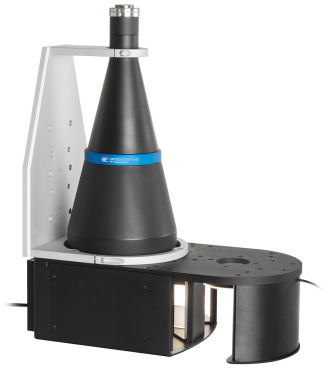
TCCAGE23096 | DATASHEET

OPTO ENGINEERING

Bi-telecentric multi mirror system for 2/3”sensors



KEY ADVANTAGES

90° lateral imaging
the 4 orthonormal views allow visualization of object features that are hidden when looked at from the top

Long and thin object inspection
the characteristic aspect ratio of the four image segments perfectly fits long and thin objects

Built-in illumination
the device also incorporates two different light sources, for back and direct illumination

Suitable for measurement
the telecentric optics makes this module perfect for any multiple-measurement application.

TCCAGE is an integrated optomechanical system designed to fully inspect and measure parts from the side without any need of rotation. Four orthonormal views of an object are provided by a bitelecentric lens through an array of mirrors.

SPECIFICATIONS

Optical specifications

Magnification		0.093
Sensor size[1]	(mm x mm)	8.5 x 7.1
FOV (diameter x height) [2]	(mm x mm)	16.0 x 68.0
Min sensor size		2/3”
wf/N[3]		8
Depth of field [4]		47.9

Mechanical specifications

Mount		C
Phase adjustment[7]		Yes
Length	(mm)	347.0
Width	(mm)	179.0
Height	(mm)	424.1
Mass	(g)	6966

Environment

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

Eye safety

Risk group (CEI EN 62471:2010)	Exempt

[1] Recommended sensor. Different sensor sizes may cause incomplete images
[2] Maximum sample diameter in each of the four views and maximum sample height with the recommended sensor.
[3] Working f/N: the real f/N of a lens in operating conditions. Lenses with reduced aperture can be supplied on request.
[4] At the limits of the depth of field, the image can still be used for measurements. For a very sharp image, however, only half of the depth of field should be considered. Pixel size used for calculation is 3.45 µm.
[5] Tolerance ± 2 %.
[6] Drop to 50% intensity @ 25°C.
[7] Indicates the availability of an integrated camera phase adjustment feature

COMPATIBLE PRODUCTS

Full list of compatible products available *here*.

A wide selection of innovative machine vision components.

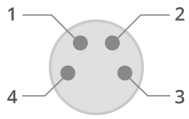
Electrical specifications of coaxial light

Light color, peak wavelength		white, 6300K
Supply voltage[5]	(V)	24
Max continuous current	(A)	620
Typical pulse voltage	(V)	36
Max pulse current	(A)	6.2
Peak power consumption	(W)	14.9
Max duty cycle	(%)	10
Max pulse duration	(ms)	10
Estimated MTBF[6]	(hours)	20000
Cable length	(mm)	-
Connector		M8
Included cables		CB244P1501

Electrical specifications of ring light

Light color, peak wavelength		white, 6300K
Supply voltage[5]	(V)	24
Max continuous current	(W)	90
Typical pulse voltage	(V)	36
Max pulse current	(A)	0.27
Peak power consumption	(W)	2.2
Max duty cycle	(%)	10
Max pulse duration	(ms)	10
Estimated MTBF[6]	(hours)	20000
Cable length	(mm)	1
Connector		Flying leads
Included cables		-

COAXIAL LIGHTING PINOUT



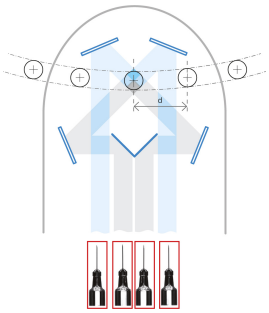
Device side

Pin	Function	Cable color
1	-	Yellow/Green
2	Ground	Black
3	-	Blue
4	+24 V	Brown

RINGLIGHT PINOUT

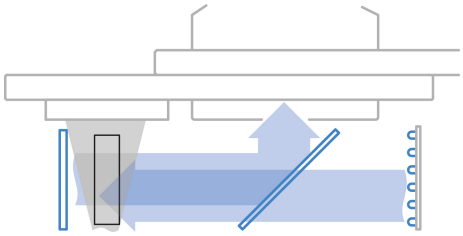
Function	Cable color
LED +	Red
LED -	White

WORKING PRINCIPLE AND ADDITIONAL INFO



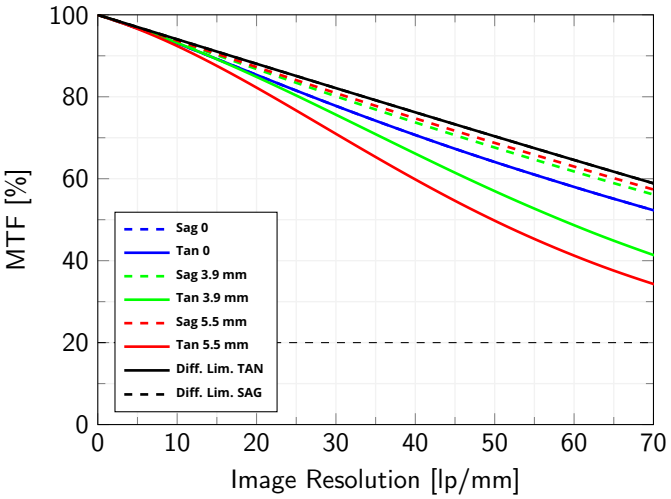
The four views are equally spaced by 90° and partially overlapped, obtaining complete coverage of the object lateral surfaces.

TCCAGE is provided with an extra port placed right above the object. This port can be used to inspect the top of the part using an additional lens and camera system.



TCCAGE series integrates both direct and backlight illumination.

Image Resolution



Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 486 nm - 656 nm from the centre to to the corner of images sensor

LED color spectrum