

The performance of the visual sensor varies greatly depending on the combination of camera, lens, and lighting. Refer to the following to create a suitable combination for your inspection purpose.

## Camera Details

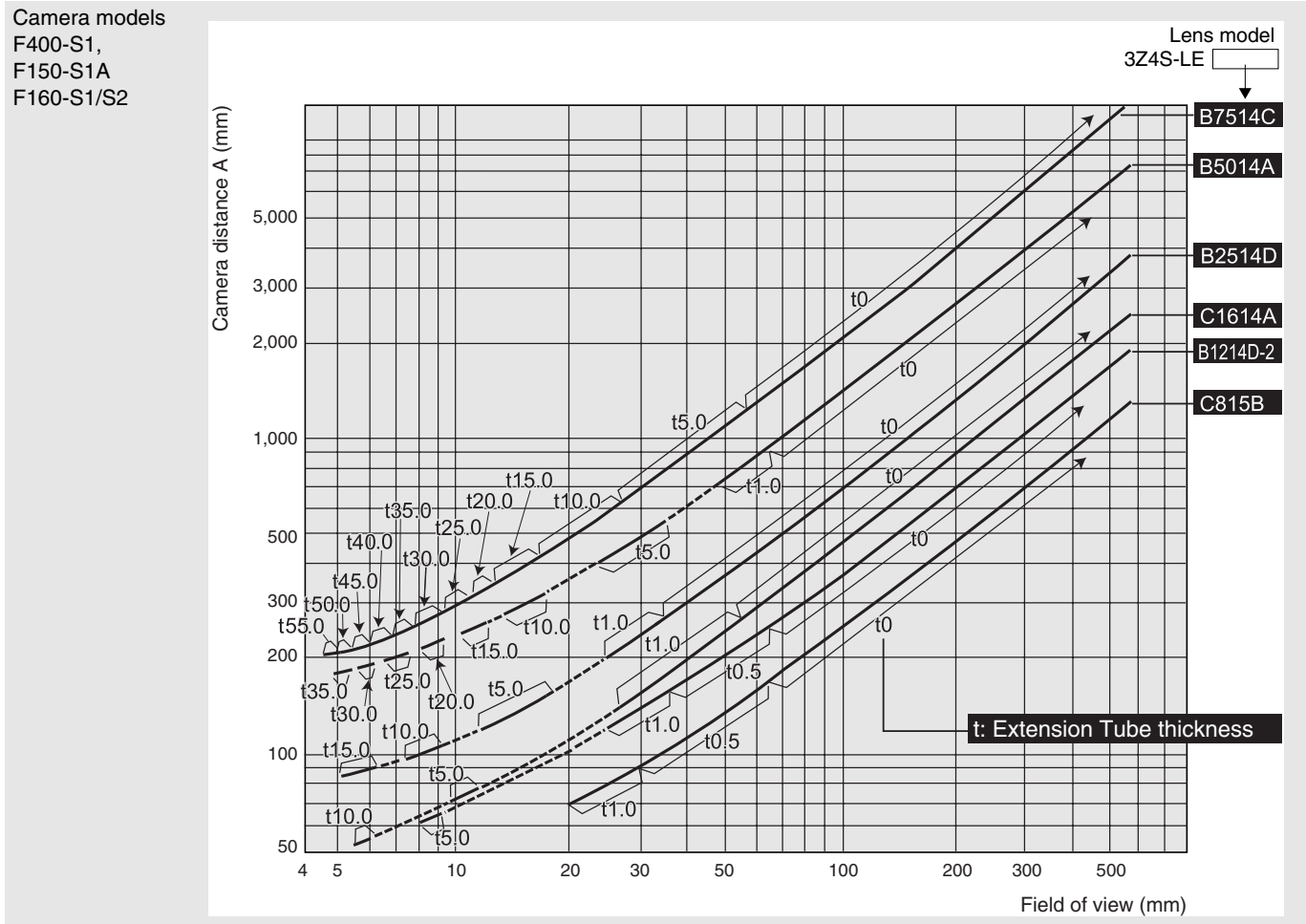
### Model

| Model                   |           | F150-S1A  | F160-S1/S2                                    | F400-S1   |
|-------------------------|-----------|---|---|---|
| Item                    |           | Shutter camera  |   |   |
| Visual appearance       |           |   |   |   |
| Image pick-up           |           | 1/3 inch CCD fixed imaging element                                  | 1/3 inch color CCD                            |   |
| Number of elements      |           | 659(H) x 494(V)   |   |   |
| Synchronization method  |           | External synchronization  |   |   |
| Scanning method         |           | Non-interlace method  | Non-interlace method<br>Interlace method      | Non-interlace method  |
| Lens mount              |           | C mount   |   |   |
| Shutter speed (s)       |           | 1/100<br>1/500<br>1/2000<br>1/10000<br>(factory setting:<br>1/2000) | 8 stages<br>OFF to<br>1/20000 Changed by menu | 1/100<br>1/500<br>1/2000<br>1/10000<br>(factory setting:<br>1/2000) |
| Weight (Unit only)      |           | Approx. 70 g  | Approx. 85 g                                  | Approx. 70 g  |
| Applicable camera cable |           | F150-VS   |   |   |
| Applicable controller   | F150      | O   | X   | X   |
|                         | F160      | O   | O   | X   |
|                         | F210      | O   | O   | X   |
|                         | F250      | O   | O   | X   |
|                         | F400      | X   | X   | O   |
|                         | V530-R150 | O   | X   | X   |
|                         | V530-R160 | O   | X   | X   |

Lens Details

Refer to the following optical graph to select a lens and connecting ring suitable for the field of view and the camera installation distance.

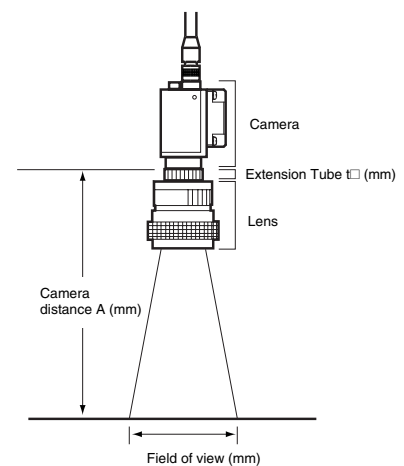
Optical graph



How to read the optical graphs







The horizontal axis of each optical graph is the field of view "L" (mm) and the vertical axis is the camera installation distance "A" (mm). Each line represents a lens, and the value "t" is the thickness of the connecting ring.

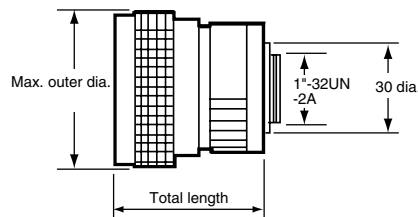
The values given in the optical graph are only approximate values. It is recommended that the camera distance is adjusted by sliding the Camera forward or backward to get the required field of view for actual operation



Ordering Information

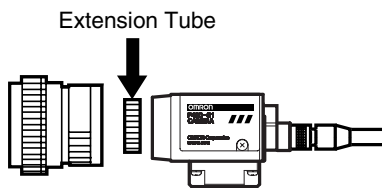
Lens

| Item              | Model | CCTV lens   |   |   |  |   |   |
|-------------------|-------|---|---|---|--|---|---|
|                   |       | 3Z4S-LE C815B   | 3Z4S-LE B1214D-2  | 3Z4S-LE C1614A  | 3Z4S-LE B2514D   | 3Z4S-LE B5014A  | 3Z4S-LE B7514C  |
| Visual appearance |       |  |  |  |  |  |  |
| Focal length      |       | 8.5 mm  | 12.5 mm   | 16.0 mm   | 25.0 mm  | 50.0 mm   | 75.0 mm   |
| Brightness        |       | F1.5  | F1.4  |   |  |   |   |
| Filter size       |       | M40.5 x P0.5  |   | M27 x P0.5  |  | M46 x P0.75   | M58 x P0.75   |
| Lock mechanism    |       | With focus and aperture lock mechanism  |   |   |  |   | ---   |



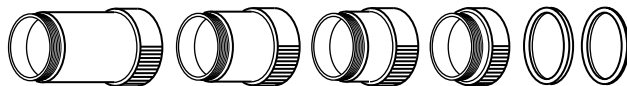
Extension ring

The extension ring is inserted between the lens and camera, and is used to adjust the focus. Combine 6 sheets for the desired thickness.



| Model         | Maximum outer diameter | Thickness  |
|---------------|------------------------|--|
| 3Z4S-LE EX-C6 | 31 mm dia.             | Six-point set: 0.5 mm, 1 mm, 5 mm, 10 mm, 20 mm, 40 mm |

Thickness: 40 mm 20mm 10mm 5mm 1.0mm 0.5mm



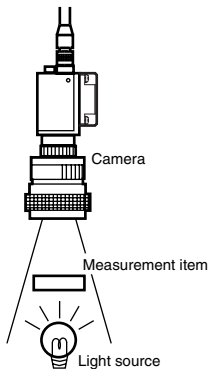
Note 1. Do not use multiple 0.5 mm and/or 1.0 mm extension rings in combination. It will not be possible to tighten the screws sufficiently.  
 2. Depending on vibration conditions, additional support may be necessary if the extension exceeds 30 mm.

## Lighting

For accurate inspection, a stable image must be obtained. Select lighting that is suitable for your purpose and measurement object.

### Lighting method

#### Back lighting



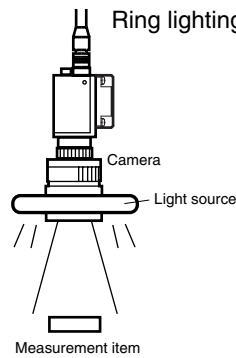
High contrast guarantees a stable image.

**Application**

Inspection of the shape of the object, positioning inspection, etc.

#### Reflective lighting

##### Ring lighting

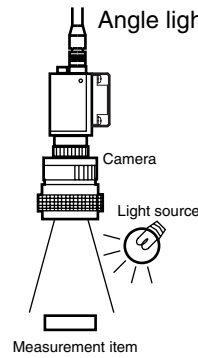


Even illumination is possible.

**Application**

Inspection of object surface

##### Angle lighting

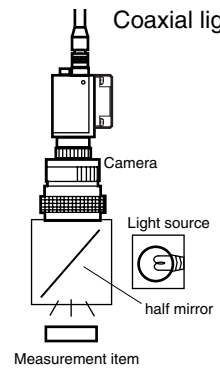


Detection using the difference between regular reflection and diffuse reflection is possible.

**Application**

Inspection for presence of object surface luster, etc.

##### Coaxial lighting



There are minimal shadows from bumps and depressions in the measurement object, enabling a stable image to be obtained.

**Application**

Surface inspection of relatively small objects, positioning, hole inspection, etc.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.