

Line scan lens

Makro-Symmar 5.6/120-1.0x

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	120.7 mm
Image circle	86 mm
Magnification	-1.0
Transmission	400 - 1000 nm
Interface	V-Mount
Weight	170 gr.
Option	Optical filter

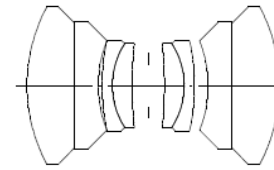
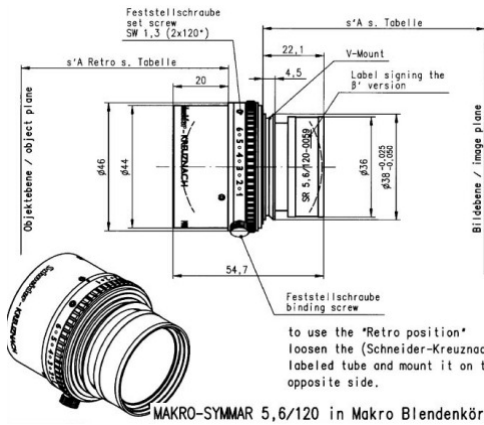
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Makro-Symmar 5.6/120-1.0



M-SR 5.6/120 BETA -0.875..-1.125

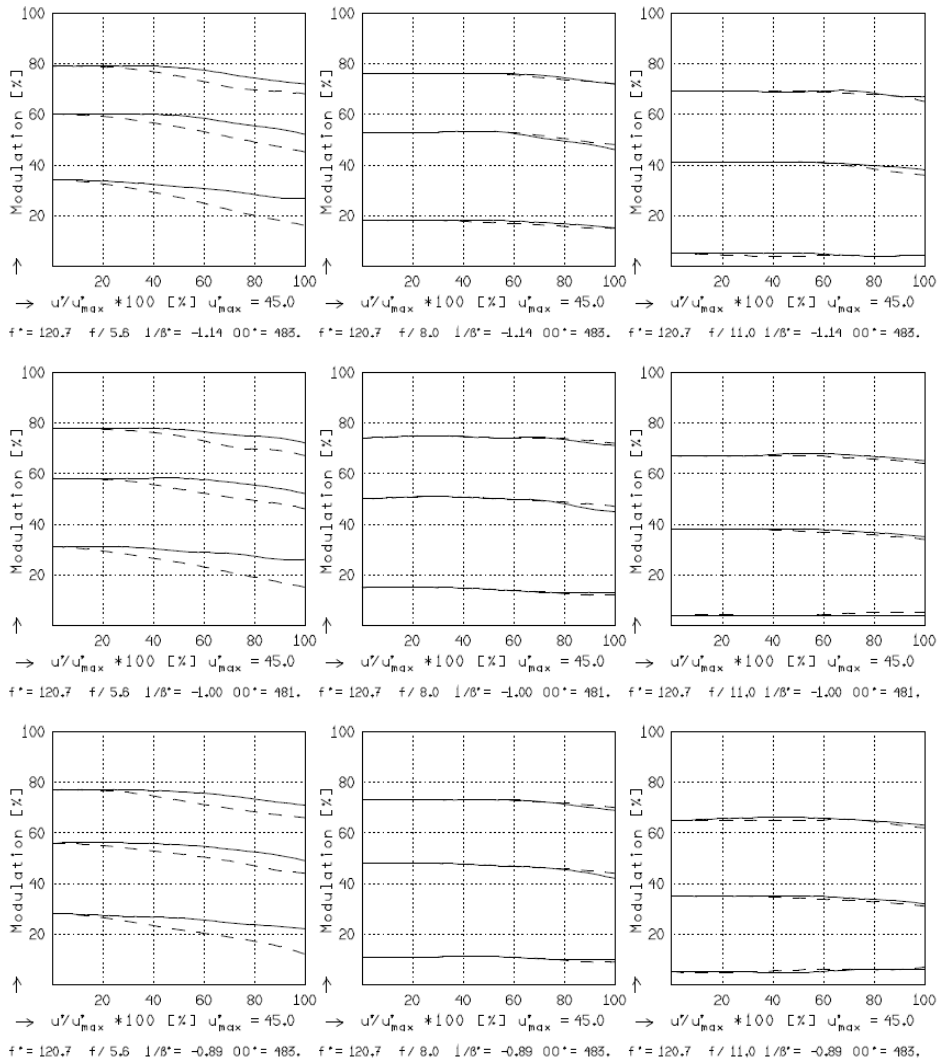
$f' = 120.7 \text{ mm}$ $\beta_p = 1.002$
 $s_F = -94.3 \text{ mm}$ $s_{EP} = 26.1 \text{ mm}$
 $s_{F^*} = 94.3 \text{ mm}$ $s_{AP}^* = -26.6 \text{ mm}$
 $HH' = -1.8 \text{ mm}$ $\Sigma d = 50.9 \text{ mm}$

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MODULATION with reference to the relative image height

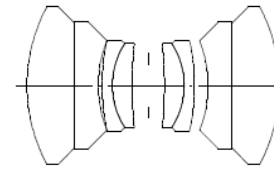
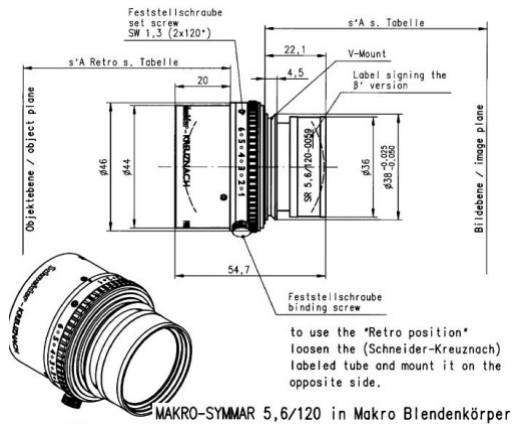
Wavelength λ [nm]	555	655	605	505	455	405
Spectral weighting [%]	19.6	23.7	22.2	15.7	12.1	6.7
Spatial frequency R [1/mm]	20	40	80			
Format [mm X mm]	90.0	X	0.0			
Diagonal $2u'$ [mm]	90.0					

radial —
 tangential - -



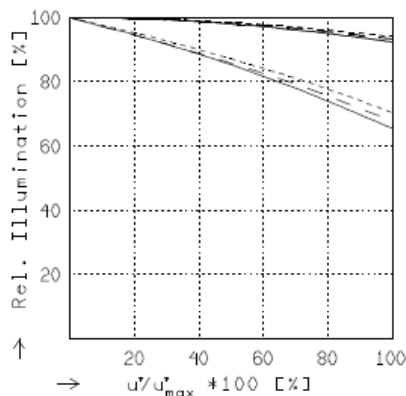
Focusing : MTF_{max} at $f / 5.6$. $R = 80$ 1/mm. $u'/u'_{max} = 0$

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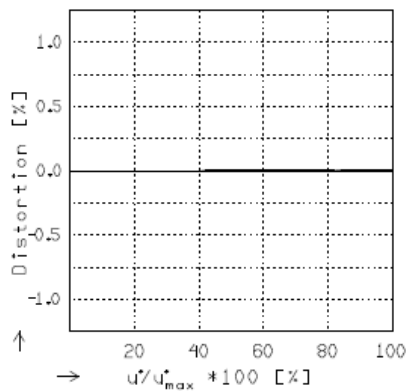


RELATIVE ILLUMINATION

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

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

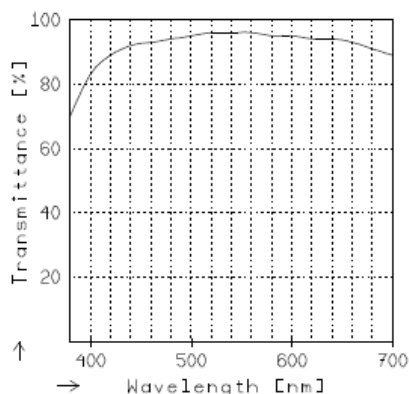
— $\beta' = -0.8750$	$u'_{max} = 45.0$	$00' = 483.$
- - $\beta' = -1.0000$	$u'_{max} = 45.0$	$00' = 481.$
.... $\beta' = -1.1250$	$u'_{max} = 45.0$	$00' = 483.$



DISTORTION

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

— $\beta' = -0.8750$	$u'_{max} = 45.0$	$00' = 483.$
- - $\beta' = -1.0000$	$u'_{max} = 45.0$	$00' = 481.$
.... $\beta' = -1.1250$	$u'_{max} = 45.0$	$00' = 483.$



TRANSMITTANCE

Relative spectral transmittance is shown with reference to wavelength.