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USE AND MAINTENANCE MANUAL
SPARE PARTS CATALOG

22/05/97 21760M00
preparato da UPT
approvato da DITE

IQNet
THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and its partner
CISQ/ICIM
hereby certify that the organization

BCS S.p.A.

Head Office and Operative Unit: **Viale Mazzini, 161 - I-20081 Abbiategrasso (MI)**
(BCS – FERRARI – PASQUALI Trade Marks)
Operative Units
Via Valbrina, 17/19 - I-42045 Luzzara (RE) - (BCS – FERRARI – PASQUALI Trade Marks)
Viale Europa, 59 - I-20090 Cusago (MI) - (Mosa Trade Mark)

for the following field of activities

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

has implemented and maintains a

Quality Management System

which fulfills the requirements of the following standard

ISO 9001:2000

Issued on: **2006-03-06**
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IQNet — *Fabio Roversi* — *President of IQNet*
CISQ — *Gianrenzo Prati* — *President of CISQ*

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CERTIFICATO n. 0192/4
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)
(marchi BCS – FERRARI – PASQUALI)
Unità Operative
Via Valbrina, 17/19 - 42045 Luzzara (RE)
(marchi BCS – FERRARI – PASQUALI)
Viale Europa, 59 - 20090 Cusago (MI)
(marchio MOSA)
Italia

E' CONFORME ALLA NORMA
IS IN COMPLIANCE WITH THE STANDARD

UNI EN ISO 9001:2000

PER LE SEGUENTI ATTIVITA'
FOR THE FOLLOWING ACTIVITIES

EA: 18

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

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

Riferirsi al Manuale della Qualità per l'applicabilità dei requisiti della Norma ISO 9001:2000.
Refer to Quality Manual for details of application to ISO 9001:2000 requirements.

Il presente certificato è soggetto al rispetto del regolamento per la certificazione dei sistemi di gestione per la qualità della azienda.
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	06/03/2006	05/03/2009

ICIM S.p.A. – PIAZZA A. DIAZ, 2 – 20123 MILANO

SINCERT

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

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www.cisq.com

ICIM CISQ IQNet
ISO 9001:2000 - Cert. 0192

UNI EN ISO 9001 : 2000

MOSA has certified its quality system according to UNI EN ISO 9001:2000 to ensure a constant, high quality of its products. This certification covers the design, production and servicing of engine driven welders and generating sets.

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

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

The advantages for MOSA clients are:

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

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

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⚠ ATTENTION

This use and maintenance manual is an important part of the machines in question.
The assistance and maintenance 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 from MOSA a high quality set.

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

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

☞ In case you do not profit on these Services and some parts are replaced, please ask and be sure that are used exclusively original MOSA 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 from MOSA.*

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 MOSA from the risks which could happen or, anyway, from that which was agreed when selling the machine; MOSA 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.

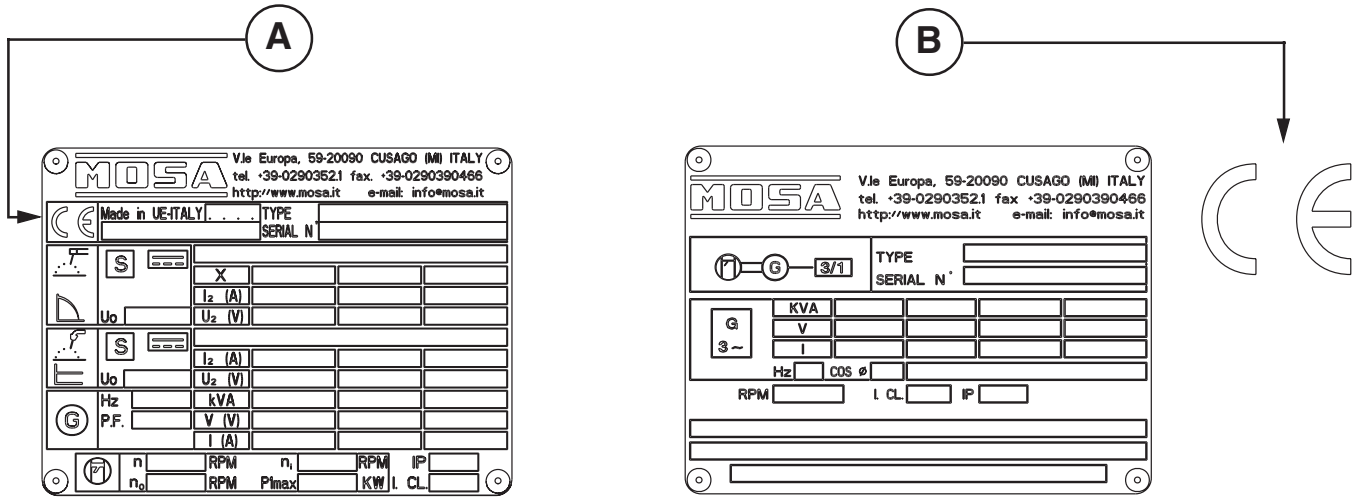
While working it is advisable to keep to the personal safety norms in force in the countries to which the product is destined (clothing, work tools, etc.).

Do not modify for any motive parts of the machine (fastenings, holes, electric or mechanical devices, others..) if not duly authorized in writing by MOSA: 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 MOSA, 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 (A) or placed as a sticker near the data-plate (B)



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

DANGEROUS

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

WARNING

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

CAUTION

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

IMPORTANT

NOTE

ATTENTION

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

SYMBOLS (for all MOSA models)

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 No harm for persons and things

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

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

Use only with safety protections, specifically suitable

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

Use only with safety protections -

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

Use only with safety protections -

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

Use only with safety protections -

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

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.

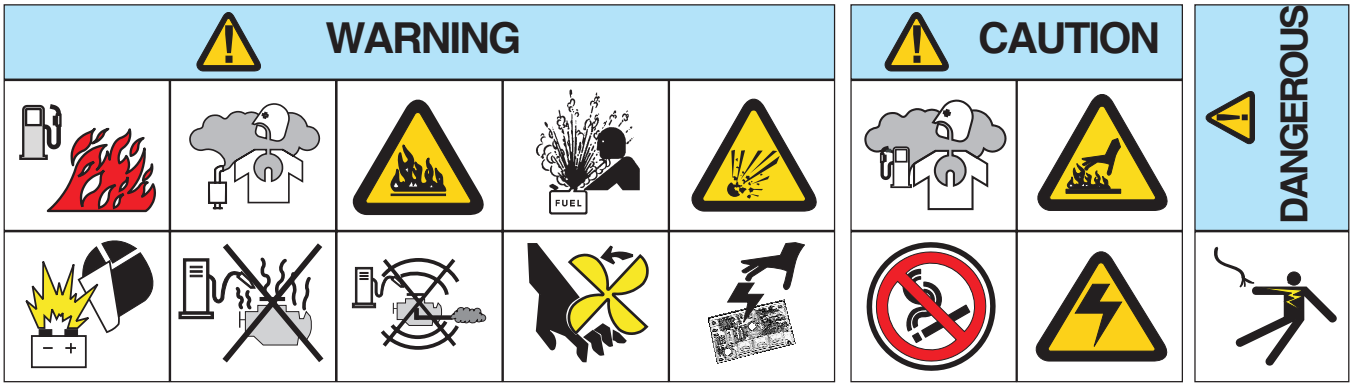
ENGINE	CHECKING BOARD
Stop engine when fueling	Do not touch electric devices if you are barefoot or with wet clothes.
Do not smoke, avoid flames, sparks or electric tools when fueling.	
Unscrew the cap slowly to let out the fuel vapours.	Always keep off leaning surfaces during work operations
Slowly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

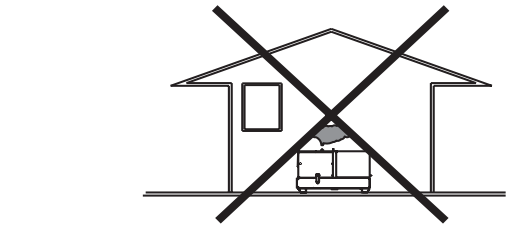
INSTALLATION AND ADVICE BEFORE USE

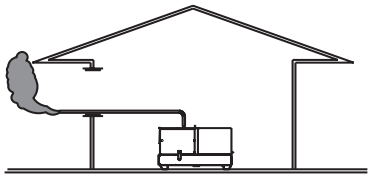
GASOLINE ENGINES

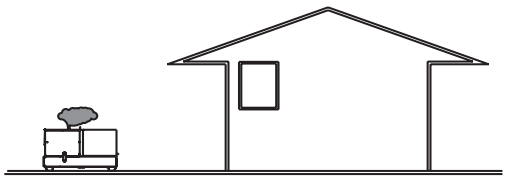
- Use in open space, air swept or vent exhaust gases, which contain the deathly carbone oxyde, far from the work area.

DIESEL ENGINES

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

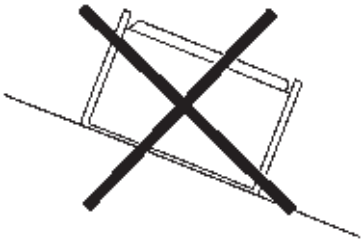




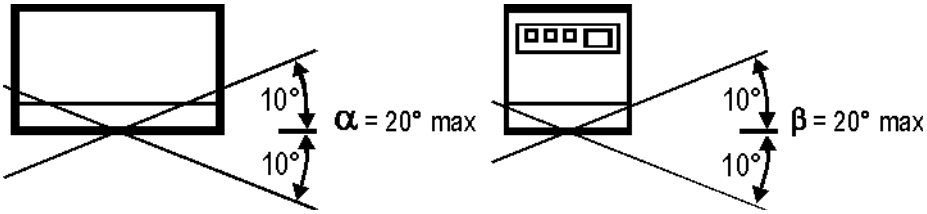


POSITION

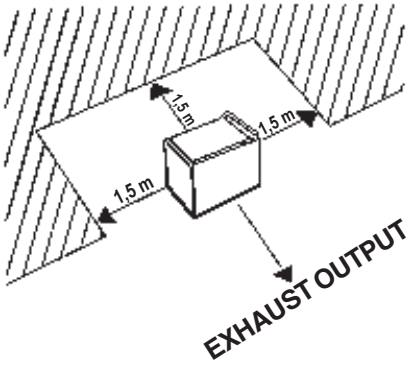
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



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.

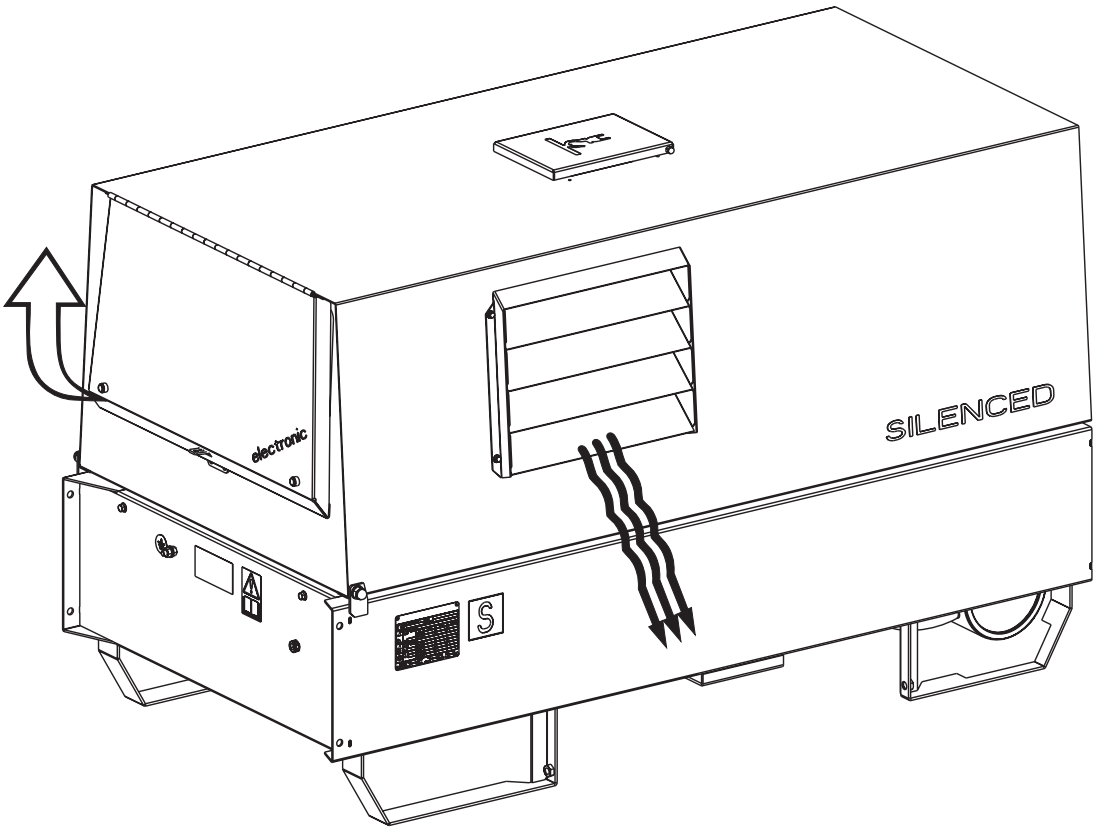
MOVES OF THE MACHINE

☞ 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.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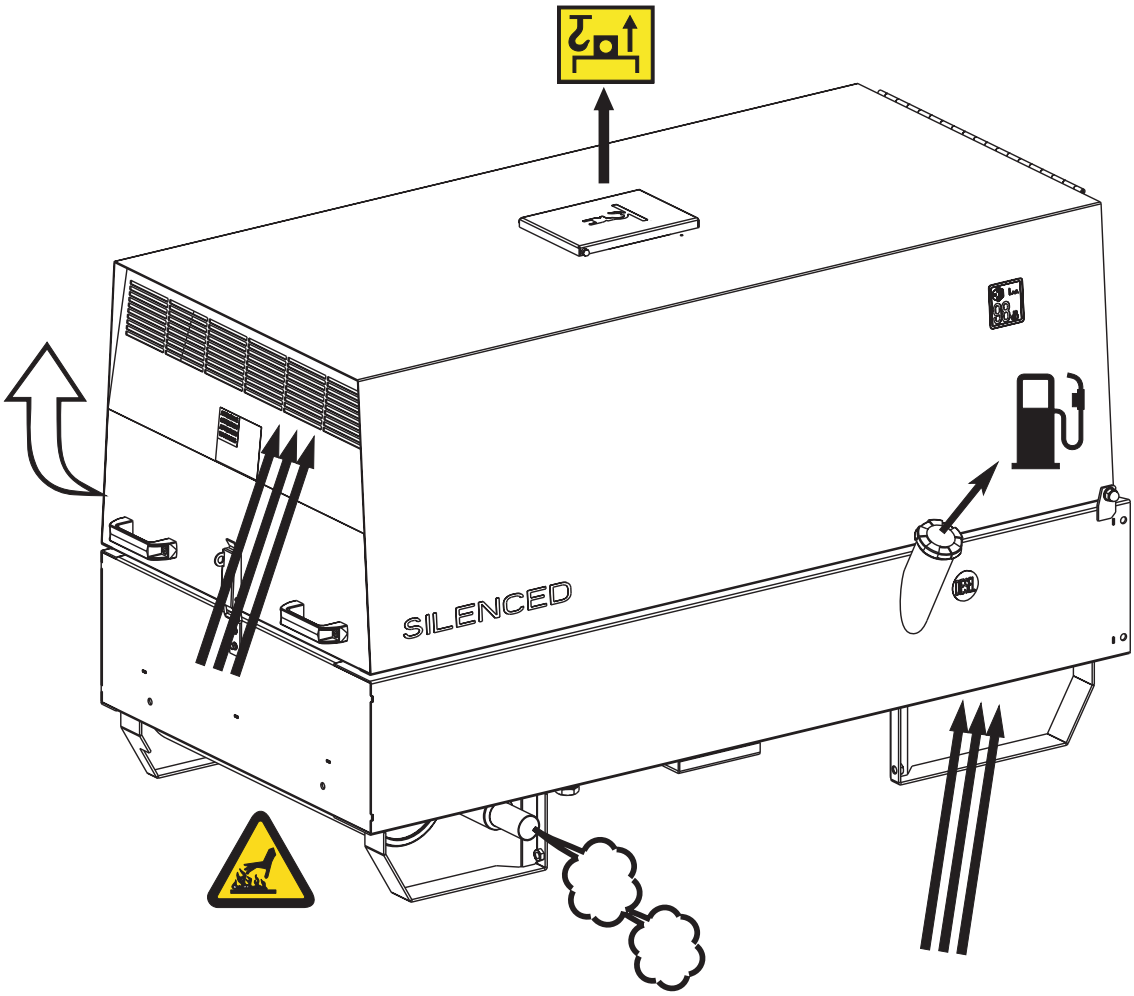
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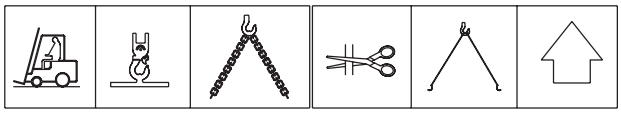
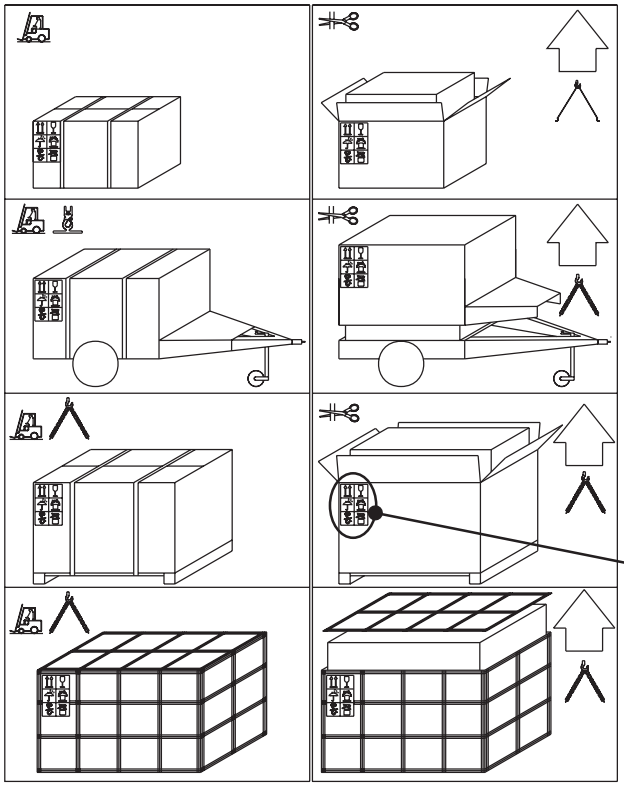


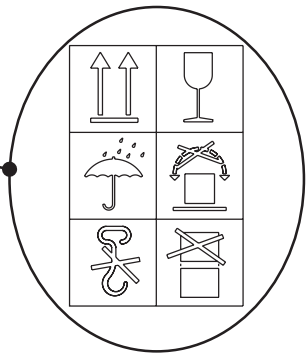


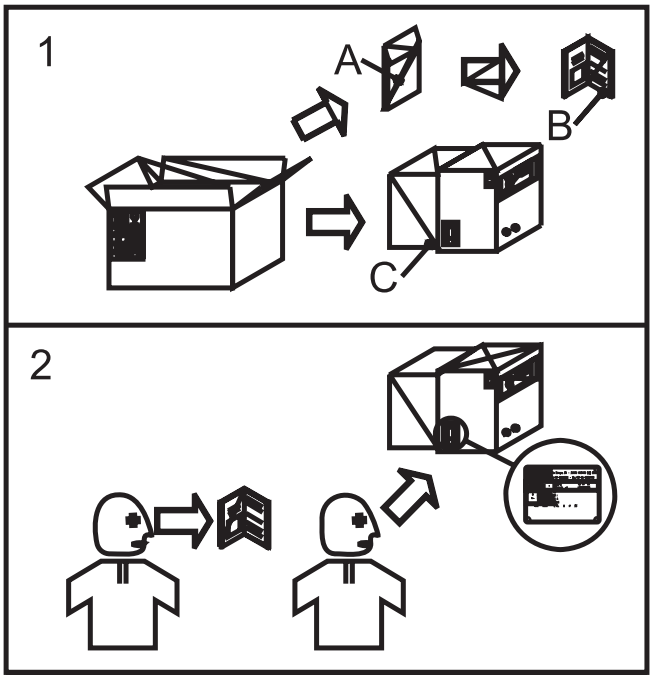
☞ Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conforms to local rules and regulations.

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.



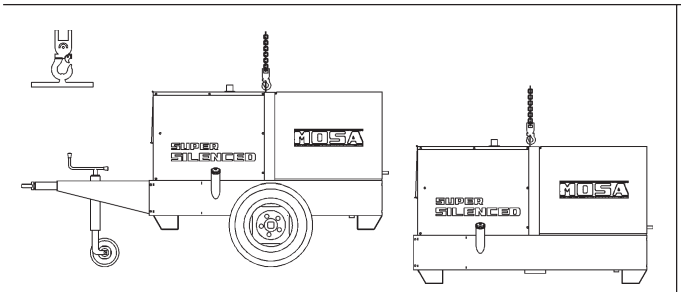


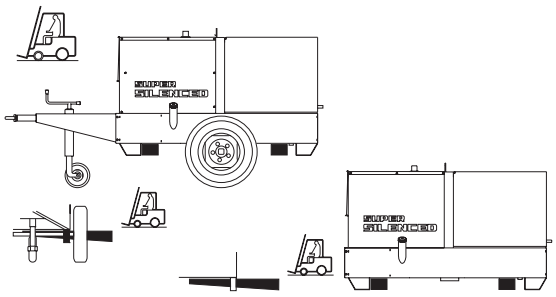
1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
2) Read: the user's manual (B), the plates fixed on the machine, the data plate.

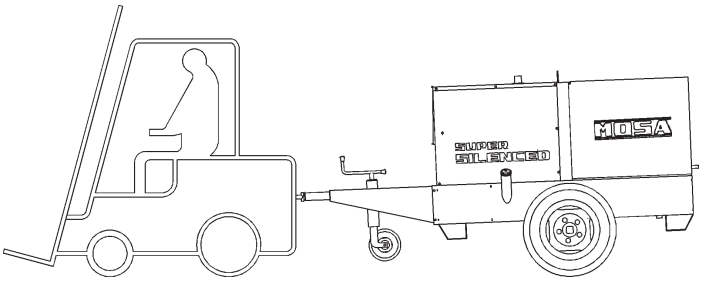
NOTE

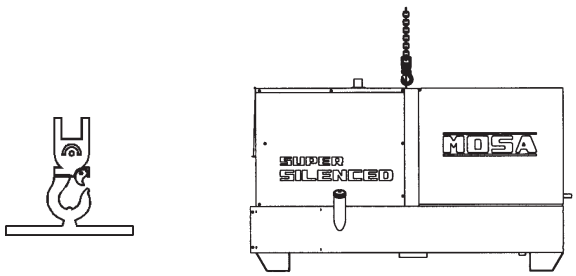
In case you should transport or move the machine, keep to the instructions as per the figures.
Make the transportation when the machine has **no** petrol in its tank, **no** oil in the engine and and electrolyte in the battery.
Be sure that the lifting devices are: correctly mounted, adequate for the 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.

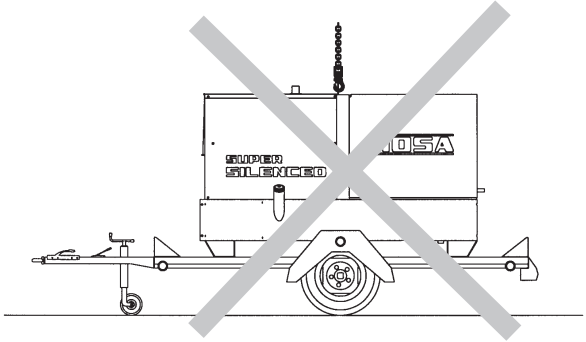








LIFT ONLY THE MACHINE



DO NOT LIFT THE MACHINE AND TRAILER

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

ATTENTION

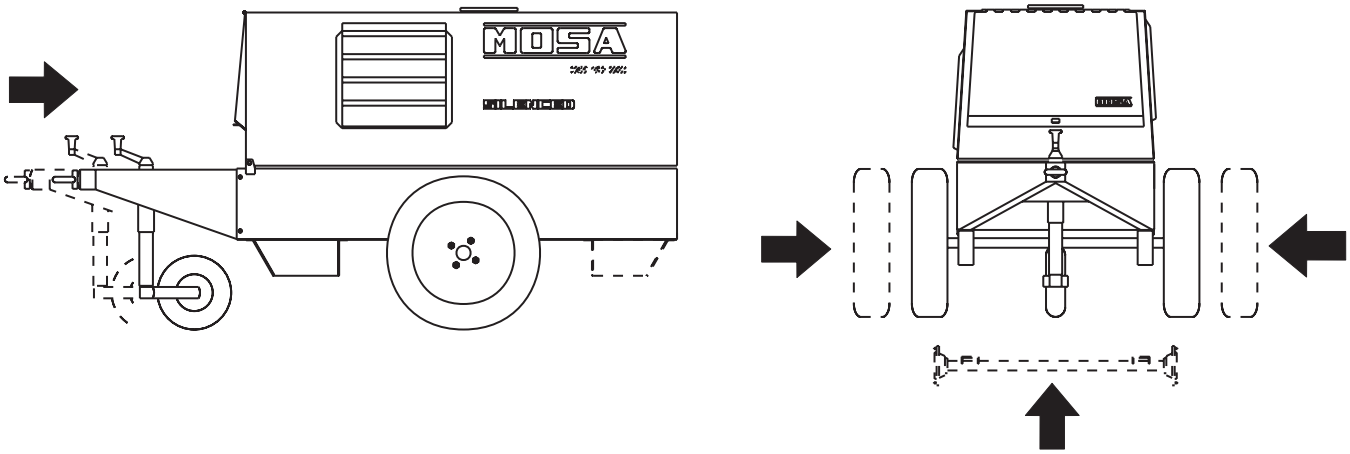
The CTL accessory cannot be removed from the machine and used separately (actioned manually or following vehicles) for the transport of loads or anyway for used different from the machine movements.

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.

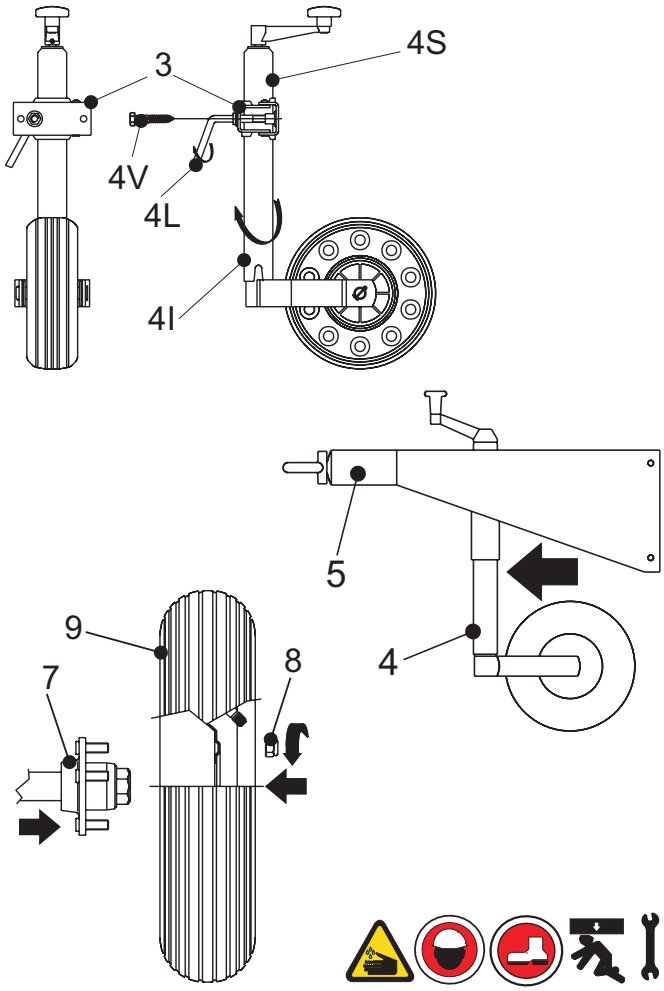
Towing on public roads or turnpikes of any type **IS EXCLUDED**, because **not** in possesion of the requirements by national and foreign traffic norms.

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



For assembling the generating set on the trolley CTL400 please keep to following instructions:

1) - Lift the generating set (by means of suitable hook).
2) - Slightly fix the jaw (3) of the parking foot to the bar with the M10x20 screws, the M10 nuts and the washers (so as to let the foot sprag go through.
3) - Split (unscrewing them) the two parts of the foot (4S-4I) to be able later to assemble them on the jaw.
4) - Introduce into the jaw (3) the upper part (4S) of the foot and screw again the lower part (4I), then tighten the screws (4V) of the jaw to the towbar and block momentaneously with the lever (4L) the whole foot.
5) - Assemble on the machine the towbar (5) complete of foot with the M10x20 screws, nuts and washers (see fig. page M6.2).
6) - Assemble the axle (7) to the base of the machine (see fig. page M6.2) with the M 10x20 screws and relative washers (two per part) so that their supports coincide.
8) - Insert the wheel (9) on the axle then screw the self blocking nuts (8).
9) - Pump the tyre (9) bringing the pressure to four atms.
10) - Lower the machine to the ground and place the parking foot definitively (regulating at the best height).



ATTENTION

Do not substitute the original tires 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

MOSA 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.

REFUELLING AND CONTROL:

Carry out refuelling and controls with motor at level position.

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

ATTENTION

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

DRY AIR FILTER

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

OIL BATH AIR FILTER

Fill the air filter using the same engine oil up to the level indicated on the filter.

FUEL

ATTENTION

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

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

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

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

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

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

GROUNDING CONNECTION

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

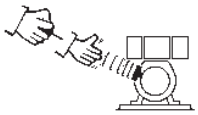
NOTE

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

ENGINES WITH MANUAL RECOIL

Hold the starting handle firmly.

Pull the rope hard and fast. Pull it all the way out. Use two hands if necessary.

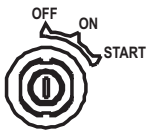


Then returning it slowly.

ENGINES WITH ACCELERATOR LEVER

Make sure that the accelerator lever or the switch (16) is at its minimum setting.

Insert the electric protection device (D-Z2-N2) lever towards above and, where mounted, check the isolation monitor (A3) see page M37 –



Introduce the key (Q1), turn it clockwise completely, leaving it as soon as the engine starts and/or the push button (32) (models without key) leaving it as soon as the engine starts.

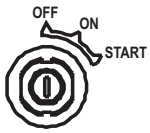
☞ **NB.: for safety reason the key must be kept by qualified personel.**

Once the engine has started leave it running at a reduced speed for some minutes.

Accelerate the engine at max., set lever on maximum position and then take up load.

ENGINES WITHOUT ACCELERATOR LEVER

Insert the electric protection device (D-Z2-N2) lever towards above and, where mounted, check the isolation monitor (A3) see page M37 –



Introduce the key (Q1), turn it clockwise completely, leaving it as soon as the engine starts.

NB.: for safety reason the key must be kept by qualified personel.

Let the engine run for some minutes before drawing the load.

Open the fuel cock (where it is assembled).

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.

NOTE

The machines with E.P.1 engine protection device (D1), use the accelerator lever ONLY IN EMERCENCY when the engine protection does not work. In this case turn immediately to our Authorized Assistance Centers.

ENGINE WITH PREHEATING GLOW PLUGS

Turn the starter key (Q1) on the position „preheating glow plugs“ (the glow plugs light will be on I4), when the light is off, turn the starter key completely clockwise until the engine begins to fire.
Let the engine run for some minutes before drawing the lood.

ENGINES WITH R.P.M. ELECTRONIC ADJUSTER (ONLY FOR GENERATING SET)

Turn the starter key (Q1) completely clockwise until the engine begins to fire.

☞ Wait for the AUTOMATIC preheating time before drawing the load

OCCASIONAL USE OF THE ENGINE

Using the engine in special conditions which need an immediate intervention, such as emergency plants, etc., use advise to use our Engine Assistance Centres for specific interventions or our Technical Assistance Service.

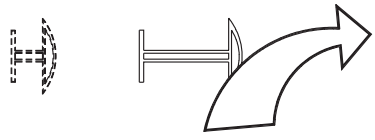
CAUTION

If the engine fails to start, do not insist for at least 15 seconds.
Space the further operations waiting for at least 4 minutes.

CAUTION

MACHINE WITH EMERGENCY BUTTON

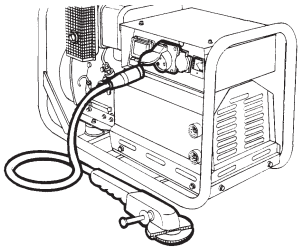
Before starting the engine, make sure that the emergency button (32B) is off (turn the button clockwise for this operation)



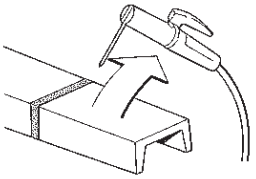
CAUTION

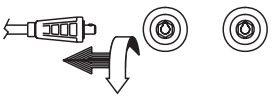
RUNNING-IN
During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, please follow the instructions on the engine use and maintenance manual..

☞ Before stopping the engine **it is compulsory** to effect the following operations:
- stop to draw three/single-phase current from the auxiliary sockets.



- stop to draw power from the welding sockets (only for TS models).





ENGINES WITH ACCELERATOR LEVER

☞ Make sure that the unit Is not supplying any power.

Disconnect the electrical protection device (D-Z2-N2) lever downward.

Set the accelerator lever or the switch (16) to minimum position and wait for a few minutes to allow the engine to cool, anyway follow the instructions contained in the engine manual.

Pull the stop lever (28) until the engine stops (where it is assembled).

Remove the key (Q1) turning it counter clockwise, OFF position, then take it out.

☞ **NB.:for safety reason the key must be kept by qualified personel.**

ENGINES WITHOUT ACCELERATOR LEVER

Make sure that the unit is not supplying any power.

Disconnect the electrical protection device (D-Z2-N2) lever downward.
Let the engine idle for a few minutes.

Press the pushbutton (F3) until the engine stops (where it is assembled).

Shut the fuel cock (where it is assembled).

Remove the key (Q1) turning it counter clockwise, OFF position, then take it out.

☞ **NB.: for safety reason the key must be kept by qualified personel.**

ENGINES WITH R.P.M. ELECTRONIC ADJUSTER (ONLY FOR GENERATING SET)

Make sure that the unit is not supplying any power.
.
Disconnect the electrical protection device (D-Z2-N2 lever downward.

Let the engine idle for a few minutes.

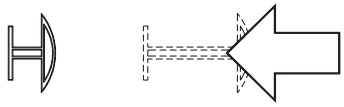
Press the pushbutton (F3) until the engine stops (where it is assembled).

Remove the key (Q1) turning it counter clockwise, OFF position, then take it out.

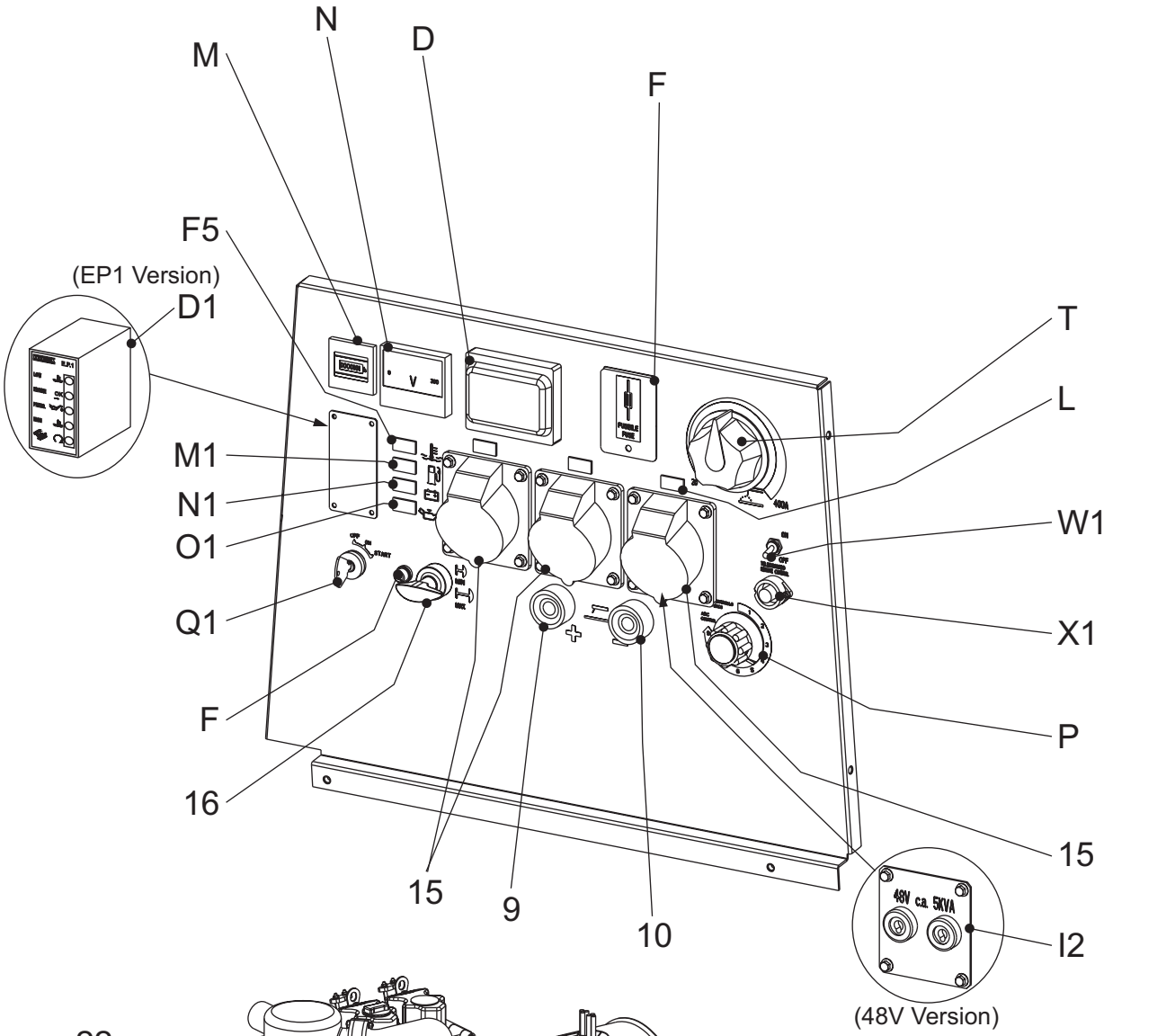
☞ **NB.: for safety reason the key must be kept by qualified personel.**

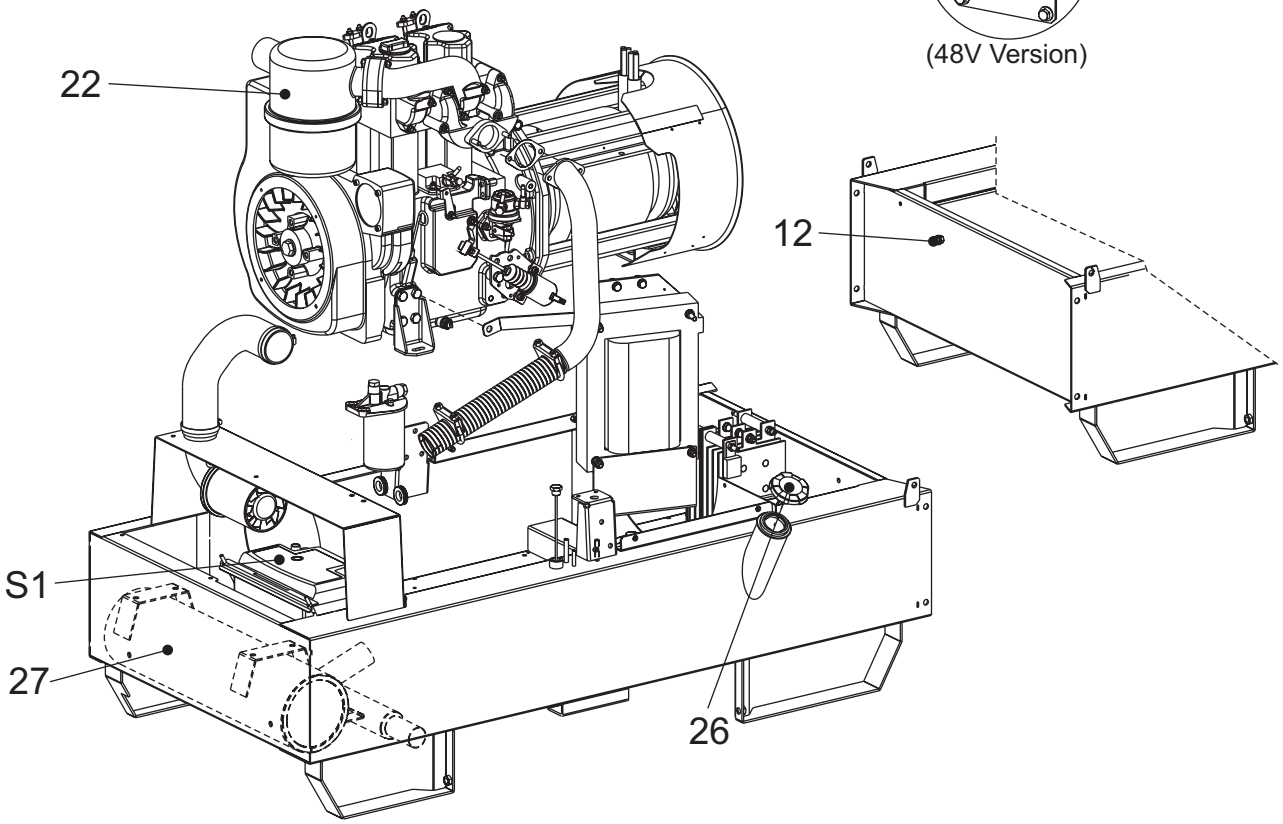
CAUTION

MACHINE WITH EMERGENCY BUTTON
Pressing it, it allows to stop the engine in any condition (32B) (when assembled).
To re-establish it, see page M21...



4A	Hydraulic oil level light
9	Welding socket (+)
10	Welding socket (-)
12	Earth terminal
15	A.C. socket
16	Accelerator lever
17	Feed pump
19	48V D.C. socket
22	Engine air filter
23	Oil level dipstick
24	Engine oil reservoir cap
24A	Hydraulic oil reservoir cap
24B	Water filling cap
25	Fuel prefilter
26	Fuel tank cap
27	Muffler
28	Stop control
29	Engine protection cover
30	Engine cooling/alternator fan belt
31	Oil drain tap
31A	Hydraulic oil drain tap
31B	Water drain tap
31C	Exhaust tap for tank fuel
32	Button
33	Start button
34	Booster socket 12V
34A	Booster socket 24V
35	Battery charge fuse
36	Space for remote control
37	Remote control
42	Space for E.A.S.
42A	Space for PAC
47	Fuel pump
49	Electric start socket
54	Reset button PTO HI
55	Quick coupling m. PTO HI
55A	Quick coupling f. PTO HI
56	Hydraulic oil filter
59	Battery charger thermal switch
59A	Engine thermal switch
59B	Aux current thermal switch
59C	Supply thermal switch wire feeder-42V
59D	Pre-heater (spark plug) thermal switch
59E	Supply thermal switch oil/water heather
59F	Electropump thermal switch
63	No load voltage control
66	Choke control
67A	Auxiliary / welding current control
68	Cellulosic electrodes control
69A	Voltmeter relay
70	Warning lights
71	Selecting knob
72	Load commut. push button
73	Starting push button
74	Operating mode selector
75	Power on warning light
76	Display
79	Wire connection unit
86	Selector
86A	Setting confirmation
87	Fuel valve
88	Oil syringe
A3	Insulation monitoring
A4	Button indicating light 30 l/1' PTO HI
B2	Engine control unit EP2
B3	E.A.S. connector
B4	Exclusion indicating light PTO HI
B5	Auxiliary current push button
C2	Fuel level light
C3	E.A.S. PCB
C6	Control unit for generating sets QEA
D	Ground fault interrupter (30 mA)
D1	Engine control unit and economiser EP1
D2	Ammeter
E2	Frequency meter
F	Fuse
F3	Stop switch
F5	Warning light, high temperature
F6	Arc-Force selector
G1	Fuel level transmitter
H2	Voltage commutator
H6	Fuel electro pump
I2	48V A.C. socket
I3	Welding scale switch
I4	Preheating indicator
I5	Y/▲ switch
I6	Start Local/Remote selector
L	A.C. output indicator
L5	Emergency button
L6	Choke button
M	Hour counter
M1	Warning level light
M2	Contactor
M5	Engine control unit EP5
M6	CC/CV switch
N	Voltmeter
N1	Battery charge warning light
N2	Thermal-magnetic circuit breaker/Ground fault interrupter
N5	Pre-heat push-button
N6	Connector - wire feader
O1	Oil pressure warning light/Oil alert
P	Welding arc regulator
Q1	Starter key
Q3	Derivation box
Q4	Battery charge sockets
Q7	Welding selector mode
R3	Siren
S	Welding ammeter
S1	Battery
S3	Engine control unit EP4
S6	Wire feeder supply switch
S7	Plug 230V singlephase
T	Welding current regulator
T4	Dirty air filter warning light/indicator
T5	Earth leakage relay
T7	Analogic instrument V/Hz
U	Current trasformer
U3	R.P.M. adjuster
U4	Polarity inverter remote control
U5	Relase coil
U7	Engine control unit EP6
V	Welding voltage voltmeter
V4	Polarity inverter control
V5	Oil pressure indicator
W1	Remote control switch
W3	Selection push button 30 l/1' PTO HI
W5	Battery voltmeter
X1	Remote control socket
Y3	Button indicating light 20 l/1' PTO HI
Y5	Commutator/switch, serial/parallel
Z2	Thermal-magnetic circuit breaker
Z3	Selection push button 20 l/1' PTO HI
Z5	Water temperature indicator





22/05/97 21760-I

(S) 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 sockets, after the machine is started (see pages M21-26), also with no cables, are anyway under voltage.

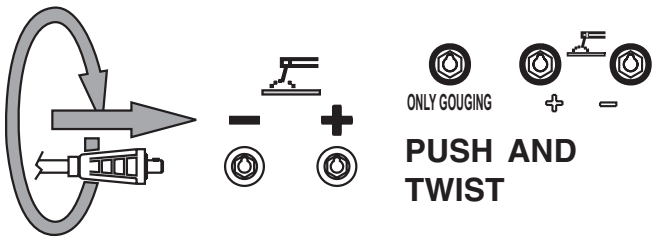
ATTENTION

The areas, access of which is forbiden to unqualified personel, are:
- the control switchboard (front) - the exhaust of the endothermic engine - the welding process.

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 (keep to installation local rules and/or to national laws), in order to integrate or ensure the working of varius electric protection devices referring to the several distribution system TT/TN/IT, operation unnecessary for machine with isometer.

Fully insert the welding cable plugs into the corresponding sockets (“only gauging”, 9+/10-) turnning them clockwise to lock them in position.



☞ Make sure that the ground clamp ,whose cable must be connected to the + or - terminal, depending on the type of electrode, makes a good connection and is near to the welding position.
Pay attention to the two polarities of the welding circuit, which must not come in electric contact between themselves.
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).

MACHINES WITH E.V. PROTECTION

Accelerate the engine at max. with the accelerator lever (16).See page M 39.

MACHINE WITH E.P.2 PROTECTION (B2)

Accelerate the engine at max. with the accelerator lever (16) (when assebled).
See page M 39

MACHINE WITH E.P.1 PROTECTION (D1)

See page M 39.1

REMOTE CONTROL TC...

See page M 38

WELDING CURRENT REGULATOR

Position welding current adjusting knob (T) in correspondance of the chasen current value, so as to obtain the necessary amperage, taking into acount the diameter and the type of the electrode.
For technical data see page M52

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 and/or M25). 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 Thechnical Assistance Service.

CAUTION

With a welding cable length up to 20 m is suggested a section of 35 mm²; wìth longer cables a bigger section is required.

MACHINE WITH REDUCTION SCALE SWITCH

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 130 A and/or 200A).

When using electrodes of a diameter greater than 3.25 and/or 4 set the welding scale knob to 100% and/or max. position.
The arc regulator (T) functions equally between both positions (100%-130A and/or 200A).

Protection fuse (when assembled):the fuse protects the electronic welding PCB in case the remote control is short circuited.

MACHINE WITH O.C.V.

It permits to choose, according to the work to be done and/or the electrode type used, the best O.C.V.

MACHINE WITH POLARITY INVERTER

Polarity switch

It permits to have at the electrode holder the positive or negative polarity of the welding diode bridge.
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

MACHINE WITH BASIC CURRENT "BC"

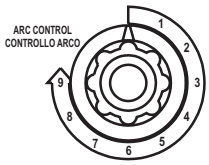
Positioning the switch on „ON“, is obtained a low voltage welding current which keeps, always, the lit arc necessary for some types of cellulosic electrodes or when a high penetration is wanted.

For electrodes of basic or rutile type, position the switch on "OFF", the welding current will always remain constant.

"CC/CV" MODELS

These models can be used with electrodes or for TIG welding by selecting the CC (constant current) mode, and with solid wire (MIG, MAG) or flux cored wire selecting the CV (constant voltage) mode. The mode of operation is selected by a switch on the front panel.

MACHINE WITH ARC CONTROL OR SELECTOR "ARC FORCE"



Set the welding arc using adjuster knob (6) so as to abtain, for the chosen current value, the best arc characteristic according to the electrode type and to the work to be performed.

On machines with an Arc Force selector, the same result can be obtained by turning the selector "ON" or "OFF". When switched "ON" a base current is applied to the welding current output acting as a sort of "automatic" arc forcing that does not need to be regulated.

For technical data see page M52

☞ At the end of every welding process and/or work, proceed with all the use operations **in inverted sense**.
To stop the machine see pages M 22-27.

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

WARNING

*Sockets are not **self-locked**: tension is avaible immediately after starting also with no plug.*

WARNING

The areas, **access** of which is forbidden to unqualified personel, are:
- the control switchboard (front), the exhaust of the endothermic engine.

☞ At the beginning of every work, check the electric parameters and/or the controls placed on the front.

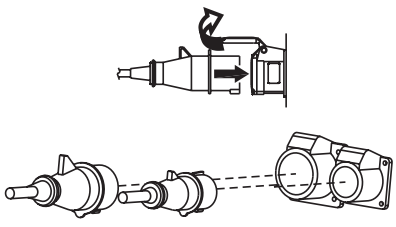
Make sure the unit is properly grounded (12) (where it is assembled).
- See page M20, 21, 22, 25, 26, 27 -.

Move the accelerator lever (16) and reach the engine maximum speed, except for the engines with constant rpm; the voltmeter (N) (where it is assembled) shows the single-phase voltage whether three or single-phase current has to be drawn.

Nominal voltage	Indicative no-load voltage	
	asynchronous	synchronous (*)
110V	±10%	±5%
230V	±10%	±5%
230V	±10%	±5%
400V	±10%	±5%

*N.B.: with electronic tens. regul. RVT ±1%

Connect up the machine, using proper plugs and cables in good condition to the AC socket (15) to draw single or three-phase power, or, by cables with adeguate section, to the terminal board, placed inside the derivation box (Q3).



The warning light (L), located near the current socket, lights up when the unit can supply alternated current, on condition that the engine is at the maximum rpm.

☞ N.B.: if the warning light does not flash, check the accelerator which must bebat its maximum, or the fuse of the relevant socket. (single-phase) or the thermoprotection.

Using several sockets at tha same time, the maximum power possible is that indicated on the data plate.

To draw power simultaneously in the TS welder version see page M52.

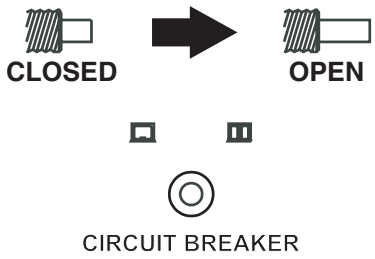
CAUTION

The replacement of the fuse must absolutely be done with the engine off (remove the mechanical protection, then shift down the small lever of the fuse holder placed on the front panel).

The max. continuous power of the generating set or theload current must not be exceeded.

MACHINE WITH THERMOPROTECTION

If you overload the genset the thermoprotection will automatically switch off.
If the thermoprotection is released, disconnect all the connected loads.



Reset the thermoprotection pressing the central pole.
When reset, connect the loads again.
In case the protection should act furtherly, check: the connections, the wires or others, and if necessary call the Assistance Service.

Avold to hold the central pole of the thermoprotection pressed for a long time.
Otherwise, in case of trouble, it will not click, **damaging** the generating set.

TS ... PL VERSION

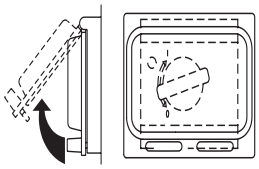
Start the machine and wait for the end of the preheating time imposed by the EP1, EP2, EP5 engine protection device. - See pages M39... -
Press the „generation possibility“ push button (B5) placed on the font side of machine.
The voltmeter will show the auxiliary voltage which, for machines at 1500/1800 RPM, must. be approx. ≈230V ± 10% and for machines at 3000/3600 RPM (engine idling) must. be approx. ≈180V ± 10%.

Push upwards the lever of magnetothermic switch reffering to the socket from which load is to be drawn.

MACHINE WITHOUT PROTECTIVE DEVICE

In case machine is not equipped wìth protective device of indirect contacts, by means of automatic breaking of supply, it **is necessary** to put between the load and the generatíon a differential swítch or a similar equipment capable, in any case, to observe the regulations in force CEI 64/8 (and/or successive) Part 4 Par. 4.13.1 and harmonzed by directive Nr. 72/23/EEC.

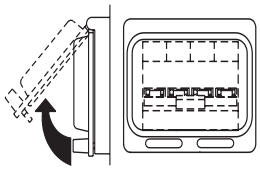
UNIT FITTED WITH GROUND FAULT INTERRUPTER SWITCH (GFI)



Turn on the GFI safety-switch (D) by pushing it upwards.

The GFI is a safety device which protects the circuit in the event of a malfunction. In this case the switch disconnects the three and single-phase circuit when in any part of the electric connections a current leakage of more than 30 mA occurs.

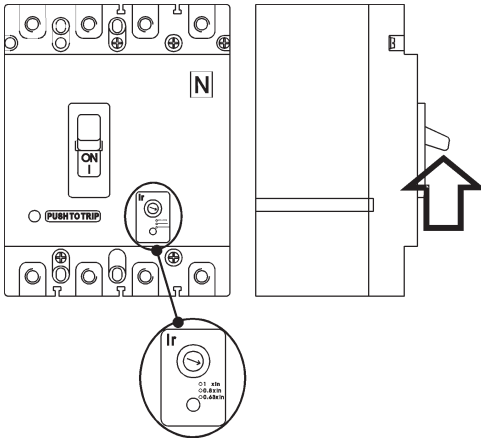
UNIT FITTED WITH THERMAL MAGNETIC BREAKER



Turn on the thermal magnetic breaker (Z2) by pushing it to the ON position.

The thermal-magnetic breaker is a safety device which protects the circuìt in the event of a malfunction. In this case the switch disconnects the three and single-phase circuit when in any part of the electric connections a short circuit or a current absorption occurs above the data specified on the label of the unit.
In the model with setting **DO NOT INTERVENE** on the setting itself. To modify it, please contact our Technical Assistance Service.

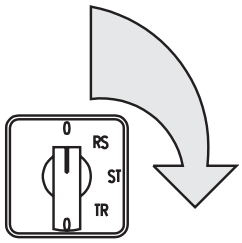
UNIT FITTED WITH GFI SWITCH THERMAL MAGNETIC BREAKER



This switch includes the characteristics of both types of breakers (N2).

UNIT WITH VOLTMETRIC COMMUTATOR (ONLY FOR GENERATING SET)

☞ **WARNING:** the possible single-phase loads must be correctly divided in the three phases, in order to avoid any possible voltage fall on one phase that results excessively loaded.

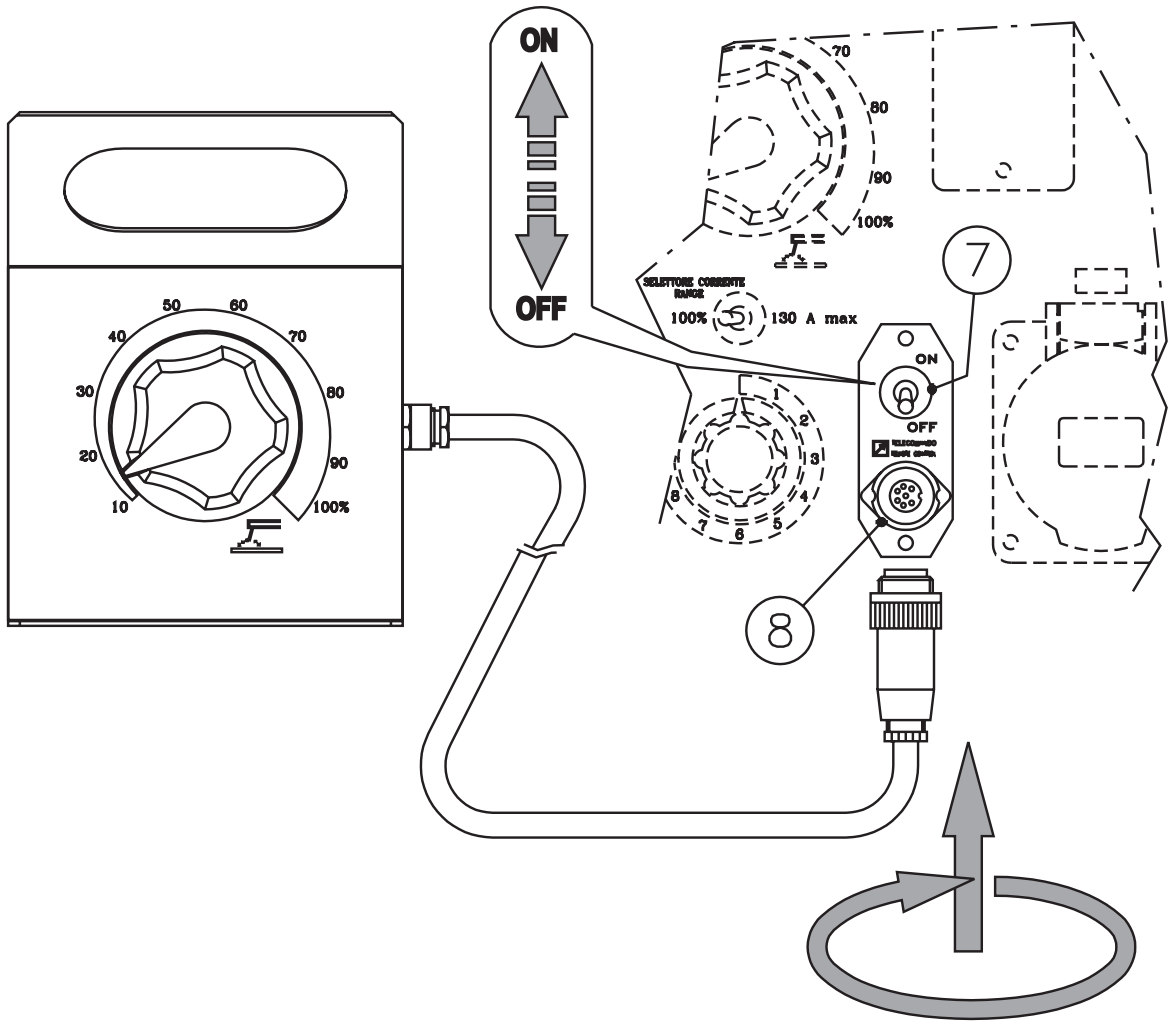


Check the voltages on the various phases with the switch located on the front (H2) and check, reading on the voltmeter (N) about the same voltage value

☞ N.B.: in case of overload, it is possible that the engine lowers its speed and the voltage is reduced remarkably. In this case, it is necessary to reduce immediately the load.

CAUTION

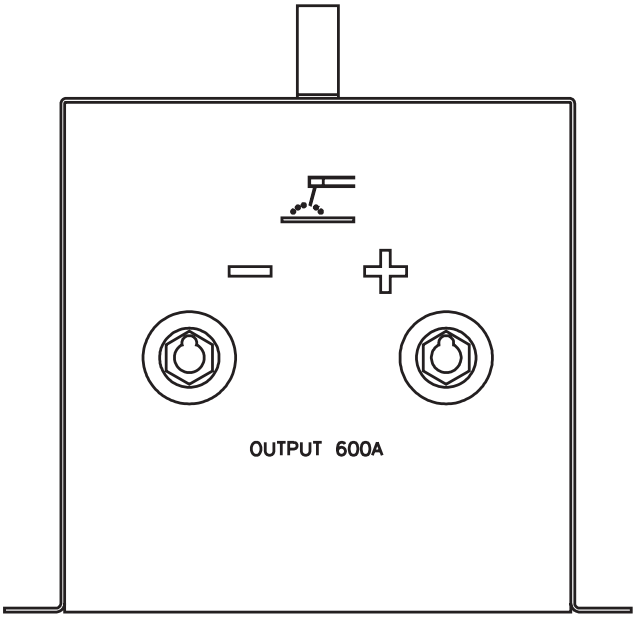
For machines at 3000/3600 RPM the EP1 safety device will automatically provide to accelerate engine when load is drawn.
- See page M39.1 -

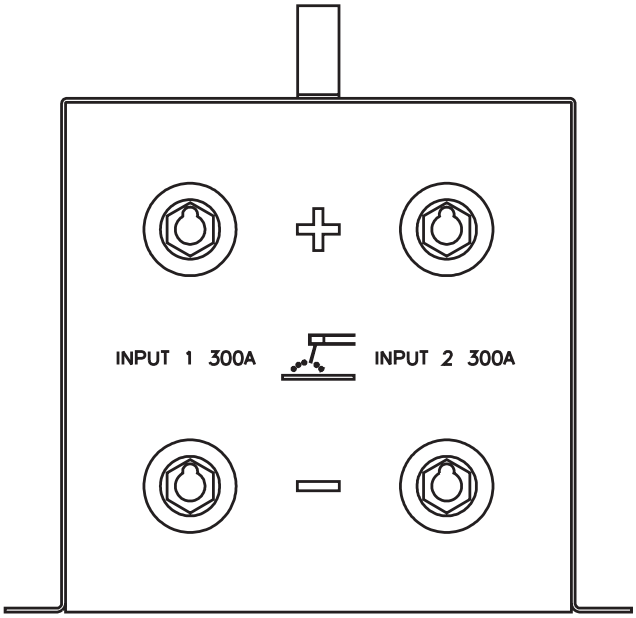


The remote control device for regulating the welding current is connected to the front panel by means of a multipole connector.

To regulate the current from the TC2 / TC2/50, 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.
- See page M51 -

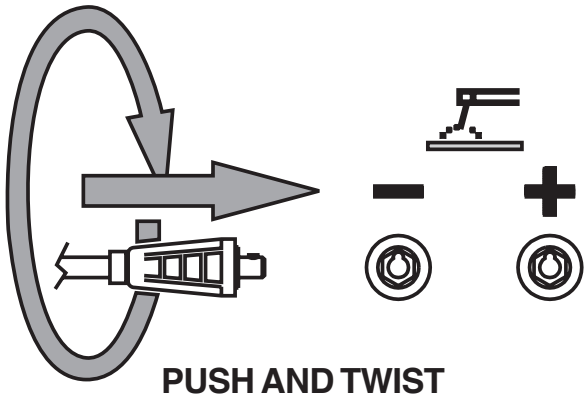




The device enables to totalize the welding current of two positions or of two welding machine.

Connect each one of the inputs "+" and "-" of the PAR 600 to each welding position and draw, according to the use, the total current from the "+" and "-" output socket.

Fully insert the welding cable plugs into the corresponding socket (9+/10-) turning them clockwise to lock them in posotion.



PUSH AND TWIST

MAKE SURE

1) the both positions have an identic polarity
2) that O.C.V. have an identic position
- See page M34.2 -

ENGINE PROTECTION (EP1)

The electronic device EP.1 (D1) is a microprocessor with logic-circuit board that ensures the protection of the engine in case of low oil pressure or engine high temperature.

Located on the front of the machine, the EP.1 enters in operation when the engine has been turned on with the ignition key.

The yellow warning light for low oil temperature (D1.1) will immediately light up; **after** 15 seconds the emgine will be checked and if everything is operating normally, the "OK engine" light will switch on.

CAUTION

IN THE FIRST FRACTION OF TIME THE DEVICE DOES NOT MAKE ANY PROTECTION.

The automatic device requires an engine warning up time of at least 45 seconds, not permitting to draw power when the engine is still cold.

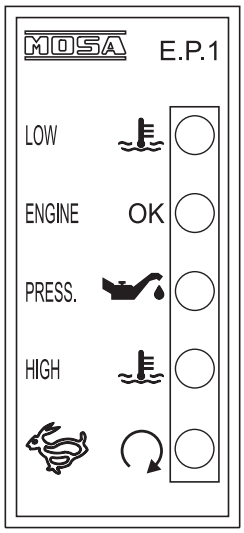
☞ **N.B.**: A longer warning up time (4-5 minutes) is advisable for temperatures below +10°C.

When the warning light (D1.1) goes off, whether the unit is used as welder or as a generator, the green light (D1.5) will light up, hte engine will go to maximum speed ,permitting to draw power.
Should the oil pressure be insufficent, the red light (D1.3) will light up and the EP.1 device will stop the engine.
If the temperature rises to dangerous levels, the red light (D1.4) will light up and the engine will stop thus preventing to draw power.

LIQUID COOLED ENGINE

In case of cooling liquid high temperature, the warning light (D1.4) will light up and the engine will stop thus preventing to draw power.
In this case it is SUGGESTED to stop the engine and control the cooling level.

In case of low pressure, check the level and if it is correct, call the service station. In case of high temperature, make sure that there are no leaves and/or pieces of material obstructing tha air circuit.



D1.1(G) Low oil temperature/ Cold engine

D1.2(V) Engine test/ OK engine

D1.3(R) Low oil pressure

D1.4(R) High temperature

D1.5(V) Engine at maximum

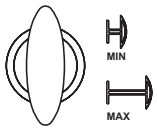
COLORS
G = yellow
V = green
R = red

ENGINE EQUIPPED WITH A MANUAL ACCELERATOR

☞ **NOTE:** This unit is equipped with a manual accelerator for use in the unlikely event that the EP.1 or the accelerator solenoid should fail.This manual accelerator can also be used in cases where the auto-idle function is not suitable for the type of welding being carried out.

CAUTION: for machines with EP.1 engine protection: use the accelerator lever **ONLY IN EMERGENCY** when the automatic idle does not work.

Accelerator lever



☞ **N.B.**: if the unit is used as a generator in hot climates and with loads near to the maximum, the protection can be triggered off, please reduce the load of the engine.

Once the cause of the problem has been removed, to ensure the protection it is sufficent to set the key to zero and restart the engine.

NOTE

THE ENGINE PROTECTIONS OF THE “EP” TYPE DO NOT WORK WHEN THE OIL IS OF LOW QUALITY BECASE NOT CHENGED REGULARY AT INTERVALS AS PRESCRIBED IN THE OWNER’S ENGINE MANUAL.

ENGINE PROTECTION (ES - EV)

The devices ES or EV ensure the protection of the engine in case of low oil pressure or engine high temperature.

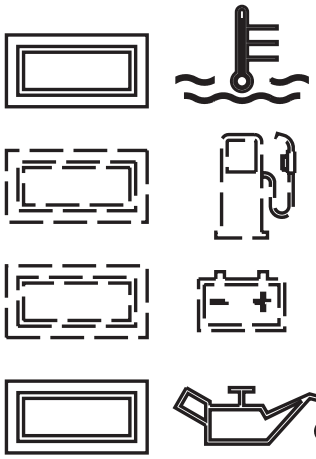
The system consist of electronic card of control and check, and of an engine stop device: solenoid (**E**lettro**S**top), electrovalve (**E**lettro**V**alvola)

The device enter in operation when the engine starts and, in case of low oil pressure and high temperature, will stop the machine and show the cause of the stop with the warning light of high temperature or low oil pressure.

In case of low oil pressure, check the level and if it is correct, call the Service Station. In case of high temperature, make sure that there are no leaves and/or pieces of material obstructing the air ducts.

☞ **N.B.:** if the unit is used as a generator in hot climates and with loads near to the maximum, the protection device can be triggered off, please reduce the load of the engine.

Once the cause of the problem is removed, to reset the protection, it is enough to report the ignition key (Q1) on "OFF" position and start the engine again.



High temperature

Low oil pressure

NOTE

THE ENGINE PROTECTIONS DO NOT WORK WHEN THE OIL IS OF LOW QUALITY BECAUSE NOT CHANGED REGULARLY AT INTERVALS AS PRESCRIBED IN THE OWNER'S ENGINE MANUAL.

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
No welding current but auxiliary output is OK	1) Defective diode bridge 2) Problem with welding current control (PCB)	1) Check the diodes of the bridge 2) Is the remote control switch in the internal position? 3) Check the diodes and SCR's of the bridge. 4) Check the transformer which supplies power to the welding control PCB. If it is OK replace the PCB
Weld poorly	1) Defective diode bridge	1) Check the open circuit welding voltage. If it is OK the diode bridge is OK. If it is 1/3 or 2/3 of the nominal value check the diodes or the SCR's.
	2) Problem with welding current control (PCB)	2) If the diode bridge is OK replace the PCB.
Intermittently welds poorly	1) Bad connections to welding current PCB	1) Check that the pins of the green connectors are clean and making good contact. Check that shunt connections are tight.
	2) Problem with welding current control PCB	2) Replace the welding current control PCB
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.

[.] only for models with electronic control of welding current.

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 MOSA.

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.

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 inflamable 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: MOSA 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 TS 400 BS/CF engine driven welder ia a unit which ensures the function as:
a) a current source for arc welding
b) a current source for the auxiliary power generation
It is meant for industrial and professional use, powered by an endothermic engine; it is composed of various main parts such as: engine, alternator, electric and electronic controls, the fairing or a protective structure.
The assembling is made on a steel structure, on which are provided elastic support which must damp the vibrations and also eliminate sounds which would produce noise.

Technical data	**TS 400 SC**	**TS 400 SXC**
ALTERNATOR	self-excited, self-regulated, brushless	
Type	Three-phase, asynchronous	
Insulating class	H	
A.C. GENERATORA.		
Three-phase generation	13 kVA / 400 V / 18.7 A	
Single-phase generation	7 kVA / 230 V / 30.4 A	
Single-phase generation	3.5 kVA / 110 V / 31.8 4	
Single-phase generation	5 kVA / 48 V / 104 A	
Frequency	50 Hz / 60 Hz	
Service	100 %	
ENGINE		
Mark	LOMBARDINI	
Model	9 LD 625-2	
Type	4-Stroke	
Displacement	1250 cm^3	
Cylinders	2	
Output	19.1 kW (26 HP)	
Speed	3000 rpm	
Fuel consumption	250 g/kWh	
Cooling system	Air	
Engine oil capacity	2.8 l	
Starter	Electric	
Fuel	Diesel	
GENERAL SPECIFICATIONS		
Battery	12V - 60Ah (without mainten.)	
Tank capacity	26 l	
Running time (60%)	8 h	
Protection	IP 23	
Dimensions / max. (Lxlxh in mm)*	1455x870x880	
Weight	450 Kg	465 Kg
Noise Level	98 LWA (73 dB(A) - 7m)	93 LWA (68 dB(A) - 7m)

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

OUTPUT

Declared powers at the following ambient conditions: temperature 20*C, relative humidity 30% altitude 100 m above sea level.
In an **approximative** way one reduces: of 1% every 100 m altitude and of 2.5% for every 5°C above 25°C.
For possible modifications or changes to be brought on the engines, with climate conditions different from those above mentioned, please call our Assistance Authorized Centers.

ACOUSTIC POWER LEVEL

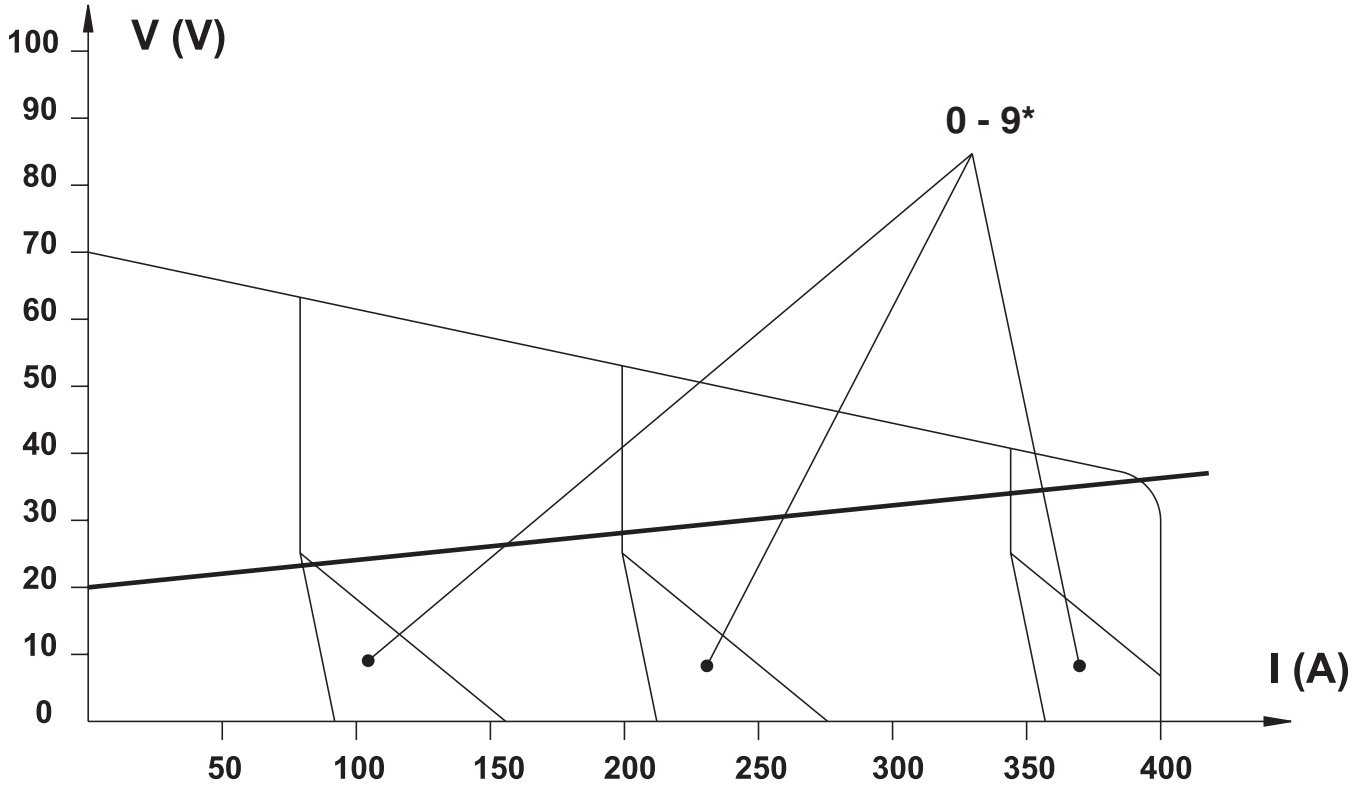
The machine respects the noise limits, expressed in sound power, given in the a.m. directives.
These limits can be used to judge the sound level produced on site.
For example: the sound power level of 100 LWA.
The sound pressure (noise produced) at 7 meters distance is about 75dBA (the limit value less 25).
To calculate the sound level at other distances use this formula:

$dBA_X = dBA_Y + 10 \log$ At 4 meters the noise level becomes: $\frac{ry^2}{rx^2}$ 75 dBA + 10 log $\frac{7^2}{4^2}$ = 80 dBA

D.C. WELDING C.C.

Service	400 A - 35%, 350 A - 60%, 300 A - 100%
Welding current regulation (I Scale)	20 - 400A
Arc Force regulation *	0 - 9
Open circuit voltage	70 V
Welding voltage	20 - 36 V

OUTPUT CARACTERISTIC

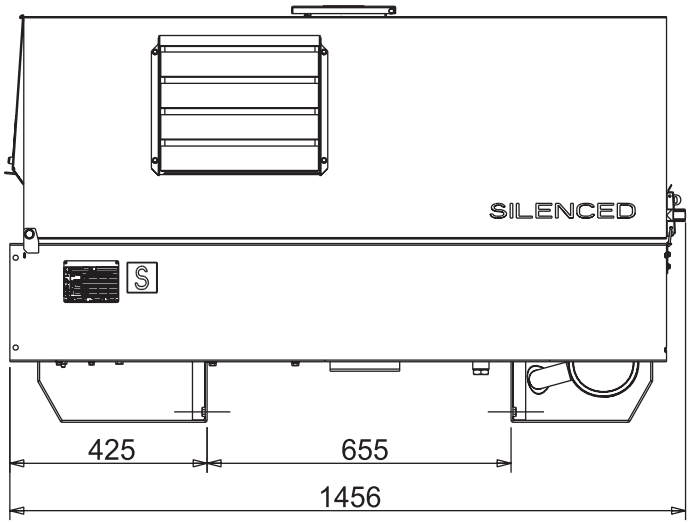


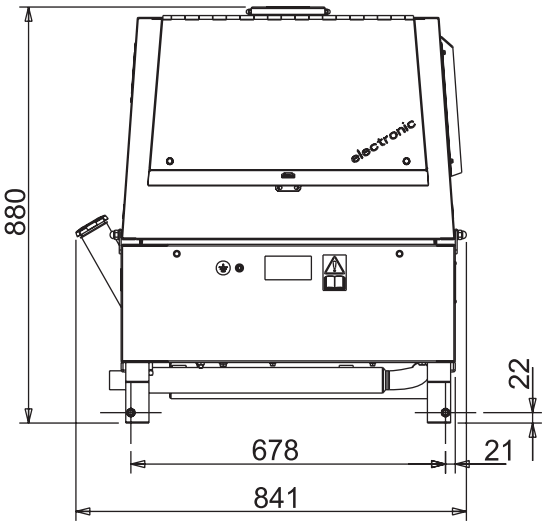
Welding current regulator position	%	0	25	50	75	75
approx. current values	A	20	100	200	300	300

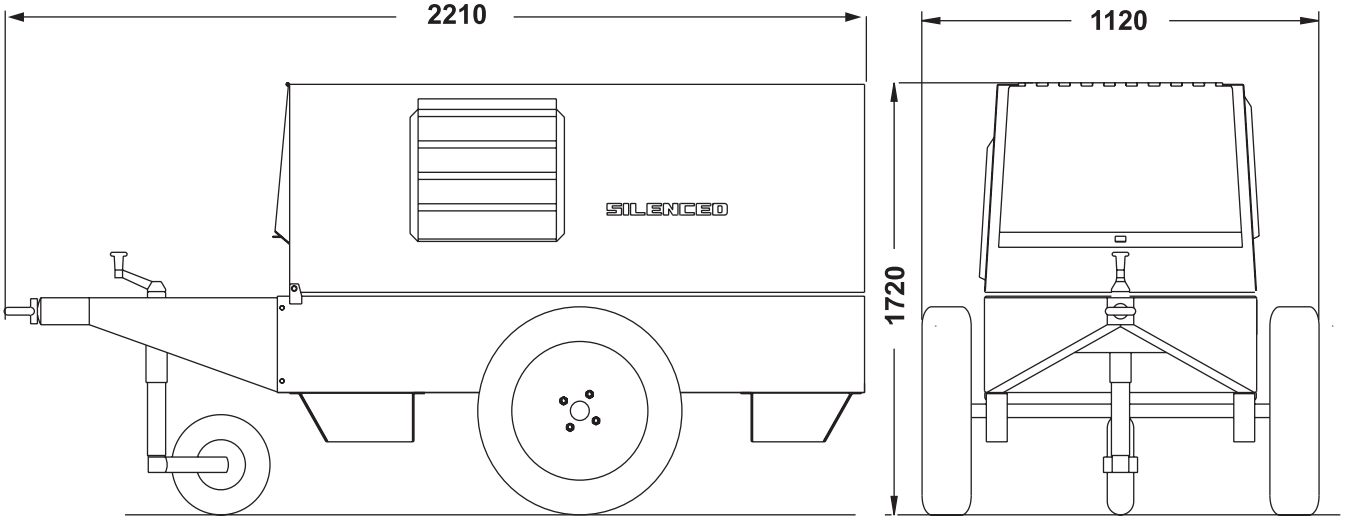
SIMULTANEOUS UTILIZATION FACTORS

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

WELDING CURRENT	>250 A	200 A	150 A	100 A	0
AUXILIARY POWER	0	4 kVA	7.5 kVA	10 kVA	13 kVA


SILENCED
425
655
1456


880
electronic
22
678
21
841


2210
1120
SILENCED
1720

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.

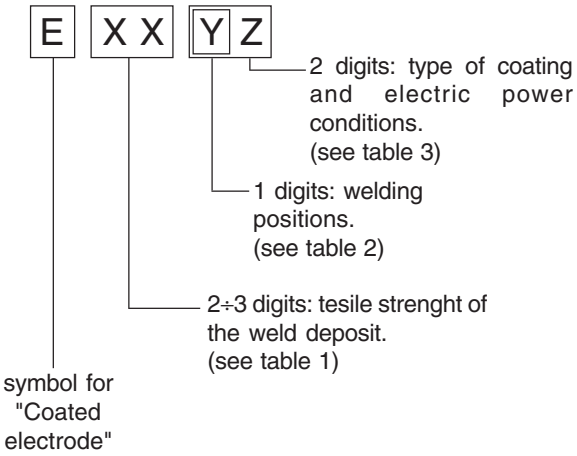
HIGH YIELD BASIC ELECTRODES: E 7018

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

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

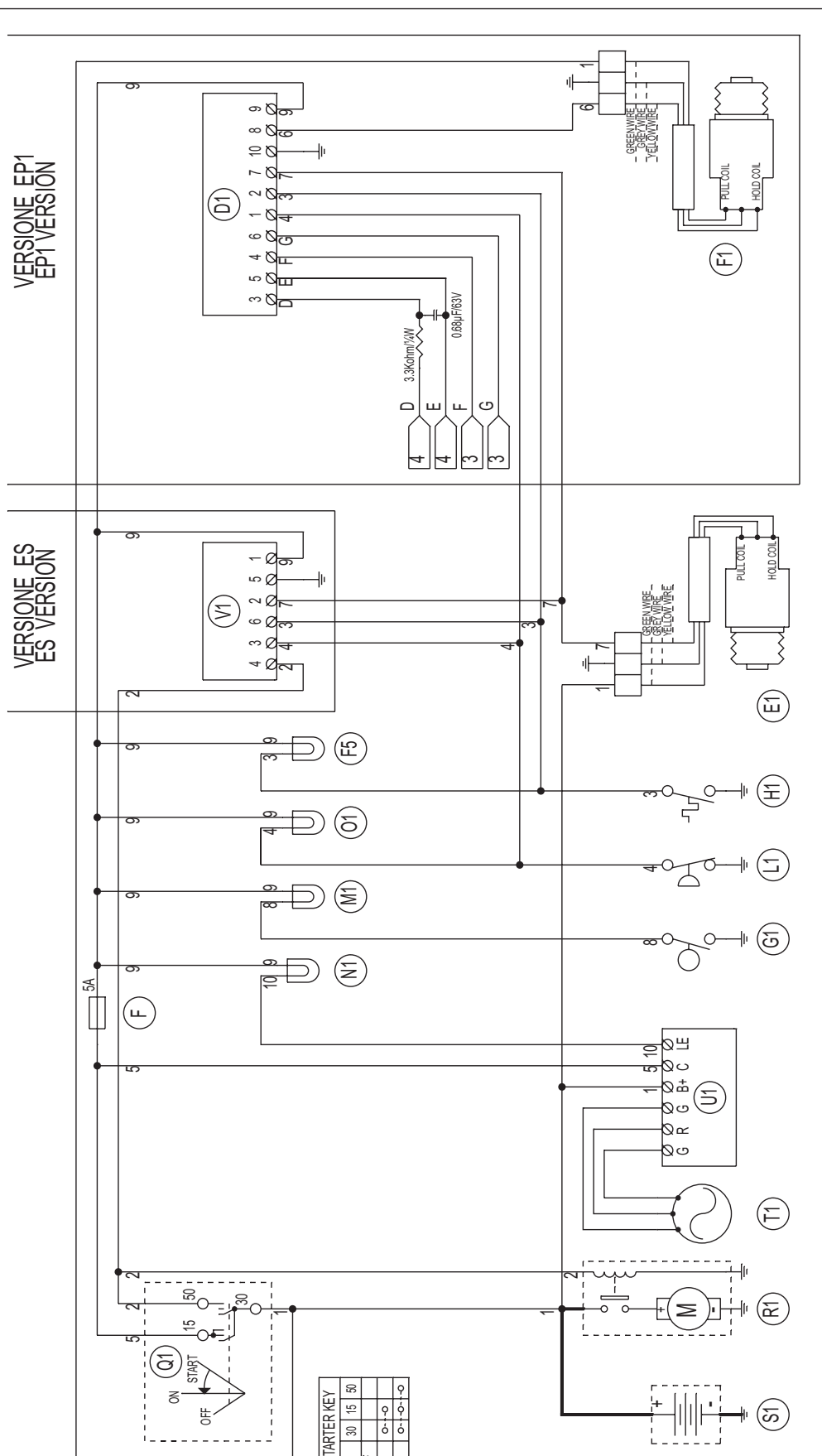
A4: PTO HI 30 l/min indicator
B4: PTO HI reset indicator
C4: PTO HI 20 l/min solenoid valve
D4: PTO HI 30 l/ min solenoid valve
E4: Hydraulic oil pressure switch
F4: Hycraulic oil level gauge
G4: Preheating glow plugs
H4: Preheating gearbox
I4: Preheating indicator
L4: R.C. filter
M4: Heater with thermostat
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/s 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: R.C. net
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:
D8:
E8:
F8:
G8: Polarity inverter two way switch
H8:
I8:
L8:
M8:
N8:
O8:
P8:
Q8:
R8:
S8:
T8:
U8:
V8:
Z8:
W8:
X8:
Y8:



C	Sostituiti elettromagneti con modello CEI (E1) (F1).	24.07.2007	L.N.
B	Eliminato modifica "A" e aggiunto filtro RC sui morsetti 3 e 5 dell'EP1.	17.05.2007	N.L.
A	Aggiunto resistenza sul cavo collegato al morsetto 3 dell'EP1.	30.09.2005	N.L.
Esp. Exp.	Modifica Modification	Data Date	Dis. Desi.

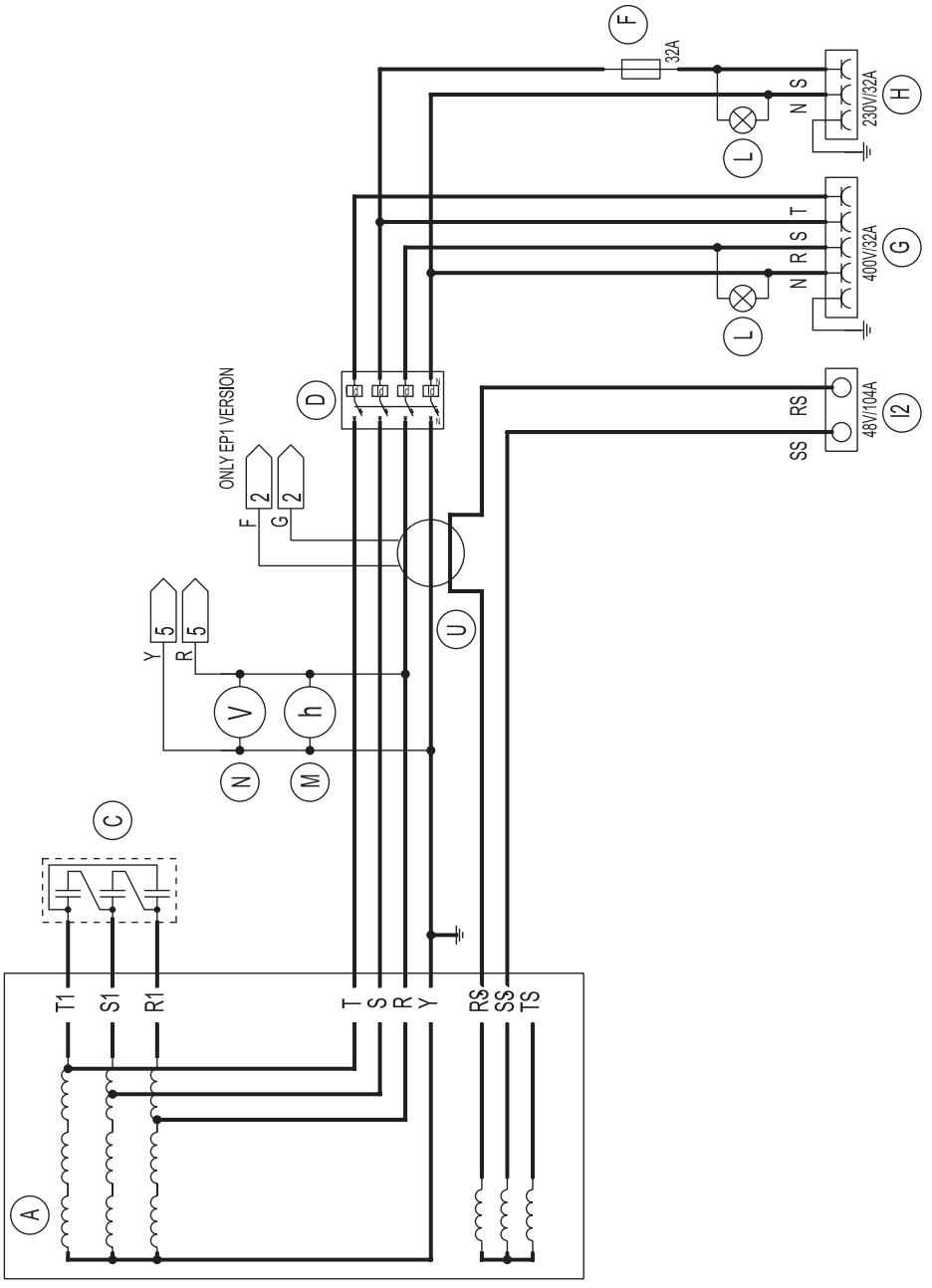
MOSA
20090-CUSAGO (MI)-ITALY
http://www.mosa.it

Da Pag. From Page
Alla Pag. To Page

Denominazione: Denomination: Engine Lombardini 9LD625-2 (vers. ES-EP1)
Macchina: Machine: TS 400 SC
Disegnatore: Designer: Leporace N.
Data: Date: 30.07.2001

Progetto: Project: 21760.prg
Pag.n° Page n° 2
di n° of n° 5
Dis. n°: Dwg. n°: 21760.S.010-C
Approvato: Approved:
Appr. Appr.

La MOSA si riserva a termini di legge la proprieta' del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.

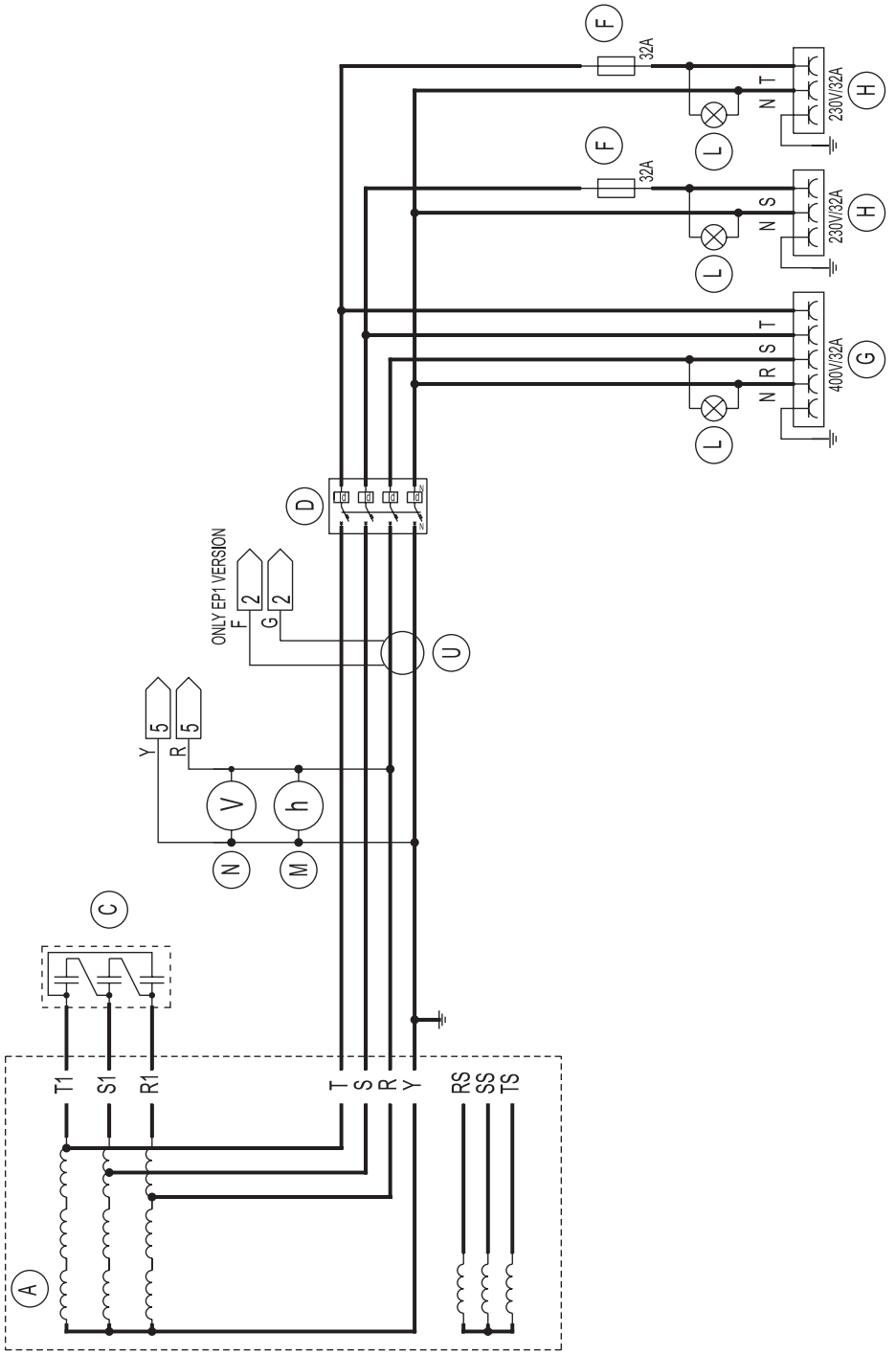


Esp. Expl. | Modifica Modification | Data Date | Dis. Desi. | Appr. Appr.

MOSA
20090-CUSAGO (MI)-ITALY
http://www.mosa.it

Da Pag. From Page | Denominazione: Denomination: aux. (400T/230M/48M) D | Progetto: Project: 21760.prg | Pag.n° Page n° 3 | di n° of n° 5

Alla Pag. To Page | Macchina: Machine: TS 400 SC | Disegnatore: Designer: Leporace N. | Data: Date: 30.07.2001 | Dis. n°: Drwg. n°: 21760.S.020 | Approvato: Approved:



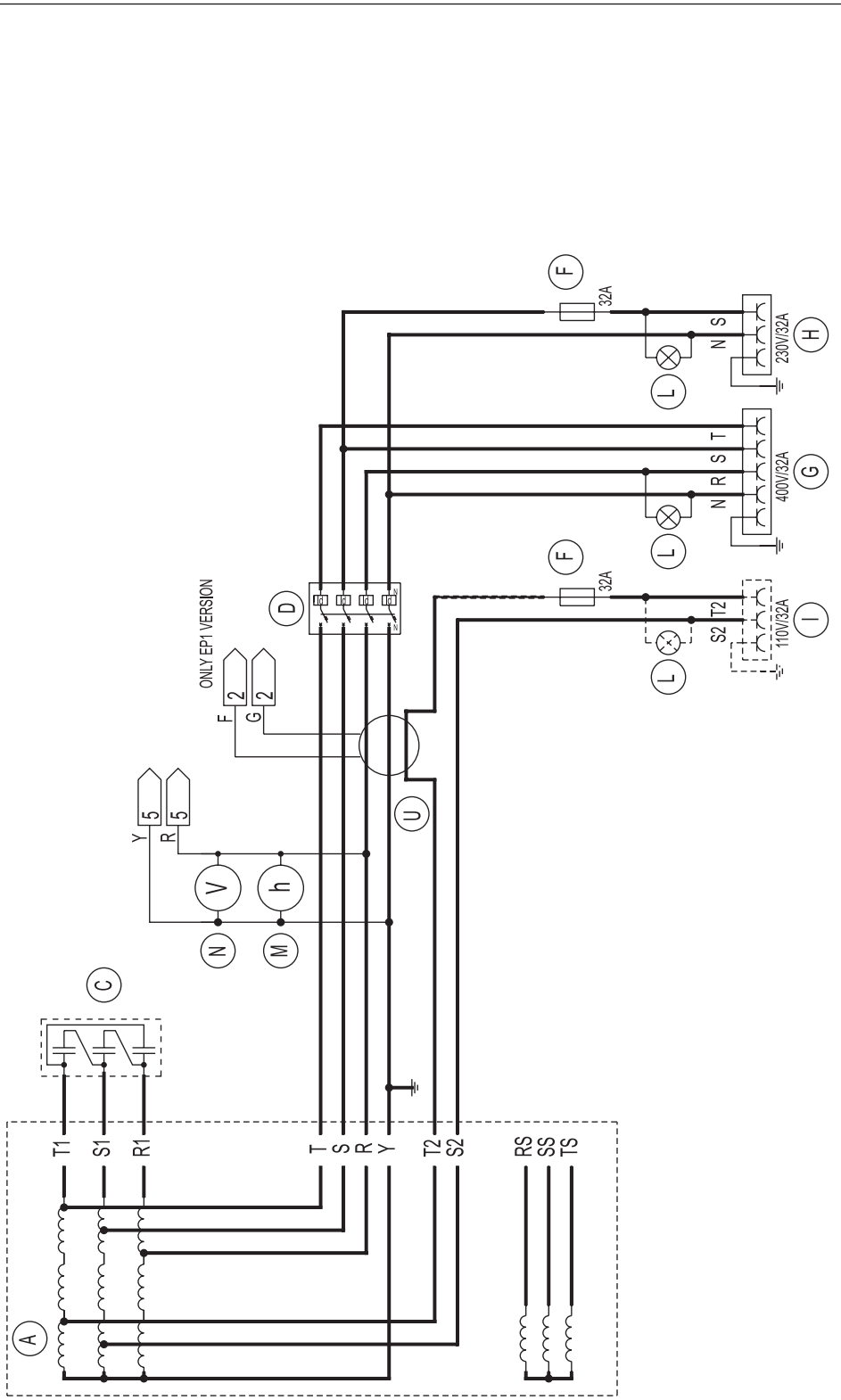
Esc. Exc. | Modifica Modification | Data Date | Dis. Desi. | Appr. Appr.

MOSA
20090-CUSAGO (MI)-ITALY
http://www.mosa.it

Da Pag. From Page
Alla Pag. To Page

Denominazione: Denomination: Aux. (400T/230Mx2) D
Macchina: Machine: TS 400 SC
Progetto: Project: 21762.prg
Pag.n° Page n° 3
di n° of n° 5

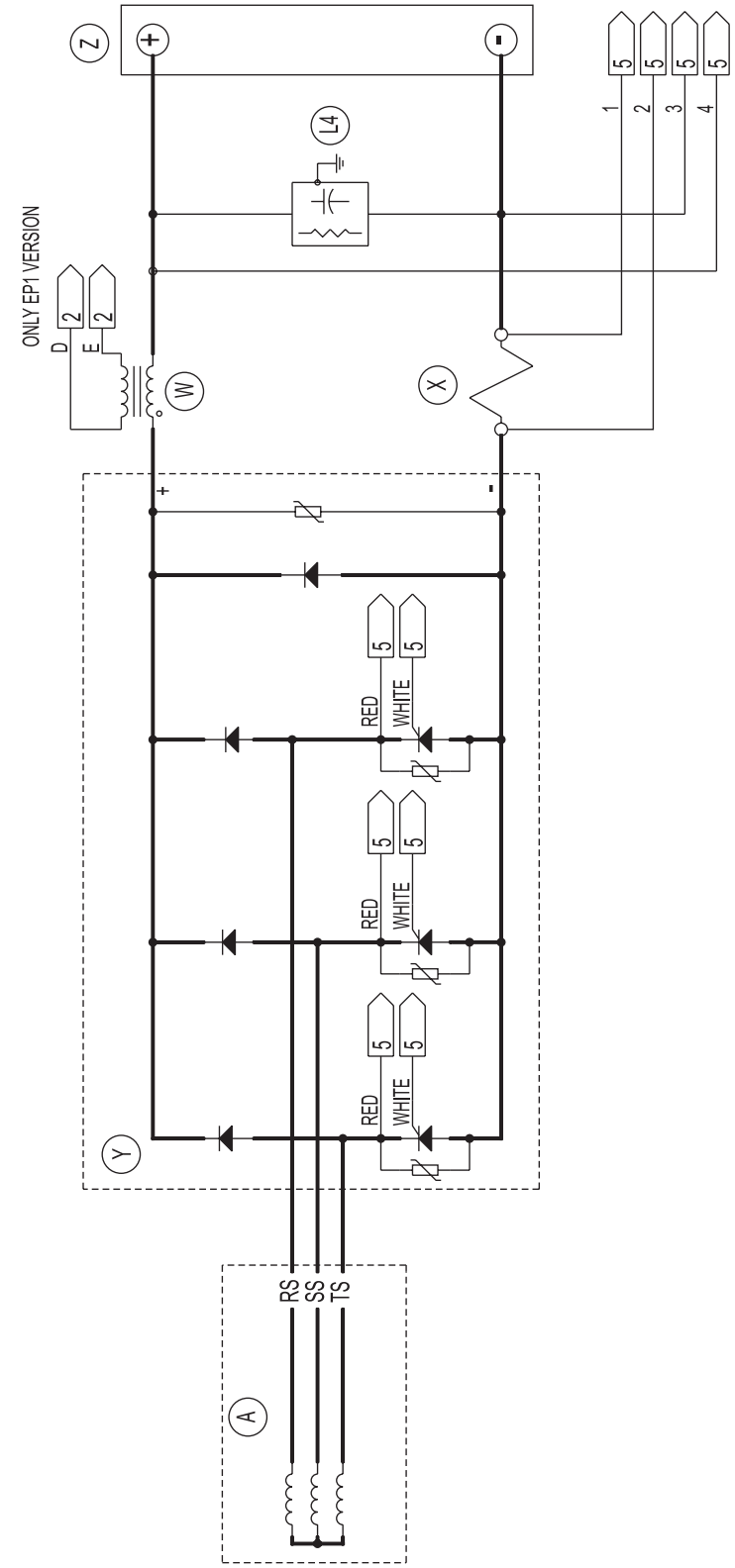
Disegnatore: Designer: Leporace N.
Data: Date: 10.09.2001
Dis. n°: Drwg. n°: 21762.S.020
Approvato: Approved:



Esp. / Exp. | Modifica / Modification | Data / Date | Dis. / Desi. | Appr. / Appr.

MOSA
20090-CUSAGO (MI)-ITALY
http://www.mosa.it

Da Pag. / From Page
Alla Pag. / To Page
Denominazione / Denomination: Aux. (400T/230M/110CTE) D
Macchina / Machine: TS 400 SC
Disegnatore / Designer: Leporace N.
Data / Date: 10.09.2001
Progetto / Project: 21768.prg
Dis. n° / Dwg. n°: 21768.S.020
Pag. n° / Page n°: 3
di n° / of n°: 5
Approvato / Approved:

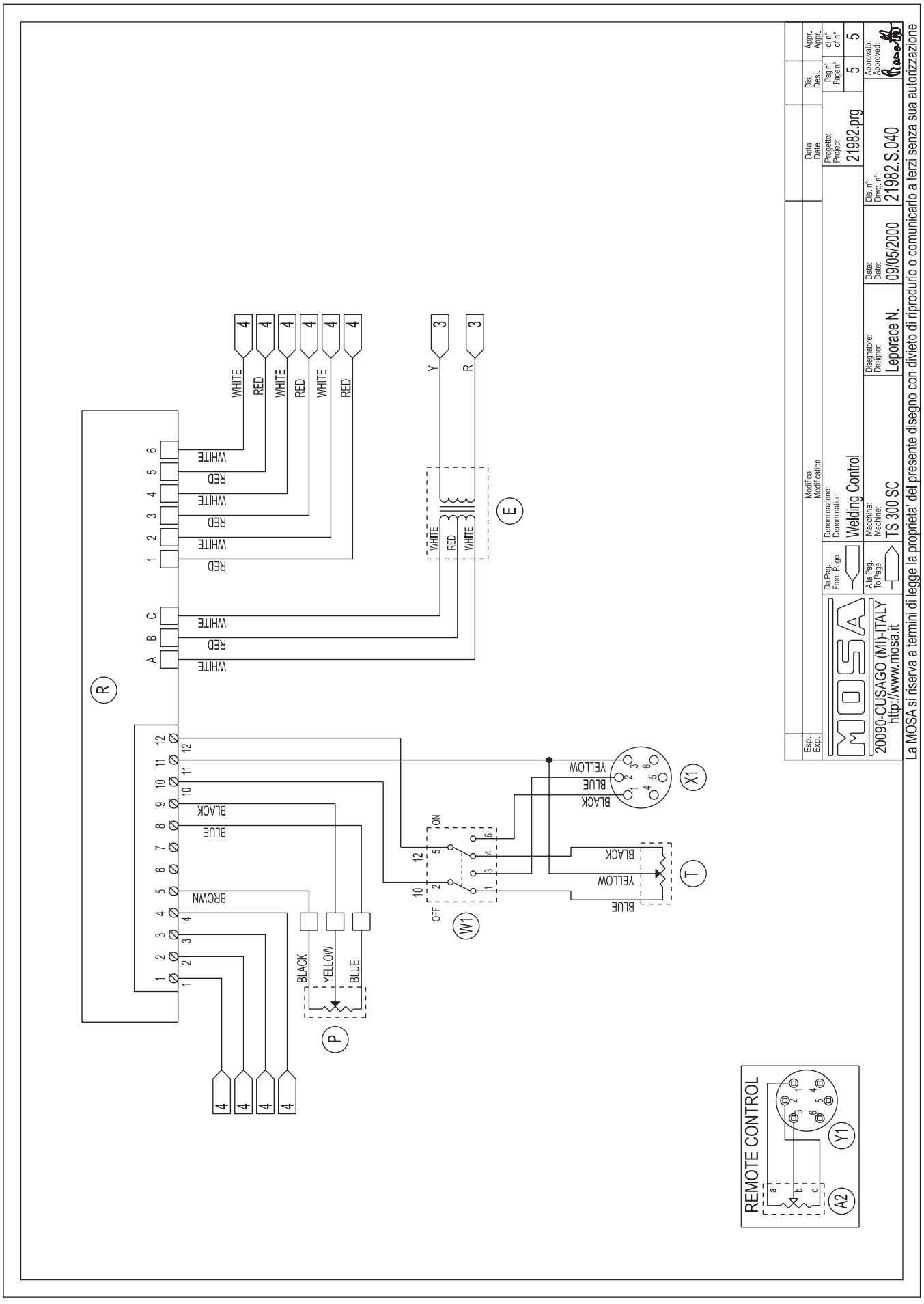


Esp. Exp. | Modifica Modification | Data Date | Dis. Desi. | Appr. Appr.

MOSA
20090-CUSAGO (MI)-ITALY
http://www.mosa.it

Da Pag. From Page
Alla Pag. To Page

Denominazione: Denomination: Welding Power
Macchina: Machine: TS 400 SC
Designatore: Designer: Leporace N.
Data: Date: 30.07.2001
Progetto: Project: 21760.prg
Dis. n°: Drwg. n°: 21760.S.030
Pag.n° Page n° 4
di n° of n° 5
Approvato: Approved:



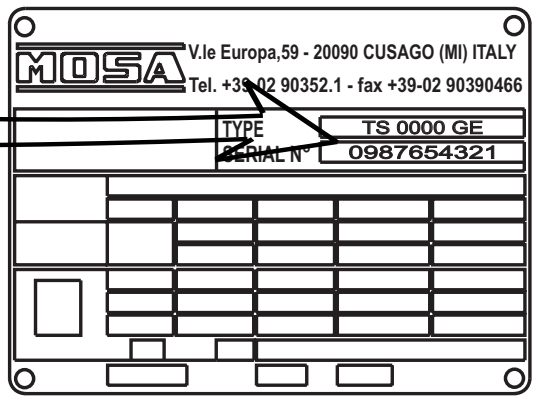
MOSA guarantees that any request for spare parts will be satisfied.

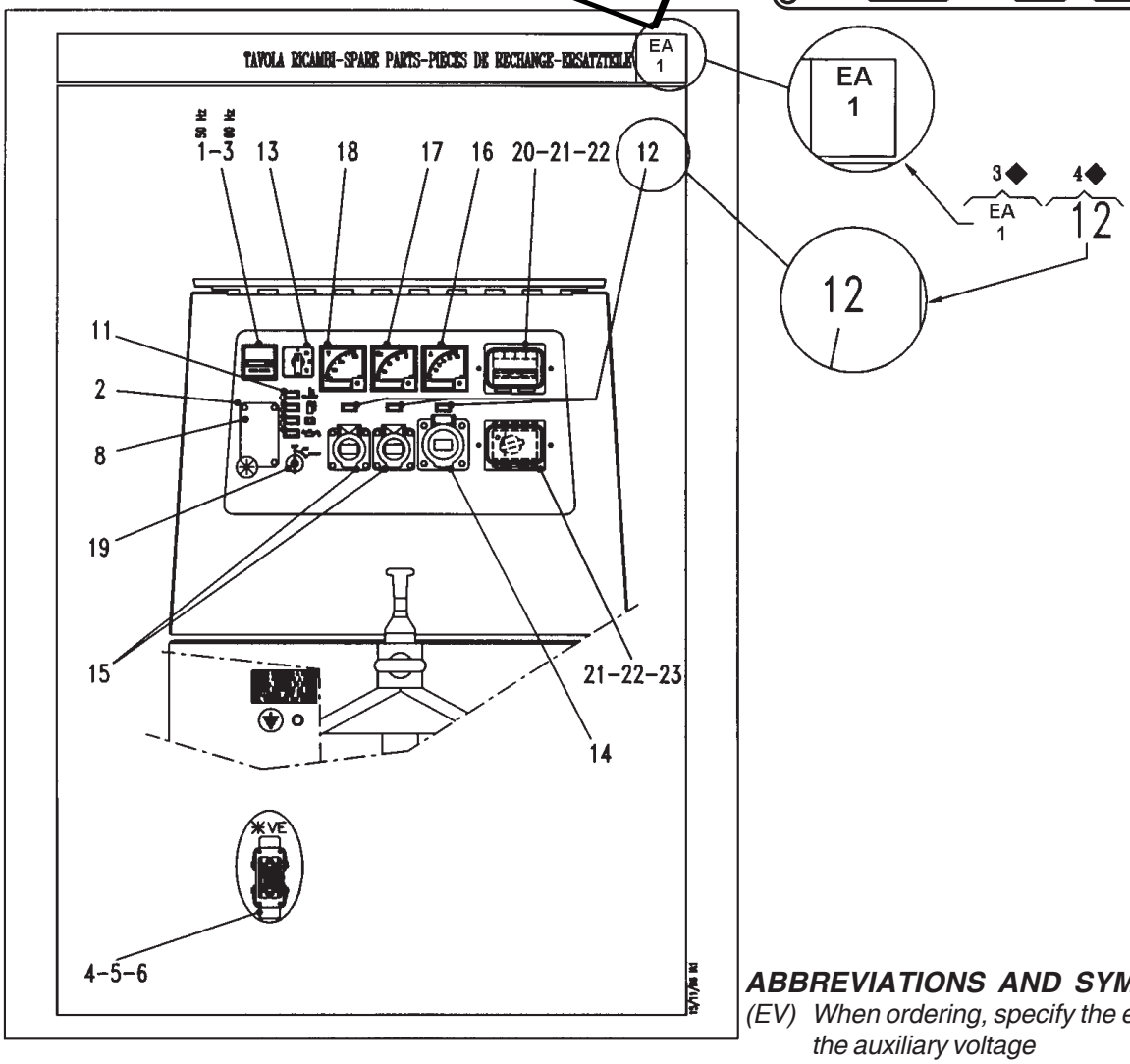
To keep the machine in full working order, when replacement of MOSA spare parts is required, always ask for genuine parts only.

☞ 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:

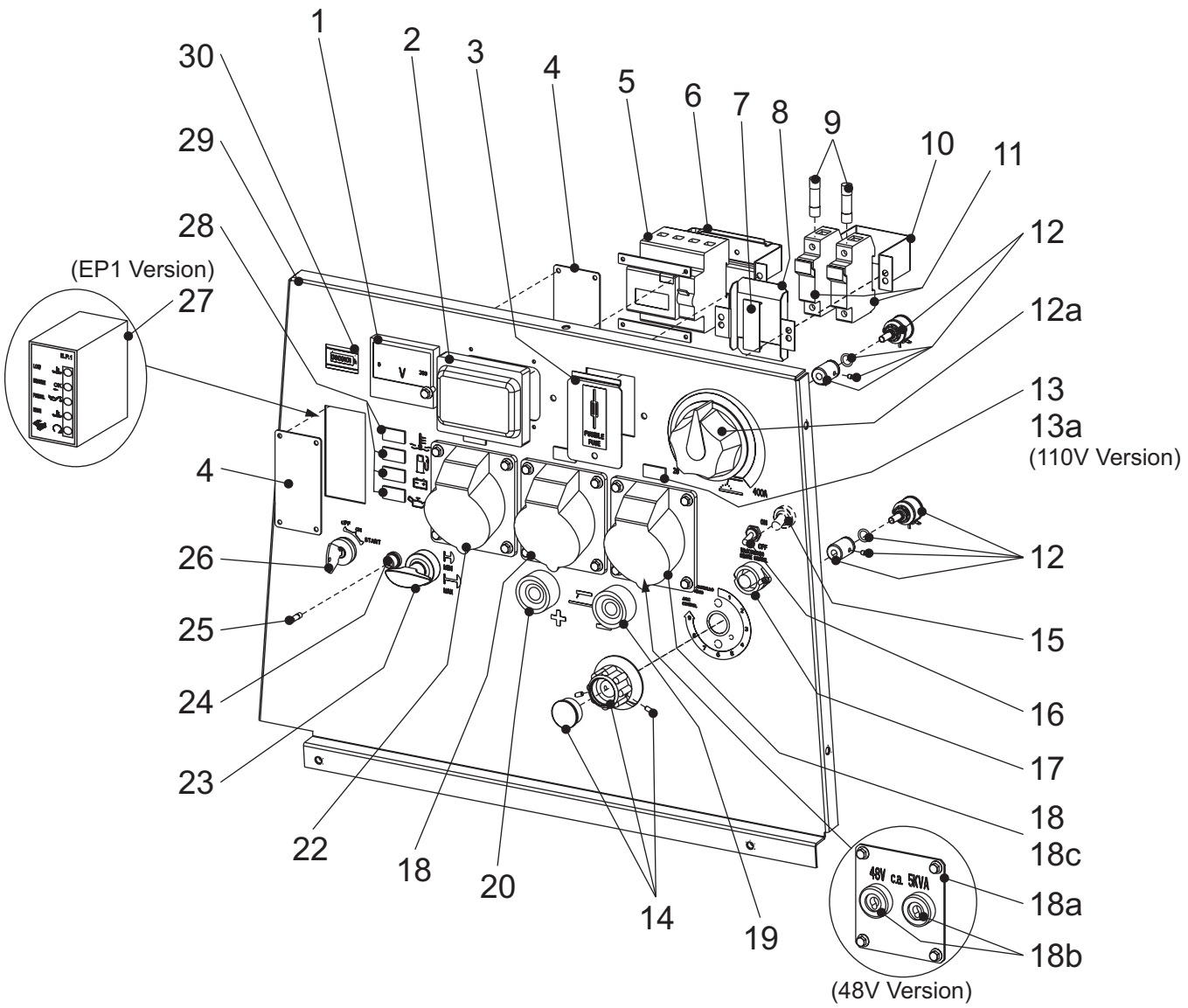
1) ✹ serial number
2) ✹ model of welder and/or generating set
3) ◆ n. table
4) ◆ n. position
5) quantity





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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13a
(110V Version)
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18c
18a
18b
(48V Version)
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(EP1 Version)
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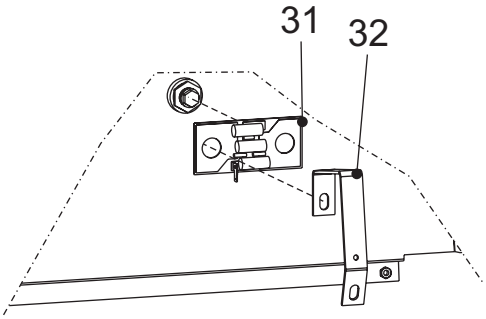
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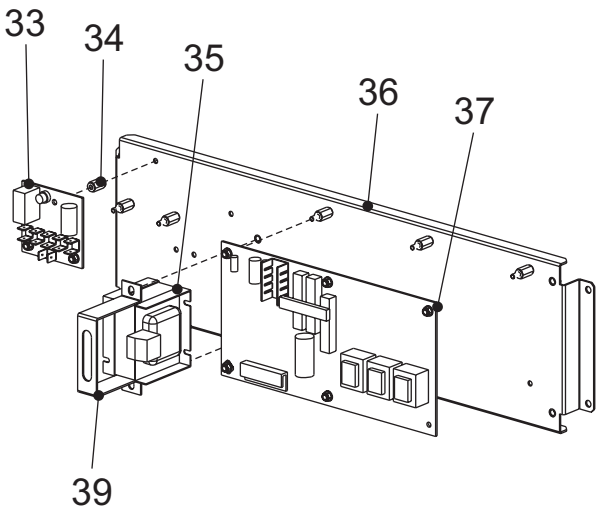
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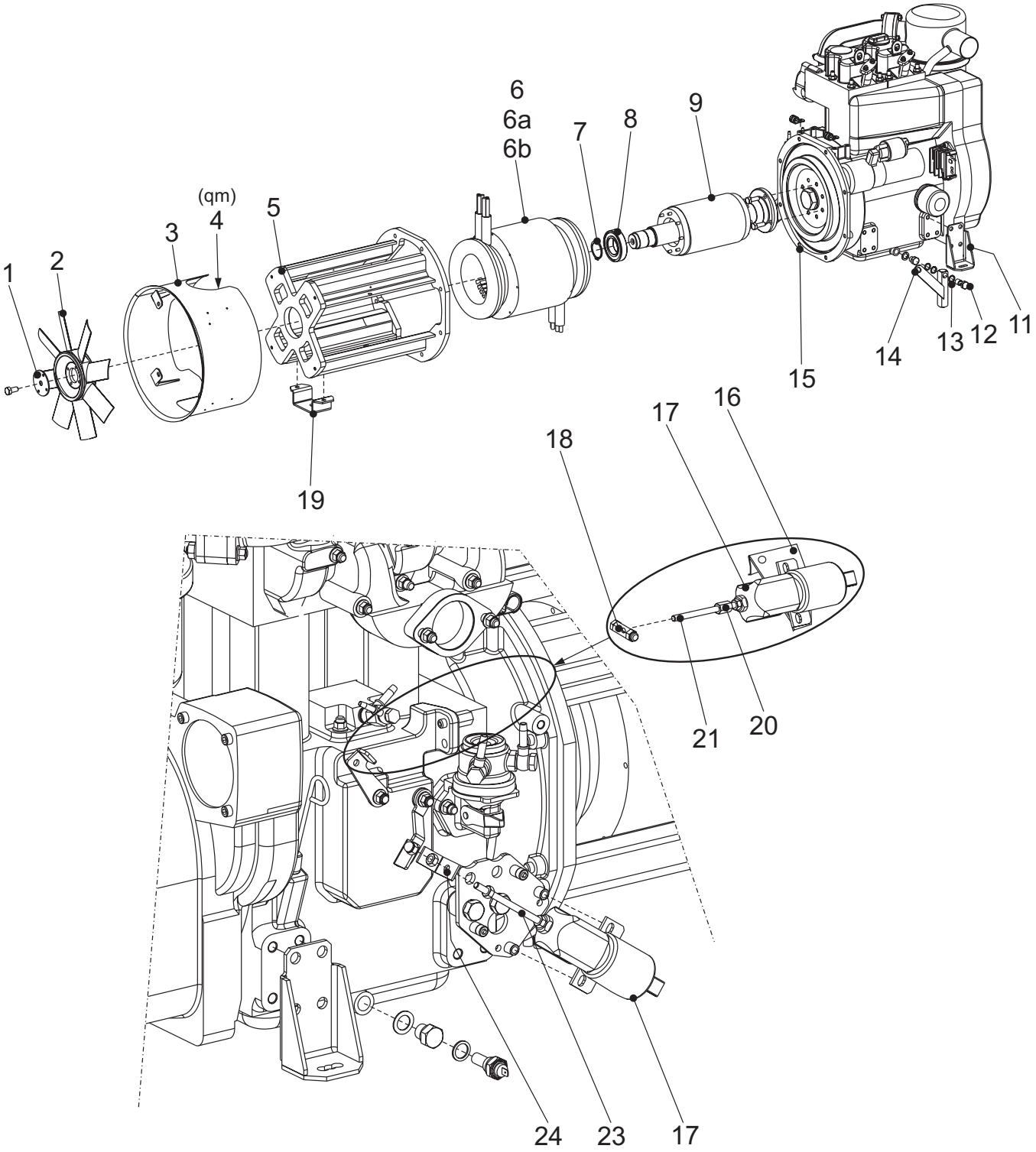
Pos.	Rev.	Cod.	Descr.	Note
1		103011310	VOLTMETRO FONDO SCALA 300V / *VOLTMETER 300V*	
2		219937130	COPERCHIO INTERRUT.DIFFERENZ. / *COVER GFI*	
3		219937235	COPERCHIO / *COVER*	
4		209717027	COPERCHIETTO CHIUSURA EP / *BLIND PLATE, EP*	
5		105111540	Vedi Cod.219937105 / *See part no. 219937105*	
6		219937036	STAFFA / *BRACKET*	
7		107519046	COPERCHIO PER PORTAFUSIBILE / *BLIND PLATE, FUSE HOLDER*	
8		219937234	STAFFA / *BRACKET*	
9		1291060	FUSIBILE / *FUSE*	
10		219937228	STAFFA / *BRACKET*	
11		107509045	PORTAFUSIBILE / *HOLDER, FUSE*	
12		0000107509715	GRUPPO POTENZIOMETRO / *POTENTIOMETER*	Fino a/Up to REV.01/06-Del.129/06 - 04/09/06
12		836709715	POTENZIOMETRO / *POTENTIOMETER*	Da/From REV. 08/07-Del. 129/06 - 04/09/06
12a		107509702	MANOPOLA / KNOB,WELDING CURRENT REGULAT	Da/From REV. 08/07-Del. 129/06 - 04/09/06
13		1302220	SPIA 230V / *WARNING LIGHT 230V*	
13a		1302160	SPIA 110V / *WARNING LIGHT 110V*	(110V Version)
14		0000207409750	GR.REGOL.ARCO SALD./ *ARC FORCE REGULATOR*	Fino a/Up to REV.01/06-Del.129/06 - 04/09/06
14		308300543	MANOPOLA REGOLAZIONE COMPL.	Da/From REV. 08/07-Del. 129/06 - 04/09/06
15		102042740	CAPPUCCIO / *CAP*	
16		102013290	COMMUTATORE / *COMMUTATOR*	
17		31760C042	GR.CAVI SEGN.COMANDI (SALD.) / SIGNALS AND CONTROLS CABLES GR.	Fino a/Up to REV.01/06-Del.129/06 - 04/09/06
17		21760C042	GR.CAVI SEGN.COMANDI (SALD.) / SIGNALS AND CONTROLS CABLES GR.	Da/From REV. 08/07-Del. 129/06 - 04/09/06
18		105111520	PRESA CEE 220V MONOF. 2P+T / *EEC SOCKET SINGLE-PH.220V 2P+N*	
18a		107517032	COPERCHIO PRESE 48V / *BLIND PLATE, SOCKETS 48V*	(48V Version)
18b		101131220	PRESA DINSE / *SOCKET*	(48V Version)
18c		105111530	PRESA CEE 32A 110V 2P+T / *EEC SOCKET 32A 110V 2P+N*	(110V Version)
19		102044400	PRESA DI SALDATURA (-) / *WELDING SOCKET (-)*	
20		102301310	PRESA DI SALDATURA (+) / *WELDING SOCKET (+)*	
22		105111510	PRESA CEE 380V TRIFASE / *EEC SOCKET THREE-PHASE 380V*	
23		207409105	COMANDO ACCELERATORE / *ACCELERATOR LEVER*	
24		307759045	PORTAFUSIBILE / *FUSE HOLDER*	
25		1291120	FUSIBILE / *FUSE*	
26		107302460	STARTER A CHIAVE / *STARTER KEY*	
27		209500015	UNITA' CONTROLLO MOTORE EP1 / *PCB, ENGINE CONTROL EP1*	(EP1 Version)
28		1302040	SPIA ROSSA 12V / *RED WARNING LIGHT 12V*	
29		207607020	PANNELLO FRONTALE / *FRONT PANEL*	
30		105511810	CONTAORE 230V 50Hz IP65 / *HOURMETER 230V 50Hz IP65*	
31		700409860	UNITA' FILTRO ANTIDISTURBI / *ANTIJAMMING FILTER*	
32		107509890	SHUNT DI MISURA / *SHUNT*	
33		209719850	SCHEDA EV/ES / *PCB EV/ES*	
34		282009807	DISTANZ. ISOLANTE PER SCHEDE / *SPACER*	
35		107509870	TRASFORMATORE / *AUXILIARY TRANSFORMER*	
36		219939801	PIASTRA / *PLATE*	
37		208019800	SCHEDA DI CONTROLLO SALDATURA / *PCB, WELDING CONTROL*	
38		218019874	STAFFA BLOCC.TRASFORM.AUSIL. / *BRACKET*	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(qm)
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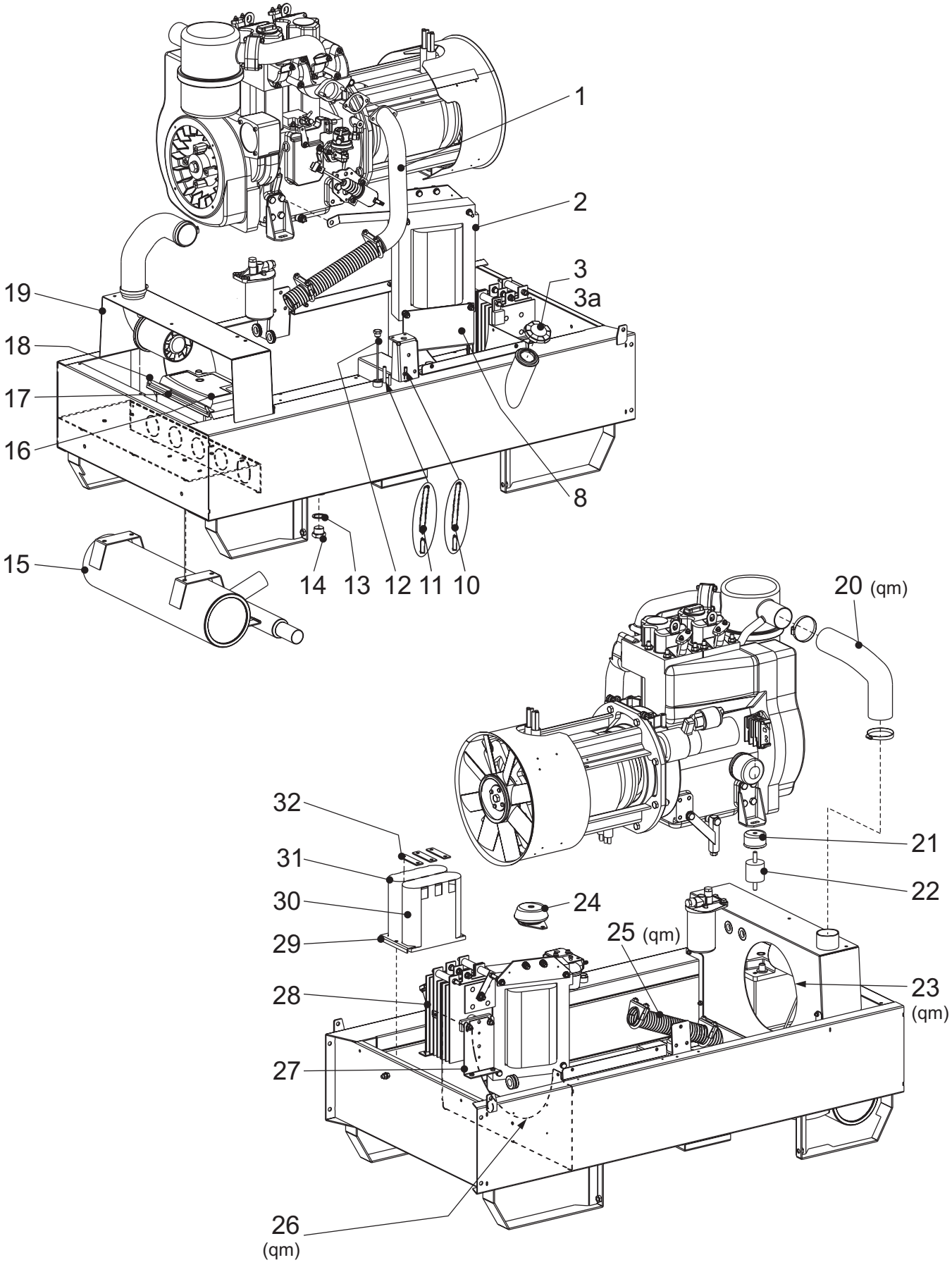
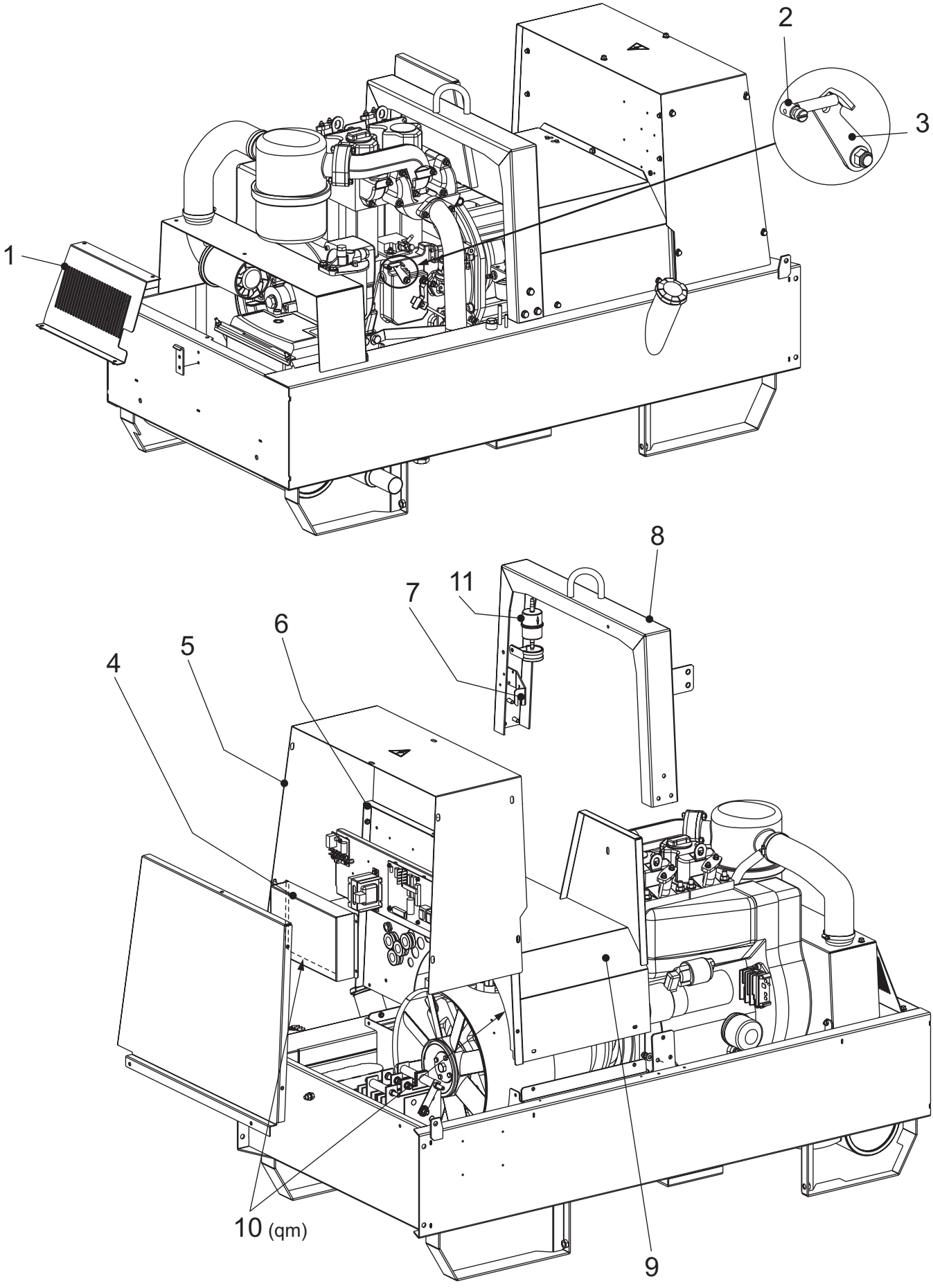
Pos.	Rev.	Cod.	Descr.	Note
1		107301390	ANELLO	
2		107301420	VENTOLA	
3		207406010	CONVOGLIATORE GENERATORE	
4		107509005	GUARNIZIONE	(qm)
5		207403010	CARCASSA PER STATORE	
6		207403020	STATORE 380/220/220(48)V	
6 a		207683020	STATORE 380/220/110V	110 V Version
6 b		205503020	STATORE 400/230	GE 15000
7		6050050	ANELLO SEEGER	
8		1001060	CUSCINETTO	
9		207403030	ALBERO CON ROTORE	
11		207402224	STAFFA	
12		207402225	VITE	
13		102043880	GUARNIZIONE	
14		207602215	PROLUNGA SCARICO OLIO	
15		207612200	MOTORE LOMBARDINI 9LD625-2	
16		207439101	PIASTRA SUPPORTO	(EP1 Version)
17		219869050	ELETTROMAGNETE ECONOMIZZATORE	(EP1 Version) Fino a REV.01/06-Del.171/07 - 25/07/07
17		264149050	ELETTROMAGNETE ECONOMIZZATORE	Da REV.08/07-Del.171/07 - 25/07/07
18		317612244	MORSETTO PER FUNE	(EP1 Version)
19		207403101	SUPPORTO	
20		107302860	GHIERA	(EP1 Version)
21		317809056	FUNE	(EP1 Version)
22		219869055	ELETTROMAGNETE ARRESTO MOTORE	Fino a REV.01/06-Del.171/07 - 25/07/07
23		317609058	TIRANTE COMANDO ELETTROMAGNETE	
24		217609118	SQUAD. GUIDA TIRANTE ELETTROM.	

Pos.	Rev.	Cod.	Descr.	Note
1		107301390	RING FIXING FAN	
2		107301420	FAN	
3		207406010	AIR DUCT	
4		107509005	GASKET	(qm)
5		207403010	HOUSING FOR STATOR	
6		207403020	STATOR 380/220/220 (48)V	
6 a		207683020	STATOR 380/220/110V	110 V Version
6 b		205503020	STATOR 400/230	GE 15000
7		6050050	RING, SEEGER	
8		1001060	BEARING	
9		207403030	SHAFT WITH ROTOR	
11		207402224	BRACKET FOR ENGINE SUPPORT	
12		207402225	SCREW	
13		102043880	GASKET	
14		207602215	EXTENSION, OIL DRAIN	
15		207612200	LOMBARDINI ENGINE 9LD625-2	
16		207439101	BRACKET	(EP1 Version)
17		219869050	ACCELERATOR SOLENOID	(EP1 Version) Up to REV.01/06-Del.171/07 - 25/07/07
17		264149050	ACCELERATOR SOLENOID	From REV.08/07-Del.171/07 - 25/07/07
18		317612244	TERMINAL	(EP1 Version)
19		207403101	SUPPORT	
20		107302860	RING NUT	(EP1 Version)
21		317809056	TIE-ROD	(EP1 Version)
22		219869055	STOP SOLENOID	Up to REV.01/06-Del.171/07 - 25/07/07
23		317609058	TIE-ROD	
24		217609118	*Manca la descrizione aggiuntiva*	



Pos.	Rev.	Cod.	Descr.	Note
1		207602070	TUBO DI SCARICO	
2		209504100	REATTANZA	
3		342202026	TAPPO SERBATOIO	
3	a	317802026	TAPPO SERBATOIO CON CHIAVE	(SR)
4		209702241	SUPPORTO FILTRO	Fino a REV.01/06-Del.150/07 - 09/07/07
5		209702242	RACCORDO	Fino a REV.01/06-Del.150/07 - 09/07/07
6		209702228	PREFILTRO GASOLIO	Fino a REV.01/06-Del.150/07 - 09/07/07
8		207404110	STAFFA SUPP.REATTANZA (FINITA)	
9		209502207	TUBO DA PREFILTRO A POMPA	Fino a REV.01/06-Del.150/07 - 09/07/07
10		107301890	TUBO SFIATO (L=MT.1)	(qm)
11		207402207	TUBO	Fino a REV.01/06-Del.150/07 - 09/07/07
11		308102207	TUBO	Da REV.08/07-Del.150/07 - 09/07/07
12		305719875	GALLEGGIANTE	
13		308102023	GUARNIZIONE	
14		308101262	TAPPO SCARICO SERBATOIO	
15		207402050	SILENZIATORE	
16		773749150	BATTERIA	
17		102041420	TRAVERSA	
18		105611270	TIRANTE PER BATTERIA	
19		215108200	PARATIA ASPIRAZIONE MOTORE	
20		1229830	TUBO FLESSIBILE (MT.1)	(qm)
21		307012037	PROTEZIONE ANTIVIBRANTE	
22		105112020	ANTIVIBRANTE	
23		105112270	GUARNIZIONE (L=MT.1)	(qm)
24		105611550	ANTIVIBRANTE	
25		309502077	TUBO FLESSIBILE FINITO	
26		102302280	GUARNIZIONE (L=MT.1)	(qm)
27		217605091	STAFFA PONTE DIODI	
28		317805100	PONTE DIODI	
29		209719882	STAFFA BOX CONDENSATORI	
30		105319880	BOX CONDENSATORI	
31		107509880	BOX CONDENSATORI	
32		107509041	SBARRETTA BOX CONDENSATORI	

Pos.	Rev.	Cod.	Descr.	Note
1		207602070	EXHAUST PIPE	
2		209504100	REACTOR	
3		342202026	CAP, FUEL TANK	
3	a	317802026	CAP, TANK	(SR)
4		209702241	SUPPORT, FILTER	Up to REV.01/06-Del.150/07 - 09/07/07
5		209702242	PIPE FITTING FOR TANK	Up to REV.01/06-Del.150/07 - 09/07/07
6		209702228	PRE-FILTER DIESEL	Up to REV.01/06-Del.150/07 - 09/07/07
8		207404110	*Manca la descrizione aggiuntiva*	
9		209502207	PIPE FROM PRE-FILTER TO PUMP	Up to REV.01/06-Del.150/07 - 09/07/07
10		107301890	PIPE, BREATHER (L=MT.1)	(qm)
11		207402207	PIPE	Up to REV.01/06-Del.150/07 - 09/07/07
11		308102207	PIPE	From REV.08/07-Del.150/07 - 09/07/07
12		305719875	FLOAT	
13		308102023	GASKET	
14		308101262	FUEL TANK CAP	
15		207402050	MUFFLER, EXHAUST	
16		773749150	BATTERY	
17		102041420	BRACKET	
18		105611270	TIE ROD, BATTERY	
19		215108200	AIR INTAKE COVER	
20		1229830	FLEXIBLE TUBE (MT.1)	(qm)
21		307012037	PROTECTION, VIBRATION-DAMPER	
22		105112020	VIBRATION DAMPER	
23		105112270	STRIP, SEALING (L=MT.1)	(qm)
24		105611550	VIBRATION DAMPER	
25		309502077	*Manca la descrizione aggiuntiva*	
26		102302280	GASKET (L=MT.1)	(qm)
27		217605091	DIODE BRIDGE BRACKET	
28		317805100	DIODE BRIDGE	
29		209719882	CAPACITOR BOX BRACKET	
30		105319880	CAPACITOR BOX	
31		107509880	CAPACITOR BOX 3x65	
32		107509041	CONNECTING PLATE-CAPACITOR BOX	



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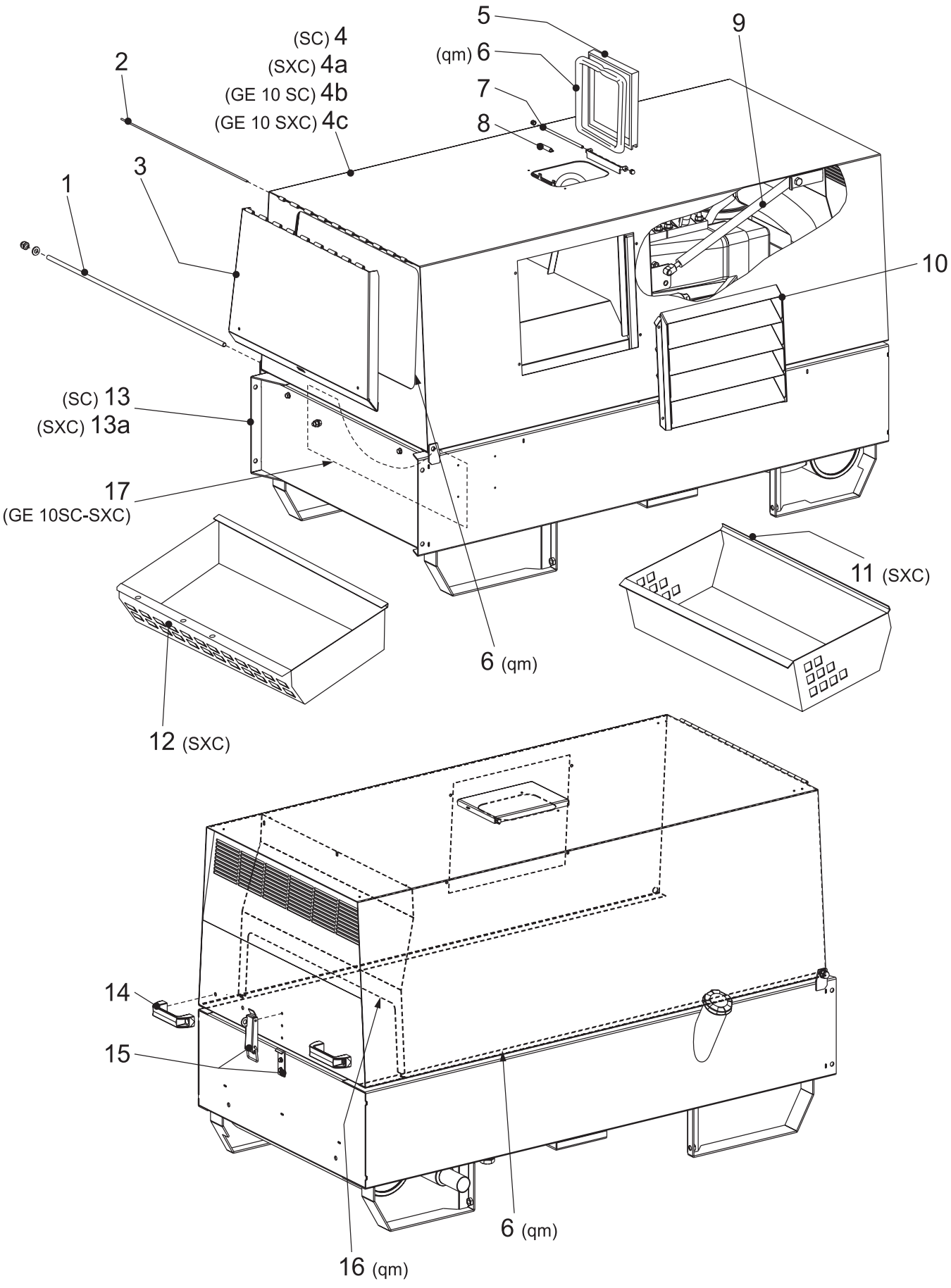
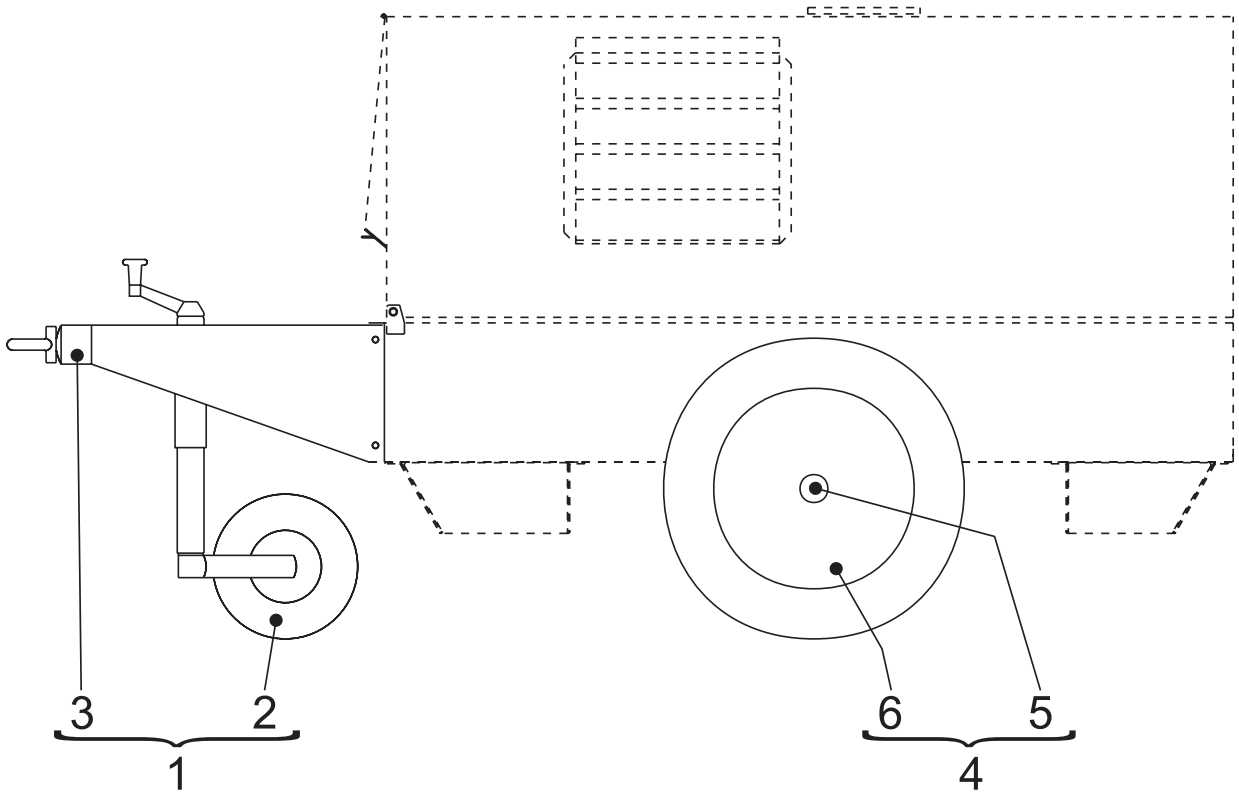
Pos.	Rev.	Cod.	Descr.	Note
1		207608230	GRIGLIA	
2		105111450	MORSETTO	
3		105111460	MOLLA	
4		217609654	SCATOLA PROT.SCHEDA SALD.	
5		207408121	COPERTURA	
6		207608219	PARATIA ASPIRAZ. ALT. (FINITA)	
7		207401112	SQUADRETTA FERMO REATTANZA	
8		207401100	ROLL BAR	
9		207600513	COPERTURA ALTERNATORE	(TS 400 - GE 15000 SC/SXC)
10		102302280	GUARNIZIONE (L=MT.1)	qm
11		256602228	FILTRO PER GASOLIO	Da REV.08/07-Del.150/07 - 09/07/07

Pos.	Rev.	Cod.	Descr.	Note
1		207608230	GRATING	
2		105111450	TERMINAL	
3		105111460	SPRING	
4		217609654	BOX PROTECTION PCB WELDER	
5		207408121	COVER	
6		207608219	*Manca la descrizione aggiuntiva*	
7		207401112	REACTANCE BRACKET	
8		207401100	ROLL BAR	
9		207600513	COVER ALTERNATOR	(TS 400 - GE 15000 SC/SXC)
10		102302280	GASKET (L=MT.1)	qm
11		256602228	FUEL FILTER	From REV.08/07-Del.150/07 - 09/07/07

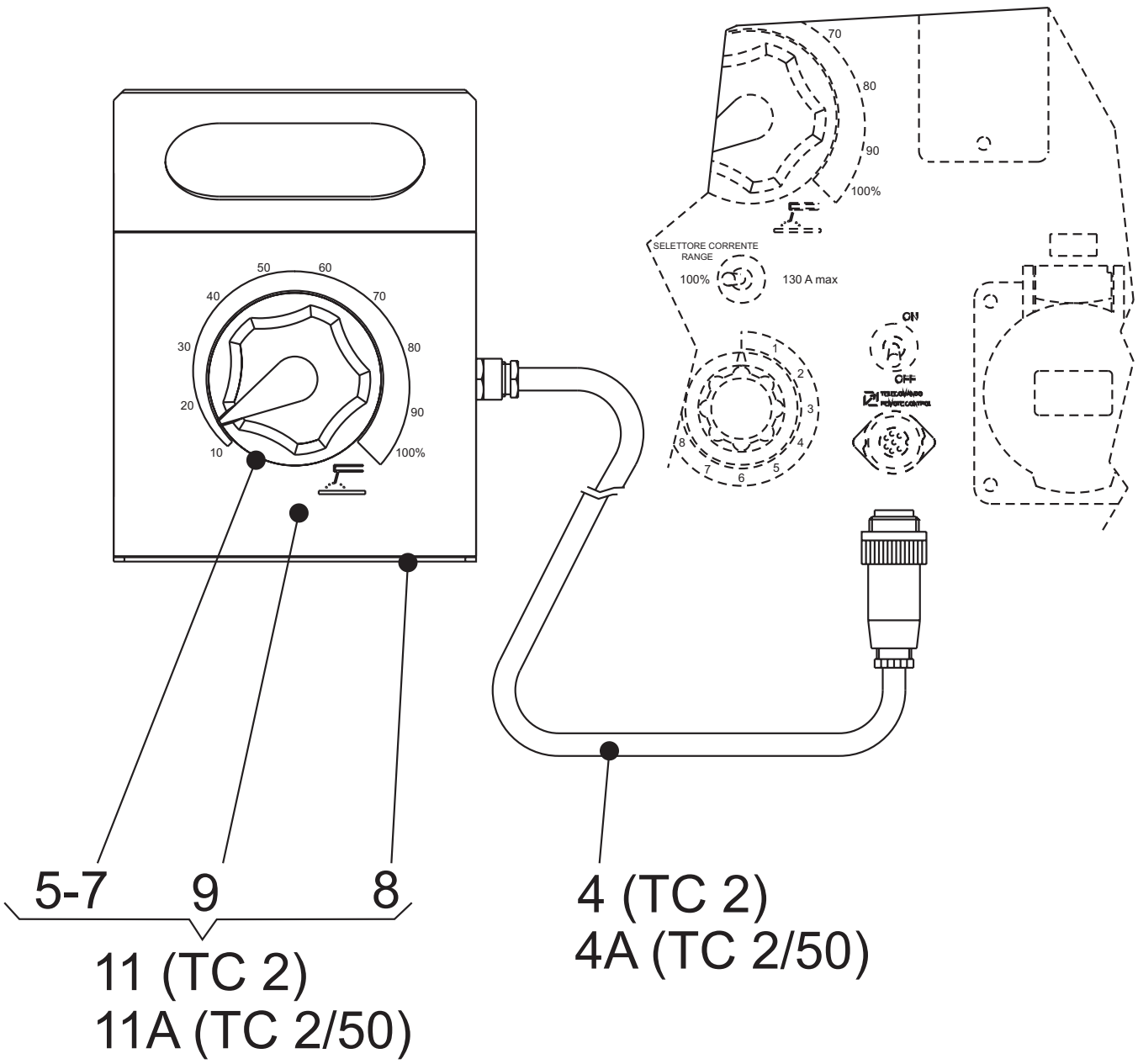

5
9
(SC) 4
(SXC) 4a
(GE 10 SC) 4b
(GE 10 SXC) 4c
(qm) 6
7
8
2
3
1
10
(SC) 13
(SXC) 13a
17
(GE 10SC-SXC)
11 (SXC)
6 (qm)
12 (SXC)
14
15
6 (qm)
16 (qm)

Pos.	Rev.	Cod.	Descr.	Note
1		207408024	TIRANTE	
2		207608270	PERNO PER CERNIERA	
3		207408100	COPERCHIO FRONTALE	
4		207600511	GRUPPO CARENATURA	(SC)
4 a		307600511	GRUPPO CARENATURA	(SXC)
4 b		215100511	CARENATURA COMPLETA	(GE 10 SC)
4 c		315100511	CARENATURA COMPLETA	(GE 10 SXC)
5		209718070	COPERCHIETTO	
6		105112270	GUARNIZIONE (L=MT.1)	(qm)
7		209718073	TIRANTE	
8		102042870	MOLLA	
9		209508115	PISTONE SOSTEGNO	
10		207408065	GRIGLIA	
11		307410515	CASSONETTO SILENZIATORE (SXC)	(SXC)
12		307410514	CASSONETTO ASPIRAZIONE	
13		207601050	BASAMENTO	(SC)
13 a		207600501	BASAMENTO COMPLETO	(SXC)
14		343339601	MANIGLIA	
15		107300180	CHIUSURA COMPL.A LEVA	
16		102302280	GUARNIZIONE (L=MT.1)	
17		215108281	RIDUZIONE PARATIA INFERIORE	(GE 10 SC/SXC)

Pos.	Rev.	Cod.	Descr.	Note
1		207408024	TIE-ROD	
2		207608270	*Manca la descrizione aggiuntiva*	
3		207408100	FRONT COVER	
4		207600511	COVER	(SC)
4 a		307600511	COVER	(SXC)
4 b		215100511	COVER	(GE 10 SC)
4 c		315100511	COVER	(GE 10 SXC)
5		209718070	COVER	
6		105112270	STRIP, SEALING (L=MT.1)	(qm)
7		209718073	TIE-ROD	
8		102042870	SPRING	
9		209508115	SUPPORT, AIR INLET WALL	
10		207408065	GRATE, AIR OUTLET	
11		307410515	EXHAUST BOX (SXC)	(SXC)
12		307410514	INTAKE BOX	
13		207601050	BASE	(SC)
13 a		207600501	BASE (COMPLETE)	(SXC)
14		343339601	KNOB	
15		107300180	LATCH	
16		102302280	GASKET (L=MT.1)	
17		215108281	UNDER COVER REDUCTION	(GE 10 SC/SXC)



Pos.	Rev.	Cod.	Descr.	Descr.
1		0000217600141	GR.TIMONE,PIEDE X TRAINO LENTO	KIT SITE TOW
2		102351750	PIEDE DI STAZIONAMENTO	PARKING STAND
3		207401150	TIMONE	TOW BAR
4		0000217600142	GR. ASSALE, RUOTE TRAINO LENTO	KIT SITE TOW
5		207401160	ASSALE	AXLE
6		102351740	RUOTA	WHEEL



Pos.	Cod.	Descr.	Note
4	209519904	CONNETTORE COMPLETO DI CAVI / *CONNECTOR WITH CABLES*	TC2 vers.
4a	930609904	CONNETTORE CON CAVI / *CONNECTORS WITH CABLES*	TC2/50 vers.
5	107509702	MANOPOLA REG.CORRENTE SALDAT. / *KNOB,WELDING CURRENT REGULAT.*	
7	107509700	POTENZIOMETRO / *WELDING CURRENT REGULATOR*	Fino a/ *Up to* REV. 10/99 - Del. 129/06 - 04/09/07
7	836709715	POTENZIOMETRO / *WELDING CURRENT REGULATOR*	Da/*From* REV. 07/07- Del. 129/06 - 04/09/07
8	107509900	SCATOLA / *CASE, BOTTOM HALF*	
9	209519901	COPERCHIO (CD) / *COVER*	
11	209510018	TC2 COMANDO DISTANZA STD / *TC2 STD REMOTE CONTROL*	
11a	930600018	TC2/50 COMANDO DISTANZA STD / *TC2/50 STD REMOTE CONTROL*	