ELC Pro HD

Service Manual

ELC 500 Pro HD (20613.1)   ELC 1000 Pro HD (20616.1)

TABLE OF CONTENT

1. SAFETY NOTICE

⚠️ The interior of the Elinchrom devices contain components carrying dangerous levels of electric charge, even though the unit has been disconnected from the mains or without supply battery. **Before all servicing operations or repairs, you must execute the following discharge process:**

ELC DISCHARGE PROCESS BEFORE SERVICING

1. Activate the Service Menu a) Unit off (not standby) b) Hold the **Modelling lamp button** c) Press **On/Off button** and immediately press and hold **Menu button** d) Wait until unit ready (green light)	
2. Enter in Service Menu a) Press **Menu button** b) Select "service menu"	
3. Discharge unit a) Press "Start" *Automatic discharge in progress...* b) Wait until the automatic Shutdown.	
4. Remove the mains cable	
5. Open the Housing right only	

6. Check that the voltage between UHTD (X305 on Flashboard) **and PGND** (X307 on Flashboard) **is under 50VDC**	
7. Unit discharged and secure Now you can open the housing, repairing and servicing safely.	
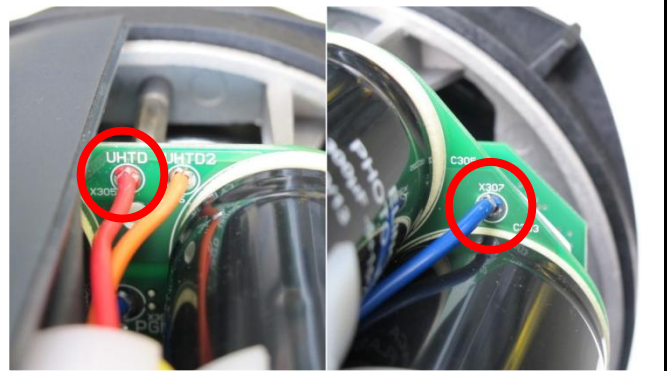
2. SPARE PARTS

The following spare parts list is only an overview of some spare parts.
This list is not updated and only the spare parts present in the Elinchrom Agent Web Shop are orderable and available.

	Item number	Part description	note	min qty	package
	270.100.ADJ	ELC Keyboard PCBA ADJ		1	1
	270.132	Skyport Unit module MK4		1	1
	270.105	ELC Mainboard PCBA		1	1
	270.030	ELC Knob		3	1
	270.540.ADJ	ELC Powerboard SMPS Adjusted	Set the "Unit type" in the service menu after replacing	1	1
	105.173	Power Mosfet N 600V 37.9A TO220AB	T200	2	1
	105.185	IGBT 1200V 25A IGW25N120H3	T201	2	1
	106.060	NTC Mini Lug 10K 3% with connector	J213 Temp FET / J216 Temp PFC	10	10
	270.065	Fan NMB 12VDC 0.12A 60x60x15mm		1	1
	270.050	Earth Cable ELC single	For ELC with Power board SMPS 270.540.ADJ version 1 & 2	10	10
	270.051	Earth Cable ELC double	For ELC with Power board SMPS 270.540.ADJ version 3 and newer	10	10
	270.520.SAV	ELC Flashboard 500		1	1
	270.530.SAV	ELC Flashboard 1000		1	1

	Item number	Part description	note	min qty	package
	270.070	Tube terminal wire red		10	10
	270.075	Tube terminal wire blue		10	10
	270.080	ELC Flash PCB Insulation Sheet		10	10
	270.116	ELC Trigger/Booster Board		1	1
	270.040	Trigger glass tube ø 6/4 L=46mm		10	10
	270.041	Trigger contact 57mm		10	10
	24084	Flashtube Plug-In S ELC		1	1
	23022	Halogen Lamp 300W/230V GX6.35	Pilot lamp 230V	1	1
	23030	HALOGEN MODEL. LAMP GX 6.35 300W 120V	Pilot lamp 110V	1	1
	19038	10 Fuses F10A 5x20mm	Mains fuse	1	1
	14348.SAV	Electrolytic Flash Capacitor 1300µF 360V	Flash capacitor	1	1
	230.060	Adhesive Disc 4008 for Capacitor	For flash capacitor 14348	10	10
	14342.SAV	Capacitor Electrolytic 2600µF 360VDC with adhesive disc	Flash capacitor	1	1
	270.005	ELC Housing Left		1	1
	270.010	ELC Housing Right		1	1
	270.143	Side Labels ELC 500 Pro HD (Left & Right)		10	10
	270.142	Side Labels ELC 1000 Pro HD (Left & Right)		10	10
	270.150	Warning Label ELC Units		10	10

	Item number	Part description	note	min qty	package
	240.080	Handle Rubber L=100mm		5	1
	620.204	Bayonet Ring Assembled		1	1
	219.001	Body Support Alu Injected		1	1
	270.045	Inner Dish Reflector ASMS		1	1
	270.015	ELC Panel Plate		3	1
	270.016	Keyboard Adhesive Foil ELC		10	1
	270.085	Complete ELC Tilt Head		1	1
	270.036	Assembled Umbrella pipe		1	1
	27124	Protective Cap MK-II		2	1
	24916	Glass Dome transparent		1	1
	24917	Glass Dome frosted		1	1

3. SERVICE MENU

3.1. Activate Service Menu

1. Unit off (not standby) 2. Hold the **Modelling lamp button** 3. Press **On/Off button** and immediately press and hold **Menu button** 4. Wait until unit ready (green light)	
5. Press **Menu button** 6. Select "service menu"	

3.2. Menus overview

3.2.1. Unit status

Select "unit status" in the service menu	

Error counter
  1. Flash count
    Tube count [number of flash. Can be reset to zero]
    Unit count [number of total flash of the unit]
  2. Tube autoignition
    On charge [number of the flashtube autoignition during the charge of the flash capacitors]
    On ready [number of the flashtube autoignition when the unit is ready]
  3. Tube hanged
    Count [number of flashtube hanged (keep on)]
  4. Overcurrent detect
    Count [number of overcurrent error]
  5. Cap asymmetry error
    Count [number of asymmetry error with the flash capacitors blocks]
  6. Emergency shutdown
  Count [number of emergency shutdown]	

Voltages

7. Voltages

Power [Power of the unit [f-stop]]
VAC [Mains voltage]
UCAP [Flash capacitors voltage]
Top [Flash capacitors voltage of the top bloc]
Bot [Flash capacitors of the bottom bloc]

Temperatures

8. Temperatures

Switch FET [temperature °C of the power Mosfet]
ModLamp [temperature °C of the modelling lamp]
Inductor [temperature °C of the power supply inductor]


```
┌─────────────────────┐
│ ◆      voltages    ◆ │
│      power: 7.3      │
│ VAC: 235V   top: 325V│
│ UCAP:649V   bot: 325V│
│  ☎        ▬        ⏏ │
└─────────────────────┘
```



```
┌─────────────────────┐
│ ◆     temperatures   │
│ SwitchFET: 28°C      │
│ ModLamp:   25°C      │
│ Inductor:  33°C      │
│  ☎        ▬        ⏏ │
└─────────────────────┘
```
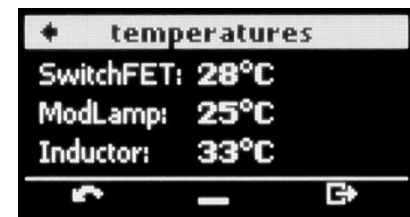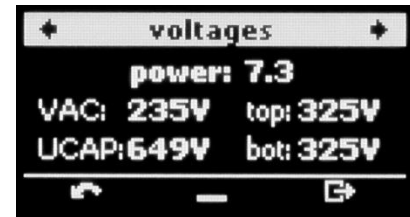
3.2.2. Discharge unit

Select "discharge unit" in the service menu


```
┌─────────────────────┐
│    service menu      │
│     unit status      │
│  discharge unit      │
│   functional tests   │
│  ☎        ✓        ⏏ │
└─────────────────────┘
```

Discharge unit
1. Press "Start"
   Automatic discharge in progress...
2. Wait until the automatic Shutdown.
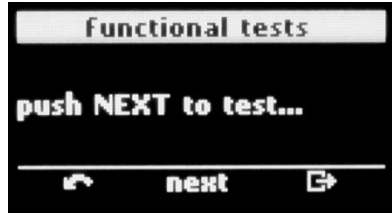
Note: remove the mains cable before open the unit (see Discharge Process)


```
┌─────────────────────┐
│   discharge unit     │
│                      │
│  ☎      start      ⏏ │
└─────────────────────┘
```



```
┌─────────────────────┐
│   discharge unit     │
│ UCAPmax: 150V        │
│ UCAP:    150V        │
│ UCAP/2:   80V        │
│ Status:  disch.      │
└─────────────────────┘
```



```
┌─────────────────────┐
│   discharge unit     │
│ UCAPmax: 16V         │
│ UCAP:    17V         │
│ UCAP/2:   9V         │
│ Status:  PASS        │
│     shutdown         │
└─────────────────────┘
```

3.2.3. Functional tests

Select "functional tests" in the service menu	service menu discharge unit **functional tests** flash test
Functional tests 1. **All pixel OFF** [Check that all pixel are OFF (black) on the display] 2. **All pixel ON** [Check that all pixel are ON (white) on the display] 3. **Orange** [check that the Test button is orange] 4. **Green** [check that the Test button is green] 5. **Red** [check that the Test button is red] 6. **All LED OFF** [check that the Test button is OFF] 7. **Push ON** [Push ON/OFF button] 8. **Push Menu** [Push Menu button] 9. **Push Left** [Push Left function button] 10. **Push Center** [Push Test button] 11. **Push Right** [Push Right function button] 12. **Push ModLamp** [Push Modelling Lamp button] 13. **Push User** [Push User button] 14. **Rotation** [Rotate the multifunctional button (test button) left and right and push next] 15. **Cell trigger** [Check the cell trigger by flashing the cell] 16. **Synchro trigger** [Check the Synchro socket by a synchro triggering]	**Functional tests** push NEXT to test... next sync trigger test test 16/16 **test OK** next

3.2.4. Flash test

Select "flash test" in the service menu	service menu functional tests **flash test** booster test

Flash test
  # of flash [Choose the number of flashes and press Next]
  tWait [Choose the time between flashes and press Next]
  Power [Choose the Power [f-stop] of flashes and press Start]
 	
  Flash test in progress...
  Results
	flash test
	# of flash: **[10]**
	tWait: **500 ms**
	Power: **0.3**
	next

3.2.5. Booster test

Select "booster test" in the service menu	service menu flash test **booster test** skyport test ↶ ✓ ⇥

Booster test
   # of flash [Choose the number of flashes and press Next]
   tWait [Choose the time between flashes and press Next]
   uCAP [Wait until the uCAP is below 60V and press Start]
 	
    Booster test in progress...
    Results
	booster test
	# of flash: **[10]**
	tWait: **50 ms**
	uCAP **89V**
	↶ next ⇥

3.2.6. Skyport test

Select "skyport test" in the service menu	service menu booster test **skyport test** burn-in test ↶ ✓ ⇥
Skyport test is only for internal debug and development. This test will be removed in the next software release.	skyport test STAT:2E CFG:3B **RXmode** FIFO:11 - 2456MHz PAEN: 1 PIPE:00 HGM: 0 RXD:0000 **IRQ: 1** ↶ mode ⇥

3.2.7. Burn-in test

Select "burn-in test" in the service menu	service menu skyport test **burn-in test** unit type ↶ ✓ ⇥

Burn-in test	
Press "Start" Step 1/5 [45 minutes at 400V uCAP] Step 2/5 [45 minutes at 500V uCAP] Step 3/5 [45 minutes at 600V uCAP] Step 4/5 [105 minutes at 700V uCAP] Step 5/5 [Discharge]	

3.2.8. Unit type

Select "unit type" in the service menu	
Unit type Select the correct unit type and press "save"	
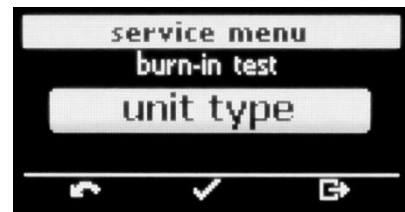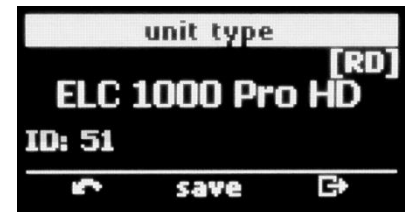
4. FIRMWARE

4.1. Release

Power ON display

Firmware Keyboard release

Firmware Powerboard SMPS release

Unique Skyport ID

4.2. Firmware Update
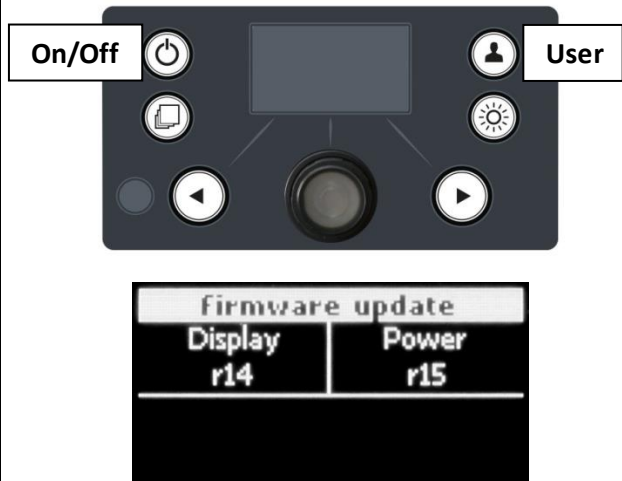
ELC firmware update could be done with a EL Skyport USB Speed MK-II (19363) and the EL-Skyport Updater software version 1.70 or newer version.

Activate Firmware update mode 1. Unit off (not standby) 2. Hold the **User button** 3. Press and hold the **On/Off button** 4. Wait until Firmware update display	
5. Recognize the unit in the EL-Skyport Updater 6. Select UPDATE in the EL-Skxport Updater	
7. Only for ELC units, repeat two times this update process on each units. (ELC Firmware have two parts)	
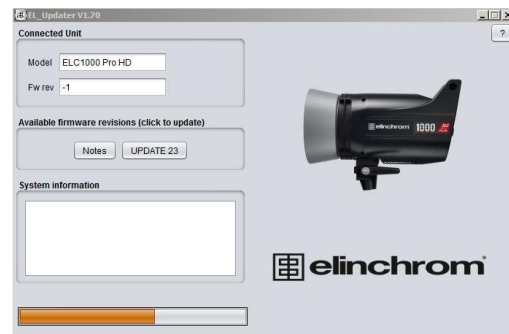
5. SOFTWARE RESET

To reset all settings to default values, power ON the unit, push the left and right buttons at the same time and hold for at least 1 second. The unit will reboot and will clear all working parameters. This will not delete the "User Preset" data which is restored in the preset menu nor will it reset the counter in the "Statistics" menu for "total lifetime", "total flash amount" and "power ON".	

6. UNIT CHECK

6.1. Thermal behaviour (error-2)

The following test is performed to know if the error-2 displayed by the unit is due to a normal overheat caused by an intensive use of the unit or by a technical problem of the unit.

This following test consist to use the "Flash test" available in the Service Menu of the unit and check the minimal quantity of flash done by the unit before the activation of the error -2.

Test conditions

Unit : ELC 500 Pro HD or ELC 1000 Pro HD	Pilot Lamp : OFF
Firmware : r23.17	Ambient temperature : 20°C
Mains: 230VAC/50Hz	Glass dome: 24930 mounted
Unit position : Horizontal	Accessories : No

Before to start, check the initial temperature conditions in the Service Menu > Unit Status > Temperatures
 	
These temperatures must be below the following values:
 	
   SwitchFET : 30°C
   ModLamp: 26°C
   Inductor: 28°C	
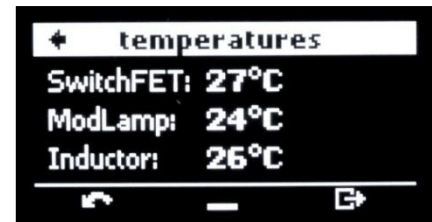
Select "flash test" in the Service menu and set the following values :
 	
  # of flash: 300
  tWait: 2000 ms
  Power: **6.3** for ELC 500 / **7.3** for ELC 1000	
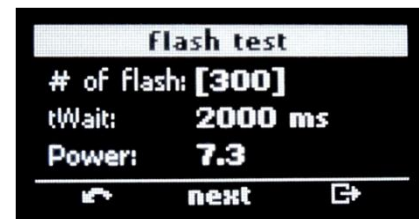
Press "start" Read the value of the flash numbers when the overheat protection mode (error -2) appears. ELC 500 Pro HD : minimum 190 ELC 1000 Pro HD : minimum 90	

Results :

The numbers of flash done before the error-2 will define a normal behaviour or not of the unit.
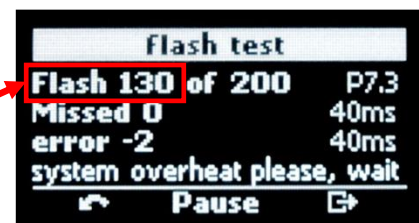
ELC units may have different results due to the electronic and assembly tolerances.

For ELC 500 Pro HD:

We consider a median value of **240 flashes** or more for a correct behaviour,

but at least **190 flashes** considering the initial temperatures of this test.

If the result is lower than 190 flashes, you can suspect a technical problem in the unit.

Follow the Error Management table to know how to manage this error-2.

For ELC 1000 Pro HD:

We consider a median value of **130 flashes** or more for a correct behaviour,

but at least **90 flashes** considering the initial temperatures of this test.

If the result is lower than 90 flashes, you can suspect a technical problem in the unit.

Follow the Error Management table to know how to manage this error-2.

7. REPAIR ASSISTANCE

7.1. Error management

The following table describes the possible errors, which could be shown on the display if the unit micro controller detects them:

Error number	Description	Solution for user (User manual)	Solution for Service
1	Capacitor over voltage	Switch the unit off, **wait 2 minutes** and switch the unit on again. If the error shows up again the unit requires a check up at an authorized Elinchrom service centre	Replace 270.540.ADJ
2	Over heat	Wait until the unit has cooled down. The unit will switch back to normal operation as soon as the temperature decreases to a normal working level.	1. Check temperature sensors 106.060 2. Check or replace fan 270.065 3. Replace 270.540.ADJ 4. Replace 270.116
3	Discharge error	Switch the unit off, **wait 2 minutes** and switch the unit on again. If the error shows up again the unit requires a check up at an authorized Elinchrom service centre	1. Check Discharge Resistor connection (J210 on 270.540.ADJ) 2. Check or replace Discharge Resistor 3. Replace 270.540.ADJ
4	Charge timeout error		Replace 270.540.ADJ
5	Charge hold error		(Error not activated)
6	Fan error		(Error not activated)
10	Supply input voltage too high	The unit has detected a mains supply fault. Please check the mains/battery inverter supply. It could be not working correctly.	1. Check mains network 2. Replace 270.540.ADJ
11	Supply input voltage too low		
12	Supply under voltage detected until charge		
13	Over current detection	Switch the unit off, **wait 2 minutes** and switch the unit on again. If the error shows up again the unit requires a check up at an authorized Elinchrom service centre	1. Check IGBT 105.185 on 270.540.ADJ 2. Check mains fuse (if broken replace 270.540.ADJ)
15	Temperature sensor "Heat Sink" not connected		Check FET Temperture sensor 106.060 (J213)
16	Temperature sensor "Front" not connected		Replace 270.116
17	Temperature sensor "Charge" not connected		Check PFC Temperture sensor 106.060 (J216)
20	Power Board not connected / found		1. Check the flat cable between the Power board and the Keyboard. 2. Replace 270.540.ADJ or the 270.100.ADJ
24	Capacitor voltage symmetry error	Switch the unit off, **wait 10 minutes** and switch the unit on again. If the error shows up again the unit requires a check up at an authorized Elinchrom service centre	1. Replace Flashboard 270.520 *for ELC500* Replace Flashboard 270.530 *for ELC1000* 2. Replace 270.540.ADJ
28	Flashtube after glow	Switch the unit off, **wait 2 minutes** and switch the unit on again. If the error shows up again please change the flashtube. If it still happens the unit requires a check up at an authorized Elinchrom service centre	Replace Flashtube 24084 If the problem is not solved, replace the Power board 270.540.ADJ
29	Auto ignition on Charge		(Error not activated)
30	Auto ignition on Ready		(Error not activated)
99	Error-99 during "Burn-in test"	(Only during "Burn-in test")	Update unit firmware and restart the "Burn-in test"

7.2. Failures management

Failure Description	Solution for Service
Skyport disturbances	Replace 270.132
Unit always on	Replace 270.105
Photocell defective	Replace 270.100.ADJ
Keyboard touch defective	Replace 270.100.ADJ
LEDs of the multifunctional control knob defectives	Replace 270.105
No Booster	Replace the Trigger/Booster board 270.116
No Trigger	Replace the Trigger/Booster board 270.116
No modelling lamp	Check the modelling lamp and/or replace the Trigger/Booster board 270.116
Modelling lamp always at maximum power	Replace the Trigger/Booster board 270.116
ELC unit self triggering all time when power is set at max power 6.3	Replace 270.540.ADJ
ELC unit does not start and control knob is blinking orange	Replace 270.540.ADJ
ELC unit reboots after flash triggering (ELC Traffic version)	Replace the Trigger/Booster board 270.116 (270.113 for Traffic version)

8. KNOWN PROBLEMS

All known problems have a corresponding Technical Note available in the online **Technical Centre**.

9. DISASSEMBLY & ASSEMBLY

9.1. ELC Housing

A complete video explain the disassembly and assembly of the ELC housing.
This video is available on the **Technical Centre** > Devices documentation > Compacts > ELC > Technical Documents

Video - ELC disassembly & assembly

The following process complements the video to help you to assembly the ELC housing after servicing.
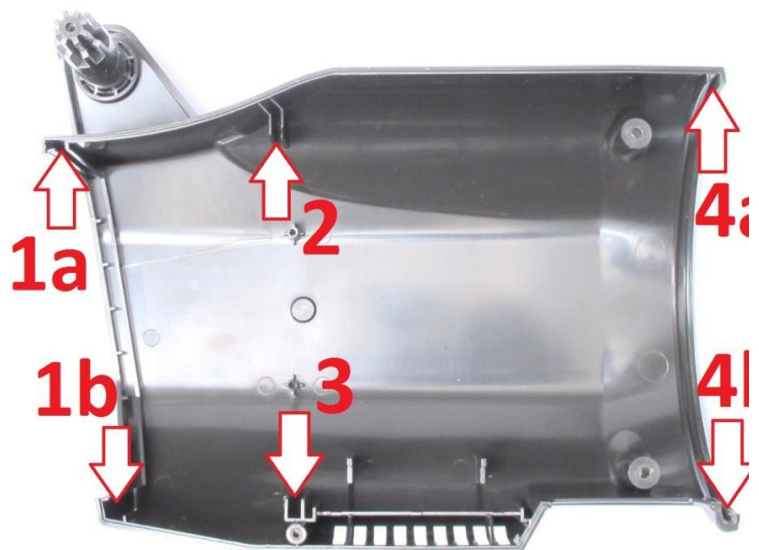
1. Place the left side housing on a table	
2. Locate the main mounting grooves 1a & 1b: *Rear panel* 2: *Power board* 3: *Cooler of the power board* 4a & 4b : *Aluminium chassis*	

3. Prepare the alignment of the boards and rear panel	
4. Check that all cables and wires are correctly positioned	
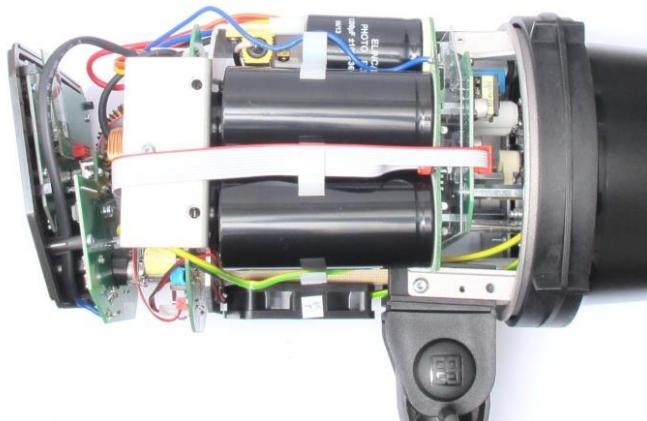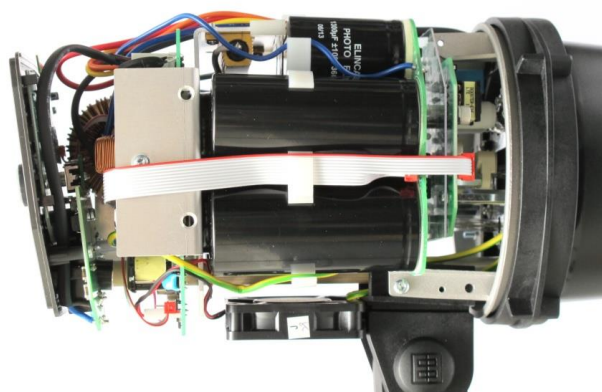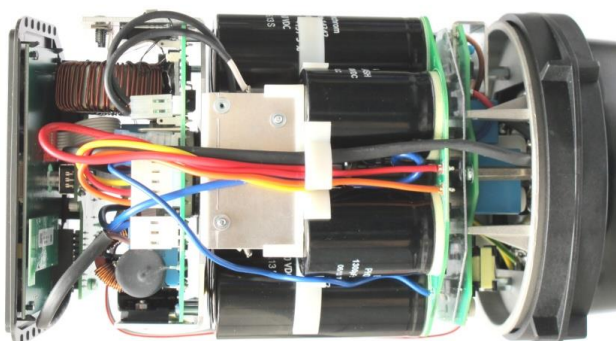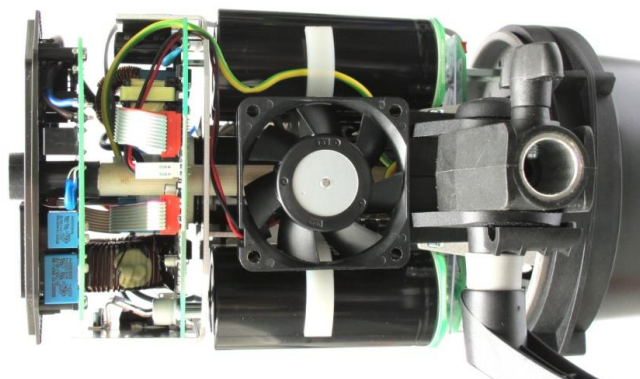
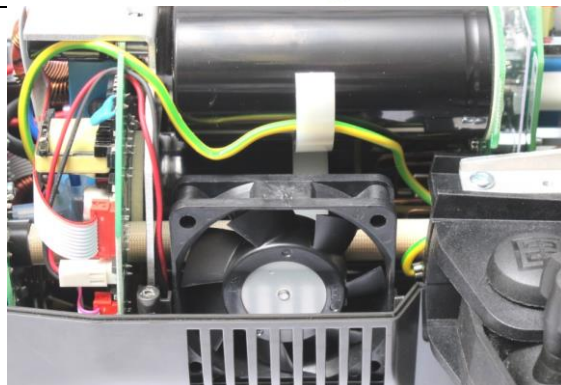|	
5. Check that the umbrella pipe is correctly positioned	
6. Slide the unit into the left side housing, taking care to insert the right elements in the corresponding grooves (see point 2) 1a & 1b: *Rear panel* 2: *Power board* 3: *Cooler of the power board* 4a & 4b : *Aluminium chassis*	
7. Place the fan	
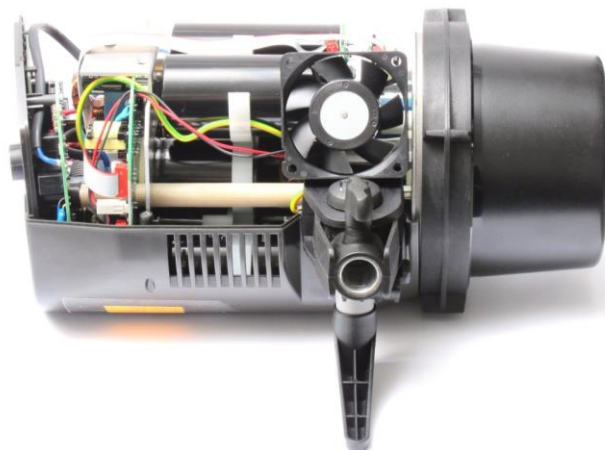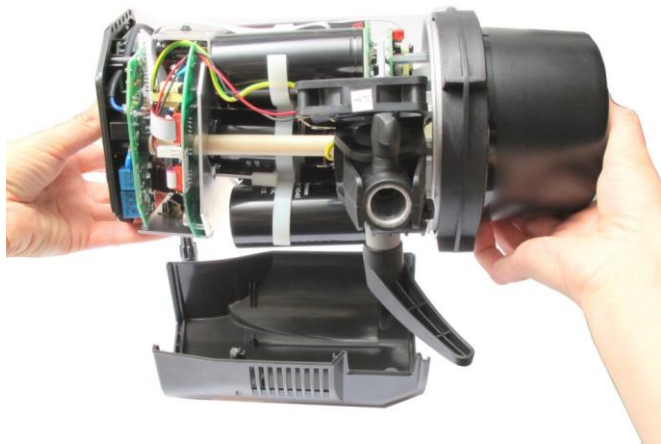
8. **Slide and close the unit with the right side housing (with handle)**	
9. **Check that the two sides are correctly closed and no wires or cables are stranded between the two housing parts**	
10. **Screw the housing sides**	

9.2. Inner Dish Reflector

The Inner dish reflector (270.045) is mounted on the Bayonet ring (620.204) with 3 screws, but one screw has a shorter length. Observe the position of this shorter screw. (See picture below)

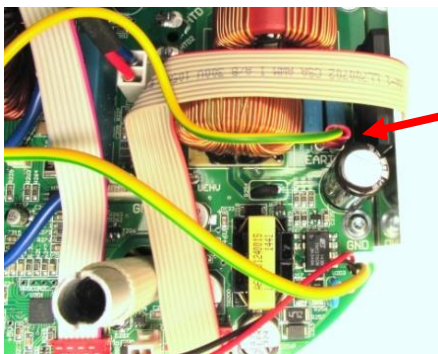**Screw M3x20** (211.897)
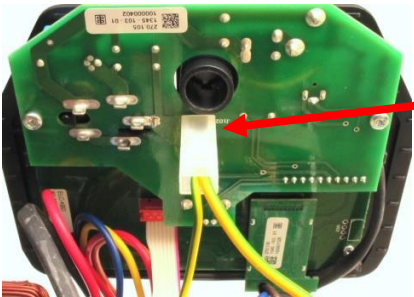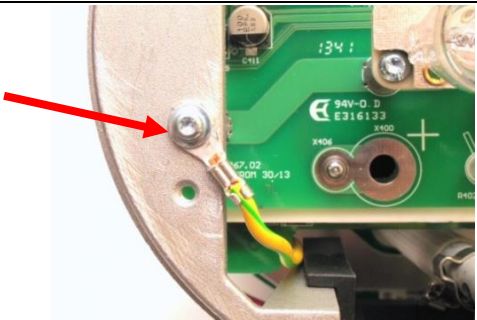
Screw M3x25 (211.021)

9.3. Earth cable

Since version 3 of the Power board SMPS (270.540.ADJ), the 2 poles Earth cable (270.050) is replaced by the 3 poles Earth cable (270.051).

	270.050	Earth Cable ELC single For ELC with Power board SMPS 270.540.ADJ version 1 & 2
	270.051	Earth Cable ELC double For ELC with Power board SMPS 270.540.ADJ version 3 and newer

Below is how to connect the 3 poles Earth cable 270.051

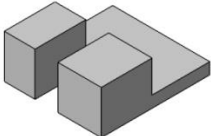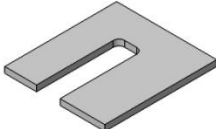|	
	1 To J208 (EARTH) on Power board SMPS 270.540.ADJ (version 3 and newer)
	2 To J102 on Mainboard 270.105
	3 To Body support alu injected 219.001

10. SERVICE TOOLS

The following tools list is only an overview.
This list is not updated and only the tools present in the Elinchrom Agent Web Shop are orderable and available.

	Item number	Part description	note
	306.270	Tool to assemble the ELC 500 shell	See video (ELC Disassembly-Assembly) available in the Technical Center
	306.271	Tool to assemble the ELC 1000 shell	See video (ELC Disassembly-Assembly) available in the Technical Center