

SCOTTY II



SERVICE MANUAL

1. Introduction

1.1 General

This document should be used if the SCOTTY II is not working properly. With this document it should be possible to find the fault/ not working device and to change this device without the direct help of the manufacturer.

1.2 Danger

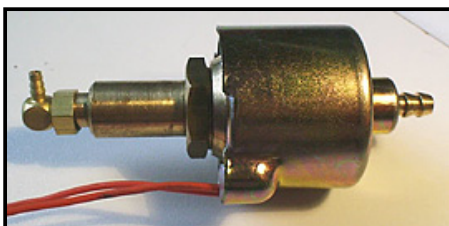
- While replacing any device the battery should be unplugged.
- Let the unit cool down before replacements or something like that.

2. Components SCOTTY II



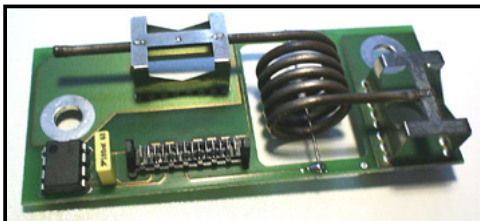
Picture 3: SCOTTY II without battery

2.1 Pump (part number 59017) and Valve (part number 50004)

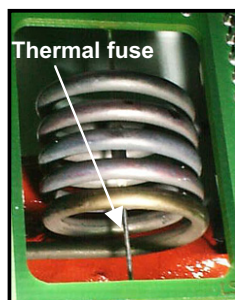


Picture 2.1: Pump (59017)

2.2 Vaporizer (part number 69023)

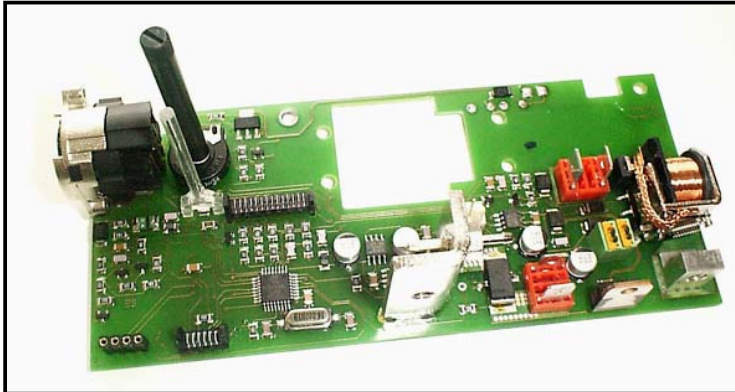


Picture 3.2a: Vaporizer for SCOTTY II (69023)



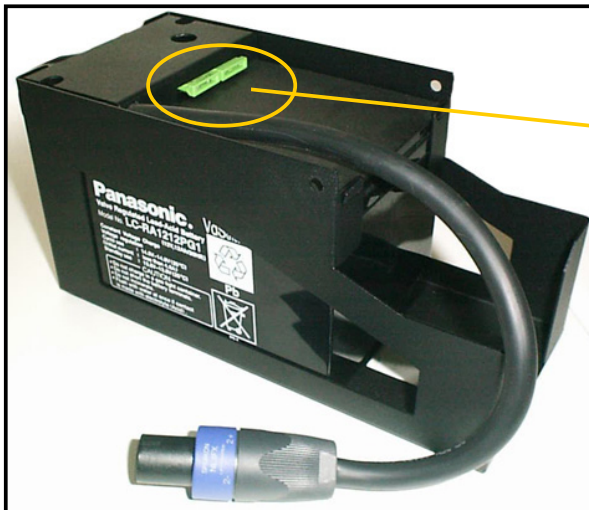
Picture 3.2b: Thermal fuse

2.3 PCB SCOTTY II (part number 39017)

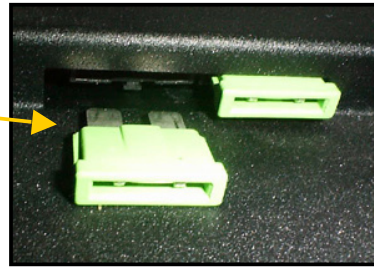


Picture 3.3: PCB SCOTTY II (39017)

2.4 Battery pack (part number 49091)



Picture 3.4a: Battery pack for SCOTTY II (49091)



Picture 3.4b: FKS fuse links 25A (40029)

2.5 Bottle and lid (part number 59005)



Picture 3.5: Bottle and lid (59005)

3. Diagrams

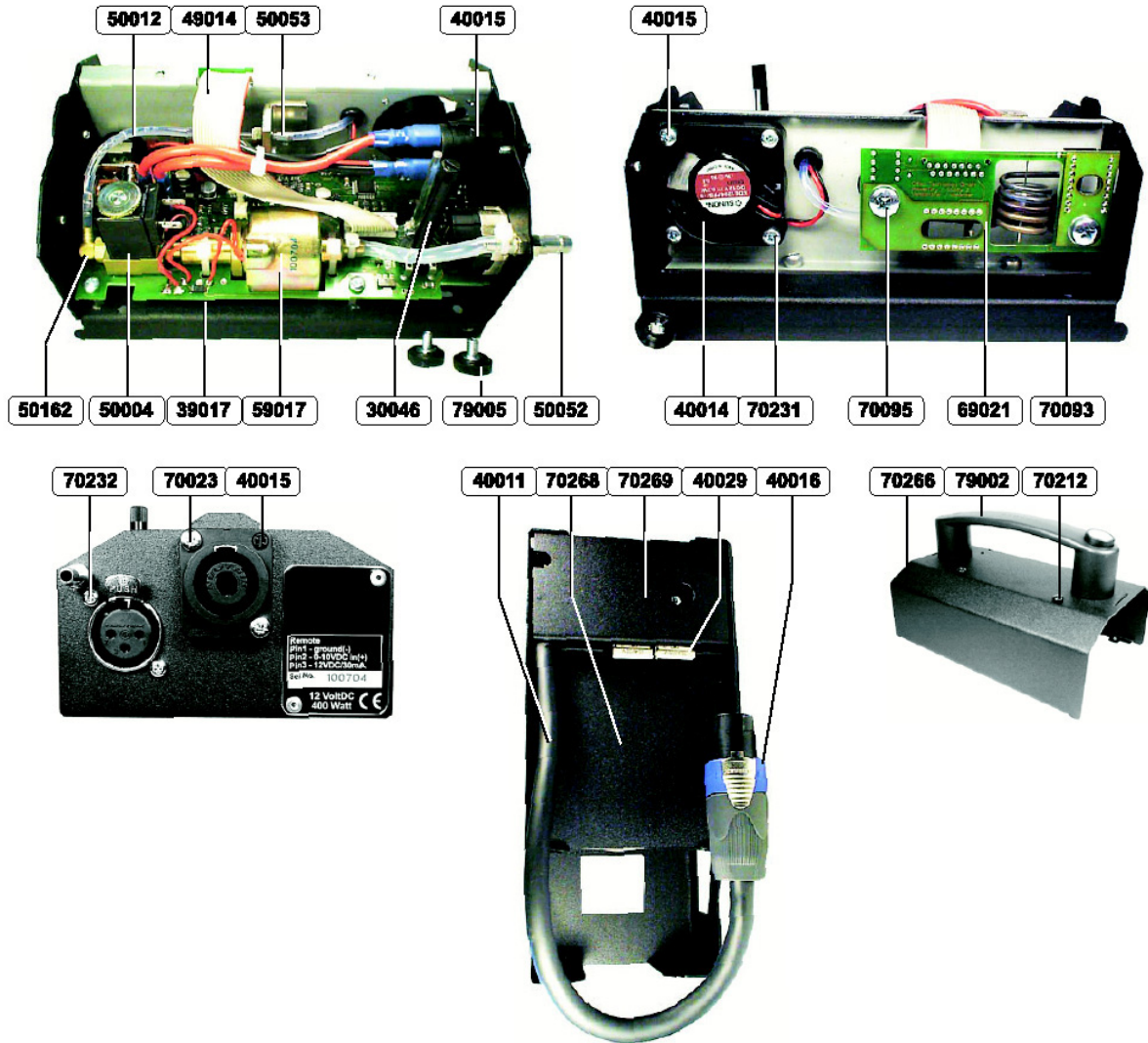
3.1 Part lists

3.1.1 Part list SCOTTY II

partnumber	description	quantity
30046	Steckachse 46mm shaft for potentiometer	1,00
39017	PCB	1,00
40014	Lüfter 40x40x10mm 12V DC fan 12VDC 40x40x10mm	1,00
40015	Speakonbuchse NL4MP-UC Speakon chassis connector	1,00
49014	KOKA Flachbandkabel Molex 14-pol 160mm flat cable 14-pin	1,00
50004	Ventil 2/2 Wege, 6V valve 2/2 ways, M5	1,00
50012	Teflonschlauch 2x0,5 PTFE tube 2x0,5mm	0,20
50052	Schottülle 4-3-M5 bulkhead coupling for fluid tube	1,00
50053	Schottülle 2-2-M5 bulkhead coupling for fluid tube	1,00
50117	Stecktülle f.Schnellkupplung 1/8 push-on spigot f.quick-acting coupling	1,00
50162	Winkel-Einschraubtülle M5 auf 2/4 gewinkelt fitting M5 angled	1,00
59005	Flasche 250ml komplett mit Schnellkupplung und E bottle complete with lid	1,00
59017	Pump	1,00
69021	Verdampfer vaporizer	1,00
70023	Gefu Schraube M3x8 tap lite screw	2,00
70093	Bodenblech housing bottom	1,00
70095	Schraube M5x25 screw M5x25mm	2,00
70151	Schraube, Linse, VZ 3X6 srew M3x6mm	2,00
70212	Blehschraube schwarz 3,5 X 9,5 tapping screw black 3,5x9,5mm	6,00
70231	Gefu Schraube 3x12 tap lite screw	4,00
70232	Gefu Schraube 2,5x6 tap lite screw	2,00
70266	Deckelblech housing lid	1,00
79002	Griff, Compact mit Taste u. Kabel handle complete	1,00
79005	Rändelschraube M4 thumb screw M4	2,00
80013	Distanzhülse 20mm M5 vernickelt spacer 20mm M5	2,00

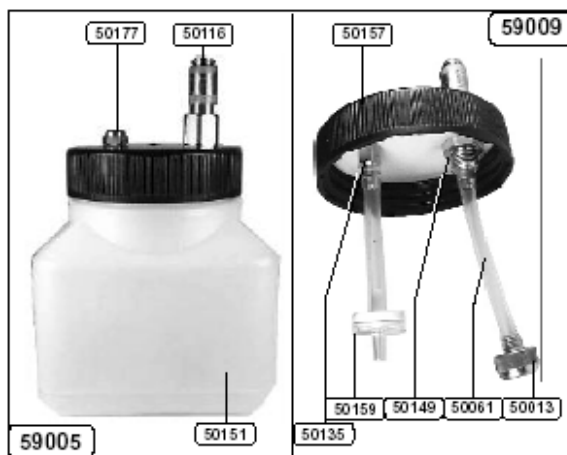
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partnumber: 59005
description: Flasche 250ml Kupplung u. Belüftungsvent

partnumber	description	quantity
50013	Sinterfilter M 5 sintered bronze filter M 5	2,00
50061	Siliconschlauch 3x1 siliconpipe 3x1	0,30
50116	Schnellkupplung 1/8"i für Tankdeckel quick-acting coupling f.lid	1,00
50135	Schlauchtülle 4mm M5 Innengewinde hose spigot 4mm M5 thread	1,00
50149	Verschraubung 1/8 to 6/4 fitting: thread 1/8" for hose 6/4	1,00
50150	Rückschlagventil erhöhter Öffnungsdr. TD	1,00
50151	Flasche 250 ohne Schlauch- kupplung	1,00

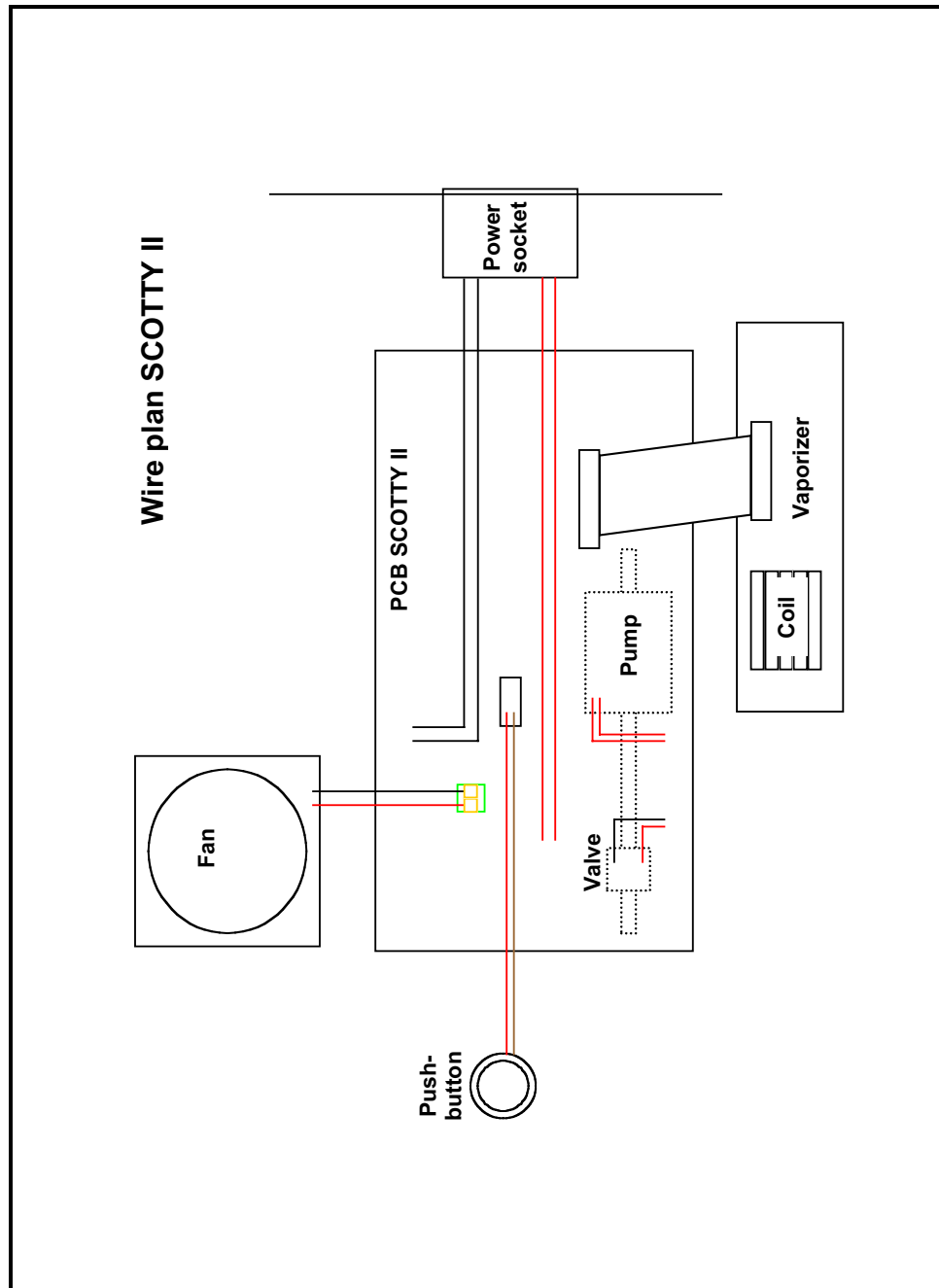


partnumber: 99011
description: AKKUPACK PARTLIST

partnumber	description	quantity
39011	PCB Battery	1,00
40013	Akku 12V / 12Ah battery lead-acid	1,00
40016	Speakon Stecker 4-pol speakon plug	1,00
40029	25A FKS Flachsicherung FKS fuse link 25A	2,00
70026	Gummifuß, schwarz selbstklebend, Akku PT rubber feet black battery	4,00
70268	Akkuhalter bracket for battery	1,00
70269	Akkublech cover for battery pack	1,00
70304	Popniete 5x10 Alu schwarz blind rivet 5x10mm black	2,00
80011	Kabel 4x 2,5mm ² Belden schwarz cable 4x2.5mm ² black	0,38

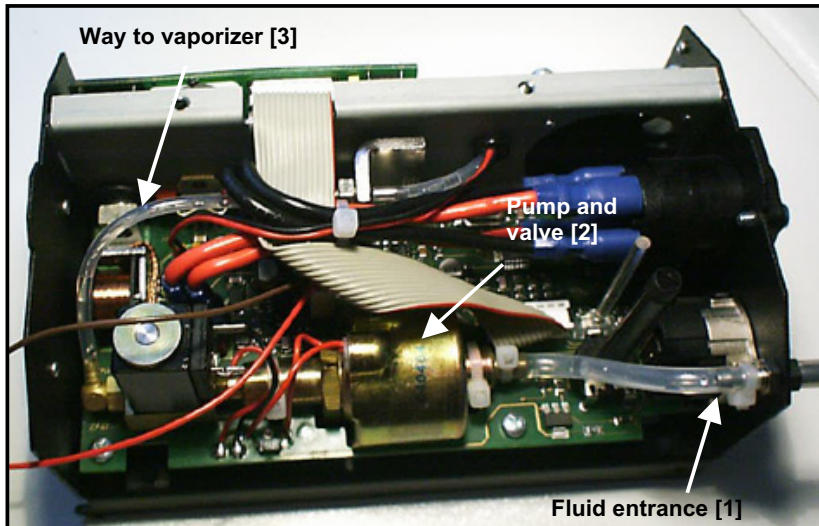
3.2 Wire plans

3.2.1 SCOTTY II

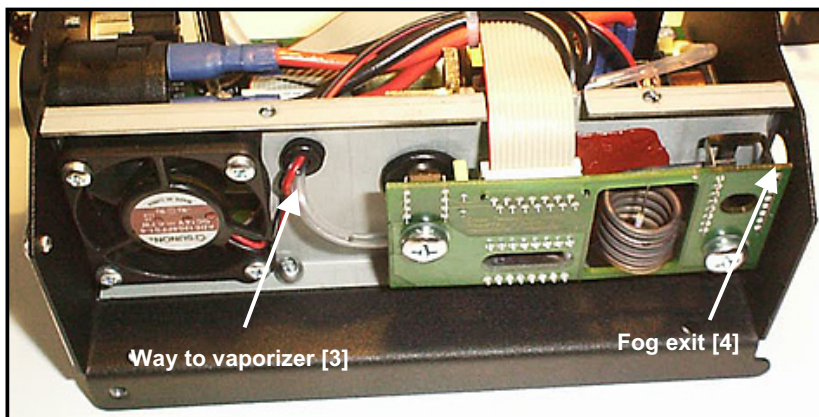


3.3 Fluid circuit (Photograph)

3.3.1 SCOTTY II



Picture 4.3.3a Fluid circuit SCOTTY II – one side



Picture 4.3.3b: Fluid circuit SCOTTY II – second side

The fluid is coming in from the bottle via fluid entrance [1]. Passing the pump and valve [2] it goes to the vaporizer [3]. Vaporized the fog leaves via fog exit [4].

4. Faults

First Step:

Plug the battery in; check the power via the yellow LED (slowly flashing). Start the SCOTTY unit and check if there is fog or not. If so check the consistency (not wet) and the smell (not pungent) of the fog. It can take a while before the unit is working normal because of unsteady fluid leavings in the tubes or maybe the fluid tank is empty. If it is not working normal open the unit and start testing. Listen if the fluid pump starts, is fluid escaped somewhere, does the vaporizer heat up, check the fog fluid (original fluid); maybe there is an apparent fault. **Be careful because of the heat.** Is the defect part apparent, have closer look to this and do the testing as described in the appropriate chapter below. Is it more difficult to locate the fault follow the steps in the table below.

5.1 Description of general faults

No.	Fault	Identification	Testing	Result	Repair
0.	Yellow LED is not shining despite a fully loaded/ new battery	Yellow LED is not shining	0.1 Press the start press-button (40 sec. after the last fogging the SCOTTY II changes automatically in the sleep mode, will wake up with the start button)	Yellow LED flashes slowly Not shining Yellow LED	Battery is ok check fuse, wiring, PCB and proceed with 1.1
1.	Always indicated low battery	A permanent shining or fast flashing yellow LED.	1.1 Check the battery (see test plan below) 1.2 Check the thermal fuse in the coil at the vaporizer (picture 2.2a/3.2b)	Battery as expected Battery not as expected Working thermal fuse Broken thermal fuse	Proceed with 1.2 Change the battery Proceed with 3.4 Change the broken component
2.	Power available, less fog/ approx. the half	The yellow LED is flashing slowly, no „normal“ fog/ less fog.	2.1 Check the vaporizer (see test plan below) 2.2 Check the battery (see test plan below) 2.3 Check the power connection	Vaporizer as expected Vaporizer not as expected Battery as expected Battery not as expected Proper connection Non proper connection	Proceed with 2.2 Change the vaporizer Proceed with 2.3 Change or reload the battery Proceed with 3.4 Connect properly
3.	Power available, no fog	The yellow LED is flashing slowly, no fog.	3.1 Check the vaporizer (see test plan below) 3.2 Check the battery (see test plan below) 3.3 Check the pump and valve (see test plan below) 3.4 Check if the PCB is working properly (see test plan below)	Vaporizer as expected Vaporizer not as expected Battery as expected Battery not as expected Pump and valve as expected Pump and valve not as expected PCB is working fine PCB is not working fine	Proceed with 3.2 Change the vaporizer Proceed with 3.3 Change or reload the battery Proceed with 3.4 Change the valve and/or pump Change the PCB

4.	Fog is wet or smells pungently	Abnormal smell or consistency of fog	4.1 Check if it's the original SCOTTY fluid	Yes No	Proceed with 4.2 Change the fluid
			4.2 Is the correct battery or power supply used	Yes No	Proceed with 4.3 Change it
			4.3 Check the cables and connectors	Not ok Ok	Fix it/them Change the vaporizer
5.	Permanently fog without triggering	Non-stop fog without pressing any button	5.1 Disconnect the remote	Fog stops Still fog	Remote cable or remote is broken, change it Wet or broken PCB, dry or change it

5.2 Testing/Test plan

5.2.1 Pump

Function test

Test:

Disconnect the tube coming from the pump going to the vaporizer and start the unit by pressing the press-button or the button on the remote.

Solution:

If there is no fluid coming out of the tube it is necessary to check if the pump or the controlling from the PCB is not working. Therefore do the power supply test. Does the pump work properly check the vaporizer resp change the vaporizer.

Power supply test

Test:

Supply 12V to the pump, for example by connecting the power supply cables of the pump pulse wisely, directly to the battery, provided that the battery works properly.

Solution:

Does the pump work now, the PCB is broken. It is necessary to change the PCB. If the pump does not work now, take the valve/pump combination out of the unit and test both of them separate, by separating them and supply power (12V) individual. Change only the broken one or change the couple.

5.2.2 Vaporizer

Optical test

Test:

Check if the fine wires at the fog exit are all right.

Solution:

Change the vaporizer if one of the fine wires is broken, else does the function test.

Function test

Test:

Check if the coil is getting hot in normal operation.
Disconnect the tube coming from the pump going to the vaporizer and start the unit while pressing the press-button.

Solution:

If the coil stays cold change the vaporizer.

If there is no fluid coming out of the tube check the pump (supply power directly to the pump). Does the pump work properly check if the yellow LED is shining and do a continuity test/ resistance test ($\approx 0\Omega$) of the thermal fuse (see picture 2.2a/3.2b). Change the vaporizer if the fuse is all right. If the fuse is broken, unsolder it and place a new one. Try to solder **rapidly**, it is a thermal fuse!!!!

5.2.3 PCB

In the case that the pump is working properly when supplying power directly, but there is no fog, the PCB SCOTTY II must be wrong. It's necessary to change it.

5.2.4 Battery

Function test

Test:

Change the battery und check at the yellow LED what happens.

Solution:

If the yellow LED is flashing slowly now, this battery is all right now. Keep this one and recharge the other one. Else press the start button maybe the unit is in sleep mode. Change the fuse if broken. Is the LED still flashing fast or shining check the thermal fuse at the vaporizer.

5.2.5 Miscellaneous

No additional/ external power supply

After separating a unit for testing, connect the device to the origin connection and start the unit, if no additional power supply is available.

Dirt/ Covered exit

Clean the exit of the unit at regular intervals. Dirt can cover the exit. Never cover the exit.

Connections

After opening the case check if all cables and tubes are connected properly.

The Fog

The fog should always smell neutral (not pungent) and should never be wet. If the fog smells somehow or is displeased, something is wrong. Check the unit and the fog fluid.

Wrong fluid

Using not the original fluid can cause clogging of the heater. It is necessary to use **only** original fluid available at Smoke Factory (www.smoke-factory.com)

Leaking tank

If there is fluid escaped, it can be a leaking tank. Dry carefully and seal it.

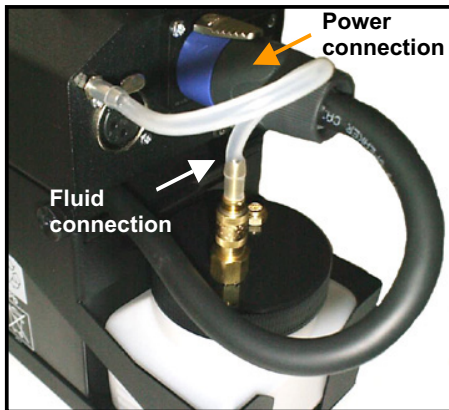
5.3 *How to clean a board accurately*

Clean a PCB as follows:

After blown off the fluid residue with a air gun the boards will be brushed with alcohol (for example Isopropyl alcohol) and blown off with the air gun again. Do this two or three times to make sure all the residues are gone.

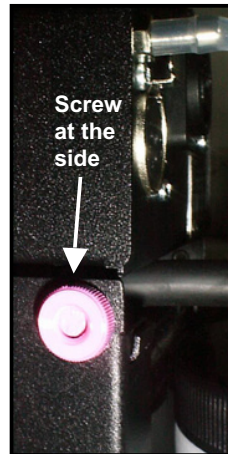
6 Replacement/Mounting/Demounting

6.1 SCOTTY II



Picture 6.3a: Connection at the SCOTTY II

Unplug the power connection and the connection to the fluid bottle (see picture 6.3a). Screw off the two screws on each side of the unit to release the battery (see picture 6.3b.)

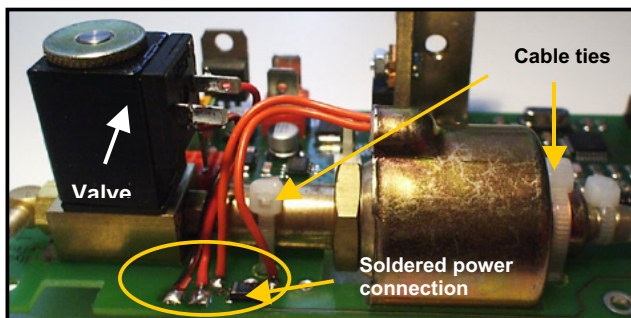


Picture 6.3b: Side-screw

Screw off the two screws at the top and four on the bottom. It's now possible to separate the lid carefully.

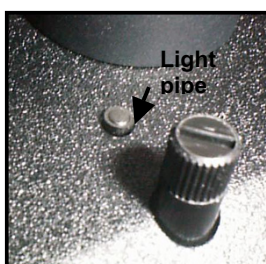
6.1.1 Pump and Valve

Unsolder the power connection of the valve and the pump at the PCB SCOTTY II (see picture 6.3.1a). Disconnect the fluid tubes at both ends of the couple (valve and pump). Cut the two cable ties fixing the couple at the PCB (see picture 6.3.1a).



Picture 6.3.1a: Pump/Valve couple

Take the couple and replace it with a new one. If necessary separate the both and change only the broken one. Refit both with two new cable ties, solder the power connection and reconnect the fluid tubes.



Picture 6.3.1b: Light pipe

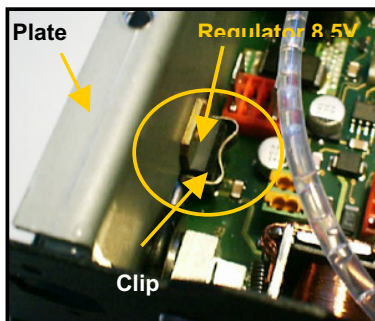
Close carefully the lid, special attention to the light pipe (see picture 6.3.1b), **don't use force.**

6.1.2 Vaporizer

Unscrew the two big screws fixing the vaporizer at the plate. Disconnect the fluid tube and the flat cable. Change the vaporizer. Reconnect the fluid tube and flat cable before tighten the vaporizer. Close carefully the lid, special attention to the light pipe (see picture 6.3.1b), **don't use force**. Tighten the outside screws.

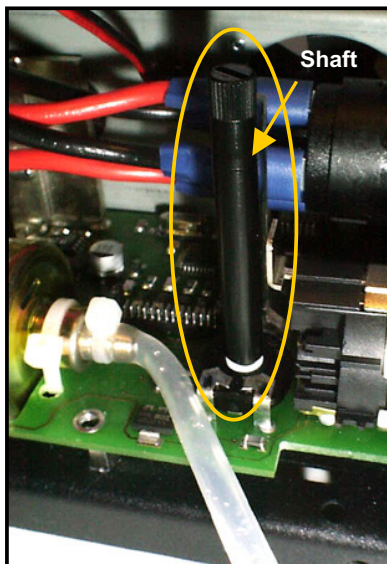
6.1.3 PCB SCOTTY II

Pull out the connector for the press-button. Disconnect the power cables coming from the power connector and unplug the flat cable connector. Disconnect the power supply for the fan (orange/green connector), while pressing the orange part down and pull out the cable (remember the polarity for reconnection). Screw off the screws of the vaporizer. Remove the fluid tube at the heat sink; be careful not to damage it, and the tube coming from the bottle. Screw off the bulkhead coupling for the fluid tube. Screw off the two screws fixing the 3-pin connector.



Picture 6.3.3a: Clip fixing the stabilizer

Release the clip fixing the voltage regulator to the plate. It is necessary to remove the silicon first to get access to the clip from the backside of this plate.



Picture 6.3.3b: Black shaft

Take out the black shaft to adjust the fog consistency. Finally screw off the two screws fixing the board to the bottom plate.

To take the PCB out now bend the front (with the "HOT" sign) a bit outwards and lift this end of the board. After passing the rivets of this sign it should be possible to take the boards out.

The new board needs to be insert the same way. Slide in the board with the 3-pin connector first, passing the rivets and finally the black rubbers at the side. Fix the board with the two screws at the bottom plate and refit the clip. Tighten the vaporizer after seal up the holes at the clip. Reinstall the bulkhead coupling for the tube; connect all cables and connectors back. Plug in the shaft. Attention to the polarity of 12V power supply and the fan power. After everything is reconnected and tighten close the device.

6.2 Testing after exchange

6.2.1 Function test

1. Test the SCOTTY II unit by pressing the button
2. Test the SCOTTY II unit via remote

6.2.2 Calibration

It's **not** necessary to calibrate the SCOTTY II.

6.2.3 Final test

Check all functions and the fog consistency. Are all screws and rivets fixed? Check if there is no fluid leaking.

SMOKE FACTORY

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