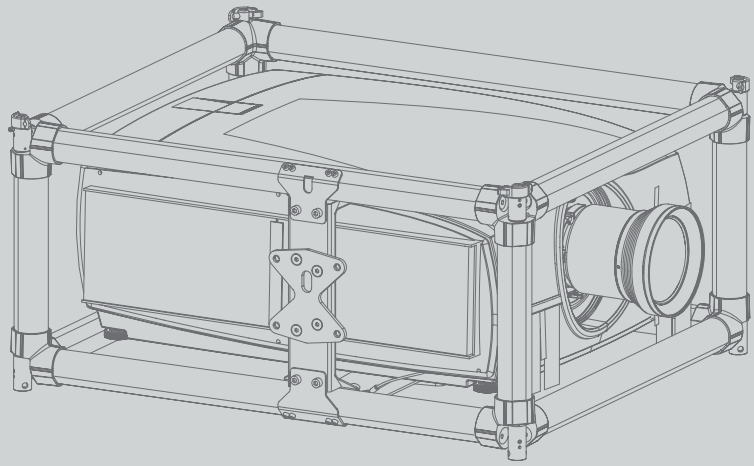
# F70 / F90 Multifunctional Frame



## Installation Manual

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BARCO

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# 1. F70 / F90-SERIES MULTIFUNCTIONAL FRAME

### Purpose of the F70 / F90-series multifunctional frame

The F70 / F90-series multifunctional frame is exclusively designed for the Barco F70 and F90 projectors and can thus not be used on any other equipment.

### Overview

- Safety
- Introduction
- Before assembling the frame
- Assembling the frame
- Installing the projector onto the multifunctional frame
- Installing the additional filter (F90 only)
- Stacking multiple projectors using the multifunctional frame
- Suspending the projector from a truss
- Skewing the projector
- Tilting the projector
- Rotating the projector
- Dimensions

## 1.1 Safety

### About this chapter

Read this chapter attentively. It contains important information to prevent damage to the rigging frame. Ensure that you understand and follow all safety instructions mentioned in this chapter before installing the rigging frame. After this chapter, additional “warnings” and “cautions” are given depending on the installation procedure. Read and follow these “warnings” and “cautions” as well.

### Installation personnel

This assembly of the frame and installation of the projector must be performed by authorized and qualified technical personnel only.

### Single assembly only

You can only assemble the rigging frame one single time. While you can remove and install other projectors into the frame and it is allowed to replace safety cables, it is not allowed to disassemble the rigging frame itself.

### Expiry date provided adhesive

Make sure to check the expiry date of the adhesive, provided with the rigging frame. Make sure the adhesive (high strength thread-locker) is not expired.

If expired, makes sure to get new adhesive of similar or higher strength than the one provided in the kit.

### Safety Data Sheets for Hazardous Chemicals

For safe handling information on chemical products, consult the Safety Data Sheet (SDS). SDSs are available upon request via safetydatasheets@barco.com.

### Securing all screws and stacking pins

Make sure that the thread of the screws and the stacking pins are provided with the necessary amount of adhesive.

**CAUTION: Make sure that all the screws are sufficiently tightened. Respect the torque required to tighten all screws.**

**Forgetting or neglecting to do this may result in an unsafe rigging frame.**

**CAUTION: When the safety cables have undergone a heavy shock, invisible damage may have occurred to the safety cables. In this case the safety cables must be replaced.**

### Maximum stacking and hanging

The projectors can be stacked on top of each other on a flat surface, or suspended from a truss using the multifunctional frame.

Keep the following in mind:

- It is allowed to stack **maximum three** projectors.
- It is allowed to suspend **maximum two** projectors.

### Transportation of the frame

Never transport the multifunctional frame in portrait position with a projector mounted. Failure to do so can cause damage the multifunctional frame. Refer to image 1-1 for a bad and good example of transportation.

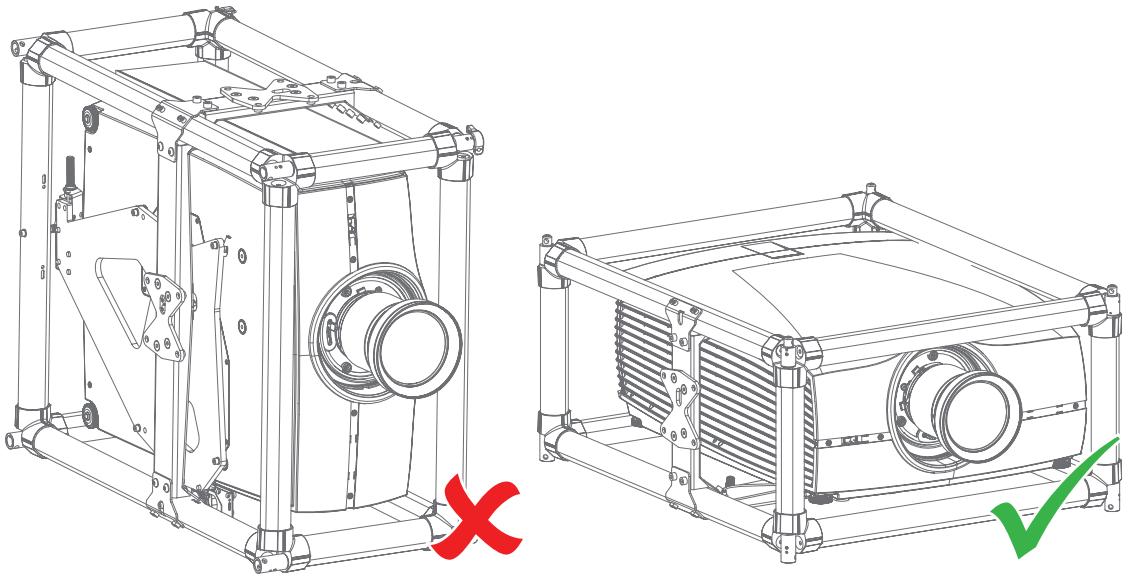

Image 1-1
Transportation method of the frame

**This limitation only counts for transportation of a rigging frame with projector mounted. You can still install the projector in portrait position while in the rigging frame.**

## 1.2 Introduction

### Functionality

An F70 / F90 projector mounted in the multifunctional frame makes the projector more rugged and handy.

The multifunctional frame makes it possible to stack multiple projectors. This can be useful for a dual projection 3D system. In the multifunctional frame, the projector can be rotated around x, y and z axis in order to obtain a seamless adjustment.

Furthermore, the multifunctional frame can be used to suspend the projector from a truss. This can be done either in a upright or upside down position.

### Content of the kit

| Parts to assemble rigging frame | Pieces |
|---|---|
| Bottom frame (contains projector supporting structure) | 1 |
| Top frame | 1 |
| Vertical profile | 4 |
| Top stacking pin | 4 |
| Bottom stacking pin | 4 |
| Stacking screw | 8 |
| Set screw M6 x 6 (to secure stacking screw) | 8 |
| Orientation rod + nut M3 x 50 (used as installation tooling) | 3 |
| High strength threadlocker | 1 |
| Side bracket | 1 |

| Parts to assemble rigging frame | Pieces |
|---|---|
| Hex screw with socket head M8 x 20 | 11 |
| Plain washer M8 | 4 |
| Locking pins | 4 |

| Parts to mount F90 projector | |
|---|---|
| Hex screw with socket head M6 x 25 | 4 |
| Spring washer M6 | 4 |
| Plain washer M6 | 4 |
| Hex screw with button head M8 x 20 | 1 |
| Spring washer M8 | 1 |
| Plain washer M8 | 1 |

| Parts to mount F70 projector | |
|---|---|
| Low head socket cap screw M8 x 25 | 4 |
| Plain washer M8 | 4 |

## Necessary tools

- Torque Wrench with **high** 17 mm hex socket
- Torque Wrench with **long** 5 mm Allen socket
- Allen wrench 6 mm
- Allen wrench 5 mm
- Allen wrench 3 mm

**The high 17 mm hex socket is not a common type of socket. Make sure you have this at your disposal before assembling the frame.**

## Parts identification

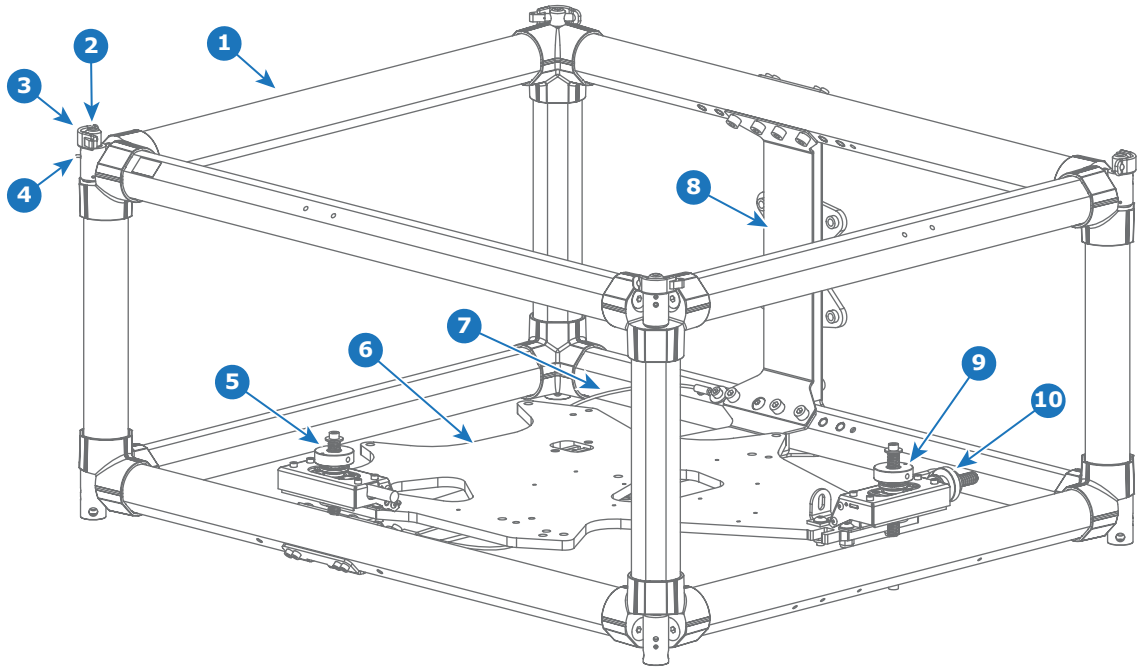


Image 1-2
1 Multifunctional frame (front side)
2 Stacking pin
3 Locking pin
4 Orientation rod + nut
5 Rotate adjustment knob
6 Projector supporting structure
7 Safety cable

8 Side bracket
9 Tilt adjustment knob
10 Skew adjustment knob

## 1.3 Before assembling the frame

### Packaging

Be careful not to remove all of the cardboard when removing the rigging frame parts from the packaging. You will need the following parts when trying to place the projector into the rigging frame.

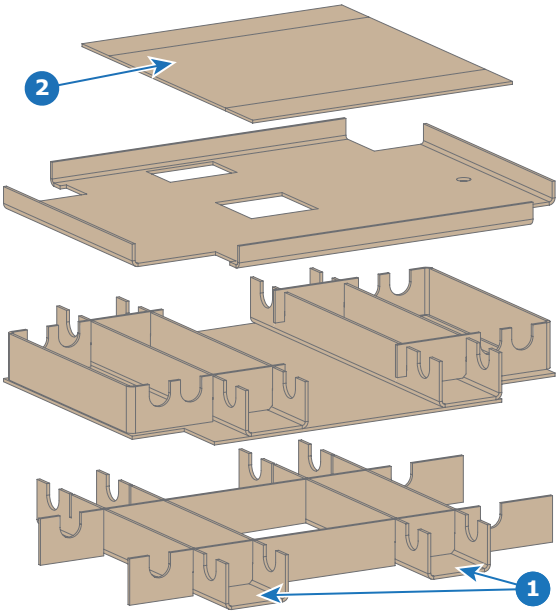


Image 1-3
1 Two bottom cardboard pieces
2 Bendable top cardboard piece

## 1.4 Assembling the frame

### Necessary tools

- Torque wrench with large 17 mm hex socket
- Allen wrench 3 mm
- Allen wrench 6 mm
- Orientation rod + nut M3
- High strength threadlocker (e.g. Loctite 262)

### Necessary parts

- Bottom frame
- Top frame
- Vertical profile (x4)
- Top stacking pin (x4)
- Bottom stacking pin (4x)
- Stacking screw (x8)
- Set screw M6 (x8)
- Support frame
- Hex screw with socket head M8 x 20 (x11)
- Plain washer M8 (x4)

### How to assemble the rigging frame

1. Lay out the bottom frame as illustrated.

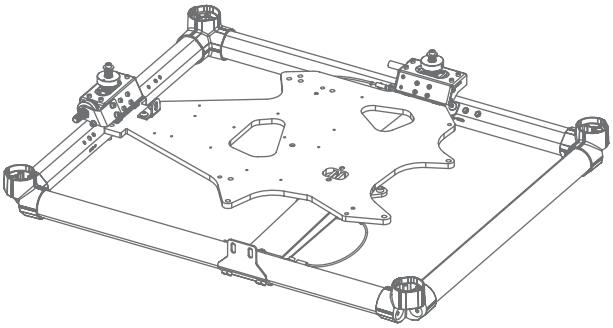

Image 1-4

2. Assemble the vertical frames onto the bottom frame as illustrated. Use the rigging screws to tighten them together.
   ***Caution:*** *Use high strength threadlocker on the rigging screws thread. Tighten the rigging screws with a torque of 40 Nm.*

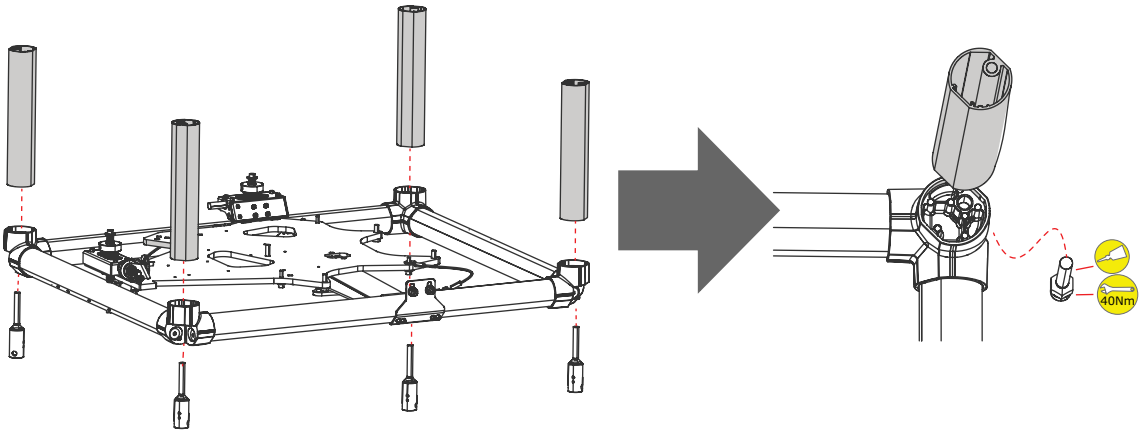


Image 1-5

3. Place the top frame onto the rest of the rigging frame. Make sure that the two side frame brackets are positioned on the same side and opposite of each other (image 1-6). If this is not possible due to mechanical error, contact Barco.

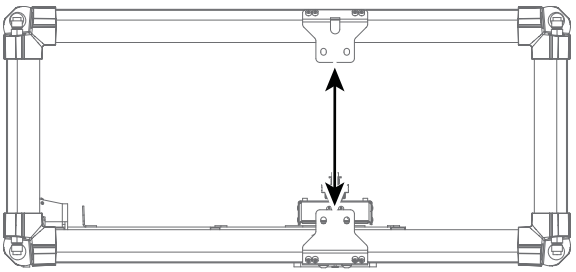

Image 1-6

4. Fixate the top frame onto the rest of the rigging frame. Use the rigging screws to tighten the two together.
   ***Caution:*** *Use high strength threadlocker on the rigging screws thread. Tighten the rigging screws with a torque of 40 Nm.*

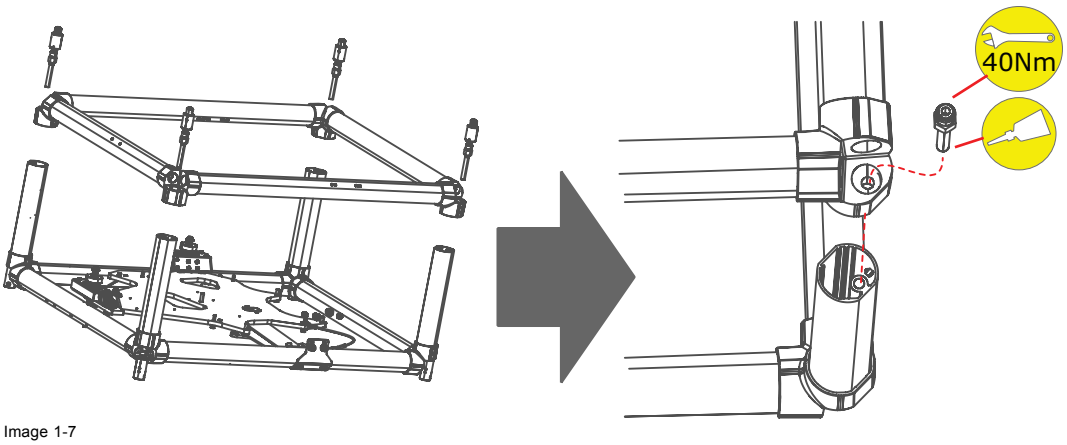


Image 1-7

5. Attach the side frame to the rigging frame as illustrated (image 1-8).

6. Install all 11 hex screws without tightening. Do this as illustrated (image 1-8). Use an 6 mm Allen wrench.
   ***Note:*** *The four screws at the outer side of the rigging frame must be provided with a plain washer (reference 1 image 1-8).*

   ***Caution:*** *Use high strength threadlocker on ALL hex screws.*

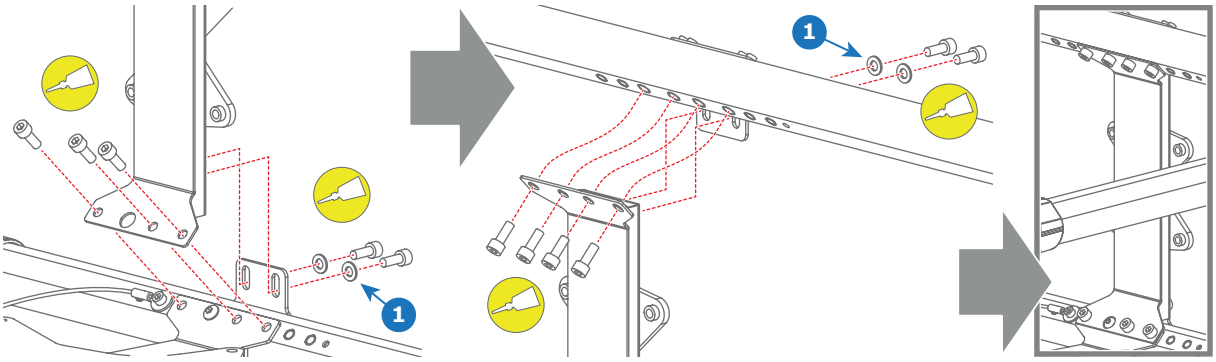


Image 1-8

7. When all screws are installed, tighten the screws.
   ***Caution:*** *Make sure that all 11 screws are well tightened.*

## How to install the stacking pins

1. Install the top and bottom stacking pins onto the top side of the frame as illustrated.
   ***Caution:*** *Provide sufficient high strength threadlocker on the inner thread of the stacking pins.*

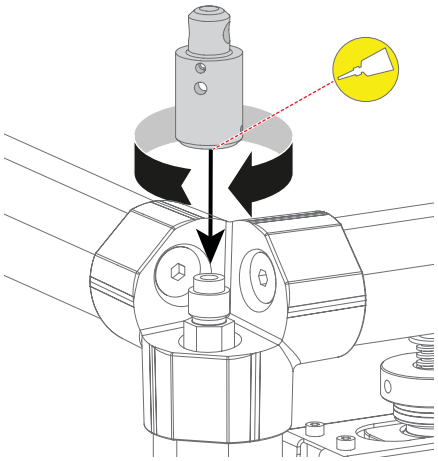

Image 1-9

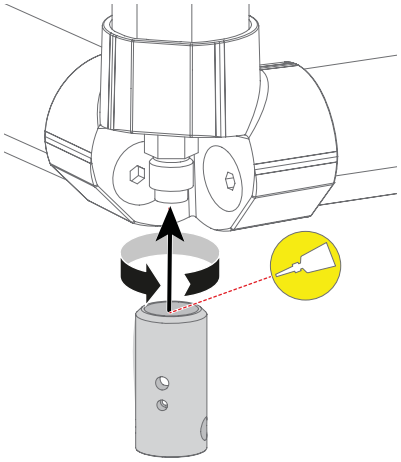

Image 1-10

2. Tighten the stacking pins by hand until you feel it's been fully tightened.
3. Turn the stacking pins back in the opposite direction until you can place the orientation rod + nut as illustrated image 1-11).
   ***Caution:*** *Make sure the orientation rod is pointing precisely in the round of the corner piece. If not done precisely, the frame will not be connectable to other frames. For more info on connecting rigging frames, see "Stacking multiple projectors using the multifunctional frame", page 10.*

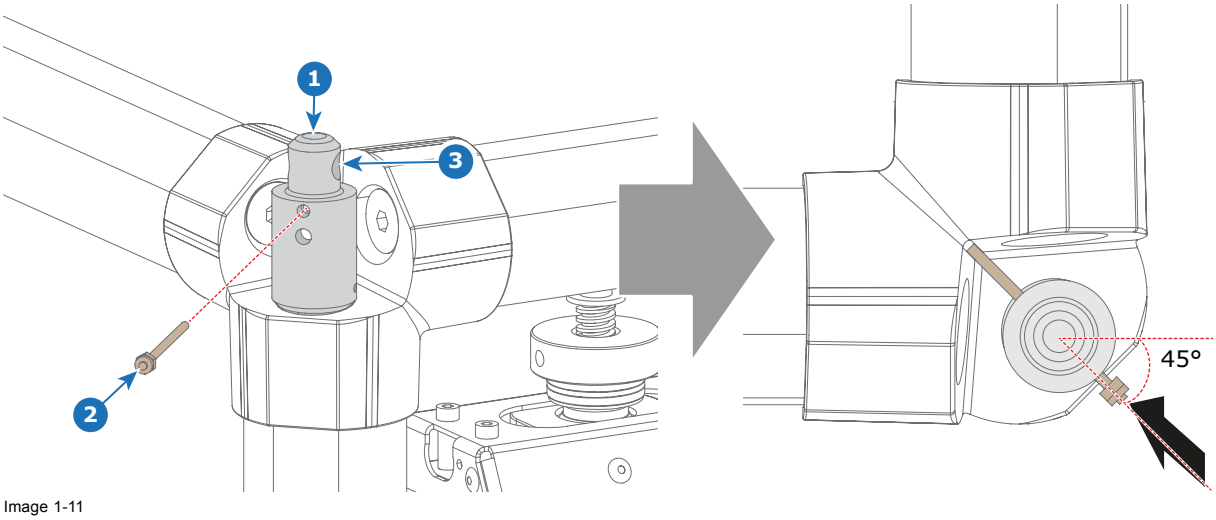


Image 1-11

1 Stacking pin
2 orientation rod M3 + M3 nut
3 Stacking hole

4. Mount the M6 set screws. Use a 3 mm Allen wrench.
***Caution:*** *Use sufficient high strength threadlocker on the set screws.*

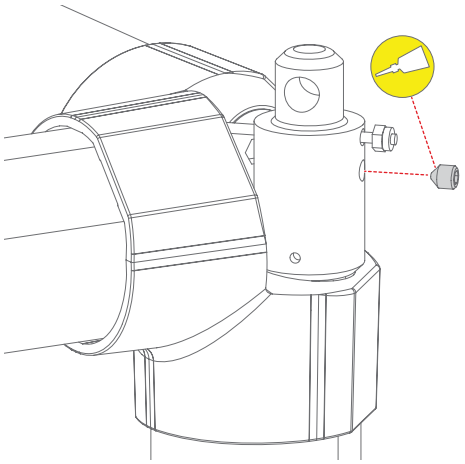

Image 1-12

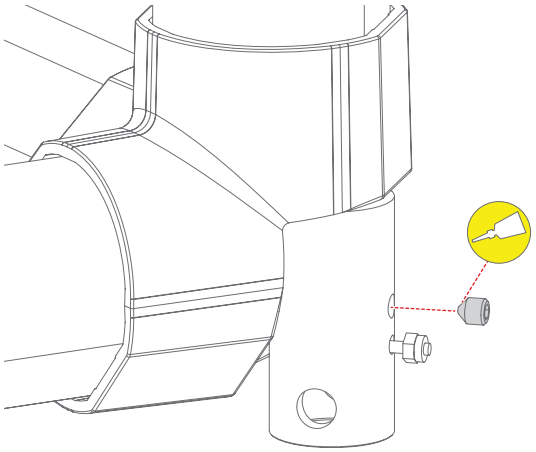

Image 1-13

5. Remove the orientation rod + nut

### How to finish the installation

1. Make sure that all screws are tightened.
2. Install the four locking pins (reference 1 image 1-14) in the top stacking pins.

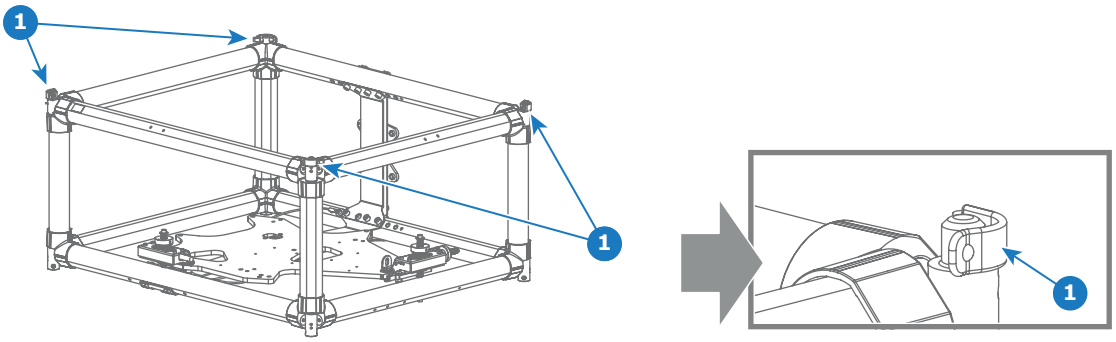


Image 1-14

***Note:*** *Skip this step if you immediately are going to stack or suspend multiple rigging frames.*

## 1.5 Installing the projector onto the multifunctional frame

**Some illustrations show the F90 projector. Nevertheless, the same principle is valid for F70.**

### Necessary tools

Torque Wrench with high 5 mm Allen socket

## Necessary parts

- Rigging frame cardboard packaging
- Hex screws with socket head M6 x 25 (x4)
- Spring washer M6 (x4)
- Plain washer M6 (x4)
- Hex screw with button head M8 x 20
- Spring washer M8
- Plain washer M8
- Low head socket cap screw M8 x 25 (x4)
- Plain washer M8 (x4)

**CAUTION: Don't tighten the five hex screws of the frame until you've positioned all screws into the projector.**

## How to install the projector onto the multifunctional frame?

1. Set up the packaging in such a way the projector can be placed upside down on it. Do this as illustrated.

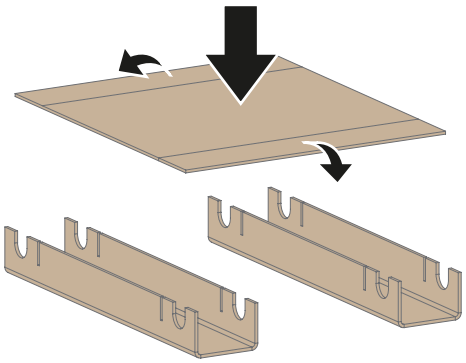

Image 1-15

Image 1-16

2. Place the projector on the packaging, upside down.
   ***Note:*** *Make sure that the openings in the bottom cardboard are left open for the frame itself.*
3. Place the rigging frame over the projector as illustrated. Align the mounting holes of the rigging frame to the mounting holes of the projector.

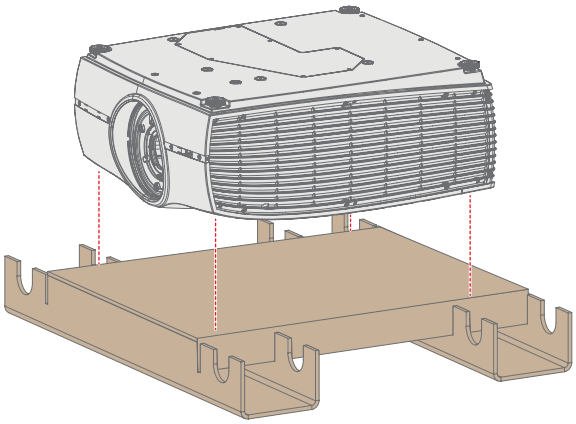

Image 1-17

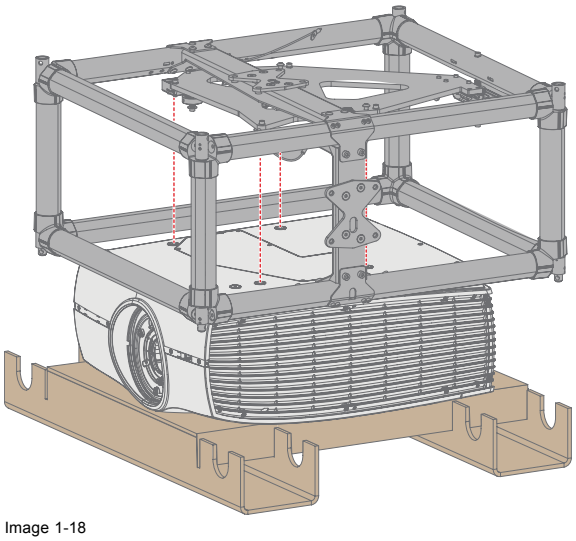

Image 1-18

4. **For the F70 Projector:** Mount the four low head socket cap screws M8 x 25 (reference 1) + plain washer (reference 2) on the bottom of the rigging frame to tie the two together. **Tighten the screws with a torque of 8,4 Nm**.

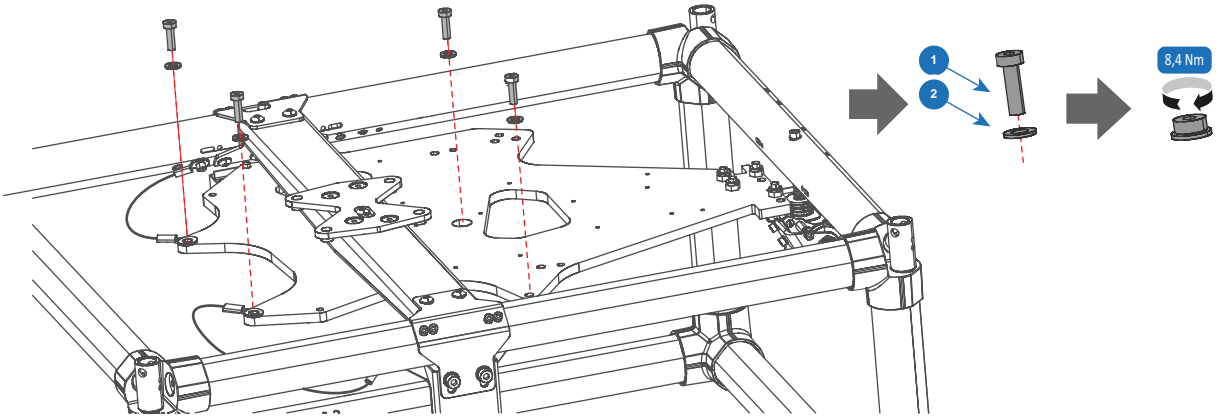


Image 1-19

5. **For the F90 Projector:**
   a) Mount the four M6 hex screws (reference 1) + spring washer (reference 2) + plain washer (reference 3 ) on the bottom of the rigging frame to tie the two together. **Tighten the screws with a torque of 8,4 Nm**.

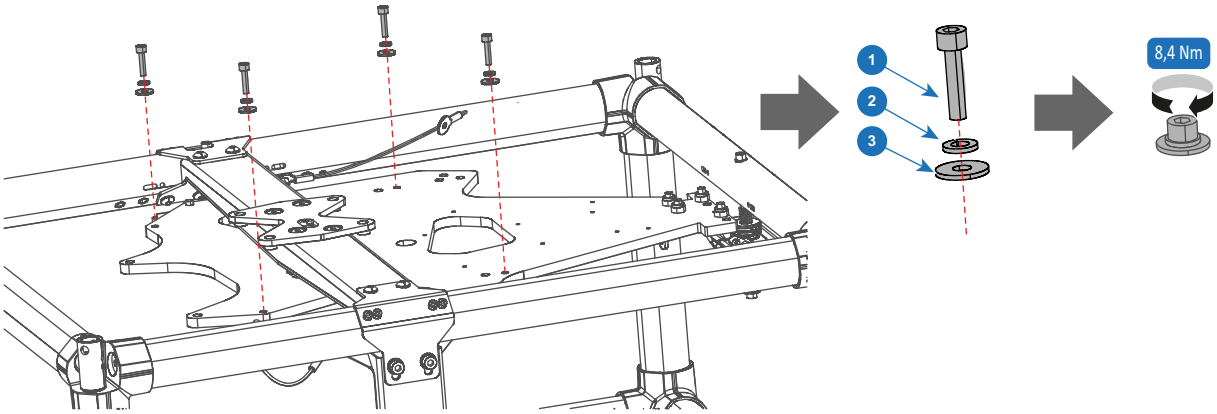


Image 1-20

   b) mount the M8 hex screw with button head + spring washer + plain washer (reference 1, 2 & 3) on the backside of the rigging frame, into the backside of the projector.

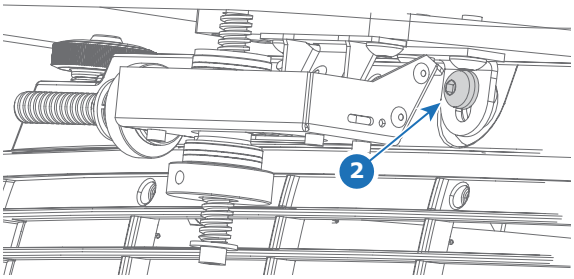


Image 1-21

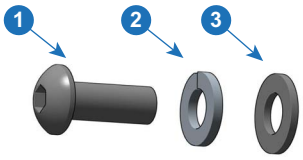


Image 1-22

6. Tighten all screws.
   ***Caution:*** *Forgetting to tighten the screw in the backside of the projector may cause damage to the projector support platform during transport.*

## 1.6 Installing the additional filter (F90 only)

### How to install the additional filter

1. Skew the projector to open the side on which the filter has to be added. For more info, see "Skewing the projector", page 16.
2. Place the filter into the frame, from the front side of the rigging frame.

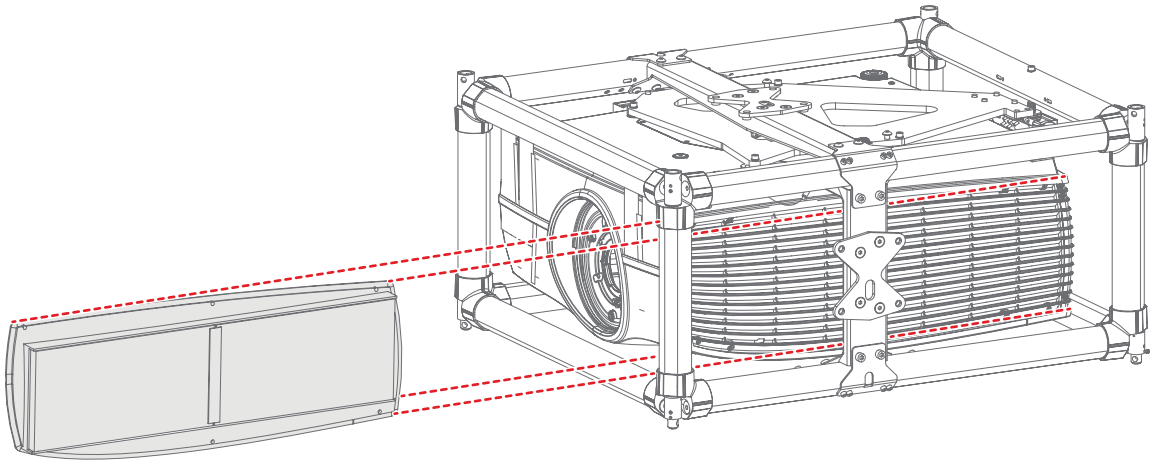

Image 1-23

3. Tighten the filter onto the side of the projector, using the screws provided with the filter.
4. Skew the projector back to its neutral position.

## 1.7 Stacking multiple projectors using the multifunctional frame

**WARNING: It is not allowed to stack more than three projectors.**

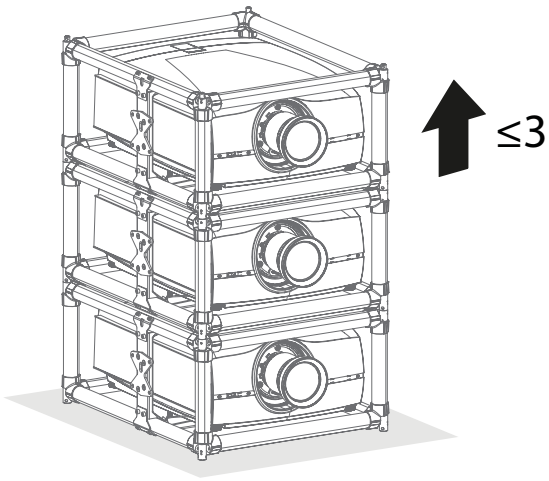


**Image 1-24**
**Example of stacking projectors on a flat surface**

### Necessary parts

Locking pins

### How to stack multiple projectors using the multifunctional frame?

1. Make sure that each projector is installed in their respective rigging frame.
2. If pre-installed, remove all four locking pins (reference 1, image 1-25) from each multifunctional frame, except the frame that will be installed on top of the stack.

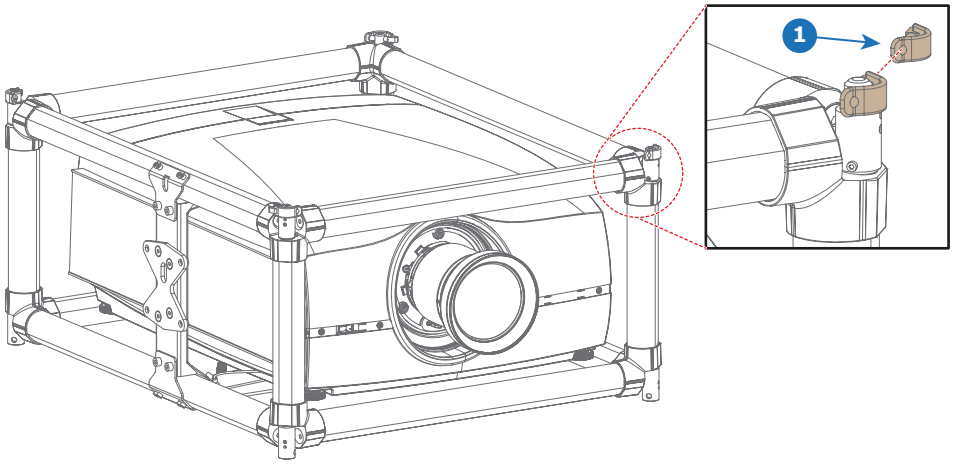


Image 1-25
1 Locking pin

***Note:*** *Even if not all pins are necessary in your current setup, it is important to keep all locking pins to their respective rigging frame for future use.*

3. Stack the multifunctional frames. Make sure the stacking pins of both frames are aligned.

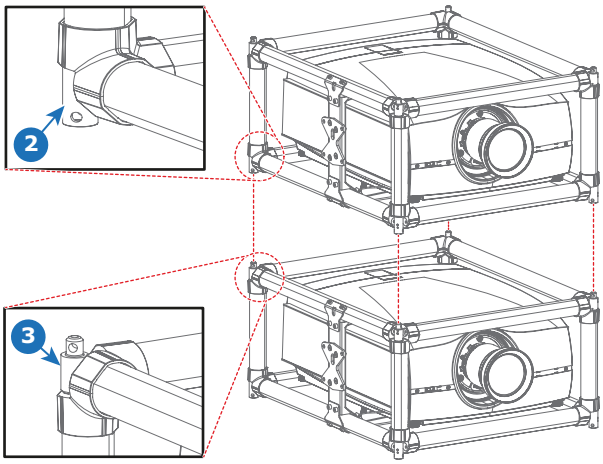


Image 1-26
2 Lower stacking pins
3 Upper stacking pins

4. Install a locking pin (reference 1, image 1-27) through the overlapping hole of both stacking pins.

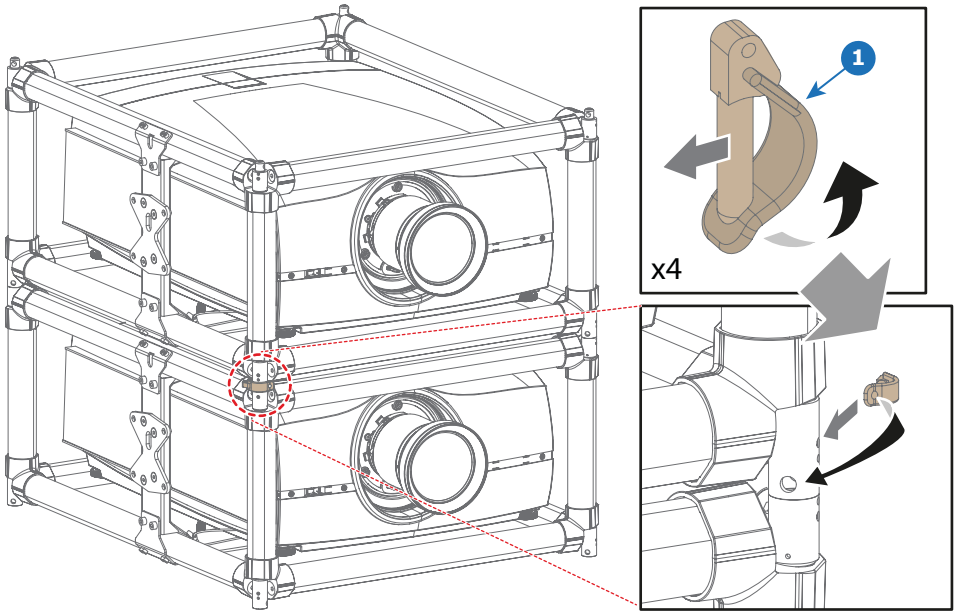


Image 1-27

5. Repeat the previous step for each overlapping corner of all stacked rigging frames.

## 1.8 Suspending the projector from a truss

**WARNING: It is the responsibility of the installer to suspend the rigging frames in a safe and secure fashion. Safety cables must be applied according to local regulations and standards. Safety cables must be dimensioned for the applicable load and no drop distance is allowed or must be limited as much as possible.**

### Suspending the projector from a truss

The projector can be suspended from a truss using the multifunctional frame.

Take the following things into account:

- If suspension clamps are used, they can be placed on any of the round profiles of the frame. The number of clamps required depends on the types of clamps used. Always make sure you use at least 4 clamps: 2 clamps at 2 opposed sides of the frame. Make sure to takes into account the total weight of all frames and projectors suspended from the truss.
- It is allowed to suspend **maximum two** projectors.

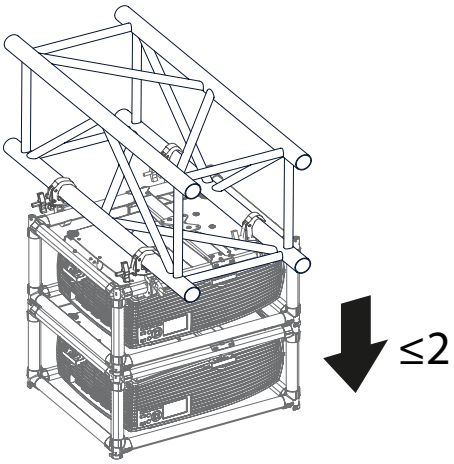


Image 1-28

- Alternatively, when using a single point of connection, you can use one of the two rigging points for suspending the frames. When using this method, also make sure to attach two safety cables. Tie these cables from the truss towards two of the frame bars opposing each other.

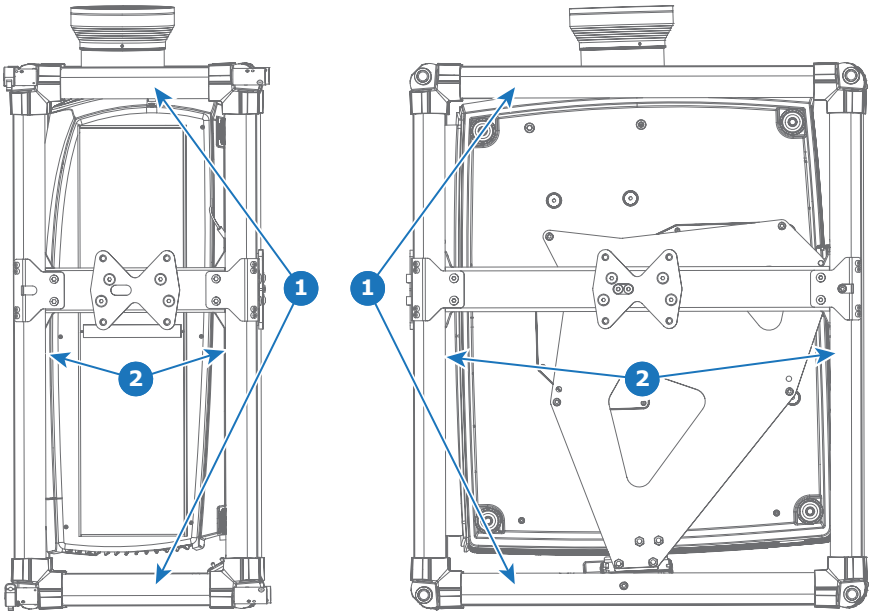


Image 1-29
Attach the safety cables to the bars marked by either 1, or by 2. Do not connect to the bar holding the single point of connection.

- When using a single point of connection, take into account that the 4 bolts connecting to the frame should be M8 bolts that can be inserted at least 15 mm into the frame rigging points.

**CAUTION: When using single point suspension (both ceiling or portrait mode), it is not allowed to incline the frame for more than 20° towards the horizon.**

## How to suspend from a truss, using the rigging clamps

1. Measure the distance between the two used support bars of the truss, using the center tube as reference.

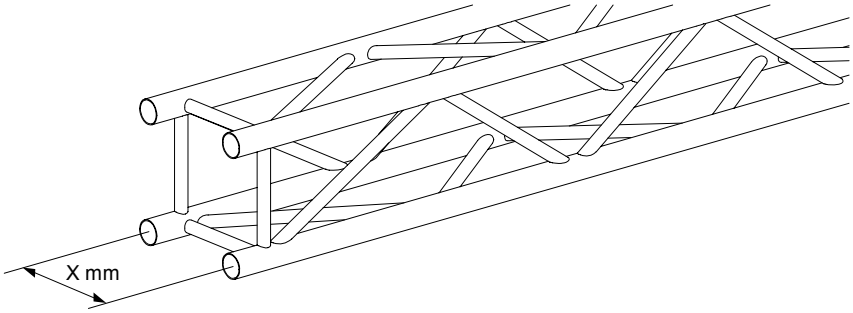


Image 1-30
Example of truss

2. Turn the projector upside down and install the rigging clamps, according the measured distance and secure this position. Ensure that the rigging points are symmetrically lined up, so that the projector will hang in balance.

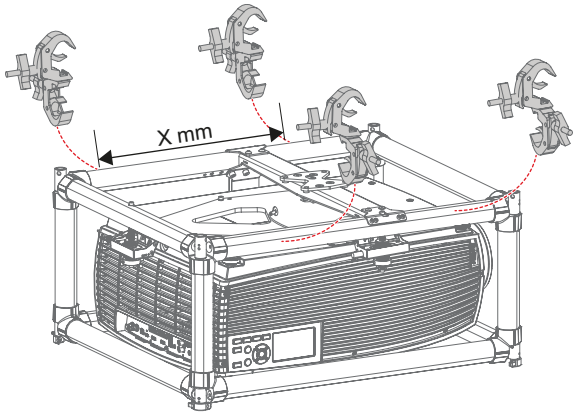


Image 1-31
Example of clamps installation

***Warning:*** *Always use four (4) rigging points, equally spread, to suspend the projector.*

3. If two projectors are suspended from each other, use the method described in "Stacking multiple projectors using the multifunctional frame", page 10.
4. Place the projector (upside down) under the truss installation and lower the truss until the support bars of the truss are nearby the rigging clamps mounted on the projector.

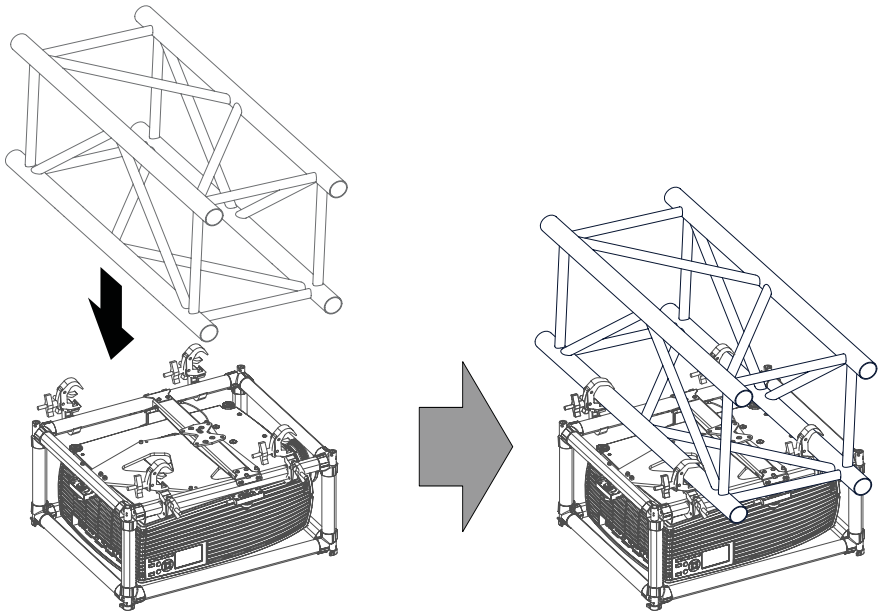

Image 1-32
Example of mounting to truss

***Warning:*** *Always secure the rigging points after adjustment.*

5. Lock all four rigging clamps by turning the fixation handle clockwise.

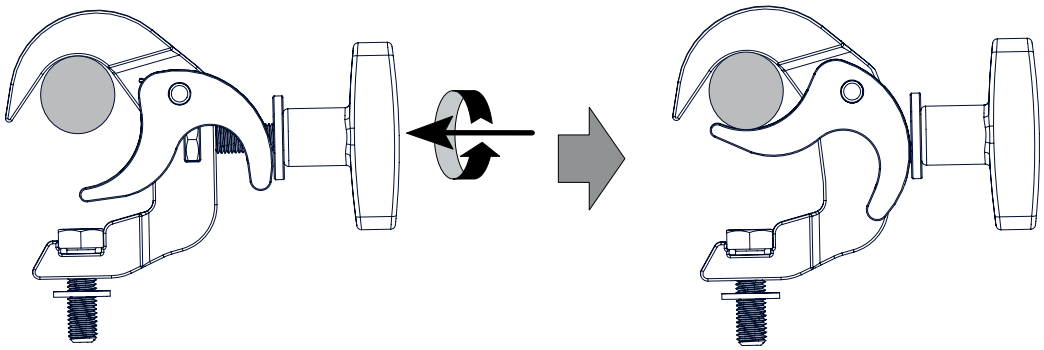

Image 1-33
Example of clamp fixation

6. Install the 2 safety cables, one on both sides of the rigging frame, and around the truss.
   Mount the 2 safety cables around the frame bar (push the hook through the loop and then around the truss so that there is not to much play (maximum 20 cm). If necessary turn the cable a few times around the truss before clasping the safety hook around the cable.

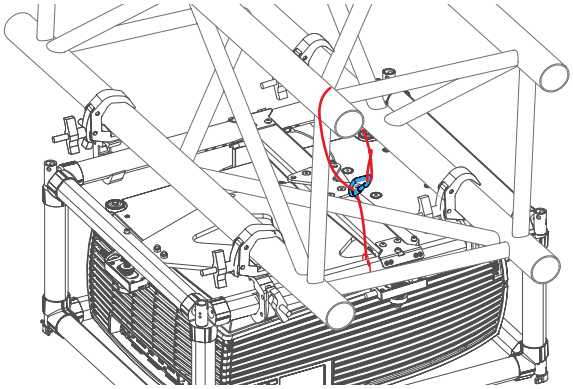

Image 1-34
Example of installation of a safety cable

***Note:*** *Mount the 2 safety cables in such a way that when something goes wrong, the projector cannot fall more than 20 cm. If necessary, turn the cables a few times around the truss to obtain this maximum distance.*

7. Lift up the truss with the attached projector to the desired height.

## How to suspend from a truss, using a single point of contact

1. Turn the projector upside down and install the floor adapter. Use the four big bolts to tighten it to the rigging frame.

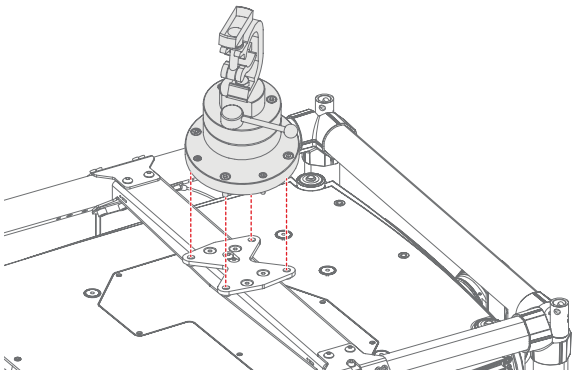

Image 1-35
Example of floor adapter installation in landscape

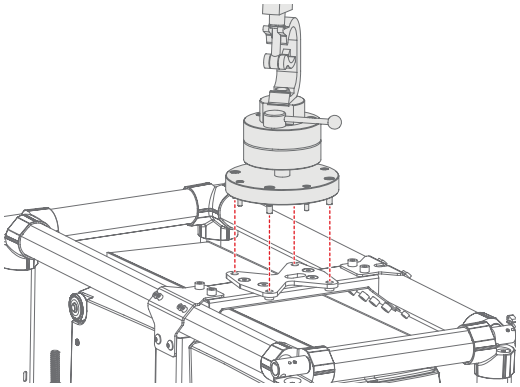

Image 1-36
Example of floor adapter installation in portrait

2. Place the projector (upside down) under the truss installation and lower the truss until the support bars of the truss are nearby the floor adapter mounted on the projector.

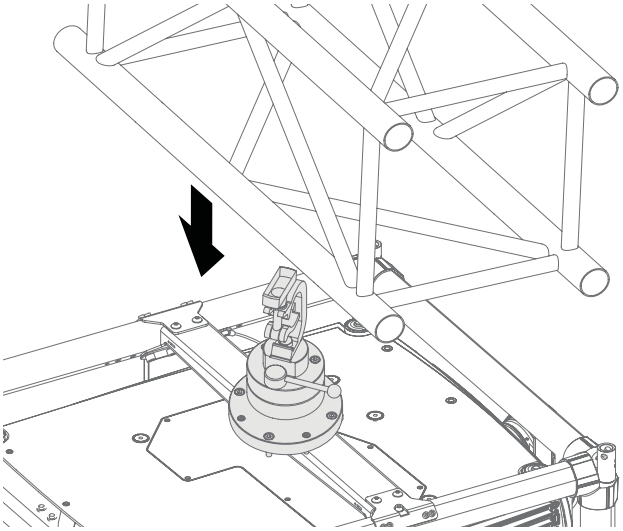

Image 1-37
Example of mounting to truss

3. Lock the floor adapter.
4. Install two safety cables, one on both sides of the rigging frame, and around the truss.
   Mount safety cables around the frame bar (push the hook through the loop and then around the truss so that there is not to much play (maximum 20 cm). If necessary turn the cable a few times around the truss before clasping the safety hook around the cable.
   ***Note:*** *Mount the 2 safety cables in such a way that when something goes wrong, the projector cannot fall more than 20 cm. If necessary, turn the cables a few times around the truss to obtain this maximum distance.*

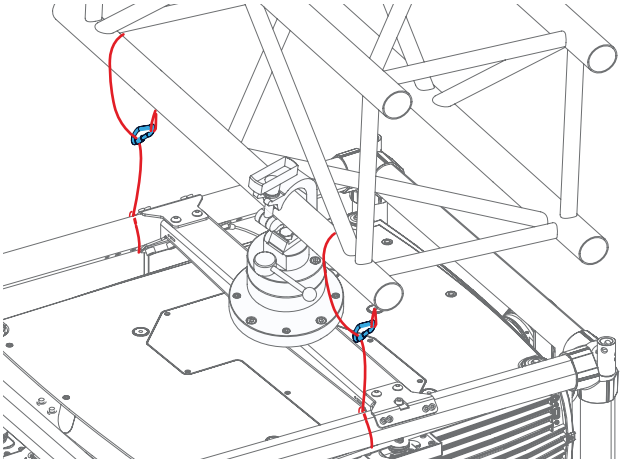

Image 1-38
Example of single point connection with safety cables

5. Lift up the truss with the attached projector to the desired height.

## 1.9 Skewing the projector

### How to skew the projector?

1. Turn the skew knob at the back (reference 1, image 1-39) to skew the projector.

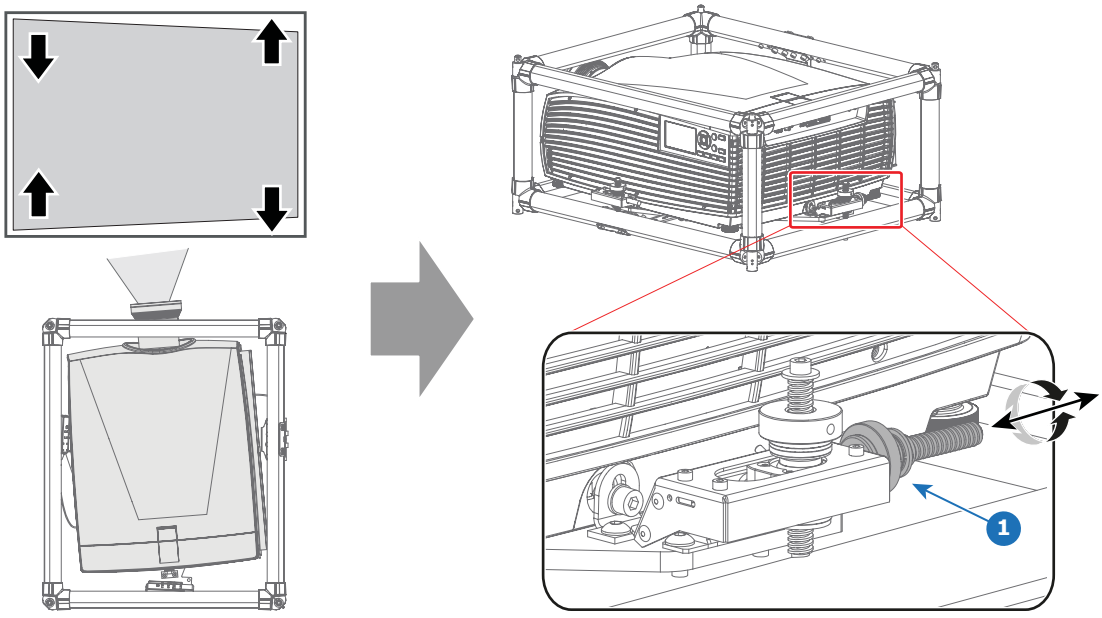


Image 1-39

## 1.10 Tilting the projector

### How to tilt the projector?

1. Turn the tilt adjustment knob at the back (reference 1, image 1-40) to lift the projector up or down.

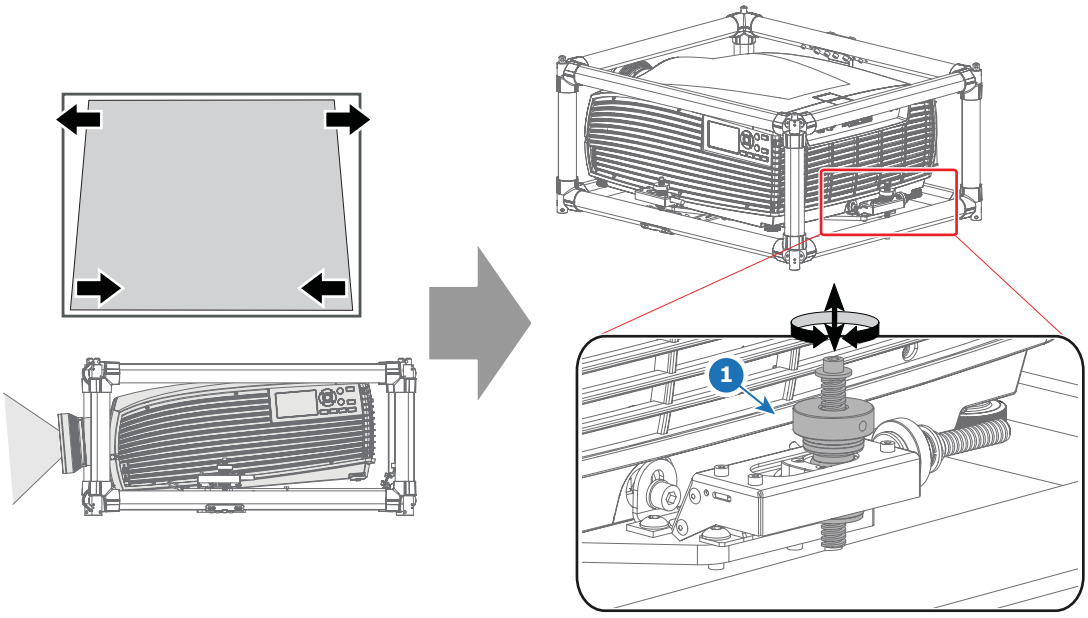


Image 1-40

## 1.11 Rotating the projector

### How to rotate the projector?

1. Turn the rotate adjustment knob on the left side (reference 1, image 1-41) to rotate the projector.

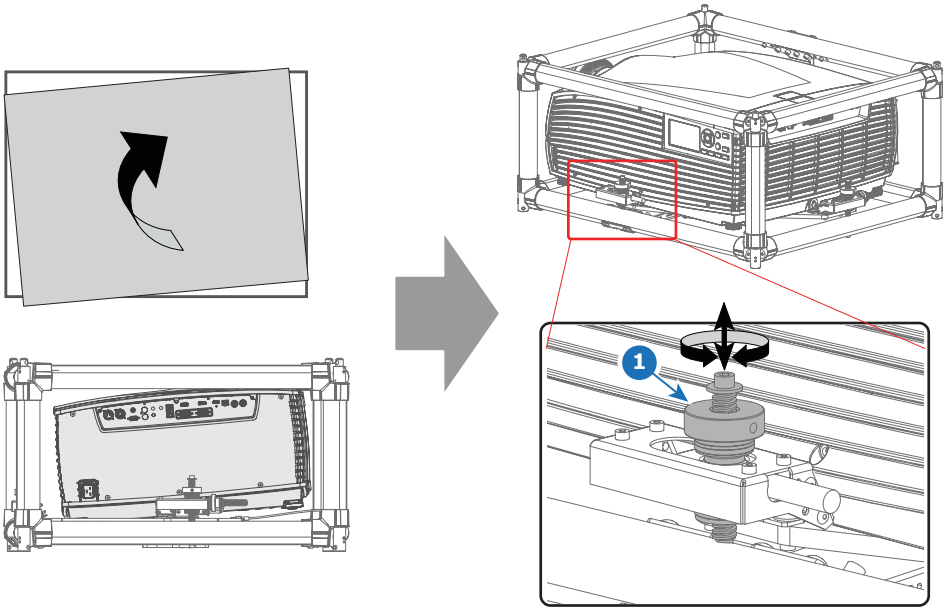


Image 1-41

## 1.12 Dimensions

### Useful Dimensions

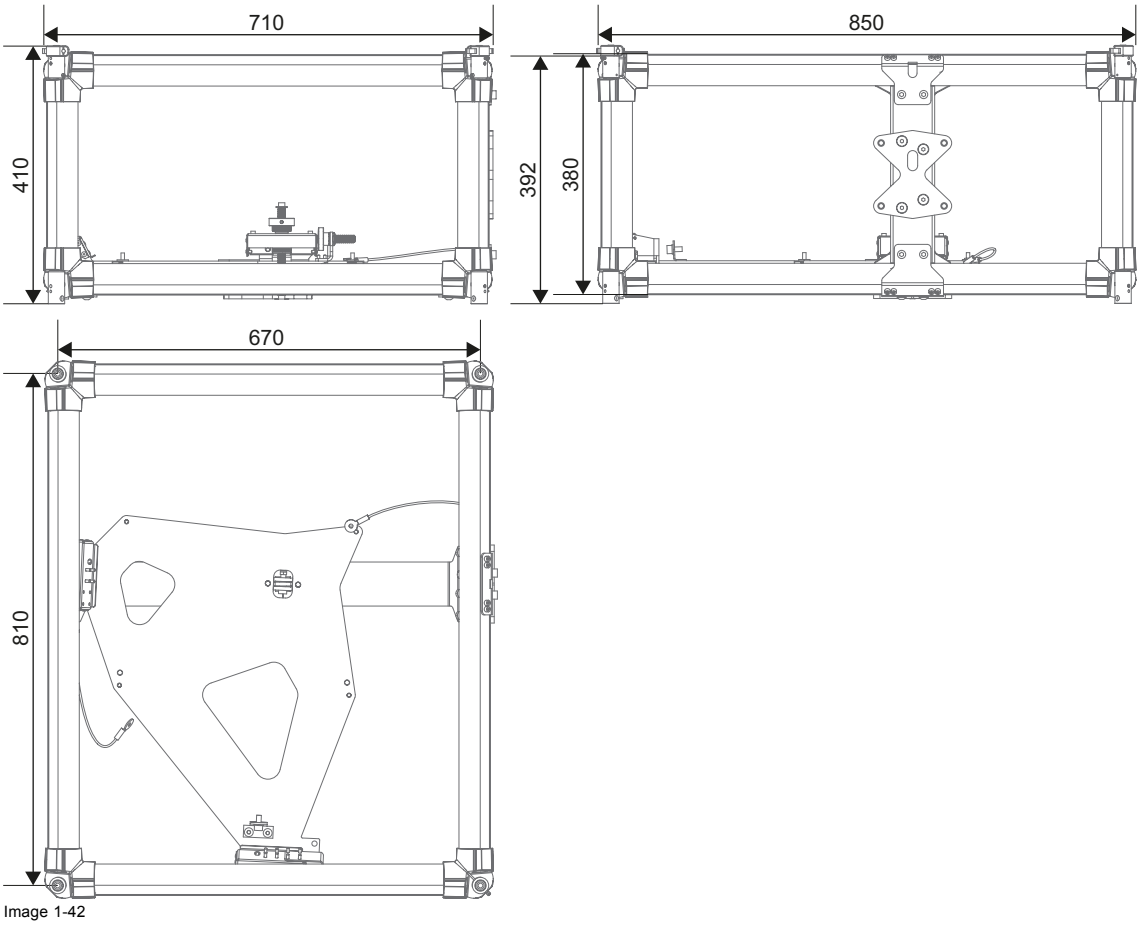


Image 1-42

**All dimensions are in mm.**

**The lens to lens distance when stacking is 392 mm.**

## Weight

The weight of the fully assembled frame without the projector is 20.6 kg (45.42 lbs).