

# **TS 200 BS/CF**

**0 3 1 1**

**272509003 - GB**

## **USE AND MAINTENANCE MANUAL SPARE PARTS CATALOG**





**UNI EN ISO 9001 : 2008**

ISO 9001:2008 - Cert. 0192

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

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

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

The advantages for MOSA clients are:

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

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

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## ATTENTION

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

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

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



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## INFORMATION

Dear Customer,  
We wish to thank you for having bought 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 applicable directives and also the fulfillment of safety requirements of the product itself; the list of these directives is part of the declaration of conformity included in any machine standard equipment.

Here below the adopted symbol:

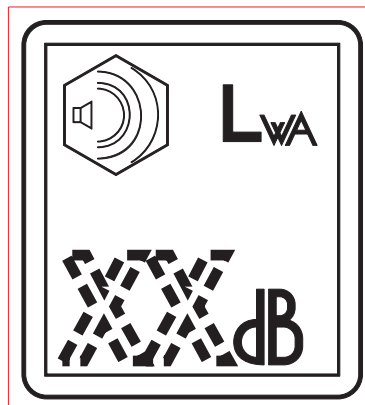


CE marking is clearly readable and unerasable and it can be either part of the data-plate.

<b>MOSA</b>		V.le Europa, 59-20090 CUSAGO (MI) ITALY	
		tel. +39-0290352.1 fax. +39-0290390466	
		http://www.mosa.it e-mail: info@mosa.it	
	Made in UE-ITALY	TYPE	
		SERIAL N	
		X	
		I <sub>2</sub> (A)	
		U <sub>2</sub> (V)	
		I <sub>2</sub> (A)	
		U <sub>2</sub> (V)	
Hz	kVA		
P.F.	V (V)		
	I (A)		
	n	RPM	n <sub>1</sub>
	n <sub>0</sub>	RPM	P <sub>max</sub>
		RPM	IP
		KW	I. CL.

<b>MOSA</b>		V.le Europa, 59-20090 CUSAGO (MI) ITALY	
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		http://www.mosa.it e-mail: info@mosa.it	
	Made in UE-ITALY	TYPE	
		SERIAL N	
		Generating Set ISO 8528	
KVA			
V			
I			
Hz	P.F.	LTP POWER IN ACCORDANCE WITH ISO 8528	
RPM	I. CL.	IP	
ALTIT. 100 m	TEMP. 25 °C	MASS	

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



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

**BCS S.p.A.**Sede legale:  
Via Marradi 1  
20123 Milano - Italia**Stabilimento di Cusago, 20090 (MI) - Italia**V.le Europa 59  
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Fax: +39 02 90390466

ISO 9001:2000 - Cert. 0192

**DICHIARAZIONE DI CONFORMITA'**Déclaration de Conformité – Declaration of Conformity – Konformitätserklärung  
Conformiteitsverklaring – Declaración de ConformidadBCS S.p.A. dichiara sotto la propria responsabilità che la macchina:  
BCS S.p.A. déclare, sous sa propre responsabilité, que la machine:  
BCS S.p.A. declares, under its own responsibility, that the machine:  
BCS S.p.A. erklärt, daß die Aggregate:  
BCS S.p.A. verklaard, onder haar eigen verantwoordelijkheid, dat de machine:  
BCS S.p.A. declara bajo su responsabilidad que la máquina:GRUPPO ELETTROGENO DI SALDATURA / WELDING GENERATOR GRUPPO ELETTROGENO / POWER GENERATOR 

Marchio / Brand : MOSA

Modello / Model :

Matricola / Serial number :

è conforme con quanto previsto dalle Direttive Comunitarie e relative modifiche:  
est en conformité avec ce qui est prévu par les Directives Communautaires et relatives modifications:  
conforms with the Community Directives and related modifications:  
mit den Vorschriften der Gemeinschaft und deren Ergänzungen übereinstimmt:  
in overeenkomst is met de inhoud van gemeenschapsrichtlijnen gerelateerde modificaties:  
comple con los requisitos de la Directiva Comunitaria y sus anexos:**2006/42/CE - 2006/95/CE - 2004/108/CE**

Nome e indirizzo della persona autorizzata a costituire il fascicolo tecnico :

Nom et adresse de la personne autorisée à composer le Dossier Technique :

Person authorized to compile the technical file and address :

Name und Adresse der zur Ausfüllung der technischen Akten ermächtigten Person :

Persoon bevoegd om het technische document, en bedrijf gegevens in te vullen

Nombre y dirección de la persona autorizada a componer el expediente técnico :

**ing. Benso Marelli - Amministratore Delegato / CEO; V.le Europa 59, 20090 Cusago (MI) - Italy**

Cusago,

  
Ing. Benso Marelli  
Amministratore Delegato  
CEO



The TS 200 engine driven welder is 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 200 BS/CF
<b>D.C. WELDING C.C.</b>	
Welding current regulation (I Scale)	20 - 100A
Welding current regulation (II Scale)	90 - 190A
Welding voltage	98 V
Service	190A - 35%, 160A - 60%, 120A - 100%
<b>ALTERNATOR</b>	
	self-excited, self-regulated, brushless
Type	Three-phase, asynchronous
Insulating class	H
<b>A.C. GENERATOR</b>	
Three-phase generation	6 kVA / 400 V / 8.7 A
Single-phase generation	5 kVA / 230 V / 21.7 A
Single-phase generation	2.5 kVA / 110 V / 22.7 A
Frequency	50 Hz
<b>ENGINE</b>	
Mark / Model	HONDA / GX 390
Type / Cooling system	Gasoline 4-Stroke / Air
Cylinders / Displacement	1 / 389 cm <sup>3</sup>
*Net power	7.7 kW (10.5 HP)
Speed	3000 rpm
Fuel consumption (welding 60%)	2.1 l/h
Engine oil capacity	1.1 l
Starter	Recoil
*Maximum output (not overloadable) according to SAE J 1349	
<b>GENERAL SPECIFICATIONS</b>	
Tank capacity	6.1 l
Running time (welding 60%)	3 h
Protection	IP 23
*Dimensions / max. (Lxlxh in mm)	910x525x613
*Weight	105 Kg
**Acoustic power LwA (Pression LpA)	98 dB(A) (73 dB(A) @ 7m)
* Dimensions and weight are inclusive of all parts without wheels and towbar CTM. - ** For fixed installation only	

### POWER

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

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

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

### ACOUSTIC POWER LEVEL

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

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

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


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

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

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

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

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

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

## 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 assist you in the correct use of the machine and/or accessories.

**SYMBOLS**



**STOP** - Read absolutely and be duly attentive



Read and pay due attention



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



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



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



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



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



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



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



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



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



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



**ACCES FORBIDDEN** to non authorizad people.

**PROHIBITIONS** No harm for persons

**Use only with safety clothing -**



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

**Use only with safety clothing -**



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

**Use only with safety protections -**



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

**Use with only safety material -**



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

**Use only with non inserted voltage -**



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

**No smoking -**



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

**No welding -**



It is forbidden to weld in rooms containing explosive gases.

**ADVICE** No harm for persons and things

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

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

**Use only with safety protections, specifically suitable**



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

**Use only with safety protections -**



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

**Use only with safety protections -**




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

**Use only with safety protections -**



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

 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.

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



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

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



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

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

WARNING					CAUTION		DANGER

 <b>WARNING</b>	<b>THE MACHINE <u>MUST NOT BE USED</u> IN AREAS WITH EXPLOSIVE ATMOSPHERE</b>
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## 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 transmitters.
3. Computer and other checking devices.
4. Critical devices for safety and/or for industrial checks.
5. People 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 gloves, without holes, and body protection.
- Do not wind cables around the body.
- Use ear protections if the noise level is high.
- Keep flammable material away from the welding area.
- Do not weld on containers which contain flammable material.
- Do not weld near refuelling areas.
- Do not weld on easily flammable 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-flammable protective clothers).



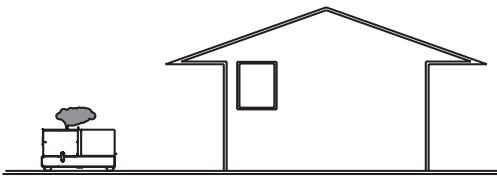
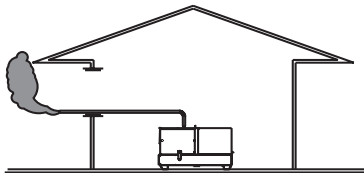
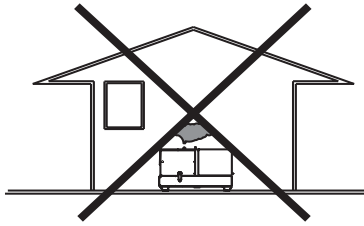
## INSTALLATION AND ADVICE BEFORE USE

### GASOLINE ENGINES

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

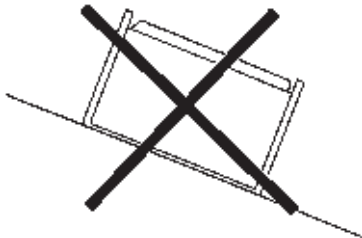
### DIESEL ENGINES

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

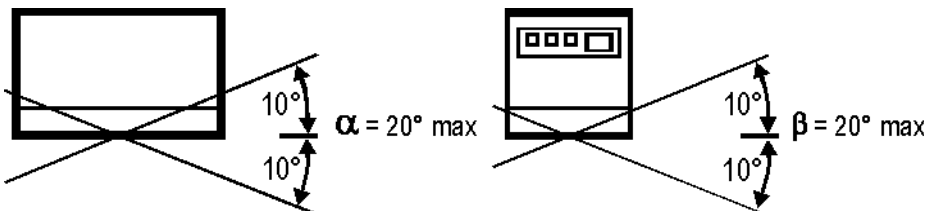


### POSITION

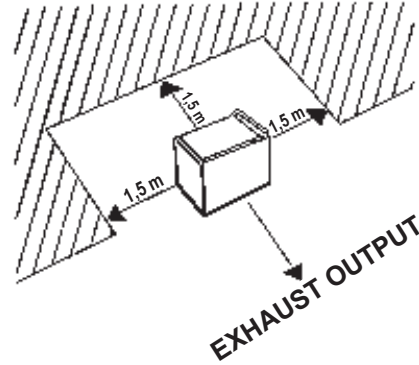
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



Maximum leaning of the machine (in case of dislevel)



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



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

### MOVES OF THE MACHINE

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

### PLACE OF THE MACHINE



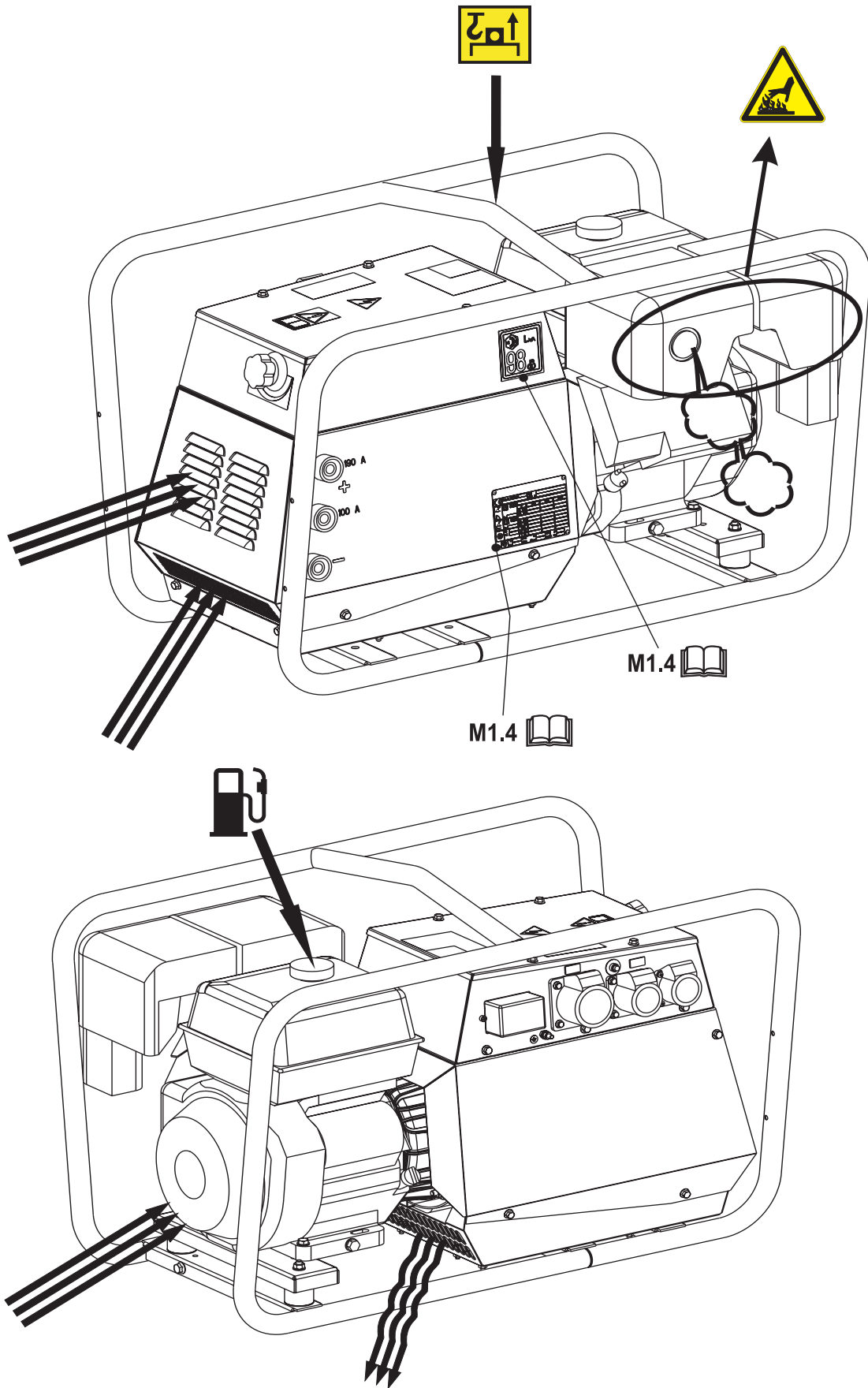
## ATTENTION



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

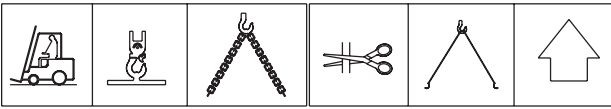
Please do not use the machine in weather conditions which are beyond IP protection shown both in the data plate and on page named "technical data" in this same manual.





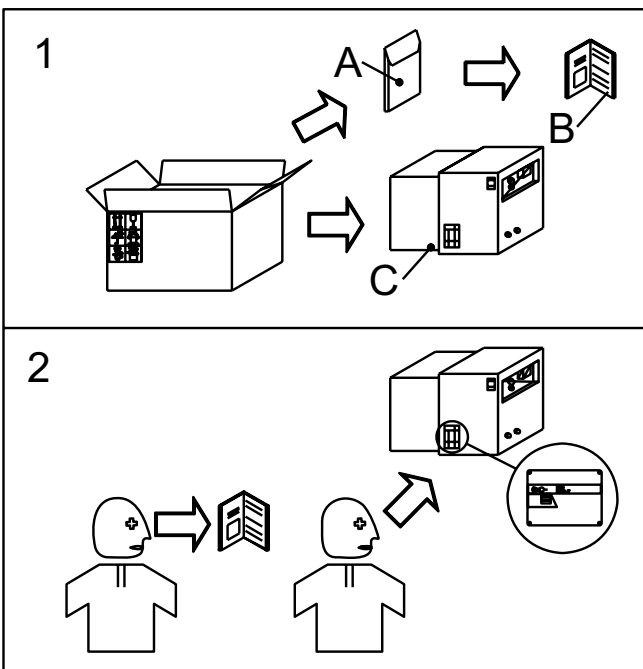
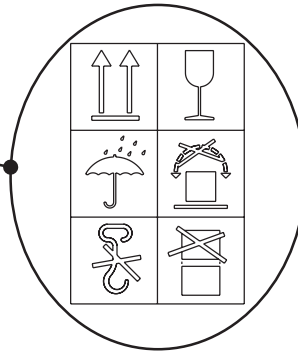
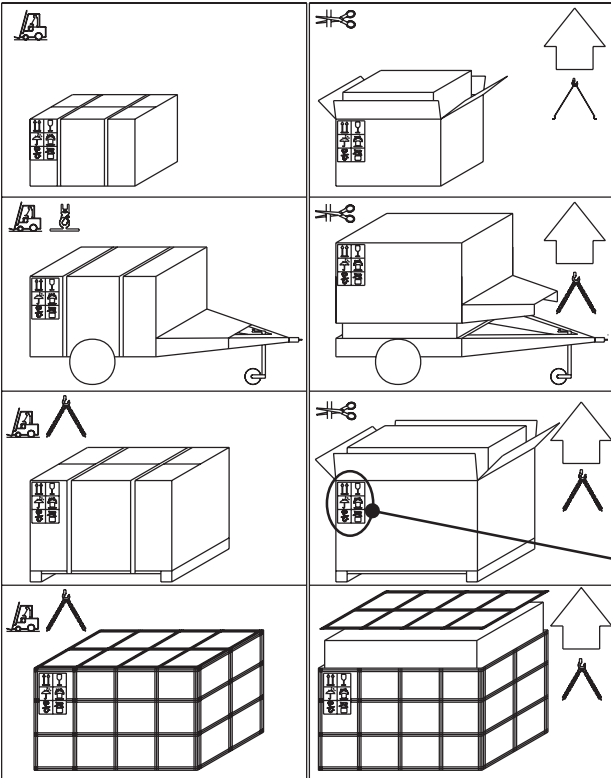


## NOTE



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

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



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







**NOTE**

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

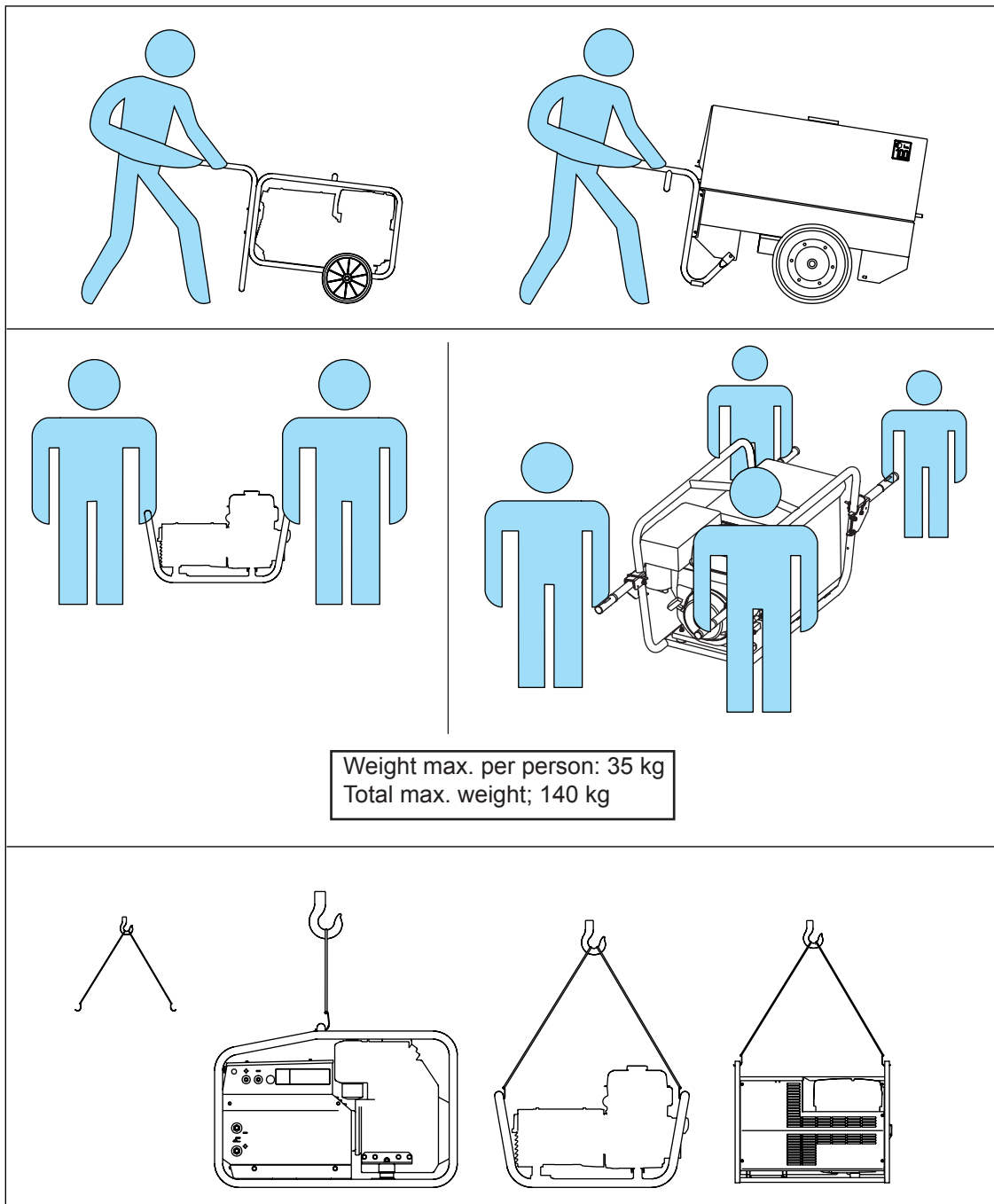
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conform to local rules and regulations.

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 CTM accessory).**

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



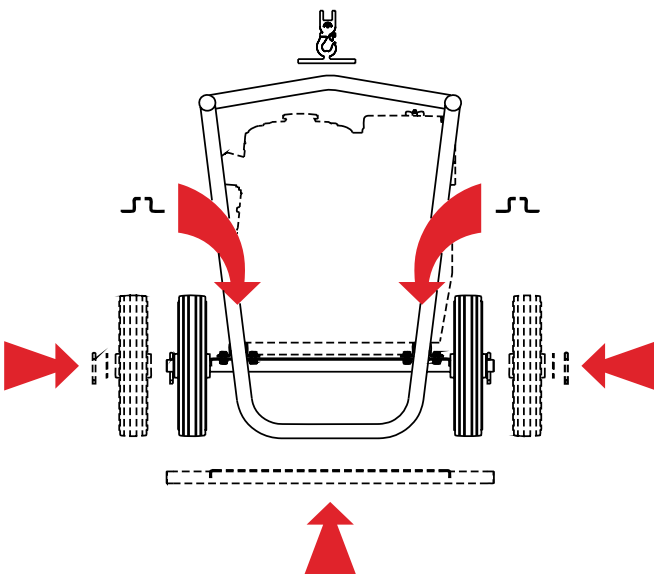
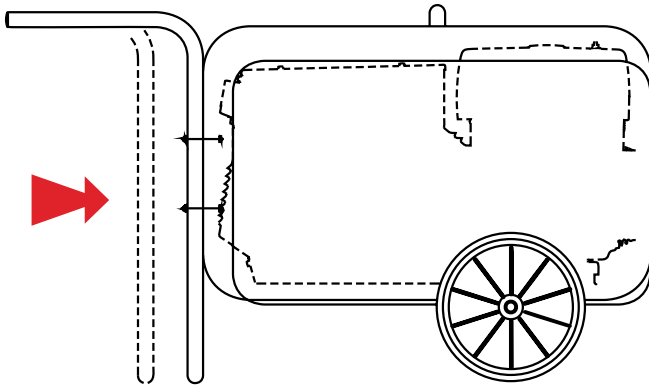
Weight max. per person: 35 kg  
Total max. weight; 140 kg



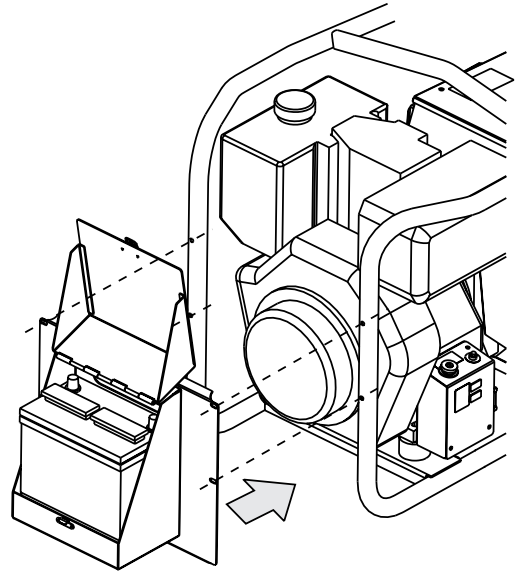
## ATTENTION

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

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



PB3





## 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



Check the level of the engine oil using the (appropriate oil dipstick: the level should be between the minimum and maximum marks.

If necessary, add more oil through the appropriate inlet

## OIL RECOMMENDED

MOSA advises to choose **AGIP** for the type of oil.

Please keep to the label put on the engine for the recommended products.

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

**NOTE:** before starting and switching off, see instructions in the engine owner's manual herewith attached.



## FUEL

Check the level of fuel in the tank and, if necessary, add unleaded gasoline.

For further information regarding the fuel which has to be used, see instructions in the engine owner's manual herewith attached.



If during the filling of the tank some gasoline is accidentally spilled around the engine chassis, clean it immediately before starting up the engine.

## ENGINE WITH OIL ALERT DEVICE

The OIL ALERT device will stop the engine in case of no oil or insufficient amount of oil in the engine.

In case one tries to start the engine with oil below the minimum level, the warning light (when assembled) will light and the device will not allow starting.



## CLEANING OF 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.



## GROUND CONNECTION

It is **obligatory** to connect the ground connection point (12) by means of a sure efficient cable (please follow the installation local rules and/or regulations in force) in order to integrate or ensure the working of various electric protection devices referring to the several distribution systems TN.

*The unit can be started only when the above operations have been correctly performed.*



Check daily

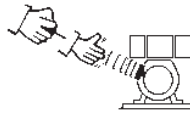


Pull the rope hard and fast. Pull it all the way out. Use two hands if necessary.



**NOTE**

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



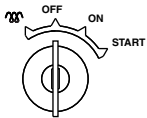
Then returning it slowly.

**ENGINES WITH ELECTRIC START**

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

Check the battery connection with the respective terminals (+) (-).

Open the gasoline cock; use the starter if the engine is cold and the temperature is low.



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 is started, with the starter off, let it turn for a few minutes before drawing the load.

Accelerate the machine by means of the right lever (16), when it is assembled.

**ENGINE WITH NO ELECTRIC START**

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

Open the gasoline cock; use the starter if the engine is cold and the temperature is low.



Hold the starting handle firmly.

Once the engine is started, with the starter off, let it turn for a few minutes before drawing the load.

Accelerate the machine by means of the right lever (16), when it is assembled.

**EMERGENCY START**

(with rope)

In the versions with electric start, in case of need, it is possible to start the engine with the rope.



**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.*



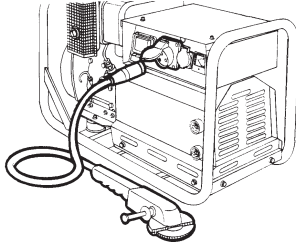
**CAUTION**

**RUNNING-IN**

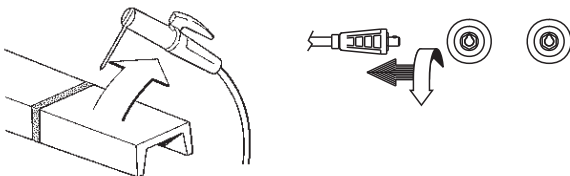
*During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently., in any case please stick to the rules given in the engine use manual.*

☞ 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).

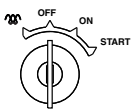


### **ENGINES WITH ELECTRIC START**

☞ Make sure that the machine is not under load.

Wait for a few minutes to allow the engine to cool down, anyway follow the instructions contained in the engine manual.

Shut the gasoline cock.



Take out the key (Q1), turning it counter clockwise (when assembled) or pressing the stop button (32) until the engine stops.

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

### **ENGINES WITHOUT ELECTRIC START**

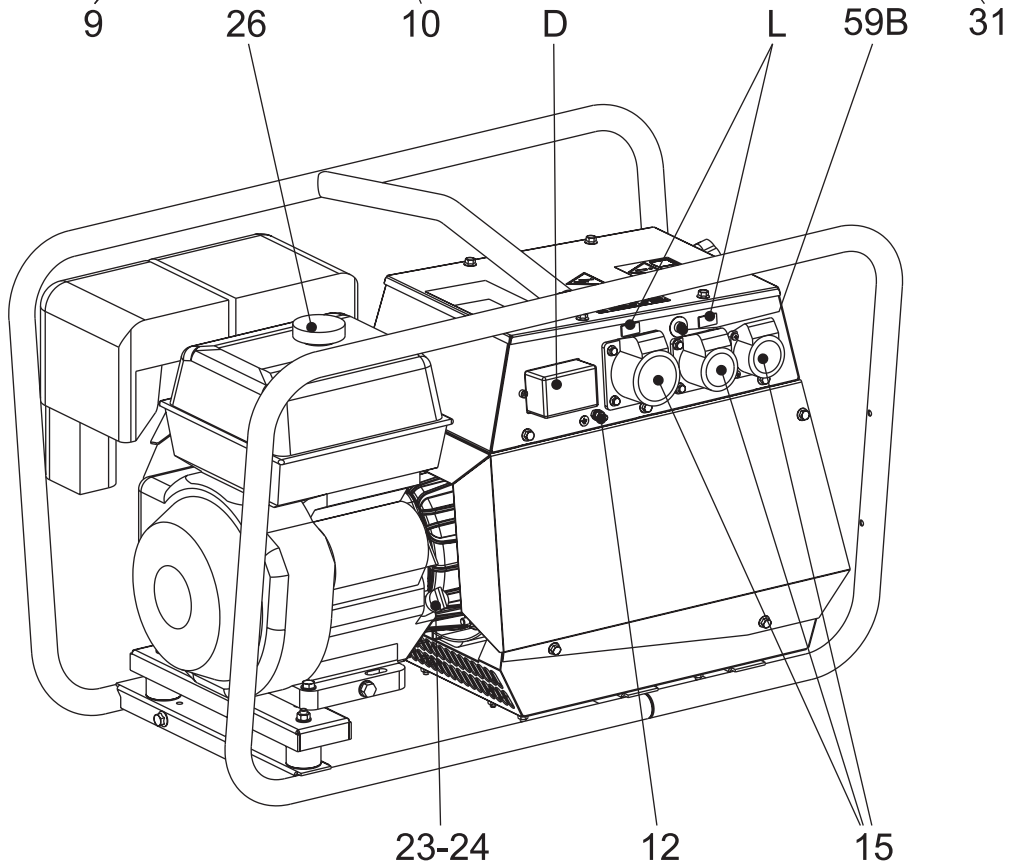
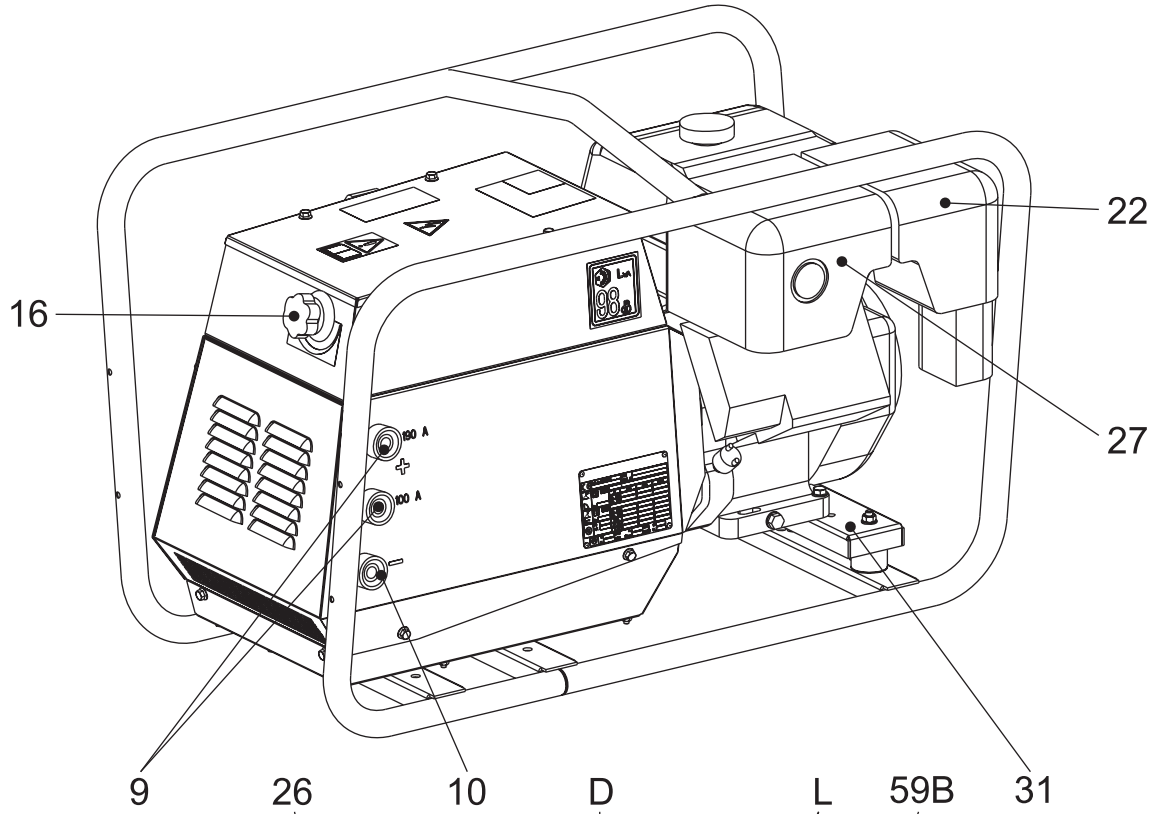
☞ Make sure that the machine is not under load.

Wait for a few minutes to allow the engine to cool down, take however into consideration the prescriptions given in the engine use manual.

Shut the gasoline cock.

Set the engine switch (32) to the OFF position.

4A	Hydraulic oil level light	A4	Button indicating light 30 l/1' PTO HI	W5	Battery voltmeter
9	Welding socket ( + )	B2	Engine control unit EP2	X1	Remote control socket
10	Welding socket ( - )	B3	E.A.S. connector	Y3	Button indicating light 20 l/1' PTO HI
12	Earth terminal	B4	Exclusion indicating light PTO HI	Y5	Commutator/switch, serial/parallel
15	A.C. socket	B5	Auxiliary current push button	Z2	Thermal-magnetic circuit breaker
16	Accelerator lever	C2	Fuel level light	Z3	Selection push button 20 l/1' PTO HI
17	Feed pump	C3	E.A.S. PCB	Z5	Water temperature indicator
19	48V D.C. socket	C6	Control unit for generating sets QEA		
22	Engine air filter	D	Ground fault interrupter ( 30 mA )		
23	Oil level dipstick	D1	Engine control unit and economiser EP1		
24	Engine oil reservoir cap	D2	Ammeter		
24A	Hydraulic oil reservoir cap	E2	Frequency meter		
24B	Water filling cap	F	Fuse		
25	Fuel prefilter	F3	Stop switch		
26	Fuel tank cap	F5	Warning light, high temperature		
27	Muffler	F6	Arc-Force selector		
28	Stop control	G1	Fuel level transmitter		
29	Engine protection cover	H2	Voltage commutator		
30	Engine cooling/alternator fan belt	H6	Fuel electro pump		
31	Oil drain tap	H8	Engine control unit EP7		
31A	Hydraulic oil drain tap	I2	48V A.C. socket		
31B	Water drain tap	I3	Welding scale switch		
31C	Exhaust tap for tank fuel	I4	Preheating indicator		
32	Button	I5	Y/▲ switch		
33	Start button	I6	Start Local/Remote selector		
34	Booster socket 12V	I8	AUTOIDLE switch		
34A	Booster socket 24V	L	A.C. output indicator		
35	Battery charge fuse	L5	Emergency button		
36	Space for remote control	L6	Choke button		
37	Remote control	M	Hour counter		
42	Space for E.A.S.	M1	Warning level light		
42A	Space for PAC	M2	Contactora		
47	Fuel pump	M5	Engine control unit EP5		
49	Electric start socket	M6	CC/CV switch		
54	Reset button PTO HI	N	Voltmeter		
55	Quick coupling m. PTO HI	N1	Battery charge warning light		
55A	Quick coupling f. PTO HI	N2	Thermal-magnetic circuit breaker/ Ground fault interrupter		
56	Hydraulic oil filter		Pre-heat push-button		
59	Battery charger thermal switch	N5	Connector - wire feeder		
59A	Engine thermal switch	N6	Oil pressure warning light/Oil alert		
59B	Aux current thermal switch	O1	Welding arc regulator		
59C	Supply thermal switch wire feeder- 42V	P	Starter key		
59D	Pre-heater (spark plug) thermal switch	Q1	Derivation box		
59E	Supply thermal switch oil/water heater	Q3	Battery charge sockets		
59F	Electropump thermal switch	Q4	Welding selector mode		
63	No load voltage control	Q7	Siren		
66	Choke control	R3	Welding ammeter		
67A	Auxiliary / welding current control	S	Battery		
68	Cellulosic electrodes control	S1	Engine control unit EP4		
69A	Voltmeter relay	S3	Wire feeder supply switch		
70	Warning lights	S6	Plug 230V singlephase		
71	Selecting knob	S7	Welding current regulator		
72	Load commut. push button	T	Dirty air filter warning light/indicator		
73	Starting push button	T4	Earth leakage relay		
74	Operating mode selector	T5	Analogic instrument V/Hz		
75	Power on warning light	T7	Current transformer		
76	Display	U	R.P.M. adjuster		
79	Wire connection unit	U3	Polarity inverter remote control		
86	Selector	U4	Release coil		
86A	Setting confirmation	U5	Engine control unit EP6		
87	Fuel valve	U7	Welding voltage voltmeter		
88	Oil syringe	V	Polarity inverter control		
A3	Insulation monitoring	V4	Oil pressure indicator		
		V5	Remote control switch		
		W1	Selection push button 30 l/1' PTO HI		
		W3			







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.



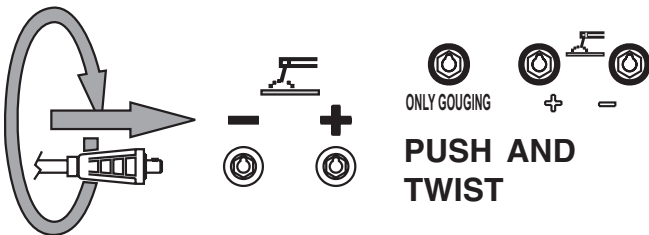
**ATTENTION**

The areas, access of which is forbidden 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 efficient (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-) turning 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)**

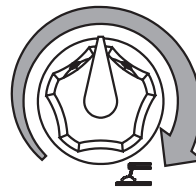
See page M 39.1

**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 mm<sup>2</sup>; with 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**

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.

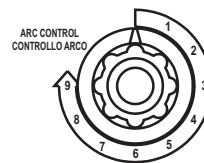
**"CC/CV" MODELS**



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 (P) so as to obtain, 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 available 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.

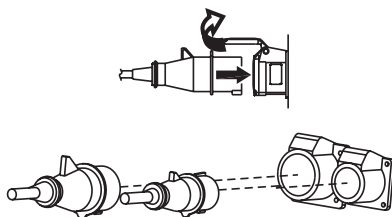
Make sure the unit is properly grounded (12) (where it is assembled).  
- See page M20, 21, 22, 25, 26, 27 -.

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 adequate 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 be at its maximum, or the fuse of the relevant socket. (single-phase) or the thermoprotection.

Using several sockets at the 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.



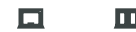
**CAUTION**

*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 the load 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.



CIRCUIT BREAKER

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.



Avoid 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 front side of machine.

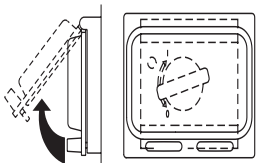
The voltmeter will show the auxiliary voltage which, for machines at 1500/1800 RPM, must. be approx.  $\approx 230V \pm 10\%$  and for machines at 3000/3600 RPM (engine idling) must. be approx.  $\approx 180V \pm 10\%$ .

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

**MACHINE WITHOUT PROTECTIVE DEVICE**

In case machine is not equipped with protective device of indirect contacts, by means of automatic breaking of supply, it is **necessary** to put between the load and the generation a differential switch 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 harmonized by directive Nr. 72/23/EEC.

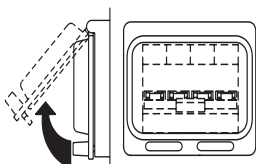
**UNIT FITTED WITH GROUND FAULT INTERRUPTER SWITCH (GFI)**



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**

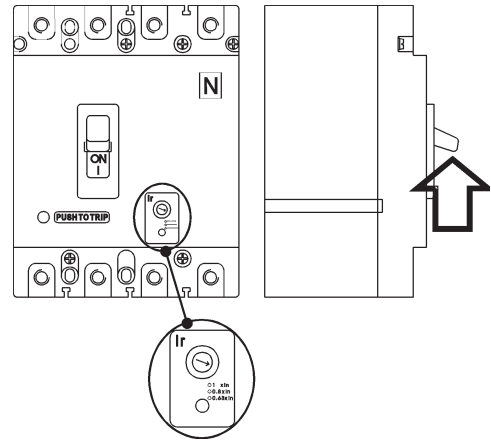


Turn on the thermal magnetic breaker (Z2) by pushing it to the ON position.

The thermal-magnetic breaker is a safety device which protects the 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 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.

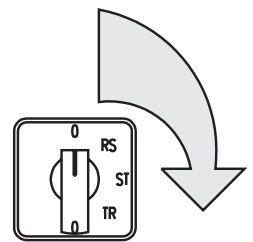
**UNIT FITTED WITH GFI SWITCH THERMAL MAGNETIC BREAKER**



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 -



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  2) Problem with welding current control (PCB)	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) If the diode bridge is OK replace the PCB.
Intermittently welds poorly	1) Bad connections to welding current PCB  2) Problem with welding current control PCB	1) Check that the pins of the green connectors are clean and making good contact. Check that shunt connections are tight.  2) Replace the welding current control PCB
No welding output and no auxiliary power output	1) Short circuit in wiring  2) Defective condenser  3) Defective stator  4) Short circuited diode bridge	1) Check the wiring inside the welder for a short circuit between cables or to ground.  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) 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) 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.





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

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

### GASOLINE ENGINE

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

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

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

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

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

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

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

### DIESEL ENGINE

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

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

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

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

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



## IMPORTANT



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

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

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

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

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

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

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

**Particular attention must be paid when getting rid of:**



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

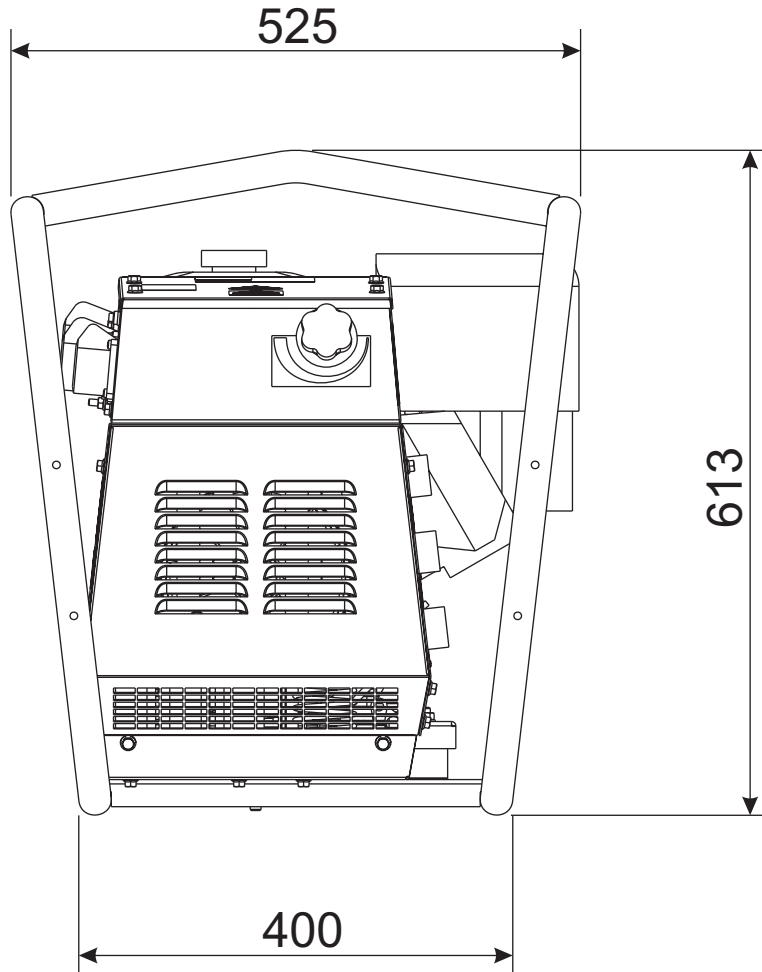
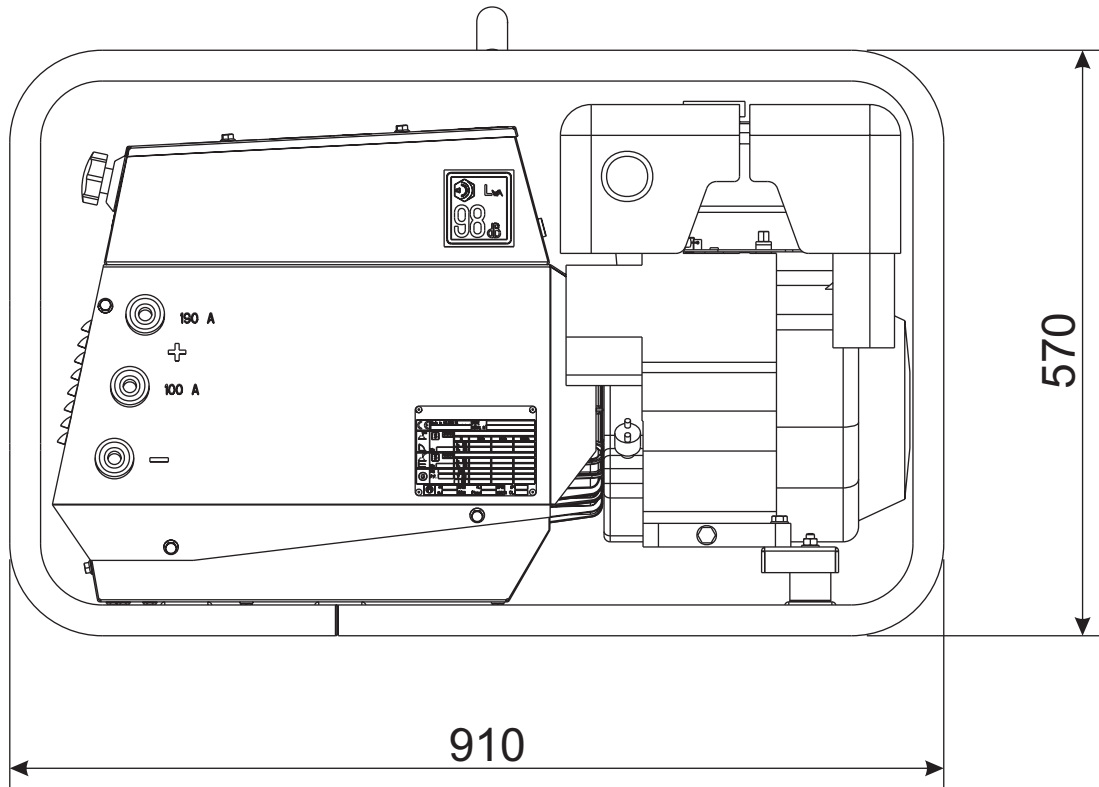
The machine user is responsible for the observance of the norms concerning the environment conditions with regard to the elimination of the machine being cust off and of all its components.

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

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

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

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





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

#### RUTILE ELECTRODES: E 6013

Easily removable fluid slag, suitable for welding in all position.  
 Rutile electrodes weld in d.c. with both polarities (electrode holder at + or -) and in a.c..  
 Suitable for soft steels R-38/45 kg/mm<sup>2</sup>. Also for soft steels of lower quality.

#### BASIC ELECTRODES: E 7015

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

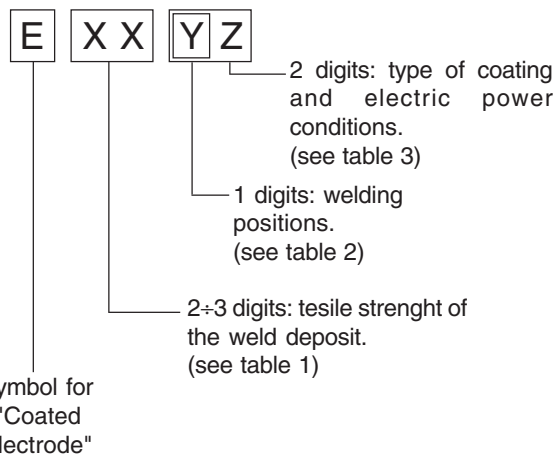
#### HIGH YIELD BASIC ELECTRODES: E 7018

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

#### CELLULOSIC ELECTRODES: E 6010

Cellulosic electrodes weld only in d.c. with polarity + electrode holder - ground clamp.  
 Special for steels run on pipes with R max 55 kg/mm<sup>2</sup>. Weld in all position. volatile slag.

## ELECTRODES IDENTIFICATION ACCORDING TO A.W.S. STANDARDS



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

Table 1

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

Table 2

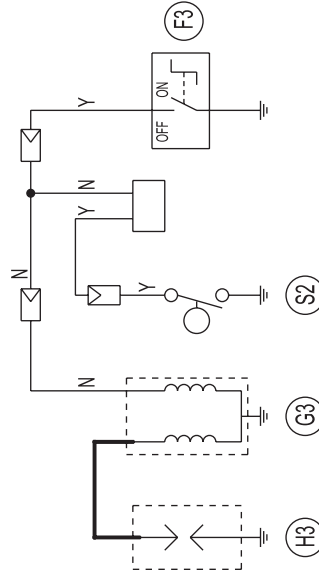
N°	Descrizione
10	Cellulose electrodes for d.c.
11	Cellulose electrodes for a.c.
12	Rutile electrode for d.c.
13	Rutile electrode for a.c.
14	High yield rutile electrodes
15	Basic electrodes for d.c.
16	Basic electrodes for a.c.
18	High yield basic electrodes for d.c. (inverse polarity)
20	Acid electrodes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

Table 3

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

**MOTORI HONDA  
HONDA ENGINES**

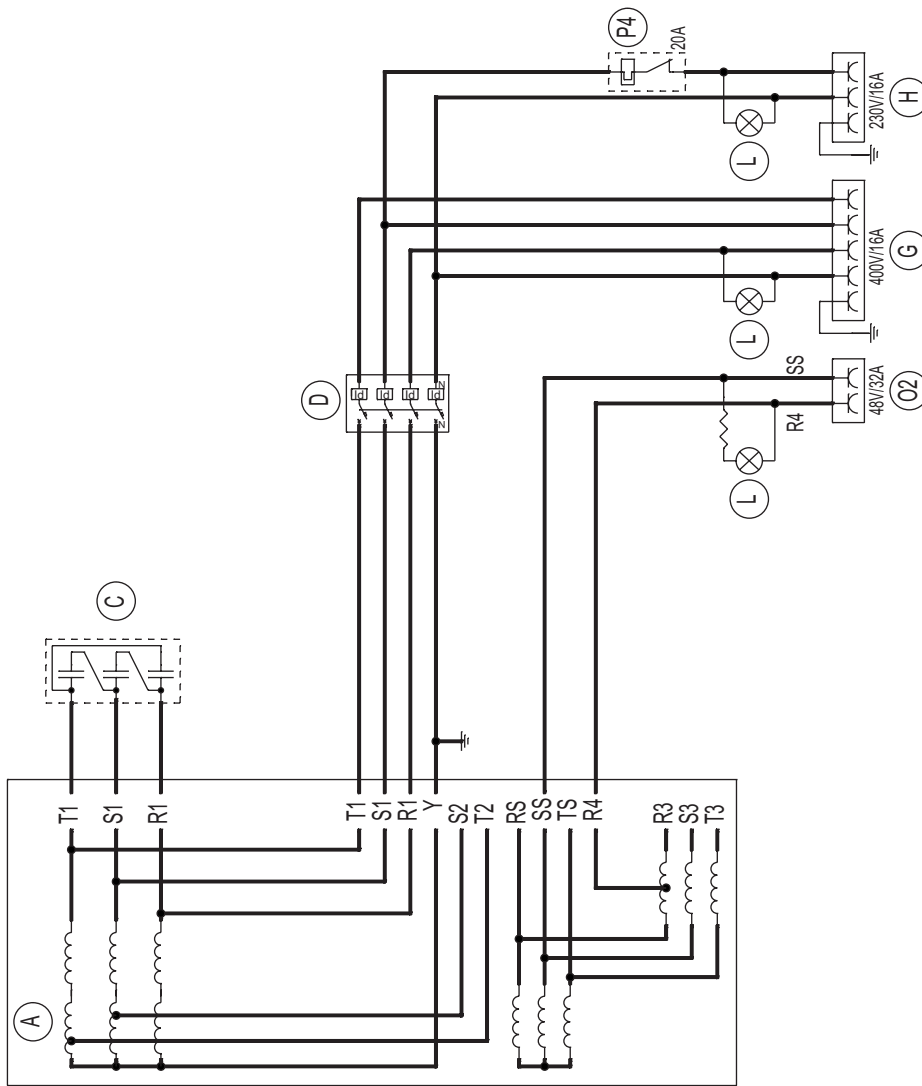
**AVVIAMENTO A STRAPPO  
MANUAL RECOIL STARTER**



LEGENDA COLORI KEY COLOR	
B	NERO/BLACK
Y	GIALLO/YELLOW

Esp.	Modifica	Data	Dis.	Appr.
	Denominazione: Engine Honda (manual recoil starter-oil alert)	Progetto: 23212.ptg	Pag.n° 2	di n° -
	Macchina: --	Disegnato: Leporace N.	Dis.n°: 23212.S.010	Approvato: <i>[Signature]</i>
		Data: 20/12/2000		

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



A Sostituito alternatore (A) con nuovo avvolgimento senza carica batteria.		16.11.2006		N.L.	
Esp.:	Modifica:	Data:	Dis.:	Dis.:	Dis.:
Exib.:	Modificazion:	Date:	Desi.:	Desi.:	Desi.:
MOSA		Aux. (400T/230M/48M) DT		27272.prg	
Da Pag.:	Denominazione:	Dis. n.°:	Progetto:	Page n.°:	Page n.°:
From Page:	Denominazion:	Dwg. n.°:	Project:	3	4
MOSA		27272.S.020-A		Approvato:	
20090-CUSAGO (MI)-ITALY	Macchina:	Dis. n.°:	Approvato:	Approvato:	
<a href="http://www.mosa.it">http://www.mosa.it</a>	Machine:	Dwg. n.°:	Approvato:	Approvato:	
TS 200 DES/CF		Leporace N.:	Approvato:	Approvato:	
La MOSA si riserva a termini di legge la proprietà del presente disegno con divieto di riproduzione o comunicazione a terzi senza sua autorizzazione.					





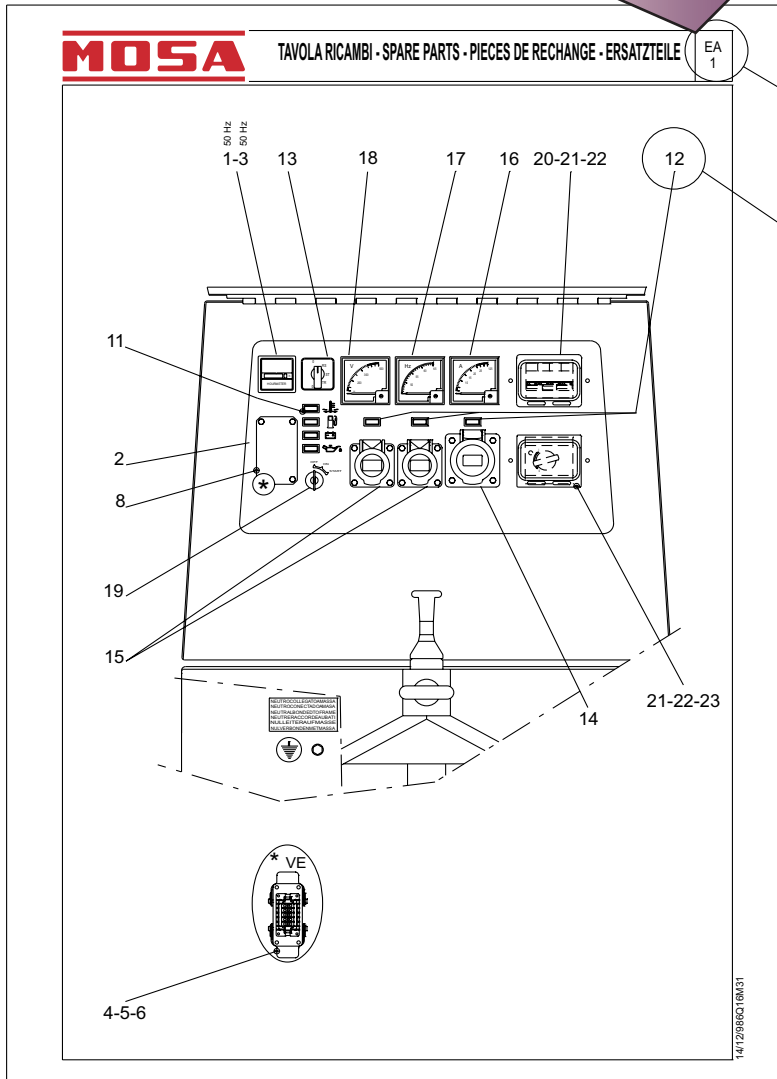
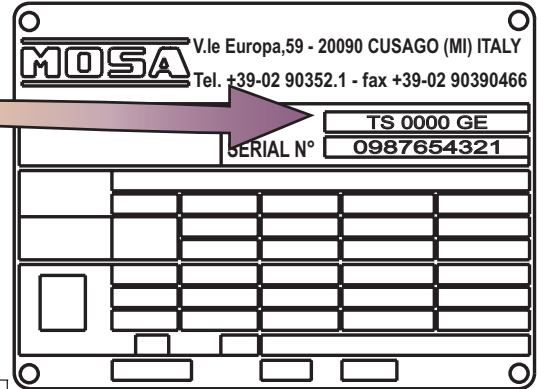
**MOSA guarantees that any request for spare parts will be satisfied.**

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. \*

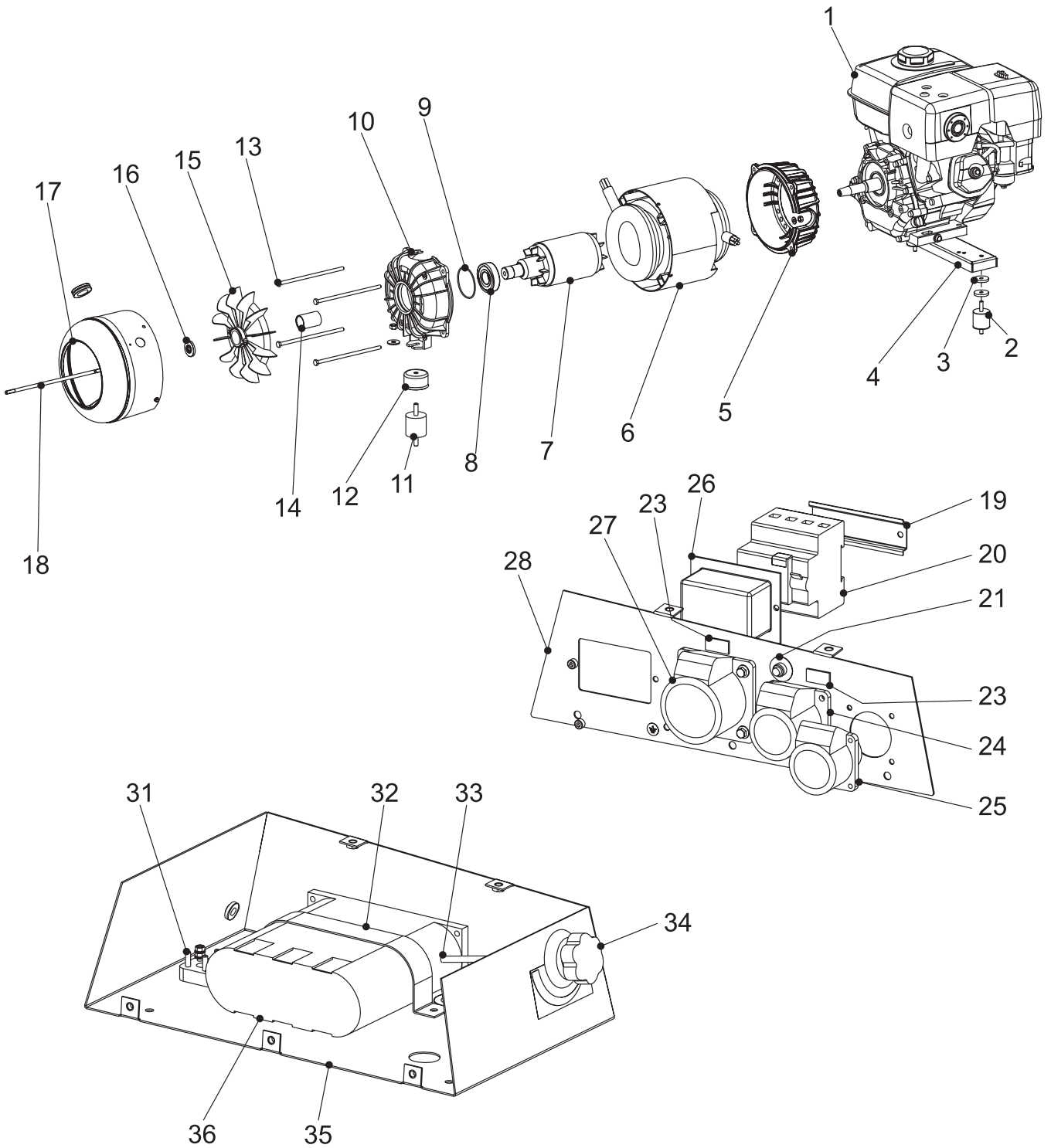
**When ordering the spare parts, it is recommended to indicate:**

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



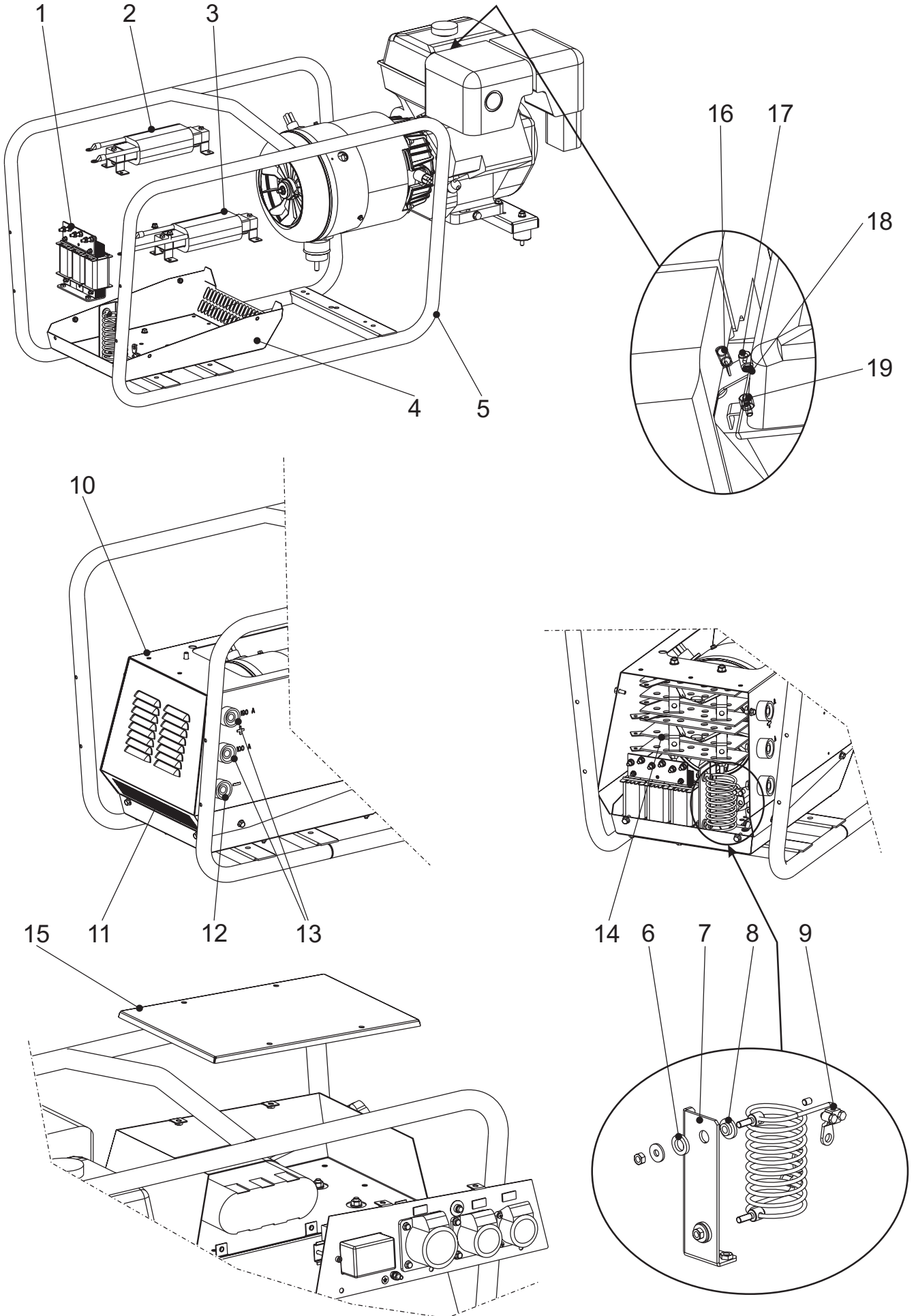
**ABBREVIATIONS AND SYMBOLS:**

- (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



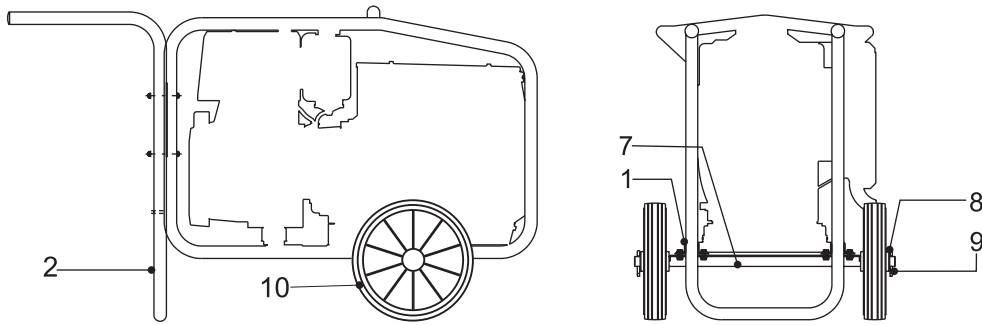


Pos.	Rev.	Cod.	Descr.	Note
1		M272612200	MOTORE HONDA / HONDA ENGINE	Fino al/Up to REV.2-05/07-Del.216/08-12/12/08
1		M256702200	MOTORE HONDA GX 390 / HONDA ENGINE GX 390	Da /From REV.3-03/11 Del.216/08 del 12/12/08
2		M102041250	ANTIVIBRANTE / VIBRATION-DAMPER	
3		M306202038	RONDELLA / WASHER	
4		M272502035	TRAVERSA SUPPORTO MOTORE / ENGINE SUPPORT BRACKET	
5		M232123040	FLANGIA ATTACCO MOTORE / FLANGE FIXING ENGINE	
6		M272703025	STATORE AVVOLTO / STATOR	Fino al/Up to REV.1-11/06-Del.202/06 del 20/11/06
6		M272723025	STATORE AVVOLTO / STATOR	Da /From REV.2-05/07 Del.202/07 del 20/11/06
7		M232123030	ALBERO CON ROTORE / SHAFT WITH ROTOR	
8		M1001030	CUSCINETTO / BEARING	
9		M1018100	ANELLO OR / OR RING	
10		M105913045	FLANGIA PORTA ALTERNATORE / FLANGE, ALTERNATOR HOLDER	
11		M105112020	ANTIVIBRANTE / VIBRATION DAMPER	
12		M307012037	PROTEZIONE ANTIVIBRANTE / PROTECTION, VIBRATION-DAMPER	
13		M107011280	TIRANTE / TIE - ROD	
14		M105311370	DISTANZIALE / SPACER	
15		M105111290	VENTOLA CON FASCETTA / FAN	
16		M105311380	RONDELLA / WASHER	Fino al/Up to REV.0-10/98 Del.91/06 del 07/06/06
16		M356403038	RONDELLA / WASHER	Da /From REV.1-11/06 Del.91/06 del 07/06/06
17		M272506010	CONVOGLIATORE ARIA / AIR DUCT	
18		M232123036	TIRANTE / TIE-ROD	
19		M232027036	GUIDA / FIXING GUIDE	
20		M105111540	Vedi Cod.219937105 / See part no. 219937105	
21		M306467107	DISGIUNT. TERMICO / THERMOPROTECTION	
23		M1302220	SPIA 230V / WARNING LIGHT 230V	Fino al/Up to REV.2-05/07-Del.52/08-03/03/08
23		M1302530	SPIA 230V / WARNING LIGHT 230V	Da /From REV.3-03/11 Del.52/08 del 03/03/08
24		M307017240	PRESA 220V 16A / EEC SOCKET 16A, 220V 2P+T	
25		M218137280	PRESA CEE 48V 32A / EEC SOCKET 48V 32A	
26		M232027130	CAPPUCCIO PROTEZIONE I.D. / CAP	
27		M305907270	PRESA CEE 16A 400V 3P+N+T / EEC SOCKET 16A 400V 3P+N+T	
28		M272507020	PANNELLO FRONTALE / FRONT PANEL	
31		M218017226	MORSETTIERA / TERMINAL BOARD	
32		M307017037	STAFFA / BRACKET	
33		M272519105	COMANDO ACCELERATORE / THROTTLE CABLE	
34		M109019702	MANOPOLA / HAND GRIP	
35		M272507010	SCATOLA ELETTRICA / ELECTRICAL BOX	
36		M307809880	BOX CONDENSATORI 3X80 UF / CAPACITOR BOX 3X80 UF	

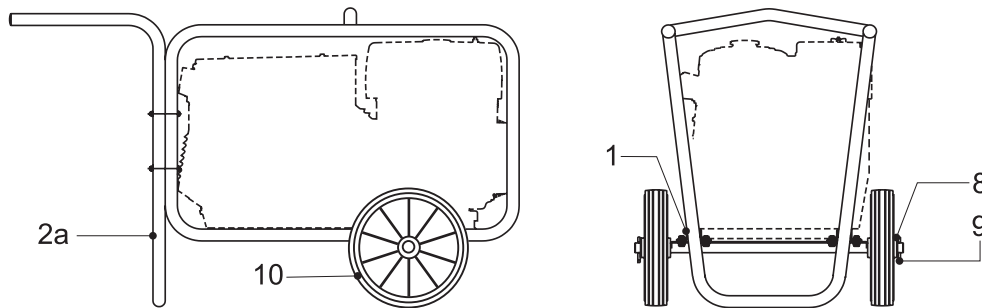


<i>Pos.</i>	<i>Rev.</i>	<i>Cod.</i>	<i>Descr.</i>
1		M272704120	REATTORE TRIFASE
2		M272704100	REATTORE DI LIVELLO
3		M220014100	REATTORE COMPLETO
4		M272708205	SCATOLA DI BASE
5		M272501050	BARELLA
6		M107814013	RONDELLA ISOLANTE
7		M271704020	SUPPORTO
8		M107815043	BOCCOLA ISOLANTE
9		M271704010	RESISTORE
10		M272708005	CARENATURA
11		M272708235	GRIGLIA DI ASPIRAZIONE
12		M102044400	PRESA DI SALDATURA (-)
13		M102301310	PRESA DI SALDATURA (+)
14		M272705100	PONTE DIODI
15		M272707015	COPERCHIO SCATOLA ELETTRICA
16		M271722305	MOLLA DI TRAZIONE
17		M271742252	NOTTOLINO FERMO GUAINA
18		M6056020	ANELLO
19		M271742244	MORSETTO PER FUNE COMANDI

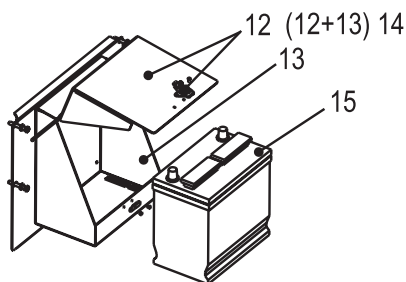
<i>Pos.</i>	<i>Rev.</i>	<i>Cod.</i>	<i>Descr.</i>
1		M272704120	REACTOR
2		M272704100	LEVEL REACTOR
3		M220014100	COMPLETE REACTOR
4		M272708205	CASE, BOTTOM HALF
5		M272501050	FRAME
6		M107814013	WASHER
7		M271704020	SUPPORT
8		M107815043	BUSH
9		M271704010	RESISTOR
10		M272708005	FRAME
11		M272708235	INTAKE GRATE
12		M102044400	WELDING SOCKET (-)
13		M102301310	WELDING SOCKET (+)
14		M272705100	DIODE BRIDGE ASSY
15		M272707015	COVER ELECTRICAL BOX
16		M271722305	SPRING
17		M271742252	STOP PAWL
18		M6056020	RING
19		M271742244	TERMINAL



Pos.	Rev.	Cod.	Descr.	Descr.	Note
1		107012150	CAVALLOTTO	U-BOLT	
2		107012130	MANIGLIA	HANDLE	
7		205311160	ASSALE	AXLE	
8		205311180	RONDELLA	WASHER	
9		6075020	COPIGLIA	PIN, SPLIT	
10		105311650	RUOTA	WHEEL	



Pos.	Rev.	Cod.	Descr.	Descr.	Note
1		107012150	CAVALLOTTO	U-BOLT	
2a		208101051	MANIGLIA	HANDLE	
7		205311160	ASSALE	AXLE	
8		205311180	RONDELLA	WASHER	
9		6075020	COPIGLIA	PIN, SPLIT	
10		105311650	RUOTA	WHEEL	



Pos.	Cod.	Descr.	Descr.	Note
12	256020549	GR.COPERCHIO COMPLETO	COMPLETE COVER	
13	256029168	CESTELLO PORTABATTERIA	BATTERY HOLDER	
14	256029160	CESTELLO P/BATT.+COPERCHIO	BATTERY HOLDER WITH COVER	
15	209509150	BATTERIA	BATTERY	(fino a/up to REV.0 04/97 Del. 74/05 del 15/07/05)
15	372859150	BATTERIA	BATTERY	(da/from REV.1 10/05 Del. 74/05 del 15/07/05)