



# PCBP023-AF | DATASHEET

## Boroscopic probe for 2/3" 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) | 7           |
| Max sensor size |      | 2/3"        |
| Viewing angle   | (°)  | 60          |
| $wf/N^1$        |      | 18          |
| 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) | 80.1 |
| Total length <sup>4</sup> | (mm) | 114  |
| Probe diameter            | (mm) | 21   |
| Mass                      | (g)  | 86   |

#### 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 |
|--------------------------------|--|--------------|

### 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.

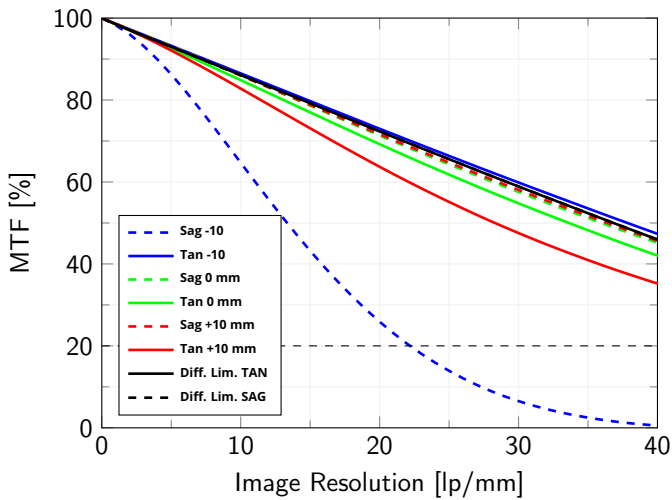
<sup>2</sup> Tolerance  $\pm 2\%$

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

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

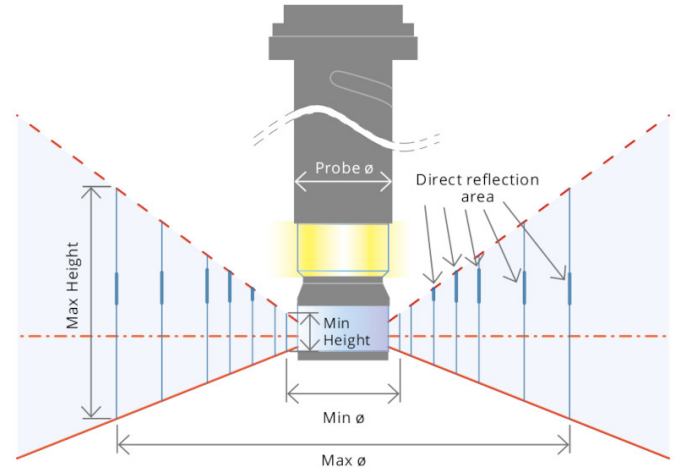
DATA WITH CAVITY DIAMETER OF 40MM

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

WORKING PRINCIPLE AND FOV OF PCBP LENSES



COMPATIBLE CONTROLLER

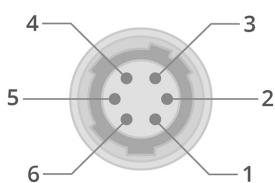
The liquid lens must be controlled by a suitable lens driver. Hirose cables and Liquid Lens driver are sold separately. Only the following part numbers are considered fully compatible with PCBP023-AF:

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

ILLUMINATOR PINOUT

| Function | Cable color |
|----------|-------------|
| GND      | Black       |
| +24 V    | Black/White |

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

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.