

TC2MHR096-E

High resolution telecentric lens for 1" detectors, magnification 0.137x, mount M42X1 FD=16

SPECIFICATIONS

Magnification	(x)	0.137
Image circle Ø	(mm)	16.9

Object field of view ⁸	(mm x mm or Ø)	
with IMX174/IMX249 13.3 mm diag w x h 11.35 x 7.13		82.81 x 52.01
with IMX255/IMX267 16.1 mm diag w x h 14.19 x 7.51		103.58 x 54.82
with IMX253/IMX304 17.6 mm diag w x h 14.16 x 10.37		Ø = 75.70
with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2		Ø = 110.62
with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6 ⁽⁷⁾		Ø = 99.24

Optical specifications

Working distance ⁽¹⁾	(mm)	278.6
wF/# ⁽²⁾		16
Telecentricity typical (max) ⁽³⁾	(deg)	<0.05 (0.10)
Distortion typical (max) ⁽⁴⁾	(%)	<0.07 (0.10)
Field depth ⁽⁵⁾	(mm)	63.9
CTF@ 50 lp/mm	(%)	> 40

Mechanical specifications

Mount		M42x1 FD16.00
Phase adjustment ⁽⁹⁾		Yes
Length ⁽⁶⁾	(mm)	370.9
Diameter	(mm)	143
Mass	(g)	2411

Last update: 2019-06-17

NOTES

- Working distance: distance between the front end of the mechanics and the object. Set this distance within +/- 3% of the nominal value for maximum resolution and minimum distortion.
- 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.
- Maximum slope of chief rays inside the lens: when converted to milliradians, it gives the maximum measurement error for any millimeter of object displacement. Typical (average production) values and maximum (guaranteed) values are listed.
- Percent deviation of the real image compared to an ideal, undistorted image: typical (average production) values and maximum (guaranteed) values are listed.
- 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 5 µm.
- Measured from the front end of the mechanics to the camera flange.
- With KAI-08050 (22.6 mm diagonal) detectors, the FOV of TC4MHRyyy-x lenses may show some vignetting at the image corners.
- For the fields with the indication "Ø =", the image of a circular object of such diameter is fully inscribed into the detector.

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

High-performance telecentric illuminators

LTCLHP096-G	Telecentric HP illuminator, beam diameter 120 mm, green
LTCLHP096-R	Telecentric HP illuminator, beam diameter 120 mm, red



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.

LTCLHP096-B	Telecentric HP illuminator, beam diameter 120 mm, blue
LTCLHP096-W	Telecentric HP illuminator, beam diameter 120 mm, white



LTCLHP CORE series

Ultra compact telecentric illuminators

LTCLCR096-R	Telecentric CORE illuminator, beam dimensions $\varnothing = 120$; x = 99, red
LTCLCR096-G	Telecentric CORE illuminator, beam dimensions $\varnothing = 120$; x = 99, green
LTCLCR096-W	Telecentric CORE illuminator, beam dimensions $\varnothing = 120$; x = 99, white



LTLADC series

Continuous LED low angle direct ringlights

LTZZO170-75-3-W24V	LED low angle ringlight, 3 LED rows, outer diameter 175 mm, 75°, white, 24V
LTZZO170-75-3-R-24V	LED low angle ringlight, 3 LED rows, outer diameter 175 mm, 75°, red, 24V
LTZZO170-75-3-G-24V	LED low angle ringlight, 3 LED rows, outer diameter 175 mm, 75°, green, 24V
LTZZO170-75-3-B-24V	LED low angle ringlight, 3 LED rows, outer diameter 175 mm, 75°, blue, 24V



LTRNST series

LED ring illuminators - straight type

LTRN096RD	Ring LED illuminator, inner diameter 143 mm, straight type, red 630 nm
LTRN096GR	Ring LED illuminator, inner diameter 143 mm, straight type, green 525 nm
LTRN096BL	Ring LED illuminator, inner diameter 143 mm, straight type, blue 470 nm
LTRN096NW	Ring LED illuminator, inner diameter 143 mm, straight type, white



LTBC series

Continuous LED backlight

LTBC174174-W	Continuous LED backlight, 174x174 illumination area, white
LTBC174174-G	Continuous LED backlight, 174x174 illumination area, green



LTBRDC series

Continuous LED bar lights

LTZPFL160-00-6-W-24V	LED bar light, 6 LED rows, 160X26.3 illumination area, white, 24V
LTZPFL160-00-6-R-24V	LED bar light, 6 LED rows, 160X26.3 illumination area, red, 24V
LTZPFL160-00-6-G-24V	LED bar light, 6 LED rows, 160X26.3 illumination area, green, 24V
LTZPFL160-00-6-B-24V	LED bar light, 6 LED rows, 160X26.3 illumination area, blue, 24V



CMMR series

45° first surface mirrors

CMMR096	45° first surface mirror for 143 mm clamping diameter optics
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WI series

Protective windows

WI096	Protective window for 143 mm clamping diameter optics
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CMHO series

Clamping mechanics

CMHO096	Clamping mechanics for TCxx085, TCxx096 lenses and LTCLHP096-X illuminators
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CMT series

Precision alignment mechanics

CMTH096	Precision alignment mechanics for telecentric optics 096
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USB3 vision camera with Sony Pregius CMOS sensors

RT-mvBF3-2024a	USB3 Vision camera with Sony Pregius CMOS sensor IMX249
RT-mvBF3-2024	USB3 Vision camera with Sony Pregius CMOS sensor IMX174
RT-mvBF3-2089a	USB3 Vision camera with Sony Pregius CMOS sensor IMX267
RT-mvBF3-2089	USB3 Vision camera with Sony Pregius CMOS sensor IMX255



mvBlueCOUGAR series

GigE & Dual GigE Vision cameras

RT-mvBC-X104f	Camera with interface GigE (1GB/s), sensor size 1/1.2", mpixel 2.35, resolution 1936 x 1216, sensor name IMX249, sensor type CMOS
RT-mvBC-XD104d	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
RT-mvBC-X109b	Camera with interface GigE (1GB/s), sensor size 1", mpixel 8.95, resolution 4112 x 2176, sensor name IMX267, sensor type CMOS
RT-mvBC-XD109b	Camera with interface Dual GigE (2GB/s), sensor size 1", mpixel 8.95, resolution 4112 X 2176, sensor name IMX267, sensor type CMOS



COE HR AS-X series

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

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