PRECISION MEASUREMENT / PRODUCT SELECTION

Choose the right system. Compare the right specification.

Vision, flash, chip coplanarity and wafer measurement systems from Navinertia Tech. This reference brings key product specifications into a consistent format for initial selection.

Find your measurement task

Inspection task	System	Page
Small parts, single-field batch checks	K100	6
Parts beyond one field of view	K221 / K321	7
Wide-field and detailed feature inspection	K433	8
High-magnification precision inspection	S-Series	2
General CNC dimensional inspection	E-Series	3
Large panels and flat workpieces	G-Series	4
Manual XY with motorized focus	MH-Series	5
Chip lead and solder-ball coplanarity	V400LS	9
Wafer thickness and flatness	W350C	10
Programming and measurement reports	iVISION	11

Read the specification correctly

• MPE, repeatability, sensor linearity and resolution are different quantities. Compare like-for-like metrics at the stated conditions.

• Travel is not optical field of view. Single-image accuracy is not the same as stitched-field accuracy.

• For formulas containing L, use the measured length in millimetres. For example, 1.2 + L/200 µm equals 2.2 µm at L = 200 mm.

• Confirm the part, fixture, sensor, environment and program before approving a measurement application.

Request an application evaluation

Send your drawing, part dimensions, material, critical tolerances and inspection volume to info@navinertia.com. State any reporting or integration requirements.

Selected technical data from the January 2026 product catalogue. This is a specification reference, not an acceptance certificate. Final configuration and instrument-specific inspection results govern delivery.

V323S / V433S / V543S

S-Series High-Precision Vision Measuring Machines

Navinertia Tech S-Series CNC vision measuring machines combine high-magnification optics, programmable illumination and servo motion for dimensional inspection of small precision features.

Typical applications: Optical communication components, semiconductor components, precision hardware, electronics and machined parts.

Measurement features

- 1.2–16× optical zoom with approximately 70–920× total video magnification.
- Automatic image matching, autofocus and configurable edge detection.
- Granite structure, 0.1 μm linear scales and three-axis servo control.
- Programmable transmitted, surface and coaxial illumination; iVISION measurement software.

Key specifications

Parameter	V323S	V433S	V543S
Travel X × Y × Z (mm)	300 × 200 × 300	400 × 300 × 300	500 × 400 × 300
EUX/EUY MPE (μm)	1.2 + L/200	1.2 + L/200	1.5 + L/200
EUXY MPE (μm)	1.5 + L/200	1.5 + L/200	1.8 + L/200
EUZ MPE (μm)	2.8 + L/150	2.8 + L/150	2.8 + L/150
Load at specified accuracy / maximum load (kg)	5 / 30	5 / 30	5 / 30
Maximum XY / Z speed (mm/s)	200 / 150	200 / 150	200 / 150
Linear scale / display increment (μm)	0.1 / 0.1	0.1 / 0.1	0.1 / 0.1
Effective working distance (mm)	30 ± 2	30 ± 2	30 ± 2
Machine L × W × H (mm)	1100 × 760 × 1850	1300 × 860 × 1850	1500 × 1080 × 1850
Net weight (kg)	480	540	680

Configuration and interpretation

MPE denotes maximum permissible error. EUX/EUY and EUXY are different length-error specifications; use the value applicable to your measurement. Z-axis performance is subject to the instrument-specific inspection report.

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

Total video magnification depends on the display size and resolution. Autofocus time and inspection throughput depend on the part and measurement program.

V323E / V433E / V543E

E-Series Automatic Vision Measuring Machines

Navinertia Tech E-Series CNC vision measuring machines automate repeat dimensional inspection with programmable lighting, image matching and precision motion.

Typical applications: Precision hardware, electronics, automotive components and general manufacturing inspection.

Measurement features

- 0.7–4.5× optical zoom; approximately 18–230× total video magnification.
- Global-shutter color imaging and adjustable edge-detection parameters.
- Granite structure with 0.1 µm linear scales and three-axis servo motion.
- iVISION software for measurement programming and reporting.

Key specifications

Parameter	V323E	V433E	V543E
Travel X × Y × Z (mm)	300 × 200 × 300	400 × 300 × 300	500 × 400 × 300
EUX/EUY MPE (µm)	1.8 + L/200	1.8 + L/200	2.0 + L/200
EUXY MPE (µm)	2.0 + L/200	2.0 + L/200	2.2 + L/200
EUZ MPE (µm)	5 + L/200	5 + L/200	5 + L/200
Load at specified accuracy / maximum load (kg)	10 / 30	10 / 30	10 / 30
Maximum XY / Z speed (mm/s)	200 / 150	200 / 150	200 / 150
Linear scale / display increment (µm)	0.1 / 0.1	0.1 / 0.1	0.1 / 0.1
Effective working distance (mm)	80 ± 2	80 ± 2	80 ± 2
Machine L × W × H (mm)	1100 × 760 × 1850	1300 × 860 × 1850	1500 × 1080 × 1850
Net weight (kg)	480	540	680

Configuration and interpretation

MPE denotes maximum permissible error. EUX/EUY and EUXY are different length-error specifications; use the value applicable to your measurement. Z-axis performance is subject to the instrument-specific inspection report.

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

The catalogue specifies a manually indexed zoom lens. Confirm motorized zoom or additional sensors separately when configuring the system.

V562G / V682G / V8102G

G-Series Gantry Vision Measuring Machines

Navinertia Tech G-Series moving-bridge vision measuring machines provide an open measurement area for large panels and flat workpieces.

Typical applications: Battery electrodes, bipolar plates, LCD panels, large PCBs, plastic parts and large glass components.

Measurement features

- 0.6–5× optical zoom and programmable transmitted, surface and coaxial illumination.
- Granite structure and linear-motor motion for large-format CNC measurement.
- Optical autofocus height measurement, with optional probing, laser or chromatic confocal configurations.
- iVISION software supports programmed inspection and integration projects.

Key specifications

Parameter	V562G	V682G	V8102G
Travel X × Y × Z (mm)	550 × 650 × 250	650 × 850 × 250	850 × 1050 × 250
EUX/EUY MPE (μm)	2.2 + L/200	2.2 + L/200	2.5 + L/200
EUXY MPE (μm)	2.5 + L/200	2.5 + L/200	3.0 + L/200
EUZ MPE (μm)	5 + L/150	5 + L/150	5 + L/150
Load at specified accuracy / maximum load (kg)	30 / 60	30 / 60	30 / 60
Maximum XY / Z speed (mm/s)	500 / 150	500 / 150	500 / 150
Linear scale / display increment (μm)	0.1 / 0.1	0.1 / 0.1	0.1 / 0.1
Effective working distance (mm)	75 ± 2	75 ± 2	75 ± 2
Machine L × W × H (mm)	1430 × 1300 × 1800	1650 × 1400 × 1800	1850 × 1600 × 1800
Net weight (kg)	1460	1780	2250

Configuration and interpretation

MPE denotes maximum permissible error. EUX/EUY and EUXY are different length-error specifications; use the value applicable to your measurement. Z-axis performance is subject to the instrument-specific inspection report.

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

Sensor availability, access to the feature and the required form evaluation must be confirmed for each application.

V322MH / V432MH

MH-Series Semi-Automatic Vision Measuring Machines

Navinertia Tech MH-Series combines manual X/Y positioning with motorized Z control and autofocus for small-batch, mixed-part inspection.

Typical applications: Small-batch precision components and inspection tasks that benefit from manual positioning with motorized focus.

Measurement features

- Manual X/Y handwheels; motorized Z-axis with autofocus and fine adjustment.
- Granite structure and laser pointer for locating features.
- 0.7–4.5× optical zoom and programmable surface illumination.
- iVISION software for geometric measurements and reports.

Key specifications

Parameter	V322MH	V432MH
Travel X × Y × Z (mm)	300 × 200 × 200	400 × 300 × 200
Published X/Y length error (μm)	2.5 + L/200	2.5 + L/200
Maximum load (kg)	30	30
Linear scale resolution (μm)	1	1
Minimum display increment (μm)	0.1	0.1
Optical magnification	0.7–4.5×	0.7–4.5×
Lens working distance (mm)	90 ± 2	90 ± 2
Machine L × W × H (mm)	880 × 770 × 1060	1080 × 920 × 1060
Net weight (kg)	220	300

Configuration and interpretation

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

Coaxial illumination is optional. Z-axis accuracy must be checked against the instrument-specific inspection report. This is not the fully manual ME-Series.

K100

K100 Fixed-Platform Flash Measuring Machine

Navinertia Tech K100 is a fixed-platform optical measuring system for batch dimensional inspection of small parts within a single field of view.

Typical applications: O-rings, seals, watch components, small stamped parts, hardware and injection-molded parts.

Measurement features

- Automatic part recognition and measurement of multiple parts within the field.
- Dual-telecentric optics with standard 0.16× and 0.64× magnification.
- 20-megapixel industrial imaging as specified in the product overview.
- Programmable illumination and an O-ring measurement module for inner diameter, outer diameter and wall thickness.

Key specifications

Parameter	K100
Wide-field coverage (mm; catalogue X × Y × Z)	82 × 55 × 100
Wide-field stated accuracy (µm)	2.0
Higher-magnification coverage (mm)	20.6 × 13.7 × 24.8
Higher-magnification stated accuracy (µm)	1.5
Optional coverage / stated accuracy	8 × 5 × 10 mm / 1 µm
Load at specified accuracy / maximum load (kg)	5 / 5
Linear scale / display increment (µm)	0.1 / 0.1
Machine L × W × H (mm)	650 × 400 × 940
Net weight (kg)	96

Configuration and interpretation

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

Coverage values are reproduced from the catalogue and are not moving-stage travel. Confirm the measurement configuration and accessible Z features for your part.

Optional lens configurations and coaxial illumination must be specified in the quotation. The optional 1 µm figure does not apply to the full wide field.

The catalogue describes approximately one-second O-ring measurement in its application example; this is not a universal cycle-time guarantee.

K221 / K321

K-Series Moving-Platform Flash Measuring Machines

Navinertia Tech K221 and K321 extend flash measurement beyond a single image using a motorized platform and image stitching.

Typical applications: Batch inspection of hardware, seals, watch components and molded parts that require more coverage than a fixed field.

Measurement features

- Automatic image matching and CNC platform motion.
- Dual-telecentric optics with wide-field and higher-magnification measurement.
- Programmable surface and transmitted illumination.
- iVISION measurement software; data integration requirements can be assessed during configuration.

Key specifications

Parameter	K221	K321
Travel X × Y × Z (mm)	200 × 200 × 75	300 × 200 × 75
Wide-field coverage (mm; catalogue X × Y × Z)	82 × 55 × 100	82 × 55 × 100
Wide-field single-image accuracy (µm)	2.0	2.0
Wide-field stitching error (µm)	3.5 + L/200	3.5 + L/200
Higher-magnification coverage (mm)	26 × 17 × 31	26 × 17 × 31
Higher-magnification single-image accuracy (µm)	1.5	1.5
Higher-magnification stitching error (µm)	2.5 + L/200	2.5 + L/200
Optional coverage / single-image accuracy	8 × 5 × 10 mm / 1 µm	8 × 5 × 10 mm / 1 µm
Optional stitching error (µm)	2.0 + L/200	2.0 + L/200
Maximum load (kg)	5	5
Maximum XY / Z speed (mm/s)	200 / 100	200 / 100
Machine L × W × H (mm)	650 × 400 × 940	650 × 500 × 940
Net weight (kg)	106	110

Configuration and interpretation

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

Single-image and stitched measurements have different specifications. Stage travel and optical coverage are separate quantities. Optional optical configurations must be confirmed in the quotation.

K433

K433 Dual-Vision Flash Measuring Machine

Navinertia Tech K433 combines a wide-field telecentric lens and a zoom lens on a CNC moving platform, allowing broad-area measurement and detailed feature inspection on one system.

Typical applications: Electronics, PCBs, connectors, precision stampings, molded parts and medical components requiring both field coverage and small-feature measurement.

Measurement features

- Lens 1: 0.7–4.5× zoom optics for detailed feature measurement.
- Lens 2: 0.16× wide-field telecentric optics with 82 × 55 mm XY coverage.
- Three-axis servo motion with 400 × 300 × 300 mm travel.
- Granite structure, programmable illumination and iVISION software.

Key specifications

Parameter	K433
Travel X × Y × Z (mm)	400 × 300 × 300
Lens 1 EUX/EUY MPE (μm)	2.0 + L/200
Lens 1 EUXY MPE (μm)	2.2 + L/200
Lens 1 EUZ MPE (μm)	5 + L/200
Lens 2 single-image accuracy (μm)	2.0
Lens 2 stitched EUX/EUY MPE (μm)	3.5 + L/200
Lens 2 stitched EUXY MPE (μm)	5.0 + L/200
Load at specified accuracy / maximum load (kg)	10 / 30
Maximum XY / Z speed (mm/s)	200 / 150
Linear scale / display increment (μm)	0.1 / 0.1
Effective working distance (mm)	65 ± 2
Machine L × W × H (mm)	1300 × 980 × 1850
Net weight (kg)	600

Configuration and interpretation

MPE denotes maximum permissible error. EUX/EUY and EUXY are different length-error specifications; use the value applicable to your measurement. Z-axis performance is subject to the instrument-specific inspection report.

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

Dual vision means two optical systems: wide field and zoom. It does not specify simultaneous inspection of the top and bottom of a part. The wide-field lens has no Z-error specification in this catalogue.

V400LS

V400LS Chip Coplanarity Measuring Machine

Navinertia Tech V400LS combines 3D laser-line scanning and 2D vision measurement for chip-package coplanarity and dimensional inspection.

Typical applications: BGA solder balls; SOP, QFP and TSSOP leads; PCB component height, position and flatness inspection.

Measurement features

- Laser scanning generates a 3D point cloud for height and coplanarity evaluation.
- Vision measurement checks solder-ball diameter, lead width and pitch.
- Supports individual parts and arrays held in fixtures or trays.
- Integrated granite gantry structure and iVISION measurement software.

Key specifications

Parameter	V400LS
XY laser measurement range (mm)	400 × 300
XY vision measurement range (mm)	300 × 300
Z-axis travel (mm)	200
Published X/Y length error (μm)	2.5 + L/200
Laser static Z measurement range (mm)	18
Laser line width (mm)	31
Laser static Z indication error (μm)	±3.6
Laser point spacing (μm)	12
Linear scale resolution (μm)	0.1
Stage load (kg)	5
Optical magnification	0.7–4.5×
Machine L × W × H (mm)	1100 × 1000 × 1800
Net weight (kg)	900

Configuration and interpretation

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

Laser static indication error, point spacing and X/Y dimensional error describe different properties. None should be presented as a universal coplanarity uncertainty or repeatability claim.

Measurement cycle time and application-specific repeatability require evaluation on the actual package, fixture and measurement program.

W350C

W350C Wafer Thickness and Flatness Measuring System

Navinertia Tech W350C uses opposing point chromatic confocal sensors to measure wafer thickness and flatness, with a separate vision module for surface dimensions.

Typical applications: 6-inch, 8-inch and 12-inch wafers, plus suitable films, sheets and transparent or semi-transparent multilayer materials after application evaluation.

Measurement features

- Opposed top and bottom sensors support non-contact thickness measurement.
- Single-sensor and opposed-sensor measurement modes.
- Point measurement and programmed scanning for surface and thickness sampling.
- Integrated vision measurement for 2D dimensions; platform motion keeps the opposing sensors aligned.

Key specifications

Parameter	W350C
Supported wafer diameters	6, 8 and 12 inches
XY confocal measurement range (mm)	350 × 350
XY vision measurement range (mm)	250 × 350
Z-axis travel (mm)	100
Vision X/Y length error (μm)	2.5 + L/200
Sensor static Z measurement range (mm)	±1.3
Sensor working distance (mm)	15
Sensor static Z linearity error (μm)	±0.3
Linear scale resolution (μm)	0.1
Stage load (kg)	5
Optical magnification	0.7–4.5×
Machine L × W × H (mm)	1430 × 740 × 1550
Net weight (kg)	900

Configuration and interpretation

Published specifications apply at 20 ± 2 °C and 30–80% relative humidity, with vibration below 0.002 g at frequencies below 15 Hz, away from vibration sources. L is the measured length in mm. Resolution and display increment are not measurement accuracy. Confirm the selected configuration and part-specific performance in a sample evaluation.

±0.3 μm is the specified static linearity error of the sensor, not the accuracy of the complete wafer-thickness measurement system. The ±1.3 mm sensor range is not a guaranteed wafer-thickness range.

Wafer thickness range, TTV/Bow/Warp evaluation, fixture requirements, material suitability and measurement repeatability must be confirmed for the selected configuration and application.

The W350C belongs to the wafer-measurement C-Series; it is different from the horizontal W-Series used for shaft and tool inspection.

iVISION

iVISION Vision Measurement Software

iVISION is the measurement software supplied with Navinertia Tech vision systems, combining geometric measurement, programmed inspection and configurable reporting.

Typical applications: Manual and CNC dimensional inspection, configured multisensor applications and production measurement workflows.

Measurement features

- Geometry tools for points, lines, circles, arcs, ellipses, slots, curves, planes, spheres, cylinders and cones.
- Constructed features including centers, parallel lines, tangents and inscribed or circumscribed circles.
- Autofocus, edge finding, lighting control, CAD-assisted measurement, barcode reading and map navigation on compatible configurations.
- Supported sensor configurations include touch probes, 3D line lasers, chromatic confocal sensors and other optical sensors.
- Export measurement reports to Excel, PDF, Word and TXT with configurable presentation.
- Temperature and proportional compensation modes support configured measurement corrections.

Key specifications

Parameter	iVISION
Reporting formats	Excel, PDF, Word, TXT
Programming support	CAD import, automatic feature finding, batch programs
Compensation modes	Temperature mode and proportional mode
Basic operator training	Typically 1–2 hours for basic tasks; advanced programming requires additional training
Configuration dependency	Hardware, sensor and integration options determine available functions

Configuration and interpretation

Confirm supported CAD versions, operating system, language, hardware interfaces, license terms and integration scope in the quotation. A supported sensor type is not necessarily included in the base machine.

Software capabilities do not establish the accuracy of an installed system. Use the machine specification and application validation.