

## Macrolenses

### Fixed and variable focal lengths for magnifications from 0.14x to 8x

Macrolenses developed by Rodenstock Präzisionsoptik for CCD cameras feature the highest resolution, excellent contrast, color neutrality and are virtually distortion-free.



**Macrolenses for CCD-cameras and magnification ratios from 1:7 to 8:1 (related to the image size on the CCD chip)**

#### **A large selection of macrolenses is available:**

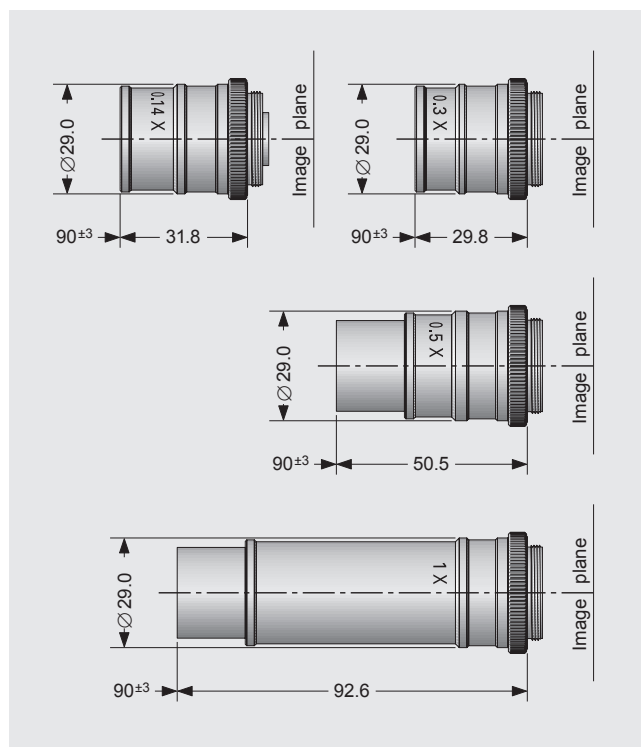
- a number of macrolenses with fixed focal lengths for magnifications of 0.14x (ratio 1:7) to 8x (ratio 8:1), which can be supplied with various fixed diaphragm aperture settings;
- a number of macrolenses with fixed focal lengths for magnifications of 2x to 8x, which are available in a choice of versions with parallel axis illumination for shadow-free illumination (for example in narrow recesses);
- a macro Vario lens covers the range from 0.8x to 4x continuously; front-mountable converters extend this range to 0.24x.

The considerable working distance (see specifications on the following pages) simplify handling and lighting.

## Macrolenses for Magnification from 0.14x to 1x

- with fixed focal length for one specific magnification each
- versions with various fixed diaphragm aperture settings
- for 1/2"- und 2/3"-CCD-cameras
- C-mount threaded adapter
- the free working distance from the front edge of the lens is 90 mm

Depending on the application, it is possible to choose between the largest relative aperture or the greatest depth of field with low vignetting and thus with more consistent illumination of the image field.



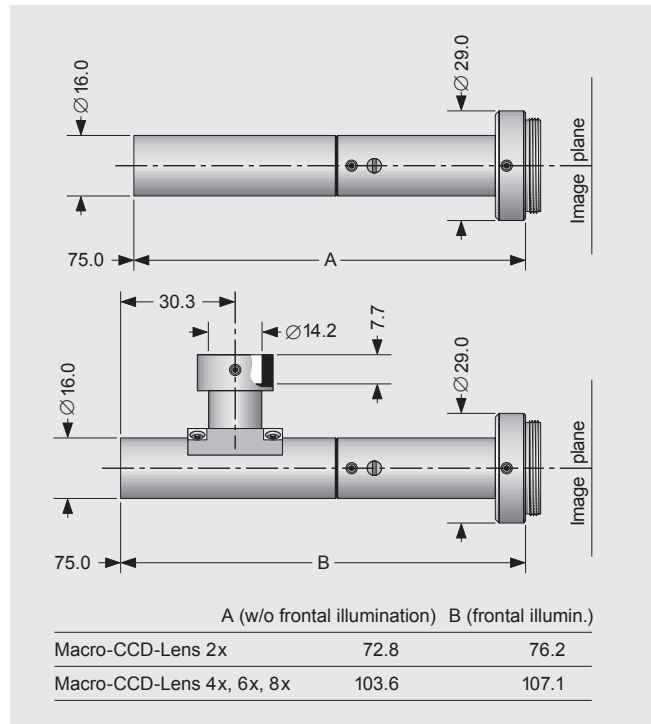
## Specifications

Lens designation	Macro-CCD Lens 0.14x	Macro-CCD Lens 0.3x	Macro-CCD Lens 0.5x	Macro-CCD Lens 1x
Lens focal length	15 mm	24 mm	35 mm	50 mm
Magnification on the CCD	0.14x (1:7.1)	0.3x ( 1:3.3)	0.5x (1:2)	1x (1:1)
Magnification on 14" monitor with 1/2" CCD	approx. 6.3x	approx. 13.5x	approx. 22.5x	approx. 45x
Magnification on 14" monitor with 2/3" CCD	approx. 4.9x	approx. 10.5x	approx. 17.5x	approx. 35x
Object field with 1/2" CCD	46x34 mm <sup>2</sup>	21x16 mm <sup>2</sup>	13x10 mm <sup>2</sup>	6.4x4.8 mm <sup>2</sup>
Object field with 2/3" CCD	59x44 mm <sup>2</sup>	31x21 mm <sup>2</sup>	17x12 mm <sup>2</sup>	8.3x6.2 mm <sup>2</sup>
Available fixed diaphragm apertures (geometric value, in relation to 1:∞)	4 5.6 8	3.5 5.6 8	- 5.6 8	4 5.6 8
Distortion	< 0.1 %	< 0.1 %	< 0.1 %	< 0.1 %
Rel. brightness in image corner with 2/3" CCD (related to 100% brightness in image center)	68% (diaphragm 4) 81% (diaphragm 5.6) 87% (diaphragm 8)	88% (diaphragm 3.5) 95% (diaphragm 5.6) 96% (diaphragm 8)	- 86% (diaphragm 5.6) 99% (diaphragm 8)	100% (diaphragm 4) 100% (diaphragm 5.6) 100% (diaphragm 8)
Resolution (related to object)	130 µm	60 µm	36 µm	18 µm
Object depth of field (related to 2/3" CCD and 350 TV lines)	±5mm (diaphragm 4) ±7mm (diaphragm 5.6) ±9mm (diaphragm 8)	±1.2mm (diaph. 3.5) ±2mm (diaph. 5.6) ±3mm (diaph. 8)	- ±0.8mm (diaph. 5.6) ±1.2mm (diaph. 8)	±0.3mm (diaph. 4) ±0.4mm (diaph. 5.6) ±0.5mm (diaph. 8)
Part No. for diaphragm 3.5		260.0030.001.020		
Part No. for diaphragm 4	260.0014.001.020			260.0100.001.020
Part No. for diaphragm 5.6	260.0014.001.021	260.0030.001.021	260.0050.001.020	260.0100.001.021
Part No. for diaphragm 8	260.0014.001.022	260.0030.001.022	260.0050.001.021	260.0100.001.022

## Macrolenses for Magnifications of 2x to 8x

- with fixed focal length for one specific magnification each
- versions with and without vertical epi-illuminator
- for 1/2" and 2/3" CCD-cameras
- C-mount threaded adapters
- the free working distance from the front edge of the lens is 75 mm

The epi-illuminator focuses the light of a glass fiber light source into the observation beam path so that it is parallel to the optical axis, allowing completely shadow-free illumination even of narrow recesses.



## Specifications

Lens designation	Macro-CCD Lens 2x	Macro-CCD Lens 4x	Macro-CCD Lens 6x	Macro-CCD Lens 8x
Lens focal length	26 mm	20 mm	13 mm	9 mm
Magnification on the CCD	2x (2:1)	4x (4:1)	6x (6:1)	8x (8:1)
Magnification on 14" monitor with 1/2"-CCD	approx. 90x	approx. 180x	approx. 270x	approx. 360x
Magnification on 14" monitor with 2/3" CCD	approx. 70x	approx. 140x	approx. 210x	approx. 280x
Object field with 1/2" CCD	3.2x2.4 mm <sup>2</sup>	1.6x1.2 mm <sup>2</sup>	1.1x0.8 mm <sup>2</sup>	0.8x0.6 mm <sup>2</sup>
Object field with 2/3" CCD	4.2x3.1 mm <sup>2</sup>	2.1x1.6 mm <sup>2</sup>	1.4x1.0 mm <sup>2</sup>	1.0x0.8 mm <sup>2</sup>
Object numerical aperture	0.076	0.076	0.076	0.076
Distortion	< 0.2%	< 0.2%	< 0.2%	< 0.2%
Relative brightness in the image corner for 2/3" CCD	100%	100%	100%	100%
Resolution (related to object)	24 µm	12 µm	9 µm	6 µm
Depth of field (with 2/3" CCD and 350 TV lines)	±0.2 mm	±0.1 mm	±0.07 mm	±0.6 mm
Part No. without Epi-illuminator	261.0200.001.020	261.0400.001.020	261.0600.001.020	261.0800.001.020
Part No. with Epi-illuminator	261.0200.002.020	261.0400.002.020	261.0600.002.020	261.0800.002.020