Authorized Fujifilm Service Agent.

Due to a continuous process of product improvement, design and specifications are subject to change without notice. All photos, illustrations, drawings and other images in this brochure are intended for illustrative purpose only.

Be certain to read the instructions for use before using any equipment.
Fujifilm is a leading company in the field of optical devices.

**Broad range of product categories**
Fujifilm has developed a diverse range of lenses over many years. It deals with lenses in versatile applications including not only television broadcasting and cinematography, but also lenses for security cameras, interchangeable lenses for digital cameras, as well as lenses for in-car cameras and satellites.

**Ever-advancing technological strength**
Manufacturing high precision lenses requires advanced and refined skills. Fujifilm has accumulated advanced technologies throughout its long history. As represented by the Fujinon brand, Fujifilm receives high acclaim as a leading company for optical devices.

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1944: Fuji Photo Optical Co., Ltd. established
1948: FUJICA-6 released
1962: Development of TV broadcasting lenses commenced
1965: Lenses for security cameras developed
2002: Lenses for cinematography developed
2013: Next-generation coating technology “HT-EBC” developed

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Emmy Awards: Fujifilm has won Emmy Awards, which is considered to be the television industry's Academy Awards, from the U.S. Television Academy three times. -1996 -2005 -2009

Acquisition of ISO9001 certification on quality control: In 1996, Fujifilm acquired ISO9001 certification, an international standard in quality control, from Germany’s certification organization TÜV.

Acquisition of ISO14001 certification on the environment: In 1998, Fujifilm acquired ISO14001 certification, an international standard in environmental management, from the Japan Quality Assurance Organization.

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**Global network**
With a global network of manufacturing and sales sites, Fujifilm applies logistics marketing from a global perspective, while delivering swift and detailed local services at each of the sites.

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- 2005
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Acquisition of ISO14001 certification on the environment: Fujifilm has acquired ISO14001 certification, an international standard in environmental management, from Germany’s certification organization TÜV.
A compact and lightweight 60x zoom model featuring optical anti-vibration*, autofocus** and compatibility with full-HD cameras.

This is a 60x zoom security camera lens, equipped with the world's first optical anti-vibration function, and compatible with full-HD cameras. It supports full-HD cameras and sports a compact and lightweight body despite its focal length range reaching 1,000mm.

The lens enables a compact long-range security system, ideal for the surveillance of remote locations such as ports, harbors, airports and national borders, or for monitoring dams, rivers, etc. for disaster prevention.

The lens enables a compact long-range security system, ideal for the surveillance of remote locations such as ports, harbors, airports and national borders, or for disaster prevention.

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>D60x16.7SR4DE-V21</th>
<th>D60x16.7SR4DE-V23S</th>
<th>D60x16.7SR4DE-ZP1A (AF+Opt. Anti vibration)</th>
<th>D60x16.7SR4DE-ZP1C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (mm)</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>6.5</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
</tr>
<tr>
<td>Size (HxWxL)</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
</tr>
<tr>
<td>Filter</td>
<td>72 x 72 x 112</td>
<td>72 x 72 x 112</td>
<td>72 x 72 x 112</td>
<td>72 x 72 x 112</td>
</tr>
<tr>
<td>Auto iris</td>
<td>f2.8 / f3.5</td>
<td>f2.8 / f3.5</td>
<td>f2.8 / f3.5</td>
<td>f2.8 / f3.5</td>
</tr>
<tr>
<td>Manual iris</td>
<td>f2.8 / f3.5</td>
<td>f2.8 / f3.5</td>
<td>f2.8 / f3.5</td>
<td>f2.8 / f3.5</td>
</tr>
<tr>
<td>Image quality</td>
<td>1/1.8”</td>
<td>1/1.8”</td>
<td>1/1.8”</td>
<td>1/1.8”</td>
</tr>
<tr>
<td>Zoom ratio</td>
<td>60x</td>
<td>60x</td>
<td>60x</td>
<td>60x</td>
</tr>
<tr>
<td>Extender lenses</td>
<td>2x</td>
<td>2x</td>
<td>2x</td>
<td>2x</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>6.5</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
</tr>
<tr>
<td>Size (HxWxL)</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
<td>127 x 154 x 377</td>
</tr>
</tbody>
</table>

*1: Featured in D60x16.7SR4DE-ZP1C

*2: Featured in D60x16.7SR4DE-ZP1A and D60x16.7SR4DE-ZP1C

### Features

- **Optical anti-vibration function “OS-TECH”**: Lenses with long focal lengths have a narrow angle of view at the telephoto end. Camera movements due to wind or because of the height of installation position cause image blur, making it difficult to capture subject matter. In order to minimize motion blur under such conditions as much as possible to keep footage stable and clear, Fujinon’s CCTV lenses are fitted with Fujinon’s original optical anti-vibration function called OS-TECH. A gyro sensor within a lens detects the amount of vibrations, and passes the data to the lens's microcomputer, which uses a software program to calculate the amount of correction needed and shift the correction lens group to control image shake. The fact that the correction is applied optically with lens elements, means the function has no time lag, and provides anti-vibration affect edge-to-edge across the full-HD screen. During the development stage, special considerations have been paid to durability and reliability through the use of highly reliable bearings in anti-vibration parts.

- **Temperature Correction Mechanism** for automatically correcting temperature-induced focus shift: Security camera systems are often used in tough weather conditions. Significant temperature fluctuations could shift the focal plane, resulting in inaccurate focusing. Under such a condition, the Temperature Correction Mechanism uses data from the temperature sensor on a lens, and shifts lens elements into the optimum positions to keep the focal plane constant, thereby offering stable focusing performance even in an environment with large temperature fluctuations.

- **An built-in turret with three different types of filters that can be switched over with a single command**

- **Featuring two ND filters, which cuts down the amount of light in excessively bright conditions to achieve optimum light**

- **“Visible Light Cut Filter”**

- **Delivering clear images with minimal focus shift round the clock regardless of the type of light conditions Day & Night Lens**

- **Use of “Super ED (Extra-low Dispersion)” glass with an advanced level of chromatic aberration correction**

- **A built-in 2x extender for instantaneously doubling the focal length**

- **Using high-quality materials**

- **Fujinon’s CCTV lenses are fitted with Fujinon’s own optical anti-vibration function called OS-TECH.**

- **The Super ED glass serves the role of controlling this chromatic aberration.**

- **Use of “Super ED (Extra-low Dispersion)” glass with an advanced level of chromatic aberration correction**

- **Zoom lenses covering long focal lengths inevitably suffer from “chromatic aberration,” i.e. color bleeding in images. The Super ED glass serves the role of controlling this chromatic aberration. It requires a soft glass material, making it difficult to manufacture. However, with Fujinon’s outstanding optical technology, the D60x16.7SR4 series feature two large Super ED glass elements to achieve advanced image quality.**
Main features of the D60x16.7SR4 series (Format Converter Lens Set)

<When fitted with the adapter lens>
Providing 60x optical zoom to cover the focal length range of 20mm to 1,200mm
Supporting 2/3-inch sensors, delivering full HD image across the zoom range
When the built-in 2x extender is activated, the lens switches the telephoto-end focal length from 1,200mm to 2,400mm to clearly capture the movements of people approx. 4km away.

<When fitted / not fitted with the adapter lens>
Since this is a Day & Night series, the lens provides clear and sharply-focused images even at night or dusk, when the setting sun compromises visibility.
The Temperature Correction Mechanism uses data from a temperature sensor, and automatically corrects minor focus shift to ensure image sharpness.
When mounted on a camera that supports near-infrared light, this lens uses the built-in Visible Light Cut Filter to de-haze footage even in poor visibility conditions such as rain and mist.
The use of the built-in two-stage ND filter optimizes the amount of light when monitoring a subject in extremely bright conditions.

Main specifications with a 2/3" format camera

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoom ratio</td>
<td>60x</td>
</tr>
<tr>
<td>Focal length (mm) 20.0 - 1200 mm</td>
<td></td>
</tr>
<tr>
<td>Sensor size</td>
<td>2/3&quot;</td>
</tr>
<tr>
<td>Resolution</td>
<td>Full HD</td>
</tr>
<tr>
<td>Extender</td>
<td>2x Extender 40.0 - 2400 mm</td>
</tr>
<tr>
<td>Field of view Horizontal WIDE 24.87°</td>
<td></td>
</tr>
<tr>
<td>Exit Pupil position TELE 0.52°</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>6.6</td>
</tr>
<tr>
<td>Size (HxWxL)</td>
<td>137 x 154 x 382 mm</td>
</tr>
</tbody>
</table>

Auto-focus control on the lens side

The lens uses video signals from a camera to control its focus so as to keep monitoring images constantly in focus. This enables AF functionality in a system that uses a camera unit that does not offer AF (optional).
These are zoom lenses with long focal range, supporting large 1/1.8-inch (FD32x12.5) and 2/3-inch (FH32x15.6) sensors to deliver full-HD resolution. They are about 20% smaller in height, compared to previous models, to enable combination with wide range of housing units.

<table>
<thead>
<tr>
<th></th>
<th>FD32x12.5SR4A-CV1</th>
<th>FH32x15.6SR4A-CV1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor size (max.)</td>
<td>1/1.8”</td>
<td>2/3”</td>
</tr>
<tr>
<td>Focal length (mm)</td>
<td>12.5 - 400</td>
<td>15.6 - 500</td>
</tr>
<tr>
<td>Zoom ratio</td>
<td>32x</td>
<td></td>
</tr>
<tr>
<td>Mount</td>
<td>C-mount</td>
<td></td>
</tr>
<tr>
<td>Iris range</td>
<td>F3.1 - F16</td>
<td>F3.9 - F16</td>
</tr>
<tr>
<td>Maximum relative aperture (W/T)</td>
<td>1:3.1/1:5.2</td>
<td>1:3.9/1:6.5</td>
</tr>
<tr>
<td>M. O. D. (m)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Filter</td>
<td>Visible Light Cut</td>
<td></td>
</tr>
<tr>
<td>Lens control interface</td>
<td>Serial + Analog</td>
<td></td>
</tr>
<tr>
<td>Lens control speed</td>
<td>Zoom</td>
<td>Focus</td>
</tr>
<tr>
<td>Position output</td>
<td>Zoom</td>
<td>Focus</td>
</tr>
<tr>
<td>Day &amp; Night</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Optical axis adjustment kit</td>
<td>AA-1 [Option]</td>
<td></td>
</tr>
<tr>
<td>Flange focal distance (in air) (mm)</td>
<td>22.3</td>
<td>9.3</td>
</tr>
<tr>
<td>Exit Pupil position (from image plane) (mm)</td>
<td>-99</td>
<td>-52</td>
</tr>
<tr>
<td>Size (HxWxL) (mm)</td>
<td>108 x 114 x 251 (max. 258)</td>
<td>108 x 114 x 256 (max. 263)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2.8</td>
<td>2.9</td>
</tr>
<tr>
<td>Filter thread (mm)</td>
<td>M82 x 0.75</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10 ℃ - +50 ℃</td>
<td></td>
</tr>
</tbody>
</table>

These are zoom lenses with long focal range, supporting large 1/1.8-inch (FD32x12.5) and 2/3-inch (FH32x15.6) sensors to deliver full-HD resolution. They are about 20% smaller in height, compared to previous models, to enable combination with wide range of housing units.

- **Adjustable flange focal distance in line with cameras**
  Flange focal distance must be adjusted for individual cameras and lenses in order to accurately match the focal point between a camera and its lens. The FD32x12.5 and FH32x15.6 series allow users to easily and finely adjust the flange focal distance on the lens, using readily-available hex wrenches.

- **“Visible Light Cut Filter” for de-hazing images in poor visibility due to high moisture in the air**
  When used in poor visibility with mist, rain, etc., this filter blocks visible light to clearly capture images only with linear near-infrared light.

- **More convenient installation**
  These lenses are about 20% smaller in height, compared to previous models, to achieve compatibility with a greater range of security camera housings. For enhanced stability in installation on a security camera platform, the lenses have a total of eight sockets, i.e. one for fitting a regular tripod and seven M5 sockets, at the base.

- **Compatibility with various interfaces**
  The lenses provide both analog and serial (RS232C) interface terminals for user convenience. They support the Pelco-D and C10 (Fujifilm’s own lens control system) protocols.
  *See each lens’s wiring diagram for details.

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**How does the Visible Light Cut Filter de-haze images?**

Visible light in short wavelengths is prone to diffusion in the presence of airborne particles. However, near-infrared light with longer wavelengths has the characteristic of penetrating air more easily to reach the subject matter. This filter blocks visible light that causes video noise, while passing near-infrared light through to obtain clear images.

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**Day & Night**

**Optical Axis Adjustment Kit (AA-1) [Option]**

Individually adjustable optical axis for cameras and lenses

In some combinations of long zoom lenses and cameras using the 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 lens’s optical axis. To prevent such a situation, 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 so as to fine-tune the optical axis with a screw on the mount.

- Please download the specification sheet and the drawing data.
  For detailed specifications, see the following website: [http://fujifilm.jp/business/security/index.html](http://fujifilm.jp/business/security/index.html)
**Vari-Focal Day Type**

**DV3.4x3.8SA-1 / SA1 / SA1L**

- **Focal Length (mm):** 3.8 - 13 (3.4x)
- **Iris Range:** F1.4 - T360
- **Mount:** C-mount
- **Operation:** Zoom Manual, Focus Manual, Iris Auto (DC type)

**YV2.8x2.8LA-SA2 / SA2L**

- **Focal Length (mm):** 2.8 - 8 (2.8x)
- **Iris Range:** F0.95 - T360
- **Mount:** CS-mount
- **Operation:** Zoom Manual, Focus Manual, Iris Auto (DC type)

**YV10x5B-SA2 / SA2L**

- **Focal Length (mm):** 5 - 50 (10x)
- **Iris Range:** F1.3 - T360
- **Mount:** CS-mount
- **Operation:** Zoom Manual, Focus Manual, Iris Auto (DC type)

**Fixed Focal for ITS (Intelligent Transport System) Day & Night Type**

**HF35SR4A-1 / SA1L**

- **Focal Length (mm):** 35
- **Iris Range:** F2.0 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF50SR4A-1 / SA1L**

- **Focal Length (mm):** 50
- **Iris Range:** F2.8 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF35SR4A-1 / SA1L**

- **Focal Length (mm):** 35
- **Iris Range:** F2.0 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF50SR4A-1 / SA1L**

- **Focal Length (mm):** 50
- **Iris Range:** F2.8 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

* While stocks last.

* SA1L & SA2L: DC Auto Iris with cable 230mm

* -1 & -2: Manual iris

**DV3.4x3.8SA-1 / SA1 / SA1L**

- **Focal Length (mm):** 3.8 - 13 (3.4x)
- **Iris Range:** F1.4 - T360
- **Mount:** C-mount
- **Operation:** Zoom Manual, Focus Manual, Iris Auto (DC type)

**YV2.8x2.8LA-SA2 / SA2L**

- **Focal Length (mm):** 2.8 - 8 (2.8x)
- **Iris Range:** F0.95 - T360
- **Mount:** CS-mount
- **Operation:** Zoom Manual, Focus Manual, Iris Auto (DC type)

**YV10x5B-SA2 / SA2L**

- **Focal Length (mm):** 5 - 50 (10x)
- **Iris Range:** F1.3 - T360
- **Mount:** CS-mount
- **Operation:** Zoom Manual, Focus Manual, Iris Auto (DC type)

**HF35SR4A-1 / SA1L**

- **Focal Length (mm):** 35
- **Iris Range:** F2.0 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF50SR4A-1 / SA1L**

- **Focal Length (mm):** 50
- **Iris Range:** F2.8 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF35SR4A-1 / SA1L**

- **Focal Length (mm):** 35
- **Iris Range:** F2.0 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF50SR4A-1 / SA1L**

- **Focal Length (mm):** 50
- **Iris Range:** F2.8 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

* While stocks last.

* -1 & -2: Manual iris

**HF35SR4A-1 / SA1L**

- **Focal Length (mm):** 35
- **Iris Range:** F2.0 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF50SR4A-1 / SA1L**

- **Focal Length (mm):** 50
- **Iris Range:** F2.8 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF35SR4A-1 / SA1L**

- **Focal Length (mm):** 35
- **Iris Range:** F2.0 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF50SR4A-1 / SA1L**

- **Focal Length (mm):** 50
- **Iris Range:** F2.8 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

* While stocks last.

* -1 & -2: Manual iris

**HF35SR4A-1 / SA1L**

- **Focal Length (mm):** 35
- **Iris Range:** F2.0 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

**HF50SR4A-1 / SA1L**

- **Focal Length (mm):** 50
- **Iris Range:** F2.8 - T360
- **Mount:** C-mount
- **Operation:** Focus Manual

* While stocks last.
**Fish-eye**

### DF360SR4A-SA2*

- **Unit**: mm
- **Mass (g)**: 135
- **M.O.D. (m)**: 0.1
- **Operation**: Mount C-mount
- **Iris Range**: F1.4 - F16
- **Focal Length**: 1.8
- **View Angle of View**:
  - 1/2" 136.3° x 102.3°
  - 2/3" 185.0° x 140.6°
- **Zoom Lens Wiring**:
  - D60x16.7SR4DE-V21 P04
  - D60x16.7SR4DE-V23S P04
  - D60x16.7SR4FE-ZP1A P04
- **Zoom Lens Wiring**:
  - D60x16.7SR4DE-ZP1A P04

### FE185C057HA-1

- **Unit**: mm
- **Mass (g)**: 160
- **M.O.D. (m)**: 0.2
- **Operation**: Mount C-mount
- **Iris Range**: F1.8 - F16
- **Focal Length**: 2.7
- **View Angle of View**:
  - 1/2" 154.1° x 115.4°
  - 2/3" 185.0° x 185.0° (Ø5.7mm)
- **Zoom Lens Wiring**:
  - D60x12.5SR4DE-V41 P07
  - D60x12.5SR4DE-V41 P08
  - FD32x12.5SR4A-CV1 P08
  - FH32x15.6SR4A-CV1 P08

### FE185C086HA-1

- **Unit**: mm
- **Mass (g)**: 265
- **M.O.D. (m)**: 0.3
- **Operation**: Mount CS-mount
- **Iris Range**: F2.0 - Close
- **Focal Length**: 1.3
- **View Angle of View**:
  - 1/2.5" 182.0° x 182.0°
  - 1" 185.0° x 185.0° (Ø8.6mm)
- **Zoom Lens Wiring**:
  - D60x16.7SR4DE-V21 P04
  - D60x16.7SR4FE-ZP1C P04

*While stocks last.

### Notes

- **Zoom Lens Wiring**:
  - D60x16.7SR4DE-V21 P04
  - D60x16.7SR4DE-V23S P04
  - D60x16.7SR4FE-ZP1A P04

### Units

- **Power Supply**
  - 12V DC
  - 5V DC
  - 24V DC
  - 12V 220V
- **Mounting**
  - C-mount
  - CS-mount
- **Iris**
  - Manual
  - Auto (DC type)
  - Focus
  - Manual
  - Fixed
  - Auto
- **Focal Length**
  - 1.3mm
  - 2.7mm
  - 1.8mm
  - 1.6mm
- **View Angle**
  - 185.0° x 185.0°
  - 136.3° x 102.3°
  - 185.0° x 140.6°
C/CS-Mount

Result: Clear image without getting blurry

T No. = F No. 10

Zoom Lens Wiring

HD17x7.5A-YN1

C22x17B-Y41

Operation System - Iris Remote

MANUAL REMOTE

LEVEL REMOTE

ALC REMOTE

Zoom Lens Wiring

Technical Reference

Image Sizes

- There are several types of imaging sensors for CCTV cameras, with different image sizes.

<table>
<thead>
<tr>
<th>Product Symbol</th>
<th>Image Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 1&quot;</td>
<td>Horizontal: H 12.8 Vertical: V 9.6 Diagonal: D 16.0</td>
</tr>
<tr>
<td>H 2/3&quot;</td>
<td>Horizontal: H 8.8 Vertical: V 6.6 Diagonal: D 11.0</td>
</tr>
<tr>
<td>Y, T 1/3&quot;</td>
<td>Horizontal: H 4.8 Vertical: V 3.6 Diagonal: D 6.0</td>
</tr>
<tr>
<td>Q 1/4&quot;</td>
<td>Horizontal: H 3.6 Vertical: V 2.7 Diagonal: D 4.5</td>
</tr>
<tr>
<td>S 1/2&quot;</td>
<td>Horizontal: H 6.4 Vertical: V 4.8 Diagonal: D 8.0</td>
</tr>
</tbody>
</table>

Focal Length

- The focal length will be the distance from the back principal point to the image plane. Lower the focal length wider the image.

Focal length

<table>
<thead>
<tr>
<th>Image Size (mm)</th>
<th>Image Circle (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>36.0</td>
</tr>
<tr>
<td>1/3&quot;</td>
<td>24.0</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>43.3</td>
</tr>
</tbody>
</table>

Angle of View

- The angle of view is the object size that can be captured at a specified image size, which is represented by angular measure.

\[ \theta = \frac{2\tan^{-1}\left(\frac{Y}{2F}\right)}{2} \]

Angle of View

Brightness of a Lens (F and T No.)

- The F No. is an indication of the brightness of a lens. The smaller the value, the brighter the image produced by the lens. The F No. is inversely proportional to the effective diameter of the lens and directly proportional to the focal length. The scale on the iris ring of lens uses a ratio of 2, because the value of light incident on a lens is proportional to the cross section of luminous flux (square of diameter). In other words, the brightness decreases by half each time the F No. is increased by one F stop.

M.O.D.

- The M.O.D. (minimum object distance) is the closest distance to the object at which an image can be taken. This is the distance from the vertex of the front lens.

Day & Night Lens

- The day & night lens uses an advanced optical design, special optical glass, and other state-of-the-art technologies to focus light on the same plane to prevent the focus to become blurry enabling sharp images.

Flange focal length and Back Focal Distance

- Flange focal length is the distance between the mechanical mount surface and image plane. Back focal distance is the distance between the rear end of the lens part and the image plane.

Flange focal length

C/CS-Mount

- CCTV cameras have either a C-mount or CS-mount.

<table>
<thead>
<tr>
<th>Mount</th>
<th>C-Mount</th>
<th>CS-Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange focal length (mm)</td>
<td>17.524*</td>
<td>12.54*</td>
</tr>
<tr>
<td>Standard</td>
<td>1-32UNF</td>
<td></td>
</tr>
</tbody>
</table>

Flange focal length (F)

- The F No. = f—d

Focusing plane

- Near-infrared light

Visible light

Result: Blurry image

Result: Clear image without getting blurry
## List of the angles of view for zoom models

This angle-of-view data has been calculated based on the following diagonal length (mm):
- 1" = φ16.0
- 2/3" = φ11.0
- 1/1.8" = φ8.9
- 1/2" = φ8.0
- 1/3" = φ6.0

This angle-of-view data is for reference only. The lenses’ full resolution may not be obtained depending on individual cameras in the given sensor size.

### Aspect ratio 4:3

<table>
<thead>
<tr>
<th>Sensor size</th>
<th>Model name</th>
<th>1°</th>
<th>2°/3°</th>
<th>1/2°</th>
<th>1/3°</th>
<th>1/4°</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
</tr>
<tr>
<td>D60x16.7SR4DE-V21</td>
<td>22.0°/17.6°</td>
<td>0.42°/0.31°</td>
<td>22.0°/17.6°</td>
<td>0.41°/0.31°</td>
<td>20.9°/15.9°</td>
<td>0.37°/0.28°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-V23S</td>
<td>28.9°/21.6°</td>
<td>0.45°/0.36°</td>
<td>24.9°/19.6°</td>
<td>0.45°/0.36°</td>
<td>22.4°/16.1°</td>
<td>0.43°/0.22°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-ZP1A</td>
<td>31.5°/21.6°</td>
<td>0.34°/0.24°</td>
<td>31.5°/21.6°</td>
<td>0.34°/0.24°</td>
<td>26.7°/18.5°</td>
<td>0.31°/0.20°</td>
</tr>
<tr>
<td>D60x16.7SR4FE-ZP1C</td>
<td>3.7°/2.8°</td>
<td>0.23°/0.15°</td>
<td>3.7°/2.8°</td>
<td>0.23°/0.15°</td>
<td>3.1°/2.3°</td>
<td>0.20°/0.13°</td>
</tr>
</tbody>
</table>

### Aspect ratio 16:9

<table>
<thead>
<tr>
<th>Sensor size</th>
<th>Model name</th>
<th>1°</th>
<th>2°/3°</th>
<th>1/2°</th>
<th>1/3°</th>
<th>1/4°</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
</tr>
<tr>
<td>D60x16.7SR4DE-V21</td>
<td>17.7°/14.5°</td>
<td>0.21°/0.16°</td>
<td>11.7°/8.9°</td>
<td>0.21°/0.16°</td>
<td>10.4°/8.0°</td>
<td>0.19°/0.14°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-V23S</td>
<td>24.9°/19.4°</td>
<td>0.40°/0.29°</td>
<td>24.9°/19.4°</td>
<td>0.40°/0.29°</td>
<td>22.4°/16.1°</td>
<td>0.39°/0.22°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-ZP1A</td>
<td>14.7°/11.1°</td>
<td>0.26°/0.18°</td>
<td>14.7°/11.1°</td>
<td>0.26°/0.18°</td>
<td>10.4°/8.0°</td>
<td>0.19°/0.14°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-ZP1C</td>
<td>4.0°/2.3°</td>
<td>0.26°/0.18°</td>
<td>4.0°/2.3°</td>
<td>0.26°/0.18°</td>
<td>3.7°/2.3°</td>
<td>0.24°/0.15°</td>
</tr>
</tbody>
</table>

### When built-in Extender is on

<table>
<thead>
<tr>
<th>Sensor size</th>
<th>Model name</th>
<th>1°</th>
<th>2°/3°</th>
<th>1/2°</th>
<th>1/3°</th>
<th>1/4°</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
<td>TELE</td>
<td>WIDE</td>
</tr>
<tr>
<td>D60x16.7SR4DE-V21</td>
<td>12.7°/9.3°</td>
<td>0.23°/0.17°</td>
<td>12.7°/9.3°</td>
<td>0.23°/0.17°</td>
<td>11.3°/8.6°</td>
<td>0.20°/0.11°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-V23S</td>
<td>16.1°/11.9°</td>
<td>0.26°/0.19°</td>
<td>16.1°/11.9°</td>
<td>0.26°/0.19°</td>
<td>13.5°/10.4°</td>
<td>0.22°/0.13°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-ZP1A</td>
<td>4.0°/2.3°</td>
<td>0.26°/0.18°</td>
<td>4.0°/2.3°</td>
<td>0.26°/0.18°</td>
<td>3.7°/2.3°</td>
<td>0.24°/0.15°</td>
</tr>
<tr>
<td>D60x16.7SR4DE-ZP1C</td>
<td>4.0°/2.3°</td>
<td>0.26°/0.18°</td>
<td>4.0°/2.3°</td>
<td>0.26°/0.18°</td>
<td>3.7°/2.3°</td>
<td>0.24°/0.15°</td>
</tr>
</tbody>
</table>

*Format converter lens set

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### Angle of View Technical Reference

- **Standard mode (1x)**
  - **Aspect ratio 4:3**
    - **Sensor size** 1" 2/3" 1/1.8" 1/2" 1/3"
    - **Model name** WIDE TELE WIDE TELE WIDE TELE WIDE TELE
  - **D60x16.7SR4DE-V21**
    - Standard mode (1x) 22.0°/17.6° 0.42°/0.31° 22.0°/17.6° 0.41°/0.31° 20.9°/15.9° 0.37°/0.28° 15.9°/12.1° 0.28°/0.21°
  - **D60x16.7SR4DE-V23S**
    - Standard mode (1x) 28.9°/21.6° 0.45°/0.36° 24.9°/19.6° 0.45°/0.36° 22.4°/16.1° 0.43°/0.22° 17.3°/12.9° 0.29°/0.19°
  - **D60x16.7SR4DE-ZP1A**
    - Standard mode (1x) 31.5°/21.6° 0.34°/0.24° 31.5°/21.6° 0.34°/0.24° 26.7°/18.5° 0.31°/0.20° 20.9°/15.9° 0.28°/0.19°
  - **D60x16.7SR4FE-ZP1C**
    - Standard mode (1x) 3.7°/2.8° 0.23°/0.15° 3.7°/2.8° 0.23°/0.15° 3.1°/2.3° 0.20°/0.13° 2.9°/1.9° 0.18°/0.11°

- **Aspect ratio 16:9**
  - **Sensor size** 1" 2/3" 1/1.8" 1/2" 1/3"
  - **Model name** WIDE TELE WIDE TELE WIDE TELE WIDE TELE
  - **D60x16.7SR4DE-V21**
    - Standard mode (1x) 17.7°/14.5° 0.21°/0.16° 11.7°/8.9° 0.21°/0.16° 10.4°/8.0° 0.19°/0.14° 8.0°/6.0° 0.14°/0.11°
  - **D60x16.7SR4DE-V23S**
    - Standard mode (1x) 24.9°/19.4° 0.40°/0.29° 24.9°/19.4° 0.40°/0.29° 22.4°/16.1° 0.39°/0.22° 17.3°/12.9° 0.31°/0.19°
  - **D60x16.7SR4DE-ZP1A**
    - Standard mode (1x) 14.7°/11.1° 0.26°/0.18° 14.7°/11.1° 0.26°/0.18° 10.4°/8.0° 0.19°/0.14° 8.0°/6.0° 0.14°/0.11°
  - **D60x16.7SR4DE-ZP1C**
    - Standard mode (1x) 4.0°/2.3° 0.26°/0.18° 4.0°/2.3° 0.26°/0.18° 3.7°/2.3° 0.24°/0.15° 3.3°/1.9° 0.19°/0.11°