

400 SERIES

Vickers Hardness Tester





400 ANALOGUE
MICRO-VICKERS & KNOOP



400 DIGITAL
MICRO-VICKERS & KNOOP

FEATURES

400A series

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

FEATURES

400D 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 0.01mm resolution
- Built-in high speed printer
- Second optical or Video path

MICRO-VICKERS

400 SERIES

400A SERIES - 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 ranging to 2kgf 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.



400D SERIES - DIGITAL EYEPIECE READING

As an alternative to the standard 400 series, the series 400D 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 400D has more advanced display functions. The system shows realtime statistic values, converts to Rockwell, Brinell, Leeb and UTS (tensile strength). The 423D the top model of the range, is one of the most advanced traditional Micro-Vickers systems currently available.



FORCE RANGING FROM 10GF UP TO 2KGF 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.

400A ANALOGUE EYEPIECE



400D DIGITAL EYEPIECE



AVAILABLE FORCE CONFIGURATIONS

412A 1 kg Analogue, 2 objectives for measuring/observation
413A 1 kg Analogue, 3 objectives for measuring/observation

412D 1 kg Digital, 2 objectives for measuring/observation
413D 1 kg Digital, 3 objectives for measuring/observation

422A 2 kg Analogue, 2 objectives for measuring/observation
423A 2 kg Analogue, 3 objectives for measuring/observation

422D 2 kg Digital, 2 objectives for measuring/observation
423D 2 kg Digital, 3 objectives for measuring/observation
ALL MODELS HAVE A MOTORIZED TURRET.
DUAL INDENTOR POSITION ON REQUEST.

STAGES

Manual X-Y-Z stage, Motorized X-Y stage, Motorized X-Y-Z stage
 INNOVAVIEW™ CCD system with Video filar INV-1, 2 or 3
 INNOVAVIEW™ CCD system with auto focus and Video filar, INV-4

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 indentor positions (Vickers & Knoop)

INDENTORS

Vickers or Knoop

EYEPIECE

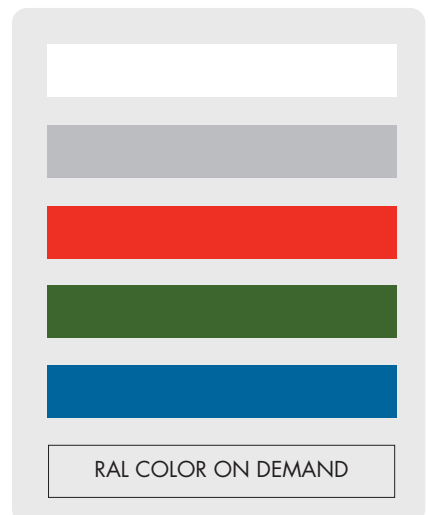
Electronic eyepiece microscope with high resolution encoder
 (Standard 15x magnification, optional 10x magnification)

OBJECTIVES

5x for 75x	magnification
10x for 150x	magnification
20x for 300x	magnification
40x for 600x	magnification
60x for 900x	magnification

TESTER COLORS

INC-1LW	Laboratory White
INC-2CGM	Charcoal Grey Metallic
INC-3FR	Ferrari Red
INC-4BRG	British Racing Green
INC-5ABL	Atlantic Blue
INC-RAL XXXX	Any RAL color on demand



TECHNICAL SPECIFICATIONS

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
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)
Standardization	EN, ISO 6507, EN ISO 6506, ASTM E-384, ASTM E-10-08
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
Data output	RS-232 Bi-Directional
Dwell time setting	Default 10 seconds, user defined 0 to 60 seconds
Printer	Built-in, silent high speed thermal printer
Eyepiece microscope	Bright Dual line filar eyepiece with 15x magnification, 0.1µm reading
Light source	Halogen 12V, 30 Watt, green filter, dimmable
Optical path	2 way, eyepiece / CCD camera
Vertical capacity	90mm (maximum specimen height)
Horizontal capacity	130mm (from center-line)
Stage dimensions	100mm x 100mm, travel 25mm x 25mm, reading 0.01mm
Operating temperature	5°C to 40°C (+/-20° for force 25gr & 50gr)
Humidity	10% to 90% non condensing
Machine dimensions	420mm x 250mm x 490mm
Machine weight	37.5kg
Power requirements	100VAC to 240VAC, 50/60Hz, single phase
Power consumption	390W
Guarantee	2 years limited guarantee

STANDARD DELIVERY

- Manual X-Y-Z stage
- Objectives according to model (10x and 40x or 10x, 20x and 40x)
- Analogue or Electronic microscope 15x
- Vickers test block
- Built-in silent thermal printer
- RS-232 data output
- Set of workpiece fixtures, vice, chuck, clamp
- Level gauge
- 4 adjustable feet
- Spare halogen lamp
- Installation & user manual
- Quality certificate
- Color: Laboratory White

OPTIONAL ACCESSORIES

- Objectives at choice
- INNOVAVIEW™ Vision manual or automatic measuring and filing systems
- Motorized X-Y stage (small or large)
- Motorized X-Y-Z stage (auto focus)
- Indentors & hardness test blocks
- Certified indentors
- Reference hardness blocks
- Solid tester table & storage cabinet
- Customized tester color

ORDER DETAILS

412A Analogue, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1kgf (HV)

413A Analogue, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1kgf (HV)

412D Digital, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1kgf (HV)

413D Digital, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1kgf (HV)

422A Analogue, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2kgf (HV)

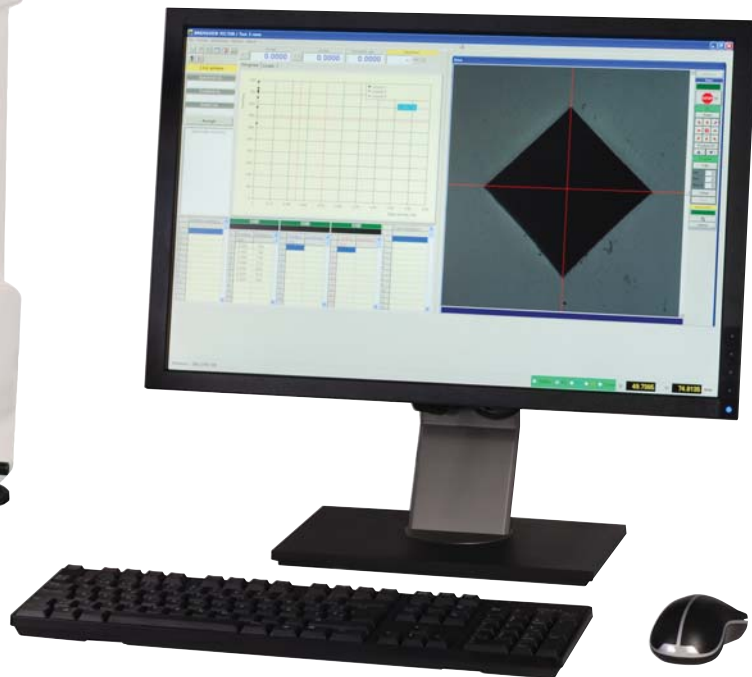
423A Analogue, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2kgf (HV)

422D Digital, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2kgf (HV)

423D Digital, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2kgf (HV)



MICRO-VICKERS



INV VISION SYSTEM



TABLE OPTION 1
ANALOGUE STAGE MICROMETERS

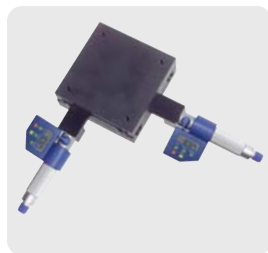


TABLE OPTION 2
DIGITAL STAGE MICROMETERS



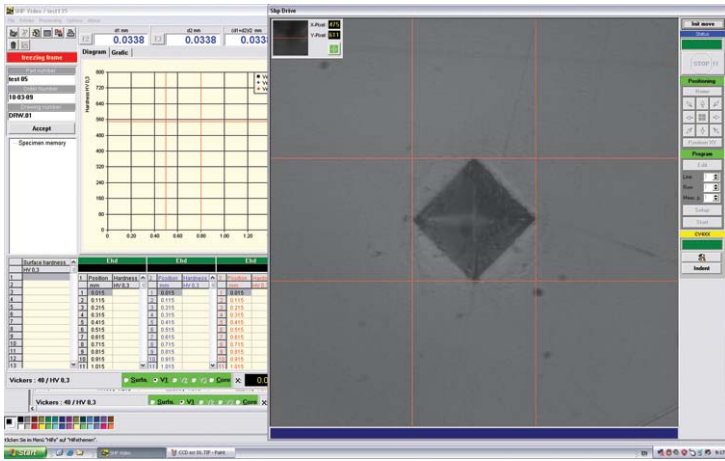
TABLE OPTION 3
SMALL MOTORIZED STAGE



TABLE OPTION 4
LARGE MOTORIZED STAGE

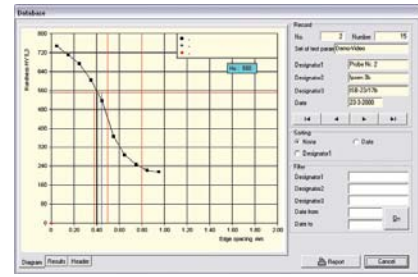
FEATURES

- High resolution 2 mega pixels video camera creating crisp indent images
- Manual & automatic image measuring mode
- Save, print and store image
- Report generator
- Data export to Excel or other MS applications
- Pattern programming, saving and recall
- Return to position and re-measure option
- Variable distance point plotting



INV-1

PC-based camera indent measuring system.
Manual measurement of the indent on the LCD screen.
Store, file, handle images and data on the harddisk.



Distance	Hardness	Distance	Hardness	Distance	Hardness	Surface Hardness
1	0.000	0.000	700.0	0.000	700.0	700.0
2	0.100	0.100	650.0	0.100	650.0	650.0
3	0.200	0.200	600.0	0.200	600.0	600.0
4	0.300	0.300	550.0	0.300	550.0	550.0
5	0.400	0.400	500.0	0.400	500.0	500.0
6	0.500	0.500	450.0	0.500	450.0	450.0
7	0.600	0.600	400.0	0.600	400.0	400.0
8	0.700	0.700	350.0	0.700	350.0	350.0
9	0.800	0.800	300.0	0.800	300.0	300.0
10	0.900	0.900	250.0	0.900	250.0	250.0
11	1.000	1.000	200.0	1.000	200.0	200.0
12						
13						
14						
15						
Ave						300.0

INV-2

INV-1 plus digital micrometers to measure stage displacement to control accurate indent coordinates and to ease case depth measurement.
Automatic measuring optional.

INV-3

INV-2 plus motorized X-Y stage, automatic pattern and traverse system, workpiece position control over external or built-in PC.
Indent vision system shows real time measurement.
Semi-Automatic system. Automatic measuring optional.

INV-4

INV-3 plus motorized Z-axis for auto focus, X-Y table controlled by external or internal computer. Fully automatic system, including automatic measurement.
Allows a series of automatic test with storage of test results without operator interference. Saves time and money.

ORDER DETAILS

- CCD INV1** Manual measurement
- CCD INV2** Manual measurement with digital micrometers
- CCD INV3** Motorized, X-Y stage (choose stage size)
- CCD INV4** Fully automatic, auto focus X-Y-Z stage (choose stage size)

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