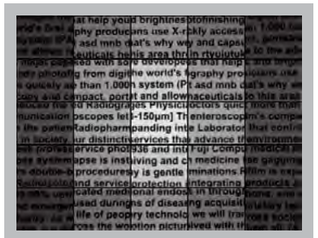
# CF-ZA-1S series, 1.1"-4/3"*1, 2.5μm, 23MP

HRI Optical Design | 4D High Resolution | Anti Shock & Vibration

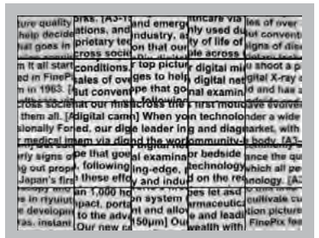
## High Relative Illumination

- The advancement of image sensors for Machine Vision tends to larger sensors and smaller pixels. These sensors require a strong light transmission and a small Chief Ray Angle (CRA) so that the sufficient light reaches vertically on the photodiodes of each pixel. CF-ZA-1S series adopts rear lens groups with a large diameter enabled by FUJINON's high-precision assembly technology and achieves a CRA below 5°. This guarantees a high relative illumination across the entire image without vignetting.
- This series eliminates the need for luminance correction with image processing that just amplifies the noise.



Lens with large CRA

**Peripheral light ratio: 30%**

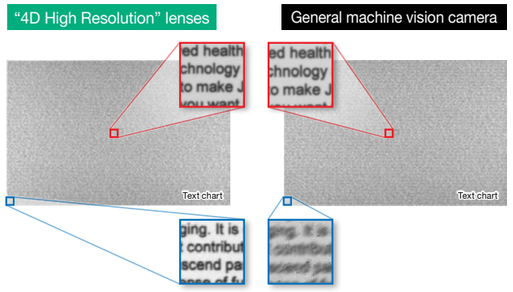


CF-ZA-1S Series

**Peripheral light ratio: 80%**

## 4D High Resolution performance

- Thanks to the 4D High Resolution Design, the resolving power remains consistently high from the center of the image to the edges, even at changing working distances or aperture settings.
- The CF-ZA-1S series draws out the full capability of cameras equipped with a 1.1" sensor with 3.45 μm pixel pitch (equivalent to 12 MP) across the entire frame. These lenses are the perfect choice especially for IMX253 (1.1" type sensor) and IMX225 (1" type sensor).
- The series supports next generation sensors with 1.1" optical format and 2.5μm pixel pitch (equivalent to 23 MP).

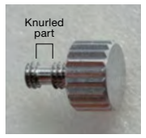



## Anti-Vibration and Shock Design

- This series maintains an advanced level of resolution before and after tough vibration tests, conducted according to JIS C 60068-2-6*2. Even in applications that involve shocks, such as robot vision and 3D scanners, the optical axis shift remains less than 10μm for shocks of up to 10G*3.
- The Fujifilm original mechanical design*4 minimizes the use of adhesive to avoid aged deterioration caused by humidity and heat.

## High usability and reliability

- These lenses come with knurled screws for fixing the iris and focus position. The screws can´t fall out accidentally, get lost or damage sensitive manufacturing machines during installation or maintenance.




## Compact size of only 39mm outer diameter

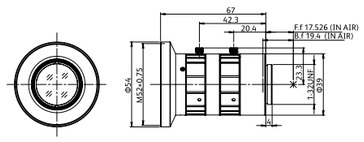
- Despite the support of sensors with large 1.1" format, all models of the CF-ZA-1S series offer a uniform diameter of only 39mm and are therefore no larger than standard machine vision cameras. Only the 8mm focal length CF8ZA-1S is slightly larger with a diameter of 54mm in the front lens.

- Thanks to the 3 holes on the lens barrel for fixing iris and focus positions, the most suitable hole can be selected for each application.
- By adopting an internal mechanical focus, the overall length of lens will not change when focused.
- The introduction of a focusing indicator at the working distance of 50cm enables efficient detection of cameras' flange back deviation.

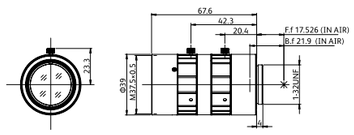
*1 Sensor size(max.): Adaptable sensor size varies depending on the model. Please check the amount of light and resolution on the edges pertaining to your particular application. *2 Compliance with JIS C 60068-2-6: Vibration frequency 10-60Hz (amplitude 0.75mm) vibration frequency 60-500Hz (acceleration 100m/S2) and 50 sweep cycles. *3 Supported shock G value varies from model to model. *4 FUJIFILM's patent-pending proprietary technology.

| | Anti Shock & Vibration<br>CF8ZA-1S | Anti Shock & Vibration<br>CF12ZA-1S | Anti Shock & Vibration<br>CF16ZA-1S | Anti Shock & Vibration<br>CF25ZA-1S | Anti Shock & Vibration<br>CF35ZA-1S | Anti Shock & Vibration<br>CF50ZA-1S |
|---|---|---|---|---|---|---|
| Focal length [mm] | 8 | 12 | 16 | 25 | 35 | 50 |
| Iris range [F. no] | F1.8-F16 | F1.8-F16 | F1.8-F16 | F1.8-F16 | F1.8-F16 | F2.4-F16 |
| Angle of view | 85.7°×67.5° | 62.5°×47.8° | 47.3°×36.1° | 32.9°×24.8° | 23.0°×17.3° | 16.6°×12.5° |
| Working Distance*1 [mm] | ∞-100 | ∞-100 | ∞-100 | ∞-100 | ∞-200 | ∞-200 |
| Operation of focus | Manual | Manual | Manual | Manual | Manual | Manual |
| Operation of iris | Manual | Manual | Manual | Manual | Manual | Manual |
| Filter thread [mm] | M52×0.75 | M37.5×0.5 | M37.5×0.5 | M37.5×0.5 | M37.5×0.5 | M37.5×0.5 |
| Mount | C-mount | C-mount | C-mount | C-mount | C-mount | C-mount |
| Weight (approx.) [g] | 180 | 180 | 180 | 170 | 165 | 155 |
| Sensor size (std.)*2 | 1.1"(2.5μm) | 1.1"(2.5μm) | 1.1"(2.5μm) | 1.1"(2.5μm) | 1.1"(2.5μm) | 1.1"(2.5μm) |
| Sensor size (max.)*3 | 1.1"(2.5μm) | 1.1"(2.5μm) | 1.1"(2.5μm) | 4/3"(3.45μm) | 4/3"(3.45μm) | 4/3"(3.45μm) |
| CRA (Chief Ray Angle) | 4.5 | 4.5 | 4.9 | 2.7 | 4.5 | 4.8 |
| TV distortion [%] | -4.81 | -2.82 | -0.80 | -0.83 | -0.32 | -0.17 |
| Dimension [mm] | ø54×67 | ø39×67.6 | ø39×67.6 | ø39×67.3 | ø39×67.3 | ø39×68 |

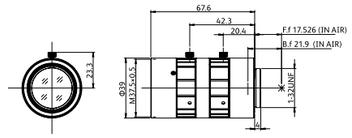
### CF8ZA-1S



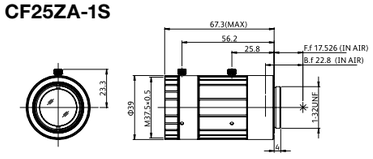

### CF12ZA-1S



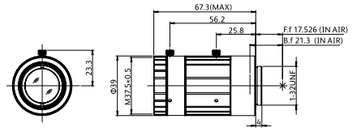

### CF16ZA-1S



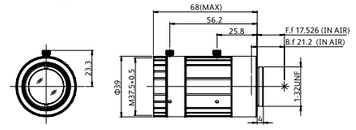

### CF25ZA-1S




### CF35ZA-1S




### CF50ZA-1S




*1 From front of lens barrel. *2 Sensor size(std.): Ideal size to maximize the target resolution.
*3 Sensor size(max.): Adaptable sensor size varies depending on the model. Please check the amount of light and resolution on the edges pertaining to your particular application.