



# LENSES

for Security & Surveillance



# Zoom Lenses



Security Camera Systems are not only used in restricted areas such as banks, retail stores or parking spaces but also for the surveillance over long distances, for example at airports, harbours, dams and national borders. To capture and to identify possible threats even at distances of several kilometres, a long focal length lens is required. Fujinon offers 60x Tele zoom lenses with a focal length of up to 2400mm for long-range applications and mid-range 32x Zoom lenses with a focal length of up to 500mm.

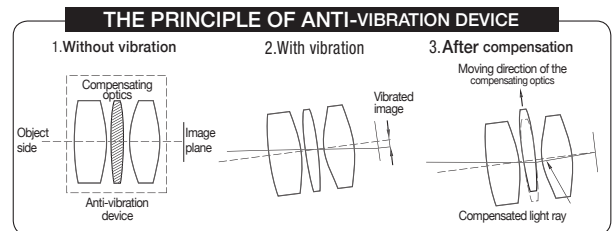
Surveillance Systems have to guarantee high resolution images day and night, 365 days a year. Even in critical conditions such as low-light, rain, fog or bright sunshine, constantly sharp pictures across the entire zoom range are required. Therefore, unique technologies are incorporated in the Fujinon Zoom lenses to get the best image quality in any condition.

# Added Value – outstanding technologies

## Optical Image Stabilization



Even small vibrations of the mounting point of zoom lenses can lead to very shaky and often unusable video captures, especially when the lens is being operated at long focal lengths. In order to minimize vibrations, avoid blur and to keep stable and clear images, several Fujinon 60x zoom models can be equipped with Fujifilm's original optical anti-vibration technology. A gyro sensor within the lens detects the amount of vibration, and a microcomputer then calculates the required correction. Finally, the correction lens group is shifted to compensate for the image vibration and the result is a stable picture even at long focal lengths.



OS-TECH OFF  
Optical Stabilized Technology



OS-TECH ON  
Optical Stabilized Technology

The optical Image Stabilization from Fujinon has multiple advantages over electronic and software based approaches:

- ▶ software based stabilization requires several frames to calculate a stabilized image, whereas optical stabilization provides instant results without losing any frames
- ▶ electronic stabilizers require cropping at the edges of the video image while optical stabilization always shows the full frame without losing image sensor resolution or field of view
- ▶ optical stabilization can compensate for up to 4x stronger vibration than software based stabilizers, depending on frequency and amplitude of the vibration

## Autofocus Function

The one-shot autofocus system enables accurate and reliable focussing based on contrast measurement within the scene. The lenses use the video signals from the camera to control the focus.



### Day & Night and minimized Chromatic Aberration



Many conventional standard lenses defocusing when switching the camera from day to night mode due to the different wavelengths between visible and (near)-infrared light. The Fujinon Day&Night lenses feature an IR correction coating and compensate for this focus shift by focussing the different wavelengths on the same focal plane ensuring the camera can switch mode without the need to refocus. In addition, Fujinon lenses minimize the chromatic aberration (colour bleeding) that often occurs at long focal lengths by using 2 glass elements with "Super ED" extra low dispersion glass.

### Visible Light Cut Filter



Atmospheric conditions such as fog, rain or snow can decrease the image quality as the shorter wavelengths of visible light cannot pass through them, leading to a lack of information on the camera sensor of a surveillance system. A remote controllable integrated visible light cut filter cuts off the shorter wavelengths and allows capturing images only with the longer wavelengths of the infrared range. In combination with an IR camera, the visible light cut filter creates a de-fog effect and creates a clear image.



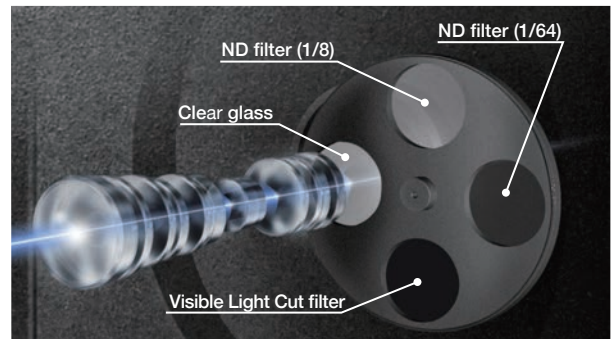
Usual view at fog or rain



Clear view with visible-light-cut filter

### Filter Wheel

A built-in turret with 3 different types of filters can be switched over with a single command. The filter wheel offers two types of ND filters, a visible light cut filter and clear glass to react immediately to changing light conditions and to get the best image possible in any weather.



ND Filters: in extremely bright conditions, such as strong sunlight, an ND filter (neutral density) can be used to reduce the amount of light to achieve optimum light on the sensor and within the image. The filter wheel incorporated into D60x16.7 lenses features two ND filters of 1/8 and 1/64 for varying conditions of brightness.

Visible light cut filter: while using in poor visibility with fog or rain, the filter blocks the visible light to clearly capture images with NIR wavelengths (in combination with a Day/Night camera).

### Built-in 2x Extender

Several models of the 60x zoom lenses are equipped with a built-in optical extender that can double the focal length up to 2000mm. Unlike an external extender, the built-in design keeps the position of the focus unchanged even when the extender is triggered.

## 60x Zooms

The Tele zoom lens series with 60x optical zoom features Full HD / 2 Megapixel resolution and is designed for a sensor size of up to 1/1.8". With a focal length reaching up to 1000mm and a compact body, the Fujinon lens is ideally suited for high quality long-range security systems at remote locations, such as airports and national borders or for monitoring dams and rivers for disaster prevention. When used on a high-resolution Day/Night or low-light camera, the lenses guarantee constantly sharp images in daylight and IR conditions without the need to refocus. Equipped with Optical Image Stabilization and Autofocus function, the Fujinon 60x Zoom lenses are the first choice for long distance surveillance 24/7.

### D60x16.7SR4 Series



Fujinon High-End 60x Tele zoom lenses offer optical image stabilization, autofocus function, visible light cut filter, ND filters and many more features to provide the highest image quality. Analog control is provided as well as a serial interface to control the lens via PC.



Technical data	D60x16.7SR4DE-V21	D60x16.7SR4DE-ZP1A	D60x16.7SR4FE-ZP1C	D60x16.7SR4FE-ZP3C
Sensor Size (max.)	1/1.8"			
Resolution	2 Megapixel / Full HD			
Focal Length (1x)	16.7 ~ 1000 mm			
Focal Length (2x)	33.4 ~ 2000 mm			
Zoom Ratio	60x			
2x Extender	Yes			
Mount	C			
Iris Range (1x)	F3.5 ~ F16			
Iris Range (2x)	F7.0 ~ F32			
Max. Relative Aperture	1:3.5			
MOD	5 m			
ND Filter	Yes (1/8 + 1/64)			
VLC Filter	Yes			
Autofocus	No	Yes	Yes	Yes
OIS	No	No	Yes	Yes
Opt. Axis Adjustment	No	No	No	Yes
Lens Control Interface	Analog	Serial	Serial	Serial
Control Zoom	Speed	Speed+Position	Speed+Position	Speed+Position
Control Focus	Speed	Speed+Position	Speed+Position	Speed+Position
Control Iris	Auto (DC)+Speed	Auto (DC)+Position	Auto (DC)+Position	Auto (DC)+Position
Potentiometer Zoom	Yes	Yes	Yes	Yes
Potentiometer Focus	Yes	Yes	Yes	Yes
Potentiometer Iris	No	Yes	Yes	Yes
Day&Night	Yes – IR Correction			
Back Focal Distance	24.85 mm			
Flange Focal Length	17.526 mm			
Exit Pupil Position	-448.80 mm from image plane			
Filter Thread	M112x0.75 mm			
Size (HxWxL)	137 x 154 x 377 mm			
Weight	~ 6.5 kg			
Operating Temp.	0°C ~ +50°C			

Additional Models are available:

**D60x16.7SR4GE-V21:** Same specification as D60x16.7SR4DE-V21, but with IR-Cut Filter instead of ND filter

**D60x16.7SR4DE-V23S:** Same specification as D60x16.7SR4DE-V21, but with strengthened bottom plate and optical axis adjustment function

## HD60x16.7R4 Series



All of the quality benefits thanks to the same optical and mechanical specifications incorporated in the High-End D60x16.7SR4A series, but without the 2x extender, ND Filters or serial interface to control from PC for the best price-performance ratio.



Technical data	HD60x16.7R4J-V21	HD60x16.7R4J-OIS	HD60x16.7R4J-OIS-A
Sensor Size (max.)		1/1.8"	
Resolution		2 Megapixel / Full HD	
Focal Length (1x)		16.7 ~ 1000 mm	
Focal Length (2x)		–	
Zoom Ratio		60x	
2x Extender		No	
Mount		C	
Iris Range (1x)		F3.5 ~ F16	
Iris Range (2x)		–	
Max. Relative Aperture		1:3.5	
MOD		5 m	
ND Filter		No	
VLC Filter		Yes	
Autofocus	No	No	Yes
OIS	No	Yes	Yes
Opt. Axis Adjustment		No	
Lens Control Interface		Analog	
Control Zoom		Speed	
Control Focus		Speed	
Control Iris		Auto (DC)+Speed	
Potentiometer Zoom		Yes	
Potentiometer Focus		Yes	
Potentiometer Iris		No	
Day&Night		Yes – IR Correction	
Back Focal Distance		24.85 mm	
Flange Focal Length		17.526 mm	
Exit Pupil Position		-448.80 mm from image plane	
Filter Thread		M112x0.75 mm	
Size (HxWxL)		137 x 154 x 377 mm	
Weight		~ 6.5 kg	
Operating Temp.		0°C ~ +50°C	

## Comparison of specification

All D60x16.7 and HD60x16.7 models have the same optical design (focal length, resolution, sensor size, day/night function, MOD, visible light cut filter). The mechanical design of both lens series remains unchanged as well (outer dimension, weight, mount, filter thread).

The differences between D60x16.7 and HD60x16.7 are as follows:

Model Name	Interface	2x Extender	ND Filter	OIS	Autofocus	Axis Adjust.
D60x16.7SR4DE-V21	Analog	✓	✓	X	X	X
D60x16.7SR4GE-V21	Analog	✓	X (IR-Cut)	X	X	X
D60x16.7SR4DE-V23S	Analog	✓	✓	X	X	✓
D60x16.7SR4DE-ZP1A	Serial	✓	✓	X	✓	X
D60x16.7SR4FE-ZP1C	Serial	✓	✓	✓	✓	X
D60x16.7SR4FE-ZP3C	Serial	✓	✓	✓	✓	✓
HD60x16.7R4J-V21	Analog	X	X	X	X	X
HD60x16.7R4J-OIS	Analog	X	X	✓	X	X
HD60x16.7R4J-OIS-A	Analog	X	X	✓	✓	X



### Accessories: HE12-1 – Format Converter to 2/3" sensors



The Format Converter Lens attached to D60x16.7SR4

All Fujinon 60x zoom lens models can be equipped with the converter lens HE12-1 to make the lenses applicable to 2/3" sensors. When fitted with the adapter lens, the focal length range changes from 16.7~1000mm to 20~1200mm on a 2/3" camera. With the built-in 2x extender, the focal length goes up to 2400mm to clearly capture movements of people at a distance of up to 4km.

### Technical specification of the 60x zooms in combination with HE12-1 and a 2/3" camera sensor:

Model Name		D60x16.7 / HD60x16.7 with HE12-1	D60x16.7 / HD60x16.7
Sensor Size		2/3"	1/1.8"
Resolution		2 Megapixel / Full HD	
Focal length (1x)		20 ~ 1200 mm	16.7 ~ 1000 mm
Focal length (2x)*		40 ~ 2400 mm	33.4 ~ 2000 mm
Zoom Ratio		60x	
Mount		C	
Iris Range		F4.2 ~ F19.2	F3.5 ~ F16
MOD		5 m	
Angle of View (H x V)	4:3	Wide	23.03° x 17.67°
		Tele	0.42° x 0.32°
	16:9	Wide	24.87° x 14.57°
		Tele	0.45° x 0.25°
Size (HxWxL)		137 x 154 x 382 mm	137 x 154 x 377 mm
Weight		~ 6.6 kg	~ 6.5 kg

\*only for D60x16.7

## 32x Zooms

FD32x12.5SR4A-CV1  
FH32x15.6SR4A-CV1



The Fujinon 32x zoom lenses provide Full HD / 2 Megapixel image quality across the entire zoom range, with maximum focal lengths of up to 400mm (FD32x12.5SR4A) and 500mm (FH32x15.6SR4A). To respond to increasing market demands for colour images even in low light, the lenses are designed for large sensor sizes of 1/1.8" and 2/3". The built-in visible light cut filter enables reliable performance even in fog, rain and snow.



Technical data	FD32x12.5SR4A-CV1	FH32x15.6SR4A-CV1
Sensor Size (max.)	1/1.8"	2/3"
Resolution	2 Megapixel / Full HD	
Focal Length	12.5 ~ 400 mm	15.6 ~ 500 mm
Zoom Ratio	32x	
Mount	C	
Iris Range	F3.1 ~ F16	F3.9 ~ F16
Max. Relative Aperture	1:3.1	1:3.9
MOD	3 m	
VLC Filter	Yes	
Lens Control Interface	Analog + Serial	
Control Zoom	Speed	
Control Focus	Speed	
Control Iris	Auto (Video/DC)+Position	
Potentiometer Zoom	Yes	
Potentiometer Focus	Yes	
Potentiometer Iris	No	
Day&Night	Yes – IR Correction	
Opt. Axis Adjustment	Yes (optionally with AA-1)	
Back Focal Distance	22.3 mm	9.3 mm
Flange Focal Length	17.526 mm	
Exit Pupil Position	-99 mm from image plane	-52 mm from image plane
Filter Thread	M82x07.5mm	
Size (HxWxL)	108 x 114 x 258 mm	108 x 114 x 263 mm
Weight	~ 2.8 kg	~ 2.9 kg
Operating Temp.	-10°C ~ +50°C	

## More convenient installation and easy handling

- ▶ Small size: with a height of 108 mm and a length of max. 263 mm the lenses achieve compatibility with a great range of security camera housings
- ▶ Control panels on top of the lens body enable direct access to adjustment functions: easy handling during and even after the installation into a housing
- ▶ Higher installation stability due to additional affixing holes: the lenses have a total of eight sockets, i.e. one for fitting a regular tripod and seven M5 sockets at the base
- ▶ Improved back focus adjustment for simple handling during set-up: the flange focal distance needs to be adjusted for individual camera-lens combinations in order to match the focal point between the camera and the lens. The FD32x12.5 and FH32x15.6 lenses allow users to easily and finely adjust the flange focal distance on the lens, using readily-available hex wrenches
- ▶ Compatibility with various interfaces: analogue control for zoom, focus and iris is supported as well as serial control via RS232C interface for operation by PC. In addition, the lenses support the widely used Pelco-D protocol.



### Accessories: Optical Axis Adjustment Kit AA-1



In some combinations of long zoom lenses and cameras using C-Mount, a subject matter at the center occasionally shifts from that position when zoomed in. This is because of minor individual variations with the position of the camera's sensor and the optical axis of the lens. To prevent this, it is necessary to align the optical axis of camera and lens at the time of installation. The optical axis adjustment mechanism "AA-1" can be fitted to the lens side to fine-tune the optical axis with a screw on the mount. AA-1 is available as an optional accessory and has to be ordered separately.



**FUJIFILM Optical Devices Europe GmbH**

Fujistr. 1, 47533 Kleve, Germany  
Tel: +49 (0) 2821 / 7115-400, Fax: +49 (0) 2821 / 7115-200  
E-mail: [cctv\\_eu@fujifilm.com](mailto:cctv_eu@fujifilm.com)  
<http://www.fujifilm.eu/fujinon>