

[DATA SHEET]

FAOSI

Inspection Head

Fully automated surface inspection of optical components to
ISO 10110-7. Modular, precise, standard-compliant.

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OVERVIEW

The inspection head at a glance

The **FAOSI** inspection head is the central optical element of the **FAOSI** system. It captures the surface of optical components at high resolution and supplies the image data for standard-compliant evaluation to ISO 10110-7. Scratches, inclusions, digs and zonal defects are detected, classified and documented.

The head is a self-contained module, not a closed inspection system: it is mounted on a motion system and integrated into a flow box or a **FAMOS** cell. The same measurement technology therefore covers both the manual workstation and fully automated inline inspection.

Key data

ACQUISITION TIME

0.3 s

per image

MAGNIFICATION

1× / 2× / 4× / 6×

interchangeable optics

PIXEL SIZE, OBJECT PLANE

0.456 to 2.740 µm

depending on magnification

SMALLEST ISO GRADE

0.0025

Renard grade to ISO 10110-7

ILLUMINATION

18 directions

rectangular LED unit

DESIGN

straight or angled

compact, easy to service

Contents

1	Optical configurations	Page 4
2	Illumination	Page 5
3	Mechanics, environment & interfaces	Page 6
4	Software: features & inspection types	Page 7
5	Software: measured values & data model	Page 8
6	System integration	Page 9
7	Indicative prices	Page 10

Optical configurations

Four magnification levels. The choice determines field of view, depth of focus and the smallest resolvable ISO defect grade, and with it the inspection time per component.

MAGN. []	FIELD OF VIEW [mm × mm]	DEPTH OF FOCUS [mm]	PIXEL SIZE object plane [μm]	SMALLEST DEFECT [μm]	SMALLEST ISO GRADE Renard [mm]
1×	8.50 × 7.09	0.9	2.740	13.700	0.016
2×	4.25 × 3.55	0.3	1.370	6.850	0.010
4×	2.13 × 1.77	0.1	0.685	3.425	0.0040
6×	1.42 × 1.18	0.1	0.456	2.283	0.0025

Pixel size, object plane = sensor pixel pitch ÷ magnification (sensor pixel pitch 2.740 μm).

Smallest defect = 5 pixels in the object plane. The ISO grade shown is the next higher Renard grade of the R10 series in accordance with ISO 10110-7.

Detection limits

Smallest visible defect	1 pixel in the object plane: 0.456 μm at 6× to 2.740 μm at 1×
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Image acquisition

Acquisition time	0.3 s per image, suitable for series production cycle times
Sensor format	approx. 8.50 × 7.09 mm, corresponding to approx. 3'100 × 2'590 pixels (≈ 8 MP)
Sensor pixel pitch	2.740 μm

Illumination

How the inspection head makes a defect visible determines how reliably it can be classified.

The purpose-built rectangular illumination unit lights the optical surface from 18 different angles of incidence. Defects are made visible from several directions, yielding additional information about their shape, orientation and structure. Combining these illumination directions in a single image creates a pseudo-3D effect that markedly improves reliable detection and precise classification of a wide range of surface defects.

Illumination unit	rectangular, developed specifically for the inspection head
Angles of incidence	18
Light source	LED, matched to the surface type
Image acquisition	one image per measurement position, all illumination directions combined
Effect	pseudo-3D effect revealing shape, orientation and structure of the defect

More than one look at the defect

Lit flatly from one side, a surface only shows that something is there. Light from 18 directions shows what it is: a scratch reflects differently than an inclusion or a pit. Those differences are already contained in the single image and are used by the evaluation for classification.

Mechanics, environment & interfaces

Design and integration data of the inspection head.

Design	compact, straight or angled; service-friendly
Mounting	on a microscope stand, XYZ linear system or industrial robot (e.g. 6-axis)
Operating environment	cleanroom compatible; equally suited to demanding production lines
Electrical connections	M12 circular connector plus data and illumination cables
Dimensions (L × W × H)	231 mm × 64 mm × 64 mm
Weight	750 g
Working distance	5 mm, adjustable to the application
Power supply	24 V DC or 240 V AC
Data interface	GigE



Head Assembly

Software: features & inspection types

The **FAOSI** software controls the entire inspection process and evaluates it fully automatically. Operation through a web dashboard in the browser.

Features

- **Standard-compliant evaluation** to ISO 10110-7 including defect classification
- **Single or multiple measurement**, freely configurable
- **Automatic report generation** as PDF, XML or CSV; database connection possible
- **User management, audit trail and batch logging**
- **Web dashboard** with order, batch and machine assignment plus export function

Inspection types

Surface defects	scratches, inclusions, digs and zonal defects on plano and aspheric apertures; several apertures definable per surface
Edge chips	optional , with a separate pass/fail verdict

Verdicts and status

Individual verdicts	surface defects and, where enabled, edge chips; each pass or fail
Overall verdict	overall quality, stating the category that triggered it
Processing status	processing completed / processing failed

Software: measured values & data model

The values and structures the software reports for each inspected component.

Measured values, surface inspection

Pixel size	reported for each measurement
Aperture	freely definable in mm × mm; several apertures per surface
Number of defects	per aperture
Largest defect	ISO notation with absolute size
Total defect area	ISO notation as an equivalent square

Data model and traceability

Assignment per measurement	part number and designation, variant, order, batch, machine, time stamp
Object ID	unique UUID per inspected component, directly addressable
Image data	acquired image and evaluated image with the defects marked
Export	PDF, XML, CSV; order and batch views linked directly

Reproducible results, free of operator influence

This makes the inspection releasable for quality assurance and therefore a prerequisite for standard-compliant series inspection.

System integration

The inspection head is designed for integration and is combined with a motion system and an inspection environment to suit the application.

Motion systems

- **Manual system** (e.g. microscope stand): a simple workstation for spot checks, first articles and the laboratory
- **XYZ linear system**: precise positioning in three axes; ideal for inspection stations with fixed part carriers
- **Industrial robot** (e.g. 6-axis): maximum flexibility with complex part geometries, changing parts or fully automated lines

Environment & protection

- **FAMOS system**: robust, fully automated and modular machine cell for industrial applications; configurable as stand-alone or inline
 - Option flow box: compact inspection cell with controlled air flow for manual or semi-automatic operation; protection against dust and ambient influences
 - Option part feeding
 - Option camera scanner for ID recognition
 - Option cleanroom-compatible enclosure
 - Option PLC control for line integration

FAMOS + FAOSI = a complete system for standard-compliant series inspection

From the simple workstation with a flow box to the fully integrated production solution with robotics: the same measurement technology, the same evaluation, the same reports.

SECTION 7

Indicative prices

Based on the **FAOSI** 2026 brochure. Indicative prices, not quoted prices.

FAOSI inspection head

Optical unit with camera and illumination, straight or angled design, one magnification level.

CHF 35'000.–

FAOSI software

Inspection sequence control, ISO 10110-7 evaluation, report generation, user management and audit trail.

CHF 25'000.–

Motion system

XYZ linear system or industrial robot, depending on part geometry and degree of automation.

from CHF 25'000.–

Environment & protection (FAMOS)

FAMOS cell, optionally with flow box, part feeding, ID recognition and PLC connection.

from CHF 15'000.–

VAT not included.



YOUR NEXT STEP

From a judgement call to a measurement

Grading surface defects to ISO 10110-7 costs time today and depends on the inspector's eye. The **FAOSI** inspection head takes both off your hands: 0.3 seconds per image, defects from 0.456 μm , every assessment documented and repeatable at any time.

Sees more than a glance

Light from 18 directions instead of one. The pseudo-3D effect reveals the shape, orientation and structure of a defect, not just its area, and makes the classification hold up. In a single image, in 0.3 seconds.

Standard-compliant, not merely similar

Defect classification to ISO 10110-7, reports as PDF, XML or CSV, plus user management, audit trail and batch logging. What you inspect, you can prove.

Grows with your application

From the manual microscope stand through XYZ axes to a robot in the **FAMOS** cell: the same measurement technology, the same evaluation, the same reports. The entry stays small, the expansion stays open.

Built for the line, not the showroom

231 × 64 × 64 mm, 750 g, 24 V DC or 240 V AC, GigE. Cleanroom compatible and rugged enough for production. Four magnification levels from 1× to 6× cover your range of parts.

Bring us your most difficult part. We will prove that it works, and you take the ISO 10110-7 inspection report with you.

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