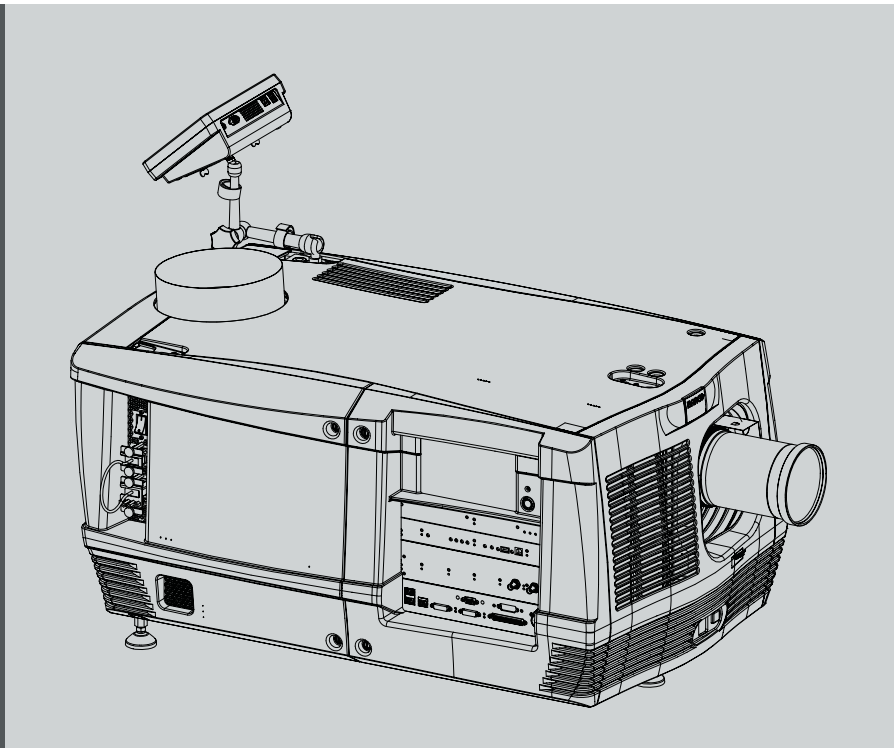
DP2K-15C/DP2K-20C/DP2K-18Cx



Service manual

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BARCO

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EN55022/CISPR22 Class A ITE (Information Technology Equipment)

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

Warning : This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Warning : This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

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Disposal Information

Waste Electrical and Electronic Equipment

This symbol on the product indicates that, under the European Directive 2012/19/EU governing waste from electrical and electronic equipment, this product must not be disposed of with other municipal waste. Please dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

For more information about recycling of this product, please contact your local city office or your municipal waste disposal service.

For details, please visit the Barco website at: http://www.barco.com/en/AboutBarco/weee

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1. SAFETY

About this chapter

Read this chapter attentively. It contains important information to prevent personal injury while servicing the DP2K-15C/DP2K-20C/DP2K-18CX projector. Furthermore, it includes several cautions to prevent damage to the DP2K-15C/DP2K-20C/DP2K-18CX projector. Ensure that you understand and follow all safety guidelines, safety instructions and warnings mentioned in this chapter before servicing the DP2K-15C/DP2K-20C/DP2K-18CX projector. After this chapter, additional “warnings” and “cautions” are given depending on the service procedure. Read and follow these “warnings” and “cautions” as well.

WARNING: This manual is only intended for qualified service personnel.

Overview

- Safety Instructions

1.1 Safety Instructions

WARNING: Before removing/replacing any projector components, disconnect the power to the unit mains terminals and unplug the power cord at UPS INLET.

Safety Instructions

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:
   a) Be sure that no built-in protective devices are defective and/or have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, insulating materials, barriers, covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Service people who defeat safety features or fail to perform safety checks may be liable for any resulting damage.
   b) Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) excessively wide cabinet ventilation slots, and (2) an improperly fitted and/or incorrectly secured cover panels.
   c) Leakage Current Hot Check. With the instrument completely reassembled, plug the AC line cord directly into a 220 V AC outlet (Do not use an isolation transformer during this test). Use a leakage current tester or a metering system that is designed to comply with the new IEC, ANSI and UL standards. With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.). especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 3,5 mA. Reverse the instrument power cord plug in the outlet and repeat test. ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING ACCESSORIES.

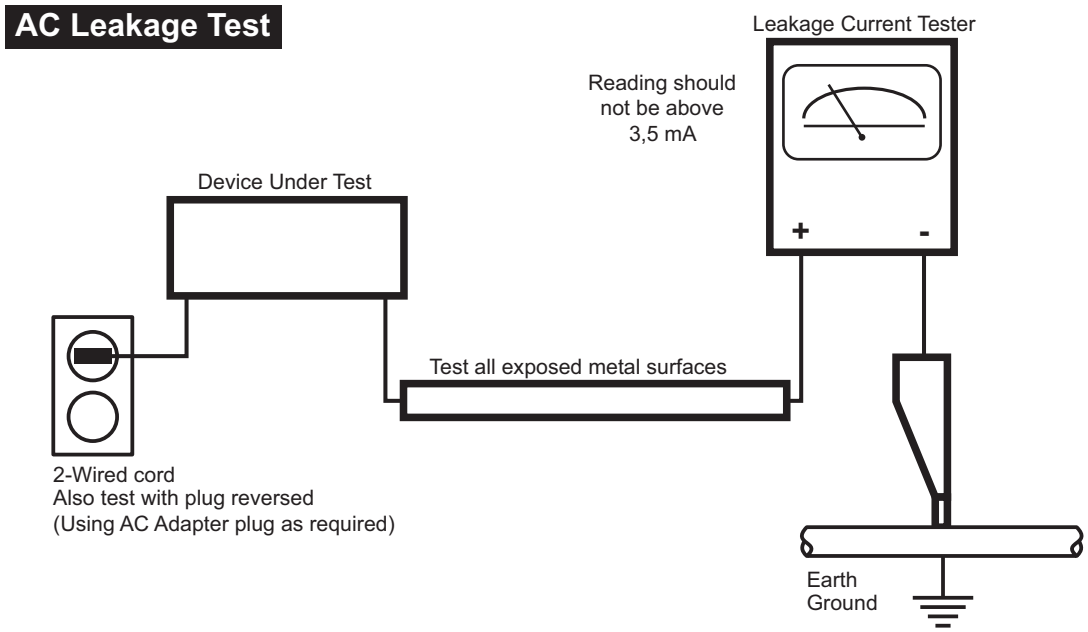


Image 1-1

   d) Ultraviolet Radiation exposure - Warning: This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if not operated in enclosed fixtures. DO NOT operate this lamp in a fixture with a missing or broken lens cover.
   e) Ozone: Operating lamp generates ozone gas which is harmful to the respiratory system. Therefore the lamp should be operated in adequately ventilated equipment.
2. Read and comply with all caution and safety-related notes on or inside the projector cabinet or on the projector chassis, or on the picture tube.
3. Design Alteration Warning - Do not alter or add to the mechanical or electrical design of this apparatus. Design alterations and additions, including, but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this apparatus and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you, the servicer responsible for personal injury or property damage resulting therefrom.

4. Lamp explosion Protection Warning – The lamp in this projector operates with a high internal pressure and there is a slight risk that the lamp may explode, particularly if it is used beyond its rated life. Do not remove, install, or otherwise handle the lamp in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while lamps are handled. Keep the lamp away from your body. For continued explosion protection, replace the lamp only with one of the same type number. Always replace the lamp before the rated life time.
5. Hot Chassis Warning - This projector chassis has two ground systems: the primary ground system is formed by the negative voltage of the rectified mains (power) and is only used as a reference in primary circuits; the secondary ground system is connected to earth ground via the earth conductor in the mains (power) lead. Separation between primary and secondary circuits is performed by the safety isolation transformers. Components bridging these transformers are also safety components and must never be defeated or altercated. All user-accessible conductive parts must be connected to earth ground, or are kept at SELV (Safety Extra Low Voltage).
6. Observe original lead dress. Always inspect in all areas for pinched, out-of-face, or frayed wiring. Do not change spacing between components, and between components and the printed-circuit board. Check AC power cord for damage. Take extra care to assure correct lead dress in the following areas:
   a) near sharp edges
   b) near thermally hot parts - be sure that leads and components do not touch thermally hot parts
   c) the AC supply
   d) high voltage
7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.
8. PRODUCT SAFETY NOTICE - Many electrical and mechanical parts have special safety-related characteristics some of which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part in BARCO service data parts list might create shock, fire, and/or other hazards. Product Safety is under review continuously and new instructions are issued whenever appropriate. For the latest information, always consult the appropriate current BARCO service literature.
9. Do not spray chemical on or near this instrument or any of its assemblies.
10. Electrostatically Sensitive (ES) Devices Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity:
    a) Immediately before handling any semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available high impedance discharging wrist strap device.
    b) After removing an electrical assembly equipped with ES devices, place the assembly on a static dissipative surface such as a 3M No 8210 table mat, to prevent electrostatic charge buildup or exposure of the assembly.
    c) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
    d) Do not remove a replacement ES device from its protective package until immediately before you are ready to install it (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminium foil or comparable conductive material).
    e) Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed. CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
    f) Minimize bodily motions when handling unpacked replacement ES devices (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

2. GENERAL

About this chapter

This chapter contains some general information on projector level such as the location of the main components, internal wiring diagram, spare parts list, etc.

Overview

- Convention projector orientation
- Location of the main components of the projector
- About the Projector Status Light
- Projector block diagrams
- Spare parts for DP2K-15C/DP2K-20C/DP2K-18Cx

2.1 Convention projector orientation

Convention

This manual refer to the left side of the projector as the side at your left hand when standing behind the projector and looking at the projection screen in front of the projector.

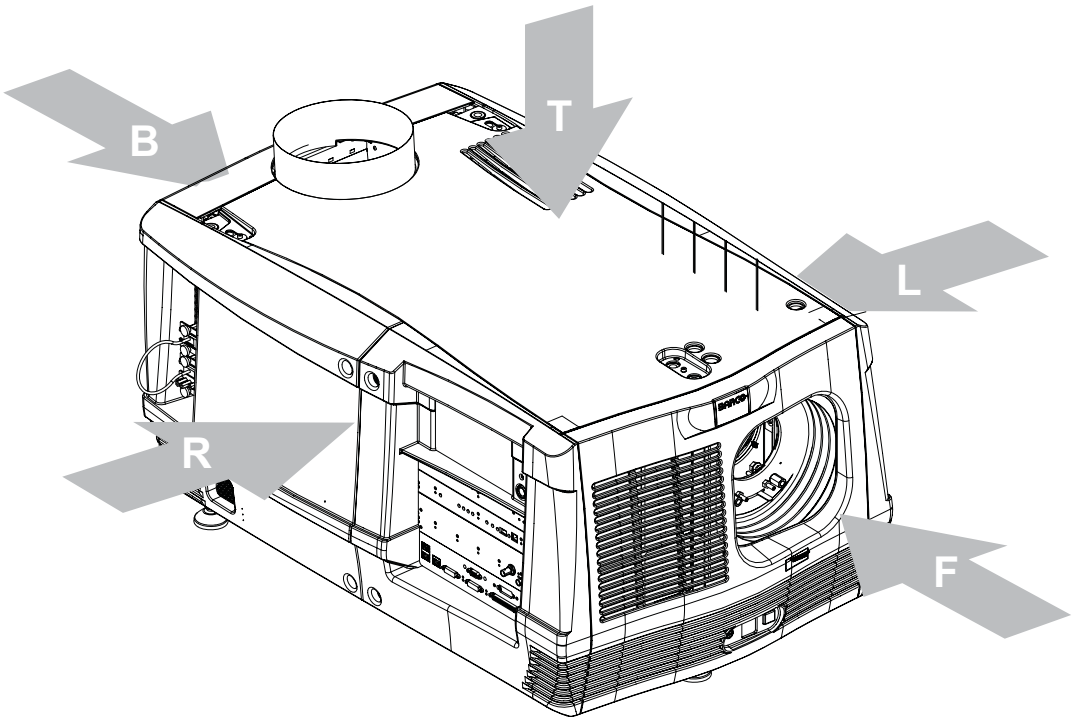


Image 2-1
T Top of the projector.
L Left side of the projector (Light Processor side).
F Front of the projector.
R Right side of the projector (Lamp side & Input side).
B Back side of the projector.

2.2 Location of the main components of the projector

Housing and air inlet filters

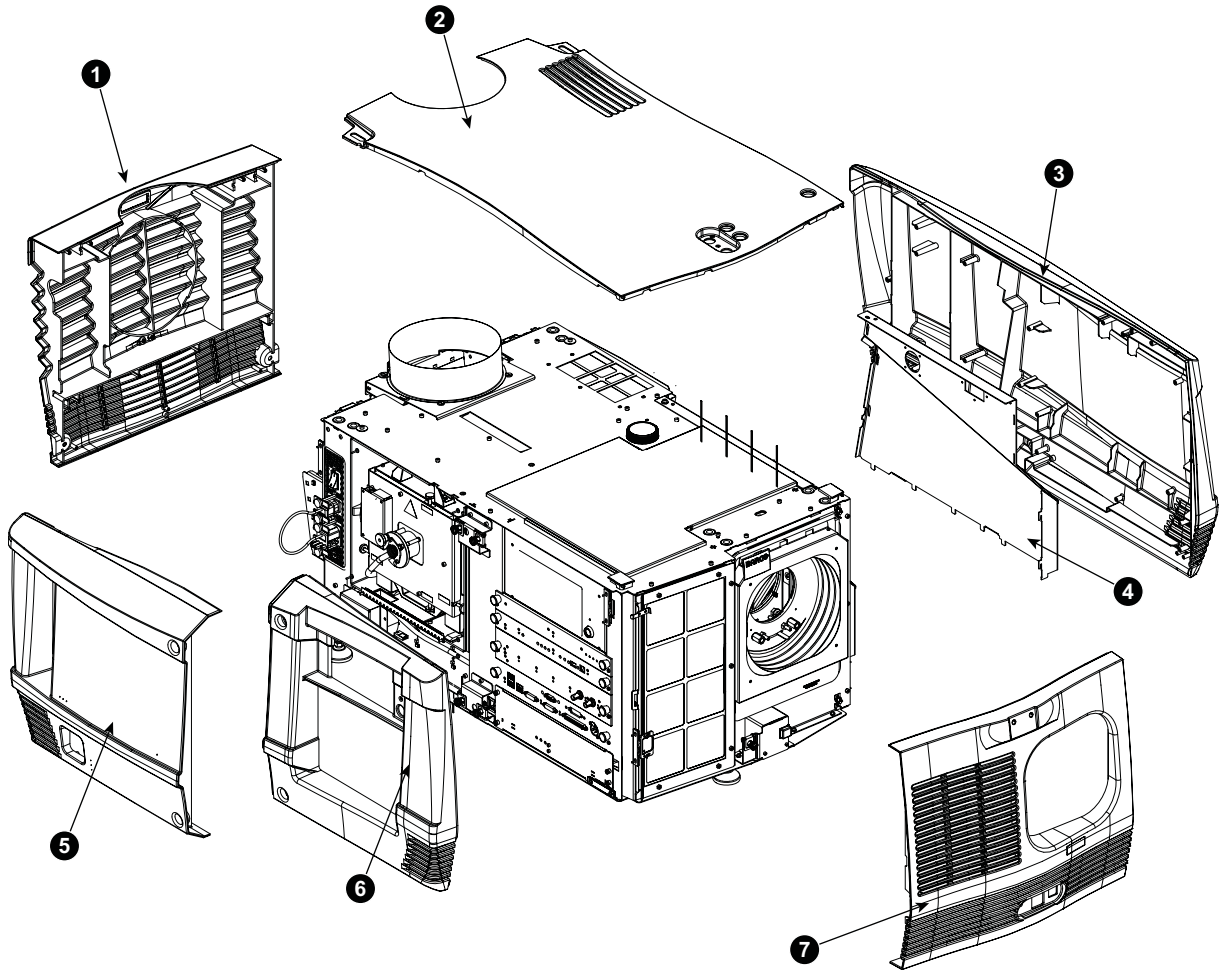


Image 2-2
1 Rear cover.
2 Top cover.
3 Left cover (Light Processor side).
4 Sealed compartment cover (Light processor side)
5 Lamp cover.
6 Input cover (Input & Communication unit).
7 Front cover.

Main internal components

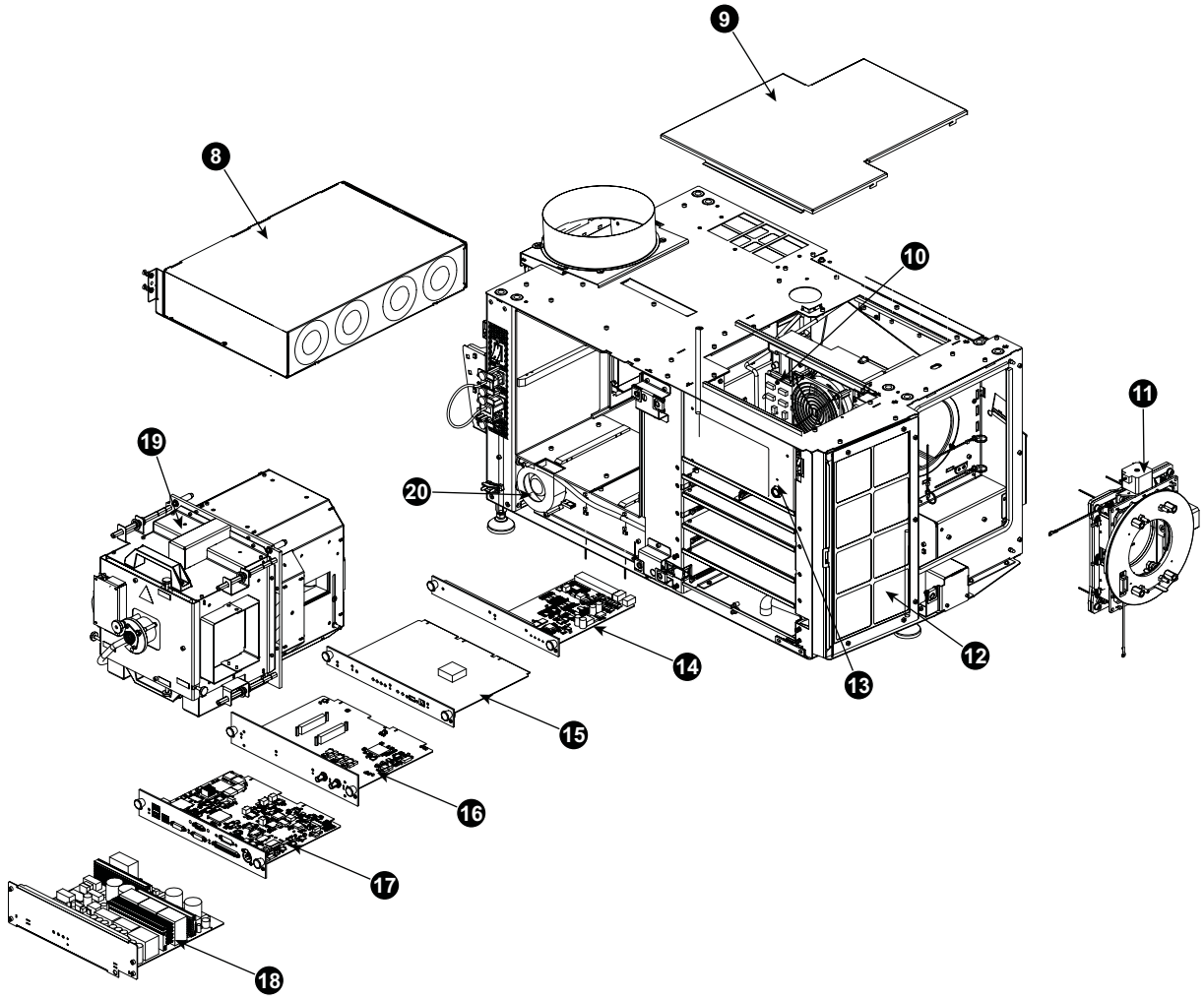


Image 2-3
8 Lamp Power Supply (LPS)
9 Convergence cover plate
10 Backplane + light processor compartment fan
11 Lens holder assembly
12 Front dust filter (cleanable)
13 Button panel
14 Fan controller board
15 Integrated Cinema Processor board (ICP)
16 HDSDI board or Mediablock
17 Cinema controller board
18 Switched mode power supply board
19 Lamp house

20 Lamp info module fan

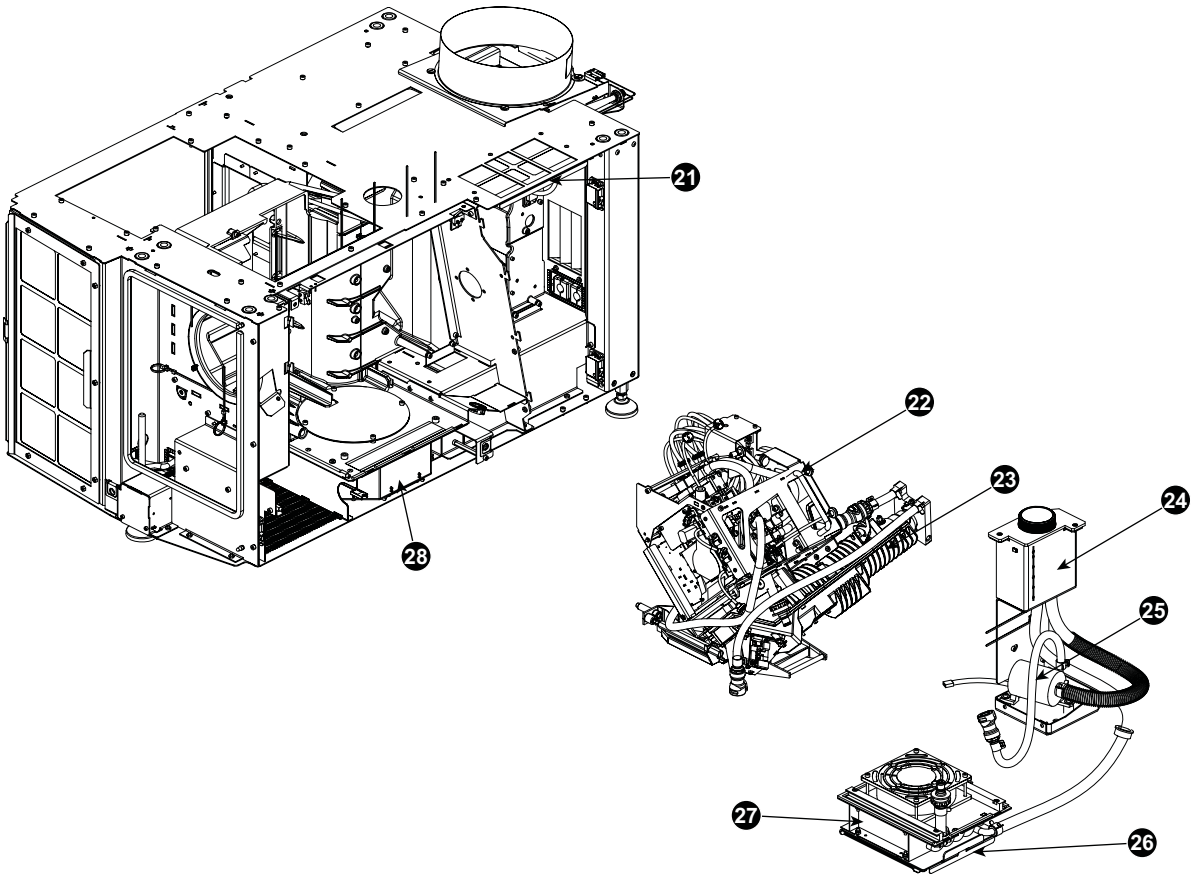


Image 2-4
21 Dust filter cold mirror
22 Light processor (assembly)
23 Light pipe
24 Water cooling circuit (reservoir)
25 Water cooling pump
26 Dust filter heat exchanger
27 Heat exchanger

28 Anode fan assembly

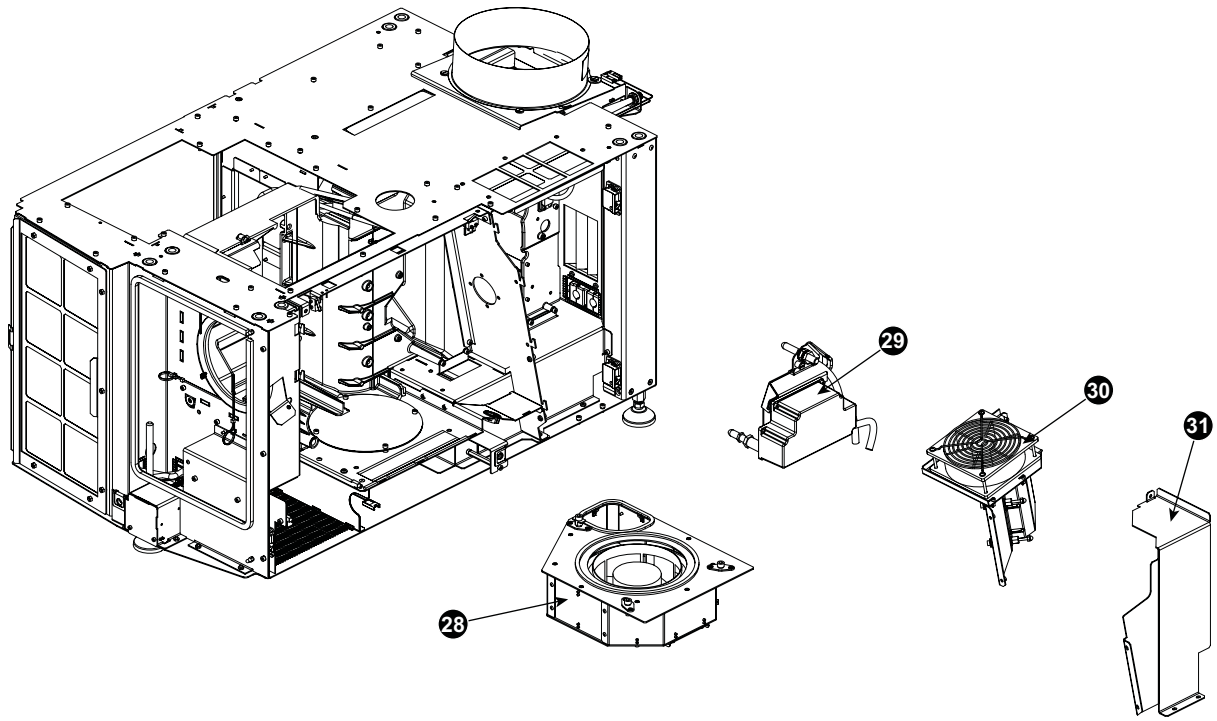


Image 2-5
28 Anode fan assembly
29 Start pulse generator (SPG)
30 Cold mirror assembly
31 SPG cover plate

2.3 About the Projector Status Light

Overview

The projector status light can have 4 colors:

Flashing green	Projector is booting up.
Green	Projector is running normal.
Yellow	Projector is running with warnings. Event can go on but a technical intervention will be necessary in the near future to prevent a complete stop of the projector.
Red	Projector is in error state. Problem could prevent normal operation. Solve the problem before continuing with the projector.
Blue	Projector runs in notification state. Maintenance action required. Lamp run time is exceeded. New lamp must be installed.

2.4 Projector block diagrams

General block diagram

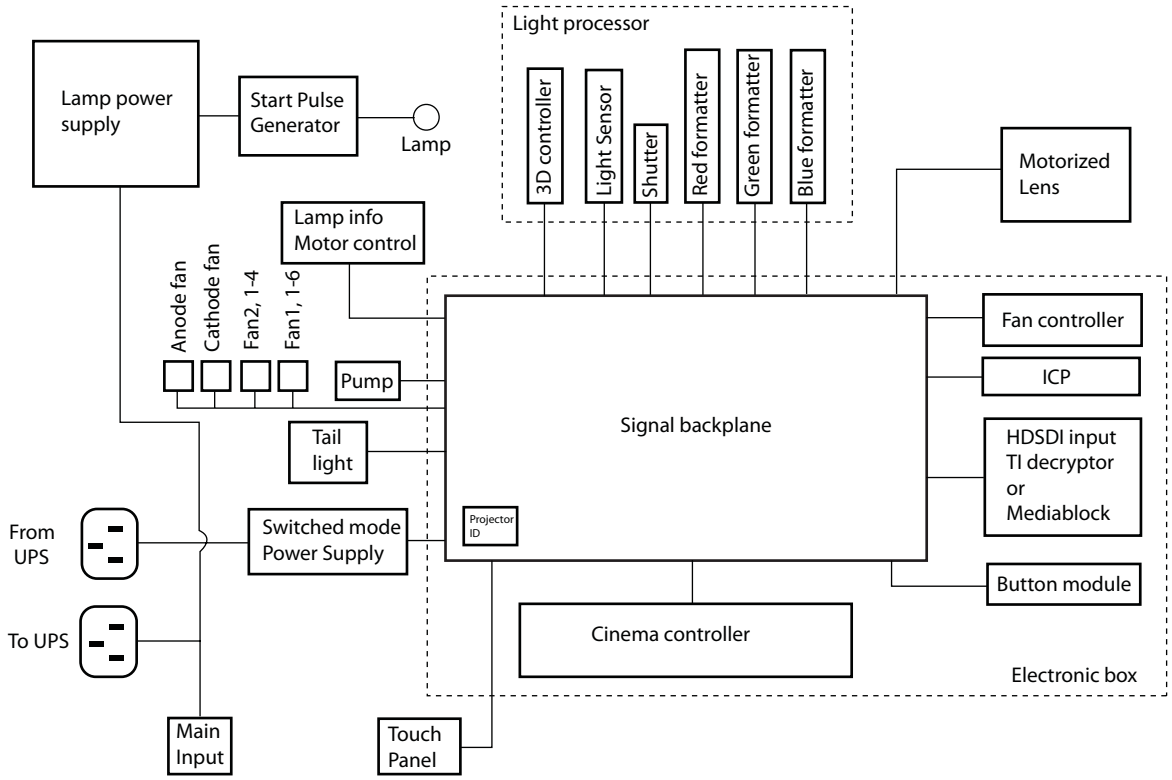


Image 2-6

Communication block diagram

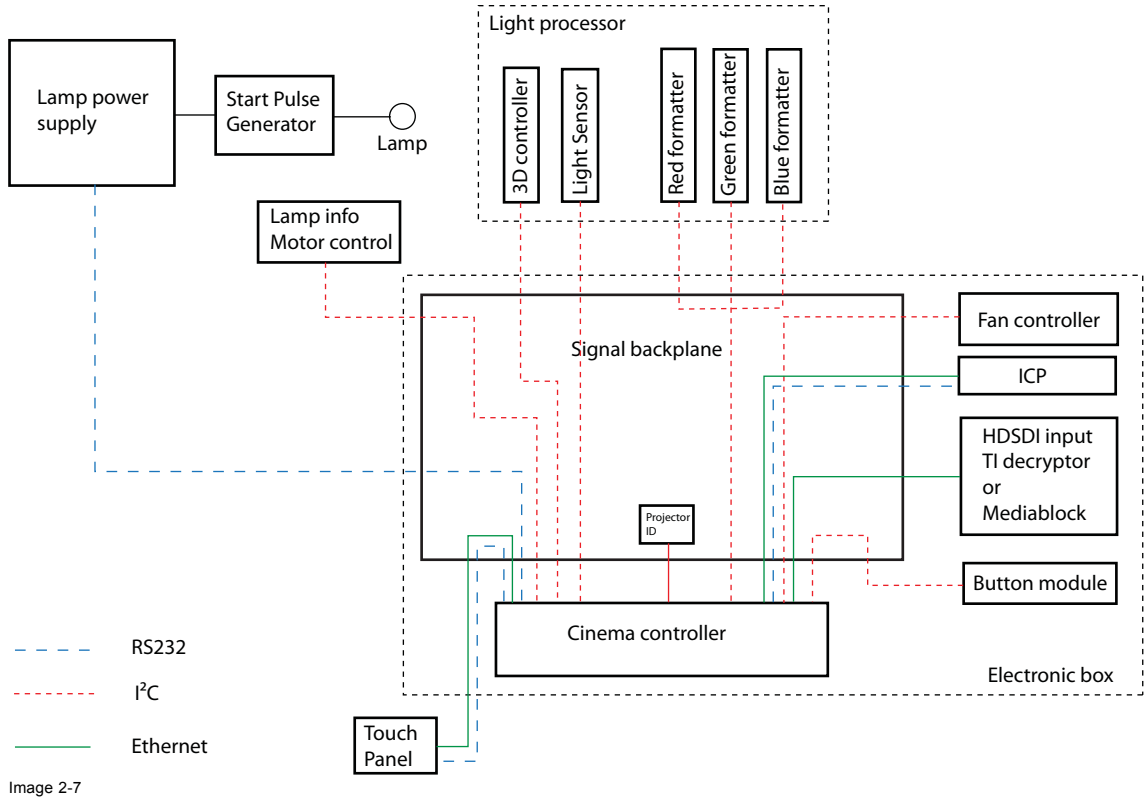


Image 2-7

- Any external command sent via Ethernet or serial will always be routed through the Cinema Controller to the Signal Backplane and then on to the end device
- Cinema Controller contains a multi port internal Ethernet router, connected to all internal Ethernet devices.
- Once the Cinema Controller receives the command, it will convert it into the necessary protocol to control the end device.
- TI controls its own devices with commands to perform functions coming from the Cinema controller or from cinema server/IMediablock.
- Decryption is handled by the Link decryptor or Mediablock.
- I²C communication between Fan Controller and Cinema Controller is used by the Fan Controller to send back error reporting to Cinema Controller
- Cinema Controller receives error reporting and sends it to the Communicator and the log files.

Video block diagram

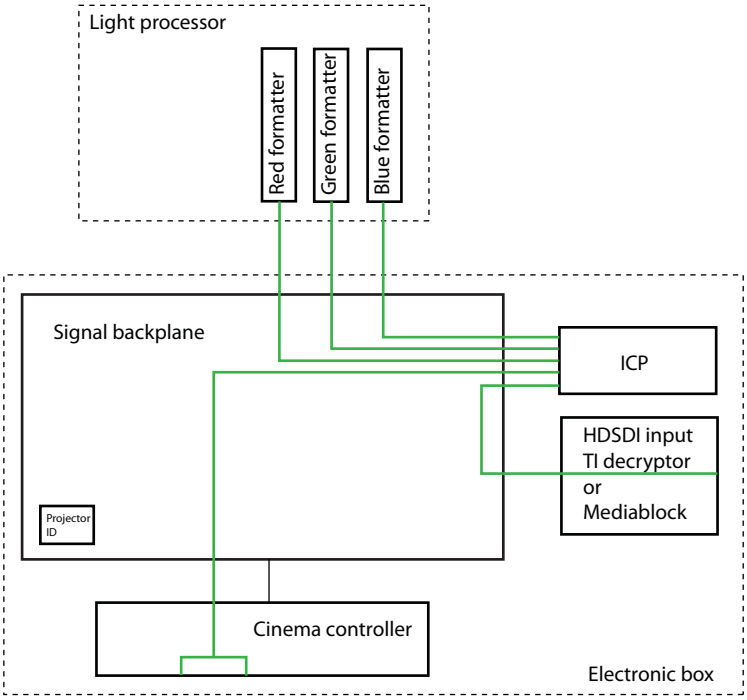


Image 2-8

The following steps happen :

- If decryption link is present; video is sent from server via HDSDI cables to the projector HDSDI board (or PCI express cable if media block is inserted).
- Video is decrypted on the Link decryptor board or Media Block and then sent to the Signal Backplane
- Video signal is sent to Integrated Cinema Processor
- ICP Board adds scaling, subtitle overlay, image cropping & applies all color correction. Also divides video signal into Red, Green and Blue signals.
- Formatter applies any 3D frame rate multiplication if needed and turns signal into pulses to drive or cycle DMD mirrors.
- DMD's are reflecting the light provided by the prism back to the prism and reflect it through the lens towards the screen.

2.5 Spare parts for DP2K-15C/DP2K-20C/DP2K-18Cx

Up to date information regarding spare parts for DP2K-15C/DP2K-20C/DP2K-18Cx

Barco continuously improves its service procedures for the customer. Managing spare parts is one of the key processes. The spare parts list is subject to change. No spare parts list is included in this manual to ensure that no spare parts are ordered based upon outdated information. Up to date information regarding spare parts, and much more, is available on Barco's web site http://www.barco.com. Go to *myBarco log in* and enter your credentials. Select your market and product and click on the product page on *Technical support*. The *Spare parts* tab becomes available.

3. PREVENTIVE MAINTENANCE ACTIONS

Maintenance program

The maintenance program is subdivided in time frames going from monthly maintenance actions which can be done by a trained projectionist to annually and 4 yearly maintenance actions which must be done by certified service personnel who are familiar with potential hazards of the product and all product safety checks.

Overview

- Monthly maintenance actions
- Lamp change maintenance actions
- Three monthly maintenance actions
- Annually maintenance actions
- 4 yearly maintenance actions

3.1 Monthly maintenance actions

MAINTENANCE TYPE A (perform every month)

The monthly maintenance actions, listed below, may be performed by a trained projectionist who is familiar with potential hazards associated with the product.

No.	Maintenance action	Remarks
1	Clean all dust filters of the projector. • dust filter at the front of the projector (electronics). • dust filter at the top of the projector (cold mirror). • dust filter at the bottom of the projector (heat exchanger).	Use a vacuum cleaner and blow away the remaining dust away with compressed air in another room. Take care of orientation when reinstalling the cleaned filters. Frequency at which filters should be replaced is dependant on environmental conditions and the way they can be cleaned. Replace damaged filters immediately. Front dust filter, "Removing the front dust filter", page 405 , cold mirror filter, "Clean the dust filter on the top side", page 408 , heat exchanger filter, "Clean the dust filter on the bottom side", page 407.
2	Check the surface of the lens output side for dust. (it is not needed to remove the lens from the projector)	Clean the lens output side in case dust is clearly visible upon the surface. See "Cleaning the lens", page 248. Note that if the lens was removed from the projector, a home and return must be executed. See user guide of the Communicator software.
3	Check the porthole (both sides) for dust.	Clean the porthole in case dust is clearly visible upon the surface. Use an optical cloth.

3.2 Lamp change maintenance actions

Maintenance actions at every lamp change

The maintenance actions, listed below, which are required at every lamp change may be performed by a trained projectionist who is familiar with potential hazards associated with the xenon bulb lamp.

No.	Maintenance action	Remarks
1	Check the UV blocker of the lamp house for dust.	Only clean the UV blocker in case dust is clearly visible upon the surface of the UV blocker (both sides). See "Cleaning the UV blocker of the Lamp House", page 136.
2	Check the reflector of the lamp house for dust.	Only clean the reflector in case dust is clearly visible upon the surface of the reflector. Take the lamp house to another room and use compressed air to blow away the dust. See "Cleaning the UV blocker of the Lamp House", page 136.
3	Visual inspection of the lamp anode and cathode connectors of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See "Removal of the lamp house", page 110.
4	Visual inspection of the lamp anode and cathode cables of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See "Removal of the lamp house", page 110.

3.3 Three monthly maintenance actions

MAINTENANCE TYPE B (perform every three months)

The 3 monthly maintenance actions, listed below, may be performed by a trained projectionist who is familiar with potential hazards associated with the product.

No.	Maintenance action	Remarks
1	Clean the air vents/inlets of the projector: • air inlet grid of the electronic compartment (front side projector). • air inlet grid of the heat exchanger (bottom side projector).	Use a vacuum cleaner.
2	Clean the cabinet of the projector. (Removal overall dust accumulation on projector covers)	See cleaning procedure "Cleaning the exterior of the projector", page 404.
3	Check cooling liquid level at cooling reservoir	Start refill procedure when level is below **Min** or almost at **Min**. See "Check cooling liquid level", page 220. If the liquid level is too low, the maintenance/repair should be performed by a service technician.
4	Verify the internal clock of the ICMP with a real time clock. Correct if needed.	See user guide of Communicator for detailed instructions.

3.4 Annually maintenance actions

MAINTENANCE TYPE C (perform every year)

The yearly maintenance actions, listed below, may ONLY be performed by certified service personnel who are familiar with potential hazards of the product and all product safety checks.

No.	Component	Maintenance action	Remarks
1	**Dust in general**	Clean the metal mesh grid of the anode fan (inside sealed compartment).	Use a vacuum cleaner and brush.
2	**Dust in general**	Remove all dust inside the lamp compartment.	Use a vacuum cleaner. Do NOT touch the cold mirror.
3	**Dust in general**	Check the cold mirror for dust, burn damage, degradation, cracks, etc.	Only clean the cold mirror in case dust is clearly visible upon the surface of the cold mirror. Replace the cold mirror in case of burn damage, degradation, cracks, etc. See "Cold mirror assembly", page 137.
4	**Dust in general**	Check the mask and the integrator entry for burn damage, degradation, cracks, etc. Remove the lamp house and look at the mask and integrator entry via the cold mirror.	Replace the integration rod and mask in case of burn damage, degradation, cracks, etc. See "Removal of the integrator rod", page 210.
5	**Dust in general**	Open the dowser (shutter) and check the prism exit side for dust, discoloration, damage, degradation, cracks, etc.	Only clean the prism exit side in case dust is clearly visible upon the surface of prism. See "Cleaning the Prism exit side", page 185. Replace the complete Light Processor Unit in case of degradation, cracks, etc. See "Light Processor assembly", page 161.
6	**Dust in general**	Check the porthole (both sides) for dust.	Only clean the porthole in case dust is clearly visible upon the surface. Use an optical cloth.
7	**Dust in general**	Clean the projector exterior (housing). Report on cleanliness of booth!	See cleaning procedure
8	**Dust in general**	Check the condition (hot state) of the light pipe and prism by looking for artifacts in the projected full white and full black patterns.	If artifacts are visible diagnose the integration rod. See "Rod diagnostic", page 209. Replace the integration rod In case the integration rod causes the artifacts. See "Removal of the integrator rod", page 210. Replace the complete Light Processor Unit in case the prism causes the artifacts. See "Light Processor assembly", page 161.
9	**Diagnostics**	Check actual diagnostics after 1 hour play with black image. See user guide of the Communicator software.	Note any irregularities and follow up. Take the necessary measurements if required.
10	**Diagnostics**	Run self tests. See user guide of the Communicator software	Note any irregularities and follow up. Take the necessary measurements if required.
11	**Diagnostics**	Create a diagnostic package and check the log files inside the package.	Use the diagnostic package reader and note any irregularity.
12	**Diagnostics**	Verify Link Decryptor clock. Time must be set to UTC/GMT time	Only a deviation of 15 minutes is allowed. See Communicator software.
13	**Software version**	Check for the latest version of Barco and TI software. See user guide of the Communicator software. The latest software version can be downloaded from the secured Barco web site.	Upgrade the projector software with the latest version. See user guide of the projector toolset.
14	**Info-T's**	Check if all Info-T's are implemented. Note that the Info-T's are listed on the secured Barco web site.	If not, implement all Info-T's and update the projector service docket.
15	**Cooling circuit**	Check the condition of the tubing of the liquid cooling circuit for degradation, UV cracking, kinking of tubes, leakage.	Replace damaged parts immediately. See "Liquid cooling circuit", page 219.

No.	Component	Maintenance action	Remarks
16	**Cooling circuit**	Replace the liquid of the cooling circuit. (drain, refill, expel air)	See chapter "Liquid cooling circuit", page 219.
18	**Electrical connections**	Check the torque values/general condition of all critical electrical connections and components. Use a torque wrench to verify the torque values of the critical electrical connections listed: • Nuts (x2) of the SPG socket inside the lamp house: 9 Nm. • Cathode cable nut for the lamp cathode socket: 17Nm • Hexagon socket head cap screw at the lamp cathode socket : 2,5 Nm. • Nuts (x4) of the LAMP OUT ports of the LPS unit: 4 Nm	Do not release the nuts to check the torque. Just verify.
19	**Lamp Module**	Check the UV blocker of the lamp house for dust, burn damage, degradation, cracks, etc. Note that in case of a passive 3D projection system the UV blocker has an adapted 3D coating.	Only clean the UV blocker in case dust is clearly visible upon the surface of the UV blocker (both sides). See page 136. Replace the UV blocker in case of burn damage, degradation, cracks, etc. See "Replacement of the UV blocker", page 129.
20	**Lamp Module**	Check the reflector of the lamp house for dust, degradation, cracks, etc.	Only clean the reflector in case dust is clearly visible upon the surface of the reflector. Take the lamp house to another room and use compressed air to blow away the dust from the reflector. See page 136. Replace the reflector in case of burn damage, degradation, cracks, etc. See "Replacement of the lamp reflector", page 132.
21	**Lamp Module**	Visual inspection of the lamp anode and cathode connectors of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See "Removal of the lamp house", page 110.
22	**Lamp Module**	Visual inspection of the lamp anode and cathode cables of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See "Removal of the lamp house", page 110.
23	**Lamp Module**	Check motors (motorized lamp house) and manual adjustments. Lubricate if needed.	
24	**Lamp Module**	Check the positional integrity of automatic lamp alignment/CLO.	Perform auto alignment. Manual adjustment afterwards should not improve light output.
25	**Lens holder**	Check the lens holder shift functionality (up/down & left/right). Lubricate where needed.	Use the local keypad and the Communicator software to shift.
26	**Lens holder**	Check the positional integrity of motorized adjustments by switching Macro's.	Verify correct alignment on screen between flat and scope.
27	**Lens holder**	Check the focus uniformity.	Adjust the lens holder (Scheimpflug) ONLY if needed. See "Scheimpflug adjustment", page 255.
28	**Lens**	Check the optic surfaces of the lens input and output for dust.	Only clean the input and/or output side in case dust is clearly visible upon the surfaces. Use an optical cloth. Note that a lens removal requires a home and return action. See user guide of the Communicator software.
29	**Lens**	Check the lens Zoom & Focus motors.	Use the local keypad and the Communicator software to Zoom and to Focus.
30	**Shutter**	Check the functionality of the Dowser (shutter). Loose components, wear and tear.	Use the local keypad and the Communicator software to Open and Close the shutter. Replace the dowser (shutter) if needed. See "Replacement of the dowser (shutter)", page 178.
31	**3D color wheel**	Check the 3D color wheel for degradation of coatings/condition of glass segments.	Replace the 3D color wheel assembly. See "3D color wheel", page 149.

No.	Component	Maintenance action	Remarks
32	**3D color wheel**	Check the spinning motor and retraction mechanism of the 3D color wheel assembly.	Wheel must turn before inserted into light path.
33	**3D color wheel**	Check the calibration of the 3D color wheel	Calibrate if required. See Communicator software.
34	**Electronic boards**	Check the general condition of the electronic boards: Status LED's, dust, connections, etc. Boards to check: LPS, SMPS, Fan Control Board, ICP Board, Cinema Controller Board, HD-SDI Board	Blow out dust.
35	**Security**	Check the Tamper Switch Activation Report and Security Logs for security infringements.	Report if intruded.
36	**Security**	Verify if the Dallas key is present and working.	Report if missing, lost or damaged.
37	**Air Extraction**	Check customer air extraction system for adequate extraction.	The air extraction system must be capable of removing minimum 6,65 m^3/min or 235 CFM per installed DP2K-15C/DP2K-20C/DP2K-18Cx digital projector. This must be measured at EACH individual projector head exhaust stack.
38	**Documentation**	Check if the projector manuals are present and up-to-date.	Download current manual version from www.My.Barco.com.
39	**Documentation**	Update projector service docket.	List all maintenance actions and remarks.

3.5 4 yearly maintenance actions

MAINTENANCE TYPE D (perform every four years)

The 4 yearly maintenance actions, listed below, may ONLY be performed by certified service personnel who are familiar with potential hazards of the product and all product safety checks.

No.	Maintenance action	Remarks
1	Replace the pump of the liquid cooling circuit	
2	Check the lamp fans: vibrations, noise, speed, etc. (speeds: via diagnostics)	Replace if needed. See "Fan replacement procedures", page 379.

4. TROUBLESHOOTING

About this chapter

This chapter enumerates all possible error codes which can appear on the Touch Panel display of the cinema projector or in the projector log files. Note that some codes have a warning and an error state. Some only have an error state, others have only a warning state. In case of a “warning” the projector remains to operate. Nevertheless, it is recommended to solve the problem which causing the “warning” as soon as possible otherwise, the “warning” state may turn into an “error” state which will switch off the projector consequently.

The codes are placed in ascending order to make it easier to look up the code and find an appropriate solution.

4.1 Troubleshooting checklist

Code 5003: “light sensor - no communication” (Error)

Situation	Solution
No communication with the Light Sensor Module (CLO).	1. Reboot the projector: a) Turn off the Lamp and cool down the Lamp for at least 1 minute if hot. b) Switch off the power of the unit and wait for at least 15 seconds. c) Switch on the power of the unit and respect normal startup procedure. 2. Check if the wire unit (reference 1 of image 4-1) is connected with the CLO module and with the Signal Backplane. **Note**: To access the Signal Backplane the top cover of the Card Cage has to be removed. Removing the top cover will lead to an authorization request upon startup. 3. If the problem remains, replace the CLO module. See chapter "Replacement of the Lamp Info module", page 127.

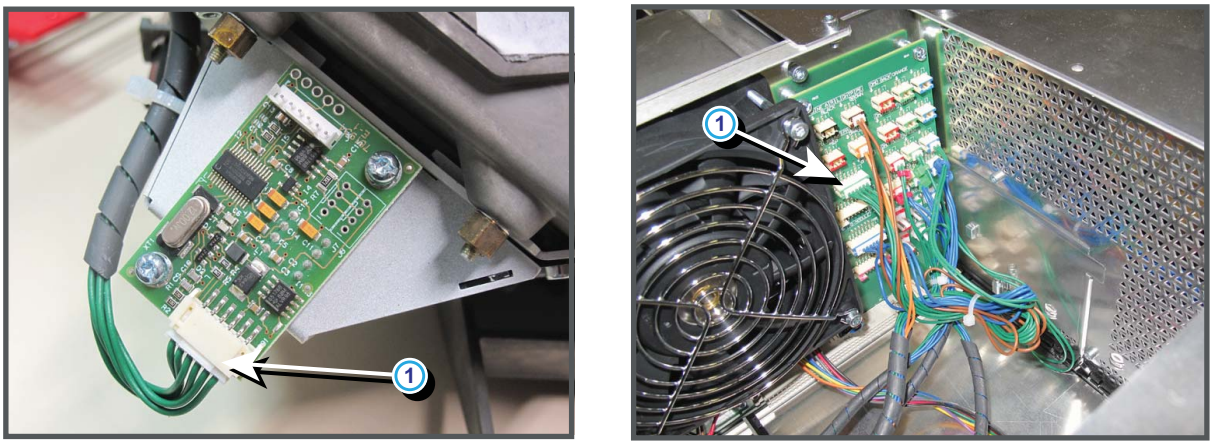


Image 4-1

Code 5004: “lamp - no communication” (Error)

Situation	Solution
Lamp House is not correctly installed.	Check if the Lamp House is properly installed. Ensure that the three fixation screws (reference 2 of image 4-2) of the Lamp House are fastened.
Wrong Lamp House detected in lamp compartment of the projector.	Replace the Lamp House with a compatible Lamp House for this projector.
No communication with the Lamp House.	1. Check if the blue socket (reference 3 of image 4-3) of the Lamp House is not damaged. 2. Check if the blue socket (reference 4 of image 4-3) in the lamp compartment is not damaged (front side and back side). 3. Check if the wire unit (reference 5 of image 4-3) is connected with the blue socket in the lamp compartment and is plugged in its socket on the Signal Backplane (reference 6 image 4-3). 4. Replace the Integrated Cinema Controller board. See "Removing a board in the card cage", page 277 5. Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

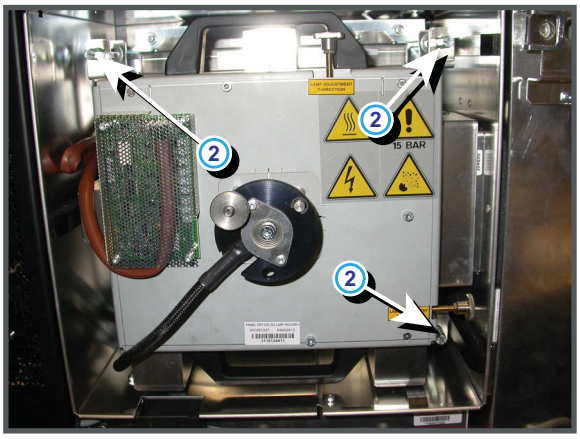


Image 4-2
Lamp fixation

2 Lamp House fixation screws.

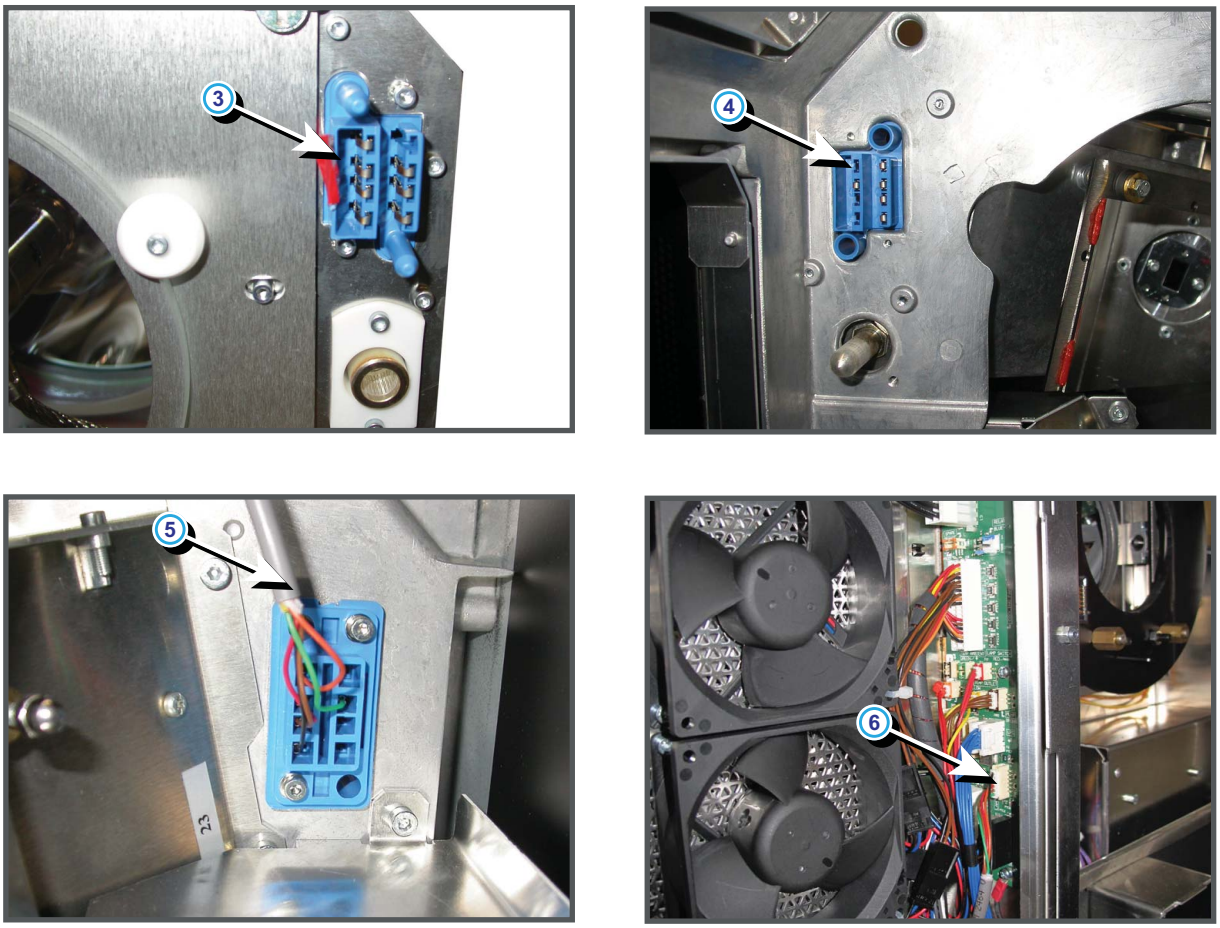


Image 4-3
Lamp connections

3 Blue socket connection Lamp Info Module of the Lamp House.
4 Blue socket inside Lamp compartment (front view).
5 Wire unit for connection with blue socket (back side).
6 Lamp info module cable connection to signal backplane

Code 5005: “lamp power supplies - communication failed” (Error)

Situation	Solution
LPS communication cable disconnected from the CTLB-IN port of the first LPS unit in the LPS rack.	Check if the LPS communication cable (reference 4 of image 4-4) is connected with the CTLB-IN port of the first LPS unit in the LPS rack of the projector.

Situation	Solution
Disconnected blue LPS cascade wire unit (CTLB-IN / CTLB-OUT).	Reconnect the blue wire unit (reference 5 image 4-4) between the “CTLB-IN” and “CTLB-OUT” sockets of the LPS units.
LPS communication cable disconnected form the Signal Backplane.	Check if the LPS communication cable (reference 7) of image 4-5) is connected with the Signal Backplane.
Malfunction of one of the LPS modules. The red LED “ERR” of the malfunction LPS module lit up.	Replace the malfunction LPS unit. See chapter "Lamp power supply", page 347.

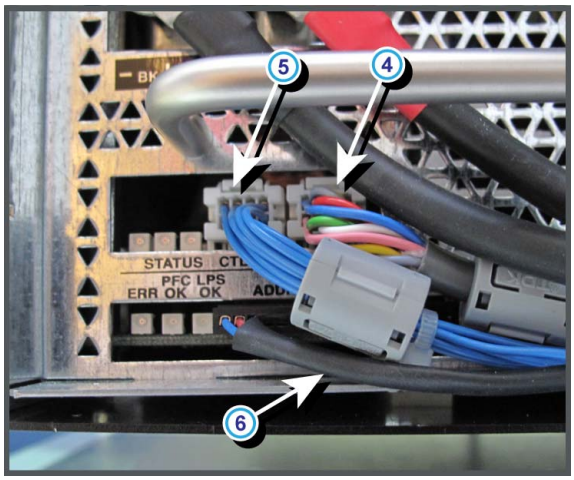


Image 4-4
Data connection LPS side

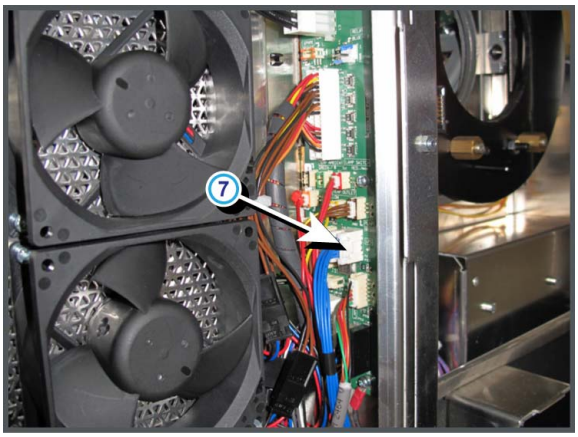


Image 4-5
LPS data connection Signal backplane

Code 5010: “pump - refill mode is on” (Warning)

Situation	Solution
The projector is in “Refill mode”. Only the pump of the liquid cooling circuit is working.	When cooling liquid refreshing is finished, tip on “Exit refill mode” in the Communicator software.

Code 5020: “system - read projector identification failed” (Error)

Situation	Solution
Cinema Controller failure.	Re-seat/replace the Cinema Controller board.
Corrupt or invalid Projector ID card (reference 1 of image 4-6)	Contact Barco for further actions.

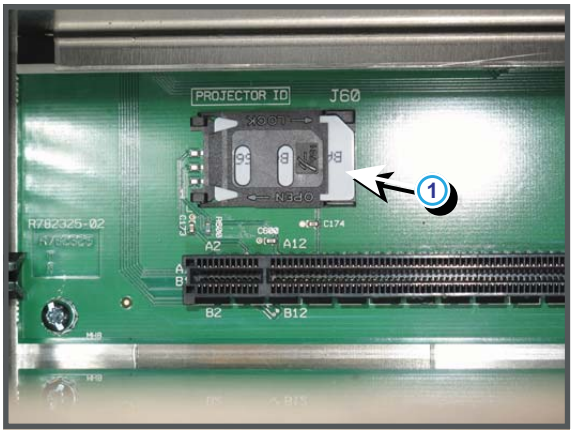


Image 4-6
Projector identification

Code 5042: “cold mirror fan - speed too low” (Error)

Situation	Solution
Wire unit (reference 1 image 4-7) of the Cold Mirror fan (reference 2 image 4-7) disconnected.	Remove the left cover of the projector and check the connection of the wire unit of the fan below the Cold Mirror.
Wire unit of the fan units (reference 5 image 4-7) disconnected from the Signal Backplane.	Remove the front cover and front dust filter from the projector and check if the wire unit (reference 5 image 4-7) is inserted in the Signal Backplane.
Blocked fan (reference 2 image 4-7).	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire unit.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Fan end of life.	Replace the fan. See chapter "Cold mirror fan", page 399.

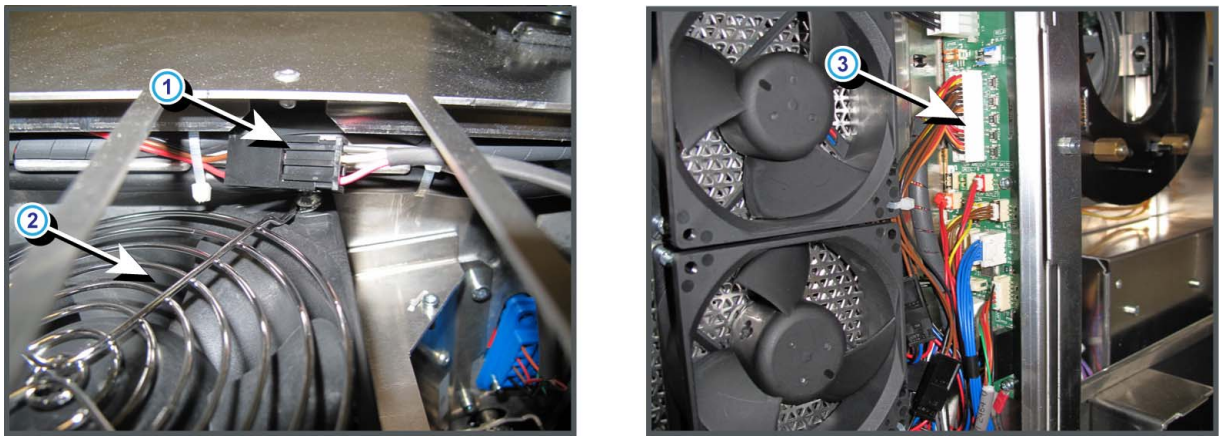


Image 4-7
Cold mirror fan connection

Code 5043: “cold mirror fan - speed low” (Warning)

Situation	Solution
Blocked fan (reference 2 image 4-7).	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire unit.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Fan end of life.	Replace the fan. See chapter "Cold mirror fan", page 399.

Code 5053: “engine fan - speed low ” (Warning)

Situation	Solution
Blocked fan (reference 1 image 4-8).	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire unit.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Fan end of life.	Replace the fan. See chapter "Light processor compartment fan", page 384.

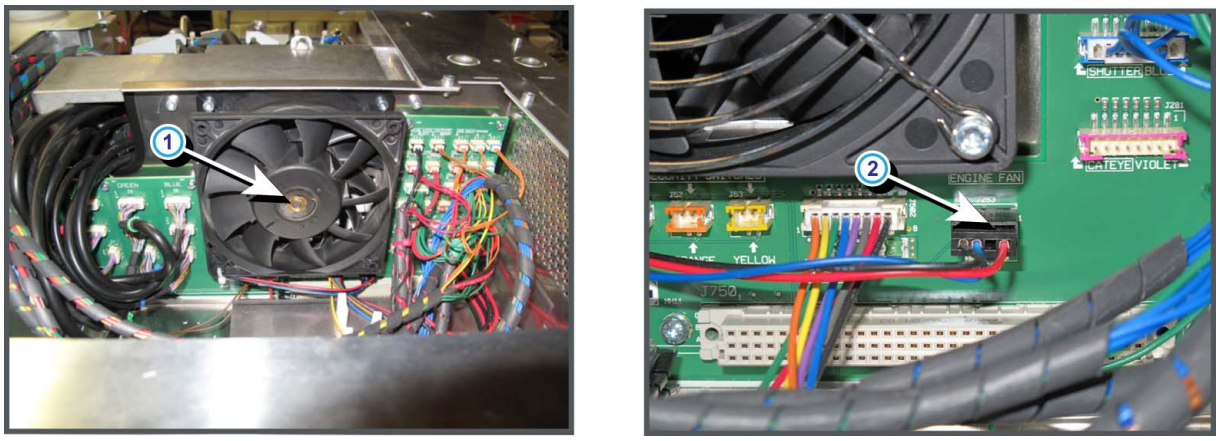


Image 4-8
Light processor compartment fan

Code 5063: “heat exchanger fan - speed low” (Warning)

Situation	Solution
Blocked fan (reference 1image 4-9).	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire unit.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Fan end of life.	Replace the fan. See "Heat exchanger fan", page 396.

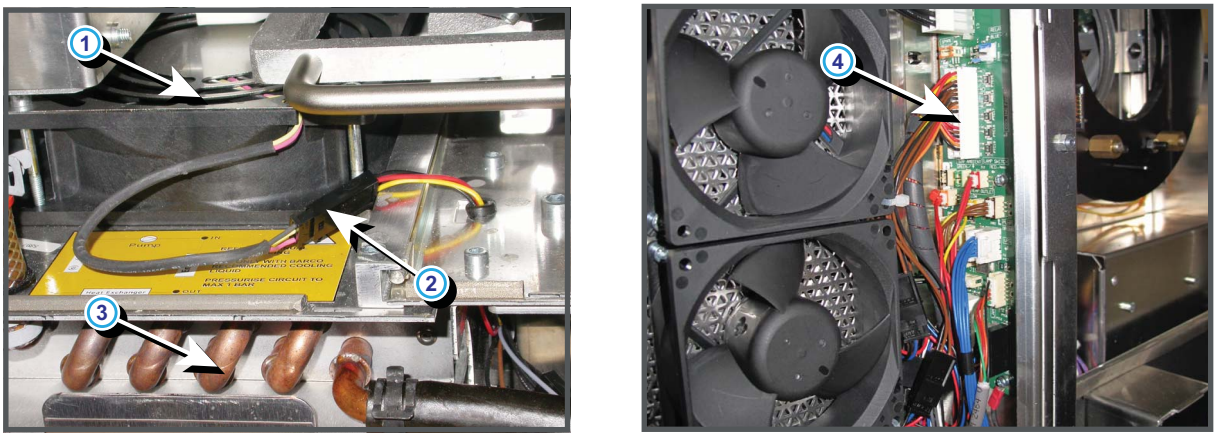


Image 4-9
Heat exchanger fan connection

Code 5072: “lamp anode fan - speed too low” (Error)

Situation	Solution
Wire unit (reference 1image 4-10) of the Anode Fan is disconnected.	Remove the left side cover of the projector and check the connection of the Anode Fan.
Wire unit (reference 3 image 4-10) of the fan units is disconnected from the Signal Backplane.	Remove the front cover and front dust filter from the projector and check if the wire unit (reference 53 image 4-10) is inserted in the Signal Backplane.
Blocked Anode Fan (reference 2 image 4-10).	Check if the Anode Fan is not blocked. Ensure that the Anode Fan can turn freely.
Damaged wire unit.	Check if the wire unit of the Anode Fan is not damaged. Repair if possible, otherwise replace with new one.

Situation	Solution
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Anode fan (reference 2 image 4-10) end of life.	Replace the Anode Fan.

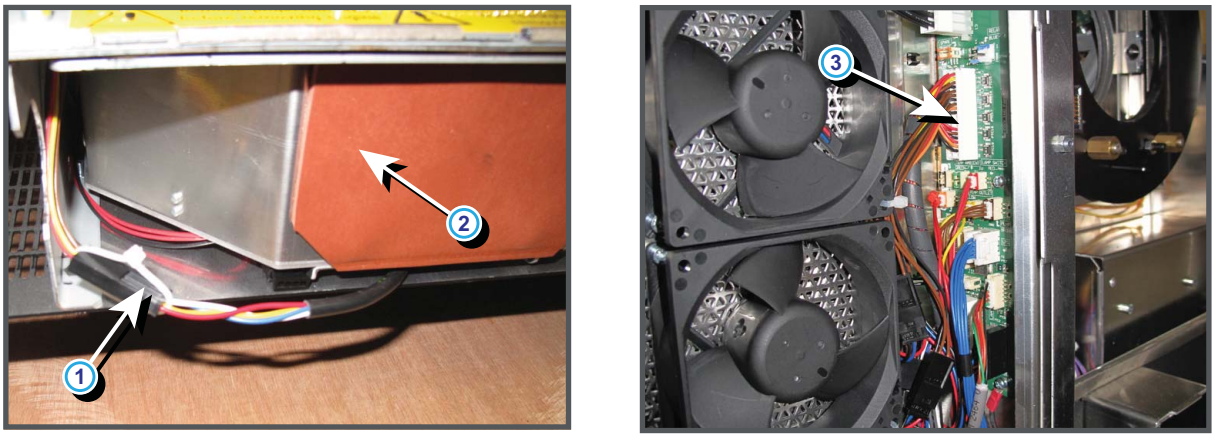


Image 4-10
Anode fan connections

Code 5073: “lamp anode fan - speed low” (Warning)

Situation	Solution
Blocked Anode Fan (reference 2 image 4-10).	Check if the Anode Fan is not blocked. Ensure that the Anode Fan can turn freely.
Damaged wire unit.	Check if the wire unit of the Anode Fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Anode fan (reference 2 image 4-10) end of life.	Replace the Anode Fan. See "Lamp anode fan", page 392.

Code 5082: “lamp cathode fan - speed too low” (Error)

Situation	Solution
Wire unit (reference 1image 4-11) of the Cathode Fan is disconnected.	Remove the left side cover of the projector and check the connection of the Cathode Fan.
Wire unit (reference 3 image 4-11) of the fan units is disconnected from the Signal Backplane.	Remove the front cover and front dust filter from the projector and check if the wire unit (reference 3 image 4-11) is inserted in the Signal Backplane.
Blocked Cathode Fan (reference 2 image 4-11).	Check if the Cathode Fan is not blocked. Ensure that the Cathode Fan can turn freely.
Damaged wire unit.	Check if the wire unit of the Cathode Fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Cathode fan (reference 1 image 4-11) end of life.	Replace the Cathode Fan. See "Lamp cathode fan", page 387.

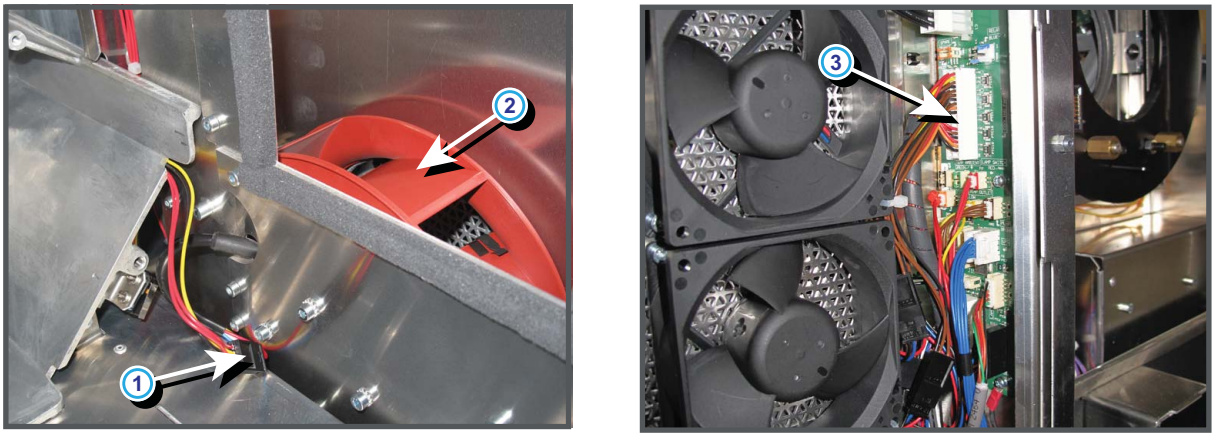


Image 4-11
Cathode fan connections

Code 5083: “lamp cathode fan - speed low” (Warning)

Situation	Solution
Blocked Cathode Fan (reference 2 image 4-11).	Check if the Cathode Fan is not blocked. Ensure that the Cathode Fan can turn freely.
Damaged wire unit.	Check if the wire unit of the Cathode Fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Cathode fan (reference 1 image 4-11) end of life.	Replace the Cathode Fan. See "Lamp cathode fan", page 387.

Code 5103: “smps fan 1 (left side) - speed low” (Warning)

Situation	Solution
Blocked fan. (reference 1 image 4-12)	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire unit. (reference 2 & 5 of image 4-12)	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "SMPS compartment fans", page 382.
Fan end of life.	Replace the fan. See "SMPS compartment fans", page 382.

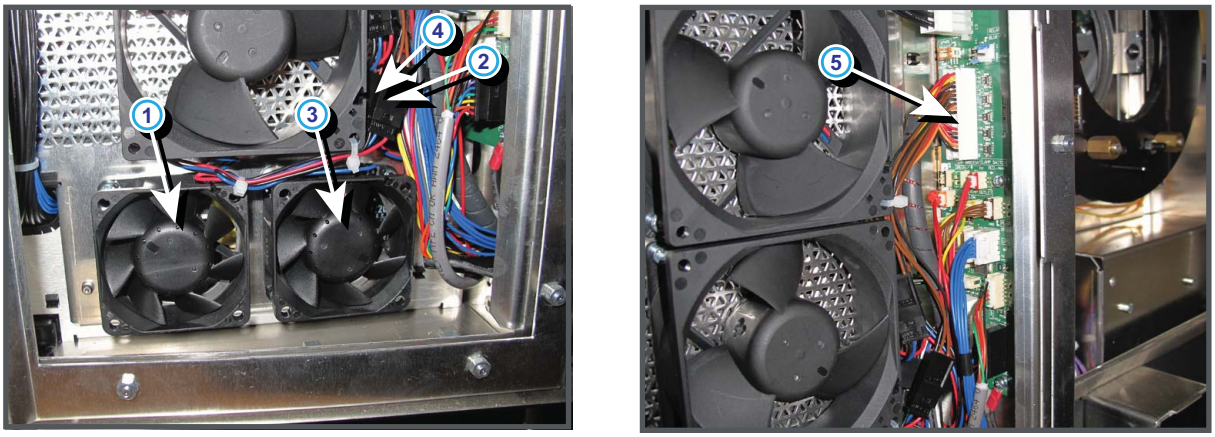


Image 4-12
SMPS fans connections

Code 5113: “smps fan 2 (right side) - speed low” (Warning)

Situation	Solution
Blocked fan. (reference 4 of image 4-12)	Unblock the fan. Ensure that the fan can turn freely.

Situation	Solution
Damaged wire unit. (reference 3 & 5 of image 4-12)	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "SMPS compartment fans", page 382.
Fan end of life.	Replace the fan. See "SMPS compartment fans", page 382.

Code 5123: “lamp rear fan - speed low” (Warning)

Situation	Solution
Blocked fan. (reference 1 image 4-13)	Unblock the fan. Ensure the fan can turn freely.
Damaged wire unit of the fan. (reference 2 & 3 image 4-13)	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Fan Control board.	Replace the Fan Control board. See "Lamp Info Module fan", page 401.
Fan end of life.	Replace the fan. See "SMPS compartment fans", page 382.

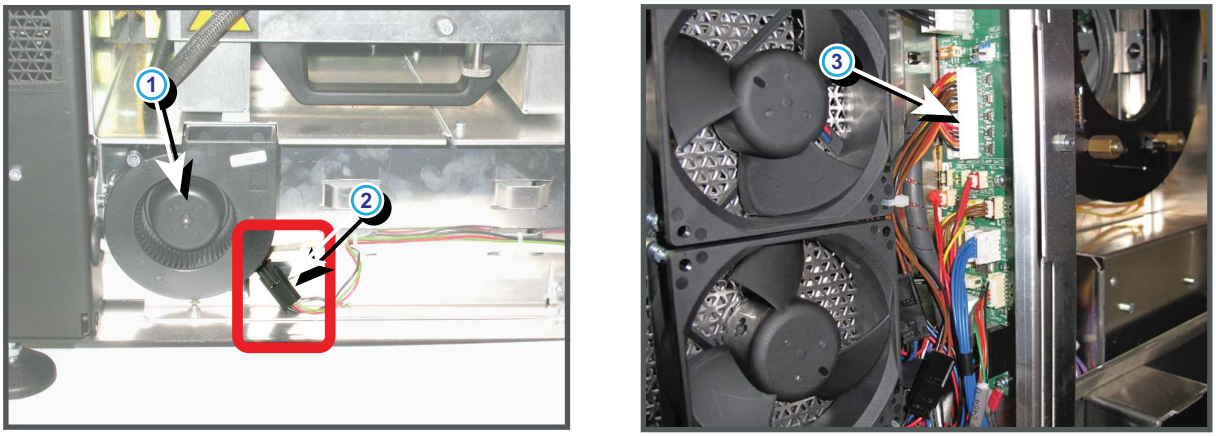


Image 4-13
Lamp rear fan connections

Code 5143: “electronics fan 1 (top side) - speed low” (Warning)

Situation	Solution
Blocked fan. (reference 1 image 4-14)	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire unit. (reference 2 & 5 of image 4-14)	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Fan end of life.	Replace the fan. See "Card cage fans", page 380.

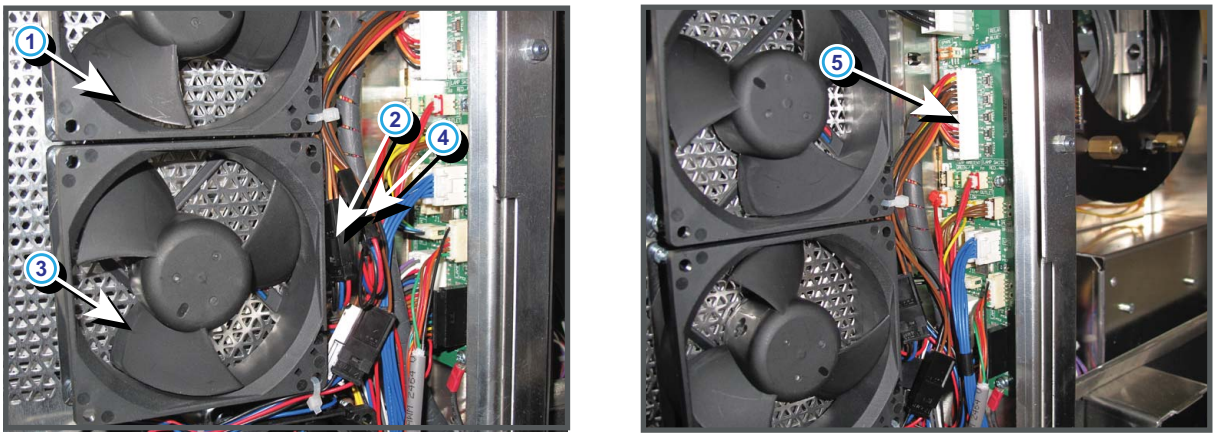


Image 4-14
Card cage fans

Code 5153: “electronics fan 2 (bottom side) - speed low” (Warning)

Situation	Solution
Blocked fan. (reference 2image 4-14)	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire unit. (reference 3 &5 of image 4-14)	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Fan end of life.	Replace the fan. See "Card cage fans", page 380.

Code 5160: “engine switch - not ok” (Error)

Situation	Solution
The Light Processor Unit is not correctly installed.	Check if the Light Processor Unit is properly installed. Ensure that both fixation screws at the foot of the Light Processor Unit are fastened.
Switch disconnected (reference 1 on image 4-15) on Signal Backplane.	Check connection of engine switch at the signal backplane, if connections are OK, measure switch at connector for continuity.
Damaged switch.	Remove the Light Processor Unit and check that switch is not damaged. The switch is located behind left hand side set pin which guides the engine into place. Replace switch if needed.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

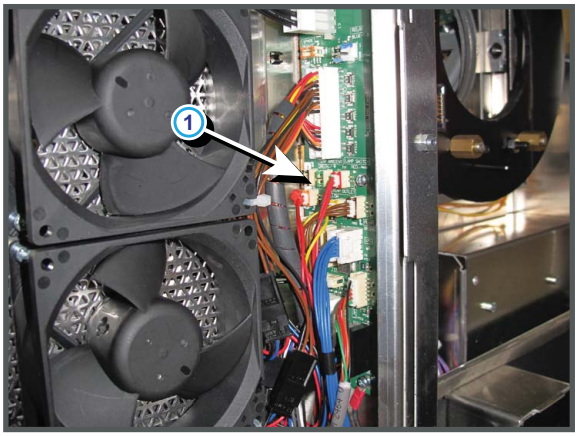
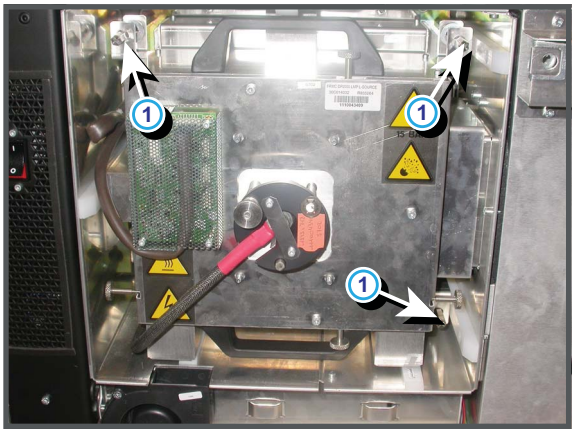


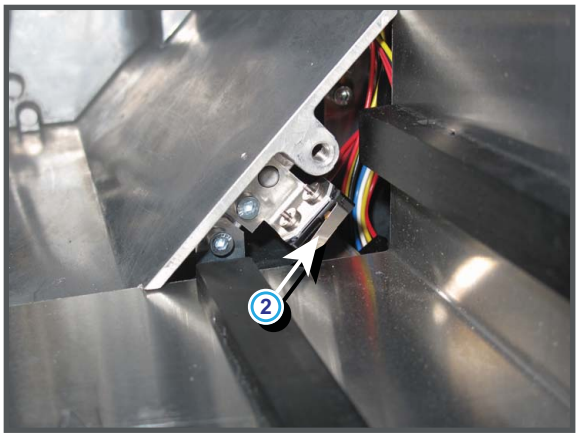
Image 4-15
Light processor switch connection

Code 5180: “lamp house - not connected” (Error)

Situation	Solution
The lamp house is not correctly installed in its compartment.	Check if the lamp house is properly installed. Ensure that the three fixation screws (reference 1 image 4-16) of the lamp house are fastened.

Situation	Solution
Switch damaged (reference 2 image 4-16).	Check lamp house detection switch for damage. The switch is located at the bottom right corner. Replace if damaged.
Switch disconnected (reference 3 image 4-16).	Check connection of lamp house detection switch at the Signal Backplane, if connections are OK then measure switch cable for continuity.





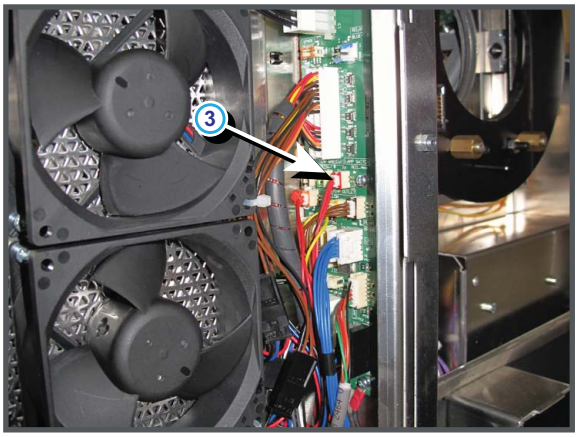


Image 4-16
Lamp house switch

Code 5191: “prism switch - warning (lens probably touches prism)” (Warning)

Situation	Solution
Lens is touching the sensor (reference PR of image 4-17) on the prism. Maximum lens shift position reached.	Shift the lens upwards and/or to the left.
Defect prism sensor.	Remove lens and reboot projector, if warning appears again then the prism sensor is defective and needs to be replaced.

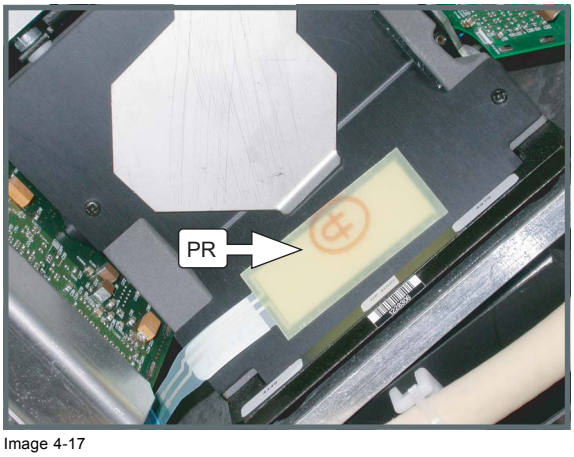


Image 4-17

PR Prism switch.

Code 5212: “pump - speed too low” (Error)

Situation	Solution
The pump of the cooling circuit is electrical disconnected.	Check if the wire unit (reference 1 image 4-18) of the pump is properly connected.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 232.
Wire unit of the pump (reference 2 image 4-18) is disconnected from the Signal Backplane.	Remove the front cover and front dust filter from the projector and check if the wire unit (reference 2 image 4-18) is inserted in the Signal Backplane.
Malfunction Fan Control board	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Pump end of life.	Replace the pump. See "Replacement of the pump motor and rotor", page 234 or "Replacement of the complete cooling pump", page 238.

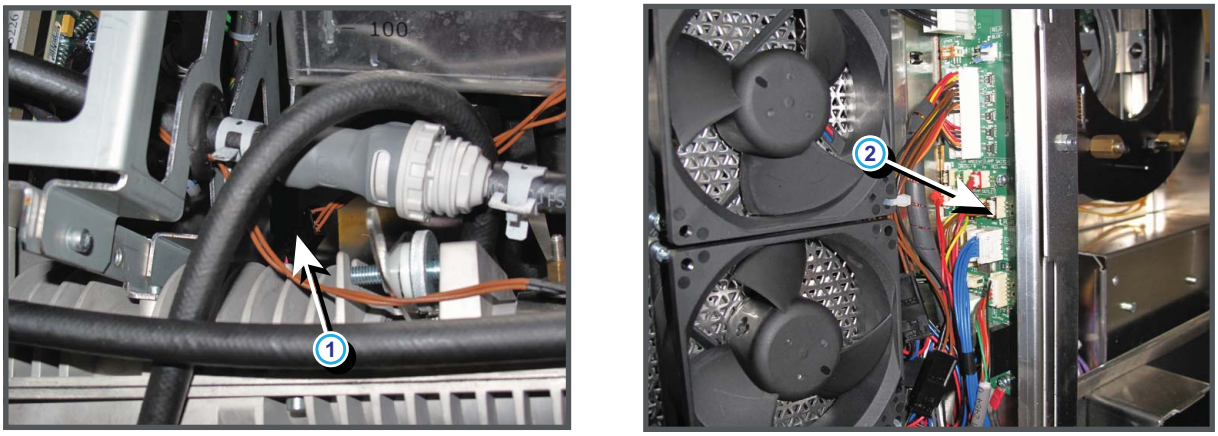


Image 4-18
Pump connection

Code 5213: “pump - speed low” (Warning)

Situation	Solution
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 232.
Malfunction Fan Control board	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Pump end of life.	Replace the pump. See "Replacement of the pump motor and rotor", page 234 or "Replacement of the complete cooling pump", page 238.

Code 5230: “lens zoom position - requested target not reached” (Warning)

Situation	Solution
Manual lens installed.	Replace the manual lens with a motorized lens.
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which corresponds with the lens file you want to activate.
Corrupt lens file.	Delete the lens file and program correct lens type into communicator under Advanced/lens parameters and recreate a new lens file. Tip: perform a “Lens Homing” before creating a new lens file. Otherwise, if the lens is removed the existing lens file becomes useless. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that the lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom.

Situation	Solution
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	Position the lens manually, or reposition the projector so that the lens position lies further away from the mechanical limits, or try to use another lens which range is more suitable. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
Disconnected wire units (reference 1 image 4-19) of the zoom motor of the motorized lens.	Remove the front cover of the projector and check if all wire units at the left bottom of the lens holder are connected.
Disconnected wire unit, of the lens zoom/shift signals, from the Signal Backplane.	Remove the front cover and front dust filter from the projector and check if the wire unit (reference 4 image 4-19) is inserted in the Signal Backplane (white plug behind blue wires).
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Malfunction zoom motor of the lens.	Use the local keypad to zoom the image on the screen. If unsuccessful, replace the motorized lens.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345.

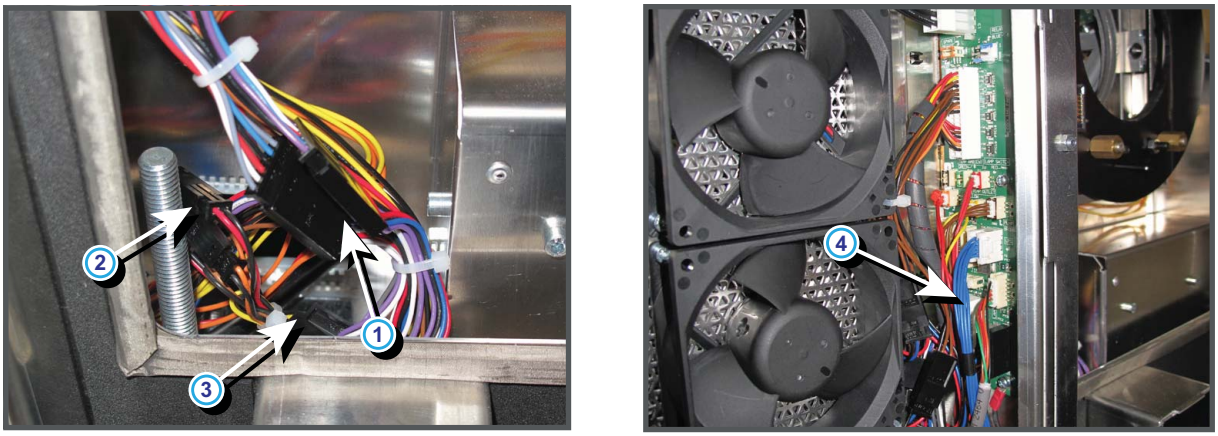


Image 4-19
Lens connections

Code 5231: “lens focus position - requested target not reached” (Warning)

Situation	Solution
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which correspond with the lens file you want to activate.
Corrupt lens file.	Delete the lens file and program correct lens type into communicator under Advanced/lens parameters and recreate a new lens file. Tip: perform a “Lens Homing” before creating a new lens file. Otherwise, if the lens is removed the existing lens file becomes useless. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that the lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom.
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	Position the lens manually, or reposition the projector so that the lens position lays further away from the mechanical limits, or try to use another lens which range is more suitable. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
Wire unit (reference 1 image 4-19) of the lens focus signals disconnected from the Signal Backplane.	Remove the front cover and front dust filter from the projector and check if the wire unit (reference 1 image 4-19) is inserted in the Signal Backplane.
Disconnected wire unit of the Signal backplane.	Remove the front cover of the projector and check if the wire unit (reference 4 image 4-19) is connected with the Signal backplane.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

Situation	Solution
Malfunction focus motor of the lens.	Use the local keypad to focus the image on the screen. If unsuccessful, replace the motorized lens.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345.

Code 5232: “lens horizontal shift position - requested target not reached” (Warning)

Situation	Solution
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which correspond with the lens file you want to activate.
Corrupt lens file.	Delete all current lens files and create new lens files. Note that each time the lens is removed new lens files has to be created. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	Position the lens manually, or reposition the projector so that the lens position lays further away from the mechanical limits, or try to use another lens which range is more suitable. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
Disconnected wire unit of the horizontal shift motor of the motorized lens holder.	Remove the front cover of the projector and check if the wire unit is connected with the shift motor. See reference 1 image 4-20.
Disconnected wire unit on the Signal Backplane	Remove the front cover of the projector and check if the wire unit (reference 2 image 4-20) is connected with the Signal backplane.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Malfunction shift motor of the motorized lens holder.	Use the local keypad to shift the image on the screen horizontally. If unsuccessful, replace the horizontal shift motor of the motorized lens holder.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane, see "Replacement of the signal back plane", page 295.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345.

Image 4-20
Horizontal lens shift connection

Code 5233: “lens vertical shift position - requested target not reached” (Warning)

Situation	Solution
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which correspond with the lens file you want to activate.

Situation	Solution
Corrupt lens file.	Delete all current lens files and create new lens files. Note that each time the lens is removed new lens files has to be created. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	Position the lens manually, or reposition the projector so that the lens position lies further away from the mechanical limits, or try to use another lens which range is more suitable. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
Disconnected wire unit of the vertical shift motor of the motorized lens holder.	Remove the front cover of the projector and check if the wire unit is connected with the shift motor. See reference 1 image 4-21.
Disconnected wire unit on the Signal Backplane	Remove the front cover of the projector and check if the wire unit (reference 2 image 4-21) is connected with the Signal backplane.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Malfunction shift motor of the motorized lens holder.	Use the local keypad to shift the image on the screen vertically. If unsuccessful, replace the vertical shift motor of the motorized lens holder.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane, see "Replacement of the signal back plane", page 295.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345.

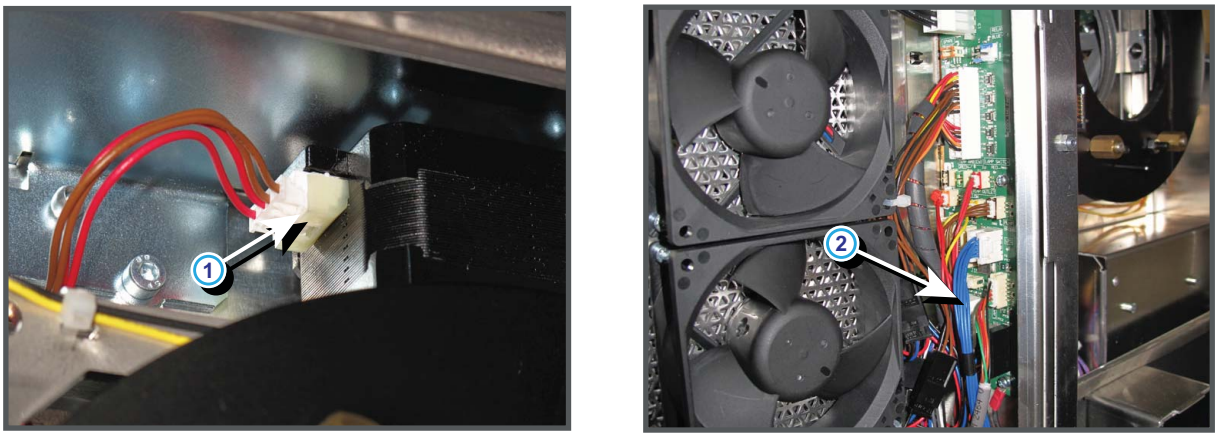


Image 4-21
Vertical lens shift connection

Code 5280: “ambient - temperature too high” (Error)

This error code is probably preceded by the warning code: ambient - temperature high”.

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked filter at the front side of the projector.	Clean the front filter or replace with new one. See "Removing the front dust filter", page 405
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 6,65 m³/min or 235 CFM per installed digital projector.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

Code 5281: “ambient - temperature high” (Warning)

Situation	Solution
Blocked high density filter at the front side of the projector.	Replace the front high density filter with a new one. See "Removing the front dust filter", page 405.

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 6,65 m³/min or 235 CFM per installed digital projector.

Code 5284: “ambient - temperature sensor open” (Error)

Situation	Solution
Malfunction Fan Control board.	Replace the Fan Control board, see "Removing a board in the card cage", page 277.

Code 5285: “ambient - temperature sensor short” (Error)

Situation	Solution
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

Code 5290: “dmd blue - temperature too high” (Error)

This error code is probably preceded by the warning code 5291: “dmd blue - temperature high”. The same troubleshooting table can be applied.

Code 5291: “dmd blue - temperature high” (Warning)

Situation	Solution
Blocked filter of the Heat Exchanger. The other DMD temperatures are too high as well.	Clean filter of the heat exchanger (bottom side) or replace with a new oner. See service manual chapter "Removal of the heat exchanger", page 228.
The liquid cooling circuit of the Light Processor is mistakenly excluded from the main liquid cooling circuit. Most likely the other DMD temperatures are too high as well.	Check of the cooling circuit of the Light Processor is connected with the pump and heat exchanger.
The Peltier element (TEC) of the DMD in the blue channel is disconnected from the Signal Backplane.	Check if the wire unit (reference 23 image 4-22) of the Peltier element (TEC) of the DMD in the blue channel is connected with the Signal Backplane.
The wire units of two Peltier elements (TEC) or there respective temperature sensors (NTC’s) have been swapped. While the temperature of one DMD is too high, the other will most likely be too low.	Check if the wire units of all Peltiers (TEC) and all temperature sensors (NTC’s) are plugged in their respective connector sockets on the Signal Backplane. See image 4-22. Note that there are two temperature sensors per channel. The first sensor is visible on top of the cooling block. The second sensor is located at the front of the DMD.
Malfunction Fan Control board or SMPS board. The LED “+VTEC” on the Fan Control board remains off.	Measure on the Signal Backplane the +VTEC voltage on pin 4, 5, 6, 7 or 8 of the connector of the black wire unit which comes from the SMPS board. See image 4-23. If the +VTEC voltage is about 16V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345..
Malfunction Peltier element (TEC) of the involved DMD. Use the “diode test” of a multi-meter to check out the Peltier. Polarity doesn’t matter. The Peltier is not OK in case the measured value is higher then 0,01 volt.	Remove the Light Processor from its compartment and contact Barco for further instructions.
Poor assembly of DMD or Peltier + cooler block.	Remove the Light Processor from its compartment and contact Barco for further instructions.
Defect temperature sensor which measures the temperature at the front side of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

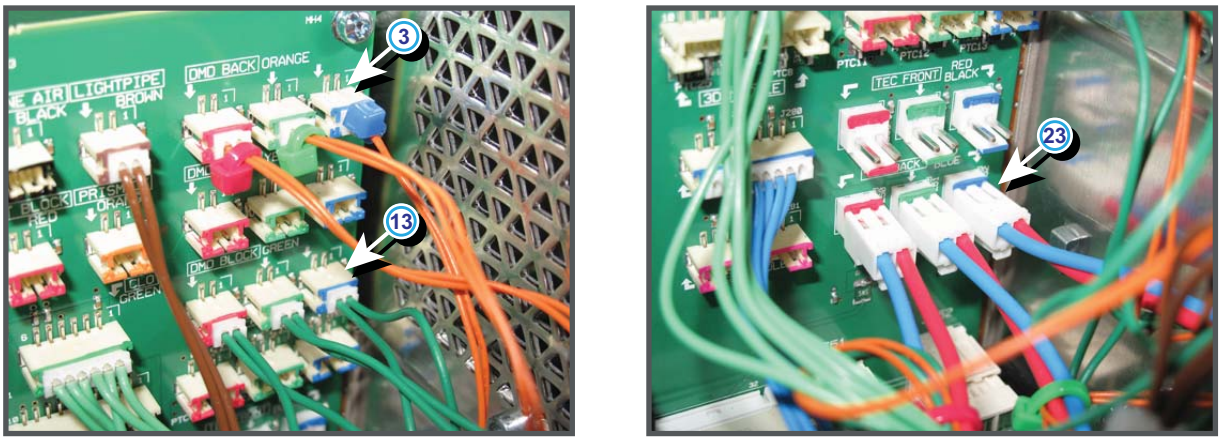


Image 4-22
Temp sensor and Peltier connection blue DMD

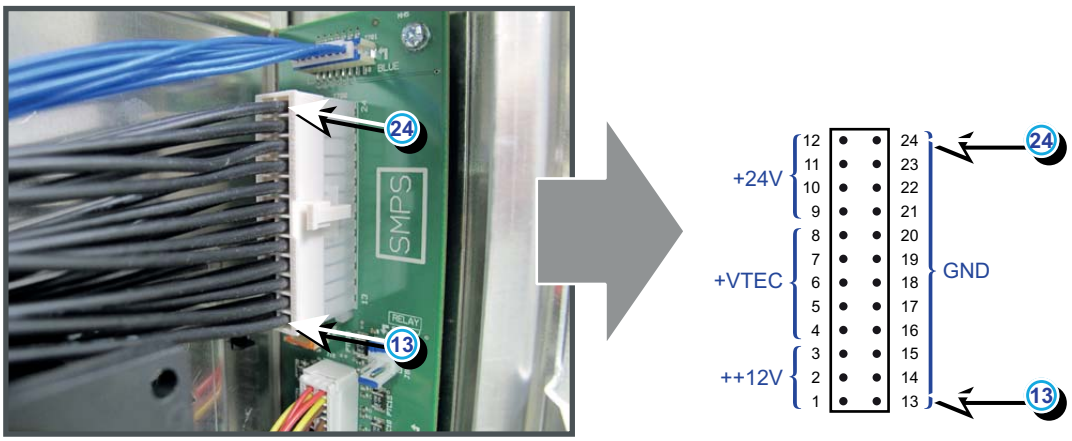


Image 4-23

Code 5293: “dmd blue - temperature low” (Warning)

Situation	Solution
The electronics of the Light Processor Unit remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs (higher then 10°C (50°F)). Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensation.
Defect temperature sensor which measures the temperature of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

Code 5294: “dmd blue - temperature sensor open” (Error)

Situation	Solution
Wire units of the temperature sensors are disconnected from the Signal Backplane.	Check if the wire units (reference 3 image 4-22) of the temperature sensors are plugged into their sockets on the Signal Backplane.
Damaged wire unit of the temperature sensors (reference 3 image 4-22) which measures the temperature of the DMD of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

Code 5295: “dmd blue - temperature sensor short” (Error)

Situation	Solution
Damaged wire unit of the temperature sensors (reference 3 image 4-22) which measures the temperature of the DMD of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

Code 5300: “dmd green - temperature too high” (Error)

This error code is probably preceded by the warning code 5301 : “dmd green - temperature high”. The same troubleshooting table can be applied.

Code 5301: “dmd green - temperature high” (Error)

Situation	Solution
Blocked filter of the Heat Exchanger. The other DMD temperatures are too high as well.	Clean filter of the heat exchanger (bottom side) or replace with a new oner. See "Clean the dust filter on the bottom side", page 407.
The liquid cooling circuit of the Light Processor is mistakenly excluded from the main liquid cooling circuit. Most likely the other DMD temperatures are too high as well.	Check of the cooling circuit of the Light Processor is connected with the pump and heat exchanger.
The Peltier element (TEC) of the DMD in the green channel is disconnected from the Signal Backplane.	Check if the wire unit (reference 22 image 4-24) of the Peltier element (TEC) of the DMD in the green channel is connected with the Signal Backplane.
The wire units of two Peltier elements (TEC) or there respective temperature sensors (NTC’s) have been swapped. While the temperature of one DMD is too high, the other will most likely be too low.	Check if the wire units of all Peltiers (TEC) and all temperature sensors (NTC’s) are plugged in their respective connector sockets on the Signal Backplane. See image 4-24. Note that there are two temperature sensors per channel. The first sensor is visible on top of the cooling block. The second sensor is located at the front of the DMD.
Malfunction Fan Control board or SMPS board. The LED “+VTEC” on the Fan Control board remains off.	Measure on the Signal Backplane the +VTEC voltage on pin 4, 5, 6, 7 or 8 of the connector of the black wire unit which comes from the SMPS board. See image 4-23. If the +VTEC voltage is about 16V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345..
Malfunction Peltier element (TEC) of the involved DMD. Use the “diode test” of a multi-meter to check out the Peltier. Polarity doesn’t matter. The Peltier is not OK in case the measured value is higher then 0,01 volt.	Remove the Light Processor from its compartment and contact Barco for further instructions.
Poor assembly of DMD or Peltier + cooler block.	Remove the Light Processor from its compartment and contact Barco for further instructions.
Defect temperature sensor which measures the temperature at the front side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

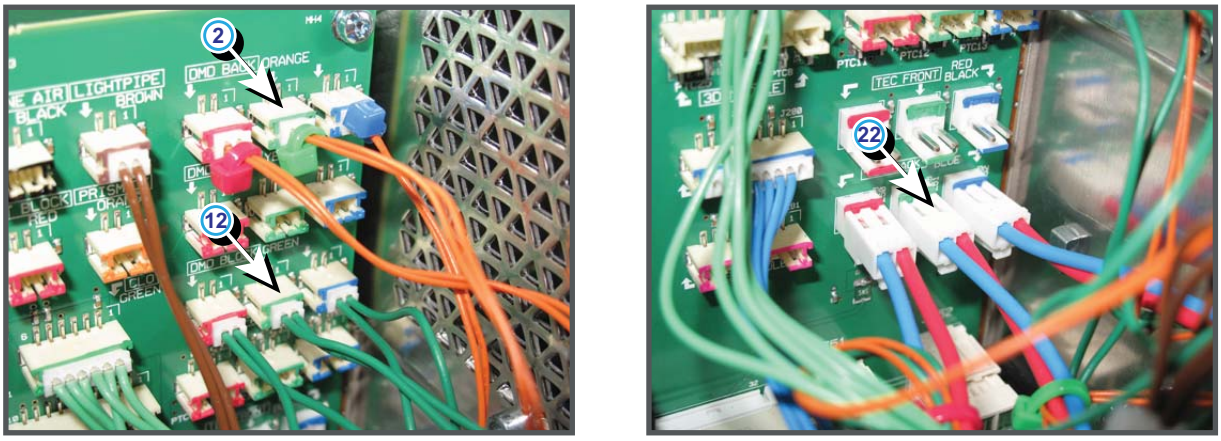


Image 4-24
Temp sensor and Peltier connection green DMD

Code 5303: “dmd green - temperature low” (Warning)

Situation	Solution
The electronics of the Light Processor Unit remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs (higher then 10°C (50°F)). Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensate.
Defect temperature sensor which measures the temperature of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

Code 5304: “dmd green - temperature sensor open” (Error)

Situation	Solution
Wire units of the temperature sensors are disconnected from the Signal Backplane.	Check if the wire units (reference 2 image 4-24) of the temperature sensors are plugged into their sockets on the Signal Backplane.
Damaged wire unit of the temperature sensors (reference 2 image 4-24) which measures the temperature of the DMD of the green channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

Code 5305: “dmd green - temperature sensor short” (Error)

Situation	Solution
Damaged wire unit of the temperature sensors (reference 2 image 4-24) which measures the temperature of the DMD of the green channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

Code 5310: “lamp - temperature too high” (Error)

This error code is probably preceded by the warning code 5311 : “lamp - temperature high”. The same troubleshooting table can be applied.

Code 5311: “lamp - temperature high” (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).

Situation	Solution
Blocked filters.	Check filters. Clean filthy filters or replace with new ones.
Malfunction air extraction system.	Check customer air extraction system for adequate extraction. The air extraction system must be capable of removing minimum 6,65 m³/min or 235 CFM per installed digital projector.
Malfunction lamp anode fan or lamp cathode fan.	Check the speed and voltage of the lamp anode and lamp cathode fan. Replace any malfunction fan.

Code 5314: “lamp - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 3 image 4-25) of the temperature sensor is disconnected from the Signal Backplane.	Plug the wire unit of the temperature sensor into its socket on the Signal Backplane.
Disconnected wire (reference 2image 4-25) units between Signal Backplane and temperature sensor in the air outlet channel of the projector.	Check the connection between the wire units. The connection is made behind the back cover.
Damaged wire unit of the temperature sensor (reference 1 image 4-25).	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (reference 1 image 4-25).	Replace the temperature sensor. Temperature sensor is visible through the air outlet on top of the projector.

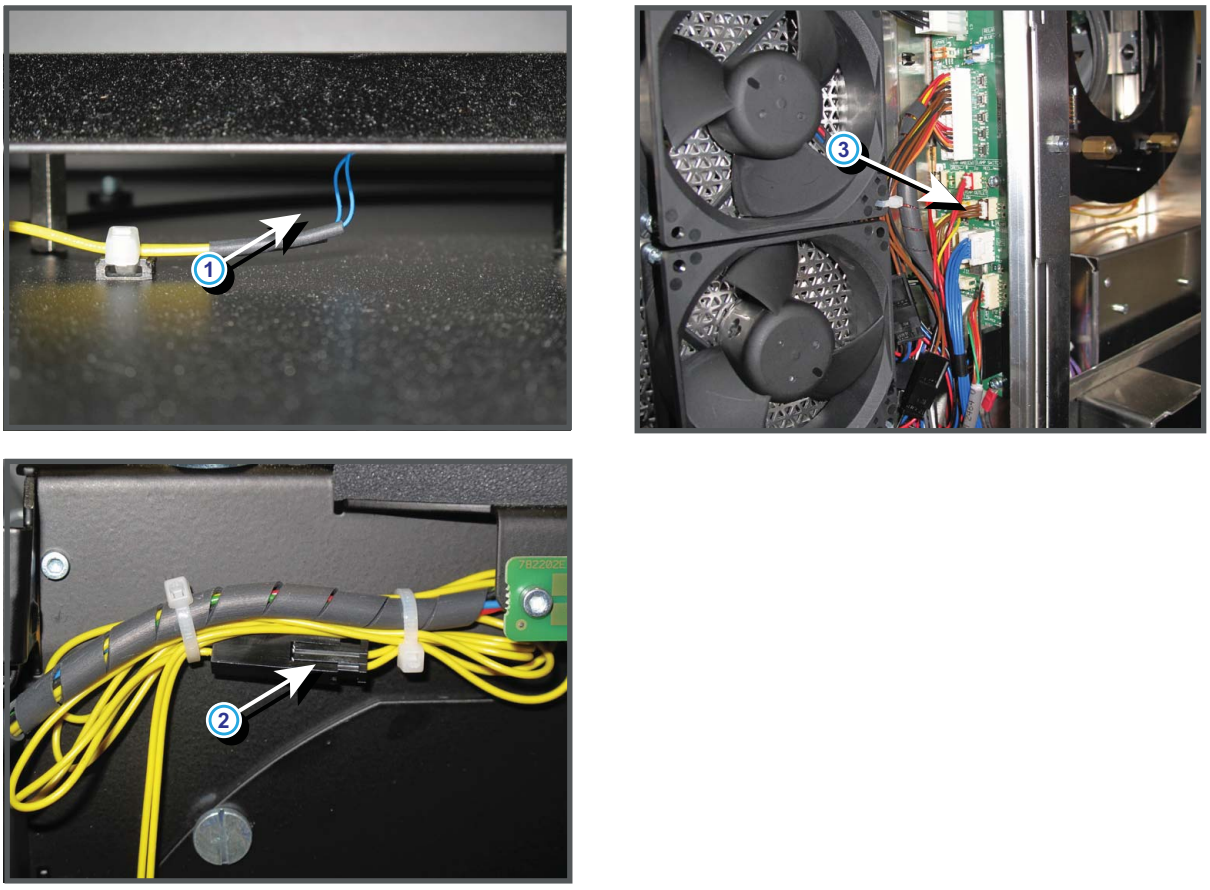


Image 4-25
Lamp temperature sensor connection

Code 5315: “lamp - temperature sensor short ” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference 1 & 2image 4-25), which measures the temperature in the channel of the air outlet of the Lamp House. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 3 image 4-25) the error code is changed to “lamp - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (reference 1 image 4-25), which measures the temperature in the channel of the air outlet of the Lamp House. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 3 image 4-25 the error code is changed to “lamp - temperature sensor open”.	Replace the temperature sensor.

Code 5320: “fcb - force lps/lamp off ” (Error)

Situation	Solution
The Fan Control & Motor board forces to switch off the Lamp Power Supply due to an Error.	Look for other errors in the log files and try to solve them. This can be due to: • Overtemperature • Lamp house not connected. • Light processor is not connected.
Malfunction Fan Control & Motor board.	Replace the Fan Control & Motor board. See "Removing a board in the card cage", page 277.

Code 5331: “pfc heatsink - temperature high” (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked front filter.	Clean the filter at the front side of the projector or replace with a new one. See "Removing the front dust filter", page 405.
Malfunction SMPS module	Replace the SMPS module, see "Replacement of the Switched Mode Power Supply", page 345.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

Code 5340: “dmd red - temperature too high” (Error)

This error code is probably preceded by the warning code 5341 : “dmd red - temperature high”. The same troubleshooting table can be applied.

Code 5341: “dmd red - temperature high” (Error)

Situation	Solution
Blocked filter of the Heat Exchanger. The other DMD temperatures are too high as well.	Clean filter of the heat exchanger or replace with a new one. See "Clean the dust filter on the bottom side", page 407.
The liquid cooling circuit of the Light Processor is excluded by mistake from the main liquid cooling circuit. Most likely the other DMD temperatures are too high as well.	Check of the cooling circuit of the Light Processor is connected with the pump and heat exchanger.
The Peltier element (TEC) of the DMD in the red channel is disconnected from the Signal Backplane.	Check if the wire unit (reference 21 image 4-26) of the Peltier element (TEC) of the DMD in the red channel is connected with the Signal Backplane.

Situation	Solution
The wire unit of the temperature sensor (NTC) of the DMD in the red channel is disconnected from the Signal Backplane.	Check if the wire unit (reference 1 image 4-26) of the temperature sensor (NTC) of the DMD in the red channel is connected with the Signal Backplane.
The wire units of two Peltier elements (TEC) or there respective temperature sensors (NTC's) have been swapped. While the temperature of one DMD is too high, the other will most likely be too low.	Check if the wire units of all Peltiers (TEC) and all temperature sensors (NTC's) are plugged in their respective connector sockets on the Signal Backplane. See image 4-26. Note that there are two temperature sensors per channel. The first sensor is visible on top of the cooling block. The second sensor is located at the front of the DMD.
Malfunction Fan Control board or SMPS board. The LED "+VTEC" on the Fan Control board remains off.	Measure on the Signal Backplane the +VTEC voltage on pin 4, 5, 6, 7 or 8 of the connector of the black wire unit which comes from the SMPS board. See image 4-23. If the +VTEC voltage is about 16V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345..
Malfunction Peltier element (TEC) of the involved DMD. Use the "diode test" of a multi-meter to check out the Peltier. Polarity doesn't matter. The Peltier is not OK in case the measured value is higher then 0,01 volt.	Remove the Light Processor from its compartment and contact Barco for further instructions.
Poor assembly of DMD or Peltier + cooler block.	Remove the Light Processor from its compartment and contact Barco for further instructions.
Defect temperature sensor which measures the temperature at the front side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

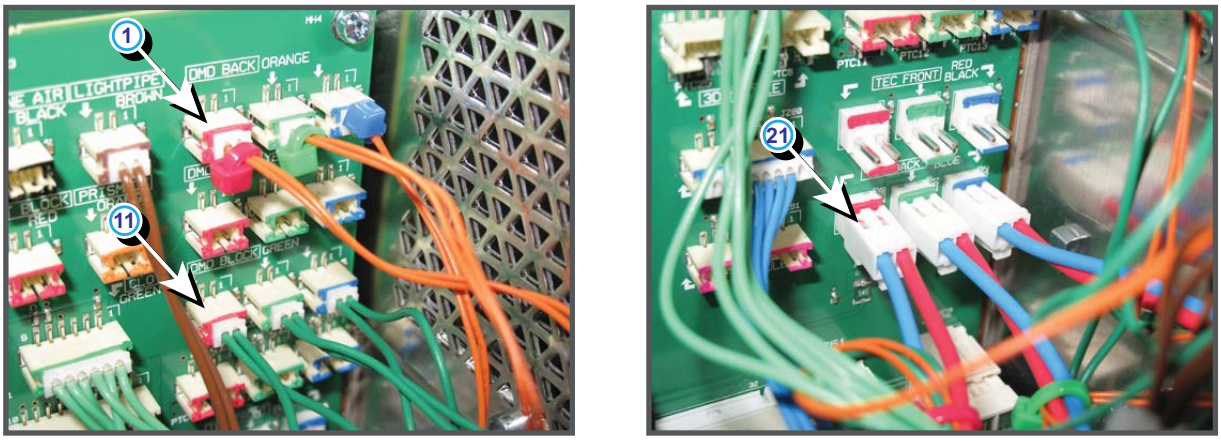


Image 4-26
Temp sensor and Peltier connection green DMD

Code 5343: "dmd red - temperature low" (Warning)

Situation	Solution
The electronics of the Light Processor Unit remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs (higher then 10°C (50°F)). Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensation.
Defect temperature sensor which measures the temperature of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

Code 5344: "dmd red - temperature sensor open" (Error)

Situation	Solution
Wire units of the temperature sensors are disconnected from the Signal Backplane.	Check if the wire units (reference 1 image 4-26) of the temperature sensors are plugged into their sockets on the Signal Backplane.

Situation	Solution
Damaged wire unit of the temperature sensors (reference 1 image 4-26) which measures the temperature of the DMD of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

Code 5345: “dmd red - temperature sensor short” (Error)

Situation	Solution
Damaged wire unit of the temperature sensors (reference 1 image 4-27) which measures the temperature of the DMD of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

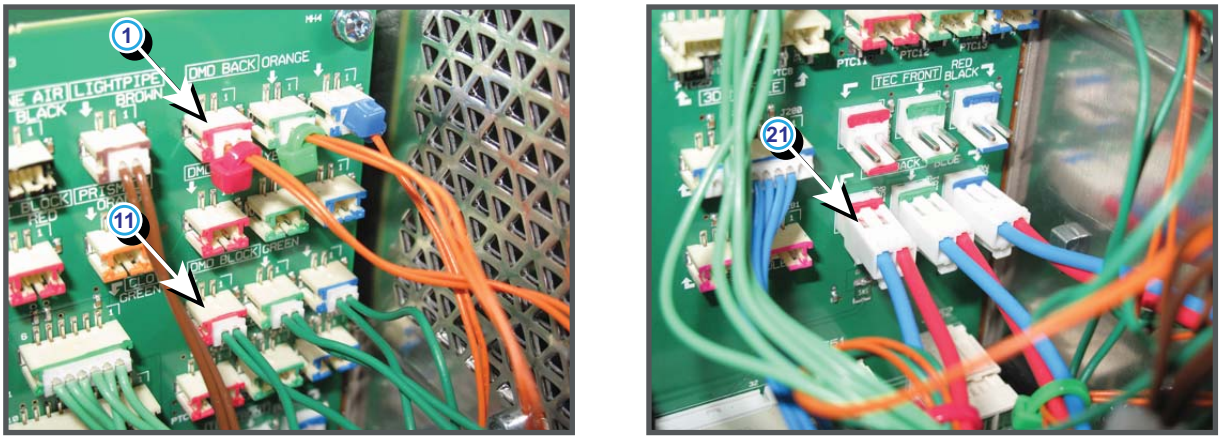


Image 4-27
Temp sensor and Peltier connection green DMD

Code 5351: “smps primary heatsink - temperature high” (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked front filter.	Clean the filter at the front side of the projector or replace with a new one. See "Removing the front dust filter", page 405.
Malfunction SMPS module	Replace the SMPS module.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

Code 5361: “smps secondary heatsink - temperature high” (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked front filter.	Clean the filter at the front side of the projector or replace with a new one. See "Removing the front dust filter", page 405.
Malfunction SMPS module	Replace the SMPS module.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

Code 5364: “smps secondary heatsink - temperature sensor open ” (Error)

Situation	Solution
Malfunction SMPS module	Replace the SMPS module. See "Replacement of the Switched Mode Power Supply", page 345.

Code 5365: “smps secondary heatsink - temperature sensor short” (Error)

Situation	Solution
Malfunction SMPS module	Replace the SMPS module. See "Replacement of the Switched Mode Power Supply", page 345.

Code 5431: “cold mirror fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

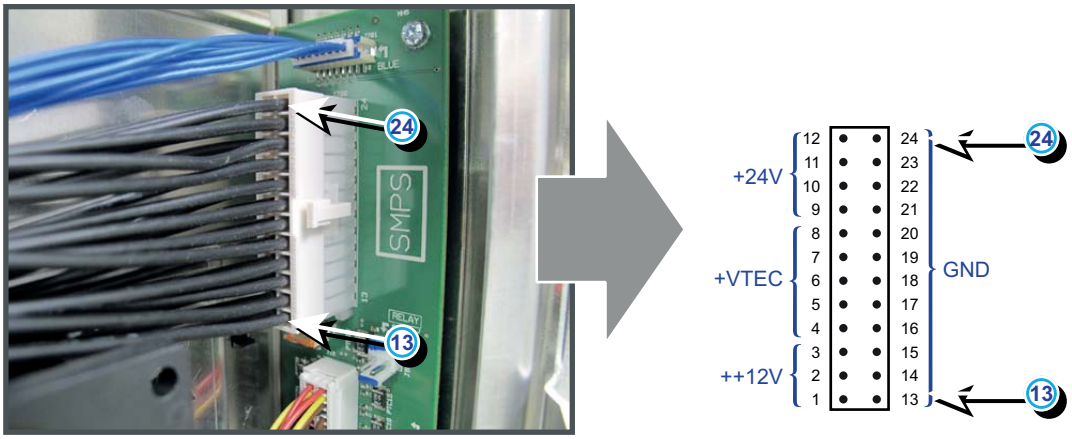


Image 4-28

Code 5432: “cold mirror fan - voltage too low” (Error)

This error code is probably proceeded by the warning code 5433 : “cold mirror fan - voltage low”. The same troubleshooting table can be applied.

Code 5433: “cold mirror fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the brown/red wire unit (reference 2 image 4-29) of the cold mirror fan (reference 1 image 4-29).	Remove the top cover of the projector, pull out the top dust filter to access the fan connection. Check the insulation of the wire unit. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If the wire unit of the fan is not repairable, replace the Cold Mirror fan. See "Removal of the cold mirror assembly", page 139.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

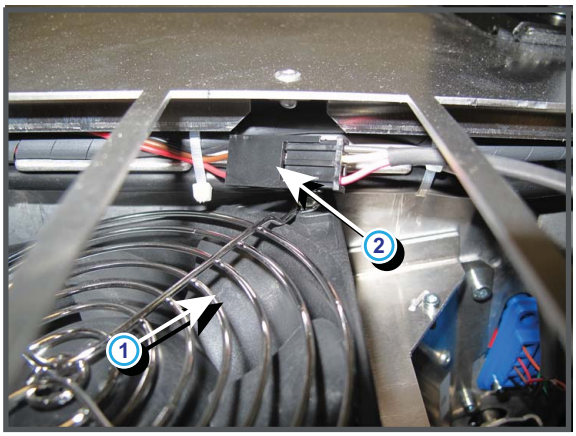


Image 4-29
Cold mirror fan connection

Code 5441: “engine fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5442: “engine fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5443: “engine fan - voltage low”. The same troubleshooting table can be applied.

Code 5443: “engine fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the wire unit (reference 21 image 4-30) of the Light Processor fan (reference 1 image 4-30). Note that this fan is located between the Card Cage compartment and Light Processor compartment.	Check the insulation of the wire unit of the fan. The fan is accessible via the Card Cage. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan. See "Light processor compartment fan", page 384.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295

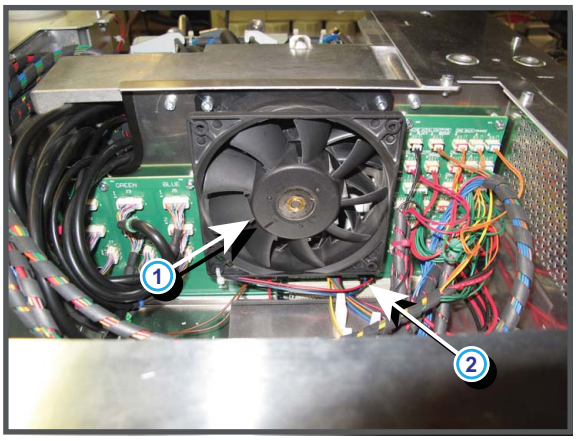


Image 4-30
Light processor fan

Code 5451: “heat exchanger fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5452: “heat exchanger fan - voltage too low” (Error)

This error code is probably proceeded by the warning code 5453: “heat exchanger fan - voltage low”. The same troubleshooting table can be applied.

Code 5453: “heat exchanger fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the wire units (reference 1 image 4-31) of the fan (reference 2 image 4-31) of the Heat Exchanger.	Remove the left cover of the projector and pull out the Heat Exchanger assembly. Check the insulation of the wire units of the fans in the assembly. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If the wire unit of the fan is not repairable, replace the fan. See "Heat exchanger fan", page 396
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

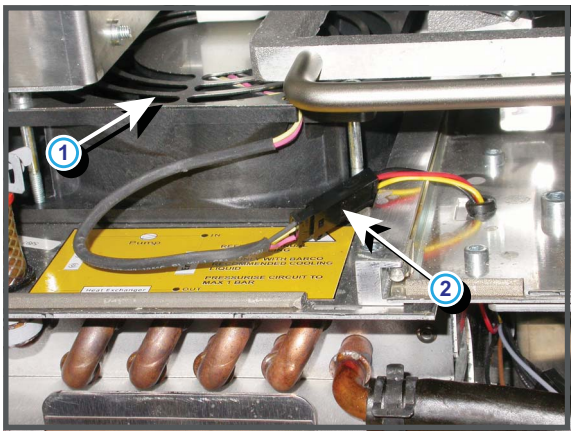


Image 4-31
Heat exchanger fan

Code 5461: “lamp anode fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5462: “lamp anode fan - voltage too low” (Error)

This error code is probably proceeded by the warning code 5463: “lamp anode fan - voltage low”. The same troubleshooting table can be applied.

Code 5463: “lamp anode fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Damaged insulation of the wire unit (reference 2 image 4-32) of the Anode fan (reference 1 image 4-32).	Check the insulation of the wire unit of the Anode fan. The Anode fan is located below the compartment of the Light Processor. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable replace the Anode fan. See "Lamp anode fan", page 392.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

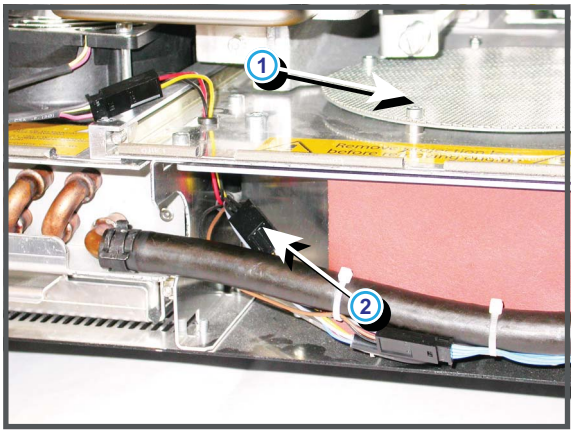


Image 4-32
Anode fan connection

Code 5471: “lamp cathode fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5472: “lamp cathode fan - voltage too low” (Error)

This error code is probably proceeded by the warning code 5473: “lamp cathode fan - voltage low”. The same troubleshooting table can be applied.

Code 5473: “lamp cathode fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Damaged insulation of the wire unit (reference 1 image 4-33) of the Cathode fan (reference 3 image 4-33).	To Check the insulation of the wire unit of the Cathode fan, pull out the wire unit (reference 1 image 4-33). The Cathode fan is located at the right inner side of the Lamp compartment. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable replace the Cathode fan. See "Lamp cathode fan", page 387.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

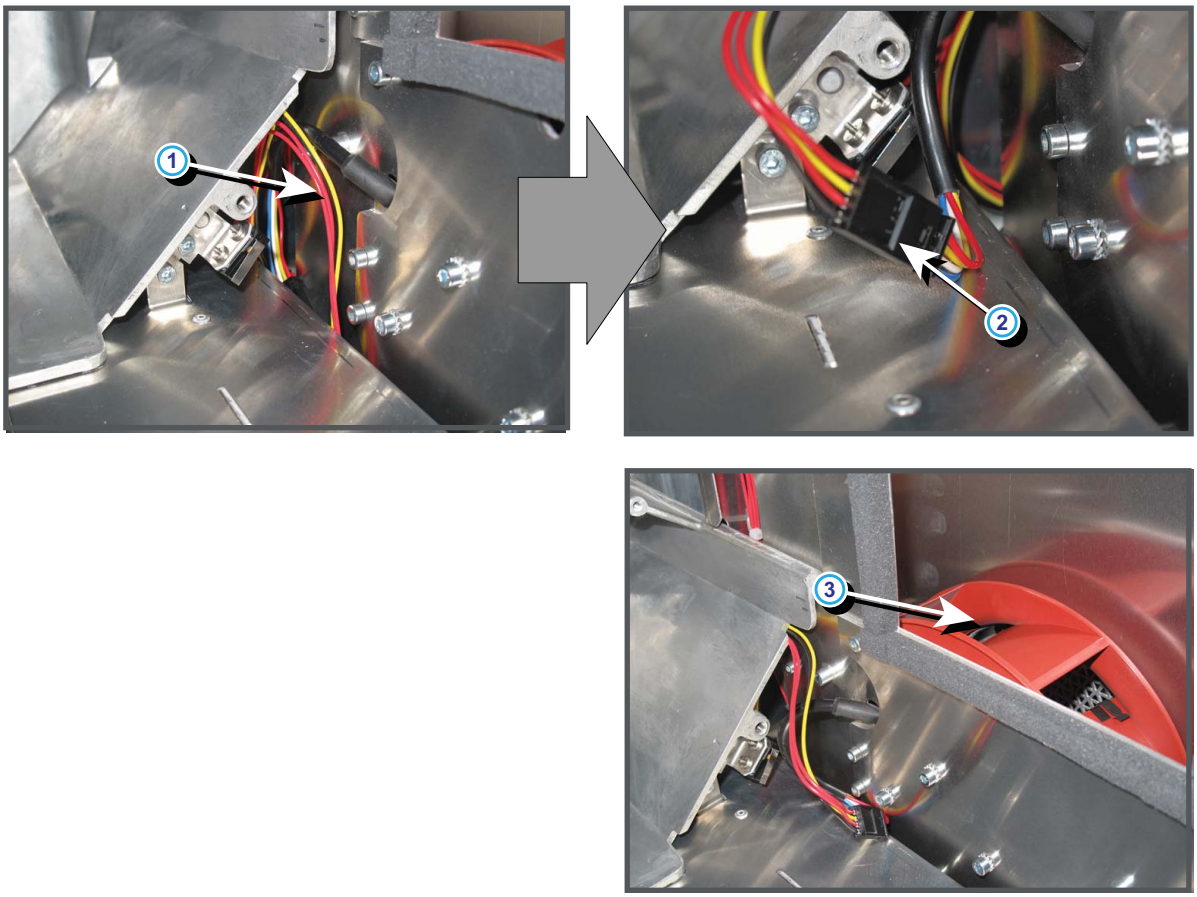


Image 4-33
Cathode fan connections

Code 5491: “smps fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5492: “smps fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5493: “smps fan - voltage low”. The same troubleshooting table can be applied.

Code 5493: “smps fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the wire unit (reference 3 & 4image 4-34) of the SMPS fans (reference 1 & 2image 4-34).	Check the insulation of the wire unit of the SMPS fans. The two SMPS fans are located behind the front filter (two lower fans). 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable replace the Cathode fan. See "Lamp cathode fan", page 387.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

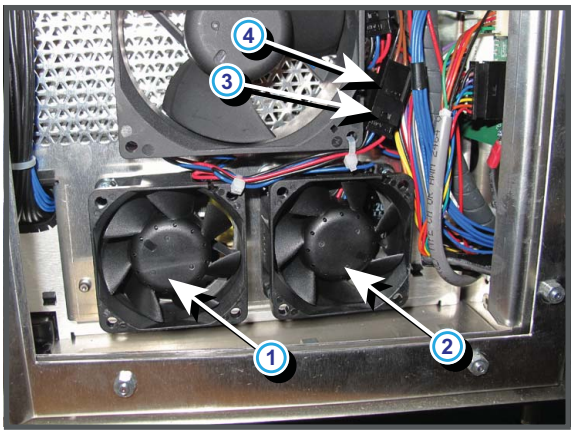


Image 4-34
SMPS fans connection

Code 5531: “pump - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5532: “pump - voltage too low” (Error)

This error code is probably preceded by the warning code 5633: “pump - voltage low”. The same troubleshooting table can be applied.

Code 5533: “pump - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the wire unit (reference 1 image 4-35) of the pump .	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable replace the pump. See "Replacement of the pump motor and rotor", page 234 or "Replacement of the complete cooling pump", page 238.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

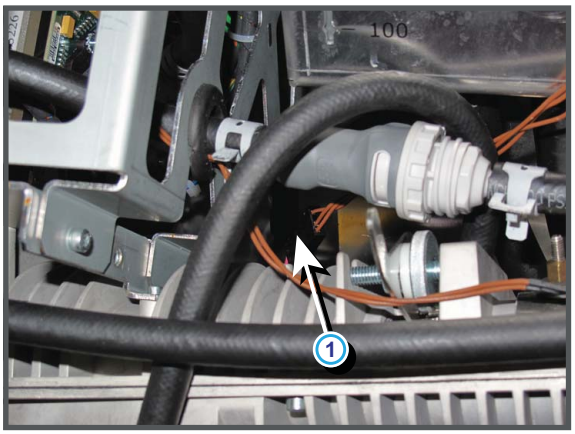


Image 4-35
Pump connections

Code 5551: “tec - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +VTEC voltage on pin 4, 5, 6, 7 or 8 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 16V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5553: “tec - voltage low” (Warning)

Situation	Solution
Damaged insulation of the wire unit of one of three Peltier elements (TEC) causing a short circuit with the projector chassis. Disconnecting the wire unit of the damaged Peltier element from the Signal Backplane will clear the warning.	Check the wire units of each Peltier element. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the Light Processor unit. Return the malfunction Light Processor to factory for repair. See "Light Processor assembly", page 161.
One of the Peltier elements causes a short circuit.	Replace the Light Processor unit. Return the malfunction Light Processor to factory for repair. See "Light Processor assembly", page 161.
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +VTEC voltage on pin 4, 5, 6, 7 or 8 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 16V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5571: “lamp rear fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5572: “lamp rear fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5573: “lamp rear fan - voltage low”. The same troubleshooting table can be applied.

Code 5573: “lamp rear fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the wire unit (reference 2 image 4-36) of the fan (reference 1 image 4-36).	Check the insulation of the wire unit of the fan. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan. See "Lamp Info Module fan", page 401.
Malfunction Signal Backplane (bad connection, reference 3 image 4-36)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

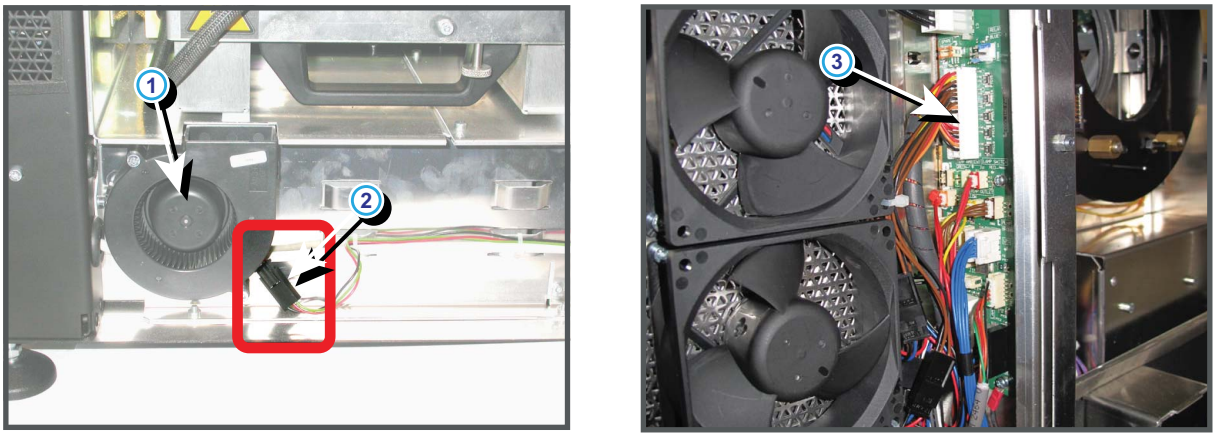


Image 4-36
Lamp rear fan connections

Code 5621: “electronics fan 1 (top side) - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5622: “electronics fan 1 (top side) - voltage too low” (Error)

This error code is probably preceded by the warning code 5623: “electronics fan 1 (top side) - voltage low”. The same troubleshooting table can be applied.

Code 5623: “electronics fan 1 (top side) - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the wire unit (reference 2 image 4-37) of the upper fan (reference 1 image 4-37) for the Card Cage electronics. The fan is the upper fan located behind the dust filter at the front of the projector.	Remove the dust filter at the front side of the projector and check the insulation of the wire unit of the fan. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan. See "Card cage fans", page 380.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

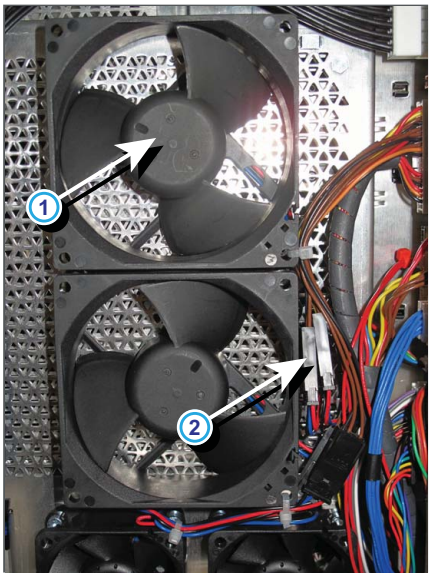


Image 4-37
Card cage, upper fan connection

Code 5631: “electronics fan 2 (bottom side) - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 5632: “electronics fan 2 (bottom side) - voltage too low” (Error)

This error code is probably preceded by the warning code 5633: “electronics fan 2 (bottom side) - voltage low”. The same troubleshooting table can be applied.

Code 5633: “electronics fan 2 (bottom side) - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-28. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.
Damaged insulation of the wire unit (reference 2 image 4-38) of the lower fan (reference 1 image 4-38) for the Card Cage electronics. The fan is the lower fan located behind the dust filter at the front of the projector.	Remove the dust filter at the front side of the projector and check the insulation of the wire unit of the fan. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan. See "Card cage fans", page 380.
Malfunction Signal Backplane (bad connection)	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

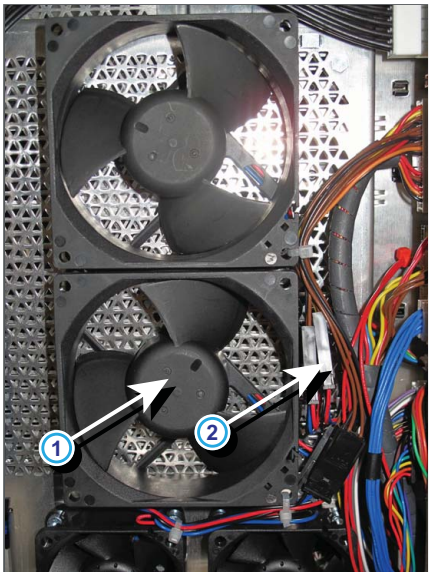


Image 4-38
Card cage, lower fan connection

Code 5640: “lamp power supplies - zero lamp power supplies detected” (Error)

Situation	Solution
Disconnected wire unit between the Signal Backplane and the LPS module (reference 4, LPS side and reference 5 Signal backplane side image 4-39).	Reconnect the wire unit between the Signal Backplane and the LPS module.
Disconnected wire unit between the “CTLB IN” and “CTLB OUT” sockets of the LPS units (reference 3 image 4-39).	Reconnect the wire unit between the “CTLB IN” and “CTLB OUT” sockets of the LPS units.
Malfunction of one of the LPS units. The orange LED (Heartbeat) of the malfunction LPS is not blinking.	Replace the whole LPS module. See "Removing the LPS module", page 351.
Defect Signal Backplane.	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

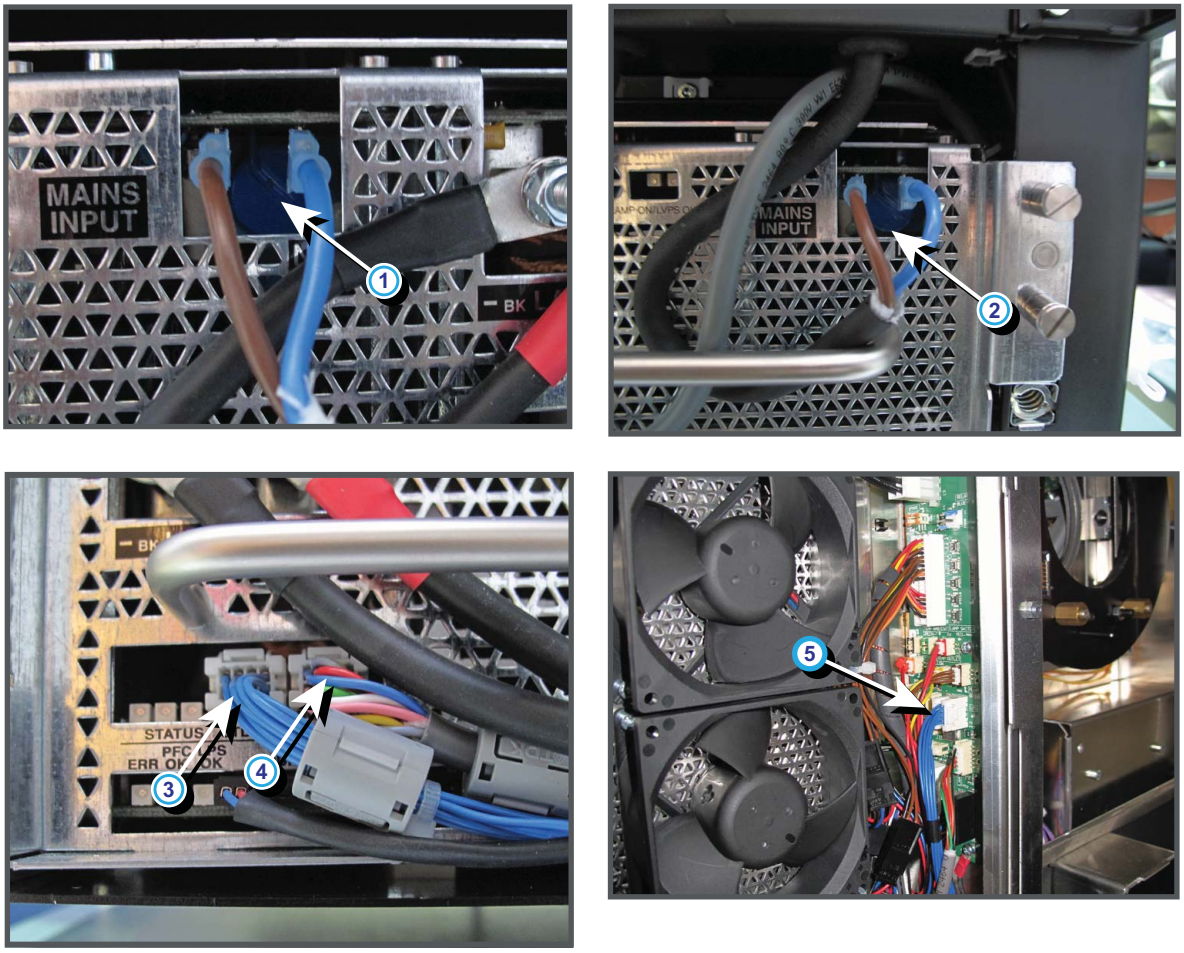


Image 4-39
Mains and CTRL connection LPS

Code 5641: “lamp power supplies - lamp is on, but smps is off” (Error)

Situation	Solution
Malfunction SMPS module.	Replace the SMPS module. See "Replacement of the Switched Mode Power Supply", page 345.
Malfunction LPS module.	Replace the LPS module. See "Removing the LPS module", page 351.
Defect Signal Backplane.	Replace the Signal Backplane. See "Replacement of the signal back plane", page 295.

Code 5642: “lamp power supplies - at least one lamp power supply could not be detected” (Error)

Situation	Solution
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units (reference 3 image 4-40).	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Malfunction of one of the LPS units. The orange LED (Heartbeat) of the malfunction LPS is not blinking.	Replace the whole LPS module. See "Removing the LPS module", page 351.

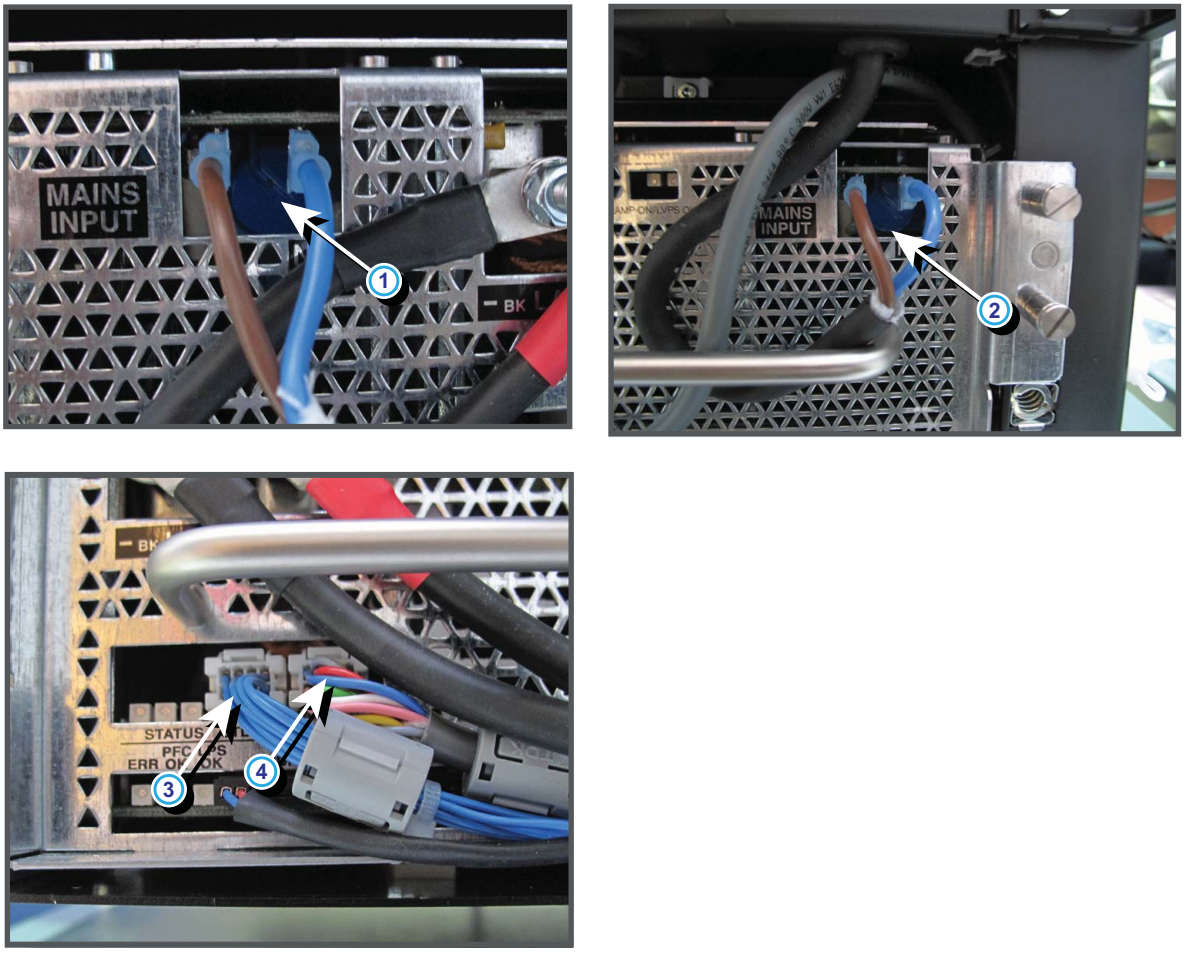


Image 4-40
LPS connections

Code 5643: “lamp power supplies - communication failed with at least one lamp power supply” (Error)

Situation	Solution
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units (reference 3 image 4-40).	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Malfunction of one of the LPS units. The orange LED (Heartbeat) of the malfunction LPS is not blinking.	Replace the whole LPS module. See "Removing the LPS module", page 351.

Code 5644: “lamp power supplies - lamp is on, but at least one lamp power supply is off” (Error)

Situation	Solution
Main power cable disconnected from one of the LPS units (reference 1 & 2 image 4-40).	Check if the main power cable is connected with the “MAINS INPUT” socket of the LPS unit.
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units (reference 3 image 4-40).	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Malfunction of one of the LPS units. The red LED “ERR” of the malfunction LPS unit flashes fast.	Replace the whole LPS module. See "Removing the LPS module", page 351.

Code 5646: “lamp - set lamp on failed” (Error)

Situation	Solution
The lamp goes out immediately after the ignition or does not go on at all. SMPS and LPS seems to work normally. This situation can be the result of a bad lamp or SPG module. See chapter "Start Pulse Generator", page 371.	• Install another xenon lamp in case the voltage on the “LAMP OUT” pins is 140 volt and you hear the SPG module three times clicking to ignite the lamp. • 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 modules in case the voltage value on the “LAMP OUT” pins is below 140 volt and the lamp is not ignited. Note: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.

Code 5647: “lamp - lamp is off due to an error” (Error)

Situation	Solution
The Lamp Power Supply was triggered to switch off the lamp due to an error.	Check the projector log files for other listed errors and solve these errors first.
Malfunction Lamp Power Supply (LPS).	Replace the Lamp Power Supply unit. See "Removing the LPS module", page 351.
Defect Lamp installed.	Replace the Lamp. See "Lamps and lamp house", page 107.

Code 5654: “lamp run time - read failed” (Error)

Situation	Solution
Lamp house not correctly inserted	Check if the lamp house is properly installed. Ensure that the three fixation screws (reference 1 image 4-16) of the lamp house are fastened.
Lamp Info Module with old firmware.	Check lamp info module firmware version in the "version info" area of the communicator. If mismatch is detected then run update.
Malfunction Lamp Info Module.	Replace the Lamp Info Module. See "Replacement of the Lamp Info module", page 127.

Code 5657: “lamp run time - exceeds maximum” (Error)

Situation	Solution
The lamp inside the lamp house has exceeded its maximum run time.	Replace the lamp and reset hours and bulb type. See "Lamps and lamp house", page 107.

Code 5658: “lamp run time - read limits failed” (Error)

Situation	Solution
Lamp house not correctly inserted	Check if the lamp house is properly installed. Ensure that the three fixation screws (reference 1 image 4-16) of the lamp house are fastened.
Lamp Info Module with old firmware.	Check lamp info module firmware version in the "version info" area of the communicator. If mismatch is detected then run update.
Malfunction Lamp Info Module.	Replace the Lamp Info Module. See "Replacement of the Lamp Info module", page 127.

Code 5659: “lamp run time - warning” (Warning)

Situation	Solution
The lamp inside the lamp house is about to exceed its maximum run time. Status light lights up blue (notification state)	Replace the lamp as soon as possible. See "Lamps and lamp house", page 107.

Code 5670: “dowser - set dowser open failed” (Error)

Situation	Solution
Wire unit Dowser disconnected (reference 1 image 4-41).	Reconnect the dowser wire unit with the blue wire unit on the light processor unit (reference 1 image 4-41).
Wire unit Dowser disconnected from the Signal Backplane (reference 2 image 4-41.	Reconnect the blue wire unit of the Dowser with the Signal Backplane.

Situation	Solution
Blocked blade of the Dowser	Check if noting is blocking the blade of the Dowser. Do NOT force the blade from the open position to the closed position or vice versa.
Damaged wire unit of the Dowser	Try to repair the damaged wire unit. If not possible replace the Dowser unit. See "Replacement of the dowser (shutter)", page 178.
Malfunction motor of the Dowser unit	Replace the Dowser unit. See "Replacement of the dowser (shutter)", page 178.
Malfunction Fan Control board	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

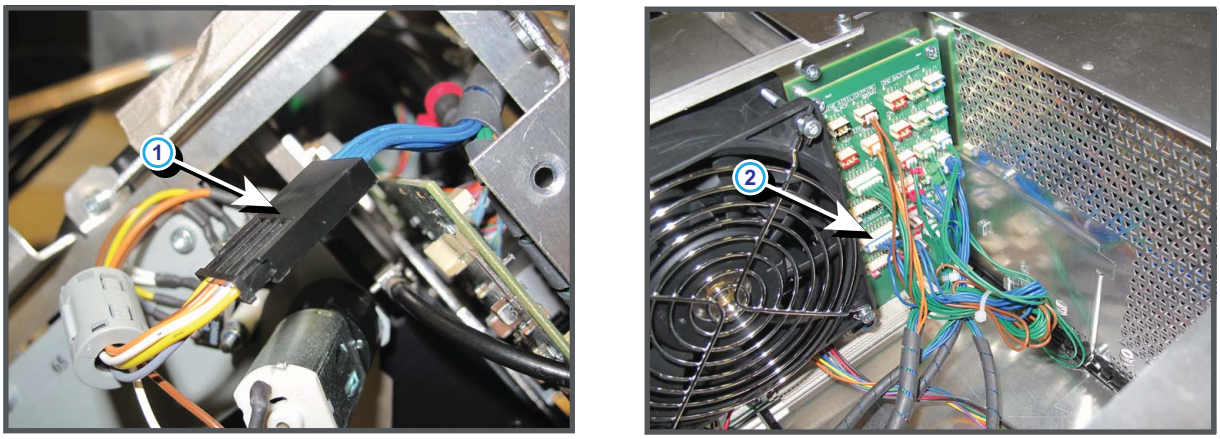


Image 4-41
Dowser connection

Code 5800: “ti-icp - system status = fail” (Error)

This is a generic TI error. Use the Communicator to make a detailed analysis. Go to *Diagnostics* > *Actual* > *Cinema Front End Status* > *Detailed status* > *Error Messages*. Possible error messages are:

Situation	Solution
ICP self test - ICP frame memory test failed	Replace the ICP board. See "Removing a board in the card cage", page 277.
ICP self test - ICP data path signature test failed	Check the connections to the formatters. Replace the ICP board. See "Removing a board in the card cage", page 277.
ICP Normal Configuration Error	Replace the ICP board. See "Removing a board in the card cage", page 277.
ICP Boot Configuration Error	Replace the ICP board. See "Removing a board in the card cage", page 277.
FMT Normal Configuration Error	Replace the ICP board. See "Removing a board in the card cage", page 277.
FMT Boot Configuration Error	Replace the ICP board. See "Removing a board in the card cage", page 277.
FMT Satellite Configuration Error	Replace the ICP board. See "Removing a board in the card cage", page 277.
1.20V Supply out of range	Replace the ICP board. See "Removing a board in the card cage", page 277.
1.80V Supply out of range	Replace the ICP board. See "Removing a board in the card cage", page 277
2.50V Supply out of range	Replace the ICP board. See "Removing a board in the card cage", page 277
3.30V Supply out of range	Replace the ICP board. See "Removing a board in the card cage", page 277
ICP FPGA Temperature out of range	Temperature on ICP is too high. Current active fans have errors. Solve the fan problem first. For a correct airflow, check if all covers are closed. Ambient temperature is too high. Reduce the ambient temperature.
ICP FMT FPGA Temperature out of range	Temperature on ICP is too high. Current active fans have errors. Solve the fan problem first. For a correct airflow, check if all covers are closed. Ambient temperature is too high. Reduce the ambient temperature.
ICP Flash Update Error	Replace the ICP board. See "Removing a board in the card cage", page 277.

Situation	Solution
ICP real time clock error	1. Clear the error by configuring the RTC (Real Time Clock) of the ICP. See user manual Communicator chapter “Set up of the ICP clock”, choose the option UTC/GMT time calculated from current PC time current time. 2. If the error stays: - replace the RTC (Real Time Clock) battery of the ICP board. See "Replacement of the RTC battery of the ICP board", page 279. - Clear the projector error 5800 “ti-icp - system status = fail” with error message “ICP real time clock error” by configuring the RTC (Real Time Clock) of the ICP. See user manual Communicator chapter “Set up of the ICP clock”, choose the option UTC/GMT time calculated from current PC time current time. - Clear the projector error 5834 “physical marriage tamper event” by remarrying the projector. See service manual chapter "Authorization to clear security warning on the projector". 3. If problem remains, replace the ICP board. See "Removing a board in the card cage", page 277
Satellite Hardware Mismatch	Replace light processor assembly. See "Light Processor assembly", page 161.

Code 5801: “ti-link-decryptor - service door tamper event ” (Error)

Situation	Solution
A board in the Card Cage has been removed.	Clear the security warning. See "Authorization to clear security warning on the projector", page 309. Brief procedure to clear the security warning: 1. Ensure the cover plate of the Light Processor compartment is properly installed. 2. Ensure that all boards in the Card Cage are properly installed. 3. Start up the projector. 4. Initiate authorization by holding the security key in the security socket (image 4-42). 5. Enter the pin code within 5 seconds.
The cover plate of the Light Processor compartment has been removed. Security switches are activated (reference 1 & 2 image 4-43)	Clear the security warning. See "Authorization to clear security warning on the projector", page 309. Brief procedure to clear the security warning: 1. Ensure the cover plate of the Light Processor compartment is properly installed. 2. Ensure that all boards in the Card Cage are properly installed. 3. Start up the projector. 4. Initiate authorization by holding the security key in the security socket. 5. Enter the pin code within 5 seconds.
Defect security switches (reference 1 & 2 image 4-43).	If all compartments and devices are installed and security error will not authorize, replace DCI security switches.
Malfunction Signal Backplane	If switch replacement is not the solution, then replace Signal Backplane. See "Replacement of the signal back plane", page 295.

Image 4-42
Dallas key slot

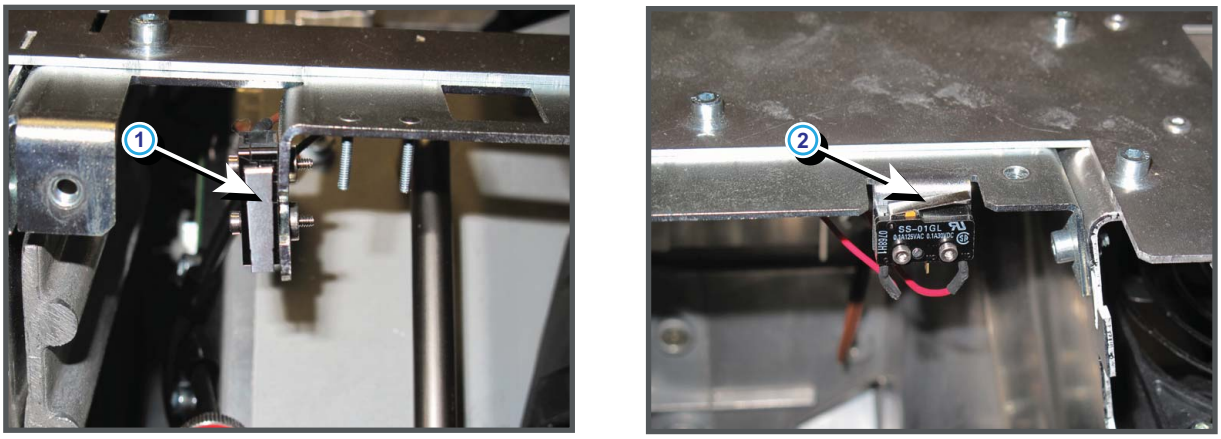


Image 4-43
Light processor cover tamper switches

Code 5807: “ti-icp - read system status failed” (Error)

The Barco controller can not read the status of the ICP.

Situation	Solution
ICP board is not correctly inserted	Insert the ICP board properly.
ICP crash. The most left LED is not blinking	Restart the projector.
ICP is being upgrading	Wait until projector reset after the upgrade.

Code 5812: “ti-icp - read satellite info failed” (Error)

Situation	Solution
A wire unit to one of the formatters is not correctly connected to the Signal backplane (reference 1, 2, 3 for green on image 4-44).	Check the connections between the formatters and the Signal backplane on the Signal backplane side.
A wire unit on one of the formatters is not correctly connected (reference 4, 5, 6 for red on image 4-44)	Check the connections between the formatters and the Signal backplane on the formatter side.

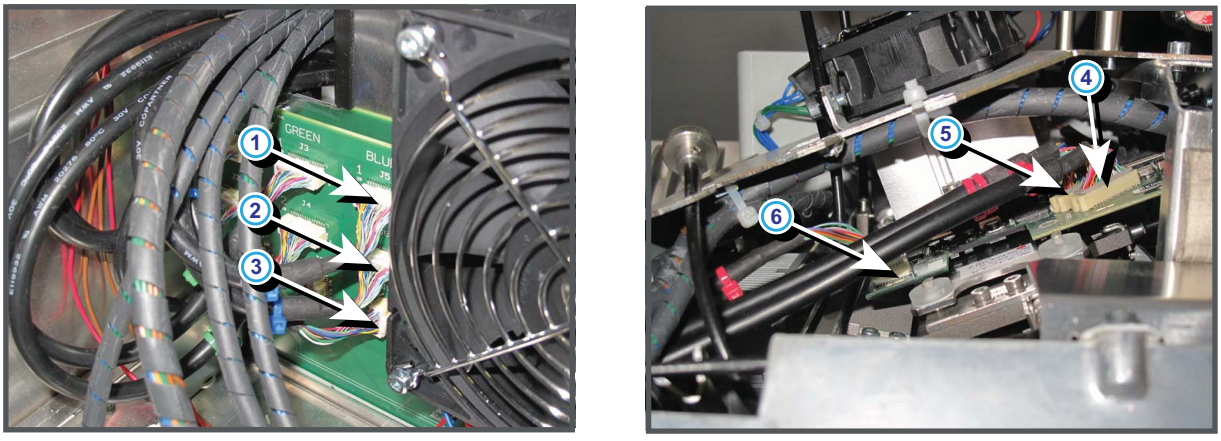


Image 4-44
Formatter connections

Code 5813: “ti-icp - satellite firmware mismatch” (Error)

This error can occur when you move ICP boards between projectors which have a different DMD configuration. (E.g. switching an ICP between a 1.2 and 0.98 inch system)

Situation	Solution
ICP software corrupt	Reinstall the ICP software. Use the “DC update companion” to update the software. These software is part of the Communicator software. • Start your communicator, make a connection and login as service technician. • Browse to Maintenance - Software upgade and click on Launch DC Update companion. Follow the instruction on the screen. For more information on “launching DC update companion”, see Communicator’s User Guide. Continue then with “ICP software upgrade” as described in the same user guide.

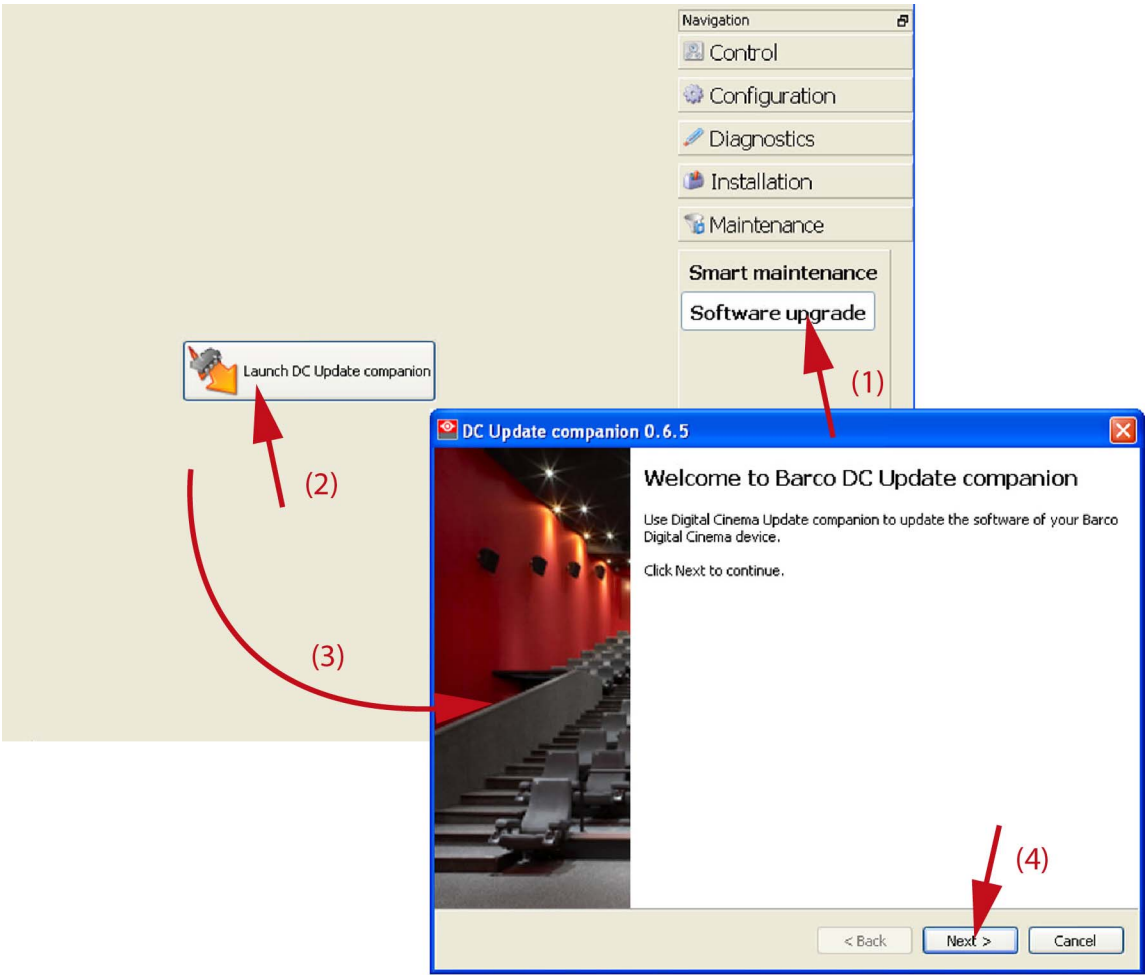


Image 4-45
Launch DC update companion

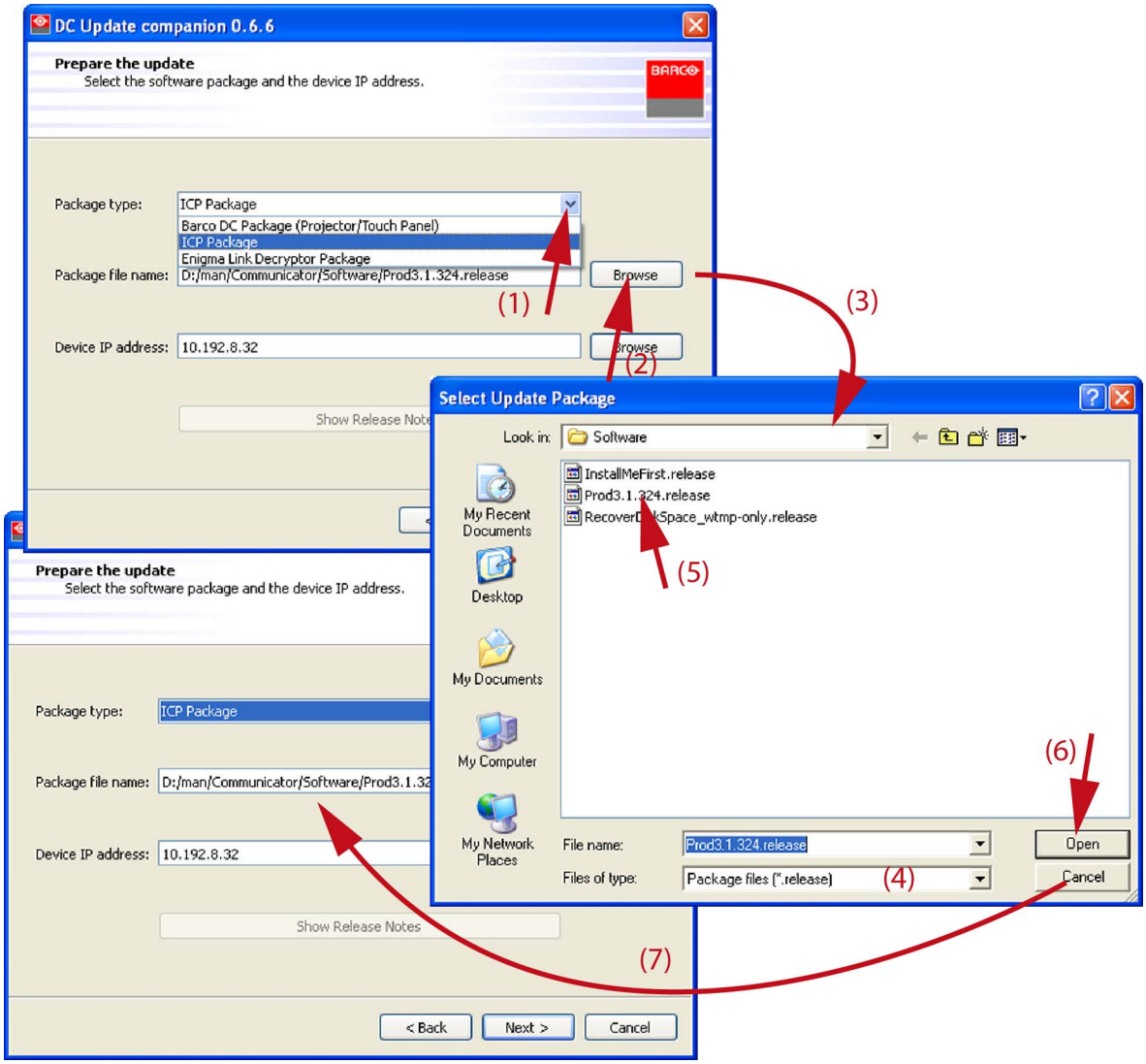


Image 4-46

Code 5814: “ti-icp - self test = fail” (Error)

Situation	Solution
A wire unit to one of the formatters is not correctly connected to the Signal backplane (reference 1, 2, 3 for green on image 4-44).	Check the connections between the formatters and the Signal backplane on the Signal backplane side. The TI log file will indicate which formatter connection has failed If problem remains, replace ICP board. See "Removing a board in the card cage", page 277.
A wire unit on one of the formatters is not correctly connected (reference 4, 5, 6 for red on image 4-44).	Check the connections between the formatters and the Signal backplane on the formatter side. If problem remains, replace ICP board. See "Removing a board in the card cage", page 277.

Code 5815: “ti-icp - certificate error” (Error)

Situation	Solution
New ICP software version installed but no reboot of projector has happen.	Reboot projector
Error remains occurring after different boot cycles.	Replace ICP board. See "Removing a board in the card cage", page 277.

Code 5816: “ti-icp - key error” (Error)

Situation	Solution
New ICP software version installed but no reboot of projector has happen.	Reboot projector
Error remains occurring after different boot cycles.	Replace ICP board. See "Removing a board in the card cage", page 277.

Code 5817: “ti-icp - icp board not detected” (Error)

Situation	Solution
There is no ICP board installed.	Install an ICP board.
ICP board not correctly inserted.	Re-install the ICP board.

Code 5830: “ti-link-decryptor - no communication” (Error)

Situation	Solution
Link decryptor is not correctly seated.	Reseat the link decryptor. If problem remains, replace the link decryptor.

Code 5831: “ti-link-decryptor - system error” (Error)

With the Communicator, go to *Diagnostics → Actual → Link Decryptor status → Error messages*

The following errors can occur:

Error	Solution
Link decryptor - User loader integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - Main application integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - RNG hardware integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - DRNG hardware integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - RSA algorithm integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - AES algorithm integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - HMAC algorithm integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - SHA algorithm integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - TLS integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - FPGA configuration integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - FPGA cinelink 2 decryption integrity error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - Real time clock error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - FPGA configuration error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - FPGA temperature out of range	Temperature on the link decryptor is to high. Check for other fan or temperature error messages. Check if the front cover of the HDSDI module is closed.
Link decryptor - RNG Hardware duplicate output error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - DRNG Hardware duplicate output error	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.

Error	Solution
Link decryptor - 1.20V supply out of range	Replace SMPS. See "Replacement of the Switched Mode Power Supply", page 345. Replace Signal backplane. See "Replacement of the signal back plane", page 295. Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - 1.80V supply out of range	Replace SMPS. See "Replacement of the Switched Mode Power Supply", page 345. Replace Signal backplane. See "Replacement of the signal back plane", page 295. Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - 2.50V supply out of range	Replace SMPS. See "Replacement of the Switched Mode Power Supply", page 345. Replace Signal backplane. See "Replacement of the signal back plane", page 295. Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - 3.30V regulator out of range	Replace SMPS. See "Replacement of the Switched Mode Power Supply", page 345. Replace Signal backplane. See "Replacement of the signal back plane", page 295. Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - Security tamper	The link decryptor has been tampered. Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - Top side security enclosure open	The top side enclosure has been tampered. Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - Bottom side security enclosure open	The bottom side enclosure has been tampered. Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - Software command Zeroization	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.
Link decryptor - Physical marriage tamper	The ICP and/or link decryptor have been removed and inserted again. You need to remarry both. Start the clear security warning procedure. See "Authorization to clear security warning on the projector", page 309.
Link decryptor - Logical marriage tamper	The ICP and link decryptor are not a couple. This means one of both has been replaced. You need to marry both. Start the clear security warning procedure. See "Authorization to clear security warning on the projector", page 309.
Link decryptor - Service door tamper	The Card Cage cover has been removed. Clear the security warning. See "Authorization to clear security warning on the projector", page 309. The cover plate of the Light Processor compartment has been removed. Clear the security warning. See "Authorization to clear security warning on the projector", page 309. Defect security switches. If all compartments and devices are installed and security error will not authorize, replace DCI security switches. Malfunction Signal Backplane. If switch replacement is not the solution, then replace Signal Backplane. See "Replacement of the signal back plane", page 295.
Link decryptor - Service log error	The Security Log Error indicates that there is no more room to write log entries in the link decryptor log file. When this error is active, the DCI compliant Server needs to extract the log data (via ASM/TLS session) from the link decryptor Security Log. Reads of the security log by any other entity/means will not impact this error. This error will remain active until the Server reads enough log entries to create room for 512 log entries. This can take some time. Playback will be prohibited (black image) as long as this error is active.
Link decryptor - Security battery low warning	The battery of the link-decryptor is low. Leave the projector on for some time to recharge the battery.
Link decryptor - Security log warning	The security log warning indicates that there are less than 512 log entry locations available in the link decryptor log before the log is full. The attached server needs to read the log which will clear the log of the projector. When this warning is active, the DCI compliant server needs to extract the log data (via ASM/TLS session) from the link decryptor Security Log. This can take some time. Reads of the security log by any other entity/means will not impact this warning.

Code 5832: “ti-link-decryptor - security tamper event” (Error)

Situation	Solution
The link decryptor has been tampered.	Replace link decryptor. See "Replacement of the Link Decryptor", page 307.

Code 5833: “ti-link-decryptor - logical marriage tamper event” (Error)

Situation	Solution
The ICP and link decryptor are not a couple.	This means one of both has been replaced. You need to marry both. Start the clear security warning procedure. See "Authorization to clear security warning on the projector", page 309. Together with this error you will always have an error *“ti-link-decryptor physical marriage tamper event”*. Brief procedure to clear the security warning and marriage ICP and decryptor: 1. Ensure the cover plate of the Light Processor compartment is properly installed. 2. Ensure that all boards in the Card Cage are properly installed. 3. Start up the projector. 4. Initiate authorization by holding the security key in the security socket (image 4-42). 5. Enter the pin code within 5 seconds.

Code 5834: “ti-link-decryptor - physical marriage tamper event” (Error)

Situation	Solution
The ICP and/or link decryptor have been removed and inserted again.	You need to remarry both. Start the clear security warning procedure. See "Authorization to clear security warning on the projector", page 309. Brief procedure to clear the security warning and marriage ICP and decryptor: 1. Ensure the cover plate of the Light Processor compartment is properly installed. 2. Ensure that all boards in the Card Cage are properly installed. 3. Start up the projector. 4. Initiate authorization by holding the security key in the security socket (image 4-42). 5. Enter the pin code within 5 seconds.

Code 5835: “ti-link-decryptor - security log is almost full” (Error)

Situation	Solution
The security log almost full indicates that there are less than 512 log entry locations available in the link decryptor log before the log is full. The attached server needs to read the log which will clear the log of the projector.	When this warning is active, the DCI compliant server needs to extract the log data (via ASM/TLS session) from the link decryptor Security Log. This can take some time. Reads of the security log by any other entity/means will not impact this warning.

Code 5836: “ti-link-decryptor - security log is full” (Error)

Situation	Solution
The Security Log is full indicates that there is no more room to write log entries in the link decryptor log file.	When this error is active, the DCI compliant Server needs to extract the log data (via ASM/TLS session) from the link decryptor Security Log. Reads of the security log by any other entity/means will not impact this error. This error will remain active until the Server reads enough log entries to create room for 512 log entries. This can take some time. Playback will be prohibited (black image) as long as this error is active.

Code 5837: “ti-link-decryptor - read system status failed ” (Error)

Situation	Solution
Link decryptor is not correctly seated.	Reseat the link decryptor. If problem remains, replace link decryptor. See "Replacement of the Link Decryptor", page 307.

Code 5850: “imb - no communication” (Error)

Situation	Solution
No communication with media block	Check if the media block is well seated. Replace the media block.

Code 5851: “imb - service door tamper event” (Error)

Situation	Solution
A board in the Card Cage has been removed.	Clear the security warning. See "Authorization to clear security warning on the projector", page 309. Brief procedure to clear the security warning: 1. Ensure the cover plate of the Light Processor compartment is properly installed. 2. Ensure that all boards in the Card Cage are properly installed. 3. Start up the projector. 4. Initiate authorization by holding the security key in the security socket (image 4-42). 5. Enter the pin code within 5 seconds.
The cover plate of the Light Processor compartment has been removed. Security switches are activated (reference 1 & 2 image 4-43).	Clear the security warning. See "Authorization to clear security warning on the projector", page 309. Brief procedure to clear the security warning: 1. Ensure the cover plate of the Light Processor compartment is properly installed. 2. Ensure that all boards in the Card Cage are properly installed. 3. Start up the projector. 4. Initiate authorization by holding the security key in the security socket (image 4-42). 5. Enter the pin code within 5 seconds.
Defect security switches (reference 1 & 2 image 4-43).	If all compartments and devices are installed and security error will not authorize, replace DCI security switches.
Malfunction Signal Backplane	If switch replacement is not the solution, then replace Signal Backplane. See "Replacement of the signal back plane", page 295.

Code 5853: “imb - logical marriage tamper event” (Error)

Situation	Solution
The ICP and Mediablock are not a couple.	This means one of both has been replaced. You need to marry both. Start the clear security warning procedure. See "Authorization to clear security warning on the projector", page 309. Together with this error you will always have an error *“imb - physical marriage tamper event”*.

Code 5854: “imb - physical marriage tamper event” (Error)

Situation	Solution
The ICP and/or IMediablock have been removed and inserted again.	You need to remarry both. Start the clear security warning procedure. See "Authorization to clear security warning on the projector", page 309.

Code 5880: “dolby 3d key-server - read status failed” (Warning)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Corrupt Dolby 3D key server program. Unable to read the “Version Info” from the “Dolby 3D key server program” via the Communicator software.	Reinstall the “Dolby 3D key server program” on the projector. Use the Projector Toolset.

Code 5881: “dolby 3d key-server - status = locked” (Warning)

Situation	Solution
The content server does not support Dolby 3D.	Check if the projector is connected with a Dolby 3D certified server.
Malfunction content server.	Check the Dolby certified content server. As a temporally solution unlock the 3D key-server by pressing the button “Manual unlock” in the “3D integrated color wheel” menu of the Communicator software. Note that in this case the 3D key-server remains unlocked for 24 hours.

Code 5882: “3d module - read status failed” (Warning)

Situation	Solution
Exceptional software failure.	Reboot the projector.

Situation	Solution
There is no 3D color wheel installed in the projector but the flag for 3D is set in the Communicator software.	Either install the 3D color wheel unit or disable the 3D option in the Communicator software.
The 3D color wheel unit is disconnected from the Formatting Interface Board.	Check the connection between the 3D color wheel unit and the Signal backplane.
Malfunction electronic board of the 3D color wheel unit. The color wheel can be rotated by hand (spinning motor OK) and be moved back and forward by hand (retraction mechanism OK). Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the electronic board of the 3D color wheel unit.
Malfunction of the 3D color wheel unit.	Replace the whole 3D color wheel unit. Send the malfunction unit back to Barco.

Code 5884: “3d module - change status failed due to dolby 3d key-server lock” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Corrupt Dolby 3D key server program. Unable to read the “Version Info” from the “Dolby 3D key server program” via the Communicator software.	Reinstall the “Dolby 3D key server program” on the projector. Use the DC Toolset.
The content server does not support Dolby 3D.	Check if the projector is connected with a Dolby 3D certified server.
Malfunction content server.	Check the Dolby certified content server. As a temporally solution unlock the 3D key-server by pressing the button “Manual unlock” in the “3D integrated color wheel” menu of the Communicator software. Note that in this case the 3D key-server remains unlocked for 24 hours.

Code 5885: “3d module - change status failed due to communication error” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
There is no 3D color wheel installed in the projector but the flag for 3D is set in the Communicator software.	Either install the 3D color wheel unit or disable the 3D option in the Communicator software.
The 3D color wheel unit is disconnected from the Formatting Interface Board.	Check the connection between the 3D color wheel unit and the Signal backplane. Replace wire unit if damaged.
Malfunction electronic board of the 3D color wheel unit. The color wheel can be rotated by hand (spinning motor OK) and be moved back and forward by hand (retraction mechanism OK). Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the electronic board of the 3D color wheel unit.
Malfunction of the 3D color wheel unit.	Replace the whole 3D color wheel unit. Send the malfunction unit back to Barco.

Code 5890: “3d module - color wheel spin failed” (Error)

Situation	Solution
Spinning motor disconnected.	Check the connection (reference D image 4-47) of the spinning motor. Replace wire unit if damaged.

Situation	Solution
Feedback circuit of the spinning motor disconnected.	Check the connection (reference A image 4-47) of the feedback circuit. Replace wire unit if damaged.
Blocked color wheel.	Check if the 3D color wheel can turn freely. No mechanics preventing wheel to turn.
Malfunction 3D color wheel board.	Replace the electronic board of the 3D color wheel unit.
Malfunction spinning motor.	Replace the whole 3D color wheel unit. Send the malfunction unit back to Barco.

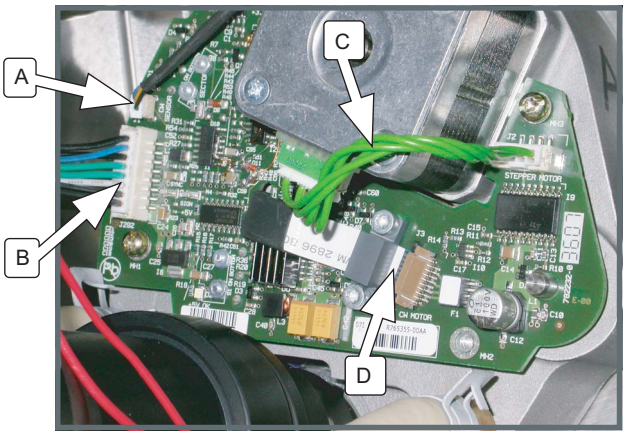


Image 4-47
3D color wheel board connections.

A Spinning motor feedback circuit.
B Connection with Signal backplane
C Wire unit between retraction motor and electronic board.
D Wire unit between spinning motor and electronic board.

Code 5891: “3d module - color wheel in failed” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Retraction motor disconnected.	Check if the wire unit (reference C image 4-47) of the retraction motor is well inserted. Replace wire unit if damaged.
Defect micro switch.	Replace the electronic board of the 3D color wheel unit.
Mechanical mechanism is blocked. The color wheel can not be moved back and forward by hand. Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the whole 3D color wheel unit in case you can not unlock the color wheel. Send the blocked unit back to Barco.
Malfunction retraction motor.	Replace the whole 3D color wheel unit. Send the malfunction unit back to Barco.

Code 5892: “3d module - color wheel out failed” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Retraction motor disconnected.	Check if the wire unit (reference C image 4-47) of the retraction motor is well inserted. Replace wire unit if damaged.
Defect micro switch.	Replace the electronic board of the 3D color wheel unit.
Mechanical mechanism is blocked. The color wheel can not be moved back and forward by hand. Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the whole 3D color wheel unit in case you can not unlock the color wheel. Send the blocked unit back to Barco.
Malfunction retraction motor.	Replace the whole 3D color wheel unit. Send the malfunction unit back to Barco.

Code 5893: “3d module - color wheel temperature too high” (Error)

Situation	Solution
A high light pipe temperature increases the temperature of the 3D color wheel board.	Check the temperature of the light pipe.
Jammed wire unit of the spinning motor.	Check the condition of the wire unit (reference D image 4-47) of the spinning motor.
Malfunction 3D color wheel board.	Replace the electronic board of the 3D color wheel unit.
Malfunction spinning motor.	Replace the whole 3D color wheel unit. Send the malfunction unit back to Barco.

Code 5894: “3d module - color wheel speed not ok (not locked)” (Error)

Situation	Solution
Wrong 3D settings on the 3D content server.	Check the 3D settings on the 3D content server. See Dolby or color wheel documentation. The locking frequency for the 3D color wheel must be in the range of 48 and 72 Hz. You can verify the locking frequency via the Communicator software menu “3D settings - integrated color wheel”.
Feedback circuit of the spinning motor disconnected.	Check the connection (reference A image 4-47) of the feedback circuit. Replace wire unit if damaged.
Spinning motor disconnected.	Check the connection (reference D image 4-47) of the spinning motor. Replace wire unit if damaged.
Malfunction 3D color wheel board.	Replace the electronic board of the 3D color wheel unit.
Malfunction spinning motor	Replace the whole 3D color wheel unit. Send the malfunction unit back to Barco.

Code 5960: “light pipe - temperature too high” (Error)

This error code is probably preceded by the warning code 5961: “light pipe - temperature high”. The same troubleshooting table can be applied.

Code 5961: “light pipe - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit (reference 1 image 4-48) of the pump is properly connected.
Blocked high density filter of the heat exchanger.	Replace the high density filter. See "Clean the dust filter on the bottom side", page 407.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Fill the cooling circuit with liquid and expel all air.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. See "Replacement of the complete cooling pump", page 238. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See "Cleaning the cooling pump", page 232.
Defect temperature sensor on the water cooling block of the Light Pipe entrance.	Replace the temperature sensor on the Light Pipe entrance.
Misalignment of the lamp inside the lamp house.	1. Readjust the Z-alignment of the lamp. See "Realignment of the lamp in its reflector", page 125. 2. Replace the lamp house with a new lamp house. See "Removal of the lamp house", page 110.
Misalignment of the cold mirror.	Readjust the cold mirror. See "Cold mirror assembly", page 137.

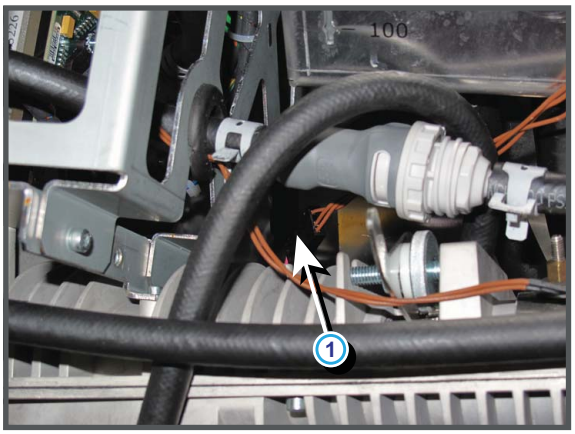


Image 4-48
Pump connections

Code 5964: “light pipe - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 1image 4-49) of the temperature sensor is disconnected from the Signal Backplane.	Plug in the wire unit of the temperature sensor into its socket on the Signal Backplane.
Damaged wire unit of the temperature sensor which measures the temperature of the water cooling block of the light pipe entrance.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the light pipe entrance.	Replace the temperature sensor.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

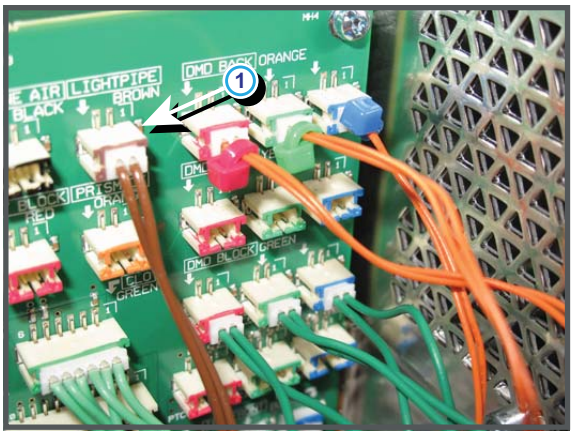


Image 4-49
Light pipe temperature sensor connection

Code 5965: “light pipe - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference 1 image 4-49) which measures the temperature of the water cooling block of the light pipe entrance. When disconnecting the wire unit (reference 3 image 4-49) of the temperature sensor from the Formatting Interface Board the error code is changed to “light pipe - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.

Situation	Solution
Defect temperature sensor on the water cooling block of the light pipe entrance. When disconnecting the wire unit (reference 1 image 4-49) of the temperature sensor from the Signal backplane, the error code is changed to “light pipe - temperature sensor open”.	Replace the temperature sensor.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.

Code 5970: “dmd red front - temperature too high” (Error)

This error code is probably preceded by the warning code 5971 : “dmd red front - temperature high”. The same troubleshooting table can be applied.

Code 5971: “dmd red front - temperature high” (Warning)

Situation	Solution
The wire unit of the temperature sensor at the front of the DMD is mistakenly switched with one of the wire units of the other temperature sensors of the Light Processor Unit.	Check if all wire units of the temperature sensors are plugged into their respective sockets on the Signal Backplane.
The wire units of the Peltier elements (TEC’s), mounted on the common cooling block of the heat pipes, are mistakenly switched.	Check if all wire units of the Peltier elements are plugged into their respective sockets on the Signal Backplane (reference 1 image 4-50).
No thermal contact between heat pipes and common cooling block due to loose screws.	Check if the four screws, which attach the heat pipes of the involved channel to the common cooling block, are fastened.
Malfunction Peltier element (TEC) between heat pipes and common cooling block. Use the “diode test” of a multi-meter to check out the Peltier. Polarity does not matter. The Peltier is OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier. If problem persist, contact Barco for further instructions.

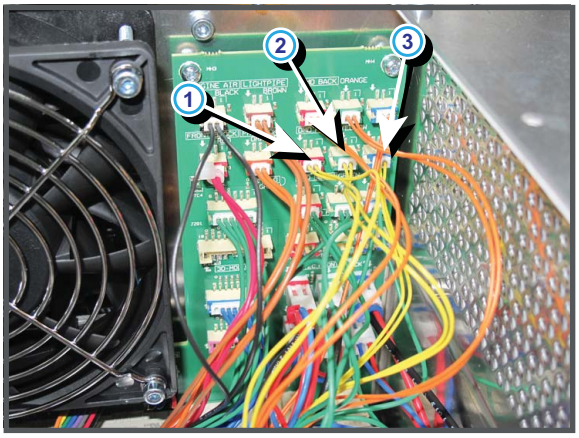


Image 4-50
Red DMD front temperature sensor connection

Code 5973: “dmd red front - temperature low” (Warning)

Situation	Solution
DMD temperature low.	Make sure that the ambient temperature is within specs. Let the projector acclimate to the normal room temperature which should be higher then 10°C (50°F) and lower then 35°C (95°F). Do not ignite the lamp, otherwise there is a risk for condensate.
Malfunction Fan Control board. TEC (Peltier) is continuously on.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
The temperature on the front side of the DMD of the red channel is low.	If this problem persist, contact Barco for further instructions.

Code 5974: “dmd red front - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 1 image 4-50) of the temperature sensor is disconnected from the Signal Backplane.	Plug in the wire unit of the temperature sensor into its socket on the Signal Backplane.
Damaged wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5975: “dmd red front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the red channel. When disconnecting the wire unit (reference 1 image 4-50) of the temperature sensor from the Signal Backplane the error code is changed to “dmd red front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5980: “dmd green front - temperature too high” (Error)

This error code is probably preceded by the warning code 5981: “dmd green front - temperature high”. The same troubleshooting table can be applied.

Code 5981: “dmd green front - temperature high” (Warning)

Situation	Solution
The wire unit of the temperature sensor at the front of the DMD is mistakenly switched with one of the wire units of the other temperature sensors of the Light Processor Unit.	Check if all wire units of the temperature sensors are plugged into their respective sockets on the Signal Backplane (reference 2 image 4-50.
The wire units of the Peltier elements (TEC’s), mounted on the common cooling block of the heat pipes, are mistakenly switched.	Check if all wire units of the Peltier elements are plugged into their respective sockets on the Signal Backplane.
No thermal contact between heat pipes and common cooling block due to loose screws.	Check if the four screws, which attach the heat pipes of the involved channel to the common cooling block, are fastened.
Malfunction Peltier element (TEC) between heat pipes and common cooling block. Use the “diode test” of a multi-meter to check out the Peltier. Polarity does not matter. The Peltier is OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier. If problem persist, contact Barco for further instructions.

Code 5983: “dmd green front - temperature low” (Warning)

Situation	Solution
DMD temperature low.	Make sure that the ambient temperature is within specs. Let the projector acclimate to the normal room temperature which should be higher then 10°C (50°F) and lower then 35°C (95°F). Do not ignite the lamp, otherwise there is a risk for condensate.

Situation	Solution
Malfunction Fan Control board. TEC (Peltier) is continuously on.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
The temperature on the front side of the DMD of the green channel is low.	If this problem persist, contact Barco for further instructions.

Code 5984: “dmd green front - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 2 image 4-50) of the temperature sensor is disconnected from the Signal backplane	Plug in the wire unit of the temperature sensor into its socket on the Signal backplane.
Damaged wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the green channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5985: “dmd green front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the green channel. When disconnecting the wire unit (reference 3 image 4-50) of the temperature sensor from the Signal backplane the error code is changed to “dmd green front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5990: “dmd blue front - temperature too high” (Error)

This error code is probably preceded by the warning code 5991: “dmd blue front - temperature high”. The same troubleshooting table can be applied.

Code 5991: “dmd blue front - temperature high” (Warning)

Situation	Solution
The wire unit of the temperature sensor at the front of the DMD is mistakenly switched with one of the wire units of the other temperature sensors of the Light Processor Unit.	Check if all wire units of the temperature sensors are plugged into their respective sockets on the Signal Backplane (reference 3 image 4-50.
The wire units of the Peltier elements (TEC’s), mounted on the common cooling block of the heat pipes, are mistakenly switched.	Check if all wire units of the Peltier elements are plugged into their respective sockets on the Signal Backplane.
No thermal contact between heat pipes and common cooling block due to loose screws.	Check if the four screws, which attach the heat pipes of the involved channel to the common cooling block, are fastened.
Malfunction Peltier element (TEC) between heat pipes and common cooling block. Use the “diode test” of a multi-meter to check out the Peltier. Polarity does not matter. The Peltier is OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier. If problem persist, contact Barco for further instructions.

Code 5993: “dmd blue front - temperature low” (Warning)

Situation	Solution
DMD temperature low.	Make sure that the ambient temperature is within specs. Let the projector acclimate to the normal room temperature which should be higher then 10°C (50°F) and lower then 35°C (95°F). Do not ignite the lamp, otherwise there is a risk for condensate.
Malfunction Fan Control board. TEC (Peltier) is continuously on.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
The temperature on the front side of the DMD of the blue channel is low.	If this problem persist, contact Barco for further instructions.

Code 5994: “dmd blue front - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 3 image 4-50) of the temperature sensor is disconnected from the Signal backplane.	Plug in the wire unit of the temperature sensor into its socket on the Signal Backplane.
Damaged wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5995: “dmd blue front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the blue channel. When disconnecting the wire unit (reference 3image 4-50) of the temperature sensor from the Signal Backplane the error code is changed to “dmd blue front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 6000: “block front - temperature too high” (Error)

This error code is probably preceded by the warning code 6001: “block front - temperature high”. The same troubleshooting table can be applied.

Code 6001: “block front - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit (reference 1 image 4-51) of the pump is properly connected.
Blocked high density filter of the heat exchanger (bottom side).	Clean or replace the high density filter. See "Clean the dust filter on the bottom side", page 407.

Situation	Solution
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Start the top up procedure to fill the cooling circuit with liquid. See "Filling the liquid cooling circuit", page 226.
Malfunction pump of the cooling circuit. You don't feel any vibrations when touching the pump after activating the "Refill mode" via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. See "Replacement of the pump motor and rotor", page 234 or "Replacement of the complete cooling pump", page 238. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See "Cleaning the cooling pump", page 232.

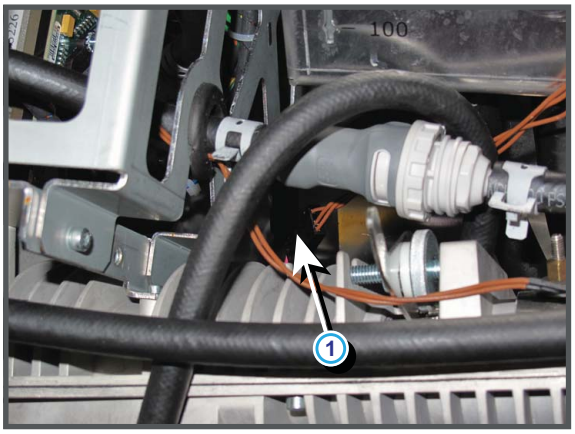


Image 4-51
Pump connections

Code 6004: "block front - temperature sensor open" (Error)

Situation	Solution
Wire unit of the temperature sensor is disconnected from the Signal backplane (reference 1 image 4-52.	Plug in the wire unit of the temperature sensor into its socket on the Signal backplane.
Damaged wire unit of the temperature sensor which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD's.	1. Repair the wire unit. 2. If not repairable, replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD's.	Replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

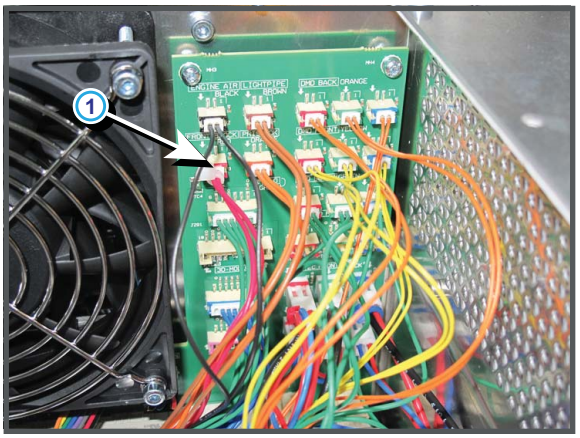


Image 4-52

Code 6005: “block front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD’s. When disconnecting the wire the wire unit of the temperature sensor from the Signal backplane the error coded is changed to “block front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD’s. When disconnecting the wire the wire unit of the temperature sensor from the Signal backplane the error coded is changed to “block front - temperature sensor open”.	Replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

Code 6010: “block red - temperature too high” (Error)

This error code is probably preceded by the warning code 6011: “block red - temperature high”. The same troubleshooting table can be applied.

Code 6011: “block red - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit (reference 1 image 4-51) of the pump is properly connected.
Blocked high density filter of the heat exchanger (bottom filter).	Clean or replace the high density filter. See "Clean the dust filter on the bottom side", page 407.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Start the top up procedure to fill the cooling circuit with liquid. See "Filling the liquid cooling circuit", page 226.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. See "Replacement of the pump motor and rotor", page 234 or "Replacement of the complete cooling pump", page 238. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See "Cleaning the cooling pump", page 232.

Code 6014: “block red - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 1 image 4-53) of the temperature sensor is disconnected from the Signal backplane.	Plug in the wire unit of the temperature sensor into its socket on the Signal backplane.
Damaged wire unit of the temperature sensor (Reference 1 image 4-53) which measures the temperature of the water cooling block of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the red channel.	Replace the temperature sensor.

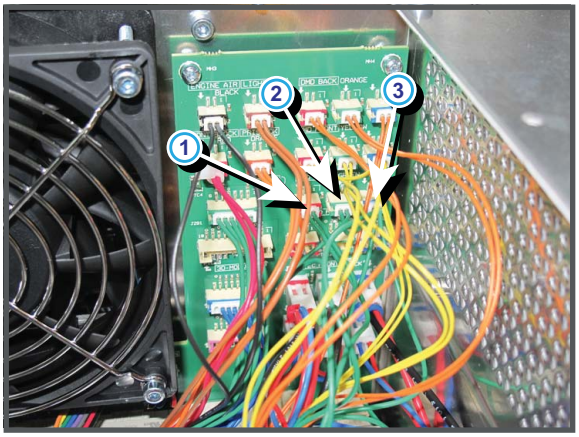


Image 4-53
Temperature sensor connection DMD blocks

Code 6015: “block red- temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor which measures the temperature of the water cooling block of the red channel. When disconnecting the wire unit (reference 1 image 4-53) of the temperature sensor from the Signal backplane the error code is changed to “block red - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the red channel. When disconnecting the wire unit of the temperature sensor from the Signal backplane the error code is changed to “block red - temperature sensor open”.	Replace the temperature sensor.

Code 6020: “block green - temperature too high” (Error)

This error code is probably preceded by the warning code 6021 : “block green - temperature high”. The same troubleshooting table can be applied.

Code 6021: “block green - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit (reference 1 image 4-51) of the pump is properly connected.
Blocked high density filter of the heat exchanger (bottom filter).	Clean or replace the filter. See "Clean the dust filter on the bottom side", page 407.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Start the top up procedure to fill the cooling circuit with liquid. See "Filling the liquid cooling circuit", page 226.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. See "Replacement of the pump motor and rotor", page 234 or "Replacement of the complete cooling pump", page 238. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See "Cleaning the cooling pump", page 232.

Code 6024: “block green - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 2 image 4-53) of the temperature sensor is disconnected from the Signal backplane.	Plug in the wire unit of the temperature sensor into its socket on the Signal backplane.
Damaged wire unit of the temperature sensor (Reference 2 image 4-53) which measures the temperature of the water cooling block of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the red channel.	Replace the temperature sensor.

Code 6025: “block green - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor which measures the temperature of the water cooling block of the red channel. When disconnecting the wire unit (reference 2image 4-53) of the temperature sensor from the Signal backplane the error code is changed to “block green - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the red channel. When disconnecting the wire unit of the temperature sensor from the Signal backplane the error code is changed to “block green - temperature sensor open”.	Replace the temperature sensor.

Code 6030: “block blue - temperature too high” (Error)

This error code is probably preceded by the warning code 6031: “block blue - temperature high”. The same troubleshooting table can be applied.

Code 6031: “block blue - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit (reference 1 image 4-51) of the pump is properly connected.
Blocked high density filter of the heat exchanger (bottom filter).	Clean or replace the high density filter. See "Clean the dust filter on the bottom side", page 407.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Start the top up procedure to fill the cooling circuit with liquid. See "Filling the liquid cooling circuit", page 226.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. See "Replacement of the pump motor and rotor", page 234 or "Replacement of the complete cooling pump", page 238. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See "Cleaning the cooling pump", page 232.

Code 6034: “block blue - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference 3image 4-53) of the temperature sensor is disconnected from the Signal backplane.	Plug in the wire unit of the temperature sensor into its socket on the Signal backplane.
Damaged wire unit of the temperature sensor (Reference 2 image 4-53) which measures the temperature of the water cooling block of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the blue channel.	Replace the temperature sensor.

Code 6035: “block blue - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor which measures the temperature of the water cooling block of the red channel. When disconnecting the wire unit (reference 3image 4-53) of the temperature sensor from the Signal backplane the error code is changed to “block blue - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the red channel. When disconnecting the wire unit of the temperature sensor from the Signal backplane the error code is changed to “block blue - temperature sensor open”.	Replace the temperature sensor.

Code 6050: “dmd - temperature hardware protection warning” (Warning)

Situation	Solution
DMD temperature low.	Make sure that the ambient temperature is within specs. Let the projector acclimate to the normal room temperature which should be higher then 10°C (50°F) and lower then 35°C (95°F). Do not ignite the lamp, otherwise there is a risk for condensate.
DMD temperature high.	Check all cooling systems: Liquid cooling, air extraction system, dust filters, ...

Code 6061: “+24v - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-54. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

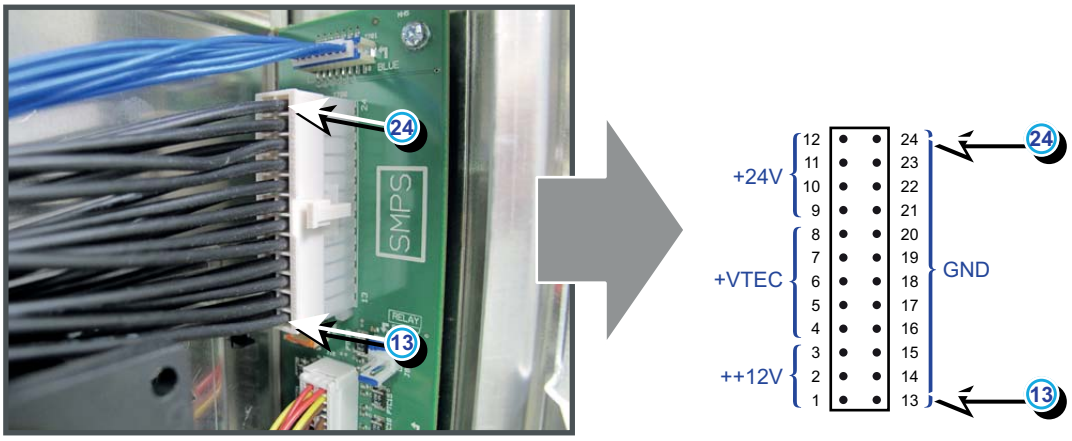


Image 4-54

Code 6062: “+24v - voltage too low” (Error)

This error code is probably preceded by the warning code 6063: “+24v - voltage low”. The same troubleshooting table can be applied.

Code 6063: “+24v - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the black wire unit which comes from the SMPS board. See image 4-54. If the measured voltage is about 24V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	1. Check the Signal Backplane for bad connections. Ensure that all wire units are well connected. (Note that the +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane) 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits.

Code 6071: “++12v - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the ++12V voltage on pin 1, 2 or 3 of the connector of the black wire unit which comes from the SMPS board. See image 4-54. If the measured voltage is about12V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 6073: “++12v - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the ++12V voltage on pin 1, 2 or 3 of the connector of the black wire unit which comes from the SMPS board. See image 4-54. If the measured voltage is about 12V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	Check the Signal Backplane for bad connections.

Code 6082: “lens motors - voltage too low” (Error)

Situation	Solution
The supply voltage for the lens motors is below its minimum.	Measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector of the wire unit which comes from the SMPS board. See image 4-54. (The supply voltage for the lens motors is derived form the +24V on the Cinema Controller board. The +24V supply is generated on the SMPS board and enters the Fan Control board and Cinema Control board via the Signal Backplane.) If the measured voltage is **about 24V** then: 1. reseat the Cinema Controller board. See "Removing a board in the card cage", page 277. 2. if the problem remains, replace the Cinema Controller board. If the measured voltage is **not OK** then: 1. Check the Signal Backplane for bad connections or short circuits. Ensure that all wire units are well connected. 2. Check the wiring of the Anode fan for short circuits. 3. Check the wiring of the Cathode fan for short circuits. 4. replace the Fan Control board. See "Removing a board in the card cage", page 277. 5. replace the SMPS board. See "Replacement of the Switched Mode Power Supply", page 345.

Code 6123: “icp fan - speed low” (Warning)

Situation	Solution
Wire unit (reference 2 image 4-55) disconnected from the Signal Backplane.	Remove the Card Cage cover from the projector and check if the wire unit (reference 2 image 4-55) is inserted in the Signal Backplane.
Blocked fan (reference 1 image 4-55).	Remove the Fan Control board and look inside the compartment to check if the fan is not blocked. Unblock the fan. Ensure that the fan can turn freely. See "Removing a board in the card cage", page 277.
Damaged wire unit.	Remove the Fan Control board and look inside the compartment to check the wire unit of the ICP fan. Repair if possible, otherwise replace with new one. See "Integrated cinema processor fan", page 402.
Malfunction Fan Control board.	Replace the Fan Control board. See "Removing a board in the card cage", page 277.
Fan end of life.	Replace the fan. See "Integrated cinema processor fan", page 402..

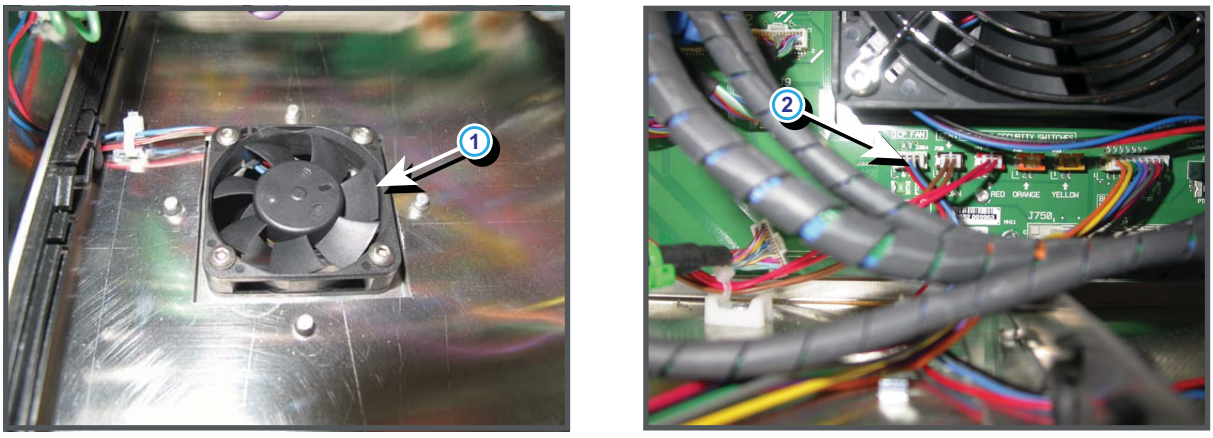


Image 4-55
ICP fan connection

Code 6131: “icp fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the ++12V voltage on pin 1, 2 or 3 of the connector of the black wire unit which comes from the SMPS board. See image 4-54. If the measured voltage is about12V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.

Code 6133: “icp fan - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	Measure on the Signal Backplane the ++12V voltage on pin 1, 2 or 3 of the connector of the black wire unit which comes from the SMPS board. See image 4-54. If the measured voltage is about12V then replace the Fan Control board. See "Removing a board in the card cage", page 277. Otherwise replace the SMPS board. See"Replacement of the Switched Mode Power Supply", page 345.
Short circuit or bad connection.	Check the Signal Backplane for bad connections.
Damaged insulation of the wire unit of the fan (reference 1 & 2 image 4-55) Note that this fan is in the Card Cage compartment underneath the Fan & Motor Control board.	Check the insulation of the wire unit of the fan. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan. See "Integrated cinema processor fan", page 402.

Code 6200: “maintenance - maintenance required” (Notification)

Situation	Solution
Projector requires maintenance.	Go to the menu “Maintenance → Smart maintenance” in the Communicator software. See also maintenance program of the projector (included in the service manual).

Code 6210: “lens - no lens parameter file has been activated” (Warning)

Situation	Solution
No lens parameter file has been activated.	Select a suitable lens parameter file for the installed lens using the Communicator software. >Installation >Advanced >Lens parameters >Select

4.2 Log files

Creating and downloading log files

A diagnostic package can be created with the Communicator software. Start up the software and go to *Diagnostics → Package*. A zip file will be created with the following information:

- ICP log file
- Security log file
- Projector log

These log files can be red with the Diagnostic package reader which was delivered as separate program together with the Communicator software. For more information about the use of this Diagnostic package reader, consult the User Guide of the Communicator software.

ICP Log File

Records events listed below:

- Handshakes with server
- TI system initialization
- Reading of TI board status
- Opening of TCP connection
- Failure of TI boards

Security Log File

Records events listed below:

- Monitoring of security switches
- Monitoring of key exchange
- Authorizing of Dallas key

Projector Log

Records events listed below:

- Lamp control commands
- Booting of Barco software
- Detection of TI boards
- Log on details of users
- Detection of Barco modules (LPS, FCB, etc.)

DP2K Log file analysis

Example of log file content

```
Dec 31 17:00:17 localhost local0.info license-manager[221]: main - starting application (version 1.0.1)
Dec 31 17:00:17 localhost local0.info router[224]: main - starting application (version 1.0.1)
Dec 31 17:00:17 localhost local0.info router[231]: network - wan ip-address is 0.0.0.0
Dec 31 17:00:18 localhost local0.info dp60[233]: main - starting application (version 1.0.7)
Dec 31 17:00:18 localhost local0.info dp60[233]: main - projector type is "DP2K-20C"
Dec 31 17:00:21 localhost local0.info dp60[233]: ti-icp - wait until ready
Dec 31 17:00:34 localhost local0.info dp60[233]: system - synchronize date to 20100406124925
Apr 6 12:49:25 localhost local0.info dp60[233]: system - ti-link-decryptor login started...
Apr 6 12:49:41 localhost local0.info dp60[233]: system - ti-link-decryptor login successful
Apr 6 12:49:41 localhost local0.info dp60[233]: system - load lens encoder file "R9855931"
Apr 6 12:49:41 localhost local0.info dp60[233]: command (port = internal) - execute lens file '.init'
...
```

Format :

```
'Time' localhost 'facility code'.'severity code' 'component name' ['pid']:  'message'
```

Where :

- 'Time' = the time when the event occurred
- 'facility code' = component level that generates a log message
- 'severity code' = the severity can be : info – debug – warning – alert – err.
- 'component name' = component name that generates a log message.
  - dp60 = main process
  - kernel = Linux kernel
  - router = component which manages the router
  - TI_marriage = component which handles the marriage
  - clo = component which handles Light Sensor logic
  - license-manager = internal license manager
  - crypto memory = process which handles communication with crypto memory module (ID card)
- 'pid' = Process identifier. The internal process identifier, of the component generating the log message.
- 'message' = The actual error message.

The Barco controller inserts every hour an unique entry in the Barco log file and in the TI log file. This is done to be able to synchronize events in both log files, when the clocks are not aligned. It will also be used for a tool, that is still to be implemented, that will merge both log files, to make better analysis.

Example of such an entry :

```
Feb 3 02:41:16 localhost local0.info dp60[233]:  log mark - 0000003c1b84 - 8
```

Each Barco entry into a TI log is proceeded with a B.

What does the id means (as in the example) :

- 0000003c
  - the first 4 bytes give a hex interpretation of how many time the system has been booted.
  - 3c hex is 60 in decimal. It means that this system has been booted 60 times. Every boot cycle increases the timer with 1.
- 1b84 = the last two bytes, are random unique 2 bytes.
- 8 = the last digit indicates the number of hours passed in this boot cycle (in a decimal value). Every boot cycle resets this number to 0.

Ethernet connection messages in log file (some examples).

```
Apr 6 14:05:19 localhost local0.info dp60[233]:  main - closing connection of
150.158.197.64:43680 (keep-alive time expired)
```

→ after 15 minutes of inactivity projector will close connection.

```
Apr 6 14:08:55 localhost local0.info dp60[233]:  main - accepted connection from
150.158.192.133:43680
```

→ connection from communicator, from pc with ip address 150.158.192.133

```
Apr 6 14:08:58 localhost local0.info dp60[233]:  log (port = 150.158.192.133:43680:1e) - lo-
gon-phmt-barco-default
```

→ communicator inserts in log file, who logged on to projector

```
Apr 6 14:09:07 localhost local0.info dp60[233]:  command (port = 150.158.192.133:43680:1e) - set
lamp on
```

→ Command messages also indicate originator.

```
Apr 6 14:09:07 localhost local0.info dp60[233]:  system - load fcb file "lamp-on"
```

→ on fan controller board, lamp-on state is set.

External commands received by the Barco controller are preceded with the command (port = xxx) string

Where xxx can be :

- /dev/ttyS0:0 = Command comes from the serial connection labeled (“RS232 IN"). That can be from a touch panel which is connected through a RS232 cable, or from a communicator which is connected serially.
- /dev/ttyS2:0 = Command comes from a touch panel attached with a dedicated cable to the back of the projector (touch panel input).
- /dev/ttyS3:0 = Command comes from the TI board. This is typically a command that is part of a macro stored on that board.
- 10.36.62.17:43680 = Command comes from a remote machine with indicated IP address, followed by the local of the remote machine that send this command internal. The command is initiated internally, due to an internal reason.
- button = button is triggered from the keypad, attached to the projector.

Some examples :

- `command (port = /dev/ttyS2:0) - set network ip-address to 10.140.162.141 (dhcp off)` = From the touch panel, the IP address of the projector was set to 10.140.162.141
- `command (port = 10.36.62.17:43680) - set network ip-address to 10.36.62.62 (dhcp off)` = From a device with IP address 10.36.63.17, the IP address of the projector was changed to 10.36.63.17
- `command (port = /dev/ttyS0:0) - set dowser open.` = From a touch panel or PC, connected serially (connector labeled "Touch panel"), the dowser was set to open.
- `command (port = /dev/ttyS0:0) - set lamp off` = From a touch panel or PC, connected serially (connector labeled "Touch panel"), the lamp was powered off.
- `command (port = internal) - set lamp off` = For an internal reason the state of the lamp was set to off.
- `command (port = button) - set dowser closed` = The dowser was closed from the keypad.

The error messages are explained in the troubleshooting list - code 5831

ICP log files

Example of log file content :

```
2010/04/06 09:02:40.964797 I  ICP application 1.2(126) init  Shows the ICP package
2010/04/06 09:02:40.980964 I  successfully initialized the LoginLevelProtection mutex
2010/04/06 09:02:41.039022 I  Autotiming initialized
2010/04/06 09:02:41.049829 I  Autotiming using VSyncs
2010/04/06 09:02:41.051245 I  Started Autotiming Port threads
2010/04/06 09:02:41.051755 I  Autotiming started
2010/04/06 09:02:41.052149 I  Port thread running
2010/04/06 09:02:41.052897 I  Port thread running
2010/04/06 09:02:43.632304 I  Started Autotiming Main thread
2010/04/06 09:02:43.633017 D  Autotiming thread running
2010/04/06 09:02:43.633476 D  Autotiming: blank the image
2010/04/06 09:02:43.792939 D  Autotiming: unblank the image
...
```

Format

`'Date Time' 'Severity' 'message'`

Where :

- `'Date Time'` = the time when the event occurred.
- `'Severity'` = One character severity indication can be : ’D” (Debug) – “E” (Error) – “I” (Informational) - “U” (User).
- `'message'` = The actual error message.

Example :

`24.03.2010 17:17:12.185 TPPL = 2848, APPL = 2048, TLPF = 4095, ALPF = 128`

This line is entered when the auto timing on the ICP computes values that are not within valid ranges.

Where :

- `TPPL` = Total Pixels Per Line
- `APPL` = Active Pixels Per Line
- `TLPF` = Total Lines Per Frame
- `ALPF` = Active Lines Per Frame
- 512 <= APPL <= TPPL <= 8191
- 288 <= ALPF <= TLPF <= 4095

In this example ALPF = 128 which is less than the minimum of 288. When this happens, auto timing will attempt to blank the image.

5. REMOVAL AND INSTALLATION OF THE PROJECTOR COVERS

About this chapter

Most maintenance and servicing procedures demand removing one or more of the projector covers to gain access to the parts to maintain or to service. To avoid redundancy, all procedures about cover removing or installing are grouped together in this chapter. The maintenance and servicing procedures also refer to this chapter if required. The procedures in this chapter describe, with detailed step by step actions and illustrations, how to remove or install the projector covers. Note that some covers may only be removed by qualified service personnel, see remarks above each procedure.

WARNING: Disconnect the power to the unit mains terminals and unplug power cord at UPS inlet for removal of all power from the unit

5.1 Removal of the lamp cover

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

Necessary tools

Flat screw driver.

How to remove the lamp cover of the projector?

1. Release the two captive screws at the right side, top and bottom, of the lamp cover, using a flat screw driver.

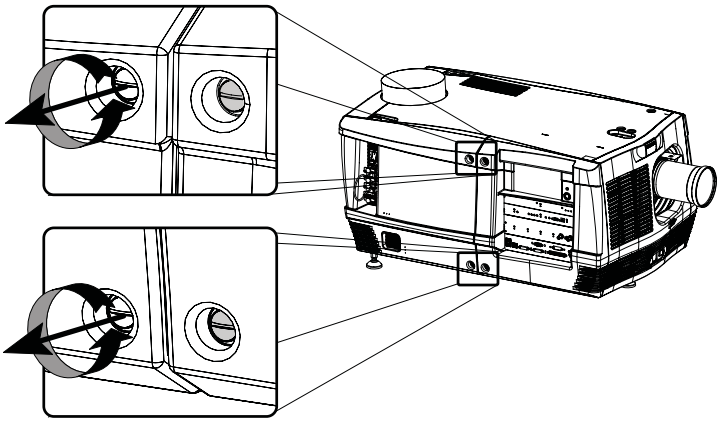


Image 5-1
Release lamp cover

2. Remove the lamp cover from the projector doing the following:
   a) gently pull out the left bottom corner (A) of the lamp cover,
   b) then gently pull out the left top corner (B) of the lamp cover,
   c) then move the lamp cover away from the projector (C).

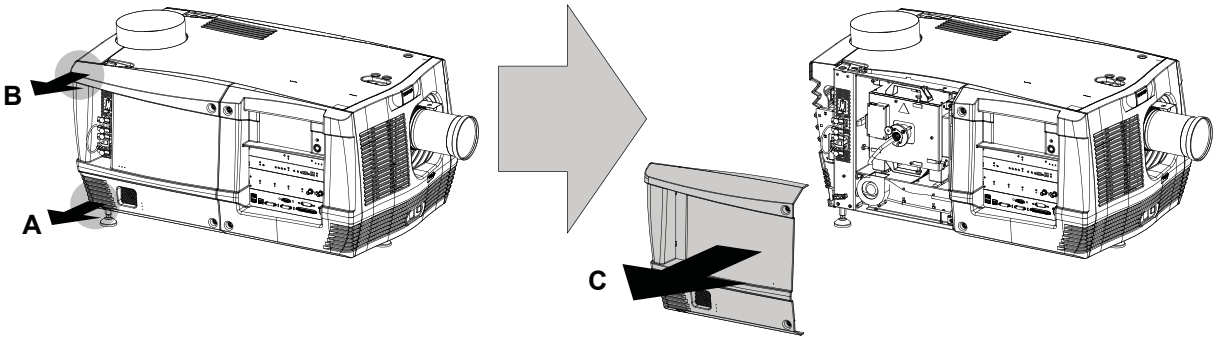


Image 5-2
Remove lamp cover

5.2 Removal of the input cover

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

Necessary tools

Flat screw driver.

How to remove the input cover of the projector?

1. Release the two captive screws at the top and bottom left side of the input cover, using a flat screw driver.

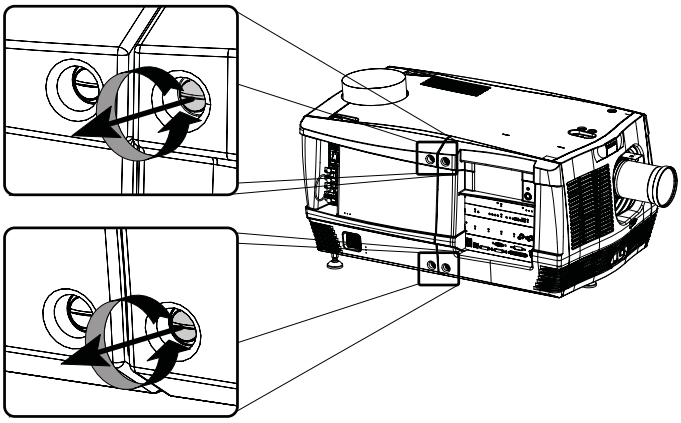


Image 5-3
Release input cover

2. Remove the input cover from the projector doing the following:
   a) gently pull out the right bottom corner (A) of the input cover,
   b) then gently pull out the right top corner (B) of the input cover,
   c) then move the input cover away from the projector (C).

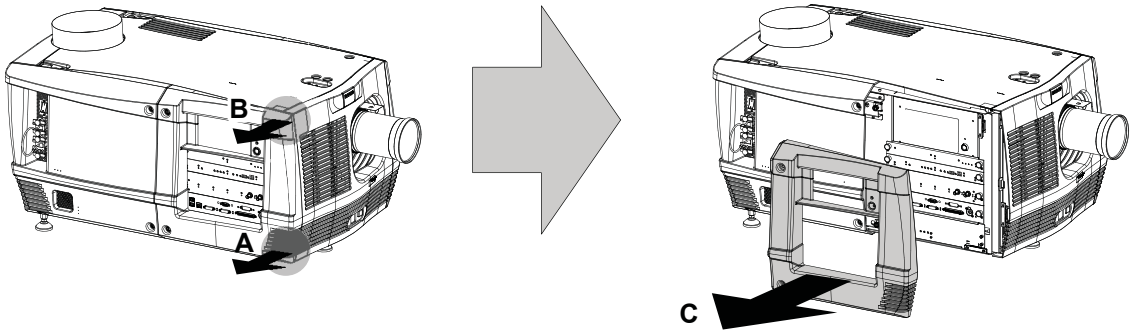


Image 5-4
Remove input cover

5.3 Removal of the front cover

The input cover and the lens have to be removed before removing the front cover. See procedures "Removal of the input cover", page 93, and "Lens removal", page 245.

Necessary tools

Flat screw driver

How to remove the front cover of the projector

1. Check if the input cover and the lens are removed.
2. Remove the rubber dust ring from the lens holder. See the detail at the right side of image 5-5.
3. Release the captive screw at the middle bottom of the front cover, using a flat screw driver.

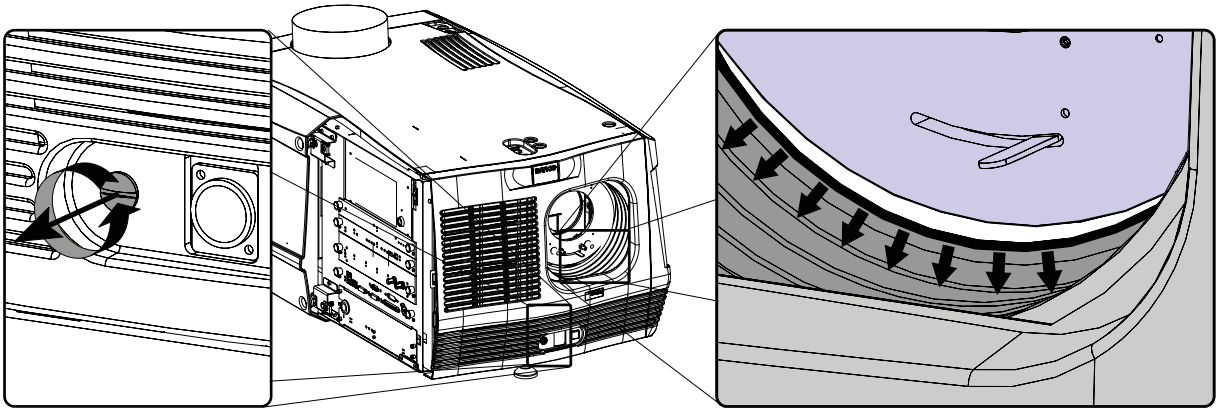


Image 5-5
Release front cover

4. Remove the front cover from the projector doing the following:
   a) standing in front of the projector, pull the upper right corner (A) of the front cover toward you until the latch releases,
   b) pull the lower right corner (B) of the front cover toward you until the latch releases,
   c) then move the front cover away from the projector.

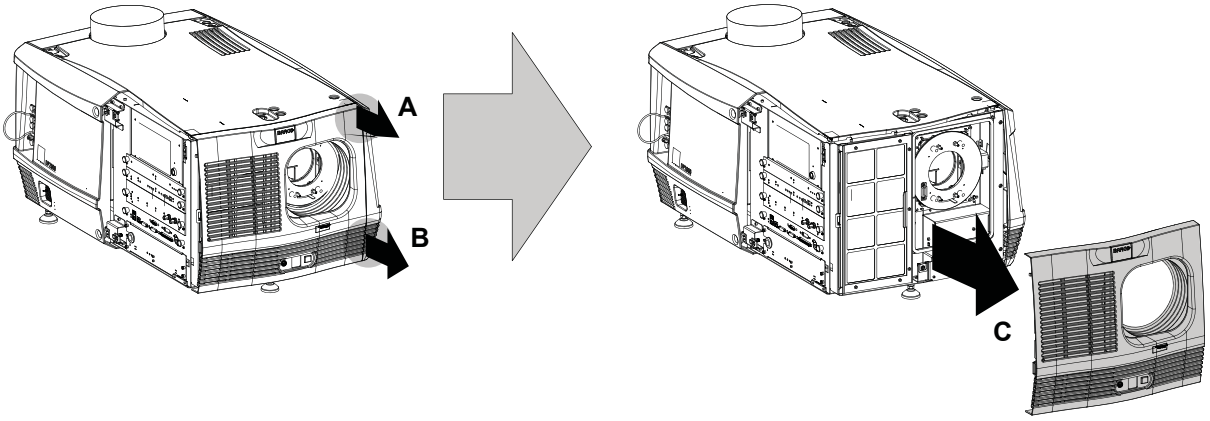


Image 5-6
Remove front cover

5.4 Removal of the side cover

Necessary tools

Flat screw driver.

How to remove the side cover of the projector?

1. Release the captive screw at the middle bottom of the side cover, using a flat screw driver.

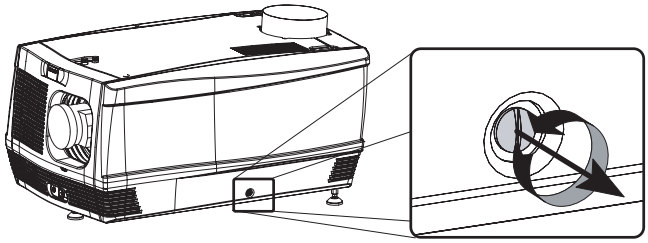


Image 5-7

2. Remove the side cover from the projector doing the following:
   a) gently pull out the bottom corners (A) of the side cover,
   b) then gently pull out the top corners (B) of the side cover,
   c) then move the side cover away from the projector (C).

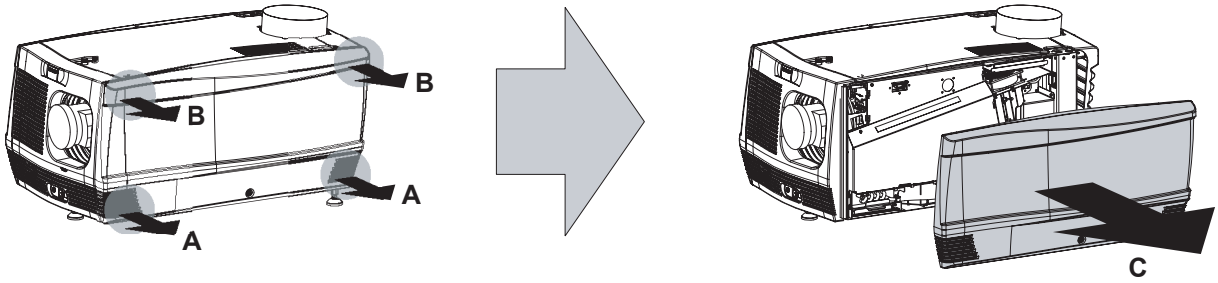


Image 5-8

5.5 Removal of the rear cover

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

Necessary tools

Flat screwdriver.

How to remove the rear cover from the projector?

1. Release the two captive screws at the bottom corners of the rear cover, using a flat screw driver.

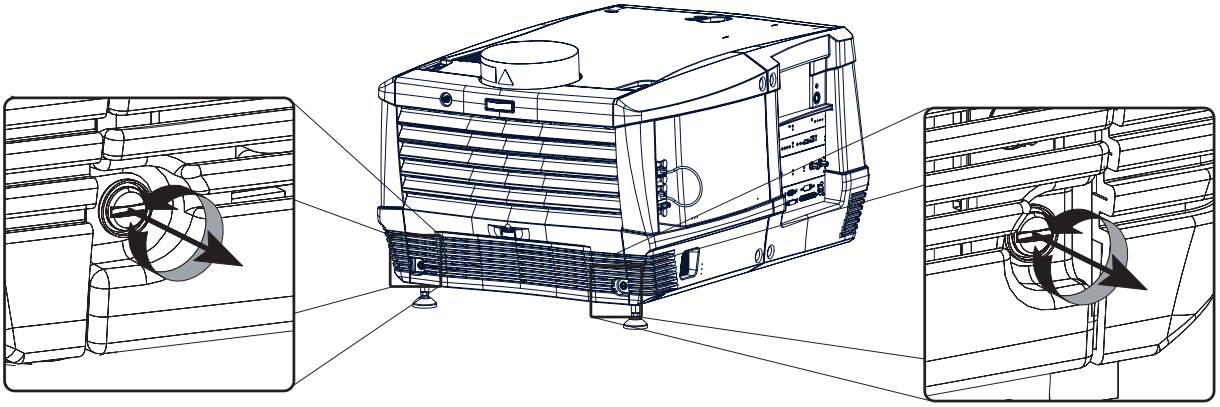


Image 5-9
Release rear cover

2. Remove the rear cover of the projector doing the following:
   a) gently pull out the top corners of the rear cover,
   b) then move the rear cover away from the projector.

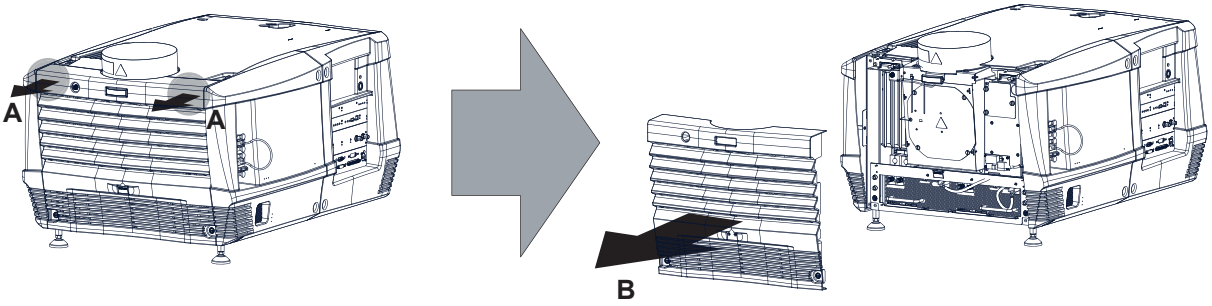


Image 5-10
Remove rear cover

5.6 Removal of the top cover

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

All side covers, front cover and back cover have to be removed before removing the top cover.

Necessary tools

Allen key 3mm

How to remove the top cover of the projector?

1. After all side covers, front and back cover are removed, turn all 3 fixation screws.

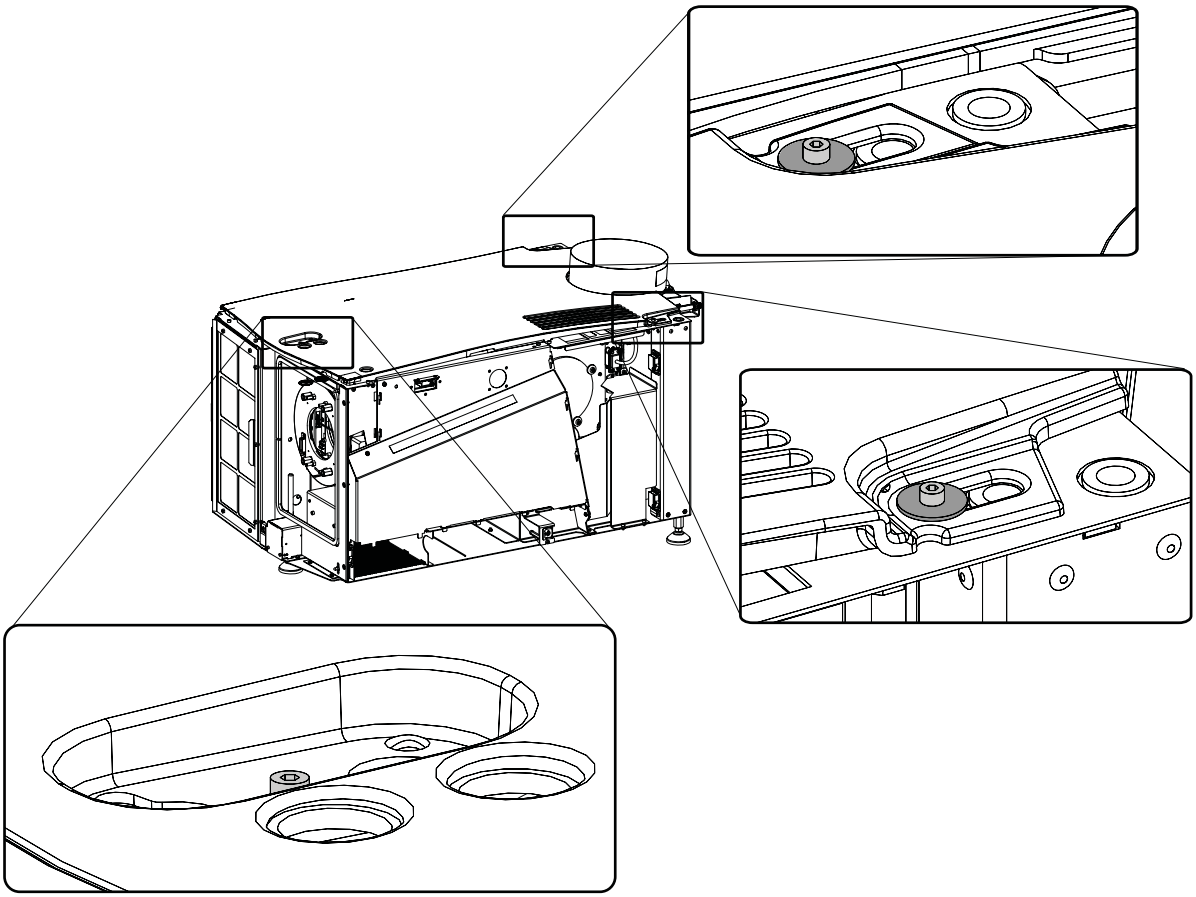


Image 5-11
Top cover removal

2. Left up the top cover and take it off.

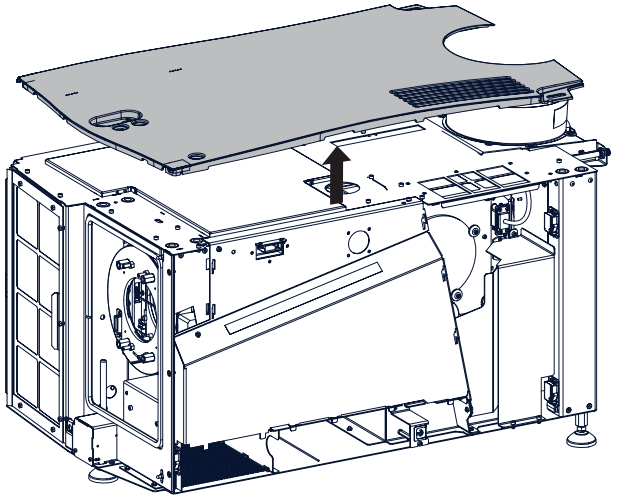


Image 5-12
Top cover removal

5.7 Open the sealed compartment

This procedure assumes that the left side cover of the projector is already removed.

Necessary tools

Allen wrench 3 mm

How to open the sealed compartment of the Light Processor Unit?

1. Release the three hexagon head cap screws as illustrated. Use for that a 3 mm Allen wrench.
   Note: *A washer is mounted between the plate and the screw head.*

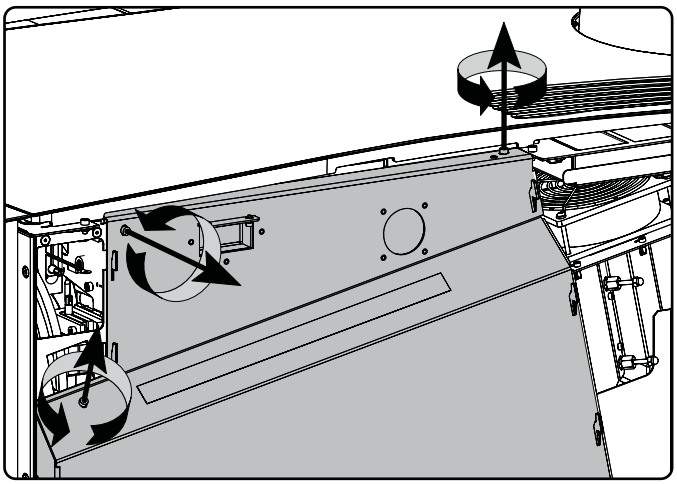


Image 5-13

2. Lift up the cover plate slightly, using the two lower lips provided, and then remove the cover plate away from the projector.

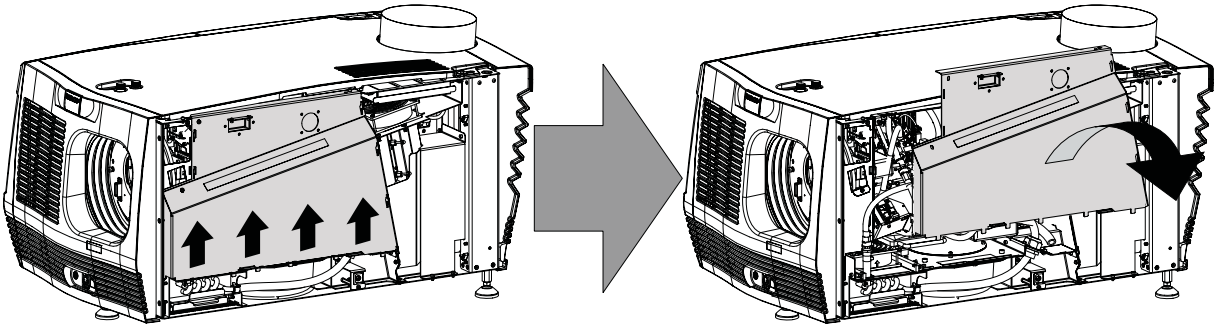


Image 5-14

5.8 Close the sealed compartment

Necessary tools

3 mm Allen wrench.

How to close the sealed compartment of the Light Processor Unit?

1. Place the cover plate in its place as illustrated.
   Caution: *Do not damage the micro switch at the top of the projector.*

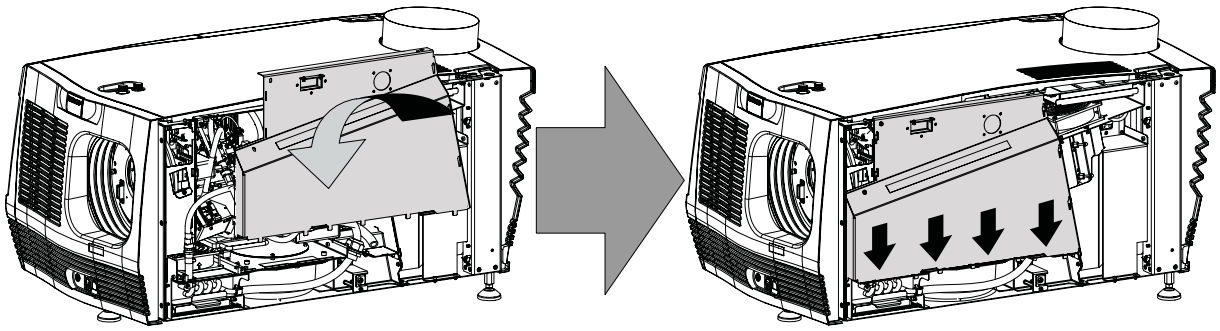


Image 5-15

2. Fasten the three hexagon head cap screws as illustrated. Use for that a 3 mm Allen wrench.
   Note: *Insert a washer between the each screw and the plate.*

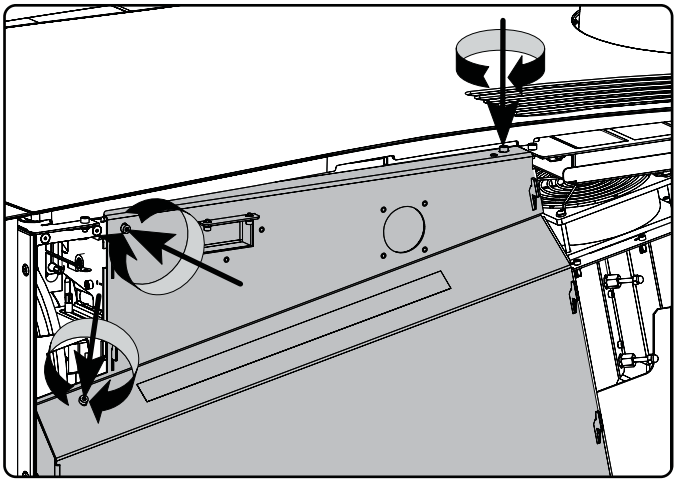


Image 5-16

5.9 Installation of the top cover

Necessary tools

Allen key 3 mm

How to install the top cover of the projector?

1. Place the top cover on the projector so that both holes matches the adjustment studs on top of the projector.

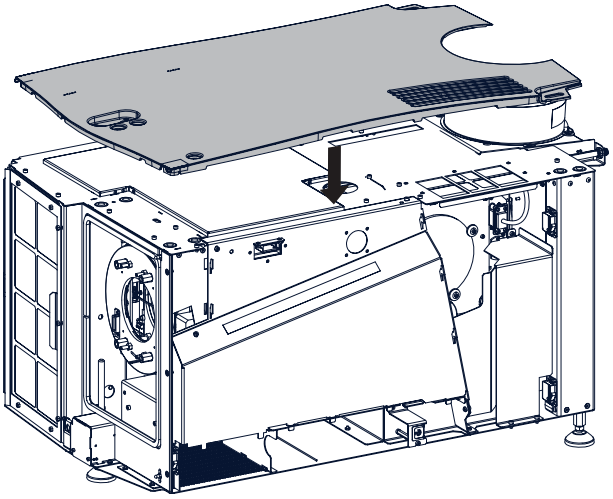


Image 5-17
Mount top cover

2. Turn all 3 fixation screws. Insert the washer between the screw and the top cover.

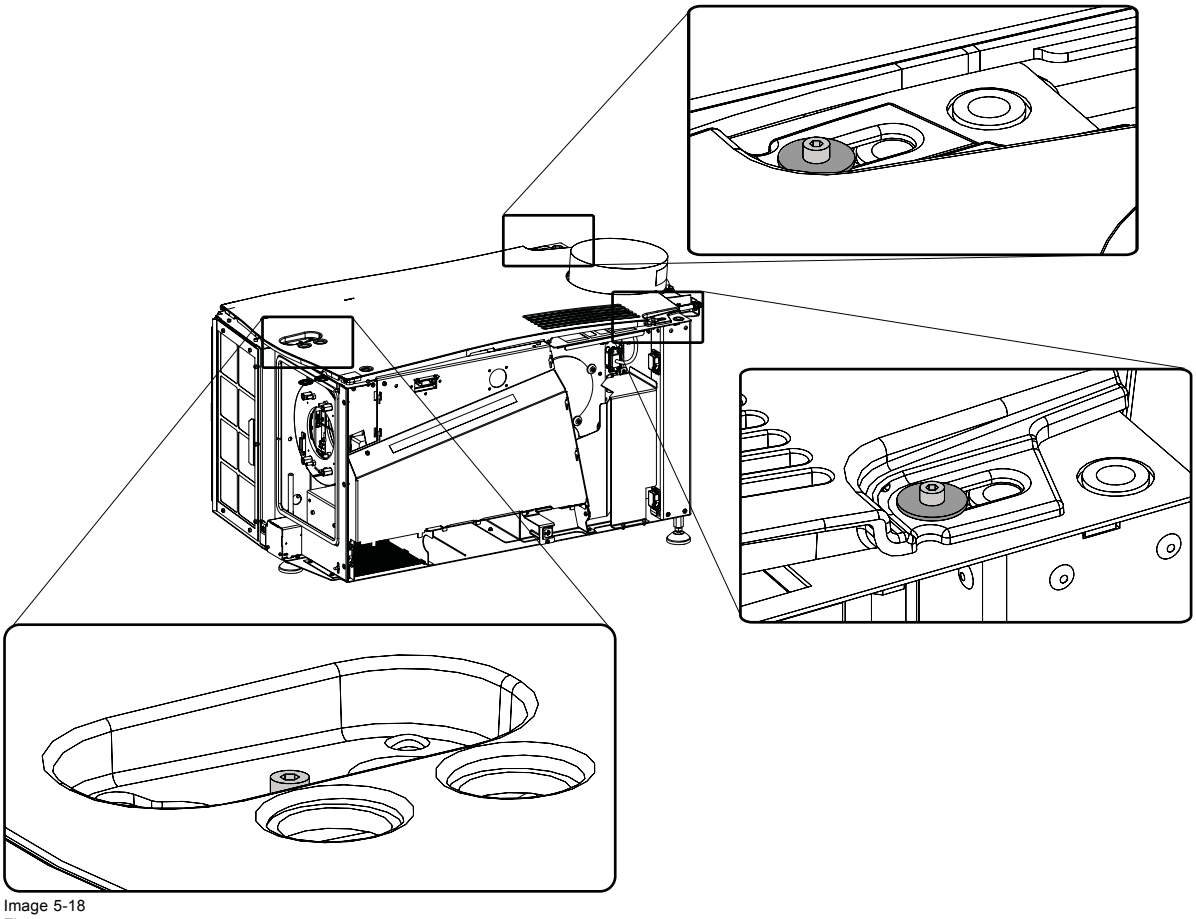


Image 5-18
Fixate top cover

5.10 Installation of the rear cover

Necessary tools

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

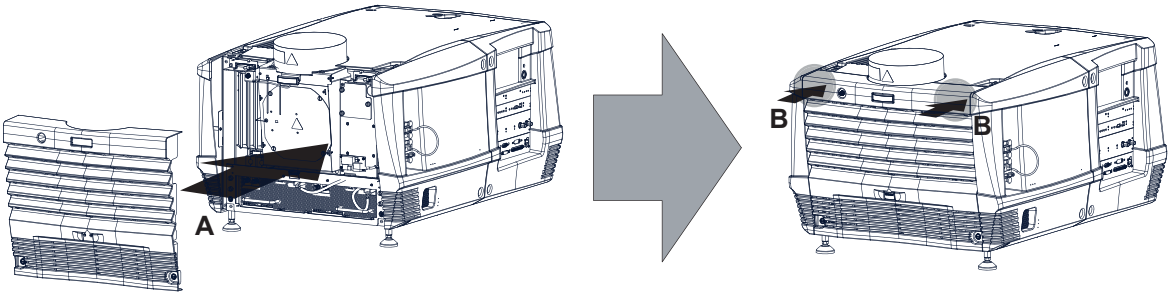


Image 5-19
Install rear housing

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

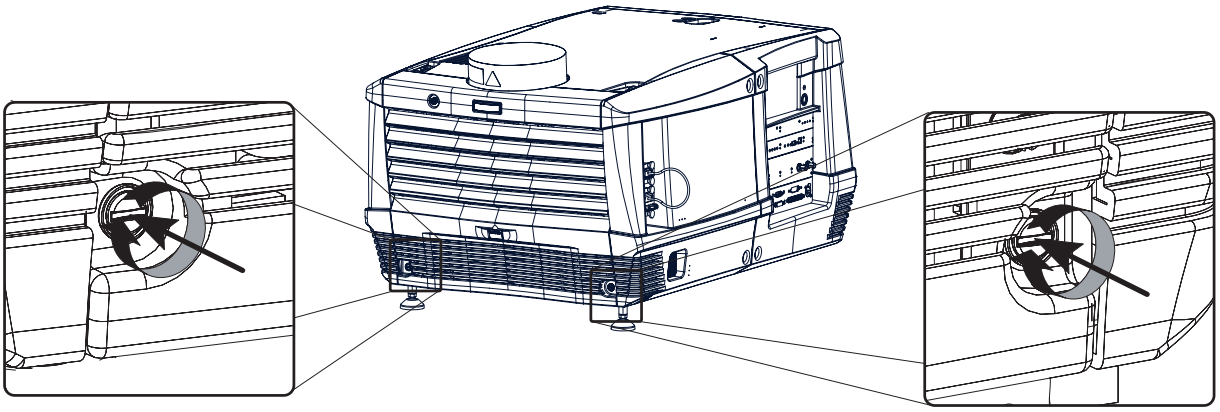


Image 5-20
Fasten rear housing

5.11 Installation of the side cover

Necessary tools

Flat screw driver.

How to install the side cover of the projector?

1. Check if the bottom and top filters are present.
2. Install the side cover of the projector doing the following:
   a) Bring the side cover towards its final position (A),
   b) then gently push the locking studs of the top corners (B) into their receivers,
   c) then gently push the locking studs of the bottom corners (C) into their receivers.

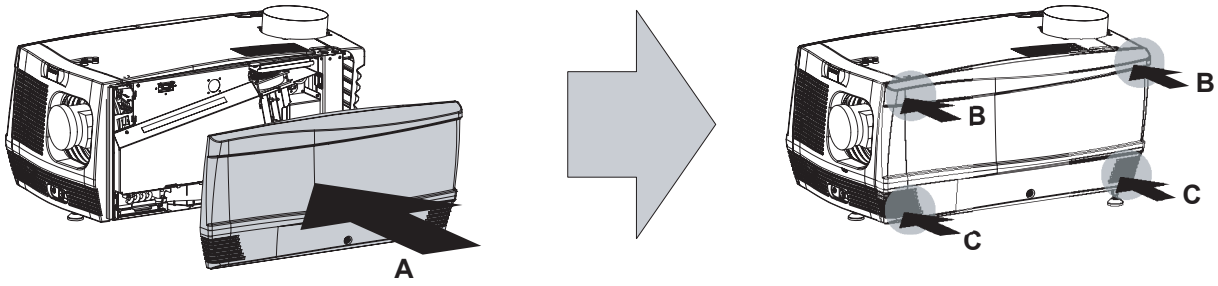


Image 5-21

3. Secure the side cover by locking the captive screw in the middle at the bottom of the side cover.

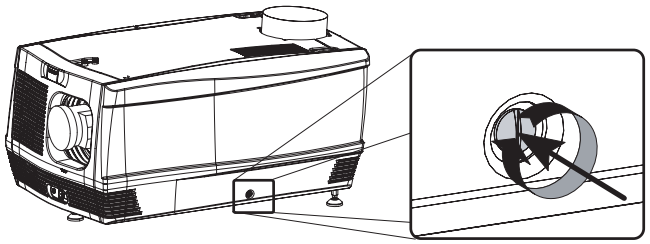


Image 5-22

5.12 Installation of the front cover

The input cover and the lens may not be installed yet.

Necessary tools

Flat screw driver.

How to install the front cover of the projector?

1. Check if the front filter is present.
2. Ensure that no lens is mounted and that the input cover is not installed.
3. Install the front cover of the projector doing the following:
   a) first hook in the side of the front cover at the front filter,
   b) then gently push the other side of the front cover into position,
   c) ensure that the locking studs in the corners click into their receivers.

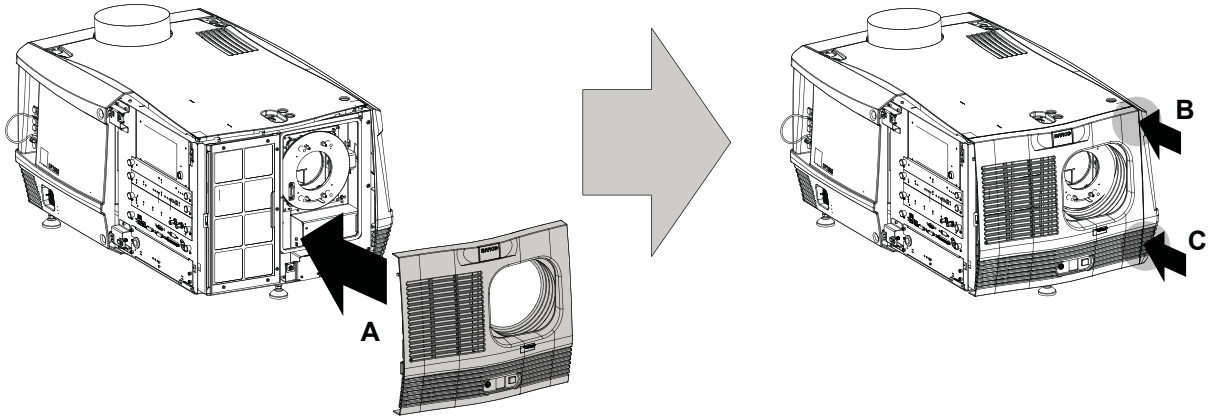


Image 5-23
Install front cover

4. Secure the front cover by locking the captive screw in the middle at the bottom of the front cover.

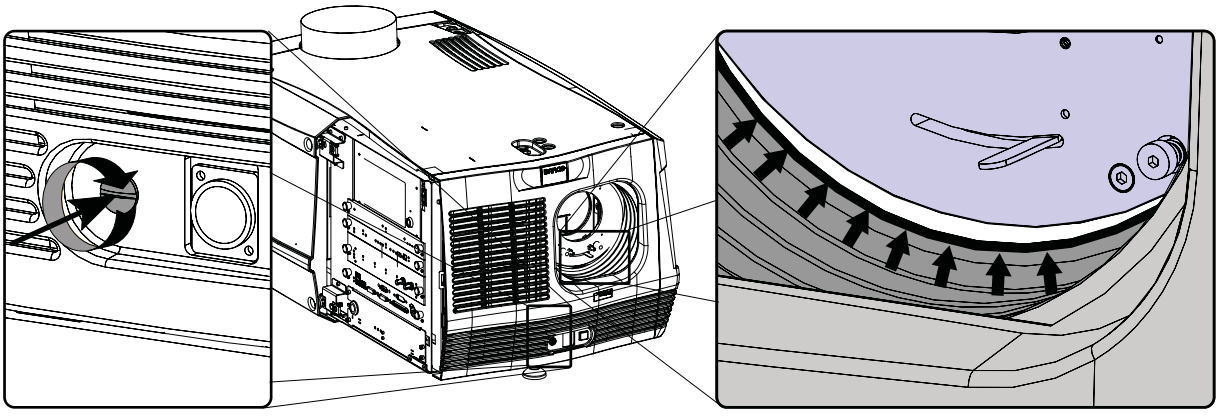


Image 5-24
Fasten front cover

5. Reinstall the rubber dust ring around the lens holder. See detail at the right of image 5-24.

5.13 Installation of the input cover

Necessary tools

Flat screw driver.

How to install the input cover of the projector?

1. Install the input cover of the projector doing the following:
   a) Bring the input cover towards its final position (A),
   b) then gently push the locking stud at the right top corner (B) into its receiver,
   c) then gently push the locking stud at the right bottom corner (C) into its receiver.

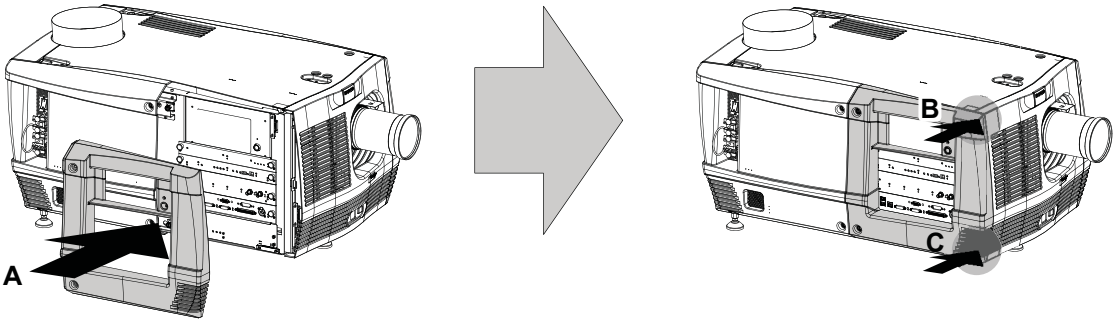


Image 5-25
Install input cover

2. Secure the input cover by locking the two captive screws at the left side of the input cover.

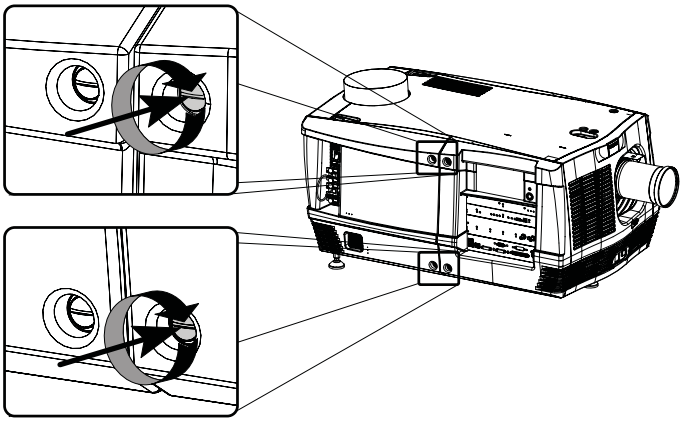


Image 5-26
Fasten input cover

6. LAMPS AND LAMP HOUSE

About this chapter

This chapter enumerates all the supported xenon lamps for the DP2K-15C/DP2K-20C/DP2K-18Cx digital projector and how to replace the xenon lamp in the lamp house. Also included is the procedure to reset the lamp parameters, which is required after a xenon lamp replacement, and the procedure to realign the lamp in its reflector for optimal performance.

WARNING: DO NOT PERMIT UNAUTHORIZED PERSONNEL TO PERFORM OR ATTEMPT ANY PHASE OF XENON LAMP HANDLING OR SERVICE. ONLY TRAINED AND QUALIFIED TECHNICAL SERVICE PERSONNEL ARE ALLOWED TO HANDLE THE XENON LAMP.

CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing MUST be worn!

WARNING: Always wear face protection (full face shield) when handling xenon lamps.

WARNING: Always wear protective clothing (welder's jacket) when handling xenon lamps.

WARNING: Always wear clean leather gloves with wrist protectors when handling xenon lamps.

Overview

- Introduction
- Removal of the lamp house
- Removal of the xenon lamp
- Installation of the Xenon lamp
- Installation of the lamp house
- Resetting the lamp parameters
- Realignment of the lamp in its reflector
- Replacement of the Lamp Info module
- Replacement of the UV blocker
- Replacement of the lamp reflector
- Cleaning the Reflector of the Lamp House
- Cleaning the UV blocker of the Lamp House

6.1 Introduction

Lamp & lamp house

Normally the lamp house of the DP2K-20C/DP2K-18CX projector is delivered with a mounted 4000 watt lamp. The lamp house of the DP2K-15C projector is delivered with a mounted 3000 watt lamp. In case the xenon lamp is delivered separately the lamp has to be installed on site by a qualified service technician.

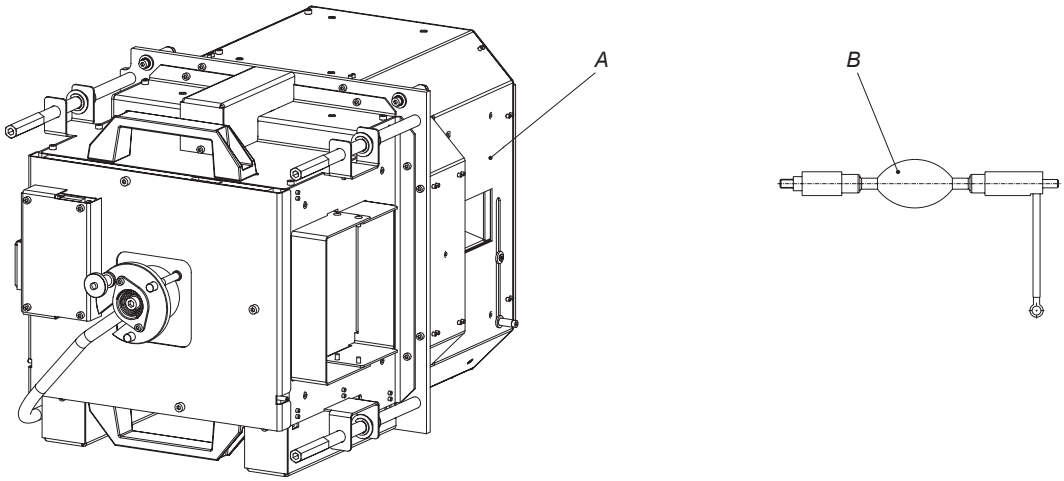


Image 6-1
A Lamp house.
B Xenon lamp.

The xenon lamp is packed in a protective container or wrapped in a protective cloth. Never remove this protective container or protective cloth without wearing adequate protective clothing (face shield, clean leather glovers, welder's jacket).

Image 6-2
Left: Xenon lamp in protective container. Right: Xenon lamp wrapped in protective cloth.

CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing MUST be worn!

Cathode adaptor

A cathode adaptor is required to mount the xenon lamp in the lamp house. The cathode adapter has to be mounted upon the cathode side of the xenon lamp prior to mounting the lamp in the lamp house. The purpose of the cathode adapter is to position the arc of the xenon lamp in the middle of the reflector inside the lamp house.

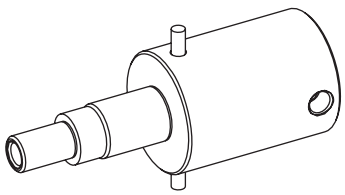


Image 6-3
Cathode adaptor (**R858100K**)

Supported xenon bulb lamps (without lamp house)

Lamp	Type	Order info	
Osram xenon lamp of 4 kW	4kW DHP	**R9855937**	Only for DP2K-20C/DP2K-18CX
Osram xenon lamp of 3 kW	3kW DHP	**R9855938**	
Osram xenon lamp of 2 kW	2kW DHP	**R9855956**	
Osram xenon lamp of 1.2kW	1200W DHP	**R9855959**	
Ushio xenon lamp of 4 kW	DXL40BAF	**R9855939**	Only for DP2K-20C/DP2K-18CX
Ushio xenon lamp of 3 kW	DXL30BAF	**R9855940**	
Ushio xenon lamp of 2 kW	DXL20BAF	**R9855955**	
Ushio xenon lamp of 2 kW	DXL20BAF/2	**R9855965**	
Ushio xenon lamp of 1.2kW	DXL12BAF	**R9855961**	
Philips xenon lamp of 4 kW	XDC-4000B	**R9856370**	Only for DP2K-20C/DP2K-18CX

6.2 Removal of the lamp house

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

CAUTION: Lamp casing is very hot after operation. To avoid burns, let the projector cool down for at least 15 minutes before proceeding to the lamp unit replacement.

CAUTION: Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled.

Necessary tools

- Flat screw driver or
- Nut driver 8 mm

How to remove the lamp house of the projector

1. Switch off the projector.
2. Remove the lamp cover.
3. Release the three spring lock screws of the lamp house as illustrated.

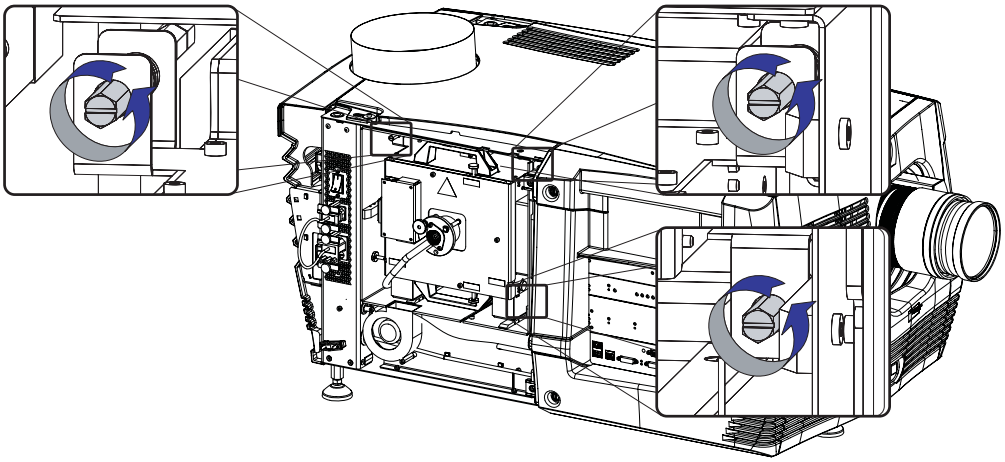


Image 6-4
Release lamp house

4. Take the lamp house by the handles and pull it out of the projector.
   Caution: *Be aware of the weight of the lamp assembly. Take the necessary precautions to avoid personal injury.*

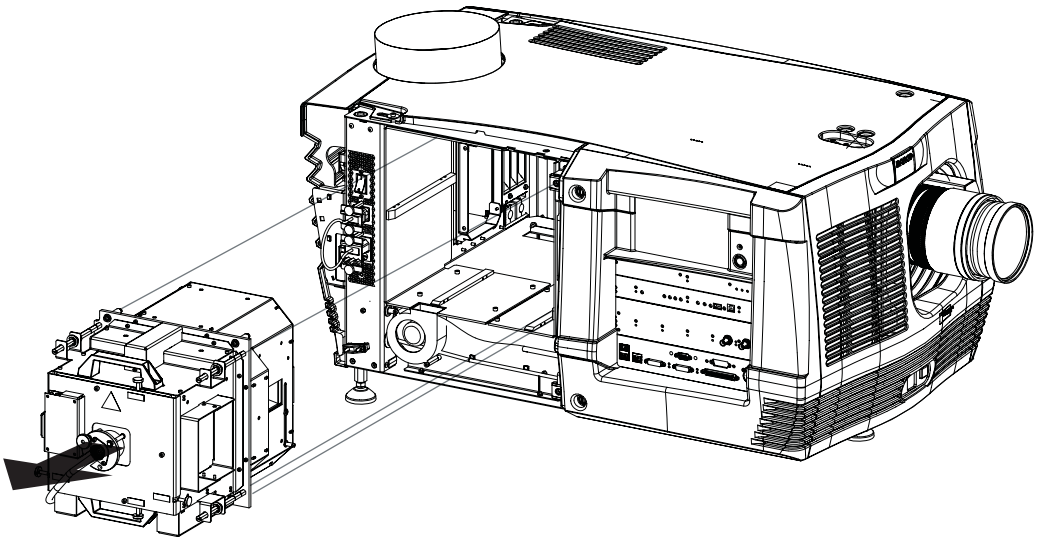


Image 6-5
Remove lamp house

5. Place the lamp house on a stable support.

While starting up the projector, the electronics detect if a lamp is installed. If no lamp is installed, it is not possible to start up the projector.

6.3 Removal of the xenon lamp

WARNING: DO NOT PERMIT UNAUTHORIZED PERSONNEL TO PERFORM OR ATTEMPT ANY PHASE OF XENON LAMP HANDLING OR SERVICE. ONLY TRAINED AND QUALIFIED TECHNICAL SERVICE PERSONNEL ARE ALLOWED TO HANDLE THE XENON LAMP.

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

CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing MUST be worn!

WARNING: Always wear face protection (full face shield) when handling xenon lamps.

WARNING: Always wear protective clothing (welder's jacket) when handling xenon lamps.

WARNING: Always wear clean leather gloves with wrist protectors when handling xenon lamps.

Necessary tools

- Flat blade screw driver.
- 5 mm Allen wrench.
- 17 mm open-end wrench (2 pieces).
- Lamp protective container or protective cloth with two binders.

How to remove the xenon lamp from the lamp house?

1. Release the xenon lamp from its socket by removing the hexagon socket head cap screw and washer as illustrated. Use a 5 mm Allen wrench.

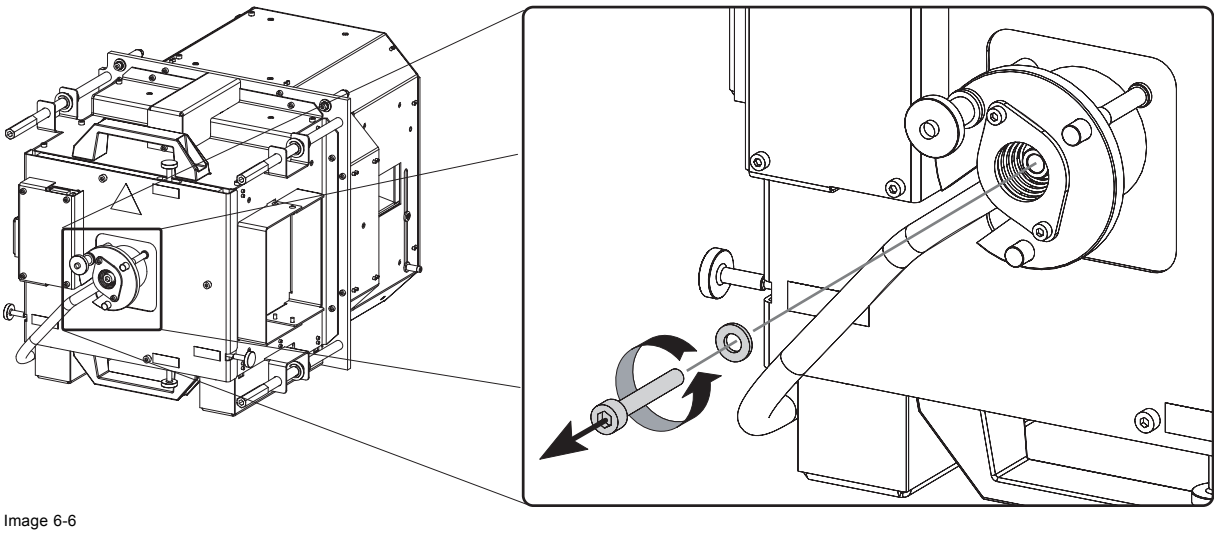


Image 6-6

2. Remove the Lamp House side cover by releasing the two retaining thumbscrews as illustrated.

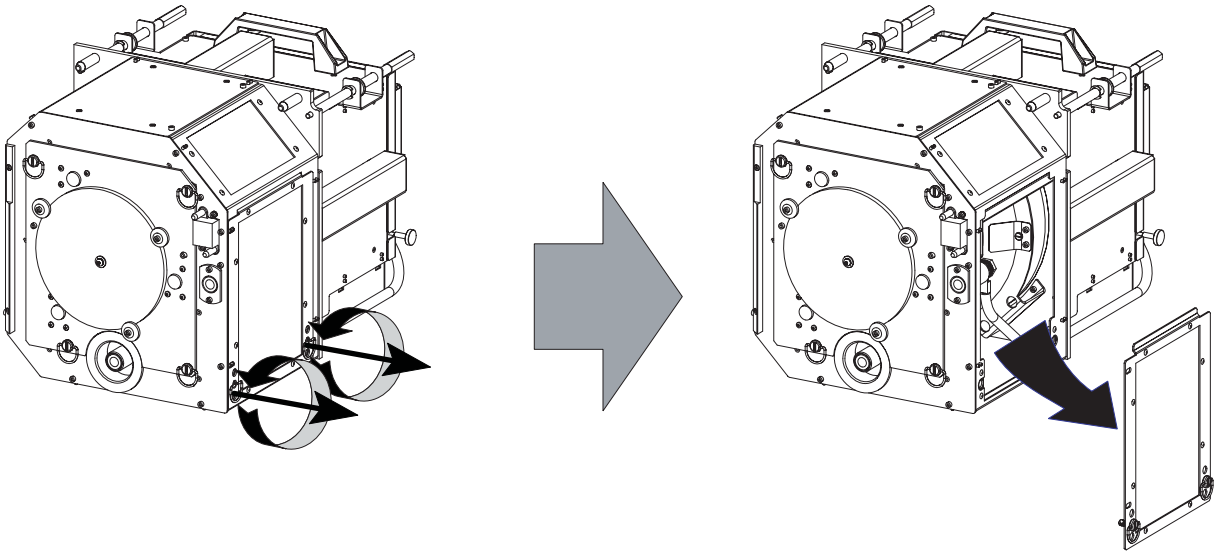


Image 6-7

3. Release the four retaining thumbscrews of the UV blocker assembly as illustrated. Make sure that the UV blocker assembly remains in its position while releasing the screws.

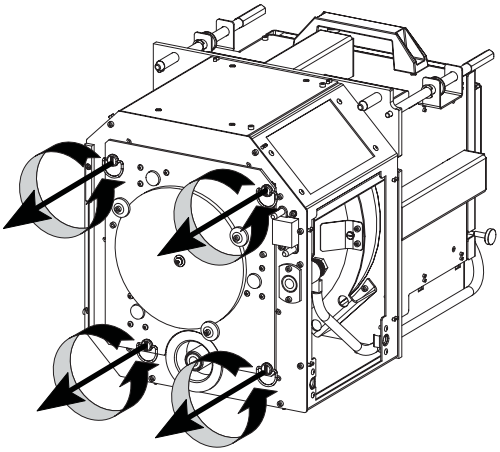


Image 6-8

4. Support the xenon lamp inside the Lamp House with one hand while removing the UV blocker assembly from the Lamp House. Note that some xenon lamps are installed with an anode adaptation bushing.
   Caution: *Ensure that you wear protective clothing, a full face shield and protective gloves.*

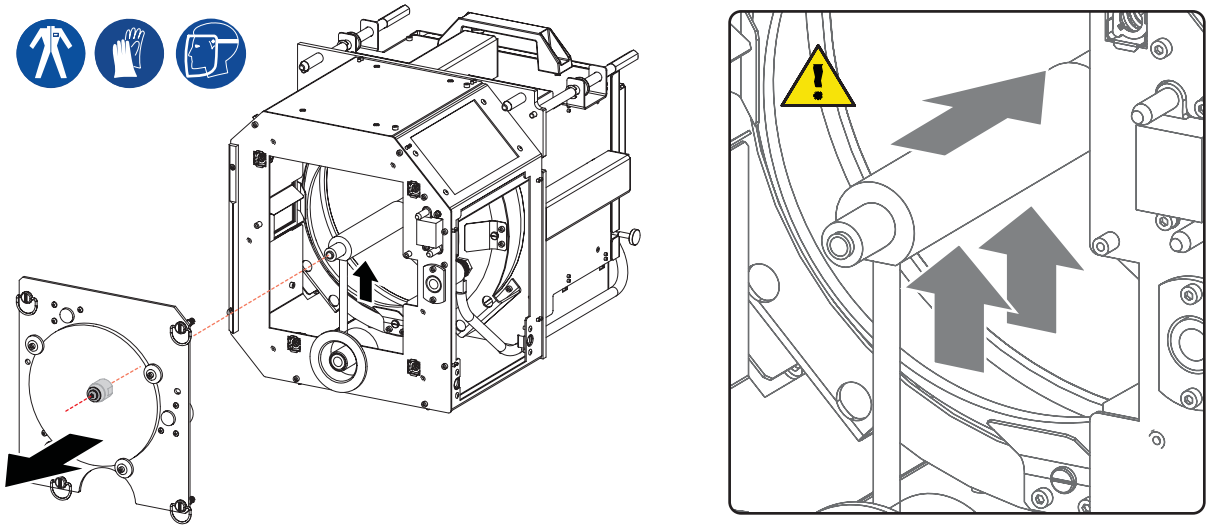


Image 6-9

5. Slide the white anode socket, which is connected via a thick wire with the xenon lamp, upwards away from its position and then remove the xenon lamp with anode socket from the Lamp House.

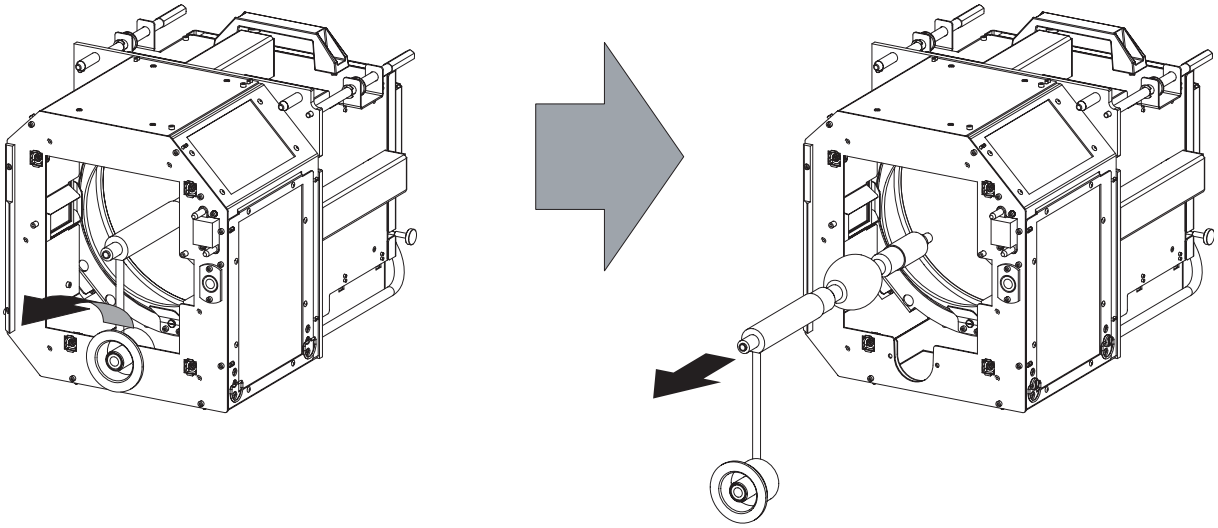


Image 6-10

6. Place the xenon lamp into a protective container or wrap a protective cloth around the xenon lamp prior to proceed with this procedure.
7. Remove the anode wire lug from the anode socket. Use for that two open end wrenches of 17 mm. Hold one nut (reference 7) with one wrench while releasing the other nut (reference 4) with the other wrench. Note that a plain washer (reference 5) is provided between the lock nut (reference 4) and the anode wire lug (reference 6).

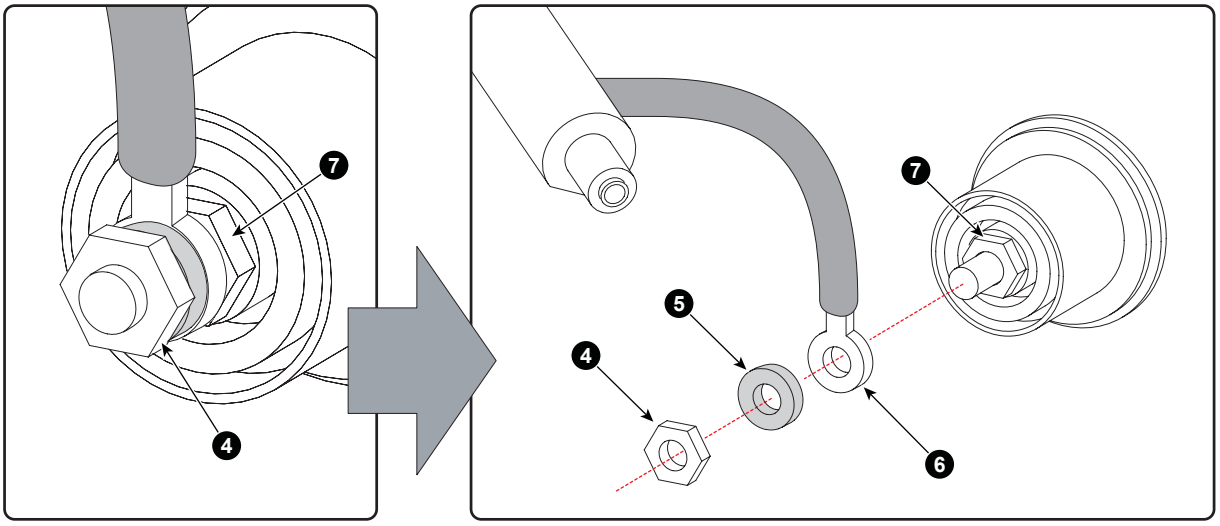


Image 6-11

Note: *The electrical connection pins of older Lamp Houses may contain two flat washers, one on each side of the wire lug. New Lamp Houses can contain only one flat washer due to the shorter thread clearance of the new improved connection pins.*

8. Remove the cathode lamp adaptor (reference 11) from the xenon lamp (reference 13) as illustrated. Use a 5 mm Allen wrench to release the adaptor fixation screw (reference 12) of the adaptor.

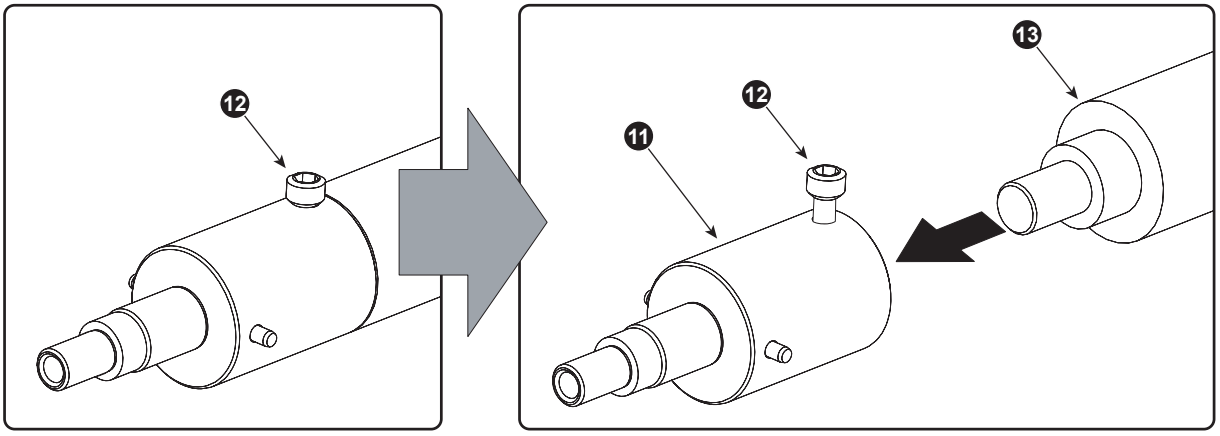


Image 6-12

CAUTION: Expired xenon lamps.

Dispose of expired bulbs that are beyond warranty in the following manner: wrap the bulb tightly in several layers of canvas or heavy cloth. Place it on hard surface and shatter the envelope with a sharp hammer blow. DO NOT place a non shattered bulb in any ordinary refuse container.

CAUTION: Small amounts of radioactive material (< 1000 Bq per lamp) are deliberately added to Xenon lamps for functional reasons. These lamps are manufactured under regulatory control as consumer product according to IAEA basic safety standard BSS 115. Disposal according to national regulations is required e.g. in Europe covered by WEEE regulation. See also related user manual of the lamp supplier for more guidance.

When returning a xenon lamp for warranty adjustment, pack it in its original shipping container. Complete and return all required warranty information.

6.4 Installation of the Xenon lamp

WARNING: DO NOT PERMIT UNAUTHORIZED PERSONNEL TO PERFORM OR ATTEMPT ANY PHASE OF XENON LAMP HANDLING OR SERVICE. ONLY TRAINED AND QUALIFIED TECHNICAL SERVICE PERSONNEL ARE ALLOWED TO HANDLE THE XENON LAMP.

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

CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing MUST be worn!

WARNING: Always wear face protection (full face shield) when handling xenon lamps.

WARNING: Always wear protective clothing (welder's jacket) when handling xenon lamps.

WARNING: Always wear clean leather gloves with wrist protectors when handling xenon lamps.

Necessary tools

- 17 mm open ended wrench.
- Torque wrench with 17 mm hexagon socket
- Torque wrench with 5 mm Allen socket.

Necessary parts

- Lamp cathode adapter.
- Hexagon socket head screw M6 x 40.
- Flat washer.

How to install the xenon lamp into the lamp house

1. Remove the UV blocker and side cover of the lamp house by releasing the retaining thumbscrews as illustrated.
   Note: *In case of a lamp replacement, the UV blocker will be already removed.*

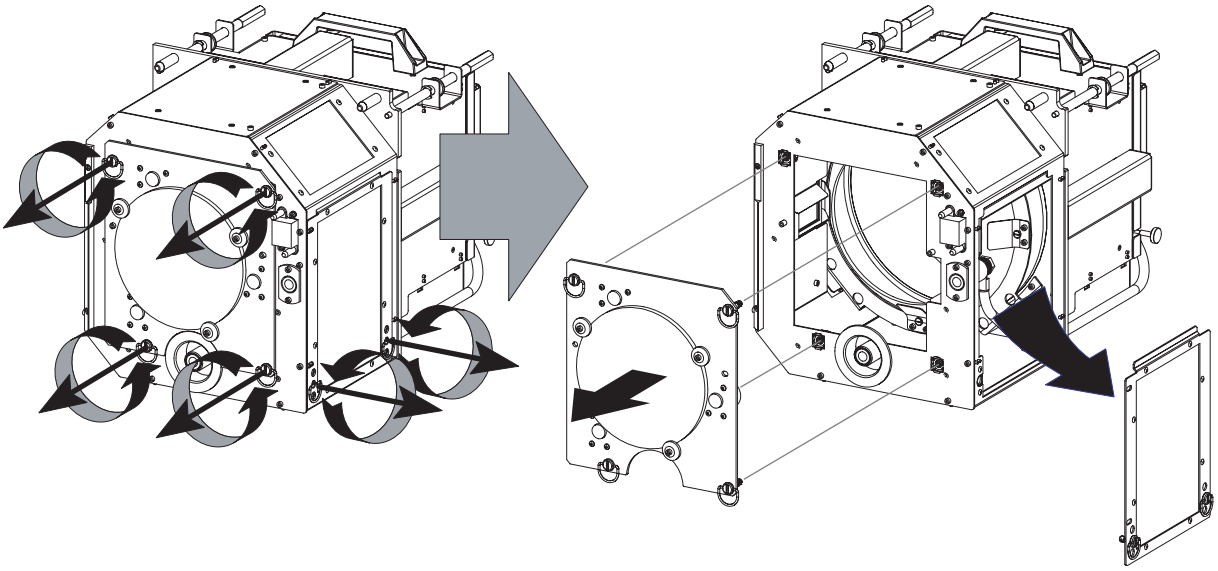


Image 6-13
Remove UV blocker and side cover

2. Install the lamp cathode adaptor (reference 1) upon the xenon lamp (reference 3) as illustrated. Tighten the adapter fixation screw (reference 2) with a torque of **2,5 Nm** (1.84 lbf*ft). Use for that a torque wrench with a 5 mm Allen socket. Make sure that there is full contact between the cathode adapter and the lamp base.
   Note: *Do not take the lamp out of its protective container or protective cloth while mounting the adapter.*

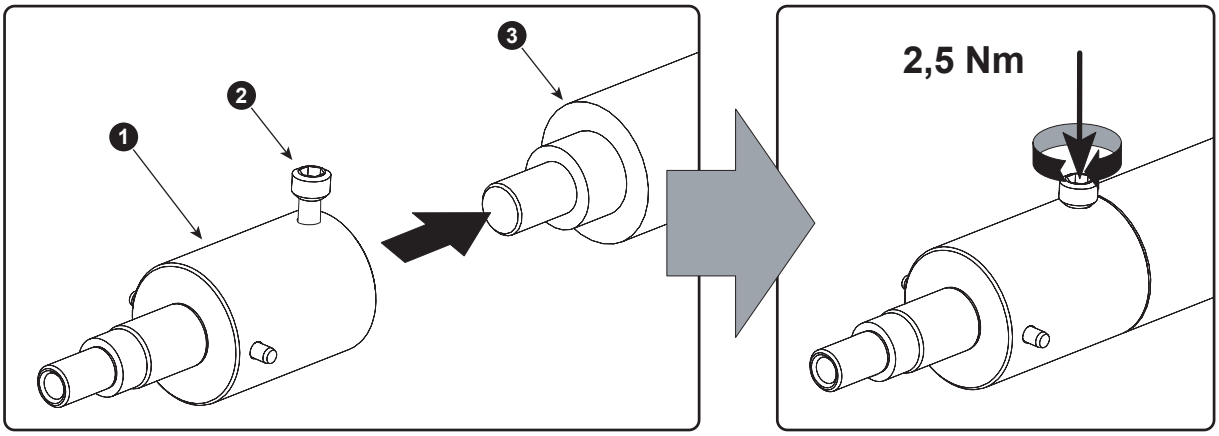


Image 6-14
Mount cathode adaptor

3. Install the anode wire lug (reference 6) upon the anode socket. Use an 17 mm open-end wrench to hold the first nut (reference 7) while fastening the lock nut (reference 4) on the rod with a torque of **9 Nm** (6,64 lbf*ft) using a torque wrench with 17 mm hexagon socket. Ensure that there is a flat washer (reference 5) between the lock nut and the wire lug.
   Caution: *Do not tighten the first nut (reference 1) against the connector housing. There must be some play (1 mm maximum). This is important to insert the Lamp House smoothly into the projector.*

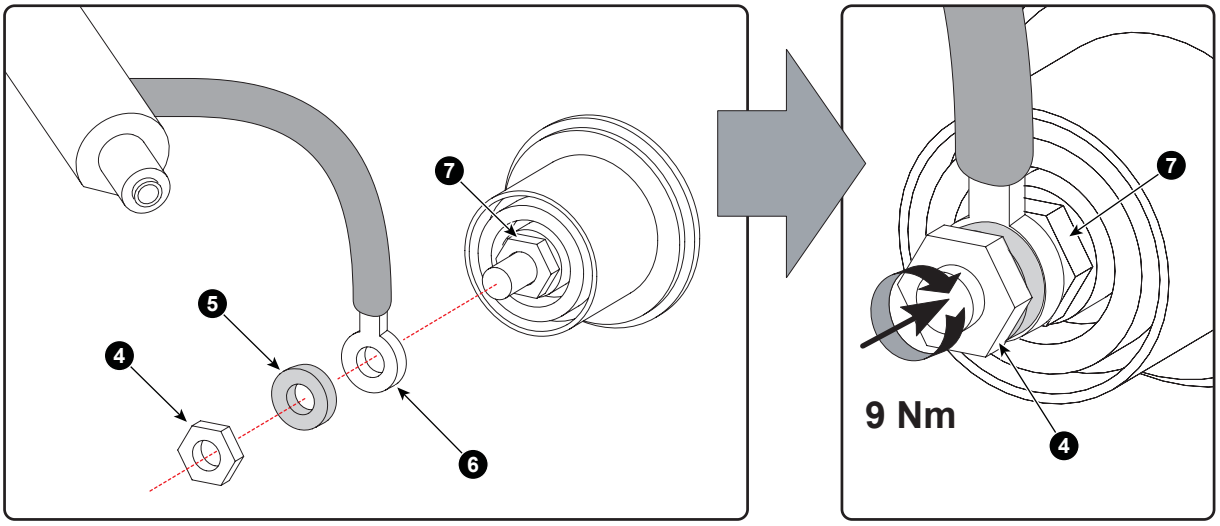


Image 6-15
Anode lug installation

4. Remove the protective container or unwrap the protective cloth from the xenon lamp.
   Warning: *Ensure that you wear protective clothing, a full face shield and protective gloves.*

   Tip: *Write down the serial number of the lamp. You will need this while updating the lamp parameters after installation of the lamp. The serial number of the lamp is engraved in the neck of the xenon lamp.*

5. Gently guide the xenon lamp into position inside the Lamp House as illustrated. Anode socket hanging vertical down. While inserting the lamp, rotate it slightly, engaging the pins of the cathode adapter in the foreseen slots. This is to ensure the lamp cathode is completely inserted.

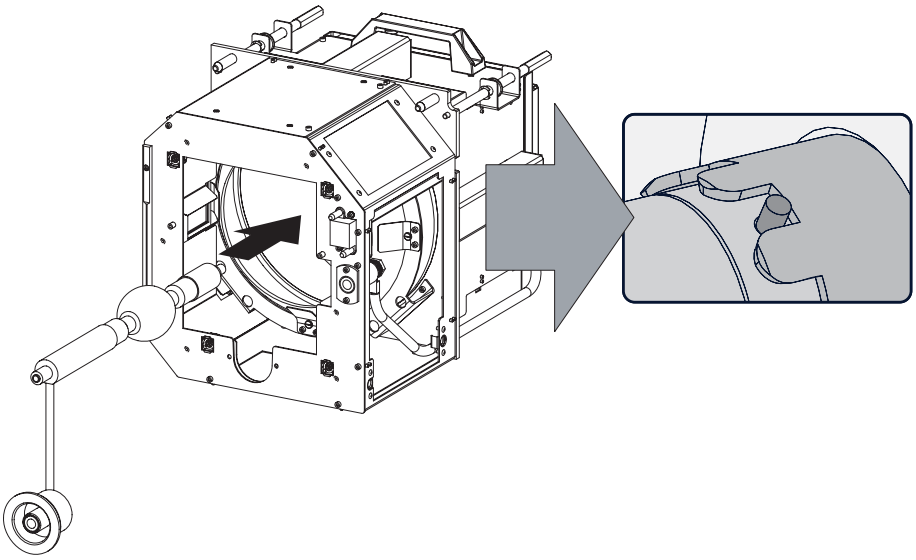


Image 6-16
Lamp bulb installation

Warning: *Make sure that the both pins of the cathode adapter are engaged in the foreseen slots.*

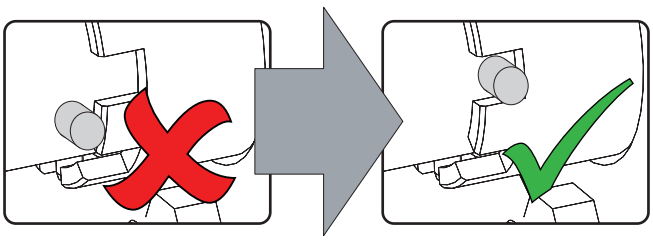


Image 6-17

6. Insert the anode socket into position as illustrated.
   Caution: *Avoid any tension on the anode wire, ensuring there is no mechanical stress on the lamp.*

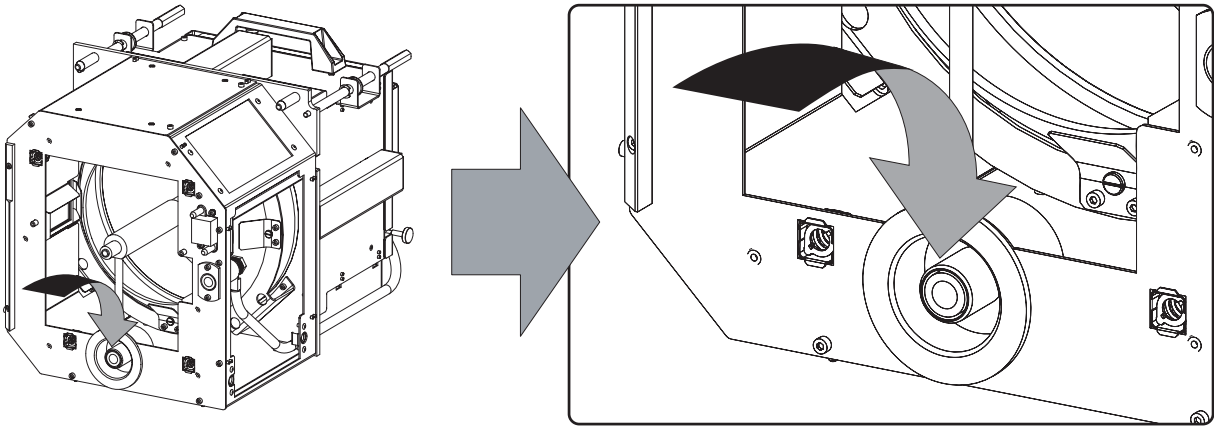


Image 6-18
Anode socket installation

7. Reinstall the UV blocker assembly as illustrated. Make sure that the xenon lamp is properly supported by the lamp supporting mechanism in the centre of the UV blocker. Use the opening at the side of the Lamp House to guide the supporting pin of the xenon lamp into the anode supporting mechanism.

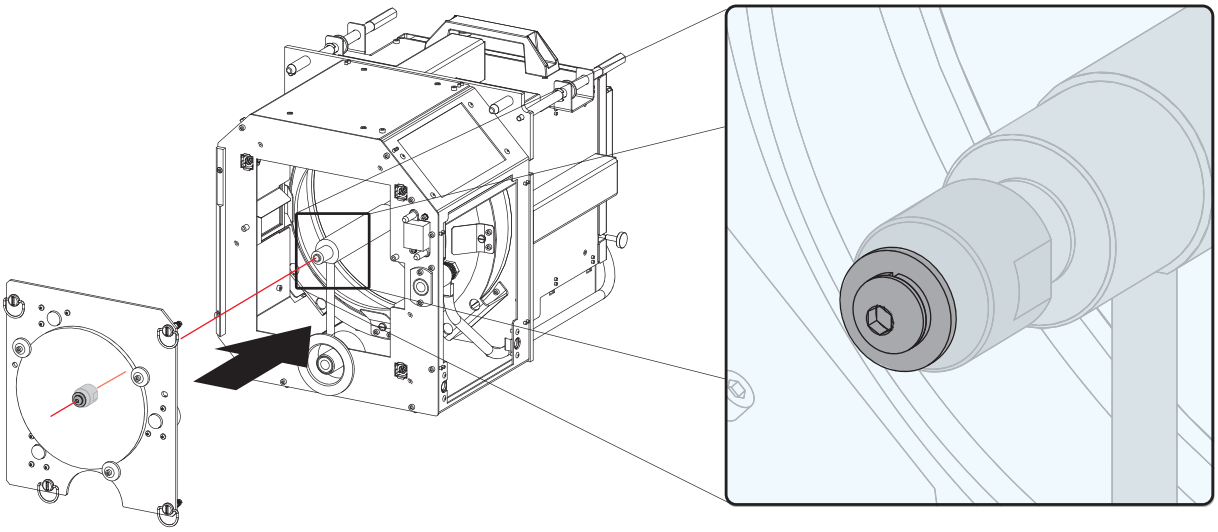


Image 6-19
UV blocker installation

8. Secure the UV blocker by fastening the four retaining thumbscrews as illustrated.
   Note: *Please ensure that the thumb screws turning wires are flush with the cover or interference will occur while inserting the lamp house into the projector.*

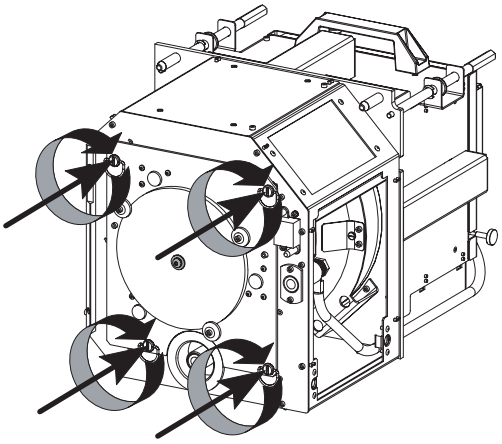


Image 6-20
Secure UV blocker

9. Fasten the cathode side of the xenon lamp using a hexagon socket head screw M6 x 40 and a plain washer as illustrated. Use a torque of **2,5 Nm** (1,84 lbf*ft) to fasten the hexagon socket head screw. Use for that a torque wrench with a 5 mm Allen socket.
   Caution: *Make sure that the both pins of the cathode adapter remain engaged in the foreseen slots. Use one hand to keep the xenon lamp into position while inserting the hexagon socket head screw.*

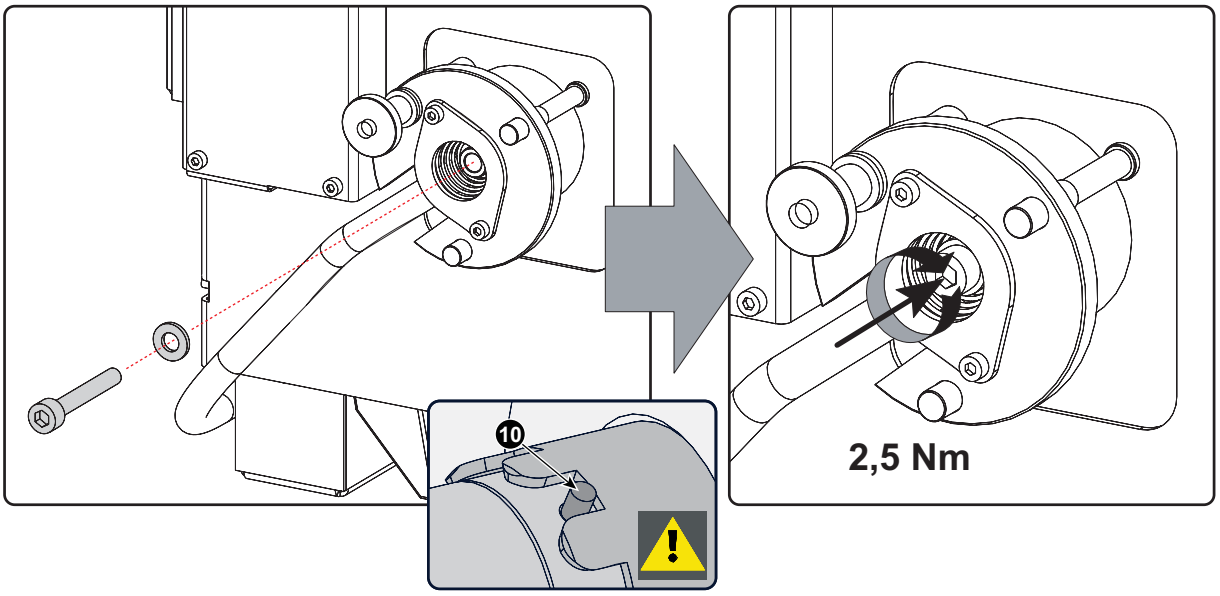


Image 6-21
Fasten cathode side

10. Check the cathode connection inside the Lamp House. Use a 17 mm open-end wrench to hold the first nut while fastening the second nut on the rod with a torque of **9 Nm** (6,64 lbf*ft) using a torque wrench with 17 mm hexagon socket. Ensure that there is a flat washer (reference 3) between the lock nut and the wire lug.
Caution: *This cathode connection must be checked with every lamp change!*

Caution: *Do not tighten the first nut (reference 1) against the connector housing. There must be some play (1 mm maximum). This is important to insert the Lamp House smoothly into the projector.*

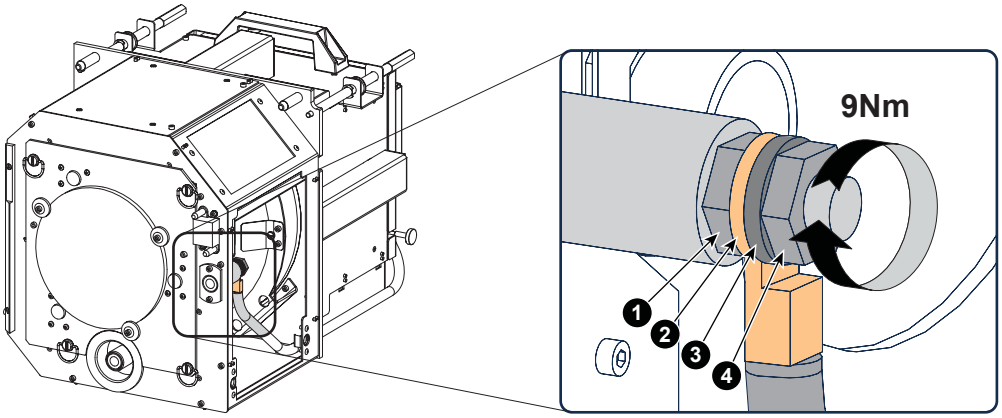


Image 6-22
Check cathode connection

Note: *The electrical connection pins of older Lamp Houses may contain two flat washers, one on each side of the wire lug. New Lamp Houses can contain only one flat washer due to the shorter thread clearance of the new improved connection pins.*

11. Reinstall the side cover of the Lamp House as illustrated.
Note: *Please ensure that the thumb screws turning wires are flash with the cover or interference will occur while inserting the Lamp House into the projector.*

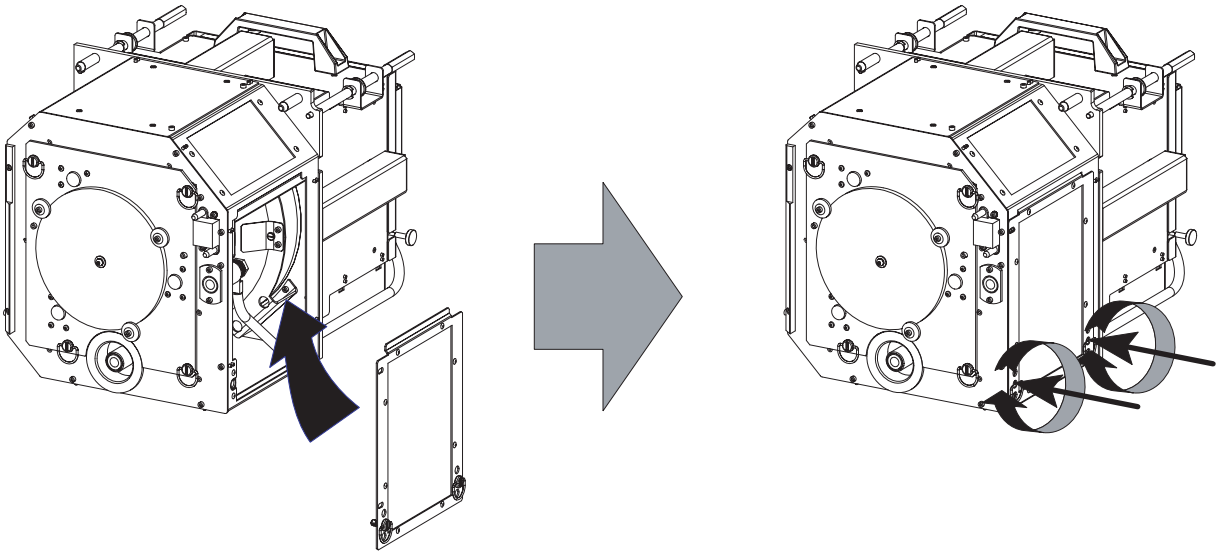


Image 6-23
Close side cover

CAUTION: The "LAMP INFO" parameters MUST be updated after each installation of a xenon lamp inside the lamp house. Neglecting this update will result in poor performance and short life time of the xenon lamp. See procedure "Resetting the lamp parameters".

A realignment of the xenon lamp in its reflector is required after the installation of the xenon lamp in the lamp house. See procedure "Realignment of the lamp in its reflector", page 125.

6.5 Installation of the lamp house

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

CAUTION: Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled.

Necessary tools

Flat screw driver.

How to install the lamp house

1. Ensure the projector is switched off.
2. Remove the lamp cover.
3. Hold fast the lamp house by its handles and gently slide the lamp house into its socket. Note that the compartment is provided with guides (G) to position the lamp house correctly.

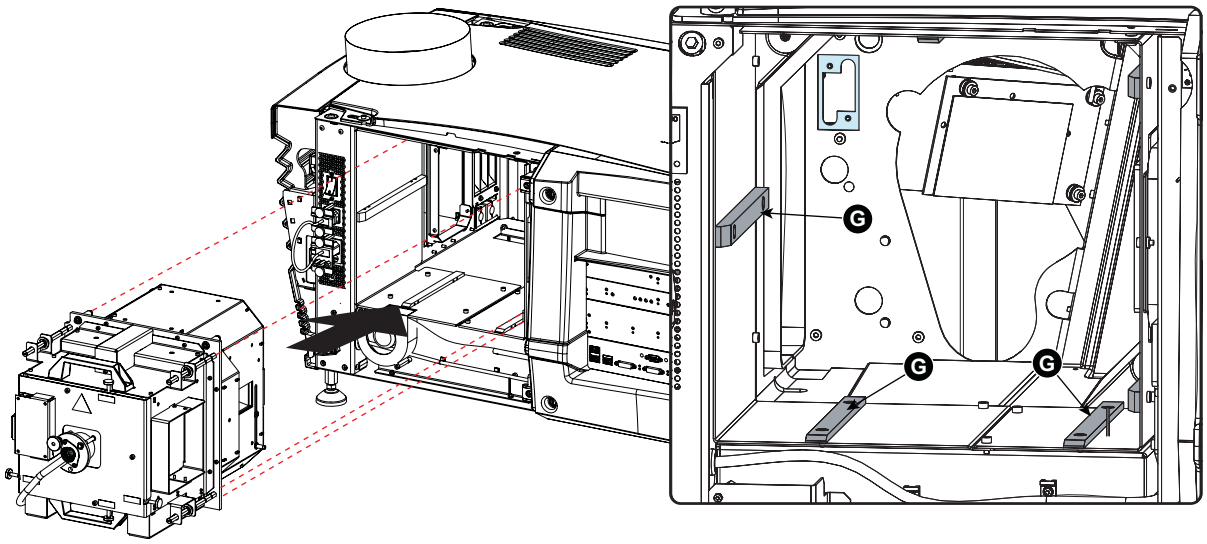


Image 6-24
Mount lamp house

4. Push the lamp house forward until it slides fully into the projector.
5. Secure the correct position of the lamp house by tightening all three spring lock screws as illustrated.

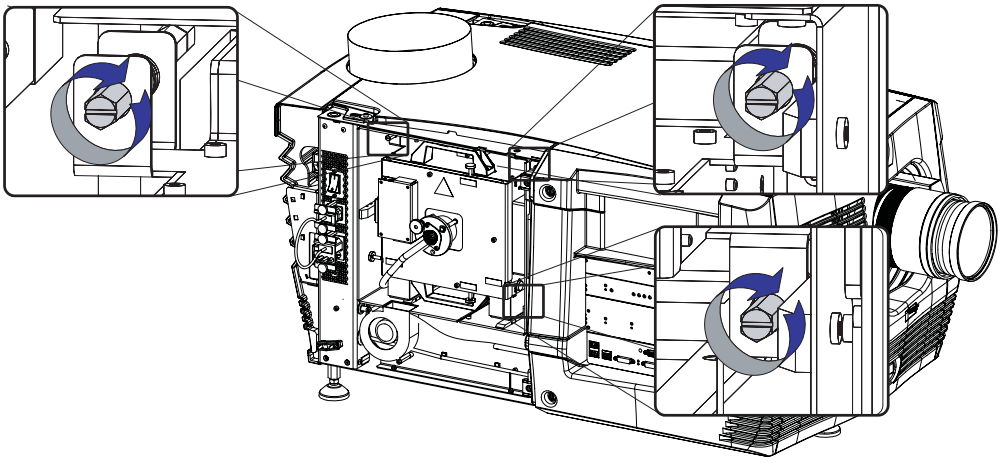


Image 6-25
Secure lamp house

6. Reinstall the lamp cover of the projector.

While starting up the projector, the electronics detect if a lamp is installed. If no lamp is installed, it is not possible to start up the projector.

6.6 Resetting the lamp parameters

CAUTION: The "LAMP INFO" parameters MUST be updated after each installation of a xenon lamp inside the Lamp House. Neglecting this update will result in poor performance and short life time of the xenon lamp.

How to reset the lamp parameters?

1. Start up the projector but do not ignite the lamp.
2. Go via the **Communicator** touch panel to the menu "**Installation**" > "**Lamp**" > "**Lamp information**".
3. While the *Lamp information* window is displayed, tap on **Reset** (1).

   A reset message is displayed (2).
4. Tap on **Select** (3) to display a list of possible article numbers (4). Select a article number (5) and tap **OK** (6).

   The software will validate the selected article number (7).
5. Fill out the serial number of the lamp (8).
6. Click **Reset** (9).

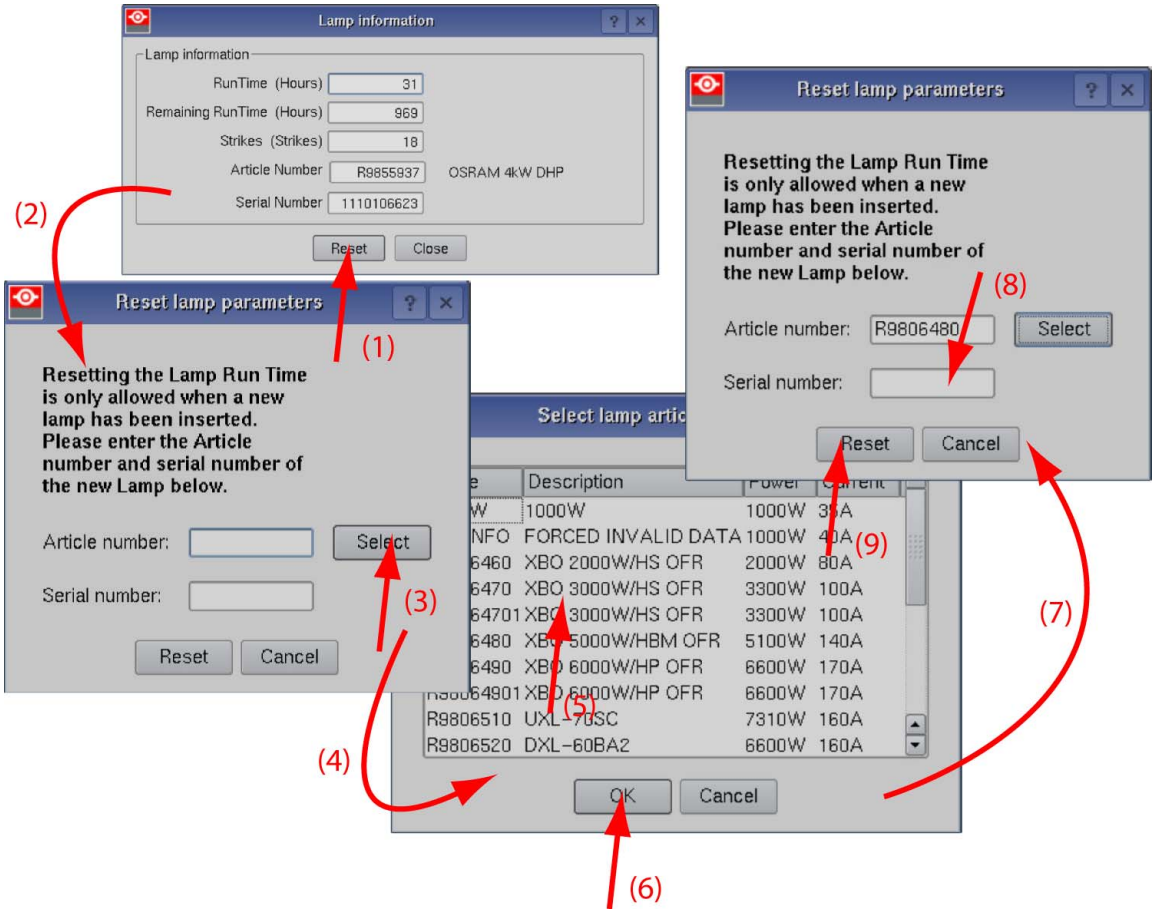


Image 6-26
Reset lamp info

CAUTION: For more information about using the Communicator Touch Panel consult the user's guide of the Communicator Touch Panel.

6.7 Realignment of the lamp in its reflector

Each xenon lamp installation requires a realignment of the lamp in its reflector for optimal performance of the xenon lamp. Furthermore, it is recommended to realign the lamp after the first run time of 100 and 200 hours. Especially the Z-axis of the lamp.

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

How to realign the lamp in its reflector?

1. Remove the cover of the lamp compartment to gain access to the X-, Y-, and Z-axis adjustment thumbscrews of the lamp.
2. Some lamp houses may have lock nuts on the X and Y adjustment screws which are locked. Before starting the adjustment, fully turn these lock nuts against the thumbscrew.

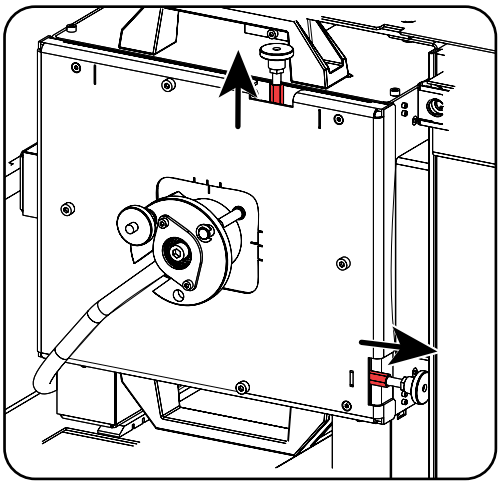


Image 6-27
Lock nuts

3. Switch on the projector and start up the lamp.
4. Go via the Communicator touch panel to the menu **“Installation”** > **“Lamp”** > **“Light output”**.
5. Set the “**Light output mode**” in **normal mode** and the “**Lamp Dimming**” on maximum (**255**).
   Note: *This window on the Communicator touch panel shows in the upper left corner the measured value of the built-in light sensor of the projector.*

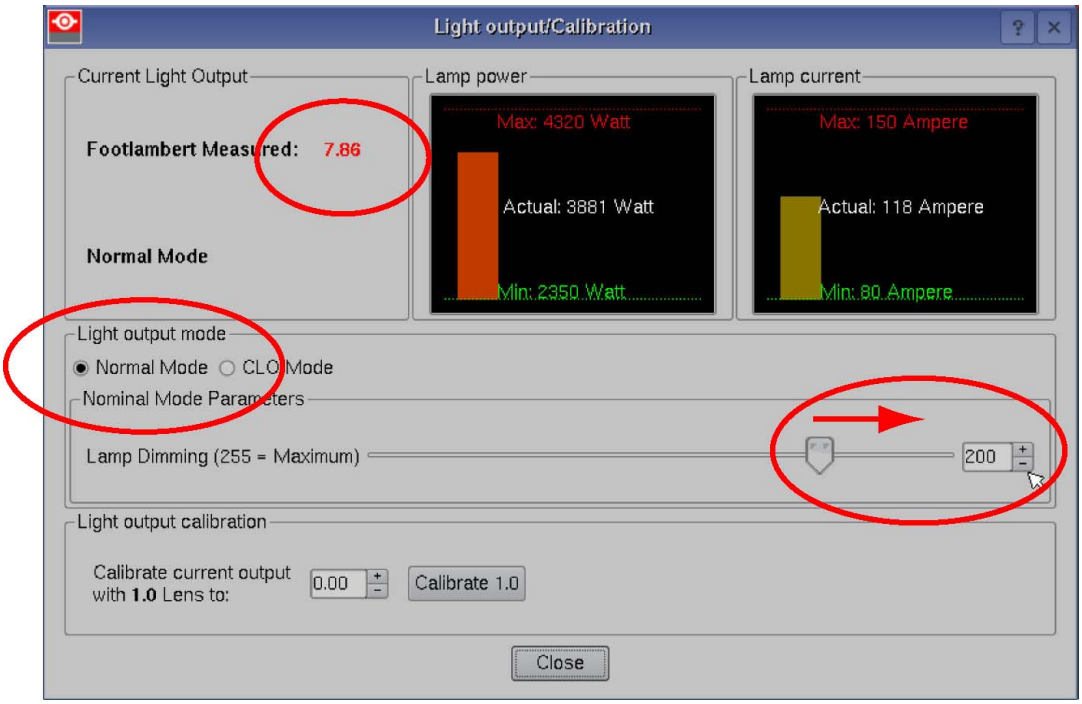


Image 6-28
Light mode selection

6. Adjust the X-axis (ref X image 6-29), the Y-axis (ref Y image 6-29) and the Z-axis (ref Z image 6-29) for maximum current light output (Footlambert Measured). Carefully turn the thumbscrew for maximum light output. Once over the maximum, turn slightly in opposite direction to reach the maximum light output again. Do this for each direction and repeat this adjustment cycle twice.

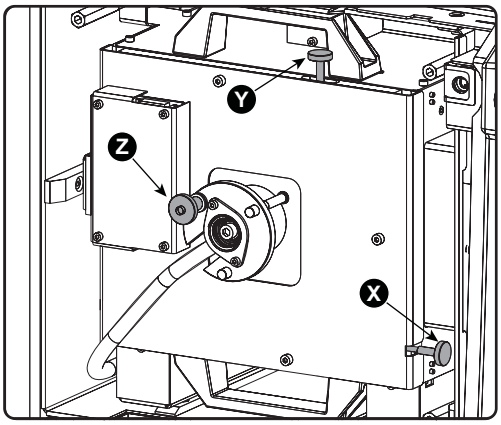


Image 6-29
Lamp adjustment

7. If lock nuts are available, these nuts can be locked again.
8. Switch off the projector.
9. Reinstall the cover of the lamp compartment.

6.8 Replacement of the Lamp Info module

This procedure requires that the lamp house is removed from the projector. See procedure "Removal of the lamp house", page 110.

Necessary tools

- 2,5 mm Allen wrench.
- 5 mm nut driver.

How to replace the Lamp Info module?

1. Remove the cover of the Lamp Info module by releasing the hexagon socket head cap screws (reference 1) as illustrated. Use a 2,5 mm Allen wrench.

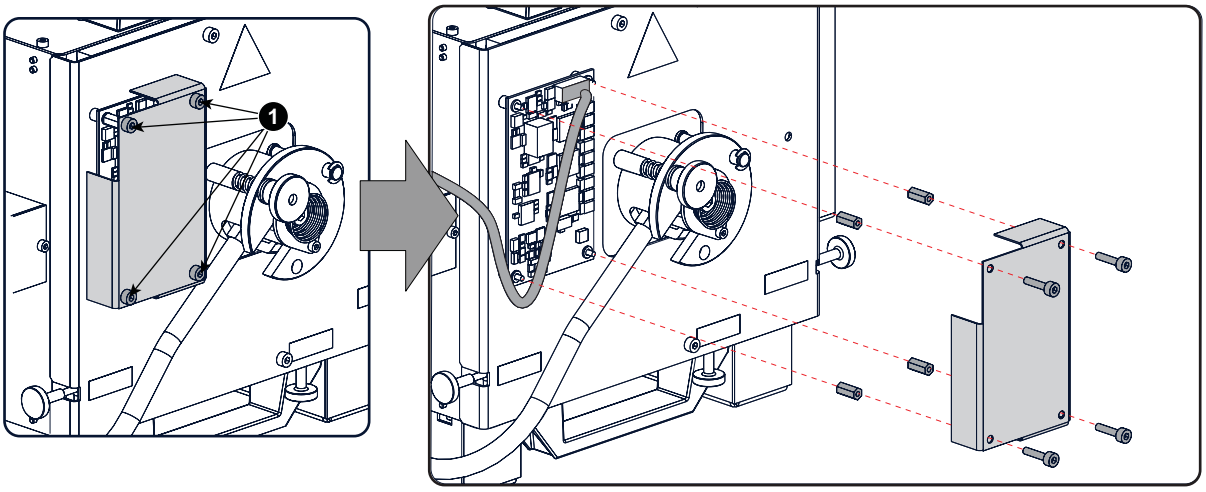


Image 6-30

2. Disconnect the wire unit (reference C) from the Lamp Info module as illustrated.

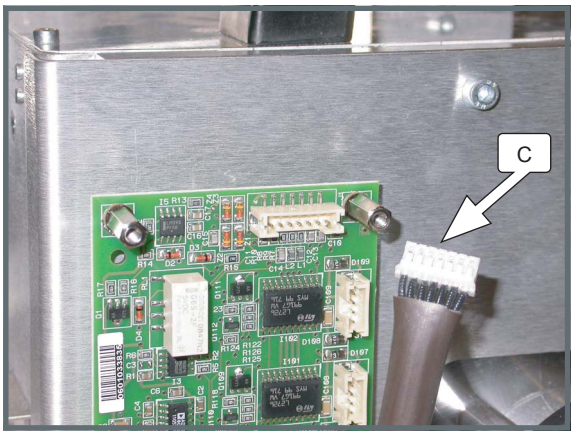


Image 6-31

3. Remove the Lamp Info module from the lamp house by releasing the four spacers (reference 2) as illustrated. Use a 5 mm nut driver. Do not loose the isolating rings (reference 3).

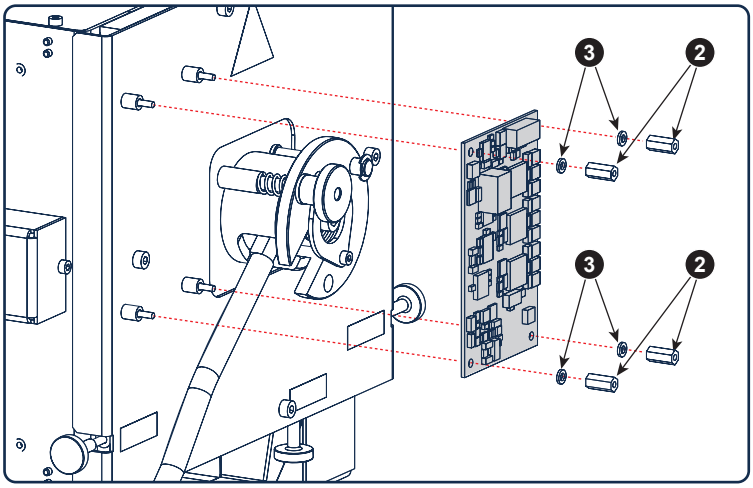


Image 6-32

4. Reinstall a new Lamp Info module and fasten with four spacers (reference 2 image 6-32). Make sure to place a isolating ring (reference 3 image 6-32) between the module and the spacer. Use a 5mm nut driver.
5. Reconnect the wire unit (reference C) as illustrated.

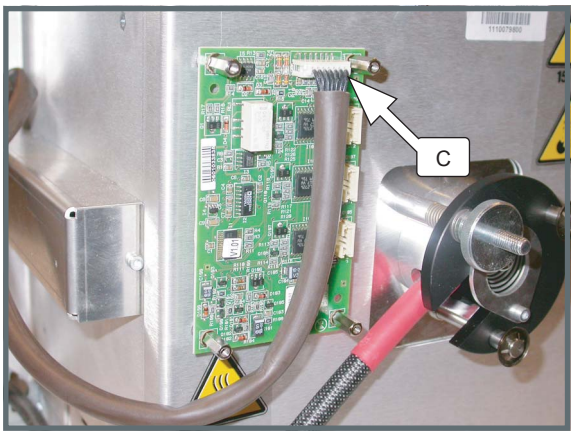


Image 6-33

6. Reinstall the cover of the Lamp Info module. Fasten with four hexagon socket head cap screws (reference 1 image 6-30). Use a 2,5 mm Allen wrench

6.9 Replacement of the UV blocker

This procedure is only valid when replacing an UV blocker with an glued or screwed anode support.

This procedure requires that the lamp house is removed from the projector. See procedure "Removal of the lamp house", page 110.

CAUTION: The person that performs this procedure MUST be wearing a full face shield with neck protector, a welder's jacket and clean leather gloves with wrist protectors. This is required to safely dismantle or assemble the lamp house, which contains a xenon lamp.

Necessary tools

2,5 mm Allen wrench.

How to replace the UV blocker

1. Ensure that you wear protective clothing, a full face shield and protective gloves.
2. Remove first the lamps house side cover and then the lamp house UV blocker assembly by releasing the retaining thumbscrews as illustrated. Support the xenon lamp while removing the UV blocker assembly.

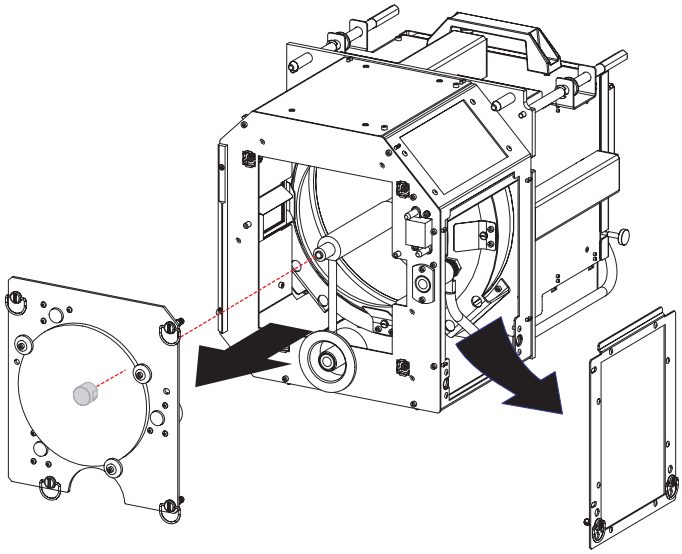


Image 6-34

3. Replace the UV blocker with integrated anode support as illustrated. Use a 2,5 mm Allen wrench to loosen/fasten the three hexagon socket head cap screws (reference 3). Make sure that the anode support is on the inner side of the assembly.
   Caution: *Do not touch the new UV blocker with bare fingers. You should wear clean leather gloves to protect your hands against the danger of explosion of the high pressurized xenon lamp and to avoid that the UV blocker gets contaminated with grease or dirt. You may wear latex or cotton gloves in case there is no danger of a highly pressurized xenon lamp.*

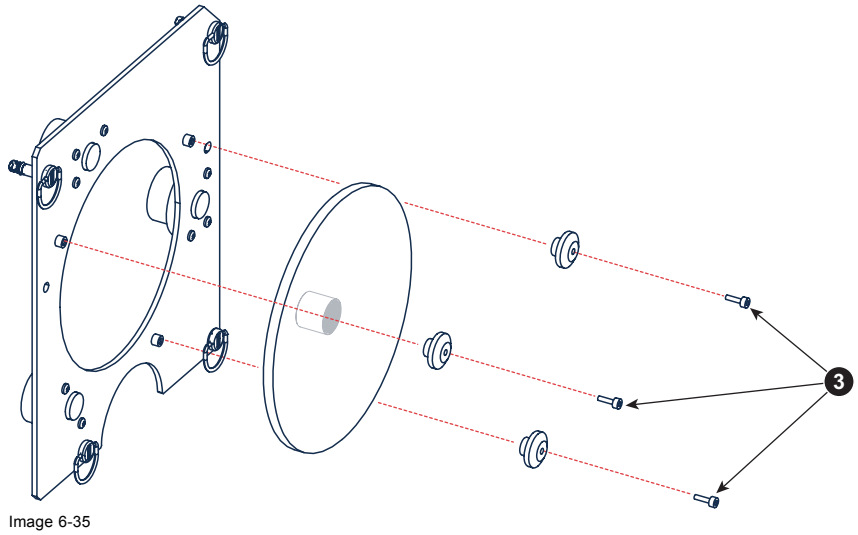


Image 6-35

4. Reinstall the UV blocker assembly as illustrated. Make sure that the xenon lamp is properly supported by the lamp supporting mechanism in the centre of the UV blocker. Use the opening at the side of the lamp house to guide the supporting pin of the xenon lamp into the anode supporting mechanism.

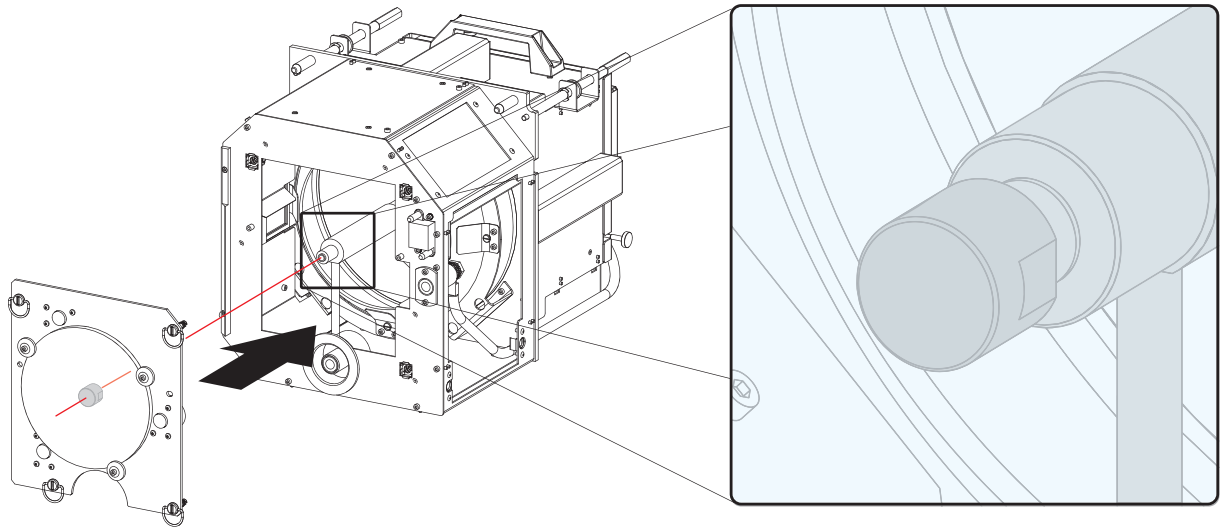


Image 6-36

5. Secure the UV blocker by fastening the four retaining thumbscrews as illustrated.
   Note: *Please ensure that the retaining thumb screws turning wires are flash with the cover or interference will occur while inserting the lamp house into the projector.*

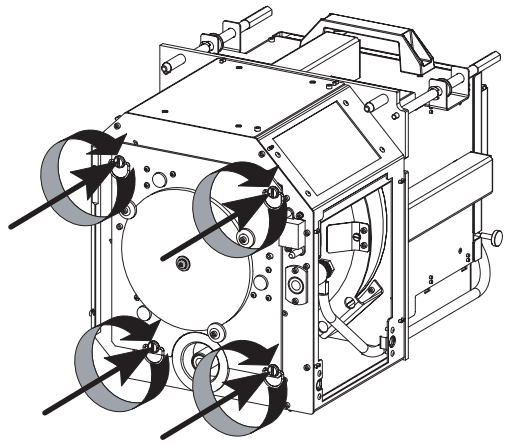


Image 6-37

6. Reinstall the side cover of the lamp house as illustrated.
   Note: *Please ensure that the retaining thumb screws turning wires are flash with the cover or interference will occur while inserting the lamp house into the projector.*

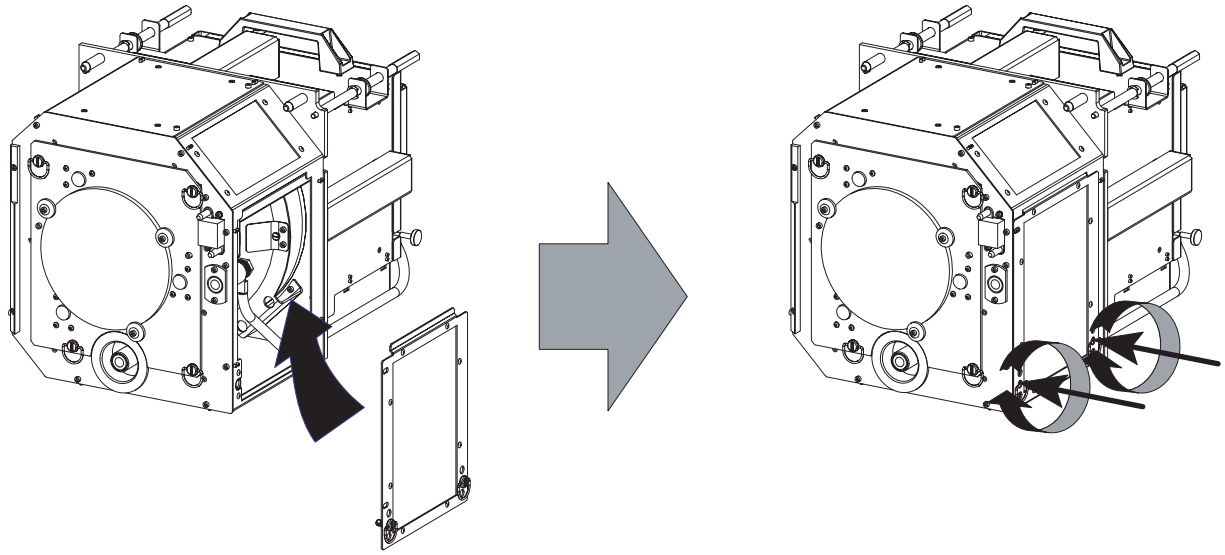


Image 6-38

6.10 Replacement of the lamp reflector

Lamp reflector assembly

The reflector of the lamp has three major parts. One mounting plate, one spheric glass mirror and one elliptic glass mirror. Both mirrors are glued on the mounting plate and are perfectly aligned with each other. The mounting plate serves also as a reference plate between the reflector and the projector optics. The mounting plate has two positioning pins which ensure a correct alignment of the reflector assembly with respect to the projector once the lamp house is inserted in the projector.

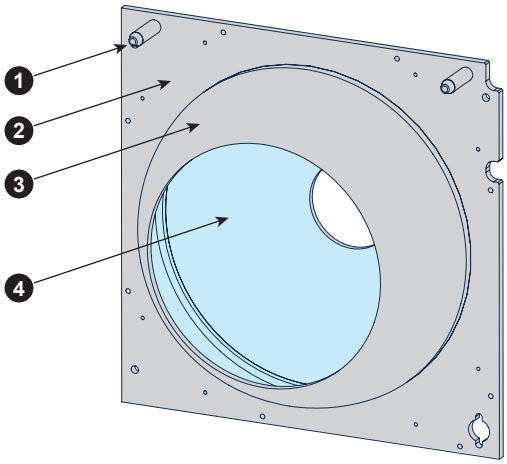


Image 6-39
1 Positioning pin.
2 Mounting plate.
3 Spheric glass mirror.
4 Elliptic glass mirror.

This procedure assumes that there is no lamp installed inside the lamp house. If so, see procedure "Removal of the xenon lamp", page 112.

CAUTION: Do not touch the glass of the reflector assembly while unpacking and installing. Hold fast the reflector assembly by its metal mounting plate.

Necessary tools

- Two 17 mm open-end wrenches.
- Torque wrench with 17 mm hexagon socket.
- 2,5 mm Allen wrench.

How to replace the reflector of the lamp house?

1. Remove the side cover of the lamp house by releasing the two retaining thumbscrews as illustrated.

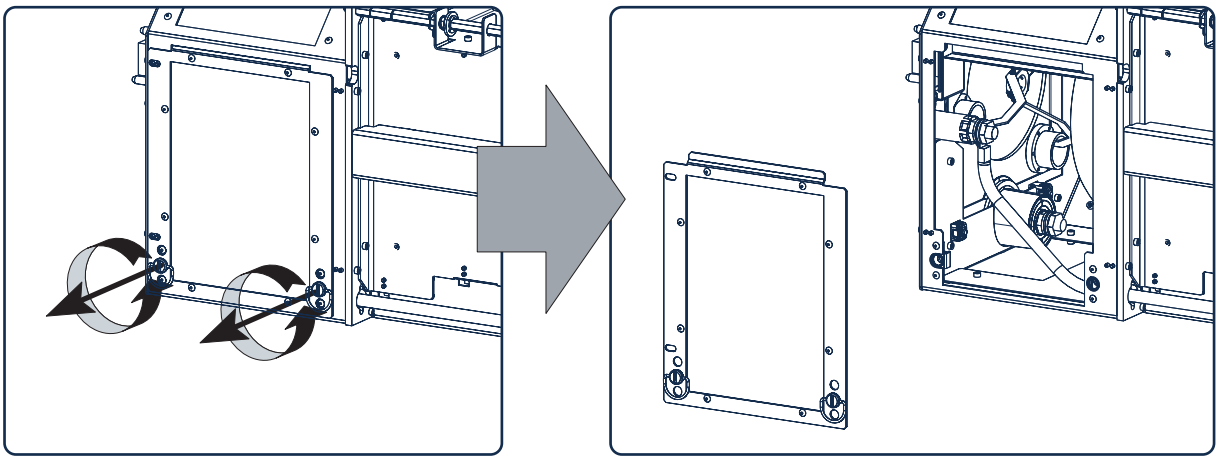


Image 6-40

2. Disconnect one end of the cathode wire from the lamp house as illustrated. Use two open-end wrenches to release the nuts.
   Tip: *Place the washers and nuts back on the socket.*

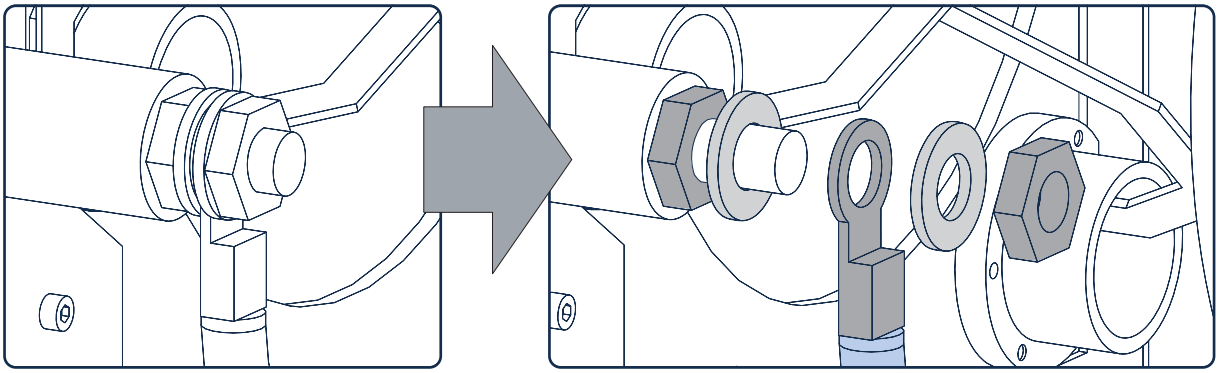


Image 6-41

3. Guide the cathode wire through the hole out of the lamp house.

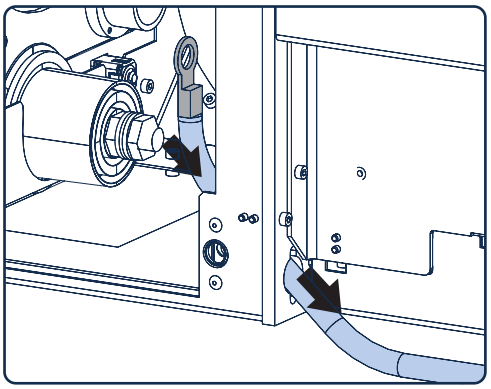


Image 6-42

4. Place the lamp house upon the anode side as illustrated and remove the bottom profiles. Use a 2,5 mm Allen wrench to release the hexagon socket head cap screws of the bottom profiles.
   Caution: *Do not damage the UV blocker or the blue electrical socket of the lamp house.*

   Tip: *Let the three spacers of the UV blocker rest upon a clean flat surface (e.g. a thick book).*

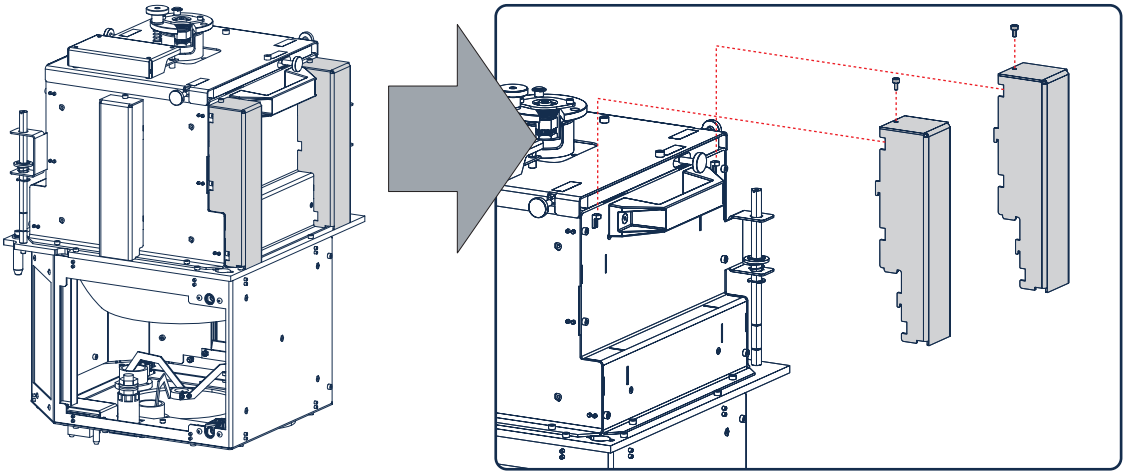


Image 6-43

5. Remove the cathode side of the lamp house by releasing 8 hexagon socket head cap screws (reference 6, two screws per side) as illustrated in image 6-44. Use a 2,5 mm Allen wrench.
6. Remove the reflector assembly of the lamp house by releasing 8 hexagon socket head cap screws (reference 7, two screws per side) as illustrated. Use a 2,5 mm Allen wrench. Note that these screws are longer than those screws which you removed in the previous step.

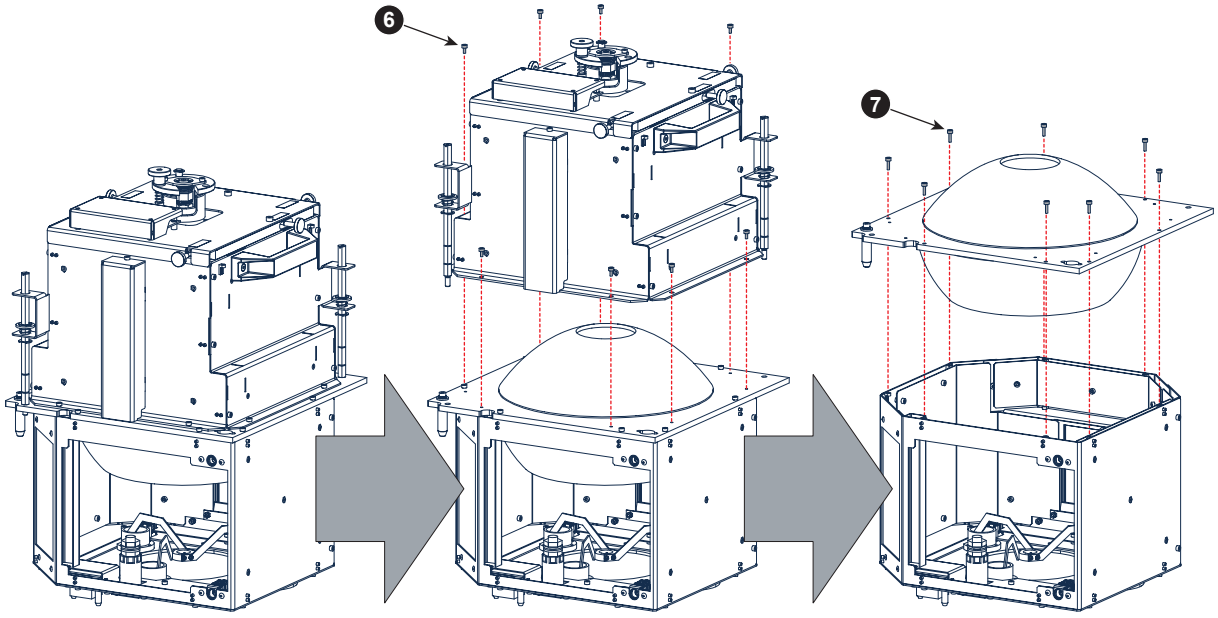


Image 6-44

7. Place a new reflector assembly upon the anode side of the lamp house and fasten with 8 hexagon head cap screws (reference 7 image 6-44). Use a 2,5 mm Allen wrench. These screws must have a length of 10 mm. Make sure to position the reflector assembly correctly.
   Caution: *Do not touch the glass of the reflector assembly. Hold fast the reflector assembly by its metal mounting plate.*
8. Reinstall the cathode side of the lamp house (see middle drawing of image 6-44). Fasten with 8 hexagon head cap screws (reference 6 image 6-44). Use a 2,5 mm Allen wrench.
9. Reinstall the bottom profiles. See image 6-43. Use a 2,5 mm Allen wrench.
10. Guide the cathode wire inside the lamp house as illustrated.

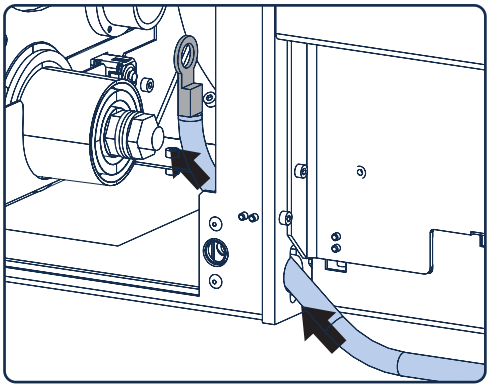


Image 6-45

11. Reconnect the cathode wire with the lamp house. Make sure to place a washer (reference 2 and 4) between the nuts and the eye of the cathode wire (reference 3). Use a torque of 9 Nm to fasten the nuts (reference 1 and 5). Block the first nut (reference 1) with a 17 mm open-end wrench while applying a torque of 9 Nm on the second nut (reference 5) with a torque wrench.

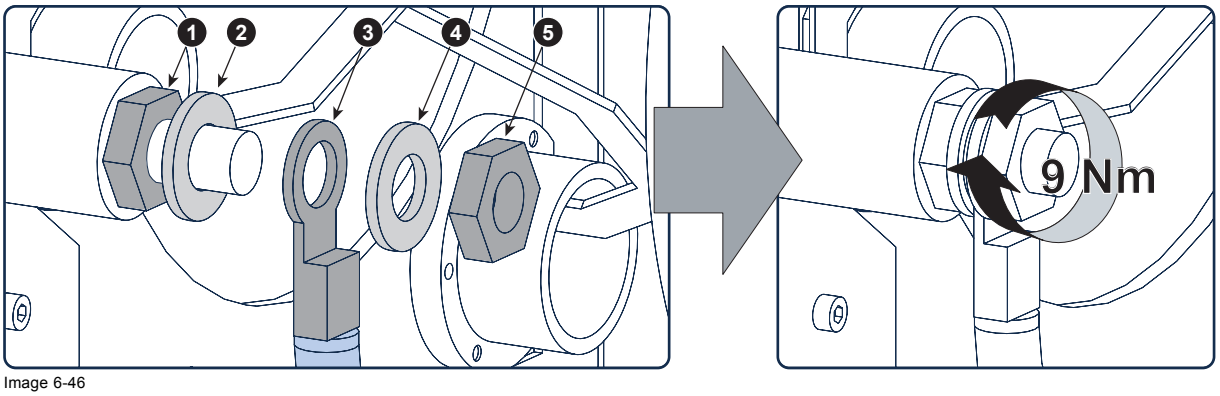


Image 6-46

12. Reinstall the side cover of the lamp house.

6.11 Cleaning the Reflector of the Lamp House

When cleaning the Reflector?

Clean the Reflector on a regular basis to maintain light output level.

This procedure requires that the lamp is removed from the Lamp House.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the Reflector of the Lamp House?

1. Blow off dust with clean compressed air (or pressurized air cans).
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

CAUTION: Never use a Lamp House with cracked or damaged Reflector. Neglecting this may result in irreversible damage of the projector.

6.12 Cleaning the UV blocker of the Lamp House

When cleaning the UV blocker?

Clean UV blocker on regular basis to maintain light output level.

This procedure requires that the UV blocker is removed from the Lamp House.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the UV blocker of the Lamp House?

1. Blow off dust with clean compressed air (or pressurized air cans).
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

CAUTION: Never reinstall a UV blocker which is cracked or has a damaged coating. Neglecting this will result in irreversible damage of optical parts in the projector.

7. COLD MIRROR ASSEMBLY

About this chapter

This chapter describes how to replace the cold mirror and top fan as complete assembly. It also describes the necessary adjustments for the cold mirror.

CAUTION: Typically the Cold Mirror should never be readjusted in the field except when the Cold Mirror or Lamp Reflector have been replaced. In case a readjustment is required follow the instructions in this chapter precisely. Only qualified technicians who have experience with adjusting the Cold Mirror may adjust the Cold Mirror. A misaligned Cold Mirror may cause irreversible damage to other parts of the projector!

Overview

- Introduction
- Removal of the cold mirror assembly
- Replace the Cold Mirror
- Installation of the cold mirror assembly
- Adjusting the cold mirror
- Cleaning the Cold Mirror

7.1 Introduction

Functionality of the cold mirror

The location of the cold mirror in the light path is between the light source (xenon lamp) and the light pipe. The cold mirror reflects the visible light and absorbs the infra red light. Due to this absorbing, a lot of heat is produced. The cold mirror is mounted with the rear side upon a big heat sink. The fan above the heat sink blows cold air upon the heat sink and cold. The hot air is transported to the outside of the projector. The cold mirror has three adjustment screws to modify the position of the cold mirror so that the centre of the light spot is precisely reflected in the centre of the integration rod entrance for optimal performance.

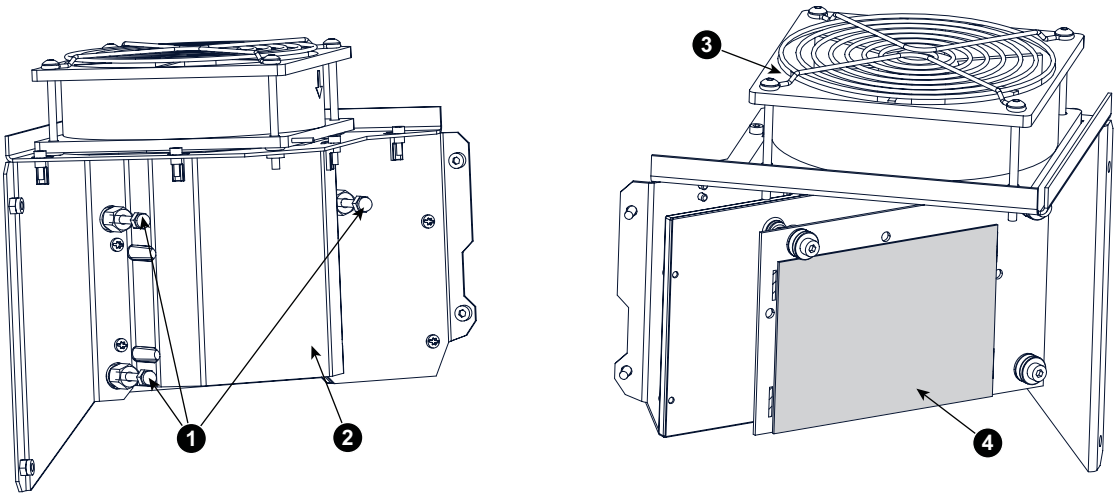


Image 7-1
Cold mirror assembly

1 Cold mirror adjustment screws

Diagnostic

The easiest way to check the condition of the cold mirror is by removing the lamp unit. When the lamp unit is removed, the cold mirror becomes visible at the end of the lamp compartment. In case the cold mirror is not damaged but dirt is clearly visible upon the surface of the mirror it is recommended to clean the cold mirror. Always replace the cold mirror with a new one in case the cold mirror is damaged. Possible damages are:

- Cold mirror is broken.
- Coating peels off.
- Cold mirror is cracked.

7.2 Removal of the cold mirror assembly

The cold mirror cannot be replaced separately. Always replace the whole assembly (mirror + heat sink + fan).

Necessary tools

- 3 mm Allen wrench
- Nut driver 7 mm

How to remove the cold mirror assembly

1. Remove cover plate of the sealed compartment. See "Open the sealed compartment", page 99.
2. Remove the cover of the Start Pulse Generator as illustrated. This cover is secured with 5 hexagon socket head cap screws. Use a 3 mm Allen wrench.

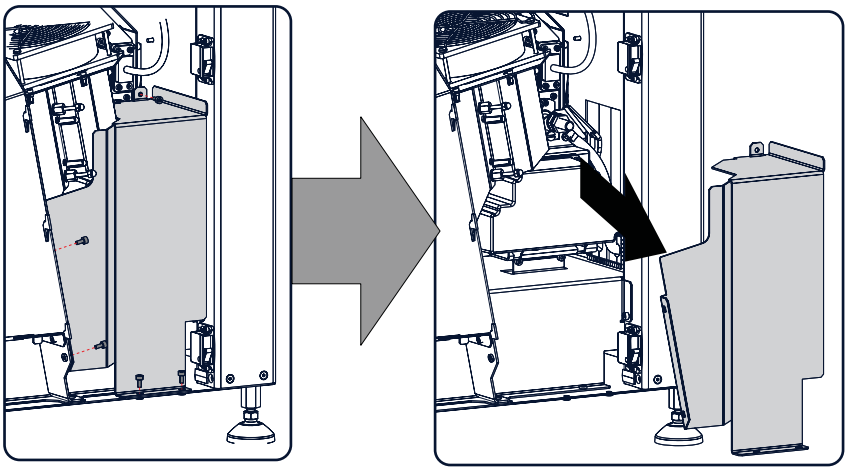


Image 7-2
Remove SPG cover

3. Disconnect the fan wire (reference 1).
   Tip: *Pull out the top filter for easy access to the fan wire connection.*

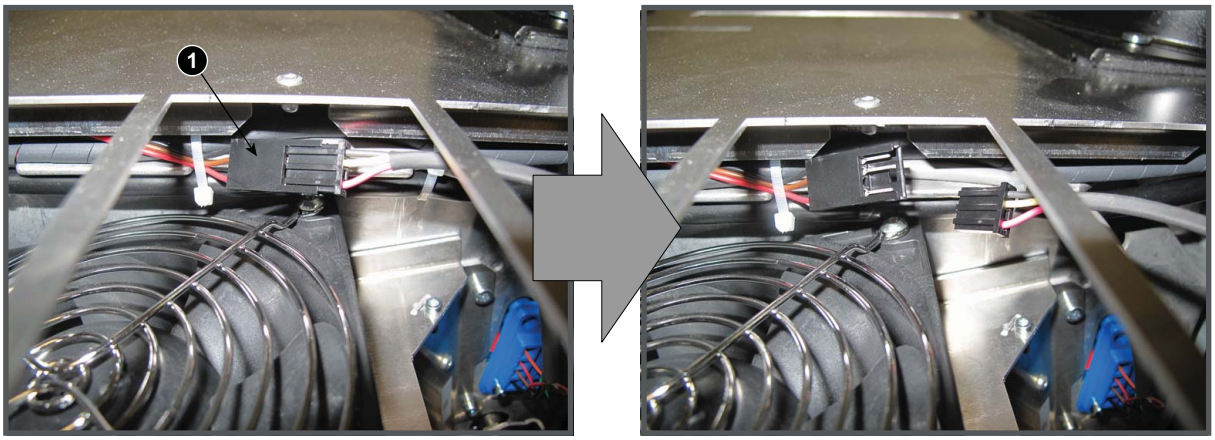


Image 7-3
Electrical disconnection

4. Turn out the 2 hexagon socket head cap screws at the right side (reference 2).

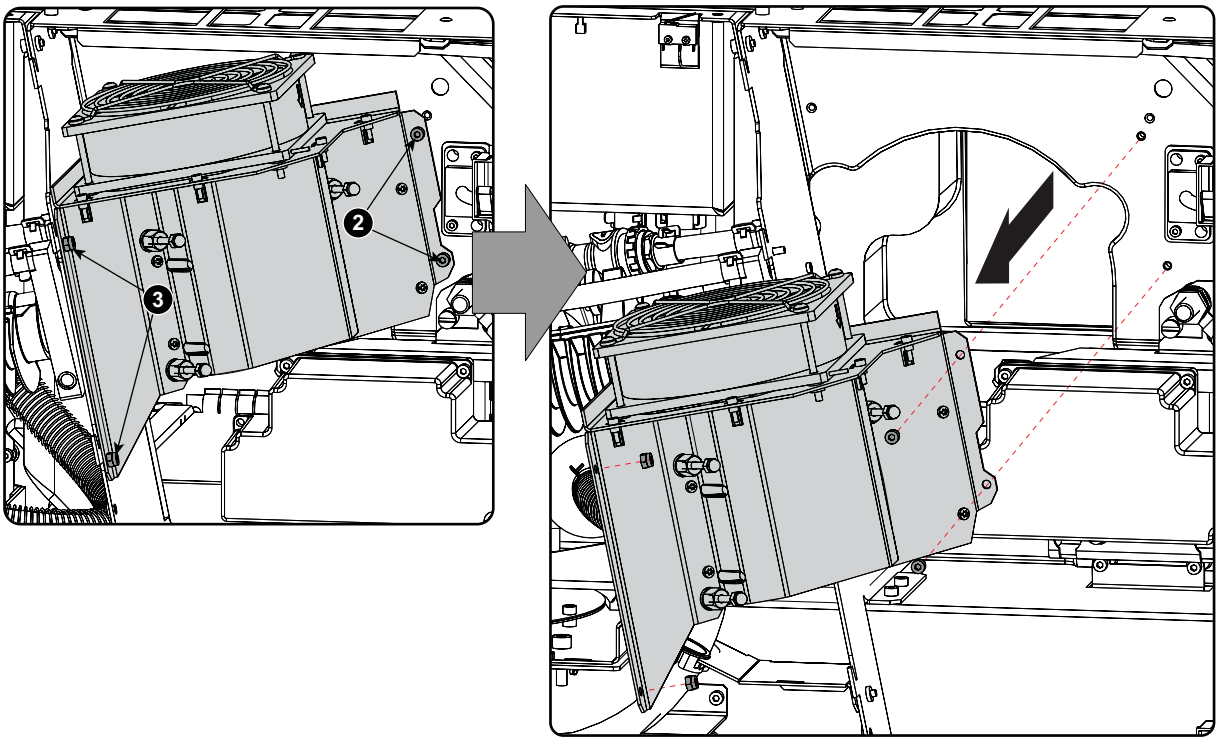


Image 7-4
Remove cold mirror

5. Remove both nuts at the left side (reference 3).
   Support the assembly while removing the nuts.
6. Slide out the cold mirror assembly.

7.3 Replace the Cold Mirror

Necessary tools

- 7mm nut driver.
- 7mm open-end wrench.
- 3mm Allen wrench.
- Latex or cotton gloves.
- Slide caliper.

How to replace the Cold Mirror?

1. Loosen the three nuts (reference 11) at the rear side of the Cold Mirror. Use a 7mm open-end wrench.
2. Loosen the three lock nuts (reference 10) at the rear side of the Cold Mirror. Use a 7mm open-end wrench.
3. Loosen the three long screws (reference 1) at the front side of the Cold Mirror. Use a 3 mm Allen wrench.
4. Remove the small components (reference 5, 6, 7, 8 & 9) from the long screws (reference 1) and take of the Cold Mirror.
5. Install the new Cold Mirror. Ensure that all mounting parts (reference 1 to 9) upon the three long screws are placed in that order as illustrated.
   Caution: *Do not touch the surface of the Cold Mirror. Use cotton gloves to handle the Cold Mirror.*

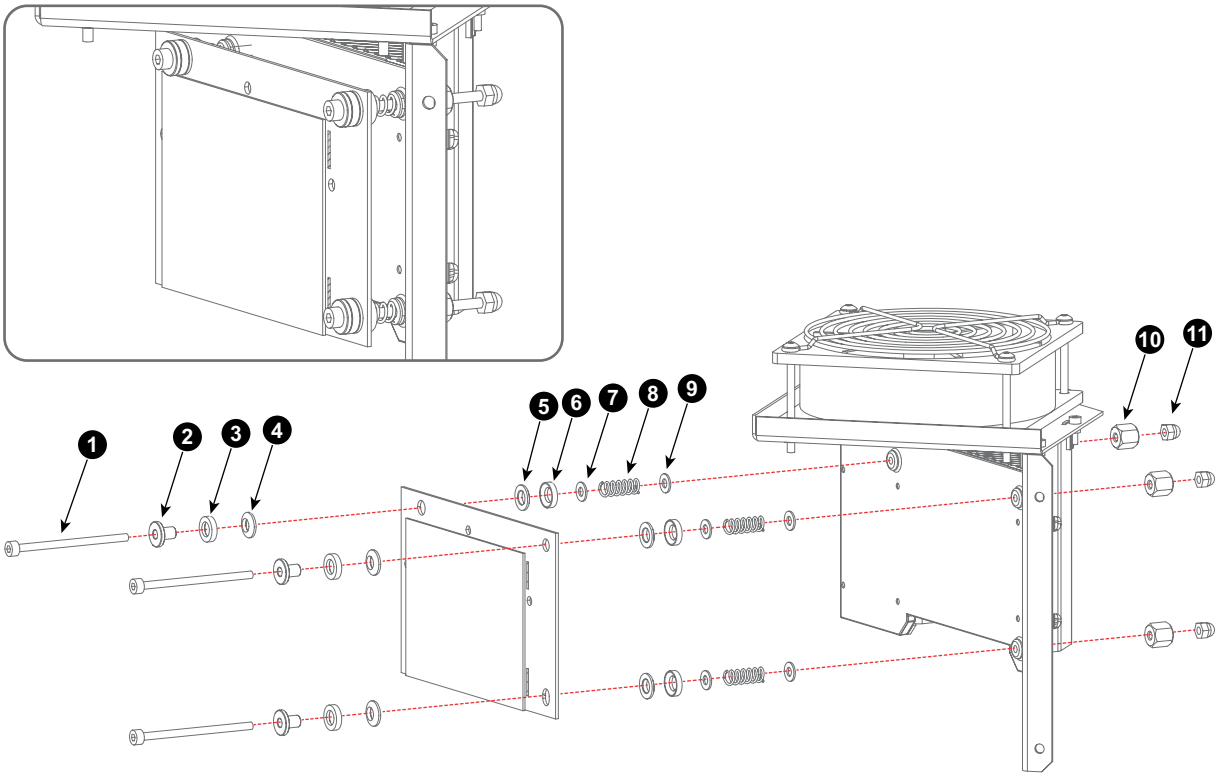


Image 7-5

6. Tighten the three long screws until the distance between the Cold Mirror and frame is 17.4mm. Tighten the lower lock nut until the distance between the Cold Mirror and the frame is 17.4mm.

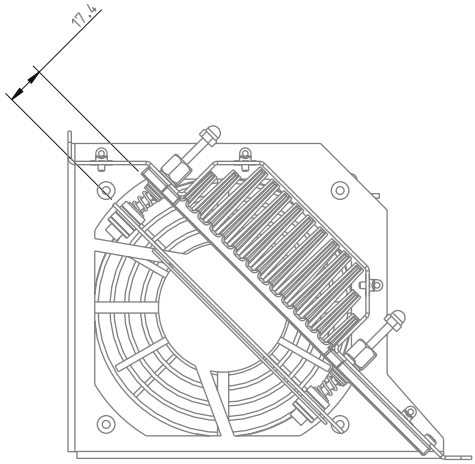


Image 7-6

7. Place a lock nut (reference 10) and a cap nut (reference 11) at the end of each long screw (reference 1).
   Note: *While tightening the lock nuts ensure that the distance between the Cold Mirror and frame remains 17.4mm. This position of the screws correspond with nearly an optimal position of the mirror.*

7.4 Installation of the cold mirror assembly

The cold mirror cannot be replaced separately. Always replace the whole assembly (mirror + heat sink + fan).

Necessary tools

- 3 mm Allen wrench
- Nut driver 7 mm

When unpacking the cold mirror assembly, check if there is no foam piece between the support plate and the backside of the cold mirror. If so, remove that piece gently.

Remove the protective layer on the mirror side. Do not touch the mirror with your fingers or other object.

How to install the cold mirror assembly

1. Insert the cold mirror assembly on its place and hold the cold mirror assembly in its place. Secure with the two nuts (reference 1) at the left side. Use a 7 mm nut driver.
   Caution: *Make sure that the wire unit of the fan does not get jammed between the assembly and the projector chassis.*

   Caution: *Do not touch the surface of the cold mirror.*

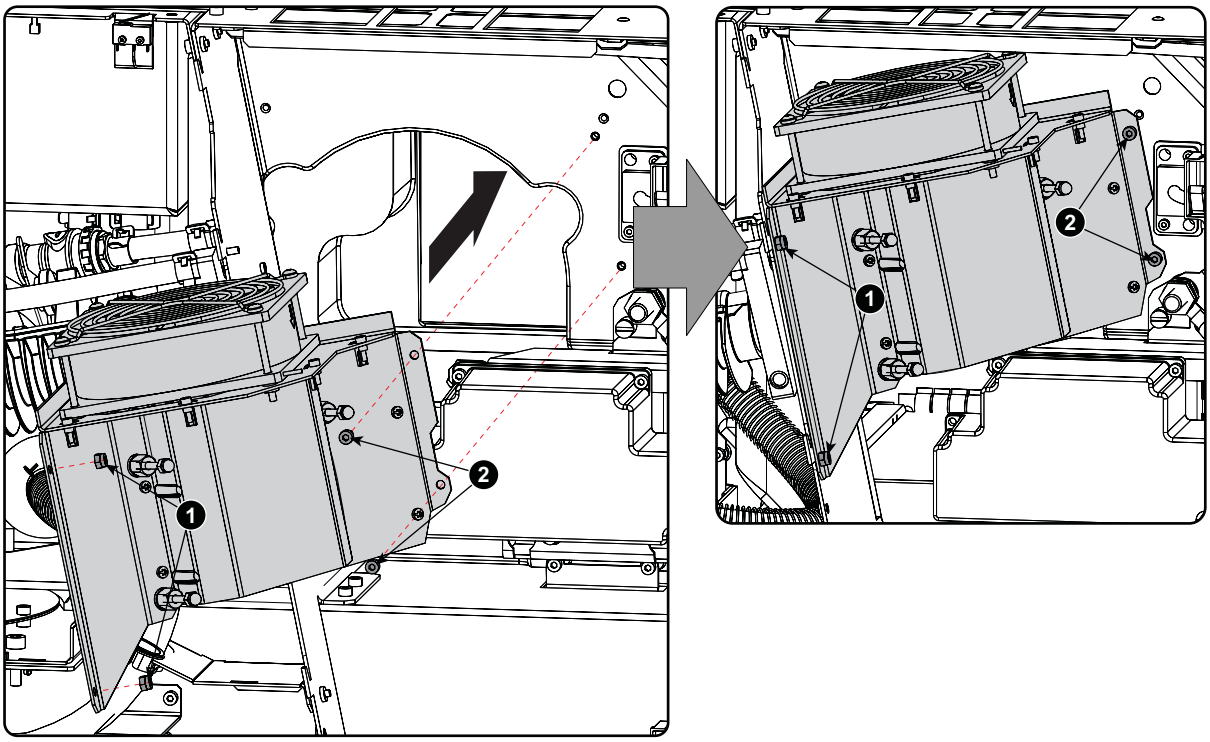


Image 7-7
Mount cold mirror

2. Fasten the right side of the cold mirror assembly using two hexagon socket head cap screws (reference 2). Use a 3 mm Allen wrench.
3. Reconnect the wire unit (reference 3) of the fan.

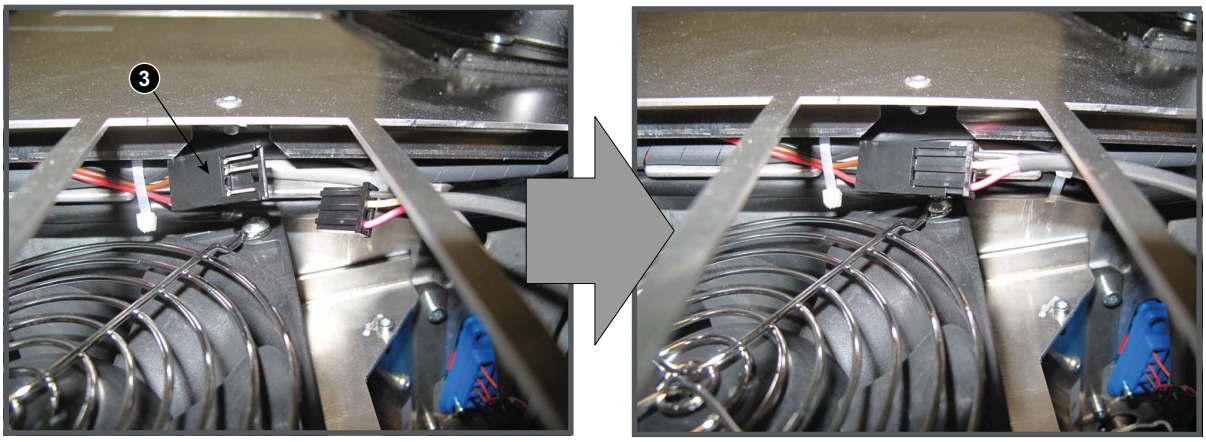


Image 7-8

4. Install the cover of the Start Pulse Generator as illustrated. The cover has to be fasten with 5 hexagon socket head cap screws. Use for that a 3 mm Allen wrench.

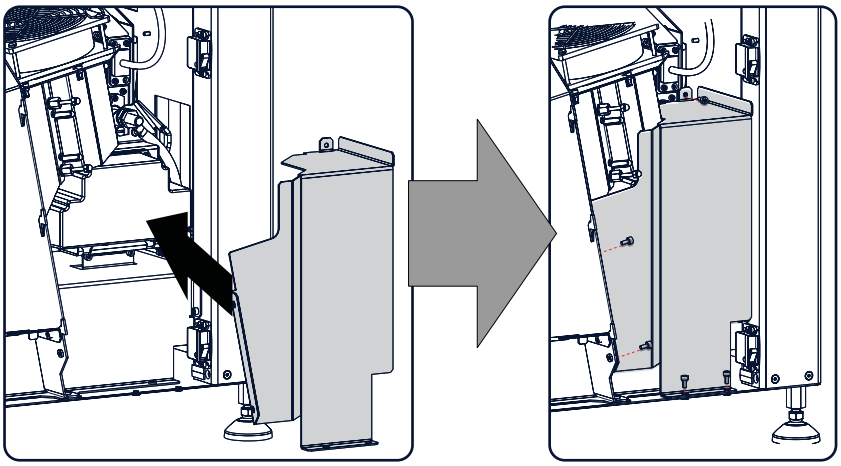


Image 7-9

5. Close the sealed compartment. See "Close the sealed compartment", page 100.
6. Readjust the cold mirror. See "Adjusting the cold mirror", page 145.

7.5 Adjusting the cold mirror

The position of the xenon bulb in its reflector effects the position of the cold mirror with respect to the entrance of the integration rod. Hence the adjustment of the cold mirror requires simultaneous adjustment of the xenon bulb in its reflector for maximum light output. Once the cold mirror and xenon bulb are optimally adjusted, the cold mirror should never be adjusted again. A xenon bulb replacement only requires realignment of the lamp in its reflector. Only when a cold mirror is replaced, should it be readjusted.

Necessary tools

- 10 mm open-end wrench.
- 7 mm nut driver.
- Light meter.
- Slide caliper.

How to setup the projector for adjusting the cold mirror?

1. Remove the left cover and lamp cover of the projector.
2. Loosen the three lock nuts (reference 4 image 7-10) of the cold mirror adjustment screws. Use for that a 10 mm open-end wrench.

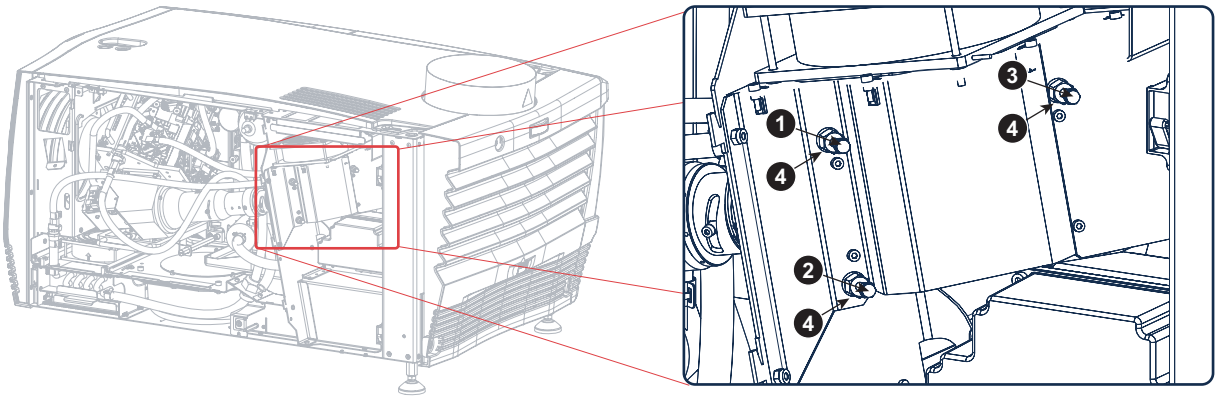


Image 7-10

3. Check the nominal position of the cold mirror and if required adjust. The distance between the head of the each adjustment screw (reference 1, 2 & 3 image 7-10) and the assembly plate should be 32,5 mm for nominal position. This distance corresponds with 17,4 mm between the cold mirror and its mounting surface. This nominal position is the best position to start the adjustment procedure. Normally the cold mirror spare part is delivered with the cold mirror in its nominal position.

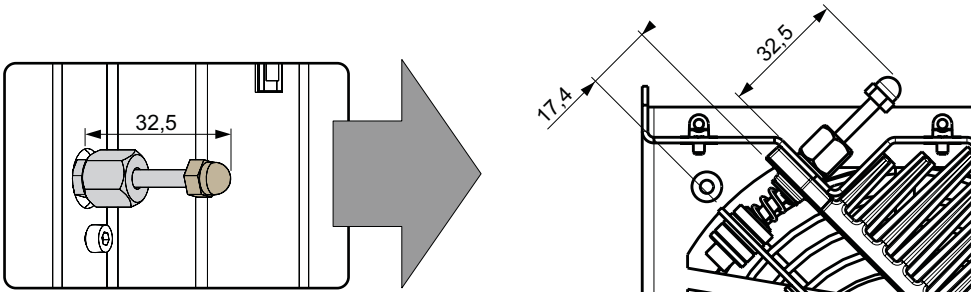


Image 7-11

4. Project a white test pattern.
5. Place the light meter in the center of the projected image.

How to adjust the cold mirror?

1. Turn the adjustment screw 2 (reference 2 image 7-12) in or out until the maximum light output is measured. Use for that a 7 mm nut driver.

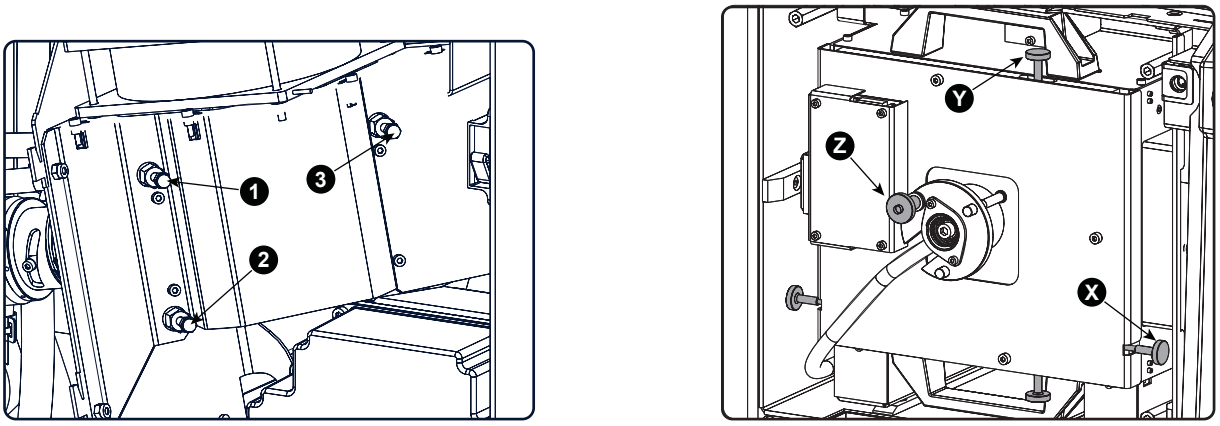


Image 7-12

2. Turn the adjustment screw 3 (reference 3 image 7-12) in or out until the maximum light output is measured.
3. Repeat step 1 and 2 until the maximum light output is measured.
4. Adjust the X-axis, Y-axis and Z-axis (reference X, Y & Z image 7-12) of the xenon lamp in the Lamp House for maximum light output. Carefully turn the thumbscrew for maximum light output. Once over the maximum, turn slightly in opposite direction to reach the maximum light output again. Do this for each direction and minimum repeat this adjustment cycle twice.
5. Turn the adjustment screw 1, 2 and 3 (reference 1, 2 & 3 image 7-12) equally in or out until the maximum light output is measured.
6. Repeat from step 1 until the maximum light output is measured.
7. Check the brightness uniformity. In most cases it will be OK.
   If not OK, turn slightly on the adjustment screws 2 and 3 (reference 2 & 3 image 7-12) until a uniform brightness is obtained.
   - Screw 2 (reference 2 image 7-12) will correct the difference between the left and the right side of the projected image.
   - Screw 3 (reference 3 image 7-12) will correct the difference between the top and the bottom side of the projected image.

   Check again and repeat if necessary.
8. When the adjustment is finished, secure the position of the cold mirror by turning the lock nuts (reference 4 image 7-12) against the plate (hold on the screws while securing the nuts).

7.6 Cleaning the Cold Mirror

When cleaning the Cold Mirror?

Clean the Cold Mirror on a regular basis to maintain light output level.

This procedure requires that the Lamp House is removed from the projector.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the Cold Mirror?

1. Blow off dust with clean compressed air (or pressurized air cans).
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

8. 3D COLOR WHEEL

About this chapter

This chapter contains information about the optional 3D color wheel.

Preparations

Take out the light processor assembly from the projector. See "Light Processor assembly", page 161.

To replace the current mounted 3D color wheel, continue with "Remove the 3D color wheel assembly on a DP2K- or DP4K-series projector", page 152 and follow then the installation procedure for a new 3D color wheel starting with "Unpacking", page 155.

To mount a 3D color wheel for the first time on the light processor assembly, start with "Remove rod entrance cooling block of a DP2K- or DP4K-series projector", page 154 and continue with "Unpacking", page 155.

CAUTION: Remove the light processor of the projector only in a clean and dust free area. Never remove the side cover in an area which is subject to airborne contaminants such as that produced by smoke machines or similar.

Overview

- Introduction
- Parts location
- Remove the 3D color wheel assembly on a DP2K- or DP4K-series projector
- Remove rod entrance cooling block of a DP2K- or DP4K-series projector
- Unpacking
- Installation of the 3D color wheel assembly on a DP2K- or DP4K-series projector
- Finalizing the installation

8.1 Introduction

Introduction of the 3D color wheel

The Barco digital projectors mentioned in the “where to use” list can be upgraded for 3D digital cinema by installing the 3D color wheel. This 3D color wheel upgrade kit is designed by Barco and fits precisely upon the light pipe entrance of the digital projector.

When 3D content is applied to the digital projector, a rotating filter wheel is inserted between the lamp and the picture element. As a result, the digital projector projects alternating full color images for the left eye and the right eye that are not quite identical with respect to their primary color frequencies. The audience wears passive glasses with filtering lenses that are precisely tuned to these differences, thereby preventing each eye from seeing the images intended for the other eye. Note that the rotating filter wheel is retracted for 2D projection. This new technology eliminates the need for the impractical silver screens or the active-shutter glasses of other systems.

The entrance and exit of the liquid cooling circuit, which passes through the 3D color wheel assembly, are equipped with respectively a short and a long tube with a valved fitting for DP2K projectors. Extra valved fittings for the DP-xx00 series are delivered separately and can be used to replace the current mounted fittings.

For DP2K-12C, remove the cooling tubes from the assembly.

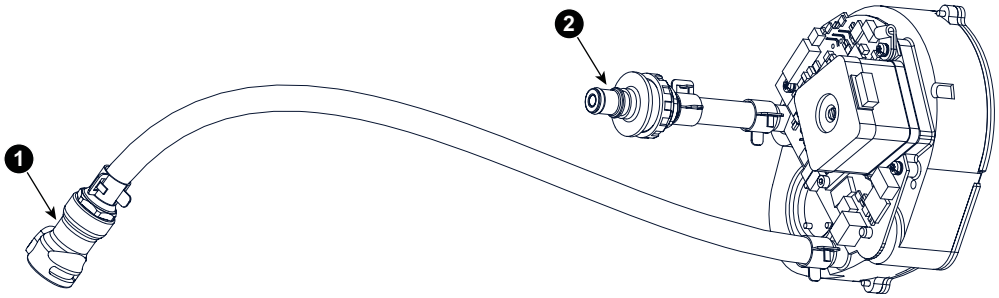


Image 8-1
1 Female valved fitting on the tube of the liquid cooling circuit exit side.
2 Male valved fitting on the tube of the liquid cooling circuit entrance side.

Purpose of the upgrade kit

The 3D color wheel upgrade kit designed by Barco may only be used to upgrade Barco digital projector for 3D digital cinema.

8.2 Parts location

Parts location of the 3D color wheel assembly

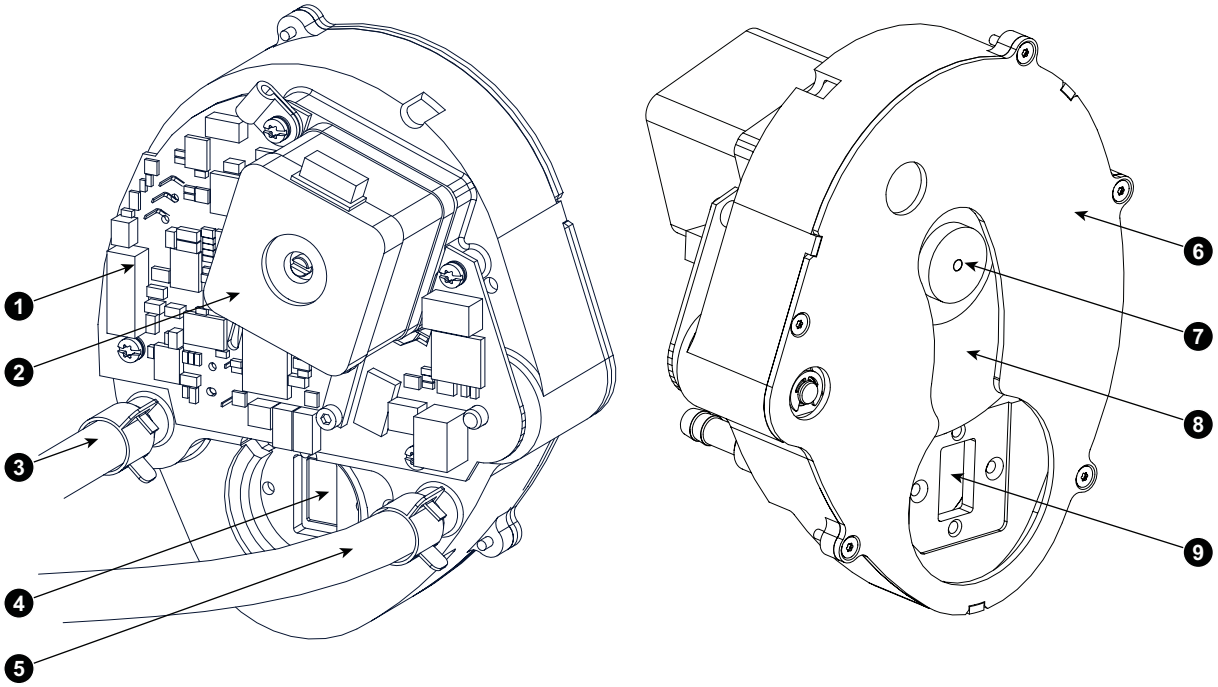


Image 8-2

1 Socket for connection with the Formatter Interface Board (FIB) on a DP-xx00 series projector or with the backplane on a DP2K C series, DP2K/DP4K B series, or DP2K-S series.
2 Color wheel retraction motor.
3 Liquid cooling circuit entrance (tube needs to be removed from assembly if the projector is not equipped with a liquid cooling circuit)[1].
4 Light path exit.
5 Liquid cooling circuit exit (tube needs to be removed from assembly if the projector is not equipped with a liquid cooling circuit)[1].
6 Cover plate 3D color wheel.
7 Spinning motor 3D color wheel.
8 3D color wheel.
9 Light path entrance.

1. DP2K-12C and DP2K-S series are not water cooled

8.3 Remove the 3D color wheel assembly on a DP2K- or DP4K-series projector

Necessary tools

Torx T10 screw driver

How to remove

1. Disconnect the data/power wire (reference 1) of the 3D color wheel assembly. Cut the wire ties. and remove the screw of the temperature sensor (reference 3)

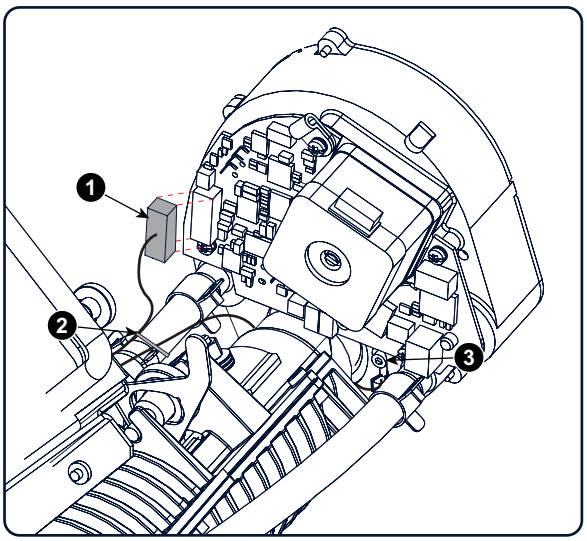


Image 8-3
Data/power cable connection

2. Uncouple the cooling circuit[2] of the Light Processor from the cooling circuit (short tube) of the 3D color wheel assembly.

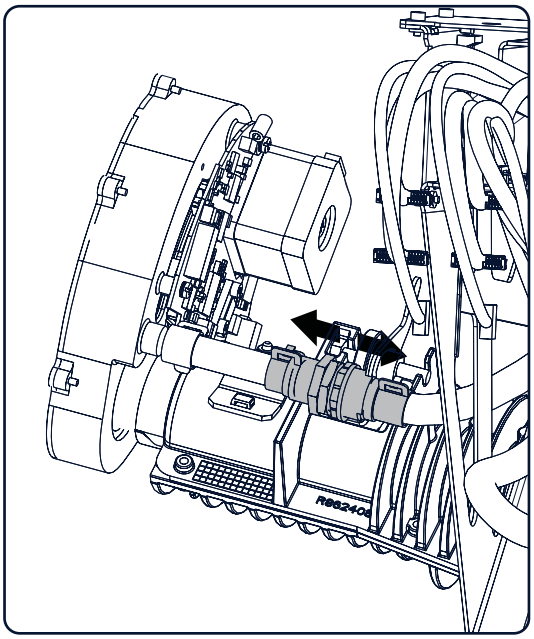


Image 8-4
Uncouple cooling circuit

3. Remove the mask (reference 2) by turning out both countersunk head screws (3). Use a Torx screw driver.
   Caution: *Take care not to damage the color wheel.*

2. No liquid cooling circuit available in a DP2K-12C projector

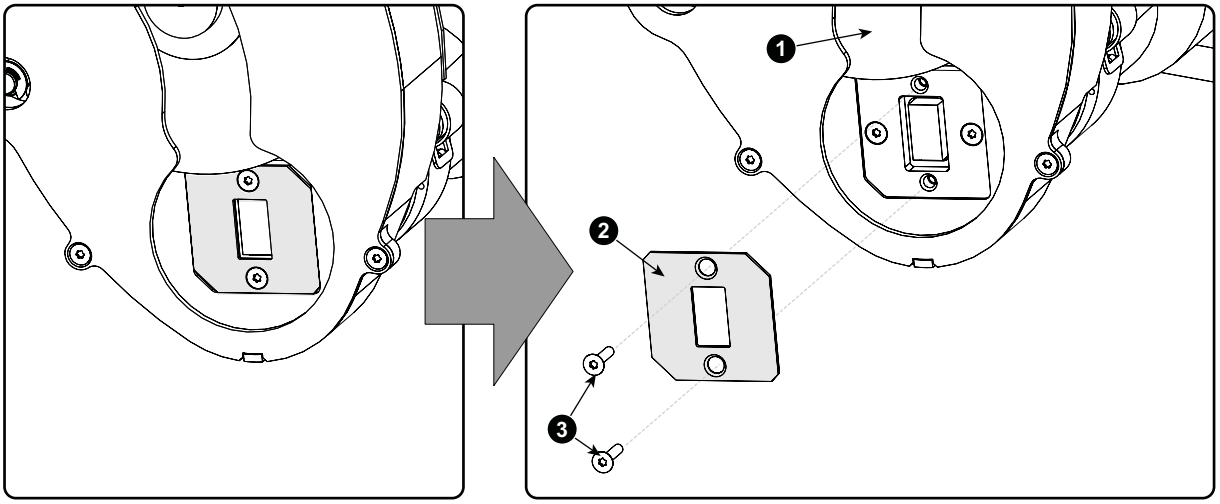


Image 8-5
Remove mask

4. Turn out both countersunk head screws (1) and then, carefully slide the 3D color wheel backwards. Take care not to touch the light pipe (4). It is very important to **look straight into the light pipe** (reference 4) via the light path opening (reference 3) of the 3D color wheel when doing this.
   Caution: *Any contact with the integration rod may cause damage.*

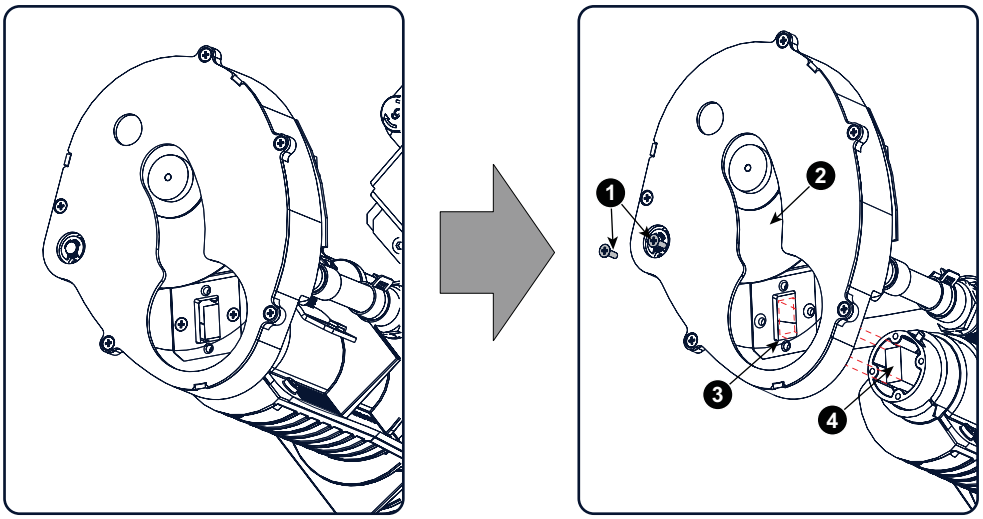


Image 8-6
Remove 3D color wheel

8.4 Remove rod entrance cooling block of a DP2K- or DP4K-series projector

Cooling block for DP2K-12C has no cooling tubes.

Necessary tools

- 2 mm Allen wrench
- 2.5 mm Allen wrench
- Torque wrench set to 2 Nm

How to remove

1. Check if nut C is still correctly secured. Use a torque wrench with a torque of 2Nm.
2. Remove the temperature sensor from the cooling block. Use a 2.5 mm Allen wrench.

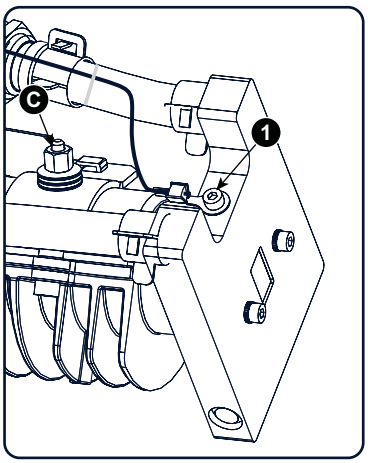


Image 8-7

3. Uncouple the cooling circuit between the Light Processor unit and the cooling block by unplugging the two valved fittings. To interrupt a valved fitting, press on the knob and pull out the connector.
4. Remove the cooling block at the light pipe entrance by removing the two socket head screws. Use a 2.5 mm Allen wrench.

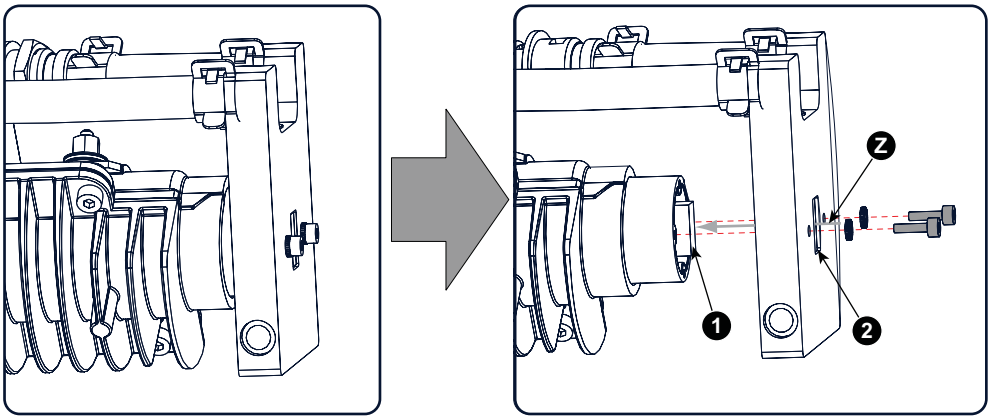


Image 8-8

Caution: *Danger of damage to the integration rod (reference 1). Look through the opening (reference 2) of the cooling block (Z-direction) while removing.*

8.5 Unpacking

Color wheel protection

To protect the color wheel during transport from scratches and dust, the color wheel is sealed with two covers (reference 2 & 5 image 8-9). These must be removed prior to installation. Note that all screws need to be reused.

Necessary tools

Torx screwdriver T10.

Unpacking the 3D color wheel assembly

1. Remove the three counter sunk screws (reference 1 image 8-9) which fasten the large cover (reference 2 image 8-9). Use a Torx screwdriver T10.
2. Remove the large cover (reference 2 image 8-9).
3. Remove the two counter sunk screws (reference 3 image 8-9). Use a Torx screwdriver T10.
   Caution: *Makes sure that the color wheel is retracted (non acting position) so you can freely look through the light path opening. Any contact with the integration rod may cause damage.*
4. Remove the two counter sunk screws (reference 4 image 8-9) which fasten the small cover (reference 5 image 8-9). Use a Torx screwdriver T10.
5. Remove the small cover (reference 5 image 8-9).

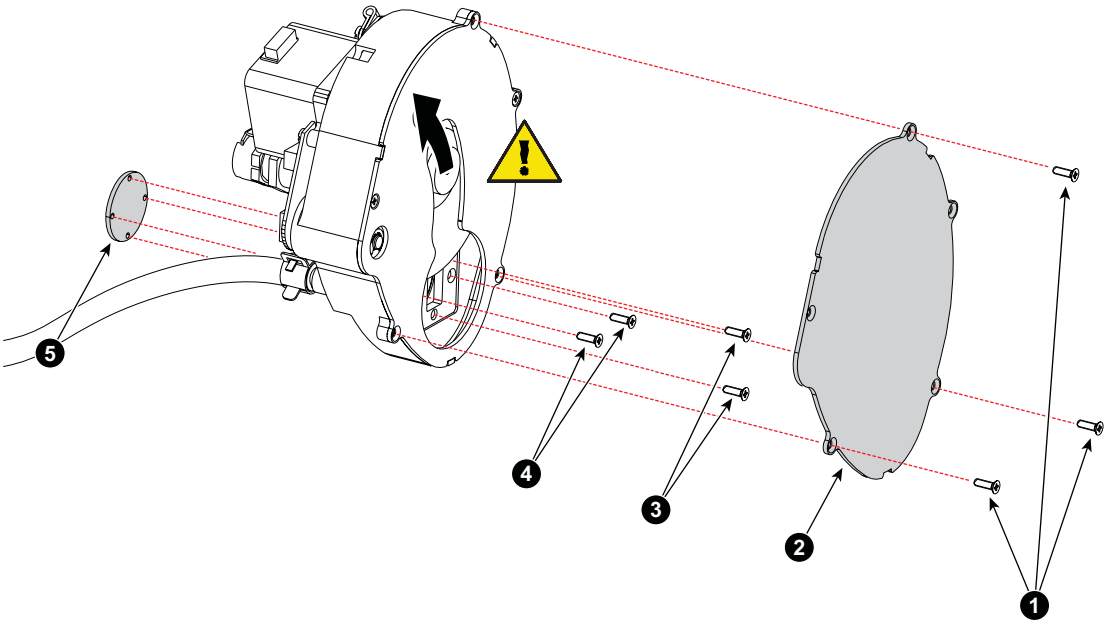


Image 8-9

6. Reinsert the three counter sunk screws (reference 1 image 8-10) as illustrated. Use a Torx screwdriver T10.

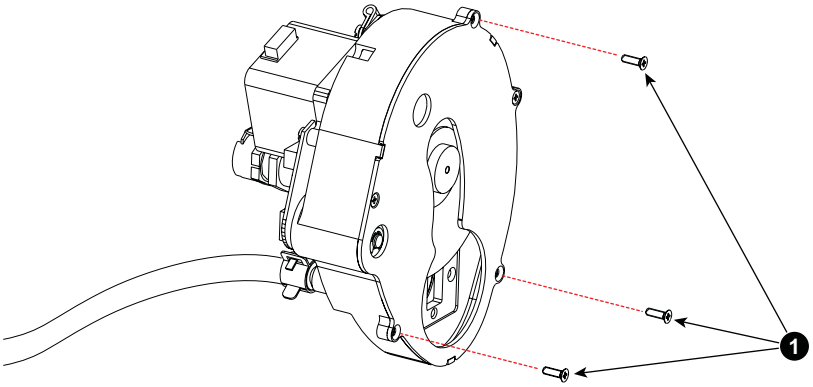


Image 8-10

CAUTION: Do not touch the optical part of the color wheel.

8.6 Installation of the 3D color wheel assembly on a DP2K- or DP4K-series projector

Necessary tools

Torx T10 screw driver

How to install

1. Make sure that the color wheel is retracted (non acting position) so you can freely look through the light path opening.

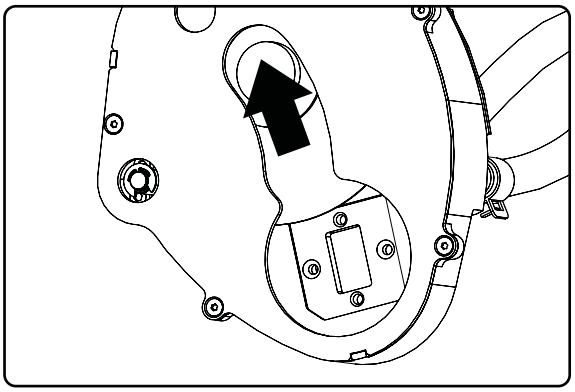


Image 8-11
Check color wheel

2. Carefully bring the 3D color wheel towards the light pipe. It is very important to **look straight into the light pipe** (reference 4) via the light path opening (reference 3) of the 3D color wheel when doing this.
   Caution: *Any contact with the integration rod may cause damage.*

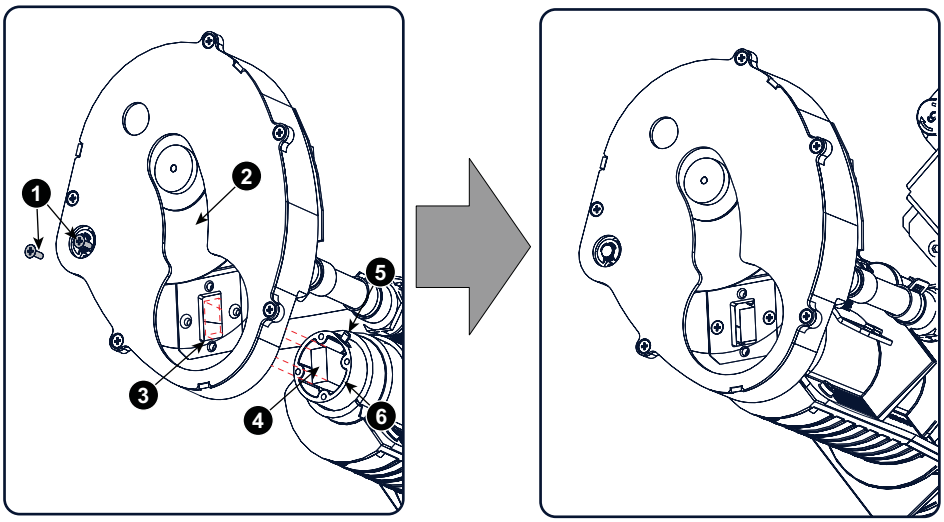


Image 8-12
Mount 3D color wheel

3. Secure the 3D color wheel with two Torx **countersunk** head screws (reference 1 image 8-12) in combination with thread fastener, Permabond type A130. Use a Torx screw driver.
   Caution: *Before fixing the 3D color wheel module with the countersunk screws provided, it is critical that the module is seated-up fully against the light pipe reference surface. See reference 6 on image 8-12. This will ensure the module is correctly positioned while allowing secure fixing. Failure to do this could result in wheel breakage.*

4. Install the mask (reference 2) into its socket as illustrated.
   - For a DP2K-xxC series projector, use the mask plate with engraved number R858504..
   - For a DP2K-xxB series projector, use the mask plate with engraved number R858505.
   - For a DP4K-xxB series projector, use the mask plate with engraved number R8760120.

   Fasten with two Torx **countersunk** head screws (reference 3). Use a Torx screw driver.
   Caution: *Do not use any screws other than the 4 countersunk screws provided to avoid wheel breakage.*

   Caution: *Do not touch the color wheel while inserting the mask.*

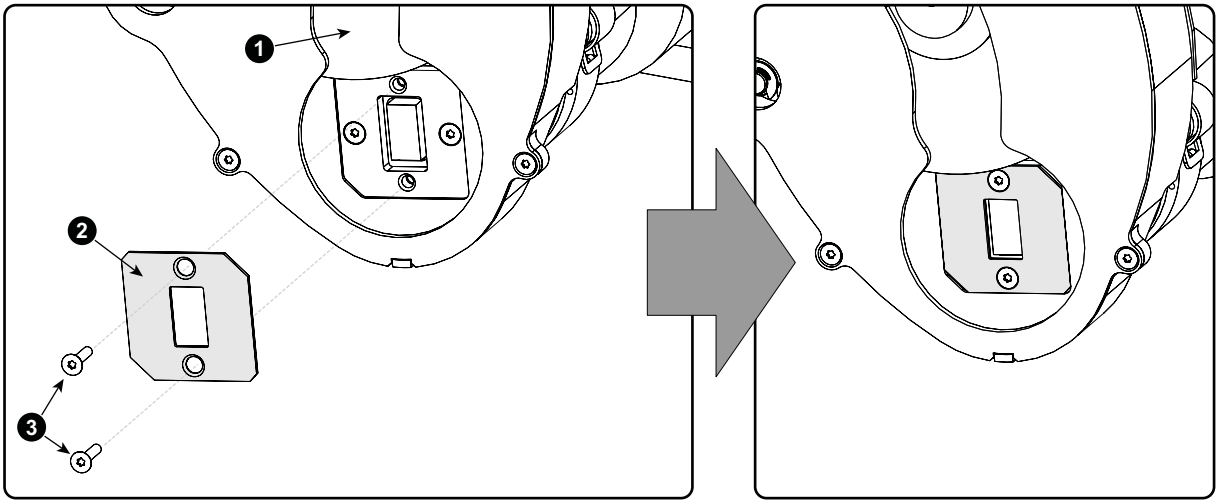


Image 8-13
Mask plate

5. Fasten the temperature sensor (reference 2) with a hexagon socket head screw (reference 1) onto the 3D color wheel assembly as illustrated. Use a 2.5 mm Allen wrench.

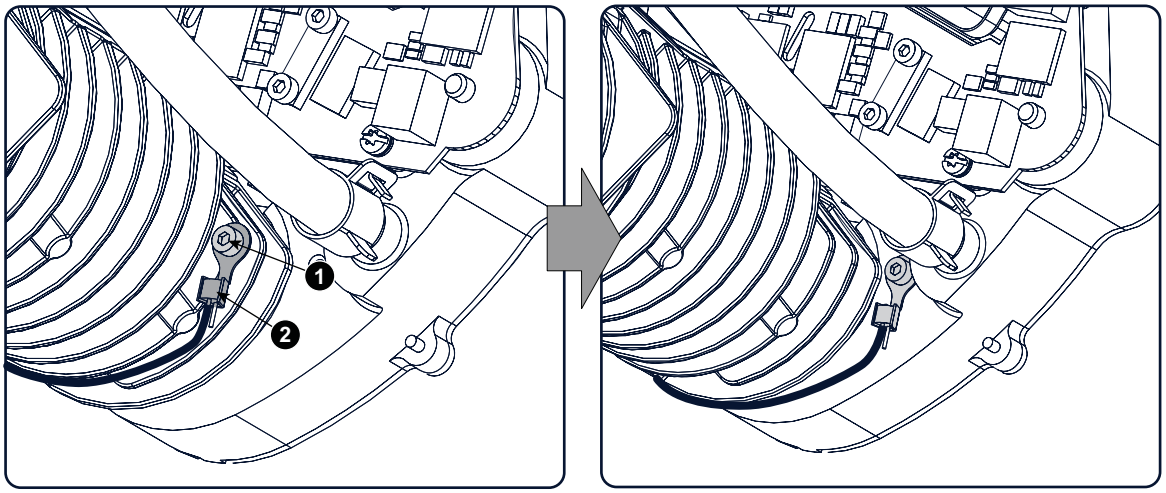


Image 8-14
Temperature sensor

6. Couple the cooling circuit[3] of the Light Processor together with the cooling circuit (short tube) of the 3D color wheel assembly.

3. No liquid cooling circuit available in a DP2K-12C projector

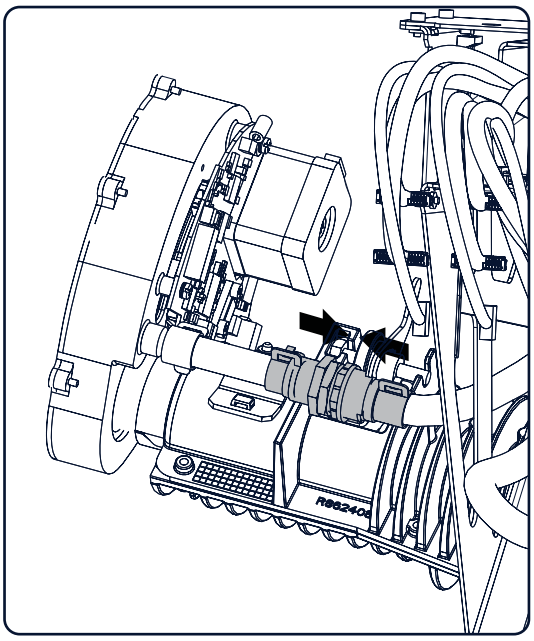


Image 8-15
Cooling connection

7. Connect the data/power wire (reference 1) with the control board of the 3D color wheel assembly. Secure the data/power wire unit (1) and the temperature sensor wire unit (reference 3) with cable ties (reference 2) as illustrated. Guide the other side of the data/power wire from the cooling tube to the cable tree.
   Caution: *Make sure the temperature sensor is properly fixed and makes good contact with the module.*

   Caution: *Make sure when strapping the data/power wire unit to the cooling tube, there is no stress on the cable.*

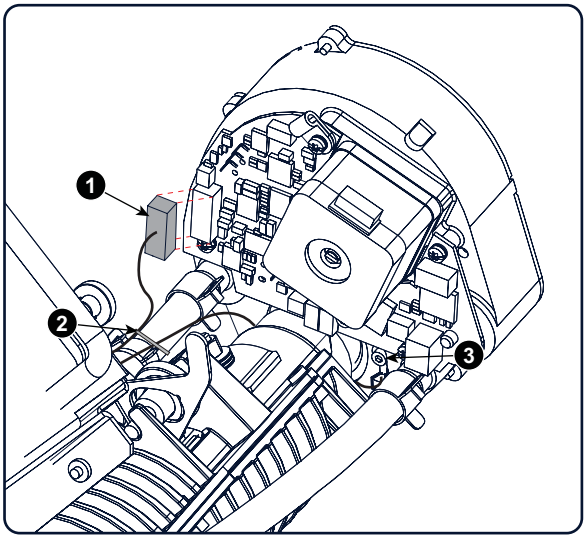


Image 8-16
Data/power cable connection

8. Guide the other end of the data/power wire unit (reference 3) next to the wire tree.

After installation of the 3D color wheel assembly proceed with installing the Light Processor unit. Then fill up the cooling circuit.

After installation, the 3D color wheel assembly still needs to be calibrated. Use the 3D calibration kit (Order No. R9856230) which includes the software and manual with instructions on how to calibrate your 3D color wheel.

8.7 Finalizing the installation

Execute the following steps :

1. Install the light processor assembly in the projector.
2. Top up the cooling liquid reservoir.
3. Close all covers again.
4. Clear the security warning due to opening the sealed compartment.

9. LIGHT PROCESSOR ASSEMBLY

About this chapter

This chapter describes how to replace the complete light processor assembly. Furthermore, this chapter includes the replacement procedure of some sub assemblies. The information about the convergence adjustment and the integration rod is grouped in separate chapters.

Overview

- Introduction
- Light Processor diagnostic
- Remove light processor top cover
- Electrical disconnection
- Light processor assembly removal
- Preparing the new light processor assembly
- Installation of the light processor assembly
- Electrical connections
- Mount light processor cover
- Finalize the installation of the light processor assembly
- Replacement of the dowser (shutter)
- Replacement of the Light Sensor Module
- Adjusting the Fold Mirror
- Adjusting the notch filter
- Cleaning the Prism exit side
- Replacement of the Peltier element from the DMD
- Replacement of a Peltier element from the heat pipe cooling block

Preparations

First execute the following steps to access the light processor assembly:

- Remove the side cover, see "Removal of the side cover", page 95.
- Remove the top cover, see "Removal of the top cover", page 97.
- Open the sealed compartment, see "Open the sealed compartment", page 99.

9.1 Introduction

Light Processor assembly

The light processor assembly has three major sub assemblies, namely: the Light Processor Unit (reference 1) with dowser (reference 2) and the Light Pipe assembly (reference 3).

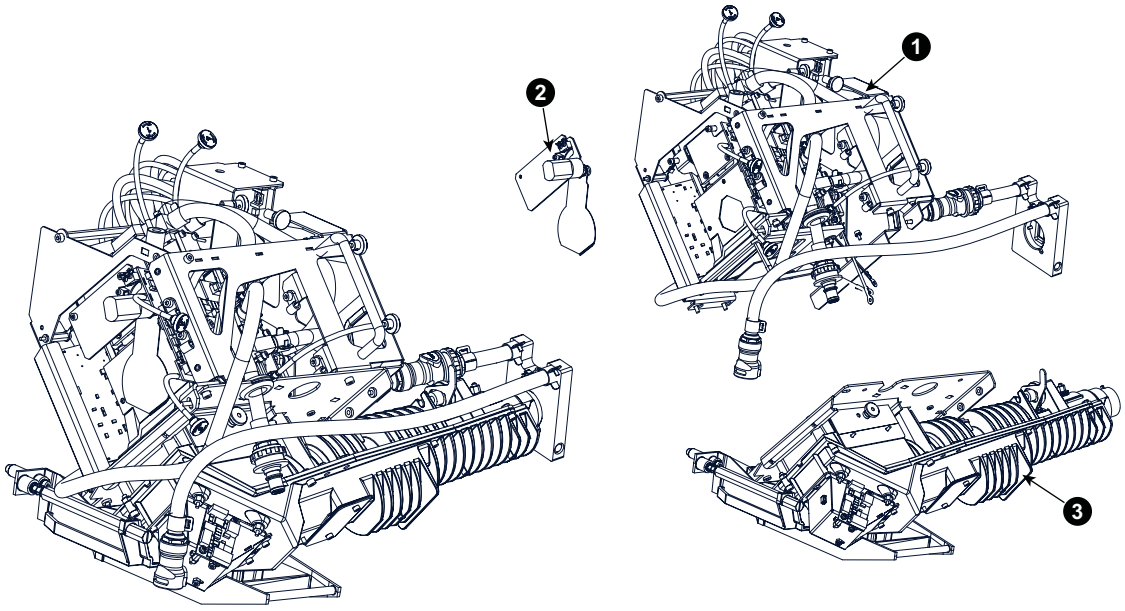


Image 9-1
Light processor assembly

Light Pipe

The Light Pipe transforms the light emitted by the lamp into a homogeneous light beam and focuses this beam precisely on the active surface of the DMD's. The Light Pipe contains the Integration Rod at the Light Pipe entrance, the Light Pipe focus and rotation knobs which matches the size of the light beam with the size of the DMD's, the Folding Mirror which folding up the light path of the projector to make the projector more compact, and the Light Sensor Module which ensures a Constant Light Output (CLO) of the projector. Furthermore, the Light Pipe has a Notch filter on the exit which applies some small color corrections on the light coming out of the Light Pipe.

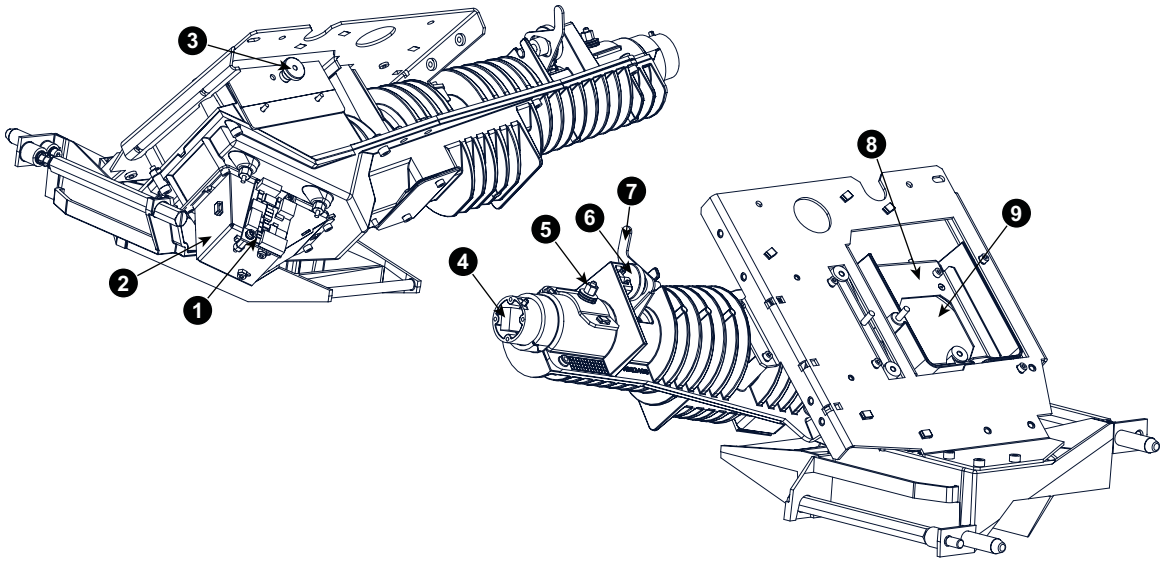


Image 9-2
Light pipe assembly

1 Light sensor unit
2 Fold mirror cover
3 Notch filter adjustment
4 Rod entrance
5 Rod lock nut
6 Rod focus knob
7 Rod focus lever
8 Notch filter
9 Fold mirror

Light Processor

The Light Processor is the heart of the projector. The prism of the Light Processor splits up the homogeneous white light coming from the Light Pipe into red, green and blue light. The video information on the three DMD's is integrated with these red green and blue light beams. The prism merges the three integrated light beams back in to one full color video image, which is projected via the lens onto the screen.

Each DMD has its own formatting board which drives the micro mirrors to integrate the video signal into the light beam. A lot of heat is produced during the integration of the video information. To protect the DMD's for overheating the Light Processor is equipped with a liquid cooling circuit. Each channel has its own cooling block. To improve the heat extraction a Peltier element is mounted between the rear side of the DMD and its cooling block. Heat pipes are used to drain the heat from the front of the DMD's to a common cooling block. To improve the heat extraction from the front of the DMD's three extra Peltier elements are mounted between these heat pipes and common cooling block. Note that the cooling circuit of the Light Processor includes a cooling block for the Light Pipe entrance.

The Light Processor is equipped with 12 temperature sensors. Each channel has one temperature sensor at the front of the DMD, one at the rear of the DMD and one on its cooling block. The common cooling block (front cooling via heat pipes) has also one temperature sensor and the cooling block for the Light Pipe entrance has also one temperature sensor. One temperature sensor is used the measure the ambient temperature of the compartment of the Light Processor assembly. These temperature sensors helps to drive the six Peltier elements and to protect the Light Processor for overheating.

The red and green channel are equipped with three extended adjustment knobs to convergence the DMD with the DMD of the blue channel which is the reference channel for convergence alignment.

The air gab between the prism and DMD is sealed to protect the DMD's for dust. It is important to know that a misaligned light path which reflects upon the sealing will damage the sealing very rapidly. At the bottom of the prism exit a "touch" sensor is mounted to protect the prism against accidental lens movements. Note that the Light Processor Unit is equipped with a motorized shutter (dowser) in front of the prism exit.

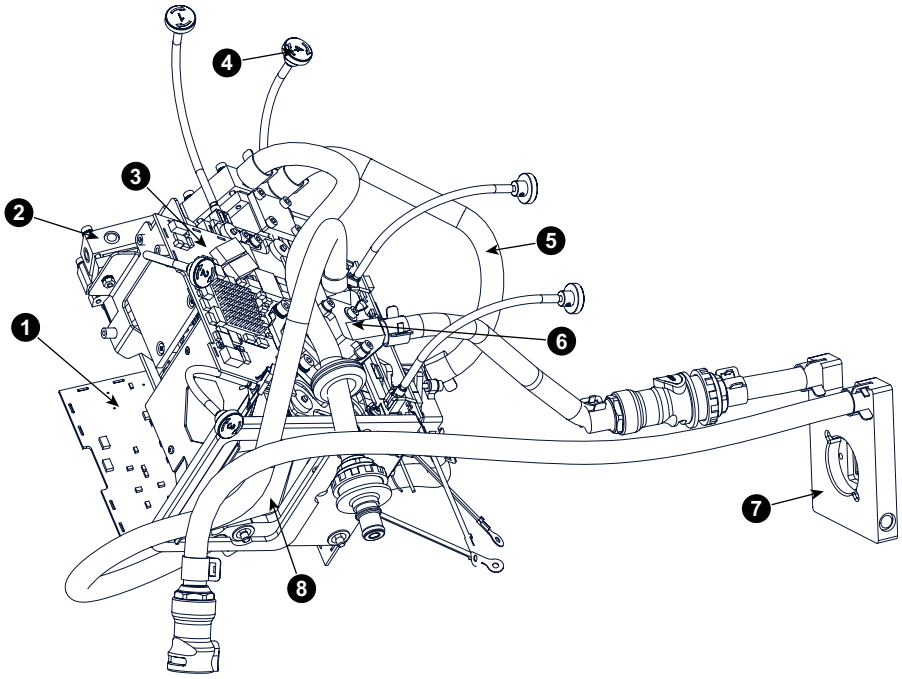


Image 9-3
Light processor

1 Formatting board blue channel
2 Common cooling block DMD front cooling
3 Formatting board green channel
4 Convergence adjustment knob
5 Cooling circuit
6 Cooling block DMD
7 Cooling block for light pipe entrance
8 Prism exit

9.2 Light Processor diagnostic

Troubleshooting of the Light Processor assembly

There are several reasons why a removal or a replacement of the Light Processor is required. Nevertheless, try to avoid unnecessary removal of the Light Processor. The list below gives an overview of the most common problems which require removal or replacement of the Light Processor. Check this list to ensure the problem is caused by the Light Processor.

- Artifacts in the projected image. These artifacts are also visible on the internal service patterns of the FIB or Formatter boards.
- A crack in the prism, which can result in convergence problems and may disables you to focus the projected image.
- Defect Peltier element, which causes a too high DMD temperature.
- Damaged integration rod, which causes permanent spots in the projected image.
- Blocked dowser (shutter). Dowser does not respond when pressing the “DOWSER” button.
- Leakage in liquid cooling circuit.

Check the projector log files for errors or warnings and look for a solution in the chapter "Troubleshooting", page 27

9.3 Remove light processor top cover

Necessary tools

No tools.

How to remove

1. Slide the cover forward so that the side hooks are unlocked (1).

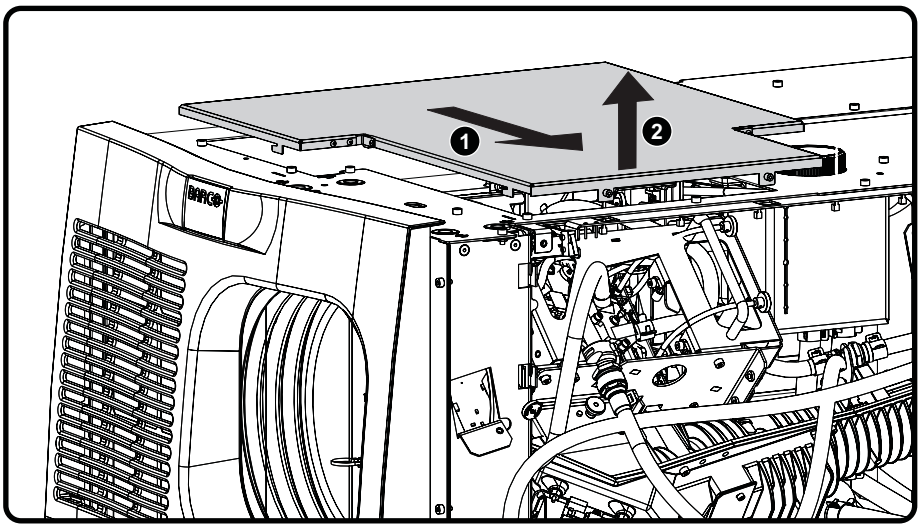


Image 9-4
Light processor top cover

2. Take off the cover (2)

9.4 Electrical disconnection

Where to find the connections

When looking from the top side, the connections are situated left and right of the big fan.

The left side are the formatter connections.

The right side are temperature controls, such as Peltier elements, sensors and motor controls for the shutter.

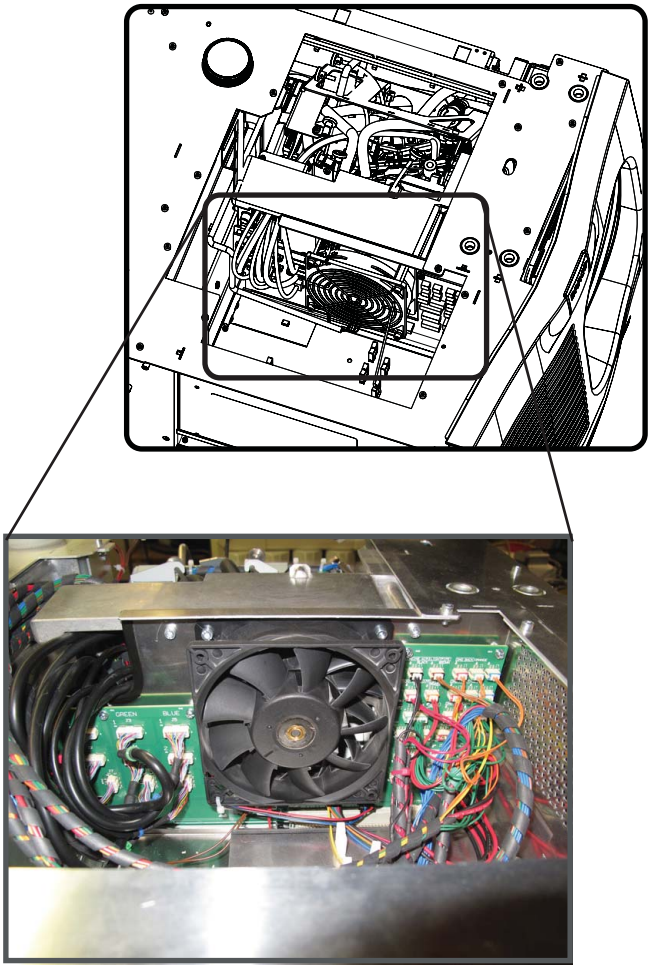


Image 9-5
Light processor cables, connector locations

Where to disconnect

1. Unplug all cables at the right and the left side of the fan.
   Caution: *The connectors of the formatter cables are with lock mechanism. Push on that the unlock mechanism to pull out the cables.*

   Note: *Do not unplug the connectors just below the fan.*

9.5 Light processor assembly removal

Necessary tools

- Flat screw driver 6 x 150
- Allen wrench 4 mm

How to remove

1. Remove the lens (see user guide of the projector).
2. Release the two captive screws at the base of the light processor (1 and 2). Use a 6 mm flat screw driver or a 10 mm nut driver.

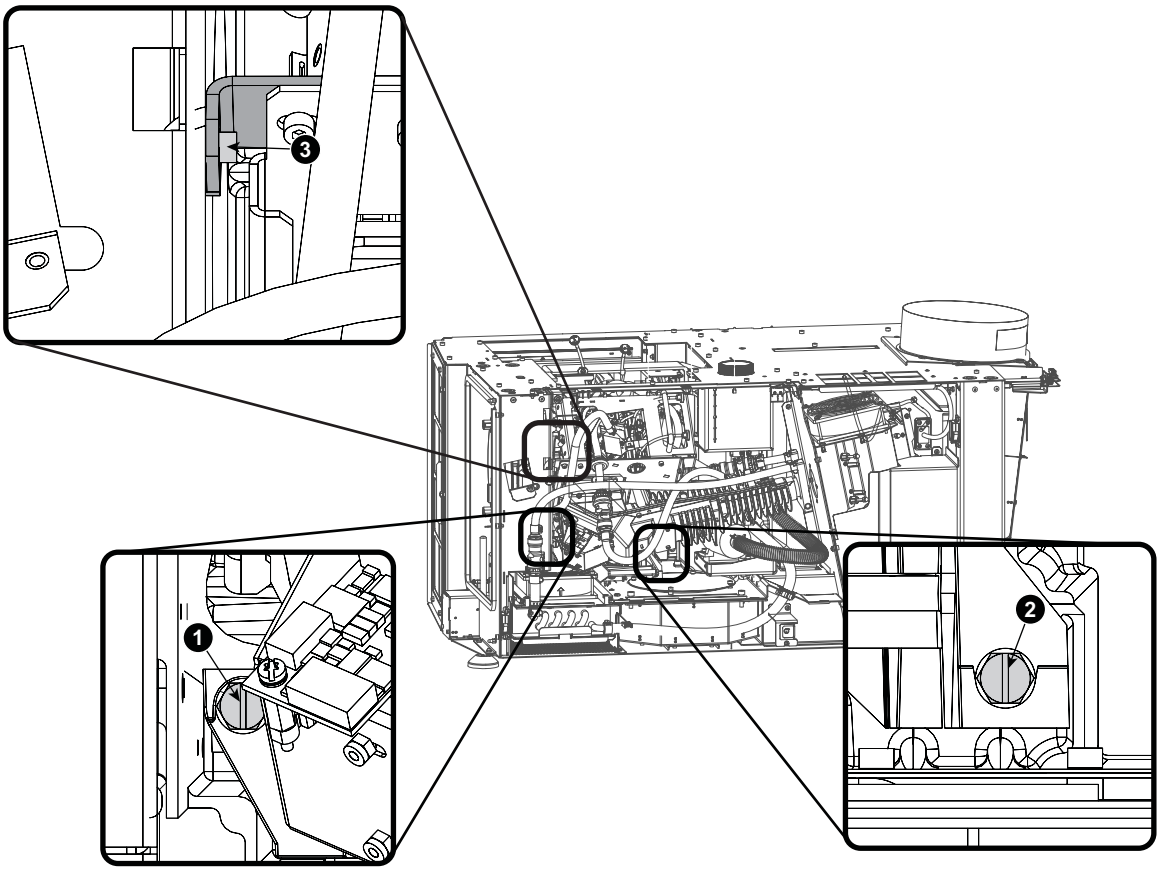


Image 9-6
Light processor fixation

3. Turn out the hexagon head screw at the left side of the light processor (3).
4. Interrupt the liquid cooling circuit by uncoupling both valved fitting[4]. Once valved fitting is located in the tube coming from the pump and leading to the light processor. The second valved fitting is located in the tube coming from the light pipe entrance and leading to the heat exchanger.
   To interrupt a valved fitting, press on the knob (1) and pull out the connector (2).

4. not for DP2K-12C

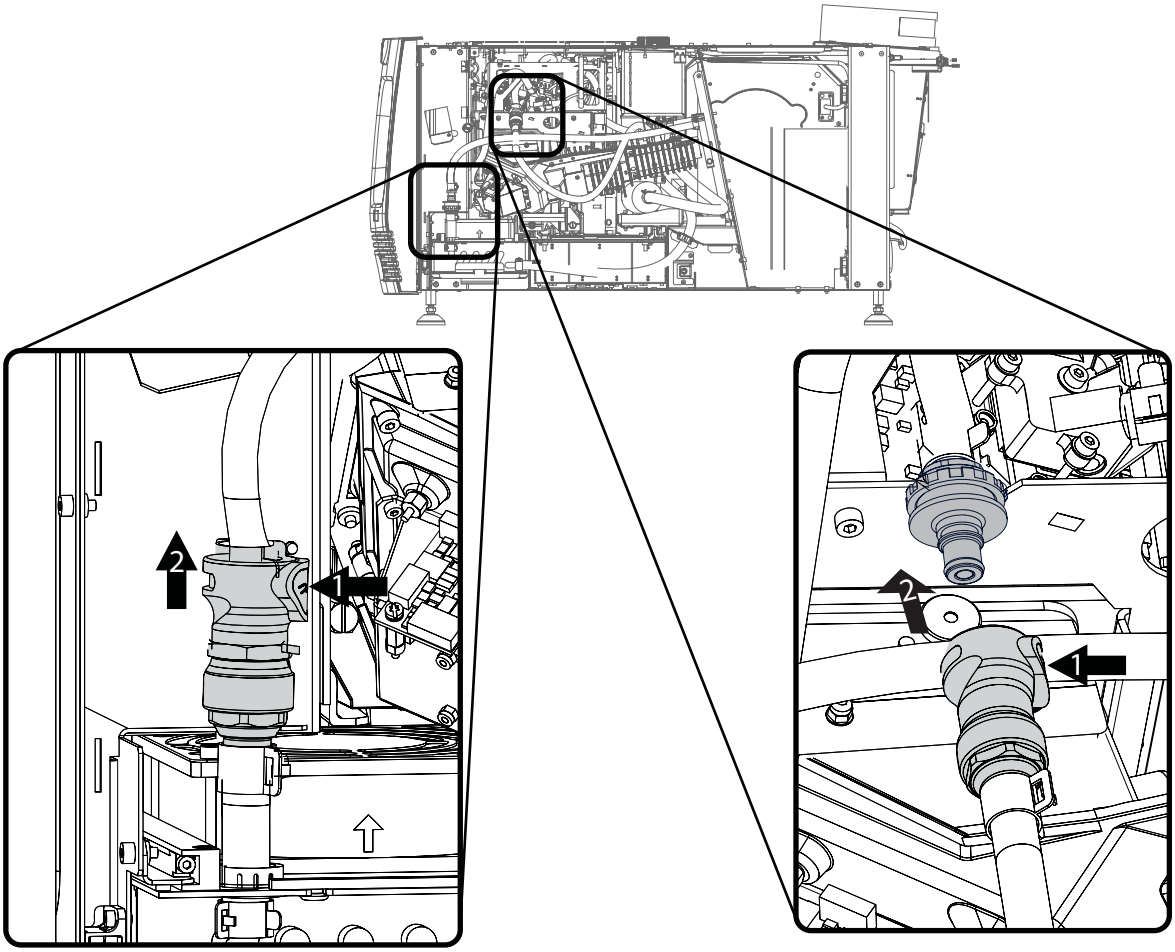


Image 9-7
Open cooling circuit

5. Take the light processor unit by its handles and gently pull out the light processor assembly of its compartment.

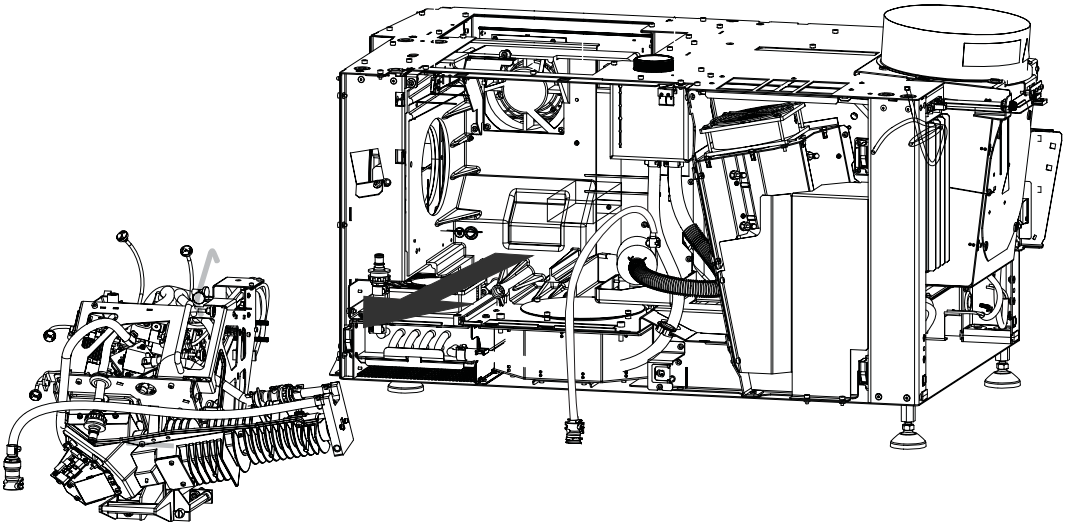


Image 9-8
Remove light processor assembly

6. Place the light processor assembly on a stable table.

9.6 Preparing the new light processor assembly

How to remove from the flight case

1. Open all flight case locks and open the flight case.
2. Release the two captive screws at the base of the light processor (1 and 2). Use a 6 mm flat screw driver or a 10 mm nut driver.

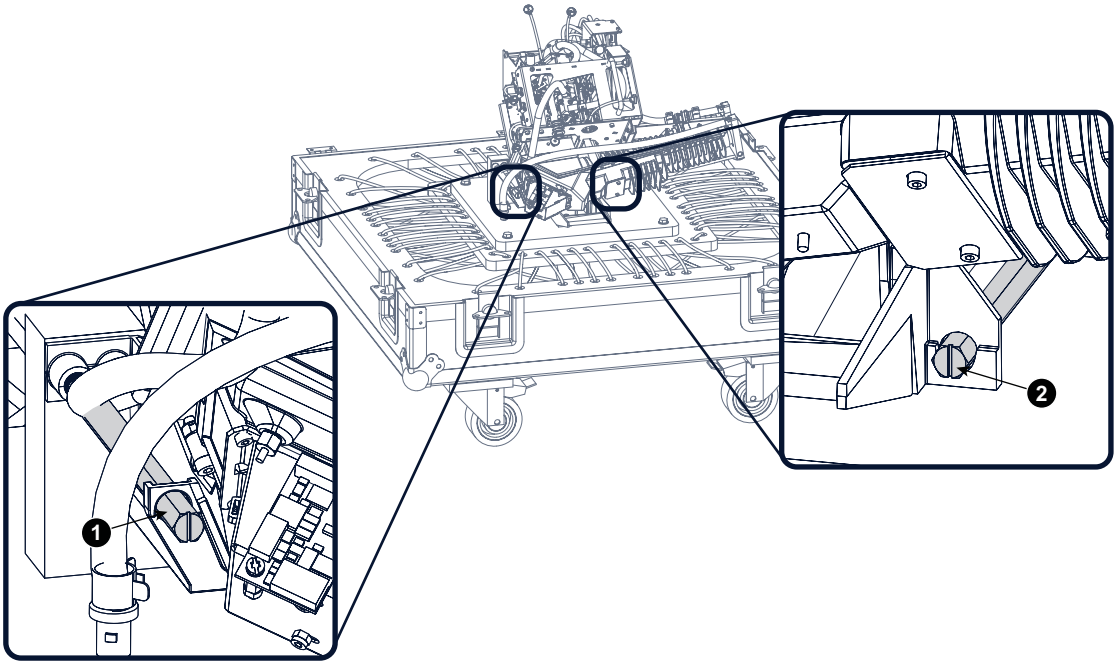


Image 9-9
Loosen light processor assembly fixations

3. To take out the light processor assembly, take it by both handles (1 & 2), slide it forward until the positioning pin are free and lift it up to remove from the flight case.

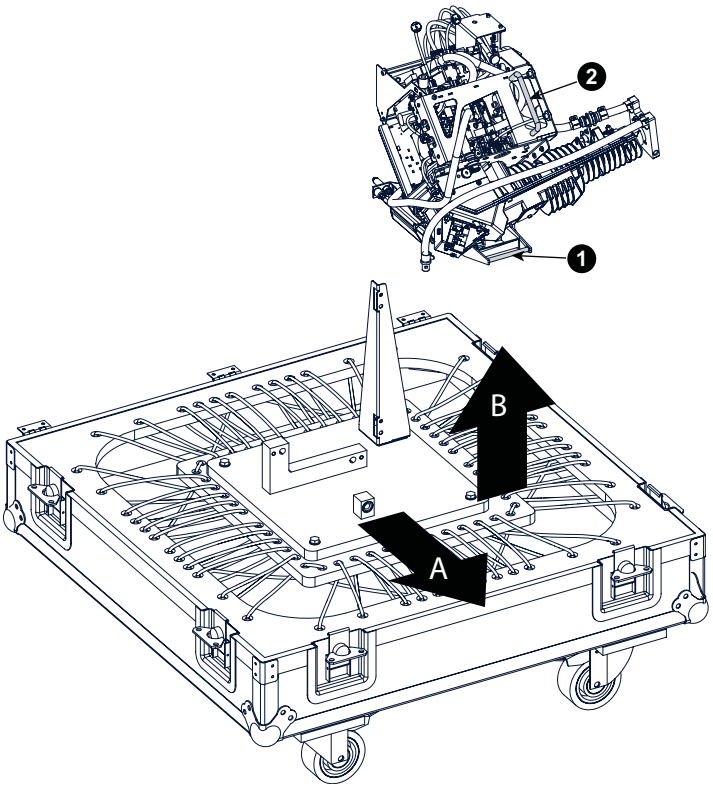


Image 9-10
Remove light processor assembly

The flight case must be reused to send back the removed light processor assembly.

9.7 Installation of the light processor assembly

After installing a new Light Processor, the LUT-SCC file of the new Light Processor has to be installed and activated. See chapter "Spatial Color Calibration (LUT-SCC)", page 191.

Necessary tools

- Flat screw driver 6 x 150
- Allen wrench 4 mm

How to install

1. Make sure there is no lens mounted.
2. Check if the corner bracket is mounted on the new assembly. If not yet mounted, remove the corner bracket of the removed assembly and mount it on the new one.

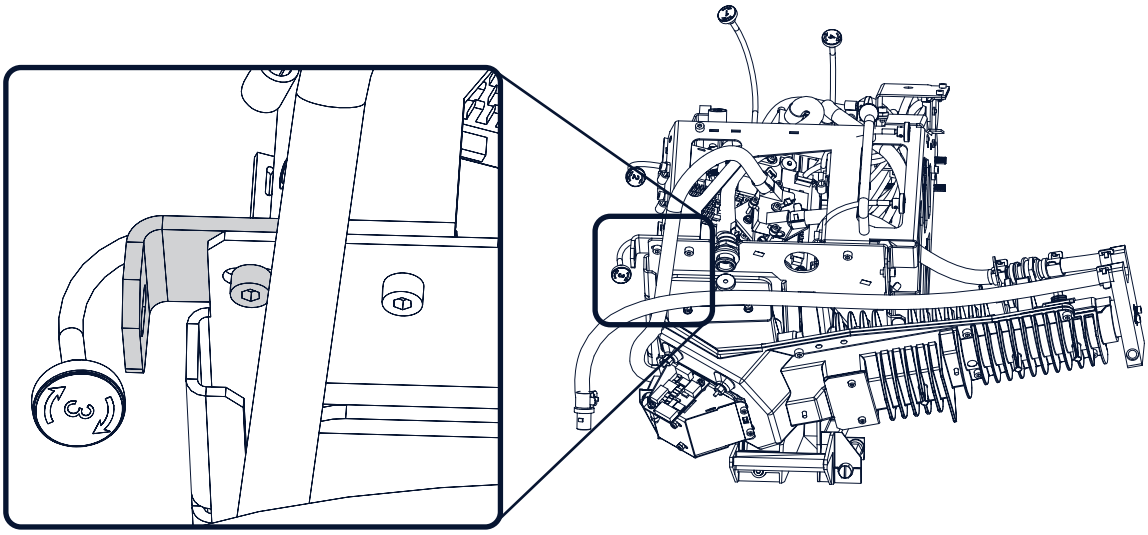


Image 9-11
corner bracket light processor assembly

3. Take the light processor assembly by its handles and gently slide in the assembly into the compartment of the projector. Make sure that the positioning pins (P) at the backside of the assemble match the positioning holes (H) in the projector.
   Note: *While inserting the assembly, guide the cables to the back plane side. Guide LVDS and power cables through the hole (1) in the back plate and all other cables (2) around the back plate.*

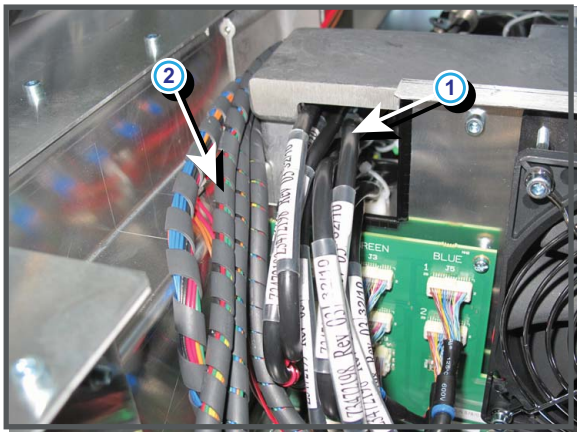


Image 9-12
Cable routing

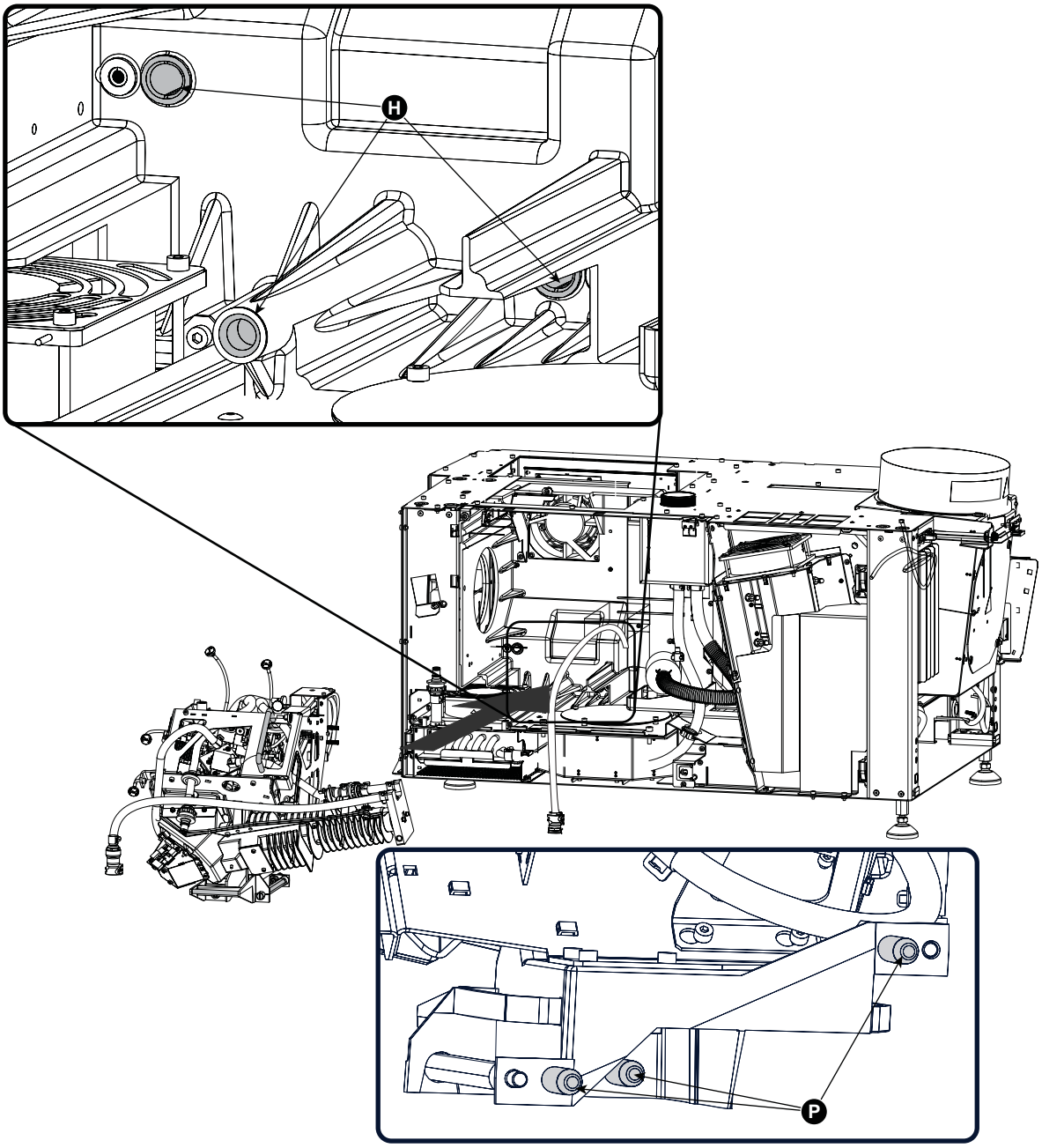


Image 9-13
Light processor installation

4. Secure the light processor assembly by fastening both captive screws (1 & 2).

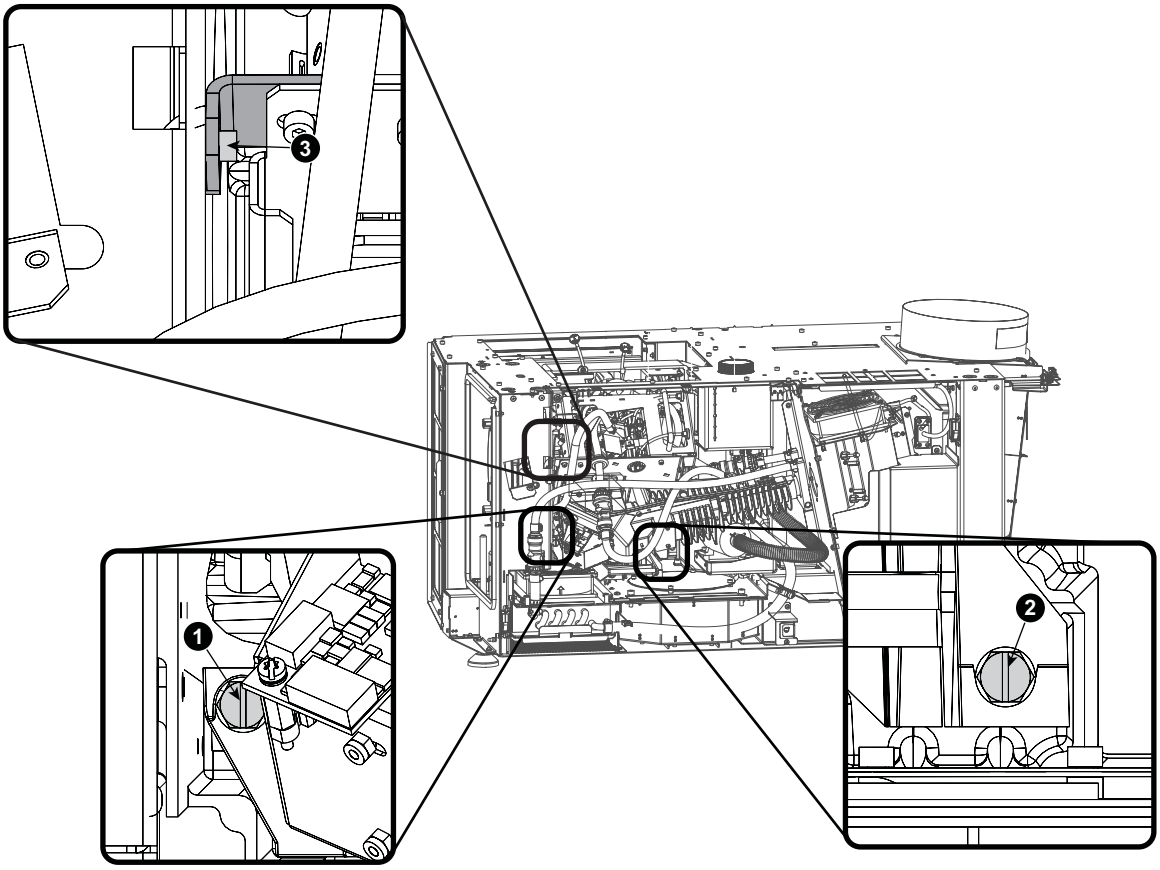


Image 9-14
Light processor fixation

5. Fixate the corner bracket to the projector frame with an hexagon head screw (3).
6. Close the cooling circuit.
   Plug in the connector with the tube coming from the pump into the connector going to the light processor.
   Plug in the connector, mounted on the tube coming from the light pipe cooling block into the connector, mounted on the tube going to the heat exchanger.

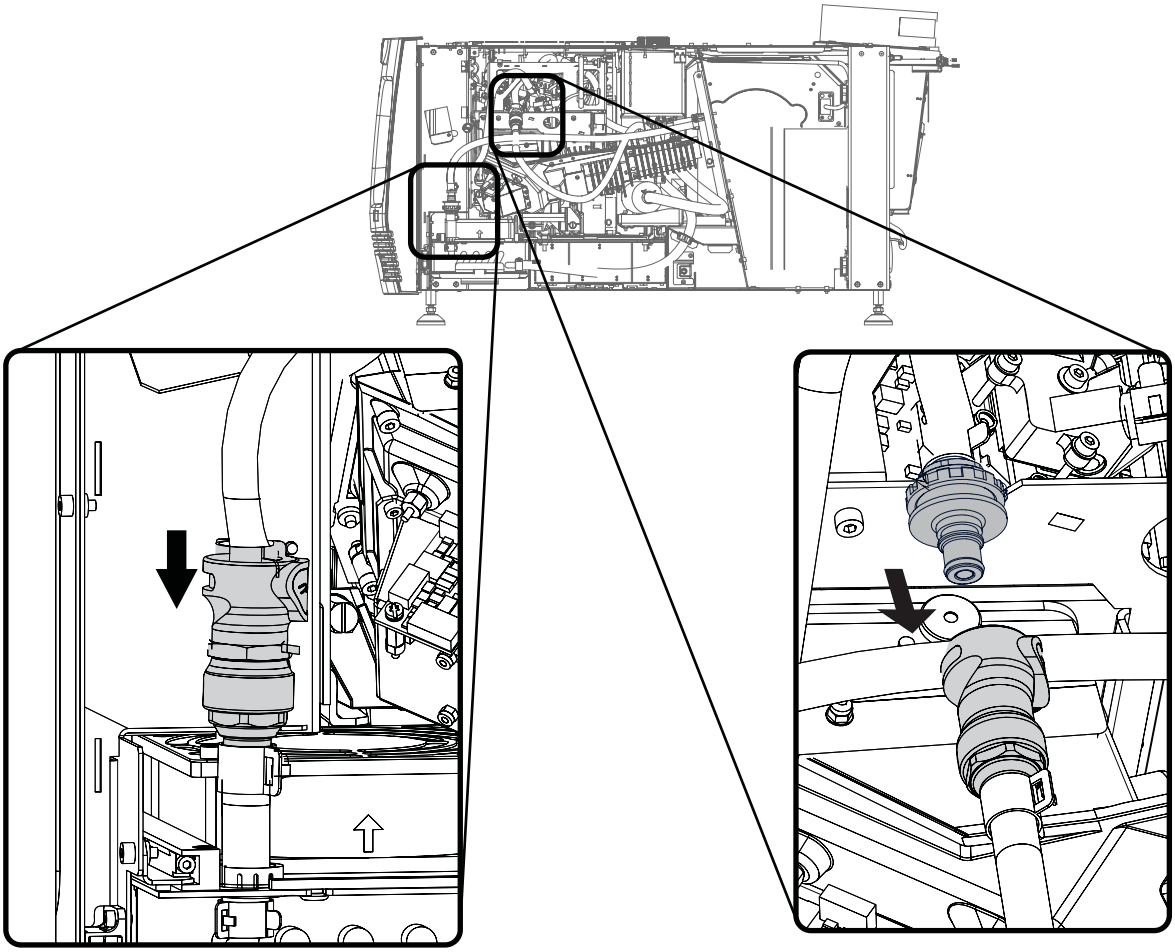


Image 9-15
Close cooking

9.8 Electrical connections

Preparations

Guide all cables to the connector side of the backplane.

Formatter connections

All formatter cables, data and power, have a colored cable tie. There are 2 cables per color available, both with a different connector. The color name is screen on the printed circuit board. Plug in the cable with e.g. a red cable tie into the connector with the same size and with the indication red. Repeat for all other cables.

Other connections (right side)

Color convention for the connections.

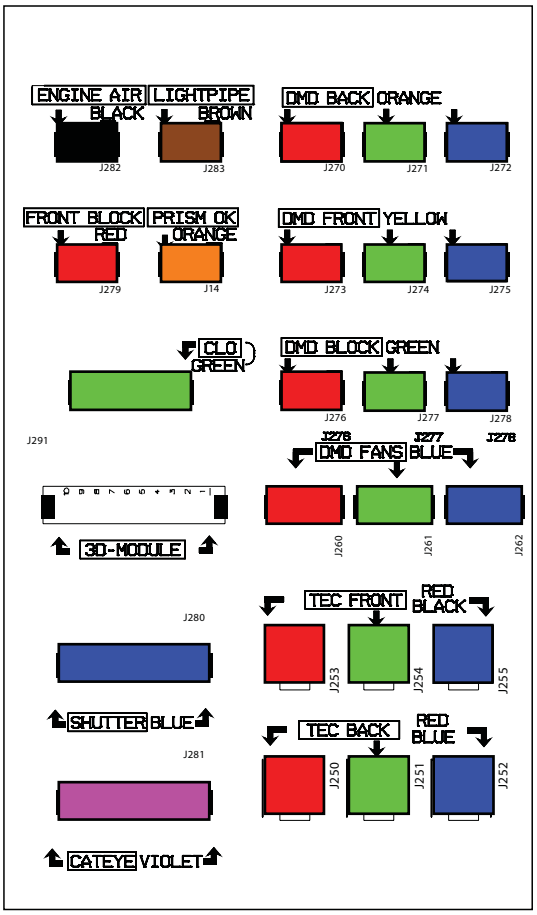


Image 9-16
Color coding cables

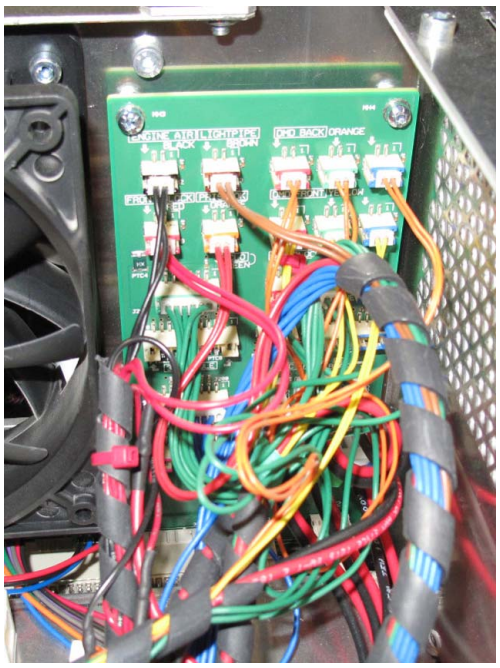


Image 9-17
Color coding cables, image

The color indication on the socket corresponds with the colored cable tie on the cable next to the connector.

The screened color indication just above the sockets corresponds with the color of the wires in the cable tree.

9.9 Mount light processor cover

How to mount

1. Place the cover on top of the projector (1) so that the hooks (H) on both sides match with the holes (F).

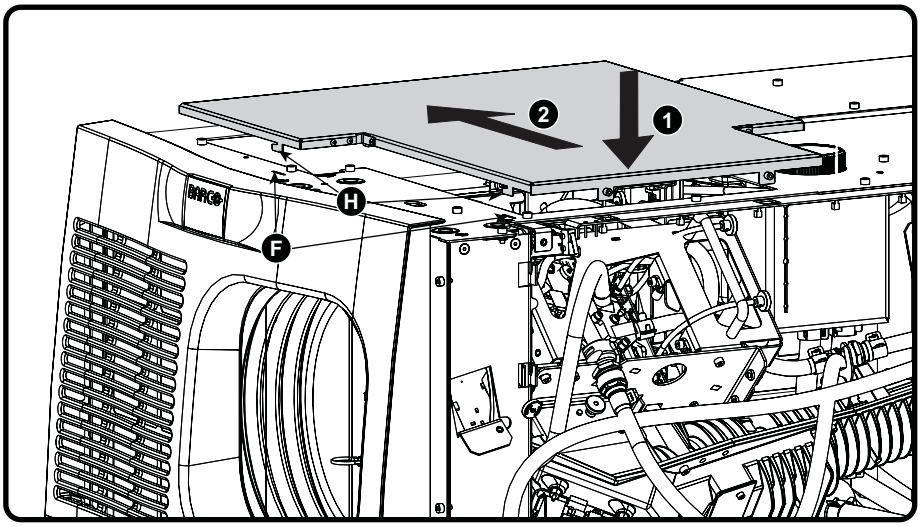


Image 9-18

2. Slide the cover backwards until the hooks slide under the top frame (2).

9.10 Finalize the installation of the light processor assembly

Execute the following steps :

1. Close the sealed compartment, "Close the sealed compartment", page 100.
2. Install the top cover, "Installation of the top cover", page 101.
3. Install the side cover, "Installation of the side cover", page 103.
4. Clear the security warning due to opening the sealed compartment.

9.11 Replacement of the dowser (shutter)

Dowser assembly

The dowser or shutter (“dowser” is more common in the cinema market and “shutter” in the events market) of the projector is mounted upon the Light Processor just above the light output path of the prism. The dowser assembly has an “open” and a “close” state. In the “close” state the dowser blade shuts off the light beam between the Light Processor (DMD’s) and lens. In the “open” state, the dowser is retracted from the light beam. Note that the local keypad has a dedicated button “DOWSER” to operate the dowser.

The Light Processor has to be removed from the projector before replacing the dowser. This procedure assumes that the Light Processor is already removed from the projector.

Necessary tools

2,5 mm Allen wrench.

How to replace the dowser of the Light Processor

1. Disconnect the wire unit of the dowser.

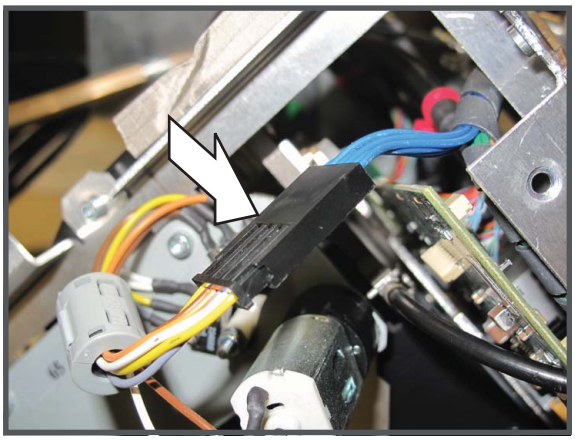


Image 9-19
Dowser connection

2. Remove the dowser assembly from the Light Processor be releasing both hexagon socket head cap screws (reference 1) as illustrated. Use a 2,5 mm Allen wrench.

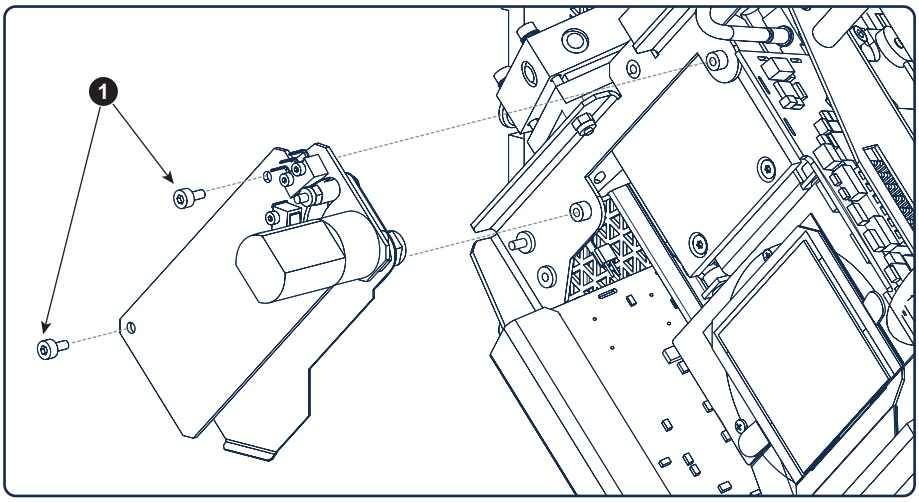


Image 9-20
Remove fixation screws

3. Place a new dowser assembly in position and fasten with two hexagon socket head cap screws (reference 1). Use a 2,5 mm Allen wrench.

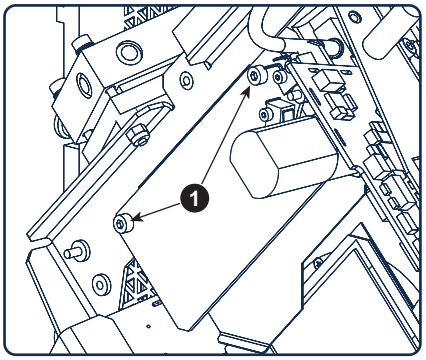


Image 9-21
Mount new dowser

4. Reconnect the wire unit of the dowser image 9-19.

9.12 Replacement of the Light Sensor Module

Purpose of the Light Sensor in the Light Pipe

To obtain a Constant Light Output (CLO) from the projector a light sensor is mounted just behind the fold mirror. On a regular base the controller of the projector read the measured values of this light sensor and, if required, sends corrective information to the Lamp Power Supply (LPS).

The left cover has to be removed from the projector to replace the Light Sensor Module. This procedure assumes that the left cover is already removed from the projector.

Necessary tools

- TX10 Torx screw driver.
- Light meter.

How to replace the Light Sensor Module of the Light Processor

1. Disconnect the wire unit from the Light Sensor Module.

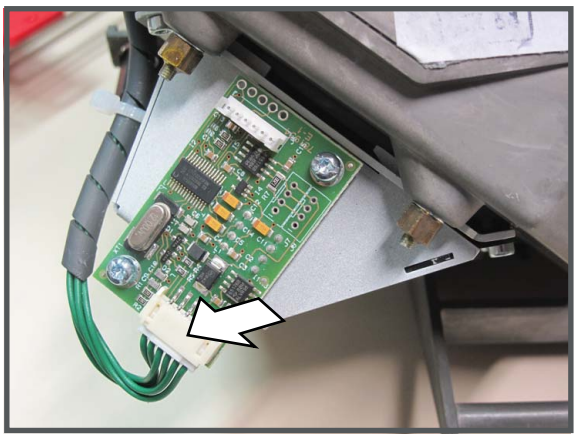


Image 9-22
Light sensor connection

2. Remove the Light Sensor Module by releasing the two Torx screws (reference 1). Use a TX10 Torx screw driver.

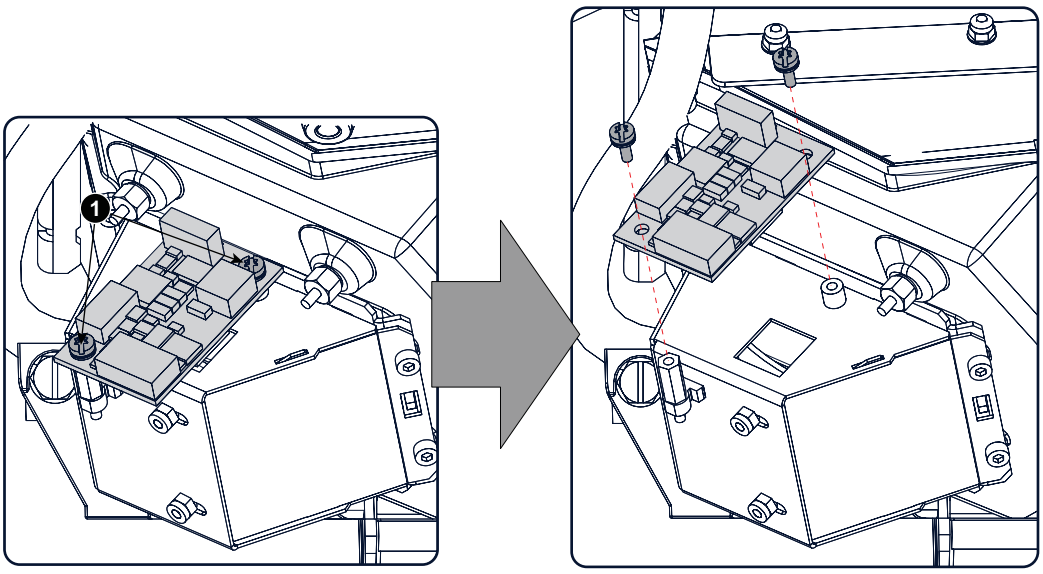


Image 9-23
Light sensor unit removal

3. Install a new Light Sensor Module. Use a TX10 Torx screw driver to fasten both screws (reference 1).
4. Reconnect the wire unit with Light Info Module (image 9-22).
5. Place a light meter in the center of the screen and calibrate the Light Sensor Module. For detailed instructions see user guide of the Communicator software.

9.13 Adjusting the Fold Mirror

Purpose of the Fold Mirror

The fold mirror is folding up the light path of the projector to make the projector more compact. The fold mirror is located at the left side of the light pipe and reflects the light, which entrance the light pipe via the integration rod, upon the prism of the light processor. The position of the light spot upon the DMD's can be adjusted with the fold mirror.

CAUTION: Normally the Fold Mirror should never be readjusted in the field. In case a readjustment is required follow the instructions in this chapter precisely. Only qualified technicians who have experience with adjusting the Fold Mirror may adjust the Fold Mirror. A misaligned Fold Mirror may cause irreversible damage to other parts of the projector!

To access all three adjustment screws of the Fold Mirror the left side cover has to be removed from the projector. Both top adjustment screws are easy accessible but to reach the bottom screw, the Fold Mirror cover plate together with the light sensor unit has be removed from the Light Pipe. This procedure assumes that the left side cover is already removed from the projector.

In most cases the Fold Mirror can be correctly aligned by turning the upper two adjustment screws of the Fold Mirror. These upper two screws can be accessed with a nut driver through the holes of the Fold Mirror cover. So, the removal of the Fold Mirror cover is unnecessary.

How to adjust the Fold Mirror

1. Disconnect the wire unit from the Light Sensor Module.
2. Remove the Fold Mirror cover and the Light Sensor Module as a whole from the Light Pipe as illustrated. Remove both indicated Torx screw (reference 1).

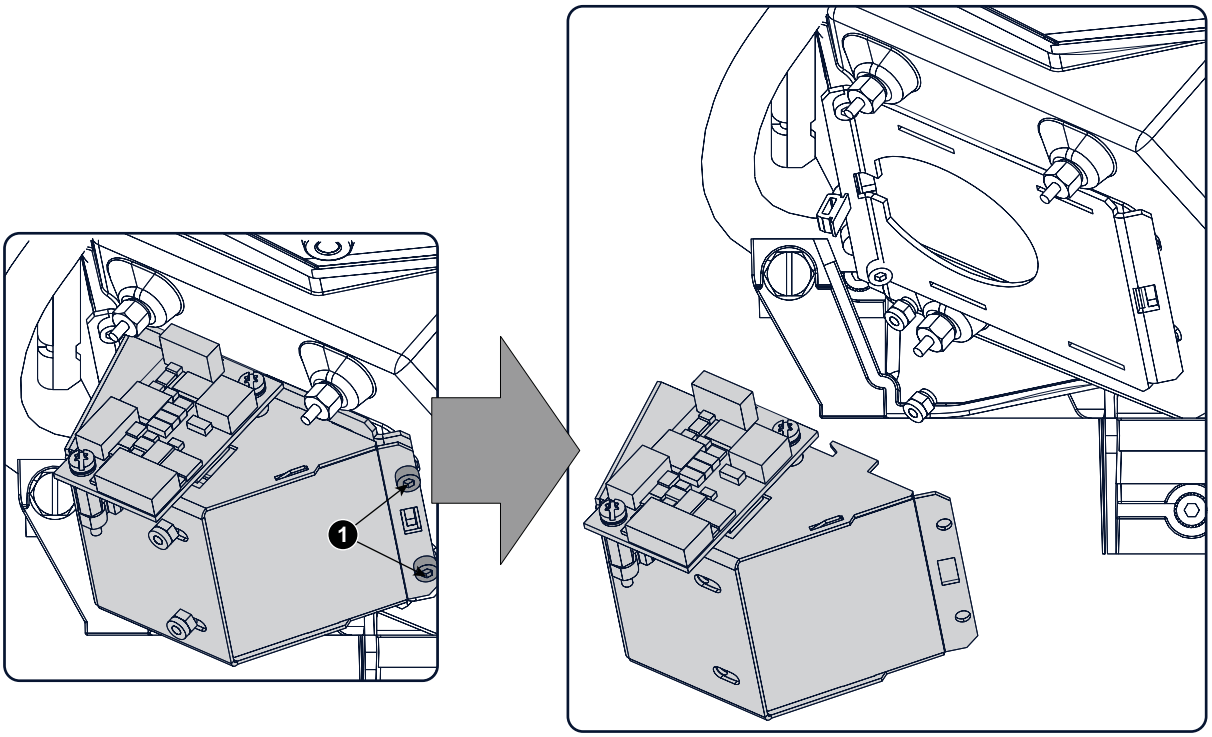


Image 9-24
Fold mirror, access adjustments

3. Start up de projector and display a white test pattern with maximum dimming.
   Caution: *Projecting a misaligned light spot for more then 10 seconds may cause irreversible damage to the Light Processor. Therefore, it is important to maximum dim the light output and adjust the light spot as quickly as possible.*
4. Turn the adjustment screws A, B or C in or out until the light spot (5) matches with the outline of the DMDs (4). Use a 5,5 mm open end wrench. The illustration below shows the movements of the light spot (5) upon the screen (6) for each adjustment screw.

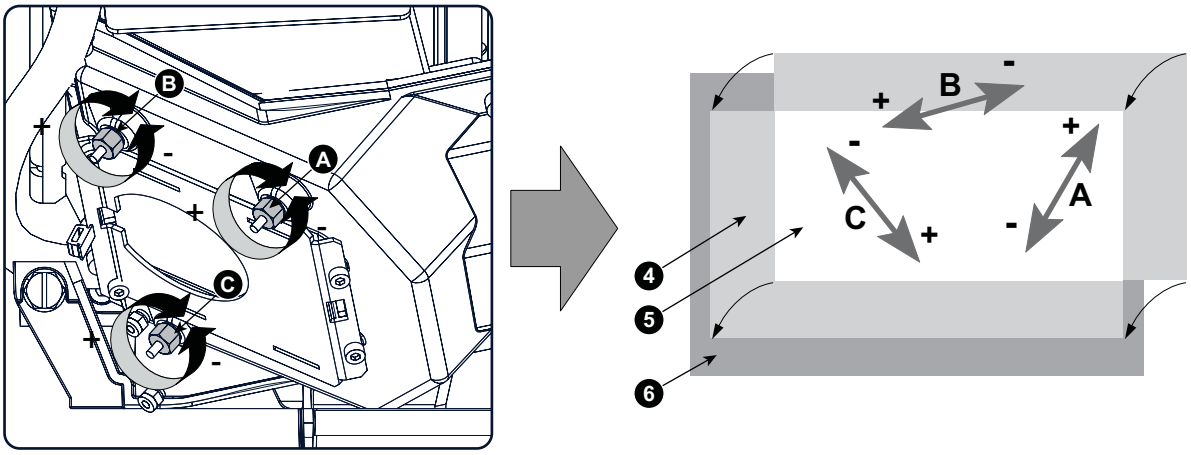


Image 9-25
Fold mirror, adjustment

5. Reinstall the cover of the Fold Mirror.
6. Reconnect the Light Sensor Module.
7. Place a light meter in the center of the screen and calibrate the Light Sensor Module. For detailed instructions see user guide of the Communicator software.

9.14 Adjusting the notch filter

Purpose of the notch filter

The notch filter is a coated glass plate located at the end of the light pipe assembly. The notch filter applies some small color corrections of the light coming out of the light pipe, which is emitted by the xenon lamp of the projector. This is done to achieve an optimal color calibration of the native colors. The notch filter can slightly turn, with respect to the light path, which allows a small adjustment of the native colors. Note that, next to the pure optical color calibration by the notch filter, there is also a software color calibration.

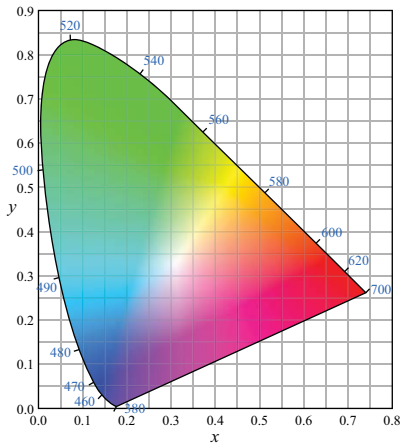


Image 9-26
Color gamut.

Target range for x, y Chroma values

- **Uncorrected GREEN:** (changes together with red)
  - x : 0.245 – 0.285
  - y : 0.67 – 0.71
- **Uncorrected RED:** (changes together with green)
  - x : 0.67 – 0.69
  - y :0.31 – 0.33
- **Uncorrected BLUE:** (no impact)
  - x : 0.12 – 0.16
  - y : 0.02 – 0.8

To access the notch filter, the left side cover has to be removed from the projector. This procedure assumes that the left side cover is already removed from the projector.

Necessary tools

No tools.

How to adjust the notch filter

1. Release the Thumb screw (reference 1) of the notch filter.

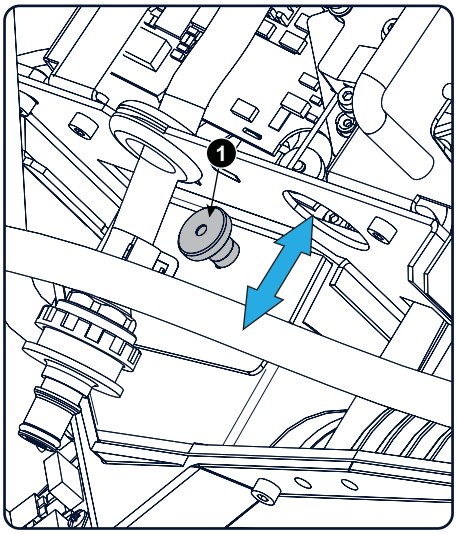


Image 9-27
Notch filter, adjustment button

2. Start up the projector and display an uncorrected red test pattern.
   Tip: *See user guide of the Communicator software for detail instructions about color calibration*
3. Measure the X and Y values of the projected red test pattern. Use for that a colorimeter. Make sure that the red test pattern is uncorrected.
4. Slightly move the adjustment button up or down until the measured X and Y values are within the required specs. (See above)
   Note: *The adjustment range of the notch filter is limited. For most projectors the mid position gives also the most optimal result.*
5. Fasten the thumb screw again (reference 1), to secure the position of the notch filter. Make sure that the position of the notch filter remains unchanged while fastening the thumb screw.

9.15 Cleaning the Prism exit side

When should one clean the Prism exit side?

Clean the Prism exit on a regular basis to maintain light output level.

This procedure requires that the lens is removed from the projector.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the Prism exit side?

1. Wipe off the dust of the Prism exit. Use for that a clean Lens cleaning cloth.
   Tip: *Limit the number of wipe movements. This to protect the optical coating. It is better to wipe off the dust with one good wipe movement than with 10 soft wipe movements.*
2. Is all dust removed from the Prism exit?
   If yes, stop this cleaning procedure.
   If no, wipe off the dust of the Prism exit with a clean lens cleaning cloth and lens cleaner.

9.16 Replacement of the Peltier element from the DMD

To replace the Peltier from the DMD the Light Processor must be removed from the projector. This procedure assumes that the Light Processor is already removed.

The illustration in this procedure are from the red channel. Nevertheless the same procedure is applicable for the green and blue channel as well.

Necessary tools

- Torque wrench with a 2,5 mm Allen socket.
- Set of pliers.
- Clean cloth.

Necessary parts

- Peltier element.
- Tube with thermal paste.
- Cable ties.

How to replace

1. Cut the connector of the Peltier element and pull the wires out of the cable tree.
   Or,
   remove the spiral around cable tree and take out the wires of the Peltier element.
2. Remove the cooling block by releasing the four hexagon socket head cap screws (reference 1) as illustrated. Note that the screws are captured with a plastic ring.

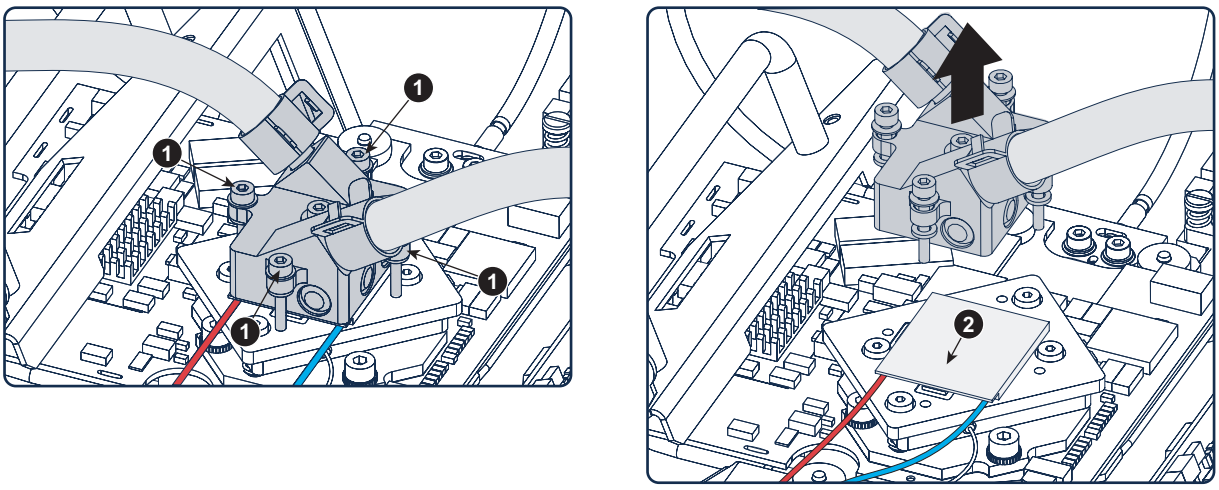


Image 9-28

3. Remove the Peltier element (reference 2 of image 9-28) and remove all old thermal paste from the Peltier socket and bottom side of the cooling block. Use a clean cloth to remove the old thermal paste.
4. Rub some thermal paste on both sides of the new Peltier element .
5. Place the new Peltier element in its socket, slide a little bit up and down to ensure a good contact and finally slide it against the upright sides of both studs (reference 3).
   Caution: *Make sure that the cold side (reference 4) of the Peltier element is facing the socket and make sure that the Peltier element is not laying on the studs.*

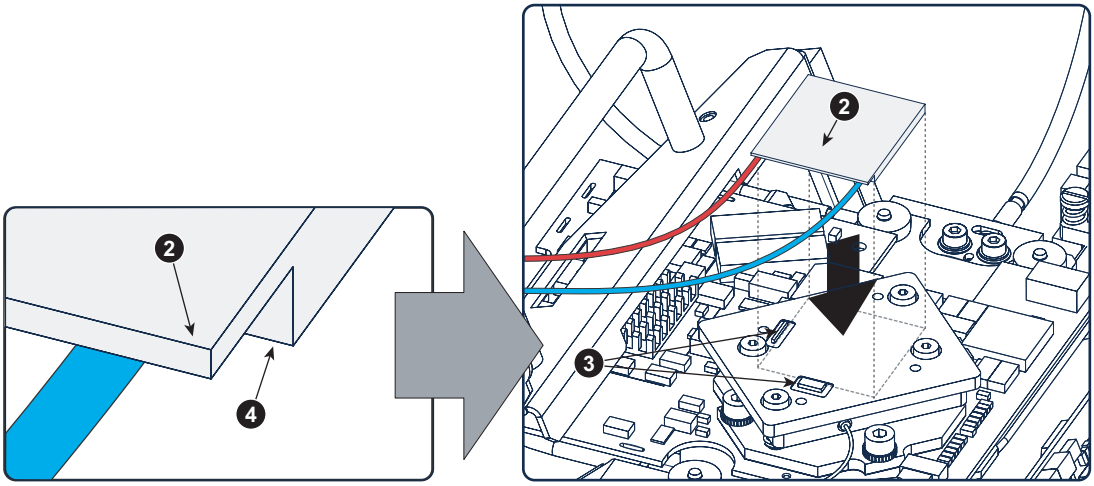


Image 9-29

6. Reinstall the cooling block upon the new Peltier element. Use a torque wrench with a 2,5 mm Allen socket to fasten the four screws (reference 1 of image 9-28) crosswise with a torque of 0,9 Nm.
7. Reinstall the spiral around the cable tree.
   Or,
   use cable ties to secure the wires.

9.17 Replacement of a Peltier element from the heat pipe cooling block

To replace the Peltier from the heat pipe cooling block the Light Processor must be removed from the projector. This procedure assumes that the Light Processor is already removed.

The illustration in this procedure shows a replacement of the Peltier of the red channel. Nevertheless the same procedure is applicable for the green and blue channel.

Necessary tools

- Torque wrench with a 2,5 mm Allen socket.
- Set of pliers.
- Clean cloth.

Necessary parts

- Peltier element.
- Tube with thermal paste.
- Cable ties.

How to replace

1. Cut the connector of the Peltier element and pull the wires out of the cable tree.
   Or,
   remove the spiral around cable tree and take out the wires of the Peltier element.
2. Remove the common cooling block by releasing the eleven hexagon socket head cap screws (reference 1, 3 & 5) as illustrated. Note that two screws (reference 3) are sunken and one screw (reference 5) has an additional washer (reference 7) and nut (reference 8).

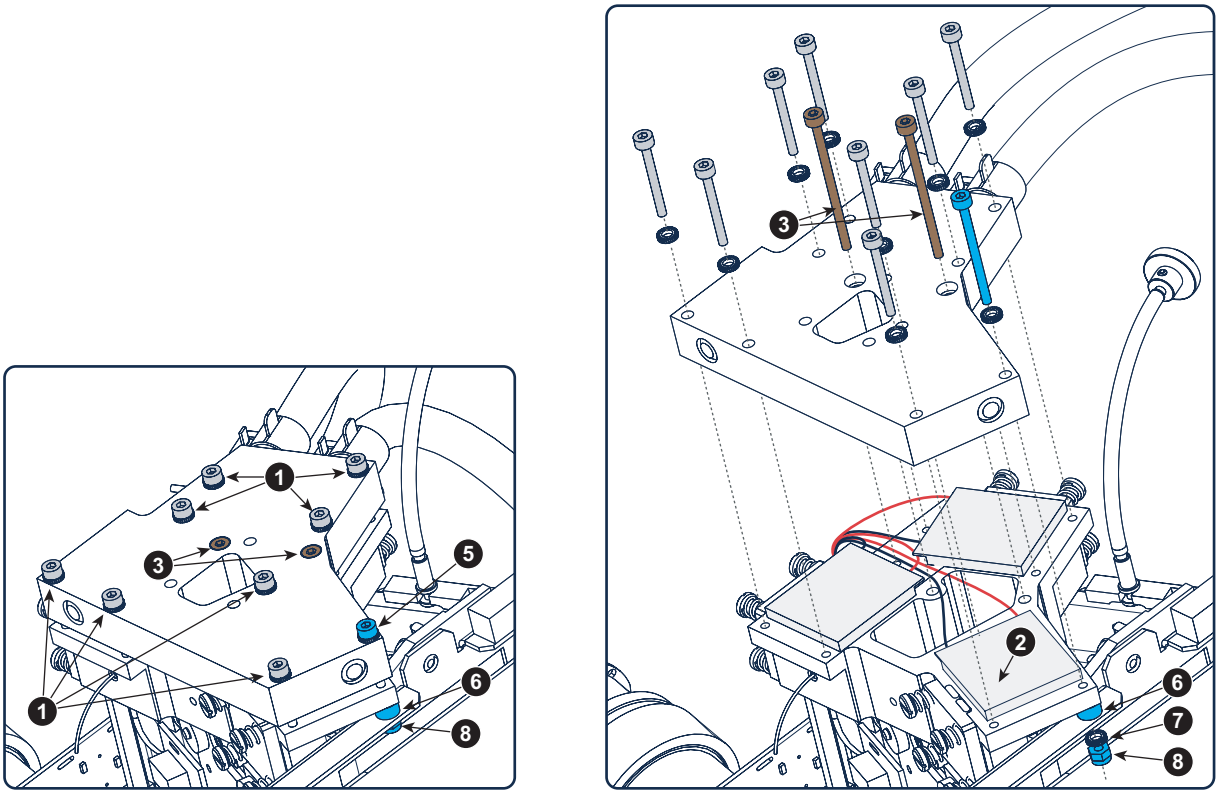


Image 9-30

3. Remove the Peltier element (reference 2 of image 9-30) and remove all old thermal paste from the Peltier socket and bottom side of the common cooling block. Use a clean cloth to remove the old thermal paste.
4. Rub some thermal paste on both sides of the new Peltier element .
5. Place the new Peltier element in its place as illustrated. Slide a little bit up and down to ensure a good contact.
   Caution: *Make sure that the cold side (reference 4) of the Peltier element is facing downwards.*

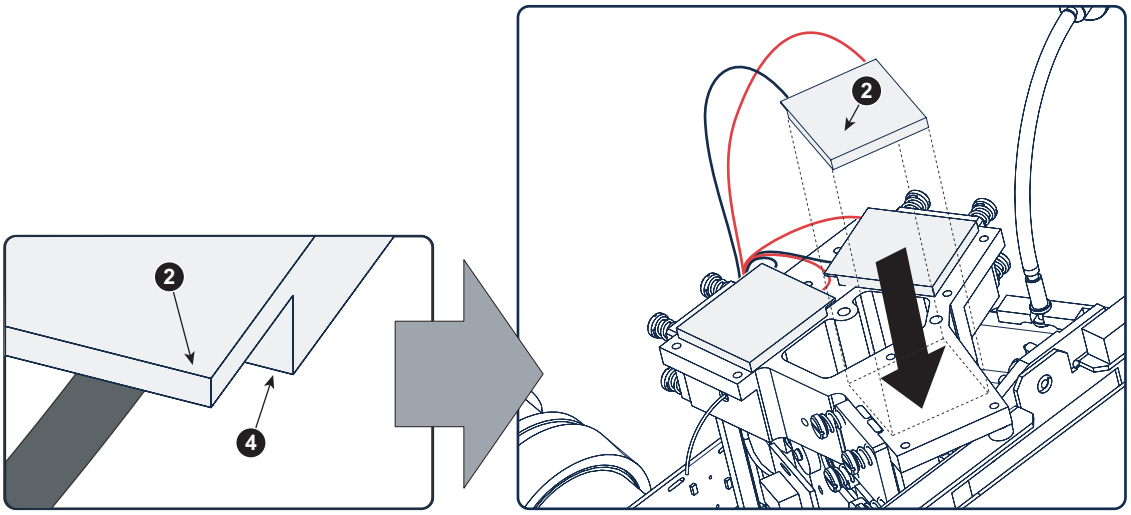


Image 9-31

6. Reinstall the common cooling block upon the new Peltier element. Use a torque wrench with a 2,5 mm Allen socket to fasten the eleven screws (reference 1, 3 & 5 of image 9-30) crosswise with a torque of 0,9 Nm. Note that two screws, which are longer (reference 3), are sunken and one screw (reference 5) has an additional washer (reference 7) and nut (reference 8).

7. Reinstall the spiral around the cable tree.
   Or,
   use cable ties to secure the wires.

10. SPATIAL COLOR CALIBRATION (LUT-SCC)

About this chapter

This chapter explains how to obtain the correct LUT-SCC file and how to install it after having replaced the Light Processor or ICMP/ICP board.

Overview

- Introduction to SCC file
- Obtain the Serial Number of the installed Light Processor
- Download the LUT-SCC file from the Barco website
- Upload Spatial Color Calibration file
- Activate Spatial Color Calibration file

10.1 Introduction to SCC file

Introduction

Barco has introduced the Spatial Color Calibration (SCC) file on the DP2K-15C/DP2K-20C/DP2K-18Cx digital projectors. The SCC file contains information to improve the color uniformity of the image. The uniformity is measured in the factory and stored in a LUT-SCC file on the ICP board. This LUT-SCC file is activated on the projector at factory.

Impact on service

As the LUT-SCC file is Light Processor specific, when replacing the **Light Processor** of the projector a **new LUT-SCC file** has to be uploaded and set as active file. As the LUT-SCC file is stored on the Integrated Cinema Processor (located on the **ICMP or ICP** board) the **LUT-SCC file** should be uploaded and activated after replacement of the ICMP or ICP board.

This chapter explains how to obtain the correct LUT-SCC file and how to install it after having replaced the Light Processor or ICMP/ICP.

Communicator version 4.7.8 [5] or later is required to activate LUT-SCC files.

5. For DP4K-P and DP2K-S the SCC functionality is already incorporate in the Communicator version 4.7.3

10.2 Obtain the Serial Number of the installed Light Processor

The Serial Number of the installed Light Processor can be obtained in two different ways. Either by reading it from the label on site or by reading it remotely using the Communicator software.

How to obtain the Serial Number of the installed Light Processor remotely?

1. Start up the Communicator software version **4.7.9** [6] or later.
   Note: *The **DP2K/DP4K software package** version **1.11** [7] or later must be installed to read out the Light Processor serial via the Communicator.*
2. Create a Diagnostic Package of the projector. For detailed instructions see User Guide of the Communicator chapter “Diagnostic Package”.
3. Open the Diagnostic Package using Windows Explorer or the ’Diagnostic Package Reader’ included in the PC version of the Communicator software.
4. Look in the file/section “Hardware Info” for the serial number of the Light Processor.
   Note: *Only for recent Light Processors the serial number will be available in the Diagnostic Package. For older Light Processors the serial number has to be read from the label (see below).*

How to obtain the Serial Number of the installed Light Processor on site?

1. Remove the Lens from the projector.
2. Write down the Serial Number of the Light Processor. The label with Serial Number of the Light Processor (reference 1 image 10-1) is visible through the Lens Holder opening. The label is located at the front base of the Light Processor.

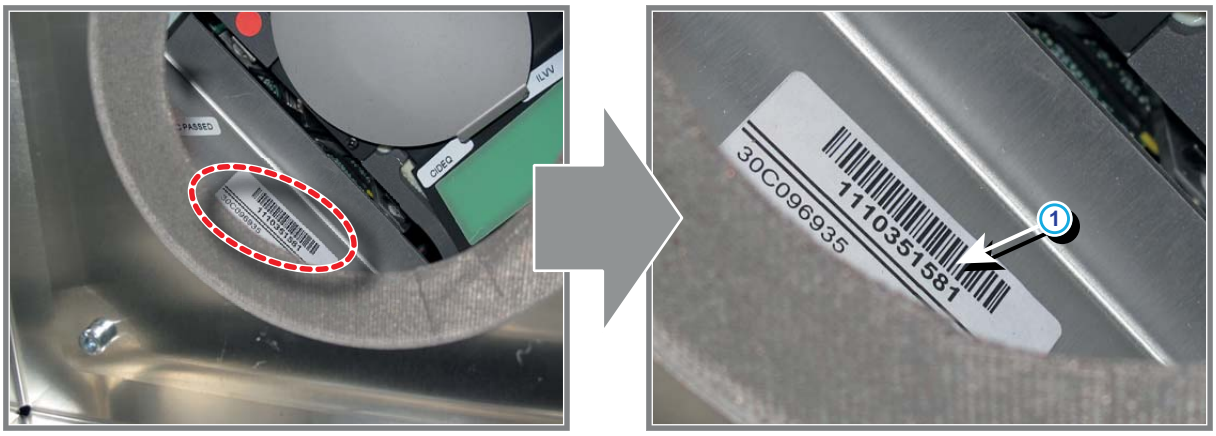


Image 10-1
Location label with Serial Number of the Light Processor of a DP4K-P projector.

The position of the label with Serial Number of the Light Processor may be slightly different. However, it will always be located at the front base of the Light Processor.

6. For DP4K-P and DP2K-S the SCC functionality is already incorporate in the Communicator version 4.7.3
7. *For DP4K-P and DP2K-S the SCC functionality is already incorporate in the DP2K/DP4K software package version 1.09.104*

10.3 Download the LUT-SCC file from the Barco website

A logon ID is required to access the secured zone myBarco on the Barco website https://www.barco.com. A logon ID for the secured zone can be requested at the portal page of the Barco website.

Necessary parts

Serial Number of the installed Light Processor.

How to download the Spatial Color Calibration file (LUT-SCC) from the secured Barco website?

1. Open the url: https://www.barco.com in a web browser.
2. Login into the secured Barco website.

Image 10-2

Or,
in case you are already logged in, click on your login name and select “**My support section**”.

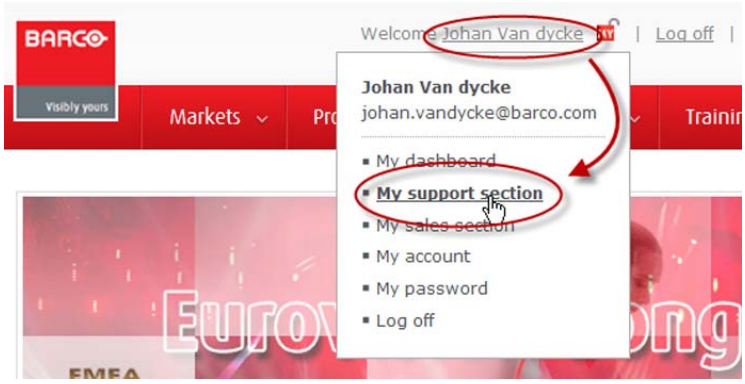


Image 10-3

3. Navigate in the **My Support** section at the left side to **Digital Cinema > Spatial color corrections**.
4. Fill in the Serial Number of the Light Processor and press the “**Search file**” button.

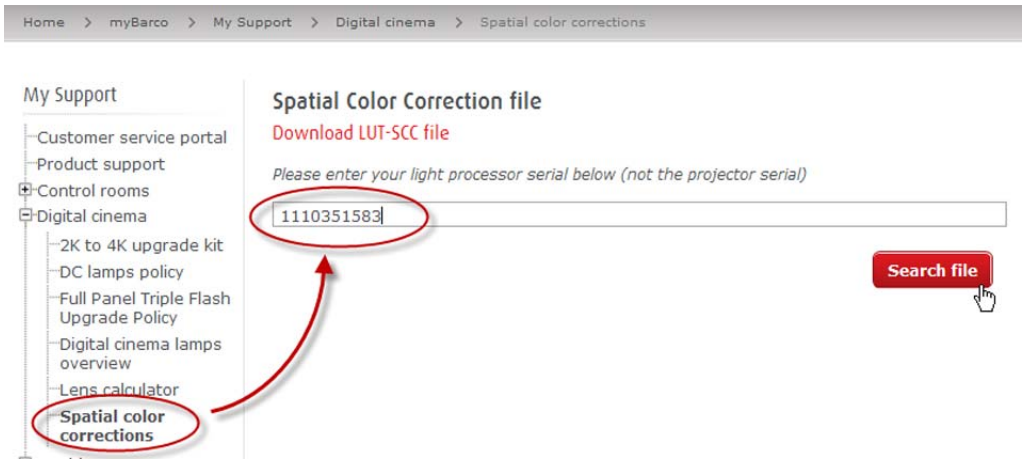


Image 10-4

If a LUT-SCC files is found a download link will appear. Proceed with the next step.

In case no LUT-SCC file is found end this procedure and use the default LUT-SCC file which is already installed on the ICP board. For 2K projectors this is “ones2K_LE”, for 4K projectors this is “ones4K_LE”.

5. Click on the LUT-SCC download file.

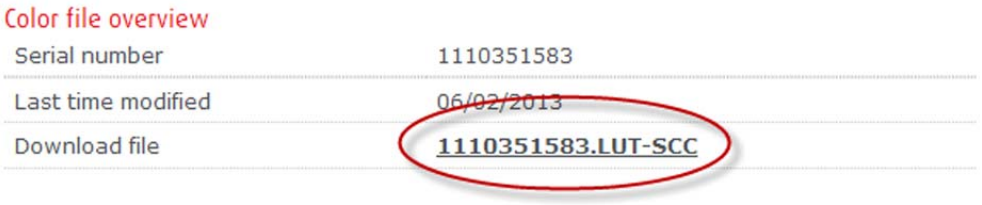


Image 10-5

10.4 Upload Spatial Color Calibration file

When replacing the Light Processor a new LUT-SCC file should be downloaded from the secured Barco website.

When replacing the ICP board the LUT-SCC file should be available if the projector files were backed up properly. If not, the LUT-SCC file can also be downloaded from the secured Barco website using the serial number of the installed Light Processor.

For detailed instructions see procedures "Obtain the Serial Number of the installed Light Processor", page 193, and "Download the LUT-SCC file from the Barco website", page 194.

Necessary tools

Communicator software version 4.7.9 (or later)

Necessary parts

- Serial Number of the installed Light Processor.
- LUT-SCC file available on the PC of the Communicator or on USB-stick when using the Communicator Touch Panel.

How to upload the LUT-SCC file into the projector?

1. Start up the projector and the Communicator (version **4.7.9** [8] or later).
2. Ensure that the projector is connected with the Communicator. Either via a direct connection or via network. For detailed instructions see User Guide of the Communicator (manual version 07).
3. Go to the File manager of the Communicator.
4. Click on the drop down box in *Local files* (1) and browse to the LUT-SCC file to be uploaded (2).

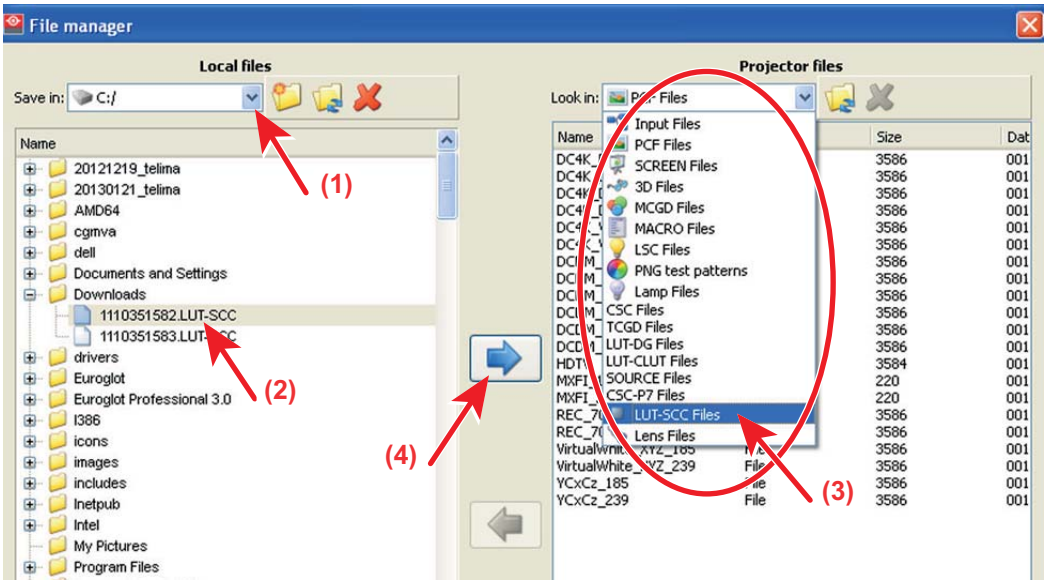


Image 10-6

5. Click on the drop down box in *Projector files* and select the file type LUT-SCC (3).
6. Click on the arrow pointing to the right (4).

   The file is uploaded from its original location to the projector file system.

8. For DP4K-P and DP2K-S the SCC functionality is already incorporate in the Communicator version 4.7.3

10.5 Activate Spatial Color Calibration file

Necessary tools

Communicator software version 4.7.9 (or later)

How to activate the LUT-SCC file?

1. Open the *File manager* in the Communicator and select in the drop down box of *Projector files* the file type LUT-SCC (1).
2. Select the desired LUT-SCC file from the list (2).
3. Click **Select active** (3).

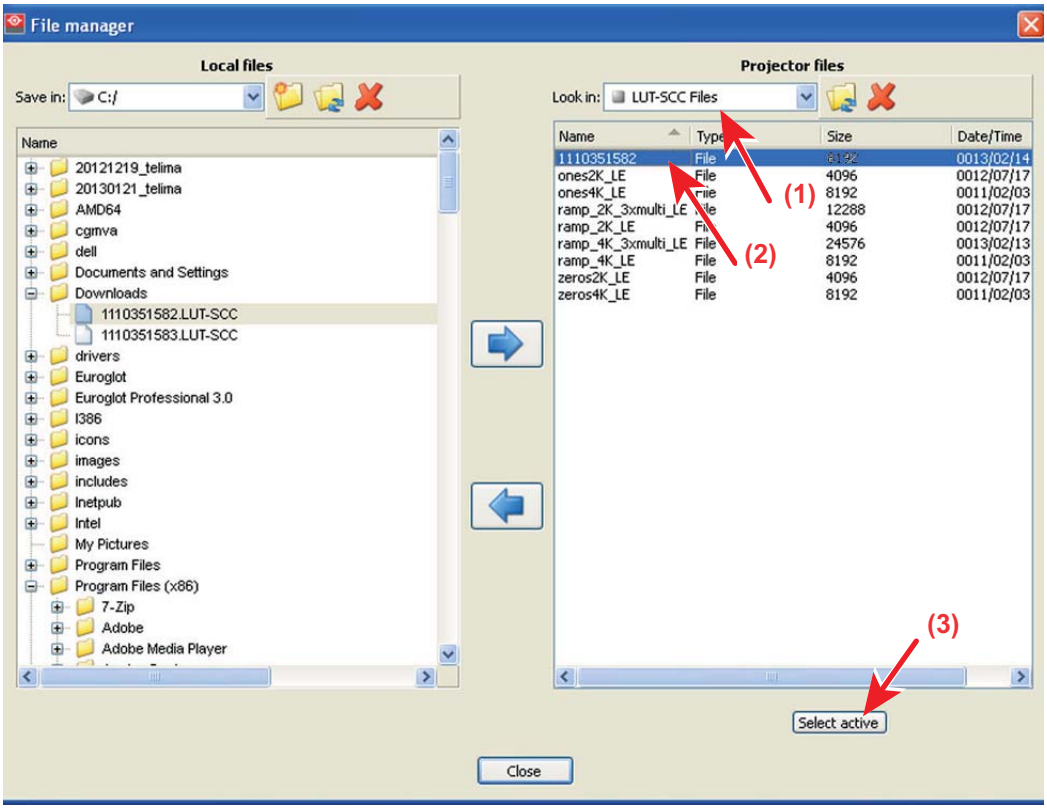


Image 10-7

4. Click on **Close** to exit the File manager.

In case no Light Processor serial LUT-SCC file is available use the default LUT-SCC file which is factory installed on the ICP board and thus displayed in the list. For 2K projectors this is “ones2K_LE”, for 4K projectors this is “ones4K_LE”.

11. CONVERGENCE

About this chapter

This chapter describes how to prepare the projector for convergence adjustment and how to adjust the convergence with the extenders.

Overview

- Convergence controls
- Preparing the convergence adjustment
- Red on Blue convergence
- Green on Blue convergence

11.1 Convergence controls

Extended control knobs

As the DMD of the blue channel is not accessible in the projector, the image of this DMD will be taken as reference. Red and green will be aligned on blue when a small convergence drift is recognized. So, the DMD of the blue channel is fixed and can not be adjusted. The red and green channel is equipped with three extended control knobs for convergence adjustment. The adjustment knobs are numbered from 1 to 6 and have the same color as the channel which they effect (1, 2 and 3 for red and 4, 5 and 6 for green).

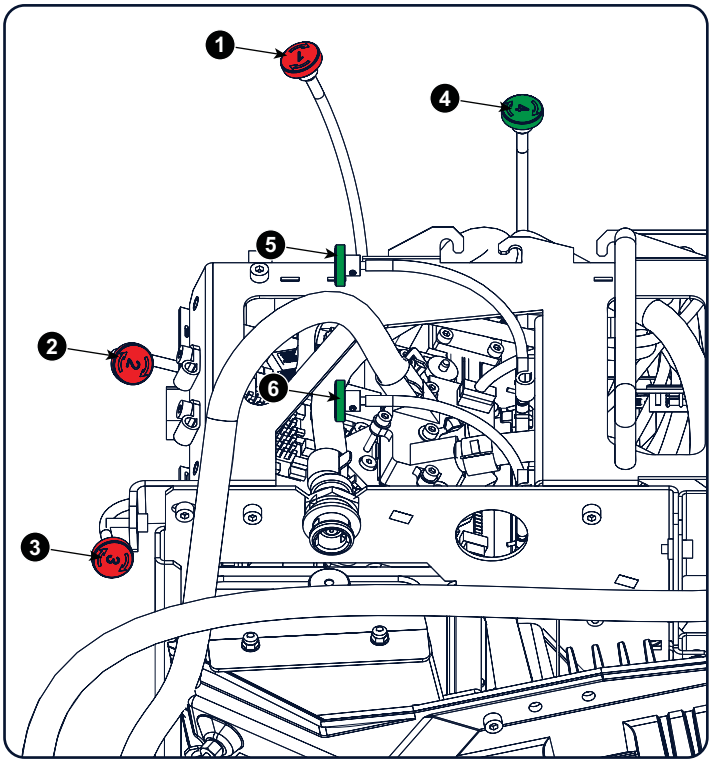


Image 11-1
Convergence knobs

1 Red channel, knob number 1
2 Red channel, knob number 2
3 Red channel, knob number 3
4 Green channel, knob number 4
5 Green channel, knob number 5
6 Green channel, knob number 6

Convergence test pattern

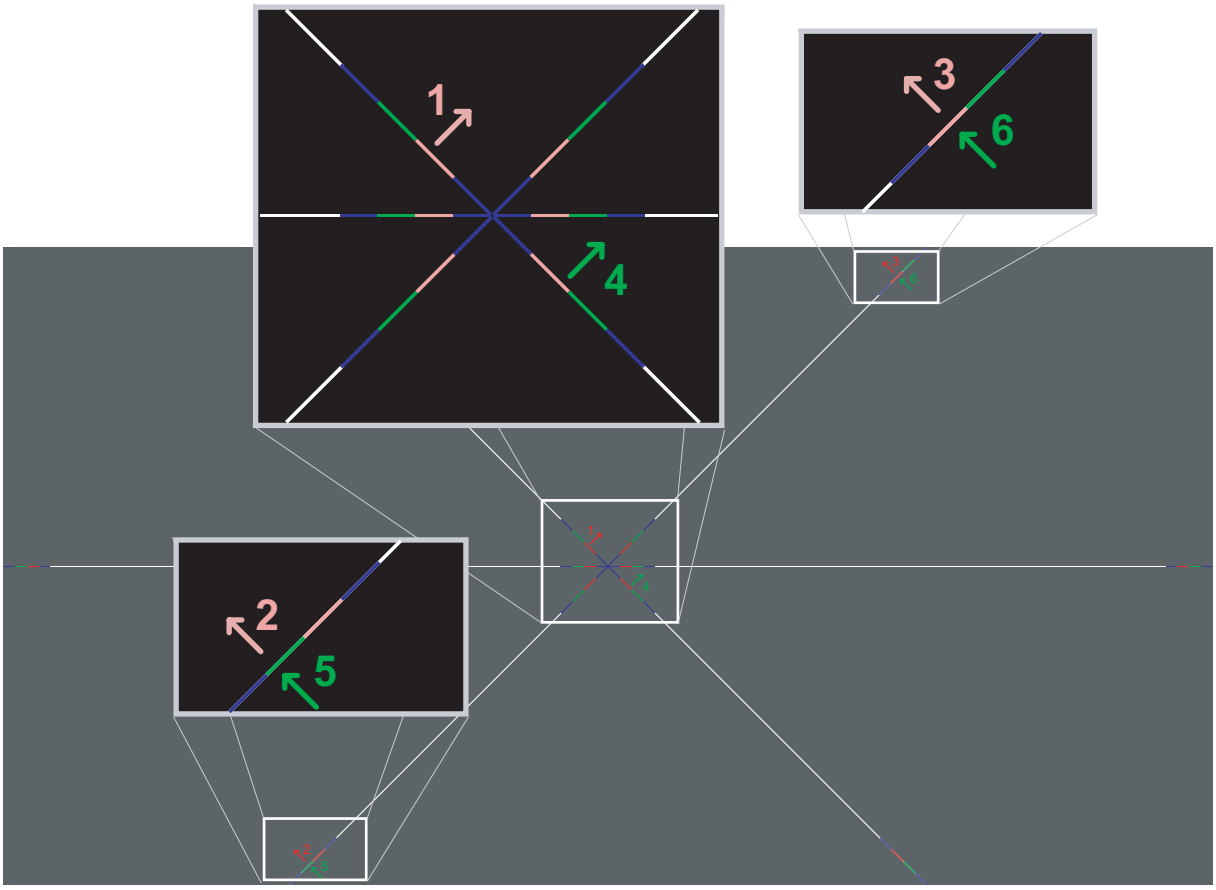


Image 11-2
Convergence test pattern

The test pattern illustrated above is specially designed for convergence purposes. The test pattern has three red arrows numbered from 1 to 3 and three green arrows numbered from 4 to 6. These numbers and colors correspond with the numbers and colors of the extended control knobs (image 11-1). The direction of the arrow shows the movement of the channel color (red or green) when turning the corresponding knob in the direction indicated by the arrow marked on the knob.

The three convergence control knobs of one channel stand in relation with each other. So, a change to one of them will also effect the adjustment results of the two others. Therefore, all three control knobs have to be alternately and repeatedly adjusted until the projected color is perfectly converged with the blue reference color of the test pattern.

Adjustment range

- The adjustment range is limited to approximately 30 pixels in both directions.
- One turn (360°) of a control knob relates to an approximately 30 pixel displacement on the screen.
- When changing the adjustment direction there will be some play of approximately one turn (360°).

11.2 Preparing the convergence adjustment

Necessary tools

Flat blade screwdriver

Prepare projector for convergence adjustment

1. Remove all side covers and top cover of the projector, see "Removal and installation of the projector covers", page 91.
2. Open the sealed compartment of the light processor, see "Open the sealed compartment", page 99.
3. Remove the convergence cover plate as follow:
   a) Slide the plate forwards until all hooks at both sides of the plate become free.
   b) Take off the plate.

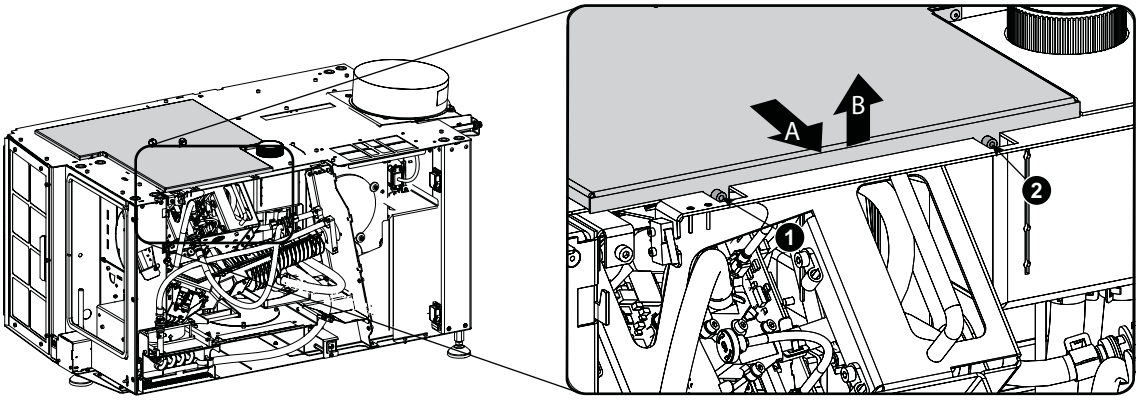


Image 11-3
Convergence cover plate

4. Reinstall the lens and start up the projector.
5. Use the Communicator software to activate the convergence test pattern.

Image 11-4
Convergence test pattern

11.3 Red on Blue convergence

This procedure can only be executed when all preparations are taken to converge the image.

Necessary tools

No tools.

How to converge

1. Slightly turn the red colored control knob number 1 until the red pattern in the center of the projected image converges with the blue pattern. Note that a turn of a few degrees corresponds with one full pixel.
   Note: *When start turning the knob, a little resistance can be felt. This resistance is part of the internal locking mechanism of the adjustment.*

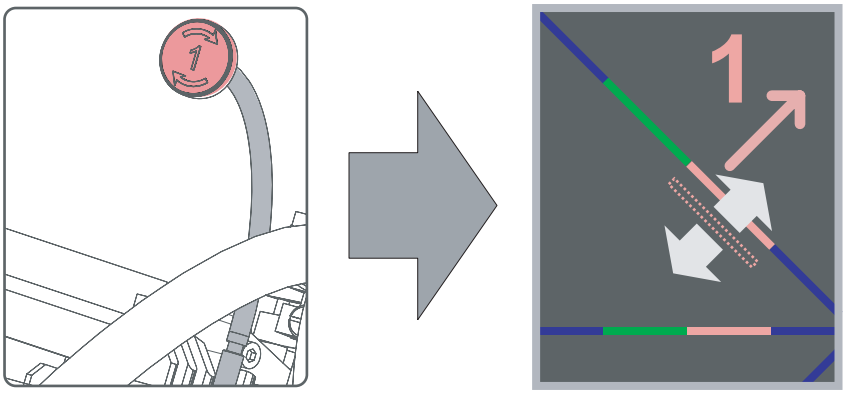


Image 11-5
Clockwise turning will move line downwards.

2. Slightly turn the red colored control knob number 2 until the red pattern in the lower left of the projected image converges with the blue pattern.

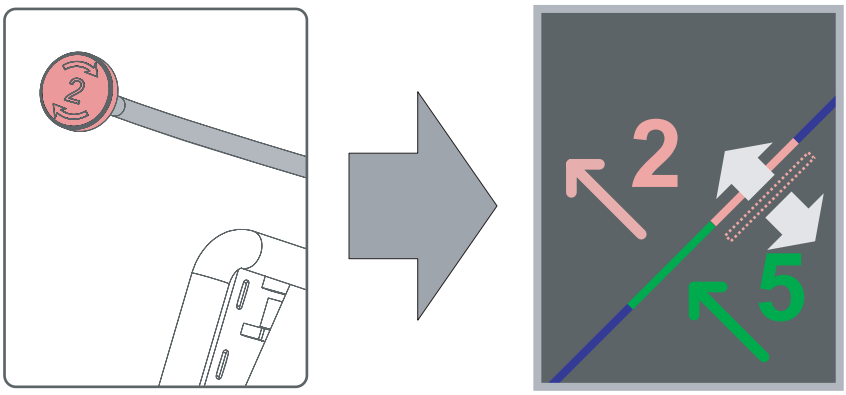


Image 11-6
Clockwise turning will move the line upwards.

3. Slightly turn the red colored control knob number 3 until the red pattern in the upper right of the projected image converges with the blue pattern.

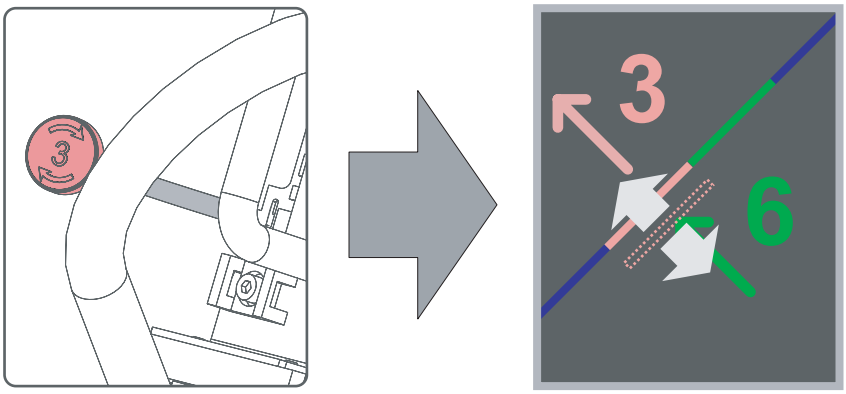


Image 11-7
Clockwise turning will move the line upwards

4. Repeat step 2 and step 3 until coincidence is obtained of the red pattern in the lower left and upper right of the projected image.
5. Repeat from step 1 until full coincidence is obtained of the red pattern in the center, lower left and upper right of the projected image.

11.4 Green on Blue convergence

This procedure can only be executed when all preparations are taken to converge the image.

Necessary tools

No tools.

How to converge

1. Slightly turn the green colored control knob number 4 until the green pattern in the center of the projected image converges with the blue pattern. Note that a turn of a few degrees corresponds with one full pixel.
   Note: *When start turning the knob, a little resistance can be felt. This resistance is part of the internal locking mechanism of the adjustment.*

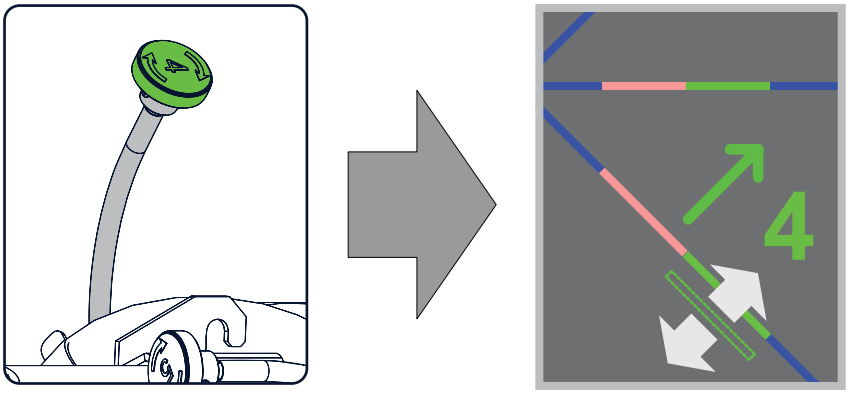


Image 11-8
Clockwise turning will move the line downwards.

2. Slightly turn the green colored control knob number 5 until the green pattern in the lower left of the projected image converges with the blue pattern.

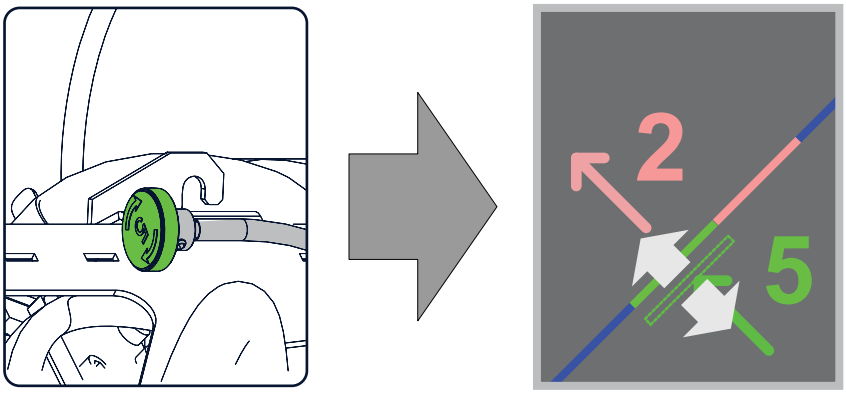


Image 11-9
Clockwise turning will move the line upwards.

3. Slightly turn the green colored control knob number 6 until the green pattern in the upper right of the projected image converges with the blue pattern.

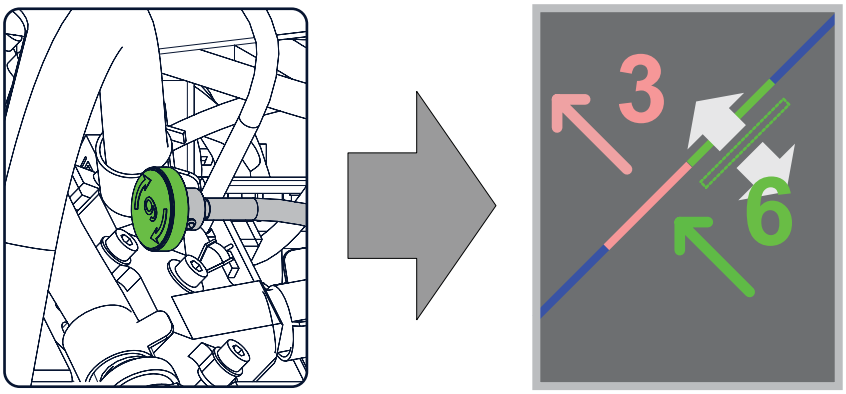


Image 11-10
Clockwise turning will move the line upwards.

4. Repeat step 2 and step 3 until coincidence is obtained of the green pattern in the lower left and upper right of the projected image.
5. Repeat from step 1 until full coincidence is obtained of the green pattern in the center, lower left and upper right of the projected image.
6. Close the sealed compartment and reinstall all covers of the projector.

12. INTEGRATOR ROD

About this chapter

Overview

- Introduction
- Rod diagnostic
- Removal of the integrator rod
- Installation of a new integrator rod
- Adjusting the integrator rod

12.1 Introduction

Functionality of the integrator rod

The integrator rod is made of fused silica. The cross-section of the rod has the same aspect ratio as the active surface of the DMD's used in the light processor. The function of the integrator rod is to match the shape of the light path to the shape of the DMD's and to neutralize the hot spot effect caused by the light source. Futhermore, the integration rod ensures that the light beam is focused on the DMD's, which results in an optimally focused light beam on the screen.

The integrator rod is located at the entrance of the light pipe. The light emitted by the lamp is reflected via the "cold mirror" into the rod, which integrates the incoming light into a homogeneous rectangle shaped beam of light.

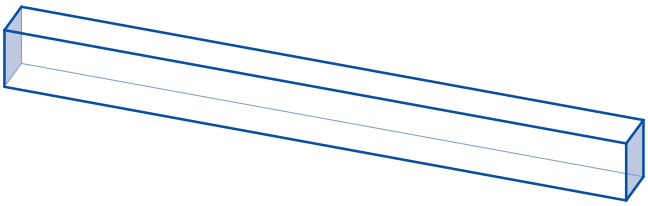


Image 12-1

The entrance and exit side of the integrator rod are coated to achieve optimal performance. Clearly the rod may never be contaminated with grease, dirt, liquid or the such. for optimal protection the rod is mounted inside an aluminium tube, which requires replacing together with the rod. This aluminum tube also contains an adjustment mechanism to position the rod inside the light pipe. The integrator rod, the aluminium tube and the adjustment mechanism together form the "integrator rod assembly".

CAUTION: Use cotton gloves to handle the integrator rod. Greasy fingerprints or other dirt on the integrator rod will burn into the rod and cause permanent damage.

12.2 Rod diagnostic

General

Due to bad environmental conditions the integration rod may become contaminated with grease, dust, dirt or other particles, which will burn into the rod and cause permanent damage. As a result spots may become visible in the projected image on the screen. To confirm that these spots are caused by a damages to the rod please diagnose the rod as described in the following procedure.

How to diagnose the integrator rod of the projector

1. Remove the side cover of the projector.
   Caution: *Remove the side cover of the projector only in a clean and dust free area. Never remove the side cover in an area which is subject to airborne contaminants such as that produced by smoke machines or similar.*
2. Switch on the projector and project a white test pattern. See users manual of the projector to do so. Make sure that the projected white test pattern is focused.
3. Loosen the lock nut on the light pipe (1)

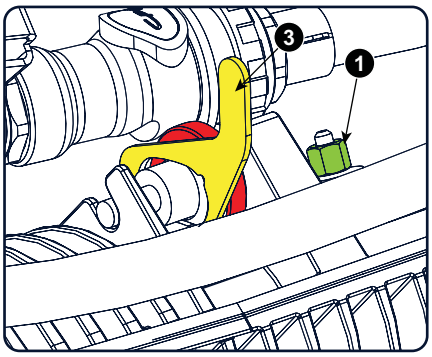


Image 12-2

4. Gently move the handle (3) forward or backward while watching the projected image.
5. Do you see spots in the projected image rotate along with the movements of the rod?
   If yes, these spots are caused by damages to the integration rod. Replace the rod assembly.
   If no, integration rod is OK. Re-adjust and secure the integration rod and reinstall the side cover of the projector.

12.3 Removal of the integrator rod

To remove the integrator rod from the light pipe the light processor unit has to be removed from the projector first.

CAUTION: All servicing to the Light Processor unit has to be done in a dust free area. Use compressed air to blow away all dust on the outside of the Light Processor unit before entering the unit into the dust free area.

Necessary tools

- Allen wrench 2.5 mm
- Allen wrench 3 mm

How to remove

1. Disconnect the cable of the light sensor unit.
2. Turn out both screws (reference 1) and slide out the eye plate.
   Note: *Light processor may be placed on the pins and the top of the processor mechanics. without damaging any part inside the assembly.*

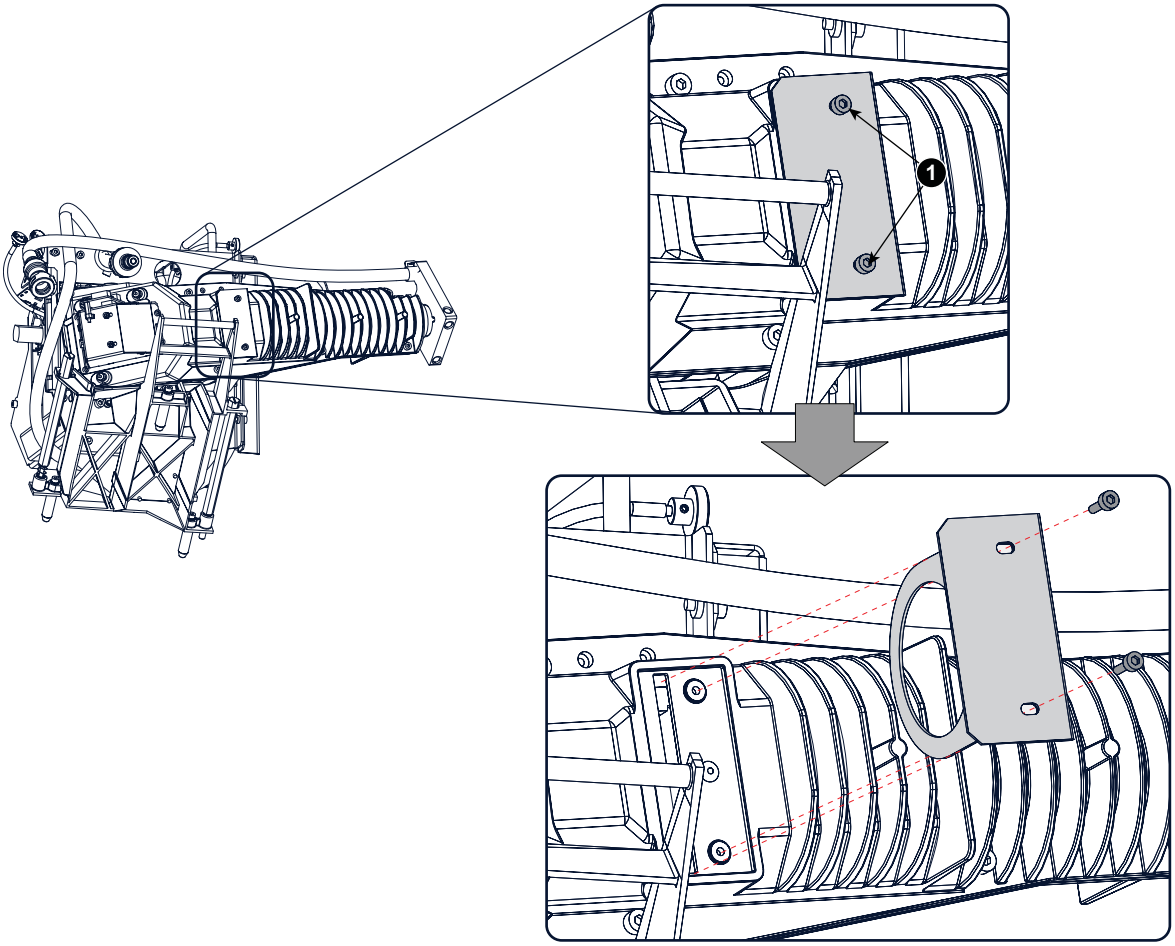


Image 12-3

3. Turn out the screws of the light pipe housing (4 times 2 screws)

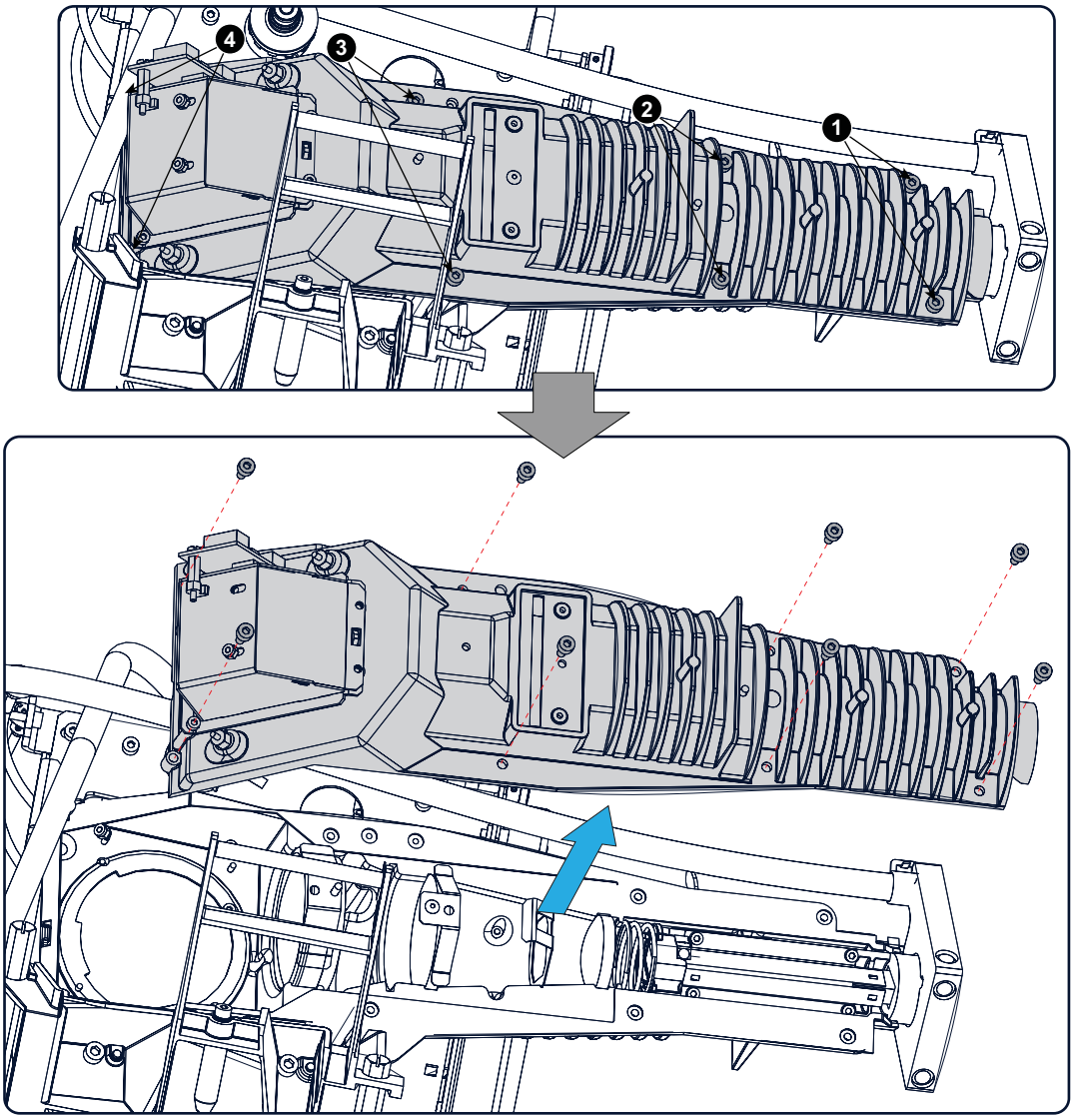


Image 12-4
Light pipe housing

4. Take off the housing.

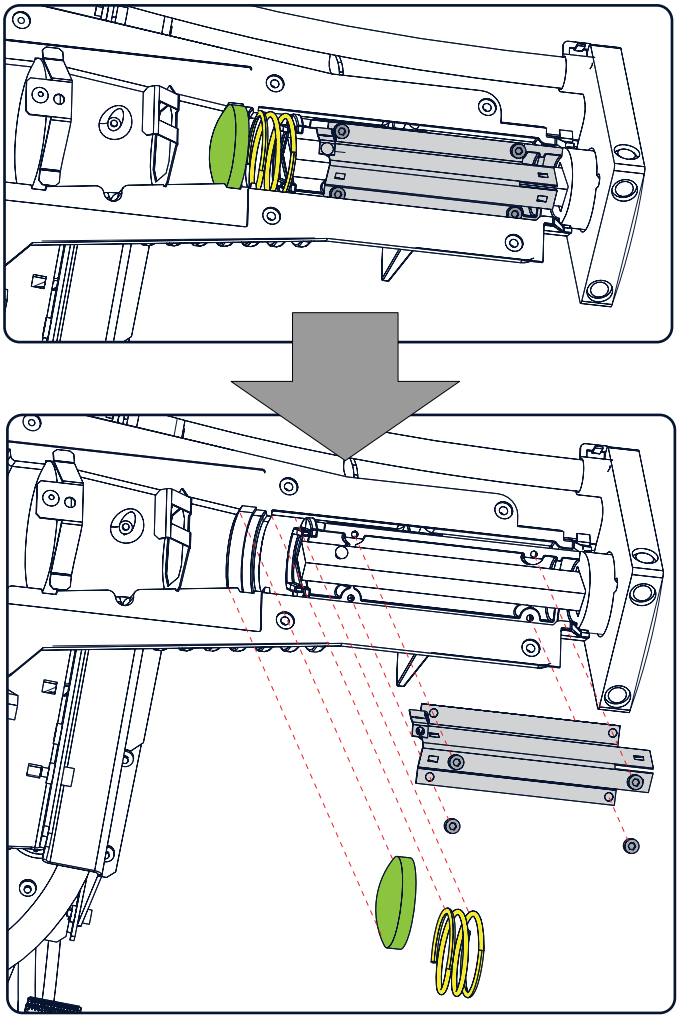


Image 12-5
Inner side light processor

5. Take out the lens.
6. Squeeze the spring and take it out.
7. Remove the 4 screws of the rod cover.
8. Slide the rod to the left until it comes out of the cooling block.
   Then, take out the rod.

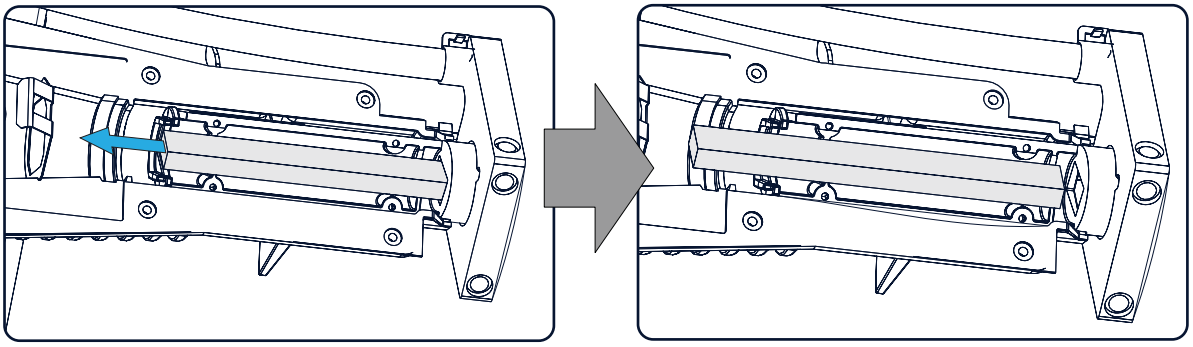


Image 12-6
Moving rod

12.4 Installation of a new integrator rod

CAUTION: Use cotton gloves to handle the integrator rod. Greasy fingerprints or other dirt on the integrator rod will burn into the rod and cause permanent damage.

How to install

1. Unpack the new integrator rod very carefully.
   Be careful not to damage the integrator rod.
2. From the left, slide the integrator rod into the opening in the cooling block (1) Do not touch the entrance of the integration rod to any mechanical part of the cooling block. That can damage the rod severely with a bad image as result.

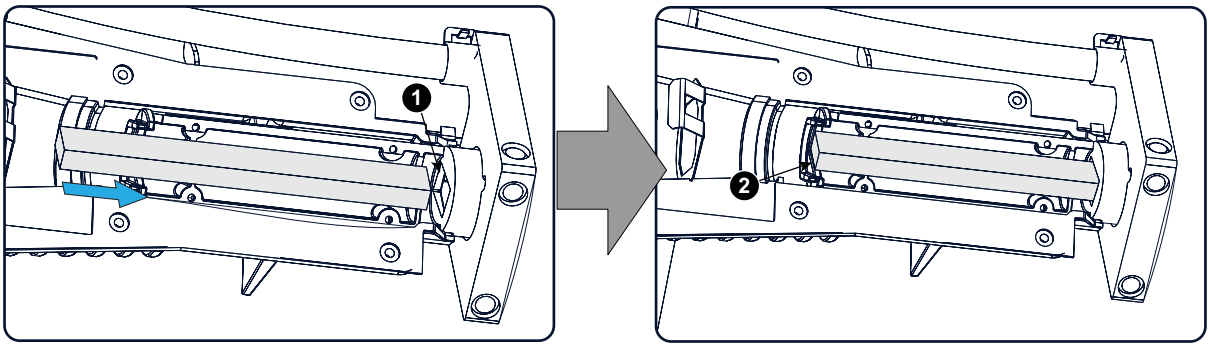


Image 12-7
Mount integration rod

3. Slide it in so that the front of the other side of the integrator rod is equal with entrance of the rod holder (2)
   Again, do not slide in the integrator rod too far to avoid damage to the entrance of the rod.
4. Place the integrator rod cover plate on its place (1) and secure with the 4 screws (2).

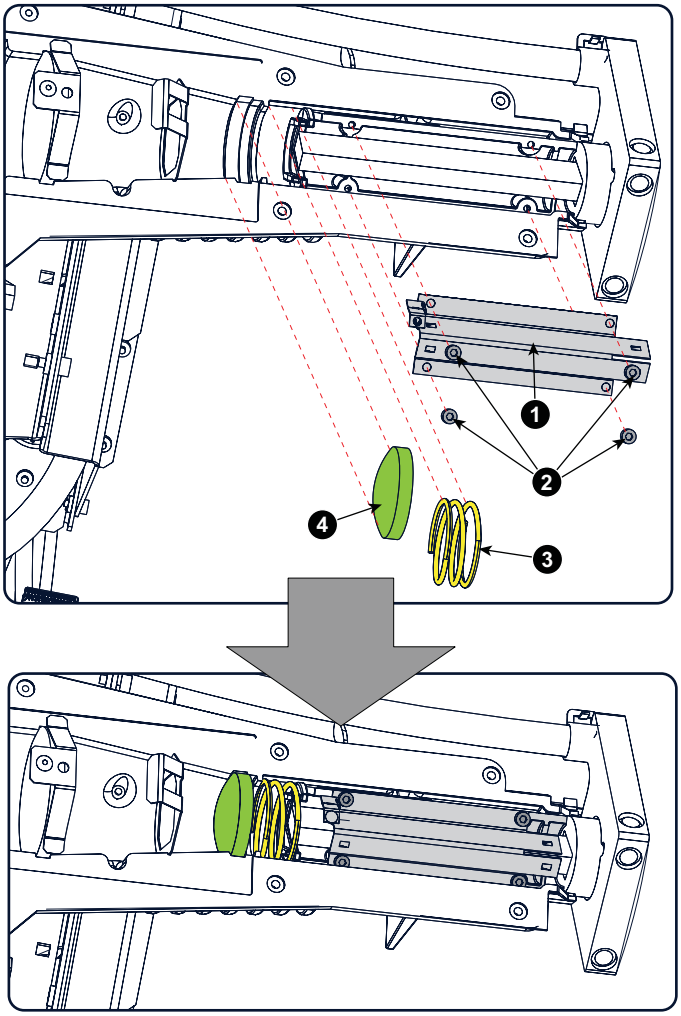


Image 12-8
Light pipe, inside

5. Take the spring, squeeze it and insert it in the compartment (reference 3, image 12-8).
   Do not touch the output of the integrator rod while inserting the spring.
   Release the spring once it is on its place.
6. Insert the lens with the convex side to the left (away from the rod entrance cooling block) (reference 4, image 12-8).
7. Place the light pipe housing back on its place and secure with 4 x 2 screws.

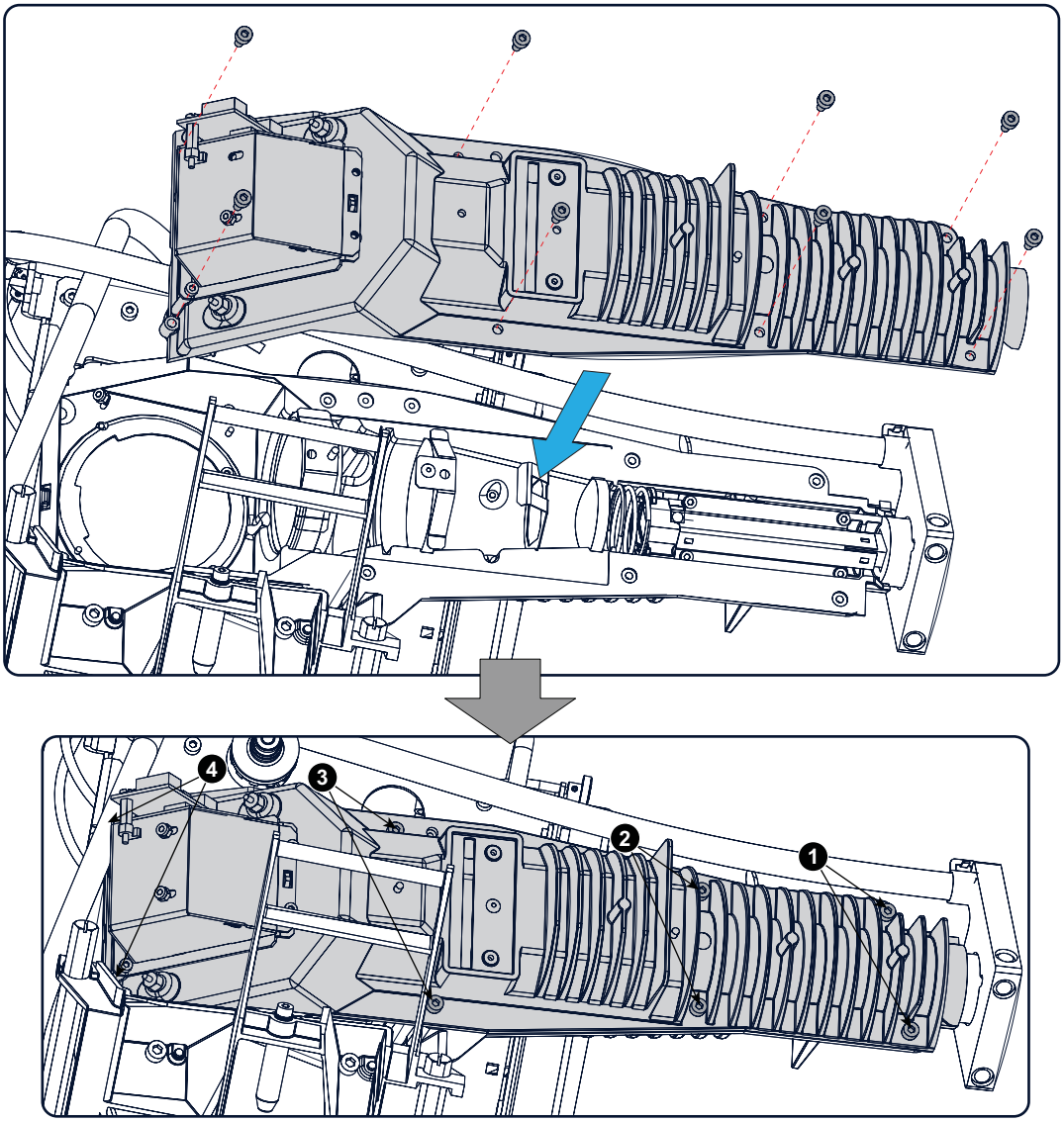


Image 12-9
Light pipe cover, mount

8. Insert the eye plate and secure with both screws.

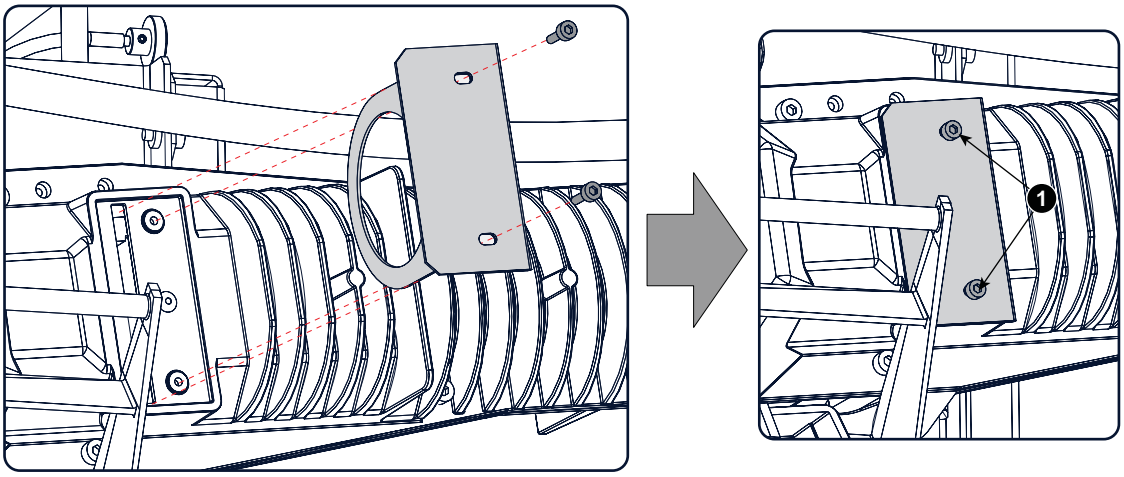


Image 12-10
Eye plate, insert

9. Connect the light sensor cable to the light sensor unit.

Normally the adjustment of the integrator rod should be correct. If not correct, continue with "Adjusting the integrator rod", page 217.

12.5 Adjusting the integrator rod

Necessary tools

- Wrench 7 mm
- Torque wrench 7 mm

How to adjust

1. Loosen the lock nut on the light pipe.

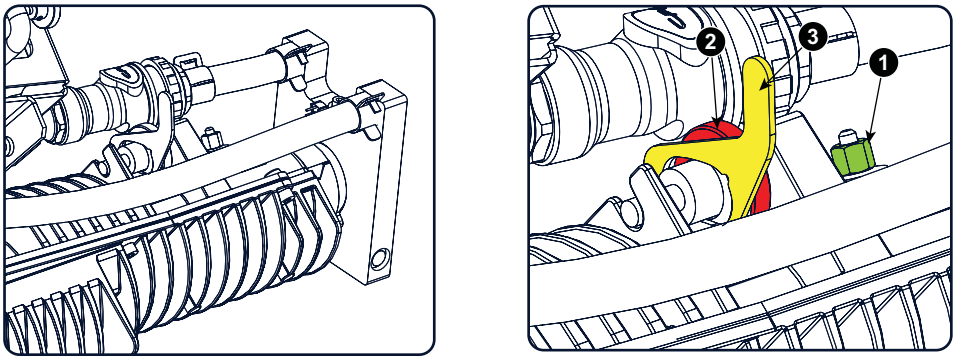


Image 12-11
Integrator rod adjustment

2. start up the projector but do not activate the lamp yet.
3. By using the Communicator software, set up the projector to display a white internal pattern with minimum lamp power. Do not activate the lamp yet !
   a) Switch on the projector. Do not activate the lamp yet.
   b) Log on to the Communicator as “Service technician” and select: `Installation > Lamp > Light output`, and adjust lamp dimming slider to 0.
   c) Select : `Control > Test patterns > Full white`

   Caution: *Maximum five (5) seconds are allowed of minimum light output on an non-adjusted Integration Rod. Otherwise, the sealing between the DMD’s and the prism will be damaged.*
4. Activate the lamp and zoom the projector lens in or out until the projected image is focused.
   Note: *Test pattern must be displayed sharp.*
5. Remove the Fold Mirror cover and the Light Sensor Module as a whole from the Light Pipe as illustrated. Remove both indicated Torx screw (reference 1).

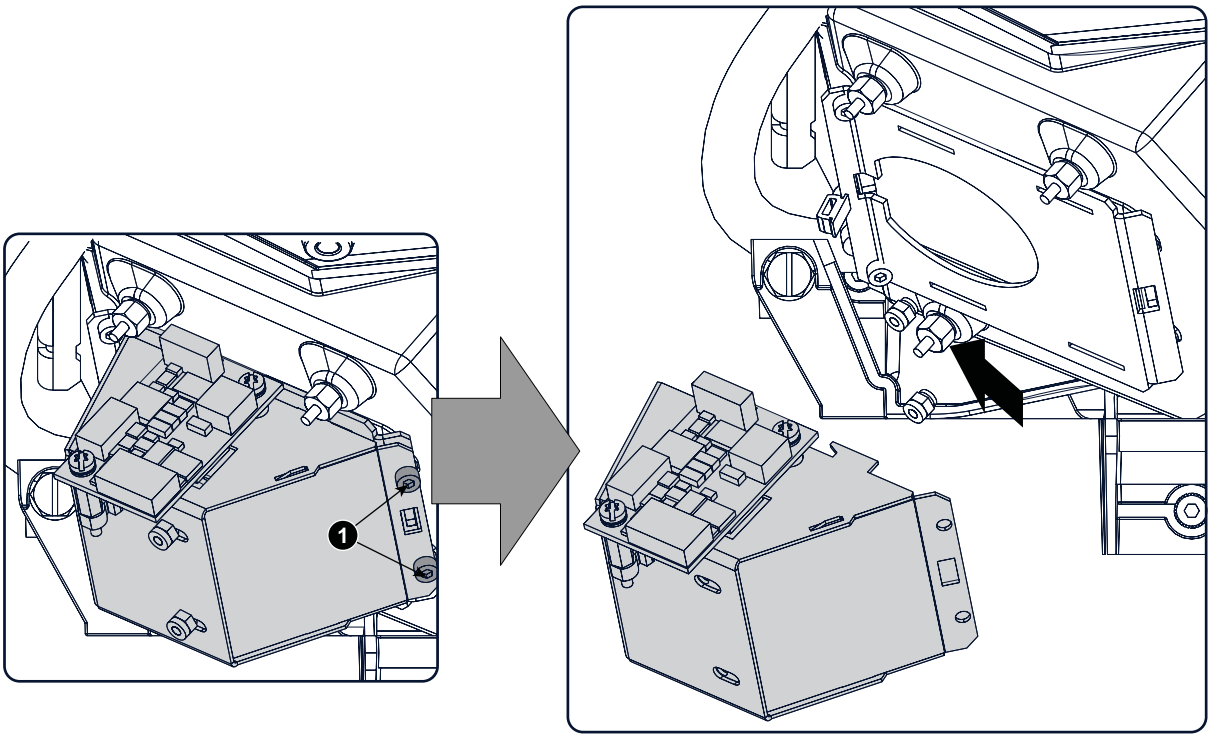


Image 12-12
Fold mirror, access adjustments

6. Turn the lower nut of the folding mirror until the upper and left edge of the rod can be seen on the screen.
7. Gently rotate ring 2 back or forward to a position which projects the sharpest possible edges on the screen.

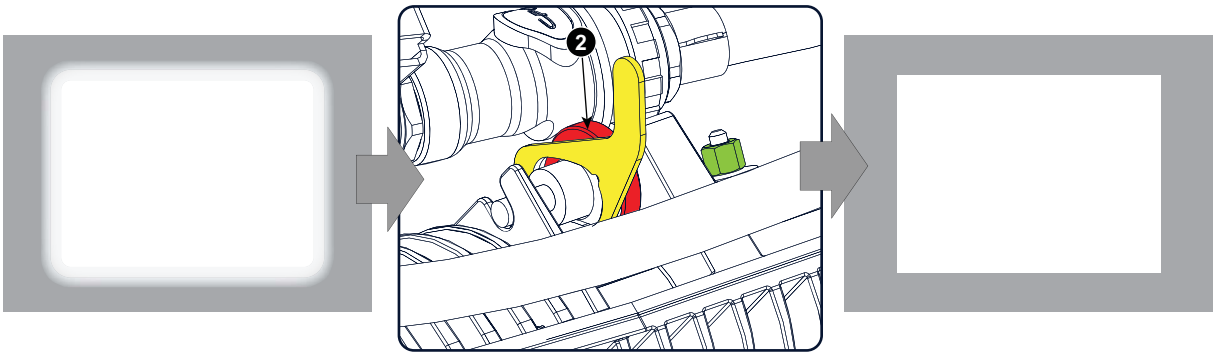


Image 12-13

8. Gently move the handle 3 back or forward to a position so that the projected light beam matches the projected outline of the DMD's

   Note: *No spots in the projected image may move along with the movements of the rod. Spots which move with the movements of the rod indicates that the exit side of the integrator rod is contaminated with dust. If this is the case, remove the integrator rod and try to blow away the dust. If this doesn't help replace the integration rod.*

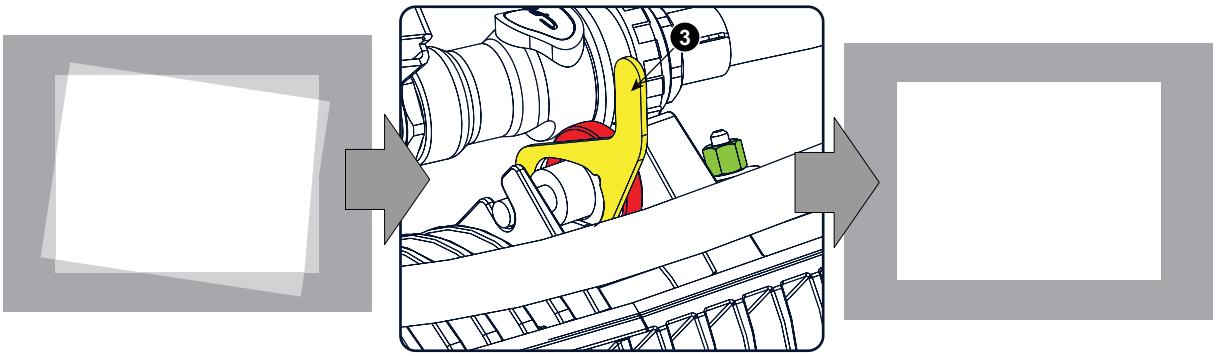


Image 12-14

9. Fasten the lock nut (1) with a torque of **2 Nm**.
10. Turn the lower nut of the folding mirror back to its original position (see alignment procedure of the folding mirror for the correct alignment)
11. Mount the Fold Mirror cover and the Light Sensor Module.

13. LIQUID COOLING CIRCUIT

About this chapter

This chapter describes how to maintain the liquid cooling circuit of the projector.

WARNING: All actions performed on the Liquid Cooling Circuit should occur in normal ambient conditions (approximately 25 °C). The projector should have sufficiently cooled down (minimum 2 hours).

WARNING: Hazardous product: Blue antifreeze diluted 1,2 ethanediol (1/3 ethanediol – 2/3 Demi water).

Not for household use. Keep out of reach of children. Harmful by oral intake. Avoid exposure to pregnant women. Avoid contact with eyes, skin and clothing. Avoid inhalation of the noxious fumes.

WARNING: Only use Barco approved cooling liquid to refill the liquid cooling circuit of the projector. Neglecting this may lead to irreversible damage of the projector.

Handling the cooling liquid

- Avoid contact of the liquid with Eyes, Skin and Clothing.
- Avoid inhaling of the noxious fumes.
- Conserve the product in the original package and in a well ventilated room.

Personal protection rules

- Handle the cooling liquid in a well ventilated room.
- Under no circumstances eat, drink and smoke while handling the liquid.
- Wear gloves (Butylrubber, PVC....) and Goggles.
- Wear suitable protection clothing.

Overview

- Check cooling liquid level
- Cooling liquid refill
- Tools used in the liquid cooling servicing procedures
- Draining the liquid cooling circuit
- Filling the liquid cooling circuit
- Excluding the Light processor Unit
- Removal of the heat exchanger
- Installation of the heat exchanger
- Cleaning the cooling pump
- Replacement of the pump motor and rotor
- Replacement of the complete cooling pump

Preparations for a draining an refilling of the cooling liquid circuit

1. Removal of all side covers, back and front cover.
2. Removal of the top cover.
3. Opening the sealed compartment.

13.1 Check cooling liquid level

What should be done ?

The projector is liquid cooled. When running with a low liquid cooling level then the cooling capacity is strongly reduced which results in higher temperatures inside the projector. These higher temperatures can cause an interruption of your film projection as the lamps can be switched off by the software as a precaution.

To avoid this problem, we strongly advise to check at least every 3 months the cooling liquid level in the cooling reservoir of the projector.

How to check

1. Remove the side cover on the light processor side, "Removal of the side cover", page 95.
2. Look through the small window in the security cover of the light processor and check the liquid cooling level in the reservoir.

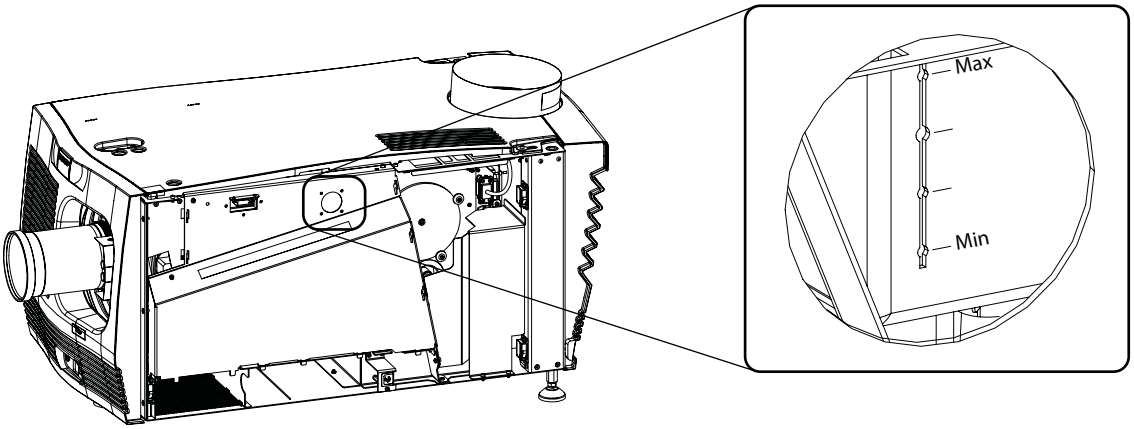


Image 13-1
Cooling liquid check

If the current liquid cooling level is somewhere between **Min** and **Max**, then no action should be taken.

If the current liquid cooling level is lower than **Min**, start the refill procedure.

If you cannot see the level , remove the top cover and shine with a torch on the filler cap while looking through the small window.

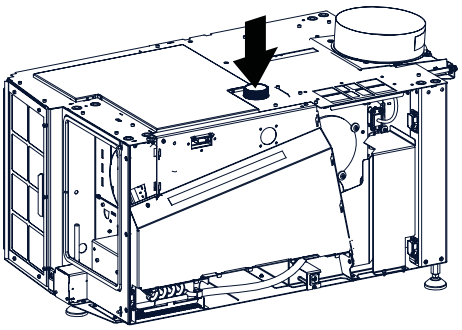


Image 13-2
Filler cap

13.2 Cooling liquid refill

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

Order info cooling liquid

B1909086K : bottle of 1 liter cooling liquid.

Necessary parts

Cooling liquid

How to refill

1. Remove all side covers, back and front cover.
2. Remove the top cover.
3. Open filler cap by turning it anti clockwise.

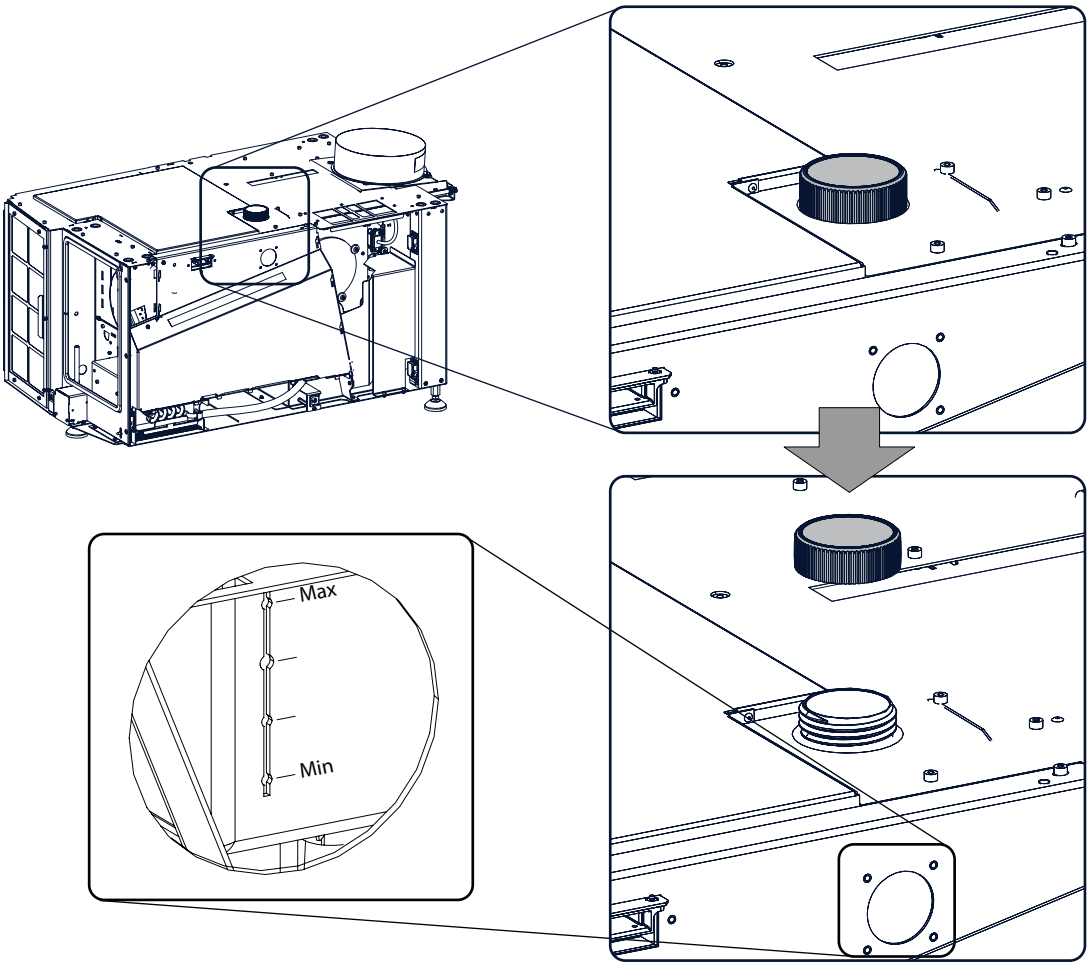


Image 13-3
Refilling

4. Fill the reservoir with cooling liquid until the level is equal with the **Max** indication on the reservoir. Look through the small window to see the indication.
5. Close the reservoir again. Turn the filler cap clockwise to close the reservoir.
6. Reinstall all covers.

13.3 Tools used in the liquid cooling servicing procedures

Overview

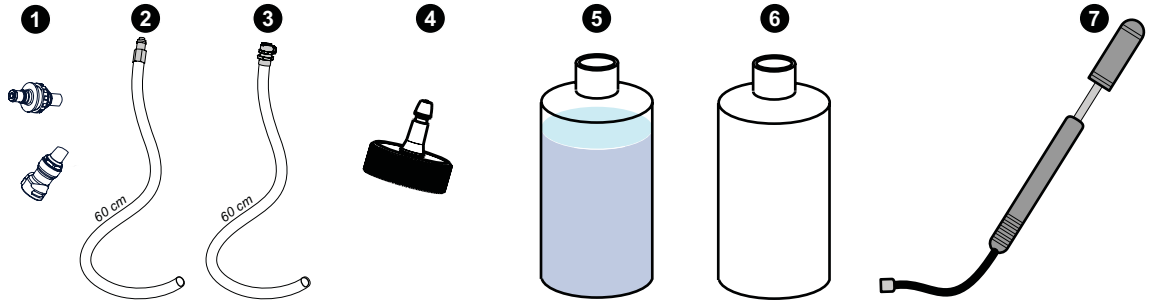


Image 13-4

1	Female and male connector for DP2K projector
2	tube 60 cm with male DP connector (to be replaced for DP2K projector)
3	tube 60 cm with female DP connector (to be replaced for DP2K projector)
4	filler cap with pressure valve
5	bottle with cooling liquid
6	empty bottle
7	bicycle pump

13.4 Draining the liquid cooling circuit

How to drain

1. Remove the filler cap (1).

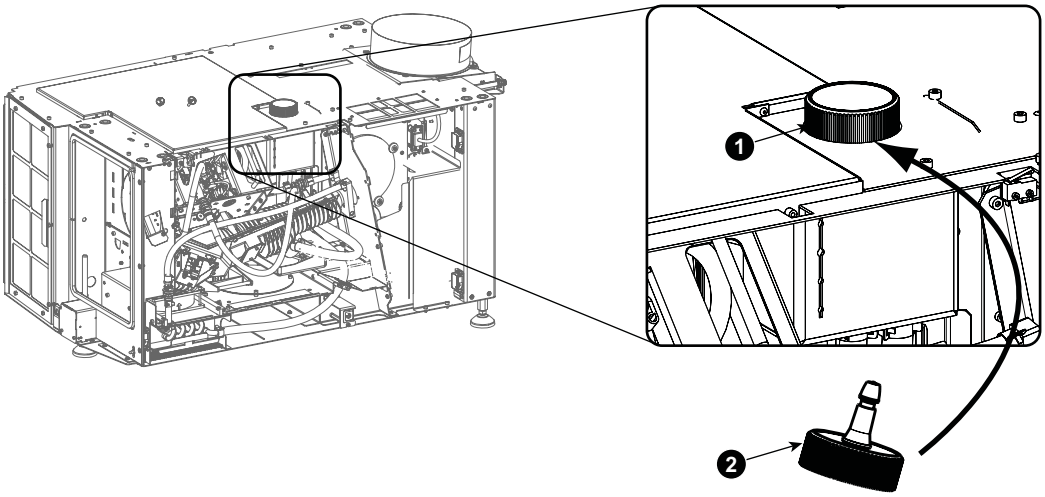


Image 13-5
Replace filler cap

2. Turn the filler cap with pressure valve, out of the cooling refill kit, on the reservoir (2).
3. Interrupt the liquid cooling circuit between the light processor and the pump by uncoupling the valved fitting.

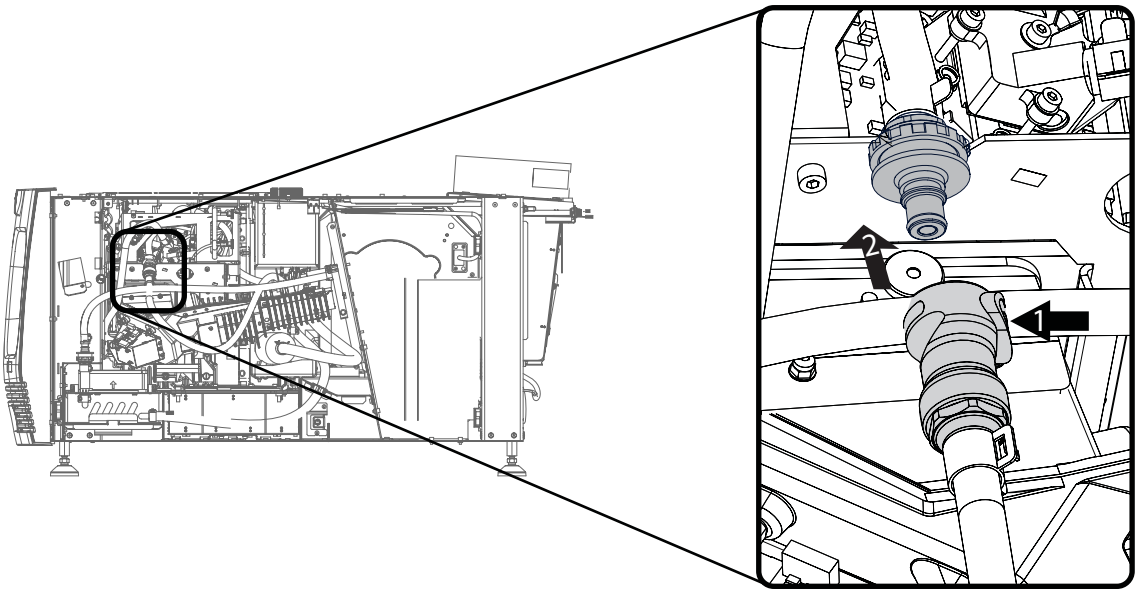


Image 13-6
Interrupt cooling circuit

4. Take a 60 cm tube with female connector and connect to the male fitting going to the light processor.
   Insert the open end of the tube into an empty bottle.

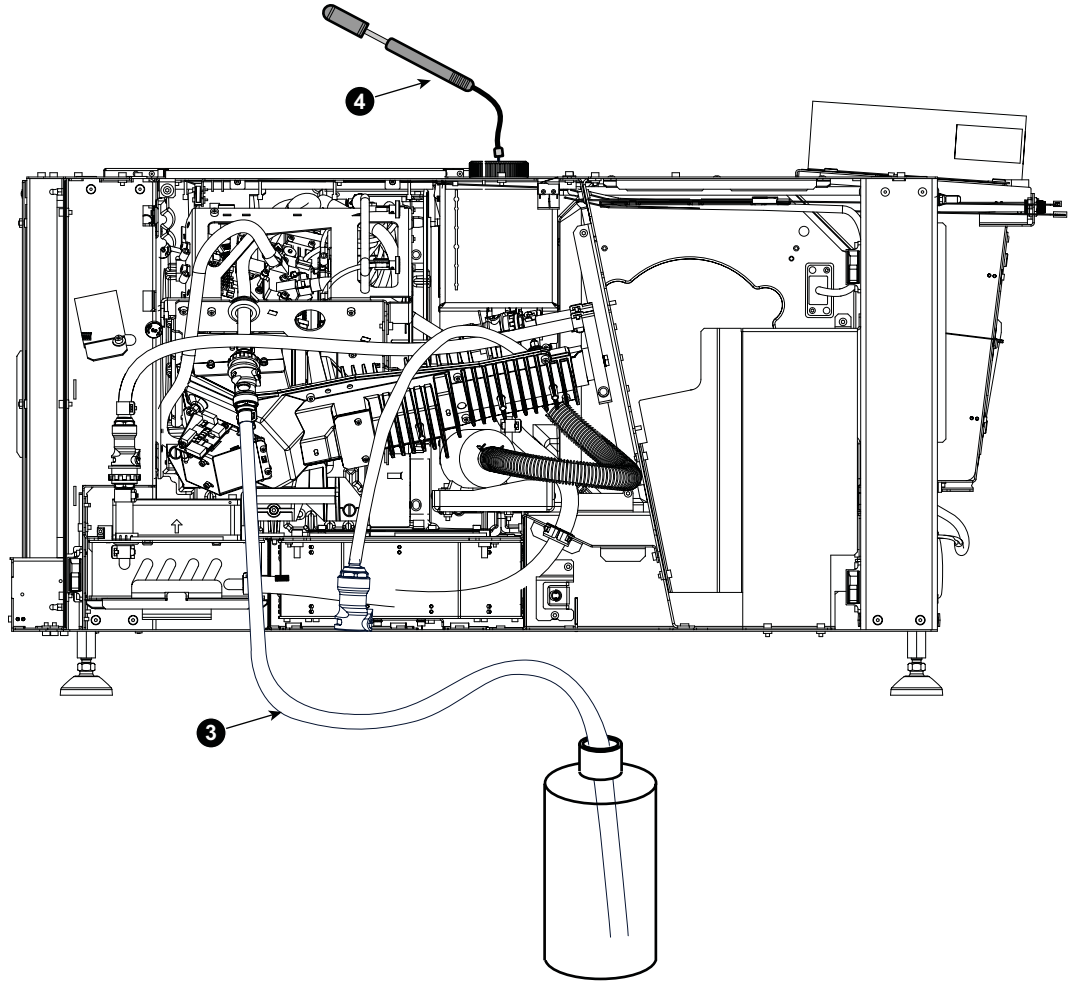


Image 13-7
Draining circuit

5. Connect a bicycle pump to the filler cap and start pumping until no more liquid is coming out of the tube.
6. Disconnect the extension tube.
7. Take a 60 cm long tube with a male connector and connect to the female connector going to the pump (5). Insert the open end of the tube into an empty bottle.

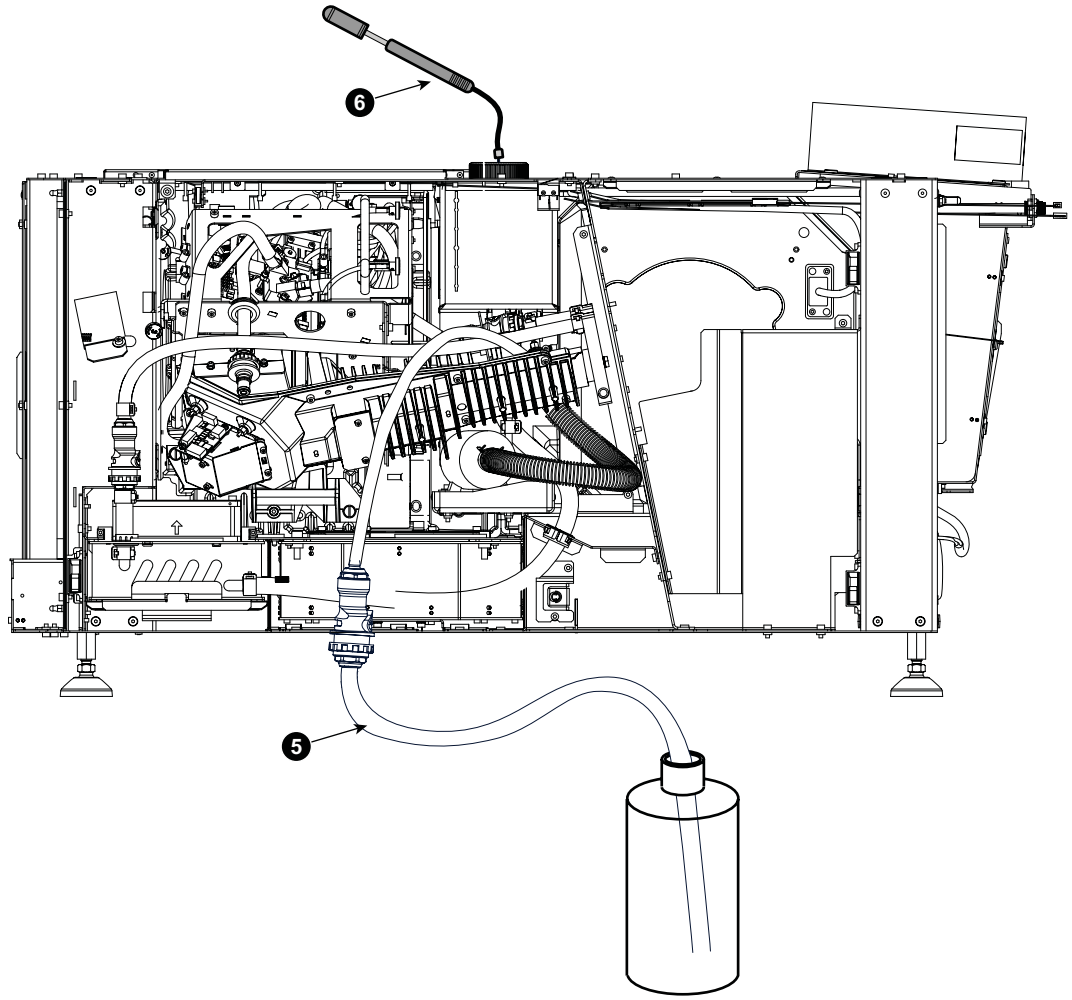


Image 13-8
Draining circuit

8. Start pumping again until all liquid is out of the circuit (6).
9. Disconnect the bicycle pump and remove the filler cap.

13.5 Filling the liquid cooling circuit

WARNING: Only use Barco approved cooling liquid to refill the liquid cooling circuit of the projector. Neglecting this may lead to irreversible damage of the projector.

How to fill

1. Bring the free end of the connected extension tube a few centimeter above the filler opening (1).
   Note: *Make sure that the original tube is still below the reservoir.*

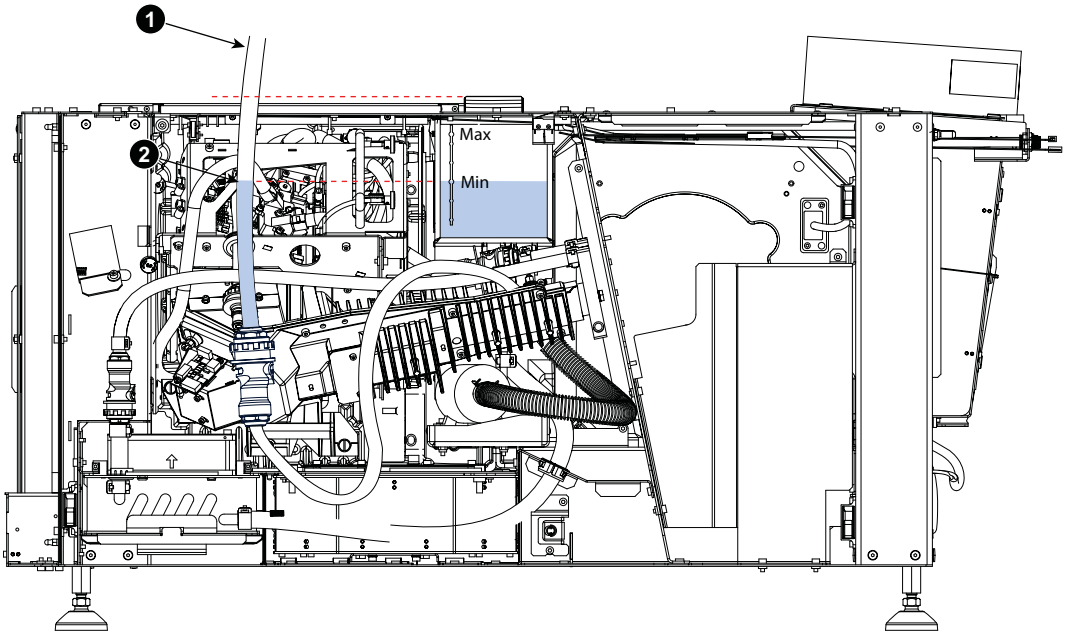


Image 13-9

2. Fill up the reservoir slowly with fresh cooling liquid until liquid is visible inside the extension tube (2).
3. Uncouple the extension tube and pour out the tube into the bottle.
4. Reestablish the connection with the light processor cooling circuit.
5. Fill up the reservoir to its maximum.
6. Reestablish the power connection to the projector and start up the refill mode (**Installation → Advanced → Refill mode**)

   Air bubbles will be visible inside the reservoir.

   The cooling circuit will be filled with liquid and the air will be pushed out.

   When the liquid level in the reservoir becomes to low, fill up with fresh liquid.
7. When the liquid level in the reservoir does not lower anymore, let run the pump for a few more minutes to expel the last air bubbles.
8. Stop the refill mode.
   Fill up the reservoir until the level is equal with the Max indication on the reservoir.
9. Close the reservoir with the filler cap.
10. Reinstall all covers
11. Clear the security warning. See projector's installation manual, chapter *Maintenance*.

13.6 Excluding the Light processor Unit

When excluding the liquid cooling circuit of the Light Processor?

When service actions are required to the pump, heat exchanger, or other parts of the liquid cooling circuit which are not mounted on the Light Processor unit then the cooling circuit of the Light Processor unit can be excluded from the cooling circuit in the projector. Excluding the Light Processor unit will minimize the risk on air bubbles in the cooling system.

The service procedures for the liquid cooling system such as draining and filling are described for the whole cooling circuit. Nevertheless, you can use the same procedures and exclude the Light Processor if applicable.

CAUTION: Do not exclude the light processor when starting the refill process.

How to exclude the light processor unit

1. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger. This tube comes from the cooling block on the Light Pipe entrance.

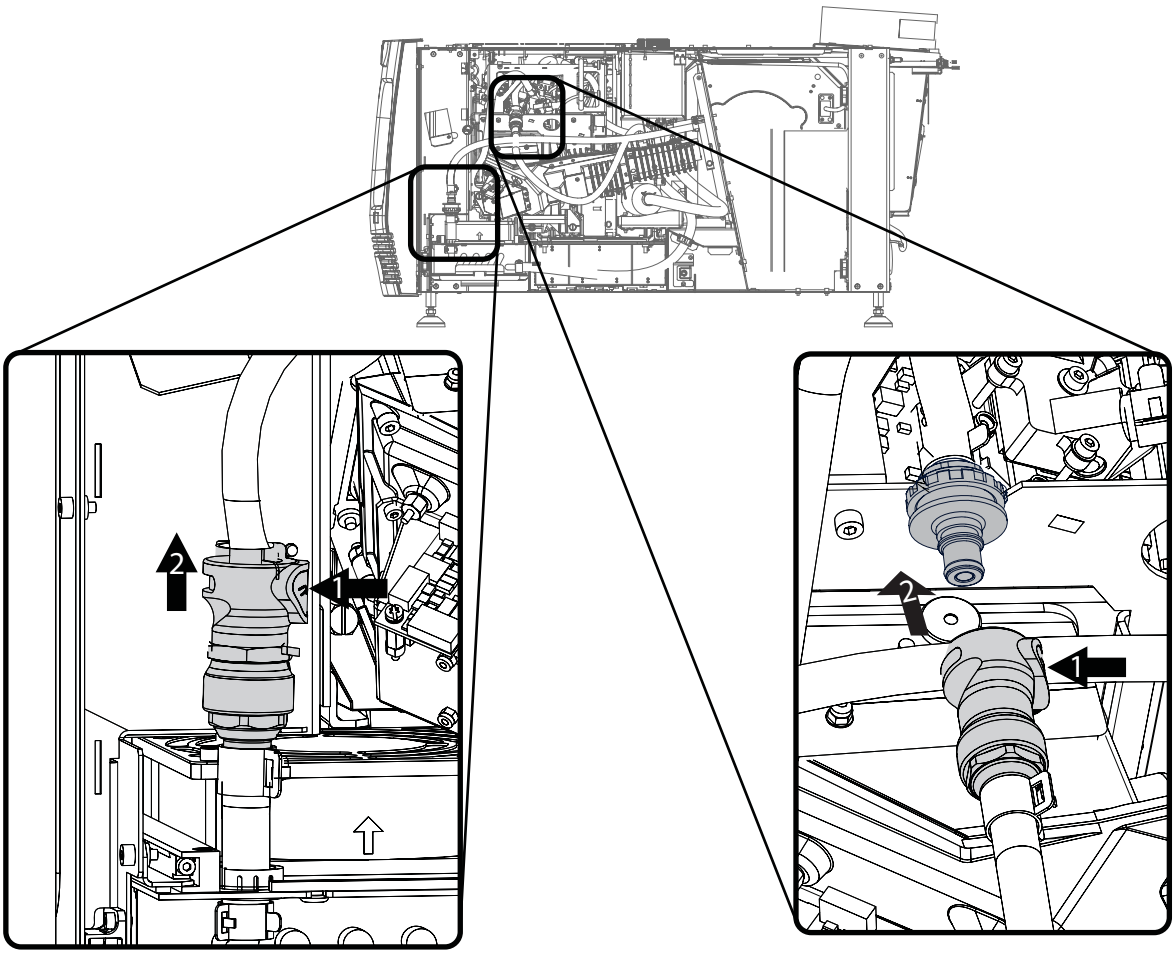


Image 13-10
Excluding light processor

2. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the Light Processor unit. This tube comes from the pump exit.
3. Draining procedure can be started in the same way as described in "Draining the liquid cooling circuit", page 223.

Connect the tube which comes from the cooling block on the Light Pipe entrance with the valved fitting at the Light Processor.

13.7 Removal of the heat exchanger

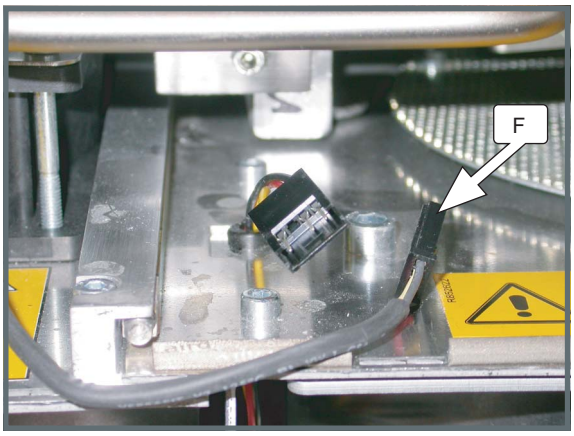
This procedure assumes that the left side cover and the cover of the sealed compartment is already removed.

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.
- Pair of pliers.
- Universal pliers.
- 7 mm open-end wrench.

How to remove

1. Drain the liquid cooling circuit, see "Draining the liquid cooling circuit", page 223.
   Tip: *Exclude the light processor unit from the draining process.*
2. Disconnect the fan (reference F) of the heat exchanger and the wire unit of the pump (reference P) as illustrated. Use a set of pliers to cut the cable tie which fasten the wire unit of the pump with the tubing.



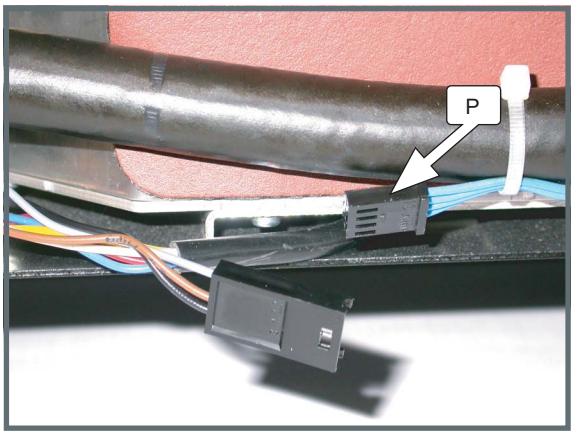


Image 13-11
Disconnection of hear exchanger fan

3. Pull out the tube out of the tube fixation.

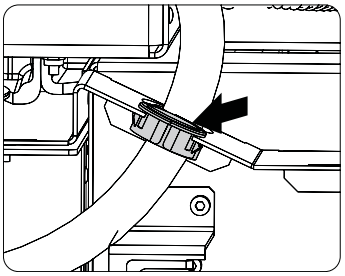


Image 13-12

4. Release the two fixation screws of the heat exchanger assembly and pull out the assembly.

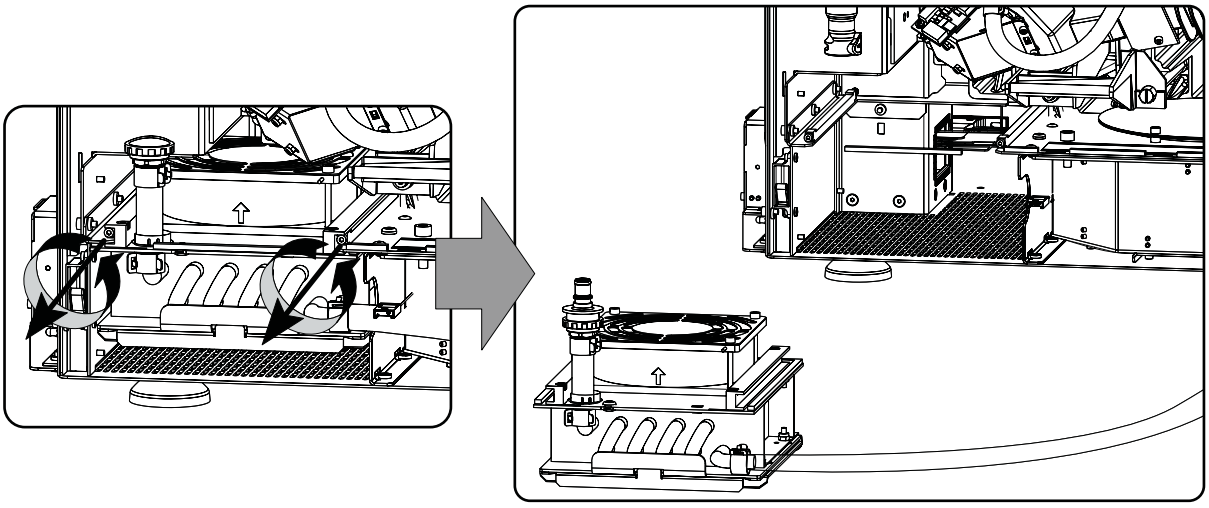


Image 13-13
Remove heat exchanger assembly

5. Remove the tubing from the heat exchanger inlet (reference 1) and outlet (reference 2). Use a universal pliers to push both clip tongs to each other in order to open the clip, which securing the tube, and move the clip away.

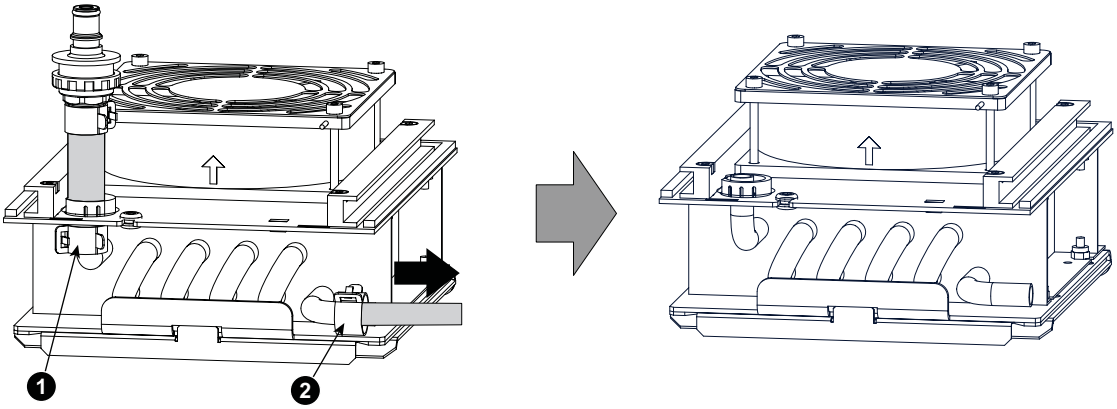


Image 13-14
Remove tubing

6. Disassembly the heat exchanger assembly by removing the eight indicated nuts (reference 3). As a result the heat exchanger (reference 5) comes loose from the fan assembly (reference 4) and from the filter assembly (reference 6).

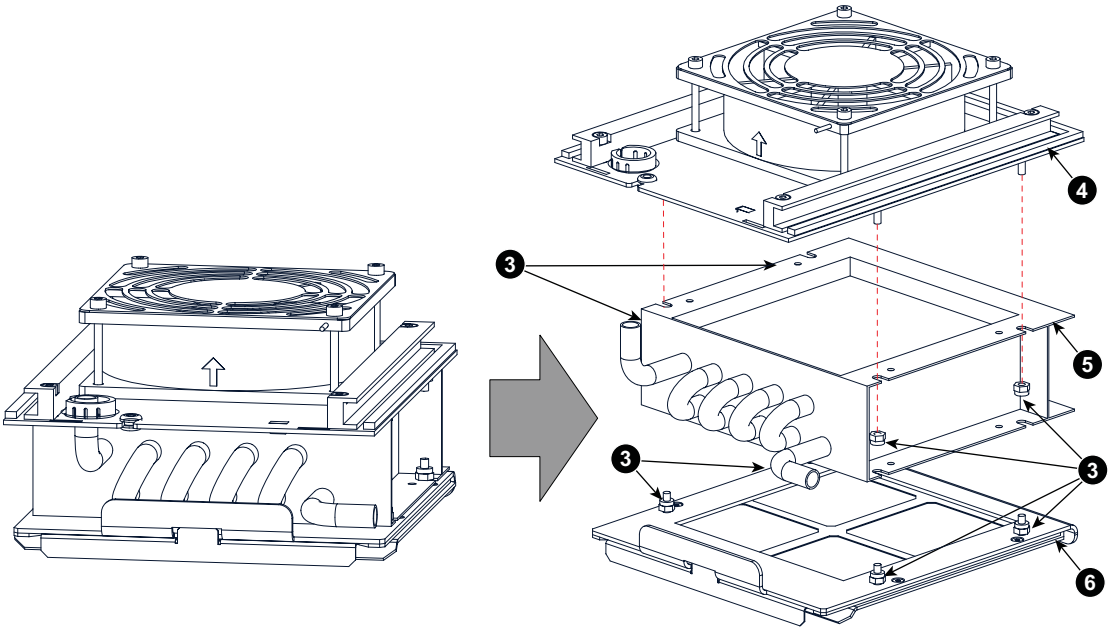


Image 13-15
Separate heat exchanger

13.8 Installation of the heat exchanger

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.
- Pair of pliers.
- Universal pliers.
- 7 mm open-end wrench.

Necessary parts

Cable tie.

How to install

1. Slide a clip (reference 7 of image 13-16) over the copper inlet tube of the heat exchanger.
2. Mount the heat exchanger (reference 5), the fan assembly (reference 4) and the filter assembly (reference 6) together as illustrated. Use a 7 mm open-end wrench to fasten the eight nuts (reference 3).

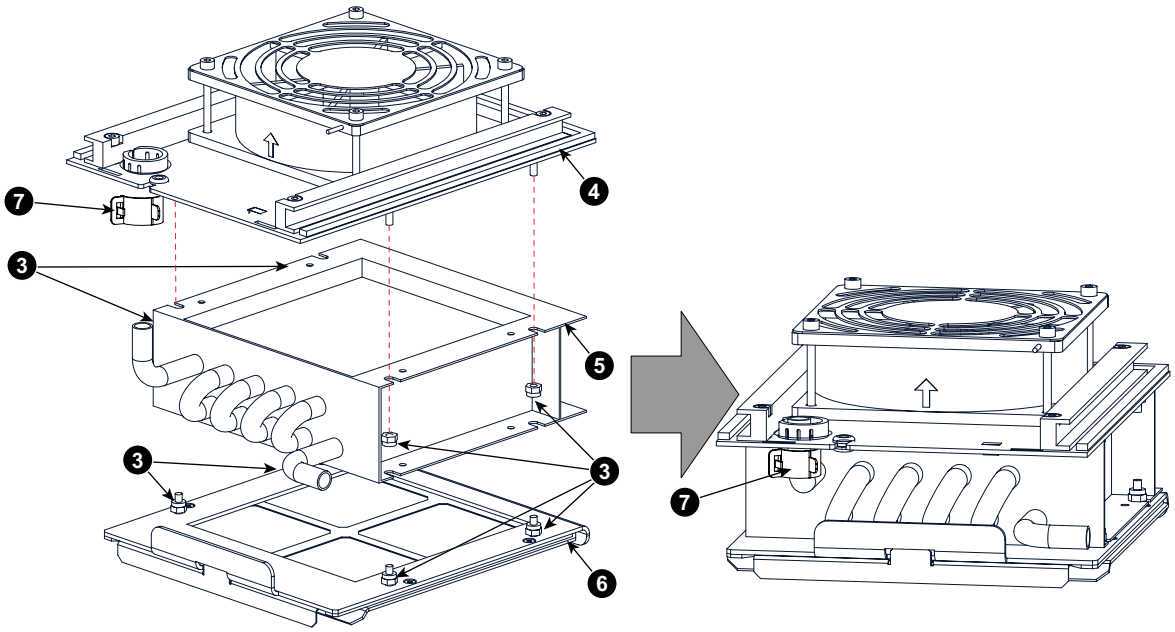


Image 13-16
Mount heat exchanger

3. Push the short tube + valved fitting through the hole in the plate on the inlet of the heat exchanger. Use a universal pliers to secure the tube with the clip (reference 1 of image 13-16) which you provided in step 1.
4. Push the long free tube he outlet of the heat exchanger. Use a universal pliers to secure the tube with a clip (reference 2).

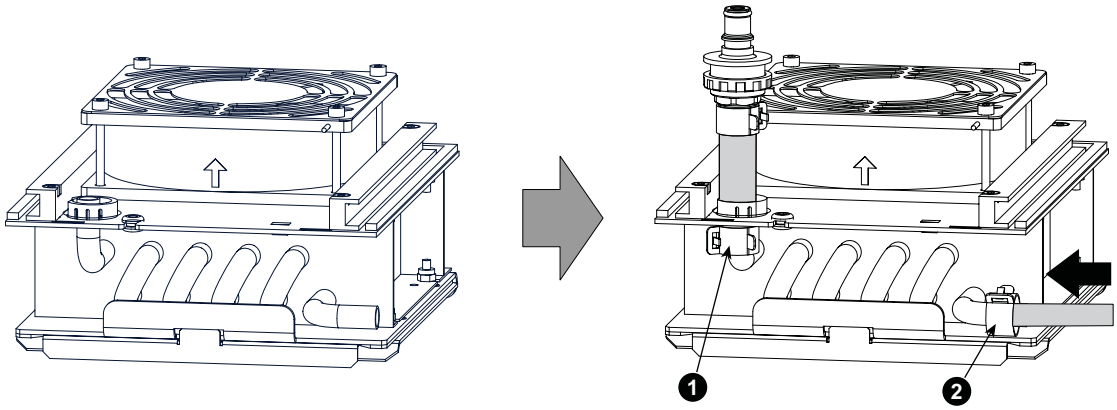


Image 13-17
Mount tubes

5. Slide the heat exchanger assembly in its place and fasten the two fixation screws.

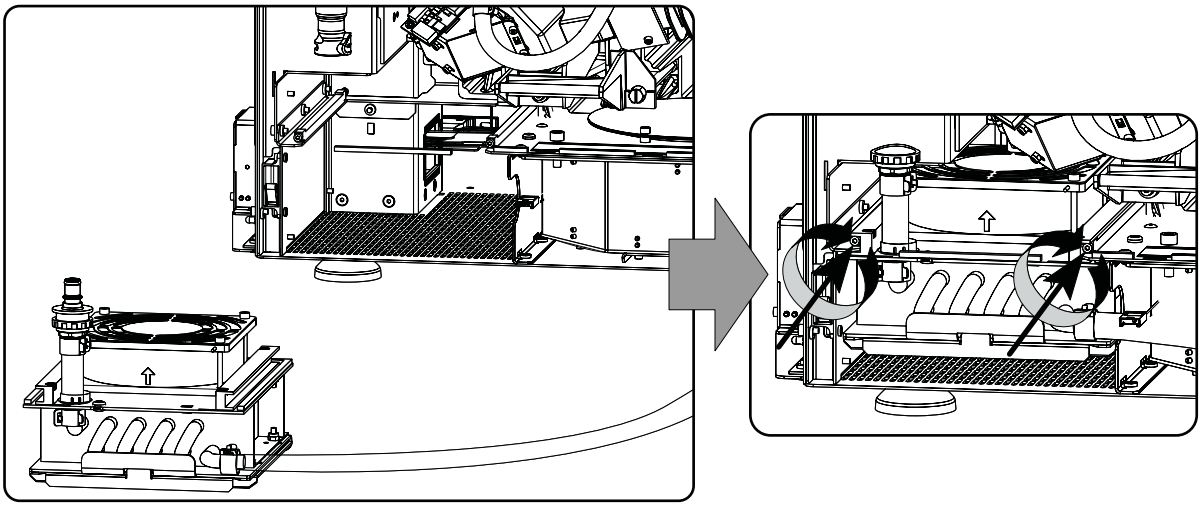


Image 13-18
Insert assembly

6. Insert the cooling fixation into the plate.
7. Reconnect the wire unit of the fan (reference F) and the wire unit of the pump (reference P). Use a cable tie (reference T) to secure the wire unit of the pump with the tubing.

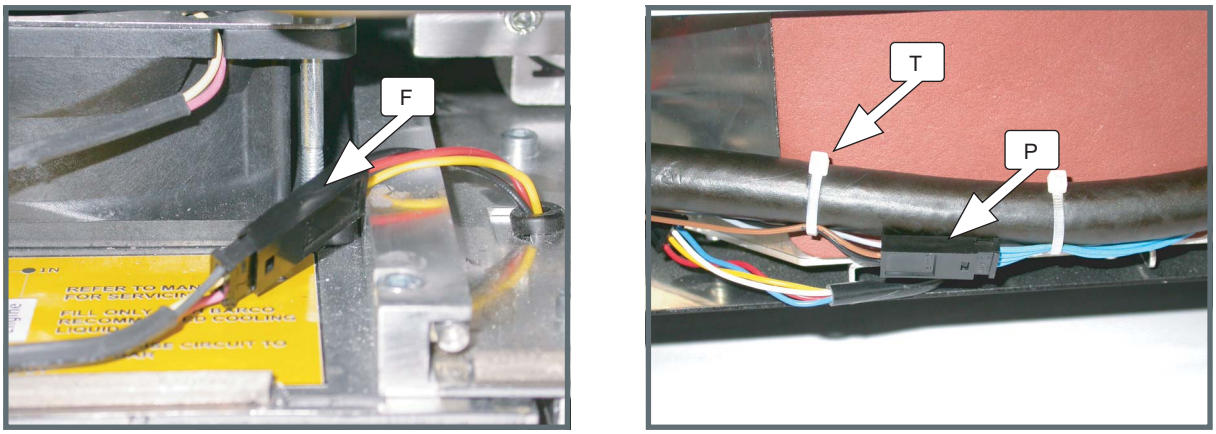


Image 13-19
Fan connection

8. Reinstall the complete cooling circuit and start up the refill procedure.

13.9 Cleaning the cooling pump

What can happen?

Due to crystallization inside the pump, the rotor can be jammed. This crystallization can be easily removed and the pump can be reused again. In most cases it will be sufficient to clean the pump instead of replacing it with a new one. However, note that the bearings of the pump are subject to wear. Because of that the complete pump (pump house included) has to be replaced every 4 years.

This procedure assumes that the Light Processor is removed from the projector (see chapter "Light processor removal) and that the liquid cooling circuit" is drained (see "Draining the liquid cooling circuit").

Necessary tools

- PH2 Phillips screwdriver.
- Soft cloths.
- Cotton swabs (Q-tips, ear buds).

How to clean

1. Remove the four screws (reference 1) which fasten the pump house to the pump motor.

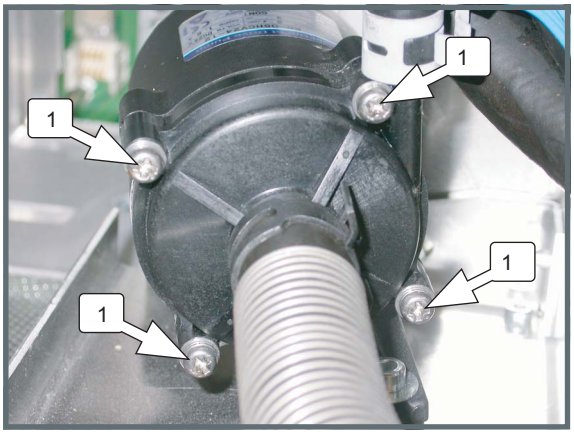


Image 13-20
Pump house, remove

2. Slide the pump house with hose backwards. Use a cloth to absorb the remaining cooling liquid.

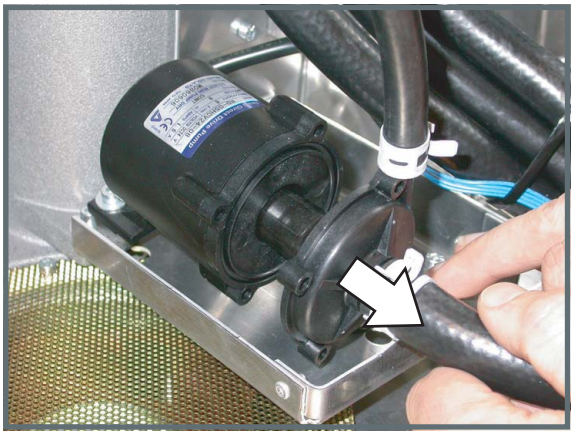


Image 13-21
Pump house removal

3. Take the rotor between thumb and finger and slide it out of the pump motor.

Image 13-22
Rotor

4. Clean the pump house, the rotor and the pump motor with a clean soft cloth. Use cotton swabs to clean the bearing inside the pump motor and pump house.
   Caution: *The bearings of the Pump are fragile. Be careful when cleaning.*
5. Reinsert the rotor and try to turn it smoothly. If not successful stop this procedure and replace the pump completely.
6. Slide the pump house with hose back on the pump motor.
   Caution: *Make sure the sealing ring of the Pump motor is not damaged and is on its place.*
7. Fasten the four screws (reference 1) of the pump house crosswise.

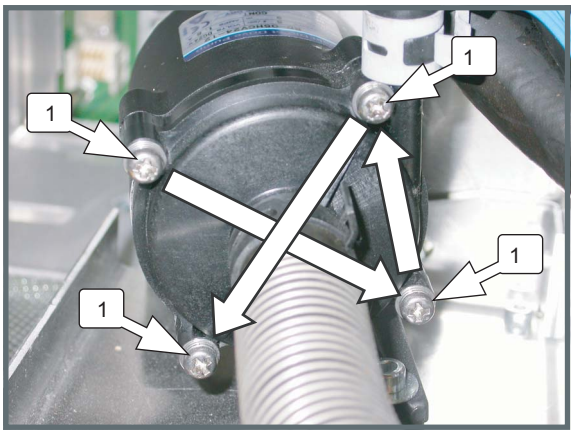


Image 13-23
Pump house, close

Refill the liquid cooling circuit in case the pump is successfully cleaned. If cleaning is not possible, replace the pump completely.

13.10 Replacement of the pump motor and rotor

When replacing the pump motor and pump rotor?

In case of an electrical failure of the pump you can replace the pump motor and pump rotor without replacing the pump house. This way you do not have to cut the hoses from the pump house which simplify the replacement procedure. However, note that the bearings of the pump are subject to wear. Because of that the complete pump (pump house included) has to be replaced every 4 years.

You have to order a complete pump but you only have to use the pump motor and pump rotor.

This procedure assumes that the Light Processor is removed from the projector (see chapter “Light processor removal) and that the liquid cooling circuit” is drained (see “Draining the liquid cooling circuit”).

Necessary tools

- 3 mm Allen wrench with ball point.
- 7 mm open-end wrench.
- PH2 Phillips screwdriver.
- Cloths.
- Cotton swab.

How to replace the pump motor and pump rotor

1. Disconnect the wire unit of the cooling pump.

Image 13-24
Electrical connection pump

2. Remove the four screws (reference 1) which fasten the pump house to the pump motor.

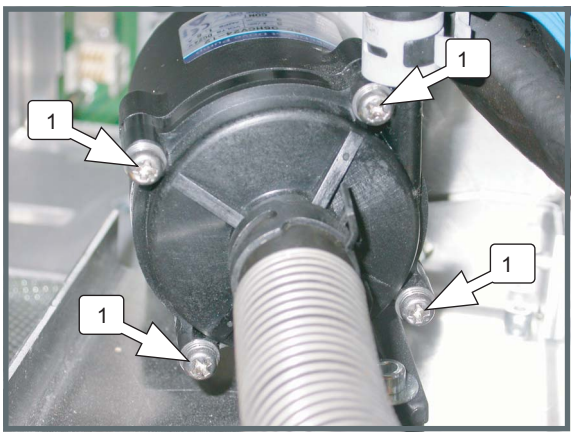


Image 13-25
Pump house, fixation

3. Slide the pump house with hose backwards. Use a cloth to absorb the remaining cooling liquid.

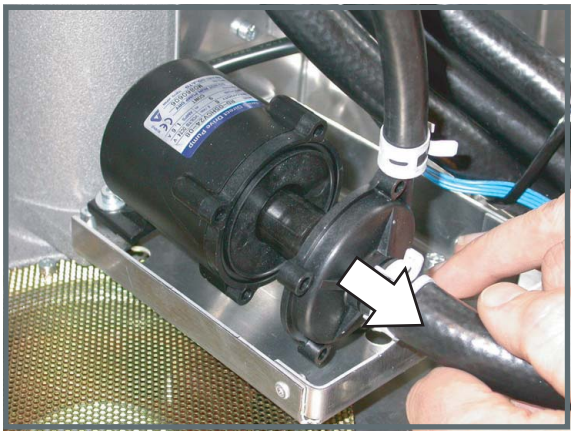
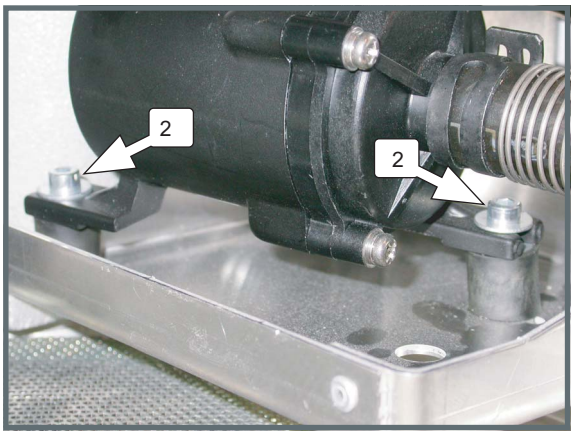


Image 13-26
Pump house, remove

4. Release the two hexagon socket head cap screws (reference 2) which fasten the pump motor to the seating of the pump. Use a 3 mm Allen wrench to release the screws and a 7 mm open-end wrench to hold the nut (reference 3) when releasing the screw.



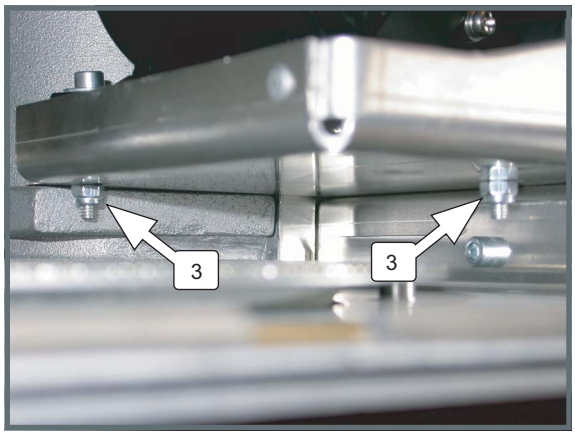


Image 13-27
Pump, removal

5. Replace the pump motor and pump rotor.

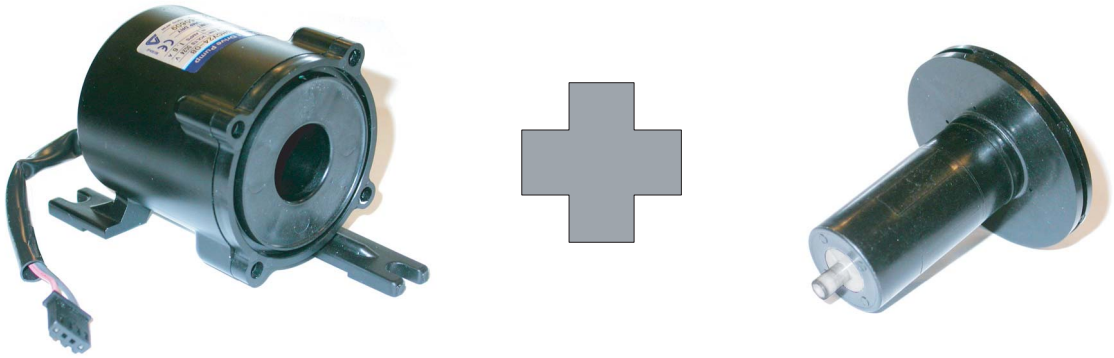


Image 13-28
Pump motor & rotor

6. Secure the pump motor with two hexagon socket head cap screws (reference 2). Use a 3 mm Allen wrench to fasten the screws and a 7 mm open-end wrench to hold the nut (reference 3) while fasten the screw.
   Caution: *Make sure that the pump is mounted upon two rubber vibration rings (reference 4).*

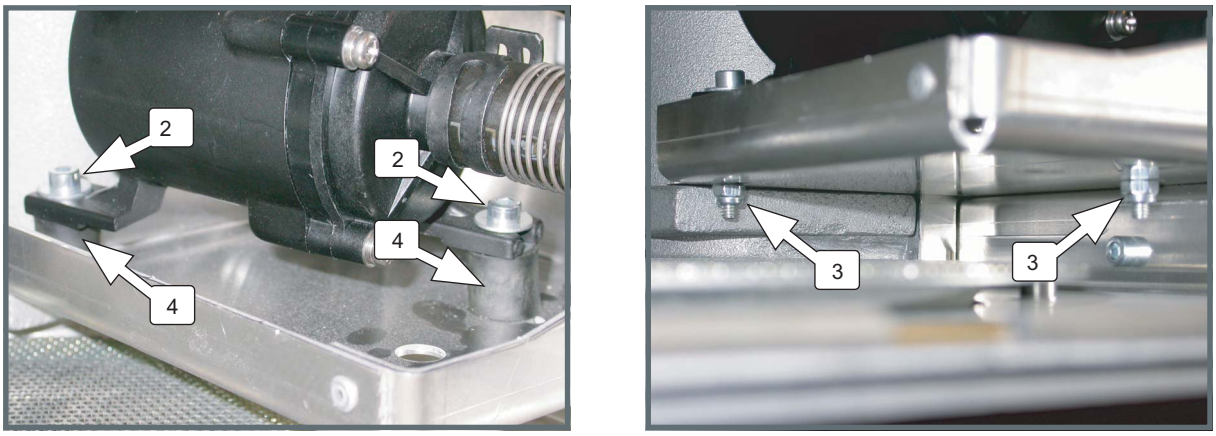


Image 13-29
Pump, fixation

7. Clean the pump house with a clean soft cloth. Use cotton swabs to clean the bearing of the pump house.
8. Slide the pump house with hose on the new pump motor.
   Caution: *Make sure that the new Pump motor is provide with a new rotor and a new sealing ring.*

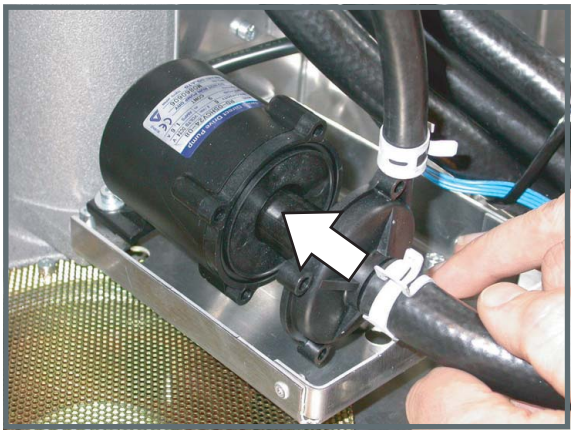


Image 13-30
Pump house, installation

9. Fasten the four screws (reference 1) of the pump house crosswise using a PH2 Phillips screwdriver.

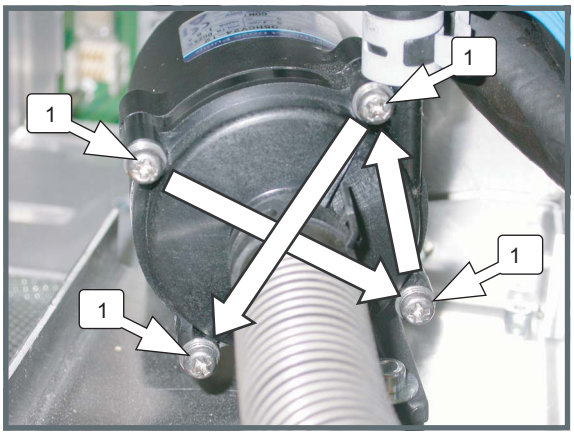


Image 13-31
Pump house, fixation

10. Reconnect the wire unit of the pump.

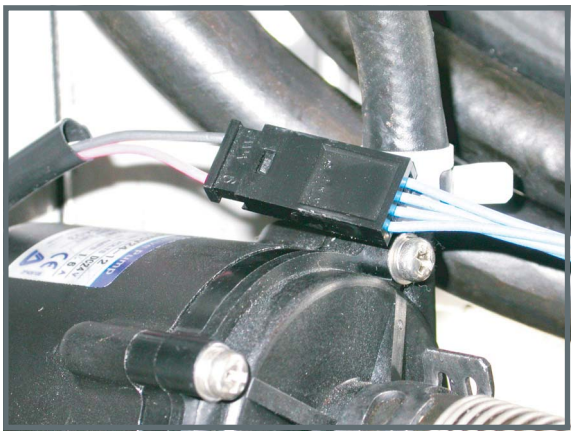


Image 13-32
Electrical connection

13.11 Replacement of the complete cooling pump

This procedure assumes that the Light Processor is removed from the projector (see chapter “Light processor removal) and that the liquid cooling circuit” is drained (see “Draining the liquid cooling circuit”).

Necessary tools

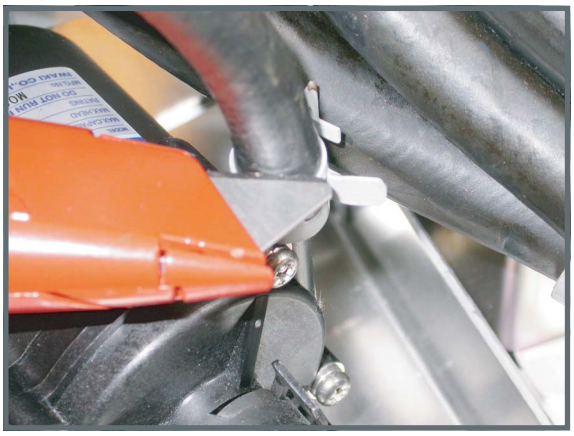
- 3 mm Allen wrench with ball point.
- 7 mm open-end wrench.
- PH2 Phillips screwdriver.
- Cloths.
- Universal pair of pliers.
- Knife.

How to replace the pump

1. Disconnect the wire unit of the pump.

Image 13-33
Electrical disconnection

2. Cut both hoses from the pump house. Cut just next to the clip to have a minimal loss in length of the hose.



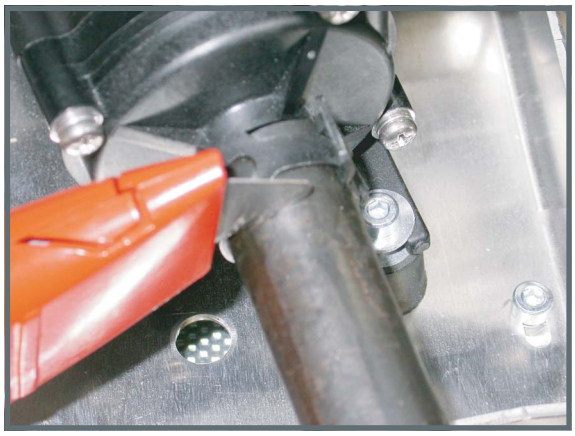


Image 13-34
hose cutting

3. Remove both clips from the pump house. Use an universal pair of pliers to push both clip tongs to each other in order to open the clip.
   Note: *It is almost impossible to remove first the clip and then to pull off the hose.*
4. Release the two hexagon socket head cap screws (reference 2) which fasten the pump motor to the seating of the pump. Use a 3 mm Allen wrench to release the screws and a 7 mm open-end wrench to hold the nut (reference 3) when releasing the screw.

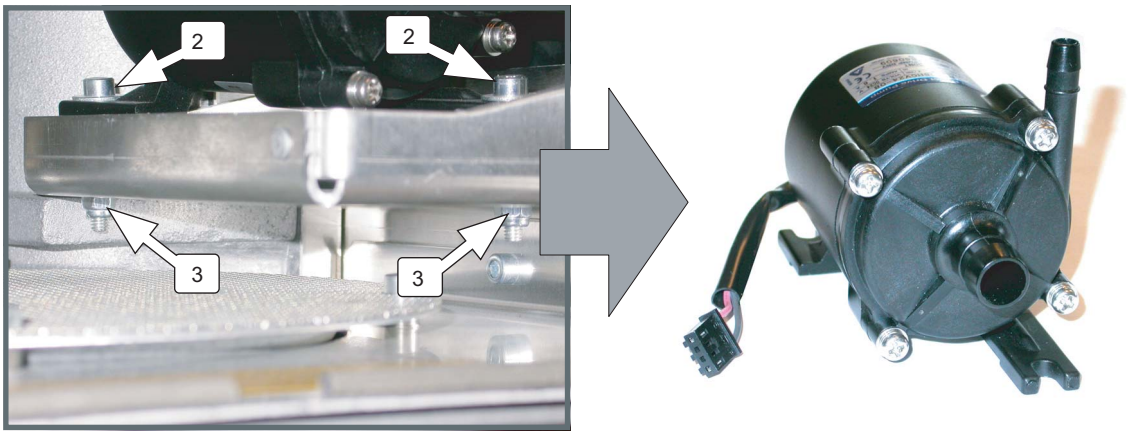


Image 13-35
Pump, removal

5. Install a new pump on the seating and fasten with two screws (reference 2), two rubbers reference 4), two washers (reference 5) and two nuts (reference 3). Use a 3 mm Allen wrench to fasten the screws and a 7 mm open-end wrench to hold the nut while fasten the screw.
   Caution: *Make sure that the pump is mounted upon two rubber vibration rings.*

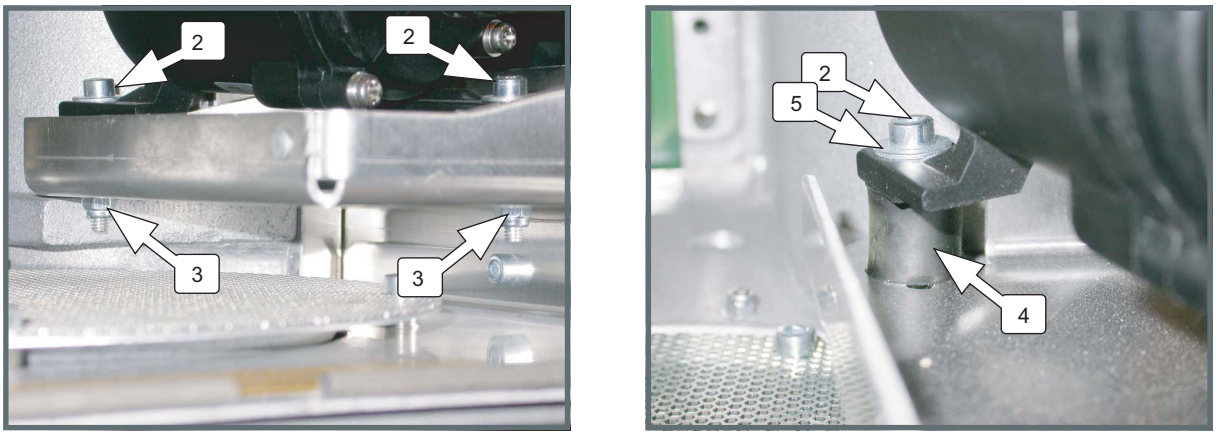


Image 13-36
Pump, mounting

6. Provide both hoses with a clip (reference 7 & 9) and push the hoses over their respective nipple of the pump house. Note that the thick nipple (reference 6) is the input side of the pump house and has to be connected with the thick hose that comes from the pressure vessel. The small nipple (reference 8) is the output side of the pump house and should be connected with the hose that comes from the Light Processor.

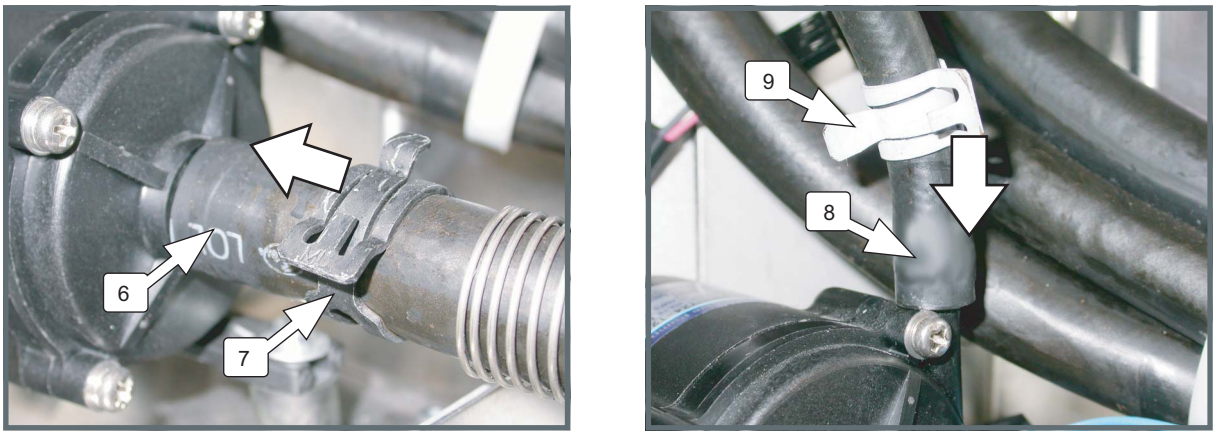


Image 13-37
Hose connection

7. Slide the clip of both hoses over the connection. Use an universal pair of pliers to push both clip tongs to each other in order to open the clip and to move the clip over the connection.
8. Reconnect the wire unit of the pump.

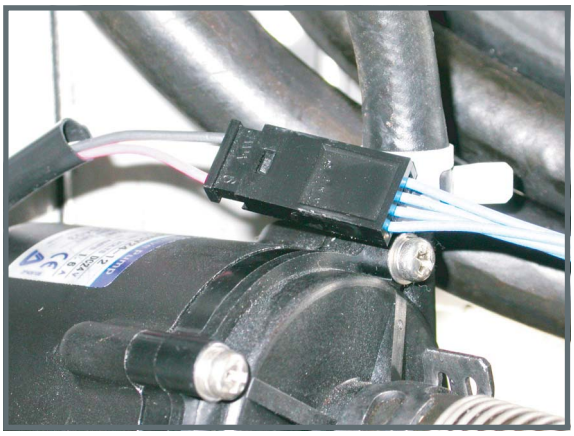


Image 13-38
Electrical connection

14. LENSES AND LENS HOLDER

Overview

- Available lenses
- Lens selection
- Lens removal
- Lens installation
- Cleaning the lens
- Remove the lens holder
- Install the lens holder
- Scheimpflug adjustment
- Replacement of the Vertical Shift stepper motor
- Replacement of the Horizontal Shift stepper motor
- First Placement of the Inner Dust Rubber
- Replacement of the Inner Dust Rubber

14.1 Available lenses

Which lenses are available for my projector?

The table below is subject to changes and was last updated on 01/06/2012. Consult my.barco.com for the most recent information about available lenses.

Product Number	Type	Zoom range	Image
R9855957	Motorized	1,2 – 1,81	image 14-1
R98559571	Manual	1,2 – 1,8	
R9855931	Motorized	1,4 – 2,05	image 14-2
R98559311	Manual	1,4 – 2,05	
R9855932	Motorized	1,6 – 2,5	image 14-3
R9855933	Motorized	1,6 – 2,5	image 14-4
R98559321	Manual	1,6 – 2,5	image 14-5
R98559331	Manual	1,6 – 2,5	
R9855934	Motorized	1,95 – 3,2	image 14-6
R9855935	Motorized	1,95 – 3,2	image 14-7
R98559341	Manual	1,95 – 3,2	image 14-8
R98559351	Manual	1,95 – 3,2	
R9855936	Motorized	2,4 – 3,9	image 14-9
R98559361	Manual	2,4 – 3,9	

Image 14-1
R9855957

Image 14-2
R9855931

Image 14-3
R9855932

Image 14-4
R9855933

Image 14-5
R98559321

Image 14-6
R9855934

Image 14-7
R9855935

Image 14-8
R98559341

Image 14-9
R9855936

14.2 Lens selection

Which lens do I need?

1. Go to Barco's website on www.barco.com and click on myBarco
2. Login on.
   If you are not yet registered create a login and password. With the created login and password, it is possible to enter myBarco.

   When your login is correct, the start page is displayed.
3. Click the **Support** tab, then **Digital cinema calculator** (on the left of the screen) and select the appropriate lens calculator.

   The lens calculator (see screenshot, image 14-10) will be displayed.

   The lens calculator allows you to have an overview of which lenses are suitable for your specific projector setup. Just make your selection of parameters and all possible configurations are displayed.

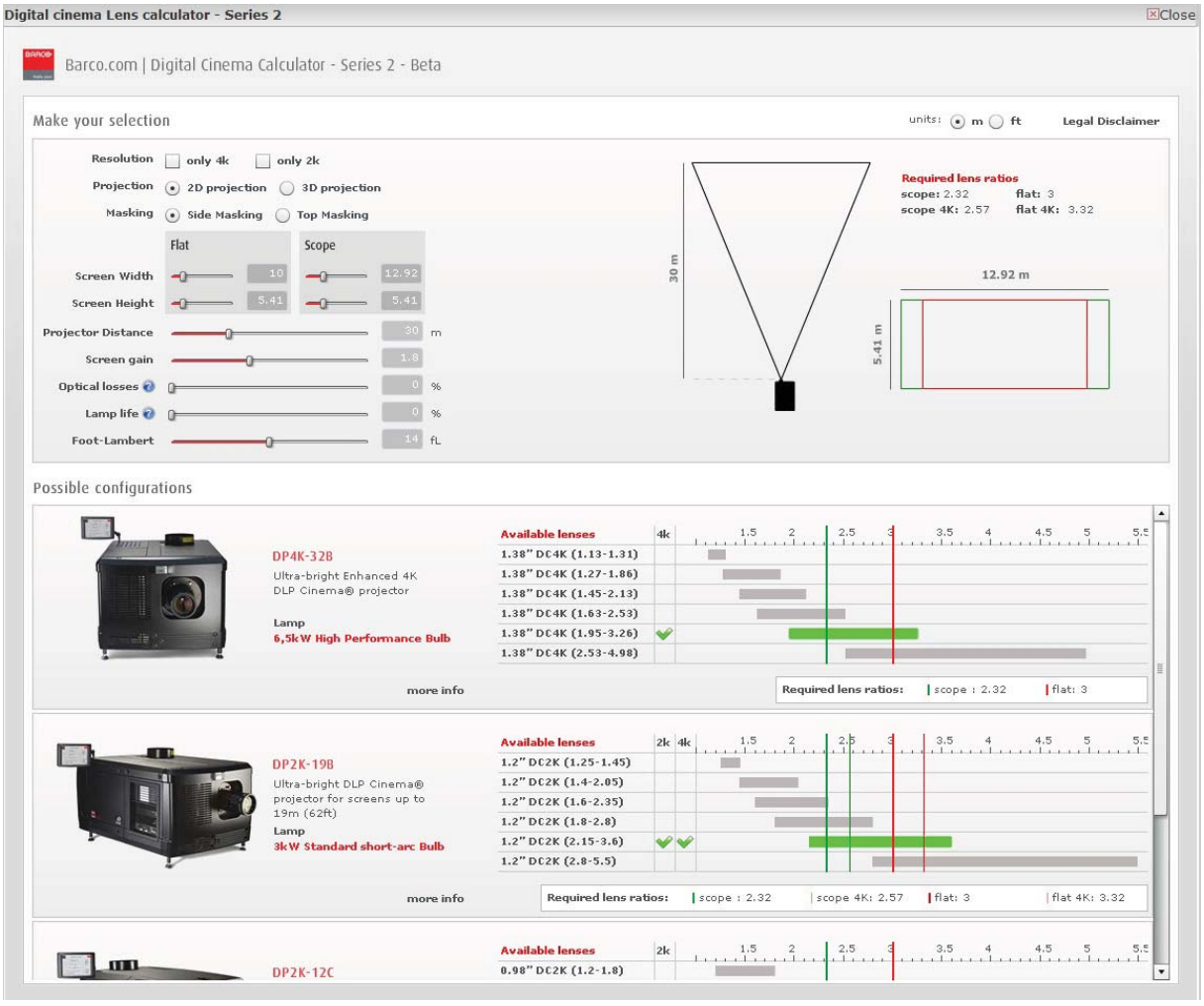


Image 14-10
Digital cinema lens calculator

Take into account that when the projector is tilted the Screen Width you have to fill in should be larger than the physical screen width due to the keystone distortion of the projected image. How much larger depends on the amount of tilt.

Due to production tolerances the real distances can differ by 2% from the calculated values.

For critical situations (fixed installs that use the lens at one of its extreme zoom positions) this should be taken into account.

14.3 Lens removal

How to remove a lens from the projector lens holder ?

1. Support the lens with one hand while you unlock the lens holder by sliding the lock handle towards the “unlocked” position as illustrated.

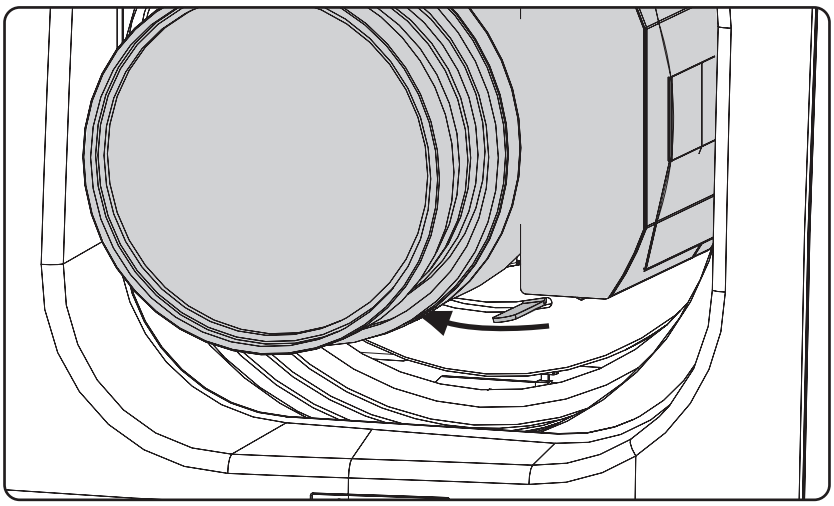


Image 14-11

2. Gently pull the lens out of the lens holder.

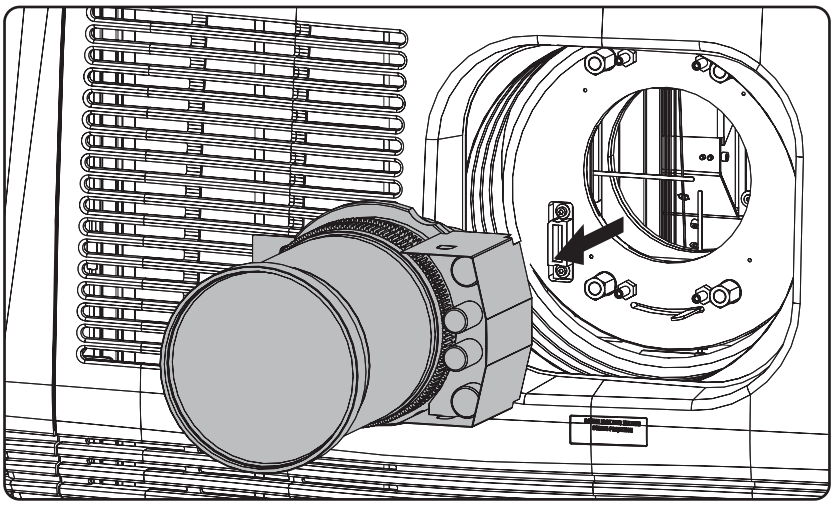


Image 14-12
Remove lens

It’s recommended to place the Lens caps of the original Lens packaging, back on both sides of the removed Lens to protect the optics of the Lens.

It’s recommended to place the foam rubber of the original projector packaging, back into the Lens opening to prevent intrusion of dust. Note that this foam rubber is packed in a plastic bag to prevent the dust, emitted by the foam, from entering the projector.

14.4 Lens installation

How to install a lens into the projector lens holder ?

1. Remove the foam rubber in the opening of the lens holder if not removed yet.
2. Take the lens assembly out of its packing material and remove the lens caps on both sides.
3. Close the lens locking mechanism prior to lens insertion (1). Lens locking mechanism is closed by pushing the lens lock to the right.

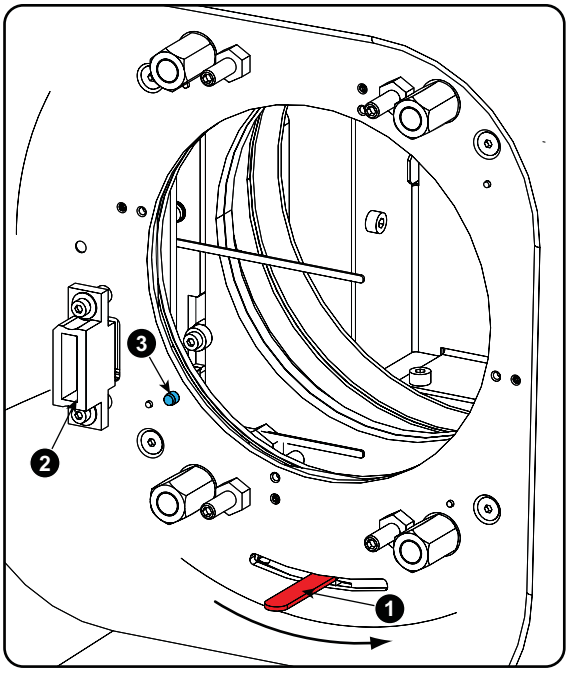


Image 14-13
1 Lens holder lock
2 Power connector lens
3 Alignment pin

4. Ensure that the lens holder stands in the On-Axis position (horizontal and vertical mid position).
   Note: *The lens holder is placed default in the On-Axis position at factory.*
5. Gently insert the lens in such a way that the lens connector matches the socket (B).

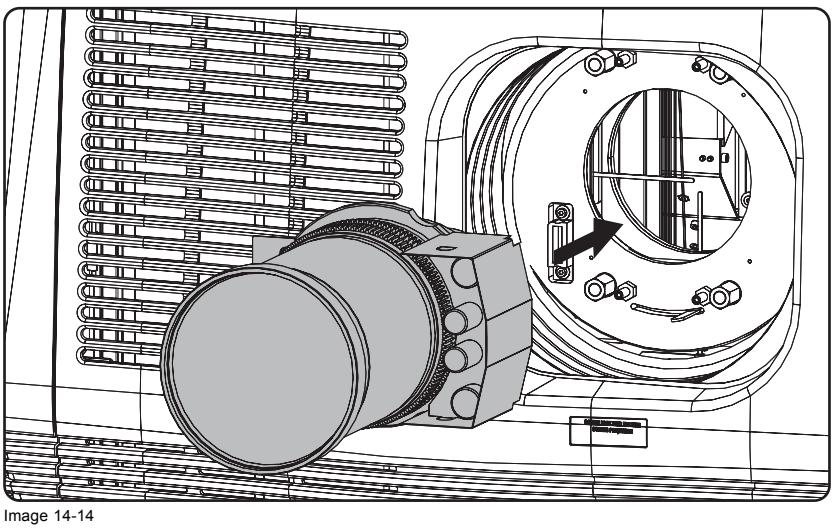


Image 14-14

6. Insert the lens until the connector seats into the socket.
   Warning: *Do not release the Lens yet, as the Lens may fall out of the Lens Holder.*

   A clear “click” should be heard when the retainer springs engage into the slot provided on the lens. Besides the clear click, the springs actually help to guide the lens into position and hence prevent jamming.
7. Check if the lens is really secured by trying to pull the lens out of the lens holder.

CAUTION: Never transport the projector with a Lens mounted in the Lens Holder. Always remove the Lens before transporting the projector. Neglecting this can damage the Lens Holder and Prism.

14.5 Cleaning the lens

To minimize the possibility of damage to optical coatings, or scratches to lens surfaces follow the cleaning procedure as described here precisely.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any water-based lens cleaner)

How to clean the lens?

1. Blow off dust with clean compressed air (or pressurized air cans[9]) .
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes in one single direction.
   Warning: *Do not wipe back and forwards across the lens surface as this tends to grind dirt into the coating.*
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

If smears occur when cleaning lenses, replace the cloth. Smears are the first indication of a dirty cloth.

9. Pressurized air cans are not efficient if there is too much dust on the surface, the pressure is too low

14.6 Remove the lens holder

Necessary tools

- Nut driver 5.5 mm or an open spanner with SW 5.5
- Allen wrench 5 mm

Electrical disconnections

1. Remove the nut, securing the EMC cable to the frame (image indication 1).

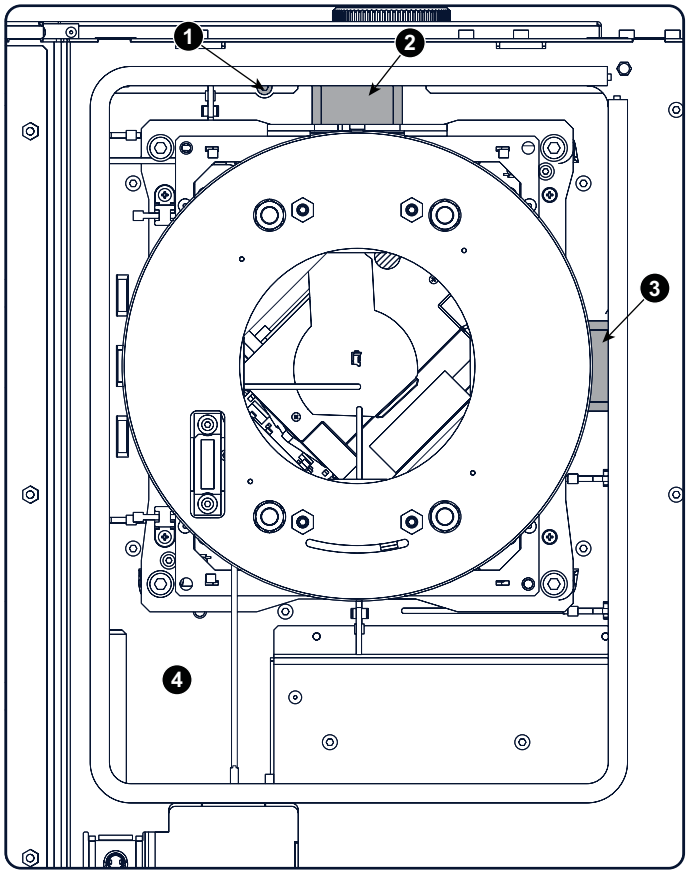


Image 14-15
Electrical connections, location

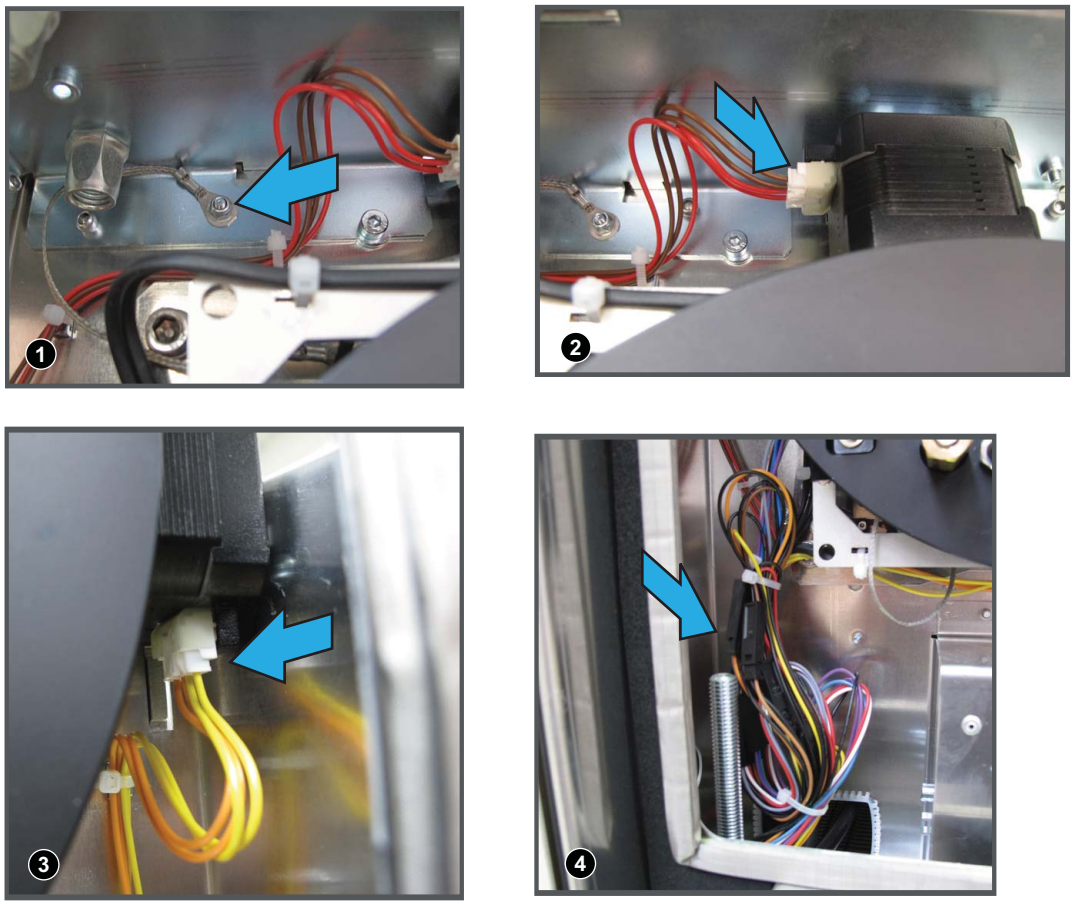


Image 14-16
Electrical connections, image view

2. Unplug the connector of the top motor (image indication 2) (brown and red wires).
3. Unplug the connector of the side motor (image indication 3) (yellow and orange wires).
4. Disconnect all connectors of the wire set (4x 2 pins connectors and 2x 6 pins connectors) (image indication 4). If necessary, cut the wire ties.

Remove lens holder

1. Remove the 4 hexagon socket heat screws (1 to 4).

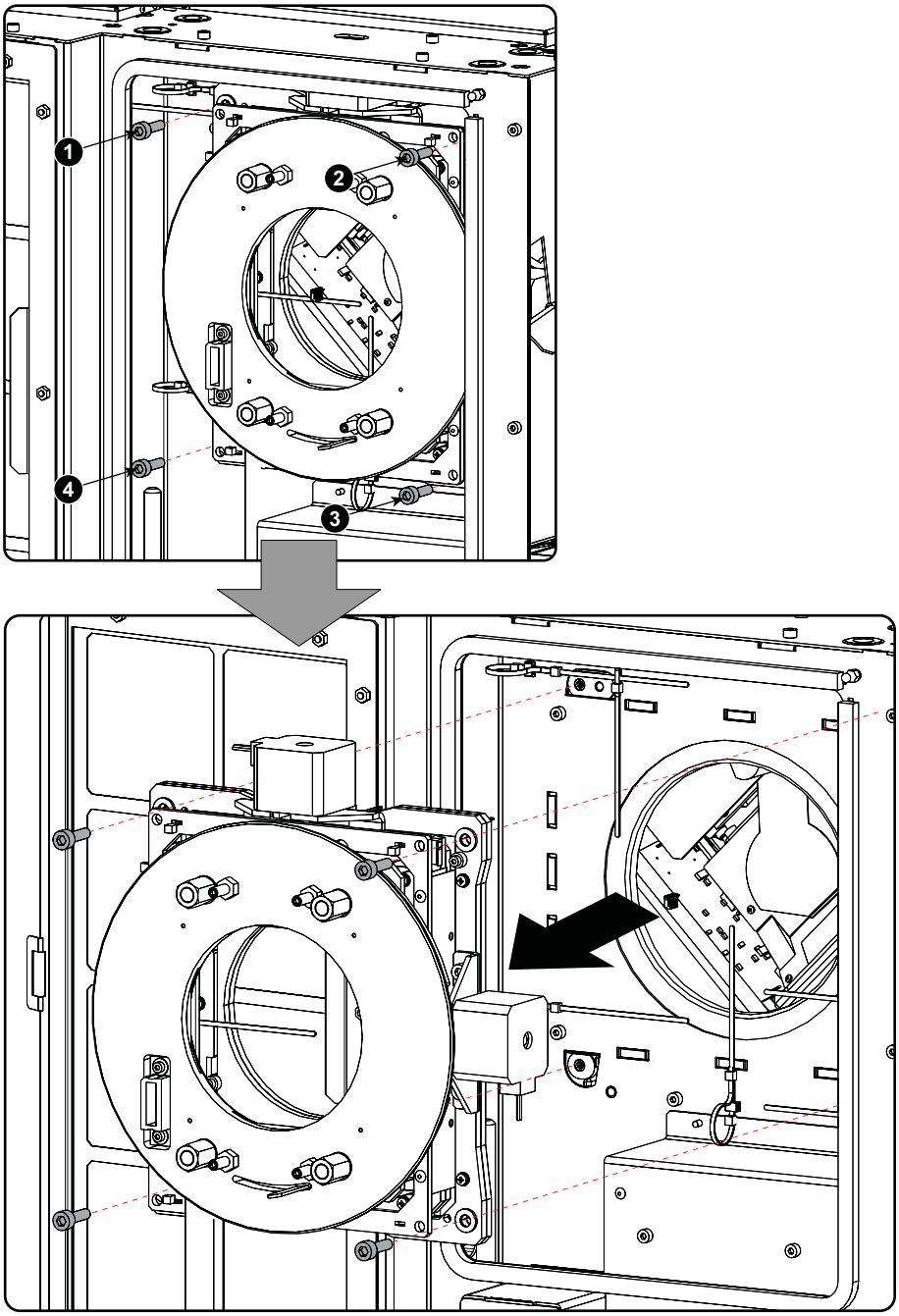


Image 14-17
Remove lens holder

2. Take out the lens holder from the front side of the projector.

14.7 Install the lens holder

Necessary tools

- Nut driver 5.5 mm or an open spanner with SW 5.5
- Allen wrench 5 mm
- 2 spindles of 4 mm or 2 Torx screw drivers T10

Install lens holder

1. Push a spindle or T10 screw driver (P) through the positioning hole A and B.

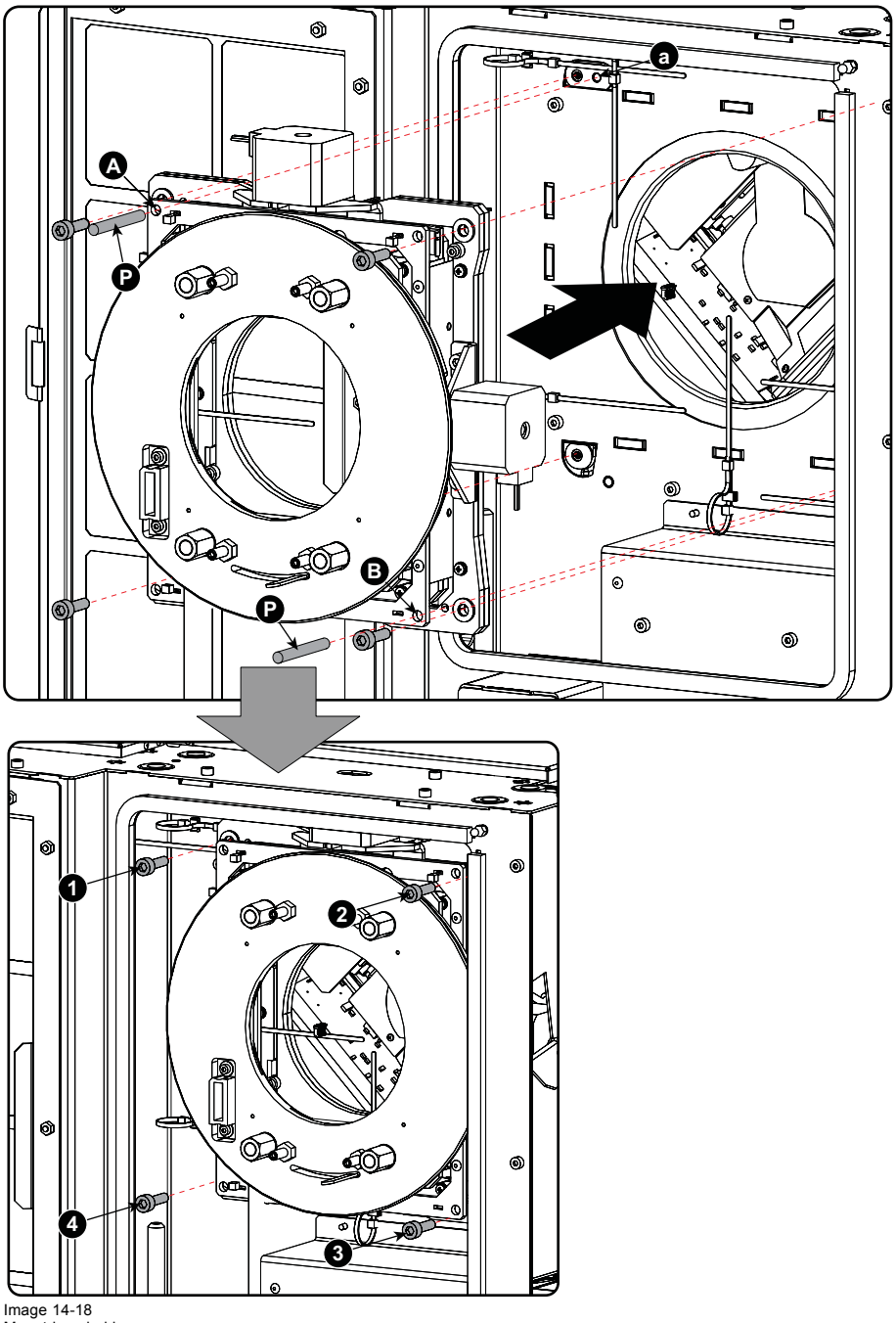


Image 14-18
Mount lens holder

2. Push the end of the spindle into the positioning sockets (a and b (not visible on the drawing).
3. Push the lens holder against the lens holder plate.
   Caution: *Make sure that no cables are stuck.*
4. Drive in the hexagon socket head screws (1 to 4).

Electrical connections

1. Slide the EMC cable eye on the stud mounted on the frame (image indication 1).
   Secure by turning on the nut.

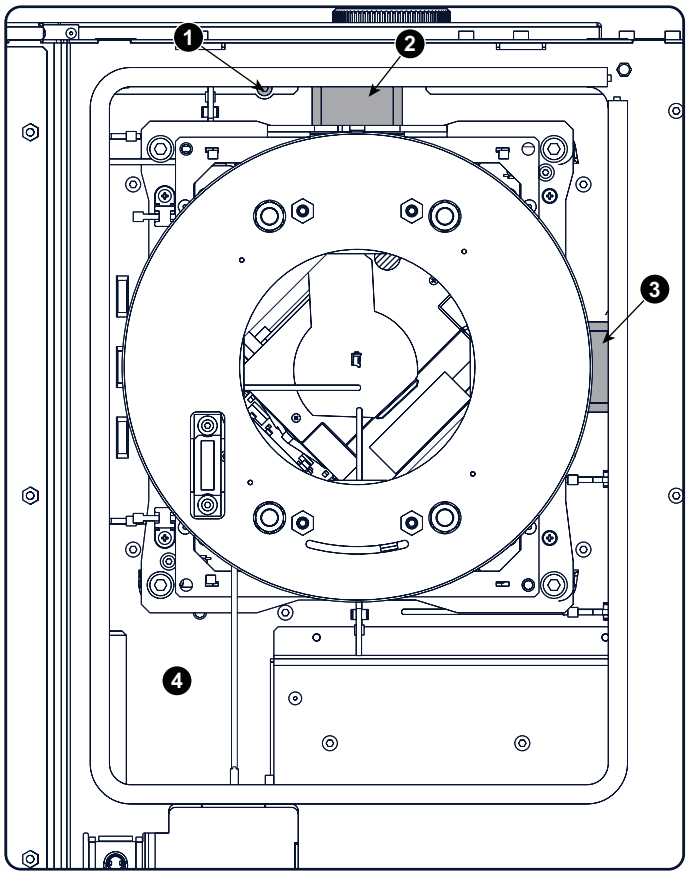


Image 14-19
Electrical connections, location

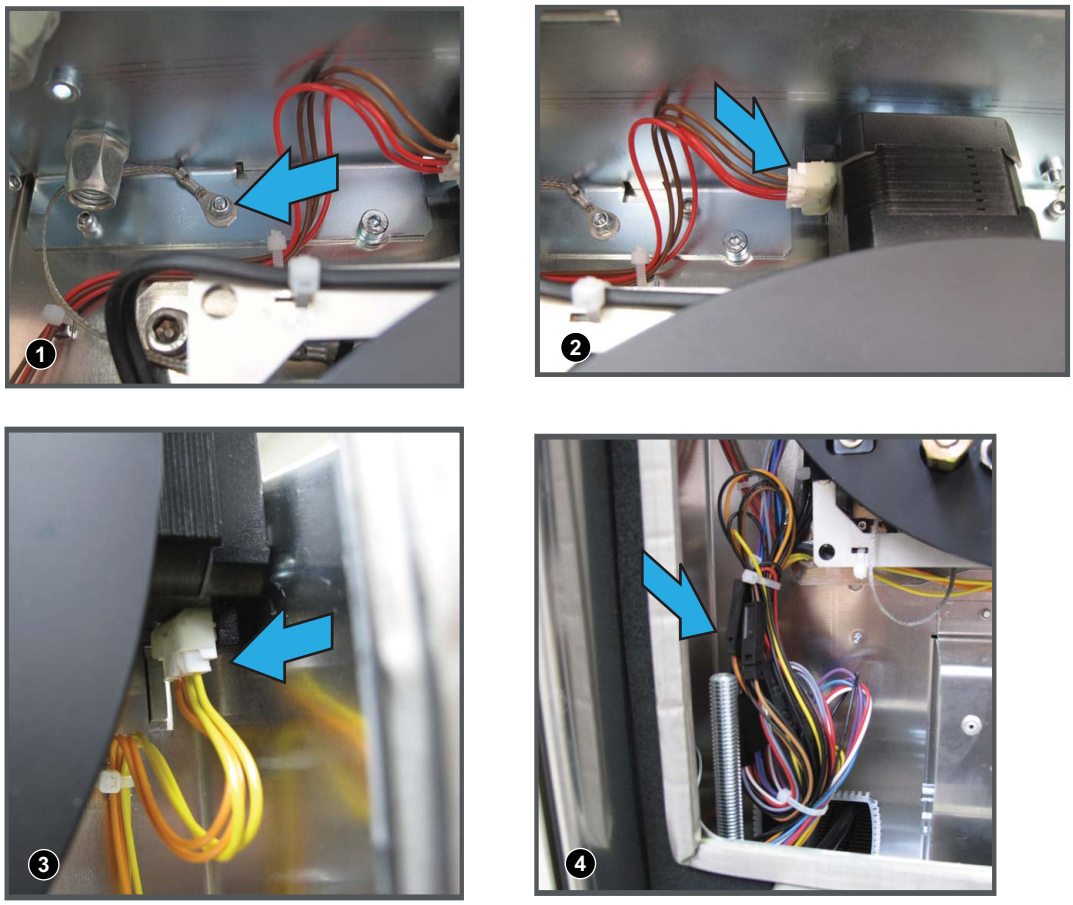


Image 14-20
Electrical connections, image view

2. Plug in the connector of the top motor (image indication 2) (brown and red wires).
3. Plug in the connector of the right motor (image indication 3) (yellow and orange wires).
4. Connect all connectors of the wire set (4x 2 pins connectors and 2x 6 pins connectors) (image indication 4). Connect those connectors with each other that have the same colored wires and exact the same position.
5. Bundle the cables together with a wire tie.

14.8 Scheimpflug adjustment

What has to be done ?

The lens holder has to be adjusted so that the “sharp focus plane” of the projected image falls together with the plane of the screen (Fp1→Fp2). This is achieved by changing the distance between the DMD plane and the lens plane (Lp1→Lp2). The closer the lens plane comes to the DMD plane the further the sharp focus plane will be. It can sometimes happen that you won’t be able to get a complete focused image on the screen due to a tilt (or swing) of the lens plane with respect to the DMD plane. This is also known as Sheimpflug’s law. To solve this the lens plane must be placed parallel with the DMD plane. This can be achieved by turning the lens holder to remove the tilt (or swing) between lens plane and DMD plane (Lp3→Lp4).

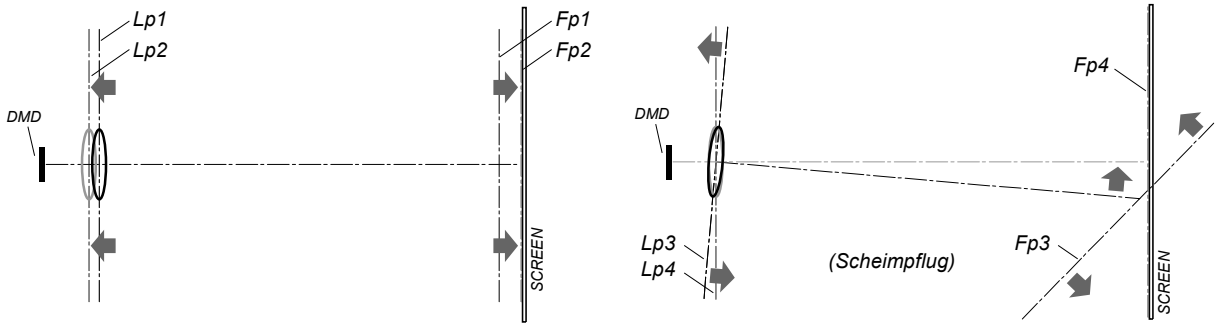


Image 14-21
Scheimpflug principle

Scheimpflug principle

The "plane of sharp focus" can be changed so that any plane can be brought into sharp focus. When the DMD plane and lens plane are parallel, the plane of sharp focus will also be parallel to these two planes. If, however, the lens plane is tilted with respect to the DMD plane, the plane of sharp focus will also be tilted according to geometrical and optical properties. The DMD plane, the principal lens plane and the sharp focus plane will intersect in a line below the projector for downward lens tilt.

Scheimpflug adjustment points

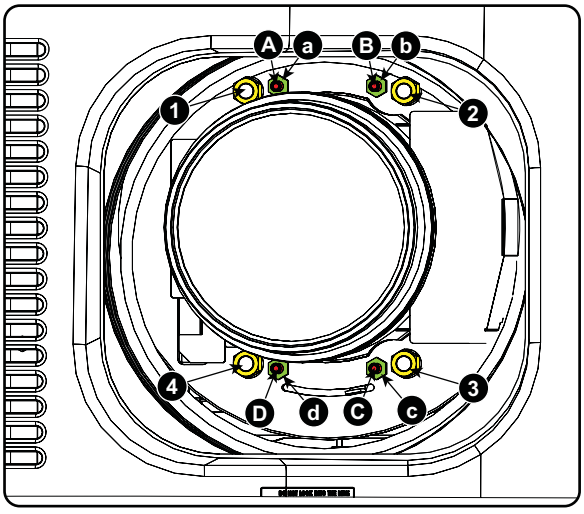


Image 14-22
Scheimpflug adjustments

Indication on drawing	Function
4	Locking nut
1, 2 and 3	Scheimpflug adjustment nuts
A, B, C and D	Set screws
a, b, c and d	lock nuts

1, 2 and 3 are adjustment points.

4 is a locking point and NOT used during Scheimpflug adjustment.

Necessary tools

- Allen key 3 mm
- Nut driver 13 mm
- Nut driver 10 mm

How to adjust

1. Project a green focus pattern.

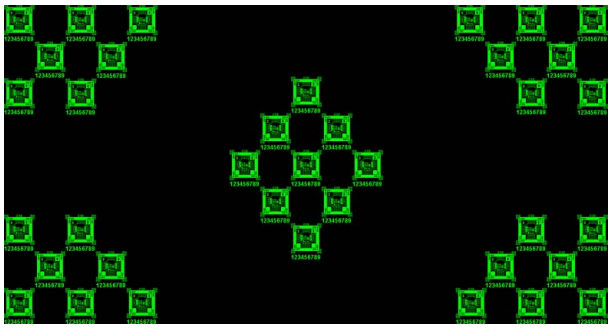


Image 14-23

2. Loosen the lock nuts (a, b, c and d). See image 14-22.
3. Loosen the 4 set screws (A, B, C and D) by 1 cm. See image 14-22.
4. Fully loosen lock nut 4. See image 14-22.
5. Optimize the focus of the projected image as follows:
   a) Place the zoom lens in TELE position (smallest projected image) and adjust the focus using the lens focus barrel or motorized focus control.
   b) Place the zoom lens in WIDE position (largest projected image) and adjust the focus by turning equally on nut 1, 2 and 3.
   c) Repeat steps “a” and “b” until the projected image is as sharp as possible.

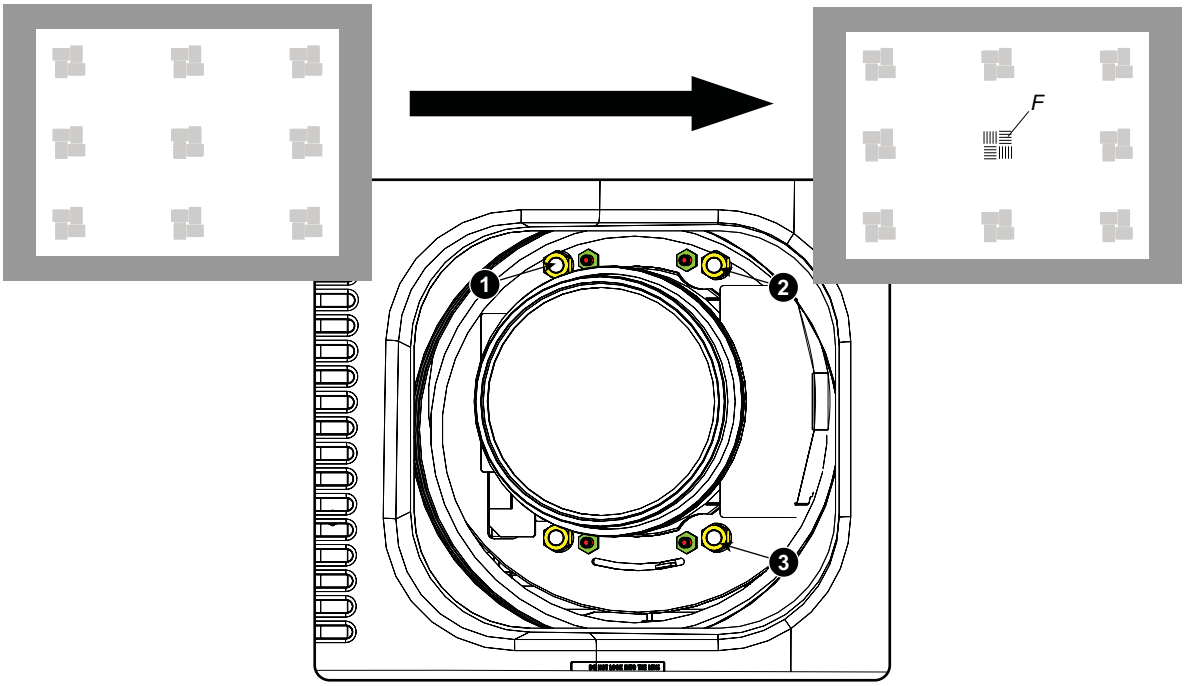


Image 14-24
Center focusing

6. Sharpen bottom left corner of the screen by adjusting nut 1.

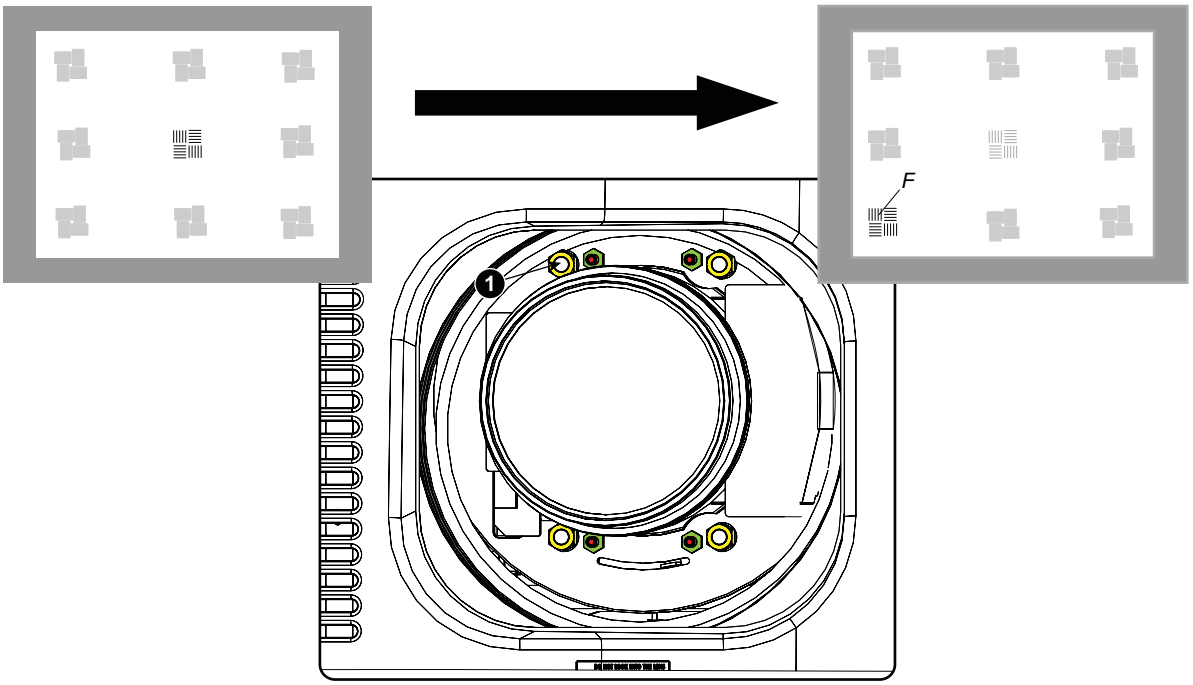


Image 14-25
Left bottom focusing

7. Sharpen bottom right corner of the screen by adjusting nut 2.

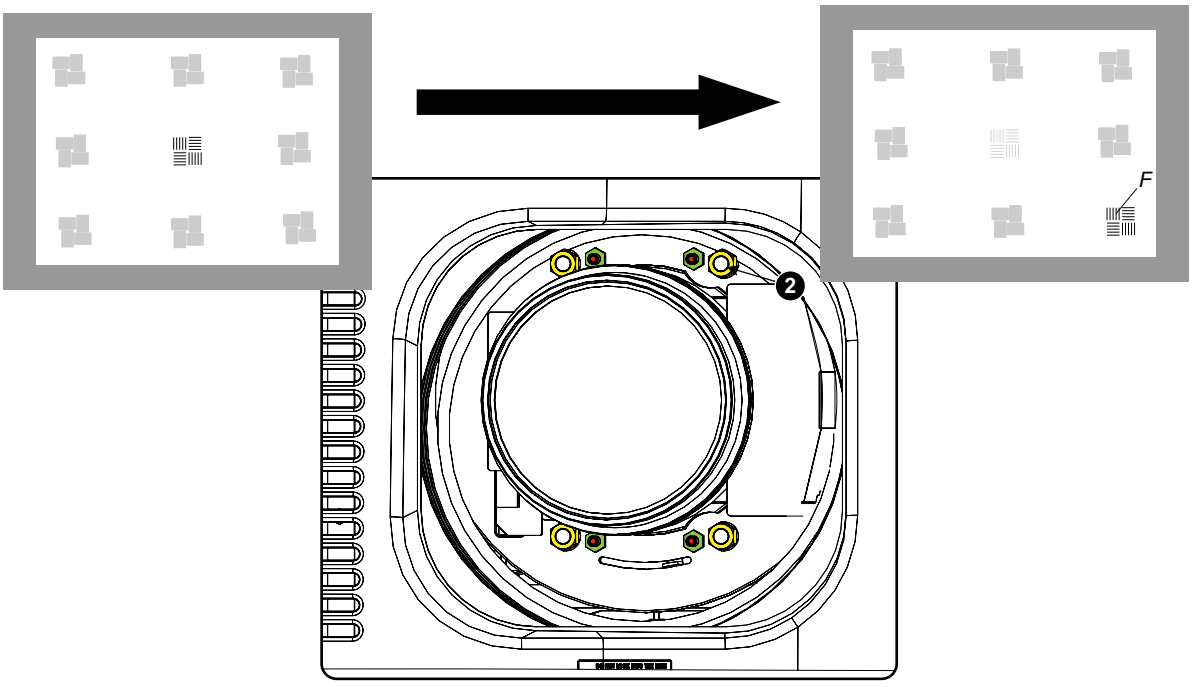


Image 14-26
Right bottom focusing

8. Sharpen top right corner of the screen by adjusting nut 3

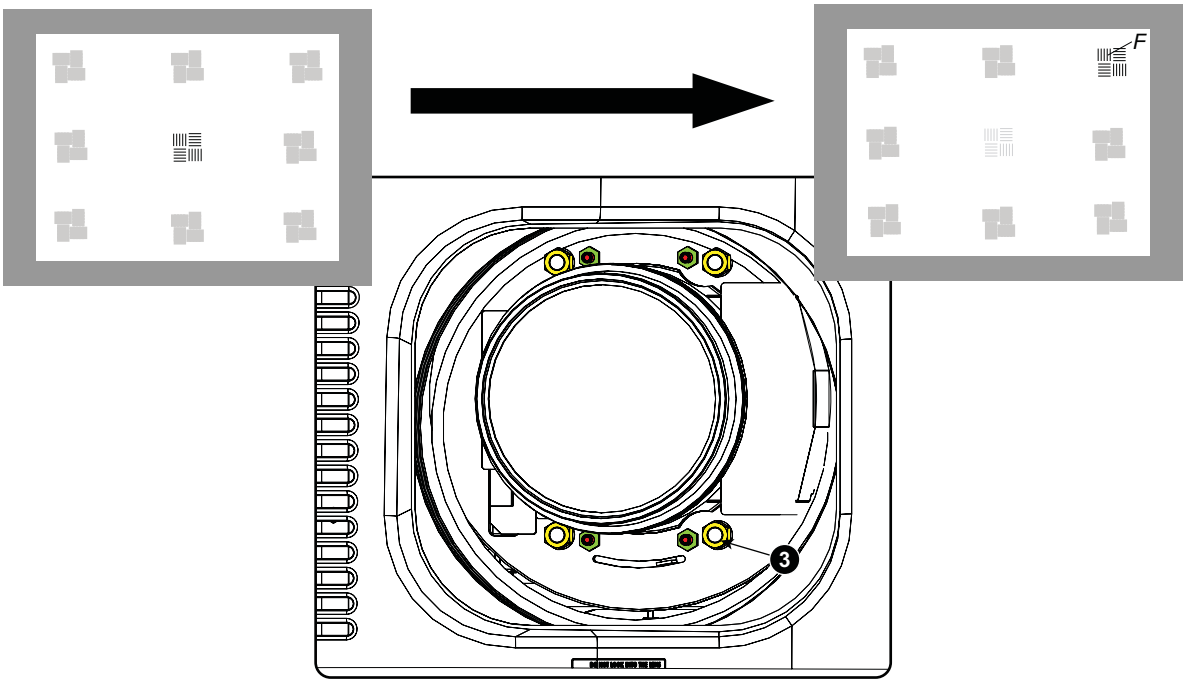


Image 14-27
Corner focusing

9. Repeat from step 6 until the projected focus pattern is as sharp as possible in the center, left, right, top and bottom of the screen.

How to fix the Scheimpflug

Start the fixation as follows (steps must be followed strictly) :

1. Turn in set screw A, B and C. Tighten lightly (by hand).
   Tip: *Any movement of the image will affect the Scheimpflug adjustment*
2. Fasten lock nuts a, b and c.
3. Turn in set screw D lightly (by hand) allowing the image to move slightly (1/3 to 1/2 of a square).

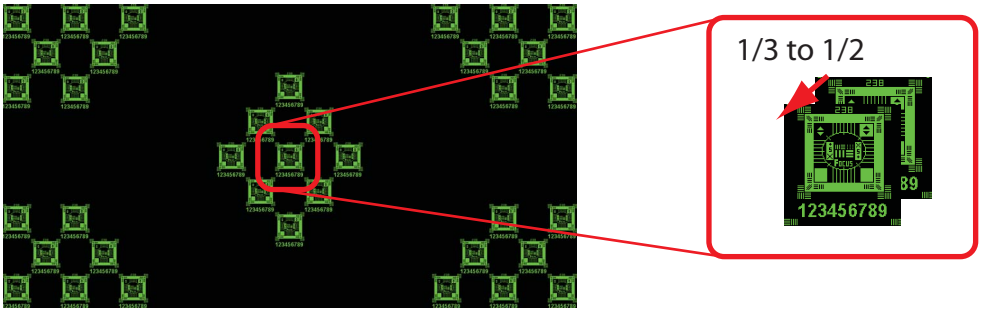


Image 14-28

4. Fasten lock nut d.
5. Tighten nut 4 until the offset of the image movement created in step 3 is canceled.
   Tip: *The amount of image movement in step 3 will determine how tight the nut in step 5 will need to be turned to return the image to its original position.*

14.9 Replacement of the Vertical Shift stepper motor

This procedure assumes that the Lens Holder is removed from the projector.

Necessary tools

- 3mm Allen wrench.
- 2.5mm Allen wrench.
- 13mm open end wrench.
- 10mm open end wrench.

How to replace the Vertical Shift stepper motor

1. Remove the front plate from the Lens Holder. Use a 13mm open end wrench to loosen the four big nuts (reference 2) as illustrated. It's not necessary to disconnect the Ground wire from the front plate. Just turn the front plate away for accessing the stepper motor.
   Caution: *Do not loose the three large springs of the Scheimpflug adjustment mechanism.*

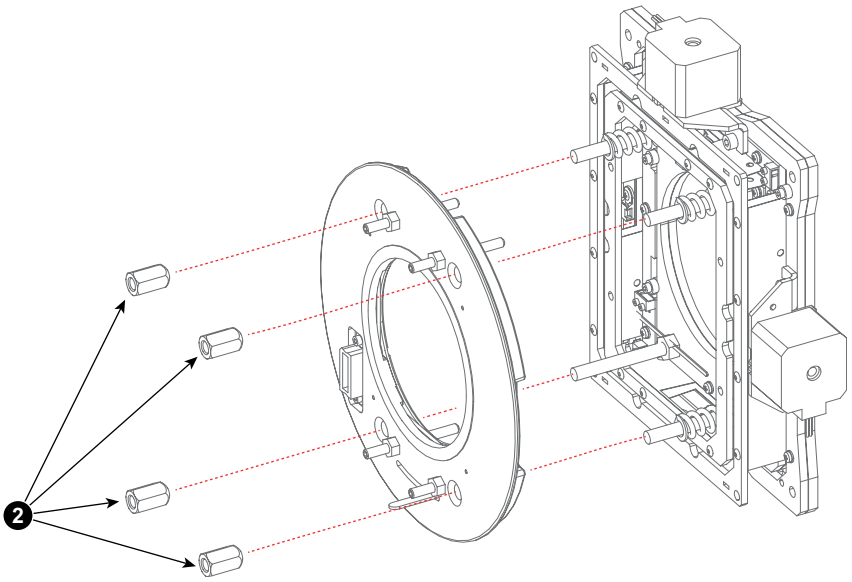


Image 14-29

2. Remove the Vertical stepper motor from the assembly by loosing the four screws (reference 9) as indicated. Use a 3mm Allen wrench.

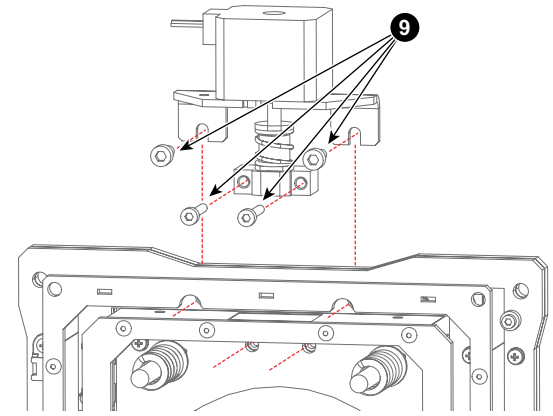


Image 14-30

3. Remove bracket and other parts from the old stepper motor and install these parts on the new stepper motor as illustrated. Use a 2.5mm Allen wrench for the four screws (reference 10) and a 10mm open end wrench (reference 11).

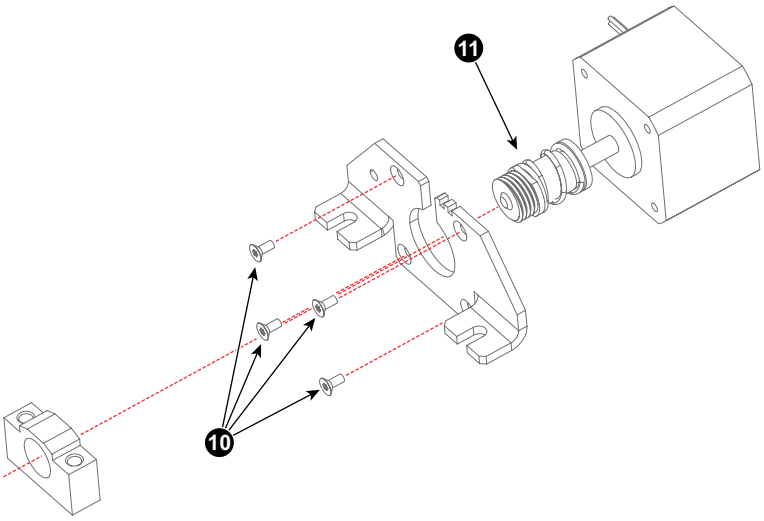


Image 14-31

4. Reinstall the stepper motor on the assembly as illustrated in image 14-30. Fasten the four screws (reference 9) with a 3mm Allen wrench.
5. Reinstall the front plate from the Lens Holder. Use a 13mm open end wrench to fasten the four big nuts (reference 7 image 14-29). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring.

Proceed with reinstalling the Lens Holder. See procedure "Install the lens holder", page 252.

The Lens Holder has to be adjusted after installation. See procedure "Scheimpflug adjustment", page 255.

14.10 Replacement of the Horizontal Shift stepper motor

This procedure assumes that the Lens Holder is removed from the projector.

Necessary tools

- 3mm Allen wrench.
- 2.5mm Allen wrench.
- 13mm open end wrench.
- 10mm open end wrench.

How to replace the Horizontal Shift stepper motor

1. Remove the front plate from the Lens Holder. Use a 13mm open end wrench to loosen the four big nuts (reference 2) as illustrated. It's not necessary to disconnect the Ground wire from the front plate. Just turn the front plate away for accessing the stepper motor.
   Caution: *Do not loose the three large springs of the Scheimpflug adjustment mechanism.*

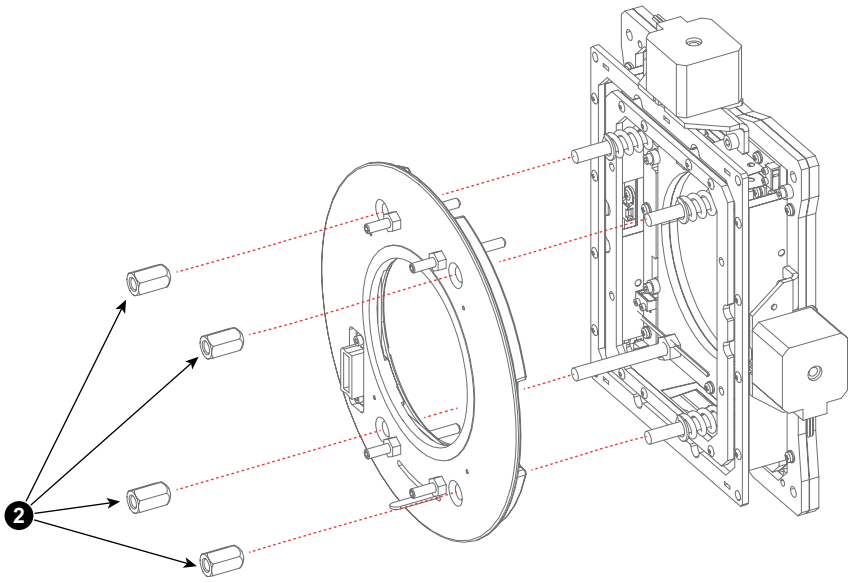


Image 14-32

2. Remove the Horizontal stepper motor from the assembly by loosing the four screws (reference 9) as indicated. Use a 3mm Allen wrench.

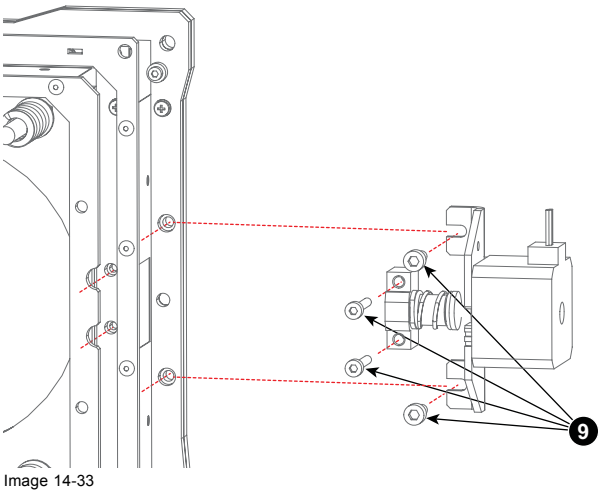


Image 14-33

3. Remove bracket and other parts from the old stepper motor and install these parts on the new stepper motor as illustrated. Use a 2.5mm Allen wrench for the four screws (reference 10) and a 10mm open end wrench (reference 11).

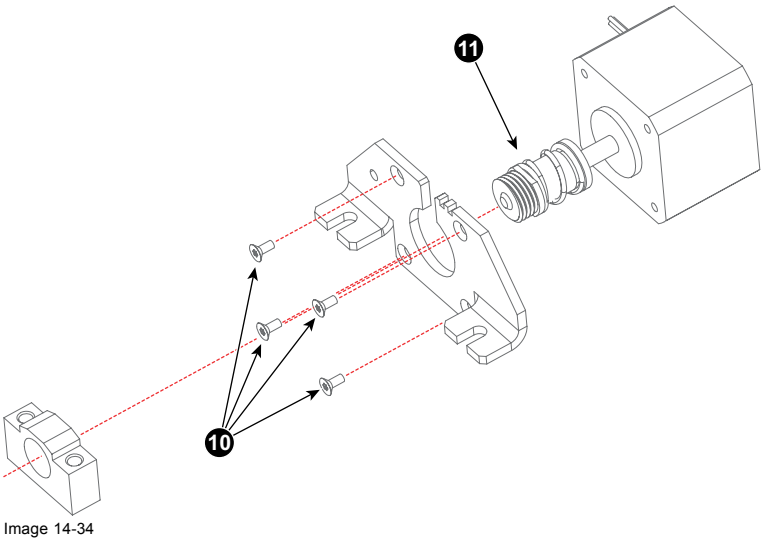


Image 14-34

4. Reinstall the stepper motor on the assembly as illustrated in image 14-33. Fasten the four screws (reference 9) with a 3 mm Allen wrench.
5. Reinstall the front plate from the Lens Holder. Use a 13mm open end wrench to fasten the four big nuts (reference 2 image 14-32). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring.

Proceed with reinstalling the Lens Holder. See procedure "Install the lens holder", page 252.

The Lens Holder has to be adjusted after installation. See procedure "Scheimpflug adjustment", page 255.

14.11 First Placement of the Inner Dust Rubber

This procedure assumes that the Lens Holder is removed from the projector.

CAUTION: Be careful as not to damage the inner dust rubber while executing this procedure.

The Dust Rubber Kit

The Lens Holder Inner Dust Rubber kit is an improvement kit designed by Barco and fits perfectly on the Lens Holder of the DP2K-15C/DP2K-20C/DP2K-18Cx series digital projectors. the Inner Dust Rubber helps prevent dust from entering via the Lens Holder.

While the most recent versions of the DP2K-15C/DP2K-20C/DP2K-18Cx series will have the Inner Dust Rubber pre-installed, older versions may not yet have this dust rubber installed.

Necessary tools

- 13 mm nut driver or open-end wrench
- 5.5 mm nut driver or box-end wrench
- Phillips PH1 screwdriver

Necessary parts

- Lens holder cover
- Dust rubber frame
- Inner dust rubber
- 6 M3 hex nuts

How to place the Inner Dust Rubber for the first time

1. Remove the front plate from the Lens Holder. Use a 13 mm nut driver to loosen the four Scheimpflug nuts (reference 2 image 14-35) as illustrated. Turn the front plate away to see the Lens Holder cover.
   Caution: *Do not loose the three large springs of the Scheimpflug adjustment mechanism.*

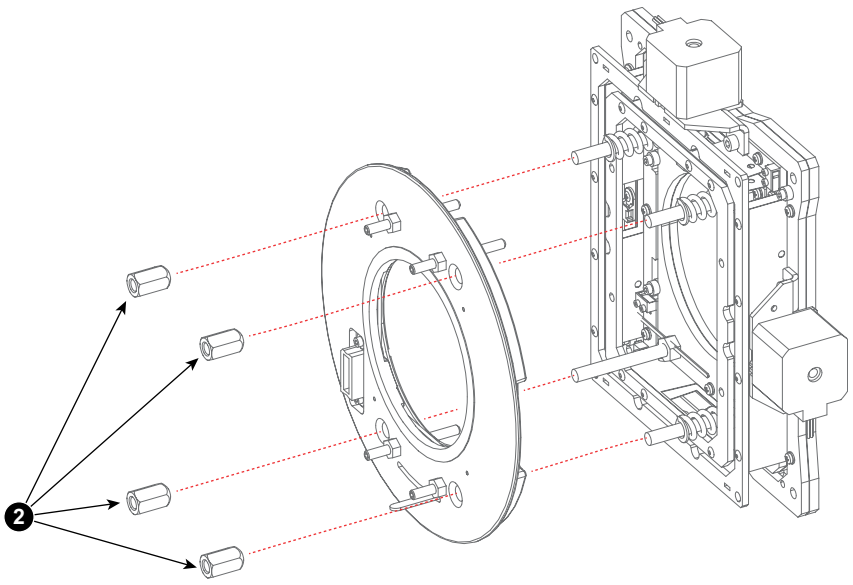


Image 14-35

2. Remove the old Lens Holder cover. Use a Phillips PH1 screwdriver to loosen the seven screws (reference 3 image 14-36) as illustrated. By doing this, you will also release the ground cable (reference 4).

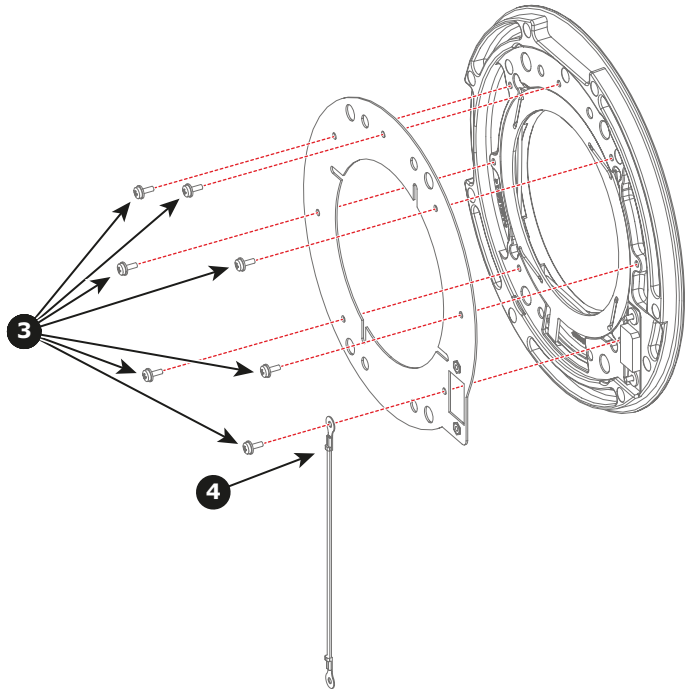


Image 14-36

3. Place the rubber (reference 7 image 14-37) over the pins of the new cover. Carefully place the dust rubber frame (reference 6) over the top of the dust rubber and over the pins of the new cover. Then use a 5.5 mm nut driver to tighten the dust rubber and frame with six hex nuts (reference 5).

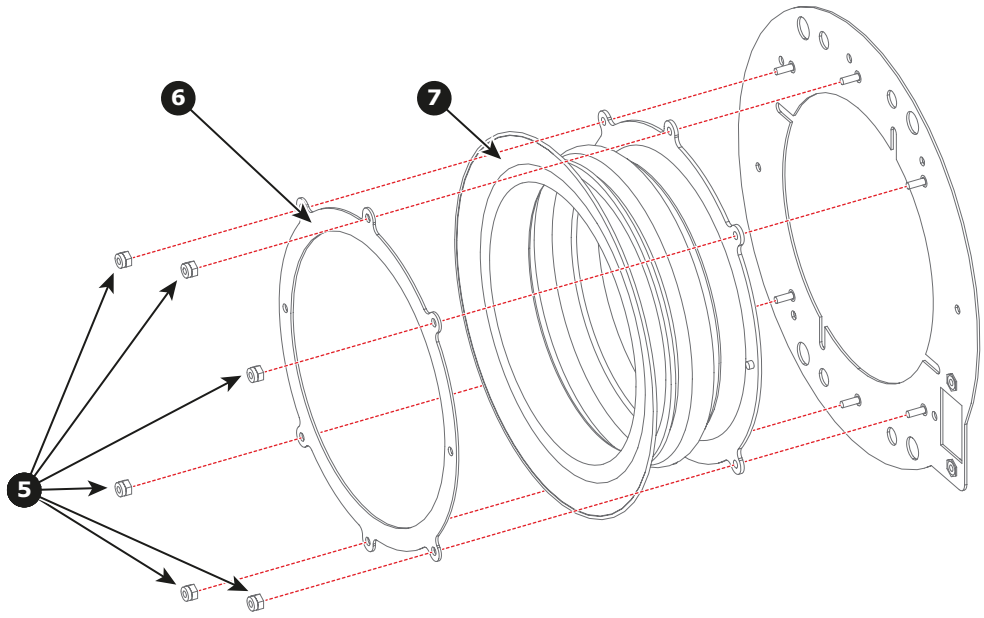


Image 14-37

4. Install the new Lens Holder Cover assembly onto the front plate. Use a Phillips PH1 screwdriver to tighten the seven original screws (reference 3). Make sure you tighten the earth wire (reference 4) back to its original place.

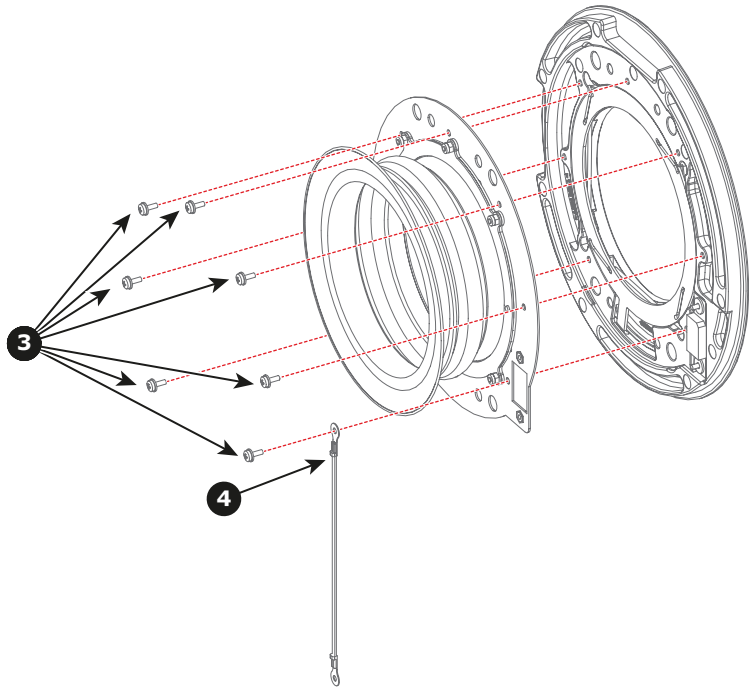


Image 14-38

5. Carefully reinstall the front plate onto the Lens Holder. Help the rubber through the Lens Holder onto the other side.

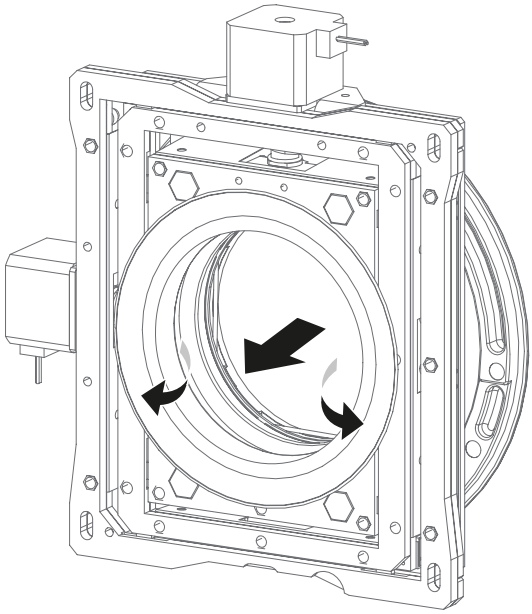


Image 14-39

6. Use a 13 mm nut driver to fasten the four big nuts (reference 2). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring.

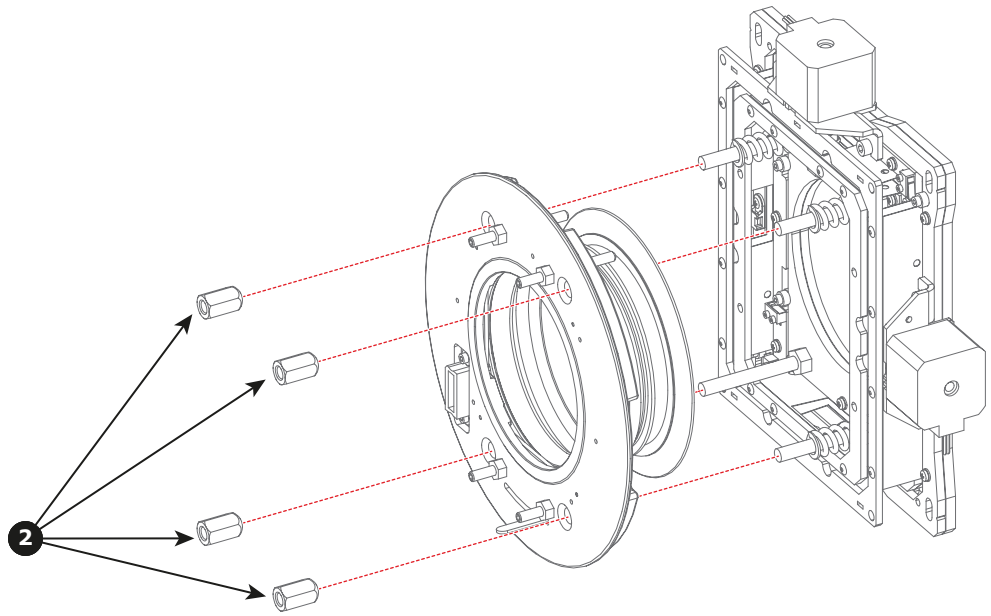


Image 14-40

Proceed with reinstalling the Lens Holder. See procedure "Install the lens holder", page 252

The Lens Holder has to be adjusted after installation. See procedure "Scheimpflug adjustment", page 255.

14.12 Replacement of the Inner Dust Rubber

This procedure assumes that the Lens Holder is removed from the projector.

CAUTION: Be careful as not to damage the new inner dust rubber while executing this procedure.

Necessary tools

- 13 mm nut driver or open-end wrench
- 5.5 mm nut driver or box-end wrench
- PH1 Phillips screwdriver

Necessary parts

- Lens holder cover
- Dust rubber frame
- Inner dust rubber
- 6 M3 hex nuts

How to replace the Inner Dust Rubber

1. Remove the front plate from the Lens Holder. Use a 13 mm nut driver to loosen the four big nuts (reference 2 image 14-41) as illustrated. Turn the front plate away to see the Lens Holder cover.
   Caution: *Do not loose the three large springs of the Scheimpflug adjustment mechanism.*

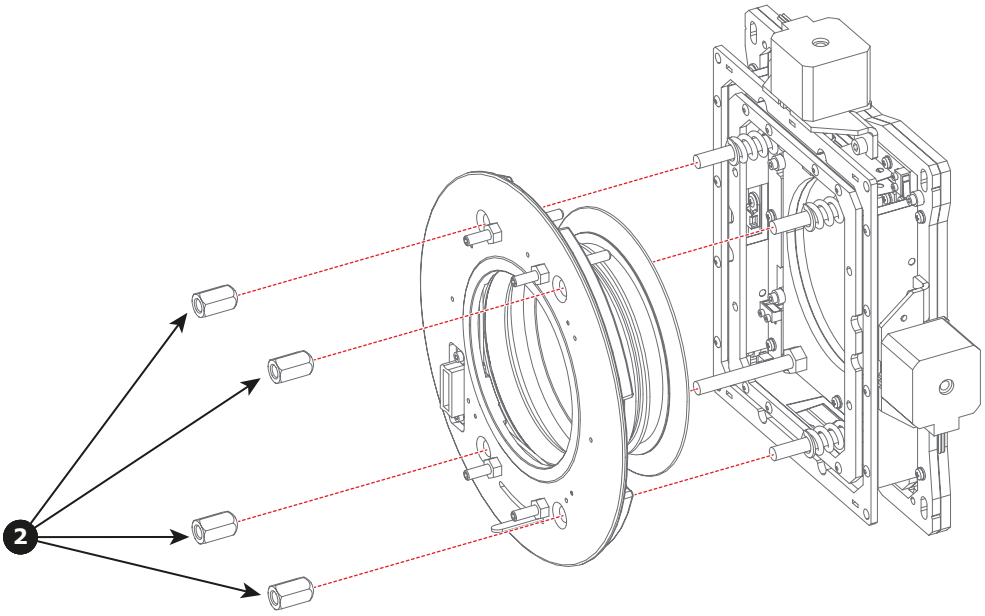


Image 14-41

2. Remove the Lens Holder cover. Use a PH1 Phillips screwdriver to loosen the seven screws (reference 3 image 14-42) as illustrated. By doing this, you will also release the ground cable (reference 4).

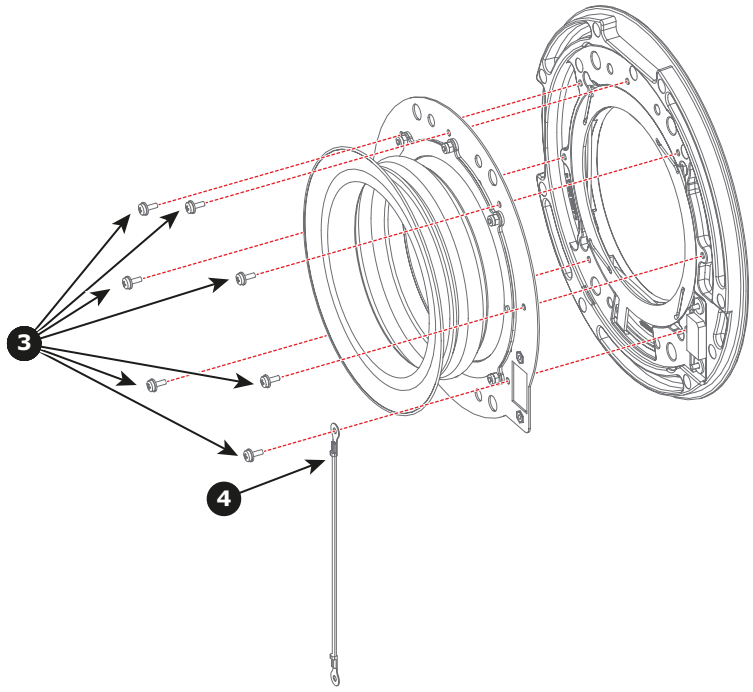


Image 14-42

3. Use a 5.5 mm nut driver to loosen the six nuts on the dust rubber (reference 5 image 14-43). Remove the nuts, the inner dust rubber frame (reference 6) and the old rubber (reference 7).

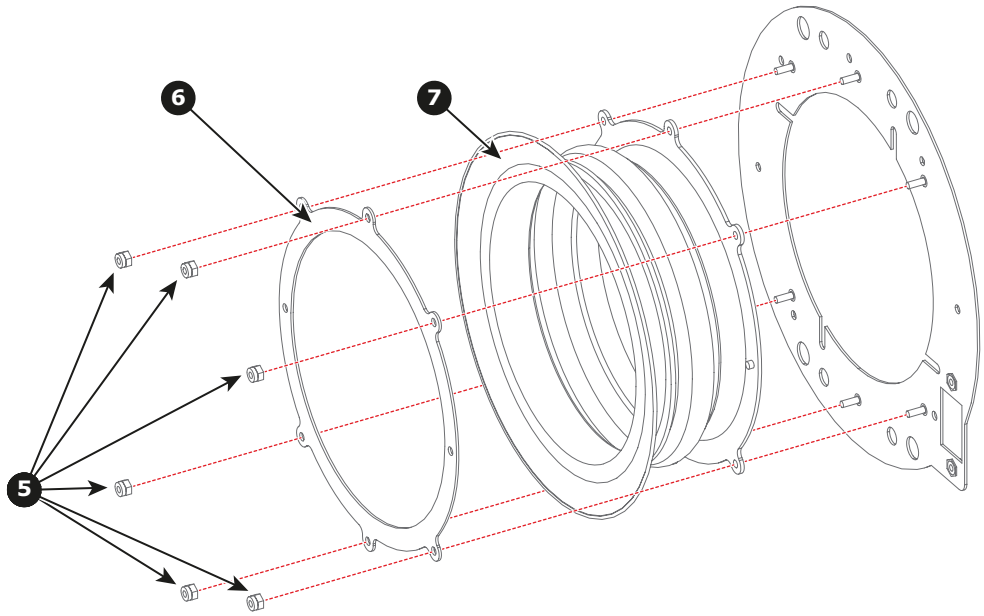


Image 14-43

4. Place the new inner dust rubber (reference 7 image 14-43) over the pins of the new cover. Carefully place the new dust rubber frame (reference 6) of the dust seal over the top of the rubber and over the pins of the new cover. Then use a 5.5 mm nut driver to tighten the dust rubber and dust rubber frame with the six nuts (reference 5).
5. Install the new Lens Holder Cover. Use a PH1 Phillips screwdriver to tighten the seven original screws (reference 3 image 14-42). Make sure you tighten the earth wire (reference 4) back to its original place. Be careful as not to damage the rubber while doing these actions.
6. Carefully reinstall the front plate onto the Lens Holder. Help the rubber through the Lens Holder onto the other side.

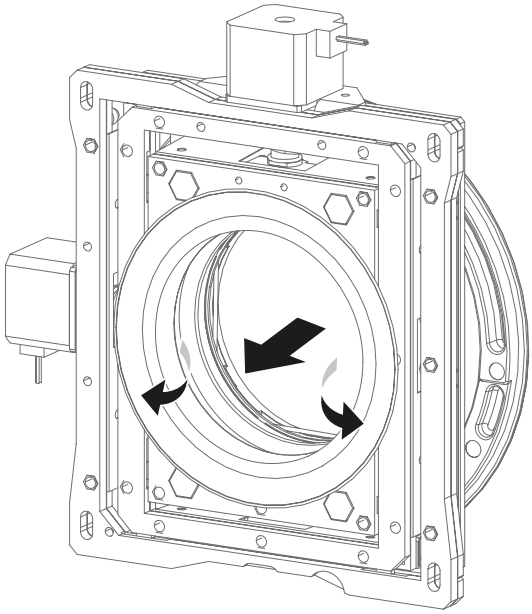


Image 14-44

7. Use a 13 mm nut driver to fasten the four big nuts (reference 2 image 14-41). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring.

Proceed with reinstalling the Lens Holder. See procedure "Install the lens holder", page 252.

The Lens Holder has to be adjusted after installation. See procedure "Scheimpflug adjustment", page 255.

15. CARD CAGE

Overview

- Fan controller board
- Integrated Cinema Processor (ICP) board
- HD-SDI board + link decryptor
- Cinema controller board
- Removing a board in the card cage
- Inserting a board in the card cage
- Replacement of the RTC battery of the ICP board
- Battery replacement on the Cinema Controller Board
- Removing the button unit
- Installation of the button unit
- Replacement of the Button module (first generation Keypad)
- Replacement of the Keypad (first generation Keypad)
- Replacement of the Keypad assembly (second generation Keypad)
- Replacement of the signal back plane
- Replacement of the Link Decryptor
- Authorization to clear security warning on the projector
- Replacement of the Status Light

15.1 Fan controller board

Functionalities

Image 15-1
Fan controller board

- Monitors and controls all fans.
- Monitors and controls all voltages provided by the SMPS board.
- Monitors all temperature sensors.
- Controls and monitors the Peltier’s on rear of the DMDs.
- Controls the front active cooling.
- Monitors pump speed.
- LEDs on front plate can be used to monitor the output voltages of the SMPS board.
- Drives the dowser (shutter).
- Contains all hardware protections for the projector.
- Controls error line to the LPS and will shut down lamp accordingly.

Conditions included on this board :

- DMD over temperature
- Lamp over temperature
- Lamp cooling down
- Lamp house not connected
- Light processor not connected
- Ambient temperature below 10°.C

15.2 Integrated Cinema Processor (ICP) board

In case the projector is equipped with a Barco ICMP no ICP board is inserted. All ICP functionality is integrated in the Barco ICMP.

LEDs and ports on the Integrated Cinema Processor

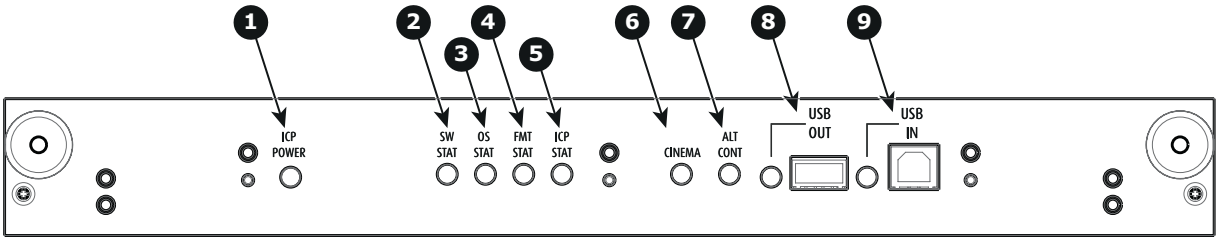


Image 15-2
1 ICP is powered.
2 ICP software state, normal operation is green blinking.
3 ICP operating system state, normally full green .
4 ICP FMT configuration state, normally full green.
5 ICP MAIN configuration state, normally full green.
6 CINEMA port selected. When on, LED 7 will be out.
7 ALTERNATIVE port selection. When on, LED 6 will be out. (note that this function is disabled. Led never lights up)
8 USB, for future use.
9 USB, for future use.

LED diagnostic

State description	Normal operation	Error state
Software state (LED reference 2)	flashing green	red or orange
Operating System state (LED reference 3)	green	off, red or yellow
FMT FPGA state (LED reference 4)	green	red : unable to configure the FPGA yellow : FPGA is loaded with the Boot application
ICP FPGA state (LED reference 5)	green	red : unable to configure the FPGA yellow : FPGA is loaded with the Boot application

ICP functions:

- Stores all projector files. When board is replaced; clone package must be reloaded.
- Stores and generates test patterns.
- Scaling to native resolution, re-sizing, masking, line-insertion de-interlacing, subtitle overlay, color space conversion, de-gamma, color correction
- Source Selection between alternative content and cinema content.
- Stores a Certificate and Private Key needed for Playback validation
- Contains a real time clock, which must be synchronized with the GMT/UTC time stored in the link decryptor module or Integrated Media Block (see Communicator software)
- Handles unpacking of special video formats

The ICP board spare part kit is programmed specifically for DP2K-C series projectors. When installing an ICP board in other types of projectors, the software must be reinstalled after installation. See chapter "ICP software upgrade", page 319.

When installing a new ICP board, the Spatial Color Calibration file must be reloaded and activated. See chapter "Activate Spatial Color Calibration file", page 197.

CAUTION: Make sure not to short circuit the battery on the board. That will destroy the board completely !

15.3 HD-SDI board + link decryptor

Functionality

Image 15-3
HD-SDI + Link Decryptor

- Converts all HD/SDI video formats to ICP compliant pixel mapping
- Contains 7 Full-HD test patterns (e.g. Color Bars, H-Ramp, Moiré, ...)
- Decryption of Cinelink-2 encrypted content
- Permanent Security monitoring (with battery back-up) : intrusion detection; voltage monitoring; temperature monitoring; security switches; build in self test; ...
- Handles communication with content servers.
- Contains a real time clock (GMT/UTC time); a Certificate and a Private Key
- Battery shelf life: 6 months

Replace board

To replace the board, follow the procedure as described in *Replacement of a Card Cage board*. Remove the Link decryptor as described in *Replacement of the Link Decryptor*

Place the link decryptor on the new board and insert the assembly in the Card Cage.

15.4 Cinema controller board

Functionality

Image 15-4
Cinema controller board

- Ethernet Communication to ICP, Media block or Link decryptor.
- Two DVI ports (with HDCP) for alternative content.
- RS232 port to BARCO Controller.
- Standardized 3D interface on board.
- GPIO controls
- Peripheral Port
- Lensholder motors (stepper motors)
- Stores lens files and lens type / Controls lens
- Lens motor drivers (DC motors)
- Stores Dallas key
- Controls lamp power supply
- Stores SNMP key
- Stores Barco IP address and host name
- Handles reporting of errors, version info & Barco logs to Communicator
- Controls ICP board
- Controls Dolby 3D color wheel
- Controls and monitors keypad
- Controls and monitors status lights
- Stores Macro, Input, Lens file, 3D file and LSC file.

Prior to replace the Cinema Controller board try to read out the SMNP key. Use for that the Communicator software. In case it is not possible to read out the SNMP key a new SNMP key has to be requested. See chapter "Request for new SNMP key" in the user guide of the Communicator software.

When inserting a new Cinema Controller board the SNMP key must be reprogrammed in the new board and the Dallas key must be re-identified with the new board. See user guide Communicator for precise instructions.

Ethernet network communication

The DP2K-15C/DP2K-20C/DP2K-18Cx projector can be connected to a LAN (local area network) using one of the 10/100/1000 base T ports on the communication interface. Once connected to the LAN, users are capable of accessing the projector from any location, inside or outside (if allowed) their company network using the control software (Communicator touch panel). This toolset locates the projector on the network in case there is a DHCP server or the user can insert the correct IP-address of the projector to access the projector. Once accessed, it is possible to check and manipulate all the projector settings. Remote diagnostics, control and monitoring of the projector can then become a daily and very simple operation. The network connectivity permits to detect potential errors and consequently improve the time to servicing.

As there is a need to daisy chain projectors when they are in Ethernet network, an Ethernet switch is build in, the incoming network is hereby available for the internal PC and for the next device in the chain. In this way a 'star' network interconnection can be avoid. The switch used is a stand alone 10/100Mbit Ethernet switch. This assures no influence on the network speed. Whenever a slow (10Mbit) device is connected the speed between the 100Mbit devices remains 100Mbit.

Both Ethernet ports are equipped with a yellow and a green LED. The yellow LED lights up in case the port is connected with a 100Mbit network. The green LED blinks in case there is network activity.

The connectors used for both Ethernet ports are of the type RJ45, which is compatible with standard RJ45 cable connector. Straight (most common) as well as cross linked network cables can be used. The 2 ports are functionally identical. Both ports are connected via the projector hub (Auto sensing enabled).

RS232 serial communication

The communication interface of the DP2K-15C/DP2K-20C/DP2K-18Cx supports RS232 serial communication. You can use the RS232 input port to connect a local PC to your DP2K-15C/DP2K-20C/DP2K-18Cx projector. This way you can configure and control your DP2K-15C/DP2K-20C/DP2K-18Cx projector from your local PC.

Do not forget to set the projector's baud rate (default = 115200) to match that of the computer.

Advantages of using RS232 serial communication:

- easy adjustment of the projector via PC (or MAC).
- wide range of control possibilities.
- address range from 0 to 255.
- sending data to the projector (update).
- copying data from the projector (backup).

RS232

An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either D-SUB 9 pins or D-SUB 25 pins connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length and type of connector to be used. The standard specifies component connection standards with regard to computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard. Logical '0' is > + 3V, Logical '1' is < -3V. The range between -3V and +3V is the transition zone.

GENERAL PURPOSE IN/OUT (GPIO)

This female 37 pins D-SUB connector can be used to send or receive trigger signals from other devices. These input/output pins can be programmed by macros created via the Communicator touch panel. See user's guide of the Touch panel, section Macro editor, for more information about this functionality.

15.5 Removing a board in the card cage

About the procedure

The same procedure can be used to replace one of the following boards:

- Fan controller board
- Integrated cinema processor board
- HD-SDI board + Link Decrypter
- Cinema controller board

CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.

Necessary tools

Phillips screw driver

How to replace a board

1. Remove the input cover.
2. Turn out both fixation screws (1).

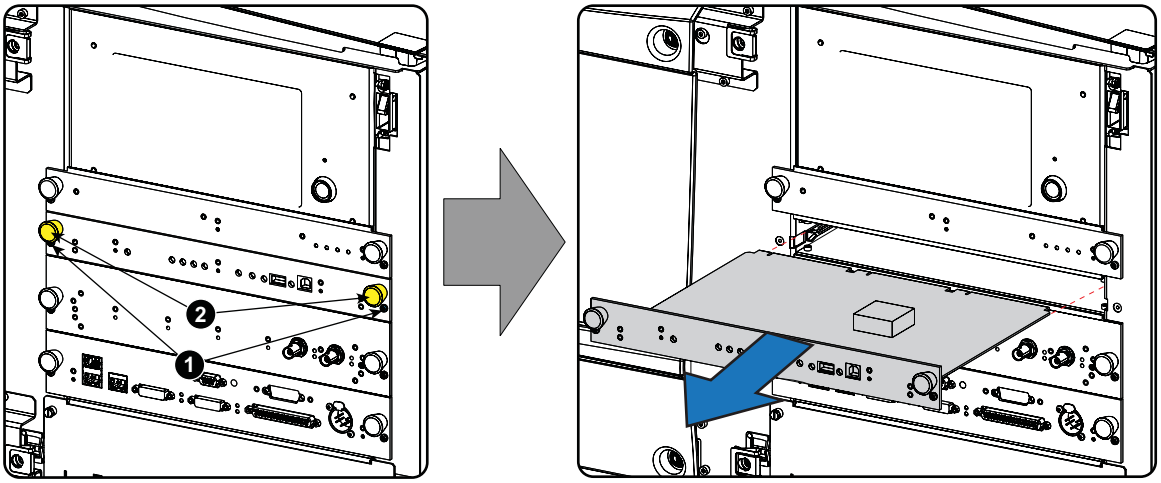


Image 15-5
Removal of a board

3. Take the board by both handles (2) and pull it out.

   All connections are made via the board to board connection with the back plane.

15.6 Inserting a board in the card cage

CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.

Necessary tools

Phillips screw driver

How to insert

1. Take the board by both handles (2).

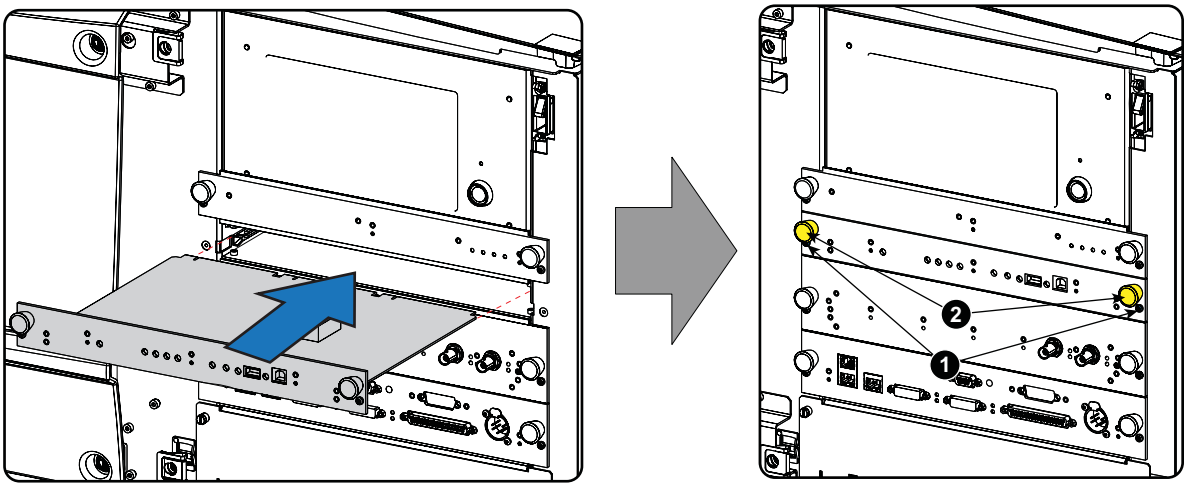


Image 15-6
Insertion of a board

2. Slide the board into both groves.
3. Push on both handles until the board is fully inserted and the connection is made with the back plane.
4. Secure the board by turning in both fixation screws (1).

When inserting a new ICP board in the card cage, the ICP software must be re-installed. See "Software update via Communicator (DC update companion)", page 311.

15.7 Replacement of the RTC battery of the ICP board

Necessary tools

Phillips screw driver

Necessary parts

All parts are included in kit R8766526K (battery cover, coin cell battery BR2330 and a pair of gloves).

How to replace

1. Put on the gloves.
2. Remove the ICP board from the card cage. See chapter “Removing a board in the card cage”.
3. Carefully put the ICP board on a table.
4. Place the battery cover over battery ‘B2’ of the ICP board to protect this battery while replacing the RTC battery ‘B1’ which is seated in the battery holder.
   Note: *The battery cover can be left on the board.*

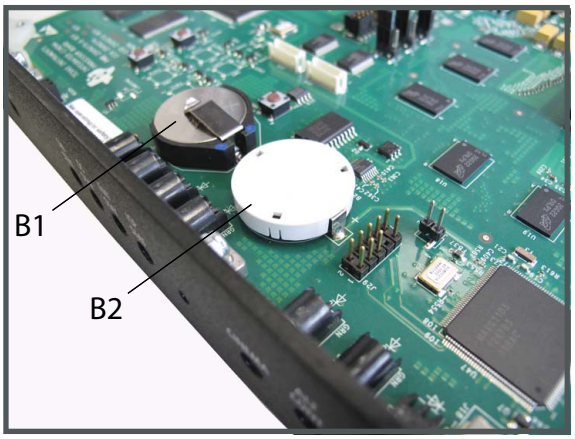


Image 15-7

5. Remove the RTC battery ‘B1’ from the battery holder and insert the new battery in the battery holder.

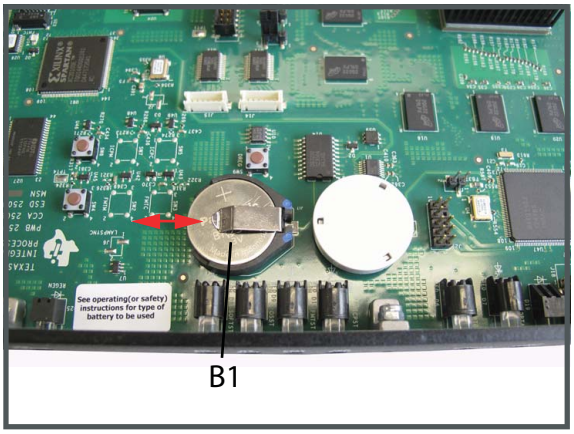


Image 15-8

6. Insert and fixate the ICP board back in the card cage. See chapter “Inserting a board in the card cage”.
7. Power on the projector.
8. Clear the projector error 5800 “ti-icp - system status = fail” with error message “ICP real time clock error” by configuring the RTC (Real Time Clock) of the ICP. See user manual Communicator chapter “Set up of the ICP clock”, choose the option UTC/GMT time calculated from current PC time as current time.

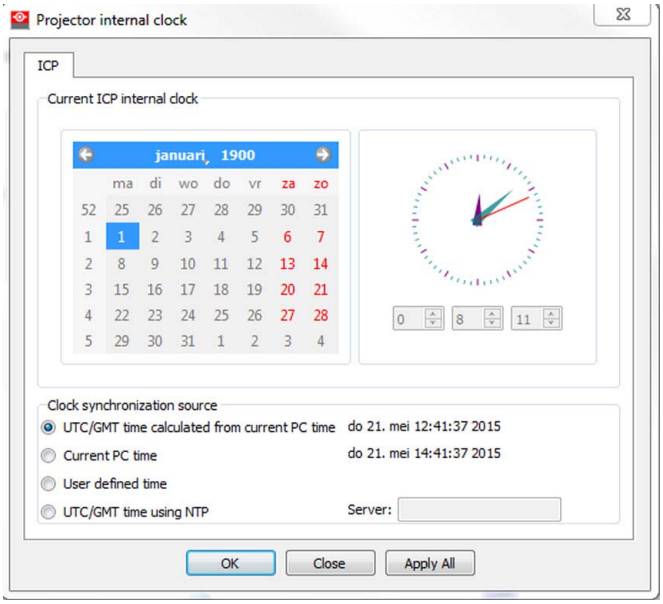


Image 15-9

9. Clear the projector error 5834 “physical marriage tamper event” by remarrying the projector. See service manual chapter "Authorization to clear security warning on the projector".

15.8 Battery replacement on the Cinema Controller Board

About an empty battery

There is no error indication in Communicator when the battery is almost empty. Only when opening the error logging after powering on the projector, you will see that some time stamps in the beginning of the list are missing or that these time stamps are still old timings. That is due to an empty battery on the Cinema Controller Board.

There is no battery kit available. The customer has to buy a new battery himself.

Battery type used : CR1220 (3V, 0.03AH, Li)

Necessary tools

PH2 Phillips screwdriver.

Necessary parts

Battery CR1220

How to replace

1. Loosen the two screws (reference 1) at the front of the Cinema Controller.
2. Pull the Cinema Controller out of its compartment.
3. Pull out the empty battery and insert a new CR1220 battery with the flat side of the battery facing to the top.
   Note: *No battery kit available as spare part. Buy a new one in a dedicated shop.*

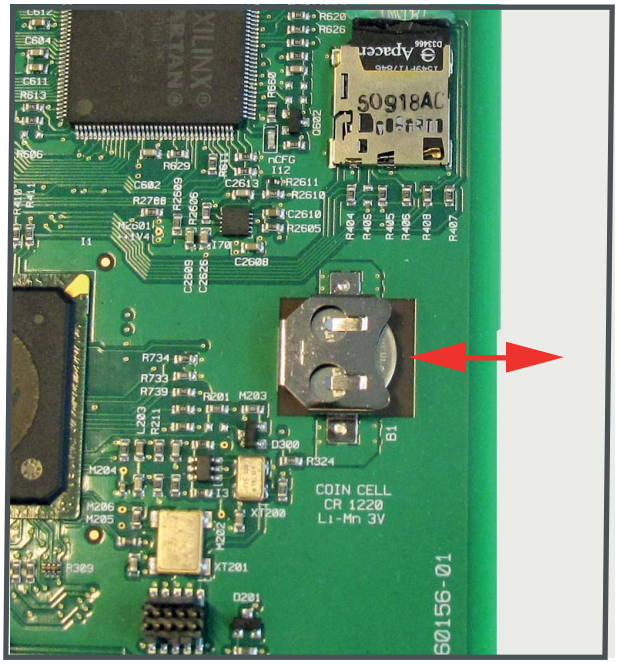


Image 15-10
Battery replacement

4. Gently insert the Cinema Controller in the guides of the Cinema Controller compartment as illustrated. Push it completely in.
   Caution: *Ensure that the both sides of the Cinema Controller are captured by the guides inside the Cinema Controller compartment, as shown in the detail of the illustration.*
5. Fasten the two screws at the front side of the Cinema Controller (reference 1).

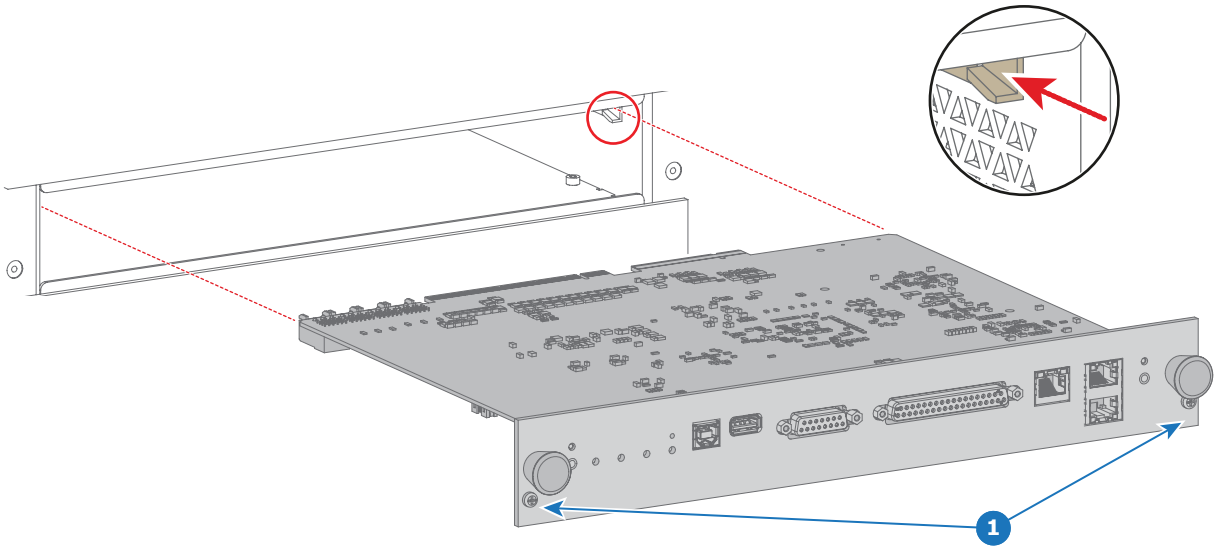


Image 15-11

15.9 Removing the button unit

Preparations

Before starting with the replacement of the button unit, remove first:

- Side covers and top cover, see Removal and Installation of the projector covers.
- Light processor top cover (Convergence cover plate).

Necessary tools

- Allen wrench 3 mm
- Phillips screw driver

How to remove

1. Unplug the wire unit at the backside of the button unit.

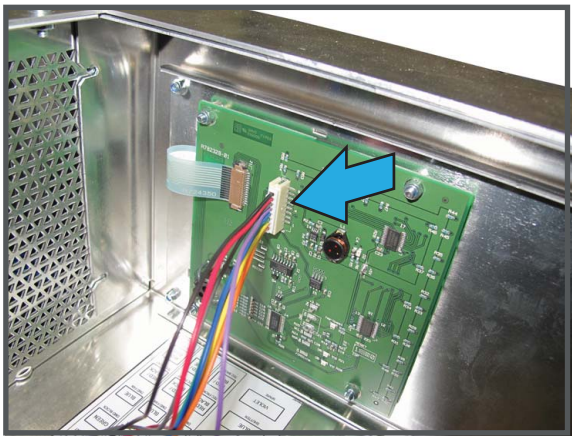


Image 15-12
Button unit, connections

2. Pull out all he cable from the cable holders.

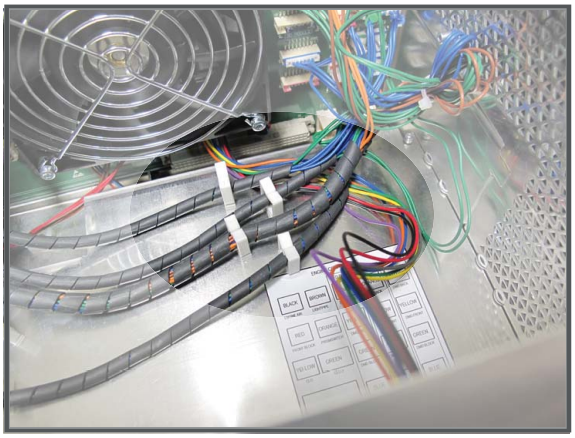


Image 15-13
Button unit, cable holders

3. At the inner side, loosen both hexagon screws at the left side of the button unit (1).

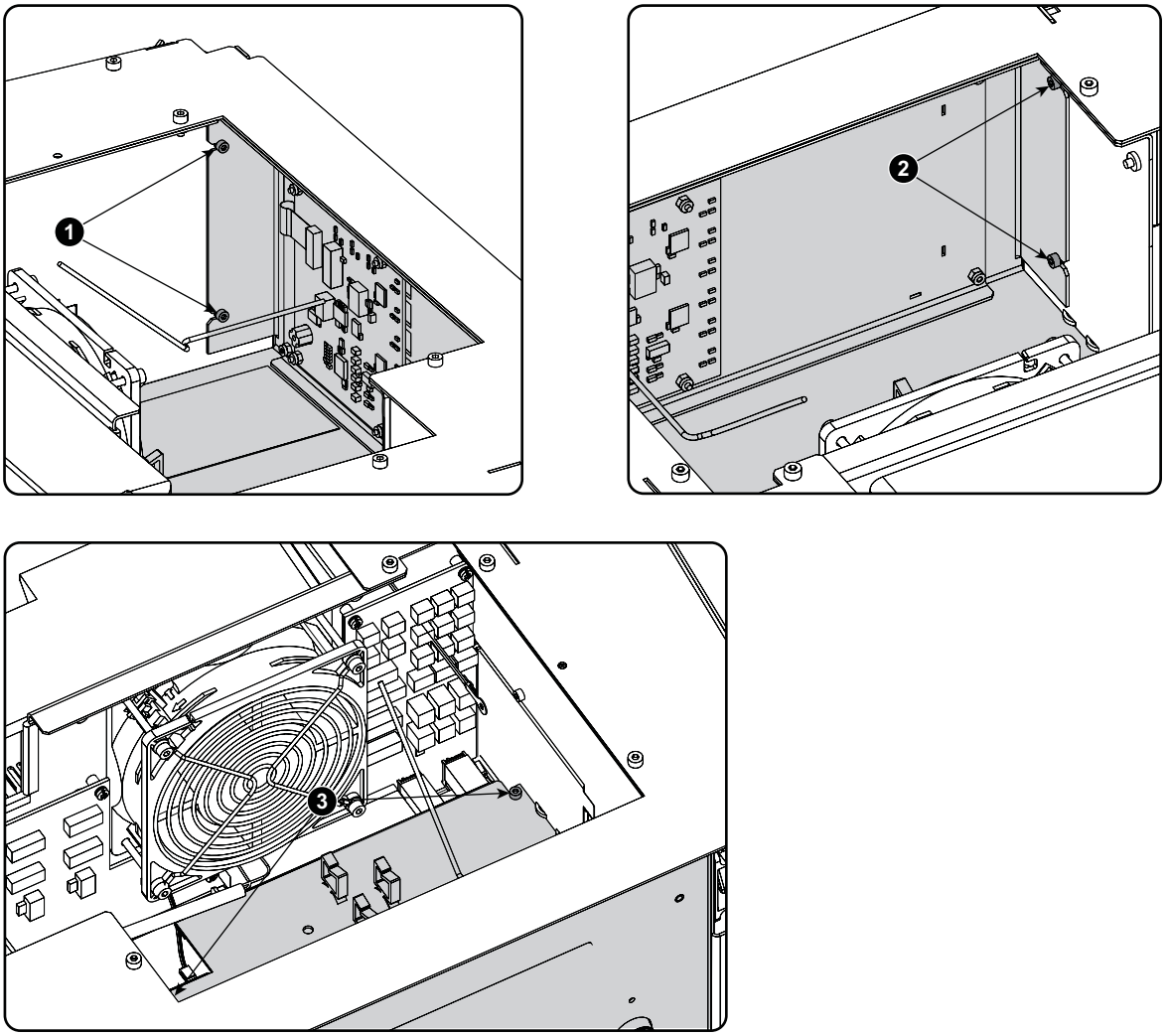


Image 15-14
Button unit fixations

4. Loosen also both hexagon screws at the right side (2).
5. Loosen both screws at the bottom plate (3) of the button unit.
6. Loosen the fixation screws of the fan controller board and pull the board a little out.
7. Slide out the button unit.

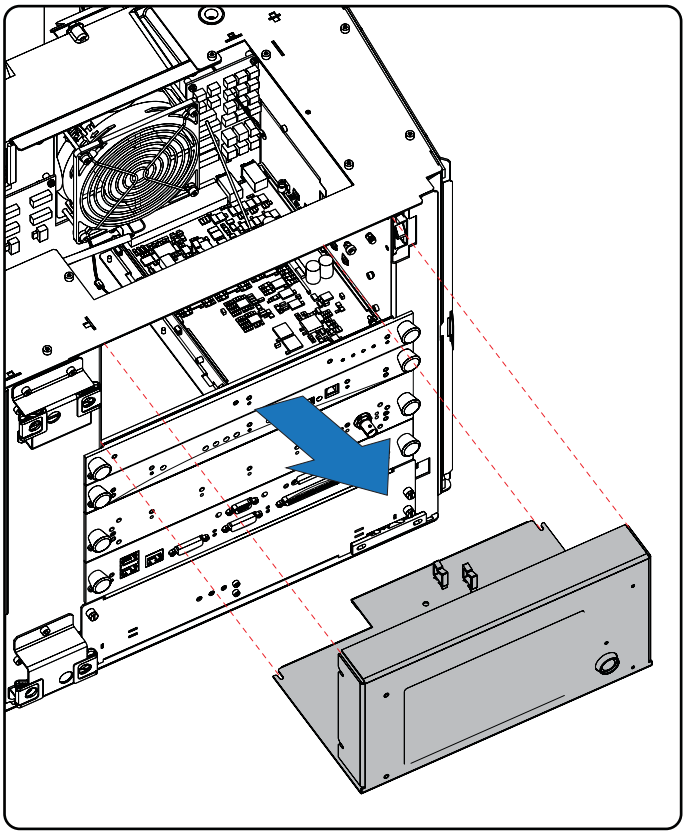


Image 15-15
Button unit removal

15.10 Installation of the button unit

How to install

1. Insert the button module so that the bottom plate of the unit fits into the support grooves at both sides of the card cage.

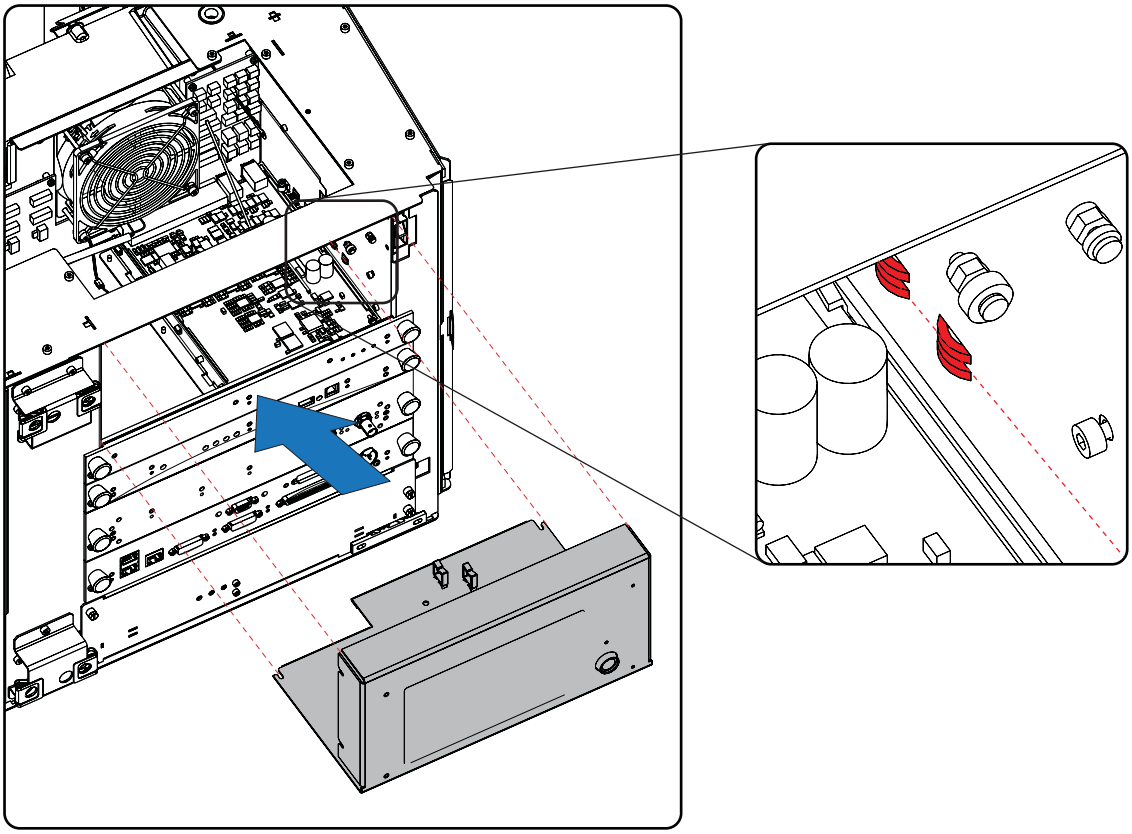


Image 15-16
Button unit, installation

2. Slide in the unit until it is completely inserted.
   Note: *The front of the unit must be equal with the front of the card cage.*
3. Secure its position by driving in:
   - both fixation screws at the bottom plate of the unit (3).
   - both fixation screws at the left (1) and the right side of the unit (2).
4. Reconnect the wire unit with the back side of the button unit.
5. Secure the cables by pushing them back in the cable holders.

15.11 Replacement of the Button module (first generation Keypad)

This procedure assumes that the Button assembly is already removed from the Card Cage.

Necessary tools

5.5 mm nut driver

How to replace the Button module?

1. Disconnect the flat cable (reference 1, image 15-17) from the Button module (reference 2, image 15-17) by performing the following procedure:
   a) Pull out the locks at both sides of the socket (step 2, image 15-18).
   b) Pull out the flat cable from the socket (step 3, image 15-18).

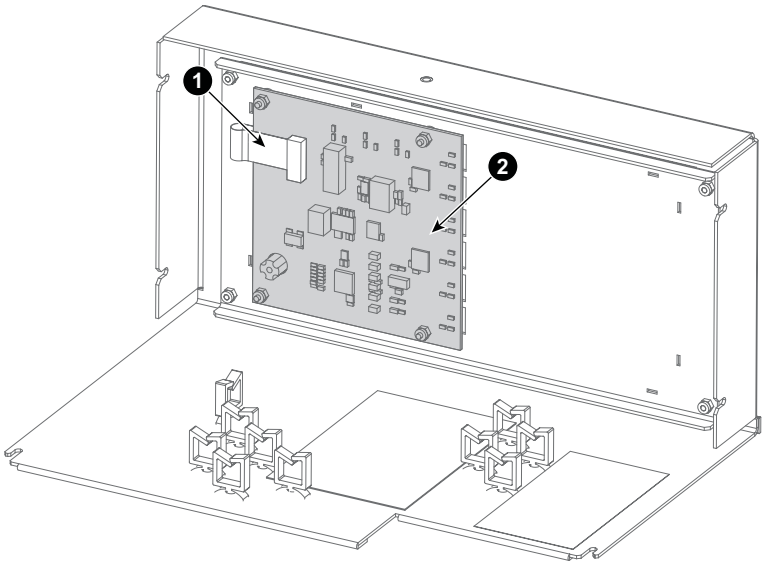


Image 15-17

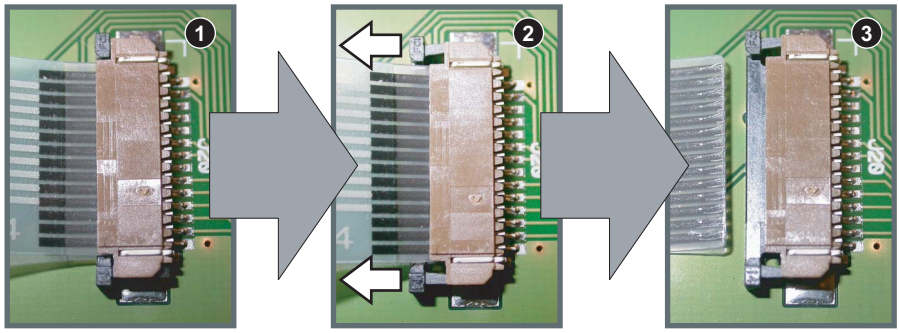


Image 15-18

2. Remove the 4 lock nuts (reference 3, image 15-19) from the Button module mounting bolts.

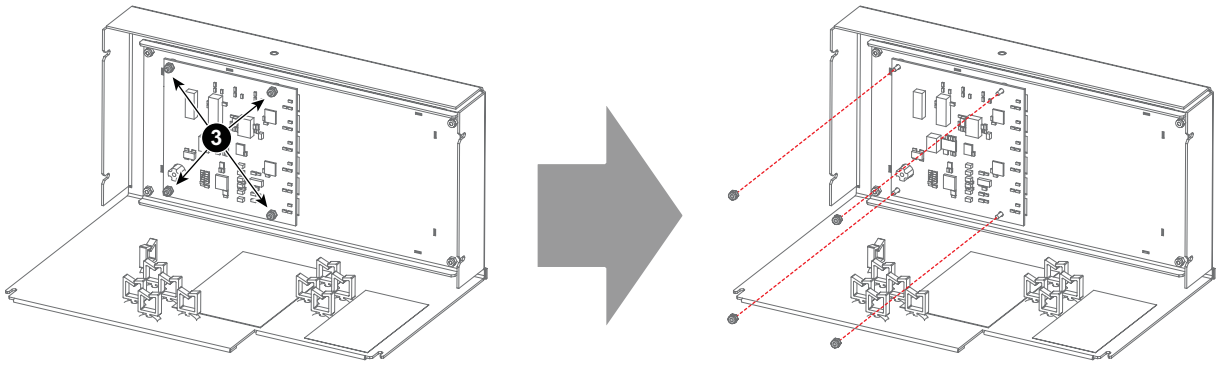


Image 15-19

3. Remove the Button module (reference 4, image 15-20).
   Tip: *Make sure the 4 washers (reference 5, image 15-20) don't drop off the Button module mounting bolts.*

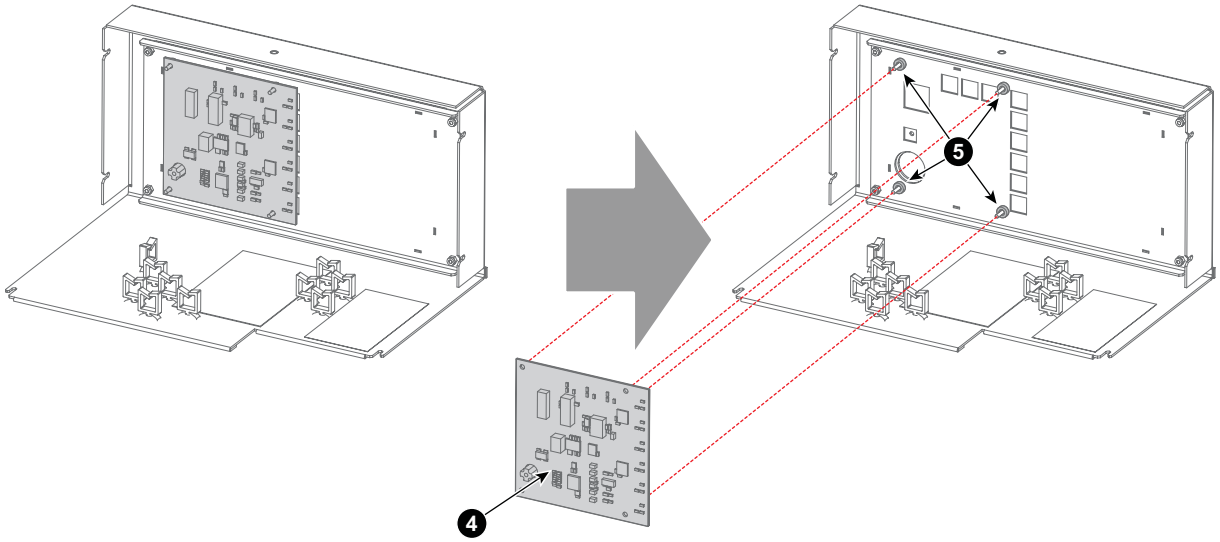


Image 15-20

4. Install the new Button module (reference 6, image 15-21).

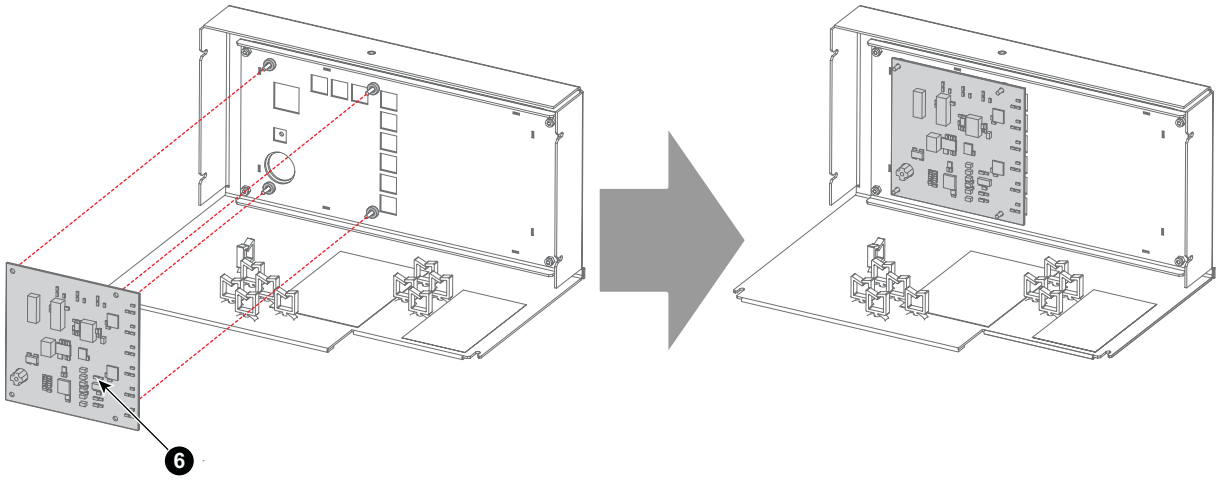


Image 15-21

5. Tighten the 4 lock nuts (reference 7, image 15-22) on the Button module mounting bolts.

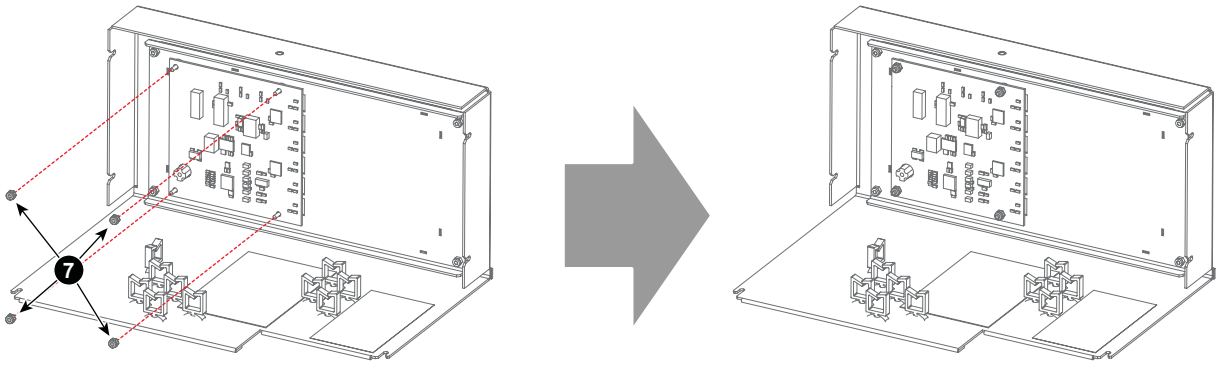


Image 15-22

6. Connect the flat cable to the Button module by performing the following procedure:
   a) Make sure the locks at both sides of the socket are pulled out (step 1, image 15-23).
   b) Insert the flat cable into the socket (step 2, image 15-23).
   c) Lock the flat cable by pushing in the locks at both sides of the socket (step 3, image 15-23).

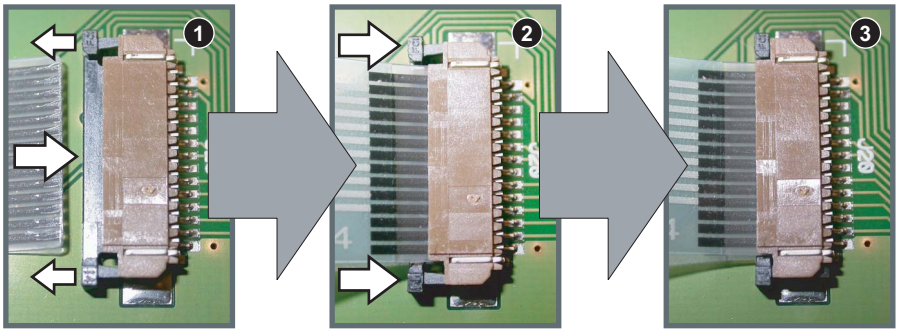


Image 15-23

15.12 Replacement of the Keypad (first generation Keypad)

This procedure assumes that the Button assembly is already removed from the Card Cage.

Necessary tools

5.5 mm nut driver

How to replace the Keypad?

1. Disconnect the flat cable (reference 1, image 15-24) from the Button module (reference 2, image 15-24) by performing the following procedure:
   a) Pull out the locks at both sides of the socket (step 2, image 15-25).
   b) Pull out the flat cable from the socket (step 3, image 15-25).

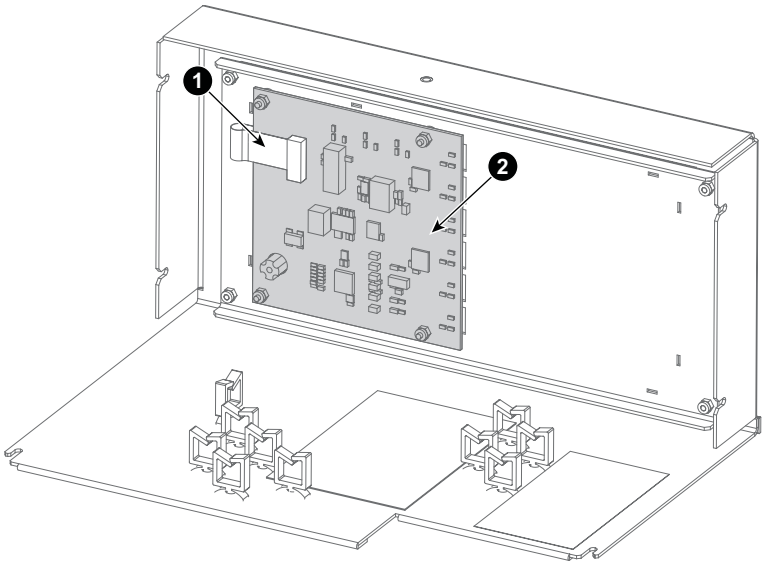


Image 15-24

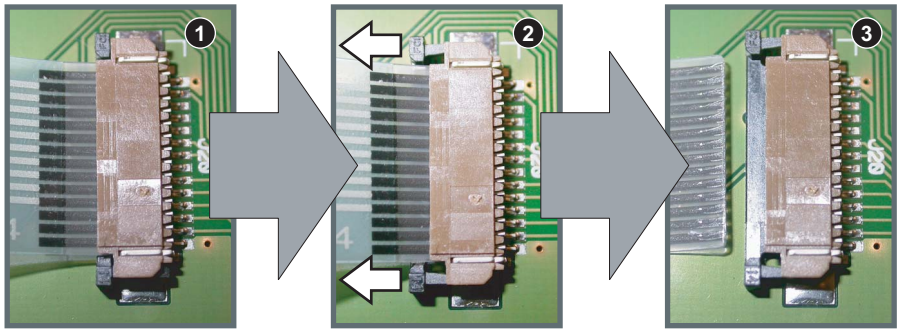


Image 15-25

2. Remove the 4 lock nuts (reference 3, image 15-26) from the Button module mounting bolts.

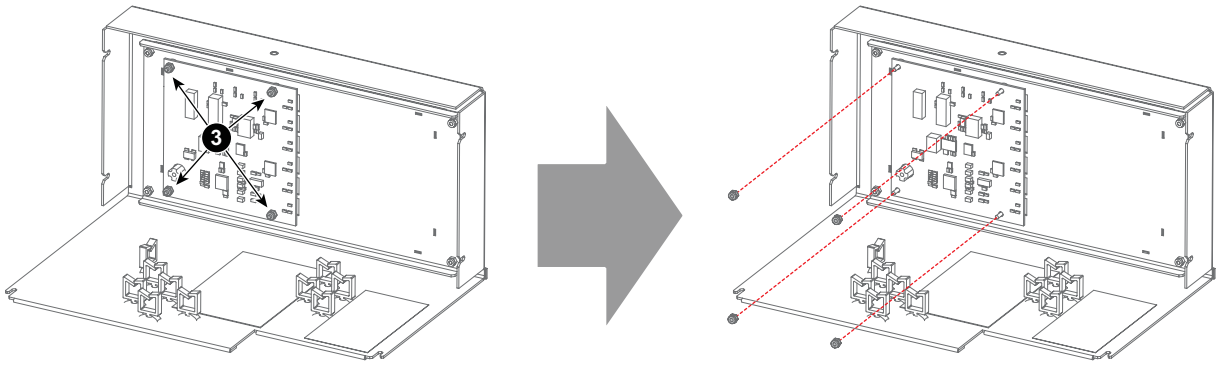


Image 15-26

3. Remove the Button module (reference 4, image 15-27) and the 4 washers (reference 5, image 15-27) from the Button module mounting bolts.

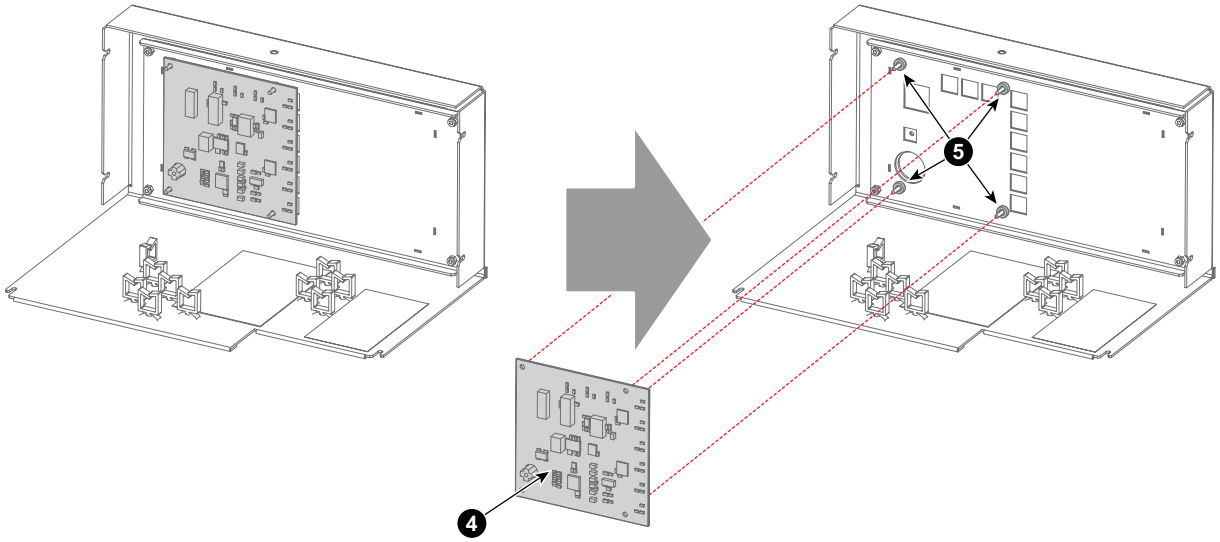


Image 15-27

4. Remove the 4 lock nuts (reference 6, image 15-28) from the Keypad mounting bolts.

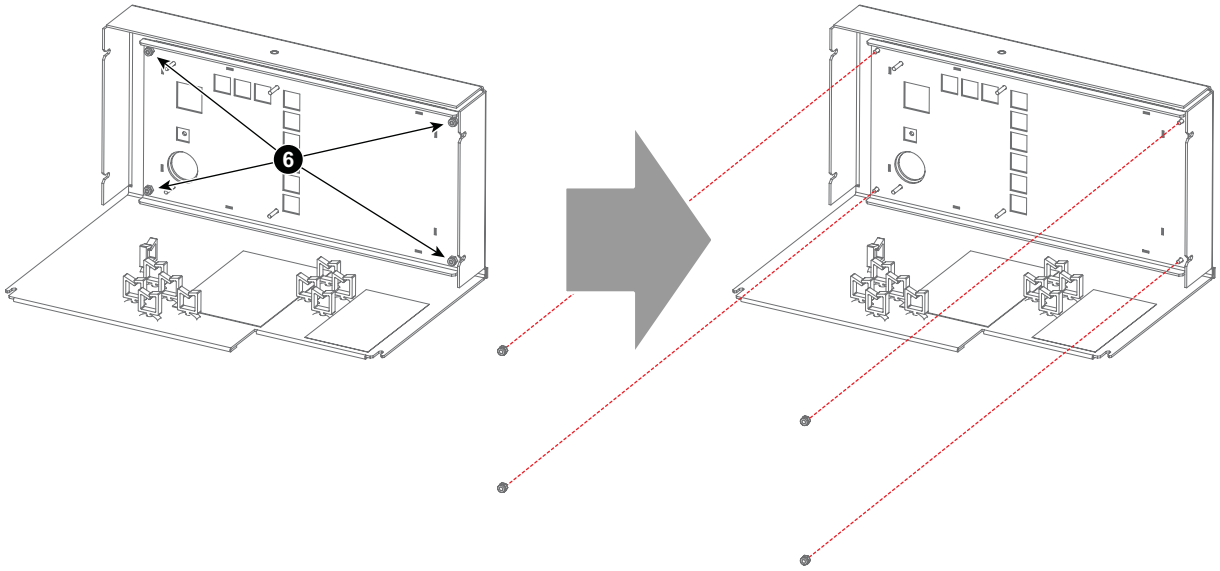


Image 15-28

5. Remove the Keypad (reference 7, image 15-29).
   Tip: *Make sure the 4 washers (reference 8, image 15-29) don't drop off the Keypad mounting bolts.*

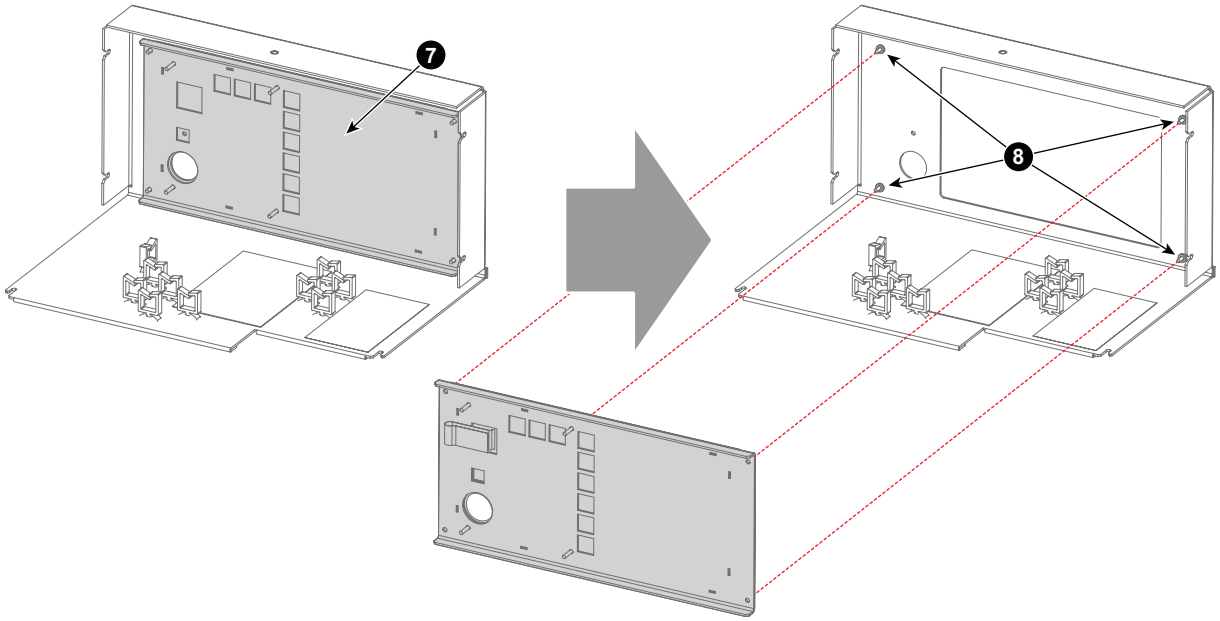


Image 15-29

6. Install the new Keypad (reference 9, image 15-30).

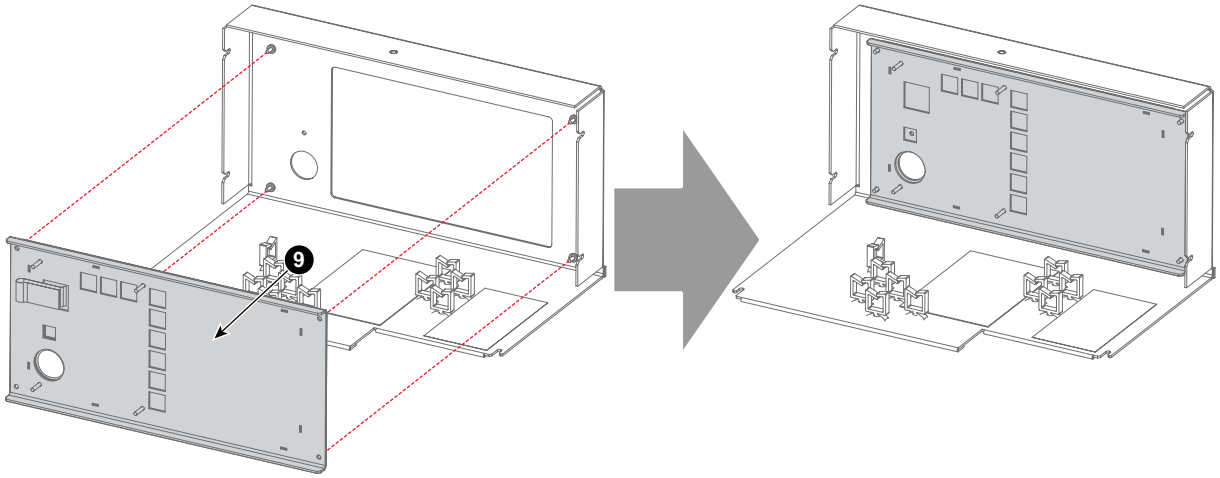


Image 15-30

7. Tighten the 4 lock nuts (reference 10, image 15-31) on the Keypad mounting bolts.

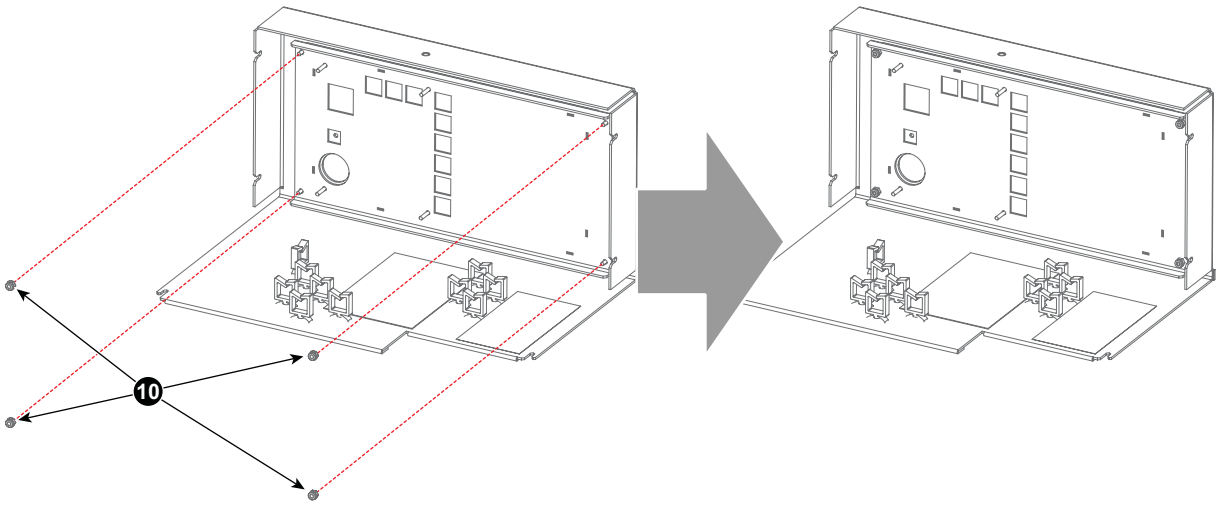


Image 15-31

8. Install the new Button module (reference 11, image 15-32).

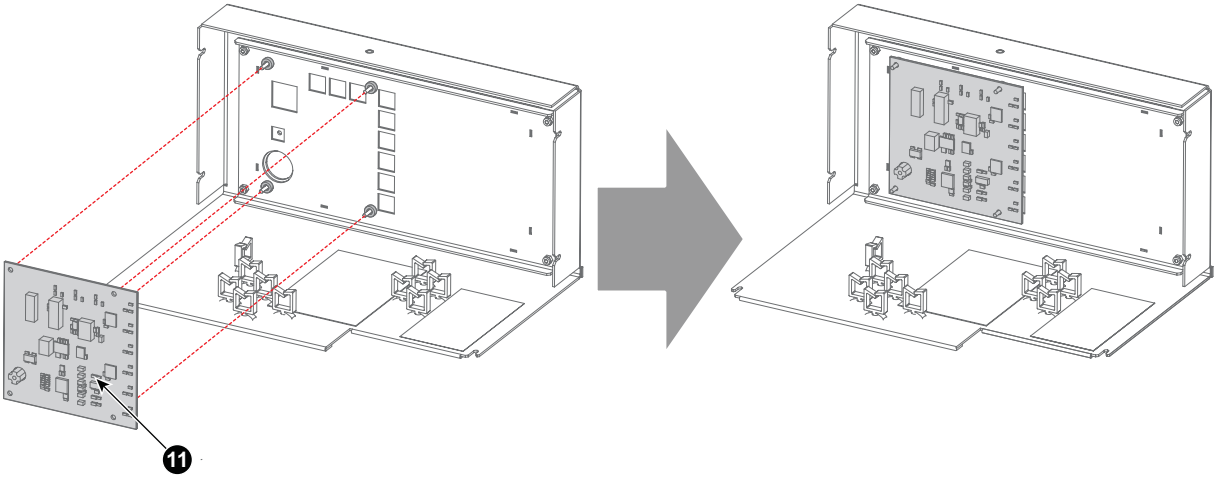


Image 15-32

9. Tighten the 4 lock nuts (reference 12, image 15-33) on the Button module mounting bolts.

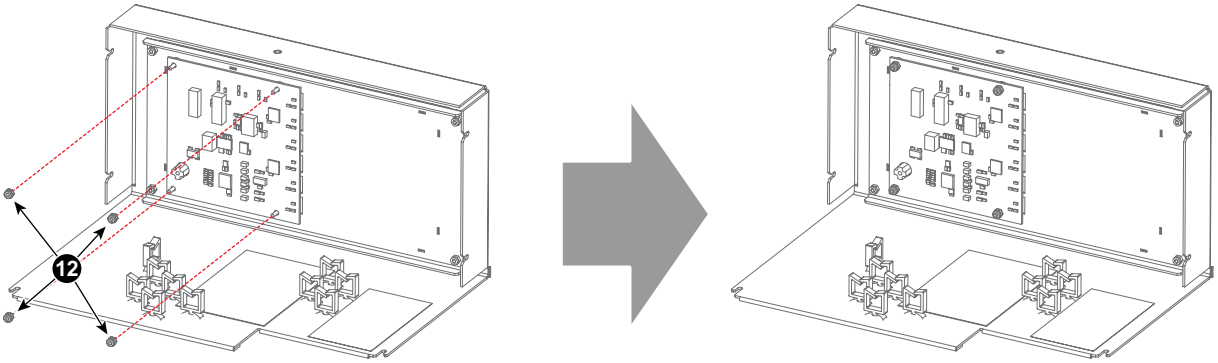


Image 15-33

10. Connect the flat cable to the Button module by performing the following procedure:
    a) Make sure the locks at both sides of the socket are pulled out (step 1, image 15-34).
    b) Insert the flat cable into the socket (step 2, image 15-34).
    c) Lock the flat cable by pushing in the locks at both sides of the socket (step 3, image 15-34).

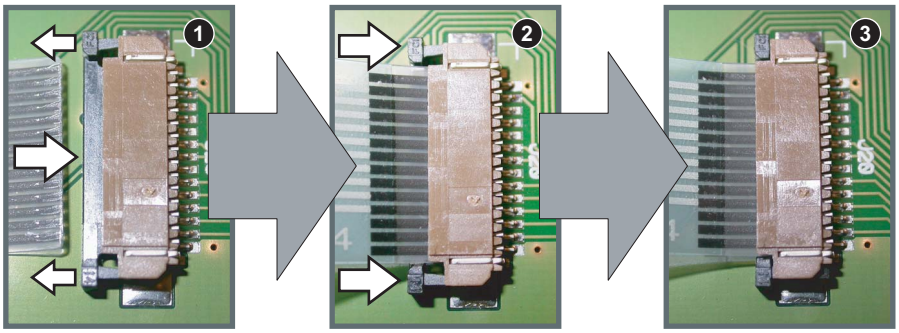


Image 15-34

15.13 Replacement of the Keypad assembly (second generation Keypad)

How to replace the Keypad assembly?

1. Remove the 4 lock nuts (reference 1, image 15-35) from the Keypad assembly mounting bolts.
2. Remove the Keypad assembly (reference 2, image 15-35).
   Tip: *Make sure the four washers (reference 3, image 15-35) don't drop off the keypad assembly mounting bolts.*
3. Install the new Keypad assembly (reference 2, image 15-35).
4. Tighten the 4 lock nuts (reference 1, image 15-35) on the Keypad assembly mounting bolts.

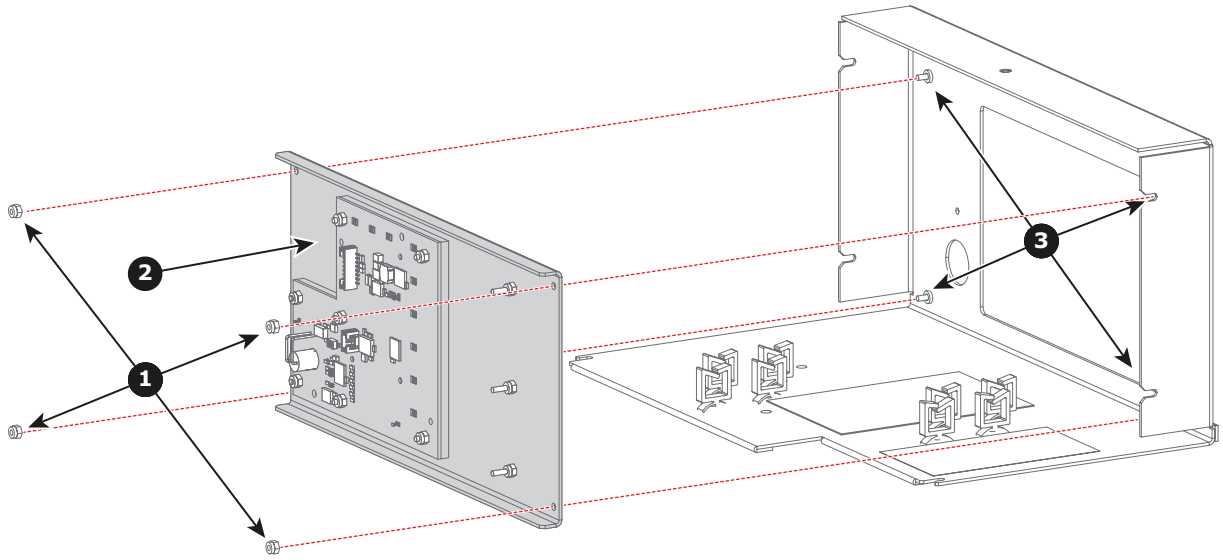


Image 15-35

15.14 Replacement of the signal back plane

About the Signal back plane

- Provides direct connection between all components listed below:
  - Fan Controller
  - Integrated Cinema Processor
  - HD-SDI Board
  - Cinema Controller
  - ID card
- All DC voltages are passed through this board from SMPS board to final board / module.
- Provides cable connection between all components listed below:
  - SMPS board
  - Pump
  - Lens motors and lens holder
  - Light processor
  - CLO sensor
  - Dolby 3D controller
  - Fans
  - Security switches
  - Temperature sensors
  - Touch panel
  - Keypad
  - Prism switch sensor
  - Dowser

Necessary tools

- Flat blade screwdriver
- Allen key 2.5 mm

Preparations

1. Remove the front, input cover and top cover, see Removal and Installation of the projector covers.
2. Remove the convergence cover plate as follow:
   a) Loosen both screws (reference 1 and 2).
   b) Slide the plate forwards until all hooks at both sides of the plate become free.
   c) Take off the plate.

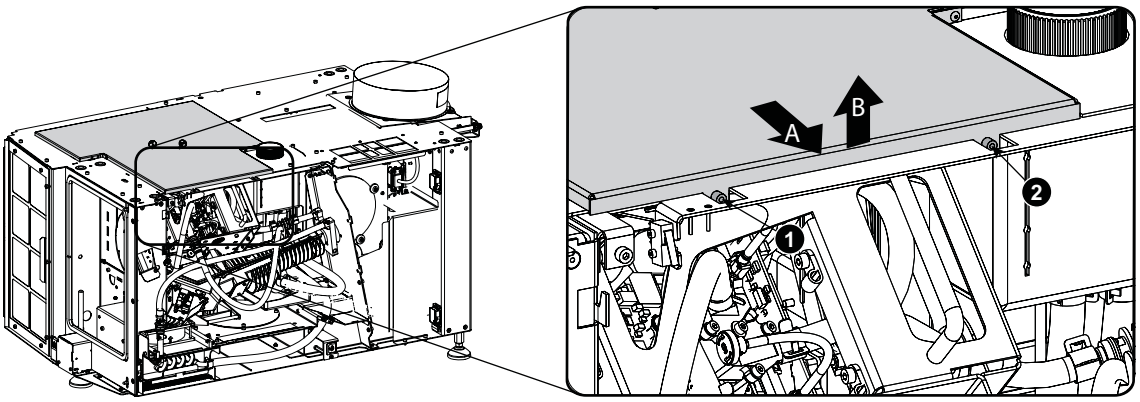


Image 15-36
Convergence cover plate

3. Remove the button panel assembly, "Removing the button unit", page 283.

   Remove :
   - the fan controller board.
   - Integrated cinema controller board
   - the HD-SDI board
   - Cinema controller board
4. Pull the small handle a little backwards and then to the front of the projector until the filter frame is released and slide out the filter.

Removing the signal backplane

1. Remove the first intermediary plate as follow:
   a) Unplug the fan connection from the signal backplane (1).
   b) Turn out both fixation screws (2).
   c) Slide out the plate (3).

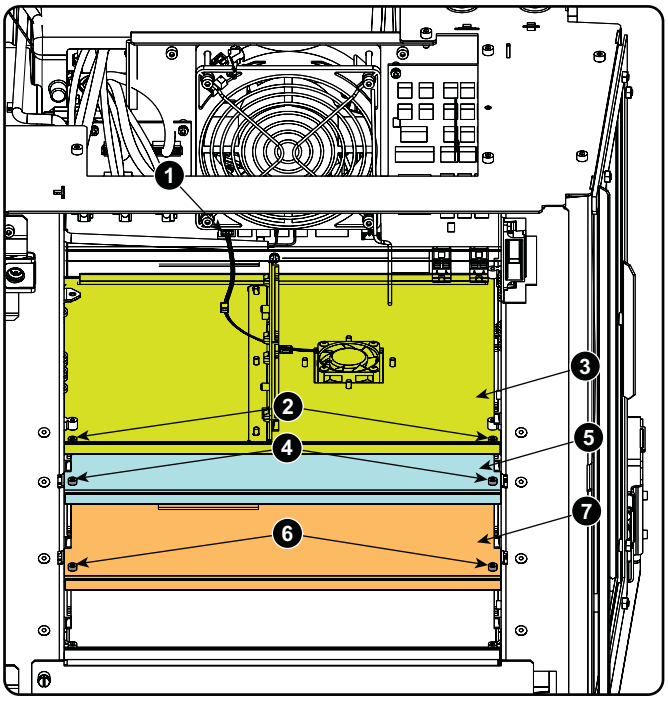


Image 15-37
Intermediary plate

2. To remove the next plate (5), turn out both fixation screws (4) and slide out the plate.
   Repeat in the same way for the next plate (7).
3. Unplug all cables from the signal backplane. Those inside the card cage and those next to the fans accessible via the front side.

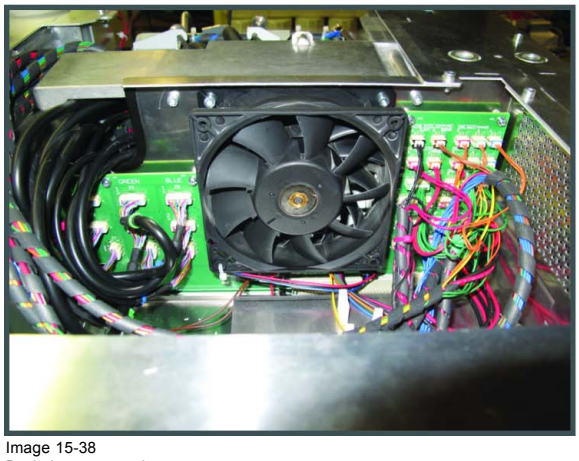


Image 15-38
Backplane connections

4. From inside the card cage, remove the screws 1 to 6

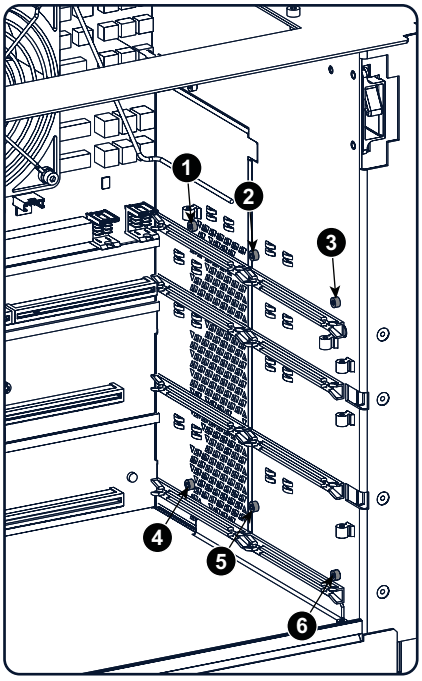


Image 15-39
Side card cage, screws

5. From the front side, pull the fan assembly a little bit forward and turn it to the left, or take it out completely.
   The blue and black wires coming from the SMPS are tied to the fan assembly. To make it possible to move the assembly forward, open the SMPS compartment and unplug the connector with the blue and black wires (reference 3 and 4 on image 15-41).

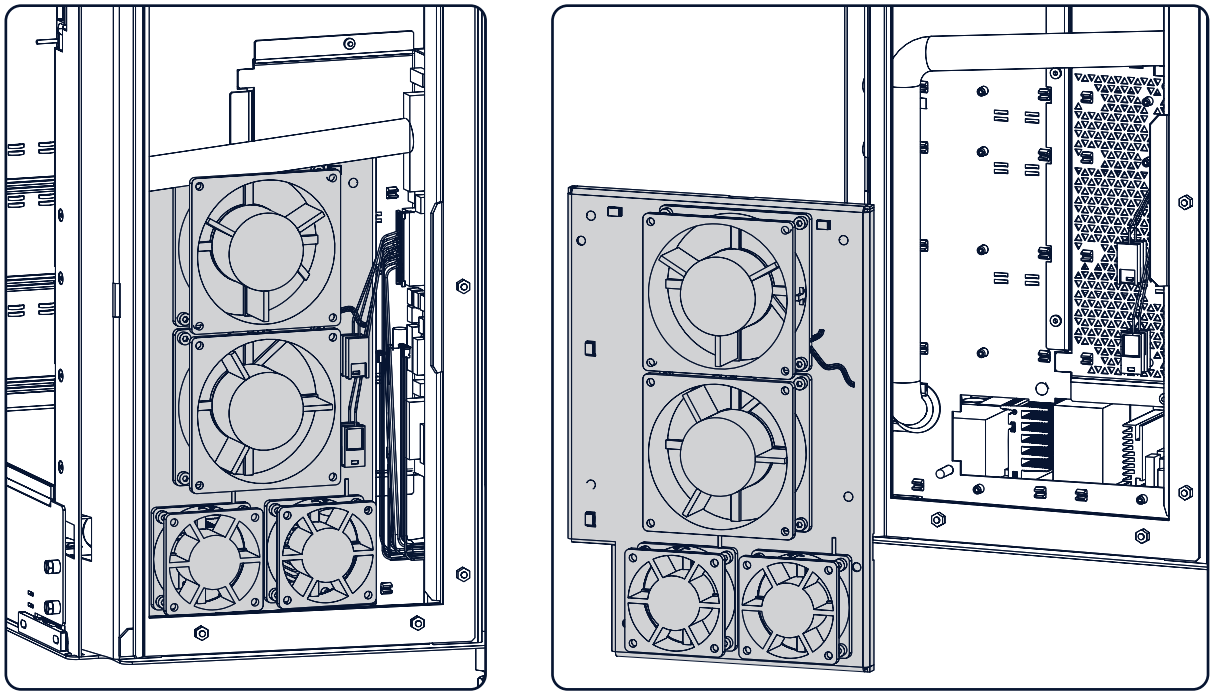


Image 15-40
Fan assembly removal

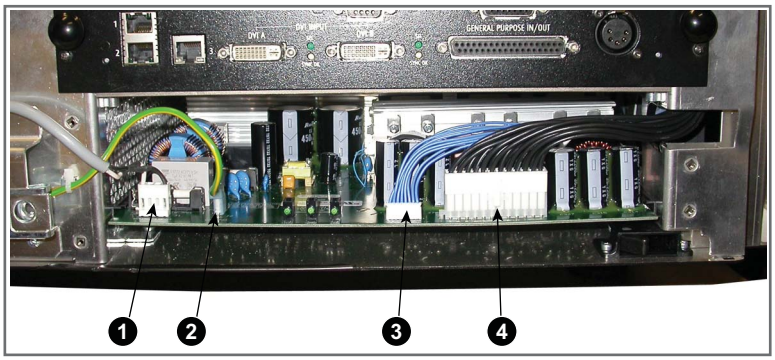


Image 15-41
SMPS connections

6. Pull out the hatch in the side of the card cage.

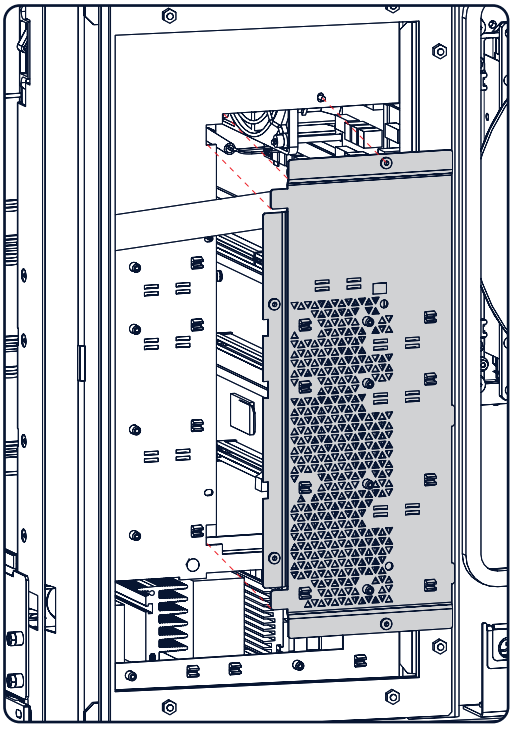


Image 15-42
Hatch removal

7. Remove the fixation screws 1 to 11 of the backplane unit.

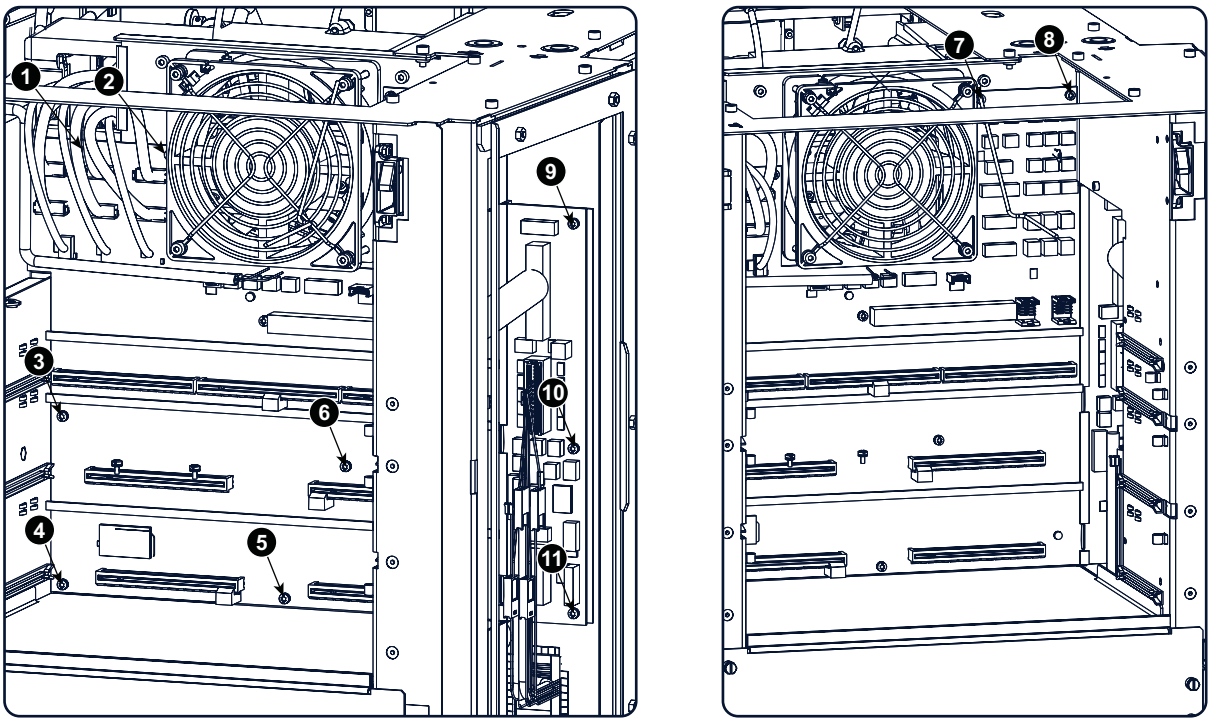


Image 15-43
Backplane fixation screws

8. Pull the signal backplane a little bit forward Pivot the left side as far as possible and slide out the board.

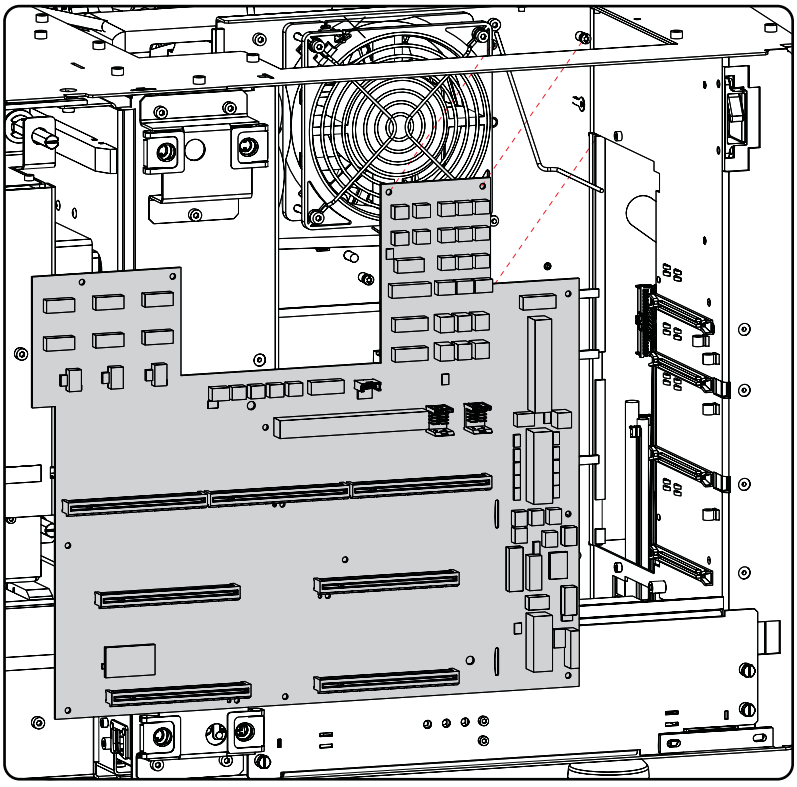


Image 15-44
Signal backplane removal

9. Remove the projector ID card.
   Push the card holder a few millimeters to the left until the lock opens.
   Turn it over and slide out the projector ID card.

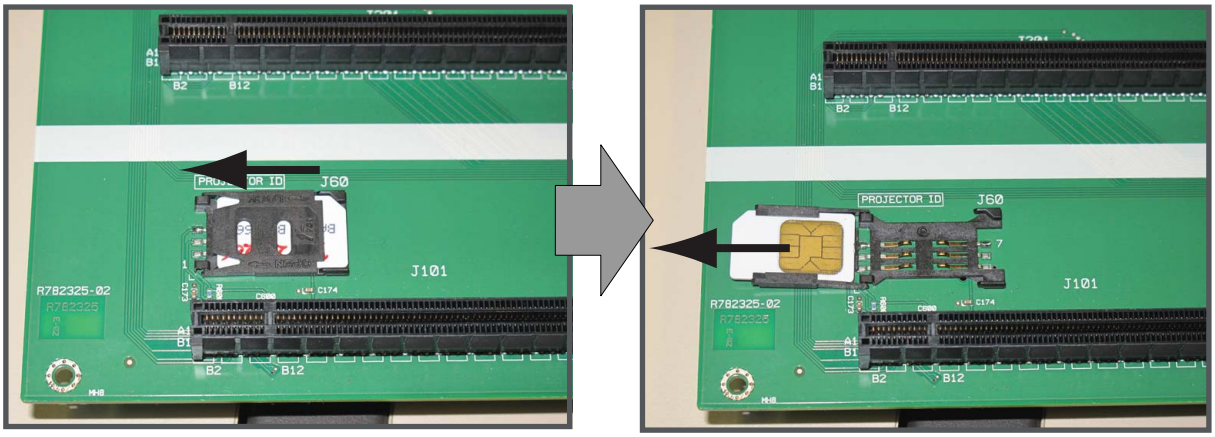


Image 15-45
Projector ID card removal

Mounting new signal backplane

1. Open the Projector Id card holder by pushing it a few millimeters to the left and turn it over.
   Insert the Projector ID card with the chip upwards.
   Turn the holder back, push it a little bit down while sliding it to the right until it locks.

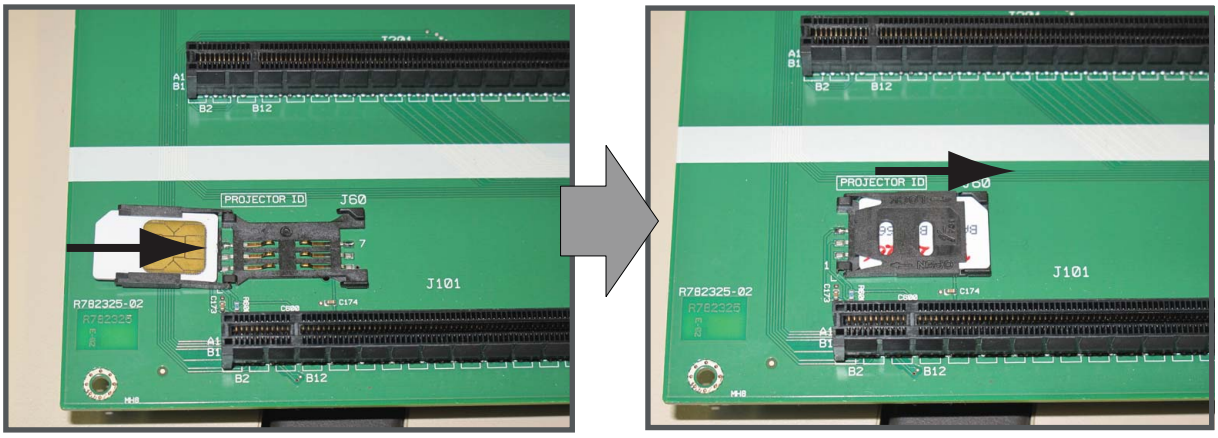


Image 15-46
Projector ID card, installation

2. Take the new backplane and slight the right side under an angle through the gap in the side of the card cage.
   Pivot the backplane on its place.

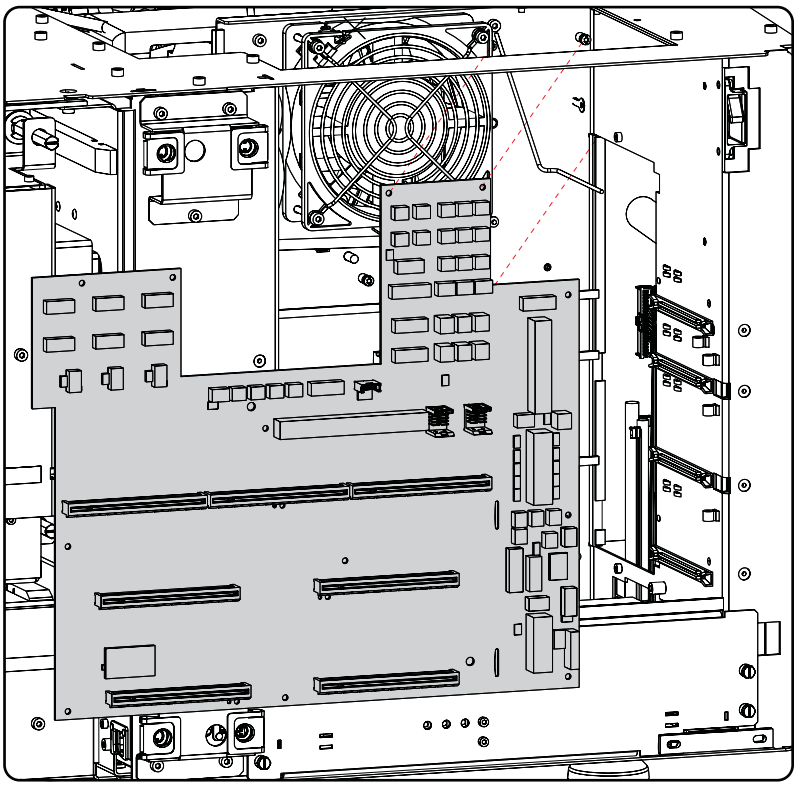


Image 15-47
Signal backplane insertion

3. Drive in screw 1 to 11.

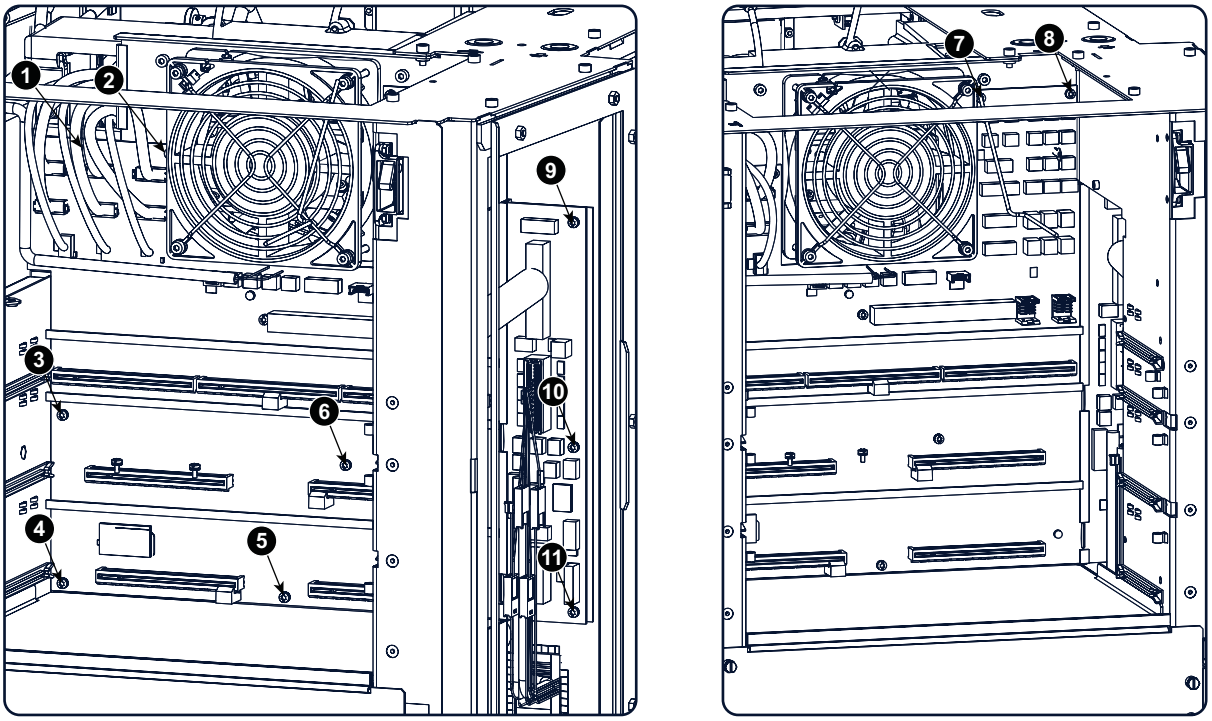


Image 15-48
Backplane fixation screws

4. Place the hatch back on its place.

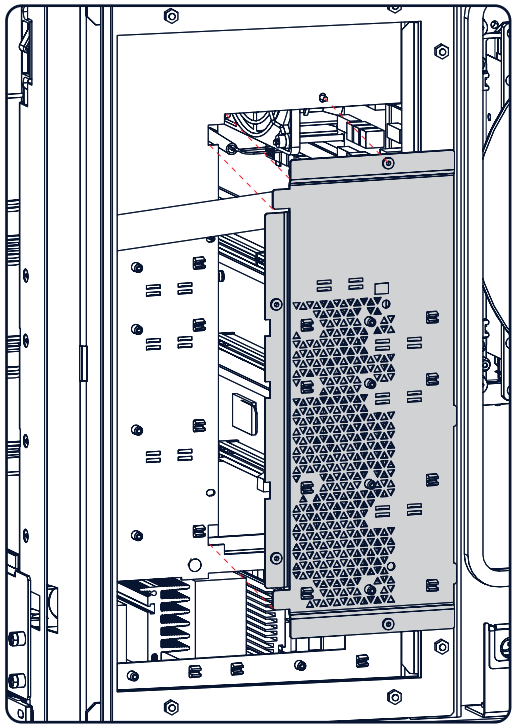


Image 15-49
Hatch installation

5. Mount the fan assembly back on its place.
   Pull the blue and black wire unit towards the Switched mode power supply and plug-in both wire units (3 an d4).

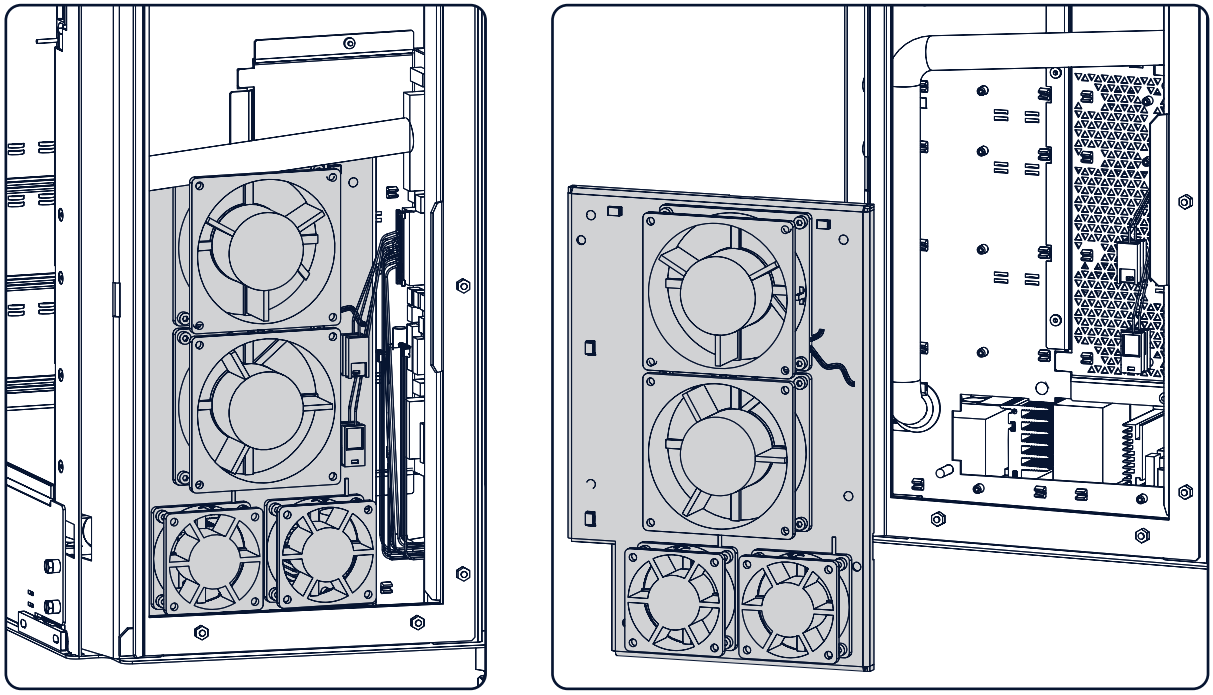


Image 15-50
Fan assembly installation

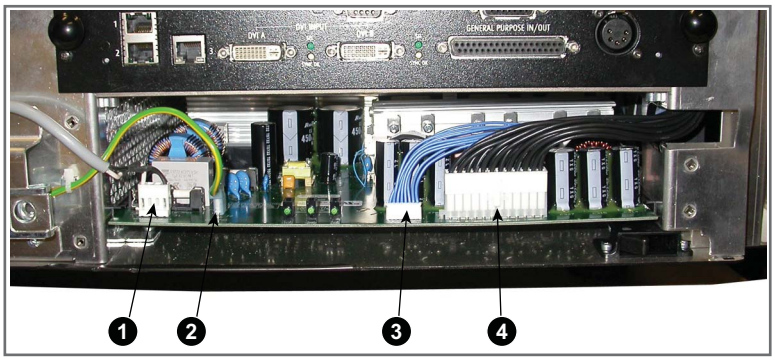


Image 15-51
SMPS connections

6. From the inside of the card cage, drive in screw 1 to 6 to fixate the fan assembly.

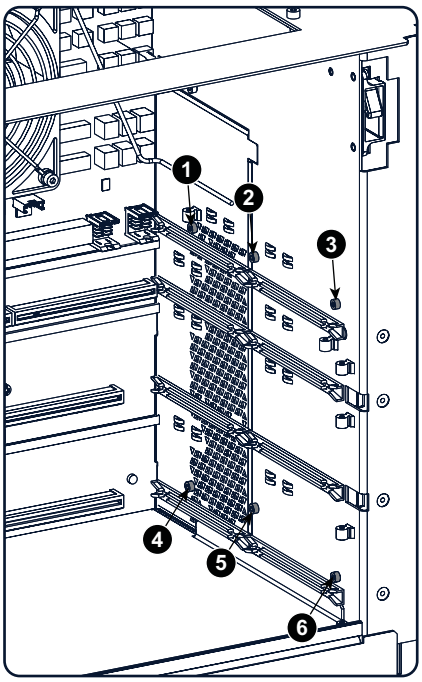


Image 15-52
Side card cage, screws

7. Make all electrical connections. See *"Electrical connections"* further in this topic for more info

8. Insert the lower intermediary plate and drive in both fixation screws.
   Repeat for the second intermediary plate and the upper plate (plate with fan)

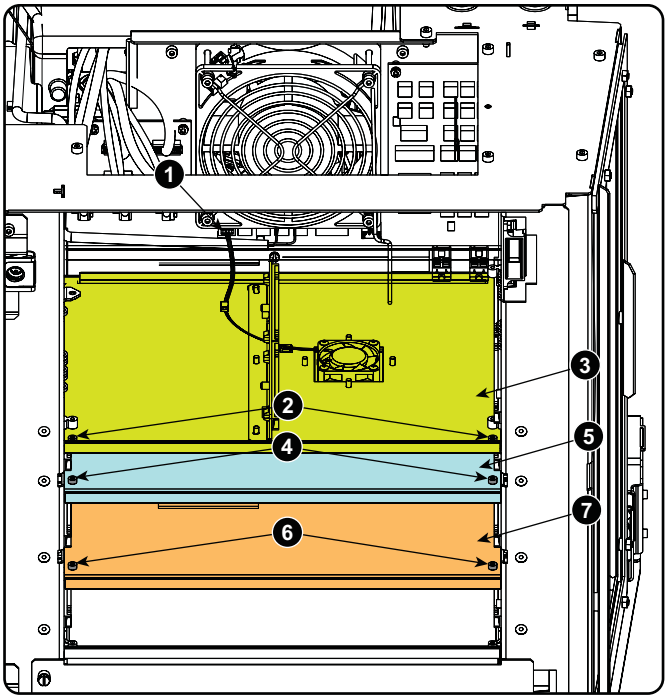


Image 15-53
Intermediary plates

9. Reconnect the fan with the signal backplane.

Finalizing the procedure

1. Reinstall the SMPS cover plate.

   Insert from top to bottom:
   - the fan controller board.
   - the Integrated cinema controller board
   - the HD-SDI board
   - the Cinema controller board

2. Mount the button panel, "Installation of the button unit", page 286.
3. Mount the convergence cover plate.
4. Reinstall the housing, see Removal and Installation of projector covers.

Electrical connections

Formatter connections

All formatter cables, data and power, have a colored cable tie. There are 3 cables per color available, two with same connector but one with one cable tie and one with 2 cable ties. The color name is screened on the printed circuit board (1, 2 and 3). Plug in the cable with e.g. a red cable tie into the connector with the same size and with the indication red. For those with the same connector plug the one with one cable tie into the upper connector (row A), The one with 2 cable ties into the second connector (row B). Repeat for all other cables.

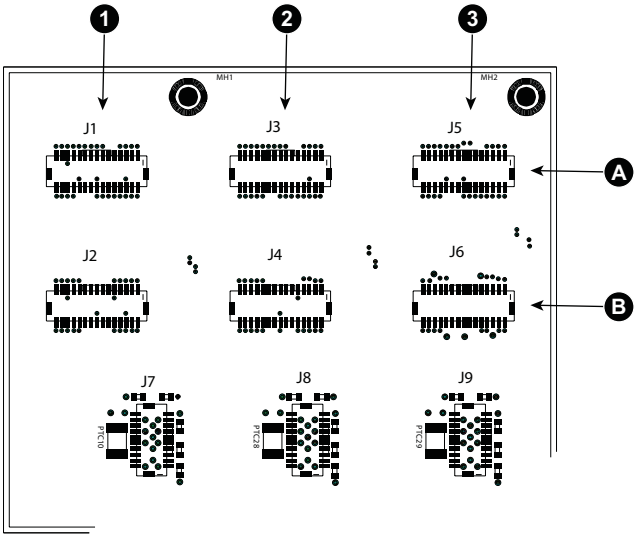


Image 15-54
Formatter connections

1 Red formatter connections
2 Green formatter connections
3 Blue formatter connections
A Cables with one cable tie
B Cables with two cable ties

Right side connections

Color convention for the connections.

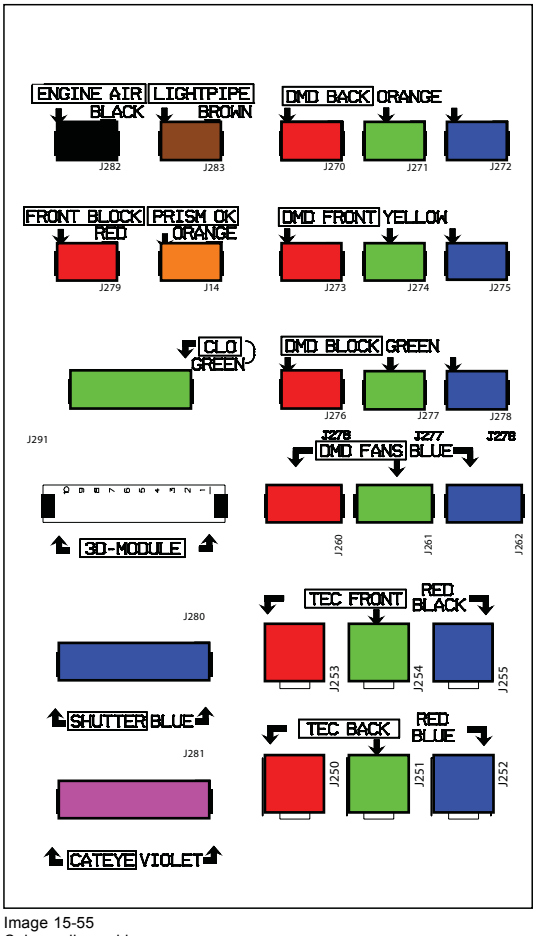


Image 15-55
Color coding cables

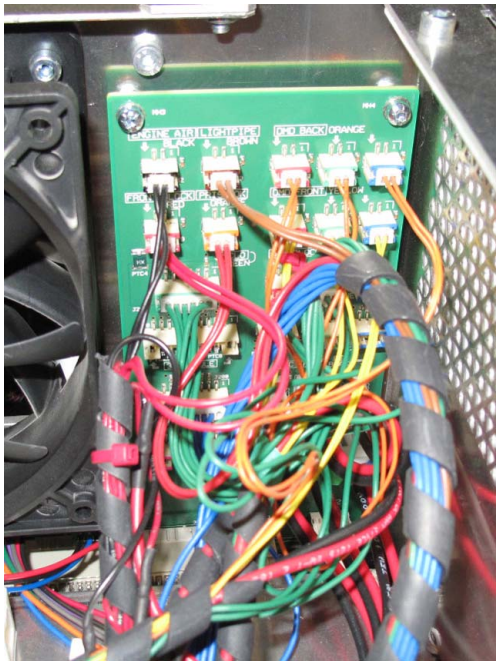


Image 15-56
Color coding cables, image

The color indication on the socket corresponds with the colored cable tie on the cable next to the connector.

The screened color indication just above the sockets corresponds with the color of the wires in the cable tree.

Connections below light processor compartment fan

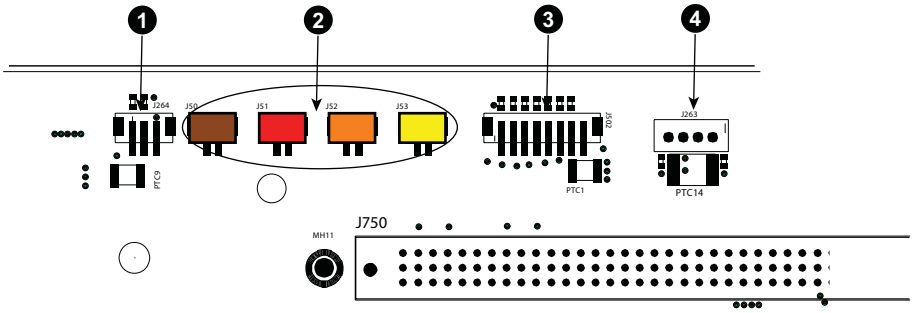


Image 15-57
Cabling below fan

1 ICP fan connection
2 Security door switches
3 Button module connection
4 Light processor compartment fan connection

The color indication on the socket corresponds with the color of the wires in the cable tree.

Connections accessible via front side

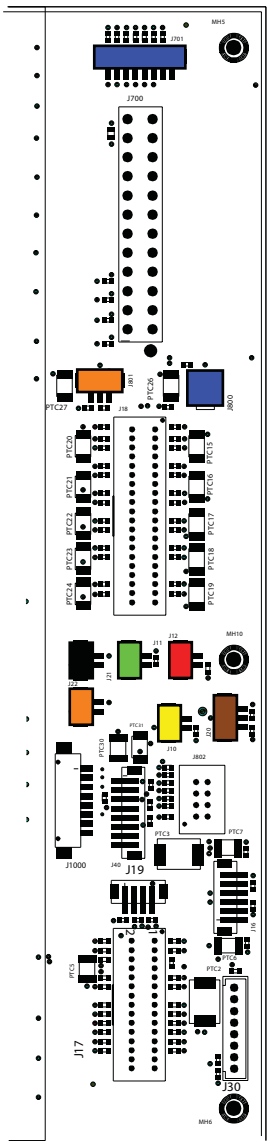


Image 15-58
Front connections

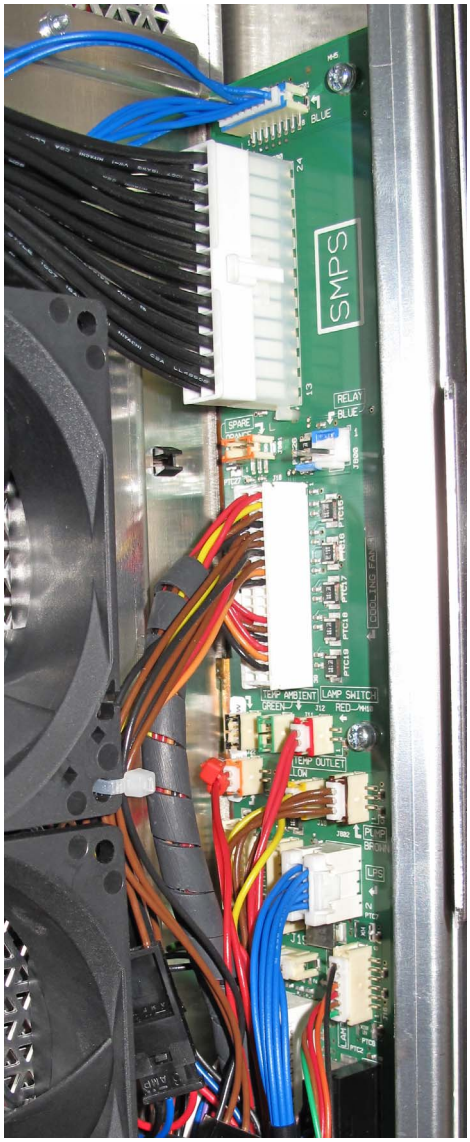


Image 15-59

The color indication on the socket corresponds with the color of the wires in the cable tree. If there are equal colors, look to the cable tie.

All other connectors are different.

15.15 Replacement of the Link Decryptor

Location

The link decryptor is mounted on the HD-SDI board.

Necessary tools

Torx screwdriver T10

How to replace

1. Remove the HD-SDI board in the card cage. See "Removing a board in the card cage", page 277.
2. Turn out the 4 fixation screws.

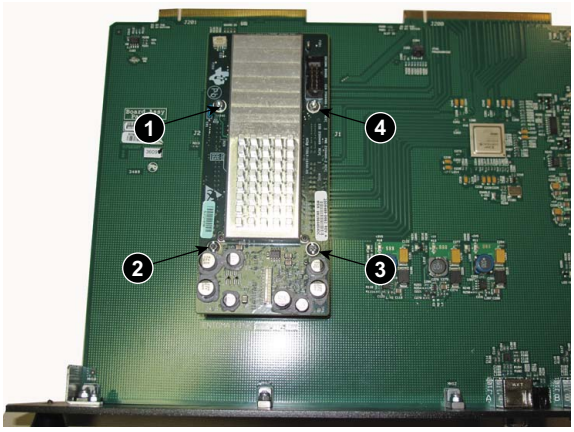


Image 15-60
Link decryptor fixation

3. Pull off the current mounted link decryptor board.
4. Unpack the new link decryptor board and plug it in both connectors at the same time (black and white connector on the link decryptor must facing the board connectors of the HD-SDI board..

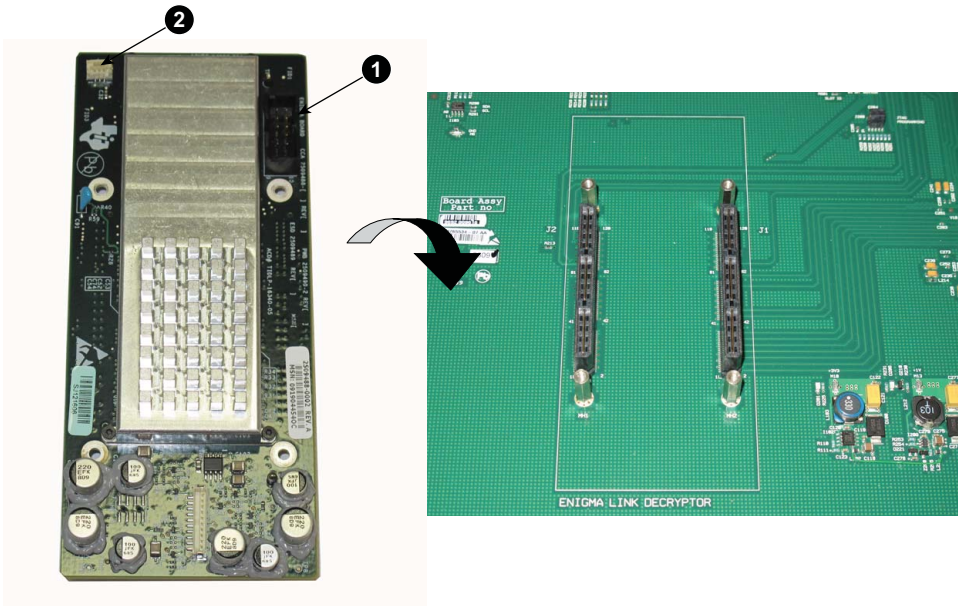


Image 15-61
Link decryptor, mounting

5. Drive in the 4 fixation screws.
6. Re-install the board in the card cage.

When inserting a new Link decryptor, the link decryptor software must be re-installed. See "Software update via Communicator (DC update companion)", page 311.

A marriage between the new link decryptor and the ICP board must be realized; Follow the procedure to clear a security warning on the projector. See "Authorization to clear security warning on the projector", page 309.

15.16 Authorization to clear security warning on the projector

When is an authorization required to clear the security warning?

If a module has been removed or if the sealed compartment has been opened, an authorization will be required to clear the security warning.

Necessary tools

- Security key (Dallas iButton®).
- Authorization pin code.

Authorization procedure to clear security warning

1. Ensure that all modules are properly installed.
2. Start up the projector (standby mode).
3. Initiate authorization by holding the security key in the security socket D..

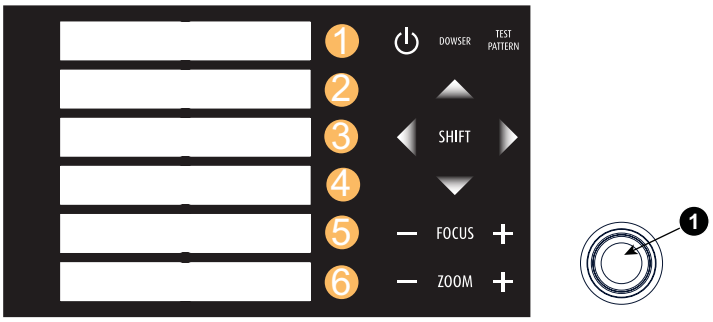


Image 15-62
Keypad

The color of the backlight of the numeric keys 1 to 6 of the local keypad changes from blue to yellow.

4. Enter pin code within 5 seconds.
   - In case no keys are pressed, the color of the backlight of the numeric keys 1 to 6 changes back to blue.
   - In case of an **incorrect code** entry, the color of the backlight of the numeric keys changes to **red** for 1 second and then back to blue.
   - In case of a **correct code** entry, the color of the backlight of the numeric keys 1 to 10 changes to **green** for 1 second and then back to blue.

Each attempt to clear the security warning and its result (successfully or unsuccessfully) is logged inside the projector.

15.17 Replacement of the Status Light

To access the Status Light board the rear cover of the projector has to be removed. This procedure assumes that the rear cover is already removed.

Necessary tools

2,5 mm Allen wrench.

How to replace the Status Light from the projector?

1. Remove the two indicated screws (reference 1) of the Status Light board. As a result the board will come loose but remains connected via the wire unit.
2. Disconnect the wire unit (reference 2) of the Status Light board.

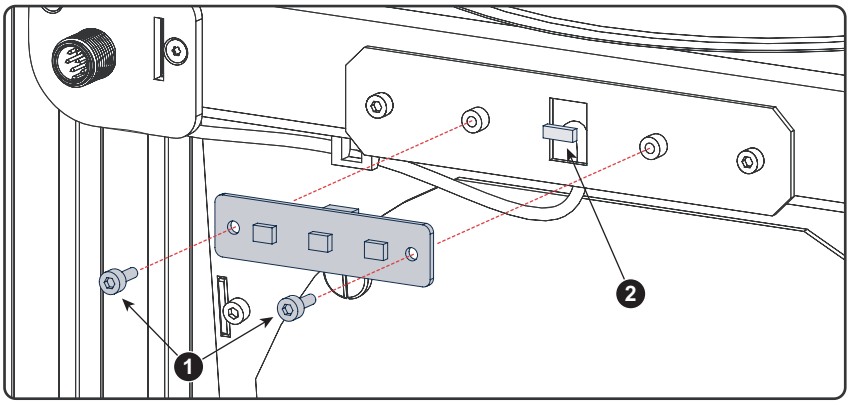


Image 15-63

3. Connect a new Status Light board with the wire unit.
4. Fasten the new Status Light board with two screws. Use a 2,5 mm Allen wrench.

16. SOFTWARE UPDATE VIA COMMUNICATOR (DC UPDATE COMPANION)

Overview

- Software upgrade, launch DC update companion
- Software upgrade, projector, ICMP or touch panel
- ICP software upgrade
- Link decryptor software update
- Update logging

During an upgrade, certificate (code 5815) and key errors (code 5816) are possible. Restarting the projector will resolve these errors. If these errors remain after a restart, replace the ICP board.

16.1 Software upgrade, launch DC update companion

What can now be done ?

The following updates of the software are possible with Communicator (DC update companion)

- Barco DC package update:
  - Projector software
  - Touch panel software
- Enigma link decryptor software
- Integrated Cinema Processor (ICP) software
- ICMP software

Download the corresponding update package from Barco's web site, http://www.barco.com on your PC. Select via the product name.

For Enigma link decrypor and ICP update package, unzip the package file into a new directory.

For the projector software, ICMP and the touch panel software package, unzipping is not possible. the file can be used as is.

The ICP and Linkdecryptor package file contains at least

- a zipped version of the update program which contains a *setup.exe* file to install the program. Can also be unzipped.
- a release file with the new software.
- a release note (pdf document)
- a Software Manifest for ICP Production Release (pdf document)

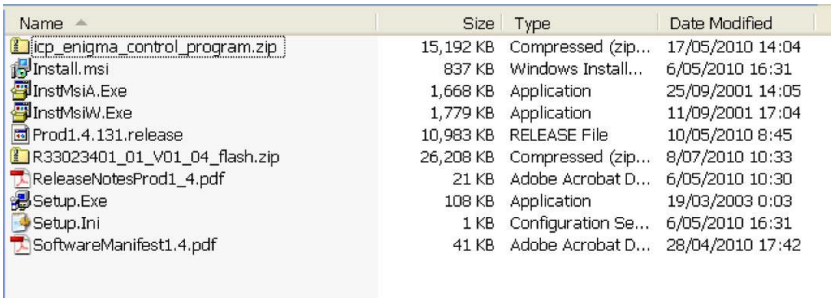


Image 16-1
Content ICP update package

DC Update Companion can also be started as a separate application. The start up button is located next to the Communicator start button in the start programs tree.

How to launch

1. While in the *Maintenance* tab page, click on **Software update** (1).

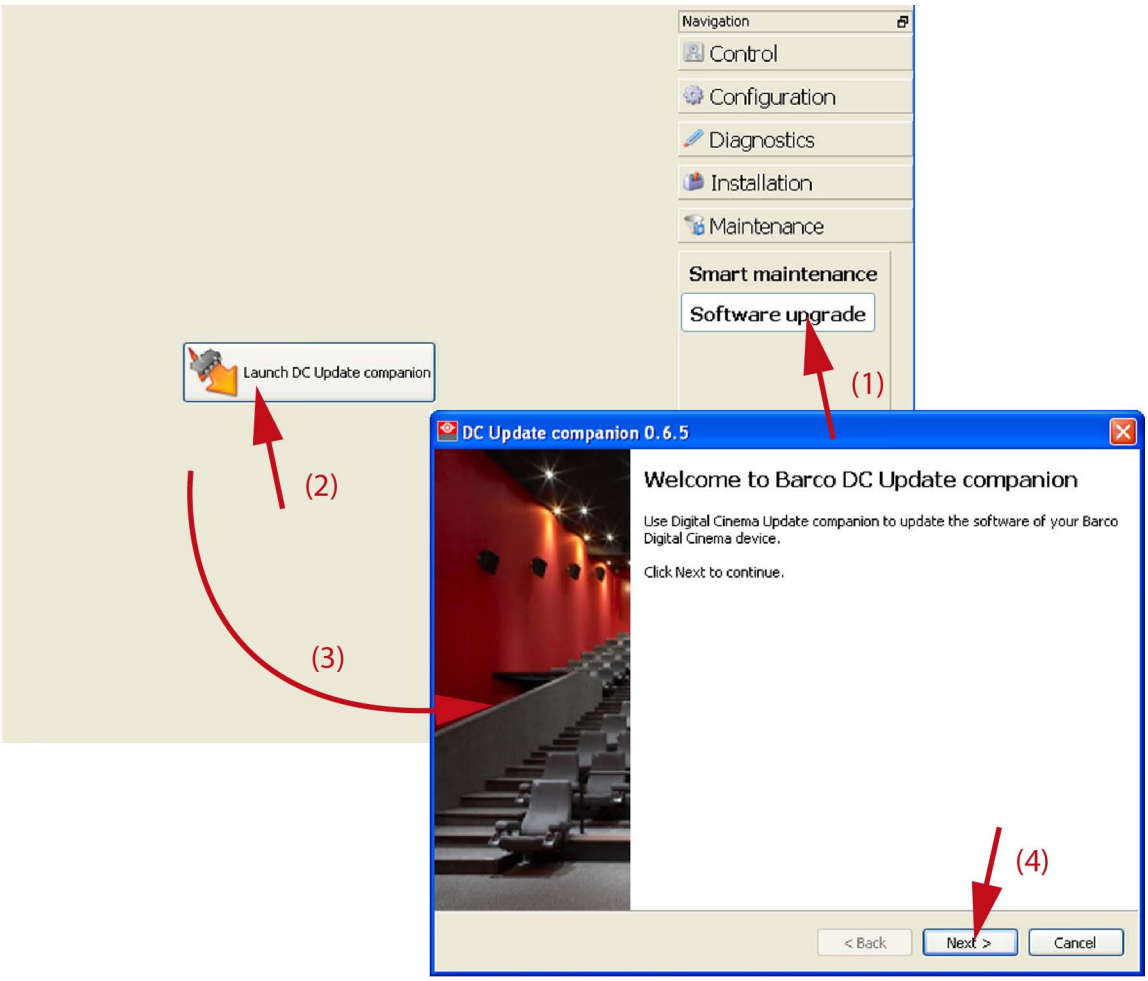


Image 16-2
Launch DC update companion

2. Click on **Launch DC update companion** (2).

   The *DC update companion* window starts up (3).

3. Click **Next** to continue (4).

4. Read the licence agreement and check accept. Click **Next** to continue.

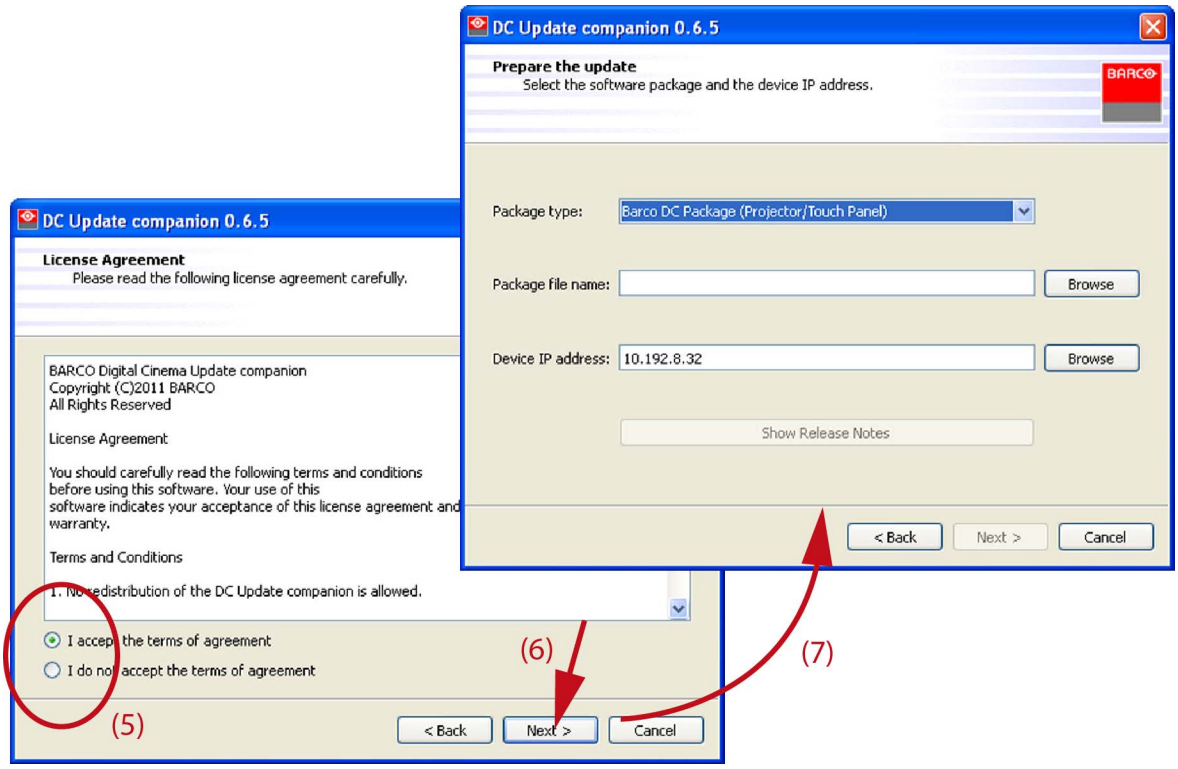


Image 16-3
Start up selection window

5. Continue with the specific procedure for each type of package.

16.2 Software upgrade, projector, ICMP or touch panel

How to update

1. Launch the *DC Update Companion* as described in "Software upgrade, launch DC update companion", page 312.
2. Select package type. Click on the drop down box (1) and select Barco DC Package (for projector or touch panel update) or ICMP package (for ICMP update).

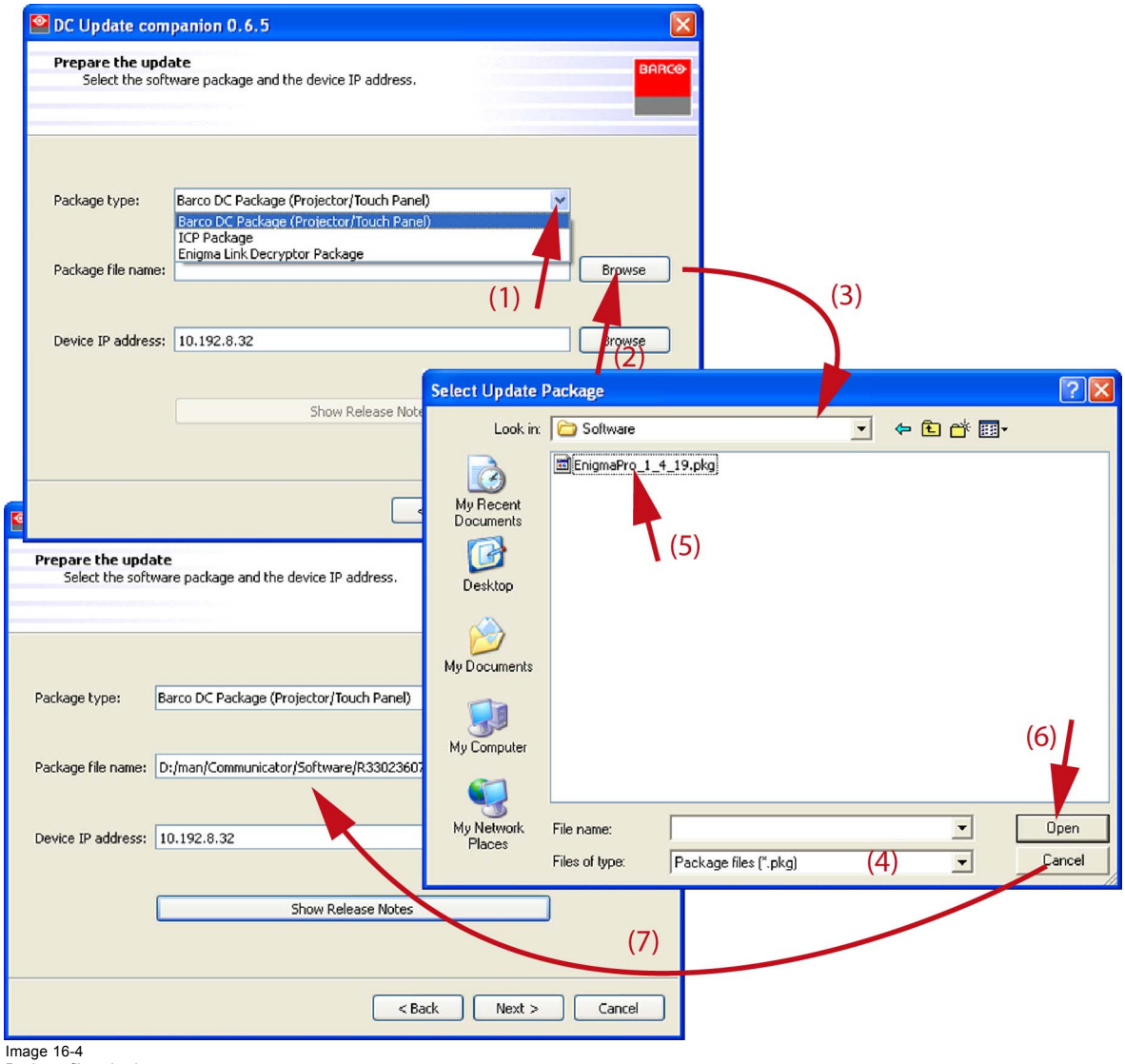


Image 16-4
Package file selection

3. Browse the package file name. Click on **Browse** (2) to open the Browser window (3).

   The correct file type is already filled out (4).
4. Browse for the desired file (5), select the file and click on **Open** (6).

   The Package file name line is filled out (7).
5. To read the release notes, click on **Show Release Notes** (8).

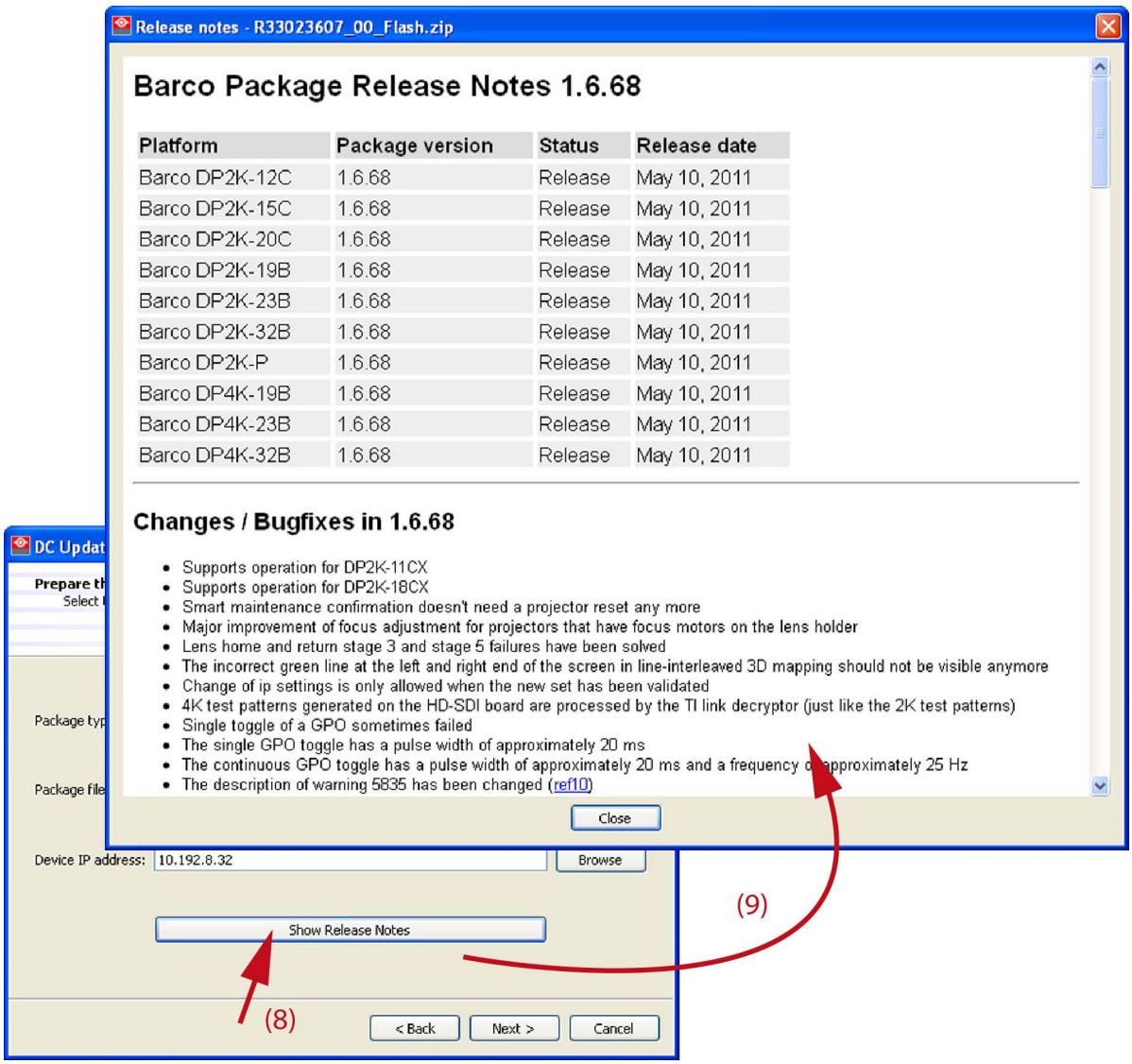


Image 16-5
Barco release notes

6. Enter the device IP address (10) or click on **Browse** to open a device selection window (11).
   Note: *The IP of the connected projector is already filled out. When using the DC Update Companion as stand alone program, then this field is blank.*

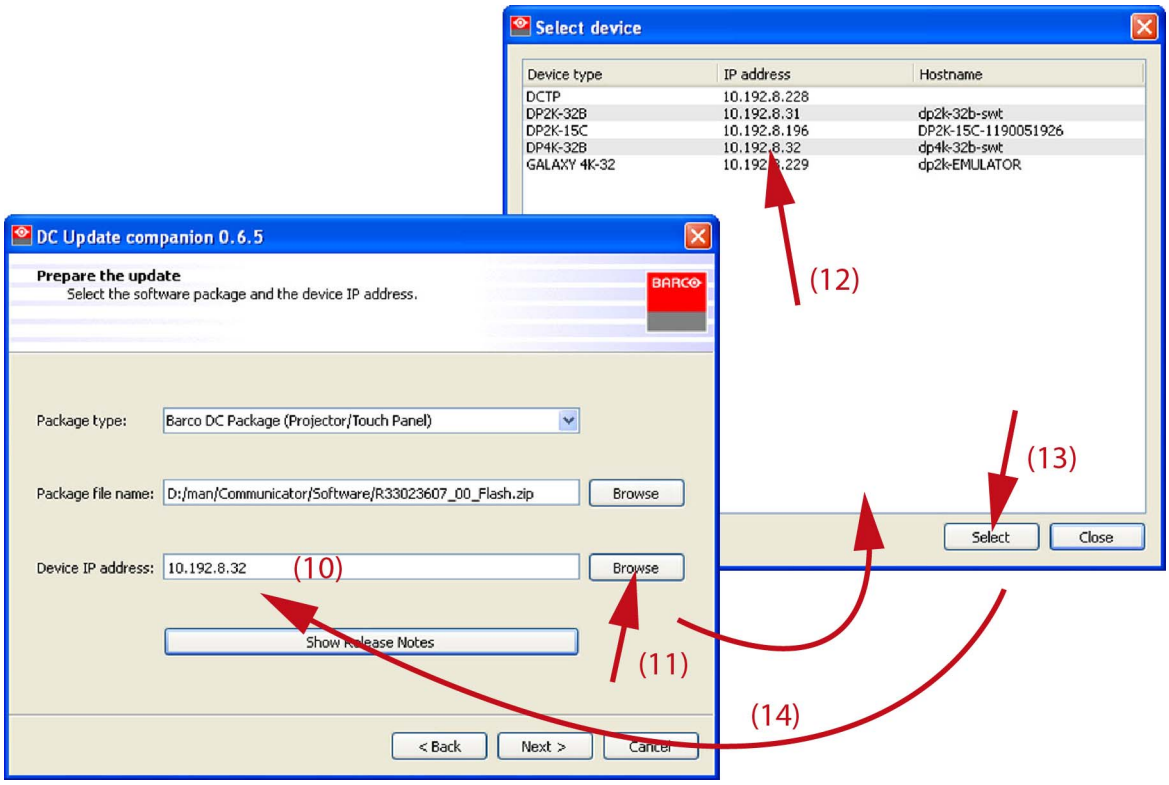


Image 16-6
IP selection

7. Select the desired IP address (12) and click **Select** (13).

   The selected IP address is filled out next to *Device IP address*.

8. Click **Next** to continue.

The necessary information is gathered.

The current installed version is shown next to the package version (15).

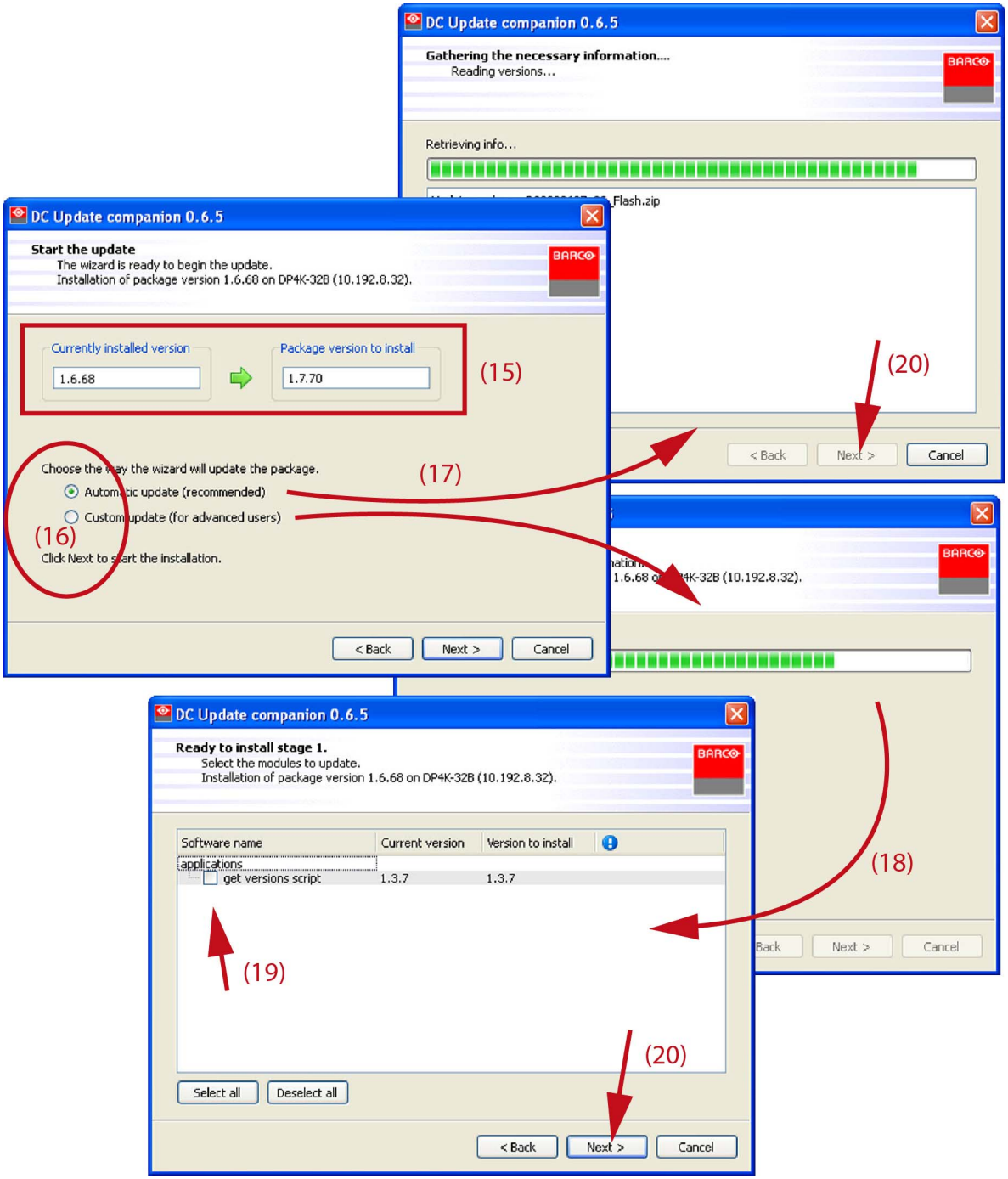


Image 16-7
Projector software update

9. Select the way the wizard will update the package. Check the desired radio button (16).
10. If automatically is selected the wizard gathered the information (17). Then click **Next** to start the update (20).
    If custom update (for advanced users) is selected, the wizard starts collecting the information (17) of the different software modules.
11. Select the modules to update (19) and click **Next** to start the update (20).

The update can take a lot of time. Make sure not to interrupt the power during the update process. At the end, an update status will be displayed.

16.3 ICP software upgrade

About updating ICP board

The ICP board contains 2 slots to store software before this software can be installed. Therefore it is recommended to store the previous version of the software in a location and the current version in the other. When an new update becomes available, overwrite always the oldest version.

These 2 loaded versions make it possible to switch on an easy way between the current version and the previous one.

How to upgrade

1. Launch the *DC Update Companion* as described in "Software upgrade, launch DC update companion", page 312.
2. Select package type. Click on the drop down box (1) and select *ICP Package* .

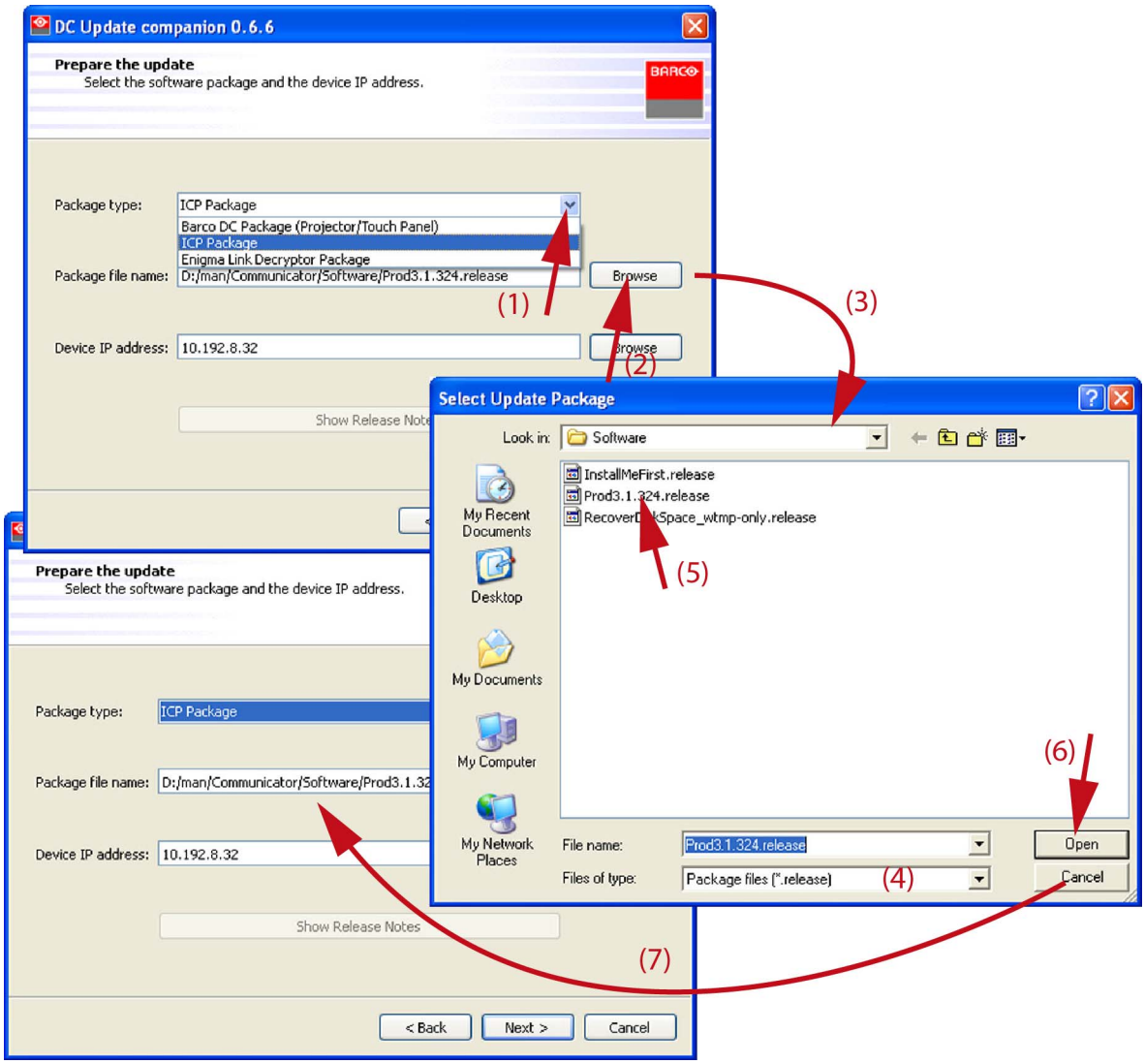


Image 16-8

3. Browse the package file name. Click on **Browse** (2) to open the Browser window (3).
   Note: *File has extension release.*

   The correct file type is already filled out (4).
4. Browse for the desired file (5), select the file and click on **Open** (6).

   The Package file name line is filled out (7).
5. Enter the device IP address (10) or click on **Browse** to open a device selection window (11).
   Note: *The IP of the connected projector is already filled out. When using the DC Update Companion as stand alone program, then this field is blank.*

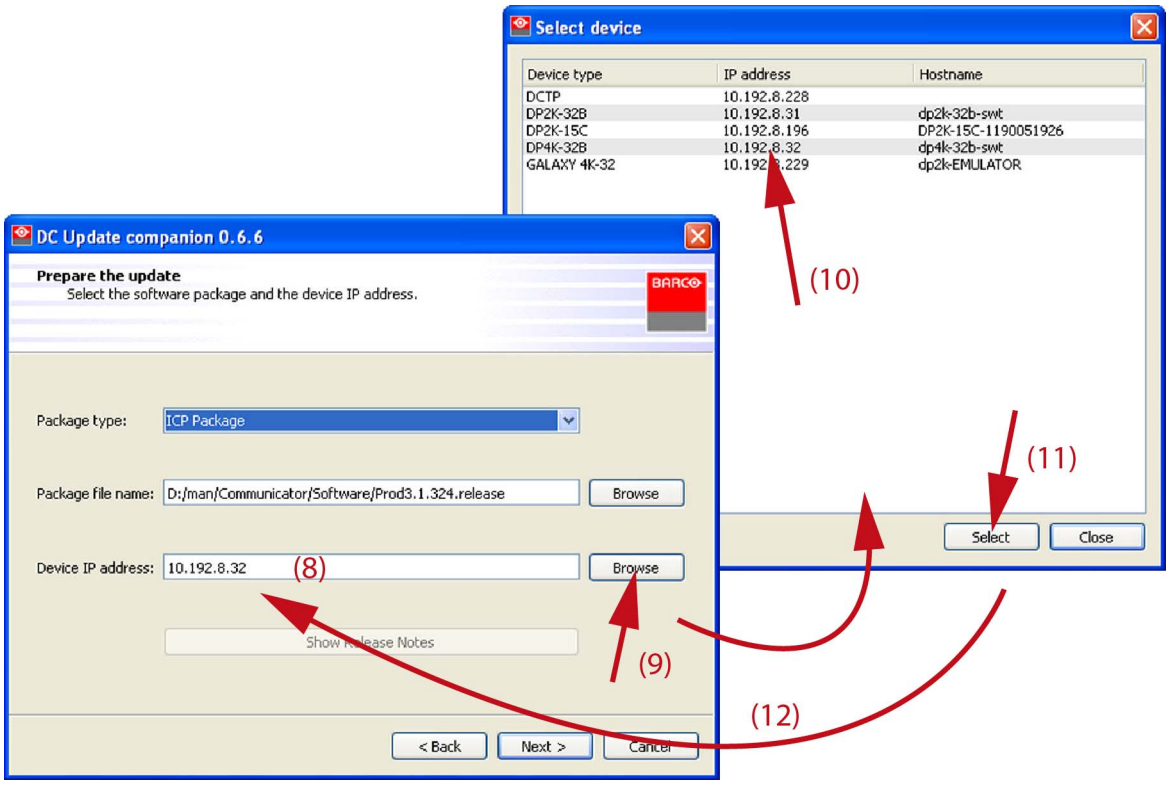


Image 16-9
IP selection

6. Click **Next** to continue.

The necessary information is gathered.

The current installed version is shown next to the package version (13).

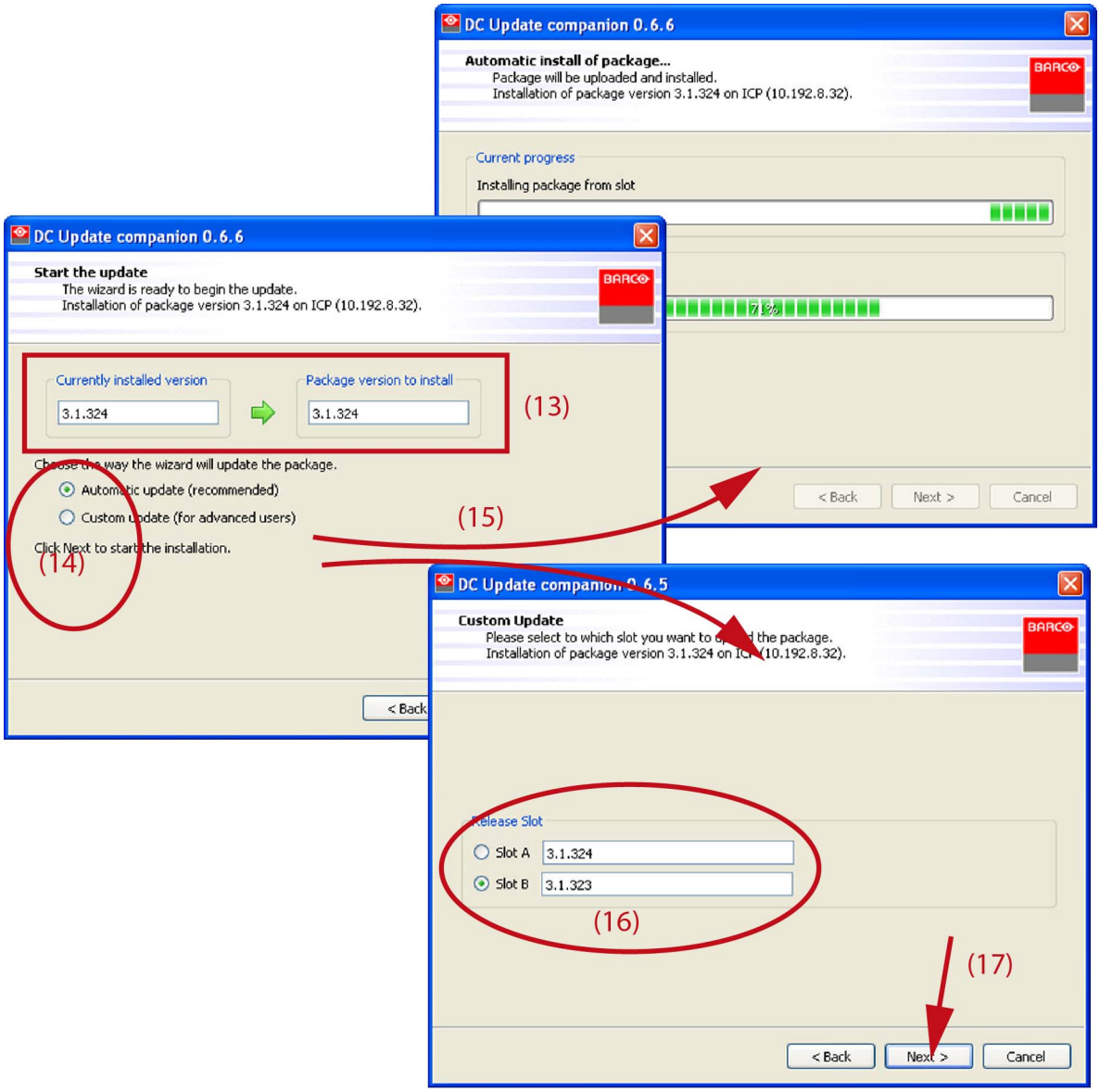


Image 16-10
Load and install software

7. Select the way the wizard will update the package. Check the desired radio button (14).
8. If automatically is selected the wizard will load the software in the oldest slot and install the software immediately (15).
   If custom update (for advanced users) is selected, the wizard displays the selection for slot A or slot B (16). Check the radio button of your choice and press **Next** (17).

   The software will be loaded to the selected slot and will be installed immediately

   When the update is finished, an status window is displayed.

16.4 Link decryptor software update

How to update

1. Launch the *DC Update Companion* as described in "Software upgrade, launch DC update companion", page 312.
2. Select package type. Click on the drop down box (1) and select *Enigma Link Decryptor Package* .

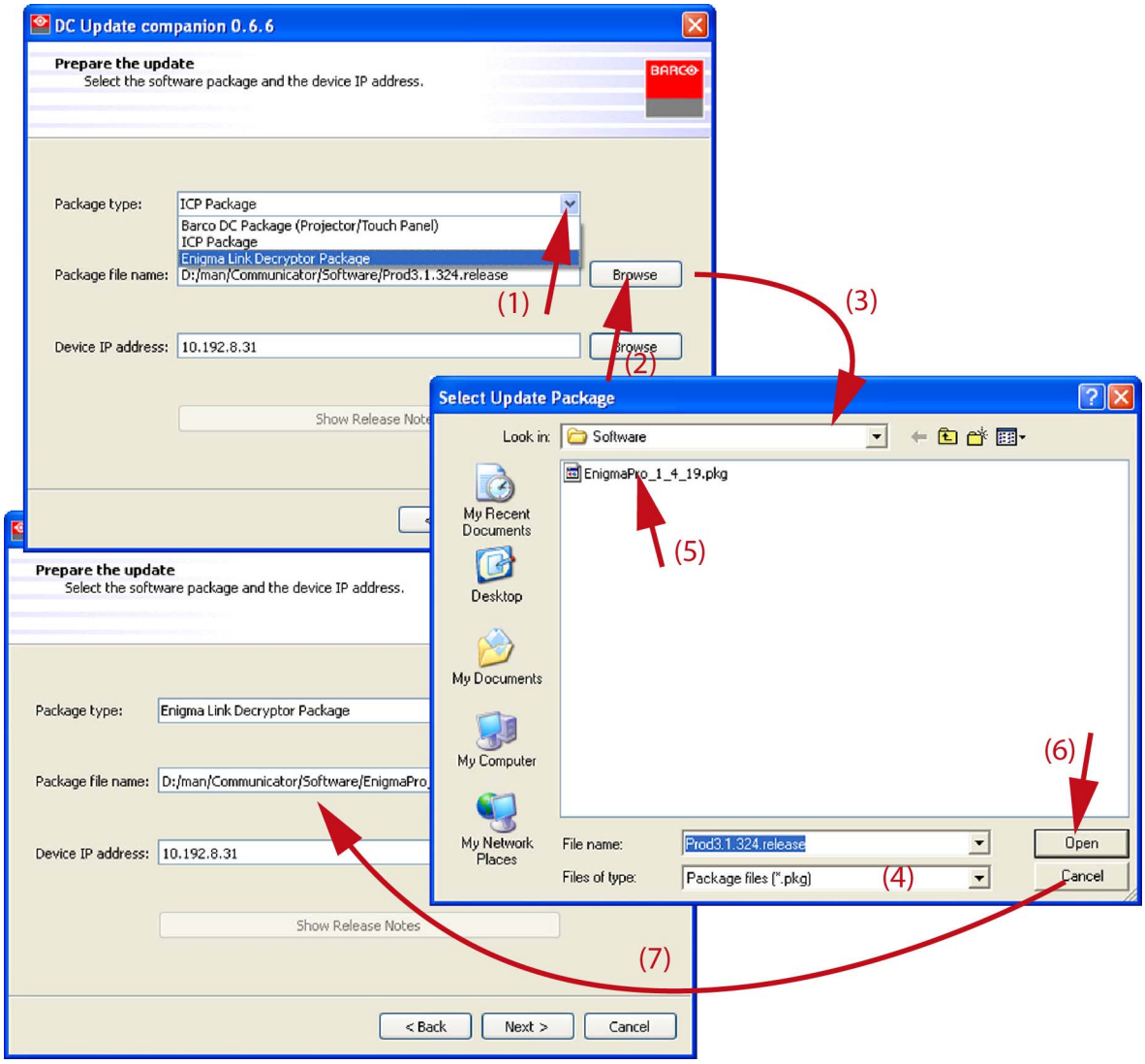


Image 16-11

3. Browse the package file name. Click on **Browse** (2) to open the Browser window (3).

   The correct file type is already filled out (4).

4. Browse for the desired file (5), select the file and click on **Open** (6).
   Note: *File has extension pkg.*

   The Package file name line is filled out (7).

5. Enter the device IP address (10) or click on **Browse** to open a device selection window (11).
   Note: *The IP of the connected projector is already filled out. When using the DC Update Companion as stand alone program, then this field is blank.*

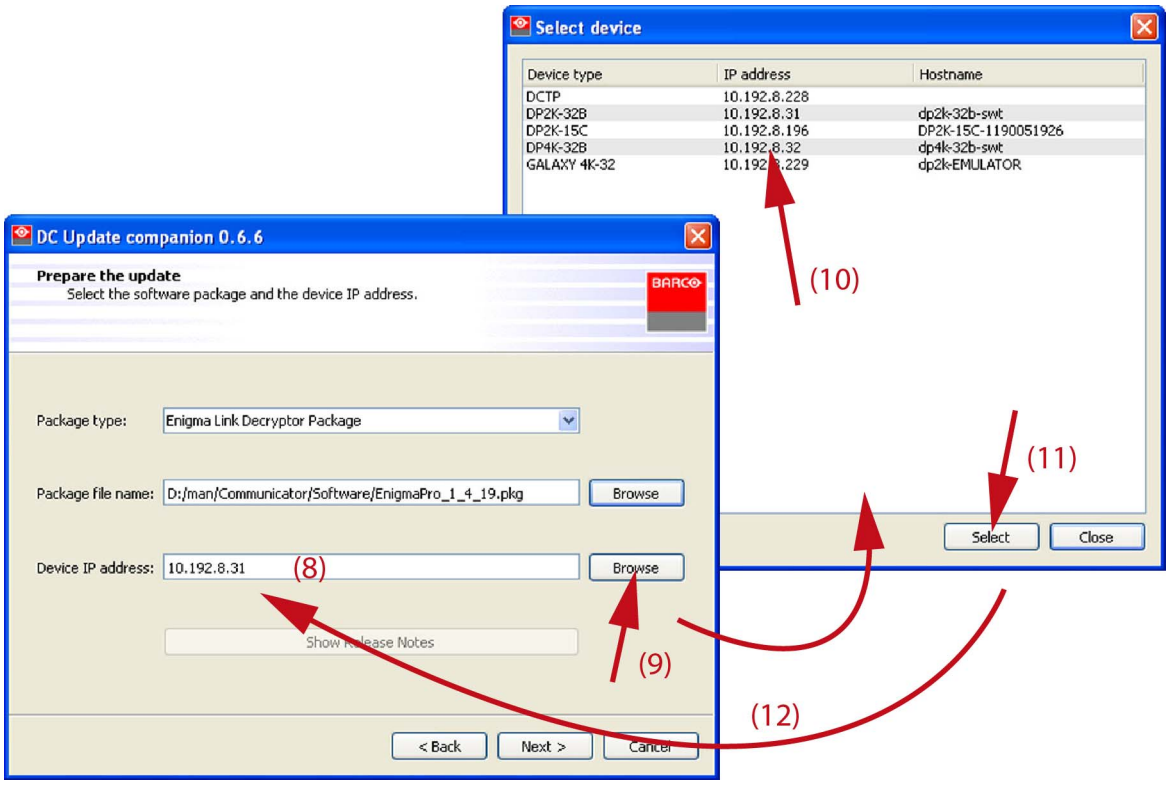


Image 16-12
IP selection

6. Click **Next** to continue.
   The necessary information is gathered.
   The current installed version is shown next to the package version (13).

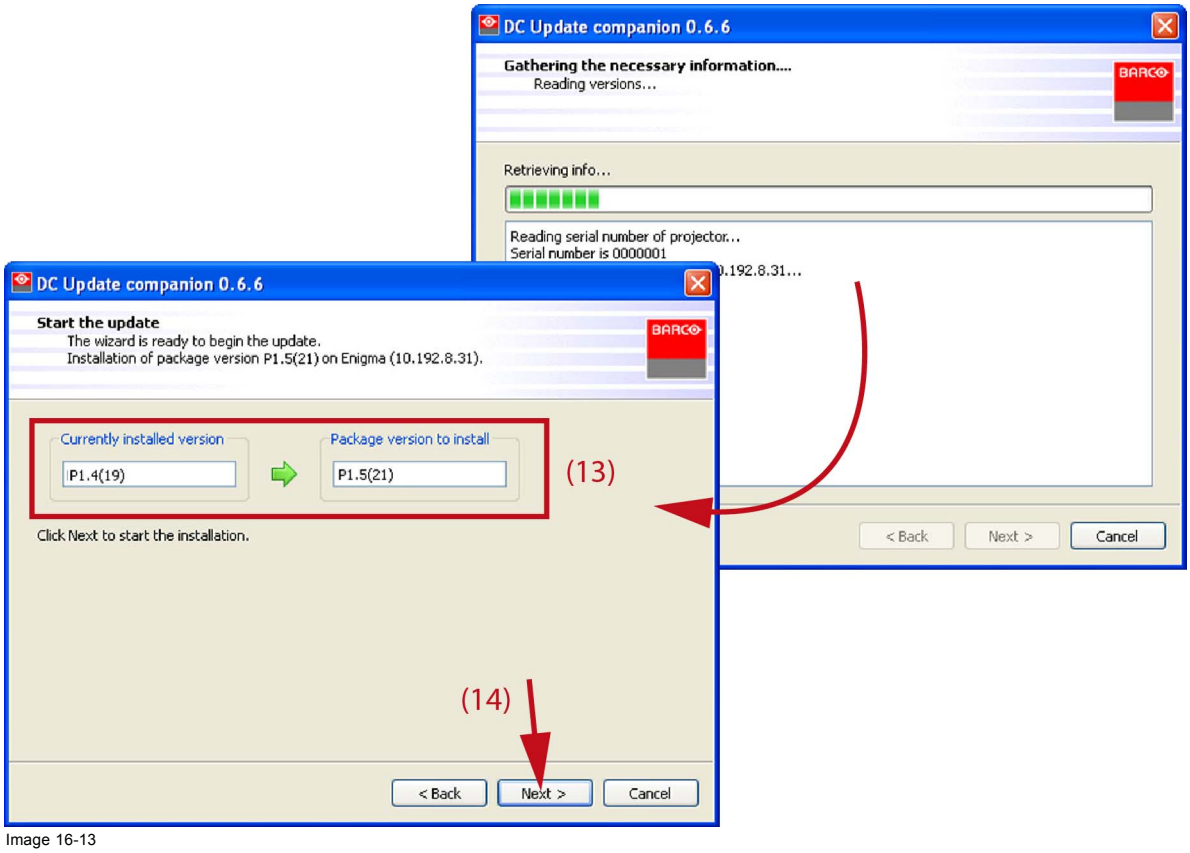


Image 16-13

7. Click **Next** to start the software update (14).

   When the update is finished, an status window is displayed.

16.5 Update logging

Installation logging

When the software update is finished, a status window is displayed. This window is almost equal for all possible updates.

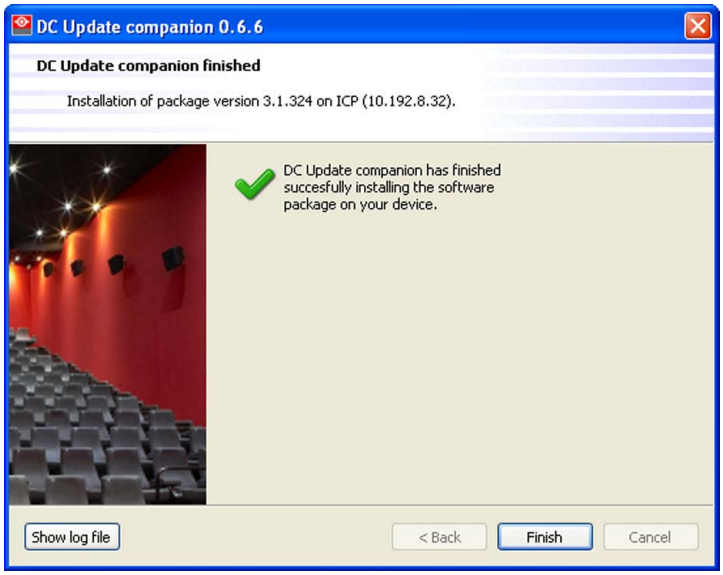


Image 16-14
Status window.

To show the log file, click on **Show log file**.

All information about the update process is logged in this log file.

17. COMMUNICATOR TOUCH PANEL

Overview

- Introduction
- Installing the touch panel interface
- Reposition the touch panel interface

17.1 Introduction

Communicator Touch Panel for digital cinema projectors

The Communicator Touch Panel is designed for multi-user command and control, the Communicator enables users to learn quickly and operate efficiently - using an elegant and flexible touch panel interface. The interface's commonality means that operators can intuitively use any model in the product line, without restriction, and its user-friendly nature translates directly into a short and enjoyable learning curve.

Image 17-1

Flexible touch panel interface

The touch panel interface can be mounted upon a swivel arm which easily fits on top of the DP2K-15C/DP2K-20C/DP2K-18Cx projector. One central locking mechanism of the swivel arm allows an instant fixation of the touch panel interface in any position.

The touch panel interface can also be installed further away from the DP2K-15C/DP2K-20C/DP2K-18Cx projector. For that you can use a serial (RS232) cable up to 10 meter or an Ethernet cable up to 50 meter to realize a direct data communication between the DP2K-15C/DP2K-20C/DP2K-18Cx projector and the Communicator Touch Panel.

The touch panel interface can also be connected with a Local Area Network (LAN) just like the DP2K-15C/DP2K-20C/DP2K-18Cx projector. In this case both devices can communicate with each other as well.

The touch panel interface requires a voltage supply +12 VDC and 1,5 ampere. Note that the DP2K-15C/DP2K-20C/DP2K-18Cx projector has a 12 VDC output which can be used to power up the touch panel interface. Nevertheless, the use of a separate +12 VDC adaptor (1,5 ampere minimum) is required in case the touch panel interface is installed more then a few meters away from the DP2K-15C/DP2K-20C/DP2K-18Cx projector.

A crossed DC cable has to be used when connecting the +12 VDC output from the Input & Communication unit of the DP2K-15C/DP2K-20C/DP2K-18Cx projector directly with the Touch Panel interface.

Parts location of the touch panel interface

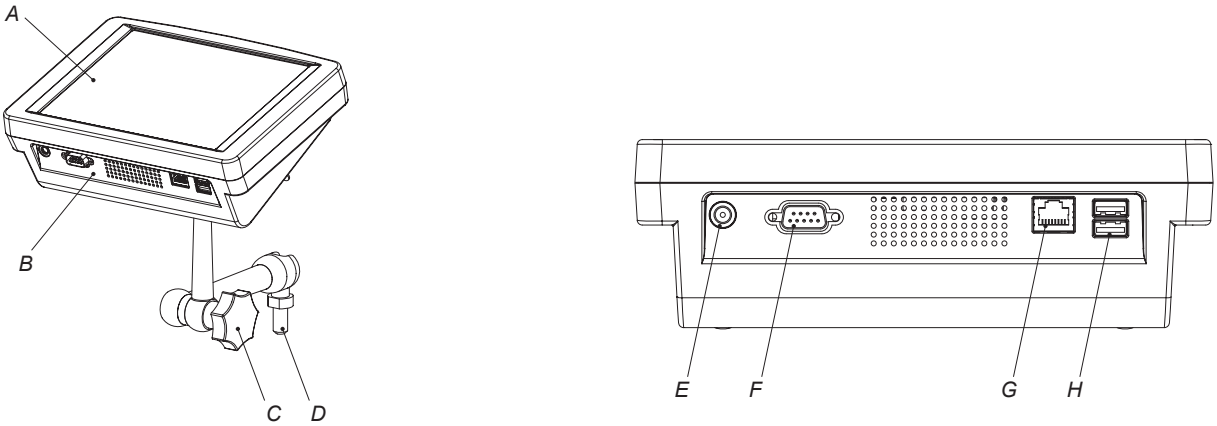


Image 17-2
A Touch screen.
B Communication ports.
C Knob to operate central swivel clamp.
D Base of swivel arm.
E Power input (12 VDC – 1,5 A).
F RS323 port (9 pins SUB-D).
G Ethernet port (RJ45).
H Two USB ports to connect USB stick, mouse or keyboard.

CAUTION: Refer to the user guide of the Communicator Touch Panel for more information about usage guidelines.

17.2 Installing the touch panel interface

Necessary tools

- 17 mm wrench.
- 10 mm wrench.

How to install the touch panel interface upon the DP2K-15C/DP2K-20C/DP2K-18Cx?

1. Assemble the mounting plate and the swivel arm together as illustrated. First place the nut (N) upon the rod of the mounting plate, then add the lock washer (L), then fasten the mounting plate and the swivel arm together. When the arm is mounted, turn nut (N) against the arm to secure the position.

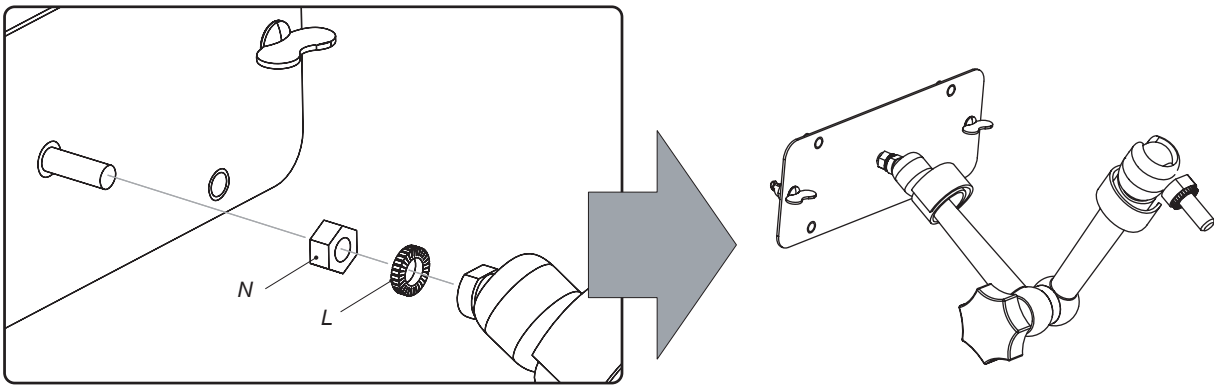


Image 17-3
Assemble swivel arm

2. Slide a washer (M) over the base of the swivel arm and Insert the base of the swivel arm into the mounting hole at the top of the DP2K-15C/DP2K-20C/DP2K-18Cxas illustrated.

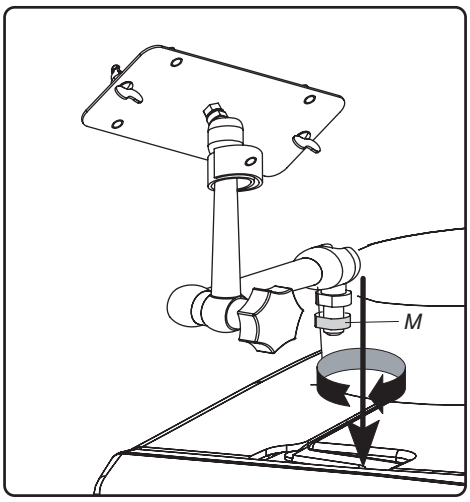


Image 17-4
Mount swivel arm

3. Place the touch panel interface upon the mounting plate of the swivel arm and fasten the two wing nuts (W) as illustrated.

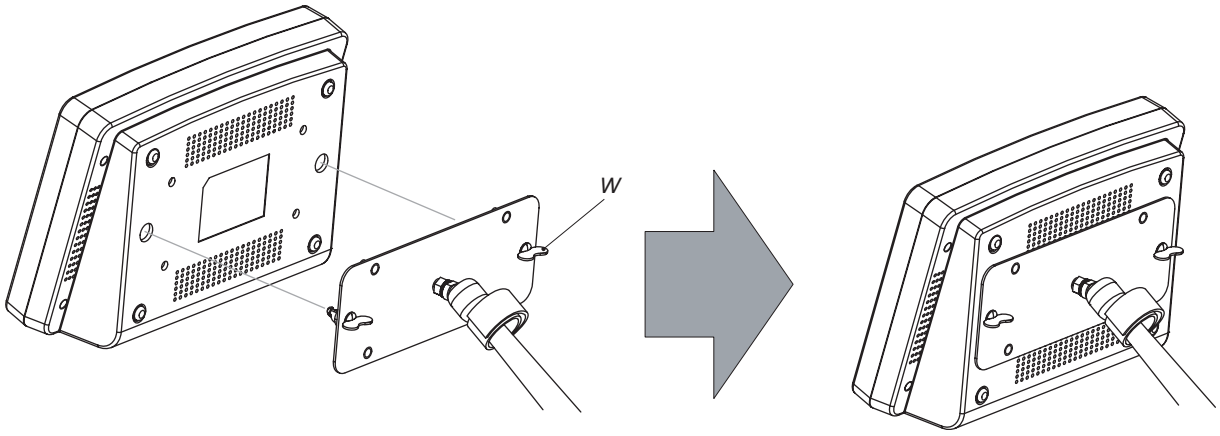


Image 17-5
Mount touch panel

4. Connect the circular plug of the multi cable with the circular socket at the rear side of the DP2K-15C/DP2K-20C/DP2K-18Cx.

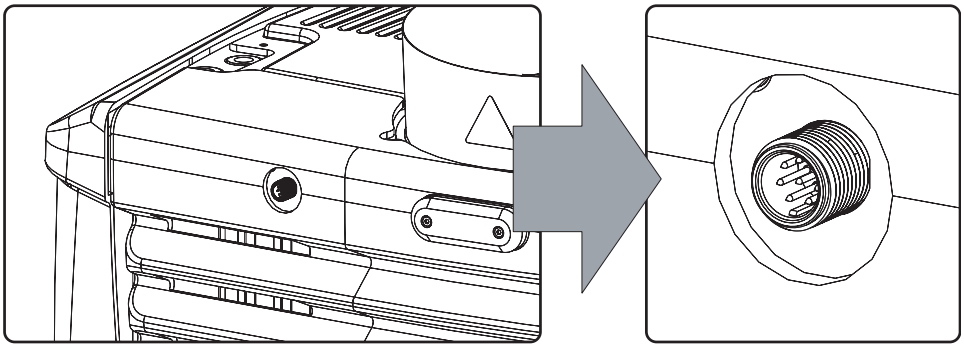


Image 17-6
Connections

5. Attach the multi cable to the swivel arm using the two Velcro strips.
6. Connect the DC plug, the RJ45 Ethernet plug and the D-SUB plug into their respective sockets on the touch panel interface.

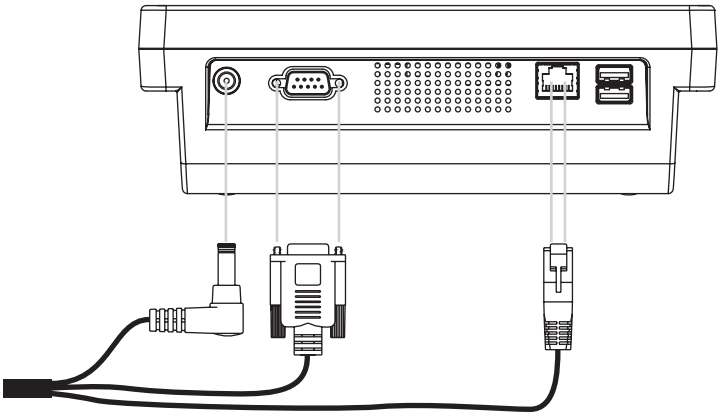


Image 17-7
Connections

17.3 Reposition the touch panel interface

How to reposition the touch panel interface?

1. Hold fast the touch panel interface.
2. Release the central swivel clamp by turning the big black knob (K) counterclockwise.

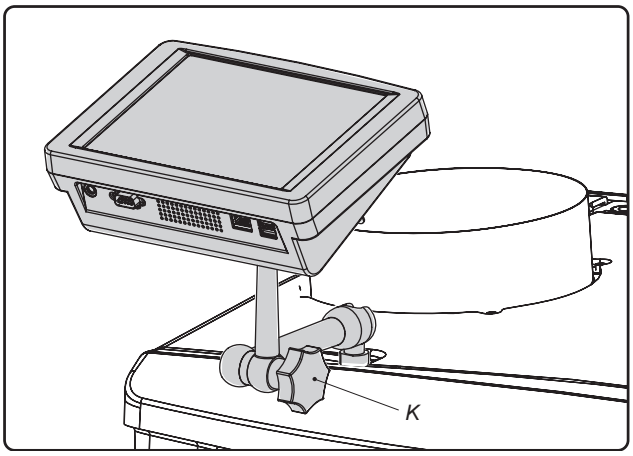


Image 17-8

3. Move the touch panel interface into the desired position.
4. Fasten the central swivel clamp by turning the big black knob clockwise.

CAUTION: Never release the central swivel lock without supporting the Touch Panel interface.

18. POWER INPUT

About this chapter

This chapter describes the procedures to replace the power input components such as main switch, mains filter, ...

WARNING: Always disconnect the power cord from the local power net before start any service action on the Mains Input of the projector.

Overview

- Introduction
- Getting access to the Mains Input components
- Replacement of the mains ON/OFF switch
- Replacement of the mains input filter
- Closing the Mains Input compartment

18.1 Introduction

Power Input

The power input of the projector is located at the rear side of the projector. The electrical connection with the local power net is fixed wired. The local power net is connected with a built-in 3-terminal strip. The power is applied to the mains filter via the mains switch. Three power cables are connected with the output side (LOAD) of the mains filter. One cable leads via the 5,5 ampere protected C13 power output socket and a C14 power input socket to the SMPS and is used to provide the electronics of the projector with power. The two other cables go to the Laser Driver Modules (one for each module). By default the power output and input socket are connected with a short power cable. When an Uninterrupted Power Supply (UPS) is required, the short cable is removed and the UPS is connected to the power input C14 socket.

Power Input parts location

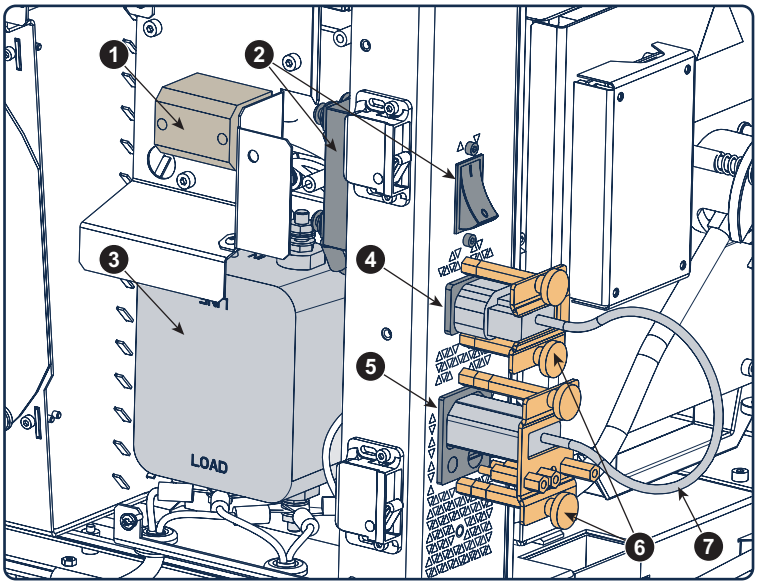


Image 18-1
Power input

1 Terminator block.
2 Automatic circuit breaker with ON/OFF switch.
3 Mains input filter.
4 Power input C14 socket for projector electronics (UPS purpose).
5 Protected power output C13 socket.
6 Adjustable brackets for securing the power plugs.
7 Loop through power cable.

18.2 Getting access to the Mains Input components

This procedure explains how to disconnect the power cord and how to remove the terminator block in order to get access to the mains filter and mains ON/OFF switch. This procedure assumes that the rear cover and lamp cover of the projector are already removed.

Necessary tools

- 3 mm Allen wrench.
- Flat blade screw driver.
- Torx screw driver T20

How to get access to the Mains Input components?

1. Make sure that the power cord of the projector is powerless.
2. Remove the cover of the AC compartment by releasing the three captive dumb screws.

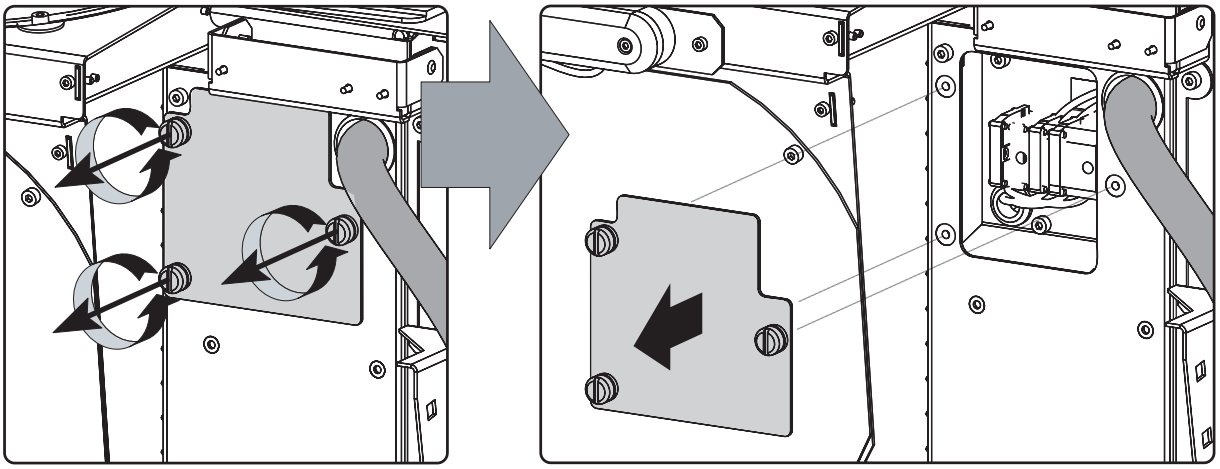


Image 18-2
AC power compartment cover

3. Disconnect the AC power cord from the 3–terminal strip and guide the AC power cord out of the compartment.
4. Remove the cover plate by releasing the 3 hexagon socket head cap screws and the 2 Torx screws as illustrated.

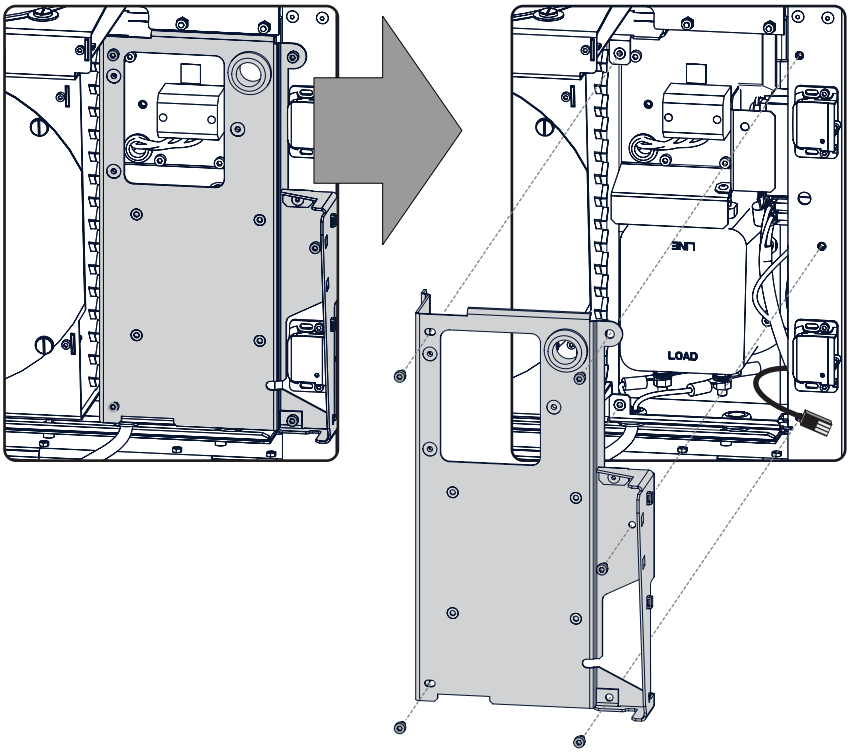


Image 18-3
Mains input cover

5. Disconnect the three wires from the 3-terminal strip. Use a flat blade screw driver.
6. Remove the 3-terminal strip together with its mounting plate by releasing the 4 hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.

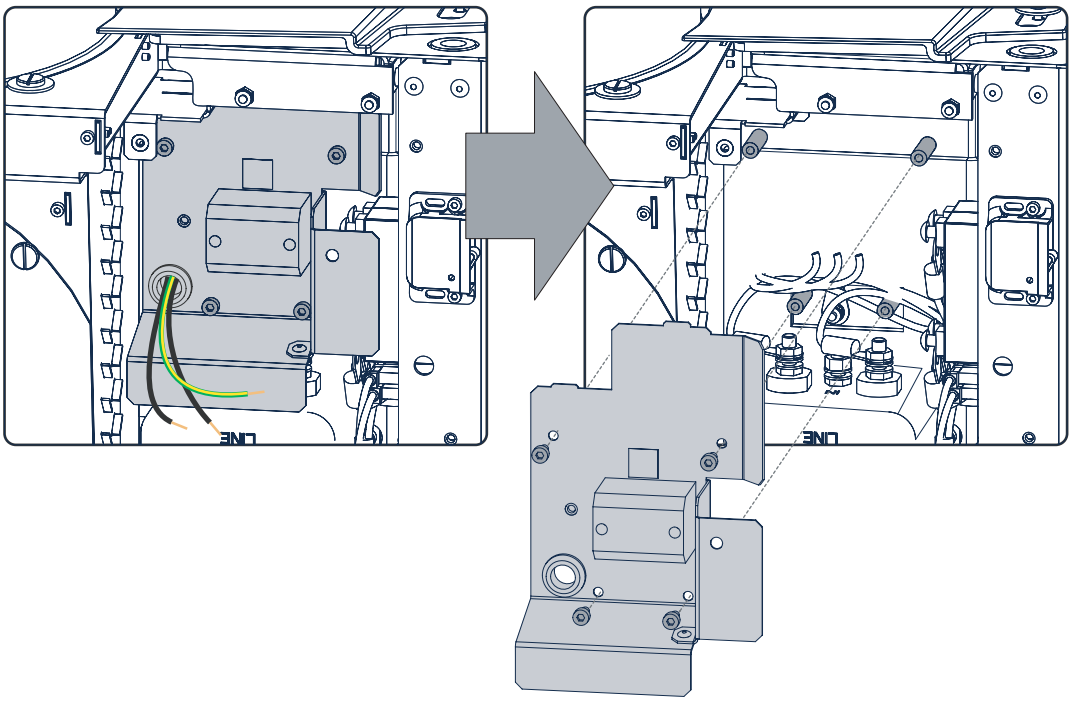


Image 18-4
Mains input strip

18.3 Replacement of the mains ON/OFF switch

This procedure assumes that the Mains Input components are accessible.

Necessary tools

- 2,5 mm Allen wrench.
- Flat blade screw driver.

How to replace the mains ON/OFF switch

1. Remove the two hexagon socket head cap screws which securing the ON/OFF switch. Use a 2,5 mm Allen wrench. Note that the ON/OFF switch is still connected with the mains input filter. Once the switch is detached from the projector chassis it will be easier to disconnect the wires as described in the next step.

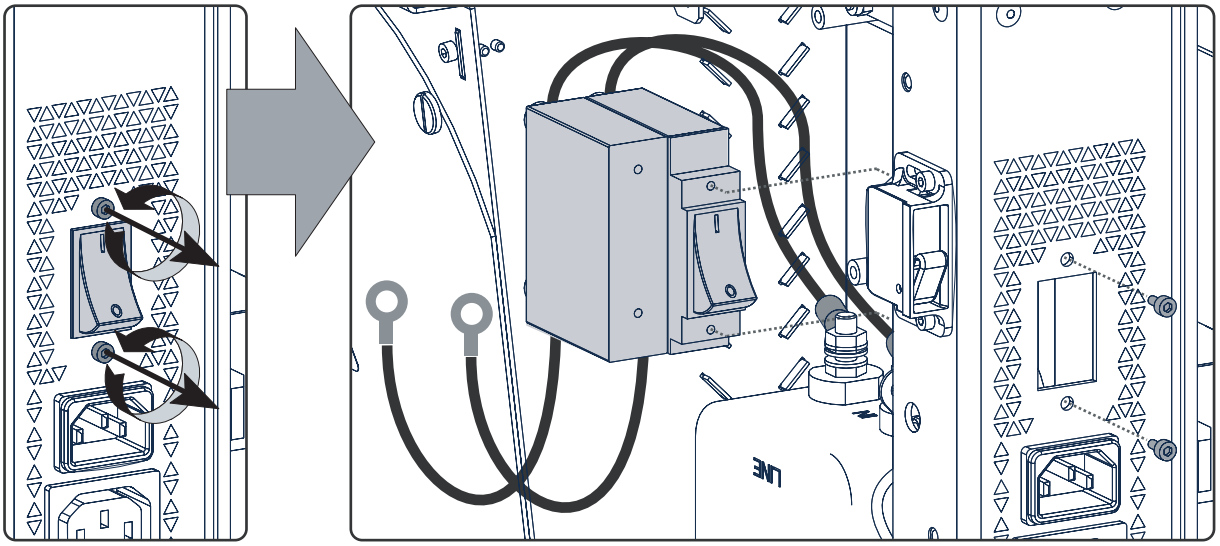


Image 18-5
ON/OFF switch assembly removal

2. Remove the connection screws at the back side of the ON/OFF switch and slide off the eye connectors. Do not drop the washers inside the projector. Use a flat blade screw driver.
3. Connect the two wires from the mains filter (reference 3 image 18-6) with the two upper pins of the ON/OFF switch. Slide a lock washer followed by a washer over the screw and then the eye connector of the wire. Turn in the screw and tighten completely.
   Note: *The top side of the ON/OFF switch is the upper side when holding the ON/OFF switch vertically with the indication "1" (reference 1 image 18-6) points to the top of the projector.*
4. Connect the two loose wires (reference 2 image 18-6) with the two lower pins of the ON/OFF switch. Slide a lock washer followed by a washer over the screw and then the eye connector of the wire. Turn in the screw and tighten completely.

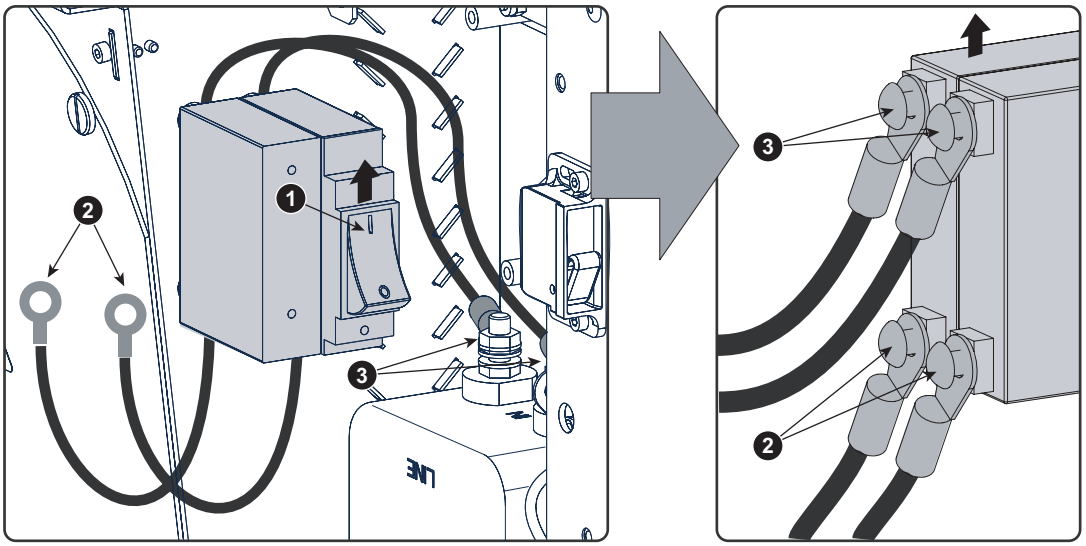


Image 18-6
Connections with main switch

5. Slide the new ON/OFF switch from the inside of the projector through the cabinet. Make sure that the indication “1” (reference 1) points to the top of the projector.

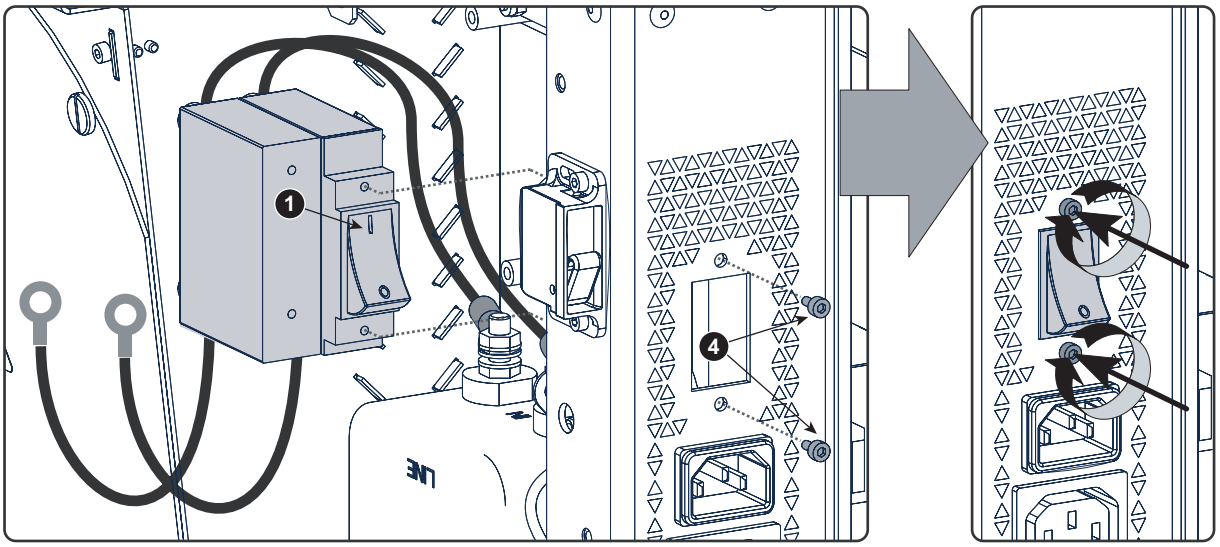


Image 18-7
Mount Main switch assembly

6. Fasten the ON/OFF switch with two hexagon socket head cap screws (reference 4 image 18-7).

18.4 Replacement of the mains input filter

This procedure assumes that the Mains Input components are accessible.

Necessary tools

- 3 mm Allen wrench.
- 10 mm open-end wrench.

How to replace the mains input filter

1. Remove both nuts on the “LOAD” side (reference A and B of image 18-8) of the mains input filter and slide off all eye connections. Do not drop the lock washers in the projector. Use a 10 mm open-end wrench.
2. Remove both nuts on the “LINE” side (reference C and D of image 18-8) of the mains input filter and slide off all eye connections. Do not drop the lock washers in the projector. Use a 10 mm open-end wrench.

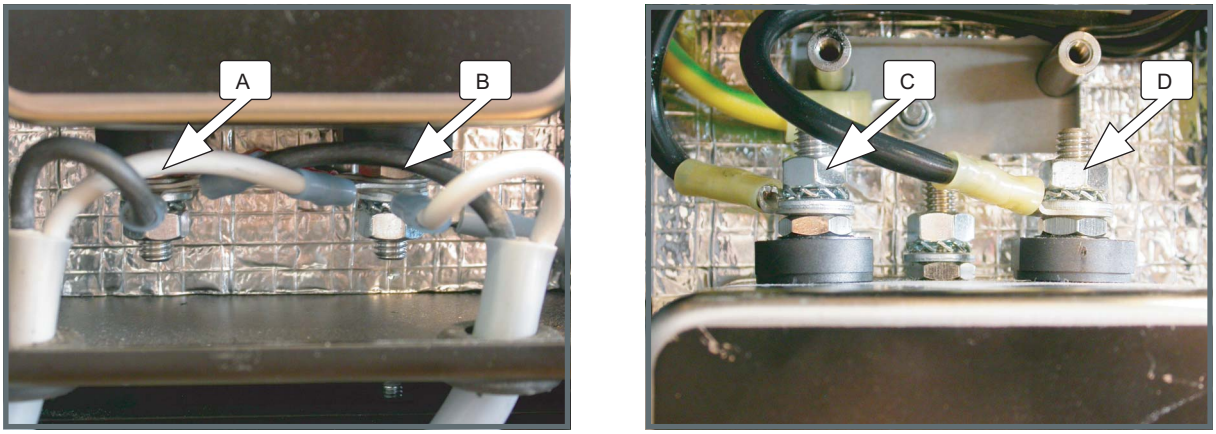


Image 18-8
LOAD connections

3. Remove the mains input filter by releasing the four hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.

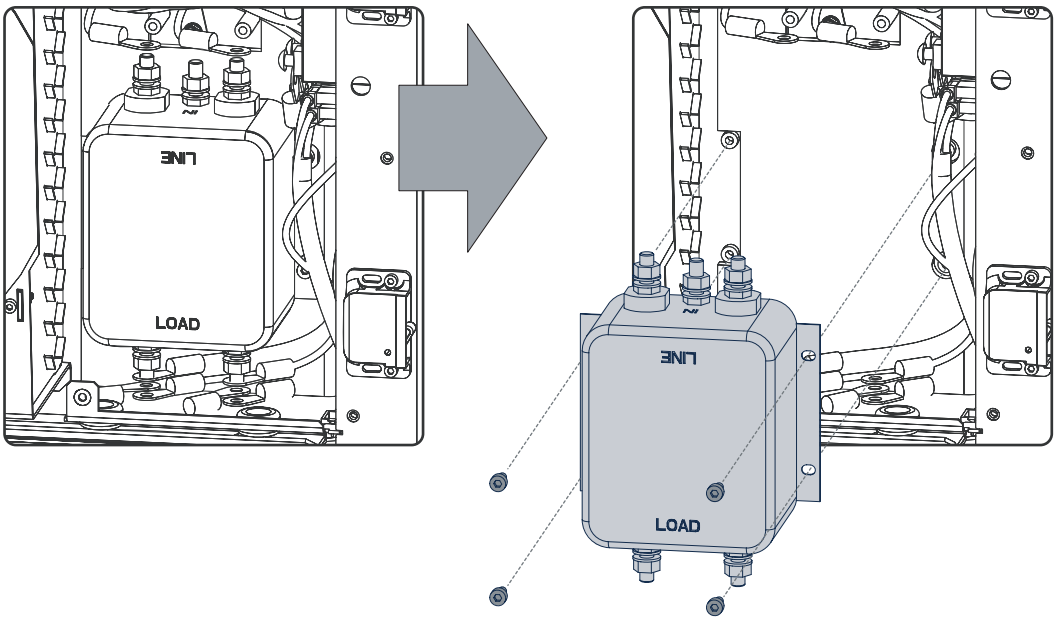


Image 18-9
Mains input filter removal

4. Place a new mains input filter on its position and fasten with four hexagon socket head cap screws. Make sure that the “LOAD” side is facing downwards. Use a 3 mm Allen wrench.
5. Connect the wires with the same colors of the LPS cables and the wire from the mains output with the “LOAD” side of the mains input filter (reference A and B of image 18-8). First slide the eye connections of the wires over the pin (same colors together), then slide a washer followed by a lock washer over the pin and secure with a nut. Use a 10 mm open-end wrench.

6. Connect both wires (reference C and D of image 18-8) from the ON/OFF switch with the “LINE” side of the mains input filter. First slide the eye connections of the wire over the pin, then slide a washer followed by a lock washer over the pin and secure with a nut. Use a 10 mm open-end wrench.

18.5 Closing the Mains Input compartment

Necessary tools

- 3 mm Allen wrench.
- Flat blade screw driver.
- Torx screw driver T20

How to close the Mains Input compartment?

1. Guide the ground wire and the two wires from the ON/OFF switch through the opening in the mounting plate of the 3-terminator strip and secure the mounting plate with four hexagon socket head cap screws as illustrated.

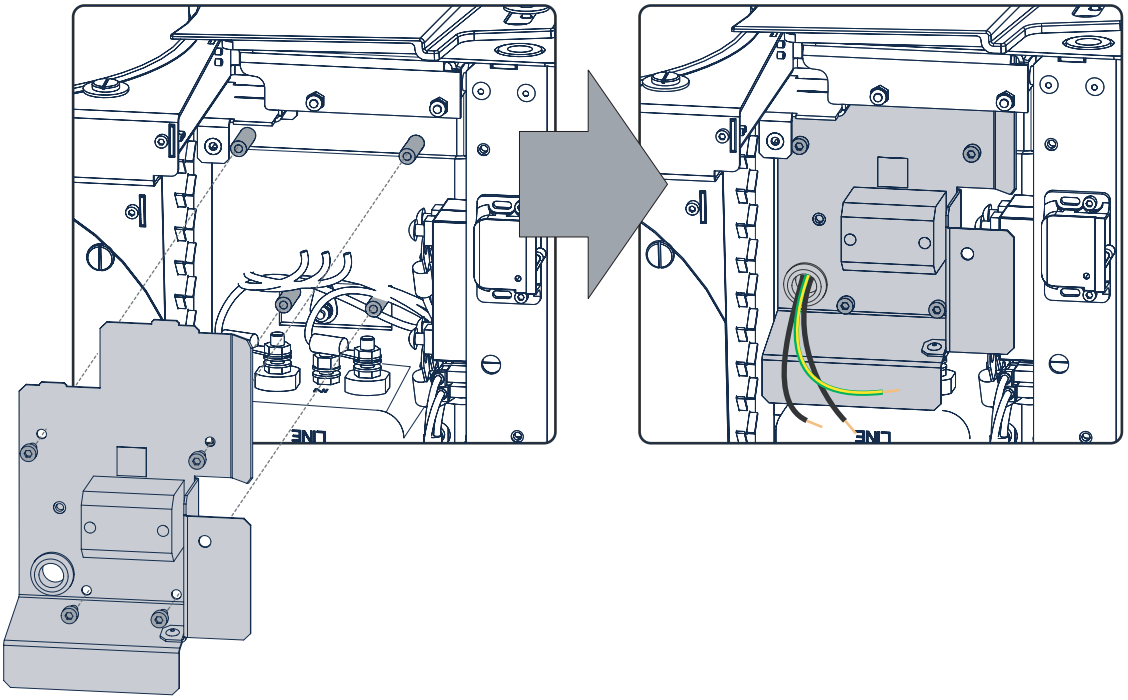


Image 18-10

2. Connect the ground wire and the two wires from the ON/OFF switch with the lower pins of the 3-terminator strip. Make sure to connect the ground wire with the marked ground pin of the 3-terminator strip.
3. Fasten the cover plate with 3 hexagon socket head cap screws and 2 Torx screws as illustrated.

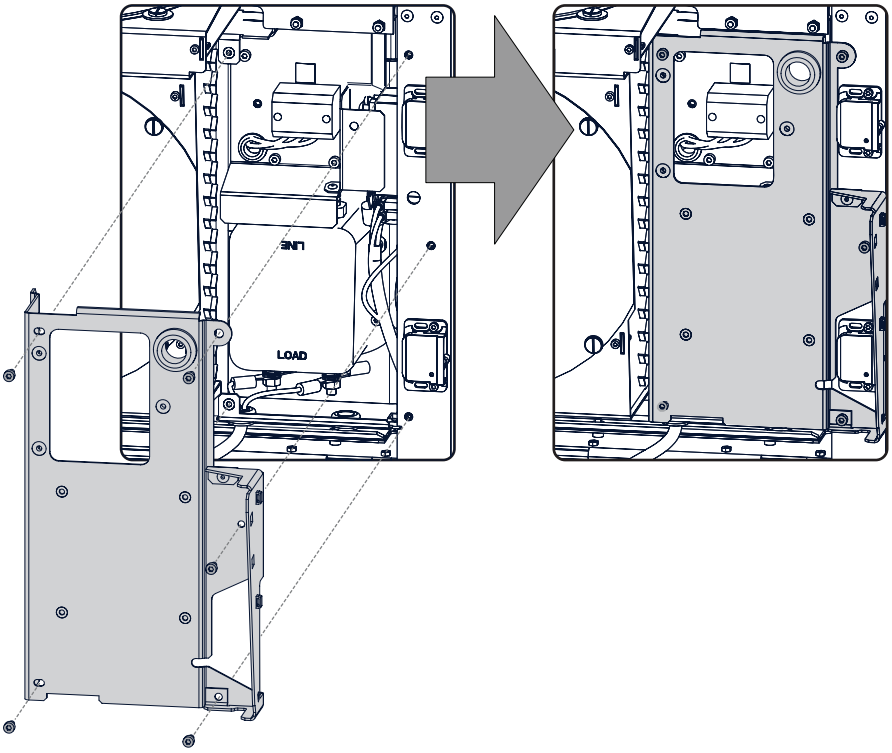


Image 18-11
Mains input cover, installation

4. Guide the AC power cord through the cable gland and connect the wires to the 3-terminal strip as illustrated.
   Warning: *Always connect first the ground wire (PE).*

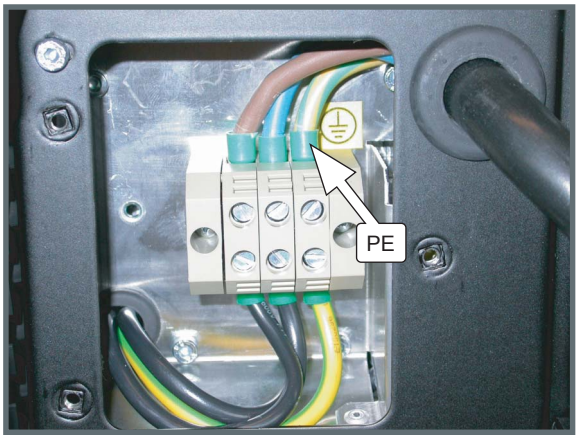


Image 18-12
Wire connections

5. Reinstall the cover of the main AC compartment.

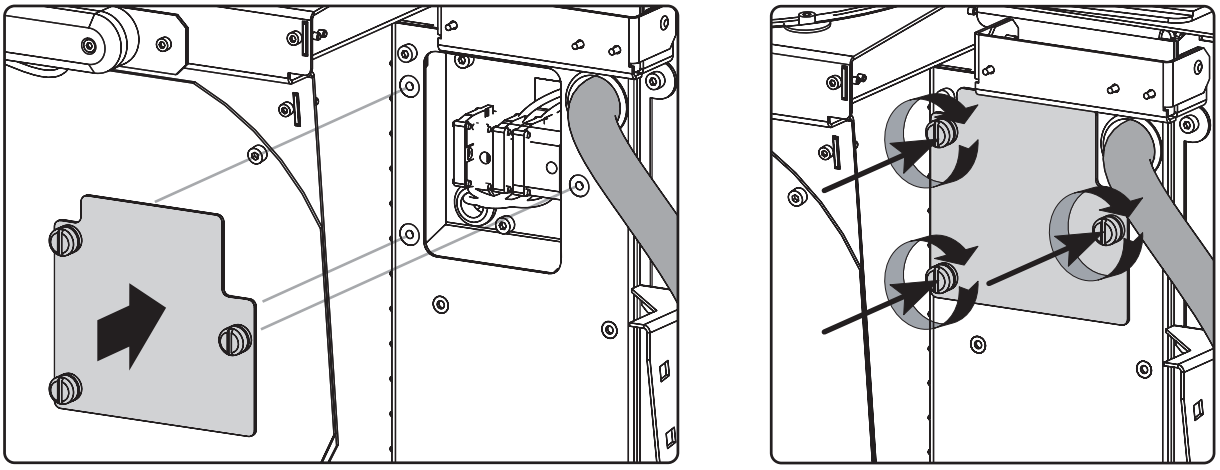


Image 18-13
Mains AC compartment cover

19. SWITCHED MODE POWER SUPPLY

Overview

- Diagnostic LEDs on the SMPS
- Replacement of the Switched Mode Power Supply

Preparations

Before getting access to the Switched mode power supply, remove the input cover.

19.1 Diagnostic LEDs on the SMPS

Diagnostic LEDs

Not that the projector input cover must be removed to see the LEDs.

+12V	Indicates that the supply voltage of +12 volt is present for the electronics.
+ VTEC	Indicates that the voltage to drive the Peltier elements (TEC), which are mounted on the Light Processor unit, is present
+24V	Indicates that the supply voltage +24 volt is present.

19.2 Replacement of the Switched Mode Power Supply

Necessary tools

- 7 mm nut driver or
- flat screw driver

How to replace

1. Release the 4 spring locks (1).

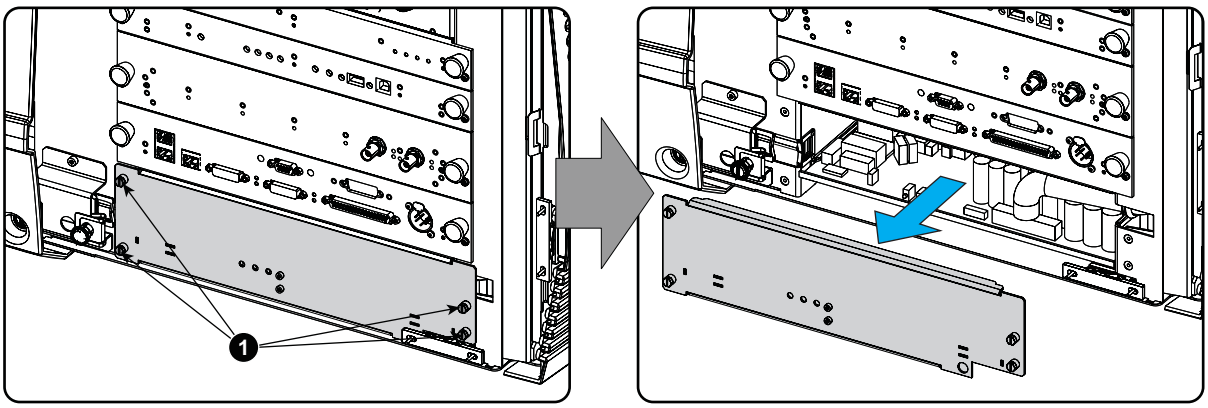


Image 19-1
SMPS cover

2. Take off the cover.
3. Disconnect the following connectors:
   - Mains input (1)
   - Ground wire (2)
   - Control connector (blue wires) (3)
   - Power out connector (black wires) (4)

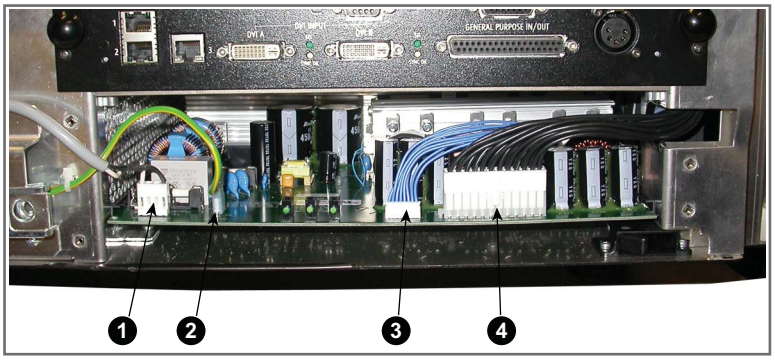


Image 19-2
SMPS connections

4. Slide out the Switched Mode Power Supply board.

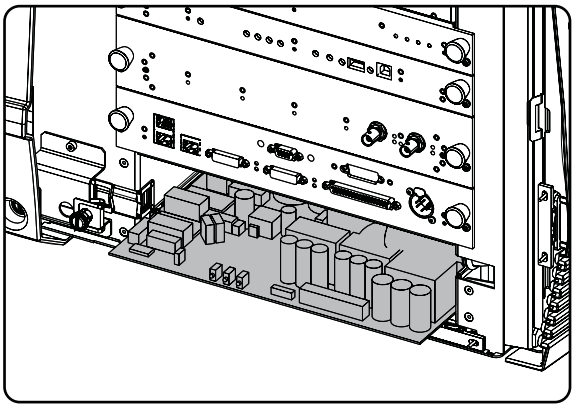


Image 19-3

5. Take a new unit and inset the board in the guides.
   Pull it completely in.

6. Make the electrical connections (image 19-2):
   - Mains input (1)
   - Ground wire (2)
   - Control connector (blue wires) (3)
   - Power out connector (black wires) (4)
7. Place the cover on its place and secure with the 4 spring locks.

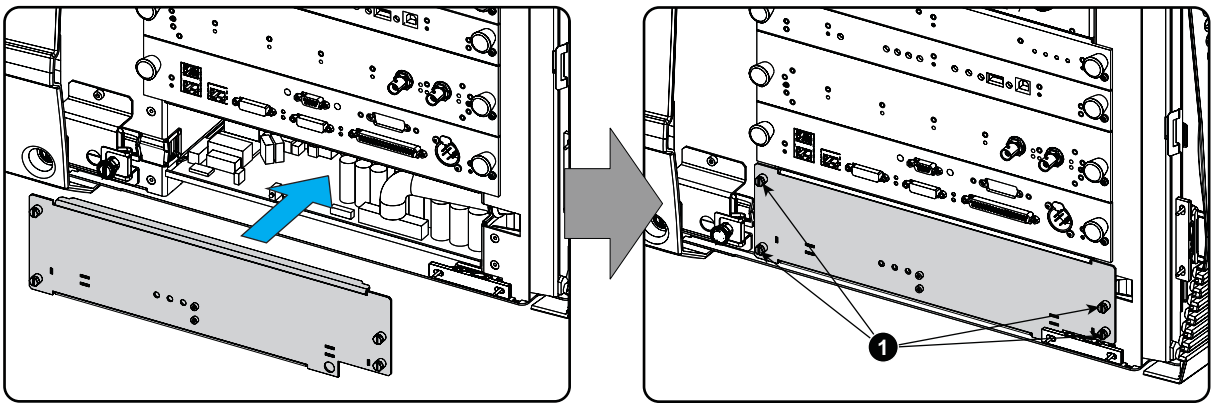


Image 19-4
Mount SMPS cover

20. LAMP POWER SUPPLY

About this chapter

This chapter describes briefly the functionality, the different parts, the diagnostic LED's and the replacement of the Lamp Power Supply (LPS).

Not used in a DP2K-18CX.

Overview

- Introduction
- LPS diagnostic LED's
- Removing the LPS module
- Installation of the LPS module

Preparations

Remove first the rear cover of the projector, see "Removal of the rear cover", page 96.

20.1 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

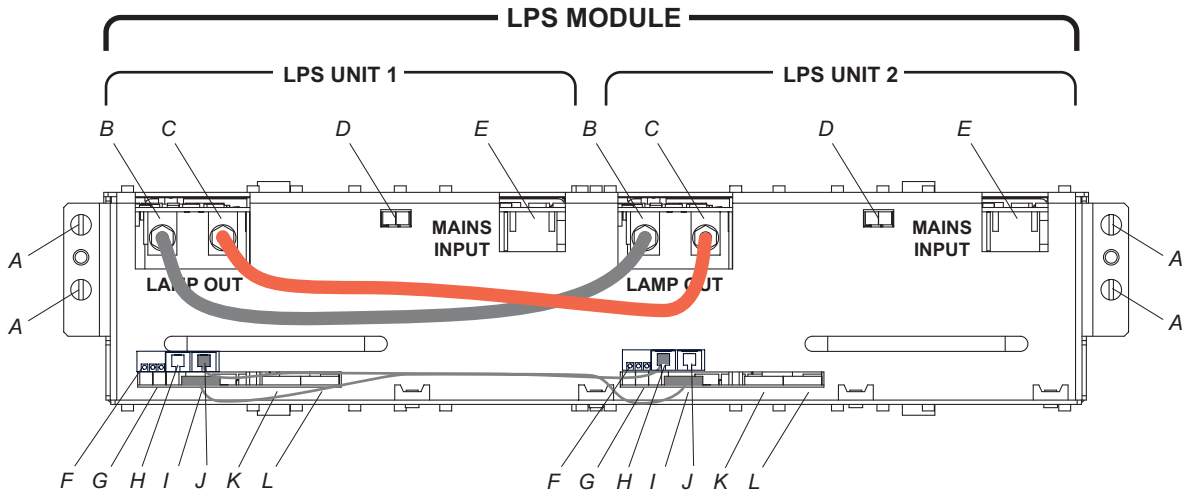


Image 20-1

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

20.2 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 sent 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 are ordered to shutdown due to a malfunction somewhere else inside the projector.

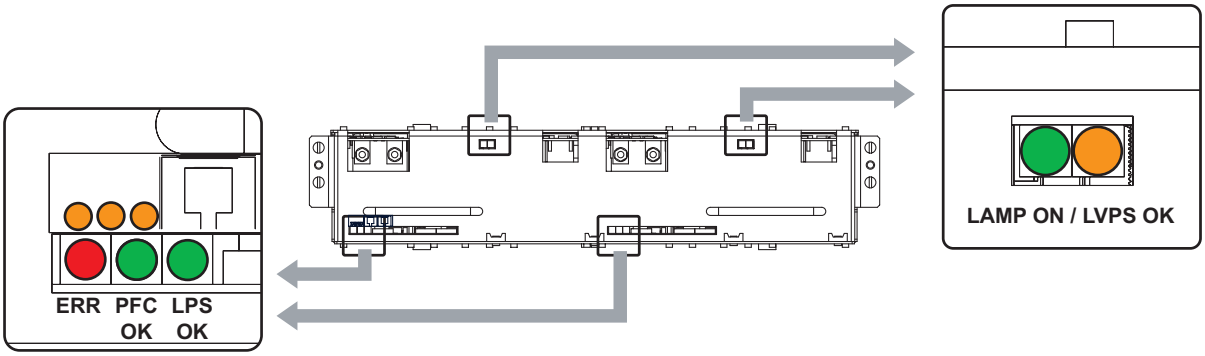


Image 20-2
LED indications

Diagnostic

About the orange LEDs next to the CTRL connectors:

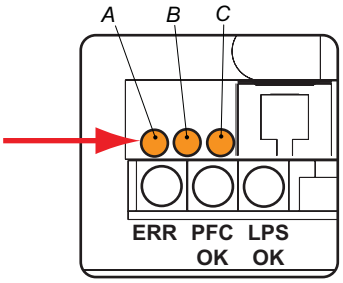


Image 20-3

LED A LPS trans LED B is only for internal use. LED C is the heartbeat LED.

Orange LED A	Diagnostics	Action
Blinking	Normal operation, blinks each time a valid transmission has been received	-
OFF or ON	Communication fault (no reception of valid commands from primary side)	Replace LPS unit
	Fault on primary side of LPS (E.g. fuse blown and no mains voltage available inside LPS)	Replace fuse. If the problem is not solved, replace LPS
	No mains voltage present at input of LPS mains terminals	Check main voltage.

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	Green	Red	Diagnostic	Action
LVPS OK	PFC OK	LPS OK	LAMP OK	ERR		
OFF	OFF	OFF	OFF	OFF	No input voltage.	Switch on the projector.

Orange	Green	Green	Green	Red	Diagnostic	Action
LVPS OK	PFC OK	LPS OK	LAMP OK	ERR		
ON	OFF	OFF	OFF	OFF	Standby modus of LPS unit.	—
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 a new lamp in case the voltage on the “LAMP OUT” pins is > 140 volt for a short time (few seconds). • 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	Blinking	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.
					External error detected from Fan Control board.	• Check projector log files for error messages (temperatures, fan speed, etc.) • Check Fan Control board.

Normal conditions of diagnostic LEDs when a lamp is switched ON

- ERR : OFF
- PFC OK : ON (green)
- LPS OK : ON (green)
- LED A (Yellow left) : flashing few times / second
- LED B (Yellow center) : not defined
- LED C (Yellow right) : flashing (beating as a heart)
- LAMP ON : ON (green)
- LVPS OK : ON (yellow/orange)

20.3 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.

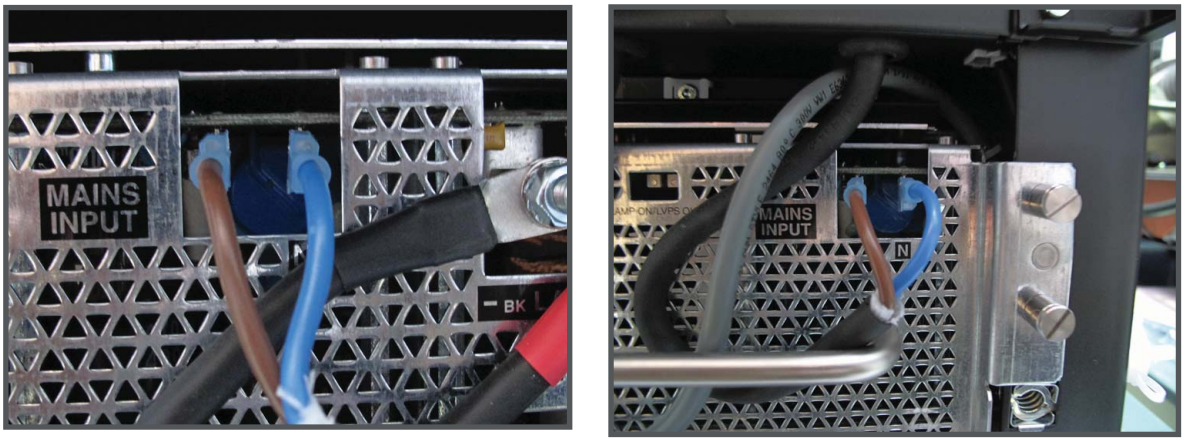


Image 20-4
Mains input

3. Disconnect the wire unit from the ***CTLB IN*** socket of LPS unit 2.

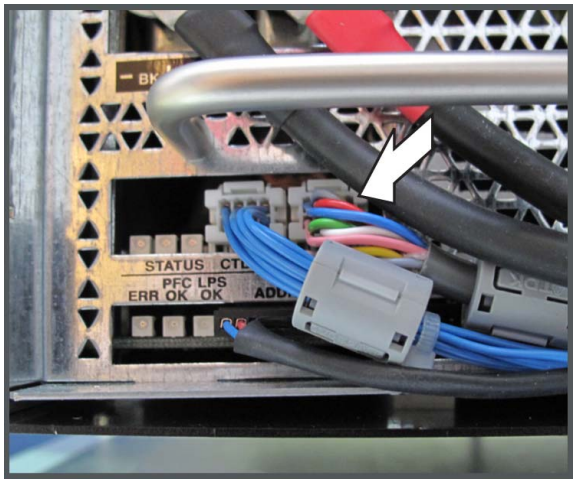


Image 20-5
CTLB in connector

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.*

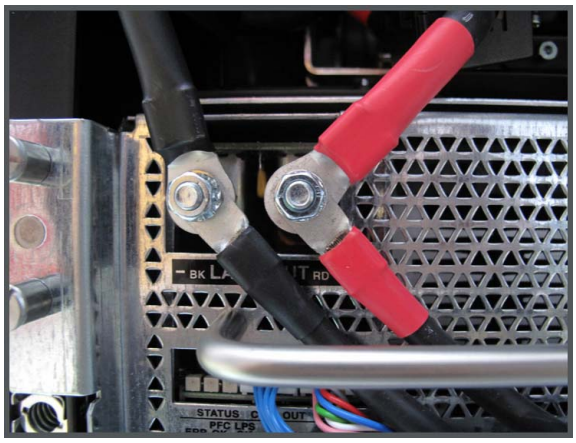


Image 20-6
Lamp out connection

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).

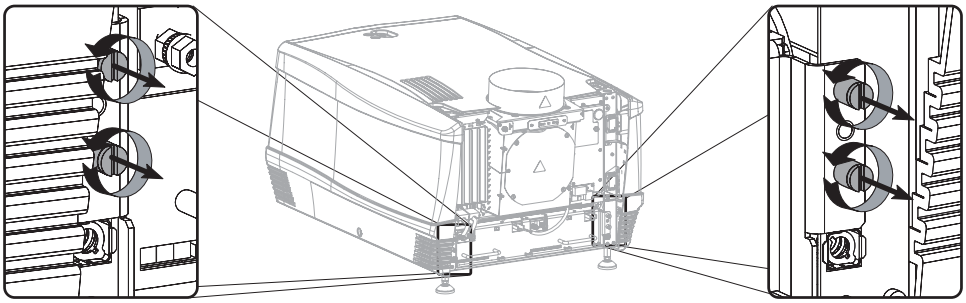


Image 20-7
LPS module fixation

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

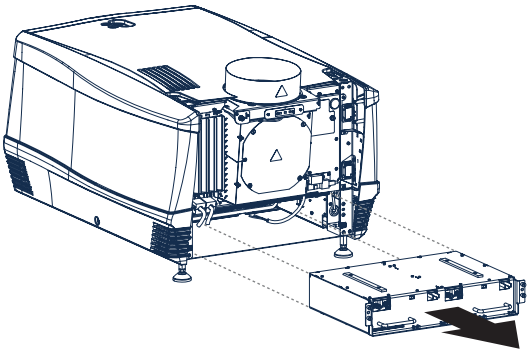


Image 20-8
Remove LPS module

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

20.4 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.

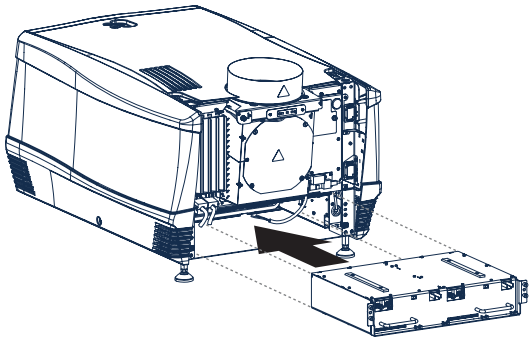


Image 20-9
Insert LPS module

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

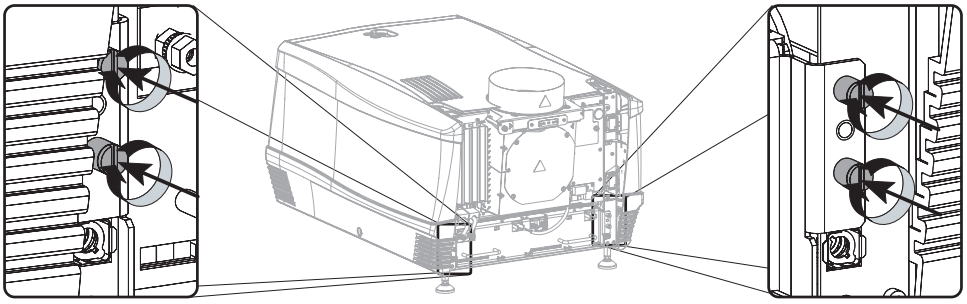


Image 20-10
Fixate LPS module

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.*

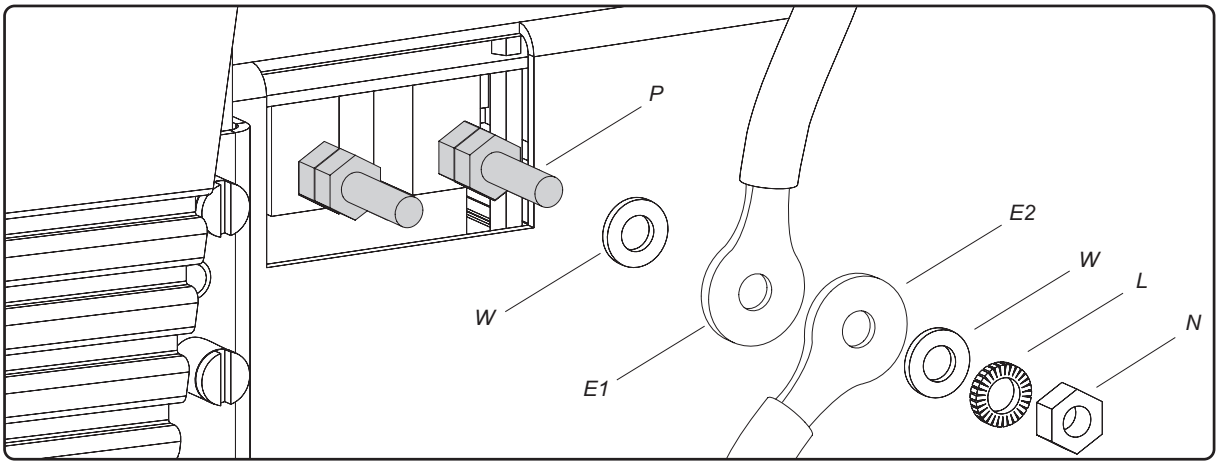


Image 20-11
Lamp out connection

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.*

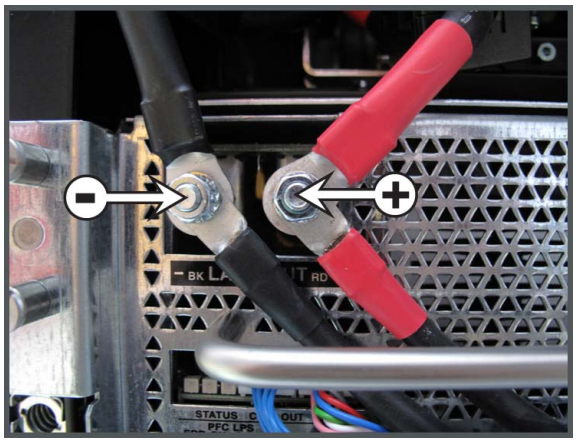


Image 20-12
Lamp power cables

4. Connect the wire unit coming out of the projector with the “CTRL IN” socket of LPS unit 2 as illustrated.

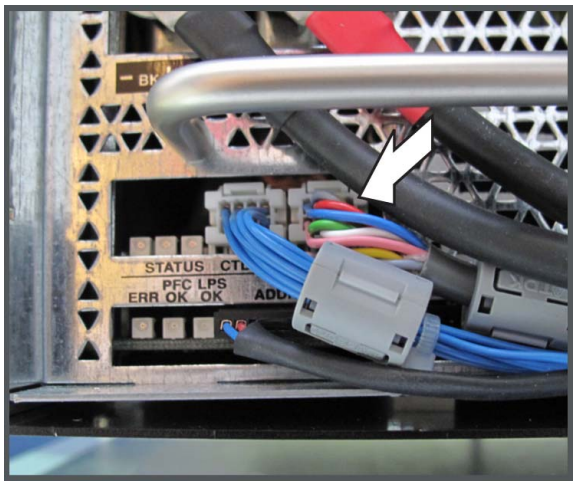
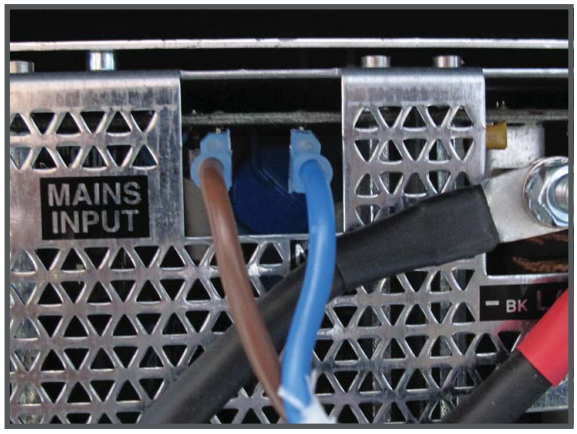


Image 20-13
CTRL in connector

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



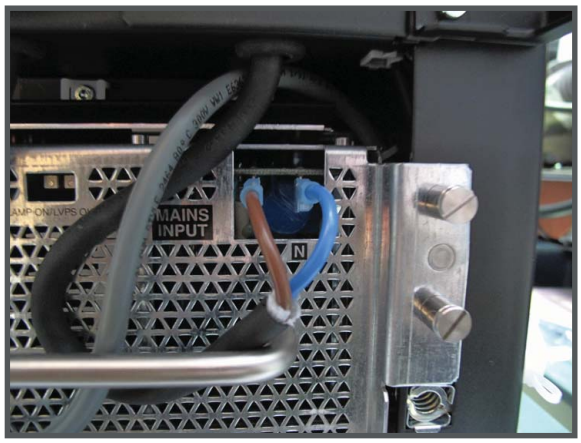


Image 20-14
Mains input connection

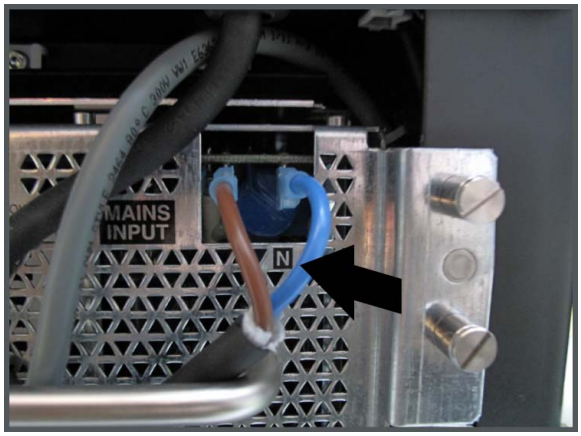


Image 20-15
Neutral wire indication

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.

21. LAMP POWER SUPPLY (SINGLE MODULE)

About this chapter

This chapter describes briefly

- the functionality,
- the different parts,
- the diagnostic LED's,
- the replacement of the Lamp power supply module
- the replacement of a large Lamp Power Supply (LPS) with a 2 single modules Lamp power supplies.

Overview

- LPS module diagnostic LED's
- Removal of a LPS module
- Installation of a LPS module
- Replacing a large frame LPS with a 2 single module LPS

About the Lamp power supply

The second generation lamp power supply module can be used to replace first generation lamp power supply unit. Therefore a special kit is created to replace a first generation power supply. This kit must only be used to replace the first generation power supply for the first time. Once the kit is installed, when a next LPS replacement is required, only a single LPS unit is necessary.

Kit overview table:

Kit order number	Kit content	When used
R765523K	Single LPS module	To replace a single module LPS module
R7655232K	2 single LPS modules + fixation frame	To replace for the first time a large LPS module. A once-only action.

Preparations

Remove first the rear cover of the projector, see "Removal of the rear cover", page 96.

21.1 LPS module diagnostic LED's

Status LED's on the LPS module

There are 8 diagnostic LED's on the LPS module. 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 sent 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 the LPS unit is ordered to shutdown due to a malfunction somewhere else inside the projector.

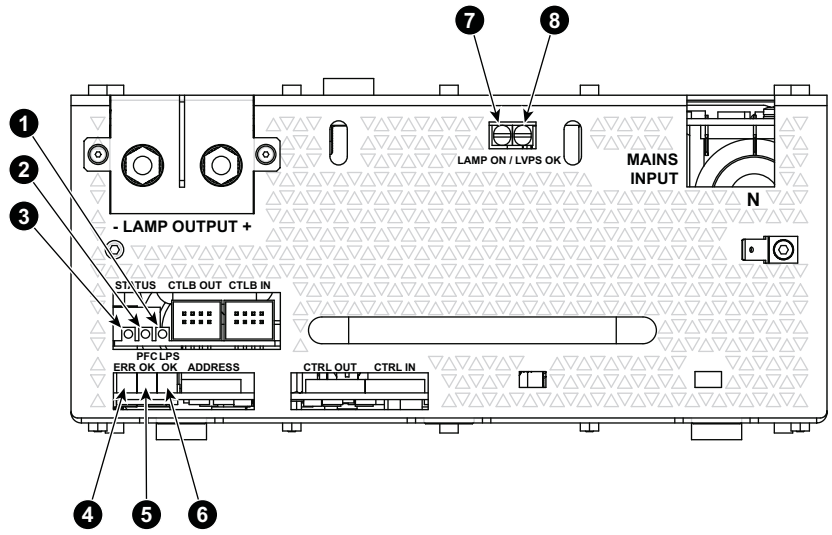


Image 21-1
1 Diagnostic LED "LPS HEARTBEAT" (orange).
2 Diagnostic LED (internal use only) (orange).
3 Diagnostic LED "LPS TRANS" (orange).
4 Diagnostic LED "ERROR" (red).
5 Diagnostic LED "PFC OK" (green).
6 Diagnostic LED "LPS OK" (green).
7 Diagnostic LED "LAMP ON" (green).
8 Diagnostic LED "LVPS OK" (orange).

Diagnostic

About the orange LEDs next to the CTRL connectors:

LED 2 is only for internal use. LED 1 is the heartbeat LED.

LPS HEARTBEAT (Orange LED 1)	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 unit.

LPS TRANS (Orange LED 3)	Diagnostics	Action
Blinking	Normal operation, blinks each time a valid transmission has been received	-
OFF or ON	Communication fault (no reception of valid commands from primary side)	Replace LPS unit.
	Fault on primary side of LPS (E.g. fuse blown and no mains voltage available inside LPS)	Replace fuse. If the problem is not solved, replace LPS
	No mains voltage present at input of LPS mains terminals	Check main voltage.

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

Orange	Green	Green	Green	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.	—
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 xenon lamp in case the voltage on the “LAMP OUT” pins is 140 volt and you hear the SPG three times clicking to ignite the lamp. • 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 inside 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 LPS module.
ON	OFF	OFF	OFF	Blinking	Error detected inside this LPS unit.	Replace the LPS module.
					External error detected from Fan Control board.	• Check projector log files for error messages (temperatures, fan speed, etc.) • Check Fan Control board.

Normal conditions of diagnostic LEDs when a lamp is switched ON

- LED 1 (orange right) : flashing (heartbeat)
- LED 2 (orange center) : not defined
- LED 3 (orange left) : flashing few times / second
- ERR : OFF
- PFC OK : ON (green)
- LPS OK : ON (green)
- LAMP ON : ON (green)
- LVPS OK : ON (orange)

21.2 Removal of a LPS module

Necessary tools

- Flat screw driver
- Nut driver 10mm

How to remove

1. Remove the connection between the *Address* connectors of both LPS modules (3).

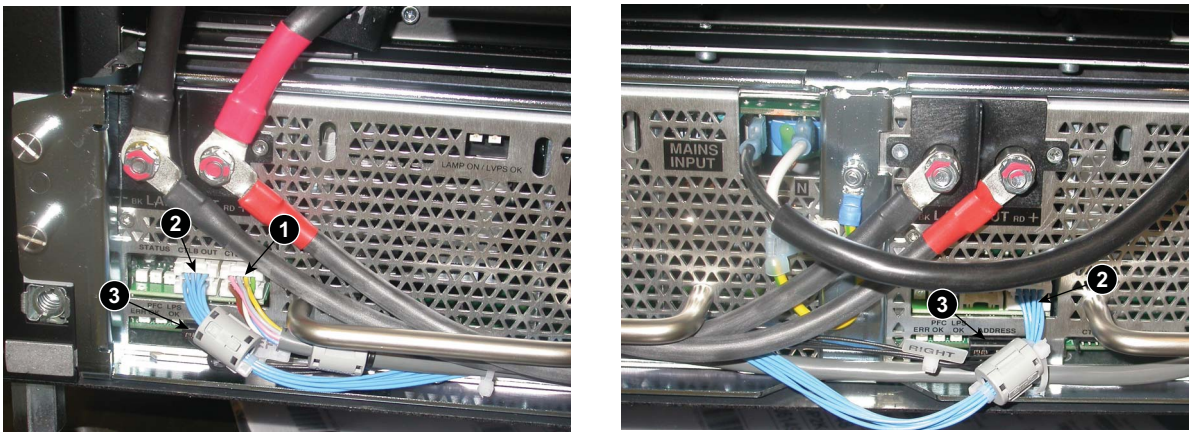


Image 21-2
Communication connections

2. For the left LPS module, remove the ***CTLB OUT*** (2) and ***CTLB IN*** (1) connections.
   For the right LPS module, remove the ***CTLB IN*** connection (2).
3. Disconnect the ***LAMP OUT*** cables from the LPS module. Use a 10 mm nut driver.
   Note: *Do not loose the washers !*
4. Disconnect the ***MAINS INPUT*** cables.
5. Disconnect the grounding wires (PE wires) (4) from both LPS modules.

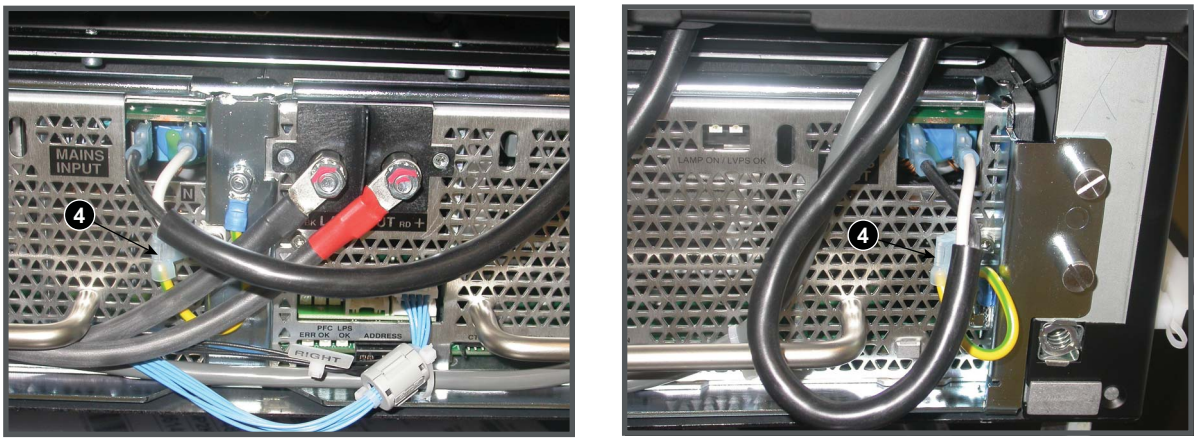


Image 21-3
Grounding wires

6. Release the 4 captive screws (1) and take off the fixation frame.

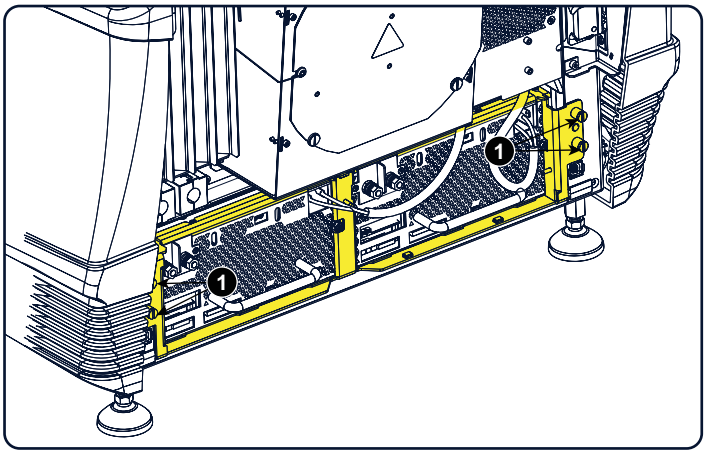


Image 21-4
Fixation screws

7. Slide out the defective LPS module.

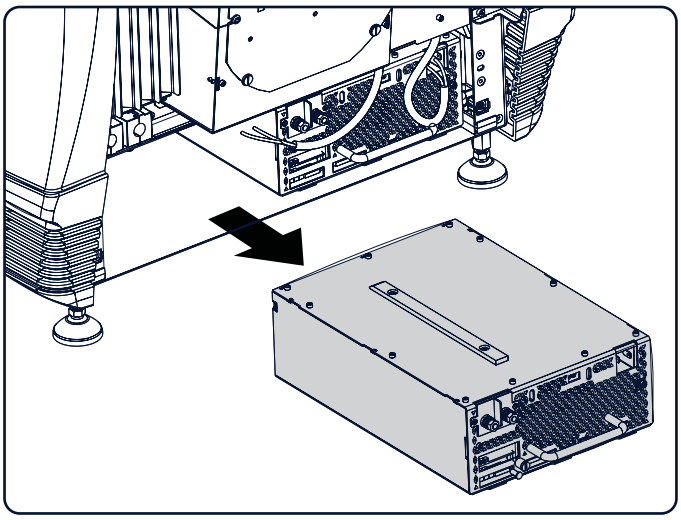


Image 21-5
LPS module removal

21.3 Installation of a LPS module

Necessary tools

- Flat screw driver.
- Torque wrench with a 10 mm hexagon socket.

How to install

1. Before inserting an LPS unit, place the mounting pin at the backside in its correct position.

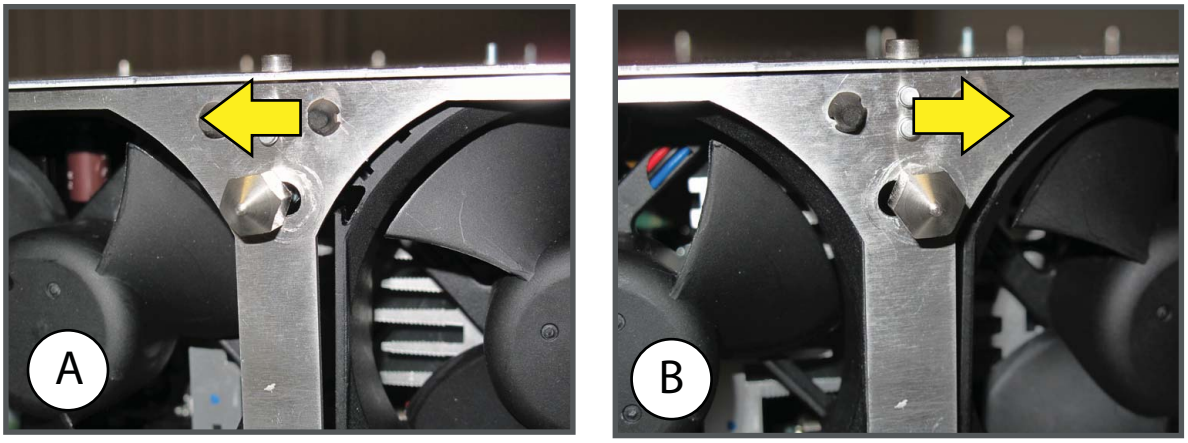


Image 21-6
Mounting pin

A To be built-in in the left position
B To be built-in in the right position

For a LPS unit to be built-in at the left side of the LPS compartment, the positioning pin must be in the left position when seen from the backside of the unit.

For a LPS unit to be built-in at the right side of the LPS compartment, the positioning pin must be in the right position when seen from the backside of the unit.

To move the pin to the left or the right, pull on the pin and slide it to the left or to the right.

2. Take the new LPS module and slide in the LPS module in the LPS compartment so that the ***LAMP OUT*** connection points are to the upper side.

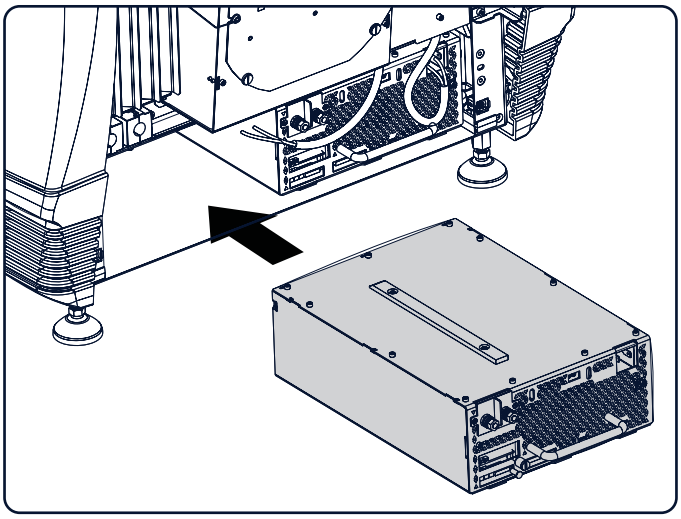


Image 21-7
LPS module insertion

3. Slide the fixation frame on the front of the LPS units in such a way that the fixation pins match the fixation holes.

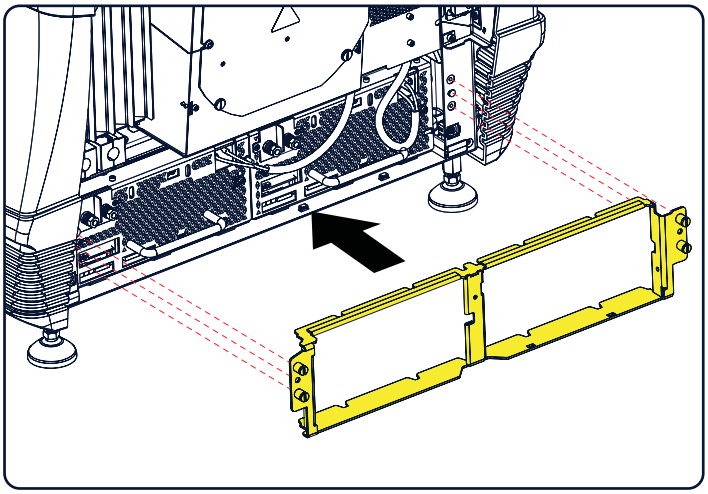


Image 21-8
Fixation frame

4. Secure the 4 spring screws (1).

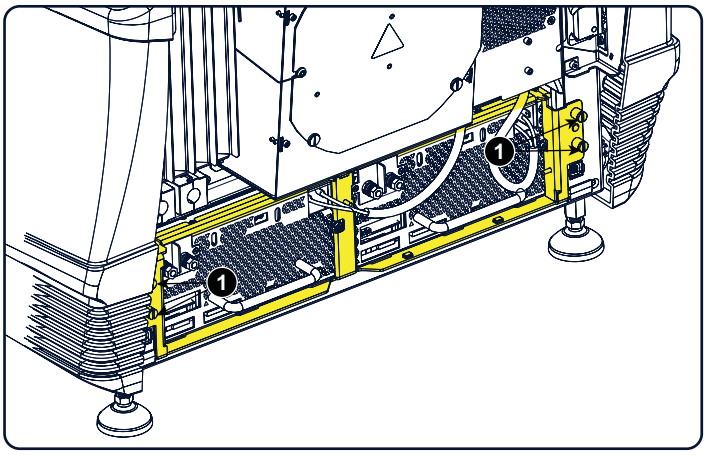


Image 21-9
Fixation screws

5. Connect the grounding wires mounted on the LPS fixation into the socket of each LPS unit.

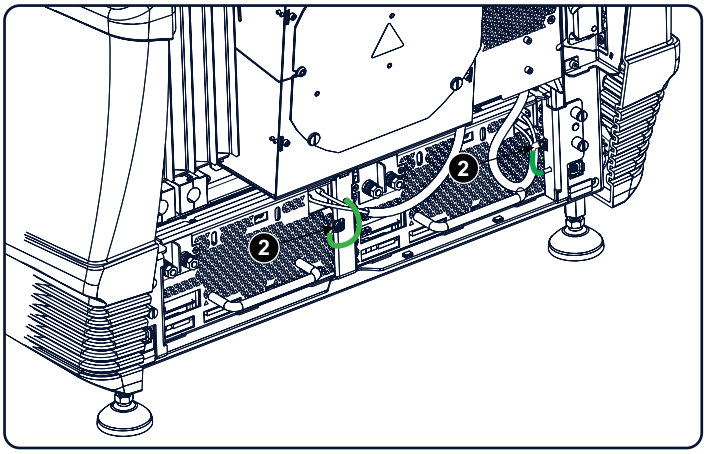


Image 21-10
Grounding wires

6. Connect the power cables coming from the SPG module with the ***LAMP OUT*** sockets of the LPS module as illustrated. Insert at the same time the connector coming from he second LPS unit. Fasten the nuts with a torque of **4Nm** (2.95 lbf*ft).
   If it is the left LPS module, push the high power cables through the handle of the this LPS module before connecting to the ***LAMP OUT*** socket.
   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.*

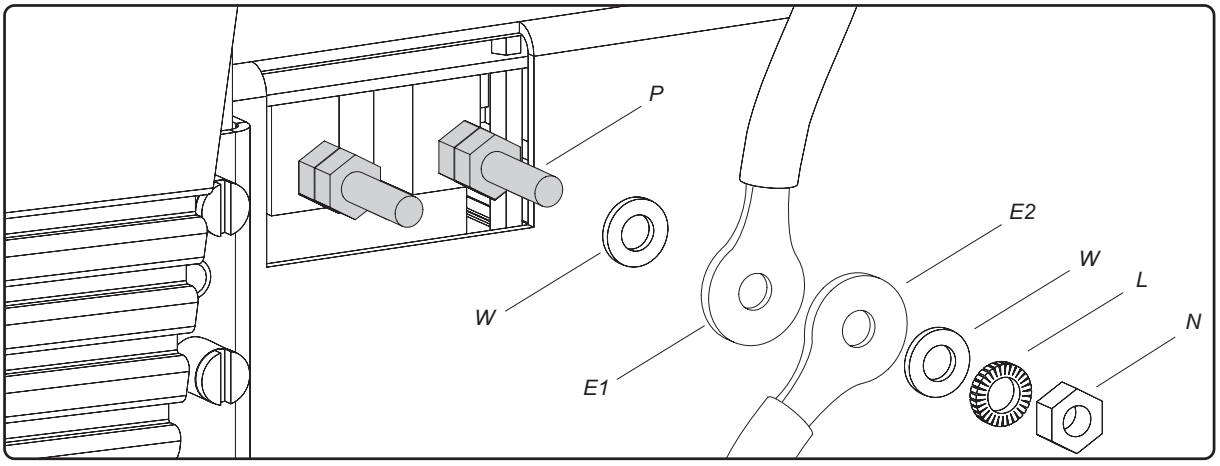


Image 21-11
Lamp out connection

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.*

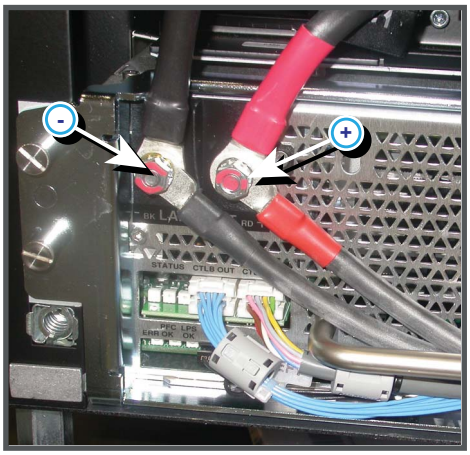


Image 21-12
High power connection, left

7. Connect the mains input cables with the ***MAINS INPUT*** sockets of the new LPS module as illustrated. Plug the connector of the blue (or white) wire into the socket labeled with N.

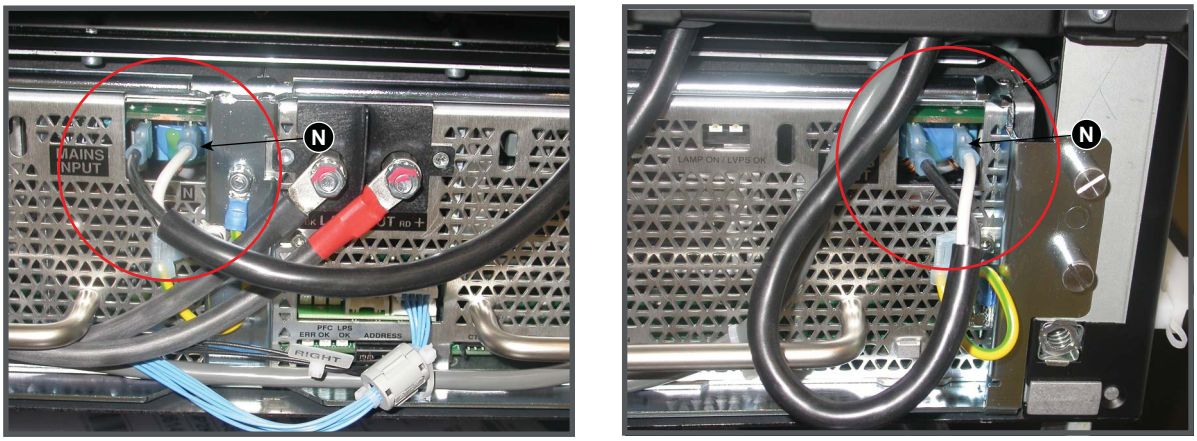


Image 21-13
Mains input connection, left and right LPS module

When the **left** LPS module is replaced:

- Connect the wire unit coming out of the projector with the ***CTLB IN*** socket (1).
- Connect the ***CTLB OUT*** socket of the left LPS with the ***CTLB IN*** socket of the right LPS unit (2).
- Make the connection between the ***ADDRESS*** connector of the left LPS unit and the ***ADDRESS*** connector of the right LPS unit (3). Make sure that the indication *Left* and *Right* is at the correct side.

When the **right** LPS module is replaced:

- connect the wire unit coming from ***CTLB OUT*** socket of the left LPS with the ***CTLB IN*** socket (2)
- Make the connection between the ***ADDRESS*** connector of the left LPS unit and the ***ADDRESS*** connector of the right LPS unit (3). Make sure that the indication *Left* and *Right* is at the correct side.

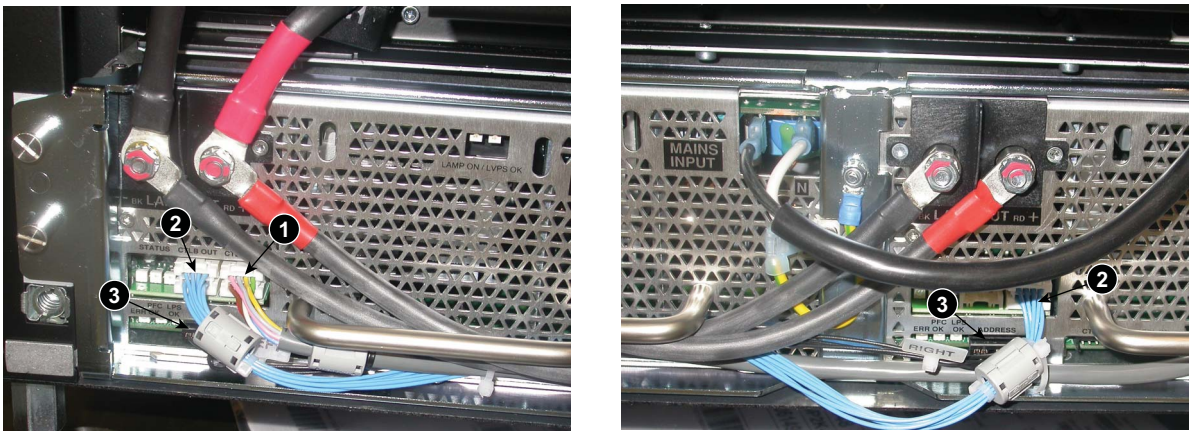


Image 21-14
Communication connections

21.4 Replacing a large frame LPS with a 2 single module LPS

Interconnection cables installed on the old LPS module must be reused while installing the new LPS modules (high power cables, address cable and CTLB cable).

How to replace

1. Remove the large frame LPS module, see "Removal of a LPS module", page 360.
2. Before inserting an LPS unit, place the positioning pin at the backside in its correct position.

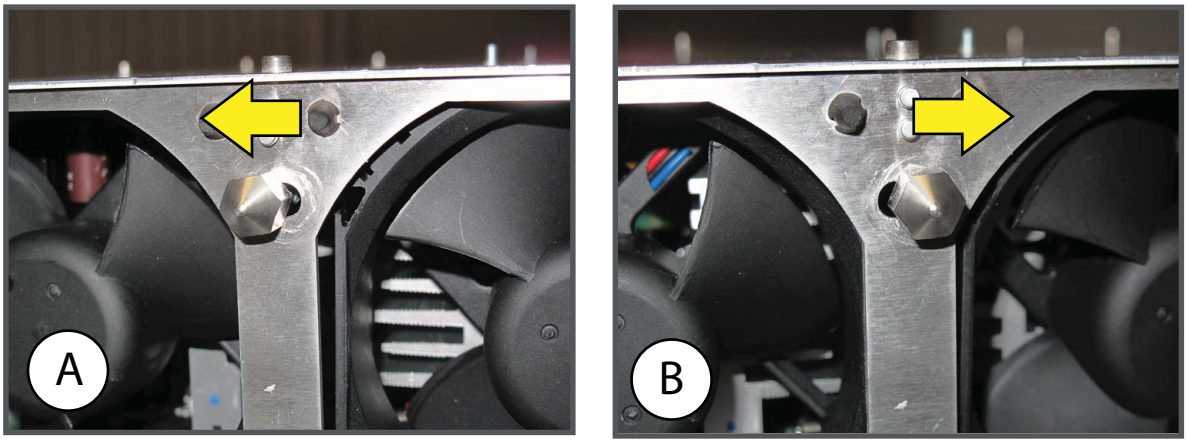


Image 21-15
Positioning pin

A To be built-in in the left position
B To be built-in in the right position

For a LPS unit to be built-in at the left side of the LPS compartment, the positioning pin must be in the left position when seen from the backside of the unit.

For a LPS unit to be built-in at the right side of the LPS compartment, the positioning pin must be in the right position when seen from the backside of the unit.

To move the pin to the left or the right, pull on the pin and slide it to the left or to the right.

3. Slide both single units next to each other in the projector.

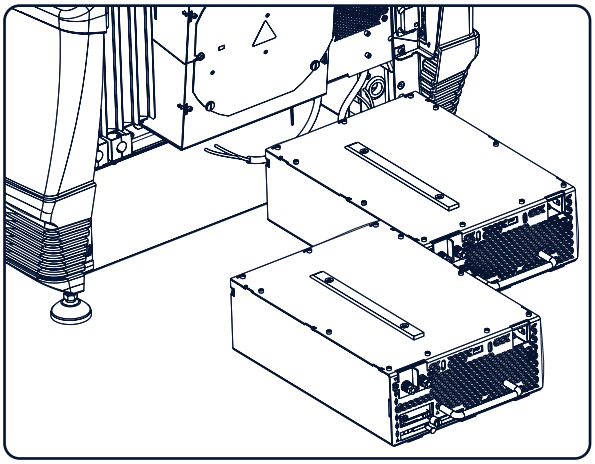


Image 21-16
Insert LPS units

4. Slide the fixation frame on the front of the LPS units in such a way that the fixation pins match the fixation holes.

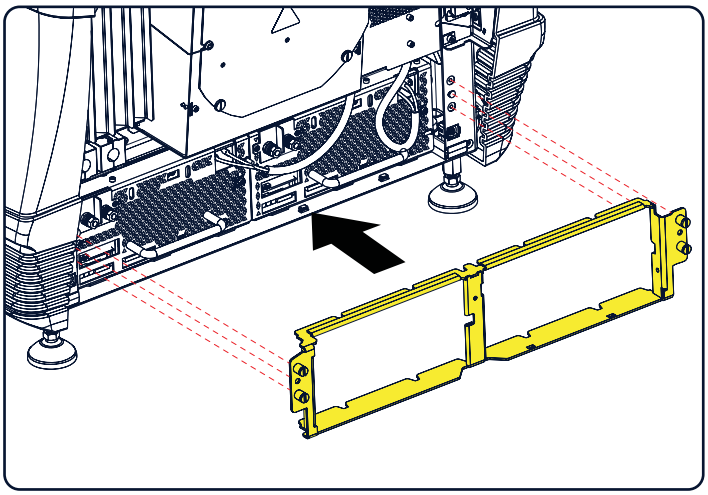


Image 21-17
Fixation frame

5. Secure the 4 spring screws (1).

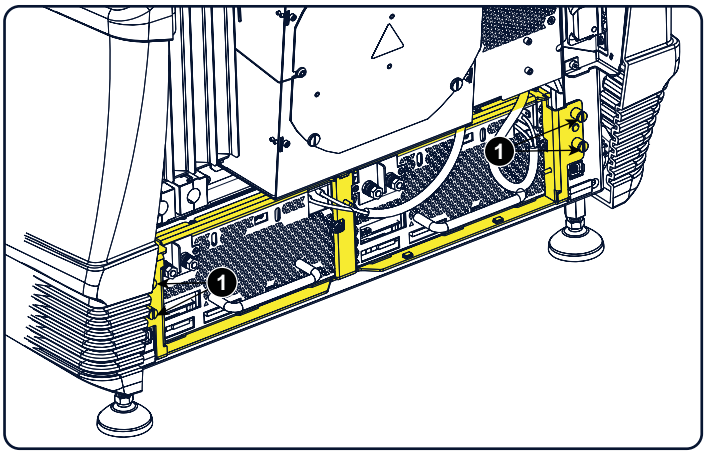


Image 21-18
Fixation screws

6. Connect the grounding wires mounted on the LPS fixation into the socket of each LPS unit.

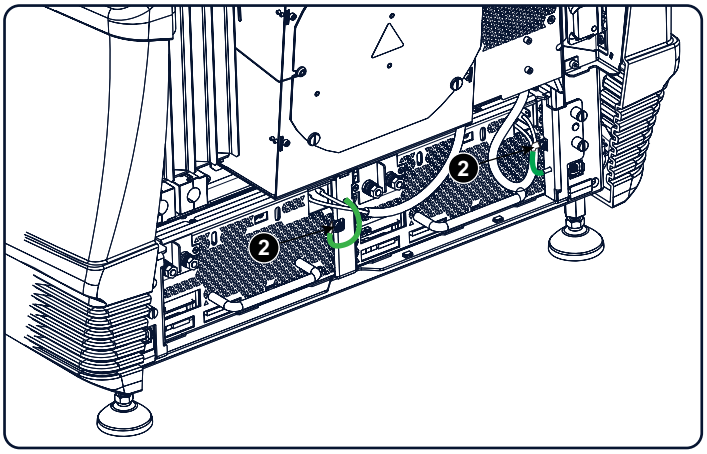


Image 21-19
Grounding wires

7. Connect the power cables coming from the SPG module with the ***LAMP OUT*** sockets of the LPS module as illustrated. Insert at the same time the connector coming from he second LPS unit. 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.*

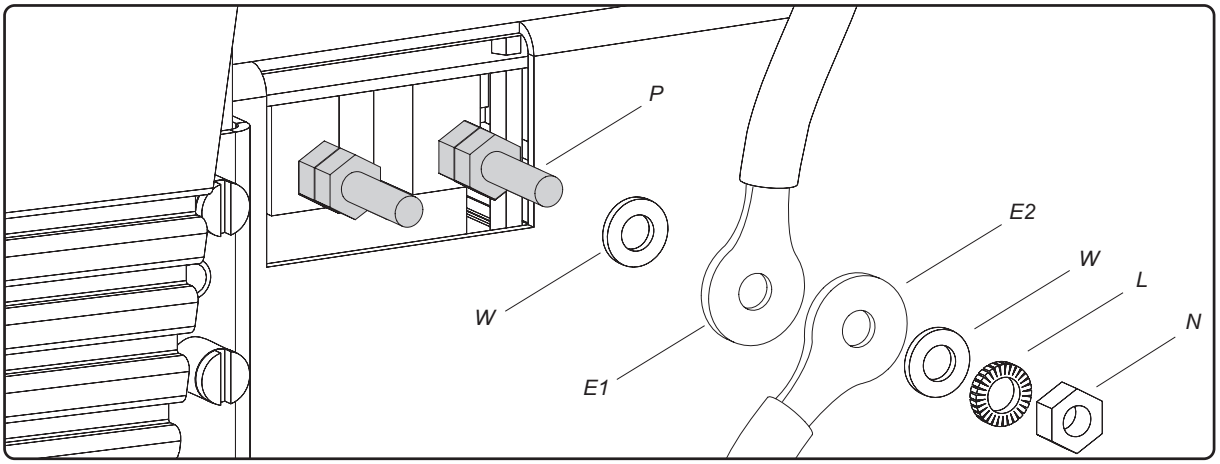


Image 21-20
Lamp out connection

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.*

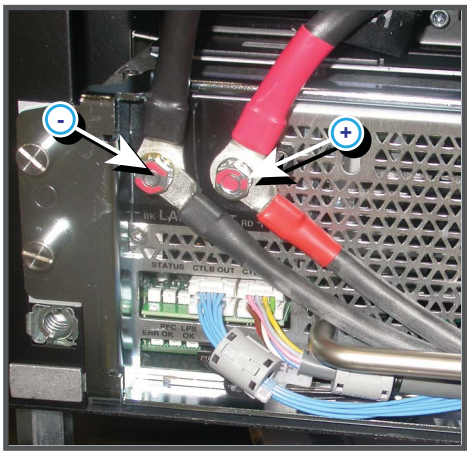


Image 21-21
High power connection, left

8. Pull the high power cables through the handle of the left LPS unit before connecting to the second LPS unit. Use again the same type and sequence of washers secure with a nut. Fasten the nuts with a torque of **4Nm** (2.95 lbf*ft).

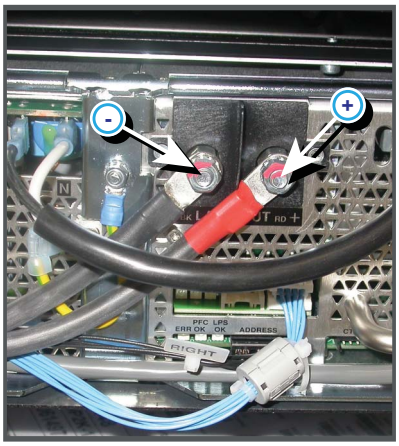


Image 21-22
High power connection, right

9. Connect the mains input cables with the ***MAINS INPUT*** sockets of each LPS module as illustrated. Plug the connector of the blue (or white) wire into the socket labeled with ***N***.

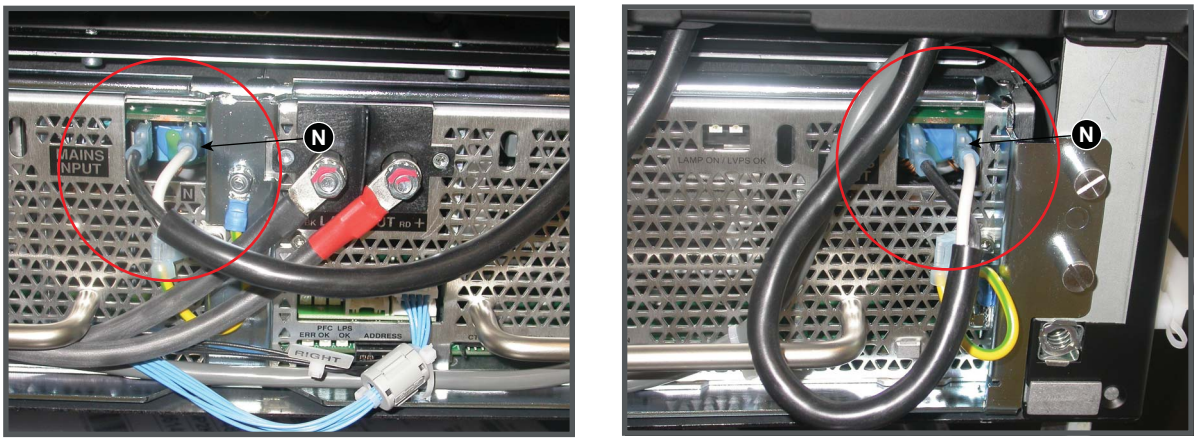


Image 21-23
Mains input connection

10. Connect the wire unit coming out of the projector with the ***CTLB IN*** socket of the left LPS unit (1).
Connect the ***CTLB OUT*** socket of the left LPS with the ***CTLB IN*** socket of the right LPS unit (2).
Make the connection between the ***ADDRESS*** connector of the left LPS unit and the ***ADDRESS*** connector of the right LPS unit (3). Make sure that the indication *Left* and *Right* is at the correct side.

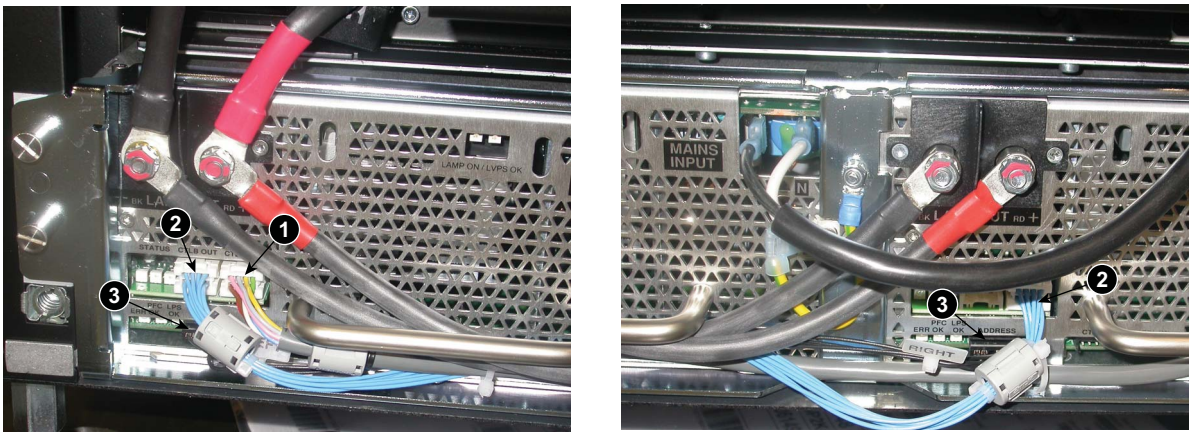


Image 21-24
Communication connections

22. START PULSE GENERATOR

About this chapter

This chapter describes briefly the functionality, the different parts and the replacement procedure of the Start Pulse Generator (SPG).

Overview

- Introduction
- Troubleshooting
- Removal of the Start Pulse Generator
- Installation of the Start Pulse Generator

22.1 Introduction

Functionality

The purpose of the Start Pulse Generator (SPG) is to ignite the lamp with a burst of high voltage peaks. The SPG superimposes high voltage peaks onto the normal dc start-up voltage of the lamp supplied by the Lamp Power Supply. Once the lamp is started up and illuminating, the high voltage is removed and the lamp voltage drops to the arc voltage. The high voltage peaks are added to the lamp voltage by a superimposing transformer which is in series with the positive connection from the LPS to the lamp. The negative connection from LPS to lamp is direct and is connected to the chassis at the lamp side. The full lamp current passes through the secondary of the superimposing transformer.

Parts

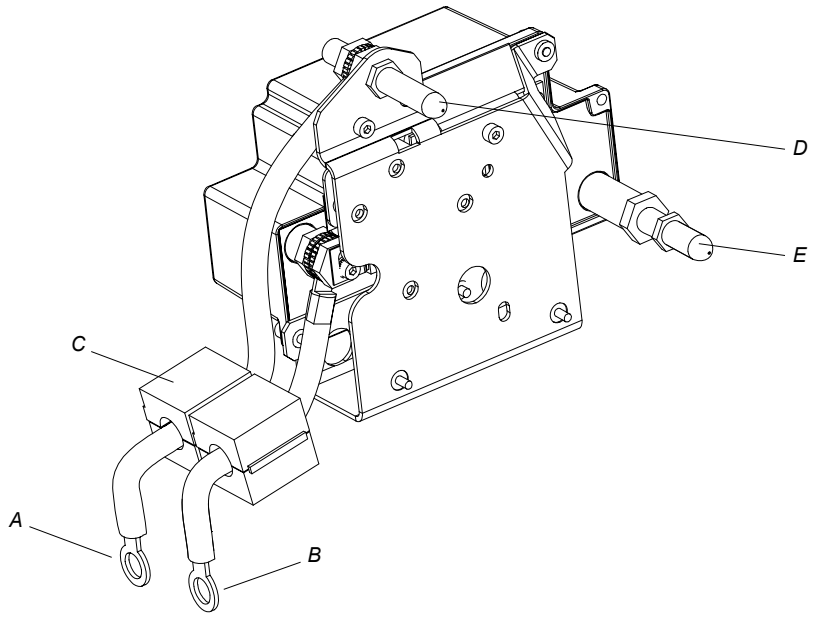


Image 22-1
A Black marked cable lug. Has to be connected with the negative “LAMP OUT” pin of the LPS module.
B Red marked cable lug. Has to be connected with the positive “LAMP OUT” pin of the LPS module.
C Ferrite block.
D Negative connection pin from SPG to lamp house.
E Positive connection pin from SPG to lamp house.

22.2 Troubleshooting

Lamp fails to ignite after you switched the projector from standby to operation

Situation	Solution
You can hear the SPG module three times clicking in an attempt to ignite the lamp. The voltage on the “LAMP OUT” pins of the LPS module is first 140 volt during the attempt to ignite and then drops to 0 volt. **Note**: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.	• The LPS and SPG seem to work normally but the lamp is bad. Install another lamp house. • If the problem remains, replace the SPG module.
You can not hear the SPG module three times clicking in an attempt to ignite the lamp. The voltage on the “LAMP OUT” pins of the LPS module is first 140 volt during the attempt to ignite and then drops to 0 volt. **Note**: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.	• Check the cabling of the SPG module. • Replace the SPG module.
You can not hear the SPG module three times clicking in an attempt to ignite the lamp. The voltage on the “LAMP OUT” pins of the LPS module is below 140 volt during the attempt to ignite. The diagnostic LED’s of the LPS module indicates a problem with the LPS module. **Note**: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.	• Check the cabling of the LPS module. • Replace the LPS module.

22.3 Removal of the Start Pulse Generator

To remove or install the start pulse generator you have to remove the side cover, the back cover, the lamp cover and the lamp house first. This procedure assumes that these covers are already removed.

Necessary tools

- 10 mm nut driver.
- 3 mm Allen wrench.
- 6 x 120 mm flat screw driver.

How to remove the Start Pulse Generator

1. Disconnect the SPG cables from the “LAMP OUT” pins of 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.*

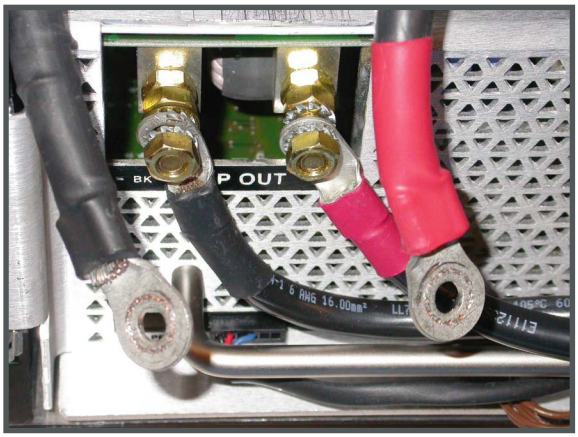


Image 22-2
Disconnect SPG cables

2. Remove the cover of the Start Pulse Generator as illustrated. This cover is secured with 5 hexagon socket head cap screws. Use a 3 mm Allen wrench.

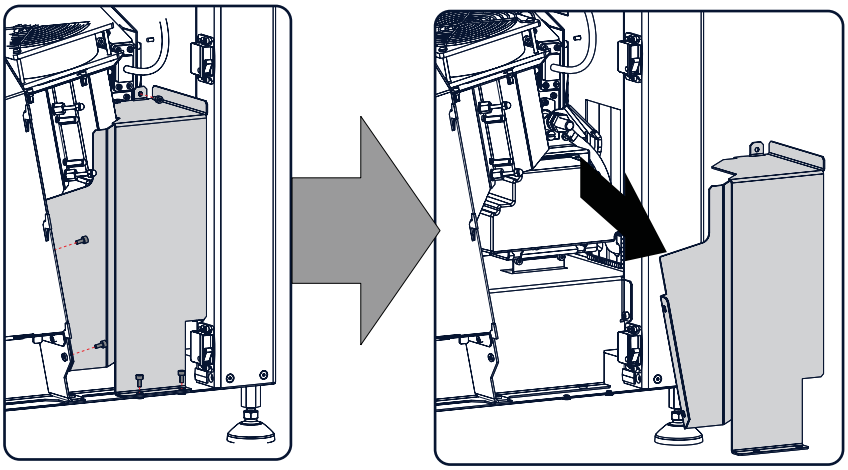


Image 22-3
Remove SPG cover

3. Release the 3 captive screws (S) of the Start Pulse Generator as illustrated. Use a flat screw driver.

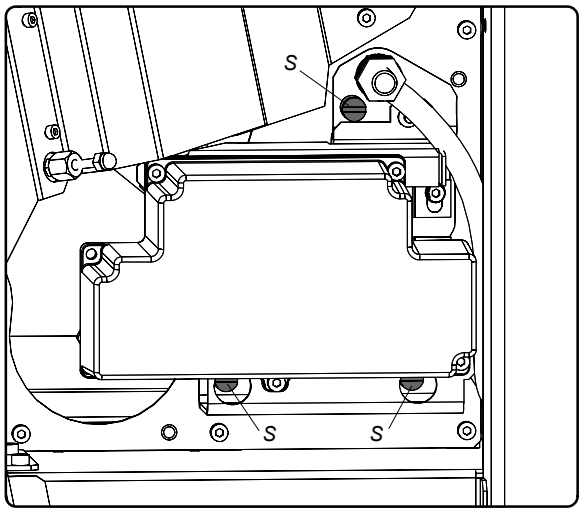


Image 22-4
Loosen SPG fixation

4. Remove the Start Pulse Generator from the projector.
   Caution: *Do not damage the ferrite blocks while removing the SPG module.*

   Note: *The ferrite blocks have to be reused upon the SPG module which you want to install.*

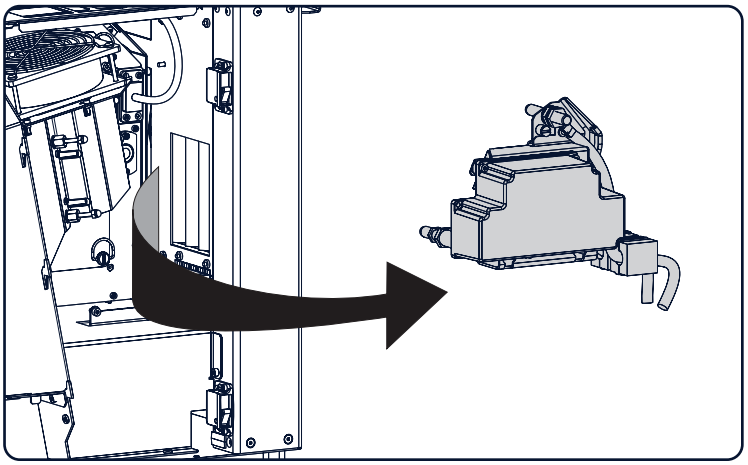


Image 22-5
Remove SPG

22.4 Installation of the Start Pulse Generator

Make sure that lamp house is removed !

Necessary tools

- Torque wrench with a 10 mm hexagon socket.
- 3 mm Allen wrench.
- 6 x 120 mm flat screw driver.

How to install the Start Pulse Generator

1. Insert the Start Pulse Generator in the projector. Guide the wires gently through the frame opening.
   Caution: *Make sure not to damage the wires.*

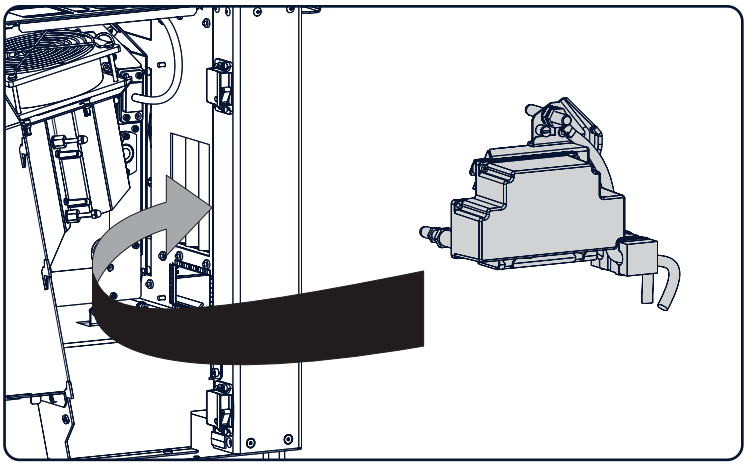


Image 22-6
Insert SPG

2. Fasten the 3 captive screws (S) of the Start Pulse Generator as illustrated, using a flat screw driver.

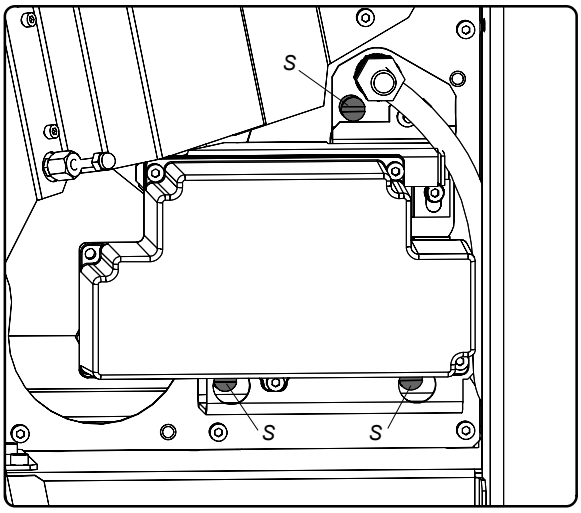


Image 22-7
Fixate SPG

3. Install the cover of the Start Pulse Generator as illustrated. The cover has to be fasten with 5 hexagon socket head cap screws. Use for that a 3 mm Allen wrench.

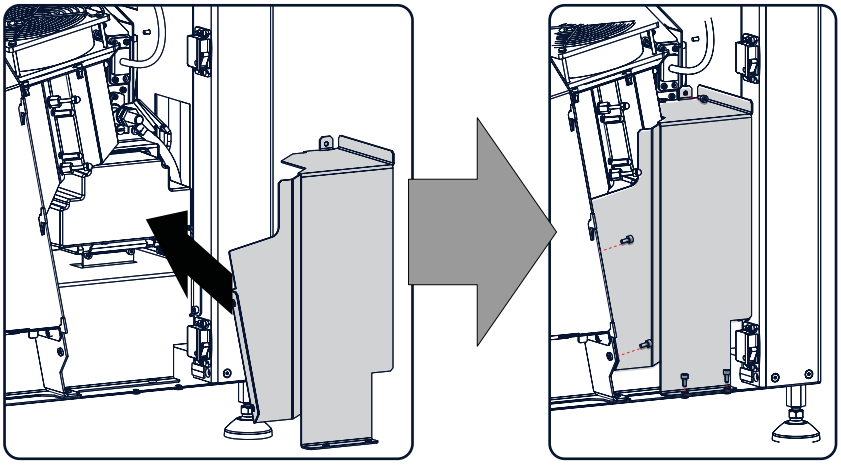


Image 22-8

4. Connect the power cables coming from the Start Pulse Generator 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.*

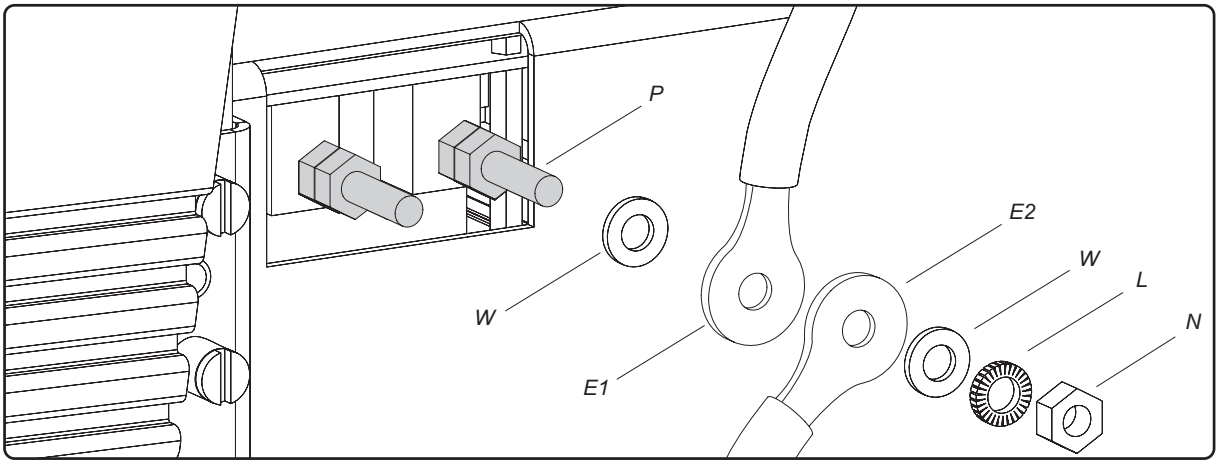


Image 22-9
Lamp out connection

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.*

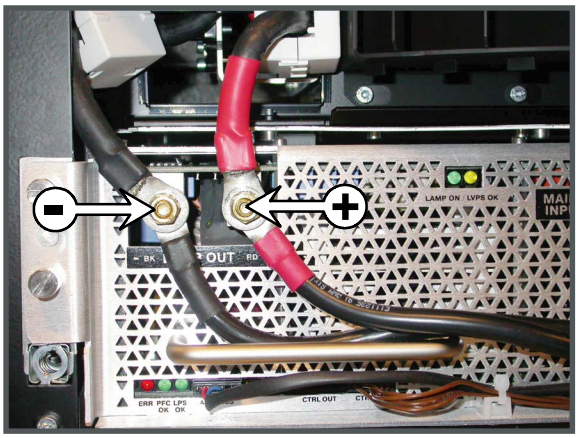


Image 22-10

Warning: *Make sure that both SPG cables are provided with ferrite blocks (C). Reuse the ferrite blocks of the removed SPG module in case no ferrite blocks are present upon the installed SPG module.*

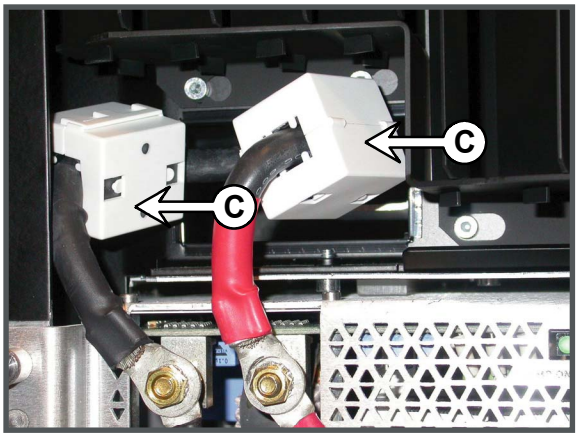


Image 22-11

5. Reinstall the lamp house and the covers of the projector.

23. FAN REPLACEMENT PROCEDURES

Overview

- Card cage fans
- SMPS compartment fans
- Light processor compartment fan
- Lamp cathode fan
- Lamp anode fan
- Heat exchanger fan
- Cold mirror fan
- Lamp Info Module fan
- Integrated cinema processor fan

23.1 Card cage fans

Necessary tools

Allen key 3 mm

How to replace

1. Remove the front cover, "Removal of the front cover", page 94.
2. Remove the front filter as follows:
   a) Remove the input cover, "Removal of the input cover", page 93.
   b) Pull the small handle a little backwards and then to the front of the projector until the filter frame is released.
   c) Slide out the filter.
3. Disconnect the fan power cable(s). If necessary, cut the cable tie.

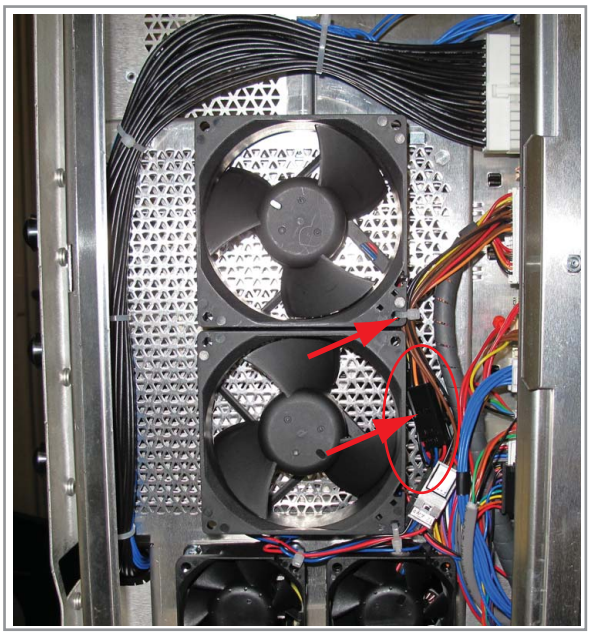


Image 23-1
Card cage fans, connection

4. Turn out the 4 fixation screws. Use the front holes in the fan housing to reach these screws.

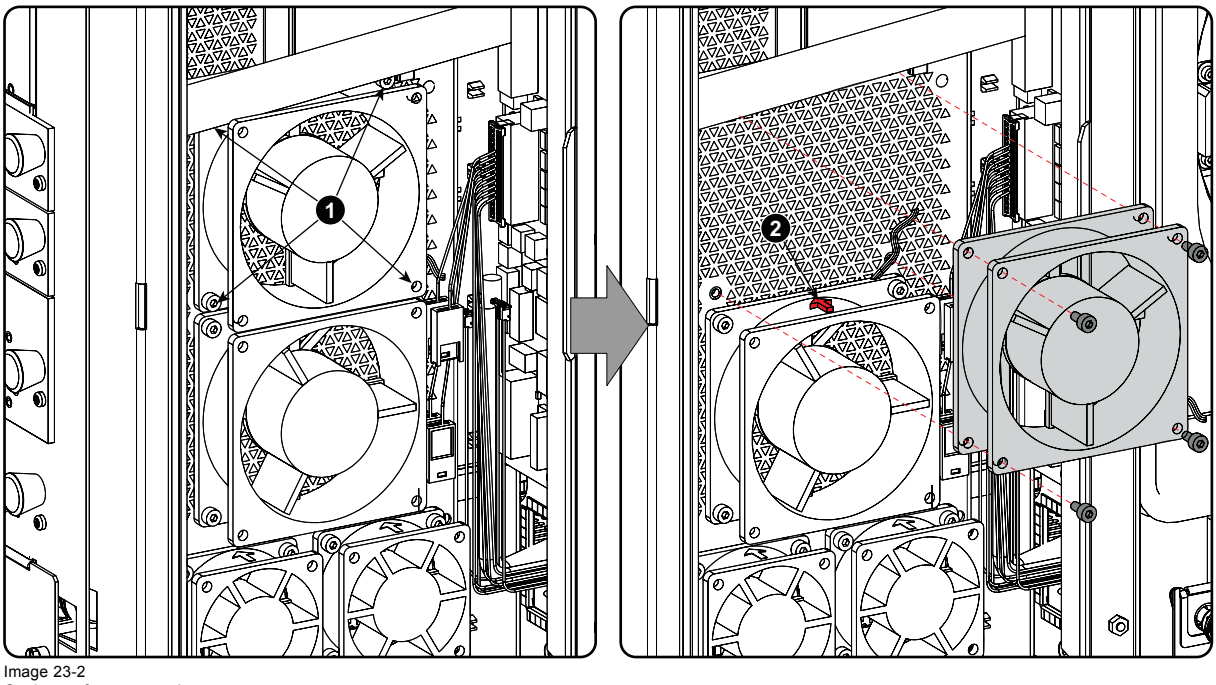


Image 23-2
Card cage fans, removal

5. Take out the fan.
6. Insert a new fan, with the arrow indication on the fan pointing to the inner side of the projector.
7. Drive in the 4 fixation screws.
8. Reconnect the fan power cable. Use a cable tie to secure the cables.

23.2 SMPS compartment fans

Necessary tools

Allen key 3 mm

How to replace

1. Remove the front cover, "Removal of the front cover", page 94.
2. Remove the front filter as follow :
   a) Remove the input cover, "Removal of the input cover", page 93.
   b) Pull the small handle a little backwards and then to the front of the projector until the filter frame is released.
   c) Slide out the filter.
3. Disconnect the power cable of the defective fan. If necessary, cut the cable tie(s).

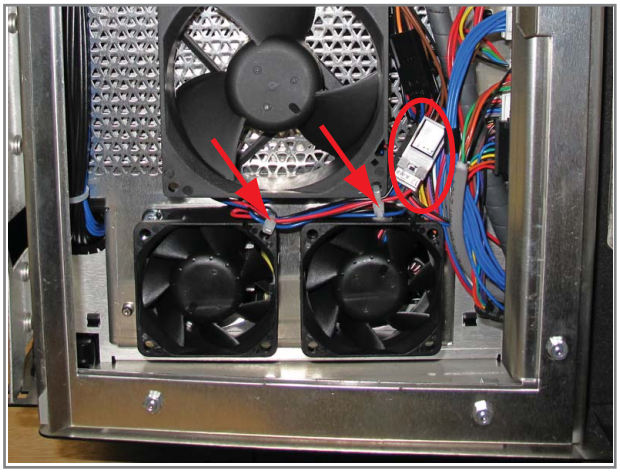


Image 23-3
SMPS fans, connection

4. Turn out the 4 fixation screws (1). Use the front holes in the fan housing to reach these screws.

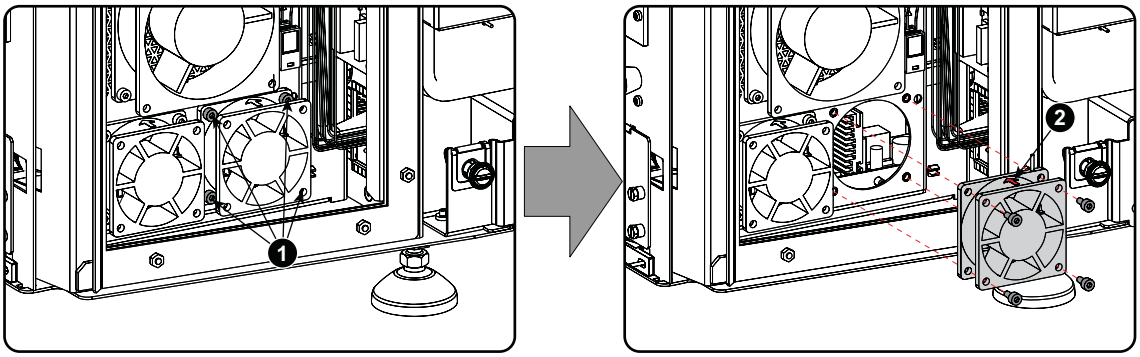


Image 23-4
Remove the SMPS compartment fan(s)

5. Take out the fan.
6. Insert a new fan, with the arrow indication on the fan pointing to the inner side of the projector (2).

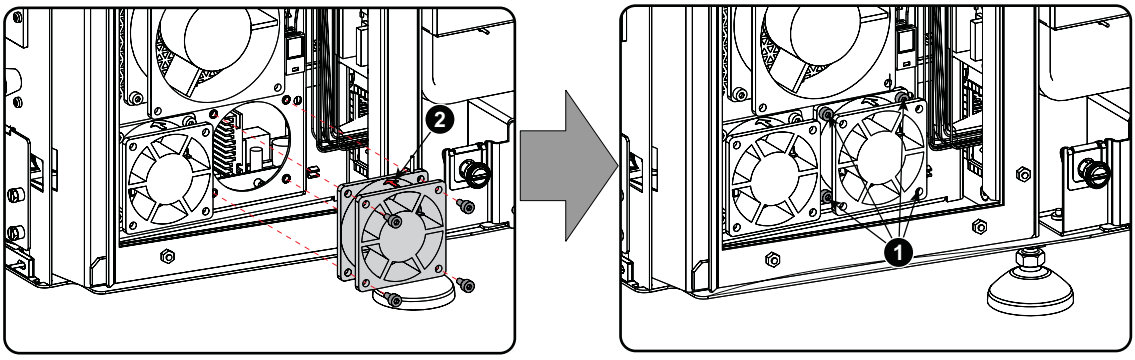


Image 23-5
Mount the SMPS compartment fan(s)

7. Drive in the 4 fixation screws.
8. Reconnect the fan power cable. Use a cable tie to secure the cables.

23.3 Light processor compartment fan

Necessary tools

Allen key 3mm

How to replace

1. Remove covers, see Removal and Installation of projector covers.
2. Remove the light processor cover.
3. Disconnect the fan power cable from the signal backplane.

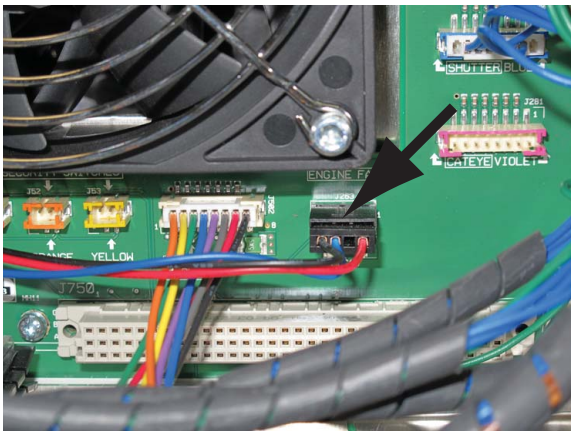


Image 23-6
Light processor fan connection

4. Remove the 4 screws.

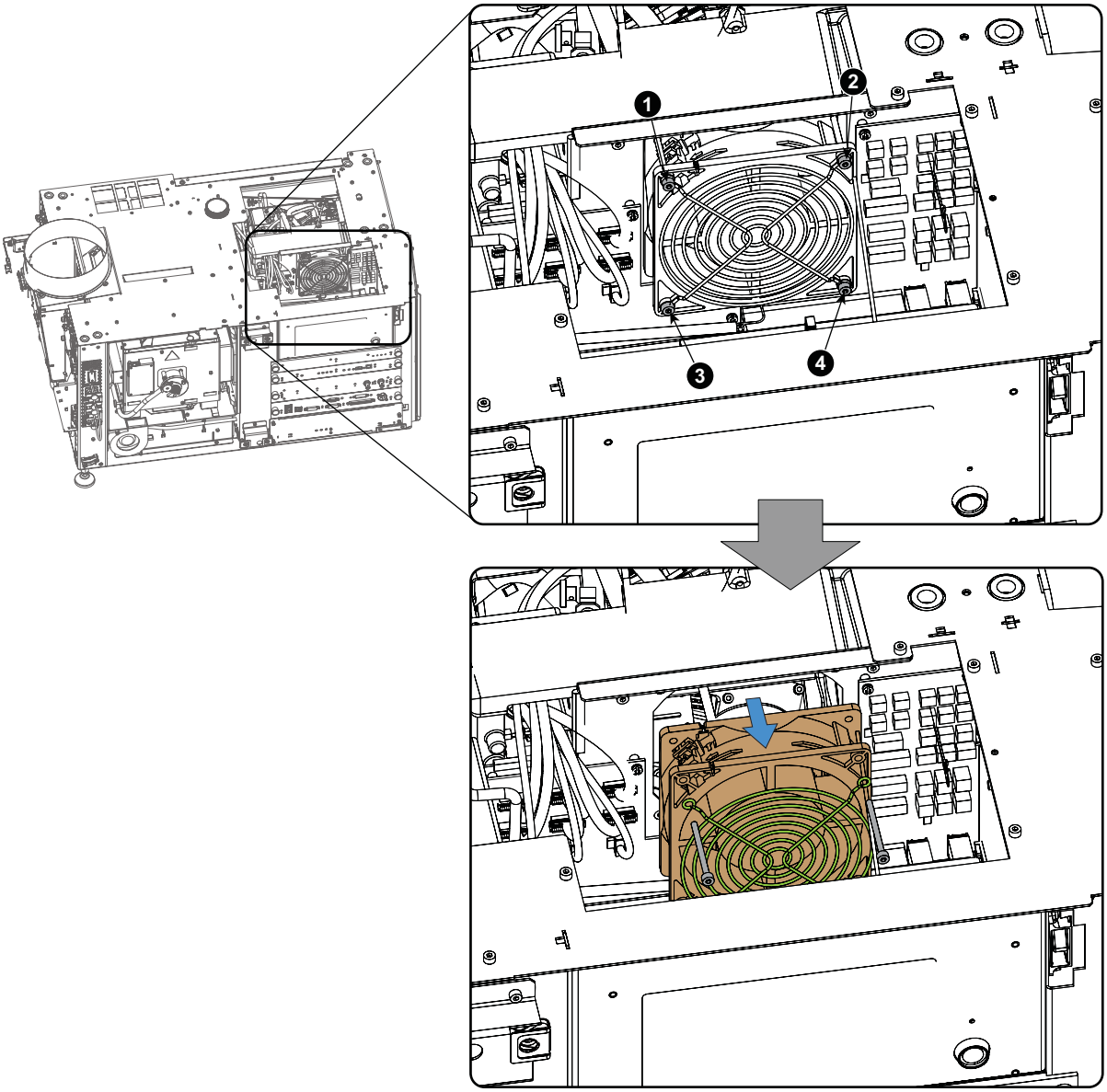


Image 23-7
Light compartment fan, removal

5. Take of the fan protection grid and the fan.
6. Insert a new fan with the arrow indication on the fan pointing towards the light processor.
   Place the grid on the fan.

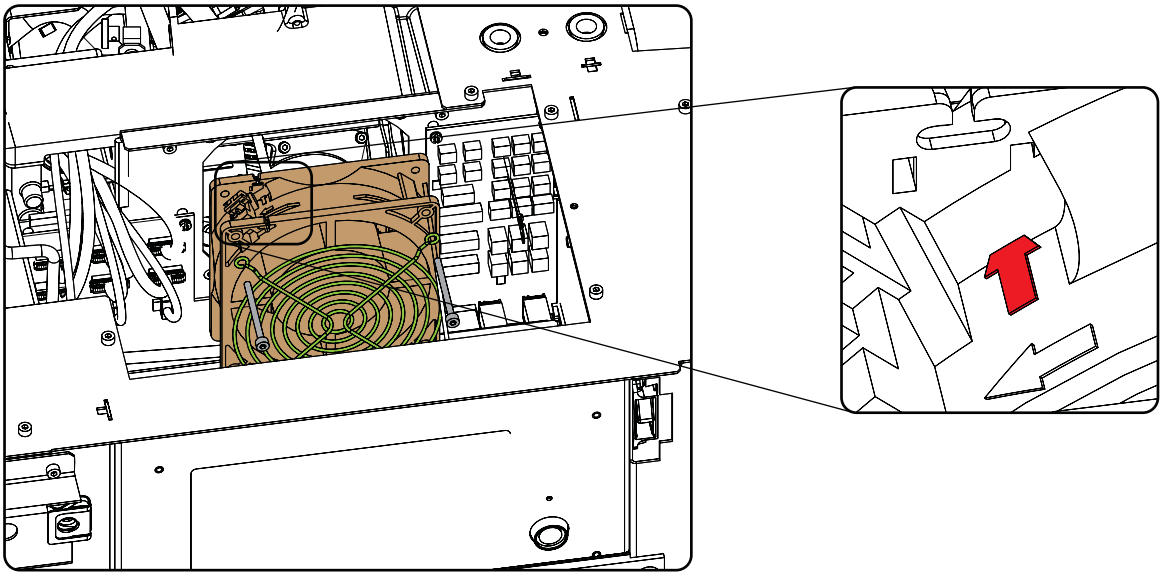


Image 23-8
Light compartment fan, mount

7. Drive in the 4 screws.

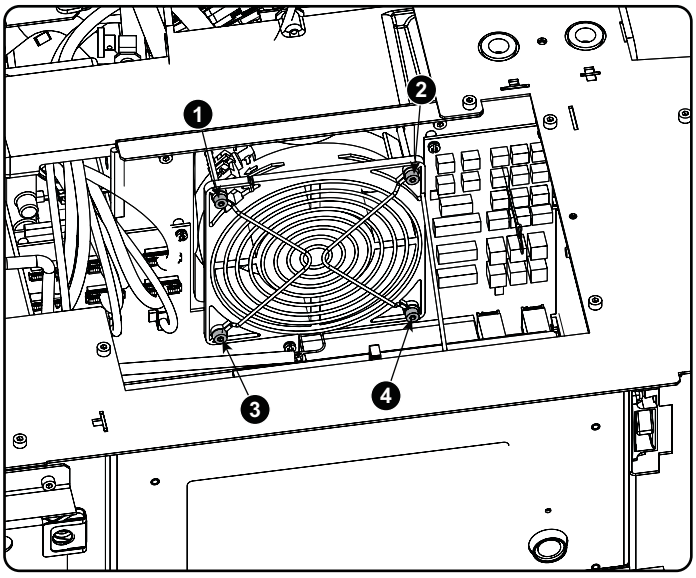


Image 23-9
Light compartment fan, screws

8. Connect the power cable to the signal backplane (image 23-6).
9. Reinstall the Light processor top cover.
   Mount the housing, see Removal and Installation of the projector covers..

23.4 Lamp cathode fan

To access the cathode fan, the lamp house has to be removed. This procedure assumes that the lamp cover and lamp house are already removed.

Preparations

1. Remove the lamp cover.
2. Remove the lamp house.

Necessary tools

- 3 mm Allen wrench.
- 7 mm flat screwdriver.
- 7 mm nut driver.

How to replace

1. Remove the left side panel of the lamp compartment by removing the six indicated screws (reference 1).

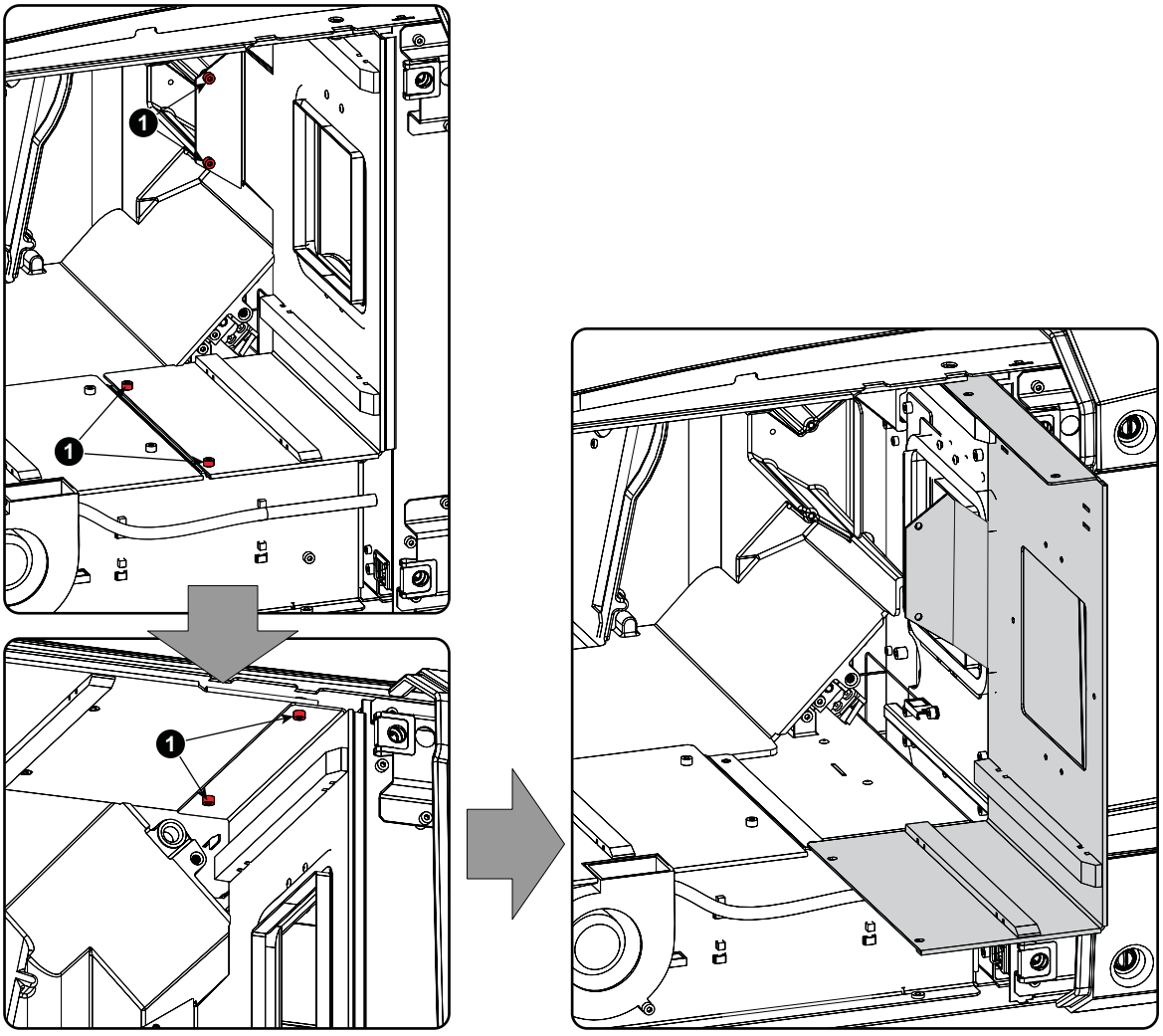


Image 23-10
Side panel lamp house, removal

2. Pull out the wire unit with connector from behind the plate and disconnect the power cable of the cathode fan.

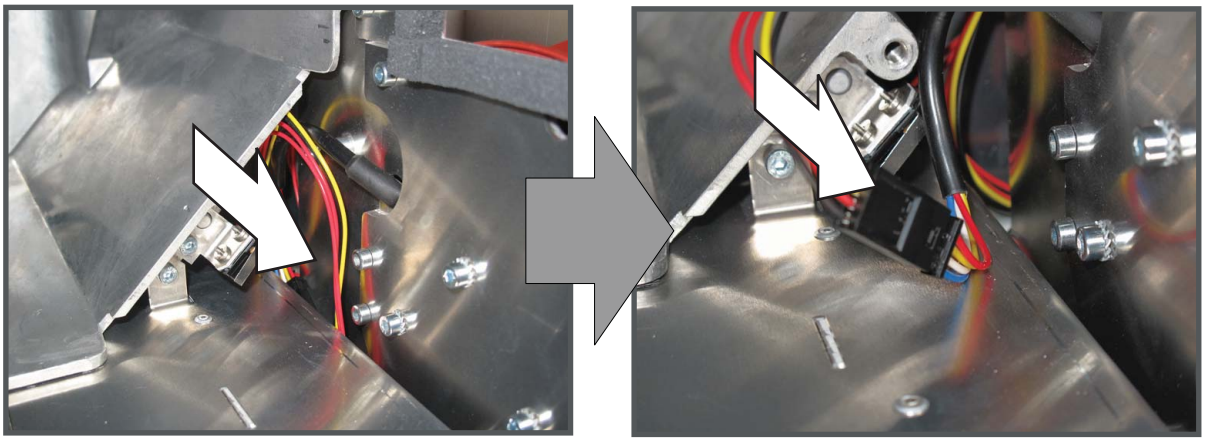


Image 23-11
Cathode fan, power disconnection

3. Remove the small side plate of the air channel by releasing the three screws (reference 2). Cut the foam rubber (reference 3) as it is stuck on different plates.

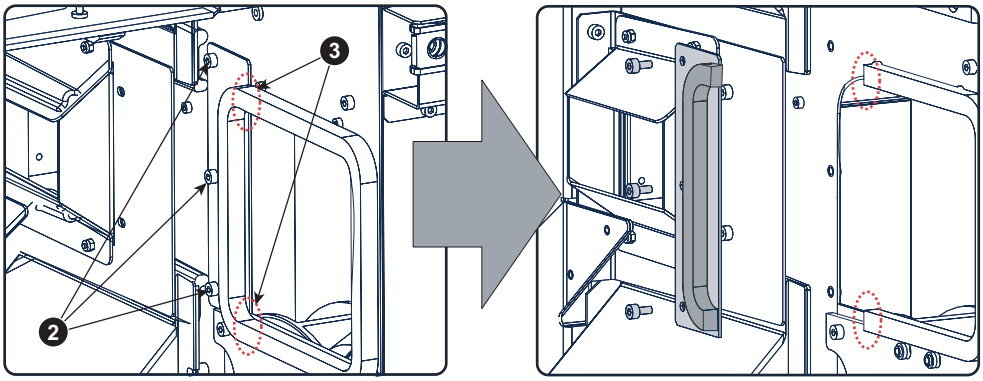


Image 23-12
Small side plate, removal

4. Remove the cathode fan assembly out of its compartment by releasing the five indicated screws (reference 4). Cut the foam rubber (reference 5) as it is stuck on different plates.
   Tip: *Lift up and slightly turn the fan assembly to remove.*

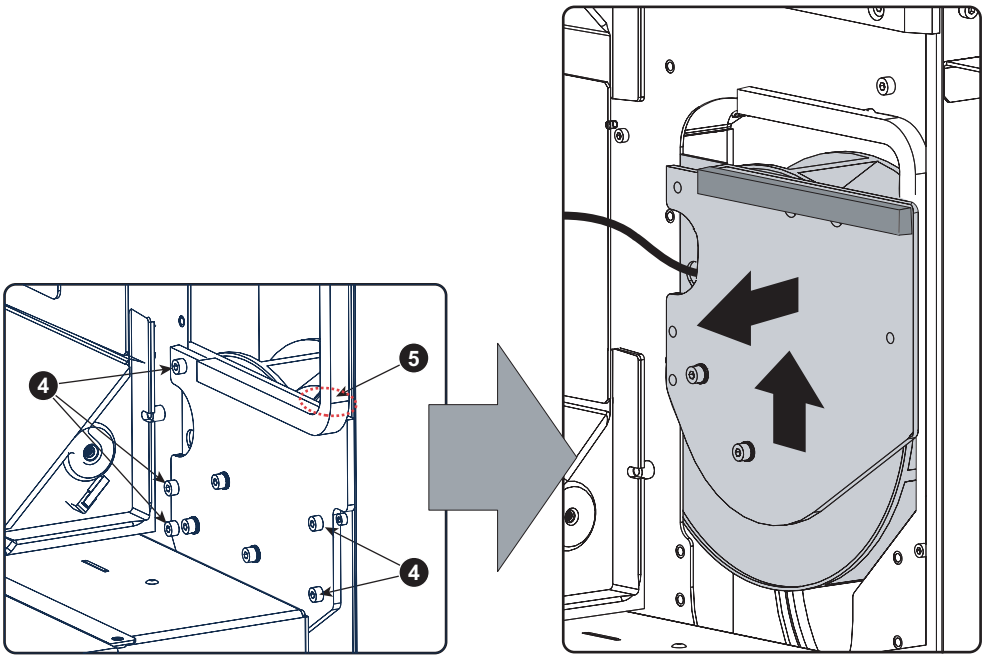


Image 23-13
Cathode fan assembly removal

5. Disassemble the cathode fan assembly by removing the five indicated screws (reference 6).

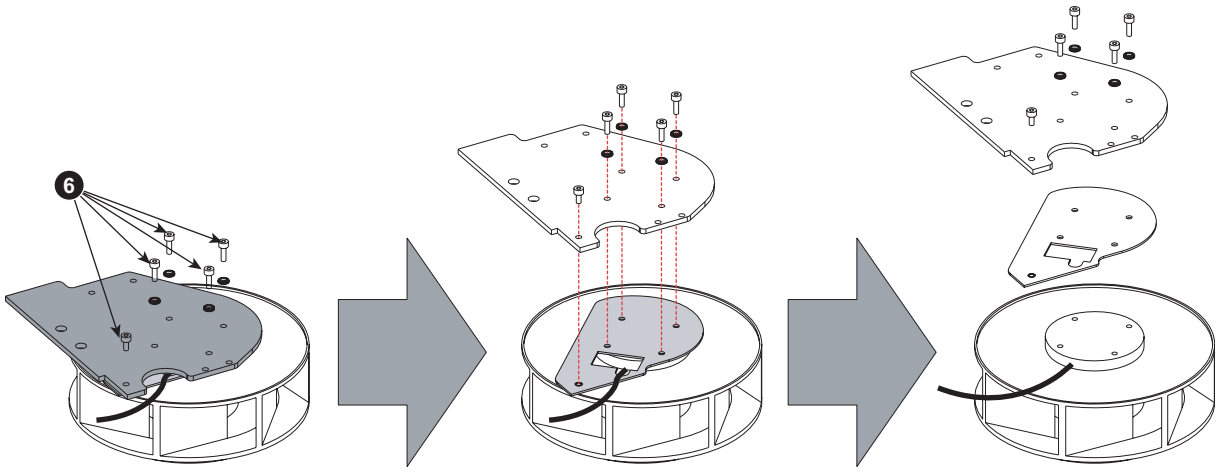


Image 23-14
Cathode fan disassembling unit

6. Fasten the two plates upon the new cathode fan with five screws (reference 6). Provide the four screws in the center with a washer (reference 7). Note that the wire unit of the fan must be guided trough the hole of the lower plate.

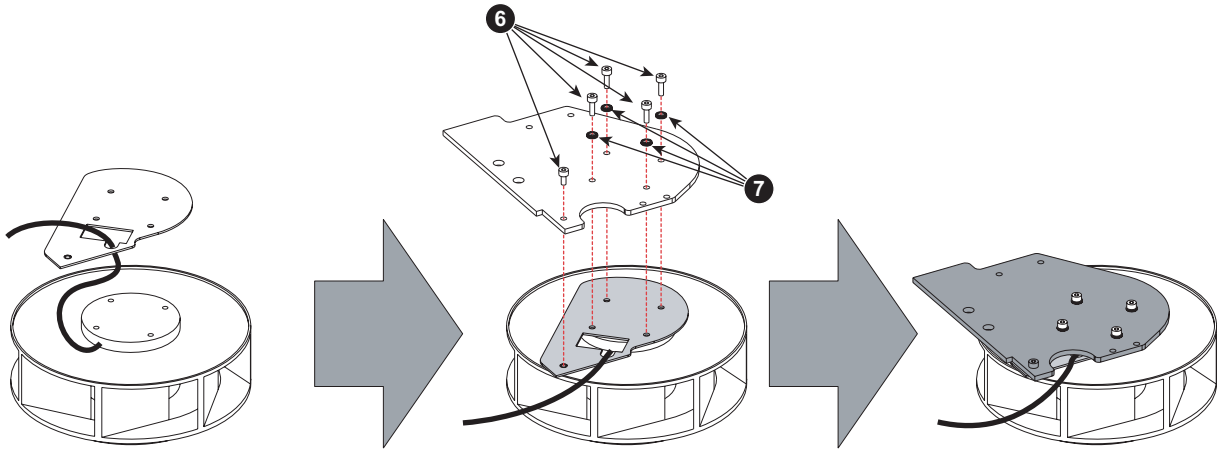


Image 23-15
Assembling the unit

7. Install the fan assembly back in its compartment with five screws (reference 8). Use a 3 mm Allen wrench.
Caution: *Make sure that the wire unit of the fan does not get jammed.*

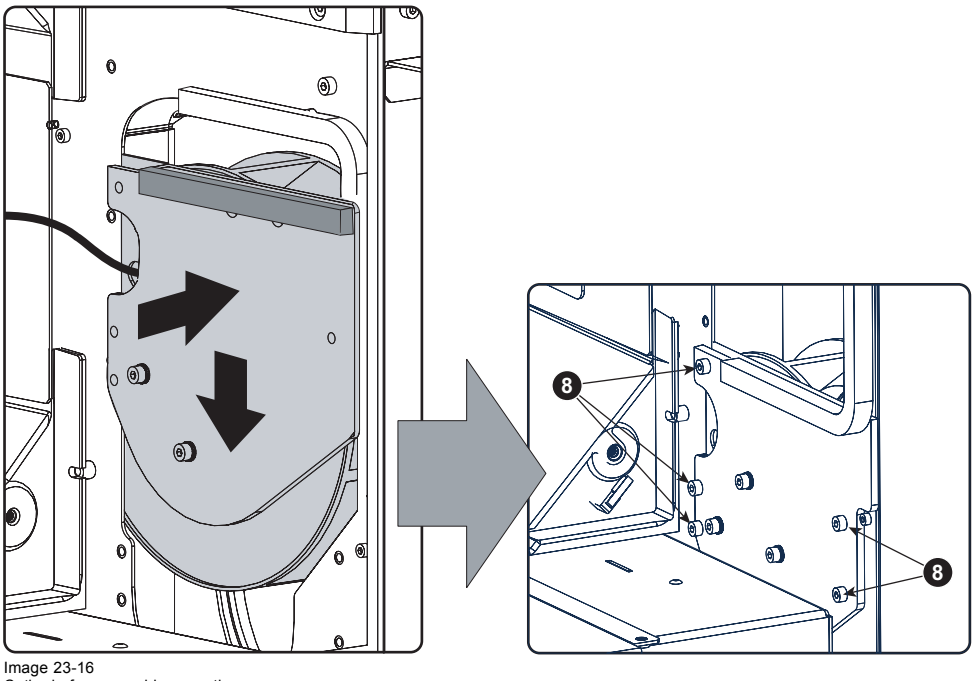


Image 23-16
Cathode fan assembly, mounting

8. Install the small side plate of the air channel with three screws (reference 9).

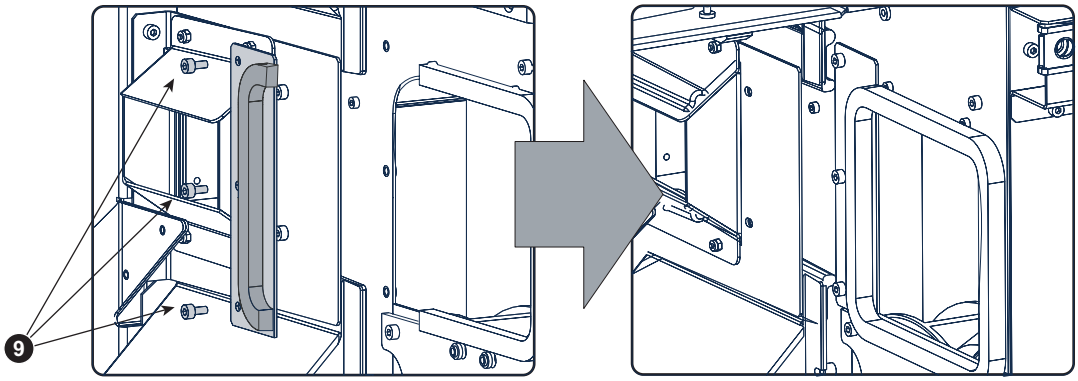


Image 23-17
Small side plate, mounting

9. Reconnect the wire unit of the cathode fan and hide the connector behind the plate.

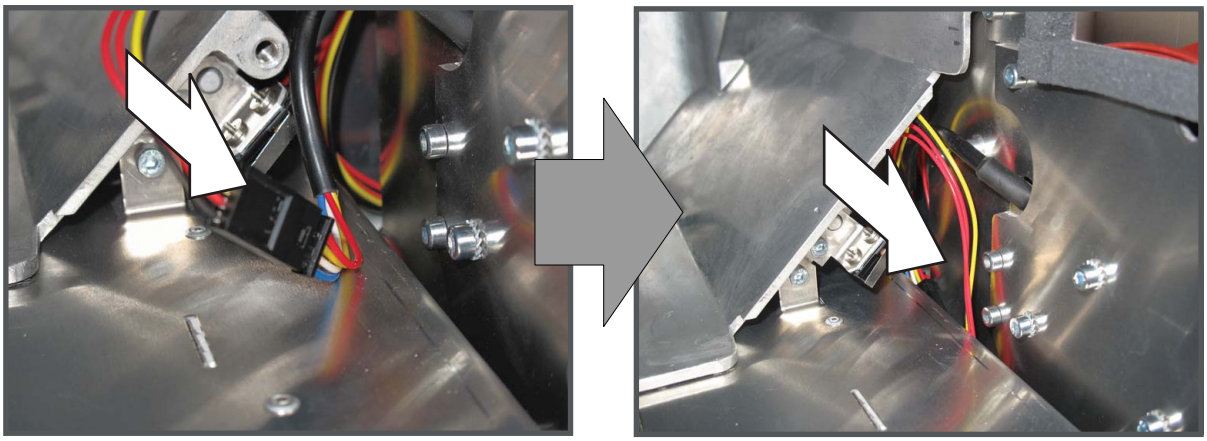


Image 23-18
Cathode fan, power connection

10. Reinstall the left side panel of the lamp compartment with six screws (reference 10).

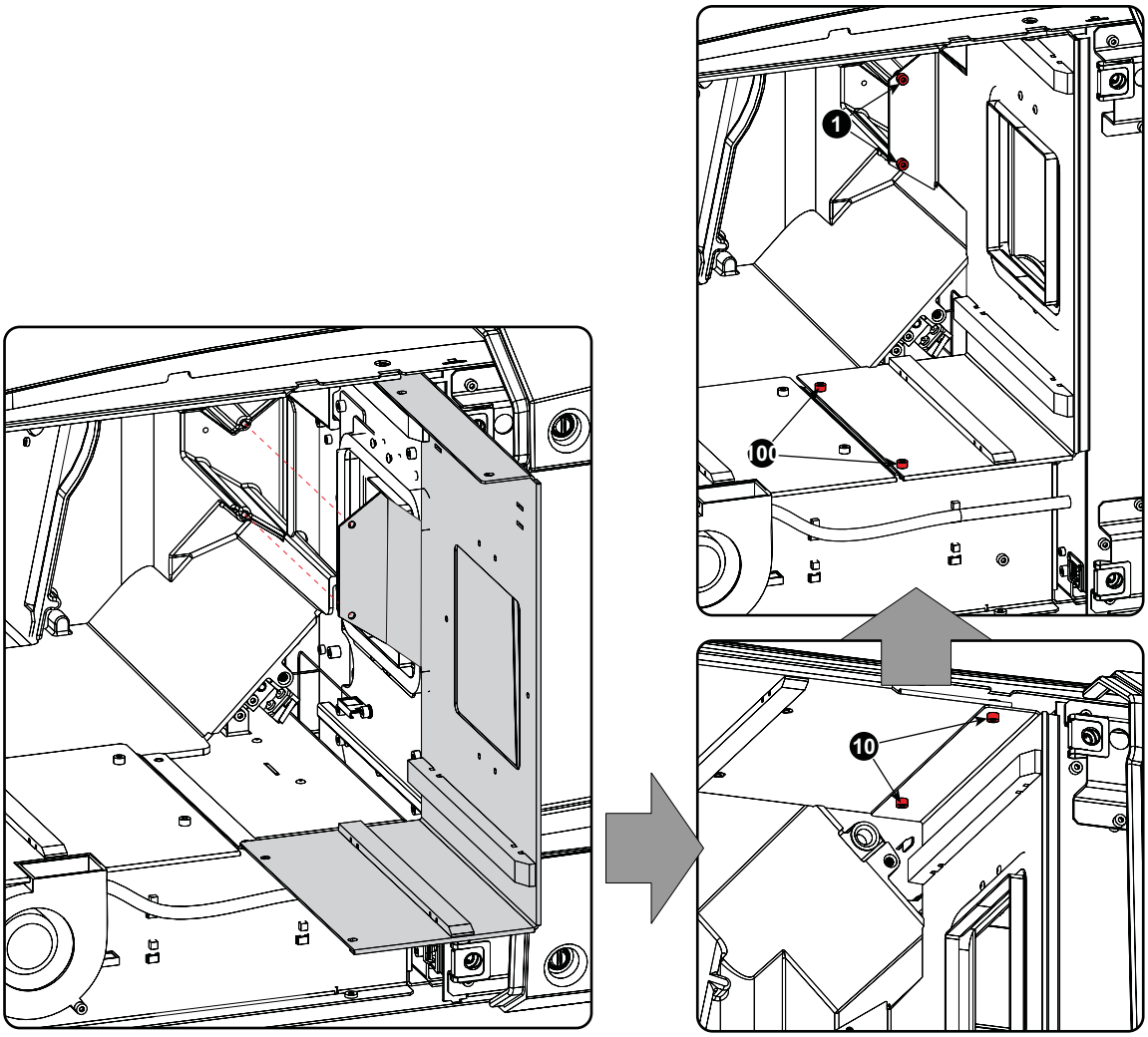


Image 23-19
Side panel lamp house, installation

23.5 Lamp anode fan

To access the anode fan, the light processor has to be removed. This procedure assumes that the light processor is already removed.

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.
- 5 mm Allen wrench.
- Pair of pliers.
- Universal pliers.
- 7 mm open-end wrench.

How to replace

1. Disconnect the anode fan (reference B), the fan (reference A) of the heat exchanger and the wire unit of the pump (reference C) as illustrated. Use a set of pliers to cut the cable tie (reference D) which fasten the wire unit of the pump with the tubing.

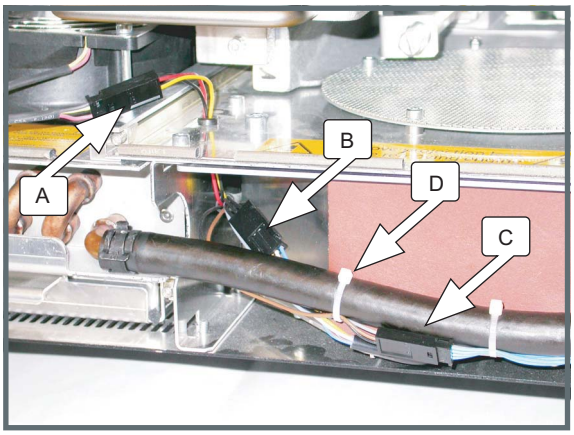


Image 23-20
Electrical disconnection

2. Pull out the tube out of the tube fixation.
3. Release the two fixation screws of the heat exchanger assembly and pull out the assembly.

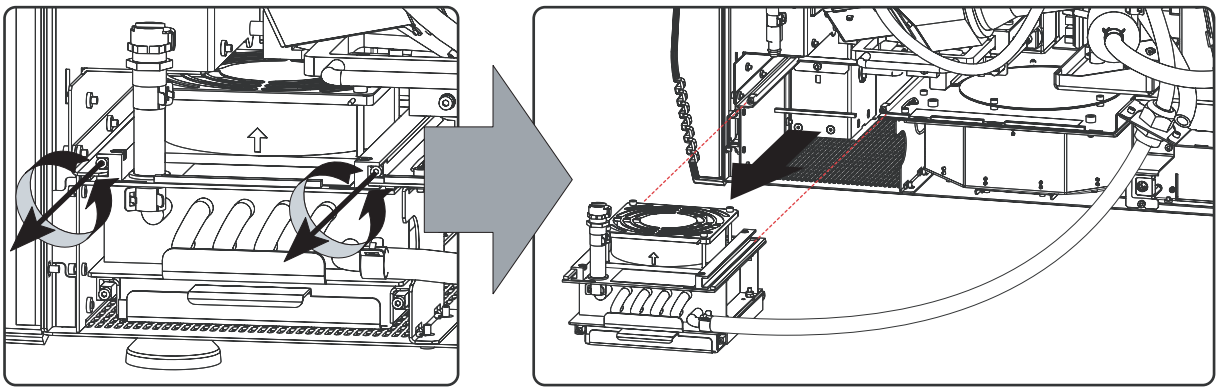


Image 23-21
Remove heat exchanger assembly

4. Remove the anode fan security guard and fan bezel by releasing the four hexagon socket head cap screws (reference 1). Use a 3 mm Allen wrench.

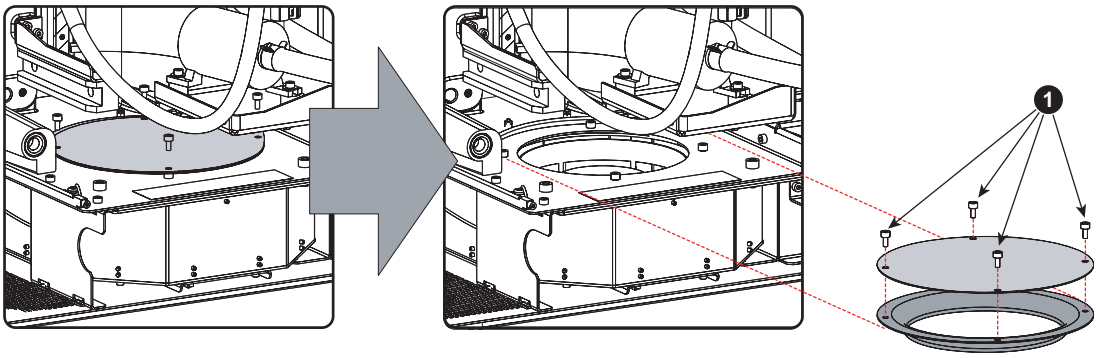


Image 23-22
Remove fan security guard

5. Release the three indicated hexagon socket head cap screws (reference 2) and slide out the anode fan assembly. Use a 5 mm Allen wrench.

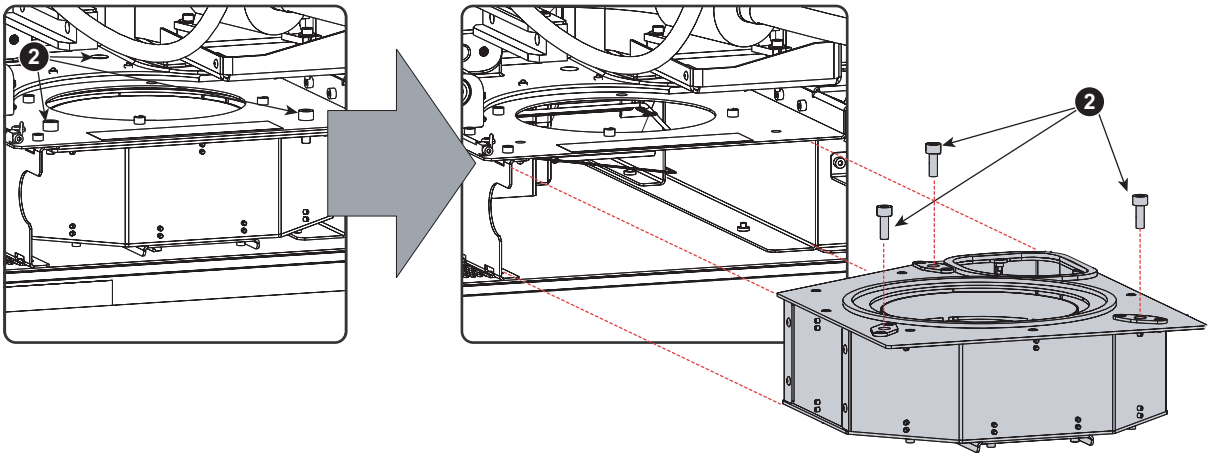


Image 23-23
Remove fan assembly

6. Remove the fan from the fan house by releasing first the 11 small screws at the edge (reference 3) and then the 4 big screws in the middle (reference 4) as illustrated. Use a 2,5 mm and a 3 mm Allen wrench.

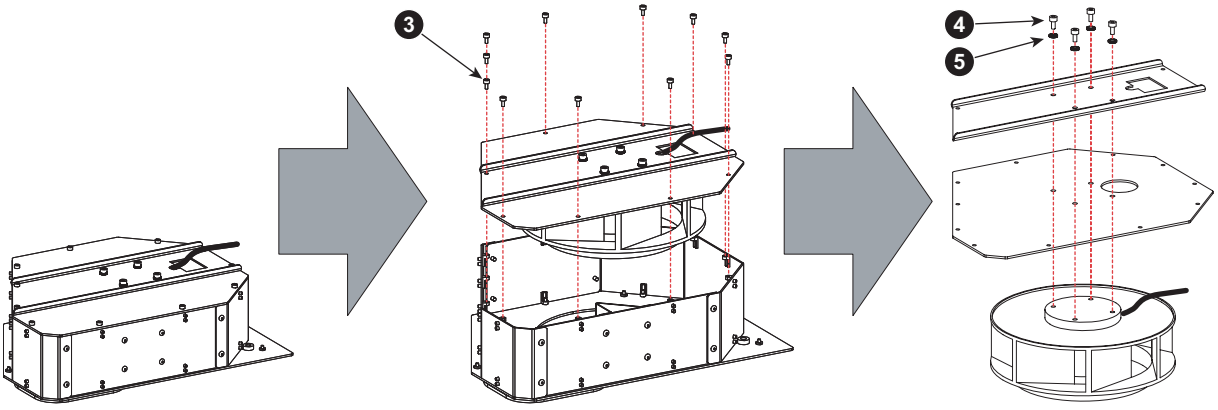


Image 23-24
Remove fan

7. Install a new anode fan inside the fan house as follows:
   a) Guide the wire unit of the anode fan through the holes in mounting plates.
   b) Fasten the two mounting plates upon the fan with four hexagon socket head cap screws (reference 6) as illustrated. Provide each screw with a washer (reference 7).
   c) Close the anode fan house with 11 screws (reference 8).

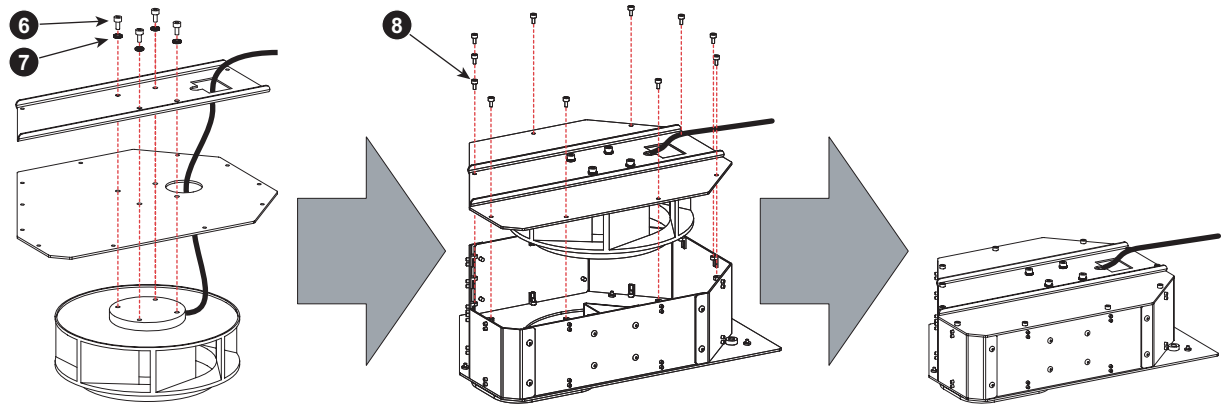


Image 23-25
Mount fan

8. Slide the anode fan assembly back in its compartment and secure with 3 big hexagon screws (reference 9). Use a 5 mm Allen wrench.

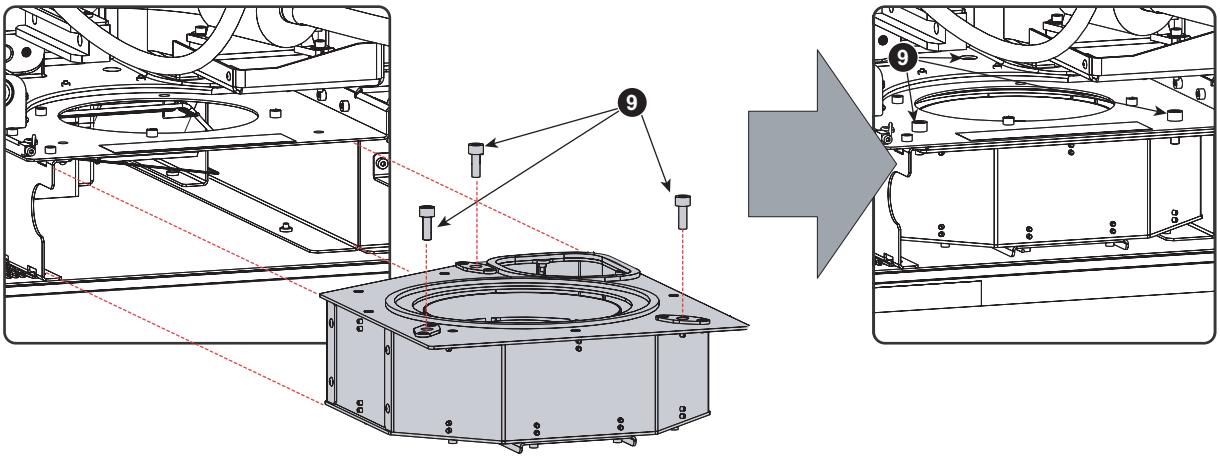


Image 23-26
Insert fan assembly

9. Reinstall the anode fan bezel and security guard. Use a 3 mm Allen wrench to secure the four hexagon socket head cap screws (reference 10).

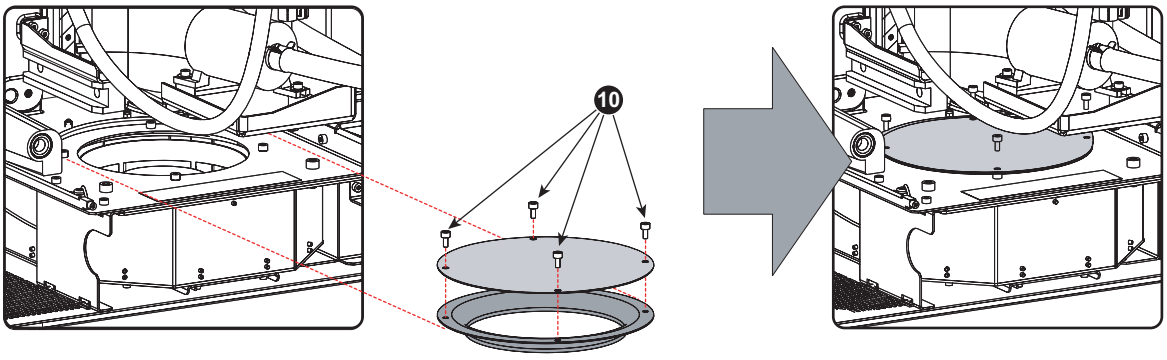


Image 23-27
Mount fan security guard

10. Slide the heat exchanger assembly in its place and fasten the two fixation screws. Use a 2,5 mm Allen wrench.

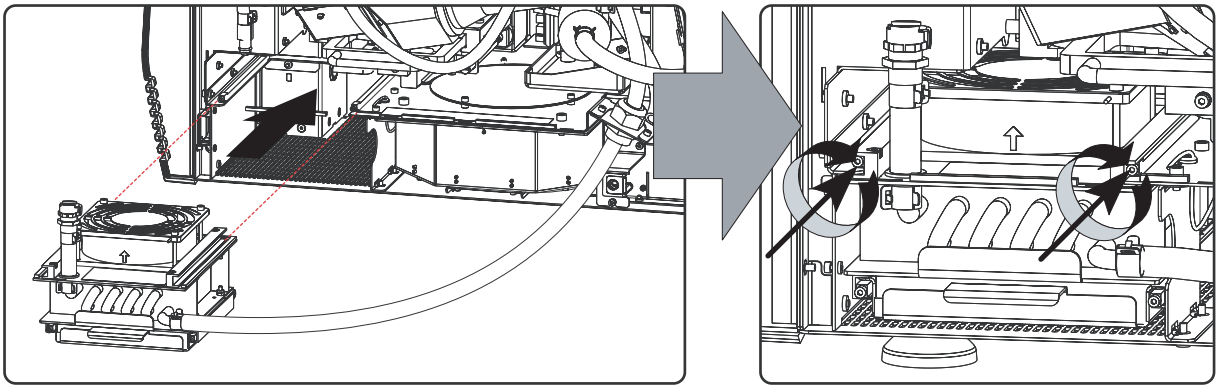


Image 23-28
Insert heat exchanger assembly

11. Insert the cooling fixation into the plate.

12. Reconnect the wire unit of the anode fan (reference B), the wire unit of the heat exchanger fan (reference A) and the wire unit of the pump (reference C). Use a cable tie (reference D) to secure the wire unit of the pump with the tubing.

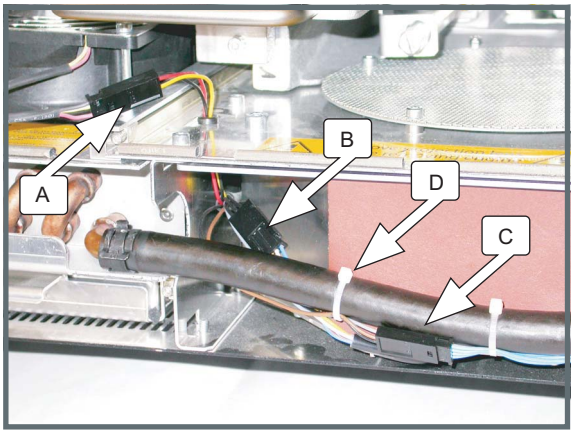


Image 23-29
Electrical connection

23.6 Heat exchanger fan

Preparations

1. Remove the side cover, see "Removal of the side cover", page 95.
2. Open the sealed compartment, see "Open the sealed compartment", page 99.

How to replace

1. Disconnect the fan (reference F) of the heat exchanger and the wire unit of the pump (reference P) as illustrated. Use a set of pliers to cut the cable tie which fasten the wire unit of the pump with the tubing.

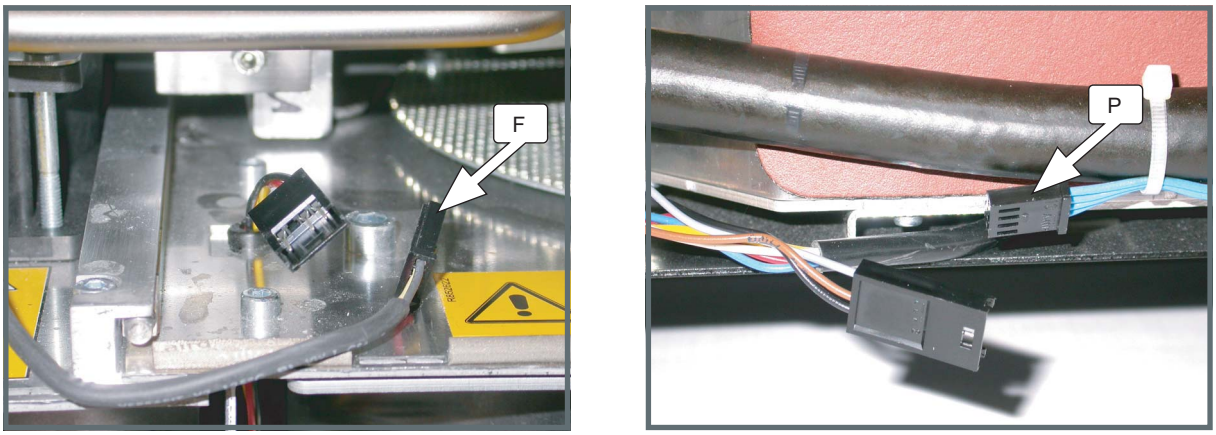


Image 23-30
Disconnection of hear exchanger fan

2. Pull out the tube out of the tube fixation.

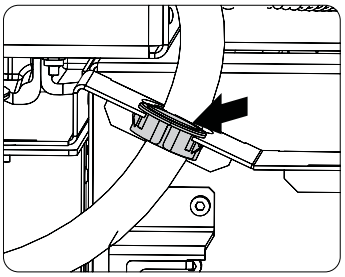


Image 23-31

3. Release the two fixation screws of the heat exchanger assembly and pull out the assembly.

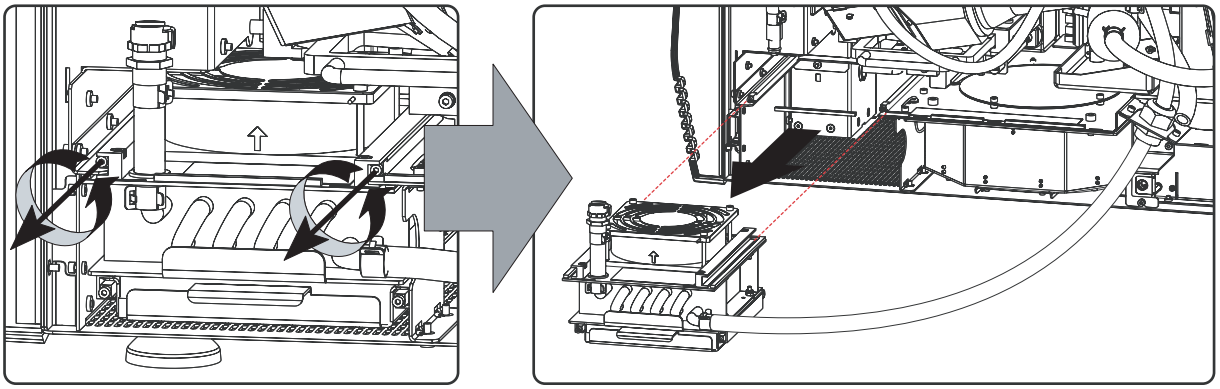


Image 23-32
Remove heat exchanger assembly

4. Remove the 4 fixation screws (1 to 4)
   Take the fan protection grid and remove the fan.

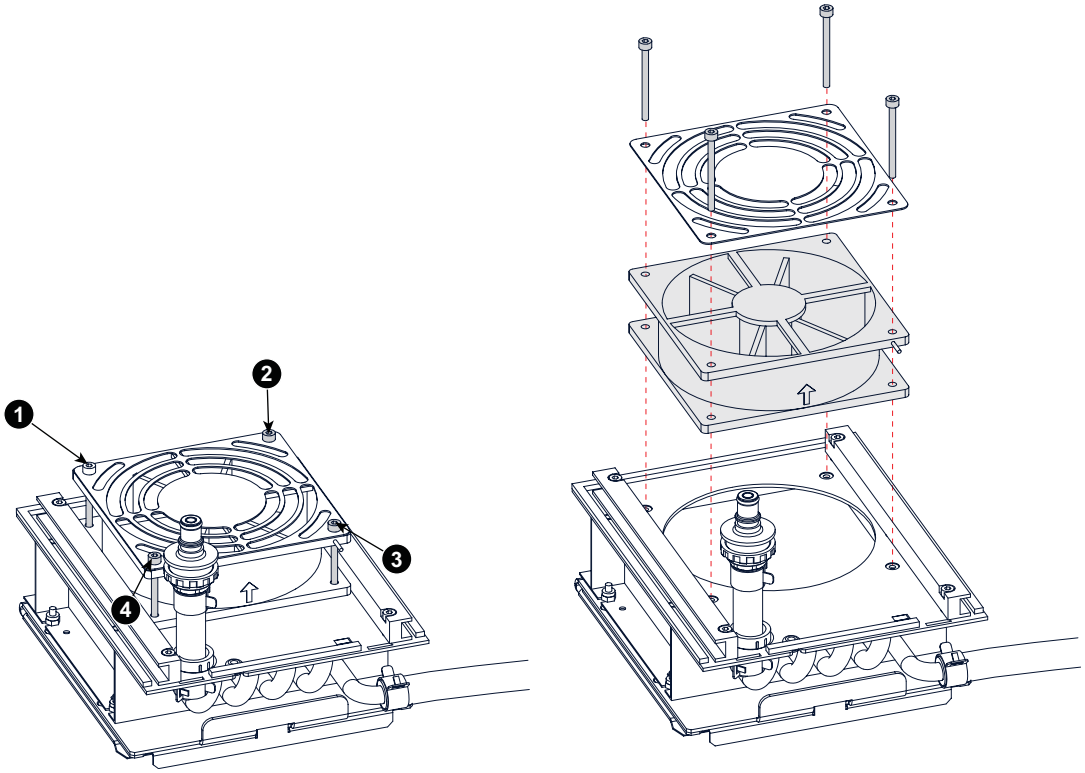


Image 23-33
Fan removal

5. Place a new fan with the arrow indication pointing upwards on the heat exchanger assembly.
   Place the fan protection grid on the fan.
   Secure with the 4 fixation screws.

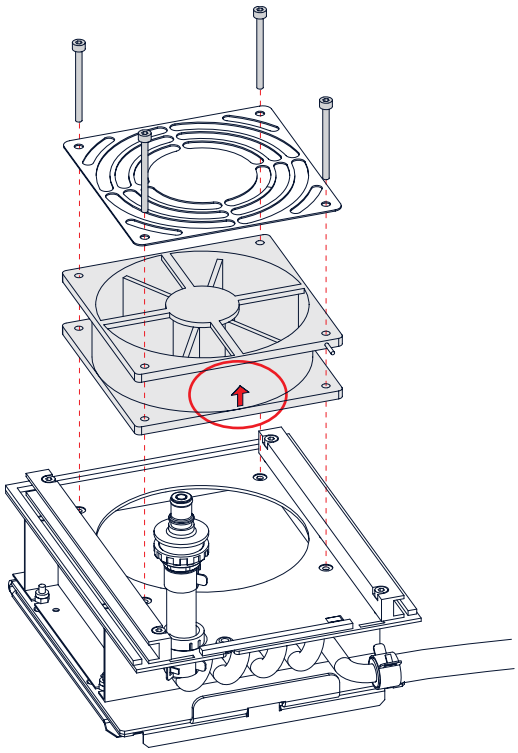


Image 23-34
Fan, mounting

6. Slide the heat exchanger assembly in its place and fasten the two fixation screws.

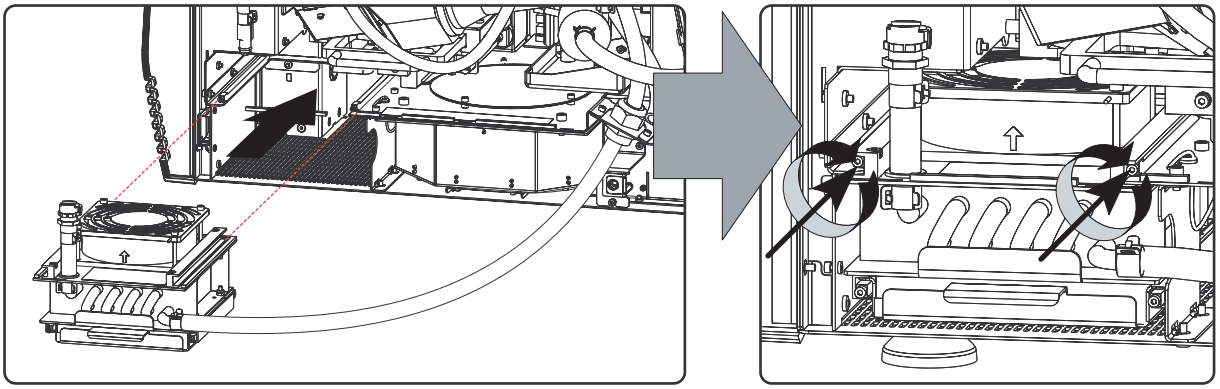


Image 23-35
Insert assembly

7. Insert the cooling fixation into the plate.
8. Reconnect the wire unit of the fan (reference F) and the wire unit of the pump (reference P). Use a cable tie (reference T) to secure the wire unit of the pump with the tubing.

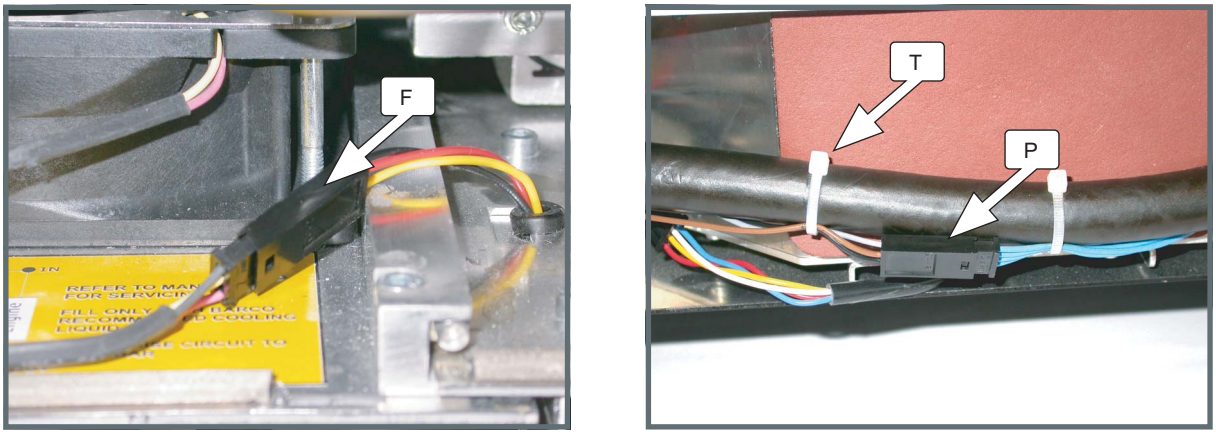


Image 23-36
Fan connection

9. Close the sealed compartment, see "Close the sealed compartment", page 100.
   Reinstall the housing.

23.7 Cold mirror fan

Preparations

1. Remove the covers to get access to the cold mirror fan.
2. Remove the cover plat of the sealed compartment.

How to replace

1. Remove the cover of the Start Pulse Generator as illustrated. This cover is secured with 5 hexagon socket head cap screws. Use a 3 mm Allen wrench.

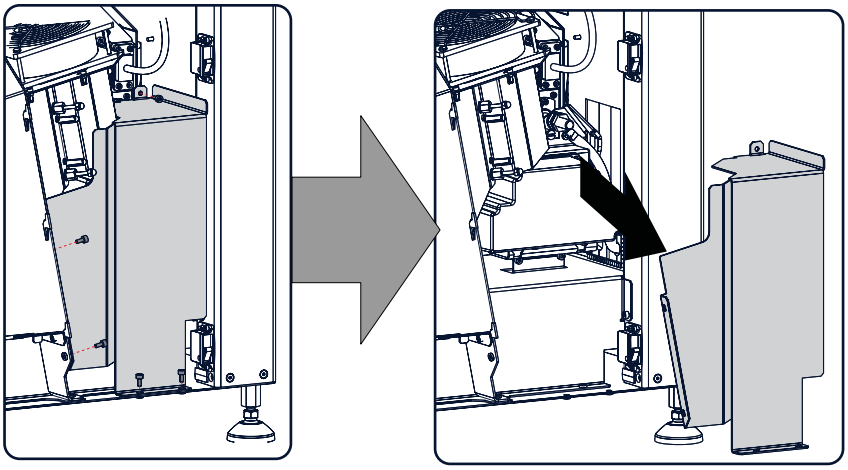


Image 23-37
Remove SPG cover

2. Disconnect the fan wire (reference 1).
   Tip: *Pull out the top filter for easy access to the fan wire connection.*

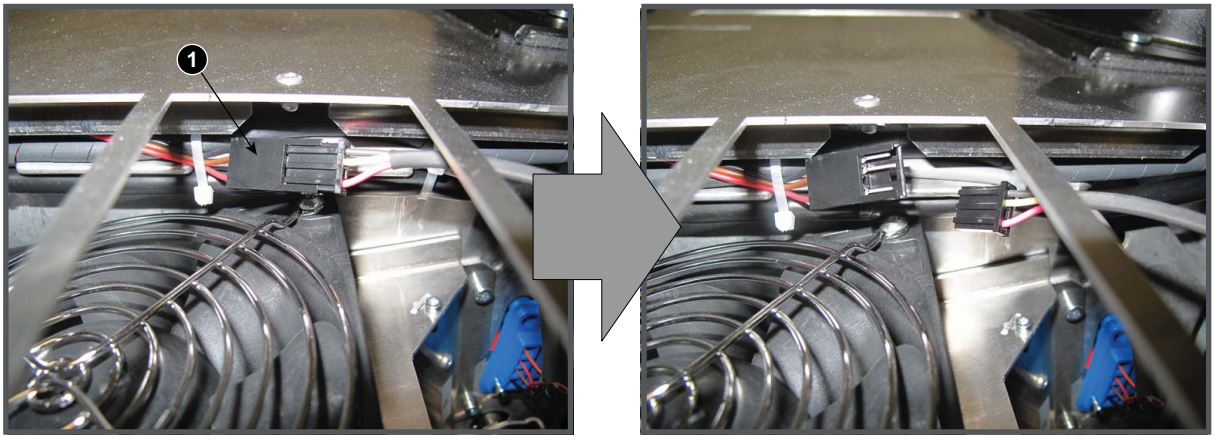


Image 23-38
Electrical disconnection

3. Turn out the 2 hexagon socket head cap screws at the right side (reference 2).

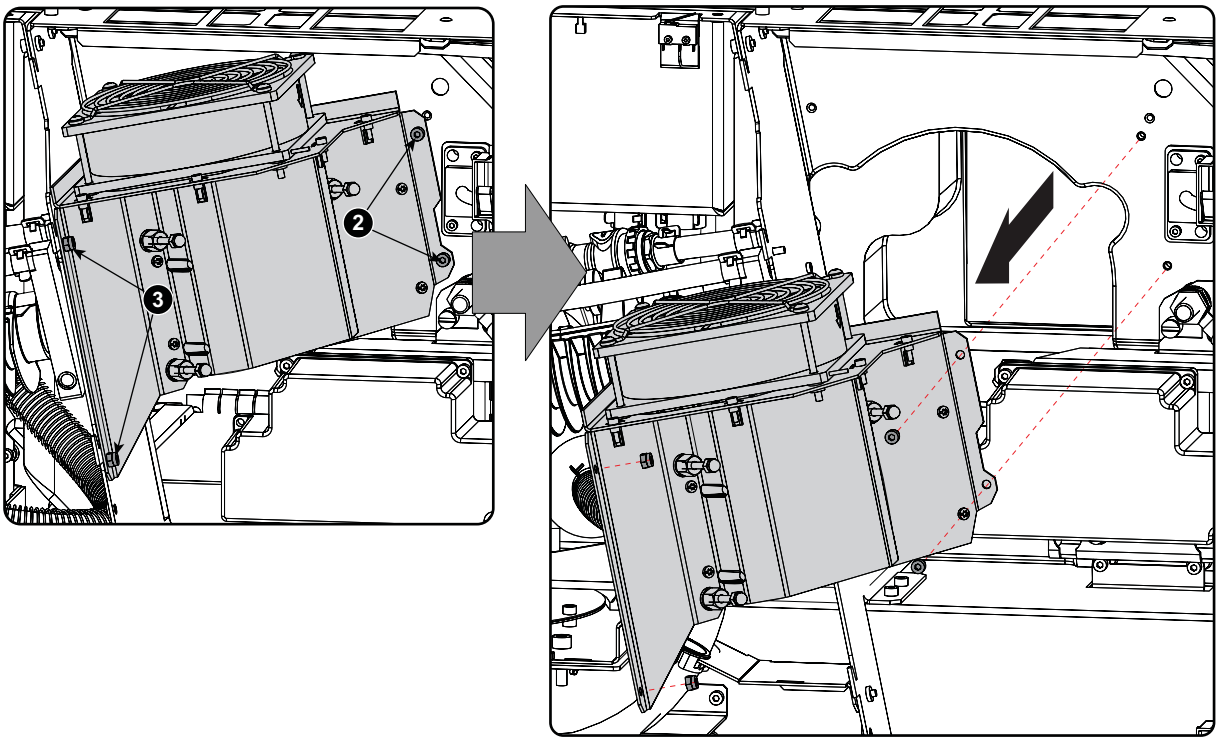


Image 23-39
Remove cold mirror

4. Remove both nuts at the left side (reference 3).
   Support the assembly while removing the nuts.
5. Slide out the cold mirror assembly.
6. Turn out the 4 fixation screws (reference 1).
   Take off the fan protection grid (reference 2) and remove the fan (reference 3.

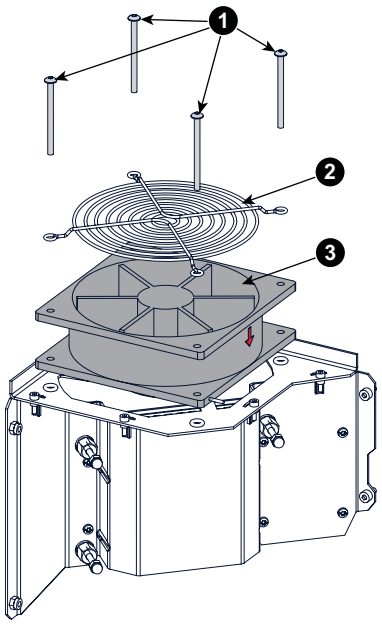


Image 23-40

7. Place new fan on the assembly with the arrow pointing to downwards.
8. Place the protection grid on the fan and drive in the 4 fixation screws.
9. Re-install the cold mirror assembly.

23.8 Lamp Info Module fan

To access the Lamp Info Module fan the lamp cover has to be removed. This procedure assumes that the lamp cover is already removed.

Necessary tools

3 mm Allen wrench.

How to replace the fan of the Lamp Info module?

1. Disconnect the wire unit (reference C) of the fan (reference FL).

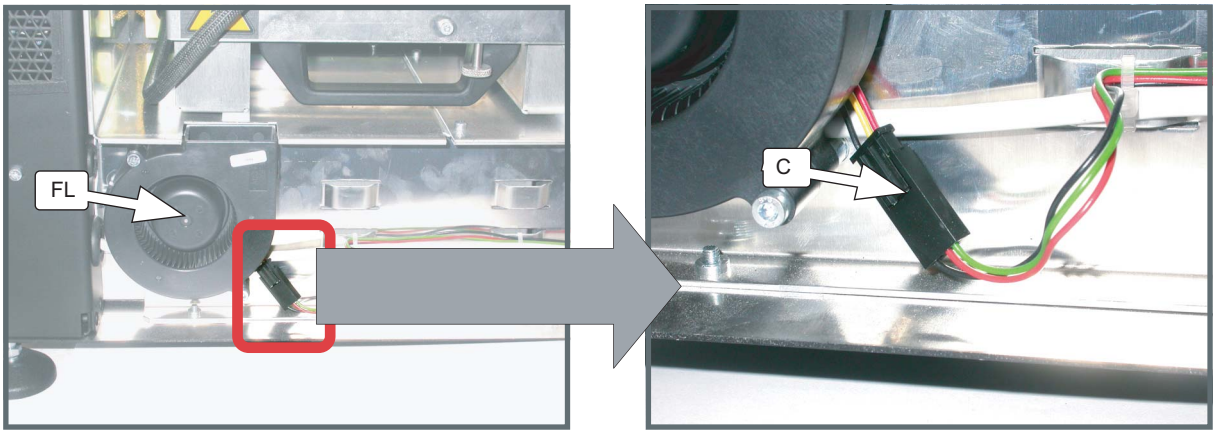


Image 23-41

2. Remove the fan from the projector by releasing the two hexagon socket head cap screws (reference 1). Use a 3 mm Allen wrench.

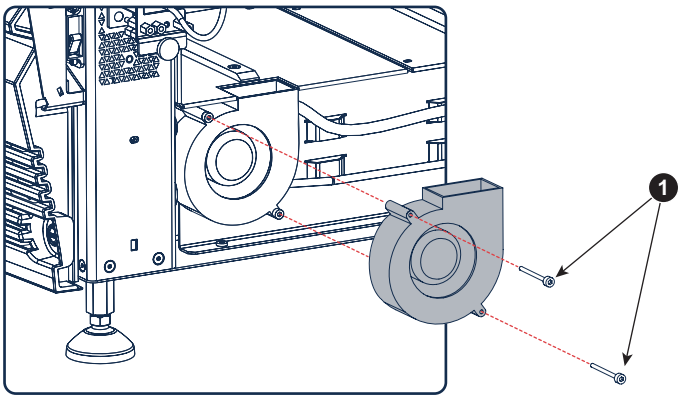


Image 23-42

3. Install a new fan as illustrated in image 23-42. Use a 3 mm Allen wrench to fasten the two hexagon socket head cap screws.
4. Reconnect the wire unit of the fan.

23.9 Integrated cinema processor fan

Preparations

First remove the following parts to get access to the fan.

1. Input cover and top cover, see Removal and Installation of the projector covers.
2. Remove the fan controller board, see "Removing a board in the card cage", page 277.
3. Remove the button unit, see "Removing the button unit", page 283.

How to replace

1. Disconnect the fan power cable from the backplane.

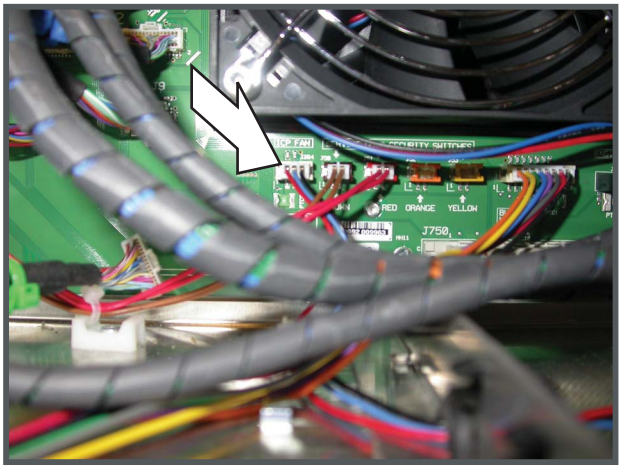


Image 23-43
Fan connection

2. To work handy it is recommended to slide out the intermediary plate a little bit. To it as follow:
   a) cut the necessary wire ties.
   b) turning out both fixation screws.
   c) sliding the plate backwards.

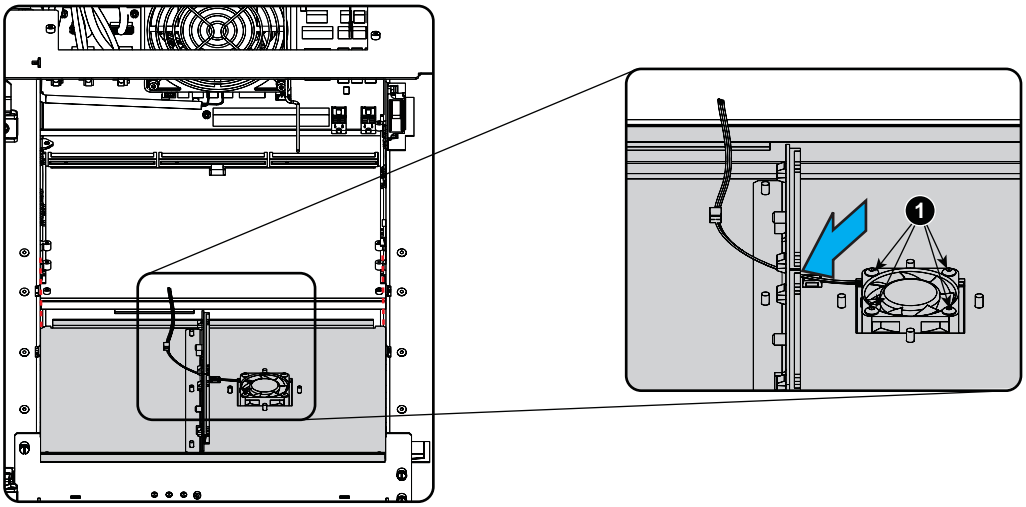


Image 23-44
Fan removal

3. Slide the cable through the hole in the intermediary plate.
4. Turn out the 4 fixation screws (reference 1).
5. Take off the fan.
6. Mount a new fan with the arrow indication pointing to the plate and drive in the 4 fixation screws.
7. Push the power cable through the hole in the plate.
8. Slide the intermediary plate back on its place and drive in both fixation screws.
9. Connect the power cable to the backplane. Secure the wires units with a few wire ties.

24. MAINTENANCE PROCEDURES

About this chapter

This chapter describes how to clean the exterior of the projector and how to clean or replace the dust filters.

Overview

- Cleaning the exterior of the projector
- Removing the front dust filter
- Clean the dust filter on the bottom side
- Clean the dust filter on the top side

24.1 Cleaning the exterior of the projector

How to clean the exterior of the projector ?

1. Switch off the projector and unplug the projector from the mains power net.
2. Clean the housing of the projector with a damp cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution.

24.2 Removing the front dust filter

The front filter of the projector can be removed from the lamp side.

The filter can be cleaned.

Remove the dust filter

1. Remove the input cover of the projector, "Removal of the input cover", page 93.
2. Release the captive screw of the front cover.
   Pull the left side of the front cover 5 centimeters forwards. There is no need to remove the cover completely.

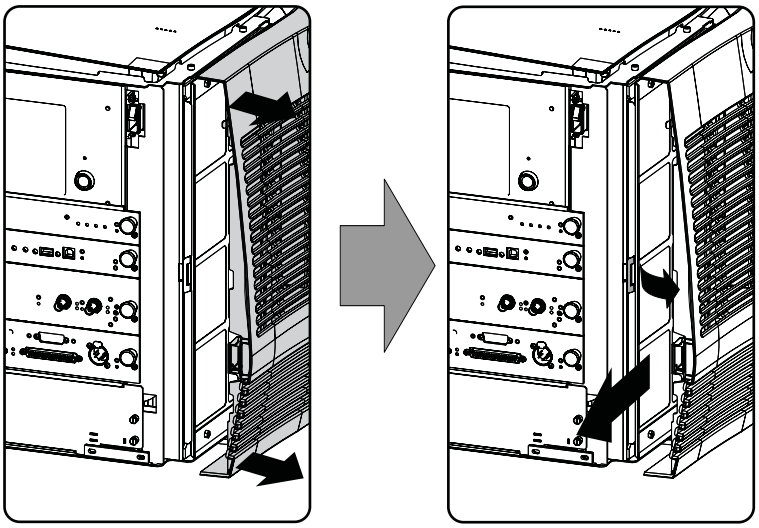


Image 24-1
Dust filter access

3. Pull the small handle a little backwards and then to the front of the projector until the filter frame is released.
4. Slide the filter to the left.

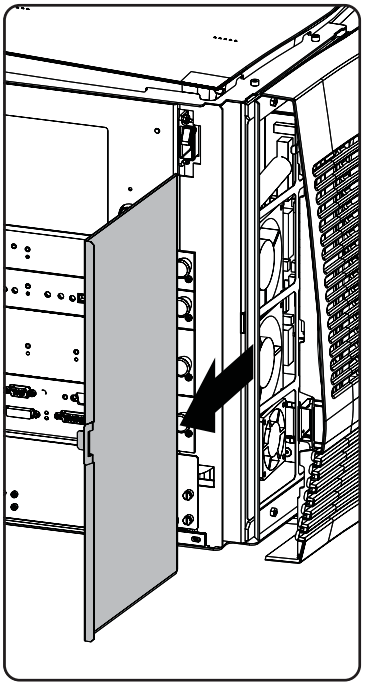


Image 24-2
Dust filter removal

Clean the dust filter

1. Remove most contamination with a vacuum cleaner in an other room or outside.
2. Blow remaining dust away with compressed air in an other room or outside.

Mount the dust filter

1. Insert the dust filter with the handle to the projector side.
2. Pull the handle a little backward, push the filter completely in. Release the handle so that it jumps in its lock.

24.3 Clean the dust filter on the bottom side

Remove the dust filter

1. Remove the side cover, see "Removal of the side cover", page 95.
2. Release the dust filter by pushing the handle a little bit downwards.

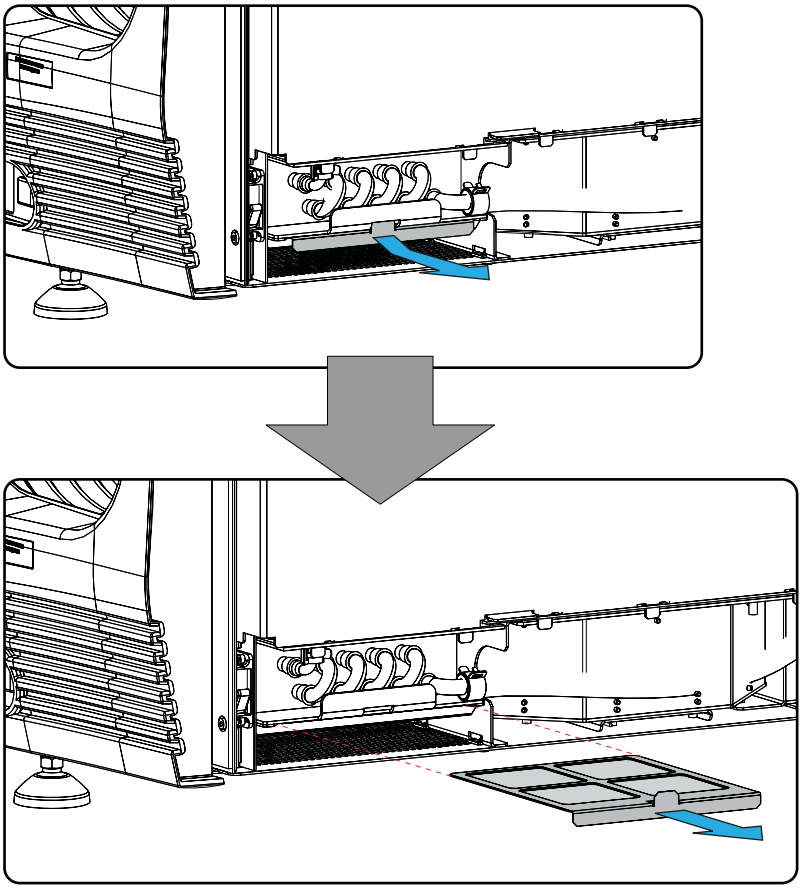


Image 24-3
Bottom dust filter

3. Pull out the dust filter.

Clean the dust filter

1. Remove most contamination with a vacuum cleaner.
2. Blow remaining dust away with compressed air in an other room or outside.

Mount the dust filter

1. Insert the dust filter with the locking lip facing up.
2. Push the handle a little downwards and insert the filter completely. Release the handle so that it jumps in to its lock.

24.4 Clean the dust filter on the top side

Remove the dust filter

1. Remove the side cover, see "Removal of the side cover", page 95.
2. Pull out the dust filter.

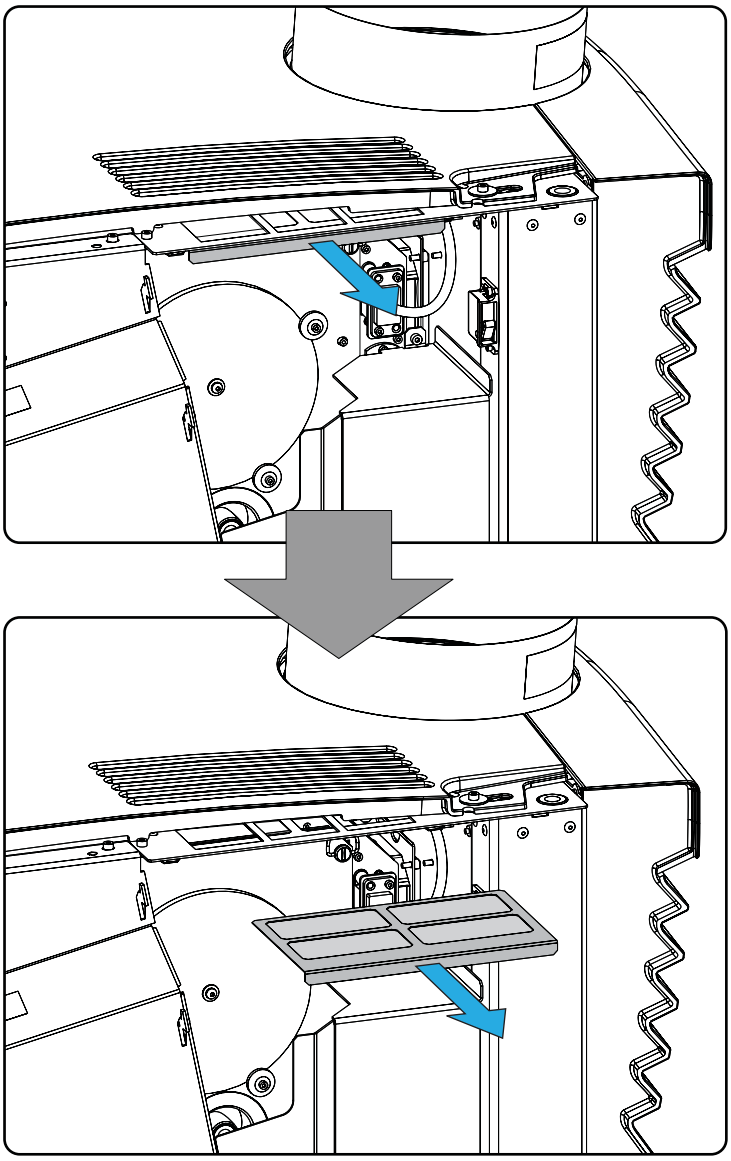


Image 24-4
Top dust filter

Clean the dust filter

1. Remove most contamination with a vacuum cleaner in an other room or outside.
2. Blow remaining dust away with compressed air in an other room or outside.

Mount the dust filter

1. Insert the dust filter and push on it until it is fully inserted.

25. PROJECTOR CLEANING PROCEDURE

Overview

- Purpose
- Necessary tools, products and tips
- Optical path
- Non optical components

25.1 Purpose

Purpose of projector cleaning

Projectors are not used in 100% ideal circumstances and due to that they might get contaminated by particles in the environment air. Due to this contamination the light output can be reduced or overheating may occur which may also lead to a projector shutdown during operation.

To keep the projector in a good shape, it is advised to clean the projector as suggested in the preventative maintenance section. Dust filter cleaning, cover cleaning and projection lens cleaning can be done by the operator of the projector. **The inside cleaning of the light path must be done by a trained and certified service engineer.**

25.2 Necessary tools, products and tips

Tools

Only the tools necessary to clean the projector are indicated here. Tools needed to disassemble or to get access are listed in the replacement procedures which are included in the projector's service manual.

- Any micro fiber lens cleaning cloth (e.g. Toraysee® cloth(s) (R379058))
- Vacuum cleaner
- Brush
- Clean cloth(s) (never use cloths that leave particles on the surfaces)

Products

- Compressed air (spray)
- Lens cleaner (e.g. Carl Zeiss cleaner or Purasol® Optical or any water based lens cleaner)

Tips

Ensure there is sufficient light in the cleaning environment. If necessary, add extra lights.

To protect the optical coatings, limit the number of wipe movements. It is better to wipe off the dust with one good wipe movement then with 10 soft wipe movements.

It is advised to use a lens cleaner in combination with a micro fiber lens cleaning cloth. These lens cleaners break the molecular bonds that dust, dirt and grime that adhere to the surface so that cleaning is much easier. These lens cleaners can also remove fingerprints without streaks.

Always use a clean cloth! If smears occur when cleaning optics, replace the cloth. Smears are the first indication of a dirty cloth.

Clean the light processor and light pipe in a dust free environment (best will be a clean room).

Make sure your booth environment corresponds with the environment specifications given in the projector's user and installation manual.

25.3 Optical path

Steps

1. Optimize the Z-axis of the lamp for highest light output.
2. Measure the light output of your projector before starting the cleaning procedure.
3. Clean the complete optical path.
4. Measure the light output again when the cleaning procedure is finished.

Write down all your results, remarks and time of measurement.

Measure always in the same environment conditions. Put your measuring device on a fixed position and always measure from this position.

Do these measurements every time you perform an optical cleaning. Overtime you will have an overview and you will be able to compare with previous measurements.

Consult the projector's service manual to see how to remove any optical part.

Before starting with the cleaning of the optical parts, first clean the outside covers of the projector.

We advise to measure the light output in every step, such as Z-axis alignment, cleaning the complete lamp house, the cold mirror, the notch filter, rod inlet and prism outlet, projection lens and port hole window. At least, make sure to measure the light output before you start and at the end of the complete cleaning procedure.

General cleaning procedure for optical parts

1. Blow off dust with **clean** compressed air (or pressurized air cans[10]).
2. Clean with lens cleaner liquid together with a clean micro fiber lens cleaning cloth to remove the dust and contamination. Use big wipes.
3. Use a dry micro fiber lens cleaning cloth to remove left liquid or stripes. Polish using small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

If there is a difference in cleaning a specific part, it is mentioned in the description of that specific part.

10. Pressurized air cans is not efficient if there is too much dust on the surface, the pressure is too low

25.3.1 Cleaning order

Overview

1. Outside lamp house
2. Reflector cleaning
3. UV blocker
4. Lamp house compartment
5. Cold mirror
6. Rod inlet
7. Notch filter
8. Light pipe cleaning
9. 3D color wheel (optional)
10. Prism outlet
11. Light processor compartment
12. Lens cleaning
13. Port hole

25.3.2 Cleaning procedure

Outside lamp house

1. Take the lamp house out of the projector. See "Removal of the lamp house", page 110.
2. Remove contamination with a vacuum cleaner and a brush.

Image 25-1

Reflector cleaning

1. Remove the lamp from the lamp house. See "Removal of the xenon lamp", page 112.
2. Follow the general cleaning procedure for optical parts, see page 412.
   To obtain the best result, it is best to use immediately a lens cleaner.

Image 25-2

Note: Polishing the reflector is very important. It improves the light output significantly.

Or,
see "Cleaning the Reflector of the Lamp House", page 135.

CAUTION: When reflector is cracked or damaged, replace with a new one.

UV blocker

1. Blow the excessive dust off with compressed air. Do this on both side.
2. Follow the general cleaning procedure for optical parts to clean both sides, see page 412.

Image 25-3

Or,
see "Cleaning the UV blocker of the Lamp House", page 136

3. Reassemble the lamp house. See "Installation of the Xenon lamp", page 116.

CAUTION: When the UV blocker is cracked or damaged, replace with a new one.

Lamp house compartment

1. Remove all dust from the complete compartment with a vacuum cleaner and a brush.

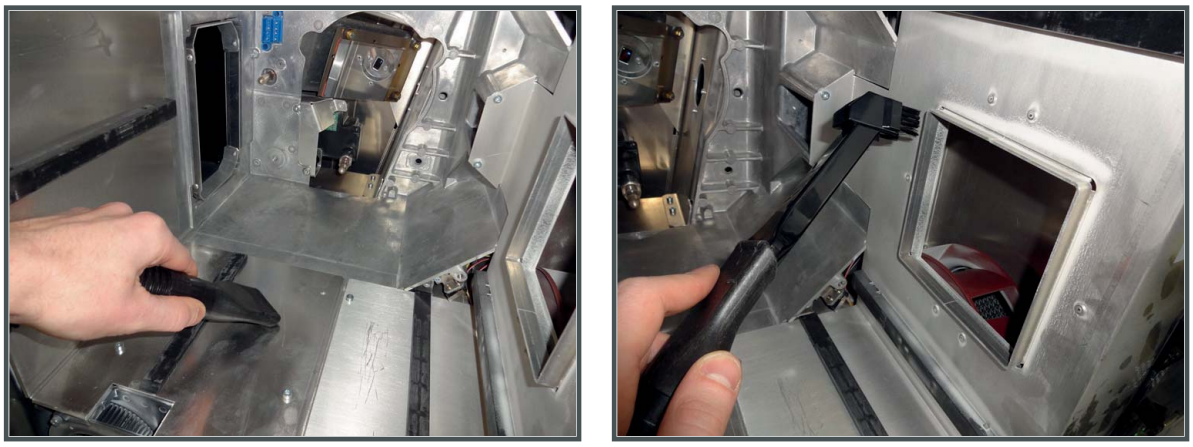


Image 25-4

Cold mirror

1. Follow the general cleaning procedure for optical parts, see page 412.
   Note: *Do not push too hard to avoid a crack.*

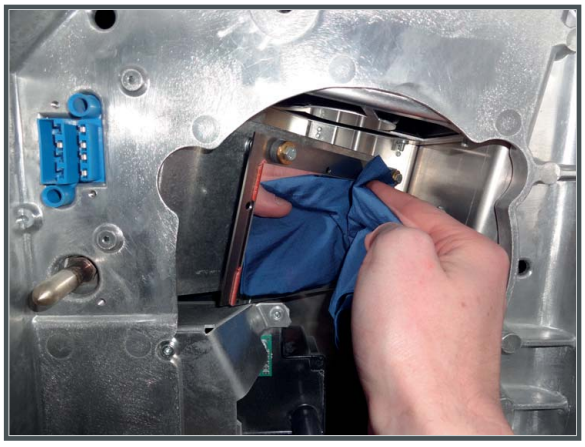


Image 25-5

Or,
see "Cleaning the Cold Mirror", page 147.

Rod inlet

1. Consult the projector's service manual to remove the Light processor assembly out of the projector. See "Light Processor assembly", page 161 to find the necessary procedures.
   If you do not want to clean other parts of the light processor assembly, then the rod inlet can be cleaned through the lamp house compartment. Be careful not to touch or damage the cold mirror.
2. Follow the general cleaning procedure for optical parts, see page 412.

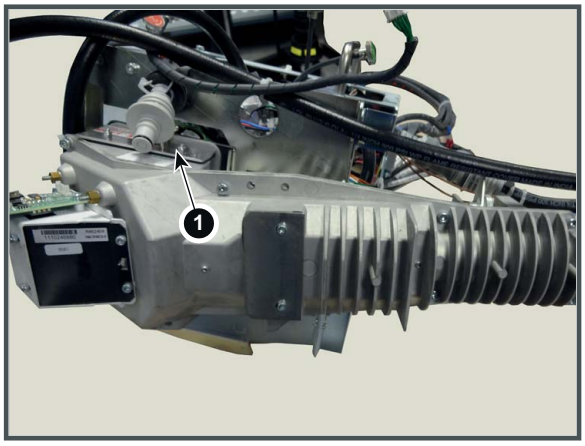
Image 25-6
Cleaning without building out the light processor

Image 25-7

CAUTION: Do not push too hard.

Notch filter

1. To access the notch filter, loosen both fixation screws and pull out the notch filter.



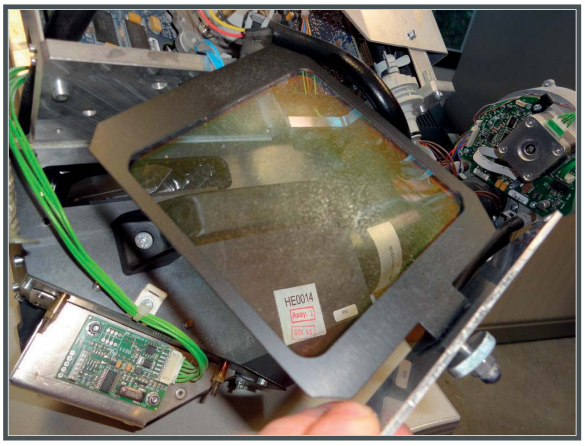


Image 25-8

2. Follow the general cleaning procedure for optical parts, see page 412.
   Note: *Do not push too hard to avoid a crack.*

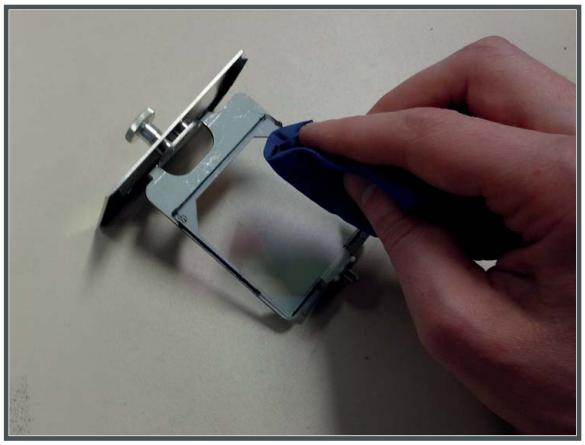


Image 25-9

3. Reinsert the notch filter.
   Note: *Realignment of the notch filter is necessary, see "Adjusting the notch filter", page 183.*

Light pipe cleaning

Light pipe cleaning is a dangerous action and should only be done when really necessary. Try first to clean all other optical parts and measure the result. If the light output is not meeting the official specifications for 2D and 3D at this point swap the lamp. If the improvement is not enough then try to improve the light output by cleaning the light pipe. Opening and cleaning the light pipe may only be done by a trained service engineer and in a clean room.

CAUTION: This action may only be done in a clean room.

How to clean the light pipe

1. Remove the Light processor assembly out of the projector. See "Light Processor assembly", page 161.
2. Disassemble the light pipe. See first part of procedure "Removal of the integrator rod", page 210.
3. Do not remove the lenses from their sockets and clean them while they're still in their place. Clean as described in the general cleaning procedure for optical parts, see page 412.

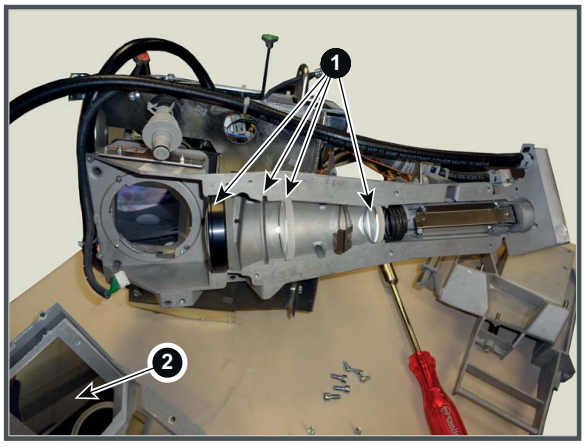


Image 25-10

4. Clean outlet of the rod with clean dry lens cleaning cloth. Do not use liquid and do not push too hard.
   Note: *Do not remove the rod. The rod is a very sensitive part and the risk to break off small parts is very high.*
5. Clean the folding mirror (2) and prism inlet (3) as described in the general cleaning procedure for optical parts, see page 412.
   Note: *Do not push too hard to avoid a crack of the folding mirror.*

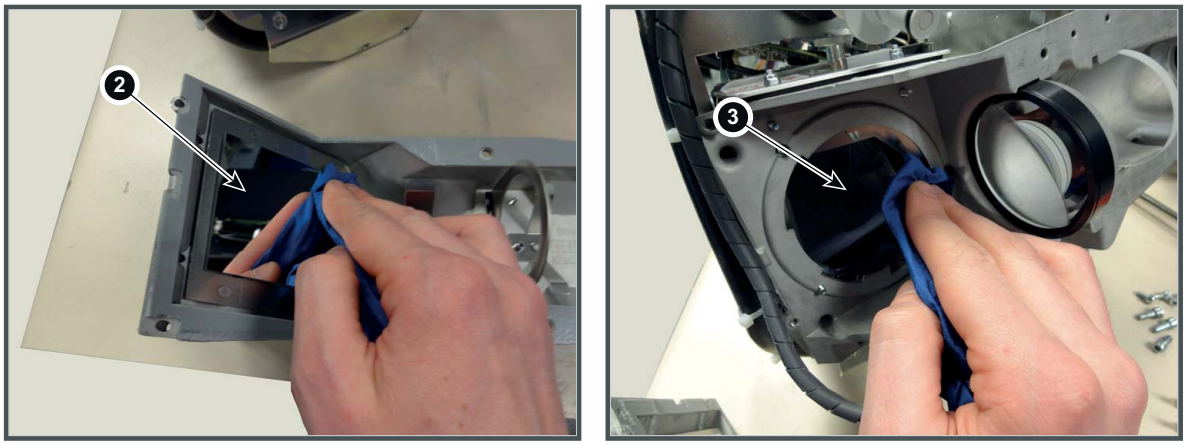


Image 25-11

6. Close the light pipe.

3D color wheel (optional)

1. Follow the general cleaning procedure for optical parts, see page 412.
2. While the projector is running, run a 3D macro so that the color wheel is down and then switch off the projector
   Or,
   Bring the 3D color wheel down by turning the axis of the stepper motor with a flat screw driver. (reference 2)
   Turn the color wheel a little so that it is possible to clean other areas (reference 1).
   Clean the 3D color wheel itself.
   Note: *Be careful not to push to hard on the color wheel as this is a very fragile and expensive thin glass.*

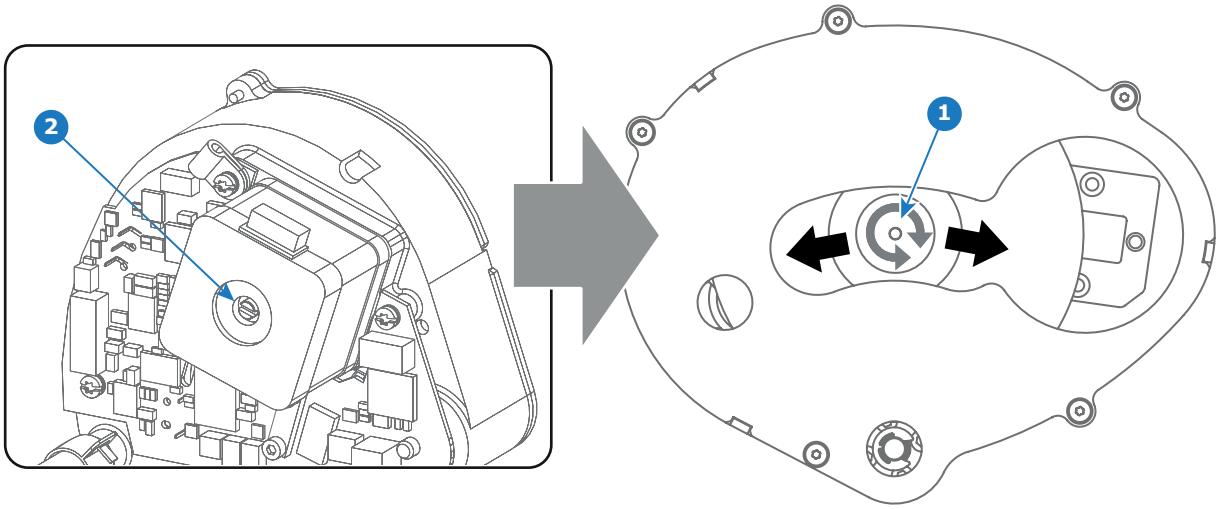


Image 25-12

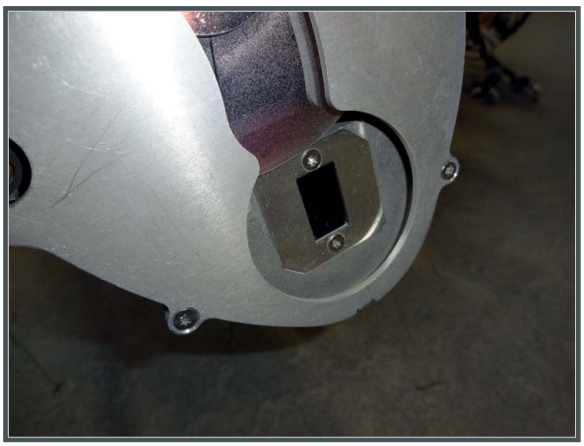


Image 25-13

3. When the color wheel was turned down manually, turn it fully back. When it was turned down by a macro, it will be automatically turned back after deactivating the 3D macro.

Prism outlet

1. Follow the general cleaning procedure for optical parts, see page 412.

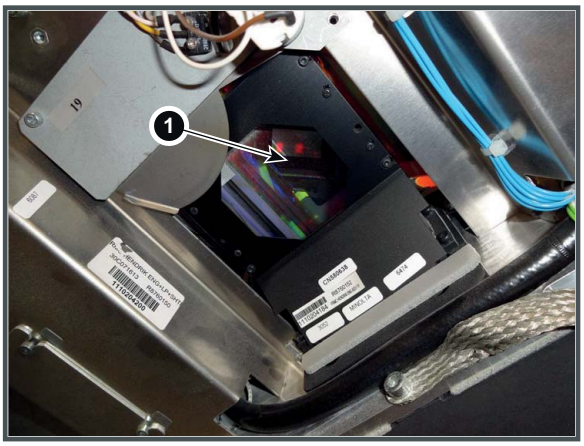


Image 25-14

Or,
see "Cleaning the Prism exit side", page 185.

Light processor compartment

1. Remove dust with a vacuum cleaner and brush.

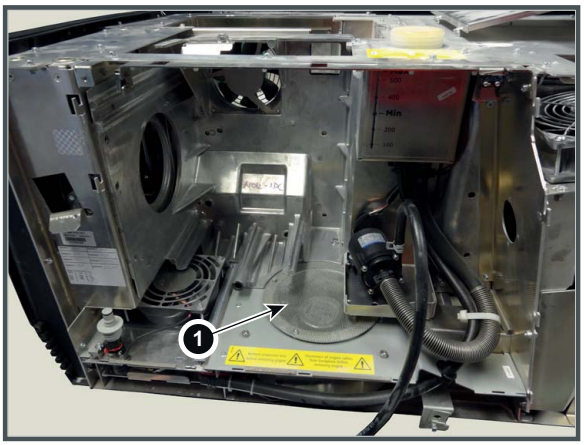


Image 25-15

2. Clean the air inlet of the anode fan (1) and clean the complete compartment.
3. Remove the light sensor module, see "Replacement of the Light Sensor Module", page 180

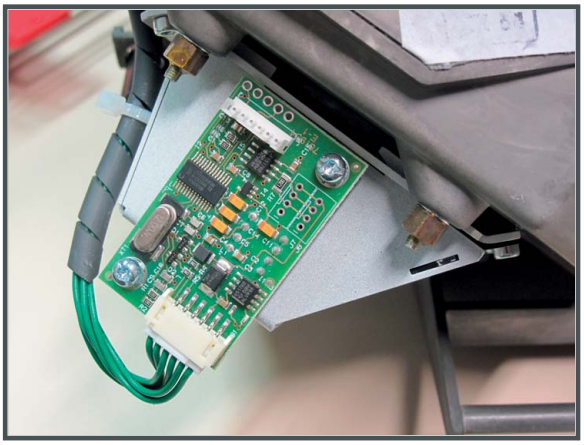


Image 25-16

4. Clean the module on both sides.

5. Reinstall the light sensor module, follow the second part of the replacement procedure.
6. Mount the light processor assembly in its compartment and insert the lamp house.

Projector lens cleaning

1. Follow the procedure as given in "Cleaning the lens", page 248.

Port hole window

1. Clean the window of the port hole on both sides. Use a lens cleaner to clean. Commercial window cleaners can destroy the anti-reflective coating of the window glass.

25.4 Non optical components

Overview

- Card cage
- External covers
- Dust filters

25.4.1 Card cage

Air intake side

1. Remove the front dust filter and take off the front cover.

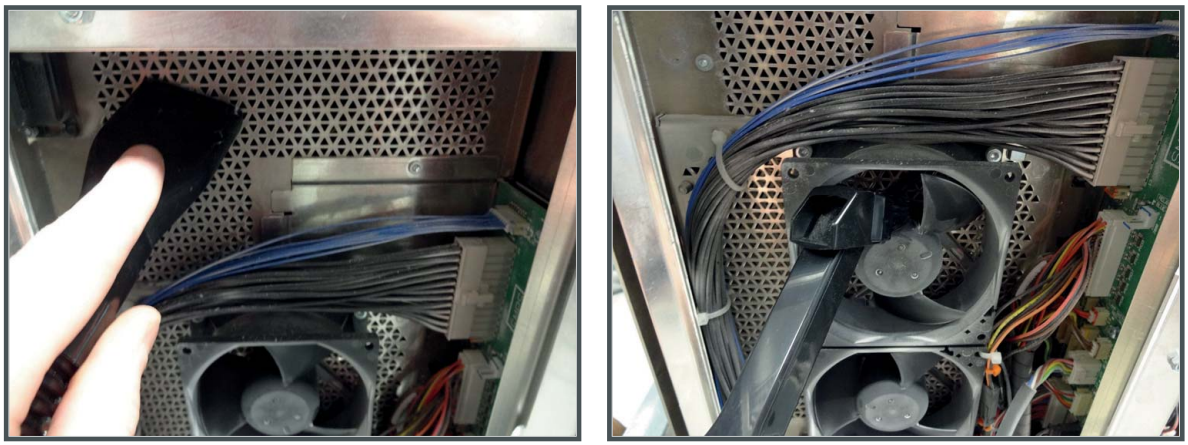


Image 25-17

2. Clean the metal mesh grid of the card cage fans and the fans itself with a vacuum cleaner and brush.
   Warning: *Do not blow with compressed air to avoid dust distribution inside the card cage.*

Card cage

1. Remove the Light processor compartment top cover (also called convergence top cover).
2. Remove all the boards out of the card cage. See "Removing a board in the card cage", page 277.
   Caution: *Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.*

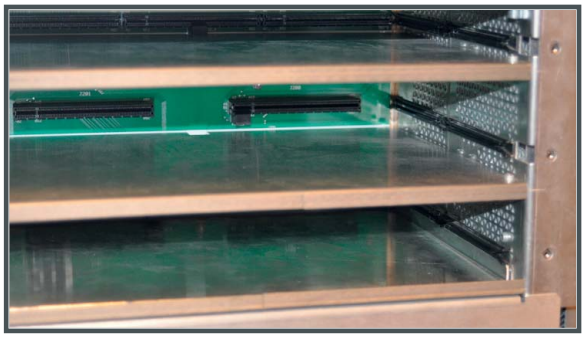


Image 25-18

3. Remove the switched mode power supply. See "Replacement of the Switched Mode Power Supply", page 345.
4. Clean the mesh grid and fan grid inside the card cage with a vacuum cleaner and brush.
5. Clean the board compartment and SMPS compartment with a vacuum cleaner and brush.
6. Clean the boards with compressed air, but be careful not to damage components.
7. Reinsert all boards.

Cold mirror fan

1. Remove the cold mirror fan assembly. See "Cold mirror fan", page 399.
2. Remove dust with a vacuum cleaner and brush.
3. If not all dust is removed, take out the fan and blow off with compressed air.

Lamp power supply

1. Remove the LPS unit. See "Removal of a LPS module", page 360 to remove a single module or see "Removing the LPS module", page 351 to remove a first generation LPS unit.
2. Clean the fans and the cabinet of the LPS unit with a vacuum cleaner and brush.
3. Reinstall the LPS unit.

Heat exchanger

1. Remove the heat exchanger assembly. See first part of procedure "Heat exchanger fan", page 396
2. Clean the heat exchanger and the heat exchanger fan with a vacuum cleaner and brush and/or compressed air.
3. Reinsert the assembly.

25.4.2 External covers

How to clean

1. Switch off the projector and unplug the projector from the mains power net.
2. Clean the housing of the projector with a damp cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution.

25.4.3 Dust filters

How to clean

For a complete explanation on how to clean the dust filters, see chapter "Maintenance procedures", page 403 and look for the dust filter topics.

To clean sticky, greasy metal mesh filters

In some conditions the metal mesh filters on the projectors are sticky and are getting clogged by dust and grease. Because of the grease the cleaning methods with a vacuum cleaner or compressed air is no longer sufficient.

To clean sticky, greasy metal mesh filters we suggest usage of **Sodium carbonate** crystals. Sodium carbonate (Often called **washing soda**, **soda crystals**, or **sal soda** in the detergent section of stores) is widely used to effectively remove oil, grease, alcohol stains … The product itself is relatively safe, sodium carbonate is used in toothpastes and as a food additive (E500). Potential Hazards are described below.

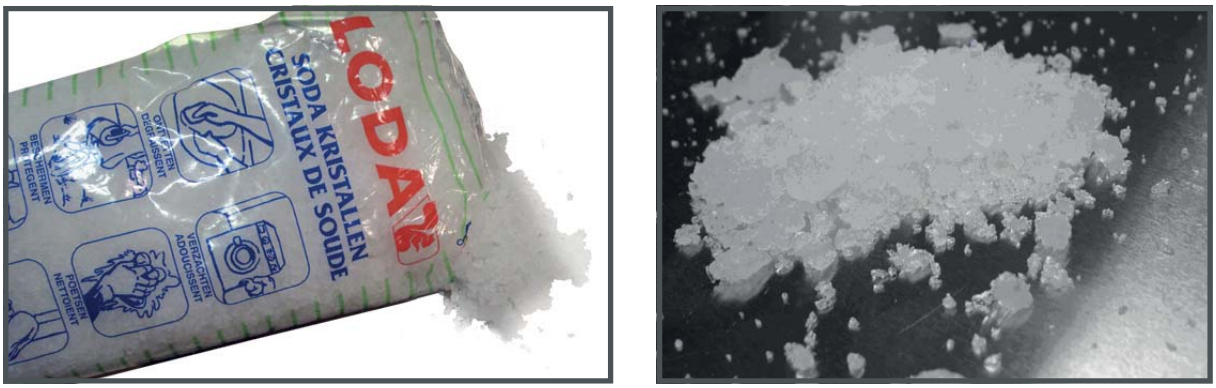


Image 25-19
Sodium carbonate crystals.

How to clean metal mesh filters?

1. Make a solution with a ratio of 30 gram (a handful) sodium carbonate to 1 liter **hot** water.
2. Soak the metal mesh filters in the solution for 30 to 60 minutes. The grease should be dissolved after 1 hour.
3. If there is still grease present after that 1 hour remove it by gently wiping off the grease from the metal mesh filter. Use a soft brush or cloth.
   Caution: *Do not damage the metal mesh filter while wiping off the grease!*
4. If the metal mesh filter is still clogged repeat this procedure from step 1.
5. Rinse the metal mesh filter with clean water to flush all grease residue away.
6. Dry the metal mesh filter with compressed air. Ensure that the metal mesh filter is clean and dry.

CAUTION: Do not install/use damaged metal mesh filters. Replace damaged metal mesh filters immediately with new metal mesh filters of the same type. See https://my.barco.com for replacement parts.

Cleaning illustration

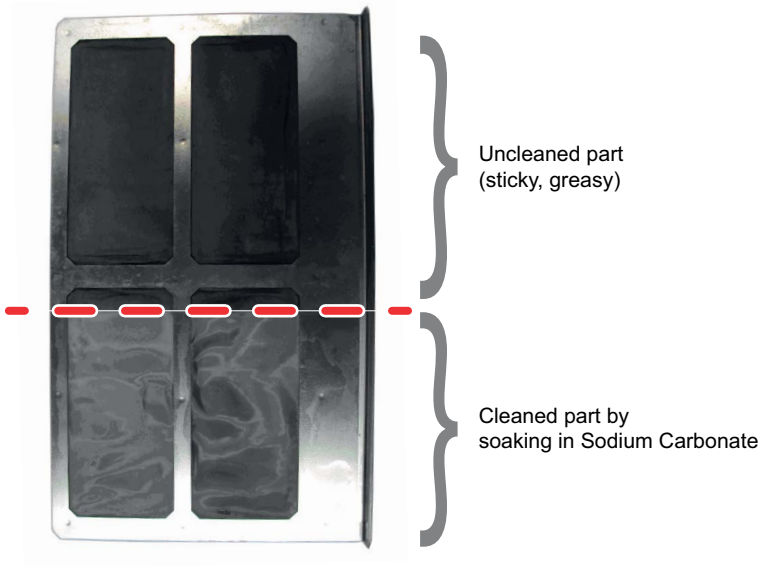


Image 25-20

Hazards, Safety notice

According to the Material Safety Data Sheet (MSDS), Sodium Carbonate could cause the following hazards:

- Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant).
- Potential Chronic Health Effects: Slightly hazardous in case of skin contact (sensitizer). The substance may be toxic to upper respiratory tract, skin, eyes. Repeated or prolonged exposure to the substance can produce target organ damage.

More info about the product can be found on website of “unep” or the link below:

http://www.chem.unep.ch/irptc/sids/oecdsids/Naco.pdf

A. PIN CONFIGURATIONS

Overview

- About General Purpose Inputs & Outputs (GPIO)
- Pin configurations of the communication ports
- Pin configurations of the ICMP communication ports
- Pin configurations of the inputs

A.1 About General Purpose Inputs & Outputs (GPIO)

The Barco Cinema Controller and the Barco ICMP are equipped with GPIO ports. The electrical specifications described in this chapter are the same for both GPIO ports.

General Purpose inputs

The Barco Cinema Controller and the Barco ICMP have each eight (8) opto-isolated general purpose inputs available. These inputs are used to trigger the execution of macro files. For more explanation about the association of a macro to a GPI, consult the user guide of the Communicator.

Input voltage

The inputs can be directly driven from a TTL or CMOS output.

- The shape of the pulse must be rectangular.
- The duration of the pulse must be at least 50 milliseconds (shorter pulses are considered as a switch bounce)
- Minimum voltage : V_{min} = +5V
- Maximum voltage : V_{max} = +18V

External power supply

When interfacing with contact closure outputs, an external power supply needs to be provided. Depending upon the configuration a suitable pull-up resistor needs to be added as well.

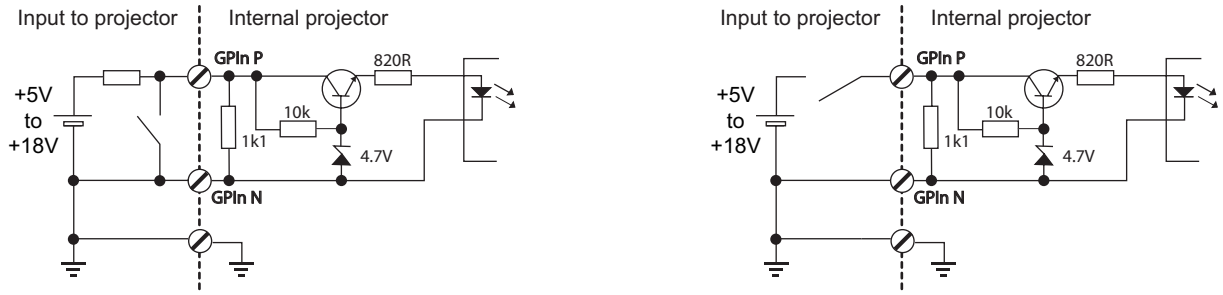


Image A-1

Cables

When long cable connections are required the use of shielded cables with twisted pairs is recommended. One twisted pair is to be assigned to each GP Input pair.

How to make the connection

When the power supply used to provide the DC voltage is isolated from ground (for example in the case of an AC adapter) it is recommended that the minus pole of that power supply is connected to ground (or to the projector chassis). This will avoid high common mode voltages at the projector GP Inputs. If that same power supply is used for other parts of the system, take care not to create ground loops. In any case when shielded cables are used that shield should be connected to the projector chassis.

General Purpose outputs

The Barco Cinema Controller and the Barco ICMP have each eight (8) opto-isolated outputs available. Four (4) of the outputs on the Cinema Controller are dedicated for TI. The other general purpose outputs can be controlled via software.

About an output

The output can generate a falling edge, rising edge, toggle or continuous toggle.

- **Generate Falling Edge** – generate a falling edge on the external GPO port if the present state of the output is high. If the present state of the external GPO is low, no edge will be generated.
- **Generate Rising Edge** – generate a rising edge on the external GPO port if the present state of the output is low. If the present state of the external GPO is high, no edge will be generated.
- **Generate Toggle** – generate a toggle on the external GPO port. If the present state of the output is low, a rising edge will be generated, followed by a falling edge. If the present state of the output is high, a falling edge will be generated, followed by a rising edge. Pulse width = 20 milliseconds.
- **Generate Continuous Toggle** - This command will generate a continuous toggle of the external GPO port. This toggle will continue until a *Generate Falling Edge*, *Generate Rising Edge*, or *Generate Toggle* command is received. The rate of toggle is 24Hz. .

Output transistor

- Maximum output driving voltage : V_{max} = 18 V
- Maximum current : I_{max} = 30 mA
- Maximum power dissipation : 120 mW

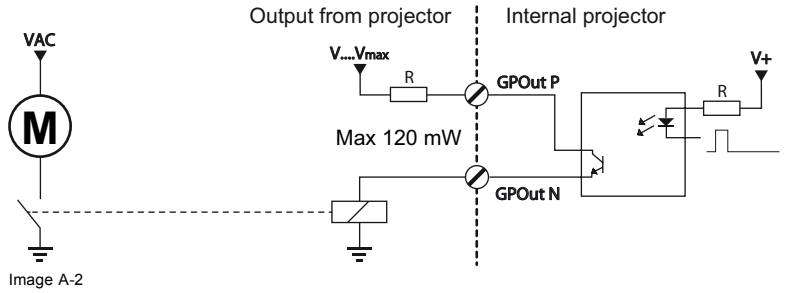


Image A-2

When the GPO driver inside the projector becomes powerless the GPO state changes to the default state. The default GPO state depends on the external system connected with the GPO port (pull-up or pull-down circuitry).

GPIO and projector Sleep mode

In case the projector is equipped with a “Sleep” mode (e.g. DP2K S series): Enter or leave Sleep mode can be done with GPIO of the Cinema Controller via two predefined Macros (not editable). Not with the GPIO of the ICMP.

The GPO signals of the ICMP will return to their default output level when the projector is switched to Sleep mode. This could generate unexpected "Falling Edge" triggers at the output pins. Also when awakening the projector (from Sleep mode to Standby mode) the GPO signals of the ICMP may generate unexpected "Rising Edge" events.

GPO and projector switching On or Off

The GPO signals of the Cinema Controller and ICMP will return to their default output level when the projector is switched to power-off. This could generate unexpected "Falling Edge" triggers at the output pins. Also during power-on the GPO signals may generate unexpected "Rising Edge" events.

A.2 Pin configurations of the communication ports

RS232IN

RS232 IN			
1	-	6	-
2 RXE-	Receive Data (RD or RX or RXD)	7	-
3 TXE-	Transmitted Data (TD or TX or TXD)	8	-
4	-	9	-
5 GND	Signal Ground (GND)	-	-

General Purpose IN/OUT

General Purpose In/Out			
1	3D Input Reference P	20	3D Input Reference N
2	3D Display Reference P	21	3D Display Reference N
3	GPIN 3 P (reserved)	22	GPIN 3 N (reserved)
4	GPIN 4 P (reserved)	23	GPIN 4 N (reserved)
5	GPIN 5 P	24	GPIN 5 N
6	GPIN 6 P	25	GPIN 6 N
7	GPIN 7 P	26	GPIN 7 N
8	GPIN 8 P	27	GPIN 8 N
9	3D Output Reference P	28	3D Output Reference N
10	GPOUT 2 P (reserved)	29	GPOUT 2 N (reserved)
11	GPOUT 3 P (reserved)	30	GPOUT 3 N (reserved)
12	GPOUT 4 P	31	GPOUT 4 N
13	GPOUT 5 P	32	GPOUT 5 N
14	GPOUT 6 P	33	GPOUT 6 N
15	GPOUT 7 P	34	GPOUT 7 N
16	GPOUT 8 P	35	GPOUT 8 N
17	reserved	36	reserved
18	reserved	37	reserved
19	reserved		

Ethernet port

			10/100 Base-T — RJ45 port	1000 Base-T — RJ45 port
Pin	**Pair**	**Color**	**Description**	**Description**
1	3	white/green	TXD+	TX0+
2	3	green	TXD-	TX0-
3	2	white/orange	RXD+	RX0+
4	1	blue	—	TX1+
5	1	white/blue	—	TX1-
6	2	orange	RXD-	RX0-
7	4	white/brown	—	Rx1+
8	4	brown	—	RX1-

Peripheral Port

Pin	Name
1	+5V

Pin	Name
2	SCL
3	SDA
4	+24V
5	GND

3D connector

Pin	Name	Pin	Name
1	+12V	9	+12V
2	Grnd	10	3D Input Reference -
3	Grnd	11	3D Display Reference +
4	RS232 RX	12	3D Display Reference -
5	RS232 TX	13	CONN_3D MODE -
6	CONN_3D_MODE +	14	CONN_SYNC -
7	CONN_SYNC +	15	-
8	3D Input Reference +		

A.3 Pin configurations of the ICMP communication ports

RJ-45 pin configuration

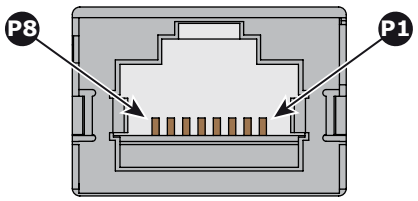


Image A-3

Audio Channels:

AUDIO-AES 1-8		
Audio channel	**AES pair**	**RJ-45 pin**
1, 2	1 +	1
	1 -	2
3, 4	2 +	3
	2 -	6
5, 6	3 +	4
	3 -	5
7, 8	4 +	7
	4 -	8

AUDIO-AES 9-16		
Audio channel	**AES pair**	**RJ-45 pin**
9, 10	5 +	1
	5 -	2
11, 12	6 +	3
	6 -	6
13, 14	7 +	4
	7 -	5
15, 16	8 +	7
	8 -	8

General Purpose Output:

GPO 1-4	
Definition	**RJ-45 pin**
EXT_GPOUT_1_P	1
EXT_GPOUT_1_N	2
EXT_GPOUT_2_P	3
EXT_GPOUT_2_N	4
EXT_GPOUT_3_P	5
EXT_GPOUT_3_N	6
EXT_GPOUT_4_P	7
EXT_GPOUT_4_N	8

GPO 5-8	
Definition	**RJ-45 pin**
EXT_GPOUT_5_P	1
EXT_GPOUT_5_N	2

GPO 5-8	
Definition	**RJ-45 pin**
EXT_GPOUT_6_P	3
EXT_GPOUT_6_N	4
EXT_GPOUT_7_P	5
EXT_GPOUT_7_N	6
EXT_GPOUT_8_P	7
EXT_GPOUT_8_N	8

General Purpose Input:

GPI 1-4	
Definition	**RJ-45 pin**
EXT_GPIN_1_P	1
EXT_GPIN_1_N	2
EXT_GPIN_2_P	3
EXT_GPIN_2_N	4
EXT_GPIN_3_P	5
EXT_GPIN_3_N	6
EXT_GPIN_4_P	7
EXT_GPIN_4_N	8

GPI 5-8	
Definition	**RJ-45 pin**
EXT_GPIN_5_P	1
EXT_GPIN_5_N	2
EXT_GPIN_6_P	3
EXT_GPIN_6_N	4
EXT_GPIN_7_P	5
EXT_GPIN_7_N	6
EXT_GPIN_8_P	7
EXT_GPIN_8_N	8

About 568A and 568B on an Ethernet connector RJ-45

TIA/EIA-568A and -568B are two standards for connecting Category 3 and Category 5 wire to connectors. Both are appropriate for high speed data, though 568B is somewhat more common for installed wiring and 568A is more common in jumpers. There is no performance advantage either way. The only real difference between the two is the order in which the pairs are used (orange and green).

Hold a cable as if to plug it into a wall jack, the locking tab down (contacts facing you). The contacts are numbered 1-8 from left to right. Here's what you will see:

RJ-45 Pin Number (Left >Right copper side)	568A		568B		AES -1-8
1	White/Green			White/Orange	AES 1&2 +plus
2	Green			Orange	AES 1&2 +minus
3	White/Orange			White/Green	AES 3&4 +plus
4	Blue			Blue	AES 5&6 +minus
5	White/Blue			White/Blue	AES 5&6 +plus
6	Orange			Green	AES 3&4 +minus
7	White/Brown			White/Brown	AES 7&8 +plus
8	Brown			Brown	AES 7&8 +minus

568A and 568B may be used interchangeably in a system SO LONG AS both ends of a given cable are terminated the same way.

568A + 568B wiring is a crossover cable.

568A + 568A wiring is a straight cable.

568B + 568B wiring is a straight cable.

The mapping of the channels is done according to the Ethernet wiring scheme and gives us 100 Ohm per pair.

A.4 Pin configurations of the inputs

DVI-D

DVI IN A & B							
1	RX2-	7	DDC Data	13	nc	19	RX0 Shield
2	RX2+	8	nc	14	+5V	20	nc
3	RX2 Shield	9	RX1-	15	GND	21	nc
4	nc	10	RX1+	16	Hot Plug Detect	22	TMDS Clock Shield
5	nc	11	RX1 Shield	17	RX0-	23	TMDS RXC+
6	DDC Clock	12	nc	18	RX0+	24	TMDS RXC-

B. INPUT FORMATS

B.1 Input formats

DVI Input formats

Input	Source standard	Vertical rate	Scan type	Color space	Sampling	Color depth
Single DVI	VESA (640x480)	60	Progressive	RGB	4:4:4	8 bit
Single DVI	VESA (640x480)	72	Progressive	RGB	4:4:4	8 bit
Single DVI	VESA (800x600)	60	Progressive	RGB	4:4:4	8 bit
Single DVI	VESA (800x600)	72	Progressive	RGB	4:4:4	8 bit
Single DVI	VESA (1024x768)	60	Progressive	RGB	4:4:4	8 bit
Single DVI	VESA (1024x768)	70	Progressive	RGB	4:4:4	8 bit
Single DVI	VESA (1280x1024)	60	Progressive	RGB	4:4:4	8 bit
Single DVI	1280x720	60	Progressive	RGB	4:4:4	8 bit
Single DVI	1920x1080	60	Progressive	RGB	4:4:4	8 bit
Single DVI	2048x1080	50/60	Progressive	RGB	4:4:4	8 bit
Single DVI	1920x1080i	50/60	Interlaced	RGB	4:4:4	8 bit
Twin DVI	ACS (2048x1080)	50/59.94	Progressive	RGB	4:4:4	10 bit
Twin DVI	ACS (2048x1080)	50/59.94	Progressive	RGB	4:4:4	12 bit

SMPTE 274M

System no	System nomenclature	Luma or RGB samples per active line (S/AL)	Active lines per frame (AL/F)	Frame rate (Hz)	Interface sampling frequency fs (MHz)	Luma sample periods per total line (S/TL)	Total lines per frame
4	1920 x 1080/60/I	1920	1080	30	74.25	2200	1125
5	1920 x 1080/59.94/I	1920	1080	30/1.001	75.25/1.001	2200	1125
6	1920 x 1080/50/I	1920	1080	50	74.25	2640	1125
7	1920 x 1080/30P	1920	1080	30	74.25	2200	1125
8	1920 x 1080/29.97/P	1920	1080	30/1.001	74.25/1.001	2200	1125
9	1920 x 1080/25/P	1920	1080	25	74.25	2640	1125
10	1920 x 1080/24/P	1920	1080	24	74.25	2750	1125
11	1920 x 1080/23.98/P	1920	1080	24/1.001	74.25/1.001	2750	1125

SMPTE 296M

System no	System nomenclature	Luma or RGB samples per active line (S/AL)	Active lines per frame (AL/F)	Frame rate (Hz)	Interface sampling frequency fs (MHz)	Luma sample periods per total line (S/TL)	Total lines per frame
1	1280 x 720/60	1280	720	60	74.25	1650	750
2	1280 x 720/59.94	1280	720	60/1.001	74.25/1.001	1650	750
3	1280 x 720/50	1280	720	50	74.25	1980	750
4	1280 x 730/30	1280	720	30	74.25	3300	750
5	1280 x 720/29.97	1280	720	30/1.001	74.25/1.001	3300	750
6	1280 x 720/25	1280	720	25	74.25	3960	750
7	1280 x 720/24	1280	720	24	74.25	4125	750
8	1280 x 720/23.98	1280	720	24/1.001	74.25/1.001	4125	750

SMPTE 260M

The system nomenclature for SMPTE 260M is 1920 x 1035 (1035 active lines) constrained to 60/60/1.001. All other parameters are the same as for SMPTE 274M.

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