REPAIRS MANUAL

ENGLISH

Genesis 200 AC-DC

Genesis 200 TLH

WU 15

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1) GUARANTEE CONDITIONS

To specify the present warranty conditions , we remind that SELCO does not repair under warranty the damages:

a) resulting from attempts by personnel not allowed by SELCO to install, repair or service the products;
b) resulting from improper use or connection to incompatible equipment;
c) in products that have been modified or integrated with other products when such modification or integration can be the cause of the failure.

The warranties will in any case be invalidated if :

- **the customer is not up-to-date with payments**
- **Selco has not received the warranty card properly filled-in with required information**
- **removal or modifing of serial numbers of machines, boards or parts**
- **damages are caused by wrong input power supply voltage/connections.**

2) PURPOSE OF THE MANUAL

The purpose of this manual is to furnish authorized service centres with essential information required to repair model Genesis 200 (TLH and AC-DC).
To avoid serious personal injury or damage to property, it is vital this manual be used by qualified technical personnel only.
Selco s.r.l. declines all responsibility for any injury or damage to property caused whilst repairs are being carried out, including any injury or damage to property subsequent to the reading or putting into practice of the contents hereof.
For a detailed description of operation, use and routine maintenance of the machine, refer to the "Owner's manual", which must always be kept together with the machine.
To perform operations described herein, you will need a digital multimeter and a clamp-on AC-DC ammeter together with basic knowledge of how the machine works. A fundamental grasp of electrical technology is also required.
Repair work consists in locating the faulty part - as this part is included on the list of available spare parts - and in replacing it.
If a circuit board is faulty, repairs will consist in replacing the board and not replacing the faulty electronic component on the actual board.
Refrain from making any changes or performing any maintenance work not contemplated herein.
Should the problem persist even after following the instructions described herein, contact Selco's Service Department or send the machine to Selco for relevant work.

The purchaser is obliged to comply with the directions contained in the manual. Failure to do so will result in Selco declining all liability.

3) WARNINGS, PRECAUTIONS, GENERAL INFORMATION ON EXECUTING REPAIRS

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

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

The notes preceded by this symbol are mainly technical and facilitate operations.

Behaviour linked expressly to HF striking, which might result in minor injuries or damage to property (especially measuring instruments).

Repairs may be executed by qualified personnel only.

Before attempting any repairs, we advise you to read and understand the information in this manual, especially in regard to safety recommendations.

Do not carry out any repair unless another person is present who can provide help in case of an accident.

To repair equipment, access is necessary to the internal parts of the machine, and to obtain this, some protective panels have to be removed. Therefore, some extra precautions are necessary, over and above those applying to normal use of the machine for welding, in order to prevent any damaged caused by contact with:

- Live parts
- moving parts
- parts at high temperature

- Live parts:

WARNING!: When accessing parts inside the machine, remember that turning off the switch will not prevent the danger of electric shocks. We therefore advise you to remove the plug and wait for about a minute before attempting any job.
Further, as capacitors charged with high voltage may be present, wait about a minute before working on the internal parts.

WARNING!: When taking measurements, remember that the measuring instruments themselves can become live and, therefore, do not touch their metal parts.

WARNING!: When TIG mode is selected with HF start, the machine generates a series of high-voltage pulses (approx. 10,000 V) to strike the welding arc. Consequently, when diagnostic phases do not expressly include an arc striking test in TIG mode with HF discharge, you are recommended to disconnect board 15.14.286.
Once repairs are done, remember to reconnect board 15.14.286 before closing the machine case for the last time, and then perform a number of welding tests, including a number of starts in TIG HF mode.

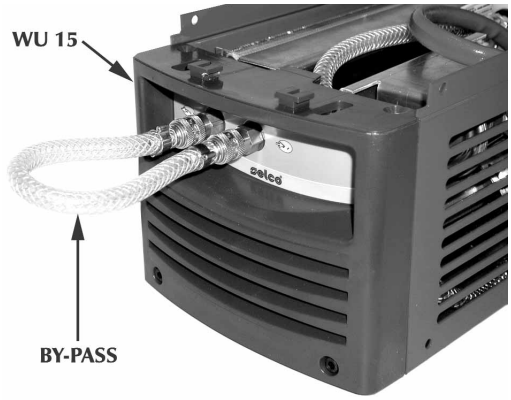
- Moving parts:

WARNING!: Keep your hands well away from the fan when the machine is connected to the power supply. Make sure that the power plug is removed and that the fan is idle before replacing it.

- Parts at high temperature:

WARNING!: When you have to handle internal parts of the machine, remember that some could be at high temperature. In particular, do not touch cooling radiators.

WARNING!: To avoid damaging the cooling unit, always fit the bypass pipe when the torch is not connected to the coolant inlet/outlet.



4) DIAGNOSTICS AND REPAIR INSTRUMENTS AND TOOLS

4.1) Instruments for basic diagnostics

You will need:

- a multimeter with the following scale:
  Ohms: in the range 0 to several Mohms
  Diode test
  Direct voltage (Vdc): from mVdc to 1000 Vdc
  Alternating voltage (Vac): in the range 10 Vac to 700 Vac

NOTE: You are advised to use an instrument with an automatic scale as, theoretically speaking, when the machine is faulty, it is not possible to foresee the level of the electrical value to be measured.

- a class 2.5 or higher clamp-on AC-DC ammeter with end of scale 300A pk
- instead of the clamp-on ammeter, you can use a shunt with a value of 60 mV @ 200 A.

NOTE:
- Remember that other shunts may do the job just as well, though a greater capacity means less accuracy, whilst with lower capacities, the measurement must be taken quickly or the shunt will overheat.

Once inserted, the shunt is at welding potential (watch out, above all, for discharges during striking in TIG HF mode!)

- Nonetheless, in practical terms, a clamp-on ammeter is the best choice.

4.2) Tools for repairs

- complete set of open-ended spanners
- complete set of 6-point socket spanners
- complete set of flat-tip screwdrivers
- complete set of Phillips screwdrivers
- complete set of Allen keys
- a Phillips torque wrench for M3 screws with torque settings in the range 1 to 2 Nxm accurate to 0.1 Nxm.
- a crimping tool for insulated wire terminals (blue, red and yellow)
- a pair of pliers for AMP contacts
- pliers and nippers commonly used with electronic components
- a larger pair of nippers for cutting small thicknesses of sheet metal
- tongs (suitable size for closing gas pipe clamps)
- a soldering iron for electronic components with min. power 50 W
- portable DIY electric drill

4.3) Conventions

We have adopted a convention whereby, when you are asked to take a measurement between two points, such as **a** ◄— **b**, the tip of the arrow always indicates where to apply the multimeter's **red probe (a)**, whilst the **black probe** is applied to the other end **(b)**.

When the arrow between two measuring points is double (e.g.: **c** ◄—► **d**), the voltage to be measured is alternating (usually at 50 Hz) and, consequently, it does not matter what order the multimeter's probes are applied in.

In drawings and tables, when a voltage measurement referring to terminals of components such as diodes, BJTs, mosfets and IGBTs appears, reference is made to the multimeter being used in "diode test" mode (such measurements should always be taken with the machine switched off, and usually give values in the range +0.10… +0.90 Vdc). In this case, the relevant symbol appears next to the value to be measured.

Junction measurement (multimeter in "diode test" mode)

Similarly, the following symbols will be used:

AC or DC voltage measurement (multimeter in voltmeter mode)

Resistance measurement (multimeter in ohmmeter mode)

Current measurement (clamp-on ammeter or shunt + multimeter in millivoltmeter mode)

Measuring conditions (power source on/off, MMA/TIG operating mode etc.) are always clearly indicated next to the value to be measured.

Connector pins are indicated with the name of the actual connector followed by a slash and by the number of the pin; for instance, CN1/2 indicates pin 2 of connector CN1.

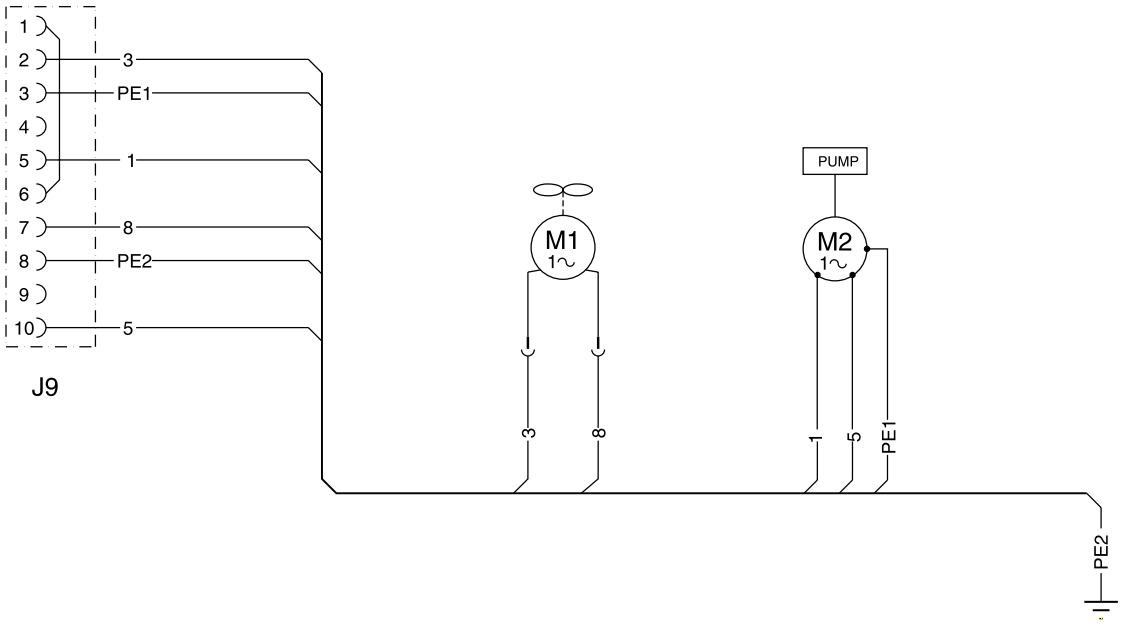
Unless otherwise specified, all measurements should be taken with the boards in their slots and connected accordingly.

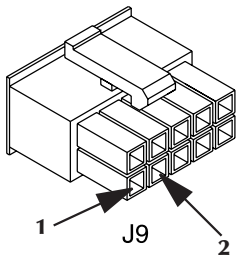
Remember that testing should always start with a VISUAL INSPECTION!
Visual inspection reduces the time spent troubleshooting and points any subsequent tests in the direction of the damaged part!

5) WIRING AND CONNECTION DIAGRAMS

5.1) WU15 Wiring diagram (fig. 1)

Review 28-04-98





5.4) Connectors (fig. 5)

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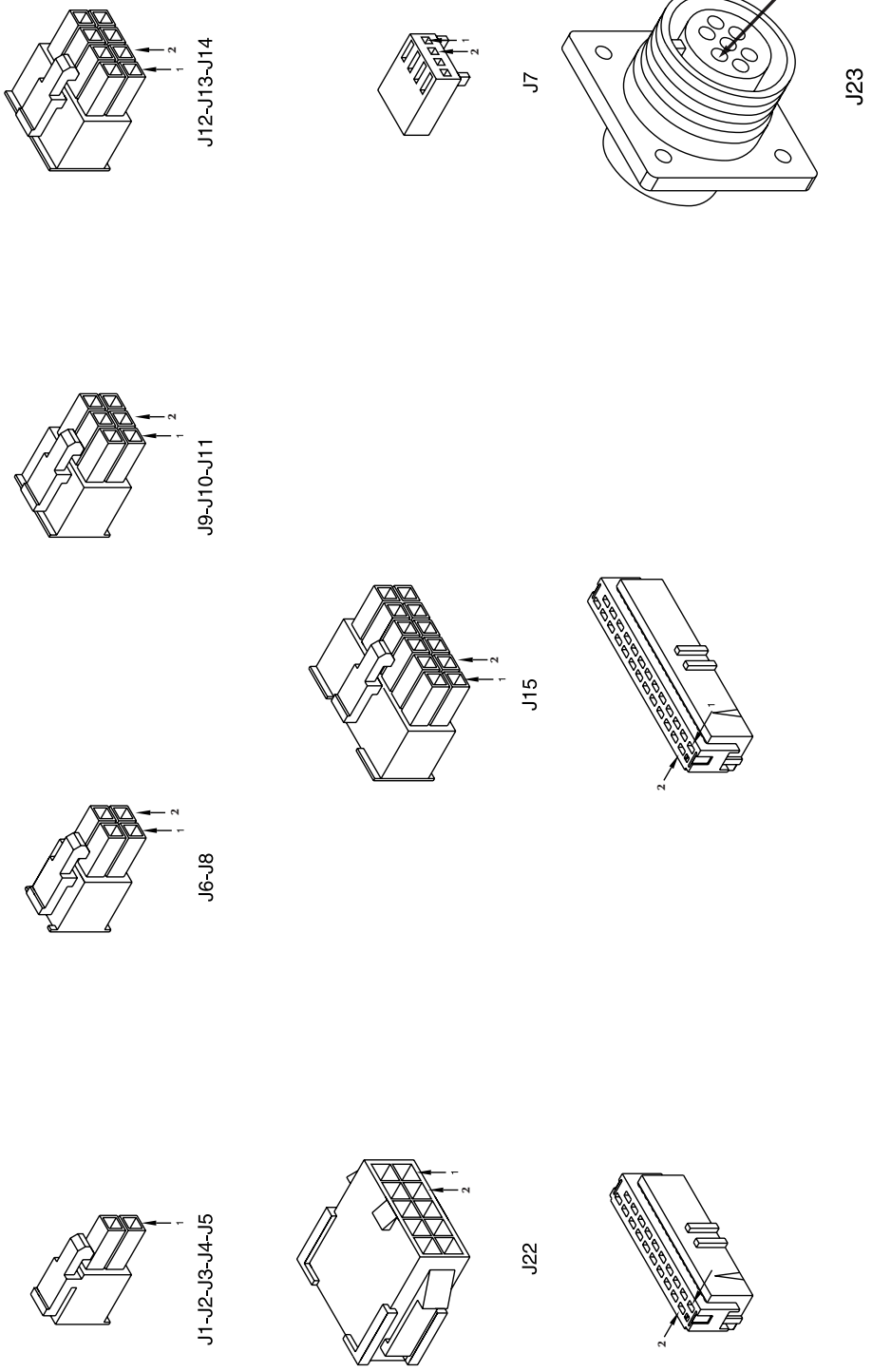
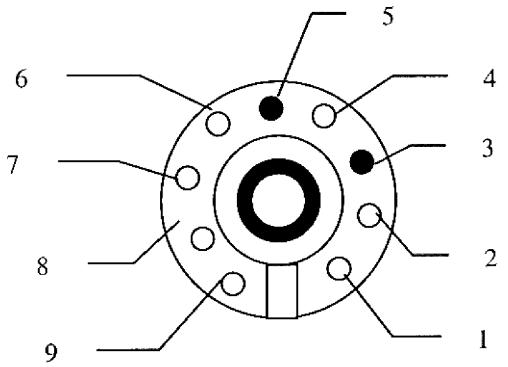


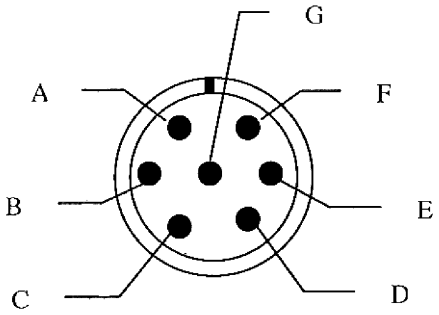
5.5) Connections for central adapter and remote control connector (fig. 5)

FRONT VIEWS



CENTRAL TORCH ADAPTER

3 - 5 = Torch trigger



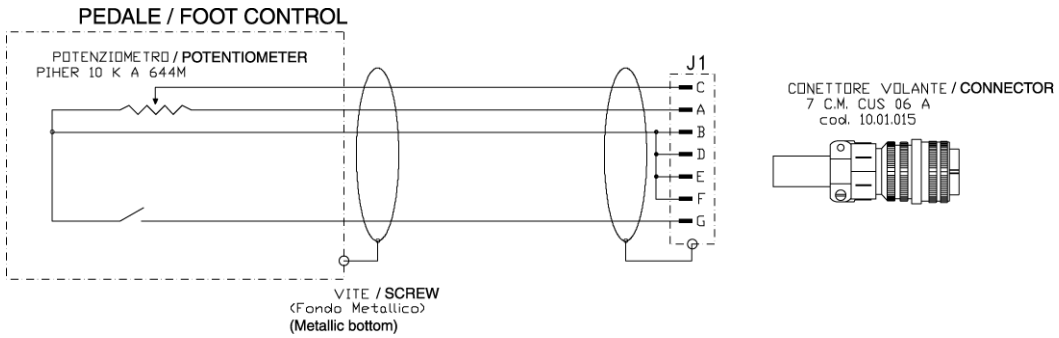
REMOTE CONTROL

A = EXT +V
B = EXT GND
C = EXT RIF
D = - (not connected)
E = - (not connected)
F = - (not connected)
G = EXT Torch trigger

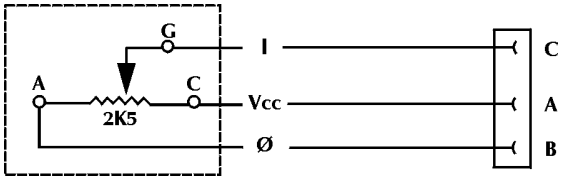
Note:
- To connect the trigger on the torch, use the central adapter only;
- The sole purpose of the military connector is to connect the button on the remote control, where applicable (e.g.: RC 12);
- if there is a potentiometer, it should have a value in the range [2.5 ~ 10] k Ω.

5.5) RC12 - RC16 remote control wiring diagrams (fig. 6)

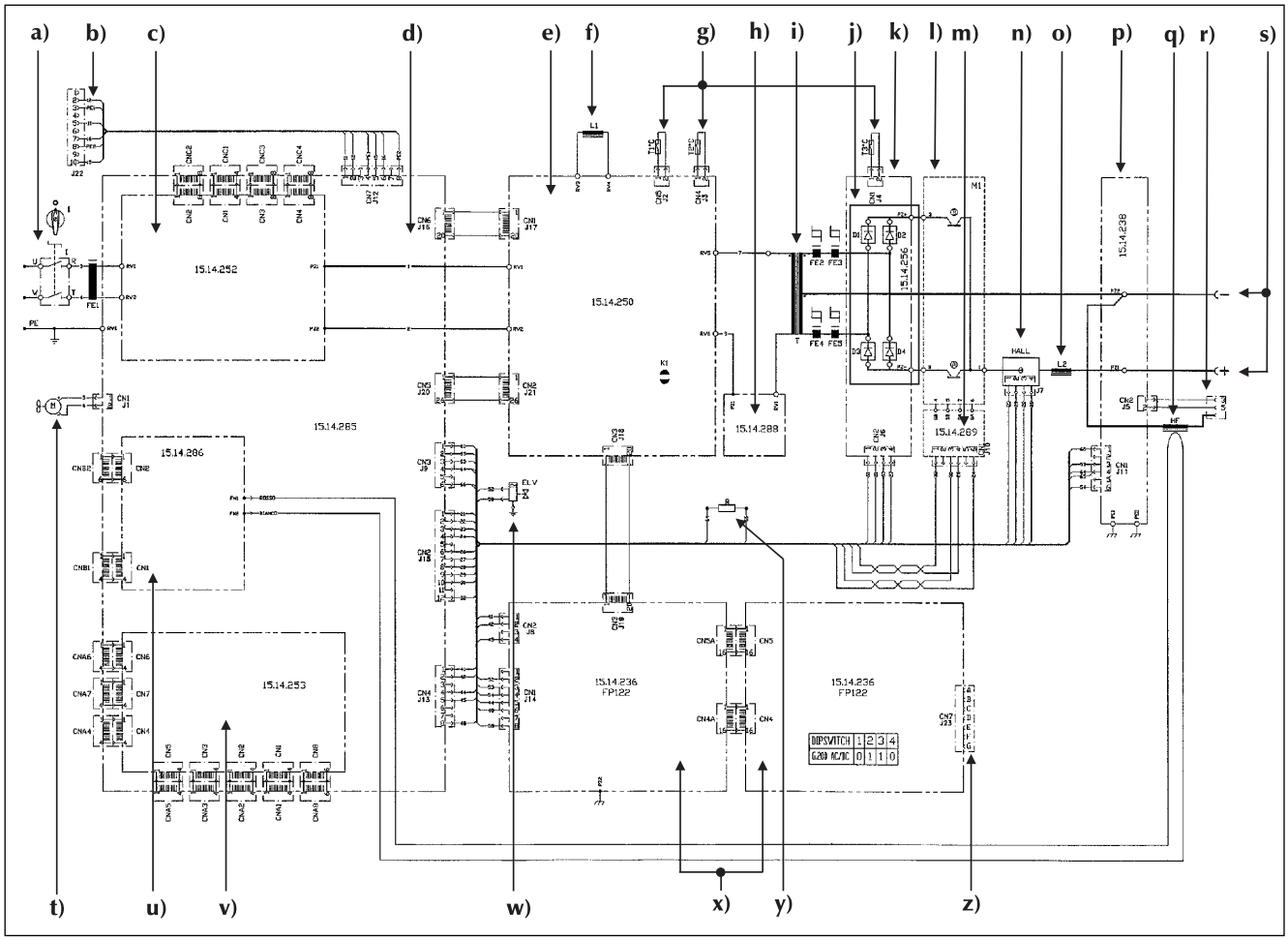
RC12 Wiring diagram



RC16 Wiring diagram



6) DESCRIPTION OF MACHINE'S PARTS (fig. 7)



6.1) In terms of electrics, power source Genesis 200 (AC-DC and TLH) is made up of the following parts:

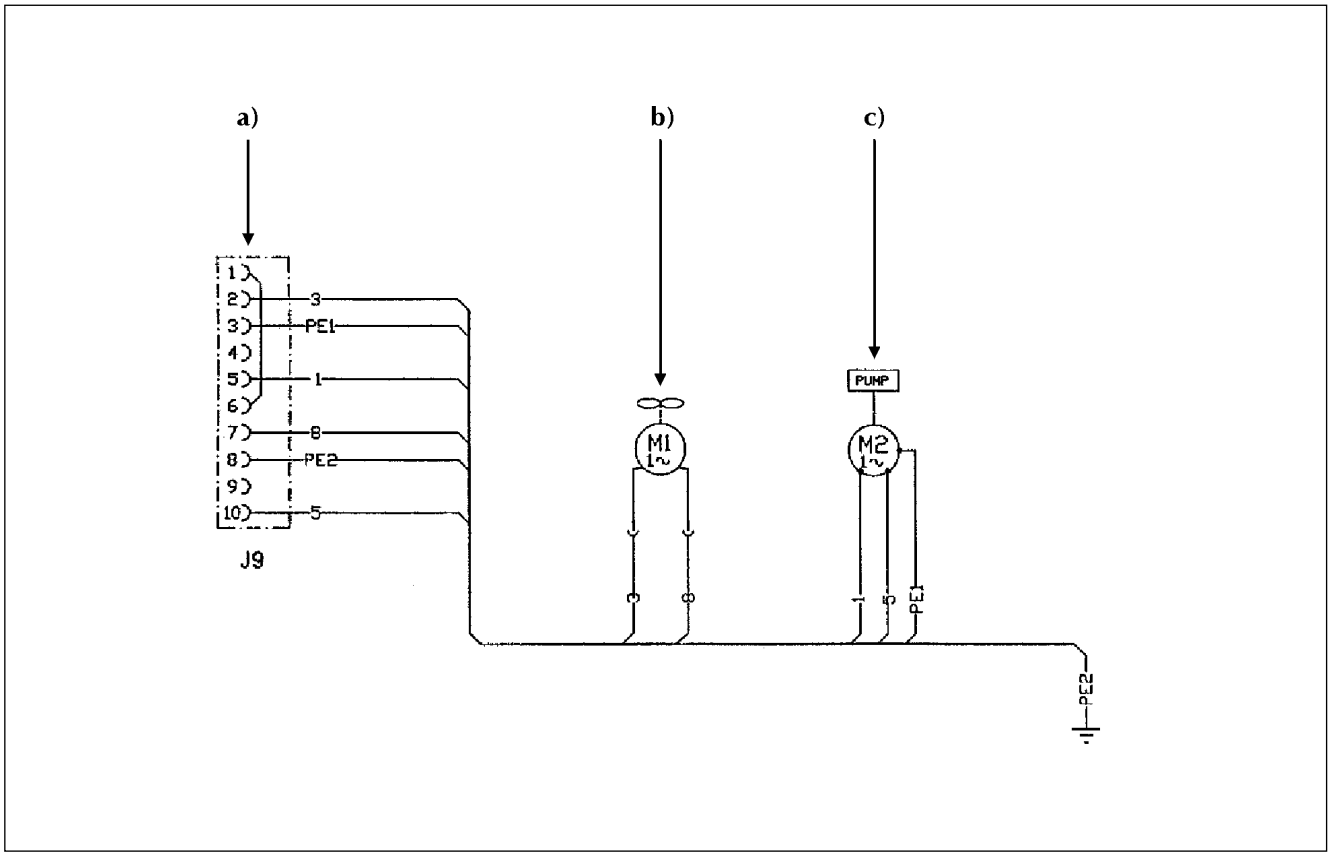
a) master switch
b) connector for cooling unit WU15
c) input filter board (15.14.252)
d) bus board (15.14.285/15.14.315)
e) power supply board + UPFR + power inverter ("main-board" 15.14.250)
f) UPFR inductor
g) thermal cutout capsules
h) inverter capacitors board (15.14.288)
i) power transformer
j) secondary power rectifier [differs from AC-DC to TLH]
k) secondary clamp board (15.14.256) [G200 AC-DC only]
l) secondary IGBT module for AC [G200 AC-DC only]
m) AC module connection board (15.14.289) [G200 AC-DC only]
n) Hall-effect current probe
o) output inductor
p) output filter board (15.14.238)
q) HF transformer
r) central adapter for TIG torch
s) outputs for earth clamp and electrode holder
t) 24Vdc motor-powered fan
u) HF generation board (15.14.286)
v) AC control and superimposition board (15.14.253) [G200 AC-DC only]
w) 48Vdc TIG gas solenoid valve
x) front panel board (15.14.236) [FP122 for G200 AC-DC, FP106 for G200 TLH]
y) output resistor
z) remote control connector

Note:
The TLH differs from the AC/DC model as follows:
- front panel " x ",
- different configuration of secondary power rectifier " j "
- does not feature parts " k-l-m-v "

as there is no AC function (also see master wiring diagram)

[1]panel boards 15.14.236 have different factory settings depending on the version of the panel they are fitted on (FP106 or FP 122); this setting can be made by the manufacturer only.

(fig. 8)



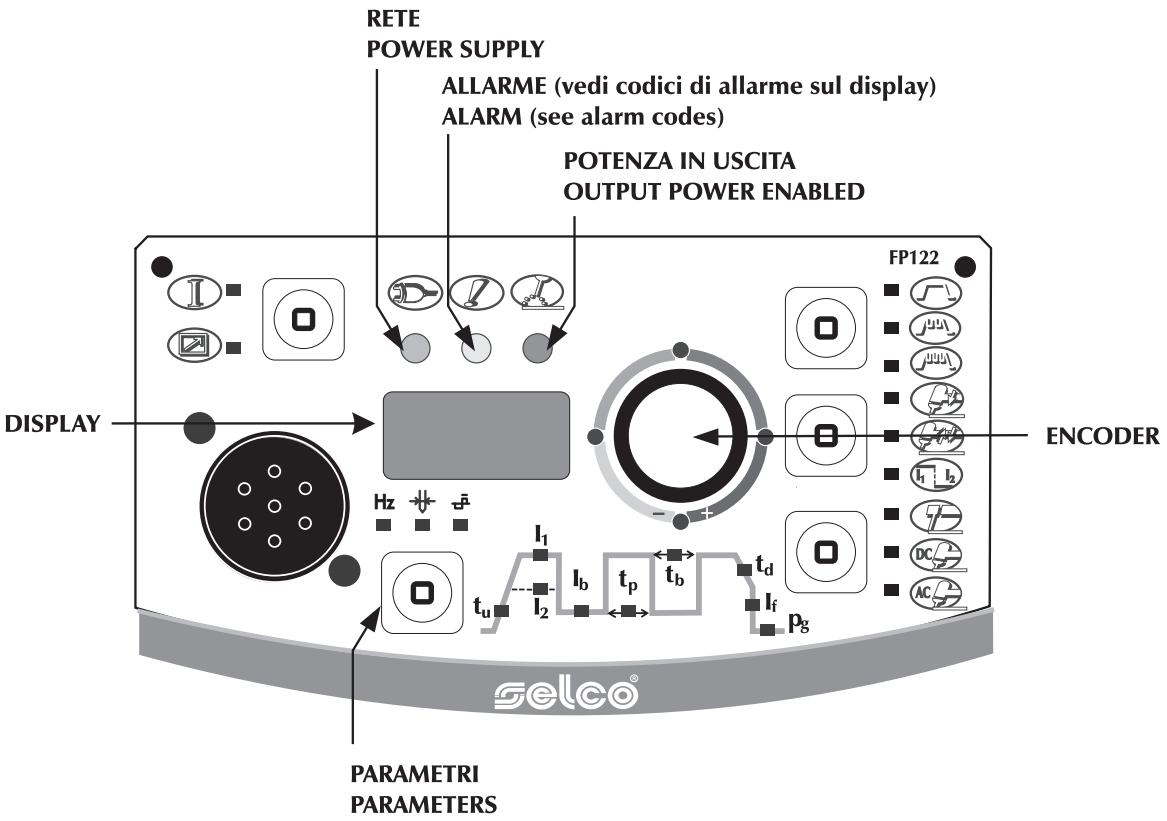
6.2) In terms of electrics, cooling unit WU15 is made up of the following parts.

a) connector for connection to power source G200
b) 230Vac motor-powered fan
c) 230Vac pump

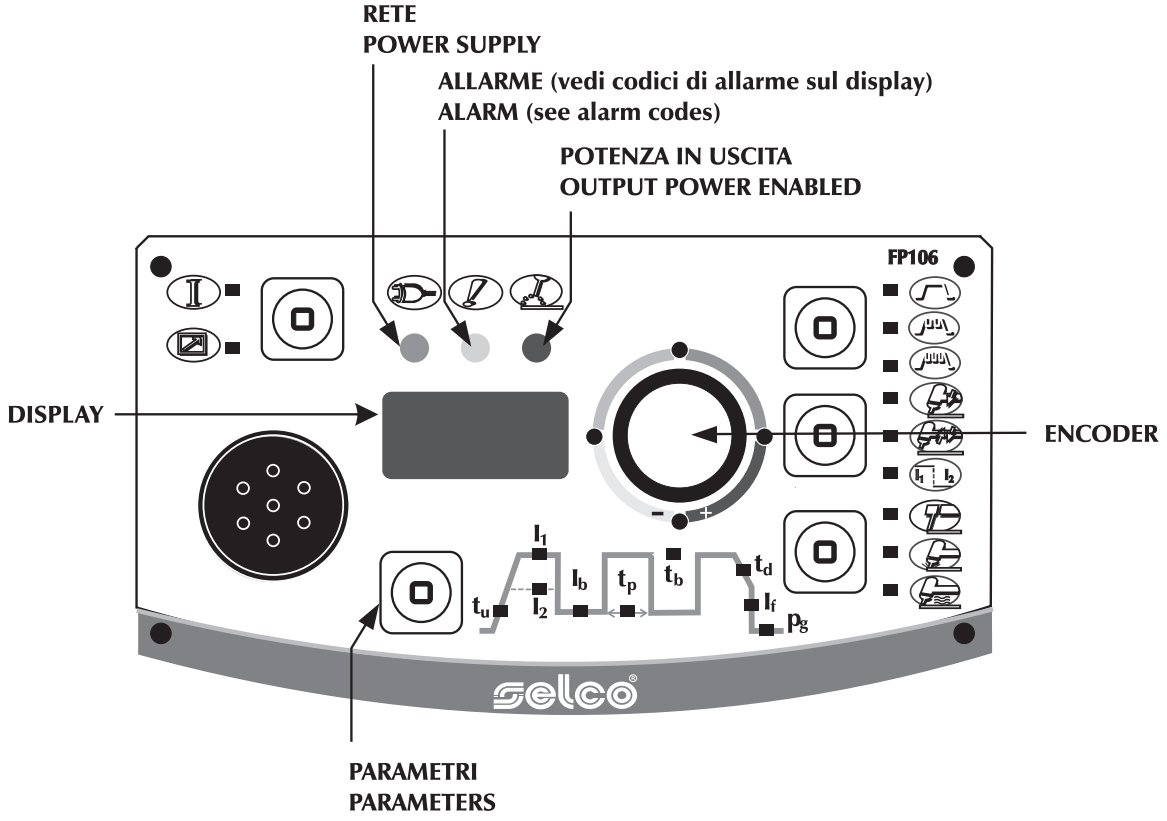
7) DESCRIPTION OF DIAGNOSTIC INDICATIONS

7.1) EXTERNAL DIAGNOSTIC INDICATIONS

FP 122 - GENESIS 200 AC-DC (fig. 9)



FP 106 - GENESIS 200 TLH (fig. 10)



The front panel controls the status of the actual equipment, which is reported to the operator via the LEDs and display.
See the owner's manual for meanings and use of the various controls as this section deals with diagnostic signals only.

Power LED (GREEN)
Indicates machine on/off status. Always lit if the panel, and hence the machine, is powered correctly.

Alarm LED (YELLOW)
Indicates the equipment is in alarm status. Never lit unless there is a problem.
The display indicates the type of alarm in question.

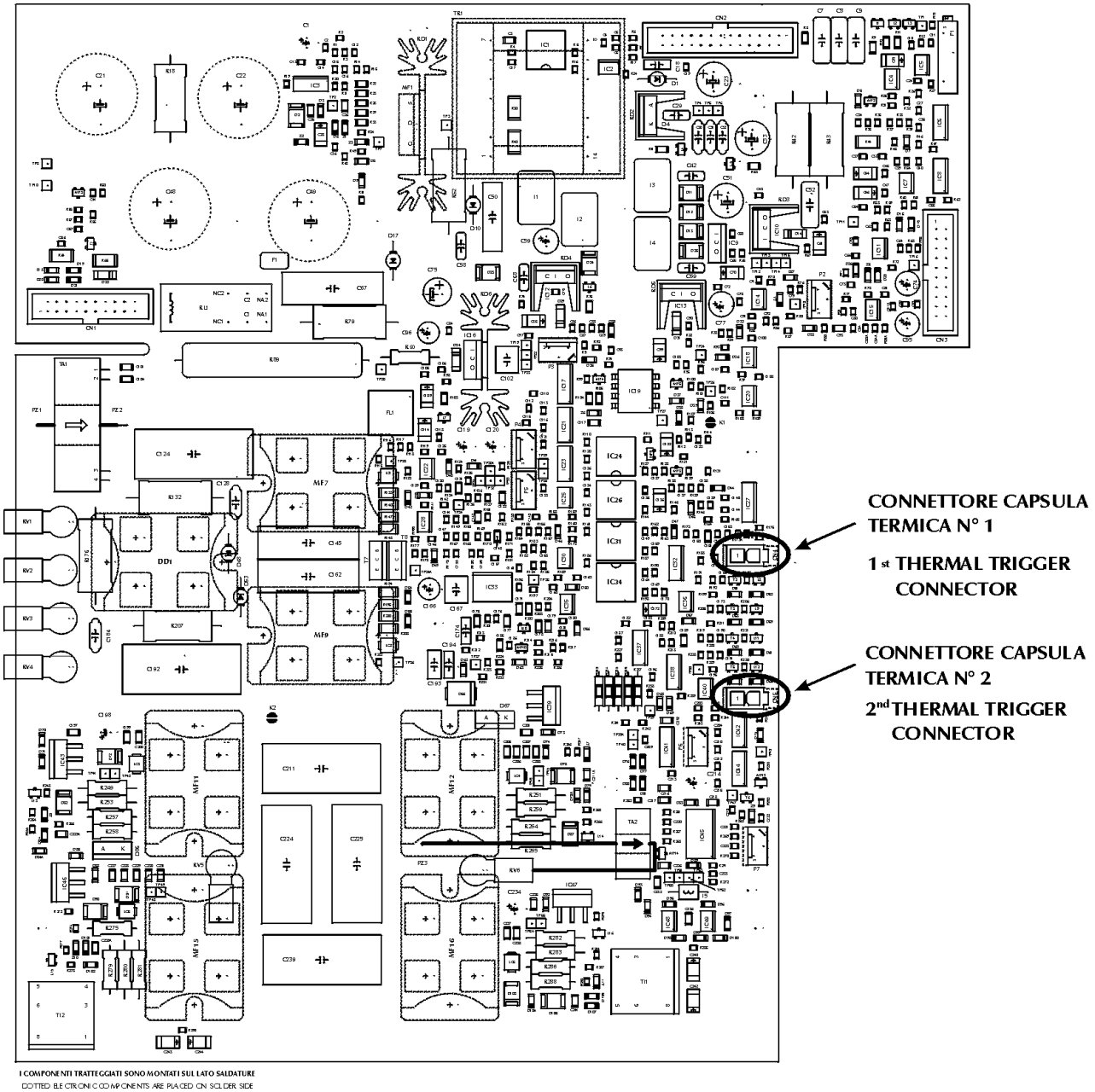
Display
When the power source is switched on, the panel runs a "self-test" during which all LEDs light and the display reads "200". Immediately afterwards, the display indicates the control panel's software version (e.g. 1.0) for a moment.
The display indicates the welding parameters requested by the operator (with the aid of other keys) and as soon as the arc is struck, it gives a readout, furnishing the real value of the current delivered.
When the yellow LED lights, flashing codes appear on the display to indicate an alarm status (in this status, only the two power and alarm LEDs are lit):

Message	Error type	Action
E10	Built-in heat sink temperature high	Remove top cover, check internal temperature, check fan, check status of thermal cutout devices (NC) (see figures 11-12-13)
E11	Supply voltage too high	Remove top cover, check supply voltage is within the prescribed range. Check voltage on 15.14.252 VRV1 ↔ RV2 < 276Vac (see sect. 9.1)
E12	Supply voltage too low	Remove top cover, check supply voltage is within the prescribed range. Check voltage on 15.14.252 VRV1 ↔ RV2 > 184Vac (see sect. 9.1)
E20 E24 E25	Front panel memory error	Remove top cover, check front panel power supply. Try resetting* front panel and, where necessary, replace. * NB: to reset the front panel (memory), see procedure in section 8 further on.

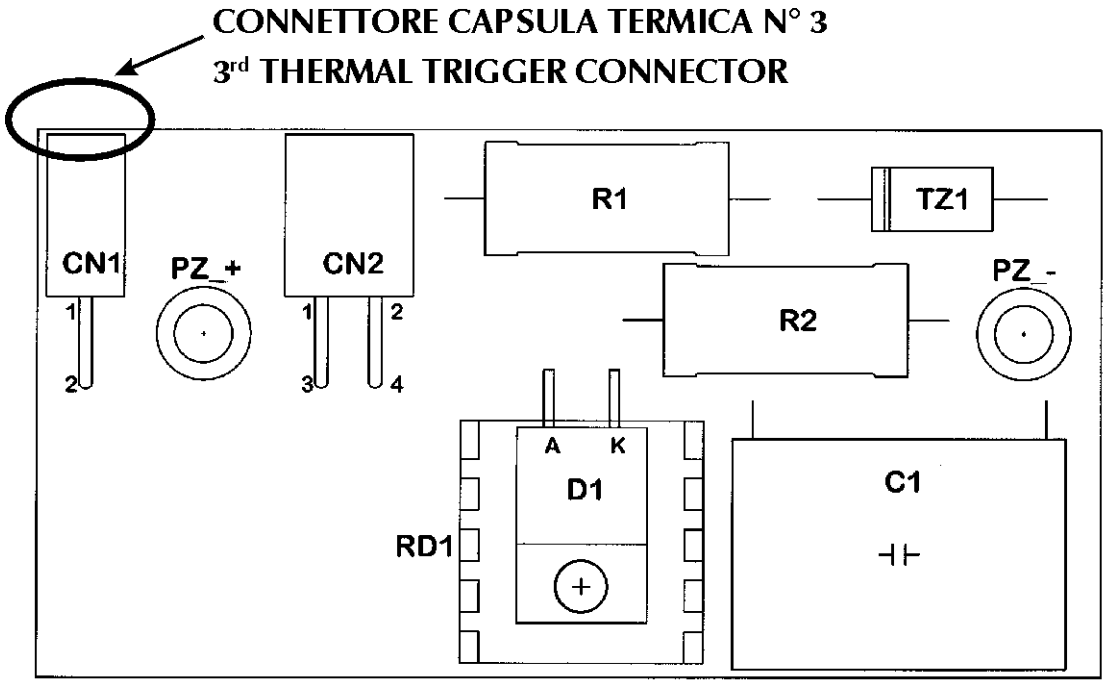
Once the causes of an alarm have been removed, pressing any key (or switching the machine off and back on) will usually exit alarm status.
The thermal cutout alarm stops automatically, allowing the power source's internal temperature to drop (it is best to keep the power source switched on as ventilation will aid cooling). The machine will run a new self-test and then resume operation as normal.

If error code E10 appears, also check the three thermal cutout capsules illustrated in the following figures (fig. 11-12-13).

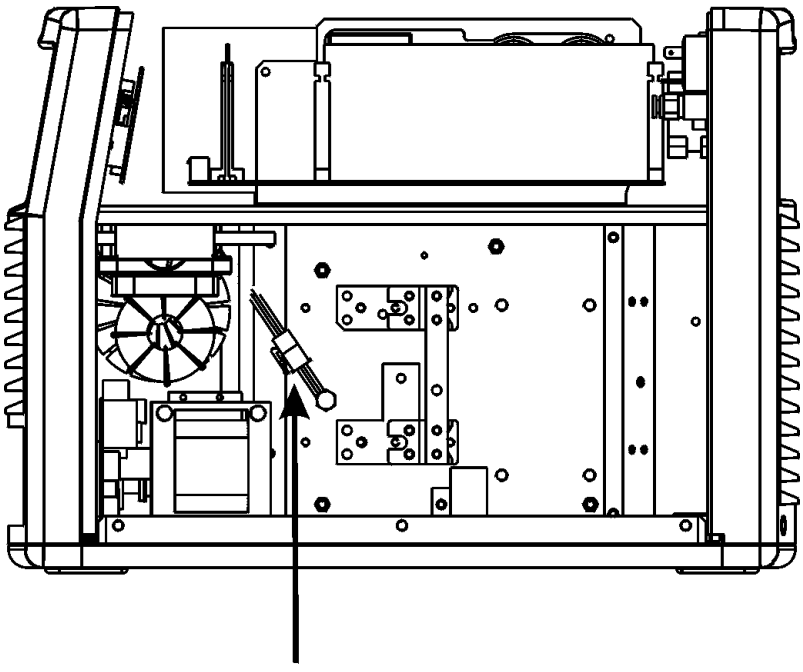
Board 15.14.250 (fig. 11)



Board 15.14.256 (only for G 200 AC-DC) (fig. 12)

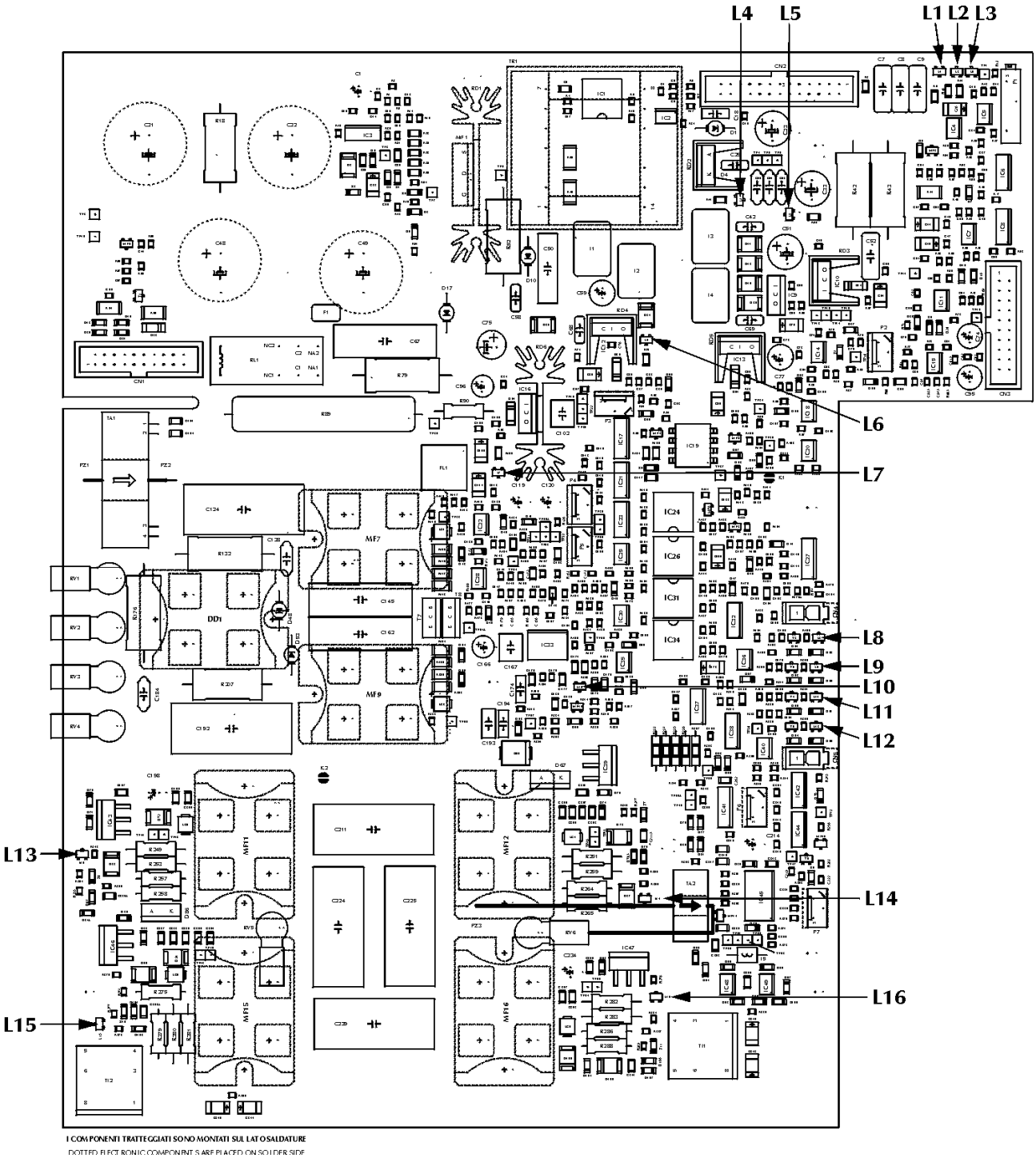


G 200 TLH (fig. 13)



7.2) INTERNAL DIAGNOSTIC INDICATIONS

Board 15.14.250 (fig. 14)



Internal diagnostic messages are supplied by the LEDs on board 15.14.250.
The LEDs indicate operating status of the relevant part, as described in the table below:

Led	Meaning	Status (in regular operating conditions)
L1	-15 Vdc supplied by 15.14.250 for 15.14.250 control section	ON
L2	+15 Vdc supplied by 15.14.250 for 15.14.250 control section	ON
L3	+5 Vdc supplied by 15.14.250 for 15.14.250 control section	ON
L4	+24 Vdc supplied by 15.14.250 to power front panel	ON
L5	+48 Vdc supplied by 15.14.250 to power front panel	ON
L6	-15 Vdc supplied by 15.14.250 for 15.14.250 UPFR section	ON
L7	+15 Vdc supplied by 15.14.250 for 15.14.250 UPFR section	ON
L8	Supply under voltage alarm	OFF = everything OK ON= unit lockup
L9	Supply overvoltage alarm	OFF = everything OK ON = unit lockup
L10	UPFR active	ON (brightness depends on output current delivered)
L11	Output power enabling (also see sect. 7.1 "output power" LED and sect. 9.2.4 "pot signal")	MMA: ON TIG: ON if torch trigger pulled
L12	Thermal cutout alarm	OFF = everything OK ON = unit lockup
L13	Gate MOS 11 present (output power enabling)	MMA: ON TIG: ON if torch trigger pulled
L14	Gate MOS 12 present (output power enabling)	MMA: ON TIG: ON if torch trigger pulled
L15	Gate MOS 15 present (output power enabling)	MMA: ON TIG: ON if torch trigger pulled
L16	Gate MOS 16 present (output power enabling)	MMA: ON TIG: ON if torch trigger pulled

8) SET-UP PARAMETERS

Front panel settings are complemented by others that can be edited in the Setup, which is accessed as follows (also see fig. 9 and fig. 10 in sect. 7.1):
- Switch unit off; wait a while (at least 10 seconds).
- Switch unit on.
- Panel runs self-test
- As soon as all the panel's LEDs go blank and the software version is displayed, press the "PARAMETERS" key once.
- The display will read "0". By turning the current encoder (knob on panel), you can set the value in the range "0" to "99". By pressing the "PARAMETERS" key, you can view the value of the associated parameter according to the data given in the table below:

Param.	Description/meaning	Range	Default
0	Saves changes and exits Setup	-	-
1	Initial current as a percentage of welding current	2 - 200%	50%
2	Pregas time	0.0 - 25.0s	0.0s
3	Hot start as a percentage of welding current (MMA only)	0 - 100%	80%
4	Arc force as a percentage of welding current (MMA only)	0 - 100%	30%
5	Waveform in AC (G200 AC/DC only)	0 - 8 *(see table below)	2 (Square)
6	Remote control current minimum	6 - 200 A	12 A
7	Remote control current maximum	6 - 200 A	200 A
8	Lift or HF start in G200 AC/DC (disregarded in TIG AC and in G200 TLH)	0 = HF 1 = LIFT	0
9	RESET all parameters	-	-
	..... parameters not used		
12	Welding in DC+ or DC- in G200 AC/DC (disregarded in G200 TLH)	0 = DC- 1 = DC+	0
	..... parameters not used		
14	Ibase in pulsed TIG DC setup mode	0 = Amperes 1 = % of welding current	0
	..... parameters not used		
98	Reset all parameters (only use when there are problems with the non-volatile memory, see errors E20 - E25 on display in sect. 7.1) Only use if solder-jumper K1 on 15.14.250 is closed (see sect. 9.2.4), otherwise use next code "99".	-	-
99	Reset all parameters (only use when there are problems with the non-volatile memory, see errors E20 - E25 on display in sect.7.1)	-	-

** note: waveform in AC*

Value parameter n° 5	Half wave -	Half wave +
0	Sine	Sine
1	Triangle	Triangle
2	Square	Square
3	Sine	Triangle
4	Sine	Square
5	Triangle	Sine
6	Triangle	Square
7	Square	Sine
8	Square	Triangle

- The value of the parameter selected during the previous step can be changed by turning the knob on the panel.
- We can see from the table that some parameters do not really have a value associated: if we select one of these parameters and press the "Parameters" key, the associated operation is performed (e.g. if we enter Setup, select parameter "9" and press the "Parameters" key, factory settings are resumed for all parameters [**RESET**]).
- Parameters labelled "not used" cannot be accessed, i.e. nothing happens when the "Parameters" key is pressed.
- To save changes made to parameters and exit the Setup menu, return to parameter "0" and press the "Parameters" key; otherwise, switching the machine off directly will mean none of the changes will be saved, and the last confirmed parameter settings will remain.
- Once you have exited Setup, the machine runs a self-test and regular operation is then resumed, based on the new parameter settings if any have been made.

9) DESCRIPTION OF BOARDS

The following sections illustrate regular work conditions of boards making up the power source, and furnish standard values for the electrical measurements that can be taken at the main points of said boards.
All measurements indicated can be taken with a digital multimeter.

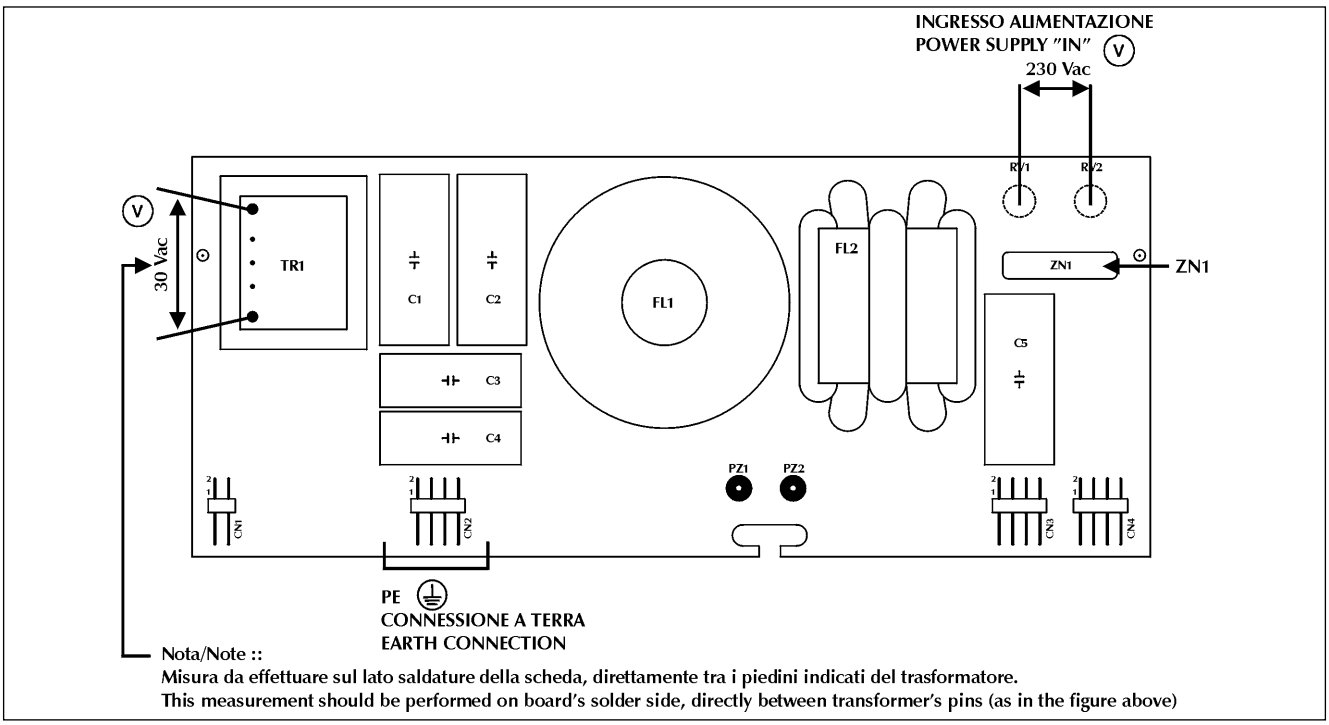
Remember that testing should always start with a VISUAL INSPECTION!
Visual inspection reduces the time spent troubleshooting and points any subsequent steps in the direction of the damaged part!

Generally speaking, the following points should be inspected visually:
- input filter zone
- DC bulk electrolytic capacitors
- check for traces of fumes on the inside of the cover
- power and signal connections
- overall status of boards.

WARNING!: Unless otherwise specified, before taking measurements described in the following sections, disconnect HF board 15.14.286 from bus board 15.14.285/15.14.315!

IMPORTANT NOTE! When the machine is connected to the mains, the master switch is live regardless of its status (open or closed). Consequently, you are recommended to unplug the unit before touching any of the parts inside!

9.1) INPUT FILTER BOARD 15.14.252 (fig. 15)



Filter board 15.14.252 contains a varistor[1] guarding against supply overvoltage, an auxiliary transformer and EMC filter circuitry.
The filter basically consists in a network of capacitors, some earthed, and a shared inductor.
This circuit has the dual purpose of limiting the machine's radiofrequency emissions to levels prescribed by regulations, and making the power source immune from similar problems caused by any electronic devices connected to the same power supply.

[1] A varistor ZN1 is inserted between the two power supply's input phases meaning that if you find an instantaneous voltage over 275Vac between terminals RV1 and RV2, the varistor instantly starts conducting so as to absorb a sufficient current spike to limit the above-mentioned overvoltage. In this way, varistor ZN1 protects other parts of the machine from overvoltage characterized by a limited energy content.
This process is actually non-destructive for the component if the energy delivered by the voltage spike is moderate, as is the case with atmospheric discharges (lighting). If, on the other hand, overvoltage is considerable and prolonged, the varistor cannot dissipate all associated energy and blows.
This happens, for instance, if the machine is accidentally connected to supply voltages over 275Vac, or if it is subjected to overvoltage caused by inadequate or non-stabilized generating sets.

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.2) MAIN-BOARD 15.14.250 (fig. 16)

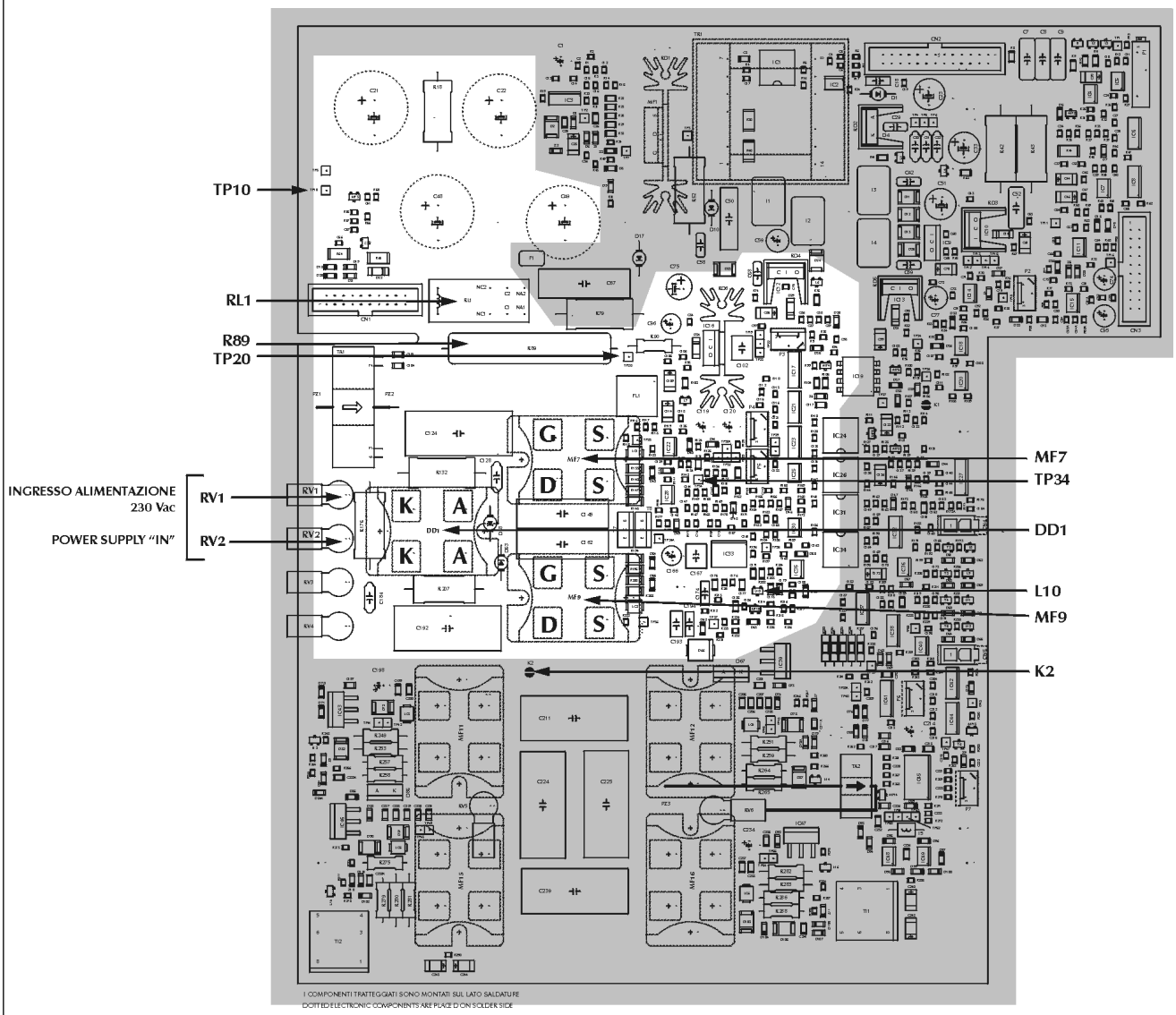
This board features the following circuits
- UPFR preregulator
- switching power supply
- power inverter
- welding current control

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.2.1) BOARD 15.14.250 "UPFR SECTION" (fig. 17)

UPFR preregulator: supplies stabilized voltage (approx. 385Vdc) to electrolytic capacitors to power the power inverter. In addition, this stage sees that current absorbed from the supply mains is sinusoidal (power factor = 0.99). Toroidal inductor L1 is also included in this stage (see point "f" in fig. 7 in sect. 6.1)

WARNING: before taking measurements described**, open solder-jumper K2 with the machine unplugged!**



Power source / Mode	Component	Test point	Value
OFF	DD1	A◄—K	+0.34 Vdc ⏚
OFF	MF7	S◄—D	+0.36 Vdc ⏚
OFF	MF7	S◄—G	+0.25 Vdc ⏚
OFF	MF9	S◄—D	+0.36 Vdc ⏚
OFF	MF9	S◄—G	+0.25 Vdc ⏚
OFF	R89	-	46 OHM* Ω

* Note = wait 10 minutes after switching off the power source before measuring R89

Power source / Mode	Test point	LED	Value
ON/TIG	-	L10	FAST BLINKING
ON	RV1 ◄—► RV2	-	230 Vac ± 20% V
ON	TP34 ◄— TP10	-	+7.7 Vdc ± 20% V
ON	TP20 ◄— TP10	-	+385 ± 5 Vdc V
ON	RL1	-	CLOSED*

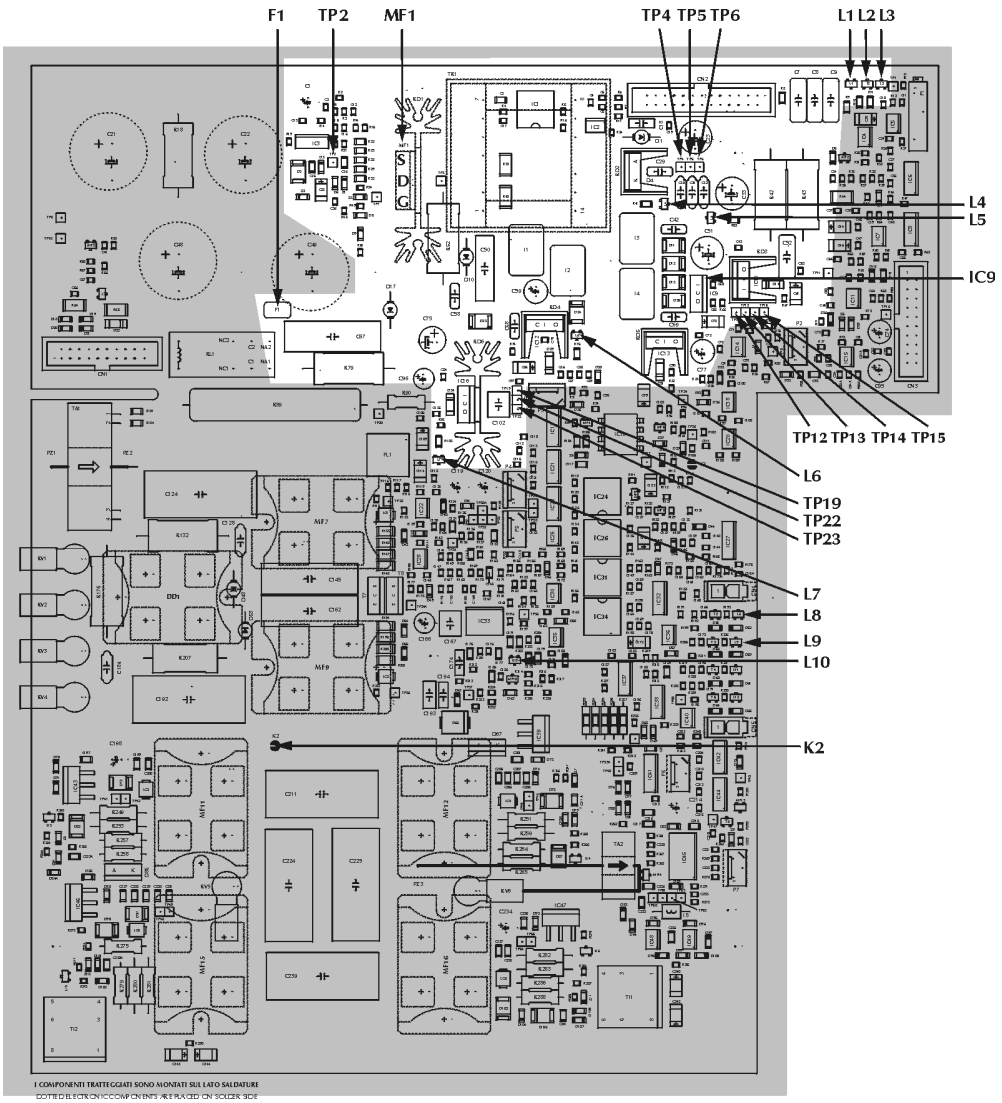
* Note: RL1 closes a few seconds after the power source is switched on

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.2.2) BOARD 15.14.250 "POWER SUPPLY SECTION" (fig. 18)

Switching power supply: supplies auxiliary voltage required for the whole machine to work. Generally, the various voltages power circuits that are electrically insulated from each other (there is no ground shared by the whole machine).

WARNING: before taking measurements described, **open solder-jumper K2 with the machine unplugged!**



Power source / Mode	Component	Test point	Value
OFF	F1	-	0 Ω Ⓞ
OFF	MF1	S ⟵ D	+0.4 Vdc Ⓥ
	MF1	S ⟵ G	10 K Ω Ⓞ

Power source / Mode	Test point	Associated LED	Value
ON	RV1⟷RV2	-	230 Vac ± 20% Ⓥ
ON	RV1⟷RV2	L8	OFF (lit if $V_{RV1⟷RV2} \leq$ 184Vac) Ⓥ
ON	RV1⟷RV2	L9	OFF (lit if $V_{RV1⟷RV2} >$ 276Vac) Ⓥ
ON	-	L10	FAST BLINKING
ON	TP13⟵TP15*	L1	-15 ± 0.3 Vdc Ⓥ
ON	TP14⟵TP15*	L2	+15 ± 0.3 Vdc Ⓥ
ON	TP12⟵TP15*	L3	+5 ± 0.3 Vdc Ⓥ
ON	TP4 ⟵TP6	L4	+24 ± 0.5 Vdc Ⓥ
ON	TP5 ⟵TP6	L5	+48 ± 2 Vdc Ⓥ
ON	TP19⟵TP22	L6	-15 ± 0.3 Vdc Ⓥ
ON	TP23⟵TP22	L7	+15 ± 0.3 Vdc Ⓥ
ON	TP2 ⟵TP22	-	+14.5 ± 0.5 Vdc Ⓥ

* Note: for greater ease of measurement, TP15 is connected electrically to the metal TAB of IC9

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.2.3) BOARD 15.14.250 "POWER INVERTER SECTION" (fig. 19)

Full-bridge power inverter

WARNING: before taking measurements described, **open solder-jumper K2 with the machine unplugged!**

Note: solder-jumper K2 causes a break in the inverter's power supply circuit and is normally closed (it may be opened to test the power source; also see chapter 10 below)

Power source / Mode	Component	V S ⟵ G	V S ⟵ D
OFF	MF11	+0.25 Vdc	+0.36 Vdc
OFF	MF12	+0.25 Vdc	+0.36 Vdc
OFF	MF15	+0.25 Vdc	+0.36 Vdc
OFF	MF16	+0.25 Vdc	+0.36 Vdc

Power source / Mode	LED	Status
ON / TIG 2T*	L13	ON (with torch trigger pulled)
ON / TIG 2T	L14	ON (with torch trigger pulled)
ON / TIG 2T	L15	ON (with torch trigger pulled)
ON / TIG 2T	L16	ON (with torch trigger pulled)

* **Note:** TIG 2T = 2 STROKE TIG (see owner's manual)

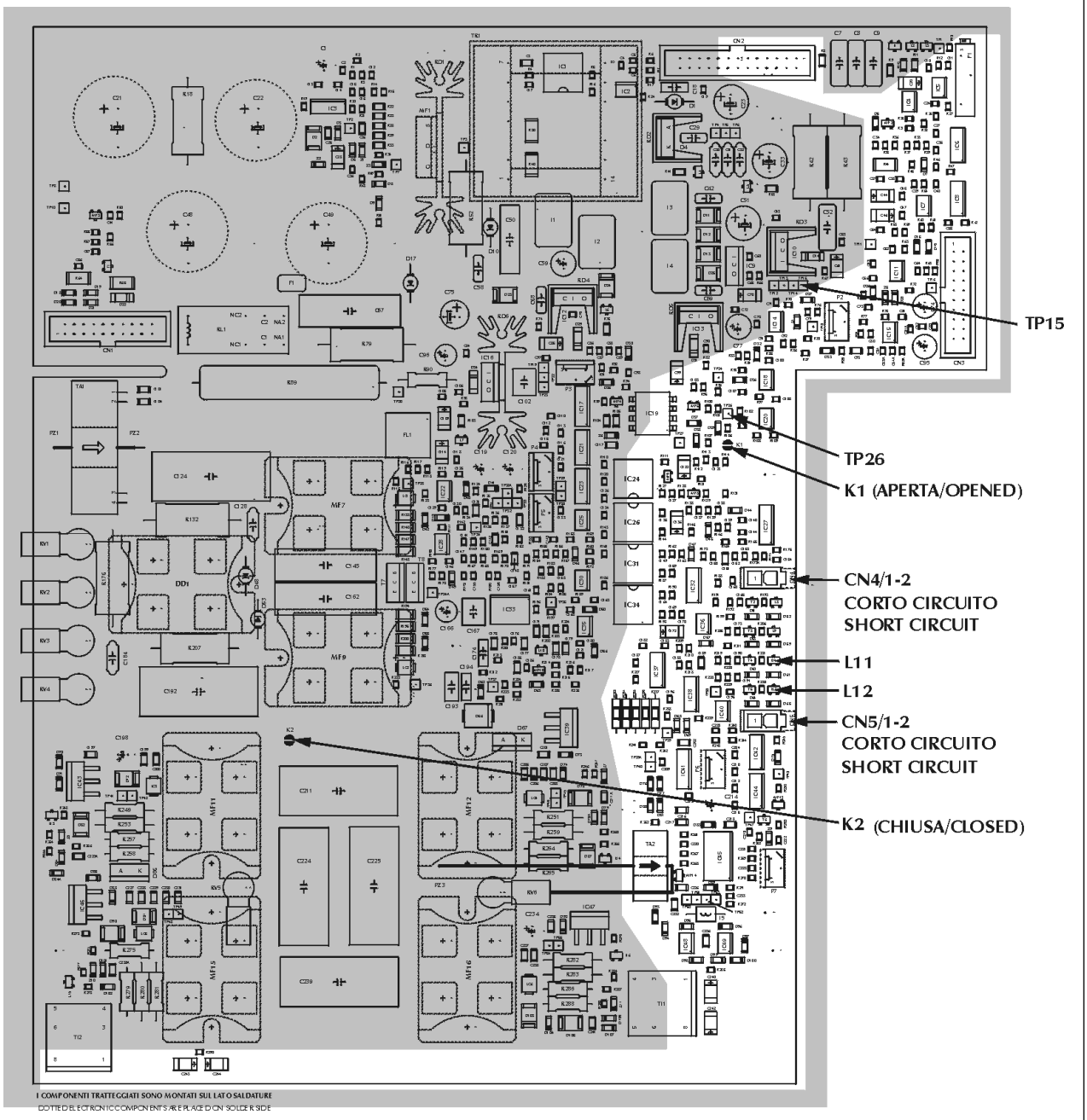
Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.2.4) BOARD 15.14.250 "WELDING CURRENT CONTROL SECTION" (fig. 20)

Analogue adjustment circuits: control welding current (relevant logic system is located in panel board 15.14.236).

WARNING: before taking measurements described, wait 5 minutes after switching off the power source and - with the machine unplugged - **close solder-jumper K2!**

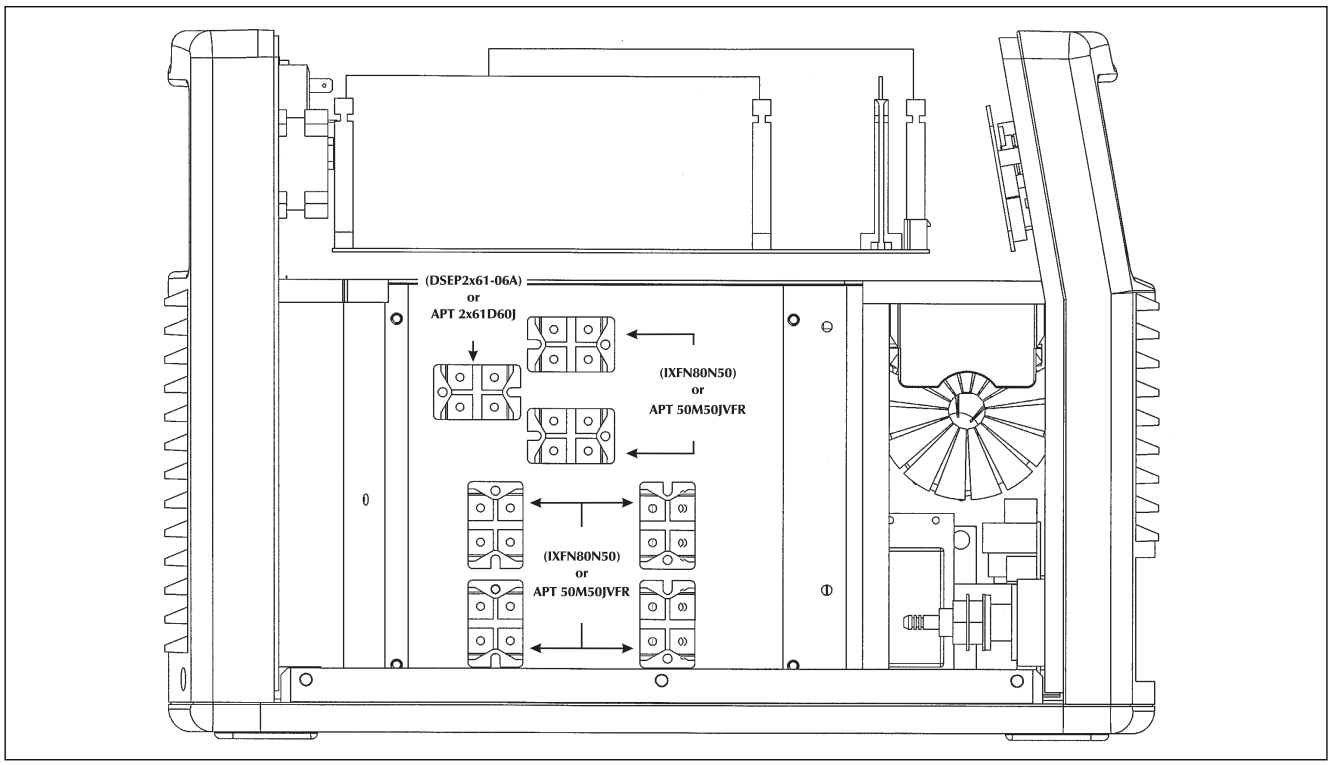
Note: solder-jumper K2 enables a limitation of the power source's open circuit voltage OCV, and is normally open (can be factory set only).



Power source / Mode	LED / Test point	Value	Notes
ON	L 12	OFF	Thermal cutout
ON / MMA	L 11	ON	"Pot" signal
ON / MMA (NO LOAD)	TP26 ← TP15	- 4.3Vdc Ⓥ	Voltage feedback

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.2.5) ASSEMBLY DIAGRAM FOR KIT 15.18.017 (BOARD 15.14.250 + POWER COMPONENTS) (fig. 21)

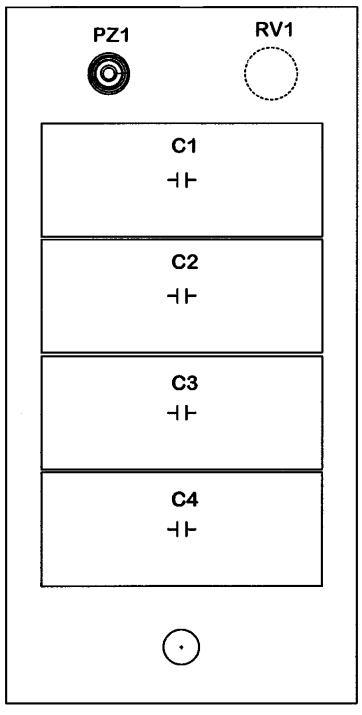


WARNING!

1) Components sensitive to electrostatic discharges.
2) Torque wrench settings:
   FASTENING ON HEAT SINK = MAX 1.5 Nx m / 13 lb x in
   BOARD FASTENING = MAX 1.5 Nx m / 13 lb x in
3) Use layer of thermal grease

9.3) POWER INVERTER CAPACITORS BOARD 15.14.288 (fig. 22)

Capacitors fitted on this board are connected in series with the power transformer's primary winding (see master wiring diagram).



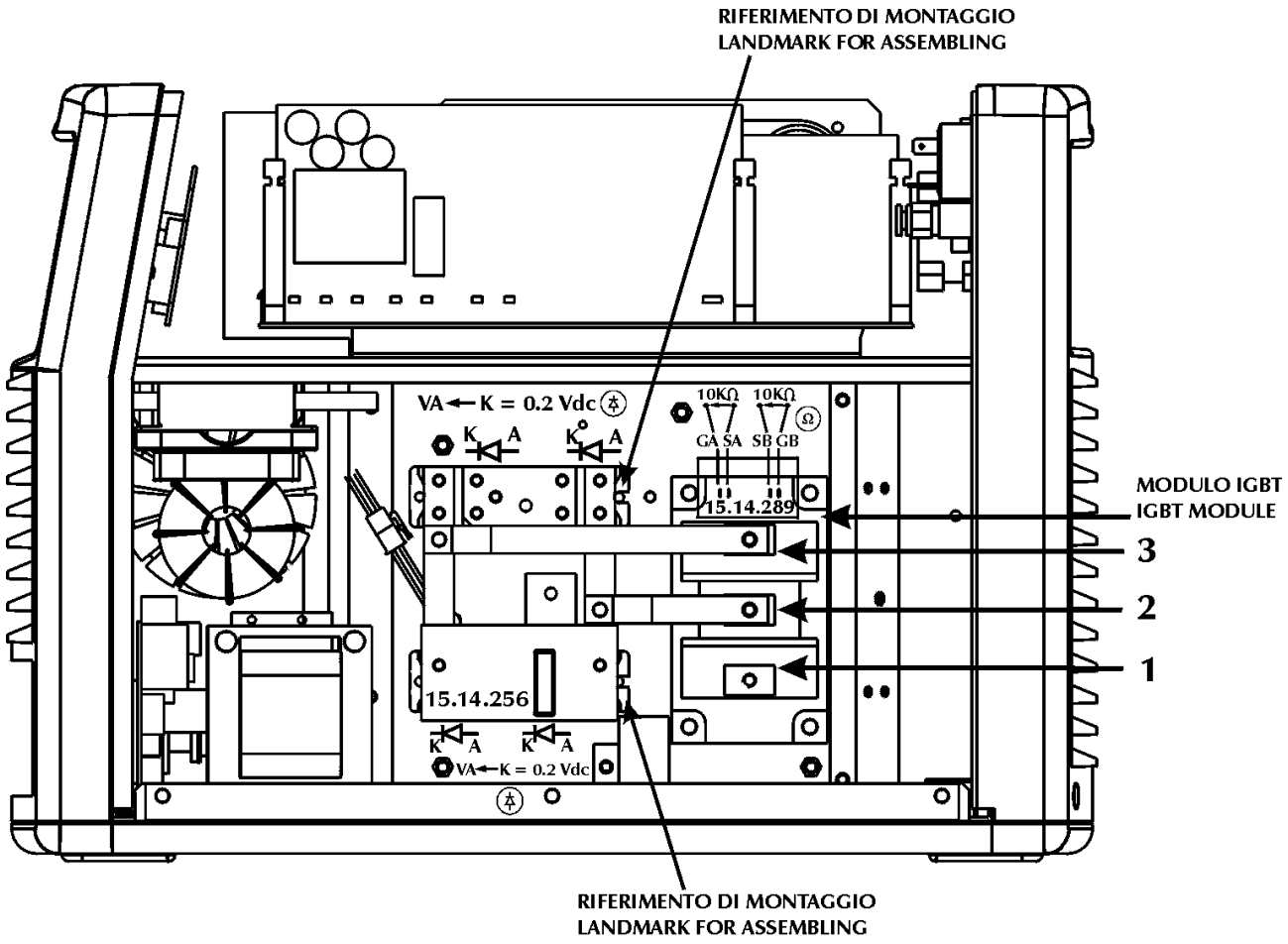
Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

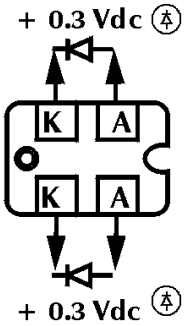
9.4) SECONDARY POWER UNIT

9.4.1) SECONDARY POWER UNIT G 200 AC- DC (fig. 24)

This unit handles secondary power rectifying and AC switching.

WARNING!: Before commencing the measurements described, make sure the HF board is disconnected from the bus board!





Power source / Mode	Test point	Value
OFF	R GA ← SA	10 k Ω Ⓞ
OFF	R GB ← SB	10 k Ω Ⓞ
OFF	V A ← K	+0.3 Vdc Ⓐ
ON / MMA	V GA ← SA	-13 Vdc Ⓥ
ON / MMA	V GB ← SB	+13 Vdc Ⓥ
ON / MMA	V 3 ← 1	+0.5 Vdc Ⓥ
ON / MMA	V 1 ← 2	+105 Vdc Ⓥ
ON / MMA	V out*	+52 Vdc Ⓥ

· note: Vout = power source's open circuit voltage OCV

WARNING!

1) Components sensitive to electrostatic discharges.
2) Torque wrench settings:
   FASTENING ON HEAT SINK = MAX 1.5 Nx m / 13 lb x in
   BOARD FASTENING = MAX 1.5 Nx m / 13 lb x in
3) Use layer of thermal grease

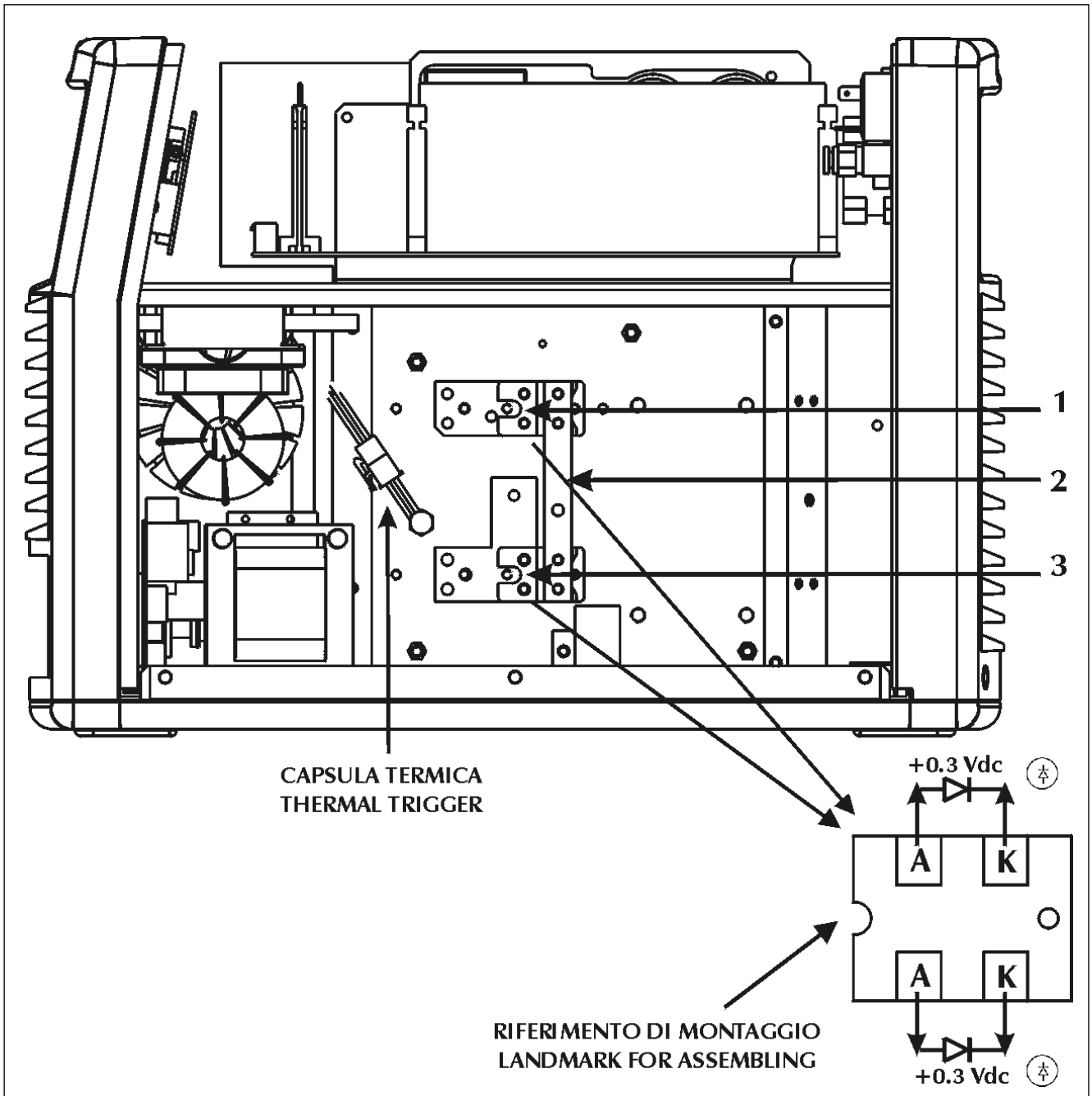
WARNING!: should module IGBT break and be replaced, board 15.14.253 (see sect. 9.7 below) must be tested before reconnecting board 15.14.289 (a faulty IGBT module can break the 15.14.253 board and vice versa)!

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.4.2) SECONDARY POWER UNIT G 200 TLH (fig. 25)

This unit handles secondary power rectifying.

WARNING!: Before commencing the measurements described, make sure the HF board is disconnected from the bus board!



Power source / Mode	Test point	Value
OFF	V 1 ← 2	+0.3 Vdc
OFF	V 3 ← 2	+0.3 Vdc
ON / MMA	V out	+52 Vdc

- V 1 ← 2 and V 3 ← 2 must be measured once connector CN1 is disconnected from output filter board 15.14.238
  REMEMBER TO RECONNECT CN1 ONCE YOU HAVE TAKEN THE MEASUREMENT!
- Vout = power source's open circuit voltage OCV

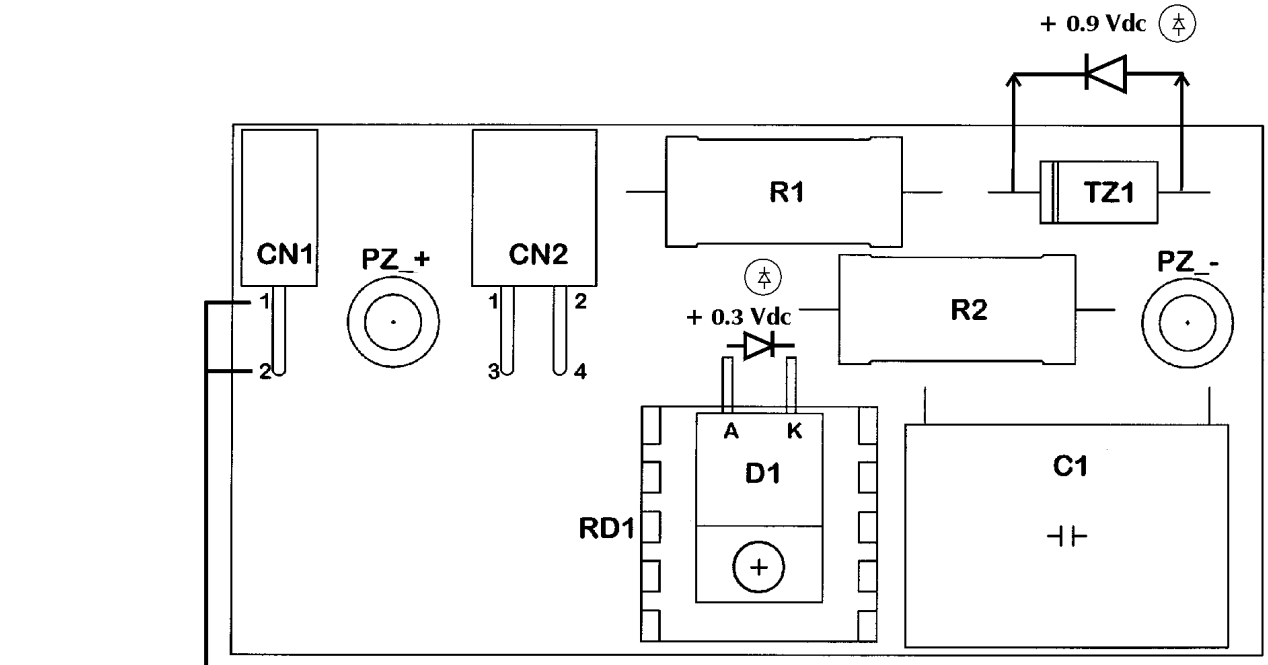
WARNING!

1) Components sensitive to electrostatic discharges.
2) Torque wrench settings:
   FASTENING ON HEAT SINK = MAX 1.5 Nx m / 13 lb x in
   BOARD FASTENING = MAX 1.5 Nx m / 13 lb x in
3) Use layer of thermal grease

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.5) AC STAGE CLAMP BOARD 15.14.256 (FOR G200 AC/DC ONLY) (fig. 26)

This circuit is a filter for the AC stage.



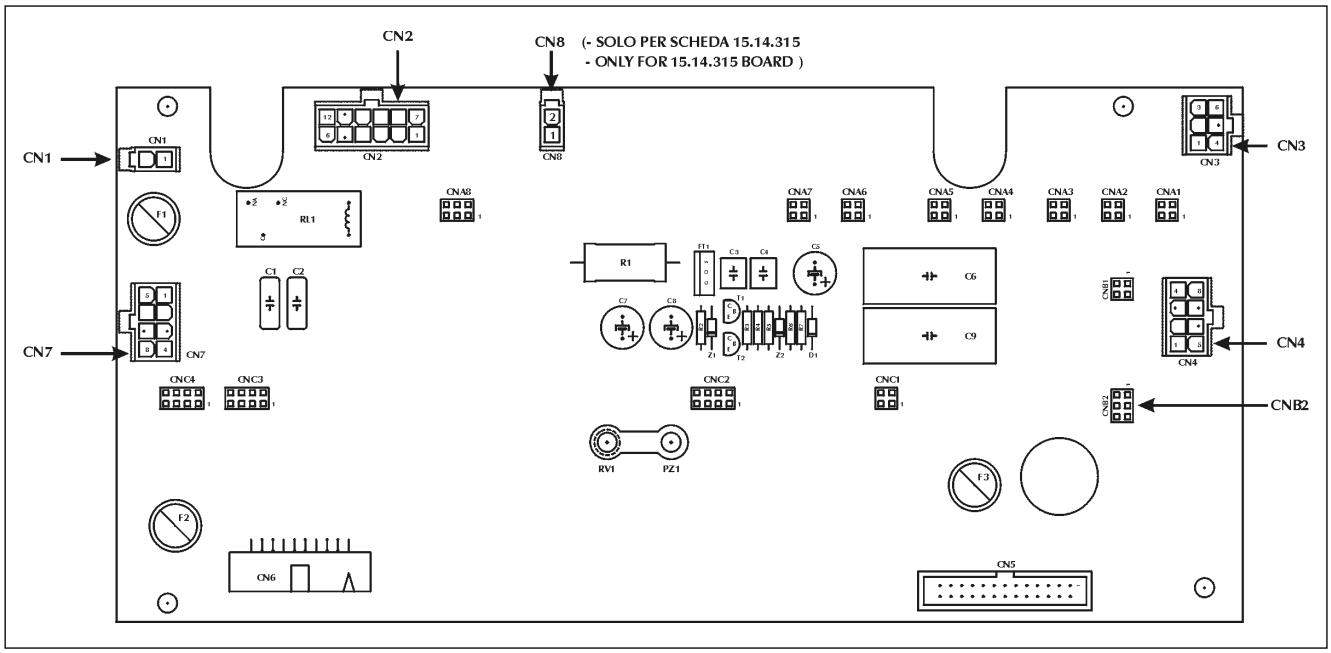
CN1/PIN 1-2
CORTO CIRCUITO
(CAPSULA PROTEZIONE TERMICA)

SHORT CIRCUIT
(THERMAL PROTECTION TRIGGER)

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.6) BOARD BUS 15.14.285/15.14.315 (fig. 27)

This is an interconnection board.



F1 = 3.15A T 250Vac cooling unit protection (pump + fan)
F2 = 3.15A T 250Vac superimposition board and HF board protection
F3 = 2.5A T 250Vac fan protection

CN1:

1	wire n° 5	+24Vdc fan power supply
2	wire n° 6	0Vdc fan power supply

CN2:

1	wire n° 21	secondary thermal cutout
2	wire n° 22	current probe output
3	wire n° 23	+15Vdc current probe power supply
4	wire n° 24	- SB driver (also see secondary power unit G 200 AC-DC sect. 9.4.1)
6	wire n° 26	- SA driver (also see secondary power unit G 200 AC-DC sect. 9.4.1)
7	wire n° 27	secondary thermal cutout
8	wire n° 28	current probe earth
9	wire n° 29	-15Vdc current probe power supply
10	wire n° 30	+ GB driver (also see secondary power unit G 200 AC-DC sect. 9.4.1)
12	wire n° 32	+ GA driver (also see secondary power unit G 200 AC-DC sect. 9.4.1)

CN3:

1	wire n° 61	- superimposition
2	wire n° 65	superimposition ground
3	wire n° 63	+ superimposition
4	wire n° 64	- power source output voltage
6	wire n° 66	+ power source output voltage

CN4:

1	wire n° 41	+24Vdc front panel power supply
2	wire n° 42	front panel power supply earth
4	wire n° 44	HF output control signal
5	wire n° 45	+48Vdc front panel power supply
8	wire n° 48	HF output control earth

CN7:

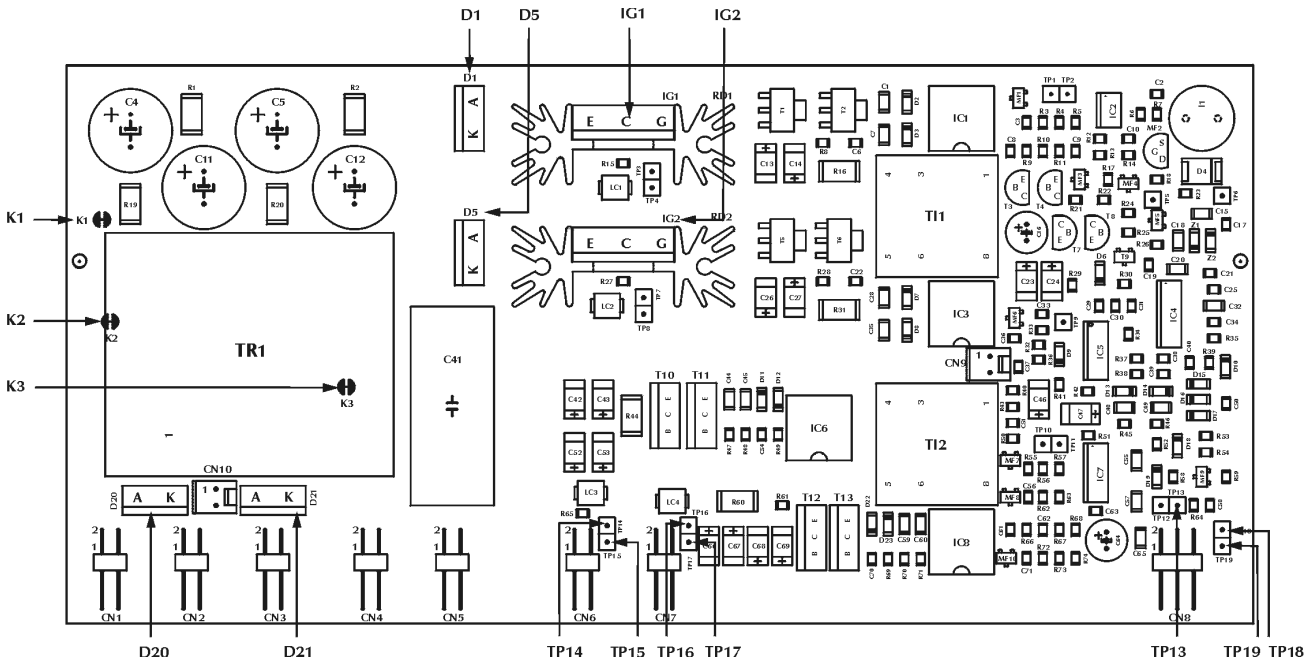
1	wire n° 11	230Vac WU15 cooling unit pump power supply
2	wire n° 12	230Vac WU15 cooling unit fan power supply
4	wire n° -	protection carth connection
5	wire n° 15	230Vac WU15 cooling unit pump power supply
6	wire n° 16	230Vac WU15 cooling unit fan power supply
8	wire n° -	protection carth connection

CN8 (only for 15.14.315 board):
1 & 2 = jumper (short circuit)

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.7) SUPERIMPOSITION AND AC CONTROL BOARD 15.14.253 (FOR G200 AC-DC ONLY) (fig. 28)

This board generates superimposing and controls AC switching of the secondary IGBT module.



Note (valid only for board 15.14.253 version 6 and higher):
- solder-jumpers K1, K2 are closed (can be factory set only)
- solder-jumper K3 is open (can be factory set only)

WARNING: perform checks following steps 1 and 2 in the given order!

1

WARNING: measurements indicated in the following table should be taken with board 15.14.253 disconnected from the machine!

Component	Test point	Value
IG1	E ← G	10 kOHM Ω
IG1	E ← C	+0.4 Vdc ⏃
IG2	E ← G	10 kOHM Ω
IG2	E ← C	+0.4 Vdc ⏃
D1	A ← K	+0.4 Vdc ⏃
D5	A ← K	+0.4 Vdc ⏃
D20	A ← K	+0.4 Vdc ⏃
D21	A ← K	+0.4 Vdc ⏃
-	TP15 ← TP14	10 kOHM Ω
-	TP17 ← TP16	10 kOHM Ω

2

WARNING:
- insert board 15.14.253 in the machine and connect it to bus board 15.14.285/15.14.315
- disconnect connector CN1 from IGBT connection board 15.14.289
- switch the power source on and take measurements indicated in the table below:

Power source / Mode	Test point	Value
ON / MMA	TP19 ← TP18	+15 Vdc V
ON / MMA	TP13 ← TP18	+5 Vdc V
ON / MMA	TP15 ← TP14	-13 Vdc V
ON / MMA	TP17 ← TP16	+13 Vdc V

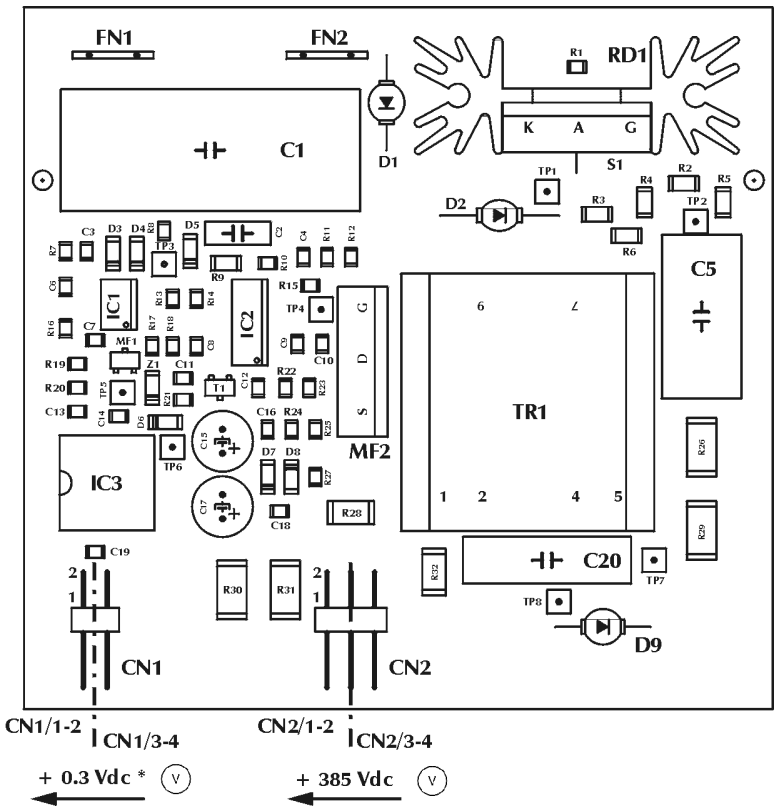
- switch off the power source, reconnect connector CN1 to board 15.14.289 and repeat measurements indicated in sect. 9.4.1

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.8) HIGH-FREQUENCY BOARD 15.14.286 (fig. 29)

This board generates series of very fast high-voltage pulses to facilitate TIG striking.

Power source	FN1	FN2
Genesis 200 TLH	WHITE	RED
Genesis 200 AC-DC	RED	WHITE



WARNING: perform checks following steps 1 and 2 in the given order!

1

WARNING: measurements indicated in the following table must be taken directly on bus board 15.14.285 /15.14.315 once HF board 15.14.286 has been removed from the machine!

Power source / Mode	Component	Test point	Value
ON	CNB2 on Bus board 15.14.285/15.14.315	PIN 1 ← 5	+385 Vdc (V)
ON / TIG HF	CN4 on Bus board 15.14.285/15.14.315	PIN 4 ← 8	+6 Vdc* (V)

* **Note:**
- this voltage remains for just 1.5 seconds once the torch trigger is pulled
- this voltage is equivalent to measuring +0.3 Vdc (V) directly on the HF board's connector CN1, when connected.

2

WARNING:
- insert HF board 15.14.286 in the machine and connect it to bus board 15.14.285/15.14.315
- switch on the power source and take measurements indicated in the table below, without pulling the torch trigger:

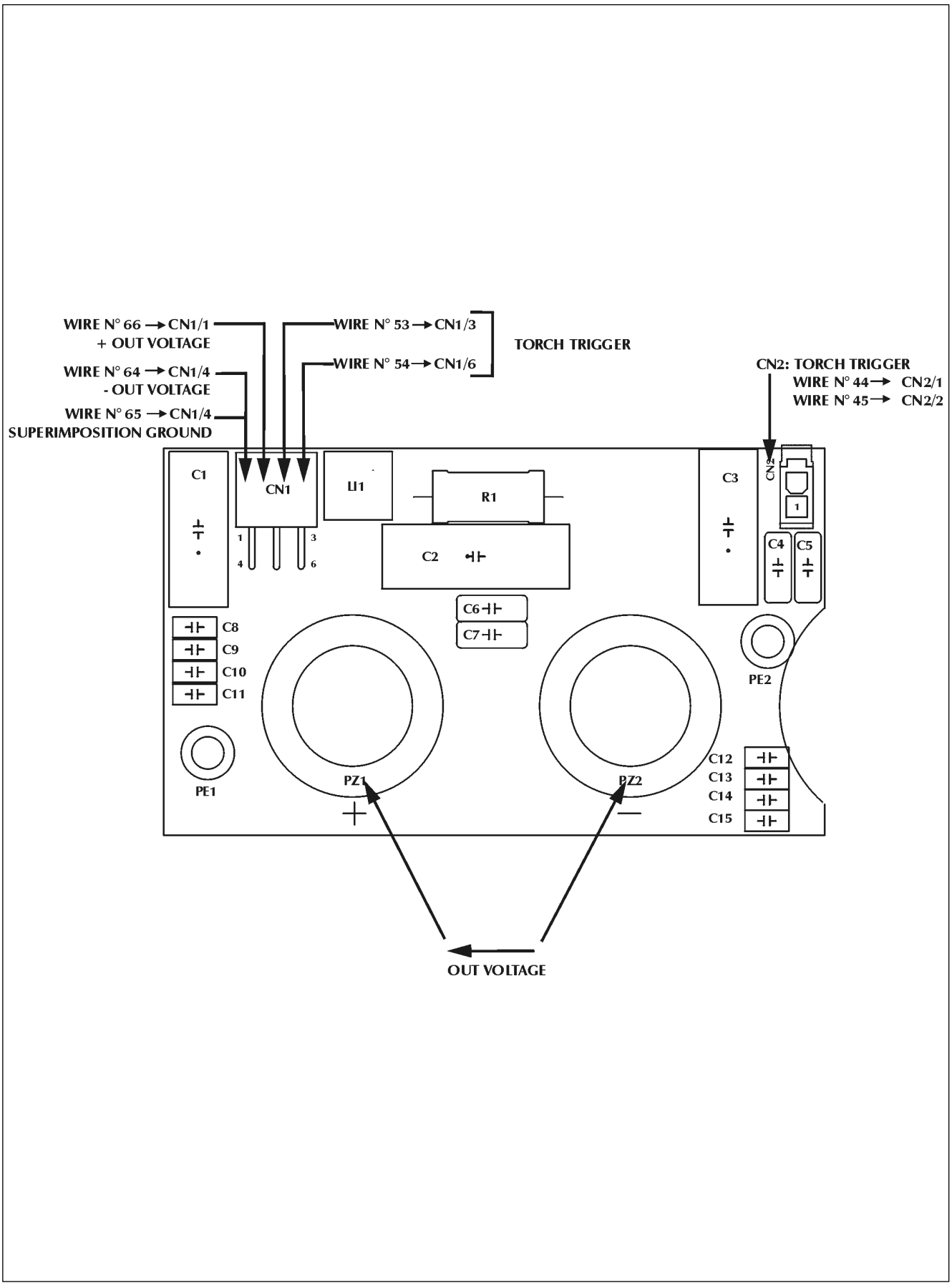
Power source / Mode	Component	Test point	Value
ON / TIG HF	D1	V A ← K	+920 Vdc (V) **(torch trigger not pulled)****

** **Note:** you are advised not to take measurements on D1 whilst the torch trigger is pulled as the HF discharge might damage your multimeter!

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

9.9) OUTPUT FILTER BOARD 15.14.238 (fig. 30)

This board performs filtering on the secondary to achieve EMC (just like the input board does on the primary - see section 9.1) and also filters out any disturbance from the torch trigger command owing to HF .



Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

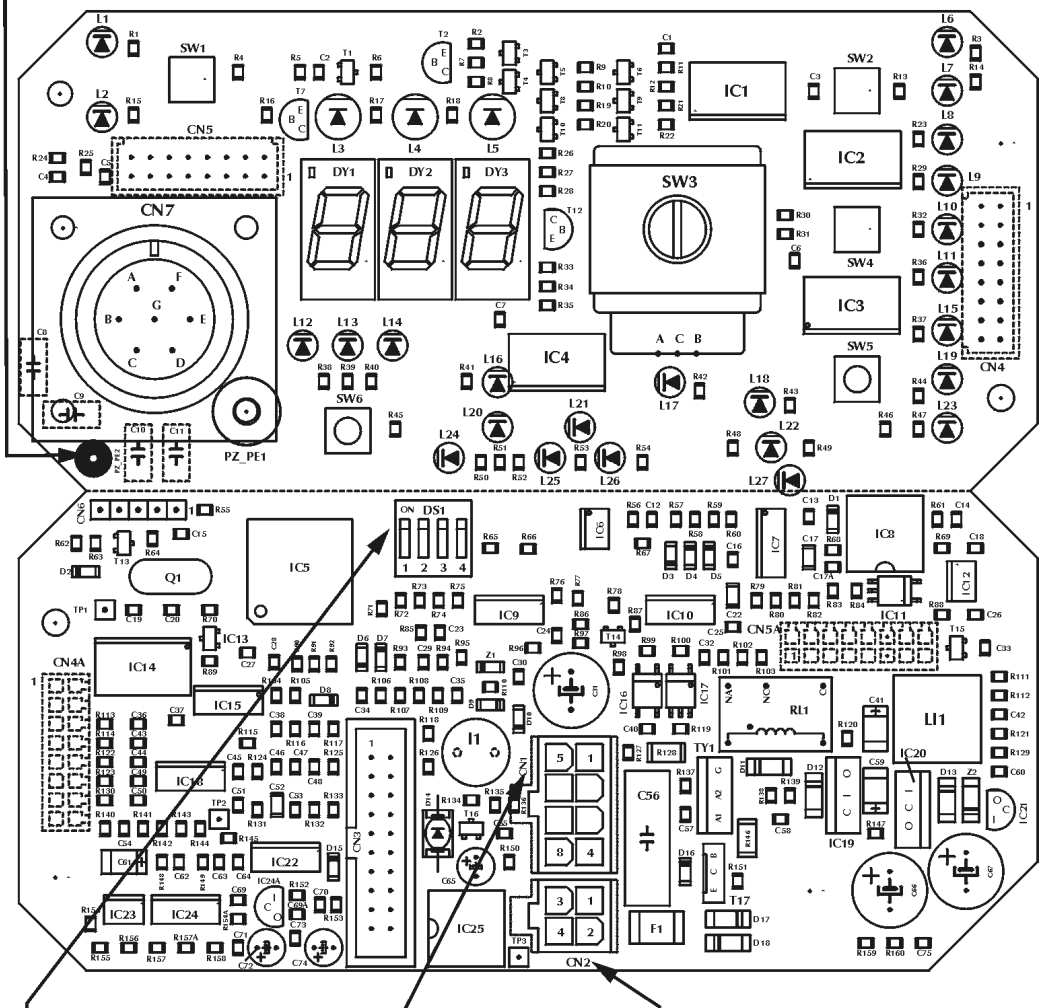
9.10) FRONT PANEL BOARD 15.14.236 (fig. 31)

This pair of interconnected boards acts as a user interface, gives the gas solenoid valve and HF striking command, and provides operating logic and microprocessor control of the whole machine.

Panel boards 15.14.236 have different factory settings depending on the version of the panel they are fitted on (FP106 for G200 TLH or FP 122 for G200AC/DC); this setting can be performed at the factory only.

See section 5.5 for connection of remote control.

Note: connection to the metal structure (and hence with earth potential) of the panel with the yellow/green wire is essential to protect the board from disturbance!



CN1:

2 wire n° 52	solenoid valve control ground
3 wire n° 53	torch trigger
4 wire n° 54	torch trigger
5 wire n° 44	HF control signal
6 wire n° 48	HF control earth
8 wire n° 58	+48Vdc solenoid valve control

CN2:

1 wire n° 41	+24 Vdc panel power supply
2 wire n° 42	panel power supply ground
3 wire n° 45	+48 Vdc panel power supply

DIP SWITCH SETTINGS	1	2	3	4
Genesis 200 TLH	0	1	1	1
Genesis 200 AC/DC	0	1	1	0

Unless otherwise specified, all measurements sholud be taken with the boards in their slots and connected accordingly

10) FINAL INSPECTION OF POWER SOURCE AND SETTINGS

Precautions (also see chapter 3)

1) live parts (bare wires, HF terminals, …)
2) moving parts (fan …)
3) parts that get hot (heat sinks …)

Instruments required (also see chapter 4):

1) digital multimeter with end of scale = 1000Vdc
2) class 2.5 or higher clamp-on AC/DC ammeter with end of scale = 300Adc
3) instead of the clamp-on ammeter, you can insert the shunt on the earth lead and select the mVdc scale for the multimeter, then connect the multimeter to the shunt's measuring terminals

WARNING!: do not perform striking in TIG HF mode with the multimeter connected to the shunt or power source's output terminals, as if might be damaged!

10.1) Preliminary checks

Conditions
- Machine unplugged, ON/OFF switch set to "O".
- Top cover removed.
- Solder-jumper K2 on board 15.14.250 open.
- Board HF (15.14.286) inserted in its tracks but disconnected from bus board (15.14.285/15.14.315)
- TIG torch not connected
- Bypass pipe connected (if cooling unit fitted) (see sect. 3).

Checks
- Make sure all boards (except the HF board) are inserted properly
- Inspect boards visually (including any components sticking out whose pins might have been bent inadvertently)
- Inspect the various wiring and relevant connections visually
- Check dip switches on board 15.14.236:
  200 TLH
  panel FP106 (1=0/OFF; 2=1/ON; 3=1/ON; 4=1/ON)
  200 AC/DC
  panel FP122 (1=0/OFF; 2=1/ON; 3=1/ON; 4=0/OFF)

10.2) Checks on startup

Conditions
- Machine connected to 230Vac supply, set ON/OFF switch to "I".

Checks
- Correct initialization of front panel (green LED lit), no alarm (yellow LED unlit) and no error message on display.
- Relay RL1 on board 15.14.250 closes approx. 2 seconds after switch is closed.
- Reset front panel with parameter 9 in Setup (see section 8): the power source automatically switches to TIG DC 2T HF mode with current set to 100A.
- Make sure the fan is working properly and airflow is correct (directed towards front).
- Correct lighting of LEDs on main-board 15.14.250:

Power source / Mode	LED	Colour	Status
ON / TIG*	L1, L2, L3, L4, L5, L6, L7	Green	ON
ON / TIG*	L8, L9, L12	Red	OFF
ON / TIG*	L10	Green	FAST BLINKING
ON / TIG*	L11, L13, L14, L15, L16	Green	OFF

* NOTE: torch trigger not connected

10.3) Check UPFR section on main-board 15.14.250

Conditions
- Machine connected to 230Vac power supply, ON/OFF switch set to "I".

Checks
- Voltage between TP20 and TP10 on board 15.14.250 at +385 ± 5 Vdc.
- Green LED L10 blinking fast.

10.4) Checking inverter gate signals on main-board 15.14.250

Conditions
- As point above, with TIG torch connected.

Checks
- Make sure output power is enabled by pulling TIG torch's trigger, that green LEDs of the 4 gates L13/L14/L15/L16 on mono-board 15.14.250 light, and that the green power enabling LED L11 also lights.
  Make sure relay RL1 on bus board 15.14.285/15.14.315 is triggered and that the cooling unit (where connected) is switched on simultaneously.
- Select operating mode MMA, make sure the above-mentioned LEDs L11/ L13/L14/L15/L16 blink.

10.5) Checking open circuit voltage OCV

Conditions
- TIG torch not connected.
- Machine switched off for last five minutes, more or less, and unplugged.
- Make sure K1 is open on main-board 15.14.250.
- Close K2 on main-board 15.14.250.
- Plug the machine into 230Vac power supply, set ON/OFF switch to "I".
- MMA mode.

Checks
- open circuit voltage OCV in MMA +52 ± 2Vdc (measured on fixed output sockets or on output filter board 15.14.238)

10.6) Checking thermal cutout operation

Conditions
- As point above.

Checks
- Disconnect connector CN4 from board 15.14.250 (thermostat T2) and make sure the thermal cutout trips:
  yellow "Alarm" LED on front panel lights;
  "E10" alarm message on display;
  no open circuit voltage.
- Reconnect CN4 and make sure all functions are operating as before.
- Disconnect connector CN5 from board 15.14.250 (thermostat T1) and make sure the thermal cutout trips:
  yellow "Alarm" LED on front panel lights;
  "E10" alarm message on display;
  no open circuit voltage.
- Reconnect CN5 and make sure all functions are operating as before.
- Disconnect connector CN1 from board 15.14.256 (thermostat T3) and make sure the thermal cutout trips (in version 200TLH, T3 is connected directly to connector J6, as there is no board 15.14.256):
  yellow "Alarm" LED on front panel lights;
  "E10" alarm message on display;
  no open circuit voltage.
- Reconnect CN1 and make sure all functions are operating as before.

10.7) Functional MMA tests

Conditions
- Power source powered, MMA mode
- Electrode holder and earth lead connected
- Welding circuit not connected to protection earth potential.

Checks
- Perform various functional tests in MMA mode, making sure the controls on the panel work, i.e.:
  correct arc striking
  correct maintenance of arc stability
  welding even at max. power, according to data given in the table below:

Electrode type	Diameter	Amperage
Basic	2.5	95
Basic	5	180
Rutile	2.5	95
Rutile	5	180

- Repeat the above tests with earth lead connected to protection earth potential.

10.8) Functional TIG tests

Conditions
- **HF board inserted in connectors of board 15.14.285/15.14.315 and secured with relevant fasteners**
- Power source on, TIG mode.
- Welding circuit not connected to protection earth potential.

Checks
- Perform various welding tests in TIG mode, making sure the controls on the panel work, i.e.:
  correct activation of solenoid valve and gas delivery
  idle HF discharge in order to discover HF leakage within central adapter
  correct arc striking in TIG DC LIFT, TIG DC HF and TIG AC modes
  correct maintenance of arc stability
  welding even at max. power
  check various functions (2 stage, 4 stage, slope up and down, BI-LEVEL, pulsation…)
  perform welding tests in DC and AC with various current, frequency and pulsation levels according to the contents of the table below:

Electrode type	red	red	green	green
Diameter	1.6	2.4	1.6	2.4
Polarity	DC	DC	AC	AC
Const. current	YES	YES	YES	YES
Pulsed	YES	YES	YES	YES
Medium freq.	YES	YES	-	-
Amperage	10-100	100-200	10-100	100-200

- Repeat the above tests with earth lead with connected to protection earth potential.

10.9) Checking current delivered

Conditions
- Ammeter clamped on earth lead.
- Power source on, set to TIG DC mode.

Checks
- Perform various welding tests in TIG mode, making sure the value read off the power source's panel matches the clamp-on ammeter's reading, i.e.:

Set value	Reading on panel	Reading on ammeter	
50 A	50 ± 2 A	50 ± 5A	Ⓐ
100 A	100 ± 2 A	100 ± 5A	Ⓐ
200 A	200 ± 2 A	200 ± 5A	Ⓐ

WARNING!: If you are using a shunt & multimeter for measuring the output current, perform tests in TIG LIFT mode so as not to risk damaging the instrument as a result of HF!

10) ENDPRÜFUNG DES GENERATORS UND EICHUNGEN

Vorsichtsmaßnahmen (siehe auch Kapitel 3)

1) unter Spannung stehende Teile (blanke Leiter, HF-Endverschlüsse, …)
2) Bewegungsteile (Ventilator …)
3) Temperatur ausgesetzte Teile (Wärmesenke …)

Erforderliche Instrumente (siehe auch Kapitel 4):

1) digitales Multimeter mit Skalenendwert = 1000Vdc
2) AC/DC Zangenstrommesser zumindest in Klasse 2.5 mit Skalenendwert = 300Adc
3) als Alternative zum Zangenstrommesser, den Shunt in das Massekabel einschalten und die Skala mVdc für das Multimeter wählen, dann das Multimeter an den Messklemmen des Shunt anschließen.

ACHTUNG!: keine Zündungen in WIG HF ausführen, wenn das Multimeter am Shunt oder an den Ausgangsendverschlüssen des Generators angeschlossen ist, da er beschädigt werden könnte!

10.1) Vorprüfungen

Bedingungen
- Von der Versorgung abgetrennte Maschine, Schalter auf "O".
- Obere Abdeckung entfernt.
- Überbrückung durch Löttropfen K2 auf Karte 15.14.250 geöffnet.
- HF-Karte (15.14.286) in ihren Führungen, aber nicht an der Bus-Karte (15.14.285/15.14.315) angeschlossen
- WIG-Brenner nicht angeschlossen
- Bypass-Schlauch angeschlossen (falls das Kühlaggregat vorhanden ist) (siehe Abschn. 3).

Überprüfungen
- Prüfen, ob alle Karten korrekt einschalten (mit Ausnahme der HF-Karte)
- Die Karten visuell überprüfen (einschließlich eventuelle vorspringende Teile, deren Füßchen nicht unregelmäßig gebogen sein dürfen)
- Die verschiedenen Verdrahtungen und die jeweiligen Verbindungen visuell kontrollieren
- Überprüfung der Dip-Switch auf Karte 15.14.236:
  200 TLH
  Schaltfeld FP106 (1=0/OFF; 2=1/ON; 3=1/ON; 4=1/ON)
  200 AC/DC
  Schaltfeld FP122 (1=0/OFF; 2=1/ON; 3=1/ON; 4=0/OFF)

10.2) Kontrollen bei der Zündung

Bedingungen
- An die 230Vac Versorgung angeschlossene Maschine, Schalter auf "I".

Überprüfungen
- Korrekte Initialisierung des vorderen Schaltfeldes (Aufleuchten der grünen LED), kein Alarm (gelbe LED aus) und keine Fehlermeldung am Display.
- Schließen des Relais RL1 an Karte 15.14.250 ca. 2 Sekunden nach dem Schließen des Schalters.
- Das vordere Schaltfeld über Parameter 9 in Setup rückstellen (siehe Kapitel 8): der Generator stellt sich auf den Betrieb im Modus WIG DC 2T HF mit auf 100A eingestellten Strom ein.
- Den Betrieb des Ventilators und die Richtung des Luftstromes überprüfen (er muss nach vorne gerichtet sein).
- Korrektes Aufleuchten der LEDs auf der Einkarte 15.14.250:

Generator / Modus	LED	Farbe	Status
EIN /WIG*	L1, L2, L3, L4, L5, L6, L7	Grün	LEUCHTET
EIN /WIG*	L8, L9, L12	Rot	LEUCHTET NICHT
EIN /WIG*	L10	Grün	BLINKT SCHNELL
EIN /WIG*	L11, L13, L14, L15, L16	Grün	LEUCHTET NICHT

* N.B.: Brennertaste nicht angeschlossen

10.3) Überprüfung der Sektion UPFR auf der Einkarte 15.14.250

Bedingungen
- An die 230Vac Versorgung angeschlossene Maschine, Schalter auf "I".

Überprüfungen
- Spannung zwischen TP20 und TP10 der Karte 15.14.250 auf +385 ± 5 Vdc.
- Grüne LED L10 blinkt schnell.

10.4) Überprüfung der Gate-Invertersignale auf Einkarte 15.14.250

Bedingungen
- Wie oben, WIG-Brenner angeschlossen.

Überprüfungen
- Die Leistungsabgabe durch die WIG-Brennertaste überprüfen, mit Aufleuchten auf der Einkarte 15.14.250 der grünen LEDs der 4 Gate L13/L14/L15/L16 und mit Aufleuchten der grünen LED L11 für Leistungsabgabe.
  Die gleichzeitige Aktivierung des Relais RL1 auf der Bus-Karte 15.14.285/15.14.315 und das folgliche Einschalten des Kühlaggregats (falls vorhanden) überprüfen.
- Die Betriebsweise MMA auswählen und prüfen, ob die oben erwähnten LEDs L11/ L13/L14/L15/L16 blinken.

10.5) Überprüfung der Leerlaufspannung

Bedingungen
- WIG-Brenner nicht angeschlossen.
- Maschine seit ca. fünf Minuten ausgeschaltet und Versorgung abgetrennt.
- Prüfen, ob K1 auf der Einkarte 15.14.250 geöffnet ist.
- K2 auf der Einkarte 15.14.250 schließen.
- Die Maschine an die 230Vac Versorgung anschließen, Schalter auf "I" stellen.
- Modus MMA.

Überprüfungen
- Leerlaufspannung in MMA +52 ± 2Vdc (an den festen Ausgangsbuchsen oder an der Ausgangsfilterkarte 15.14.238 gemessen)

10.6) Überprüfung des Ansprechens des Wärmeschutzes

Bedingungen
- Wie oben.

Überprüfungen
- Den Verbinder CN4 von der Karte 15.14.250 (Thermostat T2) abtrennen und das Ansprechen des Wärmeschutzes überprüfen:
  Aufleuchten der gelben Alarm-LED am vorderen Schaltfeld;
  Alarmanzeige "E10" am Display;
  keine Leerlaufspannung im Ausgang.
- CN4 wieder anschließen und prüfen, ob die Funktionalitäten wieder hergestellt sind.

- Den Verbinder CN5 von der Karte 15.14.250 (Thermostat T1) abtrennen und das Ansprechen des Wärmeschutzes überprüfen:
  Aufleuchten der gelben Alarm-LED am vorderen Schaltfeld;
  Alarmanzeige "E10" am Display;
  keine Leerlaufspannung im Ausgang.
- CN5 wieder anschließen und prüfen, ob die Funktionalitäten wieder hergestellt sind.
- Den Verbinder CN1 von der Karte 15.14.256 (Thermostat T3) abtrennen und das Ansprechen des Wärmeschutzes überprüfen (in der Version 200TLH ist T3 direkt an den Verbinder J6 angeschlossen, da die Karte 15.14.256 nicht vorhanden ist):
  Aufleuchten der gelben Alarm-LED am vorderen Schaltfeld;
  Alarmanzeige "E10" am Display;
  keine Leerlaufspannung im Ausgang.
- CN1 wieder anschließen und prüfen, ob die Funktionalitäten wieder hergestellt sind.

10.7) MMA-Funktionsprüfungen

Bedingungen
- Generator gespeist, Modus MMA
- Elektrodenzange und Massekabel angeschlossen
- Schweißkreislauf nicht geerdet.

Überprüfungen
- Verschiedene MMA-Funktionsprüfungen ausführen und die Richtigkeit der Einstellungen über Schaltfeld prüfen, insbesondere:
  korrekte Bogenzündung
  korrekte Beibehaltung des Bogens
  Schweißen auch auf Höchstleistung, nach den Angaben in folgender Tabelle:

Elektrodentyp	Durchmesser	Stromstärke
Basisch	2.5	95
Basisch	5	180
Rutil	2.5	95
Rutil	5	180

- Die obigen Prüfungen mit Massekabel auf Erdpotential wiederholen.

10.8) WIG-Funktionsprüfungen

Bedingungen
- **HF-Karte in die Verbinder der Karte 15.14.285/15.14.315 eingesteckt und mit ihren Feststellvorrichtungen blockiert**
- Generator eingeschaltet, Modus WIG.
- Schweißkreislauf nicht geerdet.

Überprüfungen
- Verschiedene WIG-Funktionsprüfungen ausführen und die Richtigkeit der Einstellungen über Schaltfeld prüfen, insbesondere:
  korrekte Aktivierung des Magnetventils und des Gasaustritts
  HF-Entladung in der Luft, um eventuelle Leckagen am Zentralanschluss festzustellen
  korrekte Bogenzündung in WIG DC LIFT, WIG DC HF und WIG AC
  korrekte Beibehaltung des Bogens
  Schweißen auch auf Höchstleistung
  Überprüfung der verschiedenen Funktionalitäten (2T, 4T, An- und Abstiegsrampe, BILEVEL, Pulsationen…)
  Schweißtests in DC und AC mit verschiedenen Strom-, Frequenz- und Pulsationswerten ausführen, nach den Angaben in folgender Tabelle:

Elektrodentyp	rot	rot	grün	grün
Durchmesser	1.6	2.4	1.6	2.4
Stromrichtung	DC	DC	AC	AC
Dauerstrom	Ja	Ja	Ja	Ja
Pulsiert	Ja	Ja	Ja	Ja
Mittelfrequenz	Ja	Ja	-	-
Stromstärke	10-100	100-200	10-100	100-200

- Die obigen Prüfungen mit Massekabel auf Erdpotential wiederholen.

10.9) Kontrolle des abgegebenen Stroms

Bedingungen
- Zangenstrommesser am Massekabel.
- Generator ein, Modus WIG DC.

Überprüfungen
- Verschiedene WIG-Schweißtests ausführen und prüfen, ob der am Schaltfeld des Generators gelesene Wert mit dem am Zangenstrommesser gelesenen übereinstimmt, insbesondere:

Eingestellter Wert	Am Schaltfeld gelesener Wert	An der Zange gelesener Wert	
50 A	50 ± 2 A	50 ± 5A	(A)
100 A	100 ± 2 A	100 ± 5A	(A)
200 A	200 ± 2 A	200 ± 5A	(A)

ACHTUNG!: Falls zur Messung des Ausgangsstromes ein Shunt und ein Multimeter verwendet werden, die Tests im Modus WIG LIFT ausführen, damit das Instrument aufgrund der Hochfrequenz nicht beschädigt wird!

10) ESSAI FINAL DU GÉNÉRATEUR ET RÉGLAGES

Précautions à prendre (voir également au chapitre 3)

1) parties sous tension (conducteurs sans gaine, cosses HF, etc.)
2) parties en mouvement (ventilateur, etc.)
3) parties sujettes à une certaine température (radiateurs, etc.)

Instruments nécessaires (voir également au chapitre 4):

1) multimètre numérique avec f.s. = 1000Vdc
2) pince ampèremétrique AC/DC au moins en classe 2.5 avec f.s. = 300Adc
3) à la place de la pince ampèremétrique, mettre le shunt sur le câble de masse et sélectionner l'échelle mVdc pour le multimètre, brancher ensuite le multimètre aux bornes de mesure du shunt.

ATTENTION!: ne pas effectuer de démarrages en TIG HF avec le multimètre branché au shunt ou aux cosses de sortie du générateur pour ne pas l'abîmer!

10.1) Contrôles préliminaires

Conditions
- Machine coupée du réseau d'alimentation, interrupteur d'allumage sur "O".
- Carter supérieur enlevé.
- Bulle de soudure K2 sur la carte 15.14.250 ouverte.
- Carte HF (15.14.286) placée dans son logement mais débranchée de la carte bus (15.14.285/15.14.315)
- Torche TIG pas branchée
- Tube de by-pass relié (si le groupe de refroidissement est prévu) (voir section 3).

Contrôles à effectuer
- Vérifier si toutes les cartes sont bien mises (sauf la carte HF)
- Contrôler visuellement les cartes (y compris les composants en saillie éventuels dont les pieds ne doivent pas être pliés de façon anormale)
- Contrôler visuellement les différents câbles et les connexions correspondantes
- Vérifier les microcontacts sur la carte 15.14.236:
  200 TLH
  panneau FP106 (1=0/OFF; 2=1/ON; 3=1/ON; 4=1/ON)
  200 AC/DC
  panneau FP122 (1=0/OFF; 2=1/ON; 3=1/ON; 4=0/OFF)

10.2) Contrôles à l'allumage

Conditions
- Machine reliée au réseau d'alimentation 230Vac, mettre l'interrupteur d'allumage sur "I".

Contrôles à effectuer
- Initialisation correcte du panneau frontal (allumage de la DIODE verte), aucune alarme (DIODE jaune éteinte) et aucun message d'erreur sur l'afficheur.
- Fermeture du relais RL1 sur la carte 15.14.250 environ 2 secondes après avoir actionné l'interrupteur.
- Remettre le panneau frontal avec le paramètre 9 du Setup à zéro (voir chapitre 8): le générateur se prépare à fonctionner en mode TIG DC 2T HF avec le courant saisi de 100A.
- Contrôler si le ventilateur fonctionne bien et si le courant d'air est correct (tourné vers l'avant).
- Allumage correct des DIODES sur la monocarte 15.14.250:

Générateur/ Mode	LED	Couleur	Etat
ALLUME / TIG*	L1, L2, L3, L4, L5, L6, L7	Verte	ALLUMEE
ALLUME / TIG*	L8, L9, L12	Rouge	ETEINTE
ALLUME / TIG*	L10	Verte	CLIGNOTE RAPIDEMENT
ALLUME / TIG*	L11, L13, L14, L15, L16	Verte	ETEINTE

* REMARQUE: bouton de la torche pas branché

10.3) Contrôle section UPFR sur monocarte 15.14.250

Conditions
- Machine reliée au réseau d'alimentation 230Vac, interrupteur d'allumage sur "I".

Contrôles
- Tension entre TP20 et TP10 de la carte 15.14.250 en +385 ± 5 Vdc.
- DIODE verte L10 qui clignote rapidement.

10.4) Contrôle signaux grille onduleur sur monocarte 15.14.250

Conditions
- Comme au point précédent, avec la torche TIG branchée.

Contrôles à faire
- Vérifier le déblocage de la puissance à l'aide du bouton torche TIG, avec allumage sur monocarte 15.14.250 des diodes vertes des 4 grilles L13/L14/L15/L16 et allumage de la diode verte de déblocage de la puissance L11.
  Vérifier si le relais RL1 s'active en même temps sur la carte bus 15.14.285/15.14.315 et si le groupe de refroidissement s'allume (s'il est prévu).
- Sélectionner le fonctionnement MMA, contrôler si les diodes citées plus haut L11/ L13/L14/L15/L16 clignotent.

10.5) Contrôle tension à vide

Conditions
- Torche TIG pas branchée.
- Machine éteinte depuis environ cinq minutes et coupée du réseau d'alimentation.
- Vérifier si K1 est ouverte sur la monocarte 15.14.250.
- Refermer K2 sur la monocarte 15.14.250.
- Brancher la machine au réseau d'alimentation en 230Vac, mettre l'interrupteur d'allumage sur "I".
- Mode MMA.

Contrôles à faire
- Tension à vide en MMA +52 ± 2Vdc (mesurée sur les prises fixes de sortie ou sur la carte du filtre de sortie 15.14.238)

10.6) Contrôle intervention protection thermique

Conditions
- Comme au point précédent.

Contrôles à effectuer
- Débrancher le connecteur CN4 de la carte 15.14.250 (thermostat T2) et contrôler s'il y a intervention de la protection thermique:
  allumage de la DIODE jaune "Alarme" sur le panneau frontal;
  message d'alarme "E10" sur l'afficheur;
  absence de tension à vide à la sortie.
- Brancher de nouveau le connecteur CN4 et contrôler si le fonctionnement est rétabli.

- Débrancher le connecteur CN5 de la carte 15.14.250 (thermostat T1) et vérifier s'il y a intervention de la protection thermique:
  allumage de la DIODE jaune "Alarme" sur le panneau frontal;
  message d'alarme "E10" sur l'afficheur;
  absence de tension à vide à la sortie.
- Brancher de nouveau le connecteur CN5 et vérifier si le fonctionnement est rétabli.
- Débrancher le connecteur CN1 de la carte 15.14.256 (thermostat T3) et vérifier s'il y a intervention de la protection thermique (dans la version 200TLH, le connecteur T3 est branché directement au connecteur J6 si la carte 15.14.256 n'est pas prévue):
  allumage de la DIODE jaune "Alarme" sur le panneau frontal;
  message d'alarme "E10" sur l'afficheur;
  absence de tension à vide à la sortie.
- Brancher de nouveau le connecteur CN1 et vérifier si le fonctionnement est rétabli.

10.7) Contrôles fonctionnels MMA

Conditions
- Générateur alimenté, mode MMA
- Pince porte-électrode et câble de masse branchés
- Circuit de soudure pas branché à la terre.

Contrôles à effectuer
- Faire différents essais fonctionnels de soudure en MMA, en vérifiant si les réglages sont corrects sur le panneau, en particulier:
  amorçage correct de l'arc
  maintien correct de l'arc
  soudure même à la puissance max., selon ce qui est reporté dans le tableau suivant:

Type d'électrode	Diamètre	Ampérage
Basique	2.5	95
Basique	5	180
Rutile	2.5	95
Rutile	5	180

- Répéter les essais précédents avec le câble de masse au potentiel de terre.

10.8) Contrôles fonctionnels TIG

Conditions
- **Carte HF placée dans les connecteurs de la carte 15.14.285/15.14.315 et bloquée par les butées correspondantes**
- Générateur allumé, mode TIG.
- Circuit de soudure pas branché à la terre.

Contrôles à effectuer
- Faire différents essais de soudure en TIG, en vérifiant si les réglages sont corrects sur le panneau, en particulier:
  activation correcte de l'électrovanne et sortie gaz
  évacuation de HF dans l'air pour déterminer les fuites éventuelles sur le raccord centralisé
  amorçage correct de l'arc en TIG DC LIFT, TIG DC HF et TIG AC
  maintien correct de l'arc
  soudure même à la puissance max.
  contrôle des différentes fonctions (2T, 4T, rampe de montée et de descente, BILEVEL, pulsations, etc.)
  faire des essais de soudure en DC et AC avec différents niveaux de courant, fréquence et pulsation, selon ce qui est reporté dans le tableau suivant:

Type d'électrode	rouge	rouge	verte	verte
Diamètre	1.6	2.4	1.6	2.4
Polarité	DC	DC	AC	AC
Cour. Constant	OUI	OUI	OUI	OUI
Pulsé	OUI	OUI	OUI	OUI
Fréq. moyenne	OUI	OUI	-	-
Ampérage	10-100	100-200	10-100	100-200

- Répéter les essais précédents avec le câble de masse au potentiel de terre.

10.9) Contrôle du courant distribué

Conditions
- Pince ampèremétrique placée sur le câble de masse.
- Générateur allumé, réglage en TIG DC.

Contrôles à effectuer
- Faire différents essais en mode de soudure TIG en contrôlant si la valeur lue sur le panneau du générateur correspond à celle lue avec la pince ampèremétrique, en particulier:

Valeur saisie	Valeur lue sur le panneau	Valeur lue avec la pince	
50 A	50 ± 2 A	50 ± 5A	Ⓐ
100 A	100 ± 2 A	100 ± 5A	Ⓐ
200 A	200 ± 2 A	200 ± 5A	Ⓐ

ATTENTION!: En cas d'utilisation d'un shunt et d'un multimètre pour mesurer le courant de sortie, faire les essais en mode TIG LIFT pour ne pas risquer d'abîmer l'instrument à cause du HF!

10) PRUEBA FINAL DEL GENERADOR Y CALIBRACIONES

Precauciones (ver también el capítulo 3)

1) partes bajo tensión (conductores pelados, terminales HF, etc.)
2) partes en movimiento (ventilador, etc.)
3) partes sometidas a alta temperatura (radiadores, etc.)

Instrumentos necesarios (ver también el capítulo 4):

1) multímetro digital con f.s. = 1000Vdc
2) pinza amperométrica AC/DC por lo menos en clase 2.5 con f.s. = 300Adc
3) como alternativa a la pinza amperométrica colocar un shunt en el cable de masa y seleccionar la escala mVdc del multímetro, luego conectar el multímetro a los bornes de medición del shunt

¡ATENCIÓN!: ¡No cebar TIG HF con el multímetro conectado al shunt o a los terminales de salida del generador, podría dañarse!

10.1) Verificaciones preliminares

Condiciones
- Máquina desconectada de la alimentación, interruptor de encendido en "O".
- Capó superior extraído.
- Bola de soldadura K2 en la tarjeta 15.14.250 abierta.
- Tarjeta HF (15.14.286) integrada en los patines pero desconectada de la tarjeta bus (15.14.285/15.14.315)
- Luz TIG no conectada
- Tubo by-pass conectado (si existe el grupo de enfriamiento) (ver secc. 3).

Verificaciones
- Averiguar la correcta inserción de todas las tarjetas (excepto tarjeta HF)
- Controlar a vista las fichas (incluyendo eventuales componentes salientes cuyos pis no deben estar doblados en modo anómalo)
- Controlar a vista los varios cableados y las relativas conexiones
- Verifica el dip switch en la tarjeta 15.14.236:
  200 TLH
  panel FP106 (1=0/OFF; 2=1/ON; 3=1/ON; 4=1/ON)
  200 AC/DC
  panel FP122 (1=0/OFF; 2=1/ON; 3=1/ON; 4=0/OFF)

10.2) Controles en el momento del encendido

Condiciones
- Máquina conectada a la alimentación de 230Vac, llevar el interruptor de encendido a "I".

Verificaciones
- Corregida inicialización del panel frontal (encendido LED verde), ninguna alarma (LED amarillo apagado) y ningún mensaje de error en el display.
- Cierre del relé RL1 en la tarjeta 15.14.250 después de unos 2 segundos desde el cierre del interruptor.
- Resetear el panel frontal con parámetro 9 del Setup (ver capítulo 8): el generador se prepara para funcionar en modalidad TIG DC 2T HF con corriente programada de 100A.
- Verificar el funcionamiento del ventilador y la exactitud del flujo de aire (dirigido hacia la parte delantera).
- Correcto encendido de los LED en la monotarjeta 15.14.250:

Generador / Modo	LED	Color	Estado
ENCENDIDO/TIG *	L1, L2, L3, L4, L5, L6, L7	Verde	ENCENDIDO
ENCENDIDO/TIG *	L8, L9, L12	Rojo	APAGADO
ENCENDIDO/TIG *	L10	Verde	RELAMPAGUEA VELOZMENTE
ENCENDIDO/TIG *	L11, L13, L14, L15, L16	Verde	APAGADO

* NOTA: botón luz no conectado

10.3) Verificación sección UPFR en monotarjeta 15.14.250

Condiciones
- Máquina conectada a la alimentación de 230Vac, interruptor de encendido en "I".

Verificaciones
- Tensión entre TP20 y TP10 en la tarjeta 15.14.250 a +385 ± 5 Vdc.
- LED Verde L10 relampaguea velozmente.

10.4) Verificación de las señales de gate inverter en la monotarjeta 15.14.250

Condiciones
- Como en el punto precedente, con luz TIG conectada.

Verificaciones
- Verificar el desbloqueo de potencia mediante el botón luz TIG, con encendido en la monotarjeta 15.14.250 de los Led verdes de los 4 gate L13/L14/L15/L16 y el encendido del Led verde de desbloqueo potencia L11.
  Verificar la activación contemporánea del relé RL1 en la tarjeta bus 15.14.285/15.14.315 y el consiguiente encendido del grupo de enfriamiento (si existe).
- Seleccionar el funcionamiento MMA, verificar el relampagueo de los LED mencionados arriba L11/ L13/L14/L15/L16.

10.5) Verificación de la tensión en vacío

Condiciones
- Luz TIG no conectada
- Máquina apagada desde aproximadamente cinco minutos y con la alimentación desconectada.
- Verificar que K1 esté abierto en la monotarjeta 15.14.250.
- Cerrar K2 en la monotarjeta 15.14.250.
- Conectar la máquina a la alimentación de 230Vac, llevar el interruptor de encendido a "I".
- Modalidad MMA.

Verificaciones
- Tensión en vacío en MMA +52 ± 2Vdc (medida en las tomas fijas de salida o bien en la tarjeta filtro de salida 15.14.238)

10.6) Verificación de la activación de la protección térmica

Condiciones
- Como en el punto precedente.

Verificaciones
- Desconectar el conector CN4 de la tarjeta 15.14.250 (termostato T2) y verificar la intervención de la protección térmica:
  encendido LED amarillo "Alarma" en el panel frontal;
  visualización alarma "E10" en el display;
  falta de tensión en vacío en salida.
- Volver a conectar el CN4 y verificar el restablecimiento de las funciones.

- Desconectar el conector CN5 de la tarjeta 15.14.250 (termostato T1) y verificar la intervención de la protección térmica:
  encendido LED amarillo "Alarma" en el panel frontal;
  visualización alarma "E10" en el display;
  falta de tensión en vacío en salida.
- Volver a conectar el CN5 y verificar el restablecimiento de las funciones.
- Desconectar el conector CN1 de la tarjeta 15.14.256 (termostato T3) y verificar la intervención de la protección térmica (en la versión 200TLH el T3 está conectado directamente al conector J6, falta la tarjeta 15.14.256):
  encendido LED amarillo "Alarma" en el panel frontal;
  visualización alarma "E10" en el display;
  falta de tensión en vacío en salida.
- Volver a conectar el CN1 y verificar el restablecimiento de las funciones.

10.7) Verificaciones funcionales MMA

Condiciones
- Generador alimentado, modalidad MMA
- Pinza portaelectrodo y cable de masa conectados
- Circuido de soldadura no conectado a tierra.

Verificaciones
- Ejecutar varias pruebas funcionales de soldadura en MMA, comprobando la función de las regulaciones desde el panel, en particular:
  correcto cebado del arco
  correcto mantenimiento del arco
  soldadura también a máx potencia, según cuanto indicado en la tabla siguiente:

Tipo electrodo	Diámetro	Amperaje
Básico	2.5	95
Básico	5	180
Rutilo	2.5	95
Rutilo	5	180

- Repetir las pruebas anteriores con cable de masa a potencial de tierra.

10.8) Verificaciones funcionales TIG

Condiciones
- **Tarjeta HF insertada en los conectores de la tarjeta 15.14.285/15.14.315 y bloqueada con retenes.**
- Generador encendido, modalidad TIG.
- Circuido de soldadura no conectado a tierra.

Verificaciones
- Ejecutar varias pruebas de soldadura en TIG, comprobando la función de las regulaciones desde el panel, en particular:
  correcta activación de la electroválvula y salida de gas
  descarga de HF en aire para determinar eventuales pérdidas en la conexión centralizada
  correcto cebado del arco en TIG DC LIFT, TIG DC HF y TIG AC
  correcto mantenimiento del arco
  soldadura también a máx potencia
  verificación de las varias funciones (2T, 4T, rampa de subida y bajada, BILEVEL, pulsaciones, etc.)
  ejecutar pruebas de soldadura en DC y AC con varios niveles de corriente, frecuencia y pulsación, según cuanto indicado en el tablero siguiente:

Tipo electrodo	Rojo	Rojo	Verde	Verde
Diámetro	1.6	2.4	1.6	2.4
Polaridad	DC	DC	AC	AC
Corr. constante	SÍ	SÍ	SÍ	SÍ
Pulsado	SÍ	SÍ	SÍ	SÍ
Media freq.	SÍ	SÍ	-	-
Amperaje	10-100	100-200	10-100	100-200

- Repetir las pruebas anteriores con cable de masa a potencial de tierra.

10.9) control de la corriente producida

Condiciones
- Pinza amperométrica puesta en el cable de masa.
- Generador encendido, programación modalidad TIG DC.

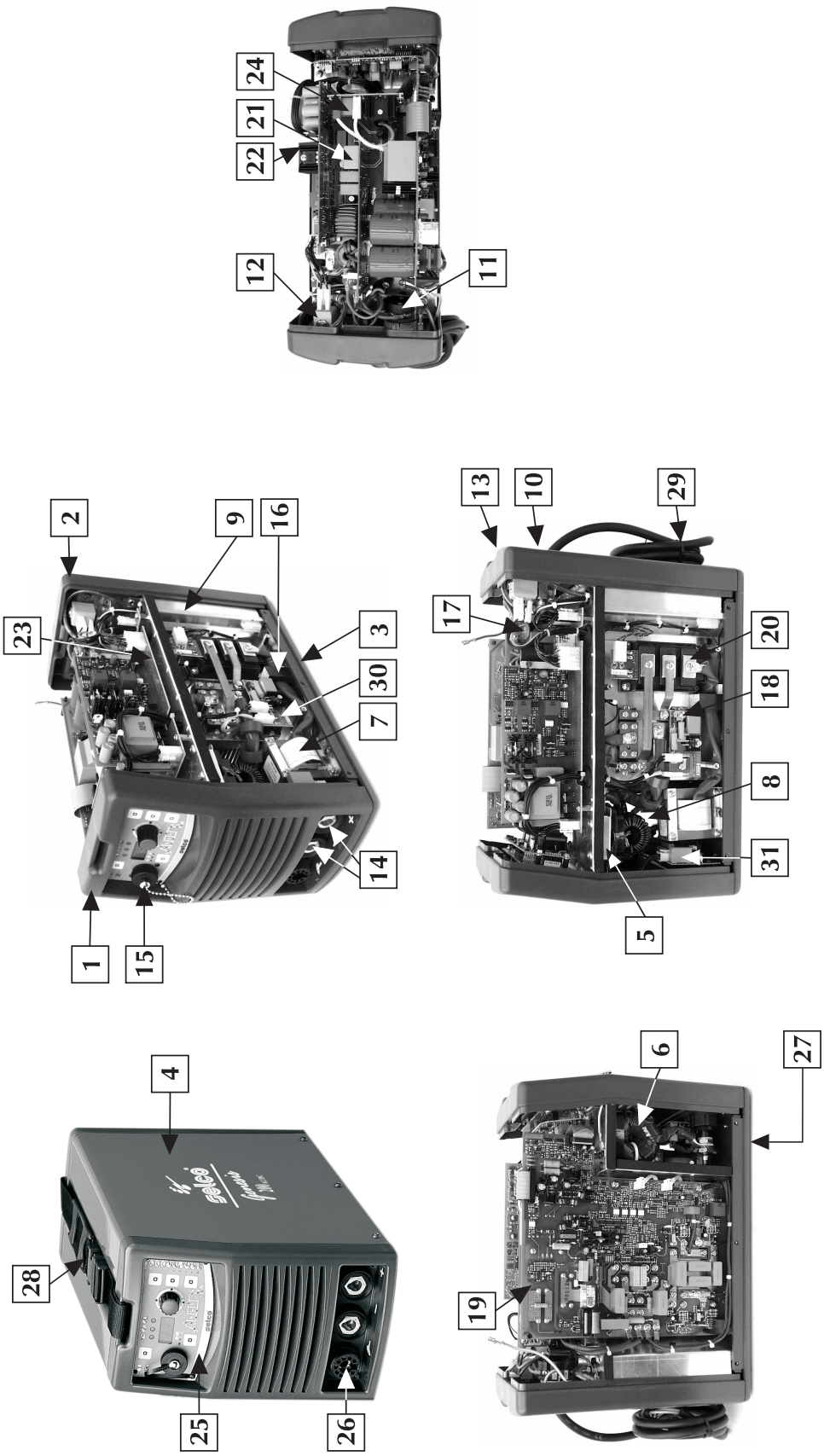
Verificaciones
- Ejecutar varias pruebas en soldadura TIG, verificando la correspondencia del valor leído en el panel del generador con el leído en la pinza amperométrica, en particular:

Valor program.	Valor leído del panel	Valor leído de la pinza	
50 A	50 ± 2 A	50 ± 5A	(A)
100 A	100 ± 2 A	100 ± 5A	(A)
200 A	200 ± 2 A	200 ± 5A	(A)

¡ATENCIÓN!: ¡En caso de utilización de shunt y multímetro por la medida de la corriente de salida, efectuar las pruebas en modalidad TIG LIFT para no perjudicar el instrumento a causa del HF!

11) AVAILABLE SPARE PARTS

11.1 GENESIS 200 AC-DC (fig. 32)



ITALIANO

POS.	DESCRIZIONE	CODICE
1	Pannello plastico frontale	01.04.262
2	Pannello plastico posteriore	01.05.220
3	Fondo plastico	01.06.100
4	Cofano serigrafato	03.07.059
5	Trasformatore	05.02.025
6	Trasformatore H.F.	05.03.018
7	Induttanza di livellamento	05.04.224
8	Induttore	05.18.003
9	Ventilatore	07.10.020
10	Serracavo	08.22.001
11	Interruttore	09.01.005
12	Elettrovalvola	09.05.010
13	Manopola	09.11.009
14	Presa fissa	10.13.020
15	Tappo	10.01.151
16	Sensore Hinode	11.19.011
17	Varistore	11.26.001
18	Diodo	14.05.083
19	Kit ricambio monoscheda (contiene scheda 15.14.250 e componenti di potenza)	15.18.017
20	Kit ricambio modulo secondario (contiene modulo IGBT secondario e scheda	15.18.018 15.14.289)
21	Scheda ingresso	15.14.252
22	Scheda comando e sovrapposizione	15.14.253
23	Scheda bus	15.14.315
24	Scheda HF	15.14.286
25	Pannello comandi FP122 (contiene scheda 15.14.236 e targa serigrafata)	15.22.122
26	Adattatore	19.06.005
27	Piedino antiscivolo	21.03.003
28	Cinghia	21.06.004
29	Cavo alimentazione	49.04.055
30	Scheda clamp secondario	15.14.256
31	Scheda filtro	15.14.238

ENGLISH

POS.	DESCRIPTION	CODE
1	Front plastic panel	01.04.262
2	Rear plastic panel	01.05.220
3	Plastic bottom	01.06.100
4	Silk-screen panel	03.07.059
5	Transformer	05.02.025
6	H.F. transformer	05.03.018
7	Leveling inductor	05.04.224
8	Inductor	05.18.003
9	Fan	07.10.020
10	Cable clamp	08.22.001
11	Switch	09.01.005
12	Solenoid valve	09.05.010
13	Knob	09.11.009
14	Fixed socket	10.13.020
15	Plug	10.01.151
16	Hinode sensor	11.19.011
17	Varistor	11.26.001
18	Diode	14.05.083
19	PC board spare kit (contains board 15.14.250 and power components)	15.18.017
20	Secondary spare kit (contains secondary IGBT moduleand board	15.18.018 15.14.289)
21	Input card	15.14.252
22	Superposition and control board	15.14.253
23	Bus board	15.14.315
24	H. F. card	15.14.286
25	Control panel FP122 (contains board 15.14.236 and screen-printed plate)	15.22.122
26	Adapter	19.06.005
27	Vibration-damping foot	21.03.003
28	Belt	21.06.004
29	Supply cable	49.04.055
30	Secondary clamp board	15.14.256
31	Filter board	15.14.238

DEUTSCH

POS.	BESCHREIBUNG	CODE
1	Stirnplastiktafel	01.04.262
2	Hintere Plastkatel	01.05.220
3	Plastikboden	01.06.100
4	Siebdruck seitenteil	03.07.059
5	Transformator	05.02.025
6	Transformator H.F.	05.03.018
7	Glättungsdrosselspule	05.04.224
8	Drosselspule	05.18.003
9	Ventilator	07.10.020
10	Kabelschelle	08.22.001
11	Schalter	09.01.005
12	Solenoidventil	09.05.010
13	Drehknopf	09.11.009
14	Feste Steckdose	10.13.020
15	Stöpsel	10.01.151
16	Sensor Hinode	11.19.011
17	Varistor	11.26.001
18	Diode	14.05.083
19	Kartenersatzteilenset (enthält die Karte 15.14.250 und die Leistungsteile)	15.18.017
20	Sekundärersatzteilenset (enthält das Sekundärmodul IGBT und Karte	15.18.018 15.14.289)
21	Eingangskarte	15.14.252
22	Steuerungskarte	15.14.253
23	Buskarte	15.14.315
24	HF-Karte	15.14.286
25	Bedienungsfeld FP122 (enthält die Karte 15.14.236 und siebgedrucktes Schild)	15.22.122
26	Adapter	19.06.005
27	Antirutschfuß	21.03.003
28	Riemen	21.06.004
29	SpeiseKabel	49.04.055
30	Sekundärkarte	15.14.256
31	Filterplatine	15.14.238

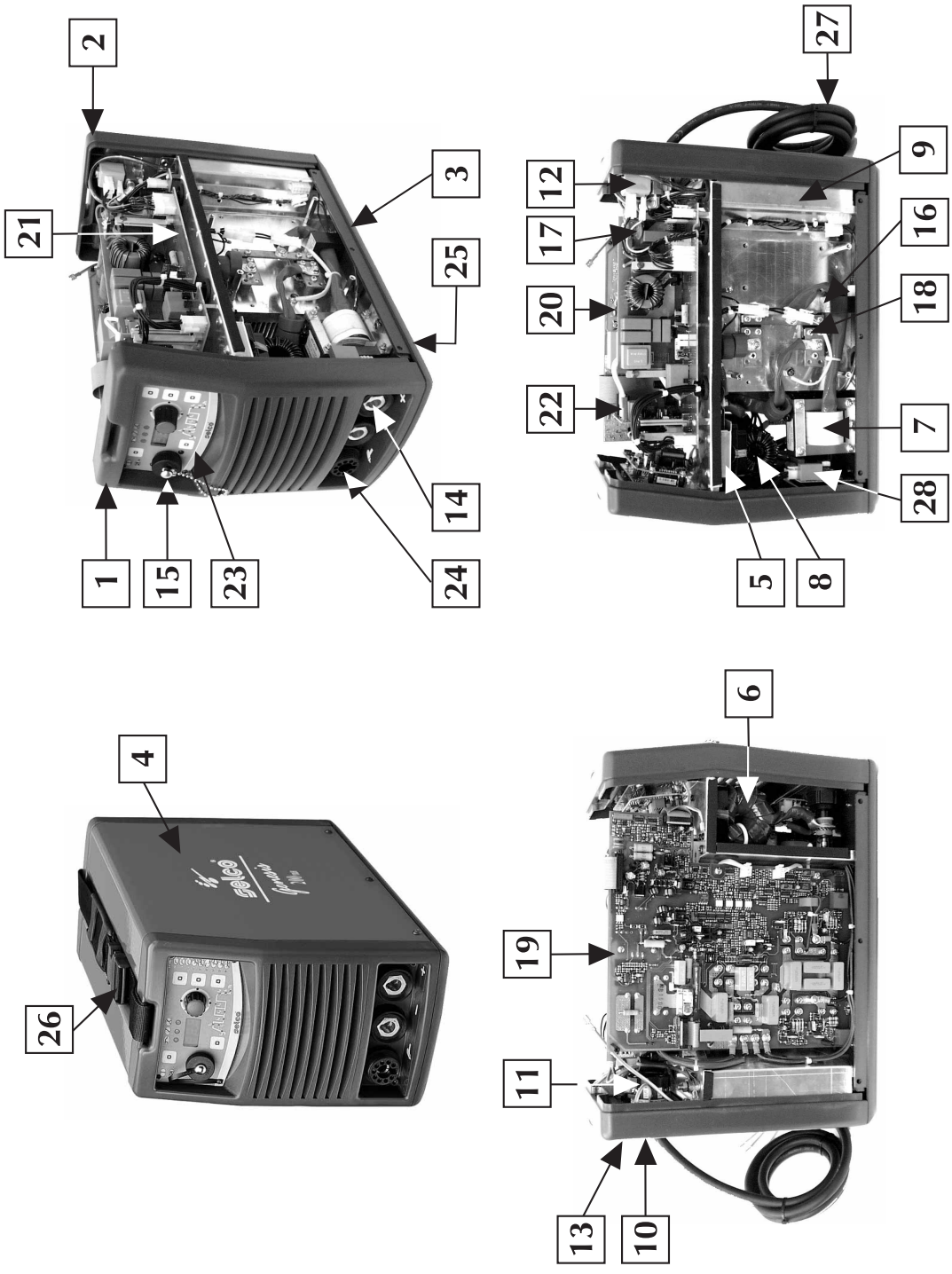
FRANÇAIS

POS.	DESCRIPTION	CODE
1	Panneau plastique antérieur	01.04.262
2	Panneau plastique postérieur	01.05.220
3	Fond plastique	01.06.100
4	Panneau avec serigraphie	03.07.059
5	Transformateur	05.02.025
6	Transformateur H.F.	05.03.018
7	Inductance d'écrêtage	05.04.224
8	Inducteur	05.18.003
9	Ventilateur	07.10.020
10	Serre-câble	08.22.001
11	Interrupteur	09.01.005
12	Electrovanne	09.05.010
13	Bouton	09.11.009
14	Prise fixe	10.13.020
15	Capot	10.01.151
16	Détecteur Hinode	11.19.011
17	Varistance	11.26.001
18	Diode	14.05.083
19	Kit de rechange platine (il contient la carte 15.14.250 et les composants de puissance)	15.18.017
20	Kit de rechange secondaire (il contient le module IGBT secondaire et la carte 15.14.289)	15.18.018
21	Carte d'entrée	15.14.252
22	Platine de contrôle et superposition	15.14.253
23	Platine bus	15.14.315
24	Carte H.F.	15.14.286
25	Panneau de reglage FP122 (il contient la carte 15.14.236 et la plaque sérigraphiée)	15.22.122
26	Adaptateur	19.06.005
27	Pied anti-vibrations	21.03.003
28	Courroie	21.06.004
29	Câble d'alimentation	49.04.055
30	Platine clamp secondaire	15.14.256
31	Platine filtre	15.14.238

ESPAÑOL

POS.	DESCRIPCION	CODIGO
1	Panel plastico anterior	01.04.262
2	Panel plástico posterior	01.05.220
3	Fondo plástico	01.06.100
4	Panel con serigrafia	03.07.059
5	Transformador	05.02.025
6	Transformador H.F.	05.03.018
7	Bobina de inductancia stabilizadora de corriente	05.04.224
8	Inductor	05.18.003
9	Ventilador	07.10.020
10	Abrazadera	08.22.001
11	Interruptor	09.01.005
12	Electroválvula	09.05.010
13	Botón	09.11.009
14	Toma fija	10.13.020
15	Tapón	10.01.151
16	Captador Hinode	11.19.011
17	Varistor	11.26.001
18	Diodo	14.05.083
19	Juego de repuestos tarjeta (contiene la tarjeta 15.14.250 y los componentes de potencia)	15.18.017
20	Juego de repuestos secundario (contiene módulo IGBT secundario y tarjeta 15.14.289)	15.18.018
21	Tarjeta entrada	15.14.252
22	Tarjeta de mando y superposición	15.14.253
23	Tarjeta bus	15.14.315
24	Tarjeta H. F.	15.14.286
25	Panel de control FP122 (contiene la tarjeta 15.14.236 y placa serigrafiada)	15.22.122
26	Adaptador	19.06.005
27	Pie antivibrador	21.03.003
28	Correa	21.06.004
29	Cable de alimentación	49.04.055
30	Tarjeta clamp secundario	15.14.256
31	Tarjeta filtro	15.14.238

11.2 GENESIS 200 TLH (fig. 33)



ITALIANO

POS.	DESCRIZIONE	CODICE
1	Pannello plastico frontale	01.04.262
2	Pannello plastico posteriore	01.05.220
3	Fondo plastico	01.06.100
4	Cofano serigrafato	03.07.077
5	Trasformatore	05.02.025
6	Trasformatore H.F.	05.03.018
7	Induttanza di livellamento	05.04.224
8	Induttore	05.18.003
9	Ventilatore	07.10.020
10	Serracavo	08.22.001
11	Interruttore	09.01.005
12	Elettrovalvola	09.05.010
13	Manopola	09.11.009
14	Presa fissa	10.13.020
15	Tappo	10.01.151
16	Sensore Hinode	11.19.011
17	Varistore	11.26.001
18	Diodo	14.05.083
19	Kit ricambio monoscheda (contiene la scheda 15.14.250 e i componenti di potenza)	15.18.017
20	Scheda ingresso	15.14.252
21	Scheda bus	15.14.315
22	Scheda HF	15.14.286
23	Pannello comandi FP106 (contiene la scheda 15.14.236 e la serigrafia frontale)	15.22.106
24	Adattatore	19.06.005
25	Piedino antiscivolo	21.03.003
26	Cinghia	21.06.004
27	Cavo alimentazione	49.04.055
28	Scheda filtro	15.14.238

ENGLISH

POS.	DESCRIPTION	CODE
1	Front plastic panel	01.04.262
2	Rear plastic panel	01.05.220
3	Plastic bottom	01.06.100
4	Silk-screen panel	03.07.077
5	Transformer	05.02.025
6	H.F. transformer	05.03.018
7	Leveling inductor	05.04.224
8	Inductor	05.18.003
9	Fan	07.10.020
10	Cable clamp	08.22.001
11	Switch	09.01.005
12	Solenoid valve	09.05.010
13	Knob	09.11.009
14	Fixed socket	10.13.020
15	Plug	10.01.151
16	Hinode sensor	11.19.011
17	Varistor	11.26.001
18	Diode	14.05.083
19	PC board spare kit (contains board 15.14.250 and power components)	15.18.017
20	Input card	15.14.252
21	Bus board	15.14.315
22	H. F. card	15.14.286
23	Control panel FP106 (contains board 15.14.236 and screen-printed plate)	15.22.106
24	Adapter	19.06.005
25	Vibration-damping foot	21.03.003
26	Belt	21.06.004
27	Supply cable	49.04.055
28	Filter board	15.14.238

DEUTSCH

POS.	BESCHREIBUNG	CODE
1	Stirnplastiktafel	01.04.262
2	Hintere Plastkatel	01.05.220
3	Plastikboden	01.06.100
4	Siebdruck seitenteil	03.07.077
5	Transformator	05.02.025
6	Transformator H.F.	05.03.018
7	Glättungsdrosselspule	05.04.224
8	Drosselspule	05.18.003
9	Ventilator	07.10.020
10	Kabelschelle	08.22.001
11	Schalter	09.01.005
12	Solenoidventil	09.05.010
13	Drehknopf	09.11.009
14	Feste Steckdose	10.13.020
15	Stöpsel	10.01.151
16	Sensor Hinode	11.19.011
17	Varistor	11.26.001
18	Diode	14.05.083
19	Kartenersatzteilenset (enthält die Karte 15.14.250 und die Leistungsteile)	15.18.017
20	Eingangskarte	15.14.252
21	Buskarte	15.14.315
22	HF.-Karte	15.14.286
23	Bedienungsfeld FP106 (enthält die Karte 15.14.236 und siebgedrucktes Schild)	15.22.106
24	Adapter	19.06.005
25	Antirutschfuß	21.03.003
26	Riemen	21.06.004
27	SpeiseKabel	49.04.055
28	Filterplatine	15.14.238

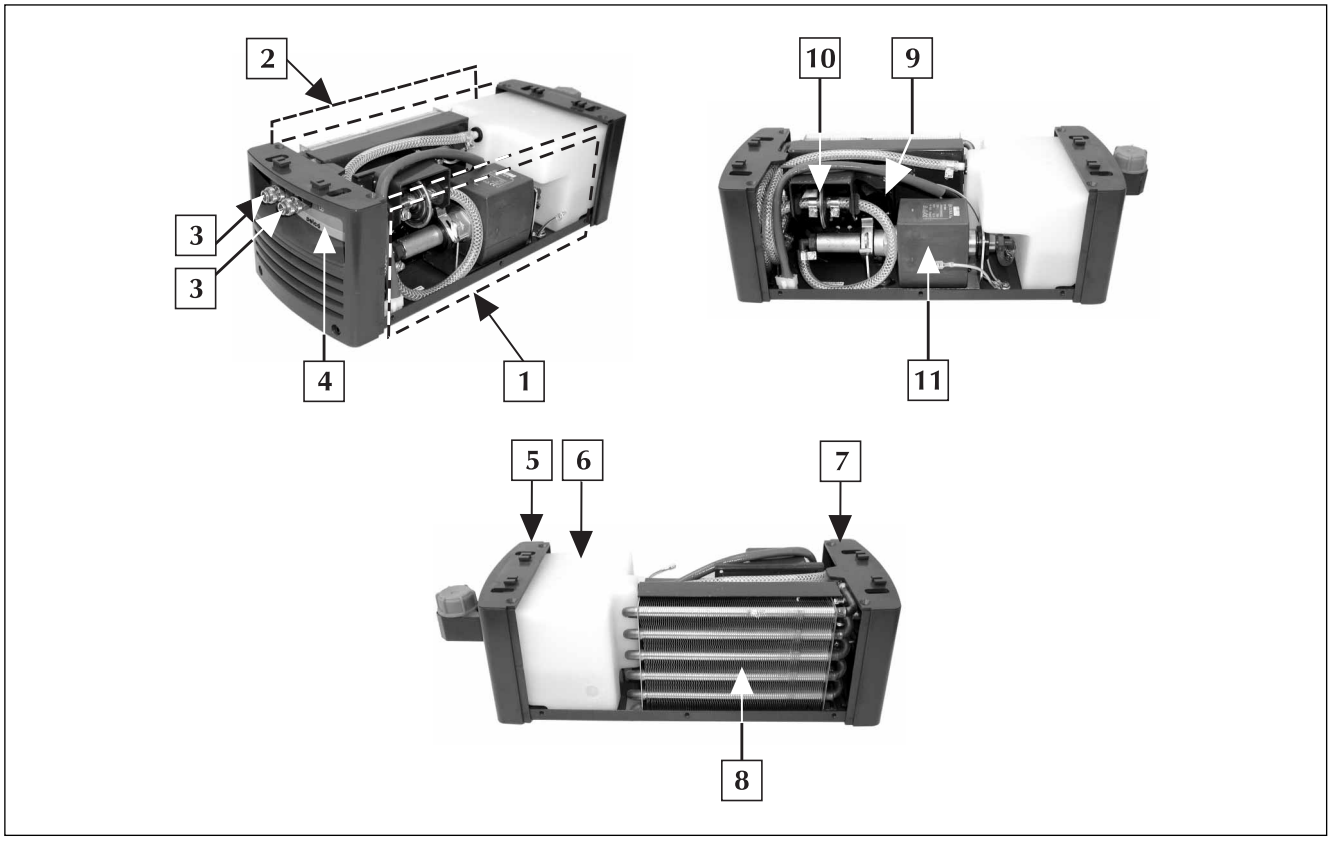
FRANÇAIS

POS.	DESCRIPTION	CODE
1	Panneau plastique antérieur	01.04.262
2	Panneau plastique postérieur	01.05.220
3	Fond plastique	01.06.100
4	Panneau avec serigraphie	03.07.077
5	Transformateur	05.02.025
6	Transformateur H.F.	05.03.018
7	Inductance d'écrêtage	05.04.224
8	Inducteur	05.18.003
9	Ventilateur	07.10.020
10	Serre-câble	08.22.001
11	Interrupteur	09.01.005
12	Electrovanne	09.05.010
13	Bouton	09.11.009
14	Prise fixe	10.13.020
15	Capot	10.01.151
16	Détecteur Hinode	11.19.011
17	Varistance	11.26.001
18	Diode	14.05.083
19	Kit de rechange platine (il contient la carte 15.14.250 et les composants de puissance)	15.18.017
20	Carte d'entrée	15.14.252
21	Platine bus	15.14.315
22	Carte H.F.	15.14.286
23	Panneau de reglage FP106 (il contient la carte 15.14.236 et la plaque sérigraphiée)	15.22.106
24	Adaptateur	19.06.005
25	Pied anti-vibrations	21.03.003
26	Courroie	21.06.004
27	Câble d'alimentation	49.04.055
28	Platine filtre	15.14.238

ESPAÑOL

POS.	DESCRIPCION	CODIGO
1	Panel plastico anterior	01.04.262
2	Panel plástico posterior	01.05.220
3	Fondo plástico	01.06.100
4	Panel con serigrafia	03.07.077
5	Transformador	05.02.025
6	Transformador H.F.	05.03.018
7	Bobina de inductancia stabilizadora de corriente	05.04.224
8	Inductor	05.18.003
9	Ventilador	07.10.020
10	Abrazadera	08.22.001
11	Interruptor	09.01.005
12	Electroválvula	09.05.010
13	Botón	09.11.009
14	Toma fija	10.13.020
15	Tapón	10.01.151
16	Captador Hinode	11.19.011
17	Varistor	11.26.001
18	Diodo	14.05.083
19	Juego de repuestos tarjeta (contiene la tarjeta 15.14.250 y los componentes de potencia)	15.18.017
20	Tarjeta entrada	15.14.252
21	Tarjeta bus	15.14.315
22	Tarjeta H. F.	15.14.286
23	Panel de control FP106 (contiene la tarjeta 15.14.236 y placa serigrafiada)	15.22.106
24	Adaptador	19.06.005
25	Pie antivibrador	21.03.003
26	Correa	21.06.004
27	Cable de alimentación	49.04.055
28	Tarjeta filtro	15.14.238

WU 15 (fig. 34)



ITALIANO

POS.	DESCRIZIONE	CODICE
1	Pannello laterale destro	01.03.027
2	Pannello laterale sinistro	01.03.026
3	Innesto rapido H2O	19.50.043
4	FP 115	03.05.305
5	Pannello posteriore plastico	01.05.218
6	Serbatoio	20.04.505
7	Pannello frontale plastico	01.04.261
8	Radiatore	18.81.003
9	Ventilatore	07.10.016
10	Polmone antivibrazioni	07.21.100
11	Pompa	07.21.002
	Anticongelante CU10 (latta da 10Kg.)	18.91.001

ENGLISH

POS.	DESCRIPTION	CODE
1	Right side panel	01.03.027
2	Left side panel	01.03.026
3	Quick coupling H2O	19.50.043
4	FP 115	03.05.305
5	Plastic back panel	01.05.218
6	Tank	20.04.505
7	Plastic front panel	01.04.261
8	Heat sink	18.81.003
9	Fan	07.10.016
10	Vibration damping device	07.21.100
11	Pump	07.21.002
	Antifreeze CU10 (10kg tin)	18.91.001

DEUTSCH

POS.	BESCHREIBUNG	CODE
1	Seitenteil re	01.03.027
2	Seitenteil l'	01.03.026
3	Schnellkupplung H2O	19.50.043
4	FP 115	03.05.305
5	Hinteres Plastikpaneel	01.05.218
6	Behälter	20.04.505
7	Stirnseitiges Plastikpaneel	01.04.261
8	Wärmesenke	18.81.003
9	Ventilator	07.10.016
10	Schwingungsdämpfende vorrichtung	07.21.100
11	Pumpe	07.21.002
	Frostschutzmittel CU10 (10Kg Kanister)	18.91.001

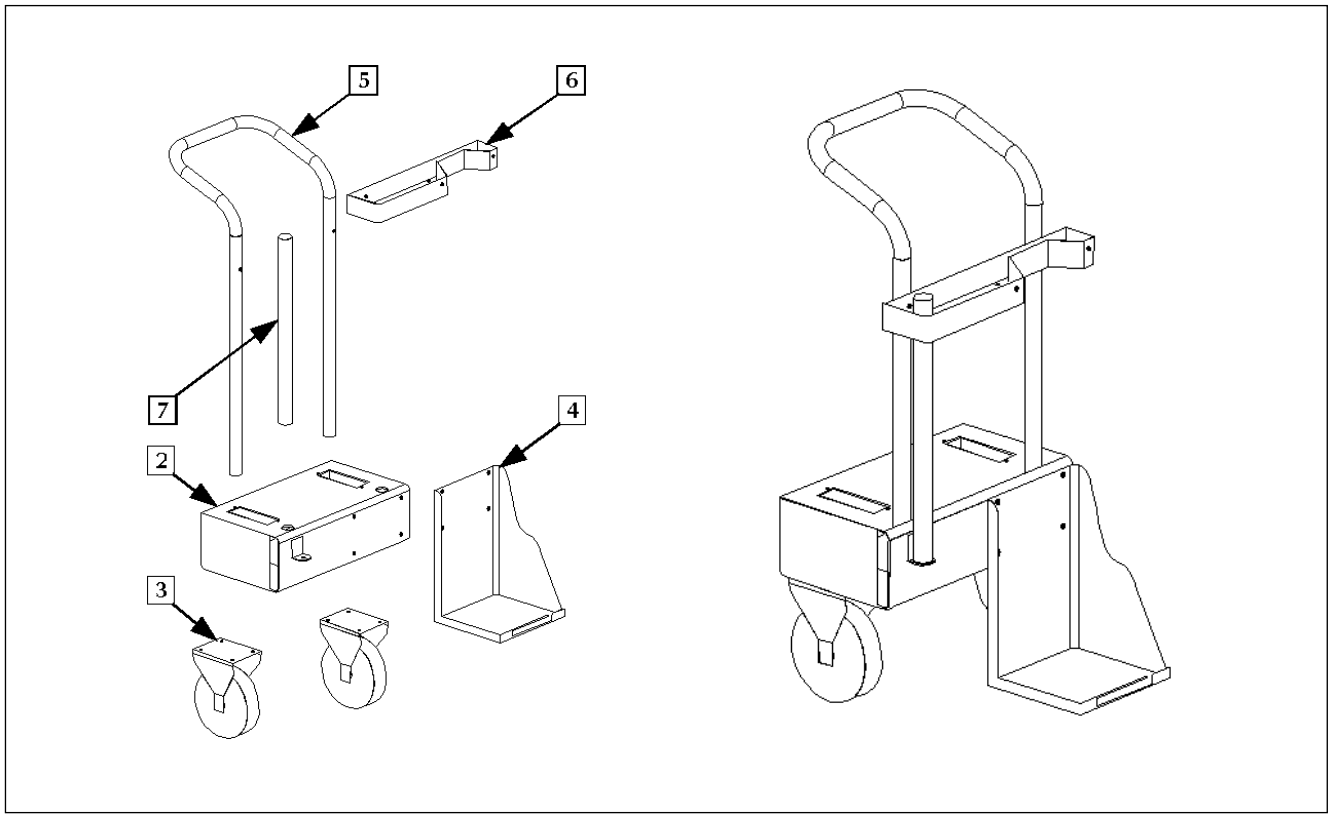
FRANÇAIS

POS.	DESCRIPTION	CODE
1	Panneau lateral droit	01.03.027
2	Panneau lateral gauche	01.03.026
3	Embrayage rapide H2O	19.50.043
4	FP 115	03.05.305
5	Panneau arrière plastique	01.05.218
6	Reservoir	20.04.505
7	Panneau avant plastique	01.04.261
8	Radiateur	18.81.003
9	Ventilateur	07.10.016
10	Dispositif antivibratoire	07.21.100
11	Pompe	07.21.002
	Antigel CU10 (bidon de 10Kg)	18.91.001

ESPAÑOL

POS.	DESCRIPCION	CODIGO
1	Panel lateral derecho	01.03.027
2	Panel lateral izquierdo	01.03.026
3	Embraque rapido H2O	19.50.043
4	FP 115	03.05.305
5	Panel posterior plástico	01.05.218
6	Tanque	20.04.505
7	Panel frontal plástico	01.04.261
8	Radiador	18.81.003
9	Ventilador	07.10.016
10	Dispositivo antivibrador	07.21.100
11	Bomba	07.21.002
	Anticongelante CU10 (lata de 10Kg.)	18.91.001

GENERATOR TROLLEY 1 CYLINDER (fig. 35)



ITALIANO

POS.	DESCRIZIONE	CODICE
1	Carrello portageneratore GT 18	71.03.019
2	Fondo completo carrello GT 18	02.07.040
3	Ruota fissa PBF 180	04.04.003
4	Porta bombola carrello	02.07.041
5	Manico a tubo carrello GT 18	01.15.032
6	Supporto bombola carrello	02.07.042
7	Tubo porta elettrodi GT 18	02.07.044

FASI DI MONTAGGIO

1) Unire le ruote (3) alla base del carrello (2) con viti e dadi M8
2) Assemblare il supporto bombola inferiore (4) alla base del carrello (2) con viti e dadi M8
3) Inserire il manico (5) negli appositi fori ed avvitare sul fondo (2) con viti M8
4) Unire il supporto bombola superiore (6) al manico con viti M6 ed inserire il porta elettrodi (7) ed unirlo al fondo con viti M8
5) Completare aggiungendo la catena e gli occhioli al supporto superiore della bombola

FRANÇAIS

POS.	DESCRIPTION	CODE
1	Chariot générateur GT 18	71.03.019
2	Parti inférieure GT 18	02.07.040
3	Roue PBF 180	04.04.003
4	Support bouteille	02.07.041
5	Manche GT 18	01.15.032
6	Unité ablocage bouteille	02.07.042
7	Etui électrodes GT 18	02.07.044

ASSEMBLAGE

1) Fixer les roues (3) sous la partie inférieure (2) par vis et écrous M8
2) Fixer le support bouteille (4) sur la partie inférieure (2) par vis et écrous M8
3) Insérer le manche dans les trous correspondants et fixer le par vis M8
4) Fixer l'unité ablocage bouteille sur le manche par vis M6 et insérer l'étui électrodes (vis m8)
5) Fixer la chaîne sur l'unité ablocage bouteille

ENGLISH

POS.	DESCRIPTION	CODE
1	Generator trolley GT 18	71.03.019
2	Bottom GT 18	02.07.040
3	Wheel PBF 180	04.04.003
4	Cylinder holder	02.07.041
5	Handle GT 18	01.15.032
6	Cylinder locking unit	02.07.042
7	Electrode holder GT 18	02.07.044

ASSEMBLY

1) Fix the wheels (3) under the bottom (2) with M8 screws and nuts
2) Fix the cylinder holder (4) to the bottom (2) with M8 and nuts
3) Put the handle (5) in the specific holes and fix to the bottom (2) with M8 screws
4) Fix the locking unit (6) to the handle (5) with M6 screws and put the electrode holder in with M8 screws
5) Fix the metal chain on the cylinder locking unit

ESPAÑOL

POS.	DESCRIPCION	CODIGO
1	Carro generador GT 18	71.03.019
2	Fondo GT 18	02.07.040
3	Rueda PBF 180	04.04.003
4	Soporte bombona	02.07.041
5	Mango GT 18	01.15.032
6	Bloqueo bombona	02.07.042
7	Portaelectrodos GT 18	02.07.044

MONTAJE

1) Fijar las ruedas (3) debajo del fondo (2) con tornillos y tuercas M8
2) Fijar el soporte bombona (4) al fondo (2) con tornillos y tuercas M8
3) Poner el mango (5) en los agujeros apropiados y fijar en el fondo con tornillos M8
4) Fijar el bloqueo bombona (6) al mango (5) con tornillos M6 y colocar el portaelectrodos (M8)
5) Colocar la cadenilla en el bloqueo bombona

DEUTSCH

POS.	BESCHREIBUNG	CODE
1	Gerätewagen GT 18	71.03.019
2	Unterteil GT 18	02.07.040
3	Rad PBF 180	04.04.003
4	Flaschenhalter	02.07.041
5	Stiel GT 18	01.15.032
6	Flaschenverriegelungseinricht.	02.07.042
7	Elektrodenhalter GT 18	02.07.044

AUFBAU

1) Räder (3) unter den Unterteil (2) durch Schrauben und Mutter M8 befestigen
2) Flaschenhalter (4) auf den Unterteil durch Schrauben und Mutter M8 befestigen
3) Stiel (5) in die entsprechenden Löcher einfügen und mit Schrauben M8 festmachen
4) Flaschenverriegelungseinrichtung (6) auf den Stiel (5) anschrauben (M6) und Elektrodenhalter einfügen (M8)
5) Kettchen auf die Verriegelungseinrichtung anbringen

12) TECHNICAL DATES

TECHNICAL CHARACTERISTICS		G 200 TLH	G 200 AC/DC
Supply voltage	(50/60 Hz)	1x230V ± 15%	1x230 V ± 15%
Max. absorbed power in TIG	(x=40%)	4.9 kW	5.3 kW
Max. absorbed current in TIG	(x=40%)	21.8 A	23.4 A
Absorbed current in TIG	(x=100%)	12.9 A	14.2 A
Max. absorbed power in MMA	(x=40%)	6.0 kW	6.6 kW
Max. absorbed current in MMA	(x=40%)	26.7 A	28.8 A
Absorbed current in MMA	(x=100%)	17.9 A	18.7 A
Power factor		0.99	0.99
Cosφ		0.99	0.99
Welding current in TIG	(x=40%)	200 A	200 A
	(x=60%)	170 A	170 A
	(x=100%)	140 A	140 A
Welding current in MMA	(x=35%)	180 A	180 A
	(x=60%)	150 A	150 A
	(x=100%)	130 A	130 A
Adjustment range in TIG (MMA)		6-200 (180 A)	6-200 (180A)
Open-circuit voltage		53.7 V	53.7 V
Protection rating		IP23C	IP23C
Insulation class		H	H
Construction standards		EN60974-1/EN50199	EN60974-1/EN50199
Dimensions (lxdxh)		179x430x293 mm	179x430x293 mm
Weight		16 Kg	16 Kg

TECHNICAL CHARACTERISTICS		WU15
Supply voltage	(50/60 Hz)	1x230 V ± 15%
Nominal input current		0.8 A
Capacity of reservoir *		1.7 l
Cooling power		900 W
Protection rating		IP23C
Dimensions (lxdxh)		179x430x160 mm
Weight with liquid		9.5 Kg

*** Note:**
- when topping up, use only coolant mod. CU-10 cod. 18.91.001 (10kg tin)
- the coolant is a ready product and should not be diluted!