language

USE AND MAINTENANCE MANUAL

TRANSLATION OF THE ORIGINAL INSTRUCTIONS — ENGLISH

CS 350 KSX CC/CV

Codice
Code
Code
Codigo
Kodezahl
Código
Код
Code

C0QB30119003

Edizione
Edition
Édition
Edición
Ausgabe
Edição
Издание
Editie

01.2016

- Motosaldatrice
- Engine Driven Welder
- Motosoudeuse
- Motosoldadoras
- Schweißaggregat
- Motosoldadora
- По Вышкам
- Lassers

MADE IN ITALY

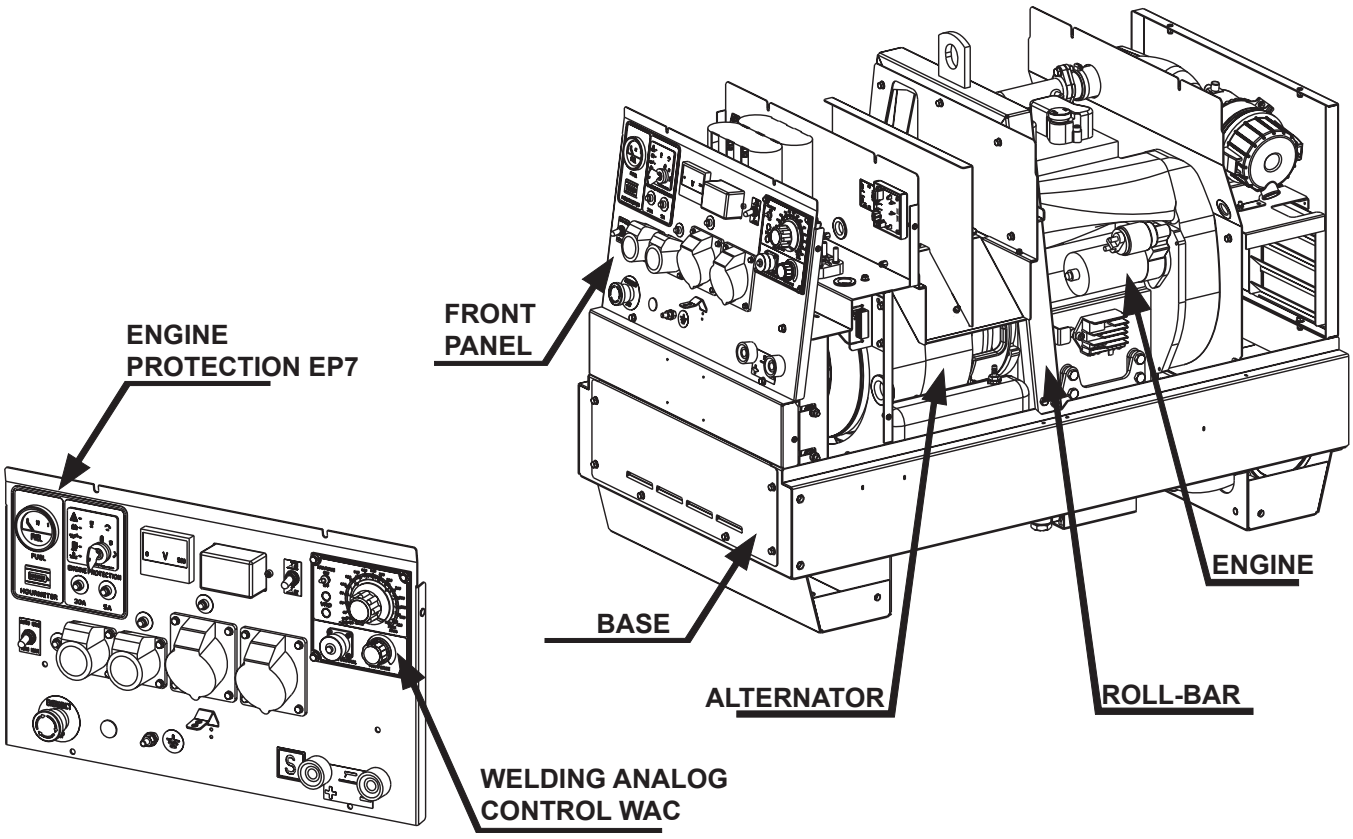
MOSA Weld

The engine driven welder is a unit which ensures the function as:
a) a current source for are welding
b) a current source for the auxiliary generation

The welding generator set is a source of DC electric power, driven by an internal combustion engine, which allows to perform arc welding processes with different types of electrodes and, with the CC/CV version, also wire welding. Besides, the generation set can provide ac 50 Hz auxiliary power, both three-phase and single phase, usable for the various needs associated with the welding. The engine which drives the generator set is a two-cylinder diesel type, air cooled, while the alternator is an asynchronous three-phase type. The welding current control is performed by means of a high frequency (20 kHz) “Chopper System” , while the regulation board is implemented with analogue technology.

From a mechanical viewpoint, the machine is composed of a bunded basement and a roll-bar, which support the engine-alternator assembly. The canopy includes a protection cover for the front panel and two lateral doors intended to allow the routine maintenance operations. For the extraordinary maintenance the canopy can be removed in a fairly simple way.

On the front panel there are the engine protection unit (EP7) and the welding control unit (WAC). Located on EP7 there are the start key and a few indicator lights which monitor the engine status. The WAC hosts the regulation knob of the welding current (which regulates also the welding voltage in the CC/CV version) and the arc force knob. The auxiliary power sockets and the welding sockets are also placed on the front panel.



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).

The Manufacturer shall not be liable for ANY USE OF THE PRODUCT OTHER THAN THAT PRECISELY SPECIFIED IN THIS MANUAL and is thus not liable for any risks which may occur as a result of IMPROPER USE. The Company does not assume any liability for any damage to persons, animals or property.

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.

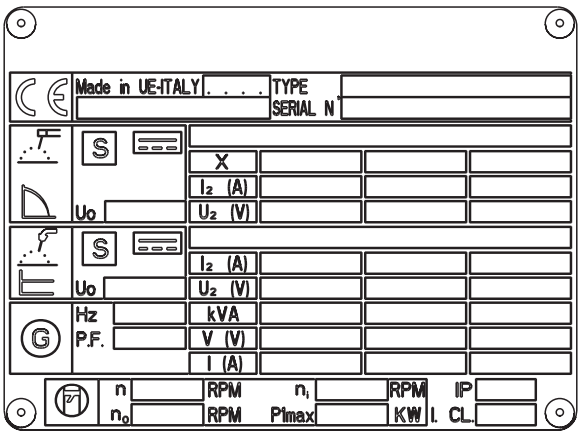
While working it is advisable to keep to the personal safety norms in force in the countries to which the product is destined (clothing, work tools, etc.).

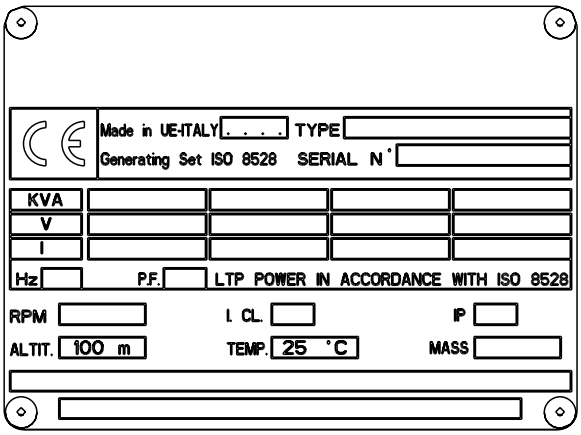
Do not modify for any motive parts of the machine (fastenings, holes, electric or mechanical devices, others..) if not duly authorized in writing: the responsibility coming from any potential intervention will fall on the executioner as in fact he becomes maker of the machine.

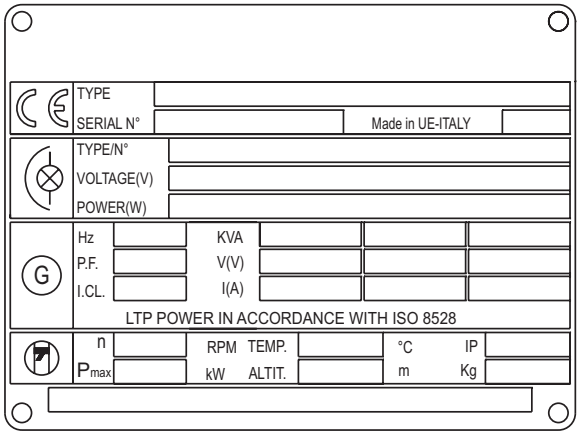
☞ ***Notice:*** *the manufacturer, who keeps the faculty, apart the essential characteristics of the model here described and illustrated, to bring betterments and modifications to parts and accessories, without putting this manual uptodate immediately.*

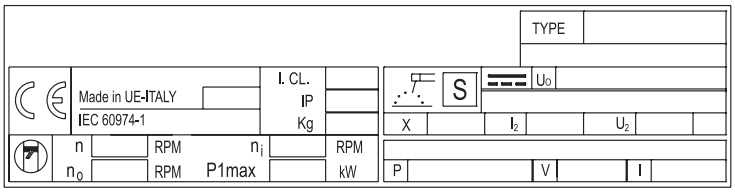
Any of our product is labelled with CE marking attesting its conformity to appliable directives and also the fulfillment of safety requirements of the product itself; the list of these directives is part of the declaration of conformity included in any machine standard equipment.
Here below the adopted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

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

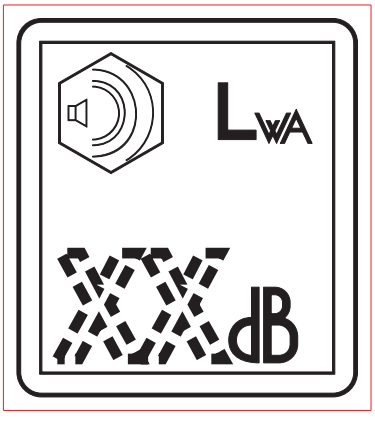








Furthermore, on each model it is shown the noise level value; the symbol used is the following:



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

Technical data	CS 350 KSX CC/CV
GENERATOR	
Three-phase generation	10 kVA / 400 V / 14.4 A
Single-phase generation	5 kVA / 230 V / 21.7 A
Single-phase generation	2.5 kVA / 110 V / 22.7 A
Single-phase generation	5 kVA / 48 V / 104 A
Frequency	50 Hz
Cos φ	0.9
ALTERNATOR	Self-excited, self-regulated
Type	three-phase, asynchronous
Insulating class	H
ENGINE	
Mark / Model	Kohler KD477.2
Type / Cooling system	Diesel 4-stroke / air
Cylinders / Displacement	2 / 954 cm^3
Output max	14 kW (19 HP)
Speed	3000 rpm
Fuel consumption	2.5 l/h
Engine oil capacity	3 l
Starter	Electric
GENERAL SPECIFICATIONS	
Tank capacity	38 l
Running time (at duty cycle 60%)	15.2 h
Protection	IP 23
*Dimensions / max. Lxwxh (mm)	1230x690x925
*Weight	345 Kg
Measured acoustic power LwA (pressure LpA)	94 dB(A) (69 dB(A) @ 7 m)
Guaranteed acoustic power LwA (pressure LpA)	95 dB(A) (70 dB(A) @ 7 m)

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

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 (L_{WA}) - 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.

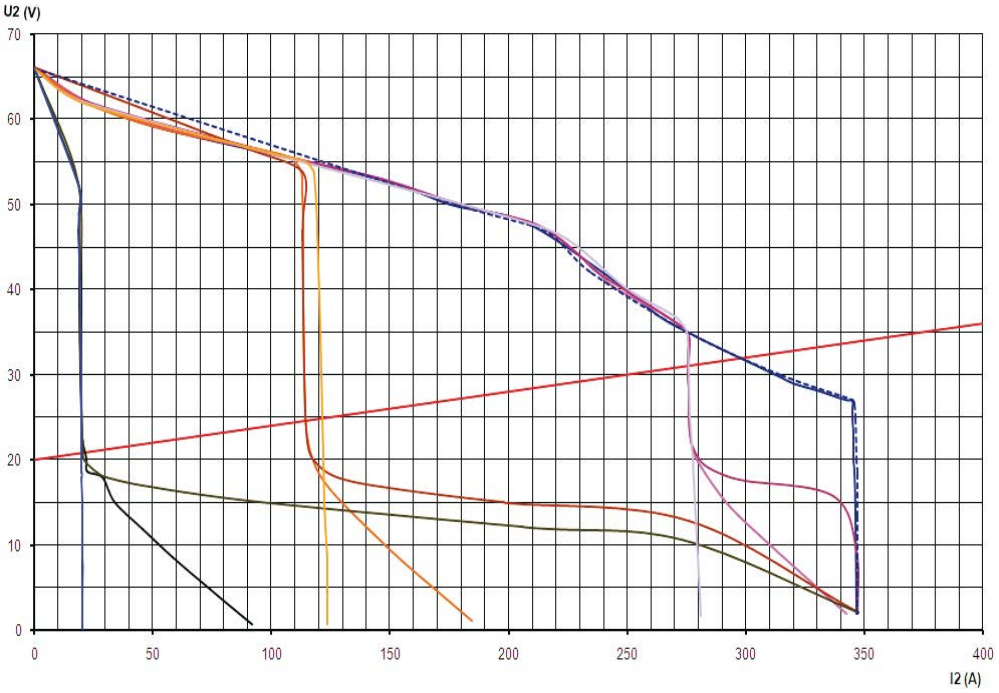
The here below table shows examples of acoustic pressure (Lp) at different distances from a machine with Acoustic Noise Level (L_{WA}) of 95 dB(A)

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)

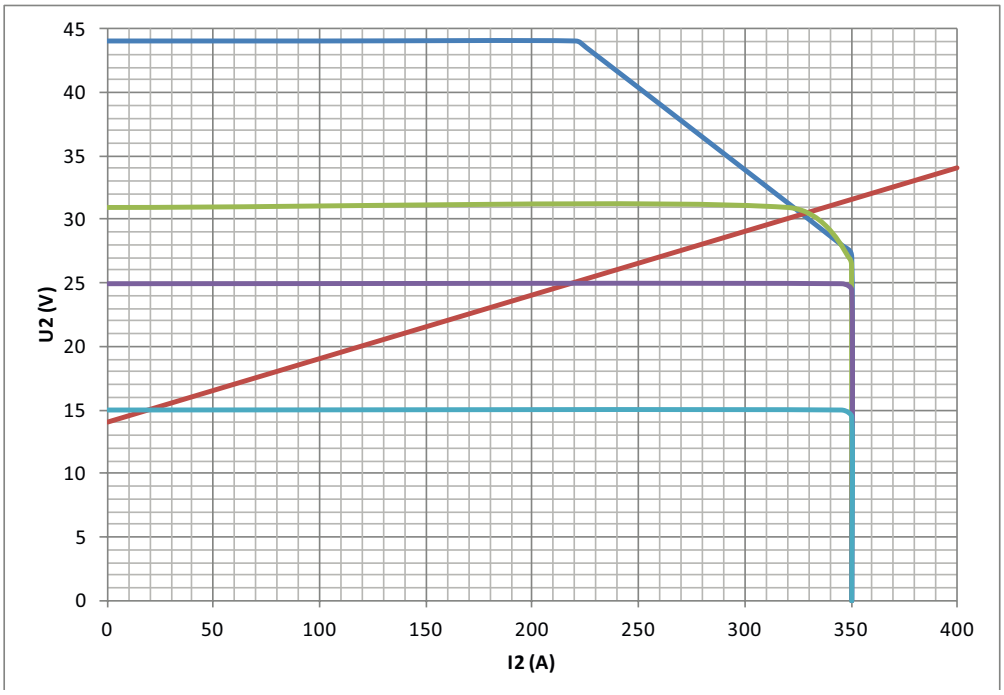
PLEASE NOTE: the symbol LWA 2000 / 14 / CE when with acoustic noise values, indicates that the device respects noise emission limits according to 2000/14/CE directive.

Technical data	CS 350 KSX CC/CV
C.C. WELDING	
Duty cycle	350A/35% - 300A/60% - 250A/100%
Welding current electronic regulation	20 - 350A
Open circuit voltage	66V
C.V. WELDING	
Duty cycle	300A/60% - 250A/100%
Welding voltage regulation	14V - 44V

C.C. STATIC CHARACTERISTICS



C.V. STATIC CHARACTERISTICS



SIMULTANEOUS UTILISATION LIMITS								
WELDING CURRENT (CC) [A]	0	50	100	150	200	250	300	350
AUXILIARY POWER 3-PHASE [Kw]	8.0	8.0	7.0	5.5	3.5	2.0	0	0
AUXILIARY POWER SINGLE PHASE [Kw]	4.0	4.0	4.0	4.0	3.5	2.0	0	0

The installation and general warnings regarding operations are aimed achieving correct use of the machine and/or apparatus in the place where it is used as a genset and/or motor welder.
- Advice to the User about the safety:

☞ NB: The information contained in the manual can be changed without notice.
Any damage caused in connection with the use of these instructions shall not be considered as they 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.

⚠ 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.

☞ **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.

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 authorized* 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.

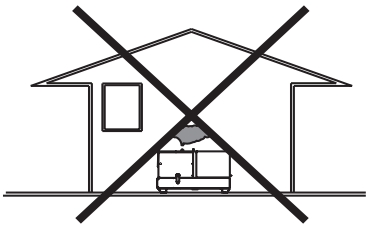
INSTALLATION AND ADVICE BEFORE USE

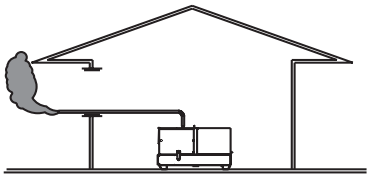
GASOLINE ENGINES

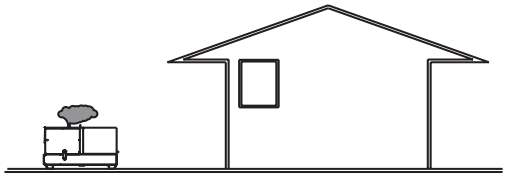
☞ Use in open space, air swept or vent exhaust gases, which contain the deathly carbone oxyde, far from the work area.

DIESEL ENGINES

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

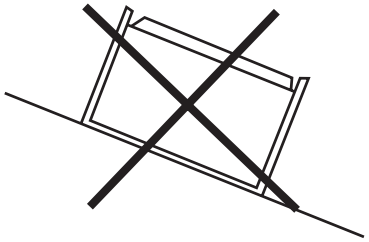




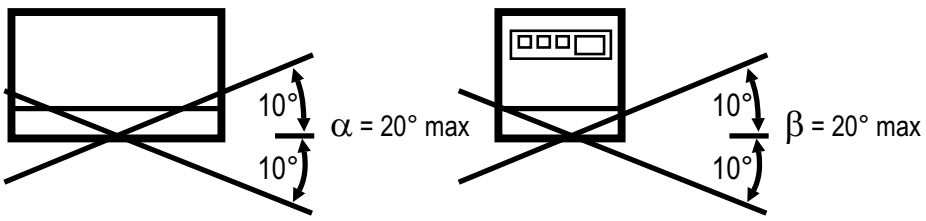


POSITION

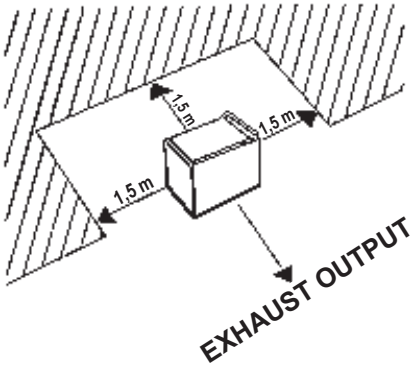
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



Maximum leaning of the machine (in case of dislevel)



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



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

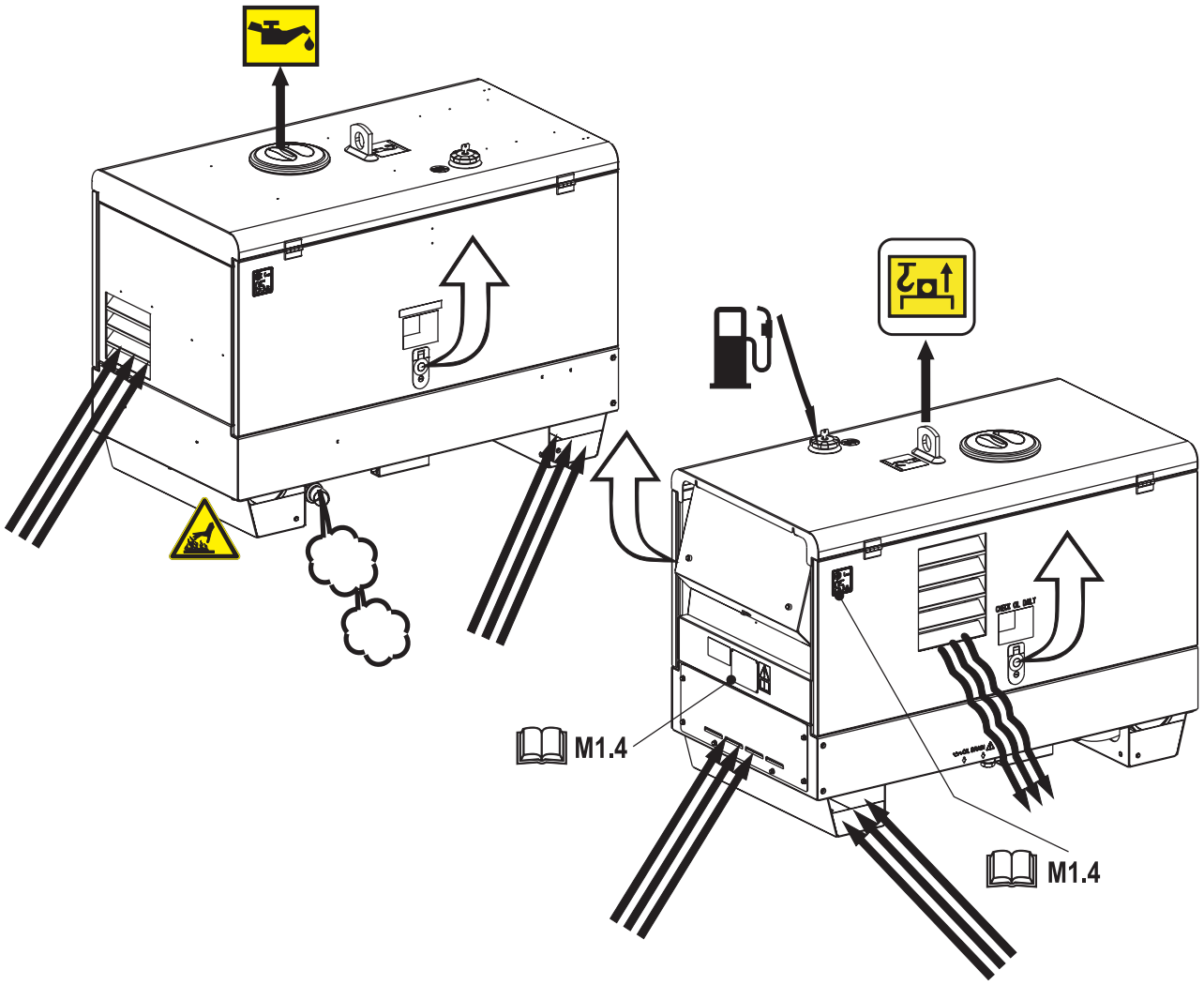
MOVES OF THE MACHINE

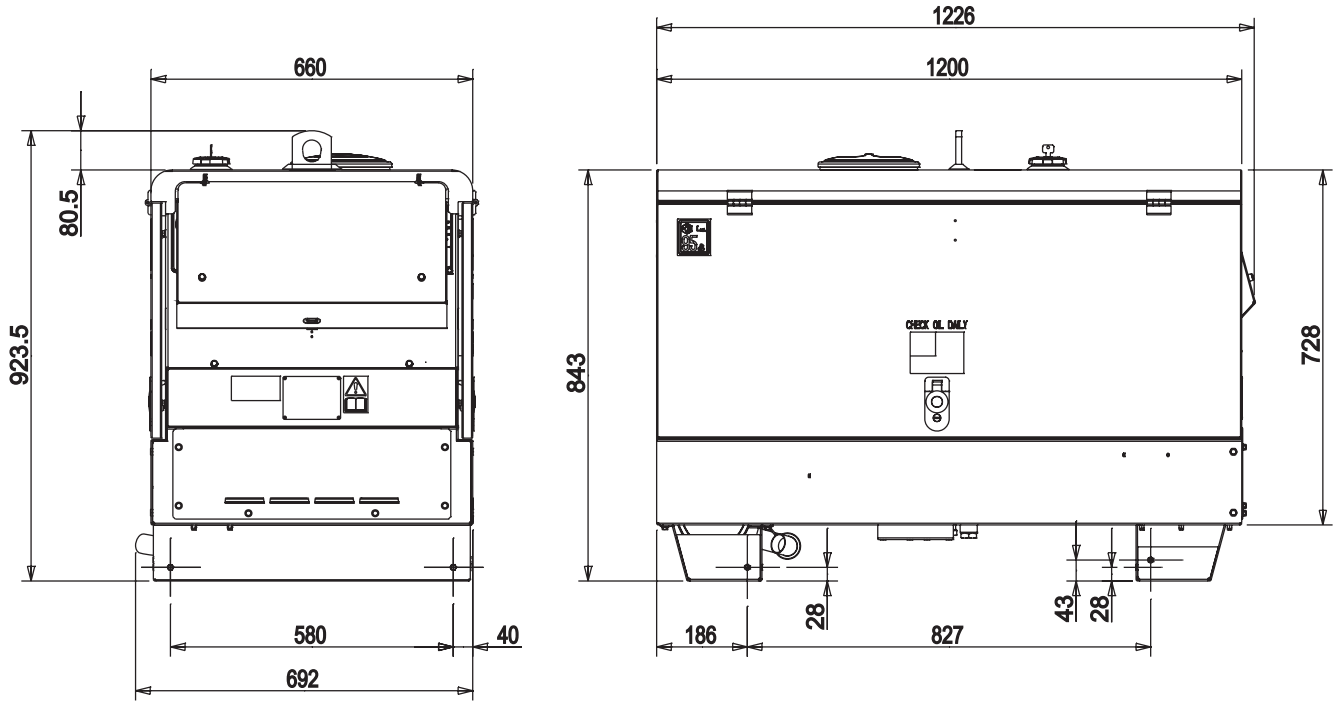
☞ At any move check that the engine is **off**, that there are no connections with cables which impede the moves.

PLACE OF THE MACHINE

ATTENTION

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





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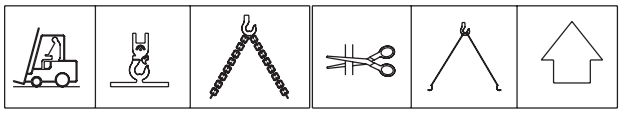
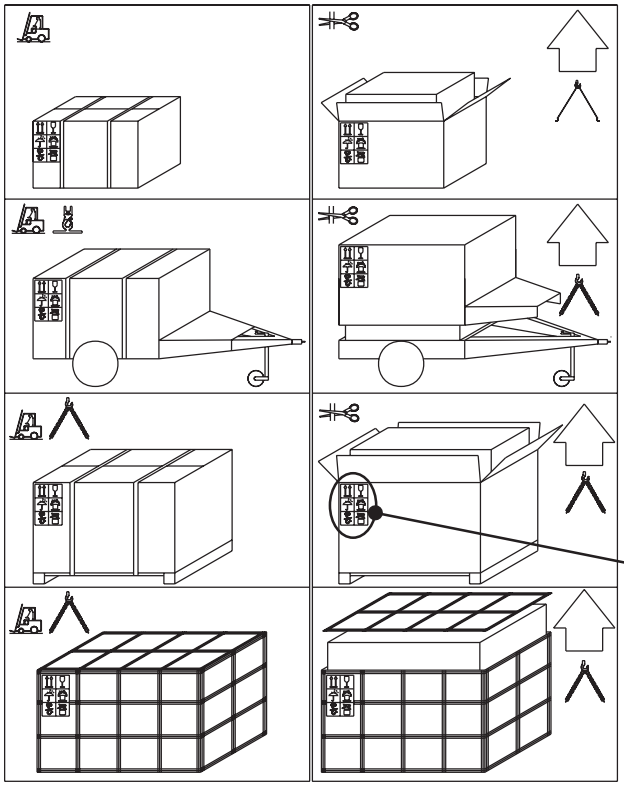
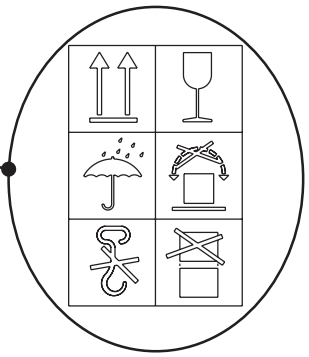
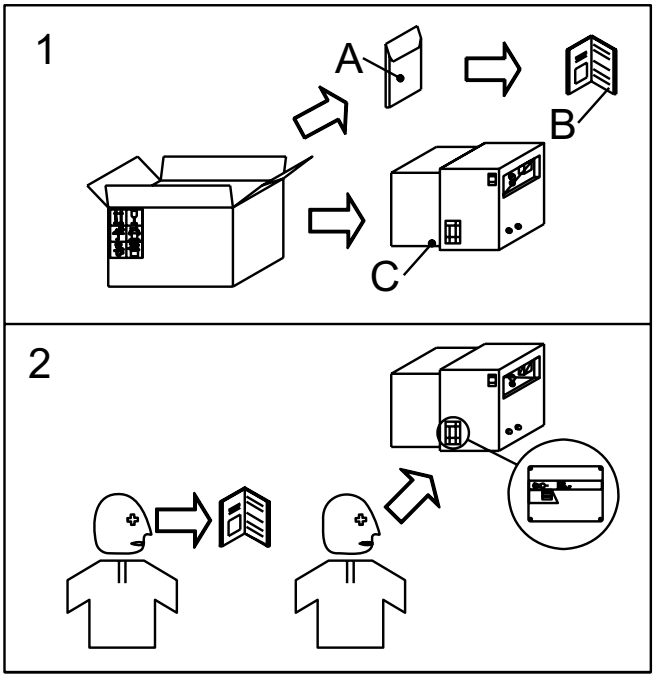




☞ Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conforms to local rules and regulations.
When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling 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.



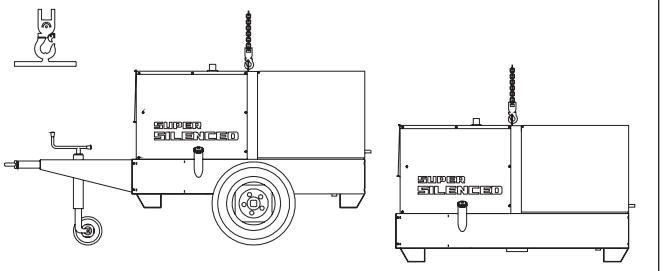


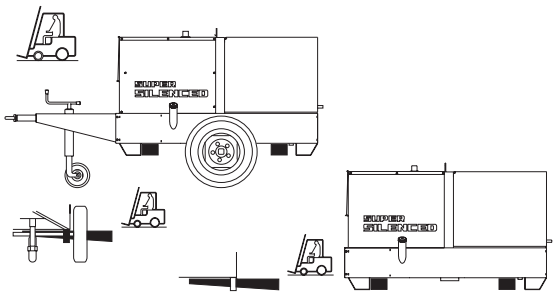
1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
2) Read: the user's manual (B), the plates fixed on the machine, the data plate.

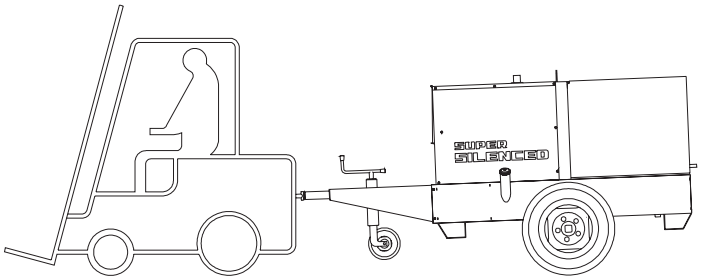
NOTE

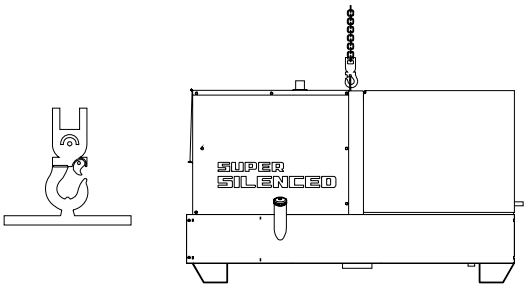
Transportation must always take place with the engine off, electrical cables and starting battery disconnected and fuel tank empty.
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with it's packaging, and conform to local rules and regulations.
Only authorized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

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.

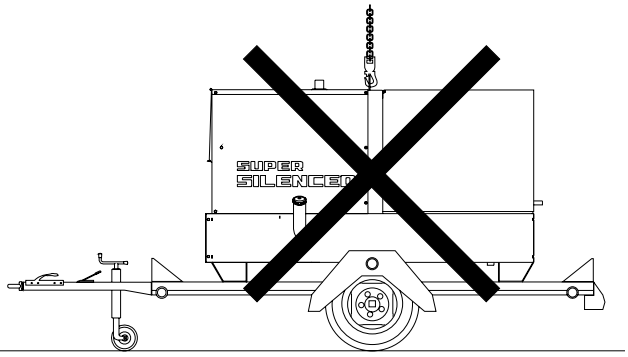








LIFT ONLY THE MACHINE



DO NOT LIFT THE MACHINE AND TRAILER

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

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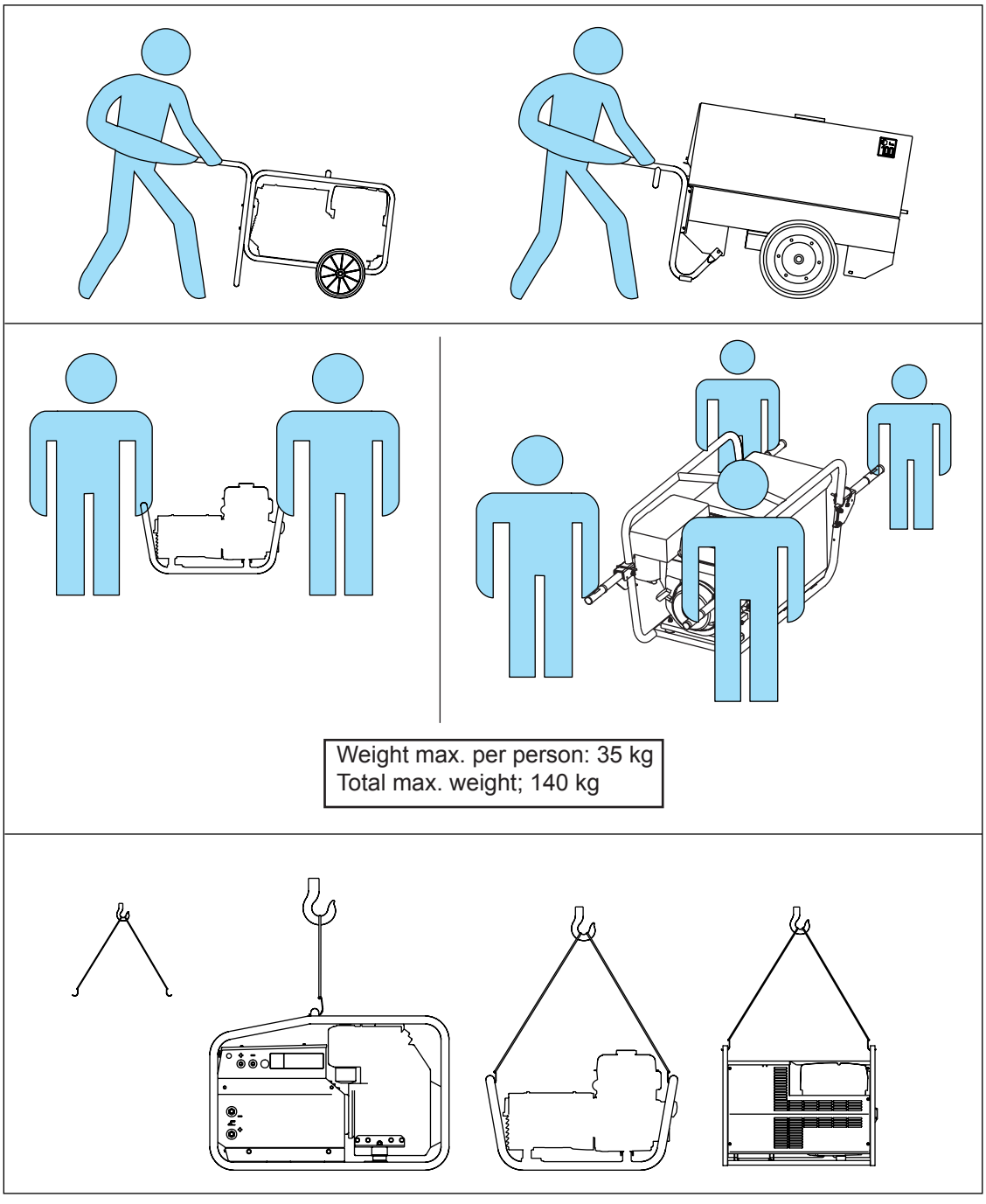


⚠ ATTENTION

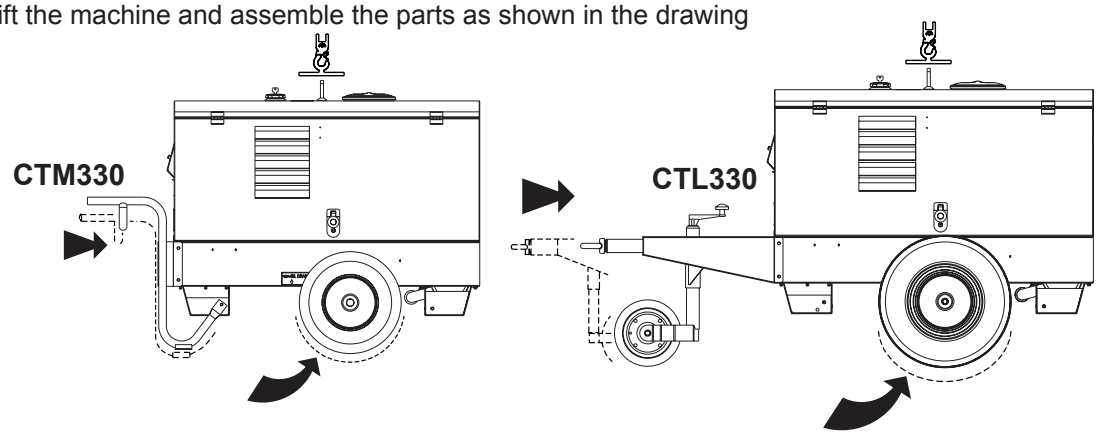
The CTL accessory cannot be removed from the machine and used separately (actioned manually or following vehicles) for the transport of loads or anyway for used different from the machine movements.

TRAILERS

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

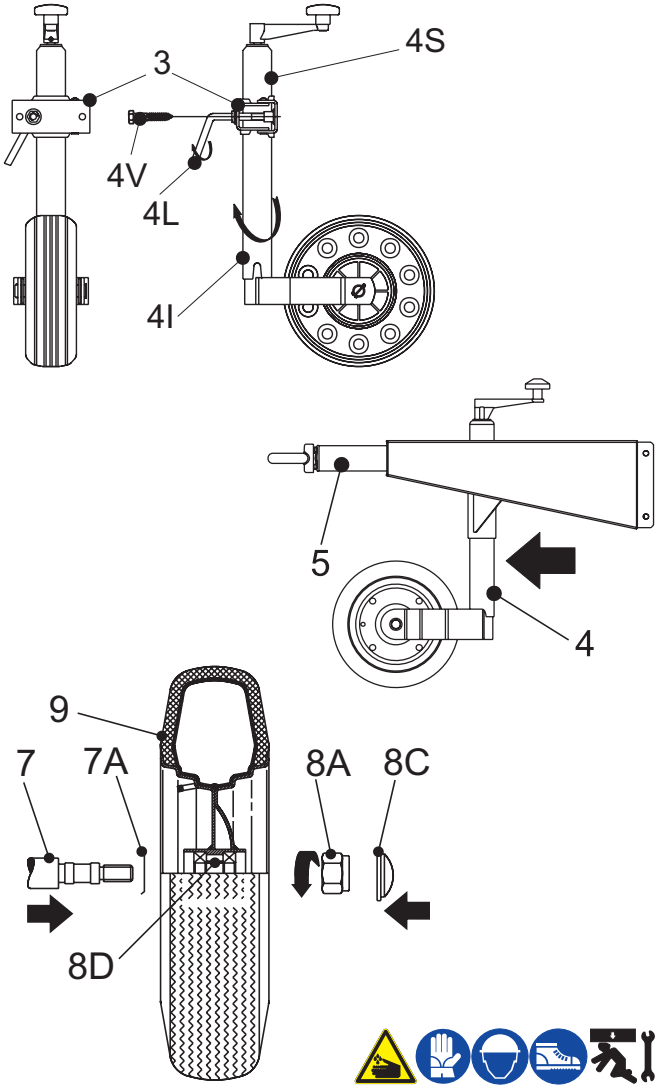
Towing on public roads or turnpikes of any type **IS EXCLUDED**, because **not** in possesion of the requirements by national and foreign traffic norms.

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



For assembling the generating set on the trolley CTL330 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 barwith 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.
6) - Assemble the axle (7) to the base of the machine with the M8x20 screws and relative washers (two per part) so that their supports coincide.
7) - Introduce on the axle the antidust ring (7A) with folded edges turned toward the machine.
8) - Insert the wheel (9) on the axle paying attention to the spacer (8D) which is between the two bearings, then insert the self blocking nut (8A) and finally assemble the shutting cap (8C).
9) - Pump the tyre (9) bringing the pressure to three atms.
10) - Lower the machine to the ground and place the parking foot definitively (regulating at the best height).



⚠ **ATTENTION**

Do not substitute the original tires with other types.

BATTERY WITHOUT MAINTENANCE

The starter battery is supplied already charged and ready for use.
Before starting the gen-set connect the cable + (positive) to the pole + of the battery, by properly tightening the clamp. In case of models with warning light: check the state of the battery by means of the indicator placed 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

The manufacturer 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.

DRY AIR FILTER

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

OIL BATH AIR FILTER

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

FUEL

ATTENTION

Stop engine when fueling. Do not smoke or use open flames during refuelling operations, in order to avoid explosions or fire hazards.

Fuel fumes are highly toxic; carry out operations outdoors only, or in a well-ventilated environment.
Avoid accidentally spilling fuel. Clean any eventual leaks before starting up motor.

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

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

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

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

GROUNDING CONNECTION

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

Check daily

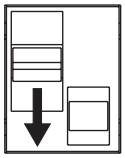
NOTE

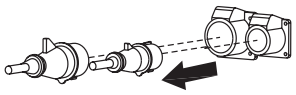
Do not alter the primary conditions of regulation and do not touch the sealed parts.

ATTENTION

1. By start-up of the generator the welding circuit is immediately operative, i.e. under voltage. Make sure that there are no unwished electrical contacts between the components of the outside welding circuit (electrode, electrode holder gun, workpiece, etc…).

2. Check that at the start-up the a.c. auxiliary generation sockets do not feed any load. Open the electric protection interrupter of the generator or disconnect the plugs of the loads from the sockets.





3. START-UP

Remember that when the machines with auto-idle have the signal set to “auto-idle” will remain at the minimum no. of revs (tickover) as long as no current is drawn.

Drawing power will automatically raise the number of engine revs to the nominal value and likewise the tension in the alternator.

Instead, by setting the auto-idle signal to “max”, the engine revs will immediately rise to the nominal value and likewise the tension in the alternator.

For the machines with manual accelerator, it is necessary to accelerate the motor manually in order to reach the nominal tension.

Starting is actuated using the key which is an integral part of the EP7 post on the front panel.

A) - Turn the key in a clockwise direction until all the LED lights are illuminated.

B) - Wait until the “OIL PRESSURE” and “BATTERY VOLTAGE” LEDs remain illuminated. If the timer lamp is used, the yellow “PREHEAT” LED comes on for the set time of the imposed settings.

C) - As soon as the green “ENGINE RUNNING” LED starts to flash, actuate the key switch in a clockwise direction (momentarily in the position then with return to rest) until obtaining starting of the engine.

If the motor does not start within 15 seconds, the non starting alert will intervene: the two LEDs “Engine running” and “glow plug” will flash alternately (see motor protection description).

D) - At any time it is possible to stop the engine by turning the key in an anti-clockwise direction (OFF position).

In case of engine anomaly due to low oil pressure, high temperature, broken transmission belt, low fuel level or emergency the EP7 will automatically stop the engine.

4. The motor starts up at its operating speed, 3000 rpm. After start-up, allow the motor to run for a few minutes before powering on the utilities. See table;

Temperature	Time
≤ - 20° C	5 min.
da - 20° C a -10°C	2 min.
da - 10° C a -5°C	1 min.
≥ 5° C	20 sec.

5. start-up at low temperatures.

The motor will normally start up without problems down to temperatures of -10° C, -15° C. In case of starting difficulty, it is possible to repeat the starting preheating for a max. time of 10 second, lightly turning the trimmer situated at the back of the EP7 in a clockwise direction (see page M39.13 relating to engine protection “trimmer/glow plug”). For start-up and use at lower temperatures please see the engine manual or turn to our Technical Assistance Center.

☞ ***In case of unsuccessful start-up, do not insist for longer than 5 seconds. Wait 10 - 15 seconds before attempting another start-up.***

CAUTION

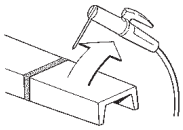
RUNNING-IN

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.

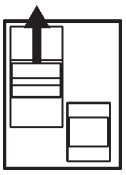
ARRESTO

Per un arresto in condizioni normali eseguire la seguente procedura:

1. Interrompere il processo saldatura in atto

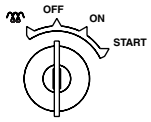


2. Interrompere l'erogazione di generazione ausiliaria c.a. sezionando i carichi oppure aprendo l'interruttore differenziale (D).



3. Lasciare girare il motore senza carico per alcuni minuti.
Portare al minimo il numero di giri del motore, deviatore giri motore su "autoidle" o acceleratore al minimo per le macchine con acceleratore manuale.

4. Ruotare la chiave di avviamento sull'EP7 in posizione OFF.

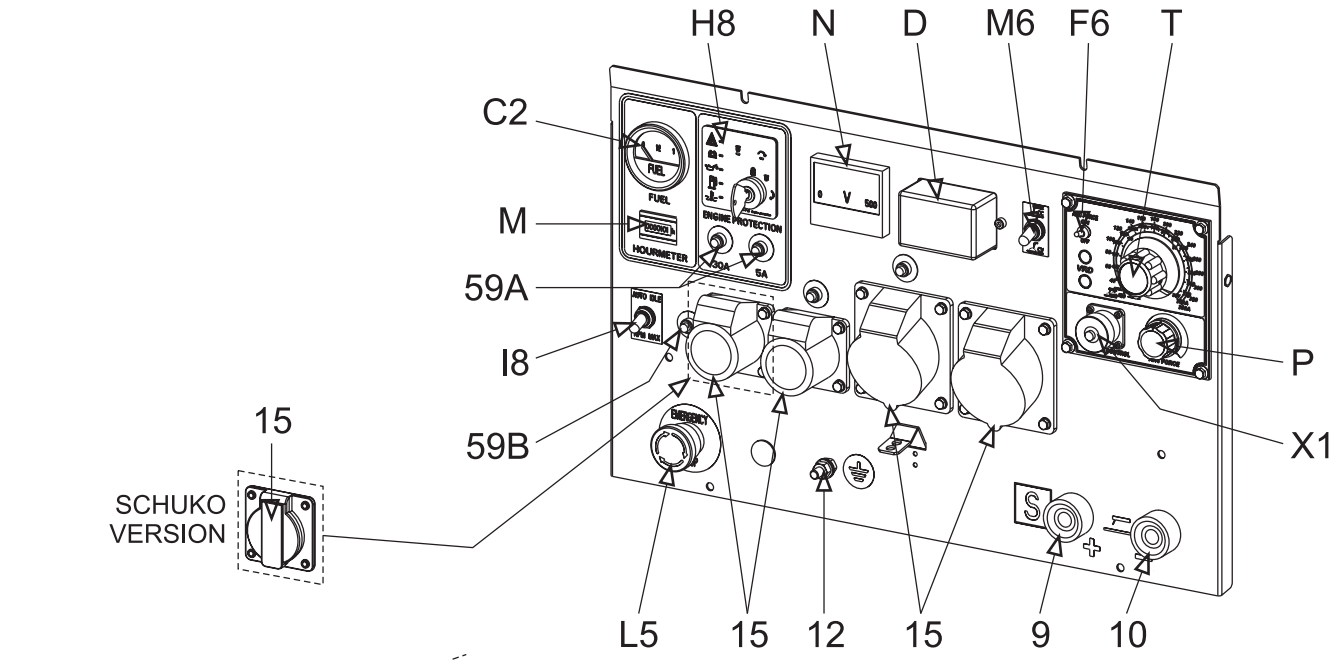


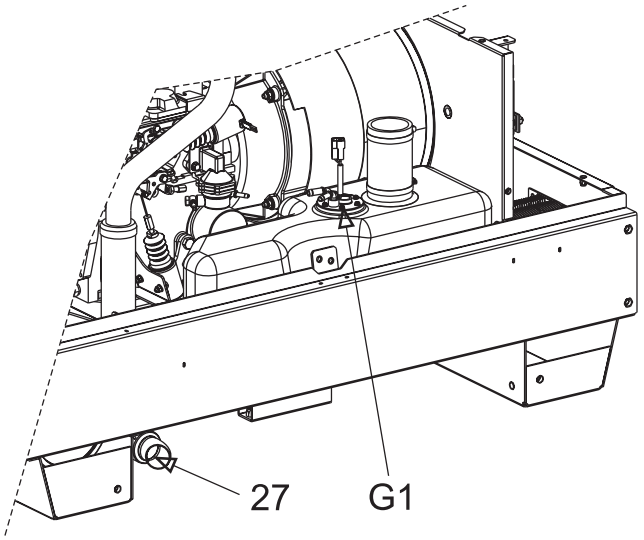
ARRESTO D'EMERGENZA

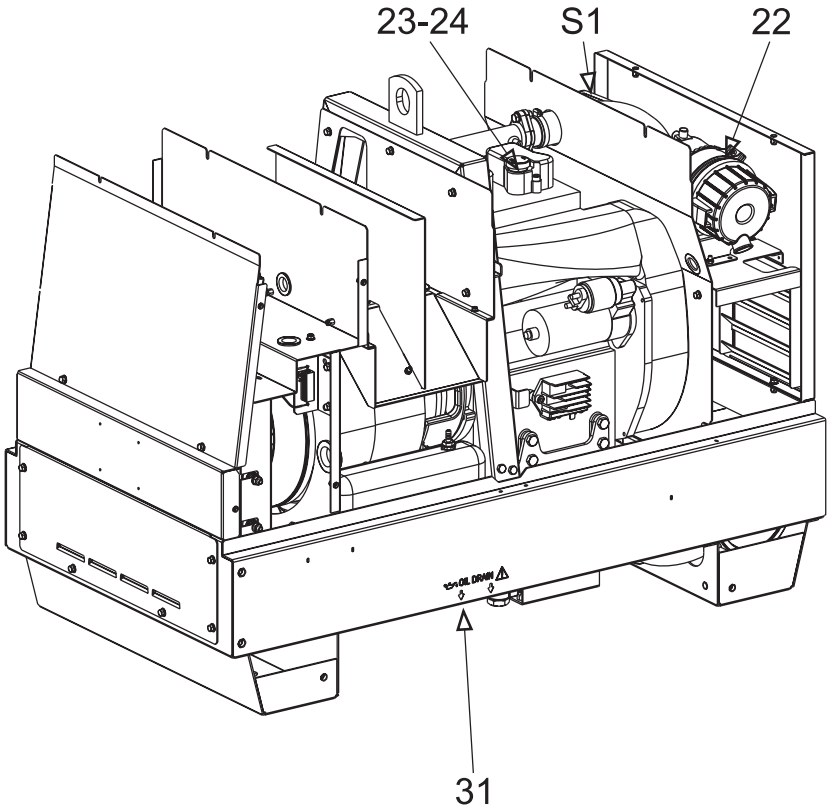
Per un arresto in condizioni di emergenza premere il pulsante d'emergenza (L5) (o ruotare la chiave in posizione OFF). Per il ripristino del pulsante ruotarlo in senso orario.

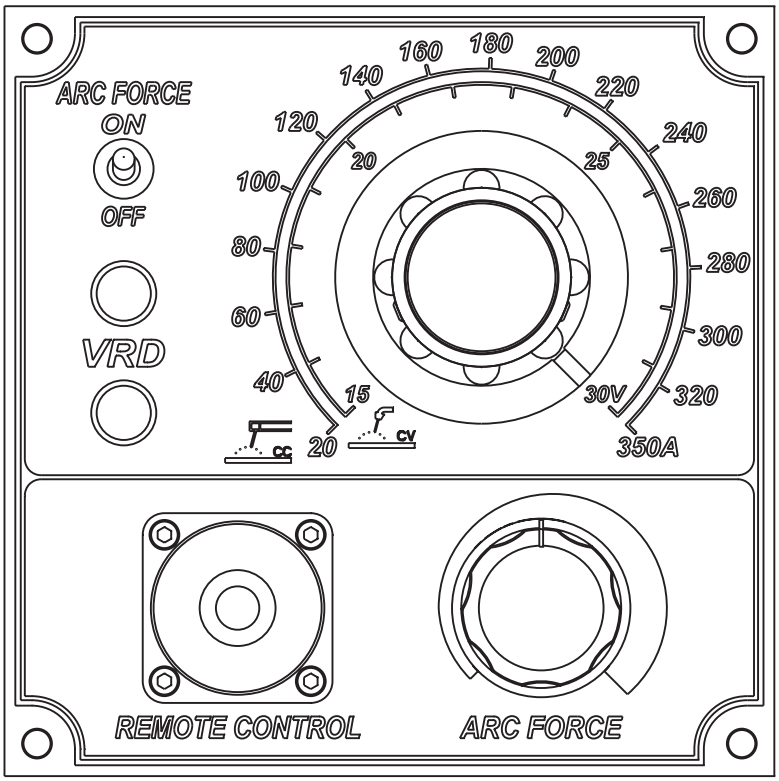
CONTROLS LEGENDE

4A	Hydraulic oil level light
9	Welding socket (+)
10	Welding socket (-)
12	Earth terminal
15	A.C. socket
16	Accelerator lever
17	Feed pump
19	48V D.C. socket
22	Engine air filter
23	Oil level dipstick
24	Engine oil reservoir cap
24A	Hydraulic oil reservoir cap
24B	Water filling cap
25	Fuel prefilter
26	Fuel tank cap
27	Muffler
28	Stop control
29	Engine protection cover
30	Engine cooling/alternator fan belt
31	Oil drain tap
31A	Hydraulic oil drain tap
31B	Water drain tap
31C	Exhaust tap for tank fuel
32	Button
33	Start button
34	Booster socket 12V
34A	Booster socket 24V
35	Battery charge fuse
36	Space for remote control
37	Remote control
42	Space for E.A.S.
42A	Space for PAC
47	Fuel pump
49	Electric start socket
54	Reset button PTO HI
55	Quick coupling m. PTO HI
55A	Quick coupling f. PTO HI
56	Hydraulic oil filter
59	Battery charger thermal switch
59A	Engine thermal switch
59B	Aux current thermal switch
59C	Supply thermal switch wire feeder-42V
59D	Pre-heater (spark plug) thermal switch
59E	Supply thermal switch oil/water heather
59F	Electropump thermal switch
63	No load voltage control
66	Choke control
67A	Auxiliary / welding current control
68	Cellulosic electrodes control
69A	Voltmeter relay
70	Warning lights
71	Selecting knob
72	Load commut. push button
73	Starting push button
74	Operating mode selector
75	Power on warning light
76	Display
79	Wire connection unit
86	Selector
86A	Setting confirmation
87	Fuel valve
88	Oil syringe
A3	Insulation monitoring
A4	Button indicating light 30 l/1' PTO HI
B2	Engine control unit EP2
B3	E.A.S. connector
B4	Exclusion indicating light PTO HI
B5	Auxiliary current push button
C2	Fuel level light
C3	E.A.S. PCB
C6	Control unit for generating sets QEA
D	Ground fault interrupter (30 mA)
D1	Engine control unit and economiser EP1
D2	Ammeter
E2	Frequency meter
E6	Frequency rpm regulator
E7	Voltmeter regulator
F	Fuse
F3	Stop switch
F5	Warning light, high temperature
F6	Arc-Force selector
G1	Fuel level transmitter
H2	Voltage commutator
H6	Fuel electro pump
H8	Engine control unit EP7
I2	48V A.C. socket
I3	Welding scale switch
I4	Preheating indicator
I5	Y/▲ switch
I6	Start Local/Remote selector
I8	AUTOIDLE switch
L	A.C. output indicator
L5	Emergency button
L6	Choke button
M	Hour counter
M1	Warning level light
M2	Contactor
M5	Engine control unit EP5
M6	CC/CV switch
N	Voltmeter
N1	Battery charge warning light
N2	Thermal-magnetic circuit breaker/ Ground fault interrupter
N5	Pre-heat push-button
N6	Connector - wire feader
O1	Oil pressure warning light/Oil alert
O8	V/A digital instruments and led VRD PCB
P	Welding arc regulator
P8	Water in fuel
Q1	Starter key
Q3	Derivation box
Q4	Battery charge sockets
Q7	Welding selector mode
R3	Siren
S	Welding ammeter
S1	Battery
S3	Engine control unit EP4
S6	Wire feeder supply switch
S7	Plug 230V singlephase
T	Welding current regulator
T4	Dirty air filter warning light/indicator
T5	Earth leakage relay
T7	Analogic instrument V/Hz
U	Current trasformer
U3	R.P.M. adjuster
U4	Polarity inverter remote control
U5	Relase coil
U7	Engine control unit EP6
V	Welding voltage voltmeter
V4	Polarity inverter control
V5	Oil pressure indicator
W1	Remote control switch
W3	Selection push button 30 l/1' PTO HI
W5	Battery voltmeter
X1	Remote control socket
Y3	Button indicating light 20 l/1' PTO HI
Y5	Commutator/switch, serial/parallel
Z2	Thermal-magnetic circuit breaker
Z3	Selection push button 20 l/1' PTO HI
Z5	Water temperature indicator


H8
N
D
M6
F6
T
C2
M
59A
I8
59B
15
SCHUKO
VERSION
P
X1
L5
15
12
15
9
10


27
G1


23-24
S1
22
31



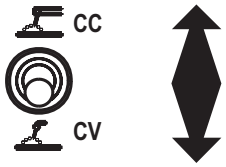
WELDING MODE SELECTION

The Welding Analogue Control unit (WAC) allows two possible control modes:

Constant Current (CC)
Constant Voltage (CV).

The welding option with C.V. characteristic is possible only on those models which support this mode of operation. On such models there is a switch on the front panel of the welder (outside the WAC unit), which allows to select the desired mode.

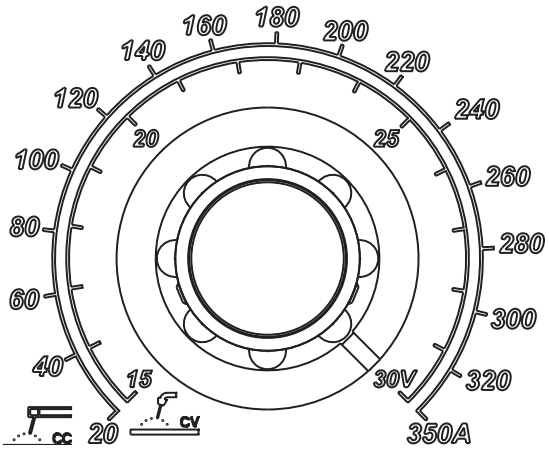
The regulation with C.C. characteristic can be used to weld with various types of electrodes.
The regulation with C.V. characteristic is suitable for the wire welding, both naked and coated.



CC Electrode welding

CV Wire welding

VOLTAGE AND CURRENT REGULATION



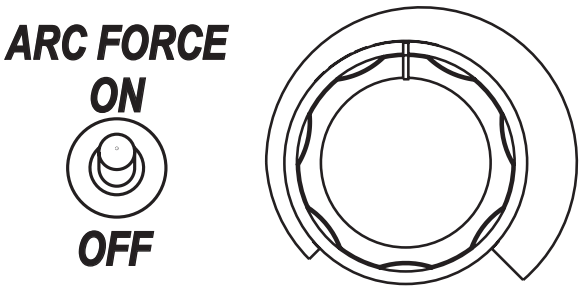
Current regulation

When the CC/CV switch is in CC position the main knob sets the welding current within a range from 20A to 350A.

Voltage regulation

With the CC/CV switch in CV position the main knob sets the welding voltage in a range between 15V and 30V.

ARC FORCE REGULATION



This type of regulation, possible only in CC mode, is accomplished by setting the position of the “arc force” switch and by adjusting the “arc force” knob. Both are located on the WAC panel.

For the welding processes which require a strictly constant current (e.g. TIG), the switch has to be placed in OFF position while the potentiometer position is irrelevant.

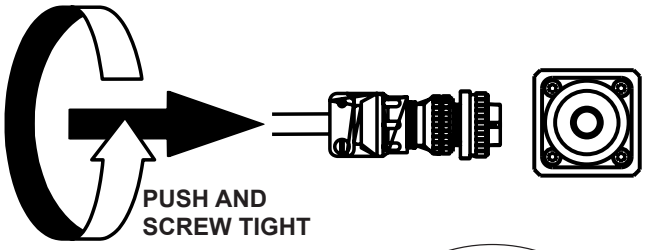
For the welding processes where a certain degree of arc force is suitable, the switch has to be positioned in ON and the potentiometer has to be properly adjusted, depending on the electrode type and the welding position.

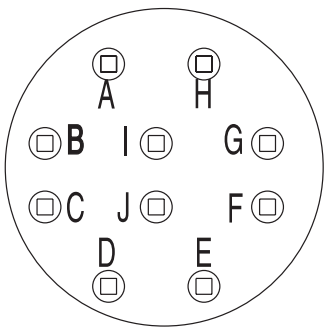
REMOTE CONTROL

The WAC can accept the connection to a remote control box (optional) through a circular connector placed on the EAC panel.

After connection to a remote controller, the regulation function of the main knob is automatically switched to the knob on the remote controller.

The following table describes the pin function of the circular connector.





CONTACTS	DESCRIPTION
A (Ground)	To the RC1 potentiometer – GND terminal
B	To the RC1 potentiometer – V_{CONTR} terminal
C	To the RC1 potentiometer – V_{REF} terminal
D	Remote connection presence contact – wire bridge towards (C) cabling side
E	Non connected
F	Non connected
G	Welding enable contact in CV – enables when the contact is closed towards (I)
H	Negative pole of the welding voltage – to monitor the welding voltage by means of an instrument on the wire feeder
I	42Vac ±10% – phase A – for the power supply of the wire feeder
J	42Vac ±10% – phase B – for the power supply of the wire feeder

WIRE FEEDER

The welding control unit WAC is ready for connection to a wire feeder (optional), to be used in C.V. mode. The wire feeder can be supplied from a 42Vac ±10% source through the circular connector of the WAC. In this case, the same connector is used to interface the controller with a contact which enables the welding (conditioned by the torch trigger) and a remote potentiometer located on the wire feeder (where present).
In case of wire feeders directly supplied from the welding power, the operation is anyway possible. With this type of wire feeders there is no need for any connection to the circular connector of the WAC.

VRD FUNCTION (VRD = Voltage Reduction Device)

The VRD function (present only on some versions) fulfils the purpose of drastically reducing the harm which may result to a person from inadvertent contact with the electrode during non-welding pauses. The VRD automatically switches the control mode in CV and sets the voltage to a safe value (typically <13V) each time the welding process is interrupted for a period longer than 3 sec.

The VRD function is active only in CC mode.

The proper operation of the VRD protection (in the models where it is implemented) is monitored by a couple of LEDs: one green and one red. During welding the red LED indicates that a condition of electrical risk is present. When the welding is stopped for more than 3 sec. the green LED turns on (and the red LED turns off) indicating that the VRD function is active. This means that the voltage on the electrode has been lowered to a safe value.

This symbol (Norm EN 60974-1 security standards for arc welders) signifies that the welder can be used in areas with increased risk of electrical shock.

ATTENTION

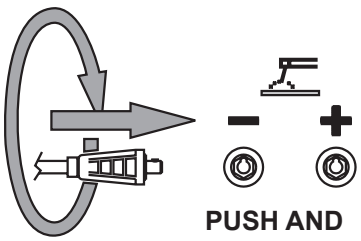
The areas, access of which is forbiden to unqualified personel, are:

- the control switchboard (front) - the exhaust of the endothermic engine - the welding process.

Check at the beginning of any work the electric parameters and/or the control placed on the front.

Make sure that the ground connection (12) is efficent (when this connection is present, being necessary). See page M20.

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



PUSH AND TWIST

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

REMOTE CONTROL

See page M 38

ATTENTION

To reduce the risk of electromagnetic interferences, use the minimum lenght of welding cables and keep them near and down (ex. on the floor).

The welding operations must take place far from any sensitive electronic device.Make sure that the unit is earthed (see M20). In case the interference should last, adapt further disposition, such as: move the unit, use screened cables, line filters, screen the entire work area.

In case the above mentioned operations are non sufficient, please contact our Technical Assistance Service.

CAUTION

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

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)

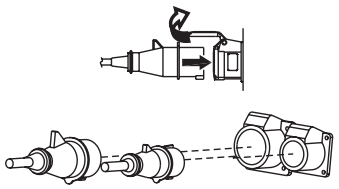
Make certain of the efficiency of the ground connection (12). - See page M20 -.

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.

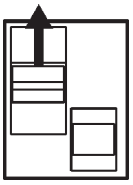
☞ Note: do not forcibly hold the central button of the thermal protection device to prevent its intervention, as this could irreparably **damage** the unit's alternator.

☞ 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.

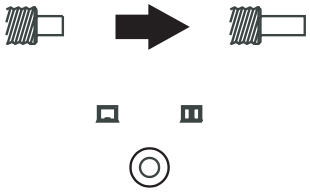
SIMULTANEOUS USE

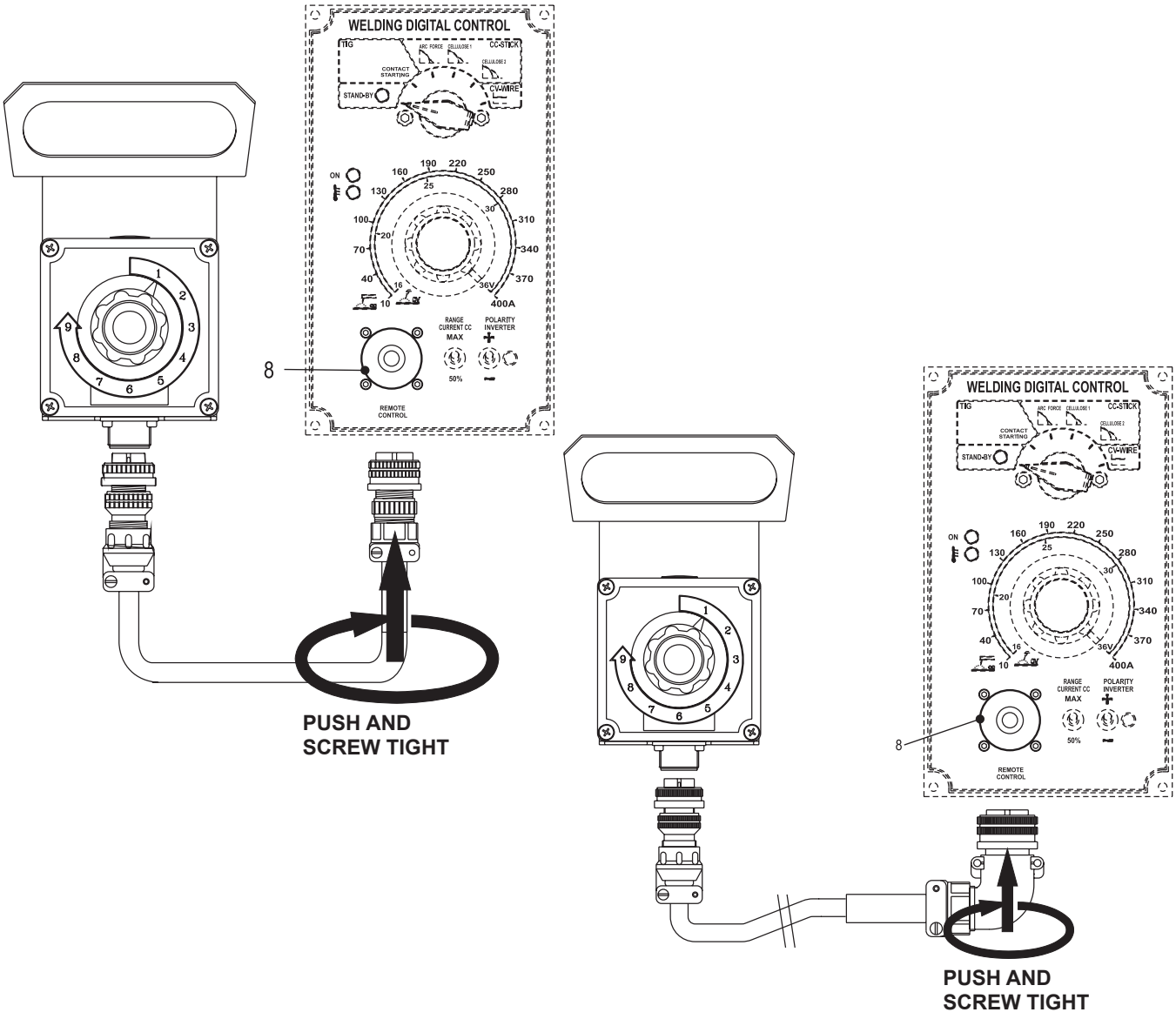
The welder's alternator permits the simultaneous use of auxiliary power and welding current. The auxiliary power available to the AC plugs (15) diminishes as the welding current drawn increases.

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.





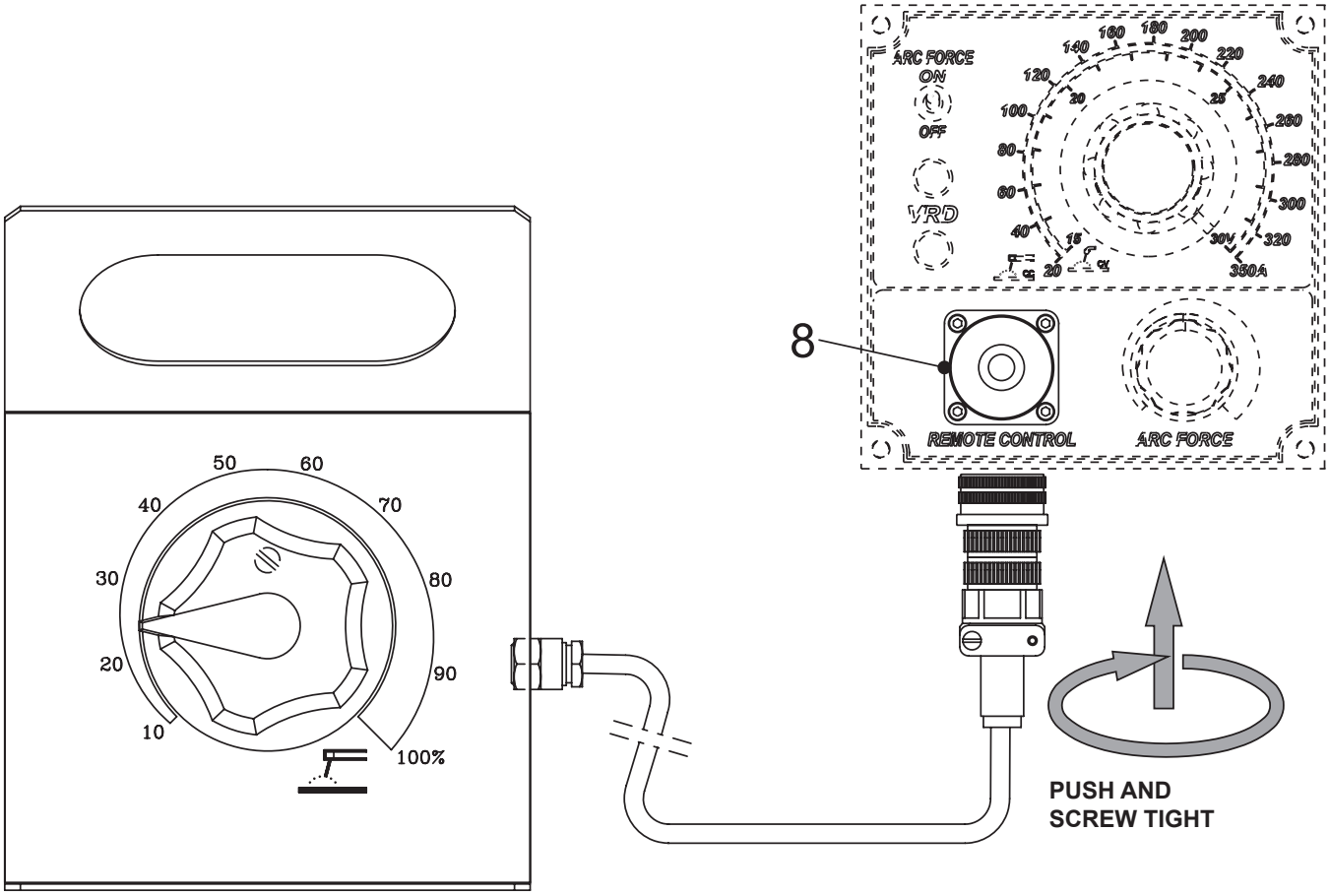
The remote control RC, which regulates the welding current in the CC (STICK welding) mode and the welding voltage in the CV (MIG/MAG welding), is connected to the front panel by means of a multipole connector.

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



The remote control device for regulating the welding current 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.

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

Description

The EP7 includes the basic safeguards to protect an DIESEL engine. The EP7 features 7 LEDs, 3 Static Outputs and a 30A Key Switch. The EP7 monitors an Oil Pressure-switch, Temperature-switch, Fuel Level-switch, Charger Alternator Voltage, and an Emergency-switch.

Specification

DC Supply, Battery Plant	8V up to 36 Vdc
Static Outputs (short circuit proof)	200 mAdc
Key Switch Rating	30 A (30 secs)/80 A (5 secs)
Dimensions-DIN 96 Size	72X72X55 (ex switch /key)
Weight	300 gr
Operating Temperature	-30° C /+70° C
Operating Humidity	96% (non-condensing)

[ENGINE RUNNING] green LED
This LED blinks for 15 seconds, indicating that the EP7 is ready to start the engine (you have to turn the key to start). If the engine does not run within 15 seconds, the "Starting Failure" alarm will take place. This LED illuminates continuously if the engine runs.

[PREHEAT] yellow LED
This indicator illuminates during the Pre-Glow cycle (10 secs to 60 secs).

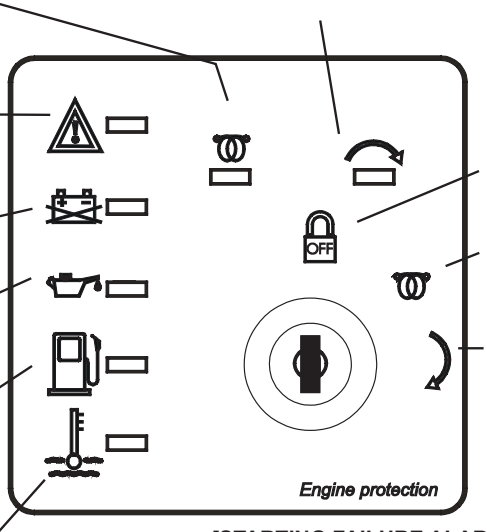
[EMERGENCY] red LED
This LED illuminates continuously when a shut down has been caused by the Emergency switch.

[ALTERNATOR FAILURE] red LED
This LED illuminates before engine starting or if a Belt Break shut down occurs (than 20 secs).

[OIL PRESSURE] red LED
This LED illuminates before engine starting or if an Oil Pressure shut down occurs.

[FUEL LEVEL] red LED
This LED blinks when a low fuel condition occurs.
This LED illuminates continuously to indicate a shut down, if the switch has been closed for more than 5 minutes.

[TEMPERATURE] red LED
This LED illuminates when an High Temperature shut down occurs.



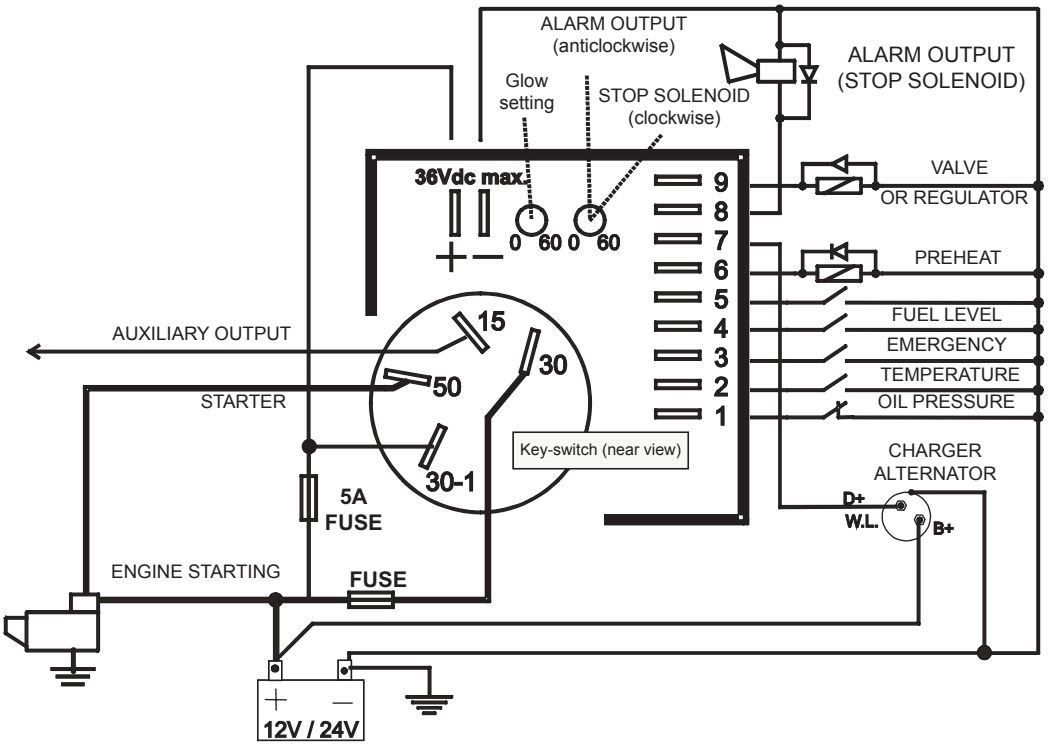
[KEY-SWITCH] OFF position

[KEY-SWITCH] Pre-Heat position

[KEY-SWITCH] START position

[STARTING FAILURE ALARM] indication
These 2 LEDs blink alternatevely (slowly) to indicate a starting failure alarm.

[OPTIONAL ALARM] indication
These 2 LEDs blink alternatevely (quickly) to indicate the intervention of the alarm.



07/05/01 M39GB

PROBLEM	ASSOCIATED SYMPTOMS	POSSIBLE CAUSE	VERIFICATIONS	WHAT TO DO
P1 No welding arc **(applicable only to machines with WAC)**	No open circuit voltage	Failed power supply within the welding control board (WAC)	With the machine running, by means of a multimeter, check if there is a voltage of 5VDC ± 0,125V between the contacts A (-) and C (+) on the circular connector of the WAC. In case of lack of voltage or condition not satisfied consider the suggested action.	Replace the welding control board of the WAC
P2 No welding arc **(applicable only to machines without WAC)**	No open circuit voltage	Failed power supply within the welding control board (WAC)	With the machine running, by means of a multimeter, check if there is a voltage of 5VDC ± 0,125V between the contacts 1 (-) and 2 (+) on the circular connector of the front panel, after having set the remote control switch in ON position. In case of lack of voltage or condition not satisfied consider the suggested action.	Replace the welding control board
P3 No welding arc	No open circuit voltage	Failure in the control or drive circuits of the welding control board	In order to check the proper operation of these circuits it is necessary to use specific test and troubleshooting tools. Anyway, a visual inspection coul be enough to localise possible damages caused by a failure. In case of evidence of damages consider the suggested action.	Replace the welding control board **ATTENTION** **For the CS 230 only, there is a risk of failure propagation towards the chopper. Before replacing this board please check that the chopper works properly. If not replace both.**
P4 Lack of welding current control	Full welding power (without current control) regardless of the knob position	Failure in the control or drive circuits of the welding control board	In order to check the proper operation of these circuits it is necessary to use specific test and troubleshooting tools. Anyway, a visual inspection coul be enough to localise possible damages caused by a failure. In case of evidence of damages consider the suggested action.	Replace the welding control board **ATTENTION** **For the CS 230 only, there is a risk of failure propagation towards the chopper. Before replacing this board please check that the chopper works properly. If not replace both.**
P5 No welding arc	No open circuit voltage or welding available current low or negligible. With auto-idle installed, the r.p.m. never slows-down to idle.	Hall sensor failed	Disconnect the Hall sensor from the welding control board (on the WAC or within the electrical box, as applicable) and check that, in this condition, the open circuit voltage reading is correct. When the VRD is installed, the voltage goes to VRD value. If a resistive load bank is available, check that it is possible draw power (do not exceed 100A). If the Auto-idle is installed, in this condition the machine does not exit the idle. In any case, don't try to weld with the Hall sensor disconnected. If the test gives positive result, consider the indicated action.	Replace the Hall sensor

PROBLEM	ASSOCIATED SYMPTOMS	POSSIBLE CAUSE	VERIFICATIONS	WHAT TO DO
P6 Lack of voltage control in CV mode (applicable to the CC-CV machines provided with filter board)	The open circuit voltage in CV mode is the same as for the CC mode, regardless of the control knob position	Failure in the EMC filter board on the welding sockets	Check by means of a multimeter (stopped machine) the resistence value between positive welding socket and the corresponding faston connector on the filter board. The condition to check is: ohmic value between + welding socket and + board faston (the one to which the red cables are connected) < 4 ohm In case of condition not satisfied take the indicated corrective action.	Replace the EMC filter board
P7 No welding arc (applicable to the machines provided with the filter board on the welding sockets)	The open circuit voltage is zero	Failure in the EMC filter board on the welding sockets	Check by means of a multimeter (stopped machine) the resistence value between positive welding socket and the corresponding faston connector on the filter board. The condition to check is: ohmic value between - welding socket and - board faston (the one to which the black cables are connected) < 4 ohm In case of condition not satisfied take the indicated corrective action.	Replace the EMC filter board
P8 Minimum welding current in CC mode too high (applicable to the machines provided with the filter board on the welding sockets)	The welding current in CC mode with the knob at beginning of scale is too high and changes when turning the arc force knob (if present, switch in ON position)	Failure in the EMC filter board on the welding sockets	Check by means of a multimeter (stopped machine) the resistence value between positive welding socket and the corresponding faston connector on the filter board. The condition to check is: ohmic value between + welding socket and + board faston (the one to which the red cables are connected) < 4 ohm In case of condition not satisfied take the indicated corrective action.	Replace the EMC filter board
P9 Minimum welding current in CC mode too high	The welding current in CC mode with the knob at beginning of scale is too high and changes when turning the arc force knob (if present, switch in ON position)	Cable interruption between the WAC or the welding control board (as applicable depending on the machine type) and the welding sockets	With the machine stopped, extract the connector plugged to J1 of the WAC / Welding control board (as applicable depending on the machine type). Check by means of a multimeter the continuity between pin 6 of the connector and the positive welding socket. The resistive value shall be < 4 ohm if there is a filter board behind the sockets, otherwise shall be < 0.5 ohm. In case of condition not satisfied take the indicated corrective action.	Fix the cabling or replace it.
P10 No welding arc	The open circuit voltage is zero	Cable interruption between the WAC or the welding control board (as applicable depending on the machine type) and the welding sockets	With the machine stopped, extract the connector plugged to J1 of the WAC / Welding control board (as applicable depending on the machine type). Check by means of a multimeter the continuity between pin 5 of the connector and the negative welding socket. The resistive value shall be < 4 ohm if there is a filter board behind the sockets, otherwise shall be < 0.5 ohm. In case of condition not satisfied take the indicated corrective action	Fix the cabling or replace it.

PROBLEM	ASSOCIATED SYMPTOMS	POSSIBLE CAUSE	VERIFICATIONS	WHAT TO DO
P11 Lack of welding current control	Full welding power (without current control) regardless of the knob position. When the auto-idle is installed, the machine remains at low r.p.m.	Hall sensor failed	In order to check the proper operation of the Hall sensor it is necessary to use specific test and troubleshooting tools. Anyway, a visual inspection coul be enough to localise possible damages, with particular reference to possible wear of the cable end coming out of the Hall sensor potting. Please check also the connector contacts crimping at the opposite end of the cable. In case of evidence of damages consider the suggested action	Replace the Hall sensor
P12 Lack of welding current control **(applicable only to CS 350)**	Full welding power (without current control) regardless of the knob position	Chopper and/or driver board failed	Disconnect the chopper cable from the connector J3 of the WAC. Check that the open circuit voltage is < 1V. If not put a light resistive load at the welding output (few kohms are enough) and check again the previous condition. If it is not satisfied the chopper is faulty. If a welding load bank and a clamp DC amp meter are available, another test can be done to localise the failed section/s. To this purpose set the load bank for a current of a few tens of amps and measure the current at the output of each chopper section (the group of cables which connect the chopper to one end of the welding current leveling reactor). The sections through which the current flows are failed or improperly driven by the driver board. If the test confirms this type of failure consider the suggested corrective action.	Replace the chopper and the driver board
P13 Lack of welding current control **(applicable only to CS 230)**	Full welding power (without current control) regardless of the knob position	Chopper faulty	Disconnect the chopper cable from the connector J3 of the WAC. Check that the open circuit voltage is < 1V. If not put a light resistive load at the welding output (few kohms are enough) and check again the previous condition. If it is not satisfied the chopper is faulty. In this case consider the suggested corrective action.	Replace the chopper
P14 Knob irregular or missing current adjustment	When turning the knob the current setting (and the voltage setting, if applicable) do not change or change irregularly	The potentiometer which regulates the welding current (and the welding voltage, when applicable) is faulty	Check if the regulation through remote control works properly. If confirmed, consider the suggested corrective action.	Replace the potentiometer

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.
- Please wear the appropriate clothing and make use of the PPE (Personal Protective Equipment), according to the type of intervention (protective gloves, insulated gloves, glasses).
- 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.

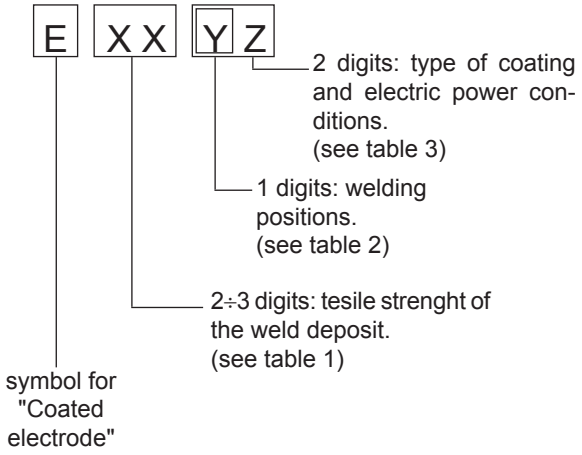
HIGH YIELD BASIC ELECTRODES: E 7018

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

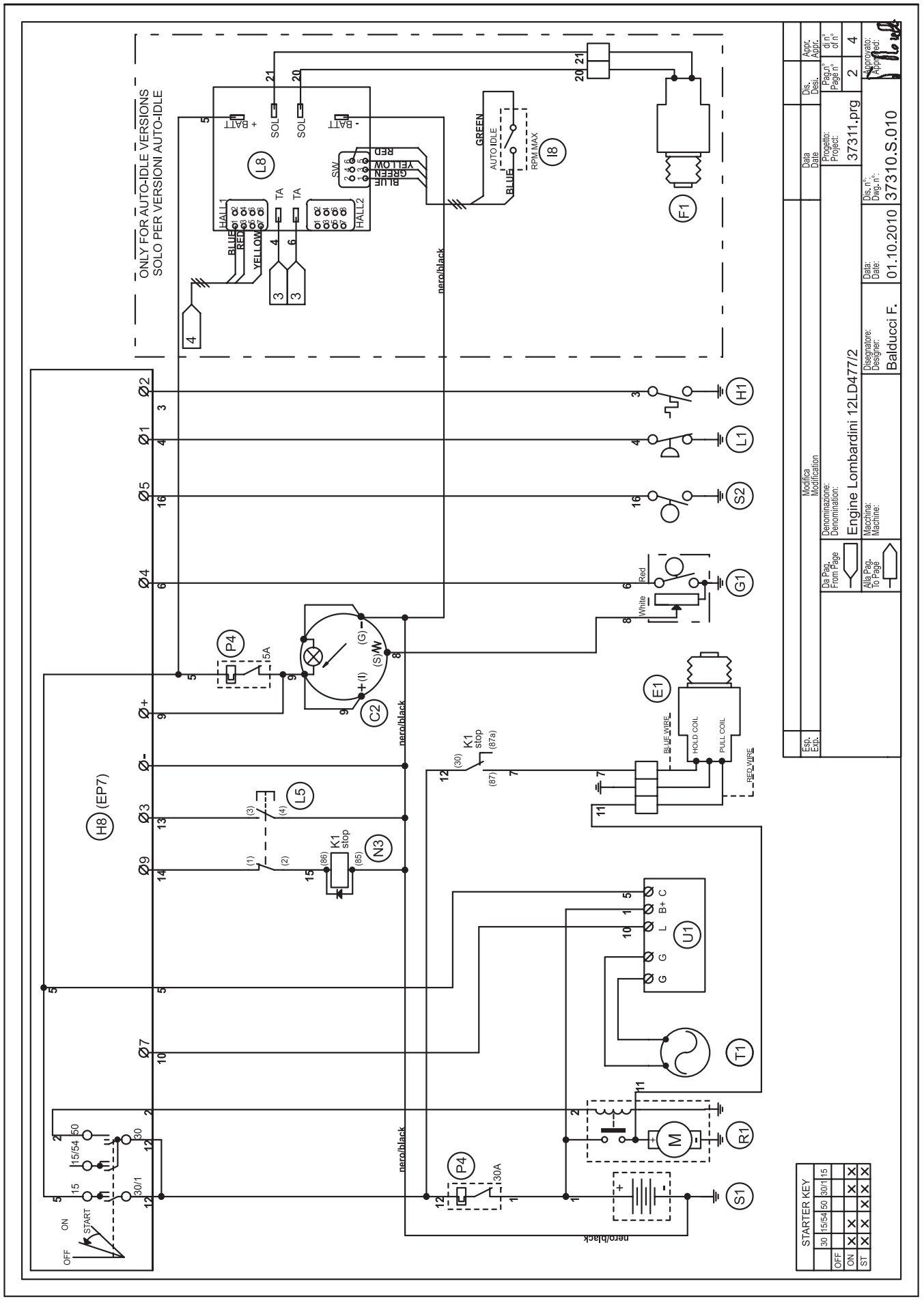
1	for all positions
2	for plane and verticl
3	for plane posotion only

Table 2

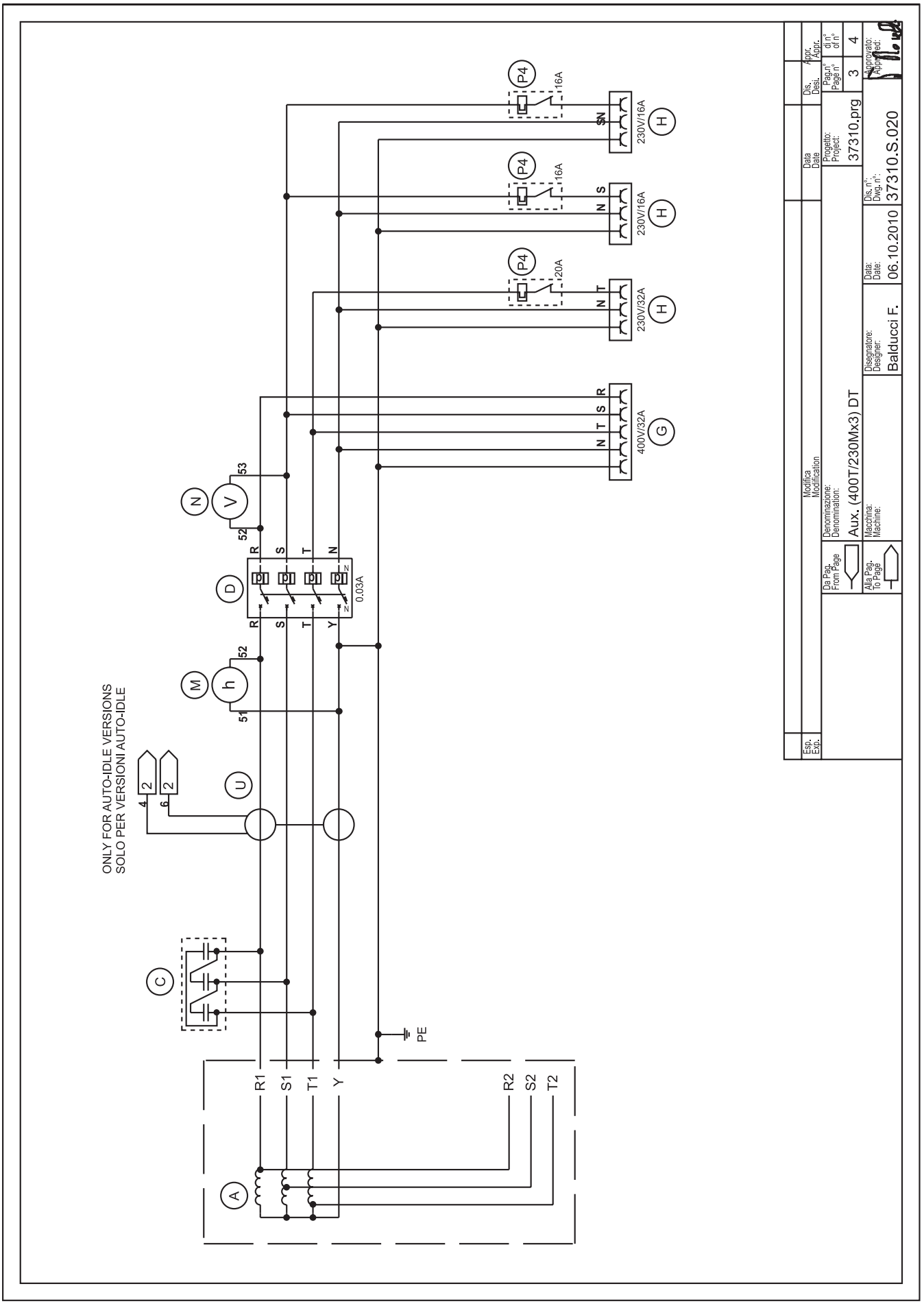
N°	Descrizione
10	Cellulose electrodes for d.c.
11	Cellulose electrodes for a.c.
12	Rutile electrode for d.c.
13	Rutile electrode for a.c.
14	High yield rutile electrodes
15	Basic electrodes for d.c.
16	Basic electrodes for c.a.
18	High yield basic electrodes for d.c. (inverse polarity)
20	Acid electrodes 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.

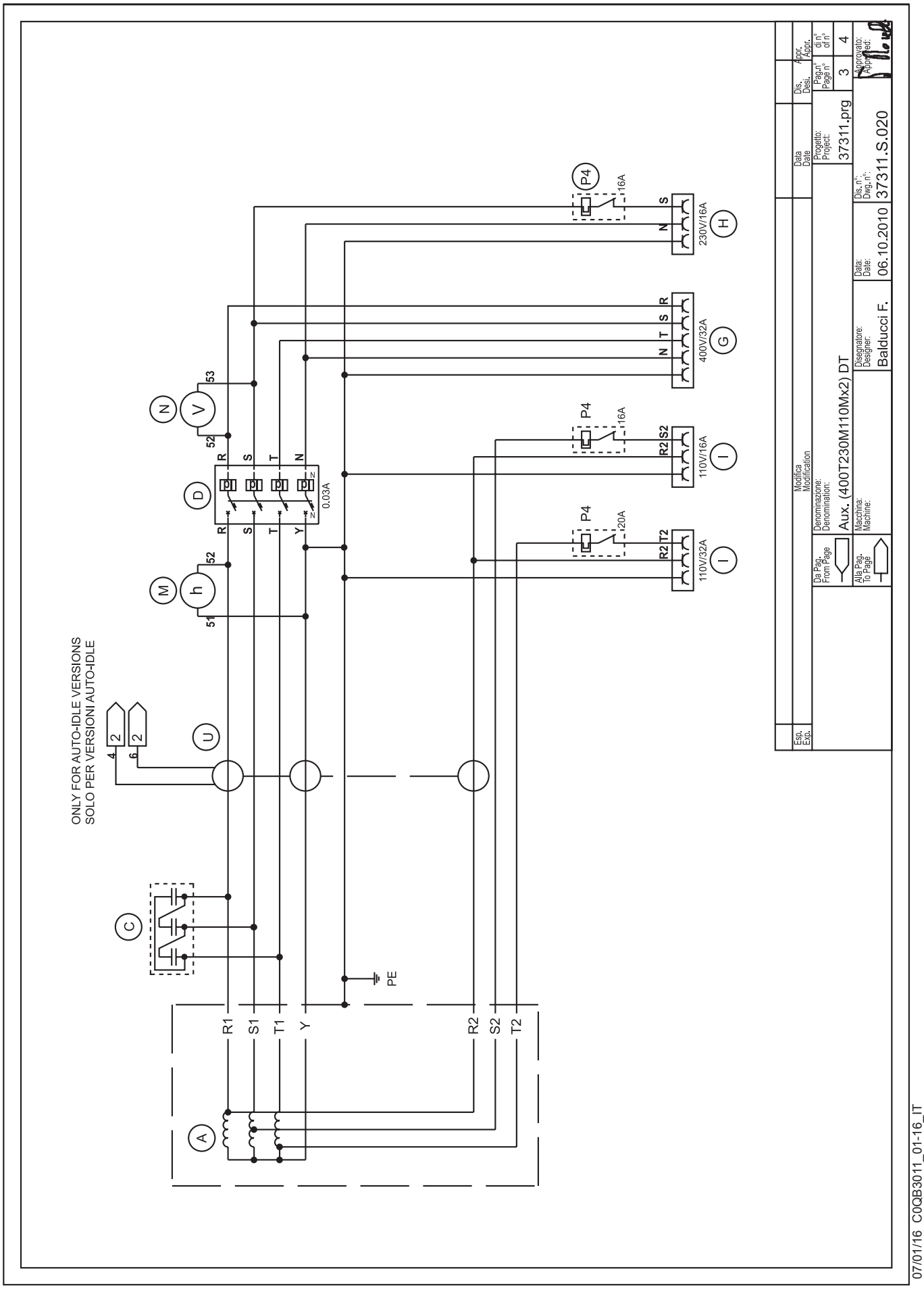
Table 3

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 : Fuel filter heater
L9 : Air heater
M9 : ON/OFF switch lamp
N9 : UP/DOWN button mast
O9 : Hydraulic unit solenoid valve
P9 : Hydraulic unit engine
Q9 : Ignitor
R9 : Lamp
S9 : Power system
T9 : 48Vdc power system
U9 : LED projector
V9 : 125/250V 1phase socket
Z9 :
W9 :
X9 :
Y9 :



07/01/16 C0QB3011_01-16_IT


ONLY FOR AUTO-IDLE VERSIONS
SOLO PER VERSIONI AUTO-IDLE
PE
R1
S1
T1
Y
R2
S2
T2
0.03A
230V/16A
230V/32A
400V/32A
16A
20A
Aux. (400T/230Mx3) DT
37310.S.020
37310.prg
06.10.2010
Balducci F.



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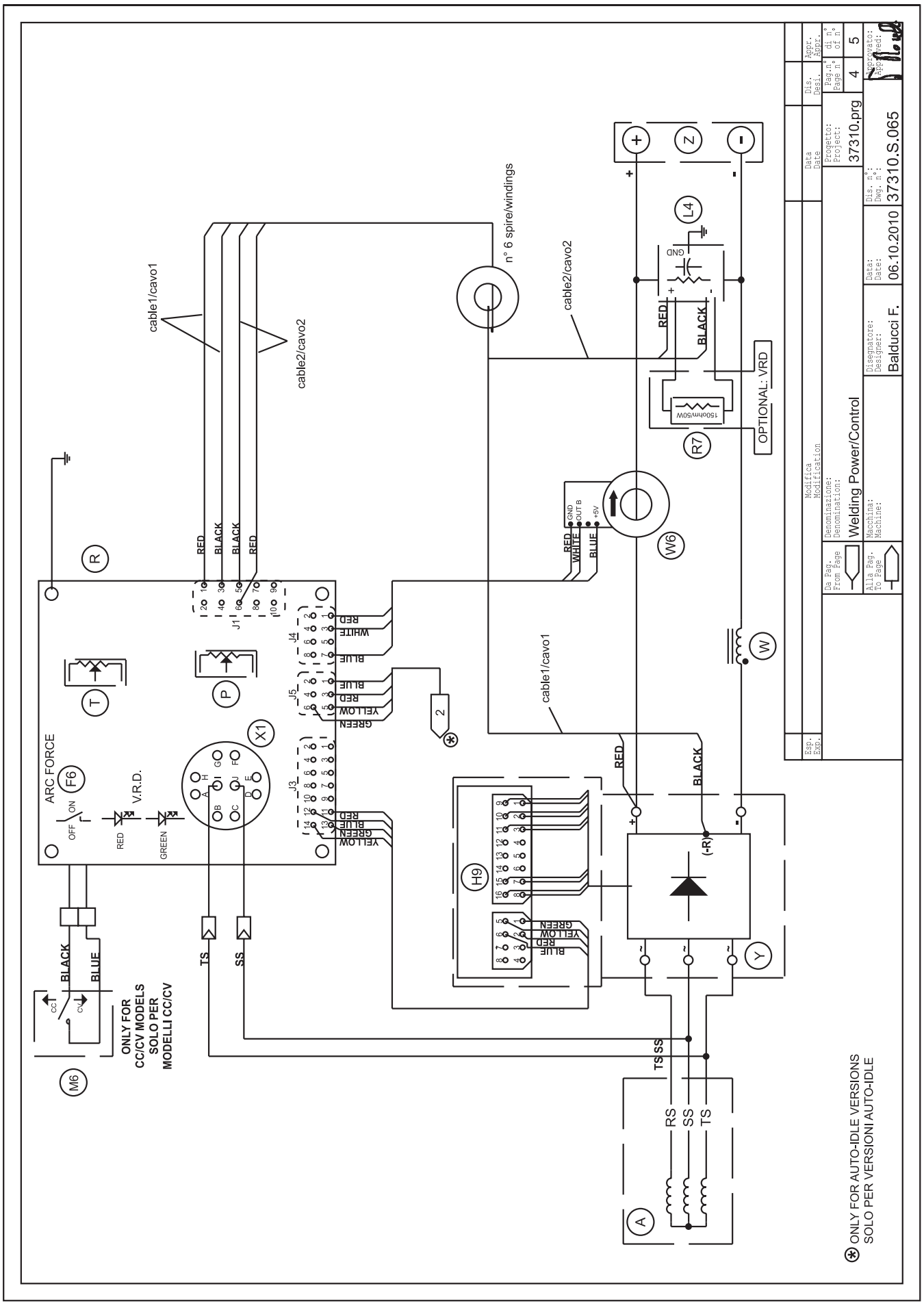
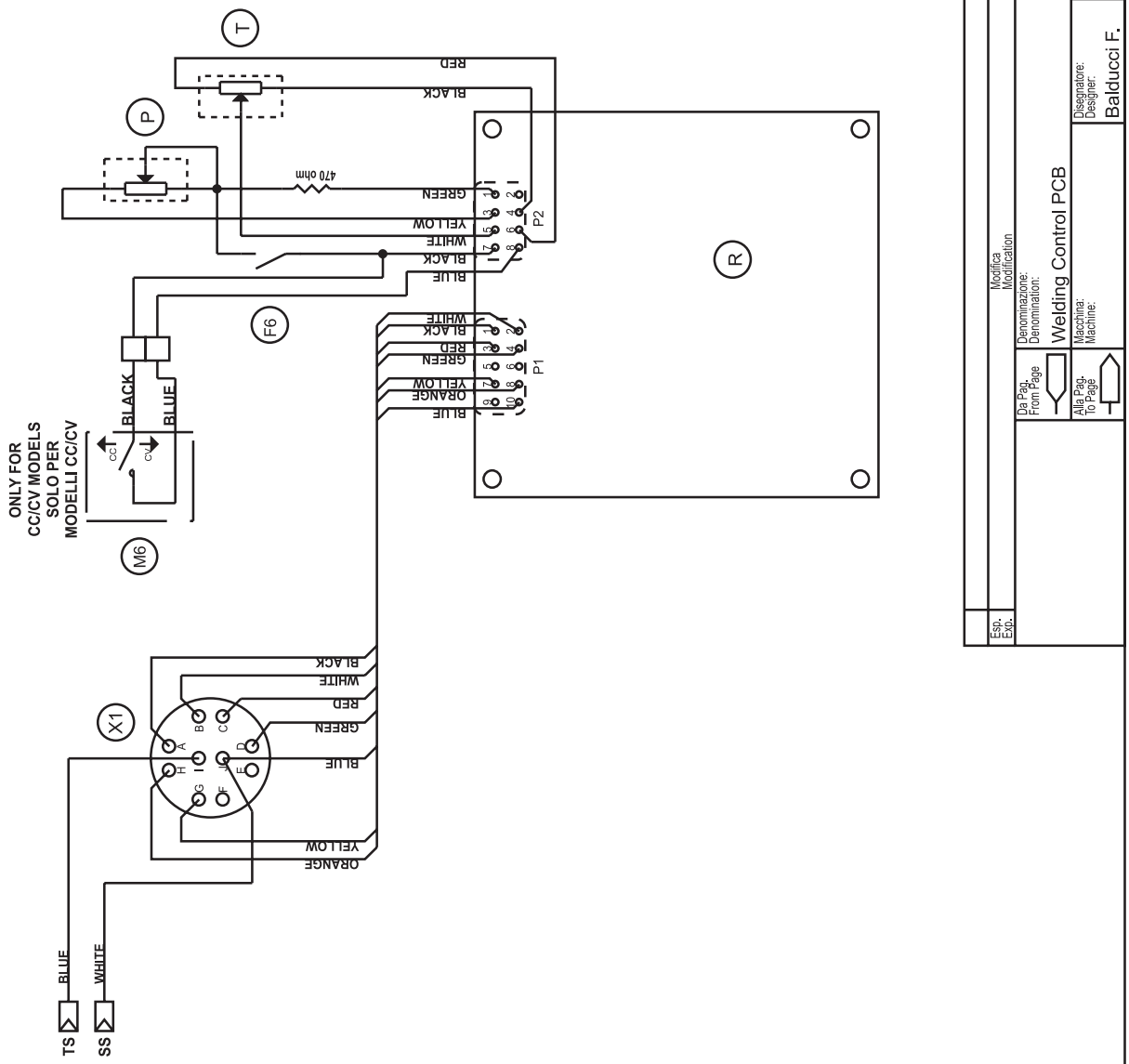

Welding Power/Control
37310.S.065
37310.prg
06.10.2010
Balducci F.
ONLY FOR CC/CV MODELS
SOLO PER MODELLI CC/CV
ONLY FOR AUTO-IDLE VERSIONS
SOLO PER VERSIONI AUTO-IDLE
OPTIONAL: VRD
ARC FORCE
V.R.D.
cable1/cavo1
cable2/cavo2
n° 6 spire/windings
07/01/16 C0QB3011_01-16_IT


T
P
R
M6
F6
X1
P1
P2
470 ohm
RED
BLACK
GREEN
YELLOW
WHITE
BLUE
ORANGE
BLACK
BLUE
ONLY FOR
CC/CV MODELS
SOLO PER
MODELLI CC/CV
CC
CV
TS
SS
Esp.
Exp.
Modifica
Modification
Data
Date
Dis.
Desi.
Appr.
Appr.
Denominazione:
Denomination:
Welding Control PCB
Progetto:
Project:
37310.prg
Pag.n°
Page n°
5
5
di n°
of n°
Da Pag.
From Page
Alla Pag.
To Page
Macchina:
Machine:
Disegnatore:
Designer:
Balducci F.
Data:
Date:
14.04.2011
Dis. n°:
Dwg. n°:
37310.S.066
Approvato:
Approved:

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