

Image Processing / Measurement Instruments Mounting Hardware

Image Processing
Measurement
Instruments
Mounting Hardware



Product Name	Macro Lens - Low Magnification	High Magnification	Objective Lens	Auto Extension Rings for Objective Lenses
Page	2029	2029	2029	2029



Mega-Pixel CCTV Lenses, CCTV Lenses	Rear Converter	Setscrews	Auto Extension Ring	Height Adjustment Screw Set for Post Clamps
2031	2031	2031	2032	2031



Free Guide Arm Sets	Free Guide Arms	Flexible Arms	Free Angle Arms
2034	2035	2035	2036



Holders for Free Angle Arms	Bases for Free Angle Arms	Magnetic Bases	Shaft Mounts - Built-in Spring
2036	2036	2037	2037



Shaft Mounts	Dial Mounts, Indicator Mounts	Dial Holders	Magnet Stand Set
2037	2037, 2038	2038	2038

Macro Lenses / Objective Lenses / CCTV Lenses

Features / How to Select

Types and Features of Lenses

Type	Features
Macro Lenses	A type of lens suitable for magnified viewing of small areas. When it becomes a high magnification, the view becomes little dark.
Objective Lenses	Although generally used for microscopes, it is possible to use them as economical macro lens with the addition of the C mounting (*) screw. Bear in mind that the view will become a little darker compared to the usual macro lenses.
CCTV Lenses	A type of lens suitable for magnified viewing of wide areas. Mounted adjusting screws enable adjustment of lens focus/diaphragm while observing the images. This type reproduces images with higher resolution and less distortion as well as enables close-up photography.

(*) C Mount: A screw standards in optical products industry. M (1 inch) x P (1/32 inch)

How to Select Lenses

(1) Macro Lenses and Objective Lenses (P:2029)

$$\text{Actual Field of View (Object Area)} = \frac{\text{CCD Camera Sensor Dimensions (Length x Width)}}{\text{Lens (Optics) Magnification}}$$

Calculate the appropriate lens magnification by using the Work Size and CCD Camera Pixel Dimensions. If an appropriate lens cannot be found, select an A.E. Ring that can be combined with a lens by referring to P:2030.

(Table 1) CCD Camera Size and Field of View in Each Lens Magnification

Magnification	CCD Camera Size and Field of View (Length x Width mm)		
	2/3 inch	1/2 inch	1/3 inch
0.3	22.0 x 29.3	16.0 x 21.3	12.0 x 16.0
0.5	13.2 x 17.6	9.6 x 12.8	7.2 x 9.6
0.7	9.4 x 12.5	6.8 x 9.1	5.1 x 6.9
1.0	6.6 x 8.8	4.8 x 6.4	3.6 x 4.8
2.0	3.3 x 4.4	2.4 x 3.2	1.8 x 2.4
4.0	1.7 x 2.2	1.2 x 1.6	0.9 x 1.2
6.0	1.1 x 1.5	0.8 x 1.1	0.6 x 0.8

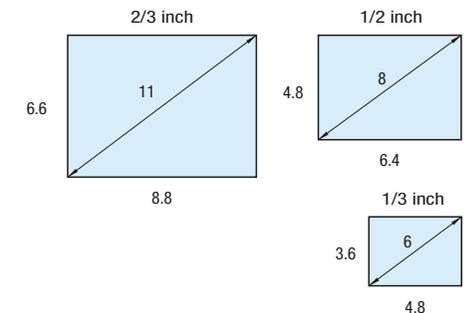
Each field of view measurement becomes 1/2 in size when the rear converter lens (x2) is attached.

(2) CCTV Lenses (P:1747)

$$\text{Focal Distance} = \frac{\text{WD (Shooting Distance)} \times \text{CCD Camera Sensor Dimensions (Length)}}{\text{Actual Field of View}}$$

Select an appropriate focal distance from WD (Shooting Distance), Field of View and CCD Camera Sensor Dimensions (Length) selections. If an appropriate lens cannot be found, select an A.E. Ring that can be combined with a lens by referring to P:2032

CCD Camera Element Dimensions



Factory Automation (FA) Applications of Objective Lenses

Combining the objective lens which is generally used for microscope with special C Mount auto extension ring (adapter), it became possible to use it as economical image inspection lens for FA. Most suitable for cost conscious use, such as inspection of product appearance or monitoring processing, which does not require high quality image.

- There are varieties of uses ranging from low magnification to high magnification or from wide-angled view to enlarged view.
- It is very inexpensive and excellent in cost vs. performance.
- Compatible with any manufacturer's CCD cameras if equipped with C mounts.
- The structure of the camera is designed for fine adjustment of magnification by rotating the lens (front most section) forward (Registered Utility Model).

Terminology

Terminology	Description
Actual Field of View	The size of the object (the area) that can be observed
WD (Shooting Distance)	Abbreviation for "Working Distance". Distance from lens surface to objects (See each product page)
CCD Camera Size	Size of CCD device (2/3 inch, 1/2 inch etc.)
Focal Distance	The distance in which initially collimated rays through a lens are brought to a focus. A lens with a shorter focal length reproduces wider field of view, while a lens with a long focal length can magnify distant images. (See each product page)
Resolution	Distinguishable minimum distance between two points (Refer to each product pages)
Depth of Field	Maximum difference of elevation for the objects/areas that can be observed without being out-of-focus (Refer to each product page)
TV Distortion	The image distortion when an image is reproduced on a monitor. A value indicating distortion in the longer side of images