

# TCCP3MHR144-C

Ultra compact bi-telecentric lens for matrix detectors up to 1/1", magnification 0.086x

## SPECIFICATIONS

Magnification	(x)	0.086
Image rectangle (1)	(mm)	14.90 x 10.90
<b>Object field of view</b>		
with IMX174/IMX249 13.3 mm diag w x h 11.35 x 7.13	(mm × mm)	131.7 x 82.8
with IMX255/IMX267 16.1 mm diag w x h 14.19 x 7.51	(mm × mm)	164.4 x 87.5
with IMX253/IMX304 17.6 mm diag w x h 14.16 x 10.37	(mm × mm)	165.4 x 121.2
with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2	(mm × mm)	
with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6	(mm × mm)	
<b>Optical specifications</b>		
Working distance (2)	(mm)	232.0
wF/# (3)		11
Telecentricity typical (max) (4)	(deg)	< 0.06 (0.10)
Distortion typical (max) (5)	(%)	< 0.8
Residual distortion (6)		< 0.01
Field depth (7)	(mm)	77
CTF @ 50 lp/mm	(%)	> 40
<b>Mechanical specifications</b>		
Mount		C
Phase Adjustment (8)		Yes
<b>Dimensions</b>		
A (9)	(mm)	332.0
B	(mm)	302.5
C (10)	(mm)	339.4
Mass	(g)	6100

Last update: 2019-11-21

## NOTES

1. Since the square 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-number (wF/#): the real F-number of a lens when used as a macro. Lenses with smaller apertures can be supplied on request. Typical (average production) values and maximum (guaranteed) values are listed .
4. Maximum slope of chief rays inside the lens: when converted to millirad, it gives the maximum measurement error for any millimeter of object displacement. Maximum (guaranteed) values are listed.
5. Percent deviation of the real image compared to an ideal, undistorted image. 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. For setup information see related table.
7. At the borders of the field depth the image can be still used for measurement but, to get a perfectly sharp image, only half of the nominal field depth should be considered. Pixel size used for calculation is 3.45 µm.
8. Indicates the availability of an integrated camera phase adjustment feature.
9. Maximum dimension of the clamping flange.
10. Measured from the front end of the mechanics to the camera flange.

## COMPATIBLE PRODUCTS

Despite the efforts made to generate an error-free compatibility list, we always recommend to consult the Opto Engineering® technical support department before purchasing a compatible product. Opto Engineering® shall not be liable for any damage or malfunctioning caused by the incorrect selection of a compatible product.

LTCLHP series



INTERNATIONAL  
PATENT  
PENDING



All product specifications and data are subject to change without notice to improve reliability, functionality, design or other. Photos and pictures are for illustration purposes only.



### High-performance telecentric illuminators

<a href="#">LTCLHP144-R</a>	Telecentric HP illuminator, beam diameter 180 mm, red
<a href="#">LTCLHP144-G</a>	Telecentric HP illuminator, beam diameter 180 mm, green



### LTBP series

High-power strobed LED backlights

<a href="#">LTBP192144-R</a>	High power strobed LED backlight, 192 x 144 mm lighting area, red
<a href="#">LTBP192144-G</a>	High power strobed LED backlight, 192 x 144 mm lighting area, green
<a href="#">LTBP192144-B</a>	High power strobed LED backlight, 192 x 144 mm lighting area, blue
<a href="#">LTBP192144-W</a>	High power strobed LED backlight, 192 x 144 mm lighting area, white



### LTBC series

Continuous LED backlight

<a href="#">LTBC174174-W</a>	Continuous LED backlight, 174x174 illumination area, white
<a href="#">LTBC174174-G</a>	Continuous LED backlight, 174x174 illumination area, green
<a href="#">LTBC234234-W</a>	Continuous LED backlight, 234x234 illumination area, white
<a href="#">LTBC234234-G</a>	Continuous LED backlight, 234x234 illumination area, green



### LT2BC series

High uniformity continuous LED backlights

<a href="#">LT2BC192144-R</a>	High uniformity continuous LED backlights, 192 x 144 mm x mm, red, 625 nm
<a href="#">LT2BC192144-G</a>	High uniformity continuous LED backlights, 192 x 144 mm x mm, green, 525 nm
<a href="#">LT2BC192144-B</a>	High uniformity continuous LED backlights, 192 x 144 mm x mm, blue, 475 nm
<a href="#">LT2BC192144-W</a>	High uniformity continuous LED backlights, 192 x 144 mm x mm, white, 6200 k



### PTTC, PTCP series

Accurate calibration patterns for machine vision systems

<a href="#">PTCP-S1-HR1-C</a>	Calibration pattern for telecentric lenses with a certificate of conformity
-------------------------------	---



### COE-G series

GeniCam® PoE cameras

<a href="#">COE-023-M-POE-060-IR-C</a>	Area Scan camera IMX249, CMOS, Global shutter, 1920 x 1200, 2.3 MP, 5.86 pix, 1/1.2", Gray, 41 fps, GigE, POE, C - mount, Glass filter
<a href="#">COE-023-C-POE-060-IR-C</a>	Area Scan camera IMX249, CMOS, Global shutter, 1920 x 1200, 2.3 MP, 5.86 pix, 1/1.2", Color, 41 fps, GigE, POE, C - mount, Infrared cut filter
<a href="#">COE-053-M-POE-070-IR-C</a>	Area Scan camera PYTHON 5000, CMOS, Global shutter, 2592 x 2048, 5.3 MP, 4.8 pix, 1", Gray, 22 fps, GigE, POE, C - mount, Glass filter
<a href="#">COE-053-C-POE-070-IR-C</a>	Area Scan camera PYTHON 5000, CMOS, Global shutter, 2592 x 2048, 5.3 MP, 4.8 pix, 1", Color, 22 fps, GigE, POE, C - mount, Infrared cut filter
<a href="#">COE-089-M-POE-070-IR-C</a>	Area Scan camera IMX267, CMOS, Global shutter, 4096 x 2160, 8.8 MP, 3.45 pix, 1", Gray, 13 fps, GigE, POE, C - mount, Glass filter
<a href="#">COE-089-C-POE-070-IR-C</a>	Area Scan camera IMX267, CMOS, Global shutter, 4096 x 2160, 8.8 MP, 3.45 pix, 1", Color, 13 fps, GigE, POE, C - mount, Infrared cut filter
<a href="#">COE-123-M-POE-080-IR-C</a>	Area Scan camera IMX304, CMOS, Global shutter, 4096 x 3000, 12.3 MP, 3.45 pix, 1.1", Gray, 9.4 fps, GigE, POE, C - mount, Glass filter
<a href="#">COE-123-C-POE-080-IR-C</a>	Area Scan camera IMX304, CMOS, Global shutter, 4096 x 3000, 12.3 MP, 3.45 pix, 1.1", Color, 9.4 fps, GigE, POE, C - mount, Infrared cut filter



### COE-U series

USB 3.0 GeniCam® cameras

<a href="#">COE-023-M-USB-060-IR-C</a>	Area Scan camera IMX249, CMOS, Global shutter, 1920 x 1200, 2.3 MP, 5.86 pix, 1/1.2", Gray, 41 fps, USB 3.0, C - mount, Glass filter
<a href="#">COE-023-C-USB-060-IR-C</a>	Area Scan camera IMX249, CMOS, Global shutter, 1920 x 1200, 2.3 MP, 5.86 pix, 1/1.2", Color, 40 fps, USB 3.0, C - mount, Infrared cut filter
<a href="#">COE-053-M-USB-070-IR-C</a>	Area Scan camera PYTHON 5000, CMOS, Global shutter, 2592 x 1944, 5 MP, 4.8 pix, 1", Gray, 60 fps, USB 3.0, C - mount, Glass filter

<a href="#">COE-053-C-USB-070-IR-C</a>	Area Scan camera PYTHON 5000, CMOS, Global shutter, 2592 x 1944, 5 MP, 4.8 pix, 1", Color, 30 fps, USB 3.0, C - mount, Infrared cut filter
<a href="#">COE-089-M-USB-070-IR-C</a>	Area Scan camera IMX267, CMOS, Global shutter, 4096 x 2160, 8.8 MP, 3.45 pix, 1", Gray, 32 fps, USB 3.0, C - mount, Glass filter
<a href="#">COE-089-C-USB-070-IR-C</a>	Area Scan camera IMX267, CMOS, Global shutter, 4096 x 2160, 8.8 MP, 3.45 pix, 1", Color, 32 fps, USB 3.0, C - mount, Infrared cut filter
<a href="#">COE-123-M-USB-080-IR-C</a>	Area Scan camera IMX304, CMOS, Global shutter, 4096 x 3000, 12.3 MP, 3.45 pix, 1.1", Gray, 23 fps, USB 3.0, C - mount, Glass filter
<a href="#">COE-123-C-USB-080-IR-C</a>	Area Scan camera IMX304, CMOS, Global shutter, 4096 x 3000, 12.3 MP, 3.45 pix, 1.1", Color, 23 fps, USB 3.0, C - mount, Infrared cut filter



#### mvBlueFOX3-2 series

USB3 vision camera with Sony Pregius CMOS sensors

<a href="#">RT-mvBF3-2024a</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX249
<a href="#">RT-mvBF3-2024</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX174
<a href="#">RT-mvBF3-2089a</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX267
<a href="#">RT-mvBF3-2089</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX255
<a href="#">RT-mvBF3-2124a</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX304
<a href="#">RT-mvBF3-2124</a>	USB3 Vision camera with Sony Pregius CMOS sensor IMX253



#### mvBlueCOUGAR series

GigE & Dual GigE Vision cameras

<a href="#">RT-mvBC-X104f</a>	Camera with interface GigE (1GB/s), sensor size 1/1.2", mpixel 2.35, resolution 1936 x 1216, sensor name IMX249, sensor type CMOS
<a href="#">RT-mvBC-XD104d</a>	Camera with interface Dual GigE (2GB/s), sensor size 1/1.2", mpixel 2.35, resolution 1936 x 1214, sensor name IMX174, sensor type CMOS
<a href="#">RT-mvBC-X109b</a>	Camera with interface GigE (1GB/s), sensor size 1", mpixel 8.95, resolution 4112 x 2176, sensor name IMX267, sensor type CMOS
<a href="#">RT-mvBC-XD109b</a>	Camera with interface Dual GigE (2GB/s), sensor size 1", mpixel 8.95, resolution 4112 X 2176, sensor name IMX267, sensor type CMOS
<a href="#">RT-mvBC-X1012b</a>	Camera with interface GigE (1GB/s), sensor size 1.1", mpixel 12.37, resolution 4112 x 3008, sensor name IMX304, sensor type CMOS
<a href="#">RT-mvBC-XD107</a>	Camera with interface Dual GigE (2GB/s), sensor size 1.1", mpixel 7.1, resolution 3216 x 2208, sensor name IMX420, sensor type CMOS
<a href="#">RT-mvBC-XD1012b</a>	Camera with interface Dual GigE (2GB/s), sensor size 1.1", mpixel 12.37, resolution 4112 x 3008, sensor name IMX304, sensor type CMOS



#### TCLIB Suite

Software library & stand-alone tools for the optimization of telecentric setups

<a href="#">TCLIB-01</a>	Software library & stand-alone tools for the optimization of telecentric setups
--------------------------	---



#### COE HR AS-X series

20MP, 26MP and 29MP area scan cameras for high-speed applications

<a href="#">COE-200-M-POE-070-IR-C</a>	HR Area Scan camera IMX183, CMOS, Rolling shutter, 5472 x 3648, 20.4 MP, 2.4 pix, 1", Gray, GigE, 6 fps, POE, C - mount, Glass filter
<a href="#">COE-200-C-POE-070-IR-C</a>	HR Area Scan camera IMX183, CMOS, Rolling shutter, 5472 x 3648, 20.4 MP, 2.4 pix, 1", Color, GigE, 6 fps, POE, C - mount, Infrared cut filter
<a href="#">COE-200-M-USB-070-IR-C</a>	HR Area Scan camera IMX183, CMOS, Rolling shutter, 5472 x 3648, 20.4 MP, 2.4 pix, 1", Gray, 14 fps, C - mount, Glass filter
<a href="#">COE-200-C-USB-070-IR-C</a>	HR Area Scan camera IMX183, CMOS, Rolling shutter, 5472 x 3648, 20.4 MP, 2.4 pix, 1", Color, 14 fps, C - mount, Infrared cut filter