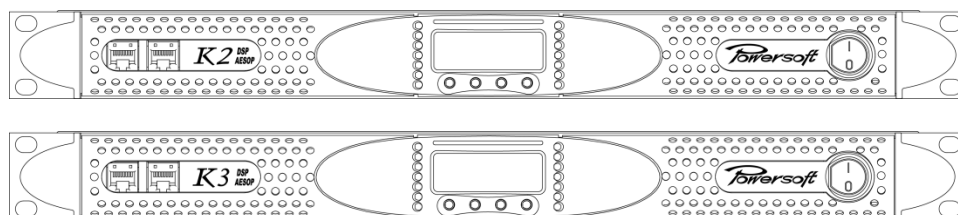


## K2 – K3 Series



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## Index

1. Opening the amplifier cover	3
2. Discharging the amp capacitors	3 – 4
3. Removing the power supply board	4 – 8
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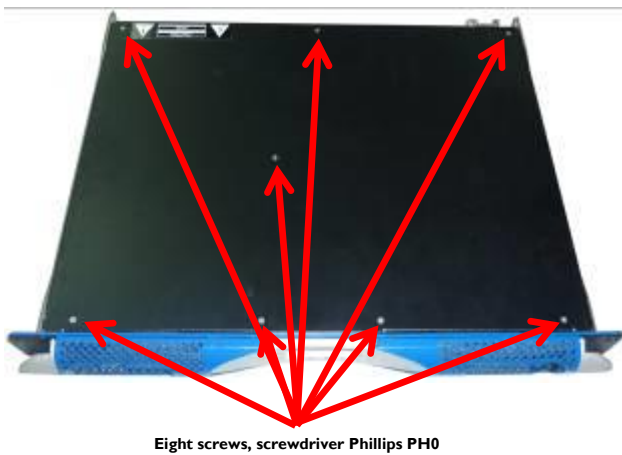
## I. OPENING THE AMPLIFIER COVER

Disconnect the amplifier from the mains. If the amplifier has been connected to the mains in the last few minutes, please proceed with attention as the internal capacitors bank could be charged and harmful!

Remove the side support steel bars, unscrewing the four bigger screws with a Phillips PH1 screwdriver. Then remove the screw in the center using a smaller Phillips PH0.



Remove the amplifier cover unscrewing the eight screws (four in the front, two in the centre and three in the rear) using a screwdriver Phillips PH 0:



## 2. DISCHARGING THE AMP CAPACITORS

Before proceeding in operating inside the amplifier it is necessary to check if the rails are completely discharged: LEDs in picture below should be off, this should happen about 15 minutes after the amplifier has been switched off and disconnected from the mains.

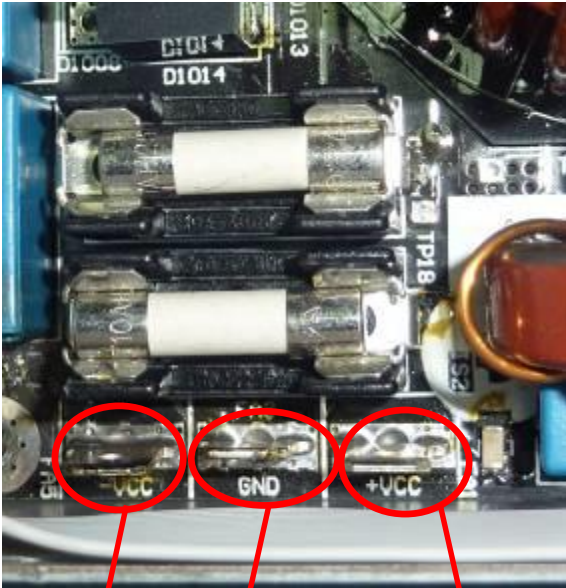


If the LEDs are still on discharge the capacitors bank by connecting a lamp of at least 40 W/230V



to the connectors seen in the two pictures below





Negative to this connector

Positive to this connector at first and then to this other one

Detail of connectors

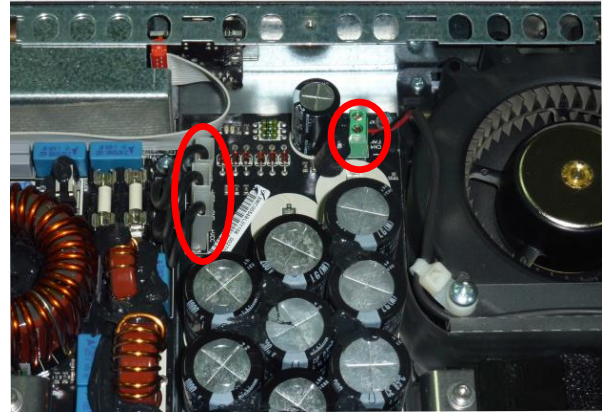
Once the amplifier is open and its power supply fully discharged, it is possible to start removing the single boards.



Opened amp

### 3. REMOVING THE POWER SUPPLY BOARD

Disconnect the faston between the power supply board and the output amplifier board :



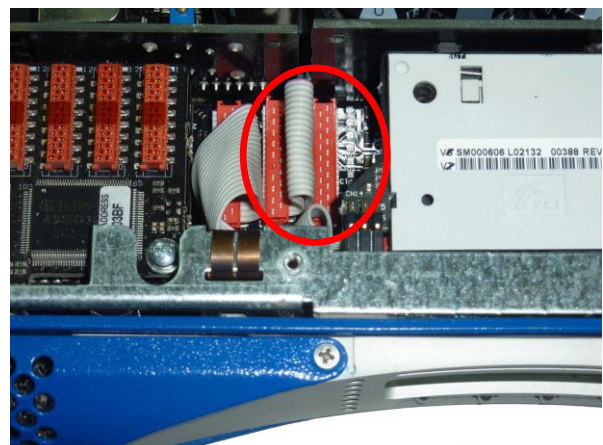
Fastons between power supply board, output amplifier board and fan power cables to be disconnected

Following this, unscrew the fans power cables close to the previous faston.



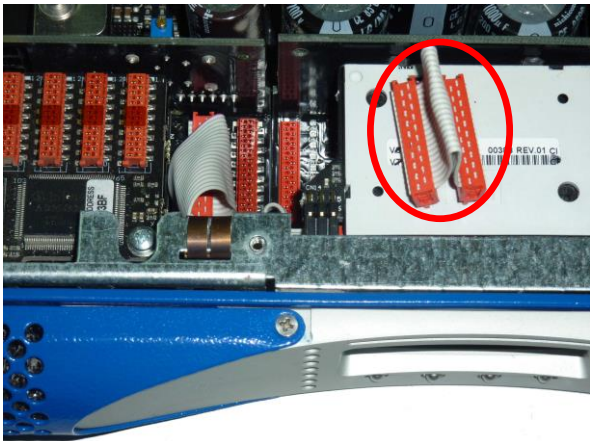
Disconnected fastons between power supply board, output amplifier board and fan power cables

Disconnect and remove the flat cable bridge between the power supply board and output amplifier board:



Flat cable to be removed





Removed flat cable

Disconnect the amplifier power switch cable removing the faston behind it:



Amplifier power switch cable to be removed

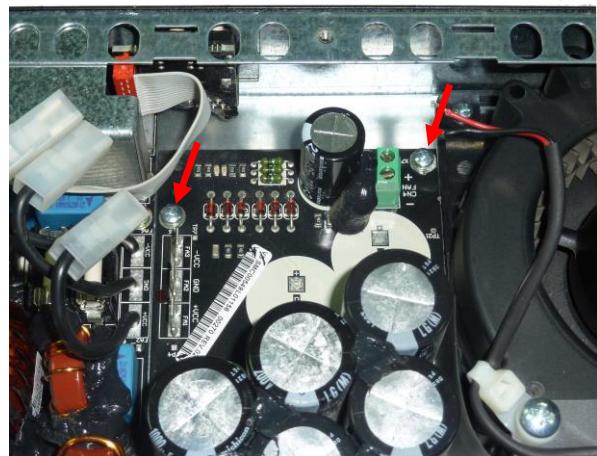


Faston of the amplifier power switch cable removed

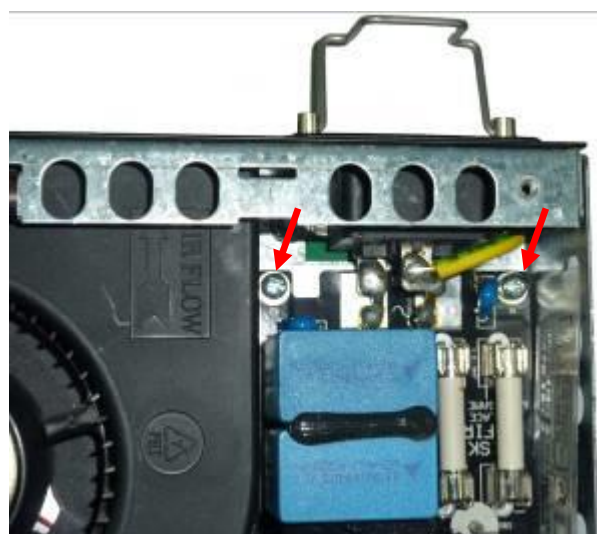
It is now possible to remove the power supply board by unscrewing it from the amplifier chassis, removing with a Phillips PH 1 screwdriver the 7 screws plus the brass stand-off as illustrated below:



Overview of the 7 screws (1-7) and of the brass stand-off (8) to unscrew for removing the power supply board



Detail of screws number 1-2



Detail of screws 3 and 4





Detail of screw number 5



Detail of brass stand-off (screw number 8)

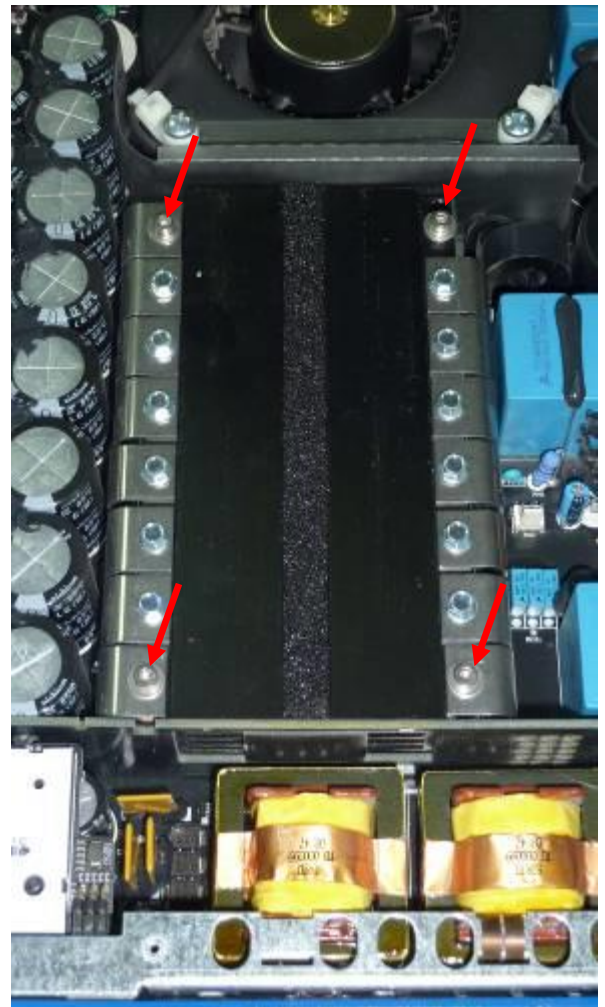
Once all the 8 screws have been removed, remove the power supply board heat sink screws with an M3 hexagonal key:



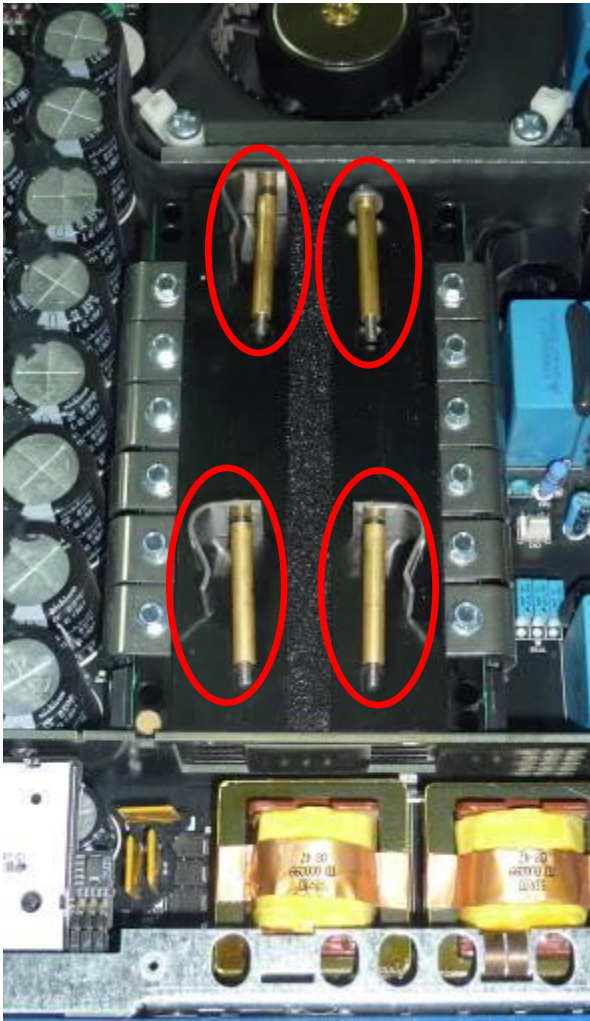
Detail of screw number 6



Detail of screw number 7

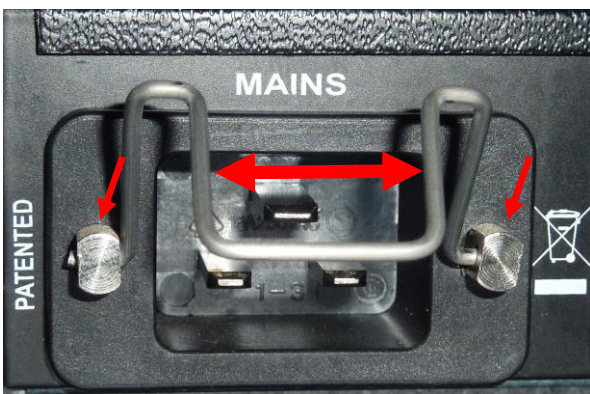


Heat sink screws to be removed

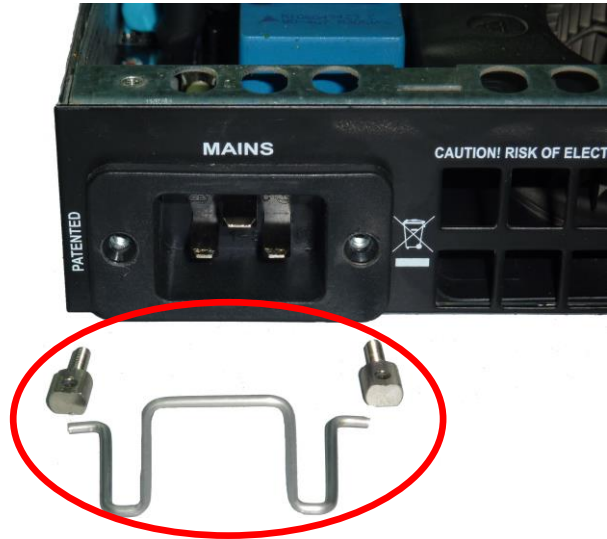


Heat sink screws removed

Now remove the mains plug holder by pressing on its sides; then remove the mains socket screws:



Mains connector screws to be removed



Mains connector screws removed

Proceed in unscrewing the nut that holds the earth ground cable behind the mains connector:



Earth ground nut to be removed

Now remove the rear panel:



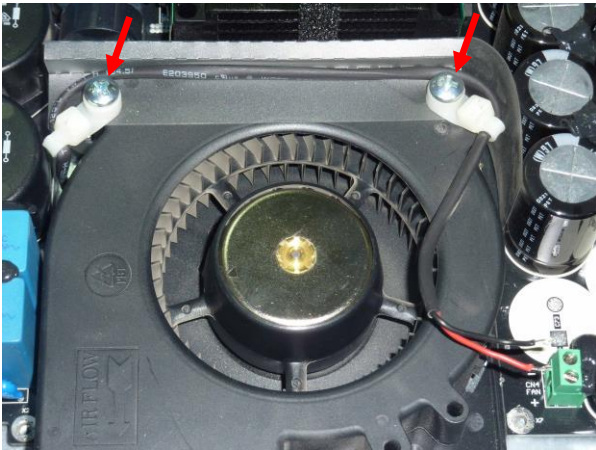
Rear panel screws to be removed



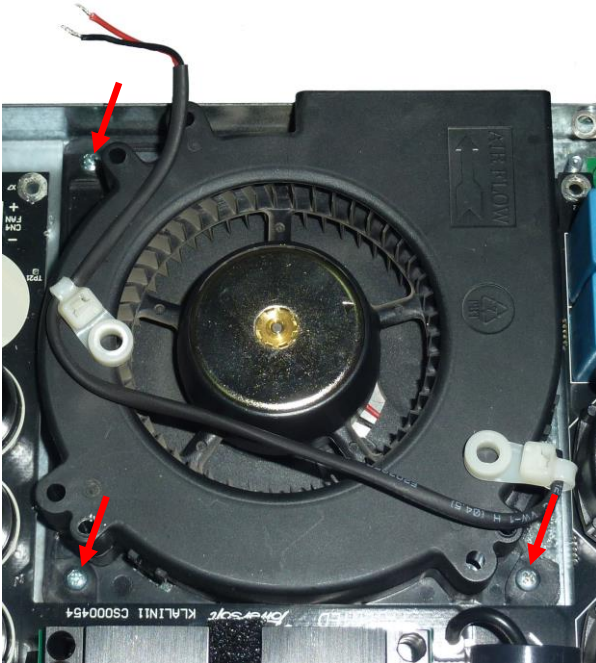
Detached rear panel



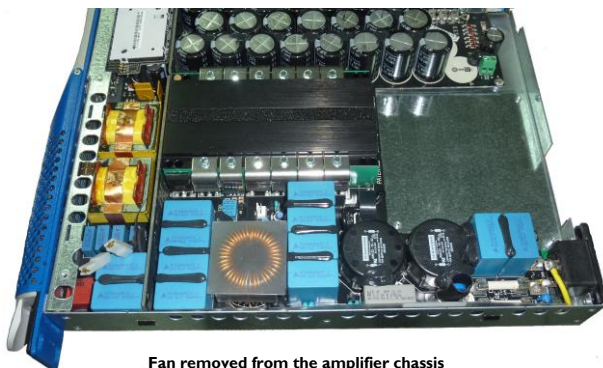
The power supply board will not be freed until the fan is not removed from the amplifier chassis. Remove the fan power cable and the fan screws:



Fan power cable holders to be removed

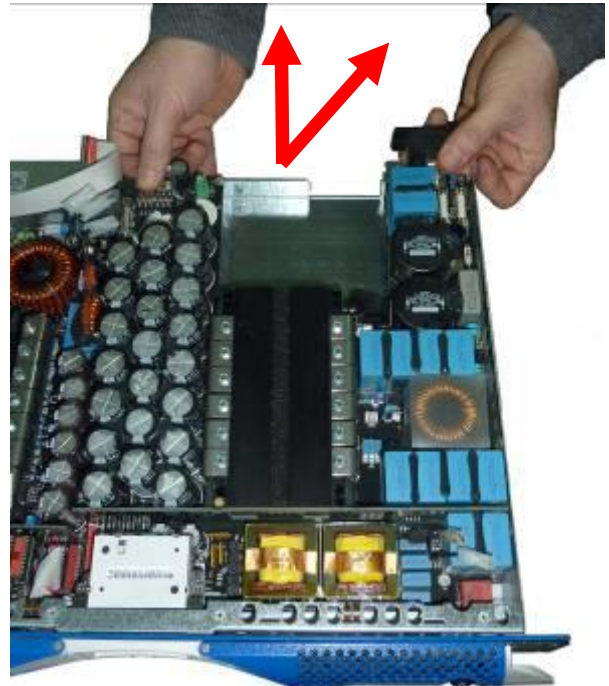


Fan screws to be removed



Fan removed from the amplifier chassis

Now it is finally possible to remove the complete power supply board from the amplifier chassis:



Lift and pull the power supply board to remove it from the amplifier chassis



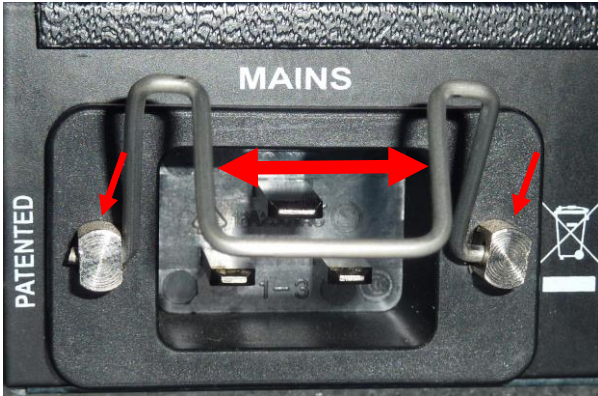
Power supply board removed from the amplifier chassis



## 4. REMOVING THE AMPLIFIER OUTPUT BOARD

Before removing the amplifier output board, please proceed in discharging the power supply capacitors as explained in chapter 2.

Start from unscrewing the rear panel connectors removing the mains connector screws and plug holder as in the images below:



Mains connector screws to be removed



Removed mains connector screws

proceed in removing the all rear panel by unscrewing the screws as marked in the images below

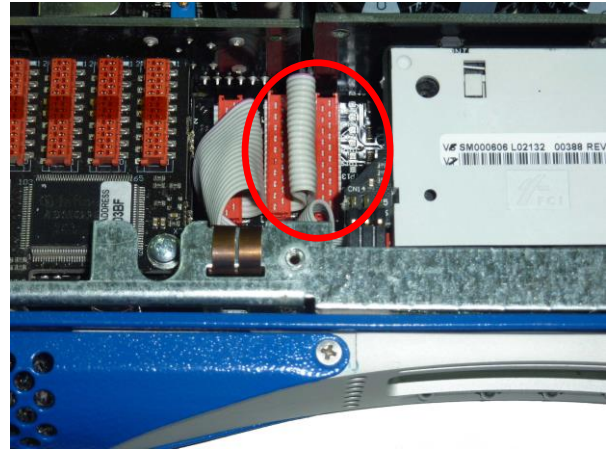


Rear panel screws to be removed

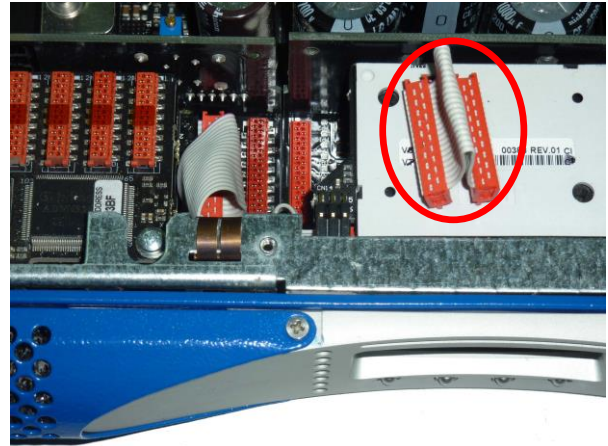


Detached rear panel

Now remove the two flat cables between the power supply board and the amplifier output board:

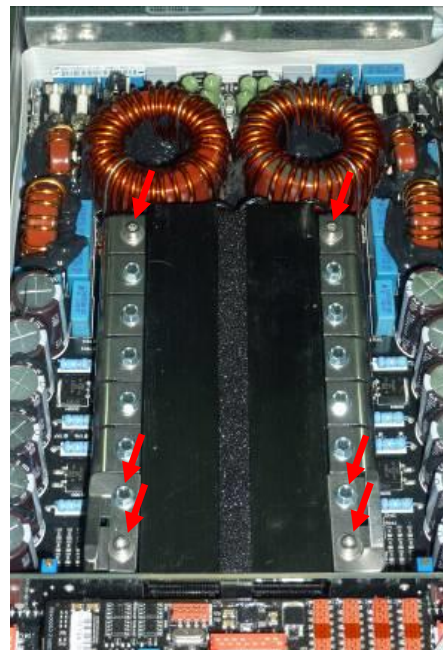


Flat cable to be removed



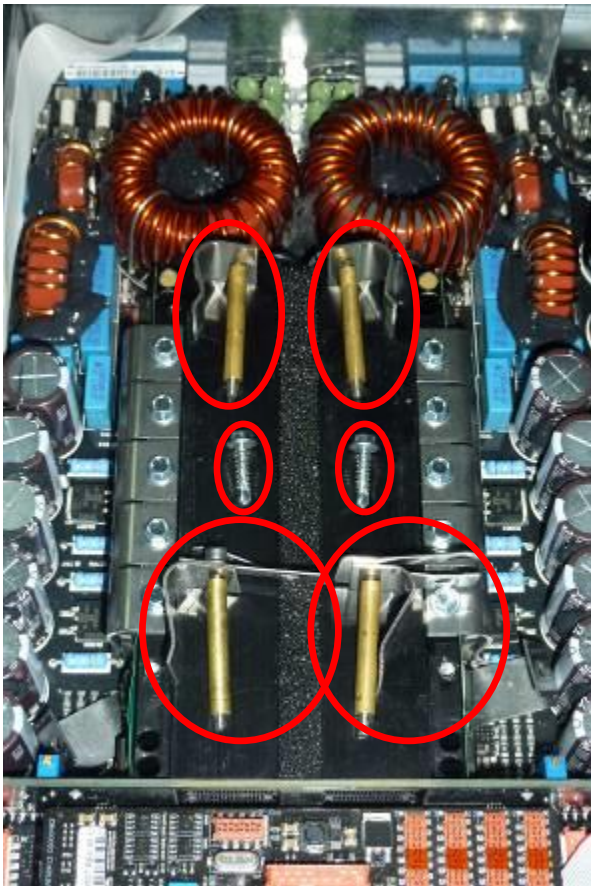
Flat cable removed

Remove the nuts that hold the amplifier output board heat sink:



Unscrew this nut





Nuts unscrewed and removed

Now remove the amplifier output board by unscrewing the 7 screws marked in the overview image below and in the following images:



Amplifier output board overview



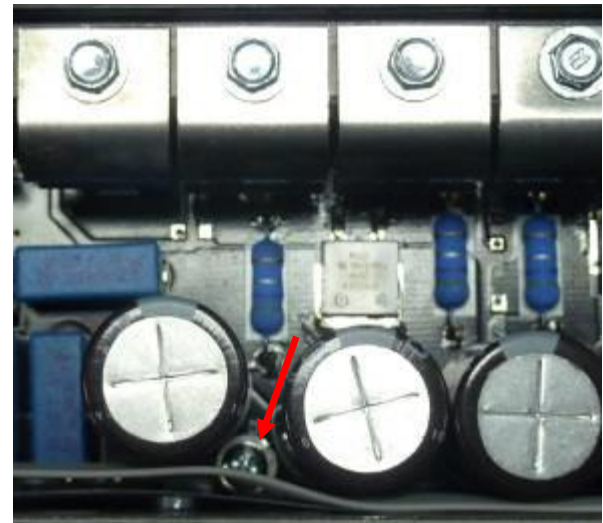
Screws 1, 2 and 3 to be removed



Screw 4 to be removed



Screw 5 and 6 to be removed



Screw 7 to be removed

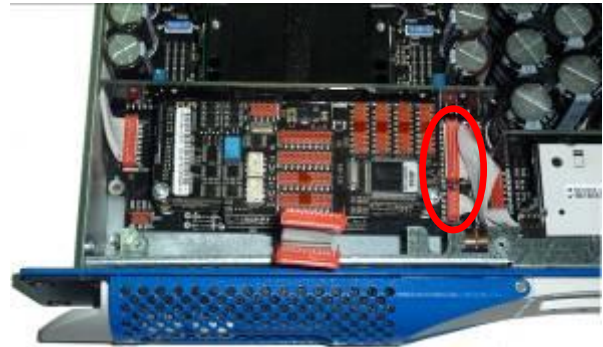
Once all the 7 screws have been removed, unplug the two flat cables that connect the optional KAESOP board (if installed) to the front panel RJ45 plugs:





KAESOP flat cable to unplug

Pull back the amplifier output board to be able to unplug the two flat cables of the control board on the other hand masked by the chassis:

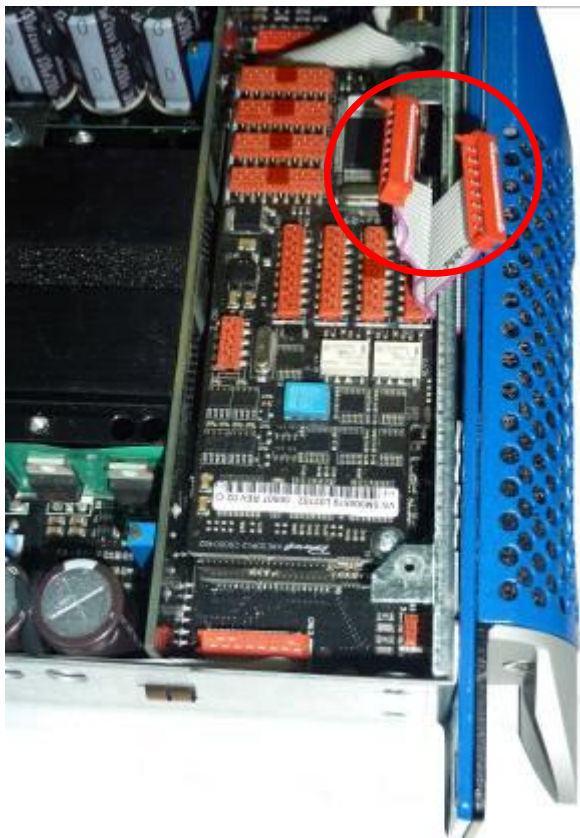


Control board flat cables to unplug



Control board flat cables unplugged

Now it is finally possible to remove the amplifier output board from the amplifier chassis:



KAESOP flat cables unplugged



Lift and pull out the amplifier output board from the amplifier chassis

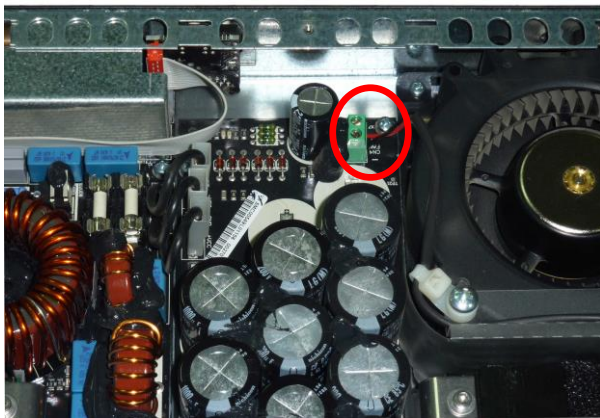




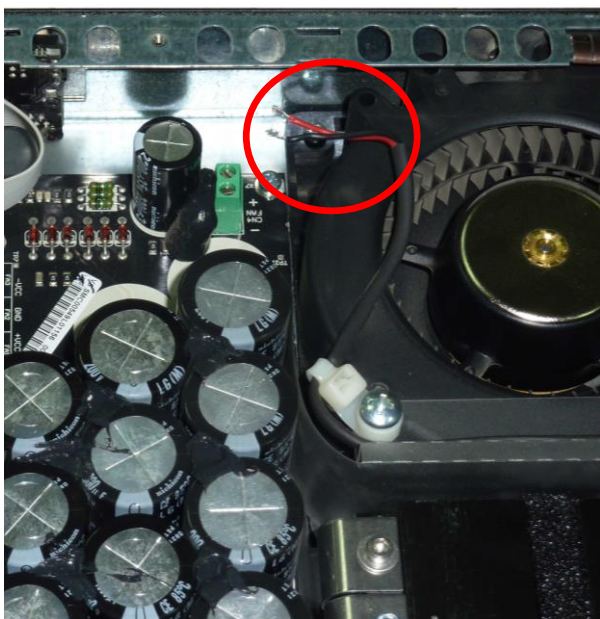
Amplifier output board out of the amplifier chassis

## 5. REMOVING THE FAN

Before starting to remove the fan please proceed in discharging the power supply as explained in chapter 2. Begin the fan disassembly by unscrewing the fans power cables.

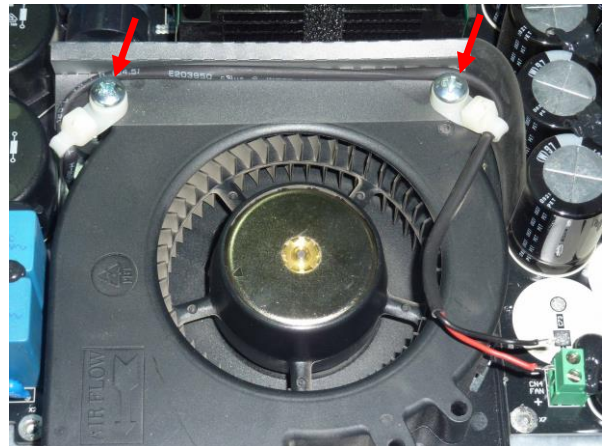


Fan power cables to be disconnected

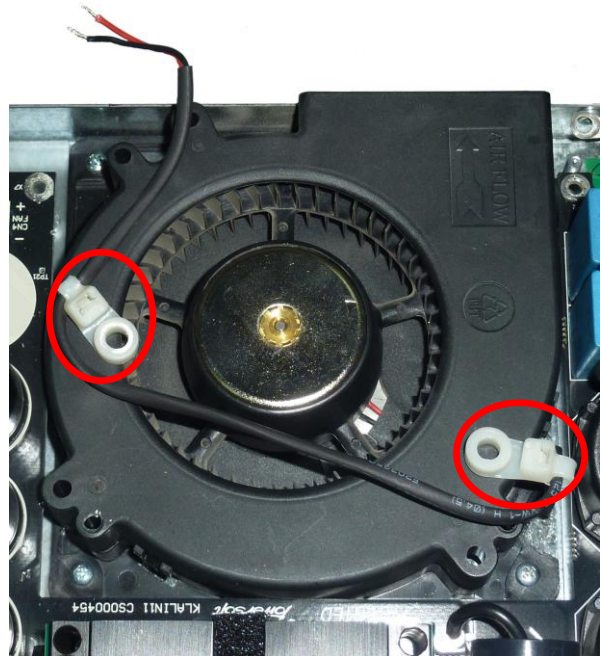


Disconnected fan power cables

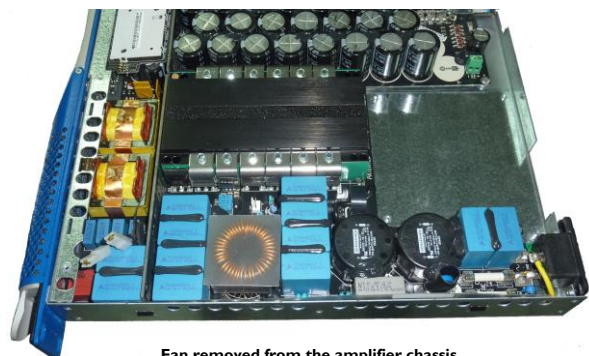
Remove the fan power cable holders:



Fan power cable holders to be removed



Removed fan power cable



Fan removed from the amplifier chassis



## 6. REMOVING THE DISPLAY (K-FRONT)

Before removing the display, discharge the power supply capacitors as explained in chapter 2.  
Remove the faston that connects the amplifier power switch:



Amplifier power switch cable to be disconnected



Disconnected faston of the amplifier power switch cable

Now remove the front panel left and right ears:



Screw for removing left ear



Screw for removing right ear

Remove the left and right protection plates:



Screws for removing the protection plates

The front panel is now free from the amplifier chassis.



Front panel removed from the amplifier chassis



Unplug these two flat cables from the display

Remove the display from the front panel by unscrewing the four screws seen below:



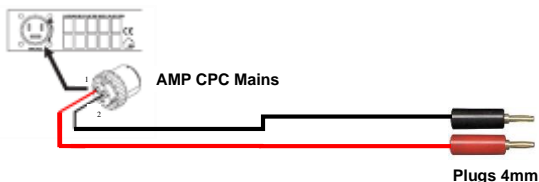
These four screws needs to be removed to free the display



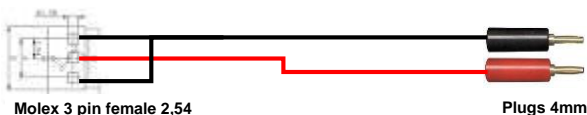
Display removed from front panel

## 7. INSTRUMENTS AND TOOLS FOR TESTING

- DC POWER SUPPLY 0-50 V<sub>cc</sub> f.s. 5 A.
- DC POWER SUPPLY +/- 30V<sub>cc</sub> 0-3 A.
- FUNCTION GENERATOR OR CD PLAYER.
- OSCILLOSCOPE DOUBLE TRACE. (IT MUST BE DISCONNECTED FROM THE GROUND)
- DIGITAL MULTIMETER.
- BOOST VOLTAGE CABLE (CB000081)



- VOLTAGE AUXILIARY CABLE (CB000077)



## 8. FIRMWARE UPDATE PROCEDURE

There is no need to update the amp's firmware when replacing power supply boards.

The following will illustrate actions to be undertaken in case of amplifier or K front boards replacement (see K front de-mounting procedure at the end of this chapter if needed).

Due to the fact that the amplifier model type is stored in the k front board and that this instructs the amplifier control board, both boards must run the same firmware version.

Should the system detect a different firmware version in the 2 boards at power on, the LCD display will show the message error "NO LINK".

To avoid this, we suggest updating to the latest release all K amps DSP you receive for service. To help solve this "NO LINK" error easily, we can also ship a FIRMWARE UPDATE CARD (Powersoft code PC000112).

K amps without DSP DO NOT NEED TO BE UPGRADED.

### FIRMWARE UPDATE procedure for K Series

Main functional parts of K Series amplifiers:

1. **KFRONT** = microcontroller that handles the front panel interface (4 pushbuttons + display)
2. **KCNTRL** = microcontroller that supervises the amplifier and power supply if DSP is installed
3. **KDSP** = microcontroller that handles the DSP parameters
4. **SHARC** = signal processor
5. The FW update procedure updates the KFRONT, then the KDSP, then the KCNTRL, and finally the SHARC.

### UPDATING AMPLIFIER (MAIN)

1. Turn the amplifier off
2. Insert the firmware smartcard. The upper code is the FW revision number (e.g. 3.8.6-161). The bottom code is the KDSP and SHARC revision number (e.g. 3.8.6-1406). Contacts on bottom.
3. Press the first and second push-buttons on the left hand side of the front panel. Keep them pressed (with one hand)
4. With the other hand, turn the amplifier on and wait 3-6 seconds.
5. Right after the fan test (full throttle blow), when the yellow LEDs on the panel begin blinking, you can release the buttons. The KFRONT panel monitors the update process.
6. After about 4 minutes, a message box (if you are upgrading from a 2.0.x firmware release) appears, telling you that the current settings are lost, and that you should verify the settings after the update. **Please check your amplifier settings after the update.** Updating from a 2.94.x or 3.x.x should however maintain your settings.



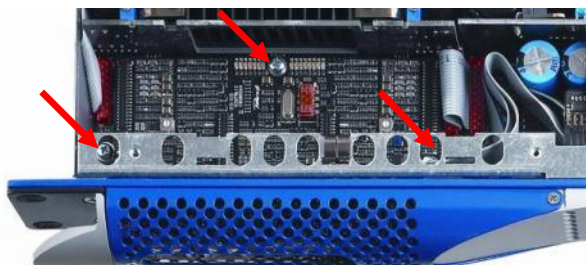
7. If a KDSP (i.e., an optional DSP board) is present, the KDSP update begins, its progress indicated by a progress bar. After about 4 minutes the update is complete. **If a KDSP is NOT present**, a START ERROR message is displayed, requiring a BACK push-button confirmation.
8. The KCNTRL update begins, its progress mapped by a progress bar. After about 2 minutes the update is complete.
9. Finally, a message asking you if you want to update the SHARC DSP is displayed. By pressing OK the SHARC DSP is updated. The update lasts as long as 15 minutes and works only if the amplifier is powered from the mains (NOT from a PowerHub!); therefore, take care in assuring that the mains supply is not disconnected during the above process.
10. **Verify the update:** go to Setup->Hardware Info, press more, the following should appear:  
 KFRONT: X.Y.Z – B KCNTRL: X.Y.Z – B KDSP: X.Y.Z – S  
 WHERE: X.Y.Z is firmware version, B is the build number (meaningless) and S is the SHARC firmware version.

**CAUTION:**

If the update process terminates before completion, you must repeat the process starting from point 1), because you could have 2 different FW versions on your boards. This could cause the amplifier to malfunction. Always check that the update was successfully completed as explained on point 10.

**9. REMOVING THE CONTROL BOARD (K-CNTRL)**

To remove the amp control board please proceed in discharging the power supply as explained in chapter 2. Remove the 3 screws over the board as in the picture below:

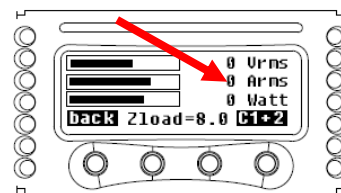
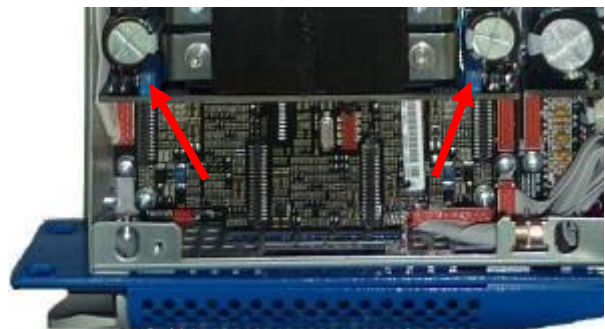


Extract care the amp board with care. Once the control board is replaced, firmware reinstall illustrated in chapter 8 is mandatory. Once the firmware is reinstalled, set the desired max output voltage by following the on display indications:

Menu → setting → amplifier setting → Max output voltage → setting the value with the two ± button.

After replacement of the K-CNRTL and/or the KFRNT boards, recalibrate the offset output current by following this procedure:

1. **Output current offset:** Insert a 1 KHz sine wave signal at the input without any output load. Set the zero current offset value following the menu display indication:  
 Menu → Display → Output meters → set the Arms value to 0, turning the multiturns pot as in the picture below:



Offset output current regulations

**10. ERROR CODES**

Error code	Error descr.
1	192KHz clock not present
2	Positive 15V aux
4	Negative 15V aux
8	Positive 5V analog
100	Negative power bus Ch1
200	Negative power bus Ch2
2000	Positive power bus Ch1
4000	Positive power bus Ch2
8000	External auxiliary voltage
Check rail fuses	Check rail fuses Ch1 and Ch2

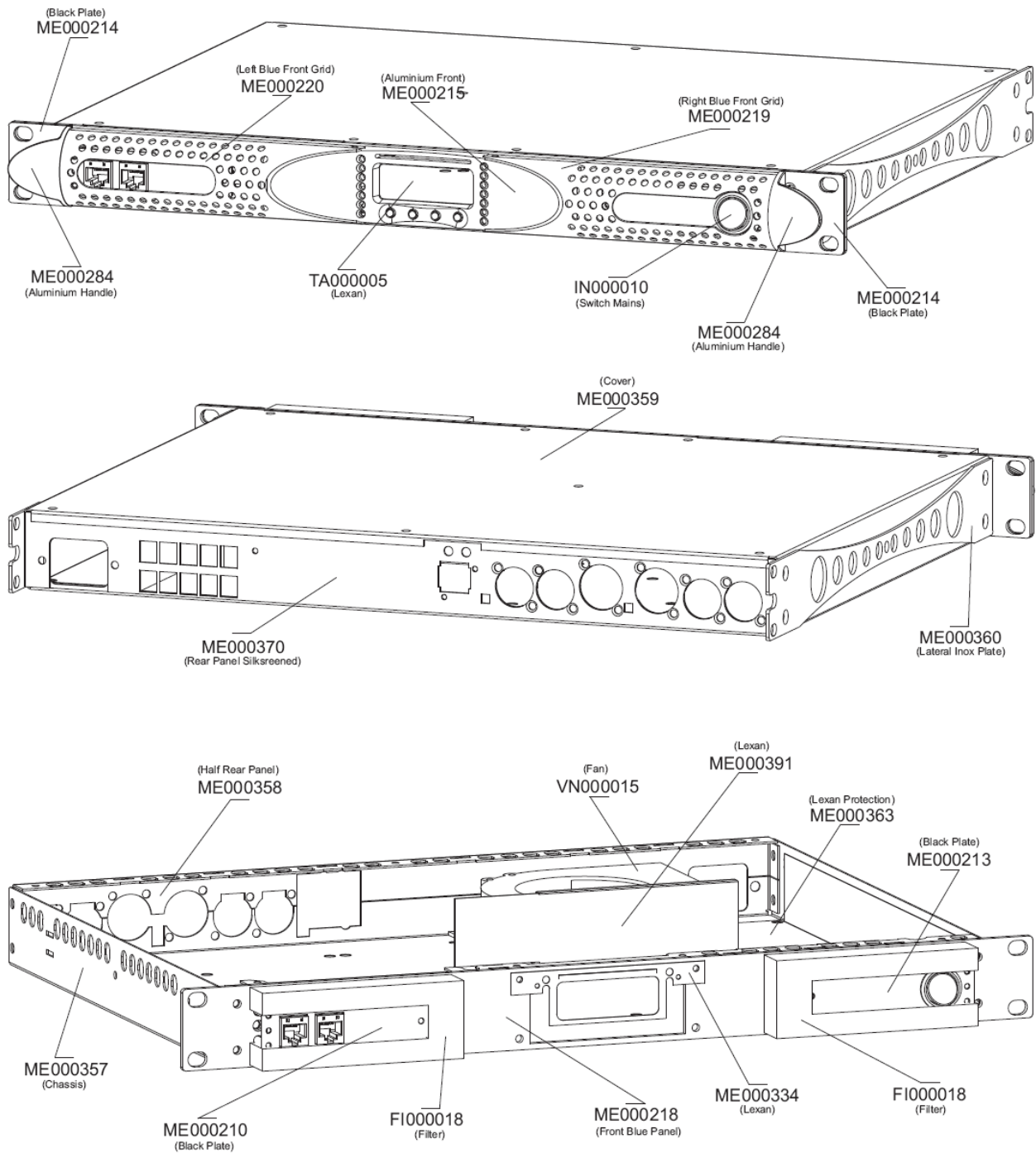
The error code value displayed in the main screen is the sum of the single error code value. **Example:** 4301=4000+200+100+1 means

---

Positive power bus Ch2 +  
Negative power bus Ch2 +  
Negative power bus Ch1 +  
192 KHz clock not present



## I I. MECHANICAL PARTS



ME000214	BLACK PLATE
ME000284	ALUMINIUM HANDLE
ME000220	LEFT BLUE FRONT GRID
ME000219	RIGHT BLUE FRONT GRID
IN000010	SWITCH MAINS
ME000215	ALUMINIUM FRONT
TA000005	LEXAN K-FRONT
ME000359	COVER
ME000370	REAR PANEL SILSKREENED
ME000360	LATERAL INOX PLATE
ME000358	HALF REAR PANEL
ME000357	CHASSIS
ME000210	LEFT BLACK PLATE
ME000213	RIGHT BLACK PLATE
ME000218	FRONT BLUE PANEL
FI000018	AIR FILTER
ME000334	FRONT LEXAN
ME000258	LEXAN PROTECTION
VN000025	COOLER FAN
ME000263	LEXAN PROTECTION K ALIN
ME000391	LEXAN FAN AIR CONDUCT K/LGT



## 12. K2-K3 SPARE PARTS LIST

KALIN		
Part Number	Description	PCB position
SMD00611	K/LGT/ALIN/12+TEST+HSINK	
RES00120		R52, R53
CA000200	ELET.1000UF 200V 25X35 SNAP IN 85° P10	C50 C51 C52 C53 C54 C55 C56 C57 C58 C59 C60 C61 C62 C63 C64 C65 C66 C67 C68 C69 C71 C72
DI000070	IRC 30EPH06	D9
DI000083	GSIB1580 PONTE A DIODI	D1 D2
DIS00007	5.1 VZ MMSZ5231B SOD123	D14
DIS00033	US1J DO214AC	D11,D13
DIS00030	13 VZ SML4743 DO214AC	D12
DIS00021	SS14 -E3/61T Schottky_Barrier_Rectifier	D44
DIS00026	BAS28 High_Speed_Double_Diode	D19
DIS00009	15 VZ MMSZ5245B SOD123	D71 D72
DIS00039	15 VZ 1W SML4744 DO214AC	D10 D18 D60
DS000009	HTSK-AL-OSA56-145 OXN HORZ. FINS REV.02 Taric. 76169990 90	SM000645
FU000032	Fuse 15A 250Vdc (6x32mm) Fast UL Serie 3AB Fast Series	F1 F2
ICS00019	IR2156S SOIC14 BALLAST_CONTROL_IC SMD	U2
ICS00120	IRC IR1150ISTRPbF PFC One Cycle Control PFC IC	U1
IG000003	IRG4PC50UDPbF N-Channel Gate Bipolar Trans IGBT 600V 50A TO-247AC	Q11 Q12
IN000010	Switch Rocker Single Pole SP-ON 6A 250Vac 13-Round Body (Ø=20.2)mm Color	ME364
IS000041	HI-FLOW300 145x32 AMPL.KALIN.LGT \$1,25	1 pc. X channel
ML000001	MOLLE Q&D INOX	2 pc. X channel
ML000007	MOLLE K&Q&D INOX SP. 1.2	13 pc. X channel
MO000038	FCH47N60F_F133 NChannel_SuperFET Vds=600V ID@25°C=47A Pd=417W TO-247 PTH	Q3 Q4 Q5
RE000335	NTC 2 Ohm 12A 20% P5.1W (21x7x28)mm Pitch 7.5mm S364 Series CONF(100)	R54
TO000099.2	"K-LGT" RES.CONV.TRASF.135015 E42/21/15 3C92 CSA from 20/09 Furukawa	T5 T6 (ORA SONO CSA)
TR000003	BDW93CFP NPN_Darlington_Power_Transistor Vceo=100V Pd=33W 100<hFE@10A(Ic)3V(Vce)<20000 TO220FP PTH	Q13 Q14
TRS00009	PBSS5320T PNP_Transistor Vceo=-20V Ic=-2A Pd=300mW(su footprint standard) hfe=220_max SOT23 SMD	Q2 Q8 Q10
TRS00010	PBSS4320T NPN_Transistor Vceo=20V Ic=2A Pd=300mW(su footprint standard) hfe=220_max SOT23 SMD	Q1 Q7 Q9
VN000025	ADDA AB1212XB-Y01 12V 1.4A Ieff=1.12A v=3100rpm Airflow_Max=36.323CFM N=57dB/A W120.5D120.5H32mm	SM000645
VR000007	VARISTOR S20K385 EPCOS CONF(200)	RV1

<b>KAMIN</b>		
<b>SMD00565</b>	<b>K/LGT/AMIN/12+DRIVER+CNTRL+COLL+HSINK</b>	
CA000257	EL.330UF200V 18X35.5 105GR LESR 7,5mm Lead spacing 3,32A Ripple 10.000hrs	C1001 C1002 C1003 C1004 C1005 C1006 C2001 C2002 C2003 C2004 C2005 C2006
DI000073	IXS DSEC29-06AC	D1005 D1006 D2005 D2006
DIS00037	FFB20UP20S 20A 200V D2 PACK	D1003 D1004 D2003 D2004
FU000026	Fuse 10A 250Vdc (5x20mm) Time Delay	F1001A F1002A F2001A F2002A
IN000012	Dip-Switch 10Position BCD 0.4VAC, DC20Vmax Series Body (10x10)mm CRD	SW3 SW4
IS000041	HI-FLOW300 145x32 AMPL.KALIN.LGT \$1,25	1 pc. X channel
ML000001	MOLLE Q&D INOX	4 pc. X channel
ML000007	MOLLE K&Q&D INOX SP. 1.2	12 pc. X channel
MO000039	N-Channel SuperFET Vds 600V Id 141A 417W TO-247 FDH45N50F-133	Q1001 Q1002 Q1003 Q1004 Q2001 Q2002 Q2003 Q2004
SM000291	K/STD/DRIVER/12	rev.01 del 03/11/2004
SM000526	K/LGT/RES/10	
SM000741	K/LGT/CONTROL/16	rev.02 del 27/06/2008
SO000004	P6KE18CA Bidirectional Vbr=18V Ipp=24A Pd=5W Ppp=600W DO15 PTH	RV1001 RV1002 RV2001 RV2002
SM000635B	K/STD/FRONT/15 senza SM000326	