATTENTION**

Do not substituite the original tyres with other types.

BATTERY WITHOUT MAINTENANCE

Connect the cable + (positive) to the pole + (positive) of the battery (after having taken away the protection), by properly tightening the clamp.

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

DO NOT OPEN THE BATTERY.

LUBRICANT

RECOMMENDED OIL

The manufacturer recommends selecting **AGIP** engine oil.
Refer to the label on the motor for the recommended products.
Please refer to the motor operating manual for the recommended viscosity.

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_2O)	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.

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.

COOLING LIQUID

ATTENTION

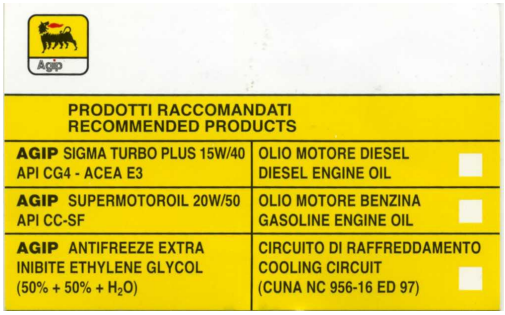
Do not remove the radiator tap with the motor in operation or still hot, as the liquid coolant may spurt out and cause serious burns. Remove the tap very carefully.

Remove the tap and pour the liquid coolant into the radiator; the quantity and composition of the liquid coolant are indicated in the motor operating manual. Replace the tap, ensuring it is perfectly closed.
After refilling operations, allow the motor to run for a brief time and check the level, as it may have diminished due to air bubbles present in the cooling circuit; restore the level with water.
To replace the liquid coolant, follow the operations described in the motor operating manual.

ATTENTION:

The engine cooling system is originally filled with coolant type:
AGIP ANTIFREEZE EXTRA

During the engine life it is strongly recommended to use the same coolant type. This is because a coolant change would require a careful cleaning of the cooling system, which is not an easy job. A lack in tacking these precautions would result in the mix of different additives used in different coolants which would originate gelatinous substances capable of obstructing the cooling system.



GROUNDING CONNECTION

The grounding connection to an earthed installation **is obligatory** for all models equipped with a differential switch (circuit breaker). In these groups the generator star point is generally connected to the machine's earthing; by employing the TN or TT distribution system, the differential switch guarantees protection against indirect contacts.
In the case of powering complex installations requiring or employing additional electrical protection devices, the coordination between the protection devices must be verified.
For the grounding connection, use the terminal (12); comply to local and/or current regulations in force for electrical installations and safety.

Check daily

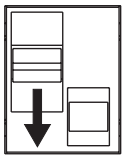
NOTE

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

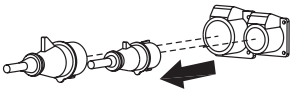
ATTENTION

1. By start-up of the generator the welding circuit is immediately operative, i.e. under voltage. Make sure that there are no unwished electrical contacts between the components of the outside welding circuit (electrode, electrode holder gun, workpiece, etc…).

2. Check that at the start-up the a.c. auxiliary generation sockets do not feed any load.



Open the electric protection interrupter of the generator or disconnect the plugs of the loads from the sockets.



3. START-UP

Starting is actuated using the key which is an integral part of the EP7 post on the front panel.

A) - Turn the key in a clockwise direction until all the LED lights are illuminated.

B) - Wait until the "OIL PRESSURE" and "BATTERY VOLTAGE" LEDs remain illuminated. If the timer lamp is used, the yellow "PREHEAT" LED comes on for the set time of the imposed settings.

C) - As soon as the green "ENGINE RUNNING" LED starts to flash, actuate the key switch in a clockwise direction (momentarily in the position then with return to rest) until obtaining starting of the engine.

If the engine does not start within 15 seconds, the non starting alert will intervene: the two LEDs "Engine running" and "glow plug" will flash alternately (see motor protection description).

D) - At any time it is possible to stop the engine by turning the key in an anti-clockwise direction (OFF position).

In case of engine anomaly due to low oil pressure, high temperature, broken transmission belt, low fuel level or emergency the EP7 will automatically stop the engine.

4. The engine starts up at its operating speed, 1500 or 1800 rpm. After start-up, allow the engine to run for a few minutes before powering on the utilities. See table;

Temperature	Time
≤ - 20° C	5 min.
to - 20° C from -10°C	2 min.
to - 10° C from -5°C	1 min.
≥ 5° C	20 sec.

5. Start-up at low temperatures

The engine has e good start-up to temperatures of -10°C. For start-up at low temperatures is necessary to use the glow plugs. You can adjust the preheating phase turning the trimmer an the back of the EP7.

For start-up and use at temperature lower then -20°C please contact our Technical Assistance.

☞ ***In case of unsuccessful start-up, do not insist for longer than 5 seconds. Wait 10 - 15 seconds before attempting another start-up.***

CAUTION

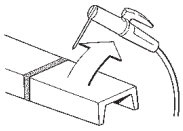
RUNNING-IN

During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, in any case please stick to the rules given in the engine use manual.

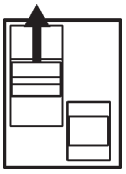
STOP

For shutdown under normal conditions, proceed as follows:

1. Break the welding process in course

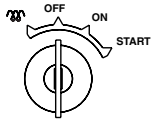


2. Break the production of a.c. auxiliary generation dividing the loads or opening the GFI (D).



3. Let the engine run with no load for a few minutes.

4. Turn the start key on the EP7 to the OFF position.



EMERGENCY SHUTDOWN

To stop the engine in a dangerous situation, press the emergency stop button (L5) (or turn the start key to the OFF position). To reset the emergency stop button, turn it clockwise.

Description

The EP7 includes the basic safeguards to protect an DIESEL engine. The EP7 features 7 LEDs, 3 Static Outputs and a 30A Key Switch. The EP7 monitors an Oil Pressure-switch, Temperature-switch, Fuel Level-switch, Charger Alternator Voltage, and an Emergency-switch.

Specification

DC Supply, Battery Plant	8V up to 36 Vdc
Static Outputs (short circuit proof)	200 mAdc
Key Switch Rating	30 A (30 secs)/80 A (5 secs)
Dimensions-DIN 96 Size	72X72X55 (ex switch /key)
Weight	300 gr
Operating Temperature	-30° C /+70° C
Operating Humidity	96% (non-condensing)

[ENGINE RUNNING] green LED
This LED blinks for 15 seconds, indicating that the EP7 is ready to start the engine (you have to turn the key to start). If the engine does not run within 15 seconds, the "Starting Failure" alarm will take place. This LED illuminates continuously if the engine runs.

[PREHEAT] yellow LED
This indicator illuminates during the Pre-Glow cycle (10 secs to 60 secs).

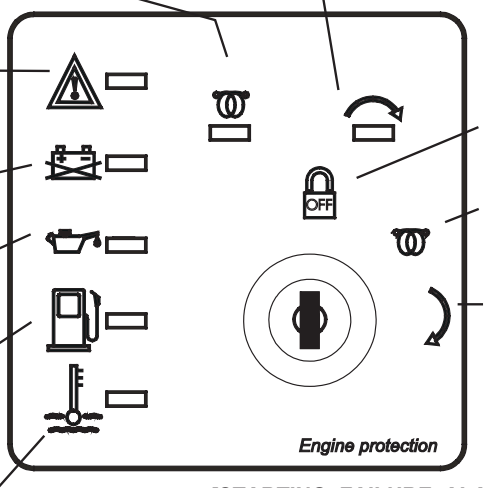
[EMERGENCY] red LED
This LED illuminates continuously when a shut down has been caused by the Emergency switch.

[ALTERNATOR FAILURE] red LED
This LED illuminates before engine starting or if a Belt Break shut down occurs (than 20 secs).

[OIL PRESSURE] red LED
This LED illuminates before engine starting or if an Oil Pressure shut down occurs.

[FUEL LEVEL] red LED
This LED blinks when a low fuel condition occurs.
This LED illuminates continuously to indicate a shut down, if the switch has been closed for more than 5 minutes.

[TEMPERATURE] red LED
This LED illuminates when an High Temperature shut down occurs.



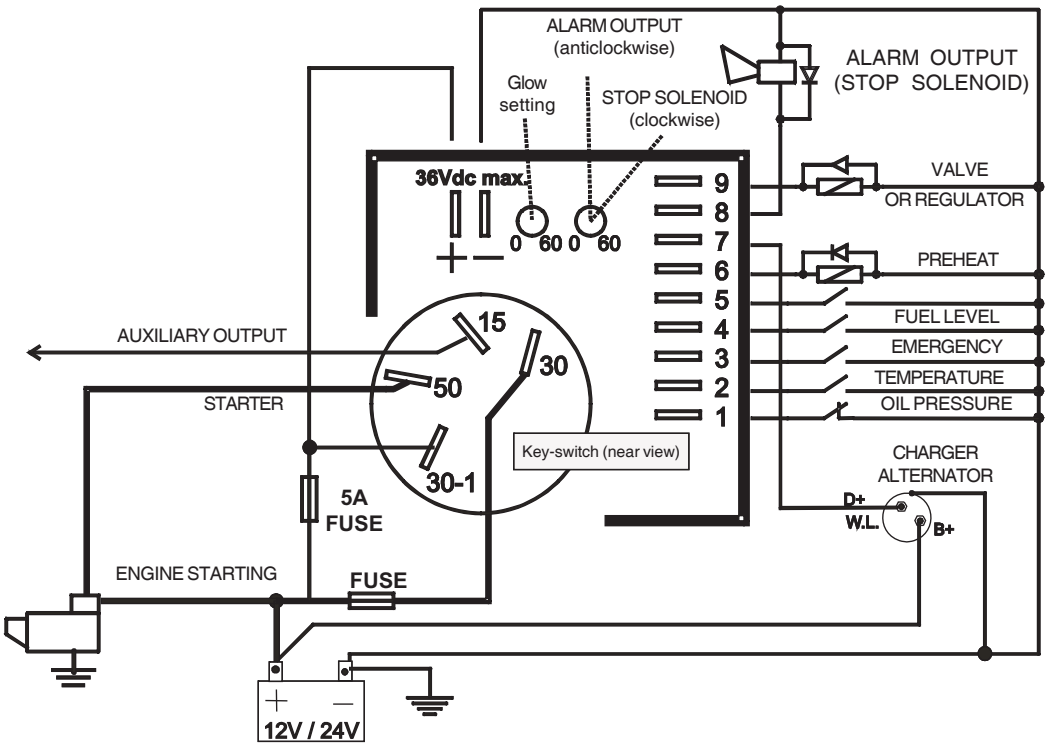
[KEY-SWITCH] OFF position

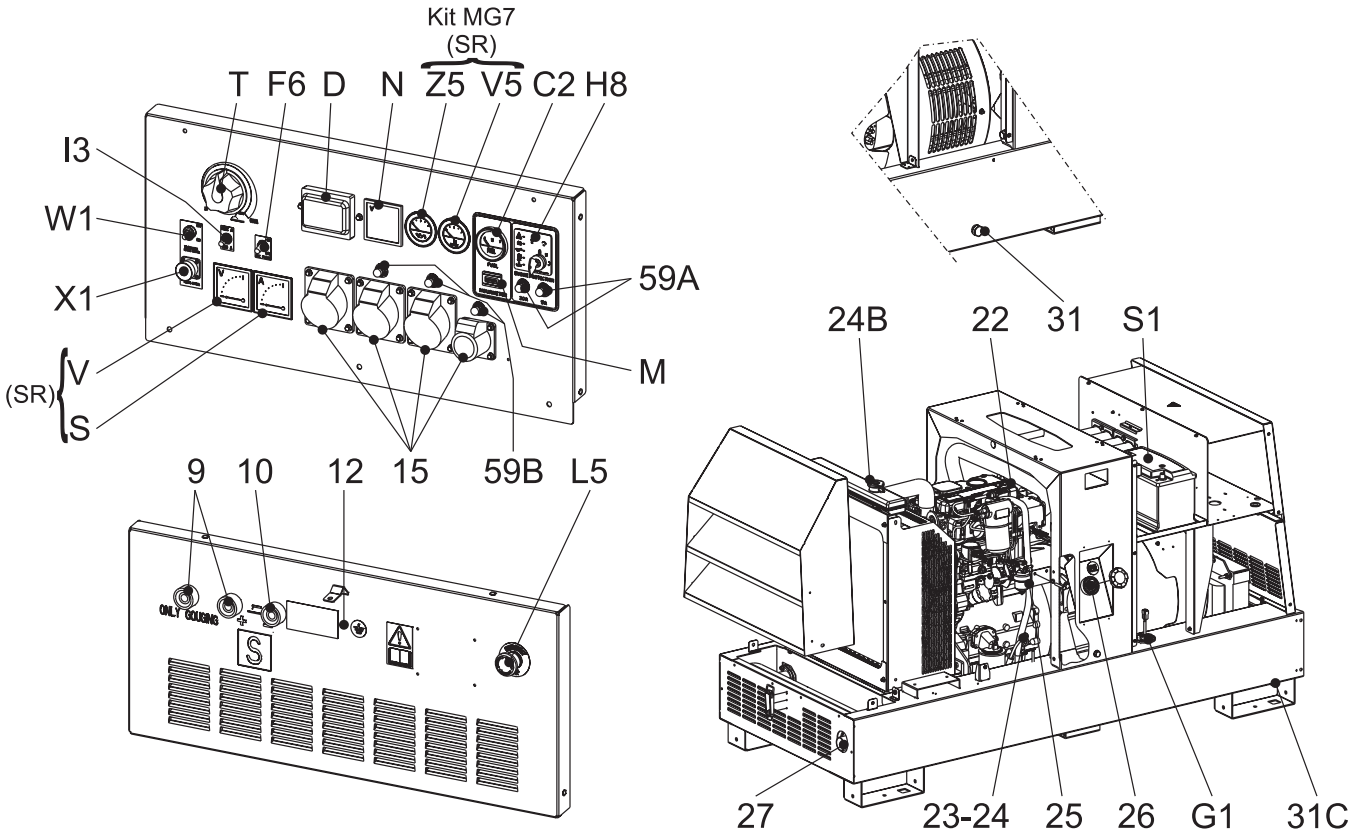
[KEY-SWITCH] Pre-Heat position

[KEY-SWITCH] START position

[STARTING FAILURE ALARM] indication
These 2 LEDs blink alternatevely (slowly) to indicate a starting failure alarm.

[OPTIONAL ALARM] indication
These 2 LEDs blink alternatevely (quickly) to indicate the intervention of the alarm.





Pos.	Descrizione	Description	Description	Referenzliste
9	Presa di saldatura (+)	Welding socket (+)	Prise de soudage (+)	Schweißbuchse (+)
10	Presa di saldatura (-)	Welding socket (-)	Prise de soudage (-)	Schweißbuchse (-)
12	Presa di messa a terra	Earth terminal	Prise de mise à terre	Erdanschluss
15	Presa di corrente in c.a.	A.C. socket	Prises de courant en c.a.	Steckdose AC
22	Filtro aria motore	Engine air filter	Filtre air moteur	Luftfilter Motor
23	Asta livello olio motore	Oil level dipstick	Jauge niveau huile moteur	Oelmess-Stab
24	Tappo caricamento olio motore	Engine oil reservoir cap	Bouchon remplissage huile moteur	Füllverschluß Motoröl
24B	Tappo caric. liquido di raffredd	Water filling cap	Bouchon remplissage liquide de refroidiss.	Füllverschluß Kühlwasser
25	Prefiltro combustibile	Fuel prefilter	Préfiltre carburant	Kraftstoffvorfilter
26	Tappo serbatoio	Fuel tank cap	Bouchon réservoir	Füllverschluß Kraftstofftank
27	Silenziatore di scarico	Muffler	Silencieux d'échappement	Auspufftopf
31	Tappo scarico olio motore	Oil drain tap	Bouchon décharge huile moteur	Ablaßöffnung Motoröl
31C	Tappo scarico combustibile serbatoio	Exhaust tap for tank fuel	Bouchon vidange carburant réservoir	Ablaßöffnung Kraftstoff
59A	Protezione termica motore	Engine thermal switch	Protection thermique moteur	Thermoschutz Motor
59B	Protezione termica corrente aux	Aux current thermal switch	Protection thermique courant aux.	Thermoschutz Hilfsstrom
C2	Indicatore livello combustibile	Fuel level light	Indicateur niveau carburant	Anzeige Kraftstoffpegel
D	Interruttore differenziale (30mA)	G.F.I.	Interrupteur differential	FI-Schalter (GFI)
F6	Selettore Arc-Force	Arc-Force selector	Selecteur Arc-Force	Schalter Arc-Force
G1	Trasmettitore livello carburante	Fuel level transmitter	Niveau carburant	Füllstandsgeber Kraftstoff
H8	Unità controllo motore EP7	Engine control unit EP7	Protection moteur EP7	Motorschutz EP7
I3	Commut. riduz. scala saldatura	Welding scale switch	Commutateur échelle soudage	Bereichsschalter Schweißstrom
L5	Pulsante stop emergenza	Emergency button	Bouton d'urgence	Notschalter
M	Contaore	Hour counter	Compte-heures	Stundenzähler
N	Voltmetro	Voltmeter	Voltmètre	Voltmeter
S	Amperometro di saldatura	Welding ammeter	Ampéromètre de soudage	Amperemeter Schweißstrom
S1	Batteria	Battery	Batterie	Batterie
T	Regolatore corrente di saldatura	Welding current regulator	Régulateur courant soudage	Schweißstromregler
V	Voltmetro tensione saldatura	Welding voltage voltmeter	Voltmètre tension soudage	Voltmeter Schweißspannung
V5	Indicatore pressione olio	Oil pressure indicator	Indicateur pression huile	Anzeige Öldruck
Z5	Indicatore temperatura acqua	Water temperature indicator	Indicateur température eau	Anzeige Wassertemperatur
X1	Presa per comando a distanza	Remote control socket	Prise pour télécommande	Steckdose Fernbedienung
W1	Interruttore comando a distanza	Remote control switch	Commutateur télécommande	Umschalter Fernbedienung

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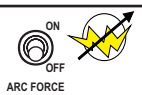
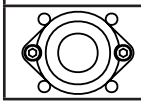
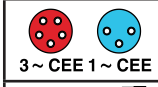
	**9** c.c. welding sockets (+) **10** c.c. welding sockets (-) **9** c.c. socket only gouging. Outlet used only for cutting works.	Connection sockets for welding cables.
	**T** Welding current regulator - allows the regulation of the welding current.	
	**I3** Switch for welding scale reduction - Placed on 200A it limits the maximum value of the welding current regulator (T) at 200A, so permitting a more accurate regulation of the welding current.	
	**F6** Arc - Force selector - The ON position powered the BC circuit (base current).	
	**W1** Remote control switch - The ON position enables the remote control to adjust the welding current.	
	**X1** Remote control socket (connector) - Multipole connector for remote control.	

	**H8** EP7 engine protection - Control and protection device for engine that includes the start-stop key.
	**59A** Engine thermic protection - They protects the battery circuit auxiliary devices: pilot lights, relays, instruments, sensors, etc. from power overloads and short circuits.
	**M** Hours meter - Indicates effective operating hours of the generator.
	**C2** Fuel level indicator - Indicates the percentage of fuel in the fuel tank.
	**L5** Emergency stop button - Allows for the generators's immediate stop in case of danger, and prevents start-up until it is released.
OPTIONAL	
	**Z5 (SR)** Engine coolant indicator. Indicates the engine coolant temperature.
	**V5 (SR)** Engine pressure oil indicator. Indicates the engine oil pression operating.

	**15** A.c. current sockets - Load connection point to generator.
	**D** Differential switch - Generally with a current of 30 mA, this is the safety device against indirect contacts.
	**59B** Thermal protection for inputs c.a. - Protects individual sockets, generally the monophase inputs, from overloads.
	**N** Line voltmeter - The presence of line voltage means that is possible to draw power from a.c. sockets.
	**12** Grounding terminal - PE terminal for the generator's earthing connection to a grounding installation.

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

ATTENTION

The welding sockets, after the machine is started, also with no cables, are anyway under voltage.

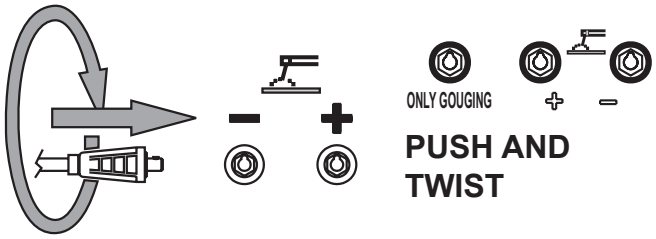
Access forbidden to area adjacent to electricity-generating set for all non authorized personnel.

Check at the beginning of any work the electric parameters and/or the control placed on the front.

Make sure that the ground connection (12) is efficent (when this connection is present, being necessary). See page M20.

CONNECT WELDING CABLES

Insert the welding cable plugs completely in the sockets, turning clockwise to lock them in place.



Connect the earth clamp to the negative pole and the electrode holder to the positive, rispecting in all cases the welding polarity required by the type of electrode used.

When using the welder for air arc gouging connect the ground lead to the - socket and the gouging lead to the socket marked "**only gouging**" (if present).

☞ Pay attention to the two polarities on the welding circuit, which must not come into electrical contact with each other.

- Carefully tighten the output cables to the bushings; if loose, they can cause problems of overheating and damage the bushings, cables, etc.
- Make certain the grounding pincer is connected as near as possible to the work station.

ADJUSTING THE WELDING CURRENT

For every welding current chosen, the machine shall run at its nominal speed.

WARNING

Do not modify the regulation of the engine rpm. Speeds different from the rated one can worsen the performances and even the reliability of the machine.

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 600A.

SWITCH REDUCTION SCALE

For small electrodes (up to Ø 3.25-130A and 4-200A) it is recommended to use the reduction scale switch (I3) allowing a more accurate regulation of the welding current (lever position at 200A).
When using electrodes of a diameter greater than 3.25 and/or 4 set the welding scale knob to max. position.

SWITCH „ARC FORCE“ (BASE CURRENT)

Positioning the switch on "ON", is obtained a low voltage welding current which keeps, always, the lit arc necessary for some types of cellulosic/basic electrodes or when a high penetration is wanted.

For electrodes of rutile type, position the switch on "OFF".

RECOMMENDED ELECTRODES

All the electrodes on the market can be used.

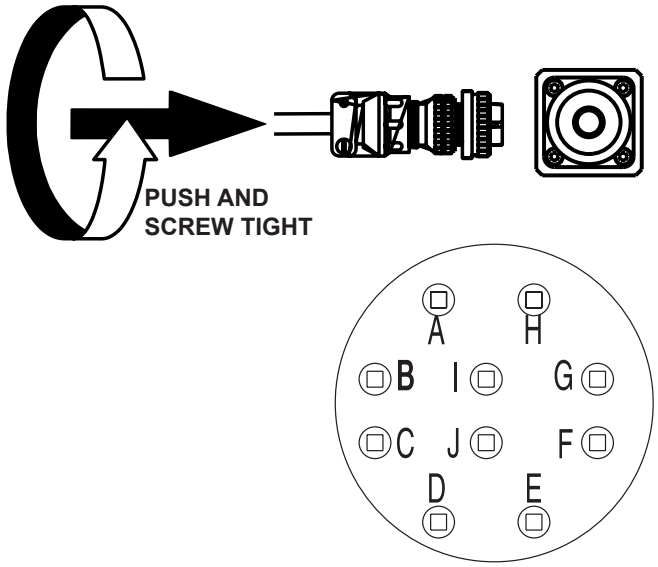
SWITCH POLARITY INVERTER

It permits to have at the electrode holder the positive or negative welding polarity.
It is used above all in the first run with cellulosic electrodes to lower the bath temperature and so doing ease up the welding on pipes of small thickness.

Note: the welder is provided with polarity inverter only on request.

REMOTE CONTROL RC…

The welding current can also be set from a distance using the optional remote control.



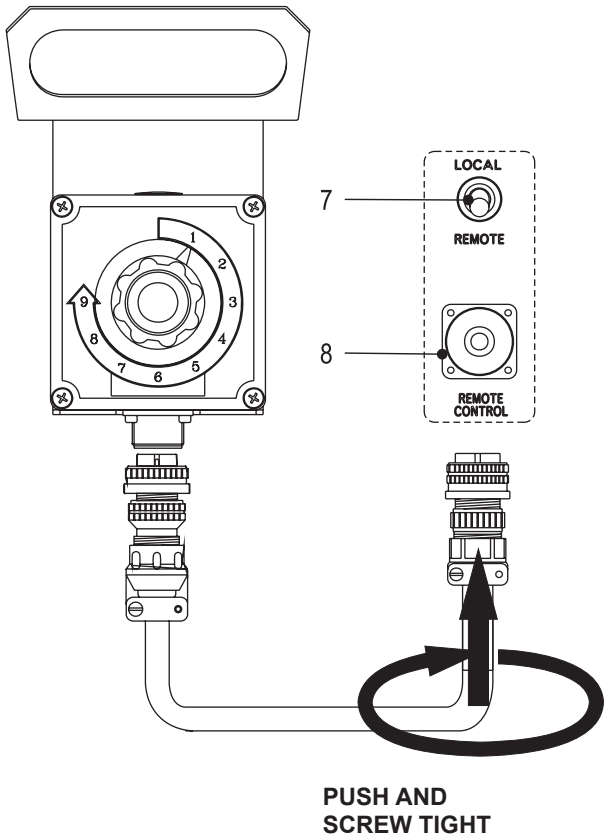
CONTACT	DESCRIPTION
A (ground)	Remote potentiometer - GND
B	Remote potentiometer - cursor
C	Remote potentiometer - ref. voltage
D	Unsed
E	Polarity change command
F	Polarity change command
G	Unsed
H	Unsed
I	Unsed
J	Unsed

ATTENTION

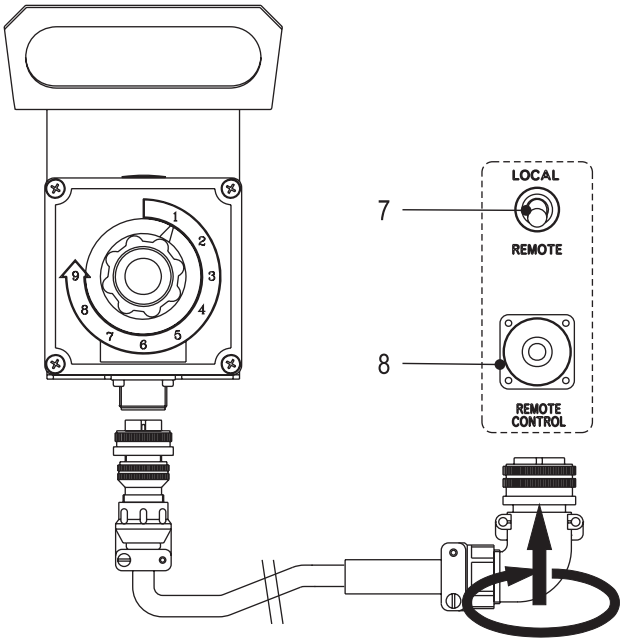
To reduce the risk of electromagnetic interferences, use the minimum lenght of welding cables and keep them near and down (ex. on the floor).

The welding operations must take place far from any sensitive electronic device.Make sure that the unit is earthed (see M20 et/or 25). In case the interference should last, adapt further disposition, such as: move the unit, use screened cables, line filters, screen the entire work area.

In case the above mentioned operations are non sufficient, please contact our Technical Assistance Service.



PUSH AND
SCREW TIGHT



PUSH AND
SCREW TIGHT

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.

DANGEROUS

It is strictly forbidden to connect the machine to the public mains a/o to another source of electric power.

Access forbidden to area adjacent to electricity-generating set for all non-authorized personnel.

The generating set are to be considered electrical energy producing stations.
The dangers of electrical energy must be considered together with those related to the presence of chemical substances (fuels, oils, etc.), rotating parts and waste products (fumes, discharge gases, heat, etc.).

RPM - VOLTAGE - FREQUECY

The engine speed determines the values of voltage and frequency of the auxiliary generation system.
Check the proper engine operation at its nominal speed before each usage.

WARNING

Do not modify the regulation of the engine rpm. Speeds different from the rated one can worsen the performances and even the reliability of the machine.

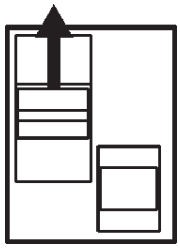
With no load the values of voltage and frequency are usually superior to their rated values, about 10% for voltage and 5% for frequency. When the power increases with inserted loads, the voltage and frequency values decrease; at full power the voltage can be reduced of 10% and the frequncy of 3%.

Before the use check that the electrical specifications for the units to be powered - voltage, power, frequency - are compatible with those of the generator. Values that are too high or too low for voltage and frequency can damage electrical equipment irreparably.

In some cases, for the powering of three-phase loads, it is necessary to ensure that the cyclic direction of the phases corresponds to the installation's requirements.

GFI

The GFI (D) at higt sensitiveness 30 mA, guarantees the protection against indirect contacts caused by faulty currents towards ground.



When the divice notes a faulty current at the ground superior to 30 mA, it breaks the feeding at the a.c. sockets.

In case of intervention check that there is no isolation fault in the plant of union cables, sockets and plugs, inserted tools.

Before each work session check the GFI device efficiency pressing the test key. The generating set must be working and the GFI lever in ON position.

WARNING

The GFI does not work correctly without grounding of the unit. Before use dispose an efficient grounding system using the PE terminal (12) and keeping to rules and laws in force concerning safety and electric plant.

PLUGS and CABLES

Before inserting a load into the machine check that the cable is in good condition, its section fit for the drawn current and the plug inserted correctly.

VOLTMETER

The presence of the voltage means that is possible to draw power from a.c. sockets.

THERMIC PROTECTION

Generally present to protect against overloads on an individual power socket c.a.
When the nominal operating current has been exceeded, the protection device intervenes by cutting off power to the socket.
The intervention of the protection device against overloads is not instantaneous, but follows a current overload/time outline; the greater the overload the less the intervention.
In case of an intervention, check that the current absorbed by the load does not exceed the protection's nominal operating current.
Allow the protection to cool off for a few minutes before resetting by pressing the central pole.

ATTENTION

Do not keep the central pole on the thermic protection forcefully pressed to prevent its intervention.

DELIVERED POWER

For each auxiliary voltage it is possible to draw the rated power declared on the data plate. Delivering rated power for a definite auxiliary voltage, it is not possible to draw further power from other output.
Drawing power from different output, their sum cannot go over the maximum power declared on data plate, generally the three-phase power.

SIMULTANEOUS USE

The welder permits the simultaneous use of auxiliary power and welding current. The auxiliary power available to the AC plugs (15) decreases as the welding current drawn increases.
The table on page M1.6 TECHNICAL SPECIFICATIONS shows the amount of auxiliary power available as the welding current varies.

Problems	*Possible cause*	*Solution*
	WELDING	
P1 No welding current but auxiliary output is OK	1) Position of remote control switch	1) Check that it is in OFF position if there is no remote control or in "ON" position with remote control inserted.
	2) Potentiometer defect in welding current control	2) Check the continuity of the welding potentiometer and relative connections.
	3) Welding current signal interrupter	3) Check that cables from shunt to card are in perfect state.
	4) Defect card	4) Replace card.
	5) Defect in diode bridge	5) Check the diode or the controlled diodes.
P2 There is welding but non penetration	1) Connnection of base current control are open	1) Check that the a.c. 48V arrives to the contactor of the base current.
	2) Defect in the base current contactor	2) Check that the contacts and the contactor shut are in good conditions.
P3 Defect in welding, high and discontinued sparks	1) Defect in connections between shunt and potentiometer	1) Check the continuity and the state of different connections which go to the card from the shunt as well as from the potentiometer.
	2) Defect in diode bridge	2) Check the diodes and SCR.
	3) Defect in card	3) Replace the card.
P4 No welding output and no auxiliary power output	1) Short circuit in wiring	1) Check the wiring inside the welder for a short circuit between cables or to ground.
	2) Defective condenser	2) If the wiring is OK, short circuit the condenser to be sure that it is discharged, disconnect all wires from condenser and, using an ohmmeter, check that the condenser is not short circuited.
	3) Defective stator	3) If the condenser box is OK, disconnect all leads from the stator except for those going to the condenser box and check the output from the alternator. If there is no output from the welding winding and the auxiliary winding, replace the stator.
	4) Short circuited diode bridge	4) If there is output from all windings reconnect the diode bridge and check if there is welding current. If not the diode bridge is defective. If there is welding current connect the auxiliary power leads one at a time until there is no output; at this point, the short circuit is in that line..
	GENERETING	
P1 Voltmeter shows no voltage or low voltage but actual voltage at the sockets is OK.	1) Voltmeter malfunction	1) Replace the voltmeter.
P2 No three-phase voltage present at the socket(s) but voltmeter reading is normal and there is voltage on the other sockets.	1) Differential switch not inserted	1) Turn on the differential switch.
	2) Differential switch malfunction	2) Replace the differential switch.
P3 No single phase voltage one sokket but voltmeter reading is normal and there is voltage on the other sockets.	1) Intervention of thermal switch due to excessive current.	1) Push in the thermal switch.
	2) Thermal switch malfunction.	2) Replace the thermal switch.
P4 No voltage present.	1) Short circuit present on the generator outputs.	1) Disconnect all outputs on the generator except for those on the condensers and re-start machine; check for voltage on condensers.

Problems	Possible cause	Solution
	ENGINE	
P1 The engine does not start or stops immediately after startup.	1) Low battery voltage, battery dead or defective. 2) Presence of air in the fuel supply circuit. 3) Engine protection thermic/fuse blown	1) Check the warning light “state of the battery”: - Green colour: battery OK - Black colour: battery to be recharged - White colour: battery to be replaced - **DO NOT OPEN THE BATTERY.** 2) Carry out de-aeration on the fuel system. See engine operating manual. 3) Replace. In case the problem persists, check the electrical circuit and eliminate the problem. Call an authorised service centre.
P2 Engine stop due to intervention of engine protection	1) Engine temperature too high or insufficient oil pressure. 2) High temperature sensor or oil pressure defective. 3) Engine protection defective. 4) Stop device defective.	1) Check oil level. 2) Replace the malfunctioning sensor. 3) Replace the protection. 4) Replace
P3 The battery is not charged	1) Battery charger alternator defective. 2) Battery charger alternator not excited.	1) Replace 2) Check the excitation system of battery charger.
P4 For other problems, refer to the attached engine manual		

⚠ WARNING

MOVING PARTS can injure

- 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.
- Use suitable tools and clothes.
- Do not modify the components if not authorized.

- See pag. M1.1 -

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.

⚠ IMPORTANT

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

ENGINE and ALTERNATOR

PLEASE REFER TO THE SPECIFIC MANUALS PROVIDED.

Every engine and alternator manufacturer has 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 suppplied 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

⚠ NOTE

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.

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 o 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 bloking of the injection system.

For long periods of inactivity, turn to the after soles 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 surroindings, 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.

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 encharged 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: BCS is involved with custing off the machine **only** for the second hand ones, when not reparable. This, of course, after authorization.

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

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 surroindings, 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 foe 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/mm^2 . Also for soft steels of lower quality.

BASIC ELECTRODES: E 7015

Basic electrrodes wels onlu 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.

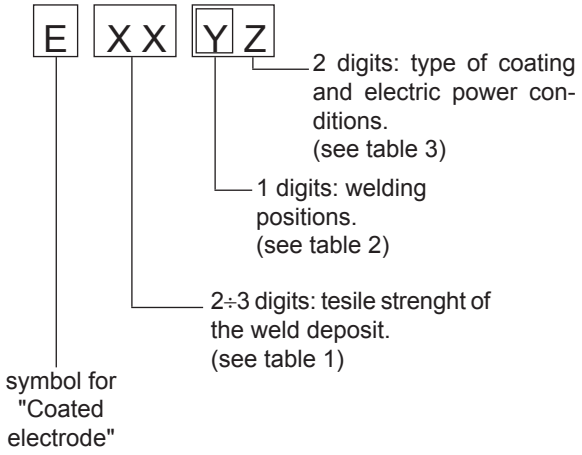
HIGH YIELD BASIC ELECTRODES: E 7018

The iron contained in the coating increases the quality of metal added. Good mechanical properties. Weld in all position. Electrode holder at + (inverse polarity). Wld deposit of nice aspect, also vertical. Workable; high yield.
Suitable for steels with high contens 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/mm^2. Weld in all position. volatile slag.

ELECTRODES IDENTIFICATION ACCORDING TO A.W.S. STANDARDS



Number	Strenght	
	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 verticl
3	for plane posotion only

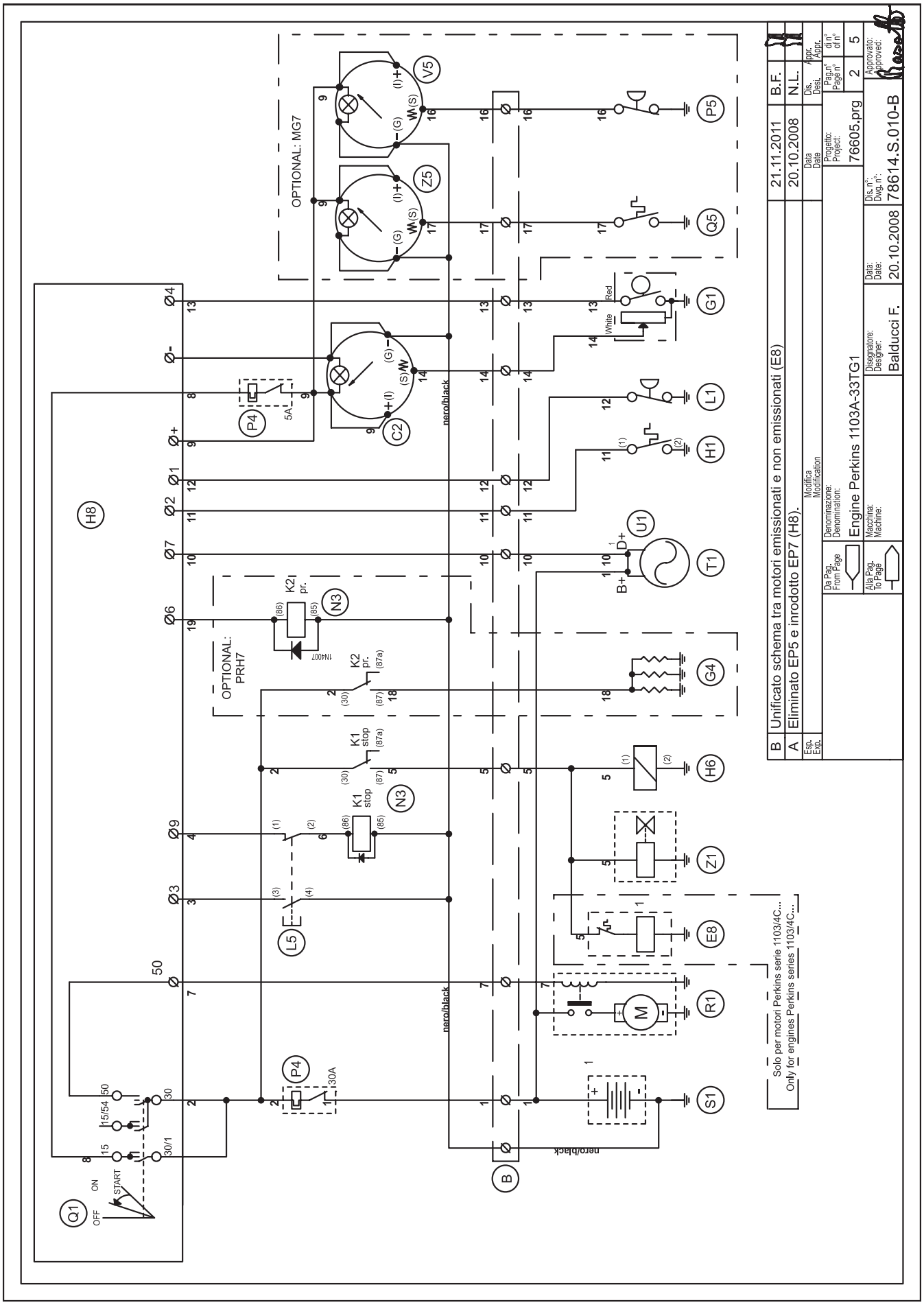
Table 2

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 c.a.
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.

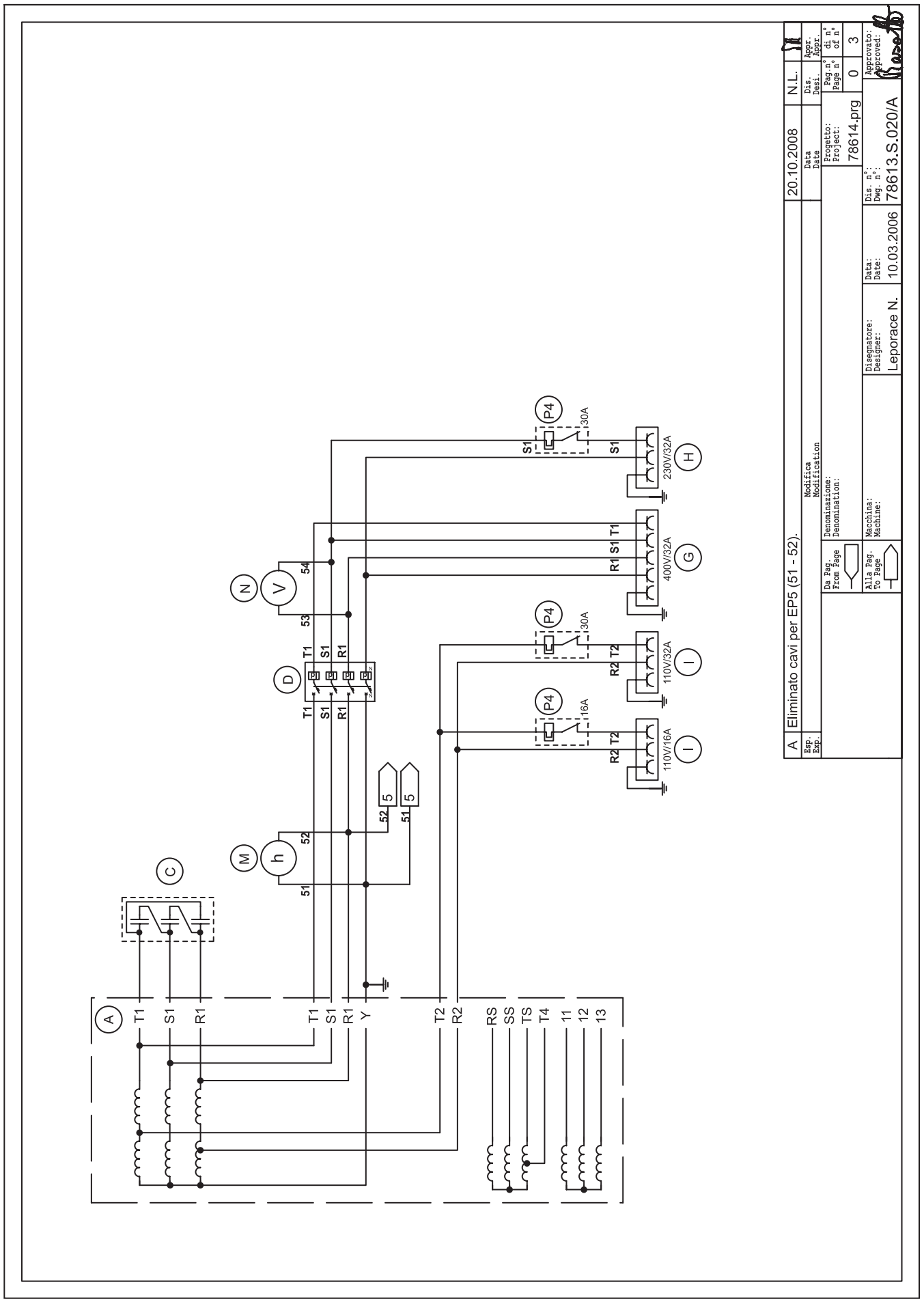
Table 3

ELECTRICAL SYSTEM LEGENDE

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

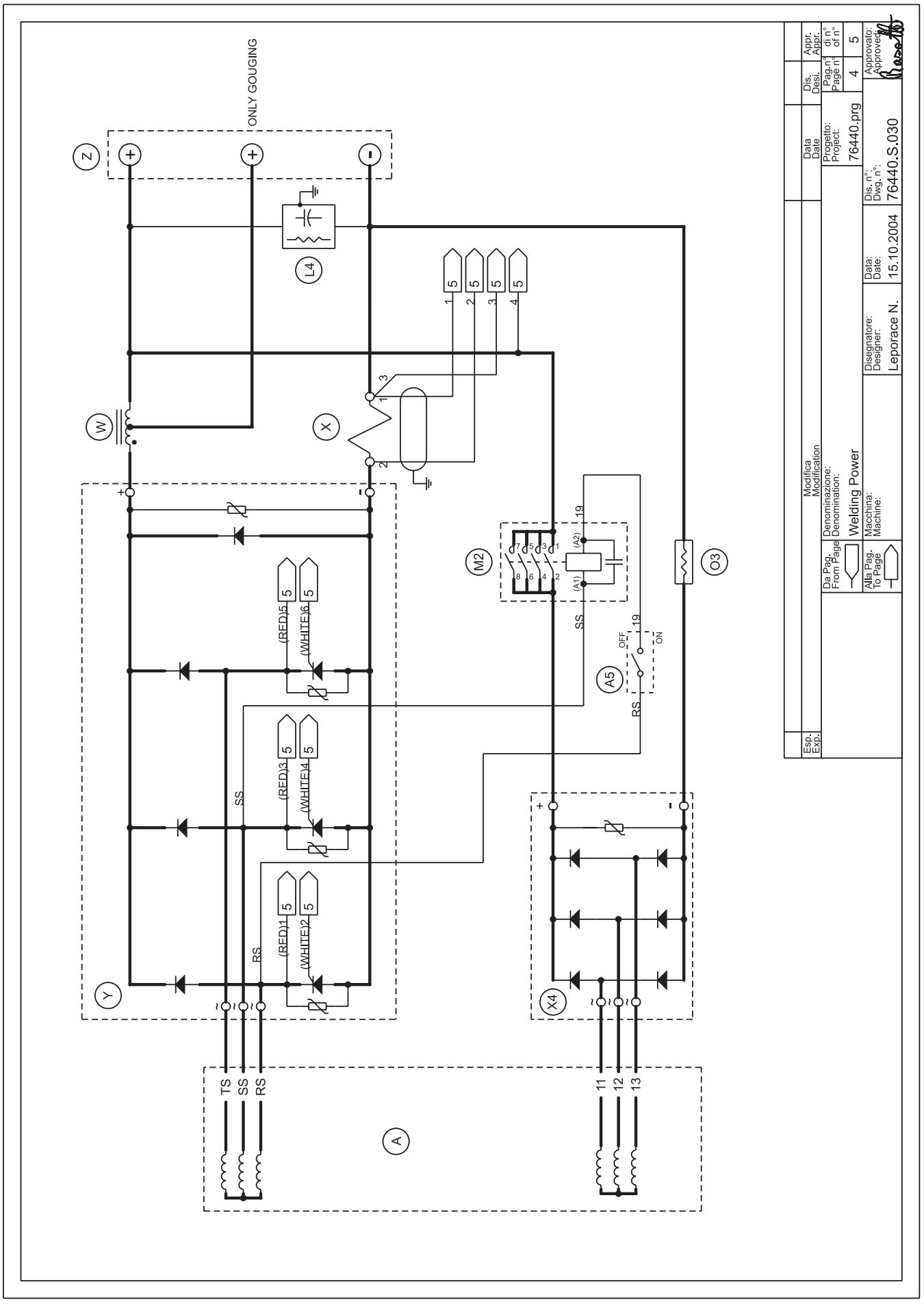


12/05/06 88611-I



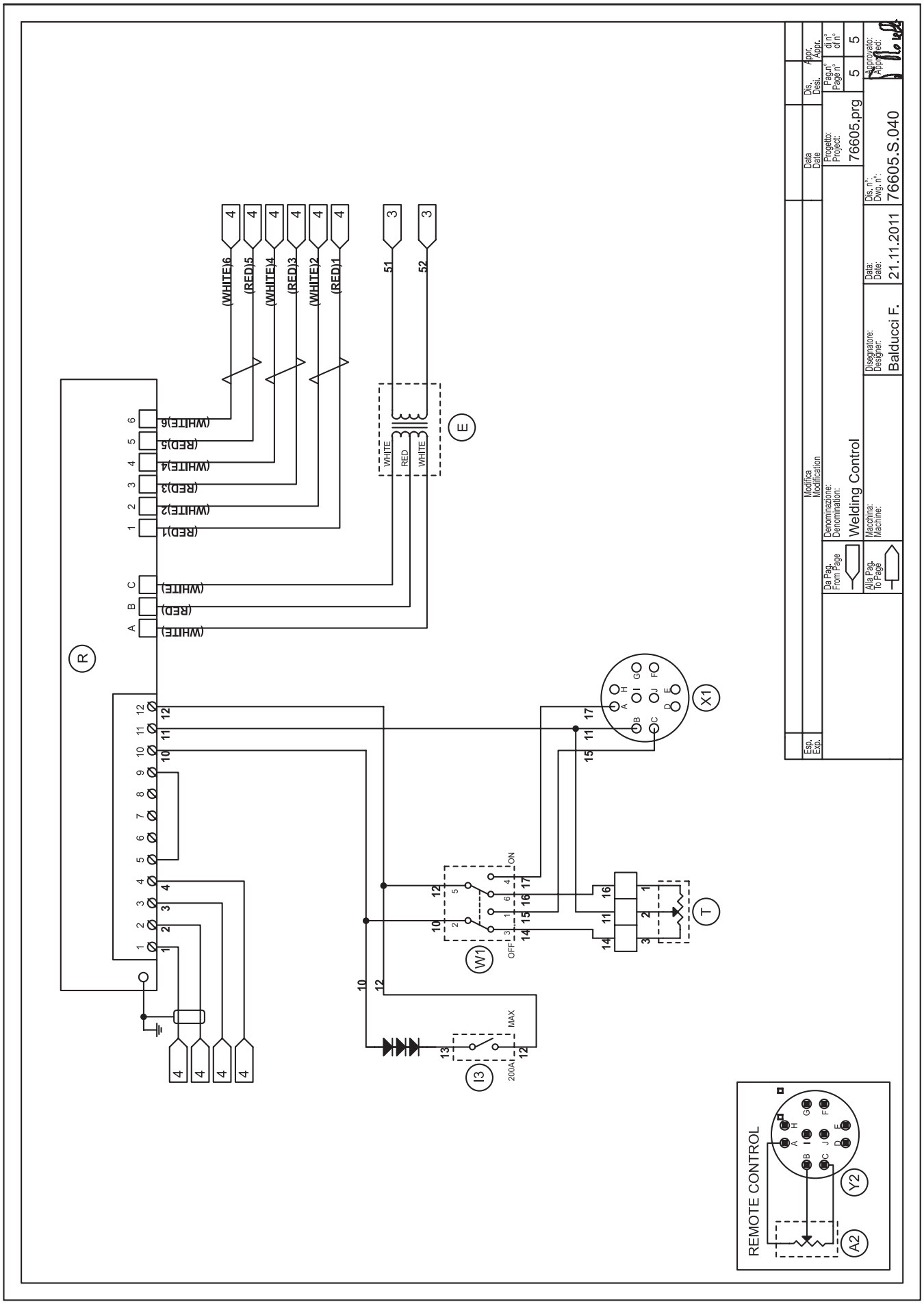
12/05/06 88611-I

(I) Schema elettrico	(D) Stromlaufplan	TS 400 PS-BC	M
(GB) Electric diagram	(E) Esquema eléctrico	TS 500 PS-BC	61.4
(F) Schemas electriques	(NL)	TS 600 PS-BC	REV.0-04/05



12/04/05 76440-I

Ⓘ **Schema elettrico** ⒼⒷ **Electric diagram** Ⓕ **Schemas electriques**	Ⓓ **Stromlaufplan** Ⓔ **Esquema eléctrico** ⓃⓁ	**TS 600 PS-BC**	**M** **61.5** REV.0-12/11



13/12/11 76605-I

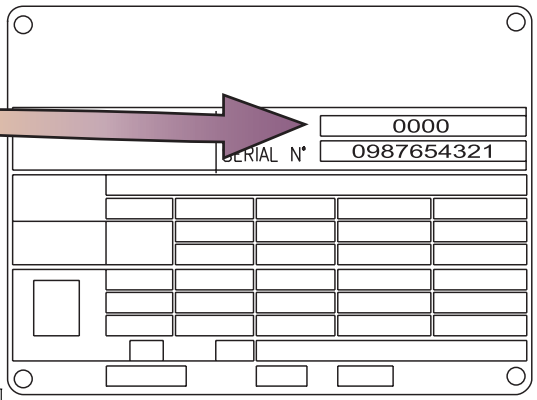
The manufacturer guarantees that any request for spare parts will be satisfied.

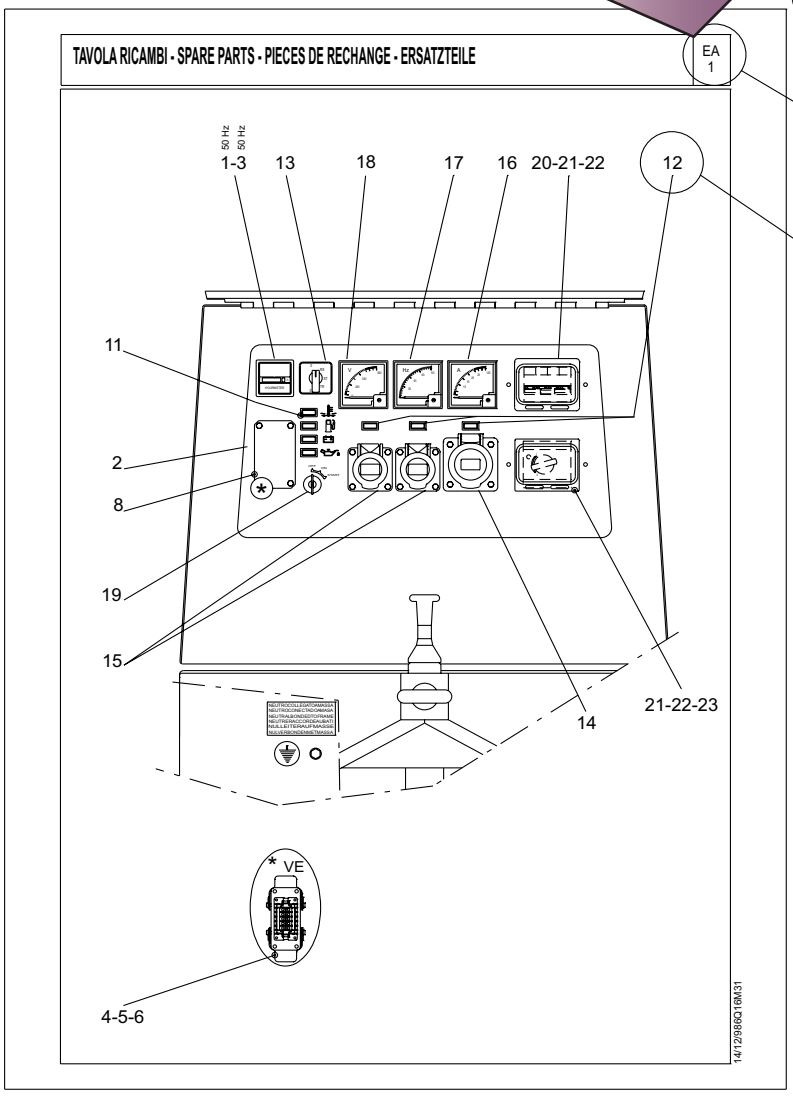
To keep the machine in full working order, when replacement spare parts is required, always ask for genuine parts only.

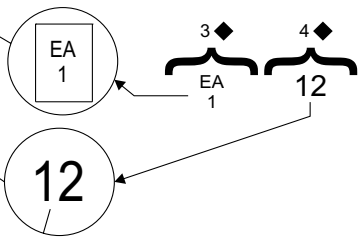
☞ The requested data are to be found on the data plate located on the machine structure, quite visible and easy to consult. ✹

When ordering the spare parts, it is recommended to indicate:

1) ✹ serial number
2) ✹ model of welder and/or generating set
3) ◆ n. table
4) ◆ n. position
5) quantity



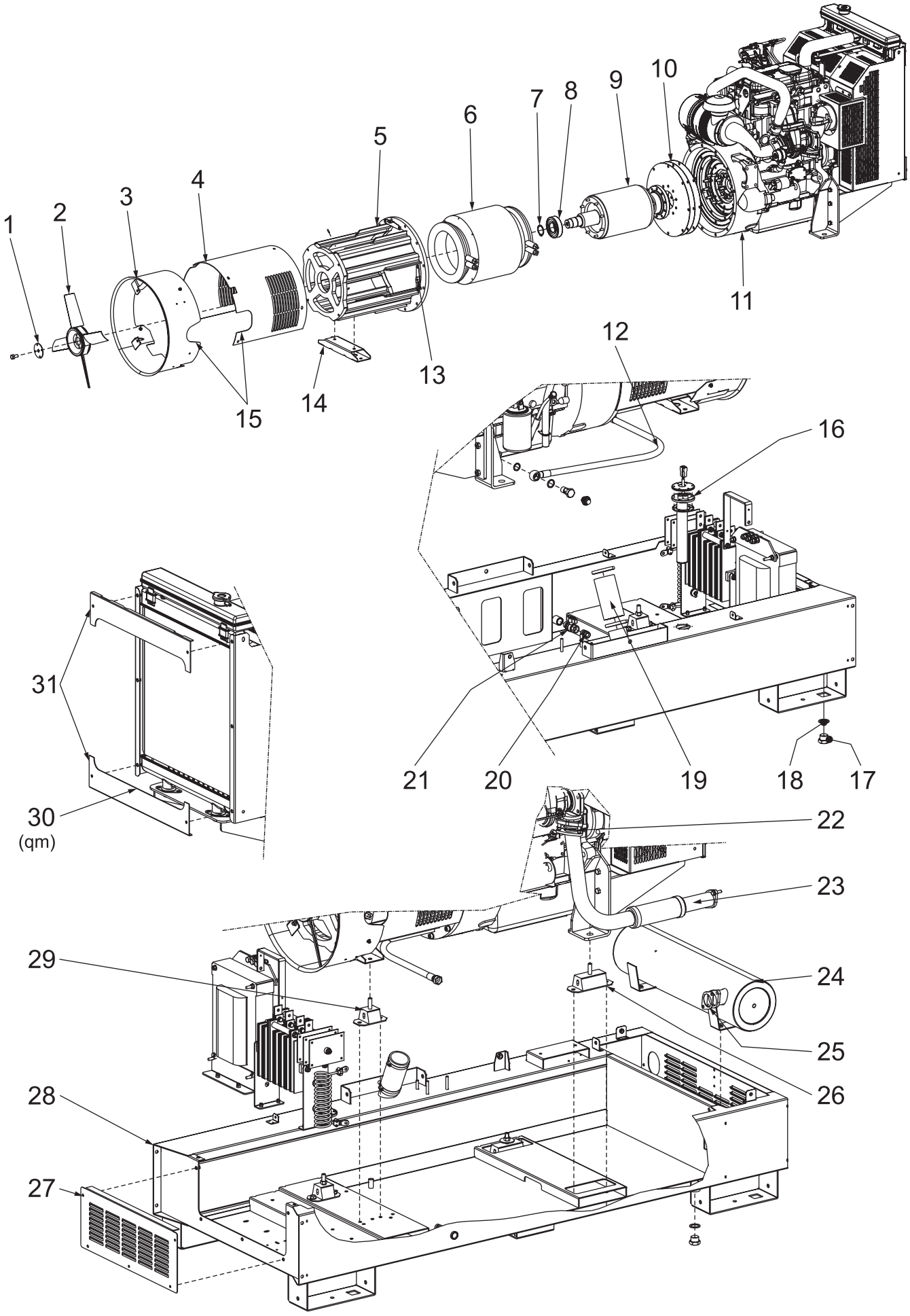




ABBREVIATIONS AND SYMBOLS:

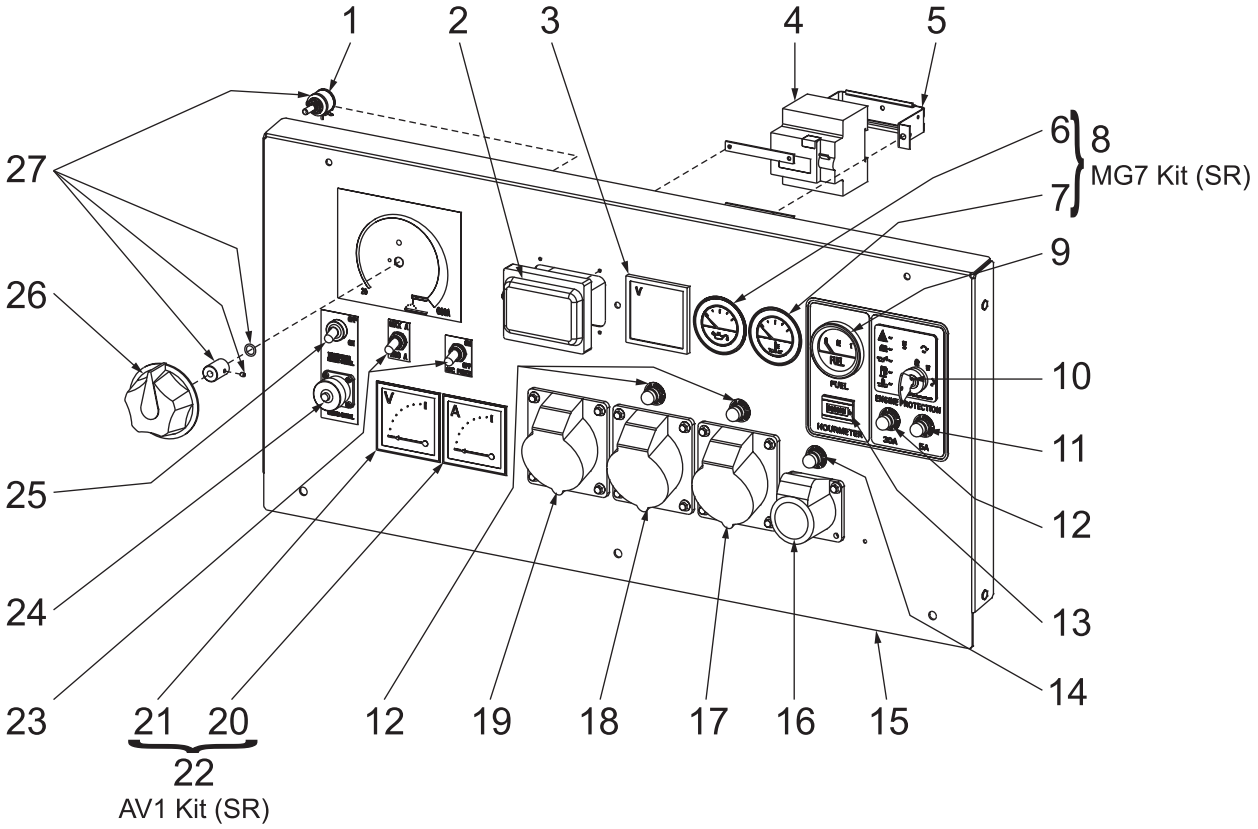
(EV) When ordering, specify the engine type and the auxiliary voltage
(ER) Engine with recoil starter only
(ES) Engine with electric starter only
(VE) E.A.S version only.
(QM) When ordering, specify the length in meters
(VS) Special version only
(SR) By request only

(I) Ricambi	(D) Ersatzteile		EF
(GB) Spare parts	(E) Tabla de recambios	TS 600 PS-BC	30
(F) Pièces de rechanges	(NL)		REV.0-12/11



13/12/11 76605-I

Pos.	Cod.	Descr.	Note
1	M107301390	ANELLO / *RING FIXING FAN*	
2	M765006020	VENTOLA PER GENERATORE / *ALTERNATOR FAN*	
3	M307806010	CONVOGLIATORE GENERATORE / *GENERATOR CONVEYOR*	
4	M765008222	COPERTURA ALTERNATORE / *ALTERNATOR COVER*	
5	M765003010	CARCASSA PER STATORE / *ALTERNATOR HOUSING*	
6	M766053020	STATORE / *STATOR*	
7	M6050050	ANELLO SEEGER / *RING, SEEGER*	
8	M1001050	CUSCINETTO / *BEARING*	
9	M366103030	ALBERO CON ROTORE / *SHAFT WITH ROTOR*	
10	M765013012	DISCO ALBERO ROTORE / *DISK*	
11	M740552200	MOTORE PERKINS 1103A-33TG1 / *PERKINS ENGINE 1103A-33TG1*	
12	M740562212	TUBO SCARICO OLIO / *EXHAUST OIL PIPE*	
13	M765008224	STAFFA SUPPORTO COPERTURA ALT. / *ALTERNATOR COVER SUPPORT*	
14	M307803101	TRAVERSA ALTERNATORE / *ALTERNATOR BRACKET*	
15	M107509005	GUARNIZIONE / *GASKET*	qm
16	M764409975	SENSORE LIVELLO CARBURANTE / *FUEL LEVEL SENSOR*	
17	M308101262	TAPPO SCARICO SERBATOIO / *FUEL TANK CAP*	
18	M308102023	GUARNIZIONE / *GASKET*	
19	M6095030	TUBO GOMMA / *PIPE*	
20	MJJ0062292	NIPPLO OLEODINAMICO 1/2" G / *NIPPLE*	
21	MJJ0062025	RUBINETTO M-F 1/2" G / *OIL TAP*	
22	M784102069	GUARNIZIONE SCARICO MOTORE / *GASKET*	
23	M740560566	KIT TUBO SCARICO / *PIPE KIT*	
24	M740562050	SILENZIATORE SCARICO (COMPL.) / *EXHAUST MUFFLER*	
25	M305232071	GUARNIZIONE / *GASKET*	
26	M105612070	ANTIVIBRANTE (40x50) / *VIBRATION-DAMPER (40x50)*	
27	M766051038	PIASTRA ANT. CHIUSURA BASAM. / *BASE FRONTAL LOCKING*	
28	M740561050	BASAMENTO / *BASE*	
29	M105612060	ANTIVIBRANTE (40x100) / *VIBRATION DAMPER (40x100)*	
30	M105112270	GUARNIZIONE (L=MT.1) / *STRIP, SEALING (L=MT.1)*	qm
31	M740568066	CORNICE PER RADIATORE / *RADIATOR FRAME*	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MG7 Kit (SR)
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AV1 Kit (SR)
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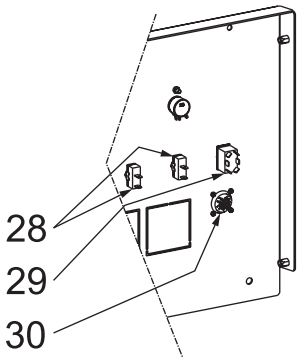
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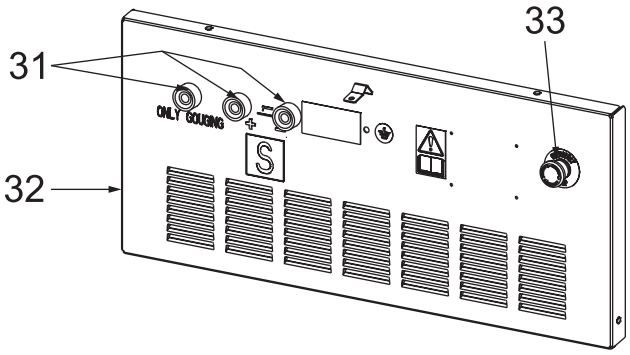
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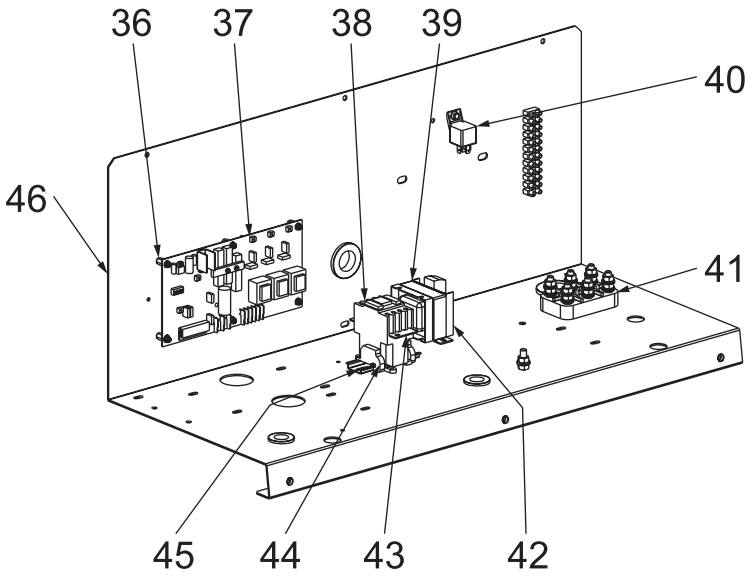
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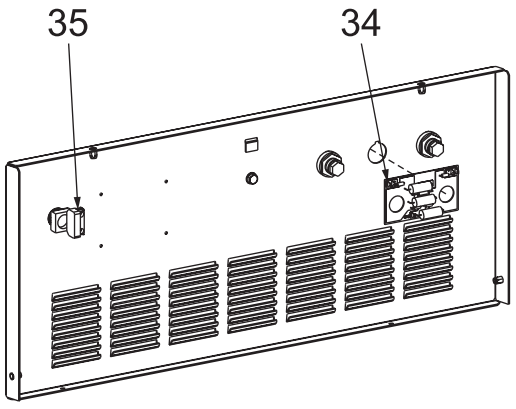
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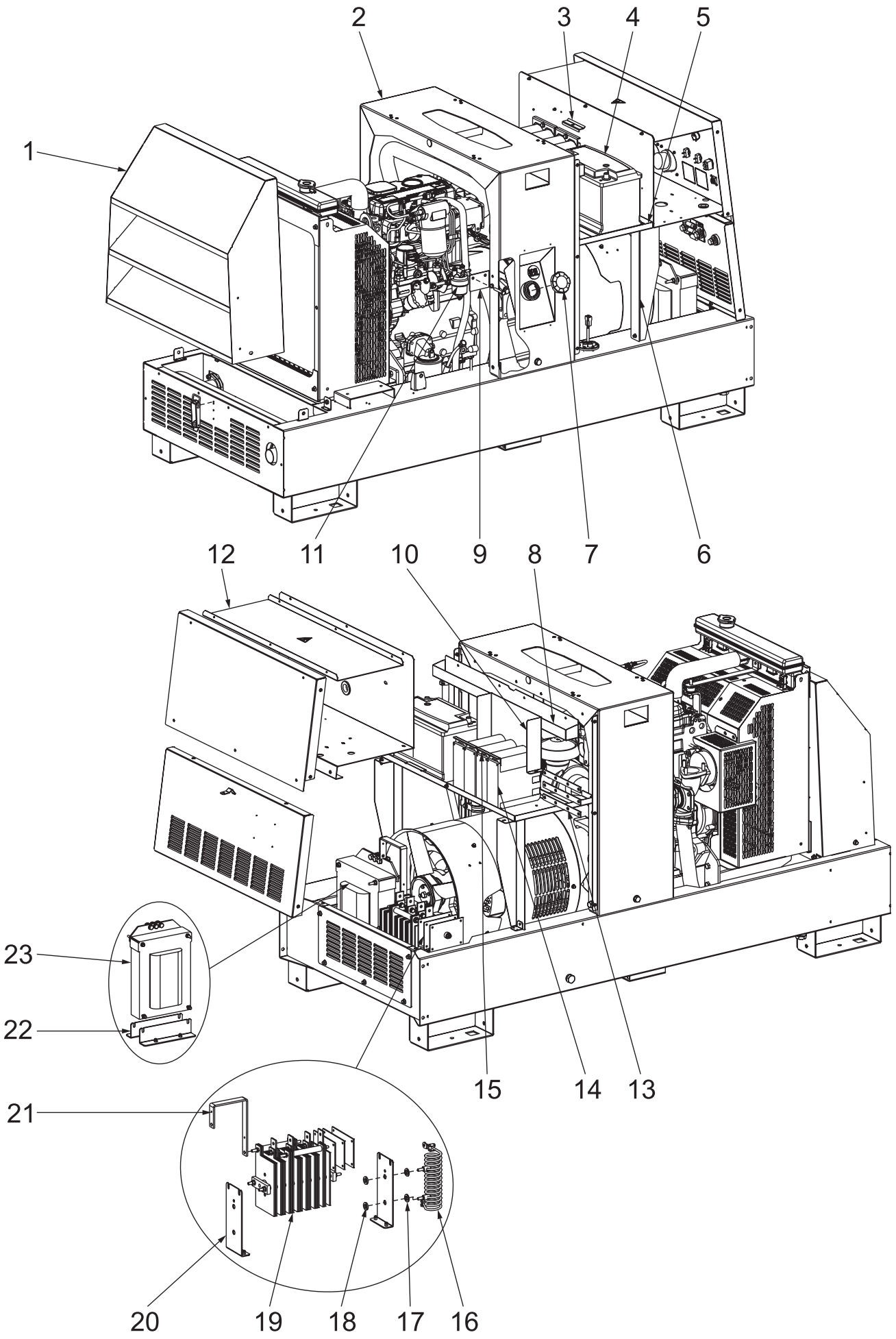
Pos.	Cod.	Descr.	Note
1	M0000836709701	POTENZIOMETRO / *WELDING CURRENT REGULATOR*	
2	M219937130	COPERCHIO INTERRUT.DIFFERENZ. / *COVER GFI*	
3	M305717300	VOLTMETRO / *VOLTMETER*	
4	M305027105	INTERRUTTORE DIFFERENZIALE / *GROUNDFAULT INTERRUPTOR (GFI)*	
5	M219937036	STAFFA / *BRACKET*	
6	M744527190	INDICATORE PRESSIONE OLIO / *OIL PRESSURE INDICATOR*	(SR)
7	M744527192	INDICATORE TEMPERATURA ACQUA / *WATER TEMPERATURE INDICATOR*	(SR)
8	M786130094	MG7 KIT TERMO/MANOMETRO / *MG7 GAUGE KIT*	(SR)
9	M325507210	INDICATORE LIVELLO CARBURANTE / *FUEL LEVEL GAUGE*	
10	M265509770	UNITA'CONTROLLO MOTORE / *ENGINE CONTROL UNIT EP7*	
11	M352007109	PROTEZIONE TERMICA 5A / *THERMOPROTECTION*	
12	M873407107	DISGIUNTORE TERMICO 30A/250V / *CIRCUIT BREAKER 30A/250V*	
13	M105511810	CONTAORE 230V 50Hz IP65 / *HOURMETER 230V 50Hz IP65*	
14	M155307107	DISGIUNTORE TERMICO 15A-250V / *THERMAL SWITCH 15A-250V*	
15	M766057020	PANNELLO FRONTALE / *FRONT PANEL*	
16	M307047250	PRESA CEE 110V 16A 2P+T / *EEC SOCKET 110V 16A 2P+N*	
17	M105111530	PRESA CEE 32A 110V 2P+T / *EEC SOCKET 32A 110V 2 P+N*	
18	M105111520	PRESA CEE 220V MONOF. 2P+T / *EEC SOCKET SINGLE-PH.220V 2P+N*	
19	M105111510	PRESA CEE 380V TRIFASE / *EEC SOCKET THREE-PHASE 380V*	
20	M765007305	AMPEROMETRO / *AMPEROMETER*	(SR)
21	M765007300	VOLTMETRO / *VOLTMETER*	(SR)
22	M765000166	AV1 KIT AMPEROMETRO/VOLTMETRO / *AV1 KIT AMPEROMETER/VOLTMETER*	(SR)
23	M282009962	CAPPUCCIO ISOLANTE / *CAP*	
24	M765009911	CAPPUCCIO X CONNETTORE / *CONNECTOR CAP*	
25	M102042740	CAPPUCCIO / *CAP*	
26	M107509702	MANOPOLA REG.CORRENTE SALDAT. / *KNOB, WELDING CURRENT REGULAT.*	
27	M836709715	POTENZIOMETRO COMPL. / *POTENTIOMETER*	
28	M282009741	INTERRUTTORE UNIPOLARE / *SWITCH*	
29	M102013290	COMMUTATORE / *COMMUTATOR*	
30	M765009910	CONNETTORE / *CONNECTOR*	
31	M765007111	PRESA DI SALDATURA NERA / *BLACK WELDING SOCKET*	
32	M765107205	PANNELLO FRONTALE (inferiore) / *FRONT PANEL*	
33	M744507219	PULSANTE STOP D'EMERGENZA / *EMERGENCY PUSH BUTTON STOP*	
34	M372959860	SCHEDA FILTRO ANTIDISTURBI / *ANTIJAMMING FILTER*	
35	M265507237	CONTATTO NORMALMENTE APERTO / *CONTACT N.O.*	
36	M282009807	DISTANZIALE ISOLANTE / *SPACER*	
37	M208019800	SCHEDA DI CONTROLLO SALDATURA / *PCB, WELDING CONTROL*	
38	M866707220	TELERUTTORE 40A / *CONTACTOR 40A*	
39	M218019874	STAFFA / *BRACKET*	
40	M306479199	RELE' AVV. ELETTRICO / *RELAY, ELECTRIC START*	
41	M105111830	MORSETTIERA / *TERMINAL BOARD*	
42	M107509870	TRASFORMATORE / *AUXILIARY TRANSFORMER*	
43	M317807212	PIASTRINA DI PARALLELO / *PLATE*	
44	M1241010	PIASTRINA / *SMALL PLATE*	
45	M1243020	GUIDA PER MORSETTIERA / *TERMINAL GUIDE*	
46	M765107010	SCATOLA ELETTRICA / *ELECTRIC BOX*	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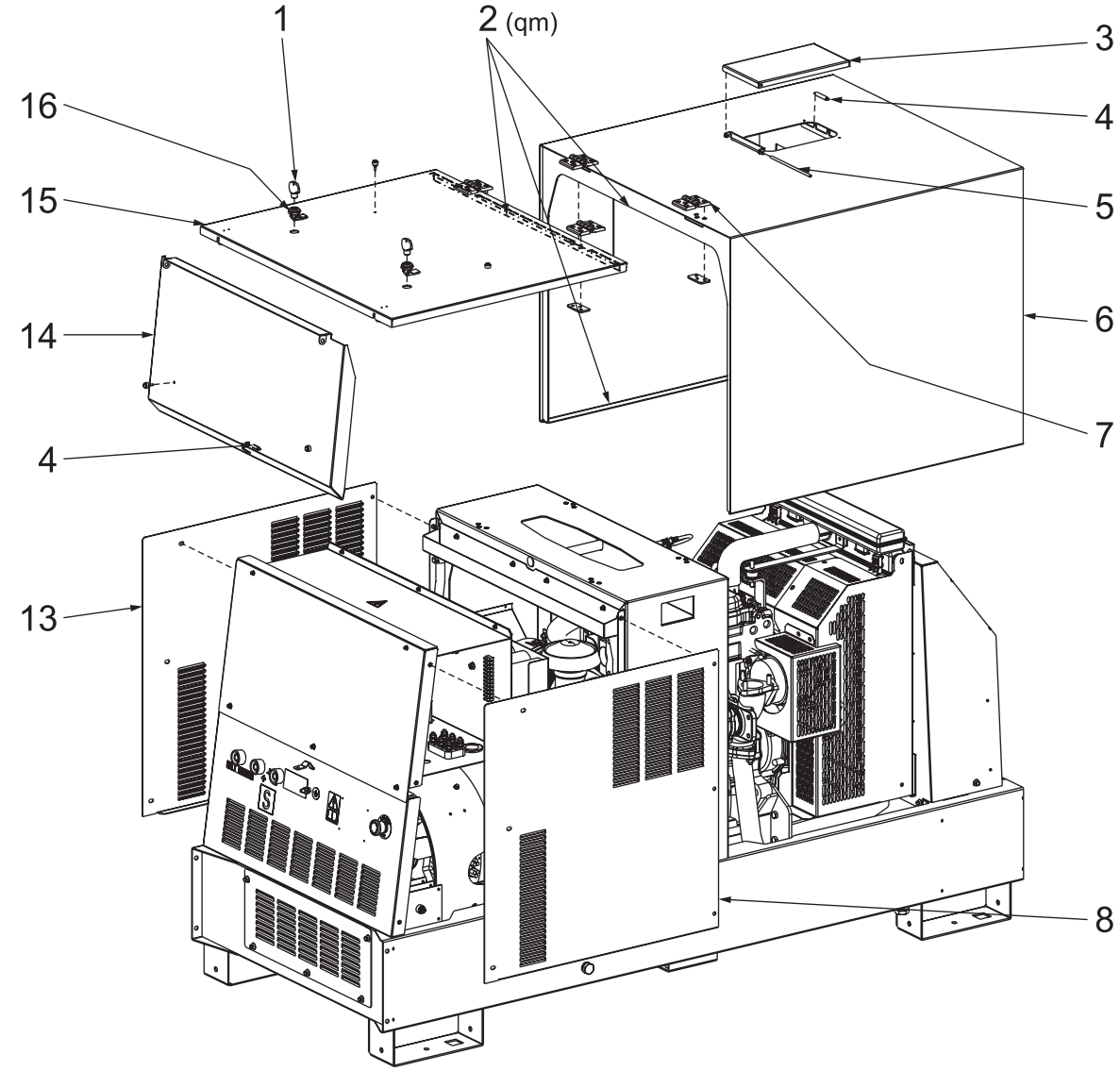
Pos.	Cod.	Descr.	Note
1	M740568065	GRIGLIA USCITA ARIA (COMPL.)	
2	M740561100	ROLL BAR	
3	M400409154	STAFFA FISSAGGIO BATTERIA	
4	M764409150	BATTERIA	
5	M740568290	PARATIA SUPERIORE ALTERNATORE	
6	M740568239	TRAVERSINO SUPP.PARATIA ALTER.	
7	M342202026	TAPPO SERBATOIO	
8	M740568164	BACINELLA RACCOLTA ACQUA	
9	M740562147	STAFFA FISS.PRE-FILTRO GASOLIO	
10	M765109863	LAMIERA PROTEZ. CONDENSATORI	
11	M841562228	FILTRO SEPARATORE ACQUA	(Fornito con motore)
12	M740567015	COPERCHIO SCATOLA ELETTRICA	
13	M766709041	SBARRETTA BOX CONDENSATORI	
14	M105319880	BOX CONDENSATORI	
15	M209719882	STAFFA BOX CONDENSATORI	
16	M766704010	RESISTORE DI POTENZA	
17	M309015043	RONDELLA	
18	M309014013	DISTANZIALE	
19	M266155300	GRUPPO RADDRIZZATORI	
20	M366105091	STAFFA	
21	M766019890	SHUNT DI MISURA	
22	M766054110	STAFFA SUPP. REATTANZA	
23	M364124100	REATTORE DI LIVELLO	

Pos.	Cod.	Descr.	Note
1	M740568065	OUT AIR GRATE	
2	M740561100	ROLL BAR	
3	M400409154	BRACKET	
4	M764409150	BATTERY	
5	M740568290	ALTERNATOR TOP COVER	
6	M740568239	ALTERNATOR RIGHT BRACKET	
7	M342202026	CAP, FUEL TANK	
8	M740568164	WATER TRAY	
9	M740562147	FUEL-FILTER FIXING BRACKET	
10	M765109863	CONDENSER PROTECTION	
11	M841562228	FUEL PRE-FILTER	(Fornito con motore)
12	M740567015	ELECTRICAL BOX COVER	
13	M766709041	CAPACITOR BOX BRACKET	
14	M105319880	CAPACITOR BOX	
15	M209719882	CAPACITOR BOX BRACKET	
16	M766704010	POWER RESISTANCE	
17	M309015043	WASHER	
18	M309014013	SPACER	
19	M266155300	RECTIFIER ASSY	
20	M366105091	RECTIFIER ASSY BRACKET	
21	M766019890	SHUNT	
22	M766054110	REACTANCE SUPPORT BRACKET	
23	M364124100	REACTANCE	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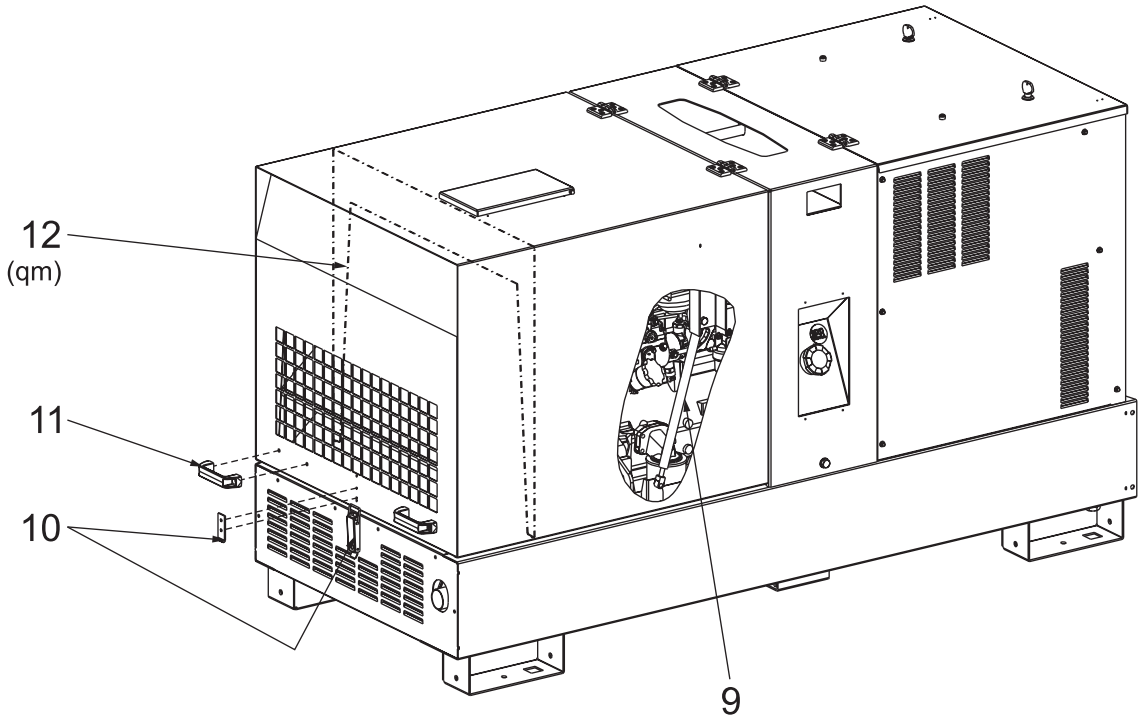
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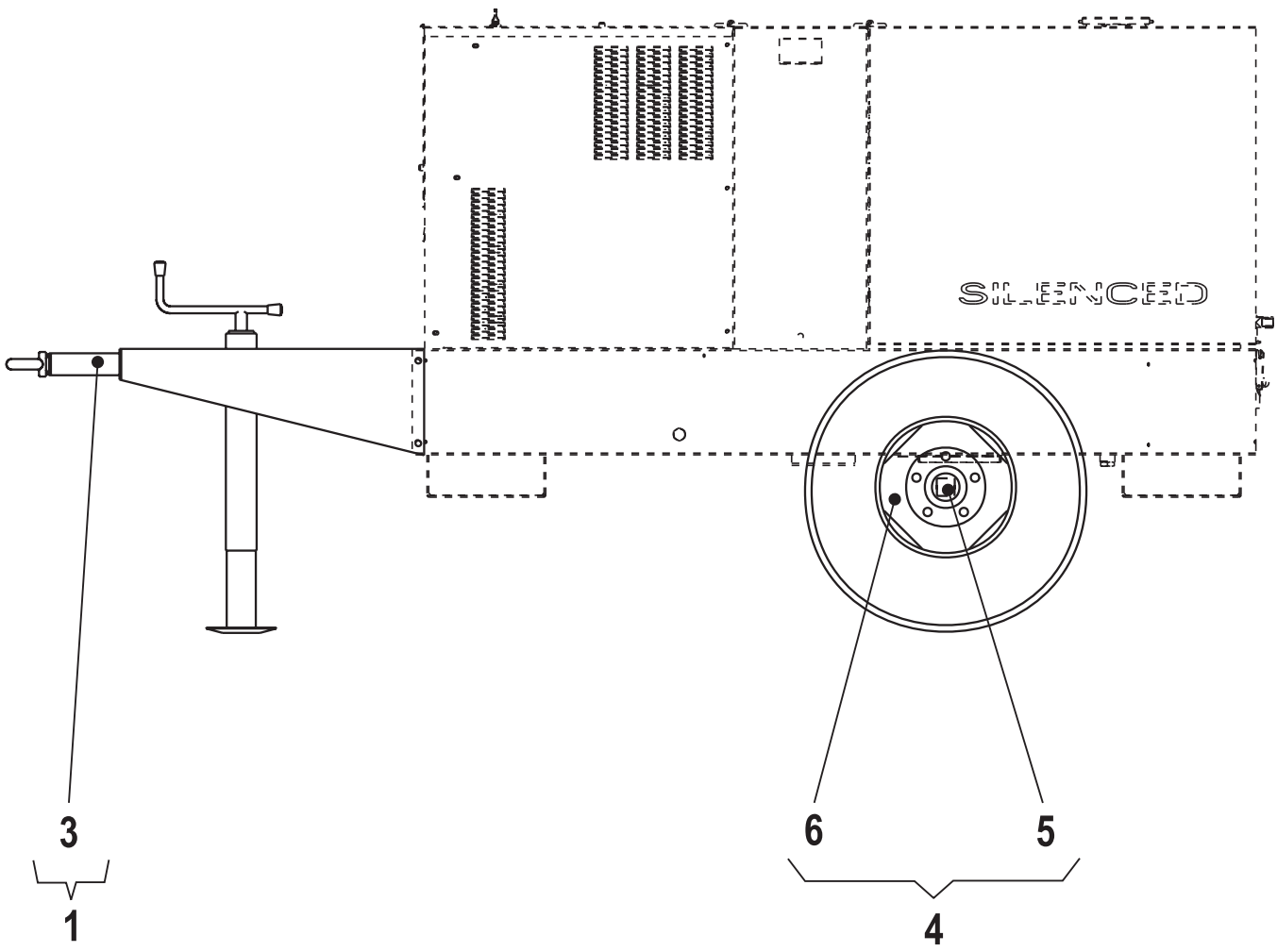
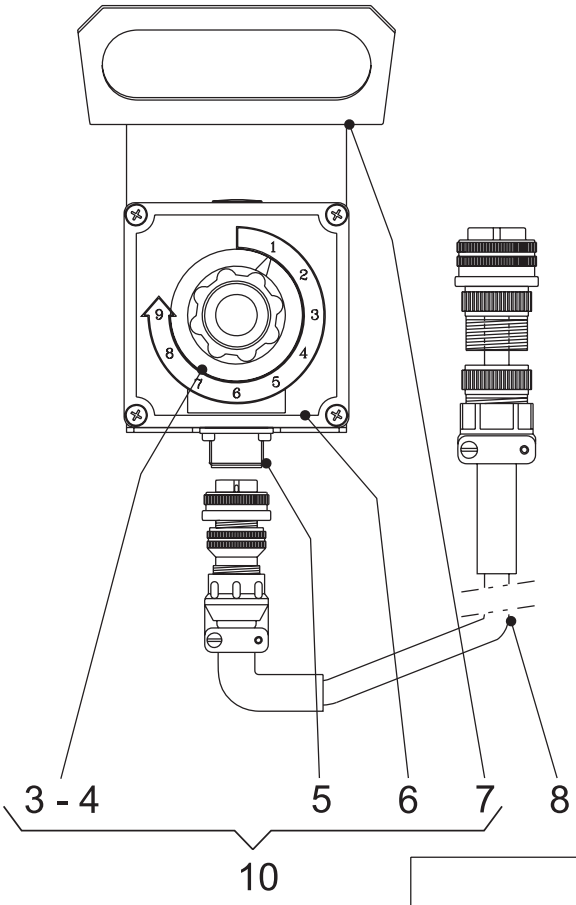
Pos.	Cod.	Descr.	Note
1	M765007057	CHIAVE PER SERRATURA	
2	M105112270	GUARNIZIONE (L=MT.1)	qm
3	M766708070	COPERCHIO TAPPO RADIATORE	
4	M102042870	MOLLA	
5	M209718073	TIRANTE	
6	M740568035	CARENATURA POSTERIORE	
7	M744508140	CERNIERA PER FIANCATA	
8	M740568010	FIANCATA DX CARENAT. ANTERIORE	
9	M305718115	PISTONE SOSTEGNO	
10	M107300180	CHIUSURA COMPL.A LEVA	
11	M343339601	MANIGLIA	
12	M102302280	GUARNIZIONE (L=MT.1)	(qm)
13	M740568004	FIANCATA SX CARENAT. ANTERIORE	
14	M766058100	COPERCHIO FRONTALE	
15	M766058021	COPERCHIO CARENATURA ANTERIORE	
16	M765008112	SERRATURA	

Pos.	Cod.	Descr.	Note
1	M765007057	ELECTRIC BOX COVER KEY	
2	M105112270	STRIP, SEALING (L=MT.1)	qm
3	M766708070	RADIATOR COVER CAP	
4	M102042870	SPRING	
5	M209718073	TIE-ROD	
6	M740568035	COVER, REAR	
7	M744508140	LATCH	
8	M740568010	FRONT COVER (RIGHT) SIDE	
9	M305718115	SUPPORT, REAR COVER	
10	M107300180	LATCH	
11	M343339601	KNOB	
12	M102302280	GASKET (L=MT.1)	(qm)
13	M740568004	FRONT COVER (LEFT) SIDE	
14	M766058100	FRONT COVER	
15	M766058021	FRONT HOUSING COVER	
16	M765008112	LATCH FOR ELECTRICAL BOX COVER	

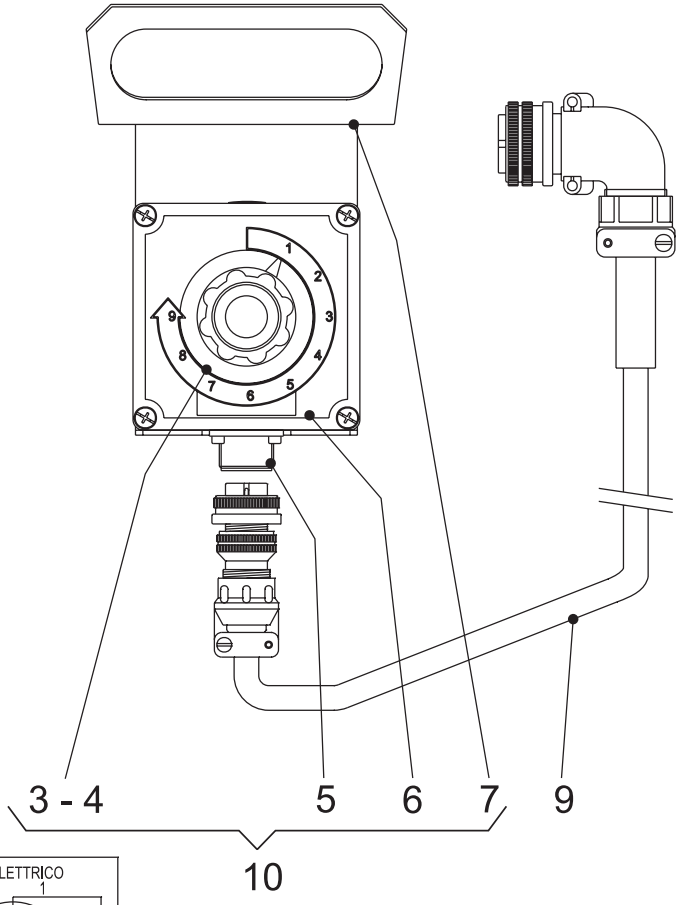


Pos.	Rev.	Cod.	Descr.	Descr.	Note
1		M225100141	GR.TIMONE,PIEDE X TRAINO LENTO	*KIT SITE TOW*	
3		M305751150	TIMONE	*TOW BAR*	
4		M740350142	GR. ASSALE, RUOTE TRAINO LENTO	*KIT SITE TOW*	
5		M305751160	ASSALE	*AXLE*	
6		M325501170	RUOTA	*WHEEL*	

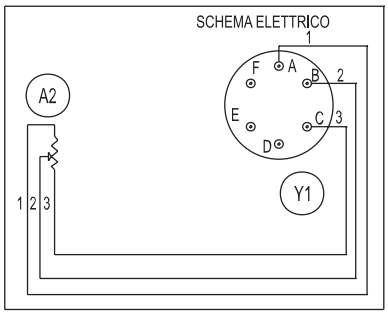
RC2



RC2/90°



SCHEMA ELETTRICO
ELECTRICAL DIAGRAM
ELECTRIQUE SCHEMA
ELEKTRISCHES SCHEMA



Pos.	Cod.	Descr.	Descr.
3	M308300543	MANOPOLA REGOLAZIONE COMPL.	*KNOB, REGULATOR COMPLETE*
4	M836709715	POTENZIOMETRO	*WELDING CURRENT REGULATOR*
5	M836709910	CONNETTORE FEMMINA	*FEMALE CONNECTOR*
6	M836700524	SCATOLA	*BOX*
7	M308309900	MANIGLIA COMANDO A DISTANZA	*REMOTE CONTROL HANDLE*
8	M0000KD0259904	CAVO COMANDO DISTANZA	*REMOTE CONTROL CABLE*
9	M936829904	CAVO COMANDO DISTANZA	*REMOTE CONTROL CABLE*
10	M936840555	COMANDO RC2 SENZA CAVO	*RC2 REMOTE CONTROL*

GRUPPI ELETTROGENI MOTOSALDATRICI

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