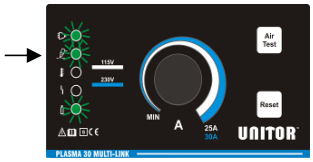
Trouble Shooting Manual UPC-310ML

CAUTION!

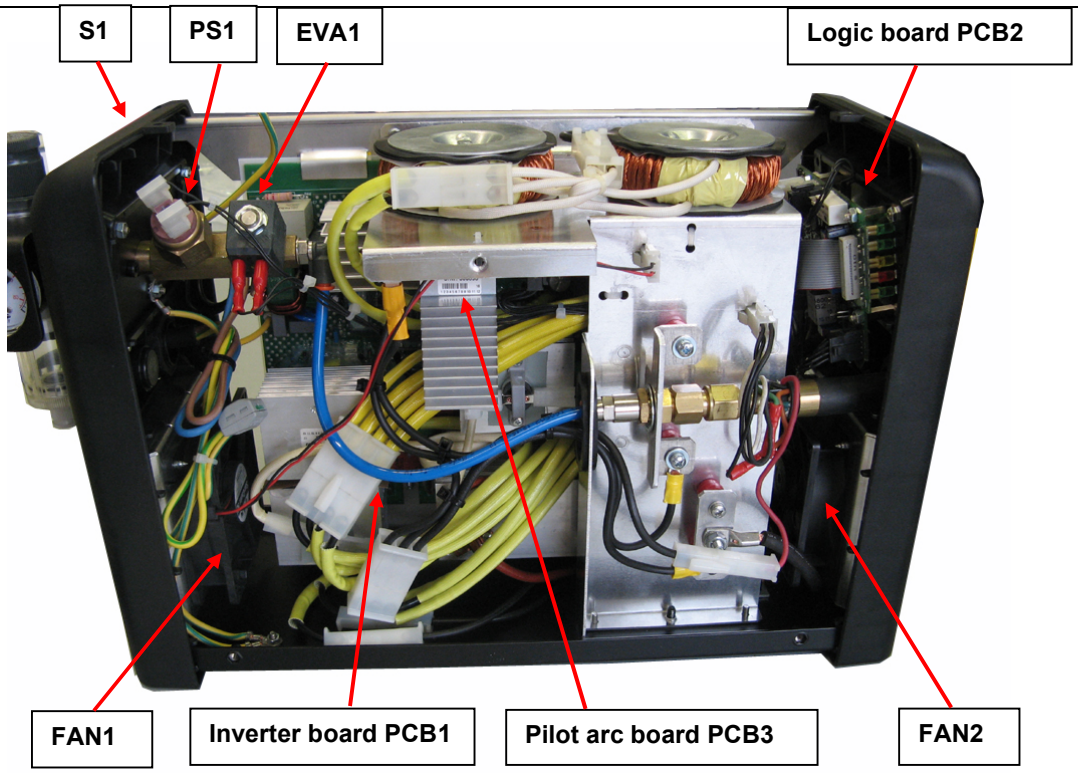
Turn OFF and disconnect input power before working on the machine
Wait discharge of capacitors (minimum 2 minutes) and be sure voltage is near zero before touching any parts.

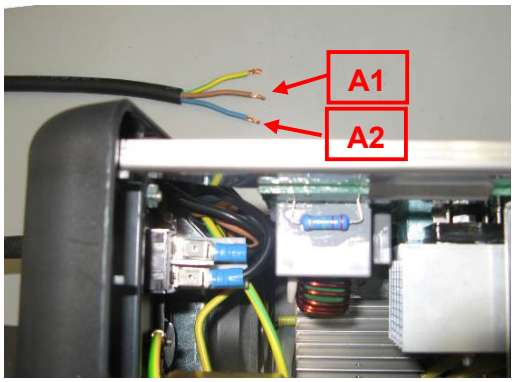
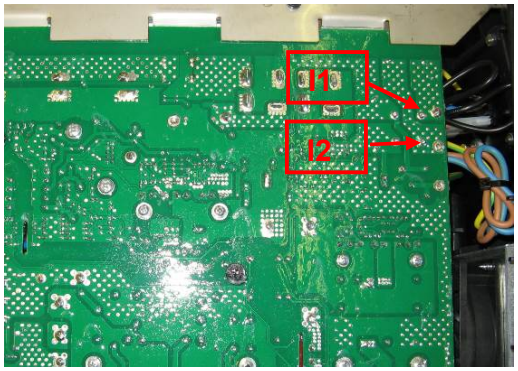
PROBLEM	CASE	SOLUTION
The Machine does not switch on.	Power supply off. Input cable damaged. Main switch damaged.	Step 1 -Check the incoming power supply are correct. (110V or 220V). Step 2 -Check the primary cable and plug (PICTURE 1). Step 3 -Check the main switch on the power source S1 and the wires to the switch (PICTURE 1). Step 4 - Check the wires from the main switch to the control board PCB 1 (PICTURE 16) and the flat connector between the control board PCB 1 and the front logic board PCB 2 (PICTURE 17).
Main Switch turned On, all Led Off.	No display on the front panel. Cooling fan does not work.	Step 1 -Switch off the machine, disconnect the plug. Make sure the flat cable that connects the front panel logic board PCB 2 to the inverter board PCB1 is inserted correctly (PICTURE 17). Step 2 Check the power supply cable (PICTURE 1) If there is continuity with a diode tester, continue to check on the Primary Inverter IGBT (PICTURE 5) Step 3 If Step 2 are correct, replace PCB1 and PCB2. If reading are wrong, replace both PCB 1.
. When powering up the plasma cutter machine, the circuit breaker trips.	Faulty Inverter PCB1.	Step 1 -Switch off the machine, disconnect the plug. Check: • Primary IGBT Inverter (PICTURE 5) • Secondary Diode Inverter (PICTURE 6) • Input bridge rectifier (PICTURE

	Input cable damaged.	4); • Varistor (PICTURE 9) . They are faulty and to be replace. Step 2 -Check the input cable and plug (PICTURE 1).
The machine “LED” will be flashing for 3 seconds during the end of the cutting process.  	-Consumable (tip and electrode) wears out.	Replace worn Tip or electrode (PICTURE 18).
The pilot arc doesn’t start.	-Red led (reset) on. -Incorrect compressed air setting or insufficient compressed air. - Faulty PCB. To determine conduct the following checks.	Step 1 -Press the reset button to be ready to cut (see instructions manual). -Check the torch, it has to be mounted in right way (PICTURE 19). -Check the O-Ring (PICTURE 2). -Check the consumables. If they are in the wrong position the led won’t turn off (PICTURE 20). -Check for incoming air pressure. It must be greater than 3 bar. Step 2 -Check the input compressed air (PICTURE 12). Step 3 -Switch off the machine, disconnect the plug. Check: • Primary IGBT Inverter (PICTURE 5) • Secondary Diode Inverter (PICTURE 6) • Input bridge rectifier (PICTURE 4) • Varistor (PICTURE 9) They are faulty and to be replace.

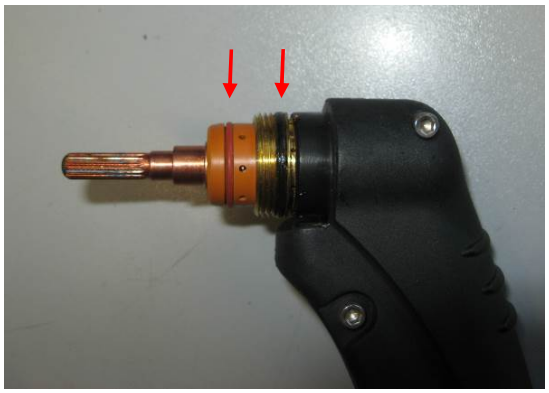
	Pilot board PCB3 damaged.	Step 4 -Check pilot arc PCB (PICTURE 14). Replace if reading are incorrect.
	The inductive value of the reading is >1 ohm.	Step 5 -The Power transformer must be replace if reading are >1 ohm. (PICTURE 10)
	The inductive value of the reading is >1 ohm.	Step 6 -The Output inductance must be replace if reading are >1 ohm. (PICTURE 11)
Cutting performance deteriorating.	-Consumable (tip and electrode) wears out.	Step 1 Check the consumables, try to substitute with new ones (PICTURE 18).
	-Cut speed not correct.	Step 2 -Check the speed, see the "cutting tables" in the instructions manual pg 14.
	-Incorrect compressed air setting or insufficient compressed air.	Step 3 -Check the input compressed air (PICTURE 12).
Nothing happen when you press the trigger or the pilot arc turns off quickly.	-Return cable defective or not correctly connected.	Step 1 -Check the ground cable to the power source for damage (PICTURE 3). Check that return clamp are clamp close to the work piece for good continuity. -Check for any loose connections inside the power source.
	-Pilot board PCB3 damaged.	Step 2 -Check pilot arc PCB (PICTURE 14).). Replace if reading are incorrect.
	-Faulty PCB. To determine conduct the following checks.	Step 3 -Switch off the machine, disconnect the plug. Check: • Primary Inverter IGBT (PICTURE 5) • Secondary Inverter Diode (PICTURE 6) • Input bridge rectifier (PICTURE 4) • Varistor (PICTURE 9) They are faulty and to be replace.

	-Front Logic board malfunction	Step 4 -If above checks are all correct. The logic board PCB2 is faulty and to be replace.
Thermal protection LED blinking	-Exceed duty cycle. -The thermal protection indication appear frequently. -Thermal switch faulty.	Step 1 -Let the machine cool down. Step 2 -Check FAN1 and FAN2 (PICTURE 13). If reading are incorrect, to be replace. Step 3 - Switch off the machine and disconnect the plug. -Check: • Thermostat 1 (PICTURE 7) • Thermostat 2 (PICTURE 7) If reading are incorrect, to be replace. -Check : • NTC Sensor thermal protection. (PICTURE 8); If reading are incorrect, to be replace.
During cutting, the Circuit Breaker trip.	Make sure the cutting current does not require input power greater than what supplied by the line or the fuse is too low.	Check the fuse size. 230V : 16A 115V : 20A
No compressed air output.	Solenoid valve damaged. Front panel logic board PCB2 faulty.	-When you push test air, check the supply voltage of EV (PICTURE 15). If the voltage is present and no air output the Solenoid valve must be replace. -If above checks are all correct. The logic board PCB2 is faulty and to be replace.



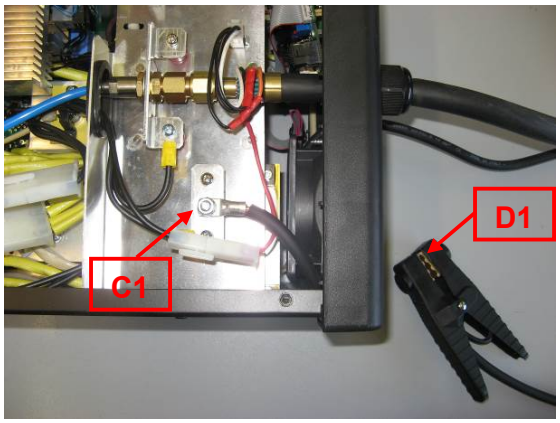
		EXPLANATION
PICTURE 1	 	Check the power supply cable and the ON/OFF switch. Disconnect the machine to the power supply and switch on the main switch. Check the continuity, with a diode tester, between points A1-I1 and A2-I2. If there is no continuity, you have to check the single parts step by step. -Check the power supply cable. -Check the main switch. -Check the wires from the main switch to the control board PCB 1 (PICTURE 16).

PICTURE 2



Check the O-ring in correct position.

PICTURE 3

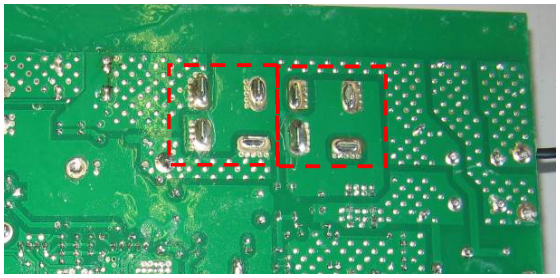


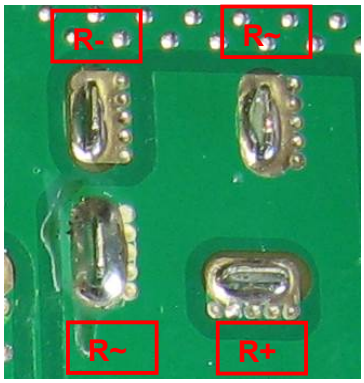
Disconnect the machine to the power supply.

Check the continuity, with a diode tester, between points C1-D1.

If there is no continuity, you have to replace ground cable.

PICTURE 4



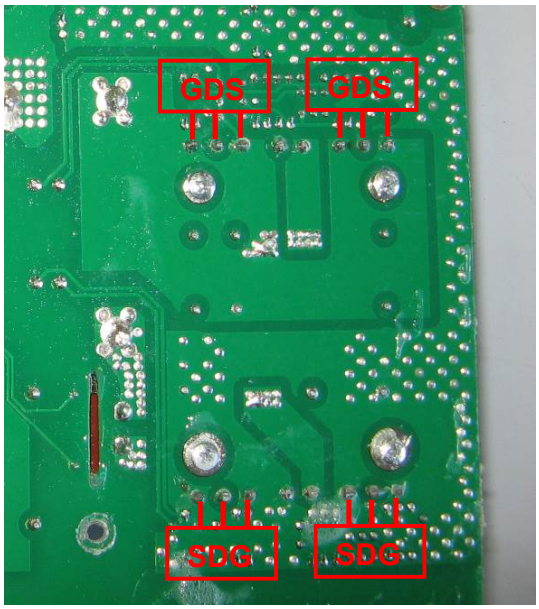


Input bridge rectifier (PCB1)

To check the Input bridge rectifier, carry out the following measurements with a diode tester:

Pin	Probe	Pin	Probe	Measure
R+	RED	R~	Black	'OL'
R-	RED	R~	Black	>.42
R+	Black	R~	RED	>.42
R-	Black	R~	RED	'OL'

PICTURE 5

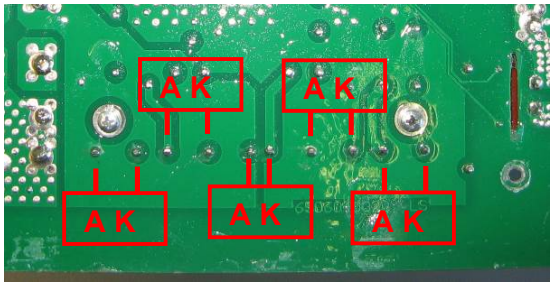


Primary inverter IGBT (PCB1)

To check the Primary inverter IGBT, carry out the following measurements with a diode tester:

Red Probe	Black probe	Measure
G	S	>0.6
D	S	'OL'
G	D	>0.9
S	G	>0.6
D	G	'OL'
S	D	>0.4

PICTURE 6

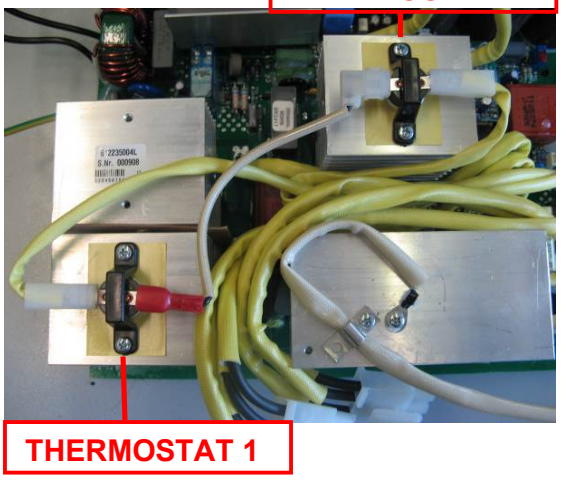


Secondary inverter DIODE (PCB1)

To check the Secondary Inverter Diode, carry out the following measurements with a diode tester:

Red Probe	Black probe	Measure
A	K	>.35
K	A	'OL'

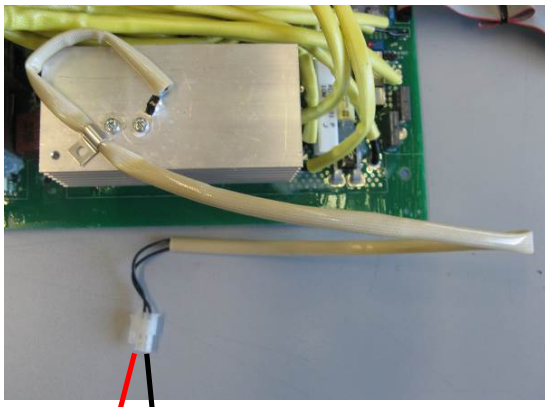
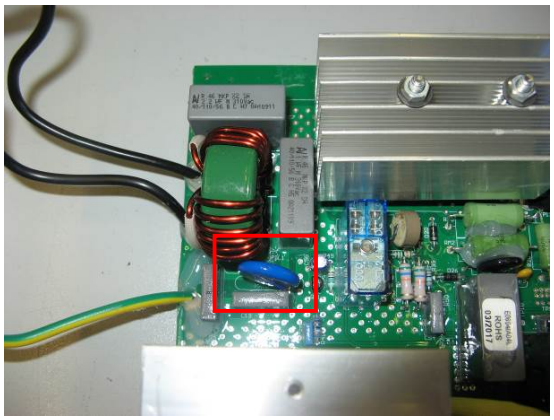
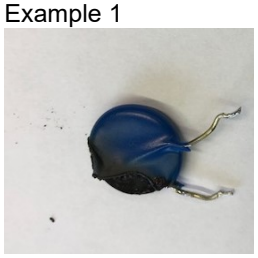
PICTURE 7

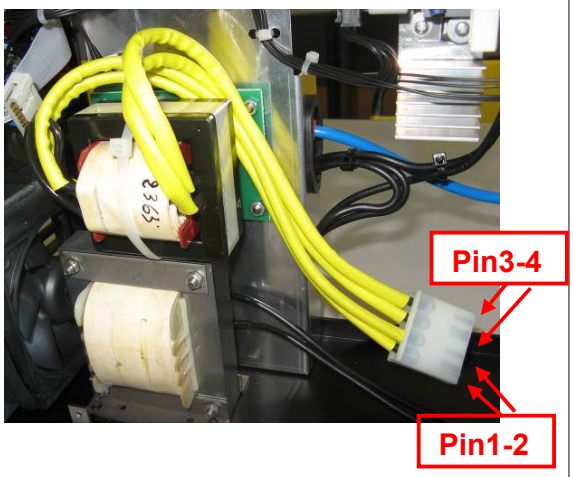
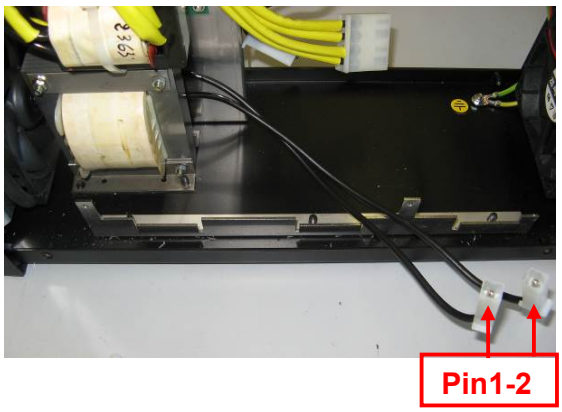
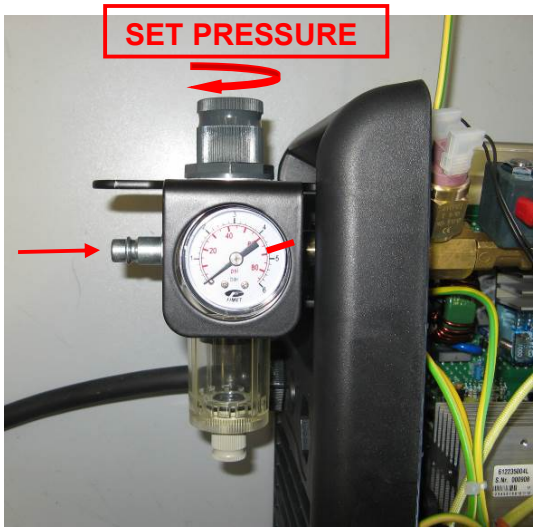


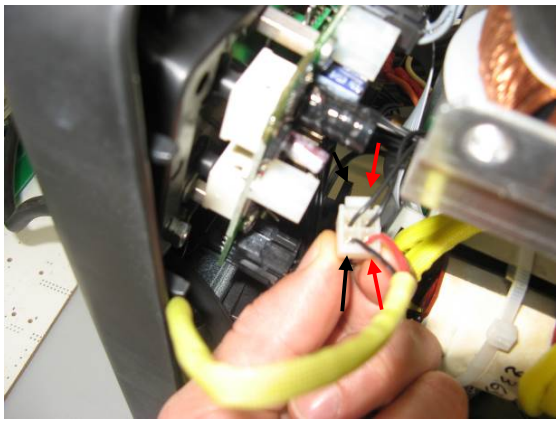
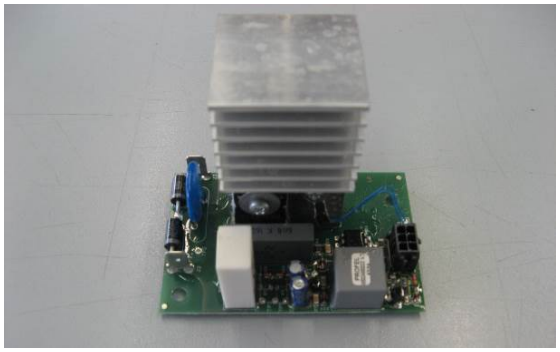
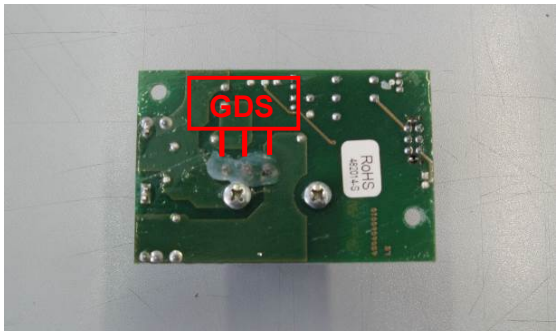
-Make sure that the wiring contact is correctly inserted in the thermostat.

-Check the continuity of the contact of the thermostat device. Make sure the heat sink had cool down sufficiently before conducting the checks.

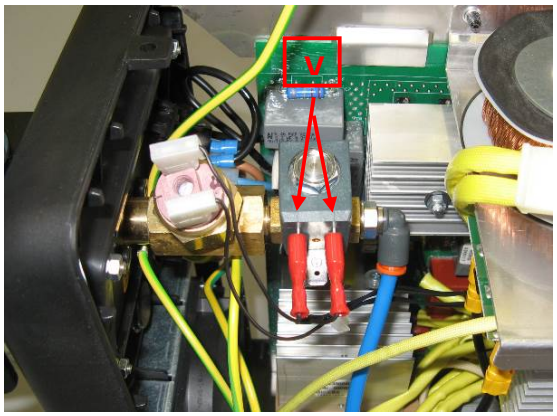
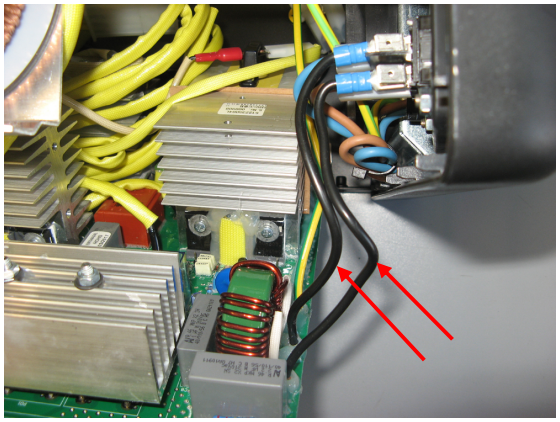
-Normally they are in short circuit.

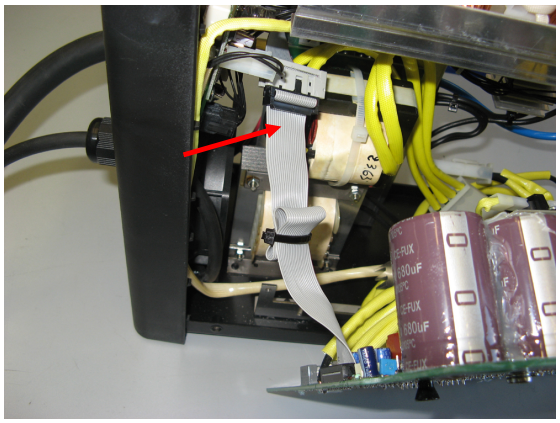
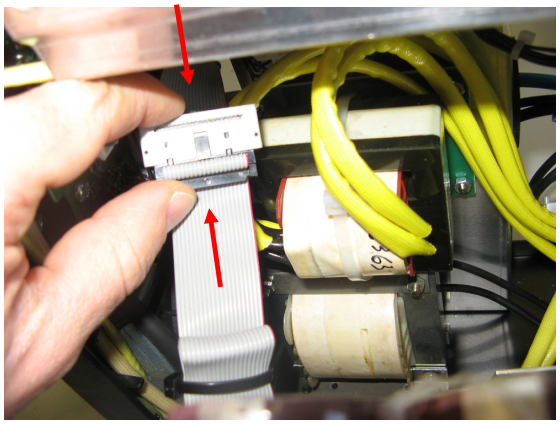
PICTURE 8		-Check the value of NTC sensor with the ohm-meter tester. Normally reading should be 10KΩ @25°C.
PICTURE 9	 Example 1  Example 2 	The varistor (PCB1) is a blue disc near the capacitors and ground wire of the power board. This device is for protecting the board from input overvoltage. When there is overvoltage above 320Vac they 'explodes' causing a short circuit. See visual example 1 and 2.

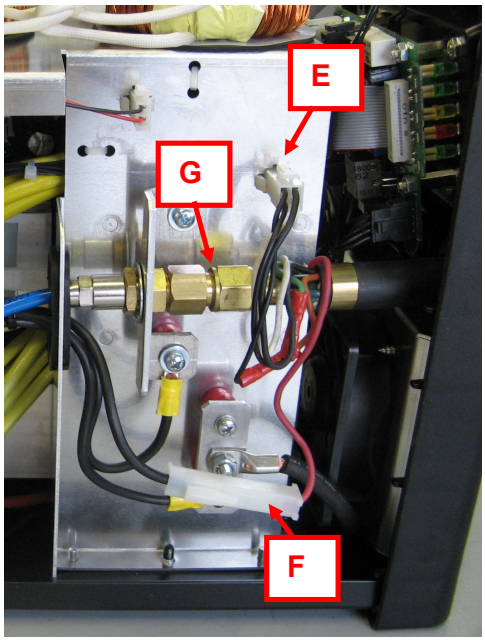
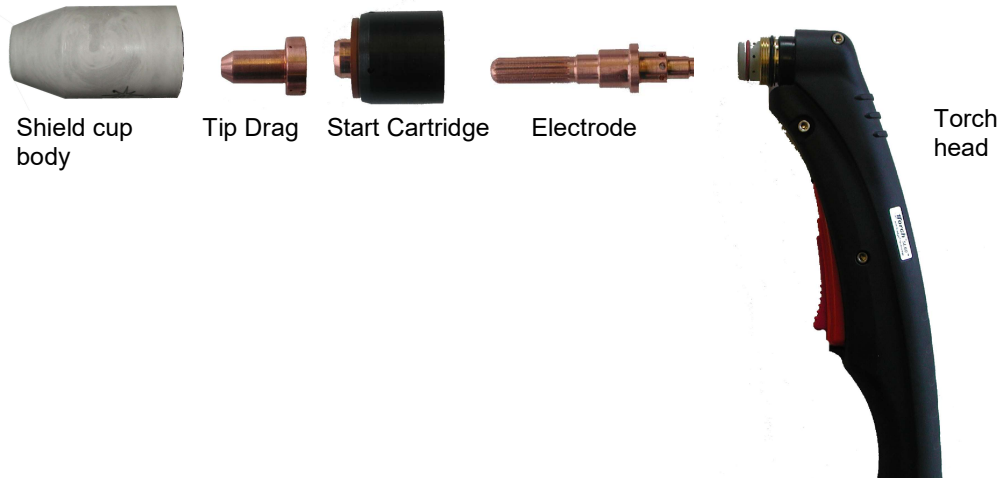
PICTURE 10		Power transformer. Measure: - Pin 1-2= < 1 ohm. - Pin 3-4= < 1 ohm.
PICTURE 11		Output Inductance. Measure: - Pin1-2= < 1 ohm.
PICTURE 12		Make sure that the air pressure regulator is setting at 4,8 bar.

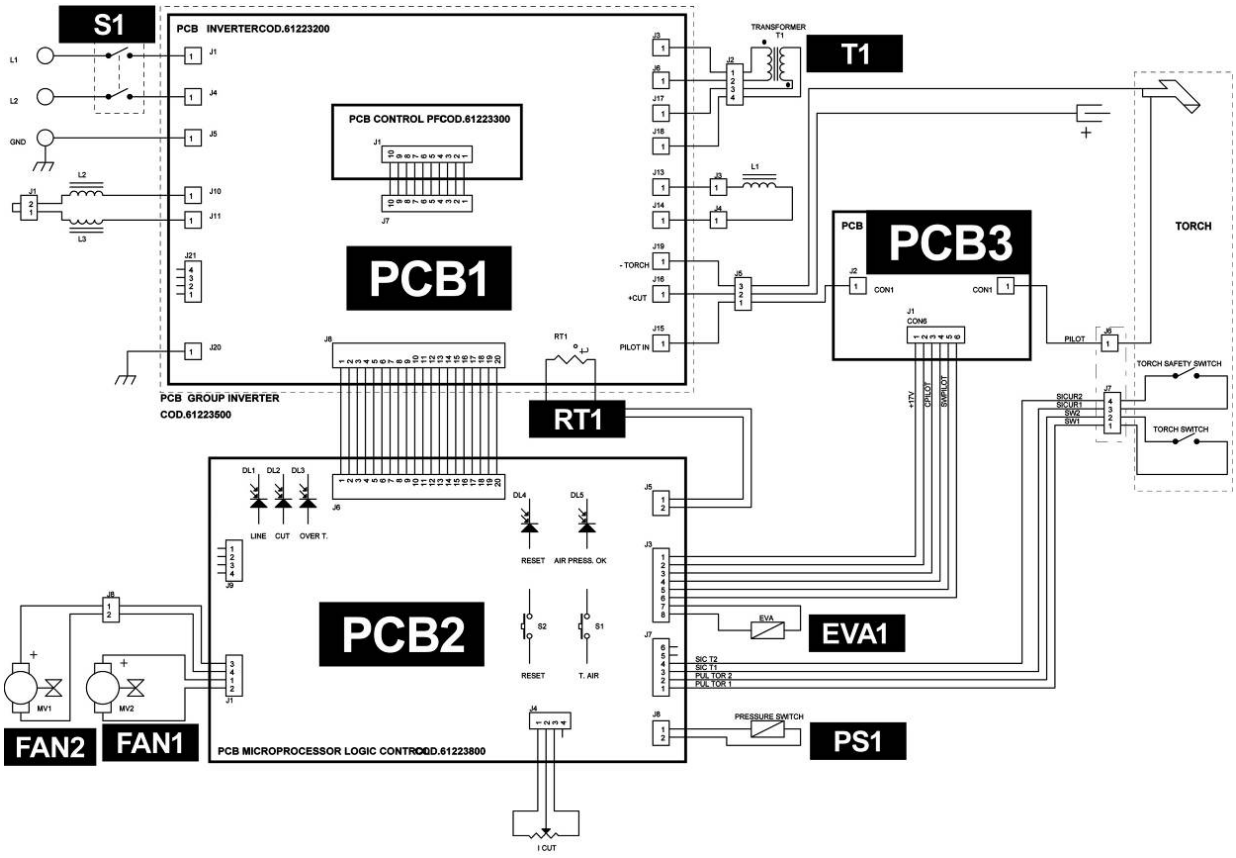
PICTURE 13		Check the motor fan: -FAN1= pin1(+), pin2(-) = 12Vdc max -FAN2= pin3(+), pin4(-) = 12Vdc max Note: Fan on demand!
PICTURE 14	 	Pilot arc board (PCB3). To check the Pilot arc IGBT, carry out the following measurements with a diode tester:

Red Probe	Black probe	Measure
G	S	>1.8
D	S	'OL'
G	D	>1.9
S	G	>1.9 / OL
D	G	'OL'
S	D	>0.5

PICTURE 15		Check the solenoid valve: V= 15Vdc
PICTURE 16		Check the continuity of the cable, with a diode tester, between the main switch and the control board PCB 1.

PICTURE 17	 	Check that the cable are properly connected.
PICTURE 18	 New tip Worn tip New electrode Worn electrode	Photos comparison of new and worn consumables.

PICTURE 19		E) 4pin connector: -pin1/pin2= switch torch (white/green cable) -pin3/pin4= safety (black/orange cable) F) 1pin connector= Pilot (red cable) G) 9/16” coupling= compressed air.
PICTURE 20		
PICTURE 21		Digital multiplemeters. For diode test refer to below pic for correct setting. ‘OL’ means Open Loop.


S1
PCB INVERTERCOD.61223200
PCB CONTROL PFCOD.61223300
PCB1
PCB GROUP INVERTER
COD.61223500
TRANSFORMER
T1
PCB
PCB3
TORCH
- TORCH
+CUT
PILOT IN
PILOT
TORCH SAFETY SWITCH
TORCH SWITCH
RT1
DL1
DL2
DL3
LINE
CUT
OVER T.
DL4
DL5
RESET
AIR PRESS. OK
PCB2
S2
S1
RESET
T. AIR
EVA
EVA1
SIC T2
SIC T1
PUL TOR 2
PUL TOR 1
PRESSURE SWITCH
PS1
MV1
MV2
FAN2
FAN1
PCB MICROPROCESSOR LOGIC CONTROL
COD.61223800
I CUT