

ARRI 

Lichttechnik

Operating instructions

as at: June 2012

COMPACT BALLAST CB2500 230/240V

for

2500W metal halide lamps

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Operating instructions

COMPACT BALLAST CB2500 230/240V

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OPERATING INSTRUCTIONS

ARRI Power Supply CB2500 - 230/240V

1. General Introduction

Thank you for purchasing a new ARRI CB2500 power supply.

Please read the following operating instructions very carefully before using the CB2500 the first time. They contain important information and instructions for the safety, use and maintenance of the appliance. For your own safety please follow all safety instructions and warnings.

Keep the operating instructions carefully in a safe space and pass them to any future owner.

2. Important safety Instructions

2.1 Warning: dangerous voltages are present in this power supply if power is applied to it and the mains switch is set to ON. Before attempting to replace components, disconnect the unit from the power source and allow at least 2 minutes for capacitor discharge.

Any repairs or changing the line plug must only be carried out by a trained technician or ARRI-Service.

Always ensure that the supply cable connection is correctly wired !

2.2 Always connect the yellow-green wire to a low resistance earth terminal.

2.3 Always connect the luminaire to the power supply by means of an earth conductor.

2.4 Do not obstruct air circulation around the power supply.

For cooling reasons never cover or mask housing and air slots for ventilation !

Ambient temperatures must be between -20°C and +50°C.

Protect the CB2500 against direct sunshine as direct sunshine might exceed the maximum permissible ambient temperature of 50°C given in the "technical data" section of this manual.

Do not operate the CB2500 in high humidity (dew) or in aggressive or explosive gas/air mixture.

2.5 Remove hot components (e.g. reactor) making use of suitable gloves, or allow components to cool down.

2.6 Do not superimpose the power supplies when operating.

2.7 Pull out the mains cable before operating the unit.

2.8 The CB2500 must be used only in accordance with the directions in this "Operating instruction". The manufacturer shall not be liable for any damages whatsoever caused by the unintended use or wrong operation.

2.9 The user of this CB2500 is urgently requested to observe the following instructions:

- dispose of packing material properly.
- do not place the CB2500 into operation if damages are apparent. In the event of problems always disconnect the CB2500 from the power supply and/or battery.
- repairs, exchange of replacement parts or any adjustments or services whatever must only be carried out by a trained technician or ARRI-Service.
- only original ARRI spare parts or ARRI approved spare parts may be used for repairs. Use only original ARRI or ARRI approved accessories.
- make sure that children do not operate the CB2500.

3. Product description

This power supply has been designed to feed a 2500W metal halide lamp.

It consists of a reactor in series to the input, a battery of power factor improving capacitors and a power relay which allows the remote ignition of the power supply. A control circuit board provides the automatic ignition sequence to grant the proper operation of the lamp.

The control board DMX-512 allows the remote control of the ballast via software (on request). The short circuit and overload protections are built-in using a circuit breaker, accessible from the front panel, as well as the mains selector which sets the unit to the mains input voltage. A thermostat has been placed into the winding coil of the ballast.

4. Start-up procedure

The power supply is normally delivered with a 10/16A input plug.

Remark: when operating, the power supply must be pulled out from its trolley to avoid the intervention of the built-in thermostat.

Set S3 voltage selector to the proper input voltage and frequency.

Connect the luminaire connector to the power supply.

Take out the power cord from its housing.

Connect the power supply plug to the main outlet.

Set QF1 main breaker to "ON".

Check the ground by means of the earth test switch. The earth lamp lights up when the power supply is earth-connected.

Remark: the earth test shows if there is any earth connection. This test is not suitable to measure the earth value.

4.1 Stand-by position: when QF1 main breaker is set to "ON" and the luminaire is connected to the power supply, the power supply is ready for use.

The main breaker feeds S2 earth test and L2 lamp.

4.2 Lamp ON: set "O - I" switches (S1 on the power supply and S5 on the luminaire) to "I". When S1-S5 are closed, they supply with the line voltage (by means of the wires 9-13 and SQ1 safety switch of the luminaire) K1 power relay. The latter supplies:

- C1 battery of power factor improving capacitors;

- L1 reactor.

K1 power relay supplies the following circuits:

- the ignition system and the igniter inside the luminaire through D and F pins of J/P output connector;

- the timer (made up of K1, C3, R5, D1 and R3 placed on A1 circuit board) which sets the operating time of the igniter and R4-C4 lamp ignition supporting system.

4.3 Low noise ignition. The voltage between pins D and F of J/P output connector supplies the igniter through SG1 spark gap, F2 fuse, the contact of K1 relay and pins 8-10 of J/P. When the lamp strikes, the no-load voltage between 8 and 5 of J/P drops under the value set by the spark gap (SG1) threshold and the feeding of the igniter is switched off. In this way the operation of the igniter is reduced to the minimum time necessary to strike the lamp, and the acoustical noise generated by the igniter is contained in a very short time. The duration of the ignition, if the lamp does not start, is determined by K1 relay (1 second approx.).

4.4 After the lamp ignition cycle, the warm-up time of the lamp starts. After a few minutes, the lighting system reaches the nominal power, and the lamp its nominal colour temperature.

4.5 Lamp OFF: Set "I-O" switch (S1 or S5) to "O", cutting off K1 power relay. K1 relay cuts off the feeding of all power components and the lamp.

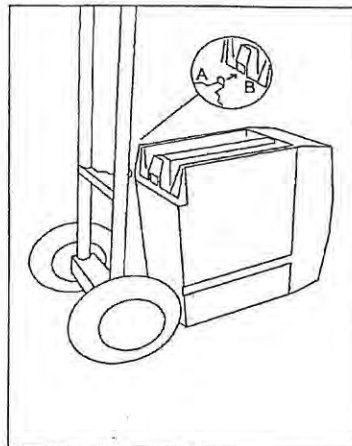
4.6 Remote control operation: Set S1-S5 switches to "I" both on power supply and luminaire.

When the unit is set to remote operation, the ignition sequence starts when the mains is applied.

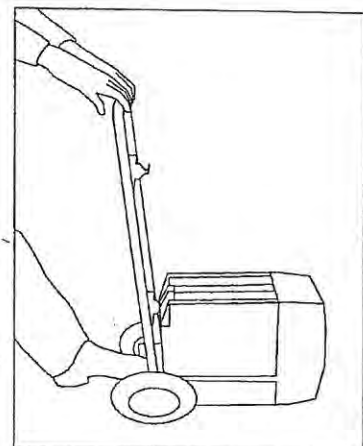
4.7 Suggested output connections for 2500W luminaire (refer to diagram no. 37427): the drawing shows that it is possible to switch ON/OFF the lamp from the luminaire, pushing S5. SQ1 is showing the normally open contact. During the normal operation it must be closed, due to its function which is to turn off the light if the U.V. protection in front of the lamp is removed.

4.8 Reignition: before the reignition of the lamp, wait a few seconds to allow K1 power relay (A1) to open.

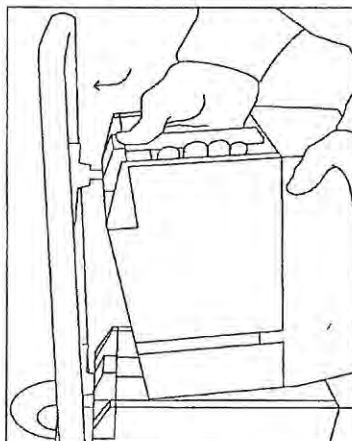
4.9 Trolley



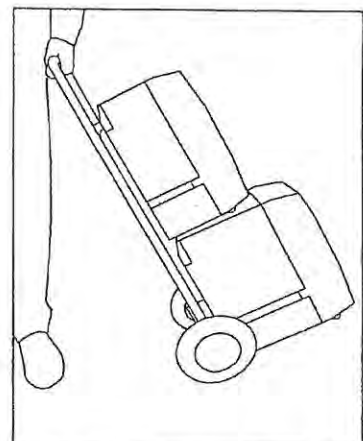
1. Put the ballast on the ground. Insert the trolley hook (see A in the figure) in the ballast carrying hole (see B in the figure).



2. Push the trolley under the ballast, using your foot as in the figure.

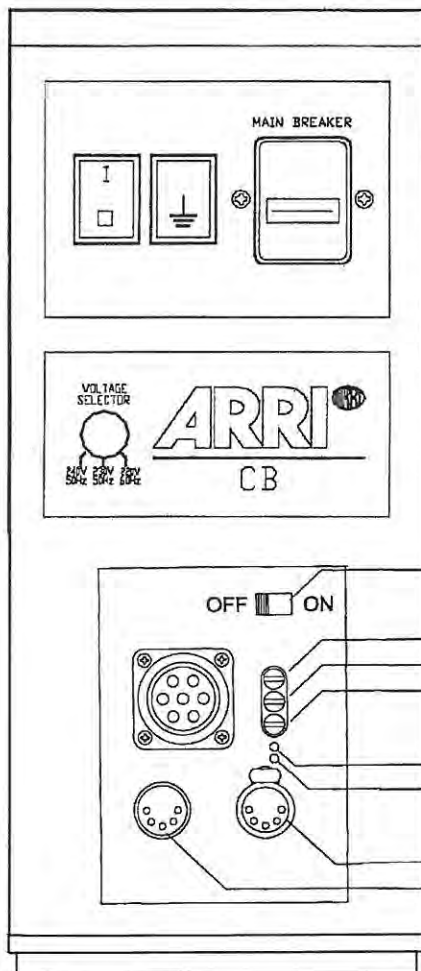


3. Hook the second ballast on the trolley as indicate in figure and put it on the other one. For the handling, tip the trolley, helping with your foot.



4. For the handling, tip the trolley, helping with your foot. The same procedure is valid for the trolley carrying four ballasts.

4.10 DMX512 device



Connect the output and input cables to the DMX connector.

a) Standard operation

Switch on the MAIN BREAKER .
Set the DMX switch to OFF and address switch to 000
The DMX doesn't recognize any signal to strike the lamps.
In this case the Ignition of the lamp is possible both from the ballast or the luminaire : put the 0/I switch to pos.I.
The red led is blinking.

b) Operation with DMX ignition.

Switch on the MAIN BREAKER .
Set the DMX switch to ON
Choose the DMX address on the address coding switch.
Close the luminaire switch (pos.I)
Set to I the ballast 0/I switch.
Send the DMX signal corresponding to the selected one on the ballast from the console.
The green led is blinking and verifying that DMX signals are OK.

Ballast operation mode switch

Address coding switch:

units	(x1)
tens	(x 10)
hundreds	(x 100)

Signals:

green led	(OPER)
red led	(ERROR)

Connectors :

DMX output	(DMX OUT)
DMX input	(DMX IN)

LEDs (signal indications)
Green: operation OK (blinking)
Red: error (blinking) at data errors or loss of communication
OFF with operation OK)

5. CB2500 technical data

Input

Input voltage	230-240V 50Hz / 220V 60Hz $\pm 10\%$
Input current	15A max
No-load current at 230V (pwr spl ON lamp OFF)	18A approx
Frequency	48-52Hz / 57-63Hz
Surge current	18A approx.
Power factor at 230V 50Hz	0.95
Efficiency	92%
Earth leakage current	less than 0.5mA

Output

No-load voltage	220/230/240V
Nominal current	25.6A
Power regulation	$\pm 19\%$ with $\pm 10\%$ input variation 230V 50Hz
Auxiliary fuses rating	2A time delay

Environmental characteristics

Operating temperature	-20°C to +50°C
Storage temperature	-20°C to +70°C

Physical

Housing material	stainless steel
Protection degree	IP32 (as per IEC60529)
Volume	20.4 litres
Weight	without DMX: 28.5 kg with DMX : 29 kg
Dimensions (mm)	A: 398 — B: 293 — C: 175

5.1 Lamp electrical characteristics

Half wave peak current during lamp ignition	250A
Max. value for warm-up	40 / 38A
Min. value for warm-up	29 / 28A
Max. power value	2880W
Rated power value	2500W
Min. power value	2000W
Min. lamp supply voltage for stable operation	198V
Suggested igniter model	AD-3050/AR 220V 50Hz AD-3050/B-3AR 220V 50Hz AD-3050/AR-3 220V 50Hz

6. Troubleshooting guide**6. 1 Suggested troubleshooting equipment**

- DMM (Digital Multimeter) rated for true rms measurement. For ex. John Fluke mFg. type 8010A or equivalent.
- For current measurement: ammeter clamps John Fluke type Y8101 range 2-150A or type 009108 or equivalent; or moving iron ammeter, 0.5 class meas. error rated at least 100A range.
- RLC bridge for capacitor measurement (rated for 500 μ F and 1 M Ω at least).

6. 2 Electrical data**A1 Board**

Voltage data across the main components during the normal operation at nominal voltage and frequency (refer to A1 control board).

- A1 control board in stand-by condition with 230V 50/60Hz (230V tap)
Earth test lamp (L2) voltage with S2 closed: 40Vdc approx. in presence of any phase connection: L, N respectively connected to phase and neutral and yellow-green earth conductor connected to the earth.
Voltage to be read on L1 red lamp ("O-I" switch set to ON): 230Vac.

- A1 control board during lamp ignition cycle (before K (A1) switching) and with mains voltage at 230V 50/60Hz
Voltage to be read on L1 red lamp ("O-I" switch set to ON): 230Vac.
Across supporting circuit (R4-C4): 230Vac max. and 20Vac min. approx. with cold lamp ignition.
Between pins 5 and 10 of J1 output connector on A1 circuit board there is the same supply voltage of the igniter, that is 200Vac max.
The same value will be found between pins D and F on J/P output connector.

- A1 control board during normal operation (after K1 (A1) switching) with mains voltage 230V 50/60Hz:
Voltage on D1 diode: 154 Vdc approx.;
Voltage on R5 resistor: 58Vdc approx.;
Voltage on R3 resistor, C3 capacitor and K1 relay: 94Vdc approx.;
Voltage across C4-R4 supporting circuit: no voltage after C4 discharge;
Voltage on C2: the lamp voltage (90-130Vac)

- Power components voltage at 230Vac 50/60Hz:
C1 capacitor, K1 relay.

6. 3 Trouble shooting procedure

- The lamp does not ignite. The causes may be the following:
 - the lamp could be damaged. Check:
 - a) if there is any cracking or blackening on the lamp;
 - b) the tightening of the lamp clamps;
 - c) the lamp life on PT hourmeter.

- There is no discharge of the igniter in the lamp. In order to check this failure, remove the power supply front panel and leave the luminaire connected to the power supply. Set the "O - I" switch to "I".

There is no voltage to pins D, F of J/P output connector.

The measurement must be done immediately after having set the "O -I" switch to "I" because K1 timing relay suddenly cuts off the igniter.

a) if there is no voltage between pins D, F of J/P, check:

- F2 fuse and wires 8 and 10, contacts 8 and 10 of J1 output connector placed on A1 control board;
- the operation of K1 power relay;
- the operation of K1 relay and its normally closed contact that cuts off the igniter through wires 8 and 10 on J/P1
- the operation of SG1 spark gap (on A1 circuit board) that glows when the igniter is operating.

b) if the mains voltage is present between pins D and F of J/P output connector but the igniter does not work, check:

- the cable and the connections to the luminaire, and test if there is any mains voltage on the terminal board of the igniter (2-2' and 1);
- if even in this case the igniter does not work, replace it.

c) there is high voltage discharge in the lamp but it does not ignite:

- check the internal connections (pins C and D of J/P output connector);
- check the value of the mains voltage (it could be lower than -10% nominal);
- it may be necessary to leave the lamp to cool down before restriking, with lamps out of their electrical characteristics or at the end of their operating life
- check the hourmeter.

- The lamp turns off.

If the lamp turns off, the causes may be the following:

- 1) the lamp has finished its life time; check the hourmeter;
- 2) the input voltage is too low; check the value of the mains;
- 3) L1 reactor is connected to the tap corresponding to a voltage higher than the nominal one (check the voltage selector) or to a higher frequency (60Hz);
- 4) the operating temperature exceeds 50°C (F1 thermostat has tripped);
- 5) the mains voltage is higher than +10% nominal (F1 thermostat has tripped).

- When the "O - I" switch is set to ON, K1 power relay does not close down.

The causes may be the following:

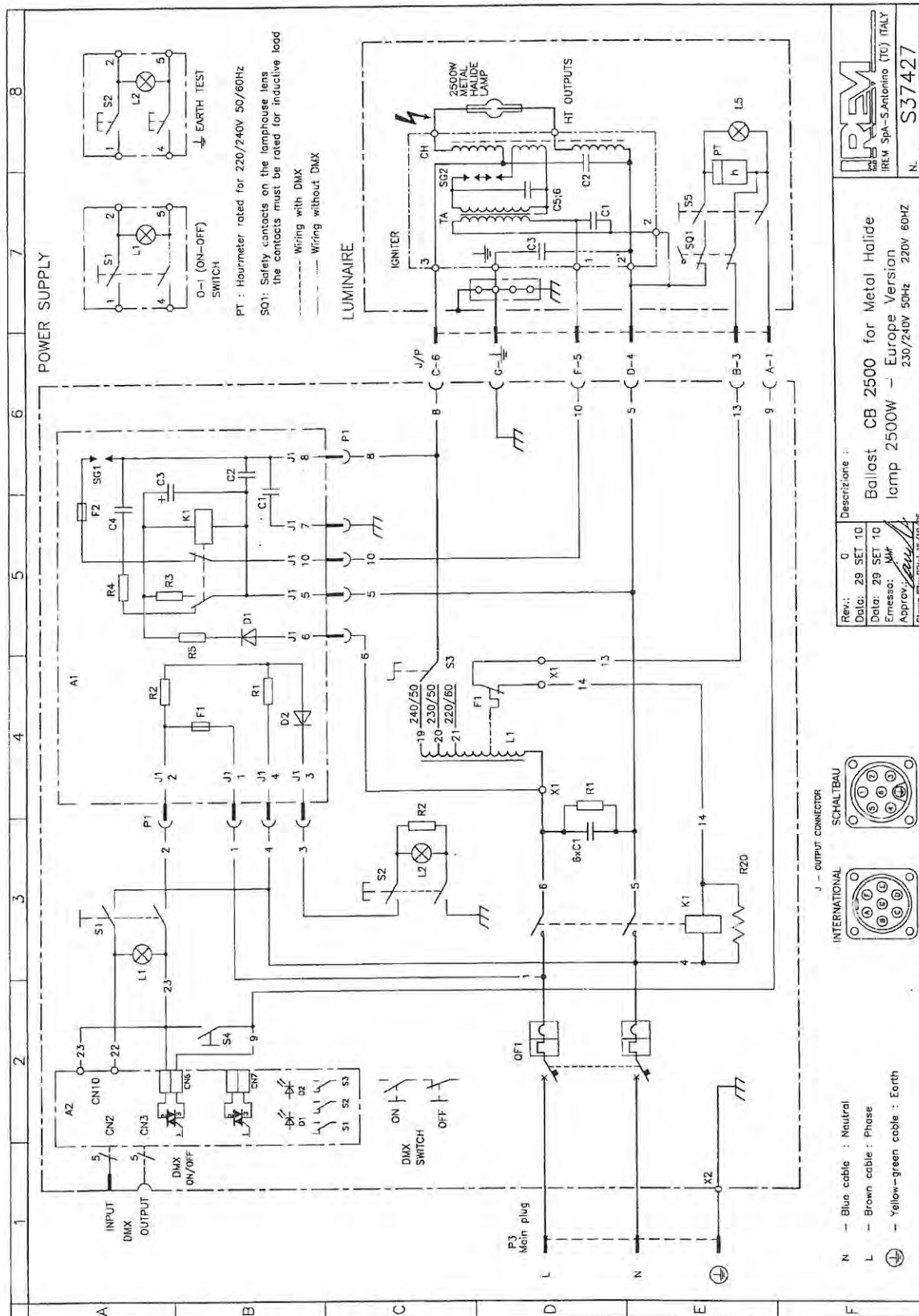
- 1) F1 fuse on A1 board is interrupted
- 2) the coil of K1 relay is interrupted or burned;
- 3) "O -I" switch is defective (in the power supply or in the luminaire);
- 4) SQ1 safety switch is defective;
- 5) A-E pins (J/P output connector) or their wiring are not connected.
Replace the defective components.

Design and specification subject to change without notice !

7. ARRI Service Locations

Germany	USA	USA	Canada	Great Britain	Italy
Arnold & Richter Cine Technik	ARRI USA CORPORATION	ARRI USA CORPORATION	ARRI Canada LTD.	ARRI (GB) LTD.	ARRI ITALIA SRL
Pulvermühle D-83071 Stephanskirchen	617 Route 303 Blauvelt NY 10913- 1109	600, N. Victory Blvd. Burbank, CA 91502-1639	415, Homer Avenue Unit 11, Etobicoke ON M8W 4W3	2 Highbridge Oxford Road, Uxbridge, Middlesex UBB 1LX England	Viale Edison 318 I-20099 Sesto S. Giovanni Milano
Tel. (0)8036-3009-0 Fax (0)8036-2471	Tel. (845) 353-1400 Fax (845) 425-1250	Tel. (818) 841-7070 Fax (818) 848-4028	Tel. (416) 255-3335 Fax (416) 255-3399	Tel.+441895-457000 Fax+441895-457001	Tel. (02) 26227175 Fax (02) 2421692

8. CB2500 wiring diagram

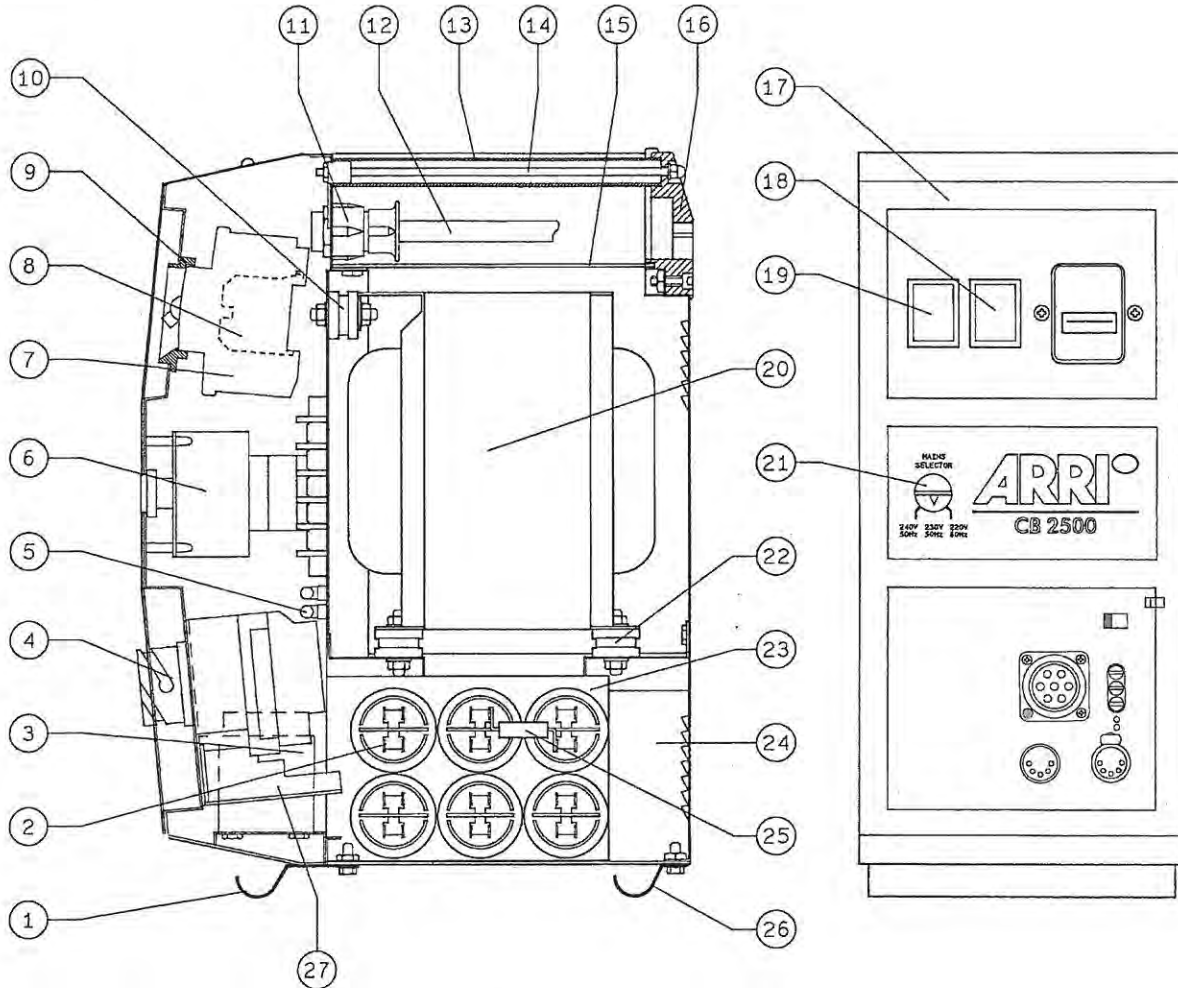


8.1 CB2500 Component list

Ref.	Description	Type	Q.
QF1	Magnetothermal protection	S202L -C32	1
S1	ON/OFF switch		1
S2	Ground push button		1
S3	Mains selector	CM13	1
K1	Power relay 220Vac 20A	VC 20 3A	1
C1	Capacitor 40µF 400V	C.87.0	2
R1	Resistor 27kΩ 6W	6CS	1
R2	Resistor 680kΩ 1/4W		1
	Spare fuse 2AT	5x20	2
L1	Reactor 230/240V 50 220V 60Hz	CB2500	1
A1	Control printed board assembly	CBA	1
X1	Terminal board 30A 5 ways	AL705/A	1
X2	Earth terminal	WPE 4	1
P3	Input plug	10/16A CEE	1
	Input cable 3x1.5ø	HO7RN-F	m 2.75
	Cable clamp	106ZB/16	1
	Fixing nut	169MS/16	1
J*	Female output connector (international)		1
J*	Female connector assembly (Schaltbau)		1
P1	A1 female connector assembly		1
	Connector 10 ways		1
	Contact		9
A2*	DMX board assembly		1

* on request

9. CB2500 component layout



- | | | | |
|-----|-----------------------------|-----|----------------------|
| 1) | Front end foot | 14) | Handle fixing |
| 2) | Capacitor | 15) | Upper side |
| 3) | Power relay | 16) | Handle support |
| 4) | Connector | 17) | Control panel |
| 5) | Spare fuses | 18) | Ground push button |
| 6) | Control board | 19) | ON/OFF switch |
| 7) | Main breaker | 20) | Choke |
| 8) | Ground terminal | 21) | Mains selector |
| 9) | Main breaker frame | 22) | Shock absorber |
| 10) | Shock absorber | 23) | Capacitor support |
| 11) | Cable clamp with fixing nut | 24) | Lower side |
| 12) | Powering cable | 25) | Resistor |
| 13) | Handle | 26) | Rear end foot |
| | | 27) | DMX 512 (on request) |