

# TC16M036-Q

Telecentric lens for 35 mm detectors, magnification 1.000 x, mount M58x0.75 FD =6.56

## SPECIFICATIONS

Magnification	(x)	1.00
Image circle Ø	(mm)	43.3

### Object field of view

with APS-H KAI-16050 32.4 mm diagonal w x h 26.93 x 17.95	(mm x mm)	26.93 x 17.95
with CHR70 38 mm diagonal w x h 31.0 x 21.99	(mm x mm)	31.00 x 21.99
with 8k x 5 µm detector	(mm)	40.80
Full frame 35 mm, 43.3 mm diagonal w x h 36.0 x 24.00	(mm x mm)	36.00 x 24.00
with CMV50000 45.72 mm diagonal w x h 36.43 x 27.62	(mm x mm)	36.43 x 27.62

### Optical specifications

Working distance (1)	(mm)	102.6
wF/# (2)		16
Telecentricity typical (max) (3)	(deg)	< 0.03 (0.05)
Distortion typical (max) (4)	(%)	< 0.02 (0.03)
Field depth (5)	(mm)	1.3
CTF@ 50 lp/mm	(%)	> 30

### Mechanical specifications

Mount (6)		M58x0.75 FD6.56
Phase adjustment (7)		
Length (8)	(mm)	348.9
Diameter	(mm)	64
Mass	(g)	1077

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## 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/#: the real F/# 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 very sharp image, only half of the nominal field depth should be considered. Pixel size used for calculation is 5.5 µm.
- FD stands for Flange Distance (in mm), defined as the distance from the mounting flange (the "metal ring" in rear part of the lens) to the camera detector plane.
- Indicates the availability of an integrated camera phase adjustment feature.
- 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

High-performance telecentric illuminators

LTCLHP036-R	Telecentric HP illuminator, beam diameter 45 mm, red
LTCLHP036-G	Telecentric HP illuminator, beam diameter 45 mm, green



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.

LTCLHP036-B	Telecentric HP illuminator, beam diameter 45 mm, blue
LTCLHP036-W	Telecentric HP illuminator, beam diameter 45 mm, white



#### LTLA series

High-power strobed LED low angle diffused ringlights

LTLAB2-R	Diffusive strobed low angle ring light illuminator - medium size high power red
LTLAB2-G	Diffusive strobed low angle ring light illuminator - medium size high power green
LTLAB2-W	Diffusive strobed low angle ring light illuminator - medium size high power white
LTLAC1-W	Diffusive strobed low angle ring light illuminator - large size medium power white
LTLAC2-R	Diffusive strobed low angle ring light illuminator - large size high power red
LTLAC2-G	Diffusive strobed low angle ring light illuminator - large size high power green
LTLAC2-W	Diffusive strobed low angle ring light illuminator - large size high power white



#### LTLAIC series (discontinued models)

Continuous LED low angle diffused ringlights

LT2RZF100-60-2-W-24V	LED ringlight, 2 LED rows, 100 mm outer diameter, 60°, white, 24V
LT2RZF100-60-2-R-24V	LED ringlight, 2 LED rows, 100 mm outer diameter, 60°, red, 24V
LT2RZF100-60-2-G-24V	LED ringlight, 2 LED rows, 100 mm outer diameter, 60°, green, 24V
LT2RZF100-60-2-B-24V	LED ringlight, 2 LED rows, 100 mm outer diameter, 60°, blue, 24V



#### LTLAIC series

Continuous LED low angle diffused ringlights

LT3RZF100-60-1-W-24V	LED ringlight, 1 LED row, 105.2 mm outer diameter, 60°, white, 24V
LT3RZF100-60-1-R-24V	LED ringlight, 1 LED row, 105.2 mm outer diameter, 60°, red, 24V
LT3RZF100-60-1-G-24V	LED ringlight, 1 LED row, 105.2 mm outer diameter, 60°, green, 24V
LT3RZF100-60-1-B-24V	LED ringlight, 1 LED row, 105.2 mm outer diameter, 60°, blue, 24V



#### LTLADC series

Continuous LED low angle direct ringlights

LTZZO130-75-3-W-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, white, 24V
LTZZO130-75-3-R-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, red, 24V
LTZZO130-75-3-G-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, green, 24V
LTZZO130-75-3-B-24V	LED low angle ringlight, 3 LED rows, outer diameter 131 mm, 75°, blue, 24V



#### LTRNST series

LED ring illuminators - straight type

LTRN036RD	Ring LED illuminator, inner diameter 61 mm, straight type, red 630 nm
LTRN036GR	Ring LED illuminator, inner diameter 61 mm, straight type, green 525 nm
LTRN036BL	Ring LED illuminator, inner diameter 61 mm, straight type, blue 470 nm
LTRN036NW	Ring LED illuminator, inner diameter 61 mm, straight type, white



#### LTBC series

Continuous LED backlight

LTBC054054-W	Continuous LED backlight, 54x54 illumination area, white
LTBC054054-G	Continuous LED backlight, 54x54 illumination area, green



#### LTBC series

Continuous flat side-emitting LED backlights

LTPVRG070-00-1-W-24V	Flat side-emitting LED backlight, thin borders, 70X70 mm illumination area, white, 24V
LTPVRG070-00-1-R-24V	Flat side-emitting LED backlight, thin borders, 70X70 mm illumination area, red, 24V
LTPVRG070-00-1-G-24V	Flat side-emitting LED backlight, thin borders, 70X70 mm illumination area, green, 24V

LTPVRG070-00-1-B-24V Flat side-emitting LED backlight, thin borders, 70X70 mm illumination area, blue, 24V



LTBRDC series

Continuous LED bar lights

LTZPFL080-00-6-W-24V LED bar light, 6 LED rows, 80X26.3 illumination area, white, 24V

LTZPFL080-00-6-R-24V LED bar light, 6 LED rows, 80X26.3 illumination area, red, 24V

LTZPFL080-00-6-G-24V LED bar light, 6 LED rows, 80X26.3 illumination area, green, 24V

LTZPFL080-00-6-B-24V LED bar light, 6 LED rows, 80X26.3 illumination area, blue, 24V



LTCXC series

Continuous LED coaxial lights

LT2QOG040-00-X-W-24V LED coaxial light, 48x48 mm light emitting area, white, 24V

LT2QOG040-00-X-R-24V LED coaxial light, 48x48 mm light emitting area, red, 24V

LT2QOG040-00-X-G-24V LED coaxial light, 48x48 mm light emitting area, green, 24V

LT2QOG040-00-X-B-24V LED coaxial light, 48x48 mm light emitting area, blue, 24V



CMBS series

45° beam splitters

CMBS036 45° beam splitter with mount for 61 mm clamping diameter optics



CMMR series

45° first surface mirrors

CMMR036 45° first surface mirror for 61 mm clamping diameter optics



WI series

Protective windows

WI036 Protective window for 61 mm clamping diameter optics



CMHO series

Clamping mechanics

CMHO036 Clamping mechanics for TCxx036 lenses and LTCLHP036-X illuminators



COE HR AS series

29 MP, 48MP and 71MP area scan cameras for high-speed applications

COE29MUSB3IR-K Area scan camera CCD, USB3, 6576 x 4384 monochrome, 35mm, 2fps, IR Cut filter, K mount

COE29CUSB3IR-K Area scan camera CCD, USB3, 6576 x 4384 color, 35mm, 2fps, IR cut, IR Cut filter, K mount

COE29MUSB3IR-F Area scan camera CCD, USB3, 6576 x 4384 monochrome, 35mm, 2fps, IR Cut filter, F-mount

COE29CUSB3IR-F Area scan camera CCD, USB3, 6576 x 4384 color, 35mm, 2fps, IR cut, IR Cut filter, F-mount

COE29MCLIR-K Area scan camera CCD, Camera Link, 6576 x 4384 monochrome, 35mm, 4fps, IR Cut filter, K mount

COE29CCLIR-K Area scan camera CCD, Camera Link, 6576 x 4384 color, 35mm, 4fps, IR Cut filter, K mount

COE29MCLIR-F Area scan camera CCD, Camera Link, 6576 x 4384 monochrome, 35mm, 4fps, IR Cut filter, F-mount

COE29CCLIR-F Area scan camera CCD, Camera Link, 6576 x 4384 color, 35mm, 4fps, IR Cut filter, F-mount

COE29MUSB3SK-K Area scan camera CCD, USB3, 6576 x 4384 monochrome, 35mm, 2fps, skylight/glass filter, K mount

COE29CUSB3SK-K Area scan camera CCD, USB3, 6576 x 4384 color, 35mm, 2fps, skylight/glass filter, K mount

COE29MUSB3SK-F Area scan camera CCD, USB3, 6576 x 4384 monochrome, 35mm, 2fps, skylight/glass filter, F-mount

COE29CUSB3SK-F	Area scan camera CCD, USB3, 6576 x 4384 color, 35mm, 2fps, skylight/glass filter, F-mount
COE29MCLSK-K	Area scan camera CCD, Camera Link, 6576 x 4384 monochrome, 35mm, 4fps, skylight/glass filter, K mount
COE29CCLSK-K	Area scan camera CCD, Camera Link, 6576 x 4384 color, 35mm, 4fps, skylight/glass filter, K mount
COE29MCLSK-F	Area scan camera CCD, Camera Link, 6576 x 4384 monochrome, 35mm, 4fps, skylight/glass filter, F-mount
COE29CCLSK-F	Area scan camera CCD, Camera Link, 6576 x 4384 color, 35mm, 4fps, skylight/glass filter, F-mount
COE50MUSB3IR-K	Area scan camera CMOS, USB3, 7920 x 6004, monochrome, 6.8fps, IR Cut filter, K mount
COE50CUSB3IR-K	Area scan camera CMOS, USB3, 7920 x 6004, color, 6.8fps, IR Cut filter, K mount
COE50MUSB3IR-F	Area scan camera CMOS, USB3, 7920 x 6004, monochrome, 6.8fps, IR Cut filter, F-mount
COE50CUSB3IR-F	Area scan camera CMOS, USB3, 7920 x 6004, color, 6.8fps, IR Cut filter, F-mount
COE50MCLIR-K	Area scan camera CMOS, Camera Link, 7920 x 6004, monochrome, 27.3fps, IR Cut filter, K mount
COE50CCLIR-K	Area scan camera CMOS, Camera Link, 7920 x 6004, color, 27.3fps, IR Cut filter, K mount
COE50MCLIR-F	Area scan camera CMOS, Camera Link, 7920 x 6004, monochrome, 27.3fps, IR Cut filter, F-mount
COE50CCLIR-F	Area scan camera CMOS, Camera Link, 7920 x 6004, color, 27.3fps, IR Cut filter, F-mount
COE50MUSB3SK-K	Area scan camera CMOS, USB3, 7920 x 6004, monochrome, 6.8fps, skylight/glass filter, K mount
COE50CUSB3SK-K	Area scan camera CMOS, USB3, 7920 x 6004, color, 6.8fps, skylight/glass filter, K mount
COE50MUSB3SK-F	Area scan camera CMOS, USB3, 7920 x 6004, monochrome, 6.8fps, skylight/glass filter, F-mount
COE50CUSB3SK-F	Area scan camera CMOS, USB3, 7920 x 6004, color, 6.8fps, skylight/glass filter, F-mount
COE50MCLSK-K	Area scan camera CMOS, Camera Link, 7920 x 6004, monochrome, 27.3fps, skylight/glass filter, K mount
COE50CCLSK-K	Area scan camera CMOS, Camera Link, 7920 x 6004, color, 27.3fps, skylight/glass filter, K mount
COE50MCLSK-F	Area scan camera CMOS, Camera Link, 7920 x 6004, monochrome, 27.3fps, skylight/glass filter, F-mount
COE50CCLSK-F	Area scan camera CMOS, Camera Link, 7920 x 6004, color, 27.3fps, skylight/glass filter, F-mount
COE71MUSB3IR-K	Area scan camera CMOS, USB3, 10000 x 7094, monochrome, 3fps, IR Cut filter, K mount
COE71CUSB3IR-K	Area scan camera CMOS, USB3, 10000 x 7094, color, 3fps, IR Cut filter, K mount
COE71MUSB3IR-F	Area scan camera CMOS, USB3, 10000 x 7094, monochrome, 3fps, IR Cut filter, F-mount
COE71CUSB3IR-F	Area scan camera CMOS, USB3, 10000 x 7094, color, 3fps, IR Cut filter, F-mount
COE71MCLIR-K	Area scan camera CMOS, Camera Link, 10000 x 7094, monochrome, 3fps, IR Cut filter, K mount
COE71CCLIR-K	Area scan camera CMOS, Camera Link, 10000 x 7094, color, 3fps, IR Cut filter, K mount
COE71MCLIR-F	Area scan camera CMOS, Camera Link, 10000 x 7094, monochrome, 3fps, IR Cut filter, F-mount
COE71CCLIR-F	Area scan camera CMOS, Camera Link, 10000 x 7094, color, 3fps, IR Cut filter, F-mount
COE71MUSB3SK-K	Area scan camera CMOS, USB3, 10000 x 7094, monochrome, 3fps, skylight/glass filter, K mount
COE71CUSB3SK-K	Area scan camera CMOS, USB3, 10000 x 7094, color, 3fps, skylight/glass filter, K mount
COE71MUSB3SK-F	Area scan camera CMOS, USB3, 10000 x 7094, monochrome, 3fps, skylight/glass filter, F-mount
COE71CUSB3SK-F	Area scan camera CMOS, USB3, 10000 x 7094, color, 3fps, skylight/glass filter, F-mount
COE71MCLSK-K	Area scan camera CMOS, Camera Link, 10000 x 7094, monochrome, 3fps, skylight/glass filter, K mount
COE71CCLSK-K	Area scan camera CMOS, Camera Link, 10000 x 7094, color, 3fps, skylight/glass filter, K mount
COE71MCLSK-F	Area scan camera CMOS, Camera Link, 10000 x 7094, monochrome, 3fps, skylight/glass filter, F-mount
COE71CCLSK-F	Area scan camera CMOS, Camera Link, 10000 x 7094, color, 3fps, skylight/glass filter, F-mount



## COE HR AS-X series

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

<a href="#">COE-260-M-10GIGE-100-IR-F</a>	HR Area Scan camera PYTHON 25K, CMOS, 5120 × 5120, 26 MP, 4.5 pix, APS-H, Gray, 10GigE, 40 fps, F - mount, Glass filter
<a href="#">COE-260-M-10GIGE-100-IR-I</a>	HR Area Scan camera PYTHON 25K, CMOS, 5120 × 5120, 26 MP, 4.5 pix, APS-H, Gray, 10GigE, 40 fps, M58x0.75 - mount, Glass filter
<a href="#">COE-290-M-GIGE-110-IR-F-A</a>	HR Area Scan camera KAI29050-B1, CCD, Global shutter, 6576 × 4384, 29 MP, 5.5 pix, 35 mm, Gray, GigE, 4 fps, F - mount, Glass filter
<a href="#">COE-290-M-GIGE-110-IR-F-B</a>	HR Area Scan camera KAI29050-B2, CCD, Global shutter, 6576 × 4384, 29 MP, 5.5 pix, 35 mm, Gray, GigE, 4 fps, F - mount, Glass filter
<a href="#">COE-290-M-GIGE-110-IR-I-A</a>	HR Area Scan camera KAI29050-B1, CCD, Global shutter, 6576 × 4384, 29 MP, 5.5 pix, 35 mm, Gray, GigE, 4 fps, M58x0.75 - mount, Glass filter
<a href="#">COE-290-M-GIGE-110-IR-I-B</a>	HR Area Scan camera KAI29050-B2, CCD, Global shutter, 6576 × 4384, 29 MP, 5.5 pix, 35 mm, Gray, GigE, 4 fps, M58x0.75 - mount, Glass filter
<a href="#">COE-290-C-GIGE-110-IR-F-B</a>	HR Area Scan camera KAI29050-B2, CCD, Global shutter, 6576 × 4384, 29 MP, 5.5 pix, 35 mm, Color, GigE, 4 fps, F - mount, Infrared cut filter
<a href="#">COE-290-C-GIGE-110-IR-I-B</a>	HR Area Scan camera KAI29050-B2, CCD, Global shutter, 6576 × 4384, 29 MP, 5.5 pix, 35 mm, Color, GigE, 4 fps, M58x0.75 - mount, Infrared cut filter