Lamp Power Supply

Installation manual
For DP2K-15C, DP2K-20C

R765524K

R59770504/00
04/02/2010

BARCO

Visibly yours

Barco nv Digital Cinema
Noordlaan 5, B-8520 Kuurne
Phone: +32 56.36.80.47
Fax: +32 56.36.83.86
E-mail: sales.digitalcinema@barco.com
Visit us at the web: www.barco.com

Printed in Belgium

1. INTRODUCTION AND DIAGNOSTICS

1.1 Introduction

Functionality of the Lamp Power Supply

The Lamp Power Supply (LPS) of the DP2K-15C/DP2K-20C digital projector is actually a dual LPS connected in parallel. Both LPS units are enclosed in one casing. The front side of the LPS casing contains the input/output connectors and diagnostic LED's of the LPS units. The rear side is equipped with fans. The whole LPS module slides into the LPS compartment at the rear bottom of the DP2K-15C/DP2K-20C projector and can be replaced easily.

To ignite the lamp the voltage on the output pins of the LPS units is brought up to 140 volt. This high voltage will trigger the Start Pulse Generator (SPG) to ignite the lamp. Once the lamp is ignited the voltage on the output pins of the LPS units is dropped to the typical arc voltage of the lamp e.g. 28 volt for a 3 kW lamp.

Each LPS unit can deliver maximum 2500 watts and maximum 100 amps. In normal situation, each LPS unit deliver the half of the required power. So, for a 3 kW lamp having an arc voltage of 28 volt, each LPS unit deliver 53,57 amps at 28 volt which is equal to 1500 watt.

When one of the two LPS units suddenly fails during an event, the other LPS unit continues delivering 53,57 amps at 28 volt. As a result, the projector's light output is reduced. In case the projector starts up with one LPS unit down, the other LPS unit will run on its maximum power and delivers 89,3 amps at 28 volt which is equal to 2500 watt.

In case one or both LPS units fails an error is logged in the projector log file.

Parts

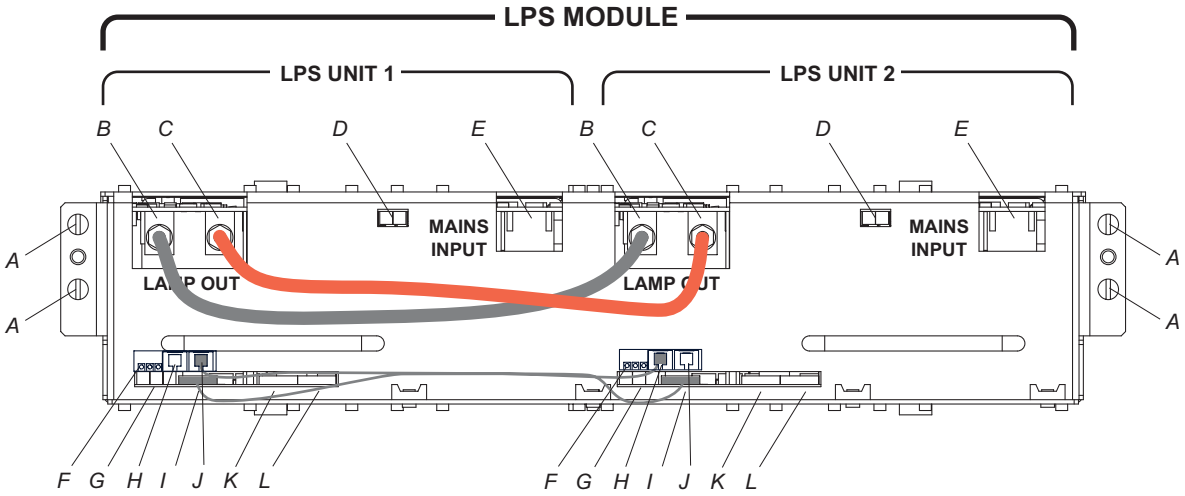

Image 1-1

A Captive screw.

B Lamp output pin "–".

C Lamp output pin "+".

D Status LEDs: "LAMP ON / LVPS OK".

E Mains input.

F Status LEDs, left and middle LED for internal use, right LED : heartbeat

G Status LEDs: "ERR", "PFC OK" & "LPS OK".

H Socket for "CTRL OUT" cable - DP2K series.

I Socket for "ADDRESS" cable.

J Socket for CTRL IN" cable - DP2K series

K Socket for "CTRL OUT" cable - not used in DP2K series.

L Socket for CTRL IN" cable - not used in DP2K series

1.2 LPS diagnostic LED's

Status LED's on LPS unit

The LPS module contains in total 16 status LEDs. 8 per LPS unit. Four orange, three green and one red LED.

The orange LED "LVPS OK" lights up immediately after the projector is switched on. At the same time, the heartbeat LED starts blinking. All other status LEDs of the LPS unit remain off. This is the standby status of the LPS unit. Once the command is send to the LPS units to start up the projection lamp, the green LEDs are lighting up one after the other. First the green LED "PFC OK", then the green LED "LPS OK" and finally, when the lamp is ignited, the green LED "LAMP ON". The right orange of the upper row blinks. This is the heartbeat signal

The red LED "ERR" remains off unless an error is detected inside the LPS unit or when both LPS units where ordered to shutdown due to a malfunction somewhere else inside the projector.

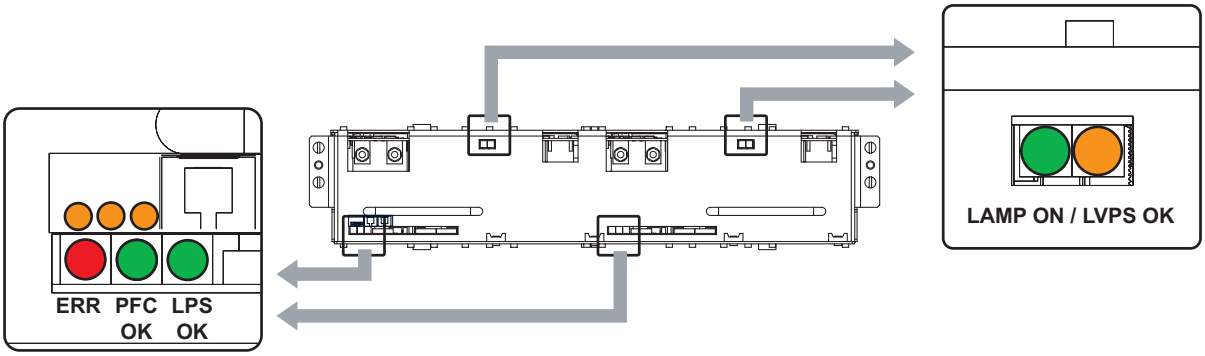

Image 1-2
LED indications

Diagnostic

About the orange LEDs next to the CTRL connectors:

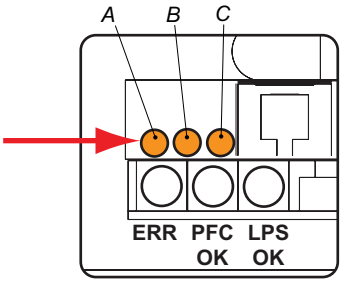

Image 1-3

LED A and B are only for internal use. LED C is the heartbeat LED.

Orange LED C	Diagnostics	Action
Blinking	Normal operation	-
OFF	12 V from backplane via CTRL IN not available on LPS unit	Check 12V out on backplane.
ON	12 V from backplane available.	Replace the LPS module.

About the diagnostic LEDs, ERR, PFC, LPS, Lamp ON and LVPS.

Orange	Green	Green	Grreen	Red	Diagnostic	Action
LVPS OK	PFC OK	LPS OK	LAMP OK	ERR		
OFF	OFF	OFF	OFF	OFF	No input voltage.	Switch on the projector.
ON	OFF	OFF	OFF	OFF	Standby modus of LPS unit.	—

Orange	Green	Green	Grreen	Red	Diagnostic	Action
LVPS OK	PFC OK	LPS OK	LAMP OK	ERR		
ON	ON	ON	OFF	OFF	PFC and LPS seems to work normally but the lamp is not ignited. This situation can be the result of a bad lamp or SPG module.	• Install another DP2K-15C/DP2K-20C lamp house in case the voltage on the “LAMP OUT” pins is > 140 volt for a short time (few seconds). • Replace the SPG module in case the voltage value on the “LAMP OUT” pins is >140 volt and you do not hear the SPG module clicking to ignite the lamp. • Replace the LPS module in case the voltage value on the “LAMP OUT” pins is below 140 volt and the lamp is not ignited.
ON	ON	ON	ON	OFF	LPS unit is operating normally. Projector lamp is ignited.	—
ON	OFF	OFF	OFF	ON	LPS internal temperature is too high.	• Check if the LPS air inlet at the bottom side of the projector is not blocked. • Check if the air outlet at the rear of the projector is not blocked. • If the problem remains, replace the whole LPS module.
ON	OFF	OFF	OFF	Flashing fast	Error detected inside this LPS unit. In case the other LPS unit operates normally the LPS module as a whole works at 50%.	Replace the LPS module.

2. LAMP POWER SUPPLY REPLACEMENT

WARNING: Always switch off the projector and unplug the power cord at the projector side before removing one of the covers.

WARNING: This procedure may only be performed by qualified technical service personnel.

2.1 Removing the back cover

Necessary tools

7 mm flat screwdriver

How to remove the back cover from the projector

1. Release the two captive screws at the bottom corners of the back cover, using a flat screwdriver.

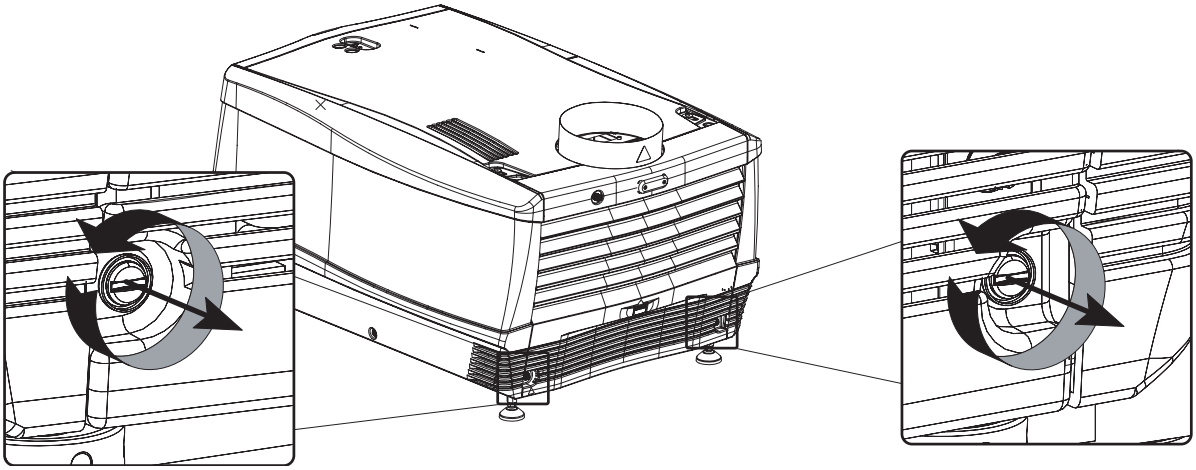

Image 2-1
Loosen the captive screws

2. Remove the back cover of the projector doing the following:
   - gently pull out the top corners of the back cover,
   - then move the back cover away from the projector.

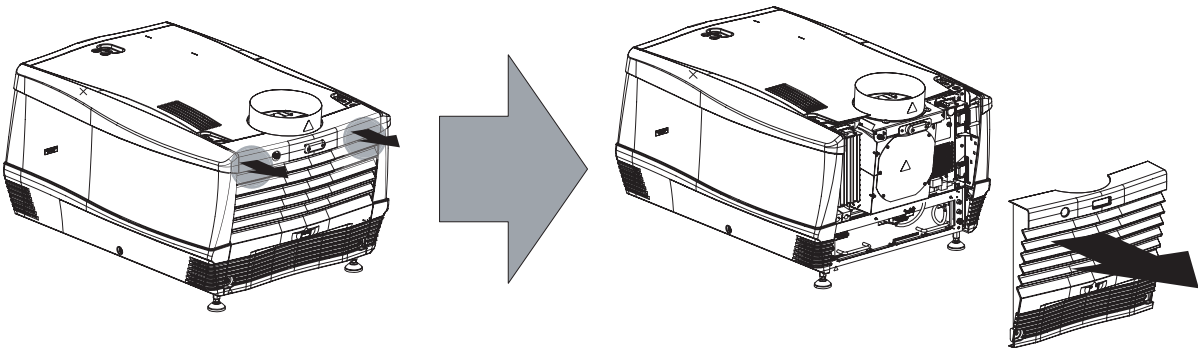

Image 2-2
Remove back cover

2.2 Removing the LPS module

Necessary tools

- 6 x 120 mm flat screw driver.
- 10 mm nut driver.

How to remove the LPS module

1. Remove the back cover of the projector.
2. Disconnect the “MAINS INPUT” from both LPS units.

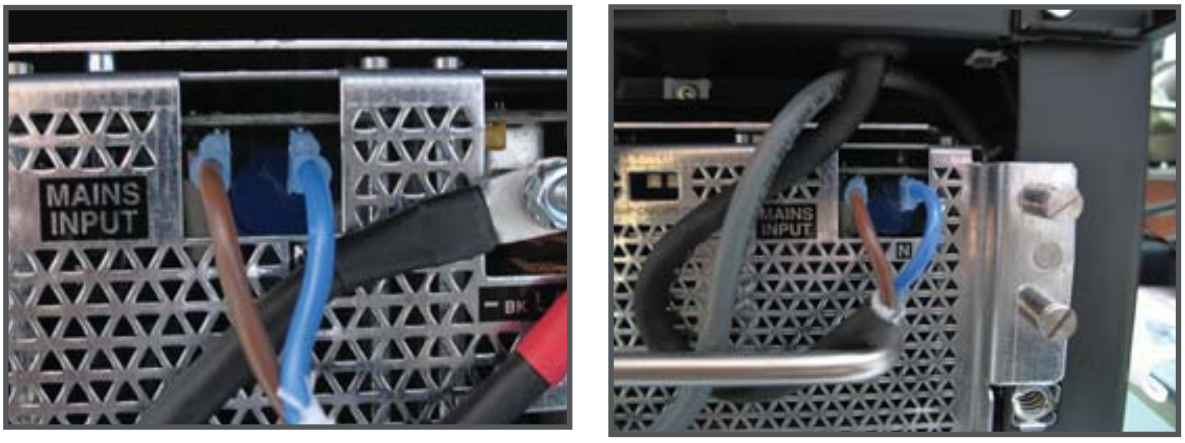

Image 2-3
Mains input

3. Disconnect the wire unit from the “CTRL IN” socket of LPS unit 2.

Image 2-4
CTRL in connector

4. Disconnect both “LAMP OUT” power cables at the left side from the LPS module. Use a 10 mm nut driver.
   Caution: *Do not loose the washers which fit between the fixation nuts and the cable eye.*

   Tip: *Place the washers and nuts back upon the output pins.*

Image 2-5
Lamp out connection

5. Release the four captive screws which fasten the LPS module to the projector chassis. Use for that a flat screwdriver (6 x 10 mm).

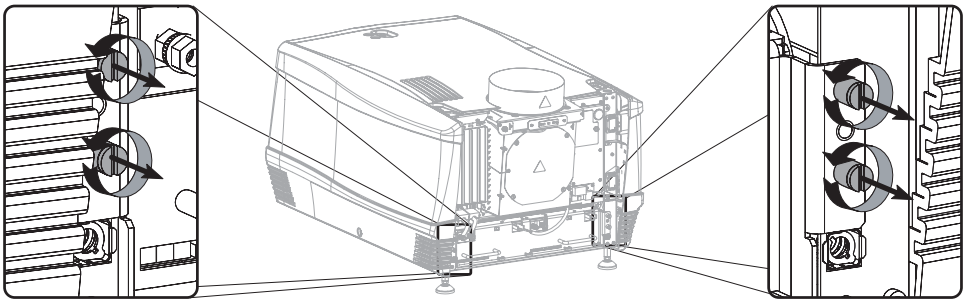

Image 2-6
LPS module fixation

6. Hold fast the LPS module by its handles pull the LPS module out of its compartment.

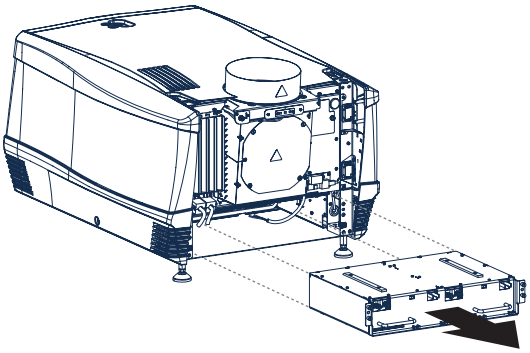

Image 2-7
Remove LPS module

7. Remove both loop through cables between LPS unit 1 and LPS unit 2. One for ADDRESS and one for CTRL. Remove both loop through lamp power cables between LPS unit 1 and LPS unit 2.

2.3 Installation of the LPS module

Necessary tools

- 6 x 120 mm flat screwdriver.
- Torque wrench with a 10 mm hexagon socket.

How to install the LPS module

1. Slide the LPS module into its compartment as illustrated.

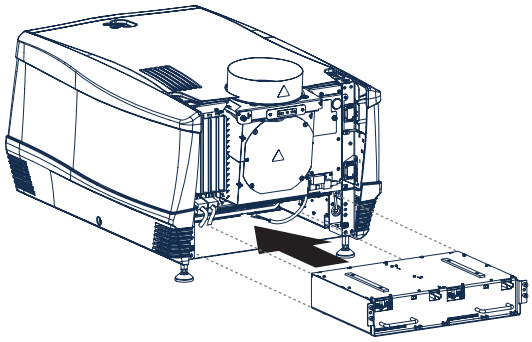

Image 2-8
Insert LPS module

2. Fasten the four captive screws of the LPS module.

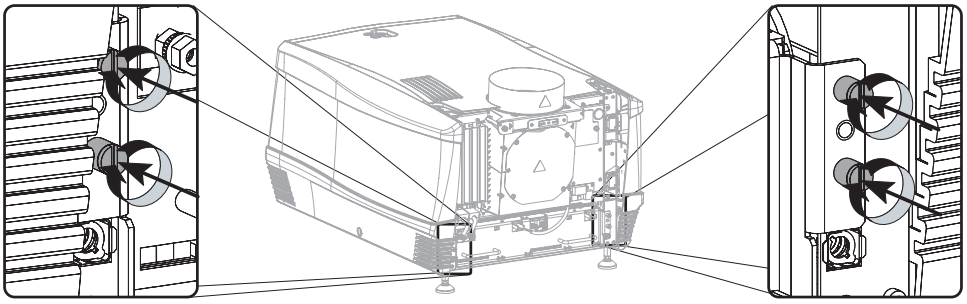

Image 2-9
Fixate LPS module

3. Connect the power cables coming from the SPG module with the “LAMP OUT” sockets of the LPS module as illustrated. Fasten the nuts with a torque of **4Nm** (2.95 lbf*ft).
   Warning: *Make sure to place the washers and cable eyes in correct order upon the pin as illustrated. Always use a plain washer between the output pin and the cable eyes.*

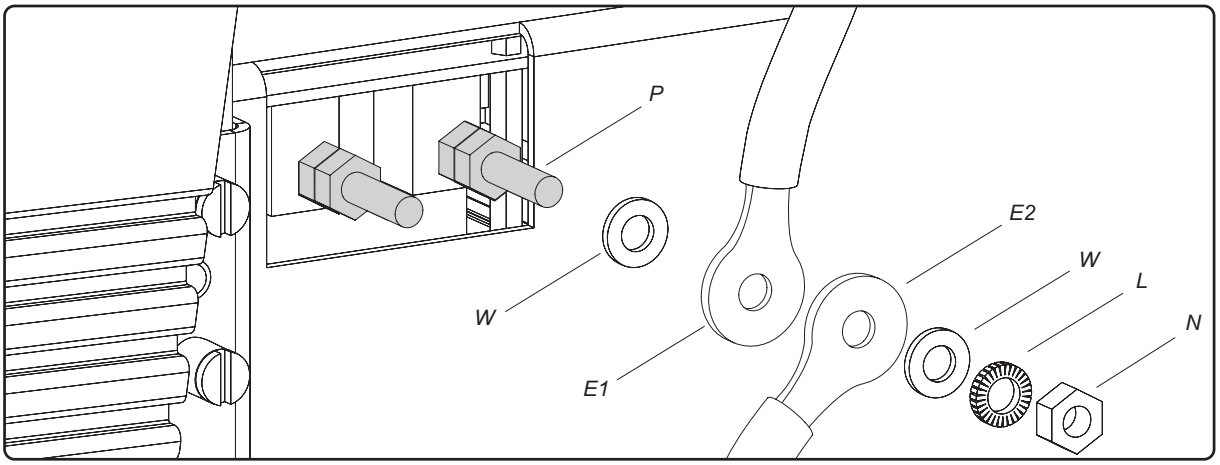

Image 2-10
Lamp out connection

P LPS output pin.
W Plain washer.
L Lock washer.
E1 Cable eye from SPG module.
E2 Cable eye from LPS unit.
N Nut.

Warning: *Respect the polarity of the socket and cables. Red marked cables with the “+” pin, black marked cables with the “-” pin.*

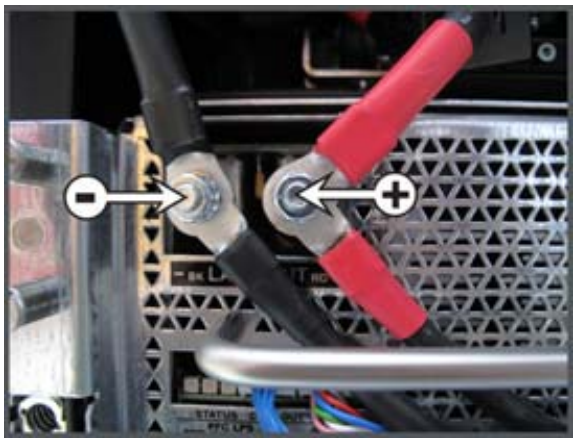

Image 2-11
Lamp power cables

4. Connect the wire unit from the LPS communication interface with the “CTRL IN” socket of LPS unit 2 as illustrated.

Image 2-12
CTRL in connector

5. Connect the mains input cables with the “MAINS INPUT” sockets of the LPS module as illustrated.
   Plug the connector of the blue wire into the socket labeled with N.

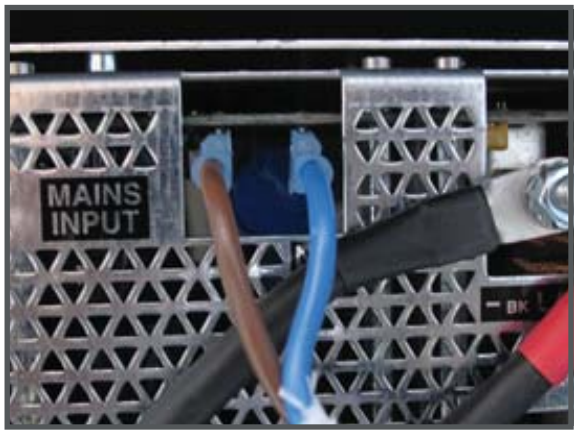

Image 2-13
Mains input connection

Image 2-14
Neutral wire indication

6. If not yet available, make the connection between “CTRL out” of LPS unit 2 to “CTRL in” of LPS unit 1. Make the connection between both “ADDRESS” connectors.

2.4 Installation of the rear cover

Necessary tools

7 mm flat screwdriver.

How to install the rear cover of the projector?

1. Install the rear cover of the projector doing the following:
   a) Bring the rear cover towards it final position,
   b) then gently push the locking studs of the top corners into their receivers

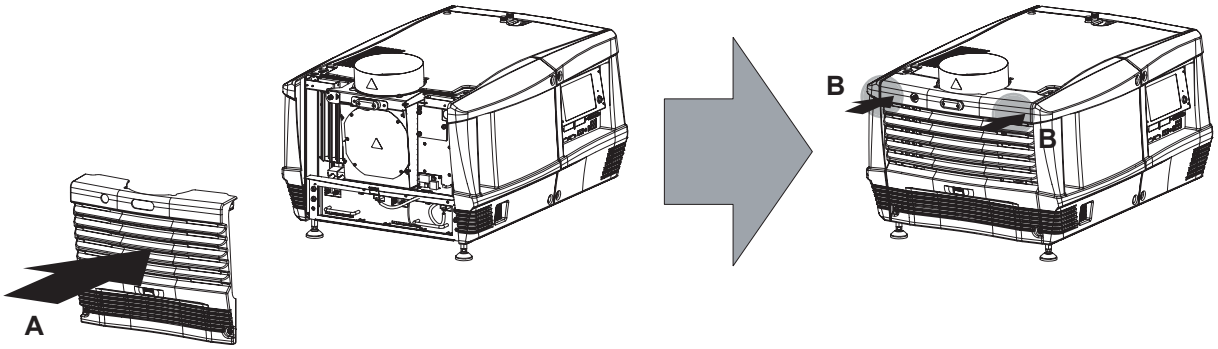

Image 2-15

2. Secure the rear cover by locking the captive screws at the bottom corners of the rear cover.

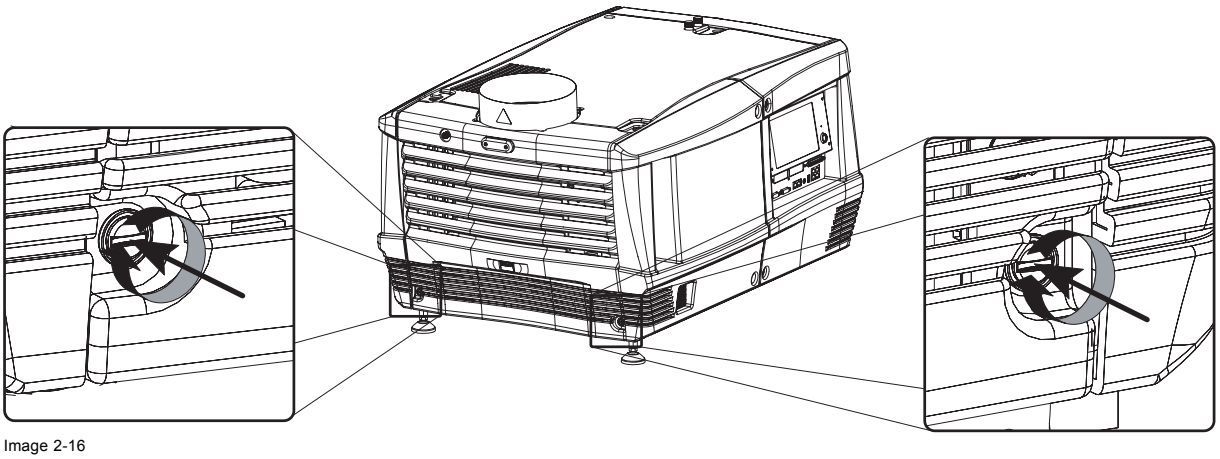

Image 2-16