# TC2MHR144-F

High resolution telecentric lens for 1" detectors, magnification 0.089x, F-mount

## SPECIFICATIONS

| | | |
|---|---|---|
| Magnification | (x) | 0.089 |
| Image circle Ø | (mm) | 16.8 |

| 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 | 127.47 x 80.07 |
| with IMX255/IMX267 16.1 mm diag w x h 14.19 x 7.51 | 159.44 x 84.38 |
| with IMX253/IMX304 17.6 mm diag w x h 14.16 x 10.37 | Ø = 116.53 |
| with KAI-4022/4021 21.5 mm diagonal w x h 15.2 x 15.2 | Ø = 170.28 |
| with KAI-08050 22.6 mm diagonal w x h 18.1 x 13.6(7) | Ø = 152.76 |

| Optical specifications | | |
|---|---|---|
| Working distance (1) | (mm) | 396.0 |
| wF/# (2) | | 16 |
| Telecentricity typical (max) (3) | (deg) | <0.05 (0.10) |
| Distortion typical (max) (4) | (%) | <0.05 (0.10) |
| Field depth (5) | (mm) | 151.5 |
| CTF@ 50 lp/mm | (%) | > 40 |

| Mechanical specifications | | |
|---|---|---|
| Mount | | F |
| Phase adjustment(9) | | Yes |
| Length (6) | (mm) | 481.8 |
| Diameter | (mm) | 200 |
| Mass | (g) | 6035 |

*Last update: 2018-06-12*

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.

## NOTES

1. 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.
2. 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.
3. 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.
4. Percent deviation of the real image compared to an ideal, undistorted image: typical (average production) values and maximum (guaranteed) values are listed.
5. 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.
6. Measured from the front end of the mechanics to the camera flange.
7. With KAI-08050 (22.6 mm diagonal) detectors, the FOV of TC4MHRyyy-x lenses may show some vignetting at the image corners.
8. 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

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|---|---|
| LTCLHP144-R | Telecentric HP illuminator, beam diameter 180 mm, red |
| LTCLHP144-G | Telecentric HP illuminator, beam diameter 180 mm, green |

LTRNST series

LED ring illuminators - straight type

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|---|---|
| LTRN144RD | Ring LED illuminator, inner diameter 200 mm, straight type, red 630 nm |
| LTRN144GR | Ring LED illuminator, inner diameter 200 mm, straight type, green 525 nm |
| LTRN144BL | Ring LED illuminator, inner diameter 200 mm, straight type, blue 470 nm |
| LTRN144NW | Ring LED illuminator, inner diameter 200 mm, straight type, white |

LTBC series

Continuos LED backlight

| | |
|---|---|
| LTBC234234-W | Continuos LED backlight, 234x234 illumination area, white |
| LTBC234234-G | Continuos LED backlight, 234x234 illumination area, green |

LTBRDC series

Continuous LED bar lights

| | |
|---|---|
| LTZPFL200-00-6-W-24V | LED bar light, 6 LED rows, 200X26.3 illumination area, white, 24V |
| LTZPFL200-00-6-R-24V | LED bar light, 6 LED rows, 200X26.3 illumination area, red, 24V |
| LTZPFL200-00-6-G-24V | LED bar light, 6 LED rows, 200X26.3 illumination area, green, 24V |
| LTZPFL200-00-6-B-24V | LED bar light, 6 LED rows, 200X26.3 illumination area, blue, 24V |

CMHO series

Clamping mechanics

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|---|---|
| CMHO144 | Clamping mechanics for TCxx130, TCxx144 lenses and LTCLHP144-X illuminators |

mvBlueFOX3-2 series

USB3 vision camera with Sony Pregius CMOS sensors

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|---|---|
| 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

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|---|---|
| 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

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|---|---|
| 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 |