

HDQ 4K35

User and Installation manual

Barco nv
Noordlaan 5, B-8520 Kurne
Phone: +32 56.36.82.11
Fax: +32 56.36.883.86
Support: www.barco.com/esupport
Visit us at the web: www.barco.com

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This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference at his own expense

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The environmental conditions as well as the servicing and maintenance regulations specified in this manual must be complied with by the customer.

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1. SAFETY

About this chapter

Read this chapter attentively. It contains important information to prevent personal injury while installing and using a Barco HDQ 4K35. Furthermore, it includes several cautions to prevent damage to the HDQ 4K35. Ensure that you understand and follow all safety guidelines, safety instructions and warnings mentioned in this chapter before installing your HDQ 4K35. After this chapter, additional “warnings” and “cautions” are given depending on the installation procedure. Read and follow these “warnings” and “cautions” as well.

1.1 General considerations



WARNING: Ensure you understand and follow all the safety guidelines, safety instructions, warnings and cautions mentioned in this manual.



WARNING: Be aware of suspended loads.



WARNING: Wear a hard hat to reduce the risk of personal injury.



WARNING: Be careful while working with heavy loads.



WARNING: Mind your fingers while working with heavy loads.



CAUTION: High pressure lamp may explode if improperly handled.

General safety instructions

- Before operating this equipment please read this manual thoroughly and retain it for future reference.
- Installation and preliminary adjustments should be performed by qualified Barco personnel or by authorized Barco service dealers.
- All warnings on the projector and in the documentation manuals should be adhered to.
- All instructions for operating and use of this equipment must be followed precisely.
- All local installation codes should be adhered to.

Notice on safety

This equipment is built in accordance with the requirements of the international safety standards IEC60950-1, EN60950-1, UL60950-1 and CAN/CSA C22.2 No.60950-1, which are the safety standards of information technology equipment including electrical business equipment. These safety standards impose important requirements on the use of safety critical components, materials and insulation, in order to protect the user or operator against risk of electric shock and energy hazard and having access to live parts. Safety standards also impose limits to the internal and external temperature rises, radiation levels, mechanical stability and strength, enclosure construction and protection against the risk of fire. Simulated single fault condition testing ensures the safety of the equipment to the user even when the equipment’s normal operation fails.

Users definition

Throughout this manual, the term SERVICE PERSONNEL refers to persons having appropriate technical training and experience necessary to be knowledgeable of potential hazards to which they are exposed (including, but not limited to HIGH VOLTAGE ELECTRIC and ELECTRONIC CIRCUITRY and HIGH BRIGHTNESS PROJECTORS) in performing a task, and of measures to minimize

1. Safety

the potential risk to themselves or other persons. The term USER and OPERATOR refers to any person other than SERVICE PERSONNEL, AUTHORIZED to operate professional projection systems.

A Barco HDQ 4K35 is intended "FOR PROFESSIONAL USE ONLY" by AUTHORIZED PERSONNEL familiar with potential hazards associated with high voltage, high intensity light beams, ultraviolet exposure and high temperatures generated by the lamp and associated circuits. Only qualified SERVICE PERSONNEL, knowledgeable of such risks, are allowed to perform service functions inside the product enclosure.

1.2 Important safety instructions

To prevent the risk of electrical shock

- This projector should be operated from an AC power source. Ensure that the mains voltage and capacity matches the projector electrical ratings.
- Installation according to the local electrical code and regulations by qualified technical personnel only.
- This product is equipped with a five-terminal barrier strip for the connection of a 3W+N+PE or 3W+PE three phase power system. If you are unable to install the AC Requirements, contact your electrician. Do not defeat the purpose of the grounding.
- The cross-sectional area of the conductors in the power supply cord shall not be less than 4 mm² or AWG 10. The cross-sectional area of the UPS inlet cord and external fan power cord shall be not less than 0.75 mm² or AWG 18.
- The electronics of the projector (UPS INLET) must be powered either from a suitable UPS unit or from the power outlet socket (UPS OUTLET) provided on the projector. An adapted short power cord (2-pole 3-wire grounding) is added to the projector accessories to loop through the power from UPS OUTLET to UPS INLET.
- The provided power output socket (UPS OUTLET) on the projector may only be used to provide power to the projector electronics. Never connect other devices to this power output socket.
- The building installation has to be provided with a circuit breaker of max. 40A to protect the complete unit.
- A readily accessible disconnect device must be incorporated externally to the equipment for removal of the power to the projector mains terminals.
- Disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET for removal of all power from the projector.
- Warning: High leakage current. Earth connection essential before connecting supply.
- Do not allow anything to rest on the power cord. Do not locate this projector where persons will walk on the cord.
- Do not operate the projector with a damaged cord or if the projector has been dropped or damaged - until it has been examined and approved for operation by a qualified service technician.
- Position the cord so that it will not be tripped over, pulled, or contact hot surfaces.
- If an extension cord is necessary, a cord with a current rating at least equal to that of the projector should be used. A cord rated for less amperage than the projector may overheat.
- Never push objects of any kind into this projector through cabinet slots as they may touch dangerous voltage points or short circuit parts that could result in a risk of fire or electrical shock.
- Do not expose this projector to rain or moisture.
- Do not immerse or expose this projector in water or other liquids.
- Do not spill liquid of any kind on this projector.
- Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.
- Do not disassemble this projector, always take it to a trained service person when service or repair work is required.
- Do not use an accessory attachment which is not recommended by the manufacturer.
- Lightning - For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, remove all power from the projector. This will prevent damage to the projector due to lightning and AC power-line surges.

To prevent personal injury

- Isolate electrically before replacing the lamp or lamp house. Caution: Hot lamp (house).
- Caution: High pressure lamp may explode if improperly handled. Refer servicing to qualified service personnel.
- To prevent injury and physical damage, always read this manual and all labels on the system before inserting the lamp casing, powering the projector or adjusting the projector.
- It is forbidden to lift up the projector with manpower, use a hoisting tool instead. Do not underestimate the weight of the projector. The projector weights ±210 kg (±462 lb.).
- To prevent injury, ensure that the lens, exhausting system and all cover plates are correctly installed. See installation instructions.
- Ensure safe fixation of the projector lens. The lens fixation mechanism must be installed. See installation instructions.
- Warning: high intensity light beam. NEVER look into the lens ! High luminance could result in damage to the eye.

- **Warning: extremely high brightness lamps:** This projector uses extremely high brightness lamps. Never attempt to look directly into the lens or at the lamp. If the projection distance is less than 6 meter, any person needs to be at least 4 meters away from the projected image. Avoid close range reflection of the projected image on any reflecting surface (such as glass, metal, ...) . When operating the projector, we strongly recommend wearing suitable safety glasses.
- Before attempting to remove any of the projector's covers, disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET for removal of all power from the projector.
- The projector may not be powered when the exhaust box on top of the projector is removed. Before attempting to remove the exhaust box, disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET for removal of all power from the projector.
- When required to remove all power from the projector, to access parts inside, always disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET.
- Do not place this equipment on an unstable cart, stand, or table. The product may fall, causing serious damage to it and possible injury to the user.
- Never stack more than three (3) HDQ projectors in a standing configuration (table mount) and never stack more than two (2) HDQ projectors in a hanging configuration (ceiling mount).
- When using the projector in a hanging configuration (ceiling mount), always mount 2 safety cables on the projector frame. See installation instructions for the correct use of these cables.
- Always check the safety cables for visible damage before operating the projector. If the safety cables are damaged, they must be replaced with new ones.
- It is hazardous to operate without lens or shield. Lenses, shields or ultra violet screens shall be changed if they have become visibly damaged to such an extent that their effectiveness is impaired. For example by cracks or deep scratches.
- **Warning: Protection from ultraviolet radiation:** Do not look directly in the light beam. The lamp contained in this product is an intense source of light and heat. One component of the light emitted from this lamp is ultraviolet light. Potential eye and skin hazards are present when the lamp is energized due to ultraviolet radiation. Avoid unnecessary exposure. Protect yourself and your employees by making them aware of the hazards and how to protect themselves. Protecting the skin can be accomplished by wearing tightly woven garments and gloves. Protecting the eyes from UV can be accomplished by wearing safety glasses that are designed to provide UV protection. In addition to the UV, the visible light from the lamp is intense and should also be considered when choosing protective eye wear.
- **Exposure to UV radiation:** Some medications are known to make individuals extra sensitive to UV radiation. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends occupational UV exposure for an-8 hour day to be less than 0,1 micro-watts per square centimeters of effective UV radiation. An evaluation of the workplace is advised to assure employees are not exposed to cumulative radiation levels exceeding these government guidelines.
- **Cooling liquid circuit.** The projector contains a cooling circuit filled with Blue antifreeze diluted (1/3 ethanediol – 2/3 Demi water).
When the cooling circuit leaks, switch off the device and contact a service technician.
The liquid is 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 inhale of the noxious fumes.



WARNING: Exposure to hazardous moving parts when the exhaust box is removed. Always disconnect the power to the projector mains terminals and unplug the power cord at the UPS INLET for removal of all power from the projector before removing the exhaust box.



WARNING: Exposure to high luminance and UV radiation when the exhaust box is removed. Always disconnect the power to the projector mains terminals and unplug the power cord at the UPS INLET for removal of all power from the projector before removing the exhaust box.



WARNING: The complete exhaust box is very hot when the projector is on. To avoid burns, let the projector cool down for at least 15 minutes before touching the exhaust box.

To prevent fire hazard

- Do not place flammable or combustible materials near the projector!
- Barco large screen projection products are designed and manufactured to meet the most stringent safety regulations. This projector radiates heat on its external surfaces and from ventilation ducts during normal operation, which is both normal and safe. Exposing flammable or combustible materials into close proximity of this projector could result in the spontaneous ignition of that material, resulting in a fire. For this reason, it is absolutely necessary to leave an "exclusion zone" around all external surfaces of the projector whereby no flammable or combustible materials are present. The exclusion zone must be not less than 40 cm (16") for all DLP projectors. The exclusion zone on the lens side must be at least 5 m. Do not cover the projector or the lens with any material while the projector is in operation. Keep flammable and combustible materials away from the projector at all times. Mount the projector in a well ventilated area away from sources of ignition and out of direct sun light. Never expose the projector to rain or moisture. In the event of fire, use sand, CO₂ or dry powder fire extinguishers. Never use water on an electrical fire. Always have service performed on this projector by authorized Barco service personnel. Always insist on genuine Barco replacement parts. Never use non-Barco replacement parts as they may degrade the safety of this projector.

1. Safety

- Slots and openings in this equipment are provided for ventilation. To ensure reliable operation of the projector and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the projector too close to walls, or other similar surface. This projector should never be placed near or over a radiator or heat register. This projector should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- Projection rooms must be well ventilated or cooled in order to avoid build up of heat.
- Let the projector cool completely before storing. Remove cord from the projector when storing.
- Heat sensitive materials should not be placed in the path of the exhausted air or on the lamp house.
- When the projector is used in portrait mode, the air outlet is positioned towards the floor. That's why the floor covering can become very hot and must be resistant to a temperature of 90 °C (194 °F).

To prevent projector damage

- This projector has been designed for use with a specific lamp (house) type. See installation instructions for its correct type.
- The air filters of the projector must be cleaned or replaced on a regular basis (a "clean" booth would be monthly-minimum). Neglecting this could result in disrupting the air flow inside the projector, causing overheating. Overheating may lead to the projector shutting down during operation.
- The projector must always be installed in a manner which ensures free flow of air into its air inlets and unimpeded evacuation of the hot air from its cooling system.
- In order to ensure that correct airflow is maintained, and that the projector complies with Electromagnetic Compatibility (EMC) and safety requirements, it should always be operated with all of its covers in place.
- Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. The device should not be placed in a built-in installation or enclosure unless proper ventilation is provided.
- Ensure that nothing can be spilled on, or dropped inside the projector. If this does happen, switch off and remove all power from the projector. Do not operate the projector again until it has been checked by qualified service personnel.
- Do not block the projector cooling fans or free air movement around the projector. Loose papers or other objects may not be nearer to the projector than 10 cm (4") on any side.
- Do not use this equipment near water.
- Proper operation of the cooling circuit can only be guaranteed in the allowed projector positions. It is not allowed to use the projector in another position. See installation instructions for correct installation.
- **Special care for Laser Beams:** Special care should be used when DLP projectors are used in the same room as high power laser equipment. Direct or indirect hitting of a laser beam on to the lens can severely damage the Digital Mirror Devices™ in which case there is a loss of warranty.
- Never place the projector in direct sun light. Sun light on the lens can severely damage the Digital Mirror Devices™ in which case there is a loss of warranty.
- Save the original shipping carton and packing material. They will come in handy if you ever have to ship your equipment. For maximum protection, repack your set as it was originally packed at the factory.
- Disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning. Never use strong solvents, such as thinner or benzine, or abrasive cleaners, since these will damage the cabinet. Stubborn stains may be removed with a cloth lightly dampened with mild detergent solution.
- To ensure the highest optical performance and resolution, the projection lenses are specially treated with an anti-reflective coating, therefore, avoid touching the lens. To remove dust on the lens, use a soft dry cloth. Do not use a damp cloth, detergent solution, or thinner.
- Rated maximum ambient temperature, $t_a = 35\text{ °C}$ (95 °F).
- The lamp house shall be replaced if it has become damaged or thermally deformed.

On servicing

- Do not attempt to service this product yourself, as opening or removing DLP covers may expose you to dangerous voltage potentials and risk of electric shock.
- Refer all servicing to qualified service personnel.
- Attempts to alter the factory-set internal controls or to change other control settings not specially discussed in this manual can lead to permanent damage to the projector and cancellation of the warranty.
- Remove all power from the projector and refer servicing to qualified service technicians under the following conditions:
 - When the power cord or plug is damaged or frayed.
 - If liquid has been spilled into the equipment.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of the other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - If the product has been dropped or the cabinet has been damaged.
 - If the product exhibits a distinct change in performance, indicating a need for service.

- Replacement parts: When replacement parts are required, be sure the service technician has used original Barco replacement parts or authorized replacement parts which have the same characteristics as the Barco original part. Unauthorized substitutions may result in degraded performance and reliability, fire, electric shock or other hazards. Unauthorized substitutions may void warranty.
- Safety check: Upon completion of any service or repairs to this projector, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
- Possible explosion hazard: Always keep in mind the caution below:



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!**

Authorized protective clothing for xenon lamp handling



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.

To prevent battery explosion

- Danger of explosion if battery is incorrectly installed.
- Replace only with the same or equivalent type recommended by the manufacturer.
- For disposal of used batteries, always consult federal, state, local and provincial hazardous waste disposal rules and regulations to ensure proper disposal.

2. GENERAL

About this chapter

Read this chapter before installing your Barco HDQ 4K35. It contains important information concerning installation requirements for the HDQ 4K35, such as minimum and maximum allowed ambient temperature, humidity conditions, required safety area around the installed projector, required power net, etc.

Furthermore, careful consideration of things such as image size, ambient light level, projector placement and type of screen to use are critical to the optimum use of the projection system.



Barco provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. Observing the specification mentioned in this chapter is critical for projector performance. Neglecting this can result in loss of warranty.



WARNING: Never transport the HDQ projector in an upside down position. Failure to do so can cause damage to the frame. This can cause the frame to break and the projector to fall down.

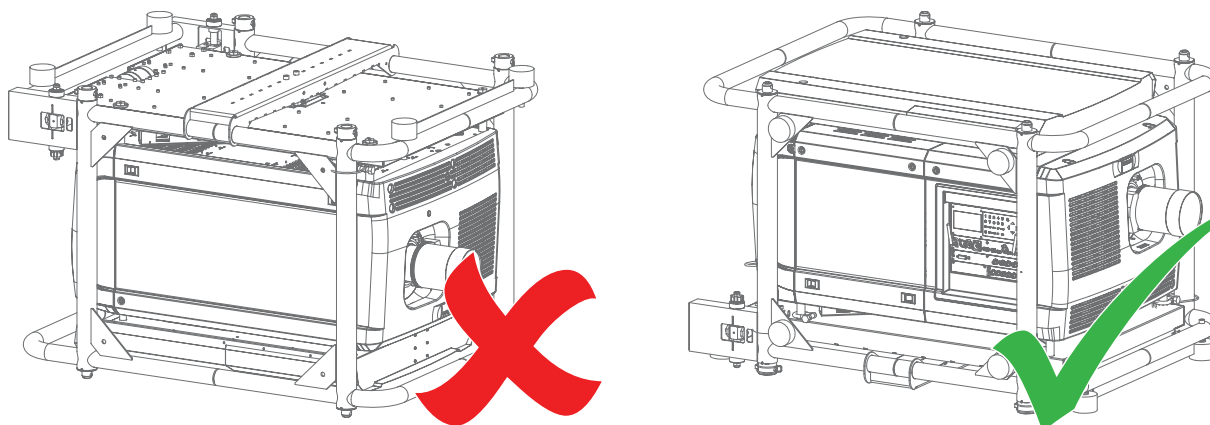


Image 2-1

Overview

- Installation requirements
- Unpacking the projector
- Initial inspection
- Air inlets and outlets
- Installation process overview

2.1 Installation requirements

Environment conditions

Table below summarizes the physical environment in which the HDQ may be safely operated or stored.

Environment	Operating	Non-Operating
Ambient Temperature	10 °C (50 °F) to 35 °C (95 °F)	-15°C (5°F) to 60°C (140°F)
Humidity	5% to 85% RH Non-condensed	5% to 95% RH Non-Condensed
Altitude	-60 (-197Ft) to 3000m (9843Ft)	-60 (-197Ft) to 10000m (32810Ft)



Let the projector acclimatise after unpacking. Neglecting this may result in a startup failure of the Light Processor Unit.

Cooling requirements

The projector is fan cooled and must be installed with sufficient space around the projector head, minimum 20 cm (8") to ensure sufficient air flow. It should be used in an area where the ambient temperature, as measured at the projector air inlet, does not exceed +35°C (+95°F).

For an overview of all air inlets and outlets of the projector, see "Air inlets and outlets", page 14.

Clean air environment

A projector must always be mounted in a manner which ensures the free flow of clean air into the projector's ventilation inlets. For installations in environments where the projector is subject to airborne contaminants such as that produced by smoke machines or similar (these deposit a thin layer of greasy residue upon the projector's internal optics and imaging electronic surfaces, degrading performance), then it is highly advisable and desirable to have this contamination removed prior to it reaching the projector's clean air supply. Devices or structures to extract or shield contaminated air well away from the projector are a prerequisite, if this is not a feasible solution then measures to relocate the projector to a clean air environment should be considered.

Only ever use the manufacturer's recommended cleaning kit which has been specifically designed for cleaning optical parts, never use industrial strength cleaners on the projector's optics as these will degrade optical coatings and damage sensitive optoelectronics components. Failure to take suitable precautions to protect the projector from the effects of persistent and prolonged air contaminants will culminate in extensive and irreversible ingrained optical damage. At this stage cleaning of the internal optical units will be ineffective and impracticable. Damage of this nature is under no circumstances covered under the manufacturer's warranty and may deem the warranty null and void. In such a case the client shall be held solely responsible for all costs incurred during any repair. It is the client's responsibility to ensure at all times that the projector is protected from the harmful effects of hostile airborne particles in the environment of the projector. The manufacturer reserves the right to refuse repair if a projector has been subject to knowingly neglect, abandon or improper use.

Main Power requirements

The HDQ 4K35 operates from a nominal 230/400V 3W+N+PE 16A 50-60Hz or 208V 3W+PE 27A 50-60Hz. The projector must be switched internally between a star connection to a delta connection or vice versa. See "Power input setup of the HDQ 4K35", page 19.

For a 3W+N+PE system, 400V is measured between the lines, 230V is measured between the lines and the neutral.

For a 3W+PE system, 208V is measured between the lines.

The power cord required to connect the projector with the power net is not delivered with the projector. It is the responsibility of the customer to provide the correct type of power cord.

The cross-sectional area of the conductors in the power supply cord shall not be less than 4 mm² or AWG 10.

The power cord must be rated for minimum 300V in case of a 3W+PE (208V) power system, and minimum 500V in case of a 3W+N+PE (230/400V) power system.

To protect operating personnel, the National Electrical Manufacturers Association (NEMA) recommends that the instrument panel and cabinet be grounded. In no event shall this projector be operated without an adequate cabinet ground connection.

The AC supply must be installed by a qualified electrician in conformance to local codes. Hardware, wire sizes and conduit types must comply with local codes.

A readily accessible disconnect device shall be incorporated externally to the equipment for removal of the power to the equipment mains terminals.

The building installation must be provided with a circuit breaker of max. 40A to protect the complete unit.

2.2 Unpacking the projector



Let the projector acclimatize after unpacking. Neglecting this may result in a startup failure of the Light Processor Unit.

Introduction

Upon delivery, the projector is packed in a cardboard box placed on a pallet and secured with banding and fastening clips. To provide protection during transportation, the projector is surrounded with foam. Once the projector has arrived at its destination, it needs to be removed from the cardboard box and the pallet in a safe manner and without damaging the projector.

How to unpack the projector?

1. Loosen the banding by pulling the free end of the banding loop in the clip.
Remove the box cover.

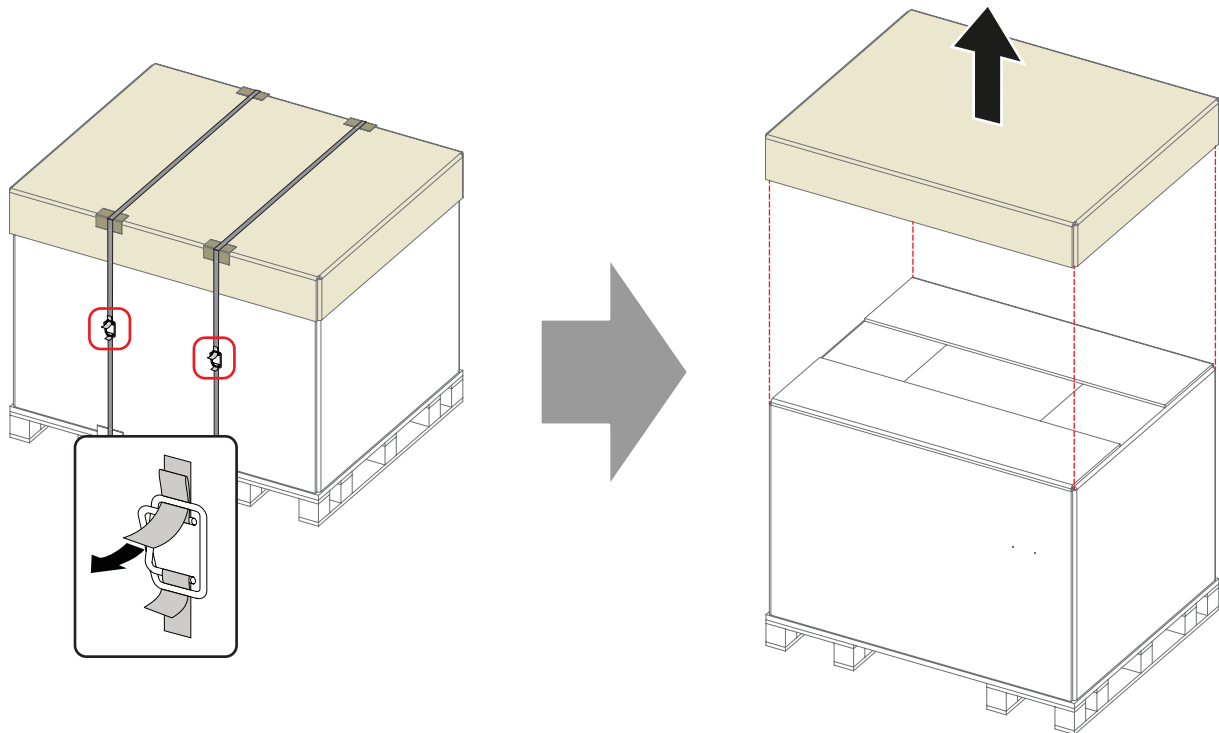


Image 2-2

2. Unfold the top side of the outer cardboard box.
Take out the small box located between inner and outer cardboard box (this box contains the accessories such as manuals, remote control, etc.).
Remove the outer cardboard box by sliding it up above the projector.

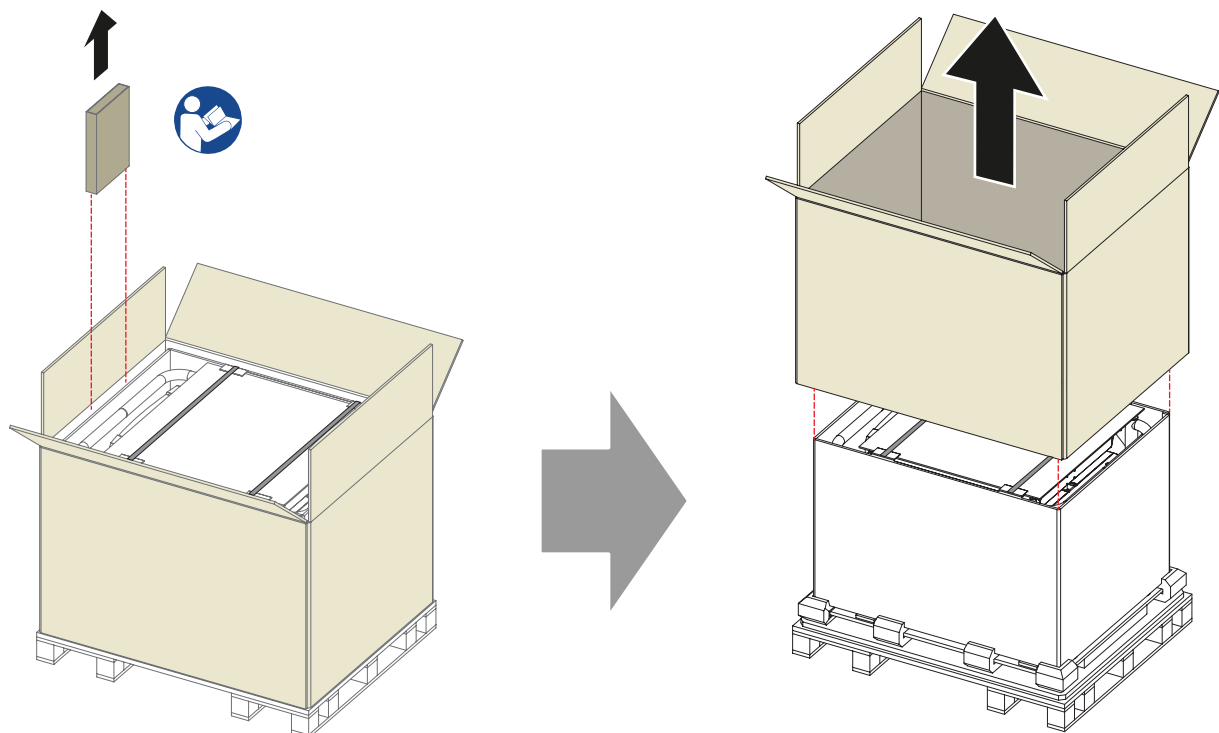


Image 2-3

3. Remove the inner cardboard box by sliding it up above the projector.
Loosen the banding by pulling the free end of the banding loop in the clip.
Remove the upper piece of cardboard from the projector.

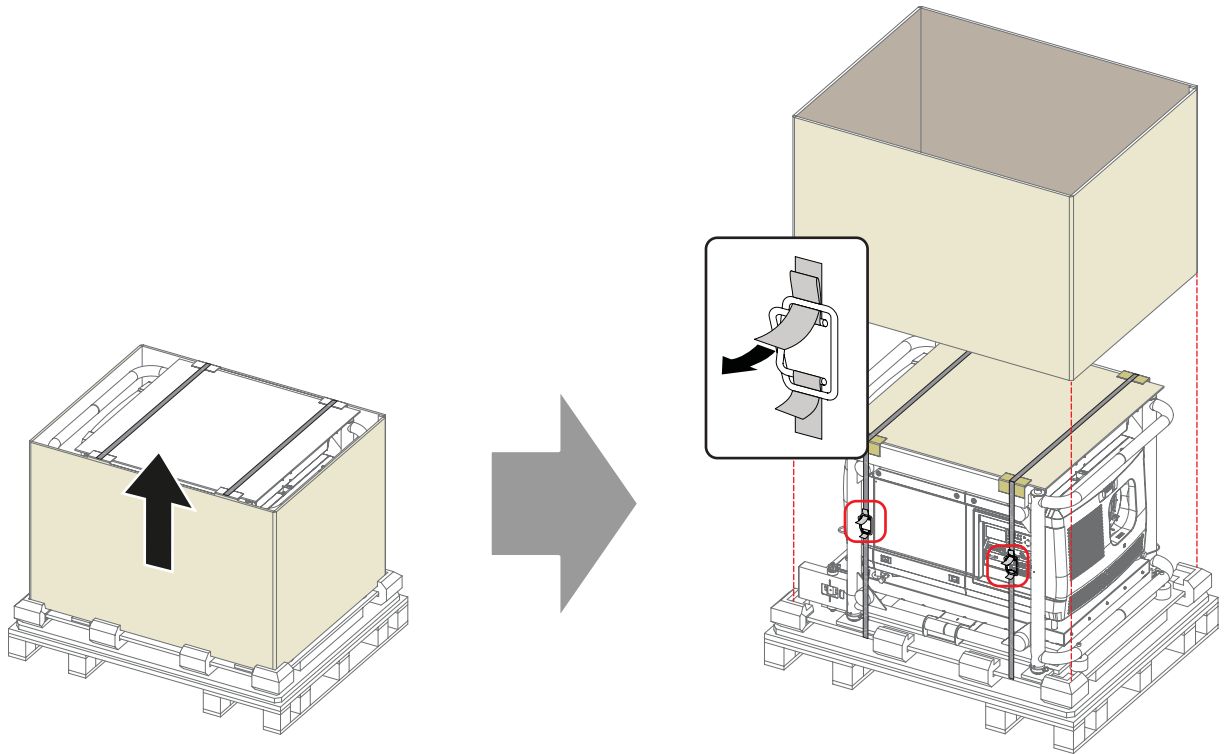


Image 2-4

4. Lift up the projector (with the supporting wooden board) from the pallet. A hoisting tool is recommended. Make sure the 4 screws on the underside of the wooden board are accessible. Release the projector from the supporting wooden board by removing the 4 screws.

Warning: It is forbidden to lift up the projector with manpower, use a hoisting tool instead. Do not underestimate the weight of the projector. The projector weights ± 210 kg (± 462 lb.).

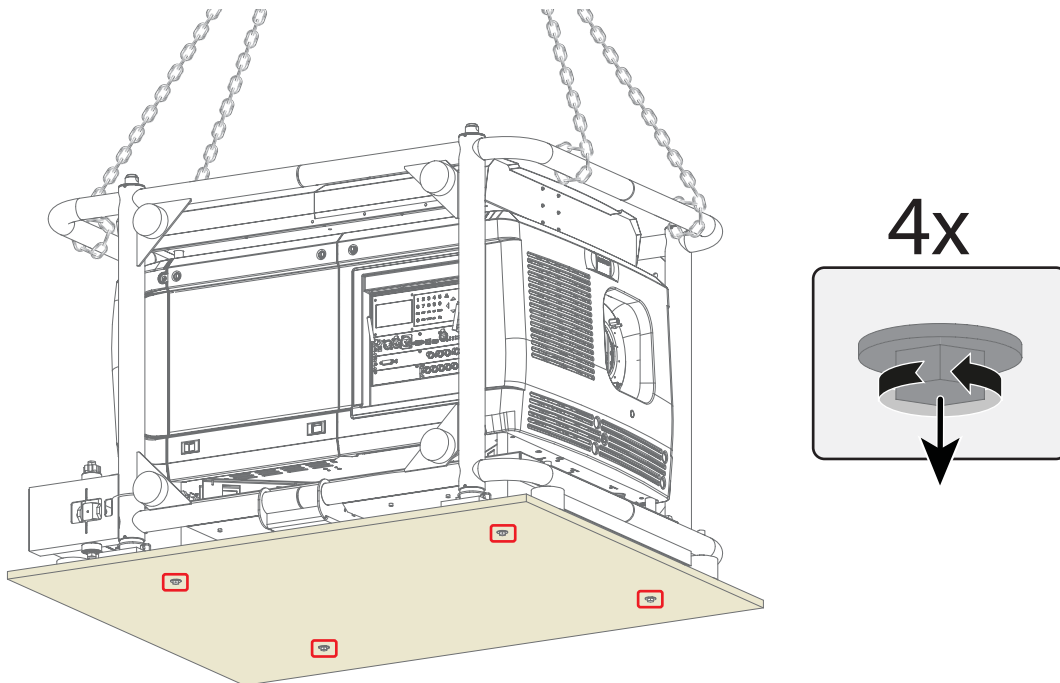


Image 2-5



Save the original shipping carton and packing material, they will be necessary if you ever have to ship your projector. For maximum protection, repack your projector as it was originally packed at the factory.



A rubber foam inside a plastic bag is placed into the lens opening of the projector. It's recommended to reuse this foam and plastic back each time you transport the projector. This to prevent intrusion of dust and foreign particles.



The lens is delivered in a separate box.

2.3 Initial inspection

General

Before shipment, the projector was inspected and found to be free of mechanical and electrical defects. As soon as the projector is unpacked, inspect for any damage that may have occurred in transit. Save all packing material until the inspection is completed. If damage is found, file claim with carrier immediately. The Barco Sales and Service office should be notified as soon as possible.



The packaging of the HDQ 4K35 projector is provided with a shock-watch label. If this shock-watch label was triggered (red colored at arrival) during transport, that indicates that the package was possibly roughly handled by the transport company. In this case, the instructions mentioned on the label, should be followed, which are: adding a note on the "bill of lading" and informing the transport company and the Barco sales and service office as soon as possible.

Box content

After unpacking the projector it is recommended to check if all following items were included:

- Safety manual
- Quick start guide
- Warranty card
- CD-ROM with electronic version of the manuals

Mechanical check

This check should confirm that there are no broken knobs or connectors, that the cabinet and panel surfaces are free of dents and scratches, and that the operating panel is not scratched or cracked. The Barco Sales and Service office should be notified as soon as possible if this is not the case.

2.4 Air inlets and outlets

Air inlets and outlets

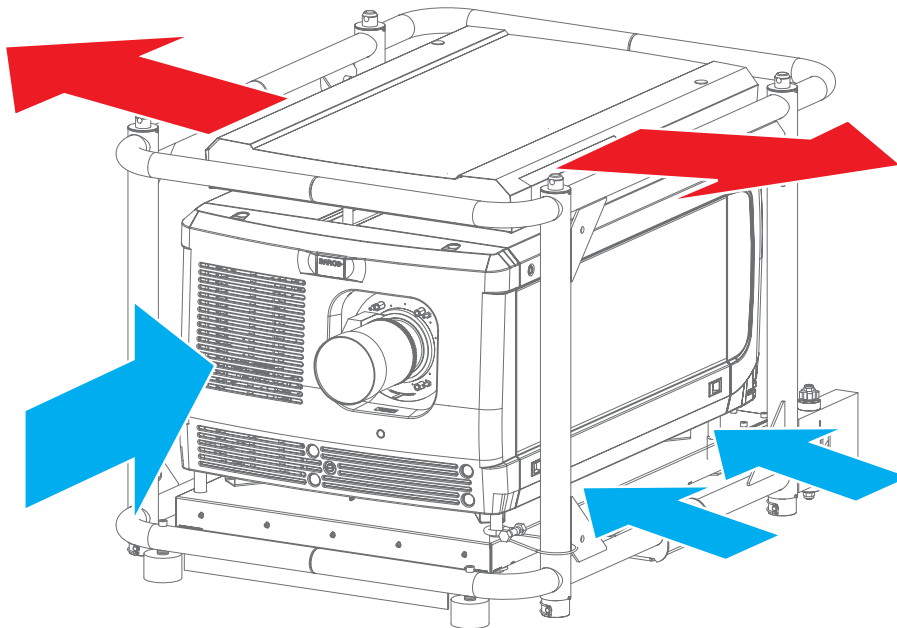


Image 2-6

The HDQ 4K35 projector has 3 air inlets (1 at the front and 2 at the bottom) and 2 air outlets (on the exhaust box on top of the projector).



WARNING: When the projector is used in portrait mode, the air outlet is positioned towards the floor. That's why the floor covering can become very hot and must be resistant to a temperature of 90 °C (194 °F).



WARNING: The air filters of the projector must be cleaned or replaced on a regular basis (a "clean" booth would be monthly-minimum). Neglecting this could result in disrupting the air flow inside the projector, causing overheating. Overheating may lead to the projector shutting down during operation. See "Cleaning the front dust filter", page 59 and "Cleaning the bottom dust filters", page 60.



WARNING: The projector is fan cooled and must be installed with sufficient space around the air inlets, minimum 20 cm (8") to ensure sufficient air flow. Loose papers or other objects may not be nearer to the projector than 10 cm (4") on any side.

The projector must always be installed in a manner which ensures unimpeded evacuation of the hot air from its cooling system.

The projector should be used in an area where the ambient temperature, as measured at the projector air inlet, does not exceed +35°C (+95°F).

2.5 Installation process overview



Let the projector acclimatize after unpacking. Neglecting this may result in a startup failure of the Light Processor Unit.

Setup from A to Z

After you have unpacked and checked the projector you can start with the installation process of your Barco HDQ 4K35. This chapter gives you an overview of all the different stages in the installation process which you have to follow to set your HDQ 4K35 up and running. Each stage is briefly described and refers to more detailed step by step procedures in this manual. Use this overview as a checklist to ensure that you have followed all stages in the setup process of your HDQ 4K35.

What has to be done?

1. **Check if all installation requirements are fulfilled** such as the environment conditions of the installation area, electrical facilities, etc. For more info see chapter "Installation requirements", page 9.
2. **Installation of the Lamp House.** The Lamp House is delivered separately from your projector. Unpack the Lamp House and install it in your projector. See chapter "Installation of the Lamp House", page 17.
3. **Installation of the Lens.** Select and install an appropriate lens for your specific situation. Don't forget to install the additional lens fixation mechanism. See chapter "Installing the lens fixation mechanism", page 40.
4. **Connect the projector with the power net.** Choose the correct power input configuration according to your local power net and connect the projector. See chapters "Access to the power connection", page 18, and "Connecting the projector with the power net", page 20. If necessary connect the projector electronics with a UPS. See chapter "Connecting a UPS to the projector electronics", page 21.
5. **Power input set up and Electrical connection with the power net.** See chapter "Power input setup of the HDQ 4K35", page 19 and "Connecting the projector with the power net", page 20.
6. **Installation of the Communicator Touch Panel.** See chapter XXXXXX.
7. **Physical installation of the projector.** Position your HDQ 4K35 in landscape or portrait mode, see chapter "Landscape and portrait mode", page 23. If necessary, choose to stack multiple projectors, either in a standing (table mount) or hanging (ceiling mount) configuration, see chapter "Stacking multiple projectors", page 25.
8. **Switch ON the projector.** See "Switching ON the HDQ", page 57.
9. **Connect your source to the appropriate input.** See "Source input ports of the Barco HDQ 4K35 projector", page 52.
10. **Select the input to which the source is connected.** Use Communicator to make the selection.
11. **Alignment of the projected image on the screen.** The projector can now be switched on to project its first image (test pattern) on the screen. Then the image can be aligned with the screen size of the application. Follow the next steps to achieve that:
 - a) Place the **ON/OFF** switch of the projector in the "I" position. As a result the projector starts to initialize. The status lights of the projector lights up GREEN once the projector is initialized.
 - b) Press the **STANDBY** button on the local keypad to activate the lamp.
 - c) Press the **DOWSER** button on the local keypad to open the dowser of the projector. The dowser is open if the color of the DOWSER button is GREEN.
 - d) Press the **TEST PATTERN** button on the local keypad to project one of the internal test patterns of the projector on the screen.
 - e) Use the lens **ZOOM**, **SHIFT** and **FOCUS** buttons on the local keypad the match the projected image with the screen. Tilt the projector in case you can not SHIFT the image completely upon the screen.
12. **Resetting the lamp parameters.** The lamp parameters MUST be updated after each installation of an xenon lamp inside the lamp house or when replacing the complete lamp house. Neglecting this update will result in poor performance and short life time of the xenon lamp. Consult the Communicator software manual section *Installation* → *Lamp*.
13. **Realignment of the xenon lamp in its reflector.** For optimal performance of the xenon lamp it is required to realign the lamp after installation in the lamp house. See "Realignment of the lamp in its reflector", page 64 for more information.
14. **Adjusting the light path.** Normally the lens holder and the convergence of the projector is perfectly adjusted at the factory. Nevertheless, some applications require a readjustment of the lens holder, convergence or both. See procedure "Scheimpflug adjustment", page 44.
15. (if applicable) **Align the projected images of the stacked projectors.** See chapters "Adjusting the multifunctional frame", page 27 and "Aligning stacked projectors", page 31.
16. **Projection of a source signal.** Apply a single or dual channel DisplayPort (DP) source to the input ports of the projector and start up the projector. See chapter "Source input ports of the Barco HDQ 4K35 projector", page 52. Use the Communicator Touch Panel to configure the applied source. See the user guide of the Communicator Touch Panel for more detailed information.

3. PHYSICAL INSTALLATION

Overview

- Installation of the Lamp House
- Access to the power connection
- Power input setup of the HDQ 4K35
- Connecting the projector with the power net
- Connecting a UPS to the projector electronics
- Landscape and portrait mode
- Stacking multiple projectors
- Adjusting the multifunctional frame
- Aligning the projected image on the screen
- Aligning stacked projectors

3.1 Installation of the Lamp House



WARNING: Before installing the Lamp House, disconnect the power to the projector mains terminals and unplug the power cord at the UPS INLET for removal of all power from the projector.

Necessary tools

10 mm nut driver or flat screwdriver

How to install the Lamp House in the projector?

1. Remove the lamp cover.
2. Position the turning wires of the six **quarter turn screws** (1) so that they are flush with the cover. If this is not the case, interference may occur while inserting the Lamp House.

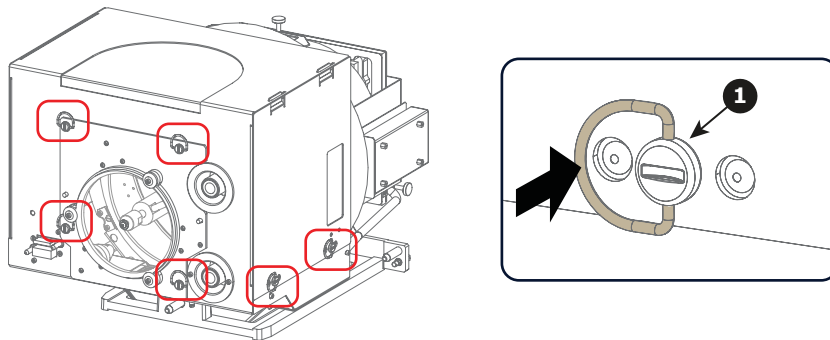


Image 3-1
Positioning the quarter turn screws

3. Grip the Lamp House by both handles (2 and 3) and place the front of the Lamp House on the base plate inside the lamp compartment of the projector, lining up the foot of the Lamp House with the slots on the base.
Warning: Be aware of the weight of the Lamp House. Take the necessary precautions to avoid personal injury.
4. Push the Lamp House fully into the slots.
5. Secure the Lamp House by fastening the two retaining screws (1) at the base of the Lamp House. Use a 10 mm nut driver or a flat screwdriver.

3. Physical installation

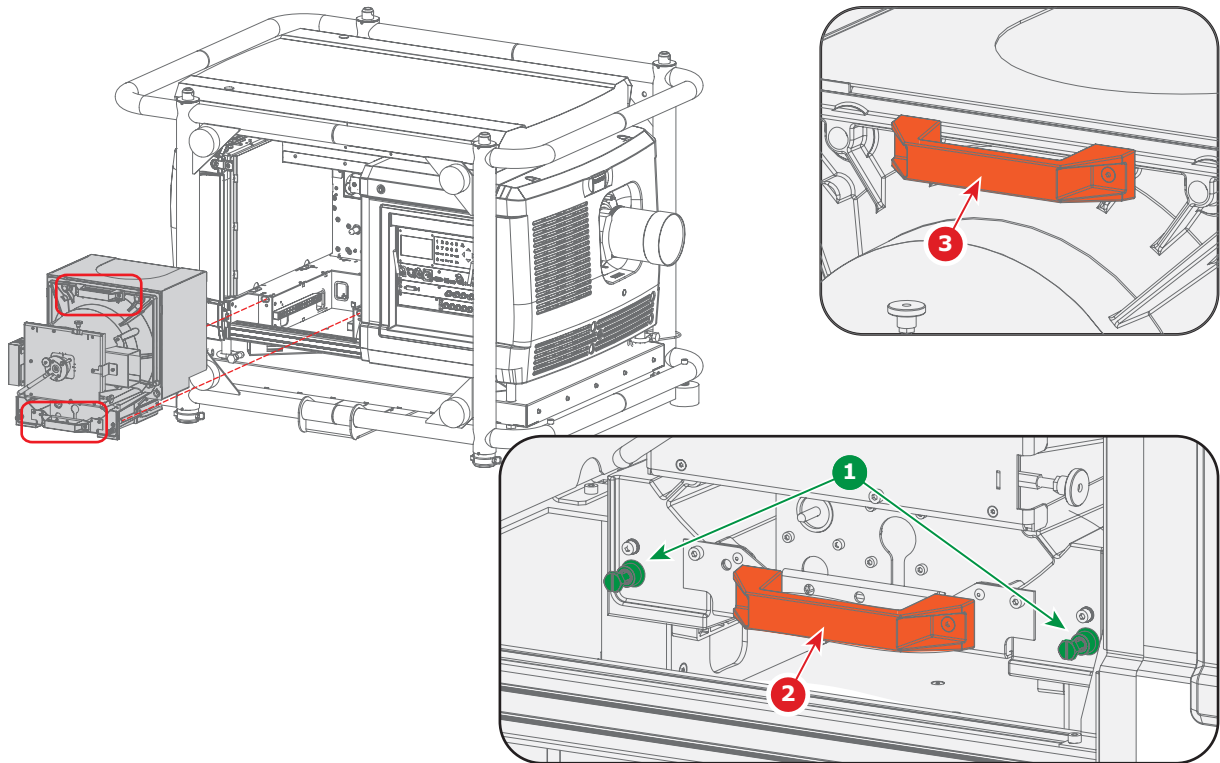


Image 3-2
Installation of the Lamp House

6. Install the lamp cover.

3.2 Access to the power connection

Necessary tools

Flat screwdriver - 6 mm

How to get access to the power connection of the projector?

1. Remove the back cover of the projector. See "Removal of the back cover", page 71.
2. Release the 2 captive screws (1).
3. Remove the power connection cover (2).

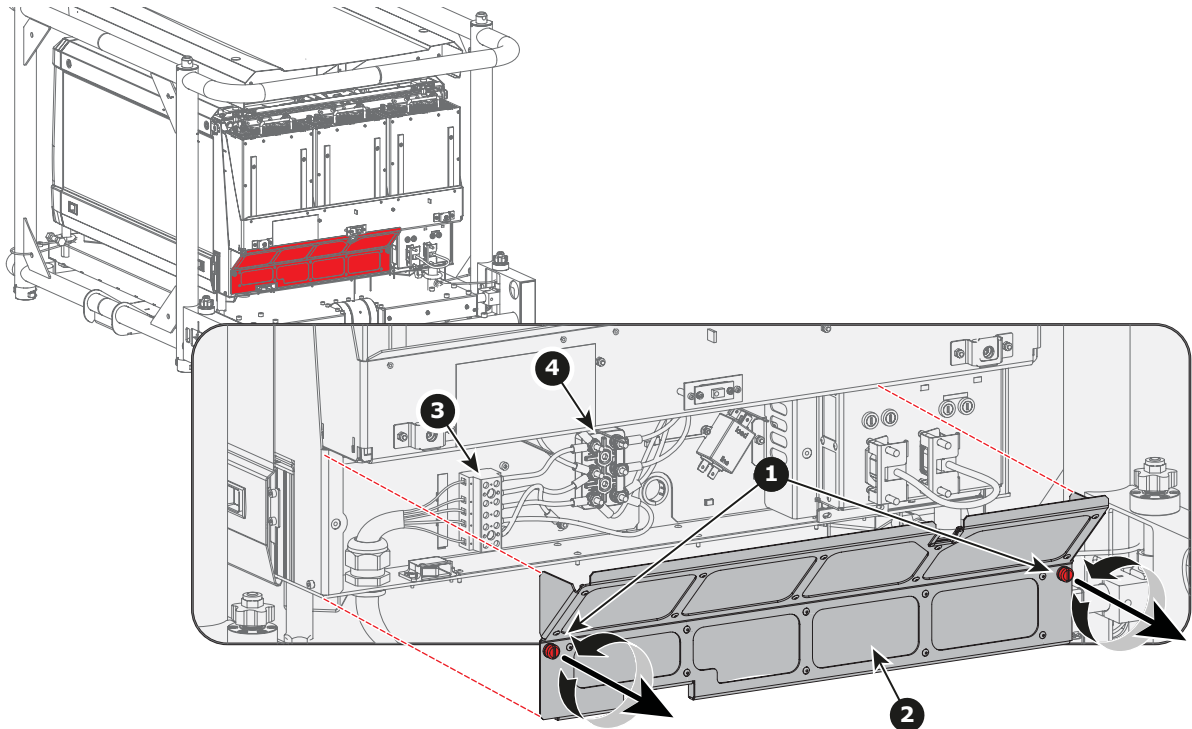


Image 3-3
Power connection access

The terminal barrier strip (3) and Y-Δ configuration block (4) is accessible.

3.3 Power input setup of the HDQ 4K35

About the power input

The projector power input can be configured for a power supply of 230/400V 3W+N+PE (Y-connection) or for 208V 3W+PE (Δ-connection). Before operating the projector, place the links in the correct position depending on the local power supply.

For a 3W+N+PE system, 400V is measured between the lines, 230V is measured between the lines and the neutral.

For a 3W+PE system, 208V is measured between the lines.

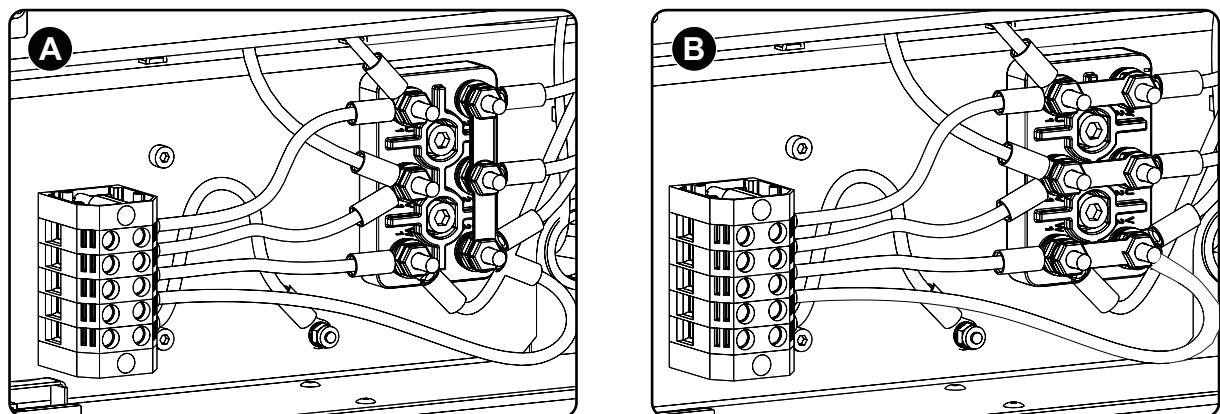


Image 3-4
Y-Δ connection

- A Y connection
- B Δ connection

Necessary tools

- Flat screw driver
- Wrench 10 mm
- Torque wrench 10 mm

How to switch from a Y-connection to Δ-connection

1. Loosen the 6 top nuts on the Y/Δ configuration block. (1 to 6)

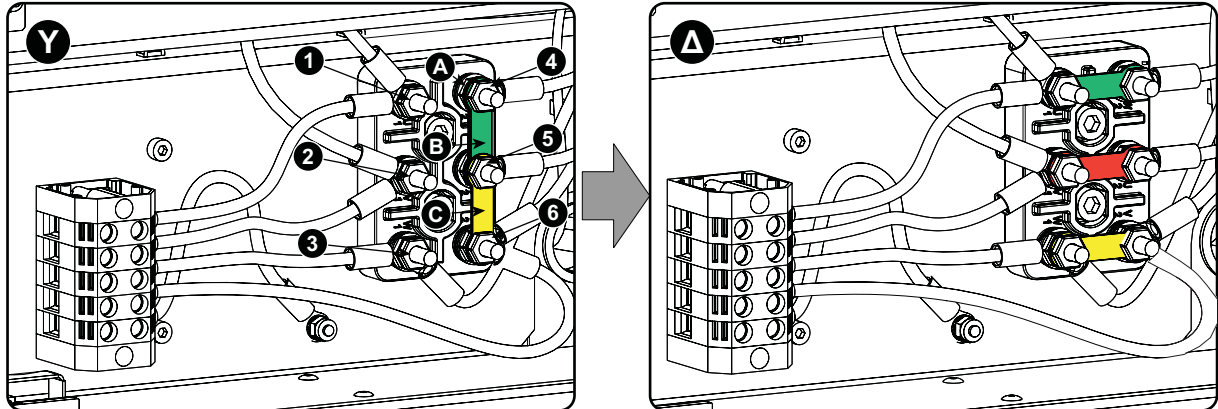


Image 3-5
Y to Δ connection

2. Take off the mounted links (A, B and C). Two links above each other or mounted between the upper and middle pin (A, B) and one link between the middle pin and lower pin (C).
3. Mount the links horizontally on the pins.
4. Turn a nut on each pin and secure with a torque wrench set to 7.5 Nm.

How to switch from a Δ-connection to Y-connection

1. Loosen the top nuts on the Y/Δ configuration block (1 to 6).

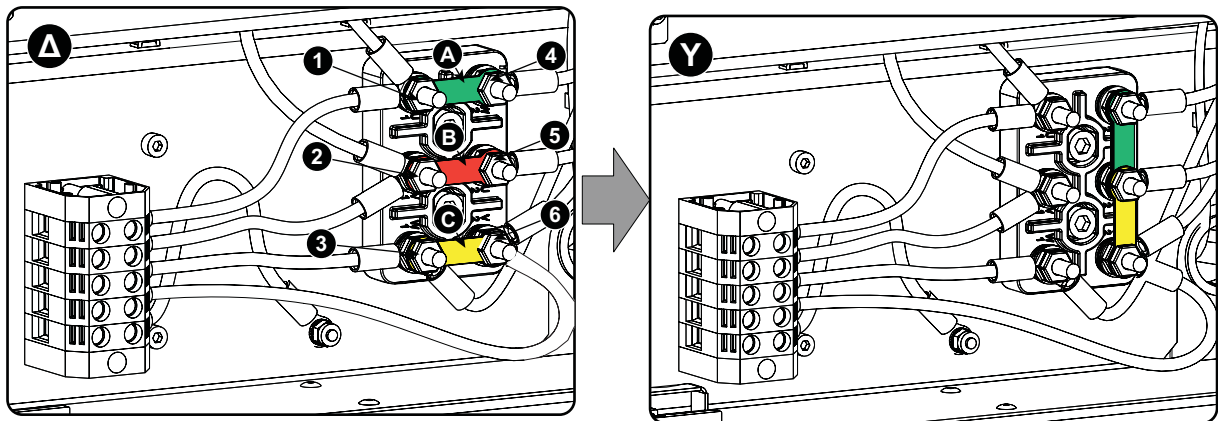


Image 3-6
Δ to Y connection

2. Take off the mounted links (A, B and C).
3. Connect the right pins together. Place 2 links between the upper pin and the middle pin (A, B) and 1 link between the middle pin and the lower pin (C).

3.4 Connecting the projector with the power net



WARNING: The total electrical installation should be protected by an appropriate rated and readily accessible disconnect switch, circuit breakers and ground fault current interrupters. The installation shall be done according to the local electrical installation codes.



WARNING: Make sure that the voltage range of projector matches with the voltage of the local power net.



CAUTION: The cross-sectional area of the conductors in the Power Supply Cord shall not be less than 4 mm² or AWG 10.

Necessary tools

- Flat torque screwdriver - 4 mm
- Adjustable wrench

Necessary parts

- (for 3W+N+PE, 230/400V) Certified power cable, minimum 4 mm² or AWG 10, 500V rated, cable diameter between 11 mm and 21 mm, or
- (for 3W+PE, 208V) Certified power cable, minimum 4 mm² or AWG 10, 300V rated, cable diameter between 11 mm and 21 mm
- Circuit breaker - maximum 40A

How to connect the projector with the power net?

1. Remove the back cover of the projector. See "Removal of the back cover", page 71.
2. Remove the power connection cover. See "Access to the power connection", page 18.
3. Loosen the cable gland fixation ring (1).
Note: The cable gland is specified for cables with a diameter between 11 mm and 21 mm.
4. Push the stripped power supply cable (2) through the cable gland. When using a flexible power cord, make sure each conductor end is provided with an end sleeve.
5. Secure the cable in the cable gland by tightening the fixation ring with an adjustable wrench.
6. Connect each wire of the power cable with the terminal barrier strip (3), according to the legend on the decal (4). Tighten the screws to a torque of 1.4 Nm.

Warning: Always connect ground conductor (PE) first.

Note: Always connect the neutral conductor (N) when available.

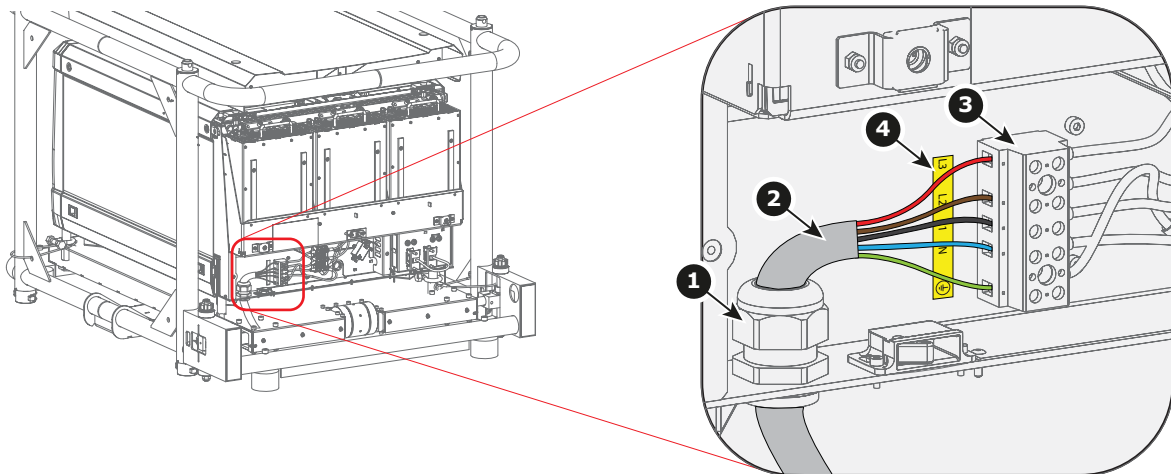


Image 3-7
Power connection

7. Install the power connection cover.
8. Install the back cover of the projector. See "Removal of the back cover", page 71.

3.5 Connecting a UPS to the projector electronics



UPS

Uninterruptible Power Supply

Introduction

This procedure explains how the projector electronics can be connected with a UPS. By default, the projector is configured for use without a UPS. A short power link cable (with plug type C13/C14) loops the power through to the projector electronics.



WARNING: Only use UPS units which are suitable for the HDQ 4K35.

How to connect a UPS to the projector electronics?

1. Install the UPS according to the instructions of the manufacturer and the local regulations.
2. Remove the short power link cable if present:
 - a) Remove both fixation springs (1) by squeezing them together and pulling them away from the power plugs.
 - b) Unplug both power plugs from the short power link cable (2).

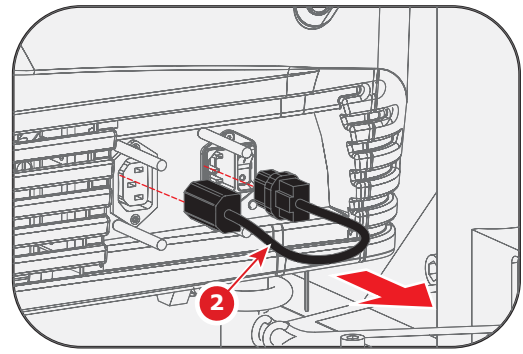
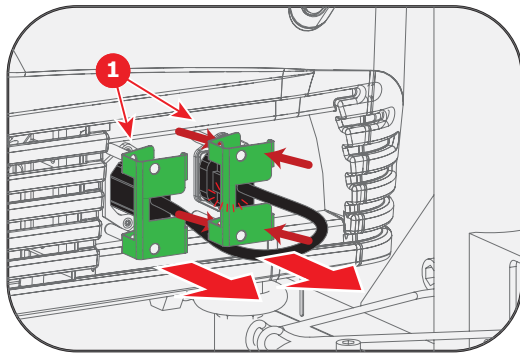
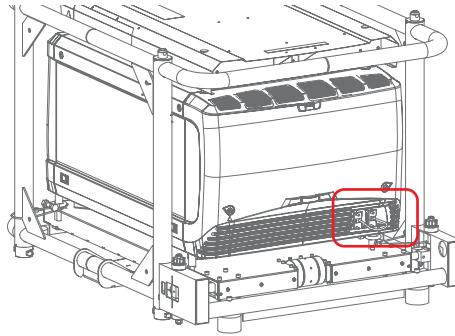


Image 3-8

3. Connect the power output cord from the UPS unit (1) to the UPS inlet socket of the projector (right socket) (2).
Tip: Position the cable behind the back cover instead of directly connecting the power plug. This will make it possible to remove the back cover without unplugging the UPS inlet cable.

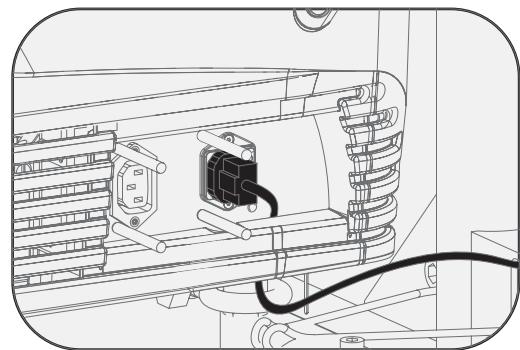
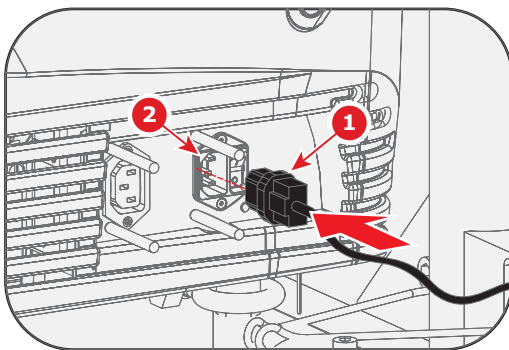


Image 3-9

4. Secure the UPS inlet socket with a fixation spring:
 - a) Squeeze the fixation spring together (1).
 - b) While squeezing, slide the fixation spring on the pins and push it against the power plug.
 - c) Release the fixation spring.
Tip: Install the second fixation spring on the power outlet socket to prevent losing it.

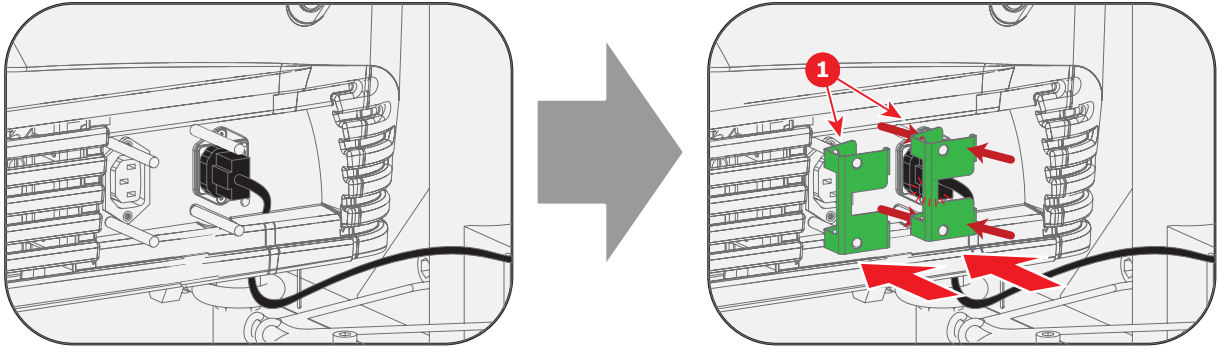


Image 3-10



CAUTION: The electrical connection with the UPS INLET socket of the projector must be done with a certified AC power supply cord (minimum 0,75 mm² or 18 AWG and minimum 300V)



CAUTION: Do not use the power OUTLET socket of the projector to provide power to other equipment!

3.6 Landscape and portrait mode



In the allowed positions, an additional inclination or rotation of $\pm 15^\circ$ is tolerated.

The inclination and rotation of the projector in the frame is included in these $\pm 15^\circ$.

Example: the projector is positioned in landscape mode and is rotated in the frame for 3° . An additional frame rotation of 12° of is allowed.

Landscape and portrait mode

The projector can be used in landscape or portrait mode.

The illustrations below shows which positions are allowed and which are not.

3. Physical installation

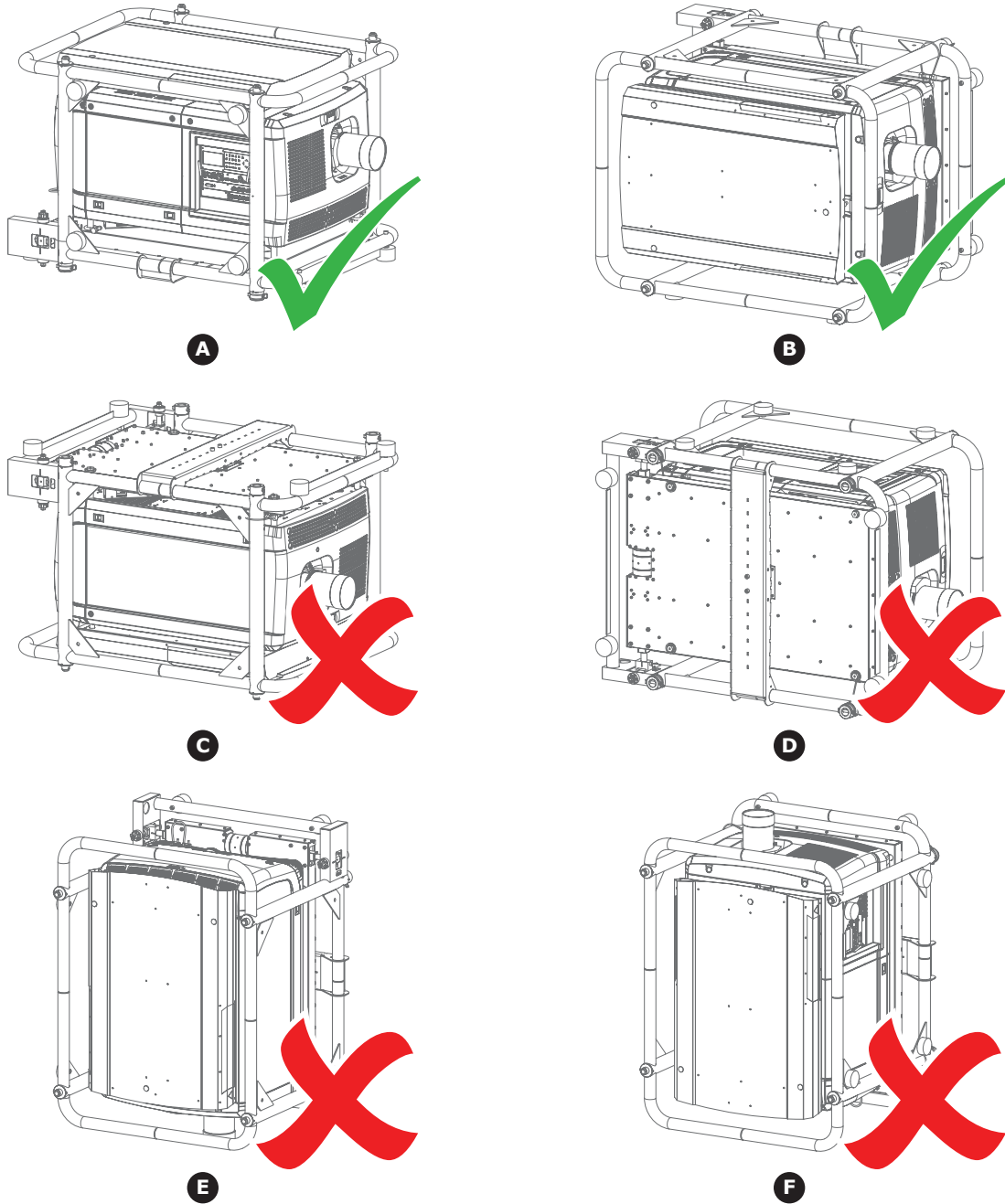


Image 3-11

- A Landscape mode (allowed)
- B Portrait mode (allowed)
- C Upside down (disallowed)
- D Turned over portrait mode (disallowed)
- E Upwards (disallowed)
- F Downwards (disallowed)



CAUTION: Do not use the projector in a disallowed position. Failure to do so can cause irreversible damage to the projector.



WARNING: It is not allowed to stack multiple projectors in portrait mode.



CAUTION: When the projector is used in portrait mode, always ensure the cooling liquid level is sufficient. To check the cooling liquid level, see "Checking cooling liquid level", page 61.

3.7 Stacking multiple projectors

Introduction

The Barco HDQ 4K35 is mounted by default in a multifunctional frame. This frame can be used to stack multiple projectors onto each other. The stacked projectors can be used in a standing (table mount) or hanging configuration (ceiling mount).



WARNING: Never stack more than three (3) projectors in a standing configuration (table mount) and never stack more than two (2) projectors in a hanging configuration (ceiling mount). Failure to do so can cause serious injury or death.



WARNING: It is not allowed to stack multiple projectors in portrait mode.



WARNING: It is forbidden to lift up the projector with manpower, use a hoisting tool instead. Do not underestimate the weight of the projector. The projector weights ± 210 kg (± 462 lb.).



WARNING: When the projector is suspended from a truss, minimum four (4) clamps must be used to secure the projector. The clamps must be fixed to the projector frame. Use a truss which is capable of handling five (5) times the complete load of the system.



WARNING: When the projector is suspended from a truss, always mount 2 safety cables around the projector frame and the truss.

When a dual stacking configuration is suspended from a truss, always mount 2 extra safety cables around both projector frames. See the procedure below for the correct use of these cables.

Allowed configurations

The illustrations below show which configurations are allowed. All other stacking configurations are not allowed.

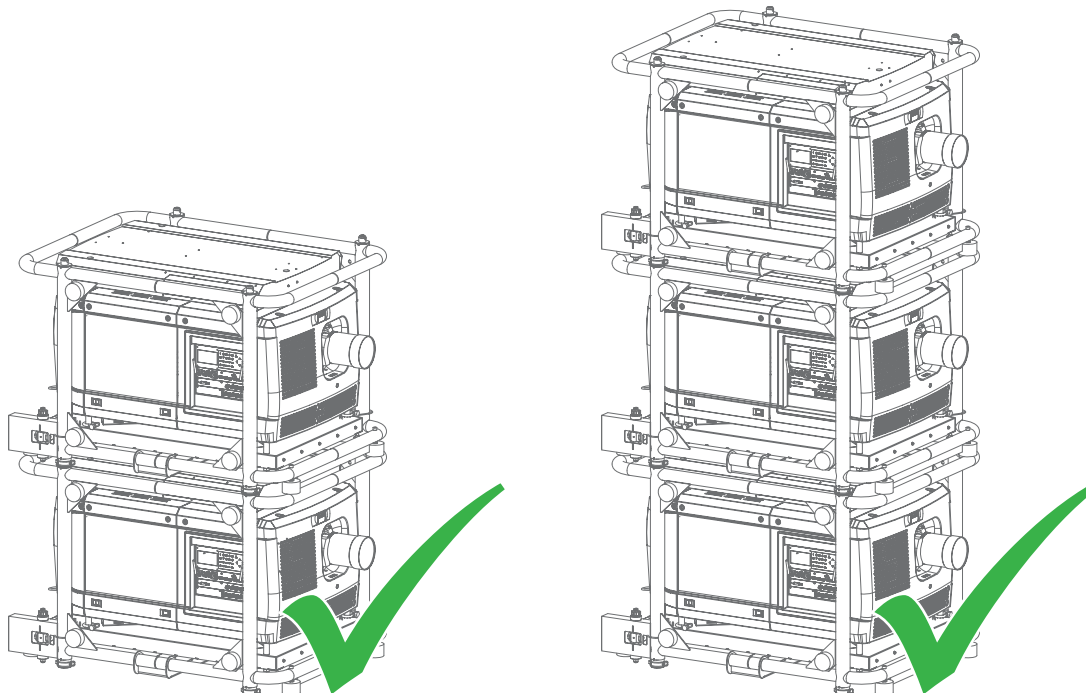


Image 3-12
Allowed configurations - table mount

3. Physical installation

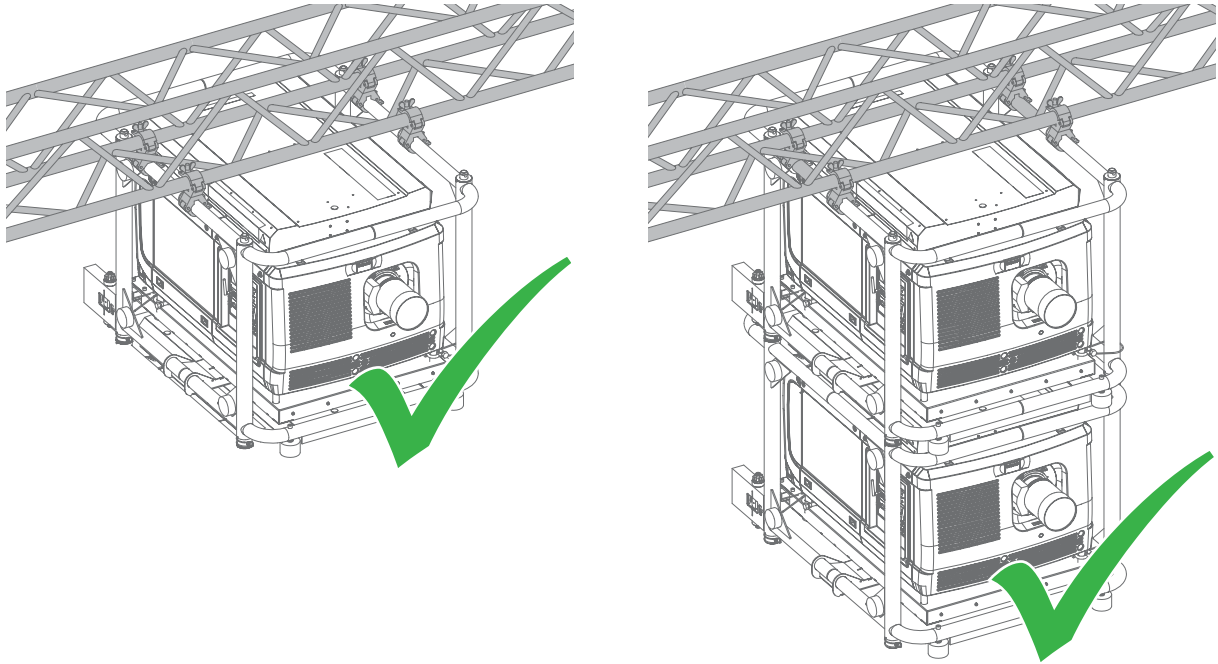


Image 3-13
Allowed configurations - ceiling mount

How to stack multiple projectors?

1. Position the first projector on a solid and level surface.
2. Remove the 4 pipe lynch pins (1) from the frame of the second projector.
3. Lift up the second projector and position it on the first projector (2). Make sure the pins of the lower frame fit in the holes of the upper frame.
Warning: It is forbidden to lift up the projector with manpower, use a hoisting tool instead. Do not underestimate the weight of the projector. The projector weights ± 210 kg (± 462 lb.).
4. Slide in the 4 pipe lynch pins (3) and secure them by swinging the lever (4).

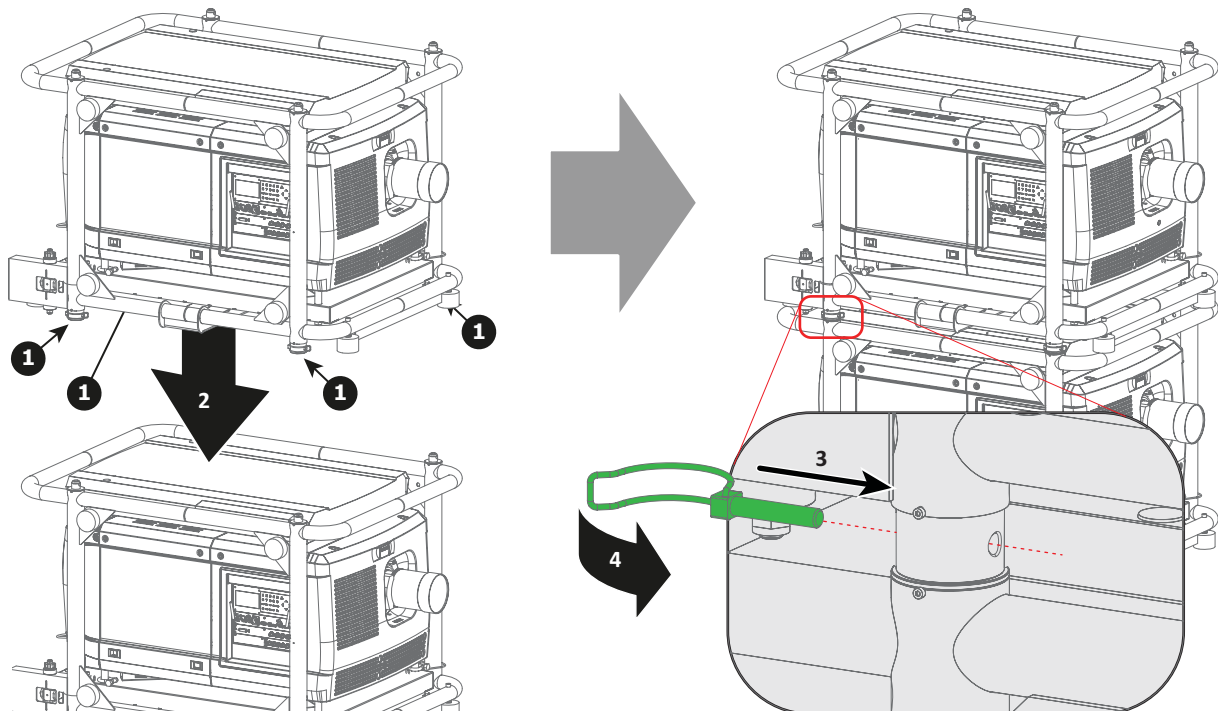


Image 3-14
Stacking projectors

5. Mount 2 (two) safety cables to secure both projector frames to each other:

- a) Push the safety hook through the loop of the safety cable and wrap the bottom frame.
- b) Mount the other end of the safety cable around the upper frame and clasp the safety hook around the cable as illustrated. Make sure that the falling distance is maximum 20 cm (8"). If necessary, before clasping the safety hook around the cable, turn the cable a few time around the frame.
- c) Repeat this procedure for the other safety cable on the other side of the frame.

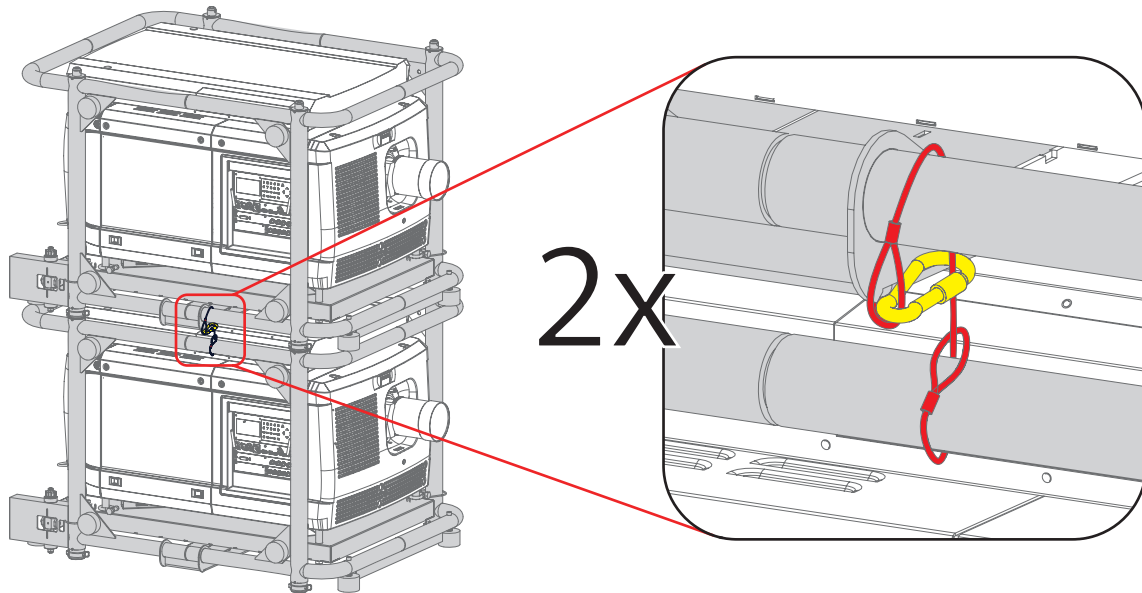


Image 3-15

3.8 Adjusting the multifunctional frame

Introduction

The Barco HDQ 4K35 is mounted by default in a multifunctional frame. This frame can be used to adjust the projector position. The frame can be adjusted in 3 different ways:

- inclining
- rotating
- skewing

The image below explains these 3 terms.

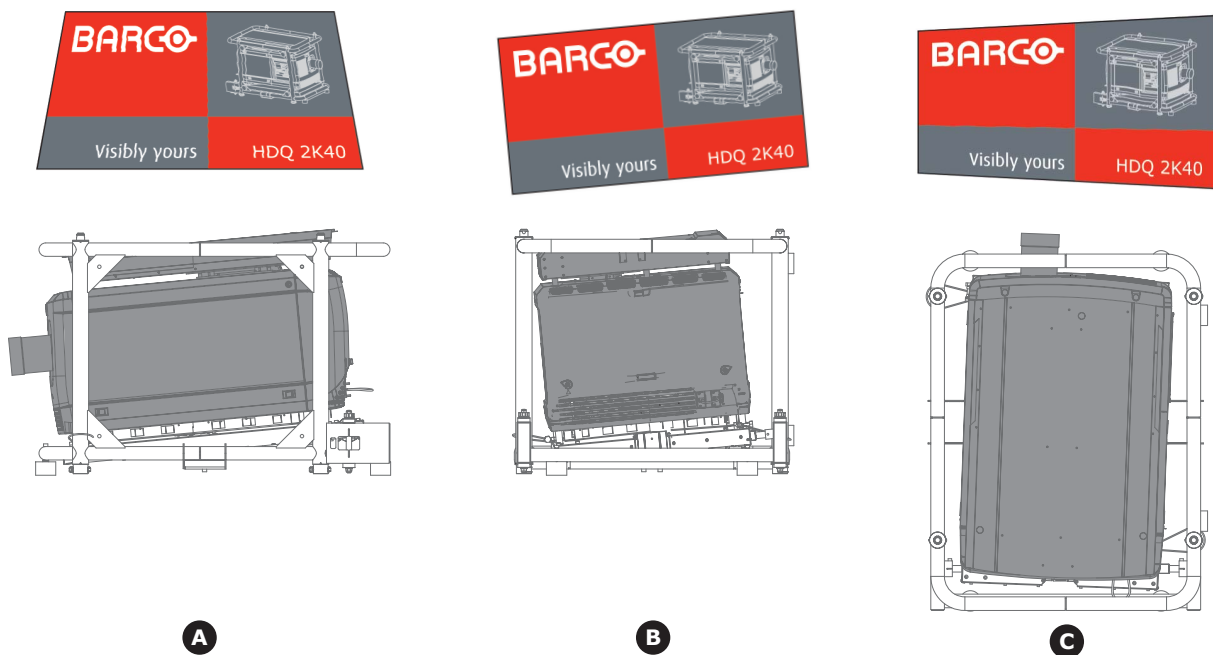


Image 3-16

3. Physical installation

- A Inclining
- B Rotating
- C Skewing

Necessary tools

- 2.5 mm Allen wrench
- 17 mm wrench

How to incline and rotate the projector in the frame?

1. Release the locking screw(s) (1) on the adjustment mechanism(s) on the back of the frame. Use a 2.5 mm Allen wrench.
2. Turn the left and right adjustment screw (2) anti clockwise to lower the back of the projector
Or,
clockwise to rise the back of the projector.
Note: A 17 mm wrench can be used to turn the adjustment screws.
3. Turn the left and right adjustment screw (2) in the opposite direction to rotate the projector.
4. Tighten the locking screw(s) (1). Use a 2.5 mm Allen wrench.

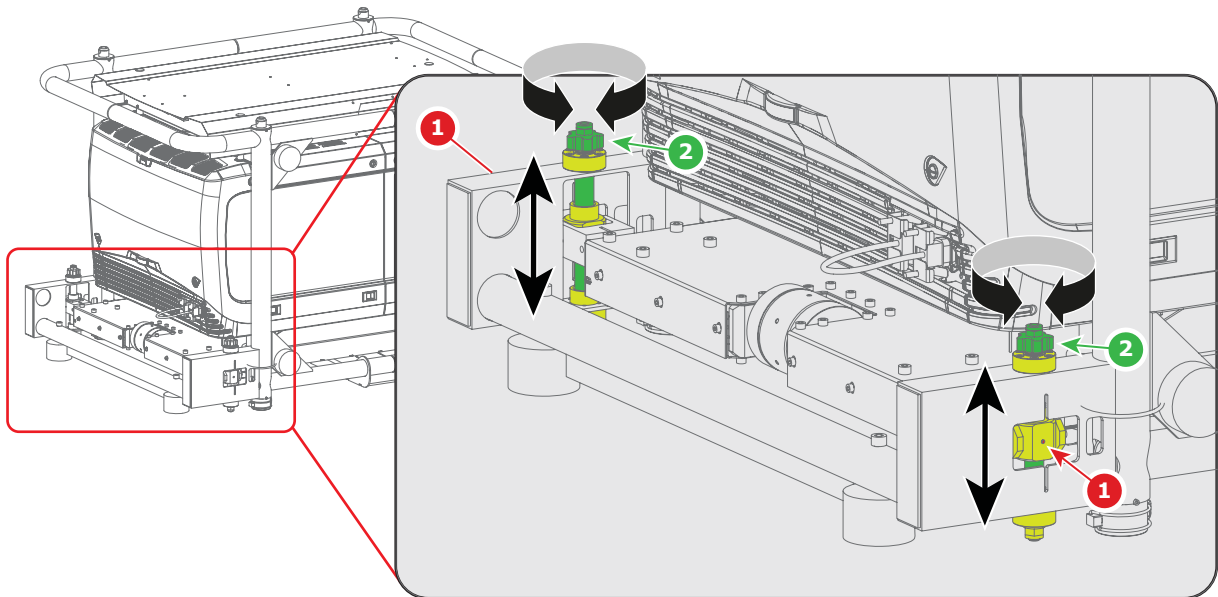


Image 3-17
Inclining and rotating the projector

How to skew the projector in the frame?

1. Release the locking screw(s) (1) on the adjustment mechanism on the back of the frame. Use a 2.5 mm Allen wrench.
Tip: Only the most reachable locking screw(s) on the adjustment rod may have been secured previously.
2. Turn the adjustment rod (2) clockwise to skew the projector clockwise
Or,
anti clockwise to skew the projector anti clockwise.
3. Tighten the locking screw(s) (1). Use a 2.5 mm Allen wrench.
Tip: Only secure the most reachable locking screw(s).

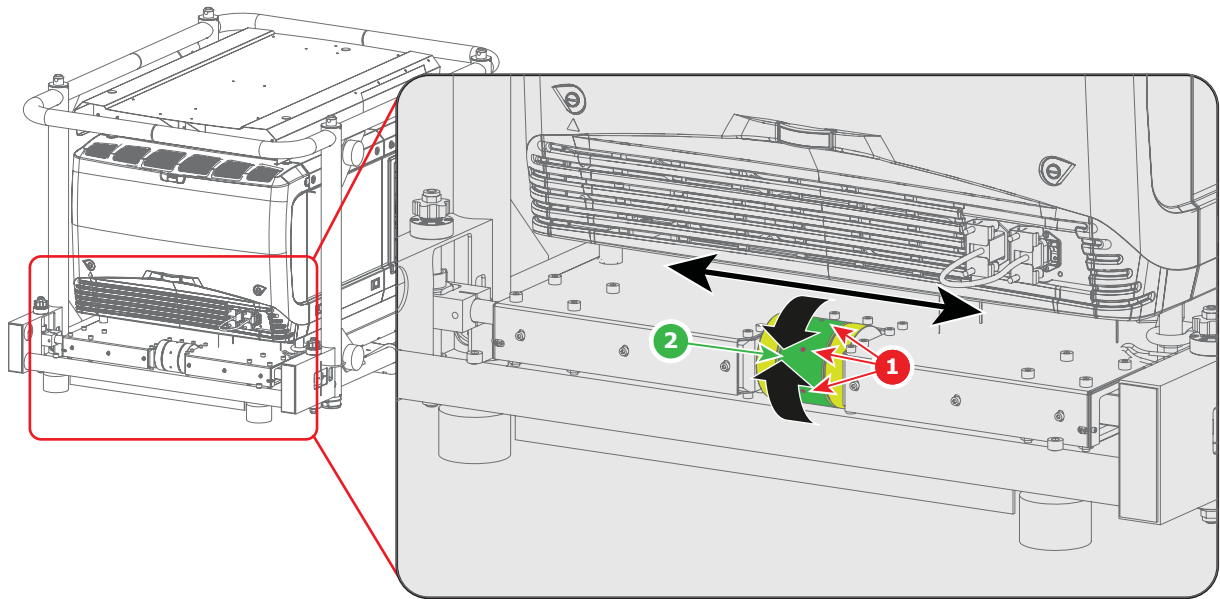


Image 3-18
Skewing the projector

3.9 Aligning the projected image on the screen

About aligning

Use the Communicator software to align the projector. For more detailed information, consult the Communicator software user guide.

Alignment steps

1. Project an internal hatch pattern with the projector. In the navigation pane, click on *Control* → *Test Patterns*. Use one of the short cuts to display a test pattern.
2. Adjust the rotation of the projector.
Adjust until the outline of the hatch pattern is most symmetric with the projection screen.

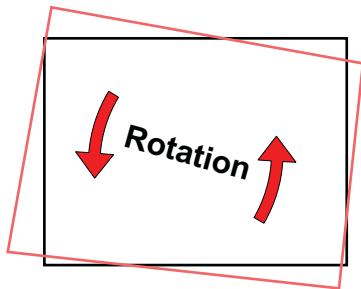


Image 3-19

3. Adjust the inclination of the projector.
Adjust until the outline of the hatch pattern is most symmetric with the projection screen.

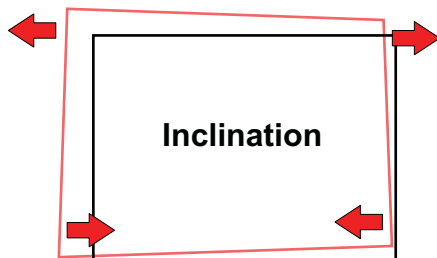


Image 3-20

4. Adjust the skew of the projector.
Adjust until the outline of the hatch pattern is most symmetric with the projection screen.

3. Physical installation

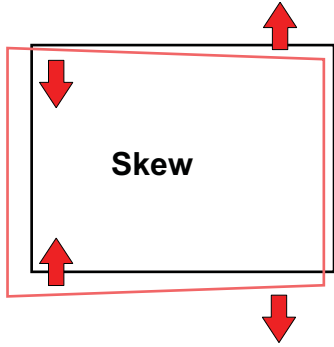


Image 3-21

- Shift the hatch pattern horizontally and vertically until the outline of the hatch pattern is most symmetrically placed with respect to projection screen.
Use Communicator software to shift. In the navigation pane, click on *Configuration* → *Lens*. The *Lens settings* menu opens.
Use the *Lens shift* buttons to shift the image.
Or, use the shift buttons on the local keypad.

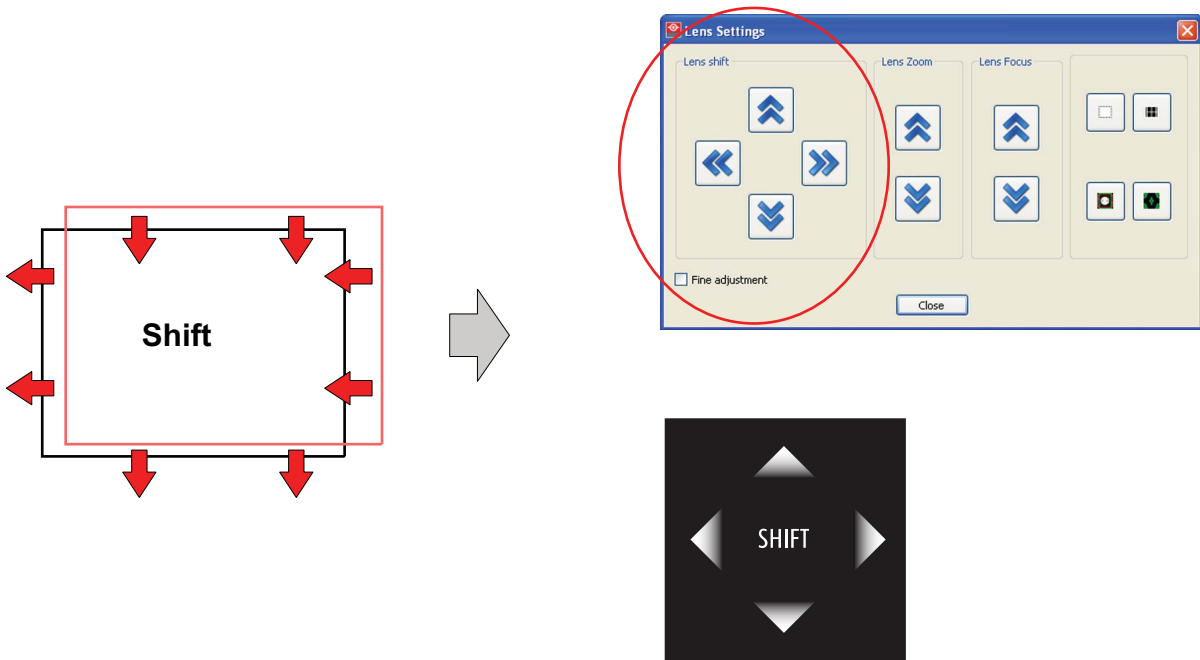


Image 3-22

- Zoom the hatch pattern in or out until the outline of the hatch pattern matches exactly the outline of the projection screen.
Use Communicator software to zoom. In the navigation pane, click on *Configuration* → *Lens*. The *Lens settings* menu opens.
Use the *Lens zoom* buttons to zoom the image.
Or, use the zoom buttons on the local keypad.

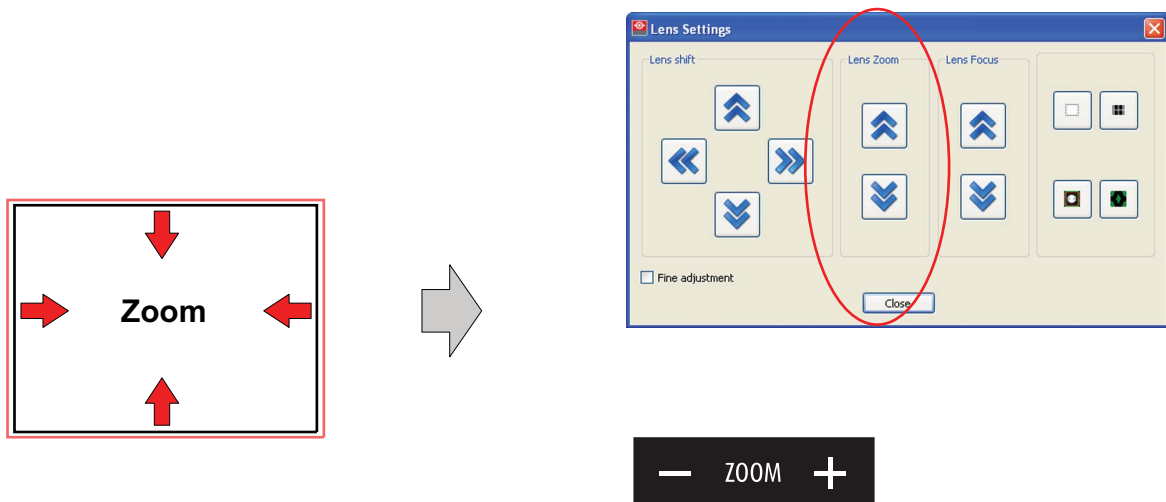


Image 3-23

7. Repeat from step 2 until the hatch pattern of the stacked projector is perfectly aligned with the projection screen.
8. Focus the projector to the screen until the hatch pattern is perfectly sharp.
Use Communicator software to focus. In the navigation pane, click on *Configuration* → *Lens*. The *Lens settings* menu opens.
Use the *Lens focus* buttons to focus the image.

3.10 Aligning stacked projectors



Prior to starting the procedure below, make yourself familiar with the adjustment mechanism of the multifunctional frame. See "Adjusting the multifunctional frame", page 27.



Reference projector

In case of a standing configuration (table mount), this is the lowest projector.

In case of a hanging configuration (ceiling mount), this is the uppermost projector.

Necessary tools

- 2.5 mm Allen wrench
- 17 mm wrench

How to align stacked projectors

1. Align the **reference projector** on the screen. See "Aligning the projected image on the screen", page 29.
2. Project an internal hatch pattern with the **reference projector**. In the navigation pane, click on *Control* → *Test Patterns* and select a hatch pattern.

Note: *The pattern must be sharp and must have a perfect rectangle outline.*

*If this is not the case, readjust the **reference projector** before aligning the other stacked projector(s) with the reference hatch pattern.*

3. Project the same internal hatch pattern with the **stacked projector**. In the navigation pane, click on *Control* → *Test Patterns* and select a hatch pattern.
4. Adjust the rotation of the **stacked projector** with respect to the **reference projector**.
Adjust until the outline of the hatch pattern is most symmetric with the reference hatch pattern.

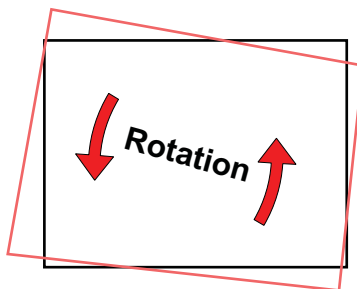


Image 3-24

5. Adjust the inclination of the **stacked projector** with respect to the **reference projector**.
Adjust until the outline of the hatch pattern is most symmetric with the reference hatch pattern.

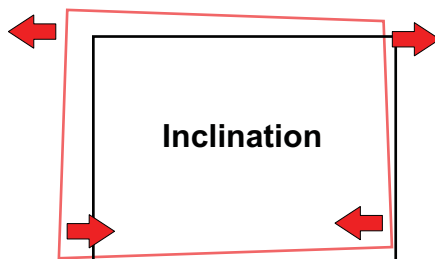


Image 3-25

6. Adjust the skew of the **stacked projector** with respect to the **reference projector**.
Adjust until the outline of the hatch pattern is most symmetric with the reference hatch pattern.

3. Physical installation

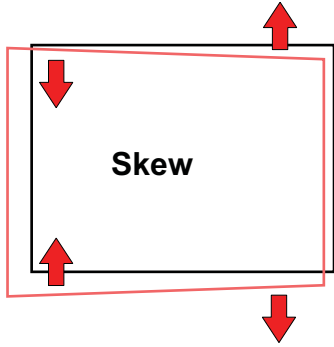


Image 3-26

- Shift the hatch pattern horizontally and vertically until the outline of the hatch pattern is most symmetrically placed with respect to the reference hatch pattern.
Use Communicator software to shift. In the navigation pane, click on *Configuration* → *Lens*. The *Lens settings* menu opens.
Use the *Lens shift* buttons to shift the image.
Or, use the shift buttons on the local keypad.

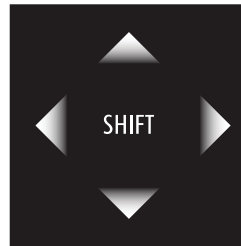
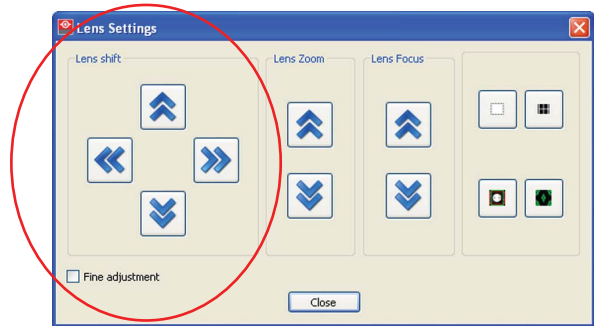
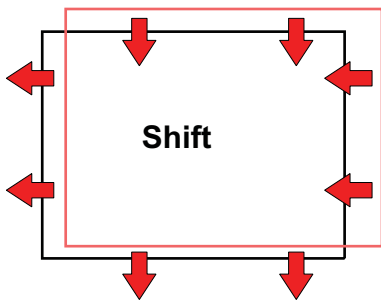


Image 3-27

- Zoom the hatch pattern in or out until the outline of the hatch pattern matches exactly the outline of the reference hatch pattern.
Use Communicator software to zoom. In the navigation pane, click on *Configuration* → *Lens*. The *Lens settings* menu opens.
Use the *Lens zoom* buttons to zoom the image.
Or, use the zoom buttons on the local keypad.

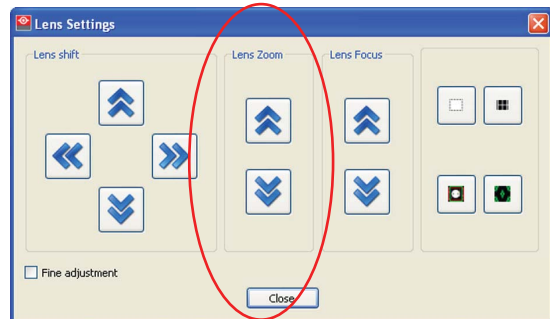
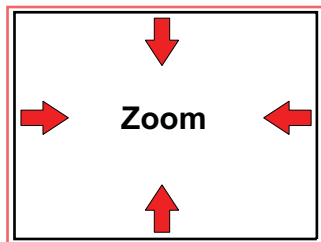


Image 3-28

9. Repeat from step 2 until the hatch pattern of the stacked projector is perfectly aligned with the hatch pattern of the reference projector.
10. Focus the projector to the screen until the hatch pattern is perfectly sharp.
Use Communicator software to focus. In the navigation pane, click on *Configuration* → *Lens*. The *Lens settings* menu opens.
Use the *Lens focus* buttons to focus the image.



In case of a triple stacked standing projector configuration (table mount) adjust and align the reference projector first, than the middle projector and finally the uppermost projector.

4. LENSES & LENS HOLDER

About this chapter

This chapter gives an overview of available lenses for the Barco HDQ 4K35 and explains how you can select the best suited lens for your specific situation using the lens formulas. Also, it is explained how to install and remove a lens from the projector lens holder. Furthermore, it is described how you can perform the Scheimpflug adjustment.



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.

Overview

- Available lenses
- Lens selection
- Lens installation
- Lens removal
- Installing the lens fixation mechanism
- Removing the lens fixation mechanism
- Lens shift, zoom & focus
- Additional vertical shift of the Lens Holder
- Scheimpflug adjustment
- Fixation of the Lens Holder front plate

4.1 Available lenses

Which lenses are available for my projector?



The table below is subject to changes. Consult Barco's web site and click on myBarco for the most recent information about available lenses.

Product Number	Zoom range	Image
R9852950	1,0 (fixed)	image 4-1
R9852090	1,45 – 1,8	image 4-2
R9852092	1,8 – 2,4	image 4-3
R9852094	2,2 – 3	image 4-4
R9852100	2,8 – 5,5	image 4-5
R9852920	5,5 – 8,5	image 4-6
R9856294	1,35 – 1,86	image 4-7
R9856297	1,46 – 2,10	image 4-8
R9856300	1,65 – 2,60	image 4-9

4. Lenses & Lens Holder



Image 4-1
R9852950



Image 4-2
R9852090



Image 4-3
R9852092



Image 4-4
R9852094



Image 4-5
R9852100



Image 4-6
R9852920



Image 4-7
R9856294



Image 4-8
R9856297



Image 4-9
R9856300

4.2 Lens selection

How to select the right lens

1. Determine the required screen width (SW).
2. Determine the approximate position of the projector in the room.
3. Start up the *Lens Calculator* on the Barco website: <http://www.barco.com/en/tools/lenscalculator> to determine the possible lenses for your configuration.

The Lens Calculator window opens.



Image 4-10
Lens calculator



The Lens Calculator can also be used to determine the position of the projector when the lens type and screen width is known.

4.3 Lens installation



WARNING: Ensure safe fixation of the projector lens. The lens fixation mechanism must be installed. See "Installing the lens fixation mechanism", page 40

How to install a lens?

1. Remove the plastic lens holder cover.
 - a) Put the lock (1) into the unlock position.
 - b) Take out the plastic cover.

4. Lenses & Lens Holder

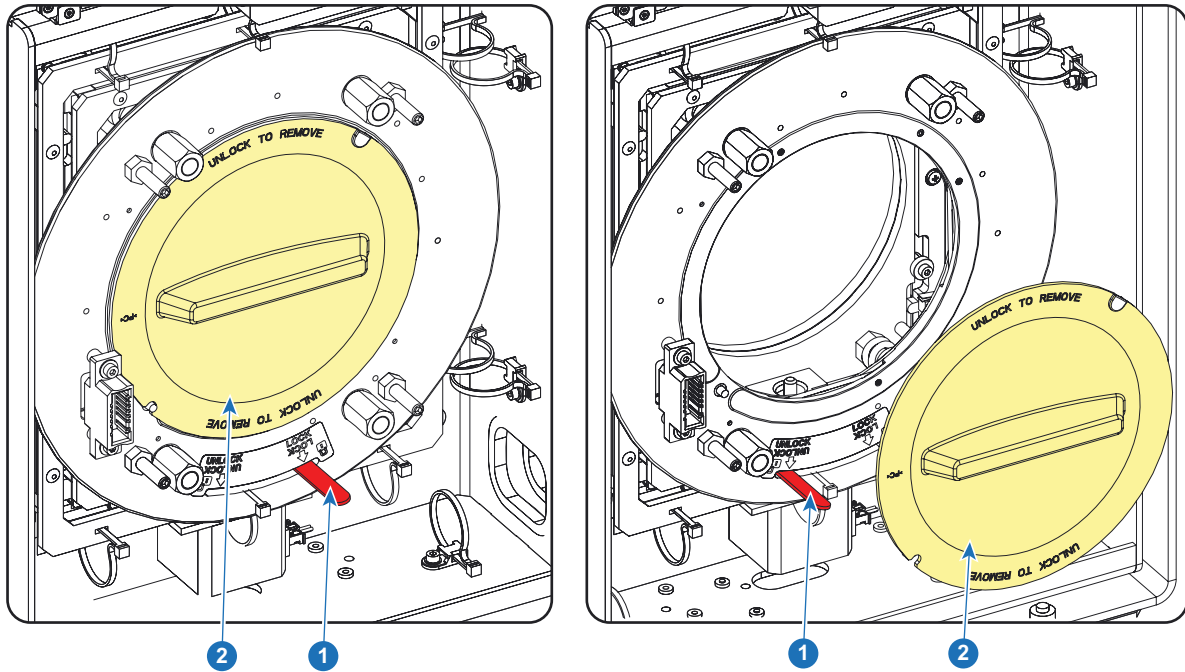


Image 4-11

2. Take the lens assembly out of its packing material and remove the lens caps on both sides.
3. Place the lens holder in the "unlocked" position by moving the lens lock handle (1) towards the lens power supply socket (2).

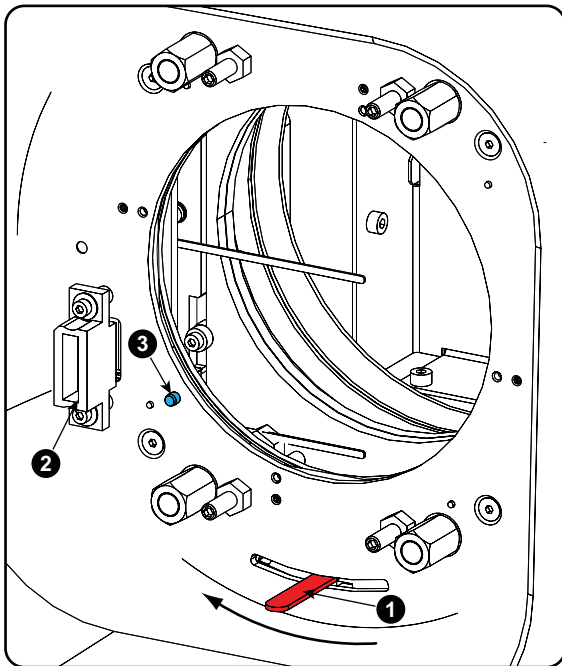


Image 4-12
Unlock lens holder

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.

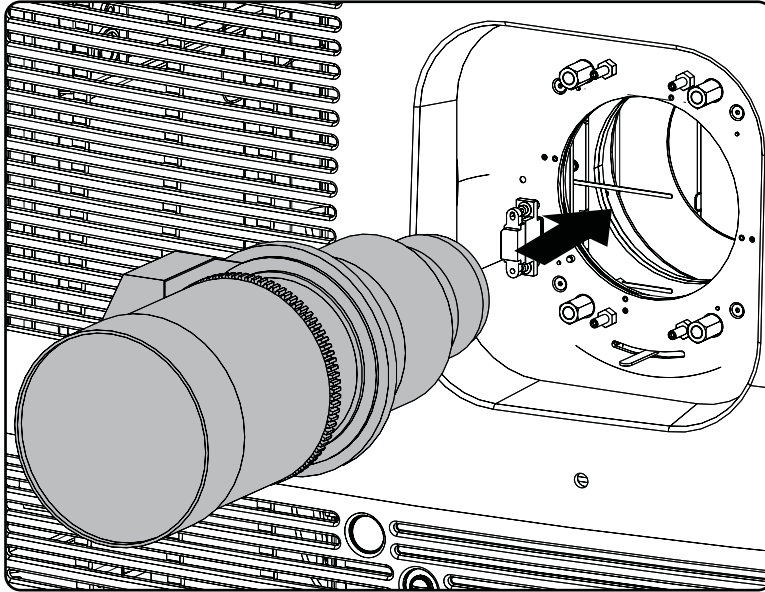


Image 4-13
Mount lens

6. Insert the lens until the connector seats into the socket.
 - the pin (3) on the lens holder matches with the sleeve in the lens.
 - the connector seats into the socket (2)

Warning: Do not release the Lens yet, as the Lens may fall out of the Lens Holder.

7. Secure the lens in the lens holder by sliding the lens lock handle into the "locked" position, which is away from the lens power supply socket. Ensure the lens touches the front plate of the lens holder.

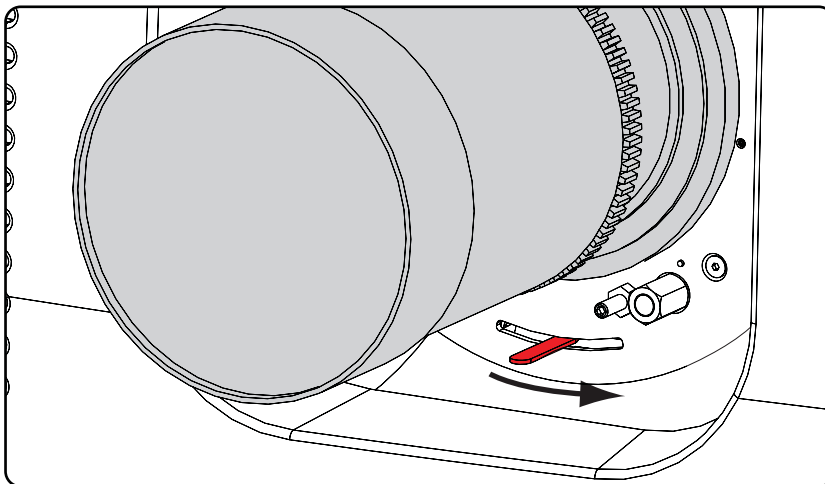


Image 4-14
Fix lens

8. Continue with the installation of the lens fixation mechanism, see "Installing the lens fixation mechanism", page 40.



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.

4.4 Lens removal

How to remove a lens?

1. Support the lens with one hand while you unlock the lens holder by sliding the lock handle towards the "unlocked" position as illustrated.

4. Lenses & Lens Holder

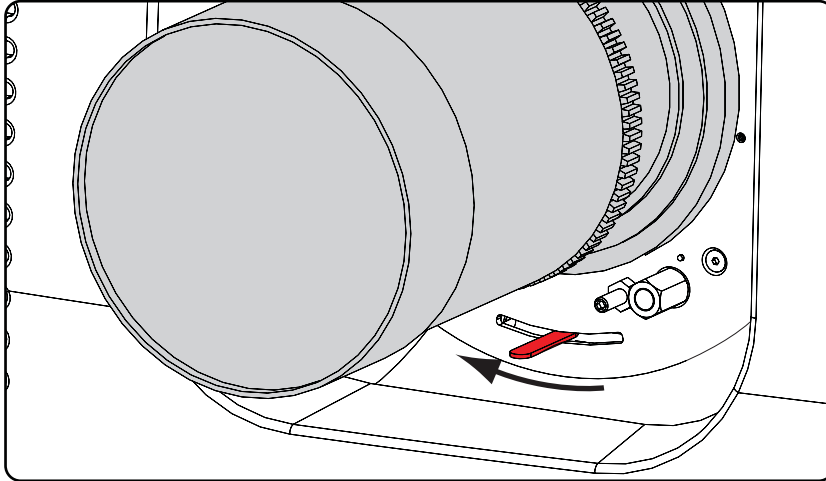


Image 4-15
Unlock lens

2. Gently pull the lens out of the lens holder.

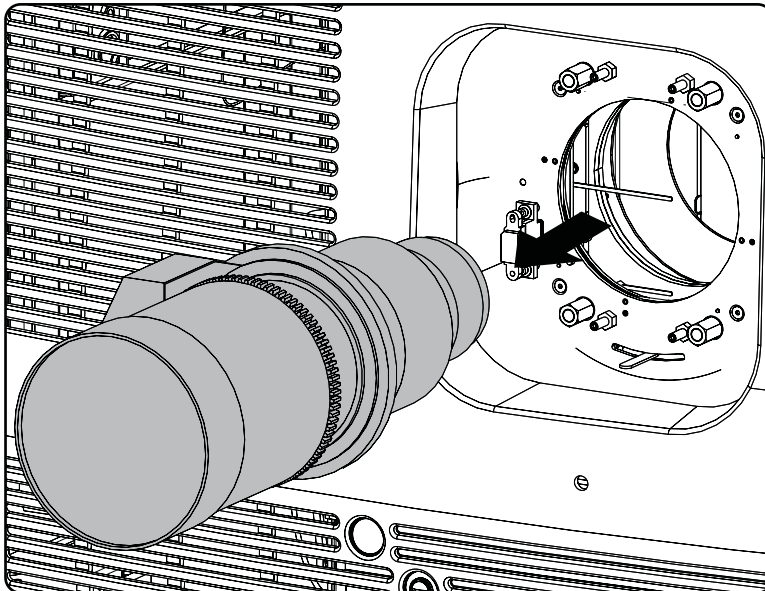


Image 4-16
Remove lens



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.

4.5 Installing the lens fixation mechanism



WARNING: Ensure safe fixation of the projector lens. The lens fixation mechanism must be installed. See "Installing the lens fixation mechanism", page 40

Necessary tools

10 mm wrench

How to install the lens fixation mechanism?

1. Place the 2 lens fixation brackets (1) into position, as illustrated below. The fixation brackets must prevent the lens from coming loose from the Lens Holder.
2. Secure the fixation brackets by installing a nut (2) on each bracket. Use a 10 mm wrench.

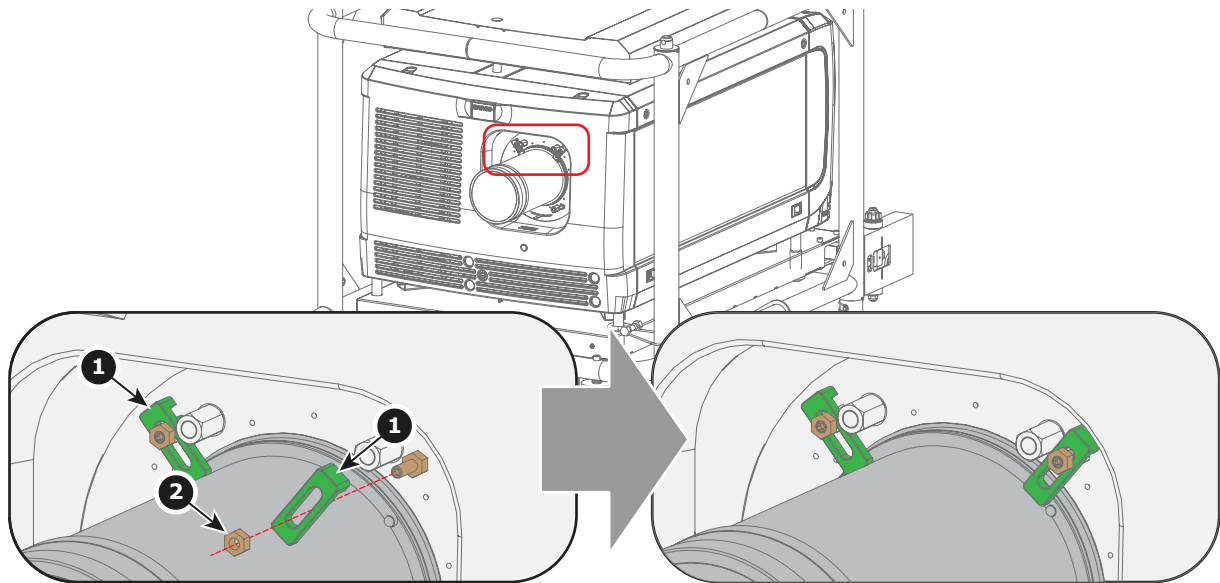


Image 4-17
Installing the lens fixation mechanism



Depending on which lens is used, it may not always be possible to install the fixation brackets at the positions showed on the illustration. In that case, the brackets may be installed on the underside of the lens, following the same principle. Always install 2 fixation brackets.

4.6 Removing the lens fixation mechanism

Necessary tools

10 mm wrench

How to remove the lens fixation mechanism?

1. Remove the nuts (2) from the fixation brackets. Use a 10 mm wrench.
2. Remove the fixation brackets (1) from the Lens Holder.

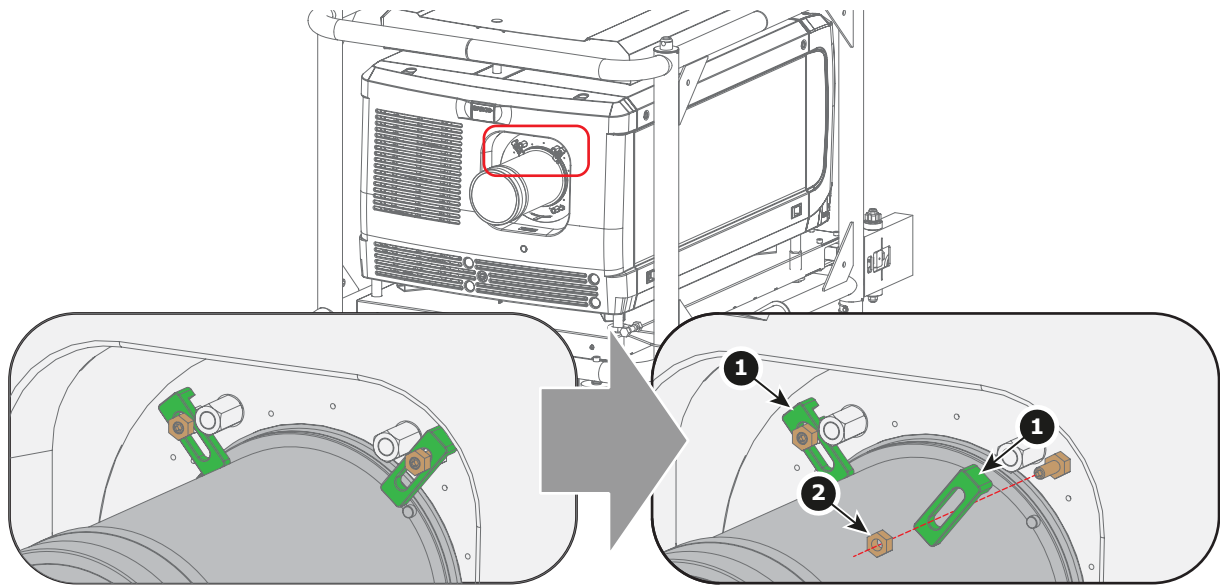


Image 4-18
Removing the lens fixation mechanism

4.7 Lens shift, zoom & focus

Motorized lens adjustment

The HDQ is equipped with a motorized lens shift functionality and a motorized zoom & focus functionality. Adjustments can be done with the keys on the local keypad or via Communicator software.

How to shift the lens

1. Use the **up and down** arrow keys on the local keypad to shift the lens **vertically** and use the **left and right** arrow keys on the local keypad to shift the lens **horizontally**.

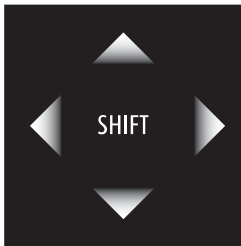


Image 4-19

Or,
in Communicator, click in the navigation pane on *Configuration* → *Lens*

How to zoom in or out

1. Is the zoom lens equipped with a motorized zoom?
If yes, use the **“+”** and **“-” zoom keys** on the local keypad to zoom in or out.



Image 4-20

If no, use the **zoom barrel** on the lens to zoom in or out.

How to focus

1. Use the **“+”** and **“-” focus keys** on the local keypad to focus the image on the screen.



Image 4-21



Take into account that the lens focus may slightly drift while the lens is warming up from cold to operation temperature. This is a typical phenomenon for projection lenses used with high brightness projectors. The operation temperature of the lens is reached after approximately 30 minutes projection of average video.

4.8 Additional vertical shift of the Lens Holder

Introduction

The lens of the HDQ 4K35 can be shifted vertically. The maximum vertical shift range is $\pm 110\%$ in both directions, which is not sufficient in some situations. To extend the vertical shift range in a certain direction, the Lens Holder can be shifted manually.



Extending the vertical shift range in a certain direction, will reduce the available range in the other direction.

Necessary tools

3 mm Allen wrench

How to shift the Lens Holder?

1. Remove the front projector cover. See "Removal of the front cover", page 70.
2. Loosen the 4 screws (1) until the central part of the Lens Holder becomes loose. Use a 3 mm Allen wrench.
3. Shift the central part up or down as desired. The lowermost, middle and uppermost shift positions are marked on the Lens Holder with a little arrow (2).
4. Tighten the 4 screws (1) to a torque of **8.4 Nm**.

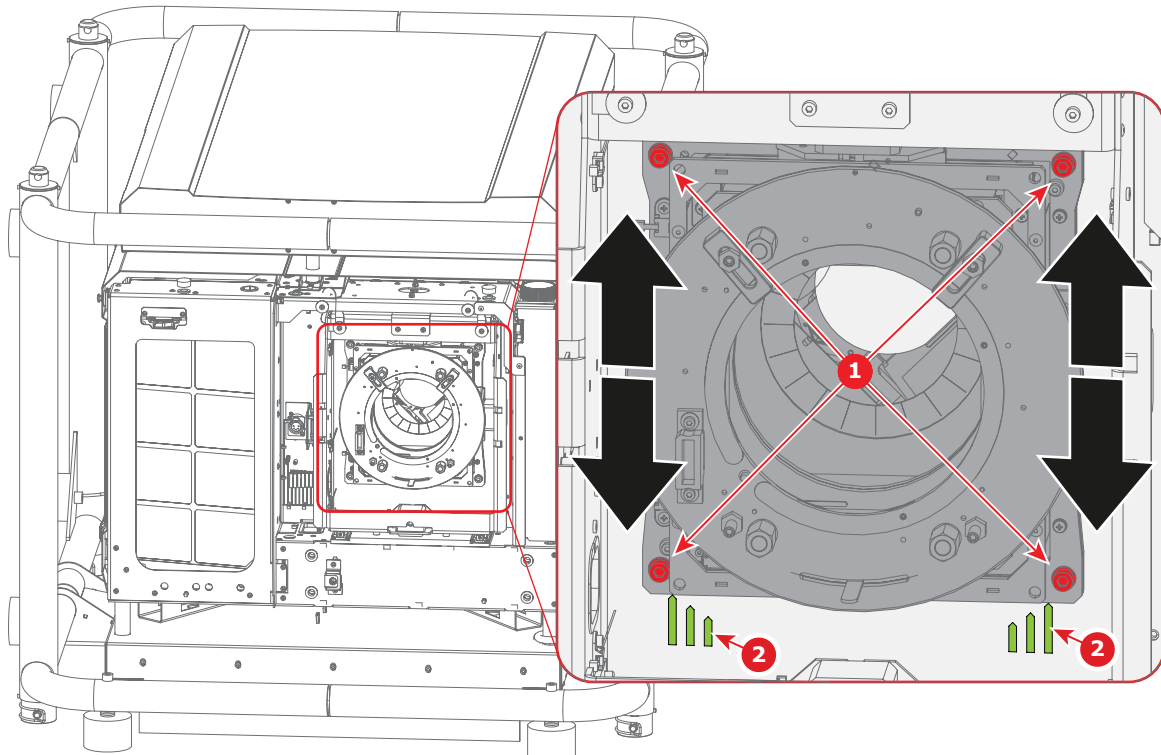


Image 4-22

5. Install the front projector cover. See "Installation of the front cover", page 70..

4.9 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 Scheimpflug'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).

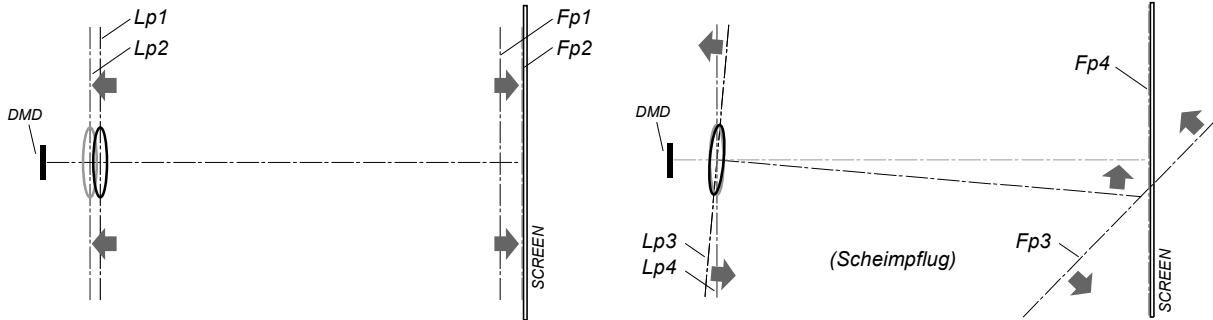


Image 4-23
Scheimpflug principle



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

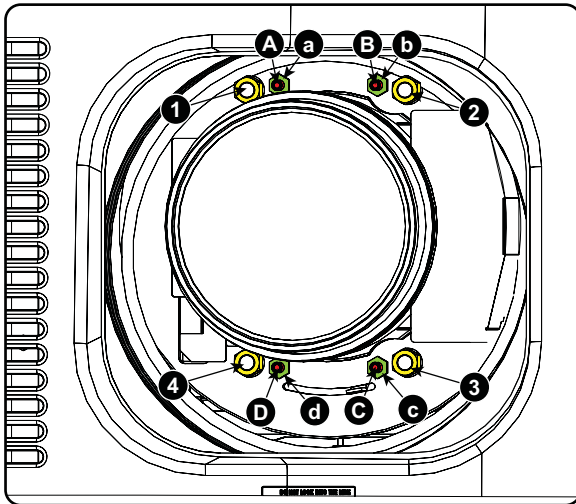


Image 4-24
Scheimpflug adjustments

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. For a 4K projector, use the 4K test pattern. Otherwise, use the 2K test pattern.

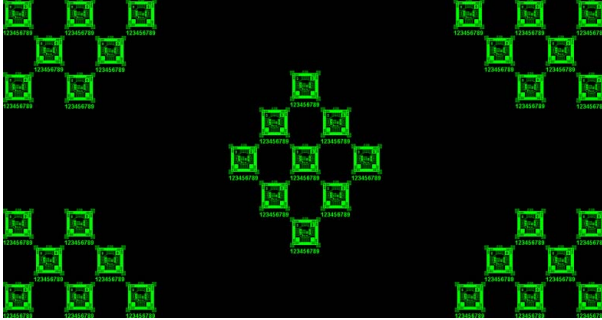
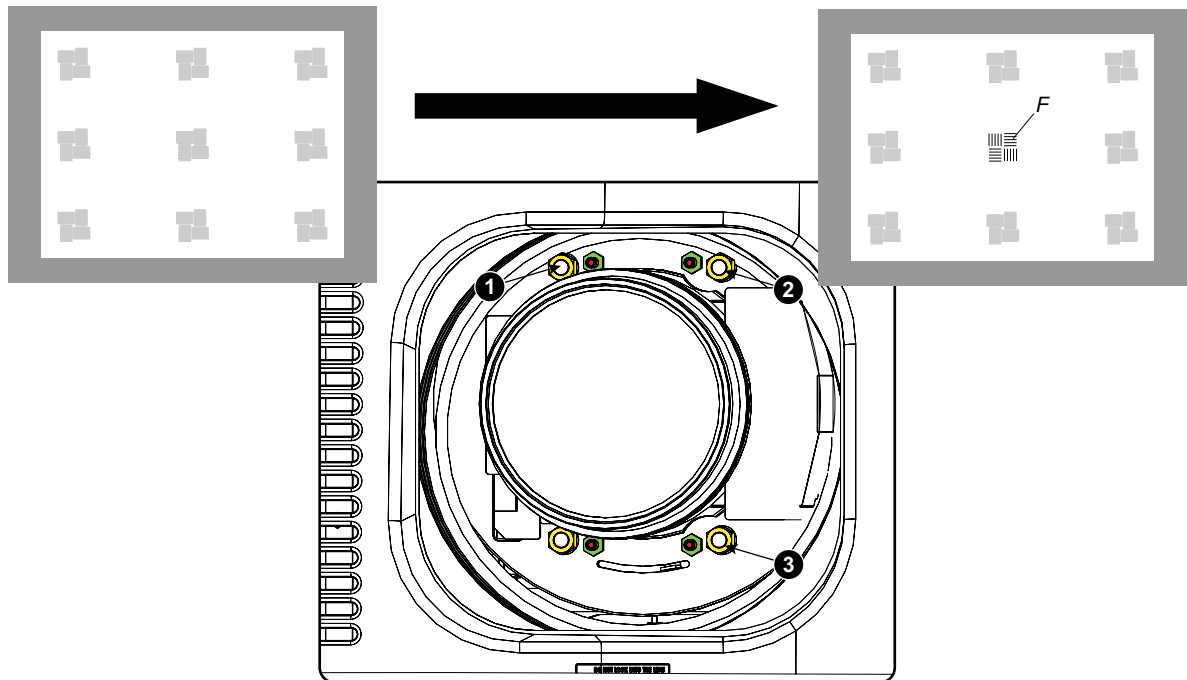


Image 4-25

2. Loosen the lock nuts (a, b, c and d). See image 4-24.
3. Loosen the 4 set screws (A, B, C and D) by 1 cm. See image 4-24.
4. Fully loosen lock nut 4. See image 4-24.
5. Optimize the focus of the projected image as follows:
 - a) Turn the Scheimpflug adjustment nuts 1, 2 and 3 until the front of the nut is equally aligned with the front of the threaded rod.
 - b) Adjust the focus in the center of the screen (F) using the motorized focus control.

Image 4-26
Center focusing

6. Sharpen bottom left corner of the screen by adjusting nut 1.

4. Lenses & Lens Holder

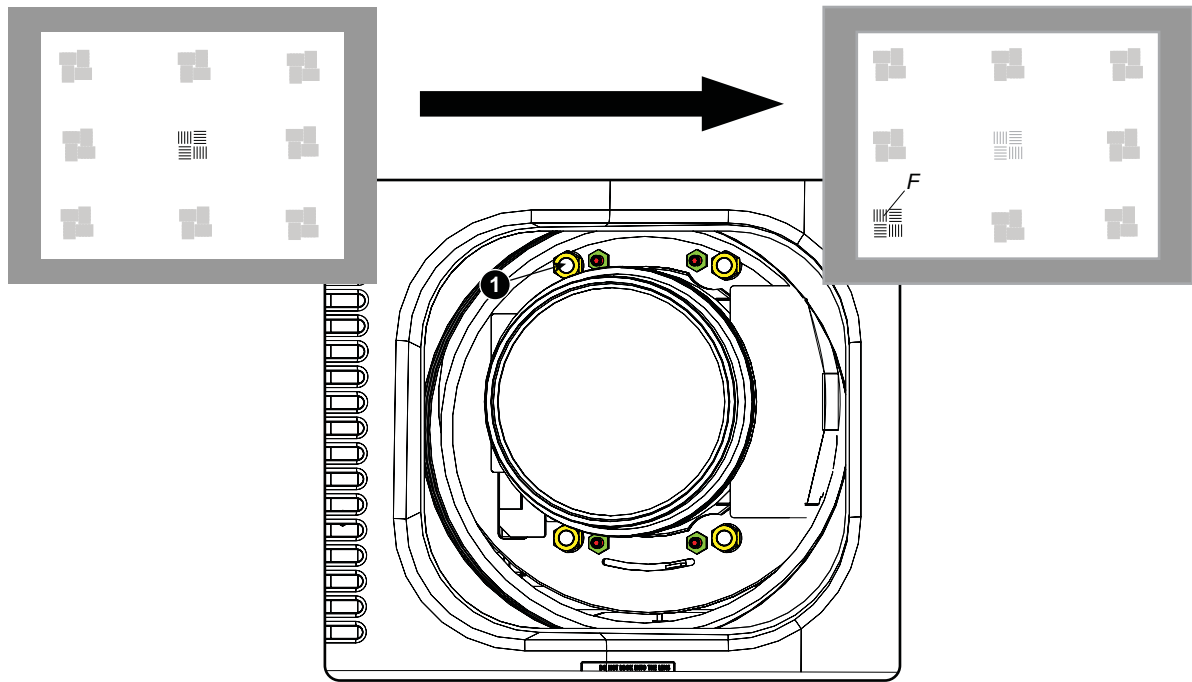


Image 4-27
Left bottom focusing

7. Sharpen bottom right corner of the screen by adjusting nut 2.

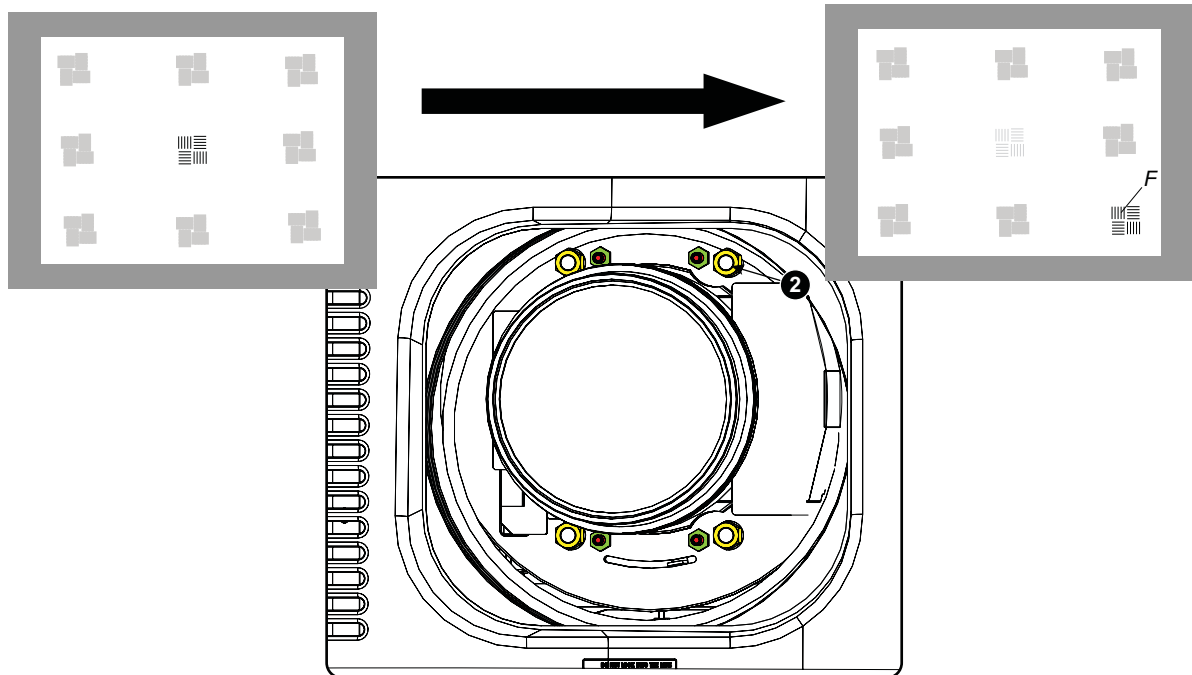


Image 4-28
Right bottom focusing

8. Sharpen top right corner of the screen by adjusting nut 3

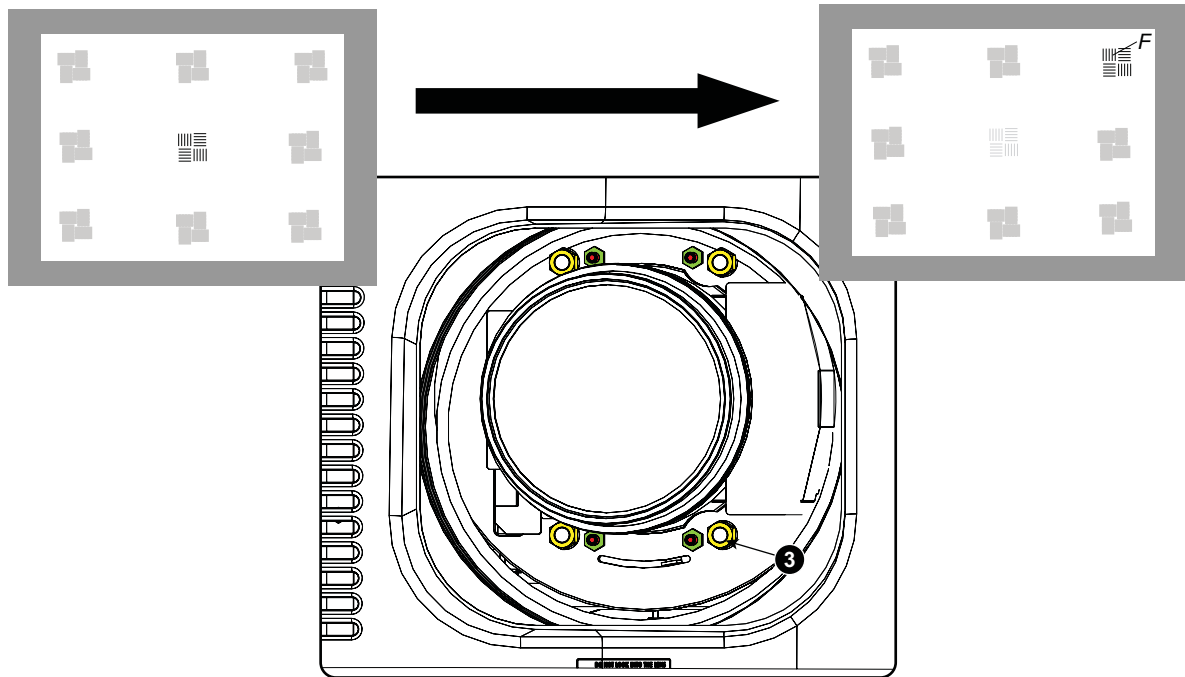


Image 4-29
Corner focusing

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.
10. Continue with the *Fixation of the lens holder front plate* procedure.

4.10 Fixation of the Lens Holder front plate

When fixing the Lens Holder front plate

After performing the procedure for Scheimpflug adjustment or Back Focal Length adjustment the Lens Holder front plate must be secured in such a way that it doesn't disturb the result of the adjustment.

Necessary tools

- 10mm nut driver.
- 3mm Allen wrench.
- 13mm nut driver.

How to fix the Lens Holder front plate

Start the fixation as follows (steps must be followed strictly) :

1. Project the framing test pattern for FLAT & SCOPE.
2. Zoom the projected image until the edges of the projected test pattern matches with the edges of the projection screen.

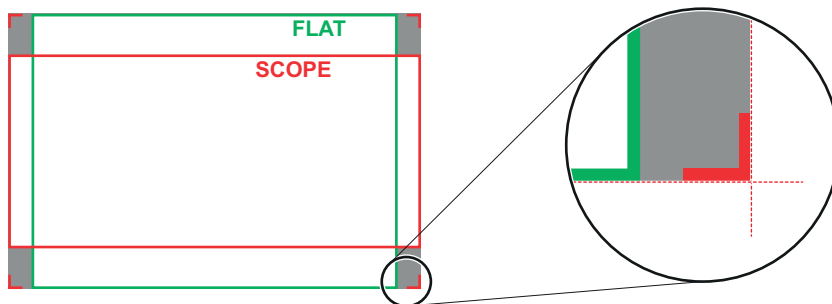


Image 4-30

3. Turn in the three set screws indicated with reference 11 image 4-31 without disturbing the projected image. Tighten lightly . Do not turn in the set screw at the lower left of the Lens Holder!
Note: *Ensure that the edges of the projected test pattern remain in place on the screen. Any movement of the image will affect the Scheimpflug adjustment.*
4. Fasten the lock nut (reference 21 image 4-31) of the three set screws. Use a 10mm nut driver. Ensure the image doesn't move.

4. Lenses & Lens Holder

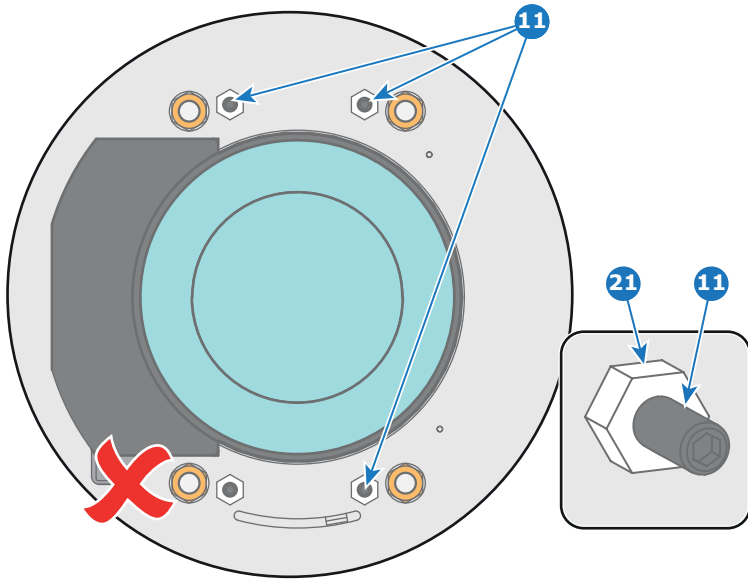


Image 4-31

5. Gently turn (by hand) the Scheimpflug adjustment nut at the lower left of the Lens Holder (reference 4 image 4-32) against the Lens Holder front plate without disturbing the projected image.
6. Turn in the set screw at the lower left of the Lens Holder (reference 14 image 4-32) without disturbing the projected image. Use a 3mm Allen wrench.

Note: Ensure that the edges of the projected test pattern remain in place on the screen. Any movement of the image will affect the Scheimpflug adjustment.

Tip: Fasten the set screw and the Scheimpflug nut alternately, without disturbing the projected image, until the Scheimpflug nut and set screw are completely tightened.

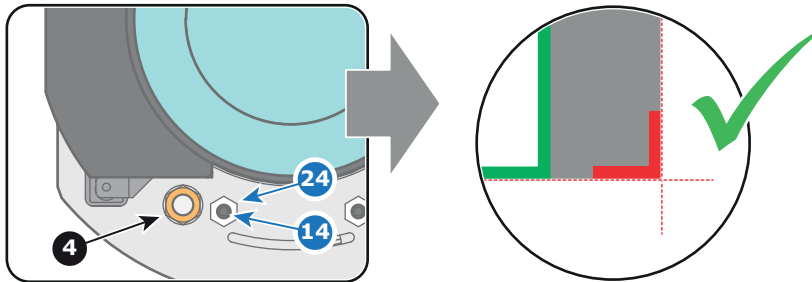


Image 4-32

7. Fasten the lock nut at the lower left of the Lens Holder. Use a 10mm nut driver.

5. INPUT AND COMMUNICATION

Overview

- Introduction
- Local keypad of the HDQ projector
- Communication ports of the HDQ projector
- Source input ports of the Barco HDQ 4K35 projector
- ICMP reset button and status LEDs

5.1 Introduction

General

The input & communication side of a HDQ consists of a button module and 2 separate removable units, fan controller module, ICMP module and an input/controller module.

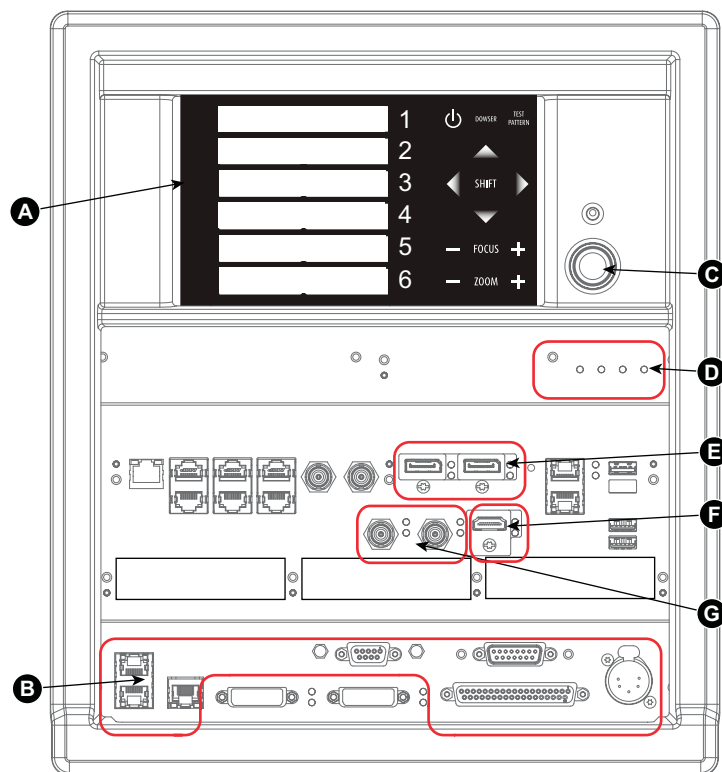


Image 5-1

- A Local keypad (button module)
- B Communication ports
- C Socket for security key
- D Fan controller module
- E Display ports
- F HDMI port
- G 3G-SDI ports



CAUTION: A unit may only be removed by qualified service personnel. Removing a unit will result in an authorization request upon starting.

5.2 Local keypad of the HDQ projector

Identification of the keys

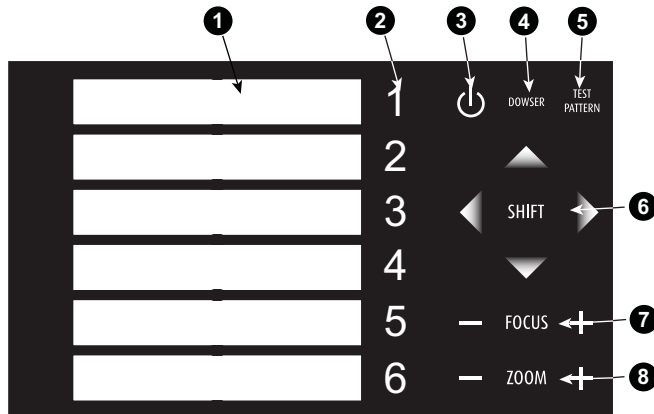


Image 5-2
Local keypad

- 1 Marker area for macro name
- 2 Numeric keyboard
- 3 Standby key
- 4 Dowser open/close switch
- 5 Test pattern toggle switch
- 6 Lens shift up/down, left/right
- 7 Lens focus
- 8 Lens zoom

Numeric keys

All the numeric keys (2) of the local keypad have a blue backlight during normal operation. When the authorization process is activated with the security key, the backlight color of the numeric keys 1 to 6 changes to orange. Each key can be linked to a macro which allows you to setup the projector to your requirements with one push of a button. Note that each numeric key has a marker area (1) where you can write down the name of the macro.

Standby key

Standby key (3) switches ON or OFF the lamp and lamp electronics. The lamp cooling fans remain active for about 5 minutes. The speed of the other fans is reduced. The backlight color of the standby key remains red in standby mode and changes to green in operation mode.

Dowser key

The dowser key (4) opens or closes the dowser. The backlight color of the dowser key is green when the dowser is open and red when the dowser is closed.

Test pattern key

The test pattern key (5) gives you direct access to the internal test patterns of the projector.

Shift keys

The shift keys (6) allow you to shift the lens up/down or left/right.

Focus keys

The focus keys (7) allow you to focus the projected image on the screen.

Zoom keys

The zoom keys (8) allow you to zoom in or out the projected image on the screen.

5.3 Communication ports of the HDQ projector

Location of the communication ports

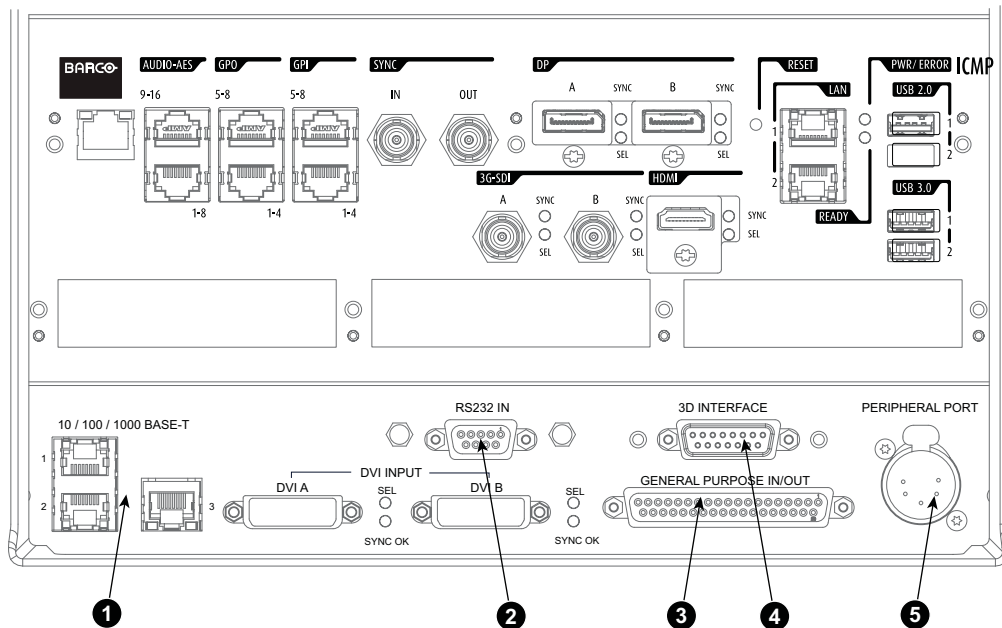


Image 5-3
Communication ports

- 1 10/100/1000 base-T
- 2 RS232 IN
- 3 General purpose input/output (GPIO)
- 4 3D interface
- 5 Peripheral port

10/100/1000 BASE-T

The HDQ projector can be connected to a LAN (local area network) using one of the Ethernet ports (1). Once connected to the LAN, users can access the projector from any location, inside or outside (if allowed) their company network using the Communicator software. This software locates the projector on the network if there is a DHCP server or the user can insert the correct IP-address 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 allows detection of potential errors and consequently improve service time.

As there is a need to daisy chain projectors when they are on an Ethernet network, an Ethernet switch is built 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 avoided. The switch used is a stand alone 10/100/1000Mbit Ethernet switch. This assures no influence on the network speed.

RS232 IN

This female DB-9 connector allows you to use a standard serial cable up to 10 meter to connect the touch panel interface with the projector. Note that the RS232 protocol is used on this connection.



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

This 37 pin connector can be used to send or receive trigger signals from other devices. These input/output pins can be programmed by macros created on the Communicator touch panel. See user's guide of the Touch panel, section Macro editor, for more information about this functionality. Note that the General Purpose Inputs accept 24 volt maximum.

3D INTERFACE

Optional port.

5. Input and Communication

Can be used to connect external 3D devices to the projector. All signals necessary for 3D projection can be provided via this connector.

PERIPHERAL PORT

For future use.

5.4 Source input ports of the Barco HDQ 4K35 projector

Location of the source input ports

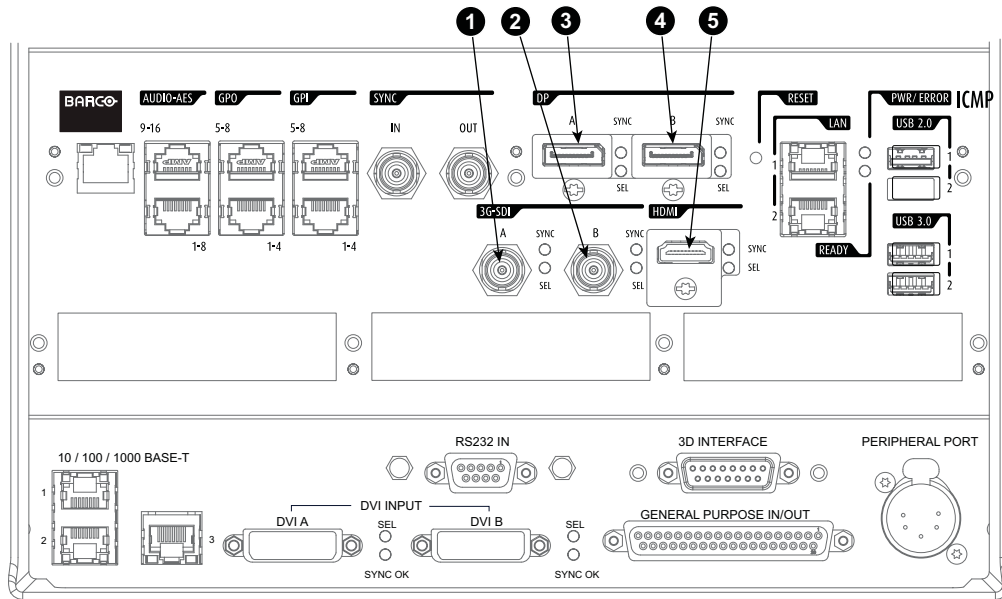


Image 5-4

- 1 3G-SDI input: SMPTE 292/424 input, port A
- 2 3G-SDI input: SMPTE 292/424 input, port B
- 3 DP input, port A, up to 2048x2160@60Hz + HDCP compatible, up to 12bpc
- 4 DP input, port B, up to 2048x2160@60Hz + HDCP compatible, up to 12bpc
- 5 HDMI input



DisplayPort

Digital display interface developed by the Video Electronics Standards Association (VESA). This royalty-free interface is primarily used to connect a video source to a display device such as a computer monitor, though it can also be used to transmit audio, USB, and other forms of data. VESA designed it to replace VGA, DVI, and FPD-Link. Backward compatibility to VGA and DVI by using active adapter dongles enables users to use DisplayPort fitted video sources without replacing existing display devices.



SMPTE

Society of Motion Picture and Television Engineers - A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video standards.



HDMI

HDMI (High-Definition Multimedia Interface) is a compact audio/video interface for transferring uncompressed video data and compressed/uncompressed digital audio data from a HDMI-compliant device ("the source device") to a compatible computer monitor, video projector, digital television, or digital audio device. HDMI is a digital replacement for existing analog video standards.



3G-SDI

Serial Digital Interface (SDI) is a serial link standardized by ITU-R BT.656 and the Society of Motion Picture and Television Engineers (SMPTE). SDI transmits uncompressed digital video over 75-ohm coaxial cable within studios, and is seen on most professional video infrastructure equipment. The first revision of the standard, SMPTE 259M, was defined to carry digital representation of analog video such as NTSC and PAL over a serial interface and is more popularly known as standard-definition (SD) SDI. The data rate required to transmit SD SDI is 270 Mbps. With the advent of high-definition (HD) video standards such as 1080i and 720p, the interface was scaled to handle higher data rates of 1.485 Gbps. The 1.485-Gbps serial interface is commonly called the HD SDI interface and is defined by SMPTE 292M, using the same 75-ohm coaxial cable. Studios and other video production facilities have invested heavily on the hardware infrastructure for coaxial cable and have a vested interest in extending the life of their infrastructure. Fortunately, SMPTE recently ratified a new standard called SMPTE 424M that doubles the SDI data rates to 2.97 Gbps using the same 75-ohm coaxial cable. This new standard, also called 3-Gbps (3G)-SDI, enables higher resolution of picture quality required for 1080p and digital cinema.

DP Input formats

- DP1.1a, 4-lanes RBR/HBR
- Audio: none
- Content Protection: HDCP 1.4
- Colordepth: 8 bit/color and 10 bit/color
- 3D-stereo mode: frame sequential (embedded stereosync on DP required from the source)

Video timings

Source standard	Colordepth (bpc)	DisplayMode (A,B)	Display Mode 2D	Projector mode	ImagePro Scaling	Black borders
640 x 480 @60Hz	8, 10	Single	2D	2k	up scale	left/right
800 x 600 @60Hz	8, 10	Single	2D	2k	up scale	left/right
1600 x 1200 @60Hz	8, 10	Single	2D	2k	up scale	left/right
1920 x 1200 @60Hz	8, 10	Single	2D	2k	up scale	left/right
2048 x 1536 @60Hz	8, 10	Single	2D	2k	up scale	left/right
1280 x 800 @60Hz	8, 10	Single	2D	2k	up scale	left/right
1280 x 720 @60Hz	8, 10	Single	2D	2k	up scale	left/right
1680 x 1050 @60Hz	8, 10	Single	2D	2k	up scale	left/right
2048 x 2160 @60Hz	8, 10	A+B span	2D	4k	-	-
1920 x 1080 @60Hz	8, 10	Single	2D	2k	up scale	left/right
2048 x 2160 @30Hz	8, 10	A+B span	2D	4k	-	-
2048 x 2160 @48Hz	8, 10	A+B span	2D	4k	-	-
2048 x 2160 @50Hz	8, 10	A+B span	2D	4k	-	-
2048 x 1080 @60Hz	8, 10	Single	2D	2k	up scale	-
2048 x 1080 @48Hz	8, 10	Single	2D	2k	up scale	-
3840 x 2160 @24Hz	8, 10	Single	2D	4k	-	left/right

Notes:

- DisplayMode = single : is applicable to both DP A, and DP B input, separately
- DisplayMode = A+B : inputs DP A and DP B are combined to 1 larger image; in this case the 2 DP links need to be genlocked (= synchronous and in phase)
- in all cases : Color space = RGB, Color sampling = 4:4:4, Scan type = progressive
- Some Graphical Cards may not permit 10bpc at all video timings, because of bandwidth restrictions

HDMI specifications

HDMI1.4b, including HDCP1.4

Video-timings:

- 1920 x 1080p at 60Hz
- 1280 x 720p at 60Hz
- 640 x 480p at 60Hz
- 800 x 600p at 60Hz
- 1024 x 768p at 60Hz
- 1400 x 1050p at 60Hz
- 1280 x 1024p at 60Hz
- 1024 x 768p at 60Hz
- 1280 x 960p at 60Hz
- 1920 x 1080p at 50Hz
- 1920 x 1080p at 24Hz
- 1920 x 1080p at 25Hz
- 1920 x 1080p at 30Hz
- 1280 x 720p at 50Hz
- 720 x 480p at 60Hz (VIC 2)
- 720 x 480p at 60Hz (VIC 3)
- 720 x 576p at 50Hz

Notes:

- Includes NTSC refresh rate = $(Hz \times 1000) / 1001$
- Upscaled x2 if smaller than 50% of native DMD size, while maintaining aspect ratio (aka automatic 2K→4K up-scaling on 4K projectors)

Audio formats

- LPCM 8-channel (7.1), 16/20/24-bit at 32/44/48/88/96 kHz

Additional features

- YCbCr 4:4:4
- YCbCr 4:2:2
- Deep Color : 30bpp, 36bpp

5.5 ICMP reset button and status LEDs

ICMP status LEDs and Reset button

LEDs on ICMP front panel give information on the status of the device.

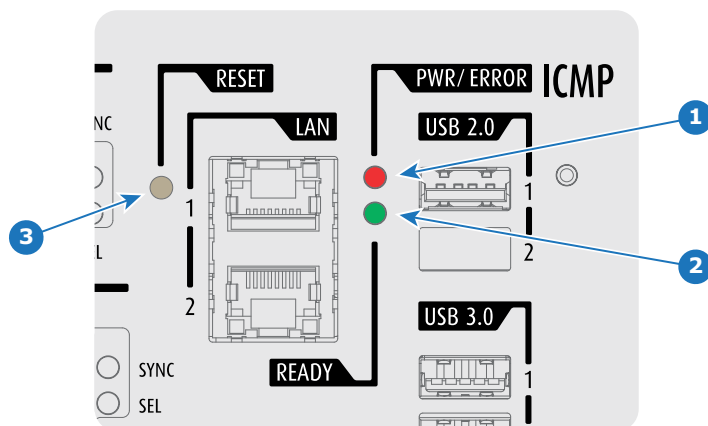


Image 5-5

Status overview PWR/ERROR and READY LEDs:

1	2	
PWR/ERROR	READY	ICMP Status
Off	Off	Turned off
Red	Off	Board reset
Blinking Green	Off	Boot loader
Blinking Green	Blinking Orange	Operating System start up
Blinking Green	Orange	Security Manager - Image Integrity tests
Blinking Green	Blinking Yellow	Security Manager - Self Test
Blinking Green	Yellow	Security Manager - FPGA self-test
Green	Blinking Orange	Update ongoing
Green	Blinking Green	FIPS ok - Application startup
Green	Green	Power on & No Error
Blinking Red	Off	FIPS error

3 Reset button

Button used to reset ICMP (reference 3 image 5-5)

WARNING: It is not recommended to use this button if conventional means to stop and restart the ICMP are always available. It is an ultimate resort in the event of complete blockage of interface.

6. STARTING UP

6.1 Switching ON the HDQ

How to switch on

1. Make sure that the HDQ is correctly installed.
2. Make sure that the right lens is installed for your application. See chapter "Lens selection", page 36.
3. Make sure that the lamp and lamp house are correctly installed.
4. Make sure the projector is correctly connected to the power net. See chapter "Connecting the projector with the power net", page 20.
5. Check if a video source is connected with the projector.
6. Check if the communicator touch panel is installed. Or, use Communicator via PC.
7. Press the power switch to switch ON the projector. As a result the projector starts up in standby. So, the lamp is OFF and the dowser closed. No internal pattern is selected. The communicator touch panel starts its initialization procedure.
 - When '0' is visible, the projector is switched OFF.
 - When '1' is visible, the projector is switched ON.
8. Press the **STANDBY** button on the local keypad or use the Communicator Touch Panel to activate the lamp.
9. Press the **DOWSER** button on the local keypad or use the Communicator Touch Panel to open the dowser. As a result the applied source will be displayed.



CAUTION: See user's guide of the Communicator Touch Panel to operate and control the HDQ.

6.2 Switching OFF the HDQ

How to switch OFF the HDQ?

1. Press the standby button on the local keypad or use the Communicator Touch Panel to switch the projector from operation to standby. As a result the lamp turns off but the fans remain turning to cool down the projector.
2. Let the projector cool down at least 5 minutes or until the speed of the fans decreases.
3. Switch OFF the projector with the power switch.

7. MAINTENANCE

Overview

- Cleaning the front dust filter
- Cleaning the bottom dust filters
- Cleaning the lens
- Cleaning the exterior of the projector
- Checking cooling liquid level
- Topping up the cooling liquid reservoir
- Removal of the Lamp House
- Realignment of the lamp in its reflector
- Authorization to clear security warning on the projector

7.1 Cleaning the front dust filter



WARNING: The procedure below may only be performed by “qualified service technicians”.



The air filters should be cleaned monthly under normal environment conditions. Equipment in very dusty or otherwise contaminated areas may require more frequent maintenance.

How to clean the front dust filter?

1. Remove the input cover. See "Removal of the input cover", page 68.
2. Slide out the front dust filter (1) from the projector.
3. Remove most contamination from the filters with a vacuum cleaner in another room or outside.
4. Blow the remaining dust away with compressed air in another room or outside.
5. Position the filter with the **up**-sign (2) upwards and slide it in until it clicks into position.

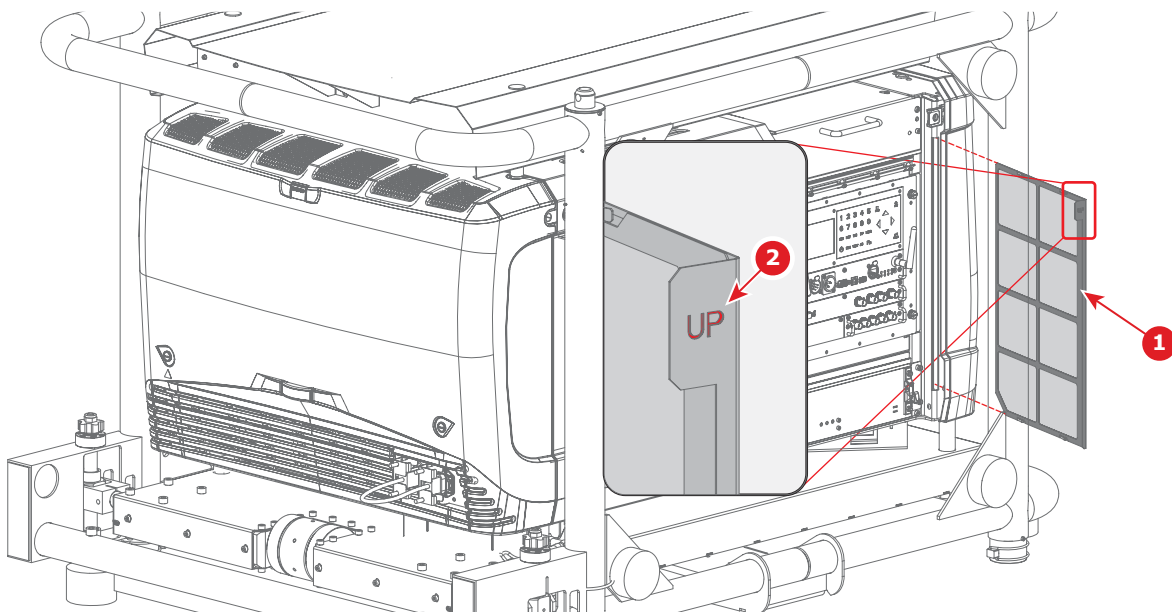


Image 7-1
Cleaning the front dust filter

6. Install the input cover. See "Removal of the input cover", page 68.

7.2 Cleaning the bottom dust filters



WARNING: The procedure below may only be performed by “qualified service technicians”.



The air filters should be cleaned monthly under normal environment conditions. Equipment in very dusty or otherwise contaminated areas may require more frequent maintenance.

How to clean the bottom dust filters?

1. Remove the left cover. See "Removal of the left cover", page 72.
2. Slide out the bottom dust filters (1 and 2) from the projector.
3. Remove most contamination from the filter with a vacuum cleaner in another room or outside.
4. Blow the remaining dust away with compressed air in another room or outside.
5. Position the filters with the flanges upwards (3) and slide them in until they click into position.

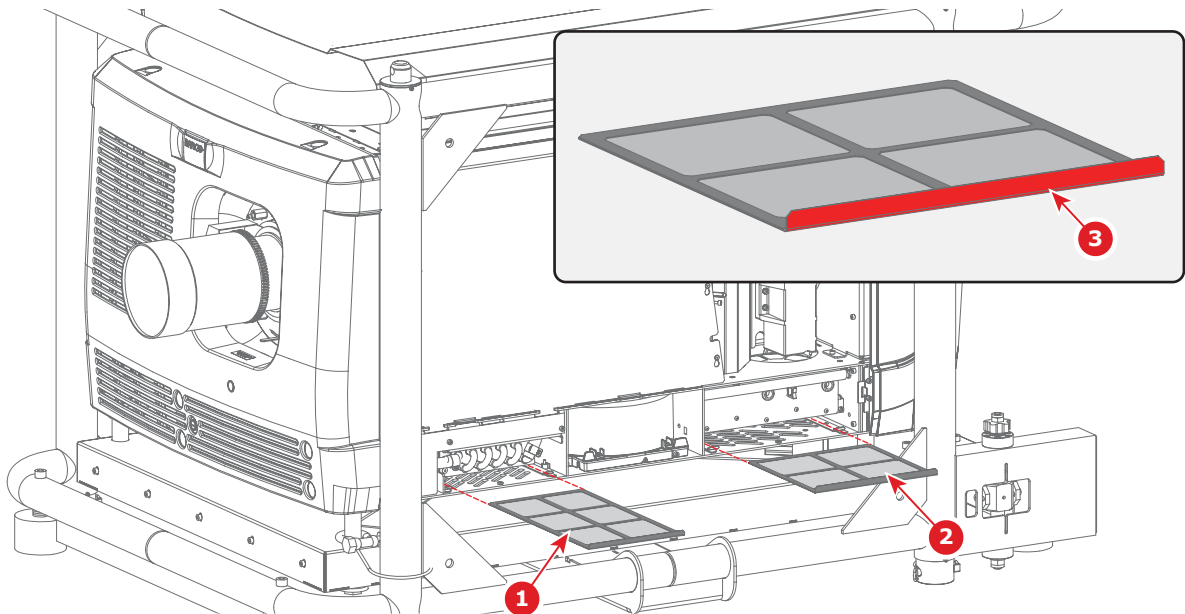


Image 7-2
Cleaning the bottom dust filters

6. Install the left cover. See "Removal of the left cover", page 72.

7.3 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!).
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.

7.4 Cleaning the exterior of the projector



WARNING: Prior to start cleaning the exterior of the projector, disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET for removal of all power from the projector.

How to clean the exterior of the projector?

1. Disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET for removal of all power from the projector.
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.

7.5 Checking cooling liquid level



WARNING: The procedure below may only be performed by “qualified service technicians”.

What should be done?

The projector is liquid cooled. It is important that the liquid level is checked at regular intervals. We advise to check every 3 months. The liquid level must be between **Min** and **Max**. Significant drop in liquid level indicates a major leakage and requires immediate attention.

How to check the cooling liquid level?

1. Remove the left projector cover. See "Removal of the left cover", page 72.
2. Check the cooling liquid level in the reservoir.

1. Pressurized air cans are not efficient if there is too much dust on the surface, the pressure is too low

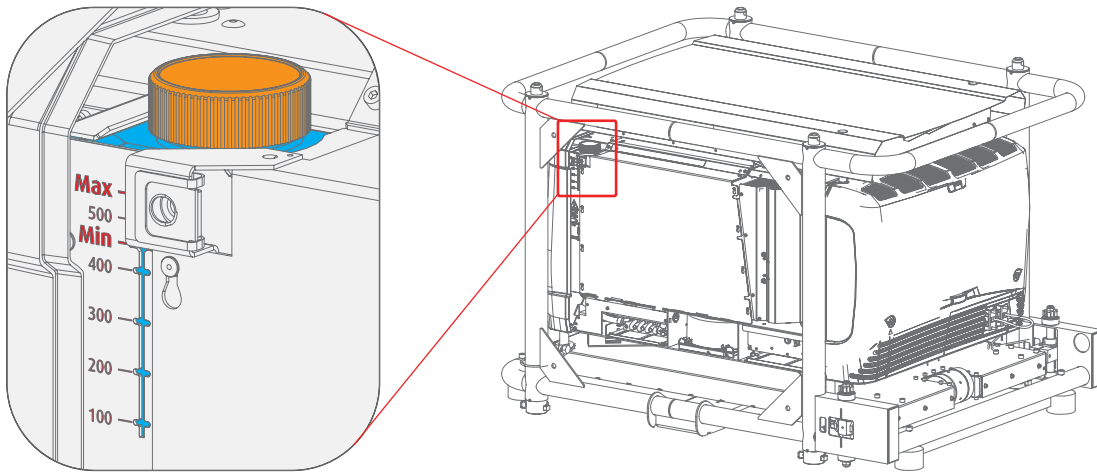


Image 7-3
Checking the cooling liquid level

If the current cooling liquid level is somewhere between **Min** and **Max**, no action is required.

If the current cooling liquid level is approaching the **Min** level point, check for leakage in the cooling system prior to starting the topping up procedure.



If the cooling liquid level is not visible, open the filler cap and shine a torch into the reservoir.

7.6 Topping up the cooling liquid reservoir



WARNING: The procedure below may only be performed by “qualified service technicians”.



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: 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.



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.



CAUTION: Tighten the filler cap sufficiently to avoid cooling liquid leakage. Tighten to a torque of 7 Nm.

Handling the cooling liquid

- Avoid contact of the liquid with Eyes, Skin and Clothing.
- Avoid inhaling 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 (Butyl rubber, PVC....) and Goggles.
- Wear suitable protection clothing.

Order info cooling liquid

B1909086K: bottle of 1 liter cooling liquid.

How to top up the cooling liquid?

1. Remove the left projector cover. See "Removal of the left cover", page 72.
2. Open the reservoir. Remove the filler cap by turning it anti clockwise.
3. Fill the reservoir with cooling liquid until the level is equal with the **Max** indication on the reservoir.
4. Close the reservoir again. Install the filler cap by turning it clockwise.

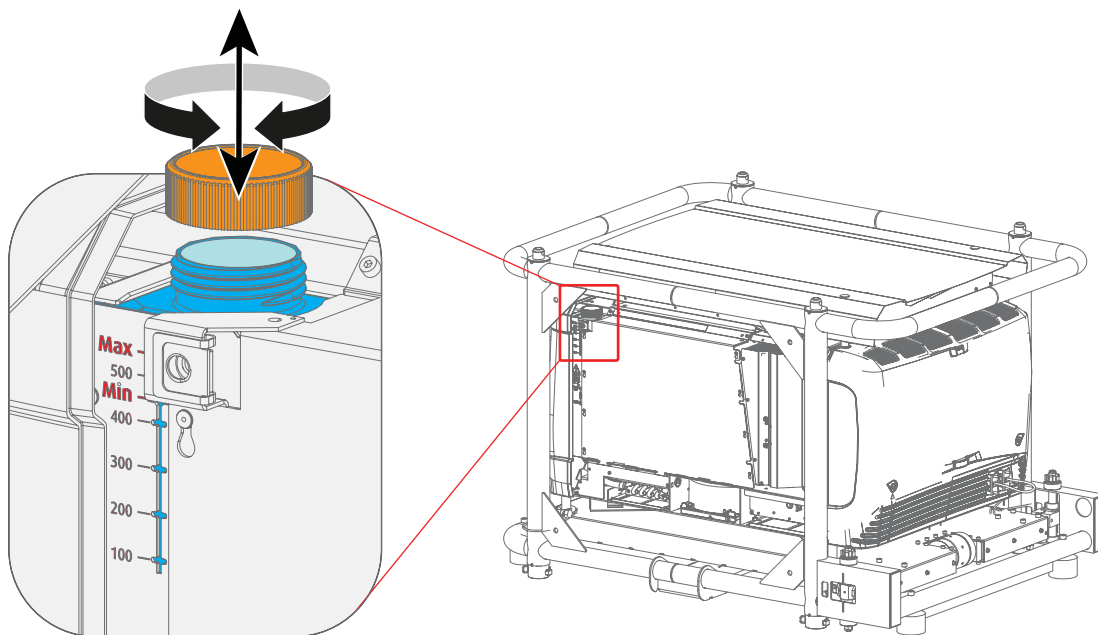


Image 7-4
Refilling the cooling liquid reservoir

Caution: Tighten the filler cap sufficiently to avoid cooling liquid leakage. Tighten to a torque of 7 Nm.

5. Install the left projector cover. See "Removal of the left cover", page 72.



CAUTION: Never fill the cooling liquid reservoir above the Max level mark.

7.7 Removal of the Lamp House



WARNING: The procedure below may only be performed by "qualified service technicians".



WARNING: Before removing the Lamp House, disconnect the power to the projector mains terminals and unplug the power cord at the UPS INLET for removal of all power from the projector.

Necessary tools

10 mm nut driver or flat screwdriver

How to remove the Lamp House from the projector?

1. Remove the lamp cover.
2. Release the two retaining screws (1) at the base of the Lamp House. Use a 10 mm nut driver or a flat screwdriver.
3. Remove the Lamp House:
 - a) Grip the Lamp House with the bottom handle (2) and partially slide it out of the Lamp House compartment.
 - b) Grip the Lamp House with the top handle also (3) and remove it completely from the projector.
 - c) Place the Lamp House on a solid and stable support.

Warning: Be aware of the weight of the Lamp House. Take the necessary precautions to avoid personal injury.

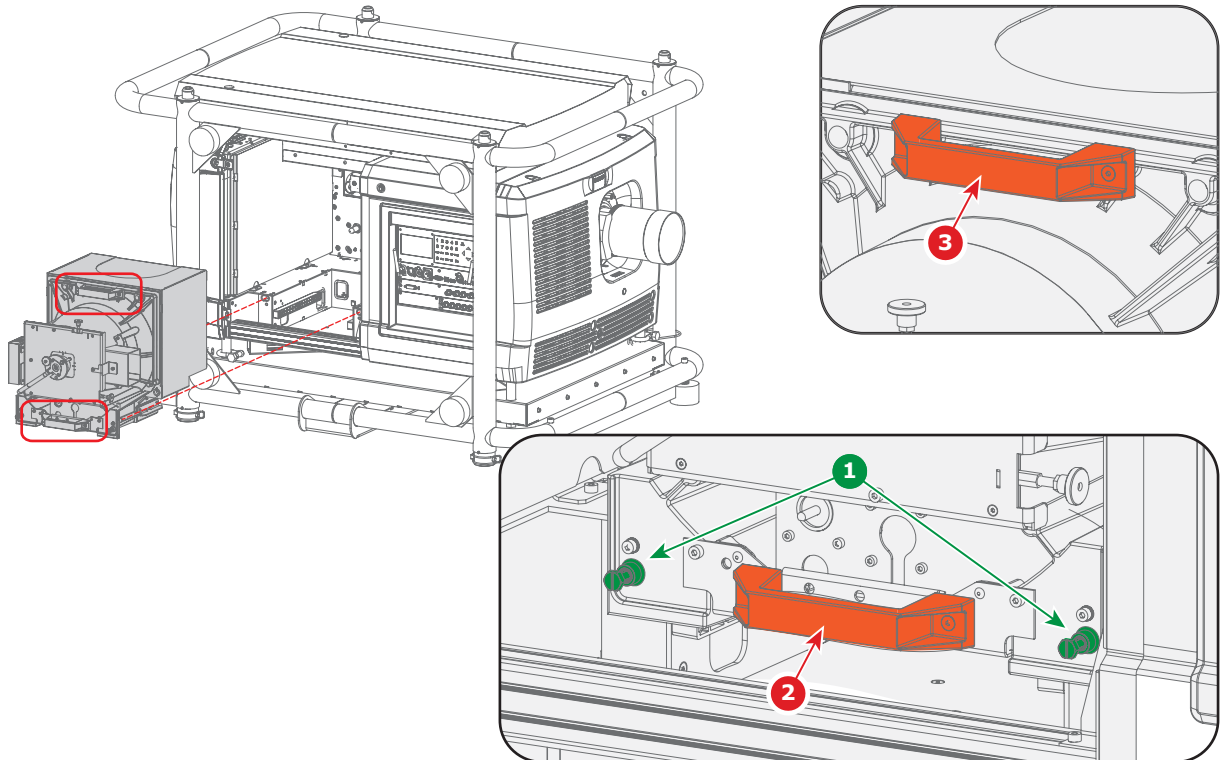


Image 7-5
Removal of the Lamp House

7.8 Realignment of the lamp in its reflector

Why realigning the lamp ?

With longer run times, the light output of the lamp will decrease, which results in a lower light output on the screen. This light output decrease can be compensated by readjusting the Z-position of the lamp.



WARNING: The procedure below may only be performed by “qualified service technicians”.

Necessary tools

3mm Allen wrench

How to realign the lamp in its reflector ?

1. Remove the lamp cover. See "Removal of the lamp cover", page 67.
2. Start up the projector, enter the menu structure and select *Lamp* → *Z-axis*.
3. Loosen the Z-axis lock screw (2).

- Carefully turn the thumb screw (1) at the rear of the Lamp House clockwise for maximum light output. Once over the maximum, turn slightly counterclockwise to reach the maximum light output again.

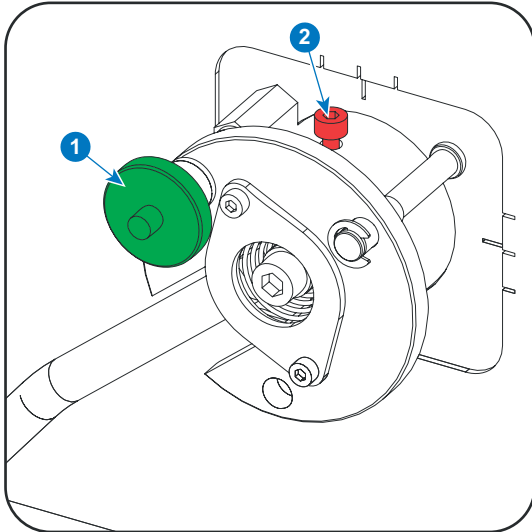


Image 7-6
Z-axis alignment

- Secure the Z-axis position by fastening the Z-axis lock screw (2).
- Switch off the projector, wait five minutes and unplug the power cord at the projector side.
- Install the lamp cover. See "Installation of the lamp cover", page 68.

7.9 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

- Ensure that all modules are properly installed.
- Start up the projector (standby mode).
- Initiate authorization by holding the security key in the security socket D..

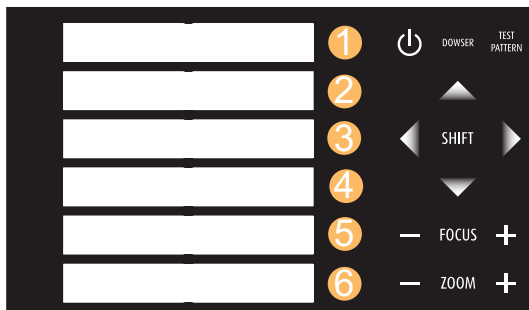
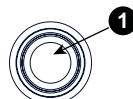


Image 7-7
Keypad



The color of the backlight of the numeric keys 1 to 6 of the local keypad changes from blue to yellow.

- Enter pin code within 5 seconds.

7. Maintenance

- 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.

8. REMOVAL AND INSTALLATION OF THE PROJECTOR COVERS



WARNING: All procedures in this chapter may only be performed by “qualified service technicians” .



WARNING: Disconnect the power to the projector mains terminals and unplug the power cord at UPS INLET, unless otherwise mentioned in the procedure.

Overview

- Removal of the lamp cover
- Installation of the lamp cover
- Removal of the input cover
- Installation of the input cover
- Removal of the front cover
- Installation of the front cover
- Removal of the back cover
- Installation of the back cover
- Removal of the left cover
- Installation of the left cover

Location of the covers

The image below shows the location of the projector covers. Each cover can be removed individually.

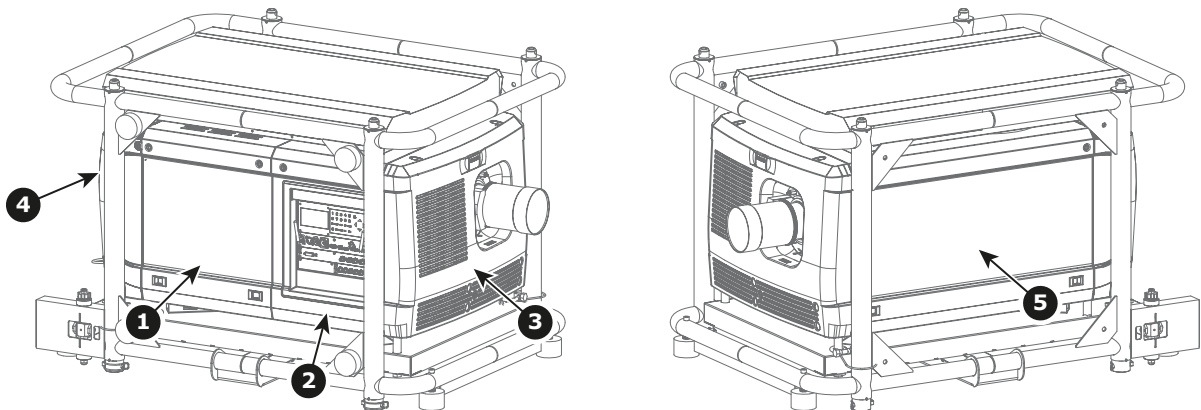


Image 8-1
Location of the covers

- 1 Lamp cover
- 2 Input cover
- 3 Front cover
- 4 Back cover
- 5 Left cover

8.1 Removal of the lamp cover

Necessary tools

Flat screwdriver

How to remove the lamp cover?

1. Release the 2 captive screws (1).
2. Release the 2 locks by sliding them towards each other (2). Pull the bottom side away from the projector.
3. Remove the cover (3).

8. Removal and installation of the projector covers

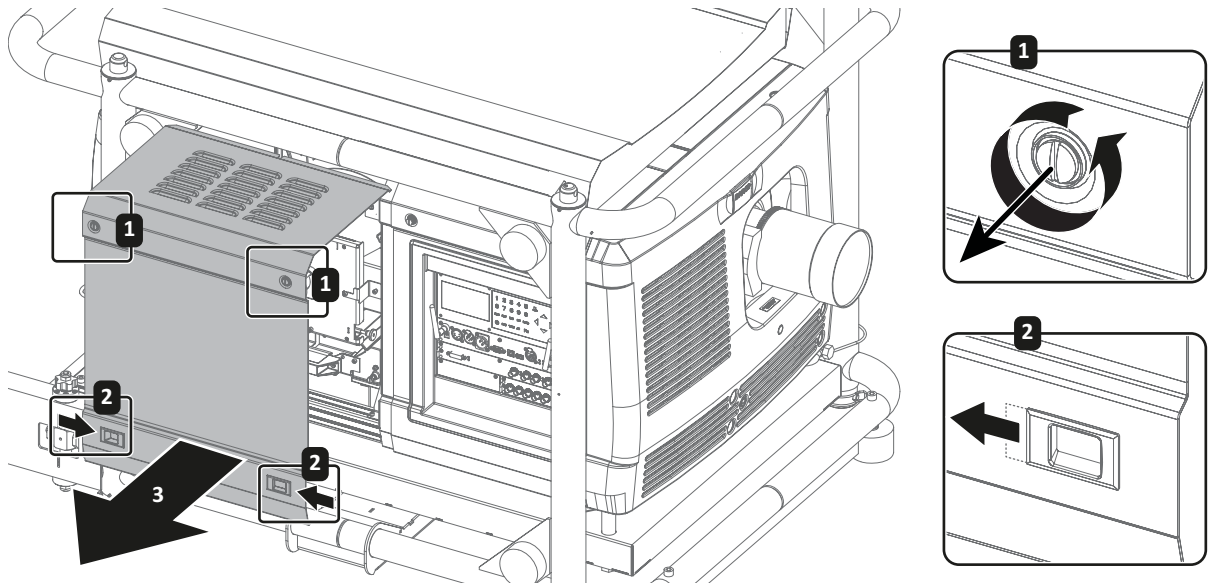


Image 8-2
Removing the lamp cover

8.2 Installation of the lamp cover

Necessary tools

Flat screwdriver

How to install the lamp cover?

1. Position the lamp cover on its place and slide it towards the projector (1).
2. Slide the locks to each other (2) and push the cover against the projector. Release the locks.
3. Tighten the 2 captive screws (3).

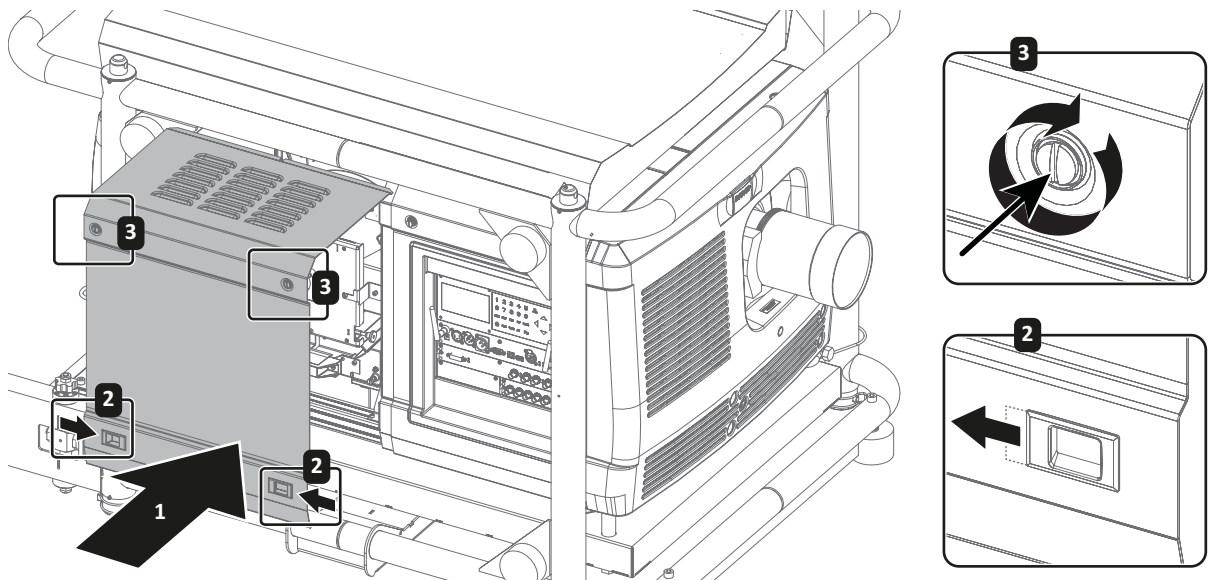


Image 8-3
Installing the lamp cover

8.3 Removal of the input cover

Necessary tools

Flat screwdriver

How to remove the input cover?

1. Release the 2 captive screws (1).
2. Pull back the cover until the locking mechanism at the bottom releases.
3. Remove the cover (2).

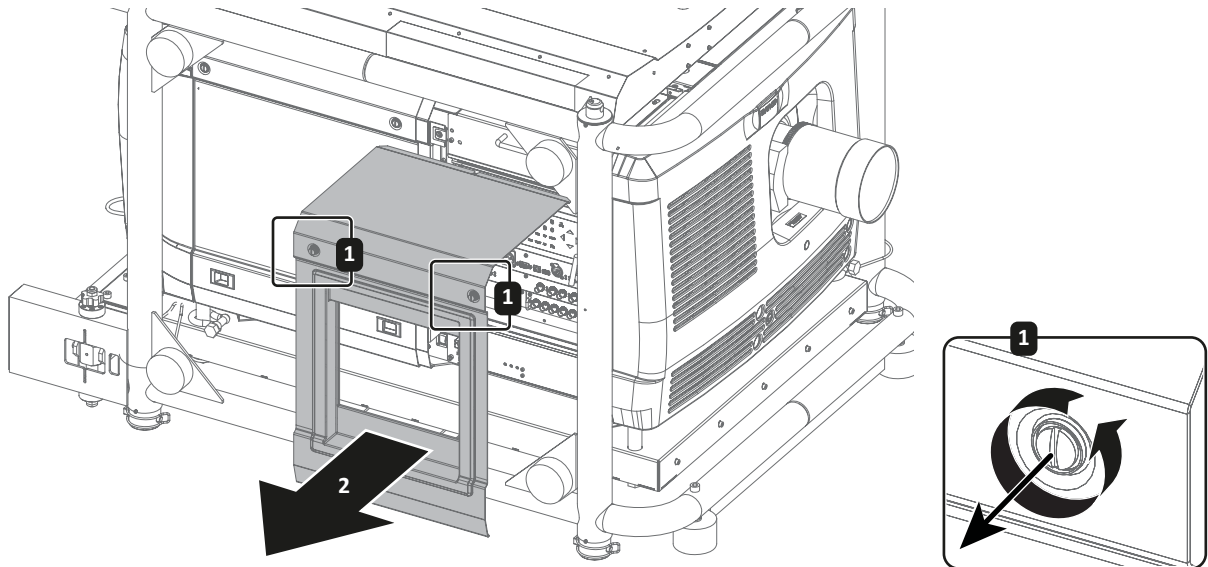


Image 8-4
Removing the input cover

8.4 Installation of the input cover

Necessary tools

Flat screwdriver

How to install the input cover?

1. Position the input cover on its place and slide it towards the projector (1).
2. Push the cover against the projector until the locks at the bottom snap.
3. Tighten the 2 captive screws (2).

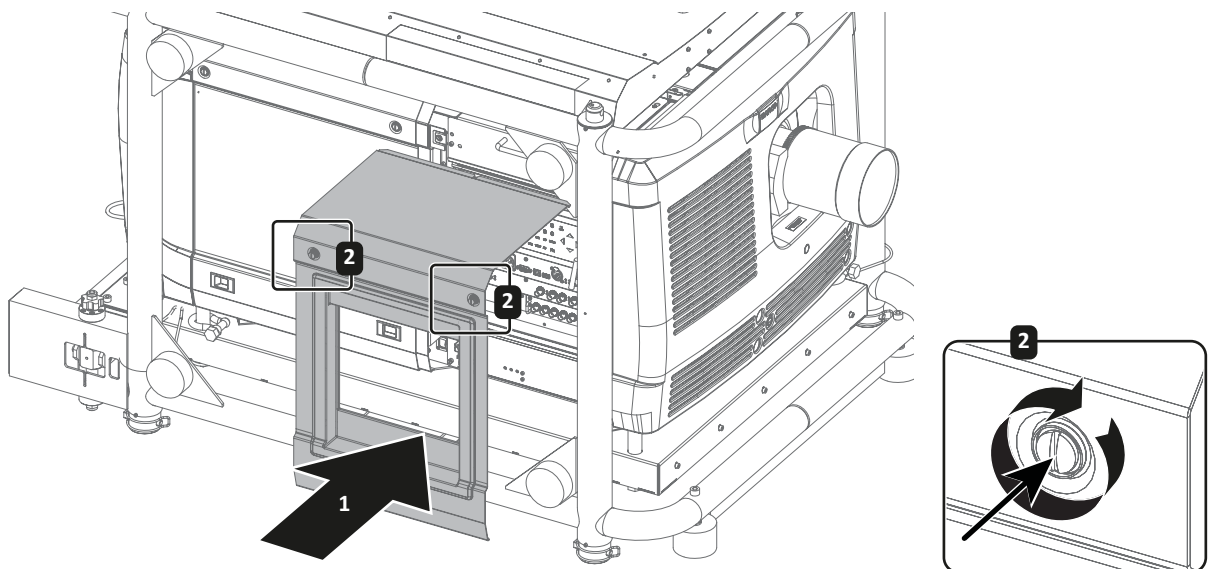


Image 8-5
Installing the input cover

8.5 Removal of the front cover

Necessary tools

Flat screwdriver



Prior to removing the front cover, the lens needs to be removed. This procedure assumes that the lens is already removed from the projector.

How to remove the front cover?

1. Remove the rubber dust ring from the Lens Holder.

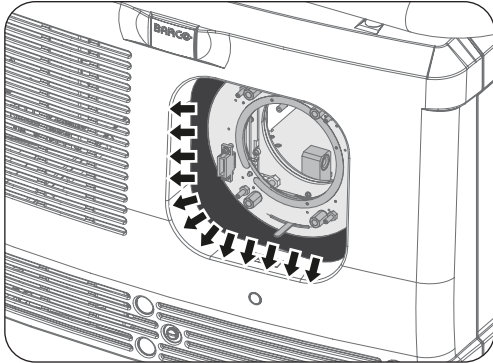


Image 8-6
Removing the rubber dust ring

2. Release the captive screw (1).
3. Pull back the cover until the locking mechanism at the top releases.
4. Remove the cover (2).

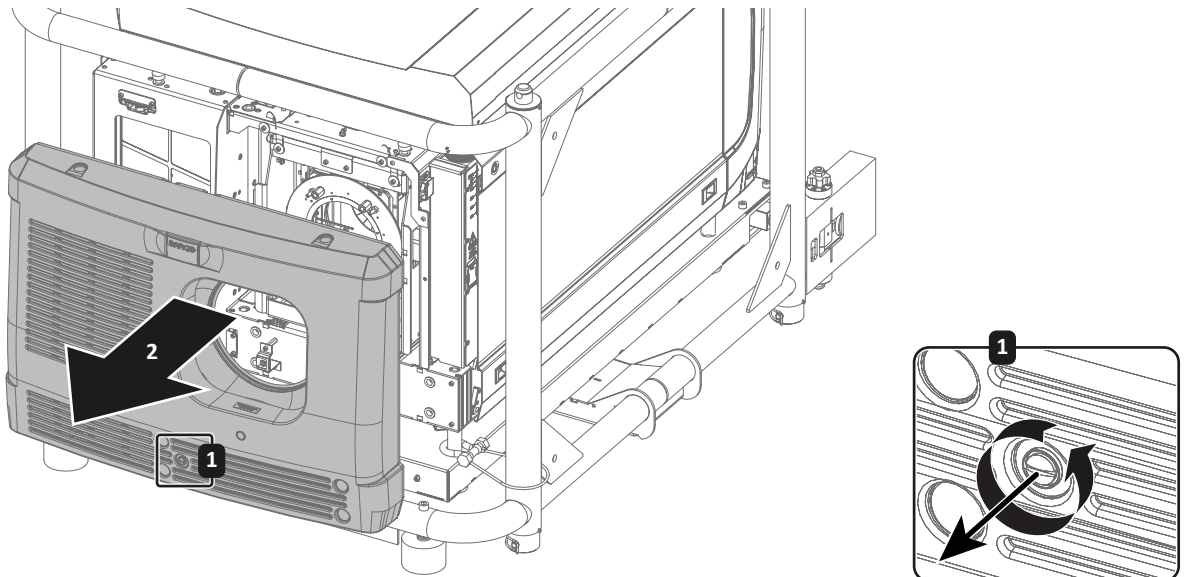


Image 8-7
Removing the front cover

8.6 Installation of the front cover

Necessary tools

Flat screwdriver

How to install the front cover?

1. Position the front cover on its place and slide it towards the projector (1).

2. Push the cover against the projector until the locks at the top snap.
3. Tighten the captive screw (2).

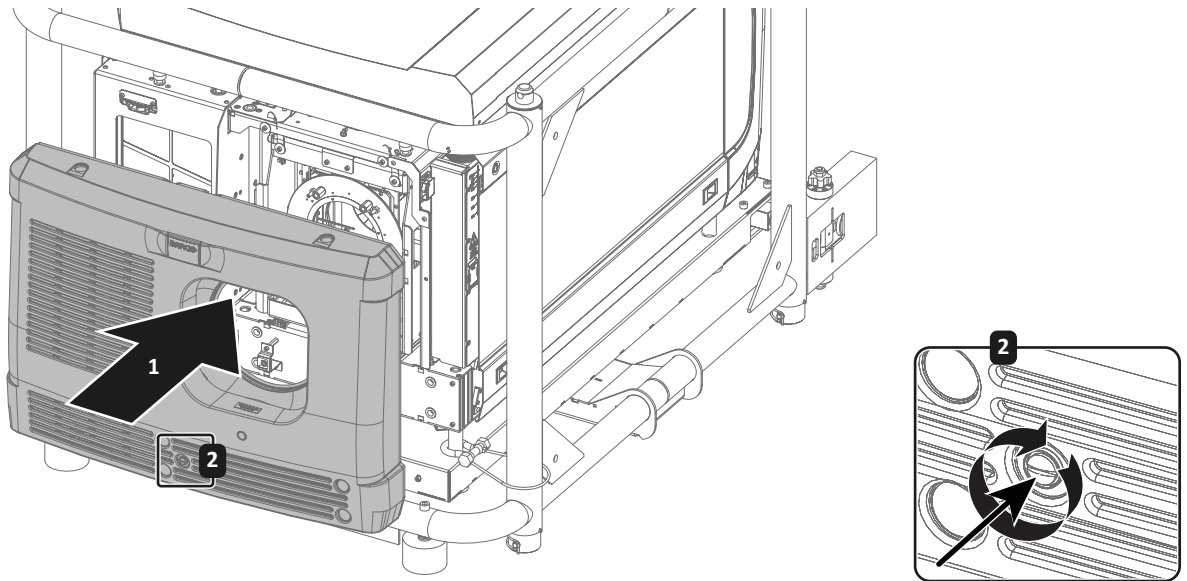


Image 8-8
Installing the front cover

4. Reinstall the rubber dust ring around the Lens Holder.

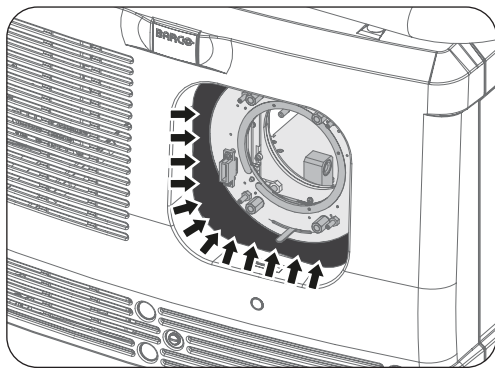


Image 8-9
Installing the rubber dust ring

8.7 Removal of the back cover

Necessary tools

Flat screwdriver

How to remove the back cover?

1. Release the 2 captive screws (1).
2. Pull back the cover until the locking mechanism at the top releases.
3. Remove the cover (2).

8. Removal and installation of the projector covers

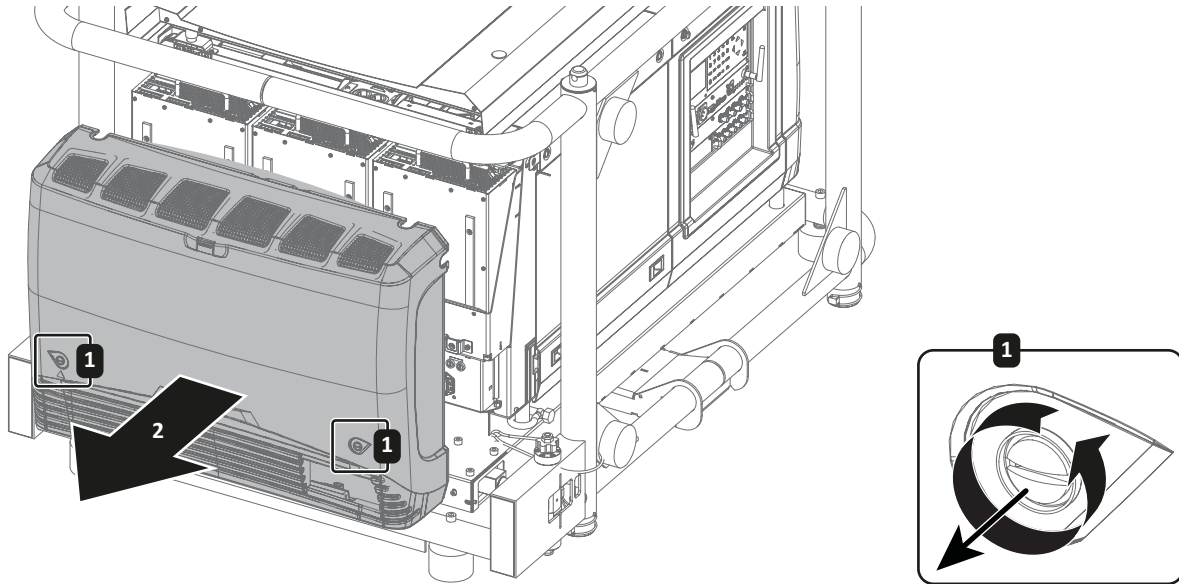


Image 8-10
Removing the back cover

8.8 Installation of the back cover

Necessary tools

Flat screwdriver

How to install the back cover?

1. Position the back cover on its place and slide it towards the projector (1).
2. Push the cover against the projector until the locks at the top snap.
3. Tighten the 2 captive screws (2).

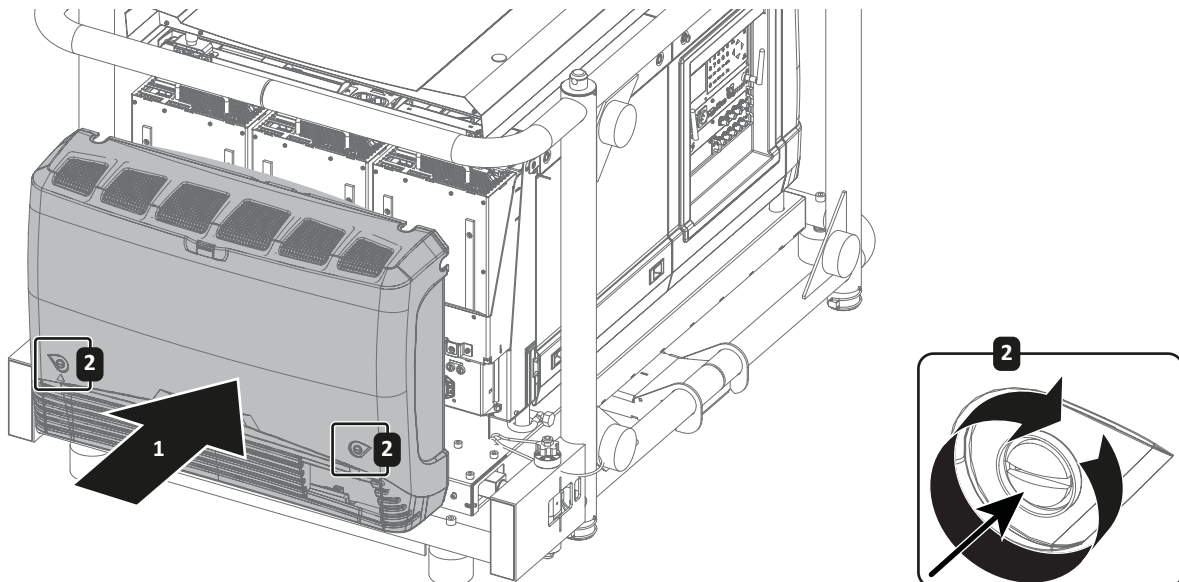


Image 8-11
Installing the back cover

8.9 Removal of the left cover

Necessary tools

Flat screwdriver

How to remove the left cover?

1. Release the 2 captive screws (1).
2. Release the 2 locks by sliding them towards each other (2). Pull the bottom side away from the projector.
3. Lift the cover up a little (3) and slide it out on the front side of the frame (5) while turning the back of the cover away from the projector (4).

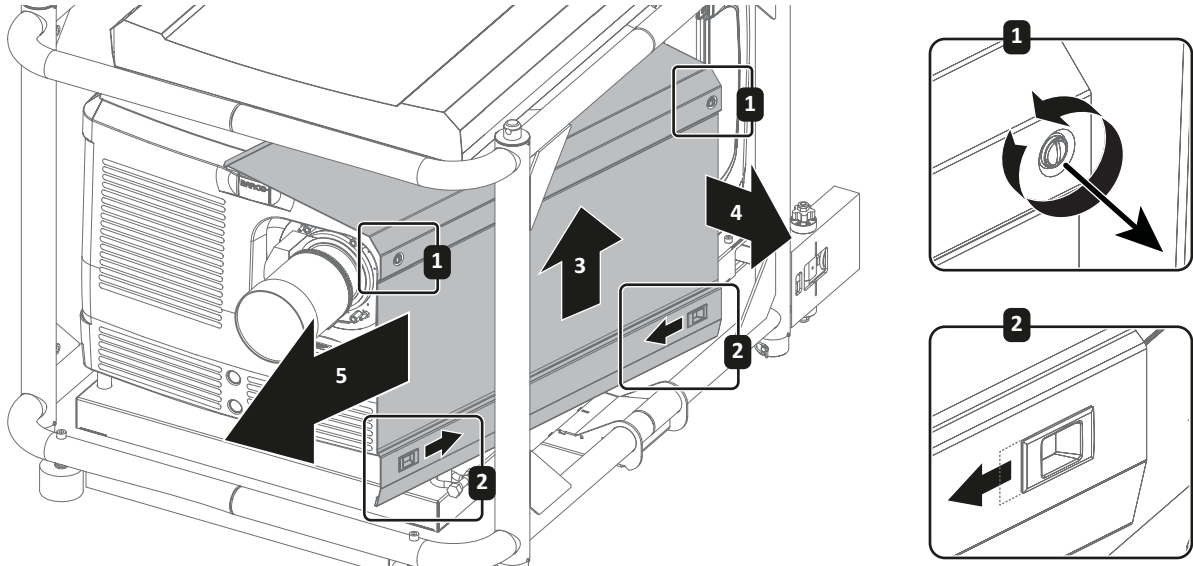


Image 8-12
Removing the left cover

8.10 Installation of the left cover

Necessary tools

Flat screwdriver

How to install the left cover?

1. Slide the cover in on the front side of the frame (1) while turning the back of the cover towards the projector (2). Lower the cover until it rests on the top side of the projector (3).
2. Slide the locks to each other (4) and push the cover against the projector. Release the locks.
3. Tighten the 2 captive screws (5).

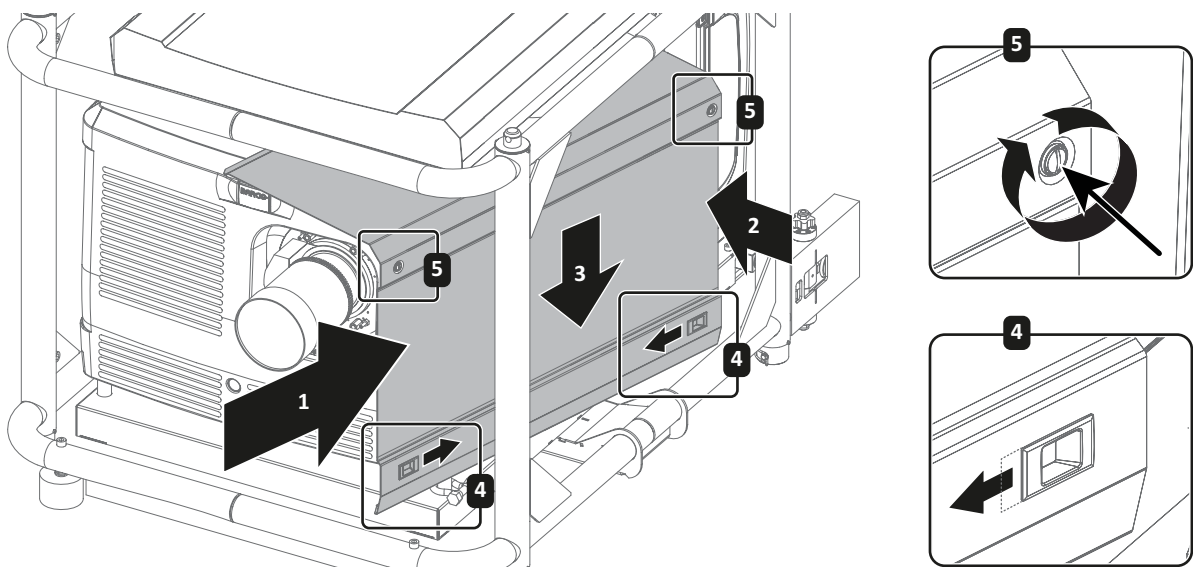


Image 8-13
Installing the left cover

A. DIMENSIONS AND SPECIFICATIONS

A.1 Dimensions of the Barco HDQ 4K35

Dimensions

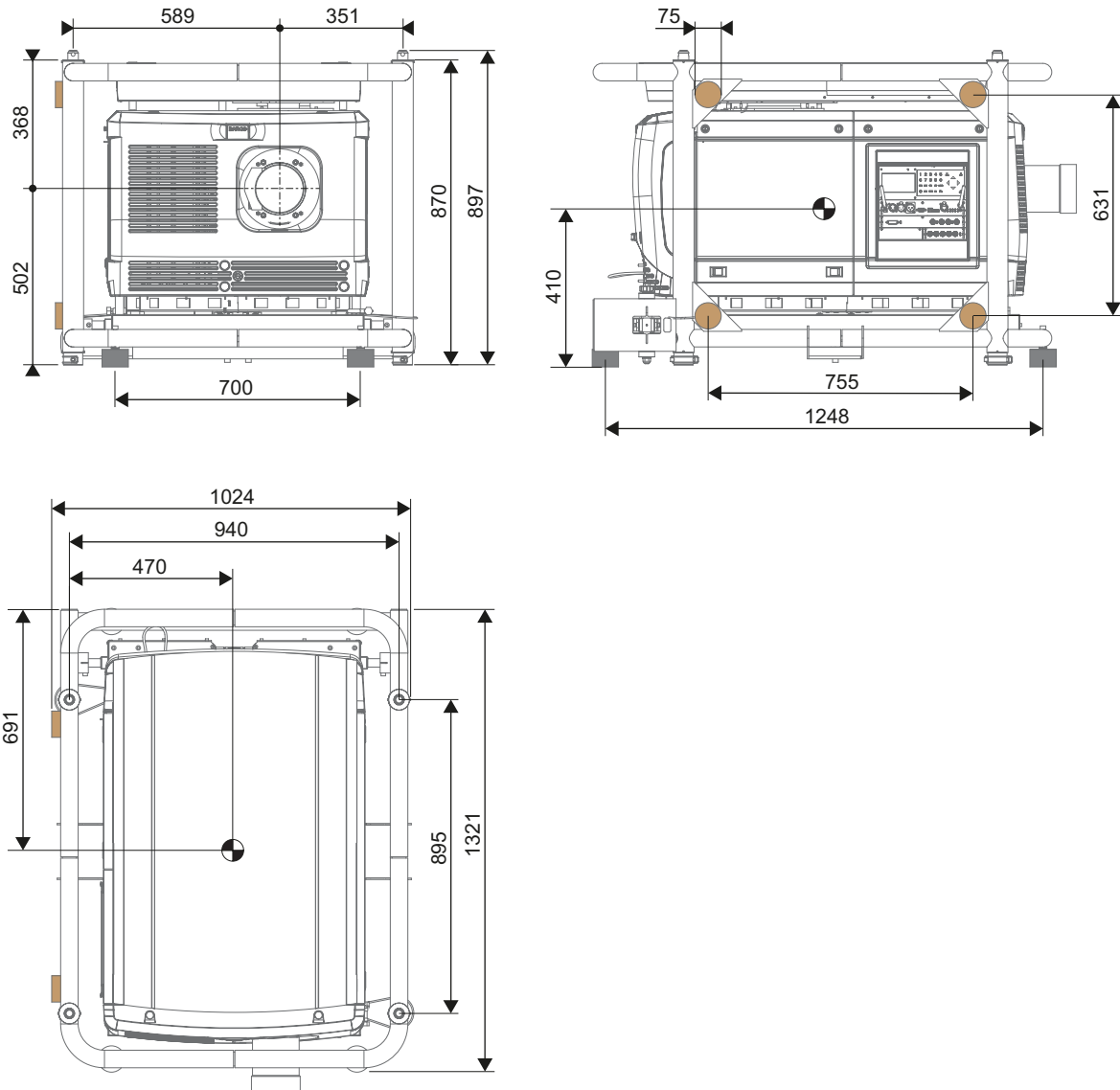


Image A-1
Dimensions of the Barco HDQ 4K35

- Lens-to-lens distance (with stacked projectors): 870 mm

A.2 Specifications of the Barco HDQ 4K35

Overview

Projector type	4K 3-chip DLP digital projector
Technology	1.38" DMD™ x3
Resolution	4,096 x 2,160
Brightness	35,000 center lumens / 33,000 ANSI lumens

A. Dimensions and specifications

Contrast ratio	2,000:1 (standard)
Brightness uniformity	90%
Aspect Ratio	1,896
Lens type	XLD / XLD HD (4K lens)
Lenses	lenses fixed 0.72; 0.9 zoom lenses starts at 1.3: 1 till 7.2 :1(check lens calculator for full details)
Optical lens shift	Vertical: +/-70% / Horizontal: +/-30% depending on the lens type shift can be inferior
Color correction	P7
Lamps	6.5 kW xenon
Lamp lifetime	500 Hrs
Transport with lamp	No
Lamp house, quick replace	Yes
Customer bulb replace	Yes
Lamp warranty (field replace/ factory replace)	90 days, 300 hours / pro rata 300 hours
3D	ready
Inputs	2 x DP 1.1 only (2 x 2,048 by 2,160) HDMI ready; DP 1.2 ready; 3GHDSI ready
Sealed DLP™ core	Standard
Optical dowser	Standard
Orientation	table - side (portrait)
WARP	external optional MCM warp
Integrated web server	yes (projector control board)
Optional Inputs	NA
Input Resolutions	Up to 4K 60p
Software tools	DC Communicator
Network connection	10/100 base-T, RJ-45 connection
Power requirements	200-240V /380-400V@50-60Hz
Max. power consumption	8,000W
Noise level (typical at 25°C/77°F)	61 dB(A)
Operational ambient temperature	0-35°C / 32°-104°F
Operational humidity	0-80% (non condens)
Dissipation BTU	Max. 27,331 BTU/h
Dimensions (WxLxH)	1,025 x 1,320 x 900mm / 40.35 x 51.96 x 35.43 inches
Weight	210kg (462.97lbs)
Shipping Dimensions	(LxWxH) 1,522 x 1,242 x 1,215 mm / 59.92 x 48.90 x 47.83 inches
Shipping Weight from Factory	270kg (595.25lbs)
Standard accessories	Power cord; adjustable frame/ clamps
Certifications	Compliant with UL60950-1 and EN60950-1 complies with FCC rules & regulations, part 15 Class A and CE EN55022 Class A, RoHS
Warranty	2 years

A.3 Technical Regulations

Certificates



Image A-2
Rohs



Image A-3
Rohs OK



Image A-4
CE mark

B. ENVIRONMENTAL INFORMATION

Overview

- Disposal information
- Rohs compliance
- Production address
- Importers contact information

B.1 Disposal information

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>

Disposal of batteries in the product



■ This product contains batteries covered by the Directive 2006/66/EC which must be collected and disposed of separately from municipal waste.

If the battery contains more than the specified values of lead (Pb), mercury (Hg) or cadmium (Cd), these chemical symbols will appear below the crossed-out wheeled bin symbol.

By participating in separate collection of batteries, you will help to ensure proper disposal and to prevent potential negative effects on the environment and human health.

Disposal of lamp

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.

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.

B.2 Rohs compliance

中国大陆 RoHS (Information for China ROHS compliance)

根据中国大陆《电子信息产品污染控制管理办法》(也称为中国大陆 RoHS), 以下部份列出了本产品中可能包含的有毒有害物质或元素的名称和含量。



B. Environmental information

Table of toxic and hazardous substances/elements and their content, as required by China's management methods for controlling pollution by electronic information products

零件项目(名称) Component name	有毒有害物质或元素 Hazardous substances and elements					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr6+	多溴联苯 PBB	多溴二苯醚 PBDE
印制电路配件 Printed Circuit Assemblies	0	0	0	0	0	0
插入式插件 Plug assembly	0	0	0	0	0	0
外接电(线)缆 External Cables	0	0	0	0	0	0
内部线路 Internal wiring	0	0	0	0	0	0
散热片(器) Heatsinks	0	0	0	0	0	0
光学镜头 Optical lenses	x	0	0	0	0	0
底架 Chassis	0	0	0	0	0	0
外壳 Enclosure	0	0	0	0	0	0
螺帽,螺钉(栓),螺旋(钉),垫圈,紧固件 Nuts, bolts, screws, washers, Fasteners	0	0	0	0	0	0
电源供应器 Power Supply Unit	0	0	0	0	0	0
风扇 Fan	0	0	0	0	0	0
键盘 Keyboard	0	0	0	0	0	0
显示(器) Display	0	0	0	0	0	0
正面(前)面板 Front panel	0	0	0	0	0	0
金属制品[制造] Metalwork	0	0	0	0	0	0
塑胶制品[制造] Plastic work	0	0	0	0	0	0
电池(组) Batteries	0	0	0	0	0	0
文件说明书 Paper Manuals	0	0	0	0	0	0
光盘说明书 CD Manual	0	0	0	0	0	0
装置配件 Installation kit	0	0	0	0	0	0
O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。 O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。 X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006						

Turkey RoHS compliance



■ Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.
[Republic of Turkey: In conformity with the WEEE Regulation]

B.3 Production address

Factories

Barco NV

Noordlaan 5, B-8520 Kurne (BELGIUM)

Barco Visual (Beijing) Electronics Co. Ltd.

巴可伟视(北京)电子有限公司

No.16 Changsheng Road, Changping District, 102200, Beijing, P.R.C

北京市昌平区中关村科技园区昌平园昌盛路16号 邮政编码: 102200

Made in information

The made in country is indicated on the product ID label on the product itself.

Production date

The month and year of production is indicated on the product ID label on the product itself.

B.4 Importers contact information

Contact

To find your local importer, contact Barco directly or one of Barco's regional offices via the contact information given on Barco's web site, www.barco.com.

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Revision Sheet

To:

► **Barco nv/Documentation**
Noordlaan 5, B-8520 Kuurne
Phone: +32 56.36.82.11, Fax: +32 56.36.88.24
Support: www.Barco.com/esupport, Web: www.barco.com

From: _____

Date: _____

Please correct the following points in this documentation (**R5905823/02**):

page	wrong	correct