Basler Accessories

Technical Specification

BASLER LENS C23-2518-2M

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2200000181

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1 Key Features

Key Features	
• Cost-effective 2 megapixel lens for machine vision / factory automation • Part of the Basler C23 lens series: 8, 12, 16, 25, 35, and 50 mm focal length models available • Metal housing • C-Mount interface • Locking screws for iris and focus	
Optimum working distance	0.9 m
Aperture range	f/1.8 – f/16
Focal length	25 mm
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2 Terms and Conventions

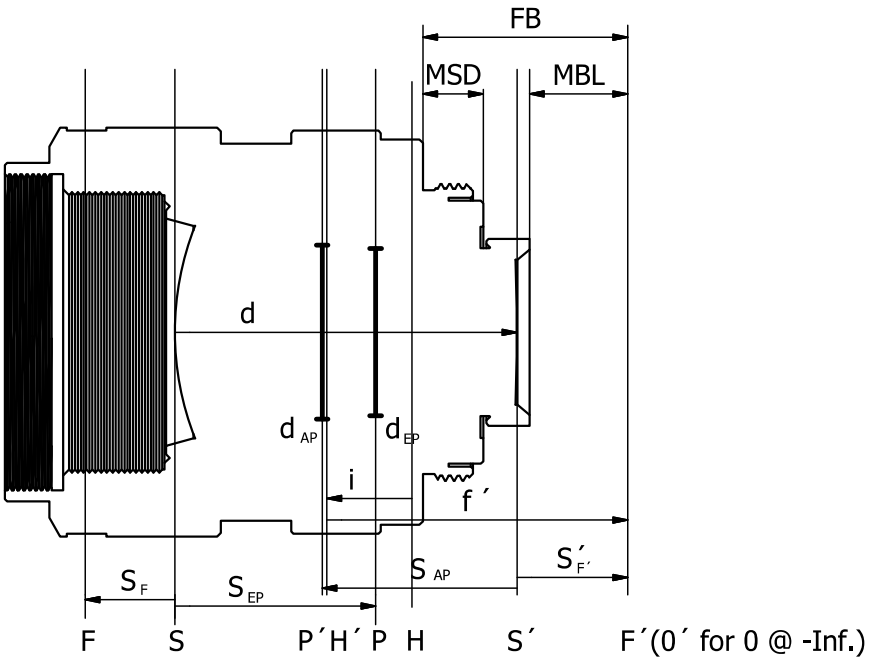

Figure 1: Terms for Lenses

Designations according to DIN 1335			
O	Object position	f' (=H′F′)	Focal length
O′	Image position	k (=f'/d_{EP})	f-number (indicated as "f/k")
H	Front principal plane	i (=HH′)	Principal point separation
H′	Back principal plane	s_F (=SF)	Front focal length
F	Front focal plane	$s'_{F'}$ (=S′F′)	Back focal length
F′	Back focal plane	s_{EP} (=SP)	Entrance pupil position
P	Entrance pupil plane	s'_{AP} (=S′P′)	Exit pupil position
P′	Exit pupil plane	d (=SS′)	Overall optical length
S	Vertex of first lens surface	d_{EP}	Entrance pupil diameter
S′	Vertex of last lens surface	d_{AP}	Exit pupil diameter
		β'_P (=d_{AP}/d_{EP})	Pupil magnification
Other Designations			
FB	Flange back	MOD	Minimum object distance
MSD	Maximum screw-in depth	CRA	Chief ray angle
MBL	Mechanical back length	Inf.	Infinity
WD	Working distance	MTF	Modulation transfer function
		SFR	Spatial frequency response

3 Mechanical Specifications and Environmental Requirements

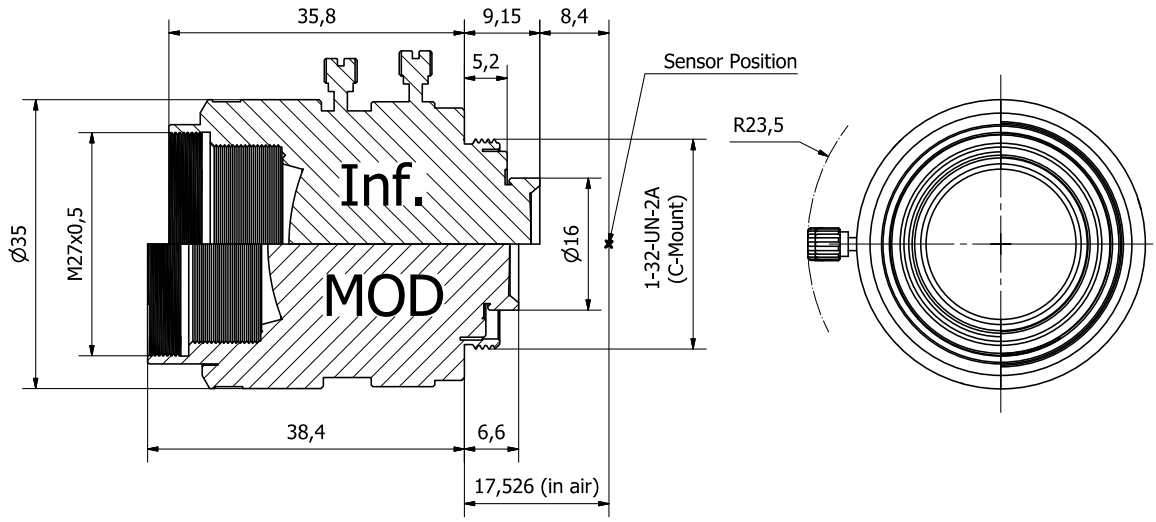

Figure 2: Mechanical Dimensions (in mm)

Environmental Requirements and Mechanical Specifications	
Storage conditions	−20–70 °C, 20–70 % relative humidity, non-condensing
Environmental requirements	−10–60 °C, 20–80 % relative humidity, non-condensing (For best results, please focus when a steady operating temperature has been reached.)
Flange back	17.526 mm
Weight	Approx. 83 g
Focus operation	Manual Operating angle: 169°

4 Optical Specifications

Optical Specifications		
Focal length *f'*		25.8 mm ± 5 %
Aperture range		*ƒ*/1.8 – *ƒ*/16
Image circle		11 mm (2/3" image format)
Focus range		0.3 m – infinity
Optimum working distance		0.9 m
Optimum magnification		−0.029
Relative illumination at full aperture		At least 79 % (see Figure 3)
Resolution (25 % MTF, center, full aperture)		Designed for 90 LP/mm (5.5 µm pixel size, see Figure 5)
Optical distortion		Typical −0.5 % (barrel distortion, see Figure 4)
Angle of view, 1/1.8" format (using an IMX265 sensor)	horizontal	14.2° (@ MOD) –15.5°
	vertical	10.7° (@ MOD) – 11.7°
Angle of view, 2/3" format (using a PYTHON 2000 sensor)	horizontal	18.1° (@ MOD) – 19.7°
	vertical	11.5° (@ MOD) – 12.6°
Wavelength range		Visible (400 – 700 nm)
Pupil magnification β'_P		1.04
Chief ray angle, CRA		11.1°
Front focal length, s_F		−7.7 mm
Back focal length, $s'_{F'}$		9.5 mm
Principal point separation, HH′		−4.6 mm
Entrance pupil position, s_{EP}		17.2 mm
Exit pupil position, s'_{AP}		−16.7 mm
Overall optical length, *d*		29.3 mm

5 Performance Charts

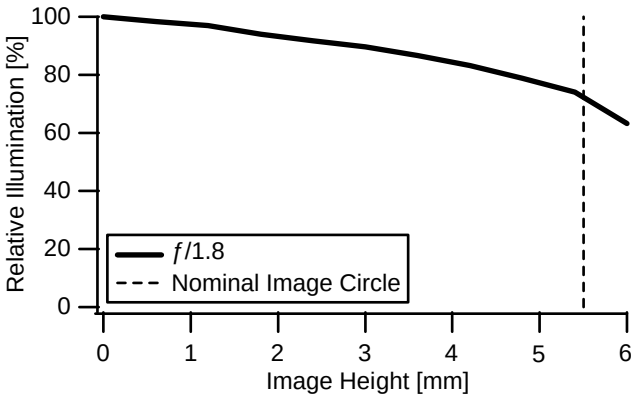

Figure 3: Simulated Relative Illumination vs. Image Height

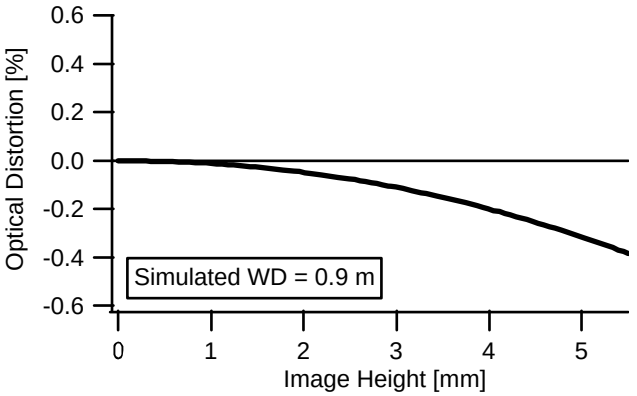

Figure 4: Simulated Distortion vs. Image Height

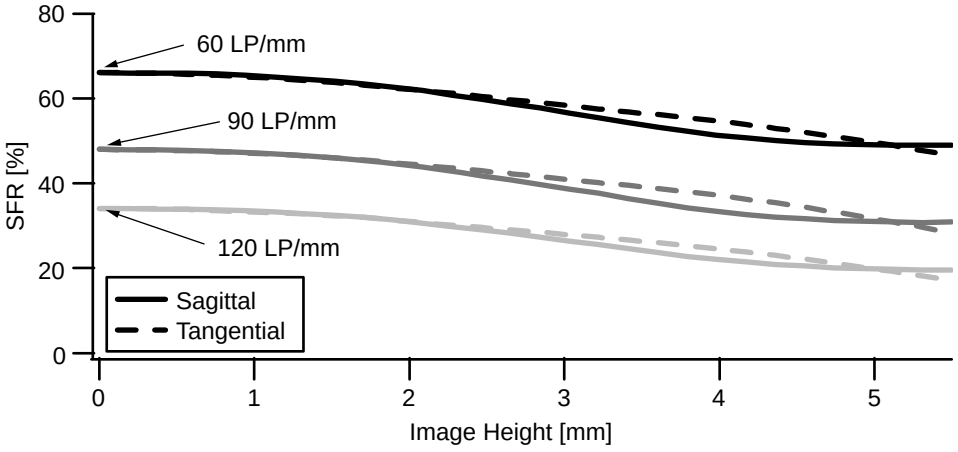

Figure 5: Measured Resolution vs. Image Height

Conditions for spatial frequency response (SFR) measurements: ƒ/1.8, polychromatic, WD 0.5 m, average result from 10 samples.

The technical data shown in chapters 1 to 5 are nominal design values. The actual values of the delivered products may deviate from the nominal design values.

Revision History

Document Number	Date	Changes
DG00191401000	17 Jan 2018	Initial release of this document.
DG00191402000	14 Mar 2019	Internal release
DG00191403000	18 Nov 2019	Took account of the Basler Lens C23 8 mm in chapter 1. Updated Figures 3 through 5. Minor adjustments throughout the manual.