DSP 2x400 PSX

0 3 1 3

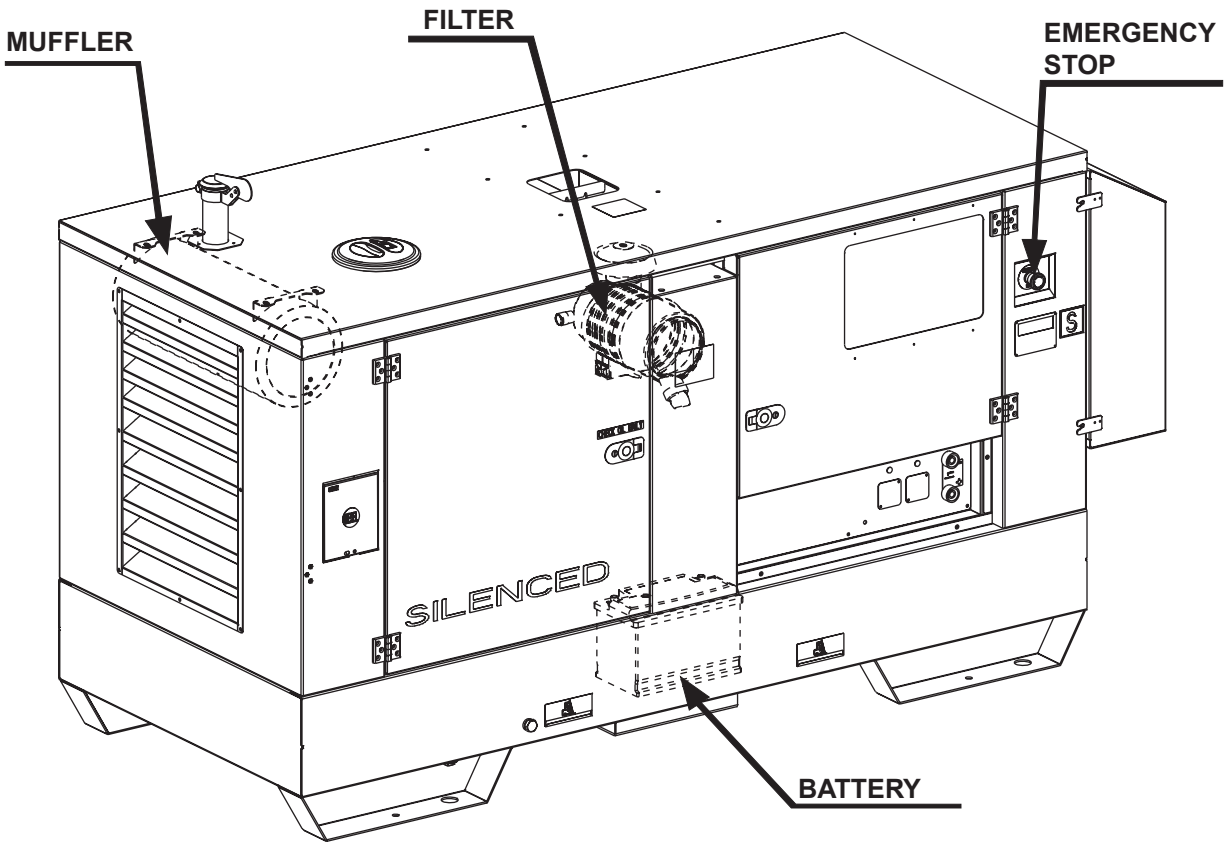
884129003 - GB

USE AND MAINTENANCE MANUAL
SPARE PARTS CATALOG

preparato da UPT
approvato da DITE

Main Characteristics of the unit:

- Control of current with CHOPPER technology at high frequency
- Digital control technique by means of DSP
- Major productivity of 15% in comparison to welders with diode controls and controlled diodes
- 5 Welding processes: TIG contact start, STICK arcforce 1, STICK arcforce 2, STICK arcforce 3, MIGMAG
- Maximum welding current 2x400A
- Polarity change (optional)
- Voltmeter and Ammeter of weld
- 40 kVA of power in three phase generation 400 V / 50 Hz
- Perkins diesel engine 1103C-33TG3 emissioned EURO 2
- Noise level at 7m 64 dBA
- Dimensions / weight: 2490x1030x1480 /1350 Kg



A base assembled to a heavy roll-bar gives solidity to the whole structure.
Accessibility to both engine chamber and electrical box is granted by four doors.
A hinged air inlet box also gives access to the welding chopper units.
Two Plexiglas windows inserted in the front doors allow to check welding parameters and to give access to welding current/voltage control devices.
The maintenance-free battery reduces checks on the state of charge to a minimum.

IQNet
THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

CISQ/ICIM

hereby certify that the organization

BCS S.p.A.

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

for the following field of activities

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

has implemented and maintains a

Quality Management System

which fulfills the requirements of the following standard

ISO 9001:2008

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

Registration Number: IT-3722

Michael Drechsel
President of IQNET

Gianrenzo Prati
President of CISQ

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IQNet, the association of the world's first class certification bodies, is the largest provider of management System Certification in the world. IQNet is composed of more than 30 bodies and counts over 150 subsidiaries all over the globe.

ICIM
www.icim.it

CERTIFICATO n. 0192/6
CERTIFICATE No.

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

BCS S.p.A.
UNITA' OPERATIVE
OPERATIVE UNITS

Sede e Unità Operativa
Viale Mazzini, 161 - 20081 Abbiategrasso (MI)
Unità Operative
Via Valbrina, 17/19 - 42045 Luzzara (RE)
Viale Europa, 59 - 20090 Cusago (MI)
Italia

E' CONFORME ALLA NORMA
IS IN COMPLIANCE WITH THE STANDARD

UNI EN ISO 9001:2008

PER LE SEGUENTI ATTIVITA'
FOR THE FOLLOWING ACTIVITIES

EA: 18

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

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

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

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

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

ACCREDIA
ENTE ITALIANO DI ACCREDITAMENTO
SGQ N° 004A SSI N° 008Q
SGA N° 005D PRD N° 004B
SCR N° 006F ISP N° 046E
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

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

FEDERAZIONE CISQ
www.cisq.com

ICIM CISQ IQNet
ISO 9001:2008 - Cert. 0192

UNI EN ISO 9001 : 2008

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

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

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

The advantages for MOSA clients are:

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

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

· Competent support in the solution of problems;

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

· Regular inspections by ICIM to confirm that therequirements of the company's quality systemand ISO 9001 are being respected.

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

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ATTENTION

This use and maintenance manual is an important part of the machines in question.
The assistance and maintenance personel must keep said manual at disposal, as well as that for the engine and alternator (if the machine is synchronous) and all other documentation about the machine.

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

INFORMATION

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

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

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

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

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

NOTES ABOUT THE MANUAL

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

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

The manual for Use Maintenance and Spare Parts is an integrant part of the product. It must be kept with care during all the life of the product.
In case the machine and/or the set should be yielded to another user, this manual must also given to him.
Do not damage it, do not take parts away, do not tear pages and keep it in places protected from dampness and heat.

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

INFORMATION OF GENERAL TYPE

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

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

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

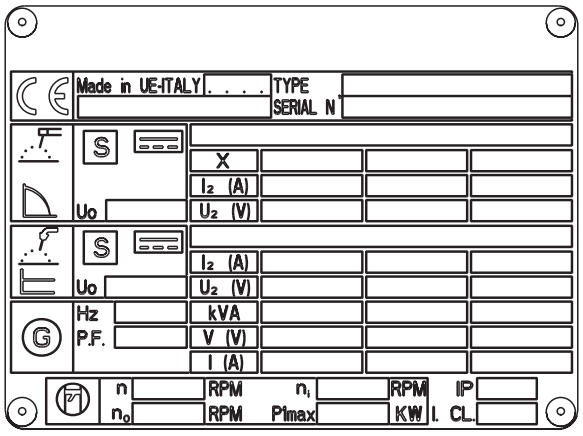
While working it is advisable to keep to the personal safety norms in force in the countries to which the product is destined (clothing, work tools, etc.).

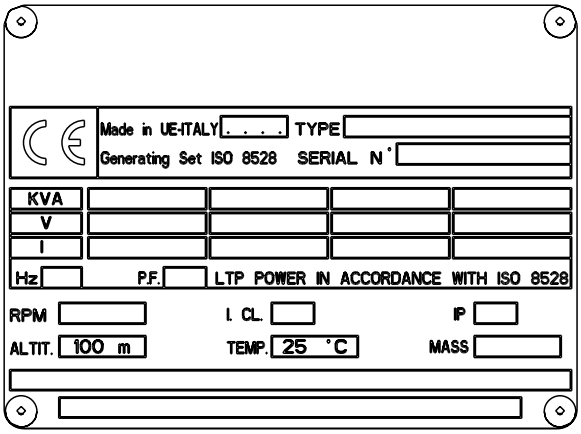
Do not modify for any motive parts of the machine (fastenings, holes, electric or mechanical devices, others..) if not duly authorized in writing: the responsibility coming from any potential intervention will fall on the executioner as in fact he becomes maker of the machine.

☞ ***Notice:*** *this manual does not engage the manufacturer, who keeps the faculty, apart the essential characteristics of the model here described and illustrated, to bring betterments and modifications to parts and accessories, without putting this manual uptodate immediately.*

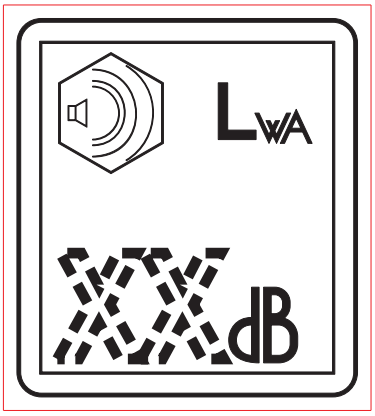
Any of our product is labelled with CE marking attesting its conformity to appliable directives and also the fulfillment of safety requirements of the product itself; the list of these directives is part of the declaration of conformity included in any machine standard equipment.
Here below the adopted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

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





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



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

BCS S.p.A.
Sede legale:
Via Marradi 1
20123 Milano - Italia

Stabilimento di Cusago, 20090 (Mi) - Italia
V.le Europa 59
Tel.: +39 02 903521
Fax: +39 02 90390466

ISO 9001:2008 - Cert. 0192

DICHIARAZIONE DI CONFORMITA'

CE

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

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

GRUPPO ELETTROGENO DI SALDATURA / WELDING GENERATOR ☐

GRUPPO ELETTROGENO / POWER GENERATOR ☐

Marchio / Brand : MOSA

Modello / Model :

Matricola / Serial number:

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

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

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

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

Cusago,

Ing. Benso Marelli
Consigliere Delegato
COO

The DSP 2x400 engine driven welder ia a unit which ensures the function as:
a) a current source for arc welding
b) a current source for the auxiliary power generation
It is meant for industrial and professional use, powered by an endothermic engine; it is composed of various main parts such as: engine, alternator, electric and electronic controls, the fairing or a protective structure.
The assembling is made on a steel structure, on which are provided elastic support which must damp the vibrations and also eliminate sounds which would produce noise.

Technical data	DSP 2x400 PSX
GENERATOR	
Output three-phase	40 kVA / 400 V / 57.8 A
Output single-phase	20 kVA / 230 V / 87 A
Output single-phase	5 kVA / 48 V / 104 A
Frequency	50 Hz
Cos φ	0.8
ALTERNATOR	Self-excited, self-regulated, brushless
Type	three-phase, asynchronous
Insulating class	H
ENGINE	
Mark / Model	PERKINS / 1103C-33TG3
Type / Cooling system	Diesel 4-Stroke / water
Cylinders / Displacement	3 / 3300 cm^3
Net output	45.6 kW (62 HP)
Speed	1500 rpm
Fuel consumption (welding 60%)	6.7 l/h
Cooling system capacity	10.2 l
Engine oil capacity	7.9 l
Starter	Electric
GENERAL SPECIFICATIONS	
Battery	12V - 100Ah
Tank capacity	102 l
Running time (welding 60%)	15 h
Protection	IP 44
Dimensions Lxwxh (mm) *	2490x1030x1480
Weight *	1350 Kg
Measured acoustic power LwA (pressure LpA)	89 dB(A) (64 dB(A) @ 7 m)
Guaranteed acoustic power LwA (pressure LpA)	90 dB(A) (65 dB(A) @ 7 m)

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

POWER

Declared power according to ISO 3046-1 (temperature 25°C, 30% relative humidity, altitude 100 m above sea level). It's admitted overload of 10% each hour every 12 h.
In an approximative way one reduces: of 1% every 100 m altitude and of 2.5% for every 5°C above 25°C.

ACOUSTIC POWER LEVEL

ATTENTION: The concrete risk due to the machine depends on the conditions in which it is used. Therefore, it is up to the end-user and under his direct responsibility to make a correct evaluation of the same risk and to adopt specific precautions (for instance, adopting a I.P.D. -Individual Protection Device)
Acoustic Noise Level (LWA) - Measure Unit dB(A): it stands for acoustic noise released in a certain delay of time. This is not submitted to the distance of measurement.
Acoustic Pressure (Lp) - Measure Unit dB(A): it measures the pressure originated by sound waves emission. Its value changes in proportion to the distance of measurement.
The here below table shows examples of acoustic pressure (Lp) at different distances from a machine with Acoustic Noise Level (LWA) of 95 dB(A)

Lp a 1 meter = 95 dB(A) - 8 dB(A) = 87 dB(A)
Lp a 4 meters = 95 dB(A) - 20 dB(A) = 75 dB(A)
Lp a 7 meters = 95 dB(A) - 25 dB(A) = 70 dB(A)
Lp a 10 meters = 95 dB(A) - 28 dB(A) = 67 dB(A)

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

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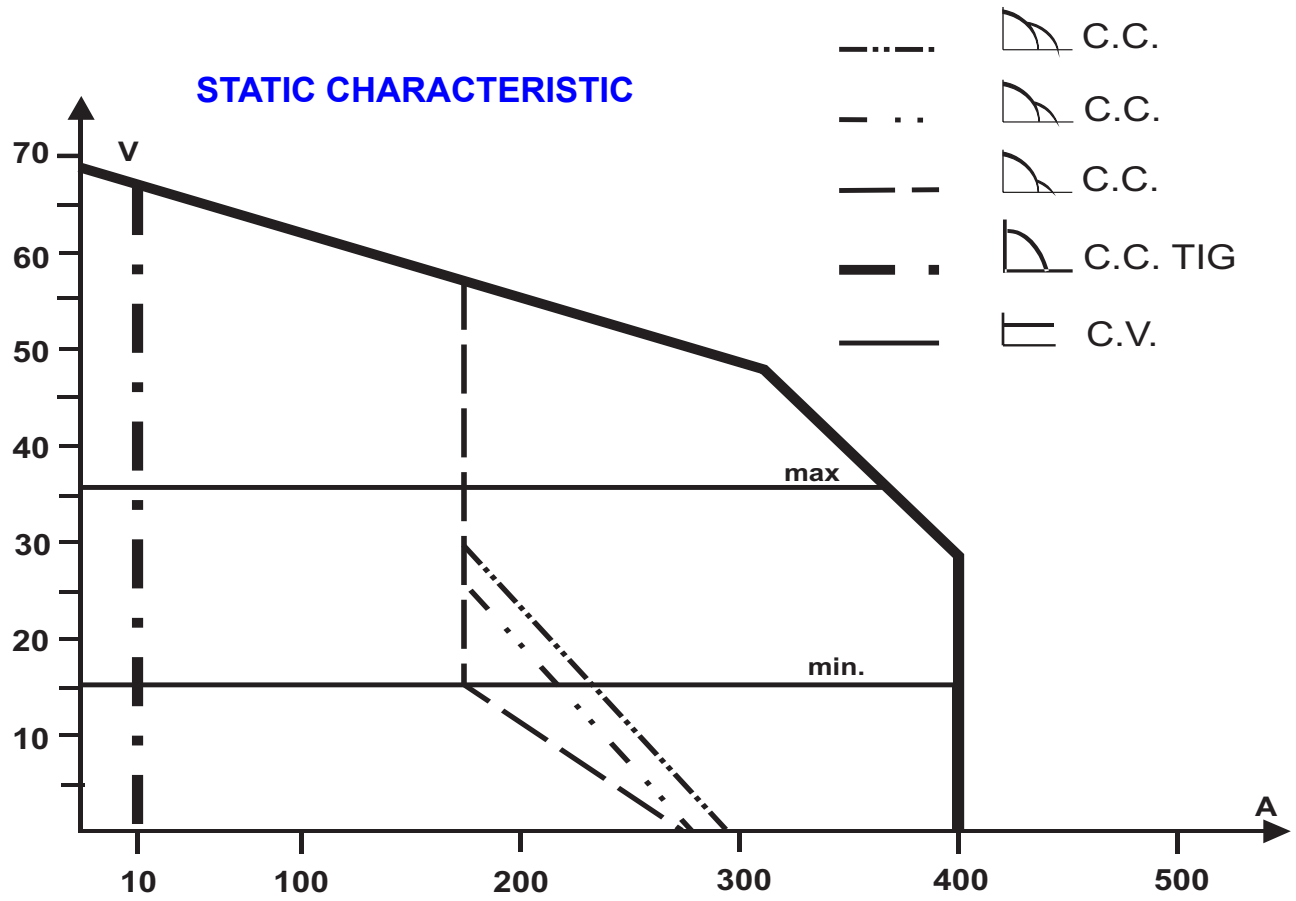
C.C. WELDING	
Welding current	2x400A/35% - 2x360A/60% - 2x330A/100%
Starting voltage	68V
C.V. WELDING	
Welding current	2x360A/60% - 2x330A/100%
Welding voltage	16 - 36V



SIMULTANEOUS UTILIZATION FACTORS

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

WELDING CURRENT SINGLE POSITION	400A	300A	200A	100A	0
AUXILIARY POWER	25kVA	30kVA	35 kVA	40 kVA	40 kVA

WELDING CURRENT DOUBLE POSITION	2x400A	2x300A	2x200A	2x100A	0
AUXILIARY POWER	10kVA	20 kVA	30 kVA	40 kVA	40 kVA

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SYMBOLS IN THIS MANUAL

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

IMPORTANT ADVICE

- Advice to the User about the safety:

☞ N.B.: The information contained in the manual can be changed without notice. Potential damages caused in relation to the use of these instructions will not be considered because these are only indicative. Remember that the non observance of the indications reported by us might cause damage to persons or things. It is understood, that local dispositions and/or laws must be respected.

WARNING

Situations of danger - no harm to persons or things

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

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

SAFETY PRECAUTIONS

DANGEROUS

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

WARNING

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

CAUTION

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

IMPORTANT

NOTE

ATTENTION

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

SYMBOLS

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

Read and pay due attention

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

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

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

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

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

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

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

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

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

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

ACCES FORBIDDEN *to non authorizad* peaple.

PROHIBITIONS No harm for persons

Use only with safety clothing -

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

Use only with safety clothing -

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

Use only with safety protections -

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

Use with only safety material -

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

Use only with non inserted voltage -

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

No smoking -

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

No welding -

It is forbidden to weld in rooms containing explosive gases.

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

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

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

Use only with safety protections, specifically suitable

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

Use only with safety protections -

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

Use only with safety protections -

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

Use only with safety protections -

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

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

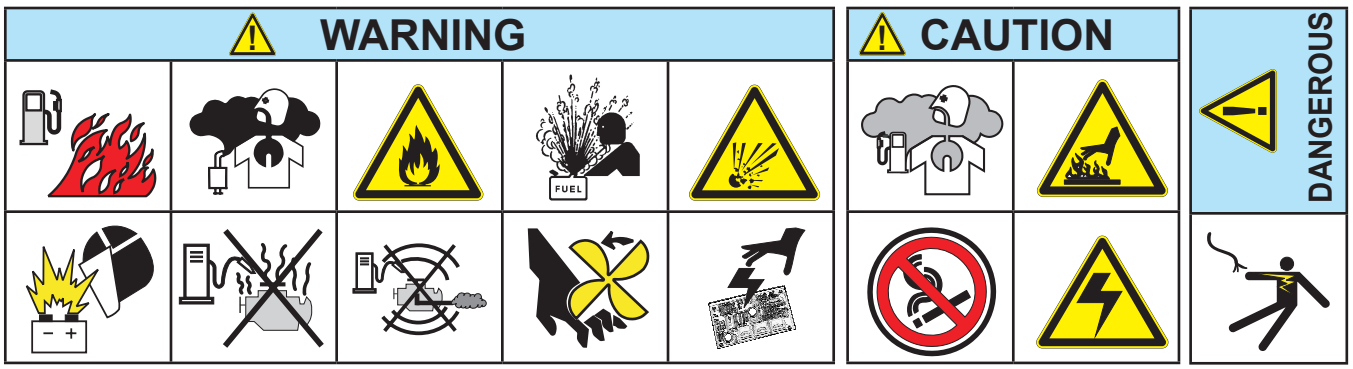
ENGINE	CHECKING BOARD
Stop engine when fueling	Do not touch electric devices if you are barefoot or with wet clothes.
Do not smoke, avoid flames, sparks or electric tools when fueling.	Always keep off leaning surfaces during work operations.
Unscrew the cap slowly to let out the fuel vapours.	Static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

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

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

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

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



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

INSTALLATION AND ADVICE BEFORE USE

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

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

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

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

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

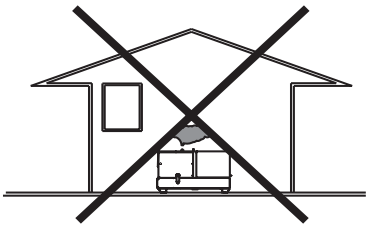
INSTALLATION AND ADVICE BEFORE USE

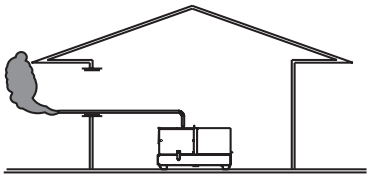
GASOLINE ENGINES

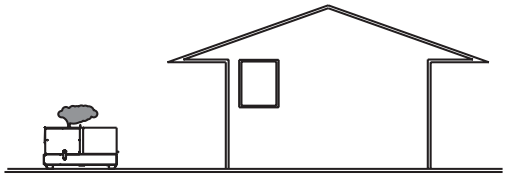
☞ Use in open space, air swept or vent exhaust gases, which contain the deathly carbone oxyde, far from the work area.

DIESEL ENGINES

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

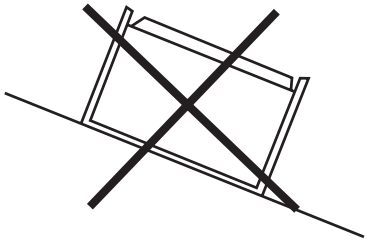




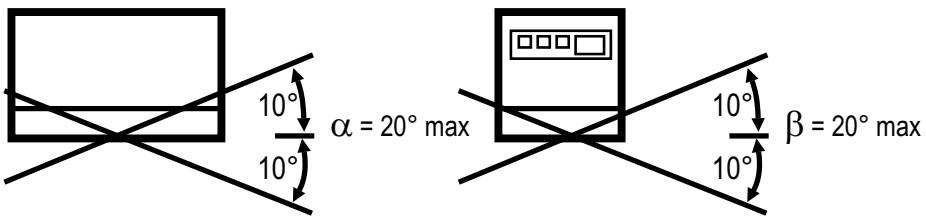


POSITION

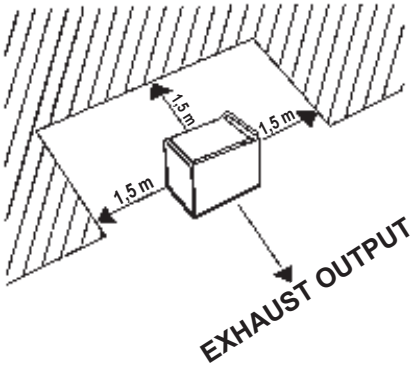
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



Maximum leaning of the machine (in case of dislevel)



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



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

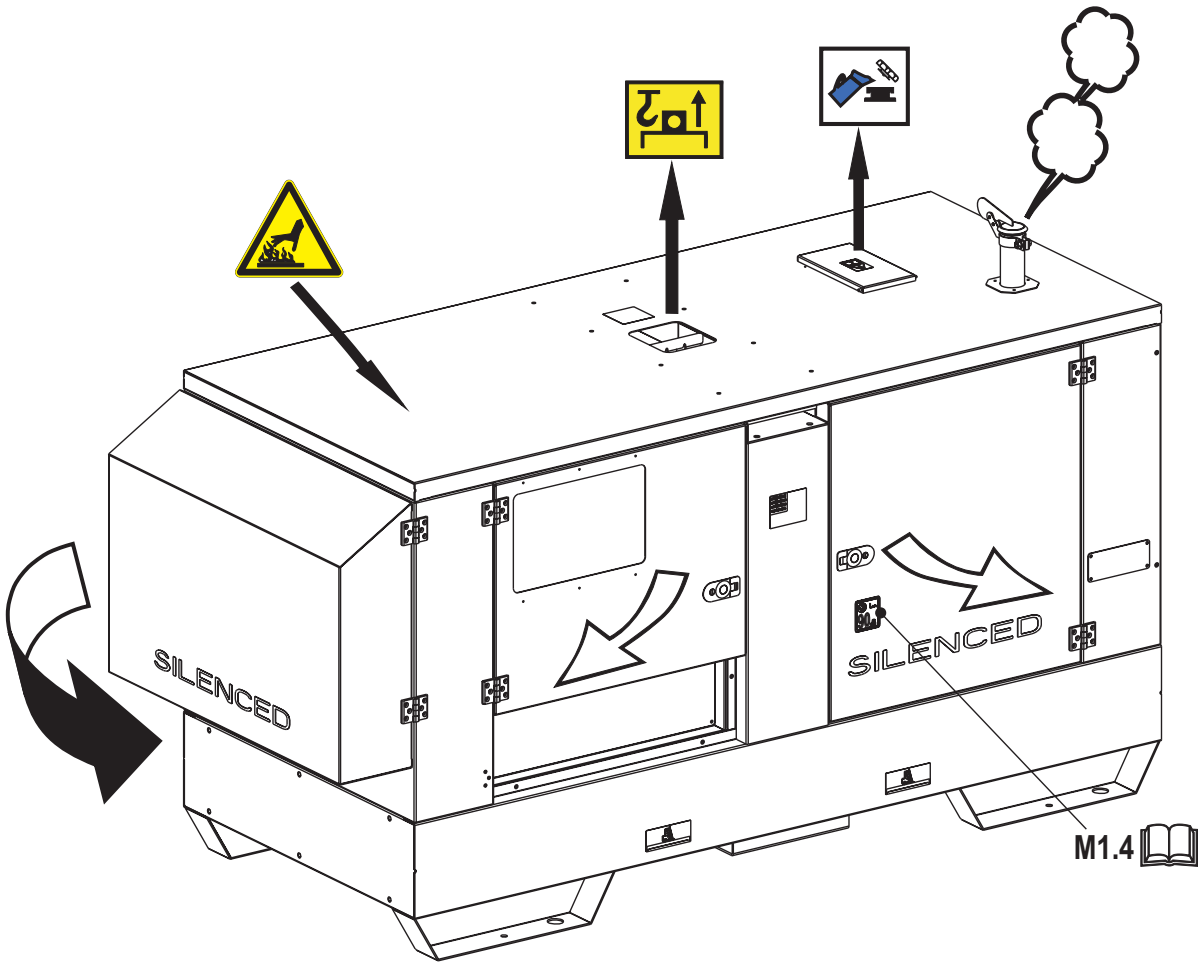
MOVES OF THE MACHINE

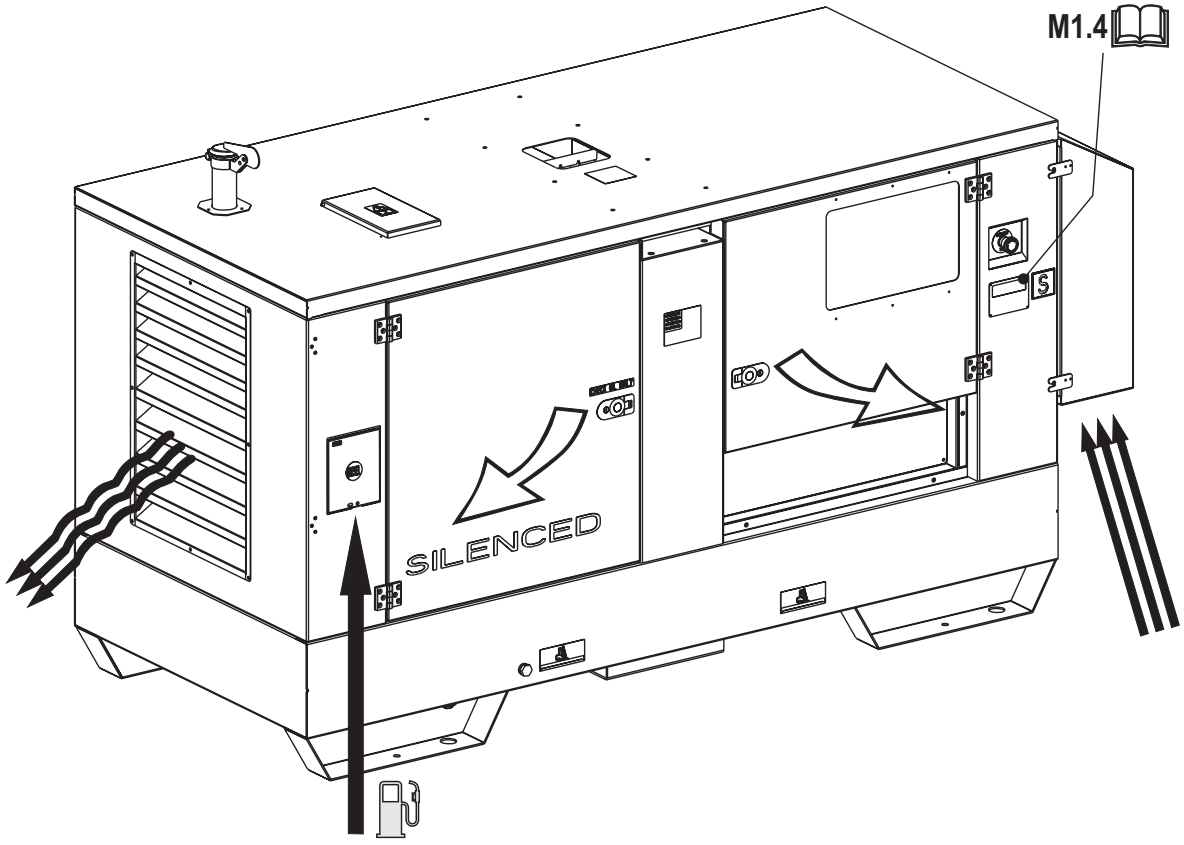
☞ At any move check that the engine is **off**, that there are no connections with cables which impede the moves.

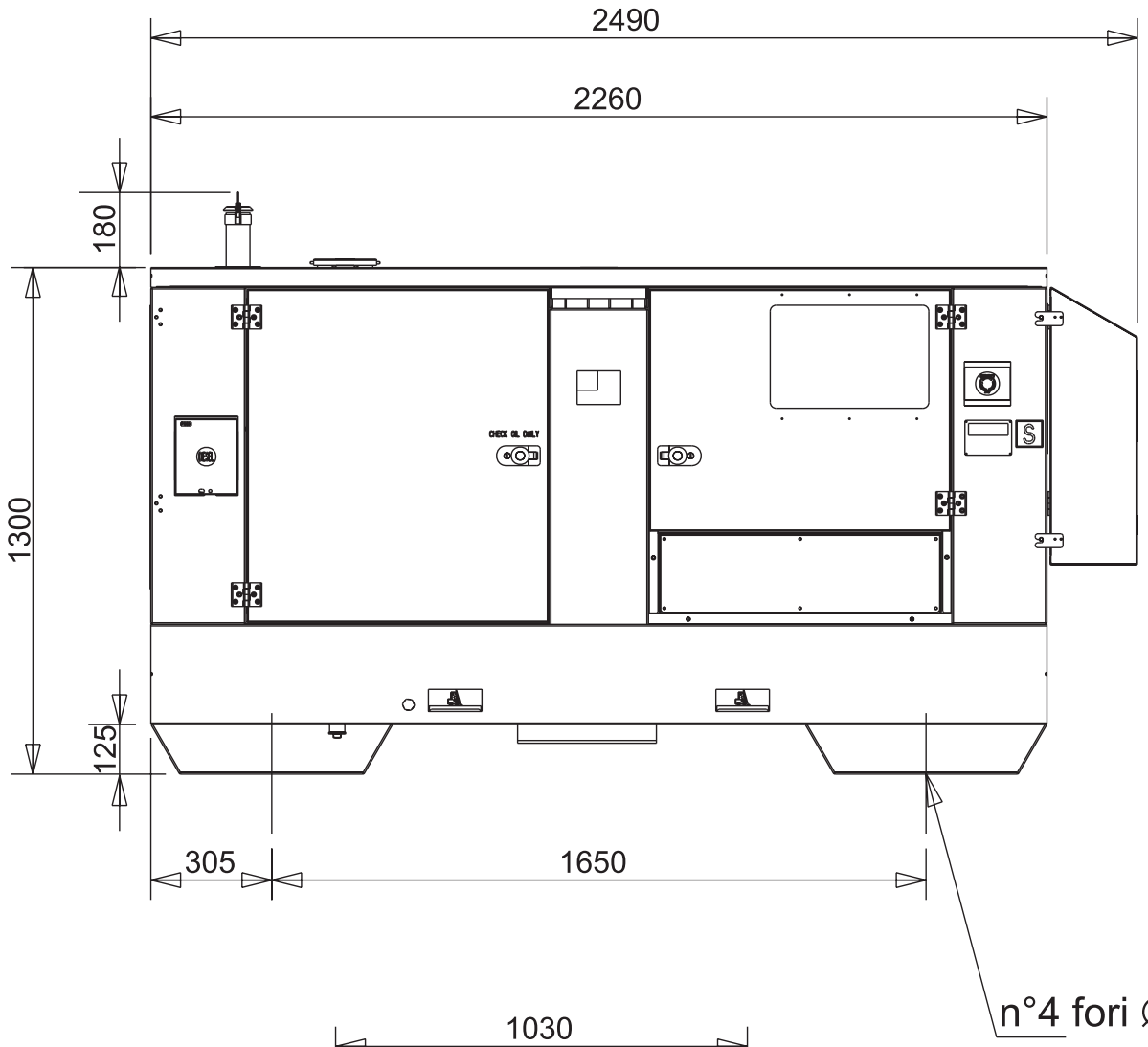
PLACE OF THE MACHINE

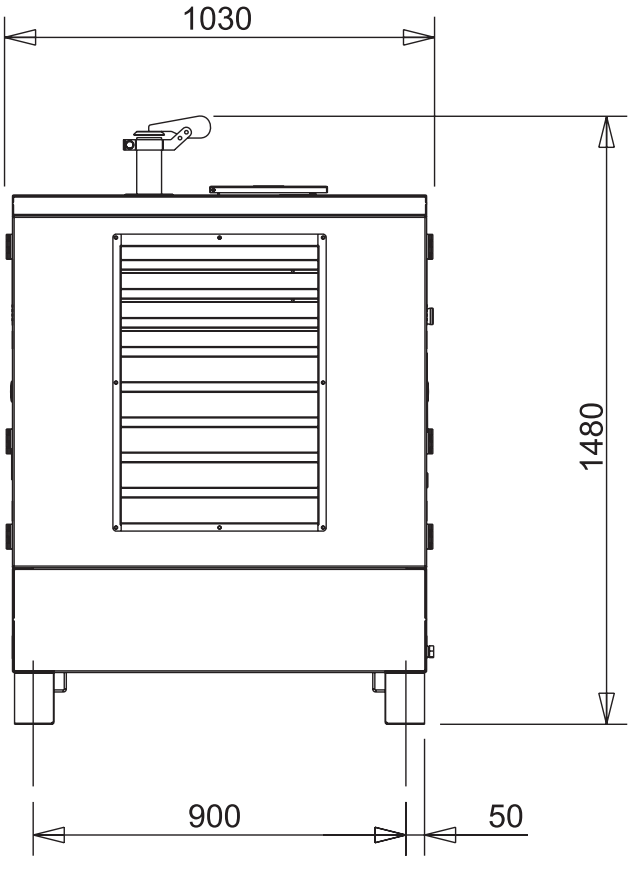
ATTENTION

For a safer use from the operator **DO NOT** fit the machine in locations with high risk of flood.
Please do not use the machine in weather conditions which are beyond IP protection shown both in the data plate and on page named "technical data" in this same manual.

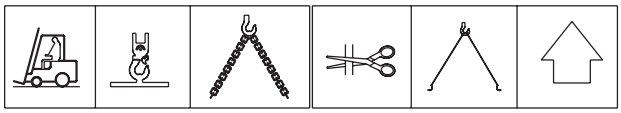

SILENCED
SILENCED
M1.4

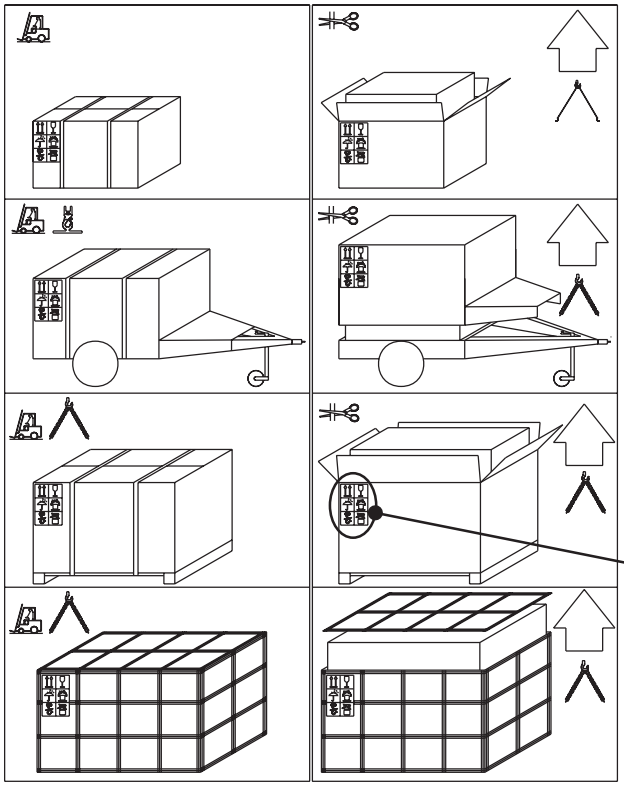

M1.4
SILENCED


2490
2260
180
1300
125
305
1650
CHECK OIL ONLY
n°4 fori ∅16


1030
1480
900
50

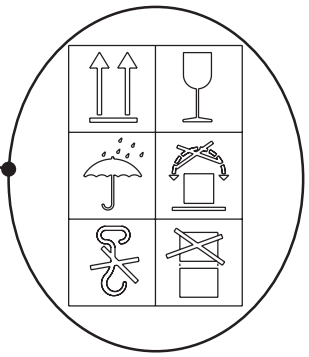
NOTE

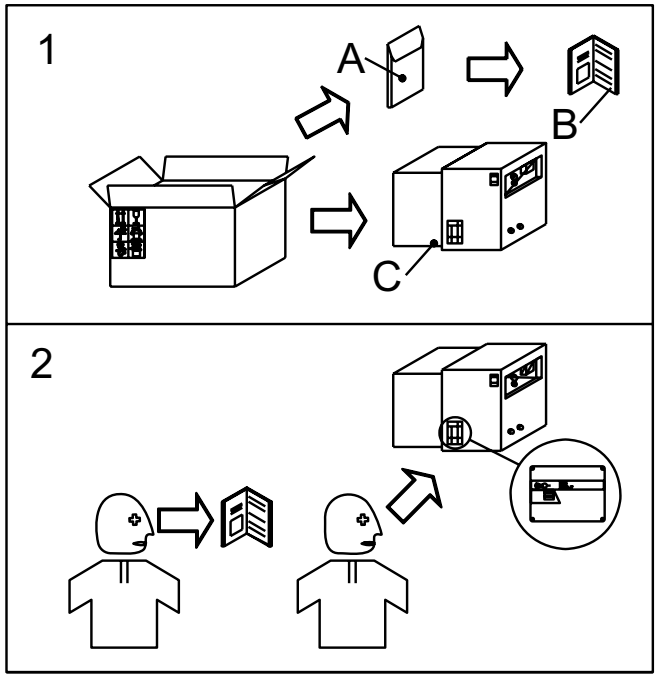




☞ Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conforms to local rules and regulations.
When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling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

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



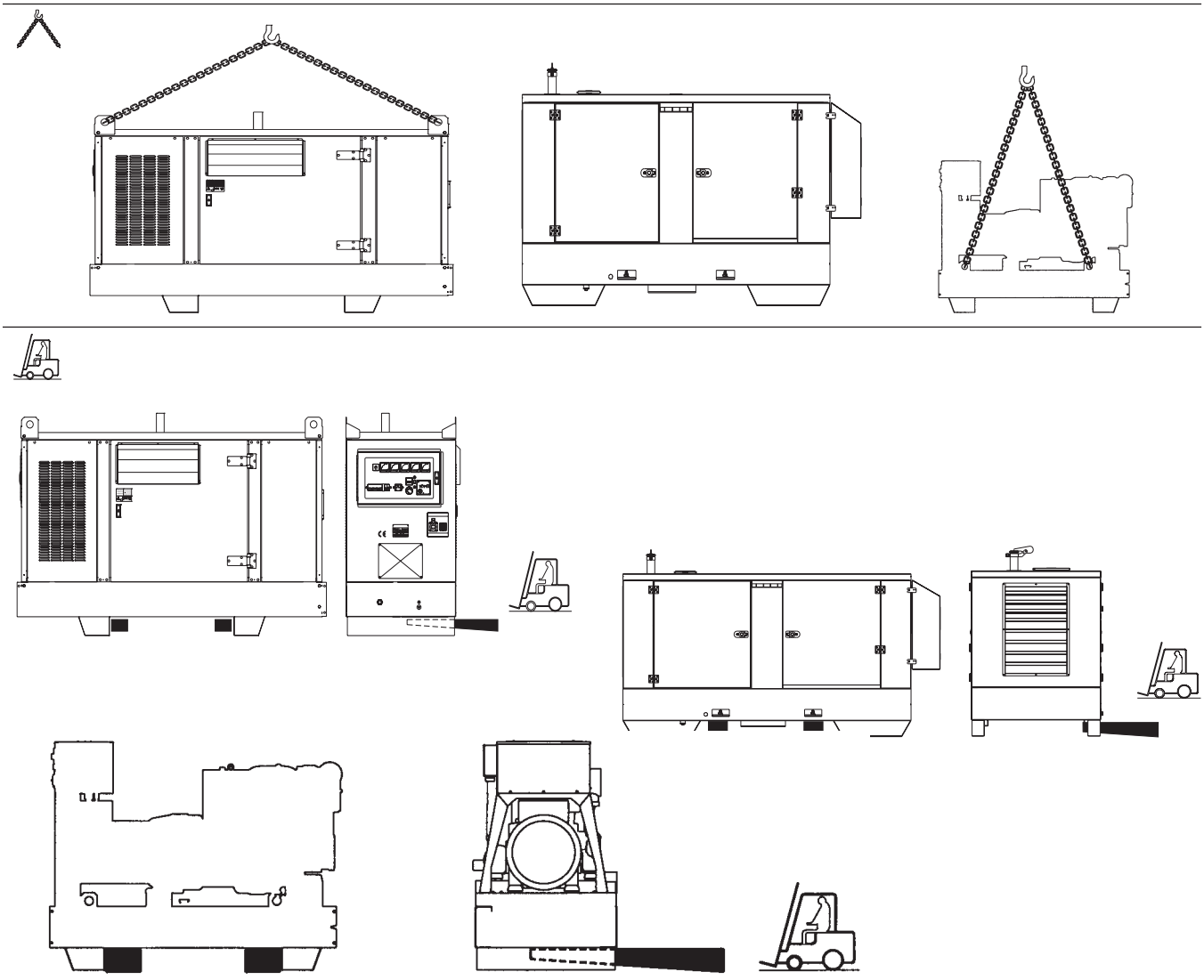


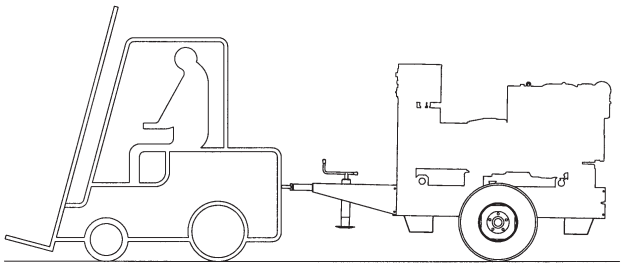
1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
2) Read: the user's manual (B), the plates fixed on the machine, the data plate.

NOTE

Transportation must always take place with the engine off, electrical cables and starting battery disconnected and fuel tank empty.
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conform to local rules and regulations.
Only authorized persons involved in the transport of the machine should be in the area of movement.

<u>DO NOT</u> LOAD OTHER PARTS WHICH CAN MODIFY WEIGHT AND BARICENTER POSITION.
IT IS STRICTLY <u>FORBIDDEN</u> 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.

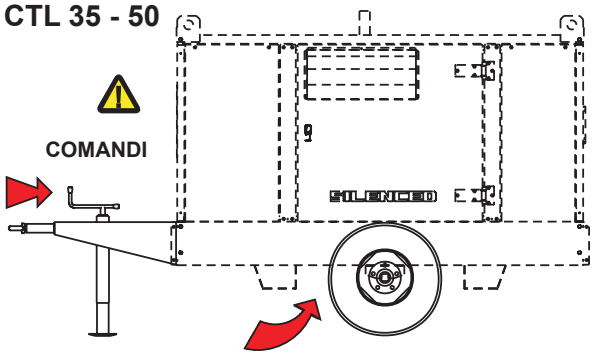
TRAILERS

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.

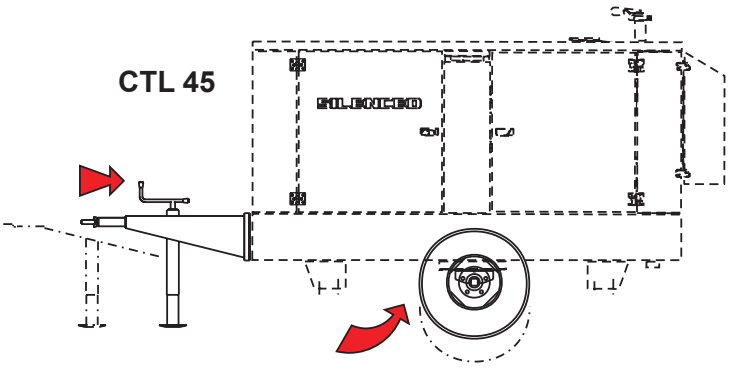
Towing on public roads or turnpikes of any type **IS EXCLUDED**, because **not** in possesion of the requirements by national and foreign traffic norms.

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

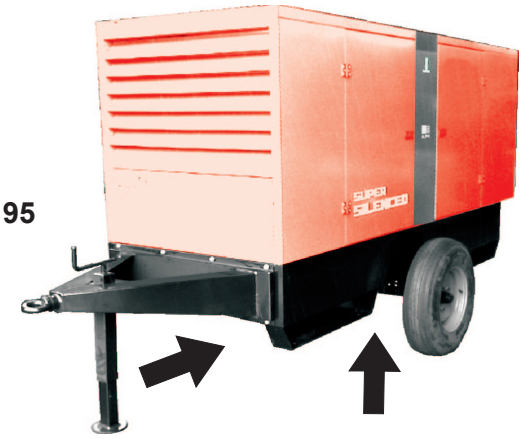
CTL 35 - 50

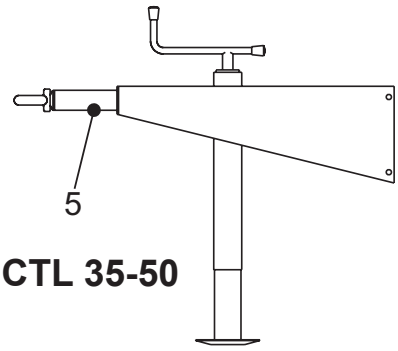


CTL 45

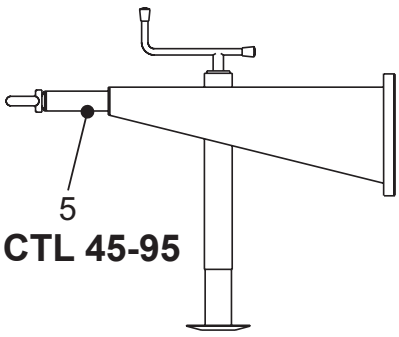


CTL 95





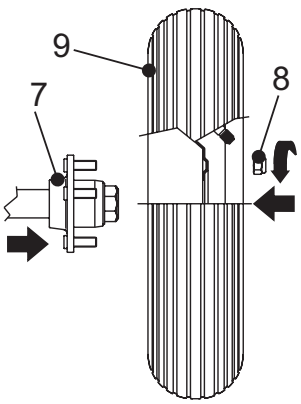
CTL 35-50



CTL 45-95

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

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



⚠ **ATTENTION**

Do not substituite the original tyres with other types.

BATTERY WITHOUT MAINTENANCE

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

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

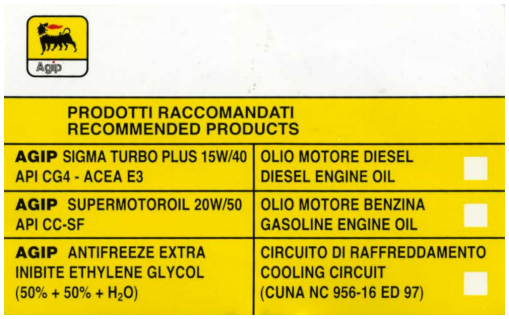
- Green colour: battery OK
- Black colour: battery to be recharged
- White colour: battery to be replaced

DO NOT OPEN THE BATTERY.

LUBRICANT

RECOMMENDED OIL

MOSA recommends selecting **AGIP** engine oil. Refer to the label on the motor for the recommended products.



PRODOTTI RACCOMANDATI RECOMMENDED PRODUCTS	
AGIP SIGMA TURBO PLUS 15W/40 API CG4 - ACEA E3	OLIO MOTORE DIESEL DIESEL ENGINE OIL
AGIP SUPERMOTOROIL 20W/50 API CC-SF	OLIO MOTORE BENZINA GASOLINE ENGINE OIL
AGIP ANTIFREEZE EXTRA INIBITE ETHYLENE GLYCOL (50% + 50% + H_2O)	CIRCUITO DI RAFFREDDAMENTO COOLING CIRCUIT (CUNA NC 956-16 ED 97)

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

REFUELLING AND CONTROL:

Carry out refuelling and controls with motor at level position.

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

ATTENTION

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

AIR FILTER

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

FUEL

ATTENTION

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

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

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

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

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

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

COOLING LIQUID

ATTENTION

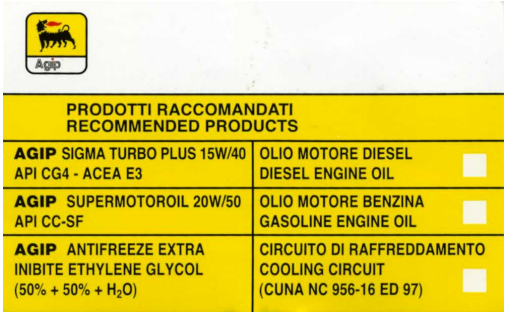
Do not remove the radiator tap with the motor in operation or still hot, as the liquid coolant may spurt out and cause serious burns. Remove the tap very carefully.

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

ATTENTION:

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

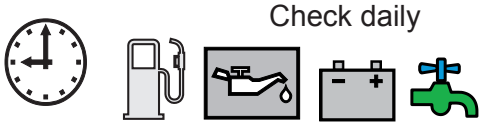
During the engine life it is strongly recommended to use the same coolant type. This is because a coolant change would require a careful cleaning of the cooling system, which is not an easy job. A lack in tacking these precautions would result in the mix of different additives used in different coolants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



GROUNDING CONNECTION

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

Check daily



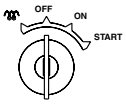
NOTE

Do not alter the factory adjustment of the engine and do not touch the sealed parts.

1500 / 1800 RPM ENGINES

These engines start their normal operating speed.

IGNITION KEY



The ingnition key is a part of the EP5 engine protection device and has three positions.

STARTING THE ENGINE

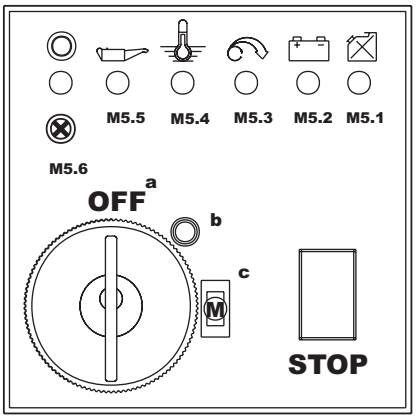
Introduce the key (Q1), turn it clockwise completely, leaving it as soon as the engine starts.

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.

ENGINE PROTECTION (EP5)

The EP5 device monitors the engine oil pressure, the engine water temperature and the rpm of the engine. If the oil pressure is too low, the water temperature too high or the speed too high, the device shuts-down the engine. For a few seconds after the engine is started the shut-down function is inhibited to allow the engine to start.



M5.1 (yellow) Fuel reserve
M5.2 (yellow) Battery charge
M5.3 (red) Overspeed
M5.4 (red) High temperature
M5.5 (red) Low oil pressure
M5.6 (green) Protection unit on

LOW OIL PRESSURE (M5.5)

In the event of low oil pressure the LED lights and the engine is shut-down.

HIGH TEMPERATURE (M5.4)

If the water temperature is too high the LED lights and the engine is shut-down.

OVERSPEED (M5.3)

If the engine speed goes over the preset value the LED lights and the engine is shutdown. The nominal frequency (50 or 60 Hz) is monitored .

FUEL RESERVE (M5.1)

If the fuel level reaches the reserve level the LED lights and the sirene sounds and the engine is shut-down.

BATTERY CHARGE (M5.2)

It the battery is not being charged the LED light but the engine does not stop.The visual signal will stay on until until the charging system is repaired.

STOP BUTTON

The stop button can be used to stop the engine at any time. Push and hold the button until the engine stops.

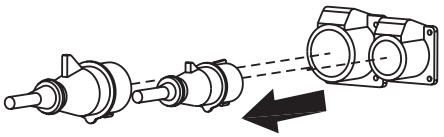
CAUTION

RUNNING-IN

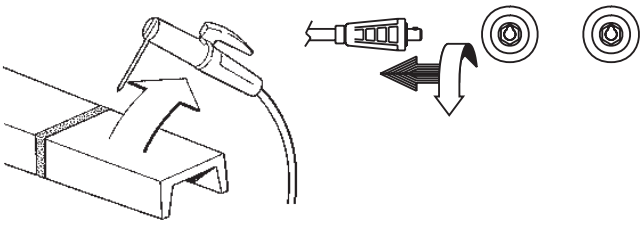
During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, in any case please stick to the rules given in the engine use manual.

Before stopping the engine **it is compulsory** to:

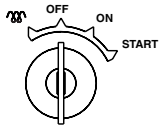
- disconnect or shut off any loads which are connected to the unit auxiliary outputs.



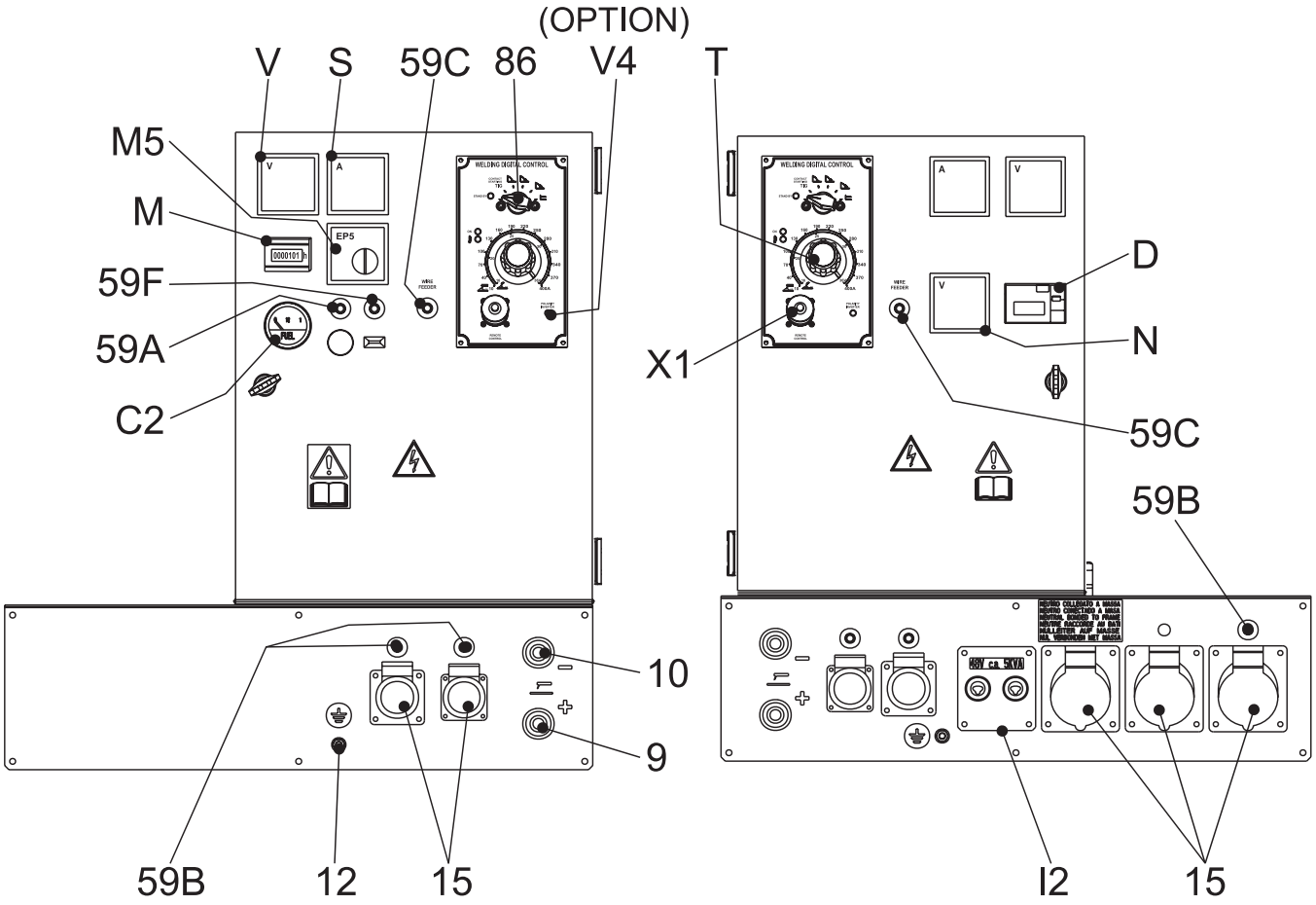
- stop welding



To stop the engine:



Turn the starter key to the off position.



Pos.	Descrizione	Description	Description	Referenzliste
9	Presa di saldatura (+)	Welding socket (+)	Prise de soudage (+)	Schweißbuchse (+)
10	Presa di saldatura (-)	Welding socket (-)	Prise de soudage (-)	Schweißbuchse (-)
12	Presa di messa a terra	Earth terminal	Prise de mise à terre	Erdanschluß
15	Presa di corrente in c.a.	A.C. socket	Prises de courant en c.a.	Steckdose AC
59A	Protezione termica motore	Engine thermal switch	Protection thermique moteur	Thermoschutz Motor
59B	Protezione termica corrente aux	Aux current thermal switch	Protection thermique courant aux.	Thermoschutz Hilfsstrom
59C	Prot. termica alim. 42V trainafilo	Supply thermal switch wire feeder-42V	Protection thermique alimentation 42V fil	Thermoschutz 42V Drahtvorschub
59F	Protezione termica elettropompa	Fuel injection pump thermal switch	Protection thermique électro-pompe	Thermoschutz elektropumpe
C2	Indicatore livello combustibile	Fuel level light	Indicateur niveau carburant	Anzeige Kraftstoffpegel
D	Interruttore differenziale (30mA)	G.F.I.	Interrupteur différentiel	FI-Schalter (GFI)
I2	Presa di corrente 48V (c.a.)	48V A.C. socket	Prise de soudage 48V (c.a.)	Steckdose 48V AC
M	Contaore	Hour counter	Compte-heures	Stundenzähler
M5	Unità controllo motore EP5	Engine control unit EP5	Protection moteur EP5	Motorschutz EP5
N	Voltmetro	Voltmete	Voltmètre	Voltmeter
Q7	Selettore modalità saldatura	Welding selector mode	Sélecteur madalité soudage	Schweissschalter
S	Amperometro di saldatura	Welding ammeter	Ampéromètre de soudage	Amperemeter Schweißstrom
T	Regolatore corrente di saldatura	Welding current regulator	Régulateur courant soudage	Schweißstromregler
V	Voltmetro tensione saldatura	Welding voltage voltmeter	Voltmètre tension soudage	Voltmeter Schweißspannung
V4	Comando invertitore di polarità	Polarity inverter control	Commande inverseur polarité	Polwendeschalter
X1	Presa per comando a distanza	Remote control socket	Prise pour télécommande	Steckdose Fernbedienung

18/11/05 88412-I

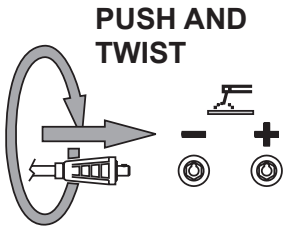
ATTENTION

Access to non qualified personnel is prohibited in proximity of these areas:
- the control panel (front-end) - the engine exhaust fumes - the welding process.

(S) This symbol (regulation EN 60974-1 on safety requirements for arc welding apparatus) indicates that the engine driven welder is suitable for use in environments with an increased risk of electrical shock.

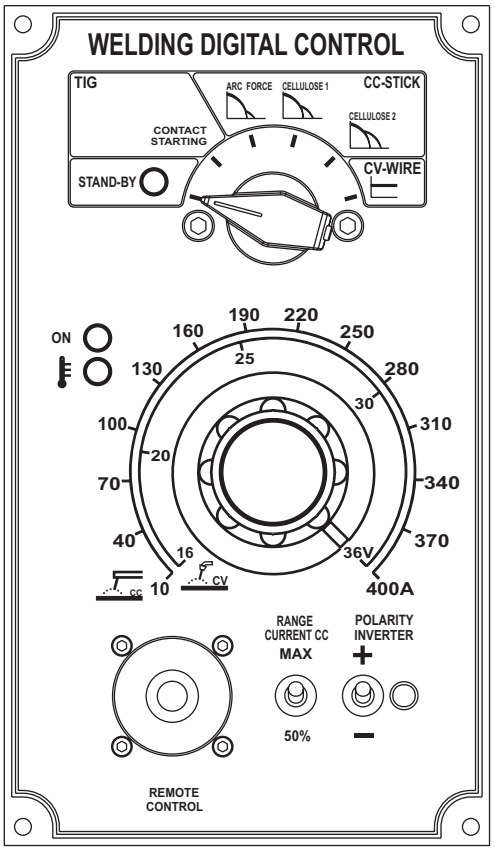
WELDING CABLE CONNECTION

Fully insert the welding cable plugs into the corresponding sockets turning them clockwise to lock them in position.



Access to non qualified personnel is prohibited in proximity of these areas:
- the control panel (front-end) - the engine exhaust fumes - the welding process.

☞ 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 posítion. Pay attention to the two polarities of the welding circuit, which must not come in electric contact between themselves.



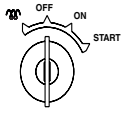
GETTING STARTED

1) After having prepared the machine (charged the battery, put in oil and fuel) the machine is ready for operation.

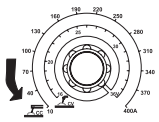
Before starting the engine please note the following:

- The welder should only be operated by qualified personnel with experience in working with engine driven welders.
- Check the oil level daily. Fuel should be put in before starting the engine.
- Before using the welder or the auxiliary power let the engine warm up and before stopping the engine let it run without load to cool down.

Refer to the following instructions regarding the function of the various controls on the front panel.

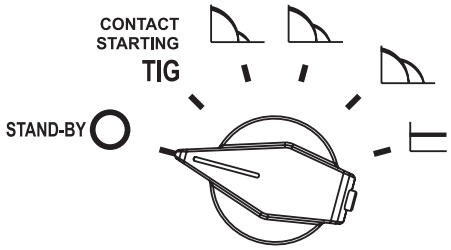


2) Start the engine of the welder



3) Turn the welding current/voltage adjusting knob to the minimum setting.

SETTING THE WELDING PROCESS



There is a manual switch for selecting the various welding processes on the welding control panel.
There are 5 processes to choose from:
1 for TIG welding
3 for STICK welding (electrode)
1 for MIG/MAG welding (continuous wire).
The switch can also be set to “stand-by” (first position). In this position there is no current at the welding connections; led “ON” off.
The process can be selected either before or after starting the motor powered welder.
After selecting the mode, the “ON” LED lights up.
If the wirefeeder connector is connected on remote control connector the “ON” LED lights only when the button torch is pressed.

TIG MODE

Contact starting TIG

This position is specifically for TIG welding. To create the arc simply place the tip of the TIG electrode on the piece that requires welding then gently move the tip away. The arc starts automatically and at the same time the welding current rises to the preset value, first using the welding current adjustment knob which is on the lower part of the control panel. The welding current can be adjusted continuously from a minimum of 10 A to a maximum which depends on the power of the machine 400 A, 500 A, 600 A.

WARNING

For EP1 version it is compulsory to accelerate the engine manually.

STICK MODE (Electrode)

Features C.C. (Constant Current)

There are three stick modes which feature increasing "arc forces" so that the arc has different levels of penetration according to the electrode and/or welding position.

MIG/MAG MODE (continuous wire)

Features C.V. (Constant Voltage)

All wire type welding processes can be carried out, naked or coated.

The voltage can be adjusted using the same knob which adjusts the current in STICK mode. Adjustment is continuous and goes from a minimum of 15 V to a maximum of 36V, 40 V.

Optional remote control

The welding current can also be set from a distance using the optional remote control. Once the remote control is connected to the connector (X1), the current is controlled by the remote control. To return to front panel control remove the connector.

Optional VRD program (Voltage Reduction Device VRD)

When you choose the program stick or stick arc force the Open Circuit Voltage (OCV) go up, red light switch ON and green light switch OFF, bat only for about 3", than the OCV go down, green light switch ON and red light switch OFF, about 11V and stop there, until the welder start welding.

When you make a short circuit with the stick the OCV immediately go up, so you can start to welding.

Inversion of polarity (Optional, available on request)

In order to invert polarity, press the switch on the remote control unit.

By selecting "inversion" the "ON" LED switches off and the voltage at the welding socket becomes zero. The power contactor is witched inside the electrical box and the voltage reappears at the welding sockets. The "ON" LED switches back on at the same time.

The "Invert polarity" LED on the front panel near the welding current adjuster switches on .

You cannot invert polarity in **"MIG/MAG"** mode.

PROTECTIONS

The Welding Digital Control features 3 protections for the control and chopper.

1) "ON" LED blinking

ON When the engine of the welder is started the control unit automatically goes to the stand by mode for few istants (stand-by LED on) and performs a self-diagnosis of the current sensor connector and power source voltage + 15V; than the last process is loaded (on led turned ON).

In case of malfunction the **"ON" LED** blinks.

2) Red LED blinking

The chopper has a thermal protection, which intervenes in case the operating temperature exceeds 85°C.

If the protection intervenes, the red LED begins to flash and the welding current/voltage goes to zero. In this case do not switch off the welder, since the alternator fan will help cool down the chopper more quickly.

After a few minutes, the LED will automatically switch itself off and the welding voltage/current will once again be available at the plugs.

3) Red LED continuously lit

If an anomalous current is detected in the chopper, the control blocks the conversion immediately, the output welding current/voltage goes to zero and the red LED lights up. To reset everything, it is necessary to switch off the machine.

If the protections 1) and 3) should intervene, it is best to immediately contact the nearest authorised Service Centre.

DIGITAL INSTRUMENTS

(Optional, available on request)

Two digital instruments showed the operating value of welding current and welding voltage.

WIRE FEEDER CONNECTED WITH REMOTE CONTROL CONNECTOR

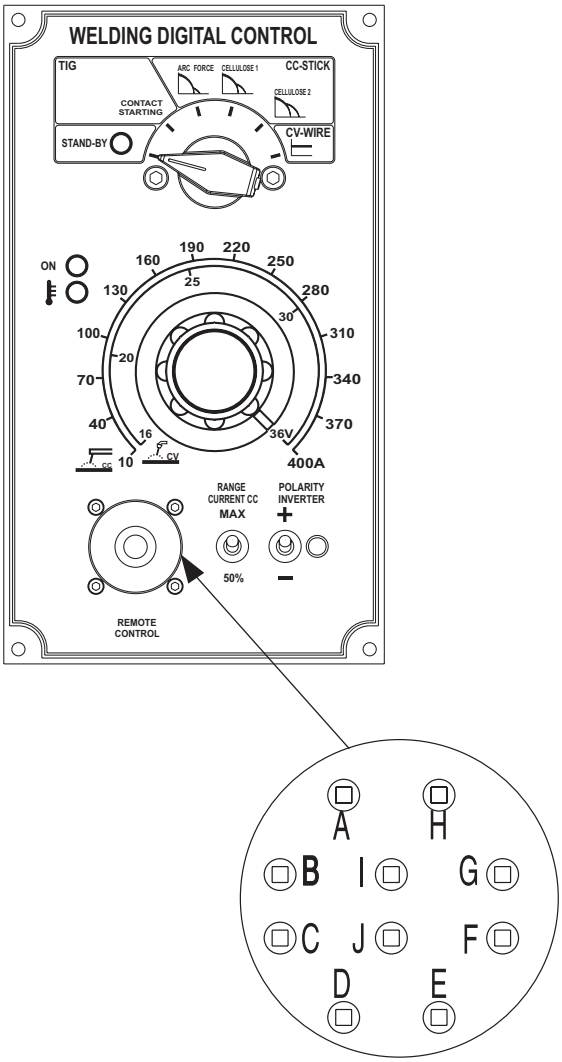
Wire feeder connection

Connect the wire feeder to the welder with the welder turned off:

-Welding cable between the machine's (9) welding plug (+) and the wire feeder.
-Welding cable between the machine's (10) welding plug (-) and the piece to be welded.
-Control/power cable between the machine's connector (X1) and the corresponding connector on the wire feeder.

Start the machine welder

The "ON" LED will be off and will turn on only when there is voltage at the welding plugs (and therefore at the wire).
The voltage is only present when the welding torch button is pressed.
The setting of the welding voltage is done using the knob on the wire feeder.
The adjusting knob on the welder is automatically inhibited.



WARNING

You can use the wire feeder only by respecting the pin configuration as shown on the below mentioned table.

"WIRE FEEDER connected without remote control connector"

Welding voltage is always present on welding sockets and also VRD is active.

-Welding cable between the machine's (9) welding plug (+) and the wire feeder.
-Welding cable between the machine's (10) welding plug (-) and the piece to be welded.

The setting of the welding voltage is done by using the knob on the front panel.

NAME OF CONTACT	DESCRIPTION
A (electric ground)	To potentiometer RC1 "terminal a"
B	To potentiometer RC1"central b" To potentiometer RC1 "terminal c"
C (5 V d.c.)	short circuit with contact "C"
D	To switch "Polarity Inverter"
E	(Close for negative polarity)
F (5 V d.c.)	Return from switch on CV wel-
G	ding gun, 1-phase (44 - 48V a.c.) Welding ground for d.c. voltmeter
H (welding ground)	on wire feeder
I (44 - 48V a.c.) J (44 - 48V a.c.)	Voltage supply for wire feeder

WARNING

It is strictly forbidden to connect the group to the public mains and/or to any other source of electric power.

GENERATION IN AC (ALTERNATING CURRENT)

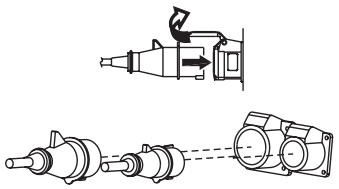
Make certain of the efficiency of the ground connection (12). - See page M20 -.

Position the GFI switch to ON.

☞Voltage is now immediately available to the AC sockets.

Verify that the voltmeter displays the nominal voltage value (at no load it is close to +10% of the nominal value).

Connect the electric devices to be powered to the AC sockets, using suitable plugs and cables in good condition.



☞ Verify that the electrical characteristics (voltage/frequency/power) of the device being powered are compatible with those of the generator.
Low frequency and/or voltage can irreparably damage some electrical devices.

Verify that the ground lead of the electrical appliance/tool to be powered is correctly connected to the terminal of the plug.

☞ For double insulation devices with the symbol ⧈ , the plug's ground terminal does not need to be grounded.

THERMAL PROTECTION

The monophase outputs are protected against overloads by the thermal protection (59B).

When the rated current is exceeded, the protection intervenes to cut off the voltage to the AC socket.

☞ **Notes:** the intervention of the thermal protection is not instantaneous, but reacts according to an overcurrent/time characteristic, whereby the greater the overcurrent the quicker the intervention.

In case of intervention by the protection device, verify that the total power for the loads connected does not exceed the declared rating and decrease if necessary. Disconnect the loads and wait a few minutes to allow the thermal protection to cool down.

Before resetting by pressing the central button and then connect the load again.

If the protection should intervene again, replace it with another one with matching intervention current specifications and/or contact the Service Department.

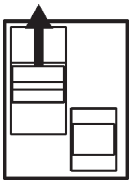
☞ Note: do not forcibly hold the central button of the thermal protection device to prevent its intervention, as this could irreparably **damage** the unit's alternator.

☞ Note: the three phase output does not require any protection against overcurrents, since it uses a self-protecting asynchronous type alternator.

GROUND FAULT INTERRUPTOR SWITCH

The high-sensitivity ground fault interruptor switch [G.F.I.] (30mA) (D), guarantees protection against indirect contacts due to faulty ground currents .

When the G.F.I. switch picks up a faulty ground current that is higher than 30mA, it intervenes by immediately cutting off voltage to the AC sockets.



In case of intervention by this protection device, reset the G.F.I. switch by moving the lever to the ON position. In case of another intervention, verify that there are no faults in the tools connected, or replace the G.F.I. switch with another one of matching specifications and/or contact the Service Department.

☞ **Notes:** Verify the operation of the G.F.I. switch at least once a month by pressing the TEST button. The generator must be running and the G.F.I. lever in the ON position.

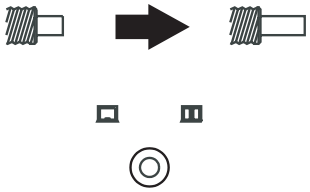
SIMULTANEOUS USE

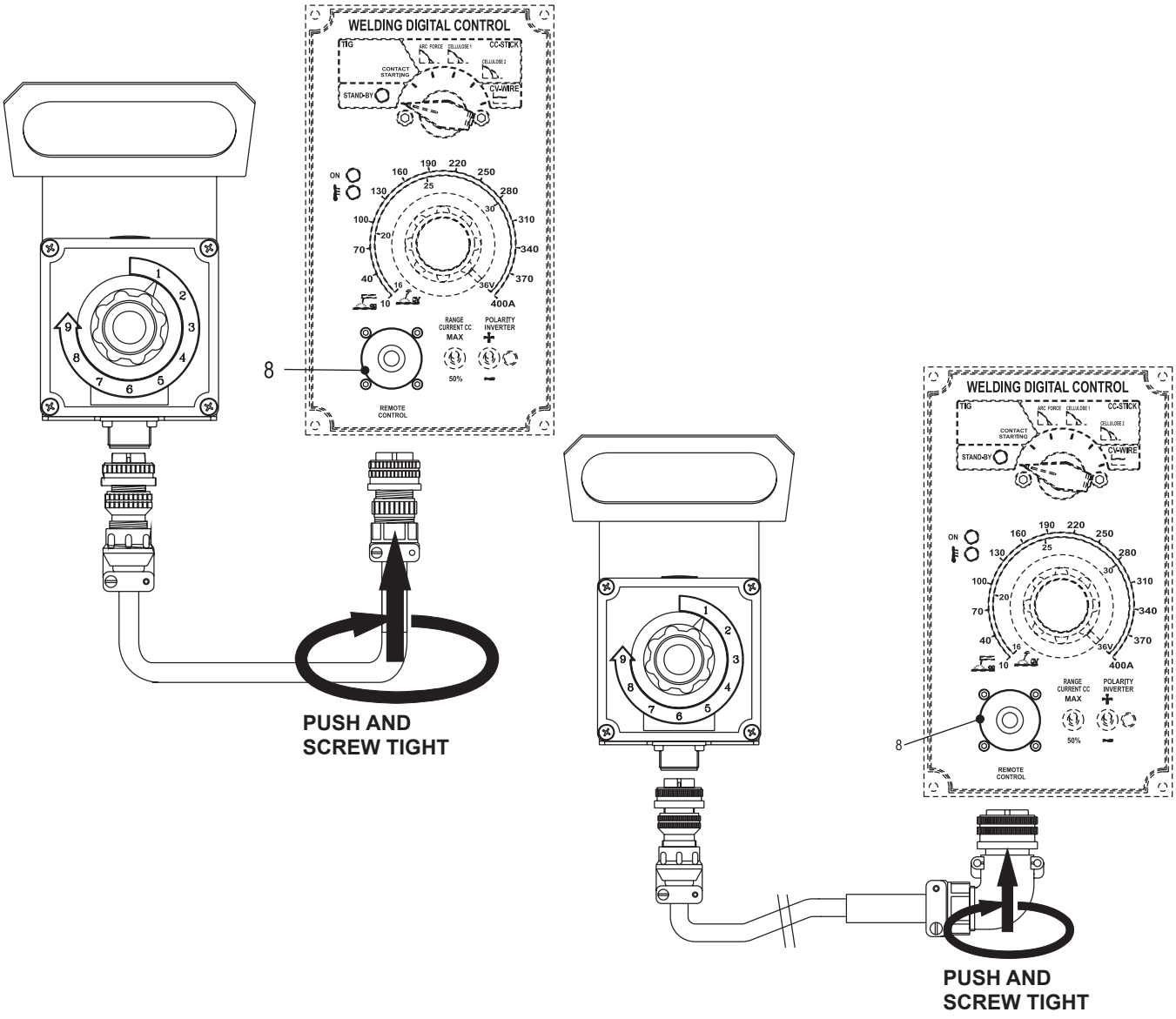
The welder's alternator permits the simultaneous use of auxiliary power and welding current. The auxiliary power available to the AC plugs (15) diminishes as the welding current drawn increases.

The table on page M1.6 TECHNICAL SPECIFICATIONS shows the amount of auxiliary power available as the welding current varies.

COMBINED USE

The output available from the various auxiliary power sockets is limited, not only by the declared output of the unit but also by the capacity of each individual socket.





The remote control RC, which regulates the welding current in the CC (STICK welding) mode and the welding voltage in the CV (MIG/MAG welding), is connected to the front panel by means of a multipole connector.

When the remote control is connected to the remote control connector (8), it is functional and automatically excludes the front panel regulation. The remote control can also be connected to the connector on the wire feeder front panel but in this case it is necessary to switch the wire feeder commutator so it can operate.

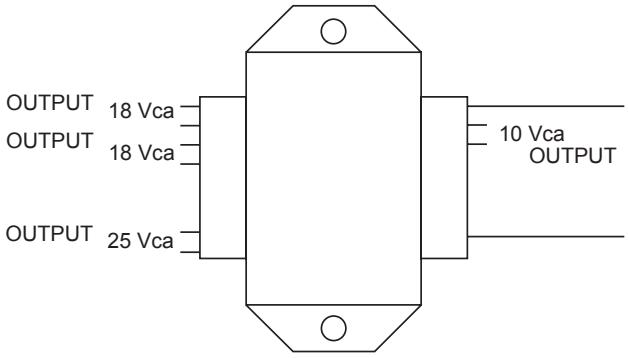
Adjust the welding current control knob to the correct current for the diameter and type of electrode being welded.

ATTENTION

When the RC is not used, it is necessary to disconnect the multipole connector

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
WELDING		
P1 All functions performed by the WDC are regular, but there is no tension on the welding sockets	1) Position of regulation potentiometer incorrect knob	1) Adjust the position of the WDC regulation knob on the potentiometer spindle so that the potentiometer is not completely at the end of its travel when the knob reaches its minimum position. Idem for the RC remote control knob.
P2 Malfunction in the selection of welding processes or in their confirmation on other functions performed by the WDC	1) WDC defective	1) **Replace** the WDC.
P3 Blinking "ON" LED	1) Current sensor connector P3 2) Aux power voltage value (±15V) too high or too low	1) Connector P3 not inserted or defective - see drawing 5 2) Check the aux trasformer, see drawing 1
P4 Blinking red LED	1) The chopper thermic protection is intervening 2) Temperature sensor situated on chopper (NTC resistor) short circuited or open. 3) WDC defective	1) The output is inhibited automatically; let the motor continue to run to cool down the chopper, and after a few minutes the LED will automatically switch off and there will be current/voltage once again at the welding sockets. 2) Check chopper connector, drawing 2, from pin 1-2. The resistor must be bigger than 1800 Ω and less than 25 KΩ, otherwise the led blinking. **Replace** the chopper. In the meantime you can work cutting the wire which arrives to pin 1 - pin 2 and put on it one resistor 10 KΩ. In this case the thermic protection don't work but you can use the machine. 3) **Replace** the WDC.
P5 Red LED always on	1) WDC defective 2) Chopper defective 3) Current sensor defective	1) **Switch off** the machine and start it up again; if the LED remains off try to weld, verifying that the welding is regular; if the LED lights up again. Replace the WDC. 2) Check the chopper as shown on drawing 2. 3) Replace the sensor.
P6 RC remote does not operate.	1) Remote control (or cable) defective. 2) WDC defective.	1) Check the RC. See drawing 4. 2) **Replace** the WDC
P7 The welding current is always at max or always at minimum	1) Potentiometer on WDC defective 2) WDC defective 3) Welding current sensor defective	1) Check from pin 1-12 connector P4 (pin 1 - ground see drawing 3) 2) Replace the WDC 3) Replace the current sensor
P8 No voltage at the welding sockets in CV mode	1) Defective wire feeder cable 2) Defective wire feeder 3) Defective WDC	1) Check the connections pin to pin of the wire 2) Check the wire feeder 3) Without wire feeder cable put the pin I in short circuit with G on remote control connector, the led ON must be light - WDC ok otherwise change WDC
P9 No welding or generation output	1) Short circuit of chopper. 2) Short circuit of generation unit. 3) Alternator defective.	1) **Disconnect** the chopper and re-start the machine; if there is now an output present, replace the chopper 2) **Disconnect** the auxiliary output circuit and re-start the machine; if there is now an output present, there is a short circuit in the auxiliary output circuit or in one of the components 3) **Disconnect** all outputs on the alternator (welding and generation unless the output going to the condensers) and check the capacity of the condensers. Restart the machine, if there is still no output, replace the alternator.

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
WELDING WITH V.R.D.		
P10 The welding tension after 3 sec isn't less enough (plus in 12V dc)	1) Net R.C. defective or disconnected from + or - welding socket 2) WDC defective.	1) Check the net R.C. Check the connections. 2) **Replace** the WDC.
GENERETING		
P1 Voltmeter shows no voltage or low voltage but actual voltage at the sockets is OK.	1) Voltmeter malfunction	1) **Replace** the voltmeter.
P2 No three-phase voltage present at the socket(s).	1) Differential switch not inserted 2) Differential switch malfunction	1) **Turn on** the switch. 2) **Replace** the switch.
P3 No single phase voltage one socket but voltmeter reading is normal and there is voltage on the other sockets.	1) Intervention of thermal switch due to excessive current. 2) Thermal switch malfunction.	1) **Push in** the thermal switch. 2) **Replace** the thermal switch.
P4 No voltage present. (See problem P9)	1) Short circuit present on the generator outputs.	1) **Disconnect** all outputs on the generator except for those on the condensers and re-start machine; check for voltage on condensers.
MOTOR		
P1 The engine does not start or stops immediately after startup.	1) Low battery voltage, battery dead or defective. 2) Presence of air in the fuel supply circuit. 3) Circuit breaker engine protection 4) Engine solenoid	1) Check the warning light "state of the battery": - Green colour: battery OK - Black colour: battery to be recharged - White colour: battery to be replaced - **DO NOT OPEN THE BATTERY.** 2) Carry out de-aeration on the fuel system. See engine operating manual. 3) Insert the circuit breaker. In case the problem persists, check the electrical circuit and eliminate the problem. Call an authorised service centre. 4) See engine manual
P2 Engine stops due to intervention of EP5/EP7/ES.	1) Engine temperature too high or insufficient oil pressure. 2) High temperature sensor or oil pressure defective. 3) EP5/EP7/ES protection defective	1) **Check** oil level. 2) **Replace** the malfunctioning sensor. 3) **Replace** the protection.
P3 The battery is not charged.	1) Battery charger alternator defective. 2) Battery charger warning light defective.	1) **Replace** 2) **Replace**
P4 For other problems, refer to the attached engine manual		



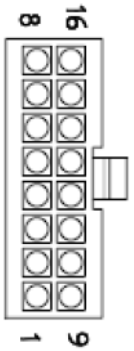
Check the transformer in this way:

input: 220 Vac
output: 18 Vac, 25 Vac, 10 Vac

DRAWING 1

CHOPPER TEST

CHECK THE FOLLOWING RESISTIVE VALUES ON THE CHOPPER CONNECTOR



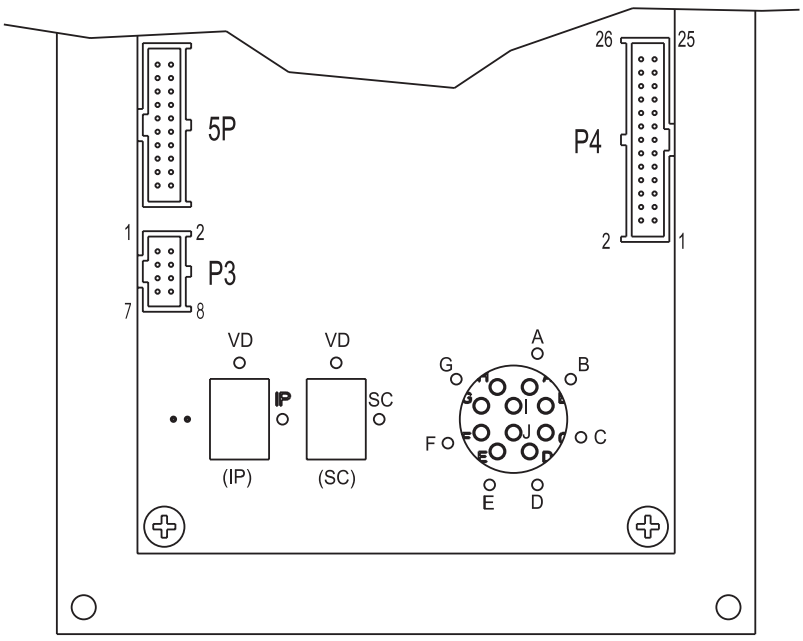
WIEW FROM INSERTION SIDE

Check the resistive values between the following pairs of pins, by means of an ohmmeter.

Pins	CT 350	DSP 400 DSP 2x400 DSP 500	DSP 600
1 - 9	3,33 KΩ ± 5%	3,33 KΩ ± 5%	3,33 KΩ ± 5%
2 - 10	3,33 KΩ ± 5%	3,33 KΩ ± 5%	3,33 KΩ ± 5%
3 - 11	3,33 KΩ ± 5%	3,33 KΩ ± 5%	3,33 KΩ ± 5%
4 - 12	-	3,33 KΩ ± 5%	3,33 KΩ ± 5%
5 - 13	-	-	3,33 KΩ ± 5%
8 - 16	1,8 ÷ 25 KΩ ± 5% (In funzione della temperatura)		

DRAWING 2

Connector P4 on WDC

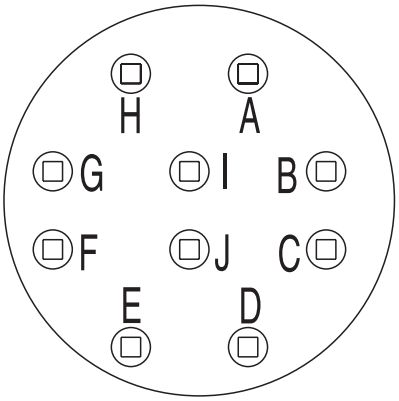


DRAWING 3

POTENTIOMETER TEST

To check if the potentiometer of the WDC works correctly perform the following test:

1) Start the welding machine and let it run at nominal r.p.m.
2) Connect a multimeter set for VDC measurement between pins 1 (GND) and 12 of connector P4
3) Turn the knob completely AKW and check thet the voltage is ≤0,5V
4) Turn the knob gradually KW and check that the voltage increases up to a value ≥4,5V at rotation stop. the voltage shall increase in a regular way with the rotation.

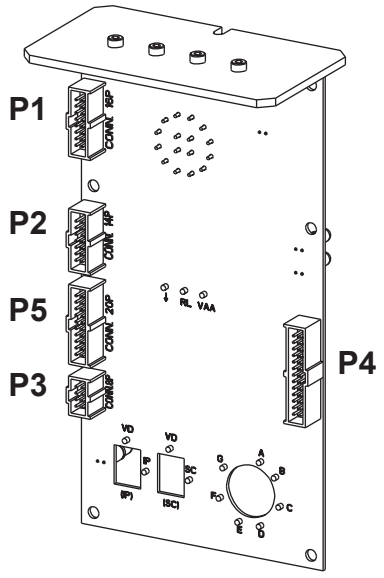


Put the knob on RC1 at minimum/max, put one ohmmeter from pin A - B and measure the resistance.

Knob	Resistance
Minimum Max	50 ÷ 100 Ω 4,5 - 4,7 KΩ

DRAWING 4

P1 Supply connector
P2 Chopper connector
P3 Current sensor connector
P4 - P5 Free



DRAWING 5

⚠ WARNING

MOVING PARTS can injure

- Have **qualified** personnel do maintenance and troubleshooting work.
- Stop the engine before doing any work inside the machine. If for any reason the machine must be operated while working inside, **pay attention** moving parts, hot parts (exhaust manifold and muffler, etc.) electrical parts which may be unprotected when the machine is open.
- Remove guards only when necessary to perform maintenance, and replace them when the maintenance requiring their removal is complete.
- Use suitable tools and clothes.
- Do not modify the components if not authorized.

- See pag. M1.1 -

HOT surface can hurt you

NOTE

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

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

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

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

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

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

⚠ IMPORTANT

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

ENGINE and ALTERNATOR

PLEASE REFER TO THE SPECIFIC MANUALS PROVIDED.

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

VENTILATION

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

ELECTRICAL PANELS

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

DECALS AND LABELS

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

STRENUOUS OPERATING CONDITIONS

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

BATTERY WITHOUT MAINTENANCE
DO NOT OPEN THE BATTERY

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

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

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

⚠ NOTE

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

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

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

GASOLINE ENGINE

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

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

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

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

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

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

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

DIESEL ENGINE

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

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

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

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

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

IMPORTANT

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

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

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

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

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

The getting rid of the various components of the machine must be made accordingly to rules in force of law a/o local rules.
Particular attention must be paid when getting rid of:
lubricating oils, battery electrolyte, and inflammable liquids such as fuel, cooling liquid.

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

In case the machine should be cust off without any previous disassembly it is however compulsory to remove:
- tank fuel
- engine lubricating oil
- cooling liquid from the engine
- battery

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

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

IMPORTANT

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

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

RUTILE ELECTRODES: E 6013

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

BASIC ELECTRODES: E 7015

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

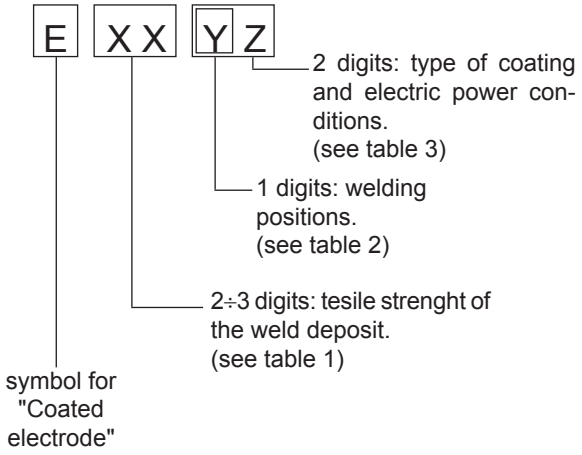
HIGH YIELD BASIC ELECTRODES: E 7018

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

CELLULOSIC ELECTRODES: E 6010

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

ELECTRODES IDENTIFICATION ACCORDING TO A.W.S. STANDARDS



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

Table 1

1	for all positions
2	for plane and verticl
3	for plane posotion only

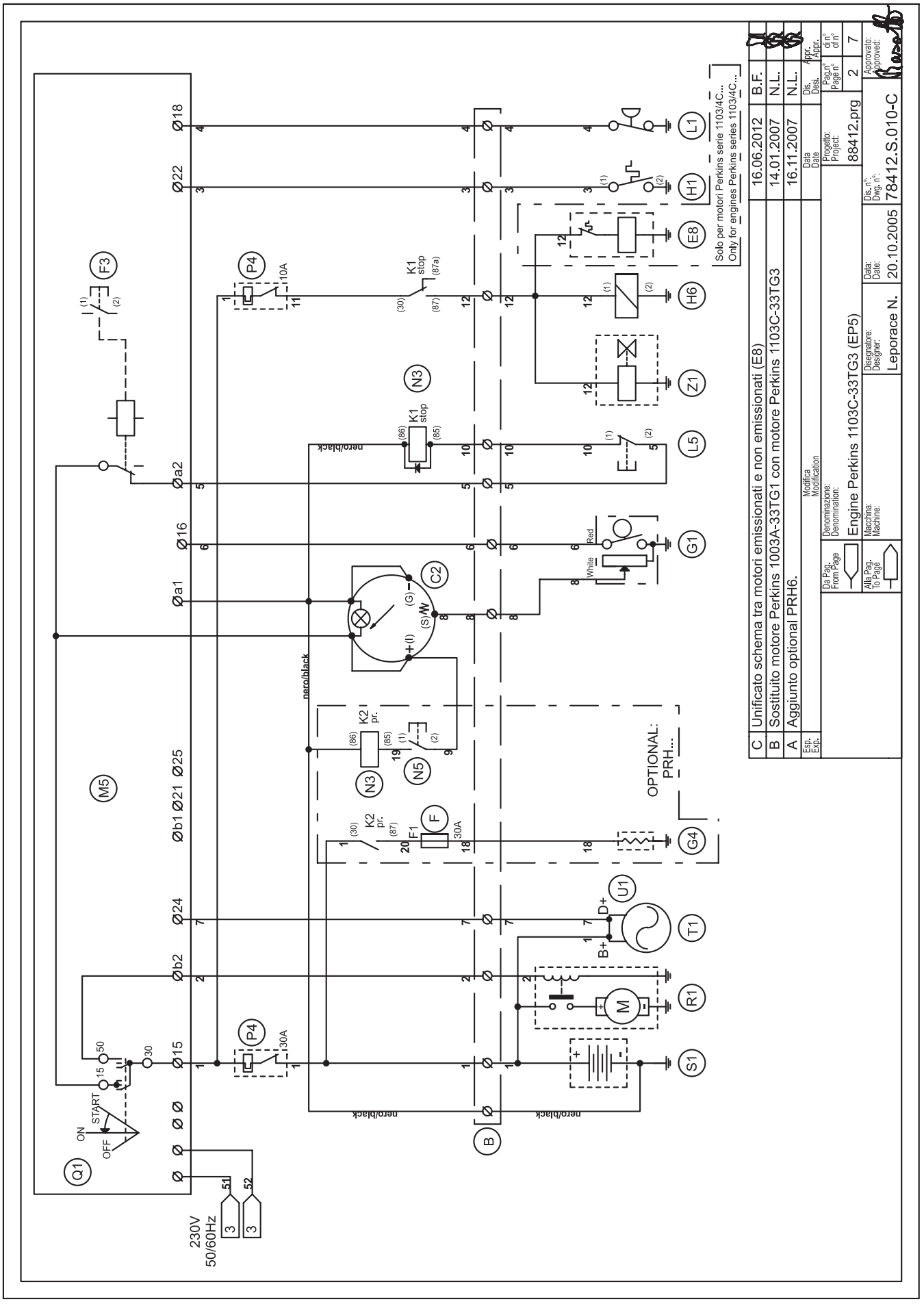
Table 2

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

Table 3

ELECTRICAL SYSTEM LEGENDE

A : Alternator
B : Wire connection unit
C : Capacitor
D : G.F.I.
E : Welding PCB transformer
F : Fuse
G : 400V 3-phase socket
H : 230V 1phase socket
I : 110V 1-phase socket
L : Socket warning light
M : Hour-counter
N : Voltmeter
P : Welding arc regulator
Q : 230V 3-phase socket
R : Welding control PCB
S : Welding current ammeter
T : Welding current regulator
U : Current transformer
V : Welding voltage voltmeter
Z : Welding sockets
X : Shunt
W : D.C. inductor
Y : Welding diode bridge
A1 : Arc striking resistor
B1 : Arc striking circuit
C1 : 110V D.C./48V D.C. diode bridge
D1 : E.P.1 engine protection
E1 : Engine stop solenoid
F1 : Acceleration solenoid
G1 : Fuel level transmitter
H1 : Oil or water thermostat
I1 : 48V D.C. socket
L1 : Oil pressure switch
M1 : Fuel warning light
N1 : Battery charge warning light
O1 : Oil pressure warning light
P1 : Fuse
Q1 : Starter key
R1 : Starter motor
S1 : Battery
T1 : Battery charge alternator
U1 : Battery charge voltage regulator
V1 : Solenoid valve control PCBT
Z1 : Solenoid valve
W1 : Remote control switch
X1 : Remote control and/or wire feeder socket
Y1 : Remote control plug
A2 : Remote control welding regulator
B2 : E.P.2 engine protection
C2 : Fuel level gauge
D2 : Ammeter
E2 : Frequency meter
F2 : Battery charge trasformer
G2 : Battery charge PCB
H2 : Voltage selector switch
I2 : 48V a.c. socket
L2 : Thermal relay
M2 : Contactor
N2 : G.F.I. and circuit breaker
O2 : 42V EEC socket
P2 : G.F.I. resistor
Q2 : T.E.P. engine protection
R2 : Solenoid control PCBT
S2 : Oil level transmitter
T2 : Engine stop push-button T.C.1
U2 : Engine start push-buttonT.C.1
V2 : 24V c.a. socket
Z2 : Thermal magnetic circuit breaker
W2 : S.C.R. protection unit
X2 : Remote control socket
Y2 : Remote control plug
A3 : Insulation moitoring
B3 : E.A.S. connector
C3 : E.A.S. PCB
D3 : Booster socket
E3 : Open circuit voltage switch
F3 : Stop push-button
G3 : Ignition coil
H3 : Spark plug
I3 : Range switch
L3 : Oil shut-down button
M3 : Battery charge diode
N3 : Relay
O3 : Resistor
P3 : Sparkler reactor
Q3 : Output power unit
R3 : Electric siren
S3 : E.P.4 engine protection
T3 : Engine control PCB
U3 : R.P.M. electronic regulator
V3 : PTO HI control PCB
Z3 : PTO HI 20 l/min push-button
W3 : PTO HI 30 l/min push-button
X3 : PTO HI reset push-button
Y3 : PTO HI 20 l/min indicator
A4 : PTO HI 30 l/min indicator
B4 : PTO HI reset indicator
C4 : PTO HI 20 l/min solenoid valve
D4 : PTO HI 30 l/ min solenoid valve
E4 : Hydraulic oil pressure switch
F4 : Hycraulic oil level gauge
G4 : Preheating glow plugs
H4 : Preheating gearbox
I4 : Preheating indicator
L4 : R.C. filter
M4 : Heater with thermostat
N4 : Choke solenoid
O4 : Step relay
P4 : Circuit breaker
Q4 : Battery charge sockets
R4 : Sensor, cooling liquid temperature
S4 : Sensor, air filter clogging
T4 : Warning light, air filter clogging
U4 : Polarity inverter remote control
V4 : Polarity inverter switch
Z4 : Transformer 230/48V
W4 : Diode bridge, polarity change
X4 : Base current diode bridge
Y4 : PCB control unit, polarity inverter
A5 : Base current switch
B5 : Auxiliary push-button ON/OFF
C5 : Accelerator electronic control
D5 : Actuator
E5 : Pick-up
F5 : Warning light, high temperature
G5 : Commutator auxiliary power
H5 : 24V diode bridge
I5 : Y/▲ commutator
L5 : Emergency stop button
M5 : Engine protection EP5
N5 : Pre-heat push-button
O5 : Accelerator solenoid PCB
P5 : Oil pressure switch
Q5 : Water temperature switch
R5 : Water heater
S5 : Engine connector 24 poles
T5 : Electronic GFI relais
U5 : Release coil, circuit breaker
V5 : Oil pressure indicator
Z5 : Water temperature indicator
W5 : Battery voltmeter
X5 : Contactor, polarity change
Y5 : Commutator/switch, series/parallel
A6 : Commutator/switch
B6 : Key switch, on/off
C6 : QEA control unit
D6 : Connector, PAC
E6 : Frequency rpm regulator
F6 : Arc-Force selector
G6 : Device starting motor
H6 : Fuel electro pump 12V c.c.
I6 : Start Local/Remote selector
L6 : Choke button
M6 : Switch CC/CV
N6 : Connector – wire feeder
O6 : 420V/110V 3-phase transformer
P6 : Switch IDLE/RUN
Q6 : Hz/V/A analogic instrument
R6 : EMC filter
S6 : Wire feeder supply switch
T6 : Wire feeder socket
U6 : DSP chopper PCB
V6 : Power chopper supply PCB
Z6 : Switch and leds PCB
W6 : Hall sensor
X6 : Water heather indicator
Y6 : Battery charge indicator
A7 : Transfer pump selector AUT-0-MAN
B7 : Fuel transfer pump
C7 : "GECO" generating set test
D7 : Flooting with level switches
E7 : Voltmeter regulator
F7 : WELD/AUX switch
G7 : Reactor, 3-phase
H7 : Switch disconnector
I7 : Solenoid stop timer
L7 : "VODIA" connector
M7 : "F" EDC4 connector
N7 : OFF-ON-DIAGN. selector
O7 : DIAGNOSTIC push-button
P7 : DIAGNOSTIC indicator
Q7 : Welding selector mode
R7 : VRD load
S7 : 230V 1-phase plug
T7 : V/Hz analogic instrument
U7 : Engine protection EP6
V7 : G.F.I. relay supply switch
Z7 : Radio remote control receiver
W7 : Radio remote control trasnsmitter
X7 : Isometer test push-button
Y7 : Remote start socket
A8 : Transfer fuel pump control
B8 : Ammeter selector switch
C8 : 400V/230V/115V commutator
D8 : 50/60 Hz switch
E8 : Cold start advance with temp. switch
F8 : START/STOP switch
G8 : Polarity inverter two way switch
H8 : Engine protection EP7
I8 : AUTOIDLE switch
L8 : AUTOIDLE PCB
M8 : A4E2 ECM engine PCB
N8 : Remote emergency stop connector
O8 : V/A digital instruments and led VRD PCB
P8 : Water in fuel
Q8 : Battery disconnect switch
R8 : Inverter
S8 : Overload led
T8 : Main IT/TN selector
U8 : NATO socket 12V
V8 : Diesel pressure switch
Z8 : Remote control PCB
W8 : Pressure turbo protection
X8 : Water in fuel sender
Y8 : EDC7-UC31 engine PCB
A9 : Low water level sender
B9 : Interface card
C9 : Limit switch
D9 : Starter timing card
E9 : Luquid pouring level float
F9 : Under voltage coil
G9 : Low water level warning light
H9 : Chopper driver PCB
I9 :
L9 :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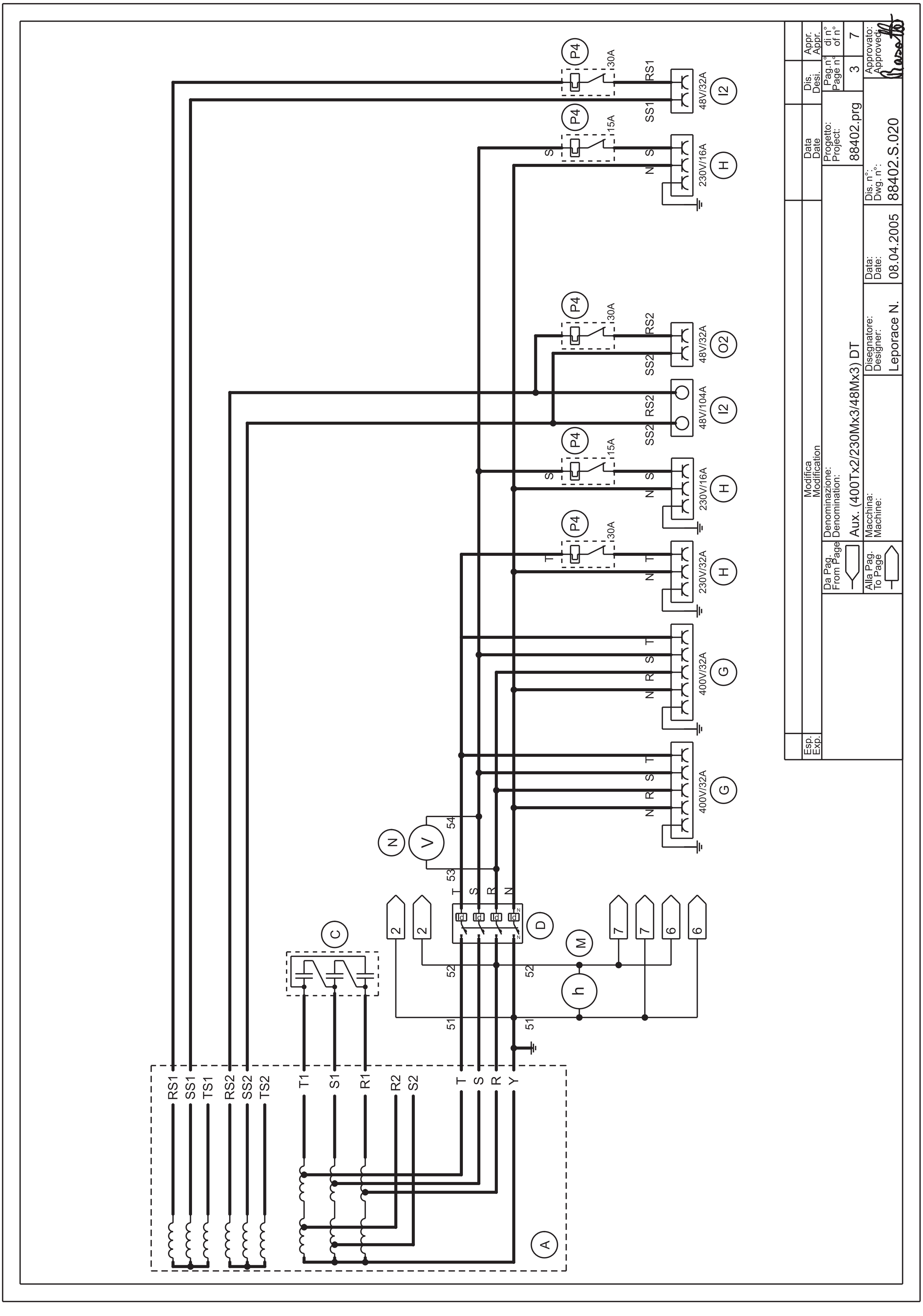
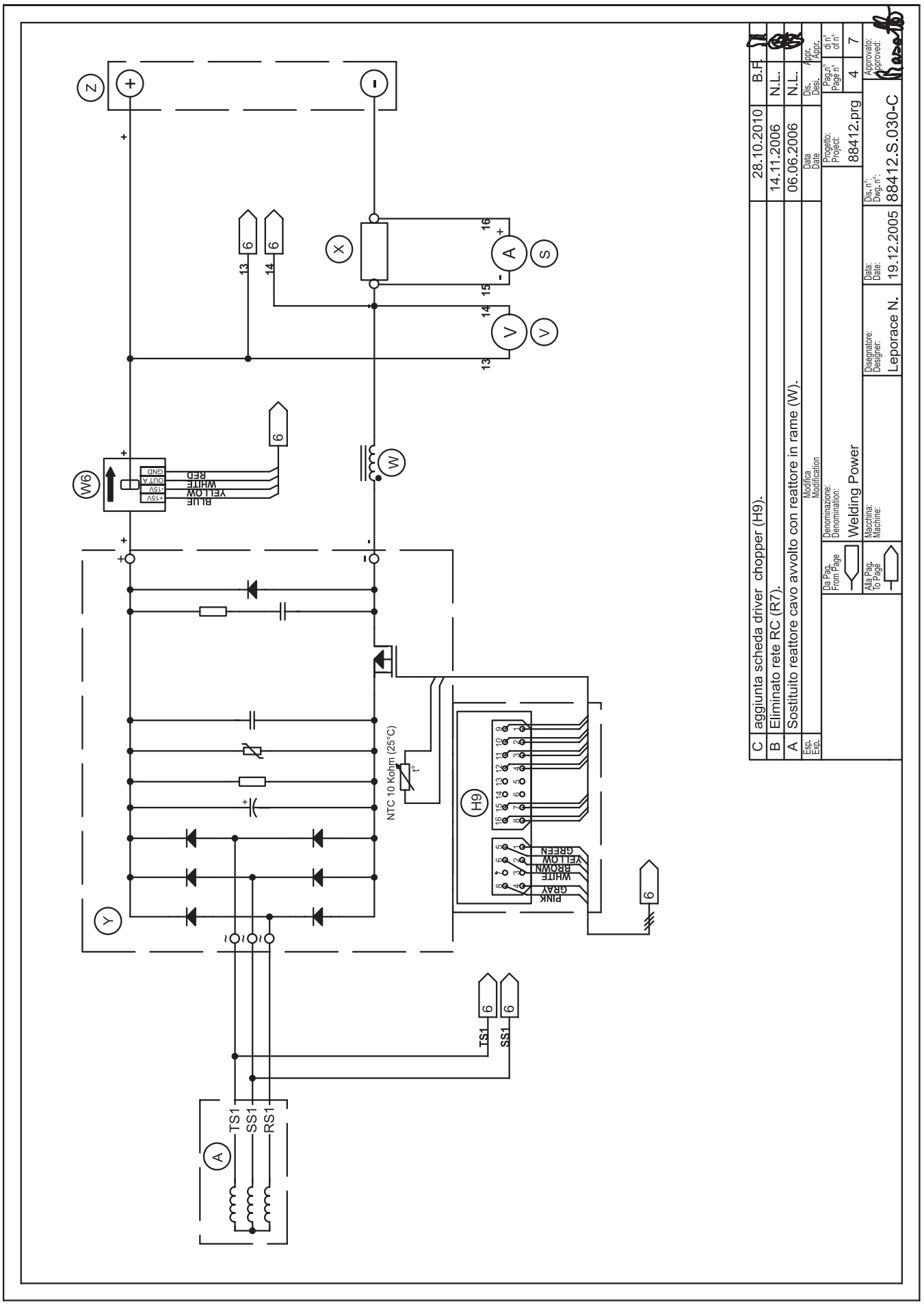
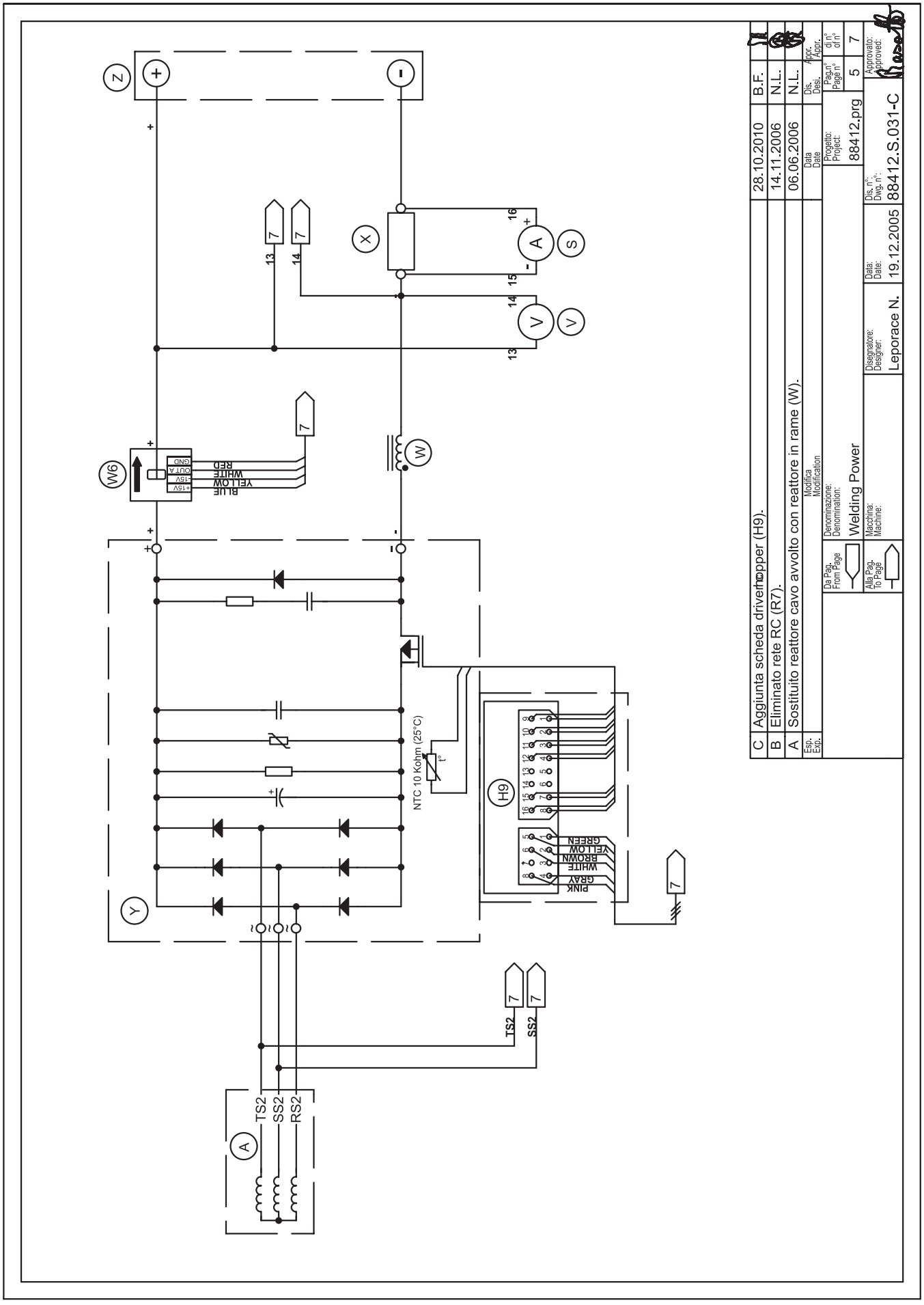
Only for engines Perkins series 1103/4C...
C Unificato schema tra motori emissionati e non emissionati (E8) 16.06.2012 B.F.
B Sostituito motore Perkins 1003A-33TG1 con motore Perkins 1103C-33TG3 14.01.2007 N.L.
A Aggiunto optional PRH6. 16.11.2007 N.L.
Engine Perkins 1103C-33TG3 (EP5)
Leporace N.
20.10.2005
78412.S.010-C
88412.prg
OPTIONAL: PRH...
230V 50/60Hz
nero/black
Red
White

(I) Schema elettrico (D) Stromlaufplan (GB) Electric diagram	DSP 2x400 PSX	M 61.2 REV.0-11/05



18/11/05 88412-I


Z
+
-
X
A
S
V
W
W6
Y
H9
NTC 10 Kohm (25°C)
t°
BLUE
YELLOW
WHITE
RED
GND
+15V
-15V
OUT A
GREEN
YELLOW
BROWN
WHITE
GRAY
PINK
TS1
SS1
RS1
13
14
15
16
6
C aggiunta scheda driver chopper (H9). 28.10.2010 B.F.
B Eliminato rete RC (R7). 14.11.2006 N.L.
A Sostituito reattore cavo avvolto con reattore in rame (W). 06.06.2006 N.L.
Esp. Exp.
Modifica
Modification
Data
Date
Dis. Desi.
Appr. Appr.
Da Pag. From Page
Alla Pag. To Page
Denominazione: Denomination:
Welding Power
Progetto: Project:
88412.prg
Pag.n° Page n°
4
di n° of n°
7
Disegnatore: Designer:
Leporace N.
Data: Date:
19.12.2005
Macchina: Machine:
Dis. n°: Dwg. n°:
88412.S.030-C
Approvato: Approved:


Z
W6
W
X
Y
A
H9
NTC 10 Kohm (25°C)
t°
TS2
SS2
RS2
BLUE
YELLOW
WHITE
RED
GND
+15V
OUT A
PINK
GRAY
WHITE
BROWN
YELLOW
GREEN
C Aggiunta scheda driver chopper (H9). 28.10.2010 B.F.
B Eliminato rete RC (R7). 14.11.2006 N.L.
A Sostituito reattore cavo avvolto con reattore in rame (W). 06.06.2006 N.L.
Esp. Modifica Data Dis. Appr.
Esp. Modification Date Desi. Appr.
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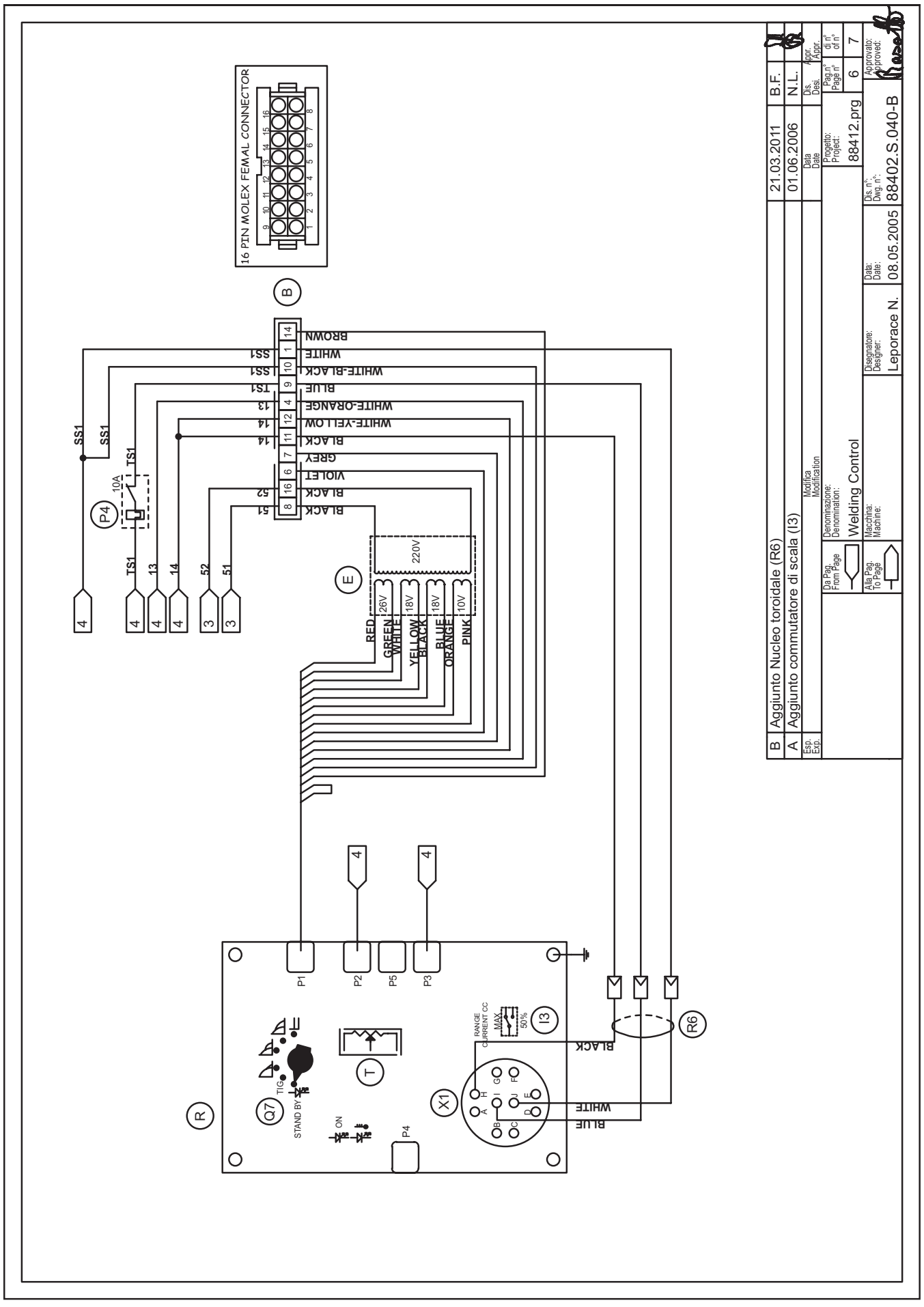
16 PIN MOLEX FEMAL CONNECTOR
B
BROWN
WHITE
WHITE-BLACK
BLUE
WHITE-ORANGE
WHITE-YELLOW
BLACK
GREY
VIOLET
BLACK
BLACK
SS1
TS1
P4
10A
220V
RED
GREEN
WHITE
YELLOW
BLACK
BLUE
ORANGE
PINK
26V
18V
18V
10V
E
P1
P2
P5
P3
R
Q7
TIG
STAND BY
ON
T
P4
X1
RANGE
CURRENT CC
MAX
50%
I3
R6
BLACK
WHITE
BLUE
B Aggiunto Nucleo toroidale (R6) 21.03.2011 B.F.
A Aggiunto commutatore di scala (I3) 01.06.2006 N.L.
Modifica Modification
Esp. Exp.
Data Date
Dis. Desi.
Appr. Appr.
Denominazione: Denomination: Welding Control
Progetto: Project: 88412.prg
Pag.n° Page n° 6
di n° of n° 7
Da Pag. From Page
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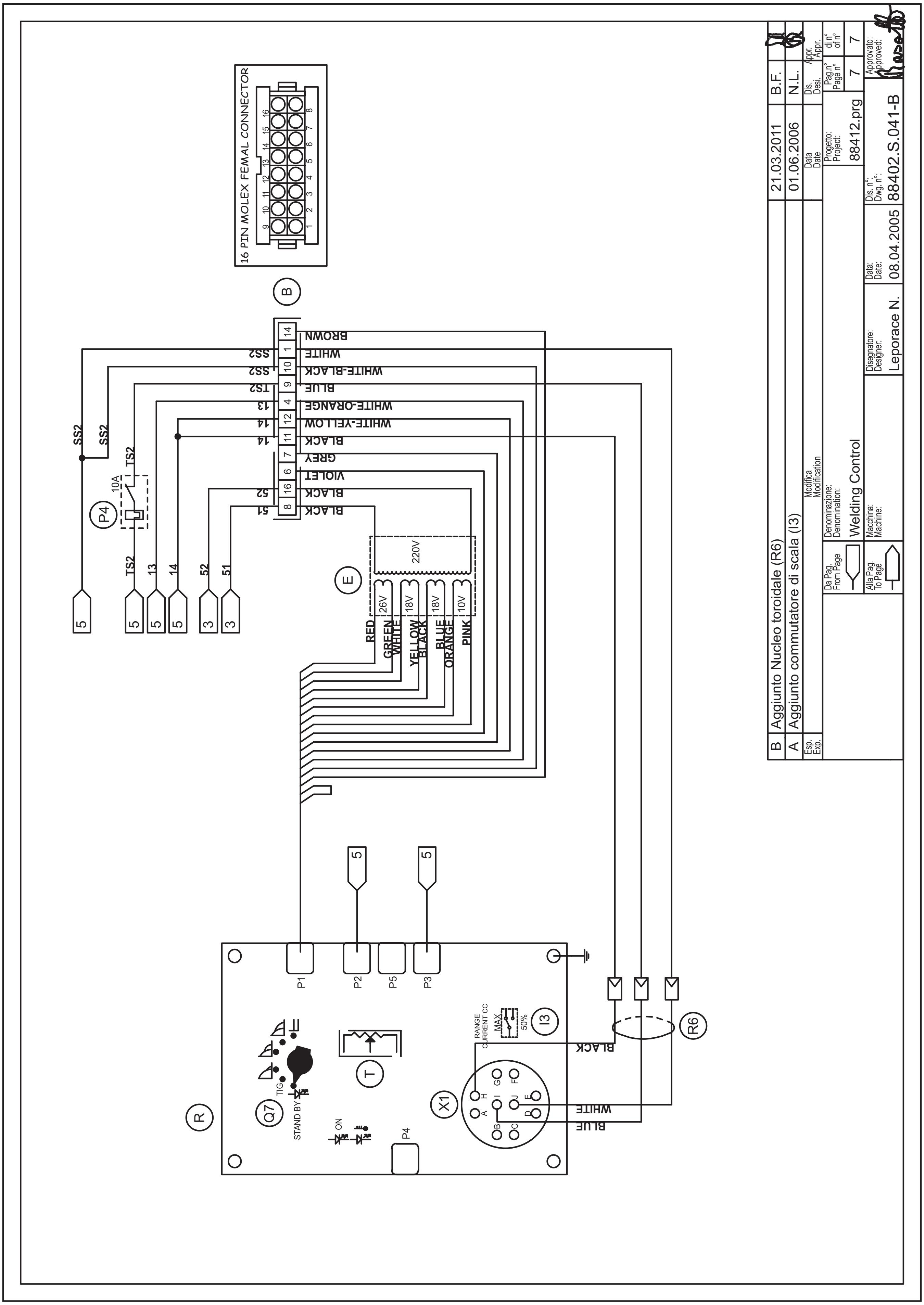
Macchina: Machine:
Disegnatore: Designer: Leporace N.
Data: Date: 08.05.2005
Dis. n°: Dwg. n°: 88402.S.040-B
Approvato: Approved:

Ⓘ **Schema elettrico** Ⓓ **Stromlaufplan** ⒼⒷ **Electric diagram**	**DSP 2x400 PSX**	**M** **61.6** REV.2-03/13



16 PIN MOLEX FEMAL CONNECTOR
B
BROWN
WHITE
WHITE-BLACK
BLUE
WHITE-ORANGE
WHITE-YELLOW
BLACK
GREY
VIOLET
BLACK
BLACK
SS2
TS2
13
14
52
51
P4
10A
E
220V
26V
18V
18V
10V
RED
GREEN
WHITE
YELLOW
BLACK
BLUE
ORANGE
PINK
R
P1
P2
P5
P3
P4
T
Q7
TIG
STAND BY
ON
X1
I3
RANGE
CURRENT CC
MAX
50%
R6
BLACK
WHITE
BLUE
B Aggiunto Nucleo toroidale (R6) 21.03.2011 B.F.
A Aggiunto commutatore di scala (I3) 01.06.2006 N.L.
Esp. Exp.
Modifica Modification
Data Date
Dis. Desi.
Appr. Appr.
Da Pag. From Page
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Welding Control
Progetto: Project:
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7
di n° of n°
7
Alla Pag. To Page
Macchina: Machine:
Disegnatore: Designer:
Leporace N.
Data: Date:
08.04.2005
Dis. n°: Dwg. n°:
88402.S.041-B
Approvato: Approved:

18/11/05 88412-I

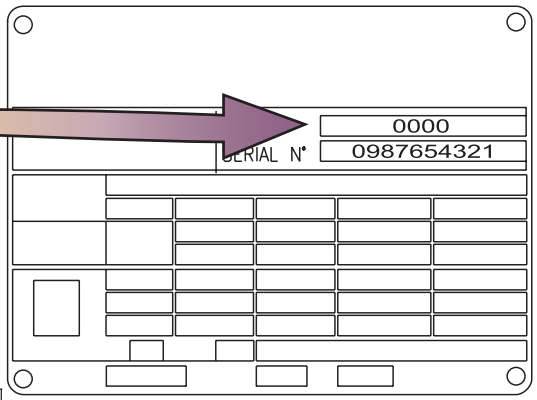
The manufacturer guarantees that any request for spare parts will be satisfied.

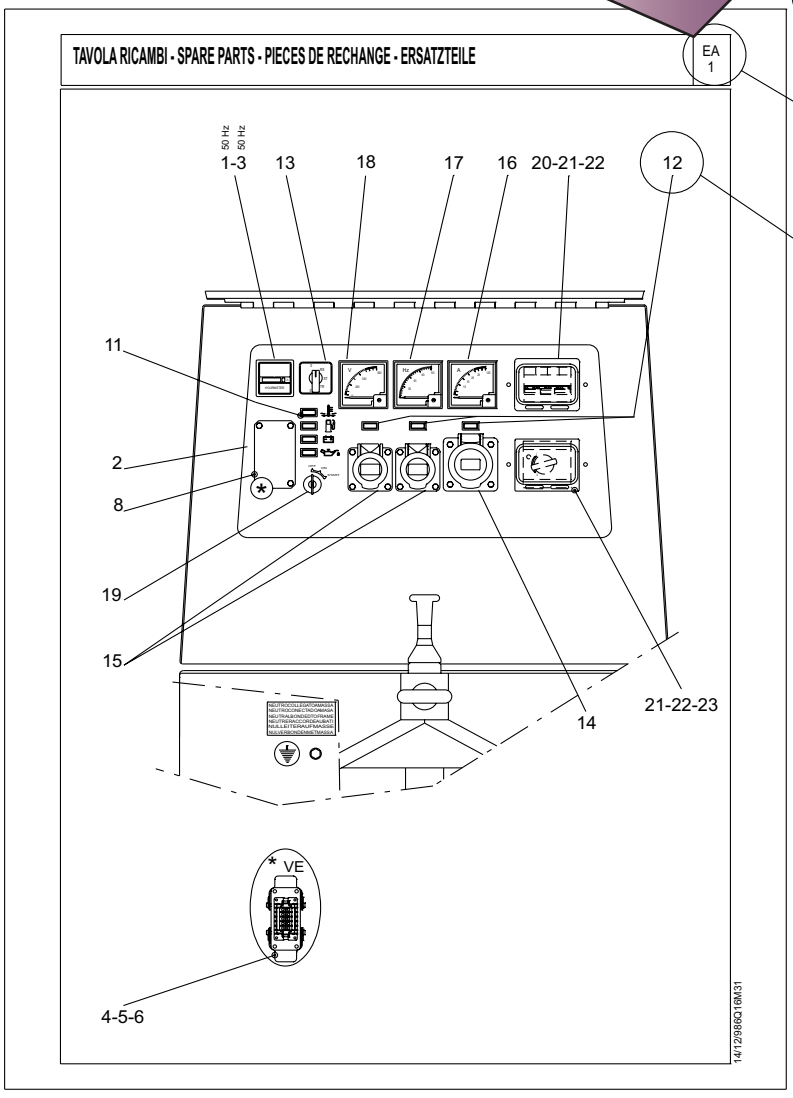
To keep the machine in full working order, when replacement spare parts is required, always ask for genuine parts only.

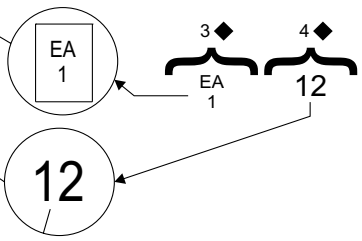
☞ The requested data are to be found on the data plate located on the machine structure, quite visible and easy to consult. ✹

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

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



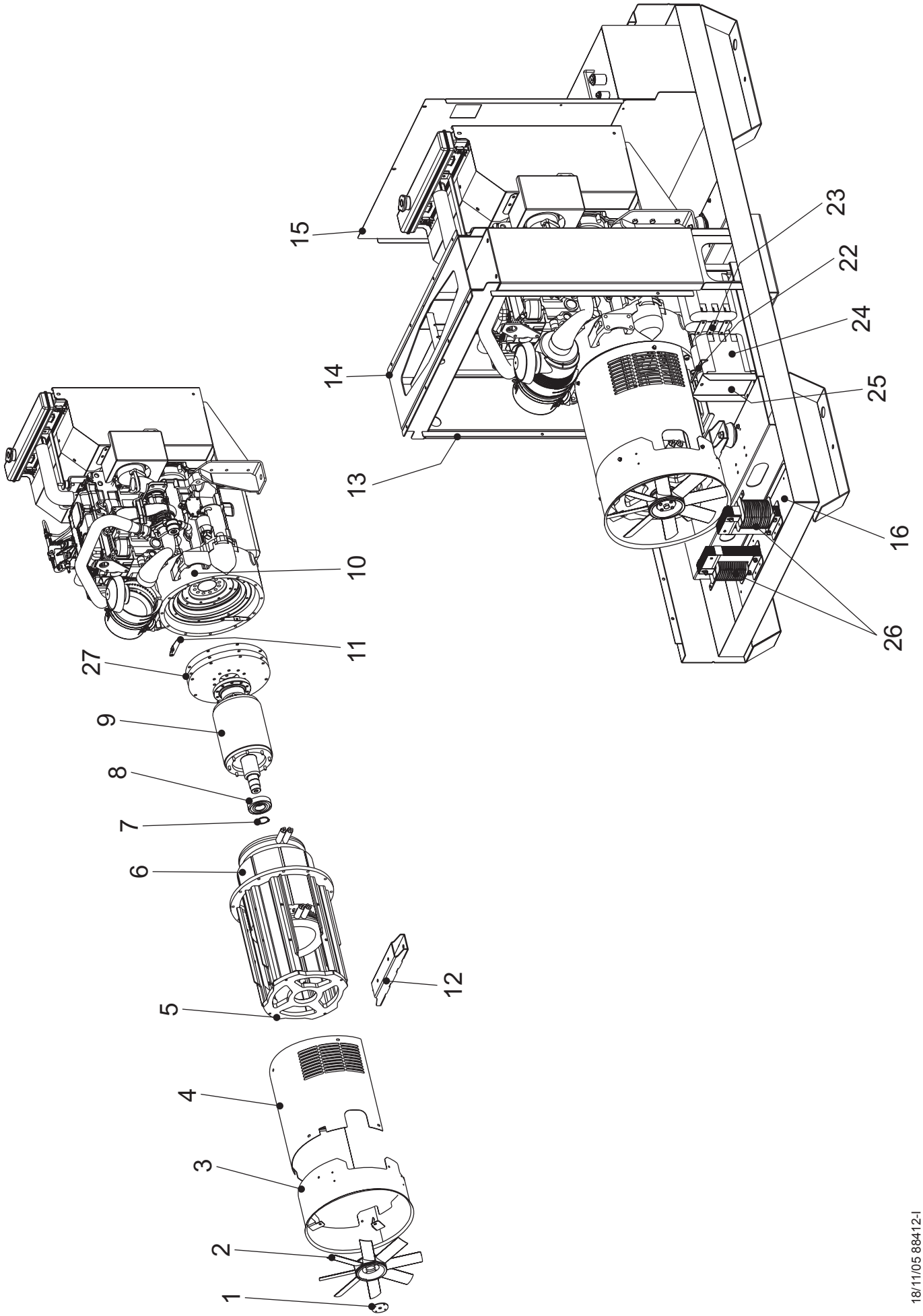




ABBREVIATIONS AND SYMBOLS:

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

(I) Ricambi (GB) Spare parts (F) Piéces de rechanges	(D) Ersatzteile (E) Tabla de recambios (NL)	DSP 2x400 PSX	ED 10 REV.2-03/13



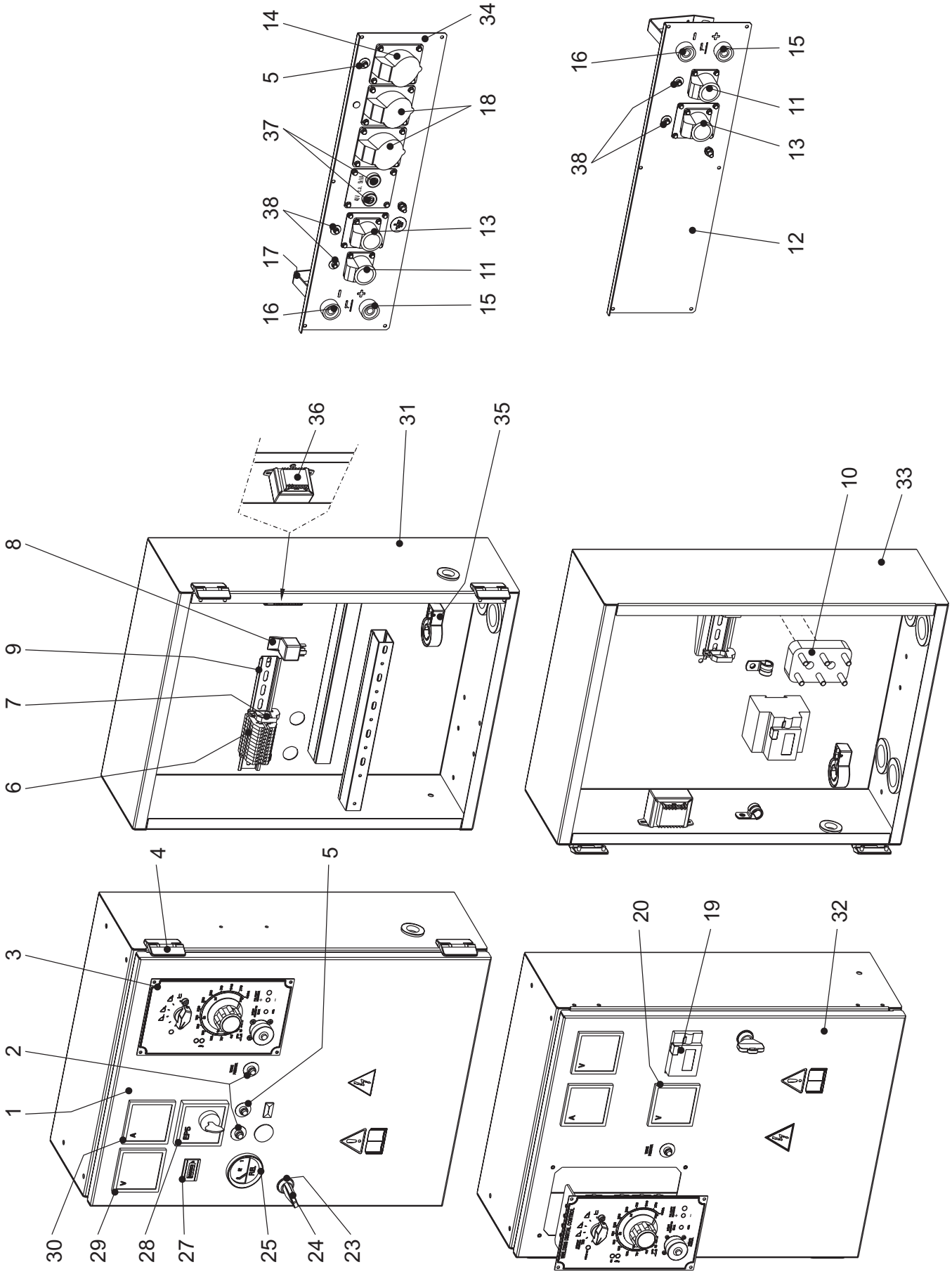
18/11/05 88412-I

(I) Tavola ricambi (GB) Spare parts table (F) Table piéces de rechange	(D) Ersatzteile (E) Tabla de recambios (NL)	DSP 2x400 PSX	ED 10.1 REV.4-03/13

Pos.	Rev.	Cod.	Descr.	Note
1		M107301390	ANELLO	
2		M107601470	VENTOLA COMPLETA	
3		M308306010	CONVOGLIATORE ARIA ALTERNATORE	
4		M784008222	COPERTURA ALTERNATORE	
5		M766703010	CARCASSA PER STATORE	
6		M784003020	STATORE	
7		M6050050	ANELLO SEEGER	
8		M1001050	CUSCINETTO	
~~9~~		~~M766703030~~	~~ALBERO CON ROTORE (COMPLETO)~~	Fino a REV.3-02/11 Del.121/12-05/11/12
9		M784103030	ALBERO CON ROTORE	Da matr. C000020418 - 13/12/12 Del.121/12
~~10~~		~~M740552200~~	~~MOTORE PERKINS 1103A-33TG1~~	Fino a REV.1-04/08 Del.5/08-16/01/08
10		M840562200	MOTORE PERKINS 1103C-33TG3	Da REV.2-09/08 Del.5/08-16/01/08
11		M765008224	STAFFA SUPPORTO COPERTURA ALT.	
~~12~~		~~M323003101~~	~~TRAVERSA ALTERNATORE (COMPL.)~~	Fino a REV.0-09/06 Del. 252/07-14/11/07
12		M884123101	TRAVERSA ALTERNATORE (COMPL.)	Da REV.1-04/08 Del. 252/07-14/11/07
13		M744508430	TRAVERSA UNIONE FIANCATE	
14		M744501060	TRAVERSA DI SOLLEVAMENTO	
15		M840768215	PARETE SCARICO ARIA MOTORE	
16		M784104126	LAMIERA PORTA REATTORE	
22		M209719882	STAFFA BOX CONDENSATORI	
23		M107509041	SBARRETTA BOX CONDENSATORI	
24		M307809880	BOX CONDENSATORI 3X80 UF	
25		M784109887	PIASTRA FISS.BOX COND.(COMPL.)	
~~26~~		~~M786104100~~	~~REATTORE DI LIVELLO~~	Era 282004100 -Fino a REV.3-02/11 Del.55/12-21/05/12
26		M794004100	REATTORE DI LIVELLO	Da matr. C000018929 - 30/10/12 Del.55/12
27		M765013012	DISCO ALBERO ROTORE	Da matr. C000020418 - 13/12/12 Del.121/12

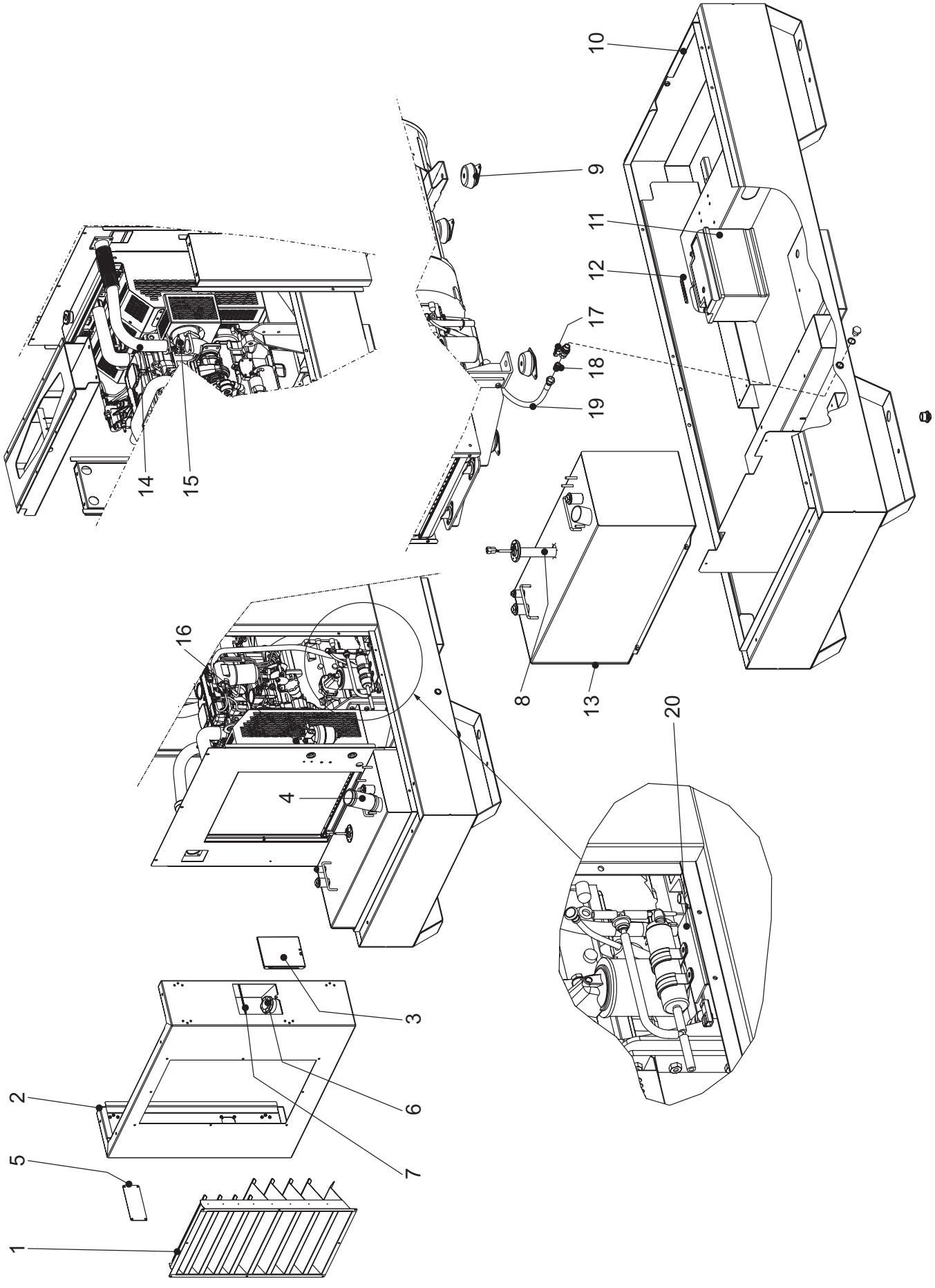
Pos.	Rev.	Cod.	Descr.	Note
1		M107301390	RING FIXING FAN	
2		M107601470	FAN COMPLETE	
3		M308306010	ALTERNATOR AIR CONVEYOR	
4		M784008222	ALTERNATOR COVER	
5		M766703010	HOUSING	
6		M784003020	STATOR	
7		M6050050	RING, SEEGER	
8		M1001050	BEARING	
~~9~~		~~M766703030~~	~~SHAFT ROTOR (COMPL.)~~	Up to REV.3-02/11 Del.121/12-05/11/12
9		M784103030	SHAFT ROTOR	From matr. C000020418 - 13/12/12 Del.121/12
~~10~~		~~M740552200~~	~~ENGINE PERKINS 1103A-33TG1~~	Up to REV.04/08 Del.5/08-16/01/08
10		M840562200	ENGINE PERKINS 1103C-33TG3	From REV.09/08 Del.5/08-16/01/08
11		M765008224	ALTERNATOR COVER SUPPORT	
~~12~~		~~M323003101~~	~~ALTERNATOR BRACKET (COMPL.)~~	Up to REV.04/08 Del. 252/07-14/11/07
12		M884123101	ALTERNATOR BRACKET (COMPL.)	From REV.04/08 Del. 252/07-14/11/07
13		M744508430	COVERS BRACKET	
14		M744501060	BRACKET LIFT	
15		M840768215	ENGINE AIR EXHAUST SITE	
16		M784104126	REACTOR HOLDING STEEL SHEET	
22		M209719882	CAPACITOR BOX BRACKET	
23		M107509041	CONNECTING PLATE-CAPACITOR BOX	
24		M307809880	CAPACITOR BOX 3X80 UF	
25		M784109887	CAPACITOR SUPPORT BRACKET	
26		M786104100	REACTOR	Was 282004100 -Up to REV.3-02/11 Del.55/12-21/05/12
26		M794004100	REATTORE DI LIVELLO	From matr. C000018929 - 30/10/12 Del.55/12
27		M765013012	SHAFT WITH ROTOR DISC	From matr. C000020418 - 13/12/12 Del.121/12

(I) **Ricambi** (GB) **Spare parts** (F) **Piéces de rechanges**	(D) **Ersatzteile** (E) **Tabla de recambios** (NL)	**DSP 2x400 PSX**	**ED** **11** REV.0-09/06



Pos.	Cod.	Descr.	Note
1	M784017080	FRONTALE LATO MOTORE / *ENGINE SIDE FRONT PANEL*	
2	M306467109	PROTEZIONE TERMICA (C.B.) / *THERMOPROTECTION (B.C.)*	
~~3~~	~~M0000794057425~~	~~FRONT.CONTR.SALD.(PROGR.)(WDC 400) / *WDC FRONT*~~	Fino a/Up to REV.0-09/06 Del.193/06-13/11/06
3	M884127425	FRONT.CONTR.SALD.(PROGR.)(WDC 400) / *WDC FRONT*	Da/From REV.1-11/06 Del 193/06-13/11/06
4	M744508103	CERNIERA X COPERCHIO FRONTALE / *LATCH X FRONT COVER*	
5	M873407107	DISGIUNTORE TERMICO 30A/250V / *CIRCUIT BREAKER 30A/250V*	
6	M1240020	MORSETTO 4mmq / *TERMINAL 4mmq*	
7	M1241010	PIASTRINA / *PLATE*	
8	M306479199	RELE' AVV. ELETTRICO / *RELAY, ELECTRIC START*	
9	M1243020	GUIDA PER MORSETTIERA / *TERMINAL GUIDE*	
10	M105111830	MORSETTIERA / *TERMINAL BOARD*	
11	M218137280	PRESA CEE 48V 32A / *EEC SOCKET 48V 32A*	
12	M884027085	PANNELLO PORTA PRESE LATO SALD. / *SOCKET HOLDER PANEL, WELDING SIDE*	
13	M307017240	PRESA 220V 16A / *EEC SOCKET 16A, 220V 2P+T*	
14	M105111520	PRESA CEE 220V MONOF. 2P+T / *EEC SOCKET SINGLE-PH.220V 2P+T*	
15	M102301310	PRESA DI SALDATURA (+) / *WELDING SOCKET (+)*	
16	M102044400	PRESA DI SALDATURA (-) / *WELDING SOCKET (-)*	
17	M107509890	SHUNT DI MISURA / *SHUNT*	
18	M105111510	PRESA CEE 380V TRIFASE / *EEC SOCKET THREE-PHASE 380V*	
19	M305027105	INTERRUTTORE DIFFERENZIALE / *GROUND FAULT INTERRUPTOR (GFI)*	
20	M305717300	VOLTMETRO / *VOLTMETER*	
23	M744508112	SERRATURA PER COPERCHIO FRONT. / *FRONT COVER LOCK*	
24	M744507057	CHIAVE SERRATURA QUADRO ELETT. / *ELECTRICAL BOARD KEY*	
25	M325507210	INDICATORE LIVELLO CARBURANTE / *FUEL LEVEL GAUGE*	
27	M105511810	CONTAORE 230V 50Hz IP65 / *HOURMETER 230V 50Hz IP65*	
28	M744509770	UNITA'CONTROLLO MOTORE / *PCB ENGINE CONTROL EP5*	
29	M765007300	VOLTMETRO DI SALD.100V F.S. DC / *WELDING VOLTMETER 100V, DC RANGE BOTTOM*	
30	M765007305	AMPEROMETRO DI SALD.600A/90mV / *WELDING AMMETER 600 A/90mV*	
31	M784007010	SCATOLA ELETTRICA LATO MOTORE / *ELECTRICAL BOX ENGINE SIDE*	
32	M784017020	FRONTALE LATO GENERAZIONE / *FRONT PANEL GENERATION SIDE*	
33	M784007090	SCATOLA ELETTR. LATO GENERAZ. / *ELECTRICAL BOX GENERATION SIDE*	
34	M884027065	PANNELLO PORTA PRESE / *SOCKETS HOLDER FRONT PANEL*	
35	M282005107	SENSORE DI HALL 400A / *HALL SENSOR*	
36	M282009869	TRASFORMATORE / *TRANSFORMER*	
37	M101131220	PRESA DINSE / *SOCKET*	
38	M155307107	DISGIUNTORE TERMICO 15A - 250V / *CIRCUIT BREAKER 15A - 250V*	

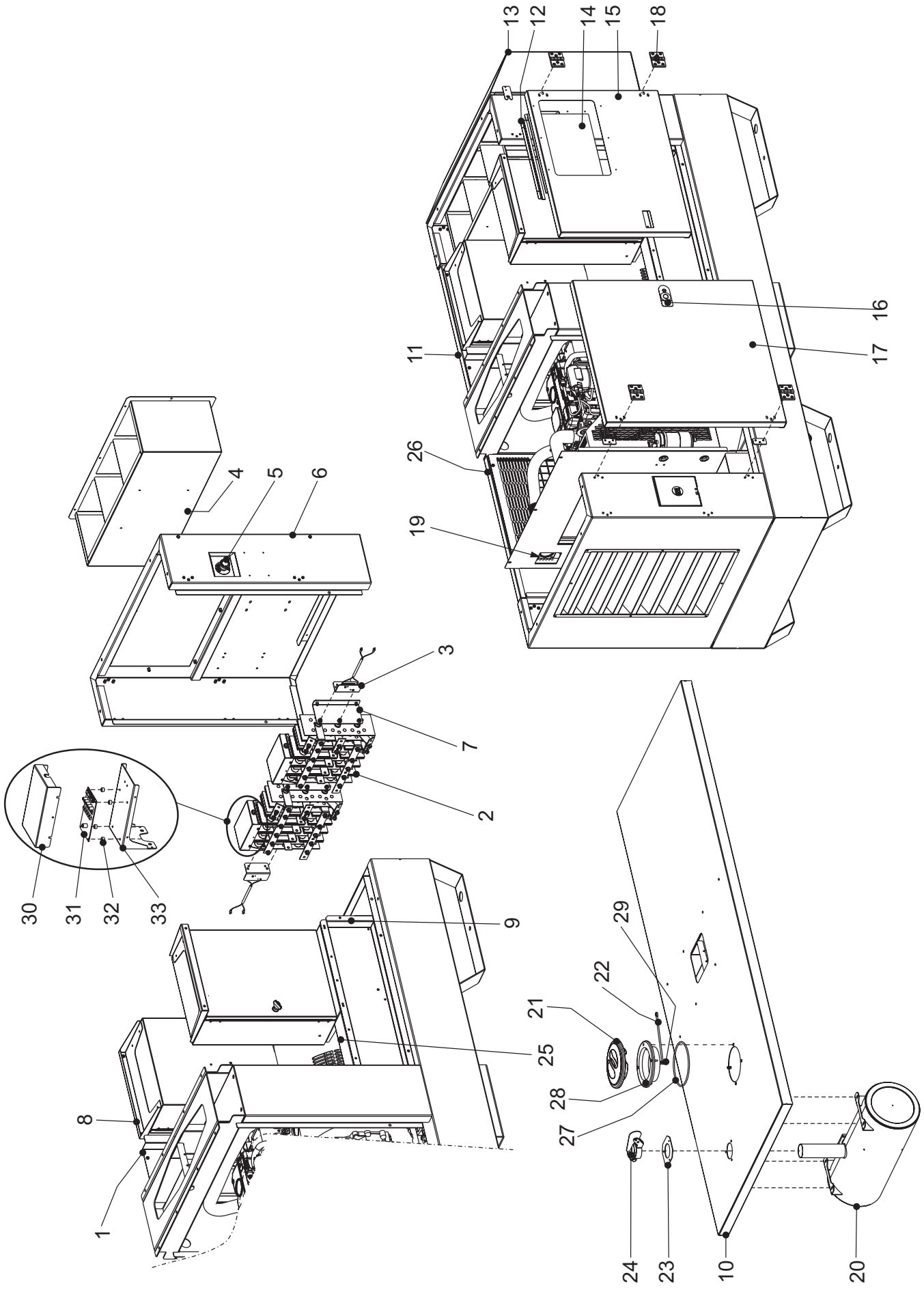
(I) Ricambi (GB) Spare parts (F) Piéces de rechanges	(D) Ersatzteile (E) Tabla de recambios (NL)	DSP 2x400 PSX	ED 12 REV.1 -03/13



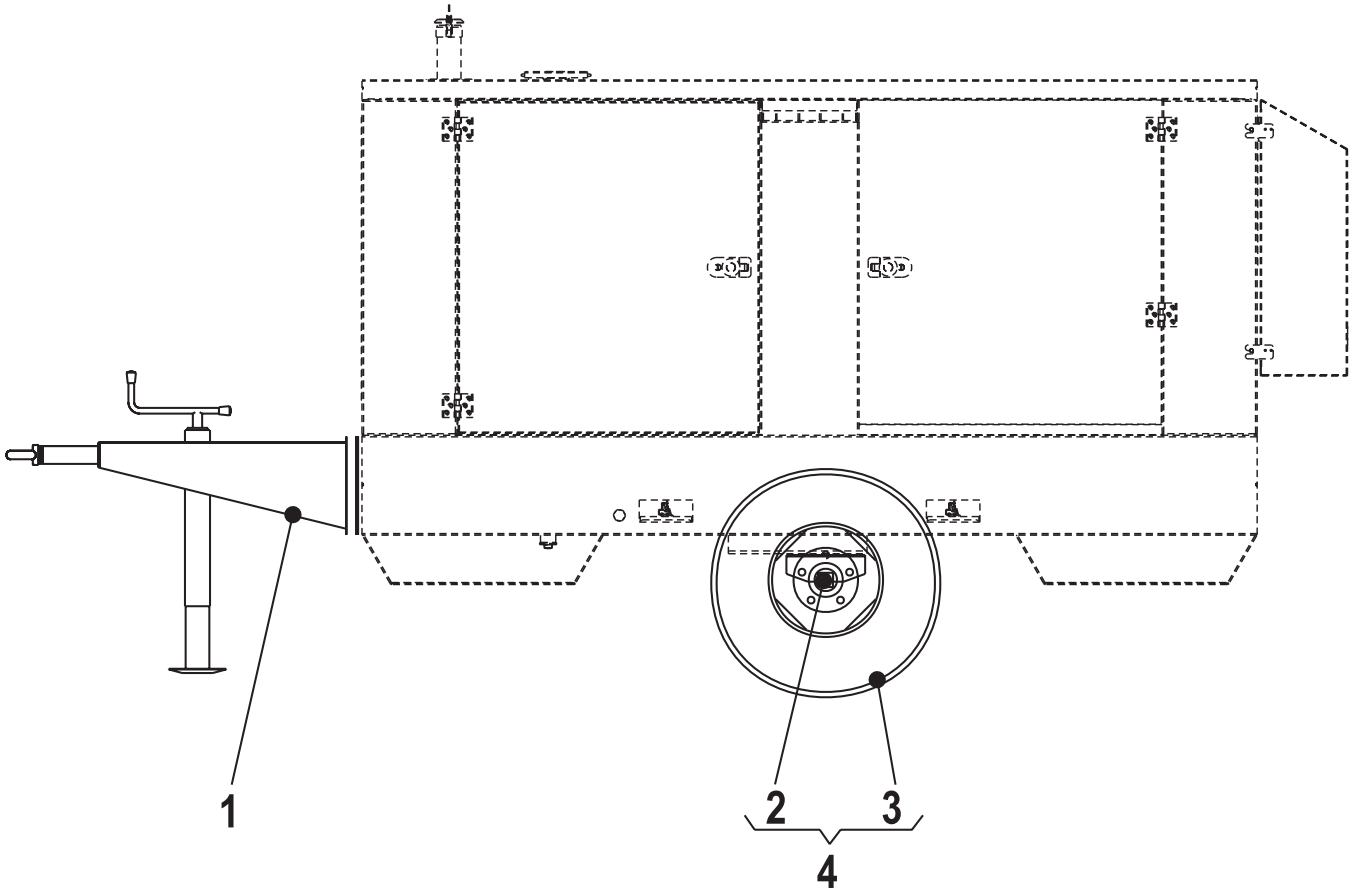
Pos.	Rev.	Cod.	Descr.	Note
1		M766708065	GRIGLIA PER CARENATURA	
2		M766708035	CARENATURA POSTERIORE	
3		M744501255	COPERCHIO VANO RIFORNIMENTO	
4		M6095030	TUBO GOMMA	
~~5~~		~~M305607032~~	~~COPERCHIO~~	Fino a REV.0-09/06-Del.106/09-14/10/09
5		M841657032	COPERCHIO	Da REV.1-02/11-Del.106/09-14/10/09
6		M342202026	TAPPO SERBATOIO	
7		M740558073	TIRANTE M5x175	
8		M840759975	SENSORE LIVELLO CARBURANTE (L=355)	
9		M105611550	ANTIVIBRANTE	
10		M840761050	BASAMENTO	
11		M764409150	BATTERIA	
12		M400409154	STAFFA FISSAGGIO BATTERIA	
13		M840762020	SERBATOIO CARBURANTE (capacità 102lt.)	
14		M784102070	TUBO DI SCARICO	
15		M784102069	GUARNIZIONE SCARICO MOTORE	
16		M766702241	STAFFA SUPP. FILTRO GASOLIO	
17		MJJ0062025	RUBINETTO M-F 1/2” G	
18		MJJ0062292	NIPPLO OLEODINAMICO 1/2” G	
19		M744502212	TUBO SCARICO OLIO	
20		M842272241	SQUAD.SUPP. PREFILTRO CARBURANTE	Da REV.2-03/13-Del.117/10-27/09/10

Pos.	Rev.	Cod.	Descr.	Note
1		M766708065	COVER GRATE	
2		M766708035	REAR COVER	
3		M744501255	FUEL COVER	
4		M6095030	PIPE	
~~5~~		~~M305607032~~	~~COVER~~	Up to REV.0-09/06-Del.106/09-14/10/09
5		M841657032	COVER	From REV.1-02/11-Del.106/09-14/10/09
6		M342202026	CAP, FUEL TANK	
7		M740558073	TIE-ROD	
8		M840759975	FUEL LEVEL SENSOR	
9		M105611550	VIBRATION DAMPER	
10		M840761050	BASE	
11		M764409150	BATTERY	
12		M400409154	BATTERY BRACKET	
13		M840762020	FUEL TANK	
14		M784102070	EXHAUST PIPE	
15		M784102069	GASKET	
16		M766702241	SUPPORT FILTER	
17		MJJ0062025	COCK	
18		MJJ0062292	OLEODYNAMIC NIPPLE	
19		M744502212	OIL EXHAUST TUBE	
20		M842272241	SUPPORT BRACKET FUEL FILTER	From REV.2-03/13-Del.117/10-27/09/10

(I) Ricambi (GB) Spare parts (F) Piéces de rechanges	(D) Ersatzteile (E) Tabla de recambios (NL)	DSP 2x400 PSX	ED 13 REV.1-02/11



Pos.	Cod.	Descr.	Note
1	M766707070	FIANCATA DX COPERT.SCAT.ELETTR. / *RIGHT SIDE ELECTRICAL BOX COVER*	
~~2~~	~~M785005400~~	~~PONTE CHOPPER / *CHOPPER BRIDGE*~~	Fino a/*Up to* Del.06/09-26/01/09
~~2~~	~~M784115400~~	~~PONTE CHOPPER / *CHOPPER BRIDGE*~~	Da/*From* Del.06/09-26/01/09 - Fino a/*Up to* Del.52/09-20/04/09
~~2~~	~~M784135400~~	~~PONTE CHOPPER / *CHOPPER BRIDGE*~~	Da/*From* Del.52/09-20/04/09 - Fino a/*Up to* REV.1-11/06 Del.118/10-27/09/10
2	M884125400	PONTE CHOPPER / *CHOPPER BRIDGE*	Da/*From* REV.2-02/11 Del.118/10-27/09/10
3	M000078610A725	RETE R.C. (VRD) (RICAMBI) / *R.C. NET (VRD)*	Solo versione VRD / *Only VRD version*
4	M766708160	CASSONETTO INT.ASPIRAZ.(COMPL) / *INTAKE CASE (COMPLETE)*	
5	M744507219	PULSANTE STOP D'EMERGENZA / *EMERGENCY PUSH BUTTON STOP*	
6	M784008005	CARENATURA ANTERIORE (COMPL.) / *FRONT COVER (COMPL.)*	
7	M784005091	STAFFA SUPPORTO PONTE DIODI / *SUPPORT BRACKET DIODE BRIDGE*	
8	M784007102	STAFFA SUPP. SCATOLA ELETTRICA / *SUPPPORT BRACKET ELECTRIC BOX*	
9	M766707004	SCATOLA SUPP.APPARECC.ELETTR. / *ELECTRICAL DEVICES HOLDING BOX*	
10	M840768091	CARENATURA SUPERIORE / *TOP COVER*	
11	M766708426	FIANCATA LATO STRUMEN. (COMPL) / *INSTRUMENTS SIDE*	
12	M744508090	SQUADR.FISS.SCHERMO PORTELLA / *FIXING BRACKET DOOR SCREEN*	
13	M766708220	CASSONETTO ASPIRAZIONE ARIA / *AIR INTAKE BOX*	
14	M744508089	SCHERMO PER PORTELLA / *GLASS COVER*	
15	M744508426	FIANCATA LATO STRUMENTI / *COVER COMMANDS SIDE*	
16	M744508136	MANIGLIA A PULSANTE / *HANDLE*	
17	M744508428	FIANCATA INTERMEDIA / *MIDDLE COVER*	
18	M744508140	CERNIERA PER FIANCATA / *LATCH*	
19	M325252069	GUARNIZIONE / *GASKET*	
20	M840752050	SILENZIATORE DI SCARICO / *EXHAUST MUFFLER*	
21	M841658360	COPERCHIO ERMETICO / *RADIATOR COVER CAP*	Era/*was* 766708070
22	M841659357	TIRANTE IN GOMMA / *TIE-ROD*	Era/*was* 209718073
23	M766702068	FLANGIA PER TUBO SCARICO / *FLANGE FOR EXHAUST PIPE*	
24	M305012053	COPERCHIETTO / *CAP*	
25	M766707203	SCATOLA PROTEZIONE PRESE / *PROTECTION SOCKETS BOX*	
26	M840762058	PROTEZIONE TERMICA / *THERMAL PROTECTION*	
27	M1018130	ANELLO OR/ *OR RING*	
28	M841658361	GHIERA PER COPERCHIO ERMETICO / *FLANGE FOR AIR-TIGHT SEALED COVER*	
29	M841659358	ANELLO DOPPIO / *DOUBLE RING*	
30	M273119654	SCATOLA PROTEZ. SCHEDA SALDATURA / *BOX PROTECTION PCB WELDER*	
31	M785109625	SCHEDA ALIMENTAZIONE/DRIVE / *POWER SUPPLY PCB*	
32	M102302060	DISTANZIALE / *SPACER*	
33	M273119756	STAFFA SUPP. SCHEDA / *BRACKET PCB WELDER SUPPORT*	



Pos.	Cod.	Descr.	Descr.	Note
1	M0000744500141	GR.TIMONE,PIEDE X TRAINO LENTO	*KIT SITE TOW*	
2	M225101160	ASSALE	*AXLE*	
3	M325501170	RUOTA	*WHEEL*	
4	M0000225100142	GR. ASSALE, RUOTE TRAINO LENTO	*KIT WHEELS AND*	

WWW.MOSA.IT

MOSA div. della BCS S.p.A.
Stabilimento di Viale Europa, 59
20090 Cusago (MI) Italia

Tel. + 39 - 0290352.1
Fax + 39 - 0290390466

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