OPTO ENGINEERING

PCHI LENS WITH ELECTRONIC FOCUSING

PCHI023-AF

INSTRUCTIONS MANUAL

V 2.0 - eng

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1. PRODUCT OVERVIEW

PCHI optics have been developed by Opto Engineering® to easily inspect holes, cavities and containers. Unlike common optics or so called “pinhole lenses” which can only image flat fields of view, hole inspection optics are specifically designed to image both the bottom of a hole and its vertical walls.

Thanks to the large view angle (>82°) and innovative optical design, these lenses are compatible with a wide range of object diameters and thicknesses. Hole inspection optics are the perfect solution to inspect a variety of different object shapes such as cylinders, cones, holes, bottles or threaded objects.

PCHI023-AF integrates a liquid lens module which allows for fast and accurate refocusing of the lens. This solution is dedicated to fully automated lines, or applications with frequent change in product types.

2. SAFETY WARNINGS

- **Read carefully this instructions manual.**
  This document contains the necessary information to use the product properly.
- **Do not inspect the internal parts of the product. Warranty will not be valid if product is opened.**
  The lens contains very delicate components that might be permanently damaged if handled carelessly.
- **Product must be adequately shielded if employed in dusty and humid places**
- **Do not use together with machines that generate strong vibrations**
  The lens might be permanently damaged if deployed in the presence of strong vibrations and impulsive forces
- **Do not use the product out of the fields of usage marked in the specifications.**
  See Specifications paragraph.

3. PRODUCT WARRANTY

The device warranty is 12 months from the effective delivery date with reference to the device serial number.

The warranty covers the replacement or repairs of the defective part (components, device or part of it) with the exclusion of dismantling and shipping costs.

The replacement of one or more components does not renew the warranty period of the entire device. The manufacturer cannot be held liable for any compensation for whatever reason and the buyer renounces any claims for costs or damages to third parties due to any machine downtime.

The information in this document can only be used by customers who have been given the manual along with the device and only for the purposes of installing, using and performing maintenance on PENSO-01.

4. SPECIFICATIONS

4.1. Objective specification

Detector type		2/3"
Image circle Ø	(mm)	6.6

Field of view (diameter x height) [1]

Minimum	(mm x mm)	10 x 10
Maximum	(mm x mm)	120 x 190

Optical specifications

Wavelength range	(nm)	450..650
Working distance	(mm)	5..62
CTF @ 50 lp/mm	(%)	> 30
wF/# [2]		8.3
Focusing		Adaptive lens

Mechanical specifications

Diameter	(mm)	40.0
Length	(mm)	115.2
Mass	(g)	270
Mount		C-mount

Environmental specifications

Operating temperatute	(°C)	5÷40
Storage temperature	(°C)	0÷50
Humidity	(%)	10-85 non condensing
IP rating		-
Installation		Indoor use only

NOTES

1. Cameras with CS- to C-mount adapters, filters or protective windows in front of the sensor or other mechanical constraints in the C-mount can limit the focus range of PCHI0xx lenses. Contact us to check compatibility with your specific camera.
2. Working F-number (wF/#): the real F-number of a lens when used as a macro.

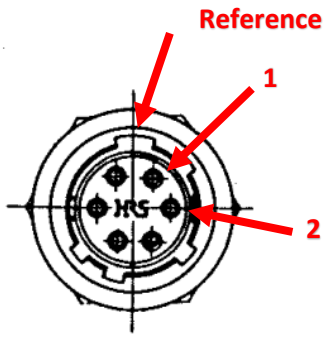
4.2. Electronic specification

Electronic specification	
Liquid lens model	Optotune EL-3-10-XXX-26D
Temperature sensor	No
Response time	1 ms
Setting time	4 ms
Control current range	-120 to +120 mA
Lifecycles (10%-90% sinusoidal)	> 1,000,000,000
Temperature sensor	No
Focal power mode	No

5. PINOUT AND CONTROLLER

5.1. Connector and pinout

The PCHI mounts a circular 6-pin male connector, whose part number is HR10A-7R-6PB(73).
The figure on the right represents the connector. Note that some of the pins are not used. In particular, the connector pinout is described in the following table:



Pin number	Description
1	Lens + control pin
2	Lens - control pin
3	Not connected
4	Not connected
5	Not connected

5.2. Compatible controllers

The PCHI tunable lens must be controlled by a suitable lens driver.
Only the following part numbers are considered fully compliant with the PCHI023-AF.

CBGPIO6PMF-3M, 6 Pin Hirose Male - Female moulded connector cable, 3 m
RT-EL-E-4i, USB driver for electrical lenses, Industrial housing with 6-pin Hirose connector, Output current: 0 to +/-250 mA, I2C sensor read-out.

Opto Engineering doesn't respond for product damages and malfunctioning if other drivers are used. Check the manufacturer website for the driver installation and configuration.

Contact your Opto Engineering Area Manager for more information on pricing and availability.

6. TUNABLE LENS CHARACTERISTICS

6.1. Optical power vs Current

The optical power of the EL-3-10 increases with positive current and decreases with negative current.
For more information please check the Optotune's datasheet for EL-3-10.

6.2. Response time

Maximum response time of the lens is 4 ms.
For more information please check the Optotune's datasheet for EL-3-10.

6.3. Temperature effects

Temperature changes affects the lens behaviour resulting in a drift of the optical power.
For more information please check the Optotune's datasheet for EL-3-10.

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