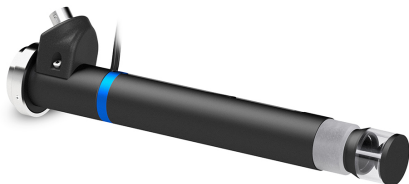


# PCBP013-AF | DATASHEET

## Boroscopic probe for 1/3" detectors, liquid lens focusing



### KEY ADVANTAGES

#### Inspection of cavities from inside

Hidden internal features and defects are clearly viewed

#### High resolution

The catadioptric design enables the detection of tiny defects over a very wide view angle

#### Flaw detection

Coarse deformations revealed using direct illumination

#### Surface defect enhancement

Mixing direct and indirect illumination makes it possible to emphasize tiny and scarcely visible defects.

#### Small diameter inspection

Now down to 5.5 mm

**PCBP probes** are used to inspect holed objects such as engine parts, containers and tubes whose hidden features can only be controlled by introducing a probe into the cavity.

### SPECIFICATIONS

#### Optical specifications

Image circle	(mm)	3.4
Max sensor size		1/3"
Viewing angle	(°)	60
$wf/N^1$		14
Focusing		Liquid lens
Light color		white

#### Electrical specifications

Supply voltage <sup>2</sup>	(V)	24
Current <sup>3</sup>	(mA)	40
Power consumption <sup>3</sup>	(W)	1

#### Liquid lens specifications

Liquid lens model		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

Mount		C
Phase adjustment		Yes
Probe length	(mm)	139.6
Total length <sup>4</sup>	(mm)	168.2
Probe diameter	(mm)	21
Mass	(g)	111

#### 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)		Risk group 1
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### FIELD OF VIEW

#### Diameter x Height

	(mm x mm)
Minimum	25.0 x 11.0
Maximum	inf x inf

<sup>1</sup> working  $f/N$ : the real  $f/N$  of a lens in operating conditions.

<sup>3</sup> Tolerance  $\pm 2\%$

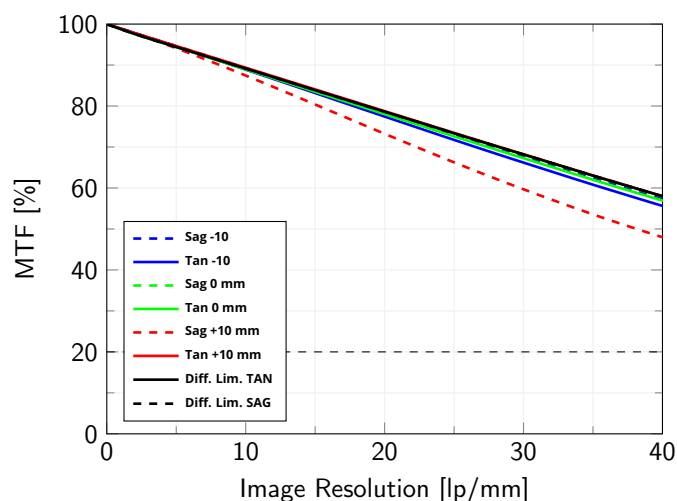
<sup>3</sup> Used in continuous (not pulsed) mode

<sup>4</sup> Measured from the front end of the mechanics to the camera flange.

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.

## DATA WITH CAVITY DIAMETER OF 40MM

Image Resolution



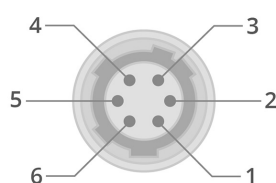
Modulation Transfer Function (MTF) vs. Image Resolution, wavelength range 486 nm - 656 nm. Fields in legend are represented as distance from the center of the boroscope tip

## 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 PCBP013-AF:

- **CBGPI06PMF-3M**, 6 Pin Hirose Male - Female moulded connector cable, 3 m.
- **RT-EL-E-4i**, USB Controllers for liquid lens modules, industrial version.

## CONNECTOR PINOUT



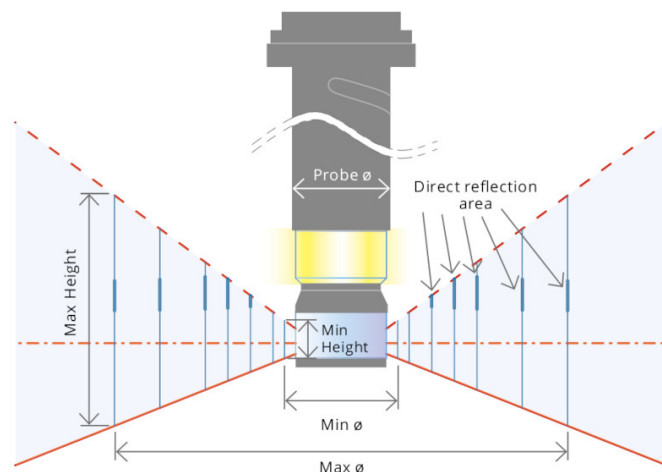
Device side

Pin	Description
1	Control current +
2	Control current -
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

## WORKING PRINCIPLE AND FOV OF PCBP LENSES



## ILLUMINATOR PINOUT

Function	Cable color
GND	Black
+24 V	Black/White

## COMPATIBLE PRODUCTS

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



A wide selection of innovative machine vision components.