



## Optional Lens User's Manual

### Important Safety Instructions





(Always follow these instructions)





Please read this section on important safety instructions before replacing the projector lens. To prevent accidents during lens replacement and ensure product safety after replacing the lens, be sure to follow the safety instructions described herein.

- These symbols indicate actions that can result in injury or damage if these operations are not followed correctly.

 <b>Warning</b>	This symbol indicates that there is a possibility of serious injury or even death if the operation is not followed correctly
 <b>Caution</b>	This symbol indicates that there is a possibility of physical injury or damage to equipment if the operation is not followed correctly.

- These symbols indicate the types of precautions that must be followed.

 This symbol indicates that caution must be taken.	 This symbol warns of possible high heat.
 This symbol warns of possible electrical shock.	 This symbol indicates an action that must not be performed.

 <b>Warning</b>
 ■ <b>For safety, do work in accordance with the Exchange Manual to replace the lens.</b>
 ■ <b>Please read this manual and manuals for the LCD projector to be used thoroughly to ensure correct usage through understanding.</b> Incorrect usage could result in fire, an injury or damage.
 ■ <b>Do not subject the device any shock or impact.</b> Any shock or impact could result in an injury or damage. The lens projects out of the device. Take care not to strike it.

<b>Notice</b>
■ <b>Take care of the lens.</b>
• When transporting the lens, protect the lens by attaching the lens cap.
• Do not touch the lens to prevent fog or dirt on the lens that could cause deterioration of display quality.
• Do not touch the lens directly. This can dirty the lens and cause deterioration in image quality.
• The lens is a precision optical device. Carefully handle the lens without subjecting it to shocks or vibrations.
• When resting the lens on a surface, place the lens face down on a soft cloth.
■ <b>Cleaning</b>
• Use commercially available lens tissue to clean the lens (used to clean cameras, eyeglasses, etc.).
• Excepting for lens, use a soft cloth to clean. When excessively soiled dilute a neutral detergent in water, wet and wring out the soft cloth.
• Do not use detergents or chemicals other than those noted above (e.g. benzene or thinners).

### Information for users

#### applicable in European Union countries



This symbol on the product or on its packaging means that your electrical and electronic equipment should be disposed at the end of life separately from your household wastes. There are separate collection systems for recycling in EU. For more information, please contact the local authority or the dealer where you purchased the product.







### Operations




- Project an image as described in the LCD Projector user's manual, and adjust the size and focus of the projected image.
- See the Projection Distance table in this user's manual for information on optional lens projection distances.

#### Note

- The distance of projection may not allow focusing on the peripheral area of the screen. Adjust the focus to keep the center and the peripheral area of the screen balanced.
- These specifications are subject to change without notice.
- The zoom lens may cause some distortion of the image on the screen depending on the zoom position.
- Distortion may appear on screen if the keystone correction (trapezoidal distortion correction) is overly adjusted.
- Keystone correction (trapezoidal distortion correction) may be limited with some lenses.

### Important Operation Instructions

 <b>Warning</b>
 ■ <b>Do not place the lens in a location subject to direct sunlight or other strong lighting or near heat-radiating equipment.</b> This can cause a fire due to the properties of the lens. It can also cause injury or damage to the lens.
 ■ <b>Be sure to unplug the LCD projector before replacing the lens.</b> The inside of the LCD projector has areas of high voltage which can cause electrical shock.
 ■ <b>Before replacing the lens, be sure to turn off and unplug the LCD projector, and allow at least 45 minutes for the projector to fully cool down.</b>
 ■ <b>When attaching, take care so that dust does not enter inside or stick to the connector.</b> Continued use with dust inside may result in fire or electric shock.
 ■ <b>If the projector is mounted on a ceiling, ask the dealer to replace the lens.</b> This can cause injury.

 <b>Caution</b>
 ■ <b>When replacing the lens, do not touch the LCD panels or polarizing plates of the LCD projector or subject them to shocks.</b> This can cause damage to the equipment. It can also cause a misalignment of the optical adjustment and, therefore, require readjustments.
 ■ <b>When replacing the lens, be careful not to damage the connectors or wires inside the LCD projector.</b> This can cause damage to the equipment. Be careful not to pull on the connectors or wires or get them caught in the circuit board or case.

## Contents of package

The following accessories are included with each lens.

Lens	Model	Supplied accessories
Fixed short throw lens	FL-701	Lens caps (front and rear) Optional Lens User's Manual
Short throw zoom lens	SL-702	Lens caps (front and rear) Optional Lens User's Manual
Middle throw zoom lens	ML-703	Lens caps (front and rear) Optional Lens User's Manual
Long throw zoom lens	LL-704	Lens caps (front and rear) Optional Lens User's Manual
Ultra long throw zoom lens	UL-705	Lens caps (front and rear) Optional Lens User's Manual

## Specifications

Model		FL-701	SL-702	ML-703	LL-704	UL-705	
Zoom		-	Motorized	Motorized	Motorized	Motorized	
Focus		Motorized	Motorized	Motorized	Motorized	Motorized	
Lens shift position	Vertical	8970	1:1	9:-1 - 1:1	9:-1 - 1:1	9:-1 - 1:1	
		8972W	1:1	5:-1 - 1:1	5:-1 - 1:1	5:-1 - 1:1	
		8971 8976SX	1:1	9:1 - 1:1	10:0 - 1:1	9:1 - 1:1	9:1 - 1:1
		8973W 8974WU 8975WU	1:1	10:0 - 1:1	10:-1 - 1:1	10:0 - 1:1	10:0 - 1:1
	Horizontal	8970 8972W	1:1	10:0 - 0:10	10:0 - 0:10	10:0 - 0:10	10:0 - 0:10
		8971 8973W 8976SX 8974WU 8975WU	1:1	6:4 - 4:6	6:4 - 4:6	6:4 - 4:6	6:4 - 4:6
F-number		1.8	1.6 - 2.0	1.6 - 2.9	1.7 - 2.0	1.7 - 2.0	
Focal length		13 mm	19 - 29 mm	24 - 48 mm	46 - 79 mm	77 - 133 mm	
Zoom ratio		1.0:1	1.5:1	2.0:1	1.7:1	1.7:1	
Projection ratio	8970 8972W	1.0:1	1.5 - 2.2:1	1.9 - 3.8:1	3.6 - 6.1:1	6.0 - 10.3:1	
	8971 8973W 8976SX 8974WU 8975WU	0.8:1	1.2 - 1.8:1	1.5 - 3.0:1	2.8 - 4.9:1	4.9 - 8.3:1	
Projection size		30 - 600 inch	30 - 600 inch	30 - 600 inch	30 - 600 inch	30 - 600 inch	
Weight		1.1 kg	0.7 kg	0.9 kg	1.5 kg	1.6 kg	

\* Depending on the projector you have, FL-701 may not be recognized by the projector and the lens can be shifted over proper shift range, which causes shading on a part of picture on screen. Perform the CENTERING feature, referring to the "**Lens Replacement Procedure**".

## Projection distance (from the front of the projector unit)

### ■ FL-701

Aspect ratio 4:3

Screen size					8970		8971		8976SX	
Dia.	H		V							
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	24	0.6	18	0.5	26	0.7	21	0.5	21	0.5
40	32	0.8	24	0.6	34	0.9	28	0.7	28	0.7
50	40	1.0	30	0.8	42	1.1	34	0.9	34	0.9
60	48	1.2	36	0.9	50	1.3	41	1.0	40	1.0
70	56	1.4	42	1.1	59	1.5	47	1.2	47	1.2
80	64	1.6	48	1.2	67	1.7	54	1.4	53	1.4
90	72	1.8	54	1.4	75	1.9	60	1.5	60	1.5
100	80	2.0	60	1.5	83	2.1	67	1.7	66	1.7
120	96	2.4	72	1.8	99	2.5	80	2.0	79	2.0
150	120	3.0	90	2.3	124	3.1	99	2.5	99	2.5
200	160	4.1	120	3.0	164	4.2	132	3.4	131	3.3
250	200	5.1	150	3.8	205	5.2	165	4.2	163	4.1
300	240	6.1	180	4.6	246	6.2	197	5.0	196	5.0
350	280	7.1	210	5.3	286	7.3	230	5.8	228	5.8
400	320	8.1	240	6.1	327	8.3	262	6.7	260	6.6
500	400	10.2	300	7.6	408	10.4	327	8.3	325	8.3
600	480	12.2	360	9.1	490	12.4	393	10.0	390	9.9
K1					0.8132	0.0207	0.6516	0.0166	0.6465	0.0164
K2					1.6704	0.0424	1.6704	0.0424	1.6704	0.0424

Aspect ratio 16:10

Screen size					8972W		8973W		8974WU CP- WU8450	
Dia.	H		V							
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	25	0.6	16	0.4	28	0.7	22	0.6	22	0.6
40	34	0.9	21	0.5	36	0.9	29	0.7	29	0.7
50	42	1.1	26	0.7	45	1.1	36	0.9	35	0.9
60	51	1.3	32	0.8	53	1.4	43	1.1	42	1.1
70	59	1.5	37	0.9	62	1.6	50	1.3	49	1.2
80	68	1.7	42	1.1	71	1.8	57	1.4	56	1.4
90	76	1.9	48	1.2	79	2.0	64	1.6	63	1.6
100	85	2.2	53	1.3	88	2.2	71	1.8	69	1.8
120	102	2.6	64	1.6	105	2.7	84	2.1	83	2.1
150	127	3.2	79	2.0	131	3.3	105	2.7	103	2.6
200	170	4.3	106	2.7	174	4.4	140	3.5	137	3.5
250	212	5.4	132	3.4	217	5.5	174	4.4	171	4.3
300	254	6.5	159	4.0	260	6.6	209	5.3	204	5.2
350	297	7.5	185	4.7	303	7.7	243	6.2	238	6.1
400	339	8.6	212	5.4	346	8.8	278	7.0	272	6.9
500	424	10.8	265	6.7	433	11.0	346	8.8	340	8.6
600	509	12.9	318	8.1	519	13.2	415	10.6	407	10.3
K1					0.8620	0.0219	0.6896	0.0175	0.6761	0.0172
K2					1.6704	0.0424	1.6704	0.0424	1.6704	0.0424

\* The above figures are design values only. Actual distances will be within  $\pm 10\%$  of those provided.

\* Projection distances other than those in the above table can be obtained by the following formula.

Projection distance = (K1) x diagonal screen size + (K2)

\* The projection distances for screen sizes 4:3, 16:10 and 16:9 can be obtained by the following formulas depending on the panel aspect ratio.

8970 / 8971 / 8976SX For screen size 16: 9 : Projection distance = (K1) x 1.0895 x diagonal screen size + (K2) For screen size 16:10 : Projection distance = (K1) x 1.0600 x diagonal screen size + (K2)

8972W / 8973W / 8974WU / 8975WU

For screen size 4: 3 : Projection distance = (K1) x 1.1321 x diagonal screen size + (K2)

For screen size 16: 9 : Projection distance = (K1) x 1.0278 x diagonal screen size + (K2)

(continued on next page)

**Projection distance (continued)**

■ **SL-702**

Aspect ratio 4:3

Screen size					8970				8971				8976SX			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	24	0.6	18	0.5	37	0.9	55	1.4	30	0.8	44	1.1	29	0.7	44	1.1
40	32	0.8	24	0.6	49	1.2	73	1.9	39	1.0	59	1.5	39	1.0	58	1.5
50	40	1.0	30	0.8	61	1.5	91	2.3	49	1.2	73	1.9	48	1.2	73	1.8
60	48	1.2	36	0.9	73	1.8	109	2.8	58	1.5	88	2.2	58	1.5	87	2.2
70	56	1.4	42	1.1	84	2.1	127	3.2	68	1.7	102	2.6	67	1.7	101	2.6
80	64	1.6	48	1.2	96	2.4	145	3.7	77	2.0	116	3.0	77	2.0	115	2.9
90	72	1.8	54	1.4	108	2.8	163	4.1	87	2.2	131	3.3	86	2.2	130	3.3
100	80	2.0	60	1.5	120	3.1	181	4.6	97	2.5	145	3.7	96	2.4	144	3.7
120	96	2.4	72	1.8	144	3.7	217	5.5	116	2.9	174	4.4	115	2.9	173	4.4
150	120	3.0	90	2.3	180	4.6	271	6.9	144	3.7	217	5.5	143	3.6	216	5.5
200	160	4.1	120	3.0	239	6.1	361	9.2	192	4.9	289	7.4	191	4.8	287	7.3
250	200	5.1	150	3.8	299	7.6	451	11.5	240	6.1	362	9.2	238	6.0	359	9.1
300	240	6.1	180	4.6	359	9.1	541	13.7	288	7.3	434	11.0	285	7.2	430	10.9
350	280	7.1	210	5.3	418	10.6	631	16.0	335	8.5	506	12.8	333	8.4	502	12.7
400	320	8.1	240	6.1	478	12.1	721	18.3	383	9.7	578	14.7	380	9.7	573	14.6
500	400	10.2	300	7.6	597	15.2	901	22.9	478	12.2	722	18.3	475	12.1	717	18.2
600	480	12.2	360	9.1	716	18.2	1081	27.5	574	14.6	866	22.0	570	14.5	860	21.8
K1					1.1917	0.0303	1.8000	0.0457	0.9549	0.0243	1.4423	0.0366	0.9474	0.0241	1.4311	0.0363
K2					-1.4942	-0.0380	-1.5449	-0.0392	-1.4942	-0.0380	-1.5449	-0.0392	-1.4942	-0.0380	-1.5449	-0.0392

Aspect ratio 16:10

Screen size					8972W				8973W				8974WU, 8975WU			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	25	0.6	16	0.4	39	1.0	58	1.5	31	0.8	47	1.2	31	0.8	46	1.2
40	34	0.9	21	0.5	52	1.3	77	2.0	41	1.1	62	1.6	41	1.0	61	1.5
50	42	1.1	26	0.7	64	1.6	96	2.4	52	1.3	77	2.0	51	1.3	76	1.9
60	51	1.3	32	0.8	77	2.0	115	2.9	62	1.6	93	2.4	60	1.5	91	2.3
70	59	1.5	37	0.9	89	2.3	135	3.4	72	1.8	108	2.7	70	1.8	106	2.7
80	68	1.7	42	1.1	102	2.6	154	3.9	82	2.1	123	3.1	80	2.0	121	3.1
90	76	1.9	48	1.2	115	2.9	173	4.4	92	2.3	138	3.5	90	2.3	136	3.4
100	85	2.2	53	1.3	127	3.2	192	4.9	102	2.6	154	3.9	100	2.5	151	3.8
120	102	2.6	64	1.6	153	3.9	230	5.8	122	3.1	184	4.7	120	3.0	181	4.6
150	127	3.2	79	2.0	191	4.8	287	7.3	153	3.9	230	5.8	150	3.8	225	5.7
200	170	4.3	106	2.7	254	6.4	383	9.7	203	5.2	306	7.8	199	5.1	300	7.6
250	212	5.4	132	3.4	317	8.0	478	12.1	254	6.4	383	9.7	249	6.3	375	9.5
300	254	6.5	159	4.0	380	9.7	573	14.6	304	7.7	459	11.7	298	7.6	450	11.4
350	297	7.5	185	4.7	443	11.3	669	17.0	355	9.0	535	13.6	348	8.8	525	13.3
400	339	8.6	212	5.4	506	12.9	764	19.4	405	10.3	612	15.5	397	10.1	600	15.2
500	424	10.8	265	6.7	633	16.1	955	24.3	506	12.9	764	19.4	496	12.6	749	19.0
600	509	12.9	318	8.1	759	19.3	1146	29.1	607	15.4	917	23.3	595	15.1	899	22.8
K1					1.2632	0.0321	1.9080	0.0485	1.0105	0.0257	1.5264	0.0388	0.9907	0.0252	1.4965	0.0380
K2					-1.4942	-0.0380	-1.5449	-0.0392	-1.4942	-0.0380	-1.5449	-0.0392	-1.4942	-0.0380	-1.5449	-0.0392

\* The above figures are design values only. Actual distances will be within ±10% of those provided.

\* Projection distances other than those in the above table can be obtained by the following formula.

$$\text{Projection distance} = (K1) \times \text{diagonal screen size} + (K2)$$

\* The projection distances for screen sizes 4:3, 16:10 and 16:9 can be obtained by the following formulas depending on the panel aspect ratio.

$$8970 / 8971 / 8976SX \quad \text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0895 \times \text{diagonal screen size} + (K2) \quad \text{For screen size 16:10 : Projection distance} = (K1) \times 1.0600 \times \text{diagonal screen size} + (K2)$$

$$8972W / 8973W / 8974WU / 8975WU$$

$$\text{For screen size 4: 3 : Projection distance} = (K1) \times 1.1321 \times \text{diagonal screen size} + (K2)$$

$$\text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0278 \times \text{diagonal screen size} + (K2)$$

(continued on next page)

**Projection distance (continued)**

■ **ML-703**

Aspect ratio 4:3

Screen size					8970				8971				8976SX			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	24	0.6	18	0.5	46	1.2	91	2.3	37	0.9	73	1.9	37	0.9	73	1.8
40	32	0.8	24	0.6	61	1.6	121	3.1	49	1.2	97	2.5	49	1.2	97	2.5
50	40	1.0	30	0.8	77	1.9	152	3.9	61	1.6	121	3.1	61	1.5	121	3.1
60	48	1.2	36	0.9	92	2.3	182	4.6	73	1.9	146	3.7	73	1.9	145	3.7
70	56	1.4	42	1.1	107	2.7	212	5.4	86	2.2	170	4.3	85	2.2	169	4.3
80	64	1.6	48	1.2	122	3.1	242	6.2	98	2.5	194	4.9	97	2.5	193	4.9
90	72	1.8	54	1.4	138	3.5	272	6.9	110	2.8	218	5.5	109	2.8	217	5.5
100	80	2.0	60	1.5	153	3.9	303	7.7	122	3.1	242	6.2	121	3.1	241	6.1
120	96	2.4	72	1.8	183	4.7	363	9.2	146	3.7	291	7.4	145	3.7	289	7.3
150	120	3.0	90	2.3	229	5.8	454	11.5	183	4.6	363	9.2	182	4.6	361	9.2
200	160	4.1	120	3.0	305	7.8	605	15.4	244	6.2	484	12.3	242	6.2	481	12.2
250	200	5.1	150	3.8	381	9.7	756	19.2	305	7.7	605	15.4	303	7.7	600	15.3
300	240	6.1	180	4.6	458	11.6	907	23.0	366	9.3	725	18.4	363	9.2	720	18.3
350	280	7.1	210	5.3	534	13.6	1057	26.9	426	10.8	846	21.5	423	10.8	840	21.3
400	320	8.1	240	6.1	610	15.5	1208	30.7	487	12.4	967	24.6	484	12.3	960	24.4
500	400	10.2	300	7.6	762	19.4	1510	38.4	609	15.5	1209	30.7	605	15.4	1200	30.5
600	480	12.2	360	9.1	915	23.2	1812	46.0	731	18.6	1450	36.8	726	18.4	1440	36.6
K1					1.5236	0.0387	3.0193	0.0767	1.2173	0.0309	2.4158	0.0614	1.2088	0.0307	2.3991	0.0609
K2					-2.1189	-0.0538	-1.8369	-0.0467	-2.1626	-0.0549	-1.8500	-0.0470	-2.1643	-0.0550	-1.8505	-0.0470

Aspect ratio 16:10

Screen size					8972W				8973W				8974WU, 8975WU			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	25	0.6	16	0.4	49	1.2	97	2.5	39	1.0	78	2.0	38	1.0	76	1.9
40	34	0.9	21	0.5	65	1.7	129	3.3	52	1.3	103	2.6	51	1.3	101	2.6
50	42	1.1	26	0.7	81	2.1	161	4.1	65	1.6	129	3.3	64	1.6	126	3.2
60	51	1.3	32	0.8	97	2.5	193	4.9	78	2.0	154	3.9	76	1.9	151	3.8
70	59	1.5	37	0.9	114	2.9	225	5.7	91	2.3	180	4.6	89	2.3	176	4.5
80	68	1.7	42	1.1	130	3.3	257	6.5	104	2.6	206	5.2	101	2.6	202	5.1
90	76	1.9	48	1.2	146	3.7	289	7.3	117	3.0	231	5.9	114	2.9	227	5.8
100	85	2.2	53	1.3	162	4.1	321	8.1	129	3.3	257	6.5	127	3.2	252	6.4
120	102	2.6	64	1.6	194	4.9	385	9.8	155	3.9	308	7.8	152	3.9	302	7.7
150	127	3.2	79	2.0	243	6.2	481	12.2	194	4.9	385	9.8	190	4.8	377	9.6
200	170	4.3	106	2.7	324	8.2	641	16.3	259	6.6	513	13.0	253	6.4	503	12.8
250	212	5.4	132	3.4	404	10.3	801	20.3	323	8.2	641	16.3	316	8.0	628	16.0
300	254	6.5	159	4.0	485	12.3	961	24.4	388	9.8	769	19.5	379	9.6	754	19.1
350	297	7.5	185	4.7	566	14.4	1121	28.5	452	11.5	897	22.8	443	11.2	879	22.3
400	339	8.6	212	5.4	647	16.4	1281	32.5	517	13.1	1025	26.0	506	12.8	1005	25.5
500	424	10.8	265	6.7	808	20.5	1601	40.7	646	16.4	1281	32.5	632	16.1	1256	31.9
600	509	12.9	318	8.1	970	24.6	1921	48.8	775	19.7	1537	39.0	758	19.3	1507	38.3
K1					1.6155	0.0410	3.2003	0.0813	1.2909	0.0328	2.5607	0.0650	1.2634	0.0321	2.5106	0.0638
K2					-2.1102	-0.0536	-1.8343	-0.0466	-2.1493	-0.0546	-1.8460	-0.0469	-2.2024	-0.0559	-1.8618	-0.0473

\* The above figures are design values only. Actual distances will be within ±10% of those provided.

\* Projection distances other than those in the above table can be obtained by the following formula.

$$\text{Projection distance} = (K1) \times \text{diagonal screen size} + (K2)$$

\* The projection distances for screen sizes 4:3, 16:10 and 16:9 can be obtained by the following formulas depending on the panel aspect ratio.

$$8970 / 8971 / 8976SX \quad \text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0895 \times \text{diagonal screen size} + (K2) \quad \text{For screen size 16:10 : Projection distance} = (K1) \times 1.0600 \times \text{diagonal screen size} + (K2)$$

$$8972W / 8973W / 8974WU / 8975WU$$

$$\text{For screen size 4: 3 : Projection distance} = (K1) \times 1.1321 \times \text{diagonal screen size} + (K2)$$

$$\text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0278 \times \text{diagonal screen size} + (K2)$$

(continued on next page)

## Projection distance (continued)

### ■ LL-704

Aspect ratio 4:3

Screen size					8970				8971				8976SX			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	24	0.6	18	0.5	87	2.2	145	3.7	70	1.8	116	2.9	69	1.8	115	2.9
40	32	0.8	24	0.6	116	2.9	195	4.9	93	2.4	156	4.0	92	2.3	154	3.9
50	40	1.0	30	0.8	144	3.7	244	6.2	116	2.9	195	5.0	115	2.9	193	4.9
60	48	1.2	36	0.9	173	4.4	293	7.4	139	3.5	234	6.0	138	3.5	233	5.9
70	56	1.4	42	1.1	202	5.1	342	8.7	162	4.1	274	7.0	161	4.1	272	6.9
80	64	1.6	48	1.2	231	5.9	392	9.9	185	4.7	313	8.0	183	4.7	311	7.9
90	72	1.8	54	1.4	259	6.6	441	11.2	208	5.3	353	9.0	206	5.2	350	8.9
100	80	2.0	60	1.5	288	7.3	490	12.4	231	5.9	392	10.0	229	5.8	389	9.9
120	96	2.4	72	1.8	346	8.8	589	14.9	277	7.0	471	12.0	275	7.0	467	11.9
150	120	3.0	90	2.3	432	11.0	736	18.7	346	8.8	589	15.0	344	8.7	585	14.9
200	160	4.1	120	3.0	576	14.6	982	25.0	461	11.7	787	20.0	458	11.6	781	19.8
250	200	5.1	150	3.8	720	18.3	1228	31.2	577	14.6	984	25.0	572	14.5	976	24.8
300	240	6.1	180	4.6	863	21.9	1475	37.5	692	17.6	1181	30.0	686	17.4	1172	29.8
350	280	7.1	210	5.3	1007	25.6	1721	43.7	807	20.5	1378	35.0	801	20.3	1368	34.7
400	320	8.1	240	6.1	1151	29.2	1967	50.0	922	23.4	1576	40.0	915	23.2	1563	39.7
500	400	10.2	300	7.6	1438	36.5	2459	62.5	1153	29.3	1970	50.0	1144	29.1	1955	49.6
600	480	12.2	360	9.1	1726	43.8	2951	75.0	1383	35.1	2364	60.1	1372	34.9	2346	59.6
K1					2.8756	0.0730	4.9225	0.1250	2.3042	0.0585	3.9443	0.1002	2.2862	0.0581	3.9135	0.0994
K2					-3.4191	-0.0868	-6.2127	-0.1578	-3.4191	-0.0868	-6.2127	-0.1578	-3.4191	-0.0868	-6.2127	-0.1578

Aspect ratio 16:10

Screen size					8972W				8973W				8974WU, 8975WU			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	25	0.6	16	0.4	92	2.3	154	3.9	74	1.9	123	3.1	72	1.8	121	3.1
40	34	0.9	21	0.5	123	3.1	207	5.2	98	2.5	165	4.2	96	2.4	162	4.1
50	42	1.1	26	0.7	153	3.9	259	6.6	123	3.1	207	5.2	120	3.1	202	5.1
60	51	1.3	32	0.8	183	4.7	311	7.9	147	3.7	248	6.3	144	3.7	243	6.2
70	59	1.5	37	0.9	214	5.4	363	9.2	171	4.4	290	7.4	168	4.3	284	7.2
80	68	1.7	42	1.1	244	6.2	415	10.5	196	5.0	332	8.4	192	4.9	325	8.3
90	76	1.9	48	1.2	275	7.0	467	11.9	220	5.6	373	9.5	216	5.5	366	9.3
100	85	2.2	53	1.3	305	7.8	520	13.2	244	6.2	415	10.5	240	6.1	407	10.3
120	102	2.6	64	1.6	366	9.3	624	15.8	293	7.4	499	12.7	287	7.3	489	12.4
150	127	3.2	79	2.0	458	11.6	780	19.8	366	9.3	624	15.8	359	9.1	612	15.5
200	170	4.3	106	2.7	610	15.5	1041	26.5	488	12.4	833	21.1	479	12.2	816	20.7
250	212	5.4	132	3.4	763	19.4	1302	33.1	610	15.5	1041	26.5	598	15.2	1021	25.9
300	254	6.5	159	4.0	915	23.2	1563	39.7	732	18.6	1250	31.8	718	18.2	1226	31.1
350	297	7.5	185	4.7	1067	27.1	1824	46.3	854	21.7	1459	37.1	837	21.3	1430	36.3
400	339	8.6	212	5.4	1220	31.0	2085	53.0	976	24.8	1668	42.4	957	24.3	1635	41.5
500	424	10.8	265	6.7	1525	38.7	2607	66.2	1220	31.0	2085	53.0	1196	30.4	2044	51.9
600	509	12.9	318	8.1	1829	46.5	3128	79.5	1464	37.2	2502	63.6	1435	36.4	2453	62.3
K1					3.0482	0.0774	5.2178	0.1325	2.4385	0.0619	4.1742	0.1060	2.3907	0.0607	4.0924	0.1039
K2					-3.4191	-0.0868	-6.2127	-0.1578	-3.4191	-0.0868	-6.2127	-0.1578	-3.4191	-0.0868	-6.2127	-0.1578

\* The above figures are design values only. Actual distances will be within  $\pm 10\%$  of those provided.

\* Projection distances other than those in the above table can be obtained by the following formula.

$$\text{Projection distance} = (K1) \times \text{diagonal screen size} + (K2)$$

\* The projection distances for screen sizes 4:3, 16:10 and 16:9 can be obtained by the following formulas depending on the panel aspect ratio.

$$8970 / 8971 / 8976SX \quad \text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0895 \times \text{diagonal screen size} + (K2) \quad \text{For screen size 16:10 : Projection distance} = (K1) \times 1.0600 \times \text{diagonal screen size} + (K2)$$

$$8972W / 8973W / 8974WU / 8975WU$$

$$\text{For screen size 4: 3 : Projection distance} = (K1) \times 1.1321 \times \text{diagonal screen size} + (K2)$$

$$\text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0278 \times \text{diagonal screen size} + (K2)$$

(continued on next page)

## Projection distance (continued)

### ■ UL-705

Aspect ratio 4:3

Screen size					8970				8971				8976SX			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	24	0.6	18	0.5	154	3.9	255	6.5	125	3.2	206	5.2	124	3.2	205	5.2
40	32	0.8	24	0.6	201	5.1	337	8.6	163	4.2	272	6.9	162	4.1	270	6.9
50	40	1.0	30	0.8	249	6.3	419	10.7	202	5.1	338	8.6	200	5.1	335	8.5
60	48	1.2	36	0.9	297	7.5	501	12.7	240	6.1	404	10.2	238	6.0	400	10.2
70	56	1.4	42	1.1	344	8.7	583	14.8	278	7.1	469	11.9	276	7.0	466	11.8
80	64	1.6	48	1.2	392	10.0	666	16.9	316	8.0	535	13.6	314	8.0	531	13.5
90	72	1.8	54	1.4	440	11.2	748	19.0	354	9.0	601	15.3	352	8.9	596	15.1
100	80	2.0	60	1.5	487	12.4	830	21.1	393	10.0	667	16.9	390	9.9	662	16.8
120	96	2.4	72	1.8	583	14.8	994	25.2	469	11.9	798	20.3	465	11.8	792	20.1
150	120	3.0	90	2.3	726	18.4	1240	31.5	584	14.8	996	25.3	579	14.7	988	25.1
200	160	4.1	120	3.0	964	24.5	1651	41.9	775	19.7	1324	33.6	769	19.5	1314	33.4
250	200	5.1	150	3.8	1203	30.5	2061	52.4	966	24.5	1653	42.0	958	24.3	1640	41.7
300	240	6.1	180	4.6	1441	36.6	2472	62.8	1157	29.4	1982	50.3	1148	29.2	1967	50.0
350	280	7.1	210	5.3	1679	42.7	2882	73.2	1348	34.2	2311	58.7	1337	34.0	2293	58.2
400	320	8.1	240	6.1	1918	48.7	3293	83.6	1539	39.1	2640	67.1	1527	38.8	2619	66.5
500	400	10.2	300	7.6	2395	60.8	4113	104.5	1921	48.8	3298	83.8	1906	48.4	3272	83.1
600	480	12.2	360	9.1	2871	72.9	4934	125.3	2303	58.5	3956	100.5	2285	58.0	3925	99.7
K1					4.7681	0.1211	8.2093	0.2085	3.8206	0.0970	6.5780	0.1671	3.7908	0.0963	6.5266	0.1658
K2					6.0161	0.1528	4.2732	0.1085	6.0161	0.1528	4.2732	0.1085	6.0161	0.1528	4.2732	0.1085

Aspect ratio 16:10

Screen size					8972W				8973W				8974WU, 8975WU			
Dia.		H		V	Min		Max		Min		Max		Min		Max	
[inch]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]	[inch]	[m]
30	25	0.6	16	0.4	162	4.1	270	6.9	132	3.3	218	5.5	130	3.3	214	5.4
40	34	0.9	21	0.5	213	5.4	357	9.1	172	4.4	287	7.3	169	4.3	282	7.2
50	42	1.1	26	0.7	263	6.7	444	11.3	213	5.4	357	9.1	209	5.3	350	8.9
60	51	1.3	32	0.8	314	8.0	531	13.5	253	6.4	427	10.8	248	6.3	418	10.6
70	59	1.5	37	0.9	364	9.3	618	15.7	294	7.5	496	12.6	288	7.3	487	12.4
80	68	1.7	42	1.1	415	10.5	705	17.9	334	8.5	566	14.4	328	8.3	555	14.1
90	76	1.9	48	1.2	465	11.8	792	20.1	374	9.5	635	16.1	367	9.3	623	15.8
100	85	2.2	53	1.3	516	13.1	879	22.3	415	10.5	705	17.9	407	10.3	691	17.6
120	102	2.6	64	1.6	617	15.7	1053	26.7	496	12.6	844	21.4	486	12.4	828	21.0
150	127	3.2	79	2.0	769	19.5	1314	33.4	617	15.7	1053	26.7	605	15.4	1033	26.2
200	170	4.3	106	2.7	1021	25.9	1749	44.4	819	20.8	1401	35.6	803	20.4	1374	34.9
250	212	5.4	132	3.4	1274	32.4	2184	55.5	1021	25.9	1749	44.4	1002	25.4	1715	43.6
300	254	6.5	159	4.0	1527	38.8	2619	66.5	1224	31.1	2097	53.3	1200	30.5	2056	52.2
350	297	7.5	185	4.7	1780	45.2	3054	77.6	1426	36.2	2445	62.1	1398	35.5	2398	60.9
400	339	8.6	212	5.4	2032	51.6	3490	88.6	1628	41.3	2793	71.0	1596	40.5	2739	69.6
500	424	10.8	265	6.7	2538	64.5	4360	110.7	2032	51.6	3490	88.6	1993	50.6	3421	86.9
600	509	12.9	318	8.1	3043	77.3	5230	132.8	2437	61.9	4186	106.3	2389	60.7	4104	104.2
K1					5.0542	0.1284	8.7018	0.2210	4.0434	0.1027	6.9615	0.1768	3.9641	0.1007	6.8250	0.1734
K2					6.0161	0.1528	4.2732	0.1085	6.0161	0.1528	4.2732	0.1085	6.0161	0.1528	4.2732	0.1085

\* The above figures are design values only. Actual distances will be within ±10% of those provided.

\* Projection distances other than those in the above table can be obtained by the following formula.

$$\text{Projection distance} = (K1) \times \text{diagonal screen size} + (K2)$$

\* The projection distances for screen sizes 4:3, 16:10 and 16:9 can be obtained by the following formulas depending on the panel aspect ratio.

$$8970 / 8971 / 8976SX \quad \text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0895 \times \text{diagonal screen size} + (K2) \quad \text{For screen size 16:10 : Projection distance} = (K1) \times 1.0600 \times \text{diagonal screen size} + (K2)$$

8972W / 8973W / 8974WU / 8975WU

$$\text{For screen size 4: 3 : Projection distance} = (K1) \times 1.1321 \times \text{diagonal screen size} + (K2)$$

$$\text{For screen size 16: 9 : Projection distance} = (K1) \times 1.0278 \times \text{diagonal screen size} + (K2)$$

## Lens Replacement Procedure

1. Return the lens shift to the center position
  - (1) Press the **LENS SHIFT** button. The LENS SHIFT dialog will appear.
  - (2) Press the **ENTER** or **INPUT** button while the dialog is displayed to execute the CENTERING feature, which adjusts the lens to the center. A message dialog is displayed for confirmation.
  - (3) Pressing the **▶** button performs CENTERING.

### Note

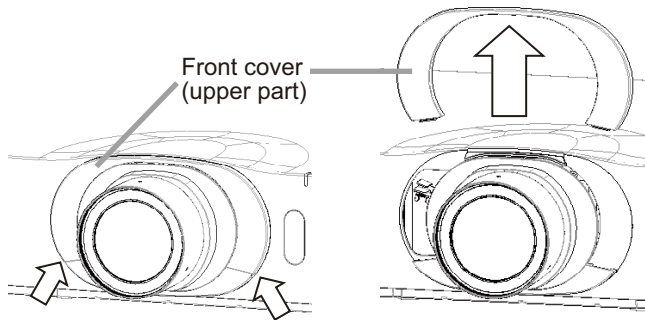
• You can also perform CENTERING in the standby mode by pressing the **FUNCTION** and **LENS SHIFT** buttons on the control panel for 3 seconds at the same time.

2. Turn off the LCD projector

Turn off and unplug the LCD projector, and allow the projector to sufficiently cool down.

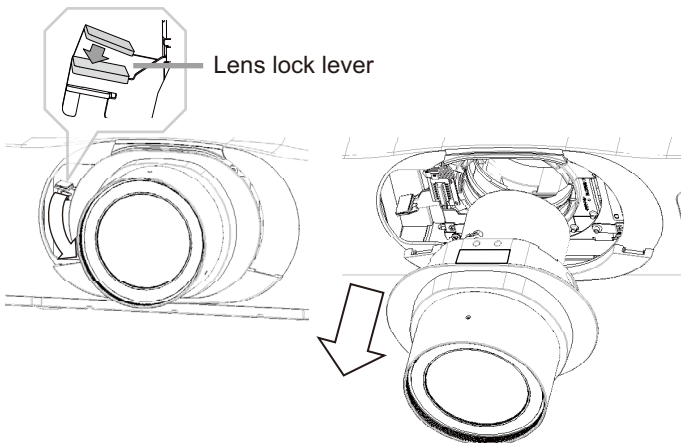
3. Remove the front cover

Move and slide the front cover up while pressing the front cover from the underside and remove the front cover from the LCD projector.



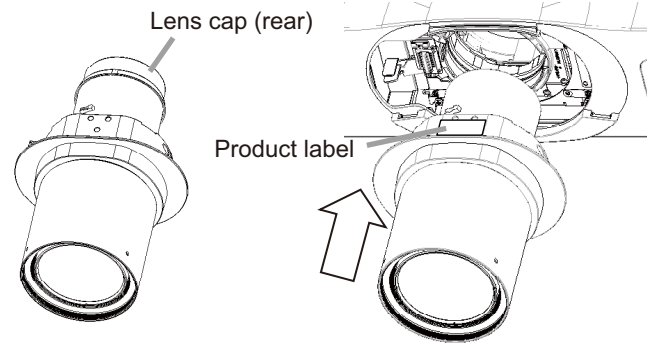
4. Remove the lens

Support the lens, and lower the lens lock lever to the lowest position and remove the lens from the LCD projector. You can move the lever while the upper plate touches lower one.



5. Attach the lens

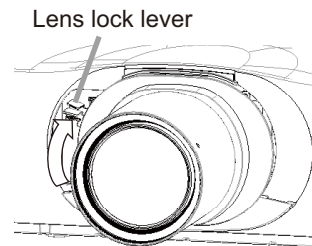
- (1) Remove the lens cap. Then turn the product label of the lens upward and install the lens in the LCD projector.



### ⚠ Caution

- Installing the lens in the LCD projector with the lens cap on may lead to malfunction.
- Take care to avoid hitting the surface of the lens on the LCD projector when attaching the lens as this may lead to malfunction.
- Do not touch the connector of the lens or subject it to impact as this may lead to malfunction.

- (2) Support the lens, and move the lens lock lever to the upside (until the lens lock lever clicks into the locked position).

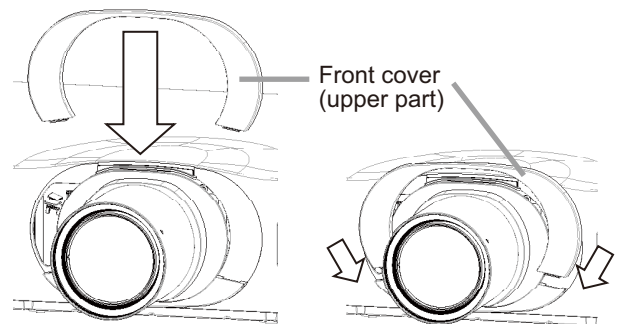


### ⚠ Warning

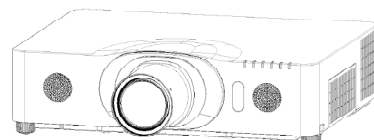
- To prevent the lens from falling off, after attaching the lens, check that it is securely mounted and that the lens does not move. If the projector falls or topples over, it could result in injury or damage to the projector and the surrounding things.

6. Attaching the front cover

Insert the front cover into the LCD projector body.



Lens attachment is completed.



### ⚠ Caution

- Take care to avoid hitting the surface of the lens on the LCD projector when removing the lens as this may lead to malfunction.
- Do not touch the socket of the lens or subject it to impact as this may lead to malfunction.