

2.5D Semi-Automatic Vision Measuring Machine

SV-2.5D Series Product Catalogue

Non-contact dimensional inspection system with manual X/Y positioning, motorized Z-axis auto focus, software-assisted edge detection, and height or height-difference measurement for precision components.

MANUAL X/Y

Z AUTO FOCUS

HEIGHT



Models

SV-2.5D-3020 / SV-2.5D-4030

Measuring Travel

300 x 200 x 200 mm / 400 x 300 x 200 mm

Linear Accuracy

(3 + 0.005L) μ m, L in mm

Main Application

Precision component dimensional inspection

Product Overview and Measurement Architecture

The SV-2.5D series combines flexible manual stage positioning with automatic Z-axis focusing and software-assisted optical measurement for repeatable laboratory and factory inspection.

Flexible semi-automatic operation

Manual X/Y positioning allows direct feature location while the motorized Z axis supports automatic focusing.

Height measurement capability

Height and height-difference measurements extend the system beyond basic planar dimensional inspection.

Software-assisted edge detection

AQ measurement software supports automatic edge recognition and saving or recalling measurement programs.

Stable granite structure

Precision granite base and X/Y body support a stable platform for dimensional measurement and stage movement.

SV-2.5D Series

Semi-Automatic Vision Measuring Machine



Manual X/Y positioning

Z-axis auto focus

Program save and recall

30 kg workpiece load

Functional Measurement Flow

1 Position Sample

Place and secure the workpiece on the stage.

2 Locate Feature

Move X/Y manually and adjust illumination.

3 Auto Focus

Use the Z axis to establish a clear surface position.

4 Detect Edge

Software identifies the selected visible geometry.

5 Calculate & Save

Dimensions are calculated and programs may be stored.

Detailed Technical Specifications

The following parameters summarize the catalogue-level SV-2.5D series configuration. Final optical setup, software functions and calibration scope should be confirmed for the ordered system.

Model and Measurement Scope

Parameter	Specification
Product models	SV-2.5D-3020 / SV-2.5D-4030
Product type	2.5D semi-automatic vision measuring machine
X/Y operation	Manual positioning
Z-axis operation	Motorized auto focus
Main functions	2D dimensions, height and height-difference measurement
Maximum workpiece load	30 kg

Accuracy and Measurement Configuration

Parameter	Specification
Linear accuracy	$(3 + 0.005L)$ μm , where L is in mm
Accuracy conditions	20 C ± 1 C; 55%-65% RH
Z-axis travel	200 mm
Linear scale resolution	1 μm standard; 0.5 μm or 0.1 μm optional
Imaging system	High-resolution color imaging system
Software	AQ measurement software

Instrument Configuration

Parameter	SV-2.5D-3020 / SV-2.5D-4030
Measuring travel	300 x 200 x 200 mm / 400 x 300 x 200 mm
Base and X/Y body	Precision granite
Drive structure	Ball screw and linear rail
Power supply	AC 110-220 V, single phase, 50/60 Hz
Machine dimensions	785 x 860 x 1040 mm / 880 x 1010 x 1040 mm
Machine weight	275 kg / 295 kg
Computer and monitor	Not included in standard supply

Technical Note

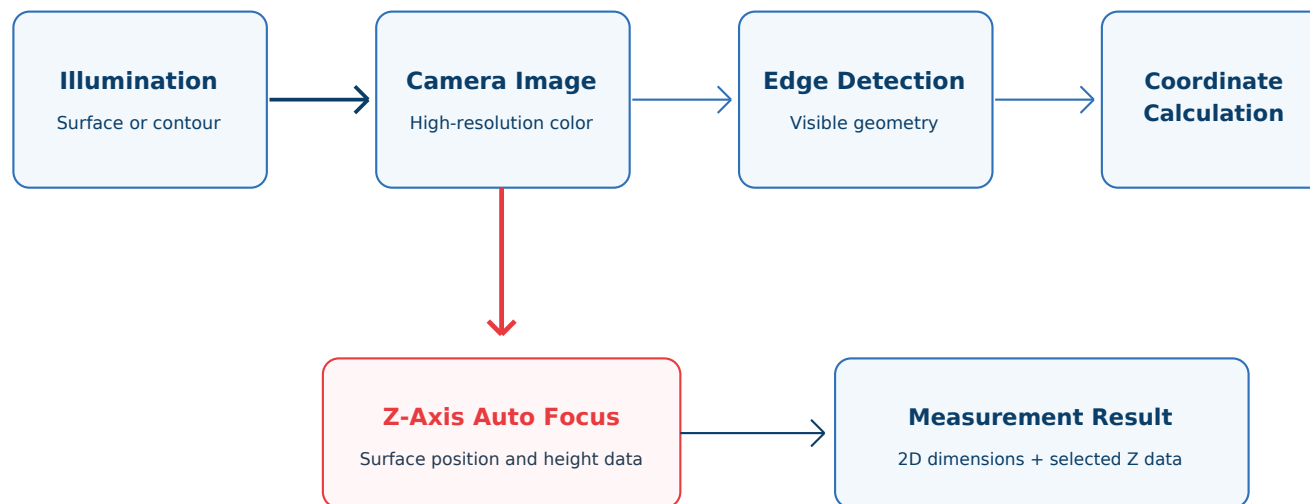
Repeatability data is not currently published. Lighting type, optical magnification, detailed software geometry tools and report export functions should be confirmed according to the selected configuration. A higher linear scale resolution does not independently define complete system accuracy. Computer and monitor are prepared separately unless otherwise agreed.

Optical Measurement Principle and Inspection Method

The system converts a captured optical image into measurable coordinates. Manual stage positioning, automatic focusing and software edge detection work together to calculate visible geometry and selected Z-axis data.

Optical Measurement Concept

Representative functional path for non-contact dimensional inspection



The 2.5D configuration supports planar geometry plus height or height-difference measurement. It is not a complete 3D surface-scanning system unless additional scanning or multi-sensor functions are specified.

Core Measurement Functions

- Length, width and spacing
- Hole diameter and outside diameter
- Radius, angle and edge position
- Contour and profile-related dimensions
- Height and height difference

Inspection Method Notes

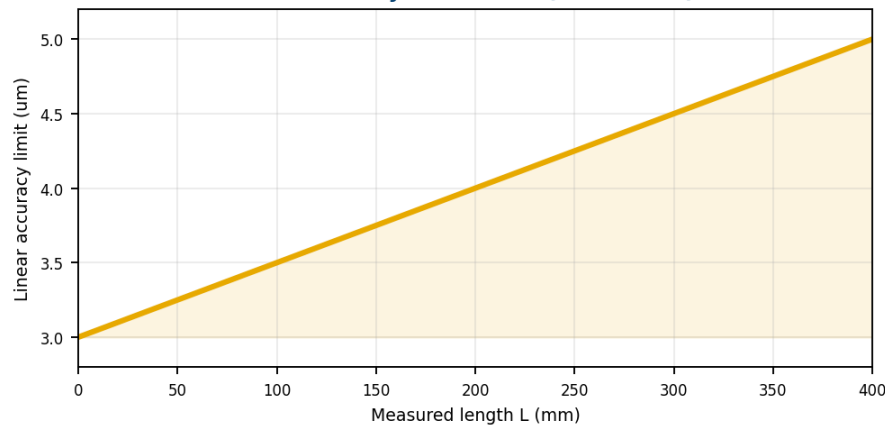
- Secure the workpiece and fixture within the stage envelope.
- Select illumination and optical settings for the surface or contour.
- Use saved programs only after confirming manual X/Y feature positioning.

1 Prepare Sample — 2 Set Illumination — 3 Locate Feature — 4 Auto Focus — 5 Calculate Result

Accuracy Reference and Measurement Verification

The published linear accuracy formula and environmental conditions should be considered together with optics, scale resolution, workpiece condition, fixturing and calibration method.

Linear Accuracy Reference: $(3 + 0.005L) \mu\text{m}$



Linear Accuracy Profile

The formula increases from 3.0 μm at $L = 0 \text{ mm}$ to 5.0 μm at $L = 400 \text{ mm}$. The curve is a catalogue reference derived directly from $(3 + 0.005L) \mu\text{m}$.

Specified Measurement Environment

TEMPERATURE

20 C +/-1 C

RELATIVE HUMIDITY

55%-65%

Linear Scale Resolution Options

1.0 μm

Standard

0.5 μm

Optional

0.1 μm

Optional

Scale resolution is a configuration parameter and should not be interpreted as the complete system measurement accuracy. Final capability depends on the entire optical, mechanical, software and calibration setup.

Verification Guidance

1. Confirm application

Review workpiece drawing, tolerance, feature accessibility and fixture envelope.

2. Control environment

Maintain stable temperature, humidity, floor vibration and workpiece cleanliness.

3. Verify documentation

Confirm third-party calibration scope, traceability, measurement points and acceptance criteria.

Applications, Model Selection and Product Distinction

Typical Users and Applications

- Quality control and metrology laboratories
- Precision machining and tooling
- Metal stampings, molded parts and connectors
- Incoming, first-article and process inspection

Model Selection

- SV-2.5D-3020: compact components and smaller fixtures
- SV-2.5D-4030: larger parts or wider fixture envelopes
- Allow travel for clamping, alignment and edge access
- Select by full workpiece plus fixture size

Calibration and Maintenance

- Third-party calibration can be arranged
- Confirm scope, points, traceability and certificate language
- Keep the stage, optics and workpiece clean
- Verify accuracy under controlled environmental conditions



Product Distinction

- X/Y manual positioning with Z-axis auto focus
- Not a fully automatic CNC vision system
- Not a tactile coordinate measuring machine
- Not a full 3D surface scanner without additional sensors



● Machined parts

● Stampings

● Connectors

● Molded parts

● PCB assemblies

● Supplier quality

Technical Inquiry and Expert Support

KingPo can review your sample, drawing, tolerance and inspection workflow to confirm the suitable measuring travel, optical configuration, software functions and calibration documentation.

Please Provide the Following Information

- Workpiece and fixture: Maximum dimensions, weight, material, surface color, reflectivity and sample images
- Drawing and tolerance: 2D drawing, critical dimensions, required tolerances and acceptance criteria
- Measurement features: Length, width, diameter, spacing, angle, contour, height or height difference
- Inspection volume: Engineering sample, first article, sampling inspection or daily production quantity
- Software and reporting: Required geometry tools, program storage, tolerance evaluation and report format
- Calibration documents: Third-party calibration scope, traceability, measurement points and certificate language
- Installation conditions: Destination country, power supply, available space and computer configuration



Product Page



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