



BOWERS GROUP

ESEWAY®

**Bowers Eclipse Equipment
Shanghai Co., Ltd.**

8th Bld, No. 178 Chengjian Rd,
Shanghai, 201108, China
Tel: +86-21-64348600 Fax: +86-21-64346488
Email: sales@bowers-shanghai.com
Website: bowers-shanghai.com



BOWERS GROUP

Micro Vickers Hardness Tester 400 SERIES



Partners in Precision

MICRO VICKERS HARDNESS TESTERS

EW-400 SERIES



Manual Z-Axis movement, precision adjustment

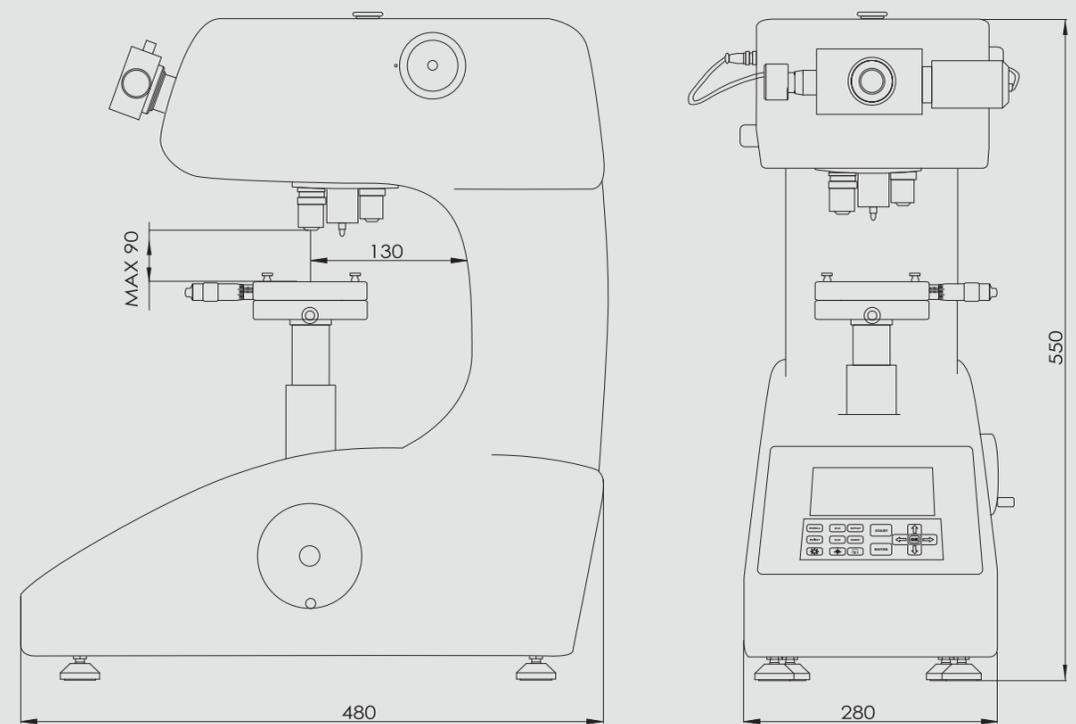
EW-400 ANALOGUE
MICRO VICKERS & KNOOP



Optional: Electronic handwheel spring loaded, for dynamic Z-Axis movement

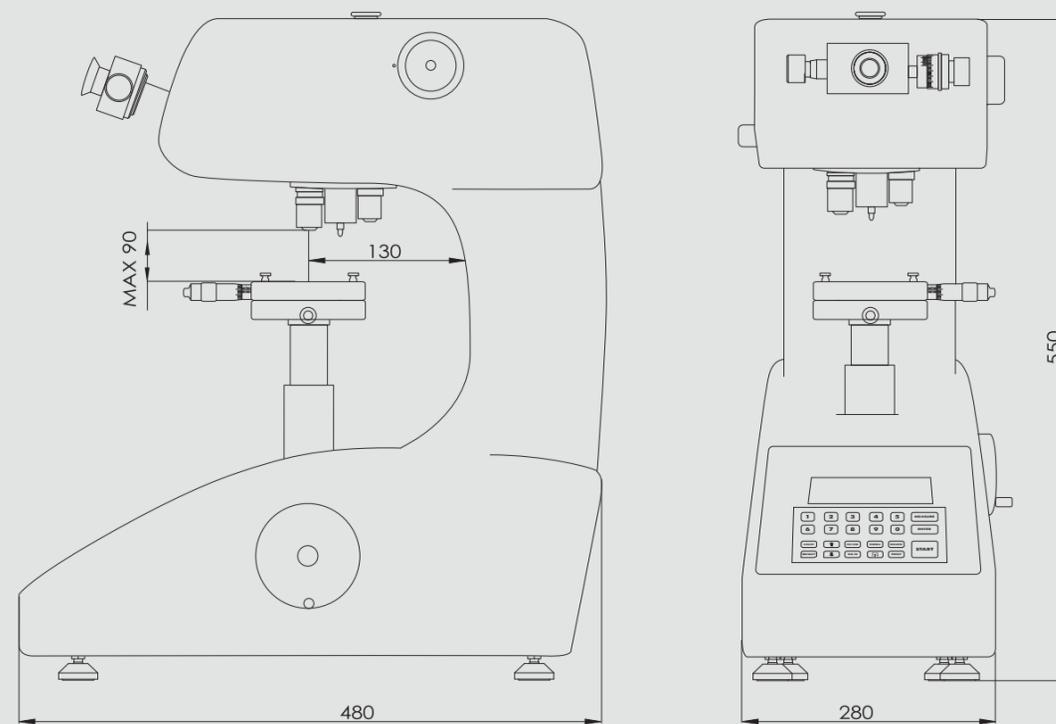
EW-400 DIGITAL
MICRO VICKERS & KNOOP

TECHNICAL DRAWING EW-400DAT



All dimensions are in mm

TECHNICAL DRAWING 400AAT



All dimensions are in mm

FEATURES EW-400AAT SERIES

- Motorized turret
- Analogue microscope
- Motorized load control
- X-Y stage with 0.01 mm resolution
- Built-in high speed printer
- Second optical or Video path

Analogue eyepiece reading

A traditional hardness testing system using a high precision load application mechanism. The 400 series is available in different configurations starting at 10gf/0.98N ranging to 2kgf/19.6N maximum force.

The standard motorized single objective turret can be completed with a second indenter or 3 objectives to ensure maximum flexibility.

The 400 series has an analogue eyepiece (15x magnification) with bright micrometer reading to determine the indent diagonals.

The values obtained from the micrometer can be keyed in to the graphic user interface. The automatically calculated Vickers or Knoop hardness will be shown on the bright display.

FEATURES EW-400DAT SERIES

- Motorized turret
- High resolution electronic microscope, digital value transfer
- Conversion to other hardness scales
- Motorized load control
- Statistics and conversions
- X-Y stage with 0.01 mm resolution
- Built-in high speed printer
- Second optical or Video path

Digital eyepiece reading

As an alternative to the standard 400 series, the series 400DAT offers a digital electronic microscope with enhanced functionality and high resolution readings.

Obtained diagonal measurements are transferred automatically to the CPU system and calculated to the actual Vickers or Knoop value. The 400DAT has more advanced display functions.

The system shows realtime statistic values, converts to Rockwell, Brinell, Leeb and UTS (tensile strength).

The 423DAT the top model of the range, is one of the most advanced traditional Micro Vickers systems currently available.

MICRO VICKERS HARDNESS TESTERS

EW-400 SERIES

FORCE RANGING FROM 10GF/0.98N UP TO 2KGF/19.6N WITHOUT CHANGING WEIGHTS

The 400 series allows testing workpieces of a wide variety. The test force can be selected with the help of an easy to operate selector knob on the side of the tester. Replacing any weights is not necessary. The tester does the full range up to 2kg by just turning the selector knob to the required force position. The test range of the 400 series is quite unique for a traditional micro-hardness tester.

High accuracy, flexibility and pure efficiency are synonyms for the 400 series.



AVAILABLE FORCE CONFIGURATIONS

- 412AAT** Analogue, 2 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N (HV)
- 413AAT** Analogue, 3 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N (HV)
- 412DAT** Digital, 2 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N (HV)
- 413DAT** Digital, 3 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N (HV)
- 422AAT** Analogue, 2 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N, 2kgf/19.6N (HV)
- 423AAT** Analogue, 3 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N, 2kgf/19.6N (HV)
- 422DAT** Digital, 2 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N, 2kgf/19.6N (HV)
- 423DAT** Digital, 3 objectives,
0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N,
0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N, 2kgf/19.6N (HV)

**ALL MODELS HAVE A MOTORIZED TURRET.
DUAL INDENTOR POSITION ON REQUEST.**

IMP-1 (Basic)

IMPRESSIONS XT V1.01 license (CCD camera and C-mount included)
Software for on screen measurement of Vickers / Knoop, LCD industrial DVI touch screen included.

IMP-2 (Standard)

IMPRESSIONS XT V1.01 license, (for manual X-Y stage). (CCD camera and C-mount included)
Software for manual and automatic measurement of Vickers / Knoop, Indent zoom function, automatic light adjustment, LCD industrial DVI touch screen included.

IMP-3 (With one stage micrometer)

IMPRESSIONS XT V1.01 license, (manual 1 axis digital X-Y stage). (CCD camera and C-mount included)
Software for manual and automatic measurement of Vickers / Knoop, Indent zoom function, digital micrometer (1) on X-Y stage, automatic light adjustment, LCD industrial DVI touch screen included.

IMP-4 (With two stage micrometers)

IMPRESSIONS XT V1.01 license, (manual 2 axis digital X-Y stage). (CCD camera and C-mount included)
Software for manual and automatic measurement of Vickers / Knoop, Indent zoom function, digital micrometers (2) on X-Y stage, automatic light adjustment, LCD industrial DVI touch screen included.

IMP-5MV (With motorized XY stage)

IMPRESSIONS XT V1.01 license, (motorized X-Y stage). (CCD camera and C-mount included)
Software for manual and automatic measurement of Vickers / Knoop, Indent zoom function, automatic light adjustment, coordinate multi pattern testing module, motorized X-Y stage, LCD industrial DVI touch screen included, virtual mouse function.

IMP-6MV (With motorized XY stage & AF)

IMPRESSIONS XT V1.01 license, (motorized X-Y stage and motorized Z-axis, auto focus). (CCD camera and C-mount included)
Software for manual and fully automatic measurement of Vickers / Knoop, Indent zoom function, automatic indent focus, automatic light adjustment, coordinate multi pattern testing module, motorized X-Y stage, LCD industrial DVI touch screen included, virtual mouse function.

OPTIONAL

Spring load height adjustment button or dynamic speed height adjustment.

All versions of Innovatest™ Impressions™ hardness testing firmware offer an easy tool to adjust the correct height of work stages for coordinate pattern testing. The absolute feel of control on a force feedback joystick or spring loaded scroll wheel with center position gives users the option to enjoy easy and accurate work piece positioning.

The approach speed goes from zero to full based on the position of the scroll wheel. Slow ramping or fast up/down all controlled by one button. Objectives and indentors are collision protected by intelligent sensor technology.

ORDER DETAILS

- IMP-1** Indent measuring software, included CCD camera (see above specifications)
- IMP-2** Indent measuring software, included CCD camera and DVI 15" touch screen (see above specifications)
- IMP-3** Indent measuring software, included CCD camera and DVI 15" touch screen (see above specifications)
- IMP-4** Indent measuring software, included CCD camera and DVI 15" touch screen (see above specifications)
- IMP-5MV** Indent measuring software, included CCD camera and DVI 15" touch screen (see above specifications)
- IMP-6MV** Indent measuring software, included CCD camera and DVI 15" touch screen (see above specifications)

MICRO VICKERS



STAGES

- Manual X-Y stage
- Digital manual X-Y stage
- Motorized X-Y stage
- Motorized X-Y-Z stage



INDENTORS

Vickers or Knoop

OBJECTIVES

- 5x for 75x magnification
- 10x for 150x magnification
- 20x for 300x magnification
- 40x for 600x magnification

EYEPIECE

Electronic eyepiece microscope with high resolution encoder
(Standard 1.5x magnification, optional 10x magnification)

TURRET CONFIGURATION

Fully automatic 4 position turret for Micro Vickers/Macro Vickers, Knoop measurements, 2 or 3 objectives at choice, all 3 objectives can be used for measuring and observation, 1 or 2 indenter positions (Vickers & Knoop)



FEATURES

- High resolution USB video camera for crisp indent images
- Manual & automatic indent measuring mode (Optional)
- Indent ZOOM function for fit to screen indent magnification (Optional)
- Automatic illumination setting (Optional)
- Save, store and print files and images
- Report generator
- Data export to Excel or other MS applications
- Pattern programming, saving and recall (Optional)
- Return to position and re-measure (Optional)
- Variable distance point plotting



TABLE OPTION 1
ANALOGUE STAGE
MICROMETERS



TABLE OPTION 2
DIGITAL STAGE
MICROMETERS



TABLE OPTION 3
LARGE MOTORIZED
STAGE

MICRO VICKERS HARDNESS TESTERS

EW-400 SERIES

TECHNICAL SPECIFICATIONS

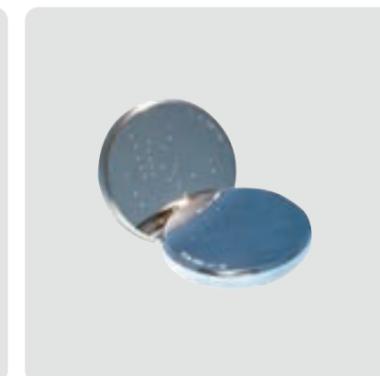
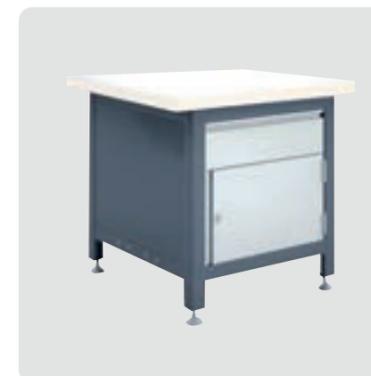
Hardness scale	Micro Vickers
Test force selection	Manual
Test procedure	Automatic, loading/dwell/unloading
Hardness value	5 digits
Turret	4 positions over 360°, fully automatic, memorized start position, option for 2 indentors and 2 objectives or 1 indentor and 3 objectives
Test force accuracy	<1% for test force 200gr to 2kg, <1.5% for test force below 100gr
Test loads	0.01kgf/0.098N, 0.025kgf/0.24N, 0.05kgf/0.49N, 0.1kgf/0.98N, 0.2kgf/1.96N, 0.3kgf/2.94N, 0.5kgf/4.9N, 1kgf/9.8N, 2kgf/19.6N depending on model
User display	Length of diagonals, hardness value, converted value, test force, online statistics
Display resolution	0.1 HV, HK
Hardness conversion	Rockwell, Rockwell Superficial, Brinell, Leeb & Tensile (D models)
Standards	Meets or exceeds, ISO, ASTM, JIS (Nadcap) standards
Statistics	Total test, max, min, average, range, standard deviation, all in real time after each test
Control panel	Start test, stop test, light intensity, dwell time, print, clear. Menu operation for date, time, scale and load settings, language (D models)
Firmware	V2.01 German, English, French (standard) V2.02 English, Italian, Spanish
Memory	Memory for batch testing results (20 results)
Connectivity	RS-232 Bi-Directional
Dwell time setting	Default 10 seconds, user defined 1 to 60 seconds (1 sec increments)
Printer	Built-in, silent high speed thermal printer
Eyepiece microscope	Bright Dual line filar eyepiece with 15x magnification, 0.1µm reading
Test color (standard)	Laboratory White
Light source	Halogen 12V, 30 Watt, green filter, dimmable
Optical path	2 way, eyepiece/CCD camera
Workpiece accommodation	Vertical capacity 90mm (maximum workpiece height), Horizontal capacity 120mm (from center-line)
Stage dimensions	Stage 100mm x 100mm, Travel 25mm x 25mm, Reading 0.01mm
Operating temperature	10°C to 35°C, non-condensing
Humidity	10% to 90% non-condensing
Machine dimensions	480mm x 280mm x 550mm
Machine weight	37.5kg
Power consumption	390W
Power supply	100VAC to 240VAC, 50/60Hz, single phase

STANDARD DELIVERY

- Vickers test block
- Manual X-Y stage
- Objectives according to model (10x and 40x or 10x, 20x and 40x)
- Analogue or Electronic microscope 15x
- Set of workpiece fixtures, vice, chuck, clamp
- Level gauge
- Spare halogen lamp
- Built-in silent thermal printer
- Four adjustable feet
- Power cable
- Quality certificate
- Installation & user manual
- Color: Laboratory White

OPTIONAL ACCESSORIES

- Factory indentors
- Certified indentors (UKAS, ASTM)
- Factory reference hardness blocks
- Certified reference hardness blocks (UKAS, ASTM)
- Custom testing tables
- Objectives at choice
- IMPRESSIONS™ XT Video indent measuring systems
- Motorized X-Y stage (small or large)
- Motorized X-Y-Z stage(auto focus)
- Solid tester table and storage cabinet



ORDER DETAILS

- 412AAT** Micro Vickers, analogue, 2 objectives for measuring/observation, test forces 0.01kgf/0.098N to 1kgf/9.8N
- 413AAT** Micro Vickers, analogue, 3 objectives for measuring/observation, test forces 0.01kgf/0.098N to 1kgf/9.8N
- 412DAT** Micro Vickers, digital, 2 objectives for measuring/observation, test forces 0.01kgf/0.098N to 1kgf/9.8N
- 413DAT** Micro Vickers, digital, 3 objectives for measuring/observation, test forces 0.01kgf/0.098N to 1kgf/9.8N
- 422AAT** Micro Vickers, analogue, 2 objectives for measuring/observation, test forces 0.01kgf/0.098N to 2kgf/19.6N
- 423AAT** Micro Vickers, analogue, 3 objectives for measuring/observation, test forces 0.01kgf/0.098N to 2kgf/19.6N
- 422DAT** Micro Vickers, digital, 2 objectives for measuring/observation, test forces 0.01kgf/0.098N to 2kgf/19.6N
- 423DAT** Micro Vickers, digital, 3 objectives for measuring/observation, test forces 0.01kgf/0.098N to 2kgf/19.6N