

Line scan lens

Makro-Symmar 5.6/120-0.33x

Wherever complex web and surface inspections are concerned, the line scan image capture method is used in most cases. Due to the principle used, this method requires a very careful choice of camera and an optimally adapted lens in order to achieve maximum system performance. It is essential to observe important application-specific and physical parameters: the size of the CCD or CMOS imaging sensor in the camera defines the minimum required image circle of the lens.



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Key Features

- Very high optical image quality in the large sensor range
- Vibration-insensitive for stable optical performance
- Reverse position of the lens possible to enlarge the magnification range
- Lockable distance and aperture settings
- Use in best azimuth position possible
- Industry-compatible V-mount interface
- 100% quality control guarantees reliability and constant quality
- Low maintenance requirements, therefore high system availability

Applications

- Web and surface inspections
- Quality control
- FPD inspection
- PCB inspection
- OLED inspection
- Line scan applications

Technical Specifications

F-number	5.6
Focal length	118.9 mm
Image circle	86 mm
Magnification	-0.33
Transmission	400 - 1000 nm
Interface	V-Mount
Weight	170 gr.
Option	Optical filter

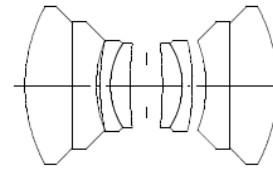
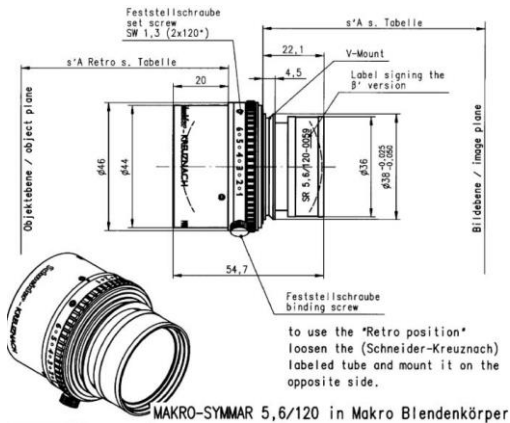
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M-SR 5.6/120

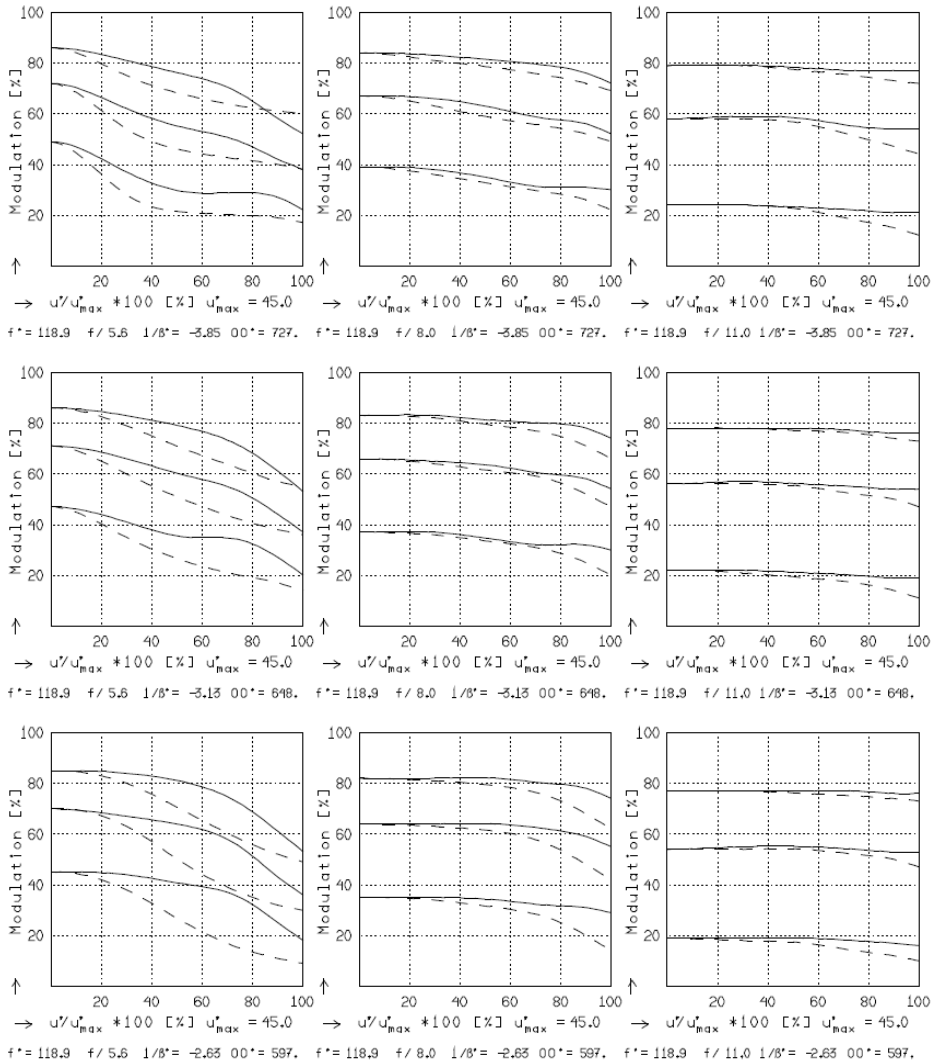
f^* = 118.9 mm	β_p = 1.001
s_F = -36.3 mm	s_{EP} = 22.6 mm
s_F^* = 93.7 mm	s_{AP} = -25.3 mm
HH^* = 0.6 mm	Σd = 48.5 mm

M-SR 5.6/120

MODULATION with reference to the relative image height

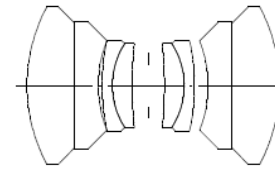
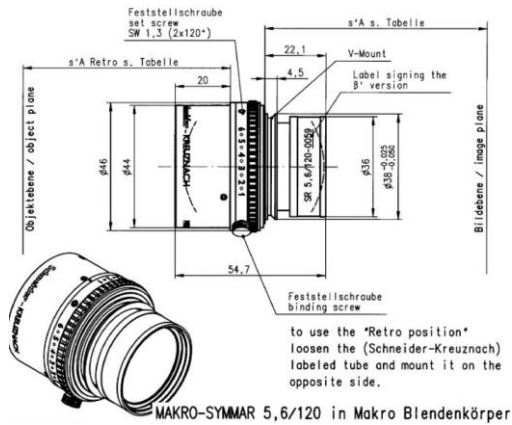
Wavelength λ [nm] :	555	655	605	505	455	405
Spectral weighting [%] :	19.6	23.7	22.2	15.7	12.1	6.7
Spatial frequency R [1/mm] :	20	40	80			
Format [mm X mm] :	90.0	0.0				
Diagonal $2u'$ [mm] :	90.0					

radial —
tangential - -



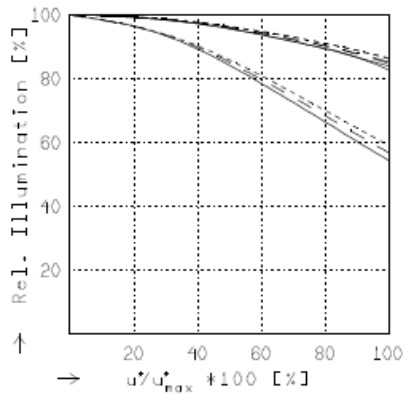
Focusing : MTF_{max} at $f / 5.6$, $R = 72$ 1/mm. $u'/u'_{max} = 0$

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f^* = 118.9 mm	β_p = 1.001
s_F = -36.3 mm	s_{EP} = 22.6 mm
s_F^* = 95.7 mm	s_{AP} = -25.3 mm
HH^* = 0.6 mm	Σd = 48.5 mm

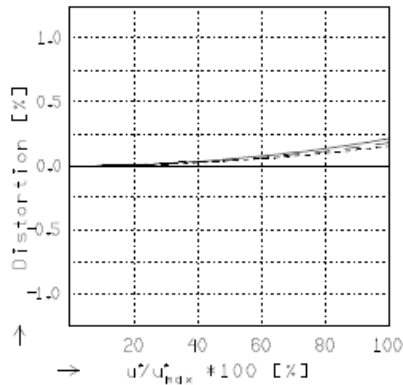


RELATIVE ILLUMINATION

The relative illumination is shown for the given focal distances or magnifications.

$f / 5.6$ $f / 8.0$ $f / 11.0$

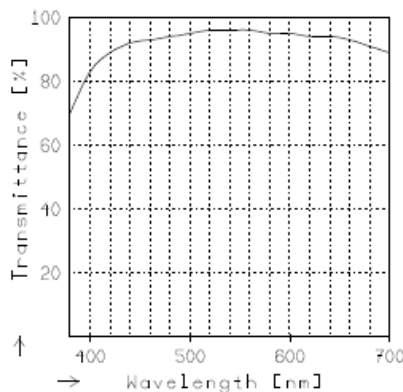
— $\beta' = -0.2600$	$u_{max}^* = 45.1$	$00^* = 727.$
- - $\beta' = -0.3200$	$u_{max}^* = 45.1$	$00^* = 648.$
- · - $\beta' = -0.3800$	$u_{max}^* = 45.1$	$00^* = 597.$



DISTORTION

Distortion is shown for the given focal distances or magnifications. Positive values indicate pincushion distortion and negative values barrel distortion.

— $\beta' = -0.2600$	$u_{max}^* = 45.1$	$00^* = 727.$
- - $\beta' = -0.3200$	$u_{max}^* = 45.1$	$00^* = 648.$
- · - $\beta' = -0.3800$	$u_{max}^* = 45.1$	$00^* = 597.$



TRANSMITTANCE

Relative spectral transmittance is shown with reference to wavelength.