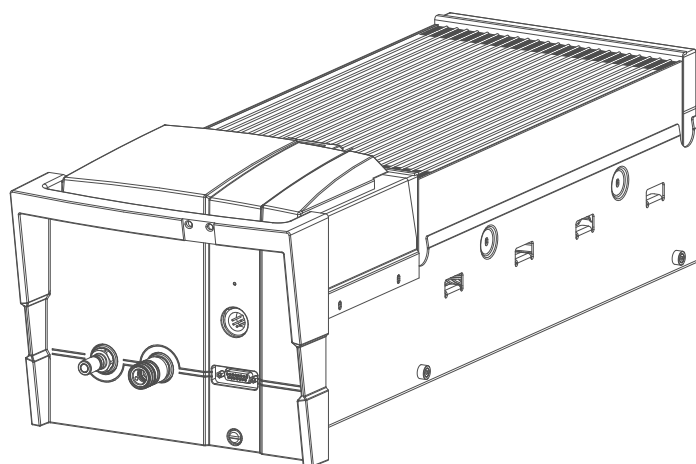


External Laser Cooler Module

For UDX



Installation manual

Barco NV

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External Laser Cooler Module

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1.1 Introduction

About the external cooler

For functionality and reliability, events projector require accurate temperature control and cooling. Therefore a liquid cooling system is provided in the projector.

The option of an additional external cooling can be chosen in two circumstances:

- If the projector stands in a public space and needs to play as silently as possible. Using the external cooler as a “replacement” cooling system, the projector will dissipate less heat and less noise (the amount varies per projector type).
- If you want to extend the lifetime of the projector and the light source, you can use the external cooler as an additional cooling system.

If the option is chosen to have an external cooling system in addition to the integrated cooling system, the cooling circuit inside of the projector will be connected to an external cooler via hoses. Only coolers and hoses exclusively developed for this application and approved by Barco are allowed to be used in this setup.

The cooler is controlled by the projector and ensures that the ambient temperature of the laser banks, and all other components within the light source are within spec.

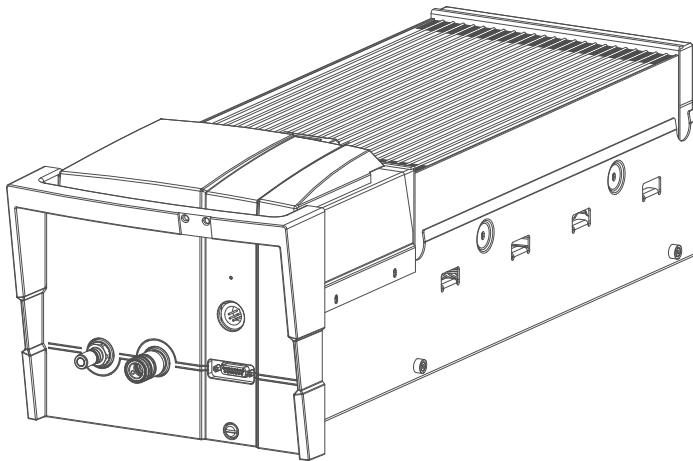


Image 1–1

About the optional cooler rigging frame

If you use multiple projectors with an external cooler, if your installation requires you to hang the coolers from a truss beam, or if you just want a handy method to move the cooler module around, it is advised to buy the optional cooler rigging frame (**R9408960**). This rigging frame has room for two cooler modules and comes with 2 filters as well.

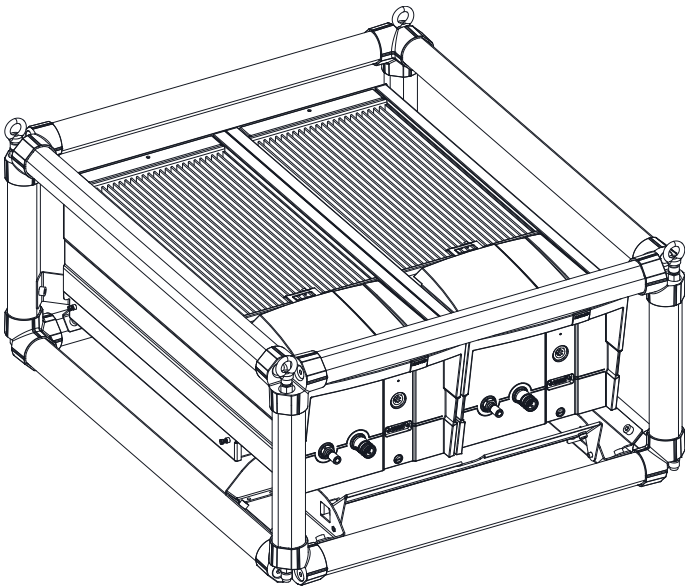


Image 1–2

1.2 Installation requirements

Environment conditions

In general, keep in account that the external cooler must comply with the same environmental conditions as the projector it is connected to. It is not advised to have huge temperature differences between cooler module, tubing and projector, as this will have an influence on the cooling liquid flowing through it. Cooling liquid that is too hot or too cold may negatively impact the performance of the projector.

The following table summarizes the physical environment in which the cooler by itself may be safely operated or stored. However, keep in mind that if the environmental conditions table of the connected projector are more strict, those must apply to the cooler as well.

Environment	Operating	Non-Operating
Ambient Temperature	<ul style="list-style-type: none">Cooler by itself: 10°C (50°F) to 40 °C (104 °F)In aspect to the projector: Within +/- 5°C. from projector environment (at startup)Ideal environment: 15-18°C (59–64.5°F)	<ul style="list-style-type: none">Cooler by itself: -15°C (5°F) to 60°C (140°F)In aspect to the connected projector: +/- 5°C. from projector environment
Humidity	0% RH to 80% RH Non-condensed	0% RH to 90% RH Non-Condensed
Altitude	<ul style="list-style-type: none">Cooler by itself: -60 m (-197 Ft) to 3000 m (9843Ft)¹Cooler in aspect to the projector: less than +/- 5 meters from projector.	<ul style="list-style-type: none">Cooler by itself: -60 m (-197 Ft) to 10000 m (32810 Ft)In aspect to the projector: less than +/- 5 meters from projector

Avoiding condensation buildup in the projector

In order to avoid building up of condensation in the projector, it is advised to have at the startup of the projector, the external cooler, tubes and projector to be in a room with similar ambient temperature (+/- 5°C difference).

During normal operation (after startup has completed and projector remains ON), the minimum temperature of the external cooler should not be lower than 10°C.

1. For PRC (People's Republic of China) the certified altitude is specified on the product label.

In air-conditioned rooms, make sure that at startup of the projector, the climatization of the room of the projector, cooler and tubes is active. If the projector is controlled remotely, make sure the room climatization can be controlled remotely as well and is included in the same control process / is in sync with the projector status.

Clean air environment

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

An air filter for a singular cooler module is not delivered by default, since it is not possible to mount a filter on a singular loose unit without use of external options (e.g. the rigging frame). However, it is still advised to use an air filter alongside the cooler module. Barco provides a kit with the filter commonly used in combination with this type of cooler module (**R9801562**).

Air flow requirements

The cooler module is fan cooled and must be installed with sufficient space around the air inlets and outlets. Make sure a space of minimum 15 cm (6 in) is available to ensure sufficient air flow. It should be used in an area where the ambient temperature, as measured at the air inlets, does not exceed 40 °C (104 °F). Also take into account the airflow coming out of the cooler (225 CFM).



If the Barco filter is used, keep in account that the distance between filter and air inlets should still be around 5 cm (2 in). Distance between filter and the solid surface then should be around 10cm (4 in).

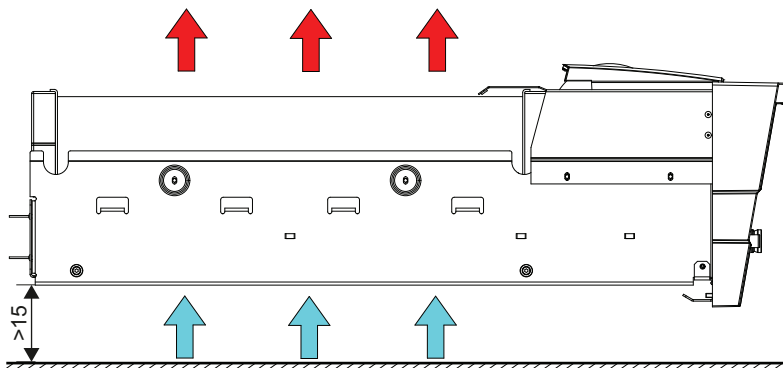


Image 1-3

For this reason, if you use one or more cooler modules without any mounting support or rigging frame, it is not allowed to place a single cooler module on the ground in normal position. In this case, the cooler should be placed either facing upwards, or on its side (with the tubes going to the left).

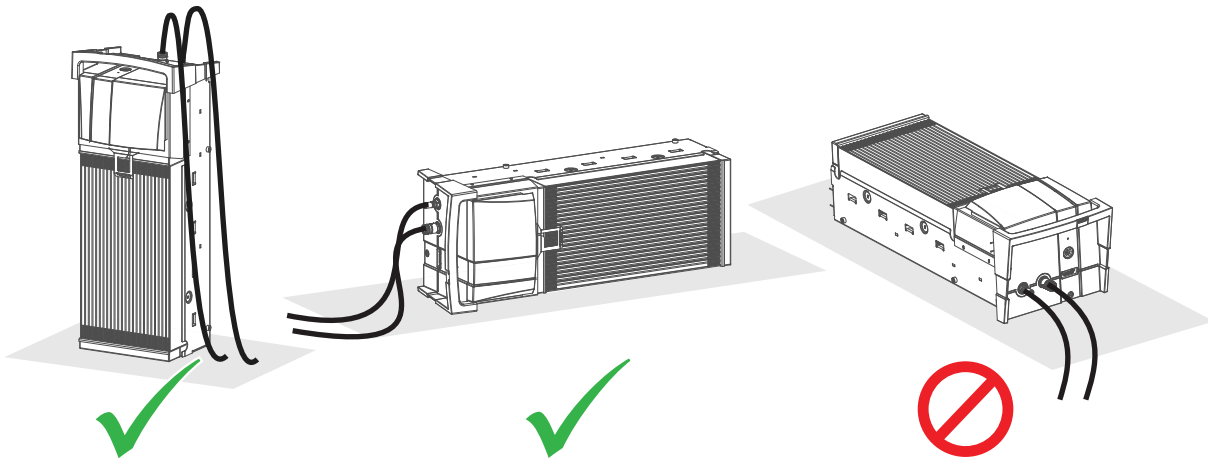


Image 1–4



WARNING: The cooler will tip over when tilted. It must therefore be attached to a fixed object/ building structure to avoid damages or injuries.

Stacking multiple cooler modules

Stacking multiple coolers on top of each other is **NOT** allowed (neither loose modules nor when mounted in a rigging frame). The air intake of the upper cooler would take in the “hot” air of the lower cooler, even at a distance of one meter apart.

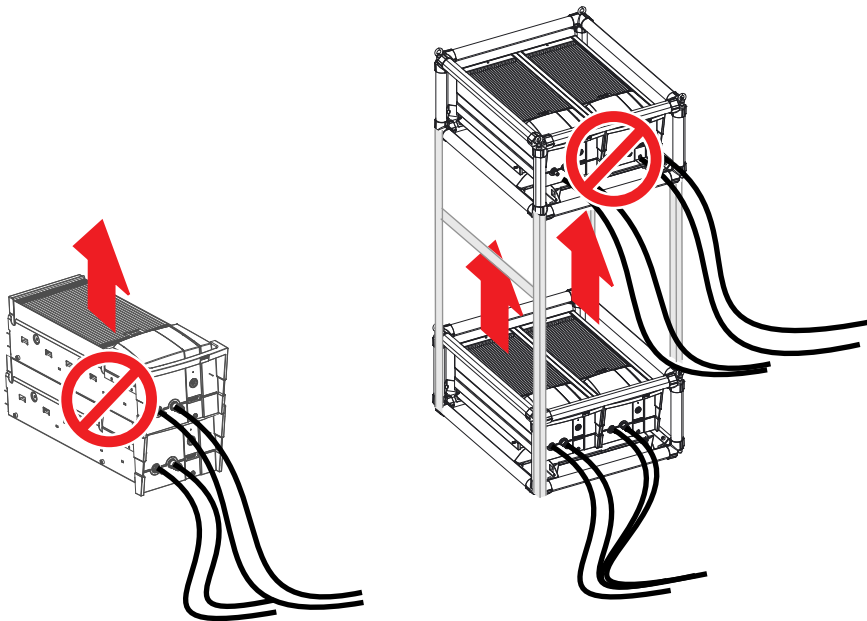


Image 1–5 Bad example of stacking cooler modules

A stack of cooler modules positioned on their sides can be considered. In this case however, make sure the direction the cooler modules have is identical, in order to make sure the air flow goes in the same direction. Also, this position is **only** allowed when the cooler modules are fixated in an adapted structure, so that they don't risk falling or tipping over.

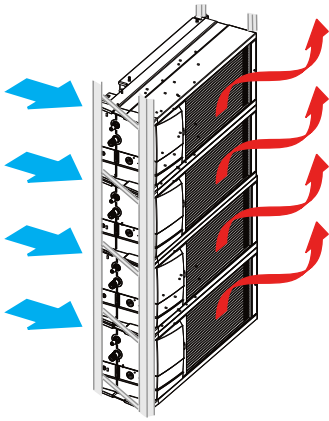


Image 1–6 Good example of stacking cooler modules



WARNING: The cooler will tip over when tilted. It must therefore be attached to a fixed object/ building structure to avoid damages or injuries.

Cooler module weight

One external cooling unit weighs about ± 16 kg (± 35.3 lb.).

Maximum height difference between projector and cooler

Regardless the mounting position or orientation of the cooler (on the floor, in a rigging frame on a truss, or on the wall in portrait or landscape mode), the difference in height (H) between the two ends of the cooling tubes should always be less than 5 meters (16.4 feet).

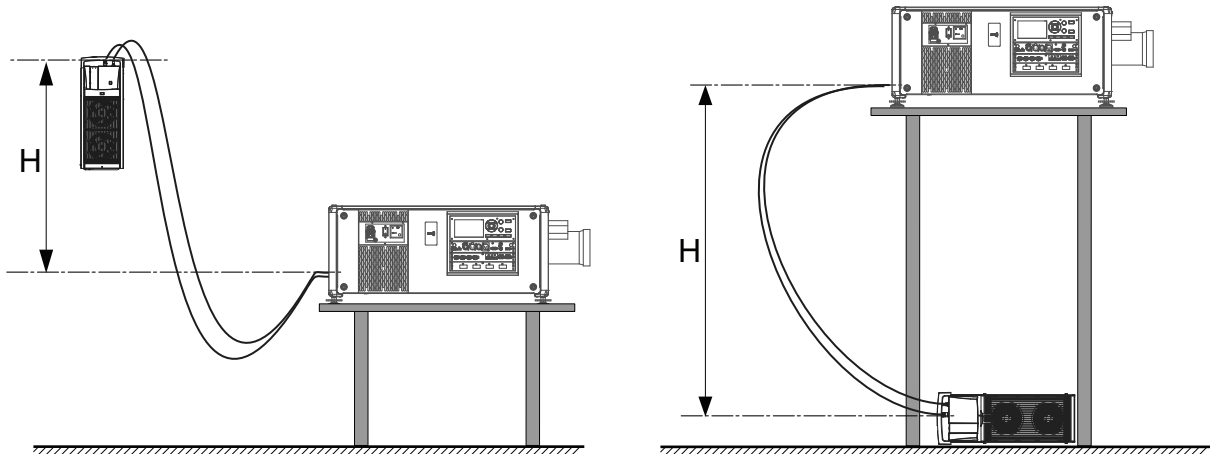


Image 1–7



CAUTION: Position the hoses of the cooling system so that they will not be tripped over, pulled, or in contact with hot surfaces.

Power requirement

The cooler module runs on 24 VDC, and should be connected with a data and power cable coming from the projector.

However, the projector can only operate in the range 200–240V while connected to the external cooler.

Extending the maximum length between projector and cooler

Regardless the mounting position or orientation of the cooler (on the floor, in a rigging frame on a truss, or on the wall in portrait or landscape mode), the length of cables and tubing is designed for 8 meters (8.75 yd) in distance.

If required, the cooling tubes can be concatenated with each other to a distance of 24 meters (26.25 yd) maximum. However, Barco doesn't supply extension cables for power and control of the external cooler. Market available solutions can be used, or alternatively, you can also build your own extension with the following instructions:

- A data cable of the desired length with the following specs:
 - RS232 cable
 - 15-pin D-Sub connectors: DA-15 and DB-15
- A custom power cable with the following specs:
 - 2 x 1.5 mm²
 - A male and female 5 pin XLR connector
 - Connect (+) = pin 2+3
 - Connect (-) = pin 4+5

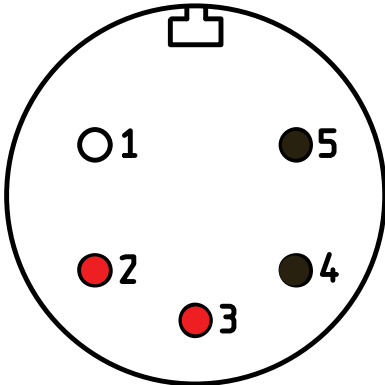


Image 1–8 Wiring of the XLR connector

1.3 Optional rigging frame

About the rigging frame

In case you have require multiple coolers and or require your cooler to be suspended from a truss or ceiling, you can order the rigging frame for coolers kit (**R9408960**).

Rigging frame kit content

The kit contains the following packages:

- **R9801646**: Empty rigging frame for cooler
- **R9801624**: Base plate for the cooler unit
- **R9801566**: Cooler housing
- **R9801560** x2: Cooler modules (two pieces)
- **R9801562** x2: Air filter (2 pieces)
- **R5906813**: Installation manual Rigging frame (packed with the empty frame kit)

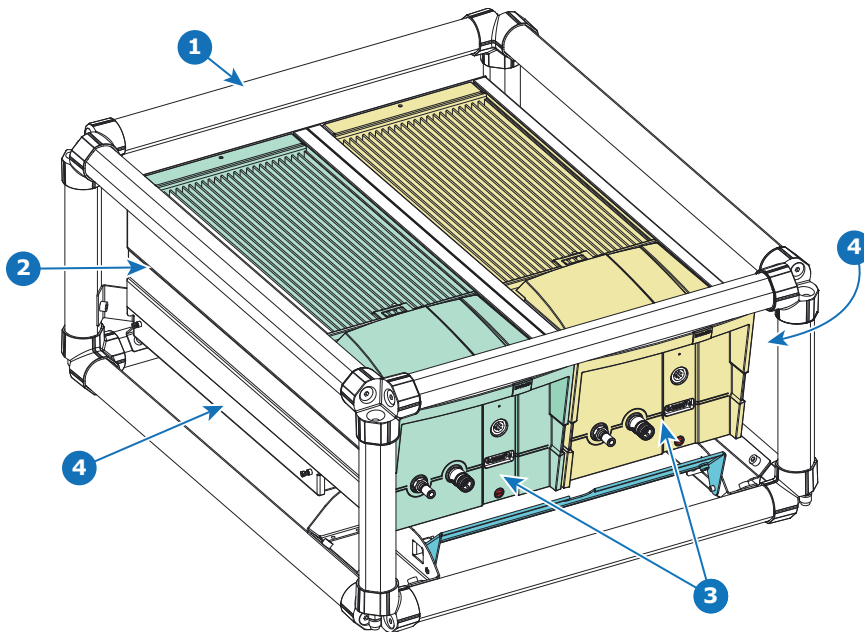


Image 1–9 Example of a fully assembled rigging frame with cooler

- 1 **R9801646:** Empty Rigging frame for cooler
- 2 **R9801624** and **R9801566:** Base plate and housing for cooler unit
- 3 **R9801560:** Cooler modules (2 pieces)
- 4 **R9801562:** Air filters (2 pieces, behind small cover)



For detailed instructions on assembling the rigging frame and mounting the cooler in the frame, consult the installation manual, included in the Empty rigging frame package (R9801646).

1.4 Supported mounting positions



WARNING: The cooler will tip over when tilted. It must therefore be attached to a fixed object/ building structure to avoid damages or injuries.

General

The Cooler module can be mounted in one of the following positions

- While hanging from a truss in landscape or portrait mode.
- Positioned on a solid surface (floor mounting).
- Fixed on a wall in portrait or landscape mode.
- Mounted in a dedicated rack.



Make sure to always take the installation requirements into account when choosing a location to install the cooler!

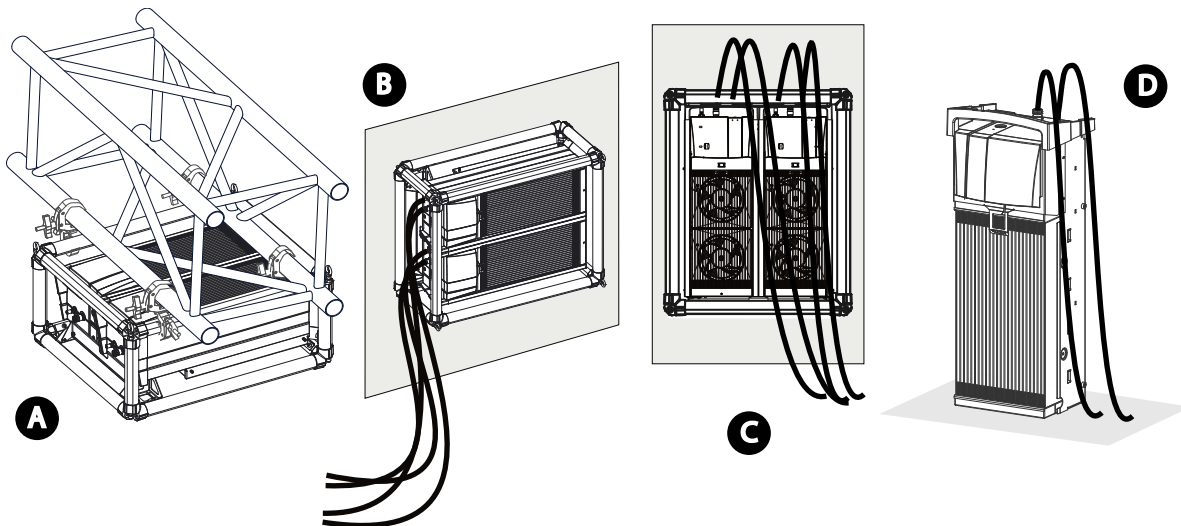


Image 1–10

- A** Hanging from a truss
- B** Wall Mounting (Landscape).
- C** Wall Mounting (Portrait).
- D** Floor Mounting

Mounting details and limitations

Depending the chosen mounting option, some limitations must be taken into account:

- Hanging from a truss beam:** When this option is chosen, it is advised to use the cooler rigging frame. When mounted in a rigging frame, only use the following rigging positions. Use the gray colored bars to mount the rigging clamps.

Caution: Only use the depicted mounting positions. For safety reasons, it's not allowed to hang up the rigging frame with the tubes facing downwards. For technical reasons, it's also not allowed to hang up the rigging frame with the tubes facing the right side.

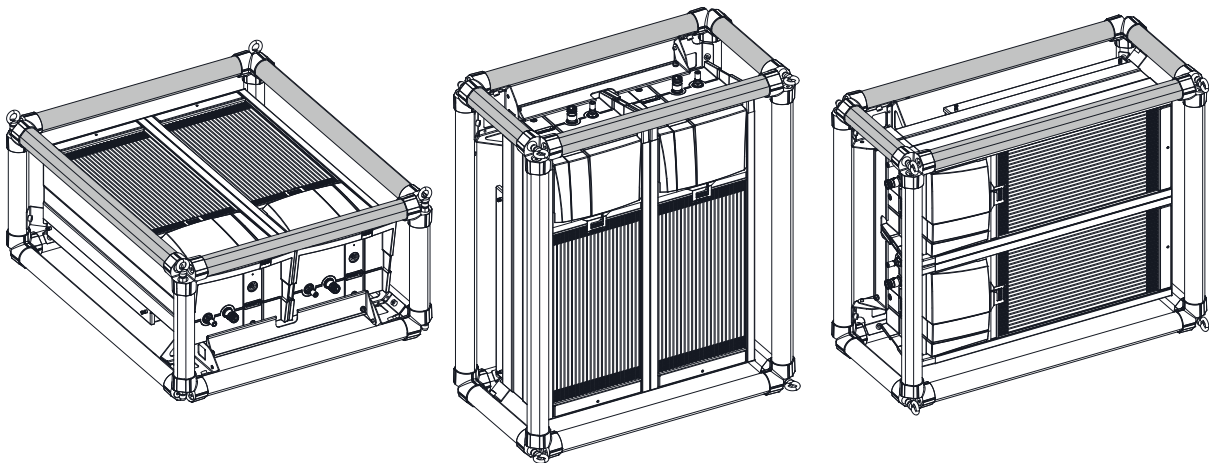


Image 1–11 mounting options when hanging from a truss beam

- Floor mounting:** When placing the cooler module on the ground, on a table, or on another similar flat surface, make sure it is placed either facing upwards, or on its side (with the tubes going to the left). Never place the cooler module with its air inlets touching the ground.

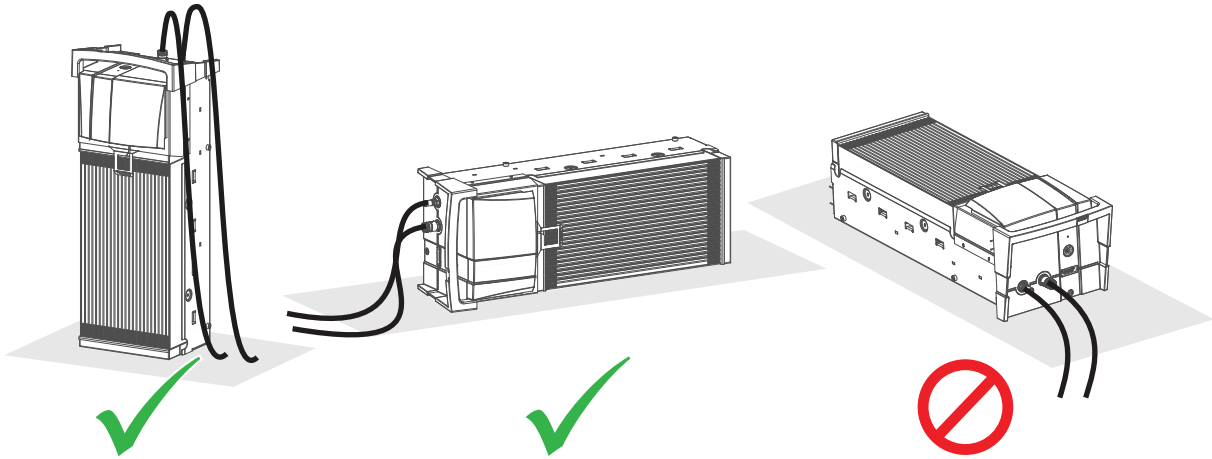


Image 1-12

- Wall mounting – portrait mode:** When this option is chosen, the cooler must be fixed on the wall in portrait mode or in landscape mode, while taking into account the installation requirements (e.g. the 15cm space between surface and air inlets).
 In portrait mode, it is advised to mount the cooler must be mounted with the cooling tubes upwards. The other position (cooling tubes down) is only allowed if you can safely secure the cooler module from falling. However, when mounted in the rigging frame or other rack it is not allowed to mount the cooler module with the tubes facing downward because of safety reasons.

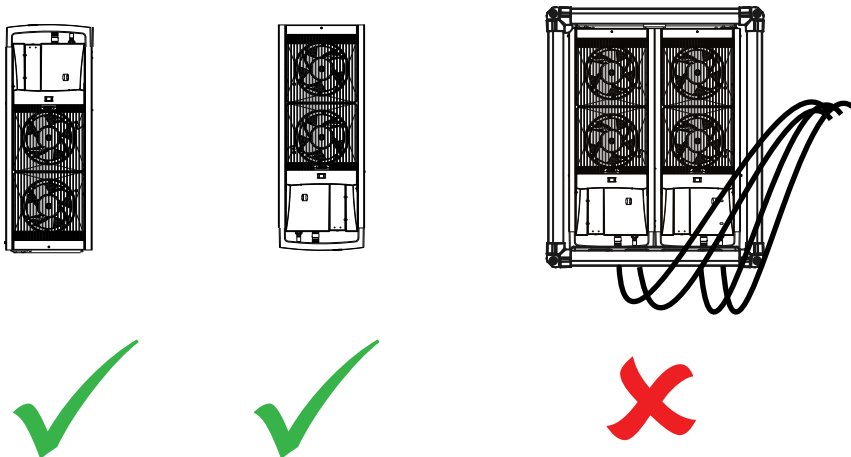


Image 1-13

- A** Portrait Mode with cooling tubes facing upward
- B** Singular cooling module in portrait mode with cooling tubes down
- C** Cooler modules in rack/rigging frame with cooling tubes down (not allowed for safety reasons).

- Wall mounting – landscape mode:** When this option is chosen, the cooler must be fixed on the wall in portrait mode or in landscape mode, while taking into account the installation requirements (e.g. the 15cm space between surface and air inlets).
 In landscape mode the cooler must be mounted with the cooling tubes to the left. The other position (cooling tubes to the right) is not allowed due to technical limitations.

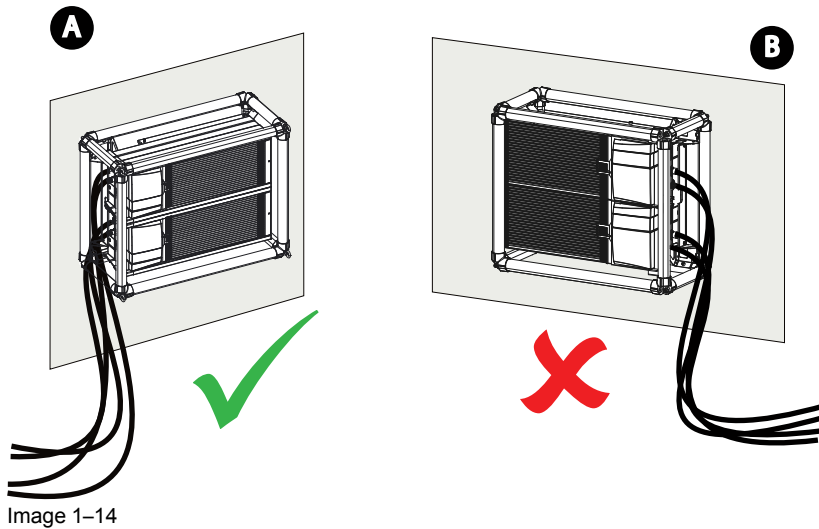


Image 1–14

- A** Landscape Mode with cooling tubes to the left
B Landscape Mode with cooling tubes to the right (not allowed due to technical limitations)

1.5 Connecting the UDX to the external cooler

Required parts

- Cooling tube (2 x 8 meters)
- Data & power cable

How to access the hose connections on the projector

1. Remove the back cover of the projector.
2. Loosen the two screws holding the protective plate from the back cover (reference 1 [Image 1–15](#)).

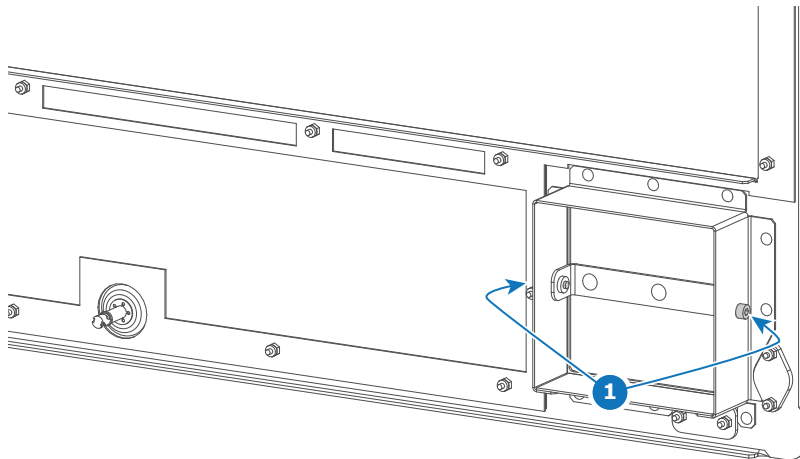


Image 1–15

3. Remove the protective plate (reference 2, [Image 1–16](#)) from the back cover.

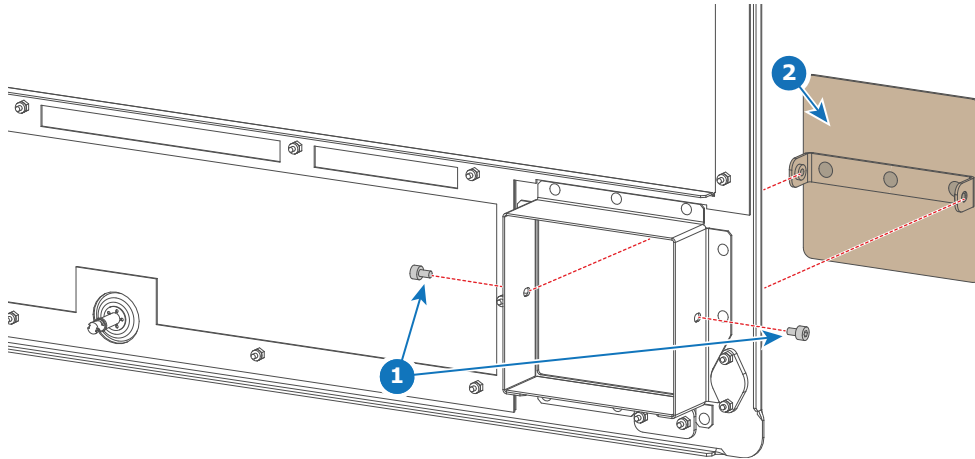


Image 1-16

4. Install the back cover again, without the protective plate.

How to connect the hoses and cable?

1. Ensure that all connectors of the hoses, chillers and projector are clean. Wipe away any dust before attaching.
2. Connect the hoses between the projector and external cooler as illustrated in [Image 1-17](#) (reference 1).

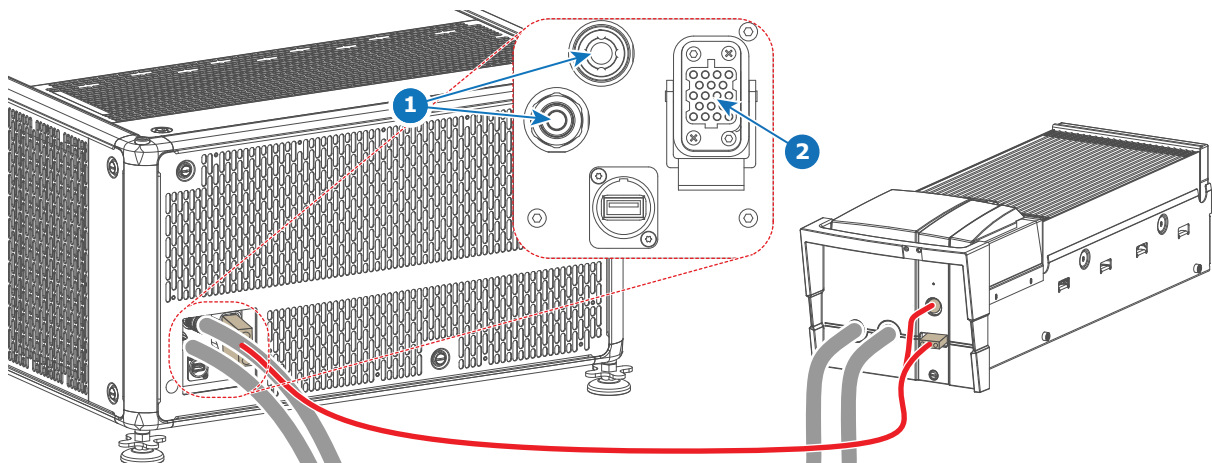


Image 1-17 A projector (left) connected to an external cooler (right), using hoses (grey) and a power and data cable (red)



Tip: First move the latch (reference 1 [Image 1-18](#)) away from the connection while coupling the hose. Then release the latch and push the hose further until the latch locks.

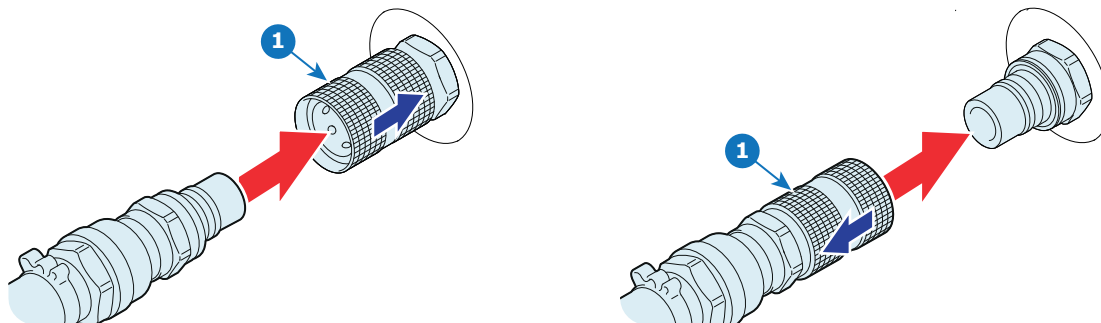


Image 1-18 Left: Male hose connection, right: Female hose connection

3. Connect the communication and power cable (reference 2, [Image 1-17](#)) on the cooler with the same port on the projector. Use a long power and communication cable for this.



Tip: Guide the long communication cable together with the hoses.

1.6 Setting up the external cooler on a UDX

Using the external cooler

When the external cooler for the projector is correctly installed, the Cooling menu will be enabled and visible in the menu.

Using the Cooling menu, you can choose between the following cooling methods:

- **Internal:** Use only the internal cooling system of the projector (default).
- **External:** Use only the external cooling system of the projector. This method is preferred when the cooler is in a different location than the projector and you want the projector to operate in “silent mode”.
- **Mixed:** Use both the external and internal cooling. Can be used to extend the lifetime of the internal cooler of the projector.

How to set up the external cooler

1. In the main menu, select *Installation* → *Cooling*.

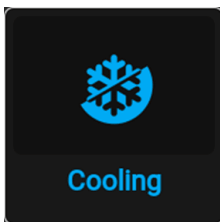


Image 1-19 Installation menu, Cooling

The Cooling menu is displayed.

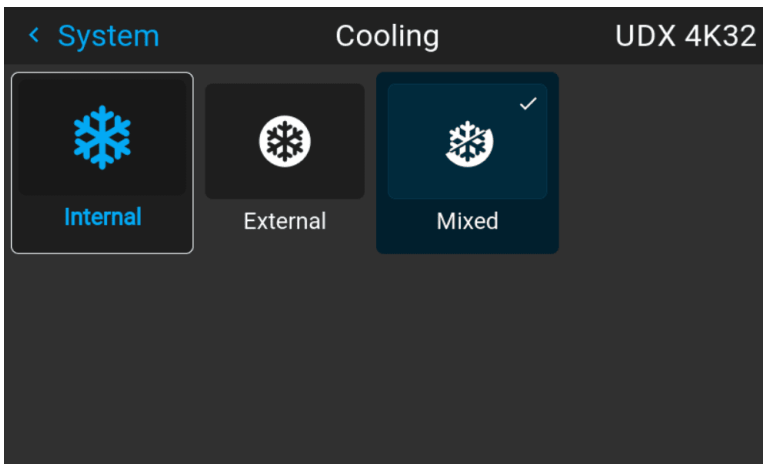


Image 1-20 Example of the cooling menu

2. In the Cooling menu, select the desired cooling option.



Note: After changing the settings, it can take up to 1 minute for the changed settings to take effect.

1.7 Specifications of the Cooler Module

Specifications

Dimensions (WxLxH)	278.1 x 733.6 x 234.4 mm / 10.95 x 28.88 x 9.23 inches
Weight	±16 kg (±35.3 lb.)
Power requirements	24 VDC, connected to projector via provided power & data cable
Noise level	50–52 dB

Ambient temperature	<ul style="list-style-type: none"> Cooler by itself: 10°C (50°F) to 40 °C (104 °F) In aspect to projector: projector ambient temperature +/- 5 °C (at startup) Ideal environment: 15-18°C (59–64.5°F)
Ambient humidity	0% RH to 80% RH Non-condensed
Exhaust airflow	<ul style="list-style-type: none"> 225 CFM (without filter) 200 CFM (with filter)
Nominal dissipated BTU	UDX with cooler: 2000 W (6 825 BTU/h)
Max dissipated BTU	<ul style="list-style-type: none"> UDX (without cooler): 2500 W (8 530 BTU/h) UDX 40, 45 (with cooler): 3750 W (12 795 BTU/h) UDX 22, 26 and 32 (with cooler): 2900 W (9 895 BTU/h)
Noise reduction performance	<ul style="list-style-type: none"> UDX 4k22, 4k26, 4k32, W22, W26, W32, U32: 1-3 dB(A) UDX 4k40, W40, U40, U45LC: ~8 dB(A) <p>All values depend on ambient temperature.</p>
Standard accessories	R9801769 : Power & data cable (8 m), cooling liquid hose (2 x 8 m)
Optional accessories	R9408960 : Rigging frame for coolers kit (includes 2 cooler modules) R9801562 : Air filter set for Laser Cooler Module (2 pieces)

1.8 Cooler fan speed settings on UDX

About the fan speed settings

The fan speed of the external cooler is determined by the projector it is connected to. The setting is pre-determined based on the type of light source used and the following two measured values:

- The altitude of the projector, based on a barometric sensor.
- The environmental temperature, measured at the air inlet of the projector.

Fan speed settings on UDX

Device	Low altitude		High Altitude	
	20°C	40°C	20°C	40°C
UDX 4K40	60%	90%	70%	100%
UDX 4K32 (Gen 2)	40%	70%	50%	90%
UDX 4K32 (Gen 1)	40%	70%	50%	90%
UDX 4K26	40%	70%	50%	90%
UDX 4K22	30%	52%	36%	72%
UDX W40	60%	90%	70%	100%
UDX W32 (Gen 2)	40%	70%	50%	90%
UDX W32 (Gen 1)	40%	70%	50%	90%
UDX W26 (Gen 2)	40%	70%	50%	90%
UDX W26 (Gen 1)	40%	70%	50%	90%
UDX W22	30%	52%	36%	72%
UDX U32	40%	70%	50%	90%

1.9 Dimensions Cooler Module

Dimensions

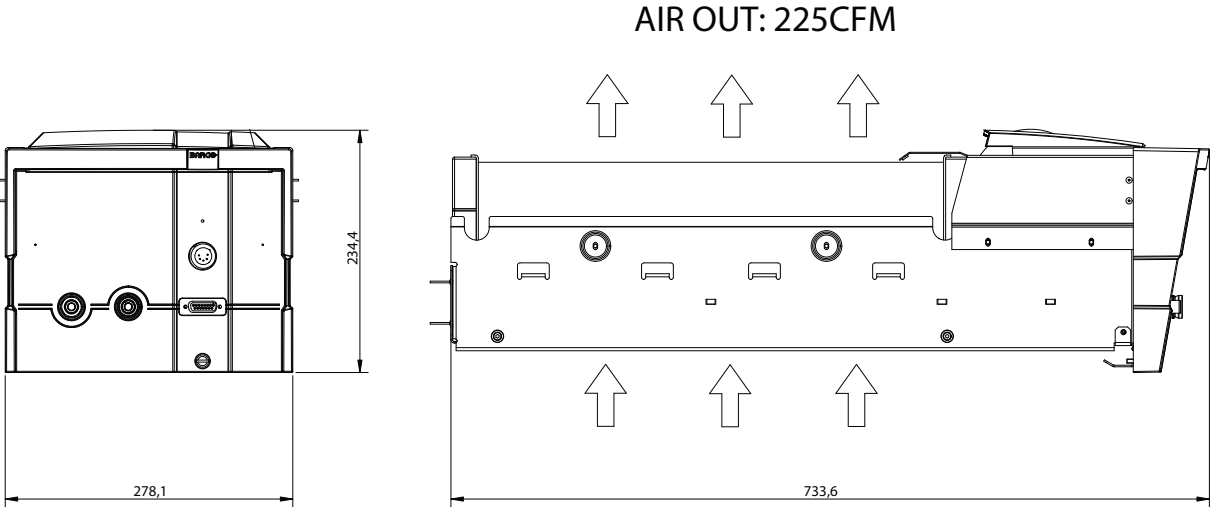


Image 1–21 Dimensions of the Cooler Module, in mm

