



Lasting Connections

URANOS 2000 SMC

SERVICE MANUAL



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Before performing any operation on the machine, make sure that you have thoroughly read and understood the contents of this booklet. Do not perform modifications or maintenance operations which are not prescribed. Please consult qualified personnel if you have any doubts or difficulties in using the equipment.

This booklet is an integral part of the equipment and must accompany it when it changes location or is sold to third parties.

The user shall be responsible for keeping this booklet intact and legible.

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The directions provided herewith are of vital importance and therefore necessary to ensure the warranties. The manufacturer accepts no liability in case of misuse or non-application of the directions by the users.

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SYMBOLS



Imminent danger of serious body harm and dangerous behaviours that may lead to serious body harm.



Important advice to be followed in order to avoid minor injuries or damage to property.



Technical notes to facilitate operations.

1. WARNING



This manual is intended to provide the authorized technical service centers with the basic information necessary to carry out repairs on the voestalpine Böhler Welding Selco welding systems.



Before carrying out the repair, it is advisable that the contents of this manual have been read and understood, in particular the safety requirements.



Before performing any operation on the machine, make sure that you have thoroughly read and understood the contents of this booklet. Do not perform modifications or maintenance operations which are not prescribed. Do consult qualified personnel for any doubt or problem concerning the use of the machine, even if not described herein.

Do not perform modifications or maintenance operations which are not prescribed. The manufacturer cannot be held responsible for damages to persons or property caused by misuse or non-application of the contents of this booklet by the user.

The operating instructions must always be at hand wherever the device is being used. In addition to the operating instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.



All persons involved in commissioning, operating, maintaining and servicing the device must:

- *be suitably qualified*
- *have sufficient knowledge of welding*
- *read and follow these operating instructions carefully*

Please consult qualified personnel if you have any doubts or difficulties in using the equipment.



To perform the operations described in this manual you need:

- *Basic machine knowledge.*
- *Basic electronic knowledge.*



For a detailed description of the operation, use and ordinary maintenance of the machine, refer to the "Instruction manual for use and maintenance" which must always accompany the machine.



voestalpine Böhler Welding Selco s.r.l. does not assume responsibility for any damage to persons or things that may occur during repairs, even after reading or putting into practice what is written in this manual.



*The purchaser is expressly obliged to comply with the provisions of this manual.
Otherwise voestalpine Böhler Welding Selco s.r.l. disclaims any responsibility.*



If the problem cannot be solved by following the instructions described in this manual, please contact voestalpine Böhler Welding Selco s.r.l. technical assistance.

Or send the machine to Service voestalpine Böhler Welding Selco s.r.l. for the appropriate interventions.



The system being repaired can consist of several parts, therefore also refer to the repair manuals of the other components

1.1 Safety warnings



WARNING!

Improperly performed work can cause serious injury or damage.

All activities described in the service manual must only be carried out by service technicians trained by voestalpine Böhler Welding Selco.



The electrical connections must be made by skilled technicians with the specific professional and technical qualifications and in compliance with the regulations in force in the country where the equipment is installed.



In order to protect users, the equipment must be correctly earthed. The power supply voltage is provided with an earth lead (yellow - green), which must be connected to a plug provided with earth contact.

This yellow/green wire shall NEVER be used with other voltage conductors.

Verify the existence of the earthing in the equipment used and the good condition of the sockets.

Install only certified plugs according to the safety regulations.



WARNING!

Improper connection of the ground conductor can cause serious injury or damage.

The housing screws provide a suitable ground conductor connection for the housing ground and should NOT be replaced by any other screws that do not provide a reliable ground conductor connection.



WARNING!

An electric shock can be fatal.

Before opening the device:

- Move the mains switch to the "O" position.
- Disconnect the device from the mains.
- Check that the device cannot be turned on again.
- Using a suitable measuring device, ensure that any electrically charged components (e.g. capacitors) are fully discharged.



WARNING!

An electric shock can be fatal.

If the device needs to be turned on briefly to test while the housing is open:

- Do not touch any part inside the housing.
- Only touch parts using suitable measuring or test probes.



The repair must only be carried out by trained personnel.
(refer to Standard EN IEC 60974-4 par. 4.1).



In order to avoid serious damage to people or things, it is essential that this manual is used only by trained personnel (with reference to the legislation EN IEC 60974-4 par. 4.1).



Welding equipment tests can be dangerous and should be performed by a person educated or experienced in the field of electrical repair, preferably also familiar with the welding, cutting and allied processes.

Instructed persons must be considered qualified for simple periodic tests and maintenance provided that it is not necessary to open the housing of the equipment.



The repair of an equipment requires access to the internal parts of the machine and consequently the removal of some protective panels.

Additional precautions are necessary with respect to the simple use of the welding machine in order to prevent possible damage caused by contact with:

- Under voltage parts.
- Moving parts.
- Parts at a high temperature.



DO NOT make changes and do not carry out maintenance not provided for in this manual.



The replacement of the faulty electronic component on the board is NOT foreseen.



When handling machine parts, be aware that some may be at a high temperature.
In particular, avoid contact with heat dissipating radiators.



Avoid carrying out a repair without the presence of another person able to provide assistance in the event of an accident.



To prevent injury to persons or damage to the equipment, the selected mains voltage and fuses must be checked BEFORE connecting the machine to the mains. Also check that the cable is connected to a socket provided with earth contact.

1.2 Work environment



All equipment shall be used exclusively for the operations for which it was designed, in the ways and ranges stated on the rating plate and/or in this booklet, according to the national and international directives regarding safety. Other uses than the one expressly declared by the manufacturer shall be considered totally inappropriate and dangerous and in this case the manufacturer disclaims all responsibility.



This unit must be used for professional applications only, in industrial environments. The manufacturer will accept no responsibility for any damages caused by use in domestic environments.



The equipment must be used in environments with a temperature between -10°C and +40°C (between +14°F and +104°F).

The equipment must be transported and stored in environments with a temperature between -25°C and +55°C (between -13°F and 131°F).

The equipment must be used in environments free from dust, acid, gas or any other corrosive substances.

The equipment shall not be used in environments with a relative humidity higher than 50% at 40°C (104°F).

The equipment shall not be used in environments with a relative humidity higher than 90% at 20°C (68°F).

The system must not be used at an higher altitude than 2,000 metres (6,500 feet) above sea level.



Do not use this machine to defrost pipes.

Do not use this equipment to charge batteries and/or accumulators.

Do not use this equipment to jump-start engines.

1.3 User's and other persons' protection



The welding process is a noxious source of radiation, noise, heat and gas emissions. Position a fire-retardant shield to protect the surrounding welding area from rays, sparks and incandescent slags. Advise any person in the area of welding not to stare at the arc or at the incandescent metal and to get an adequate protection.



Wear protective clothing to protect your skin from the arc rays, sparks or incandescent metal. Clothes must cover the whole body and must be:

- intact and in good conditions
- fireproof
- insulating and dry
- well-fitting and without cuffs or turn-ups



Always use regulation shoes that are strong and ensure insulation from water.

Always use regulation gloves ensuring electrical and thermal insulation.



Wear masks with side face guards and a suitable protection filter (at least NR10 or above) for the eyes.



Always wear safety goggles with side guards, especially during the manual or mechanical removal of welding slag.



Do not wear contact lenses!



Use headphones if dangerous noise levels are reached during the welding. If the noise level exceeds the limits prescribed by law, delimit the work area and make sure that anyone getting near it is protected with headphones or earphones.



Always keep the side covers closed while welding. Avoid your hands, hair, clothes, tools ... coming into contact with moving parts such as: fans, gears, rollers and shafts, wire reels. Do not touch gears while the wire feed unit is working. The system must not be modified in any way. Bypassing the protection devices fitted on wire feed units is extremely dangerous and releases the manufacturer from any responsibility in respect of damages to either people or property.



While loading and feeding the wire, keep your head away from the MIG/MAG torch.

The wire that is coming out can seriously damage your hands, face and eyes.



Avoid touching items that have just been welded: the heat could cause serious burning or scorching.

Follow all the precautions described above also in all operations carried out after welding since slag may detach from the items while they are cooling off.



Check that the torch is cold before working on or maintaining it.



Keep a first aid kit ready for use.
Do not underestimate any burning or injury.



Before leaving work, make the area safe, in order to avoid accidental damage to people or property.

1.4 Protection against fumes and gases



Fumes, gases and powders produced during the welding process can be noxious for your health.
Under certain circumstances, the fumes caused by welding can cause cancer or harm the foetus of pregnant women.

- Keep your head away from any welding gas and fumes.
- Provide proper ventilation, either natural or forced, in the work area.
- In case of poor ventilation, use masks and breathing apparatus.
- In case of welding in extremely small places the work should be supervised by a colleague standing nearby outside.
- Do not use oxygen for ventilation.
- Ensure that the fumes extractor is working by regularly checking the quantity of harmful exhaust gases versus the values stated in the safety regulations.
- The quantity and the danger level of the fumes depends on the parent metal used, the filler metal and on any substances used to clean and degrease the pieces to be welded. Follow the manufacturer's instructions together with the instructions given in the technical sheets.
- Do not perform welding operations near degreasing or painting stations.
- Position gas cylinders outdoors or in places with good ventilation.

1.5 Fire/explosion prevention



The welding process may cause fires and/or explosions.

- Clear the work area and the surrounding area from any flammable or combustible materials or objects.
- Flammable materials must be at least 11 metres (35 feet) from the welding area or they must be suitably protected.
- Sparks and incandescent particles might easily be sprayed quite far and reach the surrounding areas even through minute openings. Pay particular attention to keep people and property safe.
- Do not perform welding operations on or near containers under pressure.
- Do not perform welding or cutting operations on closed containers or pipes. Pay particular attention during welding operations on pipes or containers even if these are open, empty and have been cleaned thoroughly. Any residue of gas, fuel, oil or similar materials might cause an explosion.
- Do not weld in places where explosive powders, gases or vapours are present.
- When you finish welding, check that the live circuit cannot accidentally come in contact with any parts connected to the earth circuit.
- Position a fire-fighting device or material near the work area.

1.6 Prevention when using gas cylinders



Inert gas cylinders contain pressurized gas and can explode if the minimum safe conditions for transport, storage and use are not ensured.

- Cylinders must be secured in a vertical position to a wall or other supporting structure, with suitable means so that they cannot fall or accidentally hit anything else.
- Screw the cap on to protect the valve during transport, commissioning and at the end of any welding operation.
- Do not expose cylinders to direct sunlight, sudden changes of temperature, too high or extreme temperatures. Do not expose cylinders to temperatures too low or too high.
- Keep cylinders away from naked flames, electric arcs, torches or electrode guns and incandescent material sprayed by welding.
- Keep cylinders away from welding circuits and electrical circuits in general.
- Keep your head away from the gas outlet when opening the cylinder valve.
- Always close the cylinder valve at the end of the welding operations.
- Never perform welding operations on a pressurized gas cylinder.
- A compressed air cylinder must never be directly coupled to the machine pressure reducer! Pressure might exceed the capacity of the reducer which could consequently explode!

1.7 Protection from electrical shock



Electric shocks can kill you.

- Avoid touching live parts both inside and outside the welding system while this is active (torches, guns, earth cables, electrodes, wires, rollers and spools are electrically connected to the welding circuit).
- Make sure that the welding system and the welder are electrically isolated by using dry bases and floors that are adequately isolated from earth.
- Ensure the system is connected correctly to a socket and a power source equipped with an earth conductor.
- Do not touch two torches or two electrode holders at the same time.
- If you feel an electric shock, interrupt the welding operations immediately.

1.8 Electromagnetic fields and interferences



The current passing through the internal and external system cables creates an electromagnetic field in the proximity of the welding cables and the equipment itself.

- Electromagnetic fields can affect the health of people who are exposed to them for a long time (the exact effects are still unknown).
- Electromagnetic fields can interfere with some equipment like pacemakers or hearing aids.



Persons fitted with pacemakers must consult their doctor before undertaking arc welding operations.

1.8.1 EMC classification in accordance with: EN 60974-10/A1:2015.



Class B equipment complies with electromagnetic compatibility requirements in industrial and residential environments, including residential locations where the electrical power is provided by the public low-voltage supply system.



Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility of class A equipment in those locations, due to conducted as well as radiated disturbances.

For more informations, check the chapter: RATING PLATE or TECHNICAL SPECIFICATIONS.

1.8.2 Installation, use and area examination

This equipment is manufactured in compliance with the requirements of the harmonized standard EN 60974-10/A1:2015 and is identified as "CLASS A" equipment. This unit must be used for professional applications only, in industrial environments. The manufacturer will accept no responsibility for any damages caused by use in domestic environments.



The user must be an expert in the activity and as such is responsible for installation and use of the equipment according to the manufacturer's instructions. If any electromagnetic interference is noticed, the user must solve the problem, if necessary with the manufacturer's technical assistance.



In any case electromagnetic interference problems must be reduced until they are not a nuisance any longer.



Before installing this apparatus, the user must evaluate the potential electromagnetic problems that may arise in the surrounding area, considering in particular the health conditions of the persons in the vicinity, for example of persons fitted with pacemakers or hearing aids.

1.8.3 Mains power supply requirements

High power equipment may, due to the primary current drawn from the mains supply, influence the power quality of the grid. Therefore connection restrictions or requirements regarding the maximum permissible mains impedance (Z_{max}) or the required minimum supply capacity (S_{sc}) at the interface point to the public grid (point of common coupling, PCC) may apply for some types of equipment (see technical data). In this case it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected. In case of interference, it may be necessary to take further precautions like the filtering of the mains power supply.

It is also necessary to consider the possibility of shielding the power supply cable.

For more informations, check the chapter: TECHNICAL SPECIFICATIONS.

1.8.4 Precautions regarding cables

To minimise the effects of electromagnetic fields follow the following instructions:

- Where possible, collect and secure the earth and power cables together.
- Never coil the cables around your body.
- Do not place your body in between the earth and power cables (keep both on the same side).

- The cables must be kept as short as possible, positioned as close as possible to each other and laid at or approximately at ground level.
- Position the equipment at some distance from the welding area.
- The cables must be kept away from any other cables.

1.8.5 Earthing connection

The earth connection of all the metal components in the welding (cutting) equipment and in the close area must be taken in consideration. The earthing connection must be made according to the local regulations.

1.8.6 Earthing the workpiece

When the workpiece is not earthed for electrical safety reasons or due to its size and position, the earthing of the workpiece may reduce the emissions. It is important to remember that the earthing of the workpiece should neither increase the risk of accidents for the user nor damage other electric equipment. The earthing must be made according to the local regulations.

1.8.7 Shielding

The selective shielding of other cables and equipment present in the surrounding area may reduce the problems due to electromagnetic interference.

The shielding of the entire welding equipment can be taken in considered for special applications.

1.9 IP Protection rating

IP23S

IP

- Enclosure protected against access to dangerous parts by fingers and against ingress of solid bodies objects with diameter equal or greater than 12.5 mm.
- Enclosure protected against rain at an angle of 60°.
- Enclosure protected against harmful effects due to the ingress of water when the moving parts of the equipment are not operating.

1.10 Disposal

Do not dispose of electrical equipment together with normal waste!



In conformity to European Directive 2012/19/EU on Waste Electrical and Electronic Equipment and to its implementation according to national law, at the end of its life cycle, electrical equipment must be collected separately and disposed of through an authorised recovery and disposal centre. The owner of the equipment is required to identify authorised collection centres on the basis of the information provided by Local Authorities. By applying this European Directive you will improve the environment and human health!

2. TERMS AND CONVENTIONS USED

By convention, when a measurement is required between two points : A  B

The arrowhead indicates where to apply the multimeter's red test lead (A), the black tip is applied to the other end (B).

When instead a double arrow appears between two measuring points : C  D

The voltage to be measured is alternating (usually 50Hz or 60Hz) and the order of application of the multimeter terminals is indifferent.

In drawings and tables, when a voltage measurement appears referring to the terminals of components such as:

DIODI, BJT, MOSFET, IGBT

it refers to the use of the multimeter in "diode test" mode

(these measurements are always carried out with the machine off and normally give values in the range +0.10... + 0.90Vdc).

In this case, next to the value to be measured there is a box titled "Type of Measurement" where the symbol is placed:



Junction measure (multimeter in "diode test" mode)

Similarly, the following symbols will be used :



AC or CD voltage measurement (multimeter in voltmeter mode)



Resistance measurement (multimeter in ohmmeter mode)



Current measurement (current clamp or shunt + multimeter in millivoltmeter mode)



Frequency measurement (multimeter in frequency meter mode)



The measurement conditions (generator on / off, MMA / TIG operating mode, etc.) are always clearly indicated next to the values to be measured.



Connector terminals are indicated by the connector name followed by a slash and the terminal number.
For example: CN1/2 indicates terminal 2 of connector CN1.

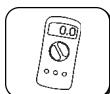


Unless otherwise specified, all measurements must be carried out with the boards inserted in their place, with the relative connections.

3. MEASURING INSTRUMENTS AND DEVICES

3.1 Measurement tools

To perform the operations described in this manual are required:



- Multimeter



- AC/DC current clamp



Some measurements with the multimeter must be made on the connectors.
Pay particular attention not to mistakenly short-circuit the various pins and possibly use thin leads.



It is advisable to use an automatic scale instrument as, with a faulty machine, it is not theoretically possible to predict the level of the electrical quantity that one is about to measure.



The tools must comply with the Standard: EN IEC 60974-4 par. 4.1.

3.2 Repair tools

To perform the operations described in this manual are required:

- Complete set of open ended spanners.
- Complete set of socket wrenches for hex nuts.
- Complete set of screwdrivers for slotted screws.
- Complete set of screwdrivers for cross head screws.
- Complete set of Allen keys.
- A cross dynamometric screwdriver for M3 screws with the possibility of setting the tightening torque from 1 to 3Nxm.
- One crimping pliers for insulated cable lugs (blue, red and yellow).
- A clamp for AMP contacts.
- A tweezers and a nippers commonly used with electronic components.
- A pincer (dimensions suitable for closing gas hose clamps).
- A soldering iron for electronic components with a minimum power of 50 W.
- A portable electric drill for hobby.

3.3 Variac

During the diagnostic phases or after the replacement of faulty parts, it is preferable to power the system via a simple Variac from the desktop.

By powering the system through this type of device which can supply an alternating voltage variable from 0V to 230Vac at 50Hz and a maximum current of a few amperes, it is possible:

- check that the system is switched on correctly
- measure and check the no-load voltage value
- test the operation of the VRD function



Minimum recommended features:

- Power supply: 220Vac 50Hz
- Output voltage: 0-220Vac
- Output protected with protection fuse

An example in the following photo:



3.4 Static load



Using a static load can facilitate troubleshooting and testing of the generator.

A fixed resistance applied to the generator output is roughly equivalent to an electric arc as long as it remains within a narrow voltage range.

This central value can be determined with formulas:

Process	Formula	Examples
TIG	$V_{out} \approx 10 + 0.04 \times I_{out}$	12Vdc @ 50A 14Vdc @ 100A 18Vdc @ 200A
MMA	$V_{out} \approx 20 + 0.04 \times I_{out}$	22Vdc @ 50A 24Vdc @ 100A 28Vdc @ 200A
MIG/MAG	$V_{out} \approx 14 + 0.05 \times I_{out}$	16Vdc @ 50A 19Vdc @ 100A 24Vdc @ 200A



If the output voltage is too high or too low compared to the expected value, the generator could saturate or some particular functions could intervene (es.: antiflash).



In both cases the actual current could be very different from the expected value and the generator could also show intermittent operation (flashing of the "output power" LED).



When using a static load, pay attention to both the current and the output voltage of the generator and use resistors of the correct value and with adequate power!

4. SYSTEM REPAIR

4.1 Troubleshooting and system repair

The repair consists of:

- Identification of the faulty part.
- Replacement of the part with the specific spare part available in the appropriate "Spare parts list".



The replacement of the faulty electronic component on the board is NOT foreseen.



DO NOT make changes and do not carry out maintenance not provided for in this manual.



If the problem cannot be solved by following the instructions described in this manual, please contact voestalpine Böhler Welding Selco s.r.l. technical assistance.

Or send the machine to Service voestalpine Böhler Welding Selco s.r.l. for the appropriate interventions.

in general we can divide the analysis activity into the following phases

4.1.1 Plant preparation.

- ▶ Remove the side panels.
- ▶ Remove the rear plastic plug to access the fans.
- ▶ Carry out a thorough cleaning of the system by carefully removing the dust inside the machine, in the area of the heat sink and the rear fans with the aid of soft bristle brushes and low intensity compressed air.



The operations must be performed in a suitable environment.

4.1.2 Visual inspection



*Remember the first test to be performed is the visual check
The visual check reduces the troubleshooting time and directs any subsequent tests towards the damaged part*

- ▶ Look for any traces of combustion or damaged components.

In general, points to check visually are:

- Inlet filter area.
- Leveling electrolytic capacitors.
- Smoke traces detectable on the inside of the hood.
- Power and signal connections.
- Overall status of the pc boards.

In the visual check remember to also include the check of the state of:

- Electrode holder.
- Welding torches.
- Ground cables and clamps.
- Adhesive and warning data plate.
- Connections and gas circuit.
- Connections to the mains supply line.
- Welding circuit.
- Hoods and plastic covers.
- Readability of signaling led.
- Readability of displays.

4.1.3 Passive component control

With generator off and disconnected from the mains :

- ▶ Perform all passive tests on the various parts of the plant involved in the analysis.



For each component under analysis, refer to the tests described in the specific repair sheet.

4.1.4 Safety start

The following procedure is recommended to power the generator in relative safety.

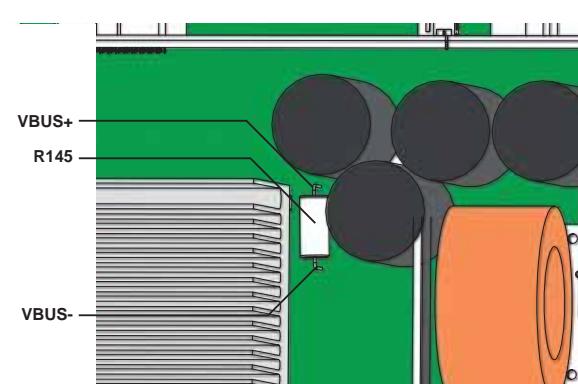
Both during the diagnosis phase and after the replacement of the faulty parts it is preferable to turn on the generator with this procedure in order to limit any damage due to the presence of faults not detected or not detectable with the generator off.

It basically involves powering the generator through a variable autotransformer (Variac) equipped with a protection fuse.

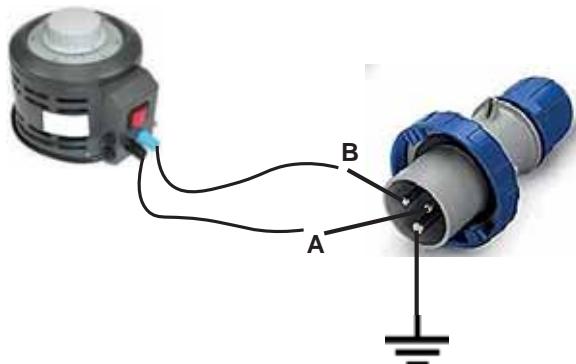


Before turning on the generator in any mode, carry out a visual inspection of the system and carry out all the diagnostic tests that can be performed with the generator off, described in the repairsheets for each part of the system.

Preliminary operations



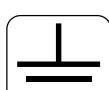
- ▶ Set the multimeter in mode for reading the DC voltage.
- ▶ Connect the red test lead of the multimeter to the measurement point marked VBUS +.
- ▶ Connect the black test lead of the multimeter to the measurement point marked VBUS -.



- ▶ Connect the Variac between two phases of the generator power socket.
A ↔ B
(See reference figure).



Be careful not to use the ground pole or the neutral pole.



In order to protect users, the equipment must be correctly earthed. The power supply voltage is provided with an earth lead (yellow - green), which must be connected to a plug provided with earth contact.

This yellow/green wire shall NEVER be used with other voltage conductors.

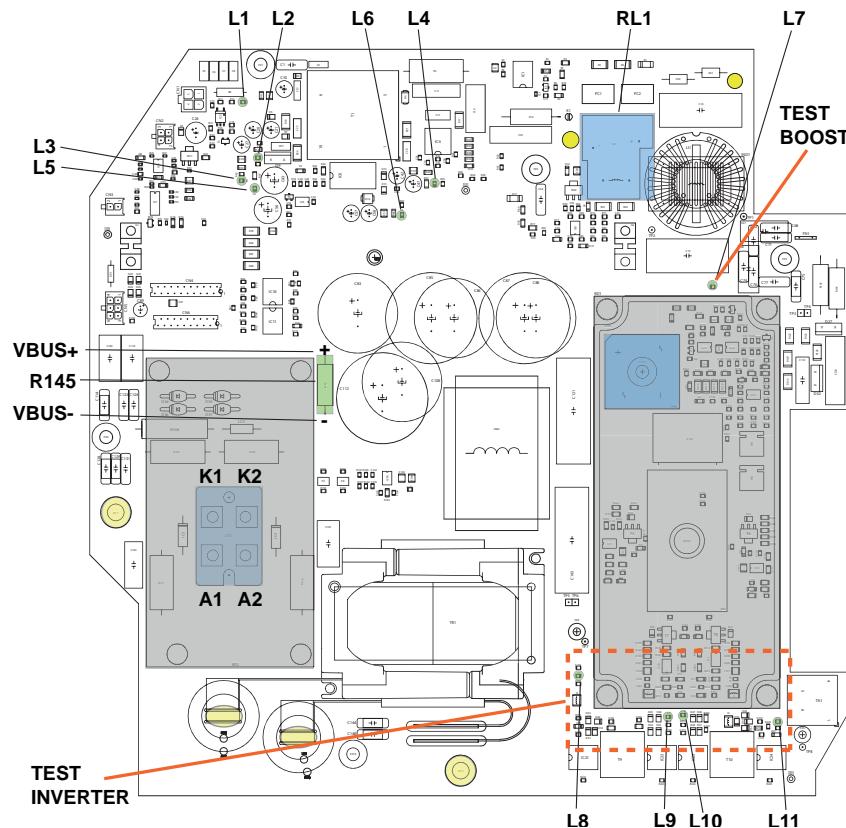
Verify the existence of the earthing in the equipment used and the good condition of the sockets.

Install only certified plugs according to the safety regulations.

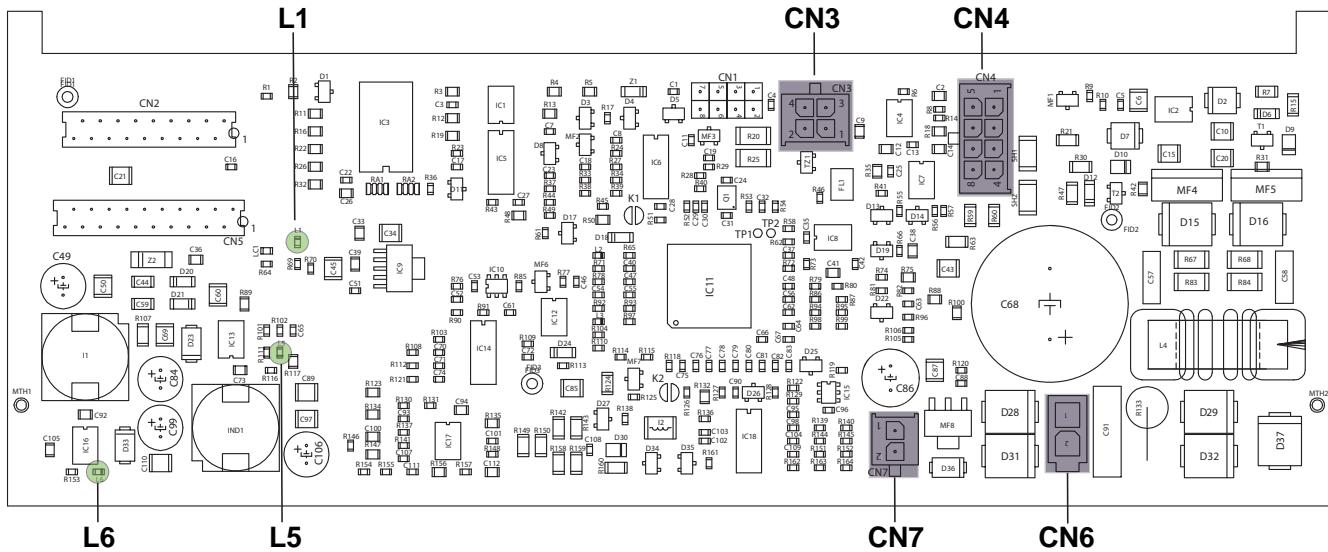


The following sections refer to the board layout.

Board layout



15.14.5912



15.14.5922

Generator start via Variac and test to be performed

- ▶ Gradually power up via the variac and check that the VBUS voltage gradually increases (with variac delivering 50Vac, the Vbus voltage is about 73Vdc).
- ▶ Raise up through Variac up to 230Vac.

Test:

- ▶ Check the generator switch on correctly.
- ▶ Check the correct intervention of the precharge relay.
- ▶ Check that the gas solenoid valve performs the purge cycle.

L1	Color:	Green	Status:	Steady on	Description:	@ 15.14.5922
L5	Color:	Green	Status:	Steady on	Description:	@ 15.14.5922
L6	Color:	Green	Status:	Steady on	Description:	@ 15.14.5922
► Check the LED diagnostics of the power board. (TEST BOOST)						
L7	Color:	Green	Status:	Steady on	Description:	@ 15.14.5912

- Set the generator in mode: MMA
- Vbus voltage value

Mode	Test point	Value	Notes
(V)	VBUS+ ← VBUS-	320±3Vdc.	@MMA

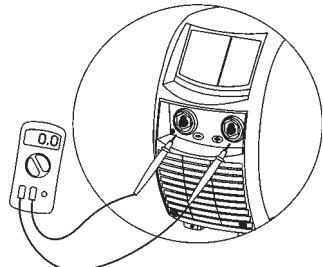
- Check the correct lighting of the LEDs on the driver board of the power board group, as indicated in the board layout. (LEDS TEST INVERTER DRIVERS)

L8	Color:	Green	Status:	Steady on	Description:	@ 15.14.5912
L9	Color:	Green	Status:	Steady on	Description:	@ 15.14.5912
L10	Color:	Green	Status:	Steady on	Description:	@ 15.14.5912
L11	Color:	Green	Status:	Steady on	Description:	@ 15.14.5912

- Check that the fans are switched on correctly.

Generator start via the mains supply and tests to be carried out

- With the generator off, turn off the Variac and unplug it from the generator power outlet.
- Maintain the connection of the multimeter for the reading of the VBUS.
- Connect the generator to the mains.
- Turn on the generator.



- Set the generator in mode: MMA
- Measure the no-load voltage of the generator with the multimeter by positioning the test leads between the socket and the socket.

Mode	Test point	Value	Notes
(V)	←	63±1Vdc	@MMA

- Set the generator in mode: MIG/MAG
- Check the wire feeder works properly.

4.1.5 Active component control

With generator on (see safety start procedure):

- Check for the presence of no-load voltage in the various ignition configurations.
- Check for alarms on the screen or on the alarm list.
- Perform all tests with the system in ON mode on the various parts of the system involved in the analysis.



For the tests to be carried out, refer to the relative technical data sheets of each component.

4.1.6 Faulty part replacement

When a faulty part is detected:

- Replace the component with the corresponding spare part.



- Repeat the control operations also on the parts linked to the same chain.

4.1.7 Functional checks

After the repair, perform functional tests of the system.

Example:

- ▶ Check that the main switch properly sections each phase conductor.
- ▶ Check the correct functioning of the Vrd device (See section "VRD Voltage Reduction Device (Set up 201)").
- ▶ Check the correct functioning of the gas solenoid valves and the passage of gas in the circuit.
- ▶ Check the operation of the fans.
- ▶ Check the status of the signaling LEDs and the display.
- ▶ Check the condition of the thread trimmer and the thread load.
- ▶ Perform appropriate welding tests in all modes.



The operations must be carried out by suitably trained personnel

4.2 System calibration

Calibrate the system using the parameters in the following order:



Offset calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Offset calibration (Set up 704)" of the generator repair manual.



Voltage calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Voltage calibration (Set up 702)" of the generator repair manual.



Current calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Current calibration (Set up 701)" of the generator repair manual.

4.3 Periodic inspection and testing



Once the repair has been completed, a check and validation of the system must be carried out according to the Standard: EN IEC 60974-4 par. 4.1

5. TROUBLESHOOTING AND SPARE PARTS REPLACEMENT

5.1 Foreword

The following sections illustrate the normal working conditions of the boards making up the device and provide the standard values of the electrical quantities that can be detected in the main measuring points of the parts themselves.



Remember the first test to be performed is the visual check

The visual check reduces the troubleshooting time and directs any subsequent tests towards the damaged part



The repair consists of:

- *Identification of the faulty part.*
- *Replacement of the part with the specific spare part available in the appropriate "Spare parts list".*

5.2 Safety warnings



WARNING!

Improperly performed work can cause serious injury or damage.

All activities described in the service manual must only be carried out by service technicians trained by voestalpine Böhler Welding Selco.



Welding equipment tests can be dangerous and should be performed by a person educated or experienced in the field of electrical repair, preferably also familiar with the welding, cutting and allied processes.

Instructed persons must be considered qualified for simple periodic tests and maintenance provided that it is not necessary to open the housing of the equipment.



In order to avoid serious damage to people or things, it is essential that this manual is used only by trained personnel (with reference to the legislation EN IEC 60974-4 par. 4.1).



WARNING!

An electric shock can be fatal.

Before opening the device:

- *Move the mains switch to the "O" position.*
- *Disconnect the device from the mains.*
- *Check that the device cannot be turned on again.*
- *Using a suitable measuring device, ensure that any electrically charged components (e.g. capacitors) are fully discharged.*



WARNING!

An electric shock can be fatal.

If the device needs to be turned on briefly to test while the housing is open:

- *Do not touch any part inside the housing.*
- *Only touch parts using suitable measuring or test probes.*



WARNING!

Improper connection of the ground conductor can cause serious injury or damage.

The housing screws provide a suitable ground conductor connection for the housing ground and should NOT be replaced by any other screws that do not provide a reliable ground conductor connection.



The repair of an equipment requires access to the internal parts of the machine and consequently the removal of some protective panels.

Additional precautions are necessary with respect to the simple use of the welding machine in order to prevent possible damage caused by contact with:

- *Under voltage parts.*
- *Moving parts.*
- *Parts at a high temperature.*



DO NOT make changes and do not carry out maintenance not provided for in this manual.



The replacement of the faulty electronic component on the board is NOT foreseen.

5.3 Handle kit code : 74.90.073

Spare Part Code

- 74.90.073

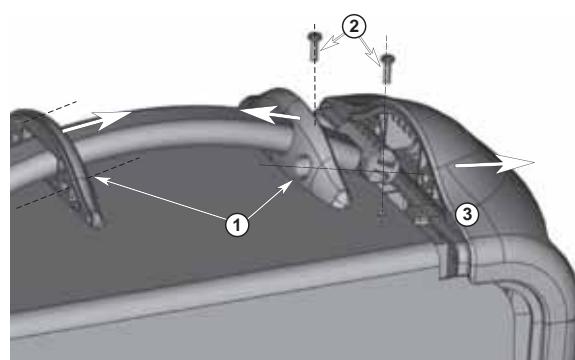
Notes

- Parts not available separately.

Parts replacement



► Remove the fixing screws. ①



► Remove the fixing screws. ①
► Slide the plastic part along the handle.
► Remove the fixing screws. ②
► Pull out the plastic frame slightly to create the space needed to extract the handle. ③

5.4 Upper cover code : 03.07.365

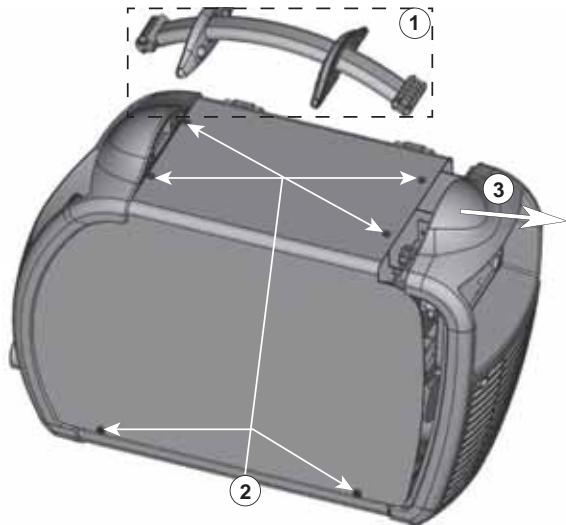
Spare Part Code

- 03.07.365



► Remove the fixing screws. ①

Parts replacement



► Remove the handle kit. ①

► Remove the fixing screws. ②

► Slightly pull out the plastic frame and take out the cover. ③

5.5 Board code : 15.14.5912

Spare Part Code

- 15.14.5912

Description and functionality

The board is equipped with:

- The management of the power stage of the machine.
- Generator's solenoid valve power supply.
- The signals coming from the flashlight.
- The NTC signal.

The board manages:

- The management of the power stage of the machine.
- Generator's solenoid valve power supply.
- The signals coming from the flashlight.
- The NTC signal.

Position



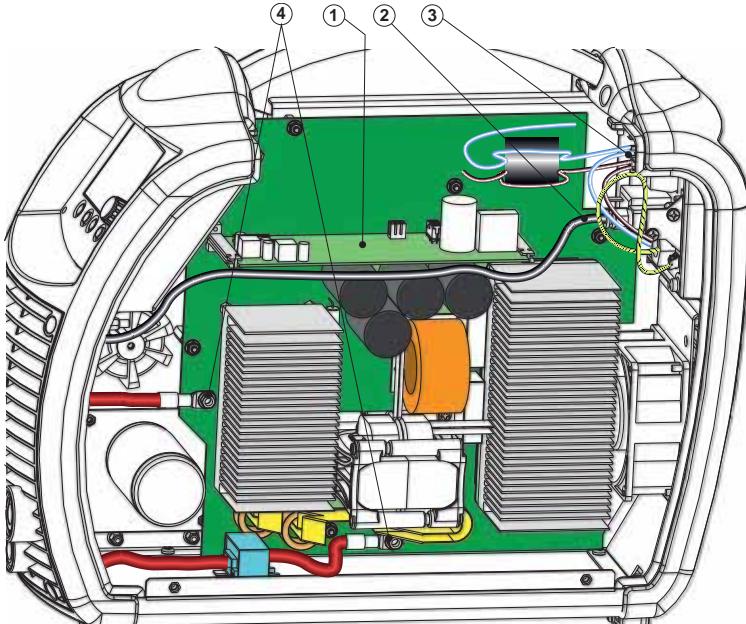
For the component position, refer to the spare parts diagram.

Parts replacement

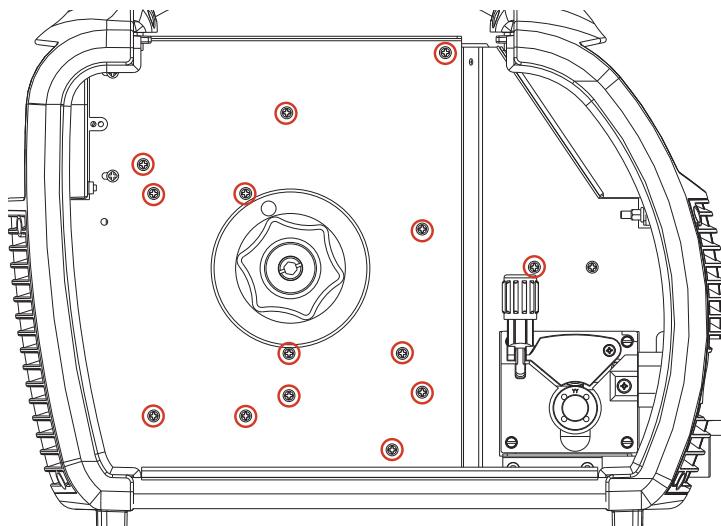


*A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.*

Faulty part removal instructions



- ▶ Remove the board 15.14.5922. ①
- ▶ Disconnect the cables connected to the switch. ②
- ▶ Disconnect the gas pipe and the power cables. ③
- ▶ Disconnect the cables connected to the fixed current sockets. ④



- ▶ Remove the fixing screws. ⑤

Diagnostics

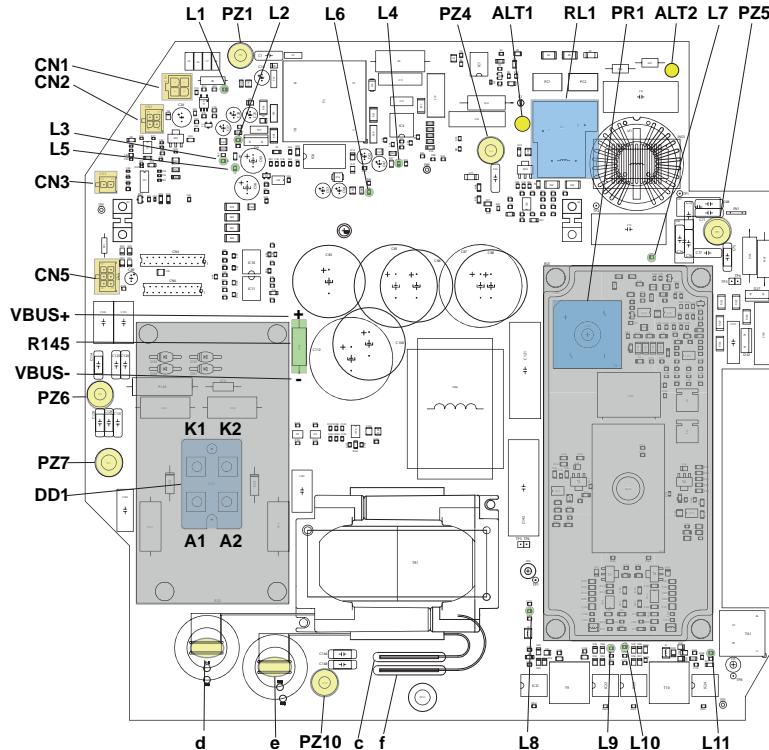
Board layout

In the board layout are showed:

- Position and color of signaling led.
- Location and name of components.
- Location and name of connectors.
- Connections.
- Position of the measurement points.



The following sections refer to the board layout.



Connectors and connections

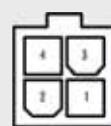
The following section describes:

- Connectors on the board with description of the Pin-out where necessary for diagnostics.
- Description of the connections.

The description of the tests to be carried out with the relative reference values are discussed in the "Diagnostic tests" section.

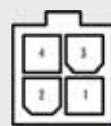


*Warning high voltage!
Always refer to the wiring diagram.*



CN1 Torch signals

CN1/1	Input	Torch control
CN1/2	Input	Torch control

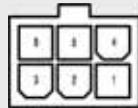


CN2 Gas solenoid valve management

CN2/1	Output	Power supply	(+24Vdc)
CN2/2	Output	Solenoid valve closing command	


CN3 Thermal sensor connector

CN3/1	Input	NTC sensor signal
CN3/2	Input	NTC sensor signal


CN5 Auxiliary signals: VOUT

CN5/1	Input	welding voltage	(VOUT+)
CN5/6	Input	welding voltage	(VOUT-)

CN4 Control board connection

CN6 Control board connection

PZ7 Connection with power transformer

PZ11 Connection with power transformer

ALT1 Connections to the main switch

ALT2 Connections to the main switch

PZ5 Earth safety connection

PZ1-PZ4-PZ6-PZ10 Earth safety connection

Led checklist

The following section describes:

- Signaling LEDs present and meaning

Power supply + 18 Vdc

L1	Color:	Green	Status:	Steady on	Description:	Power supply present
----	--------	-------	---------	-----------	--------------	----------------------

Power supply - 8 Vdc

L2	Color:	Green	Status:	Steady on	Description:	Power supply present
----	--------	-------	---------	-----------	--------------	----------------------

Power supply + 18 Vdc

L3	Color:	Green	Status:	Steady on	Description:	Power supply present
----	--------	-------	---------	-----------	--------------	----------------------

Power supply - 8 Vdc

L4	Color:	Green	Status:	Steady on	Description:	Power supply present
----	--------	-------	---------	-----------	--------------	----------------------

Power supply + 24 Vdc

L5	Color:	Green	Status:	Steady on	Description:	Power supply present
----	--------	-------	---------	-----------	--------------	----------------------

Power supply + 18 Vdc

L6	Color:	Green	Status:	Steady on	Description:	Power supply present
----	--------	-------	---------	-----------	--------------	----------------------

BOOST driver power supply

L7	Color:	Green	Status:	Steady on	Description:	Power supply present
----	--------	-------	---------	-----------	--------------	----------------------

Primary inverter

The LEDs lit when the generator supplies power indicate that the inverter is working.

L8	Color: Green	Status: Steady on	Description: Lights up during ignition
L9	Color: Green	Status: Steady on	Description: Lights up during ignition
L10	Color: Green	Status: Steady on	Description: Lights up during ignition
L11	Color: Green	Status: Steady on	Description: Lights up during ignition



The LEDs lit when the generator supplies power indicate that the inverter is working.

Diagnostic tests

In the following section for each functional part to be tested are reported:

- Indication of the components involved in the test.
- Instructions on how to set up the generator to run the test.
- Table with measurement points and reference values.
- Notes or warnings to perform the test correctly.



*Warning high voltage!
Always refer to the wiring diagram.*



Diode bridge

PR1

Measurements to be carried out with the generator off and disconnected from any power source.

Visually check the integrity of the components.

The diode bridge is located under the radiator

The points indicated allow checking also with the board mounted on the machine

Mode	Test point	Value	Notes
(Ω)	VBUS- ← ALT1	0,48±10% Vdc	
(Ω)	VBUS- ← ALT2	0,48±10% Vdc	
(Ω)	ALT1 ← VBUS+	0,48±10% Vdc	
(Ω)	ALT2 ← VBUS+	0,48±10% Vdc	



DC BUS voltage

Measurements to be made with the generator on.

Test to be carried out with generator powered on three-phase line.

Mode	Test point	Value	Notes
(V)	VBUS+ ← VBUS-	+385±3 Vdc	



Thermal sensor NTC

Measurements to be carried out with the generator off and disconnected from any power source.

Temperature reference for performing the test: T=25°C

Mode	Test point	Value	Notes
(Ω)	CN3/1 ↔ CN3/2	10kΩ	



Solenoid valve power supply

Measurements to be made with the generator on.

The solenoid valve is current controlled.

To perform the test:

- Disconnect the solenoid valves.
- With the torch trigger pressed.
- Measure the presence of no-load voltage.

Mode	Test point	Value	Notes
(V)	CN2/1 ← CN2/2	+24 Vdc	



Auxiliary power output

Measurements to be made with the generator on.

Mode	Test point	Value	Notes
(V)	J15/1 ↔ J15/2	230±10% Vac	Voltage present when the engine is running.

5.6 Output rectifier diodes 14.05.111

Spare Part Code

- 14.05.111

Notes

- The spare part code refers to a single item.
- The article can be ordered individually.

Description and functionality

The component realizes:

- The Output Rectifier stage.
- Through the parallel connection of the diodes, a half-bridge configuration is created connected to the two outputs of the power transformer.
- The diodes configuration allows the rectification of the positive part of the output current, while a socket is fixed to the middle of the secondary winding of the power transformer creating the negative current connection.

Position

- This part can be reached by extracting the board 15.14.5912
- The component is mounted on a special heat sink directly on the board 15.14.5912



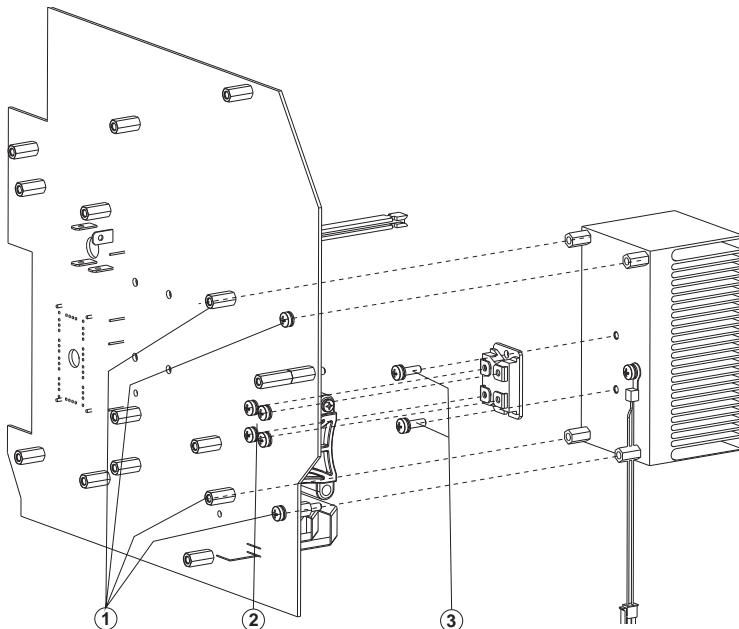
For the component position, refer to the spare parts diagram.

Parts replacement



*A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.*

Faulty part removal instructions



- ▶ Remove the board 15.14.5912
- ▶ Remove the fixing screws. ①
- ▶ Remove the fixing screws. ②
- ▶ Remove the fixing screws. ③

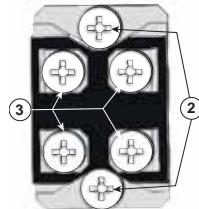
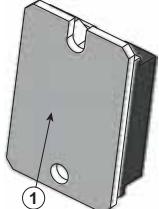


Attention, remove carefully. ②, ③
Screws for anchoring power components to the heat sink.



Remove thermal paste with paper or cloth (also with the addition of alcohol).
Do not use abrasive or mechanical tools to remove thermal paste from the aluminum heatsink

Spare part installation instructions



Spread evenly on the bottom of the component a sufficient amount of thermal paste to allow a slight spill along the edges of the same after fixing the component. ①
However, it is important not to exceed as well as to be scarce in the quantity to use.

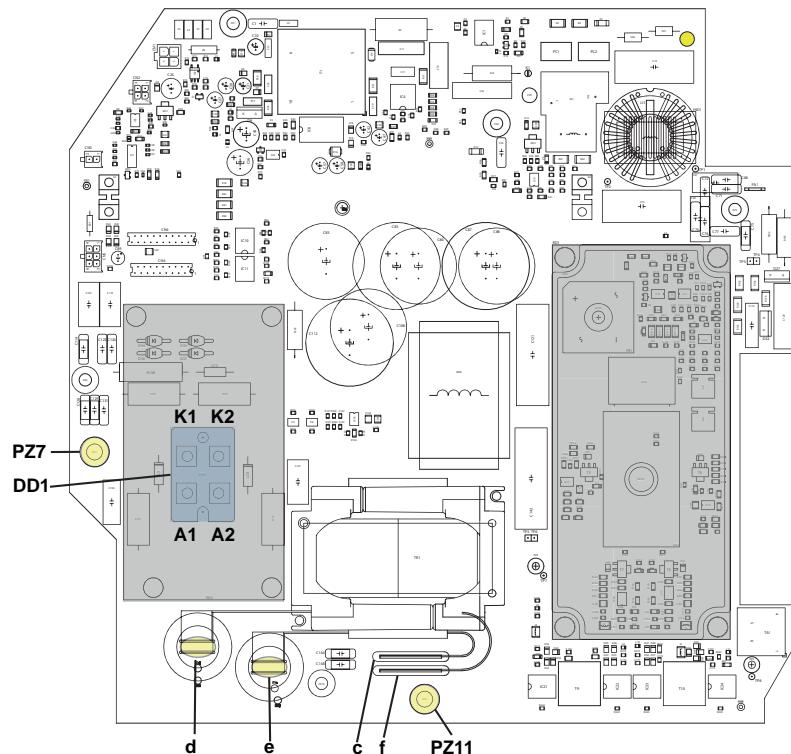


Tighten the screws indicated with tightening torque: 1,7N/m ②, ③



When mounting, pay attention to the polarity of the component.

Diagnostics



Diagnostic tests



*Warning high voltage!
Always refer to the wiring diagram.*



Rectifier diodes

Measurements to be carried out with the generator off and disconnected from any power source.

The component consists of two completely independent diodes.

By carrying out the test with the diode mounted on the board, it is possible to detect only if one of the two is shorted.

To check the absolute integrity of the component it is necessary to remove it from the board.

Mode	Test point	Value	Notes
Ⓐ	PZ7 ← d	0,33±10% Vdc	@15.14.5912
Ⓐ	PZ7 ← e	0,33±10% Vdc	@15.14.5912
Ⓐ	K1 ← A1	0,35±10% Vdc	@14.05.111
Ⓐ	K2 ← A2	0,35±10% Vdc	@14.05.111

5.7 NTC cable 49.07.447

Spare Part Code

- 49.07.447

Description and functionality

- Thermal sensor connected to the aluminum heatsink.
- The intervention of this component is associated with the thermal alarm.

Position

- Part can be reached removing the board 15.14.5912.
- The part is connected to the heatsink.



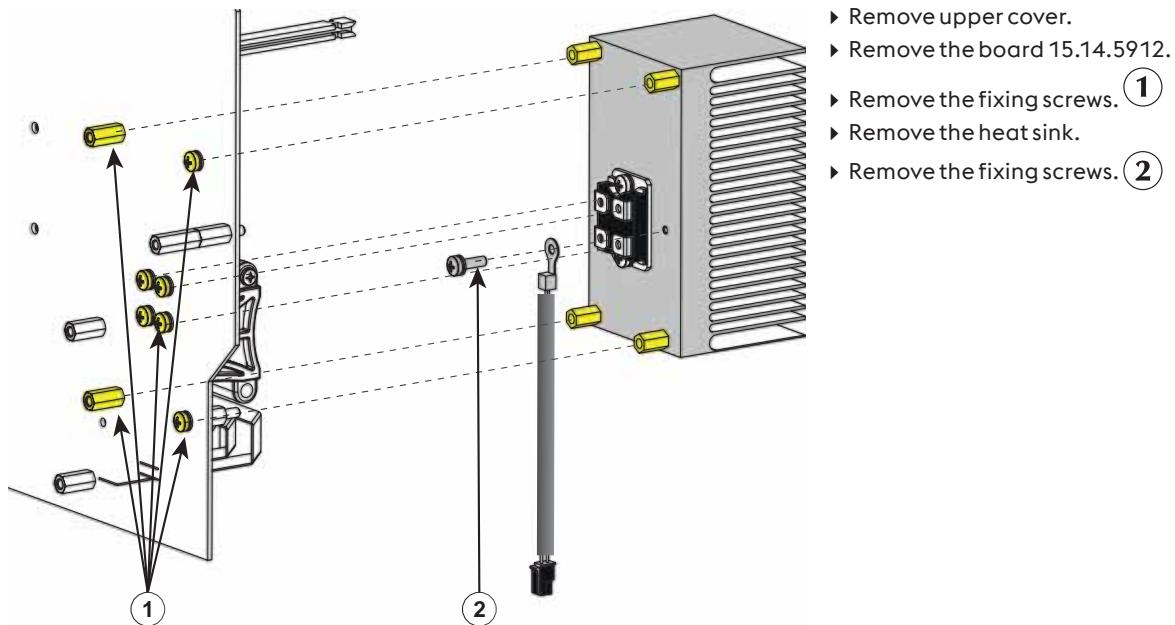
For the component position, refer to the spare parts diagram.

Parts replacement



*A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.*

Faulty part removal instructions



*Remove thermal paste with paper or cloth (also with the addition of alcohol).
Do not use abrasive or mechanical tools to remove thermal paste from the aluminum heatsink*

Spare part installation instructions



*Spread evenly on the bottom of the component a sufficient amount of thermal paste to allow a slight spill along the edges of the same after fixing the component.
However, it is important not to exceed as well as to be scarce in the quantity to use.*

Diagnostics



Diagnostic tests



Thermal sensor NTC1

*Measurements to be carried out with the generator off and disconnected from any power source.
Visually check the integrity of the components.*

Temperature reference for performing the test: T=25°C

Mode	Test point	Value	Notes
(Ω)	J4/1 ↔ J4/2	10kΩ	

5.8 Hall effect current sensor 11.19.025

Spare Part Code

- 11.19.025

Description and functionality

- The sensor reads the value of the output current from the sockets and reports it to the feedback control devices.

Position

- Located in the lower front of the generator close to the output socket.



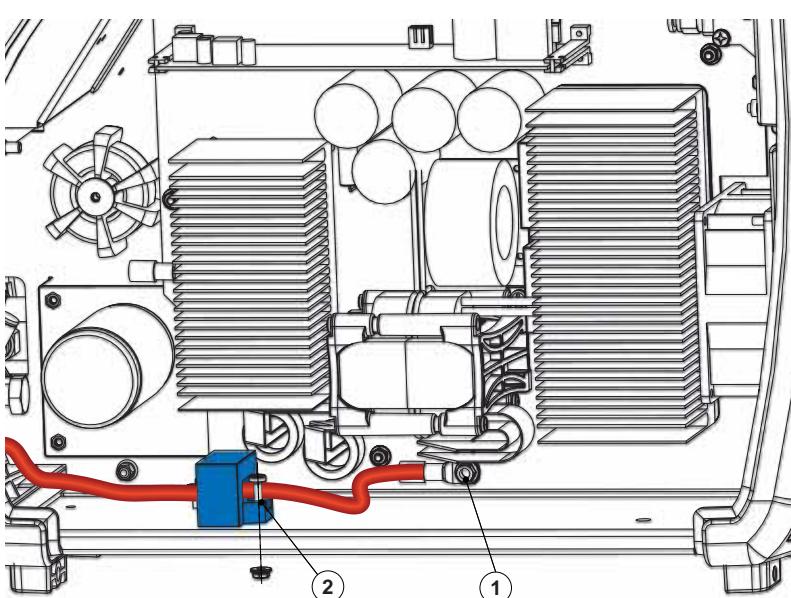
For the component position, refer to the spare parts diagram.

Parts replacement



*A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.*

Faulty part removal instructions



- ▶ Remove the nut that secures the terminal of the copper braid that passes inside the sensor. ①
- ▶ Remove the copper braid.
- ▶ Remove the fixing screws. ②
- ▶ Disconnect the connector.
- ▶ Remove the component.

Spare part installation instructions



When mounting, pay attention to the polarity of the component.



The copper braid must pass inside the component.

Diagnostics

Connector Power supply and management of sensor signals.

J7/1	Output	Power supply (HALL)	(+15Vdc)
J7/2	Output	Power supply (HALL)	(-15Vdc)
J7/3	Input	Current Signal (HALL)	(Iout)
J7/4	Input	Gnd connection	(Gnd)



HALL sensor management

Measurements to be made with the generator on.

Mode	Test point	Value	Notes
(V)	J7/1 ← J7/4	+15Vdc	
(V)	J7/2 ← J7/4	-15Vdc	
(V)	J7/3 ← J7/4	0,4 Vdc	Iout=50A
(V)	J7/3 ← J7/4	0,8 Vdc	Iout=100A
(V)	J7/3 ← J7/4	1,2 Vdc	Iout=150A
(V)	J7/3 ← J7/4	1,6 Vdc	Iout=200A

5.9 Wired fan code 14.70.009

Spare Part Code

- 14.70.009

Notes

- The spare part code refers to a single item.
- The article can be ordered individually.

Description and functionality

- Wired fan positioned at the rear of the generator to ensure correct ventilation.

Features:

- The fan speed is variable and is controlled by the control board with feedback on the internal temperature of the generator.
- In MMA mode it is always active.
- In TIG mode active after ignition.
- In MIG/MAG mode it activates after triggering.

Operation chain:

- The trigger signal starts from the torch button and is received by the DSP control board.
- The control board generates the command signal which is forwarded to the power board.
- The power board powers the fan and modulates the speed.
- Supply voltage = 24Vdc

Position

- Part can be reached by removing the plastic rear grid.



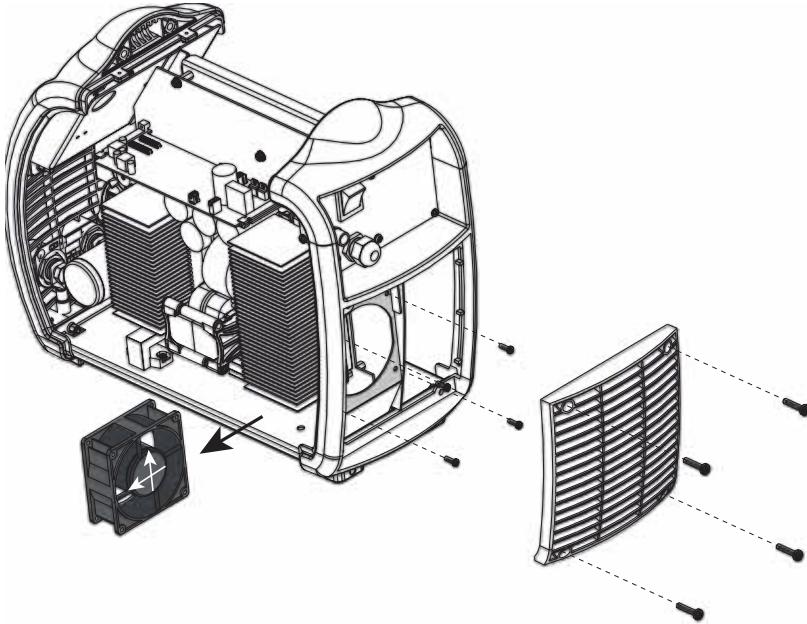
For the component position, refer to the spare parts diagram.

Parts replacement



A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.

Faulty part removal instructions



- ▶ Remove upper cover.
- ▶ Remove the plastic rear grid.
- ▶ Remove the fixing screws.
- ▶ Disconnect the connector.
- ▶ Remove the component.

Spare part installation instructions



Install the fan with the ventilation arrow pointing as shown in the figure.

Diagnostics



Warning high voltage!
Always refer to the wiring diagram.



J10	Fan power supply		
J10/1	Input	Power supply	(+24Vdc)
J10/2	Input	Gnd connection	(Gnd)



Fan power supply

Measurements to be made with the generator on.

Mode	Test point	Value	Notes
(V)	J10/1 ← J10/2	19÷24 Vdc	@MMA
(V)	J10/1 ← J10/2	0÷24 Vdc	@MIG/MAG
(V)	J10/1 ← J10/2	0÷24 Vdc	@TIG
(V)	J10/1 ← J10/2	+24 Vdc	Shutdown

5.10 Logic board 15.14.5922

Spare Part Code

- 15.14.5922

Description and functionality

The board is equipped with:

- The DSP that manages the digital control of the generator.

The board manages:

- The digital control of the inverter.
- The execution of the main program that controls the internal functions, menus and welding parameters.
- Can-bus communications with all peripherals (front panel, remote connectors, internal distribution network...)
- Wire feeder power supply and the operating speed.
- Hall probe power and signals.

Position



For the component position, refer to the spare parts diagram.

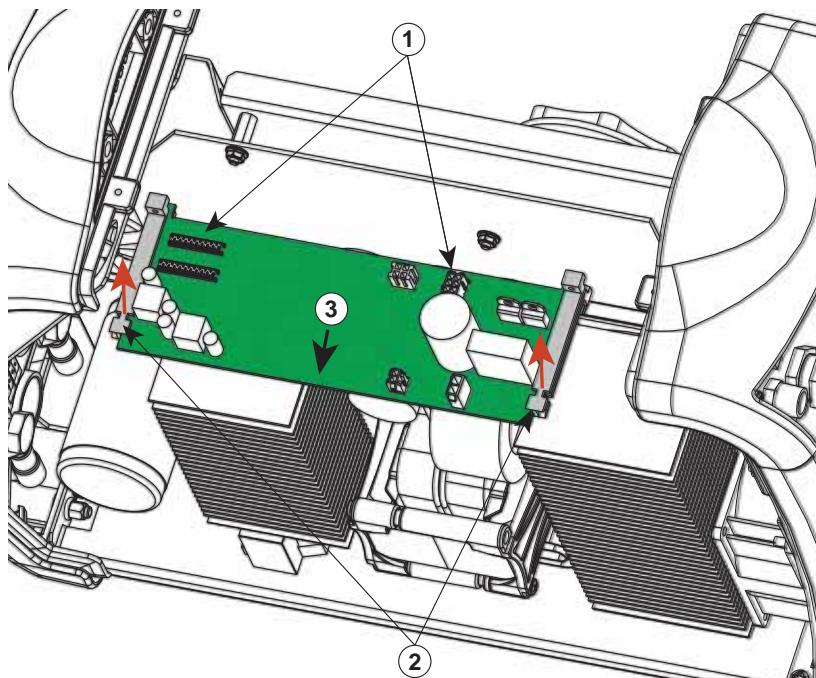
Parts replacement



A cables marking is recommended to an easily machine reassembly.

Always refer to the wiring diagram.

Faulty part removal instructions



- ▶ Remove upper cover.
- ▶ Disconnect the connectors from the board. **1**
- ▶ Lift the clips that secure the board to the plastic guides. **2**
- ▶ Remove the board. **3**



Carefully remove the glue layer present on the connectors using a suitable pliers.

Uniformly lift the connector from its seat.

Do not tear the flat cables of the connector.

Diagnostics

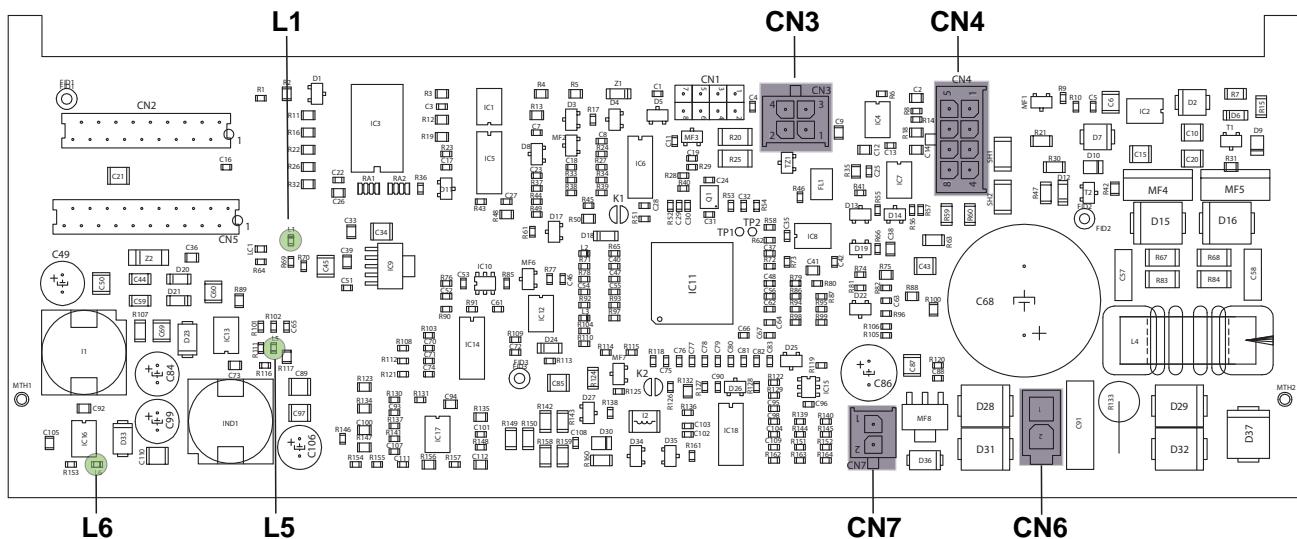
Board layout

In the board layout are showed:

- Position and color of signaling led.
- Location and name of components.
- Location and name of connectors.
- Connections.
- Position of the measurement points.



The following sections refer to the board layout.



Connectors and connections

The following section describes:

- Connectors on the board with description of the Pin-out where necessary for diagnostics.
- Description of the connections.

The description of the tests to be carried out with the relative reference values are discussed in the "Diagnostic tests" section.



*Warning high voltage!
Always refer to the wiring diagram.*

CN3 CAN-bus connection			
CN3/1	Output	Power supply	CAN-bus (+15Vdc)
CN3/2	Data bus	CAN-bus signal	(CAN-H)
CN3/3	Input	Gnd connection	(Gnd)
CN3/4	Data bus	CAN-bus signal	(CAN-L)

CN4 Auxiliary signals			
CN4/1	Output	Power supply (HALL)	(+15Vdc)
CN4/2	Input	Gnd connection	(Gnd)
CN4/3	Output	Power supply (Motor)	(VMOT-)
CN4/5	Output	Power supply (HALL)	(-15Vdc)
CN4/6	Input	Current Signal (HALL)	(Iout)
CN4/8	Output	Power supply (Motor)	(VMOT+)

CN6 Auxiliary power supplies			
CN6/1	Output	Power supply	
CN6/2	Output	Power supply	



CN7	Fan power supply		
CN7/1	Output	Power supply	(0 ÷ +24 Vdc)
CN7/2	Output	Fan ignition control	

CN2 Connection to the power board

CN5 Connection to the power board

Led checklist

The following section describes:

- Signaling LEDs present and meaning

Power supply + 3,3 Vdc

L1	Color:	Green	Status:	Steady on	Description:	Powersupply present
----	--------	-------	---------	-----------	--------------	---------------------

Power supply + 15 Vdc

L5	Color:	Green	Status:	Steady on	Description:	Powersupply present
----	--------	-------	---------	-----------	--------------	---------------------

Power supply + 5 Vdc

L6	Color:	Green	Status:	Steady on	Description:	Powersupply present
----	--------	-------	---------	-----------	--------------	---------------------

Diagnostic tests

In the following section for each functional part to be tested are reported:

- Indication of the components involved in the test.
- Instructions on how to set up the generator to run the test.
- Table with measurement points and reference values.
- Notes or warnings to perform the test correctly.



Motor power supply

Measurements to be made with the generator on.

The voltage value is proportional to the set speed.

To perform the test:

- Set a wire output speed.
- Keep the torch button pressed for at least 3s.

Mode	Test point	Value	Notes
(V)	CN4/8 ← CN4/3	+24±10% Vdc	@16m/min
(V)	CN4/8 ← CN4/3	+19±10% Vdc	@12.3m/min
(V)	CN4/8 ← CN4/3	+14±10% Vdc	@08.5m/min
(V)	CN4/8 ← CN4/3	+8,4±10% Vdc	@04,8m/min
(V)	CN4/8 ← CN4/3	+2,6±10% Vdc	@01,0m/min



Thermal sensor NTC1

Measurements to be carried out with the generator off and disconnected from any power source.

Visually check the integrity of the components.

Mode	Test point	Value	Notes
(Ω)	CN7/7 ↔ CN7/17	10kΩ	



HALL sensor management

Measurements to be made with the generator on.

Mode	Test point	Value	Notes
(V)	CN4/1 ← CN4/2	+15Vdc	
(V)	CN4/5 ← CN4/2	-15Vdc	
(V)	CN4/6 ← CN4/2	0,4 Vdc	Iout=50A
(V)	CN4/6 ← CN4/2	0,8 Vdc	Iout=100A
(V)	CN4/6 ← CN4/2	1,2 Vdc	Iout=150A
(V)	CN4/6 ← CN4/2	1,6 Vdc	Iout=200A



Fan power supply

Measurements to be made with the generator on.

In TIG mode, the fan is activated by pressing the torch button, the speed is modulated by the temperature.

In MIG/MAG mode, the fan is activated by pressing the torch button, the speed is modulated by the temperature.

In MMA mode, the fan is always active, the speed is modulated by the temperature.

Mode	Test point	Value	Notes
(V)	CN7/1 ← CN7/2	+24 Vdc	Shutdown
(V)	CN7/1 ← CN7/2	19÷24 Vdc	@MMA
(V)	CN7/1 ← CN7/2	0÷24 Vdc	@TIG
(V)	CN7/1 ← CN7/2	0÷24 Vdc	@MIG/MAG



Auxiliary power output

Measurements to be made with the generator on.

Voltage present when the engine is running.

Mode	Test point	Value	Notes
(V)	CN6/1 ← CN6/2	230 Vac	@MIG/MAG

5.11 Output filter board 15.14.5991

Spare Part Code

- 15.14.5991

Description and functionality

- The board realizes the generator output filter stage.

Position

- It is mounted near the fixed power sockets.



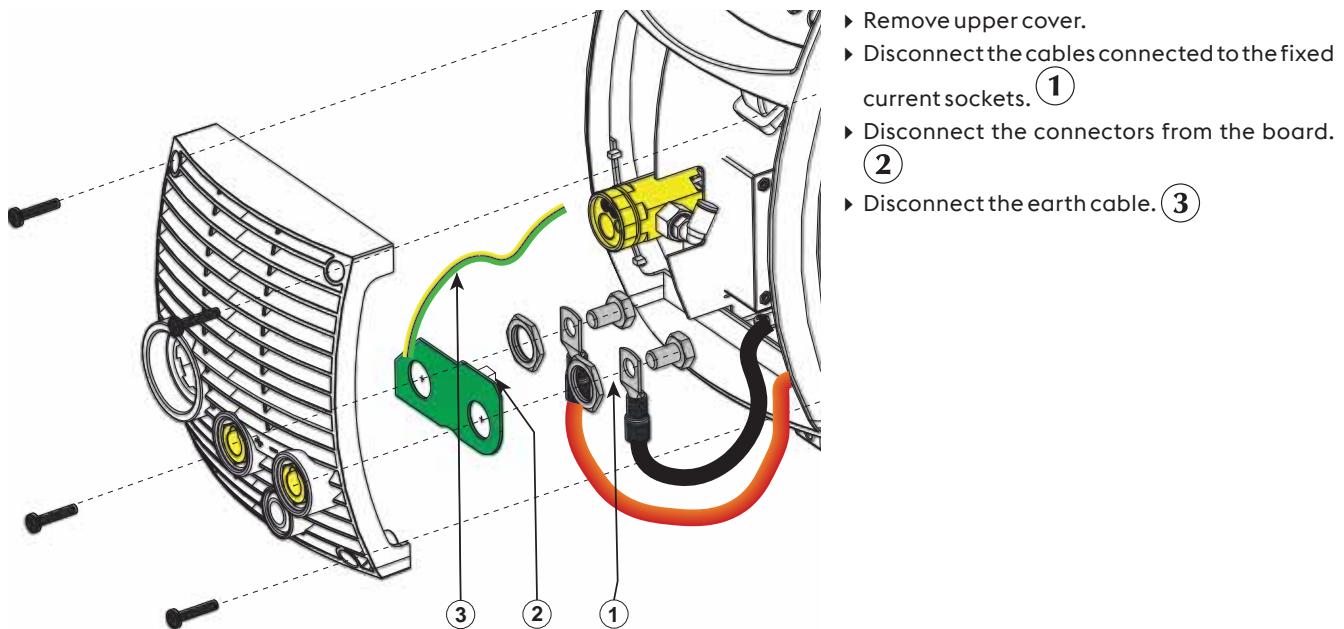
For the component position, refer to the spare parts diagram.

Parts replacement



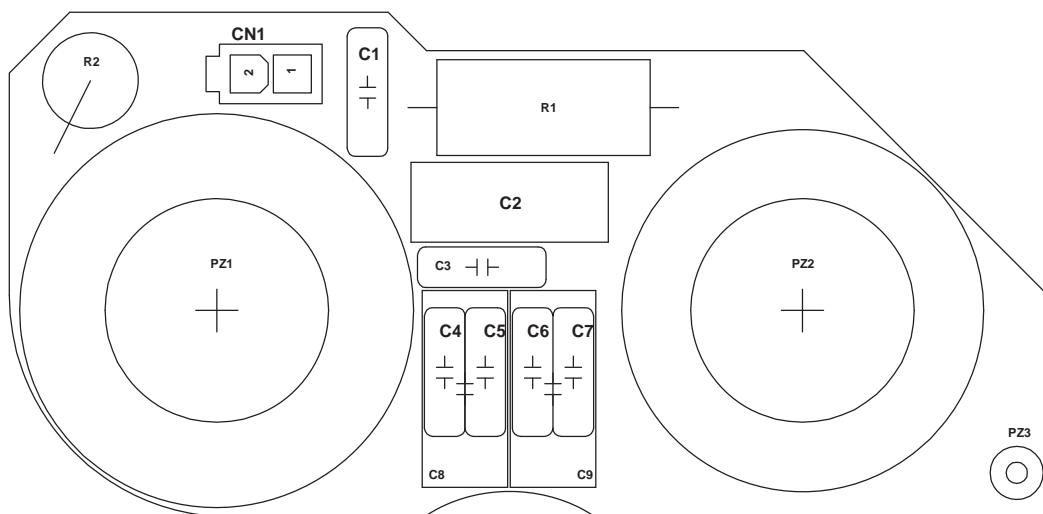
*A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.*

Faulty part removal instructions



Diagnostics

Board layout



The following sections refer to the board layout.

Connectors and connections

The following section describes:

- Connectors on the board with description of the Pin-out where necessary for diagnostics.
- Description of the connections.

The description of the tests to be carried out with the relative reference values are discussed in the "Diagnostic tests" section.



*Warning high voltage!
Always refer to the wiring diagram.*



CN1	Welding voltage reading VOUT		
CN1/1	Output	welding voltage	(VOUT-)
CN1/2	Output	welding voltage	(VOUT+)

PZ3 Earth safety connection

Diagnostic tests

In the following section for each functional part to be tested are reported:

- Indication of the components involved in the test.
- Instructions on how to set up the generator to run the test.
- Table with measurement points and reference values.
- Notes or warnings to perform the test correctly.



*Warning high voltage!
Always refer to the wiring diagram.*



Components

*Measurements to be carried out with the generator off and disconnected from any power source.
Visually check the integrity of the components.*

5.12 Gas solenoid valve 09.05.001

Spare Part Code

- 09.05.001

Description and functionality

- 1/8" Gas Solenoid Valve.

Features:

- 24V 50Hz power supply.
- Manages the torch gas flow.

Operation chain:

- The trigger signal that starts from the torch button when it is received by the DSP control board.
- The control board generates the command signal which is forwarded to the power board.
- The power board powers the solenoid valve.

Position

- Part can be reached by removing the rear panel.
- Part reachable from the right side panel.



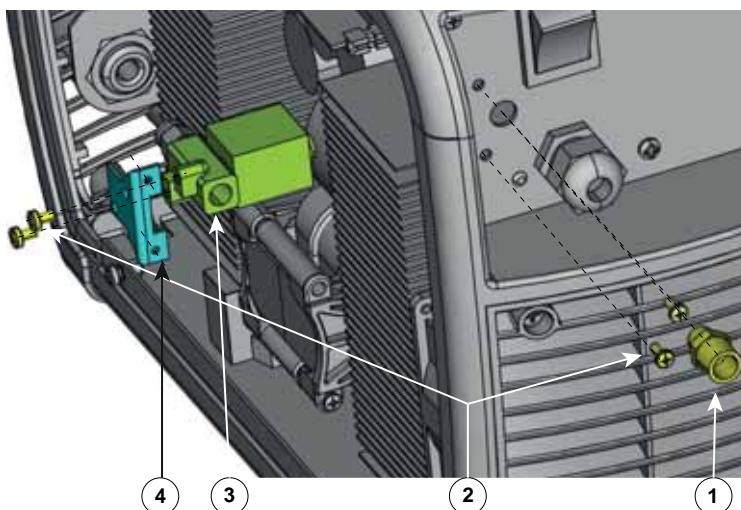
For the component position, refer to the spare parts diagram.

Parts replacement



*A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.*

Faulty part removal instructions



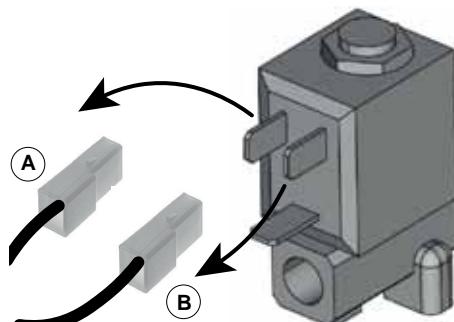
- ▶ Remove upper cover.
- ▶ Remove the fitting for the gas pipe. ①
- ▶ Remove the fixing screws. ②
- ▶ Disconnect the gas pipe and the power cables. ③
- ▶ The solenoid valve is fixed to a metal bracket which must be recovered. ④

Spare part installation instructions



Use a special sealing product to connect the external gas pipe fitting to the solenoid valve.

Diagnostics



Gas solenoid valve

*Measurements to be made with the generator on.
Make the test in open circuit.*

The solenoid valve is driven by a current modulated signal.

To check the correct presence of the supply voltage:

- ▶ Disconnect the connectors connected to points A and B of the solenoid valve.
- ▶ Insert the test leads of the tester on the disconnected cables.
- ▶ Ignite with the torch.
- ▶ Measure the value of the open circuit voltage during triggering.

Mode	Test point	Value	Notes
(V)	A ↔ B	+24 Vdc	

5.13 Wire Feed unit 2 drive rollers code 07.01.324

Spare Part Code

- 07.01.324

Description and functionality

- Integrated 2-roller wire feeder.
- speed = 16 m/min
- supply = 24 Vdc

Position

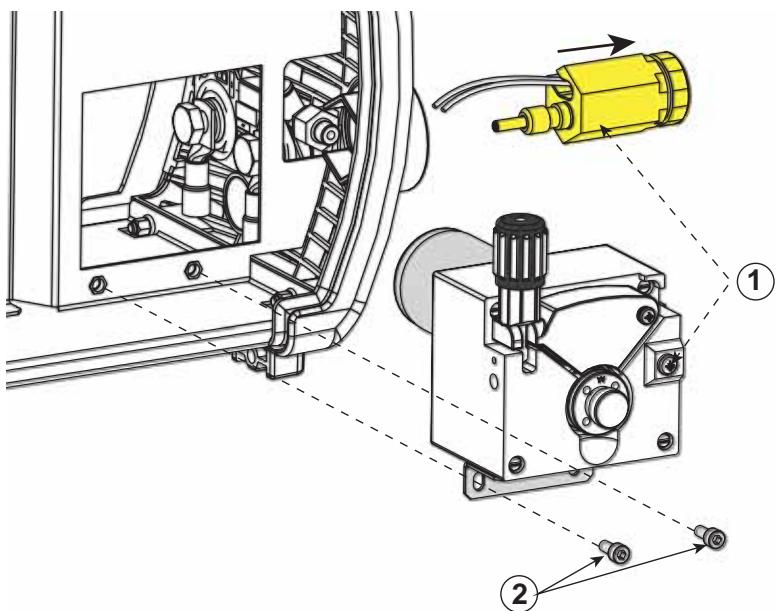
- Part can be reached from the left side panel.



For the component position, refer to the spare parts diagram.

Parts replacement

Faulty part removal instructions



- ▶ Remove upper cover.
- ▶ Remove the fixing screws. ①, ②
- ▶ Remove the central adaptor system.
- ▶ Disconnect the power connector.
- ▶ Remove the component.



A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.

Spare part installation instructions



Be careful to correctly position the motor flange.

Diagnostics



Motor power supply

*Measurements to be made with the generator on.
The voltage value is proportional to the set speed.*

To perform the test:

- Set a wire output speed.
- Keep the torch button pressed for at least 3s.

Mode	Test point	Value	Notes
(V)	J16/1 ← J16/2	+24±10% Vdc	@16m/min
(V)	J16/1 ← J16/2	+19±10% Vdc	@12.3m/min
(V)	J16/1 ← J16/2	+14±10% Vdc	@08.5m/min
(V)	J16/1 ← J16/2	+8,4±10% Vdc	@04,8m/min
(V)	J16/1 ← J16/2	+2,6±10% Vdc	@01,0m/min

5.14 Control panel LCD 3.5" code 15.22.354

Spare Part Code

- 15.22.354

Notes

- Display not available separately

Description and functionality

- Passive remote control, can be considered as the extension as well as the display of the digital card.
- It shows all the selection parameters and the internal set-up menu.

The panel is supplied already assembled complete with:

- Board 15.14.517.
- Display 3.5".
- Screen-printed and aluminum base panel.

The front panel includes:

- Dynamic lcd display.
- Status LED.
- Seven-segment display.
- Selection and rotary encoder.
- Four selection buttons for the various functions related to the context of the display.
- Buttons for recalling and storing programs.
- Buttons for recall and selection of synergies.
- Piezoelectric buzzer that signals the pressure of the keys.

Position

- It is located on the front of the machine at the top.



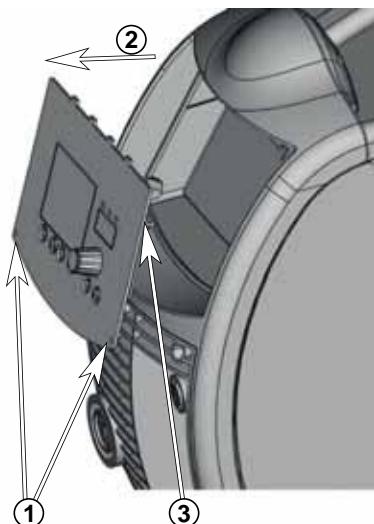
For the component position, refer to the spare parts diagram.

Parts replacement



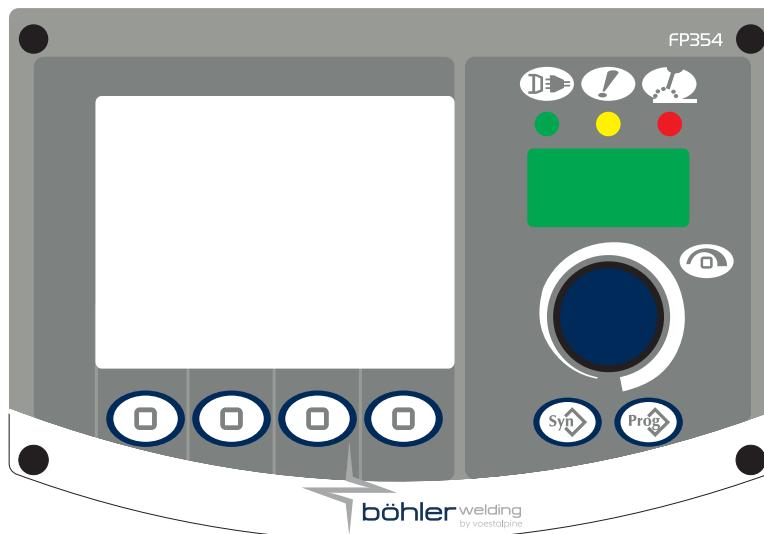
*A cables marking is recommended to an easily machine reassembly.
Always refer to the wiring diagram.*

Faulty part removal instructions



- Remove the fixing screws. ①
- Turn the panel forward. ②
- Disconnect the connectors from the board. ③

Diagnostics



The following section describes:

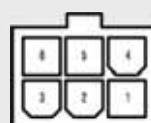
- Connectors on the board with description of the Pin-out where necessary for diagnostics.
- Description of the connections.

The description of the tests to be carried out with the relative reference values are discussed in the "Diagnostic tests" section.



*Warning high voltage!
Always refer to the wiring diagram.*

J12	CAN-bus connection		
J12/1	Input	Power supply	CAN-bus (+15Vdc)
J12/2	Input	Gnd connection	(Gnd)
J12/5	Data bus	CAN-bus signal	(CAN-H)
J12/6	Data bus	CAN-bus signal	(CAN-L)



Led checklist

The following section describes:

- Signaling LEDs present and meaning

Power supply LED

Color:	Green	Status:	Steady on	Description:	Indicates that the equipment is connected to the mains and is on.
--------	-------	---------	-----------	--------------	---

General alarm LED

Color:	Yellow	Status:	Steady on	Description:	Indicates the possible intervention of protection devices such as the temperature protection.
--------	--------	---------	-----------	--------------	---

Power on LED

Color:	Red	Status:	Steady on	Description:	Indicates the presence of voltage on the equipment outlet connections.
--------	-----	---------	-----------	--------------	--

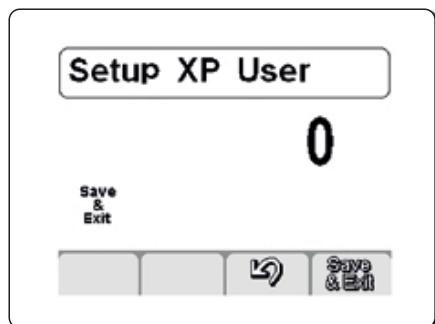
6. SETUP

6.1 Parameter set up and setting

Permits set-up and adjustment of a series of additional parameters for improved and more accurate control of the welding system.

The parameters present at set up are organised in relation to the welding process selected and have a numerical code.

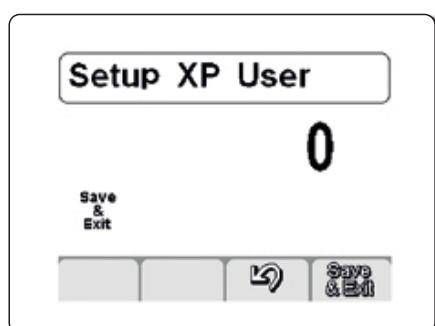
Entry to set up



- It takes place by pressing the encoder key for 5 seconds.
- The entry will be confirmed by the writing 0 on the display

Entrance to advanced set up

SERV



- It takes place by pressing the encoder key for 5 seconds.
- The entry will be confirmed by the writing 0 on the display
- Turn the encoder up to the value: 500.
- Confirm the operation by pressing the encoder key.
- Turn the encoder up to the value: Serv.
- Confirm the operation by pressing the encoder key.
- Turn the encoder up to the value: 358 (password).
- Confirm the operation by pressing the encoder key.

Selection and adjustment of the required parameter

- Rotate the encoder until you display the numerical code for the required parameter.
- If the encoder key is pressed at this point, the value set for the parameter selected can be displayed and adjusted.

Exit from set up

- To quit the "adjustment" section, press the encoder again.
- To exit the set-up, go to parameter "0" (save and quit) and press encoder key.
- Cancel the operation by pressing button .
- To save the change and exit the set up, press the key: .

6.2 Parameter description

 **SERV** Parameters accessible only from the advanced menu.

6.2.1 List of set up parameters (MMA)

0 Save and Exit

Allows you to save the changes and exit the set up.



1 Reset

Allows you to reset all the parameters to the default values.



2 Slope-up (Hot start)

Allows adjustment of the hot start value in MMA.

Permits an adjustable hot start in the arc striking phases, facilitating the start operations.

Minimum	Maximum	Default
0.01 s	2.00 s	0.08 s

3 Hot start

Allows adjustment of the hot start value in MMA.

Permits an adjustable hot start in the arc striking phases, facilitating the start operations.

Basic electrode

Minimum	Maximum	Default
0/off	500%	80%

Cellulosic electrode

Minimum	Maximum	Default
0/off	500%	150%

CrNi electrode

Minimum	Maximum	Default
0/off	500%	100%

Aluminum electrode

Minimum	Maximum	Default
0/off	500%	120%

Cast Iron electrode

Minimum	Maximum	Default
0/off	500%	100%

4 Slope-down (Hot start)

Allows adjustment of the hot start value in MMA.

Permits an adjustable hot start in the arc striking phases, facilitating the start operations.

Minimum	Maximum	Default
0.01 s	2.00 s	0.80 s

7 Welding current

Allows the regulation of the welding current.

Minimum	Maximum	Default
3 A	I _{max}	100 A

8

Arc force

Allows adjustment of the Arc force value in MMA.

Permits an adjustable energetic dynamic response in welding, facilitating the welder's operations.

Increase the value of the Arc force to reduce the risk of electrode sticking.

Basic electrode

Minimum	Maximum	Default
0/off	500%	30%

Cellulosic electrode

Minimum	Maximum	Default
0/off	500%	350%

CrNIElectrode

Minimum	Maximum	Default
0/off	500%	30%

Aluminum electrode

Minimum	Maximum	Default
0/off	500%	100%

Cast Iron electrode

Minimum	Maximum	Default
0/off	500%	70%

201

No-load voltage 

Vrd is a generator Open Circuit voltage control device.

Refer to section "VRD Voltage Reduction Device (Set up 201)".



Minimum	Maximum	Default
12.0 V	63.0V	63.0V

203

Antisticking enable 

Permits enabling or disabling of the antisticking function.

The antisticking function permits reduction of the welding current to 0A in the event of a short circuit occurring between the electrode and the piece, protecting the gun, electrode and welder and guaranteeing safety in the condition that has occurred.

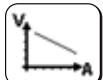
The short circuit time before the antisticking function intervenes:

Value	Antisticking	Default
0/off	INACTIVE	-
0.1s ÷ 2.0s	ACTIVE	0.5s

204

Dynamic power control (DPC)

It enables the desired V/I characteristic to be selected.



I=C Constant current

The increase or reduction in arc length has no effect on the welding current required.

Recommended for electrode: Basic, Rutile, Acid, Steel, Cast iron

1÷20 Falling characteristic with adjustable slope

The increase in arc length causes a reduction in welding current (and vice versa) according to the value imposed by 1 to 20 amps per volt.

Recommended for electrode: Cellulosic, Aluminum

P=C Constant power

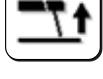
The increase in arc length causes a reduction in the welding current (and vice versa) according to the law: V·I=K

Recommended for electrode: Cellulosic, Aluminum

312

Arc detachment voltage

Allows you to set the voltage value at which the electric arc switch-off is forced.



Allows to manage better the various operating conditions that are created.

In the spot welding phase, for example, a low arc detachment voltage reduces re-striking of the arc when moving the electrode away from the piece, reducing spatter, burning and oxidisation of the piece.

If using electrodes that require high voltages, you are advised to set a high threshold to prevent arc extinction during welding.



Never set an arc detachment voltage higher than the no-load voltage of the power source.

Basic electrode

Minimum	Maximum	Default
0/off	99.9 V	57.0 V

Cellulosic electrode

Minimum	Maximum	Default
0/off	99.9 V	70.0 V



500

**Machine setting**

Allows the selection of the required graphic interface.

Allows access to the higher set-up levels.

Value	Selected level
USER	User
SERV	Service
vaBW	vaBW

501

Info SERV

Allows the display of a set of information related to the system.

Refer to section "INFO screen (Set up 501)".

502

Alarm queue SERV

Allows the intervention of an alarm to be indicated and provides the most important indications for the solution of any problem encountered.

551

Lock/unlock

Allows the locking of the panel controls and the insertion of a protection code.

Refer to section "Lock/unlock (Set up 551)".

552

Buzzer tone

Permits adjustment of the buzzer tone.

Minimum	Maximum	Default
0/off	10	10

700

Welding voltage value compensation SERV

Value	Callback function
on	active circuit resistance calibration Compensation ACTIVE
off	active circuit resistance calibration Compensation IGNORED

With active parameter the generator applies the correction factor calculated by the calibration procedure of the resistive circuit (see Parameter 705) to the welding voltage. The correction is applied both to the set value and to the value read.

With parameter NOT active, the generator ignores the correction factor calculated by the calibration procedure of the resistive circuit (see Parameter 705) at the welding voltage.

701

Current calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Current calibration (Set up 701)" of the generator repair manual.

702

Voltage calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Voltage calibration (Set up 702)" of the generator repair manual.

704

Offset calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Offset calibration (Set up 704)" of the generator repair manual.

748

Standard level Validation SERV

Allows access to the specific system validation procedure.

Refer to the appropriate section of the specific manual.

749

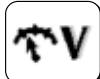
Accuracy level Validation SERV

Allows access to the specific system validation procedure.

Refer to the appropriate section of the specific manual.

751 Current reading

Allow the real value of the welding current to be displayed.

752 Voltage reading

Allows the real value of the welding voltage to be displayed.

753 Feeding phases numbers 

Indicates the number of phases of the power supply.

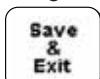
754 Reading voltage power supply 

Displays the voltage value for each phase of the power supply.

800 Read filter (Guard limits) 

Lets you filter current and voltage readings.

Minimum	Maximum	Default
1	5	1

6.2.2 List of set up parameters (TIG)**0 Save and Exit**

Allows you to save the changes and exit the set up.

1 Reset

Allows you to reset all the parameters to the default values.

2 Pre-gas

Allows you to set and adjust the gas flow prior to striking of the arc.

Permits filling of the torch with gas and preparation of the environment for welding.

Minimum	Maximum	Default
0/off	99.9 s	0.1 s

3 Initial current

Allows regulation of the weld starting current.

Allows a hotter or cooler welding pool to be obtained immediately after the arc striking.

Minimum	Maximum	Default
1%	500%	50%

Minimum	Maximum	Default
3 A	Imax	-

5 Initial current time

Allows setting of the time for which the initial current is maintained.

Minimum	Maximum	Default
0/off	99.9 s	0/off

6 Slope-up

Allows you to set a gradual passage between the initial current and the welding current.

Minimum	Maximum	Default
0/off	99.9 s	0/off

19

Final current time

Makes it possible to set the time for which the final current is maintained.



Minimum	Maximum	Default
0/off	99.9 s	0/off

20

Post-gas

Permits setting and adjustment of the gas flow at the end of welding.

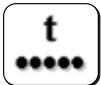


Minimum	Maximum	Default
0.0 s	99.9 s	syn

204

Spot welding

Allows you to enable the "spot welding" process and establish the welding time.



Allows the timing of the welding process.

Minimum	Maximum	Default
0/off	99.9 s	0/off

205

Restart

Allows the activation of the restart function.



Allows the immediate extinguishing of the arc during the down slope or the restarting of the welding cycle.

Value	Default	Callback function
0/off	-	off
1/on	X	on
2/of1	-	off

206

Easy joining

Allows striking of the arc in pulsed current and timing of the function before the automatic reinstatement of the pre-set welding conditions.

Allows greater speed and accuracy during tack welding operations on the parts

Minimum	Maximum	Default
0.1 s	25.0 s	0/off

208

Microtime spot welding

Allows you to enable the "microtime spot welding" process.

Allows the timing of the welding process.

Minimum	Maximum	Default
0.01 s	1.00 s	0/off

306

Short circuit current (Lift start) 🔐 SERV

It allows to vary the trigger current

Minimum	Maximum	Default
3 A	I _{max}	30 A

312

Arc detachment voltage

Allows you to set the voltage value at which the electric arc switch-off is forced.

Allows to manage better the various operating conditions that are created.

In the spot welding phase, for example, a low arc detachment voltage reduces re-striking of the arc when moving the electrode away from the piece, reducing spatter, burning and oxidisation of the piece.

If using electrodes that require high voltages, you are advised to set a high threshold to prevent arc extinction during welding.

Basic electrode

Minimum	Maximum	Default
0/off	99.9 V	57.0 V

Cellulosic electrode

Minimum	Maximum	Default
0/off	99.9 V	70.0 V



500

**Machine setting**

Allows the selection of the required graphic interface.

Allows access to the higher set-up levels.

Value	Selected level
USER	User
SERV	Service
vaBW	vaBW

501

Info SERV

Allows the display of a set of information related to the system.

Refer to section "INFO screen (Set up 501)".

502

Alarm queue SERV

Allows the intervention of an alarm to be indicated and provides the most important indications for the solution of any problem encountered.

551

Lock/unlock

Allows the locking of the panel controls and the insertion of a protection code.

Refer to section "Lock/unlock (Set up 551)".

552

Buzzer tone

Permits adjustment of the buzzer tone.

Minimum	Maximum	Default
0/off	10	10

700

Welding voltage value compensation SERV

With active parameter the generator applies the correction factor calculated by the calibration procedure of the resistive circuit (see Parameter 705) to the welding voltage. The correction is applied both to the set value and to the value read.

With parameter NOT active, the generator ignores the correction factor calculated by the calibration procedure of the resistive circuit (see Parameter 705) at the welding voltage.

Value	Callback function
on	active circuit resistance calibration Compensation ACTIVE
off	active circuit resistance calibration Compensation IGNORED

701

Current calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Current calibration (Set up 701)" of the generator repair manual.

702

Voltage calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Voltage calibration (Set up 702)" of the generator repair manual.

704

Offset calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Offset calibration (Set up 704)" of the generator repair manual.

748

Standard level Validation SERV

Allows access to the specific system validation procedure.

Refer to the appropriate section of the specific manual.

749

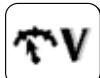
Accuracy level Validation SERV

Allows access to the specific system validation procedure.

Refer to the appropriate section of the specific manual.

751 Current reading

Allow the real value of the welding current to be displayed.

752 Voltage reading

Allows the real value of the welding voltage to be displayed.

753 Feeding phases numbers 

Displays the number of phases of the power supply.

754 Reading voltage power supply 

Displays the voltage value for each phase of the power supply.

800 Read filter (Guard limits) 

Lets you filter current and voltage readings.

Minimum	Maximum	Default
1	5	1

853 TIG Lift Start

It allows you to choose between using a TIG torch with a button or without a trigger button.

Value	Default	TIG Lift Start
on	X	trigger and gas valve controlled by torch button
off	-	power always active

6.2.3 List of set up parameters (MIG/MAG)**0 Save and Exit**

Allows you to save the changes and exit the set up.

1 Reset

Allows you to reset all the parameters to the default values.

2 Synergy

Allows selection of the manual MIG ( off) or synergic MIG ( 6) process by setting the type of material to be welded.

3 Wire speed

Allows the regulation of the wire feed rate.

Minimum	Maximum	Default
0.5 m/min	22.0 m/min	-

4 Current

Allows the regulation of the welding current.

Minimum	Maximum
3 A	I _{max}

5 Workpiece thickness

Allows the thickness of the part being welded to be set.

Allows the setting of the system via the regulation of the part being welded.



6

Corner bead "a"

Allows you to set bead depth in a corner joint.



7

Voltage - arc length

Allows the regulation of the arc voltage.

Allows regulation of the arc length during welding.

High voltage = long arc

Low voltage = short arc

Manual mode

Minimum	Maximum	Default
5.0 V	55.5 V	5.0 V

10

Pre-gas

Allows you to set and adjust the gas flow prior to striking of the arc.

Permits filling of the torch with gas and preparation of the environment for welding.



Minimum	Maximum	Default
0/off	99.9 s	0.1 s

11

Soft start

Permits adjustment of the wire feed speed in the phases prior to arc striking.

Permits striking at reduced speed, therefore softer and with less spatter.



Minimum	Maximum	Default
10 %	100 %	50 %

12

Motor slope

Allows you to set a gradual transition between the sparking wire speed and the welding wire speed.



Minimum	Maximum	Default
0/off	1.0 s	0/off

15

Burn back

Permits adjustment of the wire burn time, preventing sticking at the end of welding.

Permits adjustment of the length. Permits adjustment of the length of the piece of wire outside the torch.



Minimum	Maximum	Default
-2.00	+2.00	0/syn

16

Post-gas

Permits setting and adjustment of the gas flow at the end of welding.



Minimum	Maximum	Default
0/off	99.9 s	2.0 s

25

Initial increment

Allows regulation of the wire speed value during the first "crater-filler" welding phase.

Makes it possible to increase the energy supplied to the part during the phase when the material (still cold) requires more heat in order to melt evenly.



Minimum	Maximum	Default
20 %	200 %	120 %

26

Crater filler

Allows regulation of the wire speed value during the weld closing phase.

Makes it possible to reduce the energy supplied to the part during the phase when the material is already very hot, thus reducing the risk of unwanted deformations.



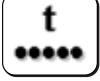
Minimum	Maximum	Default
20 %	200 %	80 %

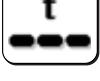
- 27 Initial increment time**

 Lets you set the initial increment time.
 Lets you automate the "crater filler" function.

Minimum	Maximum	Default
0.1 s	99.9 s	0/off
- 28 Crater filler time**

 Lets you set the "crater filler" time.
 Lets you automate the "crater filler" function.

Minimum	Maximum	Default
0.1 s	99.9 s	0/off
- 30 Spot welding**

 Allows you to enable the "spot welding" process and establish the welding time.

Minimum	Maximum	Default
0.1 s	99.9 s	0/off
- 31 Pause point**

 Allows you to enable the "pause point" process and establish the pause time between one welding operation and another.

Minimum	Maximum	Default
0.1 s	99.9 s	0/off
- 34 Initial increase slope**

 Allows to set a gradual transition between the initial wire speed and the welding wire speed.

Minimum	Maximum	Default
0 s	10 s	0/off
- 35 Crater filler slope**

 Allows to set a gradual transition between the welding wire speed and crater filler wire speed.

Minimum	Maximum	Default
0 s	10 s	0/off
- 202 Inductance**

 Allows electronic regulation of the series inductance of the welding circuit.
 Makes it possible to obtain a quicker or slower arc to compensate for the welder's movements and for the natural welding instability.
 Low inductance = reactive arc (more spatter).
 High inductance = less reactive arc (less spatter).

Minimum	Maximum	Default
-30	+30	0/syn
- 331 Tensione media compensata**

 Lets you set welding voltage.
- 500 Machine setting**

 Allows the selection of the required graphic interface.
 Allows access to the higher set-up levels.

Value	Selected level
USER	User
SERV	Service
vaBW	vaBW
- 501 Info SERV**

 Allows the display of a set of information related to the system.
 Refer to section "INFO screen (Set up 501)".



502

**Alarm queue** SERV

Allows the intervention of an alarm to be indicated and provides the most important indications for the solution of any problem encountered.

551

**Lock/unlock**

Allows the locking of the panel controls and the insertion of a protection code.
Refer to section "Lock/unlock (Set up 551)".

552

**Buzzer tone**

Permits adjustment of the buzzer tone.

Minimum	Maximum	Default
0/off	10	10

700

**Welding voltage value compensation** SERV

With active parameter the generator applies the correction factor calculated by the calibration procedure of the resistive circuit (see Parameter 705) to the welding voltage. The correction is applied both to the set value and to the value read.

With parameter NOT active, the generator ignores the correction factor calculated by the calibration procedure of the resistive circuit (see Parameter 705) at the welding voltage.

Value	Callback function
on	active circuit resistance calibration Compensation ACTIVE
off	active circuit resistance calibration Compensation IGNORED

701

**Current calibration** SERV

Allows access to the specific system calibration procedure.

Refer to section "Current calibration (Set up 701)" of the generator repair manual.

702

**Voltage calibration** SERV

Allows access to the specific system calibration procedure.

Refer to section "Voltage calibration (Set up 702)" of the generator repair manual.

703

Gas calibration SERV

704

Offset calibration SERV

Allows access to the specific system calibration procedure.

Refer to section "Offset calibration (Set up 704)" of the generator repair manual.

705

Circuit resistance calibration

Allows the calibration of the system.

Refer to section "Circuit resistance calibration (set up 705)".

707

**Motor calibration** SERV

Allows calibration of the wire feeder speed.

Refer to section "Motor calibration (Set up 707)".

748

**Standard level Validation** SERV

Allows access to the specific system validation procedure.

Refer to the appropriate section of the specific manual.

749

**Accuracy level Validation** SERV

Allows access to the specific system validation procedure.

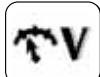
Refer to the appropriate section of the specific manual.

751

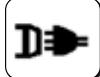
Current reading

Allow the real value of the welding current to be displayed.

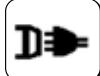


752 **Voltage reading**

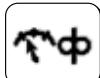
Allows the real value of the welding voltage to be displayed.

753 **Feeding phases numbers SERV**

Displays the number of phases of the power supply.

754 **Reading voltage power supply SERV**

Displays the voltage value for each phase of the power supply.

757 **Wire speed reading**

Allow the value of the motor encoder 1 to be displayed.

760 **Current reading (motor 1)**

Allow the real value of the current to be displayed (motor 1).

800 **Read filter (Guard limits) SERV**

Lets you filter current and voltage readings.

Minimum	Maximum	Default
1	5	1

6.3 Specific procedures parameters

6.3.1 7 segment display personalisation

It allows you to constantly view the value of a parameter on the 7-segment display.

The screenshot shows a 'Setup XP vaBW' screen. At the top, it says 'Setup XP vaBW'. Below that is a large 7-segment display showing the digit '4'. To the left of the display is the letter 'I'. To the right is the letter 'A'. At the bottom, there are two buttons: one labeled 'Save & Exit' and another labeled 'Save & Exit' with a small icon. The background is slightly blurred, showing the rest of the welding machine's control panel.

- ▶ Enter set-up by pressing the encoder button for at least 5 seconds.
- ▶ Select the required parameter by rotating the encoder.
- ▶ Store the selected parameter in the 7 segment display by pressing button .
- ▶ Save and exit the current screen by pressing button .

6.3.2 VRD Voltage Reduction Device (Set up 201)

Service parameter SERV

Vrd is a generator Open Circuit voltage control device.

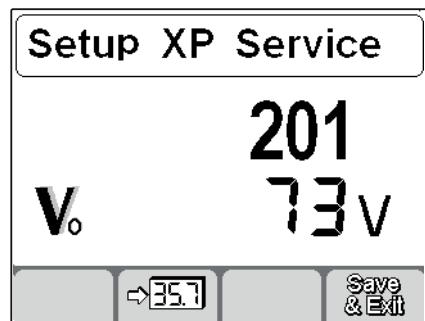
Preliminary operations

- Set the generator in mode: MMA



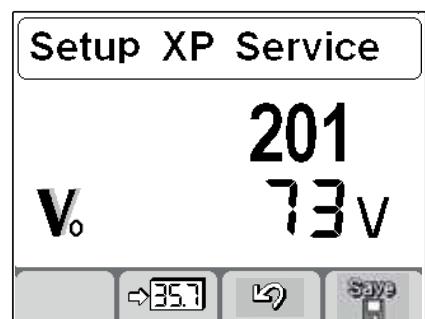
Keep the generator disconnected from any static loads.

Entry to set up



- Press and hold the encoder button for 5 seconds.
- The entry will be confirmed by the writing 0 on the display
- Turn the encoder up to the value: 500.
- Confirm the operation by pressing the encoder key.
- Turn the encoder up to the value: Serv.
- Confirm the operation by pressing the encoder key.
- Turn the encoder up to the value: 358 (password).
- Confirm the operation by pressing the encoder key.
- Turn the encoder up to the value: 201
- Confirm the operation by pressing the encoder key.

No-load voltage variation of the generator

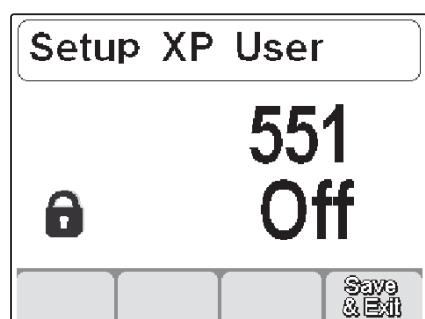


- Press the encoder key to start the procedure.
- Change the value of the no-load voltage by turning the encoder until the desired value
- To save the change, press the button: .
- Cancel the operation by pressing button .
- To save the change and exit the set up, press the key: .

6.3.3 Lock/unlock (Set up 551)

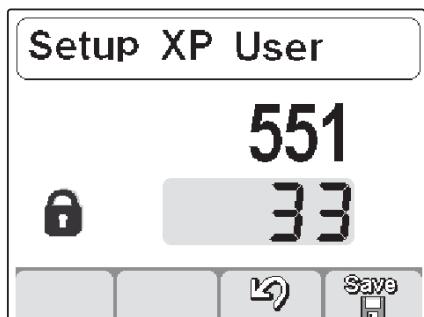
Allows the locking of the panel controls and the insertion of a protection code.

Parameter selection



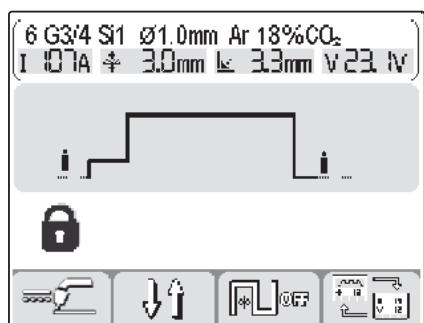
- Enter set-up by pressing the encoder button for at least 5 seconds.
- Select the required parameter (551).
- Activate the regulation of the selected parameter by pressing the encoder button.

Password setting



- ▶ Set a numerical code (password) by rotating the encoder.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Cancel the operation by pressing button .
- ▶ To save the change, press the button: .

Panel functions



The carrying out of any operation on a locked control panel causes a special screen to appear.

- ▶ Access the panel functionalities temporarily (5 minutes) by rotating the encoder and entering the correct password.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Unlock the control panel definitively by entering set-up (follow the instructions given above) and bring back parameter 551 to "off".
- ▶ Confirm the operation by pressing the encoder key.
- ▶ To save the change, press the button: .

6.3.4 Offset calibration (Set up 704)

Service parameter SERV



The calibration does not provide for output current, consequently the short circuit is to be understood as a simple reference of potential at "0".

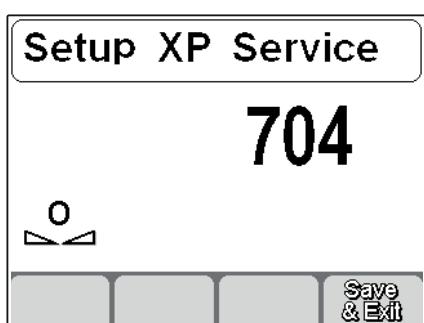
Preliminary operations

- ▶ Set the generator in mode: MIG/MAG



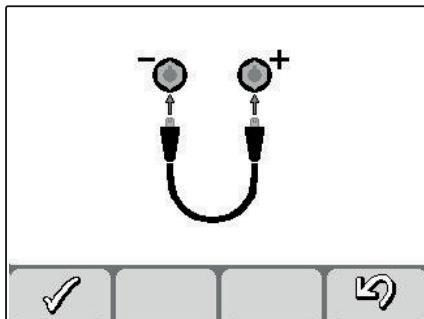
Do not perform calibration with generator set in mma.

Entry to set up



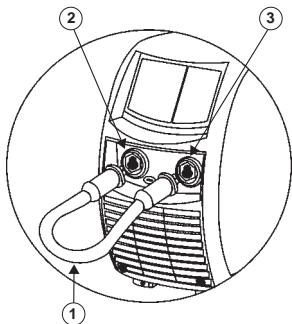
- ▶ Press and hold the encoder button for 5 seconds.
- ▶ The entry will be confirmed by the writing 0 on the display
- ▶ Turn the encoder up to the value: 500.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: Serv.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: 358 (password).
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: 704.
- ▶ Confirm the operation by pressing the encoder key.

Offset calibration



- As the figure suggests, to produce it is necessary to short-circuit the bushings.

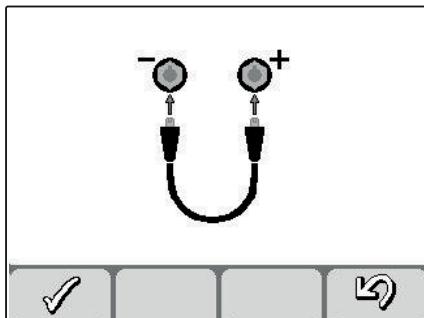
Short circuit connection



- ① Copper cable to perform short circuit
- ② Negative power socket (-)
- ③ Positive power socket (+)

► Short the Negative socket to the Positive socket using a copper wire.

Offset calibration



- Confirm the operation by pressing button .
- Cancel the operation by pressing button .



- Wait for the schematic to change indicating that the short circuit can be removed.
- Remove the short circuit.
- To save the change, press the button:
- Once the operation is completed, the system will reposition the display to the parameter entry screen.
- To save the change and exit the set up, press the key:

6.3.5 Voltage calibration (Set up 702)

Service parameter

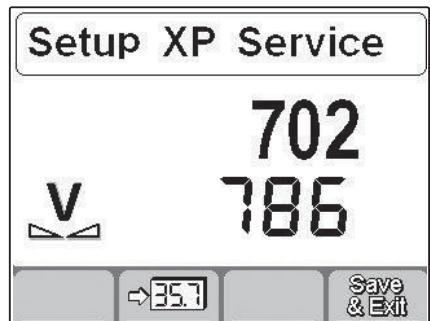
Preliminary operations

- ▶ Set the generator in mode: MIG/MAG
- ▶ Set the digital multimeter to DC voltage measurement mode.



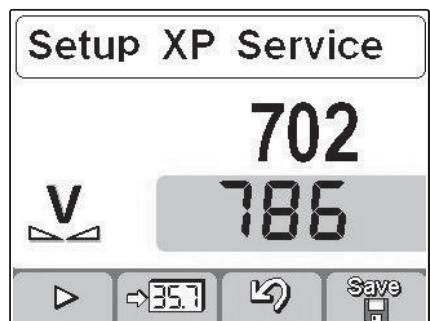
Keep the generator disconnected from any static loads.

Entry to set up

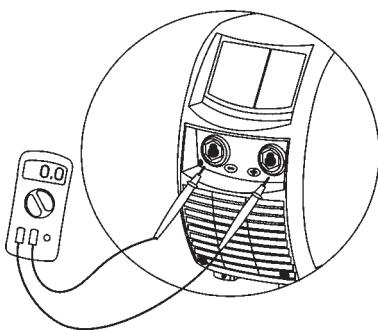


- ▶ Press and hold the encoder button for 5 seconds.
- ▶ The entry will be confirmed by the writing 0 on the display
- ▶ Turn the encoder up to the value: 500.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: Serv.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: 358 (password).
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: 702.
- ▶ Confirm the operation by pressing the encoder key.

Offset calibration



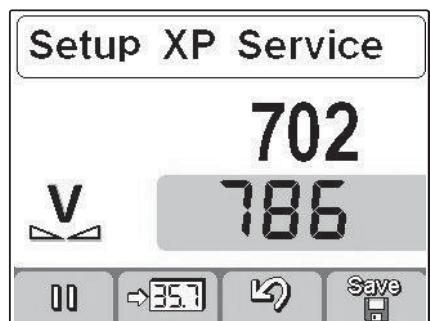
- ▶ Press the button to start the procedure.



- ▶ Measure the no-load voltage of the generator with the multimeter by positioning the test leads between the socket and the socket.
- ▶ Use the encoder knob to change the value of the parameter shown on the display until the voltage measured on the multimeter is set at 35Vdc.



A pure number not an electrical quantity is displayed on the generator display.



- ▶ Press the button to finish the procedure.
- ▶ To save the change, press the button: .
- ▶ Cancel the operation by pressing button .
- ▶ Once the operation is completed, the system will reposition the display to the parameter entry screen.
- ▶ To save the change and exit the set up, press the key: .

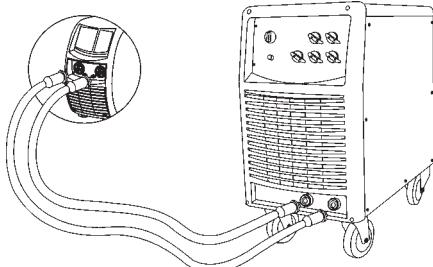
6.3.6 Current calibration (Set up 701)

Service parameter **SERV**

Preliminary operations

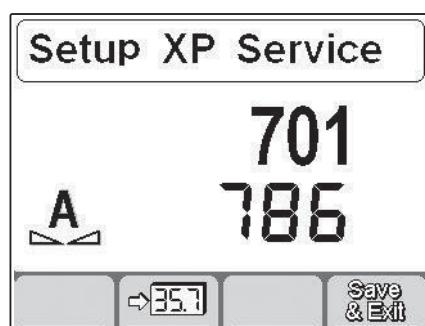


Calibration provides for output current so take precautions and connect everything you need to weld at the set current.



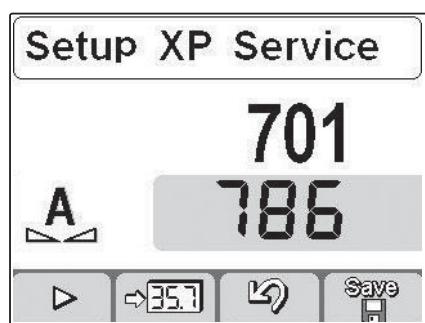
- ▶ Use a suitable calibrated instrument for reading the output current.
- ▶ Set the generator in mode: MIG/MAG
 - ↓ alternatively, if available:
- ▶ Use a static load of appropriate size.
- ▶ Set the generator in mode: MMA
- ▶ Prepare the static load for an output current of: 200A.

Entry to set up

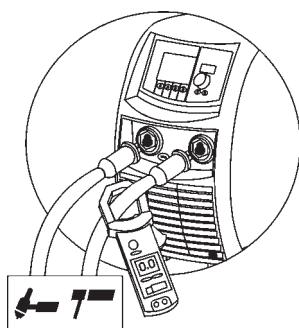


- ▶ Press and hold the encoder button for 5 seconds.
- ▶ The entry will be confirmed by the writing 0 on the display
- ▶ Turn the encoder up to the value: 500.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: Serv.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: 358 (password).
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: 701.
- ▶ Confirm the operation by pressing the encoder key.

Offset calibration



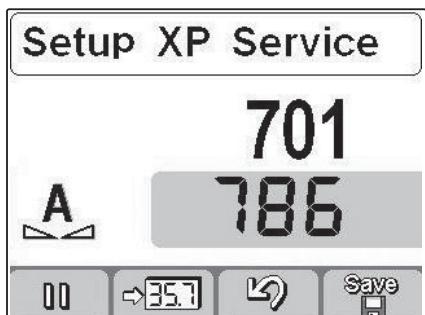
- ▶ Press the button to start the procedure.
- ▶ The generator will set itself to deliver a current of: 200A.



- ▶ Allow the generator to deliver current by pressing the torch trigger or by activating the static load.
- ▶ Rotate the encoder and then modify the factory value found until reaching the real 200A read by the appropriately calibrated amperometric clamp.



Be careful to stay within ± 20 with respect to the set-up value found, otherwise check the amperometric clamp or the real current delivered.

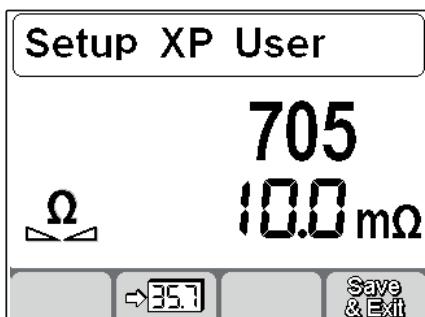


- ▶ Press the button to finish the procedure.
- ▶ To save the change, press the button: .
- ▶ Cancel the operation by pressing button .
- ▶ Once the operation is completed, the system will reposition the display to the parameter entry screen.
- ▶ To save the change and exit the set up, press the key: .

6.3.7 Circuit resistance calibration (set up 705)

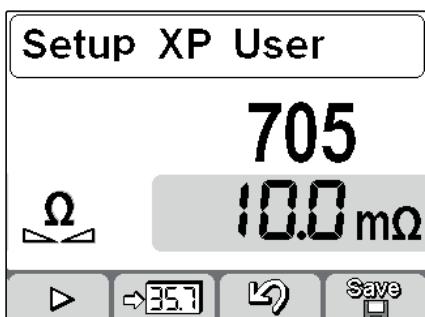
Allows to calibrate the generator on the current welding circuit resistance.

Parameter selection



- ▶ Enter set-up by pressing the encoder button for at least 5 seconds.
- ▶ Select the required parameter (705).
- ▶ Activate the regulation of the selected parameter by pressing the encoder button.
- ▶ Connect the generator to the welding circuit (bench or piece).
- ▶ Remove the cap to put the nozzle holder tip of the exposed torch. (MIG/MAG)

Calibration



- ▶ Place the tip of the wire guide in electrical contact with the work piece. (MIG/MAG)
- ▶ Press the button to start the procedure.
- ▶ Maintain contact for at least one second.
- ▶ The value shown on the display will update after calibration.
- ▶ Confirm the operation by pressing button .
- ▶ Cancel the operation by pressing button .
- ▶ To save the change and exit the set up, press the key: .

6.3.8 Motor calibration (Set up 707)

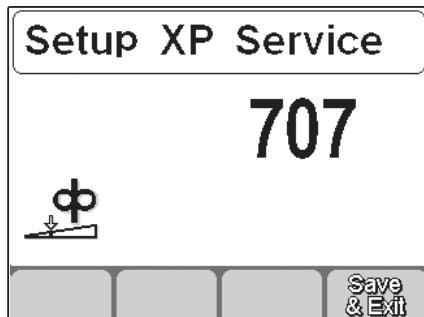
Service parameter  SERV

Allows calibration of the wire feeder speed.

Preliminary operations

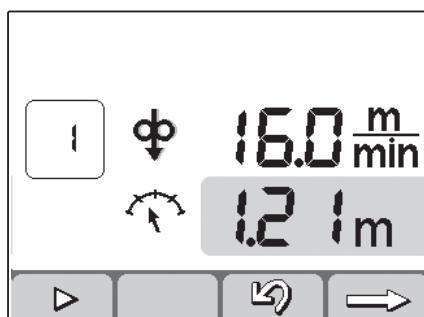
- ▶ Set the generator in mode: MIG/MAG

Entry to set up

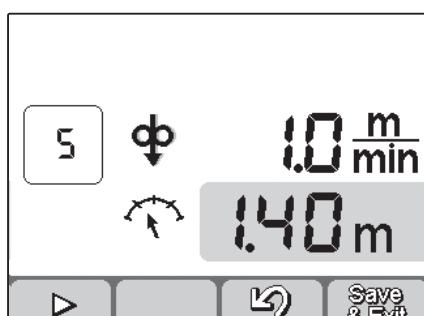


- ▶ Press and hold the encoder button for 5 seconds.
- ▶ The entry will be confirmed by the writing 0 on the display
- ▶ Turn the encoder up to the value: 500.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: Serv.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Turn the encoder up to the value: 358 (password).
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Select the required parameter (707).
- ▶ Confirm the operation by pressing the encoder key.

Offset calibration



- ▶ The first calibration step screen opens.
- ▶ Press the  button to start the procedure.
- ▶ The wire exits the wire feeder for a predetermined time.
- ▶ Use a meter to measure the length of the wire out of the wire feeder.
- ▶ Confirm the operation by pressing the encoder key.
- ▶ Press the button  to go to the next step.



- ▶ Repeat the same procedure for steps 2-3-4-5.
- ▶ To save the change, press the button: .
- ▶ Cancel the operation by pressing button .
- ▶ When the operation ends, the system returns the display to the parameter entry screen.
- ▶ To save the change and exit the set up, press the key: .

7. ALARMS

All the alarms and all the guard limits relating to the system are listed below.

ALARM

Activation of an alarm or the passing of any critical limit causes a visual signal to appear on the control panel and the immediate shut-down of welding operations.

WARNING

Exceeding a guard limit causes a visual signal on the control panel but allows the welding operations to continue.



E01

Overtemperature

Alarm directly connected to the NTC on the primary side

The alarm can be triggered by an over temperature generated by a long working time at high currents

- » Check that the fans are working properly
- » Wait the generator cooling down

The alarm can be triggered when the generator is just on (generator status "cold")

- » The NTC may be defective or a connection cable may be disconnected
- » Refer to section "Checking primary thermal probes"



E03

Overtemperature

Alarm directly connected to the NTC secondary side

The alarm can be triggered by an over temperature generated by a long working time at high currents

- » Check that the fans are working properly
- » Wait the generator cooling down

The alarm can be triggered when the generator is just on (generator status "cold")

- » The NTC2 may be defective or a connection cable may be disconnected
- » Refer to section "Secondary thermal probe control"



E07

Wire feeder motor power supply fault

Possible anomaly in the engine fuel system

- » Perform the wire feeder motor board checks as described in the specific section of the repair manual
- » Perform the generator power supply board checks as described in the specific section of the repair manual



E08

Blocked motor

A motor lock or no encoder signal has occurred

- » Check the correct encoder insertion on the motor shaft
- » Check the correct cables insertion
- » Check the correct roller block insertion, check there are no obstacles to the motor movement without load
- » Refer to the maintenance section of the wire feeder repair manual



E10

Power module overcurrent (Inverter)

Overcurrent on primary inverter stage may occurred

- » Perform the checks on the inverter unit as described in the specific section with particular attention to the checks on the primary
- » Perform the checks on the diodes of the output rectifier stage



⚠ E13

Communication error

CAN BUS communication error

- » Perform a generator reset
- » Perform a system software update

Lack of power supply on digital card

- » Check the power supply circuits of the generator digital control board
- » Perform the checks indicated in the manual described in the specific section

Faulty device connected to the CAN BUS

- » Disconnect all the devices that communicate with CAN BUS from the generator (WF, WU, RC, torch, etc...)
- » If the error persists, try replacing the front panel or digital control board
- » If the error disappears when the devices are disconnected, connect the previously disconnected devices in sequence and check which one causes the error
- » Check the devices found to be faulty by consulting the respective repair manual



⚠ E19

System configuration error

Incompatible software versions

- » Check the software versions of the system components. If they are incompatible, perform a software update by aligning the versions

Incompatible hardware versions

- » Check the versions of the boards and components that make up the system. If they are incompatible, replace the devices with those of the correct version

Hardware failure

- » Check that the Bus board connectors are correctly inserted
- » Check the integrity of the BUS RACK board
- » Perform checks on the analog control board
- » Perform the digital control board checks
- » For the checks to perform, refer to the specific sections of the manual



⚠ E20

Memory fault

Digital board EEPROM memory fault may occurred

- » Restart the generator
- » Perform a generator reset
- » If the problem persists, replace the generator digital control board



⚠ E21

Data loss

Corrupt data stored on the EEPROM memory of the digital control board

- » Perform a generator reset
- » Perform the digital control board checks and replace it if necessary



⚠ E39

System power supply fault

The system has detected an incorrect supply voltage value

- » Restart the system
- » Perform on the phases of the general power supply a check

Power supply circuit hardware failure

- » Check the integrity of the plug and the power cable
- » Check the integrity of the power switch as illustrated in the specific section
- » Check the integrity of the input filter board as illustrated in the specific section
- » Perform the analog control board checks as illustrated in the relevant section


E41
Overvoltage

The system has detected an overvoltage on one or more phases

- » Restart the system
- » Perform on the phases of the general power supply a check

Power supply circuit hardware failure

- » Check the integrity of the plug and the power cable
- » Check the integrity of the power switch as illustrated in the specific section
- » Check the integrity of the input filter board as illustrated in the specific section
- » Perform the analog control board checks as illustrated in the relevant section


E42
Undervoltage

The system has detected an undervoltage on one or more phases

- » Restart the system
- » Perform on the phases of the general power supply a check

Power supply circuit hardware failure

- » Check the integrity of the plug and the power cable
- » Check the integrity of the power switch as illustrated in the specific section
- » Check the integrity of the input filter board as illustrated in the specific section
- » Perform the analog control board checks as illustrated in the relevant section

8. TROUBLESHOOTING

The system fails to come on (green LED off)

Cause

» No mains voltage at the socket.

» Faulty plug or cable.

» Line fuse blown.

» Faulty on/off switch.

» Connection between wire feed carriage and generator incorrect or faulty.

» Faulty electronics.

Solution

» Check and repair the electrical system as needed.

» Use qualified personnel only.

» Replace the faulty component.

» Contact the nearest service centre to have the system repaired.

» Replace the faulty component.

» Contact the nearest service centre to have the system repaired.

» Check that the various parts of the system are properly connected.

» Contact the nearest service centre to have the system repaired.

No output power (the system does not weld)

Cause

» Faulty torch trigger button.

» The system has overheated (temperature alarm - yellow LED on).

» Side cover open or faulty door switch.

» Incorrect earth connection.

» Mains voltage out of range (yellow LED on).

» Faulty electronics.

Solution

» Replace the faulty component.

» Contact the nearest service centre to have the system repaired.

» Wait for the system to cool down without switching it off.

» In order to ensure safe operation the side cover must be closed while welding.

» Replace the faulty component.

» Contact the nearest service centre to have the system repaired.

» Earth the system correctly.

» Read the paragraph "Installation".

» Bring the mains voltage within the power source admissible range.

» Connect the system correctly.

» Read the paragraph "Connections".

» Contact the nearest service centre to have the system repaired.

Incorrect output power

Cause	Solution
» Incorrect selection in the welding process or faulty selector switch.	» Select the welding process correctly. » Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» System parameters or functions set incorrectly.	» Reset the system and the welding parameters.
» Faulty potentiometer/encoder for the adjustment of the welding current.	» Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» Mains voltage out of range.	» Connect the system correctly. » Read the paragraph "Connections".
» Input mains phase missing.	» Connect the system correctly. » Read the paragraph "Connections".
» Faulty electronics.	» Contact the nearest service centre to have the system repaired.

Wire feeder fails

Cause	Solution
» Faulty torch trigger button.	» Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» Incorrect or worn rollers.	» Replace the rollers.
» Faulty wire feeder.	» Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» Damaged torch liner.	» Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» No power supply to the wire feeder.	» Check the connection to the power source. » Read the paragraph "Connections". » Contact the nearest service centre to have the system repaired.
» Tangled wire on the spool.	» Untangle the wire or replace the wire spool.
» Melted torch nozzle (wire stuck)	» Replace the faulty component.

Irregular wire feeding

Cause	Solution
» Faulty torch trigger button.	» Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» Incorrect or worn rollers.	» Replace the rollers.
» Faulty wire feeder.	» Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» Damaged torch liner.	» Replace the faulty component. » Contact the nearest service centre to have the system repaired.
» Incorrect spindle clutch or misadjusted rolls locking devices.	» Release the clutch. » Increase the rolls locking pressure.

Arc instability

Cause	Solution
» Insufficient shielding gas.	» Adjust the air flow. » Check that the diffuser and the gas nozzle of the torch are in good condition.
» Humidity in the welding gas.	» Always use quality materials and products. » Ensure the gas supply system is always in perfect condition.
» Incorrect welding parameters.	» Check the welding system carefully. » Contact the nearest service centre to have the system repaired.

Excessive spatter

Cause	Solution
» Incorrect arc length.	» Decrease the distance between the electrode and the piece. » Decrease the welding voltage.
» Incorrect welding parameters.	» Decrease the welding current.
» Insufficient shielding gas.	» Adjust the air flow. » Check that the diffuser and the gas nozzle of the torch are in good condition.
» Incorrect arc regulation.	» Increase the equivalent circuit inductive value setting. » Use a higher setting inductive connection.
» Incorrect welding mode.	» Decrease the torch angle.

Insufficient penetration

Cause	Solution
» Incorrect welding mode.	» Decrease the travel speed while welding.
» Incorrect welding parameters.	» Increase the welding current.
» Incorrect electrode.	» Use a smaller diameter electrode.
» Incorrect edge preparation.	» Increase the chamfering.
» Incorrect earth connection.	» Earth the system correctly. » Read the paragraph "Installation".
» Pieces to be welded too big.	» Increase the welding current.

Slag inclusions

Cause	Solution
» Poor cleanliness.	» Clean the pieces accurately before welding.
» Electrode diameter too big.	» Use a smaller diameter electrode.
» Incorrect edge preparation.	» Increase the chamfering.
» Incorrect welding mode.	» Decrease the distance between the electrode and the piece. » Move regularly during all the welding operations.

Tungsten inclusions

Cause	Solution
» Incorrect welding parameters.	» Decrease the welding current. » Use a bigger diameter electrode.
» Incorrect electrode.	» Always use quality materials and products. » Sharpen the electrode carefully.
» Incorrect welding mode.	» Avoid contact between the electrode and the weld pool.

Blowholes

Cause	Solution
» Insufficient shielding gas.	» Adjust the air flow. » Check that the diffuser and the gas nozzle of the torch are in good condition.

Sticking

Cause	Solution
» Incorrect arc length.	» Increase the distance between the electrode and the piece. » Increase the welding voltage.
» Incorrect welding parameters.	» Increase the welding current. » Increase the welding voltage.
» Incorrect welding mode.	» Angle the torch more.
» Pieces to be welded too big.	» Increase the welding current.
» Incorrect arc regulation.	» Increase the equivalent circuit inductive value setting. » Use a higher setting inductive connection.

Undercuts

Cause	Solution
» Incorrect welding parameters.	» Decrease the welding current. » Use a smaller diameter electrode.
» Incorrect arclength.	» Decrease the distance between the electrode and the piece. » Decrease the welding voltage.
» Incorrect welding mode.	» Decrease the side oscillation speed while filling. » Decrease the travel speed while welding.
» Insufficient shielding gas.	» Use gases suitable for the materials to be welded.

Oxidations

Cause	Solution
» Insufficient shielding gas.	» Adjust the air flow. » Check that the diffuser and the gas nozzle of the torch are in good condition.

Porosity

Cause	Solution
» Grease, varnish, rust or dirt on the workpieces to be welded.	» Clean the pieces accurately before welding.
» Grease, varnish, rust or dirt on the filler material.	» Always use quality materials and products. » Keep the filler metal always in perfect condition.
» Humidity in the filler metal.	» Always use quality materials and products. » Keep the filler metal always in perfect condition.
» Incorrect arclength.	» Decrease the distance between the electrode and the piece. » Decrease the welding voltage.
» Humidity in the welding gas.	» Always use quality materials and products. » Ensure the gas supply system is always in perfect condition.
» Insufficient shielding gas.	» Adjust the air flow. » Check that the diffuser and the gas nozzle of the torch are in good condition.
» The weld pool solidifies too quickly.	» Decrease the travel speed while welding. » Pre-heat the workpieces to be welded. » Increase the welding current.

Hot cracks

Cause	Solution
» Incorrect welding parameters.	» Decrease the welding current. » Use a smaller diameter electrode.
» Grease, varnish, rust or dirt on the workpieces to be welded.	» Clean the pieces accurately before welding.
» Grease, varnish, rust or dirt on the filler material.	» Always use quality materials and products. » Keep the filler metal always in perfect condition.
» Incorrect welding mode.	» Carry out the correct sequence of operations for the type of joint to be welded.
» Pieces to be welded have different characteristics.	» Carry out buttering before welding.

Cold cracks

Cause	Solution
» Humidity in the filler metal.	» Always use quality materials and products. » Keep the filler metal always in perfect condition.
» Particular geometry of the joint to be welded.	» Pre-heat the workpieces to be welded. » Carry out post-heating. » Carry out the correct sequence of operations for the type of joint to be welded.

9. TECHNICAL SPECIFICATIONS

Electrical characteristics URANOS 2000 SMC		U.M.
Power supply voltage U1 (50/60 Hz)	1x230 ($\pm 15\%$)	Vac
Slow blow line fuse	25	A
Communication bus	DIGITAL	
Maximum input power (MMA)	5.8	kVA
Maximum input power (MMA)	5.7	kW
Maximum input power (MIG/MAG)	5.7	kVA
Maximum input power (MIG/MAG)	5.7	kW
Power factor (PF)	1	
Efficiency (μ)	85	%
Cos φ	0.99	
Max. input current I1max	24.7	A
Input current I1 (MMA)	24.7	A
Input current I1 (TIG)	19.3	A
Input current I1 (MIG/MAG)	24.7	A
Effective current I1eff	15.3	A
Adjustment range (MMA)	5-180	A
Adjustment range (TIG)	5-200	A
Adjustment range (MIG/MAG)	5-200	A
Adjustment step	1	A
Open circuit voltage	58	Vdc

Duty factor URANOS 2000 SMC		1x230	U.M.
Duty factor MMA (40°C)			
(X=35%)		180	A
(X=60%)		150	A
(X=100%)		115	A
Duty factor TIG DC (40°C)			
(X=35%)		200	A
(X=60%)		170	A
(X=100%)		140	A
Duty factor MIG/MAG (40°C)			
(X=35%)		200	A
(X=60%)		160	A
(X=100%)		130	A

**Physical characteristics
URANOS 2000 SMC**

U.M.

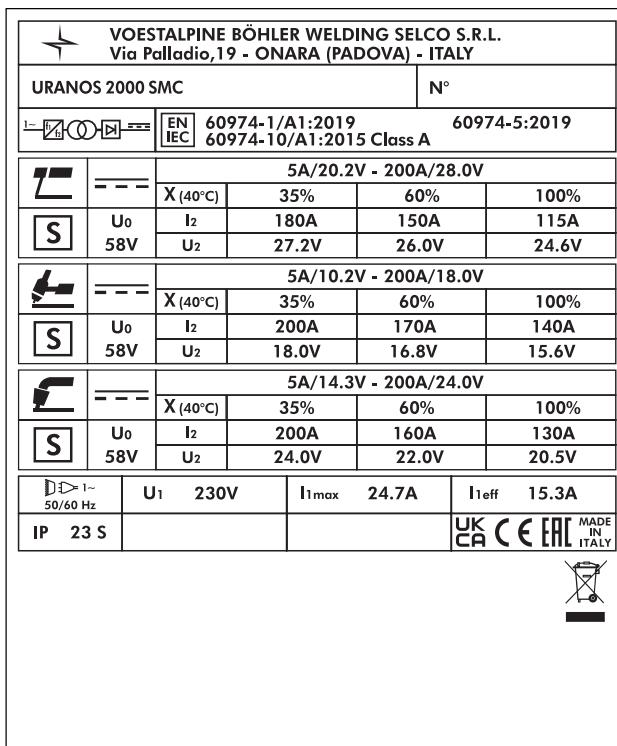
IP Protection rating	IP23S	
Insulation class	H	
Ambient temperature	-10/+40	°C
Dimensions	485x210x400	mm
Weight	12.8	Kg
Manufacturing Standards	EN IEC 60974-1/A1:2019 EN IEC 60974-5:2019 EN 60974-10/A1:2015	
Power supply cable section	3x2.5	mm ²
Length of power supply cable	2	m
Air flow	YES	

**Wire feeder characteristics
URANOS 2000 SMC**

U.M.

Coil	Ø 200	mm
Wire diameters / Tractable rollers	0.6-0.8-1.0 solid wire 0.8-1.0 mm aluminium wire 0.9-1.2 flux-core wire	mm/Material
Wire diameter / Standard roller	0.8 - 1.0	mm
No rolls	2	
Wire feeder rated power	40	W
Wire speed	0.5 - 16	m/min
Wire feed button	Torch button	
Gas test button	Torch button	
Synergic programs	19	

10. RATING PLATE



11. MEANING RATING PLATE

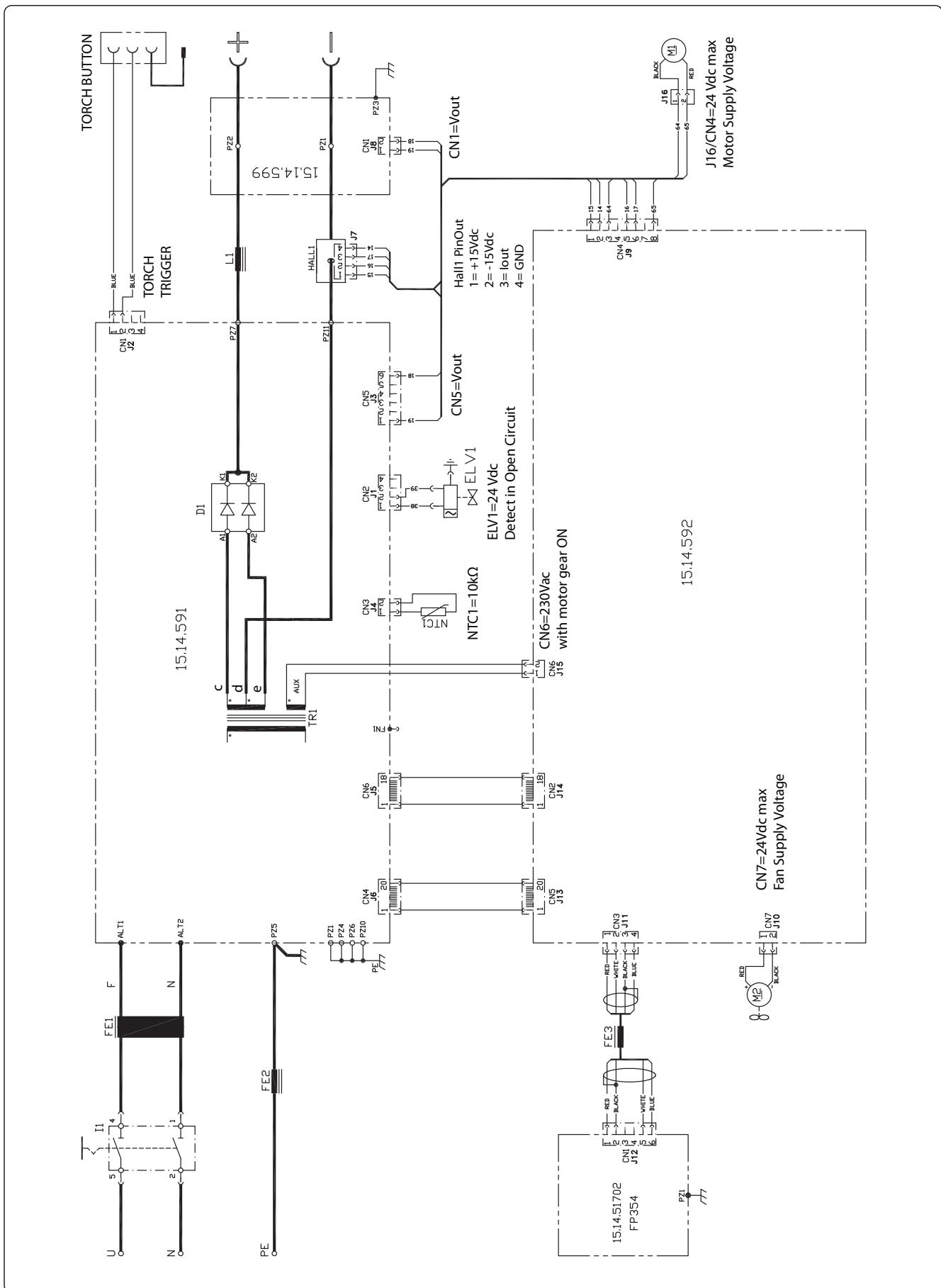
1	2		
3	4		
5	6		
7	9	23	
		11	
12	15	16	17
13	15A	16A	17A
14	15B	16B	17B
7	9	11	
12	15	16	17
8	10	13	15A
		14	16A
		15B	17A
		16B	17B
18	19	20	21
22		UK CA	CE
			MADE IN ITALY
			

CE EU declaration of conformity
 EAC EAC declaration of conformity
 UKCA UKCA declaration of conformity

- 1 Trademark
- 2 Name and address of manufacturer
- 3 Machine model
- 4 Serial no.
- XXXXXX Year of manufacture
- 5 Welding unit symbol
- 6 Reference to construction standards
- 7 Welding process symbol
- 8 Symbol for equipments suitable for operation in environments with increased electrical shock risk
- 9 Welding current symbol
- 10 Rated no load voltage
- 11 Max-Min current range and corresponding conventional load voltage
- 12 Intermittent cycle symbol
- 13 Rated welding current symbol
- 14 Rated welding voltage symbol
- 15 Intermittent cycle values
- 16 Intermittent cycle values
- 17 Intermittent cycle values
- 15A Rated welding current values
- 16A Rated welding current values
- 17A Rated welding current values
- 15B Conventional load voltage values
- 16B Conventional load voltage values
- 17B Conventional load voltage values
- 18 Power supply symbol
- 19 Rated power supply voltage
- 20 Maximum rated power supply current
- 21 Maximum effective power supply current
- 22 Protection rating
- 23 Rated peak voltage

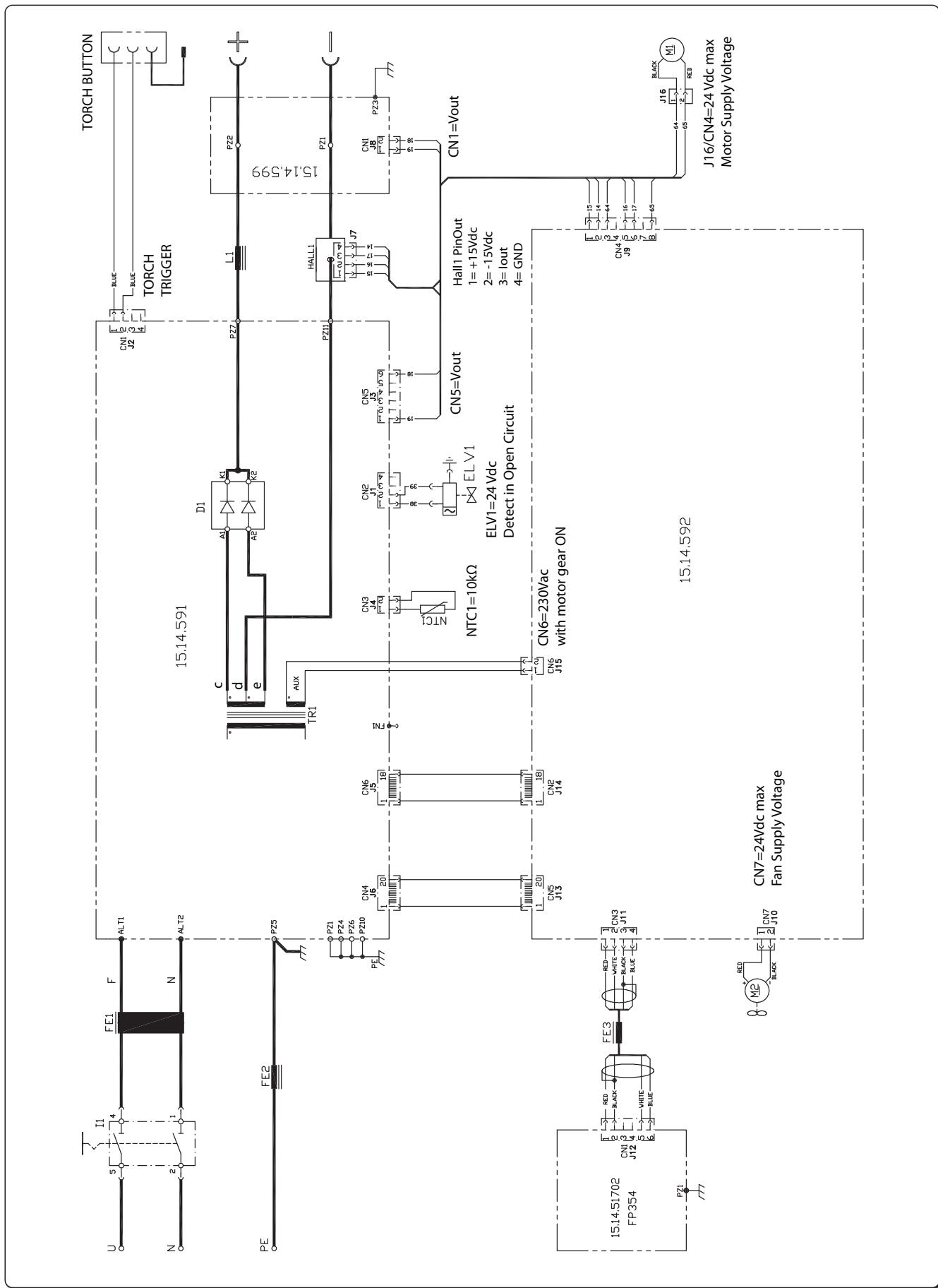
12. SCHEMA AVANZATO, ADVANCED DIAGRAM, ERWEITERTES DIAGRAMM

URANOS 2000 SMC 1x230V WITH MIG TORCH (55.05.019)



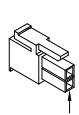
13. SCHEMA, DIAGRAM, SCHALTPLAN

URANOS 2000 SMC 1x230V WITH MIG TORCH (55.05.019)

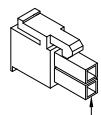


14. CONNETTORI, CONNECTORS, VERBINDER

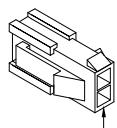
URANOS 2000 SMC 1x230V WITH MIG TORCH (55.05.019)



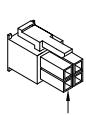
J4-J10



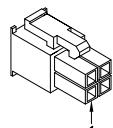
J15-J16-J8



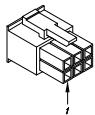
J16



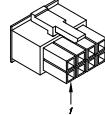
J11-J1



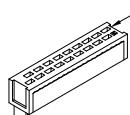
J2



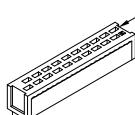
J3-J12



J9



J5-J14



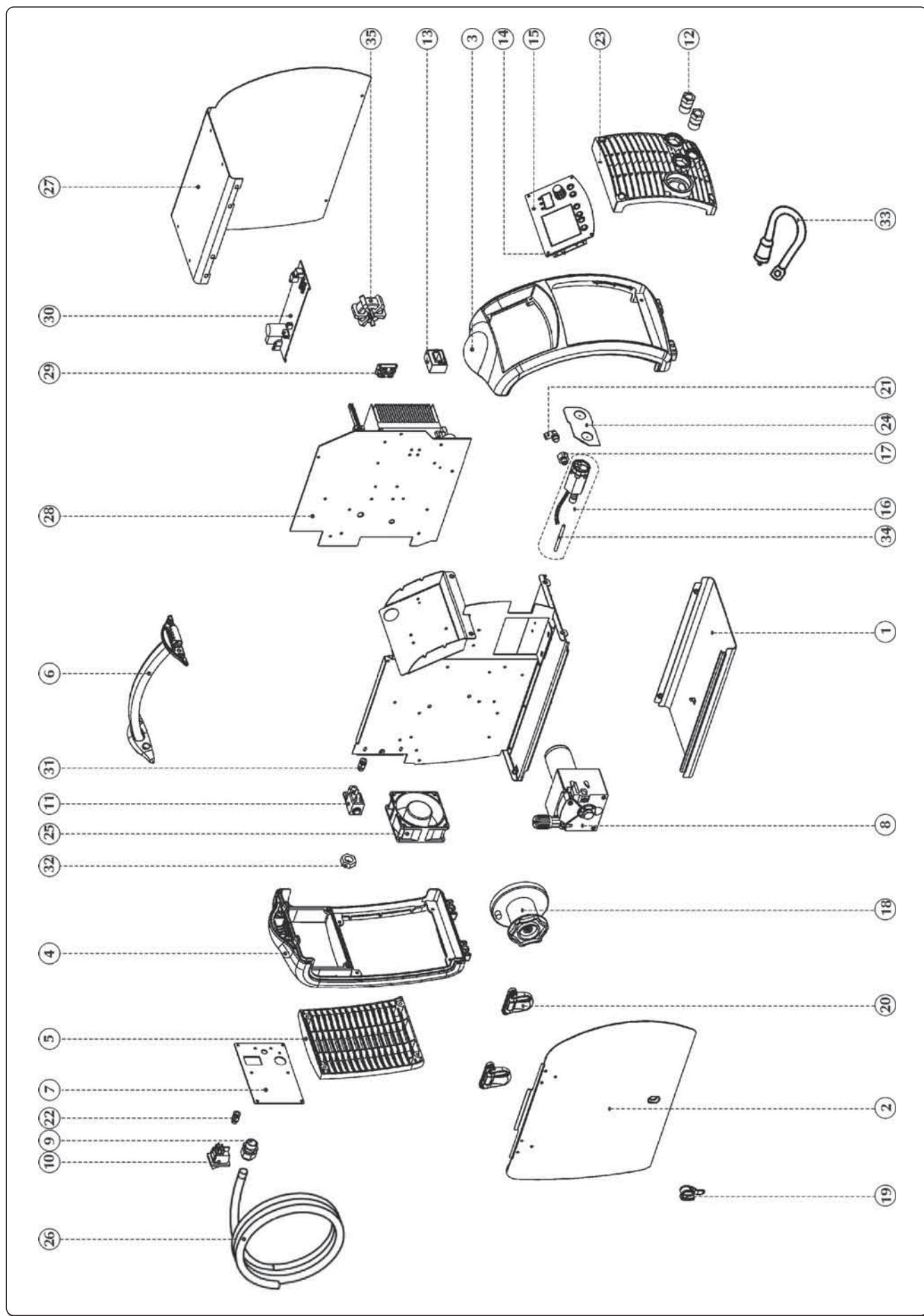
J6-J13



J7

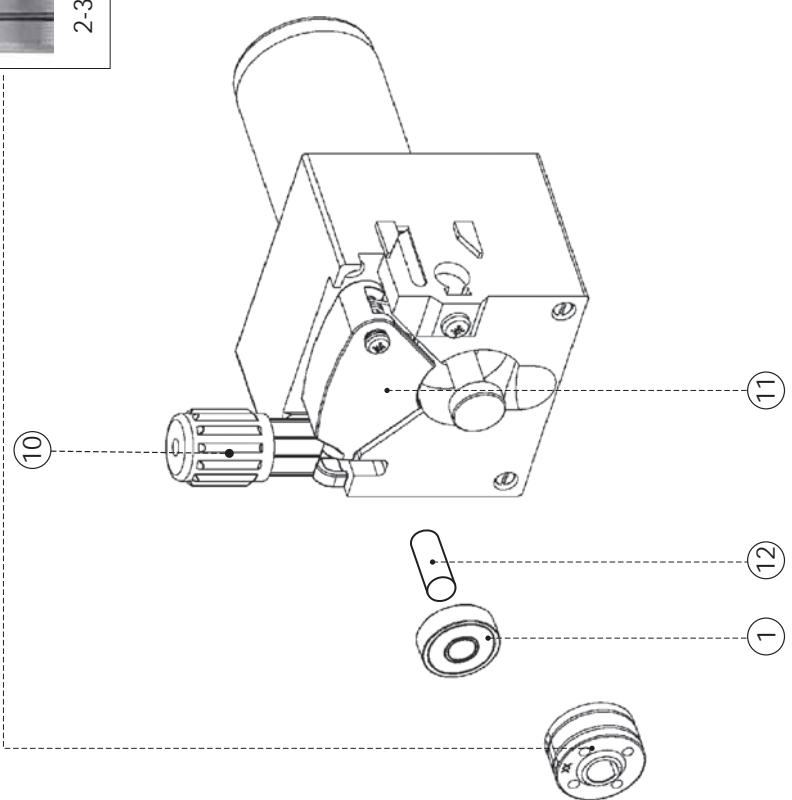
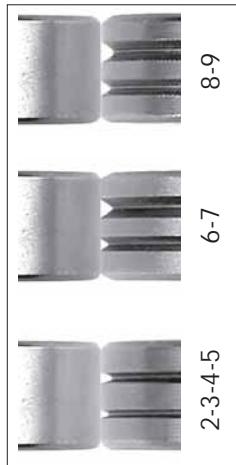
15. LISTA RICAMBI, SPARE PARTS LIST, ERSATZTEILVERZEICHNIS

URANOS 2000 SMC 1x230V WITH MIG TORCH (55.05.019)



POS.	CODE	ITALIANO	ENGLISH	DEUTSCH	FRANÇAIS	ESPAÑOL
1	01.02.13301	Cofano inferiore	Metal cover lower	Unteres Gehäuse	Carter inférieur	Chapa inferior
2	01.03.08101	Pannello laterale DX	Side panel - RIGHT	Seitenpaneel - RE	Panneau latéral droit	Panellateral derecho
3	01.04.28801	Cornice plastica frontale	Frontframe (plastic)	Plastikrahmen, vorne	Encadrement plastique frontal	Marco plástico frente
4	01.05.23701	Cornice plastica posteriore	Rear frame (plastic)	Plastikrahmen, hinten	Encadrement plastique arrière	Marco plástico posterior
5	01.05.23801	Tassello plastico posteriore	Rear grid (plastic)	Hinterer plastikdübel	Cheville plastique arrière	Taco plástico posterior
6	74.90.073	Kit manico	Handle - Sparekit	Kit griffhal	Kit manche	Kit mango
7	03.05.157	Targa posteriore	Rearnameplate	Hinterschild	Plaque arrière	Placa posterior
8	07.01.324	Gruppo traino 2 ruoli	Feedunit - 2 rolls	Drahtvorschub, 2 rollen	Groupe chariot 2 rouleaux	Grupo alimentación alambre 2 rodillos
9	08.20.052	Pressacavo	Cable clamp	Kabelklemme	Serre-câble	Racor para cable
10	09.04.101	Interruttore bipolare	Switch - 2 poles	Zweipoliger schalter	Interrupteur bipolaire	Interruptor bipolar
11	09.05.001	Elettrovalvola	Solenoid valve	Magnetventil	Électrovanne	Electroválvula
12	10.13.022	Presafissa 50-70mm ²	Current socket (panel) - 50-70mm ²	Feste steckdose 50-70mm ²	Prise fixe 50-70 mm ²	Base conector 50-70mm ²
13	11.19.025	Sensore corrente 500A	Current sensor 500A	Stromsensor 500A	Capteur courant 500A	Sensor corriente 500A
14	15.22.354	Pannello comandi FP354	Control panel FP354	Bedieneungsfeld FP354	Panneau commandes FP354	Panel mandos FP354
15	03.05.194	Targa comandi	Nameplate	Schild für steuerung	Plaque commandes	Placa mandos
16	19.01.107	Attacco torcia euro-l=57mm	Torch central adaptor euro- l=57mm	Anschluss für euro-brenner- l=57mm	Raccord torch euro-l=57mm	Conector antorcha euro-l=57mm
17	19.50.058	Dado 1/8" gas - 1/8" gas	Nut-1/8" "1/8" gas fitting	Mutter 1/8" gasgewinde - 1/8" gasgewinde	Écrou 1/8" gas - 1/8" gas	Tuerca 1/8" gas - 1/8" gas
18	20.02.022	Asporta rochetto 5kg	Wire spool spindle 5kg	Drahtspulenhaspel 5kg	Support bobine 5kg	Husillo bobina 5kg
19	20.04.080	Chiavistello	Rotary lock key	Riegel	Verrou	Cerrojo
20	20.04.157	Cerniera a scatto	Snaphinge	Scharnier	Charniere	Bisagra
21	24.01.074	Raccordo 1/8" 90°	Fitting 1/8" 90°	Anschluss 1/8" 90°	Raccord. 1/8" 90°	Racor 1/8" 90°
22	24.01.190	Raccordo 1/8" - 1/4"	Fitting 1/8" - 1/4"	Anschluss 1/8" - 1/4"	Raccord. 1/8" - 1/4"	Racor 1/8" - 1/4"
23	01.04.03401	Tassello plastico frontale	Front grid (plastic)	Vorderer plastikdübel	Cheville plastique frontale	Taco plástico frontal
24	15.14.5991	Scheda elettronica	P.C. Board	Elektronische platine	Platine électronique	Tarjeta electrónica
25	14.70.009	Ventilatore	Fan	Ventilator	Ventilateur	Ventilador
26	49.04.080	Cavo alimentazione	Input line cord	Speisekabel	Cable d'alimentation	Cable alimentación
27	03.07.365	Pannello laterale SX	Side panel -LEFT	Seitenpaneel - LI	Panneau latéral gauche	Panellateralizado
28	15.14.5912	Scheda elettronica	P.C. Board	Elektronische platine	Platine électronique	Tarjeta electrónica
29	14.05.111	Modulo diodi	Diodemodul	Diodemodul	Modulo diodos	Módulo diodos

POS.	CODE	ITALIANO	ENGLISH	DEUTSCH	FRANÇAIS	ESPAÑOL
30	15.14.5922	Scheda elettronica	P.C. Board	Elektronische platine	Platine électronique	Tarjeta electrónica
31	24.01.001	Raccordo 6 - 1/8"	Fitting 6 - 1/8"	Anschluss 6 - 1/8"	Raccord 6 - 1/8"	Racor 6 - 1/8"
32	08.20.053	Controdado	Blocking nut	Kontermutter	Contre-écrrou	Contratuerca
33	19.01.037	Cannetta - 65mm	Insulated liner - 65mm	Drahtführung - 65mm	Tuyau en plastique - 65mm	Tubo guia hilo - 65mm
34	05.04.008	Induttanza di livellamento	Output choke	Induktanz	Inductance de sortie	Inductancia de salida
35	49.07.736	Cavo cambio polarità	Cable- polarity change	Polungswechselskabel	Cable - changement de polarité'	Cable cambio polaridad
91.08.334		Manuale istruzioni: URANOS 2000 SMC [IT,EN,DE,FR,ES,PT,NL,SV,DA,NO,FI,EL]	Instruction manual: URANOS 2000 SMC [IT,EN,DE,FR,ES,PT,NL,SV,DA,NO,FI,EL]	Bediennungsanweisungen: URANOS 2000 SMC [IT,EN,DE,FR,ES,PT,NL,SV,DA,NO,FI,EL]	Manuel d'instructions: URANOS 2000 SMC [IT,EN,DE,FR,ES,PT,NL,SV,DA,NO,FI,EL]	Manual instrucciones: URANOS 2000 SMC [IT,EN,DE,FR,ES,PT,NL,SV,DA,NO,FI,EL]
91.08.363		Manuale istruzioni: URANOS 2000 SMC [CS,PL,RU,TR,RO,BG,SK,ET,LV,LT,HU,SL]	Instruction manual: URANOS 2000 SMC [CS,PL,RU,TR,RO,BG,SK,ET,LV,LT,HU,SL]	Bediennungsanweisungen: URANOS 2000 SMC [CS,PL,RU,TR,RO,BG,SK,ET,LV,LT,HU,SL]	Manuel d'instructions: URANOS 2000 SMC [CS,PL,RU,TR,RO,BG,SK,ET,LV,LT,HU,SL]	Manual instrucciones: URANOS 2000 SMC [CS,PL,RU,TR,RO,BG,SK,ET,LV,LT,HU,SL]



POS.	CODE	ITALIANO	ENGLISH	DEUTSCH	FRANÇAIS	ESPAÑOL
1	07.01.325	Rullo trainafilo liscio	Drive roll - without groove	Drahtvorschubrolle glatt	Galet lisse	Rodillo alimentador de alambre liso
2	07.01.326	Rullo trainafilo D.0,6-0,8mm filo pieno	Drive roll D.30mm - smooth v groove - solid wire - d.0,6-0,8mm	Drahtvorschubrolle D.0,6-0,8mm massivdrant	Galet D.0,6-0,8mm - gorge en v - fil plein	Rodillo alimentador de alambre D.0,6-0,8mm alambre sólido
3	07.01.327	Rullo trainafilo D.0,8-0,9mm filo pieno	Drive roll - smooth v groove - solid wire - D.0,8-0,9mm	Drahtvorschubrolle D.0,8-0,9mm massivdrant	Galet D.0,8-0,9mm - gorge en v - fil plein	Rodillo alimentador de alambre D.0,8-0,9mm alambre sólido
4	07.01.328	Rullo trainafilo D.0,8-1,0mm filo pieno	Drive roll - smooth v groove - solid wire - D.0,8-1,0mm	Drahtvorschubrolle D.0,8-1,0mm massivdrant	Galet D.0,8-1,0mm - gorge en v - fil plein	Rodillo alimentador de alambre D.0,8-1,0mm alambre sólido
5	07.01.329	Rullo trainafilo D.1,0-1,2mm filo pieno	Drive roll D.30mm - smooth v groove - solid wire - d.1,0-1,2mm	Drahtvorschubrolle D.30mm d.1,0-1,2mm - 1,2mm massivdrant	Galet D.30mm d.1,0-1,2mm - gorge en v - fil plein	Rodillo alimentador de alambre D.30mm d.1,0-1,2mm alambre sólido
6	07.01.330	Rullo trainafilo D.0,8-1,0mm filo alluminio	Drive roll aluminum wire D.0,8-1,0mm	Drahtvorschubrolle D.0,8-1,0mm aluminiumdrant	Galet D.30mm 0,8-1,0mm fil aluminium	Rodillo alimentador de alambre D.0,8-1,0mm alambre aluminio
7	07.01.331	Rullo trainafilo D.1,0-1,2mm filo alluminio	Drive roll aluminum wire - D.1,0-1,2mm	Drahtvorschubrolle D.1,0-1,2mm aluminiumdrant	Galet D.1,0-1,2mm fil aluminium 1,0-1,2mm alambre aluminio	Rodillo alimentador de alambre D.1,0-1,2mm alambre aluminio
8	07.01.332	Rullo trainafilo D.0,9-1,0mm filo animato	Drive roll cored wire D.0,9-1,0mm	Drahtvorschubrolle D.0,9-1,0mm fülldraht	Galet D.0,9-1,0mm fil fourre	Rodillo alimentador de alambre D.0,9-1,0mm alambre tubular
9	07.01.333	Rullo trainafilo D.1,0-1,2mm filo animato	Drive roll cored wire D.1,0-1,2mm	Drahtvorschubrolle D.1,0-1,2mm fülldraht	Galet D.1,0-1,2mm fil fourre	Rodillo alimentador de alambre D.1,0-1,2mm alambre tubular
10	07.01.334	Manopola	Knob	Drehknopf	Bouton	Empuñadura
11	07.01.335	Gruppo pressore	Splitwire guide	Druckkobel	Groupe presseur	Grupo prensador
12	07.01.336	Supporto rullo pressore	Splitwire guide	Halterung für niednerhalterrolle	Support rouleau presseur	Soporte rodillo prensador

