EL5MP1656 | DATASHEET

OPTO ENGINEERING

5 MP fixel focal lens with liquid lens technology, focal length 16 mm, ƒ/5.6, C-mount

KEY ADVANTAGES

Precise and quick autofocus
Electronically driven liquid lenses allow for extremely fast and precise changes of focus

Easy installation
Optotune® liquid lenses are integrated in the optics for a ready-to-use solution

Excellent accuracy
High repeatability enhanced by a precise thermal calibration algorithm

Robust design
Lifetime guaranteed for over 1 billion cycles

The EL5MP series are 5 MP fixed focal length optics for sensors up to 2/3" with integrated Optotune® liquid lens technology.

SPECIFICATIONS

Optical specifications

Focal length	(mm)	16
Magnification[1]	(x)	0.093
Image circle	(mm)	11.0
Max sensor size		2/3"
WD range[2]	(m)	160 - inf
ƒ/N		5.6
Back focal length	(mm)	10.0
Distortion [3]	(%)	< 0.6

Liquid lens specifications

Liquid lens model		Optotune EL-3-10
Temperature sensor		Yes
Focal power mode		Yes
Response time	(ms)	1.0
Setting time	(ms)	4.0
Current range	(mA)	-120 to +120
Lifecycles (10%-90% sinusoidal)		>1,000,000,000
Connector		HR10A-7R-6PB

Mechanical specifications

Mount		C
Filter thread		M27 x 0.5
Length[4]	(mm)	41.2
Outer Diameter	(mm)	30.0
Mass	(g)	81.0

Environment

Operating temperature	(°C)	0-40
Storage temperature	(°C)	0-50
Operating relative humidity	(%)	20-85, non condensing
Installation		Indoor use only

[1] Calculated at minimum working distance
[2] Working distance: distance between the front end of the mechanics and the object
[3] Percent deviation of the real image compared to an ideal, undistorted image
[4] Measured from the front end of the machanics to the camera flange at infinite focusing

ANGLE OF VIEW

Sensors	Diagonal (°)
1/3" (4.8 x 3.6 mm x mm)	21.2
1/2" (6.4 x 4.8 mm x mm)	31.1
2/3" (8.5 x 7.1 mm x mm)	38.0

FIELD OF VIEW AT MINIMUM WORKING DISTANCE

Sensors	(mm x mm)
1/3" (4.8 x 3.6 mm x mm)	51.6 x 38.7
1/2" (6.4 x 4.8 mm x mm)	76.7 x 57.3
2/3" (8.5 x 7.1 mm x mm)	91.4 x 76.2

COMPATIBLE PRODUCTS

Full list of compatible products available *here*.

A wide selection of innovative machine vision components.

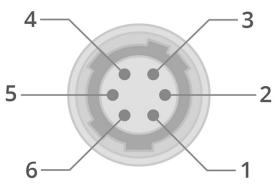
COMPATIBLE CONTROLLER

The liquid lens must be controlled by a suitable lens driver. Hirose cables and Liquid Lens driver are sold separately. Only the following part numbers are considered fully compatible with EL5MP1656:

- **CBGPIO6PMF-3M**, 6 Pin Hirose Male - Female moulded connector cable, 3 m.
- **RT-EL-E-4i**, USB Controllers for liquid lens modules, industrial version.

ATTENTION: observe precaution for handling.
Electrostatic sensitive device

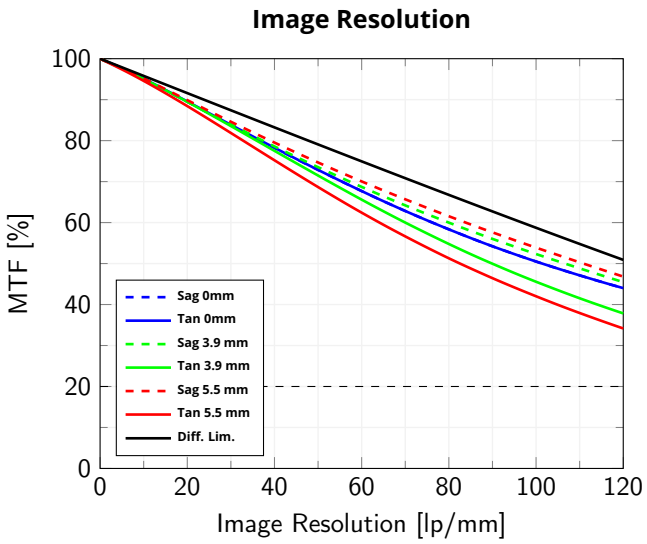
CONNECTOR PINOUT



Device side

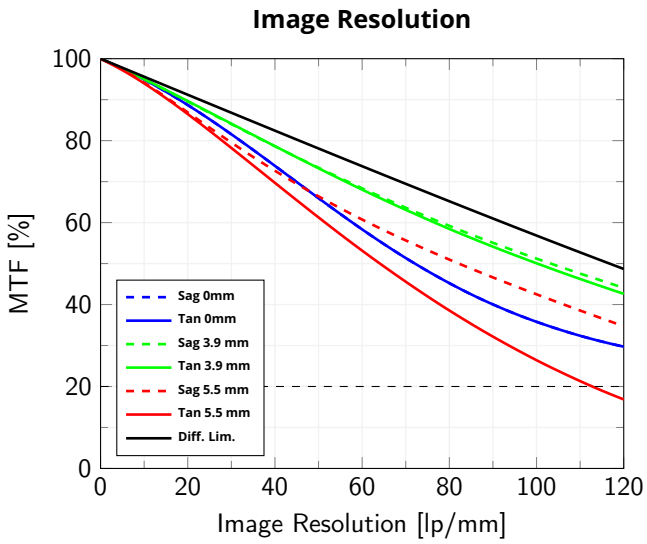
Pin	Description
1	Control current +
2	Control current -
3	GND
4	Power
5	I^2C SCL
6	I^2C SDA

IMAGE RESOLUTION AT 1 M WORKING DISTANCE



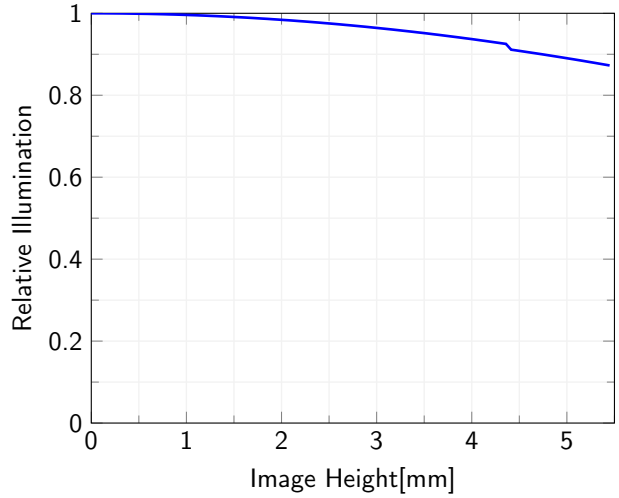
Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 486 nm - 656 nm, at 1 m working distance

IMAGE RESOLUTION AT MINIMUM WORKING DISTANCE



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

Relative Illumination



Relative illumination vs. Image Field Height, from the optical axis to the maximum image height at maximum aperture

Distortion

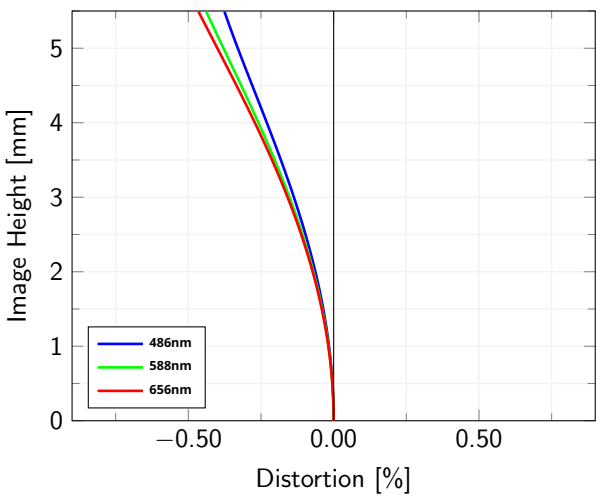
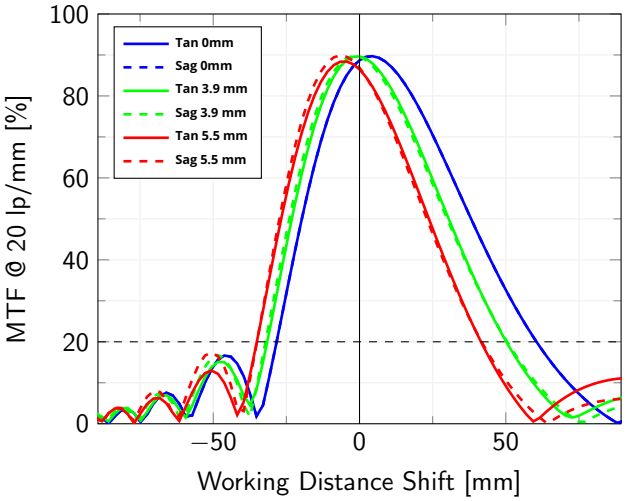


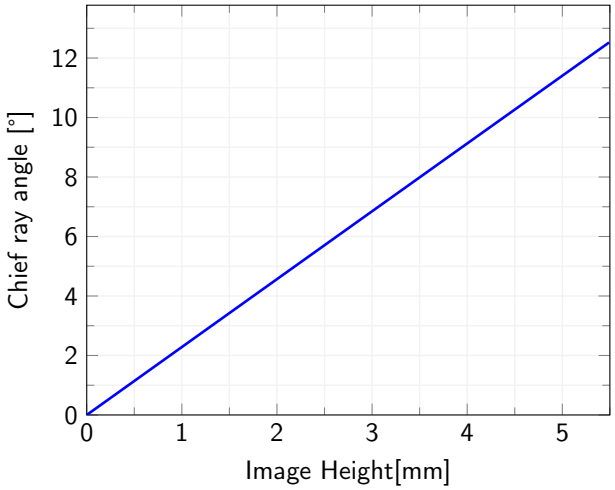
Image Field Height vs. Distortion, from the optical axis to the maximum image height

Depth of Field



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

Chief ray angle



Chief ray angle vs. Image Field Height, from the optical axis to the maximum image height at maximum aperture