G62 series

Installation manual

ENABLING BRIGHT OUTCOMES

BARCO

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Changes

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1 Introduction

Clarification of the term “G62” used in this document

When referring in this document to the term “G62” means that the content is applicable for following Barco products:

- G62 W9, G62 W11, G62-W14

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.

1.1 Installation Requirements

Environment conditions

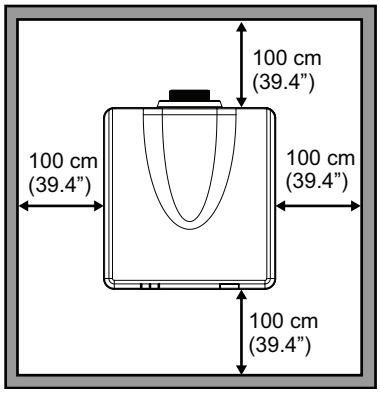
Table below summarizes the physical environment in which the G60 projector may be safely operated or stored.

Environment	Operating	Non-Operating
Ambient Temperature	0°C (41 °F) to 40 °C (104 °F)	-10°C (14°F) to 60°C (140°F)
Humidity	10% to 85% RH Non-Condensed	5% to 90% RH Non-Condensed
Altitude	10000 ft maximum at 0°C to 30°C	

Cooling requirements

The projector is fan cooled and must be installed with sufficient space around the projector head, minimum 100 cm (39.4 inch) 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 +40°C (+104°F).

For ceiling mounted installations, make sure to leave 30 mm (1.2”) between the ceiling mount and the bottom intake vents of the projector.



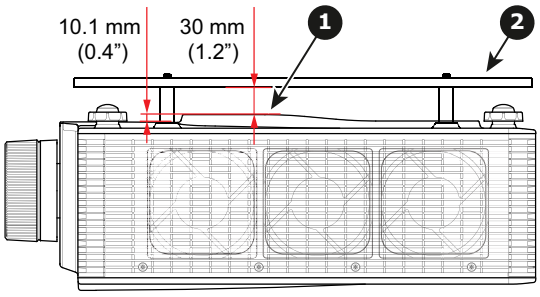


Image 1–1

1 Bottom intake vents
2 Ceiling mount plate

Clean air environment

The projector must always be mounted in a manner which ensures the free flow of clean air into the projectors 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 projectors 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 projectors 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 noneffective 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 clients 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 G60 projector operates from a nominal mono phase power net with a separate earth ground PE.

Projector	Power requirements
G62-W9	AC INPUT 100-240V, 50/60Hz
G62-W11	AC INPUT 100-240V, 50/60Hz
G62-W14	AC INPUT 100-240V, 50/60Hz

The power cord required to connect the projector with the power net is delivered with the projector.

Projector weight

Do not underestimate the weight of the projector. Be sure that the pedestal or ceiling mount on which the projector has to be installed is capable of handling five (5) times the complete load of the system.

Projector	Weight (without lens)
G62-W9	17.6 kg / 38.8 lb
G62-W11	22.7 kg / 50.0 lb
G62-W14	21.4 kg / 47.2 lb

1.2 Projector package overview

Box content

This projector comes with all the items shown below. Check to make sure your package is complete. Contact your dealer immediately if anything is missing.

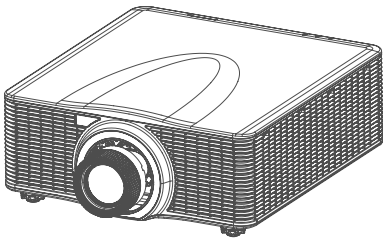


Image 1–2 Projector.

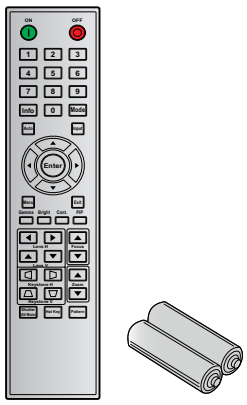


Image 1–3 Remote Control with two AAA size batteries.

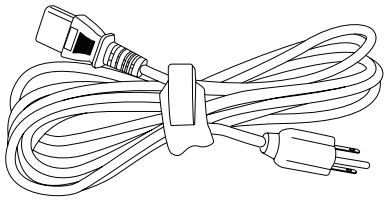


Image 1–4 Power cord.

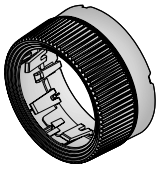


Image 1–5 Lens ring for standard lens (G LENS (1.22 - 1.53 : 1).

Image 1–6 Lens ring for G LENS (0.95 - 1.22 : 1), G LENS (1.52 - 2.92 : 1) and G LENS (2.90 - 5.50 : 1) lens.

The product Safety Manual and Quick Start Guide are also included. Download the complete and latest updated installation manual and user guide form the Barco website.

The projection lens is an optional item, not a standard accessary in the package.

Due to the difference in applications for each country, some regions may have different accessories.

1.3 Main unit

Component locations

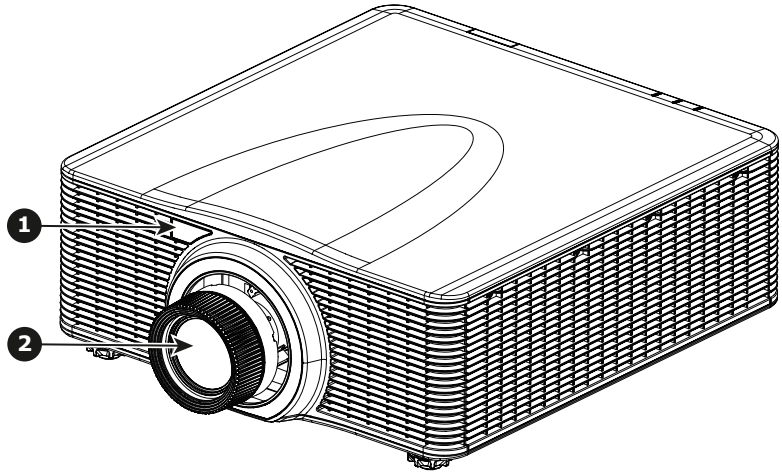


Image 1–7

1 Remote receiver (Front)
2 Projection lens

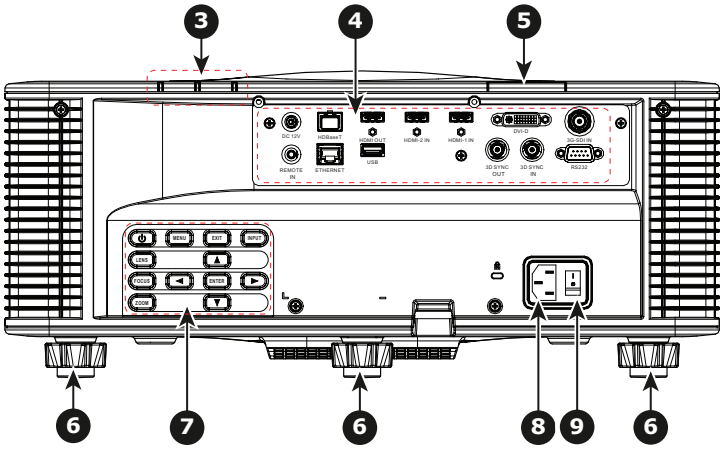


Image 1–8

3 LED Status Indicator
4 Input/Output (I/O) Panel
5 Remote receiver (Top)
6 Adjustable feet
7 Control panel
8 Power socket (AC100-240V, 50-60Hz)
9 Power switch

Airflow

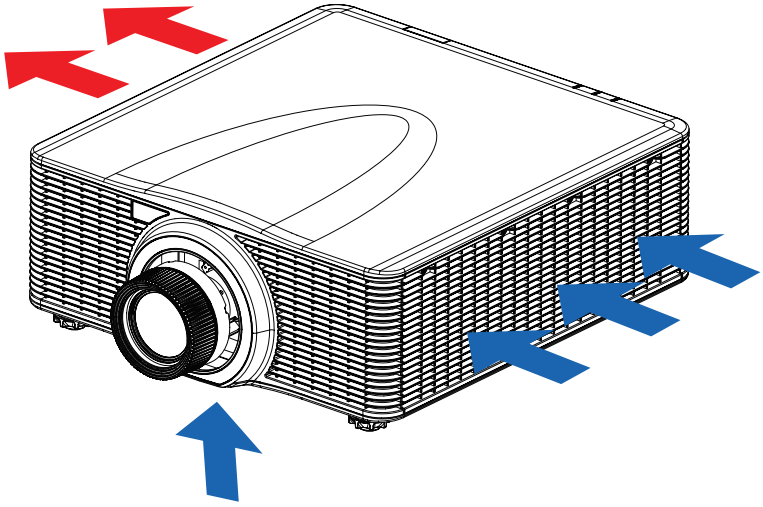


Image 1–9

1.4 Input/Output (I/O) Panel

Input and output ports location

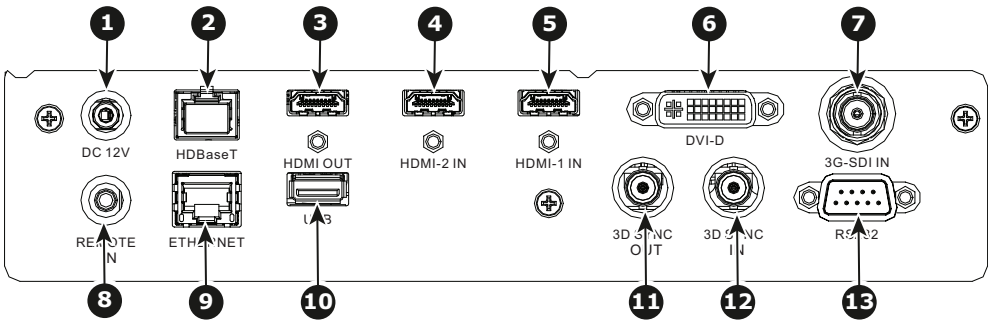


Image 1–10

1 DC 12V connector
2 HDBaseT connector
3 HDMI out connector
4 HDMI 2 in connector
5 HDMI 1 in connector
6 DVI-D connector
7 3G SDI in connector
8 Wired remote connector
9 Network connector RJ45
10 USB Type A connector
11 3D Sync out connector
12 3D Sync in connector
13 RS232 connector

1.5 Control panel

Button location

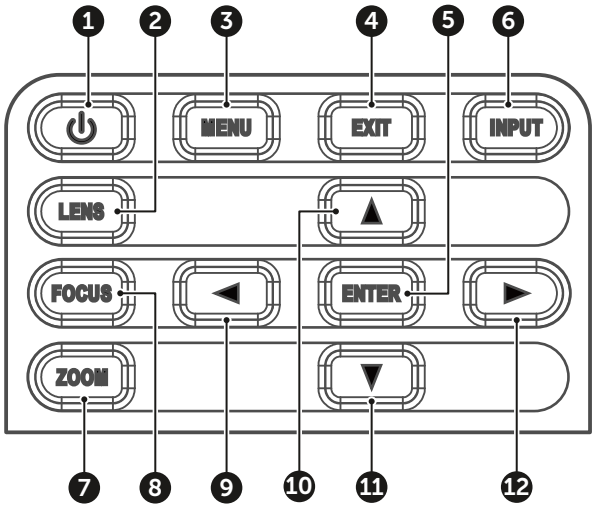


Image 1–11

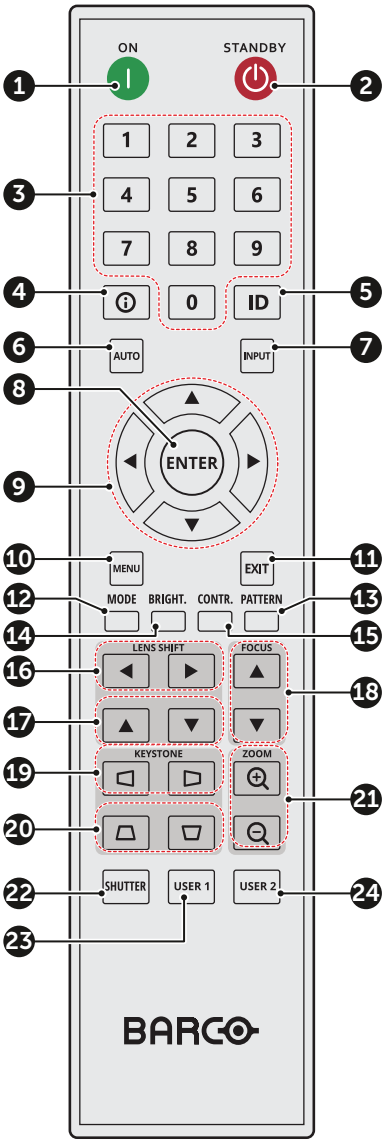
1 POWER
2 LENS
3 MENU
4 EXIT
5 ENTER
6 INPUT
7 ZOOM
8 FOCUS
9 LEFT
10 UP
11 DOWN
12 RIGHT

Button function

Button	Function
POWER	Turn the projector on or off.
LENS	Adjust lens position.
MENU	Show the main menu on screen.
EXIT	Return to previous menu or exit menu if at top level.
ENTER	Confirm the settings.
INPUT	Select an input source.
ZOOM	Adjust the image size.
FOCUS	Adjust the image focus.
LEFT	Navigate left through the menu.
UP	Navigate up through the menu.
DOWN	Navigate down through the menu.
RIGHT	Navigate right through the menu.

1.6 Remote Control Unit (RCU)

Button identification

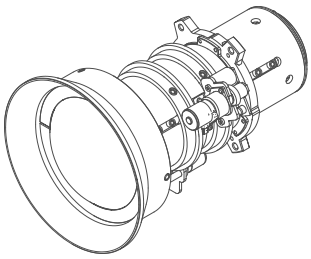
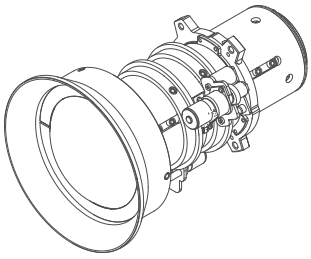
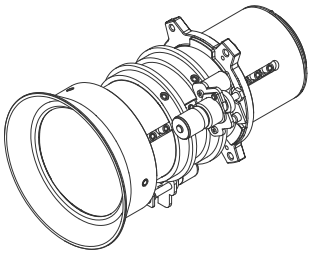
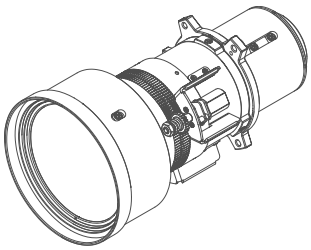
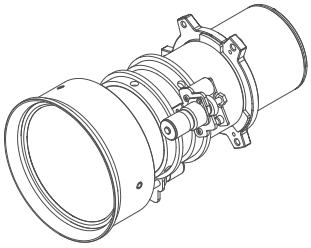
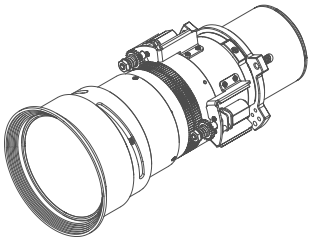


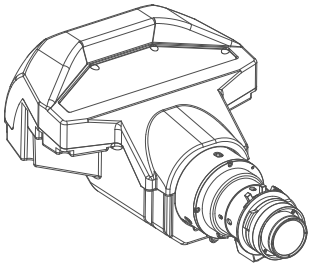
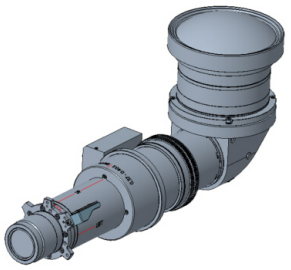
No.	Button	Function
1	ON	Turn the projector on.
2	Standby	Turn the projector off.
3	Number	Input numbers (0-9)
4	Info	Display information on the source image.
5	ID	Set the projector address.
6	Auto	Automatically synchronize the projector to an input source.
7	Input	Select an input source manually.
8	Enter	Confirm an selection.
9	Arrow keys	Use arrow keys to navigate through the menu or select the appropriate settings.
10	Menu	Show the main menu on the screen.
11	Exit	Back to previous menu.
12	Mode	Press to select the preset display mode.
13	Pattern	Displays test patterns
14	Brightness	Set the brightness of the image.
15	Contrast	Set the contrast of the image.
16	Lens shift H	Adjust the image position horizontally.
17	Lens shift V	Adjust the image position vertically.
18	Focus	Adjust the image focus.
19	Keystone H	Adjust a horizontally keystone image.
20	Keystone V	Adjust a vertically keystone image.
21	Zoom	Adjust the image size.
22	Shutter	Momentarily turn off/on the screen (AV Mute).
23	User1	Press to assign custom functions. See user guide for more info.
24	User2	Press to assign custom functions. See user guide for more info.

1.7 Lenses

The table below is subject to changes and was last updated on 2019-01-03. Consult Barco's web site for the most recent information about available lenses.

Available lenses

Order No	Description	Throw Ratio	Image
R9801840	G Lens - Short Throw (includes lens ring for G60-W series)	0.75 - 0.95 : 1 (WUXGA)	
R9802300	G Lens - Short Throw (includes lens ring for G60-W series)	0.65 - 0.75 (WUXGA)	
R9832755	G Lens - Wide zoom	0.95 - 1.22 : 1 (WUXGA)	
R9801784	G Lens - Standard	1.22 - 1.52 : 1 (WUXGA)	
R9832756	G lens - Long Zoom	1.52 - 2.92 : 1 (WUXGA)	
R9832778	G lens - Ultra Long Zoom	2.90 - 5.50 : 1 (WUXGA)	

Order No	Description	Throw Ratio	Image
R9801785 **R98017851**	G lens - Ultra Short Throw (*) (*) This lens has special installation instructions. See “UST lens R9801785(1)”, page 31)	0.361 : 1 (WUXGA)	
R9801830[1]	G lens - Ultra Short Throw (*) (*) This lens has special installation instructions. See “UST lens R9801830 G lens (0.37 - 0.40 : 1) UST 90°”, page 61)	0.37 - 0.4 : 1 (WUXGA)	

Lens specification table

Projection Lens			R98017851	R9832755		R9801784		R9832756		R9832778		R9832781	
			Ultra Short Throw	Wide Zoom		Standard		Long Zoom		Ultra Long Zoom		Short Throw	
Throw Ratio			0.361 (120")	0.95-1.22		1.22-1.52		1.52-2.92		2.90-5.50		0.75-0.95	
Zoom Ratio			NA	1.28X		1.25X		1.9X		1.9X		1.26X	
Throw Distance			0.96~2,64m	1.02~10.23-m		1.31~9.82m		1.64~18.87-m		3.12~35.54-m		0.81~10.23-m	
Screen size			**Projection distance (m)**										
Throw Ratio			0.361 (120")	0.95	1.22	1.22	1.53	1.52	2.92	2.9	5.5	0.75	0.95
Diag-onal (inch)	Heig-ht (m)	Width (m)	(m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
50	0.67	1.08	NA	1.02	1.31	1.31	1.64	1.64	3.14	3.12	5.92	0.81	1.02
60	0.81	1.29	NA	1.23	1.58	1.58	1.96	1.96	3.77	3.75	7.11	0.97	1.23
70	0.94	1.51	NA	1.43	1.84	1.84	2.29	2.29	4.40	4.37	8.29	1.13	1.43
80	1.08	1.72	NA	1.64	2.10	2.10	2.62	2.62	5.03	5.00	9.48	1.29	1.64
90	1.21	1.94	NA	1.84	2.36	2.36	2.95	2.95	5.66	5.62	10.66	1.45	1.84
100	1.35	2.15	NA	2.05	2.63	2.63	3.27	3.27	6.29	6.25	11.85	1.62	2.05
110	1.48	2.37	NA	2.25	2.89	2.89	3.60	3.60	6.92	6.87	13.03	1.78	2.25
120	1.62	2.58	0.93	2.46	3.15	3.15	3.92	3.93	7.55	7.50	14.22	1.94	2.46
130	1.75	2.80	1.01	2.66	3.42	3.42	4.26	4.27	8.18	8.12	15.40	2.10	2.66
140	1.88	3.02	1.09	2.86	3.68	3.68	4.58	4.58	8.81	8.74	16.59	2.26	2.86
150	2.02	3.23	1.17	3.07	3.94	3.94	4.91	4.91	9.43	9.37	17.77	2.42	3.07
160	2.15	3.45	1.24	3.27	4.20	4.20	5.24	5.24	10.06	9.99	18.95	2.58	3.27
170	2.29	3.66	1.32	3.48	4.47	4.47	5.57	5.57	10.69	10.62	20.14	2.75	3.48
180	2.42	3.88	1.40	3.89	4.73	4.73	5.89	5.89	11.32	11.24	21.32	2.91	3.68
190	2.56	4.09	1.48	3.92	4.99	4.99	6.22	6.22	11.95	11.87	22.51	3.07	3.89
200	2.69	4.31	1.56	4.09	5.26	5.26	6.55	6.55	12.58	12.49	23.69	3.23	4.09

1. This lens is sold as a package containing lens, lens support and safety cable (package number: =R9409750)

Projection Lens			R98017851	R9832755		R9801784		R9832756		R9832778		R9832781	
			Ultra Short Throw	Wide Zoom		Standard		Long Zoom		Ultra Long Zoom		Short Throw	
250	3.37	5.38	1.94	5.12	6.57	6.57	8.18	8.18	15.72	15.62	29.62	4.04	5.12
300	4.04	6.46	2.33	6.14	7.88	7.88	9.82	9.82	18.87	18.74	35.54	4.85	6.14
350	4.71	7.54	2.72	7.15	9.19	9.19	11.45	11.45	21.99	21.84	41.42	5.65	7.15
400	5.38	8.62	3.11	8.18	10.51	10.51	13.10	13.10	25.16	24.99	47.39	6.46	8.18
450	6.06	9.69	NA	9.21	11.82	11.82	14.73	14.73	28.30	28.11	53.31	7.27	9.21
500	6.73	10.77	NA	10.23	13.14	13.14	16.37	16.37	31.45	31.23	59.23	8.08	10.23

Projection Lens			R9802300								
			Short Throw								
Throw Ratio			0.65-0.75								
Zoom Ratio			1.15X								
Throw Distance			0.70~8.08m								
Screen size											
Throw Ratio			0.65	0.75							
Diago-nal (inch)	Height (m)	Width (m)	Min (m)	Max (m)							
50	0.67	1.08	0.70	0.81							
60	0.81	1.29	0.84	0.97							
70	0.94	1.51	0.98	1.13							
80	1.08	1.72	1.12	1.29							
90	1.21	1.94	1.26	1.45							
100	1.35	2.15	1.40	1.62							
110	1.48	2.37	1.54	1.62							
120	1.62	2.58	1.68	1.94							
130	1.75	2.80	1.82	2.10							
140	1.88	3.02	1.96	2.26							
150	2.02	3.23	2.10	2.42							
160	2.15	3.45	2.24	2.58							
170	2.29	3.66	2.38	2.75							
180	2.42	3.88	2.52	2.91							
190	2.56	4.09	2.66	3.07							
200	2.69	4.31	2.80	3.23							
250	3.37	5.38	3.50	4.04							
300	4.04	6.46	4.20	4.85							
350	4.71	7.54	4.89	5.65							
400	5.38	8.62	5.60	6.46							
450	6.06	9.69	6.30	7.27							
500	6.73	10.17	7.00	8.08							

2 Installation

2.1 RCU battery installation

How to install the batteries of the Remote Control Unit

1. Remove the cover by sliding it in the direction indicated by the arrow
2. Insert two new AAA batteries (observe the polarity).
3. Replace the cover.

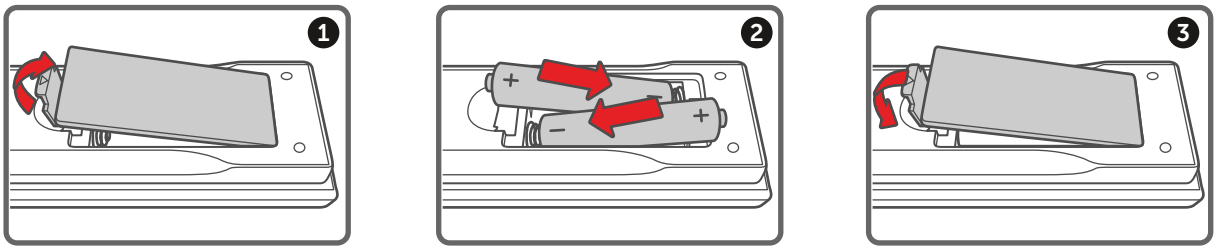


Image 2–1

Notes for the Remote Control Unit

- Be sure to insert the batteries in the corresponding orientations to match the polarities.
- Do not mix new batteries with used batteries as it would shorten the life of new batteries or cause leakage.
- Only used AAA batteries as instructed; do not attempt to insert different types of batteries into the remote control.
- If the remote is going to be unused for long periods of time, be sure to remove the batteries to prevent leakage, which could damage the remote control.
- The liquid contents in the batteries is harmful to the skin; do not touch the leakage with your bare hands directly. When installing fresh batteries, be sure to clean up the leakage thoroughly.
- Under most circumstances, you only need to point the remote control towards the screen and the IR signal would be reflected off the screen and picked up by the IR sensor on the projector. But under specific circumstances, the projector may fail to receive signals from the remote control due to environmental factors. When this happens, orient the remote control at the projector and try again.
- If the range of effective remote control signal reception decreases or if the remote control stops working, replace the batteries.
- If the infrared receiver is exposed to fluorescent lamp or strong sunlight, the remote control may not operate normally.
- Refer to the regulations enforced by your local government on the disposal of used batteries; improper disposal could damage the environment.

2.2 Installing the lens safety cable

When to use the lens safety cable

The lens safety cable must be used in any circumstance where the projector is mounted above people. Do this to secure the mounted lens in the lens holder.

Content of the lens safety cable kit (R9801196)

- Safety Cable (750 mm, Ø3 mm)
- Cable clamp M4 (U-bolt)
- Shackle 7x70 mm
- 20 x Cable clip (16x16 mm, Ø4 mm)[2]

Image 2–2

How to install the lens safety cable

1. Ensure that the safety cable and its accessories are in good condition (not damaged)
2. Paste four cable clips on the lens body between motor block and lens flange as illustrated (reference 1). Orient the open side of the clips towards the front of the lens.

2. Only four pieces are needed to assemble the safety cable to a lens. When the safety cable is used on another lens, you should not remove the cable clips. Instead, use four new ones. There are enough cable clips in the kit to secure up to five different lenses.

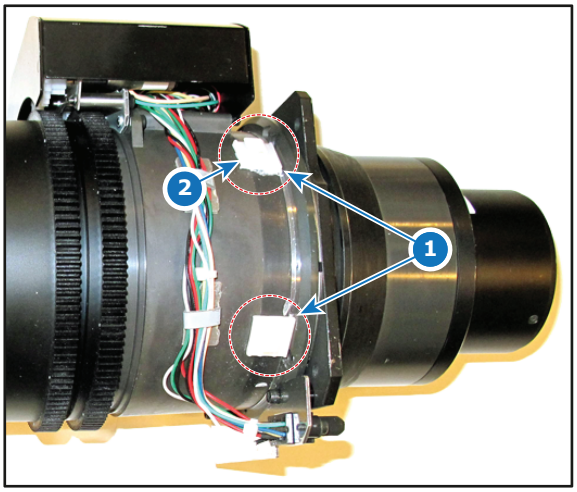


Image 2–3

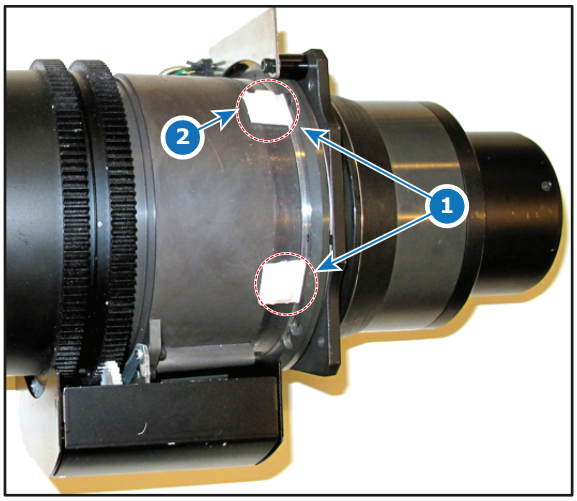


Image 2–4

3. Snap the first loop end of the safety cable into one of the following clips and let the loop end point downwards.
   1. Configuration A: Use the upper clip on the side of the cable bundle (reference 2, Image 2–3).
   2. Configuration B: Use the upper clip on the non-wired side (reference 2, Image 2–4).
4. Slide the rest of the cable around the lens counterclockwise. Click the cable into every clip it passes in this loop.

   Note: Make sure the cable passes between the lens and the cable bundle.

5. Slide the cable through the loop end at the beginning of the cable to create a lasso..

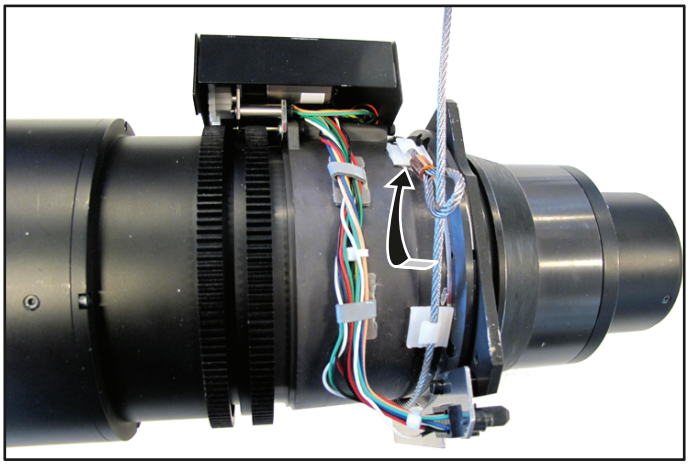


Image 2–5 Example of configuration A

6. Pull the lasso tight around the lens body and install the U-bolt on the lens holder, with the open ends oriented outwards (reference 3). Make sure that both a part of the loop end and the outgoing part of the safety cable are placed in the enclosure.

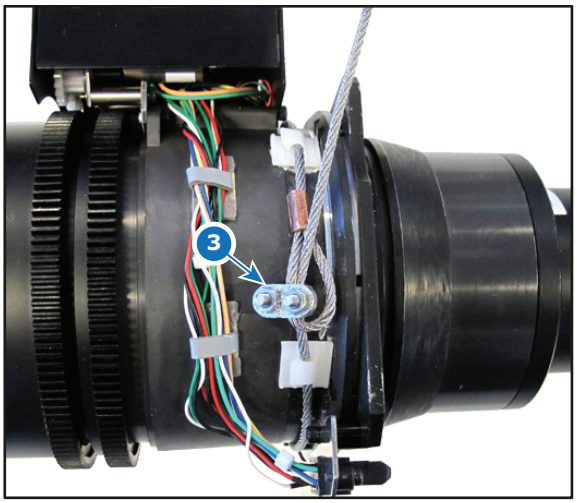


Image 2–6 Example of Configuration A

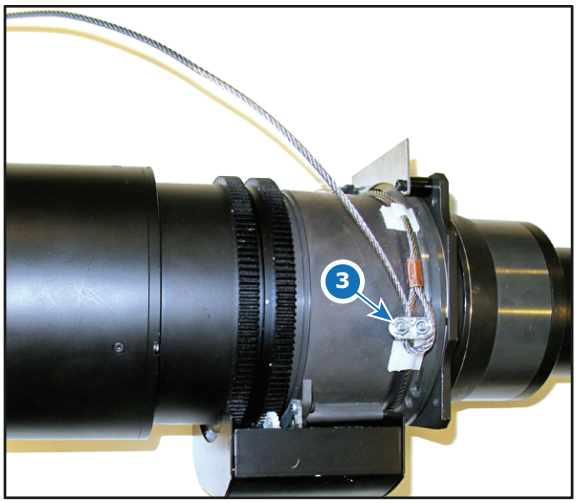


Image 2–7 Example of Configuration B

7. Close the U-bolt and tighten it.

Note: Make sure the safety cable is tightened around the lens before tightening the U-bolt nuts.

8. Place the shackle through the free loop end of the safety cable.
9. Connect the shackle on the truss or rigging frame.

Caution: The safety cable is mounted as backup so that the drop distance is as small as possible. Keep the possible drop distance of the lens as short as possible!

How to mount the cable to a short barrel lens

1. Paste two cable clips on both sides of the lens as illustrated (reference 1). Orient the open side of the clips towards the outside of the lens.

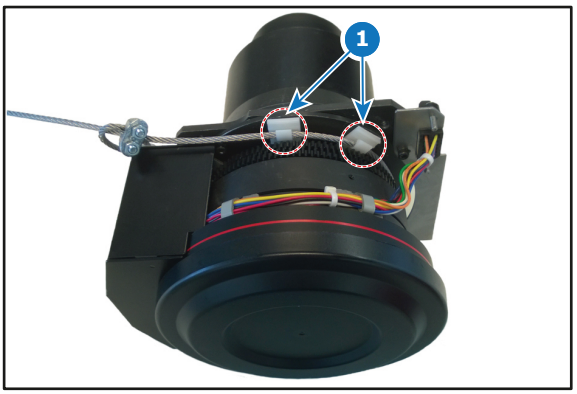


Image 2–8

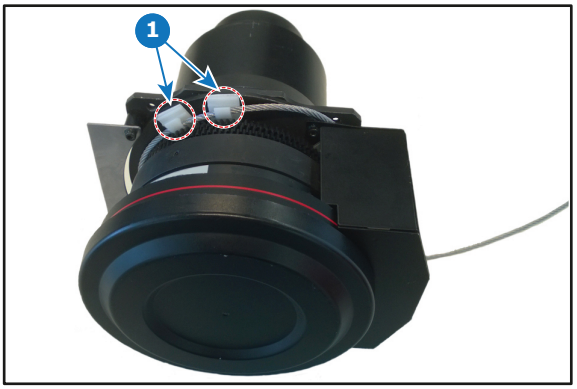


Image 2–9

2. Paste two extra cable clips on the motor block of the lens. Orient the open side to the outside of the lens.

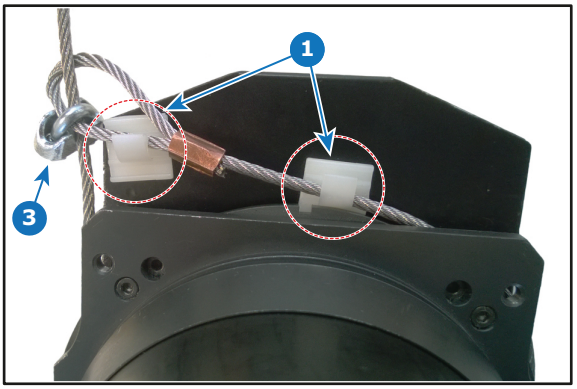


Image 2–10

3. Carefully slide the safety cable through the cable clips. Make sure the cable is placed between the motor block and the cover plate.
4. Slide the cable through the loop end at the beginning of the cable.
5. Mount a U-bolt on the cable, with the open ends oriented outwards (reference 3, Image 2–10). Make sure that both a part of the loop end and the outgoing part of the safety cable are placed in the enclosure.
6. Close the U-bolt and tighten it.

Note: Make sure the safety cable is tightened around the lens before tightening the U-bolt nuts.

The result should look similar to the following example.

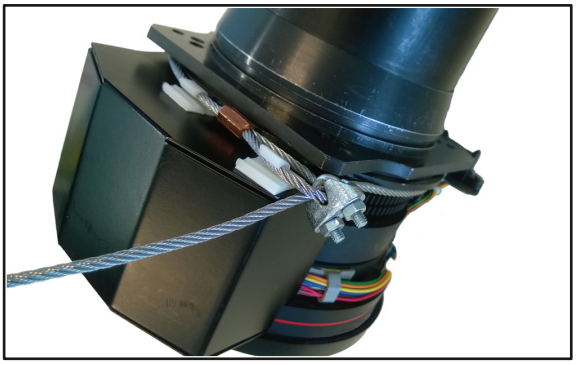


Image 2–11

7. Lead the cable end with the shackle around rigging frame bar or truss bar
8. Snap the shackle to the straight part of the cable.

   Secure the shackle by screwing the safety ring of the shackle over the open end.

2.3 Installing the lens

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

How to install the lens

1. Remove the lens cap counterclockwise.

   Caution: Lens cap should be removed before installing the lens. If not it will damage the projector.

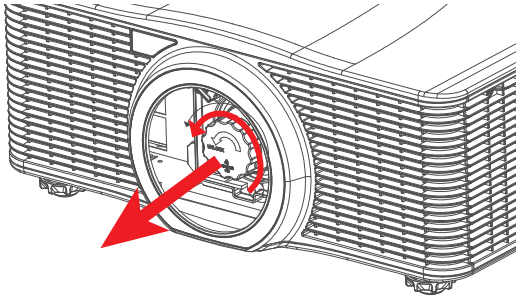


Image 2–12

2. Gently insert the lens in the lens holder. Ensure that the label “TOP” (reference 1) is upwards oriented while inserting the lens.

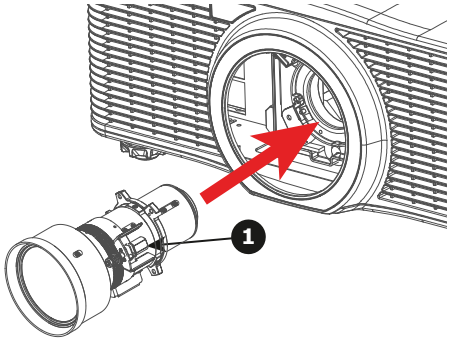


Image 2–13

3. Rotate the lens clockwise to lock the lens.

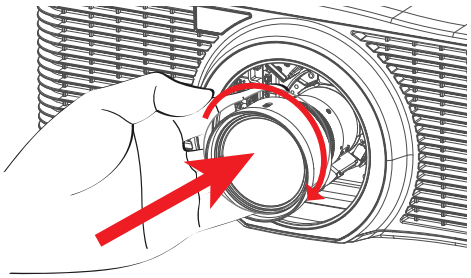


Image 2–14

4. Put the lens ring on the lens. An audible click should be noticed.

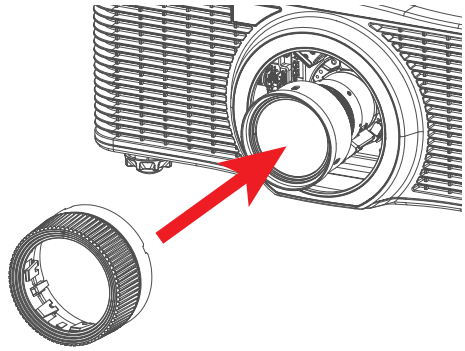


Image 2–15

CAUTION: Do not transport the projector with any lens installed.

2.4 Connecting the projector with the power net

CAUTION: Use only the power cord provided with the projector.

How to connect with local power net

1. Ensure that the power switch stands in the '0' (OFF) position (reference 1)
2. Connect the female side of the power cord with the power input socket of the projector (reference 2)

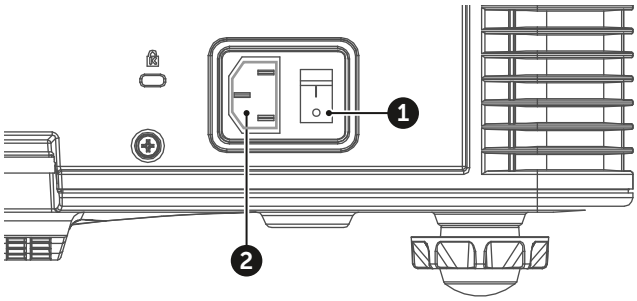


Image 2–16

3. Connect the male side of the power cord to the local power net.

Caution: Ensure that the power net meets the power requirements of the projector.

WARNING: Do not attempt operation if the AC supply and cord are not within the specified voltage and power range.

2.5 Connecting to a computer or laptop

Wiring diagram

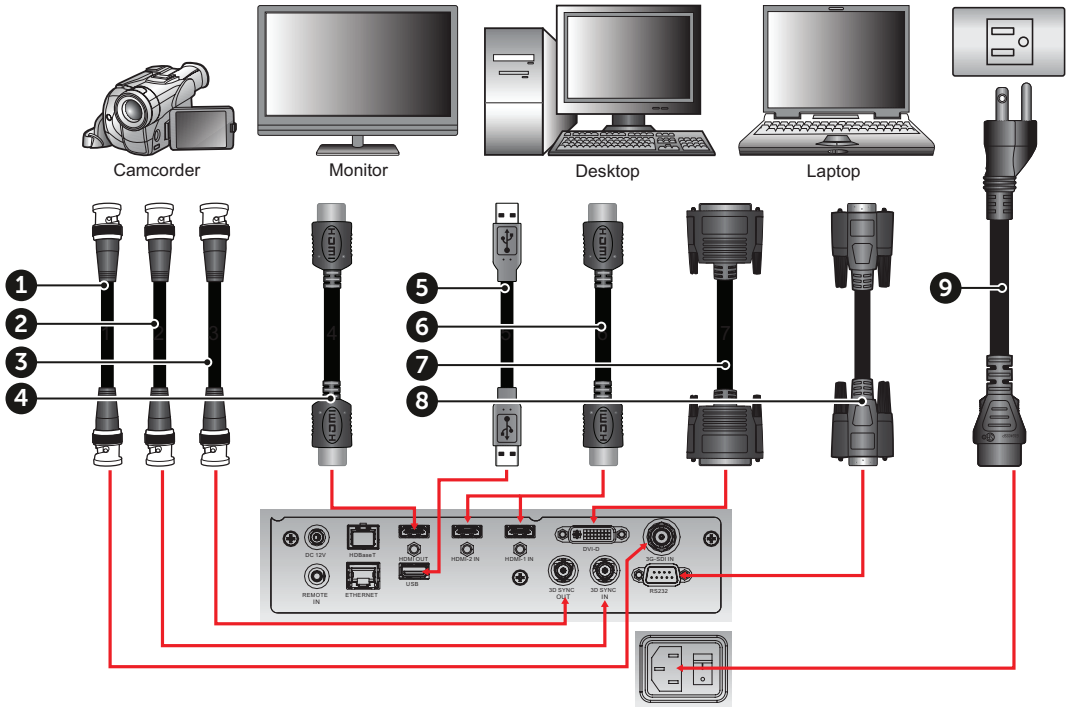


Image 2–17

1 3G-SDI cable
2 3D Sync cable
3 3D Emitter cable
4 HDMI cable
5 USB cable
6 HDMI cable
7 DVI cable
8 RS232 cable
9 Power cord

Notes on wiring diagram:

- The diagram shows the cables/connectors that may be used to connect to various devices.
- Due to the difference in applications for each country, the accessories required in some regions may be different from those shown.
- This diagram is for illustrative purposes only, and does NOT indicate that these accessories are supplied with the projector.

2.6 Connecting to video sources

Wiring diagram

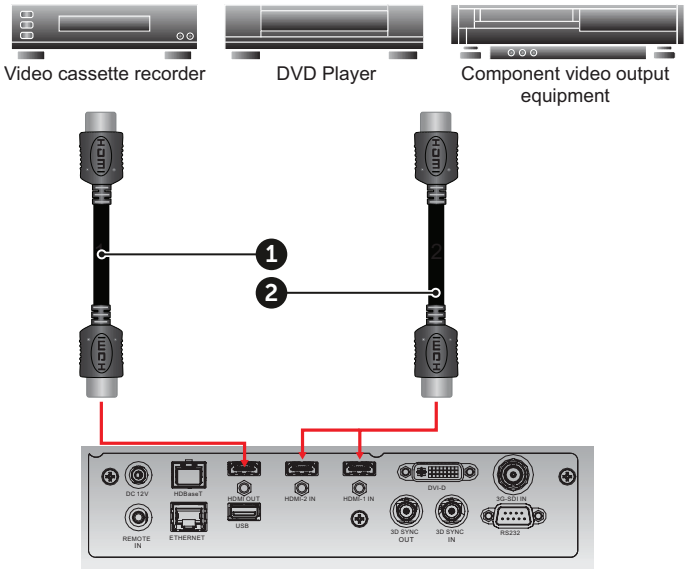


Image 2–18

1 HDMI cable
2 HDMI cable

Notes on wiring diagram:

- The diagram shows the cables/connectors that may be used to connect to various devices.
- Due to the difference in applications for each country, the accessories required in some regions may be different from those shown.
- This diagram is for illustrative purposes only, and does NOT indicate that these accessories are supplied with the projector.

2.7 Ceiling mount installation

Requirements

To prevent damage to your projector, please use a Barco recommended ceiling mount. Ensure the screws used to install the mount to the projector meet the following specifications:

- Screw type: M6 x 4
- Mounting holes (reference 1, see illustration below)

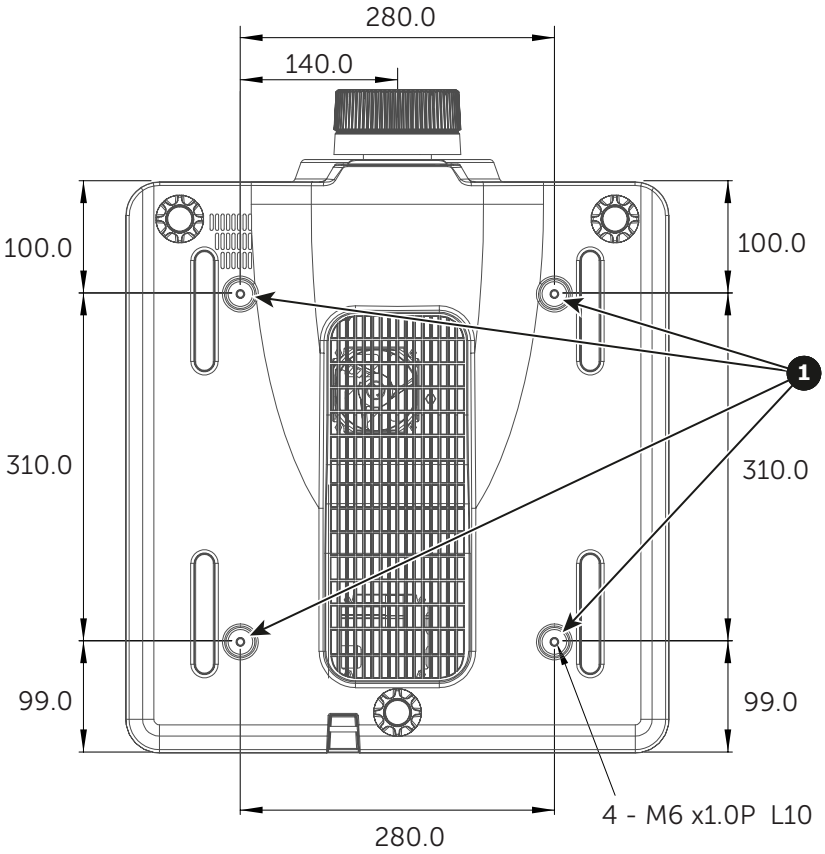


Image 2–19 Dimensions given in millimeters.

Damage resulting from incorrect installation will void the warranty.

UST lens R9801785 (1)

3

3.1 Specifications of the UST lens

Overview

Throw ratio	0.361 (120”)
Focal length	9.49-9.55
F number	2.4
Zoom ratio	No zoom
Throw distance	0.96-3.01m
Screen size	120” to 400”
Lens configuration	3 group 23 elements
Brightness ratio	70% (for reference)
Net weight	2.715 kg

Lens specification table

Screen diagonal (inch)	W (cm)	H (cm)	P (cm)[3]	A-P (cm)	B (cm)	C=PD (cm)	L (cm)	M (cm)= (A-P)+(H/2)
110	236,9	148,1	19,9	52,6	6,3	88,9	82,6	126,6
120	258,3	161,5	19,9	58,2	13,6	96,3	82,6	139,0
130	280,0	175,0	19,9	63,9	21,0	103,6	82,6	151,4
140	301,5	188,5	19,9	69,5	28,3	110,9	82,6	163,8
150	323,0	201,9	19,9	75,1	35,6	118,2	82,6	176,2
160	344,6	215,4	19,9	80,8	42,9	125,5	82,6	188,5
170	366,2	228,9	19,9	86,4	50,3	132,9	82,6	200,9
180	387,7	242,3	19,9	92,1	57,6	140,2	82,6	213,3
190	409,2	255,8	19,9	97,7	64,9	147,5	82,6	225,7
200	430,7	269,3	19,9	103,4	72,2	154,8	82,6	238,1
210	452,3	282,7	19,9	109,1	79,5	162,2	82,6	250,5
220	473,9	296,2	19,9	114,8	86,9	169,5	82,6	262,9
230	495,4	309,6	19,9	120,4	94,2	176,8	82,6	275,2
240	516,9	323,1	19,9	126,1	101,5	184,1	82,6	287,6
250	538,5	336,6	19,9	131,7	108,8	191,5	82,6	300,0
260	560,0	350,0	19,9	137,4	116,2	198,8	82,6	312,4
270	581,6	363,5	19,9	143,0	123,5	206,1	82,6	324,8
280	603,1	376,9	19,9	148,7	130,8	213,4	82,6	337,2
290	624,6	3690,4	19,9	154,4	138,1	220,8	82,6	349,6
300	646,2	404,0	19,9	160,0	145,5	228,1	82,6	361,9
310	667,7	417,3	19,9	165,7	152,8	235,4	82,6	374,3
320	689,3	430,8	19,9	171,3	160,1	242,7	82,6	386,7

3. feet turned completely in

Screen diagonal (inch)	W (cm)	H (cm)	P (cm)[4]	A-P (cm)	B (cm)	C=PD (cm)	L (cm)	M (cm)= (A-P)+(H/2)
330	710,8	444,2	19,9	177,0	167,4	250,0	82,6	399,1
340	732,3	457,7	19,9	182,6	174,7	257,4	82,6	411,5
350	754,0	471,3	19,9	188,2	182,1	264,7	82,6	423,9
400	861,6	538,6	19,9	216,5	218,7	301,3	82,6	485,8

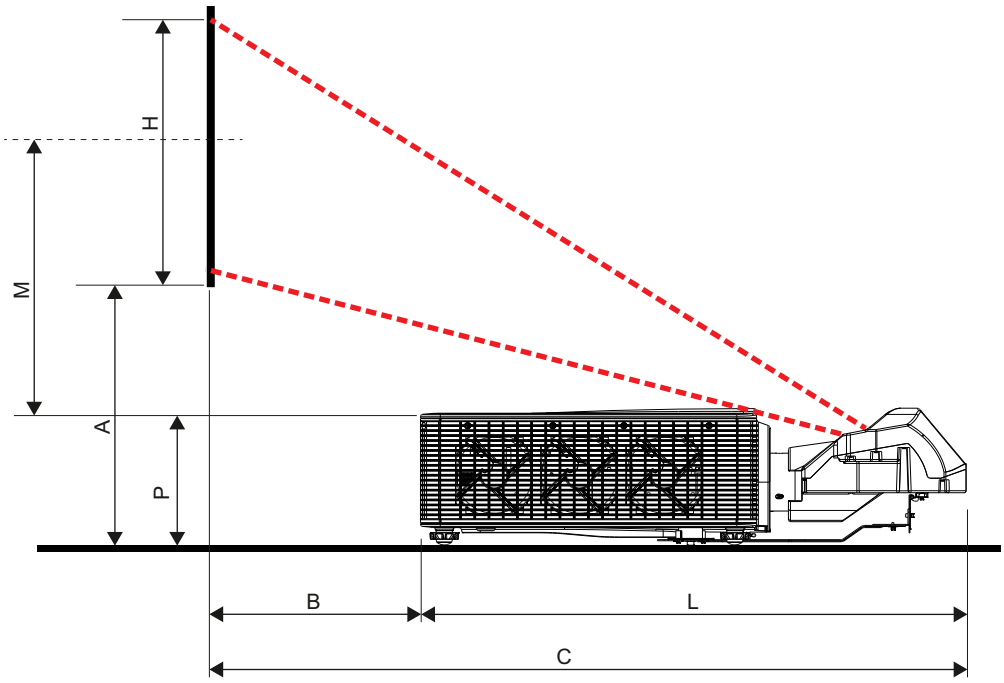


Image 3–1

Mark the Target Screen and setup project

1. Mark the size and center of the projection target screen.
2. It is recommended that the projection image size is at least 10 inch larger than the target screen size. Base on projection screen size, calculate the setup dimension.
3. Set up the projector, refer to the lens specification table

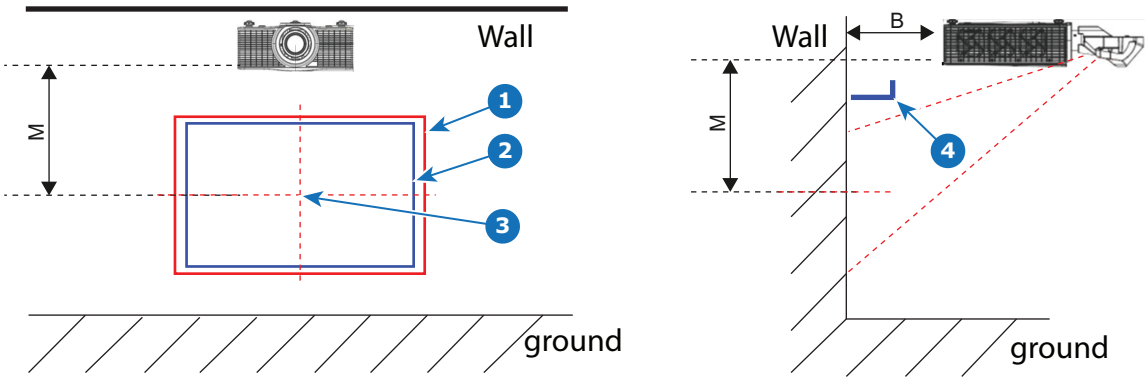


Image 3–2

1 Projection screen
2 Target screen
3 Screen center
4 Corner 90°

4. feet turned completely in

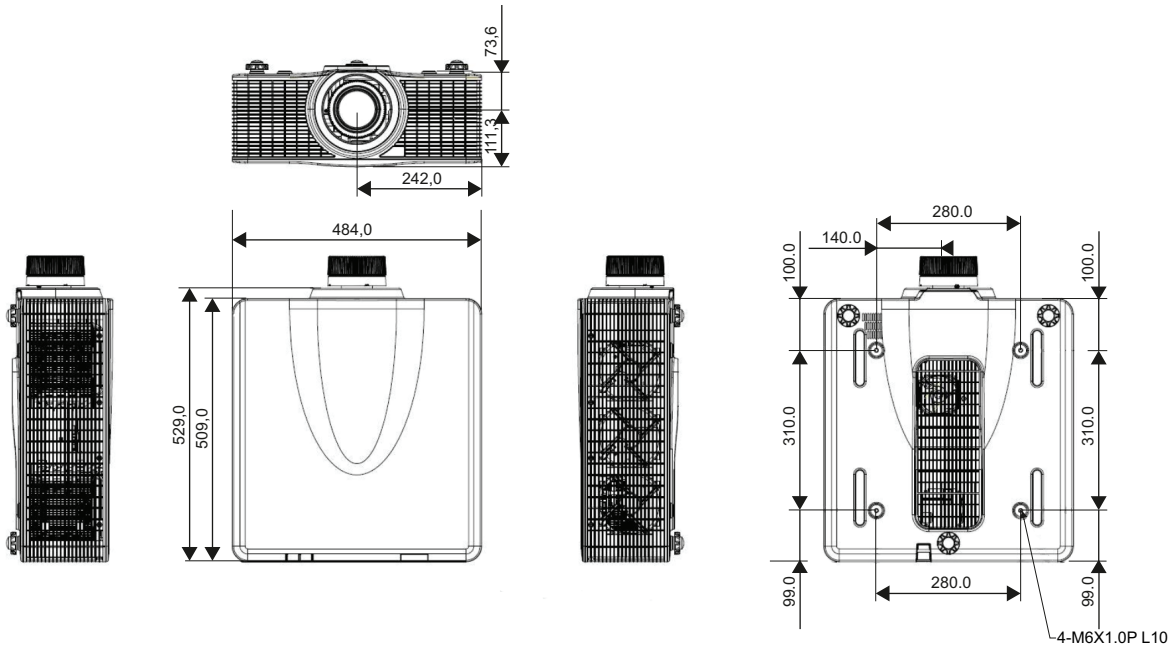

73,6
111,3
242,0
484,0
529,0
509,0
280.0
140.0
100.0
100.0
310.0
310.0
99.0
280.0
99.0
4-M6X1.0P L10

Image 3–3

3.2 Safety precautions

Overview

- Installation and adjustments should be performed by qualified technicians or authorized service dealers.
- Do not look into straight into the projector lens during the operation. The bright light may cause permanent eye injury.
- Make sure no personnel or object is in the light path of the projector during the operation.
- Do not place the projector on an unstable surface to prevent product damage and human injury.
- Failure to follow the control, adjustment or operation procedures may cause damage by the exposure.

3.3 Product version identification

Overview

The UST lens kit is designed with two types of installation accessories in order to fit the different lens shift modules (LSM) on the projectors. This manual contains installation instructions for both types. Please check the projector's boresight to identify the versions of the lens shift module.

Make sure the projector is turned off before checking the boresight.

Projector identification

Check identification label to confirm projector model series

G60 G62

Image 3–4

Type 1 Lens Shift Module (LSM 1)

- the boresight plate is secured with three screws.
- LSM 1 has a lens cable plugged to the circuit board on the top left corner.

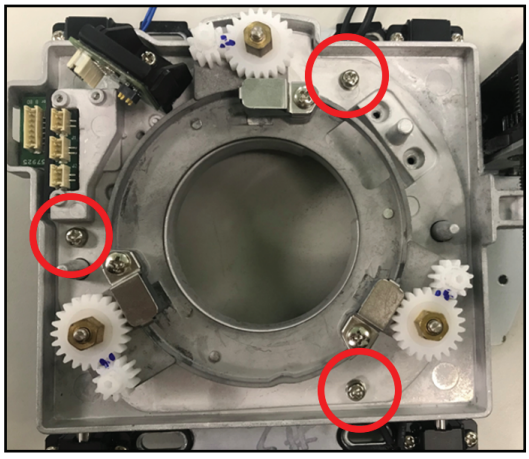


Image 3–5 LSM type 1

Type 2 Lens Shift Module (LSM 2)

- boresight plate is secured with four screws.

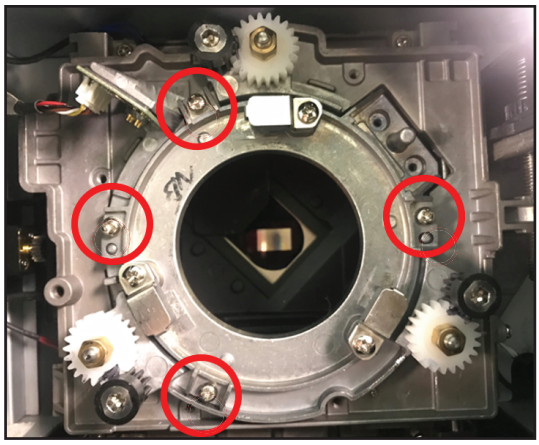


Image 3–6 LSM Type2

3.4 Required accessories and tools

Check if all items in the table are included in the package. Both LSM 1 and LSM 2 accessories are included in the lens package.

Supporting system components

Image	Description	Quantity
	UST lens	1
	Lens mount bracket	1
	Bracket	1
	Lens support	1
	M3 x L8 screw	2
	M3 x L8 hex screw	3
	M6 x L22 hex screw	2
	M3–3.7 x 0.8 x 18 washer	3
	M6-6.7 x 1 x 16 washer	2

LSM type 1 components

	UST lens boresight plate	1
	Boresight extender	3
	L-shape tool (silver)	1

LSM type 2 components

	UST lens pogo pin adapter	1
	Boresight extender (with red rubber ring)	3
	L-shape tool (black) or U-shape tool (black)	1

Required tools

The following tools are required for installing the UST lens:

- #2 Philip screwdriver with magnetic tip (long neck)
- L shape tool (provided in the lens package)
- 2.5 mm Allen wrench
- 5 mm Allen wrench

3.5 Necessary steps when installing the UST-lens on the G60/G62

Handle as follow

1. Software preparation of the projector to receive the UST lens.
   1. First you need to put the lens holder in the position suited for the UST-lens and the brightness needs to be reduced during the setup process. This is initiated by pressing a series of keys on the local keypad or on the remote control unit. The software will do the rest automatically.
   2. After the setup and calibration is done, you need to let the projector know that the setup is done. After this command, the projector will switch off and it will know the setup is done. The lens shift is then fixed and the brightness is again put at maximum.
2. Mechanical preparation of the projector to receive the UST lens.

   In this part, a lot of steps need to be done to correctly install the UST-lens.
3. Adjust the lens optically.

   In this part, the UST lens is adjusted in sheimpflug and back focal distance by using the correct procedure.

3.6 Software preparation of the projector to receive the UST lens

About the software preparation

Set the start mode of the projector to get it ready for the UST lens installation. During the setup process, the projector reduces the image brightness and performs a lens calibration to center the lens position.

How to set

1. Remove the lens cap.
2. Install an non-ultra short throw (non-UST) lens on the projector.
3. Connect the AC power cord and switch on the power button.
4. Turn on the projector.
5. Enable the UST Install mode. There are 2 possibilities:
   1. You have another projection lens available: use the on screen display (OSD) menu.
      a) Select *Menu → Settings/Service.*
      b) Enter the service password “1”, “5”, “9”, “0” on the remote control and press **OK**.
      c) Select *UST Install → Start.*
   2. You do not have another lens available: use the shotcut keys on the local keypad
      a) Enable the UST Install mode by pressing the following keys on the local keypad or on the remote control unit: ‘Exit / Input / Left / Right’.

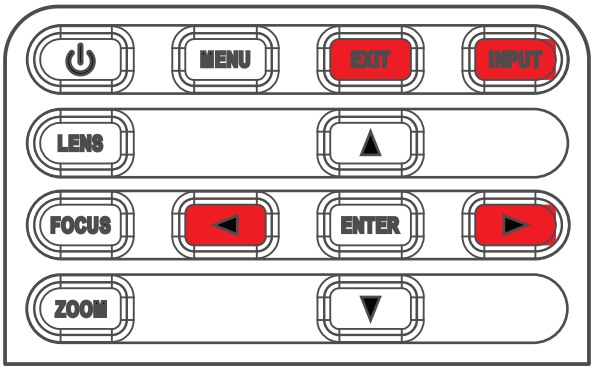


Image 3–7

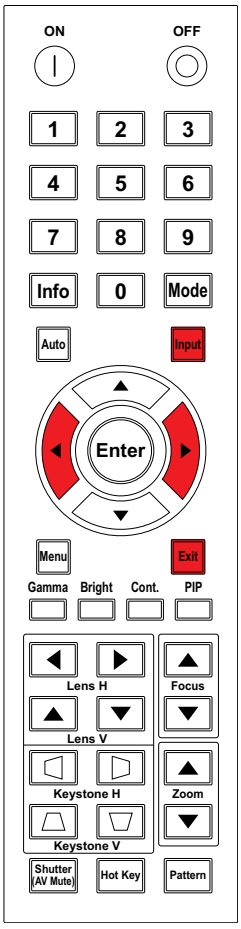


Image 3–8

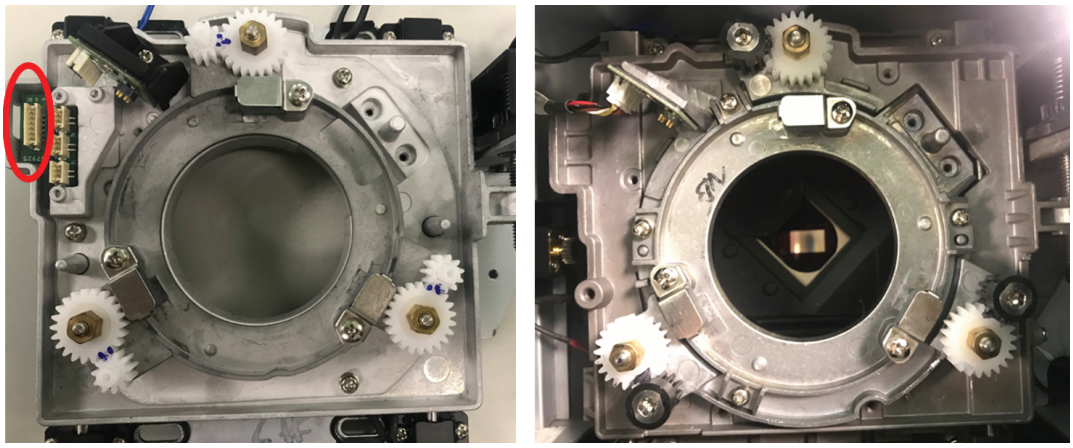
6. A lens calibration is performed automatically.
7. After the calibration, the projector will automatically shut down. If not, press the “Exit” key on the remote control to power off the projector and making it ready for the install of the UST-lens.

8. Switch off the AC power button.
   The projector is now in the mode for an UST lens.
9. Remove the power cord.

3.7 Remove the non-UST boresight module

How to remove

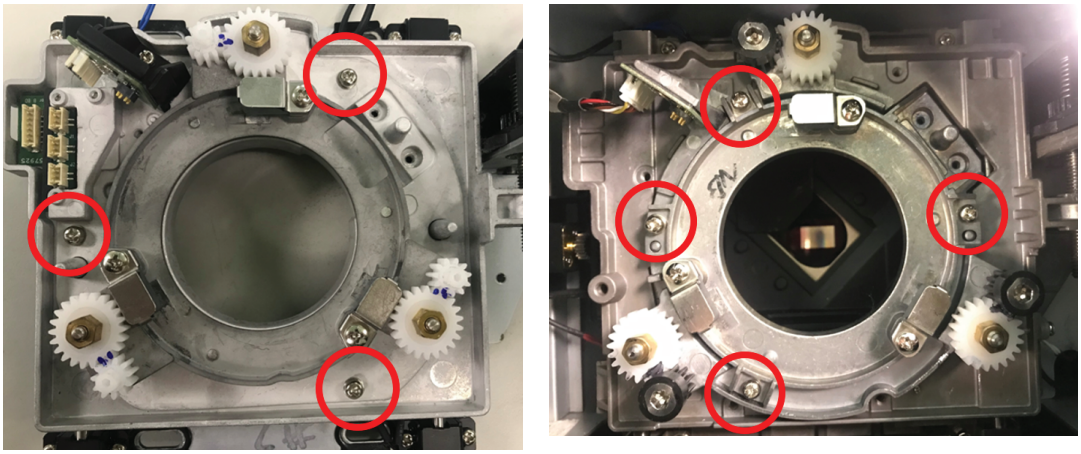
1. Remove the non-ultra short throw (non-UST) lens.
2. Disconnect the lens cable (see red reference) in LSM type1.



LSM type1 LSM type2

Image 3–9

3. Remove the screws (inside red circles) securing the non-UST lens boresight plate with a Philips #2 screwdriver.



LSM type1 LSM type2

Image 3–10

Note: To have better visibility for the lens holder, you can stand the projector with the lens opening facing up.

4. Remove the non-UST lens boresight module from the projector.

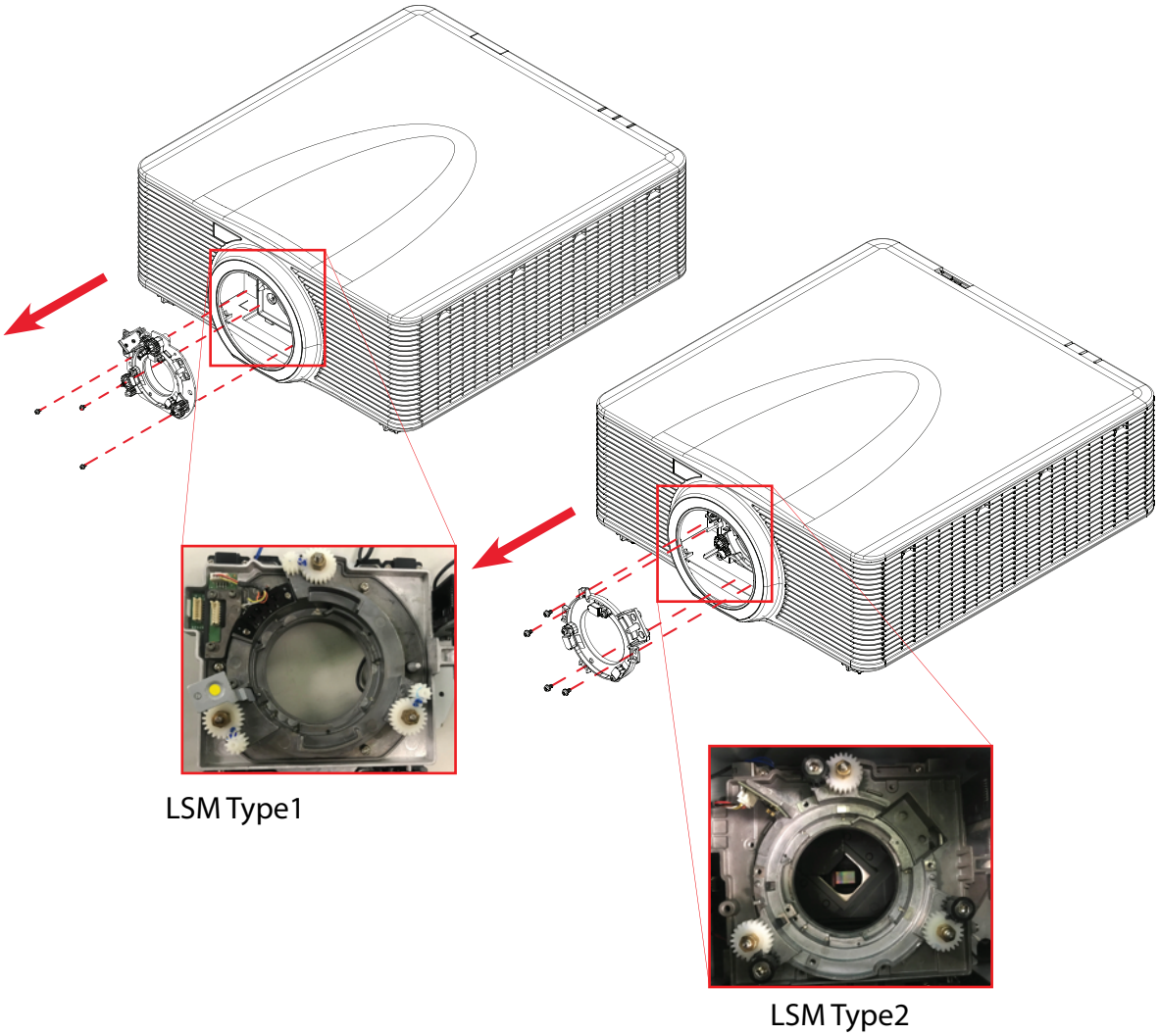


Image 3–11

3.8 Installation of the UST lens boresight module (G60 + LSM type 1)

How to install

For type 1 lens shift module (G60 + LSM 1), you need to install an UST lens boresight plate in order to attach the UST lens to the projector.

1. Disconnect the lens cable from the small circuit board on the lens shift module (If not yet done).

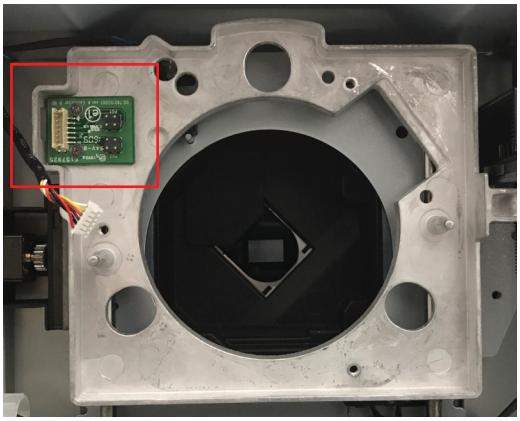


Image 3–12

Note: Ensure the cable is not wrapped or pinched when replacing the lens boresight module.

2. Insert the UST lens boresight module to the projector.

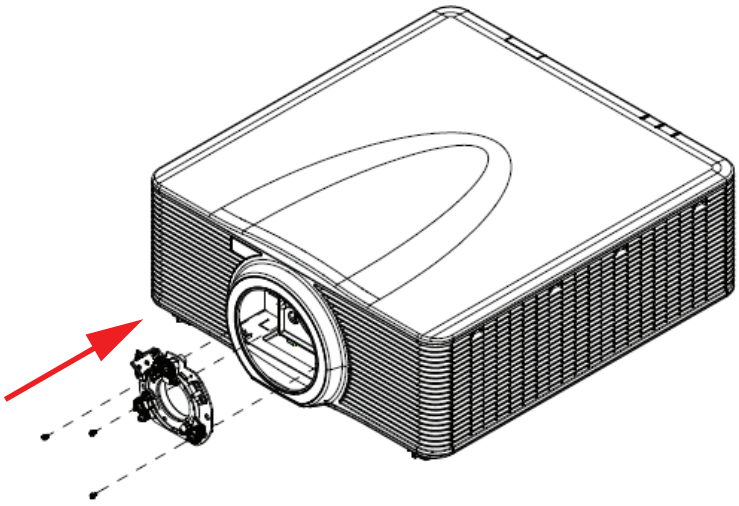


Image 3–13

3. On the UST lens boresight module, install and tighten the 3 screws with a Philips # 2 screwdriver.

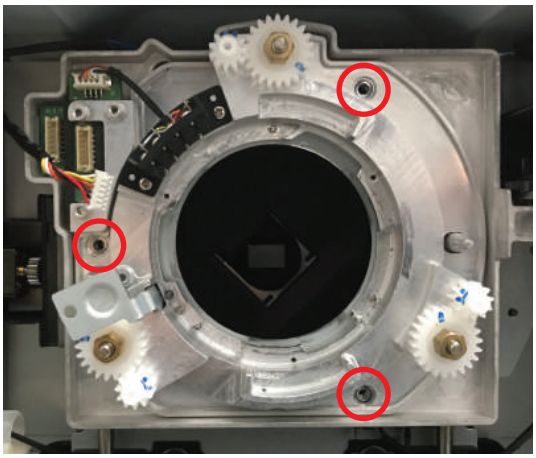


Image 3–14

4. Connect the lens cable to the lens holder.

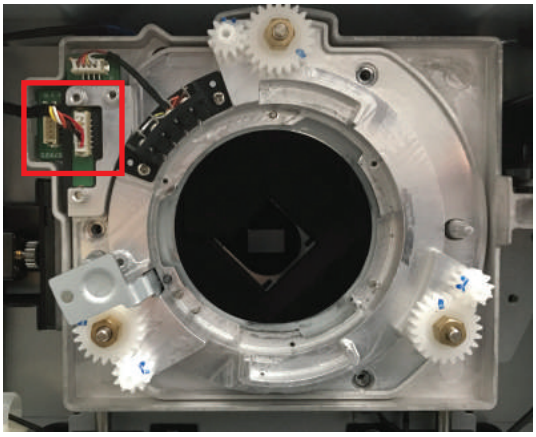


Image 3–15

3.9 Installation of the UST lens pogo pin adapter (G60 + LSM type2, G62 + LSM type2)

How to install

For type 2 lens shift module (G60 + LSM type 2, G62 + LSM type 2), you need to install an UST lens pogo pin adapter in order to attach the UST lens to the projector.

1. Loosen the three screws on the UST lens pogo pin adapter with a Philips #2 screwdriver.

   The middle screw controls the lateral position of the circuit board on the adapter:

   - Turning the screw counter-clockwise moves the circuit board towards the screw.
   - Turning the screw clockwise moves the circuit board away from the screw.

   To have the pogo pin adapter properly installed to the projector, turn this middle screw counter-clockwise for at least 3 turns before the installation.

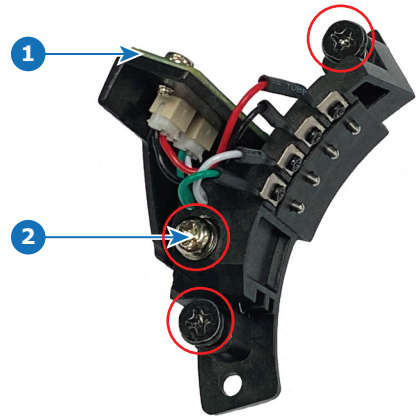


Image 3–16

1 Circuit board
2 Middle screw

2. Insert the UST lens pogo pin adapter to the projector.

   Note: Before installing the pogo pin adapter, make sure the middle screw on the adapter is turned counter-clockwise for at least 3 turns.

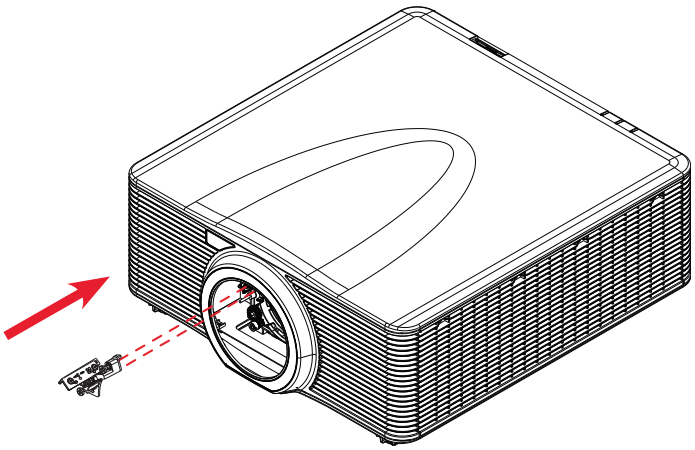


Image 3–17

3. Tighten the side screws on the pogo pin adapter.

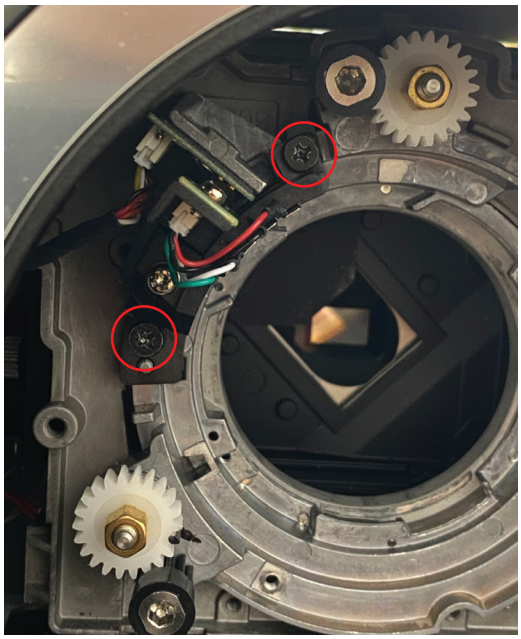


Image 3–18

4. Tighten the middle screw on the pogo pin adapter.

Note: Please tighten the side screws before tightening the middle screw.

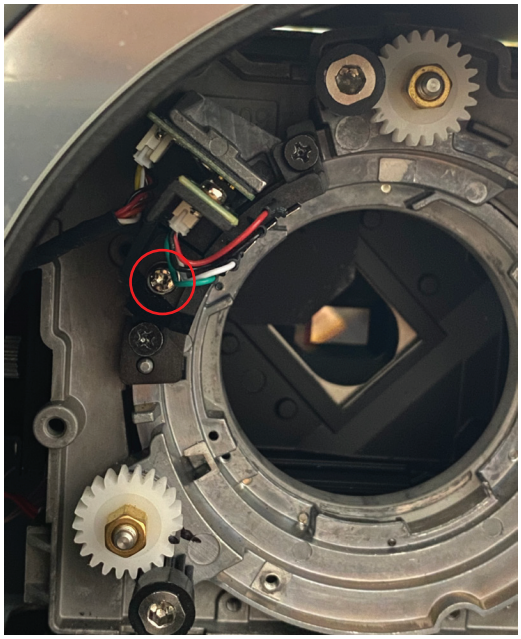


Image 3–19

3.10 Mounting the UST lens support system

Why lens support?

A support system is designed with the UST lens to provide additional support to the lens.

Required tools

- Allen wrench 5 mm
- Allen wrench 2.5 mm
- Philip #2 screwdriver
- Boresight extenders

How to mount

1. Place the lens on a cushioned surface to avoid damage.
2. To secure the lens bracket to the UST lens, install and tighten two M3 x L8 screws with a Philip #2 screwdriver.

   Note: Ensure the arrow on lens mount bracket is facing out from the lens mount.

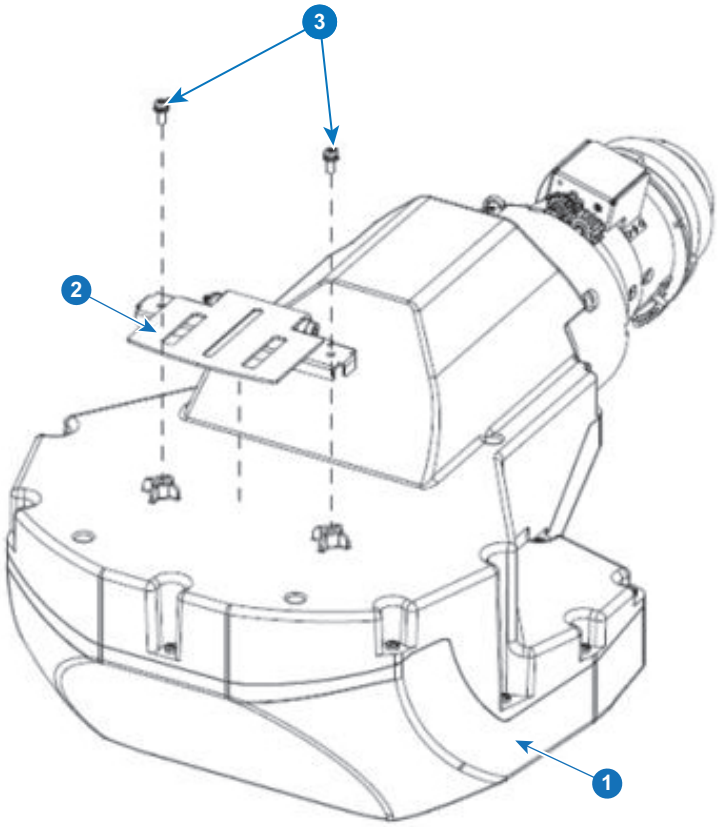


Image 3–20

1 UST lens
2 Lens bracket
3 M3xL8 screws

3. Place the projector upside down on a flat and clean surface.
4. To avoid the lens supporter touching the surface, rotate the adjustment feet counter-clockwise at least five turns.

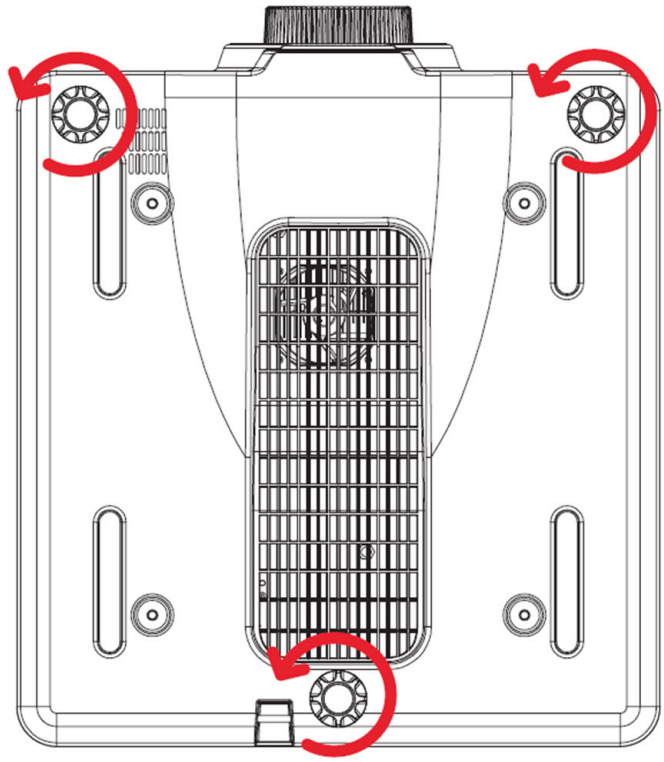


Image 3–21

5. To secure the angle bracket to the lens supporter, install one M3 x L8 hex screw and one M3 washer with a 2.5 mm Allen wrench. Do not fully tighten the screw.

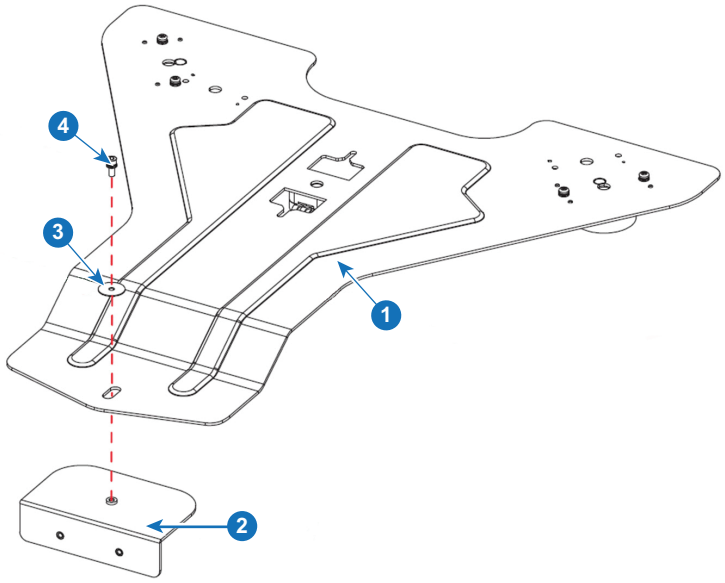


Image 3–22

1 Lens support
2 Angle bracket
3 M3-3.7 x 0.8 x18 washer
4 M3 x L8 hex screw

6. To mount the lens supporter to the bottom of the projector, install and tighten two M6 x L22 hex screws and two M6 washers with a 5 mm Allen wrench.

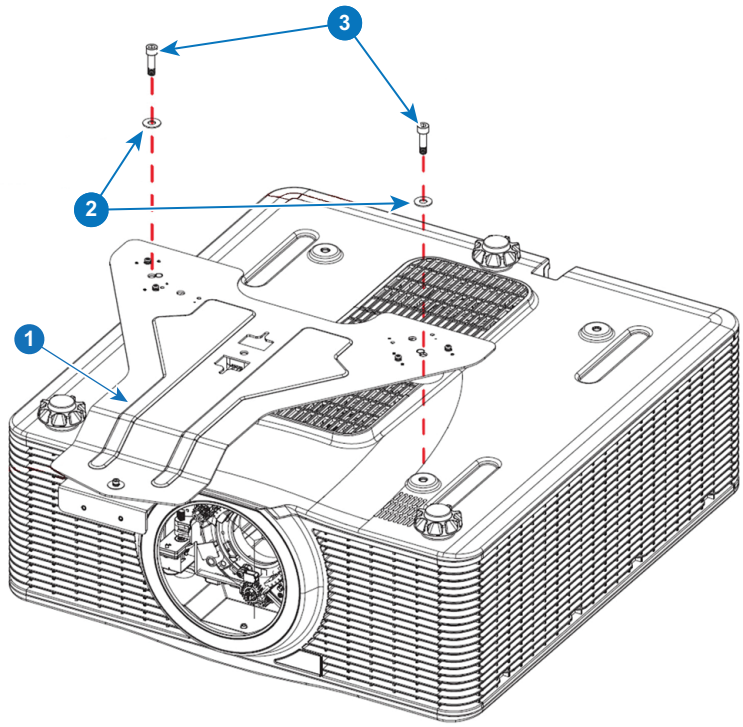


Image 3–23

1 Lens support
2 M6-6.7 x 1 x 16 washer
3 M6 x L22 hex screws

7. If using the lens supporter with a ceiling mount, make sure to leave at least 30 mm clearance space above the projector's bottom intake vents.

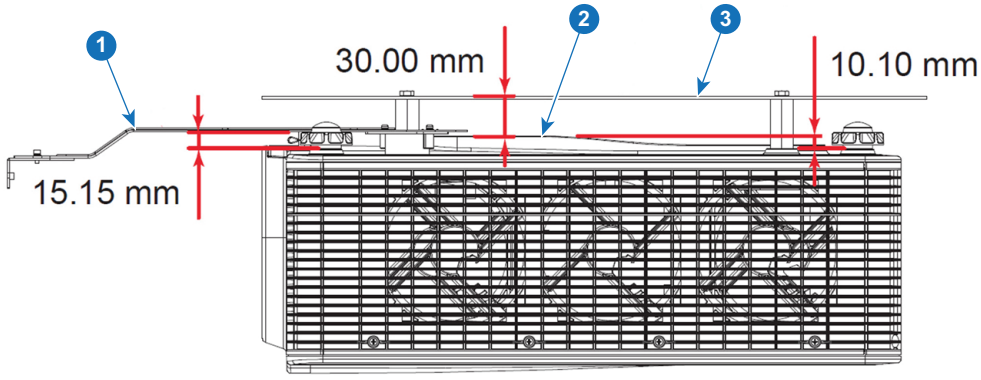


Image 3–24

1 Lens support
2 Bottom intake vents
3 Ceiling mount plate

8. Place the projector back to its original orientation.
9. Install the three boresight extenders.
   - For G60 + LSM type 1, face the socket heads of the extenders towards the projector.
   - For G60 + LSM type 2, G62 + LSM type 2, face the red rubber rings on the extenders toward the projector.

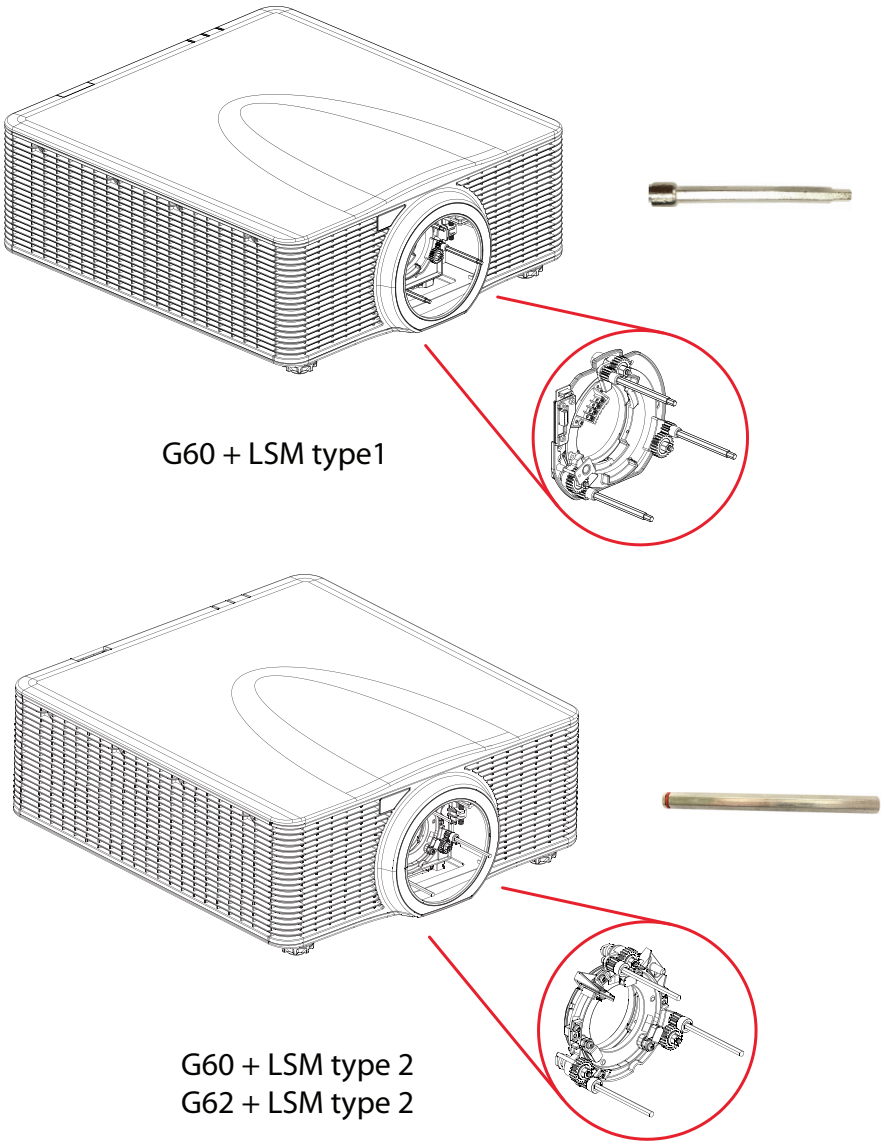


Image 3–25

3.11 Initially adjusting the boresight screws

Preparations

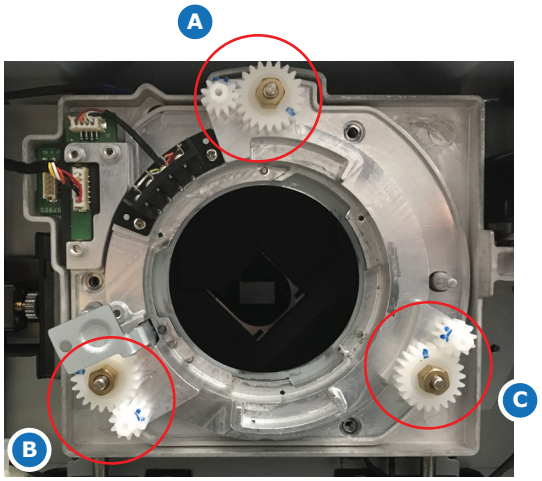
Adjust the boresight screws by turning the boresight extenders clockwise or counter-clockwise. Once a lens is installed, the adjustment ranges for the boresight screws are limited.

Required tools

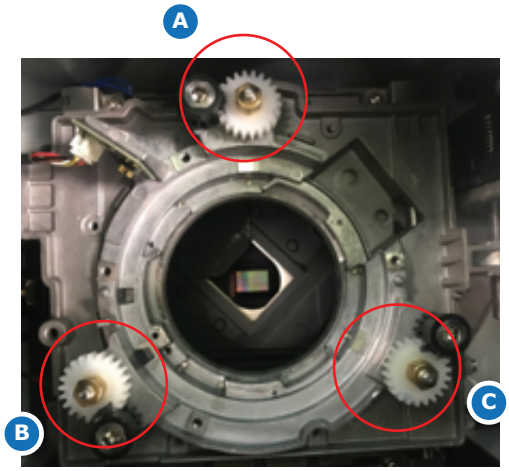
- Boresight extenders
- L-shape tool/U-shape tool

How to adjust

1. Turn the small boresight gears counter-clockwise to the end position.
2. Adjust the LSM small gears according below tables and figures.



LSM type 1



LSM type 2

Image 3–26

Adjustment ranges (in turns) for the boresight screws for G60 + LSM type 1

Orientation	A	B	C
Table top	3 + 1/4	7 + 3/4	8 + 3/4
Portrait (L)	6 + 2/4	3 + 3/4	8 + 2/4
Portrait (R)	6 + 3/4	8 + 3/4	4 + 2/4
Ceiling mount	8 + 2/4	5 + 1/4	5 + 3/4
Upright	8	7 + 3/4	8

Adjustment ranges (in turns) for the boresight screws for G60 + LSM type 2

Orientation	A	B	C
Table top	7	7	7
Portrait (L)	8 + 1/2	8 + 1/2	5 + 1/4
Portrait (R)	8 + 1/2	5 + 1/2	8 + 1/2
Ceiling mount	11	5 + 1/2	6 + 1/2
Upright	9 + 1/2	7	7

Adjustment ranges (in turns) for the boresight screws for G62 + LSM type 2

Orientation	A	B	C
Table top	3	3	3
Portrait (L)	5+ 1/4	5 + 1/4	2
Portrait (R)	5	2	5
Ceiling mount	7 + 1/2	2	3
Upright	5+ 1/2	3	3

The optical adjustments of the UST lens need to be done in the actual position of the projector.

3.12 Installing the UST lens

Required tools

Allen wrench 2.5 mm

How to install

1. Insert the UST lens to the projector with the TOP mark aligning to the top of the projector.

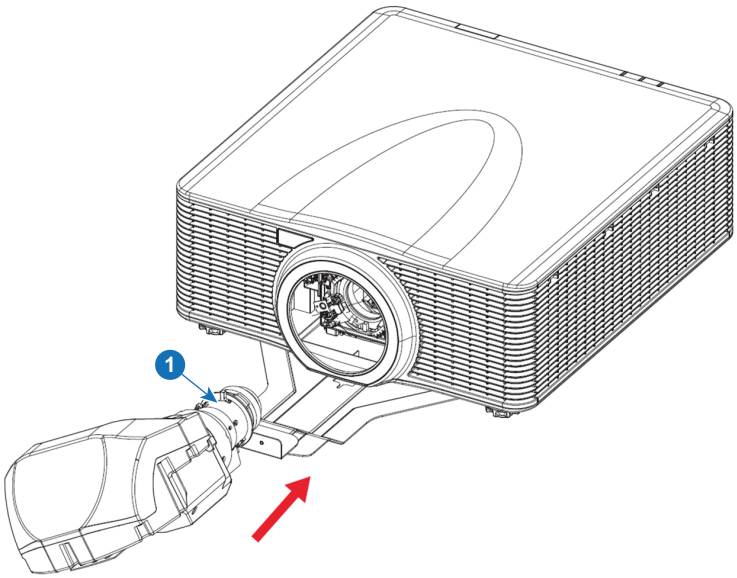


Image 3–27

1 Top

2. Rotate the UST lens clockwise to lock the lens.

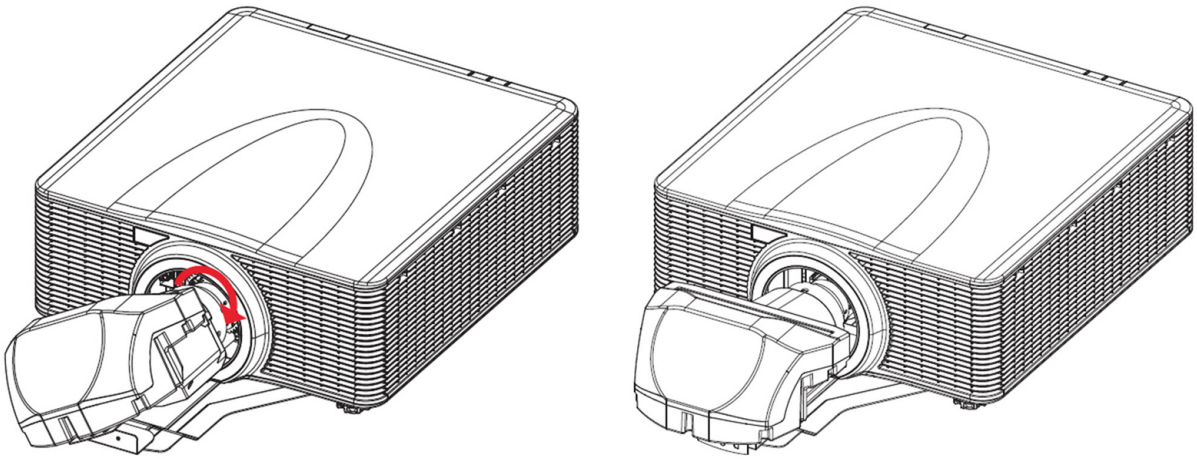


Image 3–28

3. To connect the lens bracket and the lens support assembly, install two M3 x L8 hex screws and two M3 washers with a 2.5 mm allen wrench. Do not tighten the screws, as the lens still needs to be adjusted optically.

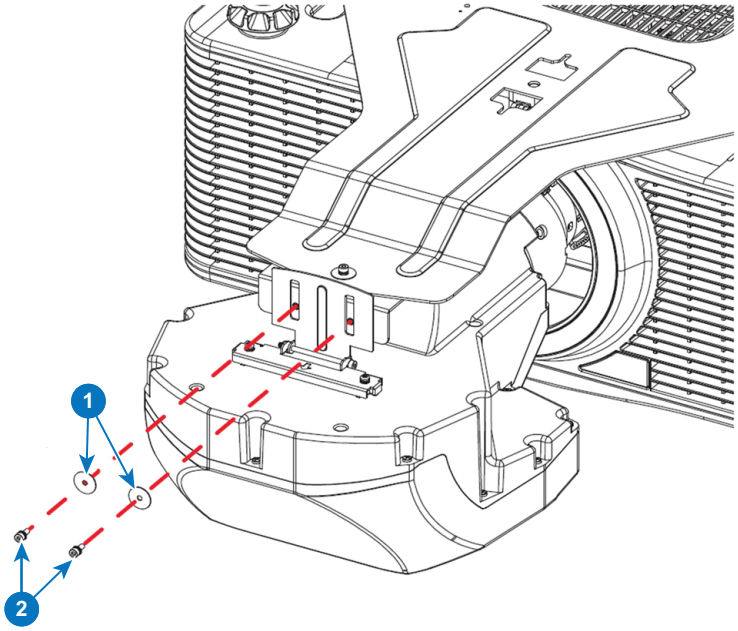


Image 3–29

1 M3 x L8 hex screw
2 M3-3.7 x 0.8 x 18 washer

4. Adjust the lens optically. See “Adjusting the UST lens”, page 57.

3.13 Adjusting the UST lens

3.13.1 Adjusting the image position and focus

What must be done?

After the UST lens is installed, turn on the projector and adjust the image position.

Required tools

- Allen wrench 2.5 mm
- Remote control

How to adjust

1. Place the projector as close as possible to the screen. Make sure the screen is flat and the projector is perpendicular to the screen.
2. Turn on the projector.
3. To display a test pattern, press the **Pattern** key on the remote control.

   The test image could be out of focus and the bottom edge may appear obscured or in dark.
4. To remove the obscured bottom edge, adjust the image position by pressing the **Lens V** keys to shift the image up or down.
5. If the obscured edge still exists after the lens shift, adjust the vertical position of the two M3 x L8 hex screws connecting the lens bracket and the lens support assembly, which mechanically moves the image up or down. Use a 2.5 mm allen key to adjust the M3 hex screws.

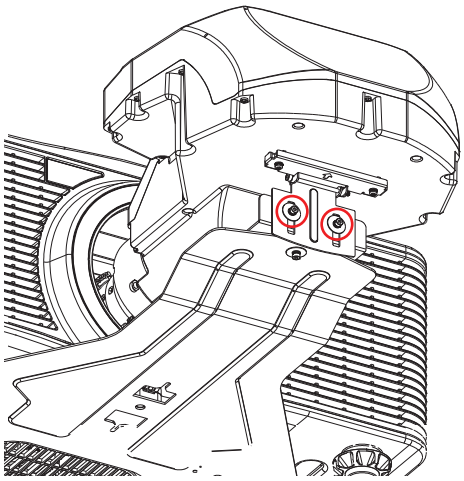


Image 3–30

6. To adjust the image focus, press the **Zoom** keys on the remote control to adjust the back focus and the **Focus** keys on the remote control to adjust the focus.
   1. Press **Zoom** keys to adjust the back focus until the screen center (point 5) is clear and sharp.
   2. Press **Focus** keys to adjust the image focus untill the screen corners (point 1, 3, 7, and 9) are clear and sharp.
   3. Repeat step a and b to balance the image focus at the center and corners.

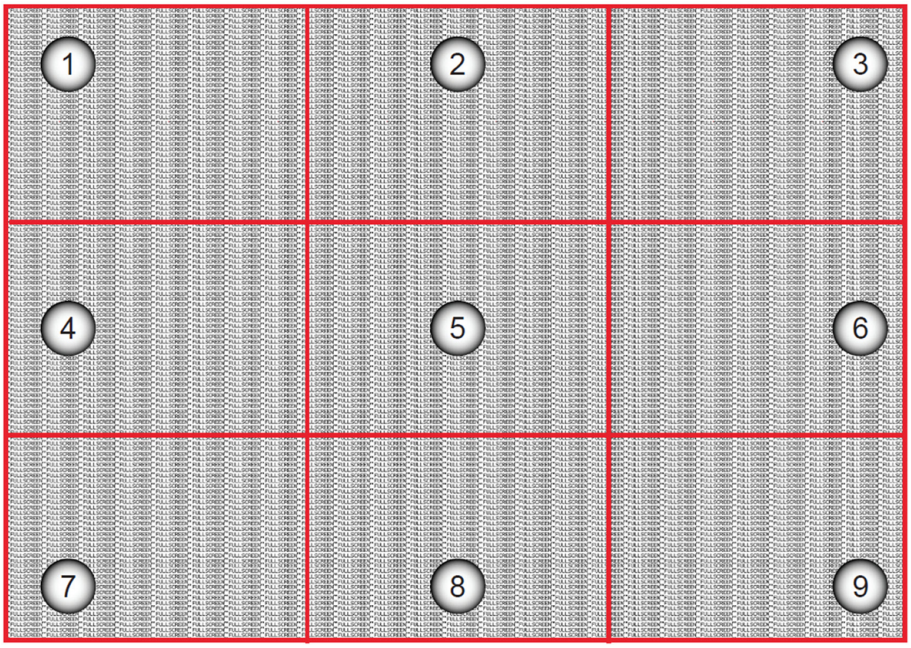


Image 3–31

Note: The image focus should be tuned finely as the balance between the back focus and focus adjustment is very subtle. One press on the **Zoom** or **Focus** keys can make a big difference on the screen.

3.13.2 Adjusting the boresight

Why boresight adjustment ?

Boresight adjustment is needed if the image is still unsharp after the focus adjustment. The boresight adjustment tilts the lens holder to parallel the lens plane and the DMD plane to fully focus the image on the screen.

Required tools

- Boresight extenders
- L-shape tool or U-shape tool
- Remote control

How to adjust

1. To perform the boresight adjustment, turn the boresight screws clockwise or counter-clockwise using the L shaped socket tool or U-shape tool and the three boresight extenders.

Note: Use the silver L shape key for the LSM type 1 and the black L shape or U-shape tool for the LSM type 2.

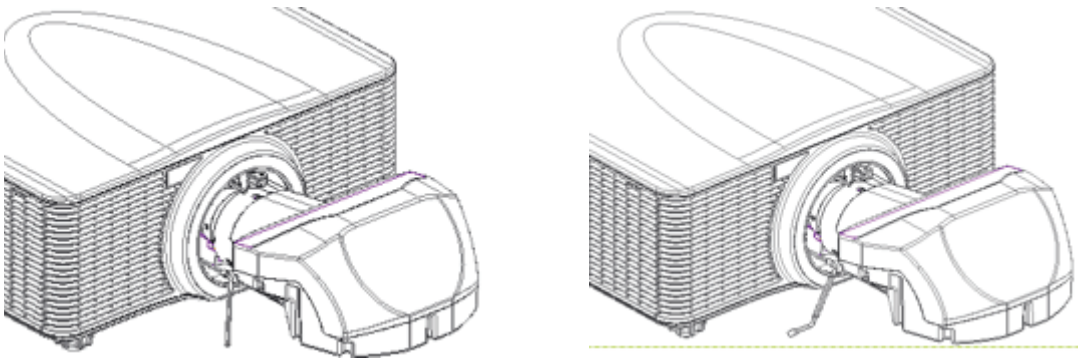


Image 3–32

2. Display a test pattern by pressing the **Pattern** key on the remote control.

   Note: The projector cannot display the input sources during the boresight adjustment.

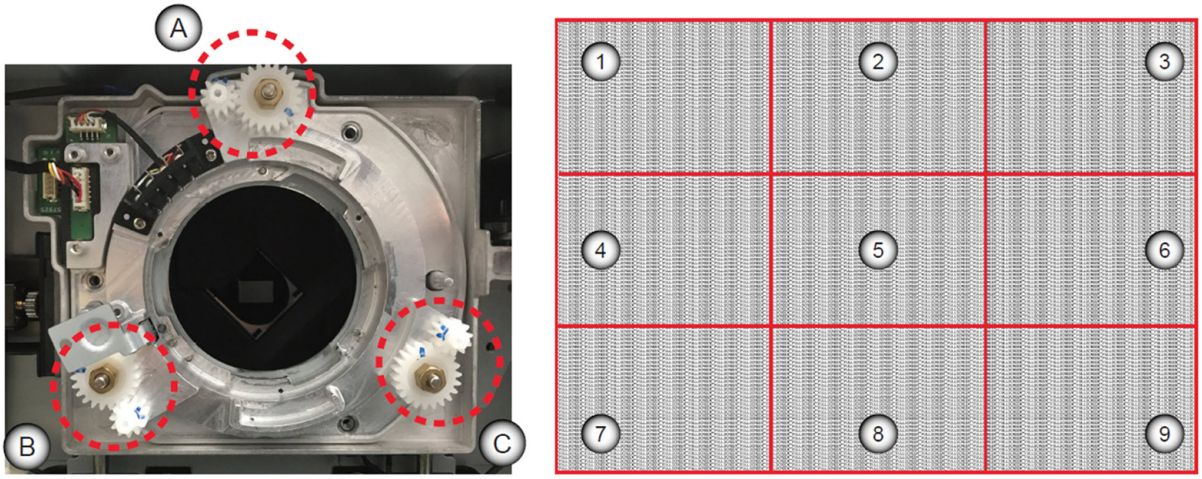


Image 3–33

3. To focus the left bottom area of the screen (point 4 and 7), turn boresight screw B clockwise or counter-clockwise.
4. To focus the right bottom area of the screen (point 6 and 9), turn boresight screw C clockwise or counter-clockwise.
5. To focus the top corners of the screen (point 1 and 3), adjust the image back focus and focus by pressing the **Zoom** and **Focus** keys on the remote control.
6. To focus the center bottom area of the screen (point 8), turn boresight screw A clockwise or counterclockwise.
7. Repeat from step 3 until the image is as sharp as possible in the center, left, right, top, and bottom of the screen.

3.13.3 Finalizing the image adjustment

What should be done?

After the boresight adjustment is complete, fix the lens support system and fine tune the image focus.

Required tools

Allen wrench 2.5 mm

How to finalize

1. Tighten the three M3 screws securing the lens support system with a 2.5 mm Allen wrench.

Note: To avoid affecting the projected image, do not use any force while fastening the screws. Start by fastening the screws by hand before using tools. And with your hand to make metal sheet B close to metal sheet A (Fig 1). tighten the screws (Fig 2), tighten the screw 1 around 180 degree then tighten the screw 2 around 180 degree, repeat until fully tightened. Tighten screw 3 (Fig 3). When tightening, do not use any force while fastening the screw.

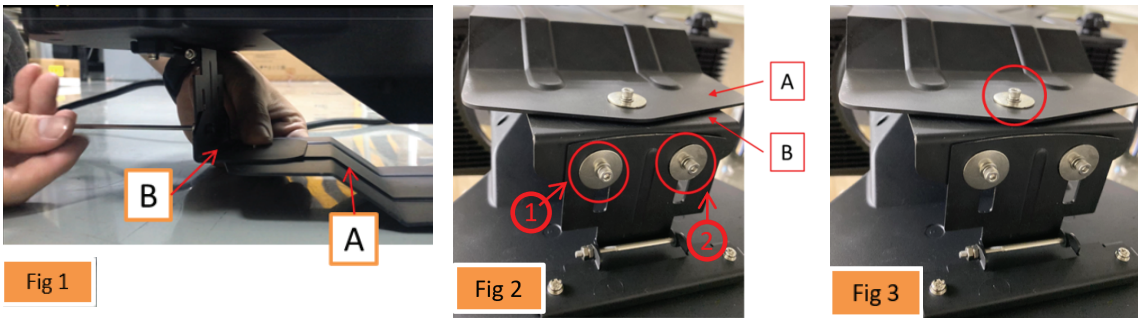


Image 3–34

→ During the operation, avoid moving projection image, only use rotation force to tighten screw.
If set up in desktop mode, check the projector footer's height in order to let the lens support hang in the air (at least five turns)
Check table top bracket or ceiling mount is stable.
Check screws on bracket and lens support are fasten enough.
Check set up surronding, avoid air-con outlet or do not set up nearby novable doors.

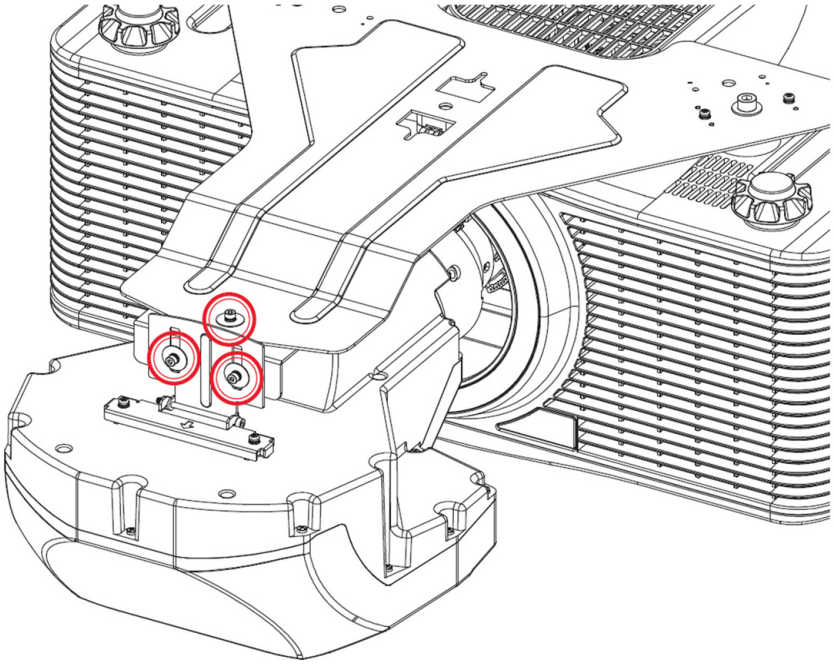


Image 3–35

2. Fine tune the image focus as bolting the support system changes the lens position slightly.
3. To restore the image brightness, press the **Exit** key twice on the remote control.

   The projector now can receive and display input sources.

UST lens R9801830 G lens (0.37 - 0.40 : 1) UST 90°

4

UST sales kit

The sales kit contains:

- The UST lens
- The UST lens support
- Safety cable

The UST lens must always be mounted with the UST lens support and the safety cable.

4.1 About the UST lens

Possible mounting positions

This lens can be mounted on the G60/G62 series of projectors and can be mounted in two positions: facing upwards and to the left. The motor housing must be turned to the correct position before the lens is mounted in the projector.

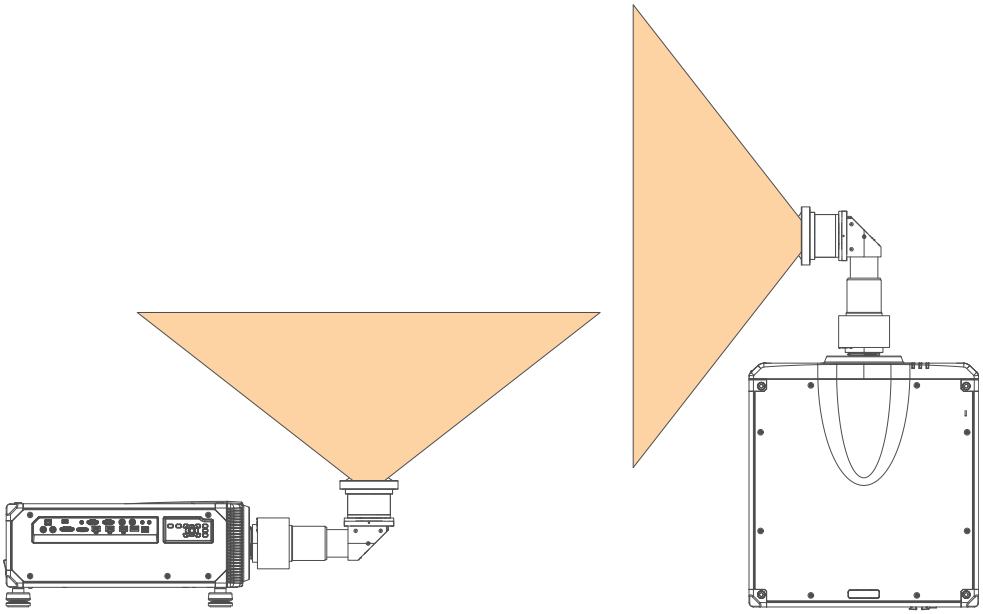


Image 4–1

4.2 Lens rotation mechanics

Overview

The Lens body can be rotated against the Interface unit when 8-M3 cap screws are removed.

It can be refastened to the Interface unit in increments of 90°.

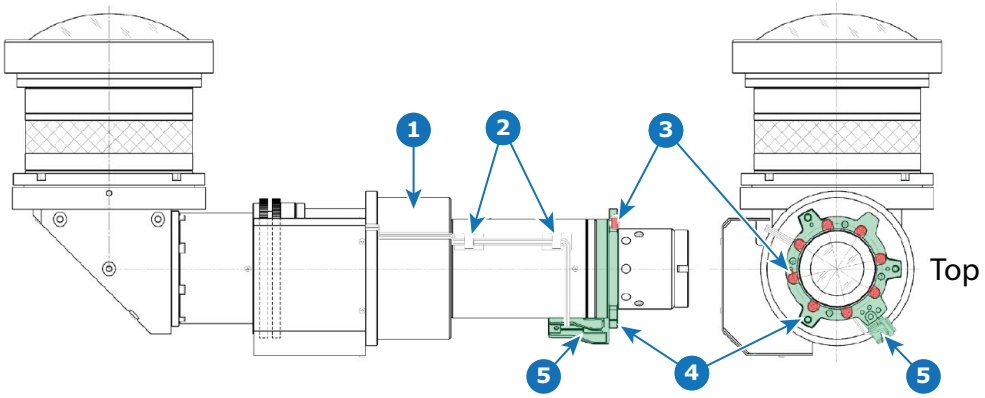


Image 4–2

1 Lens body
2 Wire clamper
3 8 M3 cap screws
4 Interface unit
5 PCBA module

Apply some glue on the head of the screws to prevent loosening when cap screws refastened.

Standard position

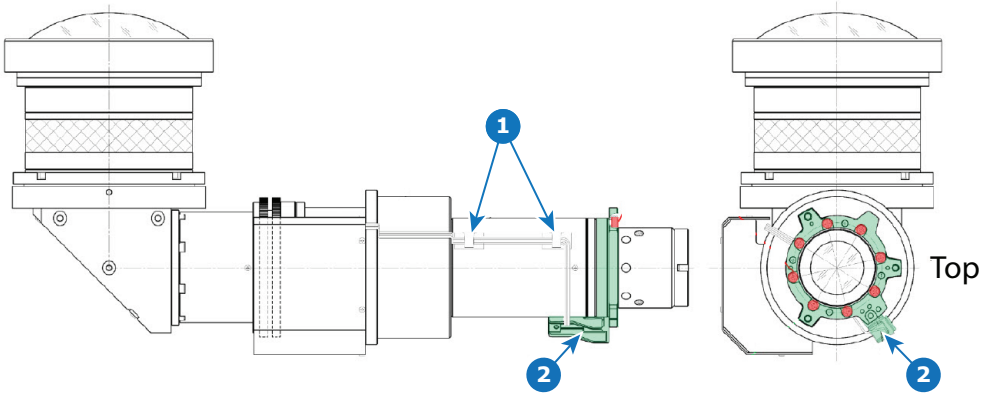


Image 4–3 Standard position

1 Wire clamper
2 PCBA module

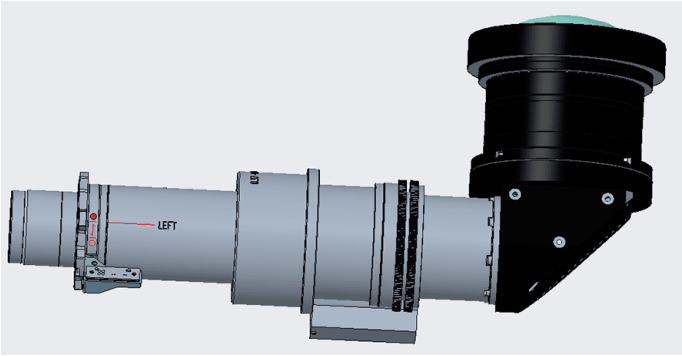


Image 4–4 Left mark on the lens

For left projection, make sure the red dot on the interface is next to the ‘Left’ marking on the lens.

Image 4–5

1 Wire routing
2 Projection orientation : left

90° rotated

To go from the standard position to a 90° rotated position, turn out the 8 M3 screws.

Slide the interface a few mm to the backside of the lens.

Rotate the interface 90° until the red dot on the interface is next to the ‘Up’ mark on the lens body.

Slide the interface back to the front of the lens to re-engage focusing gear and motor gear.

Turn in 8 M3 cap screws with some glue.

The lens is ready to be mounted in the projector.

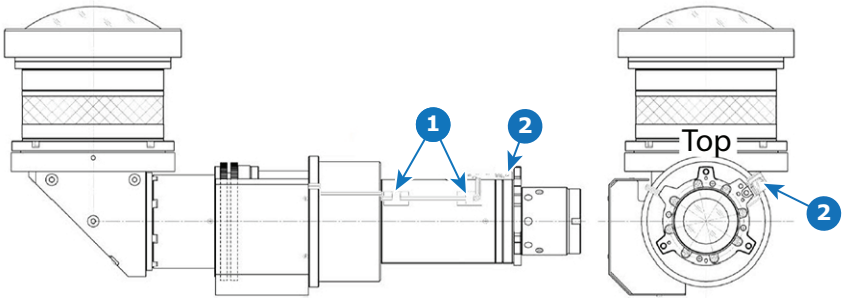


Image 4–6 90° rotated position

1 wire clamper
2 PCBA module

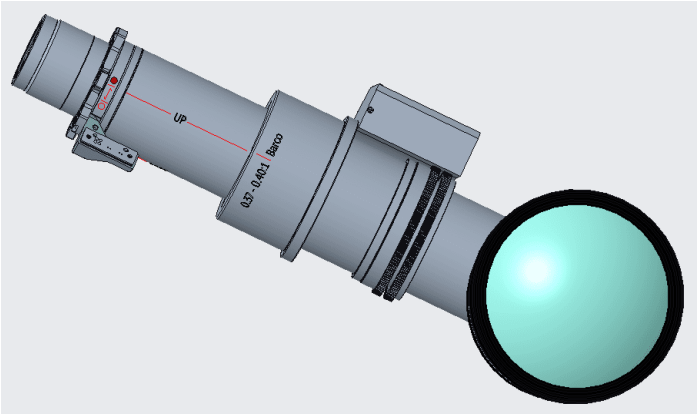


Image 4–7 Up mark on the lens

1 2

Image 4–8

1 Wire routing
2 Projection orientation : Up

4.3 Lens support installation

Components

Image	Description	Quantity
	Beam	2
	Base plate	1
	Lens holder module	1
	Lens clamp module	1
	Safety bar	1
	Socket head screw M6x12	4
	Socket head screw M6x22	8
	Spring washer M6	8
	Washer M6	10
	Socket head screw M4x10	5

Required tools

- Allen wrench 5mm
- Allen wrench 4mm
- Allen wrench 3mm

Installation steps

1. Turn the projector up side down. To avoid damage, lay it on a blanket or a foam rubber.

   Mount both beams on the bottom of the projector. Use 2 bolts M6x12 and 2 washers M6 for each beam.

   Tighten with a torque between 3.5 and 9.8 Nm

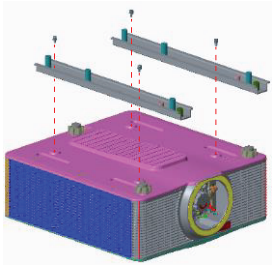


Image 4–9

2. Mount the base plate on the projector beams. Use 4 bolts M6x22 with 4 spring washers M6 and 4 washers M6 (reference 1 in Image 4–10). Insert the spring washer in between the screw head and the washer.

   Tighten with a torque between 3.5 and 9.8 Nm

   When the projector will be used in table mounting configuration, also turn in the four feet (reference 2 in drawing B).

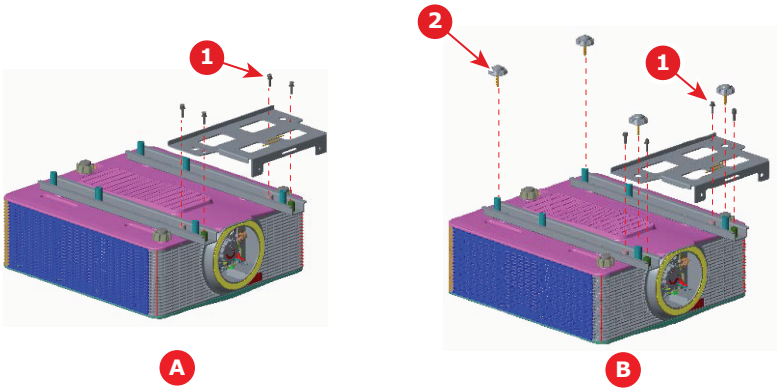


Image 4–10

3. Install the UST lens. Rotate the UST lens clockwise to lock the lens.

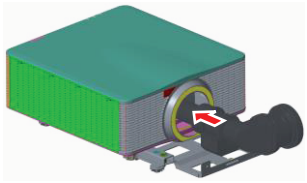


Image 4–11

4. The lens holder module is preassembled with screws 2 & 3. Start loosen screws 2 & 3 before starting the next step.

   Mount the lens holder module on the base plate with screws with reference 1 and 4 in Image 4–12. Drive them in partially. Use M6x22 screws and insert on each a spring washer M6 and washer M6.

   Note: Do not tighten the 4 bolts yet.

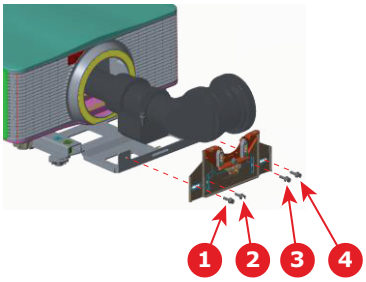


Image 4–12

5. For left projection: mount the lens clamp module on the lens holder module by inserting 2 screws M6x22, 2 spring washers M6 and 2 washers M6. Tighten with a torque between 3.5 and 9.8 Nm

Fixate the adapter plate with 3 screws M4x10 to the lens. To continue, go to step 8.

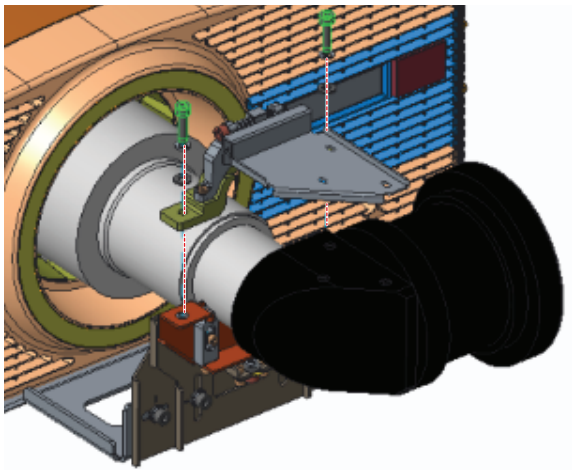


Image 4–13

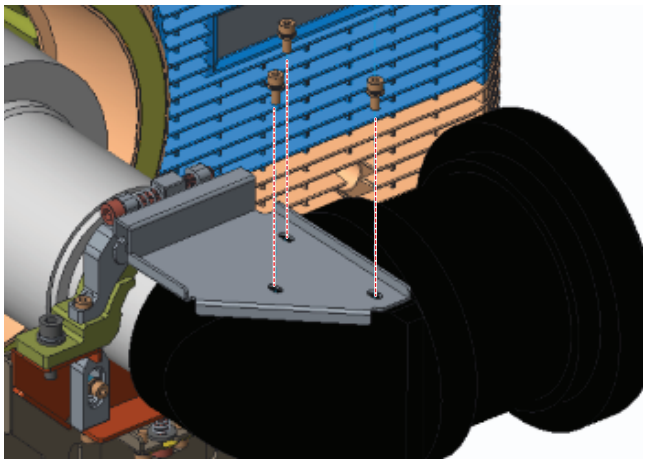


Image 4–14

6. For up projection: adapt the lens clamp module. Remove the lens clamp part from the lens clamp module by removing the 3 screws (Image 4–15. Just mount the lens clamp part on the lens holder module using 2 screws M4x10 (Image 4–16. Tighten with a torque between 3.5 and 9.8 Nm

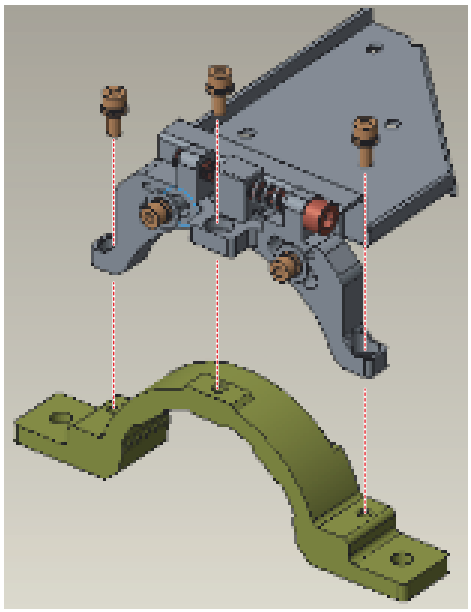


Image 4–15

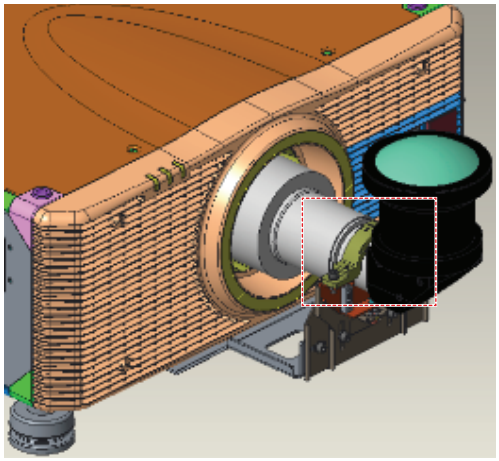


Image 4–16

7. Mount the safety bar with 2 screws M4x10 on the side of the lens (reference 1 & 2 in Image 4–17). This safety bar will be used to mount the safety cable. To continue, go to step 9

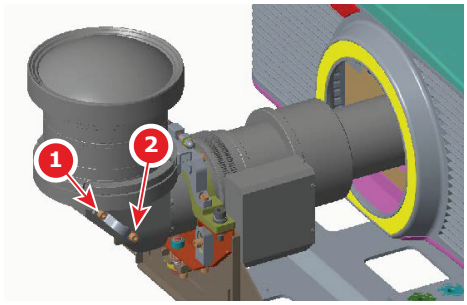


Image 4–17

8. Turn the projector up side down and mount the safety bar with 2 screws M4x10. This safety bar will be used to mount the safety cable.

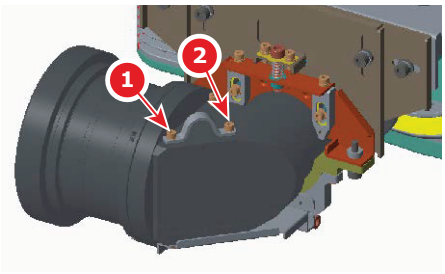


Image 4–18

9. Mount a safety cable through the eye on the safety bar.

   Slide the safety cable through the eye (reference 1 on Image 4–19) on the safety bar (reference 2 on Image 4–19) and then through the loop end at the beginning of the cable (reference 1 on Image 4–19).

   Install a U-bolt near to the safety eye (reference 3 on Image 4–19). Make sure that both a part of the loop end and the outgoing part of the safety cable are placed in the enclosure.

   Close the U-bolt and tighten it.

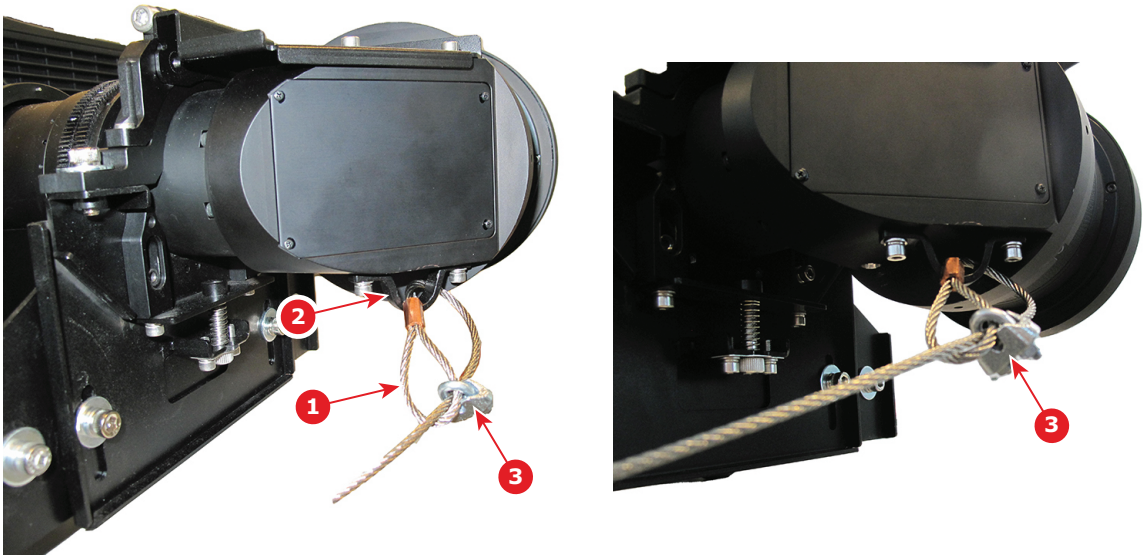


Image 4–19

10. Place the shackle through the free loop end of the safety cable.

    Connect the shackle on the truss or rigging frame. If necessary before connecting the shackle turn the cable a few times around the truss or rigging frame so the play is at a minimum.

    If it is not possible to the truss or rigging frame, mount it to the lens support. Turn it a few times around the support so the play is at a minimum and hook the shackle on the cable.

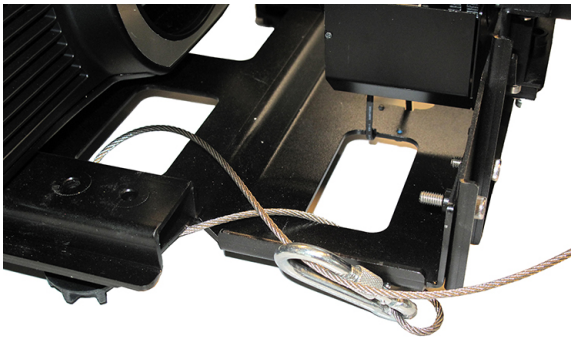


Image 4–20

4.4 UST lens support adjustment

About lens detection

G62-W14 will detect the UST lens type while inserting the lens or reboot the projector. The image will automatically flipped as default and the lens memory function will be automatically disabled.

For G62-W9 and G62-W11 it depends on the used hardware and software.

For any type of projector, do not use the memory recall functionality.

Please check the projected image, if required; please do manually flip the image while choosing the projection direction. Depending on your configuration, the lens memory function is automatically disabled when used with unsupported lens.

Location of the adjustment screws

Before adjusting the lens, make sure that screws 1 to 4 on the adapter are not tightened, and that screws 5 and 6 are in mid position.

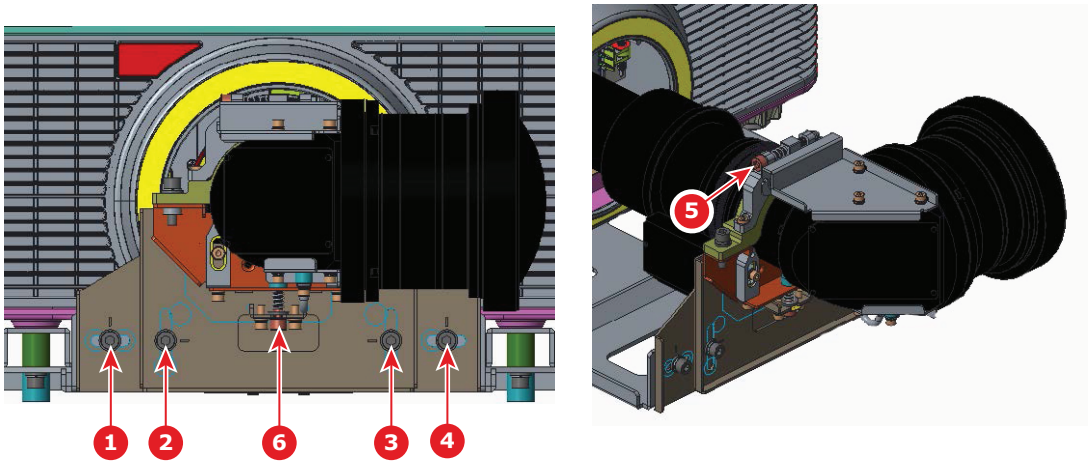


Image 4–21

How to adjust

1. Start up the projector and display a test pattern.

   Shift the UST lens to the target position.

   Vertically lift the lens by hand to have the image as good as possible (reference A).

   Tighten the vertical shifting screws 2 & 3 to secure this target position (reference B).

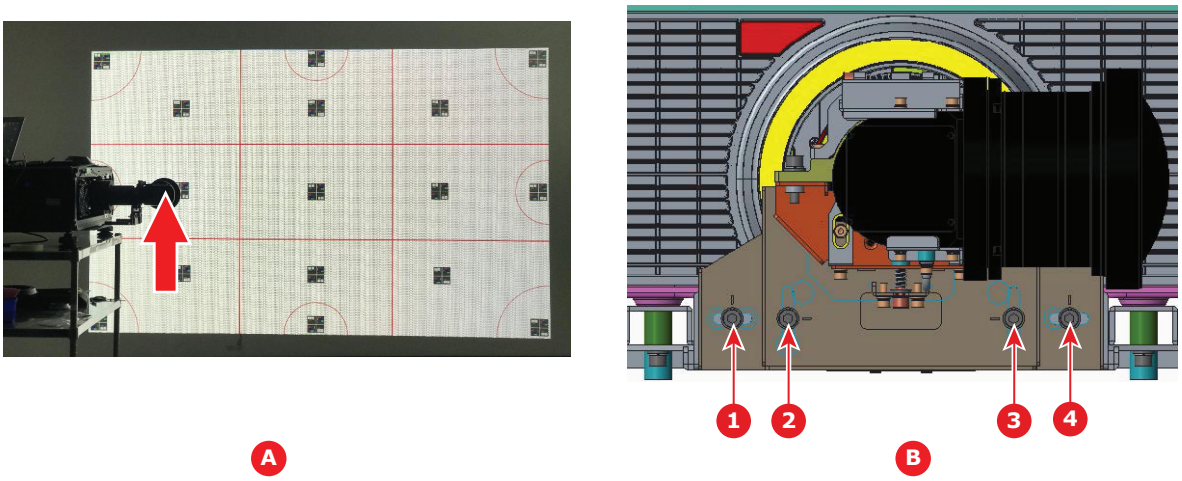


Image 4–22

2. Fine-tune the tilt of the projected image, using screw 5. Using this method, you can adjust ±7.5°.

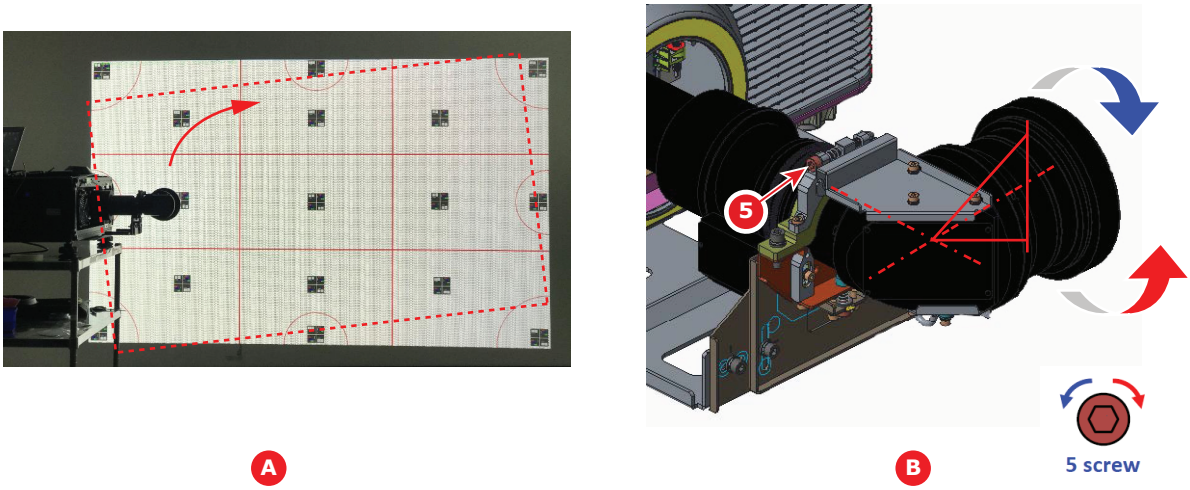


Image 4–23

Tip: Turning screw 5 clockwise will tilt the image counterclockwise. Turning the screws counterclockwise will tilt the image clockwise.

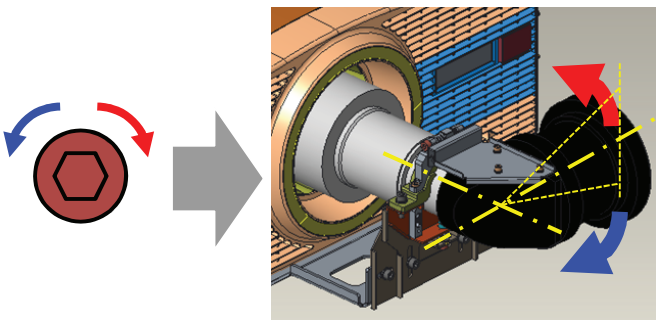


Image 4–24

3. Fine-tune the focus of the projected image vertically, using points A and B on the following image as reference points. The resolution/balance between both points should be the same.
   - Use the focus software feature to help focus the image.
   - Use adjustment screw 6 to help focus the image.
   - Use the focus ring at the end of the lens to help focus the image.
   - If necessary, loosen screws 2 and 3 a bit to push the lens a bit upward or downward to spot any variation in image quality.

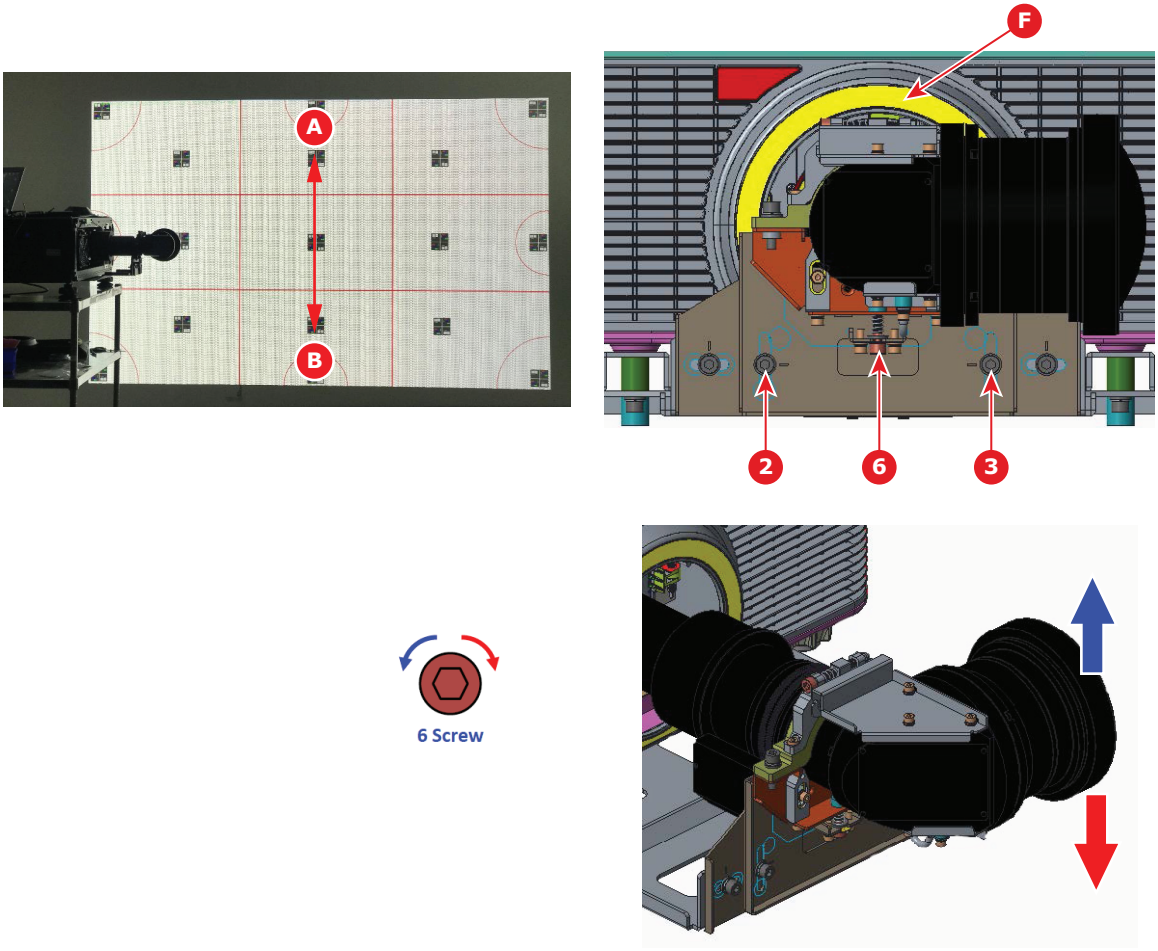


Image 4–25

Note: Screws 2 & 3 are tightened but lens can be pushed softly up or down to observe the image quality variation.

4. Is the horizontal resolution/unbalance acceptable when comparing between region C and D.
   ► If yes, tighten screws 1 and 4.
   ► If no, push lens softly horizontal and check the image quality. Tighten screws 1 and 4 when you have an acceptable image quality.

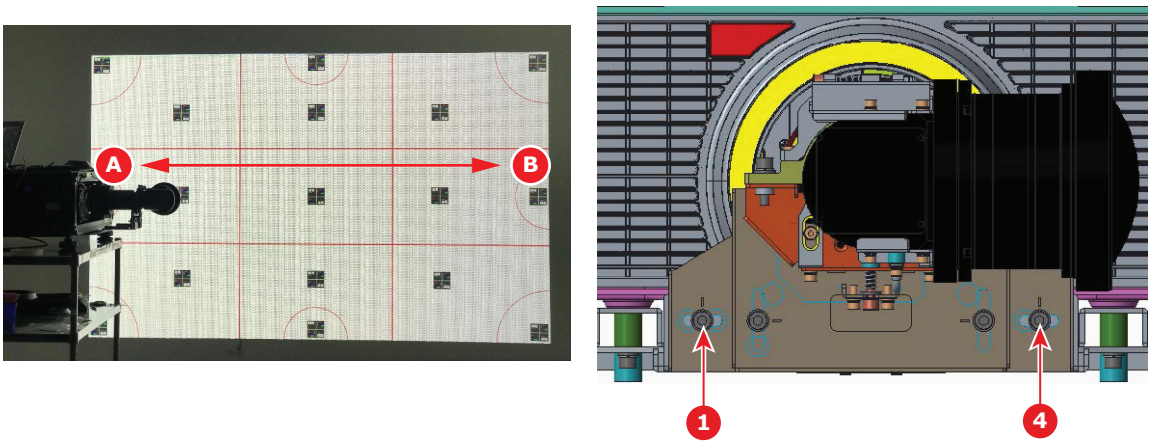


Image 4–26

5. Adjust Focus function in OSD and Focus Ring to have the best image quality.

   If the image quality is still unacceptable, please restart the procedure.

CAUTION: Do not execute any lens movements when the UST lens is fixed in the Lens Support.

Powering On/Off the projector

5

This chapter assumes that the power cord and (all) signal cables are securely connected. For detailed instructions see installation manual.

5.1 Powering On the projector

How to power On the projector

1. Power on the AC switch (1) and wait until the power button on the control panel is solid red.

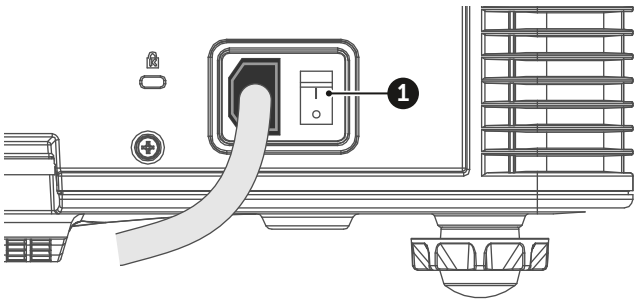
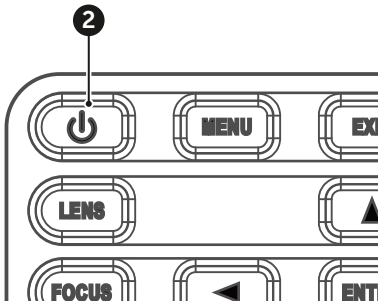


Image 5–1

2. Turn on the projector by pressing the POWER button (2) on the control panel or the ON key (3) on the remote control.



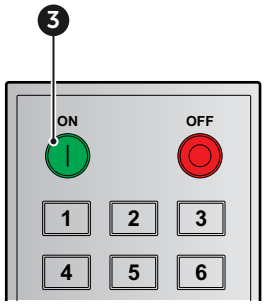


Image 5–2

The status LED (4) will flash orange. The startup screen will display and the status LED will turn to solid green.

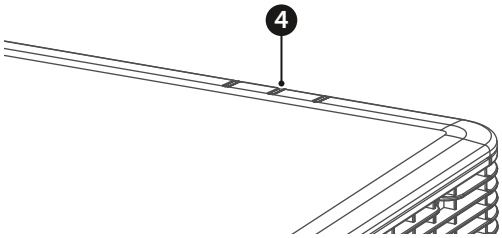


Image 5–3

3. Turn on your source. The projector detects the source you selected and displays the image.

Note: If you connect multiple sources at the same time, press “Input” key on the control panel or on the remote control to switch inputs.

WARNING: Do not look directly into the lens when the projector is turned on. The strong light might cause permanent eye damage.

5.2 Powering Off the Projector

How to power Off the projector

1. Press the POWER button (2) on the control panel or the OFF key (5) on the remote control, a message displays on the screen.

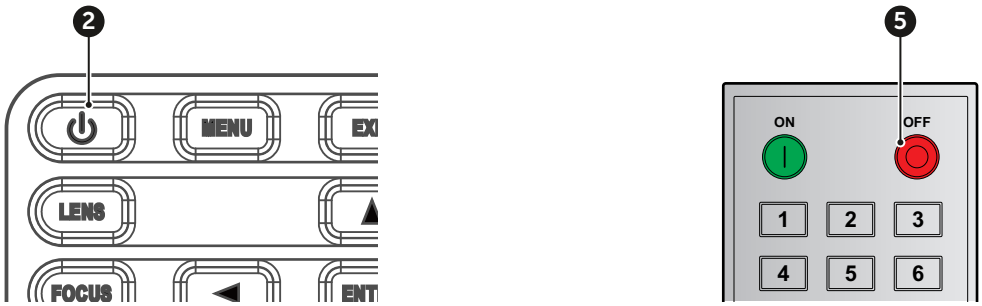


Image 5–4

2. Press the POWER button or OFF key again to confirm, otherwise the message disappears after 5 seconds and the projector remains on.

CAUTION: Don’t turn on the projector immediately after entering Standby mode.

Adjusting the projected image

6

6.1 Adjusting the projector’s position

Positioning the projector

To determine where to position the projector, consider the size and shape of your screen, the location of your power outlets, and the distance between the projector and the rest of your equipment. Here are some general guidelines:

- Position the projector on a flat surface at a right angle to the screen.
- Position the projector to the desired distance from the screen. The distance between the lens and the screen, the zoom settings, and the video format determine the size of the projected image. For projection distances of each lens, see chapter “Lenses”, page 16.
- 360 degree free orientation installation:

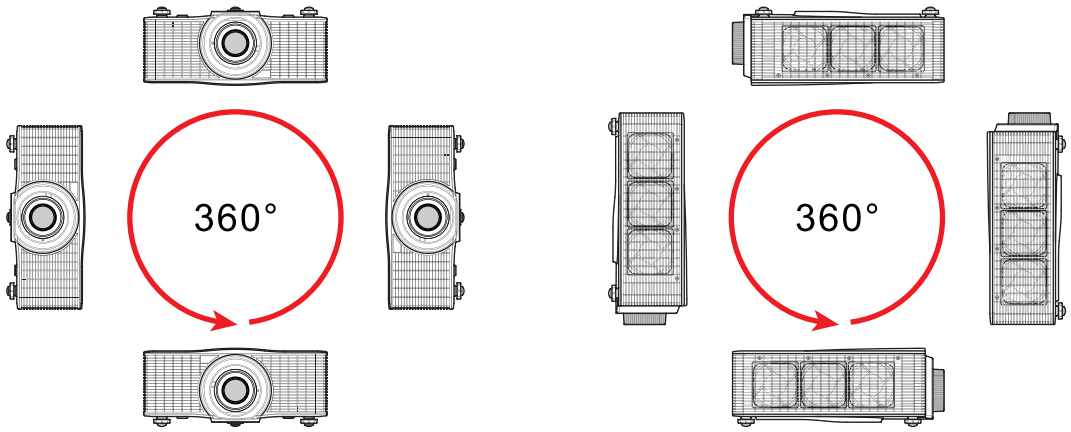


Image 6–1

6.2 Ajusting the lens offset

Overview

Adjusting the lens position to determine the image position on the screen. The veritcal lens offset (shift) range for G62 projector is +/-50%, and the horizontal lens offset (shift) range is +/-15%. The offset range is calculated in accordance with industry standards, with which the image offset is calculated by full image size. Please refer below for the image offset (shift) range for G62 projectors.

Vertical Image Offset: 0%

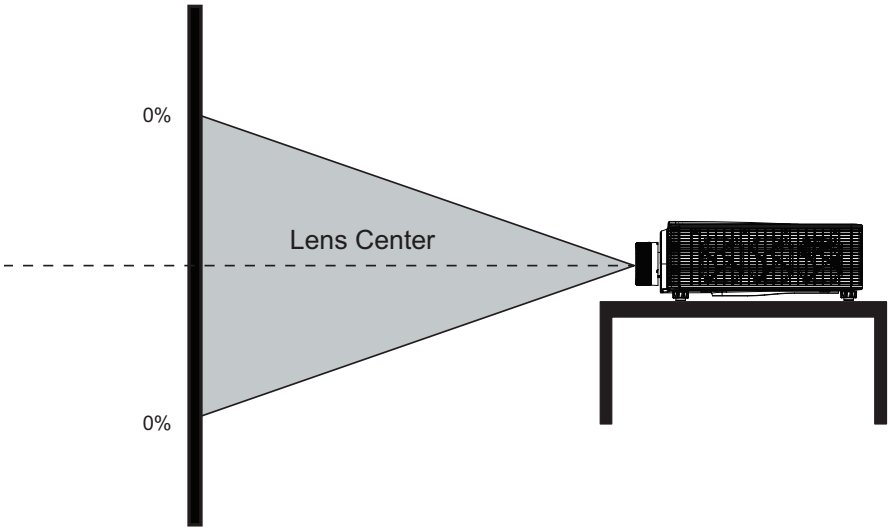


Image 6–2

Vertical Image Offset: +/-50%

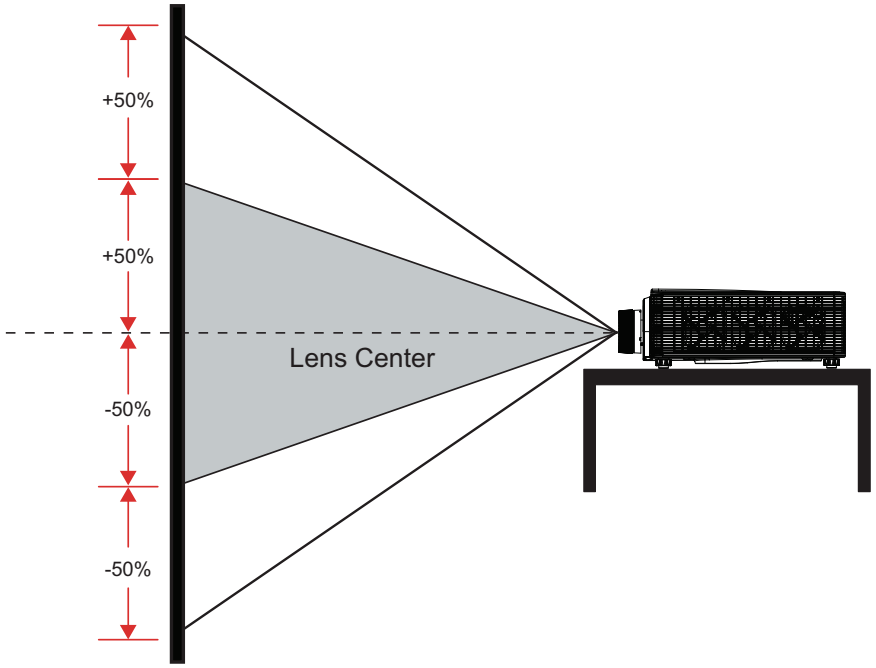


Image 6–3

Horizontal Image Offset: +/-15%

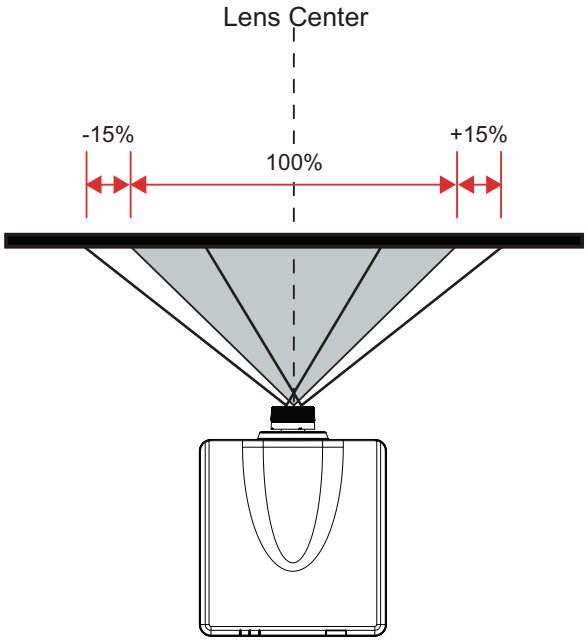


Image 6–4

6.3 Boresight (Scheimpflug) adjustment

What is Boresight (Scheimpflug)?

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 occur 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).

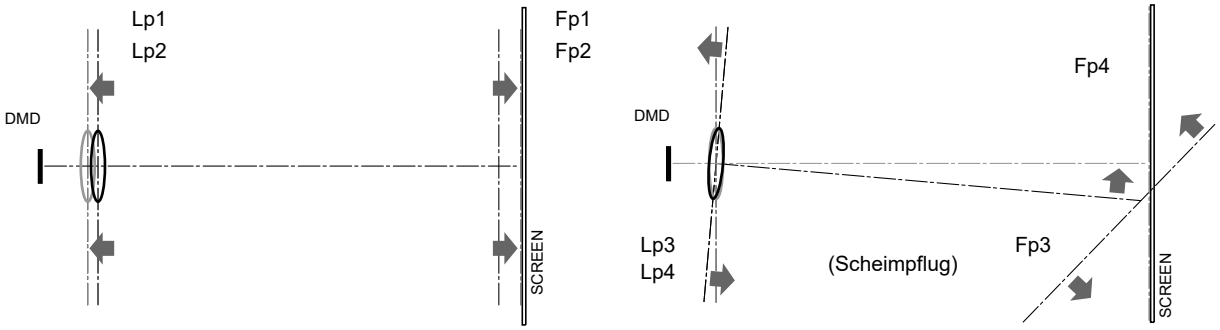


Image 6–5 Boresight (scheimpfug) principle

Preparations

1. Choose the test pattern of the OSD. Switch to full screen mode
2. Prepare the test area. Verify that the throw ratio of the installed lens matches the requirements of the installation area (projection distance and screen size).
3. Check that the lens is correctly installed.
4. Zoom the lens to its widest opening (maximum image size on the screen).
5. Adjust the focus control to search for the best sharpness of the projected image

Boresight tool:
Allen key, hex size 4mm
For lens G LENS (0.65-0.75 : 1), you need 3 boresight extenders (64 mm) and 1 L shape tool.
For G LENS (0.65-0.75 : 1) the floating ring indication must be checked.

Floating ring for G LENS (0.65-0.75 : 1) lens

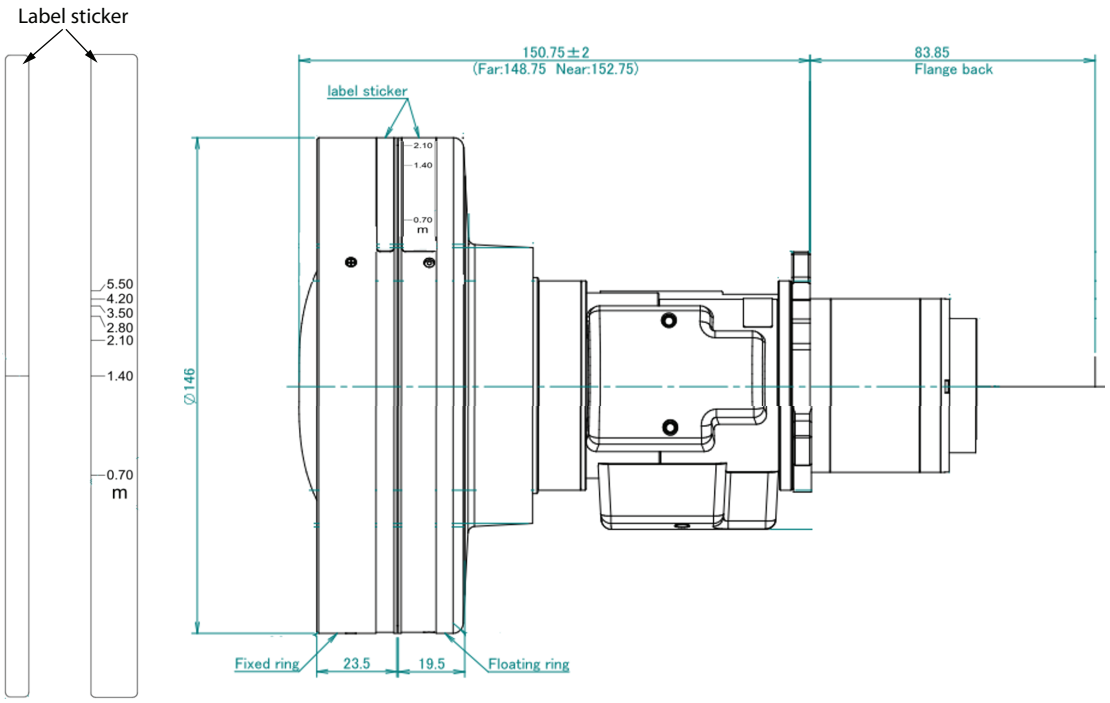


Image 6–6

- Manual adjust floating ring before adjust Zoom& Focus for better optical performance.
- Label scale shows the projection distance.
- The projection distance is from projector lens to screen.

Example:

When the distance between screen and projector lens is 1.4 meter, adjust floating ring scale to “1.40” to have better performance.

How to adjust

1. Install the extenders.
2. If zone C is in focus on the screen, please check the focal plane of zone A.
   - If clear position is just on the screen→ No need to adjust.
   - If clear position is out of the screen(close to projector), rotate screw ① CCW and then screw ②&③ CW for half amount that① rotated. → repeat until both A and C are clear. (e.g. turning ① CCW in a circle, then turn ②&③ CW in half circle).
   - If clear position is in the screen(far from projector), rotate screw ① CW and then screw ②&③ CCW for half amount that① rotated. → repeat until both A and C are clear.

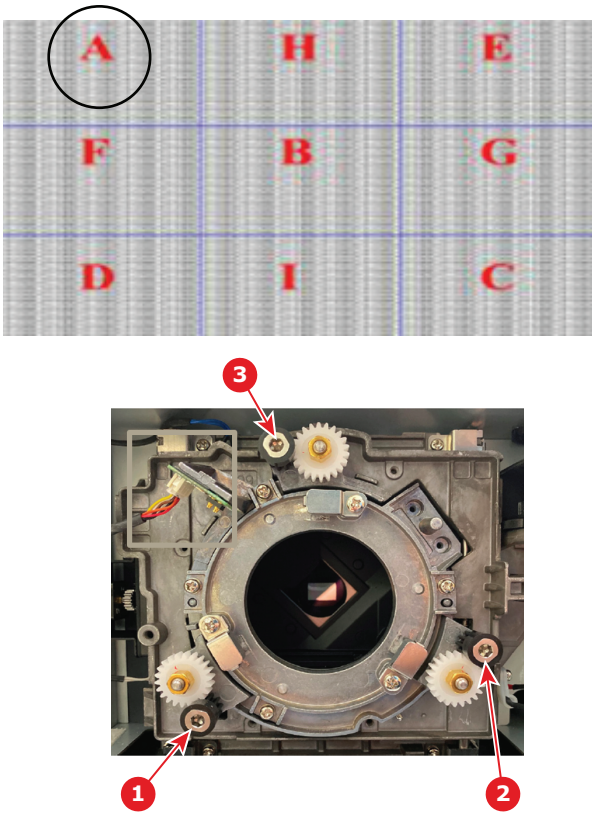


Image 6–7

Note: This process may cause the other areas of the image to slide out of focus. This is totally normal.

3. If zone D is in focus on the screen, please check the focal plane of zone E.
   - If clear position is just on the screen→ No need to adjust.
   - If clear position is out of the screen(cloe to projector), rotate screw ② CCW and then screw ① &③ CW for half amount that ② rotated. → repeat until both D and E are clear. (e.g. turning ② CCW in a circle, then turn ① &③ CW in half circle)
   - If clear position is in the screen(far from projector), rotate screw ② CW and then screw ① &③ CCW for half amount that ② rotated. → repeat until both D and E are clear.

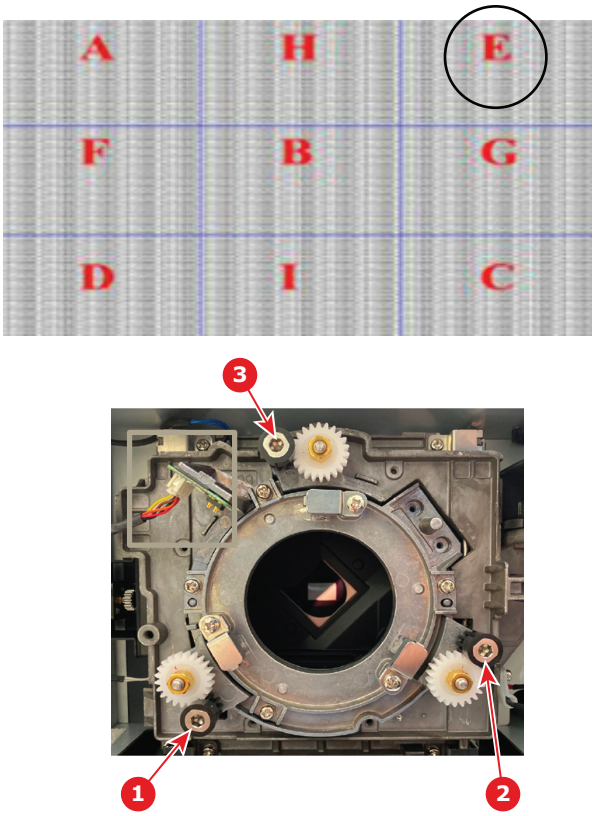


Image 6–8

Note: This process may cause the other areas of the image to slide out of focus. This is totally normal.

4. If zone H is in focus on the screen, please check the focal plane of zone I.
   - If clear position is just on the screen→ No need to adjust.
   - If clear position is out of the screen(cloe to projector), rotate screw ③ CCW and then screw ① & ② CW for half amount that ③ rotated. → repeat until both H and I are clear. (e.g. turning ③ CCW in a circle, then turn ① & ② CW in half circle).
   - If clear position is in the screen(far from projector), rotate screw ③ CW and then screw ① & ② CCW for half amount that ③ rotated. → repeat until both H and I are clear.

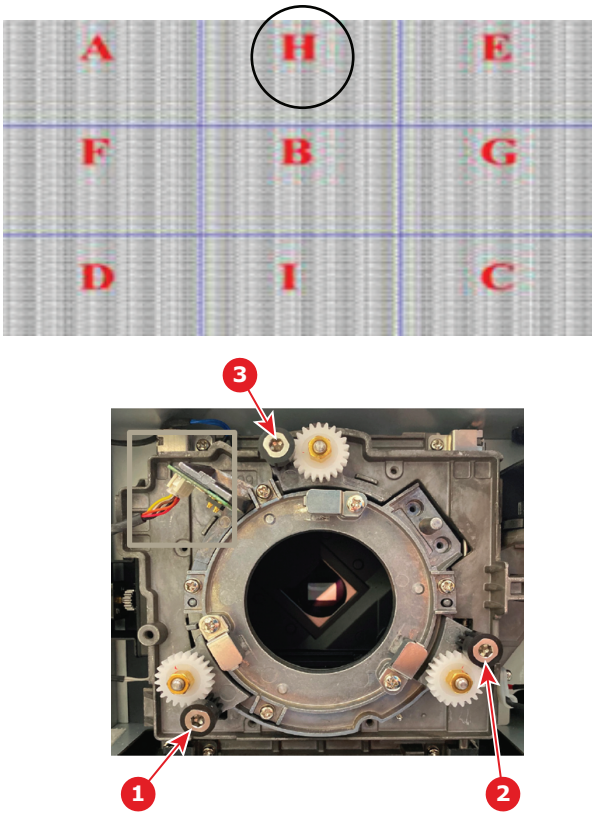


Image 6–9

Note: This process may cause the other areas of the image to slide out of focus. This is totally normal.

5. After the above adjustment of the viewing axis, the projected image from zone A to zone I still cannot achieve a clear focus on the screen. Please turn the boresight screws ① to ③ counterclockwise to the end (STOP), and then turn clockwise 2 circles to the design value position. To improve the focus, go to step 2 and repeat the complete procedure.