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LKRL-Z200 Series

2D Lenses for SRX-R320 and SRX-R220 Projectors

2nd Edition

Sony Digital Cinema 4K

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Notice:

Features and specifications are subject to change without notice.
Values for mass and dimensions are approximate.

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1. Introduction

Sony provides a comprehensive range of ultra high quality lenses for its Digital Cinema 4K projector models to accommodate most common theatre auditorium throw ratios (see table below).

The DCI's 4K image resolution format of 4096 x 2160 pixels offers the potential to display four times more detail than the 2K image resolution format of 2048 x 1080 pixels.
The optical quality of a 4K projection system also needs to be four times better than 2K projection system optics.

The LKRL-Z200 Series 2D lenses are designed and manufactured to deliver exceptionally high quality 4K image quality in conjunction with the SRX-R320 Series projection systems .

Lens	Zoom range	Focal Length mm
LKRL-Z211	x1.05 ~ x1.75	37.0 ~61.5
LKRL-Z214	x1.35 ~ x 2.41	47.8 ~ 84.6
LKRL-Z219	x1.85 ~ 4.0	63.1 ~ 137.7

Please note:

- The LKRL-Z200 Series lenses are designed for use with the SRX-R320 Series digital cinema 4K projectors and are backward compatible with the (discontinued) SRX-R220 in case of the need to replace a lens due to relocating the projector or irreparable damage. They are not compatible with the SRX-R515P projection system

- The LKRL-Z200 Series lenses are also compatible with the SRX-T Series of Sony 4K installation projectors.

- This Product Information bulletin refers specifically to use with the SRX-R320 Series digital cinema projectors. Specifications and performance may vary when used with other Sony 4K projectors

2. Projector and lens compatibility

There have been three generations of Sony Digital Cinema 4K projectors as of 2013.

The LKRL-Z200 Series lenses are compatible with the SRX-R320 Series projectors and backward compatible with the SRX-R220 projectors which share the same 4 x bolt lens mount and optical system.

The LKRL-Z200 Series lenses are not compatible with the SRX-R515P projector which utilises a bayonet mount system.

	SRX-R220*	SRX-R320 Series	SRX-R515P
Lens mount method	4 x bolts	4 x bolts	Bayonet mount
LKRL-Z200 Series lenses	✓	✓	✗
LKRL-Z500 Series lenses	✗	✗	✓

*SRX-R220 is discontinued but in the event of needing to replace an LKRL-Z100 lens due to relocation or the unlikely event of irreparable damage/failure please use LKRL-Z200 Series counterpart described in Section 8

3. Price, Availability and Ordering information

Please refer to your local Sony sales contact for the current pricing for the LKRL-Z211, LKRL-Z214 and LKRL-Z219 lenses

4. Features

4.1 True 4K quality

Sony Digital Cinema 4K projectors are manufactured to meet the highest image resolution specified by the DCI: 4K at 4096 x 2160 pixels.
The lenses are manufactured from ELD (Extra Low Dispersion) glass to create a superfine pitch 4K image

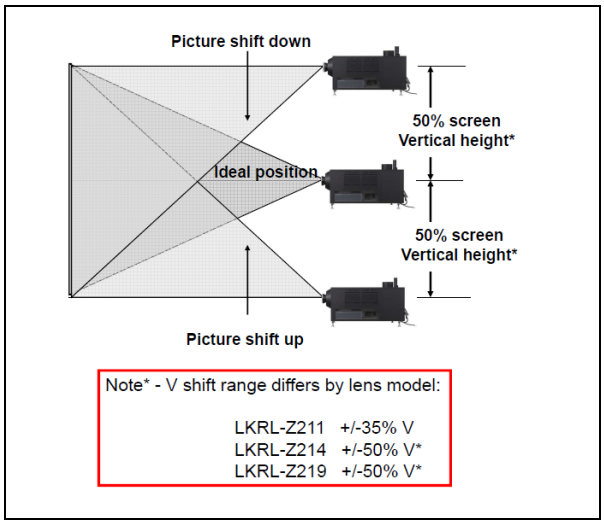
4.2 Vertical and Horizontal shift capability

- **Manual V and H shift adjustment**

Under ideal conditions the lens should be installed with the centre of the lens lined up with the centre of the screen to avoid “keystoning” of the image. In practice the projector will be installed with a vertical offset to be higher than the back row of the auditorium seating. Also under some circumstances it may not be possible to install it on the horizontal centre line. Therefore, the lens has Vertical (V) and Horizontal (H) shift capability to compensate for offsets in position between the lens centre and the screen centre.

The maximum range of lens shift varies depending on the lens model as shown below:

Lens Model	V shift	H shift
LKRL-Z211	+/-35% V	+/-11% H
LKRL-Z214	+/- 50% V	+/- 18% H
LKRL-Z219	+/- 50% V	+/- 18% H
Figures for SRX-R320 Series		



V shift is adjusted using a manual knob located above the lens mount mechanism.

The V shift adjustment is accessed via a small door on the top of the projector.

There is an indicator (pointer arrow) on the side of the lens mount mechanism to indicate when the V shift is at its mechanical centre.

- **Electric V shift**

The SRX-C also offers an electric V shift adjustment. Please refer to the SRX-R320 Installation manual for details.
Electric V shift would normally be used to correct for differences in the image centre position when going from 1.85:1 ratio to 2.39:1 ratio. For example when aligning on a Scope shaped screen:

- Display the 1.85:1 test pattern, adjust the lens zoom and focus to adjust the 1.85:1 test pattern to fill the screen height. Adjust manual V shift knob to line up the image centre with the screen centre. Save the settings in the Function memory along with masking etc.
- Switch to the 2.39:1 test pattern, adjust the zoom and focus to fill the height of the screen. Adjust the Electric V shift to align the image centre with the screen centre of necessary

4.3 H shift plate

The H shift plate is a new facility introduced on the LKRL-Z200 series lenses to simplify H shift adjustment when swapping between 2D and 3D lenses where the projector.

The H shift plate is preset at the factory at the centre position (no H shift). If H shift is needed during installation, the lens is adjusted for the required H shift and then the the H shift plate is locked in position using the two adjustment screws. The plate ensures the H shift is preset at the correct position which avoids having to readjust H shift every time the lens is swapped.

4.4 Lens Memory Function

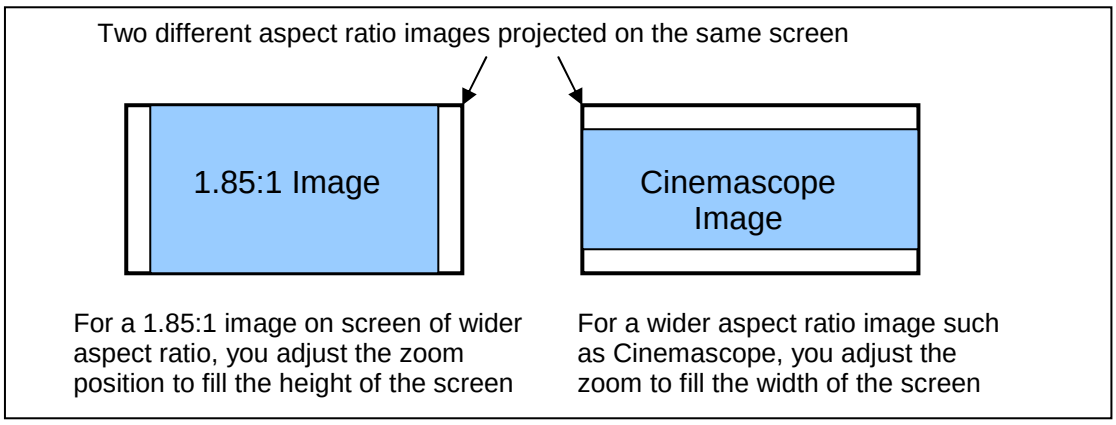
The Lens Memory function enables Sony 4K digital cinema projectors to meet the *single lens* requirement of the DCI specification for digital cinema so that the projector can re-frame an image automatically when going between different aspect ratios such as 1.85:1 aspect ratio during commercials and Scope 2.39:1 aspect ratio for the main feature movie.

The LKRL-Z200 series lenses are equipped with a positioning sensor that feeds back to the projector head the Zoom and Focus positions of the lens.

The lens has 3 connections marked as follows:

- Zoom – zoom motor drive connection
- Focus - focus motor drive connection
- Potentio – feedback from potentiometer positioning sensors for zoom and focus positions

The following diagram illustrates the difference between setting-up the framing for a Widescreen (1.85:1) and Scope (2.39:1) images during installation. Two different zoom/focus settings will be needed to correctly frame each aspect ratio image on the same screen. The Zoom Memory function enables these settings to be saved and recalled to correctly frame images during a show.



During the installation procedure Zoom and Focus are manually adjusted for each of the image framing positions and the Zoom/Focus positions are memorised for each aspect ratio setting by saving them in the Function Memory. During operation the lens can switch between different aspect ratios by recalling the appropriate Function memory setting.

5. Installation

1. Insert the lens into the projector lens mount and fix with the 4 x (M8 x 25) bolts supplied with the projector.

   The screws can be tightened/loosened with a cross head screwdriver but it is highly recommended to use a 13mm socket and ratchet with extender bar as shown.

2. Connect the three cable harnesses; Focus, Zoom and Potentio; to their respective connectors on the projector chassis.

3. Perform the lens alignment procedure as detailed in the SRX-R320 installation manual

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6. Specifications

6.1 LKRL-Z211 specifications

Screen size coverage	4.5m to 20m screen width (viewable area on scope sized screen with SRX-R320 on 14ft-L operation
Zoom ratio / focal length	x1.05 ~ 1.75 / 37.0 ~ 61.5 mm
f-stop number	f/2.8
Operating temperature	0°C to +40°C
Storage temperature	-20°C to +60°C
Operating humidity	0% to 90% without condensation)
Storage humidity	0% to 90% (without condensation)
Dimensions (W x H x L)	Approx. 187 x 222 x 451 (mm)
Mass	Approx. 11 Kg
Shipping carton size	760L x 360W x 440H approx..

6.2 LKRL-Z214 specifications

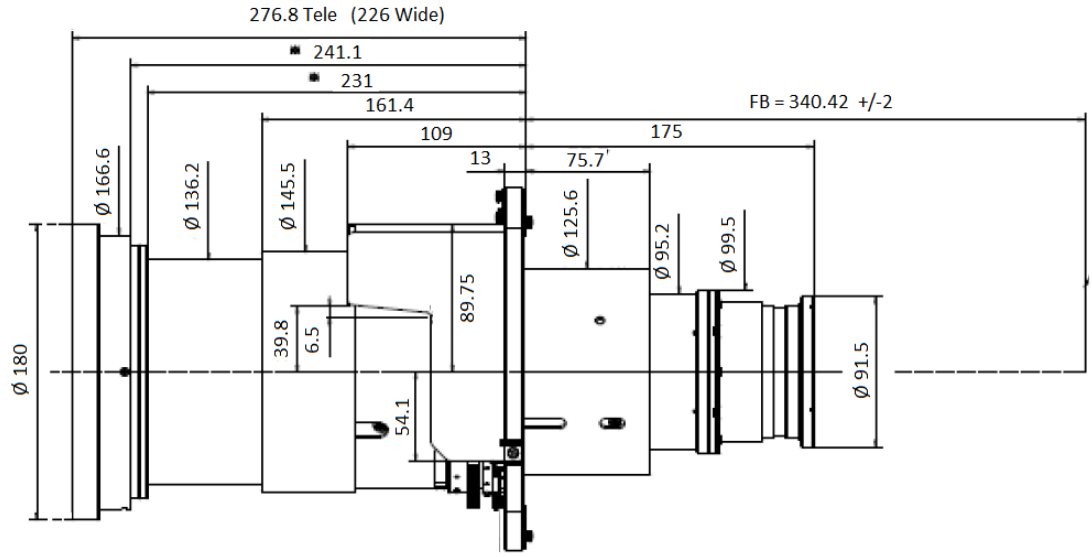
Screen size coverage	4.5m to 20m screen width (viewable area on scope sized screen with SRX-R320 on 14ft-L operation
Zoom ratio / focal length	x1.35 ~ 2.40 / 47.8 ~ 84.6 mm
f-stop number	f/2.8
Operating temperature	0°C to +40°C
Storage temperature	-20°C to +60°C
Operating humidity	0% to 90% without condensation)
Storage humidity	0% to 90% (without condensation)
Dimensions (W x H x L)	Approx. 187 x 222 x 455 (mm)
Mass	Approx. 11 Kg
Shipping carton size	760L x 360W x 440H approx..

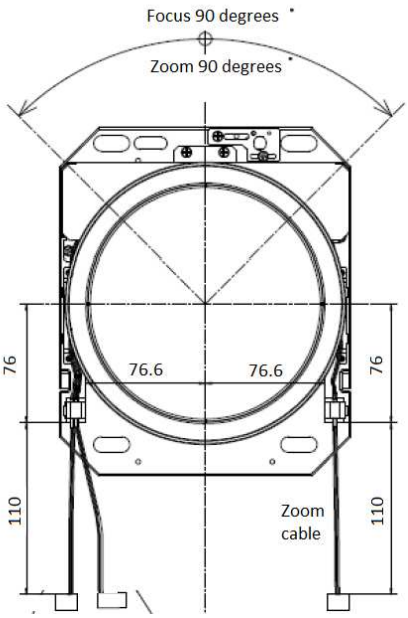
6.3 LKRL-Z219 specifications

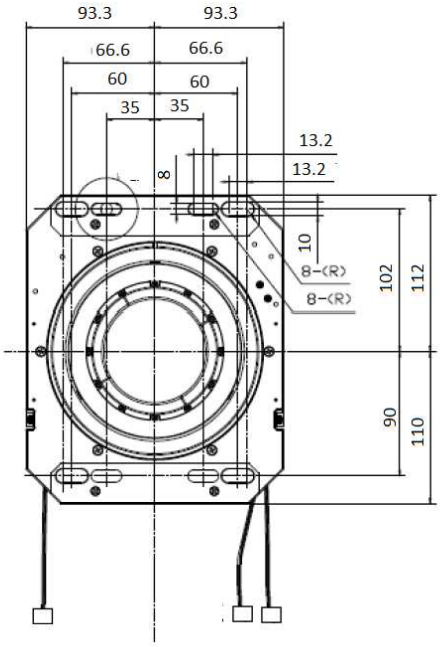
Screen size coverage	4.5m to 20m screen width (viewable area on scope sized screen with SRX-R320 on 14ft-L operation
Zoom ratio / focal length	x1.85 ~ 4.0 / 63.1 ~ 137.7
f-stop number	f/2.8
Operating temperature	0°C to +40°C
Storage temperature	-20°C to +60°C
Operating humidity	0% to 90% without condensation)
Storage humidity	0% to 90% (without condensation)
Dimensions (W x H x L)	Approx. 187 x 222 x 381 (mm)
Mass	Approx. 9 Kg
Shipping carton size	760L x 360W x 440H approx..

7. Dimensions

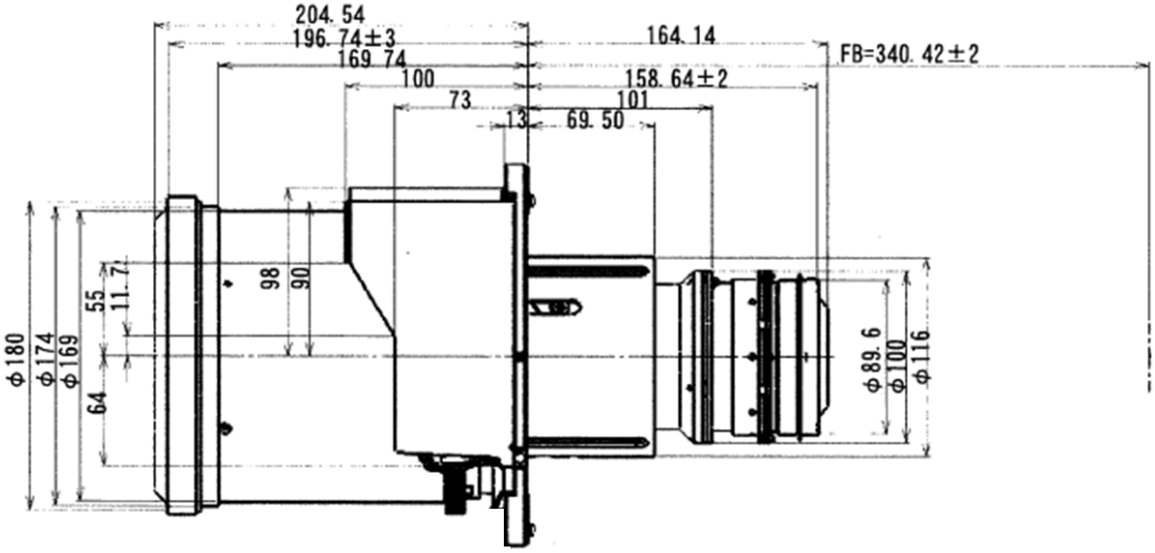
7.1 LKRL-Z211 dimensions

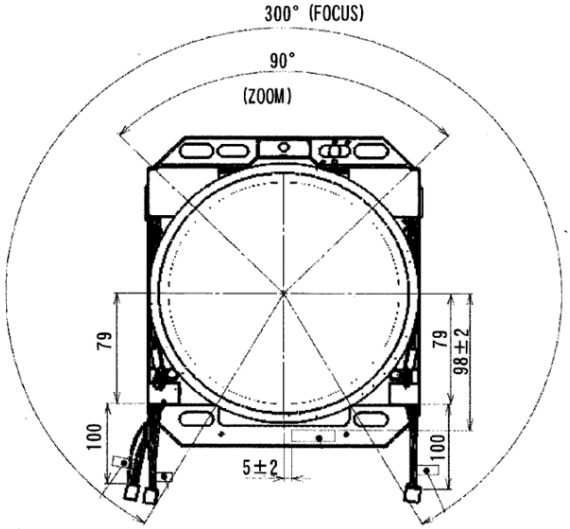


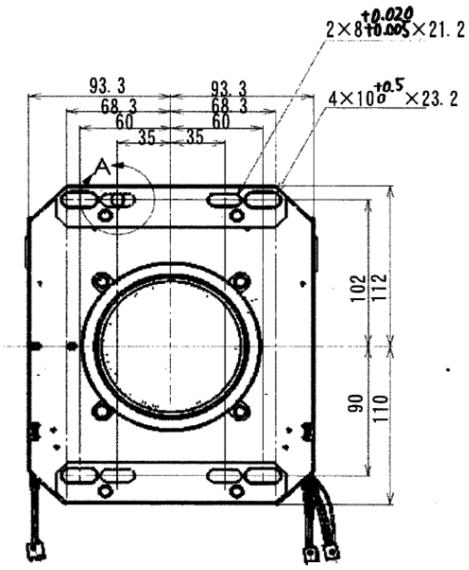




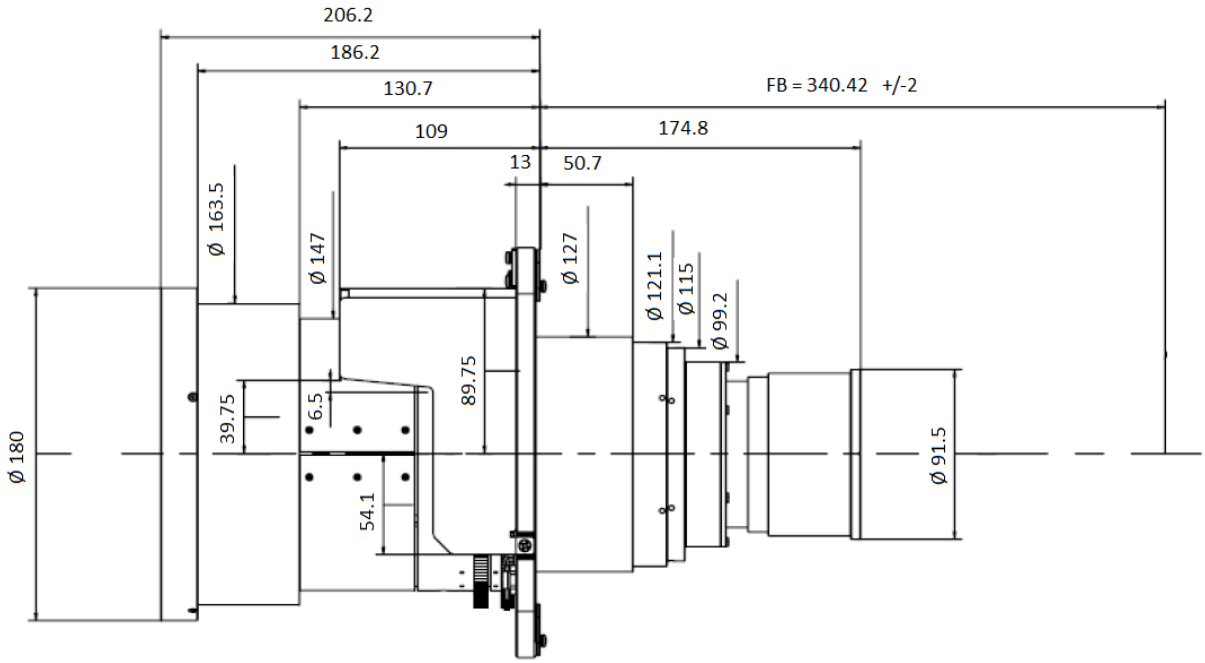
7.2 LKRL-Z214 dimensions

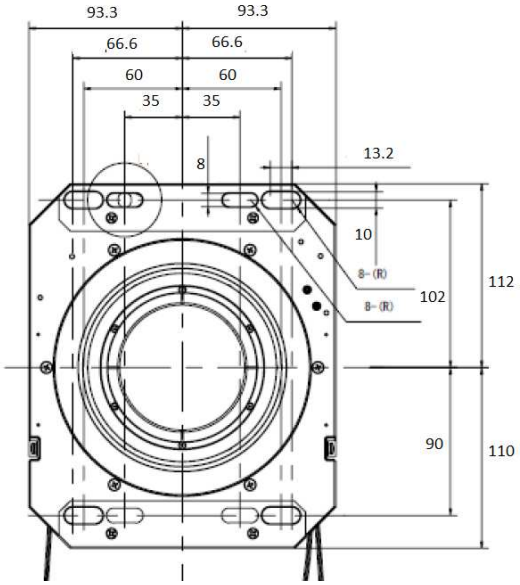


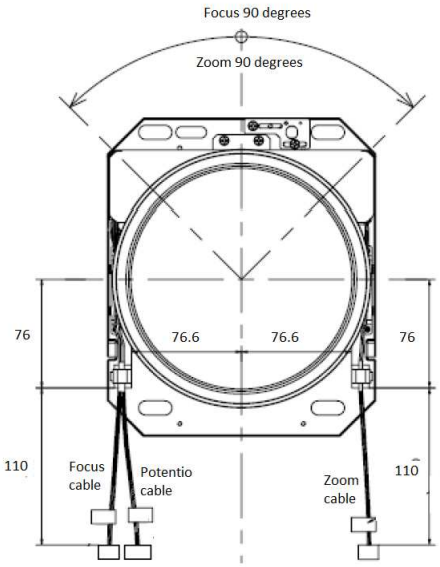




7.3 LKRL-Z219 dimensions







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8. Replacement of LKRL-Z100 Series lens

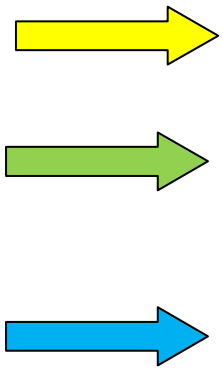
The LKRL-Z100 Series lenses were shipped prior to 2011. The introduction of the LKRL-Z200 Series lenses (with two new lenses benefiting from a wider range of zoom ratio) reduced the number of models from 6 lenses down to 3 lenses.

It may become necessary to replace the LKRL-Z100 lens on an early SRX-R220 projector, for example: if relocating an SRX-R220 to a different auditorium with a different throw ratio or in the unlikely event of an irreparable failure/damage to an LKRL-Z100 Series lens.

The diagram below highlights the original LKRL-Z100 Series lenses and their LKRL-Z200 Series equivalents.

LKRL-Z100 Series Lenses

Lens	Zoom Range
LKRL-Z111C	x1.07 ~ x1.70
LKRL-Z114C	x1.35 ~ 1.98
LKRL-Z116C	x1.5 ~ 2.29
LKRL-Z117	x1.73 ~ 2.41
LKRL-Z119	x1.81 ~ x2.94
LKRL-Z122	x2.23 ~ x3.92



LKRL-Z200 Series Lenses

Lens	Zoom Range
LKRL-Z211	x1.05 ~ x1.75
LKRL-Z214	x1.35 ~ x 2.41
LKRL-Z219	x1.85 ~4.0

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