

SONY®



SXRD 4K

SXRD 4K Ultra High Resolution Projectors

SRX-R110CE

SRX-R105CE

www.sonybiz.net/4k



Breathtaking 4K quality, high-resolution visuals with stunning 1800:1 contrast ratio for Digital Cinema and large-venue applications.





Sony is proud to introduce the SRX-R110CE and SRX-R105CE SXRD 4K Ultra High Resolution Projectors. These state-of-the-art projectors are equipped with three Silicon X-tal Reflective Display (SXRD™) imaging devices, delivering amazing resolution – more than four times the resolution of full HDTV – and meeting the 4K quality resolution level stipulated by Digital Cinema Initiative (DCI).

The SRX-R110CE and the SRX-R105CE offer a high contrast ratio of more than 1800:1. In addition, the SRX-R110CE provides high brightness of 10,000 ANSI lumens*, and the SRX-R105CE brightness of 5,000 ANSI lumens*.

The use of twin Xenon lamps combined with a gamma curve of 2.6 – (also recommended by DCI as the standard for Digital Cinema) – means the SRX-R110CE and the SRX-R105CE offer pure, high-quality colour tonal reproduction reminiscent of film.

Even in a multi-screen mode, high-resolution visuals are available from each quadrant. The SRX-R110CE and the SRX-R105CE Projectors are the ideal choice for Digital Cinema and large-venue applications such as auditoriums and concert halls.

* ANSI lumens is a measuring method of the American National Standards Institute IT 7.228.

Since there is no uniform method of measuring brightness, specifications will vary among manufacturers.





Innovative Solutions for Digital Cinema

In 1999, Sony introduced a totally new concept of digital cinema production for moviemakers to demonstrate a new higher level of picture quality, efficiency and flexibility in production processes. Sony's new approach was to produce movies in a high-definition progressive video format at 24 frames per second using digital video tape media. This concept and Sony's product line enabling this concept were named "CineAlta", and have been highly embraced by an ever-broadening spectrum of producers, directors and cinematographers all over the world. An increasing number of movies have been produced using CineAlta equipment, and from this point forward, more and more motion pictures will continue to be produced digitally using these systems.

Since this revolutionary introduction, Sony has continually provided a comprehensive range of CineAlta products including digital video cameras, digital VTRs, monitors and digital editing systems – each offering breathtaking picture quality and stunning performance. Sony's development for the motion picture industry does not remain in the content creation domain, but continues with another important revolution by engineering an incredibly high, 4K resolution digital projection system under the CineAlta logo.

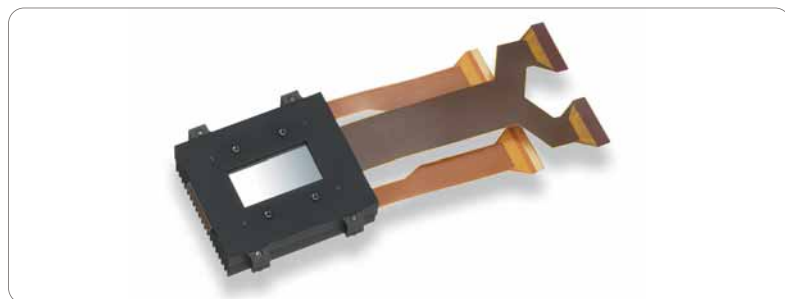
Now Sony's CineAlta line-up consists of products from acquisition through to theatrical projection. Sony's SXR-D 4K digital projector is the latest, but most important piece of the "Digital Cinema" picture.

State-of-the-art technology for high picture quality

Silicon X-tal Reflective Display (SXR-D) imaging device

The SXR-D device used by the SRX-R110CE and SRX-R105CE is a 1.55-inch* Liquid Crystal on Silicon-based imager developed using leading-edge manufacturing technology. High-quality, accurate visuals are created using this brilliant imaging device.

*Measured diagonally.



High resolution 4K

Sony original SXR-D display devices deliver the exceptionally high resolution of 4K (4096 H x 2160 V pixels at 1.85:1 aspect ratio). 4K is stipulated by DCI as a resolution corresponding to the master images of 65mm film for Digital Cinema. The resolution of 4K is more than four times as many pixels as full HDTV (1920 x 1080, 16:9 wide screen format). 4K resolution is ideal for visual applications in which quality is critical.

The SXR-D device helps to achieve this high picture quality by incorporating nearly 8.85 million pixels per imager at a narrow pitch of 8.5 microns. These high-density pixels enable an outstandingly high resolution that are quarter of the size of pixels projected using typical 2K resolution projection systems. Even in multi-screen mode, full 2K resolution per quadrant is possible.

High 1800:1 contrast ratio

The SRX-R110CE and the SRX-R105CE offer a high contrast ratio of more than 1800:1* through the use of Sony's unique new SXR-D device. The SXR-D imaging device itself achieves a contrast ratio of 4000:1.

This stunning picture quality makes the SRX-R110CE and SRX-R105CE ideal for applications in which dynamic range is essential.

The high contrast ratio has been achieved through two key technologies – the 'Vertically Aligned Liquid Crystal' system and an extremely thin liquid crystal cell gap.

* The contrast ratio is measured under the condition that projection is on the screen with a screen gain of 1.0.

Vertically Aligned Liquid Crystal system

In every type of projector system, displaying absolute black is a major issue in order to achieve a high contrast ratio.

In other words, the contrast ratio of a projector depends on how effectively the light from the source can be blocked so it does not leak through the LCD device.

All Liquid Crystal Display (LCD) devices control the amount of light to be projected by applying an electric field to the liquid crystal gap. In typical LCD devices, black is produced when an electric field is applied across the liquid crystal cell gap. However, molecules near the surface of the glass substrate may not be accurately controlled due to the influence of the alignment film. This is not an issue for bright images. However, when displaying dark black images, light can tend to leak from the LCD device, since the molecules near the surface are less accurately controlled, resulting in a creamy black colour.

The SXR D device does not exhibit these characteristics. This is because the Vertically Aligned Liquid Crystal system displays black when an electric field is not applied and because all molecules are in the correct alignment to block light. The direct result is a far deeper black level, leading to a high contrast ratio.

Thin liquid crystal cell gap

Another important factor enabling the high contrast of the SXR D device is its ultra-thin cell gap of less than 2 microns. With conventional Vertically Aligned Liquid Crystal systems, a thin cell gap could not be achieved. Sony has overcome this difficulty through the use of innovative planarisation technology in the silicon backplane structure and an advanced Silicon wafer-based assembly process.

The SXR D device also adopts a structure that does not use "spacers" – columns found in conventional reflective liquid crystal devices to maintain a constant gap between the liquid cell floor and the top of the device. Spacers tend to both scatter and reflect light, which can impair high contrast pictures. In the spacerless SXR D device, these artifacts are no longer seen.

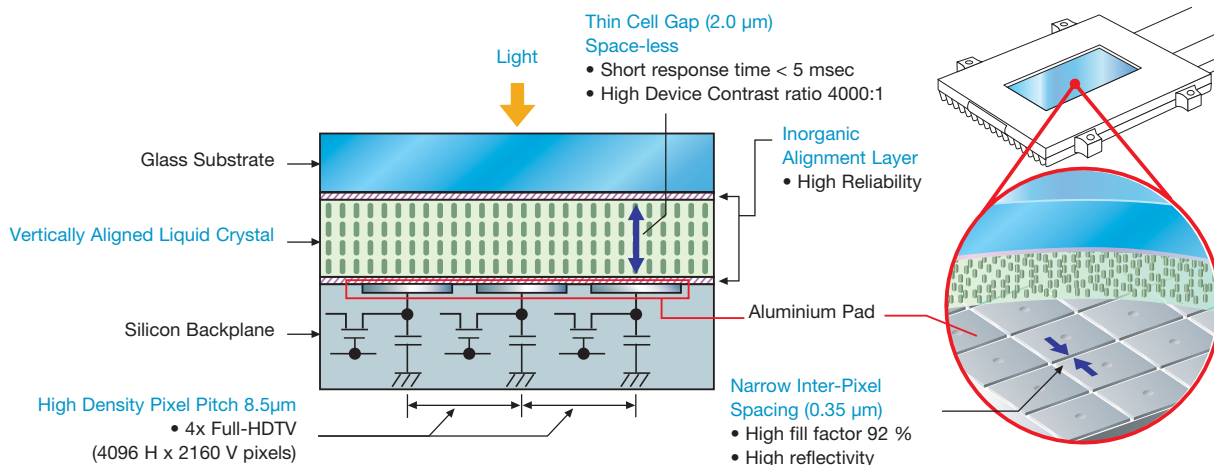
Short response time

The thin cell gap structure in SXR D devices also contributes to an ultra-short response time of 5 milliseconds. The SXR D device reacts promptly to the instantaneous change of colours, enabling the projector to display a smooth motion. Consequently, the SRX-R110CE and SRX-R105CE are free from motion blur – a particularly significant benefit for visuals that include fast-moving objects.

Reliable imaging device

The SRX-R110CE and the SRX-R105CE use high-power bright lamps. As a result, special attention has been paid to the reliability of the SXR D device. The inorganic materials utilised for the alignment layer of the SXR D device are resistant to deterioration or deformities that could occur due to the intense heat and light generated by the powerful projector lamp.

SXR D cross-section view



Highly pure, superb colour tonal reproduction

Highly bright and pure light source of Xenon lamp

The SRX-R110CE provides a high brightness of 10,000 ANSI lumens*, and the SRX-R105CE provides a brightness of 5,000 ANSI lumens using Xenon lamps.

Xenon lamps are already used in conventional film projectors and are utilised by the SRX-R110CE and SRX-R105CE to provide superb colour tonal reproduction to the standards required for Digital Cinema.

The SRX-R110CE utilises two 2kW Xenon lamps, while the SRX-R105CE uses two 1kW Xenon lamps.

The Xenon lamp used in the projectors satisfies the wide colour range needed for Digital Cinema Distribution Master (DCDM) formats stipulated by DCI.

* Measured under conditions with the lamp power at 100% in dual-lamp mode.



12-bit Panel LCD driver

The SRX-R110CE and the SRX-R105CE utilise a 12-bit imager driver for reproducing extremely natural images.

Gamma curve selection

The SRX-R110CE and the SRX-R105CE provide three preset gamma curve values. You can select an optimum value from 1.8, 2.2, and 2.6 according to the desired colour tone. The value 2.6 is available for Digital Cinema applications.



Operational versatility

Dual-lamp system with selectable lamp modes

The SRX-R110CE and SRX-R105CE adopt a dual-lamp system that uses two lamps for reliable, flexible and efficient use of light sources. With the dual-lamp system, users can select either single- or dual-lamp modes according to their desired brightness and applications.

The dual-lamp mode provides maximum lamp power and at the same time enables virtually fail-safe operation; if one bulb burns out the other can keep projecting images.

In the single-lamp mode, users can select either of two lamps manually, or the projectors can automatically select a lamp based on each lamp's operating time. Another automatic mode is provided to make the lamps operate alternately at user-defined intervals selectable from four hours to twelve hours (in increments of one hour). This feature is useful for applications where "24/7" operation is required.

The lamp power can be set between 100% and 51%, in eight steps. This function, combined with the selectable lamp modes, contributes to achieving longer lamp life.

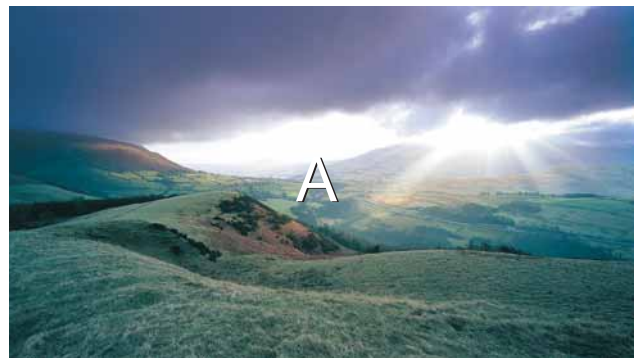
Variety of lenses

A range of optional zoom lens are available. They are all newly designed to project images of extreme resolution and contrast with minimal chromatic aberration from 174 inches (4,428 mm) to 610 inches (15,497 mm) in screen width.

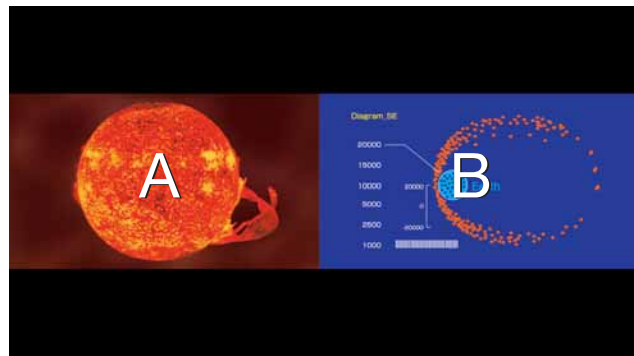


Multiple screen capability

Both the SRX-R110CE and SRX-R105CE provide single-mode, dual-mode and quad-mode display. In quad mode, four quadrants of full HD images (1920 x 1080 pixels) can be projected simultaneously. In single mode, a smooth, ultra high resolution 4096 x 2160-pixel image is projected.



Single-mode



Dual-mode



Quad-mode



Four option slots



LKRI-001
Analogue Input Board
(supplied as standard)



LKRI-002
HD-SDI (4:2:2) Input Board



LKRI-003
Dual-link HD-SDI Input Board

Input signal flexibility

Four option slots are available to increase the flexibility of the SRX-R110CE and the SRX-R105CE by using three types of option boards that connect to different types of signal formats. Four input boards can be accommodated simultaneously in the side panel of the projector. You can select the screen mode from single, dual, and quad mode, and assign the appropriate signal board to each quadrant.

- The LKRI-001 Analogue Input Board utilises 5 BNC connectors that can accept 0.7 volt analogue signal levels. This board is supplied as standard with the SRX-R110CE and SRX-R105CE.
- The LKRI-002 HD-SDI (4:2:2) Input Board can accept SMPTE 259M SD digital 525 or 625 line video. It can auto-switch to either SMPTE 292M 1080 4:2:2 YUV serial picture data or SMPTE 372M 4:2:2 RGB serial picture data.
- The LKRI-003 Dual-link HD-SDI Input Board can accept any of the following signals: SMPTE 372M dual-link HD-SDI (4:4:4), SMPTE 292M HD-SDI (4:2:2), dual-link DC-SDI (RGB 4:4:4), or DC-SDI (YPbPr 4:2:2). With four LKRI-003 boards, the SRX-R110CE or SRX-R105CE can project 4096 x 2160 4K images.

Simple remote controller unit

The supplied remote controller unit is provided to perform various simple controls of the projectors such as turning on/off lamp power, adjusting zoom/focus and lens shift control.



Operational versatility

Easy set-up on a PC using supplied software

The SRX-R110CE and SRX-R105CE come equipped with set-up software that allows easy set-up and adjustments via its intuitive GUIs on a PC*. These projectors can be controlled through an Ethernet or RS-232C interface and multiple numbers of projectors can be controlled from a single PC**.

A comprehensive range of set-up parameters including input configurations, colourimetry controls, installation adjustments and maintenance settings can be controlled via this software.

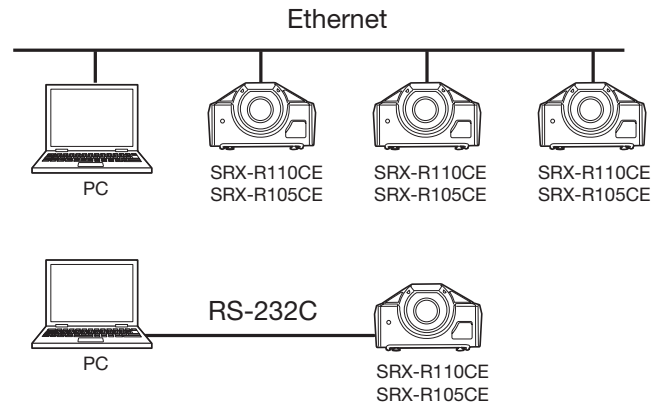
* System requirements for the set-up software
OS: Microsoft® Windows® XP Professional SP2.

** When using an Ethernet connection.

Easy maintenance

Special consideration for maintenance issue is taken into the development of these projectors in order to effectively perform periodic maintenance. Lamp bulbs and lamp house units used in the projectors can be easily replaced on site without any special tools, thus shortening the downtime required for the replacement. What's more, a cumbersome adjustment after the replacement is not required.

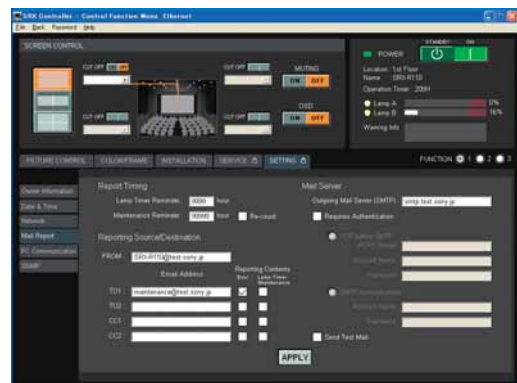
The supplied set-up software is another convenient tool for maintenance. This allows operators to easily verify the lamp's operating time. Automatic email alerts from the projector provide operators with maintenance reminders as well as error occurrences.



Installation setting

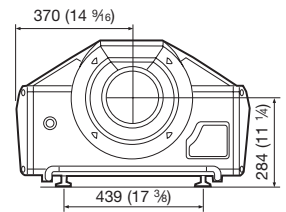
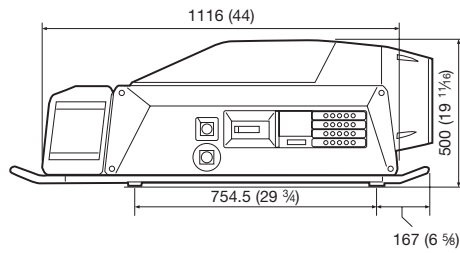
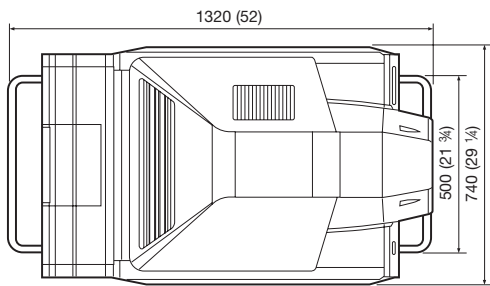


Colourimetry setting



Maintenance setting

Dimensions



Unit=mm (inches)

Optional Accessories



LKRL-Z115 Zoom Lens
1.5 to 1.9*x zoom lens



LKRL-Z120 Zoom Lens
1.9 to 2.3x zoom lens



LKRL-Z125 Zoom Lens
2.3 to 4.0x zoom lens



LKRL-Z140 Zoom Lens
4.0 to 7.0x zoom lens

*The number denotes the ratio of the projection distance to the screen width.



LKRI-001 Analogue Input Board (supplied)



LKRI-002 HD-SDI (4:2:2) Input Board



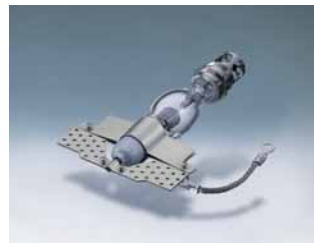
LKRI-003 Dual-link HD-SDI Input Board



LKRX-105 1kW Xenon lamp bulb
for replacement (for SRX-R105CE)



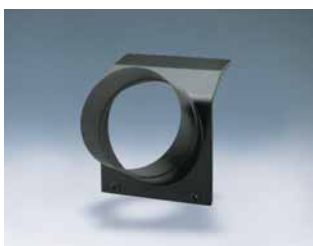
LKRX-B105 1kW Xenon lamp
house unit for replacement
(for SRX-R105CE)



LKRX-110 2kW Xenon lamp bulb
for replacement (for SRX-R110CE)



LKRX-B110 2kW Xenon lamp
house unit for replacement
(for SRX-R110CE)



LKRA-001 8-inch Exhaust Duct Adaptor

Specifications

SXRD Device Main Specifications	
Display device	SXRD (Silicon X-tal Reflective Display)
Size	1.55" across Diagonal
Resolution	4096(H) X 2160(V) Pixels
Reflectivity	72%
Contrast (as device)	More than 4000 : 1
Pixel pitch	8.5µm
Width (between pixels)	0.35µm
Response speed	5msec (tr + tf)
Liquid crystal mode	Vertical Aligned Mode
Alignment layer	Inorganic Thin Film
Backplane process	0.35µm MOS Process
Liquid crystal cell gap	Less than 2µm

Optical							
Projection system	3-SXRD panel, prism colour integrated system						
Imaging device	SXRD, 1.55-inch (diagonal), 4096(H) x 2160(V) pixels on each chip						
Lamp	2kW Xenon lamp x 2 (SRX-R110CE) 1kW Xenon lamp x 2 (SRX-R105CE)						
Screen coverage	14 feet to 51 feet (Approx. 4.5 m to 15.5 m) (viewable area, measured horizontally)						
Light output	10,000 ANSI lumens ±10% (SRX-R110CE)* 5,000 ANSI lumens ±10% (SRX-R105CE)						
General							
White reference	Xenon white reference						
	<table border="1"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> </tr> </thead> <tbody> <tr> <td>White reference</td> <td>0.3140</td> <td>0.3510</td> </tr> </tbody> </table>		X	Y	White reference	0.3140	0.3510
	X	Y					
White reference	0.3140	0.3510					
Contrast	More than 1800:1						
Resolution	600 TV lines (SDI input/SMPTE-259M) 1920 x 1080 pixels (HD-SDI input, SMPTE-292M) 4096 x 2160 pixels (RGB)						
Signal specifications	Video: Component (Y · Cb · Cr), HD (G · B · R/Y · Pb · Pr) Computer: XGA, SXGA, UXGA						
Power requirements	AC 200 to 240 V, 50/60 Hz, max. power 5.4 kW (standby 40W) (SRX-R110CE) AC 100 to 240 V, 50/60 Hz, max. power 3 kW (standby 40W) (SRX-R105CE)						
Operating temperature	+5°C to +35°C (+41°F to +90°F)						
Storage temperature	-20°C to +60°C (12°F to +140°F)						
Operating humidity	35% to 85% (without condensation)						
Storage humidity	10% to 90%						
Dimensions (W x H x D)	Approx. 740 x 500 x 1320 mm (29 1/4 x 19 11/16 x 52 inches)						
Mass	Approx. 110 kg (242 lb 8oz)						
Input/Output							
Input/Output	Open for optional signal interface board						
Input A	Open for optional signal interface board						
Input B	Open for optional signal interface board						
Input C	Open for optional signal interface board						
Input D	D-sub 9-pin, RS-232C (female) x 1						
Remote interface	Ethernet terminal, 10Base-T/100Base-TX x 1						

*ANSI lumens is a measuring method of the American National Standards Institute.

Input Boards	
LKRI-001 Analogue input board	BNC x 5, HD/SD analogue video input, RGB/Y · Cb · Cr selectable Computer signals R 0.7 Vp-p ±2dB positive, 75 Ω G 0.7 Vp-p ±2dB positive, 75 Ω B 0.7 Vp-p ±2dB positive, 75 Ω Standard definition video [Y · Cb · Cr] Y 1.0 Vp-p ±2dB sync negative, 75 Ω Cb 0.7 Vp-p ±2dB positive, 75 Ω Cr 0.7 Vp-p ±2dB positive, 75 Ω High definition video [RGB] R 0.7 Vp-p ±2dB positive, 75 Ω G with sync 1.0 Vp-p ±2dB, 75 Ω, Tri-level sync: ±0.3 Vp-p / Bi-level sync: 0.3 Vp-p B 0.7 Vp-p ±2dB positive, 75 Ω High definition video [Y · Pb · Pr] Y 1.0 Vp-p ±2dB, 75 Ω, Tri-level sync: ±0.3 Vp-p / Bi-level sync: 0.3 Vp-p Pb ±0.35 Vp-p ±2dB, positive 75 Ω Pr ±0.35 Vp-p ±2dB, positive 75 Ω Sync HD Horizontal TTL level, high impedance, sync positive/negative HD Vertical TTL level, high impedance, sync positive/negative
LKRI-002 HD-SDI (4:2:2) input board	BNC x 2 (Input x 1, Loop-through out x 1) HD-SDI (SMPTE-292M / ITU-R.BT709 / BTA-S004) SDI (SMPTE-259M / ITU-R.BT601)
LKRI-003 Dual-link HD-SDI input board	BNC x 4 (Input x 2, Loop-through out x 2) HD-SDI (Single-link, HD-SDI/4:2:2, SMPTE-292M): Y · Pb · Pr, DC-SDI (Single-link, DC-SDI/4:2:2): Y · Pb · Pr, Dual-link HD-SDI (Dual-link HD-SDI/4:4:4, SMPTE-72M): RGB, Dual-link DC-SDI (Dual-link DC-SDI/4:4:4): RGB
Others	
Safety regulations	UL60950 listed, cUL60950, FCC Class A, IC Class A, VCCI Class A, EN60950, CE Class A, C-tick, GB4943, GB9254, K60950, CISPR22, CISPR24
Supplied accessories	Remote controller x 1 / CD-ROM x 1 (Remote control application for Windows® XP Professional Edition) / Dry cell (AA size) x 2 / Ethernet Cross Cable (3 m) x 1 / LKRI-001 Analogue Input Board x 1
Optional accessories	Operation instructions x 1 / Installation manual x 1 LKRL-Z115: 1.5 to 1.9x zoom lens LKRL-Z120: 1.9 to 2.3x zoom lens LKRL-Z125: 2.3 to 4.0x zoom lens LKRL-Z140: 4.0 to 7.0x zoom lens LKRI-001: Analogue input board LKRI-002: HD-SDI (4:2:2) input board LKRI-003: Dual-link HD-SDI input board LKRX-105: 1kW Xenon lamp bulb for replacement (for SRX-R105CE) LKRX-B105: 1kW Xenon lamp house unit for replacement (for SRX-R105CE) LKRX-110: 2kW Xenon lamp bulb for replacement (for SRX-R110CE) LKRX-B110: 2kW Xenon lamp house unit for replacement (for SRX-R110CE) LKRA-001: 8-inch Exhaust Duct adaptor

Preset Data of Input Signals

No	Signal Number	fH	fV	Aspect	Horizontal Sampling	Vertical Sampling
0	NO INPUT	0	0			
3	VIDEO60(480 60I)	15.73 kHz	59.94 kHz	4:3	1280	480
4	VIDEO50(575 50I)	15.63 kHz	50.00 kHz	4:3	1280	570
5	HDTV(1080 60I)	33.75 kHz	60.00 kHz	16:9	1920	1080
23	1024 x 768 VESA60	48.36 kHz	60.00 kHz	4:3	1024	768
24	1024 x 768 VESA70	56.48 kHz	70.07 kHz	4:3	1024	768
25	1024 x 768 VESA75	60.02 kHz	75.03 kHz	4:3	1024	768
26	1024 x 768 VESA85	68.68 kHz	85.00 kHz	4:3	1024	768
32	1280 x 960 VESA60	60.00 kHz	60.00 kHz	4:3	1280	960
33	1280 x 960 VESA75	75.00 kHz	75.00 kHz	4:3	1280	960
36	1280 x 1024 VESA60	63.97 kHz	60.01 kHz	5:4	1280	1024
37	11280 x 1024 VESA75	79.98 kHz	75.03 kHz	5:4	1280	1024

No	Signal Name	fH	fV	Aspect	Horizontal Sampling	Vertical Sampling
38	1280 x 1024 VESA85	91.15 kHz	85.02 kHz	5:4	1280	1024
39	1600 x 1200 VESA60	75.00 kHz	60.00 kHz	4:3	1600	1200
45	1080 50I	31.25 kHz	50.00 kHz	16:9	1920	1080
47	720 60P	45.00 kHz	60.00 kHz	16:9	1280	720
48	720 50P	37.50 kHz	50.00 kHz	16:9	1280	720
49	1080 48I (24PsF)	27.00 kHz	48.00 kHz	16:9	1920	1080
(75)	1080 60i	33.75 kHz	60.00 kHz	16:9	1920	1080
(76)	1080 25PsF	31.25 kHz	50.00 kHz	16:9	1920	1080
(77)	1080 30PsF	33.75 kHz	60.00 kHz	16:9	1920	1080

Note:

* When a signal other than the preset signals shown above is fed into this projector, the images may not be projected properly.

* SXGA+(1400 x 1050) computer signal is not supported by this projector. If this signal is fed into the projector, one of the four directions of an image are irregularly missing.

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