MOSA

TS 350 SXY - CC/CV - PL

USE AND MAINTENANCE MANUAL

MOSA
motosaldatrici gruppi elettrogeni

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ISO 9001:2000 - Cert. 0192

05/04

TS 350 SY/SXY CC/CV-PL

0507

DS0319003 - GB

USE AND MAINTENANCE MANUAL

02/05/07 DS031M00
preparato da UPT
approvato da DITE


IQNet
THE INTERNATIONAL CERTIFICATION NETWORK
CERTIFICATE
MOSA Divisione della BCS S.p.A.
Quality Management System
ISO 9001:2000
Registration Number: IT-2722


ICIM
IQNet
MOSA Divisione della BCS S.p.A.
UNI EN ISO 9001:2000
CISQ
SINCERT

ISO 9001:2000 - Cert. 0192/3

UNI EN ISO 9001 : 2000

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

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

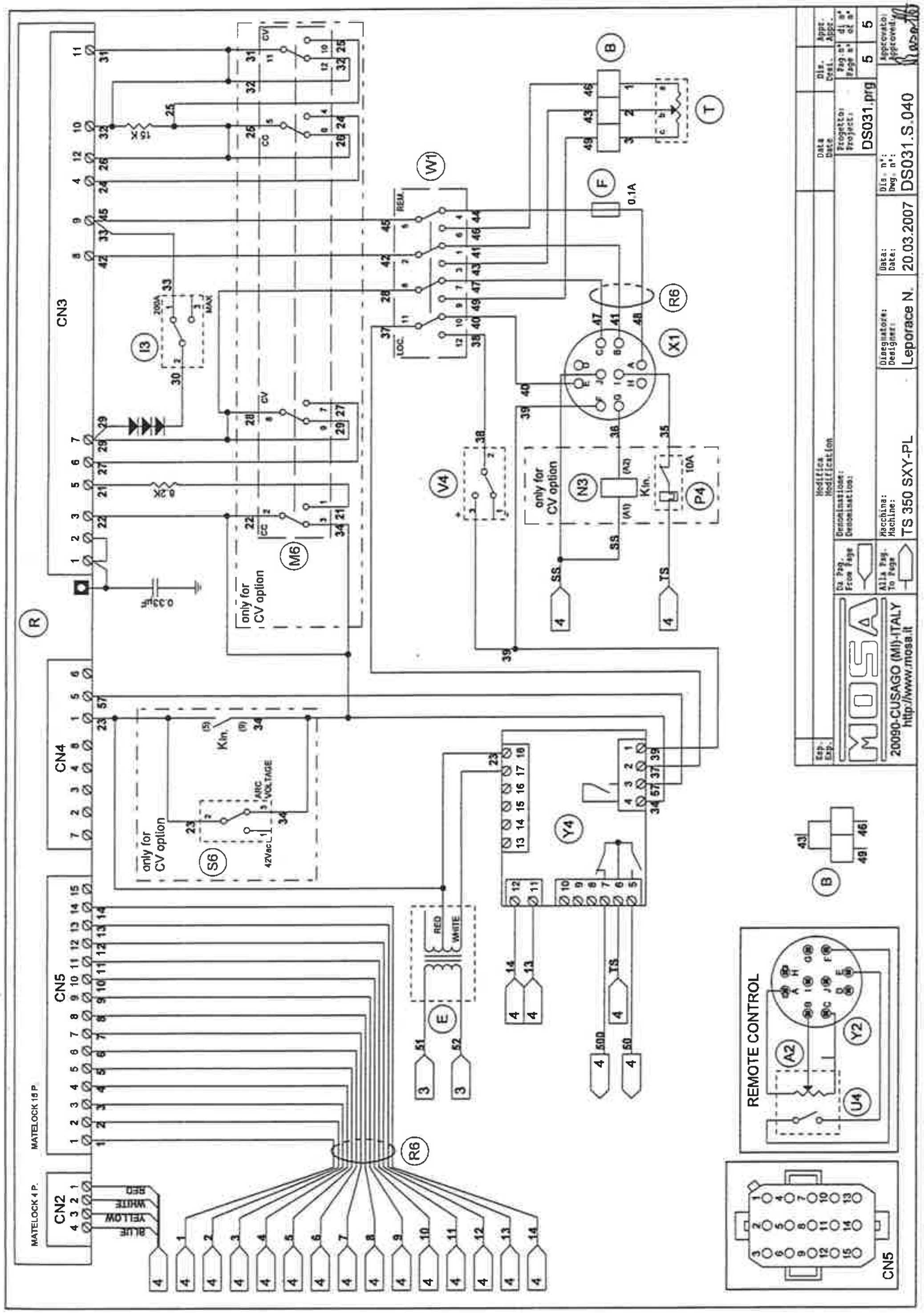
This certification is not a point of arrival but a pledge on the part of the entire company to maintain a level of quality of both its products and services which will continue to satisfy the needs of its clients, as well as to improve the transparency and the communications regarding all the company's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

The advantages for MOSA clients are:

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

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

INDEX (for all MOSA models)



⚠ ATTENTION

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

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

MOSA

INFORMATION

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

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

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

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

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

NOTES ABOUT THE MANUAL

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

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

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

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

INFORMATION OF GENERAL TYPE

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

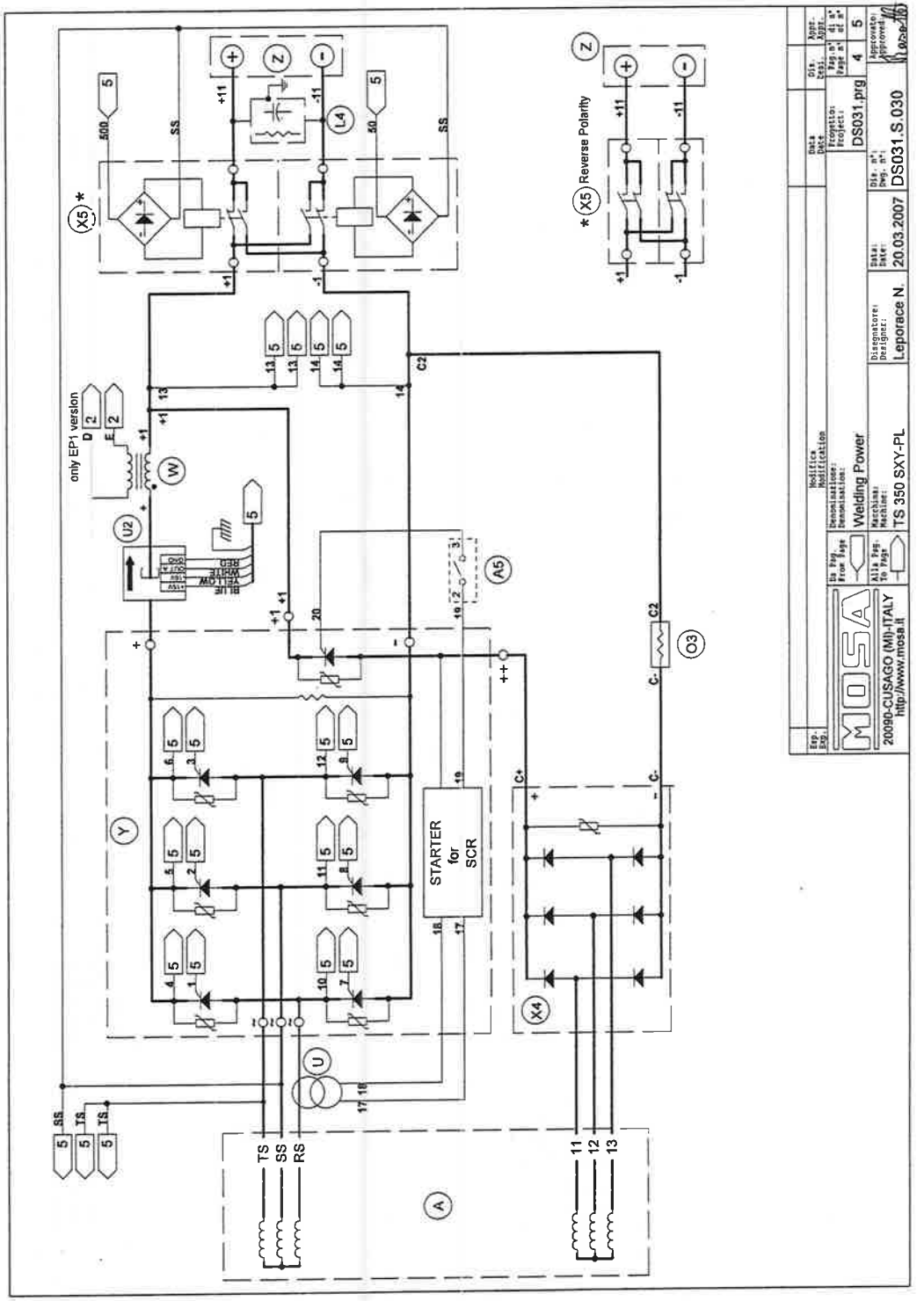
Our products have been designed for the use of generation for welding, electric and hydraulic system; ANY OTHER DIFFERENT USE NOT INCLUDED IN THE ONE INDICATED, relieves MOSA from the risks which could happen or, anyway, from that which was agreed when selling the machine; MOSA excludes any responsibility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

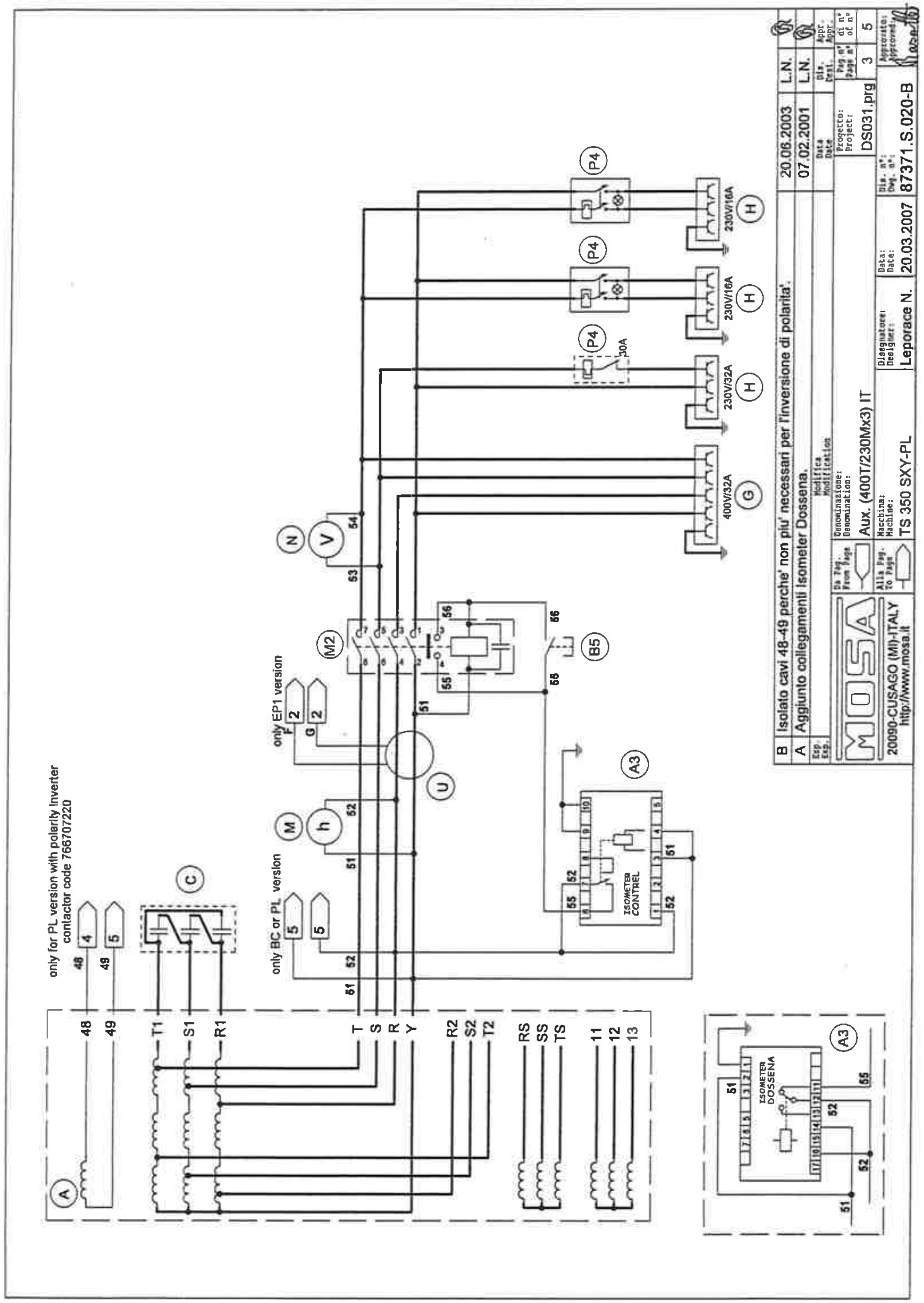
Our products are made in conformity with the safety norms in force, for which it is advisable to use all these devices or information so that the use does not bring damage to persons or things.

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

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

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





DICHIARAZIONE DI CONFORMITA'

MOSA 20090 CUSAGO (MI) - ITALY
MOSA
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20090 Cusago (MI) Italia
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E-mail: info@mosa.it

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

Modello/Modèle/Model/Model/Model/Modelo: ______________

N. di serie/Nr. de série/*Serial No.*/Serienn./Serienr./n° de serie: ______________

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

CEE 89/392 (91/368 - 93/44 - 93/68)
CEE 73/23 (93/68)
CEE 89/336 (92/31 - 93/68)

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

Norme armonizzate - normes harmonisées - *harmonized norms* - übereinstimmende Normen - geharmoniseerde normen - Normas armonizadas:
EN 292-1 EN 292-2
EN 60974-1 - EN 60439-1 - EN 60204-1
EN 60274-1 - EN 500199 (Solo per modelli - Seulement pour les modèles - *Only for models* - nur für die Modelle - Alleen voor de modellen - Sólo para modelos: MS / TS)
EN 50081-2 - EN 50082-2

Altre norme - autres normes - *other normes* - andere Normen - andere normen - otras normas:
84/536/CEE (Solo per modelli - Seulement pour les modèles - *Only for model* - nur für die Modelle - Alleen voor de modellen - Sólo para modelos: GE)
84/535/CEE (Solo per modelli - Seulement pour les modèles - *Only for model* - nur für die Modelle - Alleen voor de modellen - Sólo para modelos: MS / TS)

Ing. Benco Marelli
Direttore Generale

Cusago ______________

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

SYMBOLS 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**

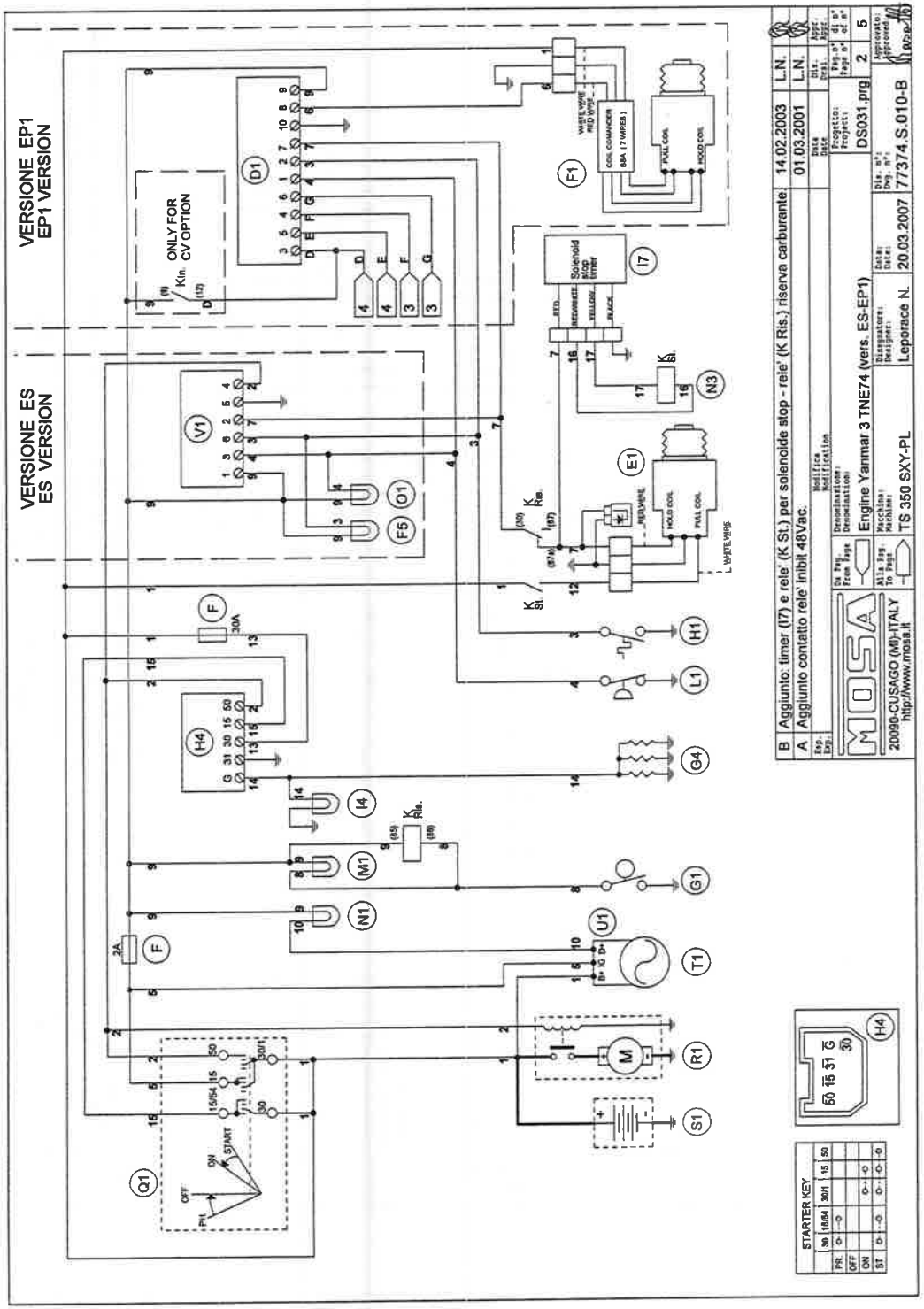
To this advice can appear a danger for persons as well as for things, for which can appear situations bringing material damage to things.

⚠ **IMPORTANT**

⚠ **NOTE**

⚠ **ATTENTION**

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



A: Alternator
B: Wire connection unit
C: Capacitor
D: G.F.I.
E: Welding PCB transformer
F: Fuse
G: 400V 3-phase socket
H: 230V 1phase socket
I: 110V 1-phase socket
L: Socket warning light
M: Hour-counter
N: Voltmeter
P: Welding arc regulator
Q: 230V 3-phase socket
R: Welding control PCB
S: Welding current ammeter
T: Welding current regulator
U: Current transformer
V: Welding voltage voltmeter
Z: Welding sockets
X: Shunt
W: D.C. inductor
Y: Welding diode bridge

A1: Arc striking resistor
B1: Arc striking circuit
C1: 110V D.C./48V D.C. diode bridge
D1: E.P.1 engine protection
E1: Engine stop solenoid
F1: Acceleration solenoid
G1: Fuel level transmitter
H1: Oil or water thermostat
I1: 48V D.C. socket
L1: Oil pressure switch
M1: Fuel warning light
N1: Battery charge warning light
O1: Oil pressure warning light
P1: Fuse
Q1: Starter key
R1: Starter motor
S1: Battery
T1: Battery charge alternator
U1: Battery charge voltage regulator
V1: Solenoid valve control PCBT
Z1: Solenoid valve
W1: Remote control switch
X1: Remote control and/or wire feeder socket
Y1: Remote control plug

A2: Remote control welding regulator
B2: E.P.2 engine protection
C2: Fuel level gauge
D2: Ammeter
E2: Frequency meter
F2: Battery charge trasformer
G2: Battery charge PCB
H2: Voltage selector switch
I2: 48V a.c. socket
L2: Thermal relay
M2: Contactor
N2: G.F.I. and circuit breaker
O2: 42V EEC socket
P2: G.F.I. resistor
Q2: T.E.P. engine protection
R2: Solenoid control PCBT
S2: Oil level transmitter
T2: Engine stop push-button T.C.1
U2: Engine start push-buttonT.C.1
V2: 24V c.a. socket
Z2: Thermal magnetic circuit breaker
W2: S.C.R. protection unit
X2: Remote control socket
Y2: Remote control plug

A3: Insulation moitoring
B3: E.A.S. connector
C3: E.A.S. PCB
D3: Booster socket
E3: Open circuit voltage switch
F3: Stop push-button
G3: Ignition coil
H3: Spark plug
I3: Range switch
L3: Oil shut-down button
M3: Battery charge diode
N3: Relay
O3: Resistor
P3: Sparkler reactor
Q3: Output power unit
R3: Electric siren
S3: E.P.4 engine protection
T3: Engine control PCB
U3: R.P.M. electronic regulator
V3: PTO HI control PCB
Z3: PTO HI 20 l/min push-button
W3: PTO HI 30 l/min push-button
X3: PTO HI reset push-button
Y3: PTO HI 20 l/min indicator

A4: PTO HI 30 l/min indicator
B4: PTO HI reset indicator
C4: PTO HI 20 l/min solenoid valve
D4: PTO HI 30 l/ min solenoid valve
E4: Hydraulic oil pressure switch
F4: Hycraulic oil level gauge
G4: Preheating glow plugs
H4: Preheating gearbox
I4: Preheating indicator
L4: R.C. filter
M4: Heater with thermostat
N4: Choke solenoid
O4: Step relay
P4: Circuit breaker
Q4: Battery charge sockets
R4: Sensor, cooling liquid temperature
S4: Sensor, air filter clogging
T4: Warning light, air filter clogging
U4: Polarity inverter remote control
V4: Polarity inverter switch
Z4: Transformer 230/48V
W4: Diode bridge, polarity change
X4: Base current diode bridge
Y4: PCB control unit, polarity inverter

A5: Base current switch
B5: Auxiliary push-button ON/OFF
C5: Accelerator electronic control
D5: Actuator
E5: Pick-up
F5: Warning light, high temperature
G5: Commutator auxiliary power
H5: 24V diode bridge
I5: Y/s commutator
L5: Emergency stop button
M5: Engine protection EP5
N5: Pre-heat push-button
O5: Accelerator solenoid PCB
P5: Oil pressure switch
Q5: Water temperature switch
R5: Water heater
S5: Engine connector 24 poles
T5: Electronic GFI relais
U5: Release coil, circuit breaker
V5: Oil pressure indicator
Z5: Water temperature indicator
W5: Battery voltmeter
X5: Contactor, polarity change
Y5: Commutator/switch, series/parallel

A6: Commutator/switch
B6: Key switch, on/off
C6: OEA control unit
D6: Connector, PAC
E6: Frequency rpm regulator
F6: Arc-Force selector
G6: Device starting motor
H6: Fuel electro pump 12V c.c.
I6: Start Local/Remote selector
L6: Choke button
M6: Switch CC/CV
N6: Connector – wire feeder
O6: 420V/110V 3-phase transformer
P6: Switch IDLE/RUN
Q6: Hz/V/A analogic instrument
R6: EMC filter
S6: Wire feeder supply switch
T6: Wire feeder socket
U6: DSP chopper PCB
V6: Power chopper supply PCB
Z6: Switch and leds PCB
W6: Hall sensor
X6: Water heather indicator
Y6: Battery charge indicator

A7: Transfer pump selector AUT-0-MAN
B7: Fuel transfer pump
C7: „GECO" generating set test
D7: Flooting with level switches
E7: Voltmeter regulator
F7: WELD/AUX switch
G7: Reactor, 3-phase
H7: Switch disconnector
I7: Solenoid stop timer
L7: "VODIA" connector
M7: "F" EDC4 connector
N7: OFF-ON-DIAGN. selector
O7: DIAGNOSTIC push-button
P7: DIAGNOSTIC indicator
Q7: Welding selector mode
R7: R.C. net
S7: 230V 1-phase plug
T7: V/Hz analogic instrument
U7:
V7:
Z7:
W7:
X7:
Y7:

A8:
B8:
C8:
D8:
E8:
F8:
G8: Polarity inverter two way switch
H8:
I8:
L8:
M8:
N8:
O8:
P8:
Q8:
R8:
S8:
T8:
U8:
V8:
Z8:
W8:
X8:
Y8:

SYMBOLS (for all MOSA models)

STOP - Read absolutely and be duly attentive

Read and pay due attention

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

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

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

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

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

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

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

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

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

PROHIBITIONS No harm for persons

Use only with safety clothing -
It is compulsory to use the personal protection means given in equipment.

Use only with safety clothing -
It is compulsory to use the personal protection means given in equipment.

Use only with safety protections -
It is a must to use protection means suitable for the different welding works.

Use with only safety material -
It is prohibited to use water to quench fires on the electric machines.

Use only with non inserted voltage -
It is prohibited to make interventions before having disinserted the voltage.

No smoking -
It is prohibited to smoke while filling the tank with fuel.

No welding -
It is forbidden to weld in rooms containing explosive gases.

ADVICE No harm for persons and things

Use only with safety tools, adapted to the specific use -
It is advisable to use tools adapted to the various maintenance works.

Use only with safety protections, specifically suitable
It is advisable to use protections suitable for the different welding works.

Use only with safety protections -
It is advisable to use protections suitable for the different daily checking works.

Use only with safety protections -
It is advisable to use all protections while shifting the machine.

Use only with safety protections -
It is advisable to use protections suitable for the different daily checking works.and/or of maintenance.

°C: temperature Celsius grades
10:10 kVA synchronous (wording example)
10000:10 kVA asynchronous (wording example)
A: Ampere
A: ADIM engine
atm: pressure
B: pretrol
BAT: battery
BC: base current
C.A.(c.a.): alternating current
C.B.: battery charger
C.C.(c.c.): direct current
cc: cm^3 (volume)
CE: European norm conformity
CF: special for pipe welding
CTL: slow touring trolley
CTM CTV: fast touring trolley: hand touring trolley
D: diesel
D: GFI
D: Deutz engine
E: electric start
EAS: automatic intervention panel for generating sets for connection to the mains
EL: electronic regulation, allows to use welder and generating set simultaneausly
EP1: automatic accelerator according to requestedpower, engine protection, low oil pressure, high temperature with engine stop, troble warning lights
EP2: engine protection, low oil pressure, hight temperature with engine stop, trouble warning lights
EP4: engine protection, low oil pressure, high temperature with engine stop, no battery charge, belt broken, low fuel level with engine stop, trouble warning lights
EP5: engine protection, low oil pressure, high temperature with engine stop, no battery charge, belt broken, low fuel level with engine stop, everspeed, trouble warning lights
ES: oil/temperature engine protection device
EV: electrovalve
g/kwh: grams/kilowatt hour (engine consumption)
GA: asynchronous alternator
GE: generating set
GHF: high frequency alternator
GS: synchronous alternator
h: hour meter (symbol)
H: Hatz engine
H: Honda engine
HI: hydraulic central
Hz: frequency
I: single-phase auxiliary generation (symbol 1~)
IP: protection grads for electric devices against acess to dangerous parts according to the IEC 529 norm (Internal Protection)
kg: kilogram (mass)
K: welding cables set
kVA: kilovolt ampere
kW: kilowatt (engine power)
kWh: kilowatt hour (energy)
l: liters (capacity)
L: Lombardini engine
Lwa: maximum acoustic (power level) according to EEC norm 535/536
mm: millimeter (length) (measure)
m: meter (length)
mA: milliampere
MS-MSG: MOSA engine driven welder with high frequency alternator
MT: magnetothermic switch
MT: grounding kit
MTD: magnetothermic switch / GFI
OH: heater (engine oil) for generating sets
P: plus
PAC: power electric frame
PAR: device for double
PB: battery holder
PL: „pipe line" welding
PS: exhaust pipe extension
PW: welder for polyethylene and propylene pipes
QEA: automatic electric panel
QEM: manual electric panel
R: Ruggerini engine
RVT: voltage electronic regulator
S: symbol of EN 60974-1
S: Suzuki mengineotore
SKID: unit assembled on a base with no protection (no fairing)
S-SC: silenced (faired) - silenced compact (faired
SX-SXC: supersilenced (faired and sound prof) - supersilenced compact (faired and super sound prof)
T: thermic switch
TC-TCM-TCPL: remote control
TS: welder with asynchronous alternator
V: Volt
Y: Yanmar engine
Y: three-phase auxiliary generation (symbol 3~)

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.

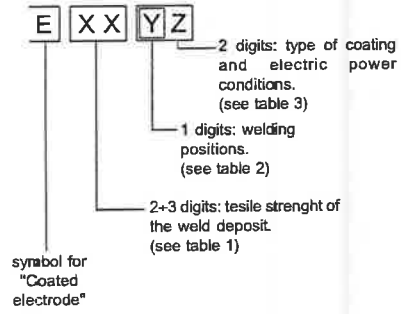
HIGH YIELD BASIC ELECTRODES: E 7018

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.i.	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

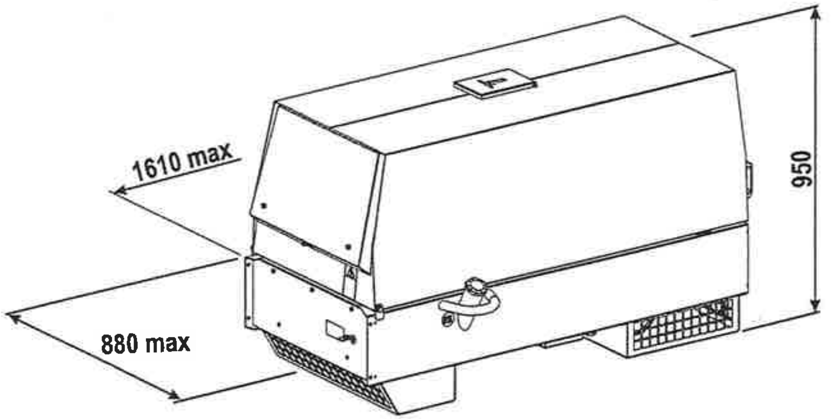
Table 1

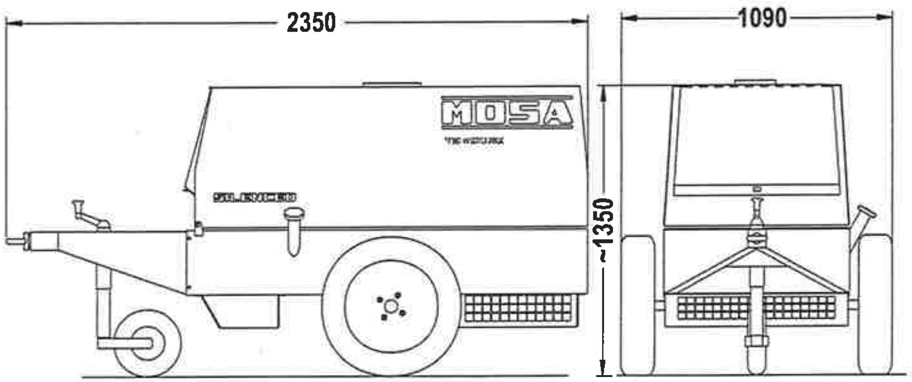
1	for all positions
2	for plane and vertici
3	for plane posotion only

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





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

Equipment and optional

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

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

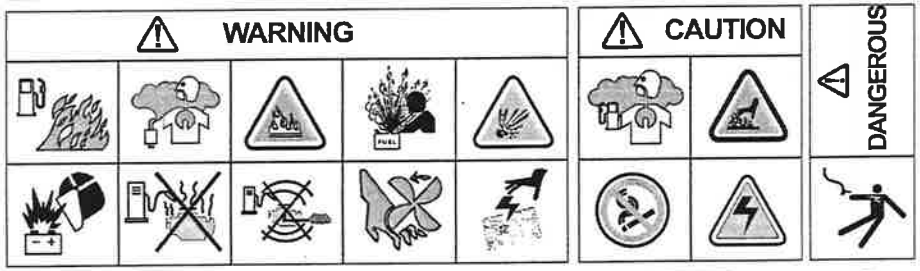
ENGINE	CHECKING BOARD
Stop engine when fueling	Do not touch electric devices if you are barefoot or with wet clothes.
Do not smoke, avoid flames, sparks or electric tools when fueling.	
Unscrew the cap slowly to let out the fuel vapours.	Always keep off leaning surfaces during work operations
Slowly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

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

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

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

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



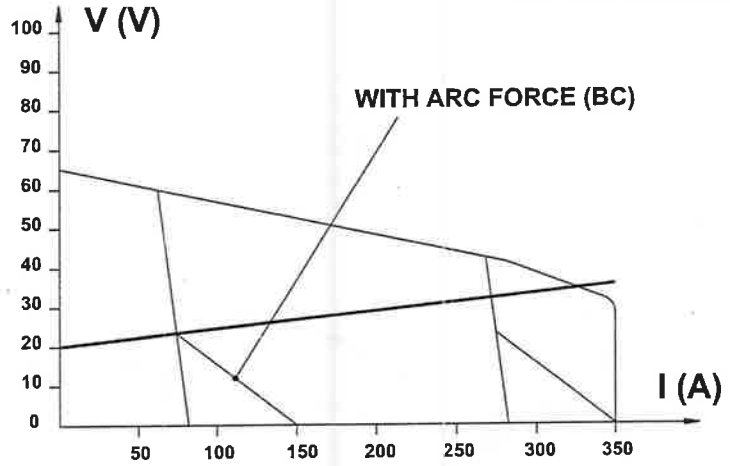
⚠ **WARNING** — *THE MACHINE MUST NOT BE USED IN AREAS WITH EXPLOSIVE ATMOSPHERE*

10/06/00 M2-5I

WELDING UNIT CC

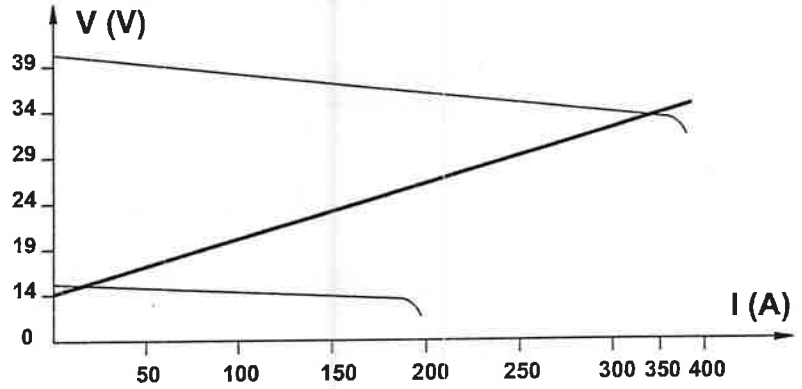
Max DC welding current	350 A 35%, 320 A - 60%, 270 A - 100%
Welding current electronic regulation (on two scales)	20 - 350A
Striking voltage (OCV)	65 V
Electrode diameter (rutile, basic, cellulosic)	2 - 6 mm

OUTPUT CARACTERISTIC



WELDING UNIT CV

Max DC welding current	270/100%
Welding voltage electronic regulation	15 - 40V
Electrode diameter	0.8 - 2 mm



SIMULTANEOUS UTILIZATION FACTORS

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

WELDING CURRENT	>250 A	200 A	150 A	100 A	0
AUXILIARY POWER	0	4 kVA	7.5 kVA	10 kVA	12 kVA

12/04/01 7737G

The TS 350 engine driven welder is a unit which function as:

a) a current source for arc welding

b) an electric auxiliary power generator

It is meant for industrial and professional use, powered by an internal combustion engine. It is composed of an engine, alternator, electric and electronic controls, and a protective housing.

Technical data	TS 350 SY CC/CV	TS 350 SXY CC/CV
ALTERNATOR	self-excited, self-regulated, brushless	
Type	asynchronous, three-phase	
A.C. GENERATOR		
Frequency	50 Hz	
Three-phase generation	12 kVA / 400 V / 17.3 A	
Single-phase generation	7 kVA / 230 V / 30.4 A	
Single-phase generation	3.5 kVA / 110 V / 32 A	
Service	100 %	
Insulating class	H	
ENGINE	Diesel, 4-stroke, water cooled	
Type	YANMAR 3 TNE 74	
Output	16.6 kW (22.3 HP)	
Speed	3000 rpm	
Displacement	1006 cm³	
Cylinders	3	
Fuel consumption	275 g/kWh	
Cooling system	Liquid	
Cooling system capacity	4 l	
Starter	Electric	
Fuel	Diesel	
Engine oil capacity	2.7 l	
GENERAL SPECIFICATIONS		
Battery	12V -60Ah	
Tank capacity	32 l	
Running time (at duty cycle 60%)	10 h	
Protection	IP 23	
Dimensions / max. Lxhxw (mm	1610x950x880	
Weight	475 Kg	495 Kg
Noise level**	98 LWA (73 dB(A))	93 LWA (68 dB(A))

* Dimensions and weight are inclusive of all parts without wheels and towbar ** LWA conforms to EEC directives 535/536, dB(A) at 7 m.

OUTPUT

The powers are guaranteed at 20°C and 1 bar pressure.
They are reduced in an **approximature** way:
of 1% every 100 m of altitude and of 2% for every 5°C above 20°C.
Up to an altitude of 1000 - 1300 m and in optimum climatic conditions (temperature, humidity, etc.), there are no notable setting variations. In particular climatic conditions for possible modifications or adjustments to be brought on the engined, please contact our Technical Assistance Centers.

ACOUSTIC POWER LEVEL

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

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

At 4 meters the noise level becomes:

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

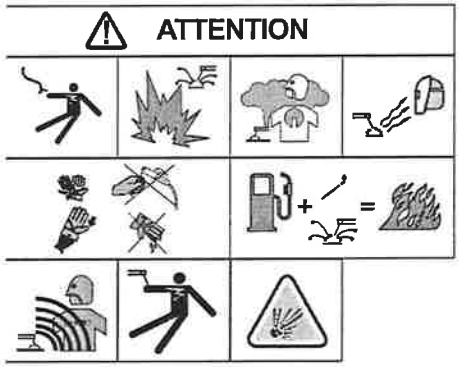
12/04/01 77376

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).

30/03/00 M2-5GB

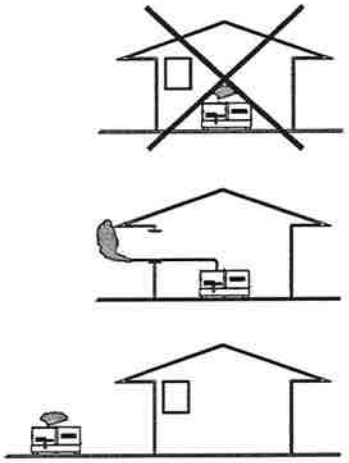
INSTALLATION AND ADVICE BEFORE USE

GASOLINE ENGINES

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

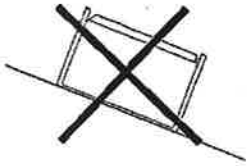
DIESEL ENGINES

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

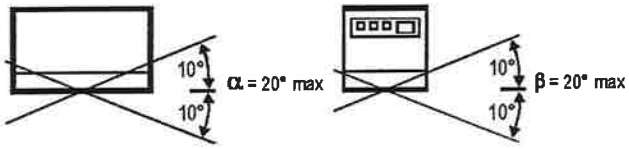


POSITION

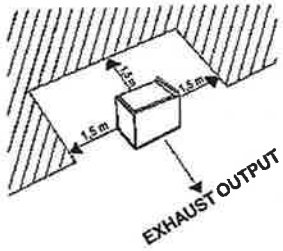
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



Maximum leaning of the machine (in case of dislevel)



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



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

MOVES OF THE MACHINE

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

PLACE OF THE MACHINE

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

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

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

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

✎ Avvalersi di personale **qualificato** per effettuare le operazioni necessarie alla dismissione.

Per dismissione s'intendono tutte le operazioni da effettuare, a carico dell'utilizzatore, quando l'impiego della macchina ha avuto termine.
Questo comprende le operazioni di smontaggio della macchina, la suddivisione dei vari elementi per un successivo riutilizzo o per lo smaltimento differenziato, l'eventuale imballaggio e trasporto di tali elementi sino alla consegna all'ente di smaltimento, al magazzino ecc.

Le diverse operazioni di dismissione comportano la manipolazione di fluidi potenzialmente pericolosi quali oli lubrificanti ed elettrolita batteria.

Lo smontaggio di parti metalliche che potrebbero determinare tagli e/o lacerazioni deve essere effettuato mediante l'impiego di guanti e/o utensili adeguati.

Lo smaltimento dei vari componenti della macchina deve essere effettuato in conformità alle normative di legge e/o disposizioni locali vigenti.
Particolare attenzione deve essere riservata allo smaltimento di:
oli lubrificanti, elettrolita batteria, combustibile, liquido di raffreddamento.

L'utilizzatore della macchina è responsabile del rispetto delle norme di tutela ambientale in ordine allo smaltimento della macchina dismessa, ovvero delle sue parti componenti.

Nei casi in cui la macchina venga dismessa senza preventivo smontaggio delle sue parti è comunque prescritto che siano rimossi:
- carburante dal serbatoio
- olio lubrificante dal motore
- liquido di raffreddamento dal motore
- batteria

N.B. la MOSA interviene nella fase di dismissione **solo** per quelle macchine che ritira come usato e che non possono essere ricondizionate.
Questa, ovviamente, previa autorizzazione.

In caso di necessità per le avvertenze di primo soccorso e le misure antincendio, vedere pag. M2.5

⚠ IMPORTANTE

Nell'effettuare le operazioni necessarie alla dismissione evitare che: sostanze inquinanti, liquidi, oli esausti, ecc. ... vadano ad arrecare danno a persone o a cose o causare effetti negativi all'ambiente, alla salute o alla sicurezza nel totale rispetto delle leggi e/o disposizioni locali vigenti.

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.

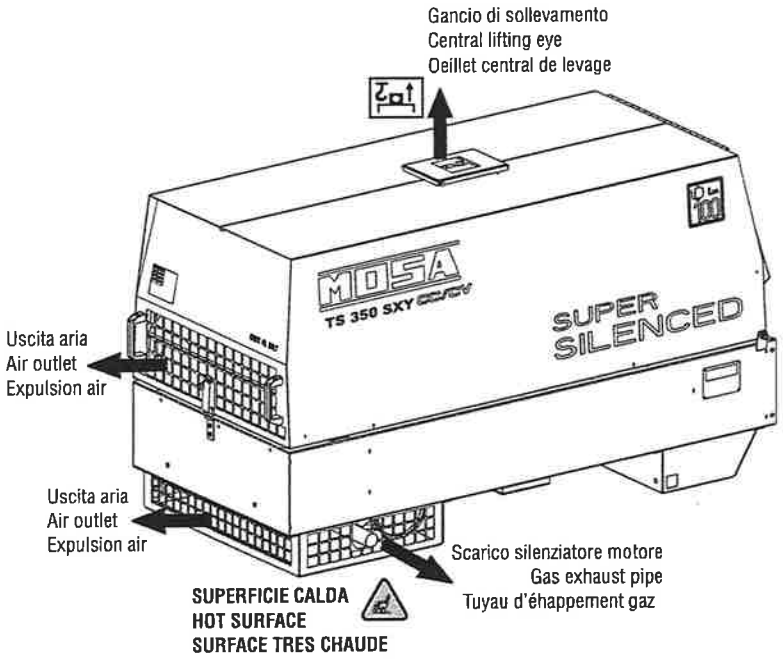
Clean the covers and all the other parts of the machine carefully.

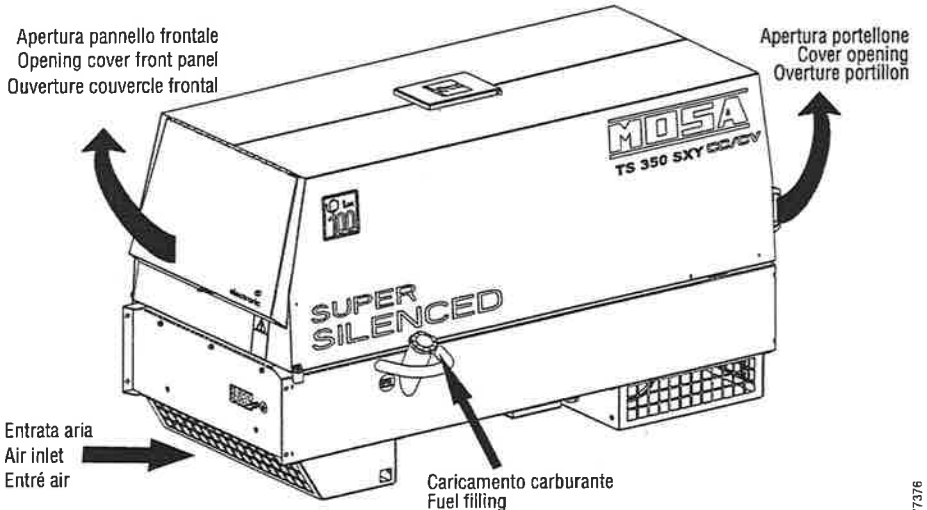
Protect the machine with a plastic hood and store it in a dry place.

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.





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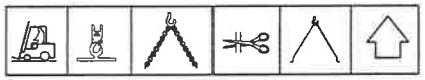
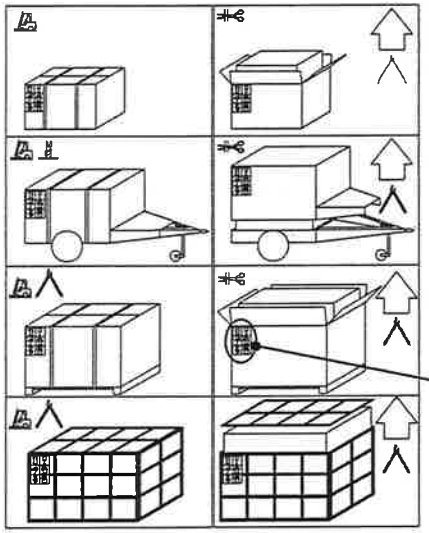
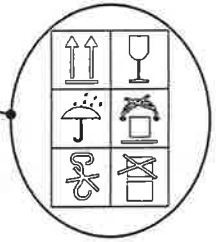
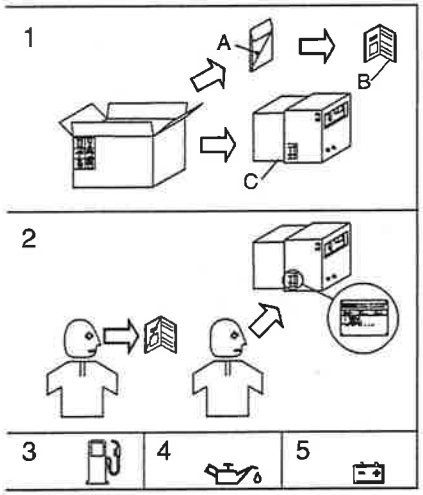






✎ Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conforms to local rules and regulations.
When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling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

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



1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
2) Read: the user's manual (B), the plates fixed on the machine, the data plate.
3) Fill the tank with fuel.
4) Introduce the engine oil (see engine manual).
5) Activate the battery (when assembled).

NB.: for points 3)-4)-5) keep to the instructions page M20 and/or M26.

UNITS WITH ELECTRIC STARTER

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

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

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

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

PROCEDURE FOR RECHARGING A BATTERY

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

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

MODELS WITH DRY AIR FILTER (CLEANING)

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

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

ALTERNATOR (brushless)

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

ALTERNATOR (with brushless)

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

MODEL WITH COOLING LIQUID

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

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

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

In case the machine should not be used for more than 30 days, make shure that the room in which it is stored presents a suitable shelter from heat sources, weather changes or anything which can cause rust, corrosion or damages to the machine. See page M45.

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

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

IMPORTANT

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

⚠ WARNING

MOVING PARTS can injure

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

- See pag. M1.1 -

HOT surface can hurt you

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

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

The routine cleaning of the machine is also considered maintenance.

The repair of the machine, the substitution of defective parts and the substitution of parts, which have been consumed in normal use, are not considered maintenance.

The substitution of tires is considered a repair rather than maintenance since the machine is not supplied with the necessary tools to change the tire

For the maintenance of the gasoline or Diesel engine please refer to the specific manual supplied with the unit.
The periodic maintenance should be performed according to the schedule shown in the engine manual. An optional hour counter (M) is available to simplify the determination of the working hours.

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

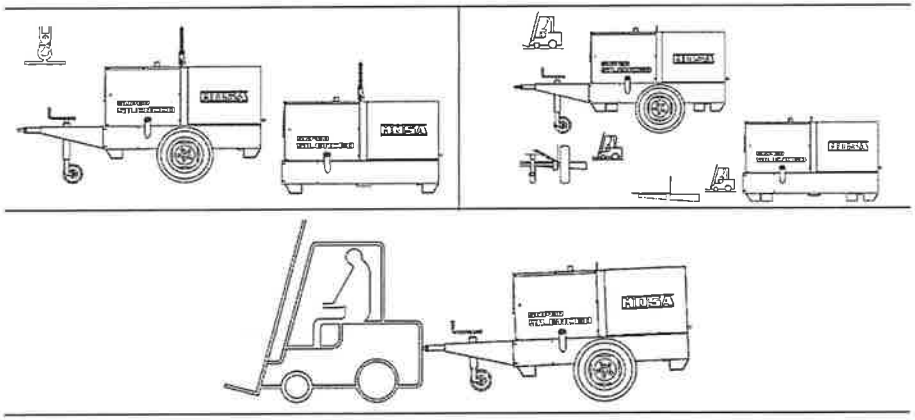
⚠ NOTE

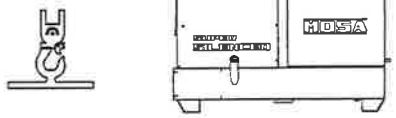
THE ENGINE PROTECTION OF THE „EP-ES-PM" TYPE DO NOT WORK WHEN THE OIL IS OF LOW QUALITY BECAUSE NOT CHARGED REGULARLY AT INTERVALS AS PRESCRIBED IN THE OWNER'S ENGINE MANUAL.

⚠ NOTE

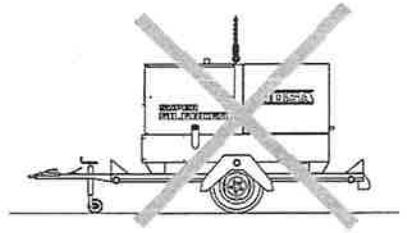
In case you should transport or move the machine, keep to the instructions as per the figures.
Make the transportation when the machine has **no** petrol in its tank, **no** oil in the engine and and electrolyte in the battery.
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conform to local rules and regulations.
Only authorized persons involved in the transport of the machine should be in the area of movement.

DO NOT LOAD OTHER PARTS WHICH CAN MODIFY WEIGHT AND BARICENTER POSITION.
IT IS STRICTLY FORBIDDEN TO DRAG THE MACHINE MANUALLY OR TOW IT BY ANY VEHICLE (model with no CTL accessory).
If you did not keep to the instructions, you could damage the structure of the machine.





LIFT ONLY THE MACHINE



DO NOT LIFT THE MACHINE AND TRAILER

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

⚠ ATTENTION

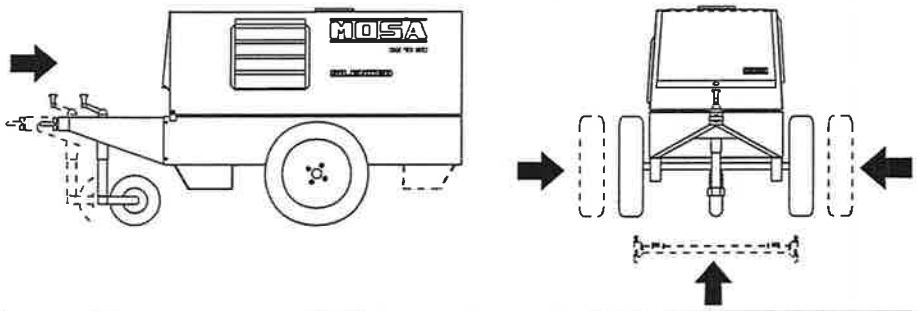
The CTL accessory cannot be removed from the machine and used separately (actioned manually or following vehicles) for the transport of loads or anyway for used different from the machine movements.

TRAILERS

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

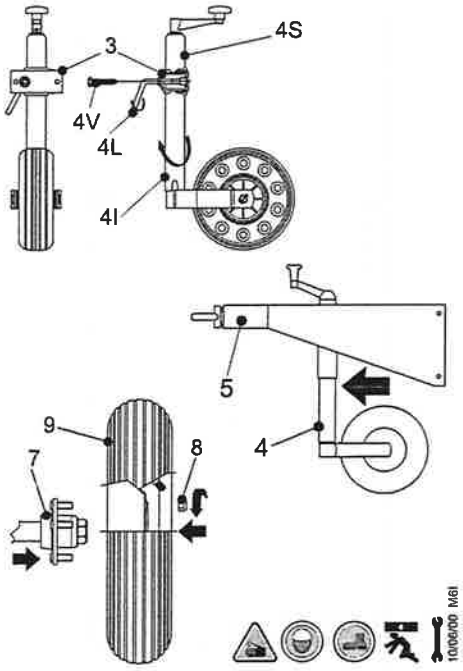
Towing on public roads or turnpikes of any type **IS EXCLUDED**, because **not** in possesion of the requirements by national and foreign traffic norms.

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



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

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



⚠ **ATTENTION**

Do not substitute the original tires with other types.

⚠ NOTE

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

USE AS TROUBLE INDICATOR:

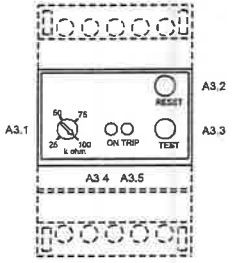
Placed on the front panel, the insulation monitor (A3) is a relay which controls continuously the insulation of the auxiliary circuits towards the ground. The device generates internally a continuous 12V voltage which is applied between the circuit under control and the ground.

USE AS TROUBLE INDICATOR AND INTERVENTION:

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

USE OF RI – R22M MODEL:

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

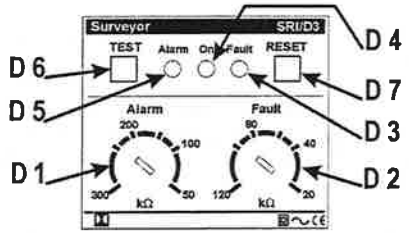


LEGEND:

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

USE OF SRI/D3 MODEL

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



LEGEND:

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

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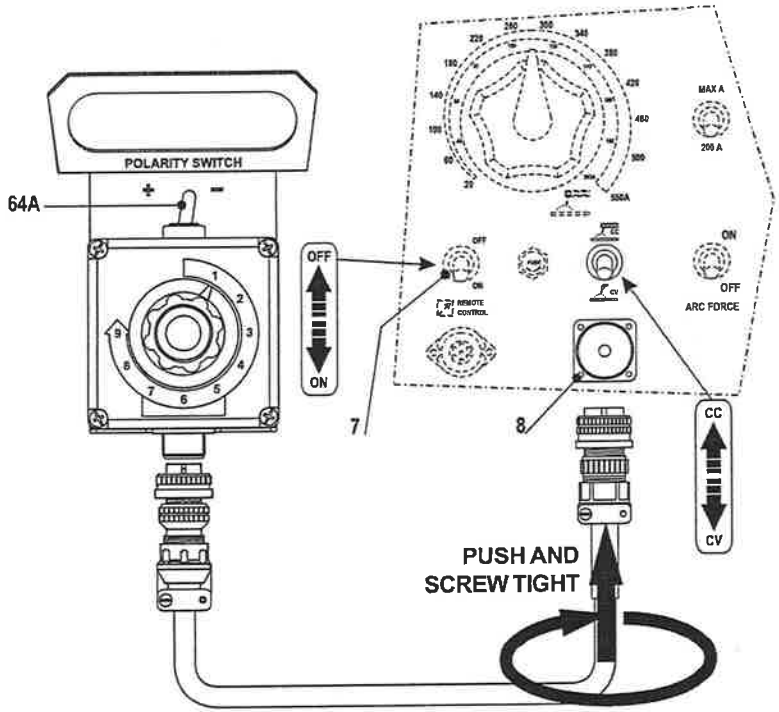


Is it possible to connect the TCPL4, to all engine driven welders CC/CV and CC/CV-PL versions.

The remote control device for regulating the welding current in the CC mode and the welding voltage in the CV mode is connected to the front panel by means of a multipole connector.

To regulate the current from the TCPL 4, move the switch (7), located above the multipole connector (8), to „ON" position.

The remote control of the polarity inverter (64A) permits to inverse the polarity directly from the control itself (only for CC/CV-PL models).

Position welding current adjusting knob at the necessary current value for the diameter and type of electrode.

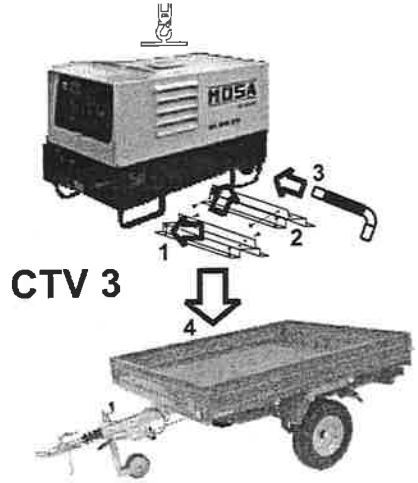
⚠ MAKE SURE

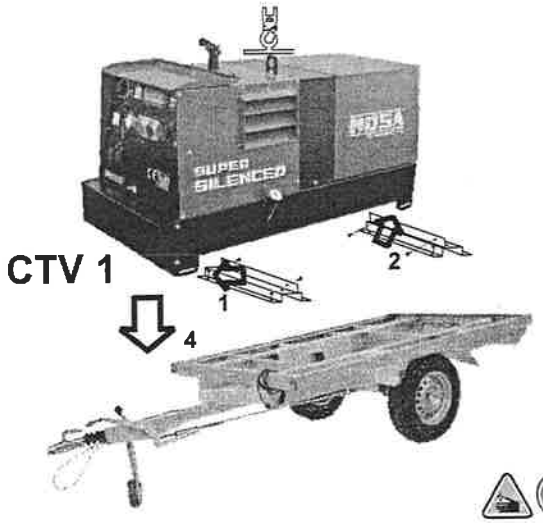
When the TCPL 4 is not used, make sure that the switch is in the "OFF" position.

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

Lift the machine and assemble the parts indicated in the figure.
1) and 2) fix the crossbars to the unit with the screws corresponding to the holes made on the supports.
3) fix the extension plate of the exhaust pipe in the points provided on the trolley.
Put the unit on the trolley platform and then fix it. Connect the flexible pipe to the plate and to the exhaust of the unit with the blocking clamps.
ATTENTION For every missing information please refer to the conformity declaration for vehicles of homologated type .... given with the trolley. declaratio

✎ The maximum permitted speed can be found in the declaration of **conformity**
For information about the trailer refer to the declaration of conformity, which is supplied with the trailer.





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.

Agip MOSA

PRODOTTI RACCOMANDATI RECOMMENDED PRODUCTS	
AGIP SUPERDIESEL 15W/40 API CF4-SG	OLIO MOTORE DIESEL DIESEL ENGINE OIL
AGIP SUPERMOTOROIL 20W/50 API CC-SF	OLIO MOTORE BENZINA GASOLINE ENGINE OIL
AGIP ANTIFREEZE EXTRA INIBITE ETIFYLENE GLYCOL (50% + 50% H_2O)	CIRCUITO DI RAFFREDDAMENTO COOLING CIRCUIT (CUNA NC 956-16 ED 07)

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.

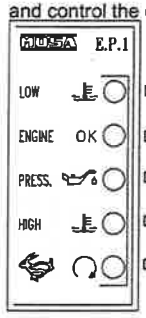
EP1 engine protection module and auto-idle
(Only for EP1 Version)

The EP1 engine protection module shuts down the engine if the oil pressure is too low or if the engine temperature is too high. There is a series of LED's, which show the status of the engine. The top, yellow LED lights every time the engine is started and inhibits the acceleration of the engine for about 30 seconds to allow the engine to warm-up. At low temperatures the engine should be kept at idle for several minutes after the LED has gone out before being loaded. After about 15 seconds the green LED lights up indication that the oil pressure is sufficient and the engine temperature is not too high. The two red LED's light up in the event of an engine shutdown and show whether low oil pressure or high engine temperature caused the shut down. The last, green LED lights when the engine is accelerated (see below).
The EP1 not only protects the engine but it also has an auto-idle feature, which keeps the engine at low speed until welding current or auxiliary power is required saving fuel, reducing the noise level and extending the life of the engine. There are two independent sensors - one for welding and one for auxiliary power:

Welding - touching the electrode to the work piece will accelerate the engine, which will remain accelerated as long as current is being drawn. If no current is drawn for about 20-30 seconds the engine will return to low speed.

Auxiliary power - plug the tool or other load into any socket and turn it on. The engine will accelerate and remain accelerated as long as current is drawn. If no current is drawn for about 20-30 seconds the engine will return to low speed.

Liquid cooled - in case of cooling liquid high temperature, the warning light will light up and the engine will be kept at MINIMUM thus preventing to draw power.
In this case it is SUGGESTED to stop the engine and control the cooling liquid level.



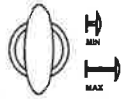
D1.1 (G) Low oil temperature / Cold engine
D1.2 (V) Engine test / OK engine
D1.3 (R) Low oil pressure
D1.4 (R) High temperature
D1.5 (V) Engine at maximum

COLORS
G= Yellow
V=Green
R=Red

Note: This unit is equipped with a manual accelerator for use in the unlikely event that the EP1 or the accelerator solenoid should fail. This manual accelerator can also be used in cases where the auto-idle function is not suitable for the type of welding being carried out.

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

Accelerator lever



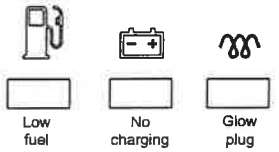
Note: The engine protections of the "EP" type do not work when the oil is of low quality because not changed regularly at intervals as prescribed in the owner's engine manual.

Indicating lamps

Battery charge indicator - this lamp lights if the battery charging circuit is not operating.

Low fuel level shut down indicator - when the fuel in the tank is at the reserve level this lamp lights and the engine is automatically shut down to prevent getting air in the engine fuel lines.

Note: This indicator will go on when the fuel level is low but may not remain on after the engine stops. The battery charge indicator and low oil pressure LED (on EP1) will be on as the engine is stopped even if the problem is not related to them. Sockets live indicators - there are lamps above the auxiliary power sockets that are lighted when power is present on the sockets.



Instruments

Standard instruments include an operating hour counter and a voltmeter for the auxiliary power that shows the three-phase voltage (400V). If the voltmeter does not show any voltage check that the GFI ground fault interrupter) is inserted. The voltage shown will vary depending on the load. At no load the voltage can be as high as 440V and at full load as low as 360V.

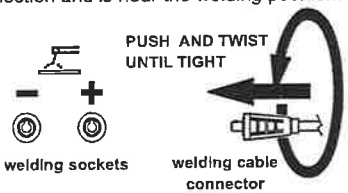

operating hours


Auxiliary power voltmeter

Welding cable connections

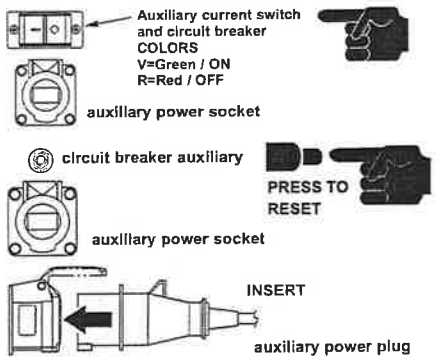
For direct current electrode positive, connect work cable to negative (-) terminal and electrode holder to positive (+) terminal. For direct current electrode negative, reverse cable connections. When gouging connect the positive lead to the socket marked "ONLY GOUGING."

✎ Make sure that the ground clamp makes a good connection and is near the welding position.



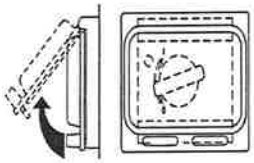
Auxiliary power outlets and thermal circuit breaker

The unit is equipped with 4 auxiliary output sockets - one three phase and three single phase. The voltages depend on the version selected. The three-phase socket requires no protection as the asynchronous alternator protects itself. The single-phase sockets are supplied with thermal circuit breakers. The 32A socket has a push button type thermal circuit breaker that pops out when overloaded. After it has been activated it needs a short time to cool down and then can be re-inserted. The two 16A sockets have thermal circuit breakers, which have an indicator lamp incorporated and can also be used to turn off the power to the socket. When they are overloaded the green button pops out and the lamp goes out. To reset wait a few minutes for it to cool down and then push in the green button. To turn off the power to the socket push in the red button. If the thermal circuit breakers continue to pop out check that the load is not too large for the output of the socket.



Ground fault interrupter

The ground fault interrupter protects the operator from injury in the event of a ground fault. If it is activated, raise the plastic cover and push the lever up to reset.



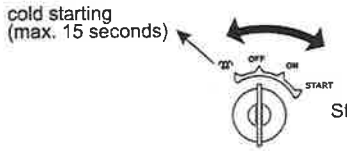
Insulation monitoring

The insulation monitor is a relay which controls continuously the insulation of the auxiliary circuits towards the ground it controls a device (release coil, contactor, etc.) which opens the whole auxiliary circuit, lifting voltage in the whole part of the machine auxiliary generation.

Starter key

To start the engine, turn the starter key to the left ("preheat" position indicated by the symbol for a glow plug). When the green lamp below the key (has the same glow plug symbol) goes out, turn the key clockwise to the "START" position to activate the starter motor. Once the engine has started return it to the "ON" position.

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



Fuse for electrical circuit (FUSE) 30A

Check daily

NOTE

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

ENGINES WITH MANUAL RECOIL

Hold the starting handle firmly.

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

Then returning it slowly.

ENGINES WITH ACCELERATOR LEVER

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

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

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

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

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

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

ENGINES WITHOUT ACCELERATOR LEVER

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

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

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

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

Open the fuel cock (where it is assembled).

CAUTION

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

NOTE

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

ENGINE WITH PREHEATING GLOW PLUGS

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

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

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

☞ Wait for the AUTOMATIC preheating time before drawing the load

OCCASIONAL USE OF THE ENGINE

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

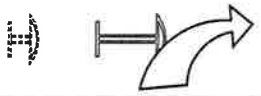
⚠ CAUTION

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

⚠ CAUTION

MACHINE WITH EMERGENCY BUTTON

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



⚠ CAUTION

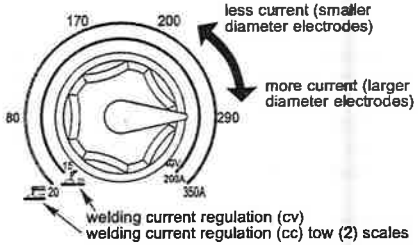
RUNNING-IN
During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, please follow the instructions on the engine use and maintenance manual..

14/06/99 M20-GB

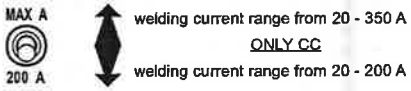
Welding current/voltage regulation (option)

Current regulation - the welding current/voltage potentiometer regulates the welding current when the CC/CV switch is in the CC (constant current) position. Select the appropriate current scale (20-200A and 20-350A) for the size of electrodes to be welded using current range selector.

Option
Voltage regulation - the welding current/voltage potentiometer regulates the welding voltage when the CC/CV switch is in the CV (constant voltage) position. Select the correct voltage for the type and size of wire being used.



Welding current range selection



Arc Force Selector

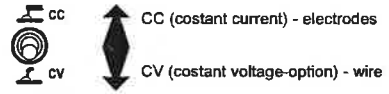
This welder is equipped with base current for improved welding with cellulose electrodes. The base current functions when the arc force selector is turned on. This base current can also be used when welding with wire.

Machines with polarity inverter

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

Mode selection - CC or CV (option)

This switch is used to select the CC (constant current) mode for welding electrodes or the CV (constant voltage) mode for welding wire. The current or voltage is regulated by the welding current/voltage regulation potentiometer (see above).

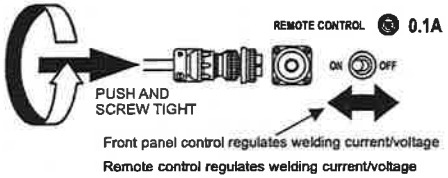


Remote control and wire feeder connection

Note: *both the devices use the same connector.*

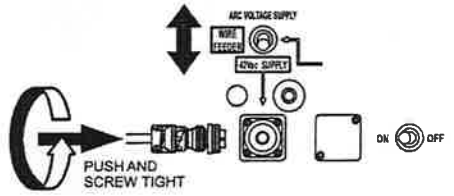
1) Remote control

The optional TCPL remote control is used to control the current or voltage at a distance. When the switch is "ON" (pointing toward the remote control connector), the current/voltage is regulated by the remote control. When the switch is "OFF" the current/voltage is regulated by the front panel potentiometer.



2) Wire feeder (MOSA model) - CV mode (option)

The welder is equipped with the output for the wire feeder connection; on the front panel you can choose the voltage supply between the d.c. arc voltage or the 42 V a.c.:



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