

# Line scan lens

## Makro-Symmar 5.6/120-0.75x

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.



Makro-Symmar 5.6/120

### 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	120.2 mm
Image circle	86 mm
Magnification	-0.75
Transmission	400 - 1000 nm
Interface	V-Mount
Weight	170 gr.
Option	Optical filter

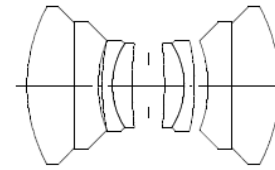
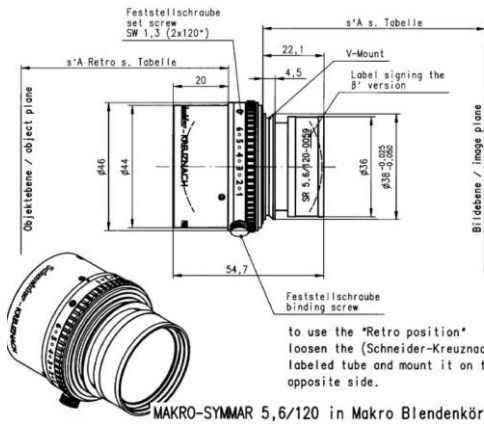
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# Makro-Symmar 5.6/120-0.75



M-SR 5.6/120 BETA -0.625...-0.875

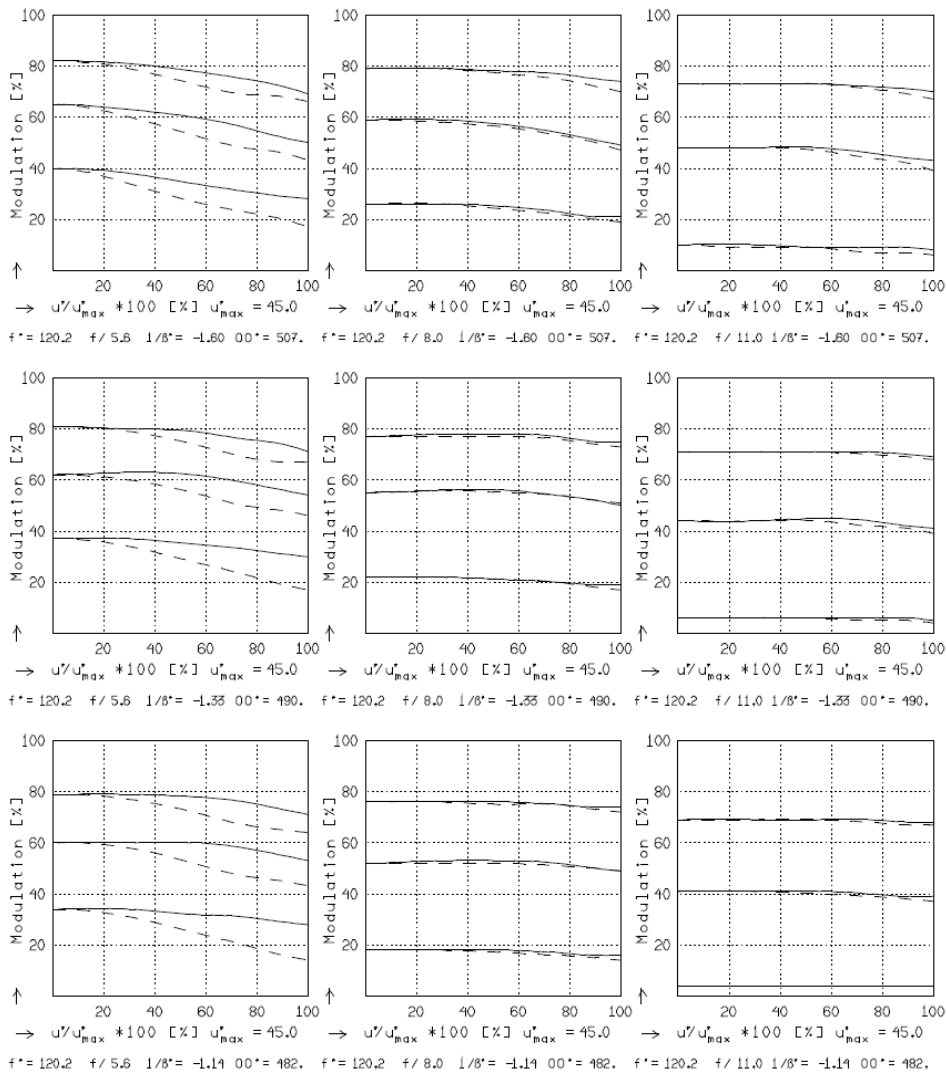
$f^* = 120.2 \text{ mm}$      $\beta_p = 0.991$   
 $s_F = -94.8 \text{ mm}$      $s_{EP} = 26.1 \text{ mm}$   
 $s_F^* = 94.1 \text{ mm}$      $s_{AP}^* = -25.4 \text{ mm}$   
 $HH^* = -1.2 \text{ mm}$      $\Sigma d = 50.4 \text{ mm}$

## M-SR 5.6/120 BETA -0.625...-0.875

MODULATION with reference to the relative image height

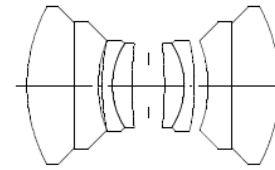
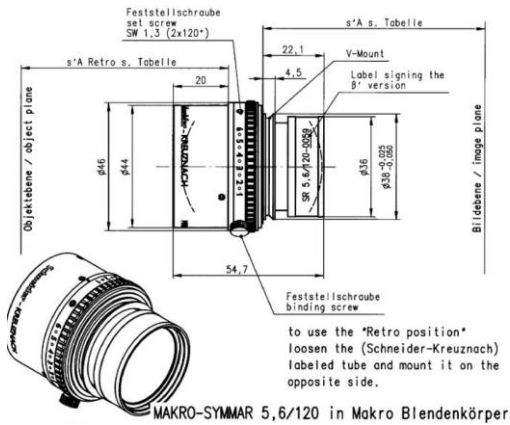
Wavelength  $\lambda$  [nm] : 555 655 605 505 455 405  
 Spectral weighting [%] : 19.6 23.7 22.2 15.7 12.1 6.7  
 Spatial frequency R [1/mm] : 20 40 80  
 Format [mm X mm] : 90.0 X 0.0  
 Diagonal  $2u^*$  [mm] : 90.0

radial —  
 tangential - -



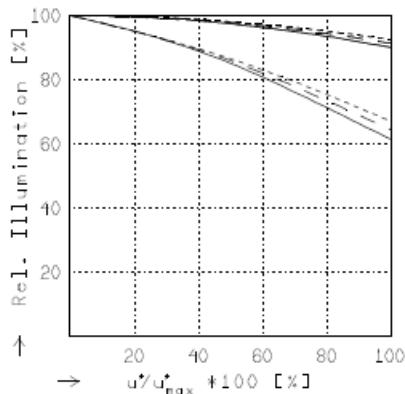
Focusing : MTF<sub>max</sub> at  $f / 5.6$  .  $R = 80$  1/mm.  $u'/u'_{max} = 0$

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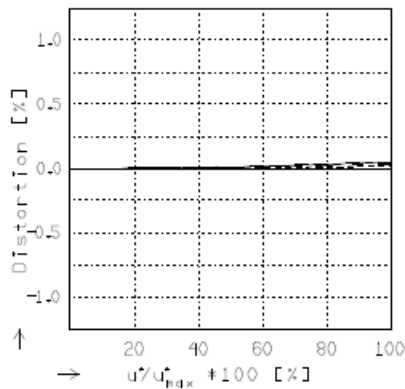


## RELATIVE ILLUMINATION

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

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

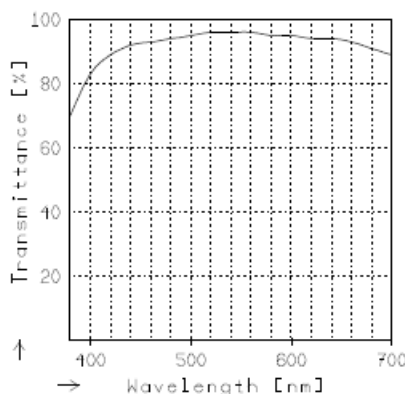
—  $\beta' = -0.6250$      $u_{max}^* = 45.0$      $00^* = 507.$   
 - -  $\beta' = -0.7500$      $u_{max}^* = 45.0$      $00^* = 490.$   
 - · -  $\beta' = -0.8750$      $u_{max}^* = 45.0$      $00^* = 482.$



## DISTORTION

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

—  $\beta' = -0.6250$      $u_{max}^* = 45.0$      $00^* = 507.$   
 - -  $\beta' = -0.7500$      $u_{max}^* = 45.0$      $00^* = 490.$   
 - · -  $\beta' = -0.8750$      $u_{max}^* = 45.0$      $00^* = 482.$



## TRANSMITTANCE

Relative spectral transmittance is shown with reference to wavelength.