Starrett®

Precision, Quality, Innovation

METROLOGY SYSTEMS

Vision Systems

Vision Inspection Systems

Optical Comparators

Software

Catalog 81

PRECISION, QUALITY, INNOVATION

For more than 135 years, manufacturers, builders and craftsmen worldwide have depended upon tools from the L.S. Starrett Company to ensure the consistent quality of their manufacturing processes.

They know that the Starrett name on Optical Comparators, Vision and Multi-Sensor Metrology systems, precision hand tools, gage blocks, hand tools, power tool accessories, saws, laser measurement, force and material testing means exceptional quality, innovative products and expert technical assistance.

With strict quality control, state-of-the-art equipment and an ongoing commitment to producing products with superior quality, the 5,000 plus products in today's Starrett line continue to be the most accurate, robust and durable tools available.

This catalog features Starrett Metrology Equipment, their applications and characteristics.

VISION SYSTEMS

Video-based measurement systems combine high-resolution images, powerful intuitive software and precision mechanical platforms to deliver superb accuracy and repeatable measurement results for a wide range of precision measurement applications

07

VIDEO INSPECTION SYSTEMS

The KineMic video based microscopes are a family of versatile and affordable inspection and measurement systems.

31

OPTICAL COMPARATORS

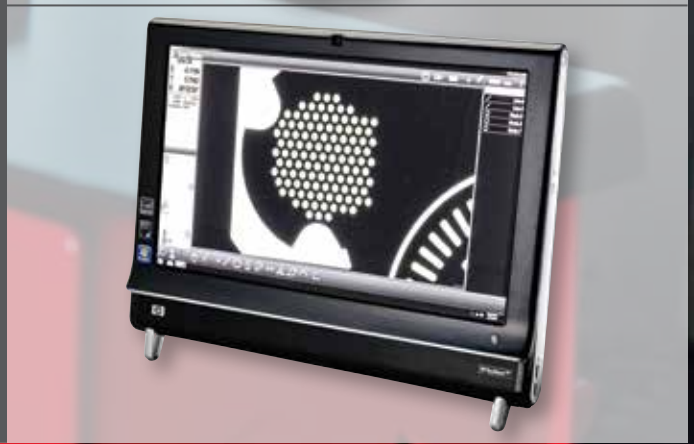
Optical comparators provide a time tested, cost effective solution for non-contact measurement. Optical comparators are used for an exceptionally wide range of dimensional measurement and inspection applications.

35

SOFTWARE

Starrett offers multiple software and metrology readout solutions to meet the needs of Quality Departments, Engineering and Manufacturing alike.

61



METROLOGY SYSTEMS

FACTORIES AROUND THE WORLD

1-Athol, Massachusetts, USA

2-Laguna Hills, California, USA

3-Waite Park, Minnesota, USA

4-Cleveland, Ohio, USA

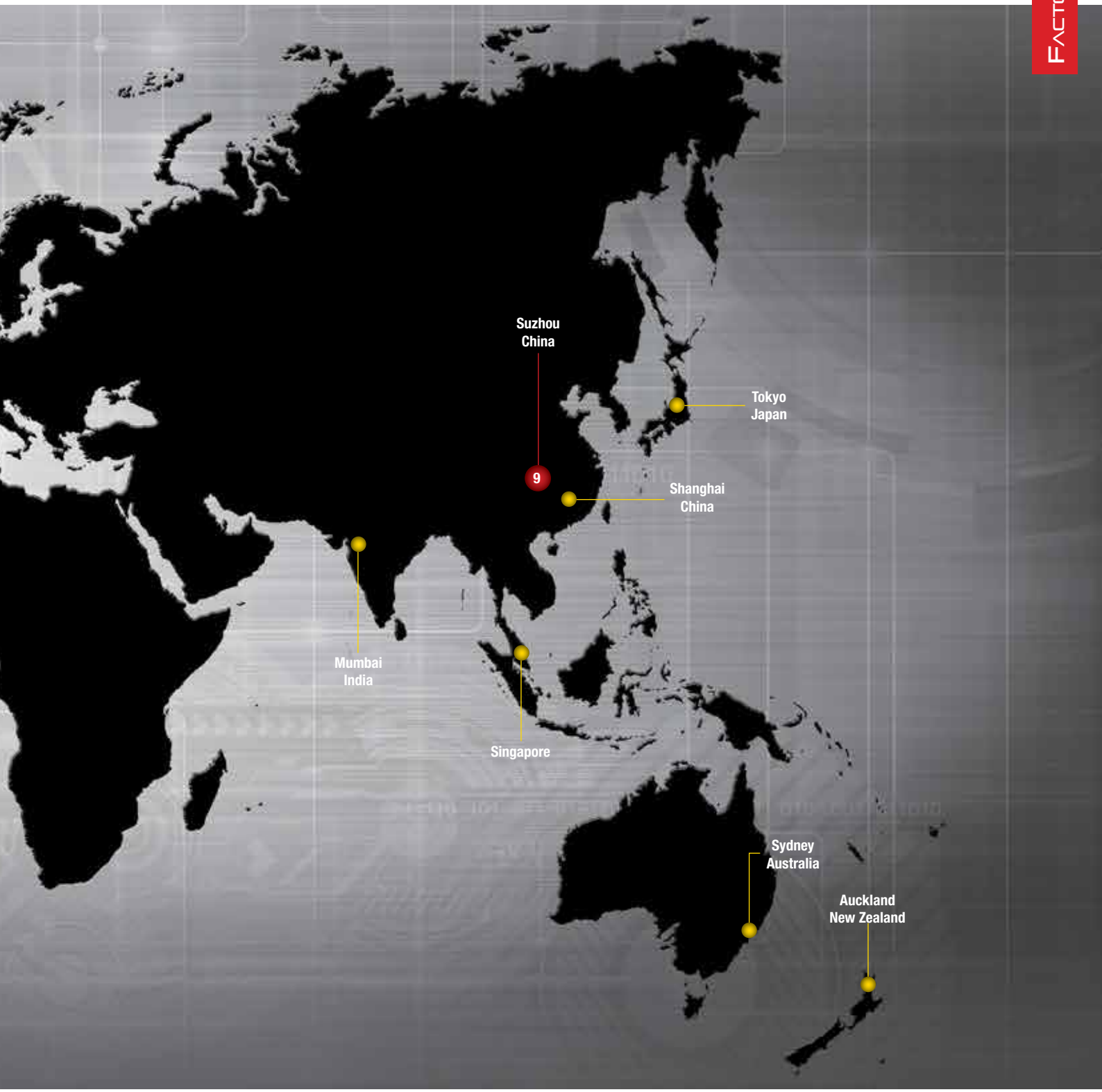
5-Mount Airy, North Carolina, USA

6-Columbus, Georgia, USA

7-Itu, São Paulo, Brazil

8-Jedburgh, Scotland

9-Suzhou, China



PRECISION MAKES THE DIFFERENCE

FOR OVER 135 YEARS, WITH INNOVATIVE TECHNOLOGIES.

More than 5,000 products including precision tools, vision systems, force measurement systems, non-contact measurement systems, optical comparators, band saw blades, band saw machines, hand tools and power tools accessories.

Read more: **www.starrett.com**

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Starrett

VISION SYSTEMS

Our broad range of metrology systems are ideal for use in QC labs, research, engineering, and manufacturing environments where small to large scale high-precision measurement is critical.

Many systems are available in either manual or CNC configurations.

Manual Vision Metrology Systems

MV

MV300

MV Video Based Metrology Systems are easy-to-use, general purpose, non-contact measurement systems with zoom optics. A highly stable mechanical design and precision linear bearings achieve superb performance. X and Y dimensions are measured by moving the stage horizontally. Z height is measured by moving vertically to maintain focus. MV systems are ideal for Quality Labs, Manufacturing floor part measurement where short runs are common.

The operator interface is an M3-equipped PC. The part image, measurement graphics, and readings are displayed on a color touch-screen. Video edge detection (VED), single and multi-point measurements of 2D geometries, and report generation are standard.

MV OPTICS

Optical Parameters	6.5:1 Zoom Optics Dedicated
Optical magnification on CCD	0.47x to 3.0x
Total magnification on monitor	31x to 200x
Field of view	.39" to .06" (10 to 1.6mm)
Working distance	3.47" (88mm)
Camera CCD	1/3" CCD Array

OPERATOR INTERFACE

Feature	All-in-One PC with M3 DXF/FOV Software
All-in-one touch screen PC	x
21.5" (55cm) color graphic touch-screen	x
Windows® 7 Professional operating system	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Z measurements	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files	x
Software developer	MetLogix™

MV300

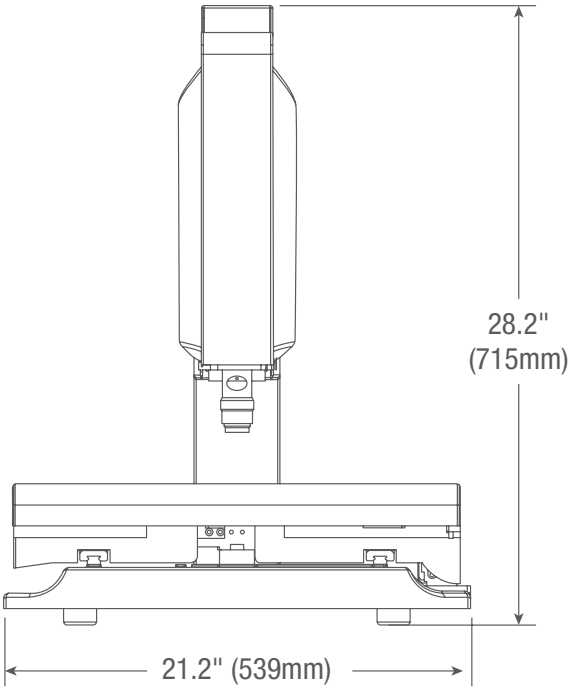
Features and Specifications

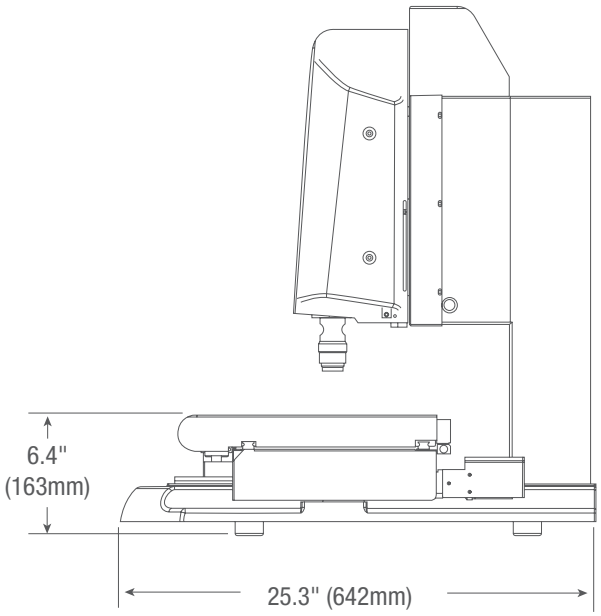
- Zoom optics 6.5:1
- MetLogix™ M3 control system software
- Video edge detection (VED)
- Fiber Optic or LED illumination, sub-stage bottom illumination and ring light surface illumination
- All in-one-PC with 21.5" (55cm) color touch-screen
- Windows® 7 Professional operating system
- Easy manual X-Y-Z positioning via hand wheels

Options

- 0.5x, 1.5x, and 2.0x auxiliary lenses for zoom optics
- Coaxial LED or fiber optic surface illumination
- Calibration standards
- DXF/FOV option pack for automatic comparison to CAD designs
- Modular workstation

MV300 Dimensions





SPECIFICATIONS

	MV300
Net Weight	115lbs 53kg
Shipping Weight	345lbs 157kg
X-Y-Z Travel	12" x 6" x 5.5" 300 x 150 x 135mm
X-Y Accuracy	3.5µm + 5L/1000
Z Accuracy	2.5µm + 5L/1000

Manual Vision Metrology Systems

MVR

MVR200 AND MVR300

The MVR Manual Vision Metrology Systems are ideal for individual measurements or short runs. They are available with dedicated 6.5:1 zoom optics or a quick-change bayonet lens mount which accepts zoom optics or telecentric lenses for micron-level resolution and accurate field-of-view (FOV) measurements. These can encompass an entire small part up to 2.00" x 1.50" or a feature of a larger part and be seamlessly integrated with stage motion to measure parts with a length up to 8" (MVR200) or 12" (MVR300). The operator interface is a 21.5" all-in-one touch screen PC which runs MetLogix™ M3 FOV software under Windows® 7 Professional. The screen displays a live video image of the part plus geometry tools and digital readings. The image of the part can be resized using zoom, and measurements can be taken by simply touching a feature on the screen.

MVR hardware features include a granite base for maximum stability, precision recirculating ball linear guides for smooth, accurate stage motion, and a motorized Z-axis with variable speed control.

MVR OPTICS

Optical Parameters	Telecentric Optics						6.5:1 Zoom Optics Interchangeable	6.5:1 Zoom Optics Dedicated
Optical magnification on CCD	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.7x to 4.5x	0.47x to 3.0x
Total magnification on monitor	13x	22x	36x	45x	89x	178x	31x to 200x	31x to 200x
Field of view	.94" (24mm)	.55" (14mm)	.35" (9mm)	.27" (7mm)	.14" (3.5mm)	1.8" (1.8mm)	.39" to .06" (10 to 1.6mm)	.39" to .06" (10 to 1.6mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	3.47" (88mm)	3.47" (88mm)
Camera CCD	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8" CCD Array	1/3" CCD Array

OPERATOR INTERFACE

Feature	All-in-One PC with M3 DXF/FOV Software
All-in-one touch screen PC	x
M3 controller housed in Z column	x
21.5" (55cm) color graphic touch-screen	x
Windows® 7 Professional operating system	x
Wi-Fi network connectivity	x
Video edge detection	x
X-Y-Z measurements	x
2D geometric constructs plus height	x
FOV measurements integrated with X-Y stage motion	x
CAD file import and export	x
Automatic comparison of measurements to CAD files	x
Software developer	MetLogix™

MVR200

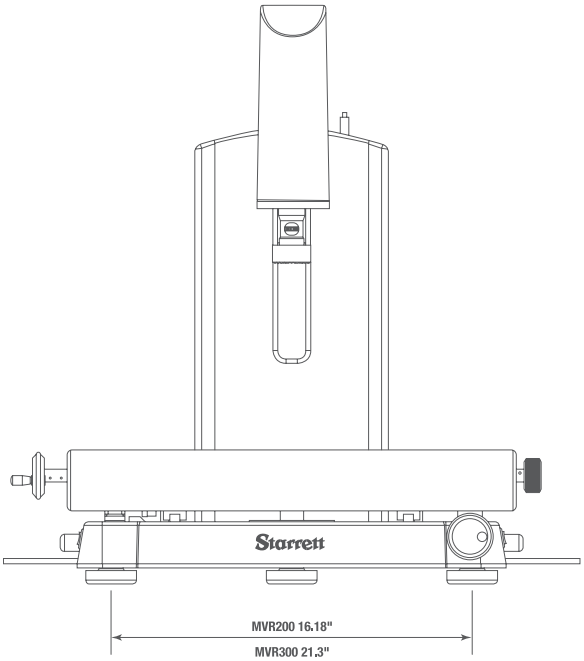
Features and Specifications

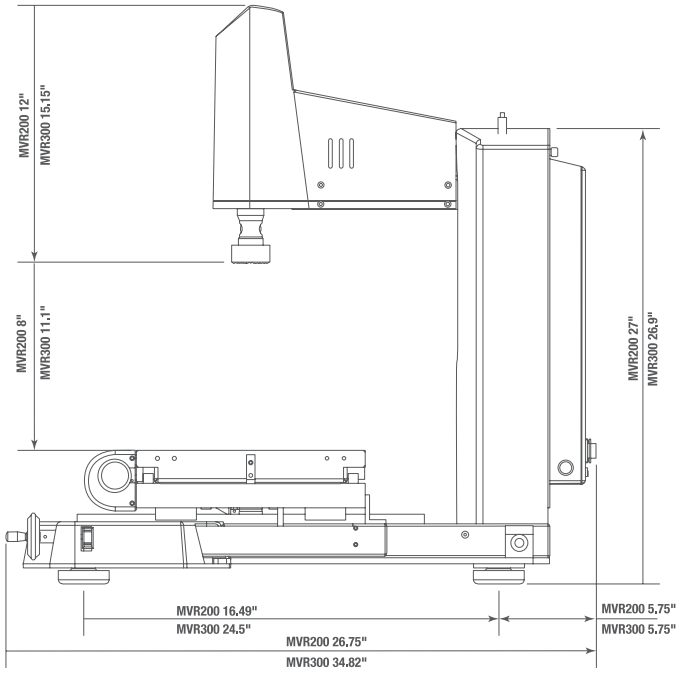
- Z travel: 8" (200 mm) with 2.0x auxiliary lens
- Manual X-Y positioning via hand wheels
- Motorized Z-axis positioning with variable speed control
- Windows® 7 Professional operating system
- MetLogix™ M3 metrology software with DXF/FOV option pack
- Video edge detection (VED)
- Field-of-view (FOV) measurements integrated with stage motion
- Renishaw scales for .00002" (0.5µm) of X and Y resolution
- Color digital video camera
- Collimated LED sub-stage illumination
- Ring light LED surface illumination
- Granite base

Options

- Auxiliary Lenses for Zoom Optics: 0.5x,1.5x and 2.0x
- Calibration standards
- Quick-change bayonet lens mount for telecentric optics
- Optional .30x, .50x, .80x, 1.0x, 2.0x and 4.0x telecentric lenses
- Modular system workstation
- Interchangeable telecentric and zoom lenses

MVR Dimensions





SPECIFICATIONS

	MVR200	MVR300
Net Weight	145lbs 90kg	230lbs 113kg
Shipping Weight	250lbs 115kg	300lbs 135kg
X-Y Travel	8" x 4" 200 x 100mm	12" x 8" 300 x 200mm
X-Y-Z Accuracy	2.5µm + 5L/1000	2.5µm + 5L/1000

Automatic Vision Metrology Systems

AV

AV300 AND AV350

The AV Automatic Vision Metrology Systems provide accurate 3-axis measurement capability (X-Y-Z) with hi-resolution video zoom optics and optional touch probe. The systems can be pre-programmed (CNC) for repetitive part inspection, or driven manually via a joystick and trackball for individual measurements. Superb performance is achieved by a highly stable mechanical design, with precision linear bearings. Throughput is maximized with either QC5000 or MetLogix™ M3 software controlling all aspects of Video Edge Detection (VED) and multiple channel Fiber Optic or LED illumination.

These automatic vision systems are ideal for quality assurance, inspection, and production runs. Flexible and powerful, the AV series allows users to cost effectively achieve maximum throughput of their inspection process. Measured data is effectively archived or networked to other devices.

AV OPTICS

Optical Parameters	Dedicated Zoom Optics 6.5:1	12:1
Optical magnification on CCD	0.47x to 3.0x	1.4x to 4.7x
Total magnification on monitor	31x to 198x	26x to 310x
Field of view width	.39" to .06" (10 to 1.6mm)	.44" to .047" (11 to 1.2mm)
Working distance	3.47" (88mm)	3.38" (86mm)
Camera CCD	1/3"	1/3"

OPERATOR INTERFACE

Feature	MetLogix™ M3	QC5000
All-in-one PC with touch screen	x	
Desktop PC with monitor	x	x
External motion control unit	x	x
Windows® 7 operating system	x	x
Wi-Fi network connectivity	x	x
CAD file import and export	x	x
Video edge detection	x	x
X-Y-Z measurements	x	x
2D geometric constructs	x	x
3D geometric constructs		x
CNC control capability	x	x
Report generation and archiving	x	x
Software developer	MetLogix™	Metronics/Heidenhain

AV350 shown with system stand and control cart - included

AV300

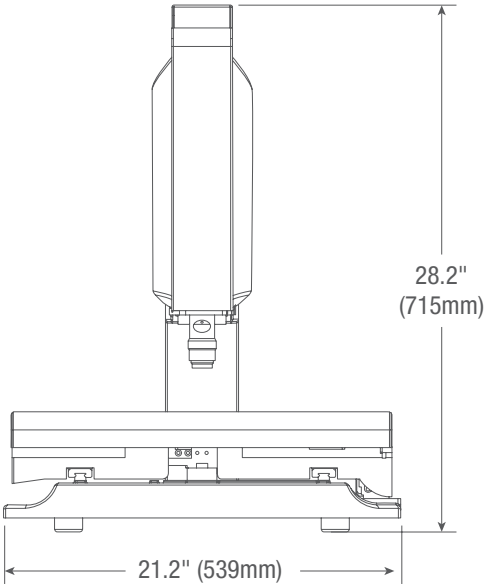
Features and Specifications

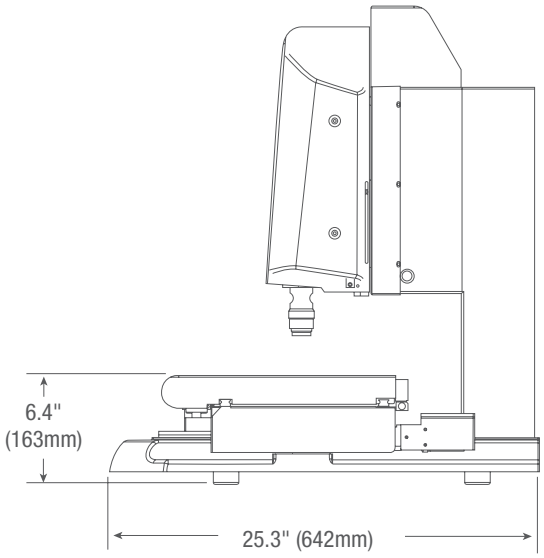
- CNC operation or manual operation via joystick and trackball
- Reading resolution 4µin (0.1µm)
- Magnification on 24" monitor, 1:1 pixel setting: 37x to 240x with 6.5:1 zoom, 25x to 240x with 12:1 zoom
- Multiple channel Fiber Optic or LED Illumination
- Cast aluminum base for AV300. Granite base on AV350
- 1.3 mega-pixel color digital video camera

Options

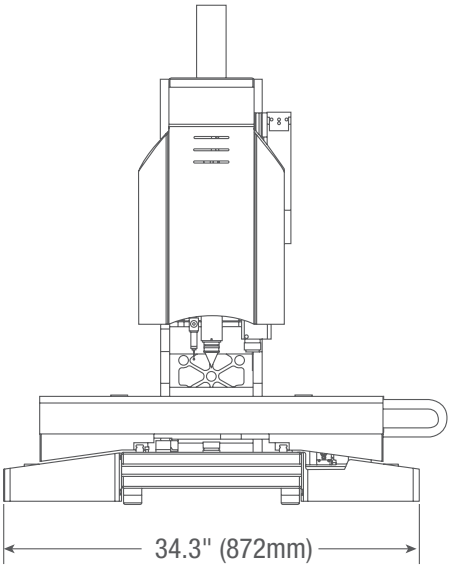
- 6.5:1 or 12:1 zoom optics
- Optional 0.5x, 1.5x and 2.0x auxiliary lenses
- Reinshaw touch probe kit
- Ergonomic workstation (machine stand and control cart standard with AV350)
- Calibration standards
- LED dark-field quadrant illuminator
- Part fixtures and work-holding devices

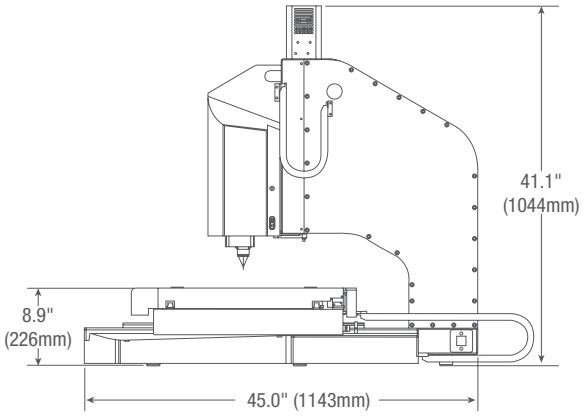
AV300 Dimensions





AV350 Dimensions





SPECIFICATIONS

	AV300	AV350
Net Weight	125lbs 57kg	409lbs 185kg
Shipping Weight	345lbs 157kg	1,275lbs 579kg
X-Y-Z Travel	12" x 6" x 5.5" 300 x 150 x 140mm	14" x 14" x 8" 350 x 350 x 200mm
X-Y Accuracy (µm)	E2 = 1.9µm + 5L/1000	E2 = 2.5µm + 5L/1000
Z Accuracy (µm)	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000

NEW!

Automatic Vision Metrology Systems

AVR

AVR200 AND AVR300

The AVR CNC Automatic Vision Metrology Systems are ideal for repetitive measurements and automatic comparison to CAD files. They are available with dedicated zoom optics or a quick-change bayonet lens mount which accepts a choice of zoom or telecentric lenses for micron-level resolution and accurate field-of-view (FOV) measurements. These can encompass an entire small part up to 2.00" x 1.50" or a feature of a larger part and be seamlessly integrated with stage motion to measure parts with a length up to 8" (AVR200) or 12" (AVR300). Systems are also touch probe compatible.

AVR hardware features a granite base for maximum stability, recirculating ball linear guides for smooth and precise stage motion, and full CNC control for high throughput. The AVR line is built around a 21" all-in-one touch screen PC which runs MetLogix™ M3-CNC software under Windows® 7. M3 software capabilities include 3-axis measurements and 2D geometric constructs (points, lines, angles, rectangles).

AVR OPTICS

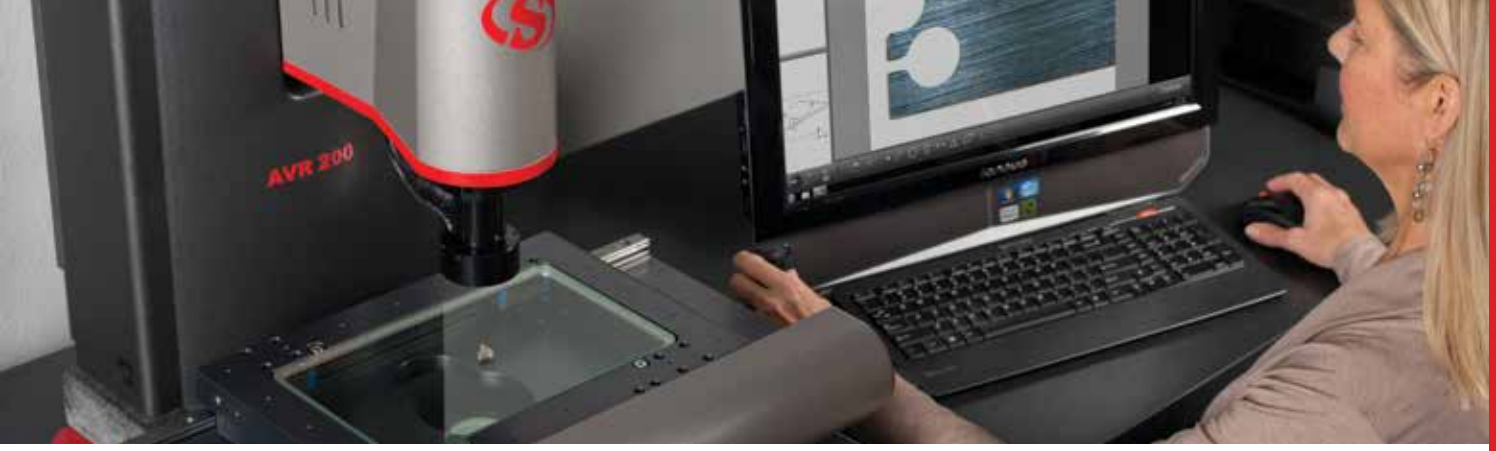
Optical Parameters	Telecentric Optics						Dedicated Zoom Optics 6.5:1*	Dedicated Zoom Optics 12:1
Optical magnification on CCD	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.47x to 3.0x	1.4x to 4.7x
Total magnification on monitor	13x	22x	36x	45x	89x	178x	31x to 198x	26x to 310x
Field of view width	.94" (24mm)	.55" (14mm)	.35" (9mm)	.27" (7mm)	.14" (3.5mm)	.07" (1.8mm)	.39" to .06" (10 to 1.6mm)	.44" to .047" (11 to 1.2mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	3.47" (88mm)	3.47" (86mm)
Camera CCD	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/1.8"	1/3"	1/3"

* 6.5:1 available as interchangeable zoom optics

OPERATOR INTERFACE

Feature	All-in-One PC with M3 DXF/FOV Software
All-in-one touch screen PC	X
M3 controller housed in Z column	X
21.5" (55cm) color graphic touch-screen	X
Windows® 7 Professional operating system	X
Wi-Fi network connectivity	X
Video edge detection	X
X-Y-Z measurements	X
2D geometric constructs plus height	X
FOV measurements integrated with X-Y stage motion	X
CAD file import and export	X
Automatic comparison of measurements to CAD files	X
Software developer	MetLogix™

AVR200



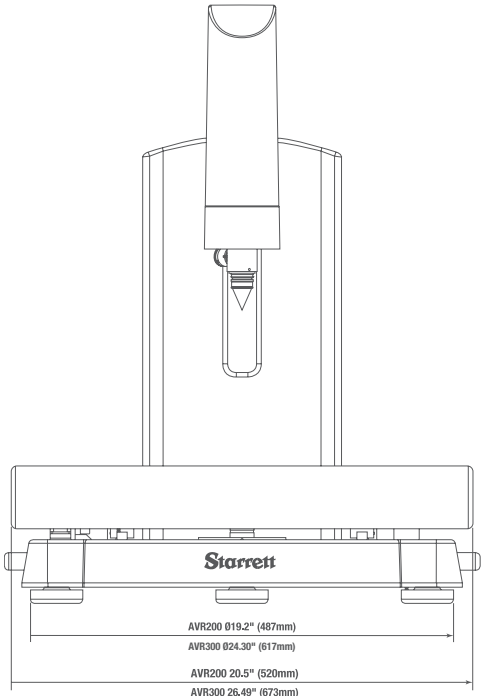
Features

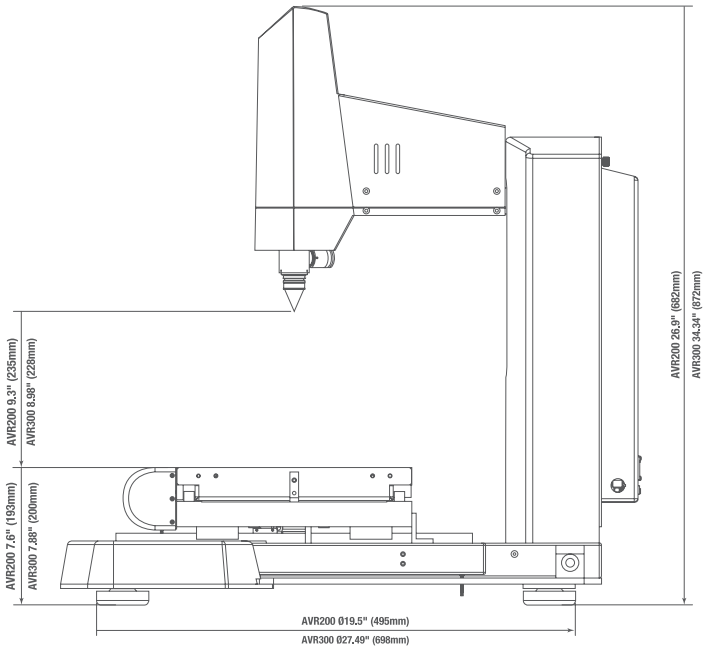
- Z travel: 8" (200 mm) with 2.0x auxiliary lens
- Full CNC X-Y-Z positioning or motorized manual positioning using a pendant with joystick and trackball
- Windows® 7 Professional operating system
- MetLogix™ M3 CNC metrology software
- Video edge detection (VED)
- Field-of-view (FOV) measurements integrated with stage motion
- Renishaw scales for .00002" (0.1µm) of X,Y and Z axis
- Color digital video camera
- Collimated LED sub-stage illumination
- Ring Light LED surface illumination
- Granite base

Options

- Dedicated 6.5:1 or 12:1 CNC zoom optics
- Quick-change bayonet lens mount for telecentric optics
- Bayonet mountable 0.30x, 0.50x, 0.80x, 1.0x, 2.0x, 4.0x telecentric optics and 6.5-1 manual zoom lens
- 0.5x, 1.5x and 2.0x auxiliary lenses for zoom optics
- Reinshaw touch probe kit
- Quadrant LED surface illumination for zoom optics
- DXF/FOV option pack for automatic comparison to CAD designs
- Modular system workstation
- Calibration standards
- Part fixtures and work holding devices

AVR Dimensions





SPECIFICATIONS

	AVR200	AVR300
Net Weight	145lbs 66kg	225lbs 102kg
Shipping Weight	250lbs 115kg	300lbs 135kg
X-Y-Z Travel	8" x 4" x 8" 200 x 100 x 200mm	12" x 8" x 8" 300 x 200 x 200mm
Dimensions (H x W x D)	34" x 20.5" x 27" 863 x 520 x 685mm	34" x 29.2" x 35" 865 x 740 x 890mm
X-Y Accuracy	1.9µm + 5L/1000	1.9µm + 5L/1000
Z Accuracy	2.5µm + 5L/1000	2.5µm + 5L/1000

Automatic Vision Metrology Systems

AV300+

MULTI-SENSOR

An enhanced version of the popular AV300 CNC Video-Based Measurement System. The AV300+ system improves measuring performance by utilizing a precision granite base along with an extended travel Z column, delivering 12" x 6" x 8" (300 x 150 x 200mm) X-Y-Z measuring range. The system is a servo driven motion platform for enhanced performance and includes a 12:1 zoom lens, hi-resolution digital color camera and a choice of fiber optic or LED Illumination. Complete with vibration isolation and integrated machine stand, the AV300+ delivers more capability for multi-sensor requirements. The AV300+ is powered by QC5300 software to handle a variety of measuring applications. Systems are available with vision, touch probe and laser sensors.

AV+ OPTICS

Optical Parameters	Dedicated Zoom Optics 12:1
Optical magnification on CCD	1.4x to 4.7x
Total magnification on monitor	26x to 310x
Field of view width	.44" to 0.47" (11 to 1.2mm)
Working distance	3.47" (86mm)
Camera CCD	1/3"

OPERATOR INTERFACE

Feature	QC5000
Desktop PC with monitor	x
External motion control unit	x
Windows® 7 operating system	x
Wi-Fi network connectivity	x
CAD file import and export	x
Video edge detection	x
X-Y-Z measurements	x
2D geometric constructs	x
3D geometric constructs	x
CNC control capability	x
Report generation and archiving	x
Software developer	Metronics/Heidenhain

AV300+ shown with system stand and control cart - included

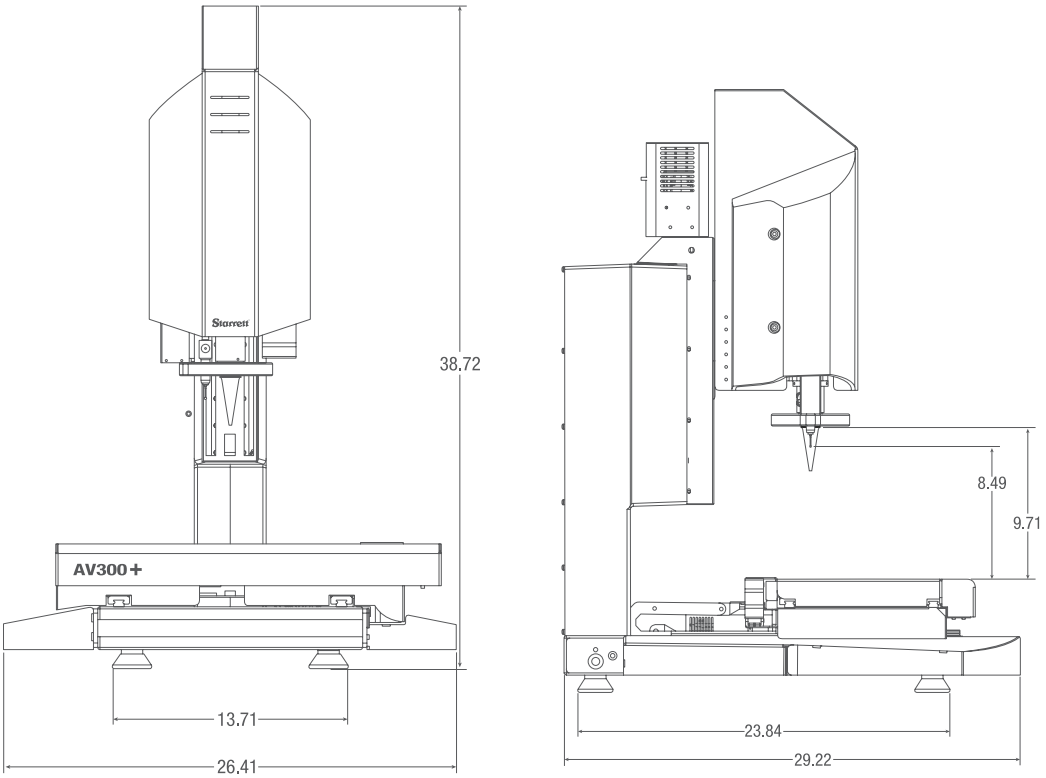
Features and Specifications

- 12:1 Zoom Optics with co-axial illumination
- Precision Granite base construction
- System stand and control cart standard
- Windows® 7 Professional operating system
- Touch probe compatible
- Touch probe change rack compatible
- CNC Rotary Axis compatible
- Laser Probe compatible

Options

- 0.5x, 1.5x and 2.0x auxiliary lenses for zoom optics
- Quadrant LED dark-field surface illumination
- Renishaw touch-probe kit
- 2 or 4 bay touch probe change pack
- Optimet laser probe
- Rotary work-holding fixture
- Part fixtures and work-holding device

AV300+ Dimensions



SPECIFICATIONS

	AV300+
Net Weight	210lbs 95kg
Shipping Weight	345lbs 157kg
X-Y Accuracy	E2 = 1.9 + 5L/1000
Z Accuracy	E1 = 2.5 + 5L/1000

Automatic Vision Metrology Systems

AV350+

MULTI-SENSOR

Offering similar attributes and performance to the AV300+ with an expanded measurement envelope of 14" x 14" x 8" (350 x 350 x 200mm) X-Y-Z measuring range for those larger part and payload measurement requirements. Systems are available with vision, touch probe and laser sensors.

AV+ OPTICS

Optical Parameters	Dedicated Zoom Optics 12:1
Optical magnification on CCD	1.4x to 4.7x
Total magnification on monitor	26x to 310x
Field of view width	.44" to .047" (11 to 1.2mm)
Working distance	3.47" (86mm)
Camera CCD	1/3"

OPERATOR INTERFACE

Feature	QC5000
Desktop PC with monitor	x
External motion control unit	x
Windows® 7 operating system	x
Wi-Fi network connectivity	x
CAD file import and export	x
Video edge detection	x
X-Y-Z measurements	x
2D geometric constructs	x
3D geometric constructs	x
CNC control capability	x
Report generation and archiving	x
Software developer	Metronics/Heidenhain

Dark Field Quadrant Illuminator

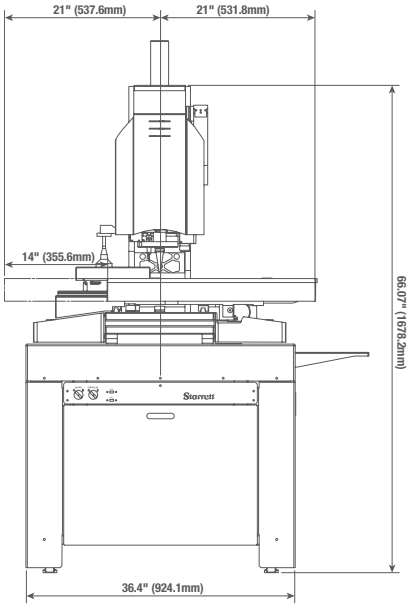
Features and Specifications

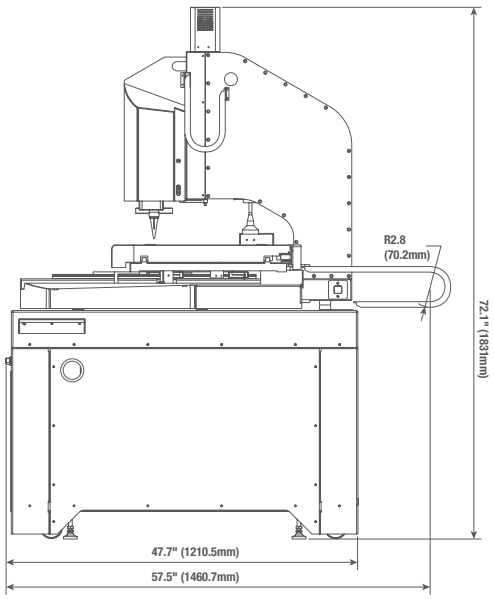
- 12:1 Zoom Optics with co-axial illumination
- Precision Granite base construction
- System stand and control cart standard
- Windows® 7 Professional operating system

Options

- Dedicated 6.5:1 or 12:1 CNC zoom optics
- 0.5x, 1.5x and 2.0x auxiliary lenses for zoom optics
- Quadrant LED surface illumination for zoom optics
- DXF/FOV option pack for automatic comparison to CAD designs
- Modular system workstation
- Calibration standards
- Part fixtures and work holding devices
- Reinshaw touch probe kit
- Touch probe change rack compatible
- CNC Rotary Axis compatible
- Laser Probe compatible

AV350+ Dimensions





Renishaw Touch Probe Kit

SPECIFICATIONS

	AV350+
Net Weight	415lbs 188kg
Shipping Weight	1,275lbs 579kg
X-Y Accuracy	E2 = 2.5 + 5L/1000
Z Accuracy	E1 = 2.5 + 5L/1000

Large Format Premier

LF

LF AND LFM

Our LF Premier machines offer X-Y travel from 18" (460mm) to a generous 28" (711mm). Z travel is 8" (200mm). (Larger sizes available upon request.) Increased accuracy helps you verify critical dimensions. Ideal for use in QC labs, research, engineering, or manufacturing environments.

LF models utilize air-rearing and linear motor X-Y transport for ultra smooth, high speed positioning. LFM models are equipped with precision mechanical bearing linear guides driven by precision ground ball screws and serve motors.

LF OPTICS

	Dedicated Zoom Optics	
Optical Parameters	**6.5:1**	**12:1**
Optical magnification on CCD	0.47x to 3.0x	1.4x to 4.7x
Total magnification on monitor	31x to 198x	26x to 310x
Field of view width	.39" to .06" (10 to 1.6mm)	.44" to .047" (11 to 1.2mm)
Working distance	3.47" (88mm)	3.47" (86mm)
Camera CCD	1/3"	1/3"

OPERATOR INTERFACE

Feature	MetLogix™ M3	QC5000
All-in-one PC with touch screen	x	
Desktop PC with monitor	x	x
External motion control unit	x	x
Windows® 7 operating system	x	x
Wi-Fi network connectivity	x	x
CAD file import and export	x	x
Video edge detection	x	x
X-Y-Z measurements	x	x
2D geometric constructs	x	x
3D geometric constructs		x
CNC control capability	x	x
Report generation and archiving	x	x
Software developer	MetLogix™	Metronics/Heidenhain

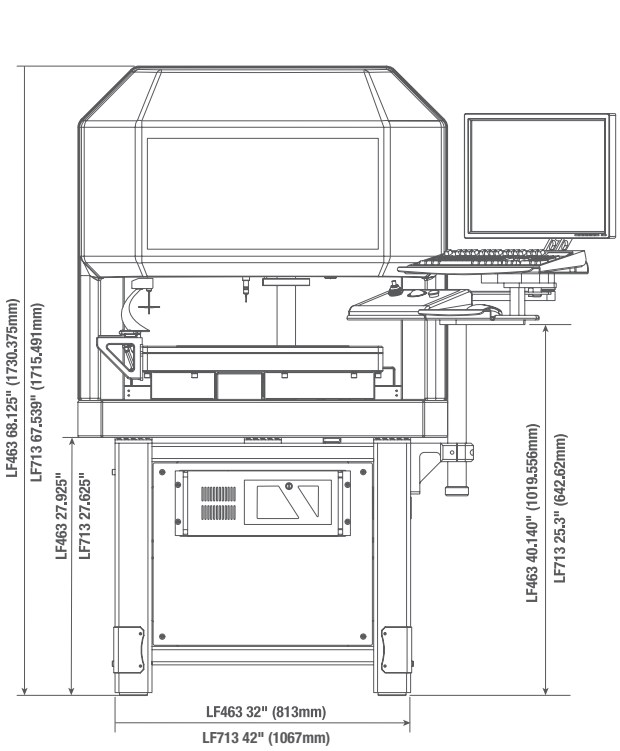
Features and Specifications

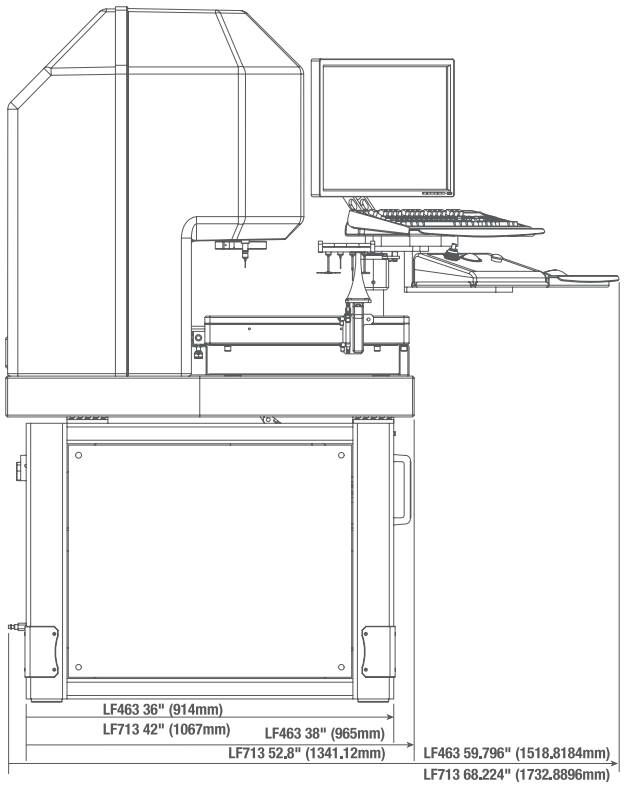
- Transports are driven on air bearings by hi-speed (up to 30" per second), zero maintenance, balanced linear motors, or precision mechanical linear bearings, which are close-looped to precision hi-resolution scales in all three axes
- Adjustable ergonomic workstation including a compact control panel and standard keyboard
- Massive granite base, bridge and mechanical or air-bearing ways for superior machine stability and precision
- Choice of QC5300 or MetLogix™ M3 Software
- 21.5" touchscreen with M3 software
- 24" monitor with QC5300
- LED Surface Ring Illumination
- LED Transmitted Illumination
- LED Coaxial Illumination
- Digital Video Color Camera: 1.2 MP, 1/3" SXVGA sensor

Options

- Dedicated 6.5:1 or 12:1 CNC zoom optics
- 0.5x, 1.5x and 2.0x auxiliary lenses for zoom optics
- Quadrant LED surface illumination
- DXF/FOV option pack for automatic comparison to CAD designs
- Calibration standards
- Part fixtures and work holding devices
- Reinshaw touch probe kit
- Touch probe spotter camera for viewing critical placement of touch probe points as well as a touch probe changing rack (with QC5300)

LF Dimensions





SPECIFICATIONS

Model		LF463†	LF713†	LFM463*	LFM713*
Dimensions (W x D x H)		40" x 40" x 68" (102 x 102 x 173cm)	50" x 64" x 68" (127 x 163 x 173cm)	40" x 40" x 68" (102 x 102 x 173cm)	50" x 64" x 68" (127 x 163 x 173cm)
Weight	gross	2300lb (1043kg)	3600lb (1630kg)	2300lb (1043kg)	3600lb (1630kg)
	net	1500lb (726kg)	2700lb (1225kg)	1500lb (726kg)	2700lb (1225kg)
Accuracy Stage X and Y		E2=2.5 + 5L/1000	E2=2.5 + 5L/1000	E2=3.5 + 5L/1000	E2=3.5 + 5L/1000
Accuracy Stage Z		E1=2.5 + 5L/1000	E1=2.5 + 5L/1000	E1=2.5 + 5L/1000	E1=2.5 + 5L/1000

† Air Bearing
* Mechanical bearing

Horizontal Digital Video Comparators

HDV

HDV300 AND HDV400

HDV300 CNC, HDV400 CNC AND HDV500 CNC

The HDV Horizontal Digital Video Comparators combine the best features of a horizontal optical comparator and a vision metrology system. With a rigid steel design, they are configured like a traditional horizontal comparator. The workstage is the same as the Starrett field-proven HB400 and HD400 comparators, with a 110lb (50kg) load capacity. The heart of the system centers on a uniquely designed interchangeable lens mounting system coupled to a hi-resolution color digital video camera (patent pending). The system is available with a choice of seven telecentric lenses for micron-level resolution and optical distortion as low as 0.001% for accurate field-of-view (FOV) measurements. Lenses provide a maximum FOV of up to 2.44" x 1.85" (62mm x 47mm). Stage movement can be related to the imported file allowing part comparison up to 16" (400mm) long.

The HDV systems house a powerful 64-bit PC, which runs MetLogix™ M3 measuring software. With M3 software, DXF CAD files can be imported and 2D Go/No-Go digital overlays can be developed directly from the CAD files. Video edge detection (VED), allows real-time interaction of the imported file with the video image of the part being inspected. Productivity, speed and accuracy are all enhanced. Systems are available in manual or CNC control.

HDV OPTICS

System Parameter	Telecentric Lenses							6.5:1 Zoom Lens	
Optical magnification	0.14x	0.30x	0.50x	0.80x	1.0x	2.0x	4.0x	0.7x	4.5x
Magnification on 24" monitor	8.6x	18.5x	21x	49x	62x	124x	247x	58x	363x
Field of view width	2.36" (63mm)	1.14" (29mm)	.59" (15mm)	.43" (11mm)	.35" (9mm)	.18" (4.3mm)	.09" (2.3mm)	.4" (11mm)	.05" (1.5mm)
Working distance	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	4.3" (110mm)	3.4" (88mm)	3.4" (88mm)
Optical Distortion, %	0.001	0.001	0.002	0.002	0.005	0.005	0.006	N/A	N/A

OPERATOR INTERFACE

Feature	MetLogix™ M3
PC installed in main housing	x
Color graphics touch screen	x
Windows® 7 operating system	x
X-Y-Q (angle) measurements	x
2D geometry software with skew	x
Video edge detection	x
CAD file import and export	x
FOV measurements	x
Elimination of Overlays	x
Software developer	MetLogix™

Lens	Field of View (FOV) in	mm
0.30x	1.2 x .87	29 x 22
0.50x	.69 x .52	18 x 13
0.80x	.43 x .32	11 x 8
1.0x	.35 x .26	8.8 x 6.6
2.0x	.17 x .13	4.4 x 3.3
4.0x	.09 x .06	2.2 x 1.65
6:1 Zoom	.44 x .37 to .07 x .06	11.2 x 9.4 to 1.8 x 1.5

HDV300

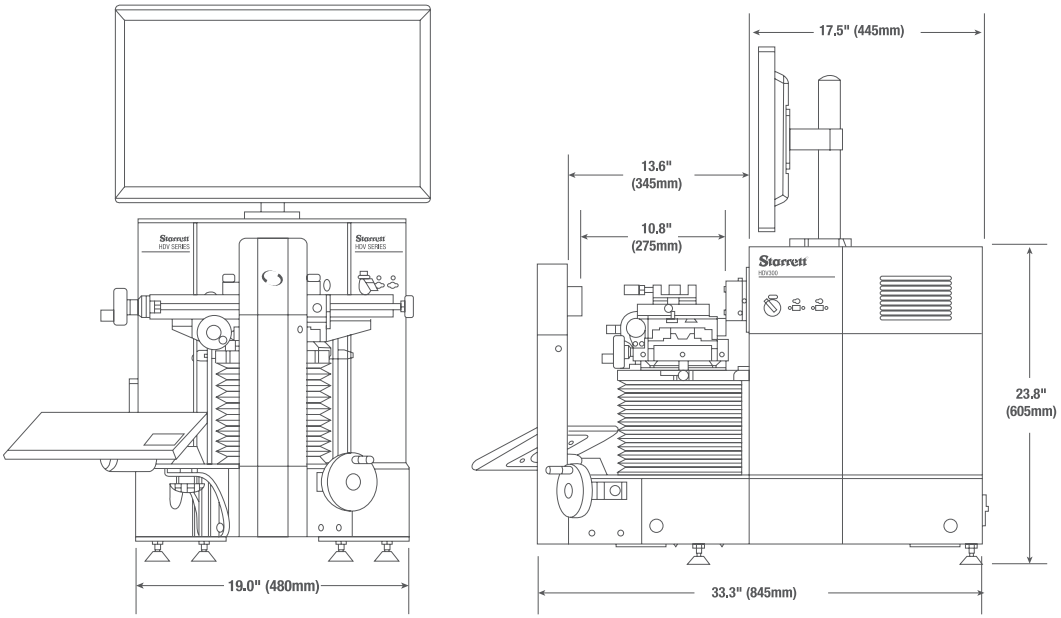
Features and Specifications

- Steel construction with hard anodized stage tooling plate
- 21.3" x 5.1" (540 x 130mm) workstage
- 110lbs (50kg) maximum load capacity
- 2" (51mm) of focus travel
- Helix adjustment with ±15° Vernier scale
- Manual X-Y and focus positioning via hand wheels or CNC with joystick and trackball positioning
- Heidenhain glass scales for 0.5µm (.00002") X and Y resolution
- LED illumination for surface and profile lighting
- 5 mega-pixel color camera (2448 x 2058 pixels)
- Ultra-low distortion to 0.001% for telecentric FOV measurements
- 64-bit Intel® processor
- Windows® 7 Professional operating system
- MetLogix™ M3 software with DXF/FOV option pack
- Software and part image displayed on 24" (60cm) touch-screen color monitor (1920 x 1080 pixels)

Options

- 6 interchangeable telecentric lenses for fields of view from 1.14" to 0.09" x 0.07" (patent pending)
- Interchangeable 6.5:1 zoom optics
- Systems are also available with fixed .14x lens offering 2.5" x 1.9" (63 x 47mm) FOV. (Lenses are not interchangeable on this model)
- 23" or 32" high cabinet stands
- Calibration standards

HDV Dimensions



SPECIFICATIONS

	HDV300	HDV400
Net Weight	220lbs 100kg	230lbs 105kg
Shipping Weight	430lbs 195kg	440lbs 200kg
X-Y Travel	12" x 6" 300 x 150mm	16" x 6" 400 x 150mm
X-Y Accuracy	E2 = 3.0 µm + L/33	E2 = 3.0 µm + L/33

Horizontal Digital Video Comparators

HDV

HDV500 CNC

The HDV500 Digital Video Comparator offers the best features of a large horizontal optical comparator and a vision metrology system. Configured like a traditional horizontal comparator, the HDV500 has a long travel 20" x 8" (500 x 200mm) X-Y stage and heavy-duty steel construction. The workstage is the same as the popular HF600 and HF750 comparators, with a 330lb (150kg) load capacity. Much like the HDV300 and 400, the heart of the system centers on a uniquely designed interchangeable lens mounting system coupled to a hi-resolution color digital video camera (patent pending). The system is available with a choice of three telecentric lenses.

The HDV systems house a powerful 64-bit PC, which runs MetLogix M3 Metrology software. With this software, DXF CAD files can be imported and 2D Go-No-Go "profile gages" can be developed directly from the CAD files. Video-Edge-Detection (VED), allows real-time interaction of the imported file with the video image of the part being inspected.

HDV OPTICS

System Parameter	Telecentric Lenses		
Optical magnification	0.11x	0.16x	0.24x
Magnification on 42" monitor	6.5x	9.3x	14.7x
Field of view	3.0" (76mm)	2.1" (54mm)	1.4" (35mm)
Working distance	9.0" (228mm)	6.25"(159mm)	6.0" (150mm)
Optical Distortion, %	0.04%	0.03%	0.04%

OPERATOR INTERFACE

Feature	MetLogix™ M3
PC installed in main housing	x
Color graphics touch screen	x
Windows® 7 operating system	x
X-Y-Q (angle) measurements	x
2D geometry software with skew	x
Video edge detection	x
CAD file import and export	x
FOV measurements	x
Elimination of Overlays	x
Software developer	MetLogix™

Lens	Field of View (FOV) in	mm
0.11x	3.0 x 2.5	76 x 64
0.16x	2.1 x 1.8	54 x 45
0.24x	1.4 x 1.1	35 x 29

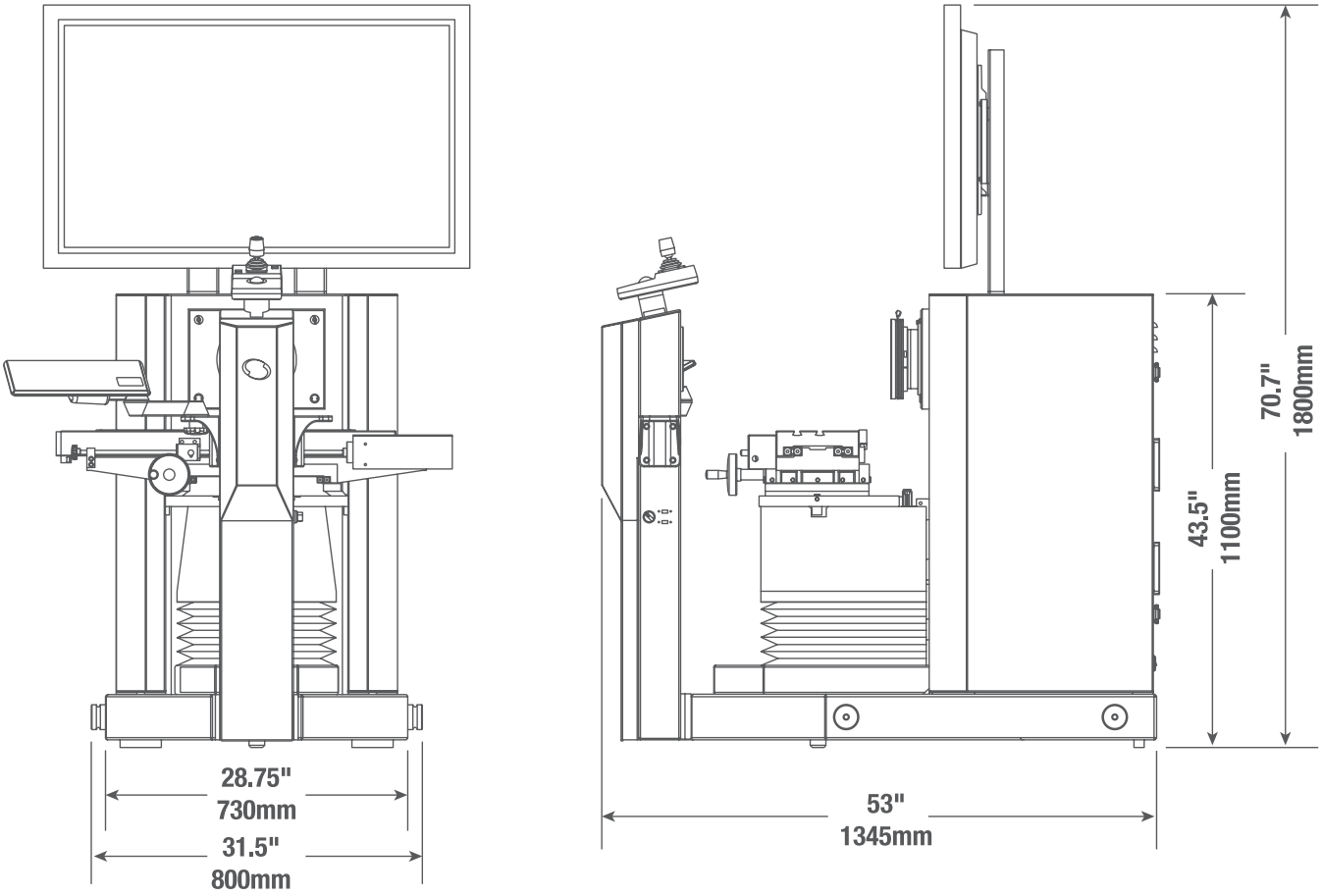
Features and Specifications

- Steel construction with nickel plated stage tooling plate
- 21.3" x 5.1" (540 x 130mm) workstage top plate
- 330lb (150kg) maximum load capacity
- 3" (75mm) of focus travel
- Helix angle adjustment with ±15° Vernier scale
- X-Y and focus positioning via joystick and trackball positioning
- Heidenhain glass scales for 0.5µm (.00002") X and Y resolution
- LED illumination for surface and profile lighting
- 5 mega-pixel black and white camera (2448 x 2058 pixels)
- Ultra-low distortion to 0.002% for telecentric FOV measurements
- 64-bit Intel® Processor
- Windows® 7 Professional operating system
- MetLogix™ M3 software with DXF/FOV option pack
- Software and measurement image (part) displayed on 42" (1070cm) touch-screen color monitor (1920 x 1080 pixels)

Options

- 3 interchangeable telecentric lenses for fields of view from 1.4" x 1.1" to 3.0" x 2.5" (patent pending)
- Extensive line of accessories, workholding devices and calibration standards

HDV500 Dimensions



SPECIFICATIONS

	HDV500
Net Weight	230lbs 105kg
Shipping Weight	440lbs 200kg
X-Y Travel	16" x 6" 400 x 150mm
X-Y Accuracy	E2 = 3.0 µm + L/33

Motion Stages

METROLOGY PLATFORMS

TM X-Y Stages

TM X-Y stages are designed for use in a variety of applications such as measurement, microscopy, inspection, and automation. TM stages adapt to existing microscopes from Nikon and Mitutoyo and are available in manual and motorized configurations. Custom sizes and configurations are also available.

Specifications

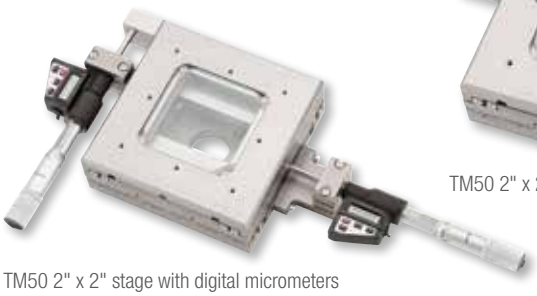
- Accuracy: E1=3.5+5L/1000
- X-Y Squareness: Within 100µin/1" (2.5µm/25mm)
- Repeatability: within 2.5µm

Features

- Manual Drives are hand wheels with lead screws on the TM200 or 2" (50mm) micrometer heads on the TM50
- Precision machined from heat treated, billet aluminum, with gray anodized finish
- Open frame (with removable stage glass) standard
- Precision cross-roller bearings
- Top plate has 4mm threaded holes for custom tooling

TM200 4" x 8" stage

TM50 2" x 2" stage



TM50 2" x 2" stage with digital micrometers

SPECIFICATIONS

	TM200	TM50
Measurement Area (X-Y)	4" x 8" 200 x 100mm	2" x 2" 50 x 50mm
Resolution	20µin 0.5µm	100µin 2.5µm
Top Tooling Plate Overall Size	14" x 8" 350 x 200mm	6" x 6" 150 x 150mm

Metrology Frames and Stages

Looking for a custom solution? Starrett offers a selection of standard and custom solutions from Z-axis columns and granite bases that work in conjunction with our TM stages as well as complete X-Y-Z metrology and precision positioning platforms. Please consult us for more information.

Accessories

Fiber-optic and LED Illumination

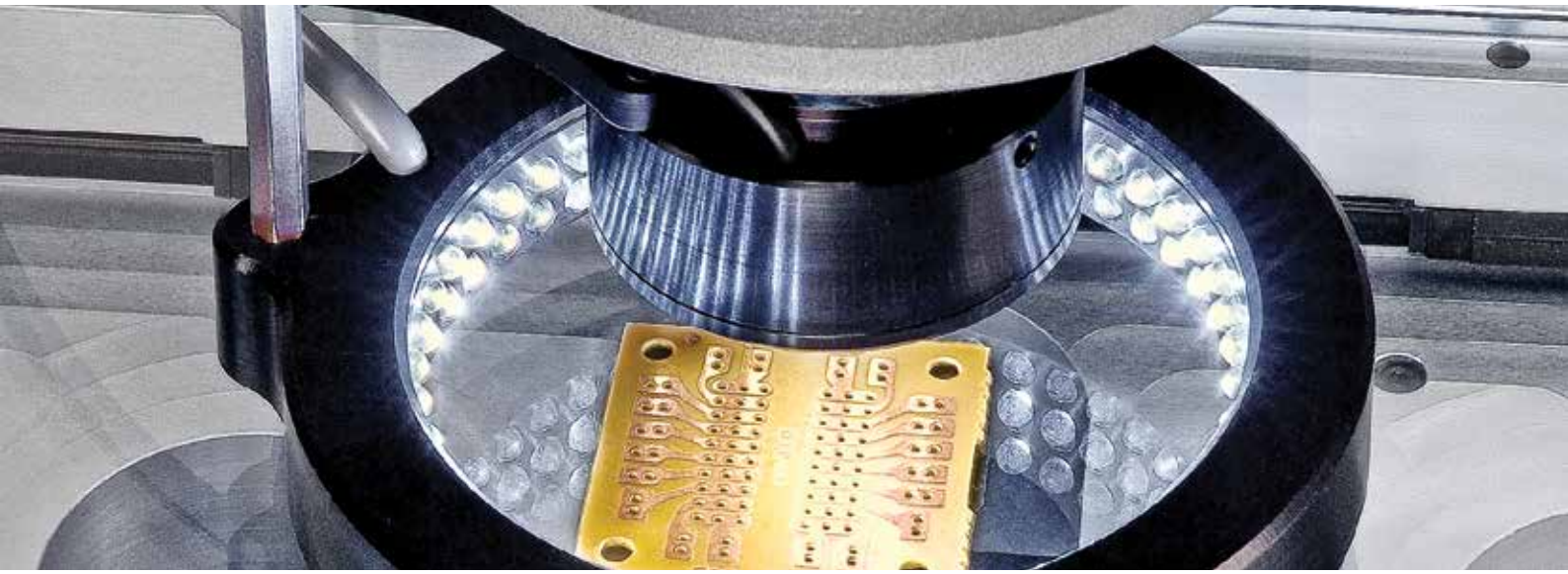
Rotary part positioner with collet kit

Modular system work stands

Part Holding Fixtures

Touch Probe Kits

NIST Traceable Calibration Standards



Specifications and Options

Model	MV300	MVR200	MVR300	AV300	AV350	AVR200
Bench-Top System	X	X	X	X	–	X
Floor-Standing System	–	–	–	–	X	–
Part View Orientation	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
X-Y-Z Travel (in)	12" x 6" x 5.5"	8" x 4" x 8"	12" x 8" x 8"	12" x 6" x 5.5"	14" x 14" x 8"	8" x 4" x 8"
X-Y-Z Travel (mm)	300 x 150 x 135mm	200 x 100 x 200mm	300 x 200 x 200mm	300 x 150 x 135mm	350 x 350 x 200mm	200 x 100 x 200mm
Z Axis Measuring	Optional	Optional	Optional	Standard	Standard	Standard
CNC	–	–	–	Standard	Standard	Standard
X-Y Accuracy (µm)	E2 = 3.5µm + 5L/1000	E2 = 2.5µm + 5L/1000	E2 = 2.5µm + 5L/1000	E2 = 1.9µm + 5L/1000	E2 = 2.5µm + 5L/1000	E2 = 1.9µm + 5L/1000
Z Accuracy (µm)	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000
Scale Resolution	0.5µm	0.5µm	0.5µm	0.1µm	0.1µm	0.1µm
Multi-Sensor Compatible	–	–	–	–	–	–
Base	Cast Aluminum	Granite	Granite	Cast Aluminum	Granite	Granite
Control System/Software	M3	M3	M3	M3 or QC5300	M3	M3
Display	21.5" Touchscreen PC	21.5" Touchscreen PC	21.5" Touchscreen PC	21.5" Touchscreen PC (M3)or 24"Monitor	21.5" Touchscreen PC	21.5" Touchscreen PC
Zoom Optics - Standard	6.5:1	6.5:1	6.5:1	6.5:1	12:1	6.5:1 - 2 LED 12:1 - 3 LED
Zoom Optics - Optional	–	–	–	–	–	–
Telecentric Optics	–	–	–	–	–	–
Digital Video Camera	1.3 MP Color	1.3 or 2.0 MP Color with Telecentric	1.3 or 2.0 MP Color with Telecentric	1.3 MP Color	1.3 MP Color	1.3 MP Color Standard; 2 MP with Telecentric
Surface Ring Illumination	LED or FO	LED	LED	LED or FO	LED or FO	LED
Transmitted Illumination	LED or FO	LED	LED	LED or FO	LED or FO	LED
Coaxial Illumination - Optional	LED or FO	LED	LED	LED or FO	LED or FO	LED
Auxiliary Lenses - Optional	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x
Rotary Fixture	–	–	–	Optional	Optional	Optional
Renishaw Touch Probe	–	–	–	Optional	Optional	Optional
Renishaw Touch Probe Change Rack	–	–	–	–	–	–
Touch Probe Spotter Camera	–	–	–	–	–	–
Optimet Laser	–	–	–	–	–	–
Machine Pedestal and Point of Control Cart/Arm	–	–	–	–	Standard	–
Cabinet Stand	–	–	–	–	–	–
Workstation Base, Extension and Swing Arm	Optional	Optional	Optional	Optional	–	Optional
Part Fixturing	Optional	Optional	Optional	Optional	Optional	Optional
Dark Field Quadrant Illumination (LED only)	–	–	–	Optional	Optional	Optional
Video Pixel Calibration Standard	Optional	Optional	Optional	Optional	Optional	Optional
Calibration Standards	Optional	Optional	Optional	Optional	Optional	Optional
FOV, Linear and 2D Calibration Standards	Optional	Optional	Optional	Optional	Optional	Optional

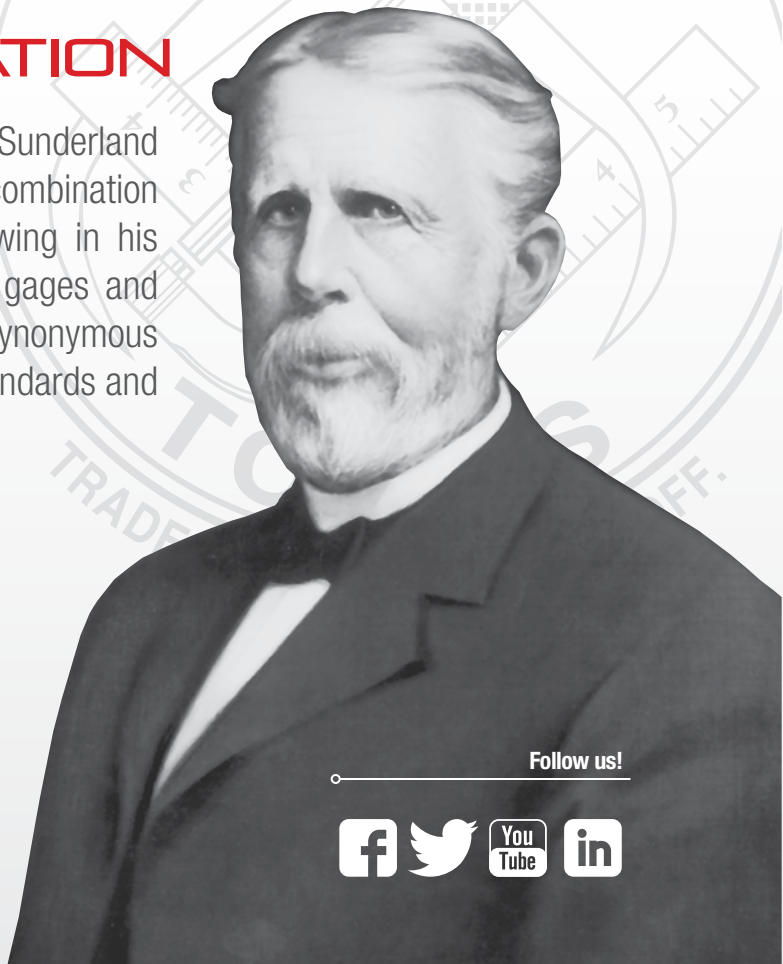
AVR300	AV300+	AV350+	LF and LFM	HDV300	HDV400	HDV500
X	–	–	–	X	X	
–	X	X	Standard	–	–	–
Vertical	Vertical	Vertical	Vertical	Horizontal	Horizontal	Horizontal
12" x 8" x 8"	12" x 6" x 8"	14" x 14" x 8"	18" x 12" x 8" 28" x 24" x 8" 38" x 30" x 8" Special Quote 50" x 36" x 8" Special Quote	12" x 6"	16" x 6"	20" x 8"
300 x 200 x 200mm	300 x 150 x 200mm	350 x 350 x 200mm	460 x 305 x 200mm 711 x 610 x 200mm 965 x 760 x 200mm Special Quote 1270 x 915 x 200mm Special Quote	300 x 150mm	400 x 150mm	500 x 200mm
Standard	Standard	Standard	Standard	–	–	–
Standard	Standard	Standard	Standard	Optional	Optional	Standard
E2 = 1.9µm + 5L/1000	E2 = 1.9µm + 5L/1000	E2 = 2.5µm + 5L/1000	E2 = 1.5 + 5L/1000 on LF and 2.5 + 5L/1000 on LFM	E1 = 3.0µm + L33	E1 = 3.0µm + L/33	E1 = 3.0µm + L/33
E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000	E1 = 2.5µm + 5L/1000	E1 = 2.5 + 5L/1000	–	–	–
0.1µm	0.1µm	0.1µm	0.1µm	0.5µm	0.5µm	0.5µm
–	Yes	Yes	X	–	–	–
Granite	Granite	Granite	Granite	Steel	Steel	Steel
M3	QC5300	QC5300	QC5300 or M3	M3	M3	M3
21.5" Touchscreen PC	24" Monitor	24" Monitor	24" Monitor	24" Touch Screen	24" Touch Screen	42" Monitor
6.5:1 - 2 LED 12:1 - 3 LED	12:1	12:1	12:1	–	–	–
–	–	–	6.5:1	6.5:1	6.5:1	-
–	–	–	–	Choice of 4.0x, 2.0x, 1.0x, 0.80x, 0.50x and 0.30x interchangeable Telecentric Lenses Optional- 0.14x fixed	Choice of 4.0x, 2.0x, 1.0x, 0.80x, 0.50x and 0.30x interchangeable Telecentric Lenses Optional- 0.14x fixed	Choice of 0.24x, 0.16x and 0.11x interchangeable Telecentric Lenses
1.3 MP Color Standard; 2 MP with Telecentric	1.3 MP Color	1.3 MP Color	1.3 MP Color	5 MP Color	5 MP Color	5 MP Black and White
LED or FO	LED or FO	LED or FO	LED	LED	LED	LED
LED or FO	LED or FO	LED or FO	LED	LED	LED	LED
LED or FO	LED or FO	LED or FO	LED	–	–	–
0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5x, 2.0x	0.5x, 1.5X, 2.0x	–	–	–
Optional	Optional	Optional	Optional	–	–	–
Optional	Optional	Optional	Optional	–	–	–
–	Optional	Optional	Optional	–	–	–
–	–	–	Optional	–	–	–
–	Optional	Optional	Optional	–	–	–
–	Standard	Standard	Standard	–	–	–
–	–	–	–	Optional	Optional	–
Optional	–	–	–	–	–	–
Optional	Optional	Optional	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	–	–	–
Optional	Standard	Standard	Standard	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional	Optional	Optional

PRECISION MAKES THE DIFFERENCE

YOU'VE HEARD OF THE MOTHER OF INVENTION?

NOW MEET THE FATHER OF INNOVATION

The L.S. Starrett Company was founded by Laroy Sunderland Starrett in 1880 who had patented the first combination square in 1878. Since then, we've been following in his footsteps, creating the kind of precision tools, gages and instruments that have made the name "Starrett" synonymous with "innovation." Laroy Starrett set very high standards and we steadfastly maintain them today.



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KMR

KineMic video microscopes are a family of seven versatile and affordable inspection and vision metrology systems. They are ideal for receiving inspection, quality assurance, training, manufacturing assembly, research, and documentation – wherever easy setup and a range of magnifications are required. Depending on the size of the parts to be measured, measurements can be all electronic within the field of view, or be integrated with stage motion for parts up to 8" (200mm).

Features

- XGA models set the standard for quick setup and ease of use by not requiring a computer
- D1 and M3 models offer the power of a 21.5" color touch-screen PC with MetLogix™ D1 or M3 inspection and metrology software
- LED surface and transmitted illumination
- Small footprint takes up minimal space

Our KMR systems line provide high performance for low cost. These machines are simple to operate without compromising performance.

With seven models to choose from, we can customize to your specific needs.

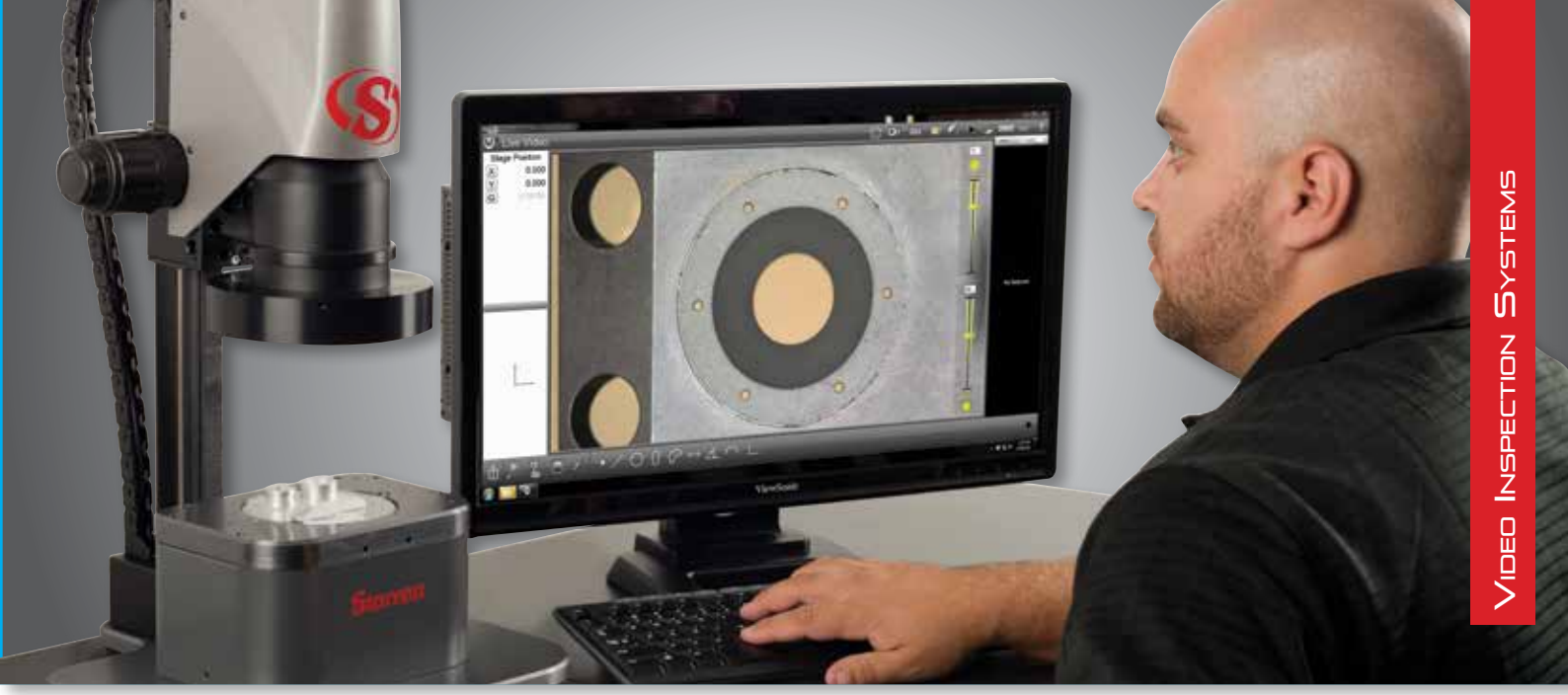
Call for an exact quote.

KMR-200 with M3

KMR-FOV-M3-0.14x

	KineMic XGA Zoom, Basic	KineMic XGA Zoom, 2 x 2 Stage	KineMic D1 Zoom	KineMic D1 Zoom, 2 x 2 Stage	KineMic M3 Zoom, 4 x 8 Stage	KineMic M3 Zoom, FOV	KineMic M3 Telecentric, FOV
Part Number	KMR-XGA	KMR-50-XGA	KMR-D1	KMR-50-D1	KMR-200-M3	KMR-M3	KMR-FOV-M3
Optics	6.5:1 zoom	6.5:1 zoom	6.5:1 zoom	6.5:1 zoom	6.5:1 zoom	6.5:1 zoom	6 telecentric lenses
CCD Sensor	0.83 MPixel	0.83 MPixel	1.33 MPixel	1.33 MPixel	1.33 MPixel	1.33 MPixel	2.02 MPixel
Camera Interface	VGA cable	VGA cable	USB cable	USB cable	USB cable	USB cable	USB cable
Computer	N/A	N/A	All-in-one PC	All-in-one PC	All-in-one PC	All-in-one PC	All-in-one PC
Software	N/A	N/A	MetLogix™ D1	MetLogix™ D1	MetLogix™ M3	MetLogix™ M3	MetLogix™ M3
Video Screen	19" XGA monitor	19" XGA monitor	21.5" all-in-one PC	21.5" all-in-one PC	21.5" all-in-one PC	21.5" all-in-one PC	21.5" all-in-one PC
Screen Resolution	1024 x 768	1024 x 768	1920 x 1080	1920 x 1080	1920 x 1080	1920 x 1080	1920 x 1080
Lens Magnification	0.7x to 4.5x	0.7x to 4.5x	0.7x to 4.5x	0.7x to 4.5x	0.7x to 4.5x	0.7x to 4.5x	0.14x, 0.30x, 0.50x, 0.80x, 1.0x, 2.0x, 4.0x
Screen Magnification	31x to 200x	31x to 200x	31x to 200x	31x to 200x	31x to 200x	31x to 200x	13x to 178x
Auxiliary lenses	0.5x, 0.75x, 1.5x, 2x	0.5x, 0.75x, 1.5x, 2x	0.5x, 0.75x, 1.5x, 2x	0.5x, 0.75x, 1.5x, 2x	0.5x, 0.75x, 1.5x, 2x	0.5x, 0.75x, 1.5x, 2x	N/A
Field of view (X-axis)	1.4 to 9.0mm	1.4 to 9.0mm	1.4 to 9.0mm	1.4 to 9.0mm	1.4 to 9.0mm	1.4 to 9.0mm	1.8 to 24mm
X-Y Stage Motion	None	50 x 50 mm	None	50 x 50 mm	200 x 100 mm	None	None
Metrology Means	None	Micrometers	D1 software**	D1 software**	X and Y encoders	M3 FOV software	M3 FOV software
Measurement Resolution	N/A	1µm (.00005")	Up to 2µm*	1µm (.00005")	0.5µm (0.00002")	Up to 2µm*	Up to 2µm*
Meas. Accuracy	N/A	3µm per 25mm	Up to ±2.5µm*	3µm per 25mm	2.5µm + 5L/1000	Up to ±2.5µm*	Up to ±2.5µm*
Basic Stand	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Boom Stand	Optional	N/A	Optional	N/A	N/A	Optional	N/A
LED Back Light	Standard	Standard	Standard	Standard	Standard	Standard	Standard
LED Ring Light	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Lighting Control	Adjustment knobs	Adjustment knobs	Adjustment knobs	Adjustment knobs	Via M3 software	Via M3 software	Via M3 software

* These are best values. Actual values will depend on the zoom lens setting or selected telecentric lens.
**D1 software basic measurements are taken by manually positioning a cross-hair on the screen.
Disclaimer: Due to continual product improvements, specifications may change without notice.



KMR 50-D1

KMR-XGA

KMR-D1

KMR-FOV with M3

	KineMic XGA Zoom, Basic	KineMic XGA Zoom, 2 x 2 Stage	KineMic D1 Zoom	KineMic D1 Zoom, 2 x 2 Stage	KineMic M3 Zoom, 4 x 8 Stage	KineMic M3 Zoom, FOV	KineMic M3 Telecentric, FOV
Model Number	KMR-XGA	KMR-50-XGA	KMR-D1	KMR-50-D1	KMR-200-M3	KMR-M3	KMR-FOV-M3
Video Inspection	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Basic Dimensions	No	Manual LCD Micrometer	Yes - Manual	Manual LCD Micrometer	Yes	VED	VED
Geometric Constructs	No	No	No	No	Yes	Yes	Yes
Image Annotation	No	No	Yes	Yes	Yes	Yes	Yes
Image Archiving	No	No	Yes	Yes	Yes	Yes	Yes
Video Edge Detection	No	No	No	No	Yes	Yes	Yes

Video Inspection Systems

KineScope

A digital video camera with precision optics and LED lighting, in a microscope that fits in the palm of your hand. The KineScope has 40-140x magnification, which lets you zoom in on the fine details of electronics, product parts, or anything else too small to see.

Place the KineScope over the object and view the image on your computer screen instead of looking into a small eyepiece. Capture images or video and easily add labels, make measurements, and draw on the live image. The KineScope connects to your computer's USB port and includes VLink imaging software.

Features

- View live and captured images on a computer screen (or use a computer comparator for large groups)
- 40-140x magnification
- Completely portable with your laptop computer
- Save still images, movies and time lapse
- Apply labels, markers, time stamps and measurement
- Draw directly on the live image
- Includes VLink imaging software

Specifications

- Image Sensor: 1/4" CMOS
- Pixel Resolution: 640 x 480
- Power Req.: USB Port, 2.0 or greater
- Minimum Operating System Requirements: Windows® 2000, XP or Vista with DirectX 8.1 and Pentium III 500MHz (also compatible with Windows® 7 and 8 in either 32 or 64 bit. MAC versions are also available)
- Illumination: Super-Bright LED

OPTICAL COMPARATORS

Horizontal Bench Optical Comparator

HE400

The most economical of our bench top comparators, the HE400 offers a 16" (400mm) diameter screen, X-Y stage travel, bayonet-style interchangeable lenses and Q-axis angular readout: all to improve capacity and performance. These latest horizontal comparators are fitted with either MetLogix™ M1 or M2 measuring software or Quadra-Chek® digital readout systems as standard, making them simple to use, but having the power to satisfy the most complex measuring requirements.

OPERATOR INTERFACE

	MetLogix™		Quadra-Chek®	
Feature	**M1**	**M2**	**QC121**	**QC221**
Mounted to comparator arm	x	x	x	x
Color graphics	x	x		
Touch screen operation	x	x		
MS Windows® operating system	x	x		
X-Y-Q axis digital readout	x	x	x	x
2D geometry software with skew	x	x	x	x
Optical edge detection option	x	x		x
Software developer	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain

SPECIFICATIONS

HE400	
Horizontal Travel	10" (250mm)
Vertical Travel	4" (100mm)
Focus Travel	1-1/8" (28mm)
Top Plate*	18.9" x 4.7" (480 x 120mm)
Image	Inverted and reversed

*With machined single slot for easy fixturing

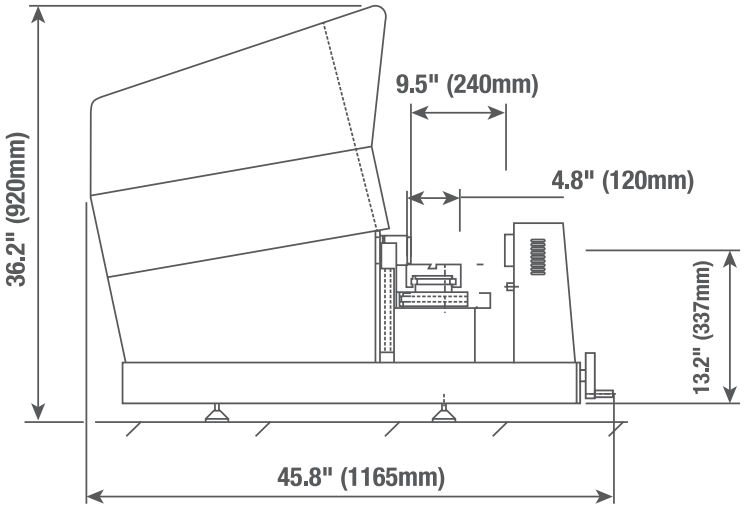
Features and Specifications

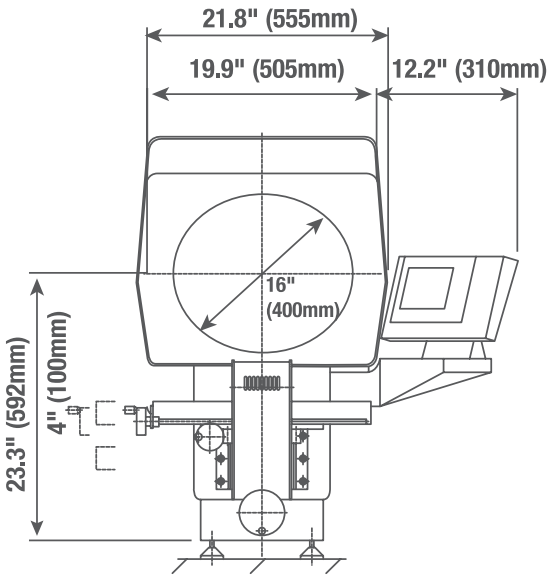
- All metal construction
- Single bayonet-style lens mounting system
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) on both X and Y axes
- LED profile and surface illumination
- Fully retractable flexible duplex fiber optic surface illumination
- Digital protractor for accurate angle measurement 1' resolution
- Available with MetLogix™ M1 tablet, M2 PC-based touch screen measuring software or Quadra-Chek® digital readout system
- Fine adjustment on all axes
- Quick mechanism on the X-axis

Options

- Six interchangeable fixed magnification lenses including 10x, 20x, 31.25x, 50x and 100x
- Canopy and curtains (designed to mount on cabinet stand)
- Purpose built cabinet stand
- Extensive line of accessories

HE400 Dimensions





WEIGHT AND DIMENSIONS

	HE400
Net Weight	230lbs 105kg
Gross Weight	300lbs 135kg
Shipping Dimensions	49" (L) x 32" (W) x 51" (H)

Horizontal Bench-Top Optical Comparator

HB400

The HB400 provides exceptional performance with a 16" (400mm) diameter viewing screen and high 110lb workload capacity. Single bayonet-style lens mount accepts a choice of interchangeable fixed lenses or choice of video camera system. Available with optional Optical and/or Video edge detection, optional motorized X-Y axes, or fully automatic CNC controls, this comparator provides performance previously only available with floor-standing models.

OPERATOR INTERFACE

	MetLogix™			Quadra-Chek®		
Feature	**M1**	**M2**	**M3**	**QC121**	**QC221**	**QC5200**
Mounted to comparator arm	x	x		x	x	x
Color graphics	x	x	x			
Touch screen operation	x	x	x			
MS Windows®/Android operating system	Android	Windows	Windows			
X-Y-Q axis digital readout	x	x	x	x	x	x
2D geometry software with skew	x	x	x	x	x	x
Optical edge detection option	x	x	x	x	x	x
Video edge detection option			x			x
CAD file import and export option			x			x
CNC drive option		x	x		x	x
Software developer	MetLogix™	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain	Metronics/Heidenhain

SPECIFICATIONS

HB400	
Horizontal Travel	12" (300mm)
Vertical Travel	6" (150mm)
Focus Travel	2" (50mm)
Top Plate*	21" x 5" (530 x 120mm)
Image	Erect and reversed

*With machined slots for easy fixturing

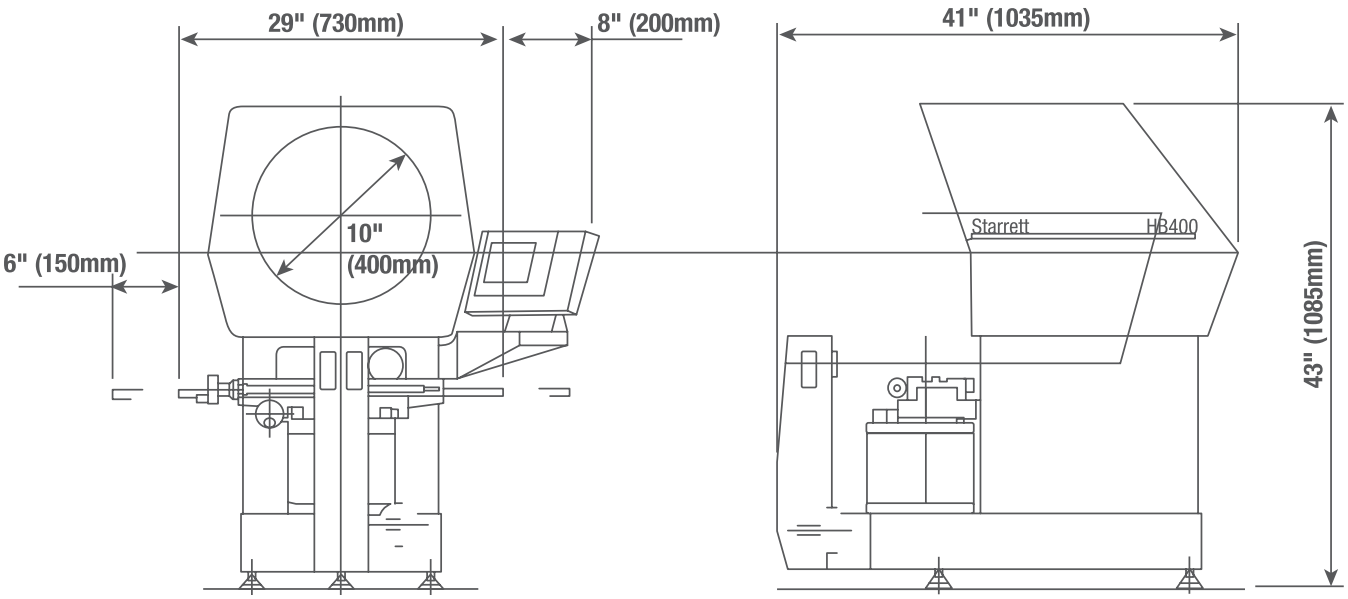
Features and Specifications

- All metal construction with hard-anodized stage tooling plate
- Single bayonet-style lens mounting system
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) on both X and Y axes
- LED profile and surface illumination
- Fixed duplex fiber optic surface illumination
- Digital protractor for accurate angle measurement (1' resolution) via Q-axis readout
- Available with MetLogix™ M1 tablet, M2 or M3 PC-based touch screen measuring software or Quadra-Chek® digital readout system
- Fine adjustment on all axes
- Quick release mechanism on the X-axis

Options

- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed lens system available by special order
- Optional extended travel workstage 16" (400mm)
- Automatic optical edge detection
- Automatic video edge detection (available only with OV2 or TOV2 video cameras)
- OV2 Video Camera with 6.5:1 zoom lens
- TOV2 Telecentric Video Camera with choice of 0.16x, 0.3x or 0.5x fixed magnification lens
- Motorized X and Y axes
- Fully automatic CNC controls
- Swing-away lamp house
- Canopy and curtains (designed to mount on cabinet stand)
- Purpose built cabinet stand
- Extensive line of accessories

HB400 Dimensions



WEIGHT AND DIMENSIONS

	HB400
Net Weight	320lbs 145kg
Gross Weight	385lbs 175kg
Shipping Dimensions	49" (L) x 32" (W) x 51" (H)

Horizontal Bench-Top Optical Comparator

HD400

DUAL LENS

The HD400 is a dual lens optical comparator offering a two-lens mount allowing instant switching between two magnification lenses or video camera adapter. Optional automatic edge detection or video edge detection removes operator subjectivity in locating edges of the part being measured. The HD400 can also be equipped with optional extended stage travel to 16" (400mm), motorized stage or fully automated CNC controls.

OPERATOR INTERFACE

	MetLogix™			Quadra-Chek®	
Feature	M1	M2	M3	QC221	QC5200
Mounted to comparator arm	x	x		x	x
Color graphics	x	x	x		
Touch screen operation	x	x	x		
MS Windows® operating system	x	x	x		
X-Y-Q axis digital readout	x	x	x	x	x
2D geometry software with skew	x	x	x	x	x
Optical edge detection option	x	x	x	x	x
Video edge detection			x		x
CAD file import and export option			x		x
CNC drive option		x	x	x	x
Software developer	MetLogix™	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain

SPECIFICATIONS

HD400	
Horizontal Travel	16" (400mm)
Vertical Travel	6" (150mm)
Focus Travel	2" (50mm)
Top Plate*	21" x 5" (530 x 120mm)
Image	Erect and reversed

*With machined slots for easy fixturing

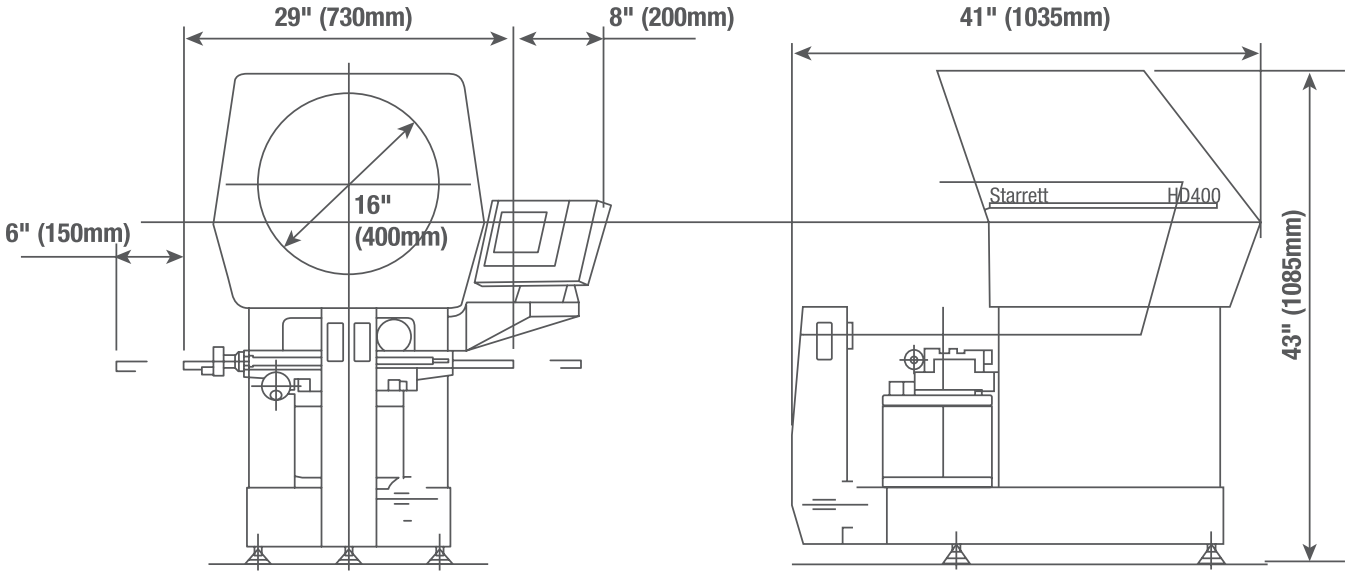
Features and Specifications

- All metal construction with hard-anodized stage tooling plate
- 16" (400mm) diameter screen
- Dual-lens mounting system
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) on both X and Y axes
- LED profile and surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Helix adjustment for accurate thread form inspection
- Available with MetLogix M2 or M3 PC-based touch screen measuring software or Quadra-Chek® digital readout system
- Fine adjustment on all axes
- Quick release mechanism on the X-axis

Options

- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed lens system available by special order
- Automatic optical edge detection
- Automatic video edge detection (available only with OV2 or TOV2 video cameras)
- OV2 Video Camera with 6.5:1 zoom lens
- TOV2 Telecentric Video Camera with choice of 0.16x, 0.3x, or 0.5x fixed magnification lens
- Motorized X and Y axes
- Fully automatic CNC controls
- Swing-away lamp house
- Canopy and curtains (designed to mount on Starrett cabinet stand)
- Purpose built cabinet stand
- Extensive line of accessories

HD400 Dimensions



WEIGHT AND DIMENSIONS

	HD400
Net Weight	320lbs 145kg
Gross Weight	385lbs 175kg
Shipping Dimensions	49" (L) x 32" (W) x 51" (H)

NEW!

Vertical Bench-Top Optical Comparator

VB300

The VB300 is another optical comparator built to the Starrett trademark formula: high performance at a low price. This vertical bench-top comparator is designed to meet the demands of modern industry, and is ideal for the rapid inspection of small light-weight components, stampings, plastic molding, electronic components, small turned parts, and more.

OPERATOR INTERFACE

Feature	Integral LED readout	MetLogix™ M1	MetLogix™ M2	Quadra-Chek® QC121	Quadra-Chek® QC221
Touch screen operation		x	x		
Angular digital measurement in readout	x	x	x	x	x
X-Y-Q axis digital readout	x	x	x	x	x
Geometric function digital readout		x	x		x
Optional automatic edge detection		x	x	x	x

SPECIFICATIONS

VB300	
Horizontal Travel	4" (100mm)
Vertical Travel	4" (100mm)
Focus Travel	4" (100mm)
Top Plate	9" x 9" (225 x 225mm)
Glass Insert	6" x 6" (150 x 150mm)
Image	Erect and reversed

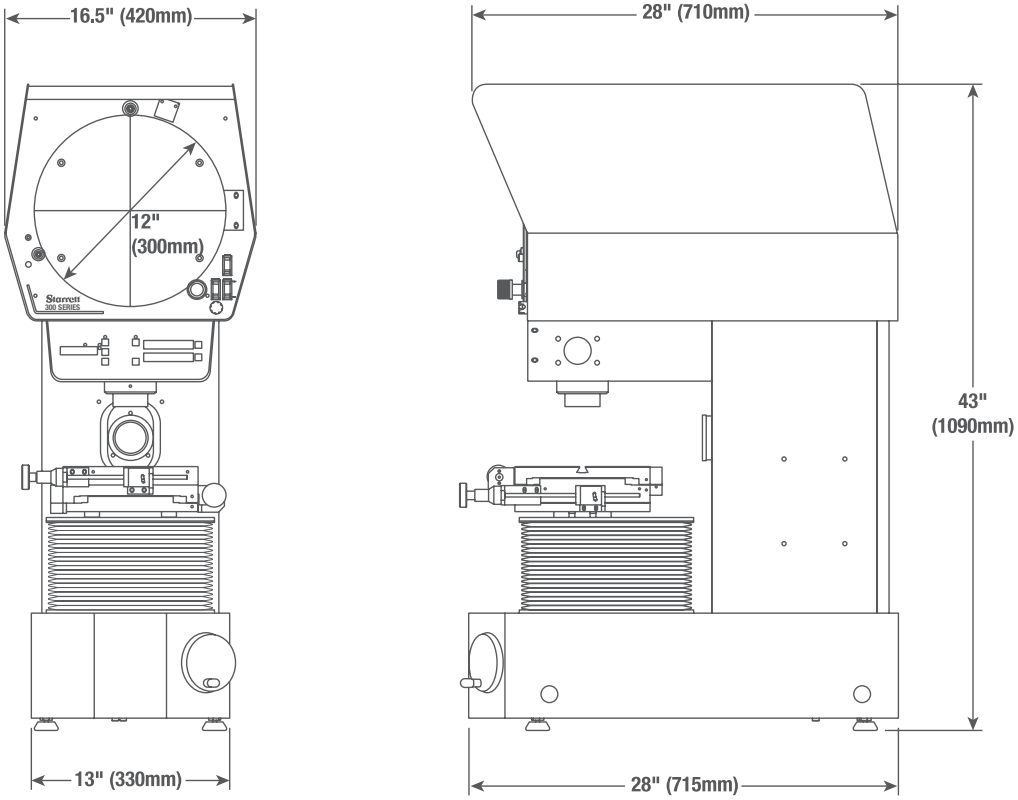
Features and Specifications

- All metal construction for optimum performance
- 12" (300mm) diameter screen with overlay clips
- Linear encoder (glass scale) on both X and Y axes
- Stage weight capacity: 11lbs (5kg) (evenly distributed)
- LED profile and surface illumination
- Screen driven Q-axis
- Quick release mechanism on X-axis and Y-axis
- Available with a simple integrated LED readout display (as shown) or choice of the new MetLogix™ or Quadra-Chek® digital readout systems

Options

- Choice of four fixed magnification lenses including 10x, 20x, 25x and 50x
- Purpose built cabinet stand
- Precision Centers and Vees accessory available

VB300 Dimensions



WEIGHT AND DIMENSIONS

	VB300
Net Weight	423lbs 192kg
Gross Weight	443lbs 201kg
Gross Dimensions (L x W x H)	44" x 33" x 52"

Vertical Bench-Top Optical Comparator

VB400

The VB400 Vertical Optical Comparator allows flat parts to be simply laid on a glass insert in the workstage. Features include a 16" (400mm) diameter vertical screen, ultra-bright LED profile and surface illumination, and linear encoder scales for .00002" (0.5µm) resolution.

OPERATOR INTERFACE

Feature	MetLogix™ M1	MetLogix™ M2	Quadra-Chek® QC121	Quadra-Chek® QC221
Mounted to comparator arm	x	x	x	x
Color graphics	x	x		
Touch screen operation	x	x		
MS Windows® operating system	x	x		
X-Y-Q axis digital readout	x	x	x	x
2D geometry software with skew	x	x	x	x
Optical edge detection option	x	x	x	x
Software developer	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain

SPECIFICATIONS

VB400	
Horizontal Travel	8" (200mm)
Vertical Travel	4" (100mm)
Focus Travel	4" (100mm)
Top Plate*	16" x 9" (400 x 230mm)
Image	Erect and reversed

*With machined slots for easy fixturing

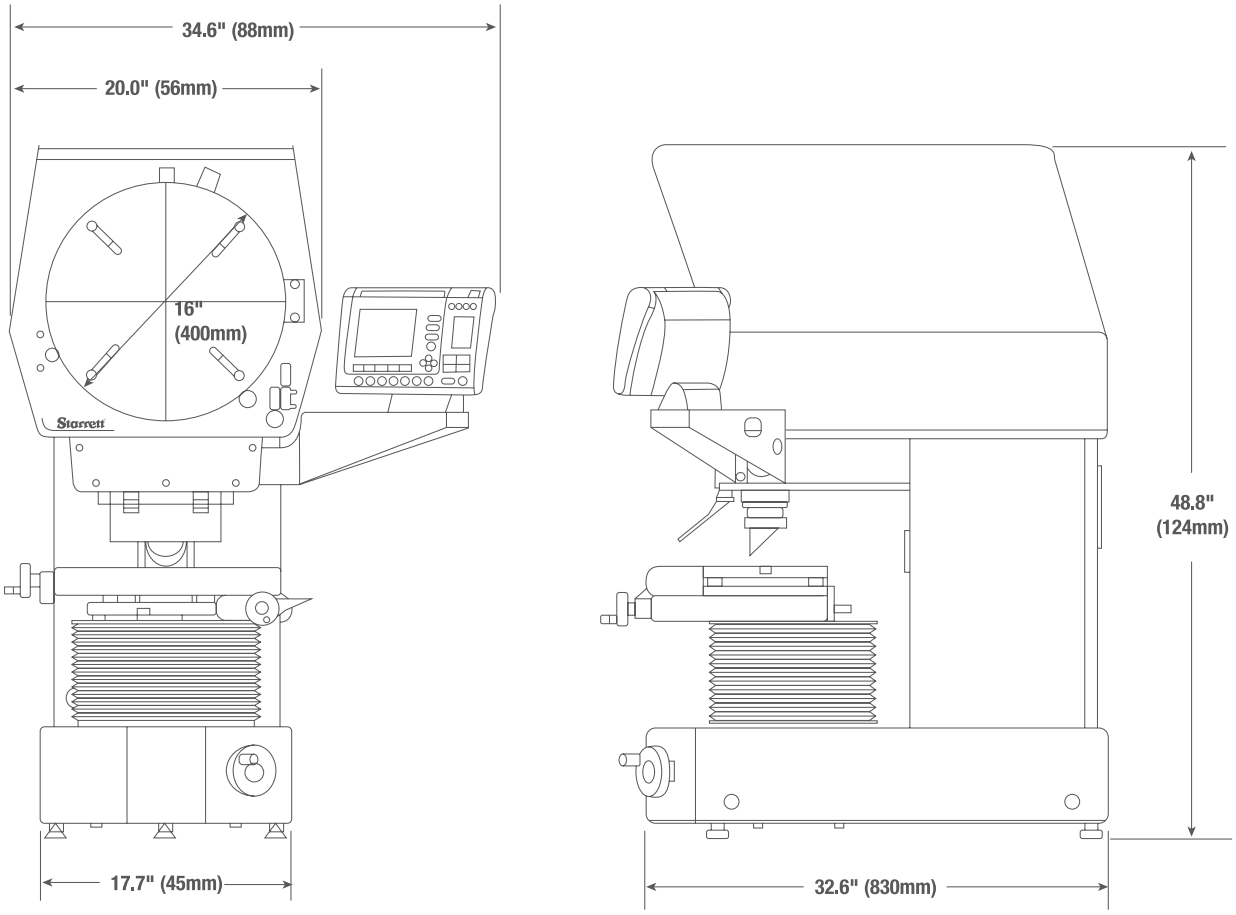
Features and Specifications

- All metal construction
- 16" (400mm) diameter screen
- Collimating condenser with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) on both X and Y axes
- LED profile and surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Available with MetLogix™ M1 tablet, M2 PC-based touch screen measuring software or Quadra-Chek® digital readout system
- Fine adjustment on all axes
- Quick release mechanism on the X-axis

Options

- Choice of six fixed magnification lenses including 10x, 20x, 25x, 31.25X, 50x and 100x
- Canopy and curtains (designed to mount on cabinet stand)
- Purpose built cabinet stand
- Work holding accessories

VB400 Dimensions



WEIGHT AND DIMENSIONS

	VB400
Net Weight	423lbs 192kg
Gross Weight	443lbs 201kg
Shipping Dimensions (L x W x H)	49" x 32" x 51"

Vertical Floor Standing Optical Comparator

VF600

If your measuring requirements demand the use of a large screen vertical axis comparator, then look no further than the VF600. Ideal for the larger components found in the electronics, stamping, and extrusion industries, the VF600 is the ultimate in vertical axis optical comparators; a design based on 35 years of knowledge in the manufacture of high performing optical comparators.

OPERATOR INTERFACE

Feature	MetLogix™ M2	Quadra-Chek® QC221
Mounted to comparator arm	x	x
Color graphics	x	
Touch screen operation	x	
MS Windows® operating system	x	
X-Y-Q axis digital readout	x	x
2D geometry software with skew	x	x
Optical edge detection option	x	x
Software developer	MetLogix™	Metronics/Heidenhain

SPECIFICATIONS

VF600	
Horizontal Travel	8" (200mm)
Vertical Travel	4" (100mm)
Focus Travel	4" (100mm)
Top Plate*	16" x 9" (400 x 230mm)
Glass Insert	9-1/4" x 5-1/2" (235 x 140mm)
Image	Erect and reversed

*With machined slots for easy fixturing

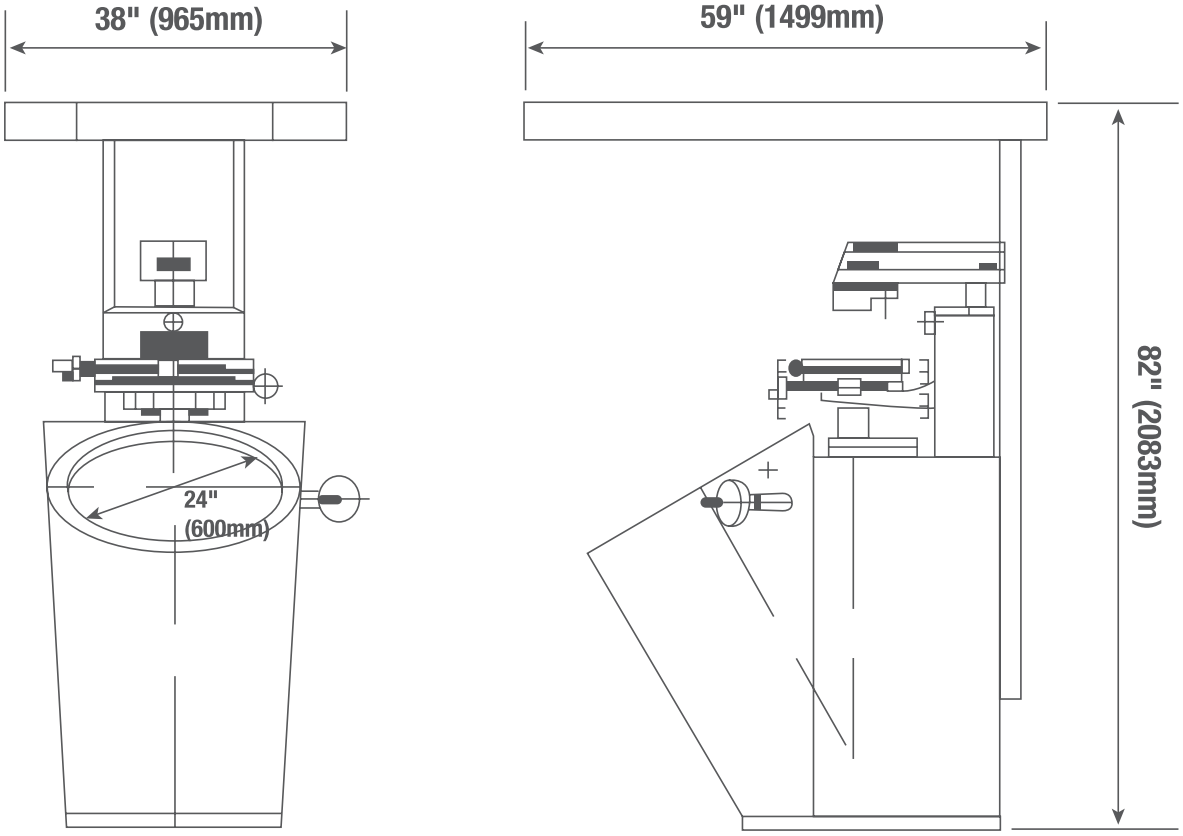
Features and Specifications

- Available with MetLogix™ M1 tablet, M2 measuring software with touch screen PC, or Quadra-Chek® digital readout system
- Screen is angled 30° from horizontal for clear, easy viewing
- Projection lens turret with three lens capacity (lenses not included)
- Turret mounted condenser system complete with two lenses and yellow/green filter with provision to mount further accessories
- Full canopy and curtains
- Linear encoder (glass scale) on both X and Y axes

Options

- Choice of five fixed magnification lenses including 10x, 20x, 25x, 50x and 100x
- 5x fixed lens by special order
- Automatic edge detection
- Motorized X-Y axis

VF600 Dimensions



WEIGHT AND DIMENSIONS

	VF600
Gross Weight	903lbs 410kg
Net Weight	507lbs 230kg
Shipping Dimensions	60" x 47" x 81" 152 x 120 x 206cm

Horizontal Floor Standing Optical Comparator

HF600

Well known throughout the world for superior value and exceptional measuring performance across the full measuring range and at all magnifications, the HF600 sets the standard in all applications from the QC lab to the production floor. The HF600 comparator has a four-position lens turret for instant selection of optional magnification lenses. Inserting the optical OV2 Video Adapter in place of a projection lens converts the comparator into a video metrology system. Ideal for use over a broad spectrum of industries and applications, the HF600 is designed and built to satisfy the requirements of measuring small to large work pieces with total precision, ruggedness, and efficiency. The HF600 utilizes 2D measurement software for geometries like diameters, radius, angles, lines, points, and for skew correction. Advanced software can also provide many tools such as CAD file import, CAD data export for reverse engineering, standard and custom reports, and Ethernet networking.

OPERATOR INTERFACE

	MetLogix™		Quadra-Chek®	
Feature	**M2**	**M3**	**QC221**	**QC5200***
Mounted to comparator arm	x		x	
Color graphics	x	x		x
Touch screen operation	x	x		
MS Windows® operating system	x	x		
X-Y-Q axis digital readout	x	x	x	x
2D geometry software with skew	x	x	x	x
Optical edge detection option	x	x	x	x
Video edge detection option		x		x
CAD file import and export option		x		x
CNC drive option	x	x	x	x
Software developer	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain

*Available with either optical edge detection or video edge detection

SPECIFICATIONS

HF600	
Horizontal Travel	12" (300mm)
Vertical Travel	8" (200mm)
Focus Travel	3" (75mm)
Top Plate*	25" x 9" (635 x 230mm)
Image	Erect and reversed

*With machined slots for easy fixturing

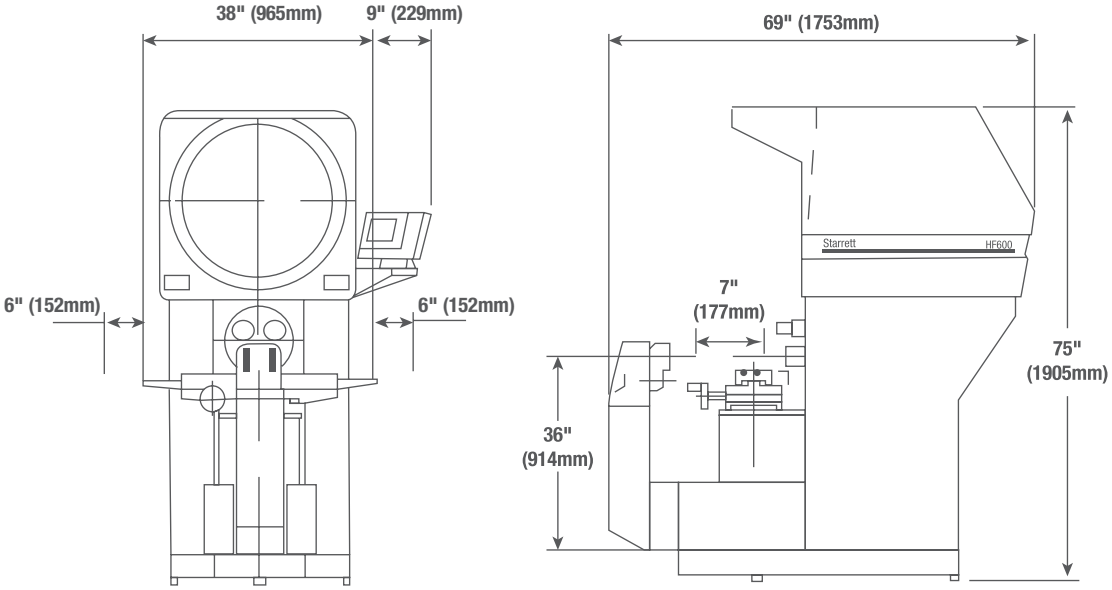
Features and Specifications

- All metal construction with nickel plated stage tooling plate
- 24" (600mm) diameter screen
- Motorized X and Y axes standard
- Two-axis power drive via joystick and variable speed control for fine adjust
- Projection lens turret with four lens capacity (lenses not included)
- Turret mounted condenser system with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) on both X and Y axes
- Halogen profile and surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Available with MetLogix™ M1 tablet, M2 PC-based touch screen measuring software or Quadra-Chek® digital readout system
- Full canopy and curtains included

Options

- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed lens system available by special order
- Optional extended travel stage 20" x 8" (500 x 200mm) with 32" x 8" (800 x 200mm) top plate
- Automatic optical edge detection
- Automatic video edge detection (available only with OV2 and TOV2 video cameras)
- OV2 Video Camera with 6.5:1 zoom lens
- TOV2 Telecentric Video Camera with choice of 0.16x, 0.3x, or 0.5x fixed magnification lens
- Fully automatic CNC controls
- Swing-away lamp house
- Extensive line of accessories

HF600 Dimensions



WEIGHT AND DIMENSIONS

	HF600
Net Weight	1340lbs 610kg
Gross Weight	1500lbs 680kg
Crated Dimensions	77" x 46" x 83" 196 x 117 x 210cm

Horizontal Floor Standing Optical Comparator

HF750

Utilizing the same exemplary build standards as the HF600, the HF750 super capacity optical comparator delivers benefits from an even larger 30" (762mm) screen, setting a new standard for clarity and brightness. Ideal for use over a broad spectrum of industries and applications, the HF750 is designed and built to satisfy the requirements of measuring small to large work pieces with total precision, ruggedness, and efficiency. The geometric software measures diameter, radius, angle, line and point features, plus part skewing for faster setup. The HF750 is available with optical edge detection or video edge detection with advanced software and OV2 or TOV2 camera options.

OPERATOR INTERFACE

	MetLogix™		Quadra-Chek®	
Feature	M2	M3	QC221	QC5200*
Mounted to comparator arm	x		x	
Color graphics	x	x		x
Touch screen operation	x	x		
MS Windows® operating system	x	x		
X-Y-Q axis digital readout	x	x	x	x
2D geometry software with skew	x	x	x	x
Optical edge detection option	x	x	x	x
Video edge detection		x		x
CAD file import and export option		x		x
CNC drive option	x	x	x	x
Software developer	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain

*Available with either optical edge detection or video edge detection

SPECIFICATIONS

HF750	
Horizontal Travel	12" (300mm)
Vertical Travel	8" (200mm)
Focus Travel	3" (75mm)
Top Plate*	25" x 9" (635 x 230mm)
Image	Erect and reversed

*With machined slots for easy fixturing

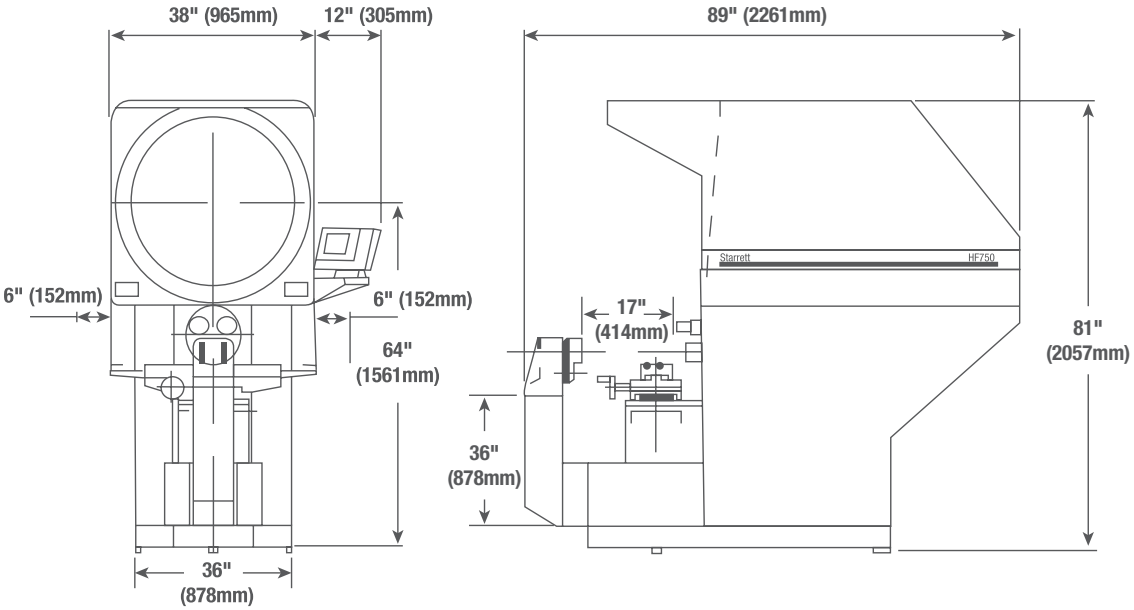
Features and Specifications

- All metal construction with nickel plated stage tooling plate
- 30" (750mm) diameter screen
- Motorized X and Y axes standard
- Two-axis power drive via joystick and variable speed control for fine adjust
- Projection lens turret with three lens capacity (lenses not included)
- Turret mounted condenser system with yellow/green filter and provision to mount further accessories
- Linear encoder (glass scale) on both X and Y axes
- Halogen profile and surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Available with MetLogix™ M2 or M3 PC-based touch screen measuring software or Quadra-Chek® digital readout system
- Full canopy and curtains included

Options

- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed lens system available by special order
- Extended travel stage 20" x 8" (500 x 200mm) with 32" x 8" (800 x 200mm) top plate
- Automatic optical edge detection
- Automatic video edge detection (available only with OV2 or TOV2 video cameras)
- OV2 Video Camera with 6.5:1zoom lens
- TOV2 Telecentric Video Camera with choice of 0.16x, 0.3x, or 0.5x fixed magnification lens
- Fully automatic CNC controls
- Swing-away lamp house
- Extensive line of accessories

HF750 Dimensions



WEIGHT AND DIMENSIONS

	HF750
Net Weight	1660lbs 752kg
Gross Weight	1800lbs 816kg
Crated Dimensions	97" x 48" x 91" 246 x 122 x 231cm

Side Bed Optical Comparators

HS600

The HS600 floor-standing horizontal optical comparator has all the same features as the HF600, except it has the screen position set to the side of the workstage area allowing close, comfortable and unrestricted access to the viewing and control area. A time tested, cost-effective solution for non-contact measurement. At the heart of these systems are precision optics, superb lighting, and a highly accurate workstage that combine to ensure bright, sharp images and exceptional accuracy. The HS600 is simple to use, yet has excellent capacity and performance to satisfy an exceptionally wide range of dimensional inspection applications and complex measuring requirements.

OPERATOR INTERFACE

	MetLogix™		Quadra-Chek®	
Feature	**M2**	**M3**	**QC221**	**QC5200***
Mounted to comparator arm	x		x	
Color graphics	x	x		x
Touch screen operation	x	x		x
MS Windows® operating system	x	x		
X-Y-Q axis digital readout	x	x	x	x
X-Y axis digital readout				
2D geometry software with skew	x	x	x	x
Optical edge detection option	x	x	x	x
Video edge detection		x		x
CAD file import and export option		x		
CNC drive option	x	x	x	x
Software developer	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain

*Available with either optical edge detection or video edge detection

SPECIFICATIONS

HF750	
Horizontal Travel	12" (300mm)
Vertical Travel	8" (200mm)
Focus Travel	3" (75mm)
Top Plate	25" x 9" (635 x 230mm)
Image	Erect and reversed

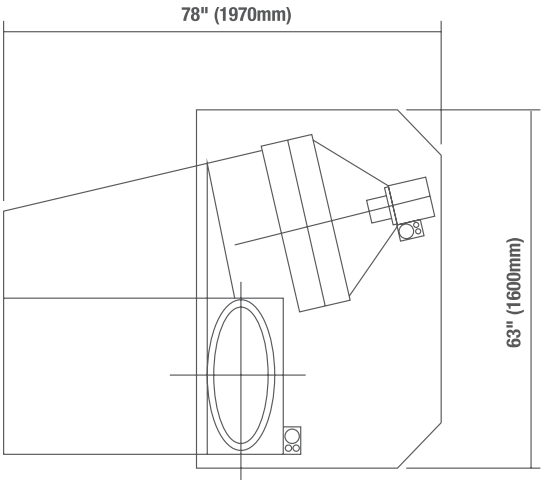
Features and Specifications

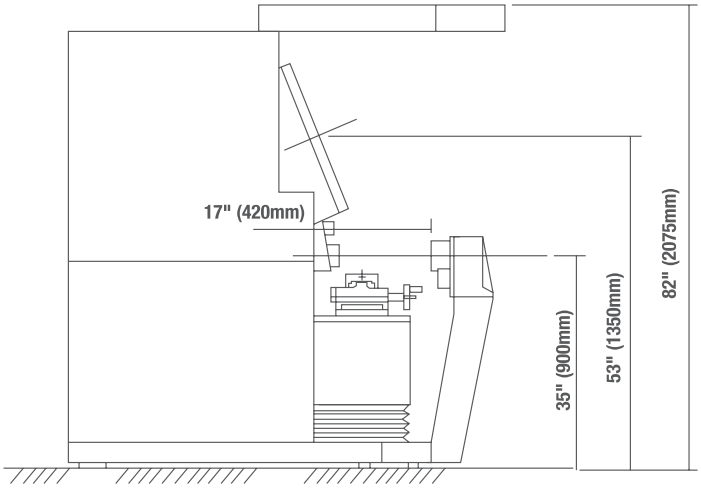
- Accommodates components up to 330lbs (150kg)
- 24" (600mm) diameter screen
- Motorized X and Y axes standard
- Projection lens turret with four lens capacity (lenses not included)
- Turret mounted condenser system complete with two lenses and yellow/green filter with provision to mount further accessories
- Linear encoder (glass scale) on both X and Y axes
- Halogen profile and surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Available with MetLogix™ M2 and M3 PC-based touch screen measuring software or Quadra-Chek® digital readout systems
- Two-axis power drive via joystick and variable speed control for fine adjust
- Full canopy and curtains included

Options

- Choice of six fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- OV2 video zoom lens
- TOV2 Video Lens Assembly with choice of 0.16x, 0.3x or 0.5x fixed magnification lenses
- Automatic optical edge detection
- Automatic video edge detection (avaiable with OV2 or TOV2 video cameras)
- Fully automatic CNC controls

HS600 Dimensions





WEIGHT AND DIMENSIONS

	HS600
Gross Weight	2646lbs 1200kg
Net Weight	2315lbs 1050kg
Dimensions (boxed)	83" x 89" x 93" 210 x 255 x 235cm

Side Bed Optical Comparators

HS750

The HS750 floor-standing horizontal optical comparator has all the same features as the HF750 except that it has the screen position set to the side of the workstage area allowing close, comfortable and unrestricted access to the viewing and control area. At the heart of these systems are precision optics, superb lighting and a highly accurate workstage that combine to ensure bright, sharp images and exceptional accuracy. A time tested, cost-effective solution for non-contact measurement, the HS750 is simple to use, yet offers excellent capacity and performance to satisfy an exceptionally wide range of dimensional inspection applications and complex measuring requirements.

OPERATOR INTERFACE

	MetLogix™		Quadra-Chek®	
Feature	**M2**	**M3**	**QC221**	**QC5200***
Mounted to comparator arm	x	x	x	
Color graphics	x	x		x
Touch screen operation	x	x		
MS Windows® operating system	x	x		
X-Y-Q axis digital readout	x	x	x	x
2D geometry software with skew	x	x	x	x
Optical edge detection option	x	x	x	x
Video edge detection option		x		x
CAD file import and export option		x		
CNC drive option	x	x	x	x
Software developer	MetLogix™	MetLogix™	Metronics/Heidenhain	Metronics/Heidenhain

*Available with either optical edge detection or video edge detection

SPECIFICATIONS

HF750	
Horizontal Travel	12" (300mm)
Vertical Travel	8" (200mm)
Focus Travel	3" (75mm)
Top Plate*	25" x 9" (635 x 230mm)
Image	Erect and reversed

*With machined slots for easy fixturing

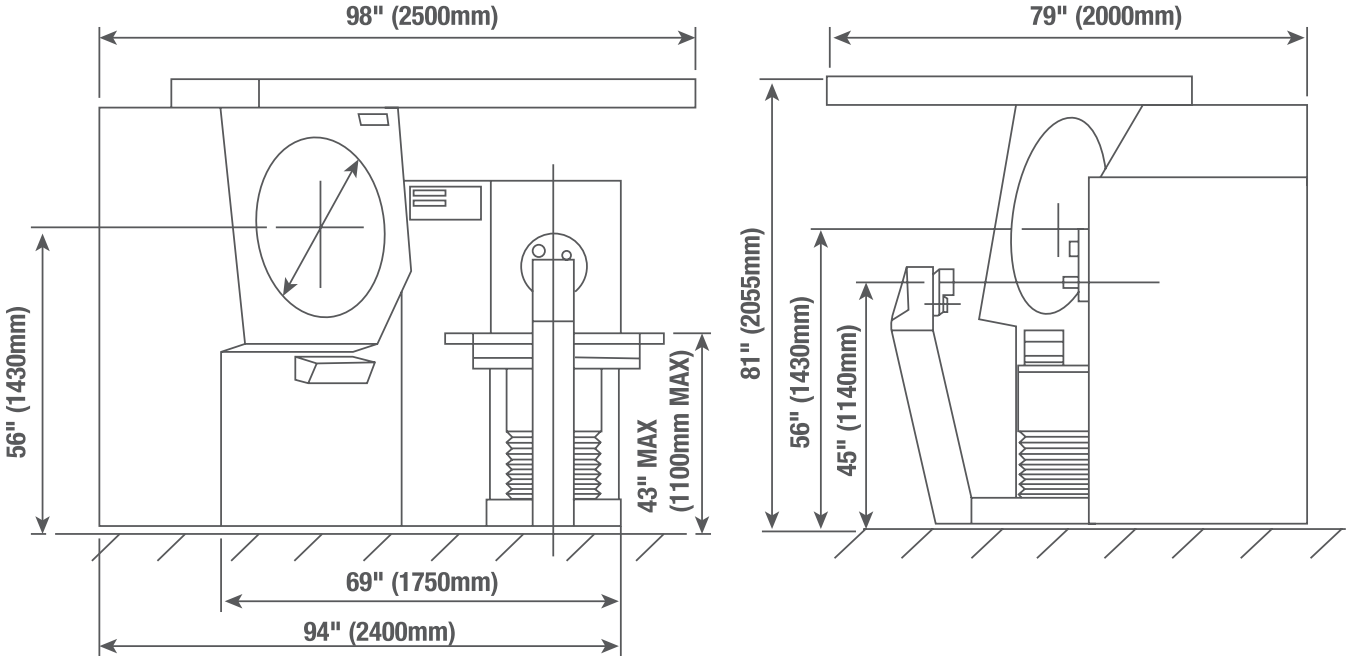
Features and Specifications

- All metal construction
- Large 30" (750mm) diameter screen provides extensive field of view giving the user more component detail on the screen
- Side-bed design gives the operator uninterrupted access to the screen and working area
- Motorized X and Y axes standard
- Linear encoder (glass scale) on both X and Y axes
- Projection lens turret with three lens capacity (lenses not included)
- Turret mounted condenser system with yellow/green filter and provision to mount further accessories
- Halogen profile and surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Available with MetLogix™ M2 or M3 PC-based touch screen measuring software or Quadra-Chek® digital readout system
- Full canopy and curtains included

Options

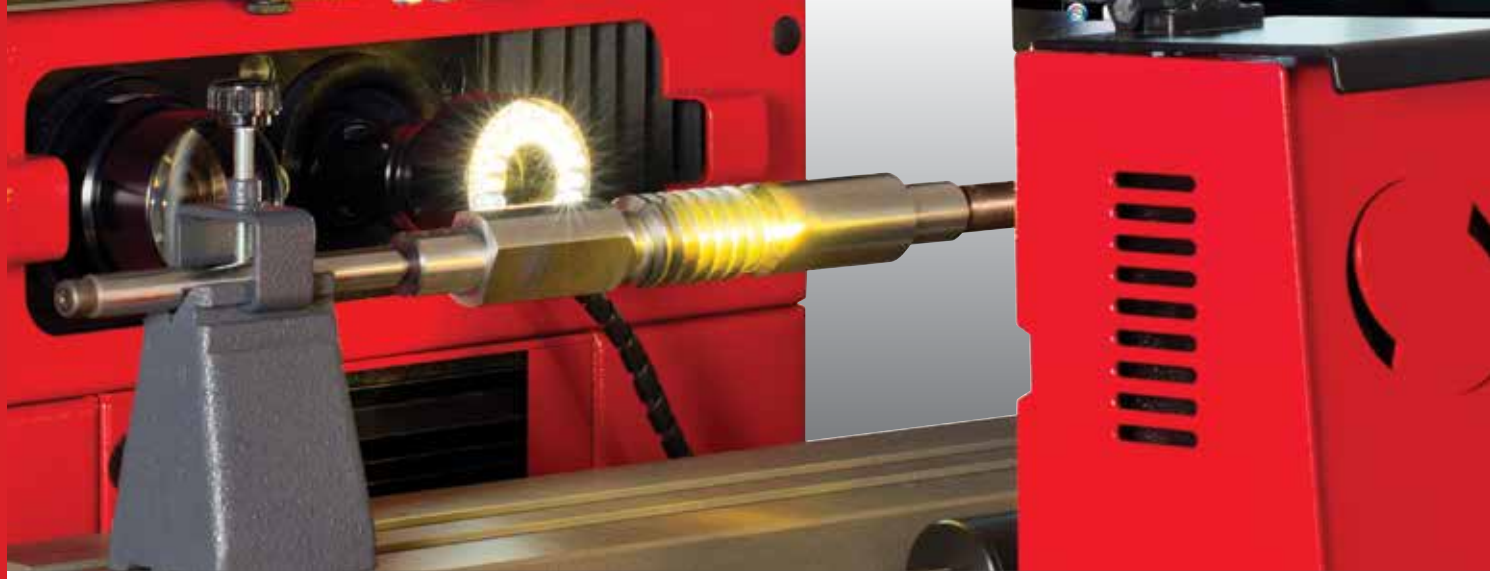
- Six interchangeable fixed magnification lenses including 10x, 20x, 25x, 31.25x, 50x and 100x
- Optional 5x fixed lens system available by special order
- Extended travel stage 20" x 8" (500 x 200mm) with 32" x 8" (800 x 200mm) top plate
- Automatic optical edge detection
- Automatic video edge detection (available only with OV2 or TOV2 video cameras)
- OV2 Video Camera with 6.5:1zoom lens
- TOV2 Telecentric Video Camera with choice of 0.16x, 0.3x, or 0.5x fixed magnification lens
- Fully automatic CNC controls
- Swing-away lamp house
- Extensive line of accessories

HS750 Dimensions



WEIGHT AND DIMENSIONS

	HS750
Gross Weight	3307lbs 1500kg
Net Weight	2932lbs 1330kg
Dimensions (boxed)	117" x 89" x 93" 297 x 225 x 235cm



OV2™ Optical Comparator Video Adapter

The OV2 is a special zoom lens and video camera adapter that can be interchanged with the fixed magnification lens on Starrett Optical Comparators. Combined with MetLogix™ M3 software and touch screen PC, the result is a low cost video measuring system, expanding the versatility of your optical comparator! The OV2 is available as an option with new Starrett comparators and as an easy-to-install field retrofit. When used with the dual-lens HD400, the OV2 allows immediate access to both Video and Optical measurement without changing the part setup.

Features and Specifications

- Interchangeable bayonet mount lens with 6.5:1 zoom lens and video camera creates a video measuring system
- Changeover between normal optical mode and OV2 is easy and fast
- Lens locks into comparator body and is pre-aligned
- Up to 1.25" (32mm) of working distance allows maximum stage travel utilization
- Video magnifications up to 240x
- Utilizes MetLogix™ M3 software and an all-in-one PC for video display and touch screen control
- Maximizes existing investment to provide a low cost entry into video measurement technology
- Available for other makes of optical comparators, please call for more information

TOV2 Optical Comparator Telecentric Video Adapter

NEW!

The TOV2 telecentric lens and video camera can be interchanged with the fixed magnification lenses on Starrett Optical Comparators. The TOV2 is available with a choice of 0.16x, 0.3x or 0.5x telecentric lenses as an option with new Starrett comparators and an easy-to-install field retrofit.

Features and Specificatons

- Replaces bayonet mount comparator lens with telecentric lens and video camera to create a video measuring system
- Changeover between normal optical mode and TOV2 is easy and fast
- Lens locks into comparator body and is pre-aligned
- Utilizes MetLogix™ M3 measuring software and a PC for video display and touch screen control
- Maximizes existing investment to provide a low cost entry into video measurement technology
- Offers a choice of .16x, .3x or .6x telecentric magnification lenses
- Available for other makes of optical comparators, please call for more information

M3 software display

Specifications and Options

Model	HE400	HB400	HD400	VB300	VB400
Bench Top System	X	X	X	X	X
Floor-Standing System	-	-	-	-	-
Part View Orientation	Horizontal	Horizontal	Horizontal	Vertical	Vertical
Side Bed Version	-	-	-	-	-
Screen Diameter (in)	16"	16"	16"	12"	16"
Screen Diameter (mm)	400mm	400mm	400mm	300mm	400mm
X-Y Measuring Range (in)	10" x 4"	12" (16" optional) x 6"	16" x 6"	4" x 4"	8" x 4"
X-Y Measuring Range (mm)	250 x 100mm	300 (400mm optional) x 150mm	400 x 150mm	100mm x 100mm	200 x 100mm
Linear Glass Scale Encoder on X and Y Axis	Standard	Standard	Standard	Standard	Standard
Motorized X-Y Axis	-	Optional	Optional	-	-
CNC Control	-	Optional	Optional	-	-
Focus Range (in)	1.2"	2"	2"	3.5"	4"
Focus Range (mm)	30mm	50mm	50mm	90mm	100mm
Work Stage (in)	18.75" x 4.75"	21.25" x 5"	21.25" x 5"	8.8" x 8.8"	16" x 19"
Work Stage (mm)	475 x 120mm	540 x 130mm	540 x 130mm	225mm x 225mm	400 x 225mm
Load Capacity with Negligible Deflection (lbs)	15lbs	22lbs	22lbs	11lbs	22lbs
Load Capacity Maximum (lbs)	55lbs	110lbs	110lbs	15lbs	50lbs
Angular Measurement Resolution	1'	1'	1'	1'	1'
Profile Illumination	Standard	Standard	Standard	Standard	Standard
Surface Illumination	Standard	Standard	Standard	Standard	Standard
Quick Change Lens Mount (lenses not included)	Single	Single	Dual	Single	Single
Collimating Condenser with Yellow/ Green Filter	Standard	Standard	Standard	Standard	Standard
Control System Software	QC100, QC200, M1, M2	QC100/QC200, QC5200, M1, M2, M3	QC200, QC5200, M1, M2, M3	LED Readout, QC100, QC200, M1, M2	QC100, QC200, M1, M2
Display (control system dependent)	QC DRO or 15.6" Touchscreen PC, M1 with 7" tablet	QC DRO, 15.6" or 21" Touchscreen PC or 24" Monitor, M1 with 7" tablet	QC DRO, 15.6" or 21" Touchscreen PC or 24" Monitor, M1 with 7" tablet	QC DRO or 15.6" Touchscreen PC, M1 with 7" tablet	QC DRO or 15.6" Touchscreen PC, M1 with 7" tablet
Optical Edge Detection	Optional	Optional	Optional	Optional	Optional
Digital Video Camera System	-	Optional	Optional	-	-
Lenses - Screen Magnification (one required, not included)	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x , 20x, 25x, 50x	10x , 20x, 25x, 50x, 100x
Iris Diaphragm	Optional	Optional	Optional	-	-
Precision Rotary Vise	Optional	Optional	Optional	-	-
Vee Block on Rotary Base	Optional	Optional	Optional	-	-
Precision Fixed Vise	Optional	Optional	Optional	-	-
Precision Centers and Vees	Optional	Optional	Optional	Optional	Optional
Helix Center Support System	-	-	-	-	Optional
Precision Rotary Work Stage	-	-	-	-	Optional
Glass Plate Work Holder	Optional	Optional	Optional	-	-
Field of View Diameter (in)	1.6",.8", .6" ,.5", .3", .15"	1.6",.8", .6" ,.5", .3", .15"	1.6",.8", .6" ,.5", .3", .15"	1.6",.8", ,6", .3"	1.6",.8", .6" ,.5", .3", .15"
Field of View Diameter (mm)	40mm, 20mm, 16mm, 13mm, 8mm, 4mm	40mm, 20mm, 16mm, 13mm, 8mm, 4mm	40mm, 20mm, 16mm, 13mm, 8mm, 4mm	40mm, 20mm, 16mm, 8mm	40mm, 20mm, 16mm, 13mm, 8mm, 4mm
Working Distance (in)	3.1", 3", 2.5", 2.2", 2", 1.5"	3.1", 3", 2.5", 2.2", 2", 1.5"	3.1", 3", 2.5", 2.2", 2", 1.5"	3.1", 3", 2.5", 2"	3.1", 3", 2.5", 2.2", 2", 1.5"
Working Distance (mm)	80mm, 76mm, 62mm, 57mm, 50mm, 41mm	80mm, 76mm, 62mm, 57mm, 50mm, 41mm	80mm, 76mm, 62mm, 57mm, 50mm, 41mm	80mm, 76mm, 62mm,50mm	80mm, 76mm, 62mm, 57mm, 50mm, 41mm
Cabinet Stand 32"	Optional	Optional	Optional	-	-
Cabinet Stand 23"	Optional	Optional	Optional	Optional	Optional
Canopy and Curtains	Optional	Optional	Optional	-	Optional

VF600	HF600	HF750	HS600	HS750
-	-	-	-	-
X	X	X	X	X
Vertical	Horizontal	Horizontal	Horizontal	Horizontal
-	-	-	Standard	Standard
24"	24"	30"	24"	30"
600mm	600mm	750mm	600mm	750mm
8" x 4"	12" (20" optional) x 8"	12" (20" optional) x 8"	12" (20" optional) x 8"	12" (20" optional) x 8"
200 x 100mm	300 (500mm optional) x 200mm	300 (500mm) x 200mm	300 (500mm) x 200mm	300 (500mm optional) x 200mm
Standard	Standard	Standard	Standard	Standard
Optional	Standard	Standard	Standard	Standard
-	Optional	Optional	Optional	Standard
4"	3"	3"	3"	3"
100mm	75mm	75mm	75mm	75mm
16" x 9"	25" x 9" (Optional 32" 8")	25" x 9" (Optional 32" 8")	25" x 9" (Optional 32" 8")	25" x 9" (Optional 32" x 8")
400 x 225mm	630 x 230mm	630 x 230mm	630 x 230mm	630 x 230mm
22lbs	110lbs	110lbs	110lbs	110lbs
66lbs	330lbs	330lbs	330lbs	330lbs
1'	1'	1'	1'	1'
Standard	Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard	Standard
3 Lens Turret	4 Lens Turret	3 Lens Turret	4 Lens Turret	3 Lens Turret
Standard	Standard	Standard	Standard	Standard
QC200, QC5200, M2, M3	QC200, QC5200, M2, M3	QC200, QC5200, M2, M3	QC200, QC5200, M2, M3	QC200, QC5200, M2, M3
QC DRO 15.6" or 21" Touchscreen PC or 24"Monitor	QC DRO 15.6" or 21" Touchscreen PC or 24" Monitor	QC DRO 15.6" or 21" PC Touchscreen or 24" Monitor	QC DRO, 15.6" or 21" Touchscreen PC or 24" Monitor	QC DRO, 15.6" or 21" Touchscreen PC or 24" Monitor
Optional	Optional	Optional	Optional	Optional
-	Optional	Optional	Optional	Optional
10x, 20x, 25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x	10x, 20x, 25x, 31.25x, 50x, 100x
-	Optional	Optional	Optional	Optional
-	Optional	Optional	Optional	Optional
-	Optional	Optional	Optional	Optional
-	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional
Optional	-	-	-	-
Optional	-	-	-	-
-	Optional	Optional	Optional	Optional
2.3", 1.2", .9", .5", .2"	2.3", 1.2", .9", .5", .2"	3", 1.5", 1.2", .6", .3"	2.3", 1.2", .9", .5", .2"	3", 1.5", 1.2", .6", .3"
60mm, 30mm, 24mm, 12mm, 6mm	60mm, 30mm, 24mm, 12mm, 6mm	75mm, 37.5mm, 30mm, 15mm, 7.5mm	60mm, 30mm, 24mm, 12mm, 6mm	75mm, 37.5mm, 30mm, 15mm, 7.5mm
5.4", 5", 4", 3.5" 1.7"	5.4", 5", 4", 3.5" 1.7"	6", 4", 3.6", 2.3", 1.9"	5.4", 5", 4", 3.5" 1.7"	6", 4", 3.6", 2.3", 1.9"
138mm, 127mm, 103mm, 88mm, 44mm	138mm, 127mm, 103mm, 88mm, 44mm	151mm, 101mm, 92mm, 60mm, 48mm	138mm, 127mm, 103mm, 88mm, 44mm	151mm, 101mm, 92mm, 60mm, 48mm
-	-	-	-	-
-	-	-	-	-
Standard	Standard	Standard	Standard	Standard

Accessories

Starrett offers a full range of accessories and purpose-built cabinet stands designed for our optical comparator systems to ensure efficient system setup for a broad range of applications.

Photo Key	Part No.	Description	For Models
A	0CN8	Large Centers and Vees	HF600, HF750
B	ORV2	2-1/32" Capacity Rotary Vise	
C	4U000	Magnification Checking Graticule	HE/HB/HD400 and VB400
	0GH1		HF600
	0GH2		HF750
D	0CN7	Small Centers and Vees	HF600, HF750
E	4G000	Centers and Vees	HB350
	7P000		HE/HB/HD400
F	9W000	Helix Center Support Fixture	VB300
	3V000		
G	6H000	Centers and Vees	VB400, VF600
H	0VH1	Vertical Glass Plate Holder	HF600, HF750
J	7U000	Vertical Glass Plate Holder	HE/HB/HD400
K	4H003	Rotary Vise with 1-1/4" Capacity	HE/HB/HD400 (also larger horizontal comparators)
M	6U003	Rotary Work-stage	VB400, VF600 for use on 200mm x 100mm workstage
N	4H002	Fixed Position Vise with 1-1/4" Capacity	HE/HB/HD400 (also larger horizontal comparators)
P	4H004	Universal Vee Block on Rotary Base	
S	P-10095	32" Cabinet Stand	HE400, HB400, HD400, VB300, VB400
	P-10102	23" Cabinet Stand	
T*	P-10485	Canopy and Curtains designed to be used with 23" or 32" cabinet stand	HE400, HB400, HD400, VB400

*Product not shown

SOFTWARE

NEW!

MetLogix™ Software

M1 and M2

FOR OPTICAL COMPARATORS

Graphics rich display, large icon buttons, and intuitive operation. Coordinate display for X and Y linear axes and Q angular values for screen rotation. Easy part alignment and datum function.

M1 shown on HE400

M2 shown

Features

- Clean and simple touchscreen interface with large icon buttons and intuitive operation
- Graphics-rich display providing instant information on feature form, tolerances, and measurement data
- Coordinate display for X and Y linear axes and Q angular values for screen rotation
- Easy part alignment and datum functions
- Measure and tolerance these geometric features: point, line, angle, distance, radius, diameter
- As you measure, a part view is created in the feature view. Constructions between features such as distances and bolt hole pattern can been done by simple selections from the part view.
- For repetitive part measurement, create a part program that will visually guide operators through part measurement
- Available optical edge detection provides better throughput and removes operator subjectivity
- Four different report forms can be printed or exported to Microsoft Excel, text files, or to an SPC program
- Mounts and displays in either vertical or horizontal position
- M2 utilize a Windows® 7 Professional-based operating system enables flexible data export and interface capability with Windows®
- Fast, easy connection to printers and networks
- M1 utilizes an Android operating system and a Bluetooth connection to the host Optical Comparator

M1, M2 and M3

MetLogix™ control software provides a broad range of powerful, user-friendly functions on a compact, icon-based touchscreen interface in place of the traditional control.

	MetLogix™ M1	MetLogix™ M2	MetLogix™ M3
Mounted to comparator arm	x	x	
Color graphics	x	x	x
Touch-screen operation	x	x	x
MS Windows® operating system		x	x
X-Y-Q (angle) measurements	x	x	x
2D geometry software with skew	x	x	x
Optical edge detection option	x	x	x
Video edge detection option			x
CAD file import and export option		x	x
CNC drive option		x	x

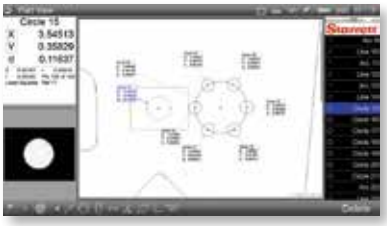
M3

FOR VISION SYSTEMS

Multi-touch software control that can pan and zoom with pinch, swipe, or touch. Works with active part views and live video feeds (or use the conventional mouse interface). Custom "Eye Measure" probe captures complex edges generated by a finger path drawn on the touch screen. Measure Logic probe intelligence provides instant feature determination and measurement with a single touch.

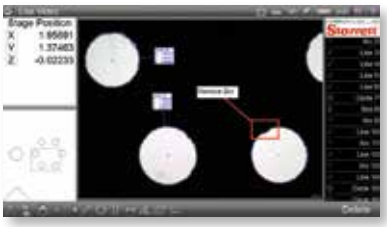
Intuitive graphic menu

Display flexibility or export the measurement report



Graphic window with selectable Features and notes

Graphical window with the selected data points



Live video image with data from selected points

FEATURES

- DXF CAD file import for comparing parts being inspected to the actual design file; no need for cumbersome Mylar overlays
- "Vtouch" Probe has video touch probe functionality – just click for simple acquisition of points on a feature's edge
- Part View can generate distance and tangent lines from within the graphical part view. The "Gesture Menu" can be used for feature creation and manipulation tools.
- "Quick Annotate" allows data on several features to be displayed simultaneously with smart marquee feature selection
- Application of universal tolerance value entry according to feature resolution groupings
- Feature Detail Graphics: Individual feature views display point cloud distributions, nominal deviations, and tolerance results. Scroll through Actual, Nominal, Tolerance, Deviation and Data Fit Type information.
- Simple machine/camera calibration with popular machine and video correction methods
- Windows® 7 Professional-based, globally recognized OS for flexible data exporting and interface with Windows® applications

Software MetLogix™ M3 with touch touchscreen interface

QUADRA-CHEK® SOFTWARE

Modern metrology is a complex sequence of measuring, recording, analyzing and reporting dimensional data. The conceptual model underlying the Quadra-Chek® digital readout design organizes the work-flow to support operators at every stage of the measurement process.

QC100

- Perform 2 and 3 axis measurements at very high levels of precision and accuracy
- Measurements viewed on the front panel LCD can be transmitted to a PC over a standard serial port connection, or to a printer over a parallel or serial port

QC200

Metrology DRO requires a video monitor display and cross-hair generator in vision configuration. QC200 is a time-saving measurement tool with patented Measure Magic® technology. Ideal for measuring 2D features on Optical Comparators and Manual Vision Machines.

- Inch/metric conversion, toggle between incremental/absolute and simple zero reset
- Skew function for ease of part alignment
- Integrated geometric tolerancing allowing for pass/fail measurements
- Simple part programming with measure guide
- USB and RS232 Interface
- Linear and segmented linear error correction
- Intuitive displays
- Crisp, clear, bright black and white LCD display
- Optional optical edge for comparators

QC100

QC200

QC5200

Metrology software is a Windows® 7 Professional 32-bit based PC inspection system for video measuring machines.

The QC5200 supports a wide range of industries that require precise measurement and inspection of 2D parts using a single sensor. This product features an intuitive user interface and simple, meaningful visual displays. The design reflects a deep understanding of the user's needs along with a process model that supports the operator at every stage in the measurement process.

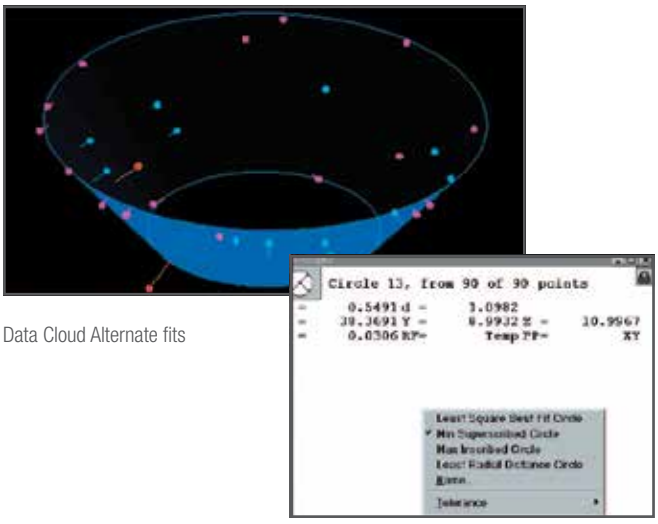
Features

- Powerful yet intuitive video edge detection tools
- Auto-Focus
- "X-Y" 2D measurements with optional "Z" axis for height measurements
- Image capture with drag and drop data reporting
- Image processing tools
- Continuous edge mode
- Patented Measure Magic technology
- Alternative algorithms
- Auto program from CAD files
- Pattern recognition
- Integrated runs database
- Geometric tolerancing
- Advanced calculation
- Data cloud analysis

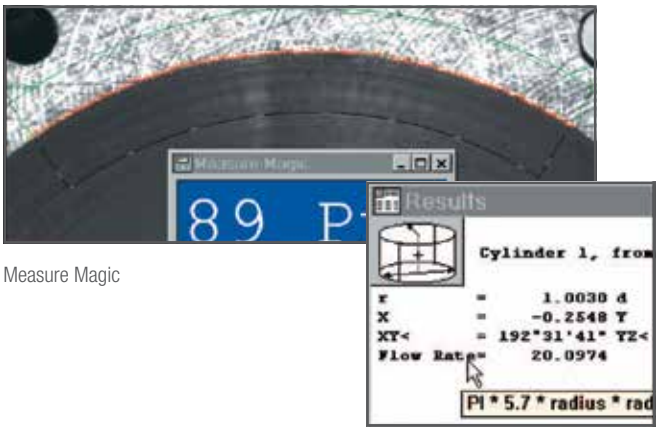
QC5300

Metrology software picks up where the QC5200 leaves off. This product offers multi-axis dimensional measurement of 2D and 3D parts. The QC5300 integrates an innovative user interface, state of the art ergonomics, powerful data import, export and data analysis tools.

- 3D measurement set
- 3D offset alignments
- Customizable screen layouts
- Multiple reference frames
- 3D part view
- Renishaw touch probe interface
- Optional laser sensor
- Vector probing
- Multiple language support
- 3D Measure Magic technology
- Advanced calculations
- 3D data clouds
- Alternate algorithms
- Drag and drop report generator
- Data export to a wide variety of applications



Data Cloud Alternate fits



Measure Magic

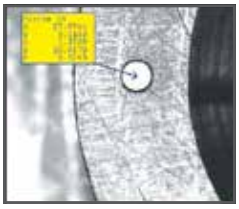
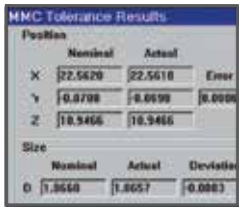
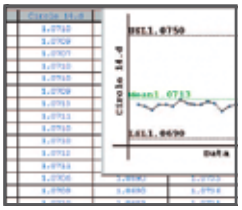


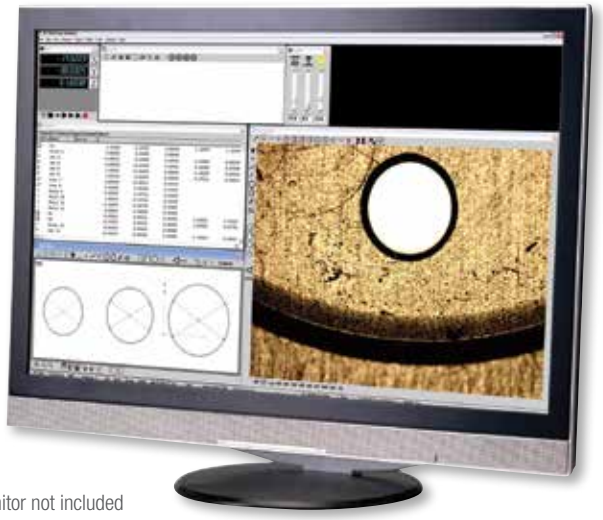
Image View



Tolerance



Integrated Database



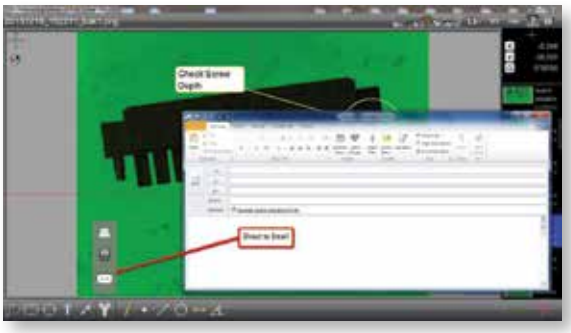
Monitor not included

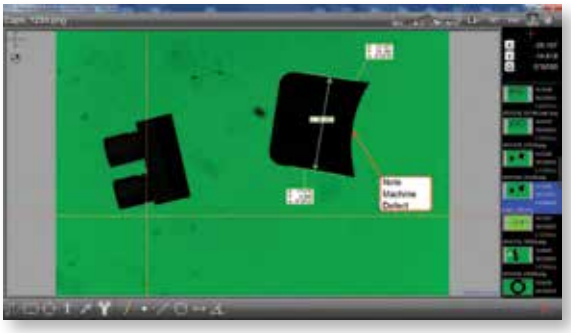
NEW!

D1 Inspection Software

Features

- View and manipulate live and static images from a variety of inspection devices on any Windows® 7 or Windows® 8 PC. Mouse/Keyboard and touchscreen systems are supported.
- A simplified operating interface requires only a few quick clicks to capture, mark up, export, print and email images directly from your inspection equipment
- Zoom and Pan the camera feed until the desired image is displayed. Add custom text, and graphic elements to generate detailed image capture for defect reporting and to improve overall visual communication of parts and component characteristics.
- Perform basic calculations of feature size, position, and orientation using a simple cross-hair tool. Translate or rotate the cross-hair tool within the image window to probe circle, line, point, and angle features within the field of view.
- Add feature annotation directly to selected features to display size, position and orientation results on either the video frame or within a blank part view space
- Access previously stored images easily in the thumbnail image list. Convenient date and time stamps are added to help sort and review collections of images.





D1 Software display

KineMic - KMR with D1 software

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