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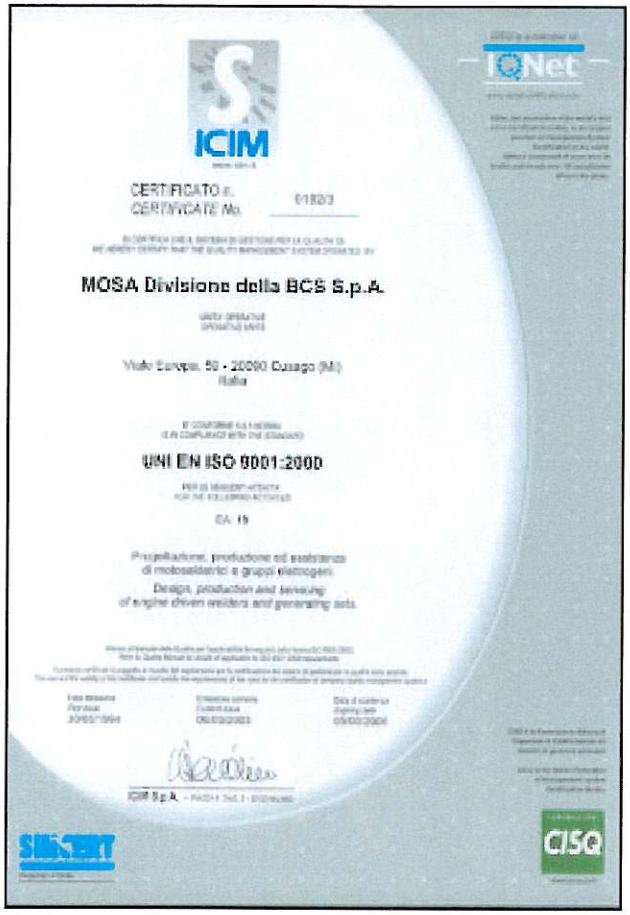
preparato da UPT
approvato da DITE


IQNet
THE INTERNATIONAL CERTIFICATION NETWORK
CERTIFICATE
CSQ/ICIM
hereby certify that the organization
MOSA Divisione della BCS S.p.A.
Viale Europa, 59
I-20090 CUSAGO (MI)
for the following field of activities
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: 2003-03-28
Validity date: 2006-03-28
Registration Number: IT-3722
President of IQNet
President of CSQ


ICIM
CERTIFICATO n.
CERTIFICATE No. 0192/3
MOSA Divisione della BCS S.p.A.
Viale Europa, 59 - 20090 Cusago (MI)
Italia
UNI EN ISO 9001:2000
CSQ

ISO 9001:2000 - Cert. 0192/3

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

INDEX (for all MOSA models)

⚠ 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.*

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.

Tel.: 02 - 90352.1
Fax: 02 - 90390466
e-mail : info@mosa.it
www.mosa.it

MOSA
Divisione della BCS S.p.A.
V.le Europa 59 - 20090 Cusago (Mi) - Italia

ICIM CISQ IQNet
ISO 9001:2000 - Cert. 0192/3

DICHIARAZIONE DI CONFORMITA'

CE

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

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

Modello/Modèle/Model/Modell/Model/Modelo: _____

Codice/ Code/ Code/ Kode/ Code/ Codigo: _____

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

98/37/CE - 73/23/CE - 89/336/CE - 2000/14/CE

per la verifica sono state considerate le seguenti norme armonizzate, Norme nazionali e internazionali:
pour la vérification de la conformité ont été consultées les normes harmonisées suivantes, normes nationales et internationales:
to check the conformity, the following harmonized norms, national and international norms, have been consulted:
zur Prüfung hat man die folgenden übereinstimmenden nationalen und internationalen Normen herangezogen:
ter verificatie van de overeenkomst, zijn de volgende geharmoniseerde normen, nationaal en internationaal, geconsulteerd:
para su verification se han tenido en cuenta las Normas armonizadas, Normas nacionales e internacionales:

Norme armonizzate - normes harmonisées - harmonized norms - übereinstimmende Normen
geharmoniseerde normen - Normas armonizadas:
EN 292-1 EN 292-2
EN 60204-1
EN 50199 EN 60974-1 (Solo per modelli - Seulement pour les modèles - Only for models - nur für die Modelle - Alleen voor de modellen - Sólo para modelos: **TS**)
EN 50081-2 EN 50082-2

Altre norme - autres normes - other norms - andere Normen - andere normen - otras normas:
ISO 8528 (Solo per modelli - Seulement pour les modèles - Only for models - nur für die Modelle - Alleen voor de modellen - Sólo para modelos: **GE**)

Ing. Benso Marelli
Direttore Generale

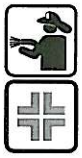
Cusago, _____

MM 065.2.doc

CE The CE mark (European Community) certifies that the product complies with the essential safety requirements provided by the applicable COMMUNITY DIRECTIVES. In the Conformity Declaration are reported the HARMONIZED NORMS and not, used for the checking.

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

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

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

Use only with safety protections, specifically suitable

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

Use only with safety protections -

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

Use only with safety protections -

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

Use only with safety protections -

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

°C: temperature Celsius grades
10:10 kVA synchronous (wording example)
10000:10 kVA asynchronous (wording example)
A: Ampere
A: ADIM engine
atm: pressure
B: pretrol
BAT: battery
BC: base current
C.A.(c.a.): alternating current
C.B.: battery charger
C.C.(c.c.): direct current
cc: cm^3 (volume)
CE: European norm conformity
CF: special for pipe welding
CTL: slow touring trolley
CTM CTV: fast touring trolley: hand touring trolley
D: diesel
D: GFI
D: Deutz engine
E: electric start
EAS: automatic intervention panel for generating sets for connection to the mains
EL: electronic regulation, allows to use welder and generating set simultaneausly
EP1: automatic accelerator according to requestedpower, engine protection, low oil pressure, high temperature with engine stop, troble warning lights
EP2: engine protection, low oil pressure, hight temperature with engine stop, trouble warning lights
EP4: engine protection, low oil pressure, high temperature with engine stop, no battery charge, belt broken, low fuel level with engine stop, trouble warning lights
EP5: engine protection, low oil pressure, high temperature with engine stop, no battery charge, belt broken, low fuel level with engine stop, everspeed, trouble warning lights
ES: oil/temperature engine protection device
EV: electrovalve
g/kwh: grams/kilowatt hour (engine consumption)
GA: asynchronous alternator
GE: generating set
GHF: high frequency alternator
GS: synchronous alternator
h: hour meter (symbol)
H: Hatz engine
H: Honda engine
HI: hydraulic central
Hz: frequency
I: single-phase auxiliary generation (symbol 1~)
IP: protection grads for electric devices against acess to dangerous parts according to the IEC 529 norm (Internal Protection)
kg: kilogram (mass)
K: welding cables set
kVA: kilovolt ampere
kW: kilowatt (engine power)
kWh: kilowatt hour (energy)
l: liters (capacity)
L: Lombardini engine
Lwa: maximum acoustic (power level) according to the regulations in force
mm: millimeter (length) (measure)
m: meter (length)
mA: milliampere
MS-MSG: MOSA engine driven welder with high frequency alternator
MT: magnetothermic switch
MT: grounding kit
MTD: magnetothermic switch / GFI
OH: heater (engine oil) for generating sets
P: plus
PAC: power electric frame
PAR: device for double
PB: battery holder
PL: „pipe line" welding
PS: exhaust pipe extension
PW: welder for polyethylene and propylene pipes
QEA: automatic electric panel
QEM: manual electric panel
R: Ruggerini engine
RVT: voltage electronic regulator
S: symbol of EN 60974-1
S: Suzuki mengineotore
SKID: unit assembled on a base with no protection (no fairing)
S-SC: silenced (faired) - silenced compact (faired
SX-SXC: supersilenced (faired and sound prof) - supersilenced compact (faired and super sound prof)
T: thermic switch
TC-TCM-TCPL: remote control
TS: welder with asynchronous alternator
V: Volt
Y: Yanmar engine
Y: three-phase auxiliary generation (symbol 3~)

	CE Conformity CE	LWA EEC Sound power conformity	S EN 60974-1 conformity	Y Triphase 3 ~	I Singlephase 1 ~			Users' manual	Information	Various news

Equipment and optional

Engine	Gasoline engine	Diesel engine	Air cooling	Water cooling	Manual recoil	Electric start	Battery 12 V			
Engine protection	E V Engine protection	ES Engine protection	EP2 Engine protection	EP1 Engine protection	EP4 Engine protection	EP5 Engine protection	Siren	Engine shut down (oil)	Engine speed	
Engine alarms	Oil level indicator	Battery charger indicator	Fuel level gauge/low fuel	Low fuel indicator	Oil temperature	Warning light for preheating glow plugs	Air filter blockage	Belt breakage	Over speed	Control unit QEA
Generation	GA Asynchronous alternator	GS Synchronous alternator	GHF Generator high frequency	V Voltmeter	Hz Frequency-meter	A Ammeter	Compound	V Voltmeter phase selector	RVT Electronic Voltage regulator	Switch
Electric protection	MTD Circuit breaker/ Ground fault interrupter	MT Circuit breaker	D Ground fault interrupter	T Thermal shut off	Fuse	R< Isolation monitoring				
Generation use	Terminal strip	3 ~ CEE Socket 400/230V EEC	1 ~ CEE Socket 230/110/48V EEC	1~ Schuko Socket 230V Schuko	Socket 48V EEC	Battery charger	Engine booster			
Welding control	Arc control	Welding with covered electrode	Welding current electr. regulation	Base current diode bridge	Polarity inverter	CC/CV selector				
Various devices	h Hour counter	Ready for TC	Ground connection point	Emergency stop button	Central lifting eye					
Various	Standard equipment	Options on request					D.C.	~ A.C.	+ Plus	- Minus	Maintenance Time
Optionals	Trolley	Site tow	Welding cables	Remote control						

⚠ 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.

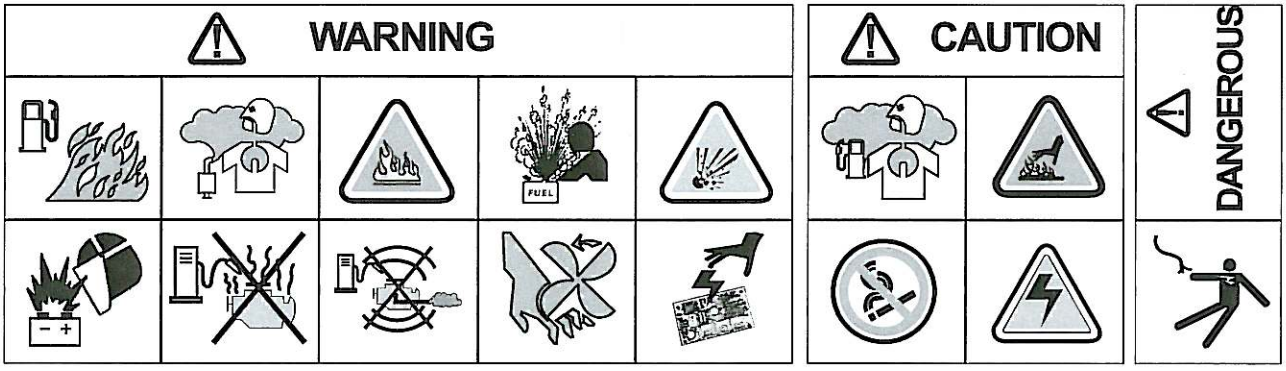
ENGINE	CHECKING BOARD
Stop engine when fueling	Do not touch electric devices if you are barefoot or with wet clothes.
Do not smoke, avoid flames, sparks or electric tools when fueling.	
Unscrew the cap slowly to let out the fuel vapours.	Always keep off leaning surfaces during work operations
Slowly 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.

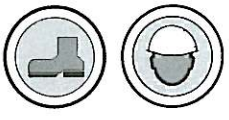
Skin contact	Wash with water and soap
Eyes contact	Irrigate with plenty of water, if the irritation persists contact a specialist
Ingestion	Do not induce vomit as to avoid the intake of vomit into the lungs, send for a doctor
Suction of liquids from lungs	If you suppose that vomit has entered the lungs (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***



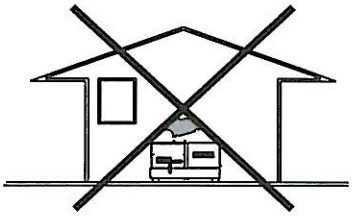
INSTALLATION AND ADVICE BEFORE USE

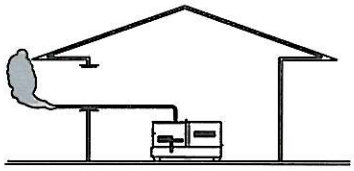
GASOLINE ENGINES

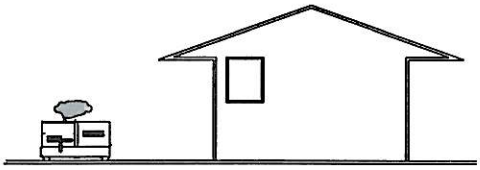
- Use in open space, air swept or vent exhaust gases, which contain the deathly carbone oxyde, far from the work area.

DIESEL ENGINES

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

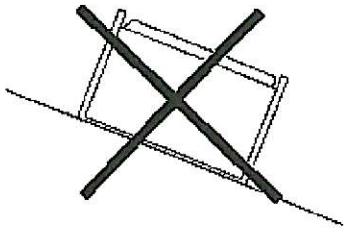




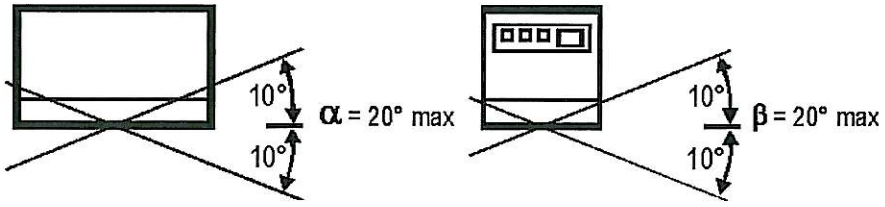


POSITION

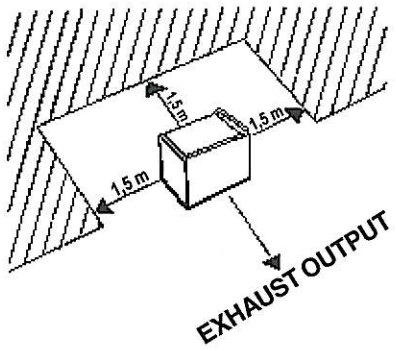
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



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.

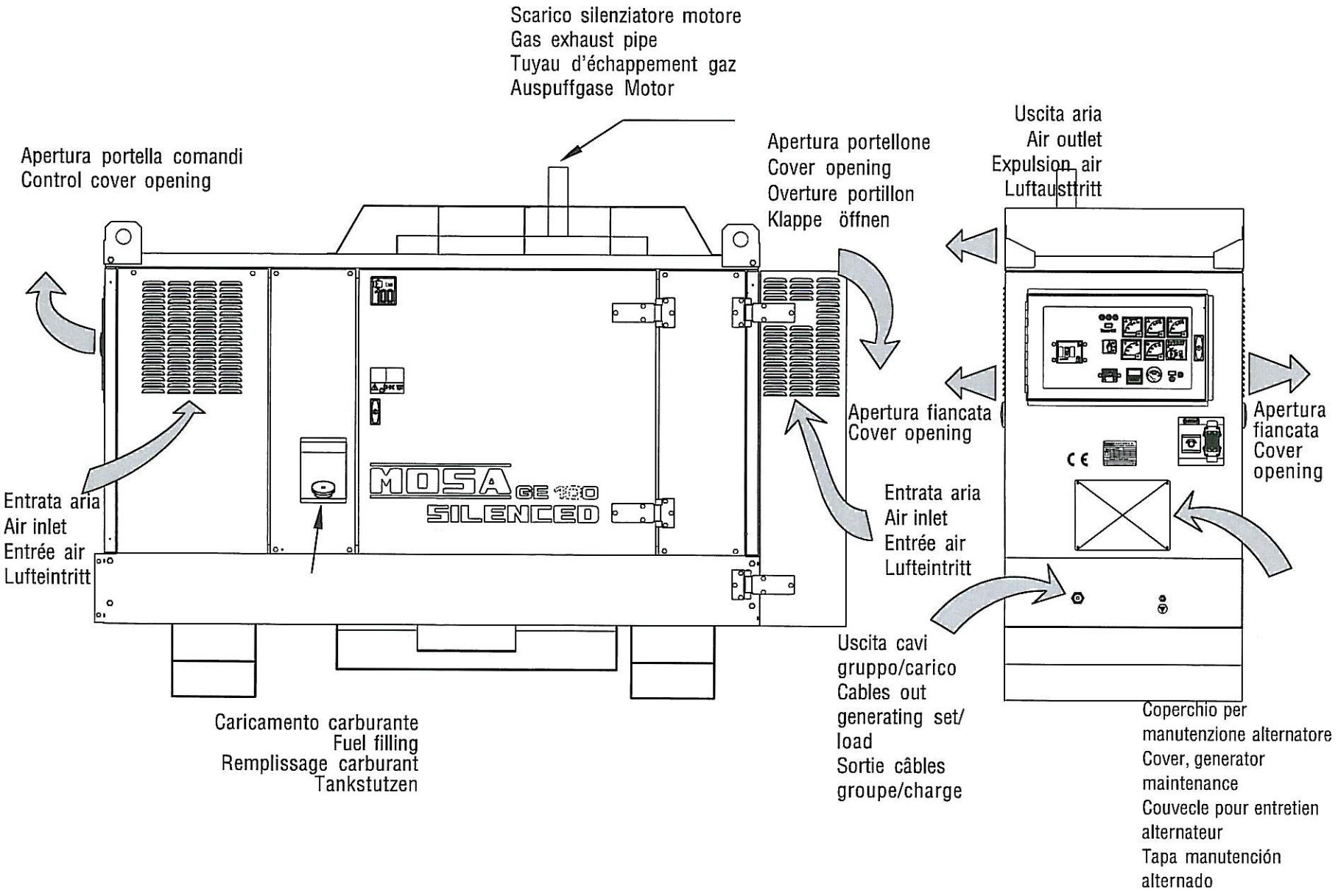
PLACE OF THE MACHINE

In spots where it often rains and/or there are flooded areas, do **not** put the machine:

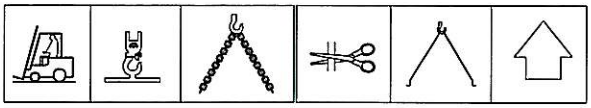
- *in the bad weather*
- *in flooded places.*

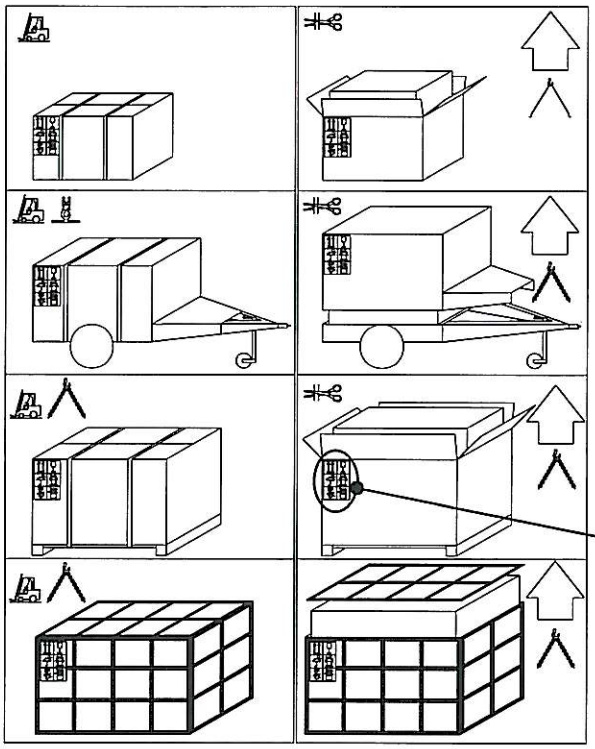
Protect all the electric parts at risk, because water infiltrations could cause short circuits with damages at persons and/or things.

The protection degree of the machine is put on the data plate and in this manual at page "Technical Data".


Scarico silenziatore motore
Gas exhaust pipe
Tuyau d'échappement gaz
Auspuffgase Motor
Apertura portella comandi
Control cover opening
Apertura portellone
Cover opening
Overture portillon
Klappe öffnen
Uscita aria
Air outlet
Expulsion air
Luftaustritt
Apertura fiancata
Cover opening
Apertura
fiancata
Cover
opening
Entrata aria
Air inlet
Entrée air
Lufteintritt
Entrata aria
Air inlet
Entrée air
Lufteintritt
MOSA GE 100
SILENCED
Uscita cavi
gruppo/carico
Cables out
generating set/
load
Sortie câbles
groupe/charge
Caricamento carburante
Fuel filling
Remplissage carburant
Tankstutzen
Coperchio per
manutenzione alternatore
Cover, generator
maintenance
Couvecle pour entretien
alternateur
Tapa manutención
alternado

NOTE



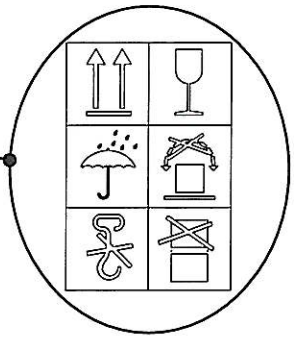


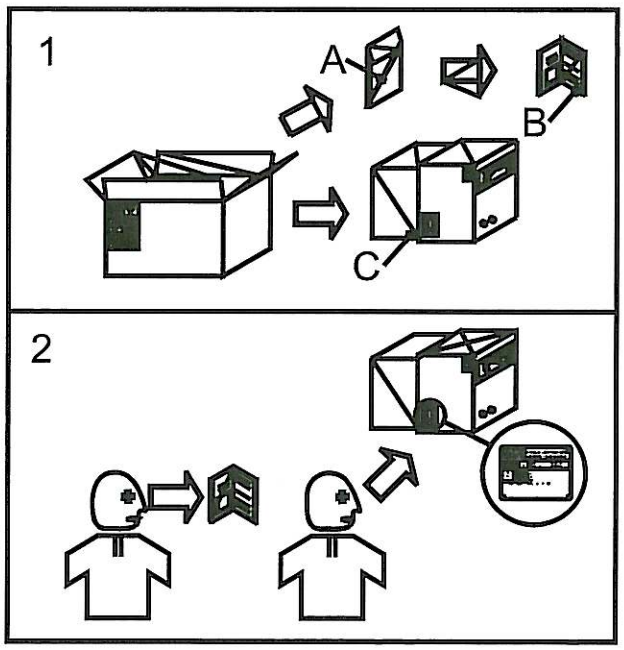
☞ Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conforms to local rules and regulations.

When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling or taking away of parts contained inside the packing or in the set.

In case you find damages, rough handling or absence of parts (envelopes, manuals, etc.), we advise you to inform immediately our Technical Service.

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



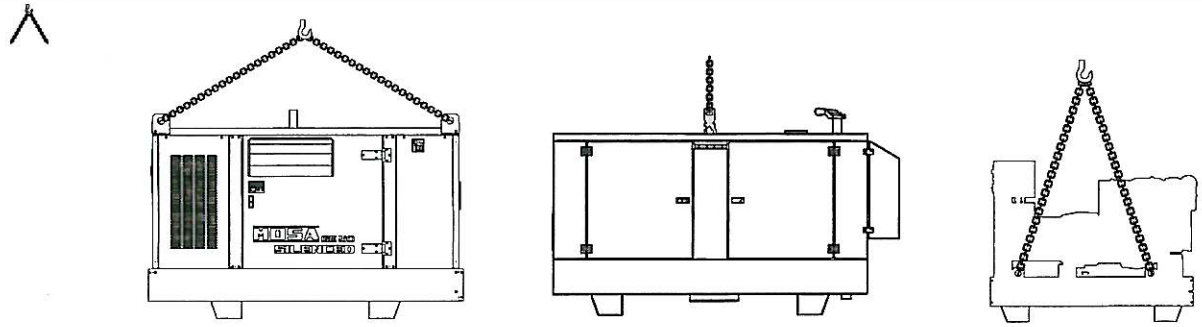


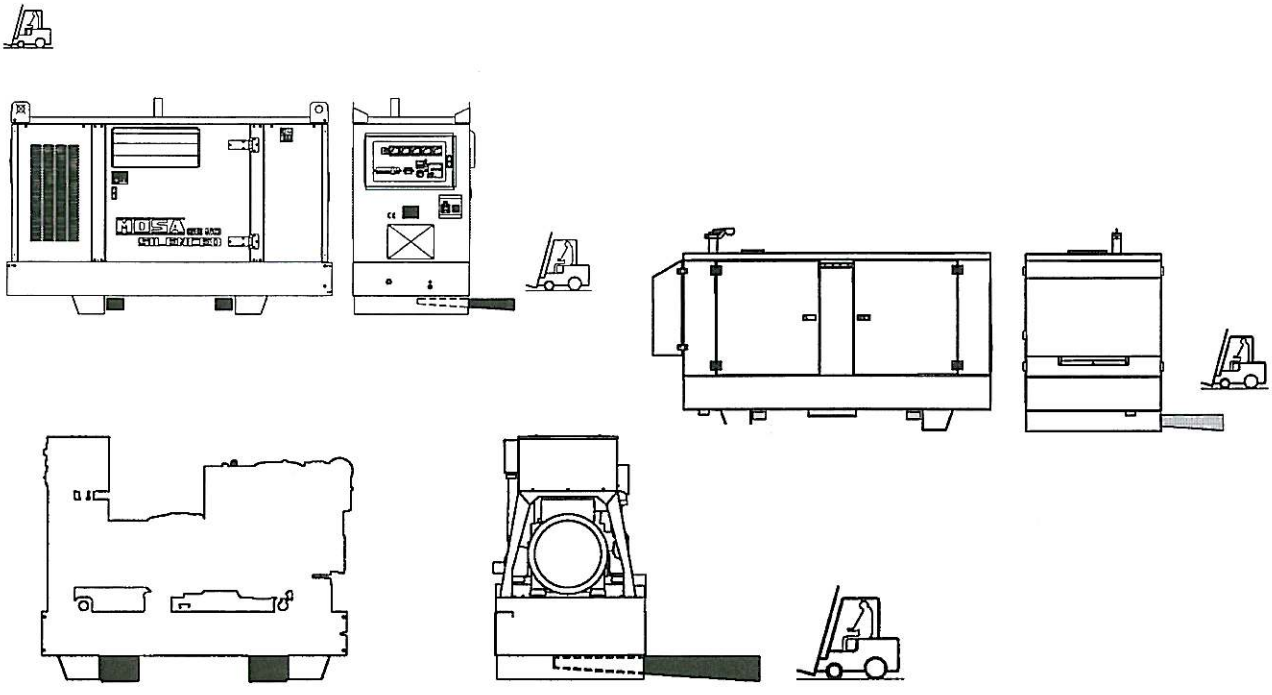
1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
2) Read: the user's manual (B), the plates fixed on the machine, the data plate.

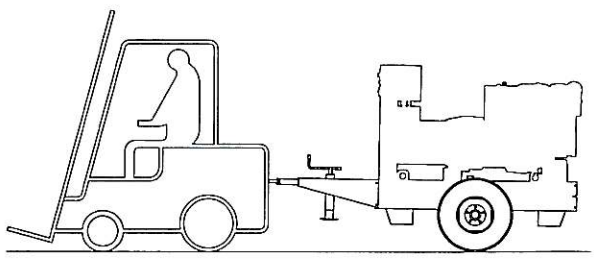
NOTE

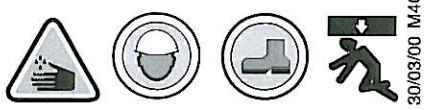
In case you should transport or move the machine, keep to the instructions as per the figures.
Make the transportation when the machine has **no** petrol in its tank, **no** oil in the engine and and electrolyte in the battery.
Be sure that the lifting devices are: correctly mounted, adequate for the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









⚠ 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

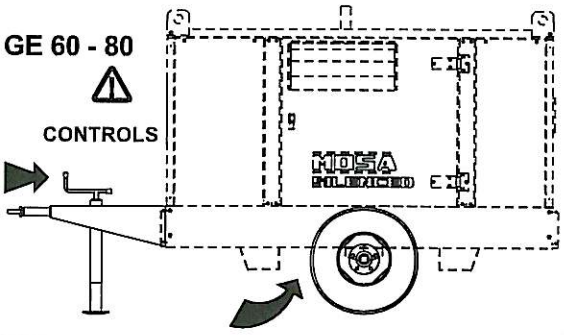
The machines provided for assembling the CTL accessory (slow towing trolley) can be towed up to a **maximum** speed of **40 Kms/hour** on asphalted surfaces.

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

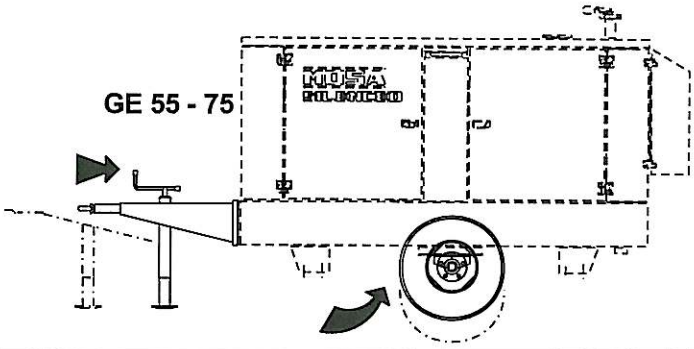
Nota: Lift the machine and assemble the parts as shown in the drawing

GE 60 - 80

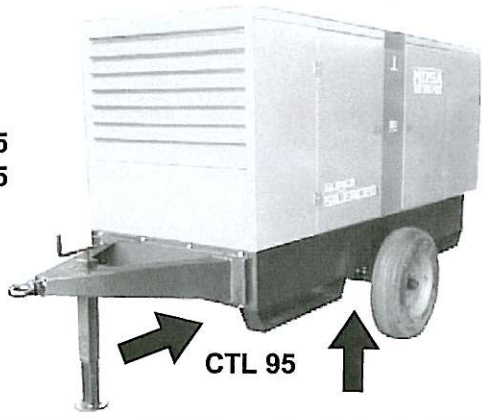
⚠ CONTROLS

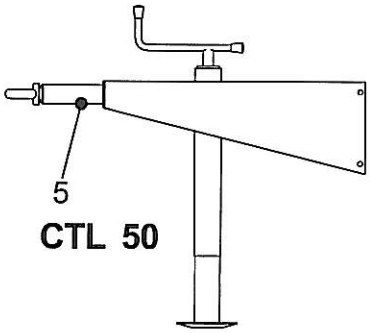


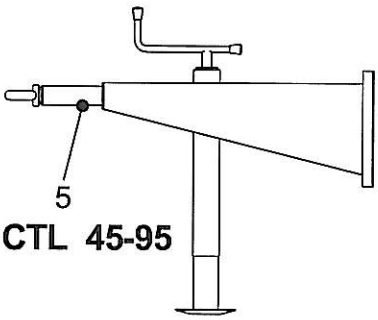
GE 55 - 75



GE 95
GE 115
GE 155

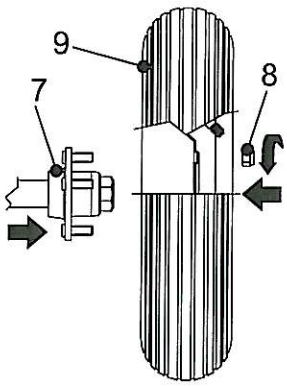






For assembling the generating set on the trolley CTL 45 -50 - 95 please keep to following instructions:

1) - Lift thr generating set (by means of suitable hook)
6) - Assemble on the machine the towbar (5) complete of foot with the M10x25 (CTL 50), M10x30 (CTL 45), M12x25 (CTL 95) screws,nuts and washers.
7) - Assemble the axle (7) to the base of the machine with the M10x20 screws and relative washers (two per part) so that their supports coincide.
8) - Insert the wheel (9) on the axle then twist the selfblocking nut (8).
9) - Pump the tyre (9) bringing the pressure to four atms for the CTL 45-50 and five/six for the CTL 95.
10) - Lower the machine to the ground and place the parking foot definitively (regulating at the best height).

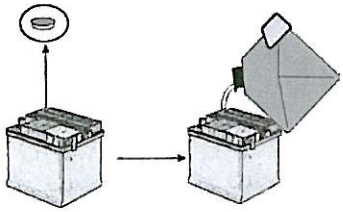


⚠ **ATTENTION**

Do not substituite the original tires with other types.

BATTERY

Take the battery out of the machine.



Fill the battery (S1) to the maximum level with electrolyte. Wait for about 30 minutes and top up with electrolyte.

In case of spilled acid, rinse with water before putting the battery back into the machine and reconnecting cables.

WARNING

Sulfuric acid is corrosive.
Protect hands, eyes and clothes

Take the battery out of the machine for filling. Warranty **VOIDED** for damages due to spilled acid.

LUBRIFICANT

Check the level of the engine oil using the oil dipstick. The level should be between the minimum and maximum marks. If necessary, add more oil.

If the air filter is of the oil bath type, fill it with the same oil up to the level indicated on the filter.

RECOMMENDED SAE VISCOSITY GRADES

For the type and viscosity of oil refer to owner's manual for the engine (supplied with the machine).

OIL AND COOLING LIQUID RECOMMENDED

MOSA advises to choose **AGIP** for the type of oil and cooling liquid.
Please keep to the label put on the engine for the recommended products.

Agip MOSA motosaldatrici gruppi elettrogeni

PRODOTTI RACCOMANDATI RECOMMENDED PRODUCTS	
AGIP SUPERDIESEL 15W/40 API CF4-SG	OLIO MOTORE DIESEL DIESEL ENGINE OIL
AGIP SUPERMOTOROIL 20W/50 API CC-SF	OLIO MOTORE BENZINA GASOLINE ENGINE OIL
AGIP ANTIFREEZE EXTRA INIBITE ETHYLENE GLYCOL (50% + 50% H_2O)	CIRCUITO DI RAFFREDDAMENTO COOLING CIRCUIT (CUNA NC 956-16 ED 97)

NOTE: Before starting the engine read the instructions in the owner's manual for the engine

FUEL

Fill the tank with good quality diesel fuel.

ATTENTION: Diesel fuel is highly inflammable; before filling the tank, stop the engine. Do not fuel in the presence of open flames.

If fuel is spilled on the engine, clean it immediately before starting up the engine.

COOLING LIQUID (Water-cooled engines only)

Pour the cooling liquid through the hole (24B) at the top of the radiator until it reaches the opening.

CLEANING OF DRY AIR FILTER

See page M43.

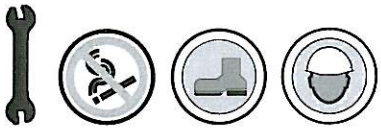
GROUND CONNECTION

A good ground is obligatory for all models with GFI (ground fault interrupter) / ELCB (earth leakage circuit breaker). These protective devices will not protect the operator unless there is a good ground.

Use a good quality ground cable and connect it to the grounding point of the machine (12).
Follow all local rules and/or regulations in force.

Machines with Isometer protection do not need to be grounded.

Once the above operations have been completed,



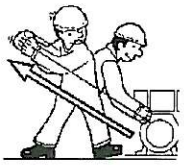
Check daily

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.



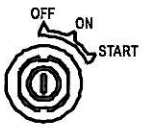
Pull the rope hard and fast. Pull it all the way out. Use two hands if necessary.

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.

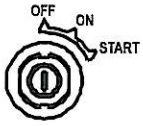
✎ **NB.: <u>for safety reason the key must be kept by qualified personel.</u>**

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.: <u>for safety reason the key must be kept by qualified personel.</u>

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.

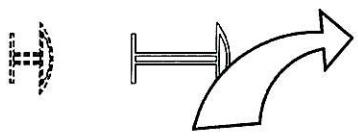
⚠ CAUTION

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

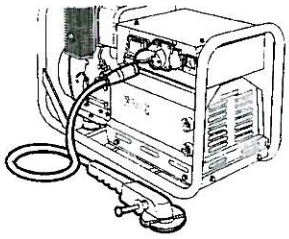
Before starting the engine, make sure that the emergency button (32B) is off (turn the button clockwise for this operation)



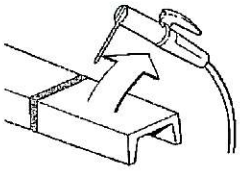
⚠ CAUTION

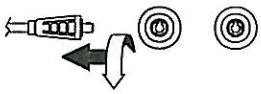
RUNNING-IN
During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, please follow the instructions on the engine use and maintenance manual..

✎ 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.:<u>for safety reason the key must be kept by qualified personel.</u>**

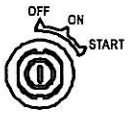
ENGINES WITHOUT ACCELERATOR LEVER

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.: <u>for safety reason the key must be kept by qualified personel.</u>**

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.

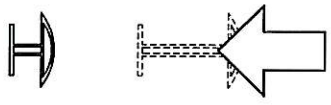
Press the pushbutton (F3) until the engine stops (where it is assembled).

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

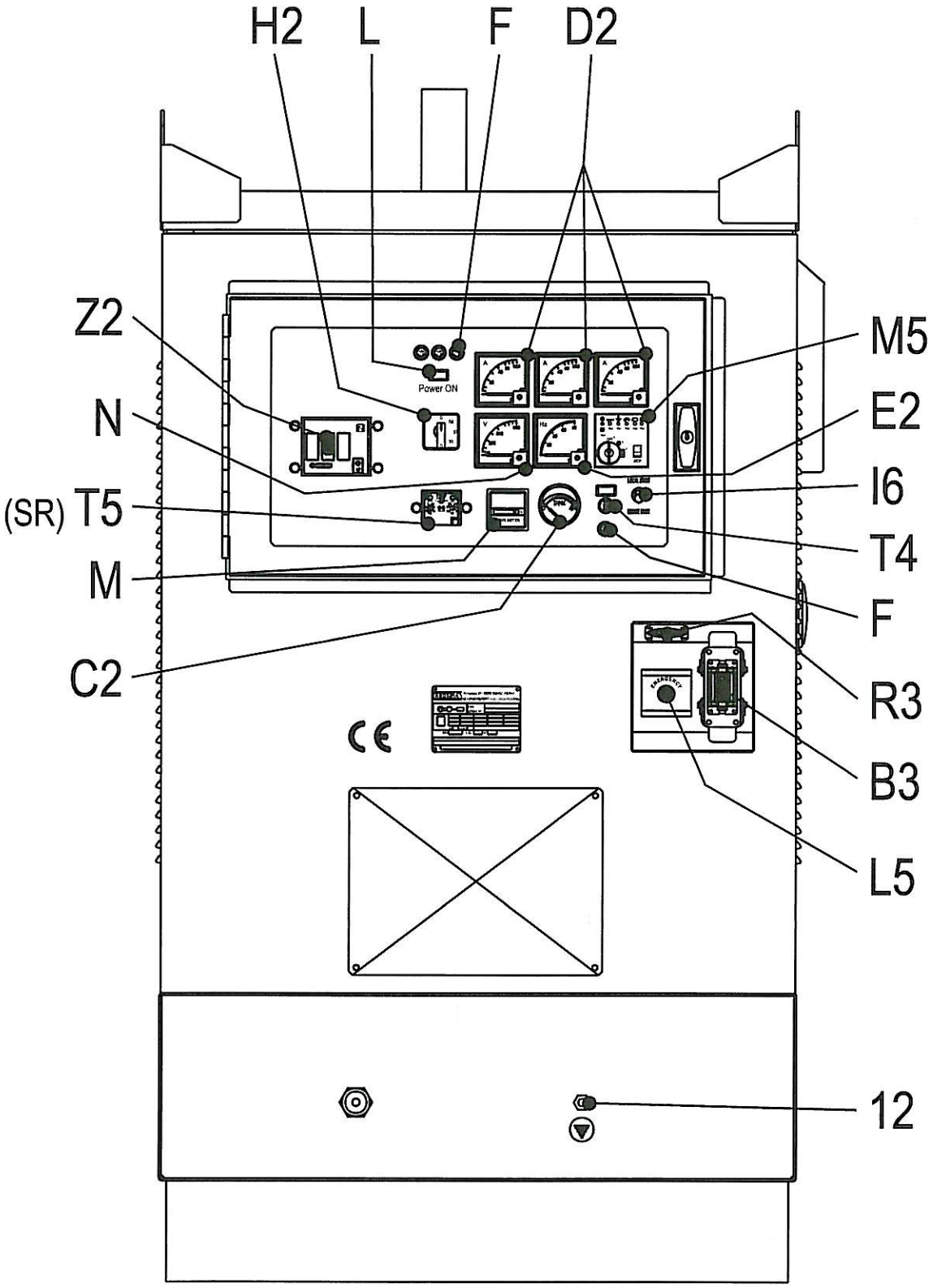
✎ **NB.: <u>for safety reason the key must be kept by qualified personel.</u>**

⚠ 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...

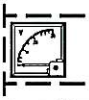
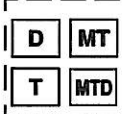
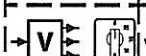
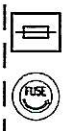
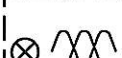
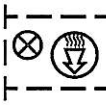
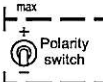
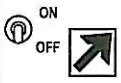


4A	Hydraulic oil level light
9	Welding socket (+)
10	Welding socket (-)
12	Earth terminal
15	A.C. socket
16	Accelerator lever
17	Feed pump
19	48V D.C. socket
22	Engine air filter
23	Oil level dipstick
24	Engine oil reservoir cap
24A	Hydraulic oil reservoir cap
24B	Water filling cap
25	Fuel prefilter
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
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
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/s 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
R3	Siren
S	Welding ammeter
S1	Battery
S3	Engine control unit EP4
S6	Wire feeder supply switch
T	Welding current regulator
T4	Dirty air filter warning light/indicator
T5	Earth leakage relay
U	Current trasformer
U3	R.P.M. adjuster
U4	Polarity inverter remote control
U5	Relase coil
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



12/10/98 74095

According to the version of the machine on the front panel there are assembled some instruments:

	warning lights (L) corresponding to the current sockets on the front panel, indicate that the current can be drawn from the sockets when they are lit (15);
	voltmeter (N);
	GFI (D), Thermal magnetic circuit breaker (Z2) (TS...PL: : one for each auxiliary socket) or Thermal magnetic circuit breaker/GFI (N2);
	voltage selector switch (H2);
	insulation monitoring (A3)- See page M 39.10 -;
	hour-counter (M), which indicates the hours of effective operation of the unit;
	fuse (F), which protects the electric circuit of the engine, replacement of which, in case it breaks, must be effected absolutely with the machine stopped. Remove the mechanical protection, then shift down the small lever of the fuse holder placed on the front panel;
	fuel level gauge (M1): when the quantity of fuel in the tank falls below 5 litres a worning light on the instrument panel lights up;
	fuel level indicator (C2);
	preheating glow plugs warning light (I4) for the preheating (for diesel engines it shows the intervention time of the glow plugs);
	dirty air filter warning light (T4);
	ammeter (D2) indicates the drown current. In case current is drawn simultaneously from several sockets, it shows the current sum. (DO NOT GO OVER THE MAX. CURRENT INDICATED ON THE LABEL);
	star/ triangle switch (I5);
	frequency meter (E2), that indicates the frequency generated and therefore the number of revolutions of the engine: the frequency should be of 52 Hz» or 62 Hz» when the unit is idle and about 50 Hz or 60 Hz at full load (in cose that the found volue is different make sure that the engine is completely accelerated), (do never use the unit with a frequency lower than 49 Hz or 59 Hz, in this case decrease the load);
	tone horn (R3)) indicates the defects in the engine;
	engine protections: EV - EP1 (D1) (for engine at 3000/3600 rpm.), EP2 (B2 for engine at 1500/1800 rpm), EP4 – EP5 (M5)- See pag. M39 .... - ;
	starter key (Q1) and engine stop;
	welding socket (gouging, when assembled, - 9+ - 10-) - See pag. M 34 -;
	Emergency button (L5);
	Control switch for accelerator (only for engine at 3000/3600 rpm) - WE ADVISE TO USE THE SWITCH ONLY IF THE EP1 DEVICE IS BROKEN);
	auxiliary current push button (B5);
	welding current regulator (T) and/or „arc force" selector (F6) - See pag. M34 -1;
	welding scale switch (I3);
	polarity inverter control (V4);- See pag M34 -1;
	cellulosic electrodes control (68);- See pag M34 -1;
	Protection fuse for welding PCB, welding ammeter (S);
	remote control switch (W1) and remote control socket (X1) - See pag M38 .... -;
	switch CC/CV (M6)- See pag M34 -1;-

✎ **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.

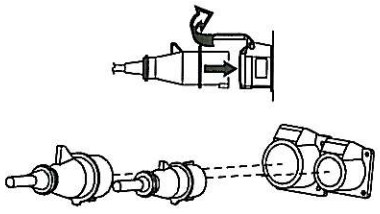
Make sure the unit is properly grounded (12) (where it is assembled).
- See page M20, 21, 22, 25, 26, 27 -.

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.

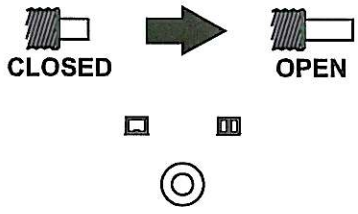
⚠ CAUTION

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.

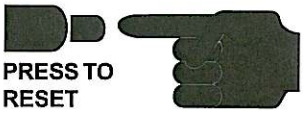
MACHINE WITH THERMOPROTECTION

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



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.



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

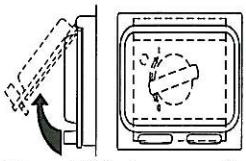
Start the machine and wait for the end of the preheating time imposed by the EP1, EP2, EP5 engine protection device. - See pages M39... -
Press the „generation possibility" push button (B5) placed on the font side of machine.
The voltmeter will show the auxiliary voltage which, for machines at 1500/1800 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 with 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.

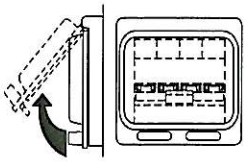
UNIT FITTED WITH GROUND FAULT INTERRUPTER SWITCH (GFI)



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.

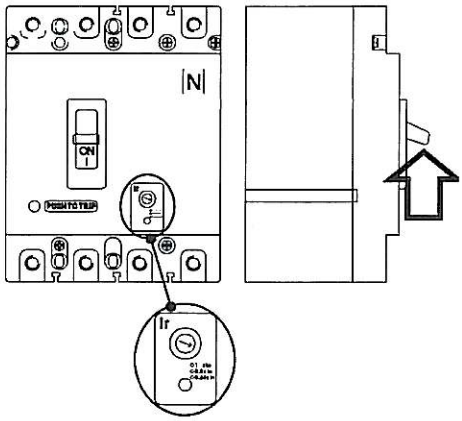
UNIT FITTED WITH THERMAL MAGNETIC BREAKER



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 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.

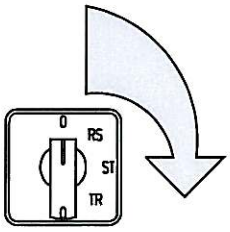
UNIT FITTED WITH GFI SWITCH THERMAL MAGNETIC BREAKER



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 -

⚠ MAKE SURE

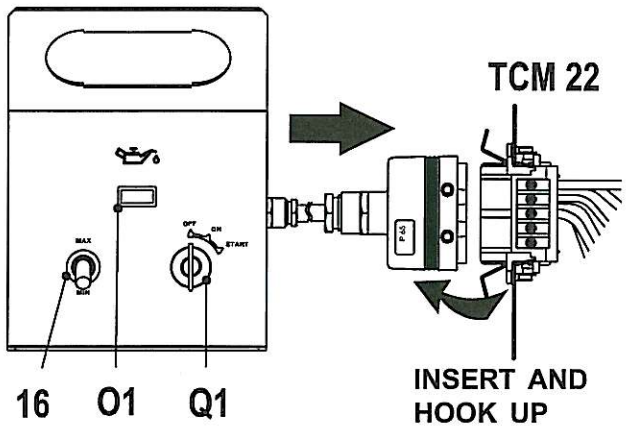
✎ *When the TCM 22-40 is used, it is not possible to connect the E.A.S automatic intervention unit.*
✎ The selector LOCAL START/REMOTE START (I6) of the generating set must be switched on REMOTE START.

USE OF THE REMOTE CONTROL TCM 22

The coupling of the TCM 22 with the generating set, ready for remot starting, permits to work far from the set itself.
The remote control is connected to the front plate, and/or rear plate, with a multiple connector.

The TCM 22 assures the following fonctions:
- starting (starting key Q1)
- acceleration (selector 16)
- stop (starting key Q1)
- indication of oil low pressure (warning light O1)

To stop the set, move the accelerator lever (16) to the minimum position, them turn the key to "OFF" position.



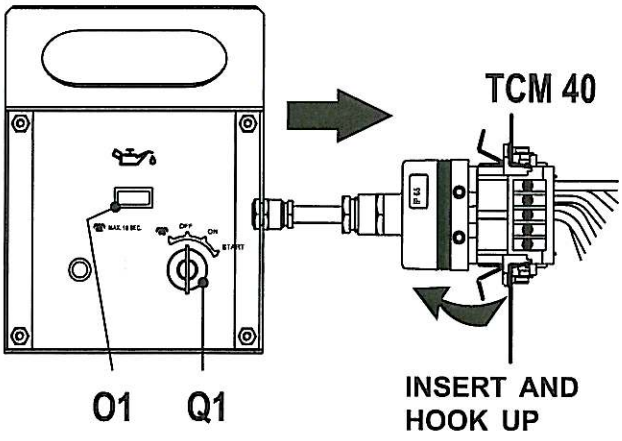
USE OF THE REMOTE CONTROL TCM 40

The coupling of the TCM 40 with the generating set, ready for remot starting, permits to work far from the set itself.
The remote control is connected to the front plate, and/or rear plate, with a multiple connector.

The TCM 40 assures the following fonctions:

- Preheat (starting key Q1). Use only for the models that need such function:
- starting (starting key Q1)
- stop (starting key Q1)
- indication of oil low pressure (warning light O1)

To stop the set turn the key to the position."OFF".



The electronic device EP 5 (M5) ensures the protection of the engine in case of:
- low oil pressure
- engine high temperature
- battery charge
- fuel stock
- overspeed

Located on the front panel of the machine, the EP 5 device enters in operation turning on the ignition key **b)** - device inserted - and will signal it is working through the warning light M5.6 .
The feeding is visualized by winking light and the activation by fixed light.
In the lapse of time between the two lights (winking and fixed) , the device will carry out a **"self control"** cycle.
To start the machine, bring the ignition key to position **c)** (starting).

IGNITION KEY
The ignition key has three operation positions:
a) device not inserted (OFF)
b) device inserted
c) starting with automatic return

STOP BUTTON
It allows to stop the engine in any condition.
Push the button until the engine stops.

OVERSPEED (M5.3)
It signals the intervention of the overspeed device connected to the alternator frequency at 50 as well as at 60 Hz .
The optical and acoustic signal is activated, and the engine **stopped**.

HIGH TEMPERATURE (M5.4)
It signals, through the temperature sensors, a high temperature anomaly.
The optical and acoustic signal is activated, and the engine **stopped**.
Check: the air duct (there must be no obstruction), the cooling liquid (if engine is water-cooled), the oil level, etc....

LOW OIL PRESSURE (M5.5)
It signals, through the pressure sensors, a low oil pressure anomaly.
The optical and acoustic signal is activated, and the engine **stopped**.
Check the oil level and, if it is correct, call the Assistance Service.

FUEL STOCK (M5.1)
It signals the fuel state, inside the tank, running out, acoustically with the siren and optically, **without** stopping the engine (the signal lasts until the cause is eliminated).

BATTERY CHARGE (M5.2)
It signals the failed exicitation of the battery charge generator and therefore the battery recharging.
The visual signal will last **without** stopping the engine, until the cause is eliminated.

FEEDING (M5.6)
The signal point out that the device is working.

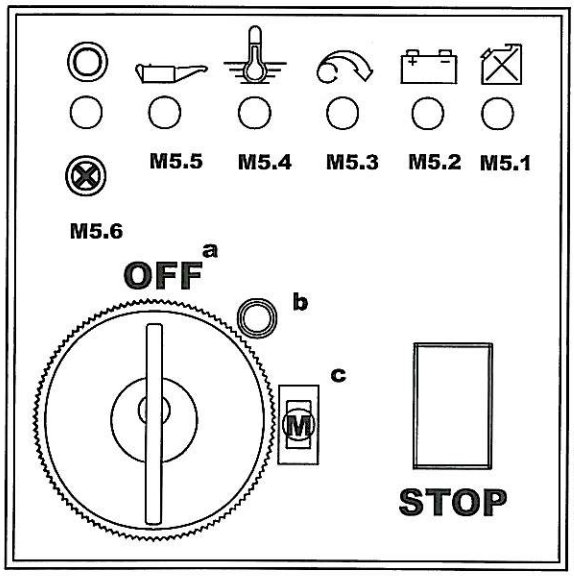
✎ **N.B.:** if the unit is used in hot climates and whit loads near to the maximum, the protection can be triggered off, please **reduce** the load of the engine.

In case of intervention of the device, after having removed the cause of the problem, it is sufficient to bring back the ignition key to the position "OFF - device not inserted", them start again the new work cycle.

⚠ NOTE

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

		COLORS
M5.1(G)	Fuel stok	
M5.2(G)	Battery charge	
M5.3(R)	Overspeed	G = yellow
M5.4(R)	High temperature	V = green
M5.5(R)	Low oil pressure	R = red
M5.6(V)	Feeding	



18/07/97 M39GB

NOTE

Don not intervene on the setting of the insulation checker.
Before using the machine check the ON warning lamp lighting

USE AS TROUBLE INDICATOR:

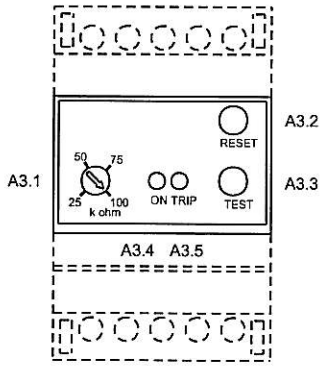
Placed on the front panel, the insulation monitor (A3) is a relay which controls continuously the insulation of the auxiliary circuits towards the ground. The device generates internally a continuous 12V voltage which is applied between the circuit under control and the ground.

USE AS TROUBLE INDICATOR AND INTERVENTION:

The insulation monitor controls a device (release coil, contactor, etc.) which opens the whole auxiliary circuit, lifting voltage in the whole part of the machine auxiliary generation.

USE OF RI – R22M MODEL:

- To vary the regulation call our Technical Assistance Department
- The LED ON shows that the device is fed.
- Check that it works correctly pressing the TEST push button
- The LED TRIP will simulate on intervention or anyway will show the real intervention in case the insulation fails.
- Reset the circuit pressing the RESET push button after having checked the plant and removed the problem cause.

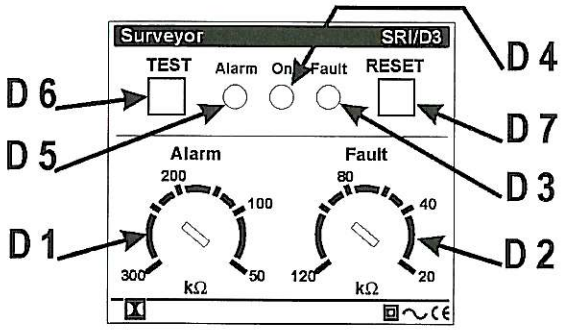


LEGEND:

A3.1 - Adjustment potentiometer insulation resistance
A3.2 - Manual reset push button
A3.3 - Test push button
A3.4 - Auxiliary fedding presence LED
A3.5 - TRIP LED

USE OF SRI/D3 MODEL

- To vary the regulation call our Technical Assistance Department
- The warning light ON shows that the device is fed.-
- Pressing a long time the Test push-button, the Fault led lights and the Alarm led twinkles;
- Leaving it, the Alarm led goes off while the Fault led remains lit. The pressure on the Reset key brings the device back to initial conditions.
- If the insulation resistance goes down below the fixed alarm value, the Alarm led twinkles, at the same time the Alarm contact switches; if the insulation resistance goes down furtherly and becomes inferior to the fixed value for the Fault, the Fault led lights and at the same time both exchange contacts switch putting the Fault in activity and the Alarm at rest.
- After having checked the device and removed the cause of the problem, re-establish the circuit pressing the push-button RESET.



LEGEND:

D1 Regulation of Alarm threshold
D2 Regulation of Fault threshold
D3 Led, fault indication
D4 Led feeding indication
D5 Led Alarm indication
D6 Test push-button
D7 Reset push-button

NOTE

Do not intervene on the setting of the earth leakage relay.
Before using the machine check the ON warning lamp lighting.

The relay allows to select the tripping current value so as to keep values of contact voltage below 50V in compliance with the CEI 64/8 specification.

These adjustments allow to perform a tripping selecticity or either current or delay when more relays are located along the same line in protection of the different starting signals.

A feature of the relay is the permanent monitoring of the connection within current transformer and relays.

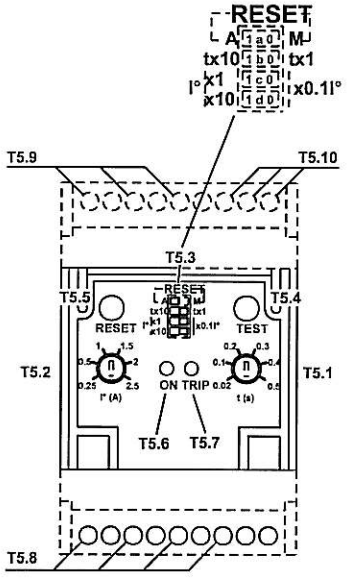
Its interruption due to a fault of the thoroid (connection wire broken) or to a fault in part of the internal circuits, leads to the automatic intervention of the protection.

All this allows to identify immediately the fault, without having to wait for the periodic check done with the test pushbutton on the device as it happens in the traditional performances.

The device, thanks to the filters placed at the circuit input, is practically immune to external disturbances.

Besides, the relay is not sensitive to the pulsanting direct currents as requested by the specifications VDE 0664 and the specification design IEC 23.

Moreover, it has the possibility of manual or automatic RESET, selected by means of microswitch and of making the regulations inaccessible thanks to the closing lid.



LEGENDA:

T5.1 - Potentiometer for intervention time regulation
T5.2 - Potentiometer for earthing fault current regulation
T5.3 - Micro-switches for setting up of:
1) Manual or automatic reset
2) Intervention time
3) Regulation of fault current
T5.4 - Test pushbutton
T5.5 - Manual reset pushbutton
T5.6 - Warning light for auxiliary voltage supply (green LED)
T5.7 - Warning light for tripped relay (red LED)
T5.8 - Terminals for auxiliary supply
T5.9 - Output terminals, final relay
T5.10 - Terminals, connection thoroidal transformer

USE OF THE DER2 / D2B MODEL (MOSA SET UP)

1) Manual reset
2) Regulation of intervention time: 0.5 seconds
3) Regulation of fault current: 30 mA
4) Output relay N.De

☞ - In order to modify the set up call the Technical Assistance Centres

The GFI is equipped with three tests, two of which are effected automatically by the instrument.

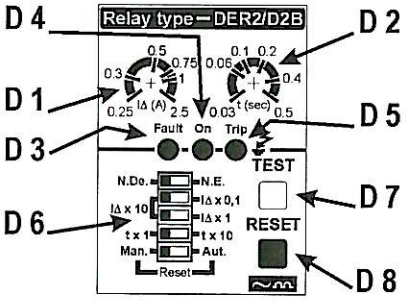
1. manual test (trial push button)
2. automatic test of the toroid/relay connection (guard)
3. automatic test of the board electronics. In case of fault the output relay trips and the Fault led lights with fixed light.

It is able to work correctly even in presence of harmonic distortion or anyway with very disturbed signals.
In case the internal temperature goes over the threshold for a good functioning , the Fault led will twinkle.
Its interruption due to a fault of the toroid (break of the connection wire) or a fault in the internal circuits brings to the automatic intervention of the protection

To help the user in setting up the intervention delay, the potentiometer t(s) rotation in correspondence of a reference mark causes the Fault led to twinkle for a few seconds.

LEGENDA:

D1 Potentiometer for earthing fault current regulation
D2 Potentiometer for intervention time regulation
D3 Multifunction led for indication of: internal electronics fault / internal temperature out of range/ t(s) centred correctly.
D4 Led indicating presence of feeding
D5 Led indicating intervention of GFI relay
D6 Micro-switches for setting up of the instrument
D7 Trial push-button
D8 Push-button for the manual reset



25/05/01 M39GB

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
ASYNCHRONOUS ALTERNATORS		
No output	1) GFI or Isometer (if installed) have been activated	1) Reset GFI or Isometer. If they are activated again check the cables and tools attached to the auxiliary sockets for short circuits or grounded leads
	2) Thermal protection activated or fuse burned out	2) Reset the thermal protection and check the fuses of the single phase sockets.
	3) Overload	3) Disconnect the load and see if the voltage is normal. If so the load caused the generator to lose its excitation. This can occur when the kWatt of the load is larger than that of the generator or, in the case of inductive loads (motors), when the device has a high starting current. In both cases the solution is a larger genset.
	4) Bad condenser or stator burned out	4) Disconnect all leads from the stator except for those going to the condenser boxIf there is no output from the auxiliary leads check the condenser box. If it is OK replace the stator.
SYNCHRONOUS ALTERNATORS		
No outputMechanical damage	1) Overload - circuit breaker activated	1) Remove the load and insert the circuit breaker. Reconnect the load. If it activates again check the rating of the load and the wiring between load and generator.
	2) GFI or Isometer (if installed) have been activated	2) Remove the load and reset Isometer or GFI. Check without the load. If they activate there is an isolation fault or leakage to ground in the generator or internal wiring. If not, reconnect the load. If they are activated with the load attached there is an isolation fault or leakage to ground in the load or related cables.
	3) Fuse burned out	3) Check the fuses of the single phase sockets.
	4) Stator burned out	4) Disconnect the load and see if the voltage is normal. If there is not output replace the alternator.
	5) Carbon brushes worn out	5) Chek the condition of the brushes (if mounted) and their position.
Mechanical damage	6) Carbon brushes worn out	6) Worn out brushes can damage the brush holder and/or collector.

⚠ 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

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.

The routine cleaning of the machine is also considered maintenance.

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.

For the maintenance of the gasoline or Diesel engine please refer to the specific manual supplied with the unit.
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.

Every day check the oil level in the engine and in the air filter (if at oil bath). Make sure that these are no obstructions in the aspiration/exhaust ducts of the alternator, in the engine or in the cover (pieces of material, leaves or other).
See page M21 and M26.

⚠ NOTE

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

UNITS WITH ELECTRIC STARTER

Check periodically the electrolyte level in the battery, especially after long periods of inactivity.

✎ **ATTENTION**: the battery must have all its elements in good condition and must be filled with electrolyte.

The battery is automatically charged while the engine is running at speed.

✎ **N.B.:** In the models with safety protections, in case the battery is not reloaded, check the thermic protection (59A) reload it if it is the caseas well as the fuse (35).

PROCEDURE FOR RECHARGING A BATTERY

Keep to the advice indicated page - M36 -
Take off the breather caps of the battery.
Check the electrolyte level in all the elements of the battery.
If necessary, add up **distilled water** to have the liquid at the recommended level.
Put back the breather caps of the battery.
Use a densimeter to determine the charge state of the battery.

SPECIFIC WEIGHT	CHARGE PERCENTAGE
1.265	100%
1.230	75%
1.200	50%
1.170	25%

MODELS WITH DRY AIR FILTER (CLEANING)

Replace the air filter cartridge every 200 hours when using the unit in a clean environment.

In a dusty environment, the filter cartridge must be replaced every 100 hours.

ALTERNATOR (brushless)

No other further periodical maintenance is necessary, as the alternator has no brushes or slip tings, and the output regulation is entirely electronic.

ALTERNATOR (with brushless)

Control the wear and the position of the carbon brushes at regular intervals (refer to the alternator manual supplied with the machine for details).

MODEL WITH COOLING LIQUID

Every day check the cooling liquid level.
Verify each day freezing liquid and check periodically the radiator state (losses obstructions for air circulation etc.)

✎ ***N.B.:*** *all warning and decals should be checked once a year and* ***replaced*** *if missing or unreadable.*

Check periodically the condition of the cables and tighten the connections.

In case the machine should not be used for more than 30 days, make shure 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.
See page M45.

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.

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

⚠ 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.

TYPE OF MAINTENANCE			Every day	Every 100 hours	Every 150 hours	Every 300 hours	Every 500 hours	Every 1000 hours	Every 2000 hours
CLEANING	Filters	Dry air filter		X					
		Fuel pump filter		X					
	Radiator	Air passages	X				X		
		Fan	X						
	Fuel tank							X	
	Injectors						X		
CHECK		Air filter condition	X						
		Crankcase oil level	X						
		Battery electrolyte level		X					
		Amount of coolant	X						
	Belt - Fan and fan belt		X		X				
	Tighten nuts and bolts					X			
	Valves, rocker arms						X		
	Injector regulation								X
	Water in the fuel pre-filter		X						
REPLACEMENT	Crankcase 1)	Change oil			X				
		Change water							X
	Cartridge	Dry air filter					X		
		Fuel filter				X			
		Oil filter1)				X			
	Brushes, starter motor								X
	Fan belt								X

1) Replace oil and oil filter after the first 50 working hours.

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.

ALTERNATOR

Brushless: if no periodic maintenance is necessary, as the alternator has no brushing electrical parts.

With brushless: Control the wear and the position of the carbon brushes at regular intervals (refer to the alternator manual supplied with the machine for details).

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.*

PROCEDURE FOR RECHARGING A BATTERY

Take off the breather caps of the battery.
Check the electrolyte level in all the elements of the battery.
If necessary, add up **distilled water** to have the liquid at the recommended level.
Put back the breather caps of the battery.
Use a densimeter to determine the charge state of the battery.

SPECIFIC WEIGHT	CHARGE PERCENTAGE
1.265	100%
1.230	75%
1.200	50%
1.170	25%

✎ For more information on maintenance to the motor and alternator, refer to the specific manuals provided.

	EVERYWEEK	EVERY ONTH AND/OR AFTER INTERVENTION ON LOAD	EVERY YEAR AND/OR AT PRESCRIBED TIMES
1. TEST or AUTOMATIC TEST cycle to keep the generating set constantly operative	○		
2. Check all levels: engine oil, fuel level, battery electrolyte,, if necessary top it up.		○	
3. Keep to the advice given in manuals: engine, alternator, and machine specific one.			○

⚠ ATTENTION

Before any intervention on the generating set, KEEP TO FOLLOWING:

- Preset the unit so as to execute the maintenance of the set.
- Disconnect the three phase, single phase plugs and/or the wires to the feed box
- Disconnect the plug of the connection cable to the EAS unit and/or to PAC 150..

After having effected the routine checks, reset all electric connections and follow the indications for a new working cycle

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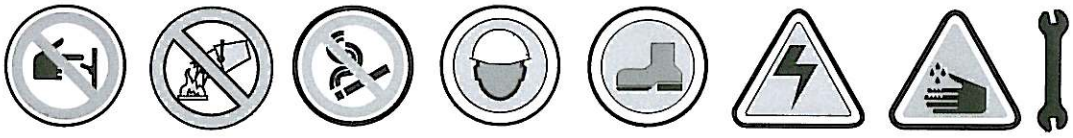

In case the machine should not be used for more than 30 days, make sure that the room in which it is stored presents a suitable shelter from heat sources, weather changes or anything which can cause rust, corrosion or damages to the machine.

✎ 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 generating set GE 100 is a unit which transforms the mechanical energy, generated by endothermic engine, into electric energy, through an alternator.
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	GE 100 S	GE 100 SX
A.C. GENERATOR		
Three-phase generation (*stand-by)	93.5 kVA (74.8 kW)/ 400 V / 135 A	
Three-phase generation (**P.R.P.)	85 kVA (68 kW)/ 400 V / 123 A	
Single-phase generation	31 kVA (kW) / 230 V / 135 A	
Frequency	50 Hz	
Power factor (cos φ)	0.8	
ALTERNATOR	self-excited, self-regulated, brushless	
Type	three-phase, synchronous	
Insulating class	H	
MOTORE		
Mark	VM SUN	
Model	6105 TE	
Type	4-Stroke	
Displacement	5975 cm^3	
Cylinders	6	
Output	88 kW (120 HP)	
Speed	1500 rpm	
Fuel consumption	210 g/kWh	
Cooling system	Liquido	
Engine oil capacity	9 l	
Starter	Elecric	
Fuel	Gasoline	
GENERAL SPECIFICATIONS		
Battery	12V - 155 Ah	
Tank capacity	130 l	
Running time (al 75%)	9 h	
Protection	IP 44	
Dimensions max. su base Lxlxh *	2700x900x1900	
Weight *	1650 Kg	1750 Kg
Noise level	97 LWA (72 dB(A) - 7 m)	90 LWA (65 dB(A) - 7 m)

* Dimensions and weight are inclusive of all parts without optional CTM

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:

$$dBA_X = dBA_Y + 10 \log \frac{ry^2}{rx^2}$$

At 4 meters the noise level becomes:

$$75\ dBA + 10 \log \frac{7^2}{4^2} = 80\ dBA$$

12/10/98 74095-GB

The generating set GE 110 is a unit which transforms the mechanical energy, generated by endothermic engine, into electric energy, through an alternator.
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	GE 110 S	GE 110 SX
A.C. GENERATOR		
Three-phase generation (*stand-by)	110 kVA (88 kW)/ 400 V / 159 A	
Three-phase generation (**P.R.P.)	100 kVA (80 kW)/ 400 V / 143 A	
Single-phase generation	36.5 kVA / 230 V / 159 A	
Frequency	50 Hz	
Power factor (cos φ)	0.8	
ALTERNATOR	self-excited, self-regulated, brushless	
Type	three-phase, synchronous	
Insulating class	H	
MOTORE		
Mark	VM SUN	
Model	6105 TE	
Type	4-Stroke	
Displacement	5975 cm^3	
Cylinders	6	
Output	97 kW (132 HP)	
Speed	1500 rpm	
Fuel consumption	210 g/kWh	
Cooling system	Liquido	
Engine oil capacity	9 l	
Starter	Elecric	
Fuel	Gasoline	
GENERAL SPECIFICATIONS		
Battery	12V - 155 Ah	
Tank capacity	130 l	
Running time (al 75%)	8 h	
Protection	IP 44	
Dimensions max. su base Lxlxh *	2700x900x1900	
Weight *	1700 Kg	1800 Kg
Noise level	97 LWA (72 dB(A) - 7 m)	90 LWA (65 dB(A) - 7 m)

* Dimensions and weight are inclusive of all parts without optional CTM

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:

$$dBA_X = dBA_Y + 10 \log \frac{ry^2}{rx^2}$$

At 4 meters the noise level becomes:

$$75\ dBA + 10 \log \frac{7^2}{4^2} = 80\ dBA$$

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