

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

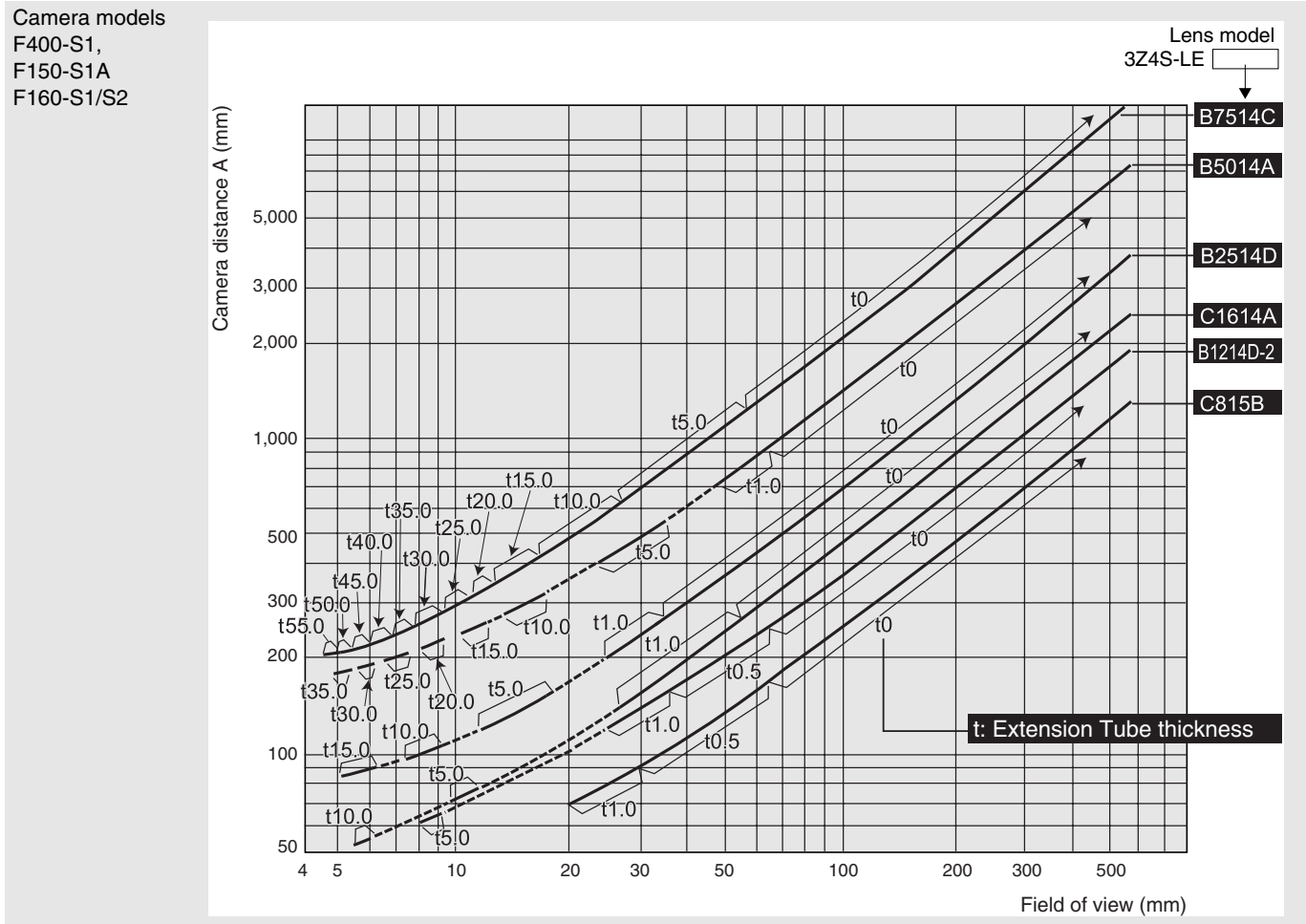
### Model

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 Interlace method	Non-interlace method
Lens mount		C mount		
Shutter speed (s)		1/100 1/500 1/2000 1/10000 (factory setting: 1/2000)	8 stages OFF to 1/20000 Changed by menu	1/100 1/500 1/2000 1/10000 (factory setting: 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.

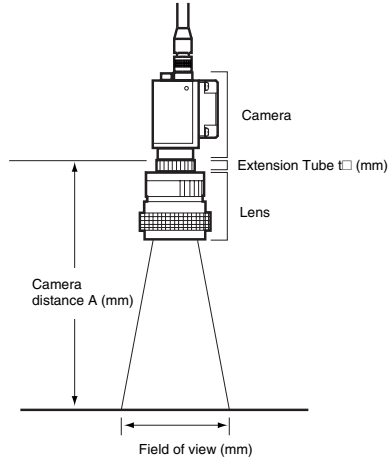
Optical graph



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.

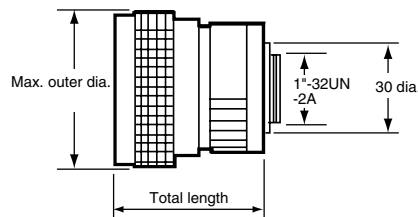
The values given in the optical graph are only approximate values. It is recommended that the camera distance is adjusted by sliding the Camera forward or backward to get the required field of view for actual operation



Ordering Information

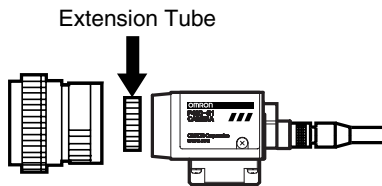
Lens

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					---



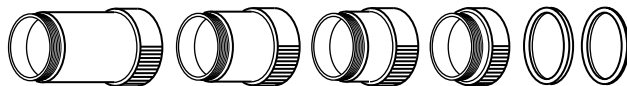
Extension ring

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



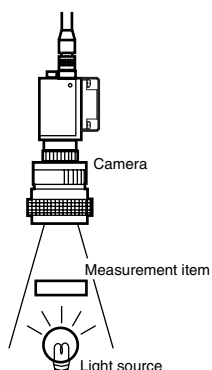
Note 1. Do not use multiple 0.5 mm and/or 1.0 mm extension rings in combination. It will not be possible to tighten the screws sufficiently.  
 2. Depending on vibration conditions, additional support may be necessary if the extension exceeds 30 mm.

## 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



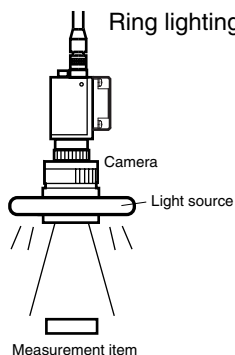
High contrast guarantees a stable image.

#### Application

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

#### Reflective lighting

##### Ring lighting

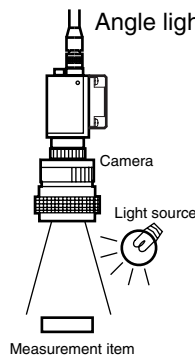


Even illumination is possible.

#### Application

Inspection of object surface

##### Angle lighting

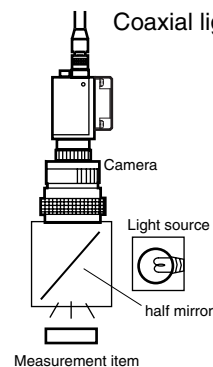


Detection using the difference between regular reflection and diffuse reflection is possible.

#### 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.