OCS TECHNOLOGIES

Starrett®

OPTICAL COMPARATORS

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.

Starrett®

OCS TECHNOLOGIES

HORIZONTAL BENCH-TOP OPTICAL COMPARATOR

HE400

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

OPERATOR INTERFACE Feature	Metlogix M1	M2	Metlogix Mx100	Mx200
Mounted to Comparator Arm	x	x	x	x
Color Graphics	x	x	x	x
MS Windows Operating System	x	x		
X-Y-Q Axis Digital Readout	x	x	x	x
2D Geometry Software View	x	x	x	x
Optical Edge Detection Option	x	x	x	x
Geometric Functions	x	x	x	x
Tolerancing		x		x
Data Export and Reporting	x	x	x	x
Part Programming and Playback		x		x

HE400

SPECIFICATIONS

HE400	
Horizontal Travel	10" (250mm)
Vertical Travel	4" (100mm)
Focus Travel	1-1/8" (28mm)
Top Plate*	18.75 x 4.7" (480 x 120mm)
Image	Inverted and reversed

*With machined single slot for easy fixturing
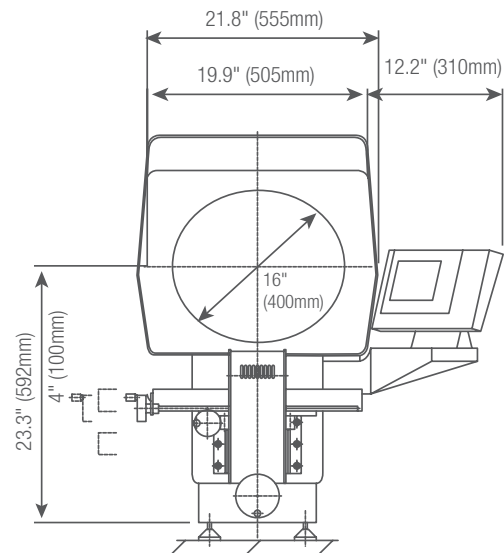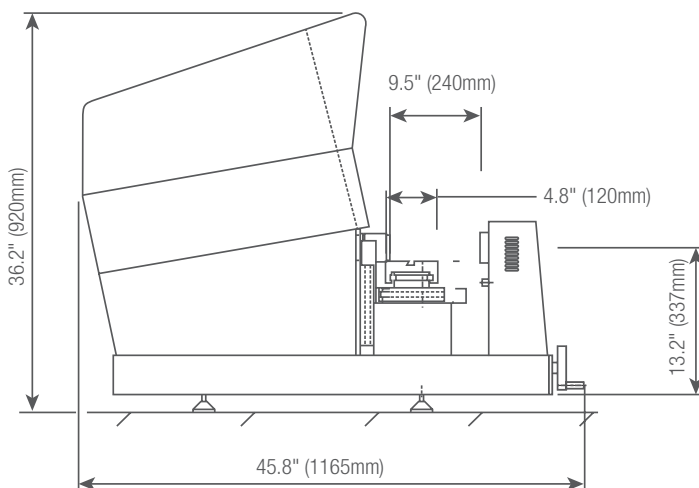
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OCS TECHNOLOGIES

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) with .5µm 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 Mx100 & Mx200
- 15.4lb (7kg) load capacity
- 18.75 x 4.74" (480 x 120mm) precision workstage top plate with machined slot for easy fixturing
- 10 x 4" (254 x 100mm) of XY stage travel
- 1-1/8" (8mm) focus travel
- 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
- Automatic fiber optic edge detection
- Canopy and curtains (designed to mount on Starrett cabinet stand
- Purpose built cabinet stand
- Extensive line of accessories

HE400 DIMENSIONS

WEIGHT AND DIMENSIONS

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

HORIZONTAL BENCH-TOP OPTICAL COMPARATOR

HB400

The HB400 Optical Comparator provides exceptional performance with a 16" (400mm) diameter viewing screen and 110lbs work-stage load capacity. Available with optical and/or video edge detection which removes operator subjectivity in locating edges of parts being measured. A bayonet style lens mounting system accepts a choice of six fixed interchangeable lenses. Motorized stage, fully automatic CNC controls and swing-away lamp house are all optional features. This comparator provides performance previously only available with floor standing models.

OPERATOR INTERFACE Feature	Metlogix M1	M2	Metlogix Mx100	Mx200
Mounted to Comparator Arm	x	x	x	x
Color Graphics	x	x	x	x
MS Windows Operating System	x	x		
X-Y-Q Axis Digital Readout	x	x	x	x
2D Geometry Software View	x	x	x	x
Optical Edge Detection Option	x	x	x	x
Geometric Functions	x	x	x	x
Tolerancing		x		x
Data Export and Reporting	x	x	x	x
Part Programming and Playback		x		x

HB400

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
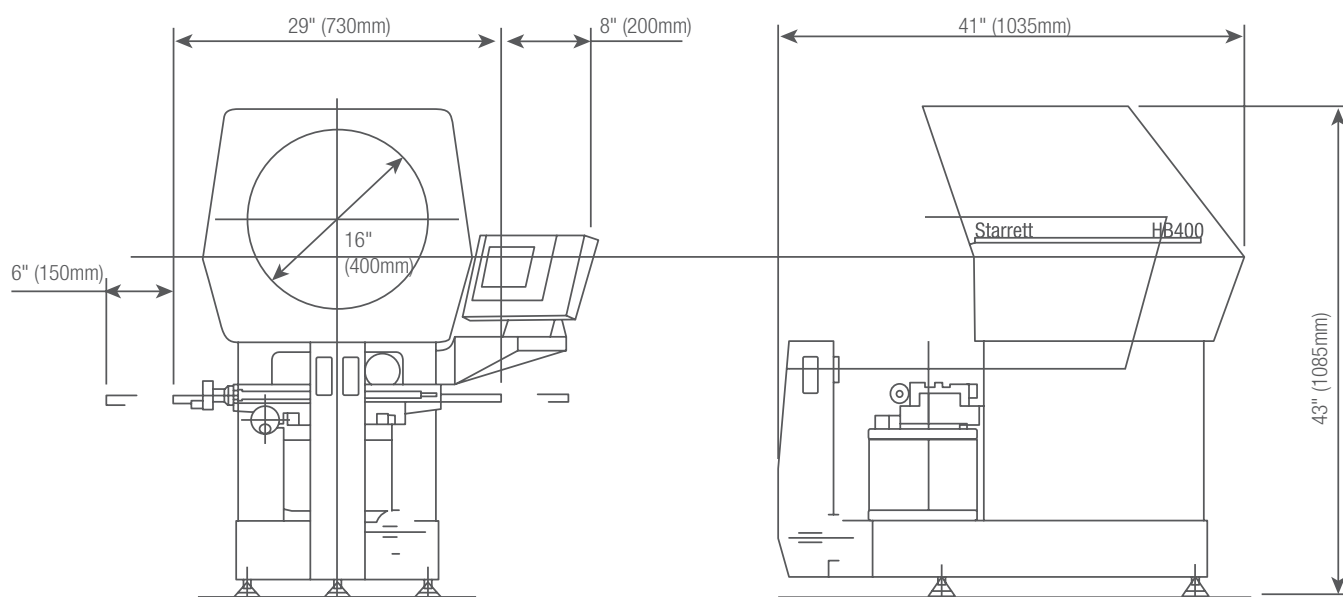
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OCS TECHNOLOGIES

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 PC-based touch screen measuring software or Mx100 & Mx200
- 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 or interchangeable lens system available by special order
- Automatic fiber optic edge detection
- 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

HB400 Dimensions

WEIGHT AND DIMENSIONS

	HB400
Net Weight	320lbs 145kg
Shipping 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 magnifications lenses or video camera adaptor. The HD400 is equipped with a 16" (400mm) travel workstage as standard. Optional automatic edge detection or video edge detection removes operator subjectivity in locating edges of parts being measured. A bayonet style lens mounting system accepts a choice of six interchangeable lenses . Motorized stage, fully automatic CNC controls and swing-away lamp house are all optional features.

OPERATOR INTERFACE Feature	Metlogix M1	M2	Metlogix Mx100	Mx200
Mounted to Comparator Arm	x	x	x	x
Color Graphics	x	x	x	x
MS Windows Operating System	x	x		
X-Y-Q Axis Digital Readout	x	x	x	x
2D Geometry Software View	x	x	x	x
Optical Edge Detection Option	x	x	x	x
Geometric Functions	x	x	x	x
Tolerancing		x		x
Data Export and Reporting	x	x	x	x
Part Programming and Playback		x		x

HD400

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
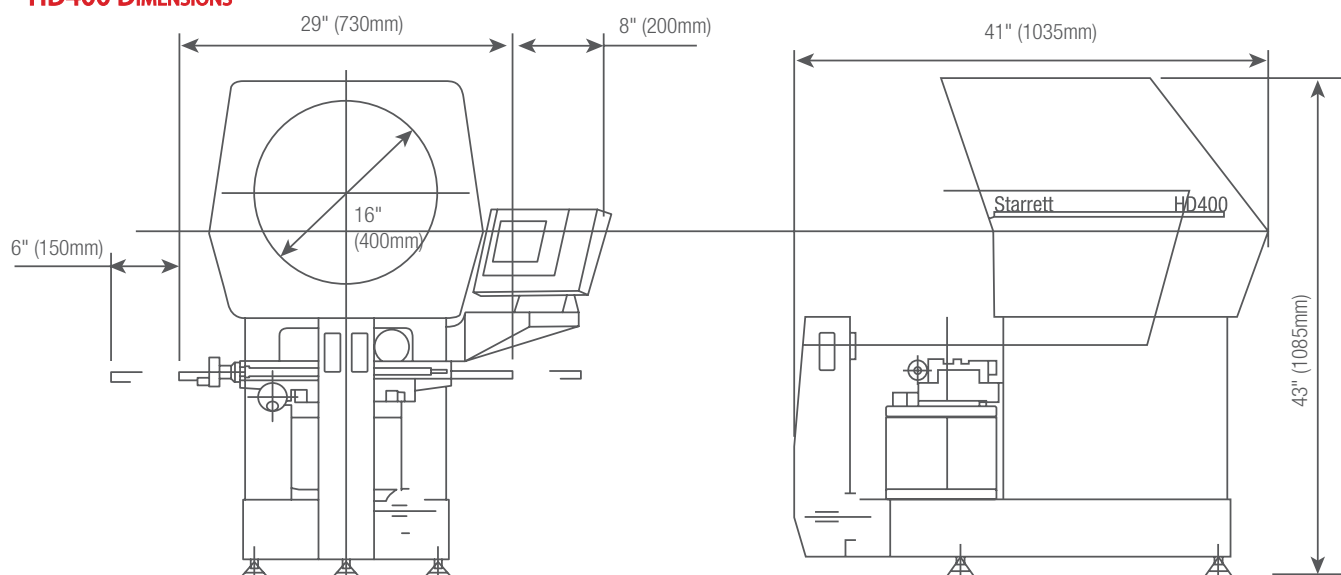
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OCS TECHNOLOGIES

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
- Fully retractable flexible duplex fiber optic surface illumination
- Digital protractor for accurate angle measurements (1' resolution) via Q-axis readout
- Helix adjustment for accurate thread form inspection
- Available with MetLogix™ M1 tablet, M2 PC-based touch screen measuring software or Mx100 & Mx200
- 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 fiber optic edge detection
- 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
Shipping Weight	385lbs 175kg
Shipping Dimensions	49" (L) x 32" (W) x 51" (H)

Specifications and Options

Model	HE400	HB400	HD400
Bench Top System	X	X	X
Floor-Standing System	-	-	-
Part View Orientation	Horizontal	Horizontal	Horizontal
Side Bed Version	-	-	-
Screen Diameter (in)	16"	16"	16"
Screen Diameter (mm)	400mm	400mm	400mm
X-Y Measuring Range (in)	10 x 4"	16" x 6"	16 x 6"
X-Y Measuring Range (mm)	250 x 100mm	400mm x 150mm	400 x 150mm
Linear Glass Scale Encoder on X and Y Axis	Standard	Standard	Standard
Motorized X-Y Axis	-	Optional	Optional
CNC Control	-	Optional	Optional
Focus Range (in)	1.2"	2"	2"
Focus Range (mm)	30mm	50mm	50mm
Work Stage (in)	18.75 x 4.75"	21.25 x 5"	21.25 x 5"
Work Stage (mm)	475 x 120mm	540 x 130mm	540 x 130mm
Load Capacity with Negligible Deflection (lbs)	15lbs	22lbs	22lbs
Load Capacity Maximum (lbs)	55lbs	110lbs	110lbs
Angular Measurement Resolution	1'	1'	1'
Profile Illumination	Standard	Standard	Standard
Surface Illumination	Standard	Standard	Standard
Quick Change Lens Mount (lenses not included)	Single	Single	Dual
Collimating Condenser with Yellow/Green Filter	Standard	Standard	Standard
Control System Software	M1, M2, Mx100, Mx200	M1, M2, Mx100, Mx200	M1, M2, Mx100, Mx200
Display (control system dependent)	Metlogix DRO, M1 tablet, 15" All-in-One touch screen PC	Metlogix DRO, M1 tablet, 15" All-in-One touch screen PC	Metlogix DRO, M1 tablet, 15" All-in-One touch screen PC
Optical Edge Detection	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
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
Helix Center Support System	-	-	-
Precision Rotary Work Stage	-	-	-
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
Field of View Diameter (mm)	40, 20, 16, 13, 8, 4mm	40, 20, 16, 13, 8, 4mm	40, 20, 16, 13, 8, 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"
Working Distance (mm)	80, 76, 62, 57, 50, 41mm	80, 76, 62, 57, 50, 41mm	80, 76, 62, 57, 50, 41mm
Cabinet Stand 32"	Optional	Optional	Optional
Cabinet Stand 23"	Optional	Optional	Optional
Canopy and Curtains	Optional	Optional	Optional

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	OCN8	Large Centers and Vees	N/A
B	ORV2	2" Capacity Rotary Vise	
C	4U000	Magnification Checking Graticule	HE/HB/HD400
D	OCN7	Small Centers and Vees	N/A
E	7P000	Centers and Vees	HE/HB/HD400
F	9W000 3V000	Helix Center Support Fixture	N/A
G	6H000	Centers and Vees	N/A
H	OVH1	Vertical Glass Plate Holder	N/A
J	7U000	Vertical Glass Plate Holder	HE/HB/HD400
K	4H003	1-1/4" Rotary Vise	HE/HB/HD400
M	6U003	Rotary Work-stage	N/A
N	4H002	Fixed Position Vise with 1-1/4" Capacity	HE/HB/HD400
P	4H004	Universal Vee Block on Rotary Base	
S	P-10095 P-10102	32" Cabinet Stand 23" Cabinet Stand	HE/HB/HD400
T*	P-10485	Canopy/Curtains designed to be used with cabinet	HE/HB/HD400

*Product not shown

METLOGIX™ SOFTWARE

M1 - 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
- Optional optical edge detection provides better throughput and removes operator subjectivity
- Video edge detection option on M3 only
- Four different report forms can be printed or exported to Microsoft Excel, text files, or to an SPC program
- M2 utilizes a Windows®-based operating system enables flexible data export and interface capability
- M1 utilizes an Android operating system and a Bluetooth® connection to the host Optical Comparator
- Fast, easy connection to printers and networks

M1 - M2

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

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

Starrett®

OCS TECHNOLOGIES

MX100 - MX200

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Mx100

- 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
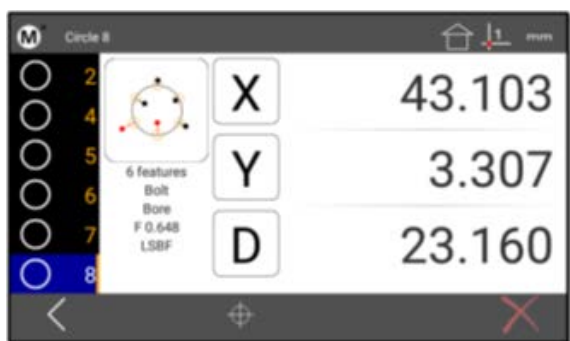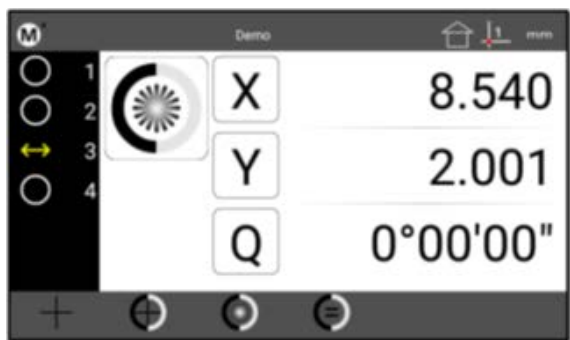
Mx200

- Inch/metric conversion, toggle between incremental/absolute and simple zero reset
- Skew function for ease of part alignment
- Integrated geometric tolerancing allows 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

Mx100

Mx200

Starrett®

OCS TECHNOLOGIES

STARRETT PRODUCT LINES

FORCE MEASUREMENT

HAND TOOLS

LASER MEASUREMENT

METROLOGY EQUIPMENT

OPTICAL SYSTEMS

PRECISION GRANITE

VISIONS SYSTEMS

WEBBER GAUGE BLOCKS

OCS TECHNOLOGIES SERVICES

ISO 17025 ACCREDITED CALIBRATION:

DIMENSIONAL

ELECTRICAL

FORCE MEASUREMENT

HARDNESS

MASS

MATERIAL TESTING

METROLOGY EQUIPMENT

OPTICAL SYSTEMS

PRESSURE

TEMPERATURE

TORQUE

VISIONS SYSTEMS

WEIGHING

METROLOGY SYSTEMS

OCS TECHNOLOGIES

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