TCCP3MHR192-C | DATASHEET

OPTO ENGINEERING

Ultra compact bi-telecentric lens for 1.1" detectors, magnification 0.064x, C mount

REACH DOSSIER PATENTED

KEY ADVANTAGES

Make your large FOV system up to 45% smaller

TC3MHR-5MHR CORE PLUS lenses are up to 45% shorter than other telecentric lenses on the market. The short working distance minimizes the size of the whole system

Designed for the latest camera sensors

TC3MHR CORE PLUS telecentric lenses are designed for sensors up to 1.1" like the IMX304, while TC5MHR CORE PLUS series lenses are ideal for sensors up to 4/3" like the IMX387

Smart integration

TC3MHR-5MHR CORE PLUS lenses integrate a mounting flange for easy mounting without additional clamps.

System compactness is a competitive advantage

TC3MHR-5MHR CORE PLUS lenses allow you to reduce the size of your vision system, resulting in less manufacturing, shipping and storage costs.

TC3MHR-5MHR CORE PLUS series are large FOV telecentric lenses for the latest generation sensors up to 1.1" like the IMX304 and 4/3" sensors like the IMX387. They are specifically designed to accurately measure large objects in a reduced space.

SPECIFICATIONS

Optical specifications		
Magnification		0.064
Image rectangle[1]	(mm x mm)	14.90 x 10.90
Working distance[2]	(mm)	288.0
wf/N[3]		10
Telecentricity typical (max)[4]	(°)	< 0.12 (0.18)
Distortion typical (max)[5]	(%)	< 0.8
Residual Distortion[6]	(%)	< 0.01
Field depth[7]	(mm)	125.9
Resolution (max)[8]	(µm)	99

Mechanical specifications		
Mount		C
Phase adjustment[9]		Yes
A[10]	(mm)	410.4
B	(mm)	344.1
C[11]	(mm)	371.0
Mass	(g)	9053

FIELD OF VIEW

Sensors	(mm x mm)
IMX174/IMX249 (11.35 x 7.13 mm)	177.07 x 111.23
IMX255/IMX267 (14.19 x 7.51 mm)	200.00 x 117.16
IMX253/IMX304 (14.16 x 10.37 mm)	200.00 x 161.78
KAI-4022/4021 (15.2 x 15.2 mm)	
KAI-08050 (18.1 x 13.6 mm)	

[1] Given the squared shape of the front window, the lens forms a rectangular image.
[2] Working distance: distance between the front end of the mechanics and the object. Set this distance within ±5% of the nominal value for maximum resolution and minimum distortion.
[3] working f/N: the real f/N of a lens in operating conditions.
[4] Maximum angle between chief rays and optical axis on the object side. Typical (average production) values and maximum (guaranteed) values are listed.
[5] Percent deviation of the real image compared to an ideal, undistorted image. Typical (average production) values and maximum (guaranteed) values are listed.
[6] Residual distortion after calibration with **TCLIB Suite** software library, using a **PTCP calibrations pattern** and a fully GenICam compliant camera.
[7] At the borders of the field depth the image can be still used for measurement but, to get a very sharp image, only half of the nominal field depth should be considered. Pixel size used for calculation is 3.45 µm.
[8] Object side, calculated with the Rayleigh criterion with λ= 520 nm
[9] Indicates the availability of an integrated camera phase adjustment feature.
[10] Maximum dimension of the clamping flange.
[11] Measured from the front end of the mechanics to the camera flange.

NOTICE ON PERFORMANCE

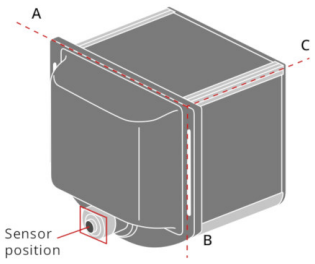
Due to its original design mainly conceived to reduce the length and weight of a telecentric lens, typically CORE PLUS optics show a thermal drift which is higher than in traditional telecentric optics, especially when the entire FOV is used for measurement. When used for measurement applications, thus, CORE PLUS optics might need to be thermally calibrated depending on the required precision and accuracy.

COMPATIBLE PRODUCTS

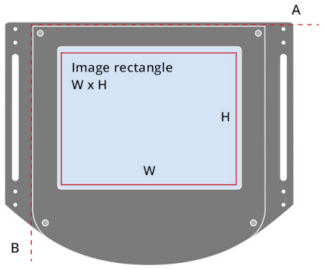
Full list of compatible products available *here*.

A wide selection of innovative machine vision components.

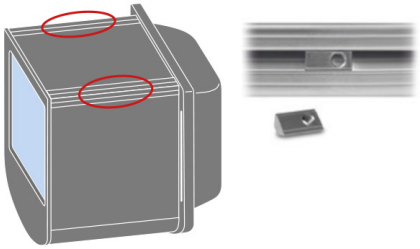
TC CORE PLUS LENS DIMENSION (A, B, C) AND CORRECT SENSOR POSITION



The long side of the sensor has to be aligned along the A axis.

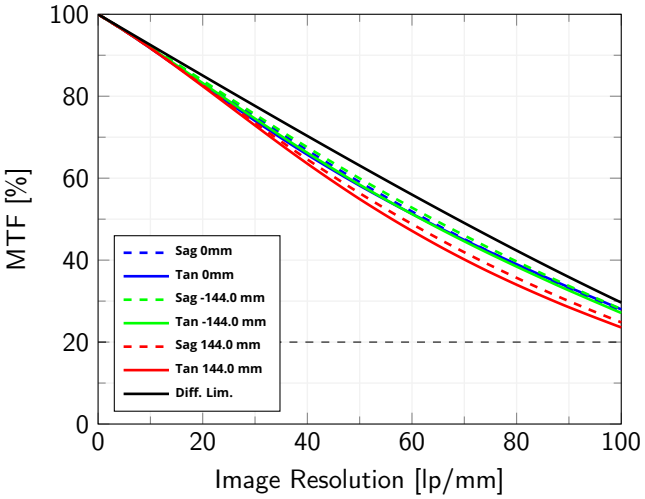


The width of the FOV (W) is aligned along the A axis. The height of the FOV (H) is aligned along the B axis.



Built-in mounting flange and standard aluminum T-slot profiles. No additional mounting clamps required.

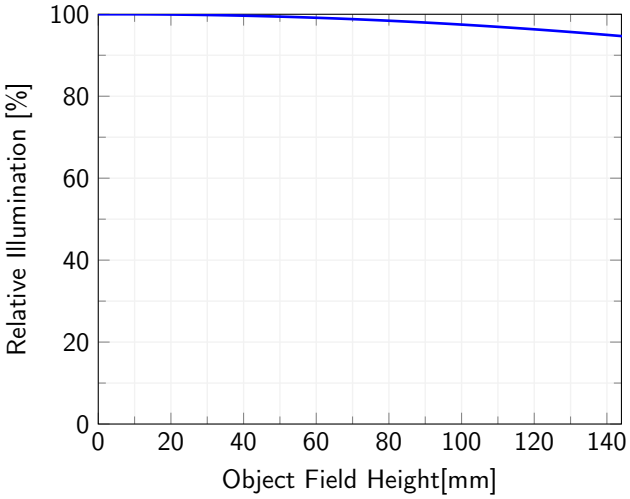
Image Resolution



Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 486 nm - 656 nm

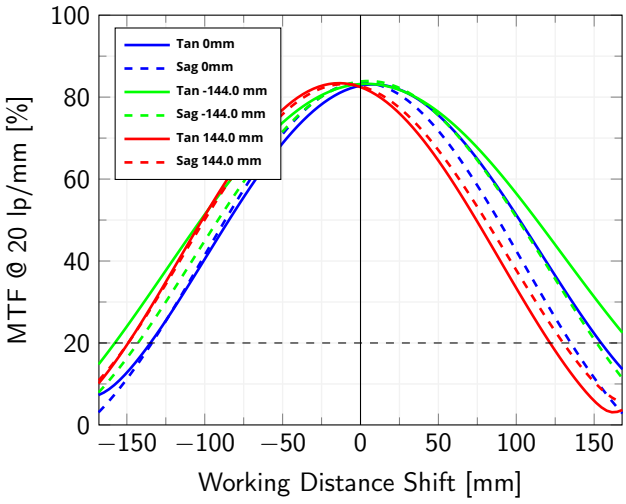
Red and green lines represt performance at the opposite corners of image rectangle

Relative Illumination



Relative illumination vs. Object Field Height, from the optical axis to the corner of the field of view

Depth of Field



Modulation Transfer Function (MTF) @ 20 lp/mm vs. Working Distance Shift from the best focus Working Distance, wavelength range 486 nm - 656 nm

Red and green lines represt performance at the opposite corners of image rectangle