Starrett optical comparators provide a time-tested, cost-effective solution for non-contact measurement. In this easy-to-learn technology, the image of a part is projected on a screen at a precisely known magnification. Measurements can then be taken off the image by moving the system’s X-Y stage, or the image can simply be compared to a transparent overlay.

Our optical comparators combine mechanical stability with precision optics and versatile lighting to produce bright, sharp images and exceptional accuracy. We offer models in different sizes, with horizontal or vertical projection, lenses for magnifications from 5X to 100X, fiber-optic or video edge detection, manual, motor-driven or CNC workstage travel, and choice of digital readouts and PCs. Our proven mechanical designs are now enhanced with the latest metrology software for unmatched flexibility and productivity.
Horizontal Benchtop Optical Projector

The Starrett HB400 horizontal optical comparator provides exceptional performance with a fully-usable 16” diameter viewing screen, a 21”x5” workstage, 12”x6” of stage travel, and high 110lb workload capacity. Linear glass scales provide 0.00002” (0.5µm) of resolution. A bayonet lens socket accepts a choice of seven lenses or an OV2 Video Adapter for video edge detection (VED). Optional optical edge detection removes operator subjectivity in locating edges.

Video Edge Detection
The HB400 can be converted from optical comparator to vision metrology system operation when the Starrett OV2 Optical Video Adapter is installed in place of one of the two lenses in the lens slide. This provides the ultimate system flexibility.

Features
- 16” (400mm) diameter screen with crosslines, overlay clips and hood
- Dual mirror design for vertically erect image
- 21.3”x5.1” (540x130mm) stage surface
- 12”x6” (300x152mm) of XY stage travel, 2” (50mm) focus travel
- 110lb (50kg) maximum load capacity
- Bayonet lens socket for quick magnification changes
- All metal construction for optimum stability
- Fine adjustment for X and Y axes
- Fast traverse, zero backlash mechanism for X-axis
- Heidenhain glass scales for 0.00002” (0.5µm) X and Y resolution
- Helix angle adjustment with ±15° Vernier scale
- 250W quartz halogen surface illumination with fiber-optic delivery
- 150W quartz halogen profile illumination

Options
- 5X, 10X, 20X, 25X, 31.25X, 50X, 100X projection lenses
- Fiber-optic edge detection
- OV2 Video Adapter for video edge detection
- Manual, motorized or CNC stage motion control
- Choice of Quadra-Chek digital readouts, tablet computer with MetLogix M2 software, or all-in-one touch-screen computer with MetLogix M3 software
- 23” (58cm) or 32” (81cm) cabinet stand
**MetLogix M2** Software on tablet PC with, color touch-screen (10”), 2D geometry software for point, line, circle, distance, angle and skew. Windows® 7 operating system and Wi-Fi network connectivity for import/export of CAD files and data. Supports optical edge detection and CNC control.

**MetLogix M3** on an all-in-one PC. All features of the M2 tablet, but with a larger 21.5” touch-screen. Supports both optical edge detection and video edge detection.

**QuAdrA-cHeK QC221/ND1203** Digital Readout. Monochrome LCD screen (5.7”), sealed metal housing, 2D geometry software. Supports optical edge detection.

**QuAdrA-cHeK QC321/ND1303** Digital Readout. All features of the QC221/ND1203, but with a larger color touch-screen (8.4”). Supports CNC control and either optical edge detection or video edge detection.

### Feature Comparison Table

<table>
<thead>
<tr>
<th>Feature</th>
<th>MetLogix M3</th>
<th>MetLogix M2</th>
<th>QuAdrA-cHeK QC321</th>
<th>QuAdrA-cHeK QC221</th>
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<tr>
<td>Mounted to comparator arm</td>
<td>x</td>
<td>x</td>
<td></td>
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<tr>
<td>Color graphics</td>
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<tr>
<td>Touch-screen operation</td>
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<tr>
<td>MS Windows operating system</td>
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<td>X-Y-Q (angle) measurements</td>
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<td>x</td>
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<tr>
<td>2D geometry software w/ skew</td>
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<td>Video edge detection option</td>
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<td>CAD file import &amp; export option</td>
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<td>CNC drive option</td>
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<td>Software developer</td>
<td>MetLogix</td>
<td>Metronics / Heidenhain</td>
<td></td>
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</tbody>
</table>

**HD400 Dimensions**

- Gross weight: 385lb (175kg)
- Net Weight: 320lb (145kg)
- Shipping dimensions: 47”x32”x50” (120x80x127cm).
HB400 Optics

The HB400 is available with a choice of seven projection lenses and the Starrett OV2 Optical Video Adapter, a video camera which can be installed in place of a projection lens to provide video edge detection (VED). All lens assemblies and the OV2 are mounted by a bayonet fitting, which allows quick changeover between magnifications or between optical projector and VED operation.

Lens Selection Guide

<table>
<thead>
<tr>
<th>MAGNIFICATION</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>25</th>
<th>31.25</th>
<th>50</th>
<th>100</th>
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</thead>
<tbody>
<tr>
<td>Screen diameter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of View</td>
<td>3.1&quot; (80mm)</td>
<td>1.6&quot; (40mm)</td>
<td>8&quot; (20mm)</td>
<td>6&quot; (16mm)</td>
<td>5&quot; (13mm)</td>
<td>3&quot; (8mm)</td>
<td>1.6&quot; (4mm)</td>
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<tr>
<td>Working Distance</td>
<td>5.3&quot; (135mm)</td>
<td>3.1&quot; (80mm)</td>
<td>3&quot; (76mm)</td>
<td>2.5&quot; (62mm)</td>
<td>2.2&quot; (57mm)</td>
<td>2&quot; (50mm)</td>
<td>1.5&quot; (41mm)</td>
</tr>
<tr>
<td>Max Dia: Half Field</td>
<td>11&quot; (280mm)</td>
<td>9.5&quot; (245mm)</td>
<td>10.3&quot; (263mm)</td>
<td>10&quot; (253mm)</td>
<td>7.1&quot; (185mm)</td>
<td>4&quot; (106mm)</td>
<td></td>
</tr>
<tr>
<td>Max Dia: Full Field</td>
<td>11&quot; (280mm)</td>
<td>7&quot; (180mm)</td>
<td>8&quot; (200mm)</td>
<td>10&quot; (250mm)</td>
<td>9&quot; (234mm)</td>
<td>5&quot; (125mm)</td>
<td>3.9&quot; (98mm)</td>
</tr>
</tbody>
</table>

Projected Image: Vertically Correct

Field Of View Terminology

- **Working Distance:** The distance between the objective lens and the component when the component is in focus.
- **Field Of View (FOV):** The viewable area. To fill the 16" (400 mm) diameter screen when using a 10x lens, the maximum diameter object projected would be 1.6" (40 mm).
- **Half Field View:** The maximum size a component can be projected to the center of the screen before colliding with the lens.
- **Full Field of View:** The maximum size a component can be projected over the full screen before colliding with the lens.
- **Projected Image:** How a component is projected onto the screen in relation to its placement on the workstage.

Accessories

Starrett manufactures a comprehensive range of fixtures and accessories for our line of optical comparators. Each accessory is made from the highest material and is machined, assembled and inspected to the same stringent quality standards as the comparator itself.

Accessories

- Precision Centers and Vees
- Rotary Vee Blocks
- Rotary Vises
- Cabinet Stands
- Vertical Glass Plate Holders
- Magnification Check Gradules
- Fixed Vises

Starrett Metrology Division

Starrett Kinemetric Engineering, Inc.
26052-103 Merit Circle
Laguna Hills, CA USA 92653
Tel: 949-348-1213

HB400

Bulletin 964
1.5M/Q 8/12
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Specifications Subject to Change

Starrett.com
Optical Comparators

HDV300
HE400
HB400
HD400
HF600
HF750
VB400
VF600

LenS SelectiOn guiDe

Magnification 10 20 25 31.25 50 100

Screen diameter 16”

Field of View 1.6” (40mm)
0.8” (20mm)
0.6” (16mm)
0.5” (13mm)
0.3” (8mm)
0.16” (4mm)

Working Distance 3.1” (80mm)
3” (76mm)
2.5” (62mm)
2.2” (57mm)
2” (50mm)
1.5” (41mm)

Max Dia: Half Field
9.5” (245mm)
10.3” (263mm)
10” (253mm)
7.1” (185mm)
4” (106mm)

Max Dia: Full Field
7” (180mm)
8” (200mm)
10” (250mm)
9” (234mm)
5” (125mm)
3.9” (98mm)

Projected Image Vertically Correct
Starrett optical comparators provide a time-tested, cost-effective solution for non-contact measurement. In this easy-to-learn technology, the image of a part is projected on a screen at a precisely known magnification. Measurements can then be taken off the image by moving the system’s X-Y stage, or the image can simply be compared to a transparent overlay.

Our optical comparators combine mechanical stability with precision optics and versatile lighting to produce bright, sharp images and exceptional accuracy. We offer models in different sizes, with horizontal or vertical projection, lenses for magnifications from 5X to 100X, fiber-optic or video edge detection, manual, motor-driven or CNC workstage travel, and choice of digital readouts and PCs. Our proven mechanical designs are now enhanced with the latest metrology software for unmatched flexibility and productivity.
The Starrett HD400 is a dual-lens benchtop horizontal projection comparator, with a 16" diameter screen, a vertically correct image, 16" x 6" of stage travel, a high 110 lb workload capacity, and ultra-bright lighting. A two-lens slide allows instant switching between two magnifications. Available with fiber-optic or video edge detection, this comparator provides performance previously only available with floor-standing models.

**Video Edge Detection**
The HD400 can be converted from optical comparator to vision metrology system operation when the Starrett OV2 Optical Video Adapter is installed in place of one of the two lenses in the lens slide. This provides the ultimate system flexibility.

### Features
- 16" (400mm) diameter screen with crosslines, overlay clips and hood
- Dual mirror design for vertically erect image
- 21.3"x5.1" (540x130mm) stage surface
- 16" x 6" (406 x 152mm) XY stage travel, 2" (50mm) focus travel
- 110lb (50kg) maximum load capacity
- Dual lens slide for instant magnification changes
- All metal construction for optimum stability
- Fine adjustment for X and Y axes
- Fast traverse, zero backlash mechanism for X-axis
- Heidenhain glass scales for 0.00002" (0.5µm) X and Y resolution
- Helix angle adjustment with ±15° Vernier scale
- 250W quartz halogen surface illumination with fiber-optic delivery
- 150W quartz halogen profile illumination

### Options
- 10X, 20X, 25X, 31.25X, 50X, 100X projection lenses
- Fiber-optic edge detection
- OV2 Video Adapter for video edge detection
- Manual, motorized or CNC stage motion control
- Choice of Quadra-Chek digital readouts, tablet computer with MetLogix M2 software, or all-in-one touch-screen computer with MetLogix M3 software
MetLogix M2 Software on tablet PC with, color touch-screen (10"), 2D geometry software for point, line, circle, distance, angle and skew. Windows® 7 operating system and Wi-Fi network connectivity for import/export of CAD files and data. Supports optical edge detection and CNC control.

MetLogix M3 on an all-in-one PC. All features of the M2 tablet, but with a larger 21.5" touch-screen. Supports both optical edge detection and video edge detection.

Quadra-Chek QC221/ND1203 Digital Readout. Monochrome LCD screen (5.7"), sealed metal housing, 2D geometry software. Supports optical edge detection.

Quadra-Chek QC321/ND1303 Digital Readout. All features of the QC221/ND1203, but with a larger color touch-screen (8.4"). Supports CNC control and either optical edge detection or video edge detection.

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</tr>
</thead>
<tbody>
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<td>Mounted to comparator arm</td>
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<td>x</td>
<td>x</td>
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<td>CNC drive option</td>
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<tr>
<td>Software developer</td>
<td>MetLogix</td>
<td></td>
<td></td>
<td>Metronics / Heidenhain</td>
</tr>
</tbody>
</table>

HD400 Dimensions

Gross weight: 375lb (170kg)
Net Weight: 320lb (145kg)
Shipping dimensions: 47"x32"x50" (120x80x127cm).
HD400 Optics

The HD400 is available with a choice of seven projection lenses and the Starrett OV2 Optical Video Adapter, a video camera which can be installed in place of a projection lens to provide video edge detection (VED). All lens assemblies and the OV2 are mounted by a bayonet fitting, which allows quick changeover between magnifications or between optical projector and VED operation.

Accessories

Starrett manufactures a comprehensive range of fixtures and accessories for our line of optical comparators. Each accessory is made from the highest material and is machined, assembled and inspected to the same stringent quality standards as the comparator itself.

Lens Selection Guide

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<th>25</th>
<th>31.25</th>
<th>50</th>
<th>100</th>
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<tr>
<td>Screen diameter</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Field of View</td>
<td>1.6&quot; (40mm)</td>
<td>8(^{\circ}) (20mm)</td>
<td>6(^{\circ}) (16mm)</td>
<td>5(^{\circ}) (13mm)</td>
<td>3(^{\circ}) (8mm)</td>
<td>1.6&quot; (40mm)</td>
</tr>
<tr>
<td>Working Distance</td>
<td>3.1&quot; (80mm)</td>
<td>3&quot; (76mm)</td>
<td>2.5&quot; (62mm)</td>
<td>2.2&quot; (57mm)</td>
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<td>1.5&quot; (41mm)</td>
</tr>
<tr>
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<td>10&quot; (253mm)</td>
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<tr>
<td>Projected Image</td>
<td>Vertically Correct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Field Of View Terminology

Working Distance: Is the distance between the objective lens and the component when the component is in focus.

Field Of View (FOV): Is the viewable area. To fill the 16" (400 mm) diameter screen when using a 10x lens, the maximum diameter object projected would be 1.6" (40mm).

Half Field View: Is the maximum size a component can be projected to the center of the screen before colliding with the lens.

Full Field of View: Is the maximum size a component can be projected over the full screen before colliding with the lens.

Projected Image: Is how a component is projected onto the screen in relation to its placement on the workstage.

Accessories

- Precision Centers and Vees
- Rotary Vee Blocks
- Rotary Vises
- Cabinet Stands
- Vertical Glass Plate Holders
- Magnification Check Gradules
- Fixed Vises

Starrett Metrology Division
Starrett Kinemetric Engineering, Inc.
26052-103 Merit Circle
Laguna Hills, CA USA 92653
Tel: 949-348-1213
Digital Video Comparators

HDV300
HE400
HB400
HD400
HF600
HF750
VB400
VF600
Starrett’s new 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 mounted 5-megapixel digital video camera and are 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 field of view of up to 62mm x 47mm. Stage movement can be related to the imported file allowing part comparison up to 400mm* long.

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 gauges 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.
The HDV Series consists of two models with stage sizes 300mmx150mm or 400mmx150mm of X-Y stage travel. They feature a 5-megapixel video camera and a choice of seven interchangeable telecentric lenses (patent pending) for ultra-low optical distortion field-of-view (FOV) measurements.

Using MetLogix M3 software, DXF CAD files can be imported for direct comparison to the part video image. The HDV series can also perform as a manual horizontal vision system for part measurement utilizing a 6.5:1 zoom lens delivering higher magnifications for increased accuracy.

**Features**

- Steel construction with hard anodized X Y stage.
- 300mm x 150mm (12”x6”) of stage travel for HDV300
- 400mm x 150mm (16”x6”) of stage travel for HDV400
- 540mm x 130mm (21.3”x5.1”) workstage
- 110lb (50kg) maximum load capacity
- 51mm (2”)mm of focus travel
- Helix angle adjustment with ±15° Vernier scale
- Manual X-Y and focus positioning via hand wheels
- Heidenhain glass scales for 0.5um (0.00002”) X and Y resolution
- LED illumination for surface and profile lighting
- 5 megapixel black & white camera (2448x2058 pixels)
- Ultra-low distortion to 0.001% for telecentric field-of-view measurements
- 64-bit Intel® Processor
- Windows® 7 Professional operating system
- MetLogix M3 software with DXF/FOV option pack
- Parts displayed on 24” (60 cm) touch-screen color monitor (1920x1080 pixels)

**Options**

- Choice of 7 telecentric lenses for fields of view from 2.36”x1.77” to 0.09”x0.07”
- 6.5:1 zoom optics
- 23” or 32” high cabinet stands
**MetLogix M3**

The **HDV Series** is available with a choice of seven telecentric lenses and a 6.5:1 zoom lens. Lenses are installed by a bayonet fitting, which allows quick changeover between magnifications and between FOV or zoom operation by the user. The 0.14X lens has a dedicated mounting configuration and illuminators.

<table>
<thead>
<tr>
<th><strong>FEATURE</strong></th>
<th><strong>MetLogix M3</strong></th>
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<tbody>
<tr>
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<tr>
<td>Color graphic touch-screen</td>
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<td>Windows® 7 operating system</td>
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<td>CAD file import &amp; export</td>
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<td>FOV measurements</td>
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<td>Elimination of overlays</td>
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<tr>
<td>Software developer</td>
<td>MetLogix</td>
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</table>

**HDV Optics**

The HDV Series is available with a choice of seven telecentric lenses and a 6.5:1 zoom lens. Lenses are installed by a bayonet fitting, which allows quick changeover between magnifications and between FOV or zoom operation by the user. The 0.14X lens has a dedicated mounting configuration and illuminators.

<table>
<thead>
<tr>
<th><strong>System Parameter</strong></th>
<th><strong>Telecentric lenses</strong></th>
<th><strong>6.5:1 zoom Lens</strong></th>
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<tr>
<td>Optical Magnification</td>
<td>0.14X 0.30X 0.50X 0.80X 1.0X 2.0X 4.0X</td>
<td>0.7X 4.5X</td>
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<tr>
<td>Magnification on 24&quot; Monitor</td>
<td>8.6X 18.5X 21X 49X 62X 124X 247X</td>
<td>58X 363X</td>
</tr>
<tr>
<td>Field of View Width</td>
<td>2.36&quot; (63mm) 1.14&quot; (29mm) 0.59&quot; (15mm) 0.43&quot; (11mm) 0.35&quot; (9mm) 0.18&quot; (4.3mm) 0.09&quot; (2.3mm)</td>
<td>0.4&quot; (11mm) 0.05&quot; (1.5mm)</td>
</tr>
<tr>
<td>Working Distance</td>
<td>4.3&quot; (110mm)</td>
<td>3.4&quot; (88mm)</td>
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<td>Optical Distortion, %</td>
<td>0.001 0.001 0.002 0.002 0.005 0.006 N/A</td>
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</table>

**HDV300 Dimensions**

Shipping weight: 300 lb (136 kg)

Net weight: 220 lb (100 kg)

Shipping dimensions: 54"x40"x46" (137x102x117cm)
ACCESSORIES

Starrett manufactures a comprehensive range of fixtures and accessories for our line of optical comparators and vision metrology systems.

<table>
<thead>
<tr>
<th>ACCESSORIES</th>
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<tbody>
<tr>
<td>Precision Centers</td>
<td>Rotary Vee</td>
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<td>and Vees</td>
<td>Blocks</td>
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<td>Cabinet Stands</td>
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<tr>
<td>Vertical Glass</td>
<td>Fixed Vises</td>
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<td>Plate Holders</td>
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<tr>
<td>Rotary Vises</td>
<td>Interchangeable Lenses</td>
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</tbody>
</table>

Starrett Metrology Division
Starrett Kinematic Engineering, Inc.
26052-103 Merit Circle
Laguna Hills, CA USA 92653
Tel: 949-348-1213

Starrett.com

HDV300
Bulletin 966
1.5M/Q 8/12
The L.S. Starrett Company 2012®
Specifications Subject to Change
Starrett’s floor model optical comparators are well known throughout the world for superior value and exceptional measuring performance across the full measuring range and at all magnifications. The Hoof sets the standard in all the applications from the DQ lab to the production floor.

The same exemplary build standards as the HF600, the HF750 super capacity optical comparator delivers benefits from an even larger 30” (762mm) screen. This large, fully usable screen sets a new standard for clarity and brightness.

Ideal for use over a broad spectrum of industries and applications, the HF750 projector is designed and built to satisfy the requirements of measuring small to large work pieces with total precision, ruggedness and efficiency.

Side bed models, HS600 and HS750, are also available.

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### Features and Specifications

- Fully usable 30” (762mm) screen diameter
- Floor model design for optimum large workpiece performance and accuracy
- Large measuring travel: 12” X-axis, 8” Y-axis (300mm x 200mm)
- High precision workstage with 25” x 9” top plate, with 2 machine slots for easy fixing
- Stage weight capacity: 330lb
- Dual mirror design for vertically correct image
- 2-lens condenser, turret mounted
- Available with the full range of Quadra-Chek readout systems
- Digital protractor for accurate angle measurements, 1’ resolution
- ±15º Sub workstage helix adjustment for accurate thread form inspection
- Standard with 3-lens indexable turret
- Power stage on vertical and horizontal axis
- Fully retractable fiber optic surface illumination with heavy duty shielding
- Canopy and curtains included standard
- Automatic edge detection option
- CNC workstage options

www.inspec-inc.com  sales@inspec-inc.com

ISO/IEC 17025:2005
ANSI/NCSL Z540-1-1994
ANSI/NCSL Z540.3-2006
Calibration Certificate #3466.01

7282 Haggerty Rd.
Canton, MI 48187
p. 734-451-8740
f. 734-451-8741
Optical Comparators

HDV300
HE400
HB400
HD400
HF600
HF750
VB400
VF600

Accessories
Precision Centers
and Vees
Rotary Vee Blocks
Rotary Vises
Cabinet Stands

Vertical Glass Plate
Magnification Check
Gradules
Fixed Vises
Starrett optical comparators provide a time-tested, cost-effective solution for non-contact measurement. In this easy-to-learn technology, the image of a part is projected on a screen at a precisely known magnification. Measurements can then be taken off the image by moving the system’s X-Y stage, or the image can simply be compared to a transparent overlay.

Our optical comparators combine mechanical stability with precision optics and versatile lighting to produce bright, sharp images and exceptional accuracy. We offer models in different sizes, with horizontal or vertical projection, lenses for magnifications from 5X to 100X, fiber-optic or video edge detection, manual, motor-driven or CNC workstage travel, and choice of digital readouts and PCs. Our proven mechanical designs are now enhanced with the latest metrology software for unmatched flexibility and productivity.
Vertical Benchtop Optical Projector

The VB400 vertical projection comparator allows flat parts to be simply laid on a glass insert in the workstage. Features include a 16" diameter vertical screen, ultra-bright LEDs for long-life illumination, linear encoder scales for 0.00002" (0.5µm) resolution, and angle readout to 1 minute resolution. Available with stages with 8"x4" or 10"x6" of travel. Options include six projection lenses from 10X to 100X and a choice of digital interfaces.

Features

- 16" (400mm) diameter screen with crosslines, calibration marks and hood
- 16" x 9" (400x230mm) workstage with 8"x4" (200x100mm) of travel, 2" (50mm) focus travel
- 22lb (10kg) maximum load capacity
- Easy-to-use manual motion control
- Bayonet lens socket for quick magnification changes
- Dual mirror design for vertically correct image
- All metal construction for optimum stability
- Fine adjustment for X and Y axes
- Fast traverse, zero backlash mechanism for X-axis
- Heidenhain glass scales for 0.00002" (0.5µm) X and Y resolution
- Helix angle adjustment with ±15° Vernier scale
- LED profile illumination
- LED surface illumination using a beam-splitting mirror

Options

- 10X, 20X, 25X, 31.25X, 50X, 100X projection lenses
- Larger 18"x11" (450 x 285 mm) workstage with 10"x6" (250x150 mm) of travel
- Fiber-optic edge detection
- Choice of Quadra-Chek digital readouts, tablet computer with MetLogix M2 software, or all-in-one touch-screen computer with MetLogix M3 software
- 23" (58cm) or 32" (81cm) cabinet stand

MetLogix M2 Software on tablet PC with, color touch-screen (10"), 2D geometry software for point, line, circle, distance, angle and skew. Windows® 7 operating system and Wi-Fi network connectivity for import/export of CAD files and data. Supports optical edge detection and CNC control.

Quadra-Chek QC221/ND1203 Digital Readout. Monochrome LCD screen (5.7"). sealed metal housing, 2D geometry software. Supports optical edge detection.

<table>
<thead>
<tr>
<th>Feature</th>
<th>MetLogix M2</th>
<th>Quadra-Chek QC221</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounted to comparator arm</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Color graphics</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Touch-screen operation</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MS Windows operating system</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>X-Y-Q angle measurements</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>2D geometry software w/ skew</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Optical edge detection option</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Video edge detection option</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CAD file import &amp; export option</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CNC drive option</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Software developer</td>
<td>MetLogix</td>
<td>Metronics / Heidenhain</td>
</tr>
</tbody>
</table>

VB400 Dimensions

Shipping weight: 443lbs (201kg)
Net weight: 423lbs (192kg)

Shipping dimensions:
48.8"x32.6"x34.6" (124x83x88cm).
The VB400 is available with a choice of six projection lenses, which are mounted by a bayonet fitting for quick changeover between magnifications. Projected images are vertically correct.

### Lens Selection Guide

<table>
<thead>
<tr>
<th>MAGNIFICATION</th>
<th>10</th>
<th>20</th>
<th>25</th>
<th>31.25</th>
<th>50</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen diameter</td>
<td>16” (400mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of View</td>
<td>1.6” (40mm)</td>
<td>.8” (20mm)</td>
<td>.6” (16mm)</td>
<td>.5” (13mm)</td>
<td>.3” (8mm)</td>
<td>.16” (4mm)</td>
</tr>
<tr>
<td>Working Distance</td>
<td>3.1” (80mm)</td>
<td>3” (76mm)</td>
<td>2.5” (62mm)</td>
<td>2.2” (57mm)</td>
<td>2” (50mm)</td>
<td>1.5” (41mm)</td>
</tr>
<tr>
<td>Half Field View</td>
<td>5.5” (140mm)</td>
<td>4” (106mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Field View</td>
<td>5.5” (140mm)</td>
<td>5.4” (138mm)</td>
<td>5” (125mm)</td>
<td>3.9” (98mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected Image</td>
<td>Vertically Correct</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Field Of View Terminology

- **Working Distance:** Is the distance between the objective lens and the component when the component is in focus.
- **Field Of View (FOV):** Is the viewable area. To fill the 16” (400 mm) diameter screen when using a 10x lens, the maximum diameter object projected would be 1.6” (40 mm).
- **Half Field View:** Is the maximum size a component can be projected to the center of the screen before colliding with the lens.
- **Full Field of View:** Is the maximum size a component can be projected over the full screen before colliding with the lens.
- **Projected Image:** Is how a component is projected onto the screen in relation to its placement on the workstage.

### Accessories

Starrett manufactures a comprehensive range of fixtures and accessories for our line of optical comparators. Each accessory is made from the highest material and is machined, assembled and inspected to the same stringent quality standards as the comparator itself.

<table>
<thead>
<tr>
<th>ACCESSORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision Centers and Vees</td>
</tr>
<tr>
<td>Vertical Glass Plate Holders</td>
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</tbody>
</table>