



OPTO ENGINEERING

# PCHIL013-EL | DATASHEET

## Hole inspection lens for 1/2.9" sensors, focusing with liquid lens



### SPECIFICATIONS

#### Optical specifications

Image circle	(mm)	3.2
Min sensor size		1/2.9"
Working distance with minimum object size <sup>1</sup>	(mm)	5
Working distance with maximum object size <sup>1</sup>	(mm)	62
Viewing angle	(°)	82
$wf/N^2$		5.6

#### Liquid lens specifications

Liquid lens model	Optotune EL-3-10	
Temperature sensor	Yes	
Focal power mode	Yes	
Response time	(ms)	1
Setting time	(ms)	4
Current range	(mA)	-120 to +120
Lifecycles (10%-90% sinusoidal)	>1,000,000,000	
Connector	HR10A-7R-6PB	

#### Mechanical specifications

Focusing	Liquid lens	
Mount	C	
Length <sup>3</sup>	(mm)	130.4
Outer diameter	(mm)	33.0
Mass	(g)	154

### KEY ADVANTAGES

**High-resolution imaging** of holed objects **from the outside**.

Simultaneous view of both the **side walls** and the **bottom of cavities**.

**Variable iris and large aperture**.

**Wide range** of object **diameters and thicknesses**.

**Wide viewing angle**.

Easy and precise **manual focusing**.

**Liquid lens models** for fast and remote autofocus.

**Opto Engineering® PCHIL series** features hole inspection lenses for the inner inspection of cavities and containers in perfect focus.

### Environment

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

<sup>1</sup> Working distance: distance between the front end of the mechanics and the object.

<sup>2</sup> Working f-number ( $wf/N$ ): the real f-number of a lens in operating conditions.

<sup>3</sup> Measured from the front end of the mechanics to the camera flange.

### FIELD OF VIEW

#### Field of view (diameter x height)

Minimum	(mm x mm)	10.0 x 6.0
Maximum	(mm x mm)	120.0 x 190.0

### COMPATIBLE PRODUCTS

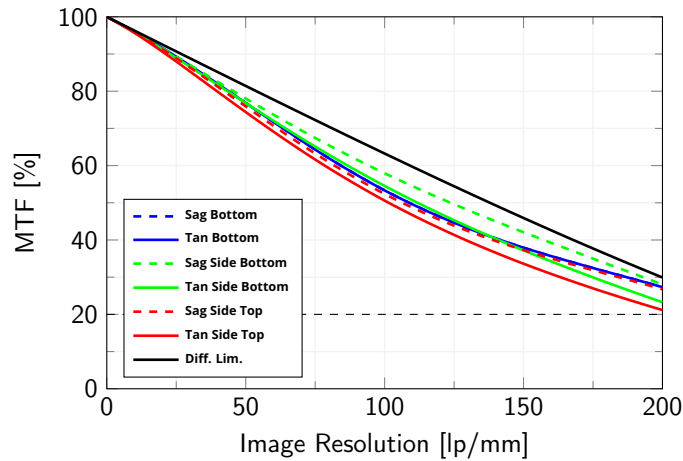
Full list of compatible products available [here](#).



A wide selection of innovative machine vision components.

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. Data are reported by design, actual lens performance may vary due to manufacturing tolerances.

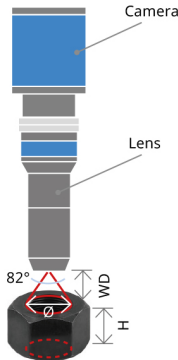
Image Resolution



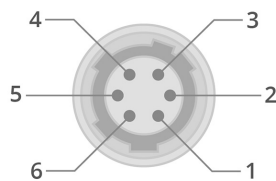
Modulation Transfer Function (MTF) vs. Image Resolution, wave-length range 486 nm - 656 nm,  $wf/N=5.6$ , of cylindrical object of diameter 30 mm and height of 20 mm

PCHIL IMAGING SETUP

PCHIL optics can image cavities whose diameters and thicknesses span over a wide range of values. PCHIL series features 82° view angle and can image both the inner walls and the bottom of cavities.



CONNECTOR PINOUT



Device side

Pin	Description
1	Lens + control pin
2	Lens - control pin
3	GND
4	Power
5	I <sup>2</sup> C SCL
6	I <sup>2</sup> C SDA



**ATTENTION:** observe precaution for handling.  
Electrostatic sensitive device