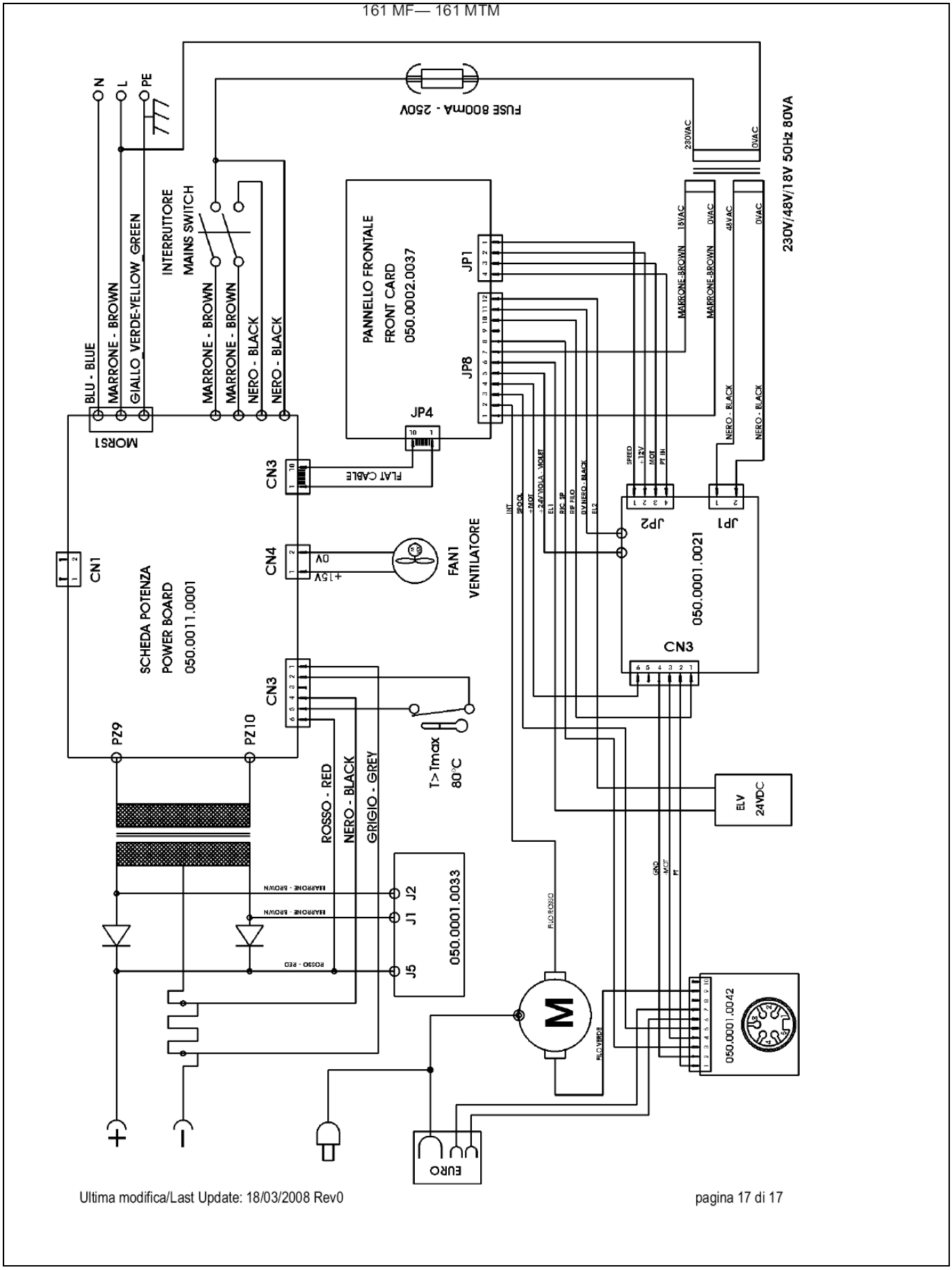
SERVISNÍ MANUÁL ALFIN 160-161 MF	SERVICE MANUAL ALFIN 160-161 MF

1. VAROVÁNÍ	WARNING
UPOZORNĚNÍ – Pouze osoba splňující kvalifikaci danou zákonem je oprávněna opravovat stroj.	**NOTE Only trained personnel are permitted to work inside the machine.**
PŘED OTEVŘENÍM KRYTU STROJE JEJ ODPOJTE VYTAŽENÍM SÍŤOVÉ VIDLICE ZE SÍTĚ.	**BEFORE OPENING THE MACHINE, CUT OFF ITS ELECTRICAL POWER BY REMOVING THE PLUG FROM THE MAINS SUPPLY SOCKET.**
Každé 4 měsíce otevřete stroj a jemně ho vyfoukejte stlačeným suchým vzduchem POZOR, NEPOUŽÍVEJTE STLAČENÝ VZDUCH O PŘÍLIŠ VYSOKÉM TLAKU, ABY NEDOŠLO K MECHANICKÉMU POŠKOZENÍ ELEKTROSOUČÁSTEK.	**Every six months, open the machine and clean it inside, using compressed dehumidified air. CAUTION. DO NOT USE COMPRESSED AIR AT TOO HIGH A PRESSURE. YOU COULD DAMAGE THE ELECTRONIC COMPONENTS.**
Každé 4 měsíce zkontrolujte řádný stav svařovacích kabelů a síťových kabelů.	**With the same frequency, check the welding cables and the supply cables.**
Není povolena žádná modifikace svařovacího stroje.	**No modification, of any type, may be made to the welding machine.**
Pro Vaši bezpečnost je nutné posečkat se sundáním krytu ze stroje po odpojení ze sítě po dobu minimálně 5 minut, kdy klesne napětí na kondenzátorech na hodnotu pod 36 V.	**For safety while maintaining the machine, please shut off the supply power and wait for 5 minutes, until capacity voltage already drops to safe**

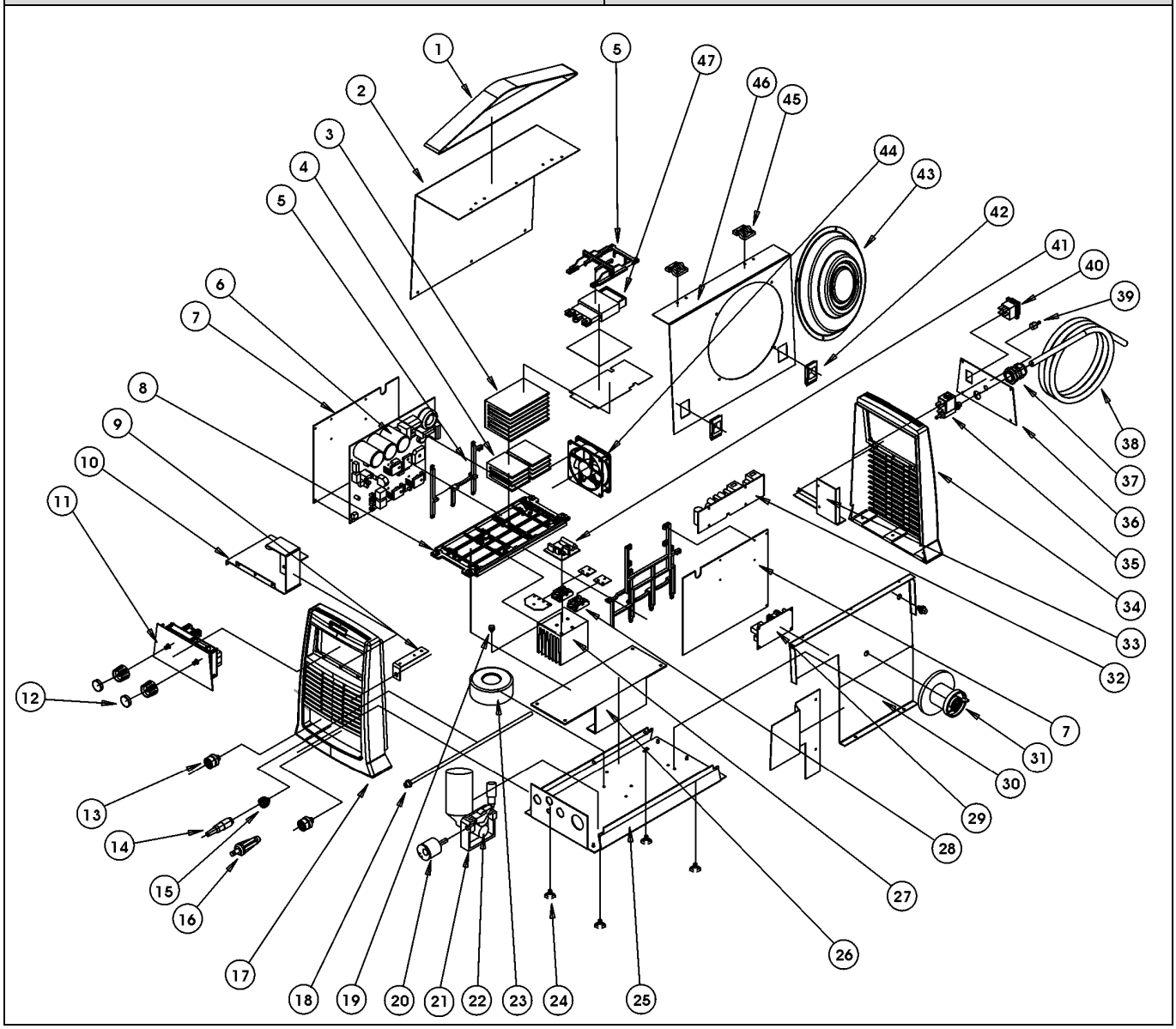
	voltage 36V.
2. BLOKOVÉ SCHÉMA	**ELECTRICAL PRINCIPLE DRAWING**



Ultima modifica/Last Update: 18/03/2008 Rev0

pagina 17 di 17

3. NÁHRADNÍ DÍLY | SPARE PARTS



Poz.	CODE	Název	DESCRIPTION	ks
1	005.0001.0008	Popruh	BELT	1
2	011.0001.0181	Kryt	CASE	1
3	0150001.0001	Chladič l = 107mm	DISSIPATER L=107mm	1
4	015.0001.0002	Chladič l = 50mm	DISSIPATER L=50mm	1
5	012.0001.0000	Vnitřní rám	INTERNAL FRAMEWORKS	1
6	050.005.0001	PCB – silová A160MF	POWER BOARD	1
7	046.0004.0004	Isolační deska	POWER BOARD INSULATION	1
8	012.0001.0001	Nylonová základní deska krátká	SHORT BLACK NYLON BASE	1
9	045.0005.0006	Bočník	SHUNT	1
10	011.0010.0005	Držák přední	FRONT SUPPORT	1
11	050.5052.0001	PCB řídící ALFIN 161	FRONT PANEL	1
12	014.0001.0004	Ovládací knoflík	COVER AND HANDLE WITH POINTER	2
13	711P001004	Rychlost. 10-25 panel	FIXED SOCKET 200A	2
14	021.0004.3360	Ovládac. konektor hořáku - vidlice	TORCH CONNECTOR	1
15	050.0001.0042	Konektor hořáku - zásuvka	TORCH CONNECTOR BOARD	1
16	AO-20501	Rychlospo. 10-25 kabel	MOVABLE PLUG 200A	1
17	012.0004.0010	Přední plastový rám	FRONT	1
18	017.0002.0806	Hadice plynová	GAS PIPE	1
19	040.0003.1080	Termostat tepelné ochrany	THERMAL CUT-OUT	1
20	BG-90625	Konektor EURO	EURO SOCKET	1
21	3494	Posuv CMS100-4 9900006 06-08	WIRE DRAWING MOTOR	1
22	2087	Kladka prům. 40/22; 0,6-0,8mm; drážka V	ROLLER Ø=40 0,6 – 0,8mm GROOVE V	1
	2088	Kladka prům. 40/22; 0,8-1,0mm; drážka V	ROLLER Ø=40 0,8 – 1,0mm GROOVE V	1
	2247	Kladka prům. 40/22; 0,8-1,0mm; drážka U	ROLLER Ø=40 0,8 – 1,0mm GROOVE U	1
	2317	Kladka prům. 40/22; 0,8-1,0mm; pro trubič. drát		1
23	041.0005.0004	Pomocný transformátor	AUXILIARY TRANSFORMER	1
24	016.0009.0001	Nožka gumová	RUBBER FOOT	4
25	011.0010,0007	Rám	BASE	1
26	011.0010.0008	Držák silové části	POWER SUPPORT	1
27	015.0001.0004	Chladič l = 75mm	DISSIPATER L=75mm	1
28	032.0002.0255	Izotop dioda	ISOTOPE DIODE	1
29	050.0001.0021	PCB regulace otáček	MOTOR BOARD	1
30	011.0010.0003	Vnitřní deska	INTERNAL PLATE	1
31	011.0006.0050	Držák cívky drátu K200	K200 SPOOL SUPPORT	1
32	050.0001.0033	PCB double A150	DOUBLER BOARD	1

33	011.0010.0006	Zadní postranní panel	REAR SIDE PANEL	1
34	012.0004.0100	Zadní plastový rám	BACK	1
35	017.0001.5542	Plynový ventil	SOLENOID VALVE	1
36	013.0007.0200	Panel zadní	REAR PANEL	1
37	045.0000.0001	Kabelová průchodka	CABLE GRIP	1
38	045.0002.0001	Síťový kabel	NEOPRENE CABLE	1
39	021.0000.0000	Sada pro připojení plynu	KIT FOR GAS CONNECTORS	1
40	040.0001.0001	Vypínač dvoupólový	TWO-POLE SWITCH	1
41	0500001.0003	PCB - snubber	SNUBBER BOARD	1
42	2681	Zámek	SLIDE CLOSURE	2
43	012.0000.0001	Kryt cívky	K200 SPOOL COVERS	1
44	2911	Ventilátor	FAN	1
45	2686	Plastový pant	PLASTIC HINGE	2
46	011.0000.0201	Otevírací kryt posuvu	DOOR	1
47	042.0003.0001	Silový transformátor	TRANSFORMER	1

4. ZÁVADY - ŘEŠENÍ

Poř.	Závada	Příčina	Řešení
1	Stroj je zapnutý, ventilátor funguje, LED zapnutí nesvítí	LED nebo její připojení je vadné.	Opravte připojení nebo vyměňte LED poř.č11
		Silová PCB je vadná.	Opravte nebo vyměňte PCB poř.č6
2	Stroj je zapnutý, LED zapnutí svítí, ventilátor neběží.	Překážka rotace ventilátor.	Odstraňte
		Motor ventilátor poškozen.	Vyměňte ventilátor
3	Stroj je zapnutý, LED zapnutí nesvítí, ventilátor neběží.	Není napětí v síti	Zkontrolujte, jestli je v síti napětí.
		Přepětí nebo podpětí v síti.	Zkontrolujte síťové napětí.
4	Žádné napětí na prázdno	Závada generátor.	Zkontrolujte hlavní vypínač
5	Žádný svařovací proud na svorkách	Svařovací kabely nejsou připojeny do konektorů.	Připojte svařovací kabely do rychlospojek na stroji.

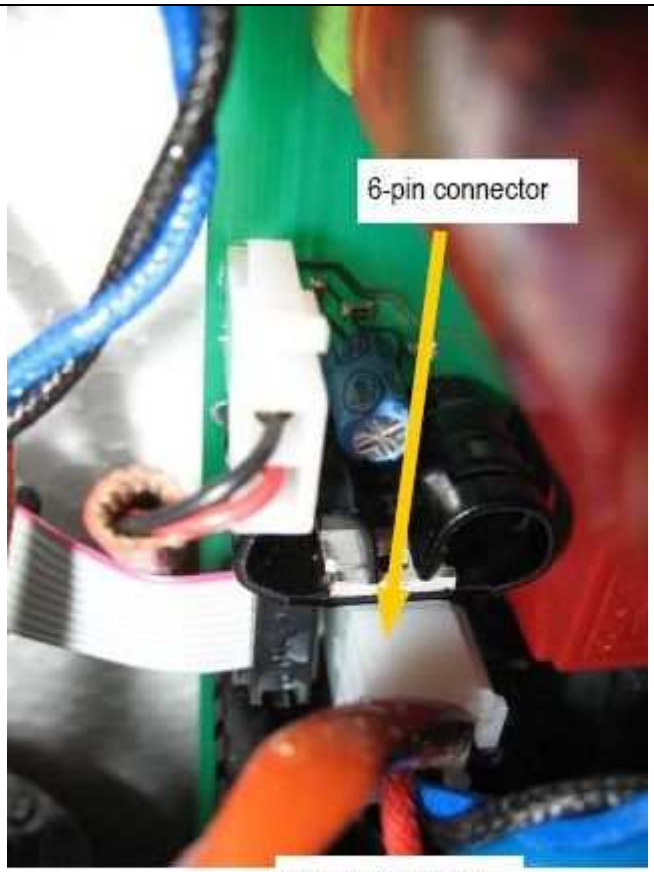
		Poškozený svařovací kabel.		Vyměňte nebo opravte svařovací kabel.
		Zemnící kabel není připojen nebo je špatně připojen.		Zkontrolujte zemnící kabel
6	Obtížně se zapaluje oblouk nebo dochází k lepení elektrody.	Špatně utažené svařovací kabely.		Zkontrolujte utažení svařovacích kabelů.
		Svařenec je znečištěn olejem nebo prachem.		Očistěte svařenec.
		MMA/TIG výběr je špatný.		Vyberte MMA svařování.
7	Svařovací proud nelze nastavit.	Poškozený potenciometr předního panelu.		Opravte nebo vyměňte potenciometr.
8	Penetrace tavné lázně nedostačující.	Svařovací proud je nastaven příliš nízko.		Zvyšte svařovací proud
9	Nestabilní oblouk	Nepříznivý vliv průvanu		Použijte zástěnu.
		Excentrická elektroda		Změňte úhle uchycení elektroda
				Vyměňte elektrodu
		Vliv magnetismu		Nahněte elektrodu proti směru magnetického vlivu.
				Změňte pozici zemnícího kabelu nebo přidejte zemnící kabel na opačnou stranu svařence.
10	LED ALARM svítí	Přehřátí	Stroj příliš zatížen	Počkejte, až se stroj vychladí
		Ochrana přepětí	Nestandardní proud na hlavním obvodu.	Otestujte a opravte hlavní obvod PCB poř.č6

TROUBLESHOOTING

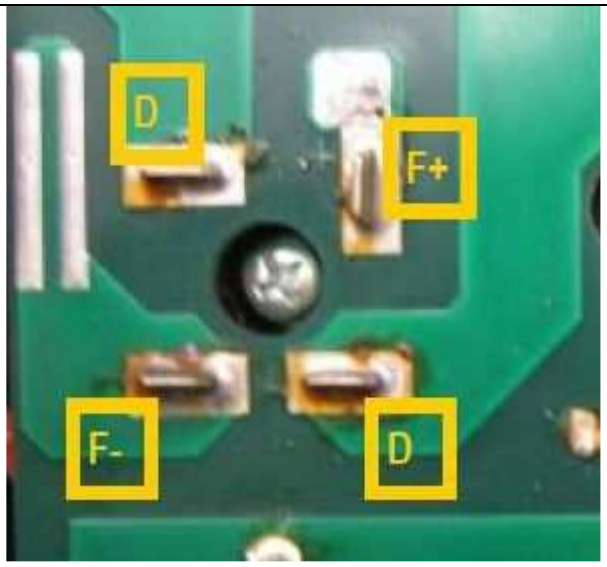
S/N	Troubles	Reasons	Solutions
1	Turn on the power source, and fan works, but the power light is not on.	The power light damaged or connection is not good	Test and repair the inside circuit of power light s/n 6
		Power PCB failures	Repair or change power PCB s/n 11
2	Turn on the power source, and the power light is on, but fan doesn't work	There is something in the fan	Clear out
		The fan motor damaged	Change fan motor
3	Turn on the power source, and the power light is not on, and fan doesn't work	No input voltage	Check whether there is input voltage
		Overvoltage (Input voltage is too much or not)	Check input voltage
4	No no-load voltage output	There is trouble inside the machine	Check the power switch
5	No current output in the welding	Welding cable is not connected with the two output of the welder.	Connect the welding cable to the welder's output

		Welding cable is broken		Wrap, repair or change the welding cable
		Earth cable is not connected or loosen		Check the earth clamp
6	Not easy to start arc in the welding, or easy to cause sticking	The plug loosen or connect not well		Check and tighten the plug
		Oil or dust covered the workpiece		Check and clear out
		MMA/TIG welding selection is wrong		Selecting the MMA welding
7	The welding current can not be adjusted	The welding current potentiometer in the front panel connection not so good or damaged		Repair or change the potentiometer
8	The penetration of molten pool is not enough(MMA)	The welding current adjusted too low		Increase the welding current
9	Arc blow	Airflow disturbance		Use the shelter from airflow
		The electrode eccentricity		Adjust the electrode angle
				Change the electrode
		Magnetic effect		Incline the electrode to the opposite way of the magnetic blow
				Change the position of earth clamp or add earth cable in the two side of workpiece
				Use the short arc operation
10	The alarm light is on	Over heat protection	Over welding current	Induce the welding current output
			Working time too long	Induce the duty cycle (interval work)
		Over current protection	Unusual current in the main circuit	Test and repair the main circuit and drive PCB s/n 6

5. KONTROLA SILOVÉ PCB — CHECKING THE POWER PCB

Obrázek 1		Pozice kontaktů v konektoru • teplotní čidlo (žluté dráty): pozice 2,5 • drát pro snímání výstupního napětí (červený): pozice 3 • dráty bočníku: pozice 1,4 Zkontrolujte spojení kontaktů tepelné ochrany pomocí testeru diod, teplota chladiče nesmí být vyšší než 40°C. Zkontrolujte spojení mezi: + objímkou a červeným drátem Zkontrolujte průchodnost mezi: - objímkou a vodiči bočníku.
Obrázek 2		Na PCB RC filtr, umístěné nad výstupním usměrňovačem jsou umístěny dva transily, Pro kontrolu musí v obou směrech vykázat přerušený obvod OL 

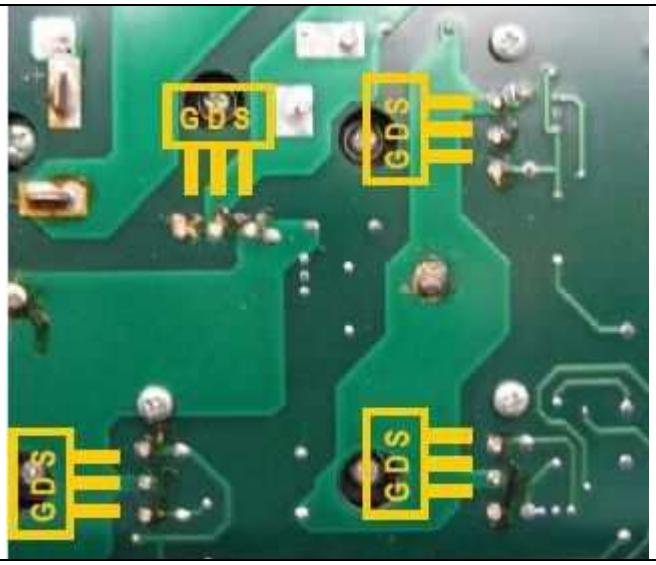
Obrázek 3



Vstupní usměrňovač na silové desce
Pro kontrolu můstku změřte tento podle následující tabulky testerem diod

Červený vodič	Černý vodič	Naměřená hodnota
F+	D	OL
D	F+	>0.450
D	F-	OL
F-	D	>0.450

Obrázek 4



Pro kontrolu tranzistorů změřte tyto podle následující tabulky testerem diod

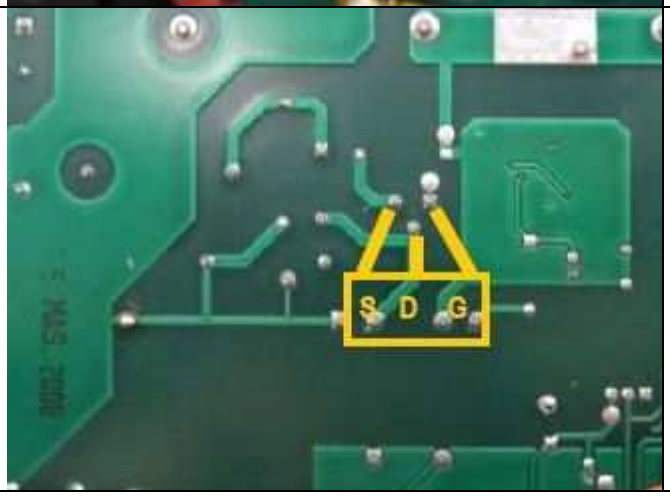
červený	černý	hodnota
S	G	0,28
G	S	0,6

Hodnoty jsou orientační. Naměříte-li zkrat, nebo rozpojený obvod (OL), je nutné PCB vyměnit

Obrázek 5

Varistor je blízko vstupu napájecího napětí na silovou PCB. Toto zařízení slouží k ochraně PCB před vstupním
přepětím. Při přepětí "exploduje" a zkratuje vstup. Je-li rozsah zkratu velmi
vysoký, obvod se přeruší

Obrázek 6



Pro kontrolu tranzistor změřte podle následující tabulky testerem diod

červený	černý	hodnota
G	D	0,5
D	S	OL
G	S	0,6

Hodnoty jsou orientační. Naměříte-li zkrat, nebo rozpojený obvod (OL), je nutné PCB vyměnit

Obrázek 7		Digitální multimetr. "OL" označuje přerušený obvod

CAUTION!

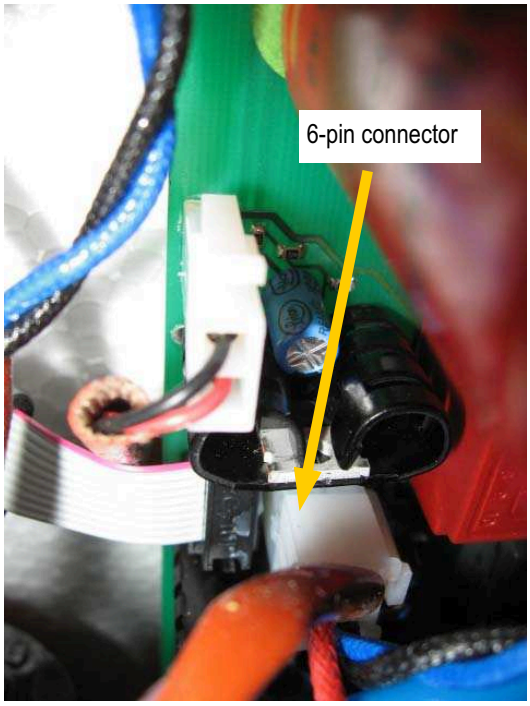
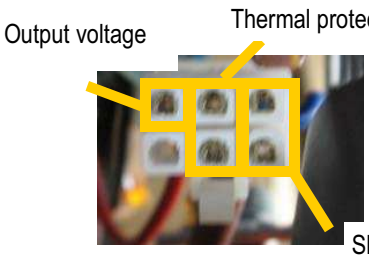
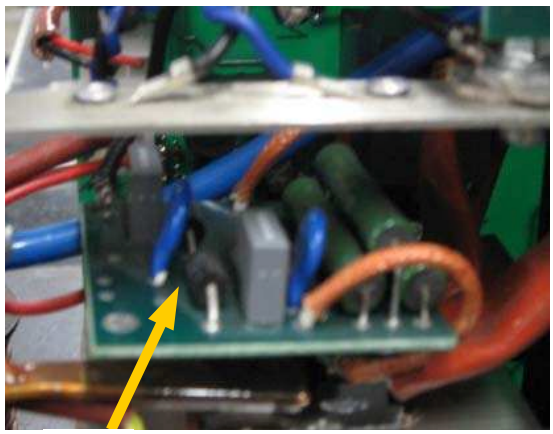
Before carrying out any work on the machine make sure it is off and the plug has been disconnected.

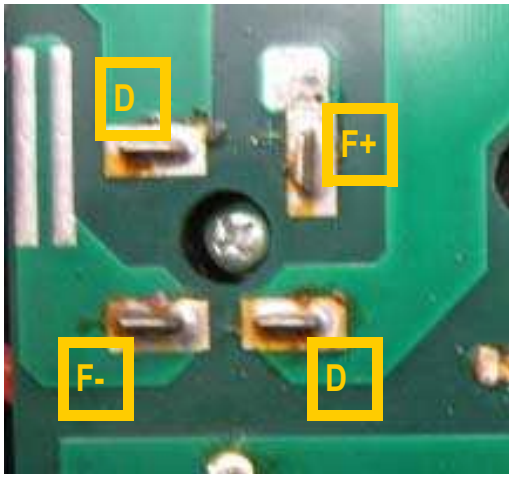
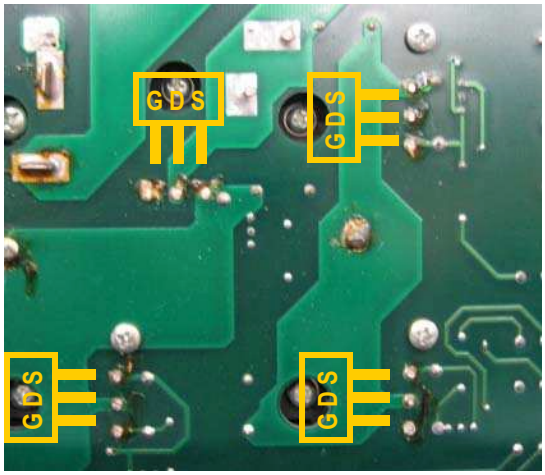
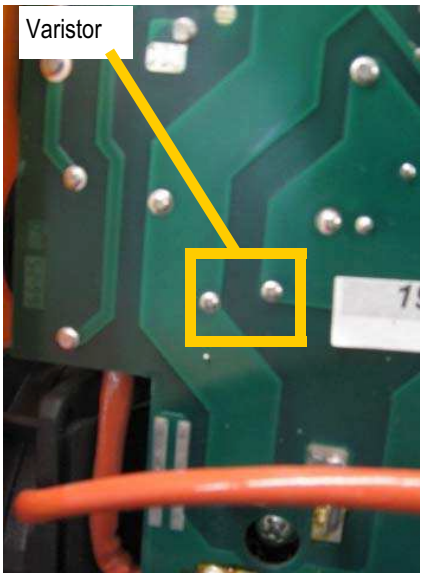
PROBLEM	CASE	SOLUTION
The machine does not switch on.	– Electrical power does not reach the machine. – Voltage reaches the machine switch but there is no voltage after the contacts. – There is voltage after the disconnecting switch but the machine does not go on.	• Make sure the line switches are closed, the protection devices (fuses) have not been enabled and that the power supply cable is intact. • Switch the machine off and disconnect the plug. Make sure that when the switch is closed, there is continuity between the contact input and output and that the varistor is not broken. In case the Poewer Board must be replaced(picture 5). • Switch the machine off and disconnect the plug. Check the mosfet of the switching power supply unit on the power board (picture 6).
The protection devices of the line set off when the switch is activated and the machine does not go on.	– Damaged power supply cable with short-circuited wires. – Inverter is damaged.	• Switch off the machine and disconnect the plug. Make sure that there are no short circuits between the poles of the plug caused by a damaged power supply cable. • Switch off the machine, disconnect the plug and check: - varistors (picture 5); - inverter (picture 4); – Input bridge rectifier (picture 3); – switching power supply unit (picture 6). If one of these components is damaged replace the power board 050.0011.0001.

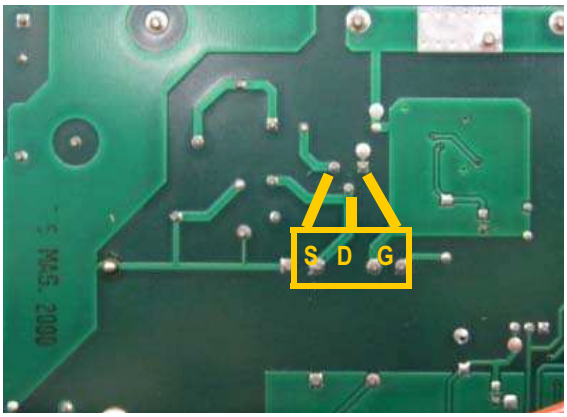
PROBLEM	CASE	SOLUTION
The front panel does not switch on.	– The fan works but the front panel does not go on.	• Switch off the machine and disconnect the plug. Make sure the flat cable that connects the front panel to the power board is inserted correctly. If correctly inserted, replace the front panel. If the front panel does not go on, one of the switching power supply unit outputs is broken. Therefore the power board must be replaced.
	– Both the fan and the front panel do not work.	• Switch off the machine, disconnect the plug and check the mosfet of the switching power supply unit on the power board. IF it's damaged it must be replaced (picture 6).
The MMA/MIG/TIG output voltage is about 11V and the machine does not weld.	– The output voltage wiring of the front panel is interrupted (picture 1).	• Switch off the machine and disconnect the plug: – Make sure that the wiring contact is correctly inserted in the connector. – Check for continuity between the +/- output outlets and that the 2-path connector is connected to the front panel (picture 1);
	– The primary current alarm on the power board is activated.	• The power board must be replaced.
The output voltage in each procedure is about 11V and enabling of the thermal protection device.	Wait a few minutes keeping the machine on to favour cooling of the inverter. If the machine continues running with the protection devices on, switch the machine off and disconnect the plug. Remove the hood and make sure: – the temperature of the heat sink tool is less than 40°C; – If it is less than 40°C, check whether the thermal protective device contacts are normally closed.	- If one of the protection devices is always opened it is defective, it must be accordingly replaced. - If it is closed, make sure the two terminals are well inserted in the connector(picture 1). - Power board feed problems, it must be accordingly replaced.
The output voltage is zero.	Switch the machine off and disconnect the plug. Check for a short circuit at the DINSE plug with a diode tester. A short circuit may be caused by : – damaged transil on the snubber board;	Switch off the machine and disconnect the plug. Remove the snubber board: • check with a diode tester the status of the transil on the snubber board (picture 2);
	– damaged diodes;	• check with a diode tester the status of the diodes;
	– damaged inverter;	• check the status of the power board (picture 4);
	– The inductive value of the Power Transformer is null.	• The Power Transformer must be replace.

PROBLEM	CASE	SOLUTION
When welding the protection devices of the line set off.	Make sure the welding current does not require greater power than the one supplied by the line.	Decrease the welding current.
The welding is non optimal.	– Spattering occurs during welding. – Porosity in the deposit. – Too narrow welding seam (“dry arc”). – Too wide welding seam (“too hot weld pool”).	• Make sure welding polarity is correct, the earth clamp is fixed correctly. • Decrease the set voltage value and check the gas emission from the torch. • Increase the electronic inductance parameter and/or voltage. • Decrease the electronic inductance parameter and/or voltage.
The machine stops welding and emits an acoustic signal.	The maximum current that can be supplied by the machine has been exceeded.	Decrease the value of the welding parameters.
Non optimal MIG welding start.	Spattering occurs on starting and crackling.	Increase post-gas to decrease the oxidation status of the welding wire.
Gas does not come out from solenoid valve.	– Excessive gas pressure. – Damage solenoid valve wiring. – The solenoid valve control relay on the front panel is damaged. – Solenoid valve is damaged.	• Remove the gas connection. Carry out a gas test on the front panel in the MIG/TIG procedure and check opening of the solenoid valve. Reduce gas pressure. Restore connections and carry out a gas test. • Switch off the machine and disconnect the plug: – Should there be no continuity, single out the disconnection and repair it; – Make sure that the wiring contacts are correctly inserted in the connectors. • The front panel must be replaced. • Should the operations carried out not have a positive outcome, replace the solenoid valve. Should the operations carried out not have a positive outcome, try to replace the Toroidal Transformer.

PROBLEM	CASE	SOLUTION
The torch button doesn't work.	– There's no continuity in the amphenol board (0042) cable. – There is no continuity between the euro connector and the connector on front panel. – The Front Panel is damaged.	• The amphenol cable must be replace. • Check the connection between the Euro-connector and pin 1/2 of the Amphenol connector. Afterwards check the connection between the Amphenol connector and the Motor board and between Motor Board and Front Panel. • The Front Panel must be replace
The machine always welds at maximum current.	– The front panel is damaged.. – The Power Board is damaged. – The shunt wires are damaged or not correctly inserted.	Switch off the machine and disconnect the plug: • The Front Panel must be replaced. • The Power Board must be replaced. • Connect the cables, or if damaged, replace them.
The wire feeding unit motor does not work.	– Primary fuse of the auxiliary transformer is damaged. – Controls from the front panel do not reach the motor board. – The motor board is damaged.	• Switch off the machine and disconnect the plug. The delayed fuse 5x20 800 mA on the back of the machine must be replaced. • Check the connection of the motor feeding wire on the front panel and after that check the continuity between the front panel and the amphenol connector (picture 9). Check connections between the front panel and the white 4-pin connector; if connections are not interrupted, replace the front panel. • The Motor board must be replaced.

		EXPLANATION
PICTURE 1	 	Position of the connector in which they are inserted: • thermal protection device : position 2, 5 (yellow wires) • Wire for the output voltage reading: position 3 (red) • Shunt wire: pin 1/ 4. Check the continuity of contact of the thermal protection device with the diode tester, with the heat sink tool temperature less than 40° C. Check the continuity between: + socket and the shunt; - socket and the output voltage wire.
PICTURE 2		Remove the snubber board and check that the transils are not in short circuit. At the ends of the two transils (see below) positioned on the snubber board, “OL” must always be measured. 

		EXPLANATION
PICTURE 3		Input bridge rectifier on power board. To check the Input bridge rectifier , carry out the following measurements with a diode tester: **Faston / Probe / Faston / Probe / Misura** F+ / Red / D / Black / "OL" F− / Red / D / Black / >.450 F+ / Black / D / Red / "OL" F− / Black / D / Red / >.450 Should there be a short circuit on one of these measurements, the input bridge rectifier must be replaced.
PICTURE 4		To check the inverter, carry out the following measurements with a diode tester: **Red Probe / Black Probe / Measure** S / G / 0.28 G / S / 0.6 Should there be a short-circuit on one of these measurements or an "OL" instead of a numeric value, the power board must be replaced.
PICTURE 5		The varistor is a blue discs near the ground wire of the power board. This device is necessary to protect the board from input overvoltage. When there is overvoltage it "explode" causing a short circuit most of the times. If the extent of the short circuit is very high its becomes an open circuit.

		SPIEGAZIONE
PICTURE 6		To check the mosfet of the switching power supply unit, carry the following measurements with a diode tester: **Red Probe** / **Black Probe** / **Measure** G / D / 0.5 D / S / "OL" G / S / 0.6 Should there be a short-circuit on one of these measurements or an "OL" instead of a numeric value, the power board must be replaced.
PICTURE 7		Tester or digital millimetre. "OL" means Open Loop.